



Mini-Circuits

SURFACE MOUNT



RF Transformer

TC1-1-13M-17+

75Ω 70 to 2700 MHz

FEATURES

- Suitable for tin/lead and RoHS solder systems
- Wideband, 70 to 2700 MHz
- Balanced transmission line
- Good return loss
- Excellent amplitude unbalance and phase unbalance
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: AT224-3

+RoHS Compliant

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

APPLICATIONS

- Balanced to unbalanced transformation
- Push-pull amplifiers
- PCS/DCS
- MMDS

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		Ohm
Frequency Range		70		2700	MHz
Insertion Loss* (average)	70-2700			2	dB
Amplitude Unbalance*	70-2700			2	dB
Phase Unbalance	70-2700			11	deg.
Return Loss	70-2700	14			dB

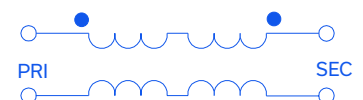
*Frequency where amplitude unbalance=0dB-2100 MHz

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. A
ECO-022263
TC1-1-13M-17+
MCL NY
240626





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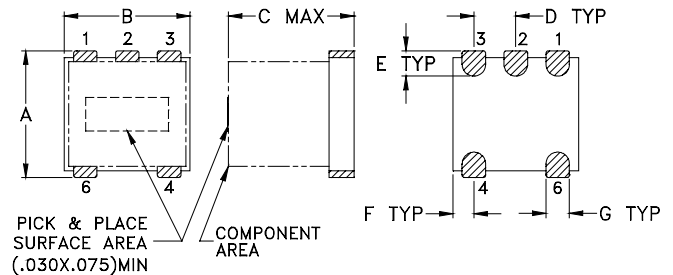
75Ω 70 to 2700 MHz

PIN CONNECTIONS

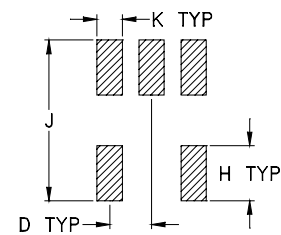
PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	1
SECONDARY	3
NOT USED	2

PRODUCT MARKING: N/A

OUTLINE DRAWING



PCB Land Pattern

Suggested Layout,
Tolerance to be within ± 0.002 OUTLINE DIMENSIONS $\left(\begin{smallmatrix} \text{Inch} \\ \text{mm} \end{smallmatrix} \right)$

A	B	C	D	E	F
.150	.150	.150	.050	.030	.025
3.81	3.81	3.81	1.27	0.76	0.64
G	H	J	K	wt	
.028	.065	.190	.030	grams	
0.71	1.65	4.83	0.76	0.10	

TAPE & REEL INFORMATION: F17



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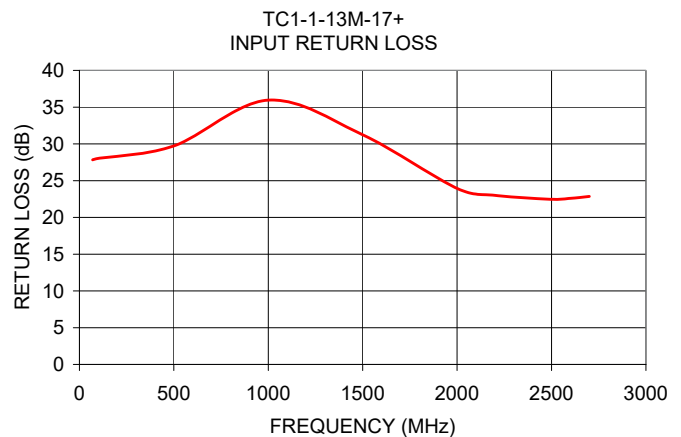
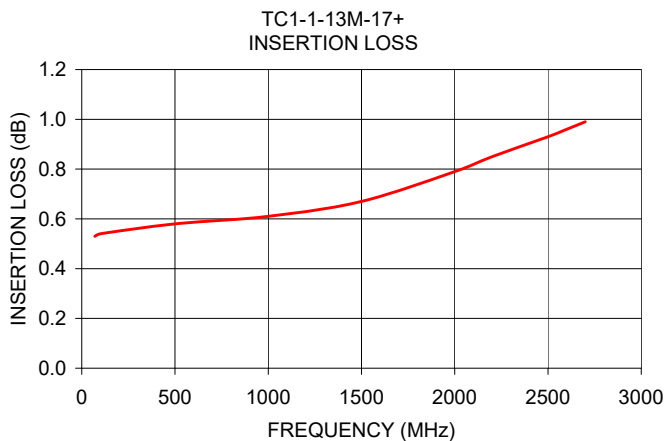
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75Ω 70 to 2700 MHz

