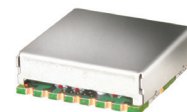


50Ω

470 to 520 MHz

## The Big Deal

- High rejection (70 dB typical)
- Linear phase ( $\pm 9$ deg typical over  $F_c \pm 30$  MHz)
- Miniature shielded case



CASE STYLE: HU1186

## Product Overview

The BPF-C495+ is a narrow band pass filter in a metal shielded package (size of 0.87" x 0.80" x .25") fabricated using SMT technology. The BPF-C495+ offers a typical pass band insertion loss of 1.7 dB with sharp roll-off and stopband rejection down to 90 dB typ. In addition, it has repeatable performance across production lots and consistent performance across temperature.

## Key Features

| Feature                                                                                    | Advantages                                                                                                                                |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Minimal Phase deviation over attenuation range: $\pm 9$ deg typical over $F_c \pm 30$ MHz. | Can provide low signal distortion for high data rate communication systems.                                                               |
| High rejection, 70dB typical                                                               | Achieving 90dB rejection at 1200MHz; the BPF-C495+ provides a versatile anti aliasing solution for high data rate receivers.              |
| Good VSWR, 1.3:1 typical over passband                                                     | The BPF-C495+ has very good return loss over the operating bandwidth which enables low ripple interface when cascaded with other devices. |
| Sharp roll off                                                                             | Provides good rejection of signals close to the passband, for improved system performance.                                                |
| Metal SMT shielded case                                                                    | Reduced interference to, and from surrounding components.                                                                                 |

### Notes

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# Surface Mount Bandpass Filter

50Ω 470 to 520 MHz

BPF-C495+



CASE STYLE: HU1186

## Features

- High rejection, 70 dB typical
- Linear phase, up to  $\pm 9$  deg typical over  $F_c \pm 30$  MHz
- Good VSWR, 1.3:1 typical in passband
- Sharp insertion loss roll off
- Shielded case
- Aqueous washable

## Applications

- Harmonic rejection
- Transmitters / receivers
- TV broadcasting

## Electrical Specifications at 25°C

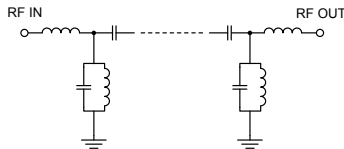
| Parameter                           | F#               | Frequency (MHz)  | Min. | Typ.    | Max.     | Unit |
|-------------------------------------|------------------|------------------|------|---------|----------|------|
| Pass Band                           | Center Frequency | $F_c$            |      | 495     |          | MHz  |
|                                     | Insertion Loss   | F1-F2            |      | 2.0     | 3.0      | dB   |
|                                     | VSWR             | F1-F2            |      | 1.3     | 1.8      | :1   |
| Stop Band, Lower                    | Insertion Loss   | DC-F3            | 20   | 27      |          | dB   |
|                                     | VSWR             | DC-F3            |      | 29      |          | :1   |
| Stop Band, Upper                    | Insertion Loss   | F4-F5            | 20   | 30      |          | dB   |
|                                     | VSWR             | F4-F5            |      | 27      |          | :1   |
| Maximum Deviation from Linear Phase |                  | $F_c \pm 30$ MHz |      | $\pm 9$ | $\pm 18$ | deg  |

## Maximum Ratings

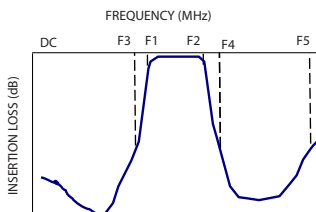
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power Input        | 1W max.        |

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

## Functional Schematic



## Typical Frequency Response

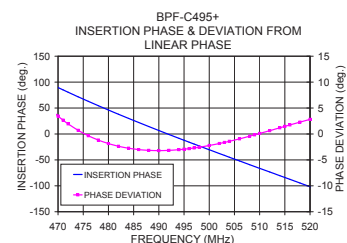
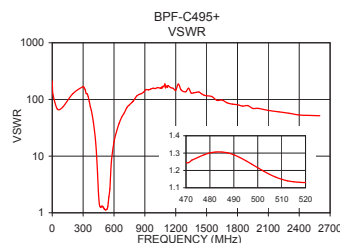
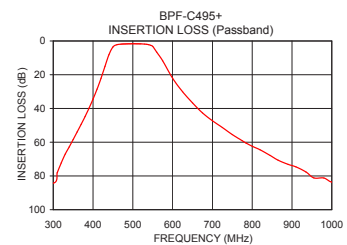
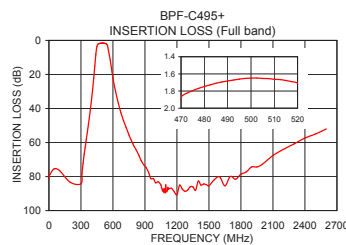


## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (nsec) |
|-----------------|---------------------|-----------|-----------------|--------------------|
| 0.5             | 87.14               | 211.87    | 465.0           | 8.60               |
| 370.0           | 48.91               | 74.88     | 466.0           | 7.39               |
| 410.0           | 28.18               | 28.64     | 470.0           | 3.46               |
| 430.0           | 14.83               | 11.27     | 472.0           | 1.95               |
| 440.0           | 8.14                | 4.95      | 474.0           | 0.70               |
| 450.0           | 3.85                | 2.08      | 476.0           | -0.34              |
| 460.0           | 2.45                | 1.34      | 478.0           | -1.18              |
| 470.0           | 2.06                | 1.25      | 480.0           | -1.85              |
| 480.0           | 1.90                | 1.30      | 484.0           | -2.75              |
| 495.0           | 1.79                | 1.26      | 490.0           | -3.21              |
| 510.0           | 1.76                | 1.15      | 495.0           | -2.93              |
| 520.0           | 1.78                | 1.13      | 500.0           | -2.22              |
| 550.0           | 3.17                | 1.90      | 503.0           | -1.63              |
| 560.0           | 6.57                | 2.63      | 504.0           | -1.41              |
| 575.0           | 11.67               | 8.09      | 506.0           | -0.94              |
| 600.0           | 21.88               | 17.81     | 510.0           | 0.10               |
| 625.0           | 29.80               | 27.07     | 515.0           | 1.47               |
| 700.0           | 46.47               | 57.93     | 518.0           | 2.28               |
| 1200.0          | 90.71               | 145.46    | 520.0           | 2.81               |
| 2600.0          | 52.36               | 51.57     | 525.0           | 3.99               |

## +RoHS Compliant

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



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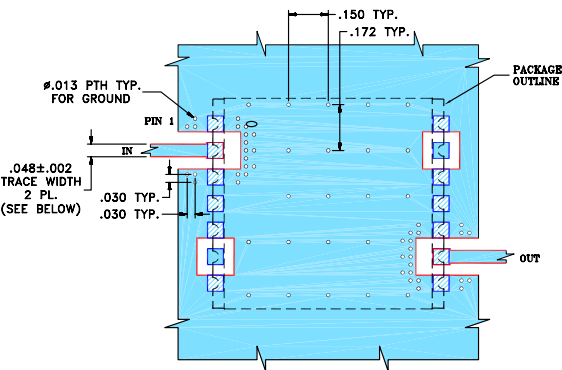
[www.minicircuits.com](http://www.minicircuits.com) P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 [sales@minicircuits.com](mailto:sales@minicircuits.com)

REV. A  
M160513  
BPF-C495+  
EDR-9350AUF1  
RAV/URJ/NY  
161230  
Page 2 of 3

Pad Connections

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

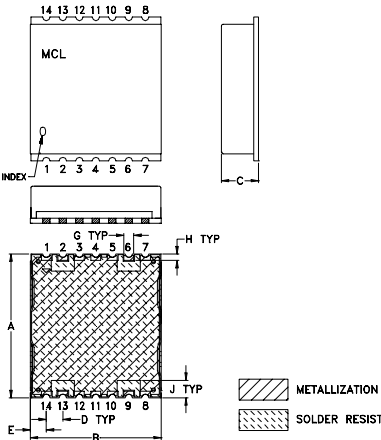
Demo Board MCL P/N: TB-500+  
Suggested PCB Layout (PL-294)



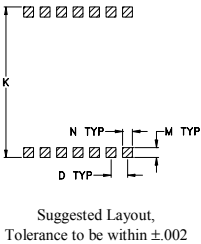
- NOTES:
- 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B, DIELECTRIC THICKNESS: .030" ± .002"; COPPER: 1/2 OZ ON EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

