*Engineering Development Model*

# RF Transformer TCM4-ED14833/2B

## Impedance Ratio : 4

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability.
At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.

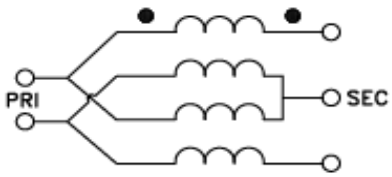
Please click "Back", and then click "Contact Us" for Applications support.

**CASE STYLE : DB1627**

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Min.** | **Typ.** | **Max.** | **Units** |
| **Frequency** | | 20 | | 4500 | MHz |
| **Insertion Loss** | **3 dB Bandwidth** | | 1.5 | | MHz |
| | **2 dB Bandwidth** | | -- | | MHz |
| | **1 dB Bandwidth** | | -- | | MHz |
| **Amplitude Unbalance** | **Over 3dB Bandwidth** | | 0.5 | | dB |
| | **Over 2dB Bandwidth** | | -- | | dB |
| | **Over 1dB Bandwidth** | | -- | | dB |
| **Phase Unbalance** | **Over 3dB Bandwidth** | | 5.0 | | deg. |
| | **Over 2dB Bandwidth** | | -- | | deg. |
| | **Over 1dB Bandwidth** | | -- | | deg. |

| MAXIMUM RATINGS | |
|---|---|
| **Operating Temperature** | -40°C to 85°C |
| **Storage Temperature** | -55°C to 100°C |
| **RF Power** | 0.4W |
| **DC Current** | 30mA |

**Config. H**




| PIN CONNECTIONS | |
|---|---|
| **PRIMARY DOT** | 3 |
| **PRIMARY** | 2 |
| **SECONDARY DOT** | 4 |
| **SECONDARY** | 6 |
| **GND** | 2,5 |
| **NOT USED** | 1 |

