

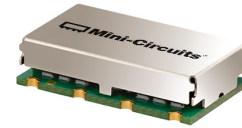
# Surface Mount Power Splitter/Combiner

## SCPS-4-62+

4 Way-0° 50Ω 1 to 650 MHz

### The Big Deal

- Excellent matching VSWR, 1.1:1
- Low unbalance, 0.3 dB / 1°
- Good isolation, 26 dB



CASE STYLE: HF1485-1

### Product Overview

Mini-Circuits' SCPS-4-62+ is a surface-mount 4-way 0° splitter/combiner covering the 1 to 650 MHz frequency range, supporting bandwidth requirements for a wide range of RF/microwave systems. This model can handle up to 1W RF input power as a splitter and provides high isolation, excellent VSWR, low amplitude unbalance, and low phase unbalance. The unit comes housed in a miniature, shielded, 8-lead package (0.44 x 0.74 x 0.19") with wrap-around terminations for excellent solderability.

### Key Features

| Feature                                                  | Advantages                                                                                                                                                                           |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low insertion loss, 1.0 dB (above 6 dB theoretical loss) | The combination of 1W power handling and low insertion loss makes this model a suitable candidate for distributing signals while maintaining excellent transmission of signal power. |
| Excellent matching VSWR, 1.1:1                           | Provides excellent thru-path transmission with low signal reflection.                                                                                                                |
| High isolation, 26 dB                                    | Minimizes interference between ports.                                                                                                                                                |
| Low unbalance, 0.3 dB / 1°                               | Low unbalance provides nearly equal output signals, ideal for parallel path/multichannel systems.                                                                                    |
| Small size, 0.44 x 0.74 x 0.19"                          | Saves space in dense PCB layouts.                                                                                                                                                    |

#### 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.  
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4 Way-0° 50Ω 1 to 650 MHz

CASE STYLE: HF1485-1

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

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 1W max.        |
| Internal Dissipation        | 0.25W max.     |

Permanent damage may occur if any of these limits are exceeded

|          |       |
|----------|-------|
| SUM PORT | 3     |
| PORT 1   | 2     |
| PORT 2   | 4     |
| PORT 3   | 6     |
| PORT 4   | 8     |
| GROUND   | 1.5.7 |

- wideband, 1 to 650 MHz,
- excellent phase unbalance, 1 deg. typ.
- good isolation, 26 dB typ.
- excellent amplitude unbalance, 0.3 dB typ.
- excellent matching VSWR, 1.2:1 typ.
- rugged, shielded case

- communication systems
- instrumentation
- cellular, GPS, PCS
- VHF/UHF/receivers/transmitters

**TOP VIEW**

**BOTTOM VIEW**

**INDEX**

**LEGEND:**

- ▨ DENOTES METALLIZATION
- ▩ DENOTES SOLDER RESIST

| A     | B     | C     | D    | E    | F    | G     |
|-------|-------|-------|------|------|------|-------|
| .440  | .740  | .19   | .200 | .07  | .140 | .110  |
| 11.18 | 18.80 | 4.83  | 5.08 | 1.78 | 3.56 | 2.79  |
| H     | J     | K     | L    | M    |      | wt    |
| .060  | .200  | .480  | .100 | .065 |      | grams |
| 1.52  | 5.08  | 12.19 | 2.54 | 1.65 |      | 3.00  |

Figure 6 is a detailed cross-sectional view of the package outline. It shows four vertical pins labeled P1, P2, P3, and P4 at the top. The overall width is .060 with 3 PL (lead) thickness. The height of the package body is .390. The distance from the bottom edge to the start of the pins is .170. The pin diameter is .040. The pitch between pins is .140 TYP. The distance from the center of PIN 1 to the center of the next pin is S. The distance from the center of the next pin to the right edge is .028. The package body has a #.020 PTH FOR GROUND. The lead thickness is .066±.002 LINE WIDTH, 5 PL. (SEE NOTE 1).

**RULES:**

1. LINE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"±.002". COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS LINE 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.

| Parameter                   | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------------------------|-----------------|------|------|------|------|
| Frequency Range             |                 | 1    | —    | 650  | MHz  |
| Insertion Loss Above 6.0 dB | 1 - 280         | —    | 0.6  | 0.9  | dB   |
|                             | 280 - 600       | —    | 1.0  | 1.5  |      |
|                             | 600 - 650       | —    | 1.4  | 1.8  |      |
| Isolation                   | 1 - 280         | 21   | 30   | —    | dB   |
|                             | 280 - 600       | 21   | 26   | —    |      |
|                             | 600 - 650       | 18   | 24   | —    |      |
| Phase Unbalance             | 1 - 280         | —    | 1    | 3    | deg. |
|                             | 280 - 600       | —    | 2    | 4    |      |
|                             | 600 - 650       | —    | 3    | 6    |      |
| Amplitude Unbalance         | 1 - 280         | —    | 0.1  | 0.2  | dB   |
|                             | 280 - 600       | —    | 0.3  | 0.5  |      |
|                             | 600 - 650       | —    | 0.4  | 0.7  |      |
| VSWR (Port S)               | 1 - 280         | —    | 1.2  | 1.3  | :1   |
|                             | 280 - 600       | —    | 1.2  | 1.37 |      |
|                             | 600 - 650       | —    | 1.4  | 1.65 |      |
| VSWR (Port 1-4)             | 1 - 280         | —    | 1.2  | 1.3  | :1   |
|                             | 280 - 600       | —    | 1.1  | 1.28 |      |
|                             | 600 - 650       | —    | 1.15 | 1.3  |      |

