

Power Splitter/Combiner

SBB-2-21W+

2 Way-0° 50Ω 1700 to 2100 MHz



Generic photo used for illustration purposes only

CASE STYLE: SM31

+RoHS Compliant

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

| | |
|--|------------------|
| Available Tape and Reel at no extra cost | |
| Reel Size | Devices/Reel |
| 7" | 20, 50, 100, 200 |
| 13" | 500, 1000 |

Maximum Ratings

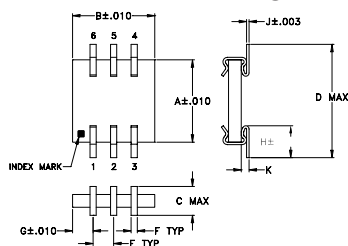
| | |
|-----------------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 10W max. |
| Internal Dissipation | 0.25W max. |

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

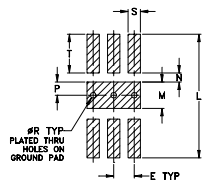
Pin Connections

| | |
|----------|-------|
| SUM PORT | 2 |
| PORT 1 | 6 |
| PORT 2 | 4 |
| GROUND | 1,3,5 |

Outline Drawing



PCB Land Pattern

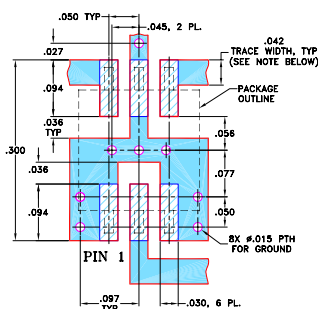


Suggested Layout,
Tolerance to be within ±.002
ADJACENT GROUND PINS SHALL BE CONNECTED TO EACH OTHER AND TO GROUND PAD

Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G | H | J | K | |
|------|------|------|------|------|------|------|------|------|------|-------|
| .200 | .200 | .070 | .275 | .050 | .015 | .050 | .085 | .006 | .019 | |
| 5.08 | 5.08 | 1.78 | 6.99 | 1.27 | 0.38 | 1.27 | 2.16 | 0.15 | 0.48 | |
| L | M | N | P | Q | R | S | T | | | wt |
| .300 | .064 | .022 | .032 | — | .014 | .030 | .094 | | | grams |
| 7.62 | 1.63 | 0.56 | 0.81 | — | 0.36 | 0.76 | 2.39 | | | 0.1 |

Demo Board MCL P/N: TB-156 Suggested PCB Layout (PL-003)



- NOTES:
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
 - Denotes PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 - Denotes COPPER LAND PATTERN FREE OF SOLDER MASK

Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuit's standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuit's website at www.minicircuits.com/WCLStore/terms.jsp

Features

- very stable performance over temp. range
- excellent insertion loss, 0.6 dB typ.
- excellent isolation, 22 dB typ.
- solder plated leads for excellent solderability and strain relief
- small size, 0.2"X0.275"X0.07"
- very low cost
- aqueous washable
- protected by U.S Patent, 6,819,202

Applications

- PCS
- DCS/GSM
- DECT,PHS

Electrical Specifications

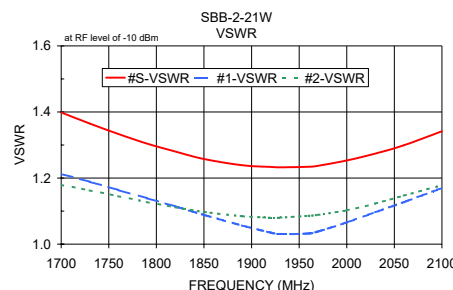
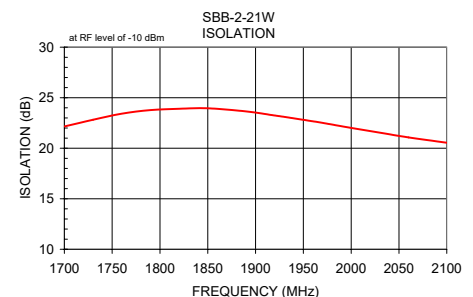
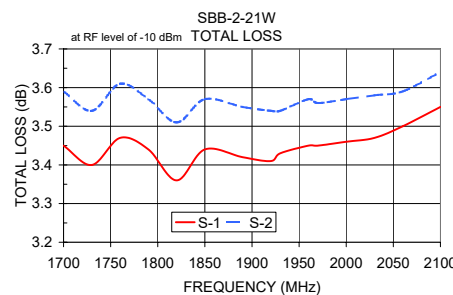
| FREQ. RANGE (MHz) | ISOLATION (dB) | | INSERTION LOSS ¹ (dB) ABOVE 3.0 dB | | PHASE UNBALANCE (Degrees) | AMPLITUDE UNBALANCE (dB) |
|-------------------|----------------|------|---|------|---------------------------|--------------------------|
| | Typ. | Min. | Typ. | Max. | Max. | Max. |
| $f_c - f_u$ | | | | | | |
| 1425-2100 | 22 | 15 | 0.6 | 1.1 | 4.0 | 0.3 |
| 1800-2000 | 24 | 18 | 0.5 | 0.9 | 4.0 | 0.3 |

