

# Surface Mount Bandpass Filter

## BPF-C670+

50Ω 470 to 870 MHz

### The Big Deal

- Wide passband
- Good VSWR (1.4:1 typical)
- High rejection (50 dB typical)
- Flat group delay (4 ns typical)
- Sharp roll-off
- Miniature shielded package



CASE STYLE: HU1186

### Product Overview

The BPF-C670+ is a band pass filter fabricated using SMT technology and built into a shielded case (size of 0.87" x 0.80" x .25"). Covering 670 MHz  $\pm$  200 MHz band width, this model is suited for Digital TV application. These units offer good matching within the passband and high rejection. This unit uses a miniature high Q capacitors and wire welded inductors for high reliability. In addition it has repeatable performance across production lots and consistent performance across temperature.

### Key Features

| Feature                                 | Advantages  |
|---|---|
| Sharp shape factor, 1.1                 | Sharp shape factor helps in adjacent channel rejection and hence increased selectivity.                 |
| Good VSWR, 1.4:1 over passband          | This provides well matched input and output ports.  |
| More than 50 dB rejection up to 2100MHz | This enables the filter to attenuate spurious signals and reject harmonics for broad band of frequency. |
| Flat group delay characteristics.       | This model has a group delay flatness of 4 ns which helps in reducing the signal distortion.            |
| Shielded case                           | Reduced interference with and from the surrounding components.  |

#### 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# Bandpass Filter

## BPF-C670+

50Ω 470 to 870 MHz



CASE STYLE: HU1186

### Features

- High rejection, 50 dB typical
- Good VSWR, 1.4:1 typical over passband
- Sharp insertion loss roll-off
- Shielded case
- Aqueous washable

### Applications

- Digital TV
- Harmonic rejection
- Transmitters / receivers

### Electrical Specifications at 25°C

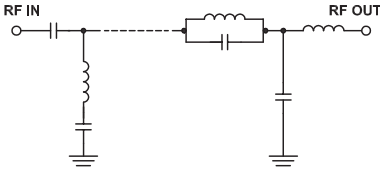
| Parameter        | F#               | Frequency (MHz) | Min.       | Typ. | Max. | Unit |    |
|------------------|------------------|-----------------|------------|------|------|------|----|
| Pass Band        | Center Frequency | —               | —          | 670  | —    | MHz  |    |
|                  | Insertion Loss   | F1-F2           | 470 - 870  | —    | 2.0  | 2.8  | dB |
|                  | VSWR             | F1-F2           | 470 - 870  | —    | 1.4  | 1.8  | :1 |
| Stop Band, Lower | Insertion Loss   | DC-F3           | DC - 365   | 20   | 40   | —    | dB |
|                  | VSWR             | DC-F3           | DC - 365   | —    | 29   | —    | :1 |
| Stop Band, Upper | Insertion Loss   | F4-F5           | 965 - 2700 | 20   | 30   | —    | dB |
|                  | VSWR             | F4-F5           | 965 - 2700 | —    | 18   | —    | :1 |

### Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power Input        | 0.7W max.      |

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

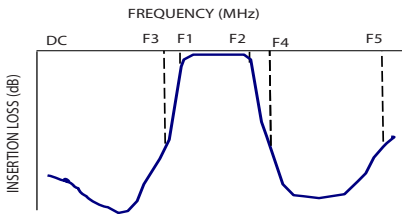
### Functional Schematic



### Typical Performance Data at 25°C

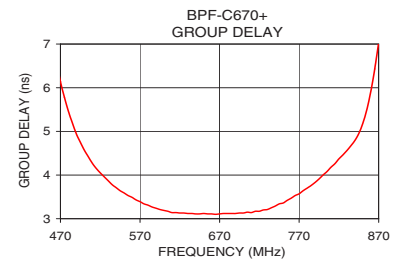
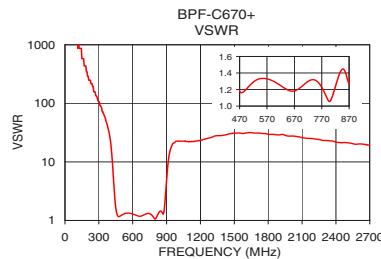
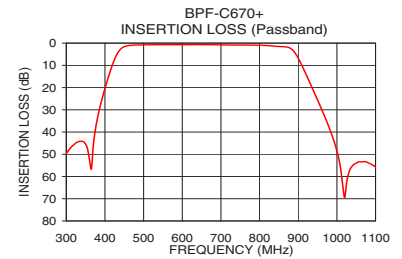
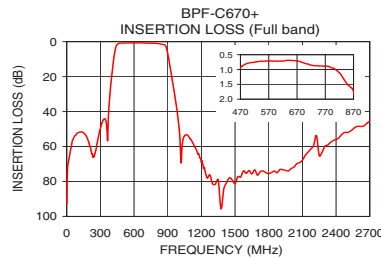
| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (nsec) |
|-----------------|---------------------|-----------|-----------------|--------------------|
| 1.0             | 92.72               | 1737.18   | 470.0           | 6.14               |
| 50.0            | 56.79               | 5124.42   | 500.0           | 4.57               |
| 300.0           | 49.71               | 108.58    | 525.0           | 3.96               |
| 365.0           | 56.55               | 48.26     | 550.0           | 3.59               |
| 400.0           | 20.38               | 24.83     | 580.0           | 3.31               |
| 410.0           | 14.61               | 17.22     | 600.0           | 3.19               |
| 425.0           | 7.25                | 7.11      | 620.0           | 3.13               |
| 440.0           | 2.79                | 2.61      | 630.0           | 3.12               |
| 450.0           | 1.60                | 1.66      | 640.0           | 3.11               |
| 470.0           | 0.94                | 1.18      | 660.0           | 3.11               |
| 670.0           | 0.71                | 1.18      | 670.0           | 3.11               |
| 870.0           | 1.74                | 1.28      | 680.0           | 3.12               |
| 885.0           | 3.02                | 2.00      | 700.0           | 3.13               |
| 900.0           | 6.77                | 4.84      | 740.0           | 3.29               |
| 920.0           | 13.98               | 12.01     | 760.0           | 3.47               |
| 965.0           | 31.63               | 20.95     | 780.0           | 3.70               |
| 1010.0          | 56.87               | 22.87     | 800.0           | 4.00               |
| 1500.0          | 81.29               | 31.03     | 840.0           | 4.79               |
| 2000.0          | 72.59               | 27.59     | 850.0           | 5.18               |
| 2700.0          | 45.58               | 19.32     | 870.0           | 7.04               |

