SURFACE MOUNT

# Directional Coupler

# TCD-18-4-75+

75Ω 10 to 1000 MHz

## FEATURES

- Wideband, 10 to 1000 MHz
- Low mainline loss, 0.7 dB typ.
- Aqueous washable
- Leads for excellent solderability
- Protected by US Patent 6,140,887



*Generic photo used for illustration purposes only*

CASE STYLE: DB714

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

## APPLICATIONS

- VHF/UHF
- CATV
- Cellular

## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Frequency Range | — | 10 | — | 1000 | MHz |
| Mainline Loss[1] | 10-100 | — | 0.9 | 1.3 | dB |
| | 100-500 | — | 0.7 | 1.2 | |
| | 500-1000 | — | 0.8 | 1.3 | |
| Coupling | 10-1000 | — | 18.0±0.5 | — | dB |
| Coupling Flatness (±) | 10-1000 | — | ±0.9 | — | dB |
| Directivity | 10-100 | 15 | 20 | — | dB |
| | 100-500 | 15 | 22 | — | |
| | 500-1000 | — | 18 | — | |
| VSWR | 10-1000 | — | 1.20 | — | :1 |
| Input Power | 10-1000 | — | — | 1.0 | W |
| | 100-1000 | — | — | 1.0 | |

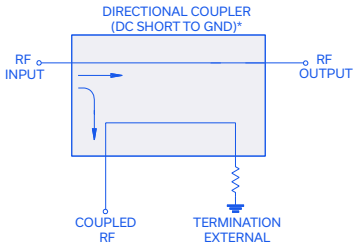
1. Mainline loss includes theoretical power loss at coupled port.

## MAXIMUM RATINGS

| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to 85°C* |
| Storage Temperature | -55°C to 100°C |

Permanent damage may occur if any of these limits are exceeded.
* Case temperature is defined as temperature on ground leads.

## ELECTRICAL SCHEMATIC




*Electrical schematic is for Directional coupler with internal transformer(s) and external termination

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# Directional Coupler

# TCD-18-4-75+

75Ω 10 to 1000 MHz

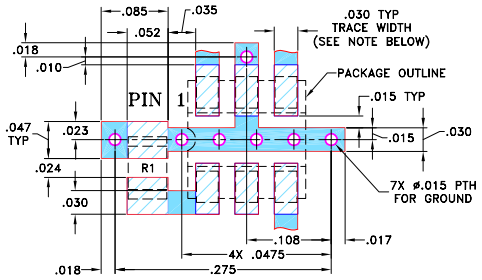
## PIN CONNECTIONS

| | |
|---|---|
| INPUT | 3 |
| OUTPUT | 4 |
| COUPLED | 1 |
| GROUND | 2 |
| 75Ω TERM EXTERNAL | 6 |
| NOT USED | 5 |

## PRODUCT MARKING: N/A

## DEMO BOARD MCL P/N: TB-72

## SUGGESTED PCB LAYOUT (PL-010)




RESISTOR R1: 75 ± 1% Ohm, 0805 SIZE

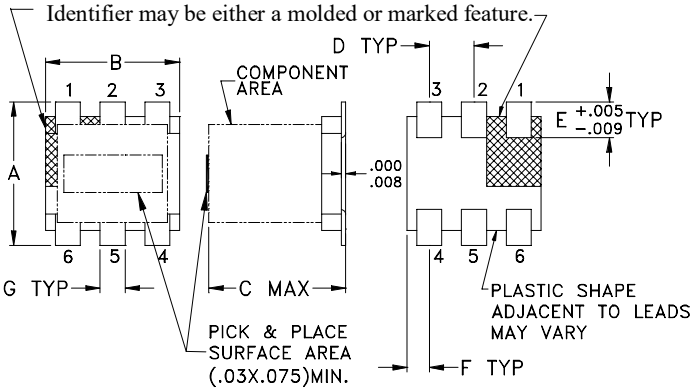
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

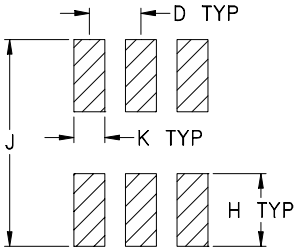
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## OUTLINE DRAWING

