SURFACE MOUNT

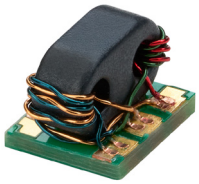
RF Transformer

TC1-182T-75H+

75Ω 5 to 1800 MHz 2 Watt

KEY FEATURES

- Wide Bandwidth 5 to 1800 MHz
- Balanced Transmission line with center-tap for DC input
- Power Handling 2 watts

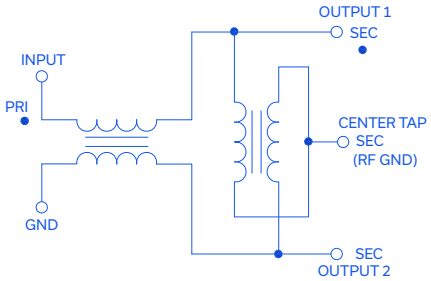


Generic photo used for illustration purposes only

APPLICATIONS

- PCS/DCS
- Wideband push-pull amplifiers
- Cellular
- DOCSIS® 4.0 & 3.1
- Cable TV

CONFIGURATION M1



PRODUCT OVERVIEW

Mini-Circuits' TC1-182T-75H+ is a 75Ω surface-mount transmission line transformer covering a wide range of applications from 5 to 1800 MHz. The transformer provides input power handling up to 2 watts, low insertion loss, good input return loss and low amplitude and phase unbalance. Featuring core and wire construction on a small PCB, the unit measures 0.212 x 0.170 x 0.144", accommodating dense circuit board layouts.

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio			1		:1
Frequency Range		5		1800	MHz
Insertion Loss	5 - 1218 1218 - 1800		0.7 1.5	1.0 2.4	dB
Amplitude Unbalance	5 - 1218 1218 - 1800		0.8 1.4	1.5 2.4	dB
Phase Unbalance	5 - 1218 1218 - 1800		3 5	6 10	Degrees
Return Loss (Primary)	5 - 800 800 - 1218 1218 - 1800		18 16 14		dB

1. Tested in Evaluation Board P/N TB-TC1-182T75H+.

ABSOLUTE MAXIMUM RATINGS[2]

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power	2 W
DC Current	400 mA

2. Permanent damage may occur if any of these limits are exceeded.

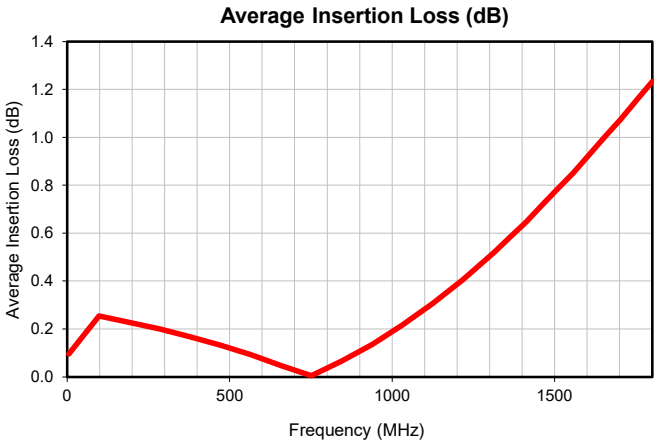
REV. OR
ECO-027038
TC1-182T-75H+
MCL NY
250919

