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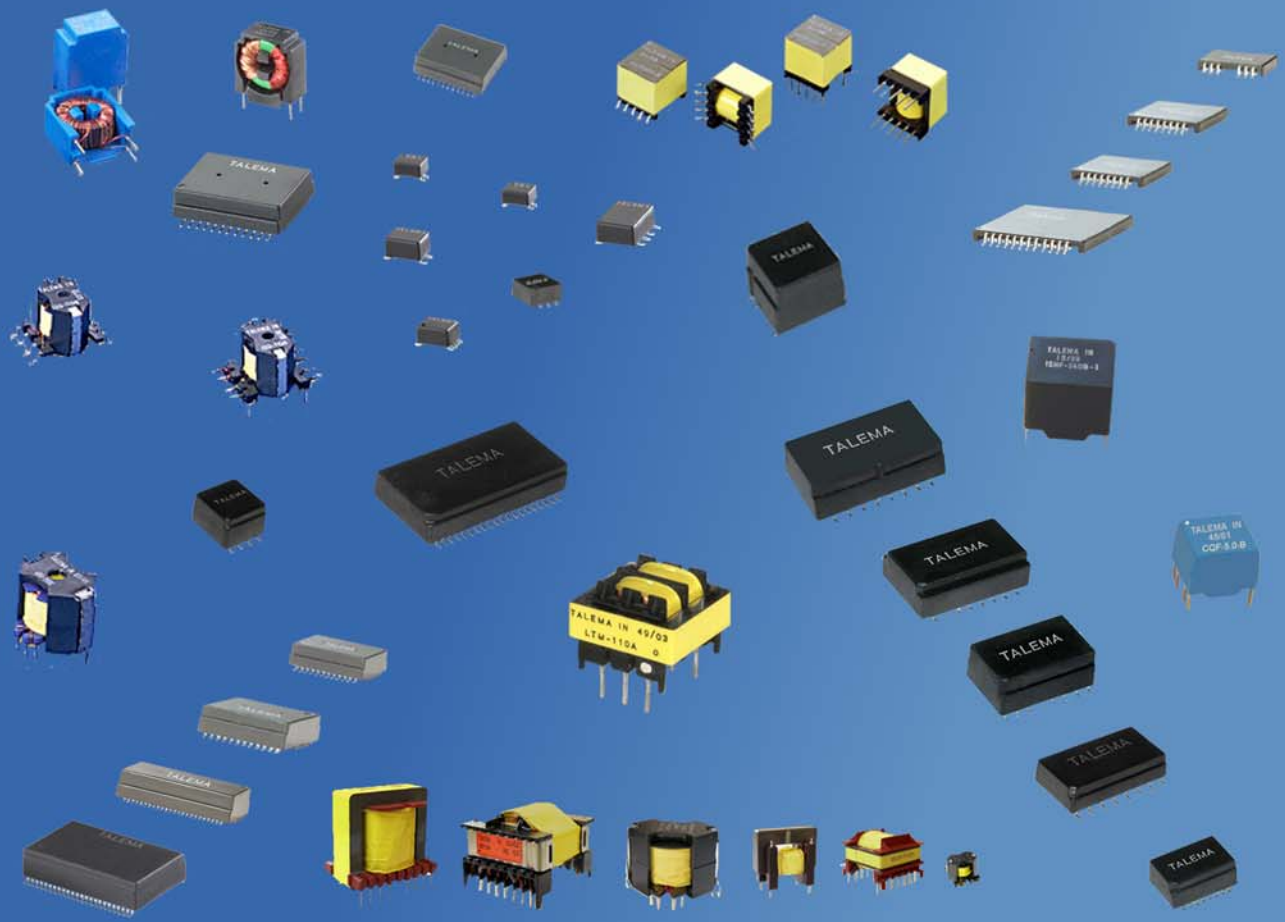
Data Line EMI Filters •
Components for ISDN and LAN •
Common Mode Interface Chokes •
Isolation/Coupling and Pulse Transformers •
Interface Signal Transformers and Modules •
S_0, E1/T1/PRI/CEPT, U, xDSL Interface Transformers •

SECTION 5

Magnetic Components for Communications and Data Line Technology



Magnetic Components for ISDN / xDSL / LAN Data Communications

TALEMA PROFILE

Founded in 1975, The TALEMA International Group has established itself as a world leader in the Design & Manufacture of toroidal transformers and related magnetic components. Our strong technical engineering expertise has contributed to the growth of our current workforce to over 800 employees in manufacturing locations in the Czech Republic and India.

Over the years The Talema Group has succeeded in designing, producing and delivering in excess of 50 million transformers to its customers. The recent incorporation of xDSL technology into our extensive range of Telecom and LAN magnetics offerings, such as ISDN, Ethernet transformers for 10/100/1000Base-T, has broadened our market offering to an even higher level.

QUALITY

The TALEMA Group has a total commitment to quality and employs Lean Six Sigma training for engineering, production and administrative staff to help achieve a goal of zero defects. All facilities maintain very stringent Quality Control and Quality Assurance procedures and are certified to and manufacture in accordance with ISO 9001:2015 (India) and ISO 9001:2016 (Czech Republic) and meet a broad range of International Standards including UL, VDE, IEC and EN.

ENVIRONMENT

All TALEMA International Group manufacturing facilities are RoHS & REACH Compliant and all chokes, inductors and HF Components are produced in an Environment Management System (EMS) facility certified to ISO 14001:2015 (India) and ISO 14001:2016 (Czech Republic).

CONTENTS

Visit our website for detailed electrical and mechanical specifications for Talema's extensive line of Magnetic Components for Toroidal Transformers, Power Conversion & LAN Applications:
www.talema.com

Inductors and Transformers for ISDN and Telecommunications

Introduction

Talema produces a broad range of inductive components for Data Communication applications including S and U Interface transformers and modules as well as Primary Rate, T1 and CEPT and Ethernet transformers and common mode chokes for EMI supression.

S / S_O Interface Signal Transformers are available in single and dual packages on high permeability ferrite cores. Additionally, most industry standard packages are available in both through hole and surface mount configuration, offering the design engineer a wide variety of options suitable for about any application.

Talema's S / S_O Interface transformer/choke modules provide a cost effective alternative to S interface solutions comprised of individual components. Incorporating two toroidal transformers and a current compensated noise suppression quad choke, the modules are available in both standard and miniature Chip SMD and through hole packages for optimal utilization of valuable PCB space.

E1/T1/PRI/CEPT Interface transformers and modules provide a high transmission rate and narrow mask in non-bias interface between the network termination and the branch exchange. The components are available in both standard and miniature SMD and DIL packages.

A cost effective range of U interface transformers for 2B1Q and 4B3T applications for equipment transmission between customer premises and exchanges is now available from Talema. The transformers meet all the requirements of recognized U interface IC's and ANSI standard T1.601 with a highly reliable pulse shape and return loss performance.

Current compensated noise suppression and filter chokes are designed for interfacing and virtual elimination of noise in ISDN and other data line transmission applications. The broad range offered by Talema features high attenuation over a wide frequency range, all popular winding/core combinations and through hole DIP, DIL and SMD packaging options at extremely competitive prices.

In addition to the ISDN inductive component range, Talema is manufacturing an extensive line of transformers for coupling and isolation in LAN, Ethernet, 10/100 Base-T and other telecommunication applications as well as transformers for general pulse and RF applications. All transformers are produced in industry standard DIP and SMD packages which can accommodate most conventional flow soldering processes and are automatically insertable.

All inductive components for telecommunications are manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility, offering excellent quality at extremely competitive prices.

Electrical Specifications and Definitions

Unless specified otherwise, all electrical ratings are measured at 25°C ambient

Transformers

Turns Ratio: Bold Face = IC side (secondary) windings

L_P = Inductance when the primary (line side) windings are connected in series (f = 10kHz; 100mVrms)

L_L = Leakage inductance of series connected primary (line side) windings with secondary (IC Side) windings series connected and short circuited (f = 100kHz, 100mVrms)

$\hat{}I_{DC}$ = Maximum permissible DC asymmetry in the primary

C_C = Coupling capacitance between parallel connected secondary (IC side) windings and primary (line side) windings (f - 10kHz)

C_W = Winding capacitance of series connected primary (line side) windings (nominal value)

R_{CU} = DC resistance per winding

$R_{CU}P$ = Nominal DC resistance of the primary (line side) windings when connected in series

$R_{CU}S$ = Nominal DC resistance of the secondary (IC side) windings when connected in series

$R_{CU}T$ = Nominal DC resistance of the tertiary winding

V_P = Test voltage on line side windings to IC side windings at 50/60 Hz for 2 seconds

Chokes

L_N = Inductance of each winding measured at 10kHz/100mV, unless otherwise stated.

I_N = Current rating per winding

I_{DC} = Maximum allowable DC current

L_L = Leakage inductance of an individual winding when all other windings are short circuited (f = 100kHz50mV)

R_{CU} = Nominal DC resistance of a winding

V_P = Test voltage at 50/60 Hz for 2 seconds, winding to winding

We reserve the right to make improvements and changes to the products in this catalog at any time and without notice. Please contact Talema for the latest specifications and product data.

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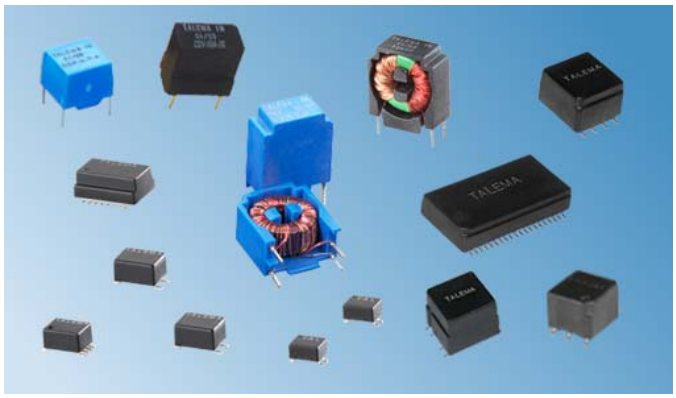
Common Mode Interface Chokes for Data and Signal Line Suppression

Talema manufactures a comprehensive range of common mode noise suppression chokes designed for interfacing and reduction of electromagnetic inteference (EMI). These chokes provide both differential and common mode noise attenuation while allowing the signal to pass through virtually undistorted. The chokes are available in sizes ranging from standard to ultra miniature in both DIL and SMD styles and offer compatability with all common footprints. The quick reference chart shown below provides a quick overview of choices available from the broad selection being offered by Talema.



RoHS REACH

DIL and SMD Common Mode Interface Chokes

Series	Inductance Range	Number of Lines	Mounting Style	No. Contacts & Pitch	Max. Board Area W x L x Ht (mm)
CTJ-2-XXX	11µH - 4.7mH	2	"J" Lead SMD	4 x 1.27	5.0 x 3.3 x 3.3
CTJ-2-XXX-S	11µH - 51µH	2			
CLJ-2-XXX	5µH - 47mH	2	"J" Lead SMD	4 x 2.54	8.9 x 5.4 x 4.8
CLJ-2-XXX-S	6µH - 51µH	2			
CLJ-4-XXX	11µH - 12mH	4		8 x 1.27	
CMJ-2-XXX	5µH - 47mH	2	"J" Lead SMD	4 x 2.54	9.0 x 5.8 x 5.3
CMJ-4-XXX	5µH - 12mH	4		8 x 1.27	
CCJ-2-XXX	26µH - 70mH	2	"J" Lead SMD	4 x 7.62	14.0 x 11.0 x 9.0
CCJ-4-XXX	26µH - 58mH	4		8 x 2.54	
CDJ-XXX	1.0mH - 70mH	2	"J" Lead SMD	4 x 10.16	16.6 x 13.2 x 11.7
CQJ-XXX	1.0mH - 90mH	4		8 x 2.54	
CDF-XXX	1.0mH - 70mH	2	Flat - THT	4 x 10.16	14.0 x 12.5 x 11.0
CDV-XXX		2	Vertical - THT		9.0 x 14.0 x 14.5
CQF-XXX	1.0mH - 90mH	4	Flat - THT	8 x 2.54	14.0 x 12.5 x 11.0
CQV-XXX		4	Vertical - THT		9.0 x 14.0 x 14.5
CKV-XXX Data Line	120µH - 68mH	2	Vertical - THT	4 x 2.54/5.08	7.4 x 15.2 x 17.6
CKV-XXX-S Power Line	4.7mH - 47mH	2			
CUJ-XXX-16E	24µH - 4.7mH	4	"J" Lead SMD	16 x 1.27	9.6 x 12.8 x 6.0
CUJ-XXX-16C		6			
CUJ-XXX-16D		6			
CUJ-XXX-16A		8			
CUJ-XXX-16B		8			
Data Line Filters		2 to 16	"J" Lead SMD	Various	

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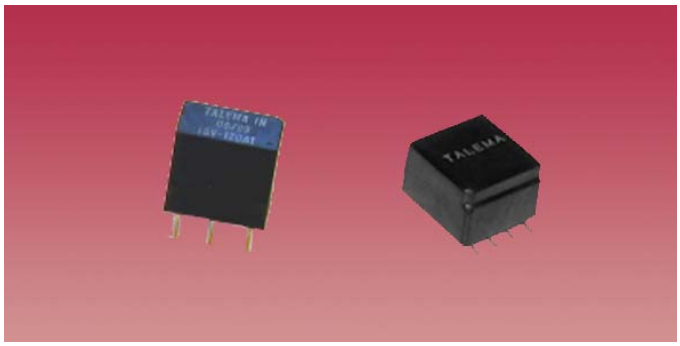
IC - S_O Single Interface Transformer Selection Guide

Talema manufactures a wide range of transformers for all S_O ISDN applications. A complete listing of transceiver IC's with recommended Talema transformers is listed on the following cross reference chart.

Performance has been proven in the many design-in's of our products in these applications. Quality and consistency is guaranteed through 100% testing of the specified parameters for Primary Inductance, Leakage Inductance, Turns Ratio, DC resistance and Interwinding Capacitance. This ensures that the Return Loss and Pulse Waveshape requirements for S-Interface can be met. Additionally, all parts are tested for 1500V minimum isolation



RoHS REACH

ISDN IC - S_O Interface Transformer Cross Reference Guide

IC Manufacturer	IC Part Number	Talema Part Number	
		Through Hole	Surface Mount
		Vertical	Miniature
Alcatel Micro	MTC2028, MTC20276, MTC20277 MTC20279, MTC202172	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Cologne Chip	HFC-Sxxx Series	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Legerity (AMD)	AM79C30A, AM79C32A	ISV-140B1	ISJ-140B ISJ-140D
Lucent	T7234, T7250, T7252, T7254, T7256, T7259, T7340, 79000	ISV-130B1	
	T7901, T7903	ISV-120A ISV-140B1	ISJ-140B ISJ-140D
Mietec	MTC-2072	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Mitel	MT8930, MT8931	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Motorola	MC145474, 145475	ISV-100B1	ISJ-100B ISJ-100D
	MC145574	ISV-130B1	
National	TP3420, TP3421	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
NEC	D98201	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
SGS	ST5420, ST5421	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Infineon	PEB80900, PEF80912, 80913 PEF81912, 81913, 82912, 82913 PEF81902, 82902	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
	PEB/PEF3081, 3086 PSB/PSF3186, 21150 PSB21381, 21382, 21384	ISV-100B1	ISJ-100B ISJ-100D
VLSI	VNS80000	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Yahama	YM7505	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D
Zarlink	MT8930/8931	ISV-120A1 ISV-140B1	ISJ-140B ISJ-140D

Standard Packaging: SMD styles - Tape and Reel; TH T styles - Anti Static tubes.

