

AME28461 Series

PD-94597B

EMI Filter

Hybrid – High Reliability

50V Input, Single and Dual Output

Features

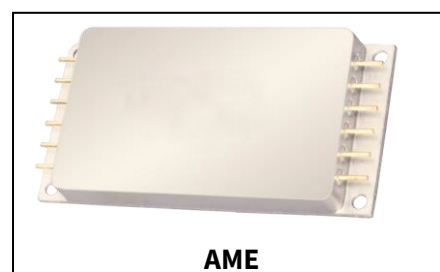
- Up to 15A Maximum output current
- Attenuation > 35dB @ 200 KHz
- Low Profile (0.38”) seam welded package
- Ceramic feed thru copper-core pins
- Operation over full military temp. range
- Standard military drawings available

Product Summary

- **Part number:** AME28461W/CH (98027-01HUA/HUC), AME28461X/CH (98027-01HXA/HXC), AME28461Y/CH (98027-01HYA/HYC), AME28461Z/CH (98027-01HZA/HZC)

Potential Applications

- DC-DC converter



Product Validation

Validated according to MIL-PRF-38534 for high-reliability applications

Ordering Information

Table 1 **Ordering Information**

Part number	Package	Screening Level
AME28461W/CH	AME	COTS
AME28461X/CH	AME	COTS
AME28461Y/CH	AME	COTS
AME28461Z/CH	AME	COTS
98027-01HUA/HUC	AME	MIL-PRF-38534
98027-01HXA/HXC	AME	MIL-PRF-38534
98027-01HYA/HYC	AME	MIL-PRF-38534
98027-01HZA/HZC	AME	MIL-PRF-38534

Description

Description

The AME Series of EMI filters have been designed to provide full compliance with the input line reflected ripple current requirement specified by CE03 of MILSTD-461C over the full military temperature range while operating in conjunction with the corresponding AFL series of DC-DC converters. These filters are offered as part of a complete family of conversion products providing single and dual output voltages while operating from nominal +28 or +270 input line voltage. Other converters operating with a similar switching frequency will also benefit by use of this device.

These EMI filters are hermetically packaged in two enclosure variations, utilizing copper-core pins to minimize resistive DC losses. Three lead styles are available, each fabricated with IR HiRel's rugged ceramic lead-to-package seal assuring long term hermetic seal integrity in harsh environments.

Manufactured in a facility fully qualified to MIL-PRF-38534, these converters are available in four screening grades to satisfy a wide range of applications. The CH grade is fully compliant to the requirements of MIL-PRF- 38534 for class H. The HB grade is fully processed and screened to the class H requirement, but does not include element evaluation to the class H requirement.

Both grades are tested to meet the complete group "A" test specification over the full military temperature range with no derating. Two grades with more limited screening are also available for use in less demanding applications. Variations in electrical, mechanical and screen requirements can be accommodated. Contact IR San Jose for special requirements.

