BALANCED

# RF Transformer

# TRS1-182-75+

75Ω 10 to 1800 MHz 1:1 Ratio

## FEATURES

- Suitable for Tin/Lead and RoHS Solder Systems
- Wideband, 10 to 1800 MHz
- Balanced Transmission Line
- Good Return Loss, 20 dB Typ. at 1 dB Band
- Excellent Amplitude Unbalance, 0.3 dB Typ.
- Aqueous Washable
- Excellent Intermod Suppression

*Generic photo used for illustration purposes only*

CASE STYLE: TT1618-1

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

## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Impedance Ratio | | | 1 | | |
| Frequency Range | | 10 | | 1800 | MHz |
| Insertion Loss[1] | 50-1200 | | 0.6 | 1.0 | dB |
| | 10-1800 | | 0.9 | 2.0 | |
| Amplitude Unbalance | 50-1000 | | 0.3 | 0.7 | dB |
| | 1000-1200 | | 0.5 | 0.7 | |
| | 10-1800 | | 0.7 | 1.4 | |
| Phase Unbalance | 50-1000 | | 2 | 4 | Degree |
| | 1000-1200 | | 3 | 8 | |
| | 10-1800 | | 7.5 | 15 | |
| Primary Return Loss (Input) | 50-500 | 16 | 22 | | dB |
| | 500-1000 | 13 | 20 | | |
| | 1000-1200 | 13 | 20 | | |
| | 10-1800 | 8 | 12.5 | | |

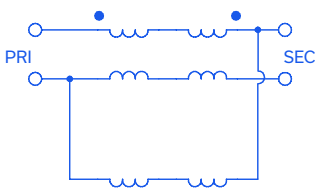
1. Insertion Loss is referenced to mid-band loss, 0.25 dB typ.

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -55°C to +100°C |
| RF Power | 1 W |
| DC Current | 30 mA |

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

## CONFIG. K




REV. C
ECO-028366
TRS1-182-75+
MCL NY
260128

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75Ω 10 to 1800 MHz 1:1 Ratio

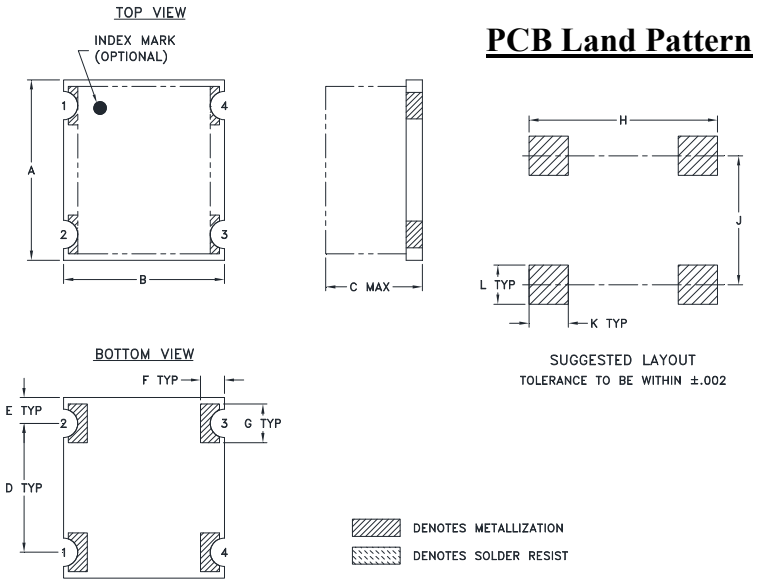
## PIN CONNECTIONS

| | |
|---|---|
| PRIMARY DOT | 4 |
| PRIMARY | 1 |
| SECONDARY DOT | 2 |
| SECONDARY | 3 |

**PRODUCT MARKING:** N/A

**DEMO BOARD MCL P/N:** TB-TRS1-182-75+

## OUTLINE DRAWING




## OUTLINE DIMENSIONS (Inch / mm)

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| .280 | .250 | .16 | .200 | .040 | .037 |
| 7.11 | 6.35 | 4.06 | 5.08 | 1.02 | 0.94 |

| G | H | J | K | L | wt. |
|---|---|---|---|---|---|
| .060 | .293 | .200 | .061 | .061 | grams |
| 1.52 | 7.44 | 5.08 | 1.55 | 1.55 | 3.00 |