Outline Drawing



PCB Land Pattern



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  |

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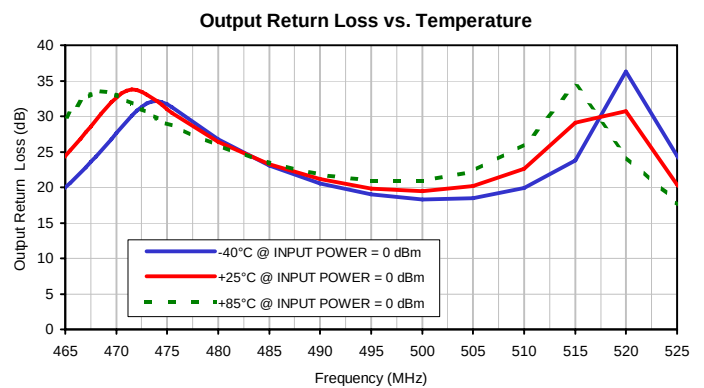
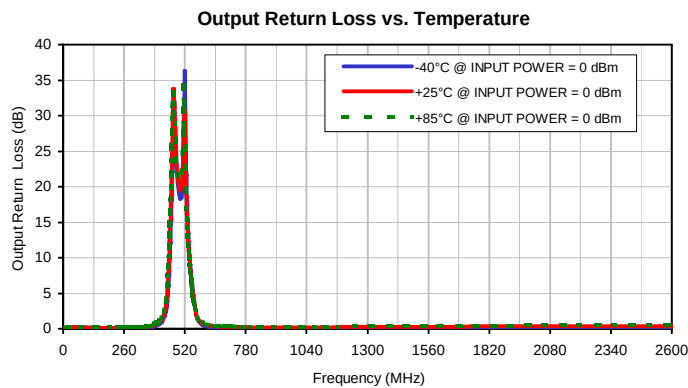
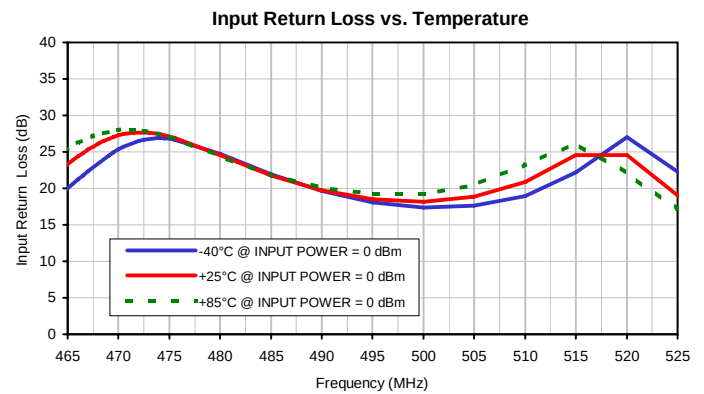
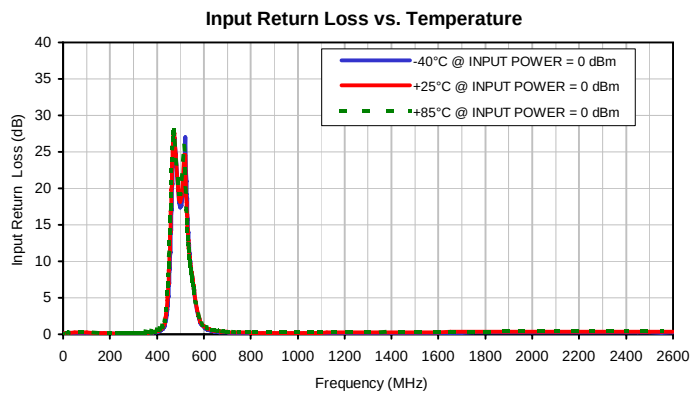
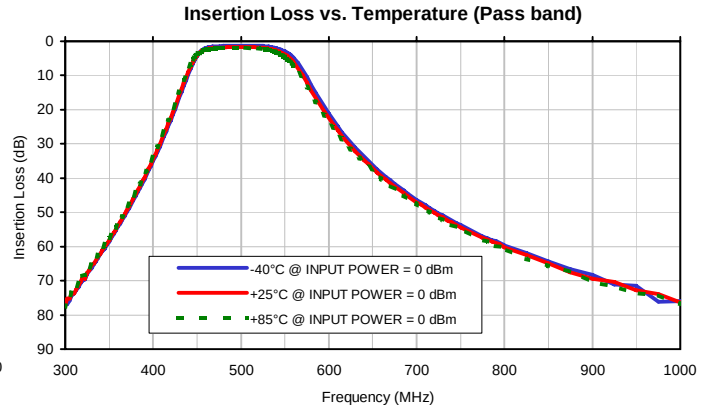
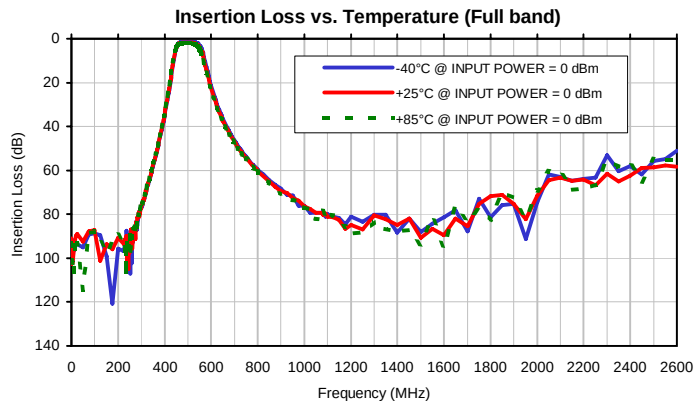
## Typical Performance Data