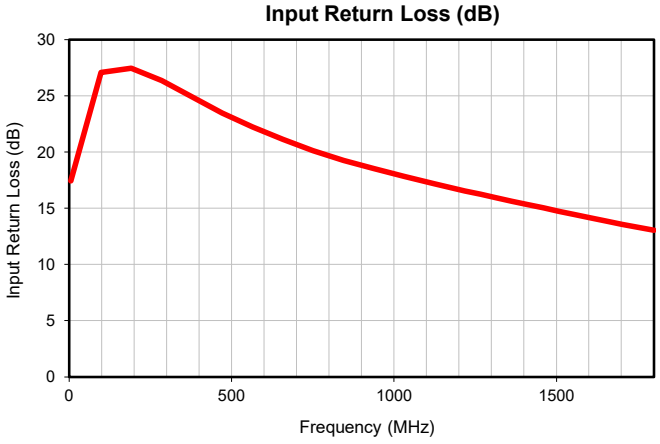
RF Transformer

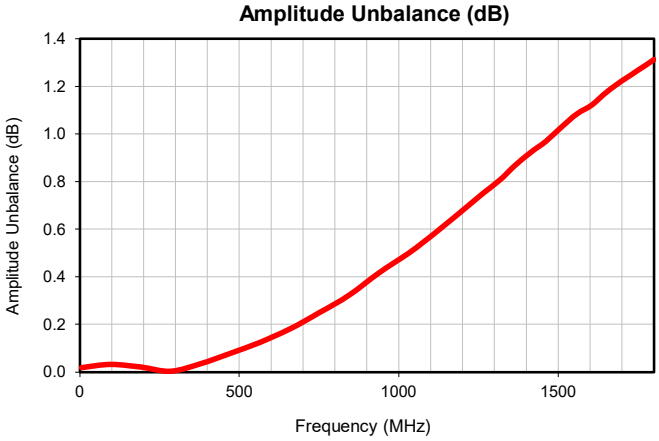
TC1-182T-75H+

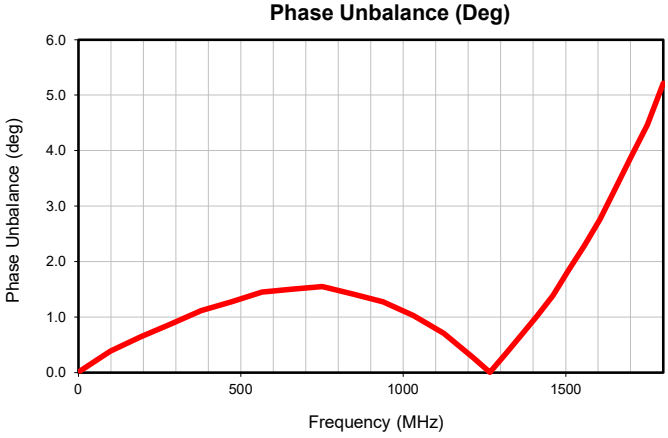
75Ω 5 to 1800 MHz 2 Watt

TYPICAL PERFORMANCE GRAPHS









SURFACE MOUNT

RF Transformer

TC1-182T-75H+

75Ω 5 to 1800 MHz 2 Watt

CONFIGURATION M1

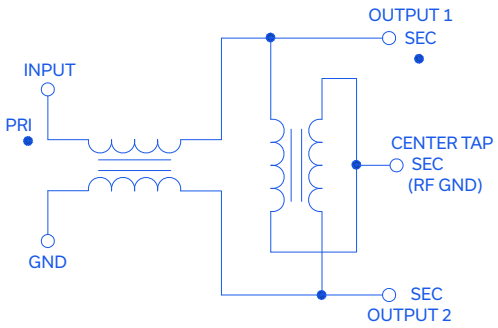
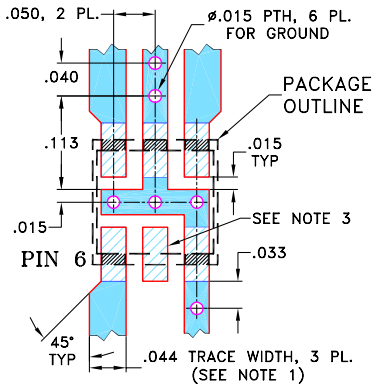


Figure 1. TC1-182T-75H+ Configuration

PAD DESCRIPTION

Function	Pad Number	Description
Primary Dot	4	RF-IN
Primary	5	GND
Secondary Dot	3	Out 1
Secondary	1	Out 2
Secondary Center-Tap	2	RF GND

SUGGESTED PCB LAYOUT (PL-244)