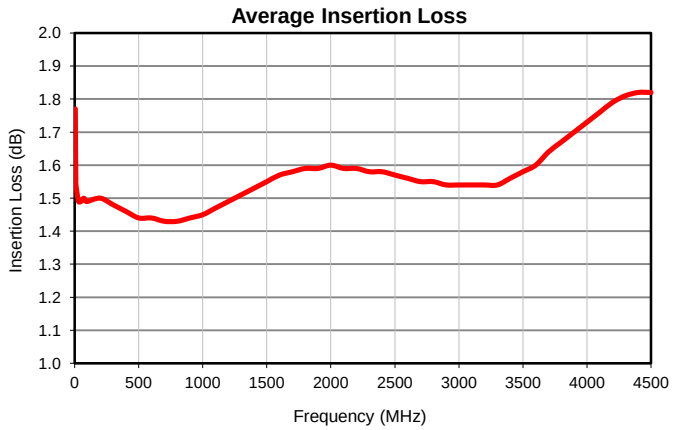
# RF Transformer TCM4-ED14833/2B

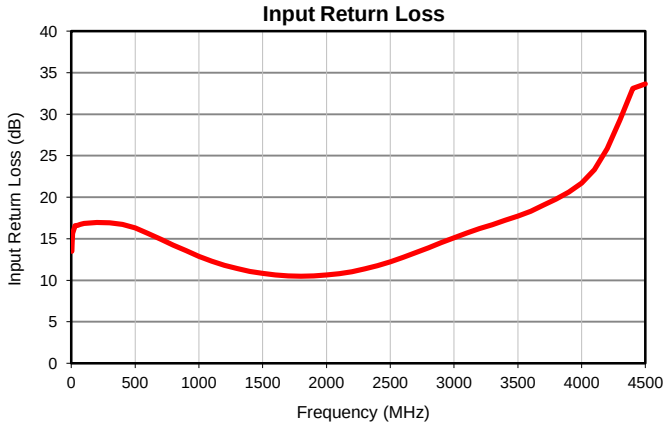
*Typical Performance Data*

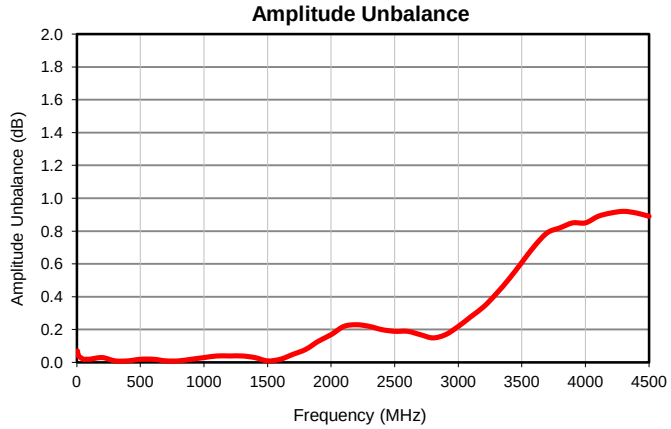
| FREQUENCY (MHz) | AVERAGE INSERTION LOSS (dB) | INPUT RETURN LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (deg.) |
|---|---|---|---|---|
| 5.0 | 1.77 | 13.47 | 0.07 | 0.08 |
| 7.0 | 1.63 | 14.63 | 0.05 | 0.06 |
| 9.0 | 1.56 | 15.34 | 0.05 | 0.07 |
| 10.0 | 1.54 | 15.59 | 0.04 | 0.06 |
| 30.0 | 1.49 | 16.57 | 0.03 | 0.22 |
| 50.0 | 1.49 | 16.62 | 0.02 | 0.36 |
| 70.0 | 1.50 | 16.73 | 0.02 | 0.49 |
| 90.0 | 1.49 | 16.79 | 0.02 | 0.62 |
| 100.0 | 1.49 | 16.83 | 0.02 | 0.65 |
| 200.0 | 1.50 | 16.95 | 0.03 | 1.21 |
| 300.0 | 1.48 | 16.92 | 0.01 | 1.77 |
| 400.0 | 1.46 | 16.72 | 0.01 | 2.30 |
| 500.0 | 1.44 | 16.30 | 0.02 | 2.83 |
| 600.0 | 1.44 | 15.66 | 0.02 | 3.24 |
| 700.0 | 1.43 | 14.95 | 0.01 | 3.64 |
| 800.0 | 1.43 | 14.23 | 0.01 | 4.04 |
| 900.0 | 1.44 | 13.55 | 0.02 | 4.45 |
| 1000.0 | 1.45 | 12.89 | 0.03 | 4.85 |
| 1100.0 | 1.47 | 12.30 | 0.04 | 5.20 |
| 1200.0 | 1.49 | 11.81 | 0.04 | 5.54 |
| 1300.0 | 1.51 | 11.40 | 0.04 | 5.75 |
| 1400.0 | 1.53 | 11.06 | 0.03 | 6.01 |
| 1500.0 | 1.55 | 10.82 | 0.01 | 6.26 |
| 1600.0 | 1.57 | 10.63 | 0.02 | 6.47 |
| 1700.0 | 1.58 | 10.52 | 0.05 | 6.64 |
| 1800.0 | 1.59 | 10.48 | 0.08 | 6.71 |
| 1900.0 | 1.59 | 10.53 | 0.13 | 6.71 |
| 2000.0 | 1.60 | 10.63 | 0.17 | 6.46 |
| 2100.0 | 1.59 | 10.80 | 0.22 | 6.21 |
| 2200.0 | 1.59 | 11.03 | 0.23 | 5.84 |
| 2300.0 | 1.58 | 11.37 | 0.22 | 5.67 |
| 2400.0 | 1.58 | 11.77 | 0.20 | 5.54 |
| 2500.0 | 1.57 | 12.23 | 0.19 | 5.36 |
| 2600.0 | 1.56 | 12.74 | 0.19 | 4.94 |
| 2700.0 | 1.55 | 13.32 | 0.17 | 4.76 |
| 2800.0 | 1.55 | 13.92 | 0.15 | 4.85 |
| 2900.0 | 1.54 | 14.52 | 0.17 | 4.91 |
| 3000.0 | 1.54 | 15.11 | 0.22 | 4.87 |
| 3100.0 | 1.54 | 15.69 | 0.28 | 4.67 |
| 3200.0 | 1.54 | 16.24 | 0.34 | 4.26 |
| 3300.0 | 1.54 | 16.69 | 0.42 | 3.85 |
| 3400.0 | 1.56 | 17.24 | 0.51 | 3.36 |
| 3500.0 | 1.58 | 17.73 | 0.61 | 2.79 |
| 3600.0 | 1.60 | 18.30 | 0.71 | 2.20 |
| 3700.0 | 1.64 | 19.02 | 0.79 | 1.55 |
| 3800.0 | 1.67 | 19.77 | 0.82 | 1.02 |
| 3900.0 | 1.70 | 20.62 | 0.85 | 0.42 |
| 4000.0 | 1.73 | 21.68 | 0.85 | 0.04 |
| 4100.0 | 1.76 | 23.33 | 0.89 | 0.20 |
| 4200.0 | 1.79 | 25.85 | 0.91 | 0.04 |
| 4300.0 | 1.81 | 29.34 | 0.92 | 0.15 |
| 4400.0 | 1.82 | 33.11 | 0.91 | 0.34 |
| 4500.0 | 1.82 | 33.66 | 0.89 | 0.58 |

