

# Electrolytic Aluminum Capacitors





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A Worldwide presence







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# Selection Guide

## SCREW TERMINALS









Reference	Capacitance ( $\mu$ F)	Voltage (V)	Dimensions in mm (inches)		Operating temperature	Main characteristics	Page
			$\emptyset$	H			
 <b>FELSIC 85 (BC) - CO 54</b> <b>FELSIC 85 (BD) - CO 53</b>	68 to 680 000	10 to 630	36 to 90 (1,417 to 3,543)	52 to 200 (2,047 to 7,874)	-55°C + 85°C	Standard 85°C	<b>16</b>
 <b>FELSIC 039 (BC) - CO 39</b> <b>FELSIC 037 (BD) - CO 37</b>	100 to 150 000	10 to 400	36 to 77 (1,417 to 3,031)	47 to 144 (1,850 to 5,669)	-55°C + 85°C	Standard C039 type (railway maintenance standard)	<b>22</b>
 <b>FELSIC 85 M (BC) - CO 54</b> <b>FELSIC 85 M (BD) - CO 53</b>	68 to 330 000	10 to 630	36 to 90 (1,417 to 3,543)	52 to 200 (2,047 to 7,874)	-55°C + 85°C	Standard 85°C $\pm$ 20% tolerance	<b>26</b>
 <b>FELSIC 105 (BC - BD)</b>	100 to 470 000	16 to 450	36 to 90 (1,417 to 3,543)	52 to 200 (2,047 to 7,874)	-55°C + 105°C	Extreme Long life	<b>31</b>
 <b>FELSIC 105 TFRS (BC - BD)</b> <b>-CO 45</b>	470 to 68 000	10 to 100	36 to 77 (1,417 to 3,031)	47 to 144 (1,850 to 5,669)	-55°C + 105°C	Very low ESR	<b>35</b>
 <b>FELSIC 105 LP (BC)</b>	1 500 to 220 000	10 to 450	90 (3,543)	67 (2,638)	-55°C + 105°C	105 with Low Profile can	<b>38</b>
 <b>FELSIC HC (BC - BD)</b>	100 to 2 200 000	10 to 500	36 to 90 (1,417 to 3,543)	52 to 200 (2,047 to 7,874)	-40°C + 85°C	High energy density	<b>40</b>
 <b>FELSIC HV (BC - BD)</b>	1 500 to 47 000	160 to 450	51 to 90 (2,008 to 3,543)	104 to 200 (4,094 to 7,874)	-55°C + 105°C	Extreme Long life; High ripple	<b>48</b>
 <b>FELSIC 125 FRS (BC) - CO 47</b> <b>FELSIC 125 FRS (BD) - CO 46</b>	220 to 150 000	16 to 350	36 to 90 (1,417 to 3,543)	53 to 145 (2,087 to 5,709)	-55°C + 125°C	Low ESR	<b>51</b>

## RADIAL LEADED






Reference	Capacitance ( $\mu$ F)	Voltage (V)	Dimensions in mm (inches)				Operating temperature	Main characteristics	Page
			I	L	$\emptyset$	H			
 <b>ALSIC 145 20g</b>	220 to 3 300	12 to 115			20 25 (0,787) (0,984)	18 22,5 (0,709) (0,886)	-55°C + 145°C	High temperature range - Long life withstand 20g vibrations	<b>56</b>
 <b>ALSIC 20g</b>	100 to 80 000	10 to 500			20 25 (0,787) (0,984)	18 to 35,5 (0,787 to 0,984)	-55°C + 105°C	Withstand 20g vibrations	<b>58</b>
 <b>CUBISIC</b>	100 to 33 000	10 to 450	35 (1,378)	35 to 50 (1,378 to 1,969)		16 (0,630)	-55°C + 105°C	Non cylindrical case, Withstand 20g vibrations, High energy density	<b>61</b>
 <b>CUBISIC LP</b>	120 to 68 000	10 to 400	45 (1,772)	12 (0,472)		35 to 75 (1,378 to 2,953)	-55°C + 105°C	Non cylindrical case, Withstand 20g vibrations, High energy density	<b>64</b>

# Selection Guide

## SNAP IN

Reference	Capacitance ( $\mu$ F)	Voltage (V)	Dimensions in mm (inches)		Operating temperature	Main characteristics	Page
			$\emptyset$	H			
 <b>SNAPSIC</b>	22 to 47 000	16 to 500	22 to 35 (0,866 to 1,378)	30 to 50 (1,181 to 1,969)	-55°C + 85°C	Standard 85°C type	<b>68</b>
 <b>SNAPSIC 105</b>	22 to 68 000	16 to 500	22 to 35 (0,866 to 1,378)	25 to 50 (0,984 to 1,969)	-55°C + 115°C	Standard 105°C type	<b>72</b>
 <b>SNAPSIC HC</b>	33 to 47 000	25 to 500	22 to 35 (0,866 to 1,378)	25 to 50 (0,984 to 1,969)	-40°C + 85°C	High energy density	<b>76</b>
 <b>SNAPSIC HV</b>	47 to 2 200	16 to 500	22 to 35 (0,866 to 1,378)	25 to 50 (0,984 to 1,969)	-55°C + 105°C	Long Life; High ripple current	<b>83</b>
 <b>SNAPSIC 4P</b>	330 to 150 000	16 to 500	35 to 45 (0,866 to 1,378)	50 to 100 (1,969 to 3,937)	-55°C + 85°C	Standard 85°C type with 4Pins	<b>86</b>
 <b>SNAPSIC 105 4P</b>	330 to 150 000	16 to 500	35 to 45 (0,866 to 1,378)	50 to 100 (1,969 to 3,937)	-55°C + 105°C	Standard 105°C type with 4Pins	<b>90</b>
 <b>SNAPSIC 105 LP</b>	150 to 68 000	16 to 500	45 (1,772)	16 to 40 (0,630 to 1,575)	-55°C + 105°C	Low Profile 105°C with 4 Pins	<b>93</b>
 <b>SNAPSIC 125</b>	470 to 47 000	16 to 100	22 to 35 (0,866 to 1,378)	25 to 50 (0,984 to 1,969)	-55°C + 125°C	High temperature range - Long Life	<b>96</b>

## AXIAL LEADED

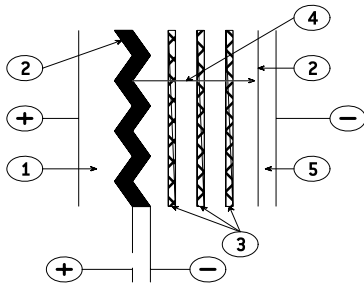
Reference	Capacitance ( $\mu$ F)	Voltage (V)	Dimensions mm (inches)		Operating temperature	Main characteristics	Page
			$\emptyset$	H			
 <b>SICAL</b> <b>SICAL CO 42</b>	2,2 to 47 000	10 to 630	6,5 to 25 (0,256 to 0,984)	15 to 75 (0,591 to 2,953)	-55°C + 85°C	Standard 85°C type	<b>100</b>
 <b>PRORELSIC 125</b> <b>CO 52</b>	1 to 15 000	10 to 450	6,5 to 25 (0,256 to 0,984)	15 to 75 (0,591 to 2,953)	-55°C + 125°C	125°C Long life	<b>106</b>
 <b>PRORELSIC 145</b> <b>CO 52</b>	6,8 to 10 000	16 to 450	14 to 25 (0,551 to 0,984)	30 to 75 (1,181 to 2,953)	-55°C + 145°C	High temperature Long life	<b>112</b>
 <b>VACSIC 105</b>	15 to 4 700	10 to 350	12 to 16 (0,472 to 0,630)	30 (1,181)	-55°C + 105°C	Standard 105°C type Withstand 45g vibrations.	<b>116</b>
 <b>VACSIC 150</b>	6,8 to 3 300	16 to 450	12 to 16 (0,472 to 0,630)	30 (1,181)	-55°C + 150°C	High temperature Long life Withstand 45g vibrations	<b>119</b>

OLD RANGES	REPLACEMENT TYPES	OLD RANGES	REPLACEMENT TYPES	OLD RANGES	REPLACEMENT TYPES
FELCIC 125	FELCIC 125 FR5	CELLSIC	FELCIC HC 10 , 16 V	RELSIC TFRS (CO 43)	SICAL CO 42
FELCIC TFRS (CO 45)	FELCIC 105 TFRS (BC) (CO 45)	CMF FP - CMF	SICAL CO 42 - SICAL	SICAL 025 (CO 25)	SICAL CO 42
FELCIC HP	FELCIC 105 77 x 220	CMF FR5 12.3	SICAL CO 42	SICAL 041 (CO 41)	SICAL CO 42
FELCIC IND (BC - BD) 93.6, 94.6	FELCIC HC FELCIC 85 (BC - BD)	PROMISIC 015 (CO 15)	PRORELSIC 125 (CO 52) PROMISIC 031		
FELCIC UPS	FELCIC HC	PROMISIC 125 (CO 16)	PRORELSIC 125 (CO 52)		
FELCIC 018 (CO 18)	FELCIC 85 BC - FELCIC 039	PROMISIC FR5 (CO 32)	SICAL CO 42		
FELCIC 019 (CO 19)	FELCIC 85 BC - FELCIC 039	PROMISIC TFRS (CO 28)	SICAL CO 42		
FELCIC DI	FELCIC 85 480 V - 500 V	PRORELSIC 105 TFRS (CO 48) (2)	PRORELSIC 125 (CO 52)		
FELCIC 036 (CO 36)	FELCIC 037 (CO 37)	RELSIC 026 (CO 26)	PRORELSIC 125 (CO 52) RELSIC 033		
FELCIC 038 (CO 38)	FELCIC 039 (CO 39)	RELSIC 125 (CO 44)	PRORELSIC 125 (CO 52)		

# General technical data

## 1. BASIC CONSTRUCTION

Structure of an electrolytic aluminum capacitor is shown hereunder:



1. Anode: aluminum foil
2. Dielectric: aluminum oxide
3. Papers spacers impregnated with electrolyte
4. Ionic conduction assumed by electrolyte
5. Cathode: aluminum foil

The positive plate is an etched aluminum foil covered with alumina which is the dielectric of the capacitor.

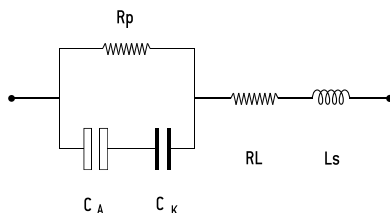
The negative plate is constituted by a second aluminum foil which serves as a current supply, and by electrolyte-impregnated papers layers.

The metal used for anode is a  $\geq 99,98\%$  grade aluminum.

The dielectric has a thickness of  $13 \text{ \AA} / V$ .

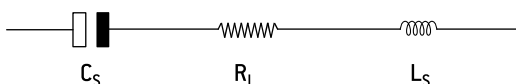
The aluminum used for the cathode is a  $\geq 98\%$  grade aluminum covered with a dielectric layer with a thickness of about  $40 \text{ \AA}$ .

## 2. DIAGRAM OF THE EQUIVALENT CIRCUIT



- $C_A$  = Capacitance of the anode  
 $C_K$  = Capacitance of the cathode  
 $R_p$  = Parallel resistance due to the aluminum oxide film.  
 $R_L$  = Series resistance of connections, plates and impregnated spacer.  
 $L_s$  = Inductance of winding and connections.

A standard simplified diagram is.



$C_s$  is the series capacitance of both anode and cathode capacitances. Electrolytic aluminum capacitors are naturally polarized because of the insulating film on the anode. Given the very thin aluminum oxide layer, a reversed voltage should not exceed 1.5 V when there is energy supply.

Short duration reverse voltages can be absorbed by special construction, second anode replacing the former cathode.

## 3. CAPACITORS MARKING

### 3.1. ARTICLE CODE (ON EACH PACKAGING)

A followed by 6 figures number. First 3 positions are specific of the range. (Ex. A 745xxx for a FELSIC 85 BD)

140 FELSIC in bank	741 FELSIC 125 FRS BD (ex 731)
701 PRORELSIC 125	742 PRORELSIC 105 TFRS
703 PRORELSIC 125	743 PRORELSIC 105 TFRS
704 SNAPSIC	744 FELSIC 85 BC
705 SNAPSIC 105	FELSIC 85 LP
706 FELSIC HP BC – BD	745 FELSIC 85 BD
708 PRORELSIC 145	746 FELSIC 85 M BC
710 CUBISIC	747 FELSIC 85 M BD
711 PROMISIC 031	748 SICAL CO 42 - SICAL
712 CUBISIC LP	749 SICAL CO 42 - SICAL
713 SNAPSIC 105 LP	750 CUBISIC 125
714 SNAPSIC 4P	756 FELSIC 105 BC
715 SNAPSIC 105 4P	FELSIC 105 LP
716 SNAPSIC HV	757 FELSIC 105 BD
717 SNAPSIC HC	760 FELSIC 105 BC
718 SNAPSIC 125	761 FELSIC HC BD
721 RELSIC 033	762 FELSIC 105 TFRS BC
722 CI FRS	763 FELSIC 105 TFRS BD
723 CI FRS	764 FELSIC HV BC
728 FELSIC 039 (ex 72?)	765 FELSIC HV BD
FELSIC DI	775 VACSIC
738 FELSIC 037 (ex 73?)	774 VACSIC 150
740 FELSIC 125 FRS BC (ex 731)	776 ALSIC 20G
	ALSIC 145 20G

In FELSIC ranges, article code without first letter A, is printed on each capacitor.

a Figure 9 in fourth position shows a special product.

### 3.2. BATCH (ON EACH CAPACITOR).

3 figures or 6 figures

### 3.3. DATE (ON EACH CAPACITOR IF APPLICABLE)

4 figures (year-week)

## 4. ELECTRICAL CHARACTERISTICS

### 4.1. RATED CAPACITANCE $C_R$

The rated capacitance is defined at 100 Hz and at ambient temperature.

### 4.2. RATED VOLTAGE $U_R$

$U_R$  is the maximum DC voltage which may be applied in continuous operation.

When applying a superimposed alternating voltage, the peak value of the resulting waveform should not exceed the rated voltage.

### 4.3. PEAK VOLTAGE $U_p$

$U_p$  is the maximum repetitive voltage which can be applied within short periods.

Defined in CECC 30 300 and IEC 60 384-4:

1000 cycles of 30 s charge followed by a no load period of 5 min. 30 s with upper category temperature.

$$U_p \leq 1,15 U_R \quad (U_R \leq 315 \text{ V})$$

$$U_p \leq 1,10 U_R \quad (U_R > 315 \text{ V})$$

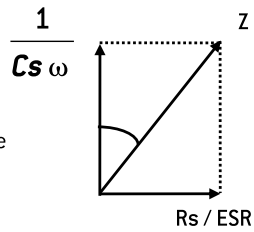
# General technical data

## 4.4. DISSIPATION FACTOR TANδ

The dissipation or loss factor is defined by its tangent  $\text{Tan}\delta$

$$\text{Tg}\delta = R_s C_s \omega$$

$$(\omega = 2\pi F)$$



**ESR** Capacitor Equivalent Series Resistance

**Cs** Capacitor capacitance

**F** Frequency [100 Hz]

**Z** Capacitor impedance

## 4.5. EQUIVALENT SERIES RESISTANCE ESR

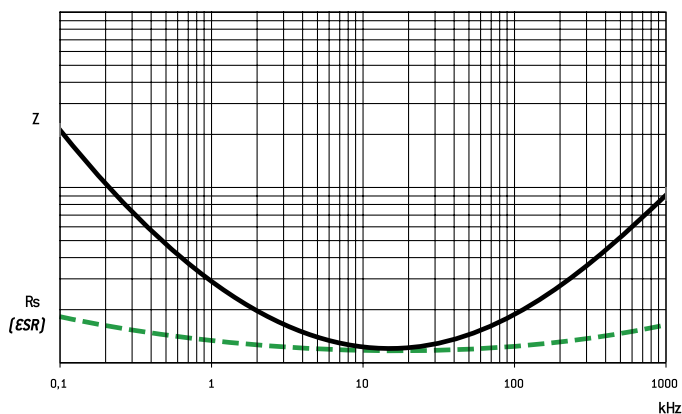
The relation between ESR and dissipation factor  $\text{Tan}\delta$  is given in § 4.4.

## 4.6. IMPEDANCE Z - INDUCTANCE L

The impedance is given by:

$$Z = \sqrt{R^2 + \left[L\omega - \frac{1}{C\omega}\right]^2}$$

L inductance. Generally  $L = 5$  to  $20$  nH



Z and ESR as function of frequency typically follows the chart:

## 4.7. PERMISSIBLE RIPPLE CURRENT (I r.m.s.) I~

The current is defined at the maximum climatic category and at 100 Hz. It is the root mean square value r.m.s. The value  $I_0$  is the rated value for calculations of expected life up to  $3 I_0$ .

## 4.8. LEAKAGE CURRENT II

It is measured at  $20^\circ\text{C}$  after a 5 min. polarization under rated voltage.

For  $C_R$  in  $\mu\text{F}$  and  $U_R$  in V:

$I \leq 0,01 C_R U_R$  or  $1 \mu\text{A}^*$

when  $C_R U_R \leq 1000 \mu\text{C}$

$I \leq 0,006 C_R U_R + 4 \mu\text{A}$

when  $C_R U_R > 1000 \mu\text{C}$

For  $U_R > 350 \text{V}_{\text{DC}}$  it can be specified:

with  $K = 4, 6$  or  $8$

or

$I \leq 0,3 (C_R U_R)^{0,7} + 4 \mu\text{A}$  (CECC 30 300)

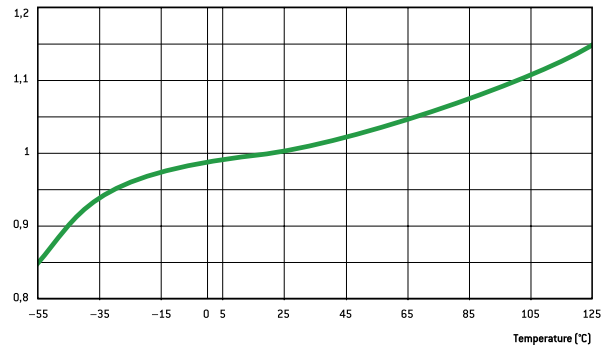
\* Whichever is the greater

## 4.9. CHARACTERISTICS

Versus temperature [typical values].

### 4.9.1. Capacitance drift

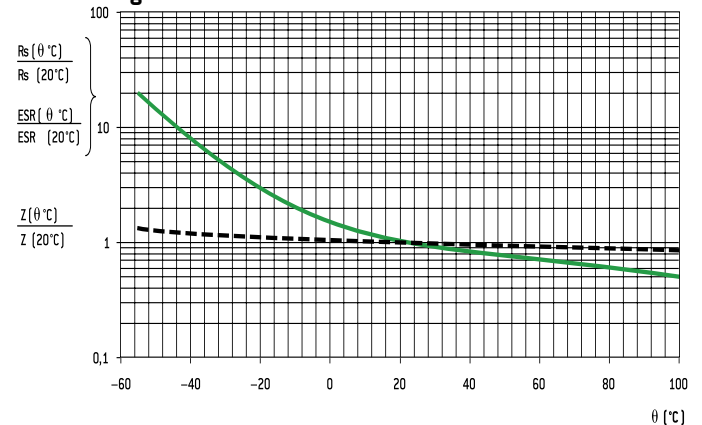
Versus temperature



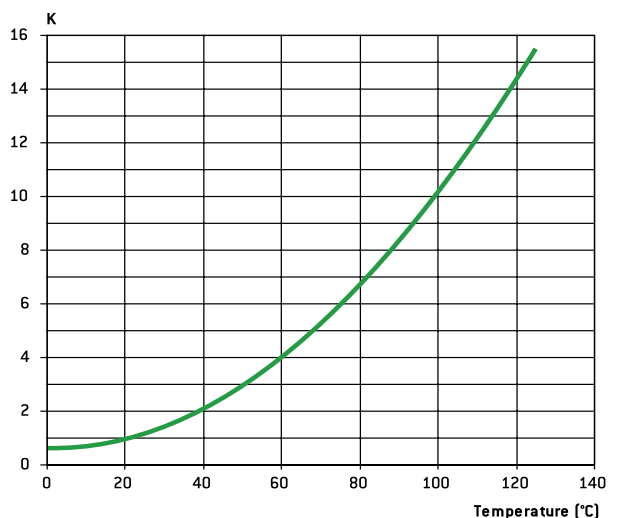
### 4.9.2. ESR and Z drifts at 100 Hz

Versus temperature

### 4.9.3 Leakage current drift



Versus temperature





# General technical data

## 5. SPECIFICATION TO APPLY

Electrolytic aluminum capacitors are defined in:

- NF and UTE French national standard
- CECC European specifications
- IEC international specifications

Quality insurance procedures are described in these specifications.

	French	European	International
Generic specification Fixed capacitors	NF C 83 100	CECC 30 000 EN 130 000	IEC 60 384 -1 QC 300 000
Sectional specification Electrolytic aluminum capacitors	NF C 83 110	CECC 30 300	IEC 60 384 - 4 C 300 300
Blank deta II specification - Electrolytic aluminum capacitors with non solid electrolyte.	UTE 83 110	CECC 30 301	IEC 60 384 - 4 -1 QC 300 301
Blank deta II specifications	CECC 30 301- 017 to CECC 30 301- 062 CO 31 to CO 55	CECC 30 301- 017 to CECC 30 301- 062 CECC 30 301- 802 to CECC 30 301- 811	

## 6. ENDURANCE TESTS / LIFE TIME

### 6.1. STANDARD ENDURANCE TEST

at max category temperature:

Temperature	Endurance test			
	Grade I - Long life			Grade II - General purpose
	10 000 h	5 000 h	2 000 h	1 000 h
125°C			•	
105°C		•	•	•
85°C	•	•	•	•

Standard endurance tests do not exceed 2000 hours at 125°C. However, present EXXELIA technologies concerning liquid electrolytes have led to endurance tests up to 5000 hours at 125°C (PRORELSIC 125 - FELSIC 125 RS) and even 20000 hours at 125°C (PRORELSIC 145 - ALSIC 145)

### 6.2. PERFORMANCE REQUIREMENTS ON STANDARD ENDURANCE TESTS.

Permissible capacitance drift  $\Delta C/C$  (%)

Permissible increase factors on  $\tan\delta$ , ESR, Z and II initial values

$U_R$	Endurance test			
	Grade I			Grade II
	10 000 h	5 000 h	2 000 h	1 000 h
6,3 V			+15 -30	+25 -40
10 V - 35 V	+15 -20	$\pm 15$	$\pm 15$	$\pm 30$
40 V - 160 V	$\pm 15$	$\pm 15$	$\pm 15$	$\pm 30$
> 160 V	$\pm 15$	$\pm 10$	$\pm 10$	$\pm 15$

	Endurance test			
	Grade I			Grade II
	10 000 h	5 000 h	2 000 h	1 000 h
$\tan\delta$ or ESR [1]	1,5	1,3	1,3	1,5
Z [2]	3	2	2	3
II	Standard values			

[1]  $\tan\delta$  or ESR: for initial value, take standard value.

[2] Z: for initial value, take specified value [see data sheet ].

Specific requirements can be taken into consideration with regards to initial values of dissipation factor or equivalent series resistance and impedance.

## 6.3. FAILURE CRITERIA FOR ELECTROLYTIC CAPACITORS.

Failure criteria are defined in CECC 30 301

- Non measurable defaults leading to complete failure.
- Measurable defaults leading to adjustment losses of the load circuit (failure due to variations).

### 6.3.1. Non measurable defaults.

They might be summed up as:

- Open circuit
- Short circuit
- Operation of pressure relief device
- Severely damaged insulation
- Unusable terminations

### 6.3.2. Measurable defaults.

Variations exceeding the values given below characterize a default.

- Capacitance drift  $\Delta C/C$  (%): 3 times the limit for standard endurance testing or 50 % (whichever is the smallest).
- $\tan\delta$  or ESR: 3 times standard max initial values.
- Z: 3 times standard max initial values.
- II: initial limit (under load conditions).

Specific requirements can be taken into consideration with regards to lower drifts.

## 6.4. INFLUENCE OF MAIN PARAMETER ON OPERATIONAL LIFE.

### 6.4.1. Temperature.

The capacitors operational life is highly dependent upon its internal temperature  $\Theta_i$  and therefore upon the ambient temperature and the ripple current.

Knowing ESR and dissipated power values (§ 6.4.3.) one can figure out, the internal temperature rise and then determine the capacitors expected life.

With present high boiling point electrolytes (§ 8.6)

$\Theta_i$  max = 125 to 185°C depending on styles.

### 6.4.2. Ripple current.

The ripple current flowing through the capacitor increase the internal temperature through power dissipation.

Standards define the permissible current at 100 Hz and generally consider a temperature rise of 5 to 10°C of max category temperature.

Current waveforms and frequencies make it difficult to clearly determine the capacitors internal temperature rise, which defines the operationally life.

Experiments confirm following relationship:

$$\Theta_i = \Theta_a + (\Theta_c - \Theta_a) K$$

Where:

- $\Theta_i$  = Internal hot spot temperature
- $\Theta_a$  = Ambient temperature
- $\Theta_c$  = Case temperature
- K = Parameter depending upon case diameter and cooling
  - $\emptyset \geq 51$  k =  $2 \pm 0,5$
  - $\emptyset < 51$  k =  $1,5 \pm 0,5$  (air cooling - 0,2 m/s)



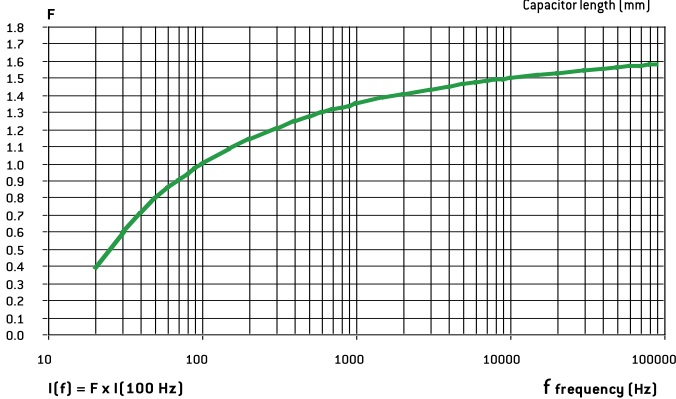
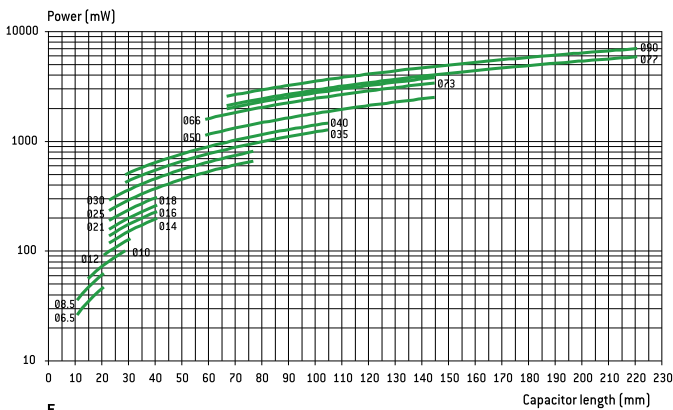
# General technical data

### r.m.s. value according to current waveform.

Function	Mean value	R.m.s. value	Function	Mean value	R.m.s. value	Function	Mean value	R.m.s. value
	$A (t_0/T)$	$A \sqrt{t_0/T}$		$A/2$	$A \sqrt{3}$		$2A/\pi$	$A/\sqrt{2}$
	$A (t_i/T)$	$A \sqrt{2t_i/3T}$		$2A/\pi (t_0/T)$	$A \sqrt{t_0/2T}$		$A/2$	$A/\sqrt{3}$
	$A/2 (t_0/T)$	$A \sqrt{t_0/3T}$		$A/2 (t_0/T)$	$A \sqrt{t_0/3T}$		0	A

### 6.4.3. Dissipated power versus case dimension

For calculations of ripple currents, considering an internal temperature rise of 10°C



$P = ESR \cdot I^2$

P = Dissipated power (mW)

( $\Theta_i - \Theta_a = 10^\circ\text{C}$ )

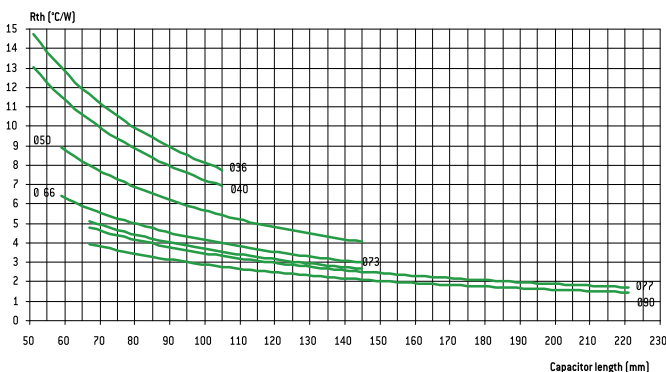
ESR: Equivalent series resistance (100 Hz 20°C)

I: Ripple current (r.m.s. value at 100 Hz)

For different frequencies from 100 Hz, I must be multiplied by the factor F, according to above chart.:

### 6.4.4. Thermal resistance Rth and air cooling

Rth is static thermal resistance (without cooling) between capacitor central hot spot and ambient temperature measured at a distance of one capacitor diameter



Forced or not cooling air can lead to a significant decrease of these values.

Consequently, r.m.s. ripple current can be increased as a function of air cooling speed:

Ø mm (inches)	≤ 0,5 m/s	1 m/s	2 m/s	3 m/s	≥ 4 m/s
66 - 90	1~	1,1~	1,2~	1,25~	1,3~
36 - 51	1~	1,2~	1,4~	1,45~	1,5~

This parameter shall be applied to one capacitor alone.

For capacitors in bank, ambient temperature must be strictly equal around all capacitors.

### 6.4.5. Quality guaranty

We guarantee products manufactured during 2 years from the data of shipment against defaults of material and assembly.

This guaranty can be involved by the buyer only if our products are used within normal conditions, always according to the state of the art and taking in account storage conditions.

The equipment design should take into consideration possible failures of our capacitors and related effects in order to avoid them.

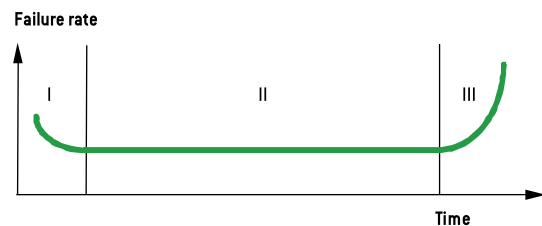
Guaranty is not applicable for damages occurred by surge voltage, irregular use, polarity inversion or maintenance default.

Guaranty is exclusively limited to the replacement of individual defective capacitors within the terms of delivery. This rule applied to all cases and particularly to any further consequence of failures.

### 6.4.6. Reliability

Failure rate:

$$FR = \frac{\text{Number of components tested} \times \text{test duration}}{\text{Number of failures}}$$



Failure rate is measured in FIT (failure in time =  $10^{-9}$  / hour).

The failure rate is set up during the life time of the capacitor (phase II)

I. Early failure phase (generally excluded during ageing process).

II. Operational life time of the capacitors

III. End of life

# General technical data

Mean time between failures MTBF = 1/FR mesured in years

Range	Failure rate for a failure percentage not exceeding 1% with a confidence level of 60 %
FELSIC 85 >350 V FELSIC HC > 350 V SNAPSIC - SNAPSIC HC > 350 V SNAPSIC 4P > 350 V PROMISIC 031 Ø = 6,5 SICAL CO 42 - SICAL > 350 V	50 FIT - (MTBF = 2280)
FELSIC 037 - 039 FELSIC 85 ≤ 350 V FELSIC HC ≤ 350 V CUBISIC CI FRS SNAPSIC 105 - SNAPSIC 105 4P SNAPSIC 105 LP - SNAPSIC HV SNAPSIC - SNAPSIC 4P ≤ 350 V SNAPSIC HC ≤ 350 V ALSIC IR - ALSIC 145 - ALSIC HV - VACSIC 150 - VACSIC SICAL CO 42 - SICAL ≤ 350 V PRORELSIC 125 Ø = 6,5 RELSIC 033 PROMISIC 031 Ø > 6,5	25 FIT - (MTBF = 4560)
FELSIC 125 FRS - SNAPSIC 125 FELSIC HV - FELSIC 105	10 FIT - (MTBF = 11410)
PRORELSIC 125 Ø > 6,5 PRORELSIC 145	5 FIT - (MTBF = 22820)

Multiplying factor of FR with voltage and temperature

Factor	Temperature [°C]							
	≤ 40	50	60	70	85	105 (1)	125 (1)	145 (1)
Factor	1	1,5	2,3	3,4	6,3	14	32	72

(1) Only for permitted capacitors

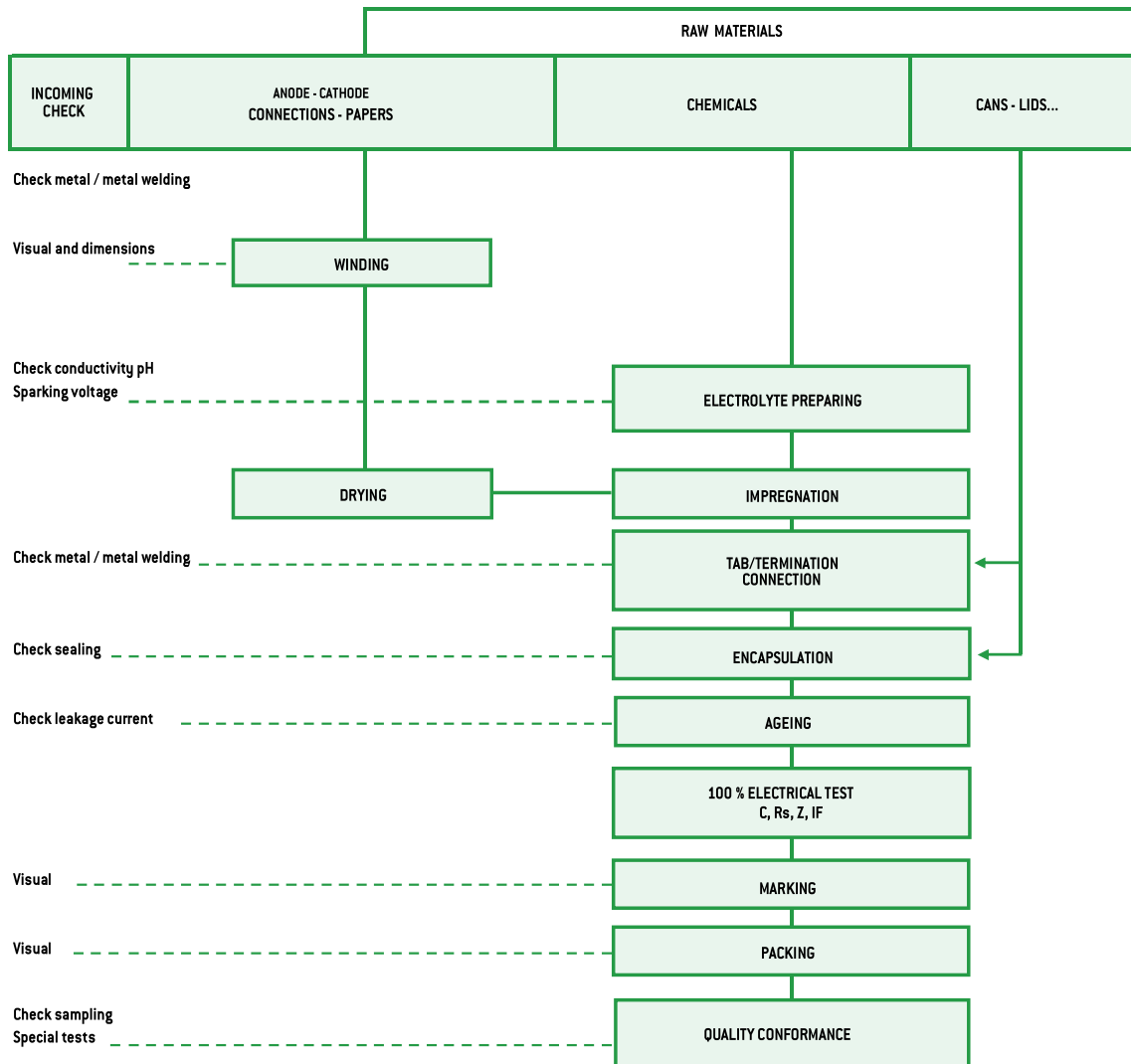
Factor	Percentage of rated voltage (2)		
	100 %	80 %	50 %
Factor	1	0,8	0,5

(2) This voltage has to be constant

Environ-ment	Without vibration		Ground with vibrations or mob Ile			
	Ground, fix Controlled air	Ground, fix	PRORELSIC SNAPSIC 20 g FELSIC 20 g	FELSIC 10 g PROMISIC SICAL Ø ≤14	CI FRS - SNAPSIC RELSIC SICAL Ø >14	ALSIC
Factor	1	2	2	4	6	12

## 7. MANUFACTURING FLOW CHART

Process controls



# General technical data

## 8. INFORMATION ON APPLICATION

### 8.1. CLEANING SOLVENTS

Use aliphatic alcohols, such as denatured ethyl alcohol, isopropanol, or butylacetate, or else alkaline diluted solutions. Avoid incompatible solvents (halogenous for example).

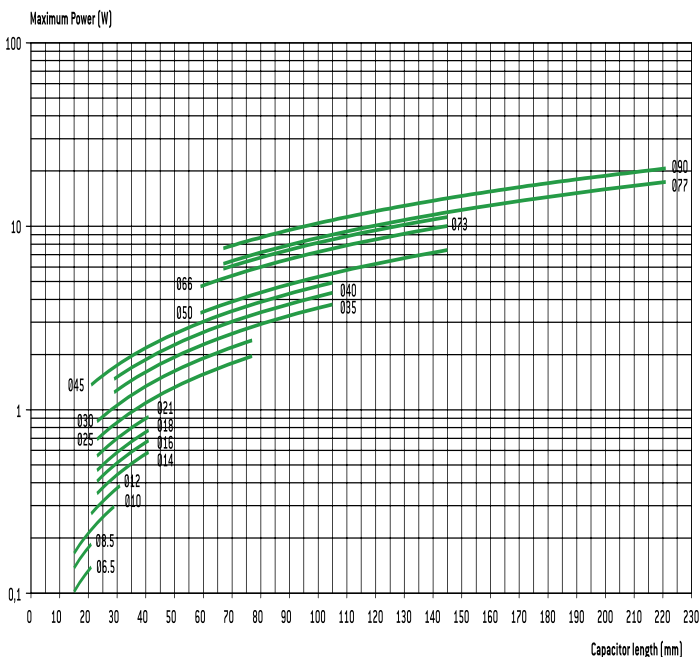
### 8.2. SHELF LIFE

There is no electrical characteristics variation for long periods of storage except leakage current which can increase.

It is caused by chemical reactions between the dielectric alumina and the electrolyte. These reactions are reversible when switched on. Capacitors can generally be stored at temperature between  $-5^{\circ}$  and  $+50^{\circ}\text{C}$  without reforming for the following periods of time:

- For  $U_R \leq 100\text{ V}$ , storage time: ..... 5 years (up to 10 years under specific conditions)
- For  $100\text{ V} < U_R \leq 360\text{ V}$  storage time: ..... 3 years
- For  $360\text{ V} < U_R < 500\text{ V}$  storage time: ..... 1 year
- For  $U_R \leq 500\text{ V}$ , storage time: ..... 6 months

Generally when these periods are overstepped, one hour at rated voltage causes the decrease of leakage current under the specified limits. An other way to avoid this leakage current increase problem is to always limit available power through capacitor during first seconds or minutes after storage or transport, according to the following chart:



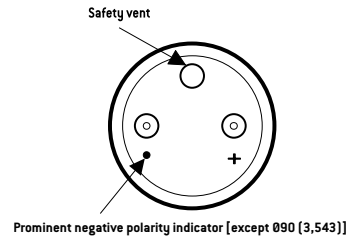
### 8.3. LOW PRESSURE RESISTANCE

EXXELIA capacitors can be used with ambient low pressure decreasing up to 10 mbar (altitude 28000 m – 92000 feet).

### 8.4. MOUNTING SCREW TERMINALS CAPACITORS (FELSIC)

Capacitors may be used vertically (terminals on top) or horizontally. When used horizontally, the following position in relation to the safety vent, is recommended:

Mounting capacitors in series may be used for operating voltage exceeding  $U_R$ . See FELSIC in bank.



### 8.5. MOUNTING SOLDER TYPE CAPACITORS.

They may be used in any position. During mounting, avoid applying excessive force to capacitor pins or wires. There is a risk of damaging internal connections.

After soldering and for the same reasons, do not try to move the capacitor's body.

### 8.6. ELECTROLYTES: SAFETY RULES.

Electrolytes used in EXXELIA capacitors are manufactured by EXXELIA. Main solvents are generally  $\gamma$  butyrolactone and ethylene glycol, very stable high boiling point solvents. Ionic conductive salts in electrolyte induce a very weak acidity (pH 5 to 7).

### 8.7. ENVIRONMENT.

In aluminium capacitors with liquid electrolyte there is no component showing a pollution risk, in small amounts, of air or water. EXXELIA is always involved in this security field particularly in using chemicals for electrolyte, without well-known risks.

- Dimethylformamide (DMF) dangerous solvent forbidden in several uses is completely excluded by EXXELIA, since 1990.
- There is no halogen compound such as chlorofluorocarbon (CFC or FCKW in German) or polychlorobiphenyl (PCBPyralene) or pentabromodiphenylether or octabromodiphenylether.

There is neither benzene, toluene or phenyl compound nor explosive such as picric acid, nor asbestos in plastic covers. All the capacitors made by EXXELIA since 1991, can be scrapped or used in raw materials recycling processes without special care in compliance with Community rules.

EXXELIA aluminium capacitors with non-solid electrolyte are particularly suitable for different kinds of environment taking in account severity increasing laws.

European directives 2003/11/EC, 2002/96/EC (WEEE) and 2002/95/EC (RoHS) applies to all EXXELIA capacitors including every solder type, manufactured with pure tin coated pins or wires, since at least January 2006.

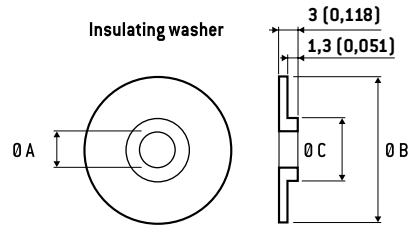
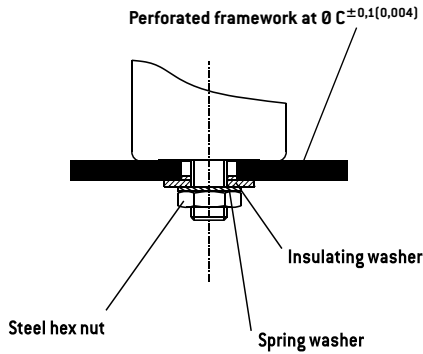
# Mounting and insulating parts

## STUD FIXING: FELSIC BD

Steel nut, spring washer and insulating washer are delivered loosely with the capacitor.

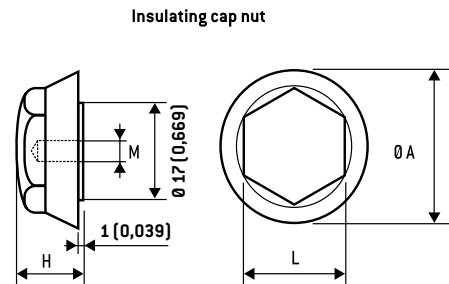
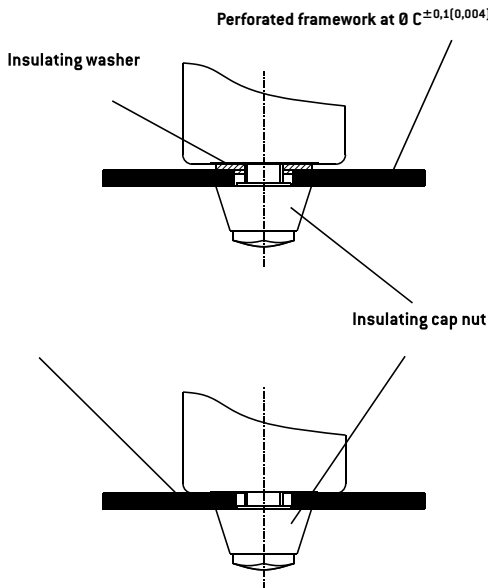
### STANDARD MOUNTING WITH:

Insulating washer and steel nut



Ø Capacitor	DIMENSIONS in mm (inches)				
	M	Ø A	Ø B	Ø C	Code
36	8	8,4	25	18,5	A 691060
51 - 77	12	12,5	30	21,5	A 691061
90	12	12,5	35	21,5	A 691062

Insulating plastic nut with or without insulating washer

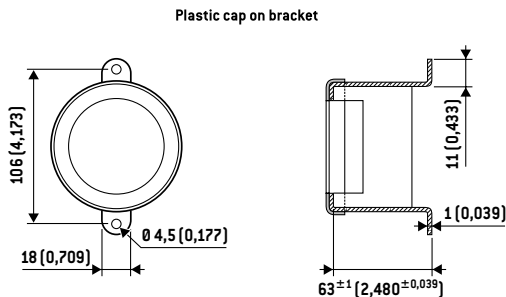


DIMENSIONS in mm (inches)					
M	Ø A	H	L	Max. torque	Code
8 [0,315]	25 [0,984]	15 [0,591]	17 [0,669]	3 Nm	A 691070
12 [0,472]	30 [1,181]	20 [0,787]	19 [0,748]	7 Nm	A 691071

## Ring - clip mounting: FELSIC LP

Ring clips shall be ordered separately.

Tightening screws and nuts are supplied loosely.



FELSIC 85 LP FELSIC 105 LP	Code
Metal bracket	A691055
Plastic cap	A691065

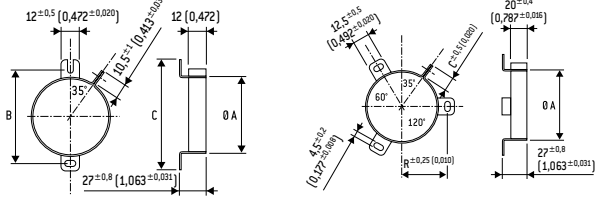
# General technical data

## Ring - clip mounting: FELSIC BC

Ring clips shall be ordered separately.

Tightening screws and nuts are supplied loosely.

### FELSIC BC - Metal ring-clips



Ø A Cap.	B	C	Code	Ø A Cap.	B	C	Code
36 (1,417)	54 (2,126)	63 (2,480)	A 691901	51 (2,008)	33,5 (1,319)	11,8 (0,465)	A 691905
				66 (2,598)	39 (1,535)	10,5 (0,413)	A 691913
				73 (2,874)	44 (1,732)	10,5 (0,413)	A 691914
				77 (3,031)	44,5 (1,752)	10,5 (0,413)	A 691907
				90 (3,543)	53,3 (2,098)	11,8 (0,465)	A 691915

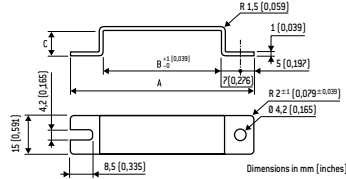
## Stirrup mounting: CUBISIC LP

Stirrups shall be ordered separately.

Tightening screws and nuts are supplied loosely

Salt mist endurance of screws and mounting accessories:  
minimum 96 h (IEC 600 68-2-11)

### CUBISIC /CUBISIC LP - Metal bracket



Ø A Cap.	A	B	C	Code
45x12 (1,772x0,472)	69 (2,717)	45 (1,772)	10 (0,394)	A 691057
35x16 (1,378x0,630)	59 (2,323)	35 (1,378)	14 (0,551)	A 691059

## PACKAGING

### 1. PACKAGING AND WEIGHT UNITS.

#### 1.1. Capacitor with screw terminals

Can DIMENSIONS in mm (inches)				Unit weight *
Ø	H			(g)
36 (1,417)	47 (1,850)	52 (2,047)	53 (2,087)	70
36 (1,417)	60 (2,362)			79
36 (1,417)	80 (3,150)	81 (3,189)		100
36 (1,417)	104 (4,094)	105 (4,134)		120
51 (2,008)	47 (1,850)			80
51 (2,008)	62 (2,441)	63 (2,480)		105
51 (2,008)	81 (3,189)	82 (3,228)		190
51 (2,008)	104 (4,094)	105 (4,134)		260
51 (2,008)	112 (4,409)			270
51 (2,008)	144 (5,669)			370
66 (2,598)	104 (4,094)	105 (4,134)		430
66 (2,598)	112 (4,409)			460
73 (2,874)	104 (4,094)	112 (4,409)		600
73 (2,874)	144 (5,669)			680
77 (3,031)	104 (4,094)	105 (4,134)		620
77 (3,031)	144 (5,669)	145 (5,709)		860
77 (3,031)	200 (7,874)			1300
77 (3,031)	220 (7,874)	221 (8,701)		1400
90 (3,543)	67 (2,638)			600
90 (3,543)	144 (5,669)	145 (5,709)		1400
90 (3,543)	200 (7,874)			1800

\* Unit weight = typical values

Possible variations of = ± 25 % according to different voltage and capacitance.

## 1.2. Radial solder types

Can dimensions mm (inches)			ALSIC	SNAP-SIC	Can dimensions			ALSIC	SNAP-SIC
Ø	H	Weight* (g)			Ø	H	Weight* (g)		
10 (0,394)	16 (0,630)	1,8	-		35 (1,378)	30 (1,181)	-	50	
12,5 (0,492)	21 (0,827)	4,5	-		35 (1,378)	40 (1,575)	-	50	
12,5 (0,492)	24 (0,945)	5	-		35 (1,378)	45 (1,772)	-	52	
					35 (1,378)	50 (1,969)	-	60	
16 (0,630)	25 (0,984)	8,2	-		35 (1,378)	75 (2,953)	-	95	
					35 (1,378)	100 (3,937)	-	125	
22 (0,866)	25 (0,984)	-	15		40 (1,575)	40 (1,575)	-	65	
22 (0,866)	30 (1,181)	-	17		40 (1,575)	50 (1,969)	-	100	
22 (0,866)	40 (1,575)	-	18		40 (1,575)	75 (2,953)	-	130	
					40 (1,575)	100 (3,937)	-	170	
25 (0,984)	25 (0,984)	-	17		45 (1,772)	21 (0,827)	-	50	
25 (0,984)	30 (1,181)	-	20		45 (1,772)	(0,984)	-	60	
25 (0,984)	35 (1,378)	-	22		45 (1,772)	30 (1,181)	-	73	
25 (0,984)	40 (1,575)	-	25		45 (1,772)	35 (1,378)	-	85	
25 (0,984)	45 (1,772)	-	28		45 (1,772)	45 (1,772)	-	110	
25 (0,984)	50 (1,969)	-	30		45 (1,772)	75 (2,953)	-	180	
					45 (1,772)	100 (3,937)	-	240	
30 (1,181)	25 (0,984)	-	28						
30 (1,181)	30 (1,181)	-	30						
30 (1,181)	35 (1,378)	-	30						
30 (1,181)	40 (1,575)	-	40						
30 (1,181)	45 (1,772)	-	45						
30 (1,181)	50 (1,969)	-	50						

Can DIMENSIONS in mm (inches)			CUBISIC
I	L	H	weight (g)
35 (1,378)	35 (1,378)	16 (0,630)	30
35 (1,378)	50 (1,969)	16 (0,630)	40
45 (1,772)	35 (1,378)	12 (0,472)	30
45 (1,772)	50 (1,969)	12 (0,472)	45
45 (1,772)	75 (2,953)	12 (0,472)	60

\* Unit weight = typical values

Possible variations of = ± 25 % according to different voltage and capacitance.

## 1.3. Axial types

Can DIMENSIONS in mm (inches)		PRORELSIC RELSIC	PRORELSIC PROMISIC	SICAL CO 42 SICAL
Ø	H	Unit weight * (g)	Unit weight * (g)	Unit weight * (g)
6,5 (0,256)	15 (0,591)	-	1,6	-
6,5 (0,256)	19 (0,748)	-	1,8	1,8
8,5 (0,335)	19 (0,748)	-	2,3	2,3
10 (0,394)	19 (0,748)	-	2,8	2,8
10 (0,394)	25 (0,984)	-	3,5	3,5
10 (0,394)	28 (1,102)	-	3,8	-
12 (0,472)	25 (0,984)	-	5	-
12 (0,472)	30 (1,181)	-	5,4	5,4
14 (0,551)	30 (1,181)	-	6,9	6,9
14 (0,551)	41 (1,614)	-	9,5	-
(0,630)	30 (1,181)	7,7	-	7,7
18 (0,709)	35 (1,378)	13,6	-	-
18 (0,709)	40 (1,575)	15,3	-	15,3
21 (0,827)	40 (1,575)	19,5	-	19,5
25 (0,984)	40 (1,575)	28	-	28
25 (0,984)	50 (1,969)	35	-	35
25 (0,984)	75 (2,953)	56	-	56

\* Unit weight = typical values

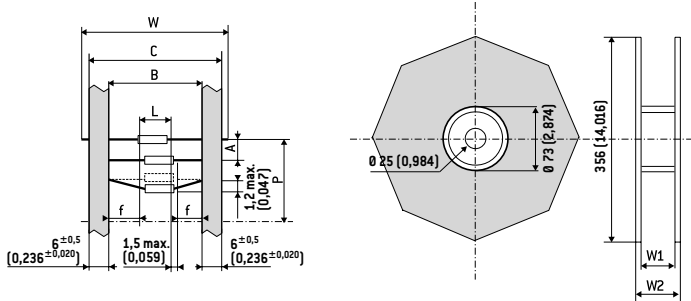
Possible variations of = ± 25 % according to different voltage and capacitance.

# General technical data

## 2. PACKAGING ON TAPE

### 2.1. Axial types

Dimensions and tolerance in accordance with IEC 60 286-



DIMENSIONS in mm (inches)									
D	L max.	B	A	P	C max.	W <sub>1</sub>	W <sub>2</sub> max.	W	n <sup>(2)</sup>
6,5 (0,256)	20 (0,787)	73±1,5 (2,874±0,059)	10±1,5 (0,394±0,059)	± 2 (0,079)	87,5 (3,445)	93 (3,661)	106 (3,661)	85±1,5 (3,346±0,059)	1000 (39,370)
8,5 (0,335) <sup>(1)</sup>									750 (29,528)
10 (0,394) <sup>(1)</sup>	32 (1,260)	73±1,5 (2,874±0,059)	15±1,5 (0,591±0,059)	± 3 (0,118)	87,5 (3,445)	93 (3,661)	106 (3,661)	85±1,5 (3,346±0,059)	400 (15,748)
12 (0,472) <sup>(1)</sup>									400 (15,748)
14 (0,551) <sup>(1)</sup>									200 (7,874)

(1) On tape only on request

(2) n = number of capacitors per reel.

White positive tape f : > 20 mm (0,787 inches)

P: 10 space



# SCREW TERMINALS

SCREW TERMINALS





# FELSIC 85

CO 54 - CO 53

15 000 h / 85°C

10 V ... 630 V	68 $\mu$ F ... 680 000 $\mu$ F	$\emptyset$ 36 (1,417) ... $\emptyset$ 90 (3,543)	- 55°C +85°C	Long Life Time
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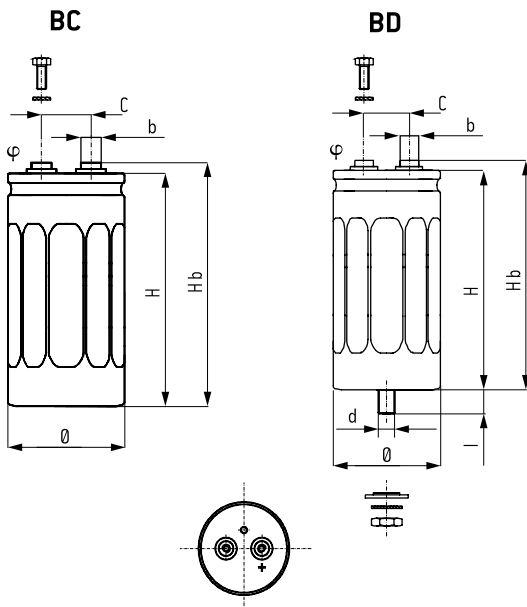


## APPLICATIONS

- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current
- 360 V and 480 V series are mainly designed for repetitive fast discharges working.

Fixing: Clip or stud fixing  
Screw terminals: M5 or M6

Tolerance on capacitance at 20°C: -10 +30 %  
Operating temperature: - 55°C + 85°C



BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor (steel hex nut, spring washer)

## DIMENSIONS in mm (inches)

$\emptyset$ $\pm 1$ (0,039)	H $\pm 2$ (0,079)	Hb $\pm 2$ (0,079)	C $\pm 0,5$ (0,020)	$\phi$	b
36 (1,417)	52 (2,047)	58 (2,283)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	60 (2,362)	66 (2,598)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	80 (3,150)	86 (3,386)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	104 (4,094)	110 (4,331)	12,7 (0,500)	M5	8 (0,315)
51 (2,008)	81 (3,189)	87 (3,425)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	104 (4,094)	110 (4,331)	22,2 (0,874)	M5	13 (0,512)
66 (2,598)	104 (4,094)	110 (4,331)	28,5 (1,122)	M5	13 (0,512)
77 (3,031)	104 (4,094)	110 (4,331)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	144 (5,669)	150 (5,906)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	220 (8,661)	226 (8,898)	31,7 (1,248)	M5	13 (0,512)
90 (3,543)	144 (5,669)	151 (5,945)	31,7 (1,248)	M6	13 (0,512)
90 (3,543)	200 (7,874)	207 (8,150)	31,7 (1,248)	M6	13 (0,512)

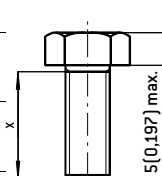
  

$\emptyset$	d	l	Max. nut torque
36 (1,417)	M8	12 $\pm 1$ (0,472 $\pm 0,472$ )	4 Nm
$\geq 51$ (2,008)	M12	16 $\pm 1,5$ (0,630 $\pm 0,059$ )	10 Nm

## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:  
3,5 (0,138) max

Max. screw torque: M5: 3 Nm [x min 8 (0,315)]  
M6: 6 Nm [x min 10 (0,394)]



## SPECIFICATIONS

NFC 83 110 - Long life  
DIN 41 240 - Climatic category GPF - 55°C + 85°C / 56 days  
CECC 30301-059 Issue 3  
CECC 30 301-810  
IEC 60 384.4 long life  
Standard endurance test at  $U_R$ :  $U_R \leq 350$  V: 5000 h / 85°C  
 $U_R > 350$  V: 2000 h / 85°C

## RESISTANCE TO VIBRATIONS

Hb mm (inches)	>150 (5,906)	$\leq 150$ (5,906)
f (Hz)	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 M $\Omega$   
Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

15 000 h / 85°C

Capacitance ( $\mu$ F)	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. ( $m\Omega$ )	II +20°C 5 min max. (mA)	I~ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $m\Omega$ )	max. ( $m\Omega$ )			+40°C max. (A)	+85°C (A)	CO 54 (BC)	CO 53 (BD)		
<b>Rated voltage 10 V</b>												
33000	36	[1,417]	52	[2,047]	16	24	25	1,8	22	6,6	A 744020	A 745020
68000	36	[1,417]	104	[4,094]	7	11	13	4	22	13,5	A 744021	A 745021
330000	66	[2,598]	104	[4,094]	4	8	7	5	50	25	A 744023	A 745023
<b>Rated voltage 16 V</b>												
22000	36	[1,417]	52	[2,047]	16	24	25	2	22	6,6	A 744040	A 745040
47000	36	[1,417]	80	[3,150]	11	16	15	4	22	8,8	A 744041	A 745041
100000	51	[2,008]	81	[3,189]	8	12	10	5	25	13,7	A 744042	A 745042
150000	51	[2,008]	104	[4,094]	7	11	8	5	25	16,4	A 744043	A 745043
220000	66	[2,598]	104	[4,094]	5	8	6	5	50	22,3	A 744044	A 745044
330000	77	[3,031]	104	[4,094]	3	5	6	6	55	31,5	A 744045	A 745045
470000	77	[3,031]	144	[5,669]	3	5	6	6	55	36	A 744046	A 745046
680000	77	[3,031]	220	[8,661]	3	5	6	7	55	43	A 744047	A 745047
<b>Rated voltage 25 V</b>												
15000	36	[1,417]	52	[2,047]	18	27	26	2	22	6,2	A 744060	A 745060
22000	36	[1,417]	52	[2,047]	17	25	24	3	22	6,5	A 744069	A 745069
33000	36	[1,417]	80	[3,150]	15	23	18	4	22	8,2	A 744061	A 745061
47000	36	[1,417]	104	[4,094]	12	18	15	5	25	10,3	A 744070	A 745070
47000	51	[2,008]	81	[3,189]	9	14	10	5	25	12,9	A 744062	A 745062
68000	51	[2,008]	81	[3,189]	8	14	10	5	25	13,7	A 744063	A 745063
100000	51	[2,008]	104	[4,094]	8	14	8	5	25	15,3	A 744064	A 745064
150000	66	[2,598]	104	[4,094]	7	11	7	5	50	18,9	A 744065	A 745065
220000	77	[3,031]	104	[4,094]	4	6	7	6	55	26	A 744066	A 745066
330000	77	[3,031]	144	[5,669]	3	5	6	7	55	36	A 744067	A 745067
<b>Rated voltage 40 V</b>												
10000	36	[1,417]	52	[2,047]	20	30	28	2	21	5,9	A 744080	A 745080
15000	36	[1,417]	80	[3,150]	18	27	23	3	22	7,5	A 744081	A 745081
22000	36	[1,417]	104	[4,094]	15	22	19	5	22	9,2	A 744082	A 745082
33000	51	[2,008]	81	[3,189]	10	15	13	5	25	12	A 744091	A 745091
47000	51	[2,008]	81	[3,189]	9	14	9	5	25	12,9	A 744083	A 745083
68000	51	[2,008]	104	[4,094]	8	12	8	6	25	14,4	A 744092	A 745092
100000	66	[2,598]	104	[4,094]	7	11	7	6	50	18,9	A 744084	A 745084
150000	77	[3,031]	104	[4,094]	5	8	7	8	55	24,5	A 744085	A 745085
220000	77	[3,031]	144	[5,669]	4	6	6	9	55	31,5	A 744086	A 745086
470000	90	[3,543]	200	[7,874]	3	5	5	15	80	46	A 744088	A 745088
<b>Rated voltage 63 V</b>												
4700	36	[1,417]	52	[2,047]	40	60	48	1,6	15	4,2	A 744100	A 745100
6800	36	[1,417]	52	[2,047]	35	50	39	2,5	15	4,4	A 744112	A 745112
10000	36	[1,417]	80	[3,150]	23	34	28	3	22	7	A 744101	A 745101
15000	51	[2,008]	81	[3,189]	13	20	18	5	25	10,7	A 744102	A 745102
22000	51	[2,008]	81	[3,189]	12	18	15	5	25	11,1	A 744103	A 745103
33000	51	[2,008]	104	[4,094]	10	15	14	5	25	13,7	A 744113	A 745113
33000	66	[2,598]	104	[4,094]	10	15	14	5	50	15,8	A 744104	A 745104
47000	66	[2,598]	104	[4,094]	8	12	11	6	50	17,7	A 744105	A 745105
68000	77	[3,031]	104	[4,094]	5	8	8	8	55	24,5	A 744106	A 745106
100000	77	[3,031]	144	[5,669]	3	8	8	9	55	36	A 744107	A 745107
150000	77	[3,031]	220	[8,661]	3	8	8	11	55	43	A 744109	A 745109
220000	90	[3,543]	200	[7,874]	3	5	4	15	80	46	A 744110	A 745110
<b>Rated voltage 80 V</b>												
3300	36	[1,417]	52	[2,047]	60	90	70	1,5	12	3,4	A 744360	A 745360
10000	51	[2,008]	81	[3,189]	19	29	23	5	25	8,9	A 744363	A 745363
15000	51	[2,008]	81	[3,189]	17	25	20	5	25	9,4	A 744364	A 745364
22000	51	[2,008]	104	[4,094]	14	21	17	6	25	12	A 744365	A 745365
33000	66	[2,598]	104	[4,094]	12	18	15	6	49	14	A 744366	A 745366
47000	77	[3,031]	104	[4,094]	8	12	10	8	55	19	A 744367	A 745367
68000	77	[3,031]	144	[5,669]	6	9	8	9	55	26	A 744368	A 745368
<b>Rated voltage 100 V</b>												
2200	36	[1,417]	52	[2,047]	70	105	90	1,1	11	3,1	A 744120	A 745120
4700	36	[1,417]	80	[3,150]	45	68	54	2,5	16	4,7	A 744121	A 745121
6800	51	[2,008]	81	[3,189]	24	36	27	4	25	7,9	A 744122	A 745122
10000	51	[2,008]	81	[3,189]	20	30	21	5	25	8,7	A 744123	A 745123
15000	51	[2,008]	104	[4,094]	17	26	18	6	25	10,5	A 744124	A 745124
22000	66	[2,598]	104	[4,094]	13	19	15	6	49	13,9	A 744125	A 745125
33000	77	[3,031]	104	[4,094]	10	15	13	8	55	17,5	A 744126	A 745126
47000	77	[3,031]	144	[5,669]	7	11	10	9	55	23	A 744127	A 745127
100000	90	[3,543]	200	[7,874]	5	8	6	11	80	35	A 744130	A 745130

