



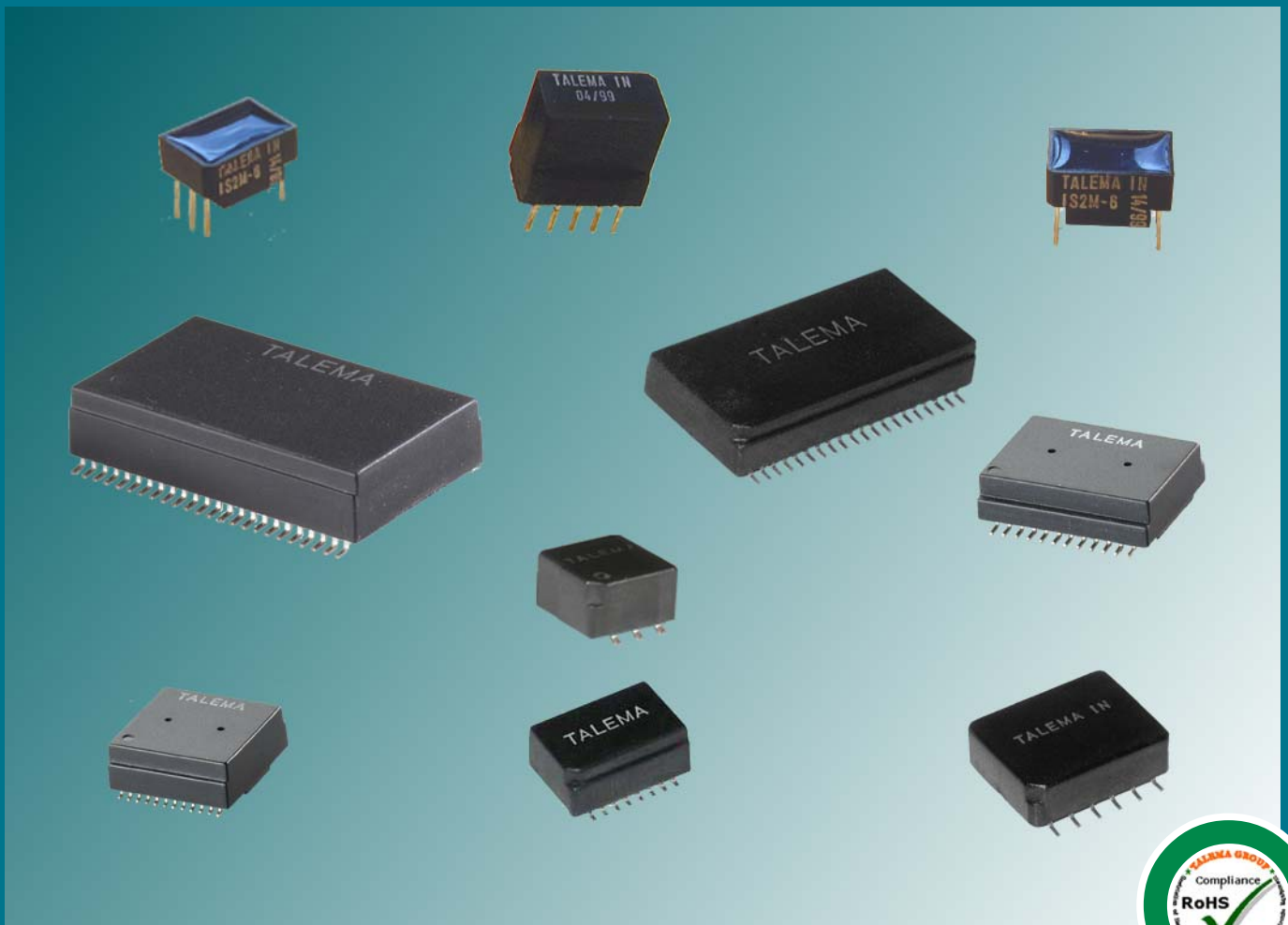
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nuvotem

- Interface Transformers •
- Common Mode Interface Chokes •
- SMD and Through Hole Packaging •
- Single, Dual and Octal Transformers •

E1/T1/CEPT/ISDN-PRI - T3/E3/D3/STS-1

Interface Transformers for Telecommunication Products



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TALEMA PROFILE

Founded in 1975, The TALEMA International Group has established itself as a world leader in the manufacture of toroidal transformers and related magnetic components. Our strong technical engineering expertise has contributed to the growth of our current workforce to over 1,200 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, 10Base-T, Ethernet transformers for 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-9001:2000, TS-16949:2002 and meet a broad range of International Standards including UL, VDE, IEC, and EN.

Performance has been proven in the many design in's of our products. The fact that we maintain a ship-to-stock vendor rating with over 200 national and international companies is, to us, the best testimonial of our commitment to quality.

ENVIRONMENT

All TALEMA International Group manufacturing facilities are RoHS compliant and all chokes, inductors and HF components are produced in an Environment Management System (EMS) facility certified to ISO-14001:2004.



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



Talema manufactures a wide range of transformers for all 1.544 and 2.048Mbps 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				
			Single Through Hole		12 Pin Dual SMD		16 Pin Dual SMD
			Transmit	Receive	Tx / Rx	Tx / Rx	Tx / Rs
Cologne Chip	HFC-E1	S2M	--	--	--	--	MJM-032
Cirrus Logic (Crystal)	61318	120 E1	IS2M-7 / -19	IS2M-15 / -20	-	MJS-018	MJM-018
	61318	75 E1	IS2M-17 / -27	IS2M-15 / -20	--	--	--
	61577	T1 & E1	IS2M-7 / -19	IS2M-19	MJS-017A	MJS-017	MJM-017
	61304A, 61305A, 61535A, 61574A, 61575	T1	IS2M-8 / 21	IS2M-21 / -19	MJS-019A	MJS-019	MJM-019
	61304A, 61305A, 61535A, 61574A, 61575	75 E1	IS2M-12	IS2M-7 / -19	MJS-018A	MJS-025	MJM-025
	61304A, 61305A, 61535A, 61574A, 61575	120 E1	IS2M-12	IS2M-7 / -19	MJS-025A	MJS-025	MJM-025
	61884	T1/E1/J1	--	--	MJS-017A	--	--
	61582, 61583		IS2M-8 / -21	IS2M-8 / -21	MJS-013A	MJS-013	MJM-013
	61310, 61581		IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	61310, 61581	Host	IS2M-7 / -19	IS2M-7 / -19	--	--	MJM-026
	61880, 61881		IS2M-8 / -21	IS2M-7 / -19	MJS-019A	MJS-019	MJM-019
	61584, 61584A	IQ3	IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MJS-017	MJM-017
61582, 61583, 61584, 61584A	IQ5	IS2M-8 / -21	IS2M-8 / -21	MJS-013A	MJS-013	MJM-013	
Maxim (Dallas)	DS2196, DS2155, DS2149, DS2148		IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	DS2151, DS2152, DS2153, DS2154		IS2M-8 / -21	IS2M-15 / -20	MJS-014A	MSJ-019	MJM-019
	DS2151, DS2152, DS2153, DS2154		IS2M-10 / -25	IS2M-15 / -20	MJS-031A	MSJ-028	MJM-028
	DS2148/Q48/Q348/349/Q59	3V	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MSJ-018	MJM-018
	DS2148, Q48	5V	IS2M-10 / -25	IS2M-15 / -20	MJS-031A	MSJ-028	MJM-028
	DS21352/Q352, DS21354/Q354	T1/E1	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MSJ-018	MJM-018
	DS21552/Q552, DS21554/Q554	T1/E1	IS2M-8 / -21	IS2M-15 / 20	MJS-014A	MSJ-019	MJM-019
	DS21552/Q552, DS21554/Q554	T1/E1	IS2M-10 / -25	IS2M-15 / -20	MJS-031A	MSJ-028	MJM-028
	DS26502, DS2503, DS21455, DS21458, DS26528		IS2M-7	IS2M-15	MJS-018A	MSJ-018	MJM-018
	Exar	XRT5683A, XRT59L91, XRT5894, XRT5897, XRT5997		IS2M-6 / -19	IS2M-6 / -19	MJS-017A	MSJ-017
XRT5793, XRT5794			IS2M-12	IS2M-24 / -20	MJS-046A	MSJ-025	MJM-025
XRT81L27, 82L24, 82D20			IS2M-25	IS2M-6 / -19	MJS-017A	MSJ-028	MJM-028
XRT83L30, XRT83L34, XRT83L38			IS2M-6 / -19	IS2M-6 / -19	MJS-018A	MSJ-018	MJM-018
XRT86L30, XRT86L32, XRT86L34, XRT86L38			IS2M-6	IS2M-24	MJS-018A	MJS-018	MJM-018
T5684, XRT7288, 82D20			IS2M-25	IS2M-7 / -19	MJS-028A	MSJ-028	MJM-028
IDT	82V2044, 82V2048, 82V2048L, 82V2054, 82V2058		IS2M-6	IS2M-6	MJS-017A	MSJ-017	MJM-043
	82V2041E, 82V2042E, 82V2044E, 82V2048E		IS2M-6	IS2M-24	MJS-018A	MSJ-018	MJM-018
	82V2081, 82V2082, 82V2084, 82V2088		IS2M-6	IS2M-24	MJS-018A	MSJ-018	MJM-018
	82P2281, 82P2282, 82P2284, 82P2288		IS2M-6	IS2M-24	MJS-018A	MSJ-018	MJM-018
Infineon (Siemens)	PEB2254, PEB2255	E1/T1/J1	--	--	MJS-021A	MSJ-021	MJM-010
	PEB2254, PEB2255	E1/T1/J1	--	--	MJS-021A	MSJ-021	MJM-021
	PEB22504, PEB22554, PEB2256	3.3V	--	--	MJS-032A	--	MJM-022