**TAPE & REEL INFORMATION: F34**

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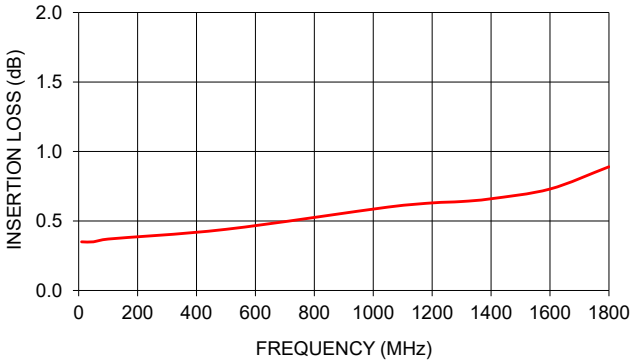
75Ω 10 to 1800 MHz 1:1 Ratio

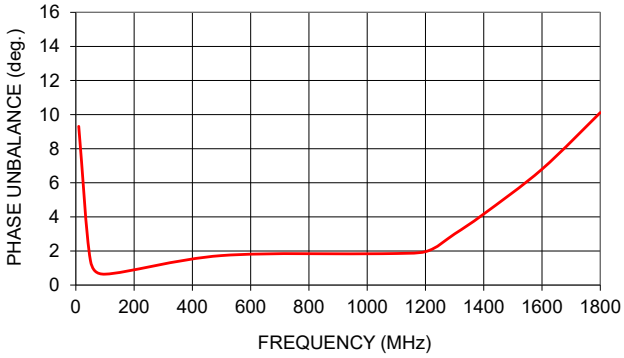
## TYPICAL PERFORMANCE DATA

| FREQUENCY (MHz) | INSERTION LOSS (dB) | INPUT R. LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (Deg.) |
|---|---|---|---|---|
| 10 | 0.35 | 11.81 | 0.40 | 9.31 |
| 50 | 0.35 | 24.24 | 0.23 | 1.45 |
| 100 | 0.37 | 24.82 | 0.21 | 0.64 |
| 500 | 0.44 | 19.21 | 0.00 | 1.73 |
| 1050 | 0.60 | 18.90 | 0.22 | 1.84 |
| 1200 | 0.63 | 20.28 | 0.23 | 1.96 |
| 1300 | 0.64 | 21.30 | 0.25 | 3.00 |
| 1400 | 0.66 | 22.02 | 0.28 | 4.17 |
| 1600 | 0.73 | 21.17 | 0.31 | 6.80 |
| 1800 | 0.89 | 14.58 | 0.35 | 10.12 |