| FREQ.  | INSERTION LOSS |        |        | INPUT RETURN LOSS |        |        | OUTPUT RETURN LOSS |        |        |
|--------|----------------|--------|--------|-------------------|--------|--------|--------------------|--------|--------|
| (MHz)  | (dB)           |        |        | (dB)              |        |        | (dB)               |        |        |
|        | @-40°C         | @+25°C | @+85°C | @-40°C            | @+25°C | @+85°C | @-40°C             | @+25°C | @+85°C |
| 0.5    | 95.47          | 91.08  | 94.38  | 0.06              | 0.09   | 0.11   | 0.05               | 0.08   | 0.11   |
| 1.0    | 94.06          | 102.59 | 93.19  | 0.06              | 0.08   | 0.10   | 0.06               | 0.08   | 0.11   |
| 5.0    | 101.18         | 101.95 | 102.43 | 0.09              | 0.11   | 0.13   | 0.08               | 0.11   | 0.14   |
| 10.0   | 91.83          | 95.36  | 107.04 | 0.11              | 0.14   | 0.15   | 0.10               | 0.14   | 0.17   |
| 50.0   | 94.94          | 92.55  | 114.36 | 0.21              | 0.24   | 0.26   | 0.20               | 0.23   | 0.25   |
| 75.0   | 89.20          | 87.91  | 88.64  | 0.21              | 0.25   | 0.26   | 0.17               | 0.22   | 0.26   |
| 125.0  | 89.50          | 101.17 | 91.55  | 0.17              | 0.20   | 0.22   | 0.12               | 0.17   | 0.20   |
| 150.0  | 99.05          | 93.57  | 97.89  | 0.15              | 0.18   | 0.20   | 0.09               | 0.15   | 0.18   |
| 175.0  | 120.83         | 95.91  | 93.46  | 0.12              | 0.16   | 0.17   | 0.07               | 0.13   | 0.17   |
| 200.0  | 95.55          | 90.80  | 89.60  | 0.11              | 0.14   | 0.16   | 0.06               | 0.12   | 0.15   |
| 240.0  | 94.66          | 101.00 | 93.43  | 0.09              | 0.12   | 0.14   | 0.04               | 0.11   | 0.15   |
| 250.0  | 91.41          | 97.46  | 89.33  | 0.08              | 0.12   | 0.14   | 0.03               | 0.11   | 0.15   |
| 260.0  | 88.69          | 95.78  | 90.77  | 0.08              | 0.12   | 0.14   | 0.04               | 0.12   | 0.16   |
| 270.0  | 88.57          | 89.98  | 84.61  | 0.08              | 0.12   | 0.14   | 0.04               | 0.12   | 0.16   |
| 280.0  | 87.30          | 83.78  | 84.08  | 0.08              | 0.12   | 0.14   | 0.04               | 0.13   | 0.17   |
| 290.0  | 78.68          | 81.11  | 80.93  | 0.08              | 0.12   | 0.14   | 0.05               | 0.13   | 0.17   |
| 300.0  | 76.20          | 77.20  | 77.55  | 0.09              | 0.13   | 0.15   | 0.05               | 0.14   | 0.18   |
| 310.0  | 73.73          | 73.73  | 72.97  | 0.09              | 0.13   | 0.16   | 0.06               | 0.16   | 0.20   |
| 320.0  | 70.00          | 69.08  | 68.70  | 0.10              | 0.14   | 0.17   | 0.07               | 0.17   | 0.22   |
| 330.0  | 66.46          | 65.52  | 65.30  | 0.10              | 0.15   | 0.18   | 0.08               | 0.19   | 0.24   |
| 340.0  | 62.12          | 62.12  | 61.79  | 0.11              | 0.16   | 0.19   | 0.10               | 0.21   | 0.27   |
| 350.0  | 58.58          | 58.18  | 57.68  | 0.13              | 0.18   | 0.21   | 0.13               | 0.25   | 0.31   |
| 360.0  | 54.34          | 53.91  | 53.43  | 0.14              | 0.20   | 0.24   | 0.16               | 0.29   | 0.36   |
| 370.0  | 49.92          | 49.46  | 48.97  | 0.17              | 0.24   | 0.28   | 0.21               | 0.35   | 0.42   |
| 380.0  | 45.30          | 44.79  | 44.27  | 0.20              | 0.28   | 0.32   | 0.27               | 0.43   | 0.51   |
| 400.0  | 35.08          | 34.47  | 33.85  | 0.31              | 0.42   | 0.49   | 0.48               | 0.69   | 0.82   |
| 410.0  | 29.38          | 28.67  | 27.97  | 0.42              | 0.56   | 0.65   | 0.66               | 0.92   | 1.09   |
| 420.0  | 23.19          | 22.40  | 21.61  | 0.59              | 0.80   | 0.93   | 0.93               | 1.27   | 1.52   |
| 440.0  | 9.70           | 8.94   | 8.25   | 2.06              | 2.85   | 3.52   | 2.55               | 3.54   | 4.38   |
| 460.0  | 2.04           | 2.35   | 2.52   | 14.27             | 17.43  | 20.12  | 14.10              | 17.60  | 21.47  |
| 470.0  | 1.52           | 1.93   | 2.15   | 25.31             | 27.26  | 27.97  | 27.62              | 32.64  | 32.97  |
| 470.5  | 1.51           | 1.92   | 2.15   | 25.69             | 27.44  | 28.04  | 28.49              | 33.21  | 32.62  |
| 471.0  | 1.50           | 1.91   | 2.14   | 25.99             | 27.55  | 28.05  | 29.31              | 33.59  | 32.25  |