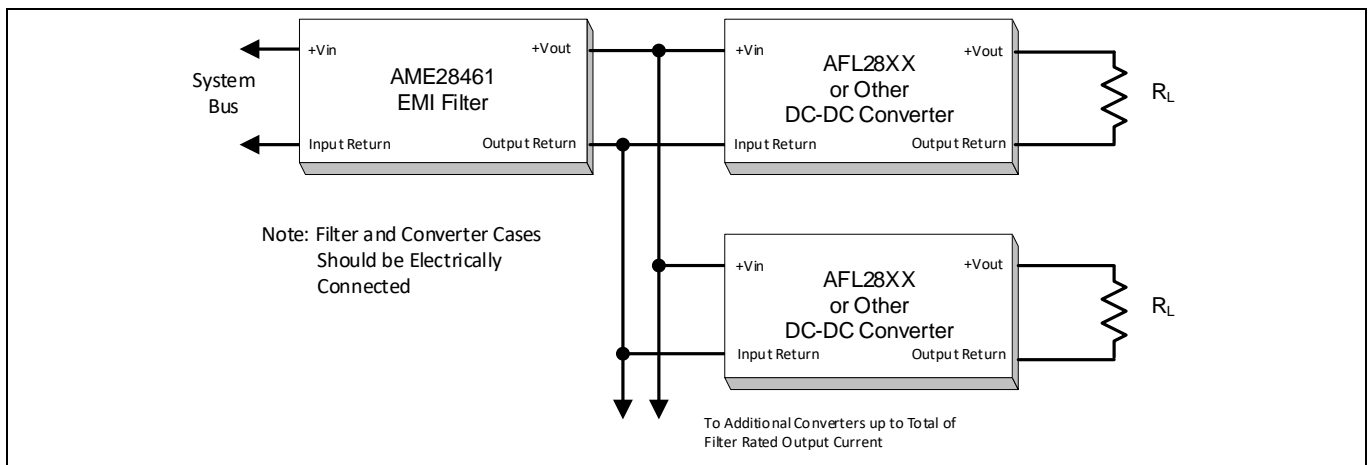


Figure 1 Typical Application Block Diagram

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Block Diagram

1 Block Diagram

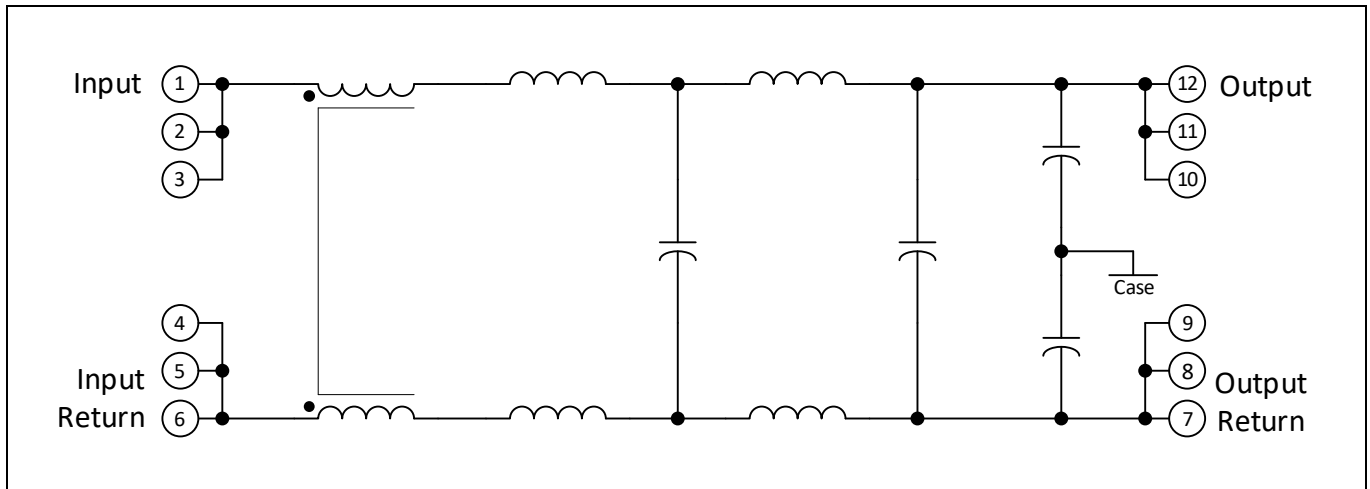


Figure 2 Block Diagram

Refer to page 5 for Pin Designation Table

Circuit Operation and Application Information

The AME series of filters employ three stages of filtering in a low pass configuration designed to attenuate the higher frequency components of ripple currents generated by high frequency switching DC-DC converters. The Block Diagram describes the general arrangement of the principal elements which have been connected to provide both differential and normal mode buffering between the input and output terminals.

Employing only passive elements, AME filter operation is initiated simply by insertion into the input power path between one or more DC-DC converters and their input DC voltage bus. In this connection, output pins of the filter will be connected to input pins of the converters. When a single AME filter is used in conjunction with multiple DC-DC converters, the use will be limited to the maximum output current capability specified in the AME electrical table¹. A typical connection utilizing one filter to drive two converters is illustrated on page 1.

Although expressly designed to complement the AFL series of DC-DC converters, when operated within their specified limits the AME filters can be successfully operated in conjunction with other converters in the Advanced Analog line including the ASA, AHF, AHV and ATR series.

¹ To calculate the input current (i_{in}) requirement of any one converter, first determine the maximum output power by multiplying output voltage by maximum load current, divide this power by the efficiency to obtain input power and then divide input power by input voltage to obtain the input current (i_{in}). Note that to obtain worst case input current, you must use maximum load current, minimum efficiency and minimum line voltage in this calculation.

Pin Designation

2 Pin Designation

2.1 Pin Configuration

Table 2 Designation

Pin Number	Designation
1	+ Input
2	+ Input
3	+ Input
4	Input Return
5	Input Return
6	Input Return
7	Output Return
8	Output Return
9	Output Return
10	+ Output
11	+ Output
12	+ Output

3 Specification

3.1 Absolute Maximum Rating Table

Table 3 Absolute Maximum Rating Note 1

Input voltage	-100V to +100V, Note 2
Input current	30A
Lead Soldering Temperature	+300°C for 10 seconds
Case Temperature-Operating	-55°C to +125°C
Case Temperature-Storage	-65°C to +135°C

