

# Surface Mount Power Splitter/Combiner

## SBD-4-25+

4 Way-0° 50Ω 1800 to 2600 MHz

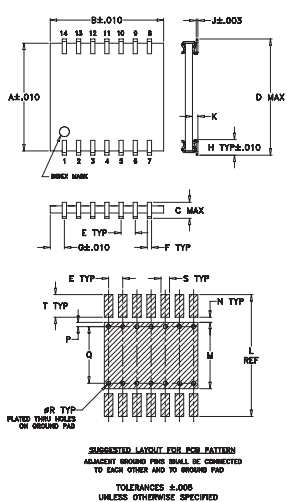
### Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| Power Input (as a splitter)                                     | 10W max.       |
| Internal Dissipation                                            | 0.375W max.    |
| Permanent damage may occur if any of these limits are exceeded. |                |

### Pin Connections

|          |              |
|----------|--------------|
| SUM PORT | 4            |
| PORT 1   | 8            |
| PORT 2   | 10           |
| PORT 3   | 12           |
| PORT 4   | 14           |
| GROUND   | 2,3,5,6,9,13 |
| NOT USED | 1,7,11       |

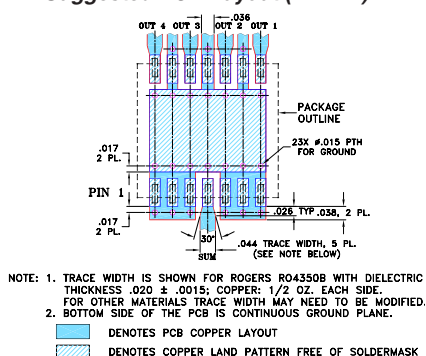
### Outline Drawing



### Outline Dimensions (inch/mm)

|      |       |      |       |      |      |      |      |      |
|------|-------|------|-------|------|------|------|------|------|
| A    | B     | C    | D     | E    | F    | G    | H    | J    |
| .380 | .400  | .070 | .420  | .050 | .015 | .050 | .060 | .006 |
| 9.65 | 10.16 | 1.78 | 10.67 | 1.27 | 0.38 | 1.27 | 1.52 | 0.15 |
| K    | L     | M    | N     | P    | Q    | R    | S    | T    |
| .020 | .430  | .234 | .018  | .015 | .200 | .014 | .030 | .080 |
| 0.51 | 10.92 | 5.94 | 0.46  | 0.38 | 5.08 | 0.36 | 0.76 | 2.03 |
|      |       |      |       |      |      |      |      | 0.3  |

### Demo Board MCL P/N: TB-85 Suggested PCB Layout (PL-142)



### 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-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)

### Features

- wideband frequency, 1800 to 2600 MHz
- high isolation, 20 dB typ.
- good input port matching VSWR, 1.26 typ.
- good output port matching VSWR, 1.26 typ.
- high power handling
- aqueous washable
- protected by U.S. Patent 6,819,202

### Applications

- PCS
- ISM
- WLAN
- VMTS

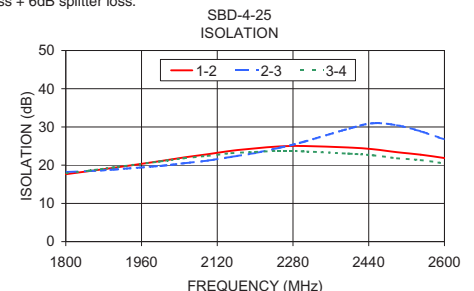
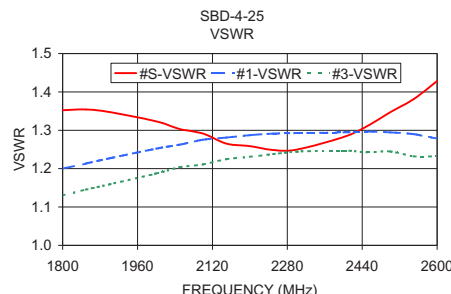
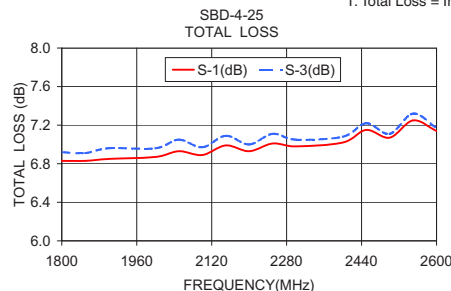
### Electrical Specifications

| FREQ.<br>RANGE<br>(MHz) | ISOLATION<br>(dB) |      | INSERTION LOSS (dB)<br>ABOVE 6.0 dB |      | PHASE<br>UNBALANCE<br>(Degrees) | AMPLITUDE<br>UNBALANCE<br>(dB) |      |
|-------------------------|-------------------|------|-------------------------------------|------|---------------------------------|--------------------------------|------|
|                         | Typ.              | Min. | Typ.                                | Max. |                                 | Typ.                           | Max. |
| 1800-2600               | 20                | 12   | 1.0                                 | 1.9  | 8                               | 0.2                            | 0.7  |
| 1800-2000               | 18                | 12   | 0.9                                 | 1.4  | 6                               | 0.15                           | 0.4  |
| 2100-2200               | 21                | 15   | 0.9                                 | 1.4  | 6                               | 0.15                           | 0.4  |
| 2200-2400               | 22                | 15   | 1.0                                 | 1.6  | 7                               | 0.15                           | 0.6  |
| 2400-2500               | 22                | 16   | 1.0                                 | 1.8  | 7                               | 0.25                           | 0.7  |

### 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   |                           |           |           |           |           |           |
| 1800.00        | 6.83                            | 6.80 | 6.92 | 6.82 | 0.13                   | 17.65             | 18.21 | 17.86 | 2.17                      | 1.35      | 1.20      | 1.10      | 1.13      | 1.20      |
| 1850.00        | 6.83                            | 6.80 | 6.91 | 6.84 | 0.12                   | 18.45             | 18.48 | 18.58 | 2.43                      | 1.35      | 1.21      | 1.11      | 1.15      | 1.21      |
| 1900.00        | 6.85                            | 6.83 | 6.96 | 6.86 | 0.13                   | 19.29             | 18.86 | 19.40 | 2.26                      | 1.35      | 1.23      | 1.12      | 1.16      | 1.22      |
| 2000.00        | 6.87                            | 6.83 | 6.96 | 6.86 | 0.13                   | 21.08             | 19.81 | 20.98 | 2.35                      | 1.32      | 1.25      | 1.14      | 1.19      | 1.23      |
| 2050.00        | 6.93                            | 6.89 | 7.05 | 6.96 | 0.16                   | 22.04             | 20.51 | 21.82 | 2.09                      | 1.30      | 1.26      | 1.15      | 1.20      | 1.24      |
| 2100.00        | 6.89                            | 6.83 | 6.97 | 6.88 | 0.14                   | 22.87             | 21.19 | 22.42 | 2.52                      | 1.29      | 1.28      | 1.15      | 1.21      | 1.24      |
| 2150.00        | 6.99                            | 6.92 | 7.09 | 7.02 | 0.17                   | 23.76             | 22.17 | 23.15 | 2.09                      | 1.27      | 1.28      | 1.16      | 1.22      | 1.25      |
| 2200.00        | 6.93                            | 6.87 | 7.00 | 6.92 | 0.13                   | 24.39             | 23.19 | 23.45 | 2.58                      | 1.26      | 1.29      | 1.17      | 1.23      | 1.25      |
| 2250.00        | 7.01                            | 6.94 | 7.11 | 7.03 | 0.17                   | 24.89             | 24.52 | 23.75 | 2.19                      | 1.25      | 1.29      | 1.17      | 1.24      | 1.25      |
| 2300.00        | 6.98                            | 6.90 | 7.05 | 6.99 | 0.15                   | 25.03             | 26.03 | 23.63 | 2.49                      | 1.25      | 1.29      | 1.18      | 1.24      | 1.25      |
| 2400.00        | 7.02                            | 6.93 | 7.08 | 7.07 | 0.15                   | 24.61             | 29.63 | 22.99 | 2.67                      | 1.28      | 1.29      | 1.19      | 1.25      | 1.24      |
| 2450.00        | 7.15                            | 7.04 | 7.22 | 7.15 | 0.18                   | 24.16             | 30.97 | 22.58 | 2.43                      | 1.31      | 1.30      | 1.19      | 1.24      | 1.23      |
| 2500.00        | 7.07                            | 6.96 | 7.11 | 7.13 | 0.17                   | 23.40             | 30.43 | 21.81 | 2.90                      | 1.35      | 1.29      | 1.20      | 1.24      | 1.23      |
| 2550.00        | 7.25                            | 7.12 | 7.32 | 7.28 | 0.20                   | 22.75             | 28.84 | 21.33 | 2.43                      | 1.38      | 1.29      | 1.20      | 1.23      | 1.21      |
| 2600.00        | 7.14                            | 7.02 | 7.17 | 7.20 | 0.18                   | 21.87             | 26.73 | 20.46 | 3.20                      | 1.43      | 1.28      | 1.21      | 1.23      | 1.21      |