## FELSIC 85

CO 54 - CO 53

15 000 h / 85°C

Capacitance ( $\mu$ F)	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. ( $m\Omega$ )	II +20°C 5 min max. (mA)	I $\sim$ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $m\Omega$ )	max. ( $m\Omega$ )			+40°C max. (A)	+85°C (A)	CO 54 (BC)	CO 53 (BD)		
<b>Rated voltage 160 V</b>												
1000	36	[1,417]	52	85	130	80	0,9	10	2,8	A 744140	A 745140	
1500	36	[1,417]	80	55	85	70	1,3	15	4,3	A 744141	A 745141	
2200	36	[1,417]	104	48	73	53	2	18	5,2	A 744142	A 745142	
3300	51	[2,008]	81	28	42	34	3	25	7,3	A 744143	A 745143	
4700	51	[2,008]	104	20	30	28	4	25	9,7	A 744144	A 745144	
6800	66	[2,598]	104	17	25	21	5	43	12,3	A 744145	A 745145	
10000	77	[3,031]	104	12	18	16	6	55	15,8	A 744146	A 745146	
15000	77	[3,031]	144	10	14	13	8	55	20	A 744147	A 745147	
22000	77	[3,031]	220	10	15	13	10	55	24	A 744148	A 745148	
33000	90	[3,543]	200	8	12	11	14	80	28	A 744150	A 745150	
<b>Rated voltage 250 V</b>												
470	36	[1,417]	52	[2,047]	110	170	100	0,7	9	2,5	A 744160	A 745160
1000	36	[1,417]	80	[3,150]	70	105	70	1,5	13	3,8	A 744161	A 745161
1500	51	[2,008]	81	[3,189]	50	75	50	2	19	5,5	A 744162	A 745162
2200	51	[2,008]	81	[3,189]	48	72	48	3	20	5,6	A 744163	A 745163
3300	51	[2,008]	104	[4,094]	35	50	35	4	25	7,6	A 744164	A 745164
4700	66	[2,598]	104	[4,094]	21	32	20	6	38	10,9	A 744165	A 745165
6800	77	[3,031]	104	[4,094]	16	24	15	8	46	13	A 744166	A 745166
10000	77	[3,031]	144	[5,669]	14	21	13	9	55	16,8	A 744167	A 745167
15000	77	[3,031]	220	[8,661]	12	18	12	10	55	22	A 744168	A 745168
22000	90	[3,543]	200	[7,874]	10	15	12	14	80	25	A 744170	A 745170
<b>Rated voltage 350 V</b>												
330	36	[1,417]	52	[2,047]	240	360	190	0,7	5,9	1,7	A 744180	A 745180
470	36	[1,417]	80	[3,150]	150	230	140	0,9	9	2,6	A 744181	A 745181
680	36	[1,417]	104	[4,094]	100	150	100	1,4	13	3,6	A 744182	A 745182
1000	51	[2,008]	81	[3,189]	75	110	65	2	16	4,5	A 744183	A 745183
1500	51	[2,008]	104	[4,094]	55	75	55	3	20	5,8	A 744184	A 745184
2200	66	[2,598]	104	[4,094]	30	45	32	4	32	9,1	A 744185	A 745185
3300	77	[3,031]	104	[4,094]	25	38	27	6	38	10,9	A 744186	A 745186
4700	77	[3,031]	104	[4,094]	20	30	18	7	43	12,2	A 744191	A 745191
6800	77	[3,031]	144	[5,669]	17	25	15	7	53	15,2	A 744187	A 745187
8200	77	[3,031]	220	[8,661]	12	18	15	8	55	22	A 744188	A 745188
10000	77	[3,031]	220	[8,661]	11	16	14	9	55	23	A 744189	A 745189
15000	90	[3,543]	200	[7,874]	10	15	13	14	80	25	A 744190	A 745190
<b>Rated voltage 360 V</b>												
910	36	[1,417]	80	[3,150]	160	200	130	3,4	9,8	2,8	A 744341	A 745341
1200	36	[1,417]	104	[4,094]	120	180	120	3,9	11	3,3	A 744342	A 745342
4700	66	[2,598]	104	[4,094]	80	120	80	7	20	5,6	A 744345	A 745345
10000	77	[3,031]	144	[5,669]	35	50	35	10	39	11	A 744347	A 745347
20000	90	[3,543]	200	[7,874]	9	14	12	16	80	26	A 744349	A 745349
<b>Rated voltage 385 V</b>												
220	36	[1,417]	52	[2,047]	380	570	360	0,5	4,6	1,3	A 744200	A 745200
1000	51	[2,008]	81	[3,189]	90	135	100	2,3	14	4,1	A 744202	A 745202
1500	51	[2,008]	104	[4,094]	70	110	80	3,4	18	5	A 744203	A 745203
2200	66	[2,598]	104	[4,094]	50	75	50	5	25	7,1	A 744204	A 745204
3300	77	[3,031]	104	[4,094]	29	45	30	6	35	10,1	A 744205	A 745205
4700	77	[3,031]	144	[5,669]	22	35	25	7	47	13,4	A 744206	A 745206
6800	77	[3,031]	220	[8,661]	17	25	15	8	55	18,4	A 744207	A 745207
<b>Rated voltage 400 V</b>												
220	36	[1,417]	52	[2,047]	400	600	500	1,7	4,6	1,3	A 744220	A 745220
330	36	[1,417]	80	[3,150]	280	420	300	2,0	6,6	1,9	A 744221	A 745221
470	36	[1,417]	104	[4,094]	200	300	200	2,5	9	2,5	A 744222	A 745222
1000	51	[2,008]	81	[3,189]	90	135	100	3,5	14	4,1	A 744223	A 745223
1500	66	[2,598]	104	[4,094]	60	90	60	4,0	22	6,4	A 744224	A 745224
2200	66	[2,598]	104	[4,094]	40	70	50	5,0	28	7,9	A 744225	A 745225
3300	77	[3,031]	104	[4,094]	29	50	35	6,0	35	10,1	A 744226	A 745226
4700	77	[3,031]	144	[5,669]	22	35	25	7,0	47	13,4	A 744227	A 745227
6800	90	[3,543]	144	[5,669]	16	25	15	9,0	64	18,4	A 744229	A 745229
10000	90	[3,543]	200	[7,874]	11	18	15	12,0	80	24,0	A 744230	A 745230

15 000 h / 85°C

Capacitance ( $\mu$ F)	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. ( $m\Omega$ )	II +20°C 5 min max. (mA)	I~ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $m\Omega$ )	max. ( $m\Omega$ )			+40°C max. (A)	+85°C (A)	CO 54 (BC)	CO 53 (BD)		
<b>Rated voltage 450 V</b>												
150	36	[1,417]	52	[2,047]	590	890	700	1,5	3,9	1,1	A 744240	A 745240
220	36	[1,417]	60	[2,362]	400	600	480	1,8	4,9	1,4	A 744241	A 745241
330	36	[1,417]	80	[3,150]	260	400	370	2,3	7	2,0	A 744242	A 745242
470	36	[1,417]	104	[4,094]	170	260	240	2,7	9,5	2,7	A 744243	A 745243
680	51	[2,008]	81	[3,189]	130	190	130	3,3	12	3,3	A 744244	A 745244
1000	51	[2,008]	104	[4,094]	85	130	90	4,0	16	4,7	A 744245	A 745245
1500	66	[2,598]	104	[4,094]	65	100	85	5,0	22	6,2	A 744246	A 745246
2200	66	[2,598]	104	[4,094]	50	85	70	6,0	25	7,0	A 744250	A 745250
2200	77	[3,031]	104	[4,094]	38	70	60	6,0	31	8,8	A 744247	A 745247
3300	77	[3,031]	144	[5,669]	25	50	40	7,3	44	12,6	A 744248	A 745248
4700	77	[3,031]	144	[5,669]	22	40	35	8,7	47	13,4	A 744252	A 745252
5600	77	[3,031]	220	[8,661]	20	40	30	9,5	55	17,0	A 744249	A 745249
6000	90	[3,543]	144	[5,669]	20	40	30	9,9	60	17,0	A 744253	A 745253
6800	90	[3,543]	200	[7,874]	15	30	20	10,0	72	20,0	A 744251	A 745251
8000	90	[3,543]	200	[7,874]	12	20	18	11,0	80	23,0	A 744255	A 745255
10000	90	[3,543]	200	[7,874]	11	18	16	13,0	80	24,0	A 744256	A 745256
<b>Rated voltage 480 V</b>												
150	36	[1,417]	52	[2,047]	550	820	600	1,6	3,9	1,1	A 744260	A 745260
220	36	[1,417]	60	[2,362]	450	680	500	2,0	4,6	1,3	A 744261	A 745261
330	36	[1,417]	80	[3,150]	290	440	400	2,4	6,7	1,9	A 744262	A 745262
470	36	[1,417]	104	[4,094]	200	300	300	2,9	8,8	2,5	A 744263	A 745263
680	51	[2,008]	81	[3,189]	150	220	150	3,8	11	3,2	A 744264	A 745264
1000	51	[2,008]	104	[4,094]	100	150	100	4,2	15	4,3	A 744265	A 745265
1500	66	[2,598]	104	[4,094]	65	100	85	5,0	22	6,2	A 744266	A 745266
2200	77	[3,031]	104	[4,094]	38	70	60	6,2	31	8,8	A 744267	A 745267
3300	77	[3,031]	144	[5,669]	25	50	40	7,5	44	12,6	A 744268	A 745268
4700	77	[3,031]	220	[8,661]	20	30	20	9,0	55	17,0	A 744269	A 745269
6800	90	[3,543]	200	[7,874]	15	25	15	11,0	74	21,0	A 744270	A 745270
<b>Rated voltage 500 V</b>												
68	36	[1,417]	52	[2,047]	700	1050	750	1,1	3,5	1,0	A 744280	A 745280
100	36	[1,417]	52	[2,047]	520	800	550	1,3	4	1,2	A 744381	A 745381
150	36	[1,417]	60	[2,362]	400	700	500	1,6	4,9	1,4	A 744382	A 745382
220	36	[1,417]	80	[3,150]	280	420	300	2,0	6,6	1,9	A 744383	A 745383
330	36	[1,417]	104	[4,094]	240	360	260	2,4	8	2,3	A 744384	A 745384
470	51	[2,008]	81	[3,189]	170	260	180	2,9	10	3,0	A 744385	A 745385
680	51	[2,008]	104	[4,094]	120	180	130	3,5	14	3,9	A 744386	A 745386
1000	66	[2,598]	104	[4,094]	80	120	80	4,2	20	5,6	A 744387	A 745387
1500	77	[3,031]	104	[4,094]	70	105	70	5,2	23	6,5	A 744388	A 745388
2200	77	[3,031]	144	[5,669]	50	75	50	6,2	31	8,9	A 744389	A 745389
3300	77	[3,031]	220	[8,661]	30	45	35	7,7	49	14,0	A 744390	A 745390
4700	90	[3,543]	200	[7,874]	20	35	25	9,2	62	18,0	A 744391	A 745391
<b>Rated voltage 550 V</b>												
68	36	[1,417]	52	[2,047]	850	1300	900	1,5	3,2	0,9	A 744302	A 745302
100	36	[1,417]	52	[2,047]	600	1000	700	1,9	3,8	1,1	A 744303	A 745303
150	36	[1,417]	80	[3,150]	500	800	600	2,3	5	1,4	A 744304	A 745304
220	36	[1,417]	104	[4,094]	400	600	450	2,8	6,3	1,8	A 744305	A 745305
330	51	[2,008]	81	[3,189]	300	450	330	3,4	7,8	2,2	A 744306	A 745306
470	51	[2,008]	104	[4,094]	200	300	230	4,1	11	3,1	A 744307	A 745307
680	66	[2,598]	104	[4,094]	130	200	150	4,9	15	4,4	A 744308	A 745308
1000	77	[3,031]	104	[4,094]	100	150	110	5,9	19	5,5	A 744309	A 745309
1500	77	[3,031]	144	[5,669]	80	120	80	7,3	25	7,0	A 744310	A 745310
2200	90	[3,543]	144	[5,669]	40	70	55	8,8	38	11,0	A 744311	A 745311
3300	90	[3,543]	200	[7,874]	25	45	35	11,0	56	16,0	A 744301	A 745301
4700	90	[3,543]	200	[7,874]	20	35	30	13,0	62	18,0	A 744313	A 745313
<b>Rated voltage 630 V</b>												
68	36	[1,417]	52	[2,047]	2400	3600	3000	2,0	1,9	0,5	A 744400	A 745400
100	36	[1,417]	52	[2,047]	2000	3000	2800	2,5	2,1	0,6	A 744411	A 745411
150	36	[1,417]	80	[3,150]	1100	1650	1200	3,1	3,3	1,0	A 744401	A 745401
220	36	[1,417]	104	[4,094]	750	1150	850	3,7	4,6	1,3	A 744402	A 745402
330	51	[2,008]	81	[3,189]	500	750	550	4,6	6	1,7	A 744403	A 745403
470	51	[2,008]	104	[4,094]	350	520	400	5,4	8	2,3	A 744404	A 745404
680	66	[2,598]	104	[4,094]	230	350	270	6,5	12	3,3	A 744405	A 745405
1000	77	[3,031]	104	[4,094]	200	300	250	7,9	14	3,9	A 744406	A 745406
1500	77	[3,031]	144	[5,669]	180	270	200	9,7	16	4,7	A 744407	A 745407
2200	90	[3,543]	144	[5,669]	120	180	120	12,0	22	6,3	A 744408	A 745408
3300	90	[3,543]	200	[7,874]	80	120	80	15,0	31	8,9	A 744409	A 745409

# FELSIC 85

**CO 54 - CO 53****15 000 h / 85°C**

## PEAK VOLTAGE (V)

1000 cycles, without ripple current

Up: Repetitive standard peak voltage (30 s)

Us: Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

U <sub>r</sub>	10 V	16 V	25 V	40 V	63 V	80 V	100 V	160 V	250 V	
Up	11,5	18	29	46	72	92	115	184	288	
Us									200	290

U <sub>r</sub>	350 V	360 V	385 V	400 V	450 V	480 V	500 V	550 V	630 V
Up	385	390	424	440	495	500	550	605	695
Us	405	405	430	450	500	540	600	650	700

## PERMISSIBLE REPETITIVE PEAK CURRENT I<sub>p</sub>:

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

DIMENSIONS in mm [inches]		I <sub>p</sub> (A)		I <sub>r</sub> max.		
Ø	H	40°C	85°C	(A)		
36	[1,417]	52	[2,047]	400	200	22
36	[1,417]	60	[2,362]	450	220	22
36	[1,417]	80	[3,150]	600	300	22
36	[1,417]	104	[4,094]	700	400	22
51	[2,008]	81	[3,189]	800	400	25
51	[2,008]	104	[4,094]	1100	500	25
66	[2,598]	104	[4,094]	1900	800	50
77	[3,031]	104	[4,094]	3100	1200	55
77	[3,031]	144	[5,669]	4200	1800	55
77	[3,031]	220	[8,661]	5700	2400	55
90	[3,543]	144	[5,669]	5700	2400	80
90	[3,543]	200	[7,874]	7700	3200	80

## EXPECTED LIFE WITH ID:

- 1 to 5 discharges per minute For I = I<sub>d</sub> 48 000 000 cycles  
In order to have the highest value of stored energy use preferably  
FELSIC 85 360 V.
- 10 discharges per minute For I = I<sub>d</sub> 36 000 000 cycles
- 15 discharges per minute For I = I<sub>d</sub> 18 000 000 cycles  
I = I<sub>d</sub>/2 > 1 x 10<sup>9</sup> cycles
- 15 to 60 discharges per minute  
To have the highest dissipated power, use preferably FELSIC 85 480 V, 500 V and 550 V and calculate r.m.s. current (general technical data § 6.4.2.).

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I<sub>r</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	50 000
I	0,8 x I <sub>r</sub>	I <sub>r</sub>	1,2 x I <sub>r</sub>	1,3 x I <sub>r</sub>	1,35 x I <sub>r</sub>	1,5 x I <sub>r</sub>	1,6 x I <sub>r</sub>

## FAST DISCHARGES WORKING (ID)

Discharge current I<sub>d</sub> = peak current of 3 ms per cycle of 1 to 60 s, at 40°C.I<sub>d</sub> as a function of case

DIMENSIONS in mm [inches]		I <sub>d</sub>		
Ø	H	(A)		
36	[1,417]	52	[2,047]	230
36	[1,417]	60	[2,362]	300
36	[1,417]	80	[3,150]	440
36	[1,417]	104	[4,094]	580
51	[2,008]	81	[3,189]	740
51	[2,008]	104	[4,094]	990
66	[2,598]	104	[4,094]	1400
77	[3,031]	104	[4,094]	2000
77	[3,031]	144	[5,669]	2800
77	[3,031]	220	[8,661]	3700
90	[3,543]	144	[5,669]	3900
90	[3,543]	200	[7,874]	4800

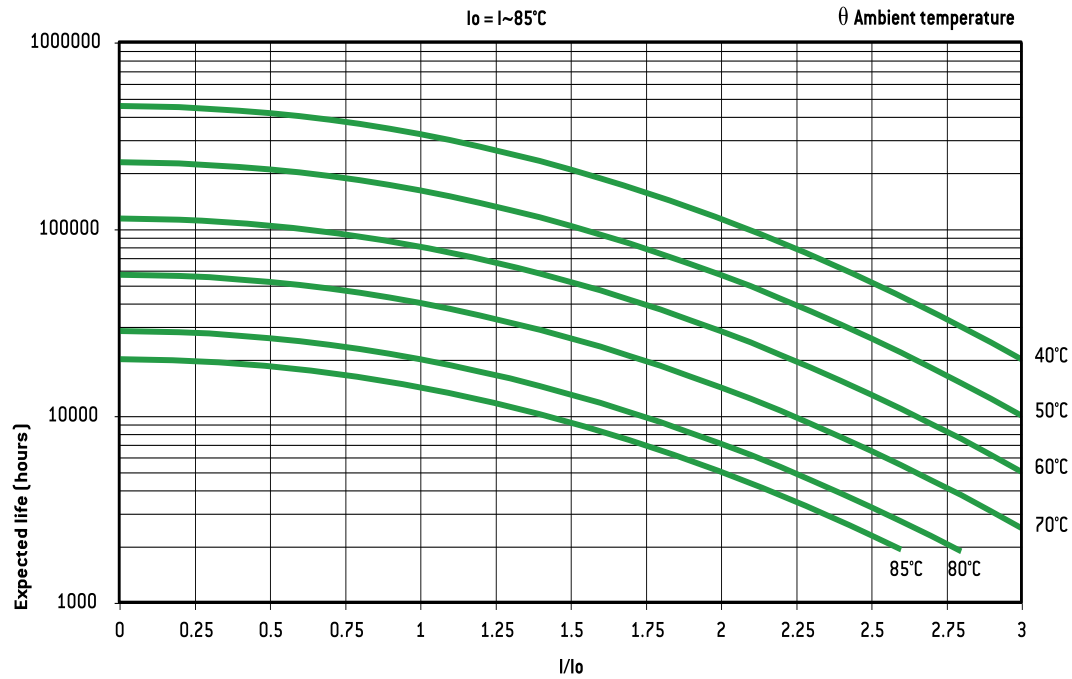
15 000 h / 85°C

**EXPECTED LIFE**

As a function of temperature and ripple current  
For  $U_R = 360\text{ V}$  and  $480\text{ V}$  do not overstep  $0.95 U_R$

**CONNECTIONS IN SERIES:**

Operating voltages exceeding  $500\text{ V}$  up to  $20000\text{ V}$  will be reached by connecting capacitors with rated voltages higher or equal to  $350\text{ V}$  in series (see FELSIC in bank.).



# FELSIK 039 - FELSIK 037

CO 37 - CO 39

32 000 h / 85°C

10V ... 400V	100 $\mu$ F ... 150 000 $\mu$ F	$\emptyset$ 36 [1,417] ... $\emptyset$ 77 [3,031]	- 55°C + 85°C	Long Life Time
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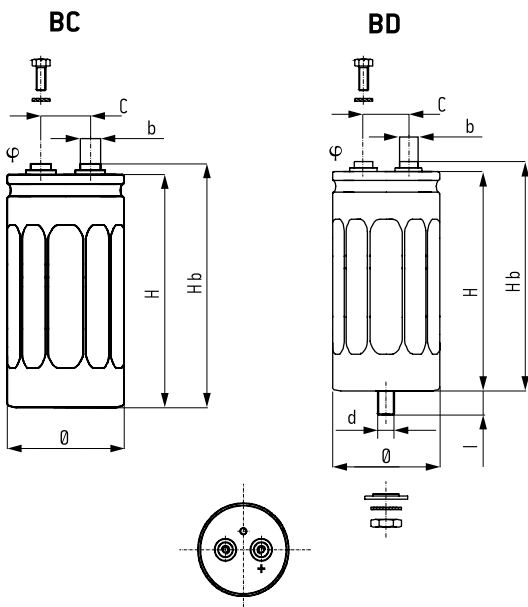
## APPLICATIONS

- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Screw terminals: M4 or M5

Tolerance on capacitance at 20°C: -10 +50 %

Operating temperature: - 55°C + 85°C



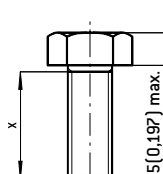
BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor (steel hex nut, spring washer)

## DIMENSIONS in mm (inches)

$\emptyset$ $\pm 1$ (0,039)	H $\pm 2$ (0,079)	Hb $\pm 2$ (0,079)	C $\pm 0,5$ (0,020)	$\phi$	b
36 [1,417]	47 [1,850]	53 [2,087]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	60 [2,362]	66 [2,598]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	80 [3,150]	86 [3,386]	12,7 [0,500]	M5	8 [0,315]
51 [2,008]	62 [2,441]	68 [2,677]	22,2 [0,874]	M5	13 [0,512]
51 [2,008]	81 [3,189]	87 [3,425]	22,2 [0,874]	M5	13 [0,512]
51 [2,008]	112 [4,409]	118 [4,646]	22,2 [0,874]	M5	13 [0,512]
66 [2,598]	112 [4,409]	118 [4,646]	28,7 [1,130]	M5	13 [0,512]
73 [2,874]	112 [4,409]	118 [4,646]	31,7 [1,248]	M5	13 [0,512]
77 [3,031]	144 [5,669]	150 [5,906]	31,7 [1,248]	M5	13 [0,512]

$\emptyset$	d	l	Max. nut torque
36 [1,417]	M8	12 $\pm 1$ [0,472 $\pm 0,472$ ]	4 Nm
$\geq 51$ [2,008]	M12	16 $\pm 1,5$ [0,630 $\pm 0,059$ ]	10 Nm

## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:  
3,5 [0,138] maxMax. screw torque: M4: 2 Nm [x min 8 [0,315]]  
M5: 3 Nm [x min 8 [0,315]]

## RESISTANCE TO VIBRATIONS

	Standard
f [Hz]	10 - 2000 Hz
Amplitude	1,5 [0,059]
Acceleration	20 g - 96 m/s <sup>2</sup>
t [h]	3 x 2 h

## SPECIFICATIONS

NFC 83 110 - Models CO 39, CO 37 - Long life

DIN 41 240 - Climatic category FDP - 55°C + 85°C / 56 days

CECC 30301-017 Issue 4

IEC 60 384.4 long life

Standard endurance test at  $U_R$ :  $U_R \leq 160$  V: 10 000 h / 85°C  
 $U_R > 160$  V: 5000 h / 85°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 M $\Omega$ 

Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s (IEC 60 695-2-2)



## FELSIC 039 - FELIC 037

32 000 h / 85°C

CO 37 - CO 39

Capacitance ( $\mu$ F)	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. (m $\Omega$ )	II +20°C 5 min max. (mA)	I $\sim$ 100 Hz			Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic (m $\Omega$ )	max. (m $\Omega$ )			+40°C max. (A)	+85°C (A)	+105°C (A)	FELSIC 039 (BC)	FELSIC 037 (BD)		
<b>Rated voltage 10 V</b>													
15000	36	(1,417)	60	(2,362)	23	35	35	0,9	22	6,5	4,2	A 728321	A 728331
22000	36	(1,417)	80	(3,150)	17	22	25	1,2	22	8,7	5,6	A 728322	A 728332
<b>Rated voltage 16 V</b>													
6800	36	(1,417)	47	(1,850)	35	42	50	0,6	17	4,5	2,9	A 728340	A 738350
10000	36	(1,417)	60	(2,362)	24	35	35	0,9	22	6,4	4,1	A 728341	A 738351
15000	36	(1,417)	80	(3,150)	19	30	25	1,4	22	8,1	5,2	A 728342	A 738352
22000	51	(2,008)	62	(2,441)	26	3	40	2	25	7,3	4,7	A 728343	A 738353
33000	51	(2,008)	81	(3,189)	18	25	30	3	25	10	6,4	A 728344	A 738354
47000	51	(2,008)	112	(4,409)	14	19	20	4	25	13	8,4	A 728345	A 738355
68000	66	(2,598)	112	(4,409)	8	11	12	5	50	18	11,6	A 728346	A 738356
100000	73	(2,874)	112	(4,409)	8	11	11	5	50	19	12,3	A 728347	A 738357
<b>Rated voltage 25 V</b>													
4700	36	(1,417)	47	(1,850)	39	62	54	0,7	16	4,3	2,8	A 728360	A 738370
6800	36	(1,417)	60	(2,362)	27	40	40	1	22	6	3,9	A 728361	A 738371
10000	36	(1,417)	80	(3,150)	21	30	30	1,5	22	7,5	4,8	A 728362	A 738372
22000	51	(2,008)	81	(3,189)	16	21	30	3	25	10	6,4	A 728364	A 738374
33000	51	(2,008)	112	(4,409)	14	20	20	4	25	13	8,4	A 728365	A 738375
47000	66	(2,598)	112	(4,409)	10	13	16	5	50	17,3	11,2	A 728366	A 738376
68000	73	(2,874)	112	(4,409)	10	13	16	5	50	18,4	11,9	A 728367	A 738377
150000	77	(3,031)	144	(5,669)	5	8	10	6	55	20	12,9	A 728368	A 738378
<b>Rated voltage 40 V</b>													
3300	36	(1,417)	47	(1,850)	43	60	60	0,7	15	4,1	2,7	A 728380	A 738390
4700	36	(1,417)	60	(2,362)	29	45	45	1	21	5,7	3,7	A 728381	A 738391
6800	36	(1,417)	80	(3,150)	23	40	35	1,5	22	7,2	4,7	A 728382	A 738392
10000	51	(2,008)	62	(2,441)	28	40	40	2	25	7	4,5	A 728383	A 738393
15000	51	(2,008)	81	(3,189)	22	33	30	3	25	8,7	5,6	A 728384	A 738394
22000	51	(2,008)	112	(4,409)	15	23	23	5	25	12,6	8	A 728385	A 738395
33000	66	(2,598)	112	(4,409)	10	13	18	5	50	16,5	10,6	A 728386	A 738396
47000	73	(2,874)	112	(4,409)	10	13	16	5	50	18,4	11,9	A 728387	A 738397
100000	77	(3,031)	144	(5,669)	5	8	10	6	55	22	14	A 728388	A 738398
<b>Rated voltage 63 V</b>													
2200	36	(1,417)	47	(1,850)	47	80	65	0,7	15	3,9	2,5	A 728400	A 738410
3300	36	(1,417)	60	(2,362)	32	60	50	1,1	20	5,4	3,5	A 728401	A 738411
4700	36	(1,417)	80	(3,150)	25	40	40	1,6	22	6,9	4,5	A 728402	A 738412
6800	51	(2,008)	62	(2,441)	30	45	45	2	25	6,7	4,3	A 728403	A 738413
10000	51	(2,008)	81	(3,189)	23	32	35	3	25	8,5	5,5	A 728404	A 738414
15000	51	(2,008)	112	(4,409)	16	24	24	5	25	12,5	8	A 728405	A 738415
22000	66	(2,598)	112	(4,409)	13	20	16	5	50	15,7	10,1	A 728406	A 738416
33000	73	(2,874)	112	(4,409)	12	16	16	5	50	17,5	11,3	A 728407	A 738417
47000	77	(3,031)	144	(5,669)	7	9	12	6	55	20	12,9	A 728408	A 738418
<b>Rated voltage 100 V</b>													
1000	36	(1,417)	47	(1,850)	58	170	150	0,5	13	3,5	2,3	A 728420	A 738430
1500	36	(1,417)	60	(2,362)	38	120	100	0,8	18	4,9	3,2	A 728421	A 738431
2200	36	(1,417)	80	(3,150)	31	85	70	1,1	22	6,1	4	A 728422	A 738432
3300	51	(2,008)	62	(2,441)	34	85	70	1,8	24	6,3	4,1	A 728423	A 738433
4700	51	(2,008)	81	(3,189)	26	52	50	2,5	25	8	5,2	A 728424	A 738434
6800	51	(2,008)	112	(4,409)	18	36	40	4	25	11,3	7,3	A 728425	A 738435
10000	66	(2,598)	112	(4,409)	16	32	18	5	50	13,9	9	A 728426	A 738436
15000	73	(2,874)	112	(4,409)	16	21	18	6	50	14,8	9,6	A 728427	A 738437
22000	77	(3,031)	144	(5,669)	10	13	14	6	55	18	11,6	A 728428	A 738438
<b>Rated voltage 160 V</b>													
470	36	(1,417)	47	(1,850)	185	270	190	0,4	8	2	1,3	A 728440	A 738450
680	36	(1,417)	60	(2,362)	130	240	130	0,5	9	2,5	1,6	A 728441	A 738451
1000	36	(1,417)	80	(3,150)	100	170	95	0,9	12	3,1	2	A 728442	A 738452
1500	51	(2,008)	62	(2,441)	72	130	95	1,3	16	4,2	2,8	A 728443	A 738453
2200	51	(2,008)	81	(3,189)	52	85	74	2	20	5,4	3,6	A 728444	A 738454
3300	51	(2,008)	112	(4,409)	35	50	60	3	25	8	5,1	A 728445	A 738455
4700	66	(2,598)	112	(4,409)	24	40	40	4	39	10,5	7	A 728446	A 738456
6800	73	(2,874)	112	(4,409)	16	25	40	5	50	13,7	8,8	A 728447	A 738457
10000	77	(3,031)	144	(5,669)	12	17	16	6	55	18	11,6	A 728448	A 738458

## FELSIC 039 - FELSIC 037

CO 37 - CO 39

32 000 h / 85°C

Capacitance [ $\mu$ F]	Can				ESR 100 Hz +20°C		Z 10 kHz +20°C max. [m $\Omega$ ]	II +20°C 5 min max. [mA]	I $\sim$ 100 Hz		Code	
	$\emptyset$ mm (inches)	H mm (inches)	Typic [m $\Omega$ ]	max. [m $\Omega$ ]	+40°C max. [A]	+85°C [A]			FELSIC 039 [BC]	FELSIC 037 [BD]		
<b>Rated voltage 250 V</b>												
220	36	[1,417]	47	[1,850]	250	800	270	0,3	5	1,2	A 728480	A 738490
330	36	[1,417]	60	[2,362]	180	450	200	0,5	7	1,8	A 728481	A 738491
470	36	[1,417]	80	[3,150]	120	300	150	0,7	9	2,3	A 728482	A 738492
680	51	[2,008]	62	[2,441]	100	200	120	1	11	3	A 728483	A 738493
1000	51	[2,008]	81	[3,189]	80	160	90	1,5	14	3,7	A 728484	A 738494
3300	73	[2,874]	112	[4,409]	25	45	40	4	36	9,6	A 728487	A 738497
4700	77	[3,031]	144	[5,669]	20	37	22	6	43	11,5	A 728488	A 738498
<b>Rated voltage 350 V</b>												
150	36	[1,417]	47	[1,850]	530	800	360	0,3	5	1,2	A 728800	A 738810
220	36	[1,417]	60	[2,362]	350	580	290	0,4	5	1,4	A 728801	A 738811
330	36	[1,417]	80	[3,150]	230	390	170	0,7	7	1,9	A 728802	A 738812
470	51	[2,008]	62	[2,441]	180	300	160	0,9	10	2,6	A 728803	A 738813
680	51	[2,008]	81	[3,189]	120	200	110	1,4	14	3,6	A 728804	A 738814
1000	51	[2,008]	112	[4,409]	80	120	70	2	19	5	A 728805	A 738815
1500	66	[2,598]	112	[4,409]	60	90	48	3	26	6,8	A 728806	A 738816
2200	73	[2,874]	112	[4,409]	50	70	44	4	30	7,9	A 728807	A 738817
3300	77	[3,031]	144	[5,669]	30	45	26	6	43	11,5	A 728808	A 738818
<b>Rated voltage 400 V</b>												
100	36	[1,417]	47	[1,850]	700	1500	1100	1,1	3	0,8	A 728830	A 738840
150	36	[1,417]	60	[2,362]	560	1200	760	1,4	4	1,0	A 728831	A 738841
220	36	[1,417]	80	[3,150]	400	850	520	1,7	5	1,4	A 728832	A 738842
330	51	[2,008]	62	[2,441]	300	550	380	2,0	7	1,8	A 728833	A 738843
470	51	[2,008]	81	[3,189]	170	320	160	2,5	10	2,6	A 728834	A 738844
680	51	[2,008]	112	[4,409]	130	230	180	3,0	13	3,5	A 728835	A 738845
1000	66	[2,598]	112	[4,409]	80	150	120	3,5	19	5,0	A 728836	A 738846
1500	73	[2,874]	112	[4,409]	55	100	95	4,0	24	6,3	A 728837	A 738847
2200	77	[3,031]	144	[5,669]	40	85	60	5,0	30	8,0	A 728848	A 738848

## FELSIC 039 - FELIC 037

CO 37 - CO 39

32 000 h / 85°C

## PEAK VOLTAGE (V)

1000 cycles, without ripple current

Up: Repetitive standard peak voltage (30 s)

Us: Repetitive surge voltage (0,1 s)

Do not exceed this value safely

U <sub>R</sub>	10 V	16 V	25 V	40 V	63 V	100 V	160 V	250 V	350 V	400 V
Up	11,5	18	29	46	72	115	184	288	385	440
Us							235	290	405	450

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I<sub>~</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	50 000
I	0,8 x I <sub>~</sub>	I <sub>~</sub>	1,2 x I <sub>~</sub>	1,3 x I <sub>~</sub>	1,35 x I <sub>~</sub>	1,5 x I <sub>~</sub>	1,6 x I <sub>~</sub>

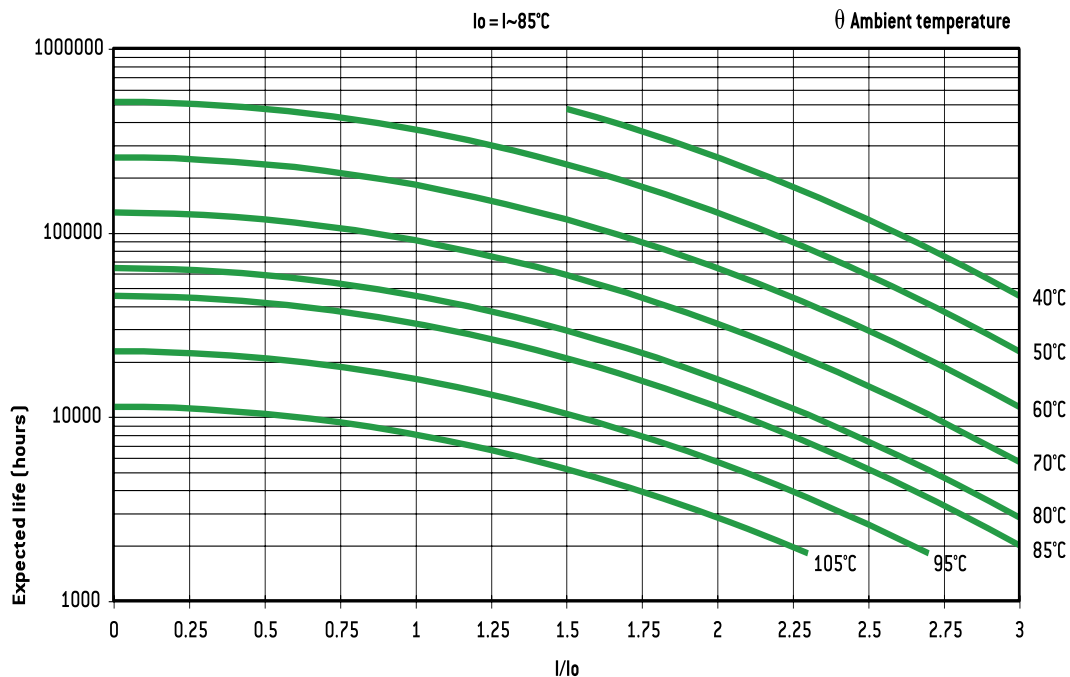
PERMISSIBLE REPETITIVE PEAK CURRENT I<sub>p</sub>:

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

DIMENSIONS in mm (inches)		I <sub>p</sub> (A)	I <sub>~</sub> max. (A)		
Ø	H				
36	(1,417)	47	(1,850)	400	22
36	(1,417)	60	(2,362)	450	22
36	(1,417)	80	(3,150)	600	22
51	(2,008)	62	(2,441)	700	25
51	(2,008)	81	(3,189)	800	25
51	(2,008)	112	(4,409)	1100	25
66	(2,598)	112	(4,409)	1900	50
73	(2,874)	112	(4,409)	3000	50
77	(3,031)	144	(5,669)	4200	55

SCREW TERMINALS

## EXPECTED LIFE as a function of temperature and ripple current



# FELSIC 85 M

CO 54 - CO 53

15 000 h / 85°C

10 V ... 630 V	68 $\mu$ F ... 330 000 $\mu$ F	$\emptyset$ 36 (1,417) ... $\emptyset$ 90 (3,543)	- 55°C + 85°C	Long Life Time
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## APPLICATIONS

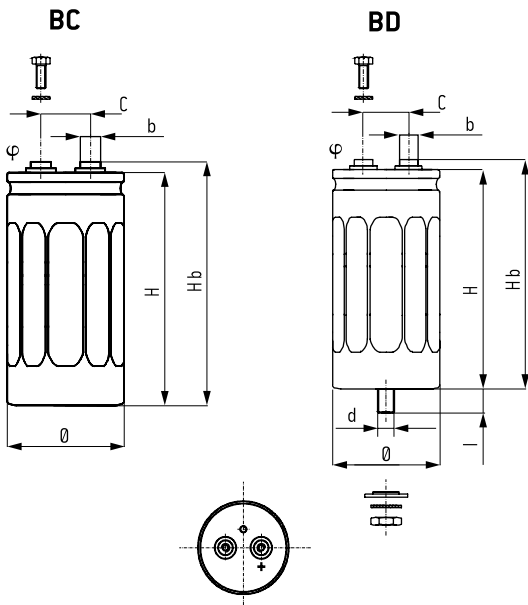
- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Fixing: Clip or stud fixing

Screw terminals: M5 or M6

Tolerance on capacitance at 20°C: -20 +20 %

Operating temperature: - 55°C + 85°C



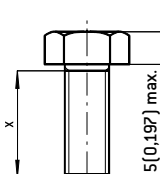
BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor (steel hex nut, spring washer)

## DIMENSIONS in mm (inches)

$\emptyset \pm 1$ (0,039)	H $\pm 2$ (0,079)	Hb $\pm 2$ (0,079)	c $\pm 0,5$ (0,020)	$\Phi$	b
36 (1,417)	52 (2,047)	58 (2,283)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	60 (2,362)	66 (2,598)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	80 (3,150)	86 (3,386)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	104 (4,094)	110 (4,331)	12,7 (0,500)	M5	8 (0,315)
51 (2,008)	81 (3,189)	87 (3,425)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	104 (4,094)	110 (4,331)	22,2 (0,874)	M5	13 (0,512)
66 (2,598)	104 (4,094)	110 (4,331)	28,5 (1,122)	M5	13 (0,512)
77 (3,031)	104 (4,094)	110 (4,331)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	144 (5,669)	150 (5,906)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	220 (8,661)	226 (8,898)	31,7 (1,248)	M5	13 (0,512)
90 (3,543)	144 (5,669)	151 (5,945)	31,7 (1,248)	M6	13 (0,512)
90 (3,543)	200 (7,874)	207 (8,150)	31,7 (1,248)	M6	13 (0,512)

$\emptyset$	d	l	Max. nut torque
36 (1,417)	M8	12 $\pm$ 1 (0,472 $\pm$ 0,472)	4 Nm
$\geq$ 51 (2,008)	M12	16 $\pm$ 1,5 (0,630 $\pm$ 0,059)	10 Nm

## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:  
3,5 (0,138) maxMax. screw torque: M5: 3 Nm [x min 8 (0,315)]  
M6: 6 Nm [x min 10 (0,394)]

## SPECIFICATIONS

NFC 83 110 - Long life

DIN 41 240 - Climatic category GPF - 55°C + 85°C / 56 days

CECC 30301-059 Issue 3

CECC 30 301-810

IEC 60 384.4 long life

Standard endurance test at  $U_R$ :  $U_R \leq 350$  V: 5000 h / 85°C  
 $U_R > 350$  V: 2000 h / 85°C

## RESISTANCE TO VIBRATIONS

Hb mm (inches)	>150 (5,906)	$\leq$ 150 (5,906)
f (Hz)	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 M $\Omega$ 

Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

## FELSIC 85 M

CO 54 - CO 53

15 000 h / 85°C

Capacitance [ $\mu$ F]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. [m $\Omega$ ]	II +20°C 5 min max. [mA]	I~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)	Typic [m $\Omega$ ]	max. [m $\Omega$ ]			+40°C max. [A]	+85°C [A]	CO 54 (M) (BC)	CO 53 (M) (BD)	
<b>Rated voltage 10 V</b>											
33000	36	[1,417]	52	[2,047]	16	24	25	1,8	22	6,6	A 746020 A 747020
<b>Rated voltage 16 V</b>											
22000	36	[1,417]	52	[2,047]	16	24	25	2	22	6,6	A 746040 A 747040
47000	36	[1,417]	80	[3,150]	11	16	15	4	22	8,8	A 746041 A 747041
100000	51	[2,008]	81	[3,189]	8	12	10	5	25	13,7	A 746042 A 747042
150000	51	[2,008]	104	[4,094]	7	11	8	5	25	16,4	A 746043 A 747043
220000	66	[2,598]	104	[4,094]	5	8	6	5	50	22,3	A 746044 A 747044
<b>Rated voltage 25 V</b>											
15000	36	[1,417]	52	[2,047]	18	27	26	2	22	6,2	A 746060 A 747060
22000	36	[1,417]	52	[2,047]	17	25	24	3	22	6,5	A 746069 A 747069
33000	36	[1,417]	80	[3,150]	15	23	18	4	22	8,2	A 746061 A 747061
47000	36	[1,417]	104	[4,094]	12	18	15	5	25	10,3	A 746070 A 747070
47000	51	[2,008]	81	[3,189]	9	14	10	5	25	12,9	A 746062 A 747062
68000	51	[2,008]	81	[3,189]	8	14	10	5	25	13,7	A 746063 A 747063
100000	51	[2,008]	104	[4,094]	8	14	8	5	25	15,3	A 746064 A 747064
220000	77	[3,031]	104	[4,094]	4	6	7	6	55	26	A 746066 A 747066
330000	77	[3,031]	144	[5,669]	3	5	6	7	55	36	A 746067 A 747067
<b>Rated voltage 40 V</b>											
10000	36	[1,417]	52	[2,047]	20	30	28	2	21	5,9	A 746080 A 747080
15000	36	[1,417]	80	[3,150]	18	27	23	3	22	7,5	A 746081 A 747081
22000	36	[1,417]	104	[4,094]	15	22	19	5	22	9,2	A 746082 A 747082
33000	51	[2,008]	81	[3,189]	10	15	13	5	25	12	A 746091 A 747091
47000	51	[2,008]	81	[3,189]	9	14	9	5	25	12,9	A 746083 A 747083
68000	51	[2,008]	104	[4,094]	8	12	8	6	25	14,4	A 746092 A 747092
100000	66	[2,598]	104	[4,094]	7	11	7	6	50	18,9	A 746084 A 747084
150000	77	[3,031]	104	[4,094]	5	8	7	8	55	24,5	A 746085 A 747085
220000	77	[3,031]	144	[5,669]	4	6	6	9	55	31,5	A 746086 A 747086
<b>Rated voltage 63 V</b>											
4700	36	[1,417]	52	[2,047]	40	60	48	1,6	15	4,2	A 746100 A 747100
6800	36	[1,417]	52	[2,047]	35	50	39	2,5	15	4,4	A 746112 A 747112
10000	36	[1,417]	80	[3,150]	23	34	28	3	22	7	A 746101 A 747101
15000	51	[2,008]	81	[3,189]	13	20	18	5	25	10,7	A 746102 A 747102
22000	51	[2,008]	81	[3,189]	12	18	15	5	25	11,1	A 746103 A 747103
33000	51	[2,008]	104	[4,094]	10	15	14	5	25	13,7	A 746113 A 747113
33000	66	[2,598]	104	[4,094]	10	15	14	5	50	15,8	A 746104 A 747104
47000	66	[2,598]	104	[4,094]	8	12	11	6	50	17,7	A 746105 A 747105
68000	77	[3,031]	104	[4,094]	5	8	8	8	55	24,5	A 746106 A 747106
100000	77	[3,031]	144	[5,669]	3	8	8	9	55	36	A 746107 A 747107
150000	77	[3,031]	220	[8,661]	3	8	8	11	55	43	A 746109 A 747109
220000	90	[3,543]	200	[7,874]	3	5	4	15	80	46	A 746110 A 747110
<b>Rated voltage 80 V</b>											
10000	51	[2,008]	81	[3,189]	19	29	23	5	25	8,9	A 746363 A 747363
15000	51	[2,008]	81	[3,189]	17	25	20	5	25	9,4	A 746364 A 747364
22000	51	[2,008]	104	[4,094]	14	21	17	6	25	12	A 746365 A 747365
33000	66	[2,598]	104	[4,094]	12	18	15	6	49	14	A 746366 A 747366
<b>Rated voltage 100 V</b>											
2200	36	[1,417]	52	[2,047]	70	105	90	1,1	11	3,1	A 746120 A 747120
4700	36	[1,417]	80	[3,150]	45	68	54	2,5	16	4,7	A 746121 A 747121
6800	51	[2,008]	81	[3,189]	24	36	27	4	25	7,9	A 746122 A 747122
10000	51	[2,008]	81	[3,189]	20	30	21	5	25	8,7	A 746123 A 747123
15000	51	[2,008]	104	[4,094]	17	26	18	6	25	10,5	A 746124 A 747124
22000	66	[2,598]	104	[4,094]	13	19	15	6	49	13,9	A 746125 A 747125
33000	77	[3,031]	104	[4,094]	10	15	13	8	55	17,5	A 746126 A 747126
47000	77	[3,031]	144	[5,669]	7	11	10	9	55	23	A 746127 A 747127
<b>Rated voltage 160 V</b>											
1000	36	[1,417]	52	[2,047]	85	130	80	0,9	10	2,8	A 746140 A 747140
1500	36	[1,417]	80	[3,150]	55	85	70	1,3	15	4,3	A 746141 A 747141
2200	36	[1,417]	104	[4,094]	48	73	53	2	18	5,2	A 746142 A 747142
3300	51	[2,008]	81	[3,189]	28	42	34	3	25	7,3	A 746143 A 747143
4700	51	[2,008]	104	[4,094]	20	30	28	4	25	9,7	A 746144 A 747144
6800	66	[2,598]	104	[4,094]	17	25	21	5	43	12,3	A 746145 A 747145
10000	77	[3,031]	104	[4,094]	12	18	16	6	55	15,8	A 746146 A 747146
15000	77	[3,031]	144	[5,669]	10	14	13	8	55	20	A 746147 A 747147
22000	77	[3,031]	220	[8,661]	10	15	13	10	55	24	A 746148 A 747148
33000	90	[3,543]	200	[7,874]	8	12	11	14	80	28	A 746150 A 747150

## FELSIC 85 M

CO 54 - CO 53

15 000 h / 85°C

Capacitance [μF]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. [mΩ]	II +20°C 5 min max. [mA]	I ~ 100 Hz		Code			
	Ø mm (inches)	H mm (inches)	Typic [mΩ]	max. [mΩ]			+40°C max. [A]	+85°C [A]	CO 54 (M) (BC)	CO 53 (M) (BD)		
<b>Rated voltage 250 V</b>												
470	36	(1,417)	52	(2,047)	110	170	100	0,7	9	2,5	A 746160	A 747160
1000	36	(1,417)	80	(3,150)	70	105	70	1,5	13	3,8	A 746161	A 747161
1500	51	(2,008)	81	(3,189)	50	75	50	2	19	5,5	A 746162	A 747162
2200	51	(2,008)	81	(3,189)	48	72	48	3	20	5,6	A 746163	A 747163
3300	51	(2,008)	104	(4,094)	35	50	35	4	25	7,6	A 746164	A 747164
4700	66	(2,598)	104	(4,094)	21	32	20	6	38	10,9	A 746165	A 747165
6800	77	(3,031)	104	(4,094)	16	24	15	8	46	13	A 746166	A 747166
10000	77	(3,031)	144	(5,669)	14	21	13	9	55	16,8	A 746167	A 747167
22000	90	(3,543)	200	(7,874)	10	15	12	14	80	25	A 746170	A 747170
<b>Rated voltage 350 V</b>												
330	36	(1,417)	52	(2,047)	240	360	190	0,7	5,9	1,7	A 746180	A 747180
470	36	(1,417)	80	(3,150)	150	230	140	0,9	9	2,6	A 746181	A 747181
680	36	(1,417)	104	(4,094)	100	150	100	1,4	13	3,6	A 746182	A 747182
1000	51	(2,008)	81	(3,189)	75	110	65	2	16	4,5	A 746183	A 747183
1500	51	(2,008)	104	(4,094)	55	75	55	3	20	5,8	A 746184	A 747184
2200	66	(2,598)	104	(4,094)	30	45	32	4	32	9,1	A 746185	A 747185
3300	77	(3,031)	104	(4,094)	25	38	27	6	38	10,9	A 746186	A 747186
4700	77	(3,031)	104	(4,094)	20	30	18	7	43	12,2	A 746191	A 747191
6800	77	(3,031)	144	(5,669)	17	25	15	7	53	15,2	A 746187	A 747187
<b>Rated voltage 385 V</b>												
220	36	(1,417)	52	(2,047)	380	570	360	0,5	4,6	1,3	A 746200	A 747200
1000	51	(2,008)	81	(3,189)	90	135	100	2,3	14	4,1	A 746202	A 747202
1500	51	(2,008)	104	(4,094)	70	110	80	3,4	18	5	A 746203	A 747203
2200	66	(2,598)	104	(4,094)	50	75	50	5	25	7,1	A 746204	A 747204
3300	77	(3,031)	104	(4,094)	29	45	30	6	35	10,1	A 746205	A 747205
4700	77	(3,031)	144	(5,669)	22	35	25	7	47	13,4	A 746206	A 747206
6800	77	(3,031)	220	(8,661)	17	25	15	8	55	18,4	A 746207	A 747207
<b>Rated voltage 400 V</b>												
220	36	(1,417)	52	(2,047)	400	600	500	1,7	4,6	1,3	A 746220	A 747220
330	36	(1,417)	80	(3,150)	280	420	300	2,0	6,6	1,9	A 746221	A 747221
470	36	(1,417)	104	(4,094)	200	300	200	2,5	9	2,5	A 746222	A 747222
1000	51	(2,008)	81	(3,189)	90	135	100	3,5	14	4,1	A 746223	A 747223
1500	66	(2,598)	104	(4,094)	60	90	60	4,0	22	6,4	A 746224	A 747224
2200	66	(2,598)	104	(4,094)	40	70	50	5,0	28	7,9	A 746225	A 747225
3300	77	(3,031)	104	(4,094)	29	50	35	6,0	35	10,1	A 746226	A 747226
4700	77	(3,031)	144	(5,669)	22	35	25	7,0	47	13,4	A 746227	A 747227
6800	90	(3,543)	144	(5,669)	16	25	15	9,0	64	18,4	A 746229	A 747229
10000	90	(3,543)	200	(7,874)	11	18	15	12,0	80	24,0	A 746230	A 747230
<b>Rated voltage 450 V</b>												
150	36	(1,417)	52	(2,047)	590	890	700	1,5	3,9	1,1	A 746240	A 747240
330	36	(1,417)	80	(3,150)	260	400	370	2,3	7	2,0	A 746242	A 747242
470	36	(1,417)	104	(4,094)	170	260	240	2,7	9,5	2,7	A 746243	A 747243
680	51	(2,008)	81	(3,189)	130	190	130	3,3	12	3,3	A 746244	A 747244
1000	51	(2,008)	104	(4,094)	85	130	90	4,0	16	4,7	A 746245	A 747245
1500	66	(2,598)	104	(4,094)	65	100	85	5,0	22	6,2	A 746246	A 747246
2200	66	(2,598)	104	(4,094)	50	85	70	6,0	25	7,0	A 746250	A 747250
2200	77	(3,031)	104	(4,094)	38	70	60	6,0	31	8,8	A 746247	A 747247
3300	77	(3,031)	144	(5,669)	25	50	40	7,3	44	12,6	A 746248	A 747248
4700	77	(3,031)	144	(5,669)	22	40	35	8,7	47	13,4	A 746252	A 747252
5600	77	(3,031)	220	(8,661)	20	40	30	9,5	55	17,0	A 746249	A 747249
6000	90	(3,543)	144	(5,669)	20	40	30	9,9	60	17,0	A 746253	A 747253
6800	90	(3,543)	200	(7,874)	15	30	20	10,0	72	20,0	A 746251	A 747251
8000	90	(3,543)	200	(7,874)	12	20	18	11,0	80	23,0	A 746255	A 747255
10000	90	(3,543)	200	(7,874)	11	18	16	13,0	80	24,0	A 746256	A 747256
<b>Rated voltage 500 V</b>												
68	36	(1,417)	52	(2,047)	700	1050	750	1,1	3,5	1,0	A 746280	A 747280
100	36	(1,417)	52	(2,047)	520	800	550	1,3	4	1,2	A 746381	A 747381
150	36	(1,417)	60	(2,362)	400	700	500	1,6	4,9	1,4	A 746382	A 747382
220	36	(1,417)	80	(3,150)	280	420	300	2,0	6,6	1,9	A 746383	A 747383
330	36	(1,417)	104	(4,094)	240	360	260	2,4	8	2,3	A 746384	A 747384
470	51	(2,008)	81	(3,189)	170	260	180	2,9	10	3,0	A 746385	A 747385
680	51	(2,008)	104	(4,094)	120	180	130	3,5	14	3,9	A 746386	A 747386
1000	66	(2,598)	104	(4,094)	80	120	80	4,2	20	5,6	A 746387	A 747387
1500	77	(3,031)	104	(4,094)	70	105	70	5,2	23	6,5	A 746388	A 747388
3300	77	(3,031)	220	(8,661)	30	45	35	7,7	49	14,0	A 746390	A 747390

## FELSIC 85 M

CO 54 - CO 53

15 000 h / 85°C

Capacitance [ $\mu$ F]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. [m $\Omega$ ]	II +20°C 5 min max. [mA]	I $\sim$ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic [m $\Omega$ ]	max. [m $\Omega$ ]			+40°C max. [A]	+85°C [A]	CO 54 (M) [BC]	CO 53 (M) [BD]		
<b>Rated voltage 550 V</b>												
68	36	[1,417]	52	[2,047]	850	1300	900	1,5	3,2	0,9	A 746302	A 747302
100	36	[1,417]	52	[2,047]	600	1000	700	1,9	3,8	1,1	A 746303	A 747303
150	36	[1,417]	80	[3,150]	500	800	600	2,3	5	1,4	A 746304	A 747304
220	36	[1,417]	104	[4,094]	400	600	450	2,8	6,3	1,8	A 746305	A 747305
330	51	[2,008]	81	[3,189]	300	450	330	3,4	7,8	2,2	A 746306	A 747306
470	51	[2,008]	104	[4,094]	200	300	230	4,1	11	3,1	A 746307	A 747307
680	66	[2,598]	104	[4,094]	130	200	150	4,9	15	4,4	A 746308	A 747308
1000	77	[3,031]	104	[4,094]	100	150	110	5,9	19	5,5	A 746309	A 747309
1500	77	[3,031]	144	[5,669]	80	120	80	7,3	25	7,0	A 746310	A 747310
2200	90	[3,543]	144	[5,669]	40	70	55	8,8	38	11,0	A 746311	A 747311
3300	90	[3,543]	200	[7,874]	25	45	35	11,0	56	16,0	A 746301	A 747301
4700	90	[3,543]	200	[7,874]	20	35	30	13,0	62	18,0	A 746313	A 747313
<b>Rated voltage 630 V</b>												
68	36	[1,417]	52	[2,047]	2400	3600	3000	2,0	1,9	0,5	A 746400	A 747400
100	36	[1,417]	52	[2,047]	2000	3000	2800	2,5	2,1	0,6	A 746411	A 747411
150	36	[1,417]	80	[3,150]	1100	1650	1200	3,1	3,3	1,0	A 746401	A 747401
220	36	[1,417]	104	[4,094]	750	1150	850	3,7	4,6	1,3	A 746402	A 747402
330	51	[2,008]	81	[3,189]	500	750	550	4,6	6	1,7	A 746403	A 747403
470	51	[2,008]	104	[4,094]	350	520	400	5,4	8	2,3	A 746404	A 747404
680	66	[2,598]	104	[4,094]	230	350	270	6,5	12	3,3	A 746405	A 747405
1000	77	[3,031]	104	[4,094]	200	300	250	7,9	14	3,9	A 746406	A 747406
1500	77	[3,031]	144	[5,669]	180	270	200	9,7	16	4,7	A 746407	A 747407
2200	90	[3,543]	144	[5,669]	120	180	120	12,0	22	6,3	A 746408	A 747408
3300	90	[3,543]	200	[7,874]	80	120	80	15,0	31	8,9	A 746409	A 747409

SCREW TERMINALS



# FELSIK 85 M

CO 54 - CO 53

15 000 h / 85°C

## PERMISSIBLE REPETITIVE PEAK CURRENT $I_p$ :

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

DIMENSIONS in mm (inches)				$I_p$ (A)		$I_{\sim}$ max.
$\varnothing$	H		40°C	85°C	(A)	
36	(1,417)	52	(2,047)	400	200	22
36	(1,417)	60	(2,362)	450	220	22
36	(1,417)	80	(3,150)	600	300	22
36	(1,417)	104	(4,094)	700	400	22
51	(2,008)	81	(3,189)	800	400	25
51	(2,008)	104	(4,094)	1100	500	25
66	(2,598)	104	(4,094)	1900	800	50
77	(3,031)	104	(4,094)	3100	1200	55
77	(3,031)	144	(5,669)	4200	1800	55
77	(3,031)	220	(8,661)	5700	2400	55
90	(3,543)	144	(5,669)	5700	2400	80
90	(3,543)	200	(7,874)	7700	3200	80

## CONNECTIONS IN SERIES:

Operating voltages exceeding 500 V up to 20000 V will be reached by connecting capacitors with rated voltages higher or equal to 350 V in series.