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

IC Manufacturer	IC Part Number	Application	Talema Transformer Part Number				
			Single Through Hole		12 Pin Dual SMD		16 Pin Dual SMD
			Transmit	Receive	Tx / Rx	Tx / Rx	Tx / Rs
Intel (Level One)	LXT300, LX301		IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MSJ-017	MJM-017
	LXT304, LXT305, LXT307	T1/E1	IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MSJ-017	MJM-017
	LXT304, LXT305, LXT307	T1	IS2M-8 / -21	IS2M-7 / -19	MJS-019A	MSJ-019	MJM-019
	LXT304, LXT305, LXT307	75, 120 E1	IS2M-12	IS2M-7 / -19	MJS-018A	MSJ-025	MJM-025
	LXT304, LXT305, LXT307	DSX-1, D4	IS2M-11	IS2M-7	MJS-015A	MSJ-016	MJM-016
	LXT310, LXT317, LXT318		IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MSJ-018	MJM-018
	LXT312, LXT313, LXT315		IS2M-26	IS2M-15 / -20	--	--	--
	LXT331	T1/E1	IS2M-7 / -19	IS2M-7 / -19	MJS-018A	MSJ-018	MJM-018
	LXT331, LXT332		IS2M-11	IS2M-7	MJS-015A	MSJ-016	MJM-016
	LXT331, LXT332		IS2M-8 / -21	IS2M-7 / -19	MJS-019A	MSJ-019	MJM-019
	LXT331, LXT332		IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MSJ-017	MJM-017
	LXT334, LXT335	T1/E1	IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MSJ-017	MJM-017
	LXT334, LXT335	120/75 E1	IS2M-10 / -25	IS2M-7 / -19	MJS-031A	MSJ-028	MJM-028
	LXT334, LXT335	75 E1	IS2M-12	IS2M-7 / -19		MSJ-025	MJM-025
	LXT334, LXT335		IS2M-16	IS2M-15			MJM-026
	LXT336		IS2M-7	IS2M-20	MJS-046A	MSJ-017	MJM-024
	LXT350, LXT351, LXT359	T1/E1	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	LXT350, LXT351		IS2M-11	IS2M-7	MJS-019A	MSJ-019	MJM-019
	LXT350, LXT351	120 E1	IS2M-11	IS2M-7	MJS-015A	MSJ-016	MJM-016
	LXT360, LXT361, LXT362, LXT363	T1/E1	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	LXT360, LXT361, LXT362, LXT363		IS2M-8 / -21	IS2M-7 / 19	MJS-019A	MSJ-019	MJM-019
	LXT360, LXT361		IS2M-11	IS2M-7		MSJ-016	MJM-016
	LXT380, LXT381, LXT384, LXT386, LXT388	T1/ E1	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MSJ-018	MJM-018
	LXT380, LXT381, LXT384, LXT386, LXT388		IS2M-11	IS2M-7		MSJ-016	MJM-016
LXT3104, LXT3108		IS2M-15 / -20	IS2M-15 / -20	MJS-046A	MSJ-017	MJM-017	
LXT3104, LXT3108						MJM-048	
Agere (Lucent)	T7288, T7290A	CEPT/E1	IS2M-10 / -25	IS2M-6 / -19	MJS-028A	MSJ-028	MJM-028
	T7289A	DS1	IS2M-23 / -21	IS2M-7 / -19	MJS-019A	MSJ-019	MJM-019
	T7630, T7688, T7690, T7698	CEPT	IS2M-10 / -25	IS2M-10 / -25	MJS-010A	MSJ-010	
	T7630, T7688, T7690, T7698	DS1	IS2M-23 / -21	IS2M-23 / -21	MJS-013A	MSJ-013	MJM-013
	T7693, T7697	CEPT			MJS-024A		MJM-038
	TLIU04C1	DS1	IS2M-23 / -21	IS2M-23 / -21	MJS-013A	MSJ-013	MJM-013
TLIU04C1	CEPT	IS2M-10 / -25	IS2M-10 / -25	MJS-010A	MSJ-010		
PMC-Sierra	PM4341, PM6341, PM4314		IS2M-25	IS2M-7 / -19	MJS-028A	MSJ-028	MJM-028
	PM4318, PM4319, PM4323, PM4325		IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MSJ-017	MJM-017
	PM4351, PM4354	COMET			MJS-024A		MJM-038
Mindspeed (Conexant)	BT8510	T1/E1	IS2M-12	IS2M-7	MJS-018A		MJM-031
	BT8510	T1/E1	IS2M-12	IS2M-7	MJS-025A	MSJ-025	MJM-025
	BT8370, BT8375, BT8376	Low Power	IS2M-8	IS2M-15	MSJ-014A	MSJ-019	MJM-019
	BT8370, BT8375, BT8376	Better RI	IS2M-25	IS2M-15	MJS-031A	MSJ-028	MJM-028
Zarlink (Mitel)	MT9071, MT9076				MSJ-024A		MJM-038
	MT9075, MT9076				MSJ-032A		MJM-022
	MT9074, MT9075		IS2M-7	IS2M-24	MJS-018A	MSJ-018	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.

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-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C
- fully RoHS compliant and meets lead free reflow level J-STD-020C



Electrical Specifications @ 25°C

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

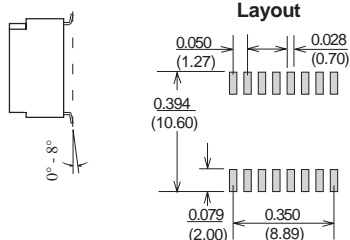
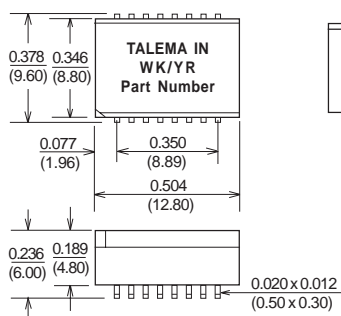
MJM Series - Dual Transformers

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

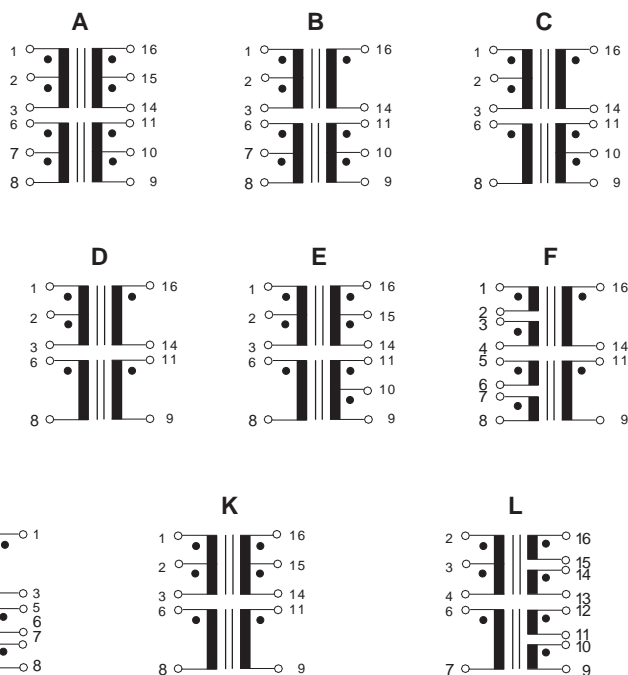
* MJM-033 Turns Ratio: Pins 16-14:1-2 = 1:1.9, Pins 16-14:1-3=1:2.4; Pins6-8:9-11=0.79:1.9, Pins 6-8:11-10=0.79:1



MJM Dimensions



Schematics



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

Sales & Marketing, Design and Manufacturing Facilities

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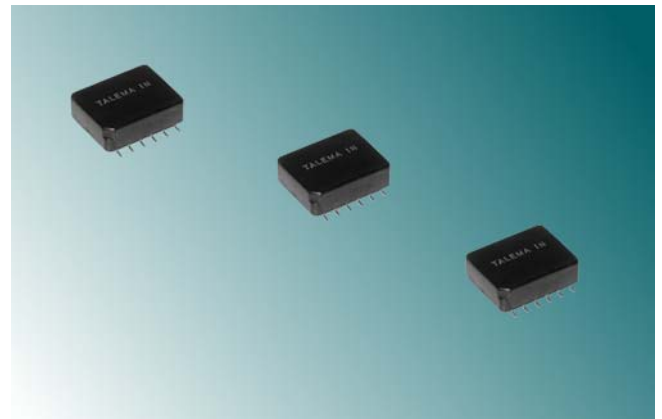
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E1/T1/ PRI/CEPT Dual Transformer Modules

Features

- SMD design ideal for pick and place compatability while providing unrivaled coplanarity
- common mode choke included on both Tx and Rx channels for optimum EMI performance
- controlled parameters ensure full compliance with ITU-T G.703 when matched with recommended IC
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C
- fully RoHS compliant and meets lead free reflow level J-STD-020C



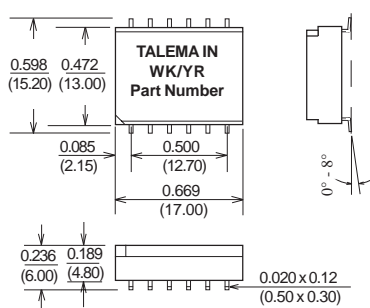
Electrical Specifications @ 25°C

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

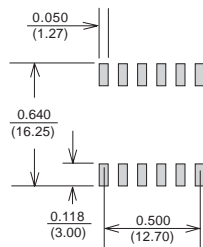
MJS Series - Dual Transformers

Part Number	Transformer - I						Transformer - II						Schematic
	Turns Ratio +/-2%	OCL (mH Min)	DCR (Ohms)		Pri. Pins	Sec. Pins	Turns Ratio +/-2%	OCL (mH Min)	DCR (Ohms)		Pri. Pins	Sec. Pins	
			Pri.	Sec.					Pri.	Sec.			
MJS-010	1ct: 1.36ct	1.2	1.20	1.40	1-2-3	12-11-10	1ct: 1.36ct	1.2	1.20	1.40	4-5-6	9-8-7	A
MJS-013	1ct: 1.15ct	1.2	1.20	1.40	1-2-3	12-11-10	1ct: 1.15ct	1.2	1.20	1.40	4-5-6	9-8-7	A
MJS-016	1ct: 2.3ct	1.2	1.20	2.10	12-11-10	1-2-3	1ct: 2ct	1.2	1.20	2.10	4-5-6	9-8-7	A
MJS-017	1ct: 2ct	1.2	1.00	1.70	12-11-10	1-2-3	1ct: 2ct	1.2	1.00	1.70	4-5-6	9-8-7	A
MJS-018	1ct: 1ct	1.2	1.00	1.00	1-2-3	12-11-10	1ct: 2ct	1.2	1.00	1.80	4-5-6	9-8-7	A
MJS-019	1: 1.15ct	1.2	1.00	1.20	12-10	1-2-3	1ct: 2ct	1.2	1.00	2.00	4-5-6	9-8-7	B
MJS-021	1ct: 1.41ct	1.2	1.40	1.20	12-11-10	1-2-3	1ct: 1.41ct	1.2	1.40	1.20	9-8-7	4-5-6	A
MJS-023	1ct: 1.15ct	1.6	1.20	1.40	12-11-10	1-2-3	1ct: 1ct	1.6	1.20	1.20	4-5-6	9-8-7	A
MJS-024	1ct: 1ct	1.2	1.00	1.00	1-2-3	12-11-10	1ct: 1ct	1.2	1.00	1.00	4-5-6	9-8-7	A
MJS-025	1: 1/1.26	1.2	1.00	1.10	12-10	1-2-3	1ct: 2ct	1.2	1.00	1.70	4-6	9-8-7	C
MJS-027	1: 2ct	1.6	1.10	1.10	1-3	12-11-10	2:1	1.6	1.10	0.70	4-6	9-7	D
MJS-028	1ct: 2ct	1.2	0.70	1.20	12-11-10	1-2-3	1: 1.36ct	1.2	0.70	0.90	4-6	9-8-7	E
MSJ-029	1ct: 1	0.7	0.25	0.80	1-2-3	12-10	1: 1.36ct	0.7	0.50	0.40	9-7	4-5-6	G
MSJ-030	1: 2ct	1.2	0.70	1.20	12-10	1-2-3	1: 1.14ct	1.2	0.70	0.90	4-6	9-8-7	C
MJS-031	1ct: 2ct	1.2	0.70	1.20	1-2-3	12-11-10	1:1	1.2	0.70	0.70	5-6	8-7	F
MSJ-036	1ct: 2ct	1.2	0.70	1.10	12-11-10	1-2-3	1: 1.08ct	1.2	0.70	0.90	4-6	9-8-7	E
MSJ-037	1: 1/1.26	1.5	0.80	1.00	12-10	1-2-3	1: 1/1.26	1.5	0.80	1.00	9-7	4-5-6	G

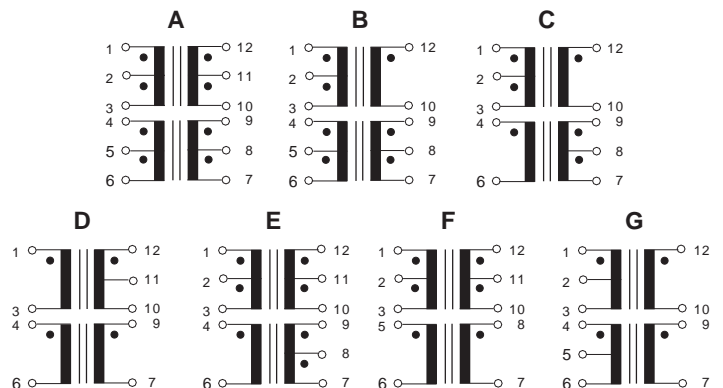
MSJ Series



Suggested Pad Layout



Schematic



Surface Coplanarity will be 0.004(0.10) maximum

Dimensions: Inches (Millimeters)