| 471.5  | 1.49           | 1.90   | 2.13   | 26.27             | 27.63  | 28.03  | 30.11              | 33.74  | 31.84  |
| 472.0  | 1.48           | 1.89   | 2.12   | 26.50             | 27.67  | 27.99  | 30.80              | 33.69  | 31.41  |
| 472.5  | 1.47           | 1.88   | 2.11   | 26.66             | 27.65  | 27.90  | 31.39              | 33.45  | 30.99  |
| 473.0  | 1.46           | 1.87   | 2.11   | 26.79             | 27.60  | 27.80  | 31.82              | 33.08  | 30.55  |
| 473.5  | 1.45           | 1.86   | 2.09   | 26.88             | 27.54  | 27.67  | 32.08              | 32.65  | 30.16  |
| 474.0  | 1.45           | 1.86   | 2.09   | 26.90             | 27.42  | 27.50  | 32.15              | 32.12  | 29.76  |
| 474.5  | 1.44           | 1.85   | 2.08   | 26.88             | 27.29  | 27.32  | 32.00              | 31.58  | 29.37  |
| 475.0  | 1.43           | 1.84   | 2.08   | 26.80             | 27.10  | 27.11  | 31.71              | 31.03  | 29.00  |
| 475.5  | 1.43           | 1.84   | 2.07   | 26.69             | 26.90  | 26.87  | 31.26              | 30.47  | 28.62  |
| 480.0  | 1.39           | 1.79   | 2.03   | 24.70             | 24.53  | 24.39  | 26.72              | 26.40  | 25.84  |
| 485.0  | 1.36           | 1.76   | 2.00   | 21.91             | 21.79  | 21.81  | 23.06              | 23.27  | 23.46  |
| 490.0  | 1.35           | 1.75   | 1.98   | 19.63             | 19.75  | 20.06  | 20.58              | 21.13  | 21.76  |
| 495.0  | 1.35           | 1.74   | 1.97   | 18.11             | 18.54  | 19.18  | 19.01              | 19.85  | 20.86  |
| 500.0  | 1.35           | 1.74   | 1.96   | 17.39             | 18.19  | 19.23  | 18.27              | 19.47  | 20.91  |
| 505.0  | 1.34           | 1.73   | 1.96   | 17.59             | 18.86  | 20.44  | 18.45              | 20.16  | 22.25  |
| 510.0  | 1.32           | 1.73   | 1.97   | 18.97             | 20.89  | 23.21  | 19.93              | 22.59  | 26.06  |
| 515.0  | 1.32           | 1.74   | 2.01   | 22.16             | 24.56  | 26.13  | 23.76              | 29.07  | 34.30  |
| 520.0  | 1.33           | 1.79   | 2.09   | 27.00             | 24.57  | 22.12  | 36.28              | 30.69  | 24.41  |
| 530.0  | 1.54           | 2.09   | 2.48   | 16.65             | 14.93  | 13.83  | 17.16              | 15.28  | 13.81  |
| 540.0  | 2.06           | 2.74   | 3.25   | 10.69             | 10.33  | 10.01  | 10.28              | 9.53   | 8.79   |
| 550.0  | 3.03           | 3.93   | 4.70   | 7.82              | 7.96   | 7.82   | 6.52               | 6.03   | 5.50   |
| 600.0  | 21.15          | 22.50  | 23.53  | 0.95              | 1.11   | 1.19   | 0.47               | 0.66   | 0.75   |
| 605.0  | 23.02          | 24.31  | 25.30  | 0.82              | 0.97   | 1.05   | 0.41               | 0.60   | 0.69   |
| 610.0  | 24.81          | 26.03  | 26.97  | 0.72              | 0.87   | 0.94   | 0.37               | 0.55   | 0.65   |
| 615.0  | 26.50          | 27.67  | 28.57  | 0.65              | 0.79   | 0.86   | 0.33               | 0.51   | 0.61   |
| 620.0  | 28.10          | 29.23  | 30.10  | 0.58              | 0.71   | 0.78   | 0.30               | 0.48   | 0.57   |
| 625.0  | 29.61          | 30.70  | 31.54  | 0.53              | 0.66   | 0.72   | 0.28               | 0.46   | 0.55   |
| 630.0  | 31.07          | 32.11  | 32.92  | 0.49              | 0.61   | 0.67   | 0.26               | 0.43   | 0.52   |
| 635.0  | 32.45          | 33.47  | 34.25  | 0.45              | 0.56   | 0.63   | 0.24               | 0.41   | 0.50   |
| 640.0  | 33.77          | 34.76  | 35.53  | 0.41              | 0.53   | 0.59   | 0.22               | 0.39   | 0.48   |
| 645.0  | 35.04          | 35.99  | 36.75  | 0.39              | 0.50   | 0.55   | 0.21               | 0.38   | 0.46   |
| 650.0  | 36.25          | 37.19  | 37.91  | 0.36              | 0.46   | 0.52   | 0.19               | 0.36   | 0.44   |
| 700.0  | 46.36          | 47.07  | 47.61  | 0.22              | 0.31   | 0.35   | 0.11               | 0.27   | 0.35   |
| 800.0  | 59.71          | 60.24  | 60.60  | 0.14              | 0.21   | 0.25   | 0.05               | 0.21   | 0.29   |
| 1000.0 | 76.04          | 76.42  | 76.65  | 0.13              | 0.21   | 0.25   | 0.02               | 0.20   | 0.28   |
| 2000.0 | 74.46          | 71.48  | 69.16  | 0.22              | 0.34   | 0.41   | 0.07               | 0.35   | 0.52   |
| 2600.0 | 50.95          | 58.37  | 55.17  | 0.23              | 0.37   | 0.45   | 0.05               | 0.37   | 0.55   |