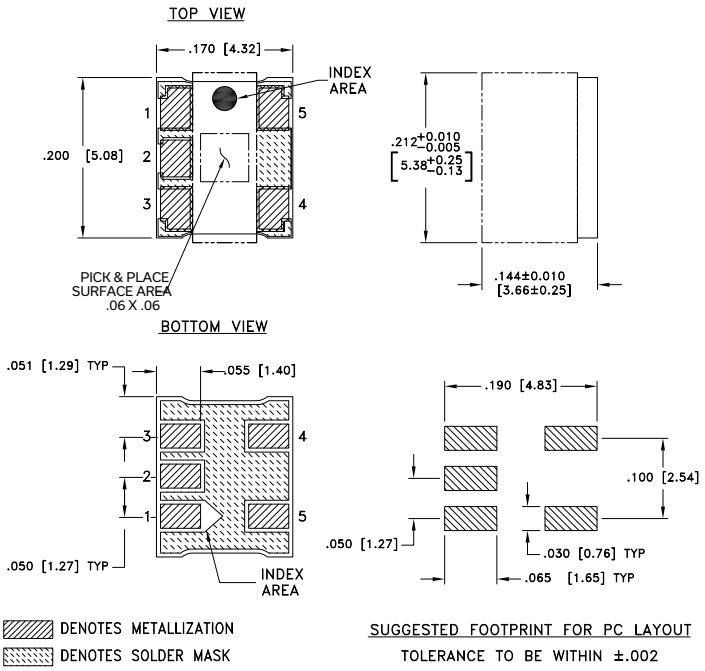
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. ON EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. THIS PAD IS NOT REQUIRED FOR AT224 CASE STYLE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Figure 2. Suggested PCB Layout PL-244

CASE STYLE DRAWING



Weight: .2 grams
Dimensions are in inches (mm). Tolerances: 2 Pl. ±.01; 3 Pl. ±.005
Orientation Dot on Unit corresponds to Pin #1.

PRODUCT MARKING*: N/A

*Marking may contain other features or characters for internal lot control.

SURFACE MOUNT

RF Transformer

TC1-182T-75H+

75Ω 5 to 1800 MHz 2 Watt

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file) De-embedded to device pads
Case Style	TT3628-1 Lead Finish: Gold over nickel
RoHS Status	Compliant
Tape and Reel	TR-F017
Suggested Layout for PCB Design	PL-244
Evaluation Board	TB-TC1-182T75H+ Gerber File
Environmental Rating	ENV02T1

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-Circuits' 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 TC1-182T-75H+

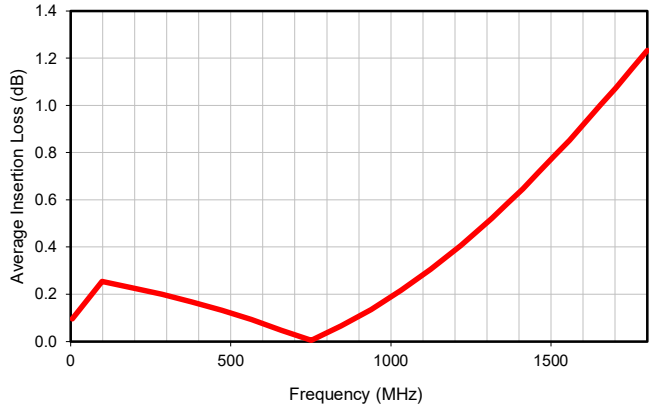
Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
5.00	0.09	17.44	0.02	0.02
98.31	0.25	27.08	0.03	0.38
191.62	0.23	27.47	0.02	0.64
284.92	0.20	26.36	0.00	0.88
378.23	0.17	24.91	0.03	1.12
471.54	0.13	23.45	0.08	1.27
564.85	0.09	22.22	0.13	1.45
658.15	0.05	21.12	0.18	1.50
751.46	0.00	20.12	0.25	1.55
844.77	0.07	19.24	0.32	1.42
938.08	0.13	18.54	0.42	1.27
1031.38	0.22	17.82	0.50	1.03
1124.69	0.31	17.18	0.60	0.71
1218.00	0.41	16.53	0.70	0.26
1266.50	0.46	16.23	0.75	0.01
1315.00	0.52	15.93	0.81	0.33
1363.50	0.58	15.60	0.87	0.67
1412.00	0.65	15.31	0.92	1.01
1460.50	0.71	15.02	0.97	1.38
1509.00	0.78	14.71	1.03	1.84
1557.50	0.85	14.43	1.08	2.28
1606.00	0.93	14.14	1.12	2.76
1654.50	1.00	13.86	1.18	3.34
1703.00	1.07	13.57	1.23	3.90
1751.50	1.15	13.29	1.27	4.46
1800.00	1.23	13.04	1.31	5.22

