

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

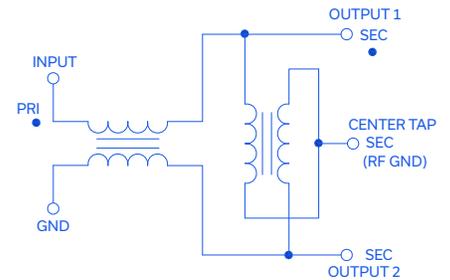


Generic photo used for illustration purposes only

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 SPECIFICATIONS¹ AT +25°C

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

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

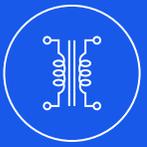
ABSOLUTE MAXIMUM RATINGS²

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





SURFACE MOUNT

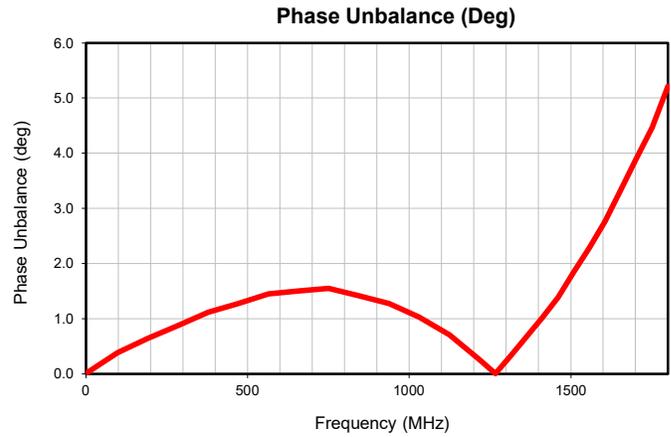
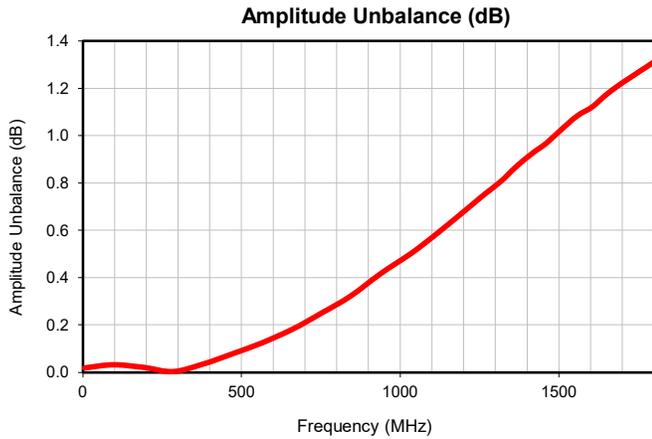
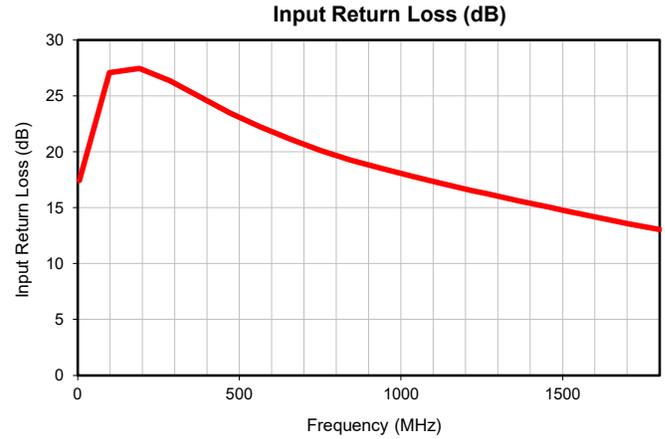
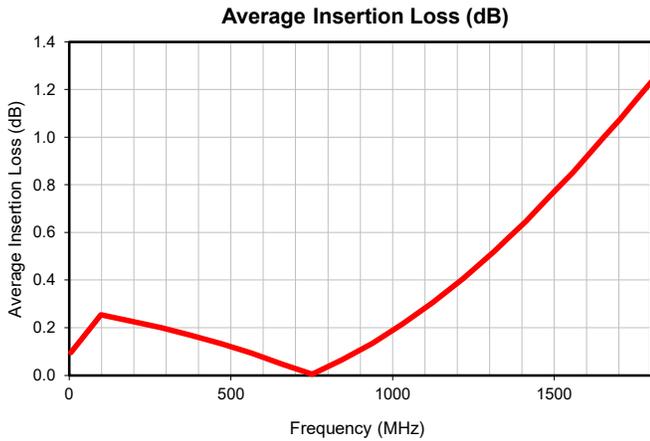
RF Transformer