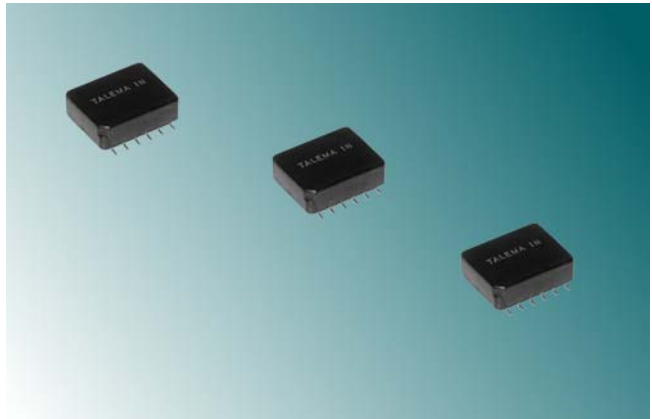
Tolerance: ±0.010 (0.25) unless specified otherwise



E1/T1/ PRI/CEPT Dual Transformer Modules

Features

- SMD design ideal for pick and place compatability while providing unrivaled coplanarity
- common mode choke included on both Tx and Rx channels for optimum EMI performance
- controlled parameters ensure full compliance with ITU-TG.703 when matched with recommended IC
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C
- fully RoHS compliant and meets lead free reflow level J-STD-020C



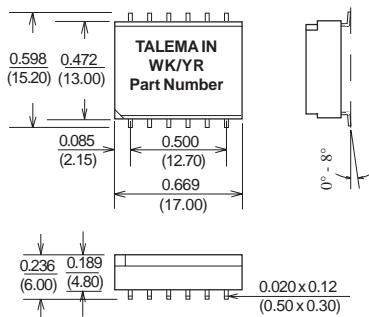
Electrical Specifications @ 25°C

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

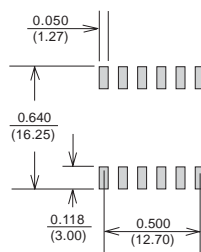
MJS Series - Dual Transformers with Common Mode Chokes on Tx & Rx Channels

Part Number	Transformer - I								Transformer - II							
	Turns Ratio +/-2%	OCL (mH Min)	L _L (μH Max)	C _{WW} (pF Max)	DCR (Ohms)		Pri. Pins	Sec. Pins	Turns Ratio +/-2%	OCL (mH Min)	L _L (μH Max)	C _{WW} (pF Max)	DCR (Ohms)		Pri. Pins	Sec. Pins
					Pri.	Sec.							Pri.	Sec.		
MJS-010A	1ct: 1.36ct	1.2	0.60	30	0.80	1.10	1-3	12-10	1ct: 1.36ct	1.2	0.60	30	0.80	1.10	4-6	9-7
MJS-013A	1ct: 1.15ct	1.2	0.60	35	0.80	0.95	1-3	12-10	1ct: 1.15ct	1.2	0.60	35	0.80	0.95	4-6	9-7
MJS-014A	1ct: 1.15ct	1.2	0.60	35	0.90	1.05	1-3	12-10	1ct: 1ct	1.2	0.60	35	0.90	0.90	4-6	9-7
MJS-015A	1ct: 2.3ct	1.2	0.60	25	0.60	1.40	1-3	12-10	1ct: 2ct	1.2	0.60	25	0.60	1.20	4-6	9-7
MJS-017A	1ct: 2ct	1.2	0.60	25	0.60	1.20	1-3	12-10	1ct: 2ct	1.2	0.60	25	0.60	1.20	4-6	9-7
MJS-018A	1ct: 1ct	1.2	0.60	35	0.90	0.90	1-3	12-10	1ct: 2ct	1.2	0.60	35	0.90	1.80	4-6	9-7
MJS-019A	1ct: 1.15ct	1.2	0.60	35	0.80	0.95	1-3	12-10	1ct: 2ct	1.2	0.60	35	0.80	11.60	4-6	9-7
MJS-021A	1ct: 1.41ct	1.2	0.60	30	0.70	1.00	1-3	12-10	1ct: 1.41ct	1.2	0.60	30	0.70	1.00	4-6	9-7
MJS-024A	1ct: 2.42ct	1.2	0.60	25	0.60	1.50	1-3	12-10	1ct: 2.42ct	1.2	0.60	25	0.60	1.50	4-6	9-7
MJS-025A	1ct: 1.26ct	1.2	0.60	30	0.80	1.00	1-3	12-10	1ct: 2ct	1.2	0.60	30	0.80	1.60	4-6	9-7
MJS-028A	1ct: 2ct	1.2	0.60	30	0.70	1.20	1-3	12-10	1ct: 1.36ct	1.2	0.60	30	0.70	0.90	4-6	9-7
MJS-031A	1ct: 1ct	1.2	0.60	35	0.90	0.90	1-3	12-10	1ct: 1.36ct	1.2	0.60	35	0.90	1.20	4-6	9-7
MJS-032A	1ct: 2.4ct	1.2	0.60	35	0.90	2.10	1-3	12-10	1ct: 1ct	1.2	0.60	35	0.90	0.90	4-6	9-7
MJS-046A	1ct:1ct	1.2	0.60	35	0.90	0.90	1-3	12-10	1ct:1ct	1.2	0.60	35	0.90	0.90	4-6	9-7

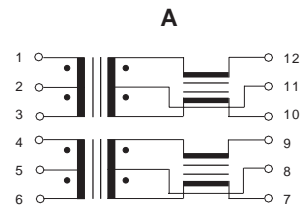
Package



Suggested Pad Layout



Schematic



Surface Coplanarity will be 0.004(0.10) maximum

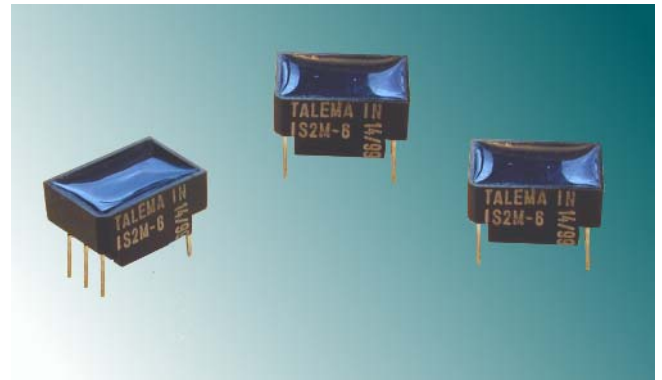
Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise

E1/T1/ PRI/CEPT Single Transformers

Features

- industry standard through-hole footprints
- wide range compatible with all common transceiver IC's
- 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-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C
- fully RoHS compliant



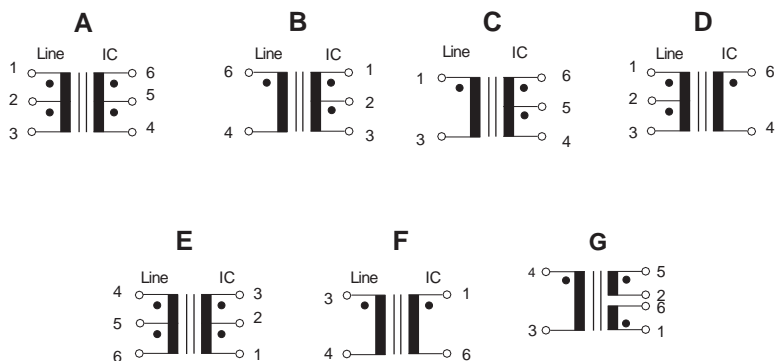
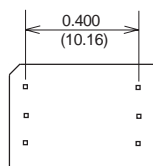
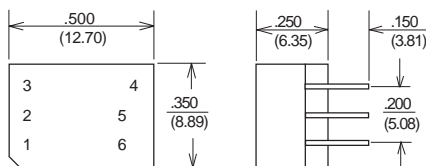
Electrical Specifications @ 25°C

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

IS2M Series Transformers								
Part Number	Turns Ratio ±5%	OCL (mH Min.)	L _L (µH Max.)	DCR Pri (Ohms)	DCR Sec (Ohms)	V _P (Vrms)	Primary Pins	Schematic
IS2M-6	1ct: 2ct	1.2	0.5	0.7	1.2	1500	1-3	A
IS2M-7	1: 2ct	1.2	0.5	0.7	1.2	1500	6-4	B
IS2M-8	1: 1.15ct	1.5	0.6	0.7	0.9	1500	6-4	B
IS2M-10	1: 1.36ct	1.2	0.8	0.5	0.8	1500	1-3	C
IS2M-11	1: 2.3ct	1.2	0.8	0.7	1.4	1500	1-3	C
IS2M-12	1: 1/1.26	1.5	0.5	0.7	0.9	1500	6-4	B
IS2M-15	1ct: 1	1.2	0.5	0.7	0.7	1500	1-3	D
IS2M-16	1: 1.5ct	1.2	0.6	0.7	1.0	1500	6-4	B
IS2M-17	1: 1.53	1.2	0.8	0.5	1.0	1500	3-4	F
IS2M-18	1: 1.185	1.2	0.5	0.7	0.8	1500	3-4	F
IS2M-19	1ct: 2ct	1.2	1.0	1.0	2.0	1500	6-4	E
IS2M-20	1ct: 1ct	1.2	1.0	1.0	1.0	1500	1-3	A
IS2M-21	1: 1.15ct	1.5	1.0	1.0	1.0	1500	6-4	B
IS2M-23	1: 1.14ct	1.2	1.0	0.7	0.8	1500	1-3	C
IS2M-24	1: 1	1.2	0.5	0.7	0.7	1500	1-6	F
IS2M-25	1: 1.36	1.2	0.8	0.7	0.9	1500	3-4	F
IS2M-26	1ct: 3ct	1.2	0.8	0.7	2.1	1500	1-3	A
IS2M-27	1: 1.583ct	1.2	0.6	0.7	1.0	1500	6-4	B

IS2M Series

Schematic



Note: Unused pins not provided

Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise



MJE Series • T1/E1/CEPT/ISDN-PRI SMD Transformers

Features

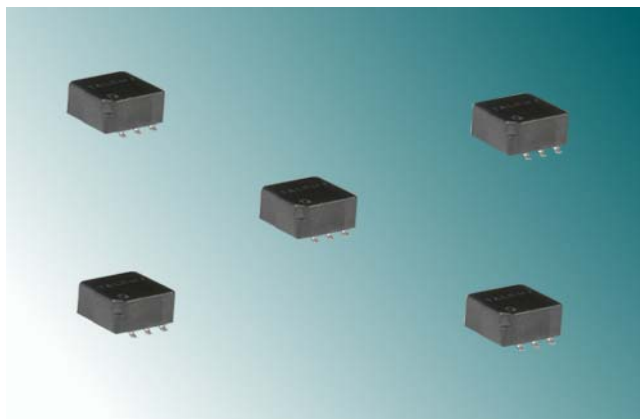
- low cost SMD for pick and place compatability while providing consistent and reliable coplanarity
- low leakage inductance
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- fully RoHS compliant and meets lead free reflow level J-STD-020C

Electrical Specifications

Ratings@ 25°C ambient

Minimum isolation voltage: 1500 Vrms

Extended Operating Temperature Range: -40° to +85°C



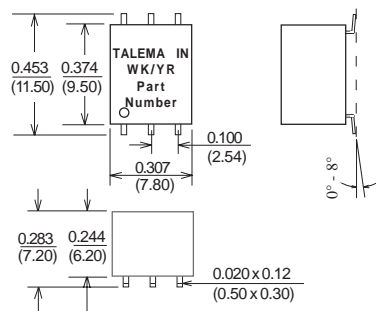
Electrical Specifications @ 25°C

MJE Series • T1/E1/CEPT/ISDN-PRI SMD Transformers

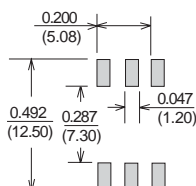
Extended Operating Temperature Range -40°C to +85°C