## PERMISSIBLE RIPPLE CURRENT $I$ (R.M.S. VALUE)

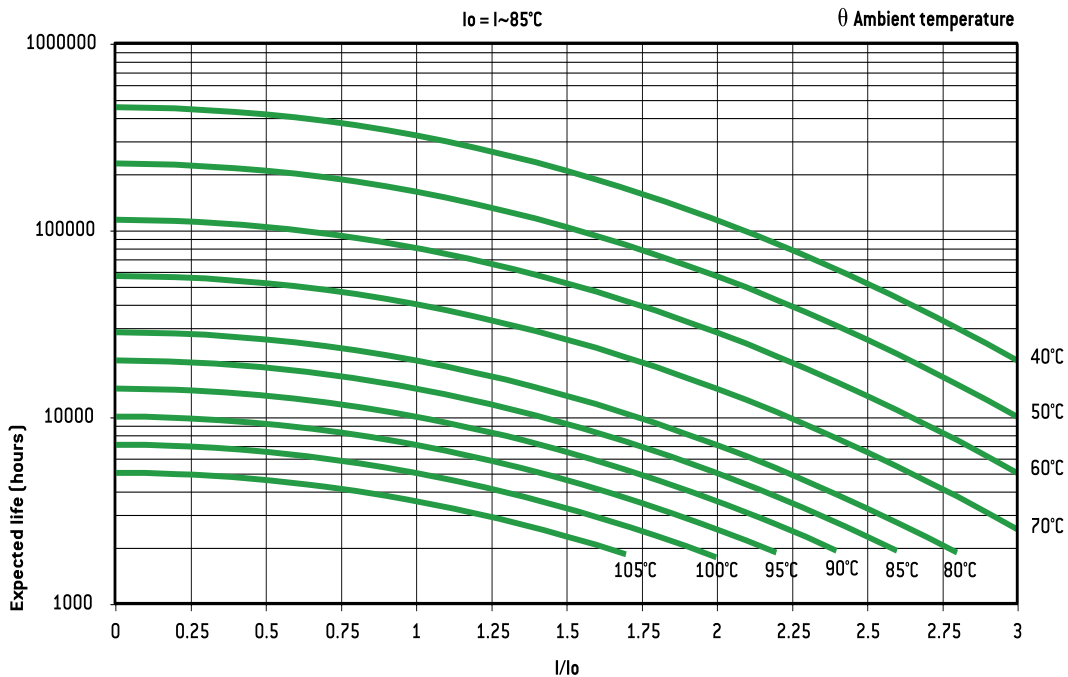
versus frequency  $f$ :

$I_{\sim}$ : permissible r.m.s. current at 100 Hz

$f$ (Hz)	50	100	300	600	1 000	10 000	50 000
$I$	$0,8 \times I_{\sim}$	$I_{\sim}$	$1,2 \times I_{\sim}$	$1,3 \times I_{\sim}$	$1,35 \times I_{\sim}$	$1,5 \times I_{\sim}$	$1,6 \times I_{\sim}$

## EXPECTED LIFE

As a function of temperature and ripple current

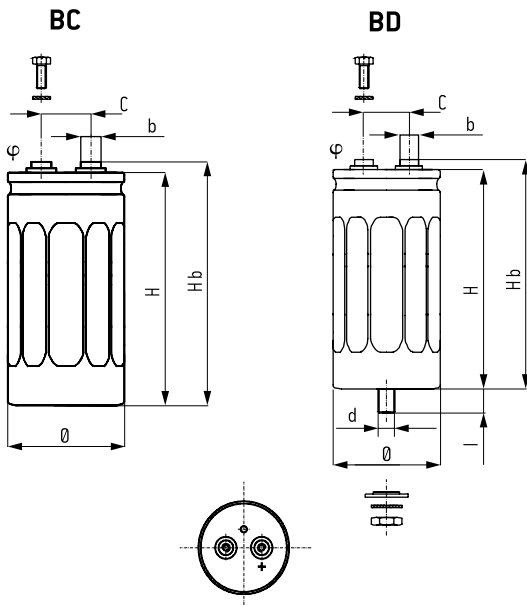


## FELSIK 105

BC - BD

8 000 h / 105°C

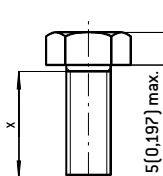
16 V ... 450 V	100 $\mu$ F ... 470 000 $\mu$ F	$\emptyset$ 36 [1,417] ... $\emptyset$ 90 [3,543]	- 55°C + 105°C	Long Life Time
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## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:  
3,5 [0,138] max

Max. screw torque: M5: 3 Nm [x min 8 [0,315]]  
M6: 6 Nm [x min 10 [0,394]]



## SPECIFICATIONS

NFC 83 110

DIN 40 040 - Climatic category FMD - 55°C + 105°C / 56 days

CECC 30301-803 Issue 2 - European standard

IEC 60 384.4 - Long life

Standard endurance test at  $U_R$ : 2000 h / 105°C  
5000 h / 85°C

## APPLICATIONS

- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Fixing: Clip or stud fixing

Screw terminals: M5 or M6

Tolerance on capacitance at 20°C: -10 +30 %

Operating temperature: - 55°C + 105°C

BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor [steel hex nut, spring washer]

## DIMENSIONS in mm (inches)

$\emptyset$ $\pm 1$ (0,039)	H $\pm 2$ (0,079)	Hb $\pm 2$ (0,079)	c $\pm 0,5$ (0,020)	$\phi$	b
36 [1,417]	52 [2,047]	58 [2,283]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	60 [2,362]	66 [2,598]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	80 [3,150]	86 [3,386]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	104 [4,094]	110 [4,331]	12,7 [0,500]	M5	8 [0,315]
51 [2,008]	81 [3,189]	87 [3,425]	22,2 [0,874]	M5	13 [0,512]
51 [2,008]	104 [4,094]	110 [4,331]	22,2 [0,874]	M5	13 [0,512]
66 [2,598]	104 [4,094]	110 [4,331]	28,5 [1,122]	M5	13 [0,512]
77 [3,031]	104 [4,094]	110 [4,331]	31,7 [1,248]	M5	13 [0,512]
77 [3,031]	144 [5,669]	150 [5,906]	31,7 [1,248]	M5	13 [0,512]
77 [3,031]	220 [8,661]	226 [8,898]	31,7 [1,248]	M5	13 [0,512]
90 [3,543]	144 [5,669]	151 [5,945]	31,7 [1,248]	M6	13 [0,512]
90 [3,543]	200 [7,874]	207 [8,150]	31,7 [1,248]	M6	13 [0,512]

$\emptyset$	d	l	Max. nut torque
36 [1,417]	M8	12 $\pm 1$ [0,472 $\pm 0,472$ ]	4 Nm
$\geq 51$ [2,008]	M12	16 $\pm 1,5$ [0,630 $\pm 0,059$ ]	10 Nm

## RESISTANCE TO VIBRATIONS

Hb mm (inches)	>150 [5,906]	$\leq 150$ [5,906]
f (Hz)	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 [0,030]	1,5 [0,059]
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 M $\Omega$ 

Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

## FELSIC 105

BC - BD

8 000 h / 105°C

Capacitance [μF]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. [mΩ]	II +20°C 5 min max. [mA]	I ~ 100 Hz			Code			
	Ø mm [inches]	H mm [inches]	Typic [mΩ]	max. [mΩ]			+40°C max. [A]	+85°C [A]	+105°C [A]	BC	BD		
<b>Rated voltage 16 V</b>													
10000	36	(1,417)	52	(2,047)	22	32	20	0,32	22	13	6,9	A 756040	A 757040
15000	36	(1,417)	80	(3,150)	18	26	16	0,48	22	17	9	A 756042	A 757042
22000	36	(1,417)	104	(4,094)	14	21	15	0,70	22	22	11,7	A 756044	A 757044
33000	51	(2,008)	81	(3,189)	12	18	12	1,05	25	25	13,7	A 756046	A 757046
47000	51	(2,008)	104	(4,094)	11	15	10	1,50	25	25	16	A 756047	A 757047
68000	66	(2,598)	104	(4,094)	10	14	10	2,18	50	35	18,5	A 756049	A 757049
100000	77	(3,031)	104	(4,094)	8	11	10	3,20	55	35	19,4	A 756050	A 757050
150000	77	(3,031)	144	(5,669)	7	10	9	4,80	55	41	23,8	A 756052	A 757052
<b>Rated voltage 25 V</b>													
4700	36	(1,417)	52	(2,047)	22	50	25	0,23	22	13	6,9	A 756080	A 757080
6800	36	(1,417)	52	(2,047)	20	30	22	0,36	22	14	7,2	A 756081	A 757081
10000	36	(1,417)	80	(3,150)	18	28	20	0,50	22	17	9	A 756083	A 757083
15000	36	(1,417)	104	(4,094)	17	25	20	0,75	22	20	10,6	A 756085	A 757085
22000	51	(2,008)	81	(3,189)	13	20	15	1,10	25	25	13,2	A 756087	A 757087
33000	51	(2,008)	104	(4,094)	11	16	12	1,65	25	25	16	A 756089	A 757089
47000	66	(2,598)	104	(4,094)	10	14	12	2,35	50	37	19,4	A 756091	A 757091
68000	77	(3,031)	104	(4,094)	7	10	8	3,40	55	37	20,6	A 756093	A 757093
100000	77	(3,031)	144	(5,669)	7	10	8	5,00	55	41	23,8	A 756095	A 757095
220000	77	(3,031)	220	(8,661)	7	10	8	6,00	55	50	28,7	A 756097	A 757097
470000	90	(3,543)	144	(5,669)	4	10	8	8,00	80	65	34	A 756098	A 757098
<b>Rated voltage 40 V</b>													
3300	36	(1,417)	52	(2,047)	22	50	25	0,27	22	13	6,9	A 756120	A 757120
4700	36	(1,417)	80	(3,150)	18	28	20	0,38	22	17	9	A 756121	A 757121
10000	36	(1,417)	80	(3,150)	16	24	16	0,80	22	18	9,7	A 756123	A 757123
15000	51	(2,008)	81	(3,189)	12	18	13	1,20	25	25	13,7	A 756126	A 757126
22000	51	(2,008)	104	(4,094)	11	17	12	1,76	25	25	16	A 756128	A 757128
33000	66	(2,598)	104	(4,094)	10	16	12	2,64	50	37	19,4	A 756130	A 757130
47000	77	(3,031)	104	(4,094)	7	10	10	3,76	55	37	20,6	A 756132	A 757132
68000	77	(3,031)	144	(5,669)	7	10	8	5,44	55	41	23	A 756134	A 757134
100000	77	(3,031)	144	(5,669)	5	10	8	8,00	55	48	27	A 756135	A 757135
150000	90	(3,543)	144	(5,669)	4	10	8	10,00	80	65	34	A 756137	A 757137
<b>Rated voltage 63 V</b>													
2200	36	(1,417)	52	(2,047)	36	54	40	0,27	20	10	5,4	A 756160	A 757160
3300	36	(1,417)	80	(3,150)	25	38	25	0,41	22	15	7,8	A 756162	A 757162
4700	36	(1,417)	104	(4,094)	22	32	22	0,59	22	18	9,3	A 756164	A 757164
6800	51	(2,008)	81	(3,189)	15	22	16	0,86	25	23	12,2	A 756166	A 757166
10000	51	(2,008)	104	(4,094)	11	16	11	1,26	25	25	16	A 756168	A 757168
15000	66	(2,598)	104	(4,094)	10	15	10	1,89	50	37	19,4	A 756170	A 757170
22000	77	(3,031)	104	(4,094)	7	11	8	2,77	55	37	20,6	A 756172	A 757172
33000	77	(3,031)	144	(5,669)	6	10	8	4,16	55	44	25,7	A 756174	A 757174
47000	77	(3,031)	144	(5,669)	6	10	8	5,92	55	44	25,7	A 756175	A 757175
68000	77	(3,031)	220	(8,661)	5	10	8	8,56	55	55	33	A 756176	A 757176
100000	90	(3,543)	144	(5,669)	4	10	8	10,00	80	65	34	A 756179	A 757179
<b>Rated voltage 100 V</b>													
1000	36	(1,417)	52	(2,047)	85	130	75	0,20	13	6,6	3,5	A 756200	A 757200
2200	36	(1,417)	80	(3,150)	40	60	40	0,44	22	12	6,2	A 756202	A 757202
3300	51	(2,008)	81	(3,189)	30	45	30	0,66	25	16	8,7	A 756204	A 757204
4700	51	(2,008)	104	(4,094)	27	40	24	0,94	25	19	10,2	A 756206	A 757206
6800	66	(2,598)	104	(4,094)	21	27	20	1,36	50	25	13,4	A 756208	A 757208
10000	66	(2,598)	104	(4,094)	16	23	15	2,00	50	29	15,3	A 756209	A 757209
15000	77	(3,031)	144	(5,669)	10	15	12	3,00	55	35	20	A 756211	A 757211
22000	77	(3,031)	144	(5,669)	8	12	10	4,40	55	40	23	A 756212	A 757212
33000	77	(3,031)	220	(8,661)	5	10	8	6,60	55	55	33	A 756213	A 757213
47000	90	(3,543)	144	(5,669)	4	10	8	9,00	80	65	34	A 756216	A 757216
<b>Rated voltage 160 V</b>													
470	36	(1,417)	52	(2,047)	120	180	100	0,15	9	4,1	2,4	A 756240	A 757240
680	36	(1,417)	80	(3,150)	70	105	60	0,21	14	6,6	3,8	A 756241	A 757241
1000	36	(1,417)	104	(4,094)	50	75	50	0,32	19	8,8	5,1	A 756242	A 757242
1500	51	(2,008)	81	(3,189)	42	63	40	0,48	23	10	6	A 756243	A 757243
2200	51	(2,008)	104	(4,094)	30	45	30	0,70	25	14	7,9	A 756245	A 757245
3300	66	(2,598)	104	(4,094)	20	30	20	1,05	42	19	11,2	A 756246	A 757246
4700	77	(3,031)	104	(4,094)	15	23	15	1,50	53	24	14,1	A 756248	A 757248
6800	77	(3,031)	144	(5,669)	10	15	11	2,18	55	38	22	A 756250	A 757250
10000	77	(3,031)	144	(5,669)	8	12	10	3,20	55	40	23	A 756251	A 757251
15000	77	(3,031)	220	(8,661)	6	10	8	4,80	55	52	30	A 756252	A 757252
15000	90	(3,543)	144	(5,669)	6	10	8	4,80	80	52	30	A 756253	A 757253

8 000 h / 105°C

Capacitance [ $\mu$ F]	Can				ESR 100 Hz +20°C		Z 10 kHz +20°C max. [m $\Omega$ ]	II +20°C 5 min max. [mA]	I~ 100 Hz			Code	
	Ø		H		Typic [m $\Omega$ ]	max. [m $\Omega$ ]			+40°C max. [A]	+85°C [A]	+105°C [A]	BC	BD
	mm [inches]	mm [inches]	mm [inches]	mm [inches]									
<b>Rated voltage 250 V</b>													
470	36	(1,417)	80	(3,150)	105	160	90	0,23	12	5,4	3,1	A 756281	A 757281
680	51	(2,008)	81	(3,189)	60	90	55	0,34	19	8,7	5	A 756283	A 757283
1000	51	(2,008)	81	(3,189)	45	68	42	0,50	22	10	5,8	A 756284	A 757284
1500	51	(2,008)	104	(4,094)	34	51	34	0,75	25	13	7,4	A 756286	A 757286
2200	66	(2,598)	104	(4,094)	26	39	26	1,13	37	17	9,8	A 756287	A 757287
3300	77	(3,031)	104	(4,094)	19	29	20	1,65	47	22	12,5	A 756289	A 757289
4700	77	(3,031)	144	(5,669)	10	15	11	2,35	55	34	20	A 756291	A 757291
6800	77	(3,031)	144	(5,669)	9	14	10	3,40	55	38	22	A 756292	A 757292
10000	77	(3,031)	220	(8,661)	8	12	10	4,50	55	45	26	A 756293	A 757293
15000	90	(3,543)	144	(5,669)	5	10	8	7,00	80	54	31	A 756296	A 757296
<b>Rated voltage 350 V</b>													
220	36	(1,417)	80	(3,150)	290	380	280	0,16	7	3,2	1,9	A 756321	A 757321
330	36	(1,417)	104	(4,094)	220	290	200	0,24	9	4,1	2,4	A 756323	A 757323
470	51	(2,008)	81	(3,189)	95	145	90	0,33	15	6,8	4	A 756325	A 757325
680	51	(2,008)	104	(4,094)	75	115	70	0,48	19	8,6	5	A 756327	A 757327
1000	51	(2,008)	104	(4,094)	65	95	65	0,70	20	9,2	5,4	A 756328	A 757328
1500	66	(2,598)	104	(4,094)	60	80	55	1,05	26	12,1	7	A 756329	A 757329
2200	77	(3,031)	104	(4,094)	30	46	34	1,50	38	17	10	A 756330	A 757330
3300	77	(3,031)	104	(4,094)	23	34	27	2,30	43	20	11,4	A 756338	A 757338
3300	77	(3,031)	144	(5,669)	20	30	25	2,30	53	24,0	14	A 756331	A 757331
4700	77	(3,031)	144	(5,669)	18	27	21	3,30	55	26,0	15	A 756332	A 757332
6000	77	(3,031)	220	(8,661)	12	20	20	4,20	55	29	17	A 756333	A 757333
6000	90	(3,543)	144	(5,669)	12	20	15	4,20	75	35	20	A 756334	A 757334
10000	90	(3,543)	200	(7,874)	10	15	12	5,00	80	43	25	A 756337	A 757337
<b>Rated voltage 400 V</b>													
150	36	(1,417)	60	(2,362)	380	500	400	0,12	5	2,4	1,4	A 756361	A 757361
220	36	(1,417)	80	(3,150)	260	400	350	0,18	7,5	3,5	2	A 756362	A 757362
330	36	(1,417)	104	(4,094)	195	300	250	0,27	10	4,5	2,6	A 756363	A 757363
470	51	(2,008)	81	(3,189)	140	220	150	0,38	12	5,7	3,3	A 756364	A 757364
680	51	(2,008)	104	(4,094)	100	150	100	0,55	16	7,4	4,3	A 756366	A 757366
1000	51	(2,008)	104	(4,094)	90	140	90	0,80	17	8	4,6	A 756367	A 757367
1500	51	(2,008)	104	(4,094)	65	85	60	1,20	20	9,5	5,4	A 756375	A 757375
1500	66	(2,598)	104	(4,094)	65	85	60	1,20	23	11	6,2	A 756368	A 757368
2200	77	(3,031)	104	(4,094)	40	60	45	1,80	32	15	8,6	A 756369	A 757369
3300	77	(3,031)	144	(5,669)	25	38	25	2,70	47	22,9	12,6	A 756370	A 757370
4700	77	(3,031)	220	(8,661)	20	30	20	3,80	55	28	16	A 756371	A 757371
6800	90	(3,543)	200	(7,874)	15	25	15	5,50	75	35	20	A 756374	A 757374
<b>Rated voltage 450 V</b>													
100	36	(1,417)	52	(2,047)	600	900	600	0,27	5	2,1	1,2	A 756400	A 757400
150	36	(1,417)	60	(2,362)	480	720	500	0,40	5	2,2	1,3	A 756401	A 757401
220	36	(1,417)	80	(3,150)	410	600	450	0,59	6	2,7	1,6	A 756402	A 757402
330	36	(1,417)	104	(4,094)	340	500	380	0,89	7	3,4	1,9	A 756403	A 757403
470	51	(2,008)	81	(3,189)	170	260	170	1,26	11	5,2	3	A 756404	A 757404
680	51	(2,008)	104	(4,094)	160	240	160	1,83	13	5,9	3,4	A 756405	A 757405
1000	66	(2,598)	104	(4,094)	70	105	70	2,70	22	10	6	A 756406	A 757406
1500	77	(3,031)	104	(4,094)	45	68	45	4,00	31	14	8,1	A 756407	A 757407
2200	77	(3,031)	144	(5,669)	30	45	30	5,90	43	20	11,5	A 756408	A 757408
3300	77	(3,031)	220	(8,661)	25	38	25	8,90	55	26	15	A 756409	A 757409
4700	77	(3,031)	220	(8,661)	20	30	23	10,00	55	29	17	A 756411	A 757411
6800	90	(3,543)	200	(7,874)	15	25	16	12,00	75	35	20	A 756413	A 757413

# FELSIC 105

BC - BD

8 000 h / 105°C

## PERMISSIBLE REPETITIVE PEAK CURRENT $I_p$ :

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows

DIMENSIONS in mm (inches)				$I_p$ (A)		$I \sim \text{max.}$ (A)
$\emptyset$	H			40°C	105°C	
36	(1,417)	52	(2,047)	400	200	22
36	(1,417)	60	(2,362)	450	220	22
36	(1,417)	80	(3,150)	600	300	22
36	(1,417)	104	(4,094)	700	400	22
51	(2,008)	81	(3,189)	800	400	25
51	(2,008)	104	(4,094)	1100	500	25
66	(2,598)	104	(4,094)	1900	800	50
77	(3,031)	104	(4,094)	3100	1200	55
77	(3,031)	144	(5,669)	4200	1800	55
77	(3,031)	220	(8,661)	5700	2400	55
90	(3,543)	144	(5,669)	5700	2400	80
90	(3,543)	200	(7,874)	7700	3200	80

## PEAK VOLTAGE (V)

1000 cycles, without ripple current  
 $U_p$ : Repetitive standard peak voltage (30 s)  
 $U_s$ : Repetitive surge voltage (0,1 s)  
 Do not overstep this value without damage.

$U_R$	16 V	25 V	40 V	63 V	100 V	160 V	250 V	350 V	400 V	450 V	
$U_p$	18	29	46	72	115	184	288	385	440	495	
$U_s$							235	340	450	495	540

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

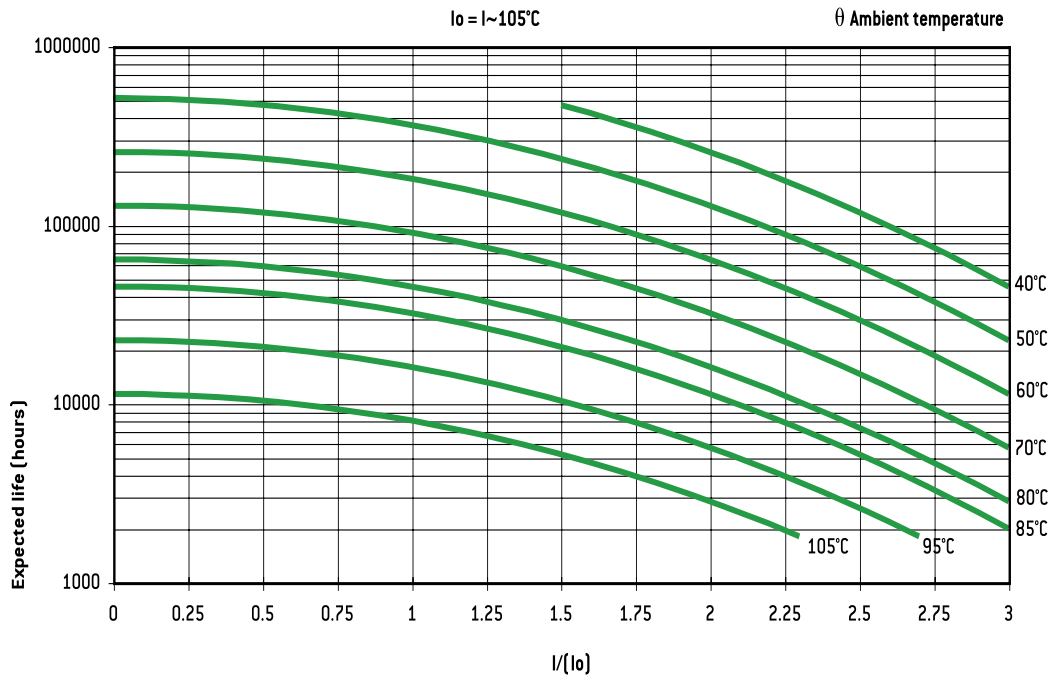
versus frequency  $f$ :

$I \sim$ : permissible r.m.s. current at 100 Hz

$f$ (Hz)	50	100	300	600	1 000	10 000	50 000
$I$	$0,8 \times I \sim$	$I \sim$	$1,2 \times I \sim$	$1,3 \times I \sim$	$1,35 \times I \sim$	$1,5 \times I \sim$	$1,6 \times I \sim$

## EXPECTED LIFE

As a function of temperature and ripple current



$U_R \leq 350 \text{ V}$ :  $\theta$  max 115°C  
 $U_R > 350 \text{ V}$ :  $\theta$  max 105°C

**FELSIC 105 TFRS****CO 45 BC - BD****8 000 h / 105°C****Very low serie resistance**

10 V ... 100 V	470 $\mu$ F ... 68 000 $\mu$ F	$\emptyset$ 36 (1,417) ... $\emptyset$ 77 (3,031)	- 55°C + 105°C	Long Life Time
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**APPLICATIONS**

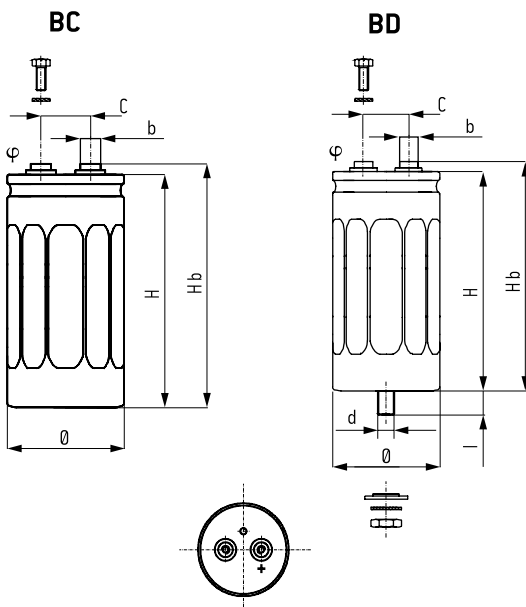
- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Fixing: Clip or stud fixing

Screw terminals: M4 or M5

Tolerance on capacitance at 20°C: -10 +50 %

Operating temperature: - 55°C + 105°C



BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor [steel hex nut, spring washer]

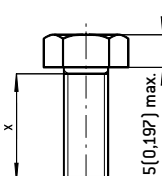
**DIMENSIONS in mm (inches)**

$\emptyset \pm 1$ (0,039)	H $\pm 2$ (0,079)	Hb $\pm 2$ (0,079)	C $\pm 0,5$ (0,020)	$\phi$	b
36 (1,417)	47 (1,850)	53 (2,087)	12,7 (0,500)	M4	8 (0,315)
36 (1,417)	60 (2,362)	66 (2,598)	12,7 (0,500)	M4	8 (0,315)
36 (1,417)	80 (3,150)	86 (3,386)	12,7 (0,500)	M4	8 (0,315)
51 (2,008)	81 (3,189)	87 (3,425)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	104 (4,094)	110 (4,331)	22,2 (0,874)	M5	13 (0,512)
66 (2,598)	104 (4,094)	110 (4,331)	28,5 (1,122)	M5	13 (0,512)
73 (2,874)	104 (4,094)	110 (4,331)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	144 (5,669)	140 (5,512)	31,7 (1,248)	M5	13 (0,512)

$\emptyset$	d	l	Max. nut torque
36 (1,417)	M8	12 $\pm$ 1 (0,472 $\pm$ 0,472)	4 Nm
$\geq$ 51 (2,008)	M12	16 $\pm$ 1,5 (0,630 $\pm$ 0,059)	10 Nm

**HEXAGONAL SCREWS mm (inches)**

Screwing height between screws and terminals:	3,5 (0,138) max
Max. screw torque:	M4: 2 Nm [x min 8 (0,315)] M5: 3 Nm [x min 8 (0,315)]

**RESISTANCE TO VIBRATIONS**

Hb mm (inches)	>150 (5,906)	$\leq$ 150 (5,906)
f (Hz)	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

**SPECIFICATIONS**

NFC 83 110 - CO 45

DIN 40 040 - Climatic category FMD - 55°C + 105°C / 56 days

CECC 30301-040

IEC 60 384.4 long life

Standard endurance test at U<sub>R</sub>: 2000 h / 105°C  
5000 h / 85°C**WITHSTAND STRENGTH OF INSULATING SLEEVE**

Insulation resistance at 20°C between terminals

and mounting hardware: 100 M $\Omega$ 

Test voltage at 50 Hz 1 min between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s (IEC 60 695-2-2).

## FELSIC 105 TFRS

CO 45 BC - BD

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Can		ESR 100 Hz +20°C		Z +20°C 10 kHz max. ( $\text{m}\Omega$ )	II +20°C 5 min. max. (mA)	I $\sim$ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+105°C (A)	BC	BD		
<b>Rated voltage 10 V</b>												
4700	36	(1,417)	47	(1,850)	15	23	15	0,09	22	7,7	A 762020	A 763020
6800	36	(1,417)	60	(2,362)	11	16	11	0,14	22	10,3	A 762021	A 763021
10000	36	(1,417)	80	(3,150)	10	13	9	0,20	22	12,3	A 762022	A 763022
15000	51	(2,008)	81	(3,189)	9	11	8	0,30	25	13	A 762023	A 763023
22000	51	(2,008)	104	(4,094)	7	9	7	0,44	25	16	A 762024	A 763024
33000	66	(2,598)	104	(4,094)	4	6	5	0,66	50	25	A 762025	A 763025
47000	73	(2,874)	104	(4,094)	3	4	2	0,94	55	31	A 762026	A 763026
68000	77	(3,031)	144	(5,669)	2	3	2	1,40	55	44	A 762027	A 763027
<b>Rated voltage 16 V</b>												
3300	36	(1,417)	47	(1,850)	19	28	16	0,10	22	6,9	A 762040	A 763040
4700	36	(1,417)	60	(2,362)	13	20	13	0,15	22	9,5	A 762041	A 763041
6800	36	(1,417)	80	(3,150)	11	15	12	0,21	22	11,7	A 762042	A 763042
10000	51	(2,008)	81	(3,189)	10	13	8	0,32	25	13	A 762043	A 763043
15000	51	(2,008)	104	(4,094)	7	10	8	0,48	25	16	A 762044	A 763044
22000	66	(2,598)	104	(4,094)	5	7	7	0,70	50	22	A 762045	A 763045
33000	73	(2,874)	104	(4,094)	3	5	3	1,05	55	31	A 762046	A 763046
47000	77	(3,031)	144	(5,669)	3	4	2	1,50	55	36	A 762047	A 763047
<b>Rated voltage 25 V</b>												
2200	36	(1,417)	47	(1,850)	22	33	18	0,11	22	6,4	A 762060	A 763060
3300	36	(1,417)	60	(2,362)	15	23	14	0,16	22	8,8	A 762061	A 763061
4700	36	(1,417)	80	(3,150)	12	18	13	0,23	22	10,1	A 762062	A 763062
6800	51	(2,008)	81	(3,189)	11	15	9	0,34	25	12	A 762063	A 763063
10000	51	(2,008)	104	(4,094)	9	12	9	0,50	25	14	A 762064	A 763064
15000	66	(2,598)	104	(4,094)	7	9	7	0,75	50	19	A 762065	A 763065
22000	73	(2,874)	104	(4,094)	3	5	3	1,10	55	31	A 762066	A 763066
33000	77	(3,031)	144	(5,669)	3	5	3	1,65	55	36	A 762067	A 763067
<b>Rated voltage 40 V</b>												
1500	36	(1,417)	47	(1,850)	27	40	20	0,12	22	5,8	A 762080	A 763080
2200	36	(1,417)	60	(2,362)	19	28	16	0,17	22	7,8	A 762081	A 763081
3300	36	(1,417)	80	(3,150)	14	21	15	0,26	22	10,4	A 762082	A 763082
4700	51	(2,008)	81	(3,189)	12	18	10	0,37	25	11	A 762083	A 763083
6800	51	(2,008)	104	(4,094)	10	14	10	0,54	25	14	A 762084	A 763084
10000	66	(2,598)	104	(4,094)	7	10	8	0,80	50	19	A 762085	A 763085
15000	73	(2,874)	104	(4,094)	5	8	3	1,20	55	24	A 762086	A 763086
22000	77	(3,031)	144	(5,669)	3	5	3	1,80	55	36	A 762087	A 763087
<b>Rated voltage 63 V</b>												
680	36	(1,417)	47	(1,850)	31	47	28	0,09	20	5,4	A 762100	A 763100
1000	36	(1,417)	60	(2,362)	22	32	20	0,12	22	7,3	A 762101	A 763101
1500	36	(1,417)	80	(3,150)	18	25	18	0,19	22	9,2	A 762102	A 763102
2200	51	(2,008)	81	(3,189)	16	21	13	0,28	25	9,7	A 762103	A 763103
3300	51	(2,008)	104	(4,094)	12	16	12	0,41	25	12	A 762104	A 763104
4700	66	(2,598)	104	(4,094)	9	12	10	0,59	50	17	A 762105	A 763105
6800	73	(2,874)	104	(4,094)	5	7	4	0,86	55	24	A 762106	A 763106
10000	77	(3,031)	144	(5,669)	4	6	4	1,30	55	31	A 762107	A 763107
<b>Rated voltage 100 V</b>												
470	36	(1,417)	47	(1,850)	39	59	40	0,10	18	4,8	A 762120	A 763120
680	36	(1,417)	60	(2,362)	27	40	28	0,14	22	6,6	A 762121	A 763121
1000	36	(1,417)	80	(3,150)	22	31	20	0,20	22	8,3	A 762122	A 763122
1500	51	(2,008)	81	(3,189)	20	26	15	0,30	25	8,7	A 762123	A 763123
2200	51	(2,008)	104	(4,094)	15	19	13	0,44	25	11	A 762124	A 763124
3300	66	(2,598)	104	(4,094)	12	15	10	0,66	50	14	A 762125	A 763125
4700	73	(2,874)	104	(4,094)	6	8	5	0,94	55	22	A 762126	A 763126
6800	77	(3,031)	144	(5,669)	5	7	5	1,40	55	24	A 762127	A 763127



## FELSIC 105 TFRS

CO 45 BC - BD

8 000 h / 105°C

PERMISSIBLE REPETITIVE PEAK CURRENT  $I_p$ :

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

DIMENSIONS in mm (inches)		$I_p$ (A)		$I_{\sim}$ max. (A)
$\emptyset$	H	40°C	105°C	
36 (1,417)	47 (1,850)	400	200	22
36 (1,417)	60 (2,362)	450	220	22
36 (1,417)	80 (3,150)	600	300	22
51 (2,008)	81 (3,189)	800	400	25
51 (2,008)	104 (4,094)	1100	500	25
66 (2,598)	104 (4,094)	1900	800	50
73 (2,874)	104 (4,094)	3100	1200	55
77 (3,031)	104 (4,094)	4200	1800	55

PERMISSIBLE RIPPLE CURRENT  $I$  (R.M.S. VALUE)

versus frequency  $f$ :

$I_{\sim}$ : permissible r.m.s. current at 100 Hz

$f$ (Hz)	50	100	300	600	1 000	10 000	50 000
$I$	$0,8 \times I_{\sim}$	$I_{\sim}$	$1,2 \times I_{\sim}$	$1,3 \times I_{\sim}$	$1,35 \times I_{\sim}$	$1,5 \times I_{\sim}$	$1,6 \times I_{\sim}$

## PEAK VOLTAGE (V)

1000 cycles, without ripple current

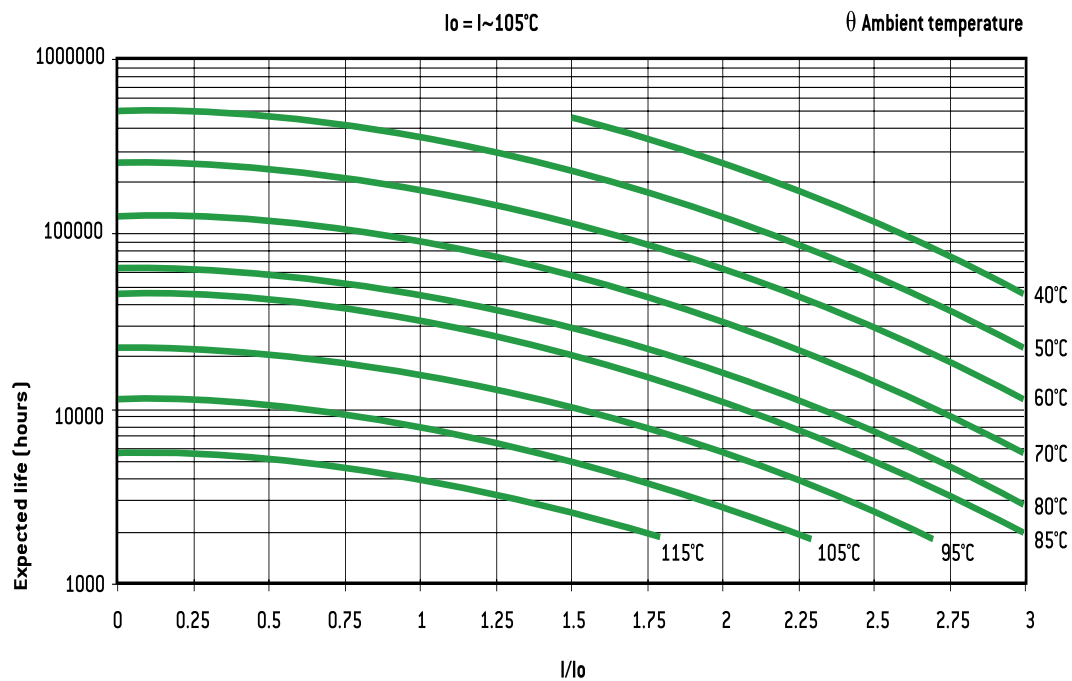
$U_p$ : Repetitive standard peak Voltage (30 s)

Do not overstep this value without damage

$U_R$	10 V	16 V	25 V	40 V	63 V	100 V
$U_p$	11,5	18	29	46	72	115

## EXPECTED LIFE

As a function of temperature and ripple current



# FELSIC 105 LP

BC

8 000 h / 105°C

10V ... 450V	1500 μF ... 220 000 μF	Ø 90 (3,543) ... H 67 (2,638)	- 55°C + 105°C	Long Life Time
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## APPLICATIONS

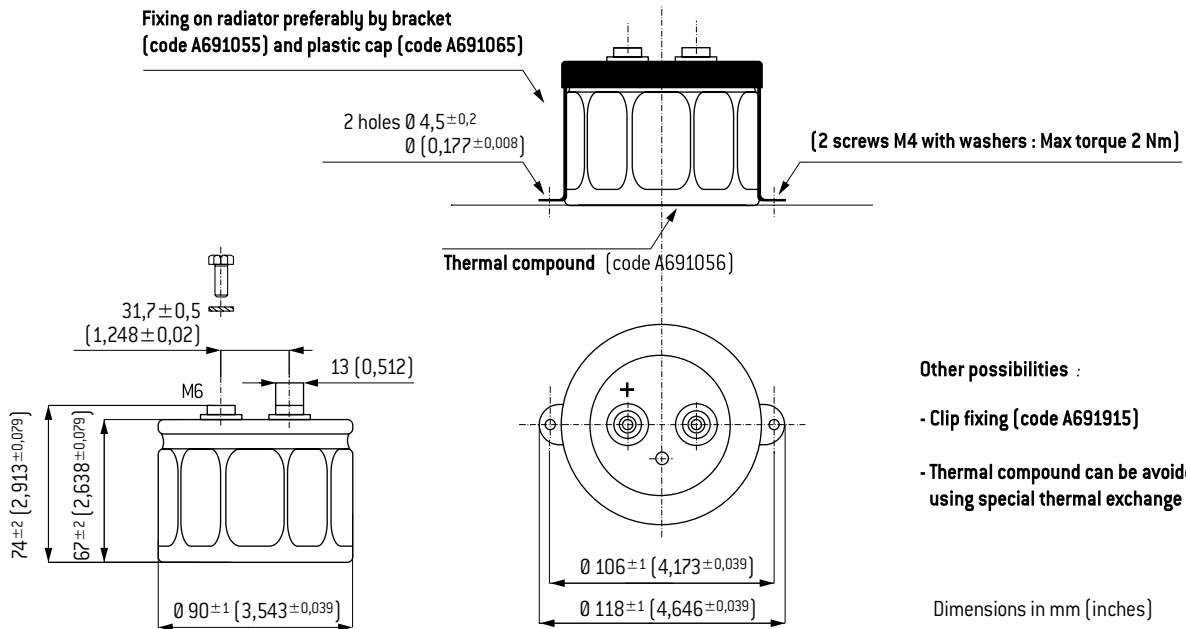
- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Fixing: Clip or stud fixing

Screw terminals: M6

Tolerance on capacitance at 20°C: -10 +30 %

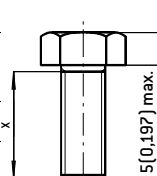
Operating temperature: - 55°C +105°C



## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:  
2 (0,079) max

Max. screw torque: M6: 6 Nm [x min 10 (0,394)]



## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 55 Hz
Amplitude	0,75 (0,030)
Acceleration	10 g - 98 m/s <sup>2</sup>
t (h)	3 x 2 h

## SPECIFICATIONS

NFC 83 110 - Long life

DIN 40 040 - Climatic category FMD - 55°C + 105°C / 56 days

CECC 30 300 - Long life

IEC 60 384.4 - Long life

Standard endurance test at U<sub>R</sub>: 2000 h / 105°C  
5000 h / 85°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 MΩ

Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

8 000 h / 105°C

Rated voltage (V)	Capacitance ( $\mu\text{F}$ )	Can		ESR 100 Hz +20°C		Z +20°C 10 kHz max. ( $\text{m}\Omega$ )	I +20°C 5 min. max. (mA)	I $\sim$		Code
		$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+105°C (A)	
10	220000	90 (3,543)	67 (2,638)	4	5	5	5	150	61	A 756032
16	150000	90 (3,543)	67 (2,638)	5	8	8	5	150	55	A 756057
25	100000	90 (3,543)	67 (2,638)	6	9	9	5	150	50	A 756099
40	68000	90 (3,543)	67 (2,638)	7	11	11	6	150	46	A 756138
63	33000	90 (3,543)	67 (2,638)	10	15	13	6	146	39	A 756178
63	47000	90 (3,543)	67 (2,638)	7	11	9	6	150	46	A 756180
100	15000	90 (3,543)	67 (2,638)	12	20	16	6	131	35	A 756215
160	6800	90 (3,543)	67 (2,638)	14	21	18	6	100	27	A 756254
250	3300	90 (3,543)	67 (2,638)	19	29	23	6	86	23	A 756295
350	2200	90 (3,543)	67 (2,638)	30	45	35	6	68	18	A 756336
350	3300	90 (3,543)	67 (2,638)	25	38	30	6	75	20	A 756339
400	2200	90 (3,543)	67 (2,638)	40	60	45	6	60	16	A 756373
450	1500	90 (3,543)	67 (2,638)	45	68	48	6	56	15	A 756412
450	2000	90 (3,543)	67 (2,638)	40	60	50	6	60	16	A 756415
450	2200	90 (3,543)	67 (2,638)	30	44	35	6	68	18	A 756416

### PEAK VOLTAGE (V)

1000 cycles, without ripple current

Up: Repetitive standard peak voltage (30 s)

Us: Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

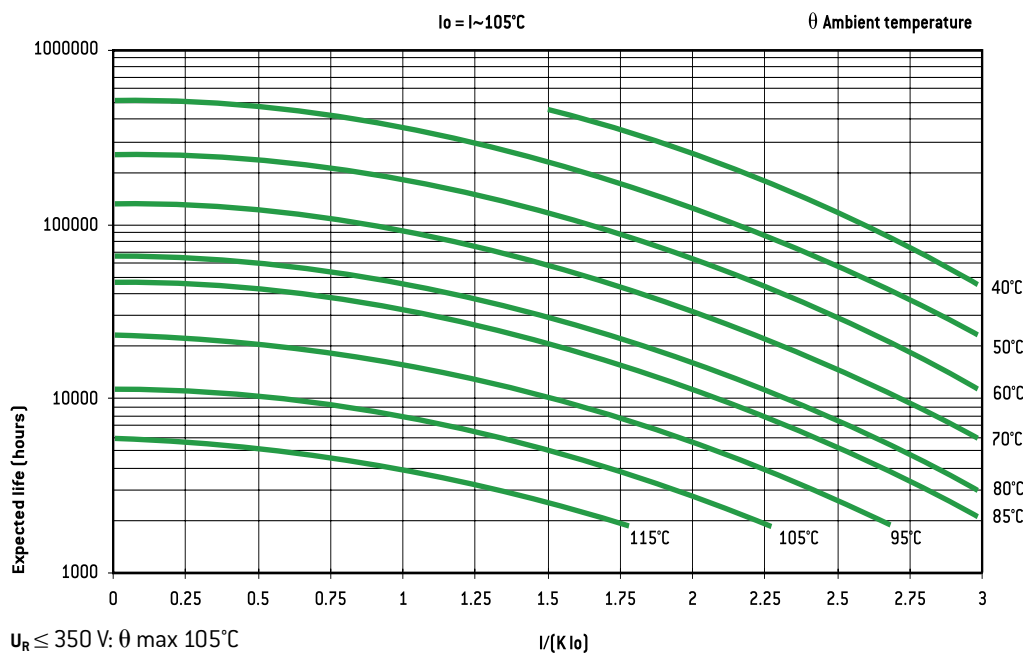
U <sub>R</sub>	10 V	16 V	25 V	40 V	63 V	100 V	160 V	250 V	350 V	400 V	450 V
Up	11,5	18	29	46	72	115	184	288	385	440	495
Us							235	340	450	495	540

### MAXIMUM PERMISSIBLE RIPPLE CURRENT 150 A

For r.m.s. current above 80 A, standard cover with  $\emptyset$  13 aluminum terminals can be replaced by special cover with  $\emptyset$  18 aluminum terminals, on request.

### EXPECTED LIFE

As a function of temperature and ripple current



### PERMISSIBLE REPETITIVE PEAK CURRENT I<sub>p</sub>:

If given permissible ripple currents are not exceeded, and with a maximum ambient temperature of 40°C

I<sub>p</sub> = 5700 A

### PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I $\sim$ : permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	50 000
I	0,8 x I $\sim$	I $\sim$	1,2 x I $\sim$	1,3 x I $\sim$	1,35 x I $\sim$	1,5 x I $\sim$	1,6 x I $\sim$

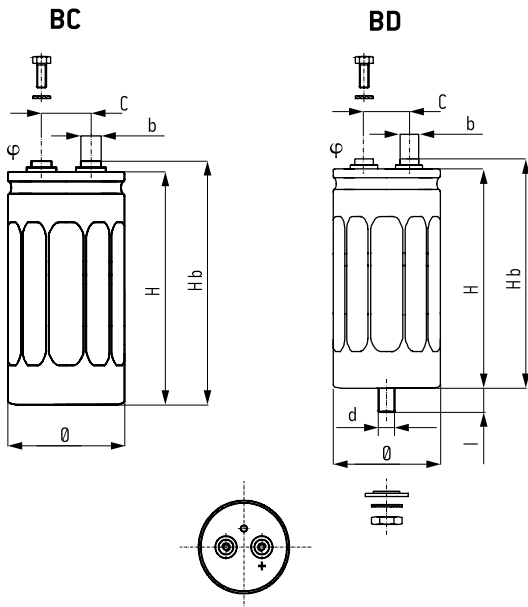
	Without cooling and without radiator	Air cooling without radiator 0,2 - 0,5 m/s	With radiator and thermal compound and without water cooling	With radiator thermal compound and water cooling
K	0,5	0,6	1	1,3
Thermal resistance °C/W	4	2,5	1	0,6

# FELSIC HC

BC - BD

8 000 h / 85°C

10V ... 500V	390 μF ... 2 700 000 μF	Ø 36 (1,417) ... Ø 90 (3,543)	- 40°C + 85°C	Long Life Time
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## APPLICATIONS

- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash

Fixing: Clip or stud fixing

Screw terminals: M5 or M6

Tolerance on capacitance at 20°C: ± 20 %

Operating temperature : - 40°C + 85°C

Subject to change. Qualification in progress

BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor (steel hex nut, spring washer)

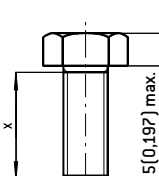
## DIMENSIONS in mm (inches)

Ø ±1 (0,039)	H ±2 (0,079)	Hb ±2 (0,079)	c ±0,5 (0,020)	φ	b
36 (1,417)	44 (1,732)	50 (1,969)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	52 (2,047)	58 (2,283)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	60 (2,362)	66 (2,598)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	80 (3,150)	86 (3,386)	12,7 (0,500)	M5	8 (0,315)
36 (1,417)	104 (4,094)	110 (4,331)	12,7 (0,500)	M5	8 (0,315)
51 (2,008)	62 (2,441)	68 (2,677)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	81 (3,189)	87 (3,425)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	104 (4,094)	110 (4,331)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	144 (5,669)	150 (5,906)	22,2 (0,874)	M5	13 (0,512)
66 (2,598)	104 (4,094)	110 (4,331)	28,5 (1,122)	M5	13 (0,512)
73 (2,874)	104 (4,094)	110 (4,331)	31,7 (1,248)	M5	13 (0,512)
73 (2,874)	144 (5,669)	150 (5,906)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	104 (4,094)	110 (4,331)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	144 (5,669)	150 (5,906)	31,7 (1,248)	M5	13 (0,512)
77 (3,031)	220 (8,661)	226 (8,898)	31,7 (1,248)	M5	13 (0,512)
90 (3,543)	144 (5,669)	151 (5,945)	31,7 (1,248)	M6	13 (0,512)
90 (3,543)	200 (7,874)	207 (8,150)	31,7 (1,248)	M6	13 (0,512)

Ø	d	l	Max. nut torque
36 (1,417)	M8	12 <sup>±1</sup> (0,472 <sup>±0,472</sup> )	4 Nm
≥ 51 (2,008)	M12	16 <sup>±1,5</sup> (0,630 <sup>±0,059</sup> )	10 Nm

## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:	3,5 (0,138) max
Max. screw torque:	M5: 3 Nm [x min 8 (0,315)] M6: 6 Nm [x min 10 (0,394)]



## RESISTANCE TO VIBRATIONS

Hb mm (inches)	>150 (5,906)	≤150 (5,906)
f [Hz]	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

## SPECIFICATIONS

NFC 83 110 - long life  
 DIN 41 240 - Climatic category GPF  
 - 40°C + 85°C / 56 days  
 CECC 30 300  
 IEC 60 384.4 long life  
 Standard endurance test at U<sub>R</sub>: 2000 h / 85°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 MΩ  
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
 Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

8 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max.	I +20°C 5 min max.	I $\sim$ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+85°C (A)	BC	BD		
<b>Rated voltage 10 V</b>												
50 000	36	[1,417]	44	[1,732]	12	18	20	2,7	22	7,1	A777001	A778001
74 000	36	[1,417]	52	[2,047]	8	11	20	3,6	22	9,5	A777002	A778002
80000	36	[1,417]	60	[2,362]	9	13	17	3,8	22	9,6	A777003	A778003
130000	36	[1,417]	80	[3,150]	6	9	13	5,3	22	12,8	A777004	A778004
174000	36	[1,417]	104	[4,094]	6	9	13	6,5	25	14,4	A777005	A778005
183000	51	[2,008]	62	[2,441]	7	10	13	6,7	25	13,5	A777006	A778006
296000	51	[2,008]	81	[3,189]	4	7	10	9,4	25	18,4	A777007	A778007
395000	51	[2,008]	104	[4,094]	4	7	10	11,6	25	20,5	A777008	A778008
593000	51	[2,008]	144	[5,669]	4	6	10	15,3	25	24,4	A777009	A778009
664000	66	[2,598]	104	[4,094]	4	6	10	16,6	25	24,3	A777010	A778010
837000	73	[2,874]	104	[4,094]	3	5	7	19,5	50	29,4	A777011	A778011
1255000	73	[2,874]	144	[5,669]	3	4	6	26,0	80	37,4	A777012	A778012
972000	77	[3,031]	104	[4,094]	3	4	6	21,7	50	33,5	A777013	A778013
1458000	77	[3,031]	144	[5,669]	3	4	6	28,8	80	38,6	A777014	A778014
2272000	77	[3,031]	220	[8,661]	2	3	6	39,3	80	51,3	A777015	A778015
2081000	90	[3,543]	144	[5,669]	2	3	6	37,0	80	46,3	A777016	A778016
2774000	90	[3,543]	200	[7,874]	3	4	6	45,2	80	48,8	A777017	A778017
3121000	90	[3,543]	220	[8,661]	3	4	6	49,1	80	50,9	A777018	A778018
<b>Rated voltage 16 V</b>												
39000	36	[1,417]	44	[1,732]	10	15	26	3,2	20	7,7	A777019	A778019
57000	36	[1,417]	52	[2,047]	9	14	24	4,2	22	8,6	A777020	A778020
62000	36	[1,417]	60	[2,362]	10	15	18	4,4	22	8,8	A777021	A778021
101000	36	[1,417]	80	[3,150]	8	11	15	6,2	22	11,5	A777022	A778022
135000	36	[1,417]	104	[4,094]	8	11	15	7,6	22	12,9	A777023	A778023
142000	51	[2,008]	62	[2,441]	7	11	13	7,8	25	13,0	A777024	A778024
230000	51	[2,008]	81	[3,189]	5	8	11	11,0	25	17,0	A777025	A778025
306000	51	[2,008]	104	[4,094]	5	8	9	13,4	25	18,8	A777026	A778026
460000	51	[2,008]	144	[5,669]	4	6	7	17,8	25	25,6	A777027	A778027
515000	66	[2,598]	104	[4,094]	4	6	7	19,3	50	25,6	A777028	A778028
649000	73	[2,874]	104	[4,094]	3	4	5	22,7	50	31,1	A777029	A778029
974000	73	[2,874]	144	[5,669]	2	3	5	30,2	80	40,0	A777030	A778030
754000	77	[3,031]	104	[4,094]	2	3	5	25,2	80	35,8	A777031	A778031
1131000	77	[3,031]	144	[5,669]	2	3	5	33,5	80	41,2	A777032	A778032
1762000	77	[3,031]	220	[8,661]	2	3	5	45,7	80	55,3	A777033	A778033
1613000	90	[3,543]	144	[5,669]	2	3	5	43,0	80	49,9	A777034	A778034
2151000	90	[3,543]	200	[7,874]	2	3	5	52,6	80	52,0	A777035	A778035
2151000	90	[3,543]	200	[7,874]	3	5	5	52,6	80	43,0	A777036	A778036
2420000	90	[3,543]	220	[8,661]	3	5	5	57,1	80	44,8	A777037	A778037
<b>Rated voltage 25 V</b>												
39000	36	[1,417]	44	[1,732]	10	15	26	3,2	20	7,7	A777019	A778019
57000	36	[1,417]	52	[2,047]	9	14	24	4,2	22	8,6	A777020	A778020
62000	36	[1,417]	60	[2,362]	10	15	18	4,4	22	8,8	A777021	A778021
101000	36	[1,417]	80	[3,150]	8	11	15	6,2	22	11,5	A777022	A778022
135000	36	[1,417]	104	[4,094]	8	11	15	7,6	22	12,9	A777023	A778023
142000	51	[2,008]	62	[2,441]	7	11	13	7,8	25	13,0	A777024	A778024
230000	51	[2,008]	81	[3,189]	5	8	11	11,0	25	17,0	A777025	A778025
306000	51	[2,008]	104	[4,094]	5	8	9	13,4	25	18,8	A777026	A778026
460000	51	[2,008]	144	[5,669]	4	6	7	17,8	25	25,6	A777027	A778027
515000	66	[2,598]	104	[4,094]	4	6	7	19,3	50	25,6	A777028	A778028
649000	73	[2,874]	104	[4,094]	3	4	5	22,7	50	31,1	A777029	A778029
974000	73	[2,874]	144	[5,669]	2	3	5	30,2	80	40,0	A777030	A778030
754000	77	[3,031]	104	[4,094]	2	3	5	25,2	80	35,8	A777031	A778031
1131000	77	[3,031]	144	[5,669]	2	3	5	33,5	80	41,2	A777032	A778032
1762000	77	[3,031]	220	[8,661]	2	3	5	45,7	80	55,3	A777033	A778033
1613000	90	[3,543]	144	[5,669]	2	3	5	43,0	80	49,9	A777034	A778034
2151000	90	[3,543]	200	[7,874]	2	3	5	52,6	80	52,0	A777035	A778035
2151000	90	[3,543]	200	[7,874]	3	5	5	52,6	80	43,0	A777036	A778036
2420000	90	[3,543]	220	[8,661]	3	5	5	57,1	80	44,8	A777037	A778037

## FELSIC HC

BC - BD

8 000 h / 85°C

Capacitance [μF]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. [mΩ]	II +20°C 5 min max. [mA]	I~ 100 Hz		Code			
	Ø mm [inches]	H mm [inches]	Typic [mΩ]	max. [mΩ]			+40°C max. [A]	+85°C [A]	BC	BD		
<b>Rated voltage 40 V</b>												
17800	36	[1,417]	44	[1,732]	2	3	5	3,5	22	16,4	A777057	A778057
26000	36	[1,417]	52	[2,047]	2	3	5	4,6	22	17,6	A777058	A778058
28700	36	[1,417]	60	[2,362]	10	15	27	4,9	22	8,8	A777059	A778059
46000	36	[1,417]	80	[3,150]	8	12	22	6,8	22	11,0	A777060	A778060
62000	36	[1,417]	104	[4,094]	7	11	18	8,3	22	13,1	A777061	A778061
65000	51	[2,008]	62	[2,441]	7	11	18	8,6	25	12,7	A777062	A778062
105000	51	[2,008]	81	[3,189]	4	6	9	12,1	25	19,0	A777063	A778063
141000	51	[2,008]	104	[4,094]	4	6	8	14,8	25	22,0	A777064	A778064
211000	51	[2,008]	144	[5,669]	3	5	8	19,7	25	26,9	A777065	A778065
237000	66	[2,598]	104	[4,094]	3	5	8	21,3	25	26,8	A777066	A778066
298000	73	[2,874]	104	[4,094]	3	5	7	25,0	55	30,5	A777067	A778067
447000	73	[2,874]	144	[5,669]	3	4	7	33,2	80	37,7	A777068	A778068
346000	77	[3,031]	104	[4,094]	3	4	7	27,8	55	33,7	A777069	A778069
519000	77	[3,031]	144	[5,669]	3	4	7	36,9	80	38,8	A777070	A778070
809000	77	[3,031]	220	[8,661]	3	4	7	50,4	80	47,0	A777071	A778071
741000	90	[3,543]	144	[5,669]	2	3	6	47,3	80	51,4	A777072	A778072
988000	90	[3,543]	200	[7,874]	2	3	5	57,9	80	52,4	A777073	A778073
1111000	90	[3,543]	220	[8,661]	2	3	5	62,9	80	54,7	A777074	A778074
<b>Rated voltage 50 V</b>												
9400	36	[1,417]	44	[1,732]	2	3	5	2,6	21	16,2	A777075	A778075
14000	36	[1,417]	52	[2,047]	15	23	30	3,4	20	6,7	A777076	A778076
15000	36	[1,417]	60	[2,362]	15	23	30	3,6	22	7,2	A777077	A778077
25000	36	[1,417]	80	[3,150]	12	17	24	5,1	22	9,3	A777078	A778078
33000	36	[1,417]	104	[4,094]	12	17	21	6,3	22	10,5	A777079	A778079
34600	51	[2,008]	62	[2,441]	12	17	21	6,5	25	10,2	A777080	A778080
56000	51	[2,008]	81	[3,189]	7	11	15	9,1	25	14,6	A777081	A778081
56000	51	[2,008]	81	[3,189]	10	14	11	9,1	25	12,6	A777082	A778082
75000	51	[2,008]	104	[4,094]	10	14	11	11,1	25	14,0	A777083	A778083
112000	51	[2,008]	144	[5,669]	6	9	10	14,8	25	20,3	A777084	A778084
126000	66	[2,598]	104	[4,094]	6	10	9	16,0	50	19,8	A777085	A778085
158000	73	[2,874]	104	[4,094]	6	10	9	18,8	55	21,0	A777086	A778086
237000	73	[2,874]	144	[5,669]	6	10	9	24,9	55	24,2	A777087	A778087
184000	77	[3,031]	104	[4,094]	6	9	10	20,8	55	22,3	A777088	A778088
275000	77	[3,031]	144	[5,669]	4	6	7	27,7	55	30,4	A777089	A778089
430000	77	[3,031]	220	[8,661]	4	6	7	37,8	80	36,8	A777090	A778090
393000	90	[3,543]	144	[5,669]	3	5	6	35,5	80	37,4	A777091	A778091
524000	90	[3,543]	200	[7,874]	3	5	6	43,5	80	43,3	A777092	A778092
590000	90	[3,543]	220	[8,661]	3	5	6	47,2	80	45,2	A777093	A778093
<b>Rated voltage 63 V</b>												
6300	36	[1,417]	44	[1,732]	34	51	52	2,3	16	4,2	A777094	A778094
9300	36	[1,417]	52	[2,047]	24	37	39	3,0	19	5,3	A777095	A778095
10100	36	[1,417]	60	[2,362]	24	37	39	3,2	22	5,7	A777096	A778096
16000	36	[1,417]	80	[3,150]	14	21	28	4,5	22	8,4	A777097	A778097
22000	36	[1,417]	104	[4,094]	15	22	25	5,6	22	9,4	A777098	A778098
23000	51	[2,008]	62	[2,441]	15	22	18	5,7	25	9,0	A777099	A778099
37000	51	[2,008]	81	[3,189]	11	16	15	8,0	25	11,8	A777100	A778100
50000	51	[2,008]	104	[4,094]	11	16	14	9,8	25	13,3	A777101	A778101
75000	51	[2,008]	144	[5,669]	8	13	12	13,0	25	17,2	A777102	A778102
83000	66	[2,598]	104	[4,094]	8	13	12	14,1	50	17,2	A777103	A778103
105000	73	[2,874]	104	[4,094]	8	13	12	16,6	55	18,2	A777104	A778104
158000	73	[2,874]	144	[5,669]	5	7	9	22,0	55	28,3	A777105	A778105
122000	77	[3,031]	104	[4,094]	5	7	9	18,4	55	25,3	A777106	A778106
183000	77	[3,031]	144	[5,669]	5	7	8	24,5	55	28,3	A777107	A778107
286000	77	[3,031]	220	[8,661]	4	6	8	33,4	80	37,6	A777108	A778108
261000	90	[3,543]	144	[5,669]	4	6	8	31,4	80	33,9	A777109	A778109
349000	90	[3,543]	200	[7,874]	3	5	4	38,4	80	44,7	A777110	A778110
392000	90	[3,543]	220	[8,661]	3	5	4	41,7	80	46,6	A777111	A778111

8 000 h / 85°C

Capacitance [ $\mu$ F]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max.	II +20°C 5 min max.	I ~ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic [m $\Omega$ ]	max. [m $\Omega$ ]			+40°C max. [A]	+85°C [A]	BC	BD		
<b>Rated voltage 80 V</b>												
5300	36	[1,417]	44	[1,732]	3	5	60	2,4	80	0,0	A777112	A778112
7900	36	[1,417]	52	[2,047]	30	45	60	3,2	13	4,8	A777113	A778113
8600	36	[1,417]	60	[2,362]	30	45	60	3,4	22	5,1	A777114	A778114
14000	36	[1,417]	80	[3,150]	17	26	42	4,8	22	7,7	A777115	A778115
18000	36	[1,417]	104	[4,094]	17	26	42	5,8	22	8,6	A777116	A778116
19000	51	[2,008]	62	[2,441]	12	17	25	6	25	10,2	A777117	A778117
31000	51	[2,008]	81	[3,189]	8	12	20	8,4	25	13,6	A777118	A778118
42000	51	[2,008]	104	[4,094]	7	11	17	10,3	25	16,0	A777119	A778119
63000	51	[2,008]	144	[5,669]	6	9	15	13,7	25	20,0	A777120	A778120
70000	66	[2,598]	104	[4,094]	7	10	13	14,8	50	19,3	A777121	A778121
89000	73	[2,874]	104	[4,094]	7	10	13	17,4	50	20,4	A777122	A778122
133000	73	[2,874]	144	[5,669]	4	6	10	23,1	55	30,2	A777123	A778123
103000	77	[3,031]	104	[4,094]	4	6	10	19,3	55	27,0	A777124	A778124
154000	77	[3,031]	144	[5,669]	4	6	7	25,6	55	31,8	A777125	A778125
241000	77	[3,031]	220	[8,661]	4	6	7	35	80	38,5	A777126	A778126
220000	90	[3,543]	144	[5,669]	4	5	7	32,9	80	36,0	A777127	A778127
294000	90	[3,543]	200	[7,874]	4	5	7	40,3	80	41,6	A777128	A778128
331000	90	[3,543]	220	[8,661]	4	5	7	43,7	80	43,4	A777129	A778129
<b>Rated voltage 100 V</b>												
3300	36	[1,417]	44	[1,732]	53	80	100	2	10	3,4	A777130	A778130
4900	36	[1,417]	52	[2,047]	45	67	80	2,7	11	3,9	A777131	A778131
5300	36	[1,417]	60	[2,362]	45	67	80	2,8	11	4,2	A777132	A778132
8700	36	[1,417]	80	[3,150]	24	37	54	4	17	6,4	A777133	A778133
11700	36	[1,417]	104	[4,094]	24	37	54	4,9	17	7,2	A777134	A778134
12000	51	[2,008]	62	[2,441]	17	26	35	5,1	22	8,4	A777135	A778135
19700	51	[2,008]	81	[3,189]	10	15	21	7,1	25	12,2	A777136	A778136
19700	51	[2,008]	81	[3,189]	14	21	19	7,1	25	10,5	A777137	A778137
26000	51	[2,008]	104	[4,094]	14	21	19	8,7	25	11,7	A777138	A778138
39000	51	[2,008]	144	[5,669]	9	14	18	11,5	25	16,7	A777139	A778139
44000	66	[2,598]	104	[4,094]	9	14	15	12,5	50	16,7	A777140	A778140
56000	73	[2,874]	104	[4,094]	9	14	15	14,7	55	17,6	A777141	A778141
83000	73	[2,874]	144	[5,669]	5	7	10	19,5	55	28,7	A777142	A778142
64000	77	[3,031]	104	[4,094]	5	7	10	16,3	55	25,7	A777143	A778143
97000	77	[3,031]	144	[5,669]	5	8	10	21,6	55	27,7	A777144	A778144
151000	77	[3,031]	220	[8,661]	5	8	10	29,6	55	33,6	A777145	A778145
138000	90	[3,543]	144	[5,669]	4	7	7	27,8	80	32,9	A777146	A778146
184000	90	[3,543]	200	[7,874]	3	4	4	34	80	48,1	A777147	A778147
207000	90	[3,543]	220	[8,661]	3	4	100	36,9	80	50,2	A777148	A778148
<b>Rated voltage 120 V</b>												
2100	36	[1,417]	44	[1,732]	3	4	80	1,7	11	14,9	A777149	A778149
3100	36	[1,417]	52	[2,047]	3	4	80	2,2	11	15,9	A777150	A778150
3300	36	[1,417]	60	[2,362]	3	4	54	2,3	17	16,9	A777151	A778151
5400	36	[1,417]	80	[3,150]	3	4	54	3,3	17	19,2	A777152	A778152
7300	36	[1,417]	104	[4,094]	3	4	35	4	22	21,7	A777153	A778153
7600	51	[2,008]	62	[2,441]	3	4	21	4,1	25	21,0	A777154	A778154
12000	51	[2,008]	81	[3,189]	3	4	19	5,8	25	23,5	A777155	A778155
16000	51	[2,008]	104	[4,094]	3	4	19	7,1	25	26,2	A777156	A778156
24700	51	[2,008]	144	[5,669]	3	4	18	9,4	25	30,4	A777157	A778157
27700	66	[2,598]	104	[4,094]	3	4	15	10,2	50	30,3	A777158	A778158
35000	73	[2,874]	104	[4,094]	3	4	15	12	55	32,1	A777159	A778159
52000	73	[2,874]	144	[5,669]	3	4	10	15,9	80	37,0	A777160	A778160
40000	77	[3,031]	104	[4,094]	3	4	10	13,3	55	33,1	A777161	A778161
61000	77	[3,031]	144	[5,669]	3	4	10	17,7	80	38,1	A777162	A778162
95000	77	[3,031]	220	[8,661]	3	4	10	24,2	80	46,1	A777163	A778163
87000	90	[3,543]	144	[5,669]	3	4	7	22,7	80	41,6	A777164	A778164
115000	90	[3,543]	200	[7,874]	3	4	4	27,8	80	48,1	A777165	A778165
130000	90	[3,543]	220	[8,661]	3	5	4	30,2	80	47,8	A777166	A778166



## FELSIC HC

BC - BD

8 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max.	II +20°C 5 min max.	I ~ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+85°C (A)	BC	BD		
<b>Rated voltage 160 V</b>												
1400	36	[1,417]	44	[1,732]	3	4	120	1,6	80	50,2	A777167	A778167
2100	36	[1,417]	52	[2,047]	48	71	90	2,1	11	3,5	A777168	A778168
2300	36	[1,417]	60	[2,362]	46	68	70	2,2	13	3,9	A777169	A778169
3800	36	[1,417]	80	[3,150]	35	52	50	3,1	16	4,7	A777170	A778170
5100	36	[1,417]	104	[4,094]	32	49	36	3,8	21	5,6	A777171	A778171
5300	51	[2,008]	62	[2,441]	32	48	36	4	21	6,3	A777172	A778172
8600	51	[2,008]	81	[3,189]	32	48	30	5,5	25	6,1	A777173	A778173
11000	51	[2,008]	104	[4,094]	17	26	23	6,7	25	9,3	A777174	A778174
17000	51	[2,008]	144	[5,669]	12	18	17	9	25	12,6	A777175	A778175
19000	66	[2,598]	104	[4,094]	12	17	17	9,7	50	14,6	A777176	A778176
24000	73	[2,874]	104	[4,094]	11	17	14	11,4	53	15,0	A777177	A778177
36000	73	[2,874]	144	[5,669]	7	11	11	15,1	55	19,6	A777178	A778178
28000	77	[3,031]	104	[4,094]	7	17	11	12,7	55	22,5	A777179	A778179
42000	77	[3,031]	144	[5,669]	7	17	11	16,8	55	20,2	A777180	A778180
66000	77	[3,031]	220	[8,661]	11	17	8	23	55	18,9	A777181	A778181
60000	90	[3,543]	144	[5,669]	11	7	8	21,6	80	22,9	A777182	A778182
80000	90	[3,543]	200	[7,874]	5	7	7	26,4	80	31,6	A777183	A778183
91000	90	[3,543]	220	[8,661]	5	6	7	28,7	80	36,6	A777184	A778184
<b>Rated voltage 200 V</b>												
1200	36	[1,417]	44	[1,732]	4	6	110	1,6	80	41,5	A777185	A778185
1780	36	[1,417]	52	[2,047]	67	101	90	2,1	10	3,0	A777186	A778186
2000	36	[1,417]	60	[2,362]	48	73	85	2,3	11	3,8	A777187	A778187
3200	36	[1,417]	80	[3,150]	41	61	75	3,2	13	4,4	A777188	A778188
3200	36	[1,417]	80	[3,150]	25	38	60	3,2	14	6,3	A777189	A778189
4200	36	[1,417]	104	[4,094]	20	31	50	3,9	18	7,9	A777190	A778190
4400	51	[2,008]	62	[2,441]	20	23	50	4,1	22	7,7	A777191	A778191
7200	51	[2,008]	81	[3,189]	15	23	38	5,7	23	9,9	A777192	A778192
9600	51	[2,008]	104	[4,094]	15	23	33	7	25	11,1	A777193	A778193
14000	51	[2,008]	144	[5,669]	9	13	25	9,2	25	16,9	A777194	A778194
16000	66	[2,598]	104	[4,094]	7	11	21	10	41	18,3	A777195	A778195
20000	73	[2,874]	104	[4,094]	6	9	18	11,7	46	21,6	A777196	A778196
30000	73	[2,874]	144	[5,669]	7	10	14	15,6	55	23,4	A777197	A778197
23600	77	[3,031]	104	[4,094]	7	8	14	13,1	55	21,0	A777198	A778198
35000	77	[3,031]	144	[5,669]	5	8	12	17,3	55	27,7	A777199	A778199
55000	77	[3,031]	220	[8,661]	5	8	12	23,7	55	33,5	A777200	A778200
50000	90	[3,543]	144	[5,669]	5	8	12	22,3	80	30,3	A777201	A778201
67000	90	[3,543]	200	[7,874]	5	8	8	27,2	80	35,0	A777202	A778202
67000	90	[3,543]	200	[7,874]	5	8	8	27,2	80	35,0	A777203	A778203
76000	90	[3,543]	220	[8,661]	6	9	9	29,6	80	33,8	A777204	A778204
<b>Rated voltage 250 V</b>												
780	36	[1,417]	44	[1,732]	5	8	120	1,4	80	36,5	A777205	A778205
1200	36	[1,417]	52	[2,047]	57	86	90	1,9	9	3,2	A777206	A778206
1300	36	[1,417]	60	[2,362]	52	78	85	2	11	3,6	A777207	A778207
2100	36	[1,417]	80	[3,150]	41	62	65	2,8	14	4,3	A777208	A778208
2900	36	[1,417]	104	[4,094]	34	52	60	3,5	16	5,4	A777209	A778209
3000	51	[2,008]	62	[2,441]	34	66	60	3,6	21	6,1	A777210	A778210
4900	51	[2,008]	81	[3,189]	44	66	40	5,1	21	5,2	A777211	A778211
6400	51	[2,008]	104	[4,094]	21	31	36	6,2	25	8,5	A777212	A778212
9700	51	[2,008]	144	[5,669]	17	26	38	8,2	25	10,5	A777213	A778213
10900	66	[2,598]	104	[4,094]	17	28	38	8,9	25	12,1	A777214	A778214
13700	73	[2,874]	104	[4,094]	19	28	23	10,4	41	11,6	A777215	A778215
20000	73	[2,874]	144	[5,669]	10	15	18	13,8	53	16,7	A777216	A778216
16000	77	[3,031]	104	[4,094]	10	23	18	11,6	37	19,3	A777217	A778217
24000	77	[3,031]	144	[5,669]	10	23	18	15,4	47	17,3	A777218	A778218
37000	77	[3,031]	220	[8,661]	10	23	18	21	60	19,9	A777219	A778219
34000	90	[3,543]	144	[5,669]	15	23	12	19,8	76	19,6	A777220	A778220
45000	90	[3,543]	200	[7,874]	5	7	10	24,1	80	31,0	A777221	A778221
51000	90	[3,543]	220	[8,661]	5	8	10	26,2	80	35,9	A777222	A778222