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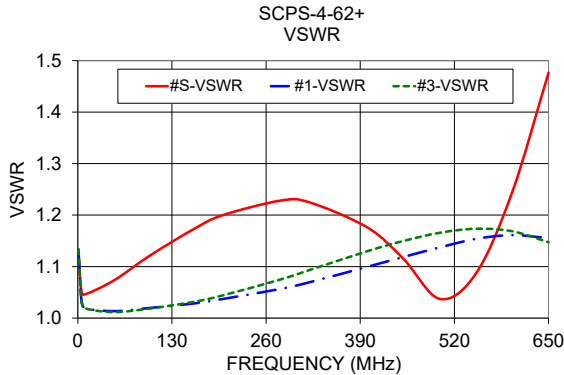
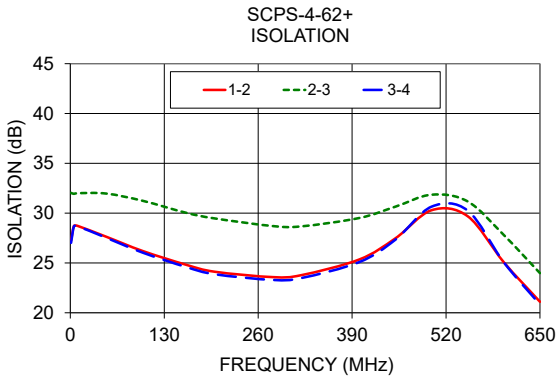
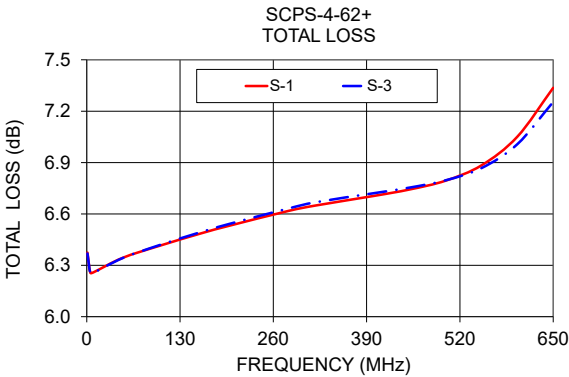


REV. OR  
M159595  
SCPS-4-62+  
ED-16290/1  
PW/CP/AM  
230328  
Page 2 of 3

Typical Performance Data

| Freq.<br>(MHz) | Total Loss <sup>1</sup><br>(dB) |      |      |      | Amp.<br>Unbal.<br>(dB) | Isolation<br>(dB) |       |       | Phase<br>Unbal.<br>(deg.) | VSWR<br>S | VSWR<br>1 | VSWR<br>2 | VSWR<br>3 | VSWR<br>4 |
|----------------|---------------------------------|------|------|------|------------------------|-------------------|-------|-------|---------------------------|-----------|-----------|-----------|-----------|-----------|
|                | S-1                             | S-2  | S-3  | S-4  |                        | 1-2               | 2-3   | 3-4   |                           |           |           |           |           |           |
| 1              | 6.37                            | 6.36 | 6.37 | 6.38 | 0.01                   | 27.24             | 32.03 | 27.02 | 0.04                      | 1.12      | 1.13      | 1.13      | 1.13      | 1.13      |
| 5              | 6.26                            | 6.25 | 6.25 | 6.26 | 0.01                   | 28.71             | 31.94 | 28.67 | 0.02                      | 1.05      | 1.03      | 1.03      | 1.03      | 1.04      |
| 10             | 6.26                            | 6.26 | 6.26 | 6.26 | 0.00                   | 28.72             | 32.00 | 28.69 | 0.04                      | 1.05      | 1.02      | 1.02      | 1.02      | 1.02      |
| 50             | 6.34                            | 6.34 | 6.34 | 6.34 | 0.00                   | 27.62             | 31.96 | 27.52 | 0.08                      | 1.07      | 1.01      | 1.01      | 1.01      | 1.01      |
| 100            | 6.41                            | 6.41 | 6.42 | 6.41 | 0.01                   | 26.21             | 31.24 | 26.04 | 0.19                      | 1.12      | 1.02      | 1.02      | 1.02      | 1.02      |
| 160            | 6.49                            | 6.49 | 6.50 | 6.48 | 0.02                   | 24.83             | 30.04 | 24.60 | 0.33                      | 1.17      | 1.03      | 1.03      | 1.03      | 1.03      |
| 200            | 6.53                            | 6.53 | 6.54 | 6.52 | 0.02                   | 24.12             | 29.47 | 23.87 | 0.40                      | 1.20      | 1.04      | 1.04      | 1.04      | 1.04      |
| 280            | 6.62                            | 6.62 | 6.63 | 6.59 | 0.04                   | 23.58             | 28.71 | 23.30 | 0.55                      | 1.23      | 1.06      | 1.07      | 1.07      | 1.07      |
| 320            | 6.65                            | 6.66 | 6.67 | 6.62 | 0.05                   | 23.78             | 28.67 | 23.49 | 0.66                      | 1.22      | 1.07      | 1.09      | 1.09      | 1.08      |
| 400            | 6.71                            | 6.71 | 6.72 | 6.65 | 0.07                   | 25.35             | 29.51 | 25.09 | 0.86                      | 1.18      | 1.10      | 1.13      | 1.13      | 1.12      |
| 450            | 6.74                            | 6.76 | 6.75 | 6.67 | 0.09                   | 27.48             | 30.65 | 27.34 | 0.97                      | 1.11      | 1.12      | 1.15      | 1.15      | 1.14      |
| 500            | 6.79                            | 6.81 | 6.80 | 6.69 | 0.12                   | 30.30             | 31.85 | 30.65 | 1.11                      | 1.04      | 1.14      | 1.17      | 1.17      | 1.16      |
| 550            | 6.88                            | 6.91 | 6.87 | 6.75 | 0.16                   | 29.69             | 31.17 | 30.25 | 1.29                      | 1.09      | 1.15      | 1.18      | 1.17      | 1.18      |
| 600            | 7.05                            | 7.08 | 7.01 | 6.87 | 0.21                   | 25.07             | 27.80 | 25.06 | 1.47                      | 1.25      | 1.16      | 1.18      | 1.17      | 1.18      |
| 650            | 7.34                            | 7.37 | 7.25 | 7.09 | 0.27                   | 21.11             | 23.98 | 20.83 | 1.67                      | 1.48      | 1.16      | 1.15      | 1.15      | 1.17      |