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



### electrical schematic



# 4 Way-0° Power Splitter/Combiner

**SBD-4-25+**

## Typical Performance Data

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

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup> |      |      |      | AMP.<br>UNBAL.<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | ISOLATION |       |       | VSWR |      |      |      |      |
|----------------|-------------------------|------|------|------|------------------------|---------------------------|-----------|-------|-------|------|------|------|------|------|
|                | S-1                     | S-2  | S-3  | S-4  |                        |                           | 1-2       | 2-3   | 3-4   | S    | 1    | 2    | 3    | 4    |
| 300            | 7.99                    | 7.92 | 7.96 | 7.96 | 0.07                   | 0.25                      | 10.32     | 10.34 | 6.24  | 3.58 | 2.56 | 2.54 | 2.55 | 2.56 |
| 400            | 7.93                    | 7.85 | 7.88 | 7.90 | 0.08                   | 0.25                      | 11.36     | 11.41 | 6.06  | 3.45 | 2.20 | 2.17 | 2.18 | 2.21 |
| 500            | 7.84                    | 7.75 | 7.77 | 7.81 | 0.09                   | 0.26                      | 12.35     | 12.45 | 6.11  | 3.29 | 1.93 | 1.89 | 1.90 | 1.94 |
| 600            | 7.72                    | 7.63 | 7.64 | 7.71 | 0.09                   | 0.13                      | 13.28     | 13.44 | 6.32  | 3.11 | 1.73 | 1.67 | 1.68 | 1.73 |
| 700            | 7.58                    | 7.49 | 7.49 | 7.58 | 0.09                   | 0.22                      | 14.14     | 14.36 | 6.65  | 2.90 | 1.57 | 1.51 | 1.52 | 1.56 |
| 800            | 7.42                    | 7.33 | 7.32 | 7.43 | 0.10                   | 0.31                      | 14.95     | 15.22 | 7.08  | 2.68 | 1.44 | 1.38 | 1.38 | 1.43 |
| 900            | 7.26                    | 7.17 | 7.16 | 7.27 | 0.11                   | 0.49                      | 15.70     | 16.02 | 7.58  | 2.44 | 1.34 | 1.27 | 1.28 | 1.32 |
| 1000           | 7.09                    | 6.99 | 6.99 | 7.09 | 0.10                   | 0.66                      | 16.43     | 16.75 | 8.15  | 2.20 | 1.25 | 1.20 | 1.19 | 1.24 |
| 1100           | 6.93                    | 6.83 | 6.84 | 6.92 | 0.10                   | 0.72                      | 17.14     | 17.44 | 8.80  | 1.97 | 1.19 | 1.13 | 1.13 | 1.17 |
| 1200           | 6.79                    | 6.69 | 6.71 | 6.77 | 0.11                   | 0.85                      | 17.86     | 18.09 | 9.53  | 1.75 | 1.14 | 1.09 | 1.08 | 1.12 |
| 1300           | 6.68                    | 6.57 | 6.60 | 6.64 | 0.11                   | 0.91                      | 18.63     | 18.72 | 10.32 | 1.55 | 1.10 | 1.07 | 1.05 | 1.08 |
| 1400           | 6.60                    | 6.49 | 6.54 | 6.56 | 0.11                   | 1.07                      | 19.48     | 19.38 | 11.15 | 1.38 | 1.07 | 1.06 | 1.03 | 1.05 |
| 1500           | 6.55                    | 6.45 | 6.49 | 6.50 | 0.10                   | 1.13                      | 20.44     | 20.11 | 11.99 | 1.25 | 1.05 | 1.06 | 1.04 | 1.03 |
| 1550           | 6.54                    | 6.43 | 6.48 | 6.49 | 0.10                   | 1.15                      | 20.98     | 20.53 | 12.42 | 1.20 | 1.05 | 1.07 | 1.05 | 1.02 |
| 1600           | 6.53                    | 6.44 | 6.49 | 6.49 | 0.09                   | 1.16                      | 21.58     | 20.98 | 12.82 | 1.17 | 1.04 | 1.08 | 1.05 | 1.01 |
| 1650           | 6.54                    | 6.45 | 6.50 | 6.50 | 0.08                   | 1.21                      | 22.22     | 21.49 | 13.22 | 1.17 | 1.03 | 1.09 | 1.07 | 1.01 |
| 1700           | 6.54                    | 6.47 | 6.51 | 6.51 | 0.08                   | 1.15                      | 22.95     | 22.04 | 13.60 | 1.18 | 1.03 | 1.10 | 1.08 | 1.02 |
| 1750           | 6.56                    | 6.49 | 6.53 | 6.52 | 0.07                   | 1.26                      | 23.75     | 22.68 | 13.97 | 1.21 | 1.03 | 1.11 | 1.09 | 1.03 |
| 1800           | 6.58                    | 6.52 | 6.56 | 6.55 | 0.06                   | 1.26                      | 24.66     | 23.42 | 14.34 | 1.24 | 1.04 | 1.12 | 1.10 | 1.05 |
| 1850           | 6.60                    | 6.55 | 6.58 | 6.58 | 0.05                   | 1.38                      | 25.67     | 24.26 | 14.71 | 1.28 | 1.04 | 1.14 | 1.11 | 1.06 |
| 1900           | 6.61                    | 6.59 | 6.61 | 6.61 | 0.03                   | 1.51                      | 26.84     | 25.22 | 15.09 | 1.31 | 1.05 | 1.15 | 1.12 | 1.07 |
| 1950           | 6.63                    | 6.61 | 6.64 | 6.64 | 0.03                   | 1.62                      | 28.20     | 26.35 | 15.51 | 1.34 | 1.06 | 1.15 | 1.13 | 1.09 |
| 2000           | 6.64                    | 6.64 | 6.66 | 6.67 | 0.03                   | 1.63                      | 29.82     | 27.72 | 15.97 | 1.36 | 1.06 | 1.16 | 1.14 | 1.10 |
| 2050           | 6.66                    | 6.67 | 6.68 | 6.70 | 0.04                   | 1.69                      | 31.80     | 29.39 | 16.49 | 1.37 | 1.07 | 1.17 | 1.15 | 1.11 |
| 2100           | 6.67                    | 6.70 | 6.70 | 6.72 | 0.05                   | 1.60                      | 34.36     | 31.44 | 17.09 | 1.38 | 1.07 | 1.17 | 1.15 | 1.12 |
| 2150           | 6.68                    | 6.71 | 6.71 | 6.73 | 0.05                   | 1.63                      | 38.01     | 34.27 | 17.78 | 1.38 | 1.08 | 1.17 | 1.15 | 1.12 |
| 2200           | 6.67                    | 6.73 | 6.73 | 6.75 | 0.07                   | 1.70                      | 44.06     | 38.27 | 18.63 | 1.36 | 1.08 | 1.17 | 1.15 | 1.12 |
| 2250           | 6.67                    | 6.74 | 6.72 | 6.74 | 0.07                   | 1.76                      | 53.55     | 44.05 | 19.65 | 1.34 | 1.07 | 1.16 | 1.14 | 1.12 |
| 2300           | 6.66                    | 6.74 | 6.73 | 6.75 | 0.09                   | 1.75                      | 43.31     | 43.52 | 20.90 | 1.30 | 1.07 | 1.15 | 1.13 | 1.12 |
| 2350           | 6.65                    | 6.74 | 6.73 | 6.76 | 0.11                   | 1.76                      | 37.86     | 37.95 | 22.45 | 1.26 | 1.06 | 1.14 | 1.13 | 1.11 |
| 2400           | 6.64                    | 6.75 | 6.73 | 6.75 | 0.11                   | 1.76                      | 34.70     | 34.25 | 24.43 | 1.21 | 1.05 | 1.13 | 1.12 | 1.10 |
| 2450           | 6.64                    | 6.75 | 6.73 | 6.75 | 0.12                   | 1.86                      | 32.37     | 31.68 | 26.94 | 1.15 | 1.03 | 1.12 | 1.11 | 1.09 |
| 2500           | 6.63                    | 6.76 | 6.74 | 6.76 | 0.13                   | 1.90                      | 30.65     | 29.80 | 29.71 | 1.10 | 1.01 | 1.12 | 1.11 | 1.08 |
| 2550           | 6.64                    | 6.78 | 6.76 | 6.78 | 0.14                   | 1.97                      | 29.33     | 28.36 | 30.63 | 1.08 | 1.01 | 1.13 | 1.13 | 1.08 |
| 2600           | 6.66                    | 6.81 | 6.80 | 6.83 | 0.17                   | 2.01                      | 28.31     | 27.24 | 28.31 | 1.13 | 1.04 | 1.15 | 1.15 | 1.09 |
| 2650           | 6.70                    | 6.86 | 6.85 | 6.88 | 0.18                   | 2.00                      | 27.50     | 26.44 | 25.33 | 1.21 | 1.07 | 1.19 | 1.19 | 1.11 |
| 2700           | 6.76                    | 6.94 | 6.92 | 6.96 | 0.20                   | 2.11                      | 26.86     | 25.82 | 22.82 | 1.32 | 1.11 | 1.23 | 1.23 | 1.15 |
| 2750           | 6.85                    | 7.04 | 7.01 | 7.06 | 0.22                   | 2.23                      | 26.36     | 25.39 | 20.82 | 1.46 | 1.15 | 1.29 | 1.28 | 1.20 |
| 2800           | 6.95                    | 7.17 | 7.13 | 7.19 | 0.24                   | 2.30                      | 26.04     | 25.11 | 19.25 | 1.62 | 1.20 | 1.34 | 1.34 | 1.25 |
| 2850           | 7.10                    | 7.33 | 7.28 | 7.36 | 0.26                   | 2.42                      | 25.79     | 25.01 | 17.99 | 1.79 | 1.25 | 1.41 | 1.41 | 1.31 |
| 2900           | 7.26                    | 7.51 | 7.46 | 7.54 | 0.28                   | 2.50                      | 25.65     | 25.01 | 16.98 | 1.99 | 1.30 | 1.48 | 1.48 | 1.38 |
| 2950           | 7.45                    | 7.72 | 7.66 | 7.75 | 0.30                   | 2.64                      | 25.60     | 25.14 | 16.18 | 2.21 | 1.36 | 1.55 | 1.55 | 1.45 |
| 3000           | 7.66                    | 7.94 | 7.87 | 7.98 | 0.32                   | 2.76                      | 25.60     | 25.35 | 15.55 | 2.45 | 1.42 | 1.62 | 1.62 | 1.52 |
| 3100           | 8.11                    | 8.43 | 8.34 | 8.45 | 0.34                   | 2.83                      | 25.80     | 26.02 | 14.72 | 2.97 | 1.54 | 1.76 | 1.77 | 1.66 |
| 3200           | 8.57                    | 8.91 | 8.81 | 8.94 | 0.37                   | 3.05                      | 26.10     | 26.86 | 14.29 | 3.52 | 1.67 | 1.91 | 1.92 | 1.82 |
| 3300           | 8.99                    | 9.32 | 9.23 | 9.35 | 0.36                   | 3.09                      | 26.48     | 27.98 | 14.27 | 3.99 | 1.81 | 2.04 | 2.06 | 1.96 |
| 3400           | 9.31                    | 9.64 | 9.56 | 9.67 | 0.37                   | 3.21                      | 26.89     | 28.97 | 14.53 | 4.38 | 1.94 | 2.17 | 2.19 | 2.10 |
| 3500           | 9.50                    | 9.81 | 9.75 | 9.86 | 0.36                   | 3.28                      | 27.19     | 29.84 | 15.13 | 4.56 | 2.07 | 2.28 | 2.32 | 2.24 |
| 3600           | 9.55                    | 9.82 | 9.79 | 9.89 | 0.34                   | 3.41                      | 27.70     | 30.69 | 16.15 | 4.50 | 2.21 | 2.38 | 2.43 | 2.36 |
| 3700           | 9.44                    | 9.66 | 9.66 | 9.76 | 0.31                   | 3.53                      | 28.23     | 31.24 | 17.73 | 4.22 | 2.33 | 2.46 | 2.53 | 2.46 |
| 3800           | 9.18                    | 9.34 | 9.38 | 9.47 | 0.28                   | 3.86                      | 29.03     | 31.76 | 20.36 | 3.73 | 2.43 | 2.52 | 2.60 | 2.54 |
| 3900           | 8.80                    | 8.91 | 8.95 | 9.06 | 0.26                   | 3.94                      | 30.51     | 32.51 | 25.55 | 3.09 | 2.51 | 2.55 | 2.64 | 2.58 |
| 4000           | 8.37                    | 8.41 | 8.46 | 8.58 | 0.21                   | 4.27                      | 33.63     | 34.30 | 45.17 | 2.42 | 2.55 | 2.55 | 2.63 | 2.59 |
| 4100           | 8.00                    | 7.98 | 8.01 | 8.17 | 0.19                   | 4.43                      | 40.99     | 39.37 | 23.69 | 1.81 | 2.56 | 2.52 | 2.60 | 2.56 |