TC1-182T-75H+

Mini-Circuits

75Ω 5 to 1800 MHz 2 Watt

TYPICAL PERFORMANCE GRAPHS





CONFIGURATION M1

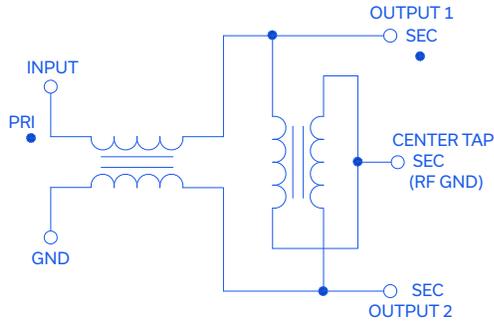
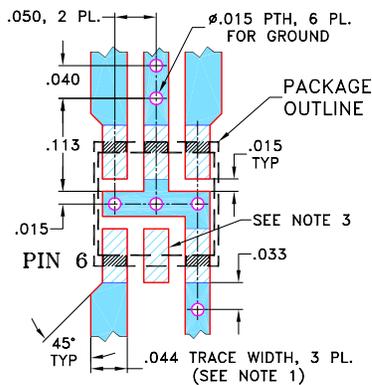


Figure 1. TC1-182T-75H+ Configuration

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

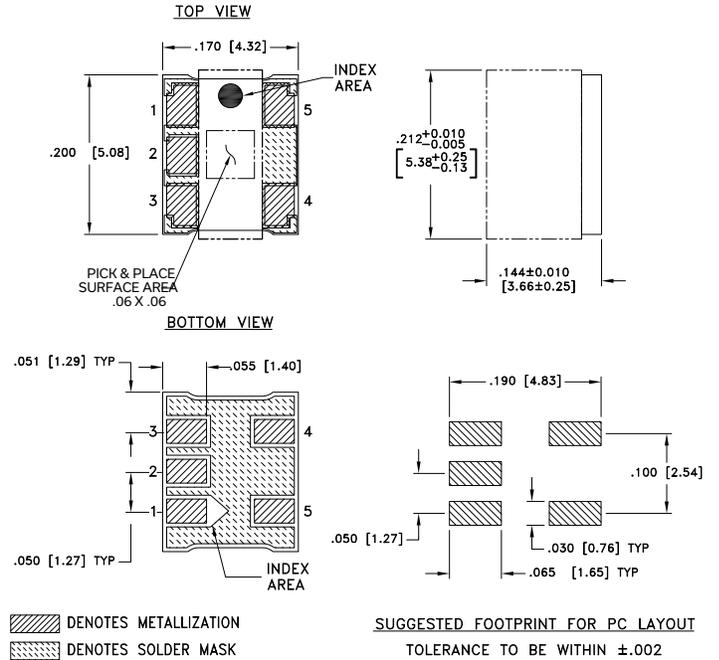
SUGGESTED PCB LAYOUT (PL-244)



- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. ON EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
 - 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