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




## PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.002

## OUTLINE DIMENSIONS (Inches / 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 |

## TAPE & REEL INFORMATION: F47

SURFACE MOUNT

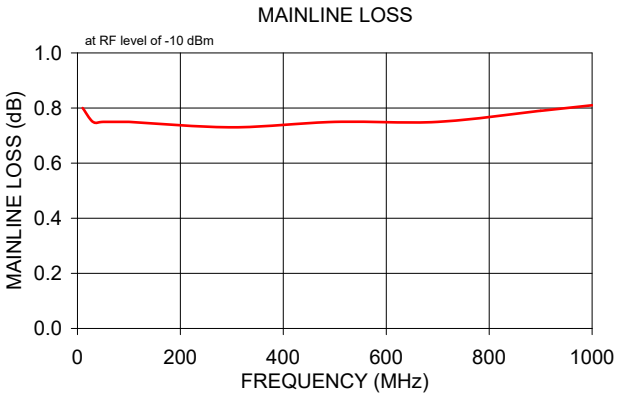
# Directional Coupler

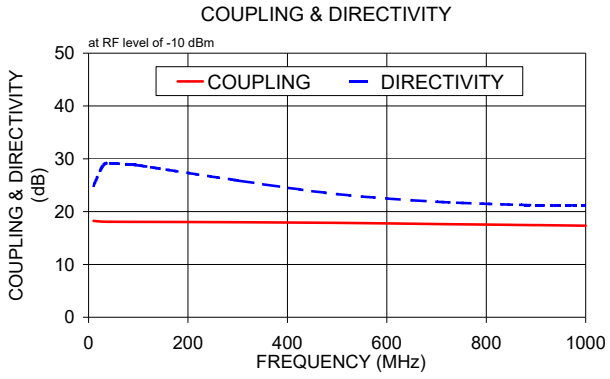
# TCD-18-4-75+

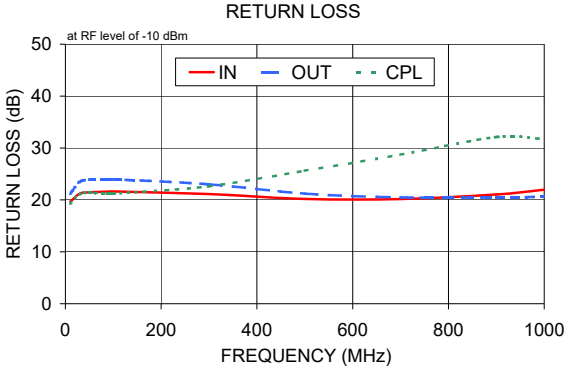
75Ω 10 to 1000 MHz

## TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) In | Out | Cpl |
|---|---|---|---|---|---|---|
| 10.00 | 0.80 | 18.25 | 24.89 | 19.65 | 21.19 | 19.31 |
| 30.00 | 0.75 | 18.09 | 28.81 | 21.21 | 23.47 | 21.05 |
| 50.00 | 0.75 | 18.07 | 29.10 | 21.46 | 23.88 | 21.36 |
| 90.00 | 0.75 | 18.05 | 28.90 | 21.60 | 23.98 | 21.20 |
| 100.00 | 0.75 | 18.05 | 28.77 | 21.62 | 23.96 | 21.20 |
| 300.00 | 0.73 | 18.00 | 25.91 | 21.12 | 23.00 | 22.63 |
| 500.00 | 0.75 | 17.87 | 23.32 | 20.19 | 21.20 | 25.64 |
| 700.00 | 0.75 | 17.64 | 21.87 | 20.17 | 20.48 | 28.73 |
| 900.00 | 0.79 | 17.44 | 21.22 | 21.04 | 20.47 | 32.11 |
| 1000.00 | 0.81 | 17.34 | 21.19 | 21.96 | 20.60 | 31.73 |




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.

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

# Directional Coupler TCD-18-4-75+

## *Typical Performance Data*

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = +25°C

| FREQUENCY (MHz) | INSERTION LOSS (dB) | COUPLING LOSS (dB) | DIRECTIVITY (dB) | RETURN LOSS (dB) | | |
|---|---|---|---|---|---|---|
| | | | | IN | OUT | CPL |
| 10 | 0.75 | 17.89 | 32.71 | 21.43 | 23.65 | 21.29 |
| 15 | 0.75 | 17.89 | 32.47 | 21.61 | 23.96 | 21.50 |
| 20 | 0.75 | 17.89 | 32.10 | 21.71 | 24.13 | 21.62 |
| 25 | 0.76 | 17.90 | 31.62 | 21.74 | 24.16 | 21.66 |
| 50 | 0.77 | 17.93 | 31.66 | 21.84 | 24.20 | 21.73 |
| 75 | 0.78 | 17.94 | 31.61 | 21.89 | 24.29 | 21.83 |
| 100 | 0.79 | 17.95 | 31.43 | 21.88 | 24.39 | 21.96 |
| 125 | 0.79 | 17.96 | 31.94 | 21.97 | 24.46 | 22.07 |
| 150 | 0.80 | 17.96 | 31.87 | 21.86 | 24.47 | 22.22 |
| 175 | 0.80 | 17.97 | 31.83 | 21.92 | 24.50 | 22.42 |
| 200 | 0.80 | 17.97 | 31.58 | 21.91 | 24.47 | 22.62 |
| 250 | 0.81 | 17.97 | 31.01 | 21.81 | 24.34 | 23.02 |
| 300 | 0.81 | 17.98 | 30.62 | 21.56 | 24.08 | 23.48 |