Part Number	OCL Primary (mH Min)	Turns Ratio Pri/Sec ±2%	C _{WW} Pri/Sec (pF Max)	L _L (µH Max)	DCR (Ohms)		V _P (Vrms)	Primary Pins	Schematic
					Pri.	Sec.			
MJE-10A	1.2	1ct:1.36ct	30	0.200	0.80	1.10	1500	1-3	A
MJE-12B	1.2	1:1/1.26	35	0.250	0.80	1.00	1500	1-3	B
MJE-20A	1.2	1ct:1ct	35	0.200	0.90	0.90	1500	1-3	A

MJE



Suggested Pad Layout



Schematic



Surface coplanarity will be 0.004 (0.01) maximum

Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise

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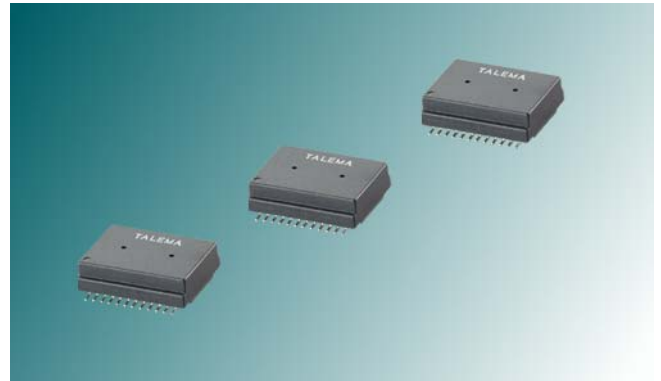
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E1/T1/ PRI/CEPT Dual Transformer Modules

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-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C
- fully RoHS compliant and meets lead free reflow level J-STD-020C



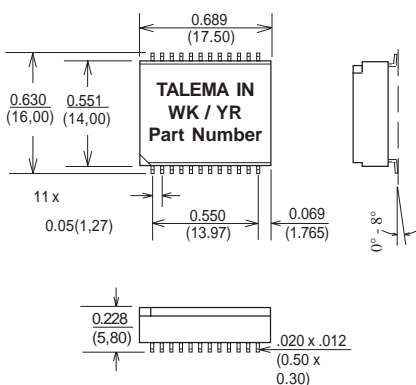
Electrical Specifications @ 25°C

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

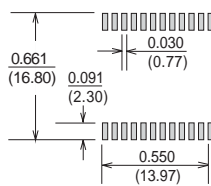
MGJ Series - Dual Port Transformers

Part Number	Transformer - Transmit				Primary Pins	Transformer - Receive				Schematic	
	Turns Ratio +/-2%	L _P (mH Min)	R _{CU} (Ohms)			Turns Ratio +/-2%	L _P (mH Min)	R _{CU} (Ohms)			
			Pri.	Sec.				Pri.	Sec.		
MGJ-100A	1ct: 2.42ct	1.2	0.39	0.94	4-6 & 10-12	1ct: 2.42ct	1.2	0.39	0.94	1-3 & 7-9	A
MGJ-101A	1ct: 2ct	1.2	0.39	0.77	4-6 & 10-12	1ct: 1ct	1.2	0.39	0.39	24-22 & 18-16	A
MGJ-102A	1ct: 1.15ct	1.2	0.39	0.44	4-5 & 10-12	1ct: 1.15ct	1.2	0.39	0.44	1-3 & 10-12	A
MGJ-103A	1ct: 2ct	1.2	0.39	0.77	4-6 & 10-12	1ct: 2ct	1.2	0.39	0.77	1-3 & 7-9	A
MGJ-104A	1ct: 2.3ct	1.2	0.39	0.90	4-6 & 10-12	1ct: 1ct	1.2	0.39	0.39	24-22 & 18-16	A
MGJ-105A	1ct: 1.36ct	1.2	0.39	0.53	4-6 & 10-12	1ct: 2ct	1.2	0.39	0.77	24-22 & 18-16	A
MGJ-106A	1ct: 1.36ct	1.2	0.39	0.53	4-6 & 10-12	1ct: 1ct	1.2	0.39	0.39	24-22 & 18-16	A
MGJ-107A	1ct: 1.15ct	1.2	0.39	0.44	4-6 & 10-12	1ct: 2ct	1.2	0.39	0.77	1-3 & 7-9	A
MGJ-108B	1ct: 2.4ct	1.2	0.39	0.94	1-3 & 10-12	1ct: 1ct	1.2	0.39	0.39	21-19 & 18-16	B
MGJ-109B	1ct: 1.41ct	1.2	0.39	0.58	1-3 & 10-12	1ct: 1.41ct	1.2	0.39	0.58	21-19 & 18-16	B
MGJ-110B	1ct: 2ct	1.2	0.39	0.77	1-3 & 10-12	1ct: 2ct	1.2	0.39	0.77	21-19 & 18-16	B

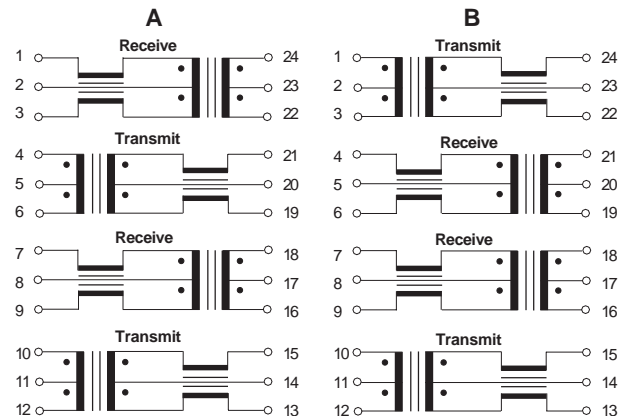
Dimensions



Suggested Pad Layout



Schematics



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



IC - Transformer Selection Guide for T1/E1/CEPT/ISDN-PRI Quad Ports

IC Manufacturer	IC Part Number	Application	Turns Ratio Pri:Sec $\pm 2\%$		Talema Part Number
			Transmit	Receive	
Mindspeed (Conexant)	BT8510	T1/E1	1:1/1.26	1:2CT	MJQ-007-40
	CN8380		1:2CT	1CT:2	MJQ-020-40
	BT8370, BT8375, BT8376	Better RI	1:1.36CT	1:2CT	MJQ-001-40
	BT8370, BT8375, BT8376	Low Power	1:1.15	1:2CT	MJQ-002-40
Cirrus Logic (Crystal)	61318	120 E1	1:2CT	1:1CT	MJQ-003-40
	61577	T1/E1	1:2CT	1:2CT	MJQ-006-40
	61304A/5A/535A/547A/75	T1	1:1.15	1:2CT	MJQ-002-40
	61304A/5A/535A/547A/75	75 E1	1:2CT	1:1CT	MJQ-003-40
	61304A/5A/535A/547A/75	120 E1	1:1/1.26	1:2CT	MJQ-007-40
	61582, 61583		1:1.14	1:1.14CT	MJQ-009-40
	61310, 61581		1:2CT	1:1CT	MJQ-003-40
	61881		1:1.15	1:2CT	MJQ-002-40
	61584, 61584A	IQ3	1:2CT	1:2CT	MJQ-006-40
	61584, 61582, 61583, 61583A	IQ5	1:1.14	1:1.14CT	MJQ-009-40
Maxim (Dallas)	DS2196		1:2CT	1:1CT	MJQ-003-40
	DS2151, DS2152, DS2153, DS2154		1:1.15	1:2CT	MJQ-002-40
	DS2151, DS2152, DS2153, DS2154		1:1.36CT	1:2CT	MJS-001-40
	DS2148, DS21Q48	3V	1:2CT	1:1CT	MJQ-003-40
	DS2148, DS21Q48	5V	1:1.36CT	1:2CT	MJQ-001-40
	DS21352, DS21Q352, DS21354, DS21Q354		1:2CT	1:1CT	MJQ-003-40
	DS21552, DS21Q552, DS21554, DS21Q554		1:1.15	1:2CT	MJQ-002-40
	DS21552, DS21Q552, DS21554, DS21Q554		1:1.36CT	1:2CT	MJQ-001-40
Exar	T5683A, 59L91, T5894, T5897, T5997	-	1:2CT	1:2CT	MJQ-006-40
	T5791, T5993, T5994, T5995		1:1/1.26	1:2CT	MJQ-007-40
	T5684, T7288, 81L27, 82L24, 82D20		1:1.36CT	1:2CT	MJQ-001-40
	83L30, 83L34, 83L38		1:2CT	1:2CT	MJQ-006-40
Infineon (Siemens)	PEB2254, PEB2255	E1/T1/J1	1CT:1.41	1CT:1.41	MJQ-016-40
	PEB22504, PEB22554	3.3V	1:2.4	1:1	MJQ-022-40
	PEB22504	5V	1:1.5	1.41:1	MJQ-026-40
	PEB2256	3.3V E1/T1/J1	1:2.4	1:1	MJQ-022-40
Intel (Level One)	LXT300, LXT301	-	1:2CT	1:2CT	MJQ-006-40
	LXT304, LXT305, LXT307	E1/T1	1:2CT	1:2CT	MJQ-006-40
	LXT304, LXT305, LXT307	T1	1:1.15	1:2CT	MJQ-002-40
	LXT304, LXT305, LXT307	75E1, 120E1	1:1/1.26	1:2CT	MJQ-007-40
	LXT310, LXT317, LXT318		1:2CT	1:1CT	MJQ-003-40
	LXT331	E1/T1	1:2CT	1:1CT	MJQ-003-40
	LXT331, LXT332		1:2CT	1:2CT	MJQ-006-40
	LXT331, LXT332		1:1.15	1:2CT	MJQ-002-40
	LXT334, LXT335	E1/T1	1:2CT	1:2CT	MJQ-006-40
	LXT334, LXT335	120/75 E1	1:1.36CT	1:2CT	MJQ-001-40
	LXT334, LXT335	75 E1	1:1/1.26	1:2CT	MJQ-007-40
	LXT336		1:2CT	1:2CT	MJQ-006-40
	LXT350, LXT351, LXT359	E1/T1	1:2CT	1:1CT	MJQ-003-40
	LXT350, LXT351		1:1.15	1:2CT	MJQ-002-40
	LXT360, LXT361, LXT362, LXT363	T1 / E1	1:2CT	1:1CT	MJQ-003-40
	LXT360, LXT361, LXT362, LXT363		1:1.15	1:2CT	MJQ-002-40
	LXT380/381/384/386/388	T1 / E1	1:2CT	1:1CT	MJQ-003-40
LXT380/381/384/386/388	T1 / E1	1:2CT	1CT:2	MJQ-020-40	
LXT3104, LXT3108		1:2CT	1:1CT	MJQ-003-40	
Lucent	T7288, T7290A	CEPT	1:1.36CT	1:2CT	MJQ-001-40
	T7289A	DS1	1:1.15	1:2CT	MJQ-002-40
	T7688, T7690, T7698	CEPT	1:1.36	1:1.36CT	MJQ-012-40
	T7688, T7690, T7698	DS1	1:1.14	1:1.14CT	MJQ-009-40
	T7693, T7697	CEPT	1:2.42	1:2.42	MJQ-028-40
	TLIU04C1	DS1	1:1.14	1:1.14CT	MJQ-009-40
	TLIU04C1	CEPT	1:1.36	1:1.36CT	MJQ-012-40
Zarlink (Mitel)	MT9071, MT9076		1:2.42	1:2.42	MJQ-028-40
	MT9075, MT9076		1:2.4	1:1	MJQ-022-40
	MT9074, MT9075		1:2CT	1:1CT	MJQ-003-40
PMC-Sierra	PM4341, PM6341, PM4314	-	1:1.36CT	1:2CT	MJQ-001-40
	PM4318	-	1:2CT	1:2CT	MJQ-006-40
	PM4351, PM4354	Comet	1:2.42	1:2.42	MJQ-028-40

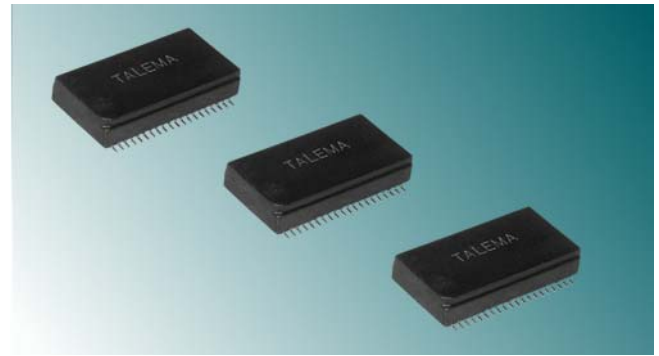
Notes:

- 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.
- P/N MJQ-007-J - To obtain a 1:1 secondary ratio connect the following secondary contacts: 40-39, 35-34, 30-29 and 25-24; a secondary ratio of 1:1.26 is obtained by connecting contacts: 40-38, 35-33, 30-28 and 25-23.

