



## 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
<b>Cologne Chip</b>	HFC-E1	S2M	--	--	--	--	MJM-032
<b>Cirrus Logic (Crystal)</b>	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	
<b>Maxim (Dallas)</b>	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	MJS-019	MJM-019
	DS2151, DS2152, DS2153, DS2154		IS2M-10 / -25	IS2M-15 / -20	MJS-031A	MJS-028	MJM-028
	DS2148/Q48/Q348/349/Q59	3V	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	DS2148, Q48	5V	IS2M-10 / -25	IS2M-15 / -20	MJS-031A	MJS-028	MJM-028
	DS21352/Q352, DS21354/Q354	T1/E1	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	DS21552/Q552, DS21554/Q554	T1/E1	IS2M-8 / -21	IS2M-15 / 20	MJS-014A	MJS-019	MJM-019
	DS21552/Q552, DS21554/Q554	T1/E1	IS2M-10 / -25	IS2M-15 / -20	MJS-031A	MJS-028	MJM-028
	DS26502, DS2503, DS21455, DS21458, DS26528		IS2M-7	IS2M-15	MJS-018A	MJS-018	MJM-018
<b>Exar</b>	XRT5683A, XRT59L91, XRT5894, XRT5897, XRT5997		IS2M-6 / -19	IS2M-6 / -19	MJS-017A	MJS-017	MJM-017
	XRT5793, XRT5794		IS2M-12	IS2M-24 / -20	MJS-046A	MJS-025	MJM-025
	XRT81L27, 82L24, 82D20		IS2M-25	IS2M-6 / -19	MJS-017A	MJS-028	MJM-028
	XRT83L30, XRT83L34, XRT83L38		IS2M-6 / -19	IS2M-6 / -19	MJS-018A	MJS-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	MJS-028	MJM-028
<b>IDT</b>	82V2044, 82V2048, 82V2048L, 82V2054, 82V2058		IS2M-6	IS2M-6	MJS-017A	MJS-017	MJM-043
	82V2041E, 82V2042E, 82V2044E, 82V2048E		IS2M-6	IS2M-24	MJS-018A	MJS-018	MJM-018
	82V2081, 82V2082, 82V2084, 82V2088		IS2M-6	IS2M-24	MJS-018A	MJS-018	MJM-018
	82P2281, 82P2282, 82P2284, 82P2288		IS2M-6	IS2M-24	MJS-018A	MJS-018	MJM-018
<b>Infineon (Siemens)</b>	PEB2254, PEB2255	E1/T1/J1	--	--	MJS-021A	MJS-021	MJM-010
	PEB2254, PEB2255	E1/T1/J1	--	--	MJS-021A	MJS-021	MJM-021
	PEB22504, PEB22554, PEB2256	3.3V	--	--	MJS-032A	--	MJM-022