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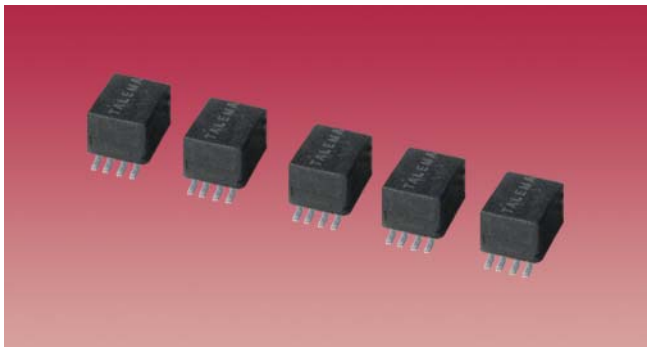
ISJ Series • ISDN S_0 Single Interface Transformers

Features

- Designed for optimum compatability with all established interface IC's
- Excellent and consistent balance between windings
- Complies fully with CCITT.I.430 recommendations and corresponding national standards for S-Interface
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Operating temperature: 0 to 85°C
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F



RoHS REACH

Electrical Specifications @ 25°C

Turns Ratio: **Bold** = IC side windings

ISJ Series comply with Basic Insulation Level EN60950, UL1950 and UL1450								
Part Number	**L_P (mH Min)**	**Turns Ratio**	**L_L (µH)**	**$^I_{DC}$ (mA)**	**C_C (pF Max)**	**$R_{CU}P$ (Ohms)**	**$R_{CU}S$ (Ohms)**	**V_P (Vrms)**
ISJ-100B	25	1:1:**1:1**	2	--	60	4.2	4.2	1500
ISJ-140B	25	1:1:**2:2**	2	--	50	4.3	9.9	1500

Test Conditions:

Inductance: Line side windings in series - measurement @ 10KHz/100mV

Polarity and turns Ratio: Pins 1-2 : 3-4 : 5-6 : 7-8

Coupling capcitance: IC side windings in series to Line side windings in series - measurement @10KHz/100mV

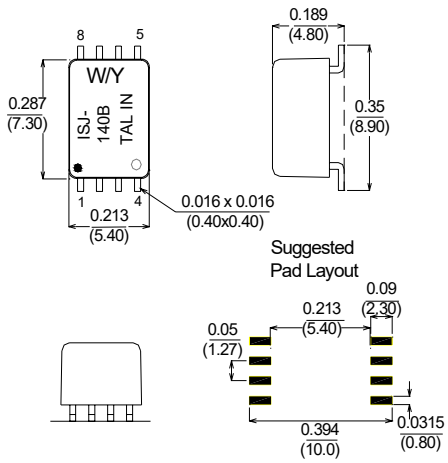
Leakage Inductance: Line side windings in series, IC side windings short circuited - measurement @ 100KHz/100mV

Test Voltage: 1.5KVrms for 2 Sec. - Line side windings in series to IC side windings in series.

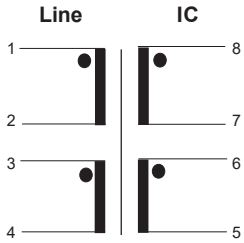
Standard Packaging: Tape and Reel

Package Style

ISJ



Schematic



Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise

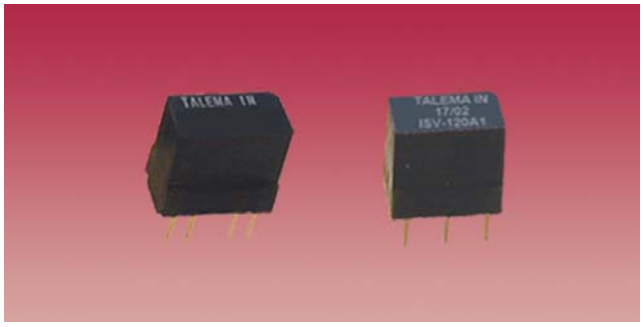
Surface Coplanarity will be 0.004 (0.10) maximum

Packing Method: Tape and Reel; Qty/Reel: 1000 Pcs

ISV Series • DN S_o DIL Style Through Hole Interface Transformers

Features

- Designed for optimum compatability with all established interface IC's
- Excellent and consistent balance between windings
- Complies fully with CCITT.I.430 recommendations and corresponding national standards for S-Interface
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Operating temperature: 0 to 85°C
- Fully RoHS & REACH Compliant



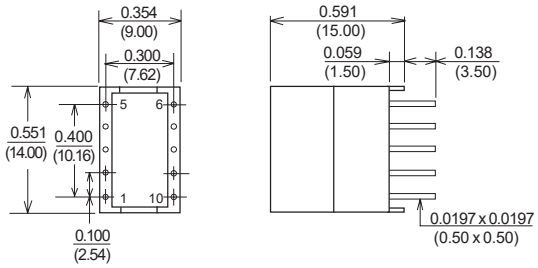
Electrical Specifications @ 25°C

Turns Ratio: **Bold** = IC side windings

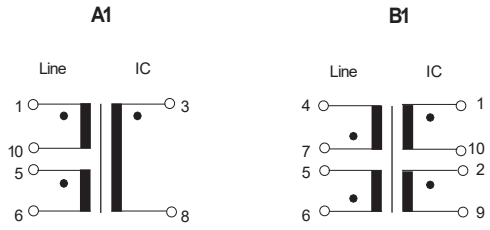
ISV Series comply with Supplementry Insulation Level EN60950, UL1950 and UL1450									
Part Number	**L_P (mH Min)**	**Turns Ratio**	**L_L (µH)**	**$^I_{DC}$ (mA)**	**C_C (pF Max)**	**$R_{CU}P$ (Ohms)**	**$R_{CU}S$ (Ohms)**	**V_P (Vrms)**	**Schematic**
ISV-100B1	30	1:1:**1:1**	10	5	150	1.7	2.0	1500	B1
ISV-120A1	30	1:1:**4**	10	5	150	1.7	4.0	1500	A1
ISV-130B1	30	1:1:**2,5:2,5**	10	5	150	1.7	4.5	1500	B1
ISV-140B1	30	1:1:**2:2**	10	5	150	1.7	4.0	1500	B1

Package Style

ISV



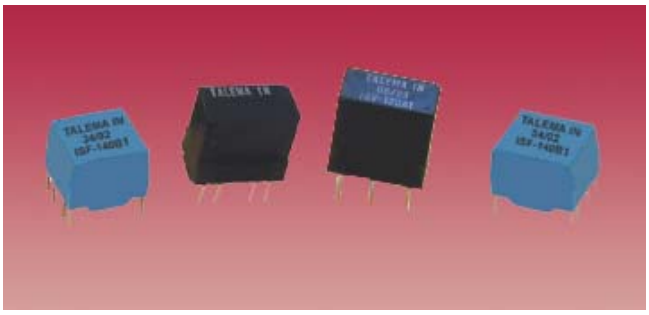
Schematic



Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Unused pins are removed

IC - S_O Interface Module Selection Guide

Talema manufactures a wide range of signal transformers for all S_O ISDN applications. Space saving modules, available in through hole and surface mount packages, offer a cost effective alternative to individual transformers and chokes and are compatible with all common IC's. A complete listing of transceiver IC's with recommended Talema transformer modules is listed on the following cross reference chart.



Performance has been proven in the many design-in's of our products in these applications. Quality and consistency is guaranteed through 100% testing of the specified parameters for Primary Inductance, Leakage Inductance, Turns Ratio, DC resistance and Interwinding Capacitance. This ensures that the Return Loss and Pulse Waveshape requirements for S-Interface can be met. Additionally, all parts are tested for 1500V minimum isolation.

ISDN IC - S_O Interface Module Cross Reference Guide

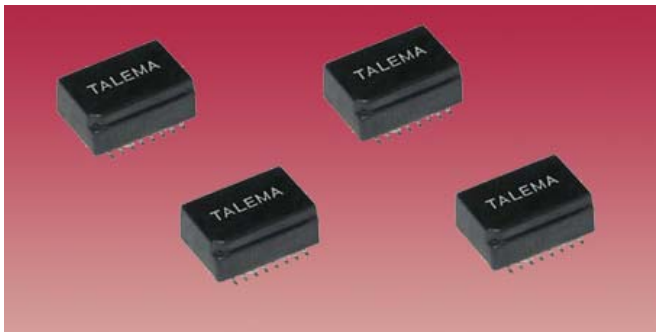
IC Manufacturer	IC Part Number	Talema Part Number	
		Surface Mount	
		Standard / Compact	Miniature
Alcatel Micro	MTC20276, MTC20277, MTC202172	MAJ-403A	MUJ-103A
Cologne Chip	HFC-Sxxx Series	MAJ-403A	MUJ-103A
Legerity (AMD)	AM79C30A, AM79C32A	MAJ-403A	MUJ-103A
Lucent	T7234, T7250, T7254, T7256, T7259	MAJ-405A	MUJ-105A
	T7901, T7903	MAJ-403A	MUJ-103A
Mietec	MTC-2072	MAJ-403A	MUJ-103A
Mitel	MT8930, MT8931	MAJ-403A	MUJ-103A
Motorola	MC145474, MC145475	MAJ-400A	MUJ-100A
	MC145574	MAJ-405A	MUJ-105A
National	TP3420, TP3421	MAJ-403A	MUJ-103A
NEC	D98201	MAJ-403A	MUJ-103A
SGS	ST5420, ST5421	MAJ-403A	MUJ-103A
Infineon	PEB2080, 2082, 2084, 2085, 2086 PSB2115, PSB2116	MAJ-403A	MUJ-103A
	PEB8090, 8091, 8190, 8191 PEB21381(5V), PEB21383(5V)	MAJ-403A	MUJ-103A
	PSB21381(3.3V), PSB21382, PSB21384 PSB21283(3.3V), PEB3086, PSB31864	MAJ-400A	MUJ-100A
VLSI	VNS8000	MAJ-403A	MUJ-103A
Yahama	YN7405	MAJ-403A	MUJ-103A

Standard Packaging: SMD styles - Tape and Reel; TH styles - Anti Static tubes.

MUJ Series • ISDN S_o Miniature SMD Interface Modules

Features

- Excellent output characteristics ensure compliance with CCITT.I.430 pulse waveform template when used with recommended IC pairing
- SMD modules are designed for pick and place compatability
- Excellent and consistent balance between windings
- Modular design maximizes suppression effectivity and transmission properties
- Full compatibility with all common IC's
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F
- Operating temperature: -40° to 85°C
- Storage temperature: -40 to +125°C



RoHS REACH

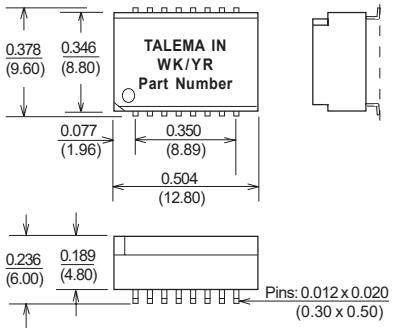
Electrical Specifications @ 25°C

Turns Ratio: Bold = IC side windings

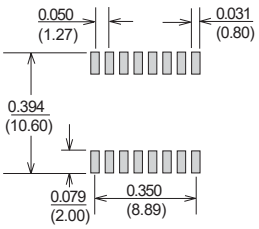
Miniature Chip SMD Modules comply with Basic Insulation Level EN60950, UL1950 and UL1459								
Part Number	**L_P (mH Min)**	**Turns Ratio**	**L_L (µH Max)**	**C_C (pF Max)**	**$R_{CU}P$ (Ohms)**	**$R_{CU}S$ (Ohms)**	**V_P (Vrms)**	**Schematic**
MUJ-100A or B-XXX	25	1:1:**1:1**	5	50	2.7	3.3	1500	A or B
MUJ-103A or B-XXX	25	1:1:**2:2**	5	50	3.7	8.4	1500	A or B
MUJ-105A or B-XXX	25	1:1:**2.5:2.5**	5	50	5.2	10.5	1500	A or B

Common Mode Quad Choke						
Basic P/N + Suffix	**L_N (µH)**	**R_{CU} (Ohms)**	**Basic P/N + Suffix**	**R_{CU} (Ohms)**	**Basic P/N + Suffix**	**R_{CU} (Ohms)**
MUJ-100A-000	No Choke		MUJ-103A -000	No Choke	MUJ-105A-000	No Choke
MUJ-100A or B-500	50	0.4	MUJ-103A or B-500	0.5	MUJ-105A or B-500	0.7
MUJ-100A or B-101	100	0.5	MUJ-103A or B-101	0.6	MUJ-105A or B-101	0.9
MUJ-100A or B-501	500	0.4	MUJ-103A or B-501	0.6	MUJ-105A or B-501	0.8
MUJ-100A or B-502	5000	0.8	MUJ-103A or B-502	0.9	MUJ-105A or B-502	1.5

MUJ Miniature Module



Suggested Pad Layout

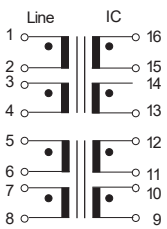


Test Conditions:

- Polarity and Turns Ratio: ±1%
- Inductance: 25mH minimum, line side windings in series @10KHz/1000mV
- Leakage Inductance: Line side windings in series, IC side windings short circuited - measurement @ 100KHz/100mV
- Coupling capacitance: IC side windings in series to Line side windings in series @ 10KHz/100mV
- Common Mode Choke Inductance: 100KHz/20mV
- Test Voltage: 1.5KVrms for 2 Sec. - Line side windings in series to IC side windings in series

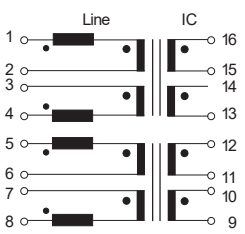
Schematic (Without Choke)

A



Schematics - With Quad Choke

A



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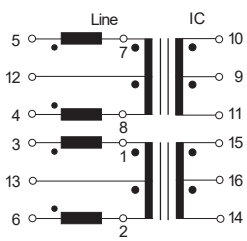

Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25)
unless specified otherwise
Surface Coplanarity will be 0.004 (0.10)

Packing Method: Tape and Reel; Qty/Reel: 600 Pcs

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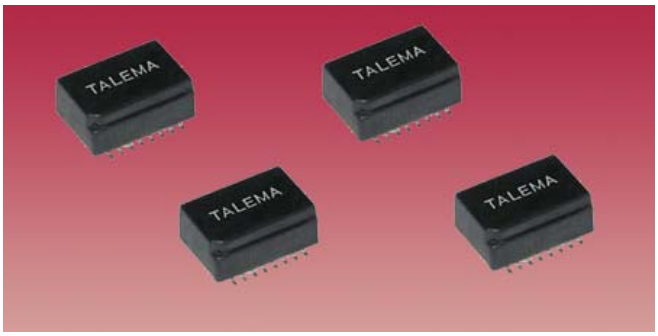
MMJ Series • ISDN S_o Miniature SMD Interface Modules

Features

- Excellent output characteristics ensure compliance with CCITT.I.430 pulse waveform template when used with recommended IC pairing
- SMD modules are designed for pick and place compatability
- Excellent and consistent balance between windings
- Modular design maximizes suppression effectivity and transmission properties
- Full compatibility with all common IC's
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F
- Operating temperature: -40° to 85°C
- Storage temperature: -40 to +125°C



