

Surface Mount RF Transformer

50Ω

10 to 1900 MHz

TCM4-19+



Generic photo used for illustration purposes only

CASE STYLE: DB714

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Features

- wide bandwidth, 10 to 1900 MHz
- balanced transmission line with secondary center tap
- plastic base with solder plated leads
- aqueous washable

Applications

- PCS
- cellular

| Available Tape and Reel at no extra cost | |
|--|-----------------------|
| Reel Size | Devices/Reel |
| 7" | 20, 50, 100, 200, 500 |
| 13" | 1000, 2000 |

Electrical Specifications

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-------------------------------------|-----------------|------|------|------|------|
| Impedance Ratio (secondary/primary) | | | 4 | | Ohm |
| Frequency Range | | 10 | | 1900 | MHz |
| Insertion Loss* | 10 - 1900 | | 3 | | dB |
| | 20 - 1000 | | 2 | | |
| | 30 - 700 | | 1 | | |
| Phase Unbalance | 30 - 700 | | 4 | | Deg. |
| | 20 - 1000 | | 6 | | |
| Amplitude Unbalance | 30 - 700 | | 0.3 | | dB |
| | 20 - 1000 | | 0.5 | | |

* Insertion Loss is referenced to mid-band loss, 1.0 dB typ. Measure back to back

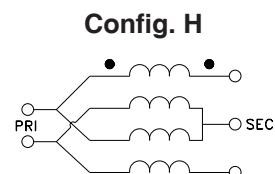
Maximum Ratings

| Parameter | Ratings |
|-----------------------|----------------|
| Operating Temperature | -20°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 0.25W |
| DC Current | 30mA |

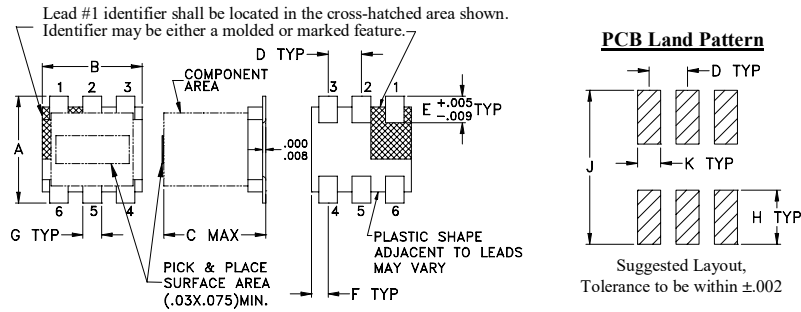
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

| Function | Pin Number |
|---------------|------------|
| PRIMARY DOT | 6 |
| PRIMARY | 4 |
| SECONDARY DOT | 3 |
| SECONDARY | 1 |
| SECONDARY CT | 2 |
| NOT USED | 5 |



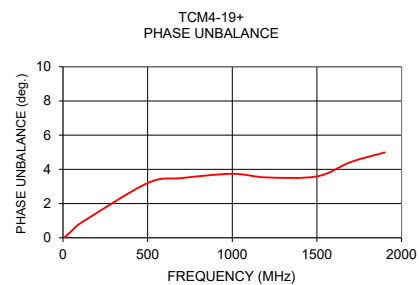
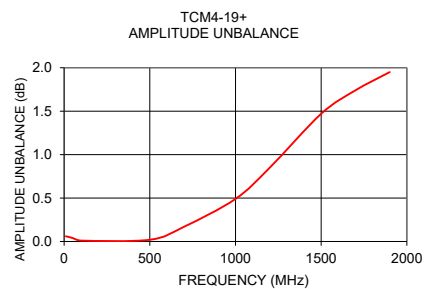
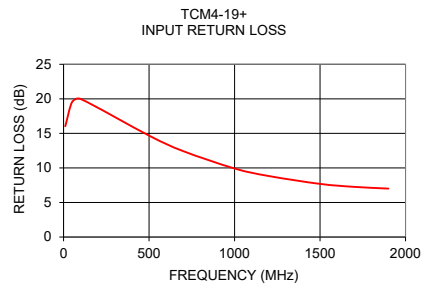
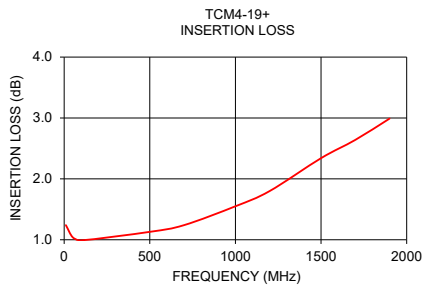
Outline Drawing