3.2 Electrical Characteristics Table

Table 4 Electrical Characteristics $-55^{\circ}\text{C} \leq T_{\text{CASE}} \leq +125^{\circ}\text{C}$, $-40\text{V} \leq V_{\text{IN}} \leq +40\text{V}$ unless otherwise specified

Parameter	Group A Subgroups	Conditions	Min	Max	Unit
Input voltage	1, 2, 3		16	40	V
Leakage current	1, 2, 3	± 100V DC Input Voltage Note 3	0	50	µA
DC Resistance (RDC)	4, 5, 6	T _C = -55°C Note 4		35	mΩ
		T _C = 25°C Note 4		40	
		T _C = 125°C Note 4		70	
Noise Reduction	1	200 KHz - 500 KHz	35		dB
		500 KHz - 1 MHz	60		
		1 MHz – 10 MHz	65		
Isolation	1	Any Pin to Case, Tested @ 500V _{DC}	100		M Ω
Capacitance	1	Measured Between Any Pin and Case	34	56	nF
	2, 3		30	62	

Notes to Specifications:

1. Operation above maximum ratings may cause permanent damage to the device. Operation at maximum ratings may degrade performance and affect reliability
2. Device can tolerate ± 100 Volt transient whose duration is ≤ 100 ms when R_S ≥ 0.5 Ω
3. Derate Output Current linearly from 100% at 125°C to 0 at 135°C
4. DC resistance is the total resistance of the device and includes the sum of the input to output resistance and the return in to return out resistance paths

3.3 Available Standard Military Drawing (SMD) Cross Reference

Table 5 Available Standard Military Drawing (SMD) Cross Reference

Standard military drawing number	Vendor cage code	IR Standard Part number
98027-01HUA	52467	AME28461W/CH
98027-01HUC	52467	AME28461W/CH
98027-01HXA	52467	AME28461X/CH
98027-01HXC	52467	AME28461X/CH
98027-01HYA	52467	AME28461Y/CH
98027-01HYC	52467	AME28461Y/CH
98027-01HZA	52467	AME28461Z/CH
98027-01HZC	52467	AME28461Z/CH

4 Mechanical Outlines

Note: For the most updated package outline, please see the website:

