

Surface Mount  **RF Transformer**

TC1-1-13M-75X+

75Ω 4.5 to 3000 MHz

Features

- wideband, 4.5 to 3000 MHz
- balanced transmission line
- good return loss
- excellent amplitude unbalance, 0.7 dB typ. and phase unbalance, 2 deg typ. in 1 dB bandwidth
- plastic base with leads
- aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: AT1521

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Available Tape and Reel at no extra cost	
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	1000, 2000

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		Ohm
Frequency Range		4.5		3000	MHz
Insertion Loss*	2000 - 3000		3.0		dB
	1000 - 2000		2.0		
	4.5 - 1000		1.0		
Amplitude Unbalance	1000 - 2000		0.5		dB
	4.5 - 1000		0.7		
Phase Unbalance	1000 - 2000		3.0		Degree
	4.5 - 1000		2.0		

* Insertion Loss is referenced to mid-band loss, 0.5 dB typ.

Maximum Ratings

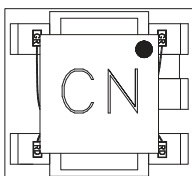
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.25W
DC Current	30mA

Permanent damage may occur if any of these limits are exceeded.

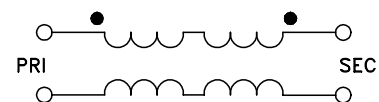
Pin Connections

Function	Pin Number
PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	1
SECONDARY	3
NOT USED	2

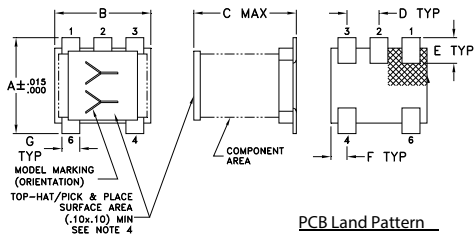
Product Marking



Config. G



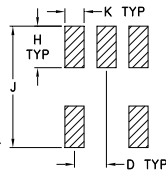
Outline Drawing



Note:

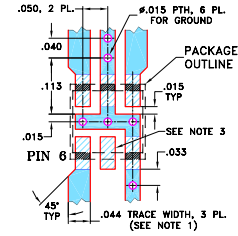
1. Case Material Plastic
2. Termination Finish: Tin plate over Nickel plate.
3. Lead #1 identifier shall be located in the cross-hatched area shown, on bottom view. Identifier may be either a molded or marked feature.
4. Top-Hat total thickness: .013 inches max.

PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

Demo Board MCL P/N: TB-145+ Suggested PCB Layout (PL-244)



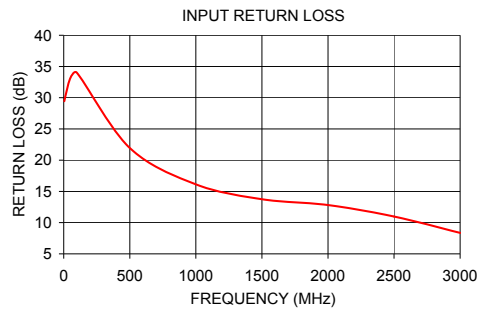
- NOTES:**
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $.020" \pm .0015"$; COPPER: 1/2 OZ. ON EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
 3. THIS PAD IS NOT REQUIRED FOR AT1224 CASE STYLE. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- Legend:
 DENOTES COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Outline Dimensions (inch/mm)

A	B	C	D	E	F
.150	.150	.160	.050	.040	.025
3.81	3.81	4.06	1.27	1.02	0.64
G	H	J	K	wt	
.028	.065	.190	.030	grams	
0.71	1.65	4.83	0.76	0.15	

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
4.50	0.31	29.45	1.10	5.08
10.00	0.29	29.98	0.90	2.60
50.00	0.30	33.14	0.88	0.06
100.00	0.33	34.00	0.91	0.32
500.00	0.55	21.95	0.65	0.81
1000.00	0.71	16.13	0.61	2.12
1500.00	0.96	13.75	0.21	1.23
2000.00	1.19	12.82	0.30	0.38
2500.00	1.63	10.98	0.47	4.03
3000.00	2.39	8.36	0.49	8.50



Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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