1. Includes test fixture losses

Typical Performance Data

| Frequency (MHz) | Total Loss ¹ (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
| | S-1 | S-2 | | | | | | |
| 1700.00 | 3.45 | 3.59 | 0.14 | 22.15 | 0.95 | 1.40 | 1.21 | 1.18 |
| 1730.00 | 3.40 | 3.54 | 0.15 | 22.82 | 1.00 | 1.37 | 1.19 | 1.16 |
| 1760.00 | 3.47 | 3.61 | 0.14 | 23.42 | 0.94 | 1.33 | 1.16 | 1.15 |
| 1790.00 | 3.44 | 3.57 | 0.13 | 23.77 | 1.06 | 1.30 | 1.14 | 1.13 |
| 1820.00 | 3.36 | 3.51 | 0.14 | 23.90 | 1.13 | 1.28 | 1.11 | 1.11 |
| 1850.00 | 3.44 | 3.57 | 0.13 | 23.95 | 1.07 | 1.26 | 1.09 | 1.10 |
| 1890.00 | 3.42 | 3.55 | 0.13 | 23.64 | 1.20 | 1.24 | 1.06 | 1.08 |
| 1920.00 | 3.41 | 3.54 | 0.13 | 23.24 | 1.25 | 1.23 | 1.04 | 1.08 |
| 1930.00 | 3.43 | 3.54 | 0.12 | 23.10 | 1.22 | 1.23 | 1.03 | 1.08 |
| 1960.00 | 3.45 | 3.57 | 0.11 | 22.66 | 1.26 | 1.23 | 1.03 | 1.09 |
| 1970.00 | 3.45 | 3.56 | 0.11 | 22.51 | 1.27 | 1.24 | 1.04 | 1.09 |
| 2000.00 | 3.46 | 3.57 | 0.11 | 22.01 | 1.35 | 1.25 | 1.07 | 1.10 |
| 2030.00 | 3.47 | 3.58 | 0.11 | 21.54 | 1.44 | 1.27 | 1.10 | 1.12 |
| 2060.00 | 3.50 | 3.59 | 0.10 | 21.07 | 1.49 | 1.30 | 1.13 | 1.15 |
| 2100.00 | 3.55 | 3.64 | 0.09 | 20.54 | 1.51 | 1.34 | 1.17 | 1.18 |

