

## SURFACE MOUNT

# RF Transformer

 $50\Omega$  0.5 to 300 MHz

- TC4-1T+
- \*Addition of Top Hat® feature Benefits
- Allows faster pick-and-place
- Enables visual identification marking

#### **FEATURES**

- Wide band 0.5-300 MHz, Usable over 0.2-450 MHz
- Good return loss
- · Impedance matching
- Plastic base with leads
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: AT224-1A

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

#### **APPLICATIONS**

CATV

#### **ELECTRICAL SPECIFICATIONS AT 25°C**

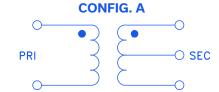
Parameter	Frequency (MHz)	Min.	Тур.	Max.	Unit
Impedance Ratio (secondary / primary)			4		Ohm
Frequency Range		0.5		300	MHz
	_		3.0		
Insertion Loss*	0.5-300		2.0		dB
	1.5-100		1.0		

<sup>\*</sup> Insertion Loss is referenced to mid-band loss, 0.3 dB typ.

#### **MAXIMUM RATINGS**

Parameter	Ratings
Operating Temperature	-20°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.





#### **SURFACE MOUNT**

# RF Transformer

TC4-1T+

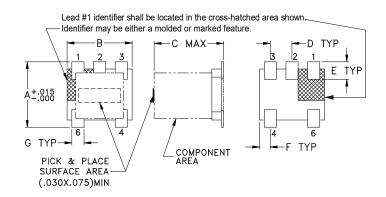
 $50\Omega$  0.5 to 300 MHz

#### **PIN CONNECTIONS**

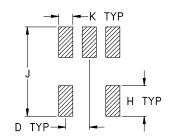
PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	1
SECONDARY	3
SECONDARY CT	2
NOT USED	5

**PRODUCT MARKING: NA** 

#### **OUTLINE DRAWING**



#### **PCB Land Pattern**



Suggested Layout, Tolerance to be within±.002

#### OUTLINE DIMENSIONS (Inch )

Α	В	С	D	Е	F
.150	.150	.160	.050	.040	.025
3.81	3.81	4.06	1.27	1.02	0.64
G	Н	J	K		wt
G .028	H .065	J .190	K .030		wt grams

**TAPE & REEL INFORMATION: F17** 



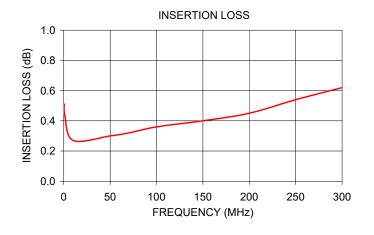
# RF Transformer

TC4-1T+

 $50\Omega$  0.5 to 300 MHz

#### **TYPICAL PERFORMANCE DATA**

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)
0.50	0.51	16.81
1.00	0.44	20.73
10.00	0.27	30.31
50.00	0.30	32.32
70.00	0.32	30.95
100.00	0.36	28.39
150.00	0.40	24.12
200.00	0.45	20.32
250.00	0.54	17.09
300.00	0.62	14.29





#### 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

**RF Transformer** TC4-1T+

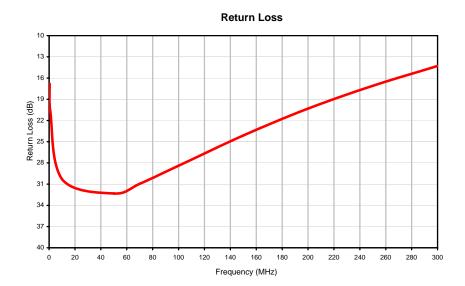
### Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
0.50	0.51	16.81
1.00	0.44	20.73
10.00	0.27	30.31
50.00	0.30	32.32
70.00	0.32	30.95
100.00	0.36	28.39
150.00	0.40	24.12
200.00	0.45	20.32
250.00	0.54	17.09
300.00	0.62	14.29

**RF Transformer** TC4-1T+

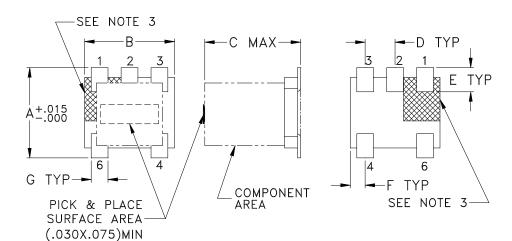
## Typical Performance Curves



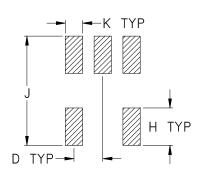


#### **Outline Dimensions**

AT224-1A



#### **PCB Land Pattern**



Suggested Layout, Tolerance to be within ±.002

CASE #	A	В	С	D	E	F	G	Н	J	K	WT. GRAMS
AT224-1A	.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)	.15

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

#### **Notes:**

- 1. Case material: Plastic.
- 2. Termination finish:

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.

3. Lead #1 identifier shall be located in the cross-hatched area shown. Identifier may be either a molded or marked feature.



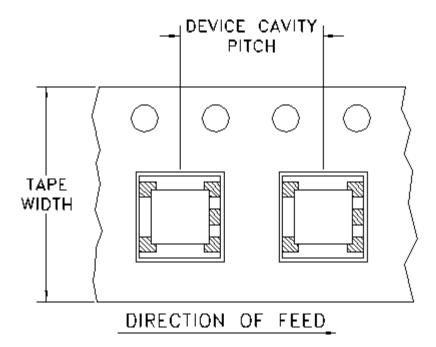


P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

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

# 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





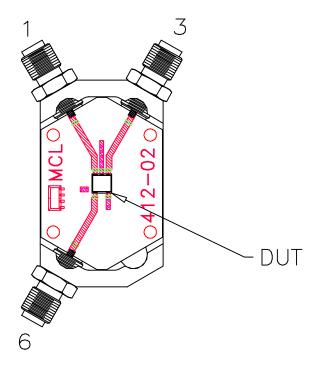
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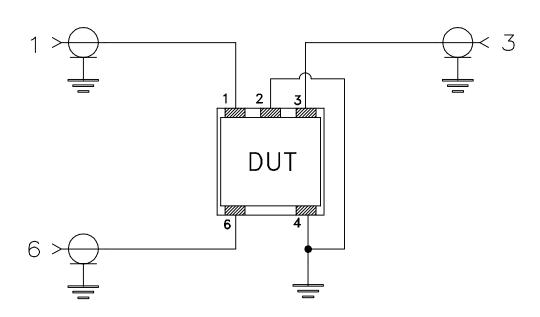
RF/IF MICROWAVE COMPONENTS

## **Evaluation Board and Circuit**

For Pin Connections refer to Data Sheet of the DUT



TB-145



Schematic Diagram

#### Notes:

- 1. 50 Ohm SMA Female connectors.
- 2. PCB Material: Rogers RO4350B or its equivalent, III Mini-Circuits® Dielectric Constant=3.5, Thickness=.020"



#### **Environmental Specifications**

ENV02

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.

Test/Inspection Condition	Reference/Spec
-20° to 85°C Ambient Environment	Individual Model Data Sheet
-55° to 100° C Ambient Environment	Individual Model Data Sheet
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
-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
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
10X Magnification	J-STD-002, 95% Coverage
20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
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
	-20° to 85°C Ambient Environment  -55° to 100° C Ambient Environment  90 to 95% RH, 240 hours, 50°C  -55° to 100°C, 100 cycles  Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak  10X Magnification  20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)  50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes  Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether +

ENV02 Rev: A

02/25/11

M130240 File: ENV02.pdf

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