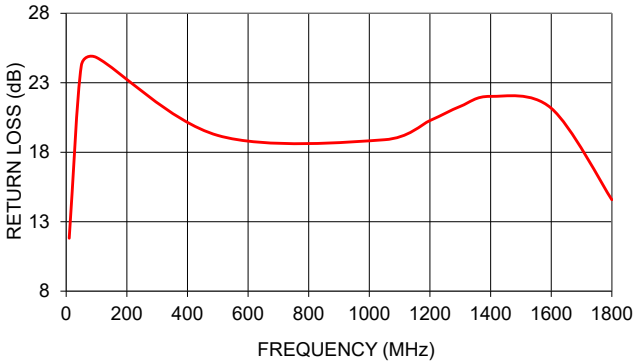
INSERTION LOSS



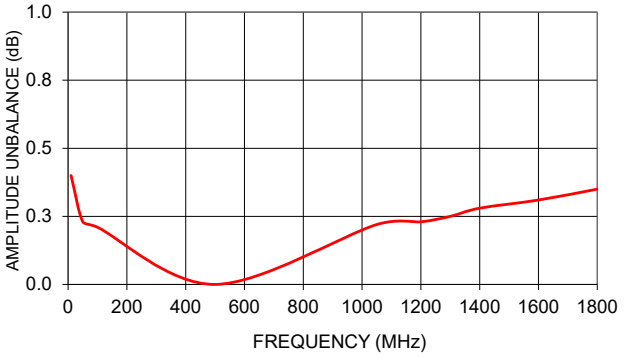

PHASE UNBALANCE




INPUT RETURN LOSS




AMPLITUDE UNBALANCE




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.
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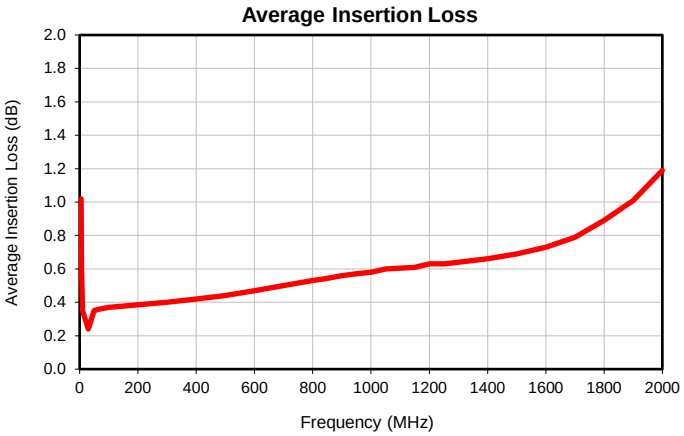
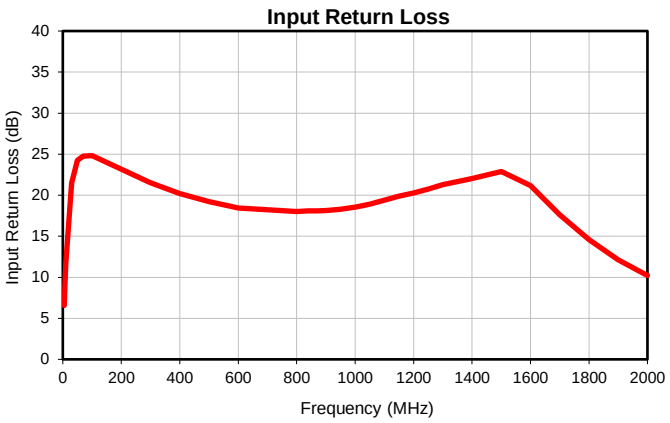
# RF Transformer TRS1-182-75+