RoHS REACH

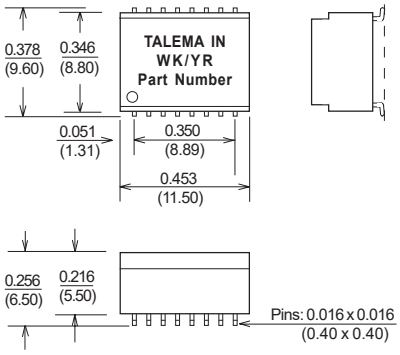
Electrical Specifications @ 25°C

Turns Ratio: Bold = IC side windings

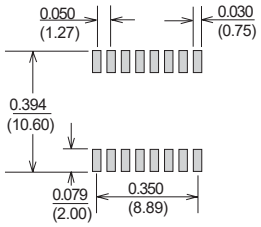
Miniature Chip SMD Modules comply with Functional Insulation Level EN60950, UL1950 and UL1459								
Part Number	**L_P (mH Min)**	**Turns Ratio**	**L_L (µH Max)**	**C_C (pF Max)**	**$R_{CU}P$ (Ohms)**	**$R_{CU}S$ (Ohms)**	**V_P (Vrms)**	**Schematic**
MMJ-100A or B-XXX	25	1:1:**1:1**	5	50	2.7	3.3	1500	A or B
MMJ-103A or B-XXX	25	1:1:**2:2**	5	50	3.7	8.4	1500	A or B
MMJ-105A or B-XXX	25	1:1:**2.5:2.5**	5	50	5.2	10.5	1500	A or B

Common Mode Choke						
Basic P/N + Suffix	**L_N (µH)**	**R_{CU} (Ohms)**	**Basic P/N + Suffix**	**R_{CU} (Ohms)**	**Basic P/N + Suffix**	**R_{CU} (Ohms)**
MMJ-100A-000	No Choke		MMJ-103A -000	No Choke	MMJ-105A-000	No Choke
MMJ-100A or B-500	50	0.4	MMJ-103A or B-500	0.5	MMJ-105A or B-500	0.7
MMJ-100A or B-101	100	0.5	MMJ-103A or B-101	0.6	MMJ-105A or B-101	0.9
MMJ-100A or B-501	500	0.4	MMJ-103A or B-501	0.6	MMJ-105A or B-501	0.8
MMJ-100A or B-502	5000	0.8	MMJ-103A or B-502	0.9	MMJ-105A or B-502	1.5

MMJ Miniature Module



Suggested Pad Layout



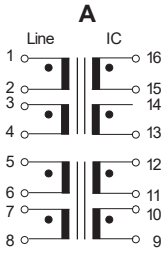
Test Conditions:

- Polarity and Turns Ratio: ±1%
- Inductance: 25mH minimum, line side windings in series @10KHz/100mV
- Leakage Inductance: Line side windings in series, IC side windings short circuited - measurement @ 100KHz/100mV
- Coupling capacitance: IC side windings in series to Line side windings in series @ 10KHz/100mV
- Common Mode Choke Inductance: 100KHz/20mV
- Test Voltage: 1.5KVrms for 2 Sec. - Line side windings in series to IC side windings in series

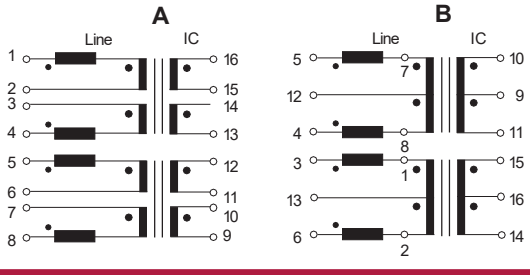
Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25)
unless specified otherwise
Surface Coplanarity will be 0.004 (0.10)

Packing Method: Tape and Reel; Qty/Reel: 600 Pcs

Schematic (Without Choke)



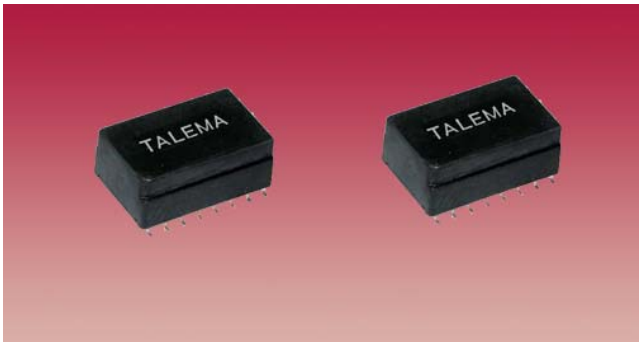
Schematics - With Choke



MAJ Series • ISDN S_o Compact SMD Interface Modules

Features

- Excellent output characteristics ensure compliance with CCITT.I.430 pulse waveform template when used with recommended IC pairing
- SMD modules are designed for pick and place compatability
- Excellent and consistent balance between windings
- Modular design maximizes suppression effectivity and transmission properties
- Full compatibility with all common IC's
- Manufactured in ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F
- Operating temperature: -40° to 85°C
- Storage temperature: -40 to +125°C



RoHS REACH

Electrical Specifications @ 25°C

Turns Ratio: **Bold** = IC side windings

Compact SMD Modules comply with Basic Insulation Level EN60950, UL1950 and UL1459

Part Number	L_P (mH Min)	Turns Ratio	L_L (µH Max)	$^I_{DC}$ (mA)	C_C (pF Max)	$R_{CU}P$ (Ohms)	$R_{CU}S$ (Ohms)	V_P (Vrms)	Schematic
MAJ-400A-XXX	30	1:1:**1:1**	5	4	120	1.7	1.7	1500	A
MAJ-403A-XXX	30	1:1:**2:2**	5	4	120	1.7	3.4	1500	A
MAJ-405A-XXX	30	1:1:**2.5:2.5**	5	4	120	1.9	4.4	1500	A
MAJ-400A-XXX-3	30	1:1:**1:1**	5	3	120	1.7	1.7	1500	A
MAJ-403A-XXX-3	30	1:1:**2:2**	5	3	120	1.7	3.4	1500	A
MAJ-405A-XXX-3	30	1:1:**2.5:2.5**	5	3	120	1.9	4.4	1500	A

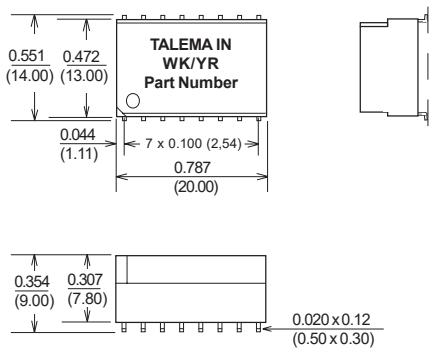
Common Mode Choke

Basic P/N + Suffix (Example: MAJ-403A-470	L_N (µH)	R_{CU} (Ohms)
-000	No Choke	
-470	47	0.5
-101	100	0.7
-501	500	0.5
-502	5000	2.0

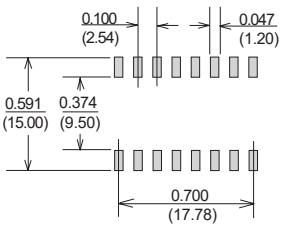
Test Conditions:

Polarity and Turns Ratio: ±1%
Inductance: 30mH minimum, line side windings in series @ 10KHz/100mV
Leakage Inductance: Line side windings in series, IC side windings short circuited @ 100KHz/100mV
Coupling Capacitance: IC side windings in series to Line side windings in series @ 10KHz/100mV
Common Mode Choke Inductance: 100KHz/20mV
Test Voltage: 1.5KV for 2 Sec. - Line side windings in series to IC side windings in series

MAJ Compact Module

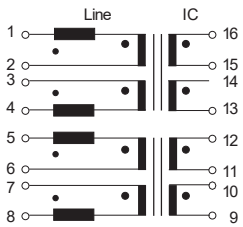


Suggested Pad Layout



Schematic

A



Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Surface Coplanarity will be 0.004 (0.10) maximum

Packing Method: Tape and Reel; Qty/Reel: 250 Pcs

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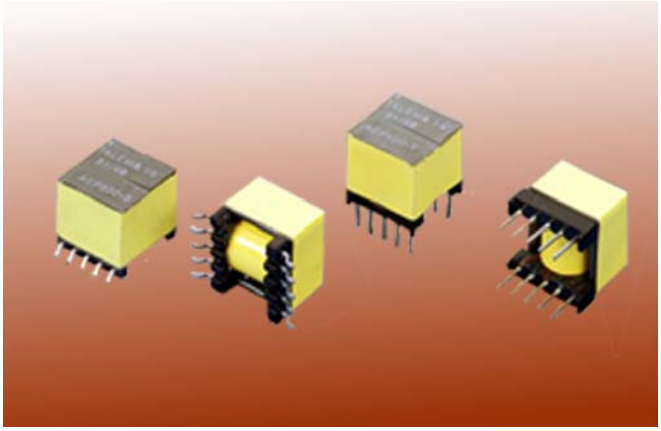
SEP Series • SDSL / SHDSL Transformers for Infineon Chipsets

Features

- Complies with ANSI and ETSI requirements
- Matched to Infineons PEB22622, PEF22623 & PEF24622 chipsets
- Very low THD
- 2000V minimum isolation
- All materials approved to UL94V-0
- Excellent quality at competitive price due to high volume production
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F for SMD



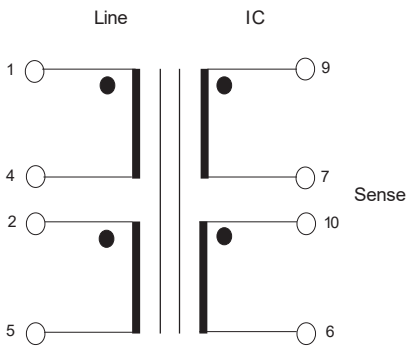
RoHS REACH

Electrical Specifications @ 25°C

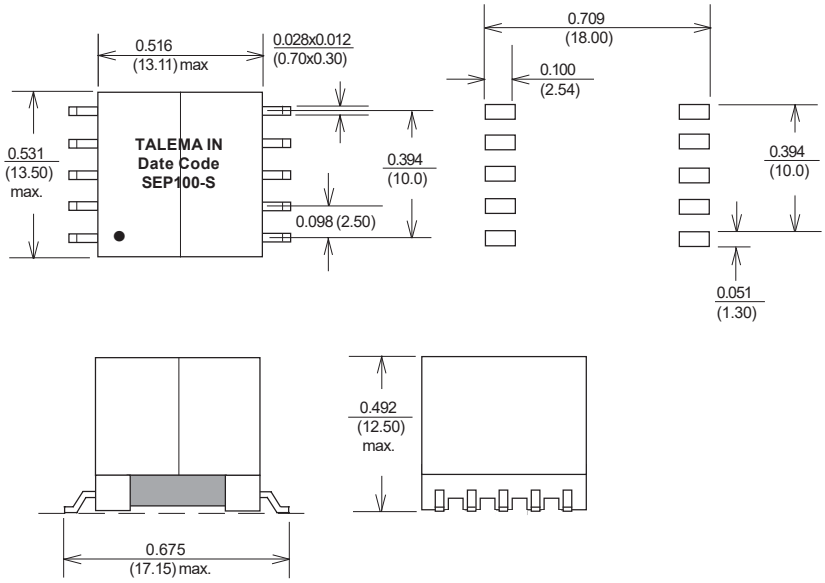
Turns Ratio: **Bold** = IC side windings

Electrical Specifications @ 25°C • Operating Temperature -40° to +85°C							
Part Number	**Package**	**Turns Ratio ±2% Line : IC:Sense**	**L_P (mH) ±10%**	**L_L (µH) Max.**	**DCR (Ohms Max.) Line / IC**	**DCR (Ohms Max.) Sense Winding**	**Isolation Voltage (Vrms)**
SEP100-T	TH	3.2 : **1 : 1**	3.0	25	5.0 / 0.80	3.6	2000
SEP100-S	SMD						

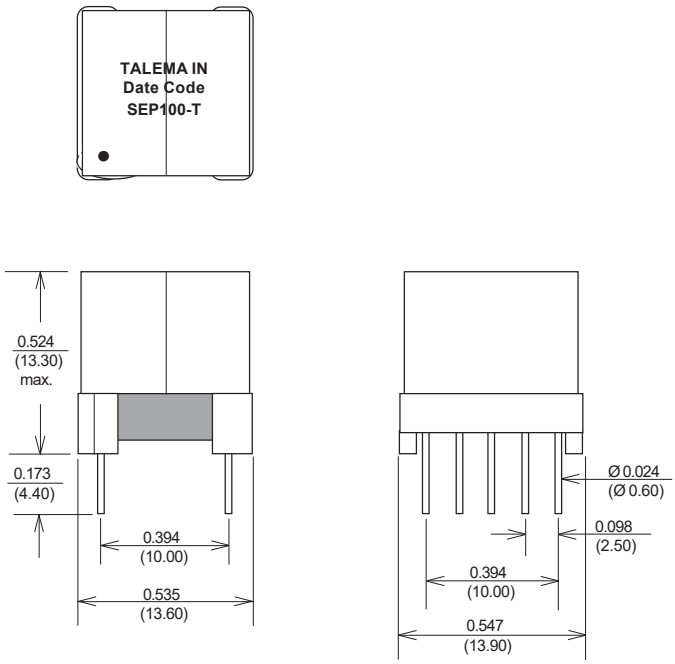
Schematic



Package "S"



Package "T"

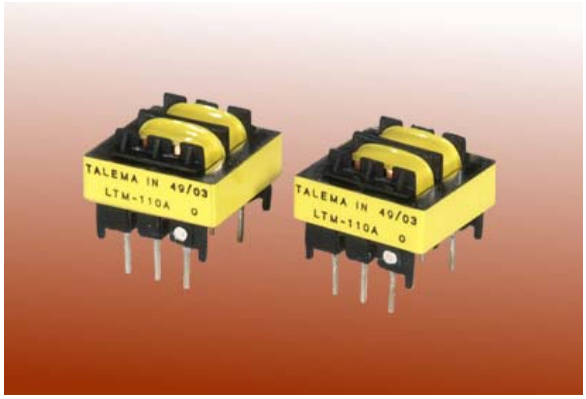


Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Surface Coplanarity will be 0.004 (0.10) maximum

LTM-110A • Line Interface 56kbps Modem Transformer

Features

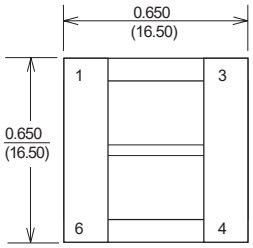
- Designed for V.90 applications (56kbps)
- Very low distortion
- Wide frequency range with flat response
- Meets IEC 60950 Supplementry Insulation levels, 1500V min.
- Excellent quality at competitive price due to high volume production
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant



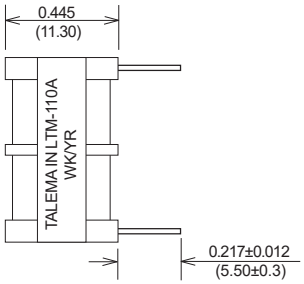
Electrical Specifications @ 25°C • Operating Temperature -40° to +85°C