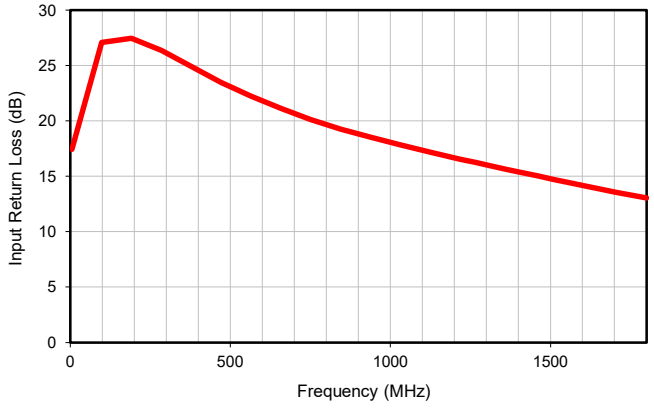
RF Transformer TC1-182T-75H+

Typical Performance Data

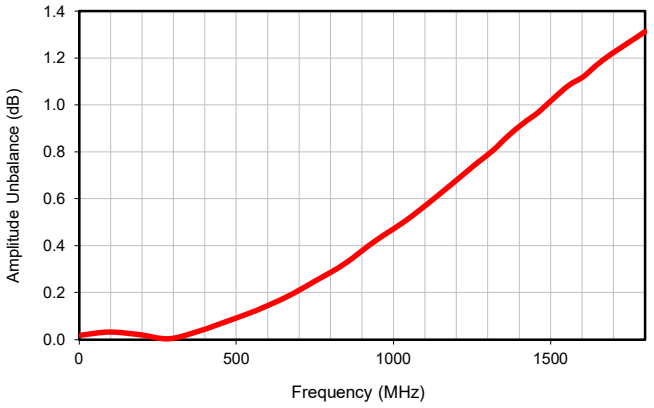
Average Insertion Loss (dB)



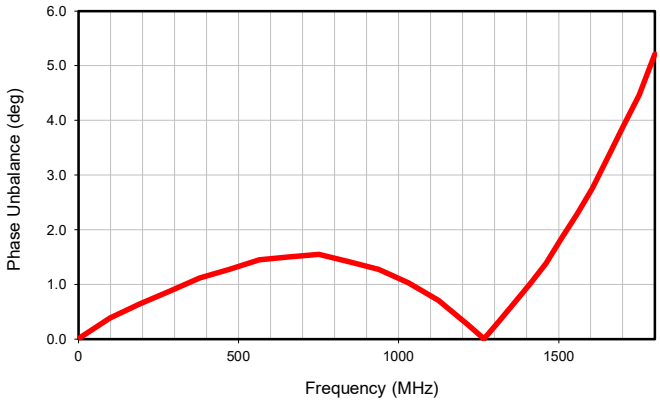
Input Return Loss (dB)



Amplitude Unbalance (dB)

