



top hat  
SURFACE MOUNT  
RF Transformer

TC1-1-13M-75X+

Mini-Circuits

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 website for methodologies and qualifications

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		

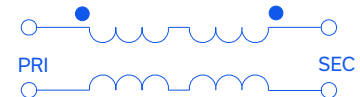
\* Insertion Loss is referenced to mid-band loss, 0.5 dB typ.

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.

CONFIG. G



REV. B  
ECO-021678  
TC1-1-13M-75X+  
MCL NY  
240501





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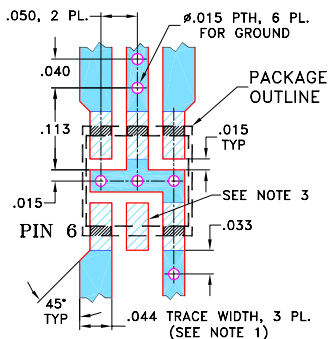
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PIN CONNECTIONS

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

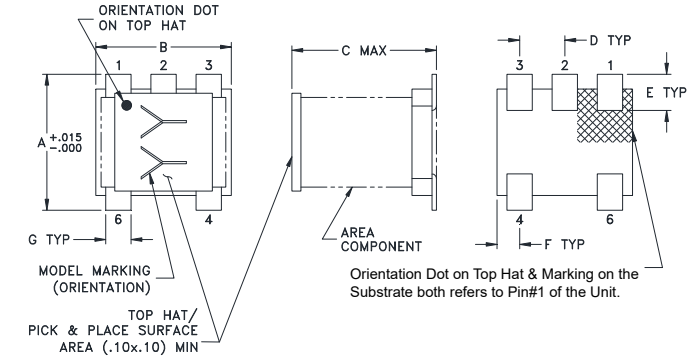
PRODUCT MARKING: CN

DEMO BOARD MCL P/N: TB-145+  
SUGGESTED PCB LAYOUT PL-244



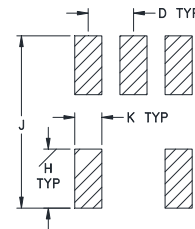
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $.020" \pm .0015"$ ; COPPER: 1/2 OZ. ON EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
  - THIS PAD IS NOT REQUIRED FOR AT224 CASE STYLE.
- 

OUTLINE DRAWING



Top-hat total thickness: .013 inches MAX.

PCB Land Pattern



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

OUTLINE DIMENSIONS (Inch mm)

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

Weight: 0.15 grams

TAPE & REEL INFORMATION: F17



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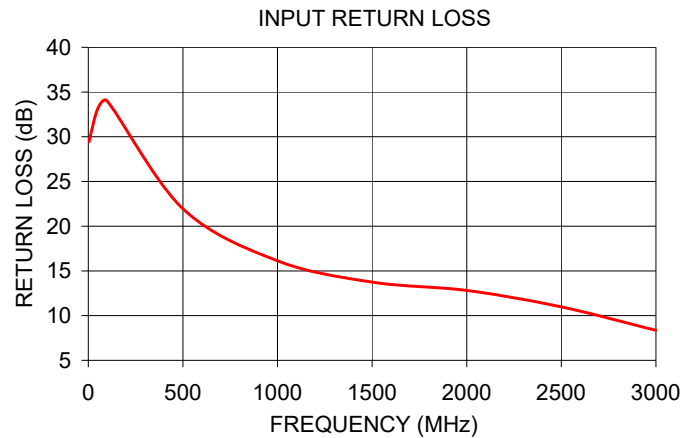
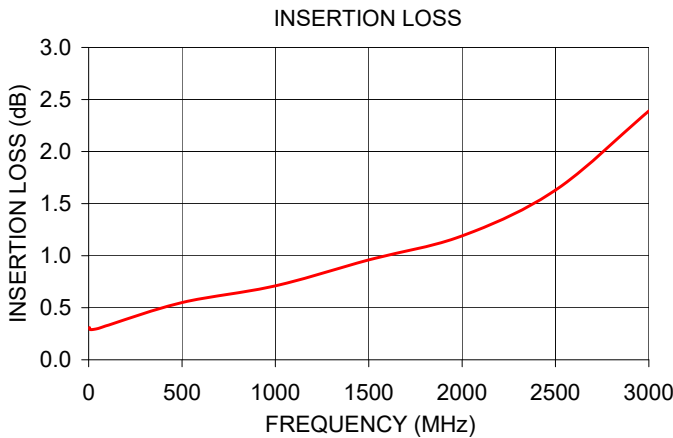
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TYPICAL PERFORMANCE DATA

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



NOTES

- A. 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.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