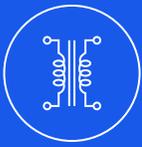
CASE STYLE DRAWING



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+

 Mini-Circuits

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



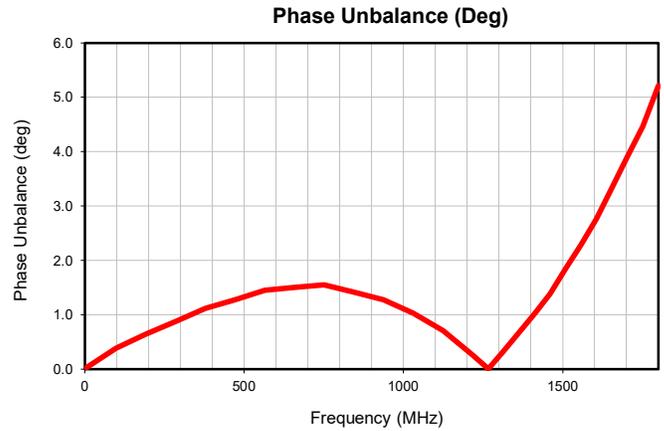
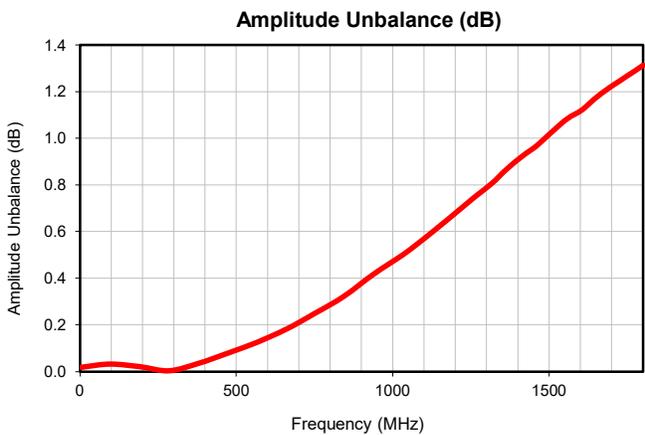
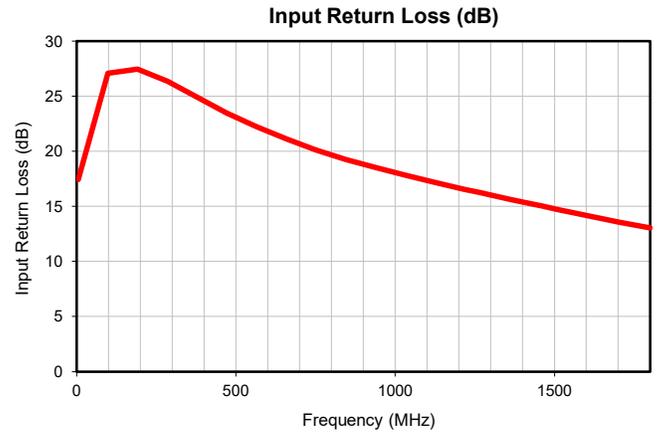
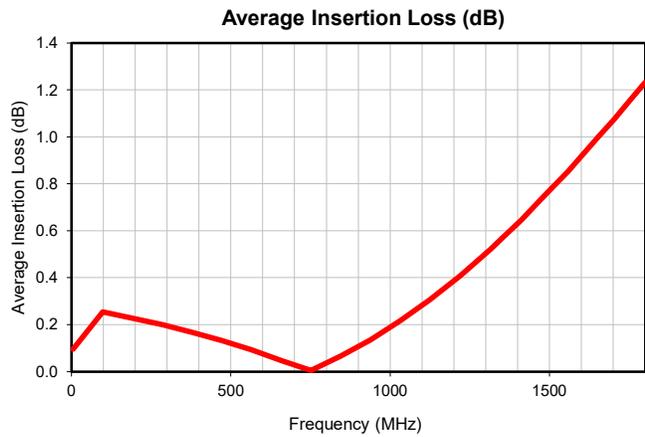
RF Transformer

