Surface Mount **RF Transformer**

50Ω 350 to 1500 MHz

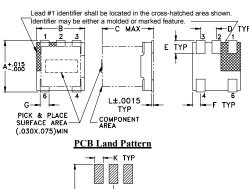
Maximum Ratings

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 o	f these limits are exceeded.

Pin Connections

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

Outline Drawing AT224-1

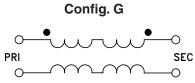


н түр D TYP Suggested Layout,

Tolerance to be within ±.002

Outline Dimensions (inch)

F
.025
0.64
wt
ams
0.15



Features

- wideband, 350 to 1500 MHz
- · balanced transmission line
- good return loss
- plastic base with leads
- · aqueous washable

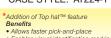
Applications

- PCS
- cellular
- impedance matching
- balanced amplifier
- baluns





Generic photo used for illustration purposes only CASE STYLE: AT224-1



Enables visual identification marking

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



Electrical Specifications

MODEL	Ω	FREQUENCY		SERTION LOSS	S*
NO.	RATIO	(MHz)	3 dB MHz	2 dB MHz	1 dB MHz
TC1-15+	1	350-1500	_	350-1500	800-1500
and the second sec					

* Insertion Loss is referenced to mid-band loss, 0.35 dB typ.

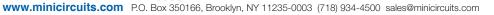
Typical Performance Data FREQUENCY INSERTION INPUT (MHz) LOSS R. LOSS (dB) (dB) 350.00 0 46 8.47 360.00 0.56 8.38 470.00 0.71 7.92 580.00 0.86 7.58 690.00 0.59 8 03 800.00 0.60 8.62 975.00 0.48 11.81 1150.00 0.38 19.36 1325.00 0.43 29.22 1500.00 0.50 30.48 INSERTION LOSS INPUT RETURN LOSS 1.0 40.0 35.0 (gp 0.8 (dB) 30.0 **NSERTION LOSS** RETURN LOSS 25.0 0.6 20.0 0.4 15.0 10.0 0.2 50 0.0 0.0 300 600 900 1200 1500 300 600 900 1200 1500 FREQUENCY (MHz) FREQUENCY (MHz)

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-Circuit's website at www.minicircuits.com/WCLStore/terms.jsp

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RF Transformer

FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
350.00	0.46	8.47
360.00	0.56	8.38
470.00	0.71	7.92
580.00	0.86	7.58
690.00	0.59	8.03
800.00	0.60	8.62
975.00	0.48	11.81
1150.00	0.38	19.36
1325.00	0.43	29.22
1500.00	0.50	30.48

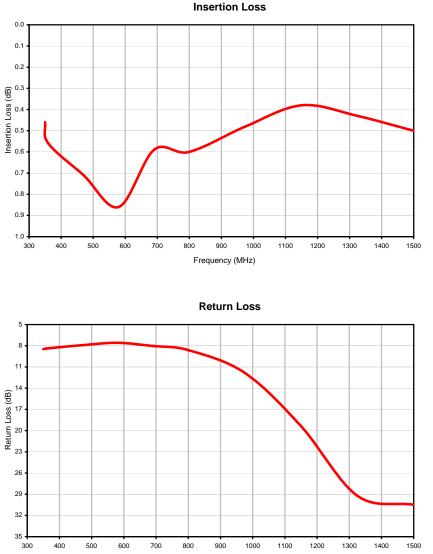


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RF Transformer

Typical Performance Curves



Frequency (MHz)



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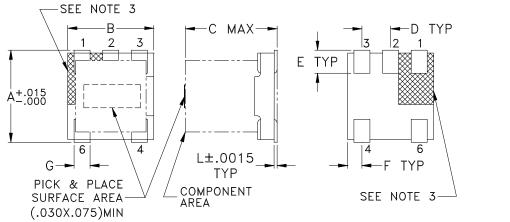
REV. X1 TC1-15+ 060803 Page 2 of 2

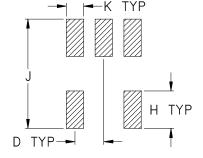
Case Style

Outline Dimensions

PCB Land Pattern

AT224-1





Suggested Layout, Tolerance to be within ±.002

CASE #	А	В	С	D	Е	F	G	Н	J	K	L	WT. GRAMS
AT224-1	.150 (3.81)	.150 (3.81)	.160 (4.06)	.050 (1.27)	.040 (1.02)	.025 (0.64)	.028 (0.71)	.065 (1.65)	.190 (4.83)	.030 (0.76)	.007 (0.18)	.15

Dimensions are in inches (mm). Tolerances: 2 Pl. + .01; 3 Pl. + .005

Notes:

- 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. Identifier may be either a molded or marked feature.