1. Total Loss = Insertion Loss + 6dB splitter loss.



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# 4 Way-0° Power Splitter/Combiner

SCPS-4-62+

## Typical Performance Data

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      |      |      | AMP.<br>UNBAL.<br>(dB) | ISOLATION<br>(dB) |       |       | PHASE<br>UNBAL.<br>(deg.) | FREQ.<br>(MHz) | VSWR<br>(:1) |      |      |      |      |
|----------------|---------------------------------|------|------|------|------------------------|-------------------|-------|-------|---------------------------|----------------|--------------|------|------|------|------|
|                | S-1                             | S-2  | S-3  | S-4  |                        | 1-2               | 2-3   | 3-4   |                           |                | S            | 1    | 2    | 3    | 4    |
| 0.3            | 6.58                            | 6.57 | 6.56 | 6.57 | 0.01                   | 24.85             | 31.94 | 24.39 | 0.16                      | 0.3            | 1.26         | 1.32 | 1.32 | 1.33 | 1.33 |
| 0.5            | 6.49                            | 6.48 | 6.48 | 6.49 | 0.01                   | 25.98             | 32.07 | 25.65 | 0.09                      | 0.5            | 1.18         | 1.22 | 1.22 | 1.22 | 1.22 |
| 0.7            | 6.43                            | 6.42 | 6.42 | 6.43 | 0.01                   | 26.60             | 32.10 | 26.32 | 0.07                      | 0.7            | 1.15         | 1.17 | 1.17 | 1.17 | 1.17 |
| 0.9            | 6.39                            | 6.38 | 6.38 | 6.39 | 0.01                   | 27.04             | 32.03 | 26.82 | 0.05                      | 0.9            | 1.12         | 1.14 | 1.14 | 1.14 | 1.15 |
| 1              | 6.37                            | 6.36 | 6.37 | 6.38 | 0.01                   | 27.24             | 32.03 | 27.02 | 0.04                      | 1              | 1.12         | 1.13 | 1.13 | 1.13 | 1.13 |
| 2              | 6.29                            | 6.30 | 6.30 | 6.30 | 0.00                   | 28.10             | 31.94 | 27.98 | 0.06                      | 2              | 1.08         | 1.08 | 1.08 | 1.08 | 1.08 |
| 3              | 6.27                            | 6.27 | 6.27 | 6.27 | 0.01                   | 28.51             | 32.02 | 28.41 | 0.03                      | 3              | 1.06         | 1.05 | 1.05 | 1.05 | 1.06 |
| 4              | 6.26                            | 6.25 | 6.26 | 6.26 | 0.01                   | 28.64             | 31.96 | 28.59 | 0.02                      | 4              | 1.06         | 1.04 | 1.04 | 1.04 | 1.04 |
| 5              | 6.26                            | 6.25 | 6.25 | 6.26 | 0.01                   | 28.71             | 31.94 | 28.67 | 0.02                      | 5              | 1.05         | 1.03 | 1.03 | 1.03 | 1.04 |
| 6              | 6.25                            | 6.25 | 6.25 | 6.26 | 0.01                   | 28.74             | 32.00 | 28.69 | 0.02                      | 6              | 1.05         | 1.03 | 1.03 | 1.03 | 1.03 |
| 7              | 6.25                            | 6.25 | 6.25 | 6.25 | 0.00                   | 28.76             | 31.96 | 28.71 | 0.03                      | 7              | 1.05         | 1.03 | 1.03 | 1.03 | 1.03 |
| 8              | 6.25                            | 6.25 | 6.25 | 6.26 | 0.00                   | 28.75             | 31.94 | 28.71 | 0.03                      | 8              | 1.05         | 1.02 | 1.02 | 1.02 | 1.02 |
| 9              | 6.26                            | 6.25 | 6.25 | 6.26 | 0.00                   | 28.77             | 31.97 | 28.69 | 0.03                      | 9              | 1.05         | 1.02 | 1.02 | 1.02 | 1.02 |
| 10             | 6.26                            | 6.26 | 6.26 | 6.26 | 0.00                   | 28.72             | 32.00 | 28.69 | 0.04                      | 10             | 1.05         | 1.02 | 1.02 | 1.02 | 1.02 |
| 20             | 6.28                            | 6.28 | 6.28 | 6.28 | 0.00                   | 28.48             | 32.10 | 28.43 | 0.05                      | 20             | 1.05         | 1.01 | 1.01 | 1.01 | 1.01 |
| 30             | 6.31                            | 6.31 | 6.31 | 6.30 | 0.00                   | 28.22             | 32.09 | 28.15 | 0.06                      | 30             | 1.05         | 1.01 | 1.01 | 1.01 | 1.01 |
| 40             | 6.32                            | 6.32 | 6.32 | 6.32 | 0.00                   | 27.93             | 32.06 | 27.84 | 0.06                      | 40             | 1.06         | 1.01 | 1.01 | 1.01 | 1.01 |
| 50             | 6.34                            | 6.34 | 6.34 | 6.34 | 0.00                   | 27.62             | 31.96 | 27.52 | 0.08                      | 50             | 1.07         | 1.01 | 1.01 | 1.01 | 1.01 |