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

REV. X2

SBD-4-25+

100627

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# 4 Way-0° Power Splitter/Combiner

**SBD-4-25+**

## Typical Performance Data

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

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      |      |      | AMP.<br>UNBAL.<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | ISOLATION<br>(dB) |       |       | VSWR<br>(:1) |      |      |      |      |
|----------------|---------------------------------|------|------|------|------------------------|---------------------------|-------------------|-------|-------|--------------|------|------|------|------|
|                | S-1                             | S-2  | S-3  | S-4  |                        |                           | 1-2               | 2-3   | 3-4   | S            | 1    | 2    | 3    | 4    |
| 300            | 7.95                            | 7.87 | 7.92 | 7.91 | 0.08                   | 0.25                      | 10.24             | 10.26 | 6.19  | 3.63         | 2.59 | 2.57 | 2.59 | 2.60 |
| 400            | 7.88                            | 7.79 | 7.82 | 7.83 | 0.09                   | 0.32                      | 11.27             | 11.32 | 6.01  | 3.49         | 2.24 | 2.20 | 2.22 | 2.24 |
| 500            | 7.78                            | 7.69 | 7.71 | 7.75 | 0.09                   | 0.47                      | 12.25             | 12.34 | 6.05  | 3.34         | 1.96 | 1.91 | 1.93 | 1.96 |
| 600            | 7.64                            | 7.57 | 7.56 | 7.63 | 0.09                   | 0.42                      | 13.17             | 13.32 | 6.27  | 3.16         | 1.75 | 1.69 | 1.71 | 1.75 |
| 700            | 7.49                            | 7.43 | 7.40 | 7.50 | 0.10                   | 0.38                      | 14.00             | 14.23 | 6.58  | 2.95         | 1.58 | 1.53 | 1.53 | 1.58 |
| 800            | 7.33                            | 7.26 | 7.23 | 7.34 | 0.11                   | 0.31                      | 14.79             | 15.08 | 6.99  | 2.73         | 1.45 | 1.39 | 1.39 | 1.44 |
| 900            | 7.14                            | 7.08 | 7.05 | 7.16 | 0.11                   | 0.41                      | 15.54             | 15.87 | 7.47  | 2.48         | 1.34 | 1.29 | 1.28 | 1.33 |
| 1000           | 6.97                            | 6.90 | 6.87 | 6.97 | 0.10                   | 0.54                      | 16.26             | 16.61 | 8.03  | 2.23         | 1.26 | 1.20 | 1.20 | 1.24 |
| 1100           | 6.81                            | 6.73 | 6.72 | 6.80 | 0.10                   | 0.49                      | 16.97             | 17.30 | 8.66  | 2.00         | 1.19 | 1.14 | 1.13 | 1.17 |
| 1200           | 6.67                            | 6.57 | 6.58 | 6.64 | 0.10                   | 0.66                      | 17.68             | 17.94 | 9.36  | 1.78         | 1.14 | 1.09 | 1.08 | 1.12 |
| 1300           | 6.55                            | 6.44 | 6.47 | 6.50 | 0.12                   | 0.76                      | 18.43             | 18.56 | 10.13 | 1.58         | 1.10 | 1.06 | 1.05 | 1.08 |
| 1400           | 6.46                            | 6.35 | 6.40 | 6.40 | 0.11                   | 1.02                      | 19.25             | 19.20 | 10.95 | 1.40         | 1.07 | 1.06 | 1.04 | 1.05 |
| 1500           | 6.41                            | 6.30 | 6.34 | 6.34 | 0.11                   | 1.23                      | 20.17             | 19.91 | 11.78 | 1.27         | 1.06 | 1.06 | 1.05 | 1.03 |
| 1550           | 6.39                            | 6.29 | 6.33 | 6.33 | 0.10                   | 1.40                      | 20.70             | 20.31 | 12.19 | 1.23         | 1.05 | 1.07 | 1.05 | 1.02 |
| 1600           | 6.38                            | 6.29 | 6.33 | 6.32 | 0.10                   | 1.50                      | 21.27             | 20.74 | 12.59 | 1.20         | 1.04 | 1.08 | 1.06 | 1.02 |
| 1650           | 6.38                            | 6.29 | 6.34 | 6.32 | 0.09                   | 1.63                      | 21.90             | 21.22 | 12.97 | 1.18         | 1.04 | 1.09 | 1.07 | 1.01 |
| 1700           | 6.38                            | 6.30 | 6.34 | 6.32 | 0.08                   | 1.75                      | 22.60             | 21.76 | 13.35 | 1.19         | 1.04 | 1.10 | 1.08 | 1.02 |
| 1750           | 6.38                            | 6.32 | 6.35 | 6.33 | 0.06                   | 1.89                      | 23.38             | 22.38 | 13.70 | 1.21         | 1.03 | 1.12 | 1.09 | 1.03 |
| 1800           | 6.40                            | 6.35 | 6.37 | 6.36 | 0.04                   | 1.96                      | 24.27             | 23.09 | 14.05 | 1.24         | 1.04 | 1.13 | 1.10 | 1.04 |
| 1850           | 6.41                            | 6.38 | 6.39 | 6.38 | 0.03                   | 1.97                      | 25.26             | 23.90 | 14.39 | 1.28         | 1.05 | 1.14 | 1.11 | 1.05 |
| 1900           | 6.42                            | 6.41 | 6.41 | 6.41 | 0.01                   | 2.05                      | 26.42             | 24.85 | 14.74 | 1.31         | 1.05 | 1.15 | 1.12 | 1.07 |
| 1950           | 6.43                            | 6.44 | 6.43 | 6.44 | 0.01                   | 2.12                      | 27.76             | 25.96 | 15.12 | 1.33         | 1.05 | 1.16 | 1.12 | 1.08 |
| 2000           | 6.44                            | 6.47 | 6.44 | 6.47 | 0.02                   | 2.14                      | 29.33             | 27.27 | 15.55 | 1.36         | 1.05 | 1.17 | 1.13 | 1.09 |
| 2050           | 6.45                            | 6.49 | 6.46 | 6.49 | 0.04                   | 2.17                      | 31.30             | 28.86 | 16.02 | 1.37         | 1.06 | 1.18 | 1.13 | 1.11 |
| 2100           | 6.46                            | 6.51 | 6.47 | 6.51 | 0.05                   | 2.09                      | 33.77             | 30.83 | 16.58 | 1.37         | 1.06 | 1.18 | 1.13 | 1.12 |