### Typical Frequency Response



### +RoHS Compliant

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



### Notes

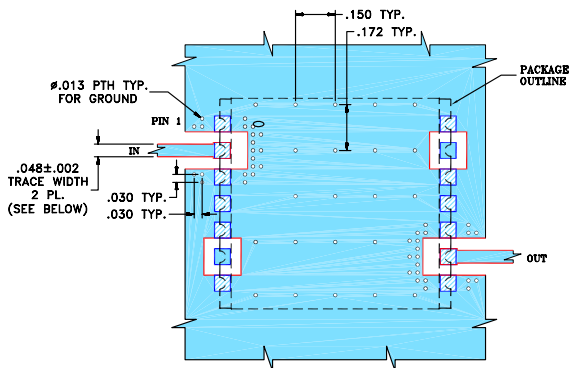
- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuit's 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-Circuit's website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



## Pad Connections

|               |                         |
|---------------|-------------------------|
| INPUT         | 2                       |
| OUTPUT        | 9                       |
| NOT CONNECTED | 6,13                    |
| GROUND        | 1,3,4,5,7,8,10,11,12,14 |

**Demo Board MCL P/N: TB-500+**  
**Suggested PCB Layout (PL-294)**

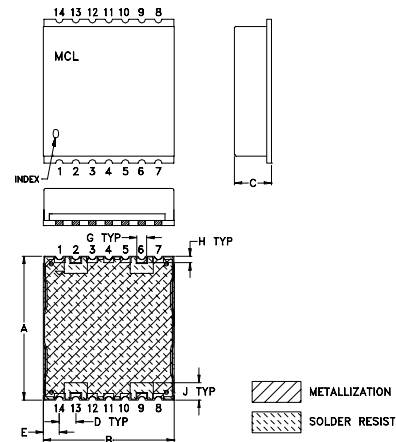


**NOTES:**

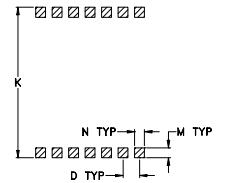
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B.  
 DIELECTRIC THICKNESS: .030" ± .002";  
 COPPER: 1/2 OZ ON EACH SIDE.  
 FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

## Outline Drawing



## PCB Land Pattern



Suggested Layout,  
 Tolerance to be within ±.002

## Outline Dimensions ( inch / mm)

| A     | B     | C    | D    | E    | F  | G     | H    |
|-------|-------|------|------|------|----|-------|------|
| .870  | .800  | .25  | .100 | .097 | -- | .060  | .040 |
| 22.10 | 20.32 | 6.35 | 2.54 | 2.46 | -- | 1.52  | 1.02 |
| J     | K     | L    | M    | N    | P  | wt    |      |
| .105  | .910  | --   | .060 | .060 | -- | grams |      |
| 2.67  | 23.11 | --   | 1.52 | 1.52 | -- | 2.85  |      |