| 350 | 0.82 | 17.98 | 29.03 | 21.33 | 23.79 | 24.02 |
| 400 | 0.83 | 17.97 | 27.95 | 21.25 | 23.52 | 24.53 |
| 425 | 0.83 | 17.98 | 27.16 | 21.09 | 23.34 | 24.83 |
| 450 | 0.83 | 17.98 | 26.36 | 21.28 | 23.24 | 25.10 |
| 475 | 0.84 | 17.97 | 26.06 | 21.04 | 23.12 | 25.40 |
| 500 | 0.85 | 17.98 | 24.81 | 21.08 | 23.03 | 25.66 |
| 550 | 0.86 | 17.97 | 23.54 | 20.86 | 22.80 | 26.17 |
| 575 | 0.87 | 17.97 | 23.45 | 21.10 | 22.79 | 26.34 |
| 600 | 0.88 | 17.99 | 22.23 | 21.01 | 22.74 | 26.54 |
| 650 | 0.89 | 17.99 | 21.34 | 21.39 | 22.76 | 26.73 |
| 700 | 0.91 | 17.99 | 20.63 | 21.60 | 22.86 | 26.76 |
| 750 | 0.92 | 17.99 | 19.98 | 21.60 | 23.03 | 26.61 |
| 800 | 0.94 | 18.00 | 19.30 | 22.26 | 23.38 | 26.35 |
| 850 | 0.94 | 18.00 | 18.59 | 23.16 | 23.84 | 25.93 |
| 900 | 0.95 | 18.01 | 17.93 | 23.92 | 24.49 | 25.47 |
| 950 | 0.96 | 18.00 | 17.48 | 24.37 | 25.13 | 25.00 |
| 975 | 0.96 | 17.98 | 17.61 | 25.31 | 25.67 | 24.82 |
| 1000 | 0.97 | 17.98 | 17.49 | 25.47 | 26.09 | 24.60 |
| 1050 | 0.98 | 17.97 | 17.30 | 26.66 | 27.17 | 24.20 |
| 1075 | 0.97 | 17.98 | 16.49 | 27.36 | 27.69 | 24.04 |
| 1100 | 0.98 | 17.98 | 16.71 | 28.47 | 28.32 | 23.88 |
| 1200 | 1.00 | 17.90 | 15.70 | 30.76 | 31.60 | 23.45 |
| 1300 | 1.04 | 17.86 | 14.04 | 33.42 | 34.78 | 23.25 |
| 1400 | 1.08 | 17.73 | 12.30 | 34.52 | 34.76 | 23.40 |
| 1500 | 1.13 | 17.51 | 11.11 | 31.04 | 31.78 | 23.56 |
| 1600 | 1.16 | 17.28 | 9.26 | 31.21 | 30.17 | 23.88 |
| 1700 | 1.18 | 17.05 | 8.41 | 29.19 | 28.65 | 23.99 |
| 1800 | 1.19 | 16.87 | 7.47 | 30.63 | 28.35 | 23.97 |
| 1900 | 1.24 | 16.71 | 7.19 | 29.80 | 28.30 | 23.54 |
| 2000 | 1.28 | 16.65 | 6.98 | 31.57 | 29.13 | 22.77 |
| 2100 | 1.37 | 16.57 | 7.24 | 31.76 | 30.18 | 21.82 |
| 2200 | 1.44 | 16.51 | 8.07 | 33.89 | 31.84 | 20.57 |
| 2300 | 1.53 | 16.42 | 8.61 | 31.74 | 32.54 | 19.54 |
| 2400 | 1.61 | 16.32 | 8.72 | 30.54 | 33.47 | 18.45 |
| 2500 | 1.72 | 16.09 | 7.94 | 27.42 | 32.46 | 17.52 |
| 2600 | 1.81 | 15.85 | 7.17 | 26.45 | 33.04 | 16.81 |
| 2700 | 1.96 | 15.34 | 5.27 | 25.89 | 33.75 | 16.35 |
| 2800 | 2.11 | 14.90 | 4.59 | 25.99 | 36.20 | 16.01 |
| 2900 | 2.23 | 14.80 | 4.03 | 25.87 | 36.98 | 15.93 |
| 3000 | 2.31 | 14.87 | 3.29 | 25.26 | 39.22 | 16.14 |