| 2150           | 6.46                            | 6.52 | 6.48 | 6.52 | 0.06                   | 2.16                      | 37.32             | 33.49 | 17.22 | 1.37         | 1.06 | 1.18 | 1.14 | 1.12 |
| 2200           | 6.46                            | 6.53 | 6.49 | 6.52 | 0.07                   | 2.21                      | 43.25             | 37.01 | 17.98 | 1.35         | 1.07 | 1.17 | 1.14 | 1.12 |
| 2250           | 6.45                            | 6.54 | 6.49 | 6.52 | 0.09                   | 2.24                      | 64.86             | 41.71 | 18.91 | 1.34         | 1.07 | 1.17 | 1.13 | 1.12 |
| 2300           | 6.45                            | 6.54 | 6.50 | 6.53 | 0.09                   | 2.24                      | 43.99             | 42.10 | 20.05 | 1.31         | 1.08 | 1.16 | 1.13 | 1.11 |
| 2350           | 6.44                            | 6.55 | 6.51 | 6.53 | 0.11                   | 2.33                      | 37.92             | 37.59 | 21.46 | 1.28         | 1.08 | 1.14 | 1.12 | 1.11 |
| 2400           | 6.43                            | 6.55 | 6.49 | 6.52 | 0.12                   | 2.36                      | 34.43             | 33.99 | 23.22 | 1.23         | 1.07 | 1.13 | 1.11 | 1.10 |
| 2450           | 6.41                            | 6.54 | 6.50 | 6.52 | 0.13                   | 2.42                      | 32.08             | 31.37 | 25.45 | 1.17         | 1.06 | 1.12 | 1.10 | 1.09 |
| 2500           | 6.40                            | 6.55 | 6.50 | 6.53 | 0.15                   | 2.52                      | 30.36             | 29.51 | 28.03 | 1.12         | 1.05 | 1.12 | 1.10 | 1.08 |
| 2550           | 6.41                            | 6.56 | 6.51 | 6.54 | 0.15                   | 2.64                      | 28.99             | 28.06 | 29.78 | 1.08         | 1.03 | 1.13 | 1.10 | 1.07 |
| 2600           | 6.41                            | 6.58 | 6.53 | 6.57 | 0.17                   | 2.64                      | 27.92             | 26.93 | 28.59 | 1.10         | 1.00 | 1.14 | 1.12 | 1.07 |
| 2650           | 6.44                            | 6.63 | 6.57 | 6.62 | 0.19                   | 2.68                      | 27.11             | 26.07 | 25.82 | 1.18         | 1.03 | 1.18 | 1.16 | 1.09 |
| 2700           | 6.49                            | 6.68 | 6.63 | 6.69 | 0.21                   | 2.75                      | 26.43             | 25.44 | 23.21 | 1.29         | 1.07 | 1.22 | 1.21 | 1.13 |
| 2750           | 6.56                            | 6.78 | 6.71 | 6.79 | 0.22                   | 2.83                      | 25.90             | 24.97 | 21.07 | 1.42         | 1.11 | 1.27 | 1.27 | 1.18 |
| 2800           | 6.66                            | 6.89 | 6.83 | 6.90 | 0.23                   | 2.85                      | 25.53             | 24.68 | 19.41 | 1.58         | 1.17 | 1.33 | 1.33 | 1.23 |
| 2850           | 6.80                            | 7.02 | 6.97 | 7.05 | 0.26                   | 2.90                      | 25.29             | 24.55 | 18.06 | 1.75         | 1.23 | 1.39 | 1.40 | 1.30 |
| 2900           | 6.96                            | 7.20 | 7.15 | 7.23 | 0.27                   | 2.92                      | 25.15             | 24.54 | 17.00 | 1.95         | 1.30 | 1.46 | 1.48 | 1.36 |
| 2950           | 7.15                            | 7.39 | 7.34 | 7.44 | 0.30                   | 3.08                      | 25.08             | 24.62 | 16.12 | 2.19         | 1.37 | 1.53 | 1.56 | 1.43 |
| 3000           | 7.37                            | 7.62 | 7.57 | 7.67 | 0.31                   | 3.16                      | 25.09             | 24.81 | 15.45 | 2.44         | 1.44 | 1.61 | 1.66 | 1.50 |
| 3100           | 7.84                            | 8.11 | 8.06 | 8.16 | 0.32                   | 3.26                      | 25.29             | 25.49 | 14.54 | 3.02         | 1.61 | 1.76 | 1.82 | 1.66 |
| 3200           | 8.30                            | 8.58 | 8.53 | 8.63 | 0.33                   | 3.45                      | 25.63             | 26.38 | 14.10 | 3.60         | 1.75 | 1.91 | 2.00 | 1.82 |
| 3300           | 8.71                            | 9.00 | 8.96 | 9.04 | 0.33                   | 3.60                      | 25.97             | 27.33 | 13.99 | 4.13         | 1.89 | 2.05 | 2.15 | 1.97 |
| 3400           | 9.03                            | 9.33 | 9.28 | 9.38 | 0.34                   | 3.84                      | 26.30             | 28.22 | 14.15 | 4.58         | 1.99 | 2.19 | 2.28 | 2.11 |
| 3500           | 9.20                            | 9.53 | 9.45 | 9.58 | 0.38                   | 3.91                      | 26.66             | 29.14 | 14.67 | 4.77         | 2.08 | 2.32 | 2.39 | 2.25 |
| 3600           | 9.22                            | 9.56 | 9.47 | 9.55 | 0.34                   | 3.78                      | 26.98             | 29.94 | 15.55 | 4.72         | 2.18 | 2.43 | 2.47 | 2.38 |
| 3700           | 9.11                            | 9.43 | 9.33 | 9.44 | 0.34                   | 3.78                      | 27.47             | 30.46 | 16.95 | 4.43         | 2.28 | 2.54 | 2.54 | 2.48 |
| 3800           | 8.85                            | 9.14 | 9.04 | 9.14 | 0.30                   | 3.61                      | 28.03             | 30.59 | 19.20 | 3.95         | 2.37 | 2.61 | 2.60 | 2.56 |
| 3900           | 8.49                            | 8.74 | 8.65 | 8.74 | 0.25                   | 3.19                      | 29.30             | 31.31 | 23.42 | 3.31         | 2.45 | 2.66 | 2.62 | 2.60 |
| 4000           | 8.06                            | 8.23 | 8.16 | 8.26 | 0.20                   | 3.10                      | 31.80             | 32.73 | 37.45 | 2.63         | 2.53 | 2.65 | 2.63 | 2.60 |
| 4100           | 7.69                            | 7.76 | 7.71 | 7.84 | 0.15                   | 2.93                      | 37.89             | 35.86 | 25.86 | 1.99         | 2.60 | 2.61 | 2.65 | 2.58 |