## Typical Performance Data

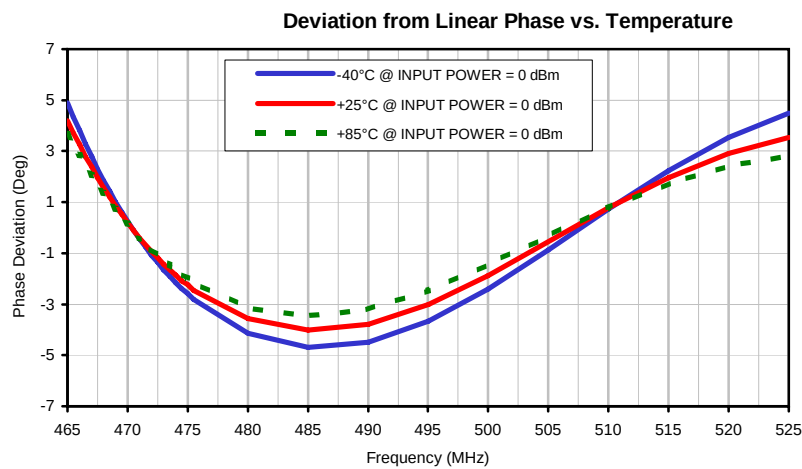
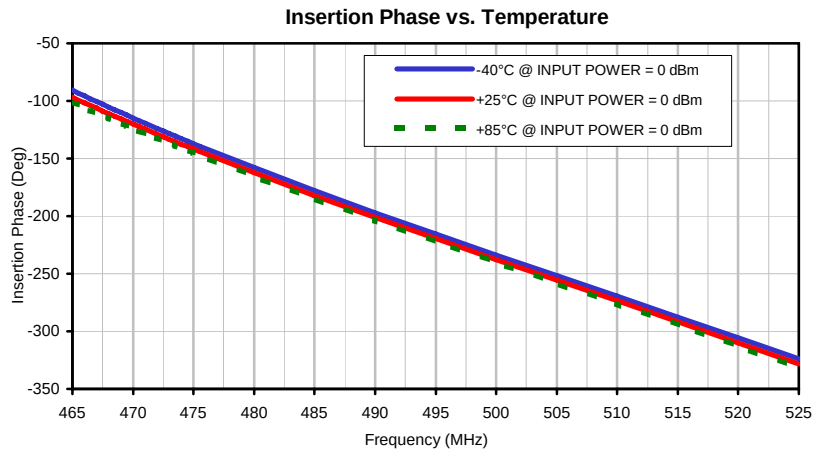
| FREQ. | Deviation from Linear Phase |        |        | Insertion Phase |         |         |
|-------|-----------------------------|--------|--------|-----------------|---------|---------|
| (MHz) | (Deg.)                      |        |        | (Deg.)          |         |         |
|       | @-40°C                      | @+25°C | @+85°C | @-40°C          | @+25°C  | @+85°C  |
| 465.0 | 4.89                        | 4.19   | 3.66   | -90.67          | -96.87  | -101.18 |
| 465.5 | 4.34                        | 3.71   | 3.25   | -93.16          | -99.28  | -103.51 |
| 466.0 | 3.81                        | 3.26   | 2.84   | -95.64          | -101.65 | -105.83 |
| 466.5 | 3.29                        | 2.79   | 2.45   | -98.10          | -104.05 | -108.13 |
| 467.0 | 2.79                        | 2.38   | 2.07   | -100.54         | -106.38 | -110.43 |
| 467.5 | 2.27                        | 1.95   | 1.70   | -103.00         | -108.74 | -112.71 |
| 468.0 | 1.85                        | 1.57   | 1.35   | -105.37         | -111.04 | -114.97 |
| 468.5 | 1.42                        | 1.21   | 1.04   | -107.74         | -113.33 | -117.20 |
| 469.0 | 1.01                        | 0.85   | 0.74   | -110.09         | -115.61 | -119.41 |
| 469.5 | 0.61                        | 0.52   | 0.44   | -112.43         | -117.87 | -121.62 |
| 470.0 | 0.25                        | 0.20   | 0.16   | -114.74         | -120.11 | -123.82 |
| 470.5 | -0.11                       | -0.11  | -0.12  | -117.04         | -122.35 | -126.01 |
| 471.0 | -0.45                       | -0.42  | -0.40  | -119.32         | -124.58 | -128.20 |
| 471.5 | -0.76                       | -0.68  | -0.61  | -121.57         | -126.77 | -130.33 |
| 472.0 | -1.08                       | -0.93  | -0.84  | -123.83         | -128.94 | -132.47 |
| 472.5 | -1.36                       | -1.18  | -1.06  | -126.06         | -131.12 | -134.60 |
| 473.0 | -1.65                       | -1.44  | -1.26  | -128.29         | -133.30 | -136.72 |
| 473.5 | -1.92                       | -1.66  | -1.46  | -130.50         | -135.45 | -138.83 |
| 474.0 | -2.15                       | -1.86  | -1.65  | -132.67         | -137.57 | -140.93 |
| 474.5 | -2.39                       | -2.07  | -1.84  | -134.86         | -139.71 | -143.04 |
| 475.0 | -2.59                       | -2.23  | -1.97  | -137.00         | -141.79 | -145.08 |
| 475.5 | -2.82                       | -2.45  | -2.15  | -139.17         | -143.94 | -147.17 |
| 480.0 | -4.15                       | -3.57  | -3.13  | -157.98         | -162.39 | -165.37 |
| 485.0 | -4.68                       | -4.01  | -3.47  | -177.94         | -182.08 | -184.85 |
| 490.0 | -4.48                       | -3.78  | -3.21  | -197.16         | -201.10 | -203.72 |
| 495.0 | -3.67                       | -3.00  | -2.47  | -215.77         | -219.57 | -222.11 |
| 500.0 | -2.41                       | -1.87  | -1.47  | -233.94         | -237.69 | -240.24 |
| 505.0 | -0.88                       | -0.55  | -0.32  | -251.83         | -255.62 | -258.23 |
| 510.0 | 0.73                        | 0.77   | 0.79   | -269.65         | -273.55 | -276.25 |
| 515.0 | 2.24                        | 1.95   | 1.73   | -287.56         | -291.62 | -294.44 |
| 520.0 | 3.54                        | 2.90   | 2.42   | -305.68         | -309.92 | -312.89 |
| 525.0 | 4.50                        | 3.55   | 2.80   | -324.15         | -328.52 | -331.64 |

## Typical Performance Curves



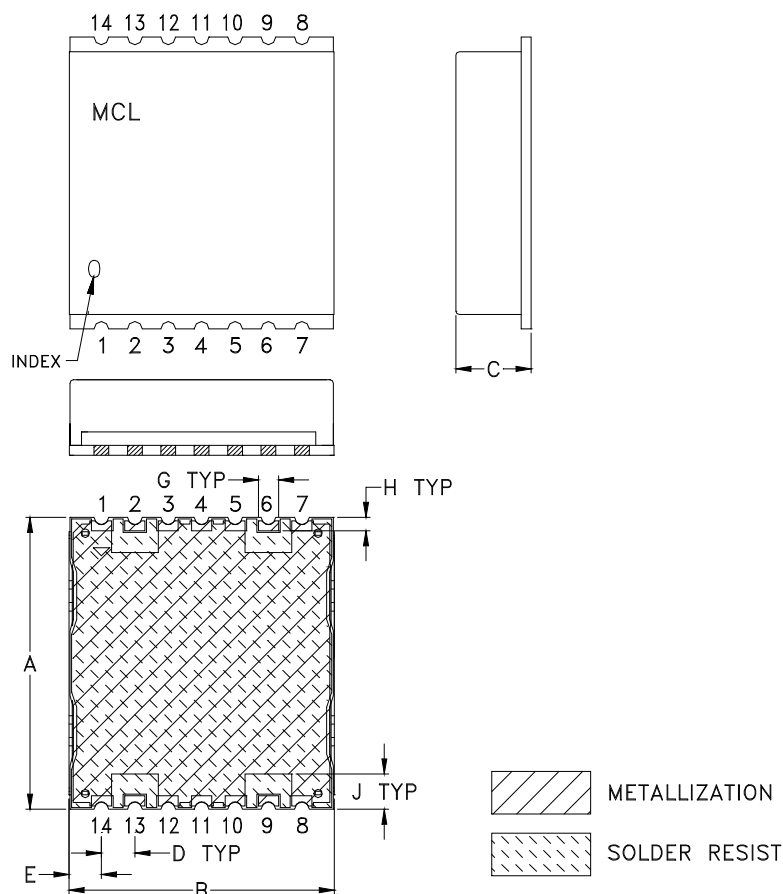
# Surface Mount Band Pass Filter BPF-C495+