1. Total Loss = Insertion Loss + 3dB splitter loss.



electrical schematic



2 Way-0° Power Splitter/Combiner

SBB-2-21W+

Typical Performance Data

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

| FREQ. (MHz) | TOTAL LOSS ¹ (dB) | | AMP. UNBAL. (dB) | PHASE UNBAL. (deg.) | ISOLATION (dB) | VSWR (:1) | | |
|----------------|---------------------------------|------|------------------------|---------------------------|-------------------|--------------|------|------|
| | S-1 | S-2 | | | | S | 1 | 2 |
| 10 | 3.55 | 3.54 | 0.01 | 0.05 | 3.57 | 1.99 | 1.98 | 1.98 |
| 50 | 3.57 | 3.56 | 0.01 | 0.16 | 3.64 | 1.98 | 1.95 | 1.95 |
| 100 | 3.59 | 3.58 | 0.01 | 0.24 | 3.75 | 1.96 | 1.91 | 1.92 |
| 200 | 3.62 | 3.60 | 0.01 | 0.35 | 4.05 | 1.95 | 1.82 | 1.82 |
| 300 | 3.64 | 3.62 | 0.02 | 0.37 | 4.48 | 1.94 | 1.71 | 1.71 |
| 400 | 3.66 | 3.62 | 0.03 | 0.45 | 5.02 | 1.93 | 1.60 | 1.59 |
| 500 | 3.67 | 3.63 | 0.04 | 0.51 | 5.64 | 1.92 | 1.48 | 1.47 |
| 600 | 3.68 | 3.63 | 0.05 | 0.53 | 6.34 | 1.91 | 1.38 | 1.36 |
| 700 | 3.68 | 3.63 | 0.05 | 0.57 | 7.10 | 1.90 | 1.28 | 1.26 |
| 800 | 3.68 | 3.62 | 0.06 | 0.60 | 7.93 | 1.87 | 1.20 | 1.18 |
| 900 | 3.67 | 3.61 | 0.05 | 0.62 | 8.83 | 1.84 | 1.14 | 1.12 |
| 1000 | 3.65 | 3.59 | 0.06 | 0.72 | 9.81 | 1.79 | 1.08 | 1.06 |
| 1100 | 3.62 | 3.57 | 0.05 | 0.74 | 10.92 | 1.73 | 1.04 | 1.02 |
| 1200 | 3.58 | 3.53 | 0.05 | 0.84 | 12.18 | 1.65 | 1.01 | 1.02 |
| 1300 | 3.54 | 3.49 | 0.05 | 0.88 | 13.64 | 1.57 | 1.03 | 1.05 |
| 1400 | 3.49 | 3.44 | 0.05 | 0.99 | 15.43 | 1.47 | 1.05 | 1.06 |
| 1425 | 3.48 | 3.44 | 0.05 | 0.98 | 15.95 | 1.44 | 1.05 | 1.07 |
| 1475 | 3.46 | 3.42 | 0.05 | 1.01 | 17.08 | 1.39 | 1.06 | 1.07 |
| 1500 | 3.46 | 3.40 | 0.06 | 1.07 | 17.72 | 1.36 | 1.07 | 1.08 |
| 1600 | 3.43 | 3.37 | 0.05 | 1.09 | 20.82 | 1.25 | 1.09 | 1.10 |
| 1700 | 3.42 | 3.36 | 0.06 | 1.18 | 25.77 | 1.15 | 1.13 | 1.13 |
| 1750 | 3.43 | 3.37 | 0.06 | 1.20 | 29.89 | 1.13 | 1.15 | 1.15 |
| 1800 | 3.45 | 3.38 | 0.06 | 1.23 | 37.39 | 1.14 | 1.18 | 1.18 |
| 1850 | 3.48 | 3.40 | 0.07 | 1.24 | 39.04 | 1.19 | 1.22 | 1.21 |
| 1900 | 3.52 | 3.44 | 0.08 | 1.28 | 30.88 | 1.26 | 1.26 | 1.26 |
| 1950 | 3.57 | 3.49 | 0.08 | 1.35 | 26.67 | 1.34 | 1.31 | 1.30 |
| 2000 | 3.65 | 3.56 | 0.09 | 1.35 | 23.81 | 1.44 | 1.36 | 1.35 |
| 2050 | 3.74 | 3.64 | 0.10 | 1.36 | 21.73 | 1.55 | 1.42 | 1.41 |
| 2100 | 3.84 | 3.75 | 0.10 | 1.35 | 20.14 | 1.68 | 1.49 | 1.48 |
| 2150 | 3.97 | 3.87 | 0.10 | 1.40 | 18.88 | 1.82 | 1.56 | 1.55 |
| 2200 | 4.11 | 4.01 | 0.10 | 1.41 | 17.79 | 1.98 | 1.64 | 1.62 |
| 2250 | 4.28 | 4.17 | 0.11 | 1.51 | 16.90 | 2.16 | 1.72 | 1.70 |
| 2300 | 4.46 | 4.35 | 0.11 | 1.51 | 16.15 | 2.36 | 1.81 | 1.79 |
| 2350 | 4.64 | 4.52 | 0.12 | 1.51 | 15.51 | 2.57 | 1.91 | 1.88 |
| 2400 | 4.84 | 4.71 | 0.13 | 1.57 | 14.96 | 2.79 | 2.01 | 1.98 |
| 2450 | 5.06 | 4.92 | 0.14 | 1.59 | 14.55 | 3.03 | 2.11 | 2.08 |
| 2500 | 5.28 | 5.14 | 0.15 | 1.55 | 14.16 | 3.28 | 2.22 | 2.19 |
| 2550 | 5.52 | 5.36 | 0.16 | 1.62 | 13.86 | 3.56 | 2.33 | 2.29 |
| 2600 | 5.76 | 5.59 | 0.17 | 1.64 | 13.60 | 3.85 | 2.44 | 2.40 |
| 2650 | 6.01 | 5.83 | 0.18 | 1.67 | 13.40 | 4.14 | 2.55 | 2.51 |
| 2700 | 6.25 | 6.08 | 0.18 | 1.56 | 13.23 | 4.44 | 2.66 | 2.61 |
| 2750 | 6.50 | 6.33 | 0.18 | 1.70 | 13.11 | 4.76 | 2.78 | 2.73 |
| 2800 | 6.76 | 6.57 | 0.19 | 1.50 | 13.01 | 5.08 | 2.88 | 2.84 |
| 2850 | 7.00 | 6.83 | 0.17 | 1.47 | 12.96 | 5.39 | 2.99 | 2.94 |
| 2900 | 7.22 | 7.05 | 0.18 | 1.60 | 12.90 | 5.75 | 3.10 | 3.05 |
| 2950 | 7.46 | 7.27 | 0.19 | 1.76 | 12.88 | 6.07 | 3.20 | 3.14 |
| 3000 | 7.71 | 7.48 | 0.23 | 1.69 | 12.90 | 6.37 | 3.31 | 3.25 |