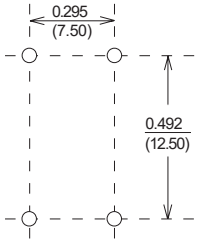
Parameter	Conditions	Typical	Limit	Units
Frequency Response	200 - 4000Hz	±0.5	-	dB
Insertion Loss	2000Hz, RL600 Ohms	1.0	1.5 max	dB
Return Loss	200 - 4000Hz	22	18 min	dB
THD	150Hz, -3dBm	-70	-	dB
THD	200Hz, -10dBm	-85	-	dB
DC Resistance	per winding	70	±10%	Ohms
Inductance	1000Hz, 1V	6.0	-	H
Leakage Inductance	1000Hz, 1V	17	-	mH
Turns Ratio		1:1	±2%	-

Mechanical Dimensions & Pinout

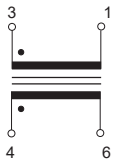


(View from Top)



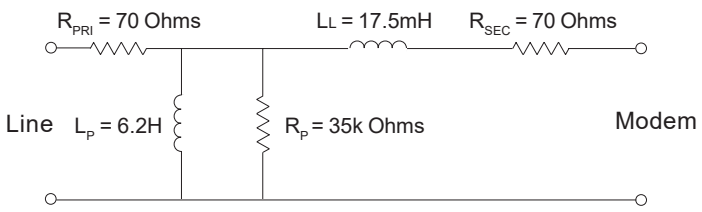


Schematic



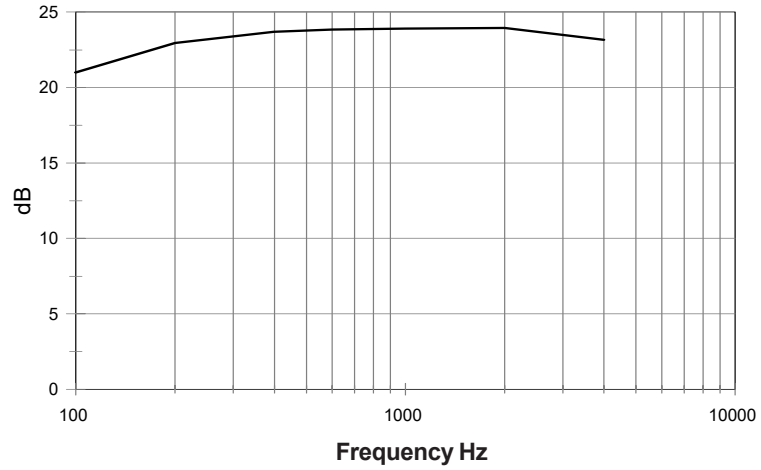
Dimensions are max. unless otherwise stated:
Inches(Millimeters)
Pinout spacings are nominal. Pins: 0.026 x 0.018 (0.66x0.45)

Equivalent Circuit: (Referenced to Primary @ 1V, 1kHz)

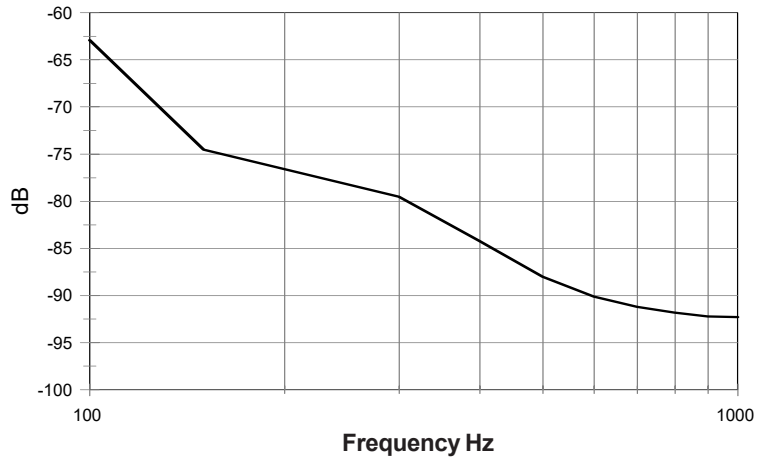


PERFORMANCE DATA

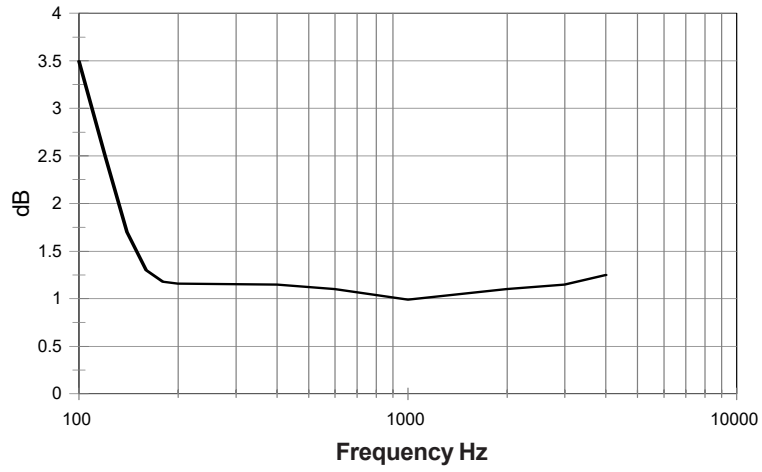
Return Loss
Typical



Total Harmonic Distortion
Typical



Insertion Loss
Typical



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IC - E1 / T1 / PRI / CEPT Transformer Selection Guide

Talema manufactures a wide range of transformers for all 1.544 and 2.048Mbbs applications. A full listing of LIU Transceiver IC's with recommended Talema transformers is listed on the following cross reference chart.

Performance has been proven in the many design-ins of our products in these applications Quality and consistency is guaranteed through 100% testing of the specified parameters for Primary Inductance, Leakage Inductance, Turns Ratio, DC resistance and Interwinding Capacitance This ensures that the Return Loss and Pulse Waveshape requirements of ITU-T G.703 and ANSI T1.102 can be met. Additionally all parts are 100% tested for 1500V minimum isolation.

Temperature Performance

Products are offered with extended temperature (-40° to 85°C) as standard. Required minimum inductance levels are maintained at the lower temperature limits.

IC - Transformer Selection Guide for T1/E1/CEPT/ISDN-PRI Interface Modules

IC Manufacturer	IC Part Number	Application	Talema Transformer Part Number
			16 Pin Dual SMD
			Tx / Rs
Cologne Chip	HFC-E1	S2M	MJM-032
Cirrus Logic (Crystal)	61318	120 E1	MJM-018
	61318	75 E1	--
	61577	T1 & E1	MJM-017
	61304A, 61305A, 61535A, 61574A, 61575	T1	MJM-019
	61304A, 61305A, 61535A, 61574A, 61575	75 E1	MJM-025
	61304A, 61305A, 61535A, 61574A, 61575	120 E1	MJM-025
	61582, 61583		MJM-013
	61310, 61581		MJM-018
	61310, 61581	Host	MJM-026
	61880, 61881		MJM-019
	61584, 61584A	IQ3	MJM-017
	61582, 61583, 61584, 61584A	IQ5	MJM-013
Maxim (Dallas)	DS2196, DS2155, DS2149, DS2148		MJM-018
	DS2151, DS2152, DS2153, DS2154		MJM-019
	DS2151, DS2152, DS2153, DS2154		MJM-028
	DS2148/Q48/Q348/349/Q59	3V	MJM-018
	DS2148, Q48	5V	MJM-028
	DS21352/Q352, DS21354/Q354	T1/E1	MJM-018
	DS21552/Q552, DS21554/Q554	T1/E1	MJM-019
	DS21552/Q552, DS21554/Q554	T1/E1	MJM-028
	DS26502, DS2503, DS21455, DS21458, DS26528		MJM-018
Exar	XRT5683A, XRT59L91, XRT5894, XRT5897, XRT5997		MJM-017
	XRT5793, XRT5794		MJM-025
	XRT81L27, 82L24, 82D20		MJM-028
	XRT83L30, XRT83L34, XRT83L38		MJM-018
	XRT86L30, XRT86L32, XRT86L34, XRT86L38		MJM-018
	T5684, XRT7288, 82D20		MJM-028
IDT	82V2044, 82V2048, 82V2048L, 82V2054, 82V2058		MJM-043
	82V2041E, 82V2042E, 82V2044E, 82V2048E		MJM-018
	82V2081, 82V2082, 82V2084, 82V2088		MJM-018
	82P2281, 82P2282, 82P2284, 82P2288		MJM-018
Infineon (Siemens)	PEB2254, PEB2255	E1/T1/J1	MJM-010
	PEB2254, PEB2255	E1/T1/J1	MJM-021
	PEB22504, PEB22554, PEB2256	3.3V	MJM-022

IC - Transformer Selection Guide for T1/E1/CEPT/ISDN-PRI Interface Modules

IC Manufacturer	IC Part Number	Application	Talema Transformer Part Number 16 Pin Dual SMD Tx / Rs
Intel (Level One)	LXT300, LX301		MJM-017
	LXT304, LXT305, LXT307	T1/E1	MJM-017
	LXT304, LXT305, LXT307	T1	MJM-019
	LXT304, LXT305, LXT307	75, 120 E1	MJM-025
	LXT304, LXT305, LXT307	DSX-1, D4	MJM-016
	LXT310, LXT317, LXT318		MJM-018
	LXT312, LXT313, LXT315		--
	LXT331	T1/E1	MJM-018
	LXT331, LXT332		MJM-016
	LXT331, LXT332		MJM-019
	LXT331, LXT332		MJM-017
	LXT334, LXT335	T1/E1	MJM-017
	LXT334, LXT335	120/75 E1	MJM-028
	LXT334, LXT335	75 E1	MJM-025
	LXT334, LXT335		MJM-026
	LXT336		MJM-024
	LXT350, LXT351, LXT359	T1/E1	MJM-018
	LXT350, LXT351		MJM-019
	LXT350, LXT351	120 E1	MJM-016
	LXT360, LXT361, LXT362, LXT363	T1/E1	MJM-018
	LXT360, LXT361, LXT362, LXT363		MJM-019
	LXT360, LXT361		MJM-016
	LXT380, LXT381, LXT384, LXT386, LXT388	T1/ E1	MJM-018
	LXT380, LXT381, LXT384, LXT386, LXT388		MJM-016
	LXT3104, LXT3108		MJM-017
	LXT3104, LXT3108		MJM-048
Agere (Lucent)	T7288, T7290A	CEPT/E1	MJM-028
	T7289A	DS1	MJM-019
	T7630, T7688, T7690, T7698	CEPT	
	T7630, T7688, T7690, T7698	DS1	MJM-013
	T7693, T7697	CEPT	MJM-038
	TLIU04C1	DS1	MJM-013
	TLIU04C1	CEPT	
PMC-Sierra	PM4341, PM6341, PM4314		MJM-028
	PM4318, PM4319, PM4323, PM4325		MJM-017
	PM4351, PM4354	COMET	MJM-038
Mindspeed (Conexant)	BT8510	T1/E1	MJM-031
	BT8510	T1/E1	MJM-025
	BT8370, BT8375, BT8376	Low Power	MJM-019
	BT8370, BT8375, BT8376	Better RI	MJM-028
Zarlink (Mitel)	MT9071, MT9076		MJM-038
	MT9075, MT9076		MJM-022
	MT9074, MT9075		MJM-018

Notes:

1. Dallas IC's use either a 1:1.15 or a 1:1.36 ratio transformer depending on the application. Consult the Dallas application notes or contact Talema.
2. Consult Siemens Application Note 12.90 ('Just a Single Line Transformer Type for all IPAT (PEB2235) Applications') for calculation of resistor values.
3. The Dual Transformer types MDM-010 and MDM-021 are electrically identical but have different schematics. Either part may be used with the PEB2254 and PEB2255.
4. See Level One Application Note 118 ('Transformer Specifications for Level One Transceiver Applications') for further details on the choice of transformer ratios.

MJM Series • E1 / T1 / PRI / CEPT Dual Transformer Modules

Features

- SMD design ideal for pick and place compatability while providing unrivaled coplanarity
- Controlled parameters ensure full compliance with ITU-T G.703 when matched with recommended IC
- Ideal for all 1.544 and 2.048 Mbs interface applications
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Extended operating temperature: -40° to +85°C
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F

- Test Frequency: No load Inductance @ 10KHz/20mV
- Minimum isolation voltage between Pri to Sec 1500Vrms