| 60             | 6.36                            | 6.36 | 6.36 | 6.36 | 0.01                   | 27.32             | 31.89 | 27.21 | 0.11                      | 60             | 1.08         | 1.01 | 1.01 | 1.01 | 1.01 |
| 70             | 6.37                            | 6.37 | 6.37 | 6.37 | 0.01                   | 27.03             | 31.78 | 26.90 | 0.15                      | 70             | 1.09         | 1.02 | 1.01 | 1.01 | 1.01 |
| 80             | 6.39                            | 6.39 | 6.39 | 6.38 | 0.01                   | 26.76             | 31.62 | 26.62 | 0.17                      | 80             | 1.10         | 1.02 | 1.01 | 1.02 | 1.01 |
| 90             | 6.40                            | 6.40 | 6.40 | 6.40 | 0.01                   | 26.48             | 31.45 | 26.33 | 0.18                      | 90             | 1.11         | 1.02 | 1.01 | 1.02 | 1.02 |
| 100            | 6.41                            | 6.41 | 6.42 | 6.41 | 0.01                   | 26.21             | 31.24 | 26.04 | 0.19                      | 100            | 1.12         | 1.02 | 1.02 | 1.02 | 1.02 |
| 120            | 6.44                            | 6.44 | 6.44 | 6.44 | 0.01                   | 25.67             | 30.90 | 25.48 | 0.24                      | 120            | 1.14         | 1.02 | 1.02 | 1.02 | 1.02 |
| 140            | 6.46                            | 6.46 | 6.47 | 6.46 | 0.01                   | 25.23             | 30.43 | 25.02 | 0.30                      | 140            | 1.16         | 1.03 | 1.02 | 1.03 | 1.02 |
| 160            | 6.49                            | 6.49 | 6.50 | 6.48 | 0.02                   | 24.83             | 30.04 | 24.60 | 0.33                      | 160            | 1.17         | 1.03 | 1.03 | 1.03 | 1.03 |
| 180            | 6.51                            | 6.51 | 6.52 | 6.50 | 0.01                   | 24.41             | 29.78 | 24.17 | 0.33                      | 180            | 1.19         | 1.03 | 1.04 | 1.04 | 1.03 |
| 200            | 6.53                            | 6.53 | 6.54 | 6.52 | 0.02                   | 24.12             | 29.47 | 23.87 | 0.40                      | 200            | 1.20         | 1.04 | 1.04 | 1.04 | 1.04 |
| 240            | 6.58                            | 6.58 | 6.59 | 6.56 | 0.03                   | 23.72             | 28.98 | 23.44 | 0.49                      | 240            | 1.22         | 1.05 | 1.06 | 1.06 | 1.05 |
| 280            | 6.62                            | 6.62 | 6.63 | 6.59 | 0.04                   | 23.58             | 28.71 | 23.30 | 0.55                      | 280            | 1.23         | 1.06 | 1.07 | 1.07 | 1.07 |
| 320            | 6.65                            | 6.66 | 6.67 | 6.62 | 0.05                   | 23.78             | 28.67 | 23.49 | 0.66                      | 320            | 1.22         | 1.07 | 1.09 | 1.09 | 1.08 |
| 360            | 6.68                            | 6.69 | 6.70 | 6.64 | 0.06                   | 24.35             | 28.97 | 24.06 | 0.77                      | 360            | 1.21         | 1.08 | 1.11 | 1.11 | 1.10 |
| 400            | 6.71                            | 6.71 | 6.72 | 6.65 | 0.07                   | 25.35             | 29.51 | 25.09 | 0.86                      | 400            | 1.18         | 1.10 | 1.13 | 1.13 | 1.12 |
| 425            | 6.72                            | 6.73 | 6.74 | 6.66 | 0.08                   | 26.28             | 30.02 | 26.06 | 0.92                      | 425            | 1.15         | 1.11 | 1.14 | 1.14 | 1.13 |
| 450            | 6.74                            | 6.76 | 6.75 | 6.67 | 0.09                   | 27.48             | 30.65 | 27.34 | 0.97                      | 450            | 1.11         | 1.12 | 1.15 | 1.15 | 1.14 |
| 475            | 6.77                            | 6.78 | 6.77 | 6.68 | 0.10                   | 28.90             | 31.34 | 28.94 | 1.03                      | 475            | 1.08         | 1.13 | 1.16 | 1.16 | 1.15 |
| 500            | 6.79                            | 6.81 | 6.80 | 6.69 | 0.12                   | 30.30             | 31.85 | 30.65 | 1.11                      | 500            | 1.04         | 1.14 | 1.17 | 1.17 | 1.16 |
| 550            | 6.88                            | 6.91 | 6.87 | 6.75 | 0.16                   | 29.69             | 31.17 | 30.25 | 1.29                      | 550            | 1.09         | 1.15 | 1.18 | 1.17 | 1.18 |
| 600            | 7.05                            | 7.08 | 7.01 | 6.87 | 0.21                   | 25.07             | 27.80 | 25.06 | 1.47                      | 600            | 1.25         | 1.16 | 1.18 | 1.17 | 1.18 |
| 650            | 7.34                            | 7.37 | 7.25 | 7.09 | 0.27                   | 21.11             | 23.98 | 20.83 | 1.67                      | 650            | 1.48         | 1.16 | 1.15 | 1.15 | 1.17 |