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss



2 Way-0° Power Splitter/Combiner

SBB-2-21W+

Typical Performance Data

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

| FREQ. (MHz) | TOTAL LOSS ¹ (dB) | | AMP. UNBAL. (dB) | PHASE UNBAL. (deg.) | ISOLATION (dB) | VSWR (:1) | | |
|----------------|---------------------------------|------|------------------------|---------------------------|-------------------|--------------|------|------|
| | S-1 | S-2 | | | | S | 1 | 2 |
| 10 | 3.54 | 3.53 | 0.01 | 0.10 | 3.55 | 1.99 | 1.98 | 1.99 |
| 50 | 3.57 | 3.54 | 0.03 | 0.06 | 3.62 | 1.97 | 1.96 | 1.96 |
| 100 | 3.56 | 3.57 | 0.01 | 0.08 | 3.71 | 1.97 | 1.91 | 1.93 |
| 200 | 3.59 | 3.57 | 0.02 | 0.06 | 4.01 | 1.96 | 1.83 | 1.83 |
| 300 | 3.60 | 3.57 | 0.03 | 0.03 | 4.43 | 1.95 | 1.72 | 1.72 |
| 400 | 3.61 | 3.57 | 0.03 | 0.18 | 4.96 | 1.94 | 1.60 | 1.60 |
| 500 | 3.61 | 3.57 | 0.04 | 0.26 | 5.58 | 1.94 | 1.49 | 1.48 |
| 600 | 3.62 | 3.55 | 0.07 | 0.42 | 6.27 | 1.92 | 1.39 | 1.36 |
| 700 | 3.61 | 3.54 | 0.07 | 0.57 | 7.03 | 1.90 | 1.29 | 1.27 |
| 800 | 3.61 | 3.52 | 0.08 | 0.75 | 7.85 | 1.88 | 1.21 | 1.19 |
| 900 | 3.58 | 3.51 | 0.07 | 0.86 | 8.73 | 1.84 | 1.14 | 1.13 |
| 1000 | 3.57 | 3.48 | 0.09 | 1.00 | 9.69 | 1.81 | 1.09 | 1.06 |
| 1100 | 3.53 | 3.45 | 0.08 | 1.11 | 10.77 | 1.74 | 1.04 | 1.03 |
| 1200 | 3.49 | 3.41 | 0.08 | 1.22 | 12.00 | 1.68 | 1.01 | 1.02 |
| 1300 | 3.44 | 3.36 | 0.08 | 1.42 | 13.43 | 1.59 | 1.02 | 1.04 |
| 1400 | 3.39 | 3.31 | 0.08 | 1.46 | 15.20 | 1.49 | 1.04 | 1.06 |
| 1425 | 3.38 | 3.30 | 0.08 | 1.48 | 15.71 | 1.46 | 1.05 | 1.06 |
| 1475 | 3.36 | 3.28 | 0.08 | 1.57 | 16.82 | 1.41 | 1.06 | 1.07 |
| 1500 | 3.35 | 3.26 | 0.08 | 1.59 | 17.45 | 1.38 | 1.06 | 1.08 |
| 1600 | 3.31 | 3.22 | 0.08 | 1.66 | 20.51 | 1.26 | 1.09 | 1.08 |
| 1700 | 3.30 | 3.20 | 0.10 | 1.82 | 25.35 | 1.17 | 1.12 | 1.13 |
| 1750 | 3.30 | 3.20 | 0.10 | 1.89 | 29.19 | 1.14 | 1.14 | 1.14 |
| 1800 | 3.31 | 3.21 | 0.10 | 1.93 | 35.58 | 1.14 | 1.17 | 1.16 |
| 1850 | 3.34 | 3.23 | 0.11 | 2.02 | 39.19 | 1.18 | 1.21 | 1.21 |
| 1900 | 3.38 | 3.26 | 0.12 | 2.08 | 31.08 | 1.25 | 1.25 | 1.25 |
| 1950 | 3.42 | 3.31 | 0.11 | 2.09 | 26.87 | 1.33 | 1.29 | 1.29 |
| 2000 | 3.49 | 3.37 | 0.13 | 2.17 | 23.89 | 1.43 | 1.35 | 1.34 |
| 2050 | 3.59 | 3.45 | 0.13 | 2.21 | 21.69 | 1.55 | 1.42 | 1.41 |
| 2100 | 3.69 | 3.55 | 0.14 | 2.33 | 20.05 | 1.69 | 1.49 | 1.47 |
| 2150 | 3.81 | 3.67 | 0.14 | 2.44 | 18.72 | 1.84 | 1.56 | 1.54 |
| 2200 | 3.95 | 3.80 | 0.14 | 2.47 | 17.64 | 2.01 | 1.64 | 1.63 |
| 2250 | 4.10 | 3.95 | 0.15 | 2.47 | 16.76 | 2.18 | 1.71 | 1.72 |
| 2300 | 4.27 | 4.11 | 0.16 | 2.55 | 15.98 | 2.38 | 1.79 | 1.79 |
| 2350 | 4.45 | 4.27 | 0.17 | 2.69 | 15.32 | 2.59 | 1.89 | 1.87 |
| 2400 | 4.65 | 4.48 | 0.17 | 2.69 | 14.78 | 2.85 | 1.99 | 1.99 |
| 2450 | 4.88 | 4.69 | 0.19 | 2.73 | 14.35 | 3.13 | 2.11 | 2.10 |
| 2500 | 5.11 | 4.90 | 0.21 | 2.93 | 13.95 | 3.39 | 2.22 | 2.18 |
| 2550 | 5.32 | 5.10 | 0.22 | 2.98 | 13.67 | 3.67 | 2.33 | 2.29 |
| 2600 | 5.54 | 5.32 | 0.22 | 3.05 | 13.42 | 3.97 | 2.43 | 2.41 |
| 2650 | 5.79 | 5.57 | 0.22 | 3.11 | 13.20 | 4.31 | 2.54 | 2.54 |
| 2700 | 6.04 | 5.82 | 0.22 | 3.17 | 13.02 | 4.67 | 2.65 | 2.66 |
| 2750 | 6.26 | 6.02 | 0.25 | 3.19 | 12.86 | 4.98 | 2.76 | 2.71 |
| 2800 | 6.50 | 6.24 | 0.27 | 3.47 | 12.74 | 5.33 | 2.86 | 2.82 |
| 2850 | 6.73 | 6.47 | 0.25 | 3.61 | 12.70 | 5.69 | 2.97 | 2.96 |
| 2900 | 6.95 | 6.68 | 0.27 | 3.50 | 12.62 | 6.10 | 3.10 | 3.03 |
| 2950 | 7.19 | 6.92 | 0.28 | 3.66 | 12.59 | 6.54 | 3.23 | 3.16 |
| 3000 | 7.45 | 7.16 | 0.29 | 3.73 | 12.65 | 6.97 | 3.35 | 3.32 |