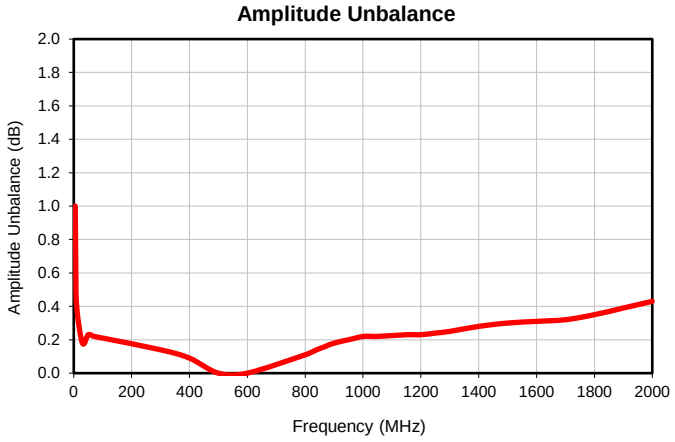
## *Typical Performance Data*

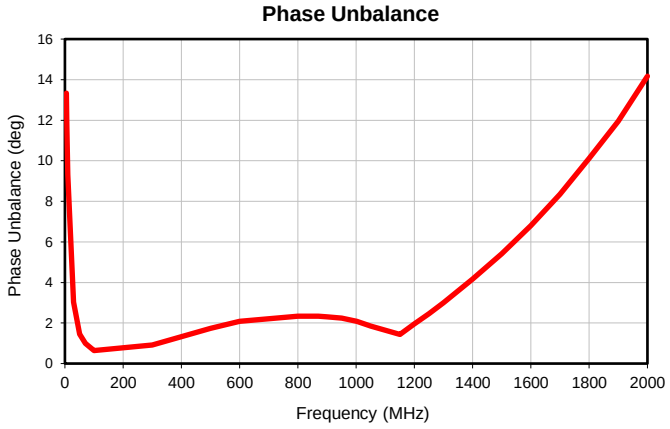
| FREQUENCY MHz | AVERAGE INSERTION LOSS (dB) | INPUT RETURN LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (deg.) |
|---|---|---|---|---|
| 5 | 1.02 | 6.57 | 1.00 | 13.33 |
| 7 | 0.59 | 8.98 | 0.66 | 11.72 |
| 10 | 0.35 | 11.81 | 0.40 | 9.31 |
| 30 | 0.24 | 21.48 | 0.18 | 3.03 |
| 50 | 0.35 | 24.24 | 0.23 | 1.45 |
| 70 | 0.36 | 24.77 | 0.22 | 0.99 |
| 100 | 0.37 | 24.82 | 0.21 | 0.64 |
| 300 | 0.40 | 21.53 | 0.14 | 0.91 |
| 400 | 0.42 | 20.19 | 0.09 | 1.33 |
| 500 | 0.44 | 19.21 | 0.00 | 1.73 |
| 600 | 0.47 | 18.45 | 0.00 | 2.09 |
| 800 | 0.53 | 18.01 | 0.11 | 2.33 |
| 840 | 0.54 | 18.08 | 0.14 | 2.34 |
| 870 | 0.55 | 18.08 | 0.16 | 2.34 |
| 900 | 0.56 | 18.13 | 0.18 | 2.31 |
| 950 | 0.57 | 18.28 | 0.20 | 2.24 |
| 1002 | 0.58 | 18.57 | 0.22 | 2.08 |
| 1050 | 0.60 | 18.90 | 0.22 | 1.84 |
| 1150 | 0.61 | 19.87 | 0.23 | 1.44 |
| 1200 | 0.63 | 20.28 | 0.23 | 1.96 |
| 1250 | 0.63 | 20.73 | 0.24 | 2.46 |
| 1300 | 0.64 | 21.30 | 0.25 | 3.00 |
| 1400 | 0.66 | 22.02 | 0.28 | 4.17 |
| 1500 | 0.69 | 22.90 | 0.30 | 5.41 |
| 1600 | 0.73 | 21.17 | 0.31 | 6.80 |
| 1700 | 0.79 | 17.62 | 0.32 | 8.34 |
| 1800 | 0.89 | 14.58 | 0.35 | 10.12 |
| 1900 | 1.01 | 12.12 | 0.39 | 11.95 |
| 2000 | 1.19 | 10.23 | 0.43 | 14.17 |