TC1-182T-75H+

Typical Performance Data

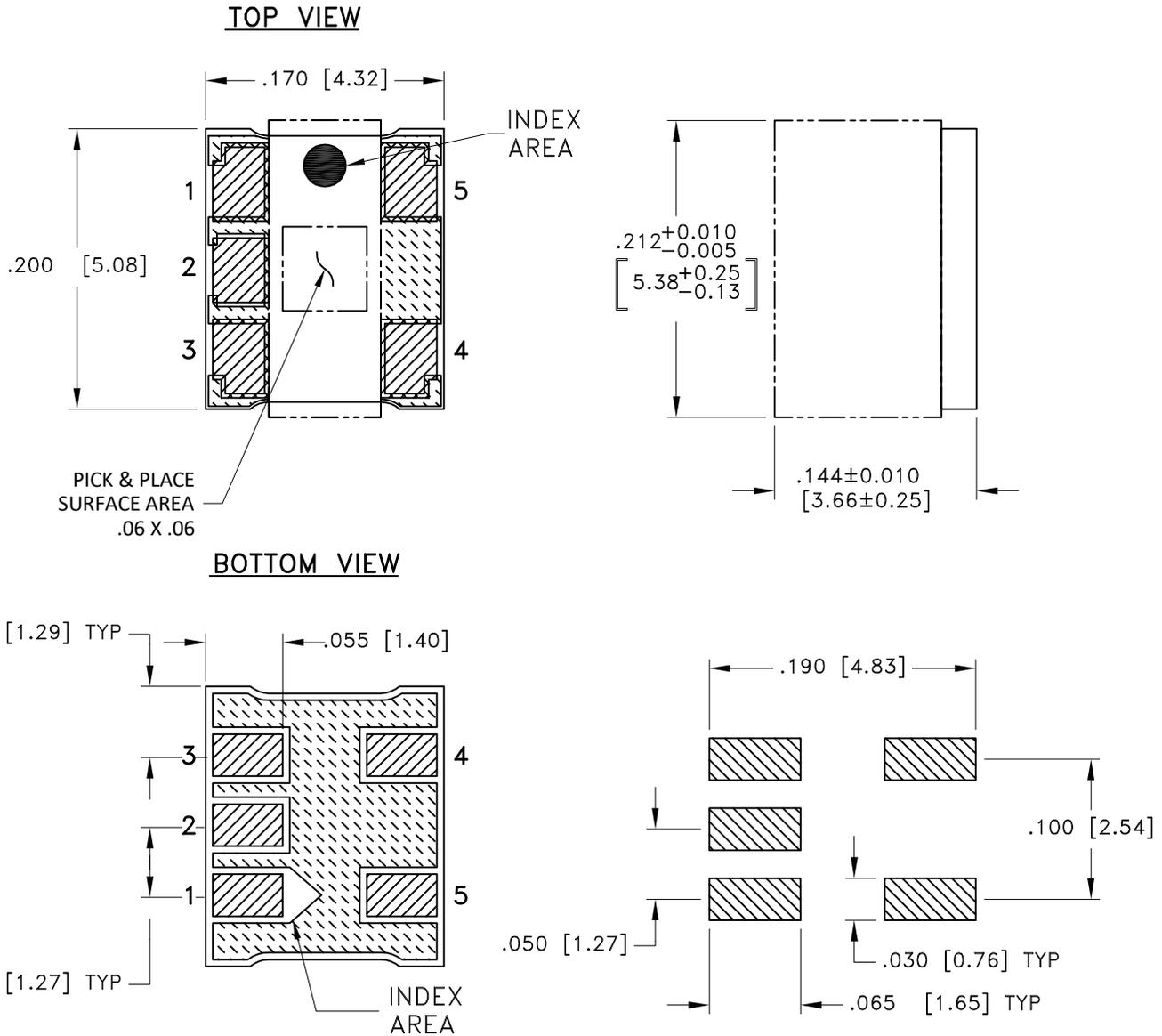
FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
5.00	0.09	17.44	0.02	0.02
98.31	0.25	27.08	0.03	0.38
191.62	0.23	27.47	0.02	0.64
284.92	0.20	26.36	0.00	0.88
378.23	0.17	24.91	0.03	1.12
471.54	0.13	23.45	0.08	1.27
564.85	0.09	22.22	0.13	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