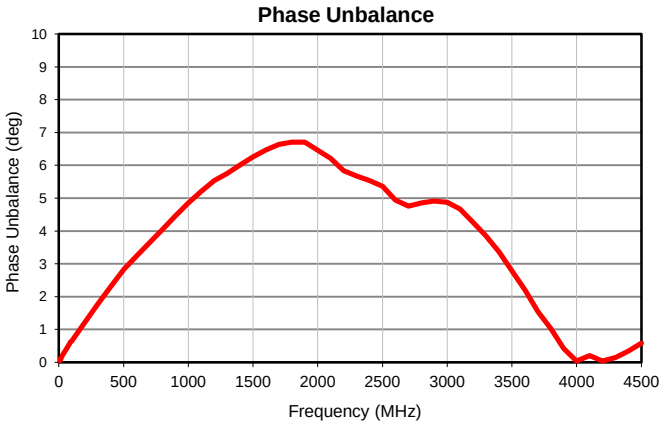
# RF Transformer TCM4-ED14833/2B

## *Typical Performance Data*



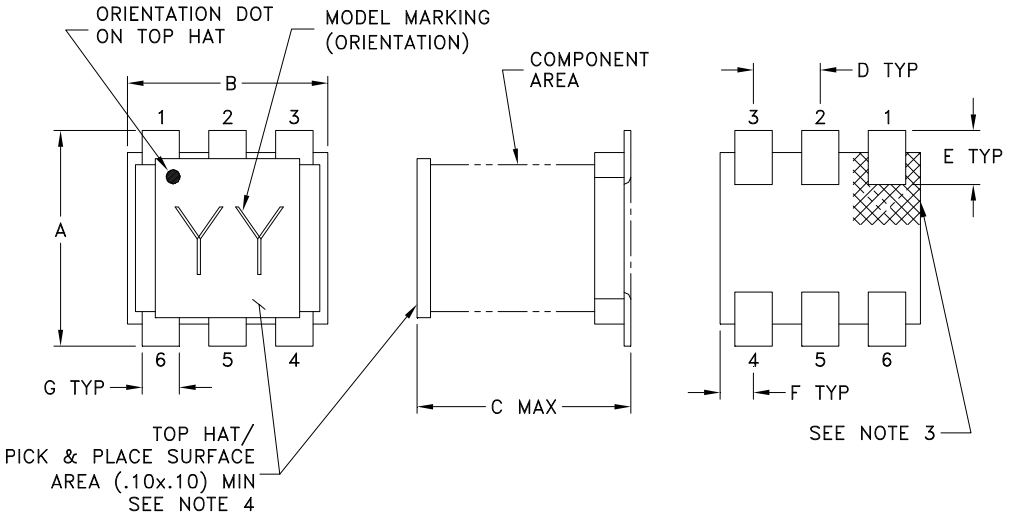



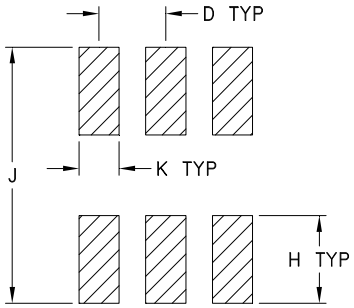
# Case Style DB

**DB1627**

## Outline Dimensions




## PCB Land Pattern




SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

| CASE # | A | B | C | D | E | F | G | H | J | K | WT. GRAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DB1627 | .160 (4.06) | .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; 3Pl. ± .005**

### Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.
3 Orientation dot on top hat & orientation feature on substrate correspondence to pin #1.
4 Top-Hat total thickness: .013 inches MAX.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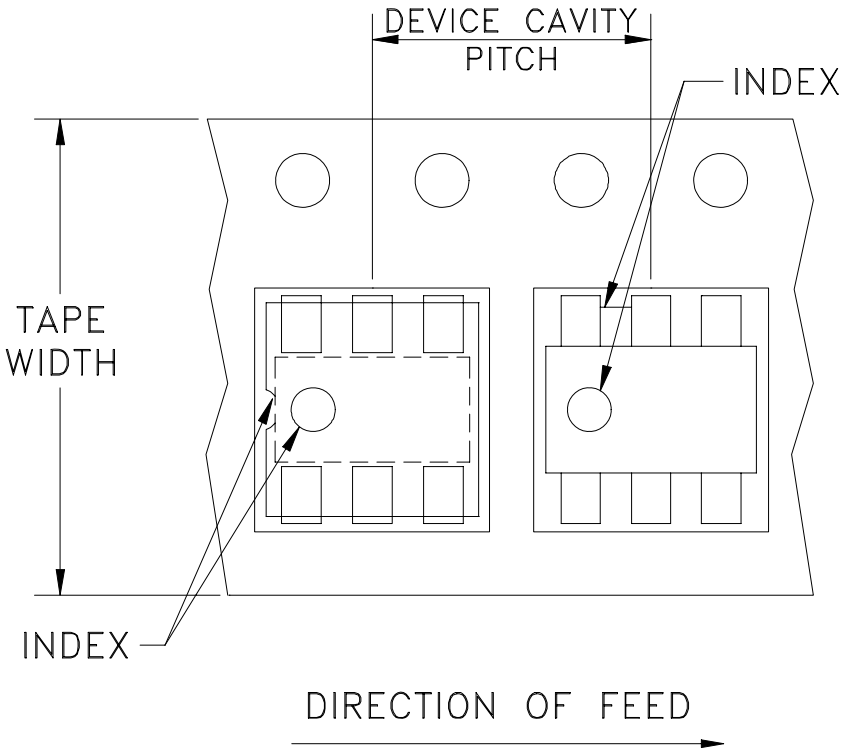
# Tape & Reel Packaging TR-F47

## DEVICE ORIENTATION IN T&R




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note |
|---|---|---|---|
| 12 | 8 | 13 | 1000, 2000 |
| | | 7 | 20, 50, 100, 200, 500 |