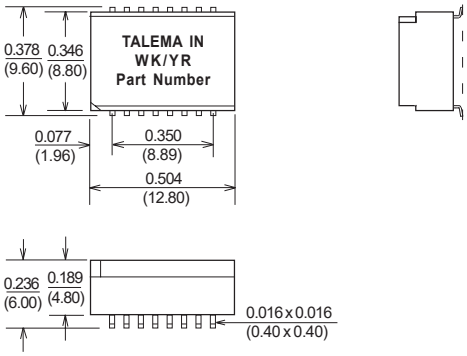
Electrical Specifications @ 25°C

MJM Series - Dual Transformers

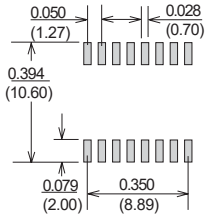
Part Number	Transformer - I						Transformer - II						Schematic
	Turns Ratio +/-5%	L_P (mH Min)	R_{CU} (Ohms)		Pri. Pins	Sec. Pins	Turns Ratio +/-5%	L_P (mH Min)	R_{CU} (Ohms)		Pri. Pins	Sec. Pins	
			Pri.	Sec.					Pri.	Sec.			
MJM-010	1ct:**1.41ct**	1.2	0.41	0.58	16-15-14	1-2-3	1ct:**1.41ct**	1.2	0.41	0.58	11-10-9	6-7-8	A
MJM-013	1ct:**1.15ct**	1.2	0.39	0.44	1-2-3	16-15-14	1ct:**1.15ct**	1.2	0.39	0.44	6-7-8	11-10-9	A
MJM-016	1ct:**2ct**	1.2	0.39	0.77	6-7-8	11-10-9	1ct:**2.3ct**	1.2	0.39	0.88	16-15-14	1-2-3	A
MJM-017	1ct:**2ct**	1.2	0.39	0.77	16-15-14	1-2-3	1ct:**2ct**	1.2	0.39	0.77	6-7-8	11-10-9	A
MJM-018	1ct:**1ct**	1.2	0.39	0.38	16-15-14	1-2-3	1ct:**2ct**	1.2	0.39	0.77	6-7-8	11-10-9	A
MJM-019	1:**1.15ct**	1.2	0.39	0.44	16--14	1-2-3	1ct:**2ct**	1.2	0.39	0.77	6-7-8	11-10-9	B
MJM-021	1ct:**1.41ct**	1.2	0.41	0.58	1-2-3	16-15-14	1ct:**1.41ct**	1.2	0.41	0.58	11-10-9	6-7-8	A
MJM-022	1ct:**1ct**	1.0	0.39	0.39	11-10-9	6-7-8	1ct:**2.4ct**	1.0	0.41	0.90	1-2-3	16-15-14	A
MJM-023	1:**1ct**	1.2	0.39	0.39	16-14	1-2-3	1:**1ct**	1.2	0.39	0.39	6-8	11-10-9	C
MJM-024	1ct:**1ct**	1.0	0.39	0.39	6-7-8	11-10-9	1ct:**1.67ct**	1.0	0.39	0.66	16-15-14	1-2-3	A
MJM-025	1:**1/1.26**	1.2	0.39	0.48	16-14	1-2-3	1ct:**2ct**	1.2	0.39	0.77	6-7-8	11-10-9	B
MJM-026	1ct:**1ct**	1.2	0.39	0.39	16-15-14	1-2-3	1ct:**1.5ct**	1.2	0.39	0.58	6-7-8	11-10-9	A
MJM-027	1:**2ct**	1.6	0.41	0.83	16-14	1-2-3	2:**1**	1.6	0.41	0.21	6-8	11-9	D
MJM-028	1ct:**2ct**	1.2	0.39	0.77	16-15-14	1-2-3	1:**1.36ct**	1.2	0.39	0.52	6-8	11-10-9	E
MJM-029	1:**2.42ct**	1.2	0.39	0.94	16-14	1-2-3	1:**2.42ct**	1.2	0.39	0.94	6-8	11-10-9	C
MJM-030	2:**1:1**	1.2	0.46	0.26	16-14	1-2, 3-4	2:**1:1**	1.2	0.46	0.26	11-9	5-6, 7-8	F
MJM-031	2ct:**1/1.26**	1.5	0.41	0.52	1-2-3	16-15-14	2ct:**1/1.26**	1.5	0.41	0.52	11-10--9	6-7-8	A
MJM-032	1:**2.42**	1.2	0.39	0.94	16-14	1-2-3	1:**1ct**	1.2	0.39	0.39	6-8	11-10-9	C
MJM-033*	1:**1.9/2.4**	1.0	0.41	0.94	16-15-14	1-2-3	0.79:**1.9/1**	1.0	0.40	0.75	6-7-8	11-10-9	A
MJM-034	1ct:**1.5ct**	1.5	0.41	0.62	1-2-3	16-15-14	1ct:**1.5ct**	1.5	0.41	0.62	6-7-8	11-10-9	A
MJM-035	1ct:**1ct**	1.2	0.39	0.39	6-7-8	11-10-9	1ct:**1.36ct**	1.2	0.39	0.52	1-2-3	16-15-14	A
MJM-036	2cs:**1.57/2**	1.5	0.41	0.82	1-2	--	2cs:**1.57/2**	1.5	0.41	0.82	5-6	--	G
MJM-037	1ct:**1ct**	1.2	0.39	0.39	16-15-14	1-2-3	1ct:**1.36ct**	1.2	0.39	0.53	6-7-8	11-10-9	A
MJM-038	1ct:**2.42ct**	1.2	0.39	0.94	1-2-3	16-15-14	1ct:**2.42ct**	1.2	0.39	0.94	6-7-8	11-10-9	A
MJM-039	1:**2/2.4**	1.0	0.39	0.94	1-3	16-15-14	1:**0.79/1**	1.0	0.39	0.39	6-8	11-10-9	H
MJM-040	1ct:**2.4ct**	1.2	0.39	0.94	1-2-3	16-15-14	1ct:**2.4ct**	1.2	0.39	0.94	6-7-8	11-10-9	A
MJM-041	1:**2ct**	1.2	0.39	0.77	1-3	16-15-14	1:**2cs**	1.2	0.39	0.77	11-9	5-6,7-8	J
MJM-042	1:**1.36ct**	1.2	0.39	0.53	16-14	1-2-3	1:**2ct**	1.2	0.39	0.77	6-8	11-10-9	C
MJM-043	1ct:**2ct**	1.2	0.39	0.77	1-2-3	16-15-14	1ct:**2ct**	1.2	0.39	0.77	6-7-8	11-10-9	A
MJM-044	1ct:**2ct**	1.2	0.39	0.77	1-2-3	16-15-14	1:**1**	1.2	0.39	0.39	6-8	11-9	K
MJM-045	1ct:**2ct**	1.2	0.39	0.77	1-2-3	16-15-14	1ct:**2.42ct**	1.2	0.39	0.95	6-7-8	11-10-9	A
MJM-046	1ct:**1ct**	1.2	0.39	0.39	1-2-3	16-15-14	1ct:**1ct**	1.2	0.39	0.39	6-7-8	11-10-9	A
MJM-047	1ct:**1.26ct**	1.2	0.39	0.50	1-2-3	16-15-14	1ct:**1.26ct**	1.2	0.39	0.50	6-7-8	11-10-9	A
MJM-048	1ct:**1:0.8**	1.2	0.39	0.39	16-15-14	1-2, 3-4	1ct:**1:0.8**	1.2	0.39	0.39	11-10-9	5-6, 7-8	G
MJM-049	1ct:**1.58:2**	1.2	0.39	0.80	2-3-4	16-15, 14-13	1:**1.65:2**	1.2	0.39	0.80	6-7	12-11, 10-9	L
MJM-050	1ct:**1:1**	1.2	0.39	0.39	16-15-14	1-2, 3-4	1ct:**1:1**	1.2	0.39	0.39	11-10-9	5-6, 7-8	G
MJM-051	1ct:2.4ct	1.2	0.39	0.94	1-2-3	16-15-14	1ct:1ct	1.2	0.39	0.39	6-7-8	11-10-9	A

* MJM-033 Turns Ratio: Pins 16-14:1-2 = 1:1.9, Pins 16-14:1-3=1:2.4; Pins 6-8:9-11=0.79:1.9, Pins 6-8:11-10=0.79:1

MJM Dimensions



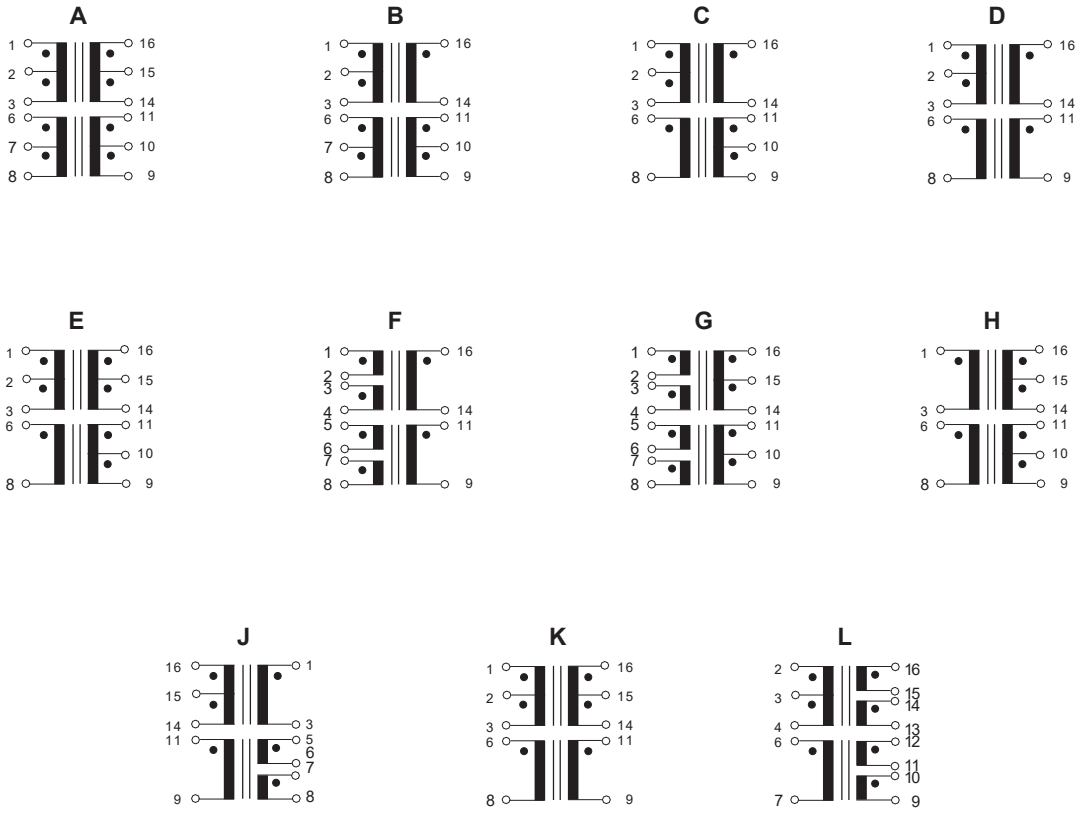
Suggested Pad Layout



Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Surface Coplanarity will be 0.004 (0.10) maximum

Packing Method: Tape and Reel; Qty/Reel: 600 Pcs

Schematics



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IC Selection Guide for 10Base-T Isolation Transformer Modules

Talema manufactures a broad range of Isolation Transformer Modules for 10Base-T, 100Base-T, 1000Base-T, AUI and ATM applications. Many of the modules include a common mode choke for noise attenuation matched to the specified transceiver and are designed for extended temperature range (-40°C to +85°C) applications.

IC Manufacturer	IC Part Number	Turns Ratio		Talema Part Number
		Transmit	Receive	Miniature Single Port 12.8x9.6x6.0
AMD	AM79C984 AM79C985 AM79C988 AM79C989	1ct:1ct	1ct:1ct	TMM-100A1-J TMCM-100A1-J TMCM-200A1-J
Cirrus Logic (Crystal)	CS8900A-CQ/IQ, CS8904-CM5 CS8920	1ct:1.414ct	1ct:1ct	TMCM-200A2-J TMCM-140A2-J TMM-140A2-J
	CS8900A-CQ3/IQ3 CS8904-CM3	1ct:2.5ct	1:1	TMM-200A4-J TMCM-200A4-J
Fujitsu	MB86951 MB86961 MB86964 MB86965B	1ct:1.414ct	1ct:1ct	TMCM-200A2-J TMCM-110B2-J TMM-140A2-J
Intel (Level One)	LXT901, LXT901A LXT907, 914, 915 LXT916, 917, 944	1ct:1.414ct	1ct:1ct	TMCM-200A2-J TMCM-110B2-J TMM-140A2-J
	LXT905 LXT908	1ct : 2ct	1ct:1ct	TMCM-140A3-J TMCM-120A3-J
µLinear	ML2652, ML2653 ML4652, ML4658	2ct:1ct	1ct:1ct	TMCM-140A6-J TMM-100A6-J
National Semi-conductor	DP83953 DP83907 DP83924A	1ct:2ct	1ct:1ct	TMCM-140A3-J TMCM-120A3-J TMCM-200A5-J
Realtek	RTL8301 80C24	2ct:1ct	1ct:1ct	TMCM-140A6-J TMM-100A6-J
Texas Instruments	TNETE100A	1ct:1.414ct	1ct:1ct	TMCM-200A2-J TMCM-110B2-J TMM-140A2-J TMCM-140A2-J
	TNETE2004	1ct:1.414ct	1ct:1ct	TMCM-200A2-J TMCM-110B2-J TMM-140A2-J
	TNETE2008	1ct:1ct	1:1	TMM-100A1-J TMCM-100A1-J TMCM-200A1-J

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IC Selection Guide for 10/100 Base-T Isolation Transformer Modules

IC Manufacturer	IC Part Number	Turns Ratio		Talema part Number
		Transmit	Receive	Miniature Single Port 12.8 x 9.6 x 6.0
ADMtek	LET406	1ct:1ct	1ct:1ct	TEM-300A-J
	ADM9511, ADM9513, AN983, AN985	1ct:1ct	1ct:1ct	TEM-300D-J
AMD	AM79C874	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300K-J
	am79c874(NetPHY-1LP)	1.25ct:1ct	1:1	TEM-302D-J
	AM79C971 (PCnet-Fast	1ct:1ct	1:1	TEM-300A-J
	AM79C973 (PCnet-FAST III)	1ct:1.41ct	1ct:1ct	TEM-300B-J
	AM79C976, AM79C977	1ct:1ct	1ct:1ct	TEM-300A-J
Broadcom	BCM5201, BCM5220, BCM5221, BCM5222, BCM5912(Dual)	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300D-J
Broadcom (Altima)	AH101	1ct:1ct	1ct:1ct	TEM-300A-J
Broadcom (Davicom)	DM9101, DM9102, DM9111, DM9131, DM9161, DM9181, DM9301, DM9601	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300H-J
Cirrus Logic (Crystyl)	CS8952	1ct:1ct	1ct:1ct	TEM-300A-J
ICS	ICS1890, ICS1891 ICS1892, ICS1893	1ct:1ct	1ct:1ct	TEM-300H-J TEM-300D-J
Intel	S82555, S82558 S82559, S82562	1ct:1ct	1ct:1ct	TEM-300A-J
Intel (Level One)	LXT970A, LXT971, LXT972, LXT973, LXT9761, LXT9762, LXT9781(Hex/Octal RMII), LXT9782(Hex/Octal SMII)	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300D-J
SIS	SiS960	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300B-J TEM-300D-J
SMSC	LAN83C180, LAN83C183, LAN83C190	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300B-J TEM-300D-J
Sundance Technology	ST100 (100BTX PMD PHY) ST101 (Fast Ethernet Media Converter)	1ct:1ct	1ct:1ct	TEM-300A-J
TDK	TSC78Q2120	1ct:1ct	1ct:1ct	TEM-300A-J
Texas Instruments	TNETE2101, TNETE2104	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300D-J
ATM Network Interface Transformer Modules				
National	155 ATM	83223	1ct:1ct	1ct:1ct	TEM-300H-J
µLinear		ML6674	1ct:1ct	1ct:1ct	TEM-300A-J
PMC Sierra		PM5350	1ct:1ct	1ct:1ct	TEM-300H-J TEM-300A-J

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IC Selection Guide for 10/100 Base-T Isolation Transformer Modules

IC Manufacturer	IC Part Number	Turns Ratio		Talema part Number
		Transmit	Receive	Miniature Single Port 12.8 x 9.6 x 6.0
Kendin	KS8728 (2.5V Octal PHY) KS8735 (3.3V Quad HUB) KS8737 (3.3V PHY MII) KS8761 (5V PHY) KS8995 (2.5V, Port Switch)	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300D-J TEM-300H-J
	KS8995E	1ct:1ct	1ct:1ct	TEM-300D-J
Lucent (Enable)	LUC3X04, LUCWX14, LUC3X24, LUC3X51	1ct:1ct	1ct:1ct	TEM-300A-J
	LU6612, T8301 (5V), T8302 (3.3V) - VoIP	1ct:1ct	1ct:1ct	TEM-300A-J
	LU3X31FT-J80, LU3X31FT-TE80, LU3X31T-T64, LU3X32FT-SE128, LU3X34FT-J160, LU3X36FTR (Hex)	1ct:1ct	1ct:1ct	TEM-300A-J
Macronix	MX715	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300B-J
Marvell	88E3061, 88E3081, 88E6050	1ct:1ct	1ct:1ct	TEM-300D-J
	88E6051, 88E6052	1ct:1ct	1ct:1ct	TEM-300D-J
MicroLinear	ML6651	1ct:1ct	1ct:1ct	TEM-300H-J
	ML6673	1ct:1ct	1ct:1ct	TEM-300H-J
	ML6692, ML6694 ML6697, ML6698	2ct:1ct 2ct:1	1:1:1ct	TEM-304G-J TEM-304J-J
Mitel (Plessy)	NWK937, NWK939, NWK954	1ct:1ct	1ct:1ct	TEM-300A-J
Myson	MTD971	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300B-J
Mysticom	MystiPHY110	1ct:1ct	1ct:1ct	TEM-300B-J TEM-300D-J
National Semiconductor	DP83843(Phyter), DP83815 (MacPhyter), DP83846A (DsPhyter)	1ct:1ct	1ct:1ct	TEM-300A-J
Realtek	RTL8139, RTL8201	1ct:1ct	1ct:1ct	TEM-300A-J
	RTL8139B	1ct:1ct	1ct:1ct	TEM-300A-J TEM-300B-J
	RTL8139C (3.3 V)	1ct:1ct	1ct:1ct	TEM-300B-J
	RTL8305S, RTL8100B	1ct:1ct	1ct:1ct	TEM-300A-J
	RTL8150	1ct:1ct	1ct:1ct	TEM-300D-J
LSI (SEEQ)	80220, 80221	2ct:1 2ct:1ct	1ct:1ct	TEM-304F-J TEM-304D-J
	80223, 80225	1ct:1ct	1ct:1ct	TEM-300B-J TEM-300D-J

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TMM Series • 10 Base-T Single Port SMD Transformer Modules

Features

- Low profile and light weight 10 Base-T modules facilitate pick and place compatability and speed of placement
- Meets requirements of IEEE 802.3
- Consistent and reliable coplanarity
- Excellent quality at extremely competitive price due to high volume production
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F

Electrical Specifications @ 25°C

Minimum isolation voltage: 1500 Vrms
Operating Temperature Range: -40°C to +85°C
Storage Temperature: -40°C to +125°C

Test Frequency:

Inductance, Interwinding Capacitance and Leakage Inductance measured @ 100KHz/20mV

Quality and consistency are guaranteed through 100% testing of the specified parameters for primary inductance, leakage inductance, turns ratio, DC resistance and interwinding capacitance.This ensures that the return loss and pulse wave shape requirements can be fully maintained. Additionally, all parts are tested for 1500V minimum isolation.