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# Directional Coupler TCD-18-4-75+

## *Typical Performance Data*

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = -40°C

| FREQUENCY (MHz) | INSERTION LOSS (dB) | COUPLING LOSS (dB) | DIRECTIVITY (dB) | RETURN LOSS (dB) | | |
|---|---|---|---|---|---|---|
| | | | | IN | OUT | CPL |
| 10 | 0.76 | 17.64 | 26.91 | 19.83 | 20.93 | 19.64 |
| 15 | 0.70 | 17.55 | 31.10 | 21.53 | 22.87 | 21.39 |
| 20 | 0.65 | 17.50 | 34.73 | 22.81 | 24.30 | 22.71 |
| 25 | 0.64 | 17.49 | 37.81 | 23.66 | 25.20 | 23.61 |
| 50 | 0.61 | 17.50 | 42.81 | 26.25 | 27.01 | 26.07 |
| 75 | 0.60 | 17.51 | 40.30 | 26.51 | 27.91 | 26.26 |
| 100 | 0.60 | 17.51 | 38.31 | 25.20 | 28.53 | 25.04 |
| 125 | 0.61 | 17.52 | 34.97 | 24.40 | 28.83 | 24.53 |
| 150 | 0.61 | 17.51 | 33.96 | 24.32 | 28.79 | 25.14 |
| 175 | 0.61 | 17.52 | 32.28 | 24.98 | 28.68 | 26.11 |
| 200 | 0.62 | 17.52 | 31.31 | 24.87 | 28.44 | 25.93 |
| 250 | 0.63 | 17.51 | 29.14 | 23.03 | 27.48 | 24.45 |
| 300 | 0.64 | 17.51 | 27.87 | 22.66 | 26.12 | 25.03 |
| 350 | 0.64 | 17.51 | 26.45 | 21.83 | 24.85 | 24.70 |
| 400 | 0.65 | 17.49 | 25.47 | 21.12 | 23.78 | 24.59 |
| 425 | 0.66 | 17.49 | 24.83 | 20.86 | 23.29 | 24.63 |
| 450 | 0.66 | 17.49 | 24.33 | 20.88 | 22.95 | 24.46 |
| 475 | 0.67 | 17.48 | 24.00 | 20.32 | 22.59 | 24.33 |
| 500 | 0.67 | 17.49 | 23.01 | 20.13 | 22.31 | 24.44 |
| 550 | 0.68 | 17.47 | 22.35 | 19.75 | 21.88 | 24.57 |
| 575 | 0.69 | 17.46 | 22.28 | 19.80 | 21.77 | 24.16 |
| 600 | 0.70 | 17.47 | 21.34 | 19.55 | 21.62 | 23.83 |
| 650 | 0.71 | 17.47 | 20.72 | 19.96 | 21.48 | 23.91 |
| 700 | 0.73 | 17.44 | 20.51 | 20.11 | 21.46 | 23.57 |
| 750 | 0.74 | 17.41 | 20.13 | 20.29 | 21.53 | 23.16 |
| 800 | 0.74 | 17.40 | 19.72 | 21.79 | 21.91 | 23.24 |
| 850 | 0.75 | 17.37 | 19.34 | 22.99 | 22.55 | 22.83 |
| 900 | 0.76 | 17.35 | 19.05 | 24.70 | 23.57 | 22.89 |
| 950 | 0.77 | 17.32 | 19.12 | 26.79 | 24.83 | 22.85 |
| 975 | 0.78 | 17.28 | 20.36 | 29.51 | 25.97 | 22.81 |
| 1000 | 0.78 | 17.31 | 19.31 | 29.75 | 26.42 | 22.77 |
| 1050 | 0.78 | 17.26 | 20.02 | 35.27 | 28.85 | 23.01 |
| 1075 | 0.78 | 17.26 | 19.19 | 38.43 | 30.02 | 23.02 |
| 1100 | 0.78 | 17.23 | 19.94 | 37.26 | 31.72 | 23.23 |
| 1200 | 0.81 | 17.15 | 19.23 | 28.60 | 36.59 | 25.41 |
| 1300 | 0.87 | 17.11 | 16.95 | 23.46 | 30.79 | 29.50 |
| 1400 | 0.92 | 16.99 | 14.29 | 22.93 | 27.93 | 32.92 |
| 1500 | 0.96 | 16.78 | 12.54 | 22.66 | 26.52 | 29.80 |
| 1600 | 0.98 | 16.54 | 10.35 | 26.60 | 26.50 | 24.06 |
| 1700 | 0.97 | 16.32 | 9.30 | 30.32 | 26.31 | 20.03 |
| 1800 | 0.97 | 16.15 | 8.27 | 29.98 | 26.07 | 18.16 |
| 1900 | 1.03 | 15.99 | 8.00 | 25.19 | 25.86 | 17.11 |
| 2000 | 1.11 | 15.96 | 8.05 | 20.30 | 25.89 | 17.56 |
| 2100 | 1.20 | 15.93 | 8.32 | 19.36 | 27.18 | 19.55 |
| 2200 | 1.29 | 15.90 | 9.52 | 17.91 | 28.65 | 21.03 |
| 2300 | 1.34 | 15.84 | 10.15 | 17.93 | 28.15 | 28.91 |
| 2400 | 1.43 | 15.75 | 10.05 | 16.77 | 26.08 | 26.98 |
| 2500 | 1.59 | 15.51 | 8.62 | 17.03 | 24.30 | 19.95 |
| 2600 | 1.73 | 15.23 | 7.50 | 16.11 | 24.72 | 15.08 |
| 2700 | 1.85 | 14.73 | 5.36 | 15.83 | 27.01 | 12.59 |
| 2800 | 1.96 | 14.31 | 4.38 | 15.20 | 33.34 | 11.06 |
| 2900 | 2.03 | 14.22 | 3.98 | 14.67 | 39.08 | 10.24 |
| 3000 | 2.11 | 14.42 | 3.20 | 14.85 | 29.73 | 9.97 |



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# Directional Coupler TCD-18-4-75+