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

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# 4 Way-0° Power Splitter/Combiner

**SBD-4-25+**

## Typical Performance Data

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

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup> |       |       |       | AMP.<br>UNBAL.<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | ISOLATION |       |       | VSWR |      |      |      |      |
|----------------|-------------------------|-------|-------|-------|------------------------|---------------------------|-----------|-------|-------|------|------|------|------|------|
|                | S-1                     | S-2   | S-3   | S-4   |                        |                           | 1-2       | 2-3   | 3-4   | S    | 1    | 2    | 3    | 4    |
| 300            | 8.01                    | 7.96  | 7.99  | 7.99  | 0.06                   | 0.42                      | 10.37     | 10.39 | 6.26  | 3.55 | 2.53 | 2.52 | 2.52 | 2.54 |
| 400            | 7.97                    | 7.89  | 7.92  | 7.93  | 0.08                   | 0.38                      | 11.41     | 11.47 | 6.08  | 3.41 | 2.17 | 2.15 | 2.15 | 2.19 |
| 500            | 7.89                    | 7.79  | 7.82  | 7.85  | 0.10                   | 0.37                      | 12.42     | 12.51 | 6.14  | 3.25 | 1.91 | 1.87 | 1.88 | 1.92 |
| 600            | 7.78                    | 7.67  | 7.70  | 7.75  | 0.11                   | 0.28                      | 13.37     | 13.52 | 6.36  | 3.07 | 1.71 | 1.66 | 1.67 | 1.72 |
| 700            | 7.65                    | 7.53  | 7.56  | 7.63  | 0.12                   | 0.34                      | 14.24     | 14.46 | 6.71  | 2.86 | 1.56 | 1.50 | 1.51 | 1.56 |
| 800            | 7.50                    | 7.38  | 7.41  | 7.49  | 0.12                   | 0.38                      | 15.05     | 15.31 | 7.14  | 2.64 | 1.43 | 1.37 | 1.38 | 1.43 |
| 900            | 7.34                    | 7.23  | 7.25  | 7.34  | 0.12                   | 0.55                      | 15.81     | 16.11 | 7.66  | 2.41 | 1.34 | 1.27 | 1.28 | 1.33 |
| 1000           | 7.18                    | 7.07  | 7.09  | 7.18  | 0.11                   | 0.72                      | 16.55     | 16.83 | 8.24  | 2.18 | 1.26 | 1.19 | 1.20 | 1.24 |
| 1100           | 7.03                    | 6.92  | 6.93  | 7.02  | 0.10                   | 0.76                      | 17.26     | 17.51 | 8.91  | 1.95 | 1.20 | 1.13 | 1.14 | 1.18 |
| 1200           | 6.88                    | 6.79  | 6.80  | 6.88  | 0.09                   | 0.92                      | 17.99     | 18.16 | 9.65  | 1.73 | 1.14 | 1.09 | 1.09 | 1.12 |
| 1300           | 6.77                    | 6.68  | 6.70  | 6.75  | 0.09                   | 1.04                      | 18.76     | 18.80 | 10.45 | 1.54 | 1.10 | 1.07 | 1.05 | 1.08 |
| 1400           | 6.70                    | 6.60  | 6.63  | 6.67  | 0.09                   | 1.15                      | 19.62     | 19.46 | 11.30 | 1.37 | 1.07 | 1.06 | 1.03 | 1.05 |
| 1500           | 6.66                    | 6.56  | 6.60  | 6.61  | 0.09                   | 1.15                      | 20.59     | 20.21 | 12.17 | 1.23 | 1.05 | 1.07 | 1.03 | 1.03 |
| 1550           | 6.65                    | 6.56  | 6.61  | 6.60  | 0.08                   | 1.17                      | 21.15     | 20.64 | 12.61 | 1.18 | 1.04 | 1.07 | 1.04 | 1.02 |
| 1600           | 6.66                    | 6.56  | 6.62  | 6.61  | 0.09                   | 1.14                      | 21.75     | 21.10 | 13.03 | 1.15 | 1.03 | 1.08 | 1.05 | 1.01 |
| 1650           | 6.66                    | 6.57  | 6.64  | 6.62  | 0.09                   | 1.16                      | 22.41     | 21.61 | 13.44 | 1.15 | 1.02 | 1.09 | 1.06 | 1.01 |
| 1700           | 6.68                    | 6.59  | 6.65  | 6.64  | 0.09                   | 1.15                      | 23.14     | 22.19 | 13.84 | 1.17 | 1.02 | 1.10 | 1.07 | 1.02 |
| 1750           | 6.70                    | 6.62  | 6.68  | 6.66  | 0.09                   | 1.27                      | 23.95     | 22.83 | 14.23 | 1.20 | 1.02 | 1.11 | 1.09 | 1.04 |
| 1800           | 6.73                    | 6.66  | 6.71  | 6.70  | 0.07                   | 1.36                      | 24.88     | 23.58 | 14.62 | 1.24 | 1.03 | 1.12 | 1.10 | 1.05 |
| 1850           | 6.75                    | 6.69  | 6.74  | 6.73  | 0.07                   | 1.41                      | 25.89     | 24.43 | 15.01 | 1.28 | 1.04 | 1.13 | 1.12 | 1.07 |
| 1900           | 6.77                    | 6.72  | 6.78  | 6.76  | 0.06                   | 1.40                      | 27.09     | 25.42 | 15.41 | 1.31 | 1.05 | 1.14 | 1.13 | 1.08 |
| 1950           | 6.80                    | 6.75  | 6.81  | 6.80  | 0.06                   | 1.54                      | 28.47     | 26.60 | 15.86 | 1.34 | 1.07 | 1.15 | 1.14 | 1.10 |
| 2000           | 6.82                    | 6.79  | 6.84  | 6.83  | 0.05                   | 1.56                      | 30.08     | 28.00 | 16.35 | 1.36 | 1.07 | 1.16 | 1.15 | 1.11 |
| 2050           | 6.83                    | 6.82  | 6.86  | 6.86  | 0.04                   | 1.62                      | 32.10     | 29.71 | 16.91 | 1.38 | 1.08 | 1.16 | 1.16 | 1.12 |
| 2100           | 6.84                    | 6.84  | 6.89  | 6.88  | 0.05                   | 1.65                      | 34.63     | 31.93 | 17.55 | 1.38 | 1.09 | 1.16 | 1.16 | 1.12 |
| 2150           | 6.85                    | 6.87  | 6.90  | 6.90  | 0.05                   | 1.74                      | 38.09     | 34.91 | 18.31 | 1.37 | 1.09 | 1.16 | 1.16 | 1.13 |
| 2200           | 6.85                    | 6.89  | 6.91  | 6.91  | 0.06                   | 1.79                      | 43.04     | 39.41 | 19.21 | 1.36 | 1.08 | 1.16 | 1.16 | 1.13 |
| 2250           | 6.84                    | 6.90  | 6.91  | 6.91  | 0.07                   | 1.82                      | 46.66     | 48.12 | 20.31 | 1.33 | 1.08 | 1.15 | 1.15 | 1.13 |
| 2300           | 6.84                    | 6.90  | 6.92  | 6.92  | 0.08                   | 1.85                      | 41.71     | 45.40 | 21.67 | 1.29 | 1.07 | 1.14 | 1.14 | 1.12 |
| 2350           | 6.83                    | 6.90  | 6.92  | 6.93  | 0.10                   | 1.85                      | 37.36     | 38.27 | 23.40 | 1.24 | 1.05 | 1.13 | 1.13 | 1.11 |
| 2400           | 6.83                    | 6.91  | 6.93  | 6.93  | 0.10                   | 1.85                      | 34.42     | 34.34 | 25.62 | 1.19 | 1.04 | 1.12 | 1.13 | 1.10 |
| 2450           | 6.82                    | 6.92  | 6.94  | 6.94  | 0.11                   | 1.94                      | 32.33     | 31.76 | 28.52 | 1.14 | 1.02 | 1.12 | 1.12 | 1.09 |
| 2500           | 6.83                    | 6.93  | 6.95  | 6.96  | 0.13                   | 1.97                      | 30.70     | 29.88 | 31.46 | 1.09 | 1.01 | 1.12 | 1.13 | 1.08 |
| 2550           | 6.85                    | 6.96  | 6.98  | 6.98  | 0.13                   | 2.05                      | 29.45     | 28.48 | 31.29 | 1.08 | 1.03 | 1.13 | 1.14 | 1.08 |
| 2600           | 6.87                    | 7.00  | 7.02  | 7.03  | 0.16                   | 2.10                      | 28.47     | 27.40 | 28.05 | 1.14 | 1.06 | 1.16 | 1.17 | 1.10 |
| 2650           | 6.92                    | 7.06  | 7.08  | 7.10  | 0.17                   | 2.11                      | 27.71     | 26.59 | 24.95 | 1.23 | 1.10 | 1.19 | 1.21 | 1.13 |
| 2700           | 6.99                    | 7.14  | 7.16  | 7.18  | 0.20                   | 2.31                      | 27.11     | 26.03 | 22.50 | 1.34 | 1.13 | 1.24 | 1.25 | 1.17 |
| 2750           | 7.08                    | 7.26  | 7.25  | 7.29  | 0.21                   | 2.44                      | 26.65     | 25.62 | 20.58 | 1.47 | 1.17 | 1.29 | 1.30 | 1.22 |
| 2800           | 7.20                    | 7.39  | 7.38  | 7.43  | 0.23                   | 2.59                      | 26.31     | 25.39 | 19.10 | 1.62 | 1.21 | 1.35 | 1.36 | 1.27 |
| 2850           | 7.34                    | 7.55  | 7.53  | 7.60  | 0.25                   | 2.69                      | 26.13     | 25.30 | 17.90 | 1.79 | 1.26 | 1.42 | 1.41 | 1.33 |
| 2900           | 7.51                    | 7.75  | 7.71  | 7.79  | 0.28                   | 2.80                      | 26.00     | 25.34 | 16.95 | 1.99 | 1.30 | 1.48 | 1.47 | 1.39 |
| 2950           | 7.70                    | 7.97  | 7.91  | 8.01  | 0.30                   | 2.85                      | 25.97     | 25.48 | 16.18 | 2.20 | 1.35 | 1.56 | 1.54 | 1.46 |
| 3000           | 7.92                    | 8.20  | 8.13  | 8.23  | 0.31                   | 3.00                      | 26.00     | 25.70 | 15.59 | 2.43 | 1.41 | 1.63 | 1.61 | 1.53 |
| 3100           | 8.37                    | 8.70  | 8.61  | 8.73  | 0.36                   | 3.08                      | 26.23     | 26.42 | 14.81 | 2.93 | 1.51 | 1.77 | 1.74 | 1.67 |
| 3200           | 8.85                    | 9.20  | 9.09  | 9.21  | 0.36                   | 3.20                      | 26.61     | 27.43 | 14.49 | 3.46 | 1.64 | 1.91 | 1.88 | 1.81 |
| 3300           | 9.28                    | 9.63  | 9.53  | 9.64  | 0.36                   | 3.14                      | 27.03     | 28.53 | 14.53 | 3.93 | 1.78 | 2.04 | 2.02 | 1.96 |
| 3400           | 9.61                    | 9.93  | 9.85  | 9.96  | 0.35                   | 3.20                      | 27.50     | 29.60 | 14.87 | 4.29 | 1.93 | 2.16 | 2.17 | 2.10 |
| 3500           | 9.81                    | 10.08 | 10.05 | 10.15 | 0.34                   | 3.31                      | 27.98     | 30.63 | 15.61 | 4.44 | 2.08 | 2.27 | 2.31 | 2.24 |
| 3600           | 9.84                    | 10.08 | 10.09 | 10.16 | 0.31                   | 3.68                      | 28.50     | 31.68 | 16.83 | 4.36 | 2.23 | 2.36 | 2.43 | 2.36 |
| 3700           | 9.71                    | 9.87  | 9.94  | 10.02 | 0.31                   | 3.77                      | 29.23     | 32.27 | 18.61 | 4.02 | 2.35 | 2.44 | 2.53 | 2.46 |
| 3800           | 9.44                    | 9.53  | 9.62  | 9.71  | 0.27                   | 3.96                      | 30.15     | 32.79 | 21.67 | 3.51 | 2.46 | 2.49 | 2.61 | 2.54 |
| 3900           | 9.05                    | 9.07  | 9.19  | 9.28  | 0.23                   | 4.09                      | 32.01     | 33.88 | 28.12 | 2.86 | 2.52 | 2.52 | 2.63 | 2.59 |
| 4000           | 8.63                    | 8.60  | 8.71  | 8.81  | 0.21                   | 4.44                      | 35.83     | 36.48 | 36.10 | 2.22 | 2.54 | 2.51 | 2.61 | 2.58 |
| 4100           | 8.30                    | 8.22  | 8.30  | 8.43  | 0.22                   | 4.70                      | 41.52     | 43.98 | 22.09 | 1.67 | 2.51 | 2.48 | 2.55 | 2.55 |

