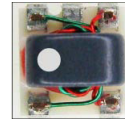


Surface Mount RF Transformer

TC1-1-13M-22+

50Ω 47 to 1000 MHz



CASE STYLE: AT224-1

Maximum Ratings

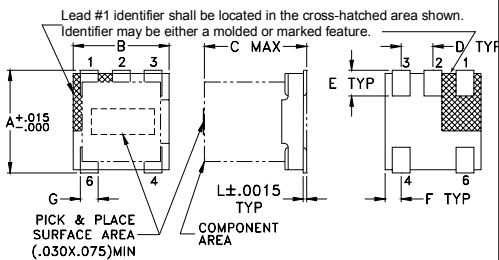
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.25W
DC Current	100mA*

Permanent damage may occur if any of these limits are exceeded.
*Equal current must be applied in opposite directions to individual windings.

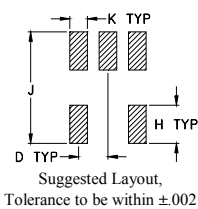
Pin Connections

PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	1
SECONDARY	3
NOT USED	2

Outline Drawing AT224-1



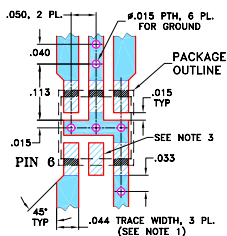
PCB Land Pattern



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	L	wt
.028	.065	.190	.030	.007	grams
0.71	1.65	4.83	0.76	0.18	0.15

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" ± .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 AT224 CASE STYLE.
4. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
5. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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/MCLStore/terms.jsp

Features

- wideband, 47 to 1000 MHz
- balanced transmission line
- good return loss
- excellent amplitude unbalance, 0.5 dB typ. and phase unbalance, 2 deg typ. in 1 dB bandwidth
- plastic base with leads
- aqueous washable

Applications

- balanced to unbalanced transformation
- push-pull amplifiers
- PCS/DCS
- MMDS

+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

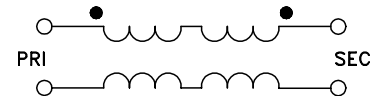
Transformer Electrical Specifications (T_{AMB} = 25°C)

Ω RATIO	FREQUENCY (MHz)	INSERTION LOSS*			PHASE ** UNBALANCE (Deg.) Typ. 1 dB bandwidth	AMPLITUDE ** UNBALANCE (dB) Typ. 1 dB bandwidth
		3 dB MHz	2 dB MHz	1 dB MHz		
1	47-1000	—	—	47-1000	2	0.5

* Insertion Loss is referenced to mid-band loss, 0.5 dB typ. DC current imbalance less than 3% between windings.

** At 30mA max.

Config. G



Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
50.0	0.19	33.50	0.56	0.11
100.0	0.24	29.68	0.55	0.19
500.0	0.46	19.52	0.45	0.81
1000.0	0.68	16.22	0.14	1.59