8 000 h / 85°C

Capacitance ( $\mu$ F)	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max.	I +20°C 5 min max.	I $\sim$ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic (m $\Omega$ )	max. (m $\Omega$ )			+40°C max. (A)	+85°C (A)	BC	BD		
<b>Rated voltage 300 V</b>												
650	36	[1,417]	44	[1,732]	5	8	120	1,4	80	37,4	A777223	A778223
1000	36	[1,417]	52	[2,047]	5	8	90	1,9	9	11,9	A777224	A778224
1100	36	[1,417]	60	[2,362]	5	8	85	2	11	12,6	A777225	A778225
1890	36	[1,417]	80	[3,150]	5	8	65	3	14	14,3	A777226	A778226
2400	36	[1,417]	104	[4,094]	5	8	60	3,6	16	16,2	A777227	A778227
2550	51	[2,008]	62	[2,441]	5	8	60	3,7	21	15,7	A777228	A778228
4200	51	[2,008]	81	[3,189]	5	8	40	5,2	21	17,5	A777229	A778229
5550	51	[2,008]	104	[4,094]	5	8	36	6,3	25	19,6	A777230	A778230
8300	51	[2,008]	144	[5,669]	5	8	38	8,4	25	22,7	A777231	A778231
9300	66	[2,598]	104	[4,094]	5	8	38	9,1	25	22,6	A777232	A778232
11800	73	[2,874]	104	[4,094]	5	8	23	10,7	41	23,9	A777233	A778233
17700	73	[2,874]	144	[5,669]	5	8	18	14,2	53	27,6	A777234	A778234
13700	77	[3,031]	104	[4,094]	5	8	18	11,9	37	24,7	A777235	A778235
20600	77	[3,031]	144	[5,669]	5	8	18	15,8	47	28,4	A777236	A778236
25800	77	[3,031]	220	[8,661]	5	8	18	18,5	80	34,4	A777237	A778237
23700	90	[3,543]	144	[5,669]	5	8	12	17,4	76	31,0	A777238	A778238
31600	90	[3,543]	200	[7,874]	5	8	10	21,3	80	35,9	A777239	A778239
35000	90	[3,543]	220	[8,661]	5	8	10	23,1	80	37,4	A777240	A778240
<b>Rated voltage 350 V</b>												
550	36	[1,417]	44	[1,732]	5	8	250	1,4	5	10,8	A777241	A778241
780	36	[1,417]	52	[2,047]	118	178	170	1,8	7	2,4	A777242	A778242
890	36	[1,417]	60	[2,362]	118	158	170	2	8	2,6	A777243	A778243
1400	36	[1,417]	80	[3,150]	106	158	100	2,7	10	3,1	A777244	A778244
1400	36	[1,417]	80	[3,150]	65	97	88	2,7	11	3,9	A777245	A778245
1890	36	[1,417]	104	[4,094]	65	74	88	3,3	16	4,4	A777246	A778246
2000	51	[2,008]	62	[2,441]	65	74	88	3,4	17	4,3	A777247	A778247
3100	51	[2,008]	81	[3,189]	49	74	60	4,7	18	5,5	A777248	A778248
3100	51	[2,008]	81	[3,189]	29	44	55	4,7	18	7,2	A777249	A778249
4200	51	[2,008]	104	[4,094]	29	43	60	5,8	21	8,0	A777250	A778250
6300	51	[2,008]	144	[5,669]	28	42	35	7,7	25	9,5	A777251	A778251
6300	51	[2,008]	144	[5,669]	18	27	30	7,7	25	11,8	A777252	A778252
7100	66	[2,598]	104	[4,094]	18	30	30	8,4	35	11,7	A777253	A778253
8900	73	[2,874]	104	[4,094]	20	30	24	9,8	38	11,9	A777254	A778254
13000	73	[2,874]	144	[5,669]	12	18	17	13	53	17,5	A777255	A778255
10300	77	[3,031]	104	[4,094]	12	23	17	10,9	53	15,6	A777256	A778256
15000	77	[3,031]	144	[5,669]	12	23	17	14,4	53	18,0	A777257	A778257
19000	77	[3,031]	220	[8,661]	16	23	14	16,9	55	19,3	A777258	A778258
17900	90	[3,543]	144	[5,669]	16	15	14	15,9	55	17,4	A777259	A778259
23800	90	[3,543]	200	[7,874]	10	15	12	19,5	80	25,0	A777260	A778260
26800	90	[3,543]	220	[8,661]	10	11	12	21,2	80	26,1	A777261	A778261
<b>Rated voltage 385 V</b>												
400	36	[1,417]	44	[1,732]	8	11	480	1,3	4	8,8	A777262	A778262
670	36	[1,417]	52	[2,047]	164	246	280	1,7	5	2,0	A777263	A778263
670	36	[1,417]	60	[2,362]	148	222	210	1,7	7	2,3	A777264	A778264
1100	36	[1,417]	80	[3,150]	94	141	180	2,4	8	3,3	A777265	A778265
1560	36	[1,417]	104	[4,094]	84	126	140	3,1	11	3,9	A777266	A778266
1560	51	[2,008]	62	[2,441]	84	135	140	3,1	13	3,8	A777267	A778267
2560	51	[2,008]	81	[3,189]	90	135	80	4,4	15	4,1	A777268	A778268
3400	51	[2,008]	104	[4,094]	35	53	60	5,4	20	7,3	A777269	A778269
5100	51	[2,008]	144	[5,669]	26	39	50	7,1	25	9,9	A777270	A778270
5800	66	[2,598]	104	[4,094]	26	43	50	7,7	28	9,8	A777271	A778271
7200	73	[2,874]	104	[4,094]	28	43	35	9	34	9,9	A777272	A778272
10900	73	[2,874]	144	[5,669]	13	19	22	12	50	17,0	A777273	A778273
8400	77	[3,031]	104	[4,094]	13	22	22	10,1	50	15,2	A777274	A778274
12700	77	[3,031]	144	[5,669]	13	22	22	13,4	50	17,5	A777275	A778275
18000	77	[3,031]	220	[8,661]	15	22	17	17,3	55	19,9	A777276	A778276
16700	90	[3,543]	144	[5,669]	15	13	17	16,2	55	18,0	A777277	A778277
22000	90	[3,543]	200	[7,874]	9	13	13	19,8	80	26,8	A777278	A778278
22000	90	[3,543]	200	[7,874]	7	11	12	19,8	80	29,4	A777279	A778279
25000	90	[3,543]	220	[8,661]	7	12	12	21,6	80	30,7	A777280	A778280

## FELSIC HC

BC - BD

8 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max.	II +20°C 5 min max.	I $\sim$ 100 Hz		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+85°C (A)	BC	BD		
<b>Rated voltage 400 V</b>												
400	36	[1,417]	44	[1,732]	8	12	520	1,3	4	8,7	A777281	A778281
670	36	[1,417]	52	[2,047]	182	273	330	1,8	5	1,9	A777282	A778282
670	36	[1,417]	60	[2,362]	171	256	240	1,8	6	2,1	A777283	A778283
1100	36	[1,417]	80	[3,150]	108	162	200	2,5	8	3,0	A777284	A778284
1550	36	[1,417]	104	[4,094]	88	132	150	3,2	10	3,8	A777285	A778285
1550	51	[2,008]	62	[2,441]	88	148	150	3,2	13	3,7	A777286	A778286
2550	51	[2,008]	81	[3,189]	99	148	85	4,5	15	3,9	A777287	A778287
2550	51	[2,008]	81	[3,189]	47	71	80	4,5	16	5,6	A777288	A778288
3400	51	[2,008]	104	[4,094]	40	60	70	5,5	20	6,8	A777289	A778289
5100	51	[2,008]	144	[5,669]	30	45	50	7,3	28	9,1	A777290	A778290
5800	66	[2,598]	104	[4,094]	23	34	40	7,9	28	10,5	A777291	A778291
7200	73	[2,874]	104	[4,094]	18	28	35	9,3	34	12,4	A777292	A778292
10900	73	[2,874]	144	[5,669]	13	19	26	12,4	46	17,0	A777293	A778293
10900	73	[2,874]	144	[5,669]	11	17	22	12,4	50	18,1	A777294	A778294
8400	77	[3,031]	104	[4,094]	11	22	22	10,4	50	16,2	A777295	A778295
12700	77	[3,031]	144	[5,669]	15	22	19	13,8	55	16,5	A777296	A778296
18000	77	[3,031]	220	[8,661]	7	11	16	17,7	55	28,2	A777297	A778297
16700	90	[3,543]	144	[5,669]	8	12	18	16,7	62	24,3	A777298	A778298
22000	90	[3,543]	200	[7,874]	7	10	13	20,4	80	30,7	A777299	A778299
22000	90	[3,543]	200	[7,874]	8	12	13	20,4	80	28,5	A777300	A778300
25000	90	[3,543]	220	[8,661]	8	10	13	22,1	80	29,8	A777301	A778301
<b>Rated voltage 450 V</b>												
330	36	[1,417]	44	[1,732]	7	10	700	1,2	4	9,4	A777302	A778302
560	36	[1,417]	52	[2,047]	236	354	500	1,7	4	1,7	A777303	A778303
560	36	[1,417]	60	[2,362]	236	401	500	1,7	6	1,8	A777304	A778304
890	36	[1,417]	80	[3,150]	267	401	330	2,3	7	1,9	A777305	A778305
1200	36	[1,417]	104	[4,094]	267	141	330	2,9	8	2,2	A777306	A778306
1300	51	[2,008]	62	[2,441]	94	141	210	3,1	9	3,6	A777307	A778307
2100	51	[2,008]	81	[3,189]	58	87	150	4,3	12	5,1	A777308	A778308
2100	51	[2,008]	81	[3,189]	57	86	100	4,3	14	5,1	A777309	A778309
2780	51	[2,008]	104	[4,094]	57	73	100	5,2	16	5,7	A777310	A778310
4100	51	[2,008]	144	[5,669]	49	73	70	6,8	23	7,2	A777311	A778311
4670	66	[2,598]	104	[4,094]	35	53	60	7,4	25	8,4	A777312	A778312
5900	73	[2,874]	104	[4,094]	28	42	50	8,7	29	10,0	A777313	A778313
8800	73	[2,874]	144	[5,669]	18	27	38	11,6	39	14,5	A777314	A778314
8 800	73	[2,874]	144	[5,669]	16	24	32	11,6	43	15	A777315	A778315
6 800	77	[3,031]	104	[4,094]	22	33	38	9,6	35	12	A777316	A778316
10 200	77	[3,031]	144	[5,669]	14	21	32	12,9	52	17	A777317	A778317
14 800	77	[3,031]	220	[8,661]	12	18	20	16,6	55	22	A777318	A778318
13 600	90	[3,543]	144	[5,669]	9	14	18	15,7	67	23	A777319	A778319
18 000	90	[3,543]	200	[7,874]	7	11	15	19,1	80	29	A777320	A778320
20 000	90	[3,543]	220	[8,661]	7	12	15	20,7	80	30	A777321	A778321
<b>Rated voltage 500 V</b>												
100	36	[1,417]	44	[1,732]	900	1350	1100	0,6	1,9	0,8	A777322	A778322
200	36	[1,417]	52	[2,047]	550	825	750	0,9	2,6	1,1	A777323	A778323
200	36	[1,417]	60	[2,362]	550	825	650	0,9	2,8	1,2	A777324	A778324
400	36	[1,417]	80	[3,150]	350	525	430	1,5	4,0	1,7	A777325	A778325
560	36	[1,417]	104	[4,094]	250	375	370	1,8	5,3	2,3	A777326	A778326
670	51	[2,008]	62	[2,441]	200	300	310	2	5,7	2,4	A777327	A778327
1 000	51	[2,008]	81	[3,189]	180	270	220	2,7	6,8	2,9	A777328	A778328
1 300	51	[2,008]	104	[4,094]	150	225	185	3,3	8,3	3,5	A777329	A778329
2 000	51	[2,008]	144	[5,669]	100	150	160	4,4	11,8	5,0	A777330	A778330
2 200	66	[2,598]	104	[4,094]	100	150	120	4,8	11,7	5,0	A777331	A778331
2 900	73	[2,874]	104	[4,094]	80	120	100	5,7	13,9	5,9	A777332	A778332
4 300	73	[2,874]	144	[5,669]	50	75	61	7,6	20,2	8,6	A777333	A778333
3 300	77	[3,031]	104	[4,094]	45	68	65	6,3	19,1	8,1	A777334	A778334
5 000	77	[3,031]	144	[5,669]	40	60	52	8,4	23,3	9,9	A777335	A778335
7 600	77	[3,031]	220	[8,661]	30	45	42	11,2	32,6	13,9	A777336	A778336
7 000	90	[3,543]	144	[5,669]	27	41	36	10,6	31,0	13,2	A777337	A778337
9 300	90	[3,543]	200	[7,874]	20	30	20	13	41,6	17,7	A777338	A778338
10 600	90	[3,543]	220	[8,661]	18	27	16	14,2	45,8	19,5	A777339	A778339

8 000 h / 85°C

## PEAK VOLTAGE (V)

1000 cycles, without ripple current

Up: Repetitive standard peak voltage (30 s)

Us: Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

U <sub>R</sub>	10 V	16 V	25 V	40 V	50 V	63 V	80 V	100 V	160 V	200 V
U <sub>p</sub>	11,5	18	29	46	58	72	92	115	184	230
U <sub>s</sub>										200 235

U <sub>R</sub>	250 V	305 V	350 V	360 V	385 V	400 V	410 V	415 V	450 V	460 V	500 V
U <sub>p</sub>	288	330	385	390	424	440	450	457	495	506	550
U <sub>s</sub>	290	335	405	405	430	450	468	468	500	540	600

PERMISSIBLE REPETITIVE PEAK CURRENT I<sub>p</sub>:

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

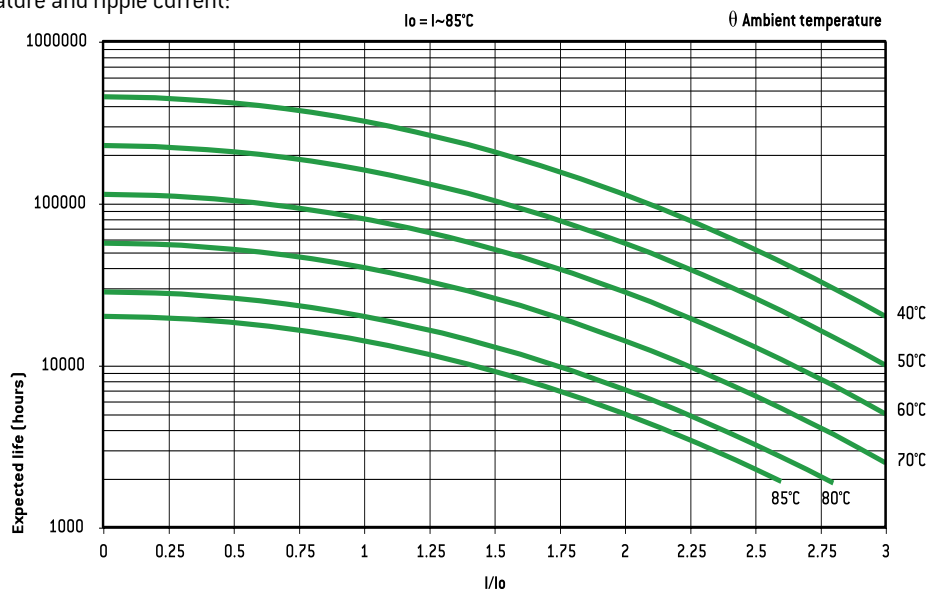
DIMENSIONS in mm (inches)				I <sub>p</sub> (A)		I <sub>rms</sub> max. (A)
Ø	H			40°C	85°C	
36	(1,417)	44	(1,732)	330	170	22
36	(1,417)	52	(2,047)	400	200	22
36	(1,417)	60	(2,362)	450	220	22
36	(1,417)	80	(3,150)	600	300	22
36	(1,417)	104	(4,094)	700	400	22
51	(2,008)	62	(2,441)	700	400	25
51	(2,008)	81	(3,189)	800	400	25
51	(2,008)	104	(4,094)	1100	500	25
51	(2,008)	144	(5,669)	1300	600	25
66	(2,598)	104	(4,094)	1900	800	50
73	(2,874)	104	(4,094)	3000	1100	55
73	(2,874)	144	(5,669)	4000	1700	55
77	(3,031)	104	(4,094)	3100	1200	55
77	(3,031)	144	(5,669)	4200	1800	55
77	(3,031)	220	(8,661)	5700	2400	55
90	(3,543)	144	(5,669)	5700	2400	80
90	(3,543)	200	(7,874)	7700	3200	80

## CONNECTIONS IN SERIES:

Operating voltages exceeding 500 V up to 20000 V will be reached by connecting capacitors with rated voltages higher or equal to 350 V in series.

## EXPECTED LIFE

as a function of temperature and ripple current:



## EXPECTED LIFE WITH ID:

- 1 to 5 discharges per minute For I = I<sub>d</sub> 48 000 000 cycles
- 10 discharges per minute For I = I<sub>d</sub> 36 000 000 cycles
- 15 discharges per minute For I = I<sub>d</sub> 18 000 000 cycles

$$I = I_d/2 > 1 \times 10^9 \text{ cycles}$$

- 15 to 60 discharges per minute

To have the highest dissipated power, use preferably FELSIC HC 500 V and calculate r.m.s. current (general technical data § 6.4.2.).

In order to have the highest value of stored energy use preferably FELSIC HC 305 V, 360 V, 410 V and 460 V (0.4 Wh/kg).

## FAST DISCHARGES WORKING (ID)

Discharge current I<sub>d</sub> = peak current of 3 ms per cycle of 1 to 60 s, at 40°C.I<sub>d</sub> as a function of case

DIMENSIONS in mm (inches)				I <sub>d</sub> (A)
Ø	H			
36	(1,417)	44	(1,732)	200
36	(1,417)	52	(2,047)	230
36	(1,417)	60	(2,362)	300
36	(1,417)	80	(3,150)	440
36	(1,417)	104	(4,094)	580
51	(2,008)	62	(2,441)	600
51	(2,008)	81	(3,189)	740
51	(2,008)	104	(4,094)	990
51	(2,008)	144	(5,669)	1280
66	(2,598)	104	(4,094)	1400
73	(2,874)	104	(4,094)	1570
73	(2,874)	144	(5,669)	2200
77	(3,031)	104	(4,094)	2000
77	(3,031)	144	(5,669)	2800
77	(3,031)	220	(8,661)	3700
90	(3,543)	144	(5,669)	3900
90	(3,543)	200	(7,874)	4800

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I<sub>rms</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I <sub>rms</sub>	I <sub>rms</sub>	1,2 x I <sub>rms</sub>	1,3 x I <sub>rms</sub>	1,35 x I <sub>rms</sub>	1,5 x I <sub>rms</sub>	1,6 x I <sub>rms</sub>

# FELSIC HV

## BC - BD

### 8 000 h / 105°C

160 V ... 450 V	1000 $\mu$ F ... 47 000 $\mu$ F	$\emptyset$ 51 (2,008) ... $\emptyset$ 90 (3,543)	- 55°C + 105°C	Long Life Time
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### APPLICATIONS

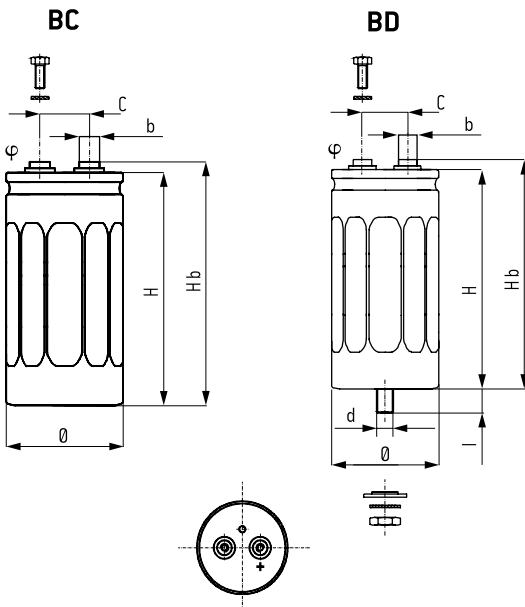
- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Fixing: Clip or stud fixing

Screw terminals: M5 or M6

Tolerance on capacitance at 20°C:  $\pm 20\%$

Operating temperature : - 55°C + 105°C



BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor (steel hex nut, spring washer)

### DIMENSIONS in mm (inches)

$\emptyset$ $\pm 1$ (0,039)	H $\pm 2$ (0,079)	Hb $\pm 2$ (0,079)	c $\pm 0,5$ (0,020)	$\emptyset$	b
51 (2,008)	81 (3,189)	87 (3,425)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	104 (4,094)	110 (4,331)	22,2 (0,874)	M5	13 (0,512)
51 (2,008)	144 (5,669)	150 (5,906)	22,2 (0,874)	M5	13 (0,512)
66 (2,598)	104 (4,094)	111 (4,370)	28,5 (1,122)	M5	13 (0,512)
77 (3,031)	104 (4,094)	111 (4,370)	31,7 (1,248)	M6	13 (0,512)
77 (3,031)	144 (5,669)	151 (5,945)	31,7 (1,248)	M6	13 (0,512)
77 (3,031)	220 (8,661)	227 (8,937)	31,7 (1,248)	M6	13 (0,512)
90 (3,543)	144 (5,669)	151 (5,945)	31,7 (1,248)	M6	13 (0,512)
90 (3,543)	200 (7,874)	207 (8,150)	31,7 (1,248)	M6	13 (0,512)

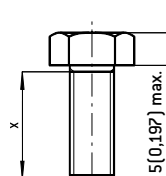
  

$\emptyset$	d	l	Max. nut torque
36 (1,417)	M8	12 $\pm 1$ (0,472 $\pm 0,472$ )	4 Nm
$\geq 51$ (2,008)	M12	16 $\pm 1,5$ (0,630 $\pm 0,059$ )	10 Nm

### HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:  
3,5 (0,138) max

Max. screw torque: M5: 3 Nm [x min 8 (0,315)]  
M6: 6 Nm [x min 10 (0,394)]



### RESISTANCE TO VIBRATIONS

Hb mm (inches)	>150 (5,906)	$\leq 150$ (5,906)
f (Hz)	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

### SPECIFICATIONS

NFC 83 110

DIN 40 040 - Climatic category FMD - 55°C + 105°C / 56 days

IEC 60 384.4 long life

Standard endurance test at  $U_R$ : 5000 h / 105°C

### WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 M $\Omega$

Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s (IEC 60 695-2-2).

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Case		ESR 100 Hz +20°C		Z +20°C 10 kHz max. ( $\text{m}\Omega$ )	I +20°C 5 min. max. (mA)	I ~		Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+105°C (A)	BC	BD		
<b>Rated voltage 160 V</b>												
4700	51	[2,008]	104	[4,094]	20	30	28	1,50	25	12	A 764080	A 765080
6800	66	[2,598]	104	[4,094]	18	26	18	2,18	50	14	A 764082	A 765082
10000	77	[3,031]	104	[4,094]	12	18	16	3,20	60	19	A 764084	A 765084
15000	77	[3,031]	144	[5,669]	10	14	13	4,80	60	24	A 764085	A 765085
22000	77	[3,031]	144	[5,669]	9	13	12	7,00	60	26	A 764086	A 765086
33000	77	[3,031]	220	[8,661]	8	12	11	10,00	60	33	A 764087	A 765087
47000	90	[3,543]	200	[7,874]	6	9	8	15,00	80	40	A 764088	A 765088
<b>Rated voltage 250 V</b>												
3300	51	[2,008]	104	[4,094]	28	45	30	1,65	25	10	A 764100	A 765100
4700	66	[2,598]	104	[4,094]	20	30	20	2,35	50	14	A 764102	A 765102
6800	77	[3,031]	104	[4,094]	16	24	16	3,40	60	17	A 764104	A 765104
10000	77	[3,031]	144	[5,669]	14	21	14	4,50	60	21	A 764105	A 765105
22000	90	[3,543]	200	[7,874]	10	15	10	10,00	80	31	A 764108	A 765108
<b>Rated voltage 350 V</b>												
1500	51	[2,008]	104	[4,094]	45	68	50	1,05	25	8	A 764020	A 765020
2200	51	[2,008]	144	[5,669]	25	38	23	1,50	25	12	A 764021	A 765021
3300	51	[2,008]	144	[5,669]	23	35	22	2,30	25	13	A 764023	A 765023
3300	66	[2,598]	104	[4,094]	25	38	28	2,30	45	12	A 764022	A 765022
4700	77	[3,031]	104	[4,094]	20	30	25	3,30	56	15	A 764024	A 765024
5600	77	[3,031]	104	[4,094]	18	27	22	3,90	59	16	A 764027	A 765027
6800	77	[3,031]	144	[5,669]	16	25	20	4,50	60	19	A 764025	A 765025
10000	77	[3,031]	220	[8,661]	10	16	14	5,00	60	29	A 764026	A 765026
15000	90	[3,543]	200	[7,874]	8	12	10	8,00	80	34	A 764028	A 765028
<b>Rated voltage 400 V</b>												
1000	51	[2,008]	81	[3,189]	75	100	70	0,80	21	6	A 764049	A 765049
1500	51	[2,008]	104	[4,094]	65	85	60	1,20	25	7	A 764040	A 765040
2200	51	[2,008]	144	[5,669]	56	80	65	1,80	25	8	A 764041	A 765041
2200	66	[2,598]	104	[4,094]	42	63	45	1,80	35	9	A 764042	A 765042
3300	66	[2,598]	104	[4,094]	37	56	42	2,70	38	10	A 764043	A 765043
4700	77	[3,031]	104	[4,094]	25	38	30	3,80	50	13	A 764044	A 765044
4700	77	[3,031]	144	[5,669]	13	21	17	3,80	60	21	A 764048	A 765048
6800	77	[3,031]	144	[5,669]	12	20	16	5,50	60	22	A 764045	A 765045
8200	77	[3,031]	220	[8,661]	15	23	18	6,60	60	24	A 764046	A 765046
10000	77	[3,031]	220	[8,661]	14	21	17	8,00	60	25	A 764050	A 765050
10000	90	[3,543]	144	[5,669]	12	19	15	8,00	80	24	A 764047	A 765047
15000	90	[3,543]	200	[7,874]	11	19	14	13,00	80	29	A 764051	A 765051
<b>Rated voltage 450 V</b>												
1500	51	[2,008]	104		75	120	85	4,00	23	6	A 764060	A 765060
2200	66	[2,598]	104		50	75	60	5,90	32	9	A 764062	A 765062
3300	77	[3,031]	104		35	52	42	7,30	42	11	A 764064	A 765064
4700	77	[3,031]	144		24	36	29	8,70	59	16	A 764065	A 765065
6800	77	[3,031]	220		20	30	24	10,00	60	21	A 764066	A 765066
8200	90	[3,543]	200		16	24	19	11,00	80	24	A 764068	A 765068
10000	90	[3,543]	200		14	21	17	12,70	80	26	A 764069	A 765069
12000	90	[3,543]	200		12	20	15	15,00	80	28	A 764070	A 765070

# FELSIC HV

BC - BD

8 000 h / 105°C

## PEAK VOLTAGE (V)

1000 cycles, without ripple current

Up: Repetitive standard peak voltage (30 s)

Us: Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

U <sub>R</sub>	160 V	250 V	350 V	400 V	450 V
U <sub>p</sub>	184	288	385	440	495
U <sub>s</sub>	235	340	450	495	540

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f

I<sub>~</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	50 000
I	0,8 x I <sub>~</sub>	I <sub>~</sub>	1,2 x I <sub>~</sub>	1,3 x I <sub>~</sub>	1,35 x I <sub>~</sub>	1,5 x I <sub>~</sub>	1,6 x I <sub>~</sub>

## PERMISSIBLE REPETITIVE PEAK CURRENT I<sub>p</sub>:

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

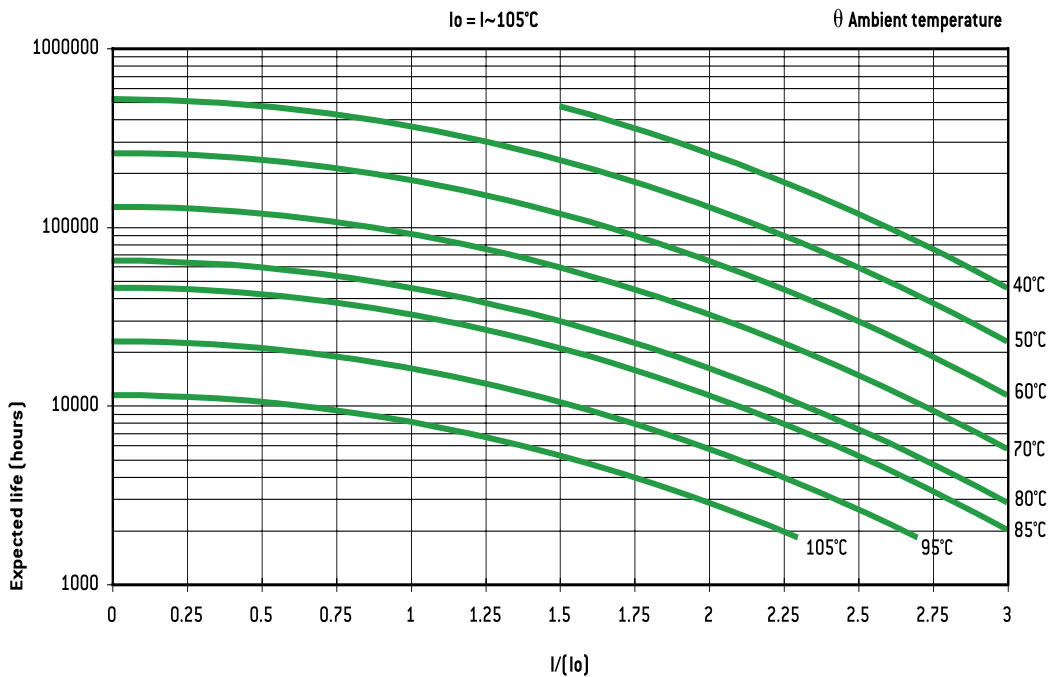
DIMENSIONS in mm (inches)				I <sub>p</sub> (A)		I <sub>~</sub> max. (A)
Ø	H			40°C	105°C	
51	(2,008)	81	(3,189)	800	400	25
51	(2,008)	104	(4,094)	1100	500	25
51	(2,008)	144	(5,669)	1300	600	25
66	(2,598)	104	(4,094)	1900	800	50
77	(3,031)	104	(4,094)	3100	1200	60
77	(3,031)	144	(5,669)	4200	1800	60
77	(3,031)	220	(8,661)	5700	2400	60
90	(3,543)	144	(5,669)	5700	2400	80
90	(3,543)	200	(7,874)	7700	3200	80

## EXPECTED LIFE

As a function of temperature and ripple current

## CONNECTIONS IN SERIES:

Operating voltages exceeding 500 V up to 20000 V will be reached by connecting capacitors with rated voltages higher or equal to 350 V in series (see FELSIC in bank).





## FELSIC 125 FRS

CO 46 - CO 47

3 500 h / 125°C

16 V ... 350 V	220 $\mu$ F ... 150 000 $\mu$ F	$\emptyset$ 36 [1,417] ... $\emptyset$ 90 [3,543]	- 55°C + 125°C	Long Life Time
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## APPLICATIONS

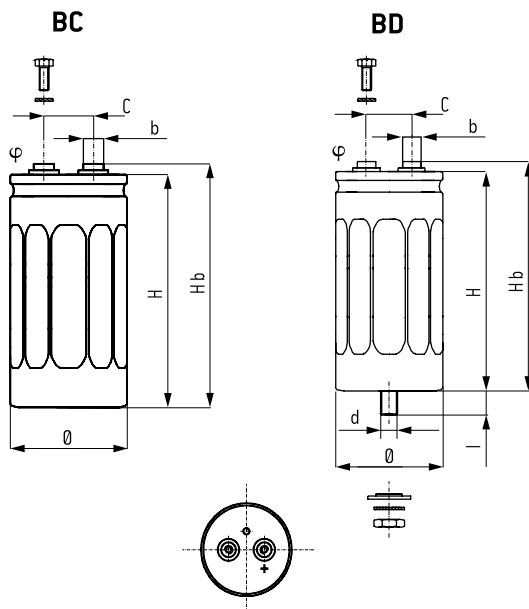
- Power electronics: converters, current inverters
- Switch mode power supplies
- Magnetization, welding machines, flash
- Circuit with high impulse current

Fixing: Clip or stud fixing

Screw terminals: M5 or M6

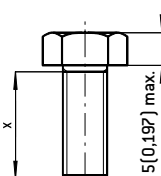
Tolerance on capacitance at 20°C: -10 +30 %

Operating temperature : - 55°C +125°C



## HEXAGONAL SCREWS mm (inches)

Screwing height between screws and terminals:	3,5 [0,138] max
Max. screw torque:	M5: 3 Nm [x min 8 [0,315]] M6: 6 Nm [x min 10 [0,394]]



## SPECIFICATIONS

NFC 83 110 - Models CO 46, CO 47 - Long life  
 DIN 41 240 - Climatic category FKD - 55°C + 125°C / 56 days  
 CECC 30301-804 Issue 2  
 IEC 60 384.4 long life  
 Standard endurance test at  $U_R$ : 2000 h / 125°C

BC	BD
Insulated aluminum can	Aluminum can with sleeve
Hexagonal screws	Hexagonal screws
Spring washers	Spring washers
Fixing clip must be ordered separately	Stud fixing delivered with capacitor [steel hex nut, spring washer]

## DIMENSIONS in mm (inches)

$\emptyset \pm 1$ [0,039]	H $\pm 2$ [0,079]	Hb $\pm 2$ [0,079]	c $\pm 0,5$ [0,020]	$\phi$	b
36 [1,417]	53 [2,087]	58 [2,283]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	81 [3,189]	86 [3,386]	12,7 [0,500]	M5	8 [0,315]
36 [1,417]	105 [4,134]	110 [4,331]	12,7 [0,500]	M5	8 [0,315]
51 [2,008]	82 [3,228]	87 [3,425]	22,2 [0,874]	M5	13 [0,512]
51 [2,008]	105 [4,134]	110 [4,331]	22,2 [0,874]	M5	13 [0,512]
66 [2,598]	105 [4,134]	110 [4,331]	28,5 [1,122]	M5	13 [0,512]
77 [3,031]	105 [4,134]	110 [4,331]	31,7 [1,248]	M5	13 [0,512]
77 [3,031]	145 [5,709]	150 [5,906]	31,7 [1,248]	M5	13 [0,512]
90 [3,543]	145 [5,709]	151 [5,945]	31,7 [1,248]	M6	13 [0,512]

$\emptyset$	d	l	Max. nut torque
36 [1,417]	M8	12 $\pm 1$ [0,472 $\pm 0,472$ ]	4 Nm
$\geq 51$ [2,008]	M12	16 $\pm 1,5$ [0,630 $\pm 0,059$ ]	10 Nm

## RESISTANCE TO VIBRATIONS

Hb mm (inches)	>150 [5,906]	$\leq 150$ [5,906]
f [Hz]	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 [0,030]	1,5 [0,059]
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between terminals and mounting hardware: 100 M $\Omega$   
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 3500 V  
 Fire resistance: self extinguish 30 s [IEC 60 695-2-2] without PVC

## FELSIC 125 FRS

CO 46 - CO 47

3 500 h / 125°C

Capacitance [μF]	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. [mΩ]	I +20°C 5 min max. [mA]	I ~ 100 Hz			Code			
	Ø mm (inches)	H mm (inches)	Typic [mΩ]	max. [mΩ]			+ 40°C max. [A]	+85°C [A]	+125°C [A]	CO 47 [BC]	CO 46 [BD]		
<b>Rated voltage 16 V</b>													
10000	36	(1,417)	53	(2,087)	22	32	20	0,32	22	13	5,6	A 740200	A 741200
15000	36	(1,417)	81	(3,189)	18	26	16	0,48	22	17	7,5	A 740201	A 741201
22000	36	(1,417)	105	(4,134)	14	21	15	0,70	22	22	9,6	A 740202	A 741202
33000	51	(2,008)	82	(3,228)	12	18	12	1,05	25	25	11	A 740203	A 741203
47000	51	(2,008)	105	(4,134)	11	15	10	1,50	25	25	13	A 740204	A 741204
68000	66	(2,598)	105	(4,134)	10	14	10	2,18	50	35	15	A 740205	A 741205
100000	77	(3,031)	105	(4,134)	8	11	10	3,20	55	35	16	A 740206	A 741206
150000	77	(3,031)	145	(5,709)	7	10	9	4,80	55	41	20	A 740207	A 741207
<b>Rated voltage 25 V</b>													
4700	36	(1,417)	53	(2,087)	22	50	25	0,23	22	13	5,6	A 740220	A 741220
10000	36	(1,417)	81	(3,189)	18	28	20	0,50	22	17	7,5	A 740221	A 741221
15000	36	(1,417)	105	(4,134)	17	25	20	0,75	22	20	8,7	A 740222	A 741222
22000	51	(2,008)	82	(3,228)	13	20	15	1,10	25	25	10	A 740223	A 741223
33000	51	(2,008)	105	(4,134)	11	16	12	1,65	25	25	13	A 740224	A 741224
47000	66	(2,598)	105	(4,134)	10	14	12	2,35	50	37	15	A 740225	A 741225
68000	77	(3,031)	105	(4,134)	7	10	8	3,40	55	37	17	A 740226	A 741226
100000	77	(3,031)	145	(5,709)	7	10	8	5,00	55	41	20	A 740227	A 741227
<b>Rated voltage 40 V</b>													
4700	36	(1,417)	81	(3,189)	18	28	20	0,38	22	17	7,5	A 740241	A 741241
10000	36	(1,417)	105	(4,134)	17	25	17	0,80	22	20	8,7	A 740242	A 741242
15000	51	(2,008)	82	(3,228)	15	23	15	1,20	25	23	10	A 740243	A 741243
22000	51	(2,008)	105	(4,134)	11	17	12	1,76	25	25	13	A 740244	A 741244
33000	66	(2,598)	105	(4,134)	10	16	12	2,64	50	37	15	A 740245	A 741245
47000	77	(3,031)	105	(4,134)	7	10	10	3,76	55	37	17	A 740246	A 741246
68000	77	(3,031)	145	(5,709)	7	10	8	5,44	55	41	20	A 740247	A 741247
<b>Rated voltage 63 V</b>													
2200	36	(1,417)	53	(2,087)	36	54	40	0,27	20	10	4,4	A 740260	A 741260
3300	36	(1,417)	81	(3,189)	25	38	25	0,41	22	15	6,4	A 740261	A 741261
4700	36	(1,417)	105	(4,134)	22	32	22	0,59	22	18	7,6	A 740262	A 741262
6800	51	(2,008)	82	(3,228)	15	22	16	0,86	25	23	10	A 740263	A 741263
10000	51	(2,008)	105	(4,134)	11	16	11	1,26	25	25	13	A 740264	A 741264
15000	66	(2,598)	105	(4,134)	10	15	10	1,89	50	37	15	A 740265	A 741265
22000	77	(3,031)	105	(4,134)	7	11	8	2,77	55	37	16	A 740266	A 741266
33000	77	(3,031)	145	(5,709)	6	10	8	4,16	55	44	18	A 740267	A 741267
100000	90	(3,543)	145	(5,709)	4	10	8	10,00	80	65	24	A 740268	A 741268
<b>Rated voltage 100 V</b>													
1000	36	(1,417)	53	(2,087)	70	115	75	0,20	14	7,3	3,1	A 740280	A 741280
2200	36	(1,417)	81	(3,189)	40	60	40	0,44	22	12	5	A 740281	A 741281
3300	51	(2,008)	82	(3,228)	30	45	30	0,66	25	16	7,1	A 740283	A 741283
4700	51	(2,008)	105	(4,134)	27	40	24	0,94	25	19	8,4	A 740284	A 741284
6800	66	(2,598)	105	(4,134)	21	27	20	1,36	50	25	11	A 740285	A 741285
10000	77	(3,031)	105	(4,134)	14	21	15	2,00	55	29	13	A 740286	A 741286
15000	77	(3,031)	145	(5,709)	10	15	12	3,00	55	35	17	A 740287	A 741287
47000	90	(3,543)	145	(5,709)	4	10	8	9,00	80	65	24	A 740288	A 741288
<b>Rated voltage 160 V</b>													
470	36	(1,417)	53	(2,087)	120	180	100	0,15	9	5,2	2,1	A 740300	A 741300
680	36	(1,417)	81	(3,189)	70	105	50	0,21	14	8,3	3,3	A 740301	A 741301
1000	36	(1,417)	105	(4,134)	50	75	35	0,32	19	11	4,4	A 740302	A 741302
1500	51	(2,008)	82	(3,228)	45	65	30	0,48	23	12	5	A 740303	A 741303
2200	51	(2,008)	105	(4,134)	30	45	27	0,70	25	17	6,9	A 740304	A 741304
3300	66	(2,598)	105	(4,134)	25	35	21	1,05	42	21	8,7	A 740305	A 741305
4700	77	(3,031)	105	(4,134)	16	24	18	1,50	53	29	11	A 740306	A 741306
6800	77	(3,031)	145	(5,709)	12	18	12	2,18	55	39	15	A 740307	A 741307
22000	90	(3,543)	145	(5,709)	4	10	8	7,00	80	65	24	A 740308	A 741308

## FELSIC 125 FRS

CO 46 - CO 47

3 500 h / 125°C

Capacitance ( $\mu\text{F}$ )	Can		ESR 100 Hz +20°C		Z 10 kHz +20°C max. ( $\text{m}\Omega$ )	II +20°C 5 min max. (mA)	I~ 100 Hz			Code			
	$\emptyset$ mm (inches)	H mm (inches)	Typic ( $\text{m}\Omega$ )	max. ( $\text{m}\Omega$ )			+40°C max. (A)	+85°C (A)	+125°C (A)	CO 47 (BC)	CO 46 (BD)		
<b>Rated voltage 250 V</b>													
220	36	(1,417)	53	(2,087)	150	230	135	0,11	5,6	4,8	1,9	A 740320	A 741320
330	36	(1,417)	81	(3,189)	95	140	85	0,16	9,2	7	2,8	A 740321	A 741321
470	36	(1,417)	105	(4,134)	70	105	62	0,23	11	9,3	3,7	A 740322	A 741322
680	51	(2,008)	82	(3,228)	60	90	60	0,34	17	11	4,3	A 740323	A 741323
1500	51	(2,008)	105	(4,134)	30	50	30	0,75	25	17	6,9	A 740324	A 741324
2200	66	(2,598)	105	(4,134)	30	45	24	1,13	37	20	7,9	A 740325	A 741325
3300	77	(3,031)	105	(4,134)	15	23	15	1,65	55	30	12	A 740326	A 741326
4700	77	(3,031)	145	(5,709)	10	15	11	2,35	55	34	14	A 740327	A 741327
10000	90	(3,543)	145	(5,709)	8	12	10	4,50	80	41	17	A 740328	A 741328
<b>Rated voltage 350 V</b>													
220	36	(1,417)	81	(3,189)	400	600	400	0,16	7	3,3	1,1	A 740340	A 741340
330	36	(1,417)	105	(4,134)	300	450	280	0,24	9	4,5	1,5	A 740341	A 741341
470	51	(2,008)	82	(3,228)	150	230	150	0,33	14	6,6	2,2	A 740342	A 741342
680	51	(2,008)	105	(4,134)	130	200	130	0,48	15	8,1	2,7	A 740343	A 741343
1000	51	(2,008)	105	(4,134)	80	120	80	0,70	19	10	3,4	A 740344	A 741344
1500	66	(2,598)	105	(4,134)	70	100	70	1,05	26	13	4,2	A 740345	A 741345
2200	77	(3,031)	105	(4,134)	40	60	40	1,50	37	18	6,1	A 740346	A 741346
3300	77	(3,031)	145	(5,709)	30	45	30	2,30	50	24	8,1	A 740347	A 741347
4700	90	(3,543)	145	(5,709)	15	25	20	3,30	78	39	13	A 740348	A 741348
6800	90	(3,543)	145	(5,709)	12	20	18	4,20	80	42	14	A 740349	A 741349

**PEAK VOLTAGE (V)**

1000 cycles, without ripple current

Up: Repetitive standard peak voltage (30 s)

Us: Repetitive surge voltage (0,1 s)

U <sub>R</sub>	16 V	25 V	40 V	63 V	100 V	160 V	250 V	350 V
Up	18	29	46	72	115	184	288	385
Us						235	340	495

**PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)**

versus frequency f:

f (Hz)	50	100	300	600	1 000	10 000	50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~

**PERMISSIBLE REPETITIVE PEAK CURRENT I<sub>p</sub>:**

If given corresponding max r.m.s. currents are not exceeded, peak current values are as follows:

DIMENSIONS in mm (inches)				I <sub>p</sub>	I~ max.
$\emptyset$	H			(A)	(A)
36	(1,417)	53	(2,087)	400	22
36	(1,417)	81	(3,189)	600	22
36	(1,417)	105	(4,134)	700	22
51	(2,008)	82	(3,228)	800	25
51	(2,008)	105	(4,134)	1100	25
66	(2,598)	105	(4,134)	1900	50
77	(3,031)	105	(4,134)	3100	55
77	(3,031)	145	(5,709)	4200	55
90	(3,543)	145	(5,709)	5700	80

**CONNECTIONS IN SERIES:**

Operating voltages exceeding 500 V up to 20000 V w III be reached by connecting capacitors with rated voltages higher or equal to 350 V in series.

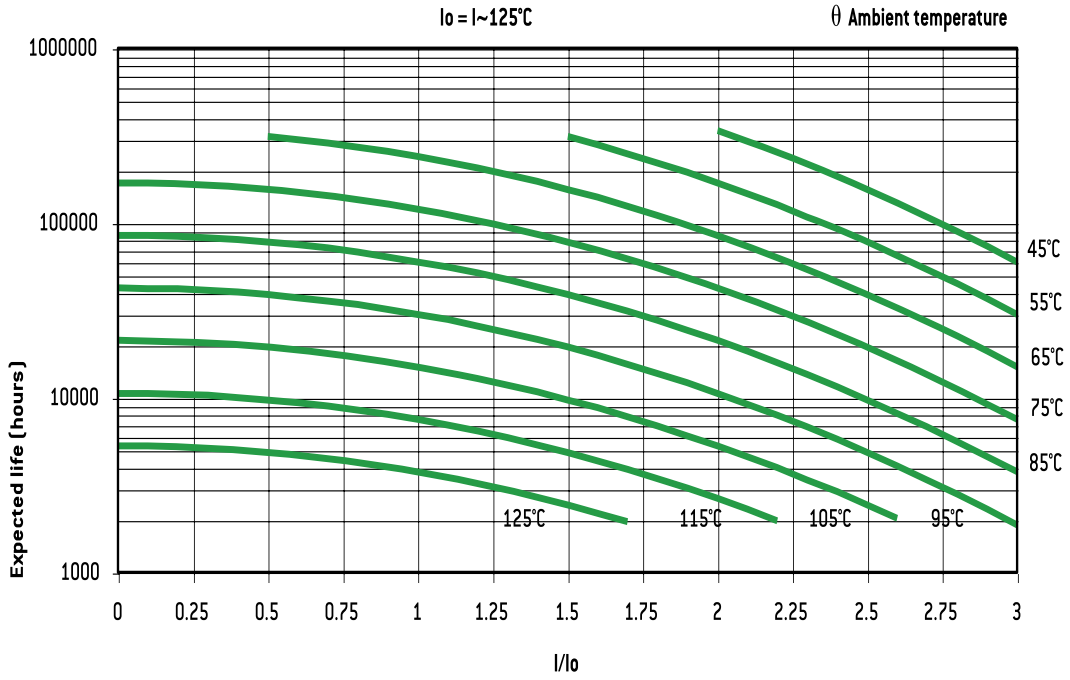
# FELSIC 125 FRS

CO 46 - CO 47

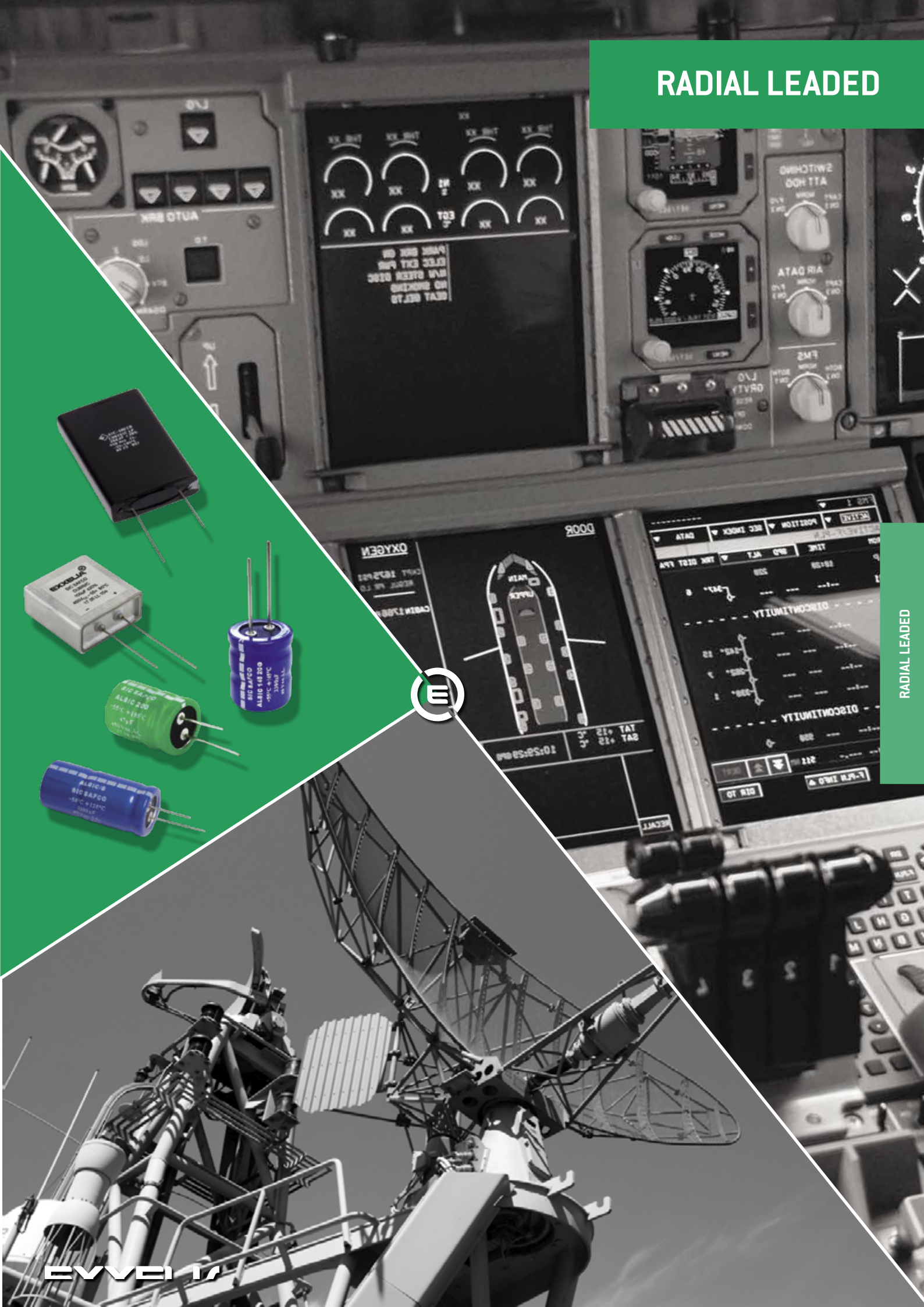
3 500 h / 125°C

## EXPECTED LIFE

As a function of temperature and ripple current



# RADIAL LEADED



RADIAL LEADED





# ALSIC 145 20G

## 2 000 h / 145°C

10 V ... 110 V	220 $\mu$ F ... 3300 $\mu$ F	$\emptyset$ 18 (0,709) ... $\emptyset$ 22,5 (0,886)	- 55°C + 145°C	Long life time
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### APPLICATIONS

- Automotive
- High frequency switched mode power supplies
- High ripple current
- Low inductance
- Low impedance

Insulating aluminum case

Tin coated leads

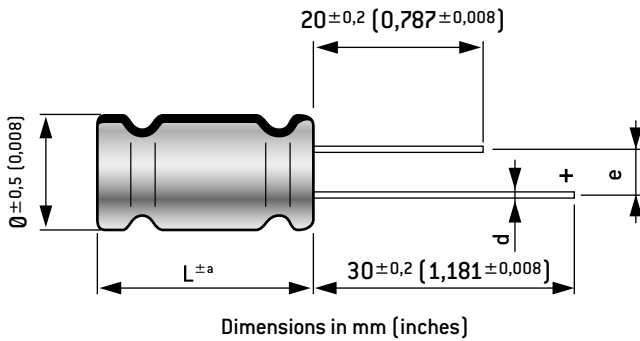
Negative pole marked

Tolerance on capacitance at 20°C

:  $\pm 20\%$

Operating temperature

: - 55°C + 145°C



### DIMENSIONS in mm (inches)

$\emptyset$	$e \pm 0,5 (0,020)$	d	b	c	$\pm a$
18 (0,709)	7,5 (0,295)	0,8 (0,031)	15 (0,591)	20 (0,787)	1 (0,039)
18 (0,709)	7,5 (0,295)	0,8 (0,031)	25 (0,984)	30 (1,181)	2 (0,079)

### RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 – 55 Hz
Amplitude	0,75 mm
Acceleration	20 g - 98 m/s <sup>2</sup>
t (h)	3 x 2 h

### SPECIFICATIONS

NFC 83 110 - Long life

CECC 30 300

IEC 60 384-4 Long life

Standard endurance test at  $U_R$ : 5000h / 125°C

Climatic category GPF: -55°C + 145°C / 56 days

### MAX ESR 100 Hz, 20°C

ESR max  $\cong$  ESR typ. x 1.3

### MAX IMPEDANCE 100 kHz, 20°C

Z max  $\cong$  Z typ. x 1.3

### WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between

leads and mounting hardware : 100 M $\Omega$

Test voltage at 50 Hz 1 min. between

terminals and mounting hardware : 1 000 V

Fire resistance

: self extinguish 30 s  
(IEC 60 695-2-2) without PVC

## ALSIC 145 20G

2 000 h / 145°C

Capacitance ( $\mu\text{F}$ )	Case		ESR 100 Hz +20°C Typic ( $\text{m}\Omega$ )	Z 100 kHz		I. leak +20°C 5 min. max. (mA)	I $\sim$ +145°C		Code		
	$\emptyset$ mm (inches)	L mm (inches)		+20° C typ. ( $\text{m}\Omega$ )	-10° C typ. ( $\text{m}\Omega$ )		100 Hz (A)	100 kHz (A)			
<b>Rated voltage / Peak voltage: 10/12V</b>											
2200	18	(0,709)	35	(1,378)	50	25	50	70	2,6	4,1	A776000
2200	18	(0,709)	40	(1,575)	50	40	80	70	2,8	4,5	A776001
<b>Rated voltage / Peak voltage: 16/18V</b>											
1500	18	(0,709)	40	(1,575)	80	60	120	75	2,2	3,6	A776002
<b>Rated voltage / Peak voltage: 40/46V</b>											
2200	18	(0,709)	30	(1,181)	50	40	80	270	2,5	4	A776003
3300	18	(0,709)	35	(1,378)	45	35	70	400	2,7	4,4	A776004
3300	22,5	(0,886)	40	(1,575)	30	20	40	400	4	6,3	A776005
<b>Rated voltage / Peak voltage: 50/58V</b>											
1800	18	(0,709)	35	(1,378)	60	50	100	270	2,4	3,8	A776006
2200	18	(0,709)	35	(1,378)	70	45	85	330	2,2	3,5	A776007
2700	18	(0,709)	40	(1,575)	50	40	80	400	2,8	4,5	A776008
<b>Rated voltage / Peak voltage: 63/72V</b>											
470	18	(0,709)	35	(1,378)	145	90	170	93	1,5	2,4	A776009
560	18	(0,709)	35	(1,378)	135	85	160	110	1,7	2,8	A776010
680	18	(0,709)	35	(1,378)	80	30	55	130	2	3,3	A776011
820	18	(0,709)	35	(1,378)	75	28	52	160	2,1	3,4	A776012
1000	18	(0,709)	30	(1,181)	70	50	100	190	2,1	3,3	A776013
<b>Rated voltage / Peak voltage: 100/115V</b>											
220	18	(0,709)	25	(0,984)	480	280	510	70	0,7	1,1	A776014
330	18	(0,709)	25	(0,984)	450	250	450	105	0,7	1,2	A776015
330	18	(0,709)	35	(1,378)	390	190	340	105	0,9	1,5	A776016
470	18	(0,709)	35	(1,378)	300	150	270	140	1,1	1,7	A776017

ESR max. 100 Hz - 20°C  
ESR max.  $\approx$  ESR typ x 1,3

Max. Impedance 100 kHz  
Z max.  $\approx$  Z typ x 1,3

## EXPECTED LIFE

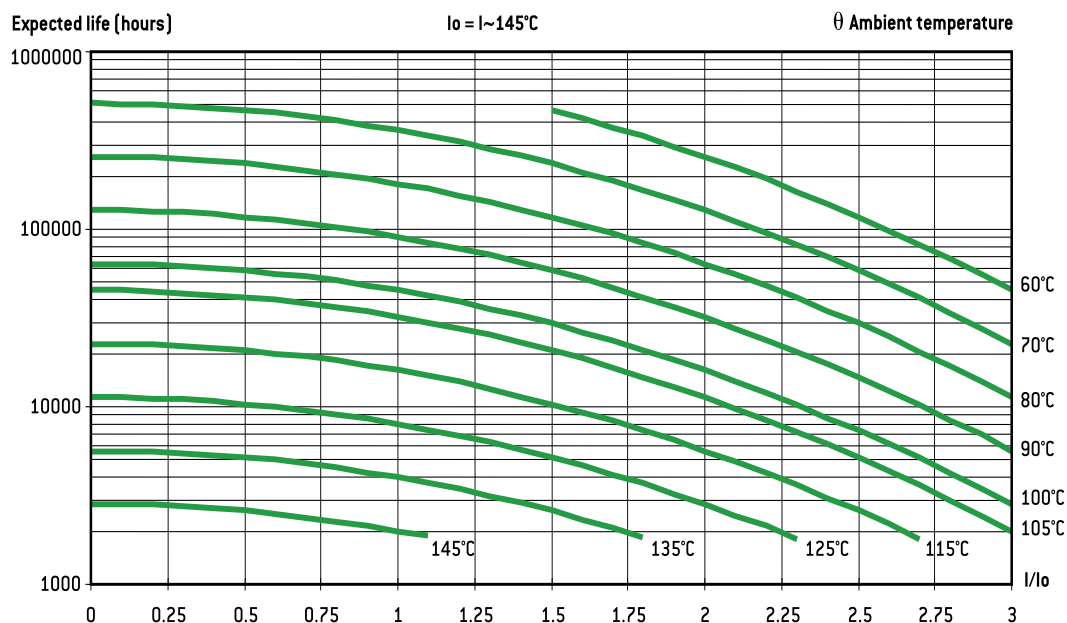
As a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

Versus frequency f:

I $\sim$ : permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	$\geq 50 000$
I	0,8 x I $\sim$	I $\sim$	1,2 x I $\sim$	1,3 x I $\sim$	1,35 x I $\sim$	1,5 x I $\sim$	1,6 x I $\sim$





# ALSIC 20G

8 000 h / 105°C

10 V ... 500 V	33 μF ... 80 000 μF	∅ 18 (0,709) ... ∅ 35,5 (1,398)	- 55°C + 105°C	Long life time
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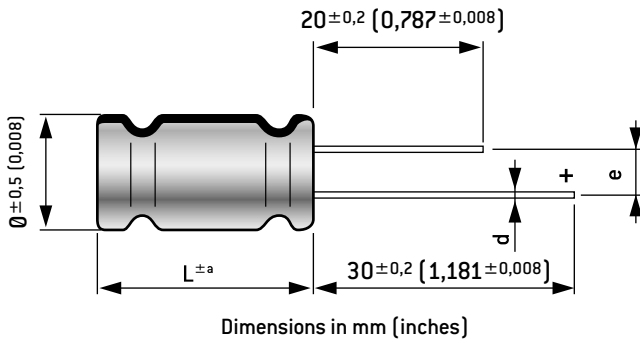


## APPLICATIONS

- Automotive
- High frequency switched mode power supplies
- High ripple current
- Low inductance
- Low impedance

Insulating aluminum case  
Tin coated leads  
Negative pole marked

Tolerance on capacitance at 20°C : ± 20 %  
Operating temperature : - 55°C + 105°C



## DIMENSIONS in mm (inches)

∅	e ±0,5 (0,020)	d	b ±2 (0,079)	±a	c ±2 (0,079)
18 (0,709)	7,5 (0,295)	0,8 (0,031)	15 (0,591)	1 (0,039)	20 (0,787)
22,5 (0,886)	8,3 (0,327)	1,2 (0,047)	25 (0,984)	2 (0,079)	30 (1,181)
35,5 (1,398)					

## RESISTANCE TO VIBRATIONS

	Standard
f [Hz]	10 - 2000 Hz
Amplitude	1,5 (0,059)
Acceleration	20 g - 196 m/s <sup>2</sup>
t [h]	3 x 2 h

## SPECIFICATIONS

NFC 83 110 - Long life  
CECC 30 300  
IEC 60 384-4 Long life  
Standard endurance test at U<sub>R</sub>: 5000h / 105°C  
Climatic category GPF: - 55°C + 105°C / 56 days

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between leads and mounting hardware : 100 MΩ  
Test voltage at 50 Hz 1 min. between terminals and mounting hardware : 1 000 V  
Fire resistance : self extinguish 30 s (IEC 60 695-2-2)

8 000 h / 105°C

Capacitance ( $\mu$ F)	Case		Tan $\delta$ max. (%)	Z F(1) +20°C max. ( $\Omega$ )	I. leak +20°C 5 min. max. (mA)	I <sub>r</sub> +105°C 100 Hz (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)							
<b>Rated voltage/Peak voltage: 10 / 12 V</b>									
15000	18	[0,709]	40	[1,575]	25	20	0,9	3,9	A776100
<b>Rated voltage/Peak voltage: 16 / 18V</b>									
8200	18	[0,709]	35	[1,378]	40	25	0,4	2,9	A776101
14000	18	[0,709]	40	[1,575]	25	20	1,3	3,9	A776102
66000	35,5	[1,398]	45	[1,772]	13	11	6,3	20	A776103
80000	35,5	[1,398]	50	[1,969]	13	11	8,1	20	A776104
<b>Rated voltage/Peak voltage: 25 / 29V</b>									
3700	22,5	[0,886]	40	[1,575]	35	25	0,6	3,7	A776105
<b>Rated voltage/Peak voltage: 35 / 40V</b>									
2200	18	[0,709]	35	[1,378]	40	30	0,42	2,9	A776106
2700	18	[0,709]	35	[1,378]	30	18	0,29	3,3	A776107
3300	18	[0,709]	30	[1,181]	35	26	0,35	2,9	A776108
4700	18	[0,709]	35	[1,378]	30	25	0,5	3,3	A776109
5800	18	[0,709]	40	[1,575]	30	25	1,2	3,5	A776110
<b>Rated voltage/Peak voltage: 50 / 58V</b>									
2200	18	[0,709]	35	[1,378]	40	27	0,33	2,9	A776111
2700	18	[0,709]	35	[1,378]	30	18	0,41	3,3	A776112
3000	18	[0,709]	35	[1,378]	40	27	0,45	2,9	A776113
3300	18	[0,709]	40	[1,575]	25	15	0,5	3,9	A776114
<b>Rated voltage/Peak voltage: 63 / 72V</b>									
600	22,5	[0,886]	25	[0,984]	75	33	0,3	2,1	A776115
2700	25,5	[1,004]	40	[1,575]	8	30	0,51	4,3	A776116
3000	18	[0,709]	40	[1,575]	30	20	0,57	3,5	A776117
4700	25,5	[1,004]	40	[1,575]	15	35	1,8	3,2	A776118
<b>Rated voltage/Peak voltage: 100 / 115V</b>									
2200	25,5	[1,004]	40	[1,575]	10	10	A776119		
<b>Rated voltage: 160 V</b>									
220	22,5	[0,886]	25	[0,984]	12	0,5	210	0,8	A776120
330	22,5	[0,886]	30	[1,181]	12	0,3	320	1,1	A776121
470	25,5	[1,004]	30	[1,181]	12	0,2	450	1,5	A776122
1000	25,5	[1,004]	40	[1,575]	12	0,1	960	2,3	A776123
2200	35,5	[1,398]	40	[1,575]	17	0,07	2100	3,4	A776124
<b>Rated voltage: 200 V</b>									
220	22,5	[0,886]	25	[0,984]	12	0,5	260	0,8	A776125
330	22,5	[0,886]	30	[1,181]	12	0,3	390	1,1	A776126
470	25,5	[1,004]	30	[1,181]	12	0,2	560	1,5	A776127
680	25,5	[1,004]	40	[1,575]	12	0,15	810	1,9	A776128
1000	25,5	[1,004]	50	[1,969]	12	0,1	1200	2,6	A776129
1500	30,5	[1,201]	50	[1,969]	15	0,09	1800	3	A776130
2200	35,5	[1,398]	50	[1,969]	15	0,055	2600	4,2	A776131
<b>Rated voltage: 250 V</b>									
100	22,5	[0,886]	25	[0,984]	12	0,8	150	0,62	A776132
150	22,5	[0,886]	25	[0,984]	12	0,6	220	0,72	A776133
220	22,5	[0,886]	30	[1,181]	12	0,4	330	1	A776134
330	25,5	[1,004]	30	[1,181]	12	0,25	500	1,3	A776135
390	22,5	[0,886]	40	[1,575]	12	0,22	600	1,4	A776136
470	25,5	[1,004]	40	[1,575]	12	0,16	700	1,8	A776137
680	25,5	[1,004]	50	[1,969]	12	0,13	1000	2,3	A776138
1000	30,5	[1,201]	50	[1,969]	12	0,1	1500	2,9	A776139
1500	35,5	[1,398]	50	[1,969]	12	0,07	2300	3,7	A776140

F(1):  $\emptyset \leq 18$  mm = 100 kHz  
 $\emptyset > 18$  mm = 10 kHz

# ALSIC 20G

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Case		Tan $\delta$ max. (%)	Z F(1)	I <sub>leak</sub> +20°C 5 min. max. (mA)	I <sub>~</sub> +105°C 100 Hz (A)	Code
	$\emptyset$ mm (inches)	L mm (inches)		+20°C max. ( $\Omega$ )			
<b>Rated voltage: 350V</b>							
100	22,5 (0,886)	25 (0,984)	12	0,7	210	0,67	A776141
220	22,5 (0,886)	40 (1,575)	12	0,35	460	1,2	A776142
470	30,5 (1,201)	40 (1,575)	12	0,15	1000	2,1	A776143
680	35,5 (1,398)	40 (1,575)	12	0,11	1400	2,7	A776144
<b>Rated voltage: 400V</b>							
68	22,5 (0,886)	25 (0,984)	10	1,2	650	0,51	A776145
100	22,5 (0,886)	30 (1,181)	10	0,9	800	0,64	A776146
150	22,5 (0,886)	40 (1,575)	10	0,6	1000	0,89	A776147
220	25,5 (1,004)	40 (1,575)	10	0,4	1200	1,3	A776148
330	30,5 (1,201)	40 (1,575)	10	0,3	1500	1,5	A776149
470	30,5 (1,201)	50 (1,969)	10	0,2	1800	2	A776150
680	35,5 (1,398)	50 (1,969)	12	0,15	2100	2,5	A776151
<b>Rated voltage: 450V</b>							
33	18 (0,709)	35 (1,378)	5	1,8	730	0,43	A776152
47	18 (0,709)	25 (0,984)	10	2	600	0,33	A776153
47	18 (0,709)	35 (1,378)	10	2	600	0,41	A776154
47	22,5 (0,886)	25 (0,984)	10	1,7	600	0,43	A776155
68	22,5 (0,886)	25 (0,984)	10	1,2	700	0,51	A776156
100	22,5 (0,886)	40 (1,575)	10	1,1	800	0,65	A776157
150	22,5 (0,886)	40 (1,575)	10	0,7	1000	0,82	A776158
220	25,5 (1,004)	50 (1,969)	10	0,4	1250	1,3	A776159
330	30,5 (1,201)	40 (1,575)	10	0,3	1500	1,5	A776160
470	35,5 (1,398)	40 (1,575)	10	0,2	1800	2	A776161
<b>Rated voltage: 500V</b>							
47	22,5 (0,886)	30 (1,181)	12	3	620	0,35	A776162
100	25,5 (1,004)	40 (1,575)	12	1,8	900	0,55	A776163
150	30,5 (1,201)	40 (1,575)	12	1	1100	0,82	A776164
220	30,5 (1,201)	50 (1,969)	12	0,4	1350	1,4	A776165
330	35,5 (1,398)	50 (1,969)	12	0,3	1600	1,8	A776166

F(1):  $\emptyset \leq 18 \text{ mm} = 100 \text{ kHz}$   
 $\emptyset > 18 \text{ mm} = 10 \text{ kHz}$

### MAX ESR 100 Hz, 20°C

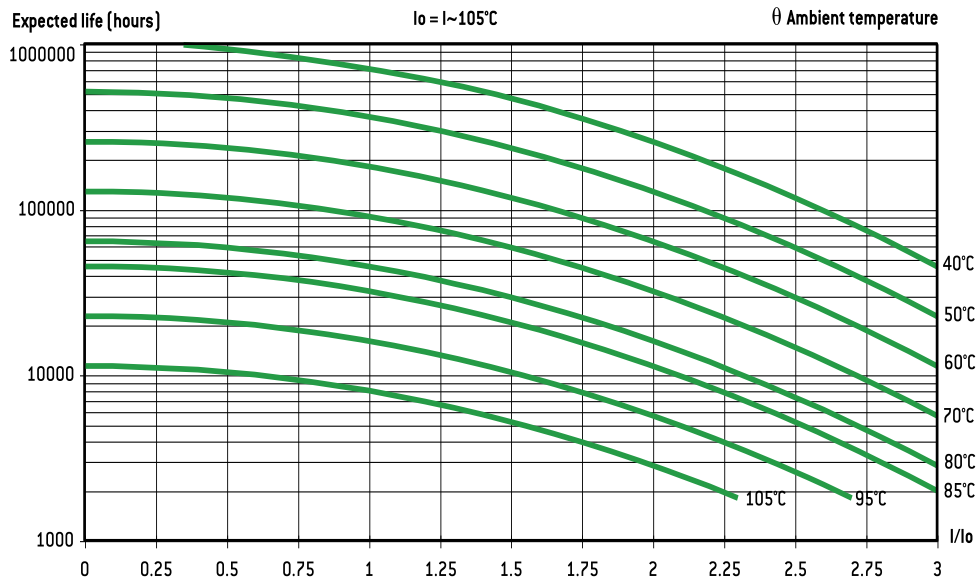
ESR max  $\cong$  ESR typ. x 1.3

### MAX IMPEDANCE 100 kHz, 20°C

Z max  $\cong$  Z typ. x 1.3

### EXPECTED LIFE

As a function of temperature and ripple current.



### PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I<sub>~</sub>: permissible r.m.s. current at 100 Hz

f(Hz)	50	100	300	600	1 000	10 000	$\geq 50 000$
I	0,8 x I <sub>~</sub>	I <sub>~</sub>	1,2 x I <sub>~</sub>	1,3 x I <sub>~</sub>	1,35 x I <sub>~</sub>	1,5 x I <sub>~</sub>	1,6 x I <sub>~</sub>

8 000 h / 105°C

10 V ... 400 V	100 $\mu$ F ... 33 000 $\mu$ F	35 (1,378) x 35 (1,378) x 16 (0,630)	- 55°C + 105°C	Long Life Time
450 V	100 $\mu$ F ... 220 $\mu$ F	35 (1,378) x 50 (1,969) x 16 (0,630)	- 55°C + 85°C	



## APPLICATIONS

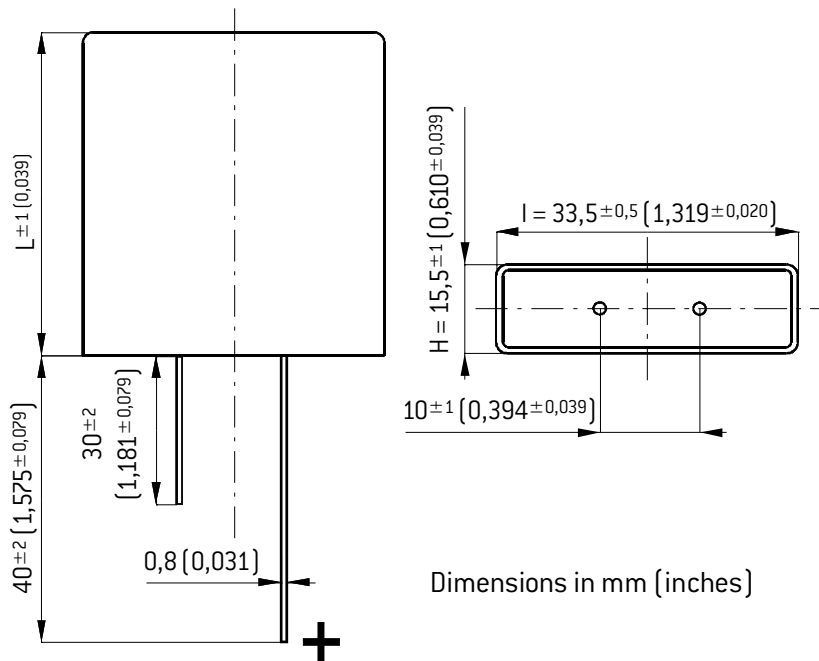
- Low profile printed circuit mounting
- Possible thermal dissipation per conduction through lower and upper surface
- Switch mode power supplies, impulse current

Aluminum case: Tin coated leads

Negative pole marked

Tolerance on capacitance at 20°C:  $\pm 20\%$ 

Operating temperature : - 55°C + 105°C



Dimensions in mm (inches)

## SPECIFICATIONS

CECC 30300 Long life

IEC 60 384-4 Long life

DIN 41 240 climatic category: - 55 + 105°C

and GPF: - 55°C + 105°C / 56 days

- 55°C + 85°C / 56 days

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 2000 Hz
Amplitude	1,5 [0,059]
Acceleration	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h

## CUBISIC

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Case			Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I ~ 100 Hz		Code			
	I mm (inches)	L mm (inches)	H mm (inches)					+40°C max. (A)	+105°C $U_R < 450\text{ V}$ +85°C $U_R = 450\text{ V}$ (A)				
<b>Rated voltage 10 V</b>													
15000	35	(1,378)	35	(1,378)	16	(0,630)	28	20	18	0,90	16,8	4,5	A 710000
22000	35	(1,378)	50	(1,969)	16	(0,630)	35	17	14	1,30	20	5,8	A 710001
33000	35	(1,378)	50	(1,969)	16	(0,630)	47	15	11	1,98	20	6,1	A 710002
<b>Rated voltage 16 V</b>													
10000	35	(1,378)	35	(1,378)	16	(0,630)	18	19	17	0,96	17,3	4,7	A 710020
15000	35	(1,378)	35	(1,378)	16	(0,630)	25	18	15	1,40	18	4,8	A 710022
22000	35	(1,378)	50	(1,969)	16	(0,630)	30	16	13	2,10	20	5,9	A 710021
<b>Rated voltage 25 V</b>													
6800	35	(1,378)	35	(1,378)	16	(0,630)	17	27	19	1,00	14,5	3,9	A 710040
10000	35	(1,378)	50	(1,969)	16	(0,630)	17	18	15	1,50	20	5,6	A 710041
15000	35	(1,378)	50	(1,969)	16	(0,630)	21	15	13	2,20	20	6,1	A 710042
<b>Rated voltage 35 V</b>													
5600	35	(1,378)	35	(1,378)	16	(0,630)	14	27	19	1,20	14,5	3,9	A 710060
6800	35	(1,378)	35	(1,378)	16	(0,630)	15	24	17	1,40	15,4	4,1	A 710061
10000	35	(1,378)	50	(1,969)	16	(0,630)	17	19	13	2,10	20	5,5	A 710062
<b>Rated voltage 40 V</b>													
4700	35	(1,378)	35	(1,378)	16	(0,630)	12	26	18	1,10	15	4	A 710080
6800	35	(1,378)	50	(1,969)	16	(0,630)	13	21	13	1,60	19	5,2	A 710081
<b>Rated voltage 50 V</b>													
3300	35	(1,378)	35	(1,378)	16	(0,630)	10	33	26	0,99	13	3,5	A 710100
5000	35	(1,378)	35	(1,378)	16	(0,630)	10	20	12	1,50	17	4,5	A 710101
8200	35	(1,378)	50	(1,969)	16	(0,630)	15	20	12	2,50	20	5,3	A 710102
<b>Rated voltage 63 V</b>													
2200	35	(1,378)	35	(1,378)	16	(0,630)	10	42	25	0,83	12	3,2	A 710120
3300	35	(1,378)	50	(1,969)	16	(0,630)	10	31	20	1,20	16	4,3	A 710121
4700	35	(1,378)	50	(1,969)	16	(0,630)	12	28	18	1,80	17	4,5	A 710122
<b>Rated voltage 80 V</b>													
1500	35	(1,378)	35	(1,378)	16	(0,630)	10	52	30	0,72	10,4	2,8	A 710140
2200	35	(1,378)	50	(1,969)	16	(0,630)	10	43	17	1,10	13,6	3,6	A 710141
<b>Rated voltage 100 V</b>													
1000	35	(1,378)	35	(1,378)	16	(0,630)	10	51	35	0,60	10,8	2,8	A 710160
1500	35	(1,378)	50	(1,969)	16	(0,630)	10	36	23	0,90	14,9	4	A 710161
1800	35	(1,378)	50	(1,969)	16	(0,630)	10	29	19	1,1	16,6	4,4	A 710162
<b>Rated voltage 160 V</b>													
470	35	(1,378)	35	(1,378)	16	(0,630)	11	170	130	0,45	5,8	1,6	A 710180
680	35	(1,378)	50	(1,969)	16	(0,630)	11	150	110	0,66	7,3	1,9	A 710181
<b>Rated voltage 200 V</b>													
330	35	(1,378)	35	(1,378)	16	(0,630)	12	250	160	0,39	4,8	1,3	A 710200
470	35	(1,378)	50	(1,969)	16	(0,630)	12	160	120	0,56	7,1	1,9	A 710201
680	35	(1,378)	50	(1,969)	16	(0,630)	12	150	110	0,81	7,3	1,9	A 710202
<b>Rated voltage 250 V</b>													
330	35	(1,378)	35	(1,378)	16	(0,630)	12	260	170	0,50	4,7	1,3	A 710220
470	35	(1,378)	50	(1,969)	16	(0,630)	12	160	120	0,70	7,1	1,9	A 710221
<b>Rated voltage 350 V</b>													
220	35	(1,378)	35	(1,378)	16	(0,630)	10	280	130	0,46	4,6	1,2	A 710240
330	35	(1,378)	50	(1,969)	16	(0,630)	10	180	80	0,69	6,6	1,8	A 710241
<b>Rated voltage 400 V</b>													
100	35	(1,378)	35	(1,378)	16	(0,630)	10	420	260	0,80	3,8	1	A 710260
150	35	(1,378)	35	(1,378)	16	(0,630)	10	280	150	1,00	4,6	1,2	A 710262
220	35	(1,378)	50	(1,969)	16	(0,630)	10	200	130	1,20	6,3	1,7	A 710261
<b>Rated voltage 450 V</b>													
100	35	(1,378)	35	(1,378)	16	(0,630)	10	600	320	0,80	3,1	0,8	A 710280
150	34	(1,339)	50	(1,969)	16	(0,630)	10	420	220	1,00	4,4	1,2	A 710281
220	35	(1,378)	50	(1,969)	16	(0,630)	10	300	160	1,30	5,2	1,4	A 710282

8 000 h / 105°C

## EXPECTED LIFE

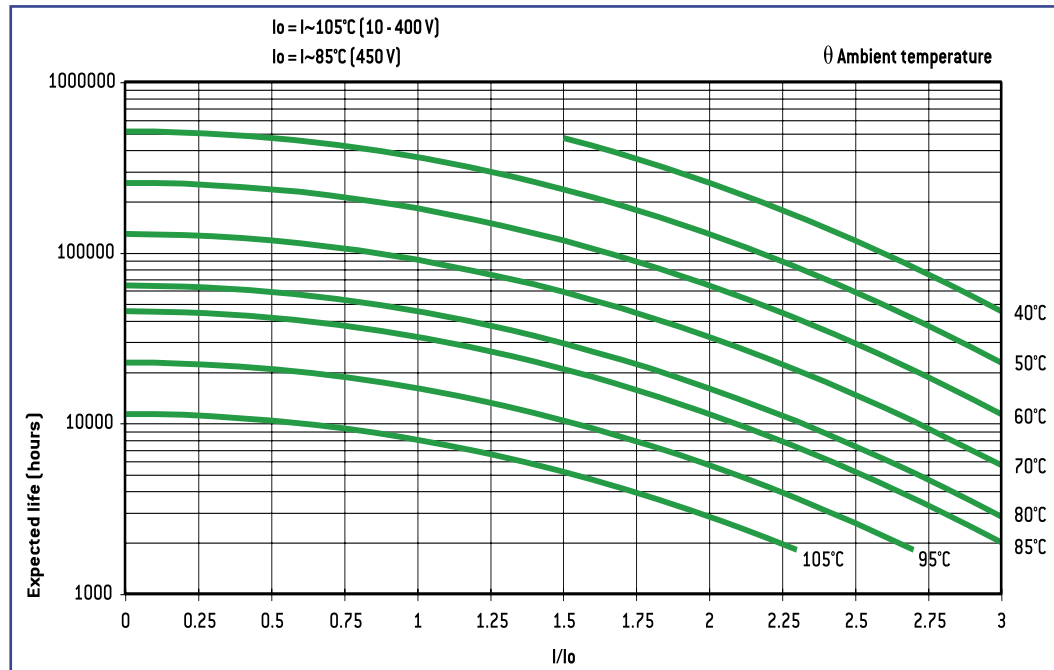
as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I ~: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~



# CUBISIC LP

8 000 h / 105°C

10 V ... 400 V	120 μF ... 68 000 μF	45 (1,772) x 12 (0,472) x 35 (1,378) 45 (1,772) x 12 (0,472) x 50 (1,969) 45 (1,772) x 12 (0,472) x 75 (2,953)	- 55°C + 105°C	Long Life Time
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## APPLICATIONS

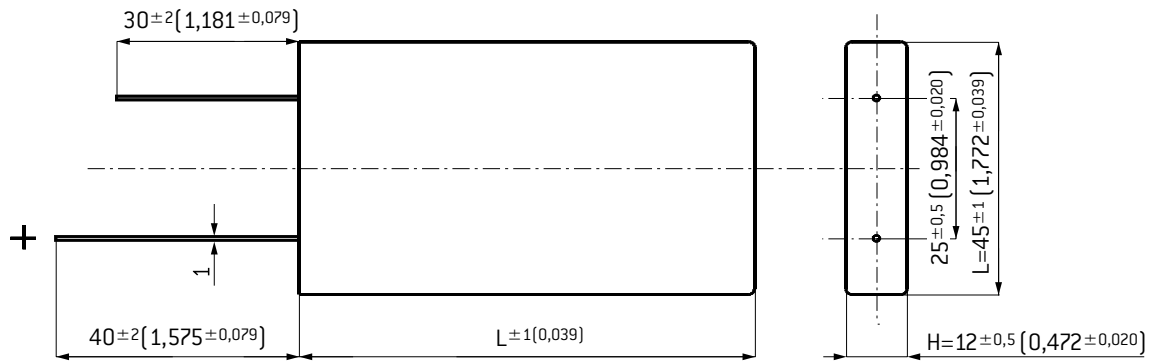
- Low prof lle printed circuit mounting
- Possible mounting with 45 x 12 bracket (A691057)
- Possible thermal dissipation per conduction through lower and upper surface
- Switch mode power supplies, impulse current

Aluminum case: Tin coated leads  
Negative pole marked

Tolerance on capacitance at 20°C: ± 20 %  
Operating temperature : - 55°C + 105°C



12 (0,472) height. The best capacitance per area unit



Dimensions in mm (inches)

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 2000 Hz
Amplitude	1,5 (0,059)
Acceleration	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h

## SPECIFICATIONS

CECC 30300 Long life  
IEC 60 384-4 Long life  
DIN 41 240 climatic category: - 55 + 105°C  
and GPF: - 55°C + 105°C / 56 days

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulating resistance at 20°C between leads and mounting hardware: 100 MΩ  
Test voltage at 50 Hz 1 min. between leads and mounting hardware: 2000 V  
Fire resistance: self extinguish 15 s. (IEC 60 695-2-2)



8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Case			Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	I +20°C 5 min. max. (mA)	I $\sim$ 100 Hz		Code			
	I mm (inches)	L mm (inches)	H mm (inches)					+40°C max. (A)	+105°C max. (A)				
<b>Rated voltage 10 V</b>													
22000	45	(1,772)	50	(1,969)	12	(0,472)	62	30	22	0,7	17	4,6	A 712000
47000	45	(1,772)	75	(2,953)	12	(0,472)	84	19	15	1,4	20	6,9	A 712001
68000	45	(1,772)	75	(2,953)	12	(0,472)	96	15	10	2,0	20	7,8	A 712002
<b>Rated voltage 16 V</b>													
15000	45	(1,772)	35	(1,378)	12	(0,472)	59	42	31	0,7	12	3,3	A 712020
22000	45	(1,772)	50	(1,969)	12	(0,472)	62	30	22	1,1	17	4,6	A 712021
33000	45	(1,772)	50	(1,969)	12	(0,472)	78	25	20	1,6	19	5,0	A 712022
47000	45	(1,772)	75	(2,953)	12	(0,472)	88	20	16	2,2	20	6,7	A 712023
<b>Rated voltage 25 V</b>													
22000	45	(1,772)	50	(1,969)	12	(0,472)	66	32	24	1,7	17	4,4	A 712040
33000	45	(1,772)	75	(2,953)	12	(0,472)	68	22	18	2,5	20	6,4	A 712041
<b>Rated voltage 35 V</b>													
10000	45	(1,772)	35	(1,378)	12	(0,472)	42	45	35	1,1	12	3,2	A 712060
15000	45	(1,772)	50	(1,969)	12	(0,472)	45	32	22	1,6	17	4,4	A 712061
22000	45	(1,772)	75	(2,953)	12	(0,472)	56	27	24	2,3	20	5,8	A 712062
<b>Rated voltage 40 V</b>													
6800	45	(1,772)	35	(1,378)	12	(0,472)	32	50	38	0,8	11	3,0	A 712080
10000	45	(1,772)	50	(1,969)	12	(0,472)	32	34	26	1,2	16	4,3	A 712081
<b>Rated voltage 50 V</b>													
10000	45	(1,772)	50	(1,969)	12	(0,472)	33	35	27	1,5	16	4,2	A 712100
15000	45	(1,772)	75	(2,953)	12	(0,472)	28	20	15	2,3	20	6,7	A 712101
<b>Rated voltage 63 V</b>													
6800	45	(1,772)	50	(1,969)	12	(0,472)	23	36	25	1,3	16	4,2	A 712120
10000	45	(1,772)	75	(2,953)	12	(0,472)	21	22	17	1,9	20	6,4	A 712121
<b>Rated voltage 80 V</b>													
4700	45	(1,772)	50	(1,969)	12	(0,472)	15	35	23	1,1	16	4,2	A 712140
6800	45	(1,772)	75	(2,953)	12	(0,472)	16	25	19	1,6	20	6,0	A 712141
<b>Rated voltage 100 V</b>													
2200	45	(1,772)	50	(1,969)	12	(0,472)	10	40	25	0,7	15	3,9	A 712160
3300	45	(1,772)	75	(2,953)	12	(0,472)	10	30	22	1,0	20	5,5	A 712161
<b>Rated voltage 160 V</b>													
1000	45	(1,772)	50	(1,969)	12	(0,472)	10	90	70	0,5	10	2,6	A 712180
1500	45	(1,772)	75	(2,953)	12	(0,472)	10	70	48	0,7	14	3,6	A 712181
<b>Rated voltage 200 V</b>													
470	45	(1,772)	35	(1,378)	12	(0,472)	10	200	130	0,3	5,6	1,5	A 712200
680	45	(1,772)	50	(1,969)	12	(0,472)	10	100	63	0,4	9,3	2,5	A 712201
1000	45	(1,772)	75	(2,953)	12	(0,472)	10	90	57	0,6	12	3,2	A 712202
<b>Rated voltage 250 V</b>													
470	45	(1,772)	50	(1,969)	12	(0,472)	10	180	120	0,4	7	1,9	A 712220
680	45	(1,772)	75	(2,953)	12	(0,472)	10	100	63	0,5	11	3,0	A 712221
<b>Rated voltage 350 V</b>													
330	45	(1,772)	50	(1,969)	12	(0,472)	10	280	180	0,3	5,6	1,5	A 712240
470	45	(1,772)	75	(2,953)	12	(0,472)	10	220	100	0,5	7,6	2,0	A 712241
<b>Rated voltage 400 V</b>													
220	45	(1,772)	50	(1,969)	12	(0,472)	10	320	220	0,3	5,2	1,4	A 712260
330	45	(1,772)	75	(2,953)	12	(0,472)	10	220	110	0,4	7,6	2,0	A 712261

RADIAL LEADED

# CUBISIC LP

8 000 h / 105°C

## EXPECTED LIFE

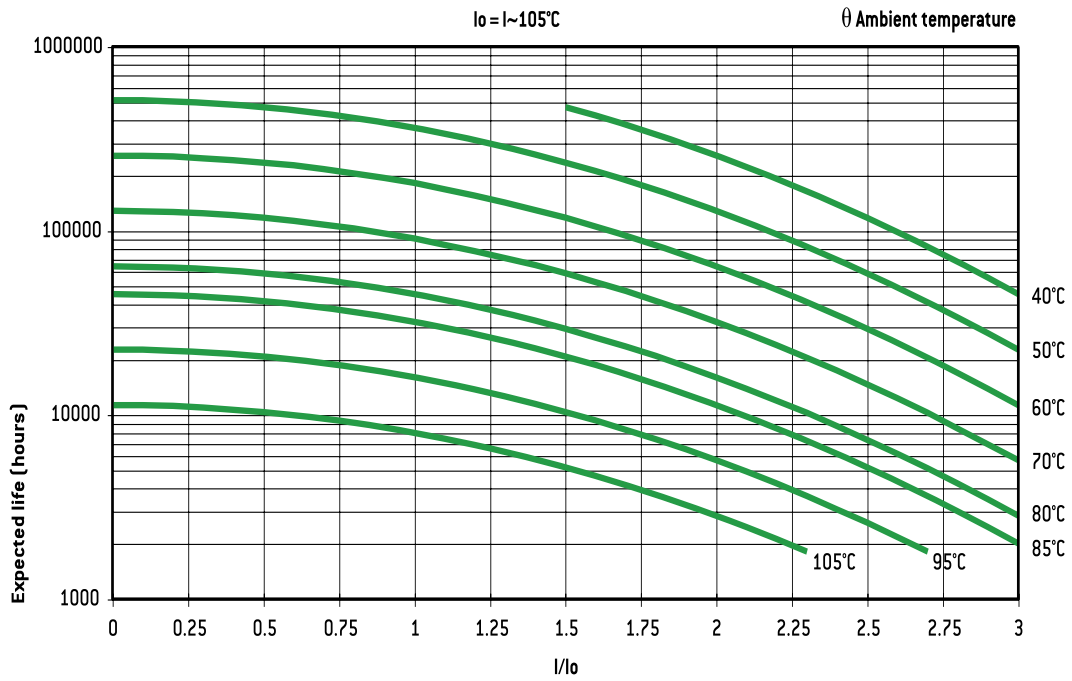
as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I ~: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~





# SNAPSIC

10 000 h / 85°C

16 V ... 500 V	22 µF ... 47 000 µF	Ø 22 (0,866) ... Ø 35 (1,378)	- 55°C + 85°C	Long Life Time
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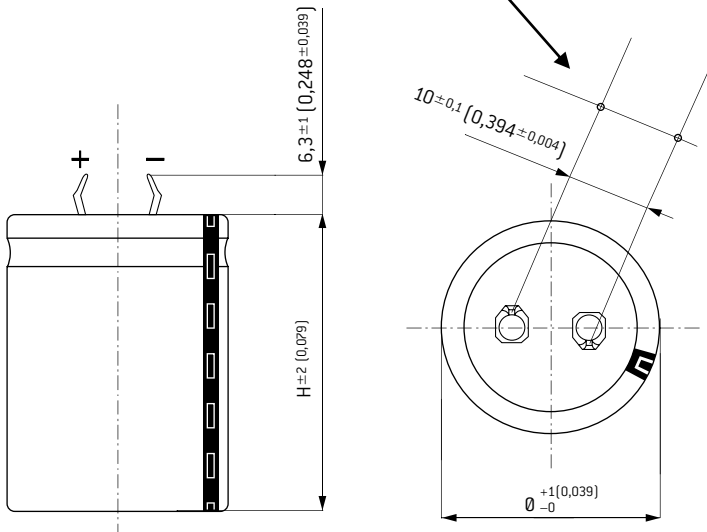
## APPLICATIONS

- For solid PC board mounting
- Switch mode power supplies
- Impulse current

Fixing: Printed SNAP-IN pins

Tolerance on capacitance at 20°C : ± 20 %  
 Operating temperature : - 55°C + 85°C

Ø PC board holes: 2 ± 0,1 (0,079 ± 0,004)



Dimensions in mm (inches)

Standard pins can be replaced by 4,5(0,177) max pins on request

## DIMENSIONS in mm (inches)

Can size	Ø		H	
1	22	(0,866)	25	(0,984)
2	22	(0,866)	30	(1,181)
3	22	(0,866)	40	(1,575)
4	25	(0,984)	25	(0,984)
5	25	(0,984)	30	(1,181)
6	25	(0,984)	40	(1,575)
7*	25	(0,984)	50	(1,969)
8*	30	(1,181)	25	(0,984)
9	30	(1,181)	30	(1,181)
10*	30	(1,181)	35	(1,378)
11	30	(1,181)	40	(1,575)
12*	30	(1,181)	45	(1,772)
13	30	(1,181)	50	(1,969)
14	35	(1,378)	30	(1,181)
15*	35	(1,378)	35	(1,378)
16	35	(1,378)	40	(1,575)
17*	35	(1,378)	45	(1,772)
18	35	(1,378)	50	(1,969)

\* Out of range

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 500 Hz
Amplitude	0,75 (0,030)
Acceleration	10 g - 98 m/s <sup>2</sup>
t (h)	3 x 10 sweep cycles

## SPECIFICATIONS

CECC 30301-811 Issue 1  
 DIN 41 240 - Climatic category GPF - 55°C + 85°C / 56 days  
 IEC 60 384.4 long life

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware: 100 MΩ.

Test voltage at 50 Hz 1 min between terminals and mounting hardware

Fire resistance: self extinguish 15 s (IEC 60 695-2-2).



10 000 h / 85°C

Capacitance ( $\mu$ F)	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I ~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)						+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage / Peaked voltage 16/18 V</b>												
4700	22	(0,866)	30	(1,181)	2	20	45	35	0,46	8,7	2,9	A 704020
10000	22	(0,866)	40	(1,575)	3	35	35	30	0,96	11	3,7	A 704022
10000	30	(1,181)	30	(1,181)	9	35	30	30	0,96	13	4,2	A 704023
22000	30	(1,181)	40	(1,575)	11	40	25	25	2,1	16	5,2	A 704026
47000	35	(1,378)	50	(1,969)	18	55	15	15	4,5	20	8	A 704028
<b>Rated voltage 25/30 V</b>												
3300	22	(0,866)	30	(1,181)	2	22	53	40	0,5	7,8	2,6	A 704040
4700	22	(0,866)	30	(1,181)	2	22	50	40	0,7	8,1	2,7	A 704041
4700	25	(0,984)	25	(0,984)	4	25	60	45	0,7	7,5	2,5	A 704042
6800	25	(0,984)	40	(1,575)	6	25	30	25	1	13	4,3	A 704049
6800	30	(1,181)	30	(1,181)	9	25	30	25	1	13	4,2	A 704044
10000	25	(0,984)	40	(1,575)	6	25	28	25	1,5	13	4,4	A 704045
15000	30	(1,181)	40	(1,575)	11	45	28	25	2,3	15	4,9	A 704047
22000	35	(1,378)	50	(1,969)	18	57	24	20	3	19	6,4	A 704048
33000	35	(1,378)	50	(1,969)	18	70	20	18	5	20	7	A 704050
<b>Rated voltage 40/48 V</b>												
2200	22	(0,866)	30	(1,181)	2	10	55	38	0,53	7,8	2,6	A 704060
3300	25	(0,984)	30	(1,181)	5	15	48	40	0,79	9	3	A 704061
4700	22	(0,866)	40	(1,575)	3	15	35	25	1,1	11	3,7	A 704062
4700	30	(1,181)	30	(1,181)	9	18	42	32	1,1	11	3,6	A 704063
6800	30	(1,181)	40	(1,575)	11	20	30	23	1,6	14	4,7	A 704064
10000	30	(1,181)	50	(1,969)	13	23	20	17	2,4	19	6,4	A 704066
10000	35	(1,378)	40	(1,575)	16	31	30	23	2,4	16	5,2	A 704067
15000	35	(1,378)	50	(1,969)	18	34	24	18	3,6	19	6,4	A 704068
<b>Rated voltage 50/58 V</b>												
2200	22	(0,866)	30	(1,181)	2	12	60	42	0,66	7,4	2,5	A 704080
3300	25	(0,984)	30	(1,181)	5	15	50	35	0,99	8,7	2,9	A 704081
4700	25	(0,984)	40	(1,575)	6	20	30	22	1,4	11	3,6	A 704082
10000	35	(1,378)	40	(1,575)	16	32	32	23	3	14	4,8	A 704086
15000	35	(1,378)	50	(1,969)	18	38	26	18	4,5	18	6,1	A 704087
<b>Rated voltage 63/76 V</b>												
1000	22	(0,866)	30	(1,181)	2	7	60	40	0,38	7,4	2,5	A 704100
1500	25	(0,984)	25	(0,984)	4	10	110	80	0,56	5,5	1,8	A 704102
2200	22	(0,866)	40	(1,575)	3	10	40	30	0,83	10	3,4	A 704103
2200	25	(0,984)	30	(1,181)	5	10	50	30	0,83	8,8	2,9	A 704104
3300	25	(0,984)	40	(1,575)	6	12	36	30	1,2	12	3,9	A 704105
3300	30	(1,181)	30	(1,181)	9	15	50	35	1,2	9,8	3,3	A 704106
4700	30	(1,181)	40	(1,575)	11	15	28	22	1,8	15	4,9	A 704107
4700	35	(1,378)	30	(1,181)	14	20	50	35	1,8	11	3,6	A 704108
6800	35	(1,378)	40	(1,575)	16	25	30	28	2,6	16	5,2	A 704110
10000	35	(1,378)	50	(1,969)	18	25	25	20	3	19	6,2	A 704111
<b>Rated voltage 100/115 V</b>												
470	22	(0,866)	30	(1,181)	2	5	80	50	0,29	6,4	2,1	A 704120
680	22	(0,866)	30	(1,181)	2	5	70	40	0,4	6,9	2,3	A 704121
1000	22	(0,866)	40	(1,575)	3	7	50	35	0,6	9,2	3,1	A 704123
1000	25	(0,984)	30	(1,181)	5	7	70	40	0,6	7,4	2,5	A 704124
1500	25	(0,984)	40	(1,575)	6	10	60	40	0,9	9	3	A 704125
1500	30	(1,181)	30	(1,181)	9	10	70	50	0,9	8,3	2,8	A 704126
2200	30	(1,181)	40	(1,575)	11	10	35	25	1,3	13	4,4	A 704127
2200	35	(1,378)	30	(1,181)	14	11	50	35	1,3	11	3,6	A 704129
3300	35	(1,378)	40	(1,575)	16	12	35	27	2	14	4,8	A 704128
<b>Rated voltage 200/230 V</b>												
100	22	(0,866)	30		2	10	600	400	0,12	2,3	0,8	A 704140
150	25	(0,984)	25		4	12	800	500	0,18	2	0,7	A 704141
220	22	(0,866)	30		2	12	400	250	0,26	2,9	1	A 704142
220	25	(0,984)	25		4	12	500	300	0,26	2,6	0,9	A 704143
330	25	(0,984)	30		5	12	250	170	0,39	3,9	1,3	A 704144
470	25	(0,984)	40		6	12	160	110	0,56	5,5	1,8	A 704145
470	30	(1,181)	30		9	12	180	130	0,56	5,2	1,7	A 704146
680	30	(1,181)	40		11	12	150	100	0,81	6,3	2,1	A 704147
680	35	(1,378)	30		14	12	160	110	0,81	6	2	A 704148
1000	35	(1,378)	40		16	14	110	70	1,2	8,1	2,7	A 704149
1500	35	(1,378)	50		18	16	90	60	1,8	9,8	3,3	A 704150

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I ~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)						+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage 250/290 V</b>												
150	25	(0,984)	25	(0,984)	4	12	500	320	0,22	2,6	0,9	A 704160
220	25	(0,984)	30	(1,181)	5	12	270	170	0,33	3,8	1,3	A 704169
330	30	(1,181)	30	(1,181)	9	12	250	150	0,49	4,3	1,5	A 704163
470	30	(1,181)	40	(1,575)	11	12	150	120	0,7	6,3	2,1	A 704164
470	35	(1,378)	30	(1,181)	14	12	170	140	0,7	5,8	1,9	A 704165
680	30	(1,181)	50	(1,969)	13	12	110	80	1	8,2	2,7	A 704166
680	35	(1,378)	40	(1,575)	16	12	120	90	1	7,8	2,6	A 704167
1000	35	(1,378)	50	(1,969)	18	14	95	65	1,5	9,6	3,2	A 704168
<b>Rated voltage 350/385 V</b>												
100	22	(0,866)	30	(0,866)	2	10	640	410	0,21	2	0,7	A 704180
150	22	(0,866)	40	(0,866)	3	10	320	220	0,31	2,8	0,9	A 704182
220	25	(0,984)	40	(0,984)	6	10	260	180	0,46	3,7	1,2	A 704184
470	35	(1,378)	40	(1,378)	16	10	140	115	0,98	6,5	2,2	A 704187
560	35	(1,378)	50	(1,378)	18	10	130	90	1,2	7,5	2,5	A 704188
<b>Rated voltage 385/425 V</b>												
68	25	(0,984)	25	(0,984)	4	10	1170	800	0,15	1,7	0,6	A 704201
100	25	(0,984)	30	(1,181)	5	10	800	450	0,23	2,2	0,7	A 704202
150	25	(0,984)	40	(1,575)	6	10	530	350	0,35	3	1	A 704203
150	30	(1,181)	30	(1,181)	9	10	530	350	0,35	3	1	A 704204
220	30	(1,181)	40	(1,575)	11	10	320	220	0,5	4,3	1,4	A 704205
220	35	(1,378)	30	(1,181)	14	10	450	340	0,5	3,6	1,2	A 704206
330	30	(1,181)	50	(1,969)	13	10	240	200	0,8	5,5	1,8	A 704207
330	35	(1,378)	40	(1,575)	16	10	240	200	0,8	5,5	1,8	A 704208
470	35	(1,378)	50	(1,969)	18	10	170	150	1,1	7,2	2,4	A 704209
<b>Rated voltage 400/450 V</b>												
47	22	(0,866)	25	(0,984)	1	10	1500	1100	0,55	1,4	0,45	A 704232
68	22	(0,866)	30	(1,181)	2	10	1000	700	0,65	1,8	0,6	A 704220
68	25	(0,984)	25	(0,984)	4	10	1300	900	0,65	1,6	0,5	A 704221
100	22	(0,866)	40	(1,575)	3	10	900	800	0,8	2,2	0,7	A 704222
100	25	(0,984)	30	(1,181)	5	10	1000	700	0,8	2	0,7	A 704223
150	25	(0,984)	40	(1,575)	6	10	530	350	1	3	1	A 704224
220	30	(1,181)	40	(1,575)	11	10	310	220	1,2	4,4	1,5	A 704226
220	35	(1,378)	30	(1,181)	14	10	340	240	1,2	4,1	1,4	A 704227
330	30	(1,181)	50	(1,969)	13	12	230	150	1,5	5,6	1,9	A 704228
330	35	(1,378)	40	(1,575)	16	12	230	150	1,5	5,6	1,9	A 704229
470	35	(1,378)	50	(1,969)	18	12	150	105	1,8	7,6	2,5	A 704230
<b>Rated voltage 450/500 V</b>												
33	22	(0,866)	30	(1,181)	2	10	1800	1300	0,7	1,4	0,5	A 704239
47	25	(0,984)	25	(0,984)	4	10	1500	1100	0,8	1,5	0,5	A 704240
68	22	(0,866)	30	(1,181)	2	10	1400	1000	1	1,5	0,5	A 704241
100	22	(0,866)	40	(1,575)	3	10	1200	950	1,3	1,9	0,6	A 704242
150	30	(1,181)	30	(1,181)	9	10	600	500	1,6	3,1	1	A 704244
220	30	(1,181)	40	(1,575)	11	10	390	280	1,9	3,9	1,3	A 704245
220	35	(1,378)	30	(1,181)	14	10	500	350	1,9	3,4	1,1	A 704248
330	35	(1,378)	50	(1,969)	18	13	280	200	2,3	5,6	1,9	A 704246
470	35	(1,378)	50	(1,969)	18	13	250	170	2,8	5,9	2	A 704247
<b>Rated voltage 500/550 V</b>												
22	22	(0,866)	25	(0,984)	1	10	5000	3400	0,63	0,8	0,3	A 704272
47	25	(0,984)	30	(1,181)	5	10	2200	1500	0,92	1,3	0,4	A 704274
100	30	(1,181)	40	(1,575)	11	10	900	500	1,3	2,6	0,9	A 704276
150	35	(1,378)	40	(1,575)	16	10	600	450	1,6	3,5	1,2	A 704278
220	35	(1,378)	50	(1,969)	18	10	350	240	2	5	1,7	A 704279

10 000 h / 85°C

**EXPECTED LIFE**

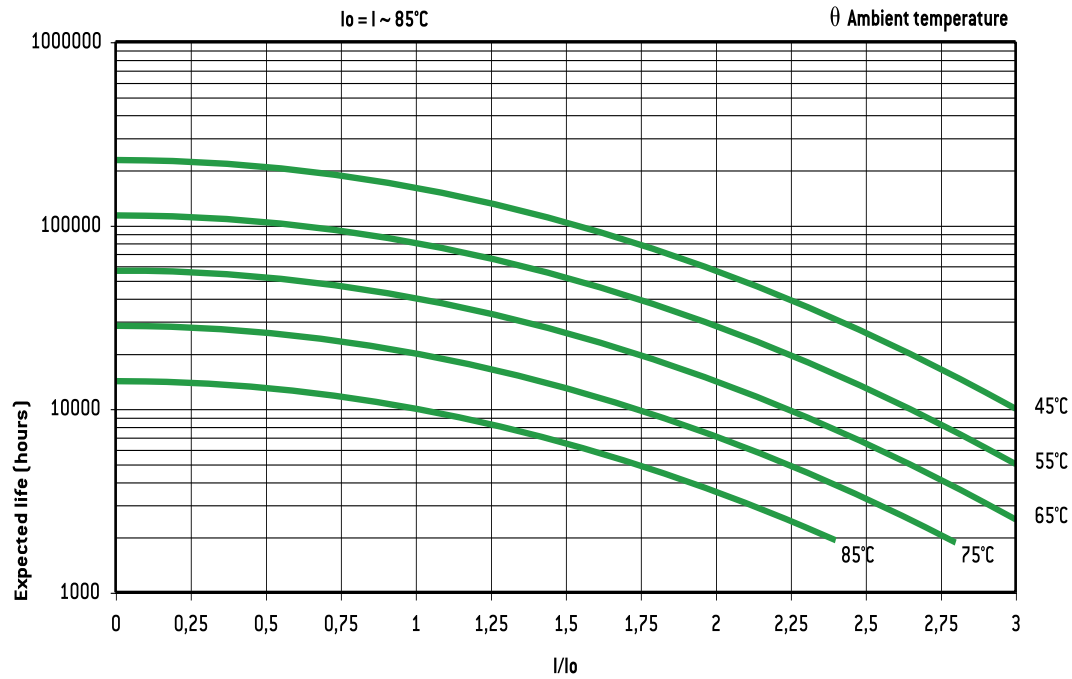
as a function of temperature and ripple current

**PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)**

versus frequency f:

I<sub>r</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I <sub>r</sub>	I <sub>r</sub>	1,2 x I <sub>r</sub>	1,3 x I <sub>r</sub>	1,35 x I <sub>r</sub>	1,5 x I <sub>r</sub>	1,6 x I <sub>r</sub>





# SNAPSIC 105

8 000 h / 105°C

16 V ... 500 V	22 µF ... 68 000 µF	Ø 22 (0,866) ... Ø 35 (1,378)	- 55°C + 115°C	Long Life Time
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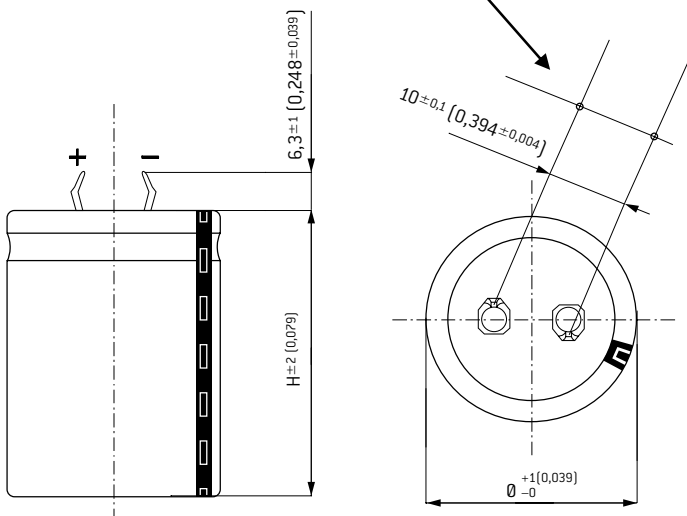
## APPLICATIONS

- For solid PC board mounting
- Switch mode power supplies
- Impulse current

Fixing: Printed SNAP-IN pins

Tolerance on capacitance at 20°C : ± 20 %  
 Operating temperature : - 55°C + 105°C

Ø PC board holes: 2 ± 0,1 (0,079 ± 0,004)



Dimensions in mm (inches)

Standard pins can be replaced by 4,5 (0,177) max pins on request

## DIMENSIONS in mm (inches)

Can size	Ø		H	
1	22	(0,866)	25	(0,984)
2	22	(0,866)	30	(1,181)
3	22	(0,866)	40	(1,575)
4	25	(0,984)	25	(0,984)
5	25	(0,984)	30	(1,181)
6	25	(0,984)	40	(1,575)
7*	25	(0,984)	50	(1,969)
8*	30	(1,181)	25	(0,984)
9	30	(1,181)	30	(1,181)
10	30	(1,181)	35	(1,378)
11	30	(1,181)	40	(1,575)
12*	30	(1,181)	45	(1,772)
13*	30	(1,181)	50	(1,969)
14	35	(1,378)	30	(1,181)
15	35	(1,378)	35	(1,378)
16	35	(1,378)	40	(1,575)
17	35	(1,378)	45	(1,772)
18	35	(1,378)	50	(1,969)

\* Out of range

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 500 Hz
Amplitude	0,75 (0,030)
Acceleration	10 g - 98 m/s <sup>2</sup>
t (h)	3 x 10 sweep cycles

## SPECIFICATIONS

CECC 30300 - Long life  
 DIN 41 240 - Climatic category: -55 + 105°C / 56 days  
 IEC 60 384.4 Long life  
 Standard endurance test at U<sub>R</sub>: 2000 h / 105°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware: 100 MΩ  
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
 Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

## SNAPIC 105

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I ~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)						+40°C max. (A)	+105°C max. (A)			
<b>Rated voltage / Peak voltage: 16/18 V</b>												
4700	22	(0,866)	25	(0,984)	1	30	65	55	0,5	6,8	1,8	A 705020
6800	22	(0,866)	30	(1,181)	2	30	55	50	0,7	7,8	2,1	A 705021
10000	22	(0,866)	30	(1,181)	2	38	40	33	1,0	9,3	2,5	A 705026
15000	25	(0,984)	40	(1,575)	6	43	35	28	1,4	12	3,2	A 705023
22000	25	(0,984)	40	(1,575)	6	49	30	22	2,1	13	3,5	A 705027
33000	30	(1,181)	40	(1,575)	11	60	25	20	3,0	16	4,2	A 705030
47000	35	(1,378)	40	(1,575)	16	65	17	15	4,5	20	5,6	A 705028
68000	35	(1,378)	50	(1,969)	18	67	12	10	6,5	20	7,3	A 705029
<b>Rated voltage / Peak voltage: 25/29 V</b>												
2200	22	(0,866)	25	(0,984)	1	15	70	45	0,3	7	1,7	A 705040
3300	22	(0,866)	25	(0,984)	1	18	60	42	0,5	7	1,9	A 705048
4700	22	(0,866)	30	(1,181)	2	22	50	40	0,7	7,8	2,2	A 705041
4700	25	(0,984)	25	(0,984)	4	25	60	45	0,7	6,9	2	A 705042
6800	22	(0,866)	40	(1,575)	3	25	35	30	1,0	11	3	A 705043
10000	22	(0,866)	40	(1,575)	3	28	32	25	1,5	12	3,1	A 705046
22000	35	(1,378)	40	(1,575)	16	58	26	20	3,0	17	4,5	A 705045
33000	35	(1,378)	50	(1,969)	18	70	20	18	5,0	20	5,7	A 705047
<b>Rated voltage / Peak voltage: 35/40 V</b>												
2200	22	(0,866)	25	(0,984)	1	15	60	47	0,5	7	1,9	A 705060
3300	22	(0,866)	30	(1,181)	2	16	50	35	0,7	8,3	2,2	A 705065
4700	25	(0,984)	30	(1,181)	3	17	32	22	1,0	12	3,1	A 705061
6800	25	(0,984)	40	(1,575)	6	22	35	25	1,4	12	3,2	A 705066
10000	30	(1,181)	40	(1,575)	11	28	30	25	2,1	14	3,9	A 705067
15000	35	(1,378)	40	(1,575)	16	37	28	23	3,1	16	4,4	A 705068
18000	35	(1,378)	45	(1,772)	17	40	25	21	3,8	18	4,9	A 705070
22000	35	(1,378)	50	(1,969)	18	46	22	19	4,6	20	5,4	A 705069
<b>Rated voltage / Peak voltage: 50/58 V</b>												
1000	22	(0,866)	25	(0,984)	1	10	90	60	0,3	5,7	1,5	A 705080
2200	22	(0,866)	30	(1,181)	2	12	60	42	0,7	7,5	2	A 705081
3300	25	(0,984)	30	(1,181)	5	15	50	35	1,0	9	2,4	A 705085
4700	25	(0,984)	40	(1,575)	6	20	30	22	1,4	13	3,5	A 705082
6800	30	(1,181)	40	(1,575)	11	25	30	22	2,0	14	3,9	A 705086
10000	35	(1,378)	40	(1,575)	16	32	32	23	3,0	15	4,1	A 705083
15000	35	(1,378)	50	(1,969)	18	38	26	18	4,5	18	5	A 705084
22000	35	(1,378)	50	(1,969)	18	46	22	15	6,6	20	5,4	A 705087
<b>Rated voltage / Peak voltage: 63/72 V</b>												
1000	22	(0,866)	25	(0,984)	1	10	110	80	0,4	5,2	1,4	A 705100
1500	22	(0,866)	30	(1,181)	2	10	60	40	0,6	7,6	2	A 705106
2200	22	(0,866)	40	(1,575)	3	10	40	30	0,8	11	2,8	A 705107
2200	25	(0,984)	30	(1,181)	5	10	50	30	0,8	9	2,4	A 705108
3300	25	(0,984)	40	(1,575)	6	12	36	30	1,2	12	3,2	A 705109
4700	30	(1,181)	40	(1,575)	11	15	28	22	1,8	15	4	A 705110
6800	35	(1,378)	40	(1,575)	16	25	30	28	2,6	16	4,2	A 705111
10000	35	(1,378)	50	(1,969)	18	25	25	20	3,0	19	5,1	A 705112
<b>Rated voltage / Peak voltage: 80/92 V</b>												
1000	22	(0,866)	30	(1,181)	2	10	100	65	0,5	5,9	1,6	A 705113
1500	22	(0,866)	40	(1,575)	3	12	70	50	0,7	7,9	2,1	A 705114
2200	25	(0,984)	40	(1,575)	6	15	60	45	1,1	9,2	2,5	A 705115
3300	30	(1,181)	40	(1,575)	11	15	40	30	1,6	13	3,3	A 705116
4700	35	(1,378)	40	(1,575)	16	16	35	25	2,2	15	3,9	A 705117
6800	35	(1,378)	50	(1,969)	18	20	30	25	3,2	17	4,6	A 705118
10000	35	(1,378)	50	(1,969)	18	30	25	22	4,8	19	5,1	A 705119
<b>Rated voltage / Peak voltage: 100/115 V</b>												
330	22	(0,866)	25	(0,984)	1	5	150	90	0,2	4,4	1,2	A 705120
470	22	(0,866)	30	(1,181)	2	5	80	50	0,3	6,6	1,8	A 705121
680	22	(0,866)	30	(1,181)	2	5	70	40	0,4	7	1,9	A 705124
1000	22	(0,866)	40	(1,575)	3	7	50	35	0,6	9,4	2,5	A 705122
1500	25	(0,984)	40	(1,575)	6	10	50	30	0,9	10	2,7	A 705125
2200	30	(1,181)	35	(1,378)	10	10	40	30	1,3	12	3,2	A 705128
2200	35	(1,378)	30	(1,181)	14	11	50	35	1,3	11	2,9	A 705129
3300	35	(1,378)	40	(1,575)	16	12	35	25	2,0	15	3,9	A 705126
4700	35	(1,378)	50	(1,969)	18	15	28	20	2,8	18	4,8	A 705127

## SNAPSIC 105

8 000 h / 105°C

Capacitance ( $\mu$ F)	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I ~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)						+40°C max. (A)	+105°C max. (A)			
<b>Rated voltage / Peak voltage: 160/185 V</b>												
100	22	(0,866)	25	(0,984)	1	10	500	250	0,1	2,4	0,6	A 705140
220	25	(0,984)	25	(0,984)	4	10	300	150	0,2	3,4	0,9	A 705141
330	25	(0,984)	30	(1,181)	5	10	200	110	0,3	4,5	1,2	A 705142
470	30	(1,181)	30	(1,181)	9	10	170	120	0,5	5,4	1,4	A 705143
680	30	(1,181)	40	(1,575)	11	10	140	100	0,7	6,7	1,8	A 705144
1000	35	(1,378)	40	(1,575)	16	10	70	50	1,0	10	2,8	A 705145
1500	35	(1,378)	50	(1,969)	18	10	70	50	1,4	11	3,0	A 705146
2200	35	(1,378)	50	(1,969)	18	15	60	40	2,1	12	3,3	A 705147
<b>Rated voltage / Peak voltage: 200/230 V</b>												
150	25	(0,984)	25	(0,984)	4	10	500	300	0,2	2,6	0,7	A 705152
220	22	(0,866)	30	(1,181)	2	10	240	150	0,3	3,8	1,0	A 705151
330	25	(0,984)	30	(1,181)	5	10	200	130	0,4	4,4	1,2	A 705153
470	25	(0,984)	40	(1,575)	6	10	140	80	0,6	6	1,6	A 705154
560	25	(0,984)	40	(1,575)	6	10	130	90	0,7	6,3	1,7	A 705158
680	30	(1,181)	40	(1,575)	11	10	100	70	0,8	7,9	2,1	A 705155
1000	35	(1,378)	40	(1,575)	16	10	90	60	1,2	9,2	2,4	A 705156
1500	35	(1,378)	50	(1,969)	18	10	70	50	1,8	11	3,0	A 705157
1800	35	(1,378)	50	(1,969)	18	11	65	45	2,2	12	3,2	A 705159
<b>Rated voltage / Peak voltage: 250/290 V</b>												
150	22	(0,866)	30	(1,181)	2	10	700	500	0,2	2,2	0,6	A 705163
220	22	(0,866)	40	(1,575)	3	10	450	280	0,3	3,1	0,8	A 705160
330	25	(0,984)	40	(1,575)	6	10	280	180	0,5	4,3	1,1	A 705164
470	30	(1,181)	40	(1,575)	11	10	210	150	0,7	5,5	1,5	A 705161
680	35	(1,378)	40	(1,575)	16	10	140	110	1,0	7,3	2,0	A 705165
1000	35	(1,378)	50	(1,969)	18	11	110	75	1,5	9,1	2,4	A 705166
<b>Rated voltage / Peak voltage: 350/385 V</b>												
68	25	(0,984)	25	(0,984)	4	10	650	340	0,1	2,1	0,6	A 705180
100	25	(0,984)	30	(1,181)	5	10	450	280	0,2	3	0,8	A 705181
150	30	(1,181)	30	(1,181)	9	10	360	240	0,3	3,7	1,0	A 705182
220	30	(1,181)	30	(1,181)	9	10	340	220	0,5	3,8	1,0	A 705185
330	30	(1,181)	40	(1,575)	11	10	210	150	0,7	5,5	1,5	A 705186
470	35	(1,378)	40	(1,575)	16	10	140	115	1,0	7,3	2,0	A 705187
560	35	(1,378)	40	(1,575)	16	10	130	105	1,2	7,6	2,0	A 705189
680	35	(1,378)	50	(1,969)	18	10	120	100	1,4	8,7	2,3	A 705188
<b>Rated voltage / Peak voltage: 400/450 V</b>												
68	22	(0,866)	30	(1,181)	2	10	1000	700	0,7	1,9	0,5	A 705200
100	22	(0,866)	40	(1,575)	3	10	700	450	0,8	2,5	0,7	A 705201
100	25	(0,984)	25	(0,984)	4	10	1100	800	0,8	1,8	0,5	A 705211
150	22	(0,866)	40	(1,575)	3	10	550	350	1,0	2,8	0,8	A 705210
150	30	(1,181)	30	(1,181)	9	10	550	350	1,0	3	0,8	A 705214
220	30	(1,181)	40	(1,575)	11	10	300	210	1,2	4,6	1,2	A 705202
220	35	(1,378)	30	(1,181)	14	10	360	260	1,2	4,1	1,1	A 705203
330	30	(1,181)	40	(1,575)	11	12	300	200	1,5	4,6	1,2	A 705212
330	35	(1,378)	35	(1,378)	15	12	290	200	1,5	4,8	1,3	A 705207
470	35	(1,378)	35	(1,378)	15	12	260	170	1,8	5,1	1,4	A 705215
470	35	(1,378)	40	(1,575)	16	12	180	120	1,8	6,4	1,7	A 705216
470	35	(1,378)	45	(1,772)	17	12	180	130	1,8	6,8	1,8	A 705208
560	35	(1,378)	50	(1,969)	18	12	140	100	1,9	8	2,1	A 705209
680	35	(1,378)	50	(1,969)	18	12	130	100	2,1	8,4	2,2	A 705213
<b>Rated voltage / Peak voltage: 450/500 V</b>												
47	25	(0,984)	25	(0,984)	4	10	1500	1100	0,6	1,8	0,5	A 705220
68	22	(0,866)	30	(1,181)	2	10	1100	1000	0,7	1,8	0,5	A 705227
100	22	(0,866)	40	(1,575)	3	10	1000	800	0,8	2,3	0,6	A 705221
100	25	(0,984)	30	(1,181)	5	10	1100	900	0,8	1,9	0,5	A 705230
150	25	(0,984)	40	(1,575)	6	10	650	450	1,0	2,8	0,7	A 705228
220	30	(1,181)	40	(1,575)	11	10	450	350	1,3	3,8	1,0	A 705225
220	35	(1,378)	35	(1,378)	15	10	420	330	1,3	4	1,1	A 705226
330	35	(1,378)	40	(1,575)	16	10	360	260	1,5	4,5	1,2	A 705229
330	35	(1,378)	50	(1,969)	18	10	290	200	1,5	5,6	1,5	A 705223
470	35	(1,378)	50	(1,969)	18	10	200	130	1,8	6,7	1,8	A 705224

SNAPSI<sup>C</sup> 105

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. [%]	ESR 100 Hz +20°C Typic [m $\Omega$ ]	Z 10 kHz +20°C Typic [m $\Omega$ ]	II +20°C 5 min. max. [mA]	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm [inches]	H mm [inches]						+40°C max. [A]	+105°C max. [A]			
Rated voltage / Peak voltage: 500/550 V												
22	22	(0,866)	30	(1,181)	2	10	3500	2200	0,4	1,1	0,3	A 705240
33	22	(0,866)	30	(1,181)	2	10	2400	1500	0,5	1,2	0,3	A 705245
47	25	(0,984)	40	(1,575)	6	10	1600	1100	0,6	1,9	0,5	A 705241
68	25	(0,984)	40	(1,575)	6	10	1200	900	0,7	2,1	0,6	A 705246
100	30	(1,181)	40	(1,575)	11	10	720	470	0,9	3,4	0,9	A 705247
150	35	(1,378)	40	(1,575)	16	10	480	310	1,1	4	1,1	A 705248
220	35	(1,378)	50	(1,969)	18	10	380	260	1,4	4,7	1,3	A 705249

## EXPECTED LIFE

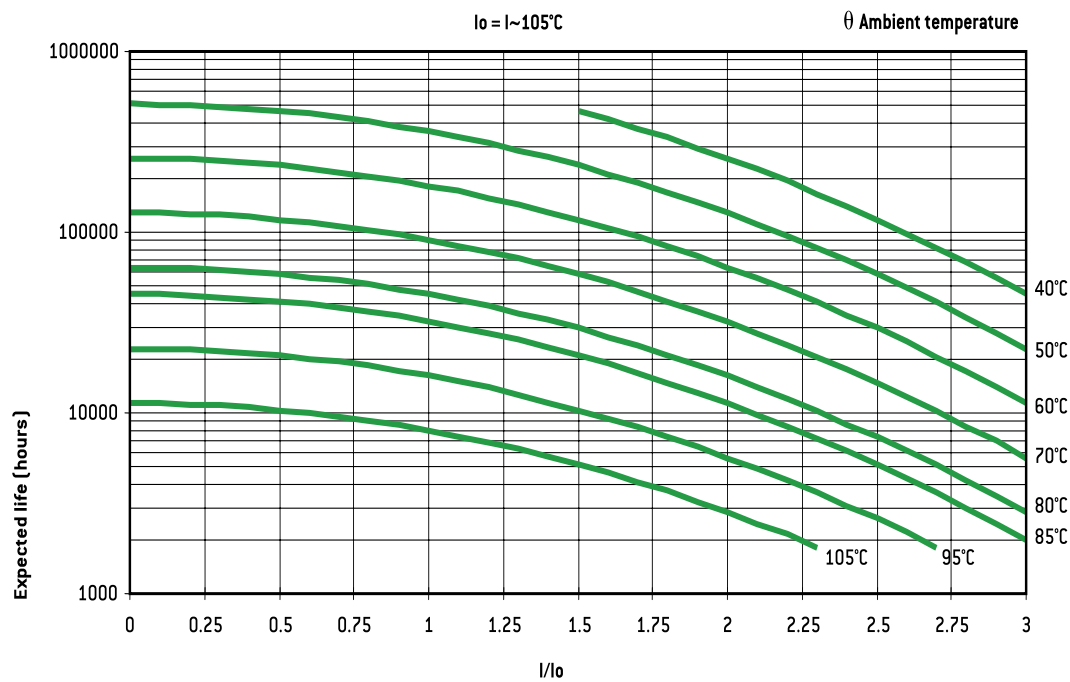
as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I $\sim$ : permissible r.m.s. current at 100 Hz

f [Hz]	50	100	300	600	1 000	10 000	$\geq 50 000$
I	0,8 x I $\sim$	I $\sim$	1,2 x I $\sim$	1,3 x I $\sim$	1,35 x I $\sim$	1,5 x I $\sim$	1,6 x I $\sim$



# SNAPSIC HC

8 000 h / 85°C

25V ... 450V	47 µF ... 47 000 µF	Ø 22 (0,866) ... Ø 35 (1,378)	- 40°C + 85°C	Long Life Time
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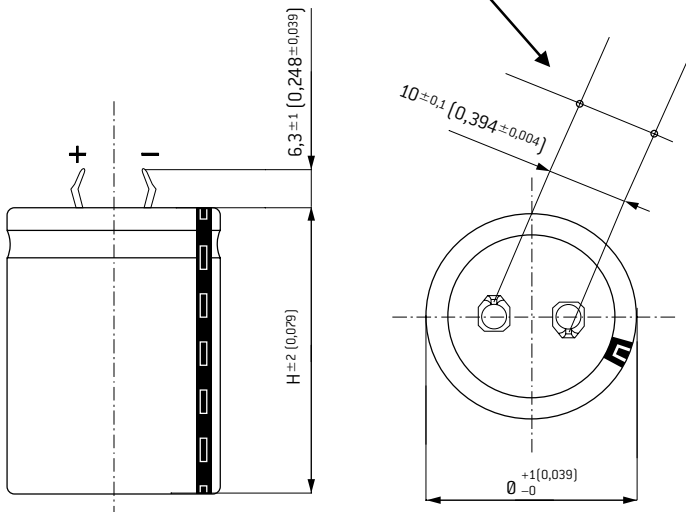
## APPLICATIONS

- For solid PC board mounting
- Switch mode power supplies
- Impulse current

Fixing: Printed SNAP-IN pins

Tolerance on capacitance at 20°C : ± 20 %  
 Operating temperature : - 40°C + 85°C

Ø PC board holes: 2 ± 0,1 (0,079 ± 0,004)



Dimensions in mm (inches)

Standard pins can be replaced by 4,5 (0,177) max pins on request

## DIMENSIONS in mm (inches)

Can size	Ø		H	
1	22	(0,866)	25	(0,984)
2	22	(0,866)	30	(1,181)
3	22	(0,866)	40	(1,575)
4	25	(0,984)	25	(0,984)
5	25	(0,984)	30	(1,181)
6	25	(0,984)	40	(1,575)
7*	25	(0,984)	50	(1,969)
8	30	(1,181)	25	(0,984)
9	30	(1,181)	30	(1,181)
10	30	(1,181)	35	(1,378)
11	30	(1,181)	40	(1,575)
12*	30	(1,181)	45	(1,772)
13	30	(1,181)	50	(1,969)
14	35	(1,378)	30	(1,181)
15	35	(1,378)	35	(1,378)
16	35	(1,378)	40	(1,575)
17	35	(1,378)	45	(1,772)
18	35	(1,378)	50	(1,969)

\* Out of range

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 2000 Hz
Amplitude	1,5 (0,059)
Acceleration	20 g
t (h)	3 x 2 h

## SPECIFICATIONS

CECC 30300 Long life  
 DIN 41 240 - Climatic category and GPF: -40 +85°C / 56 days  
 IEC 60 384.4 long life  
 Standard endurance test at U<sub>R</sub>: 2000 h / 85°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware: 100 MΩ  
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
 Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