**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](http://www.minicircuits.com/MCLStore/terms.jsp)

Typical Performance Data

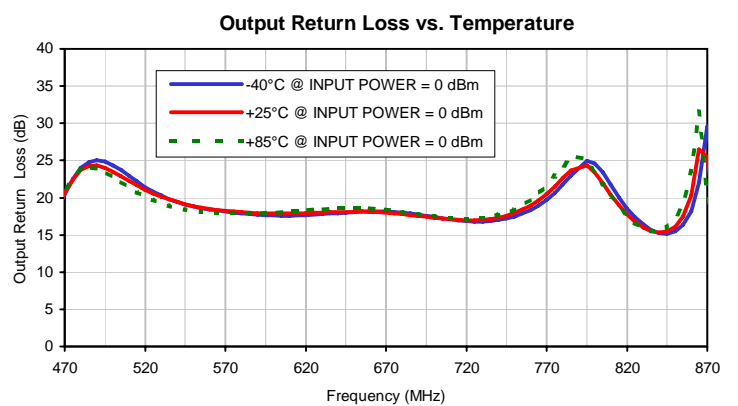
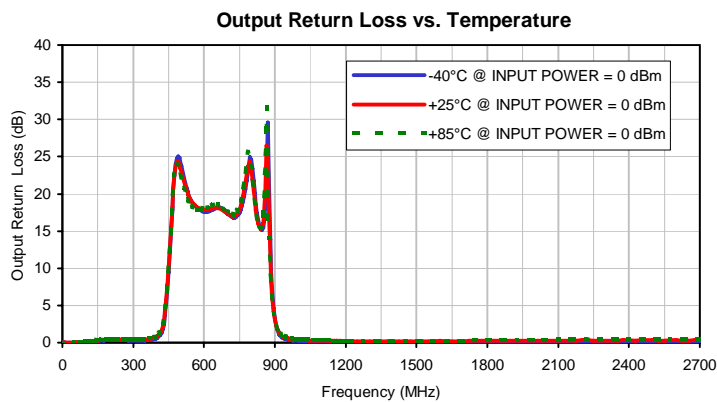
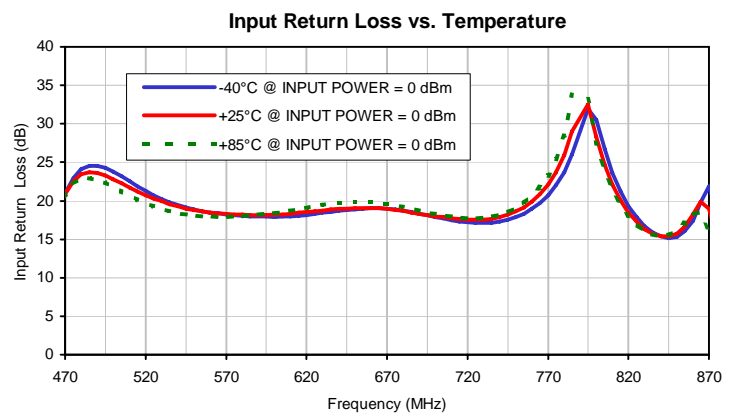
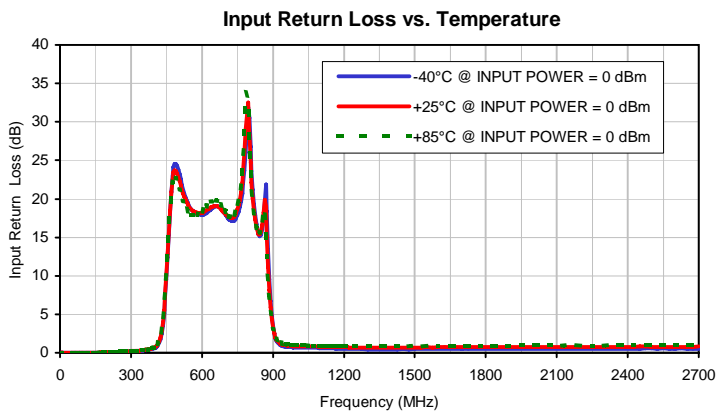
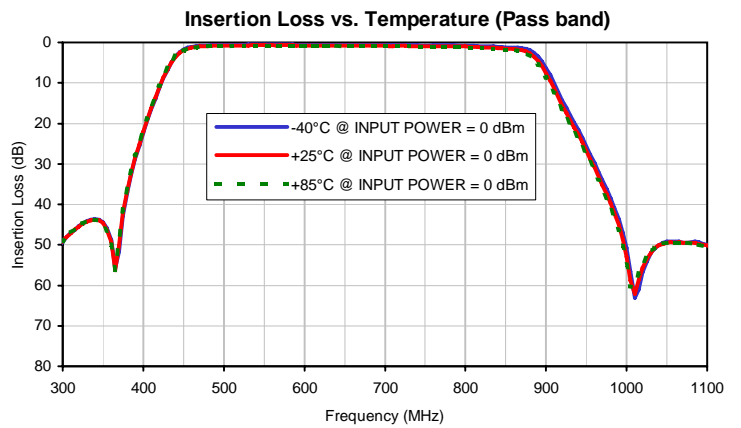
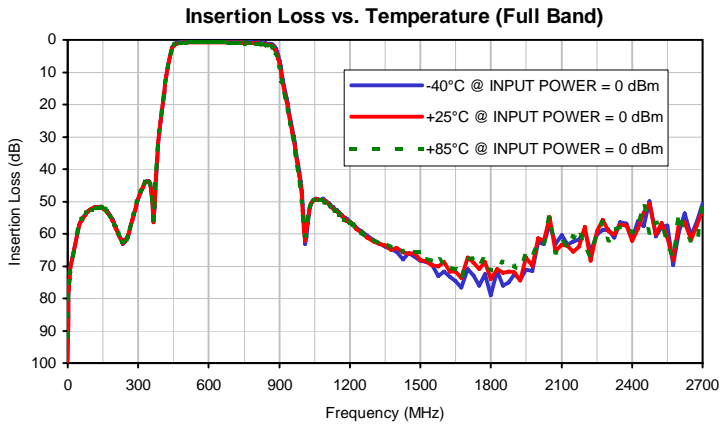
| FREQ.<br><br>(MHz) | INSERTION LOSS |        |        | INPUT RETURN LOSS |        |        | OUTPUT RETURN LOSS |        |        |
|--------------------|----------------|--------|--------|-------------------|--------|--------|--------------------|--------|--------|
|                    | (dB)           |        |        | (dB)              |        |        | (dB)               |        |        |
|                    | @-40°C         | @+25°C | @+85°C | @-40°C            | @+25°C | @+85°C | @-40°C             | @+25°C | @+85°C |
| 1.0                | 92.46          | 99.44  | 91.96  | 0.00              | 0.00   | 0.00   | 0.00               | 0.00   | 0.00   |
| 10.0               | 70.40          | 70.67  | 71.30  | 0.00              | 0.00   | 0.00   | 0.01               | 0.01   | 0.01   |
| 50.0               | 57.21          | 57.17  | 56.96  | 0.01              | 0.00   | 0.00   | 0.01               | 0.04   | 0.06   |
| 100.0              | 52.38          | 52.35  | 52.50  | 0.00              | 0.01   | 0.01   | 0.07               | 0.12   | 0.15   |
| 150.0              | 52.06          | 52.12  | 52.26  | 0.02              | 0.03   | 0.04   | 0.21               | 0.29   | 0.33   |
| 200.0              | 57.14          | 57.49  | 57.37  | 0.04              | 0.07   | 0.07   | 0.37               | 0.45   | 0.49   |
| 250.0              | 61.33          | 61.47  | 61.88  | 0.10              | 0.12   | 0.12   | 0.34               | 0.44   | 0.51   |
| 300.0              | 49.26          | 49.07  | 49.05  | 0.17              | 0.21   | 0.21   | 0.27               | 0.37   | 0.44   |
| 350.0              | 44.44          | 44.65  | 44.79  | 0.29              | 0.34   | 0.36   | 0.29               | 0.41   | 0.50   |
| 365.0              | 55.84          | 56.35  | 56.24  | 0.35              | 0.41   | 0.42   | 0.34               | 0.48   | 0.56   |
| 400.0              | 22.32          | 22.01  | 21.66  | 0.61              | 0.71   | 0.78   | 0.61               | 0.80   | 0.94   |
| 425.0              | 8.85           | 8.71   | 8.47   | 1.77              | 2.01   | 2.25   | 1.81               | 2.17   | 2.48   |
| 450.0              | 1.77           | 1.92   | 2.00   | 9.57              | 10.04  | 10.66  | 9.48               | 10.12  | 10.79  |
| 455.0              | 1.32           | 1.51   | 1.60   | 12.35             | 12.78  | 13.36  | 12.18              | 12.78  | 13.43  |
| 460.0              | 1.07           | 1.26   | 1.37   | 15.32             | 15.63  | 16.13  | 15.03              | 15.53  | 16.11  |
| 465.0              | 0.92           | 1.11   | 1.22   | 18.30             | 18.42  | 18.72  | 17.86              | 18.21  | 18.67  |
| 470.0              | 0.83           | 1.01   | 1.13   | 20.98             | 20.85  | 20.82  | 20.44              | 20.61  | 20.92  |
| 475.0              | 0.76           | 0.94   | 1.06   | 22.94             | 22.57  | 22.20  | 22.53              | 22.49  | 22.59  |
| 480.0              | 0.72           | 0.90   | 1.01   | 24.11             | 23.47  | 22.86  | 23.99              | 23.72  | 23.63  |
| 485.0              | 0.68           | 0.85   | 0.97   | 24.55             | 23.74  | 22.98  | 24.78              | 24.29  | 24.02  |
| 490.0              | 0.65           | 0.83   | 0.94   | 24.56             | 23.62  | 22.74  | 25.03              | 24.35  | 23.89  |
| 495.0              | 0.63           | 0.80   | 0.91   | 24.28             | 23.26  | 22.33  | 24.86              | 24.03  | 23.43  |
| 500.0              | 0.62           | 0.79   | 0.90   | 23.81             | 22.78  | 21.80  | 24.37              | 23.52  | 22.81  |
| 525.0              | 0.56           | 0.72   | 0.84   | 20.71             | 20.29  | 19.27  | 20.81              | 20.60  | 19.69  |
| 550.0              | 0.55           | 0.71   | 0.83   | 18.85             | 18.78  | 18.07  | 18.84              | 18.88  | 18.21  |
| 575.0              | 0.54           | 0.70   | 0.81   | 18.14             | 18.21  | 17.93  | 18.01              | 18.15  | 17.86  |
| 600.0              | 0.58           | 0.73   | 0.84   | 17.91             | 18.20  | 18.38  | 17.62              | 17.86  | 17.98  |