## Typical Performance Curves

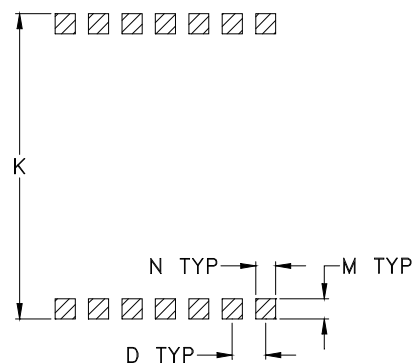


## Outline Dimensions

HU1186



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

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

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

### Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. 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.

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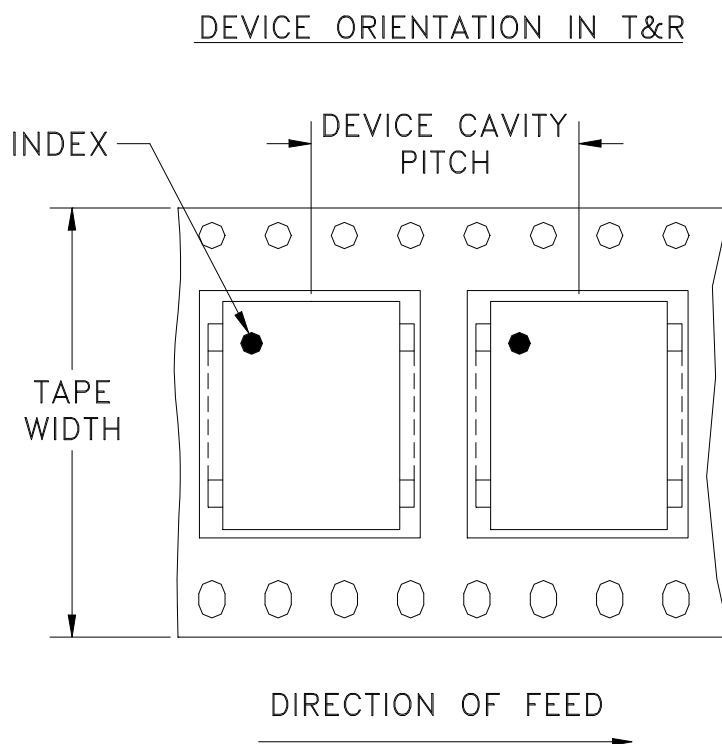
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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F21



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 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)



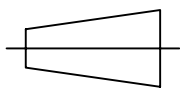
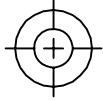
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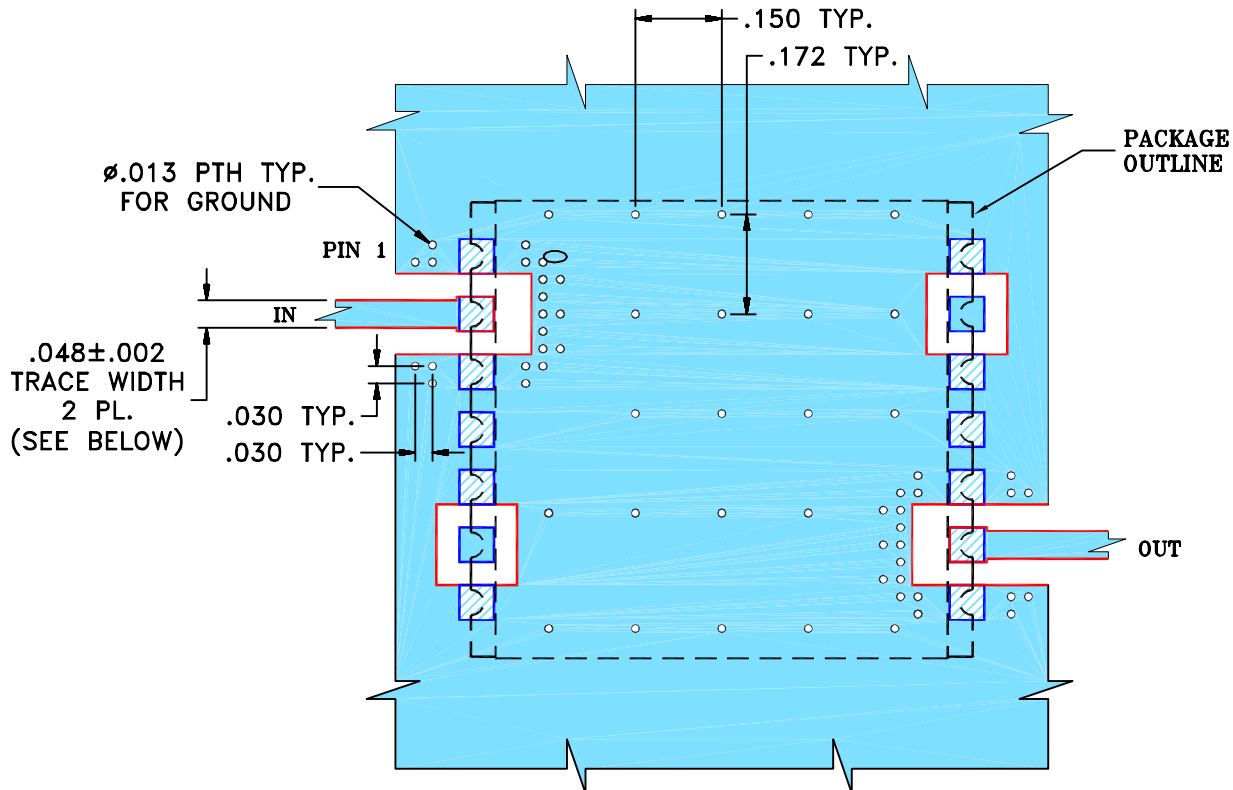
## THIRD ANGLE PROJECTION