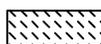
Typical Performance Data



Outline Dimensions

TT3628-1



-  DENOTES METALLIZATION
-  DENOTES SOLDER MASK

Weight: .2 grams

Dimensions are in inches (mm). Tolerances: 2 Pl. ± 0.01 ; 3 Pl. ± 0.005

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.**

Mini-Circuits[®]
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
minicircuits.com

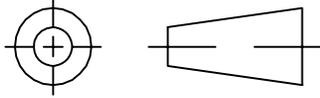
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

RF/IF MICROWAVE COMPONENTS

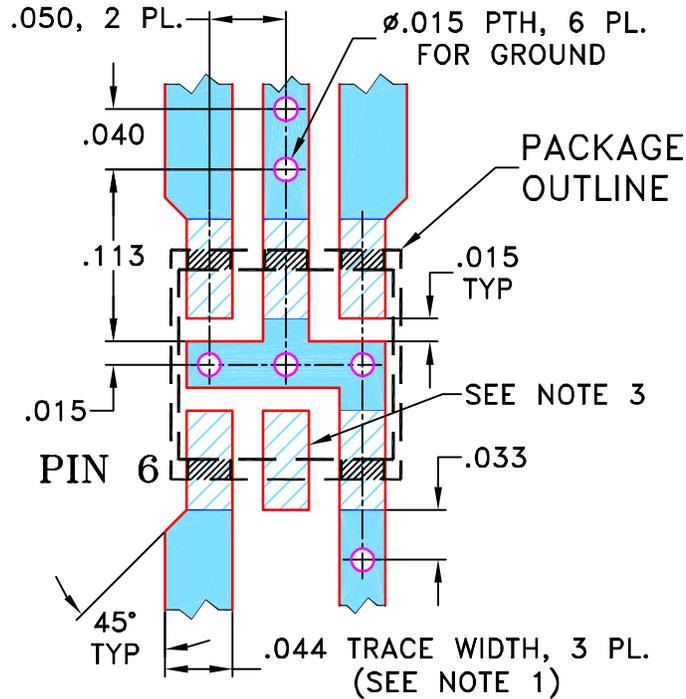
THIRD ANGLE PROJECTION



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:**
- 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.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
 - 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
DRAWN	AV	07/28/06
CHECKED	IL	08/23/06
APPROVED	IG	08/23/06

 **Mini-Circuits®** 13 Neptune Avenue
 Brooklyn NY 11235

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

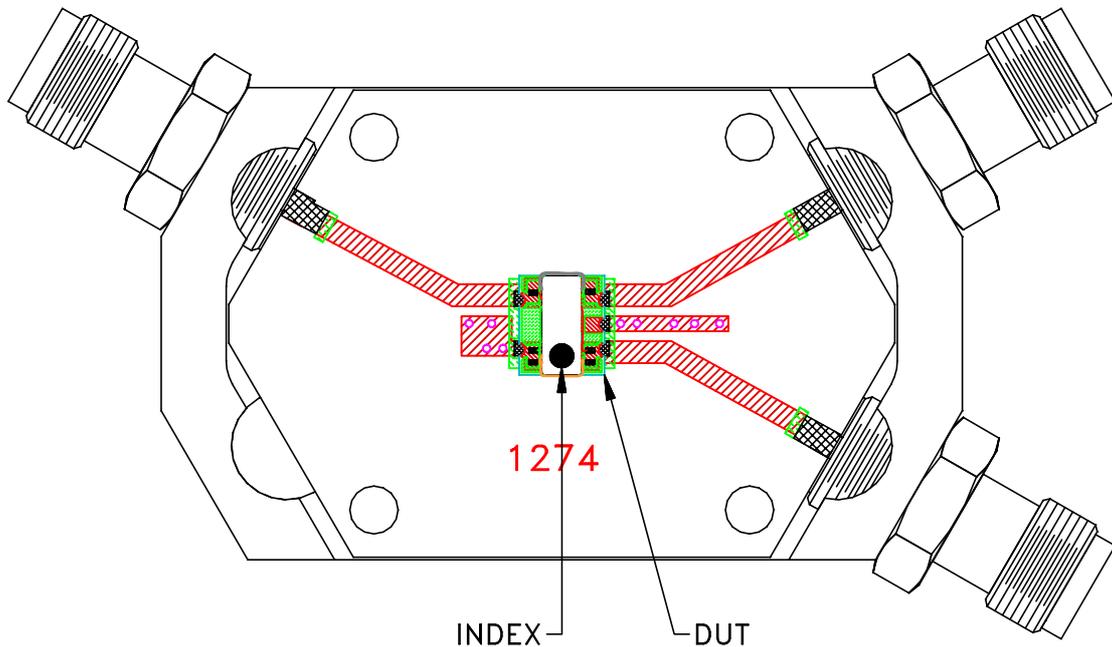
THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-244	REV: OR
FILE: 98PL244	SCALE: 8:1	SHEET: 1 OF 1	