| 625.0              | 0.56           | 0.73   | 0.83   | 18.30             | 18.64  | 19.26  | 17.71              | 17.95  | 18.38  |
| 650.0              | 0.60           | 0.78   | 0.88   | 18.88             | 19.06  | 19.88  | 18.08              | 18.07  | 18.61  |
| 670.0              | 0.58           | 0.76   | 0.88   | 18.96             | 18.93  | 19.62  | 18.16              | 17.98  | 18.37  |
| 675.0              | 0.57           | 0.76   | 0.88   | 18.85             | 18.83  | 19.45  | 18.08              | 17.89  | 18.27  |
| 700.0              | 0.66           | 0.86   | 0.99   | 17.91             | 18.00  | 18.29  | 17.43              | 17.33  | 17.51  |
| 725.0              | 0.65           | 0.85   | 0.99   | 17.13             | 17.51  | 17.73  | 16.81              | 16.97  | 17.18  |
| 750.0              | 0.73           | 0.94   | 1.08   | 17.88             | 18.62  | 19.07  | 17.49              | 17.94  | 18.45  |
| 775.0              | 0.68           | 0.91   | 1.07   | 22.03             | 23.74  | 25.36  | 20.65              | 21.50  | 22.88  |
| 800.0              | 0.76           | 1.02   | 1.20   | 30.54             | 28.31  | 27.37  | 24.59              | 23.38  | 23.56  |
| 825.0              | 0.96           | 1.27   | 1.48   | 17.84             | 17.26  | 16.95  | 17.40              | 16.77  | 16.62  |
| 850.0              | 1.20           | 1.52   | 1.76   | 15.34             | 15.75  | 16.07  | 15.47              | 16.10  | 17.03  |
| 870.0              | 1.39           | 1.87   | 2.28   | 21.86             | 18.98  | 16.08  | 29.60              | 25.49  | 20.49  |
| 900.0              | 6.25           | 7.55   | 8.67   | 3.42              | 3.24   | 3.05   | 3.25               | 3.06   | 2.88   |
| 950.0              | 25.58          | 26.73  | 27.70  | 0.80              | 0.98   | 1.10   | 0.45               | 0.61   | 0.71   |
| 965.0              | 31.91          | 33.03  | 34.03  | 0.74              | 0.91   | 1.03   | 0.35               | 0.51   | 0.60   |
| 1000.0             | 50.81          | 52.92  | 54.91  | 0.69              | 0.85   | 0.97   | 0.23               | 0.38   | 0.47   |
| 1100.0             | 49.92          | 50.14  | 50.45  | 0.62              | 0.78   | 0.93   | 0.10               | 0.25   | 0.32   |
| 1200.0             | 56.19          | 56.52  | 56.78  | 0.51              | 0.72   | 0.88   | 0.05               | 0.20   | 0.27   |
| 1300.0             | 62.04          | 62.30  | 61.86  | 0.45              | 0.68   | 0.84   | 0.04               | 0.20   | 0.27   |
| 1400.0             | 65.45          | 64.31  | 64.35  | 0.45              | 0.68   | 0.85   | 0.03               | 0.20   | 0.26   |
| 1500.0             | 68.40          | 68.12  | 65.74  | 0.47              | 0.70   | 0.88   | 0.03               | 0.20   | 0.26   |
| 1600.0             | 71.67          | 68.77  | 69.80  | 0.48              | 0.72   | 0.91   | 0.04               | 0.22   | 0.28   |
| 1700.0             | 70.83          | 67.30  | 67.69  | 0.50              | 0.73   | 0.93   | 0.03               | 0.21   | 0.30   |
| 1800.0             | 79.00          | 74.07  | 71.07  | 0.51              | 0.74   | 0.95   | 0.03               | 0.22   | 0.32   |
| 1900.0             | 72.56          | 71.83  | 69.86  | 0.50              | 0.74   | 0.95   | 0.03               | 0.24   | 0.35   |
| 2000.0             | 62.57          | 61.42  | 63.04  | 0.50              | 0.74   | 0.96   | 0.04               | 0.24   | 0.35   |
| 2100.0             | 60.39          | 63.40  | 62.14  | 0.50              | 0.75   | 0.96   | 0.05               | 0.25   | 0.39   |
| 2200.0             | 58.92          | 57.86  | 64.96  | 0.50              | 0.75   | 0.95   | 0.09               | 0.33   | 0.54   |
| 2300.0             | 58.73          | 59.17  | 62.05  | 0.48              | 0.74   | 0.95   | 0.06               | 0.27   | 0.41   |
| 2400.0             | 61.58          | 62.20  | 59.40  | 0.52              | 0.77   | 0.97   | 0.09               | 0.31   | 0.45   |
| 2500.0             | 60.86          | 60.13  | 56.87  | 0.55              | 0.79   | 0.97   | 0.10               | 0.32   | 0.45   |
| 2600.0             | 59.41          | 56.61  | 53.70  | 0.53              | 0.79   | 0.99   | 0.11               | 0.33   | 0.45   |
| 2700.0             | 50.66          | 52.76  | 51.63  | 0.52              | 0.80   | 1.00   | 0.13               | 0.35   | 0.47   |