## 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

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

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

A

CODE IDENT

15542

DRAWING NO:

98-PL-294

REV:

OR

FILE:

98PL294

SCALE:

3:1

SHEET:

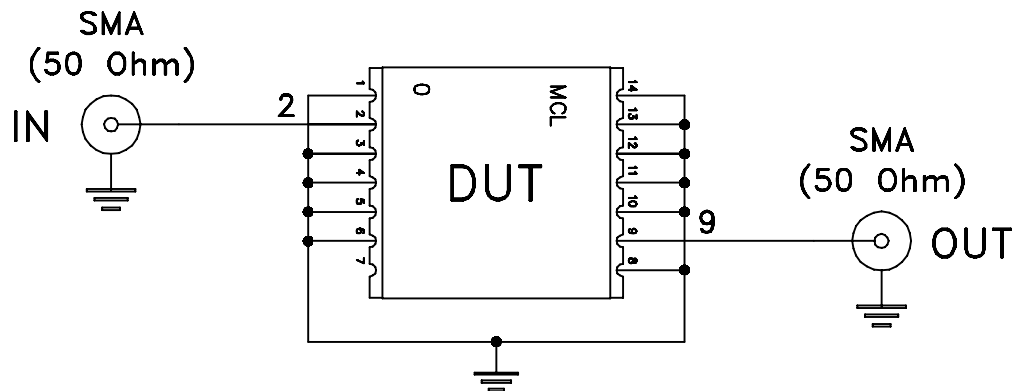
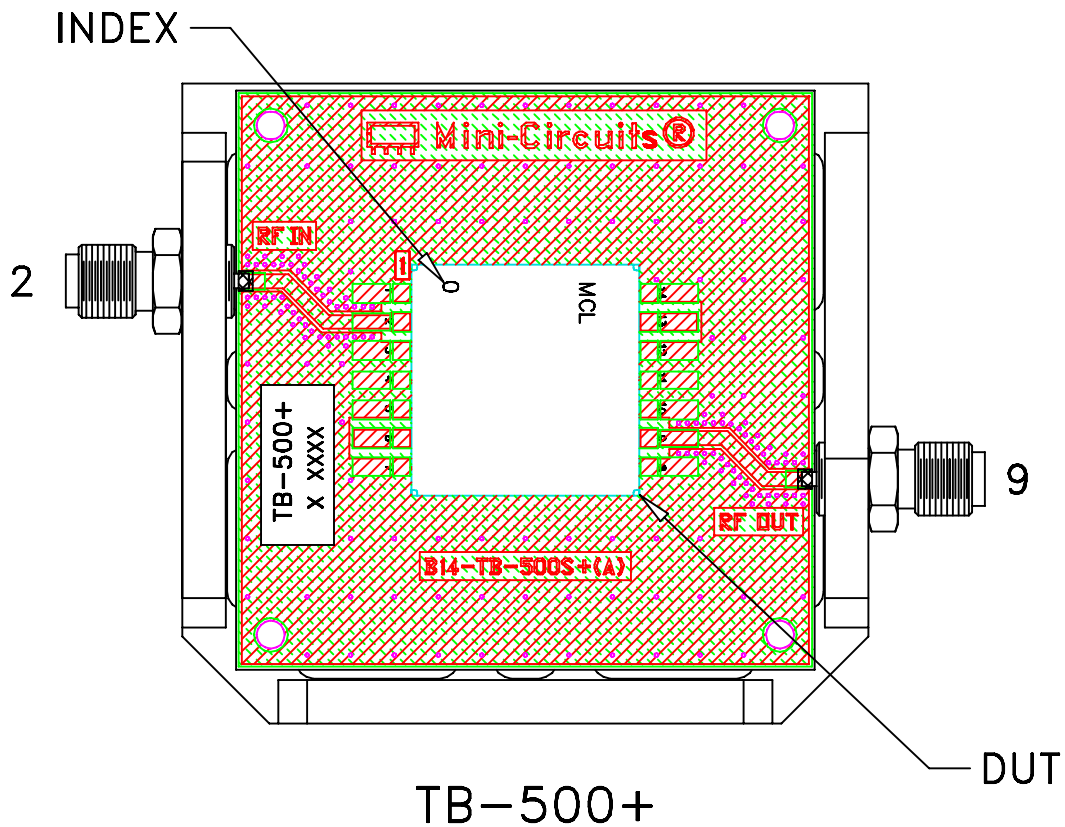
1 OF 1

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

# Evaluation Board and Circuit



Schematic Diagram

## 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          |