## *Typical Performance Data*

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = +85°C

| FREQUENCY (MHz) | INSERTION LOSS (dB) | COUPLING LOSS (dB) | DIRECTIVITY (dB) | RETURN LOSS (dB) | | |
|---|---|---|---|---|---|---|
| | | | | IN | OUT | CPL |
| 10 | 1.00 | 18.37 | 25.82 | 19.40 | 21.26 | 19.27 |
| 15 | 1.01 | 18.38 | 26.04 | 19.38 | 21.37 | 19.27 |
| 20 | 1.01 | 18.39 | 26.19 | 19.31 | 21.43 | 19.21 |
| 25 | 1.02 | 18.39 | 26.26 | 19.19 | 21.44 | 19.10 |
| 50 | 1.03 | 18.40 | 26.40 | 18.69 | 21.43 | 18.57 |
| 75 | 1.04 | 18.42 | 26.74 | 18.66 | 21.45 | 18.64 |
| 100 | 1.04 | 18.43 | 27.24 | 19.21 | 21.45 | 19.32 |
| 125 | 1.04 | 18.43 | 28.15 | 19.97 | 21.49 | 20.00 |
| 150 | 1.04 | 18.43 | 28.87 | 19.99 | 21.60 | 20.15 |
| 175 | 1.03 | 18.43 | 30.34 | 19.83 | 21.76 | 20.04 |
| 200 | 1.03 | 18.43 | 31.15 | 19.76 | 21.90 | 20.28 |
| 250 | 1.03 | 18.44 | 33.01 | 20.59 | 22.14 | 21.63 |
| 300 | 1.04 | 18.46 | 35.24 | 20.72 | 22.43 | 22.20 |
| 350 | 1.04 | 18.48 | 34.32 | 20.61 | 22.69 | 23.00 |
| 400 | 1.05 | 18.50 | 31.71 | 21.27 | 22.98 | 24.35 |
| 425 | 1.05 | 18.52 | 30.14 | 21.30 | 23.06 | 24.83 |
| 450 | 1.06 | 18.54 | 28.51 | 21.63 | 23.22 | 25.30 |
| 475 | 1.06 | 18.55 | 27.51 | 21.38 | 23.28 | 25.75 |
| 500 | 1.07 | 18.58 | 25.57 | 21.58 | 23.38 | 26.37 |
| 550 | 1.08 | 18.61 | 23.77 | 21.66 | 23.46 | 27.71 |
| 575 | 1.08 | 18.63 | 23.21 | 22.07 | 23.59 | 28.23 |
| 600 | 1.09 | 18.66 | 21.60 | 21.84 | 23.59 | 28.55 |
| 650 | 1.10 | 18.71 | 20.26 | 22.02 | 23.65 | 29.16 |
| 700 | 1.11 | 18.75 | 19.20 | 22.06 | 23.67 | 29.66 |
| 750 | 1.12 | 18.77 | 18.19 | 21.66 | 23.65 | 29.47 |
| 800 | 1.13 | 18.81 | 17.35 | 21.69 | 23.68 | 28.74 |
| 850 | 1.14 | 18.84 | 16.62 | 22.00 | 23.84 | 28.17 |
| 900 | 1.14 | 18.86 | 15.86 | 22.14 | 24.11 | 27.22 |
| 950 | 1.15 | 18.85 | 15.34 | 22.03 | 24.27 | 25.89 |
| 975 | 1.21 | 18.94 | 15.43 | 22.56 | 24.96 | 25.45 |
| 1000 | 1.16 | 18.89 | 14.93 | 22.31 | 24.52 | 24.98 |
| 1050 | 1.16 | 18.86 | 14.90 | 22.81 | 25.09 | 23.96 |
| 1075 | 1.16 | 18.88 | 14.16 | 23.11 | 25.26 | 23.48 |
| 1100 | 1.17 | 18.86 | 14.42 | 24.06 | 25.74 | 23.08 |
| 1200 | 1.19 | 18.79 | 13.57 | 25.74 | 27.57 | 22.01 |
| 1300 | 1.22 | 18.73 | 12.40 | 31.91 | 30.93 | 21.52 |
| 1400 | 1.27 | 18.58 | 11.15 | 44.67 | 34.46 | 21.77 |
| 1500 | 1.32 | 18.36 | 10.25 | 31.14 | 33.79 | 22.87 |
| 1600 | 1.36 | 18.12 | 8.71 | 26.93 | 30.12 | 25.25 |
| 1700 | 1.39 | 17.91 | 7.99 | 23.60 | 27.24 | 29.35 |
| 1800 | 1.40 | 17.73 | 7.10 | 22.76 | 25.80 | 31.15 |
| 1900 | 1.44 | 17.57 | 6.87 | 21.64 | 25.00 | 25.94 |
| 2000 | 1.48 | 17.49 | 6.77 | 22.65 | 25.20 | 21.72 |
| 2100 | 1.54 | 17.44 | 6.88 | 22.29 | 25.97 | 19.19 |
| 2200 | 1.59 | 17.38 | 7.71 | 24.38 | 27.49 | 17.68 |
| 2300 | 1.69 | 17.29 | 8.23 | 24.66 | 29.34 | 16.81 |
| 2400 | 1.77 | 17.21 | 8.38 | 28.12 | 32.27 | 16.63 |
| 2500 | 1.89 | 17.01 | 7.69 | 29.76 | 33.80 | 16.94 |
| 2600 | 1.98 | 16.81 | 6.98 | 33.80 | 35.30 | 17.64 |
| 2700 | 2.11 | 16.28 | 5.17 | 32.06 | 33.55 | 18.62 |
| 2800 | 2.26 | 15.83 | 4.57 | 26.05 | 31.78 | 19.22 |
| 2900 | 2.38 | 15.66 | 4.01 | 23.57 | 28.86 | 19.00 |
| 3000 | 2.42 | 15.68 | 3.27 | 20.23 | 26.78 | 18.16 |

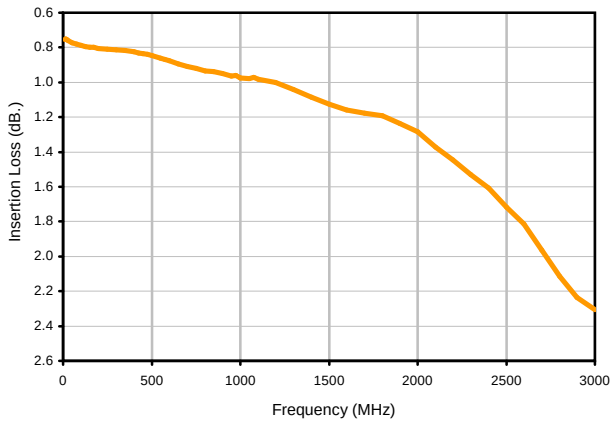


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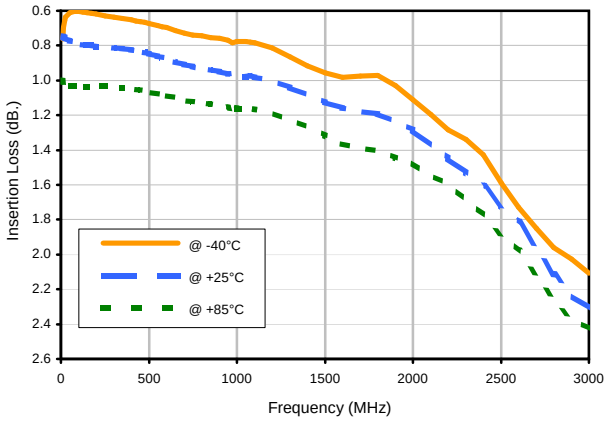
# Directional Coupler TCD-18-4-75+