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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	MJS-017	MJM-017
	LXT304, LXT305, LXT307	T1/E1	IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MJS-017	MJM-017
	LXT304, LXT305, LXT307	T1	IS2M-8 / -21	IS2M-7 / -19	MJS-019A	MJS-019	MJM-019
	LXT304, LXT305, LXT307	75, 120 E1	IS2M-12	IS2M-7 / -19	MJS-018A	MJS-025	MJM-025
	LXT304, LXT305, LXT307	DSX-1, D4	IS2M-11	IS2M-7	MJS-015A	MJS-016	MJM-016
	LXT310, LXT317, LXT318		IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	LXT312, LXT313, LXT315		IS2M-26	IS2M-15 / -20	--	--	--
	LXT331	T1/E1	IS2M-7 / -19	IS2M-7 / -19	MJS-018A	MJS-018	MJM-018
	LXT331, LXT332		IS2M-11	IS2M-7	MJS-015A	MJS-016	MJM-016
	LXT331, LXT332		IS2M-8 / -21	IS2M-7 / -19	MJS-019A	MJS-019	MJM-019
	LXT331, LXT332		IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MJS-017	MJM-017
	LXT334, LXT335	T1/E1	IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MJS-017	MJM-017
	LXT334, LXT335	120/75 E1	IS2M-10 / -25	IS2M-7 / -19	MJS-031A	MJS-028	MJM-028
	LXT334, LXT335	75 E1	IS2M-12	IS2M-7 / -19		MJS-025	MJM-025
	LXT334, LXT335		IS2M-16	IS2M-15			MJM-026
	LXT336		IS2M-7	IS2M-20	MJS-046A	MJS-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	MJS-019	MJM-019
	LXT350, LXT351	120 E1	IS2M-11	IS2M-7	MJS-015A	MJS-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	MJS-019	MJM-019
	LXT360, LXT361		IS2M-11	IS2M-7		MJS-016	MJM-016
	LXT380, LXT381, LXT384, LXT386, LXT388	T1/ E1	IS2M-7 / -19	IS2M-15 / -20	MJS-018A	MJS-018	MJM-018
	LXT380, LXT381, LXT384, LXT386, LXT388		IS2M-11	IS2M-7		MJS-016	MJM-016
LXT3104, LXT3108		IS2M-15 / -20	IS2M-15 / -20	MJS-046A	MJS-017	MJM-017	
LXT3104, LXT3108						MJM-048	
Agere (Lucent)	T7288, T7290A	CEPT/E1	IS2M-10 / -25	IS2M-6 / -19	MJS-028A	MJS-028	MJM-028
	T7289A	DS1	IS2M-23 / -21	IS2M-7 / -19	MJS-019A	MJS-019	MJM-019
	T7630, T7688, T7690, T7698	CEPT	IS2M-10 / -25	IS2M-10 / -25	MJS-010A	MJS-010	
	T7630, T7688, T7690, T7698	DS1	IS2M-23 / -21	IS2M-23 / -21	MJS-013A	MJS-013	MJM-013
	T7693, T7697	CEPT			MJS-024A		MJM-038
	TLIU04C1	DS1	IS2M-23 / -21	IS2M-23 / -21	MJS-013A	MJS-013	MJM-013
TLIU04C1	CEPT	IS2M-10 / -25	IS2M-10 / -25	MJS-010A	MJS-010		
PMC-Sierra	PM4341, PM6341, PM4314		IS2M-25	IS2M-7 / -19	MJS-028A	MJS-028	MJM-028
	PM4318, PM4319, PM4323, PM4325		IS2M-7 / -19	IS2M-7 / -19	MJS-017A	MJS-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	MJS-025	MJM-025
	BT8370, BT8375, BT8376	Low Power	IS2M-8	IS2M-15	MSJ-014A	MJS-019	MJM-019
	BT8370, BT8375, BT8376	Better RI	IS2M-25	IS2M-15	MJS-031A	MJS-028	MJM-028
Zarlink (Mitel)	MT9071, MT9076				MSJ-024A		MJM-038
	MT9075, MT9076				MSJ-032A		MJM-022
	MT9074, MT9075		IS2M-7	IS2M-24	MSJ-018A	MJS-018	MJM-018

**Notes:**

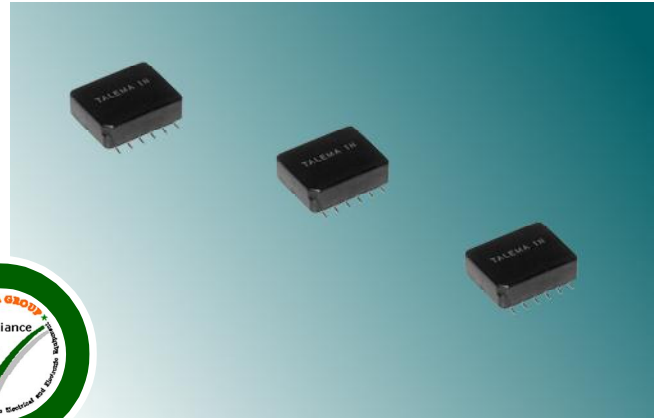
1. Dallas IC's use either a 1:1.15 or a 1:1.36 ratio transformer depending on the application. Consult the Dallas application notes or contact Talema.
2. Consult Siemens Application Note 12.90 ('Just a Single Line Transformer Type for all IPAT (PEB2235) Applications') for calculation of resistor values.
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
- 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