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

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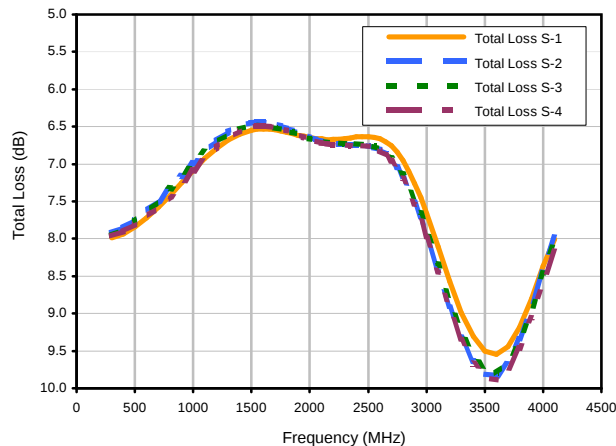


# 4 Way-0° Power Splitter/Combiner

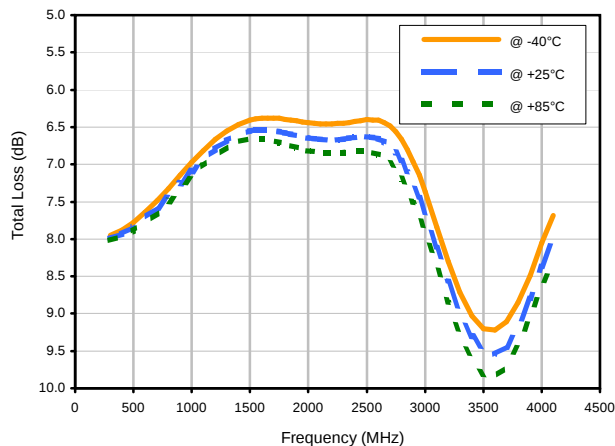
SBD-4-25+

## Typical Performance Curves

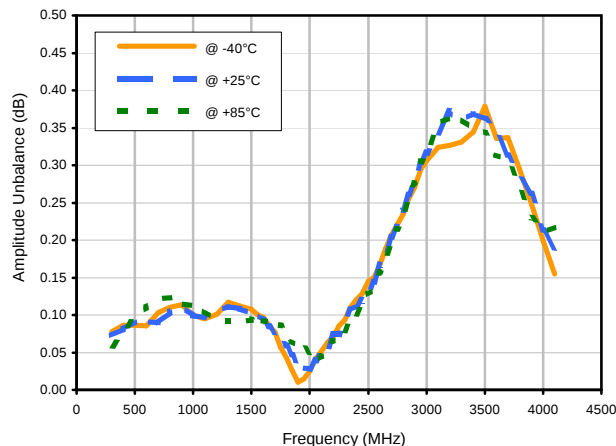
Total Loss



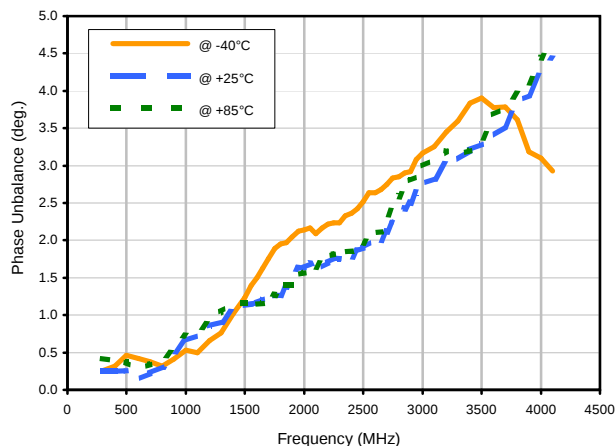
Total Loss S-1 vs. TEMPERATURE



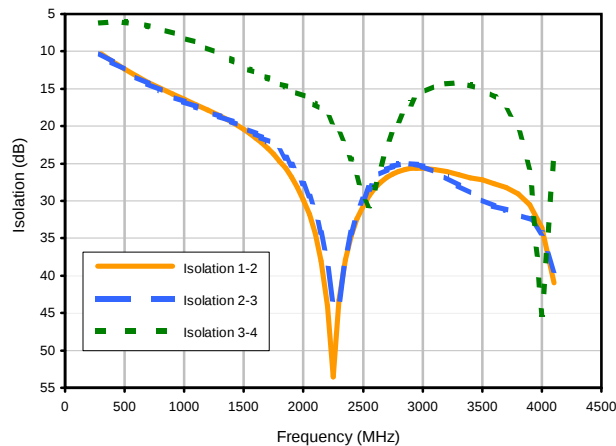
Amplitude Unbalance vs. TEMPERATURE



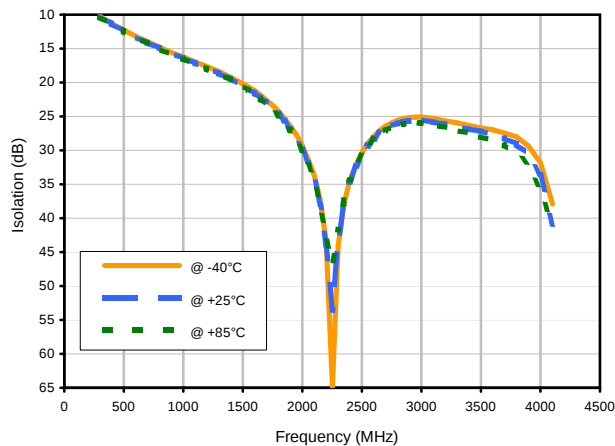
Phase Unbalance vs. TEMPERATURE



Isolation

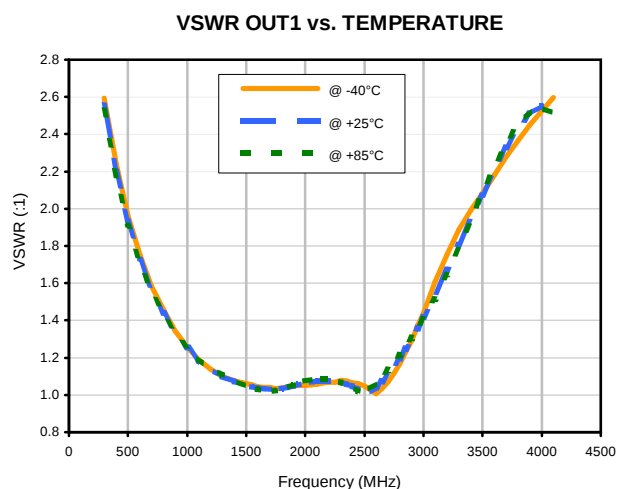
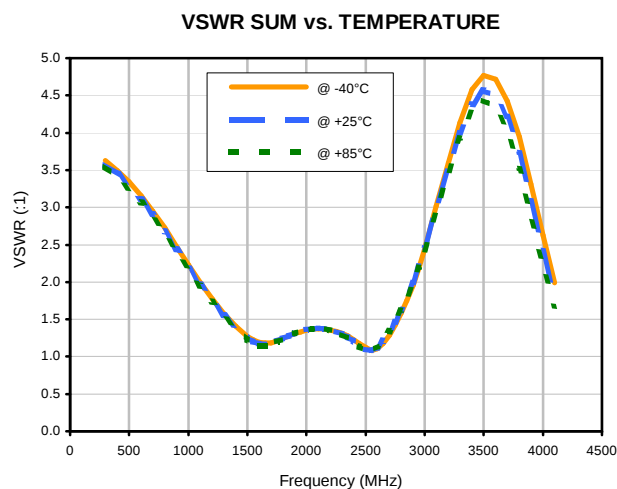
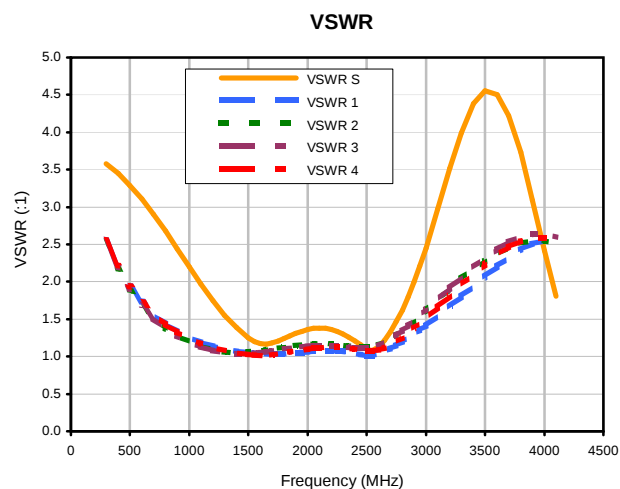


Isolation 1-2 vs. TEMPERATURE



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## Typical Performance Curves

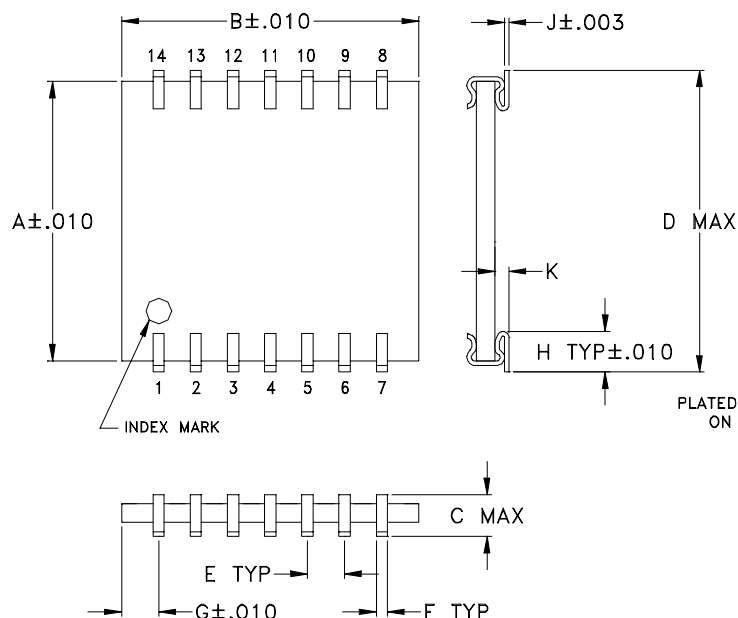


# Case Style

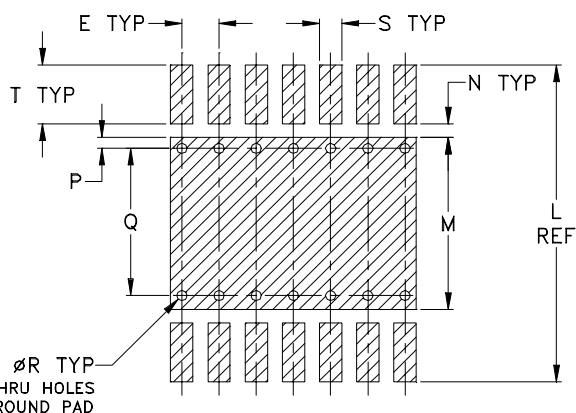
# SM34

SM34

## Outline Dimensions



## PCB Land Pattern



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

ADJACENT GROUND PINS SHALL BE CONNECTED  
TO EACH OTHER AND TO GROUND PAD