MJQ Series • T1/CEPT/E1/PRI Transformer Modules for Quad Ports

Features

- designed for optimum compatibility with all established interface IC's - see listing on last page
- module contains eight transformers for Quad T1/E1 Ports
- SMD design provides consistent and reliable coplanarity - fully pick and place compatible
- 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-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C



- fully RoHS compliant and meets lead free reflow level J-STD-020C

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

Electrical Specifications @ 25°C

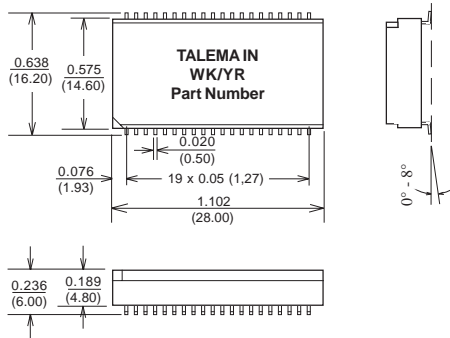
MJQ Transformer Modules for Quad T1/E1 Ports

Part Number	Transformer	Turns Ratio (Pri:Sec +/-2%)	OCL (mH Min.)	L _L (µH Max)	C _{WW} (pF Max)	DCR (mOhms)		Pins		Schematic
						Pri	Sec	Primary	Secondary	
MJQ-001-40	Transmit	1:1.36CT	1.2	0.6	35	390	550	24-25, 29-30, 34-35, 39-40	16-18, 11-13, 6-8, 1-3	C
	Receive	1:2CT	1.2	0.6	35	390	780	4-5, 9-10, 14-15, 19-20	36-38, 31-33, 26-28, 21-23	
MJQ-002-40	Transmit	1:1.15	1.2	0.6	35	390	450	1-2, 6-7, 11-12, 16-17	39-40, 34-35, 29-30, 24-25	A
	Receive	1:2CT	1.2	0.6	35	390	780	21-23, 26-28, 31-33, 36-38	18-20, 13-15, 8-10, 3-5	
MJQ-003-40	Transmit	1:2CT	1.2	0.6	35	390	780	1-2, 6-7, 11-12, 16-17	38-40, 33-35, 28-30, 23-25	B
	Receive	1:1CT	1.2	0.6	35	390	390	21-22, 26-27, 31-32, 36-37	18-20, 13-15, 8-10, 3-5	
MJQ-006-40	Transmit	1:2CT	1.2	0.6	35	390	780	4-5, 9-10, 14-15, 19-20	36-38, 31-33, 26-28, 21-23	C
	Receive	1:2CT	1.2	0.6	35	390	780	24-25, 29-30, 34-35, 39-40	16-18, 11-13, 6-8, 1-3	
MJQ-007-40	Transmit	1:1/1.26	1.2	0.6	35	390	490	1-2, 6-7, 11-12, 16-17	38-40, 33-35, 28-30, 23-25	B
	Receive	1:2CT	1.2	0.6	35	390	780	21-22, 26-27, 31-32, 36-37	18-20, 13-15, 8-10, 3-5	
MJQ-009-40	Transmit	1:1.14	1.2	0.6	35	390	440	1-2, 6-7, 11-12, 16-17	39-40, 34-35, 29-30, 24-25	A
	Receive	1:1.14CT	1.2	0.6	35	390	440	36-38, 31-33, 26-28, 21-23	3-5, 8-10, 13-15, 18-20	
MJQ-012-40	Transmit	1:1.36	1.2	0.4	20	390	540	1-2, 6-7, 11-12, 16-17	39-40, 34-35, 29-30, 24-25	A
	Receive	1:1.36CT	1.2	0.5	20	390	540	36-38, 31-33, 26-28, 21-23	3-5, 8-10, 13-15, 18-20	
MJQ-015-40	Transmit	1:1.15	1.2	0.6	35	390	450	1-3, 6-8, 11-13, 16-18	38-40, 33-35, 28-30, 23-25	E
	Receive	1:1.15	1.2	0.6	35	390	450	4-5, 9-10, 14-15, 19-20	36-37, 31-32, 26-27, 21-22	
MJQ-016-40	Transmit	1CT:1.41	1.2	0.6	35	420	580	1-3, 6-8, 11-13, 16-18	39-40, 34-35, 29-30, 24-25	C
	Receive	1CT:1.41	1.2	0.6	35	420	580	21-23, 26-28, 31-33, 36-38	19-20, 14-15, 9-10, 4-5	
MJQ-017-40	Transmit	1:2	1.2	0.6	35	390	780	1-3, 6-8, 11-13, 16-18	38-40, 33-35, 28-30, 23-25	E
	Receive	1:2	1.2	0.6	35	390	780	4-5, 9-10, 14-15, 19-20	36-37, 31-32, 26-27, 21-22	
MJQ-020-40	Transmit	1:2CT	1.2	0.6	35	390	780	4-5, 9-10, 14-15, 19-20	36-38, 31-33, 26-28, 21-23	C
	Receive	1CT:2	1.2	0.6	35	390	780	1-3, 6-8, 11-13, 16-18	39-40, 34-35, 29-30, 24-25	
MJQ-021-40	Transmit	1:2	1.2	0.6	35	390	780	1-2, 9-10, 11-12, 19-20	39-40, 31-32, 29-30, 21-22	D
	Receive	1:2CT	1.2	0.6	35	390	780	23-25, 26-28, 33-35, 36-38	16-18, 13-15, 6-8, 3-5	
MJQ-022-40	Transmit	1:2.4	1.0	0.5	35	390	390	1-2, 8-9, 11-12, 18-19	39-40, 32-33, 29-30, 22-23	F
	Receive	1:1	1.0	0.5	35	410	900	24-25, 27-28, 34-35, 37-38	16-17, 13-14, 6-7, 3-4	
MJQ-023-40	Transmit	1:1.70	1.2	0.8	35	390	670	1-2, 6-7, 11-12, 16-17	39-40, 34-35, 29-30, 24-25	A
	Receive	1:1.36CT	1.2	0.6	35	390	540	21-23, 26-28, 31-33, 36-38	18-20, 13-15, 8-10, 3-5	
MJQ-024-40	Transmit	1:1.36CT	1.2	0.6	35	390	540	24-25, 29-30, 34-35, 39-40	16-18, 11-13, 6-8, 1-3	C
	Receive	1:1CT	1.2	0.6	35	390	390	4-5, 9-10, 14-15, 19-20	36-38, 31-33, 26-28, 21-23	
MJQ-026-40	Transmit	1:1.5	1.0	0.5	35	390	580	1-2, 8-9, 11-12, 18-19	39-40, 32-33, 29-30, 22-23	F
	Receive	1.41:1	1.0	0.5	35	390	390	24-25, 27-28, 34-35, 37-38	16-17, 13-14, 6-7, 3-4	
MJQ-028-40	Transmit	1:2.42	1.2	0.6	35	390	940	1-3, 6-8, 11-13, 16-18	38-40, 33-35, 28-30, 23-25	E
	Receive	1:2.42	1.2	0.6	35	390	940	4-5, 9-10, 14-15, 19-20	36-37, 31-32, 26-27, 21-22	
MJQ-029-40	Transmit	1:2.1CT	1.2	0.6	35	390	810	1-2, 6-7, 11-12, 16-17	38-40, 33-35, 28-30, 23-25	B
	Receive	1:2.1CT	0.6	0.6	35	280	590	21-22, 26-27, 31-32, 36-37	18-20, 13-15, 8-10, 3-5	
MJQ-030-40	Transmit	1:2.45CT	1.2	0.6	35	390	960	1-2, 6-7, 11-12, 16-17	38-40, 33-35, 28-30, 23-25	B
	Receive	1:2.45CT	0.6	0.6	35	280	690	21-22, 26-27, 31-32, 36-37	18-20, 13-15, 8-10, 3-5	
MJQ-031-40	Transmit	1:2/2.4	1.0	1.0	35	410	900	1-2, 9-10, 11-12, 19-20	38-40, 33-31, 30-28, 23-21	G
	Receive	1:0.79/1	1.0	1.0	35	390	390	37-36, 35-34, 27-26, 25-24	3-5, 6-8, 13-15, 16-18	

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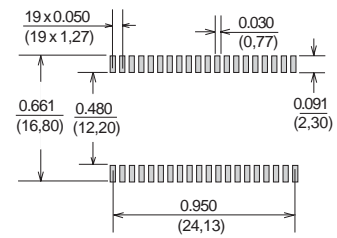
Packaging & Dimensions for SMD Quad Port Transformer Modules

MJQ Series Quad Module Package



Surface coplanarity will be <math><0.004 (0.10)</math>

Suggested Pad Layout

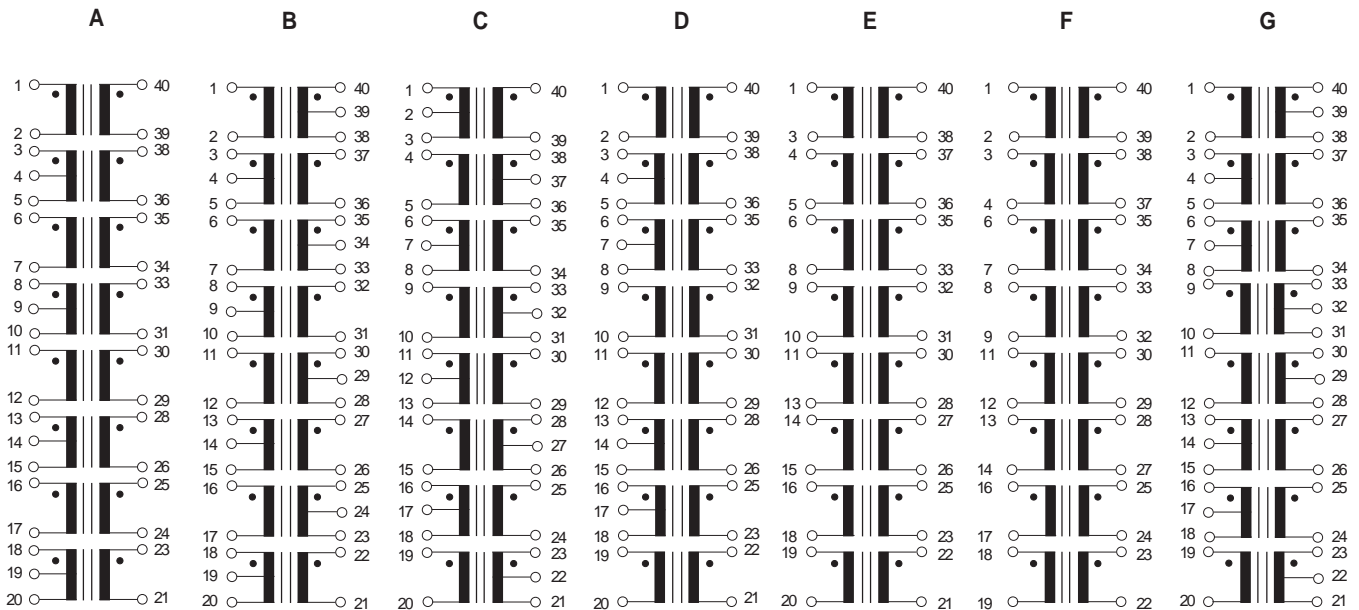


Weight: ~5 grams

Dimensions: Inches (Millimeters)