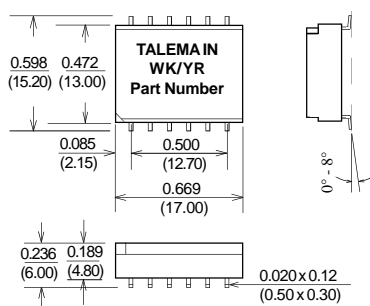
## Electrical Specifications @ 25°C

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

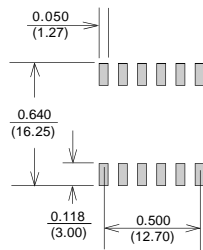
### MJS Series - Dual Transformers

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: <b>1.36ct</b>	1.2	1.20	1.40	1-2-3	12-11-10	1ct: <b>1.36ct</b>	1.2	1.20	1.40	4-5-6	9-8-7	A
MJS-013	1ct: <b>1.15ct</b>	1.2	1.20	1.40	1-2-3	12-11-10	1ct: <b>1.15ct</b>	1.2	1.20	1.40	4-5-6	9-8-7	A
MJS-016	1ct: <b>2.3ct</b>	1.2	1.20	2.10	12-11-10	1-2-3	1ct: <b>2ct</b>	1.2	1.20	2.10	4-5-6	9-8-7	A
MJS-017	1ct: <b>2ct</b>	1.2	1.00	1.70	12-11-10	1-2-3	1ct: <b>2ct</b>	1.2	1.00	1.70	4-5-6	9-8-7	A
MJS-018	1ct: <b>1ct</b>	1.2	1.00	1.00	1-2-3	12-11-10	1ct: <b>2ct</b>	1.2	1.00	1.80	4-5-6	9-8-7	A
MJS-019	1:1: <b>1.15ct</b>	1.2	1.00	1.20	12-10	1-2-3	1ct: <b>2ct</b>	1.2	1.00	2.00	4-5-6	9-8-7	B
MJS-021	1ct: <b>1.41ct</b>	1.2	1.40	1.20	12-11-10	1-2-3	1ct: <b>1.41ct</b>	1.2	1.40	1.20	9-8-7	4-5-6	A
MJS-023	1ct: <b>1.15ct</b>	1.6	1.20	1.40	12-11-10	1-2-3	1ct: <b>1ct</b>	1.6	1.20	1.20	4-5-6	9-8-7	A
MJS-024	1ct: <b>1ct</b>	1.2	1.00	1.00	1-2-3	12-11-10	1ct: <b>1ct</b>	1.2	1.00	1.00	4-5-6	9-8-7	A
MJS-025	1:1/1: <b>1.26</b>	1.2	1.00	1.10	12-10	1-2-3	1ct: <b>2ct</b>	1.2	1.00	1.70	4-6	9-8-7	C
MJS-027	1: <b>2ct</b>	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: <b>2ct</b>	1.2	0.70	1.20	12-11-10	1-2-3	1:1: <b>1.36ct</b>	1.2	0.70	0.90	4-6	9-8-7	E
MJS-029	1ct: <b>1</b>	0.7	0.25	0.80	1-2-3	12-10	1:1: <b>1.36ct</b>	0.7	0.50	0.40	9-7	4-5-6	G
MJS-030	1: <b>2ct</b>	1.2	0.70	1.20	12-10	1-2-3	1:1: <b>1.14ct</b>	1.2	0.70	0.90	4-6	9-8-7	C
MJS-031	1ct: <b>2ct</b>	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
MJS-036	1ct: <b>2ct</b>	1.2	0.70	1.10	12-11-10	1-2-3	1:1: <b>1.08ct</b>	1.2	0.70	0.90	4-6	9-8-7	E
MJS-037	1:1/1: <b>1.26</b>	1.5	0.80	1.00	12-10	1-2-3	1:1/1: <b>1.26</b>	1.5	0.80	1.00	9-7	4-5-6	G

## MJS Series



## Suggested Pad Layout



## Schematic