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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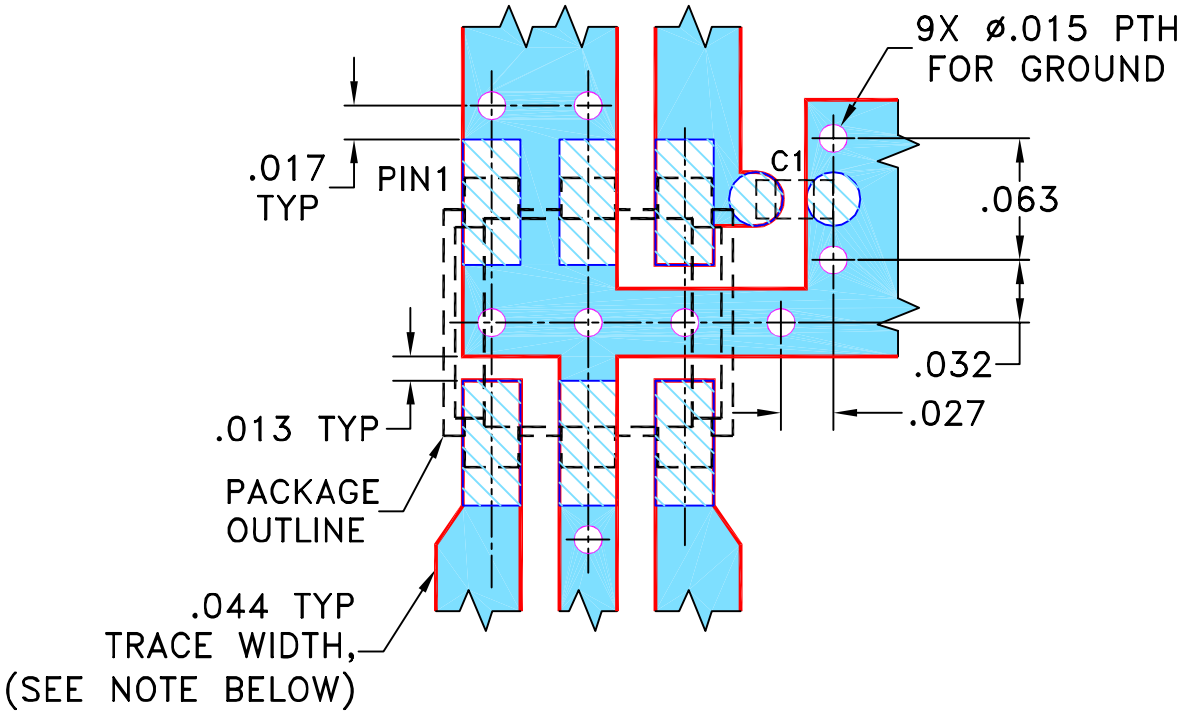
THIRD ANGLE PROJECTION

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| OR | M138571 | NEW RELEASE | 10/02/12 | GF | DJ |
| | | | | | |
| | | | | | |
| | | | | | |

# SUGGESTED MOUNTING CONFIGURATION FOR DB1627 CASE STYLE, "06TH02" PIN CONNECTION




NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. 0402 SIZE CHIP COMPONENT FOOTPRINT IS SHOWN FOR REFERENCE. FOR COMPONENT VALUE REFER TO TB-697+.

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 | GF | 09/28/12 |
| TOLERANCES ON: | CHECKED | IL | 10/02/12 |
| 2 PL DECIMALS ± | APPROVED | DJ | 10/02/12 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

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

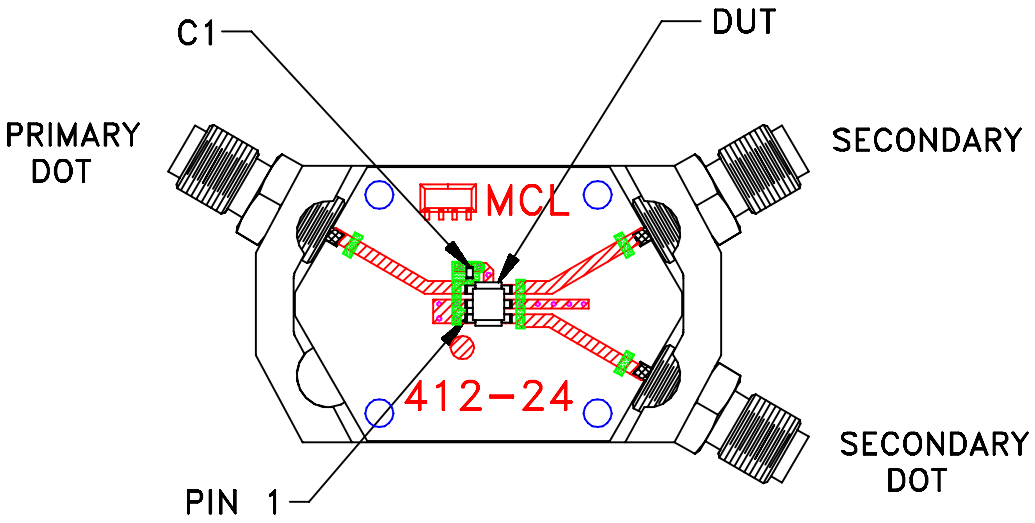
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 06TH02, DB1627, TB-697+