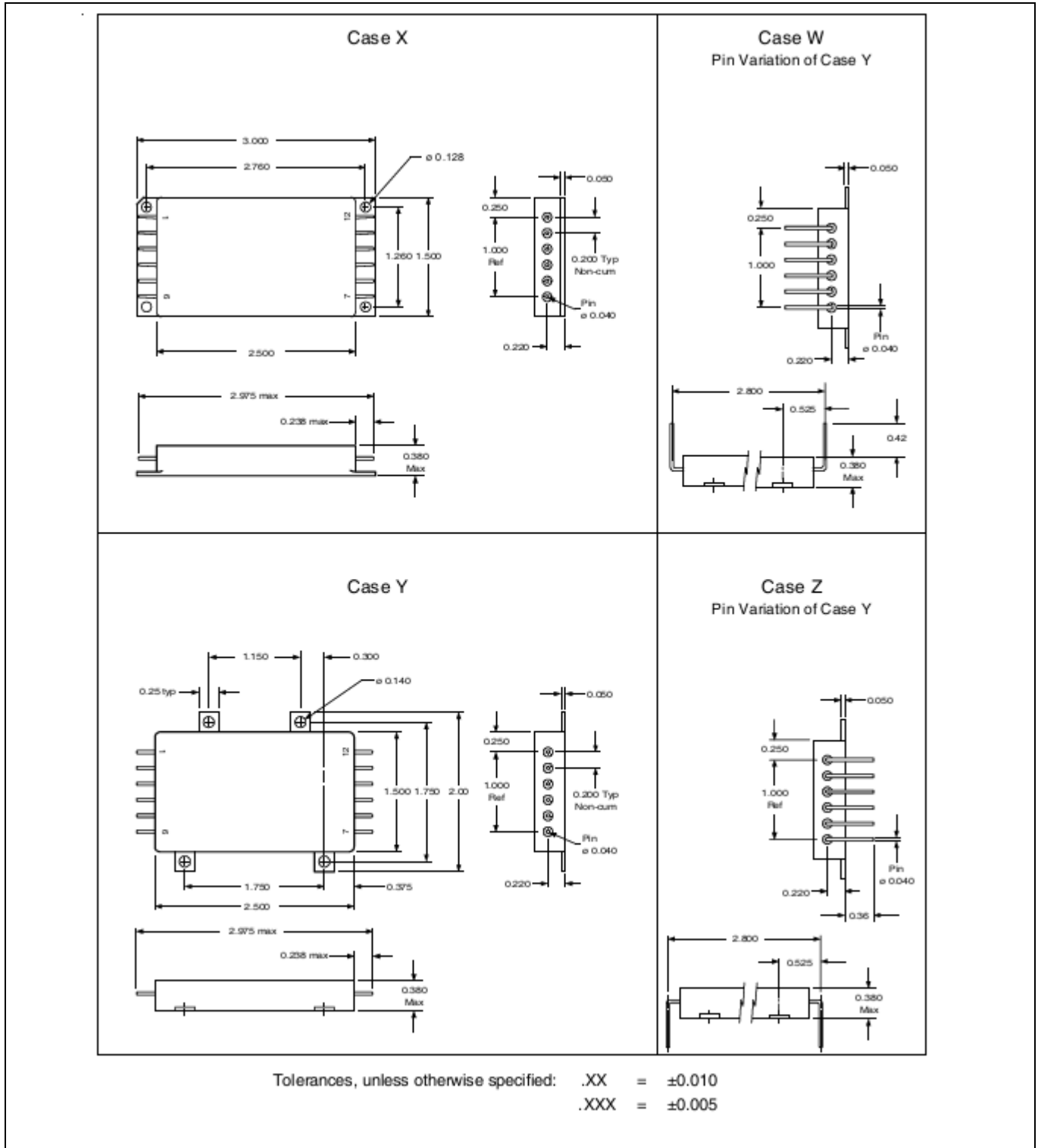


Figure 3 Package outline

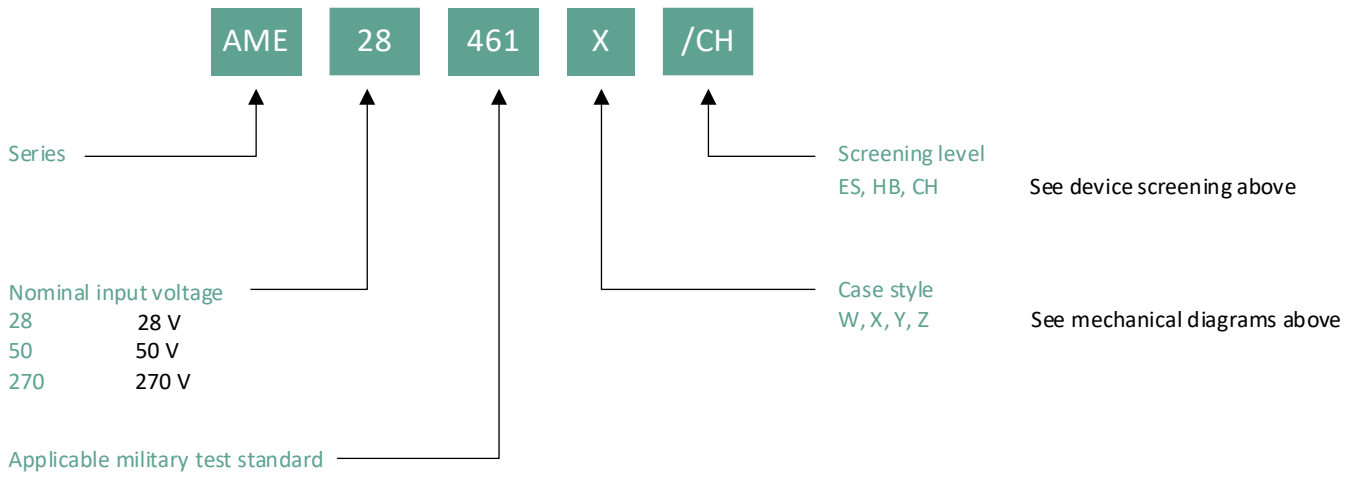
5 Device Screening

Requirement	MIL-STD-883 Method	No Suffix	ES^②	HB	CH
Temperature range		-20 to +85°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Element evaluation	MIL-PRF-38534		NA	NA	Class H
Internal Visual	2017	①	Yes	Yes	Yes
Temperature cycle	1010	NA	Cond B	Cond C	Cond C
Constant acceleration	2001	NA	500Gs	Cond A	Cond A
Burn-in	1015	48hrs @ 85°C	48hrs @ 125°C	160hrs @ 125°C	160hrs @ 125°C
Final electrical (Group A)	MIL-PRF-38534 & Specification	25°C	25°C	-55, +25, +125°C	-55, +25, +125°C
Seal, Fine & Gross	1014	Cond A	Cond A, C	Cond A, C	Cond A, C
External visual	2009	①	Yes	Yes	Yes

Notes:

- ① Best commercial practice
- ② Sample tests at low and high temperatures

6 Part Numbering



Revision history

Revision history

Document version	Date of release	Description of changes
	12/13/2002	Datasheet (PD-94597)
Rev A	02/16/2010	Updated based on ECO-22375
Rev B	05/05/2022	Updated based on ECO-30588

Need Information?