Applications:

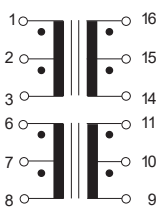
Talema 10Base-T transformer modules contain transmit and receive isolation transformers to maintain consistant wave shape and suppression of common mode noise while providing equipment isolation per IEEE 802.3. High impedance common mode quad chokes for additional EMI suppression have been added on some models as required for FCC and CISPR 22 Class B certification.

TMM Series • 10 Base-T Single Port SMD Transformer Modules

Part Number	Turns Ratio ±5%		Pri. OCL (µH Min)	L_L (µH Max)	C_{WW} (pF Max)	DCR (Ohms Max.)				V_P (Vrms)	Schematic
	1-3:16-14	6-8:11-9		Pri / Sec	Pri / Sec	1-3	16-14	6-8	11-9		
TMM-100A1-J	1ct:1ct	1ct:1ct	100	0.25	9	0.30	0.30	0.30	0.30	1500	A
TMM-100A6-J	2ct:1ct	1ct:1ct	100	0.25	12	0.60	0.30	0.30	0.30	1500	A
TMM-112A3-J	1ct:1ct	1ct:2ct	112	0.30	8	0.30	0.30	0.30	0.60	1500	A
TMM-140A2-J	1ct:1ct	1ct:1.414ct	140	0.20	12	0.30	0.30	0.30	0.45	1500	A
TMM-140A3-J	1ct:1ct	1ct:2ct	140/25	0.30	12	0.30	0.30	0.30	0.45	1500	A
TMM-150A6-J	2ct:1ct	1ct:1ct	150	0.20	12	0.60	0.30	0.30	0.30	1500	A
TMM-200A1-J	1ct:1ct	1ct:1ct	200	0.20	10	0.30	0.30	0.30	0.30	1500	A
TMM-200A2-J	1ct:1ct	1ct:1.414ct	200	0.50	15	0.30	0.30	0.30	0.45	1500	A
TMM-200A4-J	1ct:1ct	1ct:2.5ct	200/35	0.40	15	0.30	0.30	0.30	0.80	1500	A
TMM-200A5-J	1ct:2ct	1ct:1ct	50/200	0.20	12	0.30	0.60	0.30	0.30	1500	A
TMM-140B1-J	Pri. Winding:Sec. Winding		140	0.20	12	Pri. Windings		Sec. Windings		1500	B
	1:1 (4x)					0.30		0.30			
TMM-140B2-J	1:1.41(4x)		140	0.20	12	0.41		0.60		1500	B

Schematics without Choke

A



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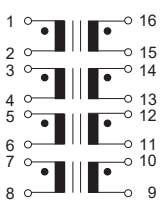
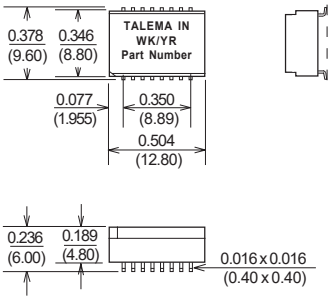


See next page for electrical specifications for modules with common mode chokes for EMI noise suppression and for dimensions and **Schematics with choke.**

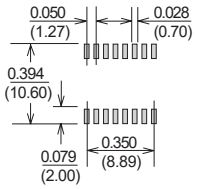
Part Number	Turns Ratio ±5%		Pri. OCL (µH Min)	L_L (µH Max)	$C_{W/W}$ (pF Max)	DCR (Ohms Max.)				V_P (Vrms)	Schematic
	1-3:16-14	6-8:11-9		Pri / Sec	Pri / Sec	1-3	16-14	6-8	11-9		
TMCM-100A1-J	1ct:1ct	1ct:1ct	100	0.30	8	0.30	0.30	0.30	0.30	1500	A
TMCM-110B2-J	1ct:1ct	1ct:1.414ct	110	0.40	15	0.30	0.30	0.30	0.90	1500	B
TMCM-112B3-J	1ct:1ct	1ct:2ct	112	0.30	8	0.40	0.40	0.40	1.10	1500	B
TMCM-120A3-J	1ct:1ct	1ct:2ct	120/20	0.40	9	0.90	0.90	0.90	0.90	1500	A
TMCM-140A2-J	1ct:1ct	1ct:1.414ct	140	0.40	20	0.40	0.40	0.40	0.40	1500	A
TMCM-140A3-J	1ct:1ct	1ct:2ct	140	0.2	12	0.30	0.30	0.30	0.90	1500	A
TMCM-140A6-J	2ct:1ct	1ct:1ct	140	0.3	12	0.60	0.30	0.30	0.30	1500	A
TMCM-150A6-J	2ct:1ct	1ct:1ct	150	0.90	10	0.70	0.35	0.35	0.35	1500	A
TMCM-200A1-J	1ct:1ct	1ct:1ct	200	0.25	10	0.30	0.30	0.30	0.30	1500	A
TMCM-200A2-J	1ct:1ct	1ct:1.414ct	200	0.5	12	0.30	0.30	0.30	0.75	1500	A
TMCM-200A4-J	1ct:1ct	1ct:1.2.5ct	200	0.5	15	0.30	0.30	0.30	1.05	1500	A
TMCM-200A5-J	1ct:2ct	1ct:1ct	200	0.3	8	0.30	0.90	0.30	0.30	1500	A
TMCM-350A4-J	1ct:1ct	1ct:2.5ct	350	0.8	30	0.30	0.30	0.30	1.05	1500	A

Dimensions

Miniature Module - TMM & TMCM



Suggested Pad Layout

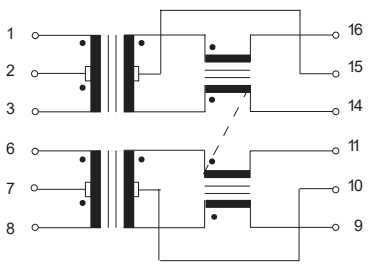


Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Surface coplanarity will be 0.004 (0.01) maximum

Packing Method: Tape and Reel; Qty/Reel: 600 Pcs

Schematics with Choke

A



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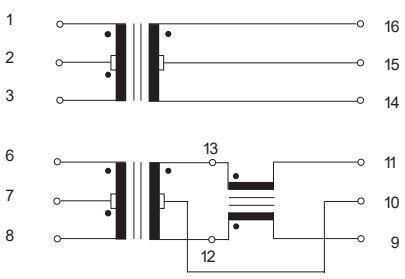


TEM Series • 10/100 Base-T Single Port Transformer Modules

Features

- Low profile and light weight 10/100 BaseT modules facilitate pick and place compatability and speed of placement
- Meets requirements of IEEE 802.3u and ANSIX3.263
- Consistent and reliable coplanarity
- Excellent quality at extremely competitive price due to high volume production
- Manufactured in an ISO 9001:2015 ISO 14001:2015 certified Talema facility
- Fully RoHS & REACH Compliant and meets Lead free reflow level J-STD-020F

Minimum isolation voltage: 1500 Vrms
Operating Temperature Range: -40°C to +85°C
Storage Temperature: -40°C to +125°C

Electrical Specifications @ 25°C

Inductance: 350µH minimum @ 100KHz/100mV, 8mA
Leakage Inductance: 0.4µH @ 1MHz
$C_{W/W:}$ 15pF typical

Quality and consistency is guaranteed through 100% testing of the specified parameters for primary inductance, leakage inductance, turns ratio, DC resistance and interwinding capacitance.This ensures that the return loss and pulse wave shape requirements can be fully maintained. Additionally, all parts are tested for 1500V minimum isolation.

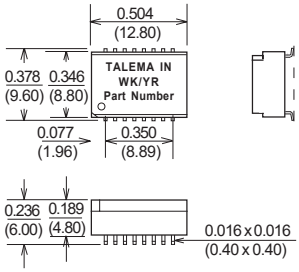
Applications:

Talema 10/100Base-T transformer modules contain transmit and receive isolation transformers to maintain consistent wave shape and suppression of common mode noise while providing equipment isolation per IEEE 802.3. High impedance common mode quad chokes for additional EMI suppression have been added on some models as required for FCC and CISPR 22 Class B certification.

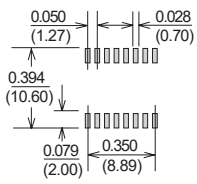
TEM Series - 10/100Base-T Single Port Isolation Transformer Modules

Part Number	Turns Ratio (Pri:Sec)		Insertion Loss (dB Max)	Return Loss (dB Min @ 100 Ohm)				Differential to Common Mode Rejection (dB Min)			Crosstalk (dB Typ)			Schematic
	Tx	Rx	0.1 - 100MHz	1-30MHz	40MHz	60MHz	80MHz	30MHz	60MHz	100MHz	30MHz	60MHz	100MHz	
TEM-300A-J	1ct:1ct	1ct:1ct	-1.0	-20	-20	-18	-14	-42	-36	-33	-50	-40	-40	A
TEM-300B-J & B1-J	1ct:1ct	1ct:1ct	-1.0	-22	-20	-18	-12	-42	-38	-32	-50	-40	-40	B
TEM-300D-J	1ct:1ct	1ct:1ct	-1.0	-22	-20	-18	-12	-45	-40	-35	-50	-40	-40	D
TEM-304D-J	2ct:1ct	1ct:1ct	-1.1	-20	-20	-14	-11.5	-42	-37	-33	-45	-40	-35	D
TEM-305D-J	1.89ct:1ct	1ct:1ct	-1.1	-18	-16	-14	-12	-30	-30	-30	-35	-35	-35	D
TEM-300E-J	1ct:1ct	1ct:1ct	-1.0	-18	-16	-14	-12	-42	-37	-32	-45	-40	-35	E
TEM-304F-J	2ct:1	1ct:1ct	-1.0	-16	-16	-16	-12	-35	-35	-32	-40	-40	-35	F
TEM-304G-J	2ct:1ct	1:1:1ct	-1.0	-16	-16	-16	-12	-35	-35	-32	-40	-40	-35	G
TEM-300H-J & H1-J	1ct:1ct	1ct:1ct	-1.0	-20	-18	-18	-14	-45	-40	-35	-45	-40	-35	H
TEM-304J-J	2ct:1	1:1:1ct	-1.0	-16	-16	-16	-12	-35	-35	-32	-40	-40	-35	J
TEM-300K-J & K1-J	1ct:1	1ct:1ct	-1.0	-16	-13.4	-11.5	-10	-45	-40	-35	-40	-38	-35	K
TEM-300L-J	1ct:1ct	1ct:1ct	-0.9	-18	-14	-12	-11	-40	-35	-30	-45	-45	-37	L
TEM-300M-J	1ct:1ct	1ct:1ct	-1.0	-20	-17	-17	-14	-40	-40	-40	-40	-40	-40	M
TEM-300N-J	1ct:1ct	1ct:1ct	-1.0	-20	-17	-17	-14	-40	-40	-40	-40	-40	-40	N
TEM-300P-J	1ct:1ct	1ct:1ct	-1.1	-18	-16	-14	-12	-42	-37	-35	-40	-40	-35	P

TEM Miniature Module



Suggested Pad layout



Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Surface Coplanarity will be 0.004 (0.10)

Packing Method: Tape and Reel; Qty/Reel: 600 Pcs

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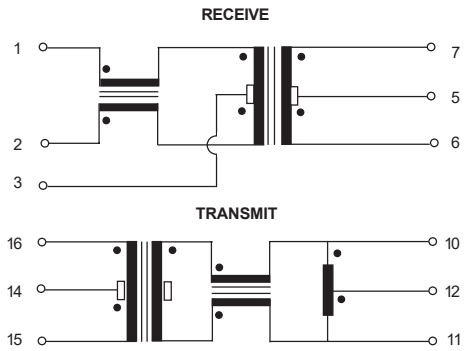
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TRANSMIT
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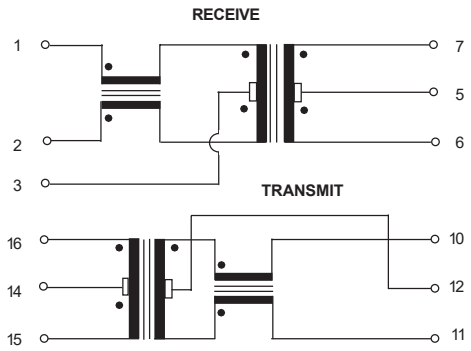
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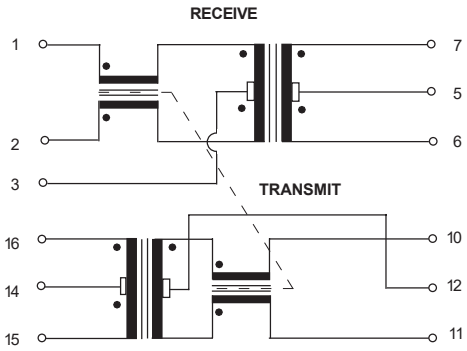
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TRANSMIT
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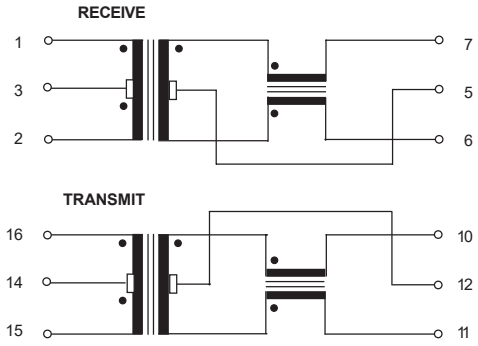
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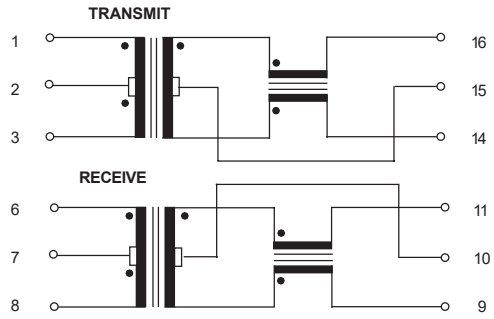
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RECEIVE
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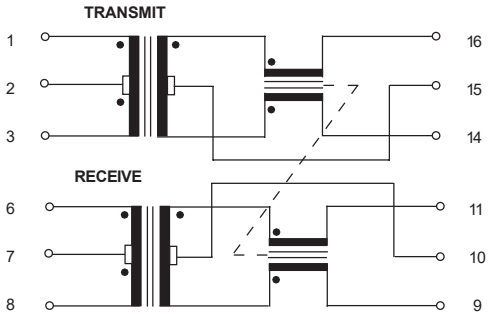
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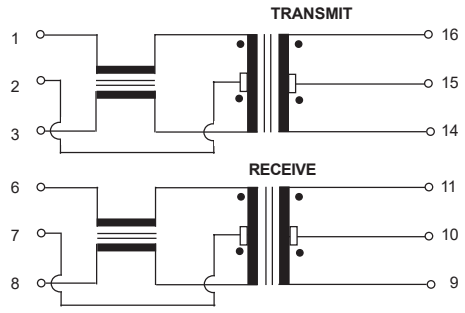
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RECEIVE
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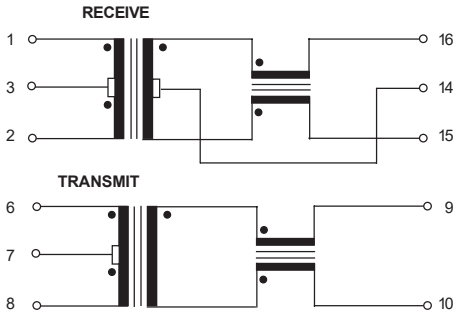
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TRANSMIT
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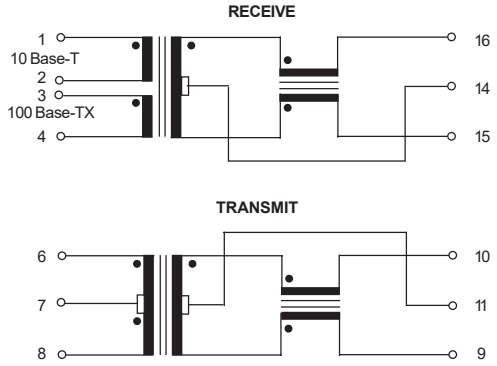