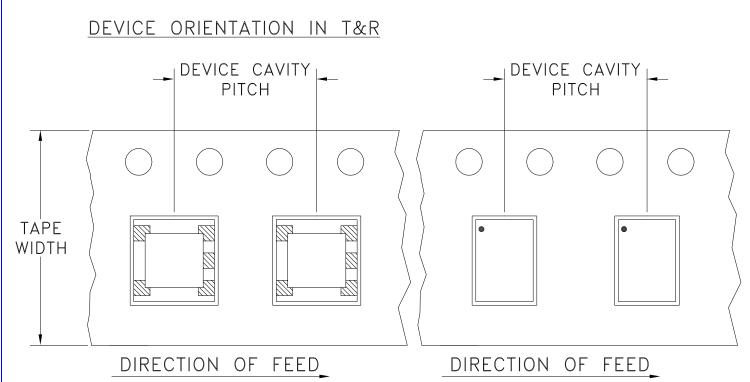
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com



RF/IF MICROWAVE COMPONENTS

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Tape & Reel Packaging TR-F17



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices	s per Reel	
			Small	20	
			quantity	50	
		7	standards	100	
12	8		(see note)	200	
				500	
		12	13	Standard	1000
		13	Standard	2000	

Note: Please Consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



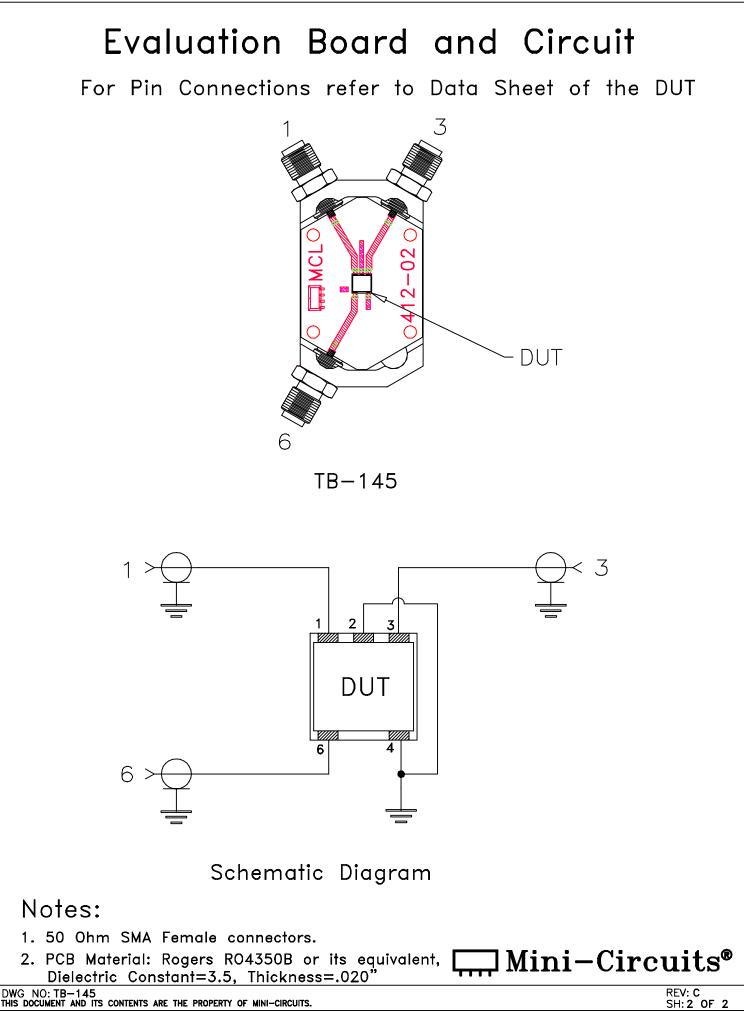


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RF/IF MICROWAVE COMPONENTS

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THIRD ANGLE PROJECTI	ON			REVISIONS				
		ECN No.		SCRIPTION	DATE	DR	AUTH	
	OR	M106563		NEW RELEASE	08/23/06		IG	
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	JGGESTED N					C		
FOR AT224/DB						2		
<u>(FOR S</u>	INGLE ENDE	<u>U TO E</u>	BALANCE	D APPLICATIO	<u>(nc</u>			
	.050, 2 PL .040 .113 r .015 PIN 6		FOF	PTH, 6 PL. GROUND PACKAGE OUTLINE 015 TYP SEE NOTE 3 .033				
NOTES: 1. TRACE WID	NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC							
THICKNESS FOR OTHER 2. BOTTOM SI 3. THIS PAD D M	.020"±.00 R MATERIALS DE OF THE F IS NOT REQU ENOTES PCB ASK OVER BA	D15"; CC TRACE V PCB IS C IRED FOI COPPER ARE COP	OPPER: 1, VIDTH MA ONTINUOU R AT224 LAYOUT PER)	/2 OZ. ON EA Y NEED TO BE JS GROUND PL	CH SIDE. MODIFIED. ANE. SOLDER			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± .005	INITIALS DATE AV 07/28/00 IL 08/23/00 IG 08/23/00	<u>в</u>	Mini	i–Circu	its [®] 13 Nept Brookly	une Av n NY 1	enue 1235	
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ASHEETA1.DWG	REV:A DATE:01/12/95		8PL244	SCALE: 8:1		OF	1	



Mini-Circuits

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215

ENV02T1 Rev: B 02/25/11 M130240 File: ENV02T1.pdf

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