TYPICAL PERFORMANCE DATA

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
70.0	0.53	27.83	1.66	0.07
100.0	0.54	28.03	1.68	0.30
500.0	0.58	29.73	1.57	1.86
1000.0	0.61	35.95	1.14	3.98
1500.0	0.67	31.24	0.58	5.81
2000.0	0.79	23.95	0.09	6.79
2200.0	0.85	23.00	0.24	6.72
2500.0	0.93	22.46	0.59	6.30
2600.0	0.96	22.59	0.69	6.07
2700.0	0.99	22.85	0.80	5.72



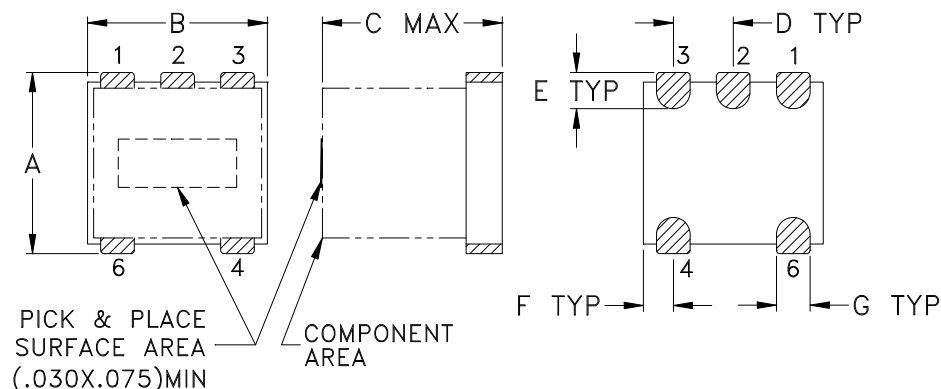
NOTES

- 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

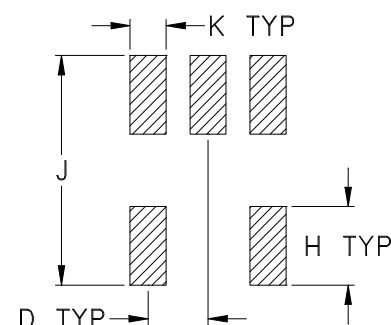


Outline Dimensions

AT224-3



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT224-3	.150 (3.81)	.150 (3.81)	.150 (3.81)	.050 (1.27)	.030 (0.76)	.025 (0.64)	.028 (0.71)	.065 (1.65)	.190 (4.83)	.030 (0.76)	-- --	.10

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

Notes:

- Open style, ceramic base.
- Termination finish: 3.15-5.12 μ inch (.08-.130 microns) Gold over 78-236 μ inch (1.98-6.0 microns) Nickel plate.



P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

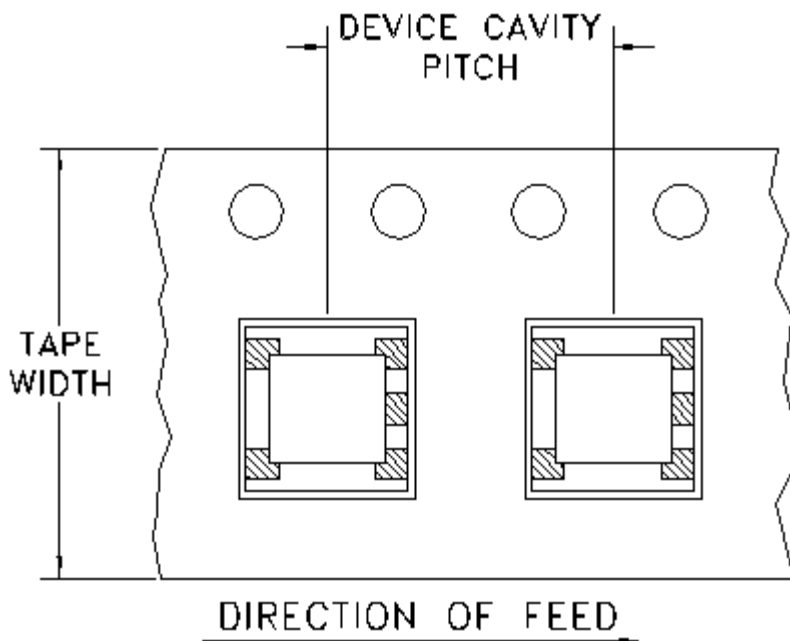


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F17

DEVICE ORIENTATION IN T&R



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