Tolerance: $\pm 0.010 (0.25)$ unless specified otherwise

Schematics



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<http://www.talema-nuvotem.com>

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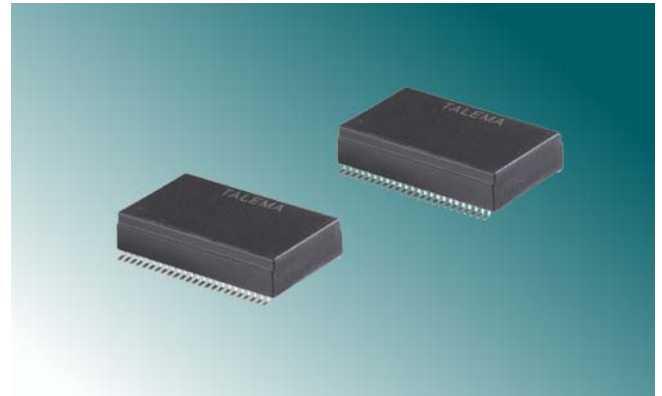
THE TALEMA GROUP • Magnetic Components for ISDN / xDSL / LAN Data Communications



T1/E1 Octal 75/120 Ohm Matching Transformer Module

Features

- module contains eight transformers for Quad T1/E1 Ports
- SMD design provides consistent and reliable coplanarity - fully pick and place compatible
- controlled parameters ensure full compliance with ITU-T G.703 when matched with recommended IC
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- 1500Vrms minimum isolation voltage
- extended operating temperature: -40° to +85°C
- fully RoHS compliant and meets lead free reflow level J-STD-020C

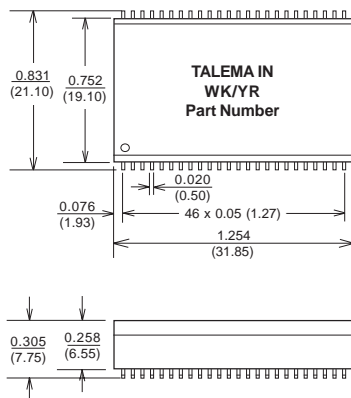


Electrical Specifications @ 25°C

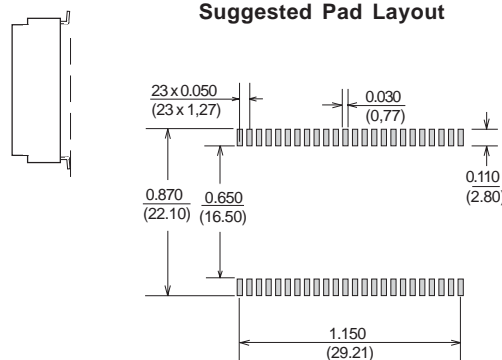
Turns Ratio: **Bold** = IC side windings

Eight 75/120 Ohm Matching Transformer Module for Quad T1/E1 Ports								
Extended Operating Temperature Range: -40° to +85°C								
Part Number	Transformer	Turns Ratio (Pri:Sec +/-2%)	OCL (mH Min.)	L _L (μH Max)	C _{ww} (pF Max)	DCR (mOhms)		Pins
						Pri	Sec	
20362	TX - 120/75 Ohm	Chip : Line 1 : 1.9/2.4	1.0	0.8	50	0.9	1.4	(1:3) : (48-47)/(48-46), (7-9) : (42-41)/(42-40) (13-15) : (36-35)/(36-34), (19-21) : (30-29)/(30-28)
	RX - 120 Ohm	Line : Chip 1 : 1.9						(45-43) : (4-6), (39-37) : (10-12) (33-31) : (16-18), (27-25) : (22-24)
	RX - 75 Ohm	Line : Chip 1 : 2.4						(45-44) : (4-6), (39-38) : (10-12) (33-32) : (16-18), (27-26) : (22-24)

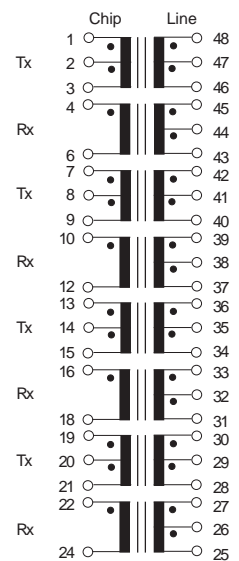
Quad Module Package



Suggested Pad Layout



Schematic



Surface coplanarity will be <0.004 (0.10)

Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise

Weight: ~ 8 grams



IC • T3 / DS3 / E3 / STS-1 Transformer Selection Guide

These transformers are typical for 75 ohm bandwidth applications requiring a very fast rise times

Talema manufactures a wide range of transmit and receive transformers for T3/DS3 applications using bit rates of 44.736 Mbps. These transformers can also be used with E3 interfaces at 34.368 Mbps and STS-1 applications at 51.84 Mbps. A listing of IC's with recommended Talema transformers is listed on the following cross reference chart.

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 CCITT G.703 and ATT T.A.34 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.



ENVIRONMENT

All TALEMA International Group manufacturing facilities are RoHS compliant and chokes, inductors and HF components are produced in an EMS facility certified to ISO-14001:2004.



IC - T3 / DS3 / E3 / STS-1 Interface Transformer Cross Reference Guide

IC Manufacturer	IC Part Number	Talema Transformer Part Number					
		Single SMD Transformer				Dual SMD	Tri-Port SMD
		Standard Temperature		Extended Temperature		Extended Temperature	
		Transmit	Receive	Transmit	Receive	TX & RX	TX & RX
Conexant (Rockwell)	CN8331, CN8332, CN8333	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	--	--
Infineon (Siemens)	PEB3452, PEB3460	--	--	DJE-40-6E	DJE-100-6A	--	--
Lucent	T7296	DJE-40-6A	--	DJE-100-6A	--	--	--
Exar	XRT75xxx	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
	XRT73L00 / 2 / 3 / 4 / 6 / 12	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
	XRT73LC03A / 04A, R12	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
	XRT7300, XRT7302	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
Maxim (Dallas)	DS3181 / 2 / 3 / 4	DJE-19-6B	DJE-19-6B	DJE-40-6D	DJE-40-6D	--	--
	DS3150 / 1 / 2 / 3 / 4	DJE-19-6B	DJE-19-6B	DJE-40-6D	DJE-40-6D	--	--
Mindspeed (Conexant)	CN28331, CN28332, CN28333	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
	M28335, M28356	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
	M28352, M28353, M28354	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	DTM-100
TDK	78P2241B	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
	78P2242, 78P2243, 78P2244	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
	78P7200, 78P7200L	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
	78P7203L, 78P7204L	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
	78P2361, 78P2362	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
Transwitch	MRT TXC-02050, E1	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
	ART TXC-02020	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	--
	ARTE TXC-02021	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	--
	DART TXC-2030, DS3	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	--
	DART TXC-2030, E3	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--
	DS3LIM-SN TXC-20153G	DJE-40-6A	DJE-40-6A	DJE-100-6A	DJE-100-6A	DJM-100B	--
E3LIM TXC-20163	DJE-19-6B	DJE-40-6A	DJE-40-6D	DJE-100-6A	DJM-100C/D	--	

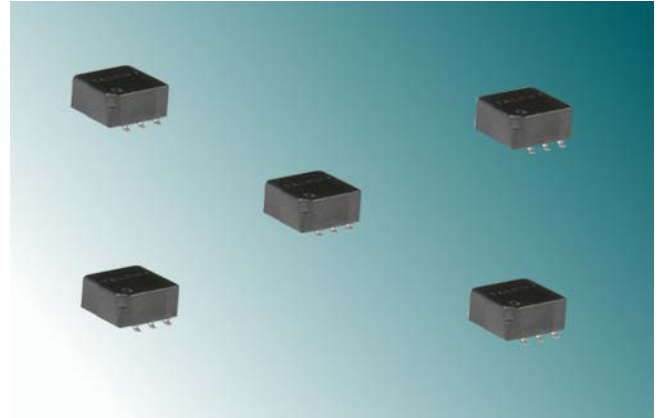
Germany: Int.+49 89 - 841 00-0 • Ireland: Int.+35 374 - 954 8666 • Czech Rep: Int.+420 37 - 744 9303 • India: Int.+91 427 - 2441325
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DJE Series • T3/DS3/E3/STS-1 Interface Transformers

These miniature transformers are typical for 75 ohm bandwidth applications requiring a very fast rise times

Features

- low cost SMD for pick and place compatibility while providing consistent and reliable coplanarity
- low leakage inductance
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- fully RoHS compliant and meets lead free reflow level J-STD-020C



Electrical Specifications

Ratings @ 25°C ambient

Minimum isolation voltage: 1500 Vrms

Extended Operating Temperature Range: -40° to +85°C

Test Conditions

Inductance measured @ 1MHz, 10mV

Interwinding Capacitance @ 100kHz/10mV

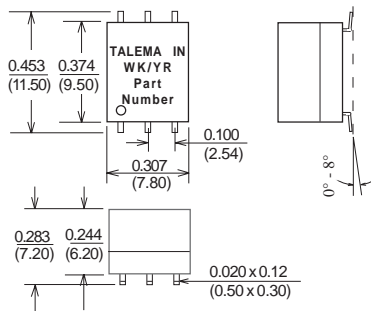
Leakage Inductance @ 100kHz/10mV

DJE Series • SMD Wideband Interface Transformers

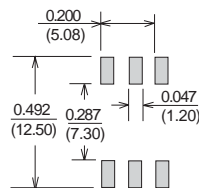
Extended Operating Temperature Range -40°C to +85°C

Part Number	OCL Primary (µH Min)	OCL Primary @ -40°C (µH Min)	Turns Ratio Pri/Sec ±2%	L _L Pri/Sec (µH Max)	C _C Pri/Sec (pF Max)	Bandwidth 75 Ohms		Isolation Voltage (Vrms Min)	Primary Pins	Schematic
						Freq. (MHz)				
						Low	High			
DJE-19-6B	19	--	1:2CT	0.06	10	0.250	500	1500	1-3	B
DJE-40-6A	40	--	1:1	0.10	10	0.200	340	1500	1-3	A
DJE-40-6B	40	20	1:2CT	0.11	12	.250	500	1500	1-3	B
DJE-40-6D	40	20	1:2CT	0.11	12	.250	500	1500	4-6	D
DJE-40-6E	40	20	1CT:1CT	0.10	10	.250	340	1500	1-3	E
DJE-45-6D	40	20	1:1.155CT	0.15	12	.200	340	1500	4-6	D
DJE-100-6A	100	40	1:1	0.11	10	.200	340	1500	1-3	A

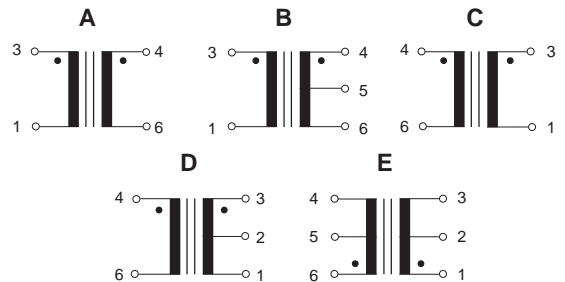
DJE-XXX-6X



Suggested Pad Layout



Schematics



Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise

Surface coplanarity will be 0.004 (0.01) maximum

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DJM Series • T3/DS3/E3/STS-1 Dual Interface Transformers

These miniature modules contain both transmit and receive transformers designed for use in T3/DS3 applications using bit rates of 44.736Mbps, E3 interfaces at 34.368Mbps and STS-1 applications at 51.84 Mbps. The transformers are typical for 75 ohm bandwidth applications requiring a very fast rise times.