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss



2 Way-0° Power Splitter/Combiner

SBB-2-21W+

Typical Performance Data

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

| FREQ. (MHz) | TOTAL LOSS ¹ (dB) | | AMP. UNBAL. (dB) | PHASE UNBAL. (deg.) | ISOLATION (dB) | VSWR (:1) | | |
|----------------|---------------------------------|------|------------------------|---------------------------|-------------------|--------------|------|------|
| | S-1 | S-2 | | | | S | 1 | 2 |
| 10 | 3.55 | 3.55 | 0.01 | 0.05 | 3.57 | 1.99 | 1.97 | 1.98 |
| 50 | 3.57 | 3.59 | 0.02 | 0.21 | 3.63 | 1.98 | 1.94 | 1.95 |
| 100 | 3.60 | 3.60 | 0.00 | 0.45 | 3.74 | 1.96 | 1.91 | 1.91 |
| 200 | 3.63 | 3.63 | 0.01 | 0.46 | 4.05 | 1.94 | 1.82 | 1.82 |
| 300 | 3.66 | 3.65 | 0.01 | 0.54 | 4.49 | 1.93 | 1.71 | 1.70 |
| 400 | 3.68 | 3.67 | 0.02 | 0.72 | 5.03 | 1.93 | 1.59 | 1.58 |
| 500 | 3.70 | 3.68 | 0.02 | 0.80 | 5.66 | 1.92 | 1.48 | 1.46 |
| 600 | 3.71 | 3.68 | 0.03 | 0.87 | 6.36 | 1.91 | 1.37 | 1.35 |
| 700 | 3.72 | 3.69 | 0.03 | 0.97 | 7.12 | 1.90 | 1.28 | 1.26 |
| 800 | 3.72 | 3.69 | 0.04 | 1.05 | 7.96 | 1.87 | 1.20 | 1.18 |
| 900 | 3.71 | 3.68 | 0.03 | 1.14 | 8.88 | 1.83 | 1.13 | 1.11 |
| 1000 | 3.69 | 3.66 | 0.03 | 1.32 | 9.88 | 1.78 | 1.08 | 1.06 |
| 1100 | 3.66 | 3.64 | 0.03 | 1.41 | 11.01 | 1.72 | 1.03 | 1.02 |
| 1200 | 3.63 | 3.61 | 0.02 | 1.57 | 12.29 | 1.64 | 1.01 | 1.02 |
| 1300 | 3.59 | 3.57 | 0.02 | 1.62 | 13.78 | 1.55 | 1.03 | 1.05 |
| 1400 | 3.55 | 3.53 | 0.01 | 1.81 | 15.58 | 1.45 | 1.05 | 1.07 |
| 1425 | 3.54 | 3.52 | 0.02 | 1.84 | 16.11 | 1.42 | 1.06 | 1.07 |
| 1475 | 3.52 | 3.50 | 0.02 | 1.93 | 17.24 | 1.37 | 1.07 | 1.08 |
| 1500 | 3.52 | 3.50 | 0.02 | 1.95 | 17.89 | 1.34 | 1.07 | 1.08 |
| 1600 | 3.50 | 3.47 | 0.02 | 2.05 | 21.00 | 1.24 | 1.10 | 1.11 |
| 1700 | 3.50 | 3.47 | 0.03 | 2.19 | 26.04 | 1.14 | 1.14 | 1.14 |
| 1750 | 3.51 | 3.47 | 0.03 | 2.25 | 30.32 | 1.12 | 1.17 | 1.16 |
| 1800 | 3.53 | 3.50 | 0.03 | 2.33 | 38.55 | 1.14 | 1.20 | 1.19 |
| 1850 | 3.56 | 3.52 | 0.04 | 2.38 | 38.96 | 1.20 | 1.24 | 1.23 |
| 1900 | 3.61 | 3.57 | 0.04 | 2.42 | 30.78 | 1.27 | 1.28 | 1.27 |
| 1950 | 3.67 | 3.62 | 0.04 | 2.52 | 26.69 | 1.35 | 1.33 | 1.32 |
| 2000 | 3.74 | 3.69 | 0.05 | 2.58 | 23.93 | 1.45 | 1.38 | 1.37 |
| 2050 | 3.83 | 3.78 | 0.06 | 2.62 | 21.87 | 1.56 | 1.44 | 1.42 |
| 2100 | 3.94 | 3.88 | 0.06 | 2.63 | 20.26 | 1.68 | 1.50 | 1.49 |
| 2150 | 4.06 | 4.00 | 0.06 | 2.70 | 19.00 | 1.82 | 1.57 | 1.56 |
| 2200 | 4.21 | 4.14 | 0.07 | 2.78 | 17.91 | 1.98 | 1.65 | 1.63 |
| 2250 | 4.37 | 4.29 | 0.08 | 2.87 | 17.02 | 2.15 | 1.74 | 1.71 |
| 2300 | 4.55 | 4.46 | 0.09 | 2.90 | 16.31 | 2.33 | 1.83 | 1.79 |
| 2350 | 4.74 | 4.65 | 0.09 | 2.92 | 15.71 | 2.53 | 1.92 | 1.88 |
| 2400 | 4.95 | 4.86 | 0.09 | 3.00 | 15.17 | 2.75 | 2.01 | 1.97 |
| 2450 | 5.16 | 5.07 | 0.10 | 3.02 | 14.75 | 2.97 | 2.11 | 2.06 |
| 2500 | 5.39 | 5.29 | 0.09 | 3.09 | 14.36 | 3.21 | 2.21 | 2.17 |
| 2550 | 5.63 | 5.52 | 0.11 | 3.19 | 14.04 | 3.48 | 2.32 | 2.27 |
| 2600 | 5.88 | 5.75 | 0.13 | 3.24 | 13.76 | 3.75 | 2.44 | 2.39 |
| 2650 | 6.13 | 5.99 | 0.14 | 3.29 | 13.56 | 4.02 | 2.55 | 2.48 |
| 2700 | 6.37 | 6.24 | 0.13 | 3.26 | 13.39 | 4.29 | 2.67 | 2.58 |
| 2750 | 6.64 | 6.50 | 0.13 | 3.40 | 13.29 | 4.60 | 2.78 | 2.71 |
| 2800 | 6.89 | 6.78 | 0.11 | 3.37 | 13.18 | 4.91 | 2.89 | 2.83 |
| 2850 | 7.13 | 7.02 | 0.11 | 3.43 | 13.13 | 5.20 | 2.98 | 2.93 |
| 2900 | 7.38 | 7.27 | 0.11 | 3.53 | 13.08 | 5.50 | 3.08 | 3.04 |
| 2950 | 7.63 | 7.49 | 0.14 | 3.69 | 13.08 | 5.78 | 3.18 | 3.13 |
| 3000 | 7.86 | 7.70 | 0.16 | 3.58 | 13.03 | 6.02 | 3.29 | 3.20 |