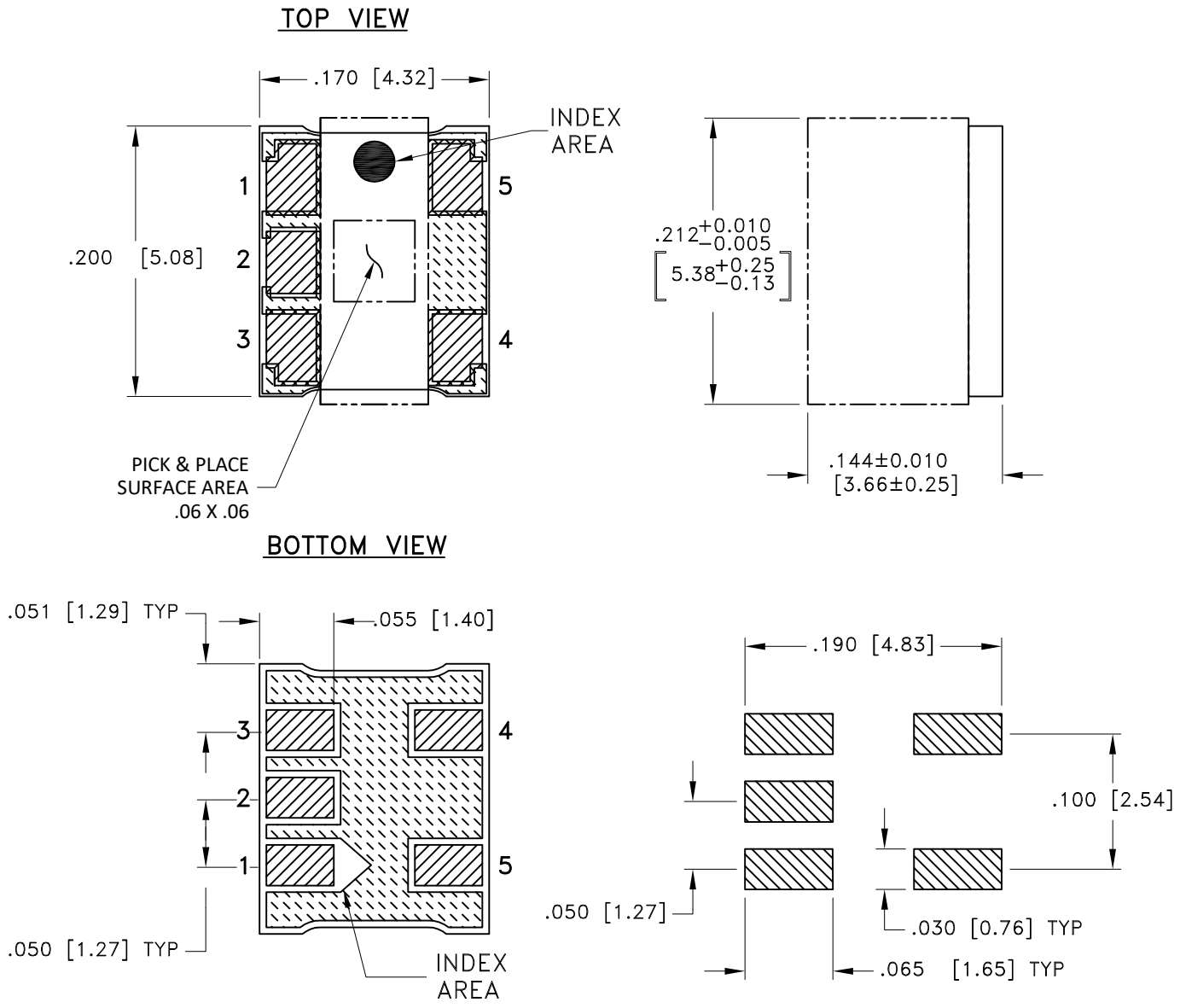


Phase Unbalance (Deg)