8 000 h / 85°C

Capacitance ( $\mu$ F)	Dimensions		Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	I <sub>r</sub> +20°C 5 min. max. (mA)	I <sub>rms</sub> ~ 100 Hz		Code		
	$\varnothing$ mm (inches)	H mm (inches)					+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage 25 V</b>											
5600	22	[0,866]	25	[0,984]	24	45	40	0,8	5,0	2,2	A780001
7200	22	[0,866]	30	[1,181]	24	35	37	1,1	6,2	2,6	A780002
10000	22	[0,866]	35	[1,378]	24	25	33	1,5	7,8	3,3	A780003
12000	22	[0,866]	40	[1,575]	24	21	31	1,8	9,0	3,8	A780004
7200	25	[0,984]	25	[0,984]	29	43	35	1,1	5,6	2,4	A780005
10000	25	[0,984]	30	[1,181]	29	31	33	1,5	7,1	3,0	A780006
12000	25	[0,984]	35	[1,378]	29	26	31	1,8	8,3	3,6	A780007
15000	25	[0,984]	40	[1,575]	29	21	29	2,3	9,9	4,2	A780008
18000	25	[0,984]	45	[1,772]	29	17	27	2,7	11,4	4,9	A780009
22000	25	[0,984]	50	[1,969]	29	14	25	3,3	13,2	5,6	A780010
12000	30	[1,181]	25	[0,984]	47	42	40	1,8	6,4	2,7	A780011
15000	30	[1,181]	30	[1,181]	47	33	29	2,3	7,6	3,3	A780012
22000	30	[1,181]	35	[1,378]	47	23	25	3,3	9,9	4,2	A780013
27000	30	[1,181]	40	[1,575]	62	24	25	4,1	10,1	4,3	A780014
33000	30	[1,181]	45	[1,772]	62	20	22	5	11,7	5,0	A780015
36000	30	[1,181]	50	[1,969]	62	18	22	5,4	12,8	5,4	A780016
18000	35	[1,378]	25	[0,984]	62	37	27	2,7	7,5	3,2	A780017
22000	35	[1,378]	30	[1,181]	62	30	25	3,3	8,9	3,8	A780018
27000	35	[1,378]	35	[1,378]	75	29	22	4,1	9,5	4,0	A780019
36000	35	[1,378]	40	[1,575]	75	22	22	5,4	11,5	4,9	A780020
42000	35	[1,378]	45	[1,772]	84	21	19	6,3	12,4	5,3	A780021
47000	35	[1,378]	50	[1,969]	84	19	20	7,1	13,7	5,8	A780022
<b>Rated voltage 35 V</b>											
2700	22	[0,866]	25	[0,984]	17	67	42	0,6	4,2	1,8	A780023
3300	22	[0,866]	30	[1,181]	22	71	30	0,7	4,4	1,9	A780024
4700	22	[0,866]	35	[1,378]	22	50	47	1	5,6	2,4	A780025
5600	22	[0,866]	40	[1,575]	22	42	22	1,2	6,4	2,7	A780026
3600	25	[0,984]	25	[0,984]	22	65	40	0,8	4,6	1,9	A780027
4700	25	[0,984]	30	[1,181]	22	50	47	1	5,6	2,4	A780028
6800	25	[0,984]	35	[1,378]	22	34	38	1,4	7,2	3,1	A780029
8200	25	[0,984]	40	[1,575]	34	44	25	1,7	6,7	2,9	A780030
10000	25	[0,984]	45	[1,772]	34	36	31	2,1	7,8	3,3	A780031
10000	25	[0,984]	50	[1,969]	34	36	31	2,1	8,2	3,5	A780032
5600	30	[1,181]	25	[0,984]	35	66	45	1,2	5,0	2,1	A780033
8000	30	[1,181]	30	[1,181]	34	45	35	1,7	6,6	2,8	A780034
10000	30	[1,181]	35	[1,378]	34	36	31	2,1	7,8	3,3	A780035
12000	30	[1,181]	40	[1,575]	45	40	24	2,5	7,9	3,4	A780036
15000	30	[1,181]	45	[1,772]	45	32	25	3,2	9,2	3,9	A780037
15000	30	[1,181]	50	[1,969]	45	32	25	3,2	9,7	4,1	A780038
8200	35	[1,378]	25	[0,984]	45	58	34	1,7	5,9	2,5	A780039
11000	35	[1,378]	30	[1,181]	45	43	29	2,3	7,3	3,1	A780040
14000	35	[1,378]	35	[1,378]	45	34	26	2,9	8,8	3,8	A780041
17000	35	[1,378]	40	[1,575]	45	28	23	3,6	10,2	4,4	A780042
21000	35	[1,378]	45	[1,772]	47	24	22	4,4	11,7	5,0	A780043
21000	35	[1,378]	45	[1,772]	65	33	20	4,4	9,9	4,2	A780044
22000	35	[1,378]	50	[1,969]	65	31	20	4,6	10,6	4,5	A780045
<b>Rated voltage 40 V</b>											
3600	22	[0,866]	25	[0,984]	13	38	49	0,9	5,5	2,3	A780046
4700	22	[0,866]	30	[1,181]	17	38	50	1,1	5,9	2,5	A780047
6200	22	[0,866]	35	[1,378]	17	29	38	1,5	7,3	3,1	A780048
8200	22	[0,866]	40	[1,575]	17	22	32	2	8,9	3,8	A780049
4700	25	[0,984]	25	[0,984]	17	38	43	1,1	5,9	2,5	A780050
6800	25	[0,984]	30	[1,181]	19	30	35	1,6	7,3	3,1	A780051
6800	25	[0,984]	30	[1,181]	21	33	35	1,6	6,9	2,9	A780052
8200	25	[0,984]	35	[1,378]	21	27	30	2	8,1	3,5	A780053
10000	25	[0,984]	40	[1,575]	23	24	28	2,4	9,0	3,9	A780054
12000	25	[0,984]	45	[1,772]	23	20	28	2,9	10,4	4,4	A780055
15000	25	[0,984]	50	[1,969]	23	16	23	3,6	12,2	5,2	A780056
8200	30	[1,181]	25	[0,984]	30	39	32	2	6,6	2,8	A780057
10000	30	[1,181]	30	[1,181]	30	32	50	2,4	7,8	3,3	A780058
12000	30	[1,181]	35	[1,378]	31	27	26	2,9	9,0	3,8	A780059
15000	30	[1,181]	40	[1,575]	31	22	24	3,6	10,6	4,5	A780060
20000	30	[1,181]	45	[1,772]	31	16	19	4,8	12,9	5,5	A780061
22000	30	[1,181]	50	[1,969]	31	15	18	5,3	14,1	6,0	A780062
10000	35	[1,378]	25	[0,984]	31	33	28	2,4	7,9	3,4	A780063
15000	35	[1,378]	30	[1,181]	31	22	23	3,6	10,3	4,4	A780064
18000	35	[1,378]	35	[1,378]	37	22	21	4,3	11,0	4,7	A780065
22000	35	[1,378]	40	[1,575]	37	18	20	5,3	12,9	5,5	A780066
27000	35	[1,378]	45	[1,772]	43	17	17	6,5	13,9	5,9	A780067
33000	35	[1,378]	50	[1,969]	43	14	17	7,9	16,0	6,8	A780068

## SNAPSIC HC

8 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Tan $\delta$ 100 Hz +20°C max.	ESR 100 Hz +20°C Typic	Z 10 kHz +20°C Typic	I +20°C 5 min. max.	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)					+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage 50 V</b>											
1800	22	[0,866]	25	[0,866]	11	65	63	0,5	4,2	1,8	A780069
2000	22	[0,866]	25	[0,866]	14	74	58	0,6	4,0	1,7	A780070
2700	22	[0,866]	30	[0,866]	14	55	55	0,8	5,0	2,1	A780071
3600	22	[0,866]	35	[0,866]	14	41	43	1,1	6,1	2,6	A780072
4200	22	[0,866]	40	[0,866]	20	51	35	1,3	5,9	2,5	A780073
2700	25	[0,984]	25	[0,984]	18	71	48	0,8	4,4	1,9	A780074
3600	25	[0,984]	30	[0,984]	18	53	30	1,1	5,4	2,3	A780075
4700	25	[0,984]	35	[0,984]	18	41	36	1,4	6,6	2,8	A780076
5600	25	[0,984]	40	[0,984]	20	38	29	1,7	7,3	3,1	A780077
6800	25	[0,984]	45	[0,984]	20	31	26	2	8,4	3,6	A780078
8200	25	[0,984]	50	[0,984]	20	26	26	2,5	9,7	4,1	A780079
4200	30	[1,181]	25	[1,181]	20	51	35	1,3	5,8	2,5	A780080
5600	30	[1,181]	30	[1,181]	20	38	29	1,7	7,2	3,1	A780081
6800	30	[1,181]	35	[1,181]	20	31	40	2	8,4	3,6	A780082
6800	30	[1,181]	35	[1,181]	26	41	26	2	7,4	3,1	A780083
8200	30	[1,181]	40	[1,181]	26	34	26	2,5	8,6	3,6	A780084
10000	30	[1,181]	45	[1,181]	26	28	23	3	9,9	4,2	A780085
12000	30	[1,181]	50	[1,181]	26	23	17	3,6	11,4	4,9	A780086
5600	35	[1,378]	25	[1,378]	26	49	29	1,7	6,4	2,7	A780087
8200	35	[1,378]	30	[1,378]	26	34	23	2,5	8,3	3,6	A780088
10000	35	[1,378]	35	[1,378]	26	28	20	3	9,8	4,2	A780089
12000	35	[1,378]	40	[1,378]	36	32	17	3,6	9,6	4,1	A780090
15000	35	[1,378]	45	[1,378]	36	25	15	4,5	11,3	4,8	A780091
16000	35	[1,378]	50	[1,378]	46	31	18	4,8	10,8	4,6	A780092
<b>Rated voltage 63 V</b>											
1200	22	[0,866]	25	[0,984]	11	97	52	0,5	3,5	1,5	A780093
1800	22	[0,866]	30	[1,181]	13	77	19	0,7	4,2	1,8	A780094
2200	22	[0,866]	35	[1,378]	13	63	41	0,8	5,0	2,1	A780095
2700	22	[0,866]	40	[1,575]	15	59	55	1	5,4	2,3	A780096
1800	25	[0,984]	25	[0,984]	13	77	40	0,7	4,2	1,8	A780097
2400	25	[0,984]	30	[1,181]	13	57	40	0,9	5,2	2,2	A780098
3100	25	[0,984]	35	[1,378]	13	44	35	1,2	6,3	2,7	A780099
3600	25	[0,984]	40	[1,575]	15	44	45	1,4	6,7	2,9	A780100
4700	25	[0,984]	45	[1,772]	15	34	30	1,8	8,1	3,4	A780101
4700	25	[0,984]	50	[1,969]	15	34	30	1,8	8,5	3,6	A780102
2700	30	[1,181]	25	[0,984]	19	75	30	1	4,8	2,0	A780103
3700	30	[1,181]	30	[1,181]	19	54	33	1,4	6,0	2,5	A780104
4700	30	[1,181]	35	[1,378]	15	34	30	1,8	8,1	3,4	A780105
5600	30	[1,181]	40	[1,575]	29	55	48	2,1	6,7	2,9	A780106
6800	30	[1,181]	45	[1,772]	29	45	26	2,6	7,8	3,3	A780107
8200	30	[1,181]	50	[1,969]	26	34	30	3,1	9,4	4,0	A780108
3700	35	[1,378]	25	[0,984]	26	75	40	1,4	5,2	2,2	A780109
5200	35	[1,378]	30	[1,181]	29	59	29	2	6,3	2,7	A780110
6800	35	[1,378]	35	[1,378]	29	45	22	2,6	7,6	3,3	A780111
8200	35	[1,378]	40	[1,575]	29	38	24	3,1	8,9	3,8	A780112
10000	35	[1,378]	45	[1,772]	26	28	40	3,8	10,9	4,6	A780113
11000	35	[1,378]	50	[1,969]	26	25	22	4,2	11,9	5,1	A780114
<b>Rated voltage 80 V</b>											
1200	22	[0,866]	25	[0,984]	9	80	58	0,6	3,8	1,6	A780115
1500	22	[0,866]	30	[1,181]	9	64	24	0,7	4,6	2,0	A780116
2000	22	[0,866]	35	[1,378]	9	48	43	1	5,7	2,4	A780117
2700	22	[0,866]	40	[1,575]	9	35	60	1,3	7,0	3,0	A780118
1500	25	[0,984]	25	[0,984]	11	78	45	0,7	4,2	1,8	A780119
2200	25	[0,984]	30	[1,181]	12	58	40	1,1	5,2	2,2	A780120
2700	25	[0,984]	35	[1,378]	12	47	35	1,3	6,1	2,6	A780121
3300	25	[0,984]	40	[1,575]	12	39	45	1,6	7,2	3,1	A780122
4200	25	[0,984]	45	[1,772]	12	30	40	2	8,5	3,6	A780123
4200	25	[0,984]	50	[1,969]	12	30	35	2	9,0	3,8	A780124
2200	30	[1,181]	25	[0,984]	12	58	30	1,1	5,4	2,3	A780125
3300	30	[1,181]	30	[1,181]	12	39	30	1,6	7,1	3,0	A780126
4200	30	[1,181]	35	[1,378]	16	40	30	2	7,4	3,1	A780127
5200	30	[1,181]	40	[1,575]	16	33	40	2,5	8,7	3,7	A780128
6200	30	[1,181]	45	[1,772]	16	27	30	3	10,0	4,3	A780129
6800	30	[1,181]	50	[1,969]	16	25	30	3,3	10,9	4,7	A780130
3300	35	[1,378]	25	[0,984]	16	51	25	1,6	6,3	2,7	A780131
4700	35	[1,378]	30	[1,181]	22	50	20	2,3	6,9	2,9	A780132
6000	35	[1,378]	35	[1,378]	22	39	20	2,9	8,2	3,5	A780133
7200	35	[1,378]	40	[1,575]	22	32	30	3,5	9,5	4,1	A780134
9000	35	[1,378]	45	[1,772]	19	22	25	4,3	12,0	5,1	A780135
10000	35	[1,378]	50	[1,969]	19	20	25	4,8	13,3	5,7	A780136



8 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I ~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)					+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage 100 V</b>											
680	22	(0,866)	25	(0,984)	6	94	20	0,4	3,5	1,5	A780137
680	22	(0,866)	25	(0,984)	7	109	20	0,4	3,3	1,4	A780138
900	22	(0,866)	30	(1,181)	7	83	15	0,5	4,0	1,7	A780139
1200	22	(0,866)	35	(1,378)	7	62	140	0,7	5,0	2,1	A780140
1500	22	(0,866)	40	(1,575)	7	50	140	0,9	5,9	2,5	A780141
900	25	(0,984)	25	(0,984)	11	130	95	0,5	3,2	1,4	A780142
1200	25	(0,984)	30	(1,181)	11	97	80	0,7	4,0	1,7	A780143
1700	25	(0,984)	35	(1,378)	11	69	65	1	5,1	2,2	A780144
2100	25	(0,984)	40	(1,575)	11	56	95	1,3	6,0	2,6	A780145
2500	25	(0,984)	45	(1,772)	11	47	80	1,5	6,9	2,9	A780146
2700	25	(0,984)	50	(1,969)	11	43	65	1,6	7,5	3,2	A780147
1500	30	(1,181)	25	(0,984)	13	92	45	0,9	4,3	1,8	A780148
2000	30	(1,181)	30	(1,181)	13	69	40	1,2	5,3	2,3	A780149
2500	30	(1,181)	35	(1,378)	13	55	40	1,5	6,3	2,7	A780150
3100	30	(1,181)	40	(1,575)	13	44	65	1,9	7,4	3,2	A780151
3700	30	(1,181)	45	(1,772)	13	37	45	2,2	8,5	3,6	A780152
4000	30	(1,181)	50	(1,969)	13	34	40	2,4	9,3	4,0	A780153
2000	35	(1,378)	25	(0,984)	13	69	30	1,2	5,4	2,3	A780154
2800	35	(1,378)	30	(1,181)	13	49	25	1,7	6,9	2,9	A780155
3600	35	(1,378)	35	(1,378)	13	38	25	2,2	8,3	3,5	A780156
4700	35	(1,378)	40	(1,575)	13	29	45	2,8	10,0	4,3	A780157
5200	35	(1,378)	45	(1,772)	13	27	40	3,1	11,1	4,7	A780158
5700	35	(1,378)	50	(1,969)	14	26	30	3,4	11,7	5,0	A780159
5700	35	(1,378)	50	(1,969)	14	26	20	3,4	11,7	5,0	A780160
<b>Rated voltage 160 V</b>											
300	22	(0,866)	25	(0,984)	19	672	20	0,3	1,3	0,6	A780161
420	22	(0,866)	30	(1,181)	18	455	20	0,4	1,7	0,7	A780162
540	22	(0,866)	35	(1,378)	18	354	15	0,5	2,1	0,9	A780163
670	22	(0,866)	40	(1,575)	18	285	420	0,6	2,5	1,1	A780164
420	25	(0,984)	25	(0,984)	18	455	290	0,4	1,7	0,7	A780165
570	25	(0,984)	30	(1,181)	18	335	250	0,6	2,2	0,9	A780166
730	25	(0,984)	35	(1,378)	18	262	205	0,7	2,6	1,1	A780167
890	25	(0,984)	40	(1,575)	18	215	325	0,9	3,1	1,3	A780168
1100	25	(0,984)	45	(1,772)	18	174	235	1,1	3,6	1,5	A780169
1200	25	(0,984)	50	(1,969)	18	159	180	1,2	3,9	1,7	A780170
680	30	(1,181)	25	(0,984)	16	250	145	0,7	2,6	1,1	A780171
870	30	(1,181)	30	(1,181)	16	195	115	0,8	3,2	1,3	A780172
1200	30	(1,181)	35	(1,378)	16	141	105	1,2	3,9	1,7	A780173
1500	30	(1,181)	40	(1,575)	18	127	195	1,4	4,4	1,9	A780174
1700	30	(1,181)	45	(1,772)	18	112	150	1,6	4,9	2,1	A780175
1800	30	(1,181)	50	(1,969)	18	106	130	1,7	5,3	2,3	A780176
820	35	(1,378)	25	(0,984)	18	233	85	0,8	3,0	1,3	A780177
1200	35	(1,378)	30	(1,181)	18	159	85	1,2	3,8	1,6	A780178
1500	35	(1,378)	35	(1,378)	18	127	70	1,4	4,6	1,9	A780179
2000	35	(1,378)	40	(1,575)	19	101	160	1,9	5,4	2,3	A780180
2500	35	(1,378)	45	(1,772)	19	81	105	2,4	6,3	2,7	A780181
2700	35	(1,378)	50	(1,969)	19	75	85	2,6	6,9	2,9	A780182
<b>Rated voltage 200 V</b>											
250	22	(0,866)	25	(0,984)	12	509	65	0,3	1,5	0,6	A780183
360	22	(0,866)	30	(1,181)	12	354	55	0,4	2,0	0,8	A780184
460	22	(0,866)	35	(1,378)	12	277	50	0,6	2,4	1,0	A780185
570	22	(0,866)	40	(1,575)	12	223	400	0,7	2,8	1,2	A780186
350	25	(0,984)	25	(0,984)	12	364	265	0,4	1,9	0,8	A780187
470	25	(0,984)	30	(1,181)	12	271	210	0,6	2,4	1,0	A780188
620	25	(0,984)	35	(1,378)	12	205	170	0,7	2,9	1,3	A780189
760	25	(0,984)	40	(1,575)	12	168	275	0,9	3,5	1,5	A780190
920	25	(0,984)	45	(1,772)	12	138	195	1,1	4,0	1,7	A780191
1000	25	(0,984)	50	(1,969)	12	127	155	1,2	4,4	1,9	A780192
540	30	(1,181)	25	(0,984)	12	236	130	0,7	2,7	1,1	A780193
680	30	(1,181)	30	(1,181)	12	187	105	0,8	3,2	1,4	A780194
1000	30	(1,181)	35	(1,378)	13	138	100	1,2	4,0	1,7	A780195
1200	30	(1,181)	40	(1,575)	13	115	180	1,4	4,6	2,0	A780196
1400	30	(1,181)	45	(1,772)	13	99	145	1,7	5,3	2,2	A780197
1500	30	(1,181)	50	(1,969)	13	92	100	1,8	5,7	2,4	A780198
760	35	(1,378)	25	(0,984)	13	181	80	0,9	3,4	1,4	A780199
1000	35	(1,378)	30	(1,181)	13	138	70	1,2	4,1	1,8	A780200
1400	35	(1,378)	35	(1,378)	13	99	65	1,7	5,2	2,2	A780201
1600	35	(1,378)	40	(1,575)	14	93	130	1,9	5,6	2,4	A780202
2000	35	(1,378)	45	(1,772)	14	74	90	2,4	6,6	2,8	A780203
2200	35	(1,378)	50	(1,969)	14	68	70	2,6	7,3	3,1	A780204

## SNAPSIC HC

8 000 h / 85°C

Capacitance ( $\mu$ F)	Dimensions		Tan $\delta$ 100 Hz +20°C max.	ESR 100 Hz +20°C Typic	Z 10 kHz +20°C Typic	I +20°C 5 min. max.	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)					+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage 250 V</b>											
190	22	[0,866]	25	[0,984]	10	558	359	0,3	1,4	0,6	A780205
270	22	[0,866]	30	[1,181]	10	393	249	0,4	1,9	0,8	A780206
330	22	[0,866]	35	[1,378]	10	322	202	0,5	2,2	0,9	A780207
420	22	[0,866]	40	[1,575]	10	253	157	0,6	2,6	1,1	A780208
250	25	[0,984]	25	[0,984]	10	424	270	0,4	1,8	0,8	A780209
370	25	[0,984]	30	[1,181]	10	287	179	0,6	2,3	1,0	A780210
470	25	[0,984]	35	[1,378]	10	226	140	0,7	2,8	1,2	A780211
560	25	[0,984]	40	[1,575]	10	189	116	0,8	3,2	1,4	A780212
680	25	[0,984]	45	[1,772]	10	156	95	1	3,8	1,6	A780213
740	25	[0,984]	50	[1,969]	10	143	87	1,1	4,1	1,8	A780214
400	30	[1,181]	25	[0,984]	10	265	165	0,6	2,5	1,1	A780215
520	30	[1,181]	30	[1,181]	10	204	126	0,8	3,1	1,3	A780216
720	30	[1,181]	35	[1,378]	10	147	89	1,1	3,9	1,6	A780217
820	30	[1,181]	40	[1,575]	10	129	78	1,2	4,4	1,9	A780218
1100	30	[1,181]	45	[1,772]	10	96	57	1,7	5,3	2,3	A780219
1200	30	[1,181]	50	[1,969]	10	88	52	1,8	5,8	2,5	A780220
560	35	[1,378]	25	[0,984]	10	189	116	0,8	3,3	1,4	A780221
770	35	[1,378]	30	[1,181]	10	138	83	1,2	4,1	1,8	A780222
1100	35	[1,378]	35	[1,378]	10	96	57	1,7	5,2	2,2	A780223
1200	35	[1,378]	40	[1,575]	10	60	52	1,8	7,0	3,0	A780224
1500	35	[1,378]	45	[1,772]	10	71	42	2,3	6,8	2,9	A780225
1700	35	[1,378]	50	[1,969]	10	40	60	2,6	8,4	3,6	A780226
<b>Rated voltage 300 V</b>											
150	22	[0,866]	25	[0,984]	10	707	491	0,3	1,3	0,5	A780227
220	22	[0,866]	30	[1,181]	10	482	335	0,4	1,7	0,7	A780228
270	22	[0,866]	35	[1,378]	10	393	273	0,5	2,0	0,8	A780229
330	22	[0,866]	40	[1,575]	10	322	223	0,6	2,3	1,0	A780230
180	25	[0,984]	25	[0,984]	10	589	409	0,3	1,5	0,6	A780231
270	25	[0,984]	30	[1,181]	10	393	273	0,5	2,0	0,9	A780232
360	25	[0,984]	35	[1,378]	10	295	205	0,7	2,5	1,0	A780233
470	25	[0,984]	40	[1,575]	10	226	157	0,9	3,0	1,3	A780234
560	25	[0,984]	45	[1,772]	10	189	132	1	3,4	1,5	A780235
630	25	[0,984]	50	[1,969]	10	168	117	1,1	3,8	1,6	A780236
330	30	[1,181]	25	[0,984]	10	322	223	0,6	2,3	1,0	A780237
470	30	[1,181]	30	[1,181]	10	226	157	0,9	2,9	1,3	A780238
560	30	[1,181]	35	[1,378]	10	189	132	1	3,4	1,5	A780239
680	30	[1,181]	40	[1,575]	10	156	108	1,2	4,0	1,7	A780240
820	30	[1,181]	45	[1,772]	10	129	90	1,5	4,6	2,0	A780241
900	30	[1,181]	50	[1,969]	10	118	82	1,6	5,0	2,1	A780242
470	35	[1,378]	25	[0,984]	10	226	157	0,9	3,0	1,3	A780243
620	35	[1,378]	30	[1,181]	10	171	119	1,1	3,7	1,6	A780244
820	35	[1,378]	35	[1,378]	10	129	90	1,5	4,5	1,9	A780245
1000	35	[1,378]	40	[1,575]	10	106	74	1,8	5,3	2,2	A780246
1200	35	[1,378]	45	[1,772]	10	88	61	2,2	6,1	2,6	A780247
1300	35	[1,378]	50	[1,969]	10	82	57	2,3	6,6	2,8	A780248
<b>Rated voltage 350 V</b>											
120	22	[0,866]	25	[0,984]	8	707	438	0,3	1,3	0,5	A780249
150	22	[0,866]	30	[1,181]	8	566	357	0,3	1,5	0,7	A780250
220	22	[0,866]	35	[1,378]	8	386	252	0,5	2,0	0,9	A780251
270	22	[0,866]	40	[1,575]	8	314	520	0,6	2,3	1,0	A780252
150	25	[0,984]	25	[0,984]	8	566	357	0,3	1,5	0,7	A780253
220	25	[0,984]	30	[1,181]	8	386	252	0,5	2,0	0,9	A780254
290	25	[0,984]	35	[1,378]	8	293	196	0,6	2,5	1,1	A780255
350	25	[0,984]	40	[1,575]	8	243	400	0,7	2,9	1,2	A780256
420	25	[0,984]	45	[1,772]	8	202	230	0,9	3,3	1,4	A780257
470	25	[0,984]	50	[1,969]	8	181	126	1	3,7	1,6	A780258
230	30	[1,181]	25	[0,984]	8	369	242	0,5	2,1	0,9	A780259
330	30	[1,181]	30	[1,181]	8	257	174	0,7	2,7	1,2	A780260
470	30	[1,181]	35	[1,378]	8	181	126	1	3,5	1,5	A780261
560	30	[1,181]	40	[1,575]	8	152	108	1,2	4,0	1,7	A780262
640	30	[1,181]	45	[1,772]	8	133	170	1,3	4,5	1,9	A780263
680	30	[1,181]	50	[1,969]	8	125	100	1,4	4,9	2,1	A780264
330	35	[1,378]	25	[0,984]	8	257	174	0,7	2,8	1,2	A780265
470	35	[1,378]	30	[1,181]	8	181	126	1	3,6	1,5	A780266
680	35	[1,378]	35	[1,378]	9	140	90	1,4	4,3	1,9	A780267
680	35	[1,378]	40	[1,575]	9	140	90	1,4	4,6	2,0	A780268
820	35	[1,378]	45	[1,772]	9	116	76	1,7	5,3	2,3	A780269
1000	35	[1,378]	50	[1,969]	10	106	120	2,1	5,8	2,5	A780270

8 000 h / 85°C

Capacitance [ $\mu$ F]	Dimensions		Tan $\delta$ 100 Hz +20°C max. [%]	ESR 100 Hz +20°C Typic [m $\Omega$ ]	Z 10 kHz +20°C Typic [m $\Omega$ ]	I +20°C 5 min. max. [mA]	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm [inches]	H mm [inches]					+40°C max. [A]	+85°C max. [A]			
<b>Rated voltage 400 V</b>											
100	22	(0,866)	25	(0,984)	8	849	689	0,2	1,2	0,5	A780271
150	22	(0,866)	30	(1,181)	9	637	473	0,4	1,5	0,6	A780272
200	22	(0,866)	35	(1,378)	9	477	60	0,5	1,8	0,8	A780273
220	22	(0,866)	40	(1,575)	9	434	850	0,5	2,0	0,9	A780274
150	25	(0,984)	25	(0,984)	9	637	650	0,4	1,5	0,6	A780275
200	25	(0,984)	30	(1,181)	9	477	362	0,5	1,8	0,8	A780276
270	25	(0,984)	35	(1,378)	9	354	274	0,7	2,2	1,0	A780277
330	25	(0,984)	40	(1,575)	10	322	227	0,8	2,5	1,1	A780278
400	25	(0,984)	45	(1,772)	10	265	190	1	2,9	1,2	A780279
440	25	(0,984)	50	(1,969)	10	241	174	1,1	3,2	1,4	A780280
220	30	(1,181)	25	(0,984)	10	482	400	0,5	1,9	0,8	A780281
330	30	(1,181)	30	(1,181)	10	322	227	0,8	2,5	1,0	A780282
410	30	(1,181)	35	(1,378)	10	259	186	1	2,9	1,2	A780283
500	30	(1,181)	40	(1,575)	10	212	520	1,2	3,4	1,5	A780284
620	30	(1,181)	45	(1,772)	10	171	360	1,5	4,0	1,7	A780285
680	30	(1,181)	50	(1,969)	10	156	116	1,6	4,4	1,9	A780286
330	35	(1,378)	25	(0,984)	10	322	230	0,8	2,5	1,1	A780287
440	35	(1,378)	30	(1,181)	10	241	174	1,1	3,1	1,3	A780288
580	35	(1,378)	35	(1,378)	10	183	135	1,4	3,8	1,6	A780289
680	35	(1,378)	40	(1,575)	10	156	116	1,6	4,3	1,9	A780290
820	35	(1,378)	45	(1,772)	10	129	98	2	5,0	2,1	A780291
1000	35	(1,378)	50	(1,969)	12	127	81	2,4	5,3	2,3	A780292
<b>Rated voltage 450 V</b>											
47	22	(0,866)	25	(0,984)	8	1806	150	0,1	0,8	0,3	A780293
66	22	(0,866)	25	(0,984)	8	1286	130	0,2	0,9	0,4	A780294
100	22	(0,866)	25	(0,984)	10	1061	110	0,3	1,0	0,4	A780295
120	22	(0,866)	30	(1,181)	10	884	1600	0,3	1,2	0,5	A780296
150	22	(0,866)	35	(1,378)	10	707	1300	0,4	1,5	0,6	A780297
220	22	(0,866)	40	(1,575)	14	675	1100	0,6	1,6	0,7	A780298
120	25	(0,984)	25	(0,984)	14	1238	668	0,3	1,0	0,4	A780299
160	25	(0,984)	30	(1,181)	11	729	519	0,4	1,5	0,6	A780300
220	25	(0,984)	35	(1,378)	11	531	700	0,6	1,8	0,8	A780301
270	25	(0,984)	40	(1,575)	11	432	329	0,7	2,1	0,9	A780302
330	25	(0,984)	45	(1,772)	11	354	950	0,9	2,5	1,1	A780303
330	25	(0,984)	50	(1,969)	11	354	276	0,9	2,6	1,1	A780304
180	30	(1,181)	25	(0,984)	11	648	468	0,5	1,6	0,7	A780305
270	30	(1,181)	30	(1,181)	11	432	329	0,7	2,1	0,9	A780306
330	30	(1,181)	35	(1,378)	15	482	276	0,9	2,1	0,9	A780307
420	30	(1,181)	40	(1,575)	12	303	223	1,1	2,8	1,2	A780308
470	30	(1,181)	45	(1,772)	12	271	202	1,3	3,2	1,4	A780309
560	30	(1,181)	50	(1,969)	12	227	520	1,5	3,6	1,5	A780310
250	35	(1,378)	25	(0,984)	12	509	280	0,7	2,0	0,9	A780311
330	35	(1,378)	30	(1,181)	12	386	276	0,9	2,5	1,1	A780312
470	35	(1,378)	35	(1,378)	12	271	202	1,3	3,1	1,3	A780313
560	35	(1,378)	40	(1,575)	12	227	174	1,5	3,6	1,5	A780314
680	35	(1,378)	45	(1,772)	12	187	146	1,8	4,2	1,8	A780315
760	35	(1,378)	50	(1,969)	12	168	280	2,1	4,6	2,0	A780316

# SNAPSIC HC

8 000 h / 85°C

## EXPECTED LIFE

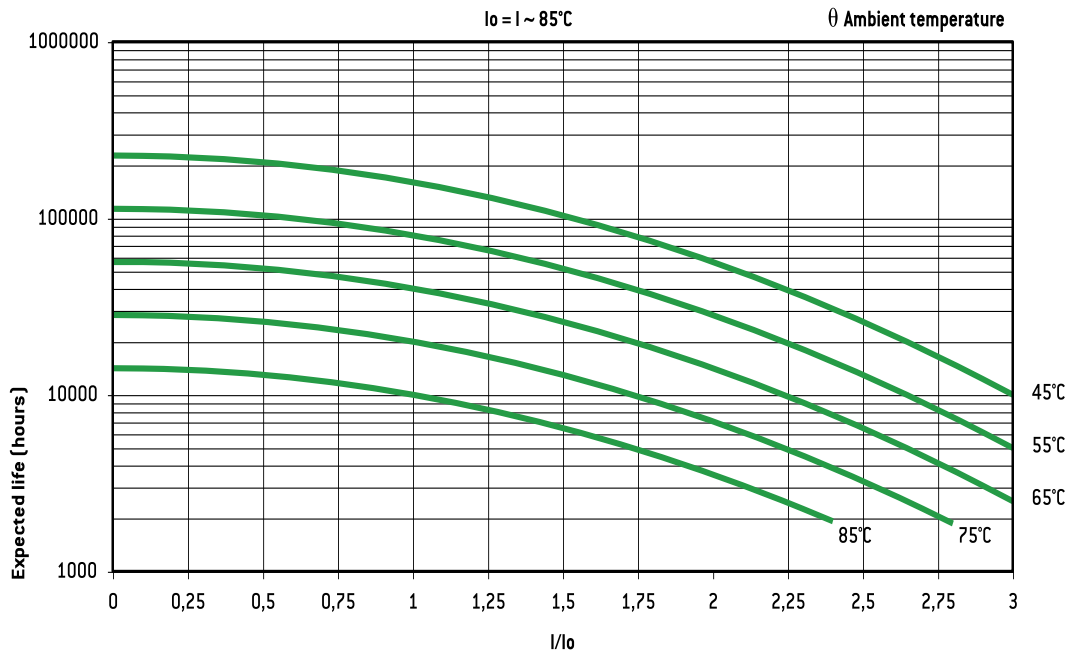
as a function of temperature and ripple current:

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I ~: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~



8 000 h / 105°C

160 V ... 500 V	47 $\mu$ F ... 2200 $\mu$ F	$\emptyset$ 22 (0,866) ... $\emptyset$ 35 (1,378)	- 55°C + 105°C	Long Life Time
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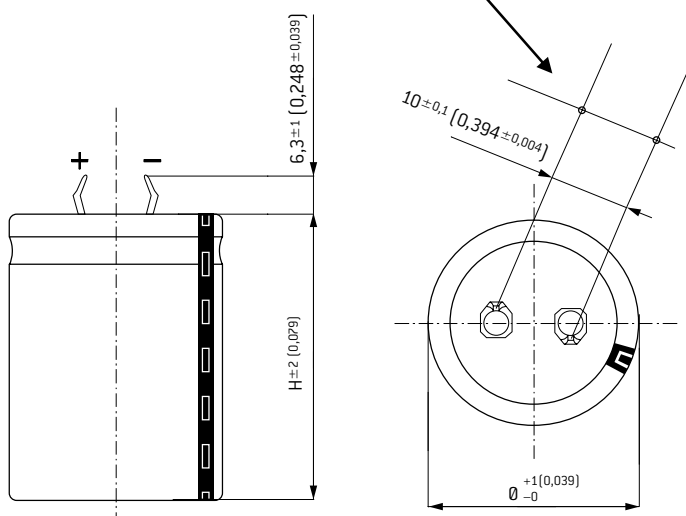


## APPLICATIONS

- For solid PC board mounting
- Switch mode power supplies
- Impulse current

Fixing: Printed SNAP-IN pins

Tolerance on capacitance at 20°C :  $\pm 20\%$   
 Operating temperature : - 55°C + 105°C

 $\emptyset$  PC board holes:  $2 \pm 0,1$  (0,079  $\pm$  0,004)

Dimensions in mm (inches)

Standard pins can be replaced by 4,5 (0,177) max pins on request

## SPECIFICATIONS

CECC 30300 - Long life  
 DIN 41 240 - Climatic category - 55°C + 105°C / 56 days  
 IEC 60 384.4 Long life  
 Standard endurance test at  $U_R$ : 2000 h / 105°C

## DIMENSIONS in mm (inches)

Can size	$\emptyset$	H
1	22 (0,866)	25 (0,984)
2	22 (0,866)	30 (1,181)
3	22 (0,866)	40 (1,575)
4*	25 (0,984)	25 (0,984)
5	25 (0,984)	30 (1,181)
6	25 (0,984)	40 (1,575)
7	25 (0,984)	50 (1,969)
8*	30 (1,181)	25 (0,984)
9	30 (1,181)	30 (1,181)
10	30 (1,181)	35 (1,378)
11	30 (1,181)	40 (1,575)
12*	30 (1,181)	45 (1,772)
13*	30 (1,181)	50 (1,969)
14	35 (1,378)	30 (1,181)
15	35 (1,378)	35 (1,378)
16	35 (1,378)	40 (1,575)
17*	35 (1,378)	45 (1,772)
18	35 (1,378)	50 (1,969)

\* Out of range

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 500 Hz
Amplitude	0,75 (0,030)
Acceleration	10 g - 98 m/s <sup>2</sup>
t (h)	3 x 10 sweep cycles

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware: 100 M $\Omega$   
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
 Fire resistance: self extinguish 30 s (IEC 60 695-2-2) without PVC

## SNAPSIC HV

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I~ 100 Hz		Code		
	$\emptyset$ mm (inches)	H mm (inches)						+40°C max. (A)	+105°C max. (A)			
<b>Rated voltage / Peak voltage: 160/185 V</b>												
220	22	(0,866)	25	(0,984)	1	10	500	300	0,21	3	0,8	A 716020
330	22	(0,866)	30	(1,181)	2	10	300	200	0,32	4,2	1,1	A 716021
470	25	(0,984)	30	(1,181)	5	10	200	130	0,45	5,5	1,5	A 716024
680	25	(0,984)	40	(1,575)	6	10	150	110	0,66	7,1	1,9	A 716025
1000	30	(1,181)	35	(1,378)	10	10	100	70	0,96	9,2	2,5	A 716027
1500	35	(1,378)	40	(1,575)	16	12	80	60	1,4	12	3,2	A 716031
2200	35	(1,378)	50	(1,969)	18	13	60	40	2,1	15	4	A 716032
<b>Rated voltage / Peak voltage: 200/230 V</b>												
150	22	(0,866)	25	(0,984)	1	9	600	350	0,18	2,7	0,7	A 716040
220	22	(0,866)	30	(1,181)	2	9	400	250	0,26	3,6	1	A 716041
330	25	(0,984)	30	(1,181)	5	7	200	130	0,39	5,5	1,5	A 716044
470	25	(0,984)	40	(1,575)	6	7	140	80	0,56	7,4	2	A 716045
560	30	(1,181)	30	(1,181)	9	8	150	100	0,67	7,1	1,9	A 716046
680	35	(1,378)	30	(1,181)	14	10	150	100	0,81	7,7	2,1	A 716049
1000	35	(1,378)	35	(1,378)	15	12	120	70	1,2	9,2	2,5	A 716050
1500	35	(1,378)	40	(1,575)	16	10	70	50	1,8	12	3,4	A 716051
2200	35	(1,378)	50	(1,969)	18	12	55	40	2,6	15	4,2	A 716052
<b>Rated voltage / Peak voltage: 250/290 V</b>												
150	22	(0,866)	25	(0,984)	1	8	600	330	0,22	2,7	0,7	A 716060
220	22	(0,866)	30	(1,181)	2	8	400	220	0,33	3,6	1	A 716061
330	25	(0,984)	30	(1,181)	5	8	180	110	0,5	5,8	1,5	A 716064
470	30	(1,181)	30	(1,181)	9	8	150	120	0,7	7,1	1,9	A 716066
680	30	(1,181)	40	(1,575)	11	8	130	95	1	8,5	2,3	A 716068
1000	35	(1,378)	40	(1,575)	16	9	90	60	1,5	12	3	A 716071
1500	35	(1,378)	50	(1,969)	18	10	70	45	2,3	14	3,7	A 716072
<b>Rated voltage / Peak voltage: 400/450 V</b>												
68	22	(0,866)	30	(1,181)	2	6	600	320	0,65	2,9	0,8	A 716101
100	22	(0,866)	30	(1,181)	2	6	500	250	0,8	3,2	0,9	A 716102
150	22	(0,866)	40	(1,575)	3	6	400	210	1	4,1	1,1	A 716103
220	25	(0,984)	40	(1,575)	6	6	340	190	1,2	4,7	1,3	A 716105
220	30	(1,181)	35	(1,378)	10	8	400	280	1,2	3,8	1	A 716106
330	25	(0,984)	50	(1,969)	7	6	200	100	1,5	6,8	1,8	A 716107
330	30	(1,181)	40	(1,575)	11	6	220	120	1,5	6,6	1,7	A 716108
470	35	(1,378)	40	(1,575)	16	6	150	100	1,8	8,7	2,3	A 716111
560	35	(1,378)	50	(1,969)	18	6	120	90	1,9	11	2,8	A 716112
<b>Rated voltage / Peak voltage: 450/500 V</b>												
47	22	(0,866)	30	(1,181)	2	6	800	410	0,6	2,5	0,7	A 716121
68	22	(0,866)	30	(1,181)	2	6	600	320	0,7	2,9	0,8	A 716122
100	22	(0,866)	40	(1,575)	3	6	500	260	0,8	3,3	1	A 716123
150	25	(0,984)	40	(1,575)	6	6	380	230	1	4,5	1,2	A 716125
220	30	(1,181)	40	(1,575)	11	6	280	170	1,25	5,8	1,5	A 716128
220	35	(1,378)	30	(1,181)	14	6	300	190	1,25	5,5	1,5	A 716129
330	35	(1,378)	40	(1,575)	16	6	200	130	1,5	7,5	2	A 716131
470	35	(1,378)	50	(1,969)	18	6	150	120	1,8	8,9	2,5	A 716132
<b>Rated voltage / Peak voltage: 500/550 V</b>												
47	22	(0,866)	30	(1,181)	2	6	1200	750	0,62	2,1	0,6	A 716141
100	25	(0,984)	40	(1,575)	6	6	650	440	0,9	3,4	0,9	A 716145
150	25	(0,984)	50	(1,969)	7	6	290	190	1,1	5,7	1,5	A 716147
150	30	(1,181)	40	(1,575)	11	6	320	210	1,1	5,4	1,4	A 716148
180	35	(1,378)	30	(1,181)	14	6	300	250	1,2	5,5	1,5	A 716149
220	35	(1,378)	40	(1,575)	16	6	260	170	1,35	6,6	1,8	A 716151
330	35	(1,378)	50	(1,969)	18	8	200	160	1,6	8	2,2	A 716153

8 000 h / 105°C

## EXPECTED LIFE

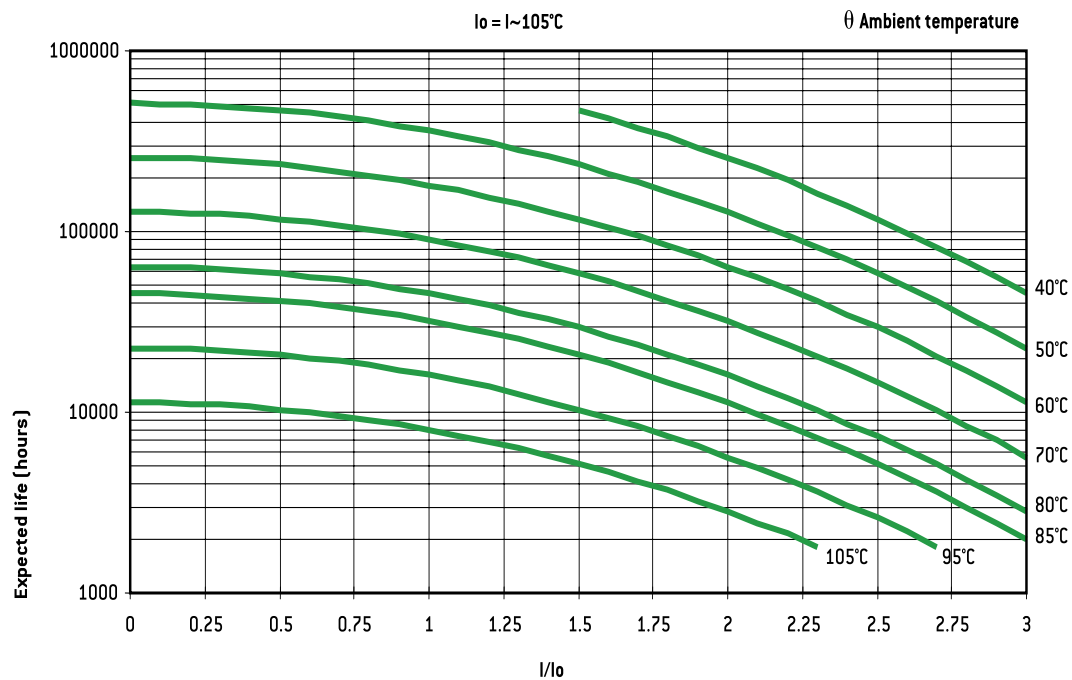
as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I<sub>~</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I <sub>~</sub>	I <sub>~</sub>	1,2 x I <sub>~</sub>	1,3 x I <sub>~</sub>	1,35 x I <sub>~</sub>	1,5 x I <sub>~</sub>	1,6 x I <sub>~</sub>





# SNAPSIC 4P

10 000 h / 85°C

16 V ... 500 V	330 µF ... 150 000 µF	Ø 35 (1,378) ... Ø 45 (1,772)	- 55°C + 85°C	Long Life Time
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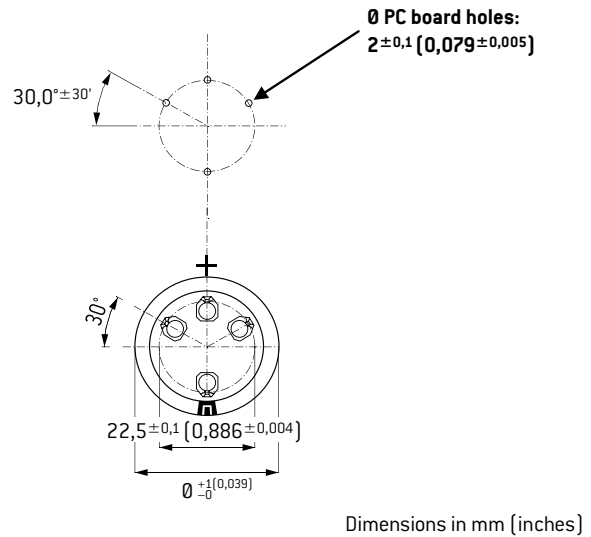
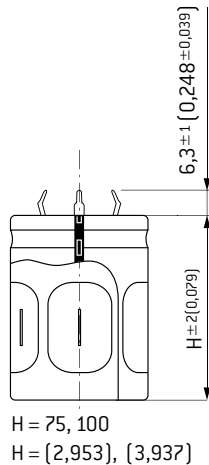
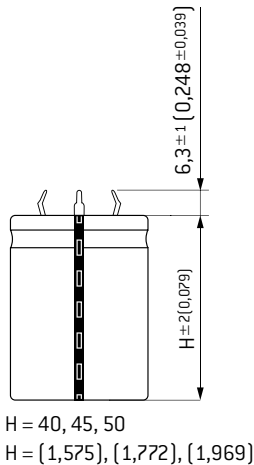
## APPLICATIONS

- Printed circuit mounting
- Switch mode power supplies
- Impulse current

Fixing: SNAP-IN pins

Tolerance on capacitance at 20°C : ± 20 %  
 Operating temperature : - 55°C +85°C

## 4 SNAP-IN terminals



Dummy pins near positive terminal are for mechanical support only. They must be electrically insulated from the positive and the negative terminals.

Can size	Ø mm (inches)		Hb mm (inches)	
1	35	{1,378}	50	{1,969}
2	35	{1,378}	75	{2,953}
3	35	{1,378}	100	{3,937}
4	40	{1,575}	40	{1,575}
5	40	{1,575}	50	{1,969}
6	40	{1,575}	75	{2,953}
7	40	{1,575}	100	{3,937}
8	45	{1,772}	45	{1,772}
9	45	{1,772}	50	{1,969}
10	45	{1,772}	75	{2,953}
11	45	{1,772}	100	{3,937}

## RESISTANCE TO VIBRATIONS

Hb mm (inches)	H = 40 (1,575), 45 (1,772), 50 (1,969)	H = 75 (2,953), 100* (3,937)
f (Hz)	10 - 500 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

\* and on request for: H = 40 {1,575}, 45 {1,772}, 50 {1,969}

## SPECIFICATIONS

CECC 30 300 Long life  
 DIN 41 240 - Climatic category PFP - 55°C + 85°C / 56 days  
 IEC 60 384.4 long life

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware:  
 100 MΩ  
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
 Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

## SNAPSIIC 4P

10 000 h / 85°C

Capacitance [μF]	Dimensions		Can size	Tan δ 100 Hz +20°C max. [%]	ESR 100 Hz +20°C Typic [mΩ]	Z 10 kHz +20°C Typic [mΩ]	II +20°C 5 min. max. [mA]	I ~ 100 Hz		Code		
	Ø mm [inches]	H mm [inches]						+40°C max. [A]	+85°C max. [A]			
<b>Rated voltage / Peak voltage: 16/18 V</b>												
47000	35	(1,378)	50	(1,969)	1	55	15	15	4.5	20	8.0	A 714020
47000	40	(1,575)	40	(1,575)	4	55	15	15	4.5	20	7.9	A 714030
68000	35	(1,378)	50	(1,969)	1	67	12	10	6.5	20	9.0	A 714021
100000	35	(1,378)	75	(2,953)	2	82	10	8	9.6	20	12.0	A 714023
100000	45	(1,772)	45	(1,772)	8	82	10	8	9.6	20	11.0	A 714035
150000	40	(1,575)	100	(3,937)	7	122	10	8	14.0	20	14.0	A 714034
<b>Rated voltage / Peak voltage: 25/30 V</b>												
33000	35	(1,378)	50	(1,969)	1	70	20	18	5.0	20	7.0	A 714040
33000	40	(1,575)	40	(1,575)	4	100	38	20	5.0	15	5.0	A 714050
47000	35	(1,378)	75	(2,953)	2	62	15	13	7.1	20	9.6	A 714043
47000	40	(1,575)	50	(1,969)	5	62	15	13	7.1	20	8.7	A 714051
68000	40	(1,575)	75	(2,953)	6	67	12	10	10.0	20	13.0	A 714053
100000	40	(1,575)	100	(3,937)	7	82	10	8	15.0	20	16.0	A 714054
<b>Rated voltage / Peak voltage: 40/48 V</b>												
22000	35	(1,378)	50	(1,969)	1	43	24	17	5,2	19	6,4	A 714060
22000	40	(1,575)	40	(1,575)	4	65	36	24	5,2	15	5,1	A 714070
33000	35	(1,378)	75	(2,953)	2	47	15	13	7,9	20	9,6	A 714063
33000	45	(1,772)	45	(1,772)	8	47	15	13	7,9	20	8,9	A 714075
47000	35	(1,378)	100	(3,937)	3	53	12	10	11,0	20	12,0	A 714064
47000	40	(1,575)	75	(2,953)	6	53	12	9	11,0	20	12,0	A 714073
<b>Rated voltage / Peak voltage: 50/58 V</b>												
15000	35	(1,378)	50	(1,969)	1	38	26	18	4,5	18	6,1	A 714080
15000	40	(1,575)	40	(1,575)	4	38	26	18	4,5	18	6,0	A 714090
22000	35	(1,378)	75	(2,953)	2	40	22	16	6,6	20	7,9	A 714083
22000	40	(1,575)	50	(1,969)	5	48	35	17	6,6	17	5,7	A 714091
33000	40	(1,575)	75	(2,953)	6	48	18	14	9,9	20	9,5	A 714093
47000	40	(1,575)	100	(3,937)	7	57	15	11	14,0	20	12,0	A 714094
<b>Rated voltage / Peak voltage: 63/76 V</b>												
10000	35	(1,378)	50	(1,969)	1	25	25	20	3,0	19	6,2	A 714100
10000	40	(1,575)	40	(1,575)	4	30	35	22	3,0	16	5,2	A 714110
15000	35	(1,378)	75	(2,953)	2	28	22	18	5,7	20	7,9	A 714103
15000	45	(1,772)	45	(1,772)	8	28	22	18	5,7	20	7,4	A 714115
22000	35	(1,378)	100	(3,937)	3	32	18	15	8,3	20	10,0	A 714104
22000	40	(1,575)	75	(2,953)	6	32	18	13	8,3	20	10,0	A 714113
33000	45	(1,772)	75	(2,953)	10	43	16	11	11,0	20	11,0	A 714117
47000	45	(1,772)	100	(3,937)	11	50	13	9	13,0	20	13,0	A 714118
<b>Rated voltage / Peak voltage: 80/92 V</b>												
6800	35	(1,378)	50	(1,969)	1	16	25	20	3,2	19	6,2	A 714120
6800	40	(1,575)	40	(1,575)	4	22	35	25	3,2	16	5,2	A 714130
8200	35	(1,378)	50	(1,969)	1	19	25	18	4,0	19	6,2	A 714121
10000	35	(1,378)	75	(2,953)	2	21	25	21	4,8	20	7,4	A 714123
10000	45	(1,772)	45	(1,772)	8	21	25	21	4,8	20	6,9	A 714135
15000	35	(1,378)	100	(3,937)	3	24	20	16	7,2	20	9,5	A 714124
15000	40	(1,575)	75	(2,953)	6	24	20	13	7,2	20	9,5	A 714133
<b>Rated voltage 100/115 V</b>												
4700	35	(1,378)	50	(1,969)	1	11	28	20	2,8	18	5,9	A 714140
4700	40	(1,575)	40	(1,575)	4	15	38	25	2,8	15	5,0	A 714150
6800	35	(1,378)	75	(2,953)	2	19	35	23	4,0	19	6,3	A 714143
6800	45	(1,772)	45	(1,772)	8	19	35	23	4,0	18	5,8	A 714155
10000	35	(1,378)	100	(3,937)	3	24	30	21	6,0	20	7,7	A 714144
10000	40	(1,575)	75	(2,953)	6	24	30	20	6,0	20	7,7	A 714153
<b>Rated voltage / Peak voltage: 160/185 V</b>												
2200	35	(1,378)	50	(1,969)	1	15	60	40	2,1	13	4,2	A 714160
2200	40	(1,575)	40	(1,575)	4	15	60	40	2,1	12	4,0	A 714170
3300	35	(1,378)	75	(2,953)	2	10	40	30	3,2	18	5,9	A 714163
3300	45	(1,772)	45	(1,772)	8	10	40	30	3,2	16	5,5	A 714175
4700	40	(1,575)	75	(2,953)	6	13	35	27	4,5	20	6,8	A 714173
<b>Rated voltage / Peak voltage: 200/230 V</b>												
1500	35	(1,378)	50	(1,969)	1	11	80	55	1,8	10,0	3,5	A 714180
2200	35	(1,378)	50	(1,969)	1	11	55	40	2,6	13,0	4,2	A 714181
3300	35	(1,378)	75	(2,953)	2	16	60	40	4,0	14,0	4,8	A 714185
3300	45	(1,772)	45	(1,772)	8	16	60	40	4,0	13,0	4,5	A 714196
4700	40	(1,575)	75	(2,953)	6	20	50	30	5,6	17,0	5,7	A 714192
6800	45	(1,772)	100	(3,937)	11	21	30	20	8,2	20	8,9	A 714198

## SNAPSIC 4P

10 000 h / 85°C

Capacitance [μF]	Dimensions		Can size	Tanδ 100 Hz +20°C max. [%]	ESR 100 Hz +20°C Typic [mΩ]	Z 10 kHz +20°C Typic [mΩ]	II +20°C 5 min. max. [mA]	I~ 100 Hz		Code		
	Ø mm [inches]	H mm [inches]						+40°C max. [A]	+85°C max. [A]			
<b>Rated voltage / Peak voltage: 250/290 V</b>												
1500	35	(1,378)	50	(1,969)	1	10	70	50	2.3	11	3,7	A 714201
1500	40	(1,575)	40	(1,575)	4	12	90	60	2.3	9.7	3.2	A 714209
2200	35	(1,378)	75	(2,953)	2	12	65	45	3.3	14.0	4.6	A 714205
2200	40	(1,575)	50	(1,969)	5	12	65	45	3.3	13.0	4.2	A 714211
3300	40	(1,575)	75	(2,953)	6	12	45	30	5.0	18.0	6.0	A 714212
4700	45	(1,772)	75	(2,953)	10	13	35	25	7.0	20.0	7.2	A 714216
<b>Rated voltage / Peak voltage: 350/385 V</b>												
1000	35	(1,378)	50	(1,969)	1	10	80	60	2.1	10,0	3,5	A 714221
1500	35	(1,378)	75	(2,953)	2	12	70	40	3.2	13.0	4.4	A 714222
1500	45	(1,772)	50	(1,969)	9	12	90	60	3,2	11	3,8	A 714236
2200	45	(1,772)	75	(2,953)	10	12	54	33	4.6	17,0	5,8	A 714237
3300	45	(1,772)	100	(3,937)	11	14	45	30	6,9	20	8,0	A 714238
<b>Rated voltage 385/425 V</b>												
560	40	(1,575)	40	(1,575)	4	10	160	100	1.3	7,3	2,4	A 714250
680	35	(1,378)	50	(1,969)	1	10	180	140	1.6	7,0	2,3	A 714241
1000	35	(1,378)	75	(2,953)	2	10	110	80	2.3	11,0	3,5	A 714242
1000	45	(1,772)	45	(1,772)	8	10	110	80	2.3	11,0	3,7	A 714255
1500	40	(1,575)	75	(2,953)	6	10	80	60	3.5	13,0	4,5	A 714252
2200	45	(1,772)	100	(3,937)	11	13	70	50	5.1	17,0	5,8	A 714258
<b>Rated voltage / Peak voltage: 400/450 V</b>												
560	35	(1,378)	50	(1,969)	1	12	220	160	1.9	6,3	2,1	A 714260
680	35	(1,378)	50	(1,969)	1	12	210	150	2.1	6,4	2,1	A 714261
1000	35	(1,378)	75	(2,953)	2	12	120	80	2.5	10,0	3,4	A 714262
1000	45	(1,772)	45	(1,772)	8	12	130	90	2.5	9,1	3,0	A 714275
1200	45	(1,772)	50	(1,969)	9	12	120	80	2,8	10	3,3	A 714276
1500	40	(1,575)	75	(2,953)	6	12	100	70	3.1	12,0	4,0	A 714272
2200	40	(1,575)	100	(3,937)	7	16	90	70	3,8	11	4,8	A 714277
2200	45	(1,772)	100	(3,937)	11	14	80	50	3,8	16,0	5,4	A 714278
<b>Rated voltage / Peak voltage: 450/500 V</b>												
470	35	(1,378)	50	(1,969)	1	13	250	170	2.8	5,9	2,0	A 714280
470	40	(1,575)	40	(1,575)	4	13	250	170	2.8	5,8	1,9	A 714290
560	35	(1,378)	50	(1,969)	1	13	180	120	3.0	7,0	2,3	A 714281
680	35	(1,378)	75	(2,953)	2	13	140	100	3.3	9,4	3,1	A 714283
680	45	(1,772)	45	(1,772)	8	13	150	110	3.3	8,8	2,9	A 714295
820	35	(1,378)	75	(2,953)	2	13	140	90	3.6	9,4	3,1	A 714285
820	45	(1,772)	45	(1,772)	8	13	140	90	3.6	8,8	2,9	A 714296
1000	35	(1,378)	100	(3,937)	3	13	120	90	4.1	12,0	3,9	A 714284
1000	40	(1,575)	75	(2,953)	6	13	120	90	4.1	11,0	3,7	A 714293
1000	45	(1,772)	50	(1,969)	9	13	130	80	4,1	9,5	3,2	A 714299
1500	45	(1,772)	75	(2,953)	10	14	110	80	4,9	12,0	4,1	A 714297
2200	45	(1,772)	100	(3,937)	11	16	90	60	6,0	15,0	5,1	A 714298
<b>Rated voltage / Peak voltage: 500/550 V</b>												
330	35	(1,378)	50	(1,969)	1	13	360	270	2.4	4,9	1,6	A 714301
470	35	(1,378)	75	(2,953)	2	13	320	230	2.9	6,2	2,1	A 714303
470	45	(1,772)	45	(1,772)	8	13	360	260	2.9	5,5	1,8	A 714315
680	40	(1,575)	75	(2,953)	6	13	240	170	3.5	7,8	2,6	A 714313
1000	45	(1,772)	75	(2,953)	10	14	160	120	4.2	10,0	3,4	A 714317
1500	45	(1,772)	100	(3,937)	11	16	130	90	5.2	13,0	4,3	A 714319

10 000 h / 85°C

**EXPECTED LIFE**

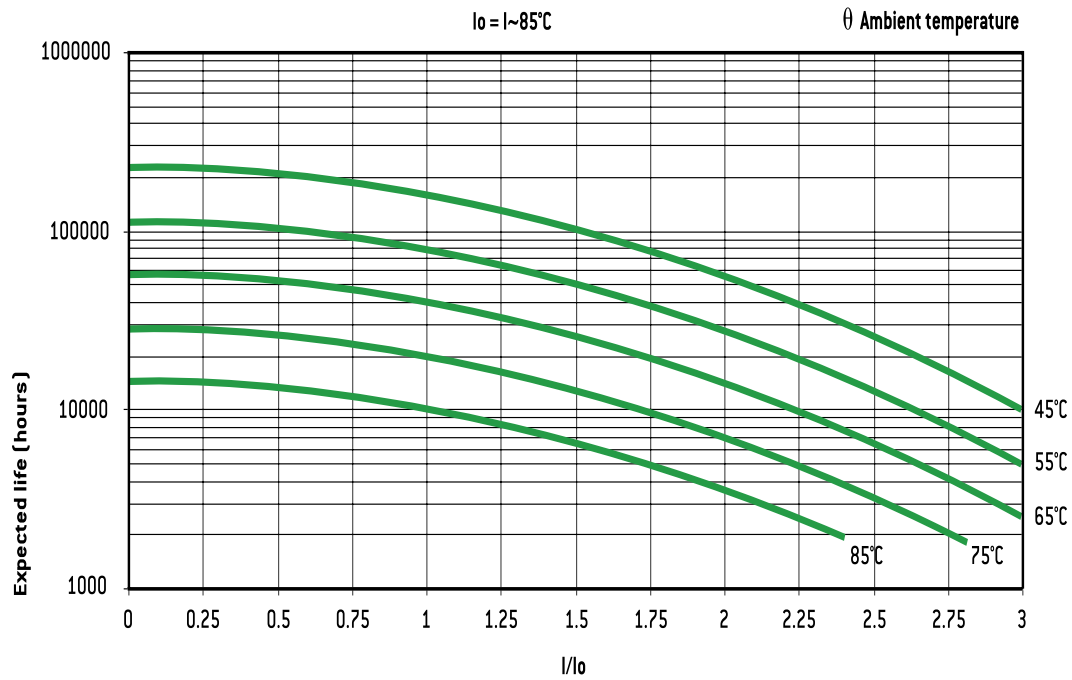
as a function of temperature and ripple current

**PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)**

versus frequency f:

I<sub>r</sub>: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I <sub>r</sub>	I <sub>r</sub>	1,2 x I <sub>r</sub>	1,3 x I <sub>r</sub>	1,35 x I <sub>r</sub>	1,5 x I <sub>r</sub>	1,6 x I <sub>r</sub>



# SNAPSIC 105 4P

8 000 h / 105°C

16 V ... 500 V	330 μF ... 150 000 μF	∅ 35 (1,378) - 45 (1,772)	- 55°C + 105°C	Long Life Time
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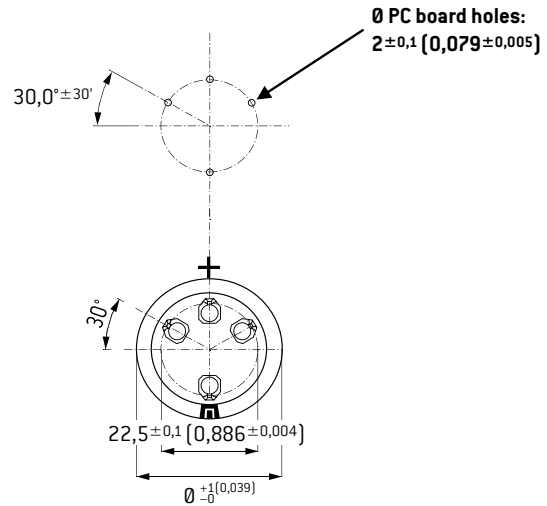
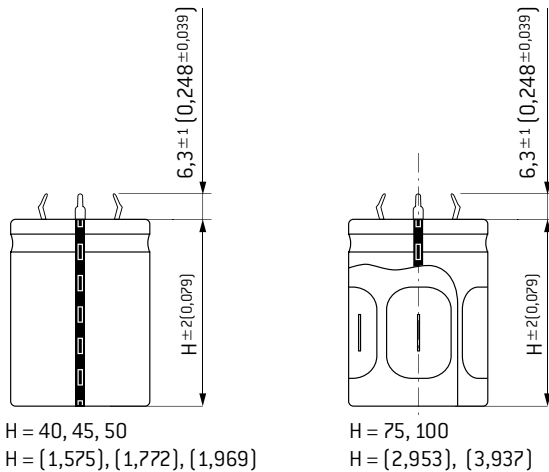
## APPLICATIONS

- Printed circuit mounting
- Switch mode power supplies
- Impulse current

Fixing: SNAP-IN pins

Tolerance on capacitance at 20°C : ± 20 %  
 Operating temperature : - 55°C + 105°C

## 4 SNAP-IN terminals



Dimensions in mm (inches)

Dummy pins near positive terminal are for mechanical support only. They must be electrically insulated from the positive and the negative terminals.