Outline Dimensions (Inch/mm)

| | | | | | |
|------|------|------|------|-------|------|
| A | B | C | D | E | F |
| .160 | .150 | .160 | .050 | .040 | .025 |
| 4.06 | 3.81 | 4.06 | 1.27 | 1.02 | 0.64 |
| G | H | J | K | wt | |
| .028 | .065 | .190 | .030 | grams | |
| 0.71 | 1.65 | 4.83 | 0.76 | 0.15 | |

| Frequency (MHz) | Insertion Loss (dB) | Input R. Loss (dB) | Amplitude Unbalance (dB) | Phase Unbalance (Deg.) |
|-----------------|---------------------|--------------------|--------------------------|------------------------|
| 10 | 1.24 | 16.03 | 0.06 | 0.03 |
| 50 | 1.04 | 19.54 | 0.04 | 0.39 |
| 100 | 0.99 | 19.98 | 0.01 | 0.83 |
| 500 | 1.13 | 14.68 | 0.02 | 3.20 |
| 700 | 1.24 | 12.43 | 0.17 | 3.49 |
| 1000 | 1.55 | 9.92 | 0.49 | 3.74 |
| 1200 | 1.80 | 8.83 | 0.85 | 3.53 |
| 1500 | 2.34 | 7.69 | 1.47 | 3.59 |
| 1700 | 2.64 | 7.26 | 1.74 | 4.43 |
| 1900 | 2.99 | 7.01 | 1.95 | 4.99 |



Additional Notes

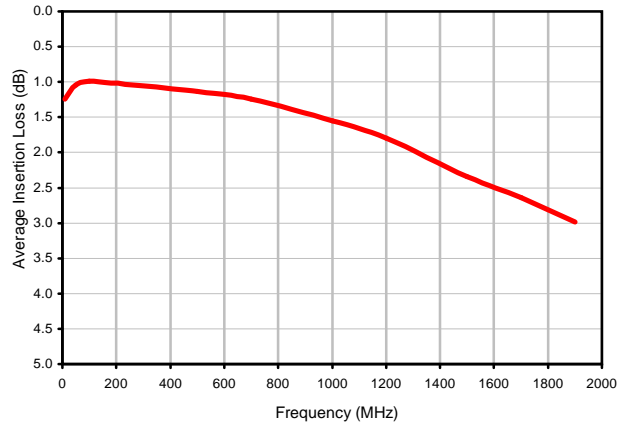
- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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/MCLStore/terms.jsp

Typical Performance Data

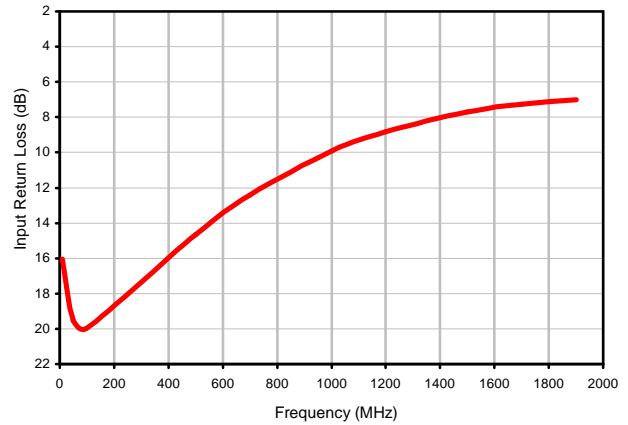
| FREQUENCY (MHz) | AVERAGE INSERTION LOSS (dB) | INPUT RETURN LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (deg) |
|--------------------|--------------------------------------|---------------------------------|--------------------------------|-----------------------------|
| 10 | 1.24 | 16.03 | 0.06 | 0.03 |
| 50 | 1.04 | 19.54 | 0.04 | 0.39 |
| 100 | 0.99 | 19.98 | 0.01 | 0.83 |
| 500 | 1.13 | 14.68 | 0.02 | 3.20 |
| 700 | 1.24 | 12.43 | 0.17 | 3.49 |
| 1000 | 1.55 | 9.92 | 0.49 | 3.74 |
| 1200 | 1.80 | 8.83 | 0.85 | 3.53 |
| 1500 | 2.34 | 7.69 | 1.47 | 3.59 |
| 1700 | 2.64 | 7.26 | 1.74 | 4.43 |
| 1900 | 2.99 | 7.01 | 1.95 | 4.99 |