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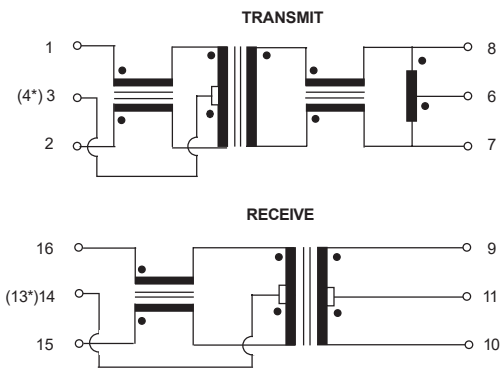

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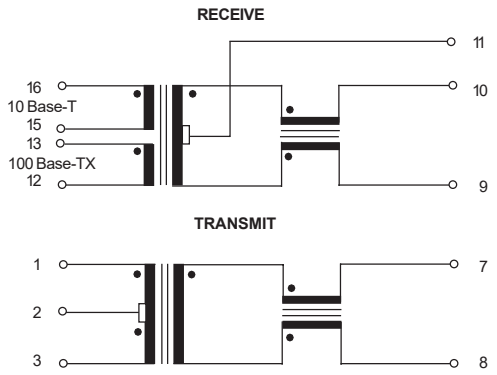

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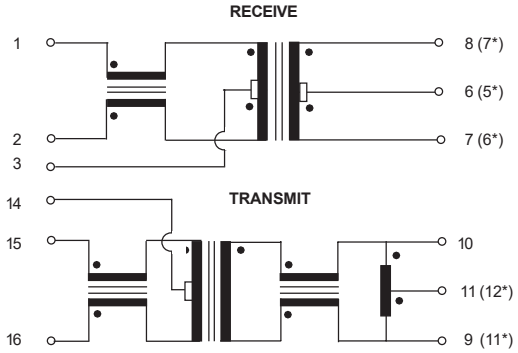

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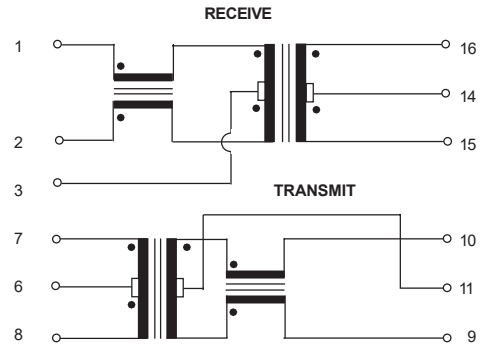

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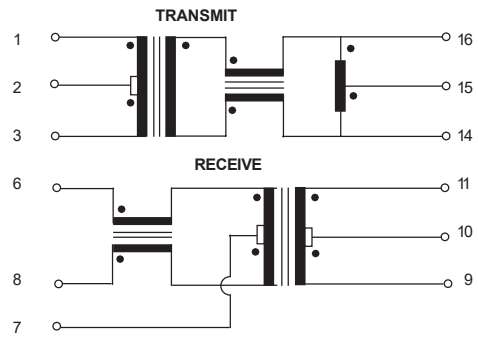

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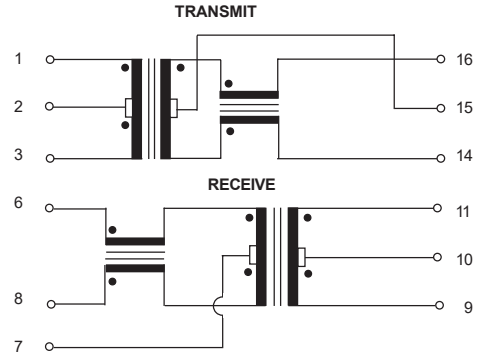

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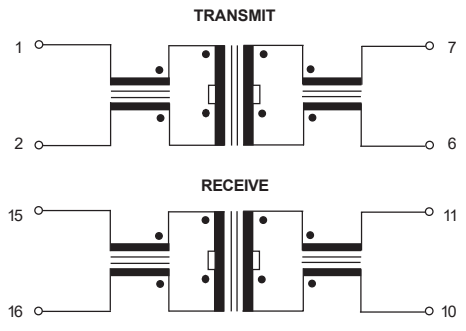
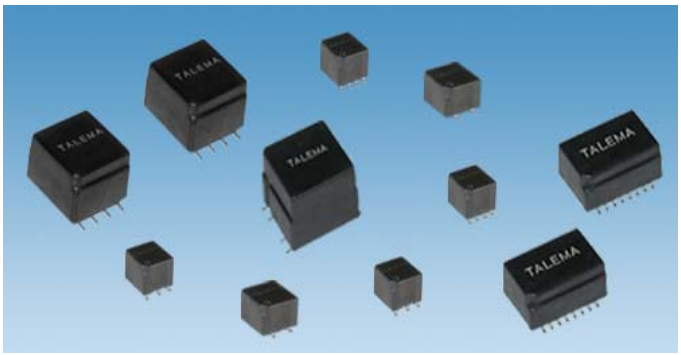


talema group

Common Mode Interface Chokes for LAN & Telecom Applications

Features

- EMI noise suppression for data and signal line filtering
- Miniature, low cost SMD common mode chokes are designed for pick and place compatability & provide reliable Coplanarity
- High attenuation over a wide frequency range
- Manufactured in an ISO 9001:2015 and ISO 14001:2015 certified Talema facility
- Other inductance values available upon request
- Parts shown below meet all popular footprints
- Fully RoHS & REACH Compliant and meets lead free reflow level J-STD-020F



Electrical Specifications @ 25°C

Nominal Voltage: 42Vac (50/60Hz), 80Vdc
Operating temperature: -25° to +85°C
Storage temperature: -40° to +125°C
Climatic category: according to IEC68-1 25/85/56

Test voltage between windings: 500Vrms
Test frequency: Inductance measured @ 100KHz/20mV

Miniature Common Mode Chokes for Data and Signal Line EMI suppression

Part Number	OCL (µH) ±30%	I_N (mA)	DCR (mOhms)	Number of Coils	Windings per Coil	Schematic
Sector winding for CAN bus and similarapplications						
CTJ-2-110SE	11	250	160	1	2	A
CTJ-2-220SE	22	250	195	1	2	A
CTJ-2-330SE	33	200	260	1	2	A
CTJ-2-510SE	51	200	300	1	2	A
CLJ/CMJ-2-060S	6	2500	80	1	2	A
CLJ/CMJ-2-250S	25	800	110	1	2	A
CLJ/CMJ-2-510S	51	800	160	1	2	A
Two Data Lines						
CTJ-2-110	11	300	160	1	2	A
CTJ-2-101	100	300	180	1	2	A
CTJ-2-221	220	200	250	1	2	A
CTJ-2-471	470	200	380	1	2	A
CTJ-2-102	1000	150	660	1	2	A
CTJ-2-222	2200	150	840	1	2	A
CTJ-2-332	3300	150	1500	1	2	A
CTJ-2-472	4700	150	1800	1	2	A
CLJ/CMJ-2-050	5	1200	60	1	2	A
CLJ/CMJ-2-110	11	500	80	1	2	A
CLJ/CMJ-2-240	24	500	100	1	2	A
CLJ/CMJ-2-250	25	500	110	1	2	A
CLJ/CMJ-2-470	47	500	130	1	2	A
CLJ/CMJ-2-510	51	500	148	1	2	A
CLJ/CMJ-2-101	100	500	315	1	2	A
CLJ/CMJ-2-471	470	500	290	1	2	A
CLJ/CMJ-2-102	1000	500	275	1	2	A
CLJ/CMJ-2-222	2200	400	345	1	2	A
CLJ/CMJ-2-472	4700	200	940	1	2	A
CLJ/CMJ-2-103	10000	200	1400	1	2	A
CLJ/CMJ-2-203	20000	140	1800	1	2	A
CLJ/CMJ-2-473	47000	100	3900	1	2	A

Part Number	OCL (µH) ±30%	I_N (mA)	DCR (mOhms)	Number of Coils	Windings per Coil	Schematic
Two Data Lines						
CCJ-2-260	26	900	55	1	2	A
CCJ-2-102	1000	550	140	1	2	A
CCJ-2-152	1500	550	100	1	2	A
CCJ-2-222	2200	550	115	1	2	A
CCJ-2-332	3300	550	140	1	2	A
CCJ-2-502	5000	500	180	1	2	A
CCJ-2-682	6800	450	300	1	2	A
CCJ-2-103	10000	400	250	1	2	A
CCJ-2-123	12000	400	270	1	2	A
CCJ-2-283	28000	270	520	1	2	A
CCJ-2-503	50000	200	970	1	2	A
CCJ-2-703	70000	170	1490	1	2	A
CDJ-1.0-A	1000	600	190	1	2	A
CDJ-1.7-A	1700	550	200	1	2	A
CDJ-2.2-A	2200	350	300	1	2	A
CDJ-3.3-A	3300	350	370	1	2	A
CDJ-4.7-A	4700	350	600	1	2	A
CDJ-6.8-A	6800	350	510	1	2	A
CDJ-10-A	10000	350	620	1	2	A
CDJ-12-A	12000	300	680	1	2	A
CDJ-15-A	15000	300	720	1	2	A
CDJ-22-A	22000	300	920	1	2	A
CDJ-28-A	28000	300	1020	1	2	A
CDJ-33-A	33000	300	1120	1	2	A
CDJ-50-A	50000	300	1800	1	2	A
CDJ-70-A	70000	300	2100	1	2	A

Common Mode Interface Chokes for LAN & Telecom Applications

Miniature Common Mode Chokes for Data and Signal Line EMI suppression						
Part Number	**OCL (µH) ±30%**	**I_N (mA)**	**DCR (mOhms)**	**Number of Coils**	**Windings per Coil**	**Schematic**
Four Data Lines						
CCJ-4-260	26	600	55	1	4	B
CCJ-4-470	47	500	100	1	4	B
CCJ-4-101	100	400	130	1	4	B
CCJ-4-221	220	400	190	1	4	B
CCJ-4-471	470	400	130	1	4	B
CCJ-4-681	680	400	140	1	4	B
CCJ-4-102	1000	350	190	1	4	B
CCJ-4-152	1500	350	120	1	4	B
CCJ-4-222	2200	350	140	1	4	B
CCJ-4-332	3300	350	180	1	4	B
CCJ-4-502	5000	330	230	1	4	B
CCJ-4-103	10000	230	430	1	4	B
CCJ-4-123	12000	170	790	1	4	B
CCJ-4-583	58000	90	2350	1	4	B
CQJ-1.0-B	1000	400	200	1	4	B
CQJ-1.7-B	1700	350	260	1	4	B
CQJ-2.2-B	2200	300	310	1	4	B
CQJ-3.3-B	3300	300	380	1	4	B
CQJ-5.0-B	5000	300	430	1	4	B
CQJ-6.8-B	6800	300	850	1	4	B
CQJ-10-B	10000	300	1060	1	4	B
CQJ-12-B	12000	250	1120	1	4	B
CQJ-58-B	58000	200	2400	1	4	B
CQJ-90-B	90000	150	4150	1	4	B
CUJ-240-16E	24	800	45	2	2	E
CUJ-340-16E	34	700	55	2	2	E
CUJ-101-16E	100	450	135	2	2	E
CUJ-471-16E	470	450	95	2	2	E
CUJ-102-16E	1000	450	135	2	2	E
CUJ-472-16E	4700	300	310	2	2	E

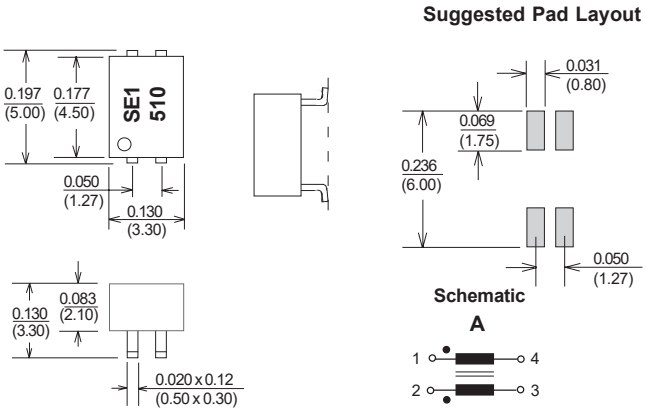
Common Mode Interface Chokes for LAN & Telecom Applications

Miniature Common Mode Chokes for Data and Signal Line EMI suppression						
Part Number	**OCL (µH) ±30%**	**I_N (mA)**	**DCR (mOhms)**	**Number of Coils**	**Windings per Coil**	**Schematic**
Six Data Lines						
CUJ-240-16C	24	650	45	2	3	C
CUJ-470-16C	47	450	90	2	3	C
CUJ-101-16C	100	350	170	2	3	C
CUJ-471-16C	470	350	95	2	3	C
CUJ-102-16C	1000	330	170	2	3	C
CUJ-472-16C	4700	200	430	2	3	C
CUJ-240-16D	24	600	75	3	2	D
CUJ-340-16D	47	500	110	3	2	D
CUJ-101-16D	100	450	135	3	2	D
CUJ-471-16D	470	350	220	3	2	D
CUJ-102-16D	1000	350	220	3	2	D
CUJ-472-16D	4700	190	750	3	2	D
Eight Data Lines						
CUJ-240-16A	24	550	45	2	4	A
CUJ-340-16A	47	400	90	2	4	A
CUJ-101-16A	100	250	240	2	4	A
CUJ-471-16A	470	250	95	2	4	A
CUJ-102-16A	1000	250	240	2	4	A
CUJ-472-16A	4700	160	600	2	4	A
CUJ-240-16B	24	430	130	4	2	B
CUJ-340-16B	47	160	180	4	2	B
CUJ-101-16B	100	300	260	4	2	B
CUJ-471-16B	470	300	180	4	2	B
CUJ-102-16B	1000	300	240	4	2	B
CUJ-472-16B	4700	160	1180	4	2	B