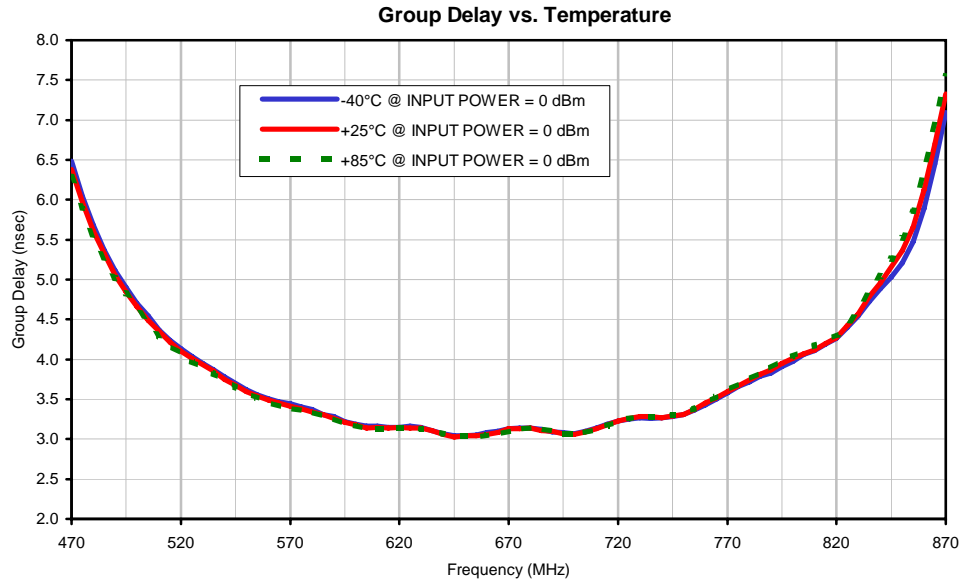
*Typical Performance Data*

| FREQ.<br><br>(MHz) | GROUP DELAY |        |        |
|--------------------|-------------|--------|--------|
|                    | (nsec)      |        |        |
|                    | @-40°C      | @+25°C | @+85°C |
| 470                | 6.48        | 6.38   | 6.29   |
| 480                | 5.68        | 5.61   | 5.54   |
| 490                | 5.11        | 5.06   | 5.02   |
| 500                | 4.70        | 4.66   | 4.62   |
| 510                | 4.37        | 4.35   | 4.30   |
| 520                | 4.13        | 4.10   | 4.07   |
| 530                | 3.95        | 3.93   | 3.90   |
| 540                | 3.78        | 3.75   | 3.74   |
| 550                | 3.62        | 3.60   | 3.58   |
| 560                | 3.51        | 3.49   | 3.46   |
| 570                | 3.44        | 3.41   | 3.39   |
| 580                | 3.37        | 3.34   | 3.34   |
| 590                | 3.28        | 3.26   | 3.26   |
| 600                | 3.19        | 3.18   | 3.17   |
| 610                | 3.16        | 3.15   | 3.13   |
| 620                | 3.15        | 3.15   | 3.14   |
| 630                | 3.15        | 3.14   | 3.13   |
| 640                | 3.07        | 3.06   | 3.07   |
| 650                | 3.04        | 3.04   | 3.04   |
| 660                | 3.08        | 3.06   | 3.05   |
| 670                | 3.13        | 3.13   | 3.10   |
| 680                | 3.14        | 3.14   | 3.14   |
| 690                | 3.09        | 3.10   | 3.10   |
| 700                | 3.07        | 3.06   | 3.06   |
| 705                | 3.10        | 3.09   | 3.08   |
| 710                | 3.14        | 3.13   | 3.12   |
| 715                | 3.19        | 3.18   | 3.17   |
| 720                | 3.23        | 3.23   | 3.22   |
| 725                | 3.25        | 3.26   | 3.26   |
| 730                | 3.27        | 3.28   | 3.28   |
| 735                | 3.26        | 3.28   | 3.28   |
| 740                | 3.27        | 3.27   | 3.29   |
| 745                | 3.28        | 3.29   | 3.30   |
| 750                | 3.31        | 3.31   | 3.33   |
| 755                | 3.36        | 3.37   | 3.38   |
| 760                | 3.43        | 3.45   | 3.45   |
| 765                | 3.50        | 3.52   | 3.53   |
| 770                | 3.58        | 3.60   | 3.61   |
| 775                | 3.66        | 3.67   | 3.69   |
| 780                | 3.72        | 3.74   | 3.75   |
| 785                | 3.79        | 3.81   | 3.83   |
| 790                | 3.83        | 3.87   | 3.89   |
| 795                | 3.91        | 3.95   | 3.98   |
| 800                | 3.97        | 4.01   | 4.04   |
| 805                | 4.06        | 4.07   | 4.11   |
| 810                | 4.11        | 4.12   | 4.17   |
| 815                | 4.19        | 4.20   | 4.23   |
| 820                | 4.26        | 4.27   | 4.31   |
| 825                | 4.40        | 4.42   | 4.45   |
| 830                | 4.54        | 4.57   | 4.61   |
| 835                | 4.72        | 4.78   | 4.83   |
| 840                | 4.89        | 4.96   | 5.04   |
| 845                | 5.03        | 5.16   | 5.26   |
| 850                | 5.21        | 5.36   | 5.51   |
| 855                | 5.47        | 5.66   | 5.85   |
| 860                | 5.89        | 6.12   | 6.36   |
| 865                | 6.45        | 6.70   | 6.96   |
| 870                | 7.09        | 7.33   | 7.55   |