Typical Performance Curves

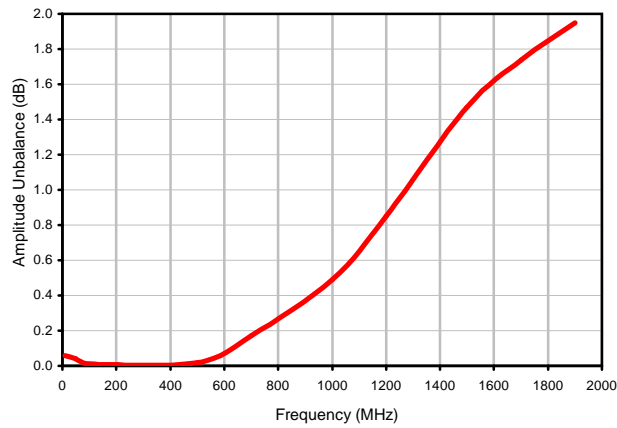
Average Insertion Loss



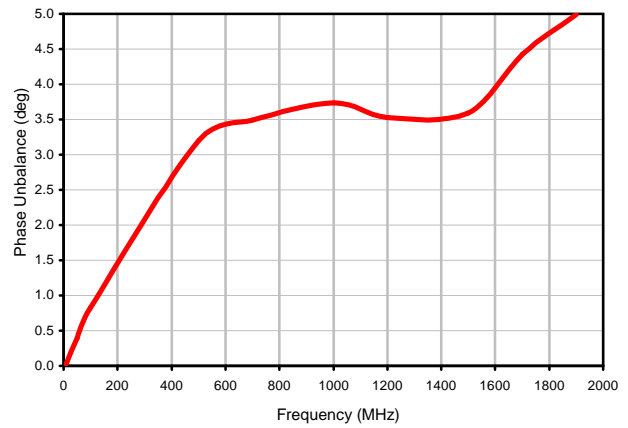
Input Return Loss



Amplitude Unbalance

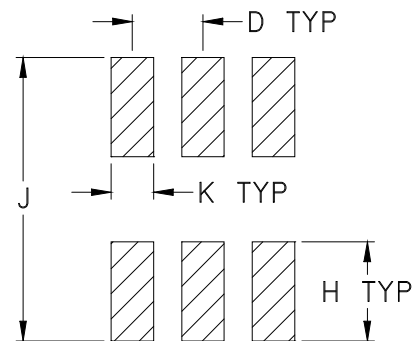
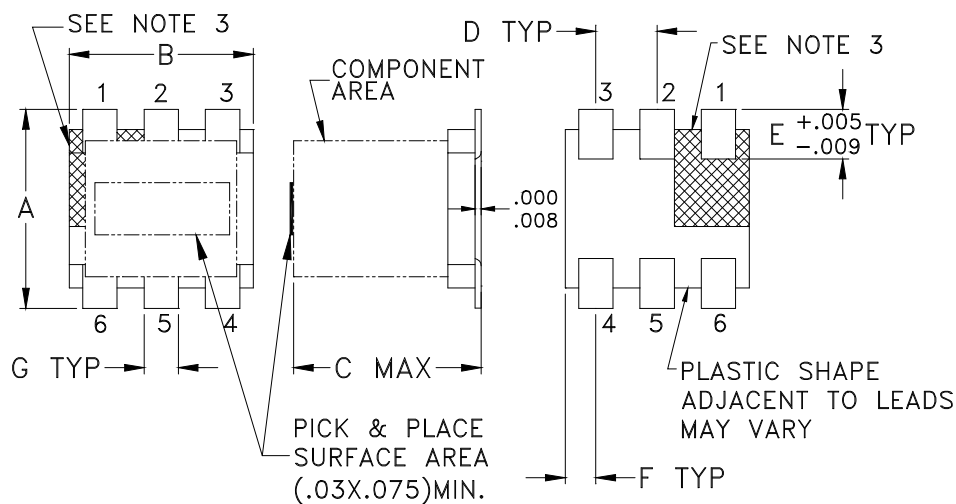


Phase Unbalance



Outline Dimensions

PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

| CASE # | A | B | C | D | E | F | G | H | J | K | WT. GRAM |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| DB714 | .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 |