Features

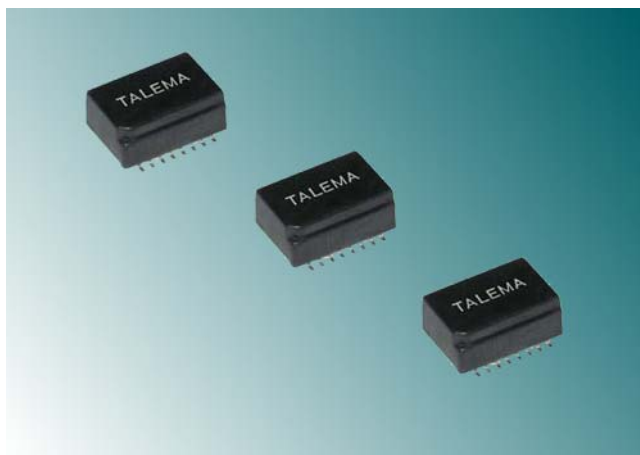
- low cost SMD for pick and place compatibility while providing consistent and reliable coplanarity
- low leakage inductance
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- fully RoHS compliant and meets lead free reflow level J-STD-020C

Electrical Specifications

Ratings @ 25°C ambient

Minimum isolation voltage: 1500 Vrms

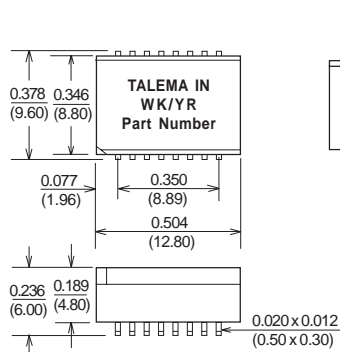
Extended Operating Temperature Range: -40° to +85°C



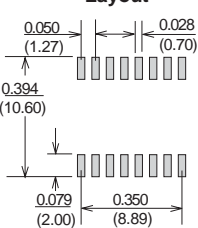
DJM Series • Dual SMD Wideband Interface Transformers

Extended Operating Temperature Range -40°C to +85°C												
Part Number	Turns Ratio Pri/Sec ±2%		OCL Primary (µH Min)		L _L (µH Max)		C _{WV} (pF Max)		Isolation Voltage (Vrms Min)	Primary Pins		Schematic
	TX	RX	TX	RX	TX	RX	TX	RX		TX	RX	
DJM-100A	1:1	1:1	40	40	0.10	0.10	10	10	1500	1-2	7-8	A
DJM-100B	1ct:1ct	1:1	100	100	0.11	0.11	10	10	1500	6-8	16-15	B
DJM-100C	1:2ct	1:1	40	100	0.11	0.11	12	10	1500	16-14	6-8	C
DJM-100D	1:2ct	1:1	100	100	0.12	0.11	12	10	1500	7-8	16-15	D
DJM-100E	1:2ct	1:2ct	40	40	0.11	0.11	12	12	1500	16-14	11-9	E

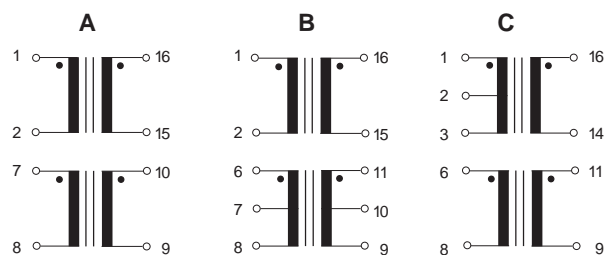
DJM Dimensions



Suggested Pad Layout



Schematics



Surface coplanarity will be 0.004 (0.01) maximum



Dimensions: Inches (Millimeters)

Tolerance: ±0.010 (0.25) unless specified otherwise

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SMD Data and Signal Line Filter Chokes

Features

- EMI noise suppression for data and signal line filtering
- Miniature, low cost SMD common mode chokes are designed for pick and place compatibility while providing reliable coplanarity
- High attenuation over a wide frequency range
- Manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- Other inductance values available
- fully RoHS compliant and meets lead free reflow level J-STD-020C

Electrical Specifications @ 25°C

Nominal Voltage: 42Vac (50/60Hz), 80Vdc

Operating temperature: -40° to +85°C



Storage temperature: -40° to +125°C

Climatic category: according to IEC68-1 25/85/56

Test voltage between windings: 500 Vrms

Test frequency: Inductance measured @ 100kHz / 20 mVrms

Test Equipment: HP4192A

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
Two Data Lines						
CTJ-2-110	11	300	160	1	2	A
CTJ-2-101	100	300	180	1	2	A
CTJ-2-471	470	200	380	1	2	A
CTJ-2-102	1000	150	660	1	2	A
CTJ-2-472	4700	150	1800	1	2	A
CLJ/CMJ-2-110	11	500	120	1	2	A
CLJ/CMJ-2-470	47	500	150	1	2	A
CLJ/CMJ-2-101	100	500	260	1	2	A
CLJ/CMJ-2-471	470	500	250	1	2	A
CLJ/CMJ-2-102	1000	500	250	1	2	A
CLJ/CMJ-2-472	4700	200	845	1	2	A
CLJ/CMJ-2-103	10000	200	1200	1	2	A
CLJ/CMJ-2-473	47000	100	3450	1	2	A
CCJ-2-102	1000	550	140	1	2	A
CCJ-2-152	1500	550	100	1	2	A
CCJ-2-502	5000	500	180	1	2	A
CCJ-2-123	12000	400	280	1	2	A
CCJ-2-283	28000	270	520	1	2	A
CCJ-2-503	50000	200	1020	1	2	A
CCJ-2-703	70000	170	1540	1	2	A
CDJ-1.0-A	1000	600	190	1	2	A
CDJ-4.7-A	4700	350	575	1	2	A
CDJ-12-A	12000	300	680	1	2	A
CDJ-28-A	28000	300	1020	1	2	A
CDJ-50-A	50000	300	1800	1	2	A
CDJ-70-A	70000	300	2150	1	2	A
Three Data Lines						
CFJ-3-240	24	1000	45	1	3	A
CFJ-3-102	1000	700	70	1	3	A
CFJ-3-222	2200	600	125	1	3	A
CFJ-3-472	4700	350	340	1	3	A
Four Data Lines						
CLJ/CMJ-4-110	11	600	130	1	4	A
CLJ/CMJ-4-470	47	500	180	1	4	A
CLJ/CMJ-4-101	100	500	330	1	4	A
CLJ/CMJ-4-471	470	500	240	1	4	A
CLJ/CMJ-4-102	1000	500	310	1	4	A
CLJ/CMJ-4-472	4700	300	860	1	4	A
CLJ/CMJ-4-123	12000	130	2300	1	4	A

Part Number	OCL (μH) ±30%	I _N (mA)	DCR (mOhms)	Number of Coils	Windings per Coil	Schematic
Four Data Lines						
CFJ-4-330	33	550	65	1	4	A
CFJ-4-470	47	540	80	1	4	A
CFJ-4-101	100	360	160	1	4	A
CFJ-4-471	470	360	65	1	4	A
CFJ-4-102	1000	300	85	1	4	A
CFJ-4-472	4700	220	430	1	4	A
CCJ-4-260	26	600	65	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	120	1	4	B
CCJ-4-102	1000	350	190	1	4	B
CCJ-4-152	1500	350	120	1	4	B
CCJ-4-502	5000	330	220	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-5.0-B	5000	300	450	1	4	B
CQJ-10-B	10000	300	1060	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-101-16E	100	450	135	2	2	E
CUJ-102-16E	1000	450	135	2	2	E
CUJ-472-16E	4700	300	310	2	2	E
Six Data Lines						
CUJ-240-16C	24	650	45	2	3	C
CUJ-101-16C	100	350	110	2	3	C
CUJ-102-16C	1000	330	170	2	3	C
CUJ-472-16C	4700	200	430	3	2	D
Eight Data Lines						
CUJ-240-16A	24	550	45	2	4	A
CUJ-101-16A	100	250	240	2	4	A
CUJ-471-16A	470	250	95	2	4	A
CUJ-472-16A	4700	160	605	2	4	A
Sixteen Data Lines						
COJ-16-470	47	300	200	8	2	--
COJ-16-502	5000	150	1900	8	2	--

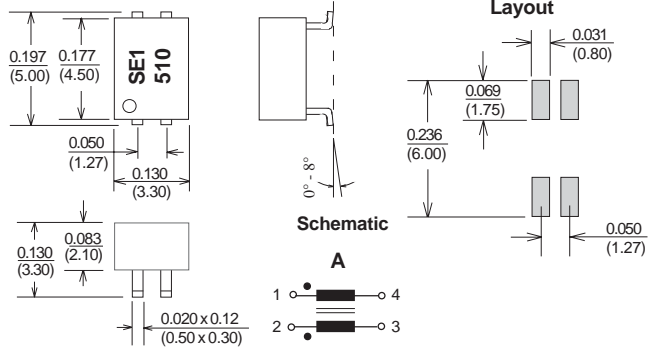
THE TALEMA GROUP • Magnetic Components for ISDN / xDSL / LAN Data Communications

Packaging & Dimensions • SMD Data and Signal Line Filter Chokes

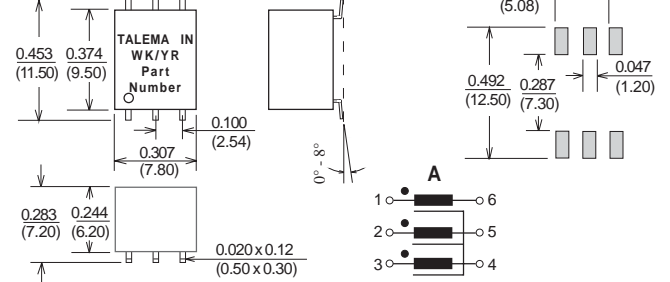
Dimensions: Inches (Millimeters)
Surface Coplanarity will be 0.004 (0.10) maximum

Tolerance: ± 0.010 (0.25) unless specified otherwise

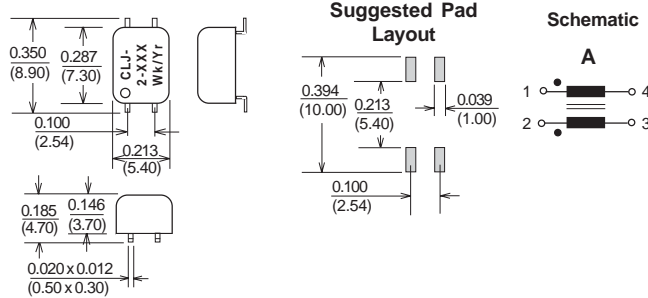
CTJ-2



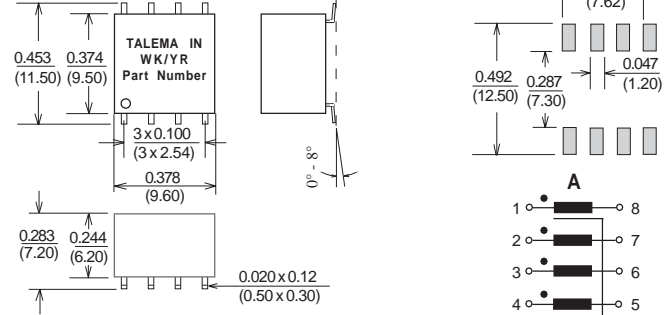
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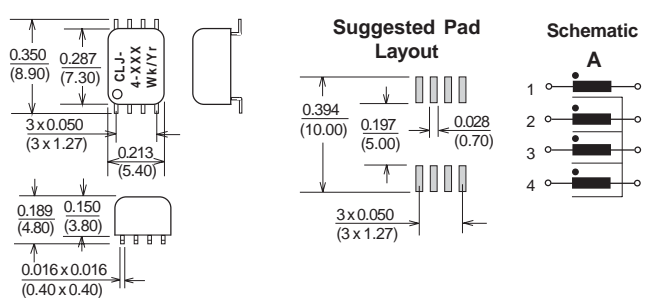
CLJ-2