Case Style TT

Outline Dimensions TT3628-1



DENOTES METALLIZATION

DENOTES SOLDER MASK

SUGGESTED FOOTPRINT FOR PC LAYOUT

TOLERANCE TO BE WITHIN ±.002

Weight: .2 grams

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

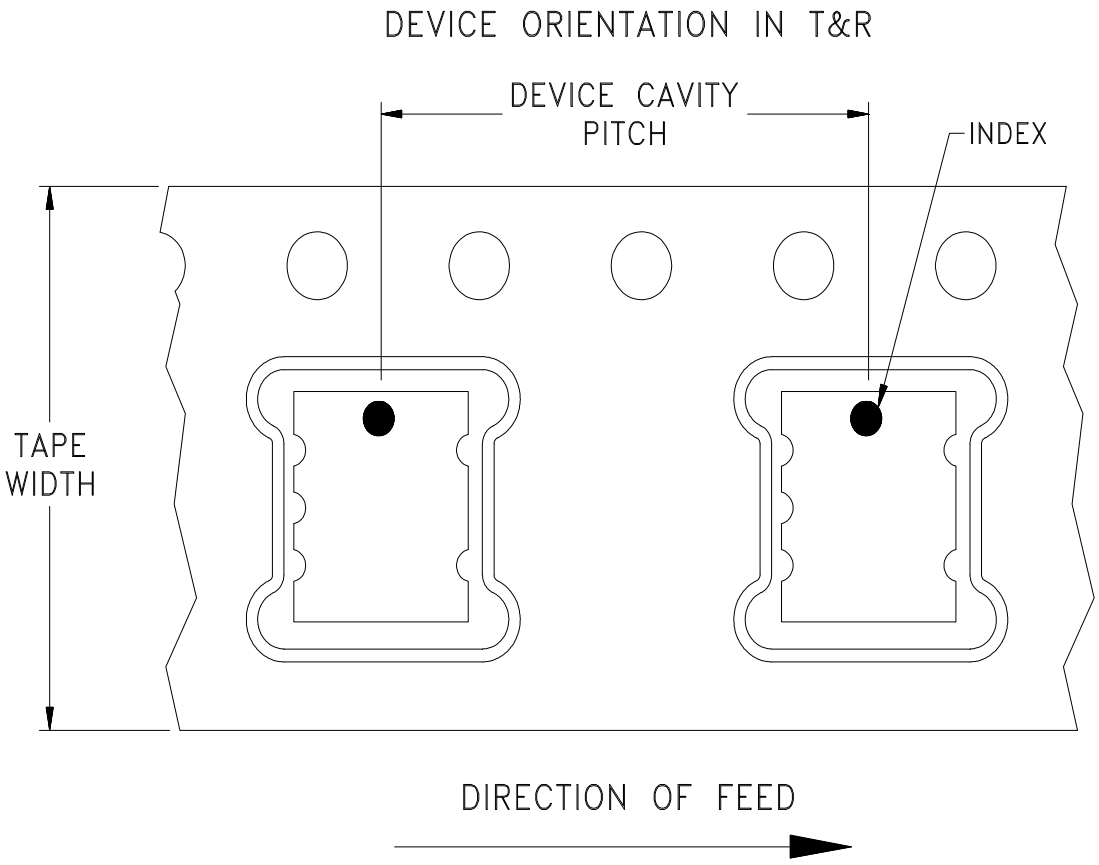
Notes:

1. Open style, Base material: Printed wiring laminate.
2. Termination finish: 3-5 µ inch (.08-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate. All models, (+) suffix.
3. **Orientation Dot on Unit corresponds to Pin #1.**

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RF/IF MICROWAVE COMPONENTS

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Tape & Reel Packaging TR-F017



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note	
16	12	13	Small quantity standards	10
				50
				100
				200
				500
			Standard	1000

Note: Please consult individual model data sheet/dashboard 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