## *Typical Performance Data*



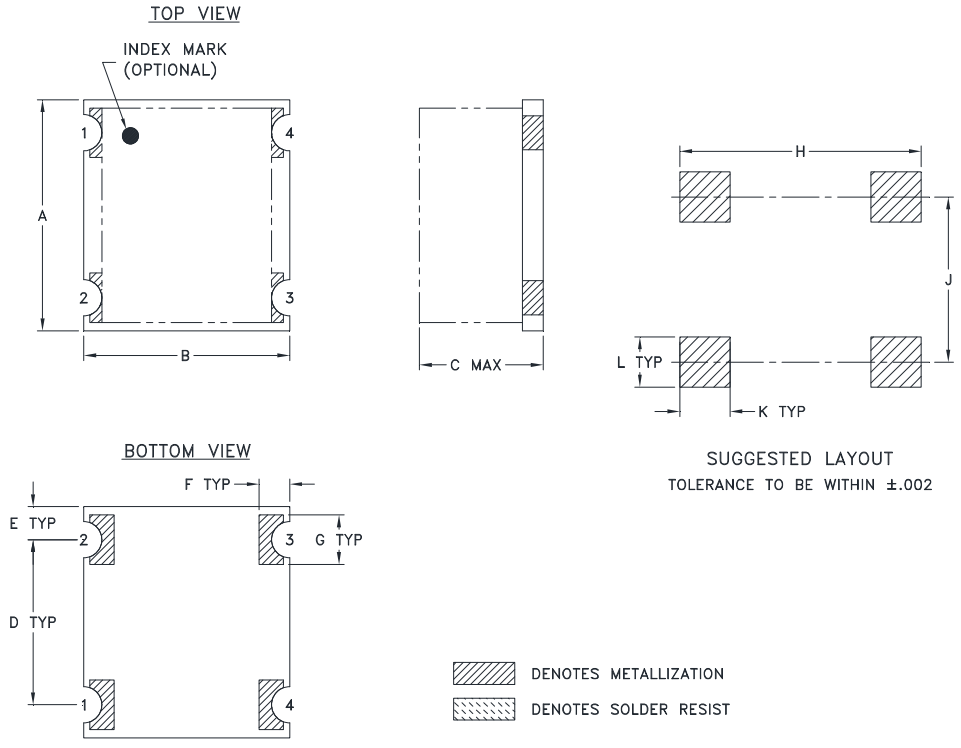



# Case Style TT1618-1

## Outline Dimensions

## PCB Land Pattern




| CASE # | A | B | C | D | E | F | G | H | J | K | L | WT GRAMS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TT1618-1 | .280 (7.11) | .250 (6.35) | .16 (4.06) | .200 (5.08) | .040 (1.02) | .037 (.94) | .060 (1.52) | .293 (7.44) | .200 (5.08) | .061 (1.55) | .061 (1.55) | 3.00 |

**Dimensions are in inches (mm). Tolerances: 2Pl. ± .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.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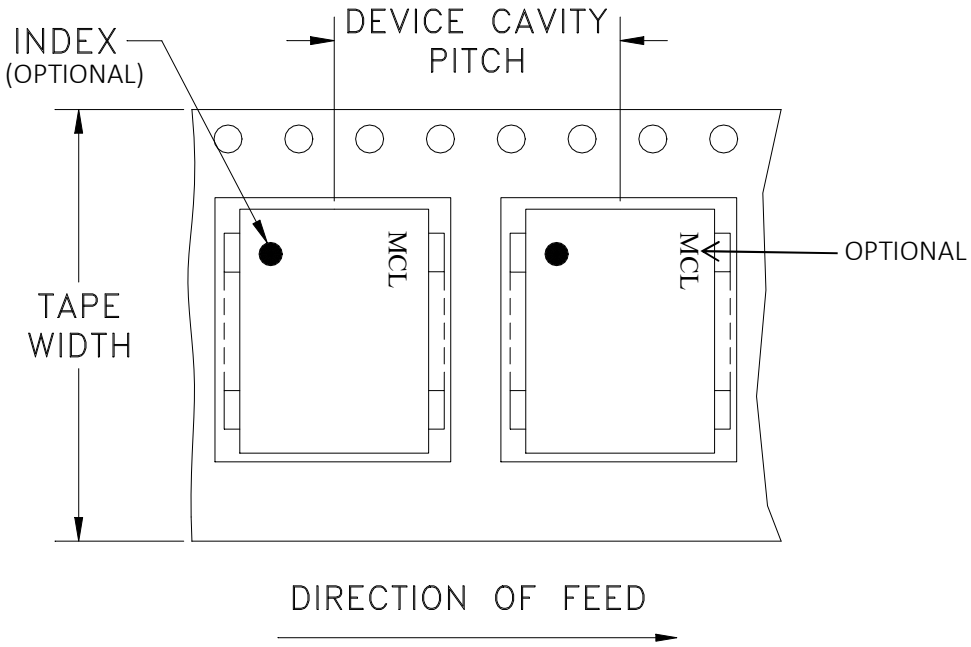
# Tape & Reel Packaging TR-F34

DEVICE ORIENTATION IN T&R




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note | |
|---|---|---|---|---|
| 16 | 12 | 7 | Small quantity standard (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | 13 | Standard | 500 |
| | | | | 1000 |