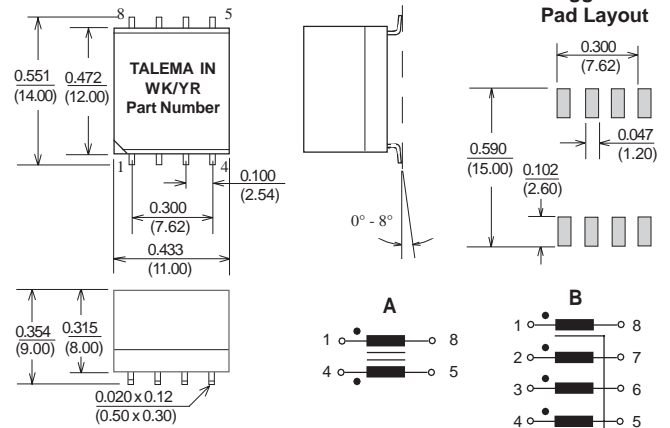
CFJ-4



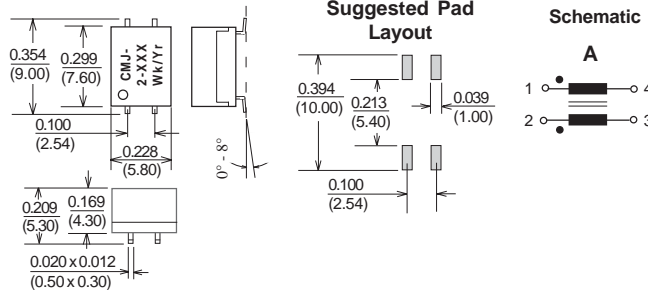
CLJ-4



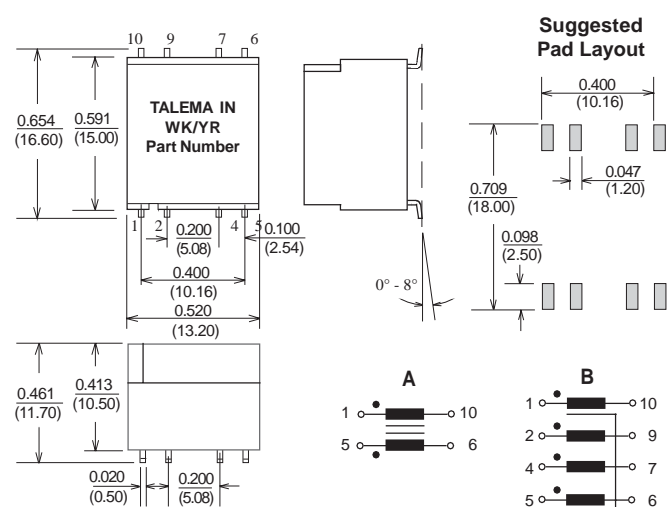
CCJ-2 / 4



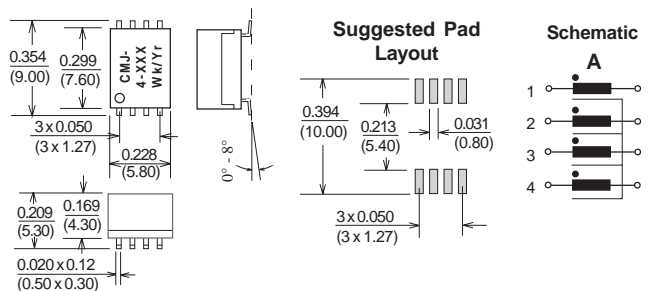
CMJ-2



CDJ / CQJ



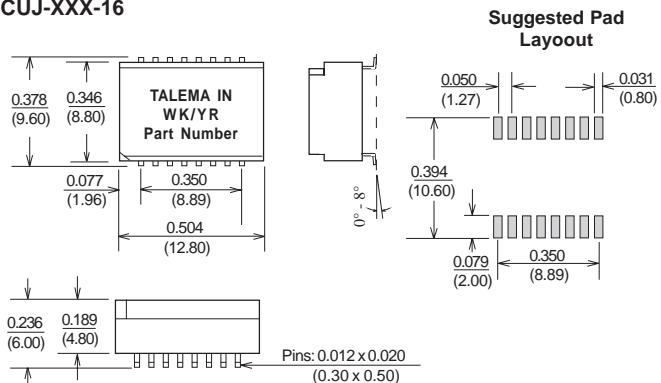
CMJ-4



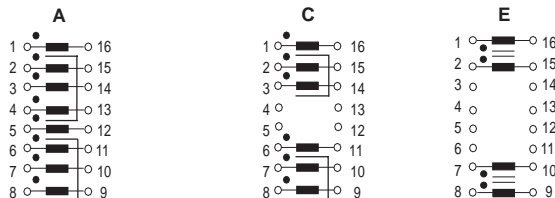


Dimensions: Inches (Millimeters)
Tolerance: ±0.010 (0.25) unless specified otherwise
Surface Coplanarity will be 0.004 (0.10) maximum

CUJ-XXX-16

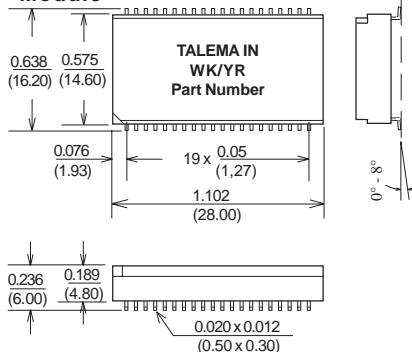


Schematics

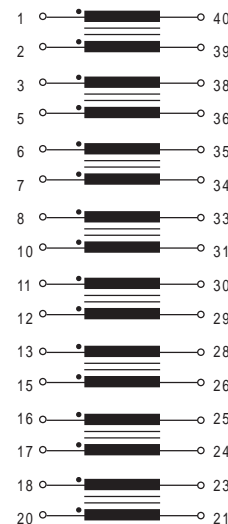


COJ

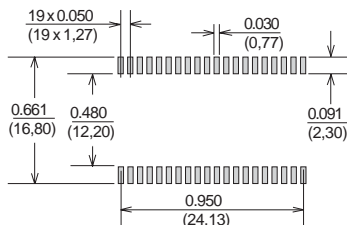
Module



Schematic



Suggested Pad layout



COJ Series - Common Mode Octal Chokes for Quad Port T1/E1

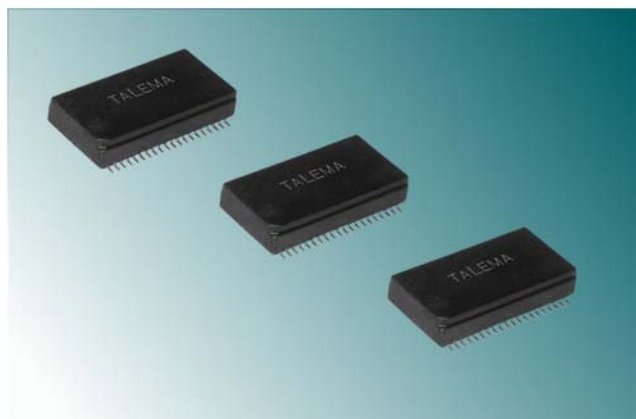
Features

- Low profile (6.0mm) and light weight (4.0 g), Talema common mode choke modules provide excellent EMI reduction in Quad Port T1/E1 applications
- High density board placement with modular design
- SMD package facilitates pick and place compatibility while ensuring consistent and reliable coplanarity
- manufactured in an ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- fully RoHS compliant and meets lead free reflow level J-STD-020C

Electrical Specifications

Ratings @ 25°C ambient
Test voltage between windings: 500 Vrms
Operating Temperature Range: 40°C to +85°C
Storage Temperature: -40°C to +125°C
Test Frequency: Inductance measured @ 100kHz/20mVrms

Standard packing in tape and reel
Weight: 4 grams



Application

The Talema 16 data line common mode choke module has been designed for T1/E1 applications and provides excellent EMI suppression for data and signal line filtering

COJ Octal Common Mode Chokes for Data and Signal Line EMI Noise Suppression

Part Number	No. of Data Lines	OCL (µH Min.)	DCR (mOhms Typ.)	Common Mode Attenuation (dB Typ.)							
				100kHz	1MHz	10MHz	30MHz	50MHz	100MHz	300MHz	500MHz
COJ-16-470	16	47	200	13	27	40	44	42	36	26	15

Dimensions and Schematic as noted above

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Web Site: www.alfamag.com

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magnetics

nuvotem

Summary TOTAL PROGRAM

SECTION 1

- TOROIDAL 50/60Hz TRANSFORMERS



SECTION 2

- TOROIDAL PCB TRANSFORMERS



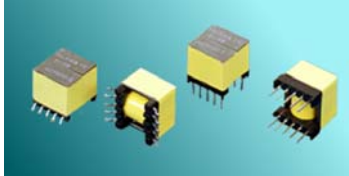
SECTION 3

- ELEVEN GOOD REASONS TO SELECT
TALEMA TOROIDAL TRANSFORMERS



SECTION 4

- CHOKES, INDUCTORS AND TRANSFORMERS
FOR POWER APPLICATIONS



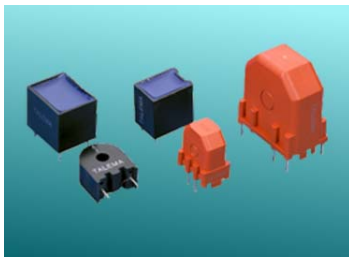
SECTION 5

- COMPONENTS FOR TELECOMMUNICATIONS
AND DATA LINE TECHNOLOGY



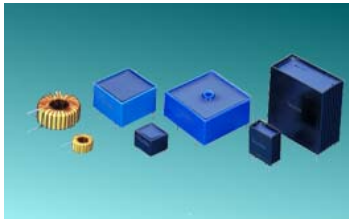
SECTION 6

- CURRENT COMPENSATED EMI
NOISE SUPPRESSION CHOKES



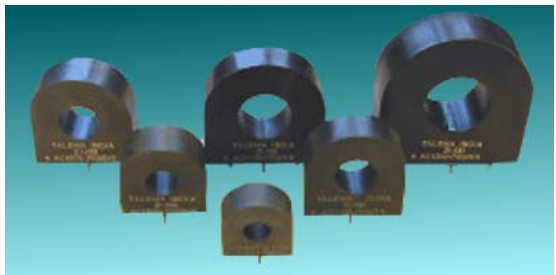
SECTION 7

- CURRENT SENSE TRANSFORMERS
AND INDUCTORS



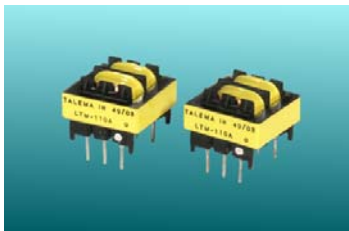
SECTION 8

- LAN MAGNETIC COMPONENTS FOR
ETHERNET APPLICATIONS



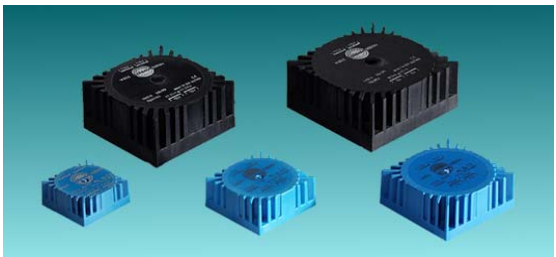
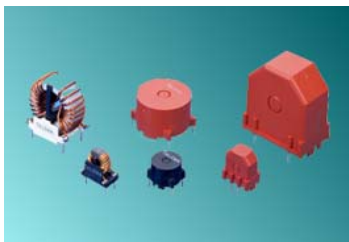
SECTION 9

- T1/E1/CEPT-PRI - T3/DS3/E3/STS-1
FOR TELECOMMUNICATION PRODUCTS



SECTION 10

- U INTERFACE TRANSFORMERS FOR
COMMUNICATIONS AND DATA LINE
TECHNOLOGY



SECTION 11

- TRANSFORMERS FOR BROADBAND
ACCESS AND FIBRE CHANNEL INTERFACE

THE TALEMA GROUP • Magnetic Components for ISDN / XDSL / LAN Data Communications