¹ Total Loss = Insertion Loss+ 3dB Splitter Loss

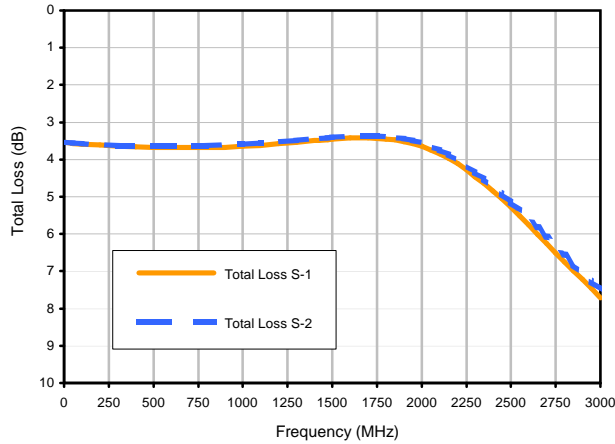


2 Way-0° Power Splitter/Combiner

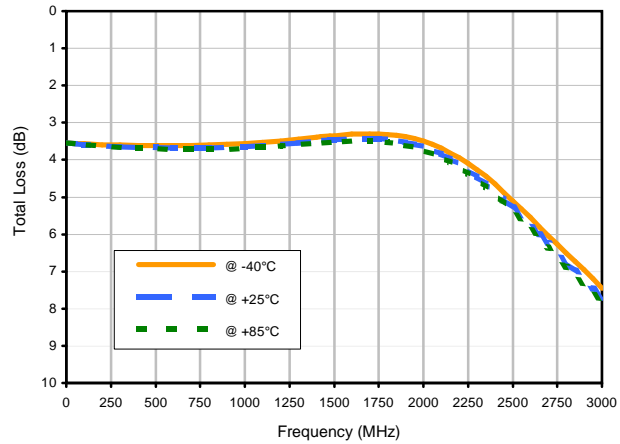
SBB-2-21W+

Typical Performance Curves

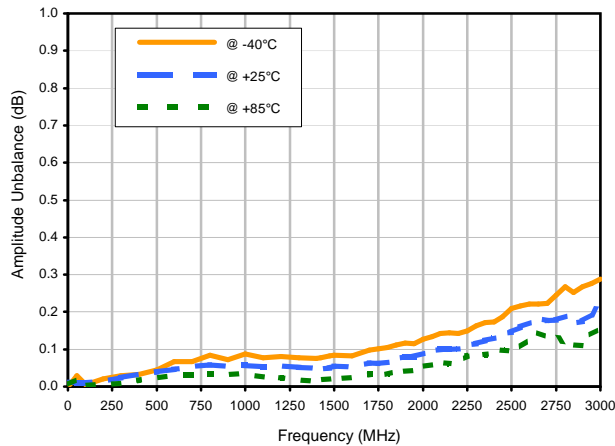
Total Loss



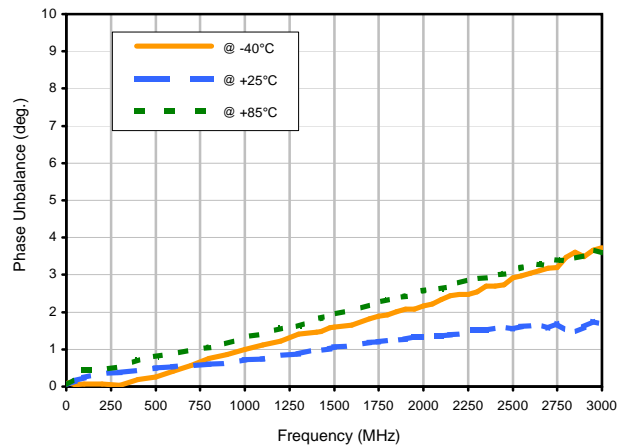
Total Loss S-1 vs. TEMPERATURE



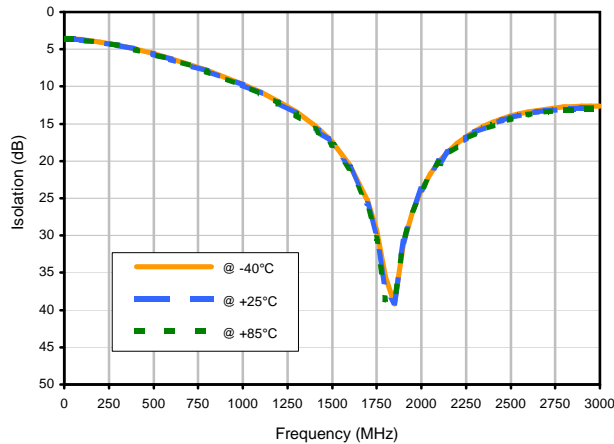
Amplitude Unbalance vs. TEMPERATURE



Phase Unbalance vs. TEMPERATURE



Isolation 1-2 vs. TEMPERATURE



REV. X2
SBB-2-21W+
100627
Page 1 of 2



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see [minicircuits.com](http://www.minicircuits.com)