| CASE # | A              | B               | C              | D               | E              | F              | G              | H              | J              | K              | L               | M              | N              |
|--------|----------------|-----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|
| SM34   | .380<br>(9.65) | .400<br>(10.16) | .070<br>(1.78) | .420<br>(10.67) | .050<br>(1.27) | .015<br>(0.38) | .050<br>(1.27) | .060<br>(1.52) | .006<br>(0.15) | .020<br>(0.51) | .430<br>(10.92) | .234<br>(5.94) | .018<br>(0.46) |

| CASE # | P              | Q              | R              | S              | T              | WT. GRAM |
|--------|----------------|----------------|----------------|----------------|----------------|----------|
| SM34   | .015<br>(0.38) | .200<br>(5.08) | .014<br>(0.36) | .030<br>(0.76) | .080<br>(2.03) | .3       |

Dimensions are in inches (mm). Tolerances:  $\pm .005$

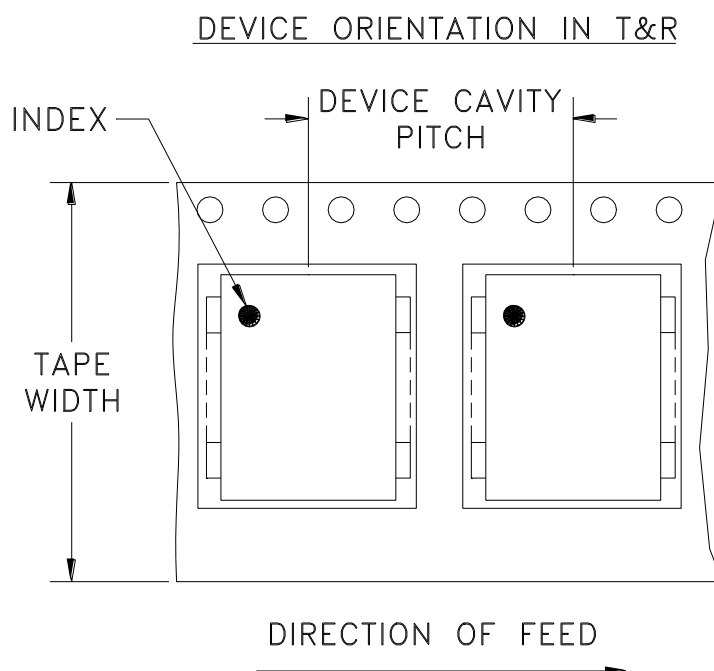
### Notes:

- Case material: Ceramic.
- Termination finish:  
For RoHS Case Styles: Tin plate over Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.