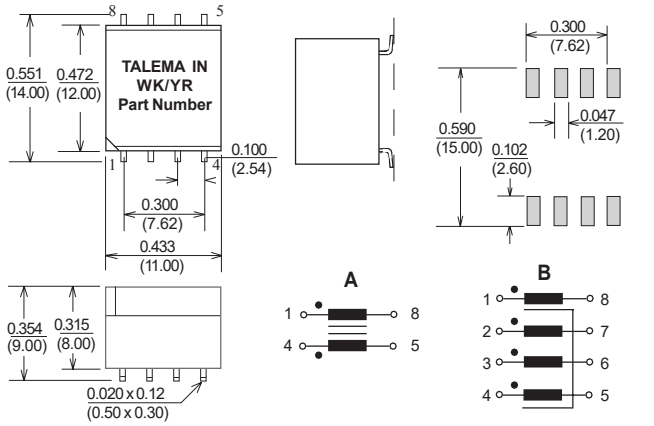
Mechanical Dimensions

Dimensions: Inches (Millimeters);
Tolerance: ±0.010 (0.25) unless specified otherwise;
Surface Coplanarity will be 0.004 (0.10) maximum

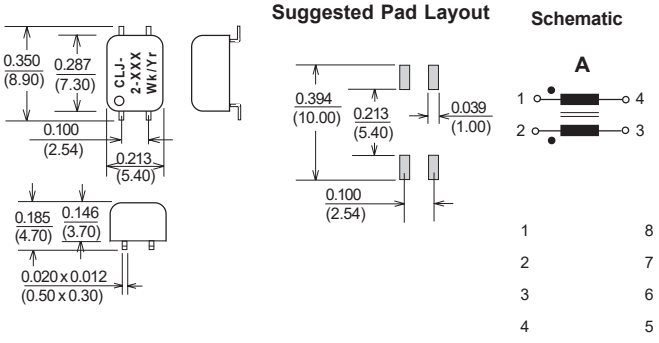
CTJ-2



CCJ-2 / 4



CLJ/CMJ-2



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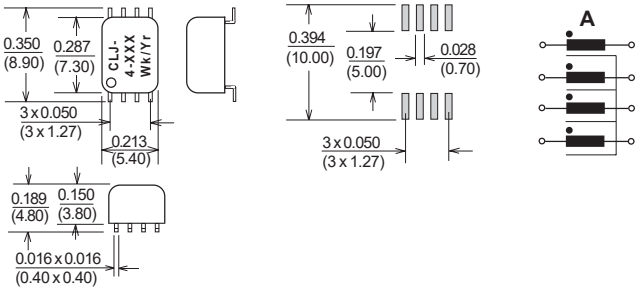
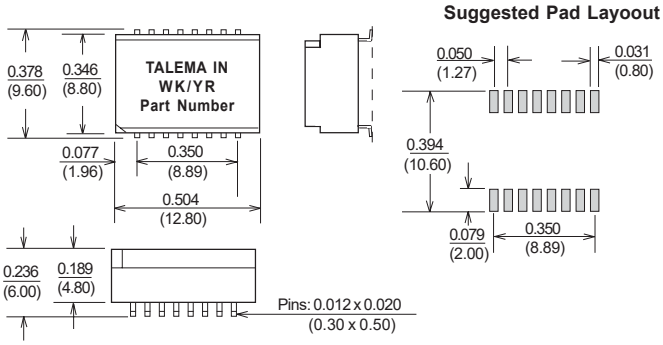
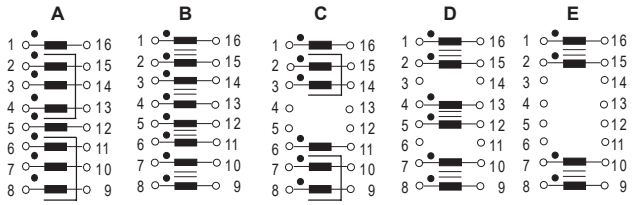


CUJ-XXX-16



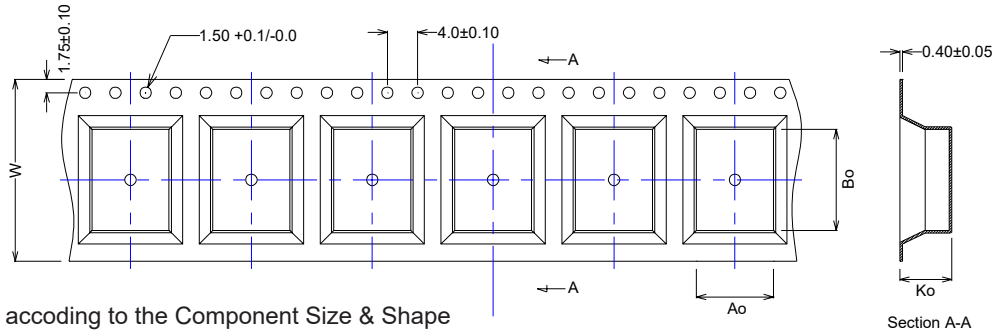
Schematics



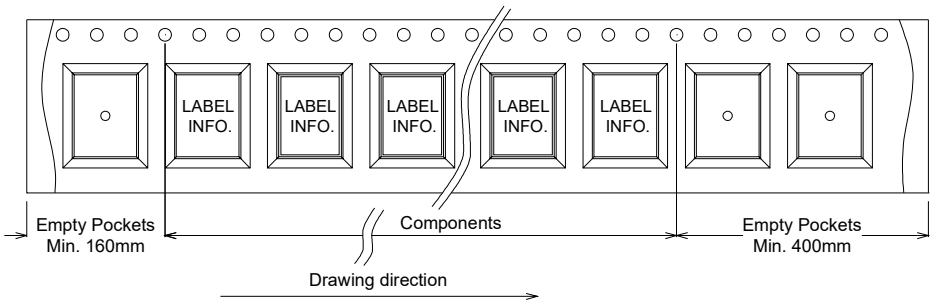
Tape & Reel Packaging and Dimensions

Carrier Tape - 1

Carrier Tape Dimensions (12.00mm, 16.00mm & 24.00mm)



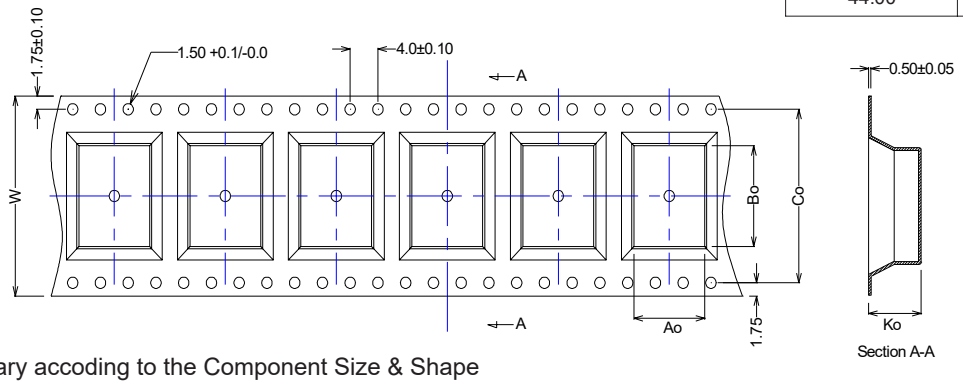
Ao, Bo & Ko - Vary accoding to the Component Size & Shape



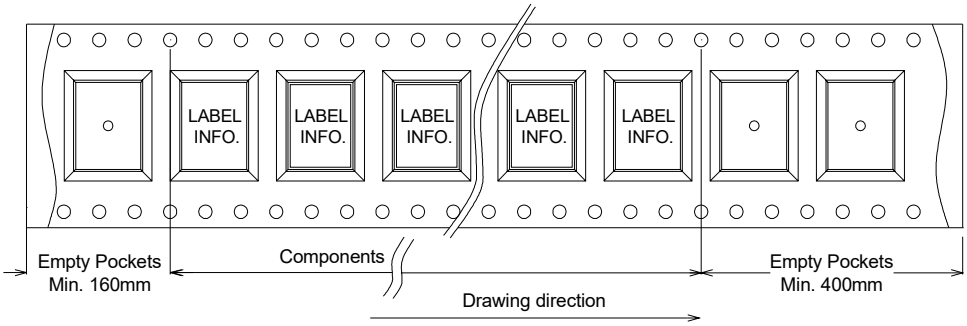
Carrier Tape - 2

Carrier Tape Dimensions in mm	
Width	Pitch Co
32.00	28.50
44.00	40.50

Carrier Tape Dimensions (32.00mm & 44.00mm)

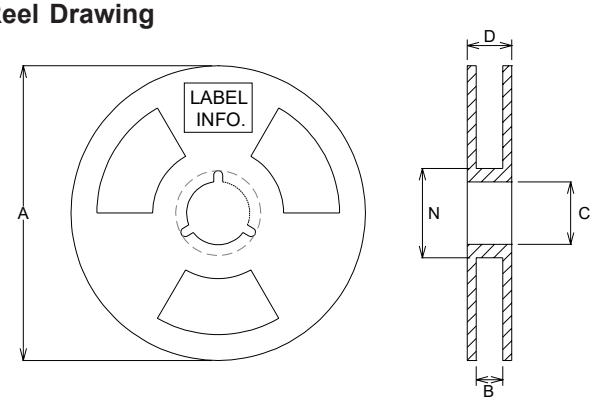


Ao, Bo, Co & Ko - Vary accoding to the Component Size & Shape



Tape & Reel Packaging and Dimensions

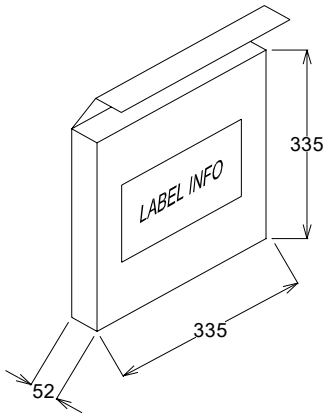
Reel Drawing



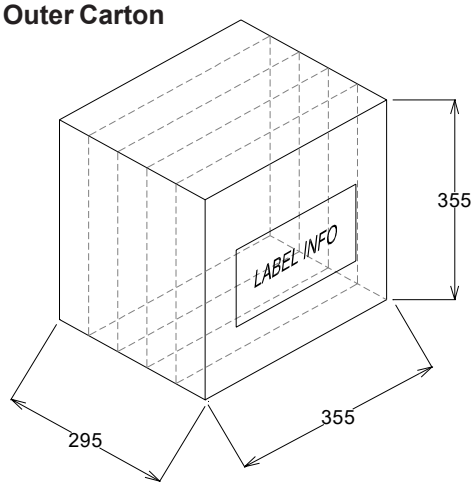
Reel Dimensions in “mm”					
Type	A	B	C	D	N
13.00mm	Ø330	13	Ø20.2	17	Ø100
16.00mm	Ø330	16	Ø20.2	20	Ø100
24.00mm	Ø330	24	Ø20.2	28	Ø100
32.00mm	Ø330	32	Ø20.2	36	Ø100
44.00mm	Ø330	44	Ø20.2	48	Ø100

Tape and Reel Dimensions				
Name of the Series	Reel Type	No. of inside Carton	Quantity (Pcs/Reel)	Quantity (Reel/Cased)
CTJ-2	13.00mm	5	2000	5/2000
CLJ/CMJ-2	16.00mm	5	1000	5/1000
CLJ/CMJ-4	16.00mm	5	1000	5/1000
ISJ	16.00mm	5	600	5/600
CCJ	24.00mm	5	375	5/375
CUJ	24.00mm	5	600	5/600
MUJ	24.00mm	5	600	5/600
MJM	24.00mm	5	600	5/600
MMJ	24.00mm	5	600	5/600
TEM	24.00mm	5	600	5/600
TMCM	24.00mm	5	600	5/600
TAM	24.00mm	5	600	5/600
TMM	24.00mm	5	600	5/600
CDJ	32.00mm	5	200	5/200
CQJ	32.00mm	5	200	5/200
MAJ	44.00mm	5	250	5/250

Inside Carton



Outer Carton



talemagroup

Regional Locations - Design, Manufacturing, Sales & Marketing

Talema Group Regional Offices

North America

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sales@talemagroup.com
Web: www.talema.com

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Fax: +91 427 - 243 3109
E-Mail: talema@talemaindia.net
Web: www.talema.com

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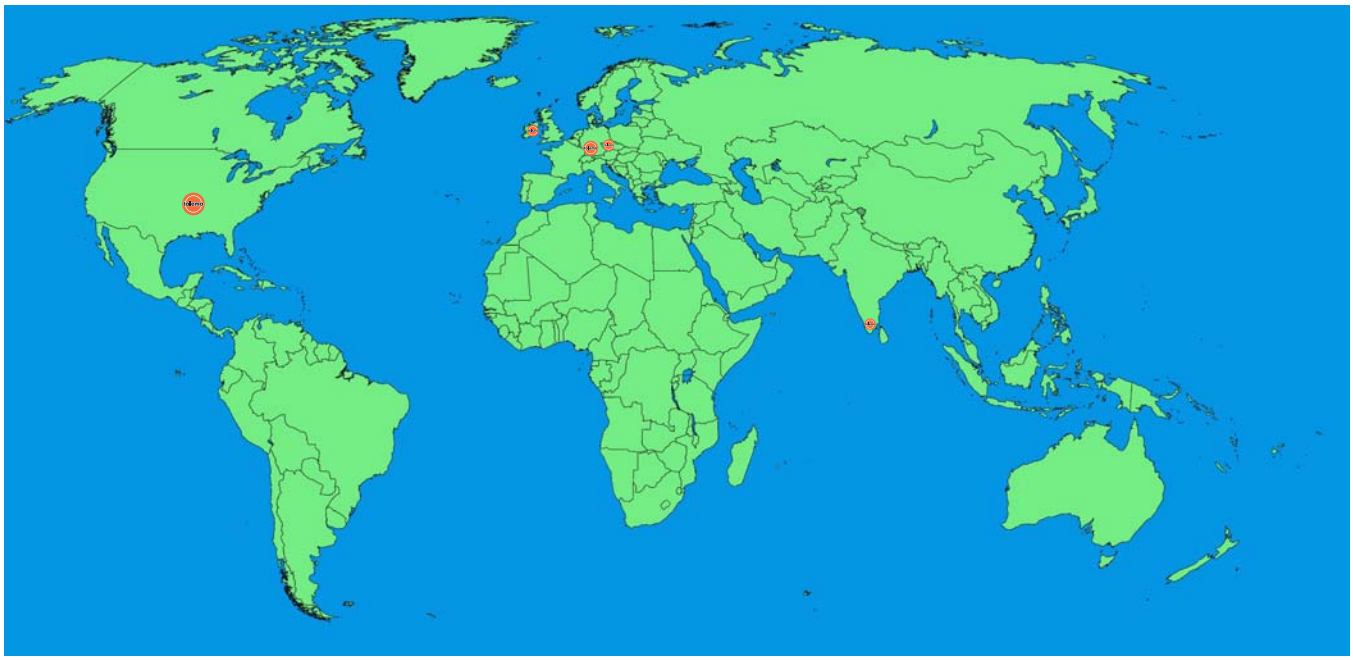
Locations of Talema Group Regional Offices



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Summary
TOTAL PROGRAM

RoHS REACH

10/23