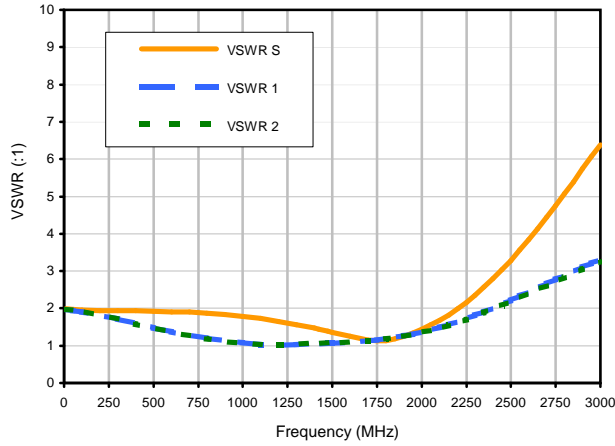
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0006 (718) 934-4500 Fax (718) 332-4661

2 Way-0° Power Splitter/Combiner

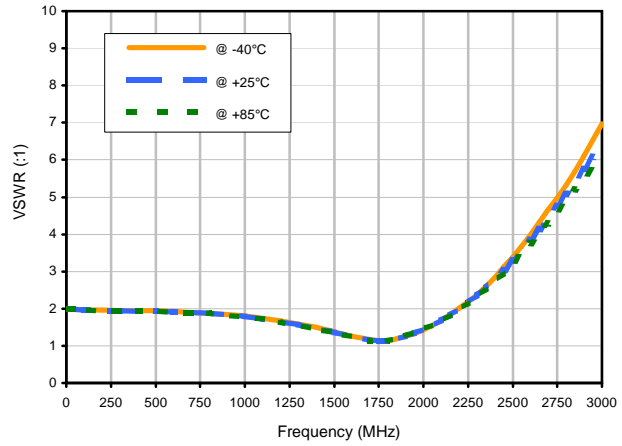
SBB-2-21W+

Typical Performance Curves

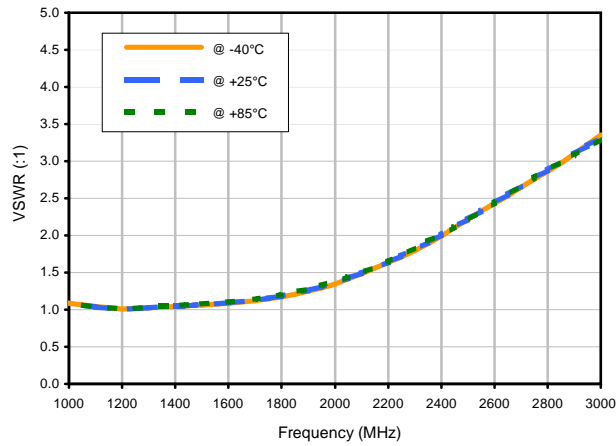
VSWR



VSWR SUM vs. TEMPERATURE



VSWR OUT1 vs. TEMPERATURE



REV. X2
SBB-2-21W+
100627
Page 2 of 2



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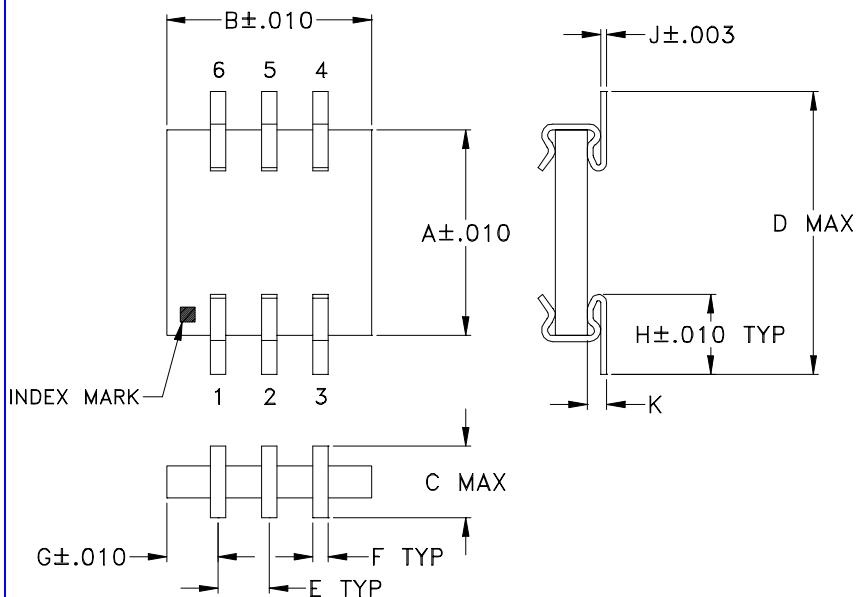