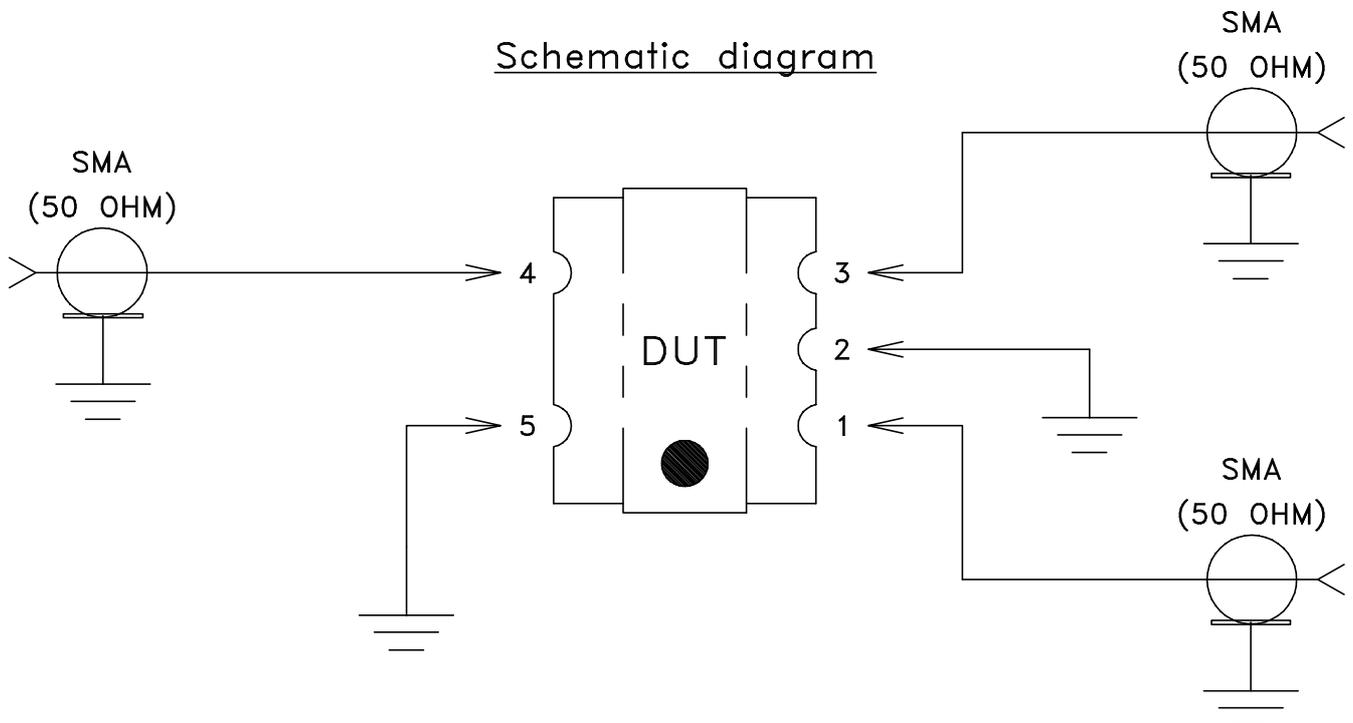
Evaluation Board and Circuit

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.

 **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