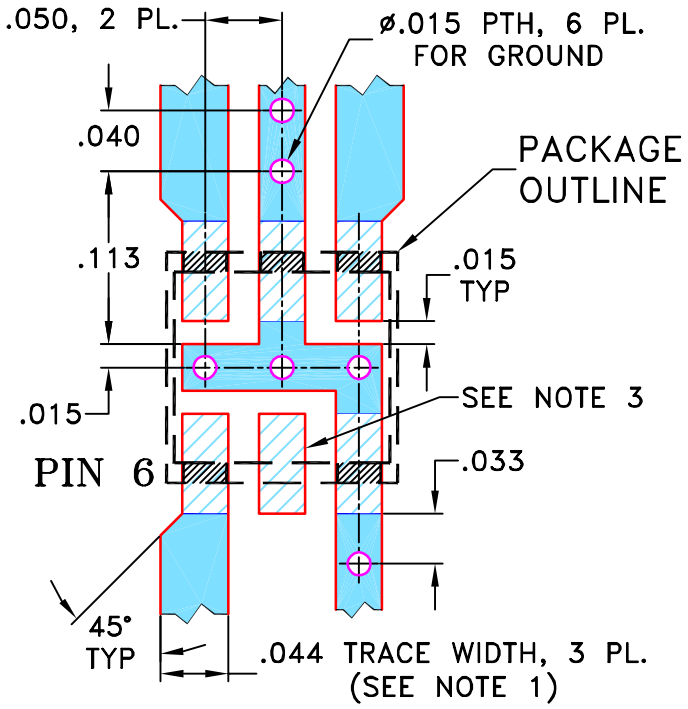
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THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M106563	NEW RELEASE	08/23/06	AV	IG

SUGGESTED MOUNTING CONFIGURATION FOR AT224/DB714 CASE STYLE, "gs/ha/hd" PIN CONNECTIONS (FOR SINGLE ENDED TO BALANCED APPLICATION)



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.
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3. THIS PAD IS NOT REQUIRED FOR AT224 CASE STYLE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	AV	07/28/06
TOLERANCES ON:	CHECKED	IL	08/23/06
2 PL DECIMALS ±	APPROVED	IG	08/23/06
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, gs/ha/hd, AT224/DB714, TC/TCM, TB-145

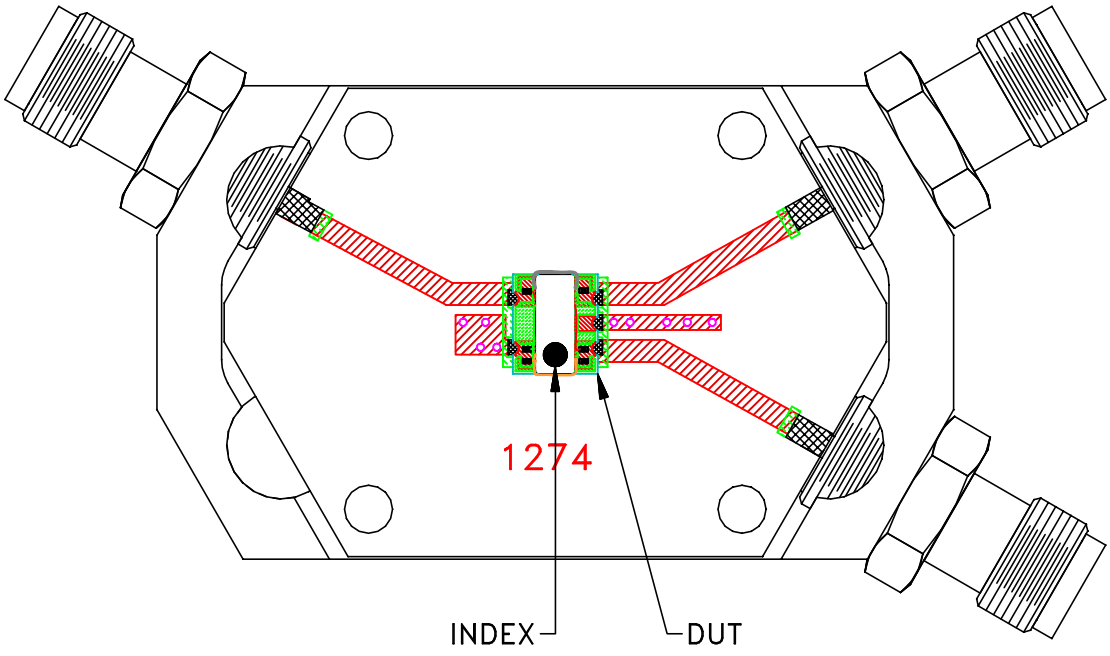
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-244	OR