*Typical Performance Curves*

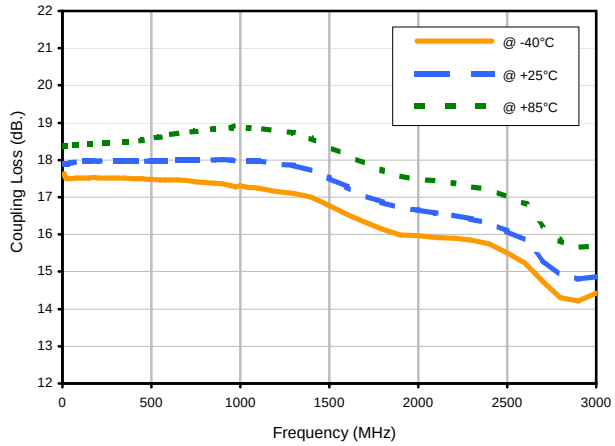
**Insertion Loss**



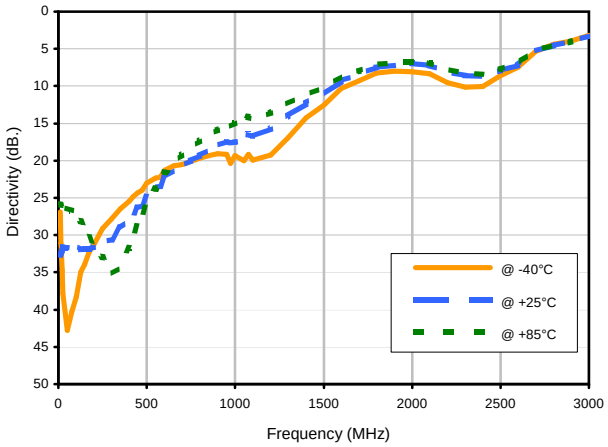

**Insertion Loss vs. TEMPERATURE**




**Coupling Loss vs. TEMPERATURE**




**Directivity vs. TEMPERATURE**



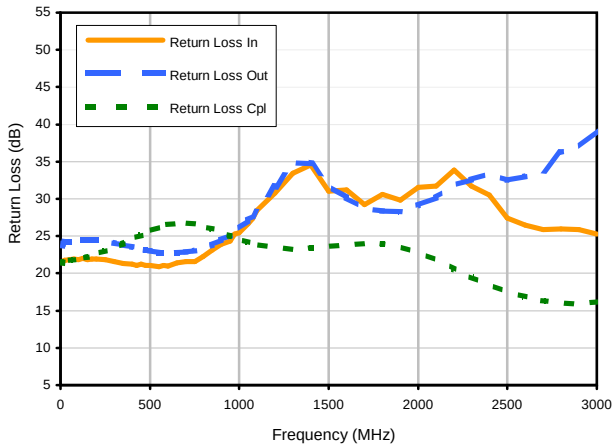




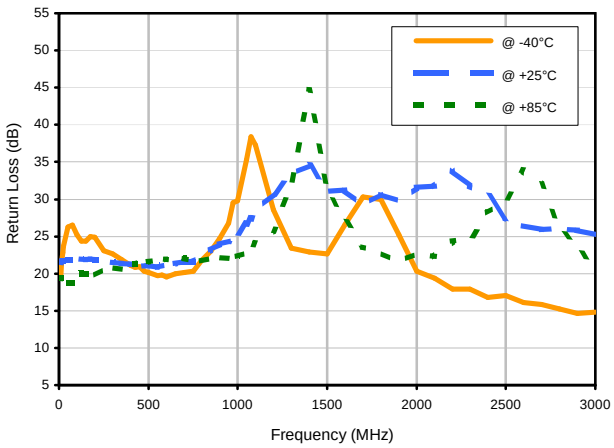
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## *Typical Performance Curves*