## Typical Performance Curves

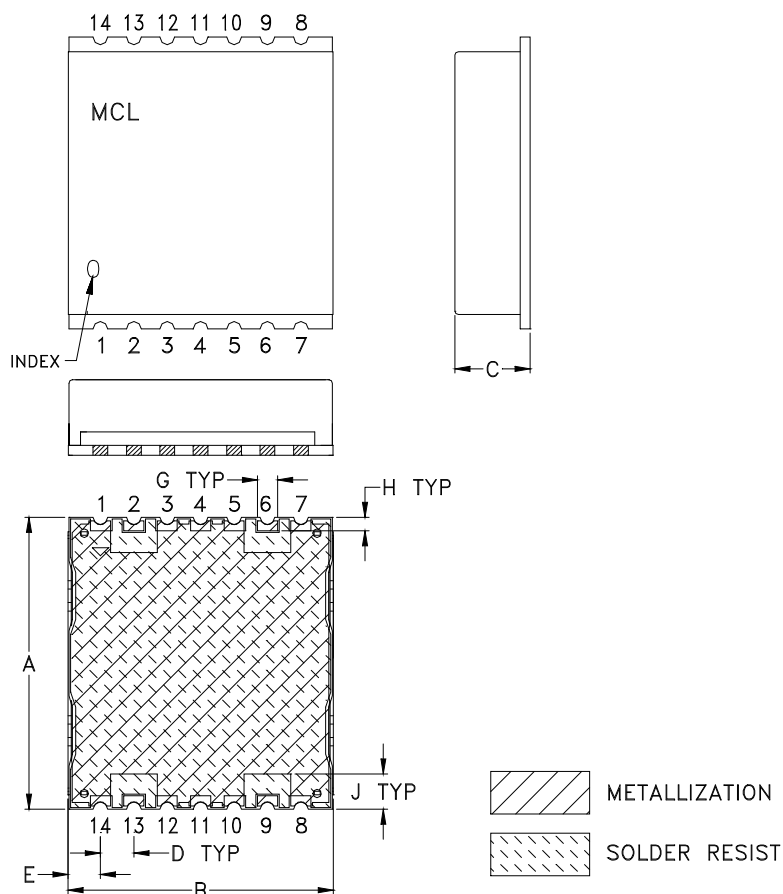


## Typical Performance Curves

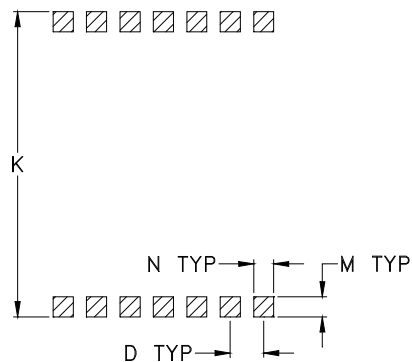


## Outline Dimensions

HU1186



## PCB Land Pattern



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

| CASE#  | A               | B               | C             | D              | E              | F | G              | H              | J              | K               | L | M              | N              | P | WT, GRAM |
|--------|-----------------|-----------------|---------------|----------------|----------------|---|----------------|----------------|----------------|-----------------|---|----------------|----------------|---|----------|
| HU1186 | .870<br>(22.10) | .800<br>(20.32) | .25<br>(6.35) | .100<br>(2.54) | .097<br>(2.46) | - | .060<br>(1.52) | .040<br>(1.02) | .105<br>(2.67) | .910<br>(23.11) | - | .060<br>(1.52) | .060<br>(1.52) | - | 2.85     |

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:  
For RoHS Case Styles: 2-5  $\mu$  inch (.05-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.