Can size	∅ mm (inches)		Hb mm (inches)	
1	35	[1,378]	50	[1,969]
2	35	[1,378]	75	[2,953]
3	35	[1,378]	100	[3,937]
4	40	[1,575]	40	[1,575]
5	40	[1,575]	50	[1,969]
6	40	[1,575]	75	[2,953]
7	40	[1,575]	100	[3,937]
8	45	[1,772]	45	[1,772]
9	45	[1,772]	50	[1,969]
10	45	[1,772]	75	[2,953]
11	45	[1,772]	100	[3,937]

## RESISTANCE TO VIBRATIONS

Hb mm (inches)	H = 40 (1,575), 45 (1,772), 50 (1,969)	H = 75 (2,953), 100 (3,937)*
f [Hz]	10 - 500 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t [h]	3 x 2 h	3 x 2 h

\* and on request for: H = 40 [1,575], 45 [1,772], 50 [1,969]

## SPECIFICATIONS

CECC 30 300 Long life  
 DIN 41 240 - Climatic category: - 55 + 105°C / 56 days  
 IEC 60 384.4 long life  
 Standard endurance test at U<sub>R</sub>: 2000 h 105°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware: 100 MΩ  
 Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
 Fire resistance: self extinguish 15 s (IEC 60 695-2-2)

## SNAPSIC 105 4P

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	I +20°C 5 min. max. (mA)	I $\sim$ 100 Hz		Code		
	$\varnothing$ mm (inches)	H mm (inches)						+40°C max. (A)	+85°C max. (A)			
<b>Rated voltage / Peak voltage: 16/18 V</b>												
47000	35	(1,378)	50	(1,969)	1	55	15	15	4.5	20	6.6	A 715020
47000	40	(1,575)	40	(1,575)	4	55	15	15	4.5	20	7.1	A 715030
68000	35	(1,378)	50	(1,969)	1	67	12	10	6.5	20	7.3	A 715021
100000	35	(1,378)	75	(2,953)	2	82	10	8	9.6	20	9.6	A 715023
100000	45	(1,772)	45	(1,772)	8	82	10	8	9.6	20	8.9	A 715035
150000	40	(1,575)	100	(3,937)	7	122	10	8	14.0	20	12.0	A 715034
<b>Rated voltage / Peak voltage: 25/30 V</b>												
33000	35	(1,378)	50	(1,969)	1	70	20	18	5.0	20	5.7	A 715040
33000	40	(1,575)	40	(1,575)	4	100	38	20	5.0	15	4.1	A 715050
47000	35	(1,378)	75	(2,953)	2	62	15	13	7.1	20	7.8	A 715043
47000	40	(1,575)	50	(1,969)	5	62	15	13	7.1	20	7.1	A 715051
68000	40	(1,575)	75	(2,953)	6	67	12	10	10.0	20	9.4	A 715053
100000	40	(1,575)	100	(3,937)	7	82	10	8	15.0	20	12.0	A 715054
<b>Rated voltage / Peak voltage: 35/40 V</b>												
22000	35	(1,378)	50	(1,969)	1	43	24	17	5.2	19	5.2	A 715060
22000	40	(1,575)	40	(1,575)	4	65	36	24	5.2	16	4.2	A 715070
33000	35	(1,378)	75	(2,953)	2	47	15	13	7.9	20	7.8	A 715063
33000	45	(1,772)	45	(1,772)	8	47	15	13	7.9	20	7.3	A 715075
47000	35	(1,378)	100	(3,937)	3	53	12	10	11.0	20	10.0	A 715064
47000	40	(1,575)	75	(2,953)	6	53	12	9	11.0	20	9.4	A 715073
<b>Rated voltage / Peak voltage: 50/58 V</b>												
15000	35	(1,378)	50	(1,969)	1	38	26	18	4.5	19	5.0	A 715080
15000	40	(1,575)	40	(1,575)	4	38	26	18	4.5	18	4.9	A 715090
22000	35	(1,378)	75	(2,953)	2	40	22	16	6.6	20	6.5	A 715083
22000	40	(1,575)	50	(1,969)	5	48	35	17	6.6	17	4.6	A 715091
33000	40	(1,575)	75	(2,953)	6	48	18	14	9.9	20	7.7	A 715093
47000	40	(1,575)	100	(3,937)	7	57	15	11	14.0	20	9.6	A 715094
<b>Rated voltage / Peak voltage: 63/76 V</b>												
10000	35	(1,378)	50	(1,969)	1	25	25	20	3.0	19	5.1	A 715100
10000	40	(1,575)	40	(1,575)	4	30	35	22	3.0	16	4.2	A 715110
15000	35	(1,378)	75	(2,953)	2	28	22	18	5.7	20	6.5	A 715103
15000	45	(1,772)	45	(1,772)	8	28	22	18	5.7	20	6.0	A 715115
22000	35	(1,378)	100	(3,937)	3	32	18	15	8.3	20	8.2	A 715104
22000	40	(1,575)	75	(2,953)	6	32	18	13	8.3	20	7.7	A 715113
33000	45	(1,772)	75	(2,953)	10	43	16	11	11.0	20	8.7	A 715117
47000	45	(1,772)	100	(3,937)	11	50	13	9	13.0	20	9.7	A 715118
<b>Rated voltage / Peak voltage: 80/92 V</b>												
6800	35	(1,378)	50	(1,969)	1	16	25	20	3.2	19	5.1	A 715120
6800	40	(1,575)	40	(1,575)	4	22	35	25	3.2	16	4.2	A 715130
8200	35	(1,378)	50	(1,969)	1	19	25	18	4.0	19	5.1	A 715121
10000	35	(1,378)	75	(2,953)	2	21	25	21	4.8	20	6.1	A 715123
10000	45	(1,772)	45	(1,772)	8	21	25	21	4.8	20	5.6	A 715135
15000	35	(1,378)	100	(3,937)	3	24	20	16	7.2	20	7.7	A 715124
15000	40	(1,575)	75	(2,953)	6	24	20	13	7.2	20	7.3	A 715133
<b>Rated voltage / Peak voltage: 100/115 V</b>												
4700	35	(1,378)	50	(1,969)	1	11	28	20	2.8	18	4.8	A 715140
4700	40	(1,575)	40	(1,575)	4	15	38	25	2.8	15	4.1	A 715150
6800	35	(1,378)	75	(2,953)	2	19	35	23	4.0	19	5.1	A 715143
6800	45	(1,772)	45	(1,772)	8	19	35	23	4.0	18	4.8	A 715155
10000	35	(1,378)	100	(3,937)	3	24	30	21	6.0	20	6.3	A 715144
10000	40	(1,575)	75	(2,953)	6	24	30	20	6.0	20	6.0	A 715153
<b>Rated voltage 160/185 V</b>												
2200	35	(1,378)	50	(1,969)	1	15	60	40	2.1	13	3.4	A 715160
2200	40	(1,575)	40	(1,575)	4	15	60	40	2.1	12	3.2	A 715170
3300	35	(1,378)	75	(2,953)	2	10	40	30	3.2	18	4.8	A 715163
3300	45	(1,772)	45	(1,772)	8	10	40	30	3.2	17	4.4	A 715175
4700	40	(1,575)	75	(2,953)	6	13	35	27	4.5	20	5.5	A 715173
<b>Rated voltage 200/230 V</b>												
1500	35	(1,378)	50	(1,969)	1	14	90	60	1.8	10.0	2.7	A 715180
2200	35	(1,378)	50	(1,969)	1	14	65	45	2.6	12.0	3.2	A 715181
3300	35	(1,378)	75	(2,953)	2	16	60	40	4.0	15.0	3.9	A 715182
3300	45	(1,772)	45	(1,772)	8	16	60	40	4.0	14.0	3.6	A 715194
4700	40	(1,575)	75	(2,953)	6	20	50	30	5.6	17.0	4.6	A 715192
6800	45	(1,772)	100	(3,937)	11	21	30	20	8.2	20.0	7.2	A 715197

# SNAPSIK 105 4P

8 000 h / 105°C

Capacitance ( $\mu$ F)	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic (m $\Omega$ )	Z 10 kHz +20°C Typic (m $\Omega$ )	II +20°C 5 min. max. (mA)	I $\sim$ 100 Hz		Code		
	$\varnothing$ mm (inches)	H mm (inches)						+40°C max. (A)	+105°C max. (A)			
<b>Rated voltage / Peak voltage: 250/290 V</b>												
1500	35	(1,378)	50	(1,969)	1	10	70	50	2.3	11,0	3,0	A 715201
1500	40	(1,575)	40	(1,575)	4	12	90	60	2.3	10,0	2,6	A 715209
2200	35	(1,378)	75	(2,953)	2	12	65	45	3.3	14,0	3,8	A 715202
2200	40	(1,575)	50	(1,969)	5	12	65	45	3.3	13,0	3,4	A 715211
3300	40	(1,575)	75	(2,953)	6	12	45	30	5.0	18,0	4,9	A 715212
4700	45	(1,772)	75	(2,953)	10	13	35	25	7,0	20,0	5,9	A 715217
<b>Rated voltage / Peak voltage: 350/385 V</b>												
680	35	(1,378)	50	(1,969)	1	10	120	80	1.4	8,7	2,3	A 715220
1500	35	(1,378)	75	(2,953)	2	12	70	40	3.2	14,0	3,6	A 715222
1500	45	(1,772)	50	(1,969)	9	12	90	60	3,2	12,0	3,1	A 715235
2200	45	(1,772)	75	(2,953)	10	12	54	33	4.6	18,0	4,8	A 715236
3300	45	(1,772)	100	(3,937)	11	14	45	30	6,9	20,0	5,9	A 715237
<b>Rated voltage / Peak voltage: 400/450 V</b>												
560	35	(1,378)	50	(1,969)	1	12	220	160	1.9	6,4	1,7	A 715260
680	35	(1,378)	75	(2,953)	2	12	170	130	2.1	8,7	2,3	A 715263
680	40	(1,575)	40	(1,575)	4	12	190	140	2.1	6,8	1,8	A 715272
1000	35	(1,378)	75	(2,953)	2	12	130	90	2.5	10,0	2,7	A 715265
1000	35	(1,378)	100	(3,937)	3	12	120	80	2.5	12,0	3,2	A 715264
1000	45	(1,772)	45	(1,772)	8	12	140	100	2.5	8,9	2,4	A 715275
1500	40	(1,575)	100	(3,937)	7	12	90	60	3.1	15,0	3,9	A 715274
1500	45	(1,772)	75	(2,953)	10	14	100	70	3.1	13,0	3,5	A 715276
2200	45	(1,772)	100	(3,937)	11	16	90	60	3,8	16,0	4,2	A 715277
<b>Rated voltage / Peak voltage: 450/500 V</b>												
470	35	(1,378)	50	(1,969)	1	10	200	130	1.8	6,7	1,8	A 715280
470	40	(1,575)	40	(1,575)	4	10	200	130	1.8	6,7	1,8	A 715290
560	40	(1,575)	50	(1,969)	5	10	170	110	2.0	7,9	2,1	A 715291
680	35	(1,378)	75	(2,953)	2	13	140	100	2.2	9,6	2,6	A 715283
680	45	(1,772)	45	(1,772)	8	13	150	110	2.2	8,6	2,3	A 715295
820	45	(1,772)	50	(1,969)	9	13	140	100	2,4	9,3	2,5	A 715296
1000	35	(1,378)	100	(3,937)	3	13	130	90	2.7	11,0	3,0	A 715284
1000	40	(1,575)	75	(2,953)	6	13	140	100	2.7	10,0	2,8	A 715292
1500	40	(1,575)	100	(3,937)	7	13	110	80	3.3	13,0	3,5	A 715293
<b>Rated voltage / Peak voltage: 500/550 V</b>												
330	35	(1,378)	50	(1,969)	1	10	350	250	1.6	5,1	1,4	A 715301
470	40	(1,575)	50	(1,969)	5	13	340	240	1.9	5,6	1,5	A 715308
560	45	(1,772)	45	(1,772)	8	16	340	240	2.1	5,7	1,5	A 715318
680	40	(1,575)	75	(2,953)	6	14	240	200	2.3	7,9	2,1	A 715309
1000	40	(1,575)	100	(3,937)	7	16	190	140	2.8	10,0	2,7	A 715312
1000	45	(1,772)	75	(2,953)	10	16	160	120	2.8	10,0	2,8	A 715319

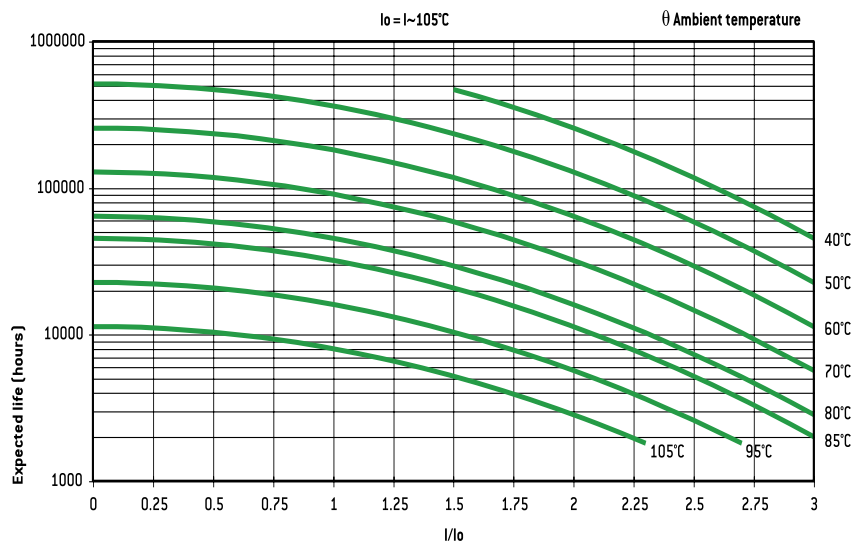
## EXPECTED LIFE

as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f: I $\sim$ : permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	$\geq$ 50 000
I	0,8 x I $\sim$	I $\sim$	1,2 x I $\sim$	1,3 x I $\sim$	1,35 x I $\sim$	1,5 x I $\sim$	1,6 x I $\sim$





## SNAP-IC 105 LP

8 000 h / 105°C

16 V ... 500 V	330 $\mu$ F ... 150 000 $\mu$ F	$\emptyset$ 45 [1,772]	- 55°C + 105°C	Long Life Time
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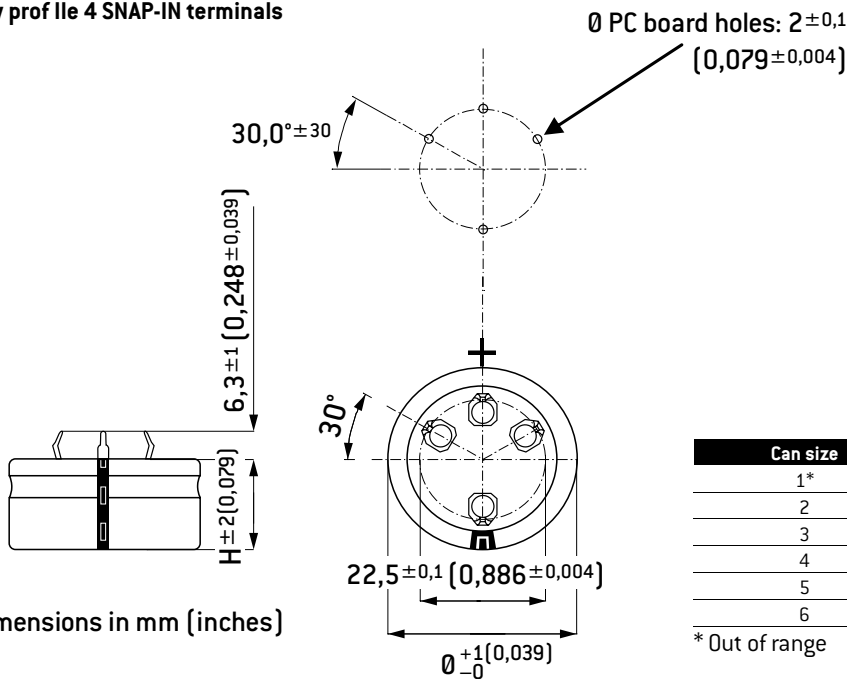
## APPLICATIONS

- Printed circuit mounting
- Switch mode power supplies
- Impulse current

Fixing: SNAP-IN pins

Tolerance on capacitance at 20°C :  $\pm 20\%$   
 Operating temperature : - 55°C + 105°C

## Low prof Ile 4 SNAP-IN terminals



Dimensions in mm (inches)

Can size	$\emptyset$ mm (inches)	Hb mm (inches)
1*	45 [1,772]	16 [0,630]
2	45 [1,772]	21 [0,827]
3	45 [1,772]	25 [0,984]
4	45 [1,772]	30 [1,181]
5	45 [1,772]	35 [1,378]
6	45 [1,772]	40 [1,575]

\* Out of range

Standard pins can be replaced by 4,5 mm [0,177 inches] max pins on request.

Dummy pins near positive terminal are for mechanical support only.

They must be electrically insulated from the positive and the negative terminals.

## SPECIFICATIONS

CECC 30 300 Long life

DIN 41 240 - Climatic category: -55 + 105°C / 56 days

IEC 60 384.4 long life

Standard endurance test at  $U_R$ : 2000 h 105°C / 56 days

## RESISTANCE TO VIBRATIONS

Frequency range 10 - 500 Hz

Displacement amplitude 0,75 [0,030]

or max acceleration 10 g - 98 m/s<sup>2</sup>

Duration 3 x 2 hours

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between pins and mounting hardware: 100 M $\Omega$

Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V

Fire resistance: self extinguish 15 s [IEC 60 695-2-2]

## SNAPSIC 105 LP

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. [%]	ESR 100 Hz +20°C Typic [m $\Omega$ ]	Z 10 kHz +20°C Typic [m $\Omega$ ]	II +20°C 5 min. max. [mA]	I ~ 100 Hz		Code		
	$\varnothing$ mm (inches)	H mm (inches)						+40°C max. [A]	+105°C max. [A]			
<b>Rated voltage / Peak voltage: 16/18 V</b>												
22000	45	(1,772)	21	(0,827)	2	117	65	48	2.1	14	3.7	A 713020
33000	45	(1,772)	25	(0,984)	3	135	50	38	3.0	17	4.5	A 713021
47000	45	(1,772)	30	(1,181)	4	135	35	26	4.5	20	5.8	A 713022
68000	45	(1,772)	35	(1,378)	5	140	25	19	6.8	20	7.2	A 713023
<b>Rated voltage / Peak voltage: 25/29 V</b>												
15000	45	(1,772)	21	(0,827)	2	80	65	50	2.2	14	3.7	A 713040
22000	45	(1,772)	25	(0,984)	3	90	50	40	3.0	17	4.5	A 713041
33000	45	(1,772)	30	(1,181)	4	93	30	22	5.0	20	6.2	A 713042
47000	45	(1,772)	40	(1,575)	6	115	30	20	7.0	20	7.6	A 713044
<b>Rated voltage / Peak voltage: 35/40 V</b>												
10000	45	(1,772)	21	(0,827)	2	56	68	52	2.1	14	3.7	A 713060
15000	45	(1,772)	25	(0,984)	3	71	58	46	3.1	16	4.2	A 713061
22000	45	(1,772)	30	(1,181)	4	86	48	33	4.6	19	4.9	A 713064
<b>Rated voltage / Peak voltage: 50/58 V</b>												
6800	45	(1,772)	21	(0,827)	2	39	70	53	2.0	14	3.6	A 713080
10000	45	(1,772)	25	(0,984)	3	47	58	45	3.0	16	4.2	A 713081
15000	45	(1,772)	35	(1,378)	5	59	48	33	4.5	20	5.2	A 713083
22000	45	(1,772)	40	(1,575)	6	72	35	25	6.6	20	6.4	A 713084
<b>Rated voltage / Peak voltage: 63/72 V</b>												
4700	45	(1,772)	21	(0,827)	2	28	75	55	1.8	13	3.5	A 713100
6800	45	(1,772)	30	(1,181)	4	33	60	45	2.6	17	4.4	A 713102
10000	45	(1,772)	35	(1,378)	5	41	50	35	3.0	19	5.1	A 713103
15000	45	(1,772)	40	(1,575)	6	54	33	28	5.7	20	6.6	A 713104
<b>Rated voltage / Peak voltage: 80/92 V</b>												
3300	45	(1,772)	21	(0,827)	2	20	75	55	1.6	13	3.5	A 713120
4700	45	(1,772)	30	(1,181)	4	20	60	45	2.2	17	4.4	A 713122
6800	45	(1,772)	35	(1,378)	5	23	40	30	3.2	20	5.7	A 713123
10000	45	(1,772)	40	(1,575)	6	30	32	25	4.8	20	6.7	A 713124
<b>Rated voltage / Peak voltage: 100/115 V</b>												
2200	45	(1,772)	21	(0,827)	2	16	90	70	1.3	12	3.2	A 713140
3300	45	(1,772)	30	(1,181)	4	20	75	60	2.0	15	3.9	A 713142
4700	45	(1,772)	35	(1,378)	5	21	55	45	2.8	18	4.9	A 713143
<b>Rated voltage / Peak voltage: 160/185 V</b>												
680	45	(1,772)	21	(0,827)	2	13	230	190	0.65	7.5	2.0	A 713160
1000	45	(1,772)	21	(0,827)	2	17	210	180	1.0	7.8	2.1	A 713164
1500	45	(1,772)	25	(0,984)	3	24	200	170	1.4	8.5	2.3	A 713165
2200	45	(1,772)	30	(1,181)	4	24	130	100	2.1	11	3.0	A 713166
<b>Rated voltage / Peak voltage: 200/230 V</b>												
680	45	(1,772)	21	(0,827)	2	11	170	130	0.81	8.7	2.3	A 713200
1000	45	(1,772)	21	(0,827)	2	15	160	120	1.2	9	2.4	A 713203
1500	45	(1,772)	30	(1,181)	4	20	140	110	1.8	11	2.9	A 713204
2200	45	(1,772)	35	(1,378)	5	22	120	100	2.6	13	3.5	A 713205
<b>Rated voltage / Peak voltage: 250/290 V</b>												
470	45	(1,772)	21	(0,827)	2	11	250	200	0.70	7.2	1.9	A 713200
680	45	(1,772)	21	(0,827)	2	11	170	130	1.0	8.7	2.3	A 713203
1000	45	(1,772)	25	(0,984)	3	15	160	120	1.5	9.5	2.5	A 713204
1500	45	(1,772)	35	(1,378)	5	20	140	110	2.3	11	3.1	A 713205
2200	45	(1,772)	40	(1,575)	6	22	120	100	3.3	13	3.5	A 713206
<b>Rated voltage / Peak voltage: 350/385 V</b>												
330	45	(1,772)	21	(0,827)	2	10	290	190	0.69	6.7	1.8	A 713220
470	45	(1,772)	25	(0,984)	3	10	220	160	1.0	8.1	2.2	A 713221
680	45	(1,772)	30	(1,181)	4	10	150	120	1.4	10	2.8	A 713225
1000	45	(1,772)	35	(1,378)	5	12	120	100	2.1	12	3.3	A 713226
<b>Rated voltage / Peak voltage: 400/450 V</b>												
220	45	(1,772)	21	(0,827)	2	10	470	360	1.2	5.2	1.4	A 713240
330	45	(1,772)	25	(0,984)	3	12	400	280	1.5	6.0	1.6	A 713241
470	45	(1,772)	30	(1,181)	4	13	300	250	1.8	7.4	2.0	A 713242
680	45	(1,772)	35	(1,378)	5	13	240	200	2.1	8.8	2.3	A 713243
820	45	(1,772)	40	(1,575)	6	13	160	120	2.3	11	3.0	A 713244

## SNAPSIC 105 LP

8 000 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz +20°C Typic ( $\text{m}\Omega$ )	Z 10 kHz +20°C Typic ( $\text{m}\Omega$ )	II +20°C 5 min. max. (mA)	I $\sim$ 100 Hz		Code		
	$\varnothing$ mm (inches)	H mm (inches)						+40°C max. (A)	+105°C max. (A)			
<b>Rated voltage / Peak voltage: 450/500 V</b>												
150	45	(1,772)	21	(0,827)	2	10	600	400	1,00	4,6	1,2	A 713260
220	45	(1,772)	21	(0,827)	2	13	500	350	1,25	5,1	1,4	A 713266
330	45	(1,772)	30	(1,181)	4	13	300	230	1,50	7,4	2,0	A 713262
440	45	(1,772)	30	(1,181)	4	13	280	220	1,70	7,7	2,0	A 713265
470	45	(1,772)	35	(1,378)	5	13	270	210	1,80	8,3	2,2	A 713263
560	45	(1,772)	35	(1,378)	5	13	250	170	2,0	8,6	2,3	A 713267
680	45	(1,772)	40	(1,575)	6	13	220	140	2,2	9,6	2,6	A 713268
<b>Rated voltage / Peak voltage: 500/550 V</b>												
150	45	(1,772)	21	(0,827)	2	15	1200	900	1,1	3,3	0,9	A 713283
220	45	(1,772)	25	(0,984)	3	15	850	690	1,4	4,1	1,1	A 713285
330	45	(1,772)	35	(1,378)	5	15	500	350	1,6	6,1	1,6	A 713286
470	45	(1,772)	40	(1,575)	6	17	430	310	1,9	6,9	1,8	A 713287

## CASE BOTTOM CONDUCTION COOLING

with radiator or frame put on the case bottom ripple current  $I_0$  is multiplied by 2 to 3. For more details, contact us.

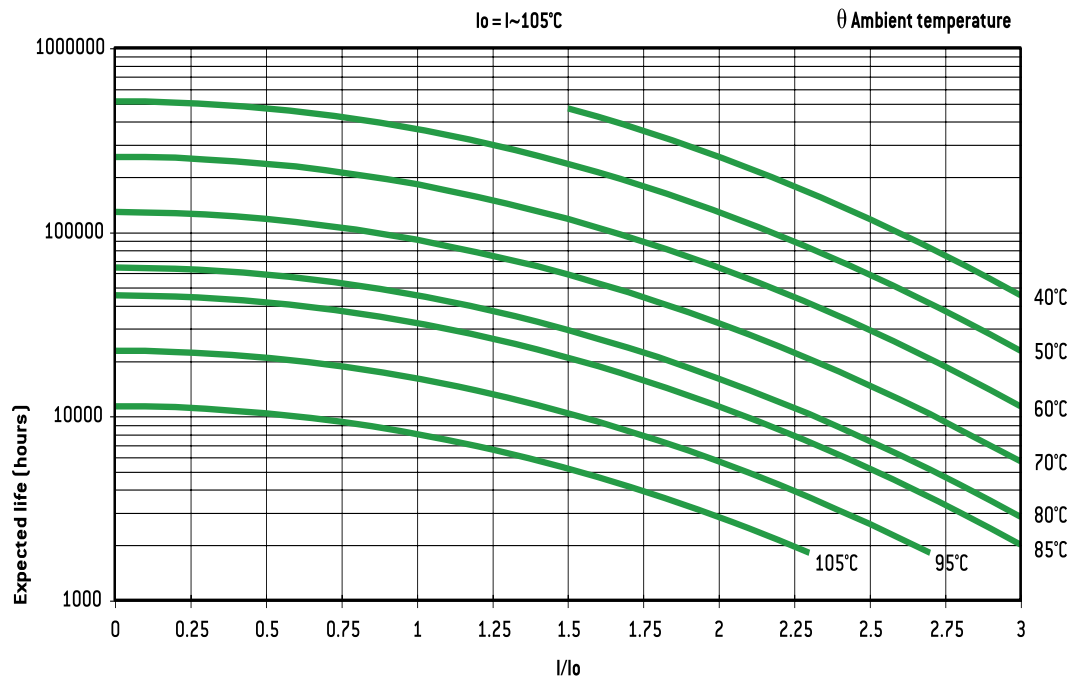
## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency  $f$ :  
I $\sim$ : permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	$\geq 50 000$
I	0,8 x I $\sim$	I $\sim$	1,2 x I $\sim$	1,3 x I $\sim$	1,35 x I $\sim$	1,5 x I $\sim$	1,6 x I $\sim$

## EXPECTED LIFE

as a function of temperature and ripple current



# SNAPSIC 125

8 000 h / 125°C

16 V ... 100 V	470 $\mu$ F ... 47 000 $\mu$ F	$\emptyset$ 22 [0,866] ... $\emptyset$ 35 [1,378]	- 55°C + 125°C	Long Life Time
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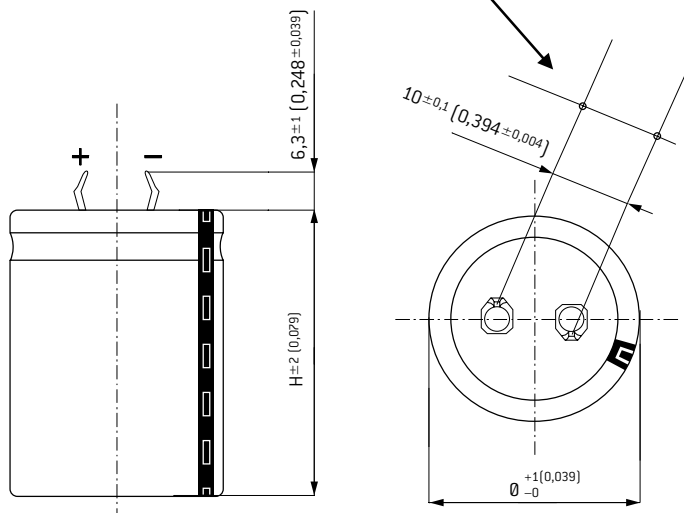
## APPLICATIONS

- High frequency switched mode power supplies
- High ripple current
- Low impedance

Insulating aluminum case pure tin coated  
Snap-in pins negative  
Pole marked

Tolerance on capacitance at 20°C : - 20 + 20 %  
Operating temperature : - 55°C + 125°C

$\emptyset$  PC board holes:  $2 \pm 0,1$  [0,079  $\pm$  0,004]



Dimensions in mm [inches]

Can size	$\emptyset$ mm [inches]	H mm [inches]
1	22 [0,866]	25 [0,984]
2	22 [0,866]	30 [1,181]
3*	22 [0,866]	40 [1,575]
4*	25 [0,984]	25 [0,984]
5	25 [0,984]	30 [1,181]
6	25 [0,984]	40 [1,575]
7*	25 [0,984]	50 [1,969]
8*	30 [1,181]	25 [0,984]
9*	30 [1,181]	30 [1,181]
10	30 [1,181]	35 [1,378]
11	30 [1,181]	40 [1,575]
12*	30 [1,181]	45 [1,772]
13*	30 [1,181]	50 [1,969]
14*	35 [1,378]	30 [1,181]
15*	35 [1,378]	35 [1,378]
16	35 [1,378]	40 [1,575]
17*	35 [1,378]	45 [1,772]
18	35 [1,378]	50 [1,969]

\* Out of range

Standard pins can be replaced by 4.5 mm [0,177 inches] max pins on request.

## SPECIFICATIONS

NFC 83 110 - Long life  
CECC 30 300  
IEC 60 384-4 Long life  
Climatic category: - 55°C + 125°C / 56 days

## RESISTANCE TO VIBRATIONS

Frequency : 10 – 500 Hz  
Displacement amplitude or : 0,75 [0,030]  
max acceleration : 10 g – 98 m/s<sup>2</sup>  
Duration : 3 x 10 sweep cycles

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulating resistance at 20°C between pins and mounting hardware:  
100 M $\Omega$   
Test voltage at 50 Hz 1 min. between terminals and mounting hardware: 2000 V  
Fire resistance: self extinguish 30 s. (IEC 60 695-2-2) Without PVC

## SNAPSIC 125

8 000 h / 125°C

Capacitance [ $\mu$ F]	Dimensions		Can size	Tan $\delta$ 100 Hz +20°C max. [%]	ESR 100 Hz +20°C Typic [m $\Omega$ ]	Z 10 kHz +20°C Typic [m $\Omega$ ]	II +20°C 5 min. max. [mA]	I $\sim$ +125°C max.		Code		
	$\emptyset$ mm [inches]	H mm [inches]						100 Hz [A]	10 kHz [A]			
<b>Rated voltage 16/18 V</b>												
4700	22	[0,866]	25	[0,984]	1	20	45	35	0,23	2,7	4,0	A 718000
6800	22	[0,866]	30	[1,181]	2	22	35	28	0,33	3,2	4,9	A 718001
10000	25	[0,984]	30	[1,181]	5	28	30	25	0,48	3,8	5,7	A 718002
15000	25	[0,984]	40	[1,575]	6	38	27	19	0,72	4,5	6,7	A 718003
22000	30	[1,181]	40	[1,575]	11	41	20	17	1,1	5,8	8,7	A 718006
33000	35	[1,378]	40	[1,575]	16	50	16	14	1,6	7,1	11	A 718007
47000	35	[1,378]	50	[1,969]	18	62	14	12	2,2	8,3	12	A 718010
<b>Rated voltage 25/29 V</b>												
3300	22	[0,866]	25	[0,984]	1	16	50	38	0,25	2,5	3,8	A 718020
4700	25	[0,984]	30	[1,181]	5	19	43	31	0,35	3,2	4,7	A 718022
6800	25	[0,984]	40	[1,575]	6	19	30	20	0,51	4,3	6,4	A 718023
10000	30	[1,181]	35	[1,378]	10	28	30	19	0,75	4,5	6,7	A 718025
15000	30	[1,181]	40	[1,575]	11	31	22	17	1,1	5,5	8,3	A 718026
22000	35	[1,378]	50	[1,969]	18	41	20	16	1,7	7,0	10	A 718028
33000	35	[1,378]	50	[1,969]	18	56	18	14	2,4	7,3	11	A 718030
<b>Rated voltage 40/46 V</b>												
2200	22	[0,866]	30	[1,181]	2	12	60	45	0,26	2,5	3,7	A 718041
3300	25	[0,984]	30	[1,181]	5	13	42	32	0,40	3,2	4,8	A 718042
4700	25	[0,984]	40	[1,575]	6	15	33	24	0,56	4,1	6,1	A 718043
6800	30	[1,181]	35	[1,378]	10	19	30	21	0,82	4,5	6,7	A 718045
10000	35	[1,378]	40	[1,575]	16	26	28	19	1,2	5,4	8,0	A 718047
15000	35	[1,378]	50	[1,969]	18	31	22	16	1,8	6,6	10	A 718048
22000	35	[1,378]	50	[1,969]	18	41	20	14	2,6	7	10	A 718050
<b>Rated voltage 50/58 V</b>												
1500	22	[0,866]	25	[0,984]	1	10	70	60	0,23	2,1	3,2	A 718060
2200	25	[0,984]	30	[1,181]	5	9	45	38	0,33	3,1	4,6	A 718062
3300	25	[0,984]	40	[1,575]	6	10	32	27	0,50	4,1	6,2	A 718063
4700	30	[1,181]	35	[1,378]	10	13	30	22	0,71	4,5	6,7	A 718065
6800	30	[1,181]	40	[1,575]	11	17	27	21	1,0	5,0	7,5	A 718066
10000	35	[1,378]	50	[1,969]	18	21	22	17	1,5	6,6	10	A 718068
15000	35	[1,378]	50	[1,969]	18	28	20	14	2,3	7	10	A 718070
<b>Rated voltage 63/72 V</b>												
1000	22	[0,866]	30	[1,181]	2	7	60	46	0,19	2,5	3,7	A 718081
1500	25	[0,984]	30	[1,181]	5	8	50	43	0,28	2,9	4,4	A 718082
2200	25	[0,984]	40	[1,575]	6	8	35	30	0,42	3,9	5,9	A 718083
2700	25	[0,984]	40	[1,575]	6	8	30	25	0,51	4,3	6,4	A 718084
3300	30	[1,181]	40	[1,575]	11	9	30	22	0,62	5,2	7,8	A 718086
4700	35	[1,378]	40	[1,575]	16	12	28	20	0,89	5,4	8,0	A 718087
6800	35	[1,378]	50	[1,969]	18	16	25	19	1,3	6,2	9,3	A 718088
10000	35	[1,378]	50	[1,969]	18	22	23	18	1,9	6,5	9,7	A 718090
<b>Rated voltage 100/115 V</b>												
470	22	[0,866]	30	[1,181]	2	8	190	130	0,14	1,4	2,1	A 718101
680	25	[0,984]	30	[1,181]	5	10	150	100	0,20	1,7	2,5	A 718102
1000	25	[0,984]	40	[1,575]	6	10	100	70	0,30	2,3	3,5	A 718103
1500	30	[1,181]	35	[1,378]	10	10	70	54	0,45	2,9	4,4	A 718105
2200	35	[1,378]	40	[1,575]	16	12	60	46	0,66	3,7	5,5	A 718107
3300	35	[1,378]	50	[1,969]	18	17	55	42	1,0	4,2	6,3	A 718108
4700	35	[1,378]	50	[1,969]	18	22	50	38	1,4	4,4	6,6	A 718110

# SNAPSIC 125

8 000 h / 125°C

## EXPECTED LIFE

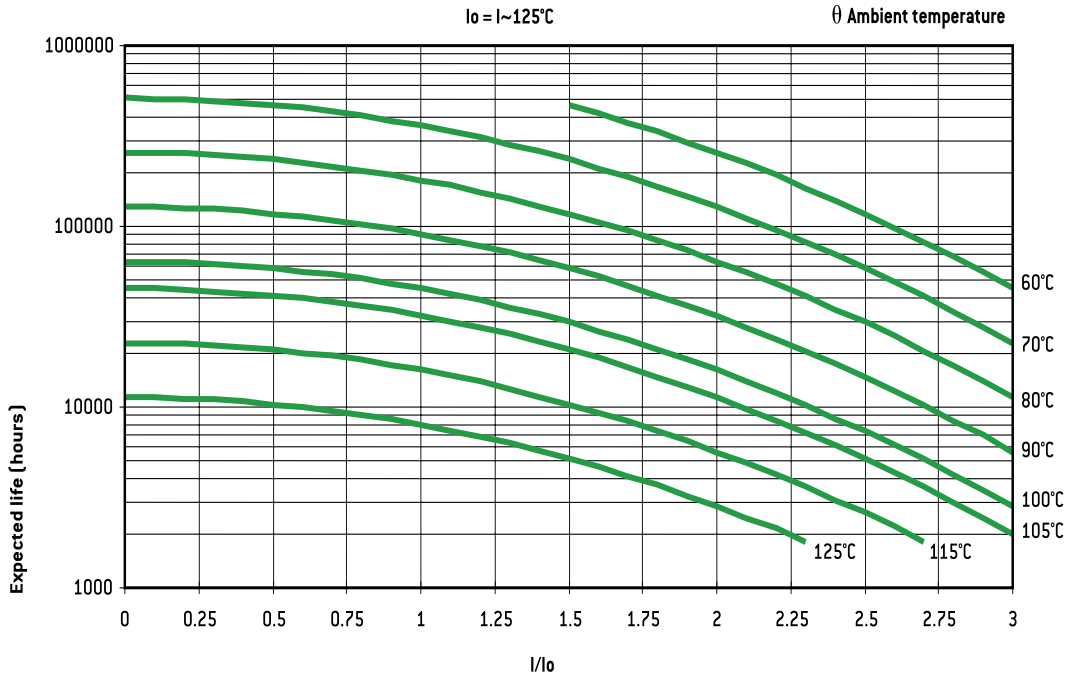
as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I ~: permissible r.m.s. current at 100 Hz


f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~





AXIAL LEADED



**EXXELIA** 

AXIAL LEADED

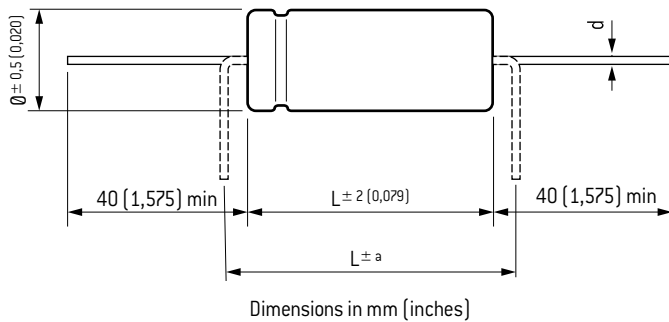
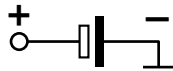


## SICAL CO42 - SICAL

CO 42

10 000 h / 85°C

10 V ... 630 V	2,2 $\mu$ F ... 47 000 $\mu$ F	$\emptyset$ 6,5 (0,256) ... $\emptyset$ 25 (0,984)	- 55°C + 105°C	Long Life Time
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## DIMENSIONS in mm (inches)

$\emptyset$		d		a	
6,5 - 21	(0,256 - 0,827)	0,8	(0,031)	4	(0,157)
25	(0,984)	1	(0,039)	8	(0,315)

## SPECIFICATIONS

NFC 83 110 - Long life  
 DIN 41 240 - Climatic category GPF - 55°C + 85°C / 56 days  
 CECC 30 301-019 (SICAL CO 42)  
 CECC 30 300 (SICAL)  
 IEC 60 384.4 - Long life  
 Standard endurance test  $U_R$ : 5000 h / 85°C

## APPLICATIONS

- Coupling/decoupling
- Filtering
- Circuits with time constant
- Switch mode power supplies

Insulating aluminum case  
 Axial tin-coated copper leads  
 Welded chain providing perfect continuity of the circuit.

Tolerance on capacitance at 20°C:

- 10 + 50 % (SICAL CO 42)
- 20 + 20 % (SICAL)

Operating temperature : - 55°C + 85°C

## RESISTANCE TO VIBRATIONS

	Standard	On request
f (Hz)	10 - 55 Hz	10 - 2000 Hz
Amplitude	0,75 (0,030)	1,5 (0,059)
Acceleration	10 g - 98 m/s <sup>2</sup>	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h	3 x 2 h

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulating resistance at 20°C between leads and mounting hardware:  
 100 M $\Omega$

Test voltage at 50 Hz 1 min. between leads and mounting hardware:  
 1000 V

Fire resistance: self extinguish 30 s (IEC 60 695-2-2) without PVC

## SICAL C042 - SICAL

C042

10 000 h / 85°C

Capacitance ( $\mu F$ )	Dimensions		Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz Typic ( $\Omega$ )	Z F(1) +20°C max. ( $\Omega$ )	II +20°C 5 min. max. ( $\mu A$ )	I ~ 100 Hz +85°C max. (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)								
<b>Rated voltage / Peak voltage: 10/12 V</b>										
100	6,5	[0,256]	19	[0,748]	13	1,5	1,1	10	0,2	A 748201
220	8,5	[0,335]	19	[0,748]	15	0,75	0,5	17	0,33	A 748203
270	6,5	[0,256]	19	[0,748]	13	0,60	0,5	18	0,26	A 748208
330	10	[0,394]	19	[0,748]	17	0,45	0,4	24	0,48	A 748204
470	10	[0,394]	19	[0,748]	17	0,35	0,3	32	0,54	A 748205
510	8,5	[0,335]	19	[0,748]	15	0,36	0,4	31	0,39	A 748209
730	10	[0,394]	19	[0,748]	17	0,30	0,3	44	0,47	A 748210
1000	10	[0,394]	25	[0,984]	17	0,18	0,2	60	0,85	A 748207
2200	16	[0,630]	30	[1,181]	17	0,07	0,09	135	1,9	A 749000
3300	18	[0,709]	30	[1,181]	17	0,05	0,07	200	2,4	A 749001
4700	16	[0,630]	30	[1,181]	17	0,07	0,09	285	1,9	A 749003
4700	18	[0,709]	40	[1,575]	17	0,04	0,05	285	3,1	A 749002
6300	18	[0,709]	30	[1,181]	17	0,05	0,07	370	2,4	A 749004
9400	18	[0,709]	40	[1,575]	17	0,04	0,05	560	3,1	A 749005
4700	14	[0,551]	30	[1,181]	23	0,05	0,06	285	2,1	A 749500
6800	16	[0,630]	30	[1,181]	24	0,04	0,05	410	2,5	A 749502
10000	18	[0,709]	40	[1,575]	26	0,03	0,04	600	3,5	A 749501
<b>Rated voltage / Peak voltage: 16/18 V</b>										
47	6,5	[0,256]	19	[0,748]	9	1,5	1,1	8	0,2	A 748219
68	6,5	[0,256]	19	[0,748]	12	1,3	0,8	10	0,22	A 748222
100	6,5	[0,256]	19	[0,748]	12	1	0,75	14	0,25	A 748220
150	6,5	[0,256]	19	[0,748]	12	1,3	0,8	18	0,22	A 748229
150	8,5	[0,335]	19	[0,748]	12	0,8	0,7	18	0,32	A 748223
220	6,5	[0,256]	19	[0,748]	12	1	0,75	25	0,25	A 748230
220	8,5	[0,335]	19	[0,748]	14	0,55	0,6	25	0,39	A 748224
280	8,5	[0,335]	19	[0,748]	12	0,8	0,7	27	0,32	A 748231
330	10	[0,394]	19	[0,748]	15	0,5	0,5	35	0,45	A 748225
420	8,5	[0,335]	19	[0,748]	14	0,55	0,6	40	0,39	A 748232
470	10	[0,394]	19	[0,748]	15	0,4	0,45	49	0,5	A 748226
590	10	[0,394]	19	[0,748]	15	0,4	0,45	57	0,5	A 748233
680	10	[0,394]	25	[0,984]	15	0,17	0,22	65	0,87	A 748227
840	10	[0,394]	25	[0,984]	15	0,17	0,22	81	0,87	A 748234
1000	12	[0,472]	30	[1,181]	15	0,13	0,13	100	1,2	A 748228
1500	16	[0,630]	30	[1,181]	15	0,11	0,11	145	1,5	A 749021
1700	12	[0,472]	30	[1,181]	15	0,13	0,13	160	1,2	A 748235
2200	18	[0,709]	30	[1,181]	15	0,05	0,05	215	2,4	A 749022
3800	16	[0,630]	30	[1,181]	15	0,11	0,11	365	1,5	A 749024
4700	21	[0,827]	40	[1,575]	15	0,03	0,04	455	3,9	A 749023
5100	18	[0,709]	30	[1,181]	15	0,05	0,05	490	2,4	A 749025
7900	21	[0,827]	40	[1,575]	15	0,03	0,04	760	3,9	A 749026
2200	14	[0,551]	30	[1,181]	16	0,08	0,11	215	1,7	A 749508
3300	16	[0,630]	30	[1,181]	16	0,06	0,08	320	2,1	A 749509
4700	18	[0,709]	30	[1,181]	16	0,04	0,05	455	2,7	A 749510
10000	21	[0,827]	40	[1,575]	29	0,03	0,03	960	3,9	A 749511
22000	25	[0,984]	40	[1,575]	36	0,02	0,02	2100	5,2	A 749513
47000	25	[0,984]	75	[2,953]	50	0,013	0,015	4500	8,6	A 749514

## SICAL C042 - SICAL

CO 42

10 000 h / 85°C

Capacitance [ $\mu$ F]	Dimensions		Tan $\delta$ 100 Hz +20°C max. [%]	ESR 100 Hz Typic [ $\Omega$ ]	Z F(1) +20°C max. [ $\Omega$ ]	II +20°C 5 min. max. [ $\mu$ A]	I $\sim$ 100 Hz +85°C max. [A]	Code		
	$\emptyset$ mm [inches]	L mm [inches]								
<b>Rated voltage / Peak voltage: 25/30 V</b>										
22	6,5	[0,256]	19	[0,748]	8	2,2	1,6	6	0,15	A 748239
47	6,5	[0,256]	19	[0,748]	12	1,9	1,5	11	0,16	A 748242
100	8,5	[0,335]	19	[0,748]	12	1	0,9	19	0,29	A 748243
140	6,5	[0,256]	19	[0,748]	12	1,9	1,5	21	0,16	A 748249
150	8,5	[0,335]	19	[0,748]	12	0,8	0,7	27	0,32	A 748246
220	10	[0,394]	19	[0,748]	11	0,6	0,6	37	0,41	A 748244
270	8,5	[0,335]	19	[0,748]	12	0,8	0,7	41	0,32	A 748250
330	10	[0,394]	19	[0,748]	11	0,4	0,4	54	0,5	A 748247
380	10	[0,394]	19	[0,748]	11	0,4	0,4	57	0,5	A 748251
470	10	[0,394]	25	[0,984]	10	0,2	0,25	75	0,8	A 748245
540	10	[0,394]	25	[0,984]	10	0,2	0,25	81	0,8	A 748252
680	12	[0,472]	30	[1,181]	10	0,13	0,15	105	1,2	A 748248
1000	16	[0,630]	30	[1,181]	10	0,09	0,08	150	1,7	A 749041
1100	12	[0,472]	30	[1,181]	10	0,13	0,15	165	1,2	A 748253
1500	18	[0,709]	30	[1,181]	10	0,06	0,06	225	2,2	A 749042
2200	18	[0,709]	40	[1,575]	10	0,04	0,04	330	3,1	A 749043
2500	16	[0,630]	30	[1,181]	10	0,09	0,08	375	1,7	A 749044
3300	18	[0,709]	30	[1,181]	10	0,06	0,06	495	2,2	A 749045
4700	25	[0,984]	40	[1,575]	10	0,02	0,03	700	5,2	A 749047
5000	18	[0,709]	40	[1,575]	10	0,04	0,04	750	3,1	A 749046
5100	25	[0,984]	40	[1,575]	10	0,02	0,03	765	5,2	A 749048
1500	14	[0,551]	30	[1,181]	12	0,09	0,09	225	1,6	A 749520
2200	16	[0,630]	30	[1,181]	12	0,06	0,06	330	2,1	A 749521
3300	18	[0,709]	30	[1,181]	12	0,05	0,05	495	2,4	A 749522
4700	18	[0,709]	40	[1,575]	12	0,04	0,04	700	3,1	A 749523
6800	21	[0,827]	40	[1,575]	18	0,03	0,04	1020	3,9	A 749524
10000	25	[0,984]	40	[1,575]	21	0,02	0,03	1500	5,2	A 749515
15000	25	[0,984]	75	[2,953]	24	0,02	0,02	2250	6,9	A 749516
22000	25	[0,984]	75	[2,953]	36	0,02	0,02	3300	6,9	A 749517
<b>Rated voltage / Peak voltage: 40/48 V</b>										
33	6,5	[0,256]	19	[0,748]	10	2,2	2	11	0,17	A 748262
47	8,5	[0,335]	19	[0,748]	9	2	1,6	15	0,2	A 748263
63	6,5	[0,256]	19	[0,748]	10	2,2	2	15	0,17	A 748269
68	8,5	[0,335]	19	[0,748]	10	1,5	1,2	20	0,24	A 748261
100	10	[0,394]	19	[0,748]	10	0,85	0,8	28	0,35	A 748264
120	8,5	[0,335]	19	[0,748]	10	1,5	1,2	29	0,24	A 748270
170	10	[0,394]	19	[0,748]	10	0,85	0,8	41	0,35	A 748271
220	10	[0,394]	25	[0,984]	9	0,35	0,3	55	0,61	A 748266
330	10	[0,394]	25	[0,984]	10	0,27	0,25	83	0,69	A 748267
470	12	[0,472]	30	[1,181]	10	0,2	0,15	115	0,96	A 748268
680	16	[0,630]	30	[1,181]	8	0,08	0,07	165	1,8	A 749061
1000	18	[0,709]	30	[1,181]	9	0,07	0,07	240	2	A 749062
1100	16	[0,630]	30	[1,181]	8	0,08	0,07	264	1,8	A 749064
1500	18	[0,709]	30	[1,181]	9	0,07	0,07	360	2	A 749065
2200	21	[0,827]	40	[1,575]	10	0,04	0,04	530	3,4	A 749063
2900	21	[0,827]	40	[1,575]	10	0,04	0,04	700	3,4	A 749066
1000	14	[0,551]	30	[1,181]	10	0,08	0,08	240	1,7	A 749530
1500	16	[0,630]	30	[1,181]	10	0,08	0,08	360	1,8	A 749533
2200	18	[0,709]	40	[1,575]	10	0,04	0,04	530	3,1	A 749531
3300	18	[0,709]	40	[1,575]	12	0,03	0,03	800	3,5	A 749534
4700	21	[0,827]	40	[1,575]	13	0,025	0,03	1130	4,2	A 749532
10000	25	[0,984]	50	[1,969]	16	0,02	0,02	2400	5,8	A 749535
15000	25	[0,984]	75	[2,953]	23	0,02	0,02	3600	6,9	A 749537

## SICAL C042 - SICAL

C042

10 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Dimensions		Tan $\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz Typic ( $\Omega$ )	Z F(1) +20°C max. ( $\Omega$ )	II +20°C 5 min. max. ( $\mu\text{A}$ )	I ~ 100 Hz +85°C max. (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)								
<b>Rated voltage / Peak voltage: 63/75 V</b>										
10	6,5	(0,256)	19	(0,748)	8	4,1	4	6	0,12	A 748279
15	6,5	(0,256)	19	(0,748)	8	3,8	3,2	10	0,13	A 748286
22	8,5	(0,335)	19	(0,748)	7	2,8	2	12	0,17	A 748287
26	6,5	(0,256)	19	(0,748)	8	4,1	4	6	0,12	A 748280
33	8,5	(0,335)	19	(0,748)	8	2	1,3	16	0,2	A 748288
39	6,5	(0,256)	19	(0,748)	8	3,8	3,2	10	0,13	A 748281
47	8,5	(0,335)	19	(0,748)	7	2,8	2	22	0,17	A 748282
47	10	(0,394)	19	(0,748)	8	1,4	1,1	22	0,27	A 748289
68	10	(0,394)	19	(0,748)	8	1,2	0,9	30	0,29	A 748290
73	8,5	(0,335)	19	(0,748)	8	2	1,3	16	0,2	A 748283
100	10	(0,394)	19	(0,748)	8	1,2	0,9	40	0,29	A 748284
100	10	(0,394)	25	(0,984)	8	0,8	0,6	40	0,4	A 748291
150	10	(0,394)	25	(0,984)	8	0,8	0,6	50	0,4	A 748285
150	12	(0,472)	30	(1,181)	8	0,4	0,35	50	0,68	A 748292
220	12	(0,472)	30	(1,181)	10	0,4	0,35	85	0,68	A 748293
290	12	(0,472)	30	(1,181)	10	0,4	0,35	85	0,68	A 748294
330	16	(0,630)	30	(1,181)	8	0,17	0,15	125	1,2	A 749081
470	18	(0,709)	30	(1,181)	8	0,11	0,1	180	1,6	A 749082
660	16	(0,630)	30	(1,181)	8	0,17	0,15	125	1,2	A 748290
1000	21	(0,827)	40	(1,575)	6	0,06	0,07	380	2,7	A 749083
2100	21	(0,827)	40	(1,575)	6	0,06	0,07	380	2,7	A 748292
2200	25	(0,984)	50	(1,969)	8	0,04	0,04	835	4,1	A 749086
4100	25	(0,984)	50	(1,969)	8	0,04	0,04	835	4,1	A 748293
4700	25	(0,984)	75	(2,953)	12	0,025	0,03	1780	5,6	A 749087
6700	25	(0,984)	75	(2,953)	12	0,025	0,03	1780	5,6	A 748294
680	14	(0,551)	30	(1,181)	8	0,14	0,12	260	1,3	A 749544
1000	16	(0,630)	30	(1,181)	9	0,12	0,11	380	1,5	A 749540
1500	18	(0,709)	40	(1,575)	9	0,09	0,08	570	2	A 749541
2200	21	(0,827)	40	(1,575)	9	0,05	0,04	835	3	A 749545
3300	25	(0,984)	40	(1,575)	11	0,04	0,03	1250	3,7	A 749546
4700	25	(0,984)	50	(1,969)	12	0,03	0,03	1780	4,7	A 749543
6800	25	(0,984)	75	(2,953)	12	0,02	0,02	2570	6,9	A 749547
<b>Rated voltage / Peak voltage: 100/115 V</b>										
4,7	6,5	(0,256)	19	(0,748)	7	9,4	5	5	0,08	A 748299
6,8	6,5	(0,256)	19	(0,748)	7	7,8	4,3	8	0,09	A 748301
10	6,5	(0,256)	19	(0,748)	7	6	3,8	10	0,1	A 748302
15	6,5	(0,256)	19	(0,748)	7	4,2	3,1	13	0,12	A 748303
22	8,5	(0,335)	19	(0,748)	7	2,6	2	17	0,18	A 748304
33	10	(0,394)	19	(0,748)	7	1,8	1,3	24	0,24	A 748307
47	10	(0,394)	25	(0,984)	7	1,2	0,7	32	0,33	A 748306
68	12	(0,472)	30	(1,181)	7	0,8	0,6	45	0,48	A 748309
100	14	(0,551)	30	(1,181)	5	0,35	0,3	60	0,74	A 749100
150	14	(0,551)	30	(1,181)	7	0,3	0,25	94	0,86	A 749105
220	18	(0,709)	30	(1,181)	5	0,18	0,16	135	1,3	A 749101
470	21	(0,827)	40	(1,575)	7	0,1	0,1	285	2,1	A 749102
1000	25	(0,984)	50	(1,969)	7	0,05	0,04	600	3,6	A 749104
220	14	(0,551)	30	(1,181)	6	0,3	0,25	135	0,86	A 749550
330	16	(0,630)	30	(1,181)	7	0,25	0,2	200	1	A 749554
470	18	(0,709)	30	(1,181)	7	0,12	0,11	285	1,6	A 749551
680	21	(0,827)	40	(1,575)	8	0,1	0,1	400	2,1	A 749555
1000	21	(0,827)	40	(1,575)	8	0,07	0,07	600	2,5	A 749552
1500	25	(0,984)	50	(1,969)	8	0,06	0,06	900	3,3	A 749557
1800	25	(0,984)	50	(1,969)	8	0,05	0,05	1080	3,6	A 749558
2200	25	(0,984)	75	(2,953)	8	0,035	0,035	1320	5,2	A 749559
3300	25	(0,984)	75	(2,953)	8	0,03	0,03	1980	5,6	A 749556

## SICAL C042 - SICAL

C0 42

10 000 h / 85°C

Capacitance [ $\mu$ F]	Dimensions		Tan $\delta$ 100 Hz +20°C max. [%]	ESR 100 Hz Typic [ $\Omega$ ]	Z F(1) +20°C max. [ $\Omega$ ]	II +20°C 5 min. max. [ $\mu$ A]	I $\sim$ 100 Hz +85°C max. [A]	Code		
	$\emptyset$ mm (inches)	L mm (inches)								
<b>Rated voltage / Peak voltage: 160/180 V</b>										
2,2	6,5	[0,256]	19	[0,748]	7	26	27	5	0,05	A 748320
4,1	6,5	[0,256]	19	[0,748]	7	26	27	8	0,05	A 748325
4,7	8,5	[0,335]	19	[0,748]	7	12	13	8	0,08	A 748321
8,1	8,5	[0,335]	19	[0,748]	7	12	13	8	0,08	A 748326
10	10	[0,394]	19	[0,748]	8	9	8	14	0,11	A 748322
22	12	[0,472]	25	[0,984]	7	2,1	2,1	25	0,28	A 748323
33	12	[0,472]	30	[1,181]	7	1,8	1,8	35	0,32	A 748324
47	16	[0,630]	30	[1,181]	7	1,4	1,3	49	0,43	A 749121
75	16	[0,630]	30	[1,181]	7	1,4	1,3	72	0,43	A 749125
100	18	[0,709]	40	[1,575]	7	0,45	0,6	100	0,92	A 749122
150	18	[0,709]	40	[1,575]	7	0,45	0,6	140	0,92	A 749126
220	25	[0,984]	40	[1,575]	7	0,25	0,3	215	1,5	A 749124
350	25	[0,984]	40	[1,575]	7	0,25	0,3	340	1,5	A 749127
47	14	[0,551]	30	[1,181]	10	1,3	1,2	49	0,41	A 749563
100	18	[0,709]	40	[1,575]	10	0,7	0,7	100	0,61	A 749560
150	18	[0,709]	30	[1,181]	10	0,6	0,6	148	0,7	A 749568
220	18	[0,709]	40	[1,575]	10	0,5	0,5	215	0,87	A 749561
330	21	[0,827]	40	[1,575]	10	0,3	0,3	321	1,2	A 749564
470	25	[0,984]	40	[1,575]	8	0,2	0,2	450	1,7	A 749565
1000	25	[0,984]	75	[2,953]	8	0,1	0,1	960	3,1	A 749567
<b>Rated voltage / Peak voltage: 250/275 V</b>										
10	10	[0,394]	19	[0,748]	8	11	10	19	0,1	A 748342
15	10	[0,394]	25	[0,984]	10	8,5	8,5	27	0,12	A 748343
22	14	[0,551]	30	[1,181]	6	2,5	2,3	37	0,3	A 749140
33	16	[0,630]	30	[1,181]	6	1,7	1,6	54	0,39	A 749141
47	18	[0,709]	30	[1,181]	6	1,1	1,1	74	0,52	A 749142
100	21	[0,827]	40	[1,575]	6	0,5	0,5	154	0,95	A 749143
22	12	[0,472]	25	[0,984]	7	3,4	3,8	37	0,22	A 748344
33	12	[0,472]	30	[1,181]	7	2	2,2	54	0,3	A 748345
47	14	[0,551]	30	[1,181]	7	1,5	1,5	74	0,38	A 749570
68	16	[0,630]	30	[1,181]	7	1,1	1,1	106	0,48	A 749573
100	18	[0,709]	30	[1,181]	7	0,7	0,7	154	0,64	A 749571
150	18	[0,709]	40	[1,575]	7	0,7	0,7	229	0,73	A 749574
220	21	[0,827]	40	[1,575]	7	0,5	0,50	334	0,95	A 749572
330	25	[0,984]	40	[1,575]	7	0,5	0,5	499	1	A 749575
470	25	[0,984]	75	[2,953]	7	0,1	0,1	709	3,1	A 749576
680	25	[0,984]	75	[2,953]	7	0,08	0,08	1020	3,50	A 749577
1000	25	[0,984]	75	[2,953]	7	0,07	0,07	1500	3,7	A 749578
<b>Rated voltage / Peak voltage: 350/385 V</b>										
6,8	10	[0,394]	19	[0,748]	7	10	10	18	0,1	A 748362
10	10	[0,394]	25	[0,984]	7	6	6	25	0,15	A 748363
15	14	[0,551]	30	[1,181]	6	3,2	3,2	36	0,26	A 749160
22	16	[0,630]	30	[1,181]	6	2,3	2,3	50	0,33	A 749161
33	18	[0,709]	30	[1,181]	6	1,2	1,2	73	0,49	A 749162
47	18	[0,709]	40	[1,575]	6	0,9	0,8	103	0,64	A 749163
15	12	[0,472]	25	[0,984]	6	3,8	3,8	36	0,2	A 748364
22	12	[0,472]	30	[1,181]	6	2,7	2,8	50	0,26	A 748365
33	14	[0,551]	30	[1,181]	6	2	2	73	0,33	A 749580
47	16	[0,630]	30	[1,181]	6	1,2	1,2	103	0,46	A 749581
100	21	[0,827]	40	[1,575]	6	0,5	0,5	214	0,94	A 749582
220	25	[0,984]	40	[1,575]	9	0,4	0,4	466	1,2	A 749585
470	25	[0,984]	75	[2,953]	9	0,3	0,3	991	1,8	A 749586

## SICAL C042 - SICAL

C0 42

10 000 h / 85°C

Capacitance ( $\mu\text{F}$ )	Dimensions		$\text{Tan}\delta$ 100 Hz +20°C max. (%)	ESR 100 Hz Typic ( $\Omega$ )	Z F(1) +20°C max. ( $\Omega$ )	II +20°C 5 min. max. ( $\mu\text{A}$ )	I ~ 100 Hz +85°C max. (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)								
Rated voltage / Peak voltage: 385/420 V										
6,8	10	(0,394)	19	(0,748)	10	20	22	20	0,07	A 748382
10	10	(0,394)	25	(0,984)	10	10,5	13	27	0,11	A 748383
15	12	(0,472)	25	(0,984)	10	4,5	5,5	39	0,19	A 748384
22	14	(0,551)	30	(1,181)	10	3,5	3,5	55	0,25	A 749590
33	16	(0,630)	30	(1,181)	10	1,9	1,9	80	0,37	A 749591
47	18	(0,709)	30	(1,181)	10	1,7	2	113	0,42	A 749592
100	21	(0,827)	40	(1,575)	10	0,8	1,1	235	0,75	A 749593
150	25	(0,984)	40	(1,575)	10	0,7	0,9	351	0,88	A 749597
220	25	(0,984)	50	(1,969)	10	0,5	0,9	512	1,2	A 749598
330	25	(0,984)	75	(2,953)	10	0,4	0,8	766	1,5	A 749599
Rated voltage / Peak voltage: 450/500 V										
6,8	10	(0,394)	19	(0,748)	13	24	26	330	0,07	A 748402
10	12	(0,472)	25	(0,984)	8	4,7	5,7	400	0,18	A 748403
10	14	(0,551)	30	(1,181)	8	5,5	4,5	400	0,2	A 749606
15	12	(0,472)	30	(1,181)	8	4	5	490	0,22	A 748405
15	14	(0,551)	30	(1,181)	8	4	3,5	490	0,24	A 749607
22	14	(0,551)	30	(1,181)	8	3,5	3,5	600	0,25	A 749600
33	16	(0,630)	30	(1,181)	9	3	3	730	0,29	A 749601
47	18	(0,709)	30	(1,181)	8	1,8	1,8	870	0,4	A 749602
100	21	(0,827)	40	(1,575)	9	0,9	0,9	1300	0,71	A 749603
150	25	(0,984)	40	(1,575)	10	0,7	0,7	1600	0,88	A 749608
220	25	(0,984)	50	(1,969)	10	0,5	0,5	1900	1,2	A 749609
330	25	(0,984)	75	(2,953)	10	0,4	0,4	2350	1,5	A 749610
Rated voltage / Peak voltage: 550/605 V										
15	18	(0,709)	40	(1,575)	7	3,5	3,5	540	0,33	A 749620
22	21	(0,827)	40	(1,575)	7	2,3	2,3	660	0,44	A 749621
33	25	(0,984)	40	(1,575)	7	1,5	1,5	810	0,6	A 749623
Rated voltage / Peak voltage: 630/695 V										
15	18	(0,591)	40	(1,575)	20	11	9	780	0,19	A 749640
22	21	(0,866)	40	(1,575)	20	7,5	5,8	940	0,24	A 749641
33	25	(1,299)	40	(1,575)	20	5,1	5,3	1150	0,33	A 749643

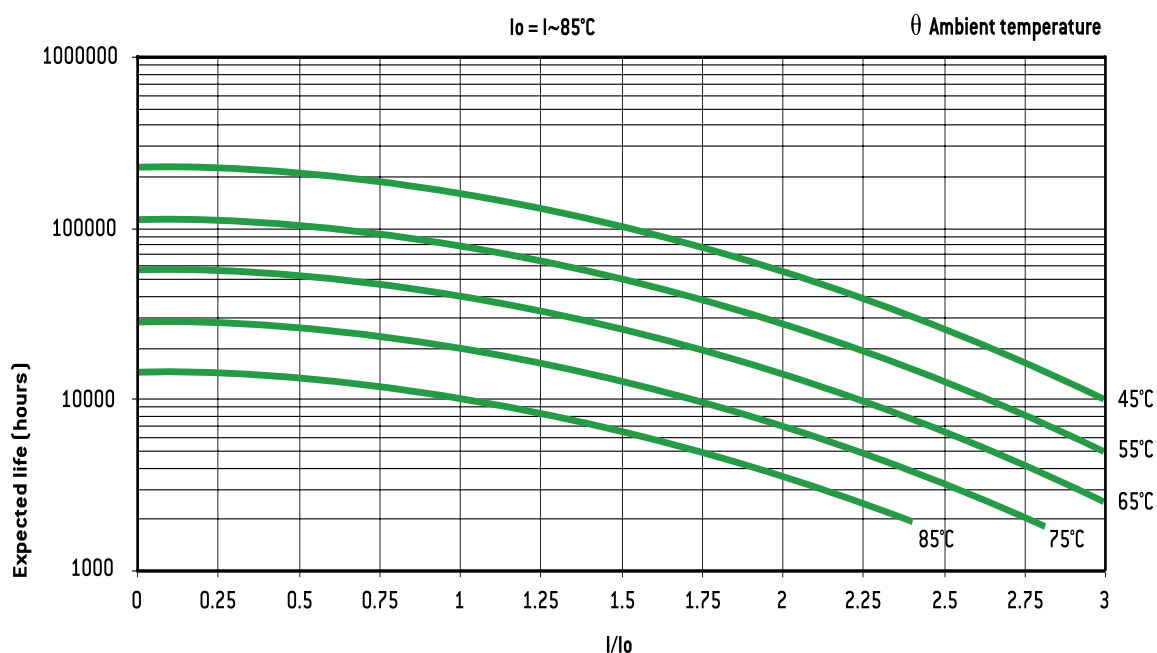
## EXPECTED LIFE

As a function of temperature and ripple current  
For  $\emptyset = 6,5$  mm half life time values are applicable.