<sup>1</sup>Total Loss = Insertion Loss+ 6dB Splitter Loss



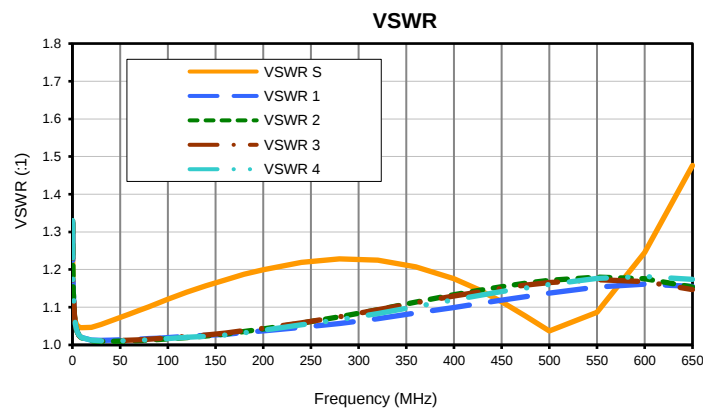
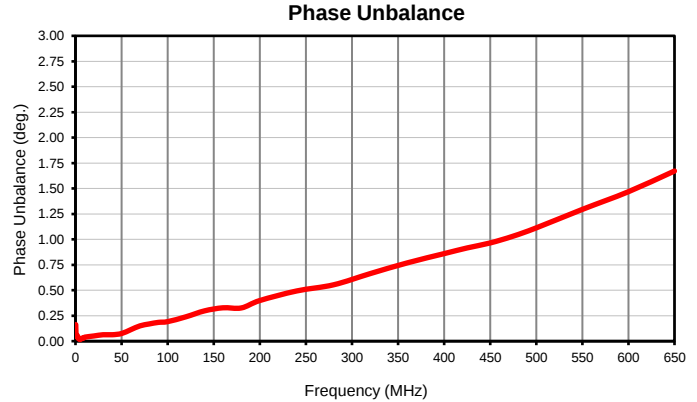
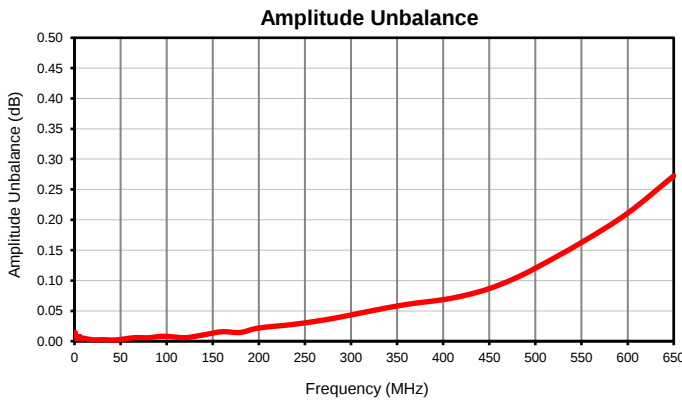
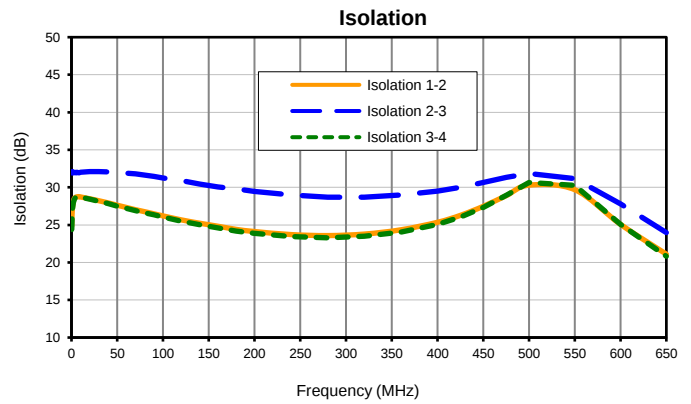
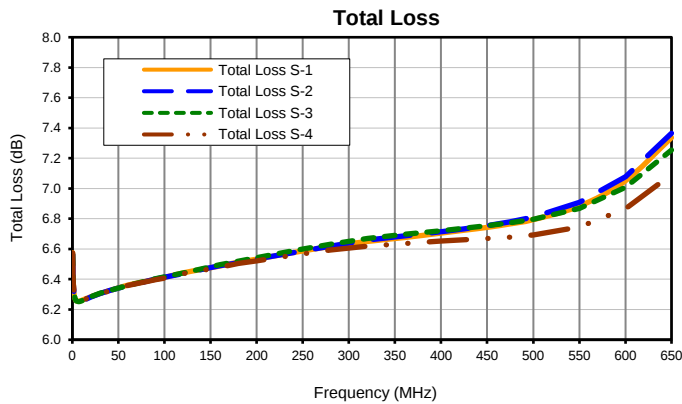
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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)