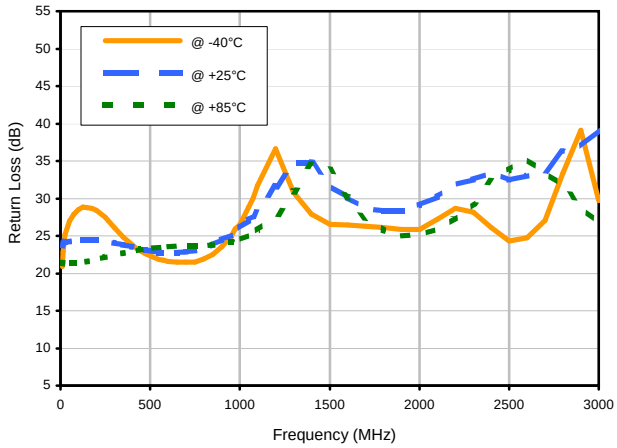
**Return Loss**



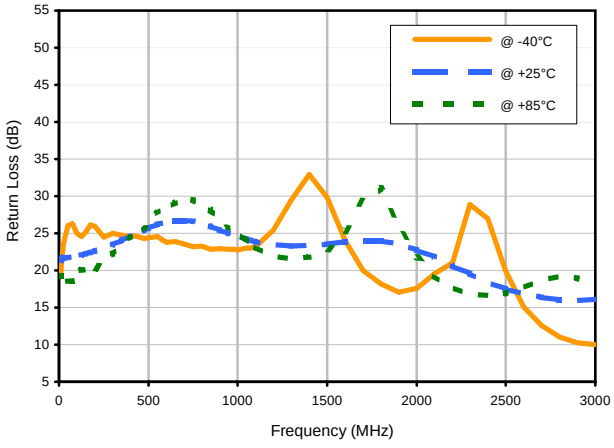

**Return Loss In vs. TEMPERATURE**




**Return Loss Out vs. TEMPERATURE**




**Return Loss Cpl vs. TEMPERATURE**





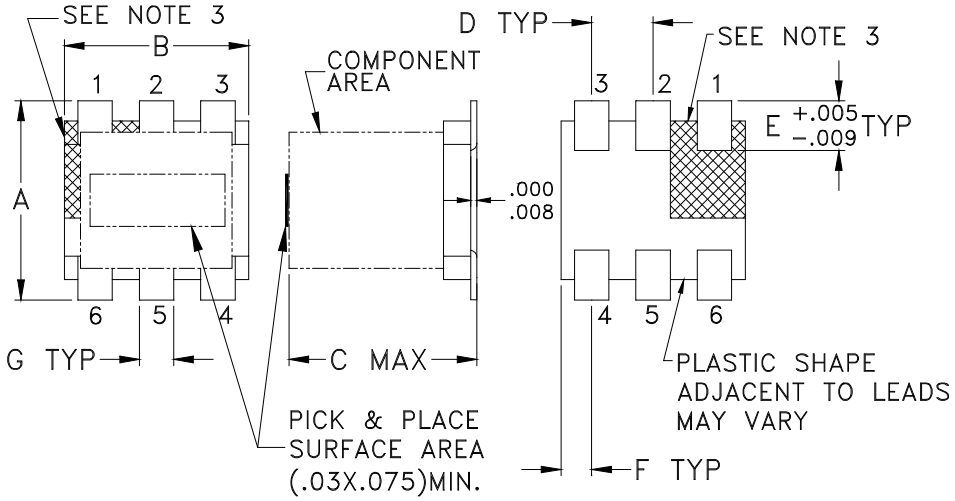


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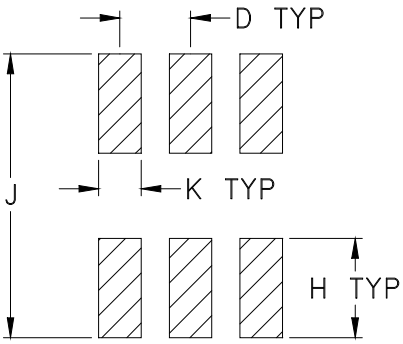
# Case Style DB

**DB714**

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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. ± .01; 3Pl. ± .005**

**Notes:**

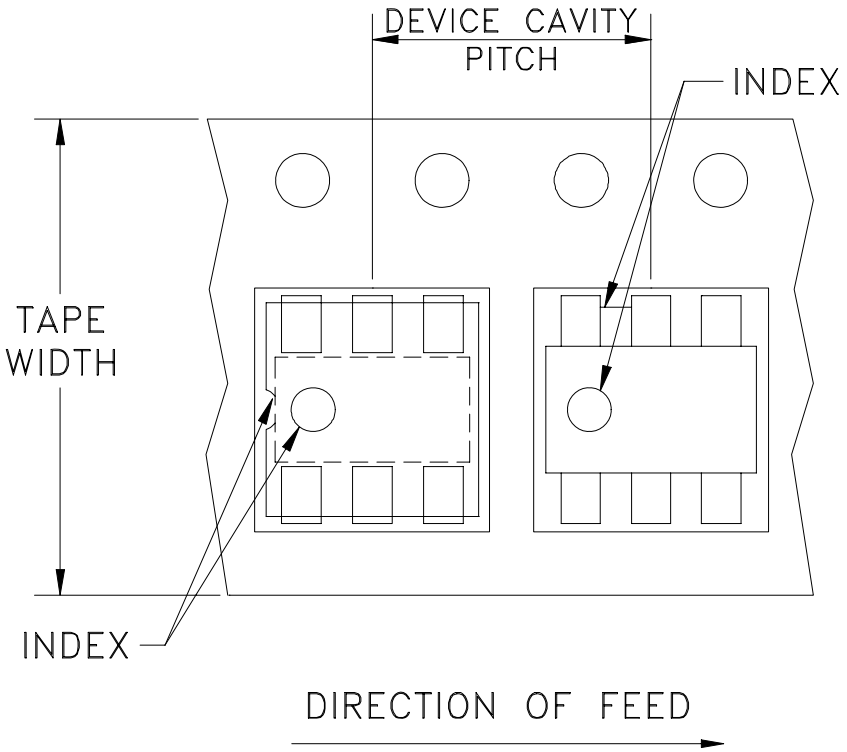
1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.
3. Lead #1 identifier shall be located in the cross-hatched area shown.
   Identifier may be either a molded or marked feature.



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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.