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:  
I ~: permissible r.m.s. current at 100 Hz

f [Hz]	50	100	300	600	1 000	10 000	$\geq 50 000$
I	$0,8 \times I \sim$	$I \sim$	$1,2 \times I \sim$	$1,3 \times I \sim$	$1,35 \times I \sim$	$1,5 \times I \sim$	$1,6 \times I \sim$



# PRORELSIC 125

CO 52

5 000 h / 125°C

10 V ... 450 V	1 $\mu$ F ... 25 000 $\mu$ F	$\emptyset$ 6,5 (0,256) ... $\emptyset$ 25 (0,984)	- 55°C + 125°C	Long Life Time
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## APPLICATIONS

- Coupling / decoupling
- Smoothing
- Energy storage
- High frequency power supply system
- Telecommunication - military applications
- Mobile and aircraft installations

Insulating aluminum case

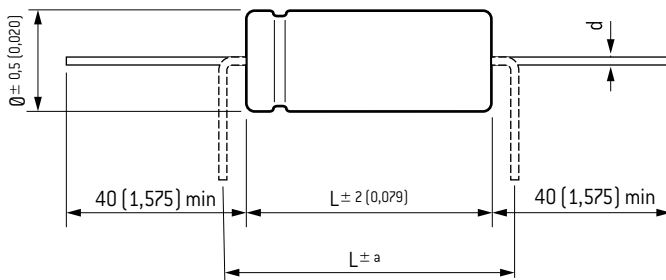
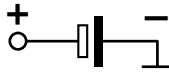
Axial tin coated copper leads

Welded chain, providing perfect continuity of the circuit.

Tolerance on capacitance at 20°C : - 10 + 50 %

(on request) : - 10 + 30 %

Operating temperature : - 55°C + 125°C



Dimensions in mm (inches)

## DIMENSIONS in mm (inches)

$\emptyset$		d		a	
6,5 - 18	(0,256 - 0,709)	0,8	(0,031)	4	(0,157)
21	(0,827)	1	(0,039)	4	(0,157)
25	(0,984)	1	(0,039)	8	(0,315)

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 2000 Hz
Amplitude	1,5 (0,059)
Acceleration	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h

## SPECIFICATIONS

NFC 83 110 - Model CO 52 - Long life

DIN 40040 FKD

DIN 41 257 - DIN 41 240

CECC 30 301-802 Issue 2

IEC 60 384.4 long life

Climatic category GPF: -55°C + 125°C / 56 days

Standard endurance test at  $U_R = 2000$  h / 125°C

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulating resistance at 20°C between leads and mounting hardware:  
100 M $\Omega$ Test voltage at 50 Hz 1 min. between leads and mounting hardware:  
1000 V

Fire resistance: self extinguish 30 s (IEC 60 695-2-2) without PVC.



5 000 h / 125°C

Capacitance [μF]	Dimensions		ESR		Z F(1) +20°C max. [Ω]	I +20°C 5 min. max. [μA]	I ~ 100 Hz		Code		
	Ø mm (inches)	L mm (inches)	Typic [Ω]	Max. [Ω]			+85°C max. [A]	+125°C max. [A]			
<b>Rated voltage 10 V</b>											
47	6,5	[0,256]	15	[0,591]	3,6	5,42	4	5	0,22	0,1	A 701020
68	6,5	[0,256]	19	[0,748]	2,5	3,74	2,8	7	0,29	0,13	A 701021
100	6,5	[0,256]	15	[0,591]	3,6	5,42	4	8	0,22	0,1	A 701029
100	8,5	[0,335]	19	[0,748]	1,5	2,25	1,6	8	0,43	0,19	A 701028
150	6,5	[0,256]	19	[0,748]	2,5	3,74	2,8	9	0,29	0,13	A 701030
150	8,5	[0,335]	19	[0,748]	1,35	2,03	1,1	9	0,46	0,2	A 701022
220	10	[0,394]	19	[0,748]	0,77	1,15	0,8	11	0,66	0,3	A 701023
300	8,5	[0,335]	19	[0,748]	1,35	2,03	1,1	13,5	0,46	0,2	A 701031
330	10	[0,394]	25	[0,984]	0,51	0,77	0,5	14	0,92	0,41	A 701024
420	10	[0,394]	19	[0,748]	0,77	1,15	0,8	16	0,66	0,3	A 701032
470	12	[0,472]	25	[0,984]	0,36	0,54	0,4	18	1,21	0,54	A 701025
600	10	[0,394]	25	[0,984]	0,51	0,77	0,5	19	0,92	0,41	A 701033
680	12	[0,472]	30	[1,181]	0,25	0,37	0,3	24	1,57	0,7	A 701026
800	12	[0,472]	25	[0,984]	0,36	0,54	0,4	24	1,21	0,54	A 701034
1000	14	[0,551]	30	[1,181]	0,21	0,31	0,21	34	1,87	0,84	A 701027
1200	12	[0,472]	30	[1,181]	0,25	0,37	0,3	36	1,57	0,7	A 701035
1500	16	[0,630]	30	[1,181]	0,14	0,21	0,19	50	2,02	0,9	A 703020
1700	14	[0,551]	30	[1,181]	0,21	0,31	0,21	51	1,87	0,84	A 703036
2200	18	[0,709]	30	[1,181]	0,11	0,17	0,14	70	3	1,33	A 703021
2400	16	[0,630]	30	[1,181]	0,14	0,21	0,19	72	2,02	0,9	A 703024
3100	18	[0,709]	30	[1,181]	0,11	0,17	0,14	93	3	1,33	A 703025
3300	18	[0,709]	40	[1,575]	0,09	0,13	0,1	100	3,7	1,7	A 703022
4700	21	[0,827]	40	[1,575]	0,06	0,09	0,08	150	5	2,2	A 703023
4800	18	[0,709]	40	[1,575]	0,09	0,13	0,1	150	3,7	1,7	A 703026
6800	25	[0,984]	40	[1,575]	0,05	0,07	0,06	200	6	2,7	A 703500
7000	21	[0,827]	40	[1,575]	0,06	0,09	0,08	210	5	2,2	A 703027
10000	25	[0,984]	40	[1,575]	0,05	0,07	0,06	300	6	2,7	A 703028
10000	25	[0,984]	50	[1,969]	0,033	0,05	0,05	300	8,2	3,7	A 703501
14000	25	[0,984]	50	[1,969]	0,033	0,05	0,05	420	8,2	3,7	A 703029
15000	25	[0,984]	75	[2,953]	0,027	0,04	0,04	450	10	4,9	A 703502
25000	25	[0,984]	75	[2,953]	0,027	0,04	0,04	660	10	4,9	A 703030
<b>Rated voltage 16 V</b>											
33	6,5	[0,256]	15	[0,591]	4,2	6,27	4	5	0,2	0,09	A 701040
47	6,5	[0,256]	19	[0,748]	2,9	4,4	3	8	0,27	0,12	A 701041
68	8,5	[0,335]	19	[0,748]	2	3,04	1,9	8	0,37	0,17	A 701042
100	6,5	[0,256]	15	[0,591]	4,2	6,27	4	9	0,2	0,09	A 701049
100	8,5	[0,335]	19	[0,748]	1,4	2,07	1,1	9	0,45	0,2	A 701043
150	6,5	[0,256]	19	[0,748]	2,9	4,4	3	11	0,27	0,12	A 701050
150	10	[0,394]	19	[0,748]	0,92	1,38	0,8	11	0,61	0,27	A 701044
220	10	[0,394]	25	[0,984]	0,63	0,94	0,6	15	0,83	0,37	A 701045
300	8,5	[0,335]	19	[0,748]	1,4	2,07	1,1	17	0,45	0,2	A 701052
330	12	[0,472]	25	[0,984]	0,41	0,62	0,4	20	1,14	0,51	A 701046
420	10	[0,394]	19	[0,748]	0,92	1,38	0,8	23	0,61	0,27	A 701053
470	12	[0,472]	30	[1,181]	0,33	0,5	0,3	27	1,37	0,61	A 701047
600	10	[0,394]	25	[0,984]	0,63	0,94	0,6	28	1,83	0,37	A 701054
680	14	[0,551]	30	[1,181]	0,25	0,37	0,23	37	1,71	0,77	A 701048
800	12	[0,472]	25	[0,984]	0,41	0,62	0,4	38	1,14	0,51	A 701055
1000	16	[0,630]	30	[1,181]	0,17	0,26	0,16	52	2,24	1	A 703040
1200	12	[0,472]	30	[1,181]	0,33	0,5	0,3	57	1,37	0,61	A 701056
1500	18	[0,709]	30	[1,181]	0,15	0,23	0,16	75	2,5	1,14	A 703041
1700	14	[0,551]	30	[1,181]	0,25	0,37	0,23	81	1,71	0,77	A 701057
2200	18	[0,709]	40	[1,575]	0,1	0,15	0,12	110	3,5	1,6	A 703042
2400	16	[0,630]	30	[1,181]	0,17	0,26	0,16	115	2,24	1	A 703044
3300	21	[0,827]	40	[1,575]	0,066	0,1	0,08	160	4,8	2,1	A 703043
4700	25	[0,984]	40	[1,575]	0,045	0,07	0,07	230	6,4	2,8	A 703510
6800	25	[0,984]	50	[1,969]	0,04	0,06	0,05	330	7,4	3,3	A 703511
10000	25	[0,984]	75	[2,953]	0,033	0,05	0,04	480	9,8	4,4	A 703512

(1) F = 10 kHz [C &gt; 1000 μF], F = 100 kHz [C ≤ 1000 μF]

Z typ = Z max / 2

## PRORELSIC 125

CO 52

5 000 h / 125°C

Capacitance ( $\mu\text{F}$ )	Dimensions		ESR		Z F(1) +20°C max. ( $\Omega$ )	II +20°C 5 min. max. ( $\mu\text{A}$ )	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm (inches)	L mm (inches)	Typic ( $\Omega$ )	Max. ( $\Omega$ )			+85°C max. (A)	+125°C max. (A)			
<b>Rated voltage 25 V</b>											
15	6,5	[0,256]	15	[0,591]	6,4	10,61	4	4	0,16	0,07	A 701060
22	6,5	[0,256]	19	[0,748]	4,3	7,23	3	6	0,22	0,1	A 701061
47	8,5	[0,335]	19	[0,748]	1,7	2,85	1,6	8	0,26	0,11	A 701068
63	6,5	[0,256]	15	[0,591]	6,4	10,61	4	19	0,16	0,07	A 701069
68	10	[0,394]	19	[0,748]	1,4	2,34	1,2	9	0,44	0,2	A 701062
90	6,5	[0,256]	19	[0,748]	4,3	7,23	3	11	0,22	0,1	A 701070
100	10	[0,394]	19	[0,748]	0,95	1,59	0,8	12	0,6	0,27	A 701063
120	10	[0,394]	19	[0,748]	1,4	2,34	1,2	13	0,44	0,2	A 701072
150	10	[0,394]	25	[0,984]	0,63	1,06	0,6	15	0,83	0,37	A 701064
170	8,5	[0,335]	19	[0,748]	1,7	2,85	1,6	16	0,26	0,11	A 701071
220	12	[0,472]	25	[0,984]	0,48	0,72	0,48	21	1,05	0,47	A 701065
240	10	[0,394]	19	[0,748]	0,95	1,59	0,8	21	0,6	0,27	A 701073
330	12	[0,472]	30	[1,181]	0,32	0,48	0,36	29	1,39	0,62	A 701066
350	10	[0,394]	25	[0,984]	0,63	1,06	0,6	29	0,83	0,37	A 701074
460	12	[0,472]	25	[0,984]	0,48	1,72	0,48	39	1,05	0,47	A 701075
470	14	[0,551]	30	[1,181]	0,29	0,44	0,26	39	1,59	0,71	A 701067
680	16	[0,630]	30	[1,181]	0,2	0,3	0,23	55	2,1	0,92	A 703060
700	12	[0,472]	30	[1,181]	0,32	0,48	0,36	55	1,39	0,62	A 701076
1000	18	[0,709]	30	[1,181]	0,15	0,24	0,14	80	2,5	1,14	A 703061
1500	18	[0,709]	40	[1,575]	0,1	0,15	0,1	120	3,5	1,59	A 703062
2200	21	[0,827]	40	[1,575]	0,066	0,1	0,08	170	4,8	2,1	A 703063
3300	25	[0,984]	40	[1,575]	0,045	0,07	0,06	250	6,4	2,8	A 703520
3600	21	[0,827]	40	[1,575]	0,066	0,1	0,08	250	4,8	2,1	A 703064
4700	25	[0,984]	50	[1,969]	0,04	0,06	0,05	360	7,4	3,3	A 703521
6800	25	[0,984]	75	[2,953]	0,033	0,05	0,04	510	9,8	4,4	A 703522
<b>Rated voltage 40 V</b>											
10	6,5	[0,256]	15	[0,591]	8	12,7	5,2	4	0,15	0,07	A 701080
15	6,5	[0,256]	19	[0,748]	5,3	8,49	3,9	6	0,2	0,09	A 701081
32	6,5	[0,256]	15	[0,591]	8	12,7	5,2	8	0,15	0,07	A 701089
33	8,5	[0,335]	19	[0,748]	2,4	3,86	2	8	0,34	0,15	A 701082
44	6,5	[0,256]	19	[0,748]	5,3	8,49	3,9	10	0,2	0,09	A 701090
44	8,5	[0,335]	19	[0,748]	2,4	3,86	2	10	0,34	0,15	A 701091
47	8,5	[0,335]	19	[0,748]	1,7	2,71	1,4	10	0,41	0,18	A 701083
68	10	[0,394]	19	[0,748]	1,2	1,87	1	12	0,53	0,24	A 701084
85	8,5	[0,335]	19	[0,748]	1,7	2,71	1,4	14	0,41	0,18	A 701092
100	10	[0,394]	25	[0,984]	0,8	1,27	0,78	16	0,73	0,33	A 701085
120	10	[0,394]	19	[0,748]	1,2	1,87	1	17	0,53	0,24	A 701093
150	12	[0,472]	25	[0,984]	0,53	0,84	0,52	22	1	0,44	A 701086
170	10	[0,394]	25	[0,984]	0,8	1,27	0,78	22	0,73	0,33	A 701094
220	12	[0,472]	30	[1,181]	0,36	0,57	0,38	30	1,31	0,59	A 701087
230	12	[0,472]	25	[0,984]	0,53	0,84	0,52	30	1	0,44	A 701095
330	14	[0,551]	30	[1,181]	0,32	0,48	0,3	44	1,51	0,68	A 701088
340	12	[0,472]	30	[1,181]	0,36	0,57	0,38	44	1,31	0,59	A 701096
470	16	[0,630]	30	[1,181]	0,23	0,34	0,25	60	1,9	0,86	A 703080
680	18	[0,709]	30	[1,181]	0,15	0,23	0,16	86	2,5	1,14	A 703081
1000	18	[0,709]	40	[1,575]	0,11	0,17	0,12	120	3,4	1,51	A 703082
1500	21	[0,827]	40	[1,575]	0,073	0,11	0,1	180	4,5	2	A 703083
2200	25	[0,984]	40	[1,575]	0,053	0,08	0,06	270	5,9	2,6	A 703530
3300	25	[0,984]	50	[1,969]	0,04	0,06	0,05	400	7,4	3,3	A 703531
4700	25	[0,984]	75	[2,953]	0,033	0,05	0,04	570	9,8	4,4	A 703532

(1) F = 10 kHz (C > 1000  $\mu\text{F}$ ), F = 100 kHz (C  $\leq$  1000  $\mu\text{F}$ )  
 Z typ = Z max / 2

5 000 h / 125°C

Capacitance [ $\mu$ F]	Dimensions		ESR		Z F(1) +20°C max. [ $\Omega$ ]	I +20°C 5 min. max. [ $\mu$ A]	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm (inches)	L mm (inches)	Typic [ $\Omega$ ]	Max. [ $\Omega$ ]			+85°C max. [A]	+125°C max. [A]			
<b>Rated voltage 63 V</b>											
4,7	6,5	[0,256]	15	[0,591]	9	18	4	3	0,12	0,06	A 701100
10	6,5	[0,256]	19	[0,748]	6,4	11,1	3	6	0,18	0,08	A 701101
15	8,5	[0,335]	19	[0,748]	2,9	5,24	1,6	9	0,31	0,14	A 701102
21	6,5	[0,256]	15	[0,591]	9	18	4	9	0,12	0,06	A 701108
22	8,5	[0,335]	19	[0,748]	2,1	4,2	1,2	9	0,36	0,16	A 701103
28	6,5	[0,256]	19	[0,748]	6,4	11,1	3	9	0,18	0,08	A 701109
28	8,5	[0,335]	19	[0,748]	2,9	5,24	1,6	9	0,31	0,14	A 701110
33	10	[0,394]	19	[0,748]	1,1	2,2	0,8	10	0,56	0,24	A 701104
47	10	[0,394]	25	[0,984]	0,9	1,8	0,6	13	0,69	0,31	A 701105
56	8,5	[0,335]	19	[0,748]	2,1	4,2	1,2	14	0,36	0,16	A 701111
68	10	[0,394]	25	[0,984]	0,7	1,4	0,5	17	0,78	0,35	A 701106
78	10	[0,394]	19	[0,748]	1,1	2,2	0,8	18	0,56	0,24	A 701112
100	12	[0,472]	30	[1,181]	0,4	0,8	0,3	23	1,24	0,56	A 701107
110	10	[0,394]	25	[0,984]	0,7	1,4	0,5	24	0,78	0,35	A 701113
220	16	[0,630]	30	[1,181]	0,27	0,41	0,3	46	1,78	0,8	A 703100
220	12	[0,472]	30	[1,181]	0,4	0,8	0,3	46	1,24	0,56	A 701114
330	18	[0,709]	30	[1,181]	0,2	0,3	0,2	66	2,2	0,99	A 703101
470	18	[0,709]	40	[1,575]	0,13	0,2	0,13	93	3,1	1,4	A 703102
550	16	[0,630]	30	[1,181]	0,27	0,41	0,3	100	1,78	0,8	A 703104
680	21	[0,827]	40	[1,575]	0,1	0,15	0,1	130	3,9	1,73	A 703103
1000	25	[0,984]	40	[1,575]	0,07	0,11	0,08	190	5,1	2,3	A 703540
1500	25	[0,984]	50	[1,969]	0,05	0,08	0,06	290	6,6	3	A 703541
2200	25	[0,984]	75	[2,953]	0,045	0,07	0,05	420	8,4	3,8	A 703542
<b>Rated voltage 100 V</b>											
2,2	6,5	[0,256]	15	[0,591]	15	30	8	2	0,11	0,05	A 701120
4,7	6,5	[0,256]	19	[0,748]	9	15	4,5	5	0,15	0,07	A 701121
6,8	8,5	[0,335]	19	[0,748]	6	10	3	7	0,22	0,1	A 701122
8	6,5	[0,256]	15	[0,591]	15	30	8	8	0,11	0,05	A 701129
10	8,5	[0,335]	19	[0,748]	5,1	8,8	2,3	10	0,23	0,1	A 701123
12	6,5	[0,256]	19	[0,748]	9	15	4,5	10	0,15	0,07	A 701130
15	10	[0,394]	19	[0,748]	3,6	6,5	2	10	0,31	0,14	A 701124
22	10	[0,394]	19	[0,748]	2,5	4,4	1,4	11	0,37	0,16	A 701125
22	8,5	[0,335]	19	[0,748]	5,1	8,8	2,3	11	0,23	0,1	A 701131
33	10	[0,394]	19	[0,748]	2,5	4,4	1,4	14	0,37	0,16	A 701132
33	12	[0,472]	25	[0,984]	1,6	2,8	1,2	14	0,58	0,26	A 701126
47	12	[0,472]	30	[1,181]	1,2	1,8	1	18	0,72	0,32	A 701127
61	12	[0,472]	25	[0,984]	1,6	2,8	1,2	19	0,58	0,26	A 701133
68	14	[0,551]	30	[1,181]	0,9	1,4	0,7	24	0,9	0,4	A 701128
92	12	[0,472]	30	[1,181]	1,2	1,8	1	27	0,72	0,32	A 701134
100	16	[0,630]	30	[1,181]	0,5	0,75	0,5	34	1,31	0,58	A 703120
140	14	[0,551]	30	[1,181]	0,9	1,4	0,7	42	0,9	0,4	A 701135
150	16	[0,630]	30	[1,181]	0,4	0,6	0,4	49	1,46	0,65	A 703123
220	18	[0,709]	40	[1,575]	0,2	0,3	0,2	70	2,5	1,12	A 703121
220	16	[0,630]	30	[1,181]	0,4	0,6	0,4	70	1,46	0,65	A 703124
310	18	[0,709]	40	[1,575]	0,2	0,3	0,2	100	2,5	1,12	A 703125
330	21	[0,827]	40	[1,575]	0,15	0,22	0,15	100	3,2	1,41	A 703122
370	21	[0,827]	40	[1,575]	0,15	0,22	0,15	111	3,2	1,41	A 703126
470	25	[0,984]	40	[1,575]	0,12	0,18	0,12	150	3,9	1,74	A 703550
670	25	[0,984]	40	[1,575]	0,12	0,18	0,12	200	3,9	1,74	A 703127
680	25	[0,984]	50	[1,969]	0,1	0,15	0,1	200	4,7	2,1	A 703128
900	25	[0,984]	50	[1,969]	0,1	0,15	0,1	270	4,7	2,1	A 703130
1000	25	[0,984]	75	[2,953]	0,07	0,1	0,06	300	6,8	3	A 703552
1100	25	[0,984]	75	[2,953]	0,07	0,1	0,06	330	6,8	3	A 703131
2200	25	[0,984]	75	[2,953]	0,04	0,06	0,04	660	8,9	4	A 703553

(1) F = 10 kHz (C > 1000  $\mu$ F), F = 100 kHz (C  $\leq$  1000  $\mu$ F)  
 $Z_{typ} = Z_{max} / 2$

## PRORELSIC 125

CO 52

5 000 h / 125°C

Capacitance ( $\mu\text{F}$ )	Dimensions		ESR		Z F(1) +20°C max. ( $\Omega$ )	II +20°C 5 min. max. ( $\mu\text{A}$ )	I $\sim$ 100 Hz		Code		
	$\emptyset$ mm (inches)	L mm (inches)	Typic ( $\Omega$ )	Max. ( $\Omega$ )			+85°C max. (A)	+125°C max. (A)			
<b>Rated voltage 160 V</b>											
1	6,5	[0,256]	15	[0,591]	53	105	18	2	0,06	0,03	A 701140
2	6,5	[0,256]	15	[0,591]	53	105	18	4	0,06	0,03	A 701149
2,2	6,5	[0,256]	19	[0,748]	24	48	12	4	0,09	0,04	A 701141
3	6,5	[0,256]	19	[0,748]	24	48	12	5	0,09	0,04	A 701150
3,3	8,5	[0,335]	19	[0,748]	15	30	6,6	5	0,14	0,06	A 701142
4,7	10	[0,394]	19	[0,748]	8	16	4,6	8	0,2	0,09	A 701143
6	8,5	[0,335]	19	[0,748]	15	30	6,6	10	0,14	0,06	A 701151
6,8	10	[0,394]	25	[0,984]	6	12	3,2	11	0,27	0,12	A 701144
8	10	[0,394]	19	[0,748]	8	16	4,6	12	0,2	0,09	A 701152
10	12	[0,472]	25	[0,984]	5	10	2,4	14	0,33	0,15	A 701145
11	10	[0,394]	25	[0,984]	6	12	3,2	14	0,27	0,12	A 701153
15	12	[0,472]	25	[0,984]	5	10	2,4	18	0,33	0,15	A 701154
15	12	[0,472]	30	[1,181]	3,5	7	1,8	18	0,42	0,19	A 701146
22	12	[0,472]	30	[1,181]	3,5	7	1,8	25	0,42	0,19	A 701155
22	14	[0,551]	30	[1,181]	2,8	5,6	1,1	25	0,51	0,23	A 701147
33	14	[0,551]	30	[1,181]	1,8	2,7	1	36	0,64	0,29	A 701148
47	18	[0,709]	40	[1,575]	1,1	1,7	0,65	45	1,07	0,48	A 703140
68	21	[0,827]	40	[1,575]	0,8	1,2	0,44	65	1,38	0,61	A 703141
100	25	[0,984]	40	[1,575]	0,4	0,6	0,3	100	2,1	0,95	A 703560
150	25	[0,984]	50	[1,969]	0,3	0,5	0,25	140	2,7	1,21	A 703561
220	25	[0,984]	75	[2,953]	0,2	0,3	0,2	210	4	1,79	A 703562
470	25	[0,984]	75	[2,953]	0,12	0,2	0,13	450	5,2	2,3	A 703563
<b>Rated voltage 250 V</b>											
15	18	[0,709]	30	[1,181]	3,3	5	2	25	0,54	0,24	A 703160
22	18	[0,709]	30	[1,181]	2,5	3,8	1,5	37	0,62	0,28	A 703165
33	18	[0,709]	40	[1,575]	1,5	2,3	1	50	0,92	0,41	A 703161
47	25	[0,984]	40	[1,575]	0,9	1,4	0,8	70	1,42	0,64	A 703570
68	25	[0,984]	50	[1,969]	0,73	1,1	0,6	100	1,75	0,78	A 703571
100	25	[0,984]	75	[2,953]	0,45	0,7	0,3	150	2,7	1,2	A 703572
<b>Rated voltage 350 V</b>											
10	18	[0,709]	30	[1,181]	4,2	6,3	3,9	120	0,48	0,22	A 703181
15	18	[0,709]	30	[1,181]	3	4,5	2,7	140	0,57	0,25	A 703184
22	18	[0,709]	40	[1,575]	2	2,9	1,8	180	0,79	0,35	A 703182
30	18	[0,709]	30	[1,181]	3	4,5	2,7	200	0,57	0,25	A 703185
33	21	[0,827]	40	[1,575]	1,3	1,9	1	210	1,07	0,48	A 703183
41	18	[0,709]	40	[1,575]	2	2,9	1,8	230	0,79	0,35	A 703186
47	25	[0,984]	40	[1,575]	1,1	1,7	0,8	250	1,3	0,57	A 703580
100	25	[0,984]	40	[1,575]	1,1	1,7	0,8	450	1,3	0,57	A 703187
<b>Rated voltage 450 V</b>											
6,8	16	[0,630]	30	[1,181]	15	23	5	110	0,24	0,11	A 703210
6,8	18	[0,709]	30	[1,181]	8	12	5	110	0,34	0,16	A 703201
10	16	[0,630]	30	[1,181]	5,5	8,5	4	130	0,39	0,18	A 703211
10	18	[0,709]	30	[1,181]	5,5	8,5	4	130	0,42	0,19	A 703203
15	16	[0,630]	30	[1,181]	15	23	5	160	0,24	0,11	A 703212
15	18	[0,709]	40	[1,575]	4	6	2,7	160	0,56	0,25	A 703204
22	18	[0,709]	30	[1,181]	5,5	8,5	4	200	0,42	0,19	A 703213
22	18	[0,709]	40	[1,575]	3,3	5	2	200	0,62	0,28	A 703208
22	21	[0,827]	40	[1,575]	2,7	4,1	2	200	0,74	0,33	A 703205
33	18	[0,709]	40	[1,575]	4	6	2,7	250	0,56	0,25	A 703214
33	25	[0,984]	40	[1,575]	1,7	2,5	1,5	250	1,03	0,46	A 703590
47	25	[0,984]	40	[1,575]	1,1	1,7	1	300	1,3	0,57	A 703591
50	21	[0,827]	40	[1,575]	2,7	4,1	2	330	0,74	0,33	A 703215

(1) F = 10 kHz (C > 1000  $\mu\text{F}$ ), F = 100 kHz (C  $\leq$  1000  $\mu\text{F}$ )

Z typ = Z max / 2

## PRORELSIC 125

C0 52

5 000 h / 125°C

## PEAK VOLTAGE (V)

 $U_R$ : rated voltage $U_p$ : Repetitive standard peak voltage (30 s) $U_s$ : Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

$U_R$	10 V	16 V	25 V	40 V	63 V	100 V	160 V	250 V	350 V	450 V
$U_p$	12	18	29	46	72	115	184	288	385	495
$U_s$							235	340	540	620*

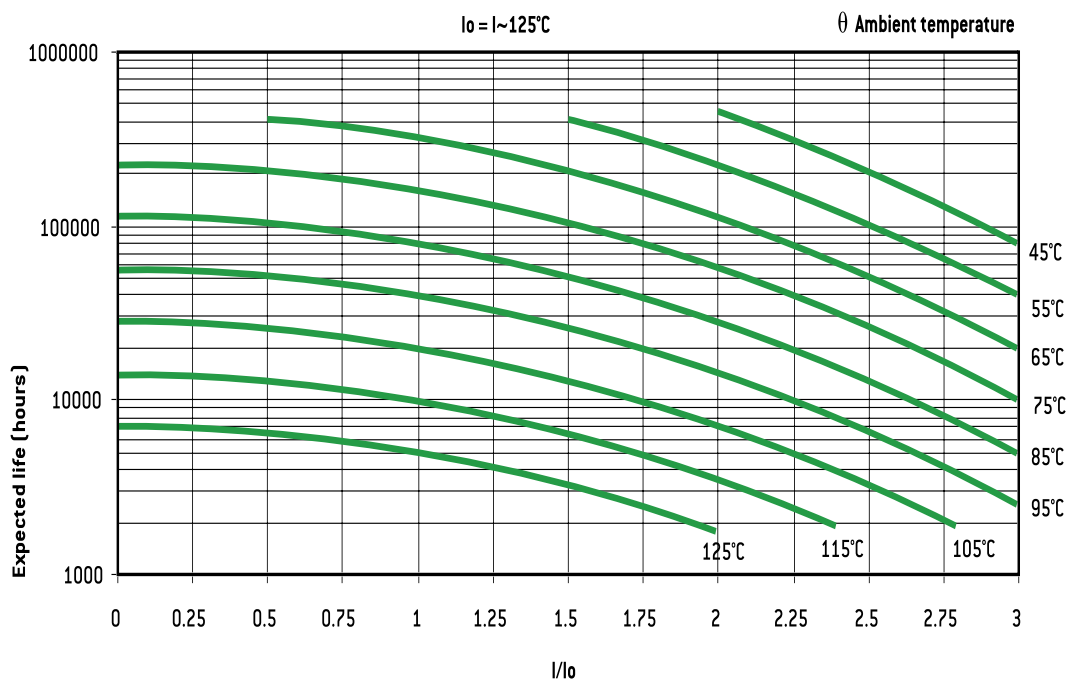
## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency  $f$ : $I_{\sim}$ : permissible r.m.s. current at 100 Hz

$f$ (Hz)	50	100	300	600	1 000	10 000	$\geq 50$ 000
$I_{\sim}$	$0,8 \times I_{\sim}$	$I_{\sim}$	$1,2 \times I_{\sim}$	$1,3 \times I_{\sim}$	$1,35 \times I_{\sim}$	$1,5 \times I_{\sim}$	$1,6 \times I_{\sim}$

## EXPECTED LIFE

As a function of temperature and ripple current

For  $\varnothing = 6,5$  mm half life time values are applicable.

# PRORELSIC 145

2 000 h / 145°C

16 V ... 450 V	6,8 μF ... 25 000 μF	∅ 14 (0,551) ... ∅ 25 (0,984)	- 55°C + 145°C	Long Life Time
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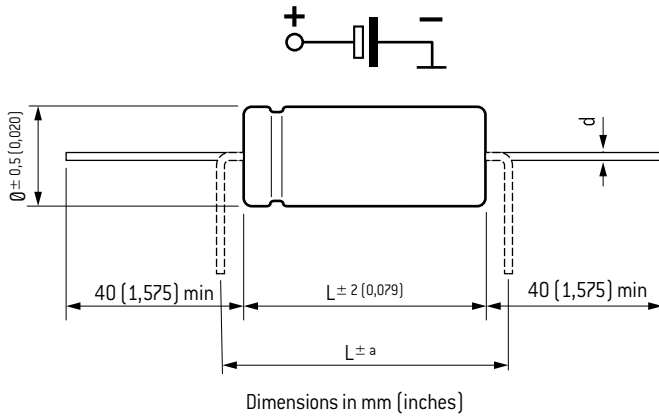


## APPLICATIONS

- Coupling / decoupling
- Smoothing
- Energy storage
- High frequency power supply system
- Telecommunication - Military applications
- Mobile and aircraft installations
- Rated voltage 450 V is specially fit to lamp electronic ballast circuits.

Insulating aluminum case  
 Axial tin coated copper leads  
 Welded chain providing perfect continuity of the circuit.

Tolerance on capacitance at 20°C : - 10 + 50%  
 (on request) : - 10 + 30 %  
 Operating temperature : - 55°C + 145°C (up to 150°C)



### DIMENSIONS in mm (inches)

	∅	d	a
14 to 18	(0,551) to (0,709)	0,8 (0,031)	4 (0,157)
21	(0,827)	1 (0,039)	4 (0,157)
25	(0,984)	1 (0,039)	8 (0,315)

### RESISTANCE TO VIBRATIONS

Hb mm (inches)	
f [Hz]	10 - 2000 Hz
Amplitude	1,5 (0,059)
Acceleration	20 g - 196 m/s <sup>2</sup>
t (h)	3 x 2 h

## SPECIFICATIONS

NFC 83 110 - Long life  
 CECC 30 301-802 Issue 2  
 IEC 60 384.4 long life  
 Climatic category GPF: -55°C + 145°C / 56 days

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulating resistance at 20°C between leads and mounting hardware: 100 MΩ  
 Test voltage at 50 Hz 1 min. between leads and mounting hardware: 1000 V  
 Fire resistance: self extinguish 30 s (IEC 60 695-2-2) without PVC.

## PRORELSIC 145

2 000 h / 145°C

Capacitance [ $\mu$ F]	Dimensions		ESR		Z F(1) +20°C max. [ $\Omega$ ]	I +20°C 5 min. max. [ $\mu$ A]	I ~ 100 Hz +145°C max. [A]	Code		
	$\emptyset$ mm (inches)	L mm (inches)	Typic [ $\Omega$ ]	Max. [ $\Omega$ ]						
<b>Rated voltage 16 V</b>										
680	14	[0,551]	30	[1,181]	0,25	0,37	0,23	37	0,77	A 708000
1000	16	[0,630]	30	[1,181]	0,17	0,26	0,16	52	1	A 708001
1500	14	[0,551]	30	[1,181]	0,25	0,23	0,23	75	0,77	A 708008
1500	18	[0,709]	30	[1,181]	0,15	0,23	0,16	75	1,14	A 708002
2200	16	[0,630]	30	[1,181]	0,17	0,26	0,16	110	1	A 708009
2200	18	[0,709]	40	[1,575]	0,1	0,15	0,12	110	1,6	A 708003
3300	18	[0,709]	30	[1,181]	0,15	0,23	0,16	160	1,14	A 708010
3300	21	[0,827]	40	[1,575]	0,066	0,1	0,08	160	2,1	A 708004
4700	18	[0,709]	40	[1,575]	0,1	0,15	0,12	230	1,6	A 708011
4700	25	[0,984]	40	[1,575]	0,045	0,07	0,07	230	2,8	A 708005
6800	25	[0,984]	50	[1,969]	0,04	0,06	0,05	330	3,3	A 708006
6800	21	[0,827]	40	[1,575]	0,066	0,1	0,08	330	2,1	A 708012
10000	25	[0,984]	40	[1,575]	0,045	0,07	0,07	480	2,8	A 708013
10000	25	[0,984]	75	[2,953]	0,033	0,05	0,04	480	4,4	A 708007
15000	25	[0,984]	50	[1,969]	0,04	0,06	0,05	720	3,3	A 708014
25000	25	[0,984]	75	[2,953]	0,033	0,05	0,04	1200	4,4	A 708015
<b>Rated voltage 25 V</b>										
470	14	[0,551]	30	[1,181]	0,29	0,44	0,26	39	0,71	A 708020
680	16	[0,630]	30	[1,181]	0,2	0,3	0,23	55	0,92	A 708021
1000	14	[0,551]	30	[1,181]	0,29	0,44	0,26	80	0,71	A 708028
1000	18	[0,709]	30	[1,181]	0,15	0,24	0,14	80	1,14	A 708022
1500	18	[0,709]	40	[1,575]	0,1	0,15	0,1	120	1,59	A 708023
1500	16	[0,630]	30	[1,181]	0,2	0,3	0,23	120	0,92	A 708029
2000	18	[0,709]	30	[1,181]	0,15	0,24	0,14	150	1,14	A 708030
2200	21	[0,827]	40	[1,575]	0,08	0,12	0,08	170	1,93	A 708024
3000	18	[0,709]	40	[1,575]	0,1	0,15	0,1	225	1,59	A 708031
3300	25	[0,984]	40	[1,575]	0,065	0,1	0,06	250	2,4	A 708025
4500	21	[0,827]	40	[1,575]	0,08	0,12	0,08	330	1,93	A 708032
4700	25	[0,984]	50	[1,969]	0,045	0,07	0,05	360	3,1	A 708026
6800	25	[0,984]	40	[1,575]	0,065	0,1	0,06	510	2,4	A 708033
6800	25	[0,984]	75	[2,953]	0,04	0,06	0,04	510	4	A 708027
9000	25	[0,984]	50	[1,969]	0,045	0,07	0,05	670	3,1	A 708034
14000	25	[0,984]	75	[2,953]	0,04	0,06	0,04	1050	4	A 708035
<b>Rated voltage 40 V</b>										
330	14	[0,551]	30	[1,181]	0,32	0,48	0,3	44	0,68	A 708040
470	16	[0,630]	30	[1,181]	0,23	0,34	0,25	60	0,86	A 708041
680	14	[0,551]	30	[1,181]	0,32	0,48	0,3	86	0,68	A 708048
680	18	[0,709]	30	[1,181]	0,15	0,23	0,16	86	1,14	A 708042
1000	16	[0,630]	30	[1,181]	0,23	0,34	0,25	120	0,86	A 708049
1000	16	[0,630]	40	[1,575]	0,11	0,17	0,12	120	1,51	A 708043
1200	18	[0,709]	30	[1,181]	0,15	0,23	0,16	140	1,14	A 708050
1500	21	[0,827]	40	[1,575]	0,073	0,11	0,1	180	2	A 708044
2100	18	[0,709]	40	[1,575]	0,11	0,17	0,12	250	1,51	A 708051
2200	25	[0,984]	40	[1,575]	0,053	0,08	0,09	270	2,6	A 708045
3000	21	[0,827]	40	[1,575]	0,073	0,11	0,1	360	2	A 708052
3300	25	[0,984]	50	[1,969]	0,04	0,06	0,05	400	3,3	A 708046
4500	25	[0,984]	40	[1,575]	0,053	0,08	0,09	540	2,6	A 708053
4700	25	[0,984]	75	[2,953]	0,033	0,05	0,05	570	4,4	A 708047
6300	25	[0,984]	50	[1,969]	0,04	0,06	0,05	750	3,3	A 708054
10000	25	[0,984]	75	[2,953]	0,033	0,05	0,05	1200	4,4	A 708055

(1) F = 10 kHz [C > 1000  $\mu$ F], F = 100 kHz [C  $\leq$  1000  $\mu$ F]

Z typ = Z max / 2



## PRORELSIC 145

2 000 h / 145°C

Capacitance ( $\mu\text{F}$ )	Dimensions		ESR		Z F(1) +20°C max. ( $\Omega$ )	II +20°C 5 min. max. ( $\mu\text{A}$ )	I ~ 100 Hz +145°C max. (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)	Typic ( $\Omega$ )	Max. ( $\Omega$ )						
<b>Rated voltage 63 V</b>										
220	16	[0,630]	30	[1,181]	0,27	0,41	0,3	46	0,8	A 708061
330	18	[0,709]	30	[1,181]	0,2	0,3	0,2	66	0,99	A 708062
470	18	[0,709]	40	[1,575]	0,13	0,2	0,13	93	1,4	A 708063
500	16	[0,630]	30	[1,181]	0,27	0,41	0,3	95	0,8	A 708068
680	21	[0,827]	40	[1,575]	0,1	0,15	0,1	130	1,73	A 708064
700	18	[0,709]	30	[1,181]	0,2	0,3	0,2	130	0,99	A 708069
1000	18	[0,709]	40	[1,575]	0,13	0,2	0,13	190	1,4	A 708070
1000	25	[0,984]	40	[1,575]	0,07	0,11	0,08	190	2,3	A 708065
1500	21	[0,827]	40	[1,575]	0,1	0,15	0,1	290	1,73	A 708071
1500	25	[0,984]	50	[1,969]	0,065	0,1	0,06	290	3	A 708066
2200	25	[0,984]	75	[2,953]	0,06	0,09	0,05	420	3,8	A 708067
2400	25	[0,984]	40	[1,575]	0,07	0,11	0,08	450	2,3	A 708072
3200	25	[0,984]	50	[1,969]	0,065	0,1	0,06	600	3	A 708073
5200	25	[0,984]	75	[2,953]	0,06	0,09	0,05	490	3,8	A 708074
<b>Rated voltage 100 V</b>										
100	16	[0,630]	30	[1,181]	1	1,5	0,77	34	0,41	A 708081
180	16	[0,630]	30	[1,181]	1	1,5	0,77	54	0,41	A 708090
220	18	[0,709]	40	[1,575]	0,4	0,6	0,4	70	0,8	A 708083
310	18	[0,709]	40	[1,575]	0,4	0,6	0,4	90	0,8	A 708091
330	21	[0,827]	40	[1,575]	0,3	0,45	0,3	100	1	A 708084
450	21	[0,827]	40	[1,575]	0,3	0,45	0,3	135	1	A 708092
470	25	[0,984]	40	[1,575]	0,2	0,3	0,25	150	1,35	A 708085
680	25	[0,984]	40	[1,575]	0,2	0,3	0,25	210	1,35	A 708093
680	25	[0,984]	50	[1,969]	0,18	0,27	0,2	210	1,6	A 708086
900	25	[0,984]	50	[1,969]	0,18	0,27	0,2	270	1,6	A 708094
1000	25	[0,984]	75	[2,953]	0,13	0,2	0,12	300	2,2	A 708087
2200	25	[0,984]	75	[2,953]	0,07	0,11	0,08	660	3	A 708089
2600	25	[0,984]	75	[2,953]	0,07	0,11	0,08	780	3	A 708095
<b>Rated voltage 160 V</b>										
22	14	[0,551]	30	[1,181]	2,8	5,6	1,1	25	0,23	A 708100
38	14	[0,551]	30	[1,181]	2,8	5,6	1,1	36	0,23	A 708110
47	18	[0,709]	40	[1,575]	1,1	1,7	0,65	45	0,48	A 708103
68	21	[0,827]	40	[1,575]	0,8	1,2	0,44	65	0,61	A 708104
100	18	[0,709]	40	[1,575]	1,1	1,7	0,65	100	0,48	A 708111
100	25	[0,984]	40	[1,575]	0,4	0,6	0,3	100	0,95	A 708105
150	25	[0,984]	50	[1,969]	0,3	0,5	0,25	140	1,21	A 708106
160	21	[0,827]	40	[1,575]	0,8	1,2	0,44	150	0,61	A 708112
220	25	[0,984]	75	[2,953]	0,2	0,3	0,2	210	1,79	A 708107
250	25	[0,984]	40	[1,575]	0,4	0,6	0,3	240	0,95	A 708113
330	25	[0,984]	50	[1,969]	0,3	0,5	0,25	310	1,21	A 708114
470	25	[0,984]	75	[2,953]	0,12	0,2	0,13	450	2,3	A 708109
530	25	[0,984]	75	[2,953]	0,12	0,2	0,13	500	2,3	A 708115
<b>Rated voltage 250 V</b>										
15	18	[0,709]	30	[1,181]	3,3	5	2	25	0,24	A 708122
33	18	[0,709]	40	[1,575]	1,5	2,3	1	50	0,41	A 708123
40	18	[0,709]	30	[1,181]	3,3	5	2	60	0,24	A 708130
47	25	[0,984]	40	[1,575]	0,9	1,4	0,8	70	0,64	A 708125
62	18	[0,709]	40	[1,575]	1,5	2,3	1	93	0,41	A 708131
68	25	[0,984]	50	[1,969]	0,73	1,1	0,6	100	0,78	A 708126
100	25	[0,984]	75	[2,953]	0,45	0,7	0,3	150	1,2	A 708127
135	25	[0,984]	40	[1,575]	0,9	1,4	0,8	200	0,64	A 708132
180	25	[0,984]	50	[1,969]	0,73	1,1	0,6	270	0,78	A 708133
220	25	[0,984]	75	[2,953]	0,3	0,45	0,25	330	1,45	A 708129
280	25	[0,984]	75	[2,953]	0,3	0,45	0,25	330	1,45	A 708134

(1) F = 10 kHz (C > 1000  $\mu\text{F}$ ), F = 100 kHz (C  $\leq$  1000  $\mu\text{F}$ )  
 $Z_{\text{typ}} = Z_{\text{max}} / 2$

## PRORELSIC 145

2 000 h / 145°C

Capacitance [ $\mu\text{F}$ ]	Dimensions		ESR		Z F(1) +20°C max. [ $\Omega$ ]	II +20°C 5 min. max. [ $\mu\text{A}$ ]	I~ 100 Hz +145°C max. [A]	Code		
	$\emptyset$ mm (inches)	L mm (inches)	Typic [ $\Omega$ ]	Max. [ $\Omega$ ]						
Rated voltage 450 V										
6,8	14	(0,551)	30	(1,181)	11	17	7	110	0,12	A 708140
10	14	(0,551)	30	(1,181)	7,2	11	5,1	130	0,14	A 708141
15	14	(0,551)	30	(1,181)	7,2	11	5,1	160	0,14	A 708150
15	16	(0,630)	30	(1,181)	4,8	7,2	4	160	0,19	A 708142
22	18	(0,709)	30	(1,181)	3	4,5	2,5	200	0,25	A 708143
33	18	(0,709)	40	(1,575)	1,7	2,5	1,5	250	0,39	A 708144
47	21	(0,827)	40	(1,575)	1,4	2,1	1,3	300	0,46	A 708145
68	25	(0,984)	40	(1,575)	1,3	1,9	1,3	350	0,53	A 708146
75	25	(0,984)	40	(1,575)	1,3	1,9	1,3	370	0,53	A 708151
100	25	(0,984)	50	(1,969)	0,9	1,4	1	430	0,7	A 708147
220	25	(0,984)	75	(2,953)	0,6	0,9	0,7	630	1	A 708149

(1) F = 10 kHz (C > 1000  $\mu\text{F}$ ), F = 100 kHz (C  $\leq$  1000  $\mu\text{F}$ )  
Z typ = Z max / 2

## PEAK VOLTAGE (V)

$U_R$ : rated voltage

$U_p$ : Repetitive standard peak voltage (30 s)

$U_s$ : Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

$U_R$	16 V	25 V	40 V	63 V	100 V	160 V	250 V	450 V
$U_p$	18	29	46	72	115	184	288	495
$U_s$						235	340	620

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

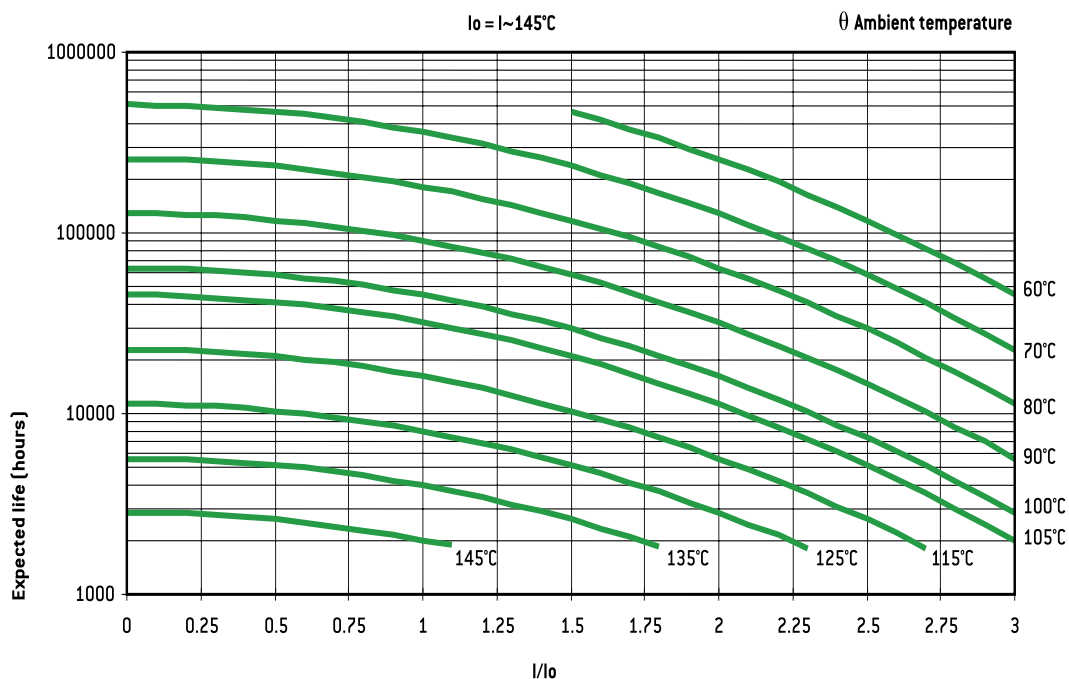
versus frequency f:

I~: permissible r.m.s. current at 100 Hz

f (Hz)	50	100	300	600	1 000	10 000	$\geq$ 50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~

## EXPECTED LIFE

as a function of temperature and ripple current



# VACSIC 105

## 2 500 h / 105°C

10 V ... 350 V	15 $\mu$ F ... 4 700 $\mu$ F	$\emptyset$ 12 (0,472) ... $\emptyset$ 16 (0,630)	- 55°C + 105°C	Long life time
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### APPLICATIONS

- Coupling / decoupling
- Filtering
- Switch mode power supplies
- Circuits with time constant
- Circuits with impulse current

Insulating aluminum case

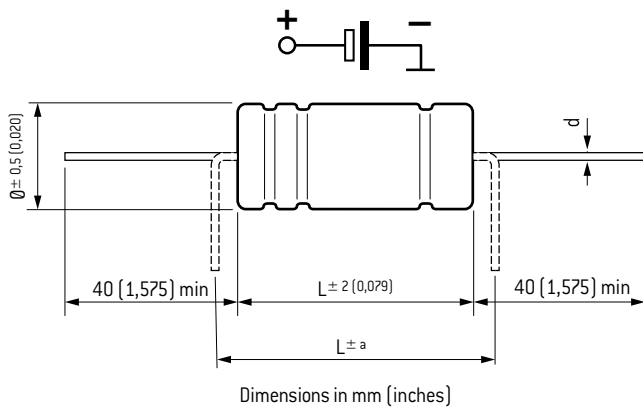
Axial tin coated copper leads

Welded chain providing perfect continuity of the circuit

Tolerance on capacitance at 20°C:  $\pm 20\%$

(on request) : -10/+50% or -10/30%

Operating temperature : - 55°C + 105°C



### DIMENSIONS in mm (inches)

$\emptyset$ mm (inches)	d	a
12 - 16 (0,472 - 0,630)	0,8 (0,031)	4 (0,157)

### RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 2000 Hz
Amplitude	1,5 (0,059)
Acceleration	45 g
t (h)	3 x 2 h

### SPECIFICATIONS

NFC 83 110 - Long life

DIN 41 240 - Climatic category GPF: -55°C + 105°C / 56 days

IEC 60 384.4 - Long life

### WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulation resistance at 20°C between leads and mounting hardware

: 100 M $\Omega$

Test voltage at 50 Hz 1 min. between terminals and mounting hardware

: 1 000 V

Fire resistance

: self extinguish 30 s  
(IEC 60 695-2-2) without PVC

## VACCSIC 105

2 500 h / 105°C

Capacitance ( $\mu\text{F}$ )	Dimensions		$T_g \delta$ 100 Hz +20°C max (%)	ESR 100 Hz +20°C Typic ( $\Omega$ )	Z +20°C max. ( $\Omega$ )	I. leak +20°C 5 min. max. (mA)	I ~ 100 Hz +105°C (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)								
<b>Rated voltage: 10 V</b>										
2200	12	(0,472)	30	(1,181)	17	0.061	0.062	135	1.42	A775000
3300	14	(0,551)	30	(1,181)	17	0.041	0.041	200	1.9	A775001
4700	16	(0,630)	30	(1,181)	17	0.029	0.029	280	2.4	A775002
<b>Rated voltage: 16 V</b>										
2200	12	(0,472)	30	(1,181)	15	0.054	0.055	210	1.52	A775020
3300	14	(0,551)	30	(1,181)	15	0.036	0.036	310	2.02	A775021
4700	16	(0,630)	30	(1,181)	15	0.025	0.025	450	2.6	A775022
<b>Rated voltage: 25 V</b>										
1000	12	(0,472)	30	(1,181)	10	0.080	0.081	150	1.25	A775040
2200	14	(0,551)	30	(1,181)	10	0.036	0.037	330	2	A775041
2700	16	(0,630)	30	(1,181)	10	0.029	0.030	405	2.4	A775042
<b>Rated voltage: 40 V</b>										
470	12	(0,472)	30	(1,181)	10	0.169	0.172	110	0.86	A775060
1000	14	(0,551)	30	(1,181)	10	0.080	0.081	240	1.35	A775061
1200	16	(0,630)	30	(1,181)	10	0.066	0.067	280	1.6	A775062
<b>Rated voltage: 63 V</b>										
330	12	(0,472)	30	(1,181)	8	0.193	0.199	120	0.8	A775080
600	14	(0,551)	30	(1,181)	8	0.106	0.109	220	1.18	A775081
800	16	(0,630)	30	(1,181)	8	0.080	0.082	300	1.5	A775082
<b>Rated voltage: 100 V</b>										
150	12	(0,472)	30	(1,181)	7	0.37	0.386	90	0.58	A775100
220	14	(0,551)	30	(1,181)	7	0.25	0.263	130	0.77	A775101
330	16	(0,630)	30	(1,181)	7	0.17	0.175	200	1	A775102
<b>Rated voltage: 160 V</b>										
33	12	(0,472)	30	(1,181)	7	1.69	1.755	30	0.27	A775120
68	14	(0,551)	30	(1,181)	7	0.82	0.852	65	0.42	A775121
75	16	(0,630)	30	(1,181)	7	0.74	0.772	72	0.5	A775122
<b>Rated voltage: 250 V</b>										
22	12	(0,472)	30	(1,181)	6	2.17	2.287	33	0.24	A775140
47	14	(0,551)	30	(1,181)	6	1.02	1.070	70	0.38	A775141
60	16	(0,630)	30	(1,181)	6	0.80	0.838	90	0.5	A775142
<b>Rated voltage: 350 V</b>										
15	12	(0,472)	30	(1,181)	6	3.18	3.355	30	0.2	A775160
22	14	(0,551)	30	(1,181)	6	2.17	2.287	46	0.26	A775161
33	16	(0,630)	30	(1,181)	6	1.45	1.525	69	0.3	A775162

# VACSIC 105

2 500 h / 105°C

## EXPECTED LIFE

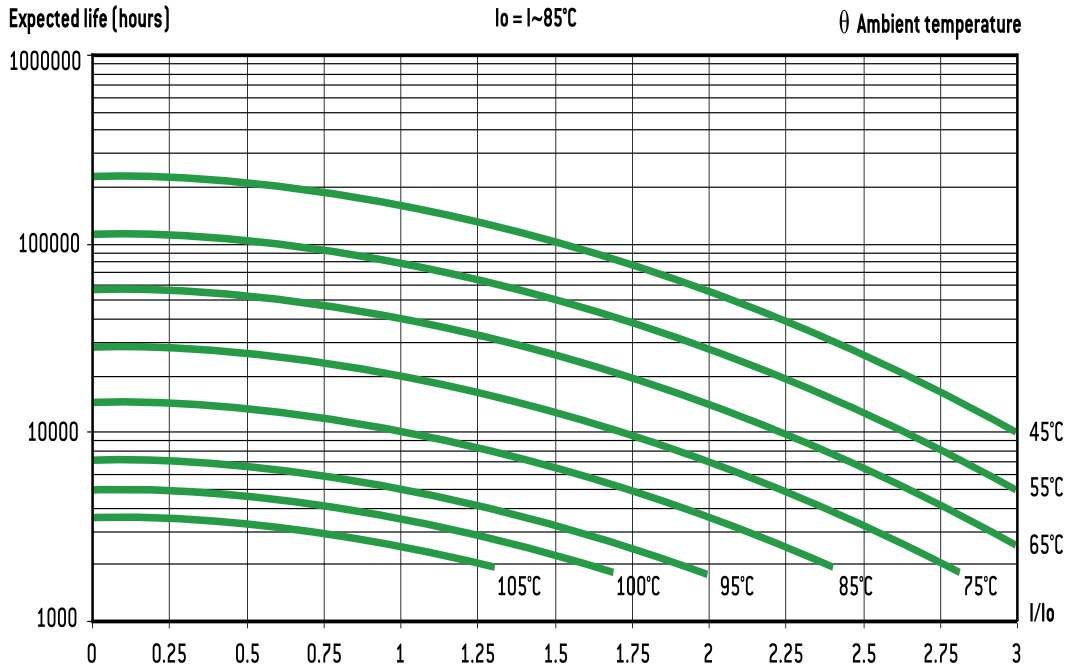
as a function of temperature and ripple current

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency f:

I ~: permissible r.m.s. current at 100 Hz

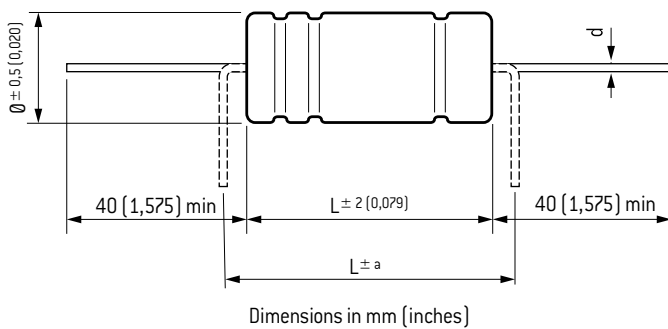
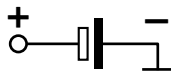
f (Hz)	50	100	300	600	1 000	10 000	≥ 50 000
I	0,8 x I~	I~	1,2 x I~	1,3 x I~	1,35 x I~	1,5 x I~	1,6 x I~



## VACSIC 150

1 500 h / 150°C

16 V ... 450 V	6.8 $\mu$ F ... 3 300 $\mu$ F	$\emptyset$ 12 [0,472] ... $\emptyset$ 16 [0,630]	- 55°C + 150°C	Long life time
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## DIMENSIONS in mm (inches)

$\emptyset$	d	a
12 - 16 [0,472 - 0,630]	0.8 [0,031]	4 [0,157]

## SPECIFICATIONS

NFC 83 110 - Long life  
 CECC 30 301-802 Issue 2  
 IEC 60 384.4 long life  
 Climatic category GPF: -55°C + 150°C / 56 days  
 Standard endurance test at  $U_R$ : 2000 h 145°C

## APPLICATIONS

- Coupling / decoupling
- Smoothing
- Energy storage
- High frequency power supply system
- Telecommunication - Military applications
- Mobile and aircraft installations
- Rated voltage 450 V is specially fit to lamp electronic ballast circuits.

Insulating aluminum case

Axial tin coated copper leads

Welded chain providing perfect continuity of the circuit.

Tolerance on capacitance at 20°C:  $\pm 20\%$

(on request)

: -10/+50% or -10/30%

Operating temperature

: - 55°C + 150°C

## RESISTANCE TO VIBRATIONS

	Standard
f (Hz)	10 - 2000 Hz
Amplitude	1,5 [0,059]
Acceleration	45 g
t (h)	3 x 2 h

## WITHSTAND STRENGTH OF INSULATING SLEEVE

Insulating resistance at 20°C between

leads and mounting hardware : 100 M $\Omega$

Test voltage at 50 Hz 1 min. between

leads and mounting hardware : 1000 V

Fire resistance

: self extinguish 30 s

(IEC 60 695-2-2) without PVC.

## VACASIC 150

1 500 h / 150°C

Capacitance ( $\mu\text{F}$ )	Dimensions		$T_g \delta$ max. (%)	ESR 100 Hz Typic ( $\Omega$ )	Z 10 kHz +20°C max. ( $\Omega$ )	I. leak +20°C 5 min. max. ( $\mu\text{A}$ )	I $\sim$ 100 Hz +150°C (A)	Code		
	$\emptyset$ mm (inches)	L mm (inches)								
<b>Rated voltage: 16 V</b>										
1500	12	(0,472)	30	(1,181)	18	0.160	0.15	72	1	A774000
2200	14	(0,551)	30	(1,181)	18	0.109	0.10	106	1.33	A774001
3300	16	(0,630)	30	(1,181)	18	0.087	0.07	158	1.7	A774002
<b>Rated voltage: 25 V</b>										
800	12	(0,472)	30	(1,181)	13	0.199	0.25	60	0.79	A774020
1200	14	(0,551)	30	(1,181)	13	0.133	0.17	90	1.05	A774021
1800	16	(0,630)	30	(1,181)	13	0.088	0.11	135	1.4	A774022
<b>Rated voltage: 40 V</b>										
470	12	(0,472)	30	(1,181)	15	0.406	0.33	56	0.69	A774040
800	14	(0,551)	30	(1,181)	15	0.239	0.19	96	0.98	A774041
1200	16	(0,630)	30	(1,181)	15	0.159	0.13	144	1.3	A774042
<b>Rated voltage: 63 V</b>										
220	12	(0,472)	30	(1,181)	8	0.445	0.57	42	0.53	A774060
470	14	(0,551)	30	(1,181)	8	0.208	0.27	89	0.84	A774061
680	16	(0,630)	30	(1,181)	8	0.144	0.18	129	1.1	A774062
<b>Rated voltage: 100 V</b>										
100	12	(0,472)	30	(1,181)	10	1.22	1.59	30	0.32	A774080
150	14	(0,551)	30	(1,181)	10	0.82	1.06	45	0.42	A774081
220	16	(0,630)	30	(1,181)	10	0.56	0.72	66	0.6	A774082
<b>Rated voltage: 160 V</b>										
33	12	(0,472)	30	(1,181)	8	2.97	3.85	32	0.2	A774100
47	14	(0,551)	30	(1,181)	8	2.08	2.70	45	0.26	A774101
68	16	(0,630)	30	(1,181)	8	1.44	1.87	65	0.3	A774102
<b>Rated voltage: 250 V</b>										
15	12	(0,472)	30	(1,181)	8	6.53	8.48	23	0.13	A774120
22	14	(0,551)	30	(1,181)	8	4.45	5.78	33	0.26	A774121
33	16	(0,630)	30	(1,181)	8	2.97	3.85	50	0.3	A774122
<b>Rated voltage: 450 V</b>										
6.8	12	(0,472)	30	(1,181)	8	14.40	18.72	18	0.09	A774140
15	14	(0,551)	30	(1,181)	8	6.53	8.48	41	0.15	A774141
20	16	(0,630)	30	(1,181)	8	4.90	6.36	54	0.2	A774142

Rs/ESR 100Hz 20°C Typ value is given for information purpose only.



## VACSIC 150

1 500 h / 150°C

## PEAK VOLTAGE (V)

 $U_R$ : rated voltage $U_p$ : Repetitive standard peak voltage (30 s) $U_s$ : Repetitive surge voltage (0,1 s)

Do not overstep this value without damage.

## EXPECTED LIFE

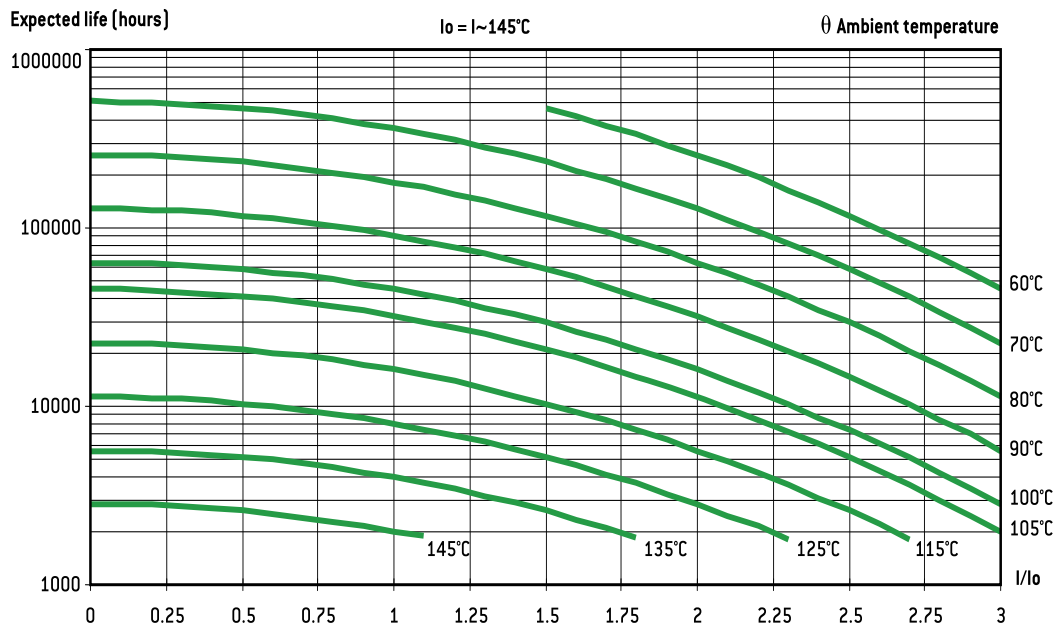
As a function of temperature and ripple current

$U_R$	16 V	25 V	40 V	63 V	100 V	160 V	250 V	450 V
$U_p$	18	29	46	72	115	184	288	495
$U_s$						235	340	620

## PERMISSIBLE RIPPLE CURRENT I (R.M.S. VALUE)

versus frequency  $f$ : $I_{\sim}$ : permissible r.m.s. current at 100 Hz

$f$ (Hz)	50	100	300	600	1 000	10 000	$\geq 50 000$
$I_{\sim}$	$0,8 \times I_{\sim}$	$I_{\sim}$	$1,2 \times I_{\sim}$	$1,3 \times I_{\sim}$	$1,35 \times I_{\sim}$	$1,5 \times I_{\sim}$	$1,6 \times I_{\sim}$



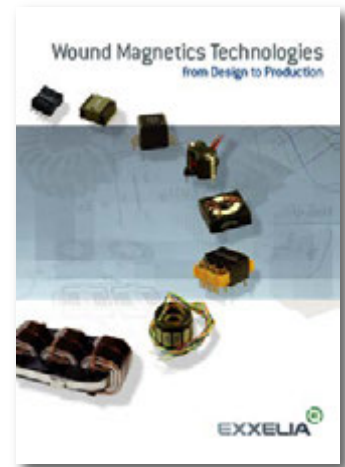
# OTHER KIND OF CUSTOM DESIGNS

Company informations		
	Examples	Informations
Company name		
Contact name		
Tel.		
E-mail		

Characteristics		
	Examples	Informations
Set	UPS, Car, etc.	
Application	Storage, smoothing, etc.	
Style	Snap in, Screw type, etc.	
Rated Voltage	250V	
Rated Capacitance	5000 $\mu$ F	
Operating voltage range	100-200V	
Dimensions	$\emptyset$ X L	
Temperature Range	from -55°C to 105°C	
ESR	20 m $\Omega$	
Lifetime	8000 hours	
Other conditions	weight, etc.	

Production informations		
	Examples	Informations
Planning	Prototype, Production	
Target Price	Prototype, Production	

# EXXELIA Components Portfolio





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