INTERNET <http://www.minicircuits.com>  
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# Tape & Reel Packaging TR-F10



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 24                | 16                         | 7                    | 10,20,50,100,200 |
|                   |                            | 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)

Note: Please consult individual model data sheet to determine device per reel availability.

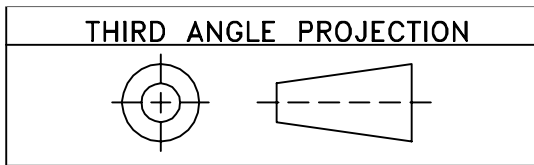


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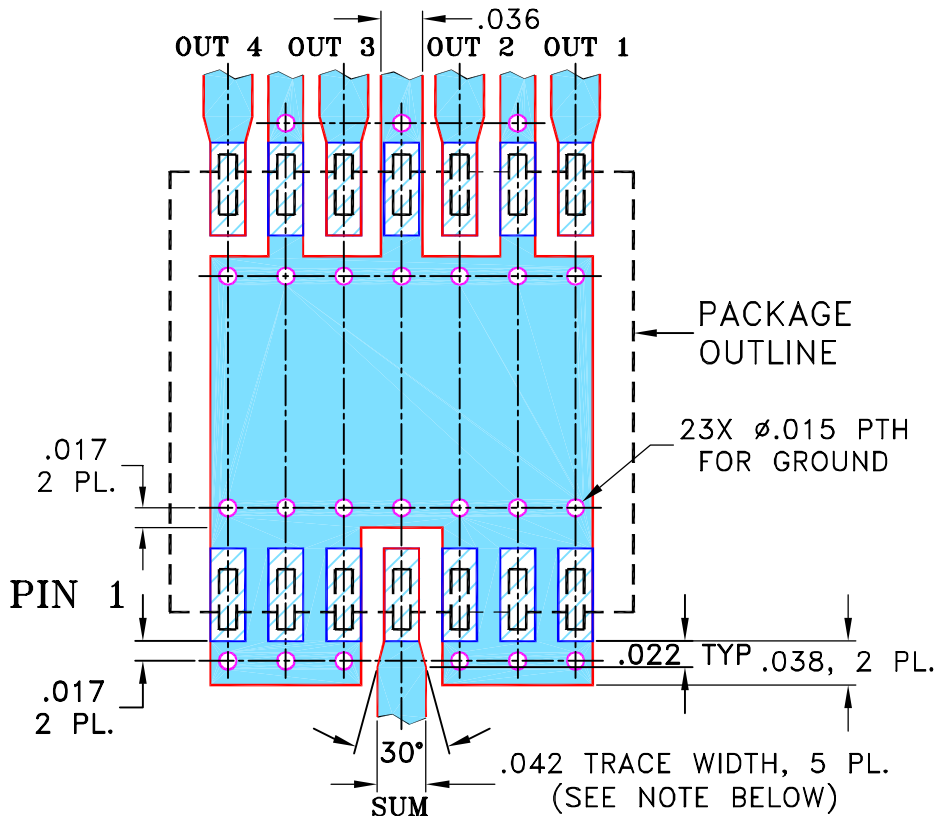
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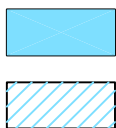


| REVISIONS |         |                                       |          |     |      |
|-----------|---------|---------------------------------------|----------|-----|------|
| REV       | ECN No. | DESCRIPTION                           | DATE     | DR  | AUTH |
| OR        | M88804  | NEW RELEASE                           | 12/13/05 | MMG | HY   |
| A         | M102713 | .042 WAS .044 & ADDED "...WITH SMOBC" | 01/25/06 | MMG | HY   |
|           |         |                                       |          |     |      |
|           |         |                                       |          |     |      |

**SUGGESTED MOUNTING CONFIGURATION  
FOR SM34 CASE STYLE, "lj" PIN CONNECTION.**



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.020 \pm .0015$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



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

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

| UNLESS OTHERWISE SPECIFIED                                                                                                                                                                                                                                                                                                                                                                                                                      | INITIALS |     | DATE     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES ON:<br>2 PL DECIMALS $\pm$<br>3 PL DECIMALS $\pm$ .005<br>ANGLES $\pm$<br>FRACTIONS $\pm$                                                                                                                                                                                                                                                                                                                | DRAWN    | MMG | 12/05/05 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CHECKED  | AV  | 12/13/05 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | APPROVED | HY  | 12/13/05 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |     |          |
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| ASHEETA1.DWG REV:A DATE:01/12/95                                                                                                                                                                                                                                                                                                                                                                                                                |          |     |          |



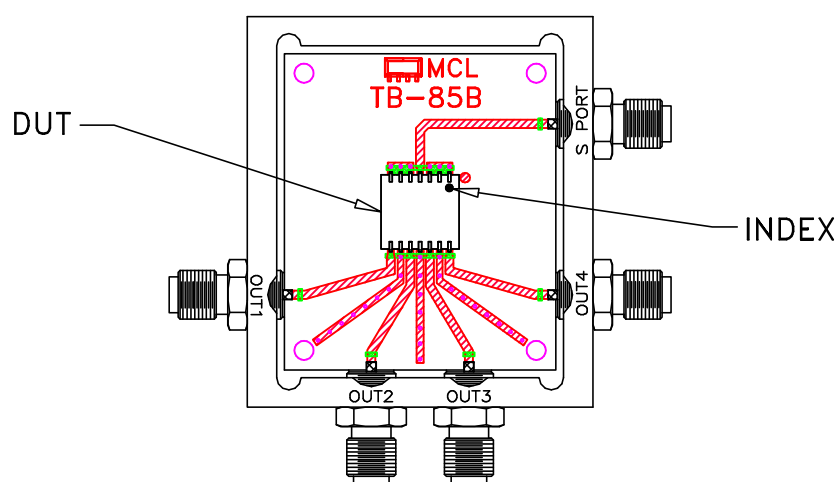
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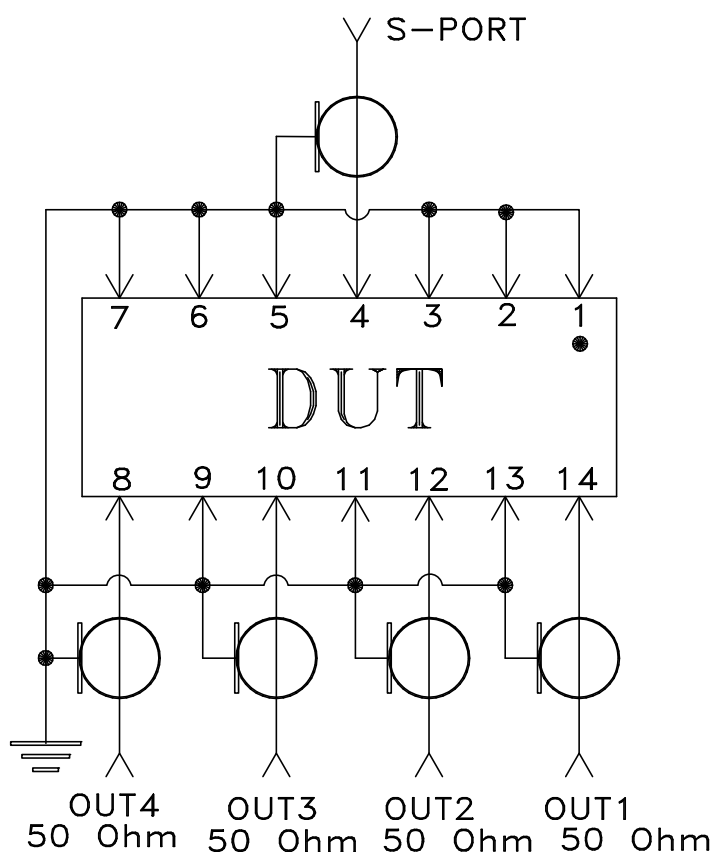
**PL, lj, SM34, SBD-4-25, TB-85**

| SIZE   | CODE IDENT | DRAWING NO: | REV: |
|--------|------------|-------------|------|
| A      | 15542      | 98-PL-142   | A    |
| FILE:  | 98PL142    | SCALE:      | 6:1  |
| SHEET: |            | 1 OF 1      |      |

# Evaluation Board and Circuit



TB-85



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.020 inch.

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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                                                                              |