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

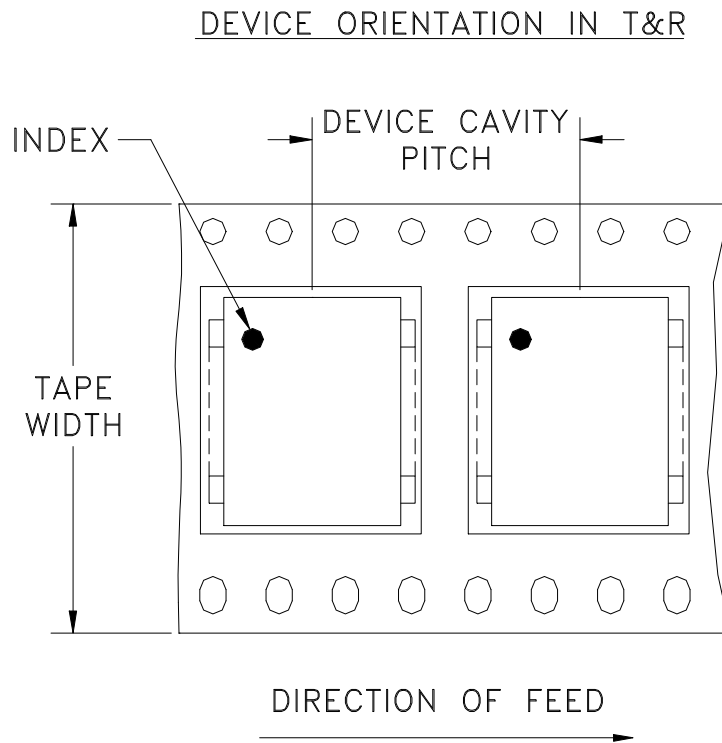


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS



# Tape & Reel Packaging TR-F21



| <b>Tape Width,<br/>mm</b> | <b>Device Cavity<br/>Pitch, mm</b> | <b>Reel Size,<br/>inches</b> | <b>Devices per Reel</b> |
|---------------------------|------------------------------------|------------------------------|-------------------------|
| 32                        | 32                                 | 13                           | 200                     |

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



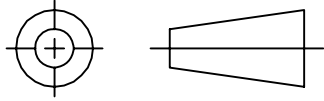
INTERNET <http://www.minicircuits.com>

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

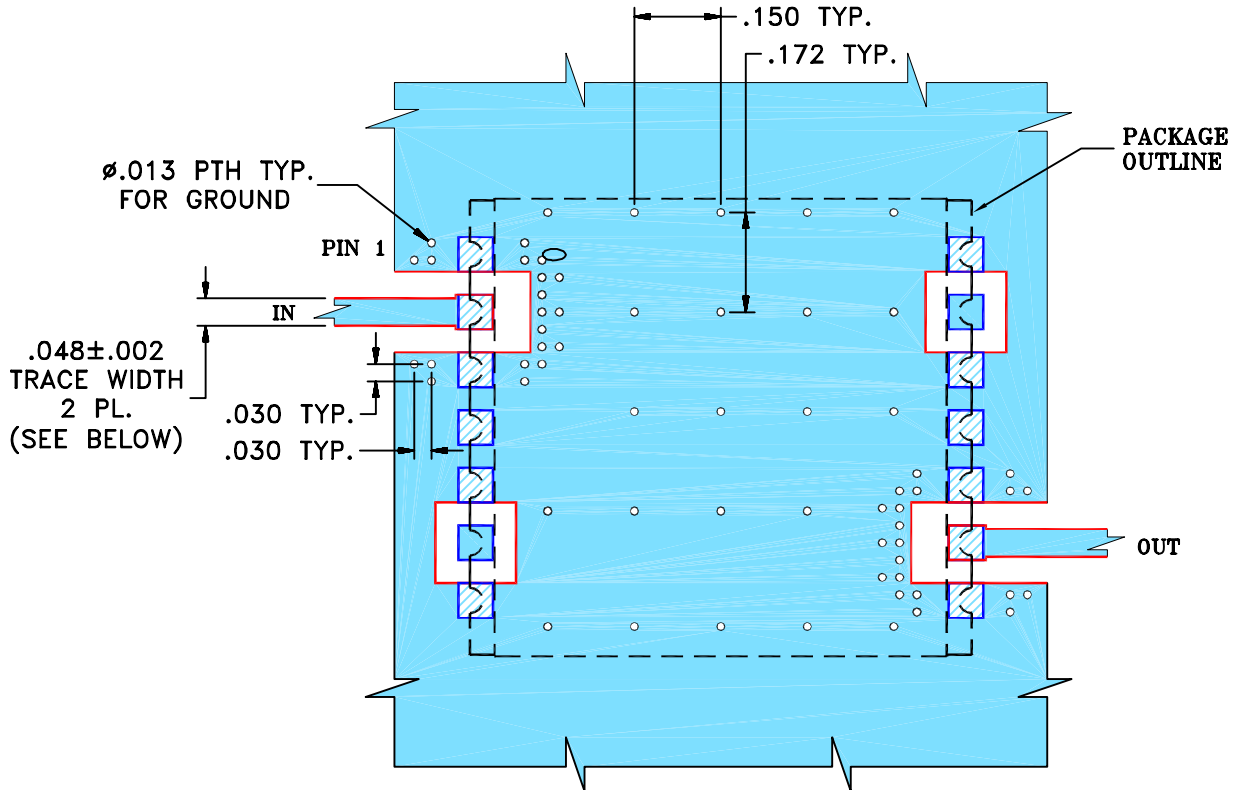
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION              | DATE  | DR | AUTH |
|-----|---------|--------------------------|-------|----|------|
| OR  | M119979 | NEW RELEASE (FROM RAVON) | 11/08 | DK | HH   |
| OR  | R74463  | NEW RELEASE (FROM RAVON) | 11/08 | DK | HH   |
|     |         |                          |       |    |      |

**SUGGESTED MOUNTING CONFIGURATION FOR HU1186 CASE STYLE, "14FL03" PIN CODE**



NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS R04350B, DIELECTRIC THICKNESS: .030" ± .002"; 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.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

| UNLESS OTHERWISE SPECIFIED   | INITIALS |            | DATE      |
|--|----------|------------|-----------|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES ON:<br>2 PL DECIMALS ±<br>3 PL DECIMALS ± .005<br>ANGLES ±<br>FRACTIONS ± | DRAWN    | DK (RAVON) | 02 NOV 08 |
|  | CHECKED  | DH (RAVON) | 02 NOV 08 |
|  | APPROVED | HH (RAVON) | 02 NOV 08 |