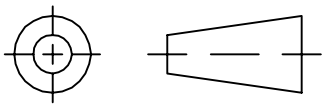
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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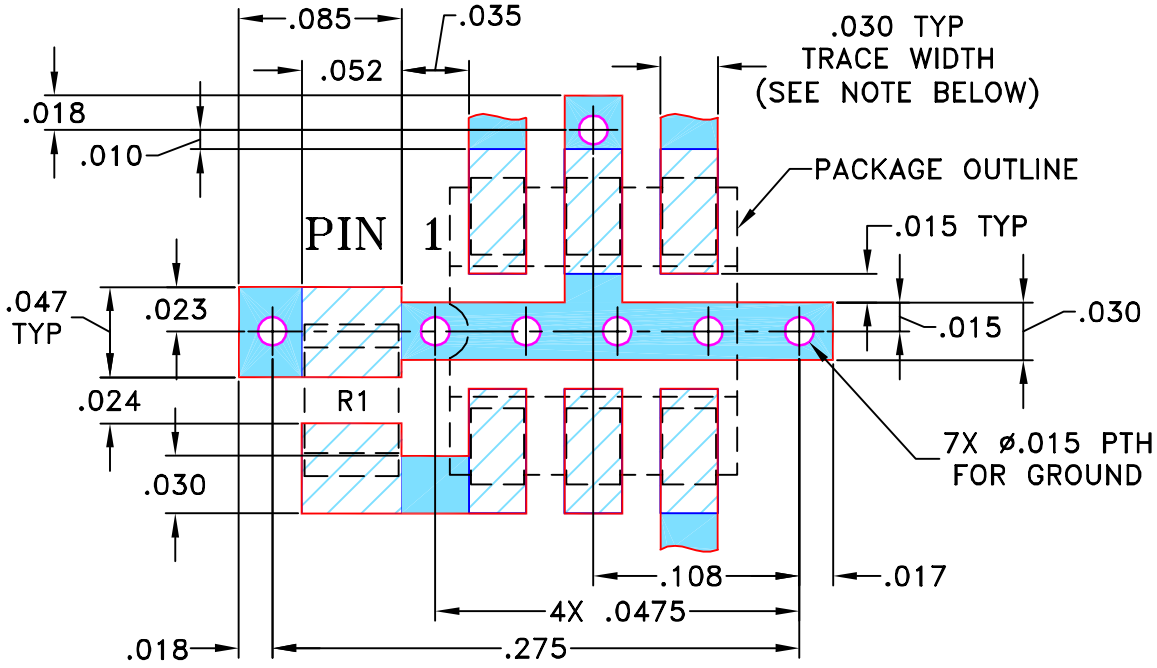

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THIRD ANGLE PROJECTION



| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| OR | M73159 | NEW RELEASE | 08/00 | IL | DB |
| A | M82377 | UPDATED DRAWING | 07/30/02 | AV | LC |
| B | M102713 | UPDATED NOTES | 01/12/06 | GF | IL |
| | | | | | |

## SUGGESTED MOUNTING CONFIGURATION FOR DB714 CASE STYLE, "mm" PIN CONNECTION




RESISTOR R1: 75 ± 1% Ohm, 0805 SIZE

NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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.

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 | IL | 08/03/00 |
| TOLERANCES ON: | CHECKED | WP | 08/08/00 |
| 2 PL DECIMALS ± | APPROVED | DB | 08/09/00 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

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

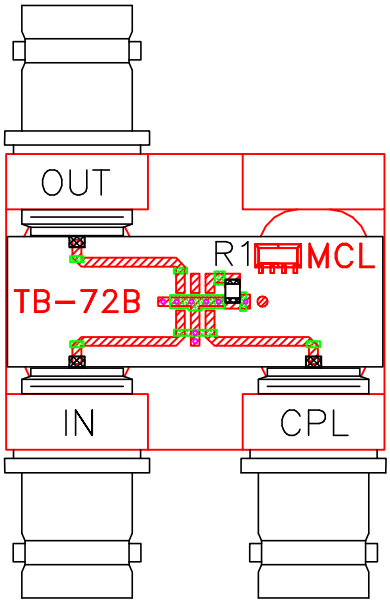
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PL, mm, 75, DB714, TCD, TB-72

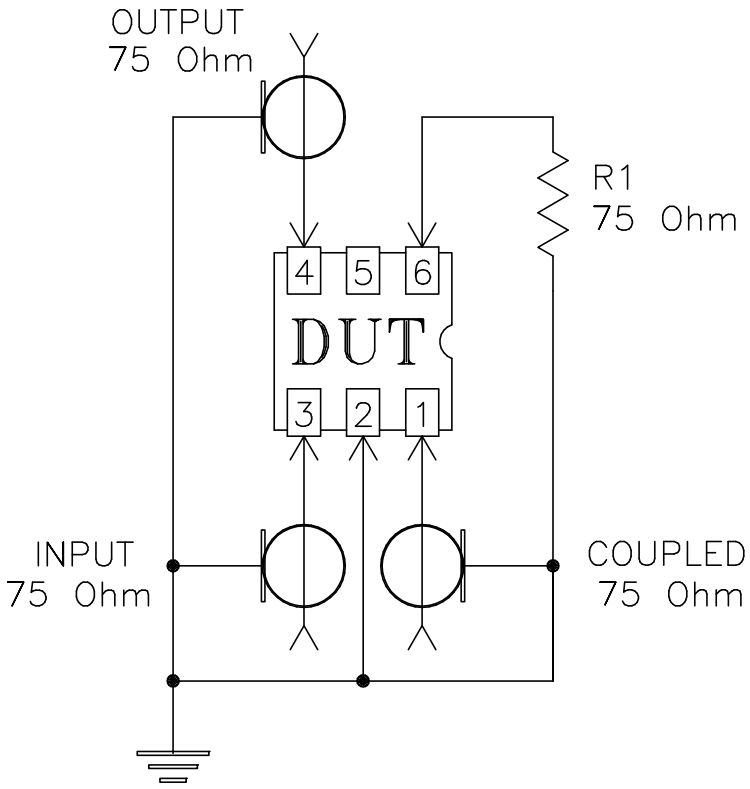
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-010 | B |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL010 | 10:1 | 1 OF 1 |

# Evaluation Board and Circuit




TB-72




Schematic Diagram

## Notes:

1. 75 Ohm BNC Female connectors.
2. PCB Material: Rogers 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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