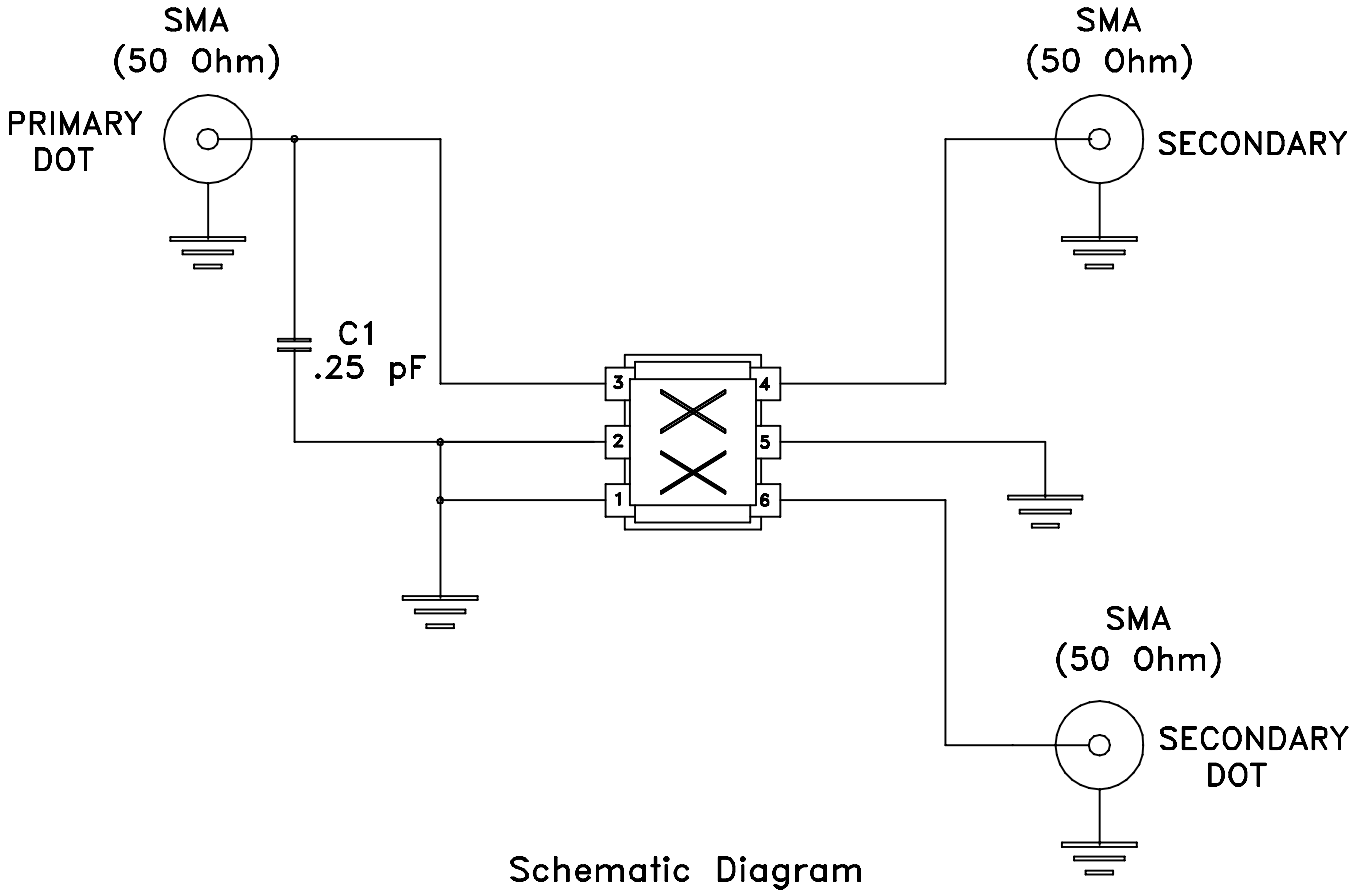
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-381 | OR |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL381 | 10:1 | 1 OF 1 |

# Evaluation Board and Circuit




TB-697+




Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 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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