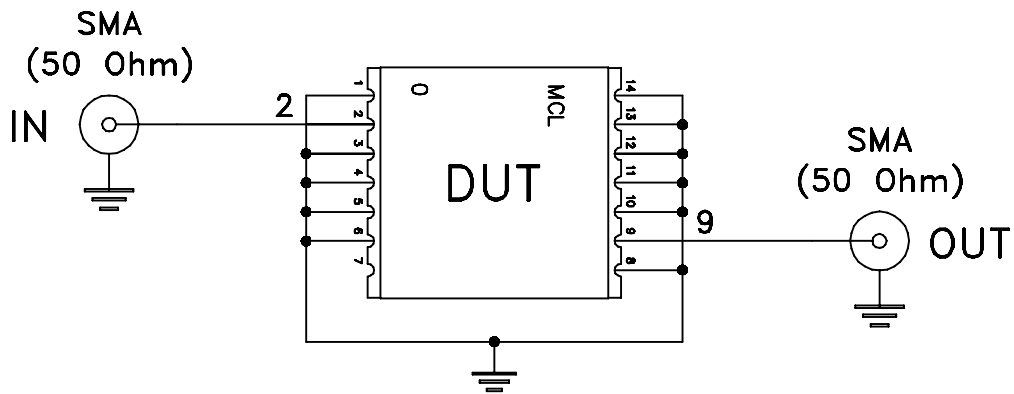
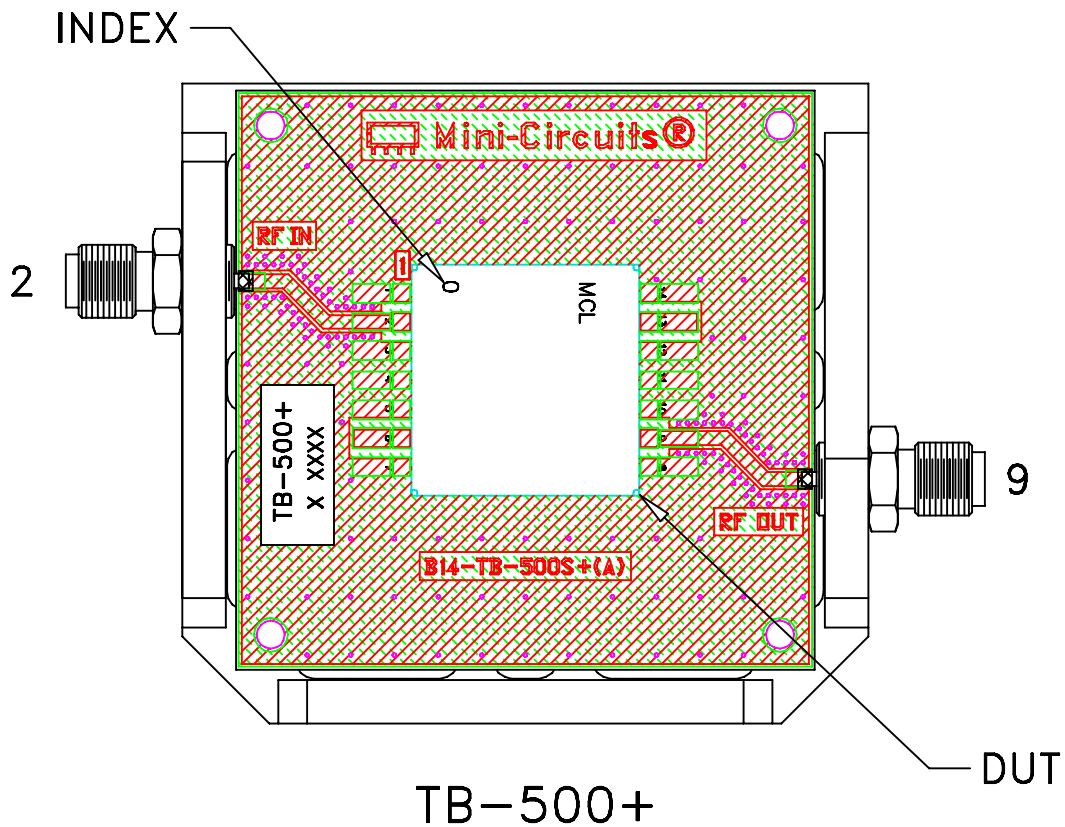
**Mini-Circuits®** 13 Neptune Avenue  
Brooklyn NY 11235

PL, 14FL03, HU1186, BPF-C  
TB-500+ (50 OHM)

|                  |                     |                          |            |
|------------------|---------------------|--------------------------|------------|
| SIZE<br>A        | CODE IDENT<br>15542 | DRAWING NO:<br>98-PL-294 | REV:<br>OR |
| FILE:<br>98PL294 | SCALE:<br>3:1       | SHEET:<br>1 OF 1         |            |

Mini-Circuits®  
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.

# Evaluation Board and Circuit



## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent.  
Dielectric Constant=3.5, Thickness=.030 inch.

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<br>Ambient Environment  | Individual Model Data Sheet                   |
| Storage Temperature           | -65° to 150° C<br>Ambient Environment   | Individual Model Data Sheet                   |
| Autoclave                     | 15 psig, 100% RH, 121°C, 96 hours   | JESD22-A102-C, Condition C                    |
| Temperature Cycling           | -65° to 150°C, 100 cycles   | JESD22-A104                                   |
| Temperature Humidity          | 85°C/ 85% RH, 168 hours   | JESD22-113                                    |
| Solder Reflow Heat            | Sn-Pb Eutetic Process: 240°C peak<br>Pb-Free Process: 260°C peak  | J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1 |
| Moisture Sensitivity: Level 1 | Bake at 125°C for 24 hours<br>Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS) | J-STD-020                                     |
| Solderability                 | 10X magnification, 95% coverage   | JESD22-B102, Method 1: Dip and Look Test      |
| Mechanical Shock              | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes   | MIL-STD-202, Method 213, Condition A          |
| 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          |