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

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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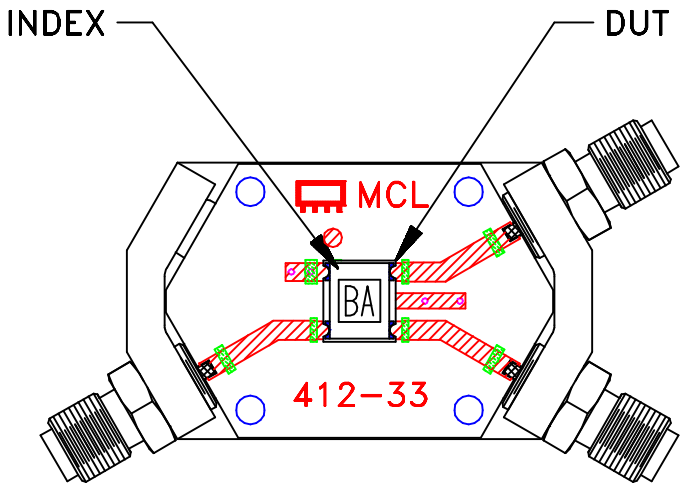
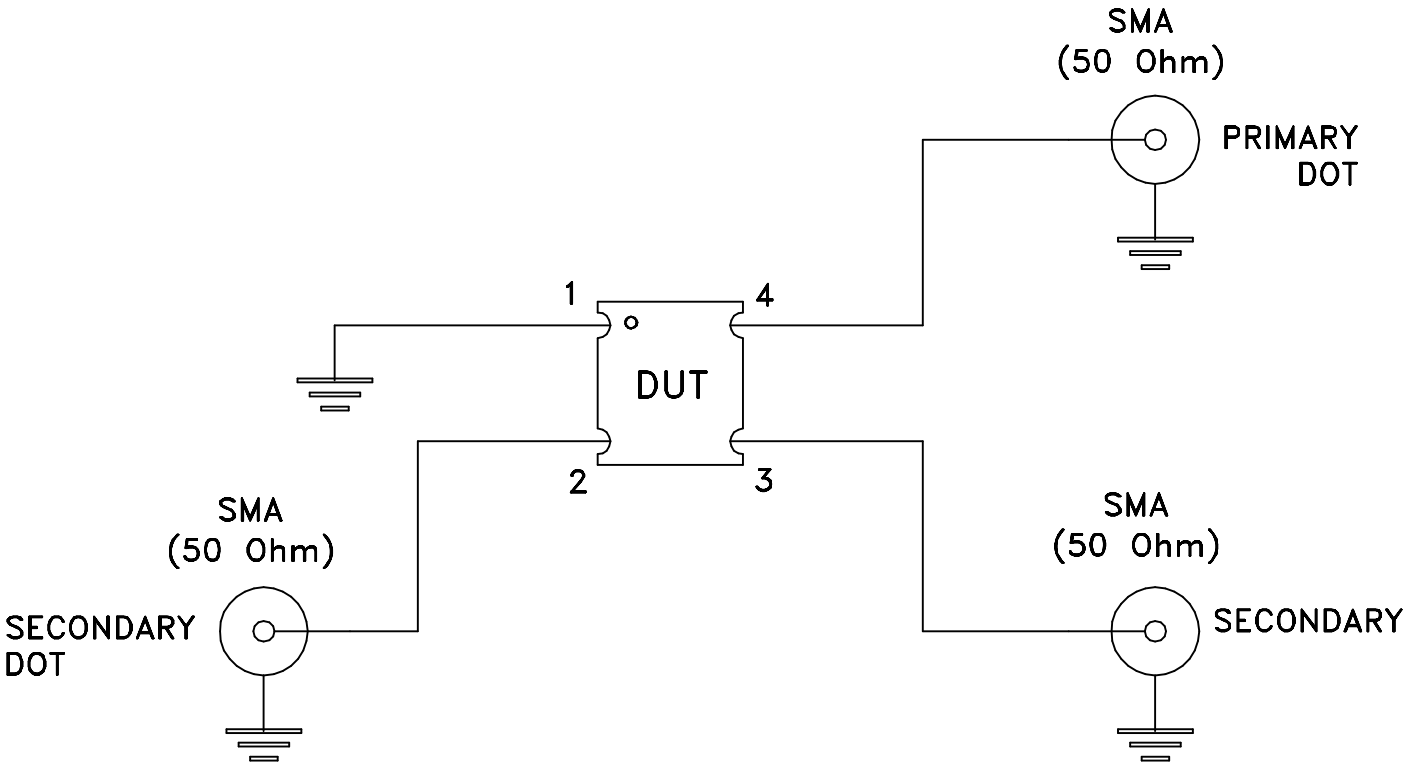
# Evaluation Board and Circuit




TB-789+




Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.5, Thickness=.030 inch.

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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<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>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<br>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;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |


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