IF/RF MICROWAVE COMPONENTS

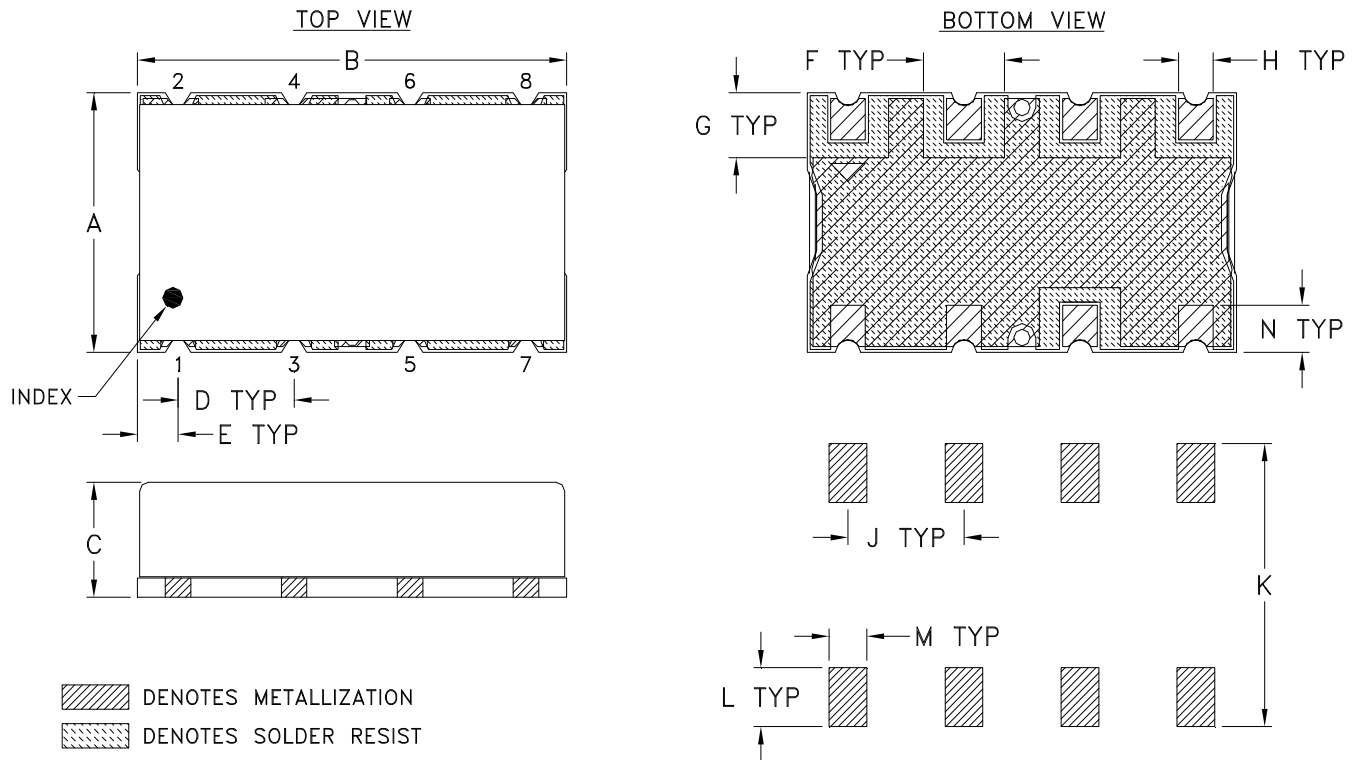
REV. OR  
SCPS-4-62+  
7/18/2017  
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## Typical Performance Curves



## Outline Dimensions

HF1485-1



| CASE #   | A              | B              | C             | D              | E             | F              | G              | H              | J              | K               | L              | M              |
|----------|----------------|----------------|---------------|----------------|---------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|
| HF1485-1 | .44<br>(11.18) | .74<br>(18.80) | .19<br>(4.83) | .200<br>(5.08) | .07<br>(1.78) | .140<br>(3.56) | .110<br>(2.79) | .060<br>(1.52) | .200<br>(5.08) | .480<br>(12.19) | .100<br>(2.54) | .065<br>(1.65) |

| CASE #   | N              | WT. GRAMS |
|----------|----------------|-----------|
| HF1485-1 | .080<br>(2.03) | 3.0       |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm 0.015$ "; 3 Pl.  $\pm 0.01$ "