FILE:	SCALE:	SHEET:
98PL244	8:1	1 OF 1

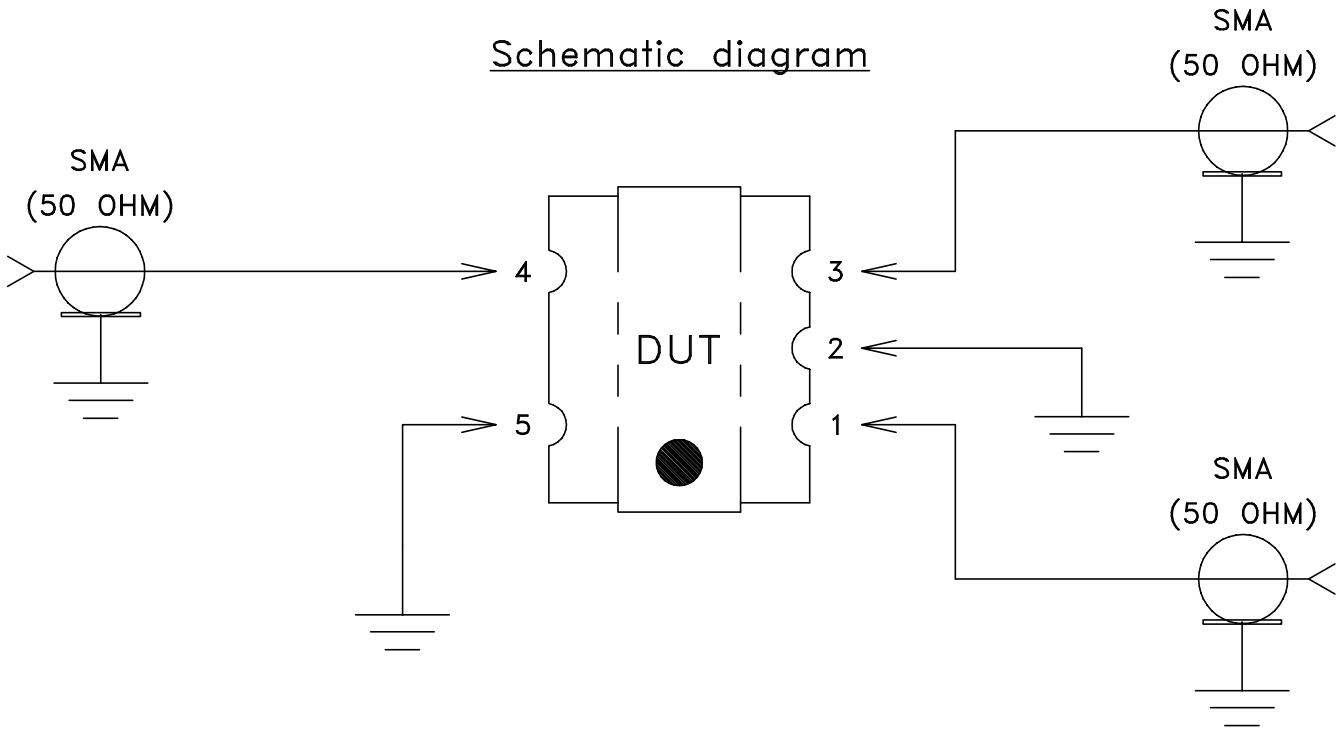
Evaluation Board and Circuit

TB-TC1-182T75H+

For Pin Connections refer to Data Sheet of the DUT



Schematic diagram



Notes:

1. PCB Material: ROGERS (RO4350B) OR Equivalent, Dielectric Constant=3.48
   Thickness=.020±.0015 inch
2. 50 Ohm SMA Female Connector.

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Environmental Specifications ENV02T1

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

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