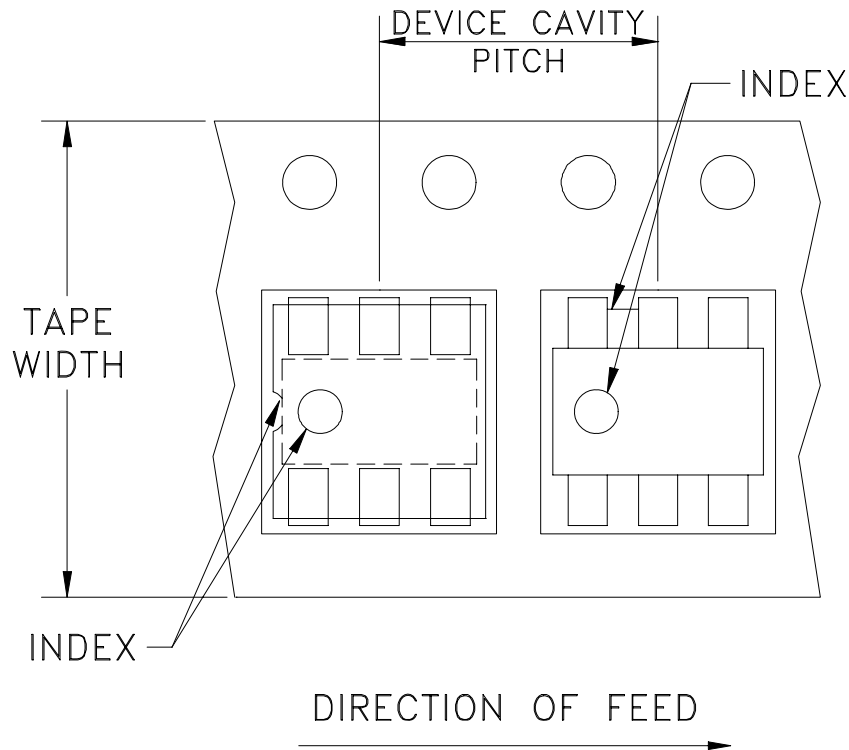
Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3Pl. $\pm .005$

Notes:

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

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

Mini-Circuits[®]

INTERNET <http://www.minicircuits.com>

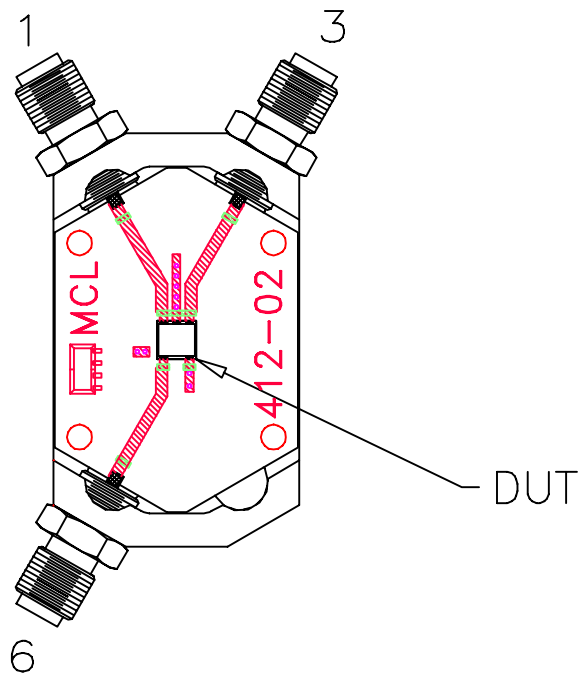
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

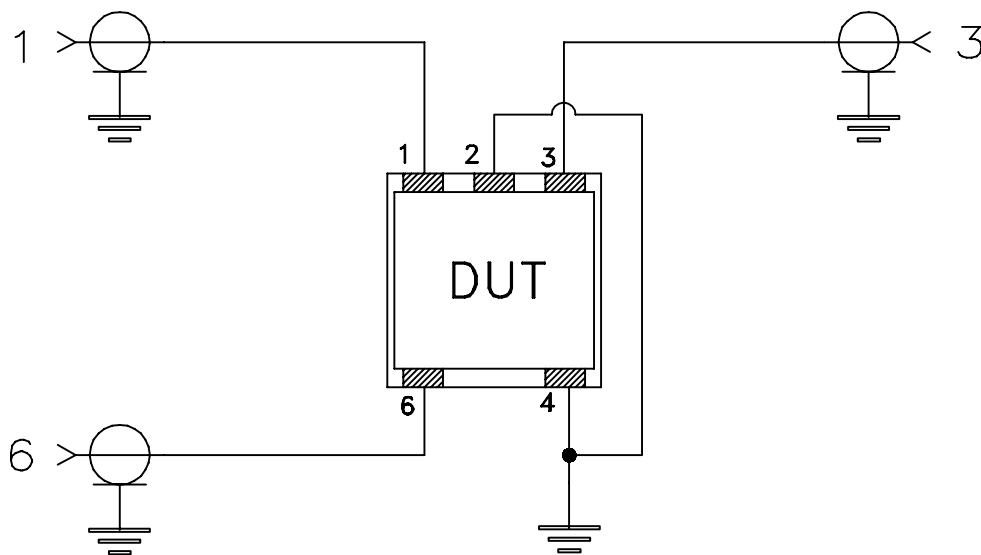
Mini-Circuits ISO 9001 & ISO 14001 Certified

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, Dielectric Constant=3.5, Thickness=.020"

 **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 | -20° 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 |