### 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-F5



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 32                | 16                         | 13                   | 500              |

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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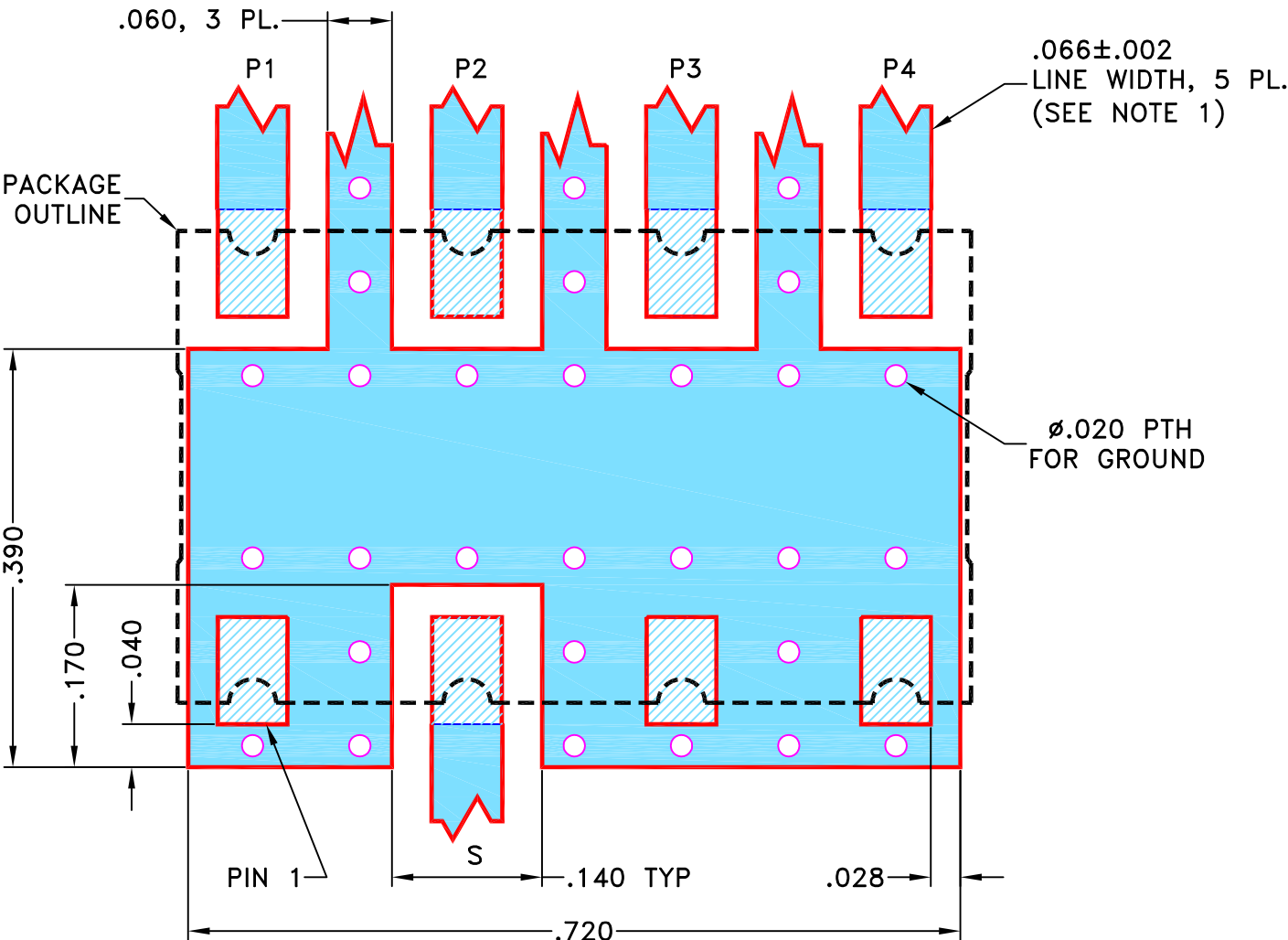
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|                        |  |           |         |             |          |         |
|------------------------|--|-----------|---------|-------------|----------|---------|
| THIRD ANGLE PROJECTION |  | REVISIONS |         |             |          |         |
|                        |  | REV       | ECN No. | DESCRIPTION | DATE     | DR AUTH |
|                        |  | OR        | M157861 | NEW RELEASE | 01/03/17 | ITG PW  |
|                        |  |           |         |             |          |         |
|                        |  |           |         |             |          |         |

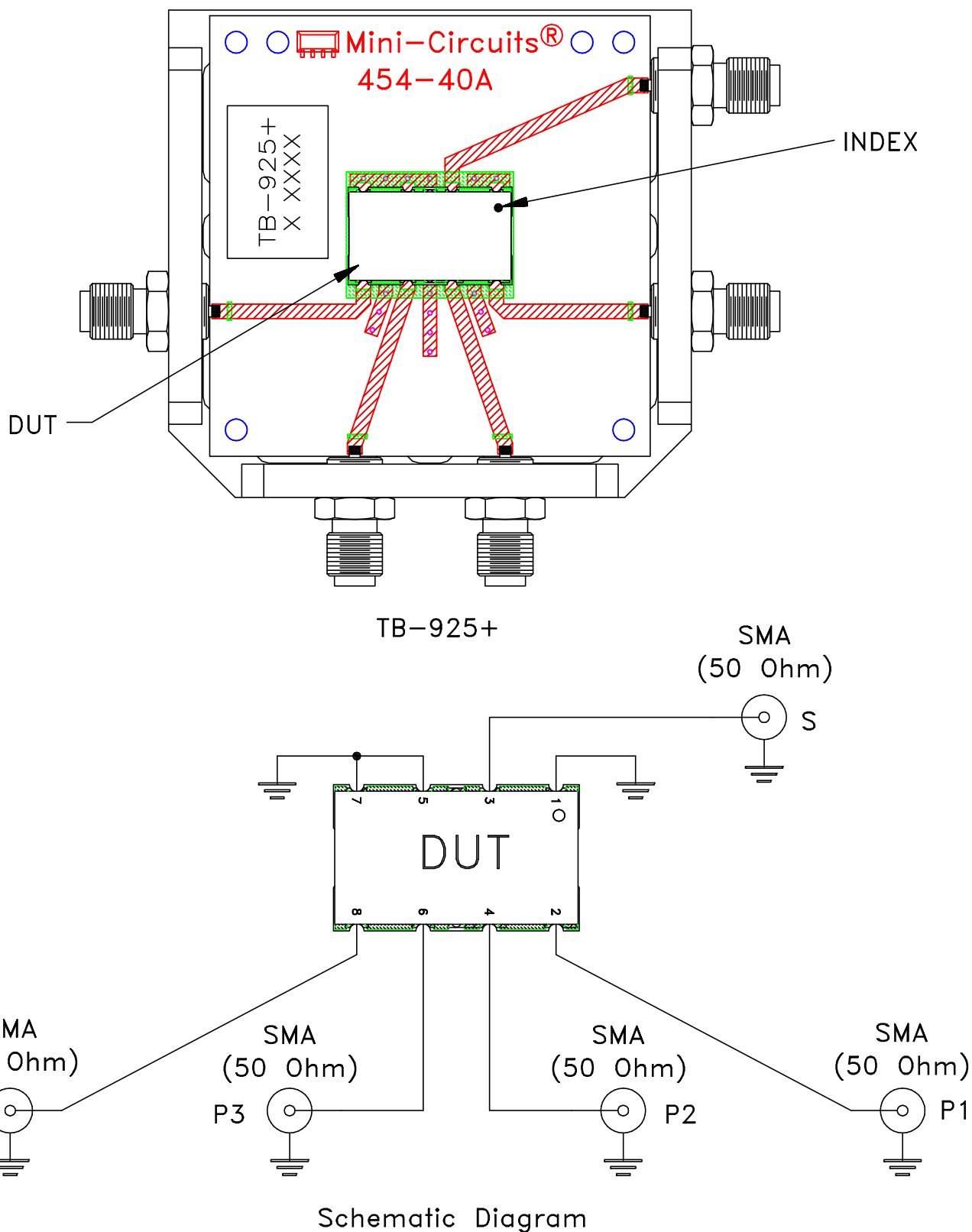
**SUGGESTED MOUNTING CONFIGURATION**  
**FOR HF1485-1 CASE STYLE, "08SP09" PIN CODE**



- NOTES:**
1. LINE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"±.002". COPPER: 1/2 OZ. EACH SIDE.
  - FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
  3. 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                  |  | <div><div><div></div><div></div><div></div><div></div></div><div>Mini-Circuits®<br/>13 Neptune Avenue<br/>Brooklyn NY 11235</div></div> |  |  |  |
| DIMENSIONS ARE IN INCHES                                                                                                                                                                                                                                                                                                                                                                                                      |  | DRAWN            | ITG | 12/28/16              |  |                                                                                                                                         |  |  |  |
| TOLERANCES ON:                                                                                                                                                                                                                                                                                                                                                                                                                |  | CHECKED          | GF  | 01/03/17              |  |                                                                                                                                         |  |  |  |
| 2 PL DECIMALS ±                                                                                                                                                                                                                                                                                                                                                                                                               |  | APPROVED         | PW  | 01/03/17              |  |                                                                                                                                         |  |  |  |
| 3 PL DECIMALS ± .005                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  |     |                       |  |                                                                                                                                         |  |  |  |
| ANGLES ±                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                  |     |                       |  | <div>PL, 08SP09, HF1485-1, TB-925+</div>                                                                                                |  |  |  |
| FRACTIONS ±                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                  |     |                       |  |                                                                                                                                         |  |  |  |
| <div><div></div><div>Mini-Circuits®</div></div>                                                                                                                                                                                                                                                                                                                                                                               |  |                  |     |                       |  |                                                                                                                                         |  |  |  |
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| ASHEETA1.DWG REV:A                                                                                                                                                                                                                                                                                                                                                                                                            |  | DATE:01/12/95    |     |                       |  |                                                                                                                                         |  |  |  |
| SIZE A                                                                                                                                                                                                                                                                                                                                                                                                                        |  | CODE IDENT 15542 |     | DRAWING NO: 98-PL-492 |  | REV: OR                                                                                                                                 |  |  |  |
| FILE: 98PL492                                                                                                                                                                                                                                                                                                                                                                                                                 |  | SCALE: 6:1       |     | SHEET: 1 OF 1         |  |                                                                                                                                         |  |  |  |

# 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            | -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                                                                              |