Case Style

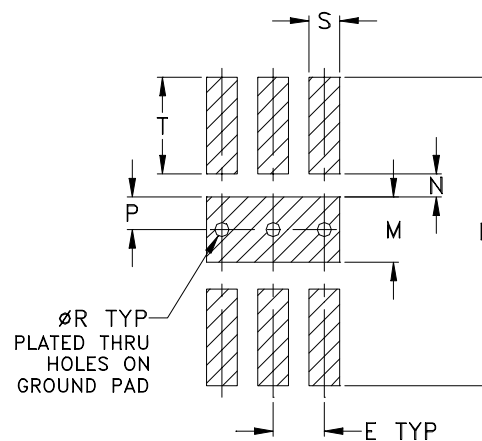
SM31

SM31

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 | P |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SM31 | .200 (5.08) | .200 (5.08) | .070 (1.78) | .275 (6.99) | .050 (1.27) | .015 (0.38) | .050 (1.27) | .085 (2.16) | .006 (0.15) | .019 (0.48) | .300 (7.62) | .064 (1.63) | .022 (0.56) | .032 (0.81) |

| CASE # | Q | R | S | T | WT. GRAM |
|--------|----|----------------|----------------|----------------|----------|
| SM31 | -- | .014 (0.36) | .030 (0.76) | .094 (2.39) | 0.1 |

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.

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Tape & Reel Packaging TR-F34



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note | |
|----------------|-------------------------|-------------------|------------------------------------|------|
| 16 | 12 | 7 | Small quantity standard (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | 13 | Standard | 500 |
| | | | | 1000 |

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

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

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



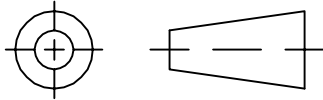
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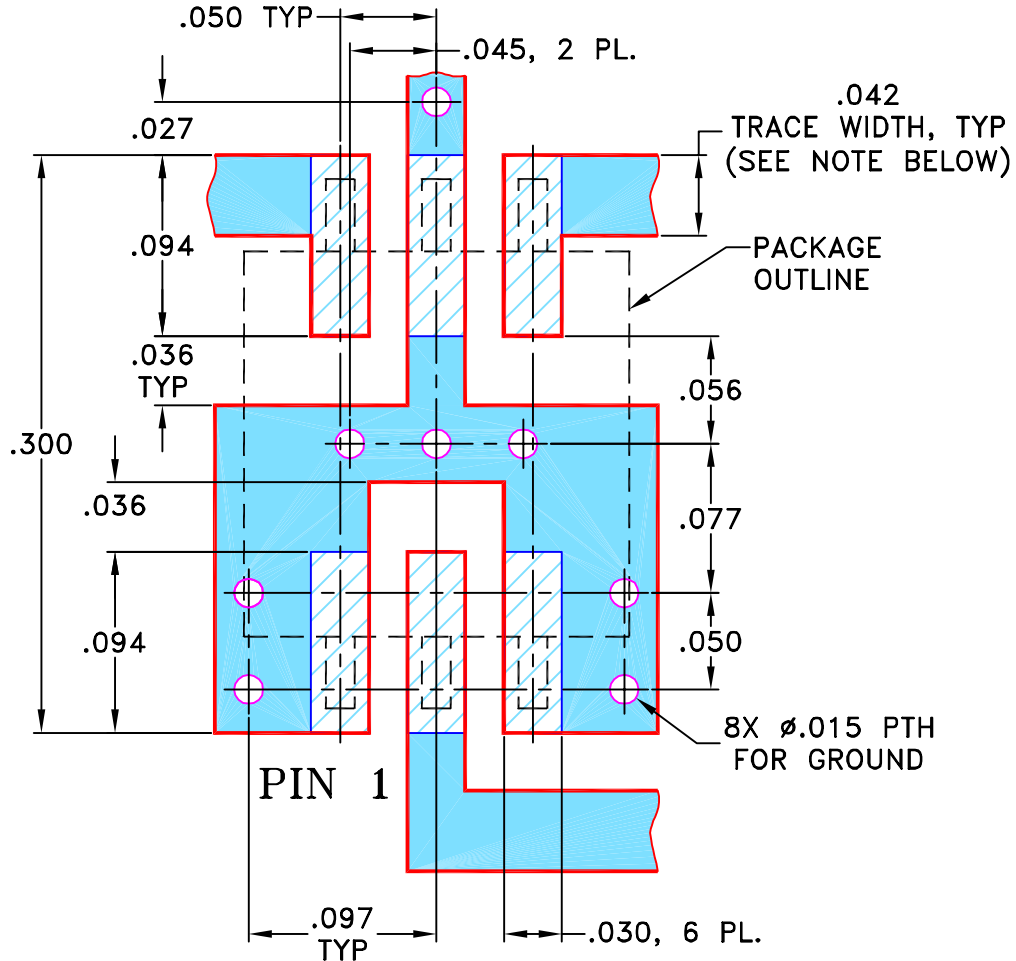
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-----------------|----------|-----|------|
| OR | M71387 | NEW RELEASE | 04/00 | MMG | DB |
| A | M82575 | UPDATED DRAWING | 08/08/02 | AV | HY |
| B | M102713 | UPDATED NOTES | 01/12/06 | GF | IL |

**SUGGESTED MOUNTING CONFIGURATION
FOR SM31 CASE STYLE, "mu" PIN CONNECTION**



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" ± .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 SOLDER MASK

| UNLESS OTHERWISE SPECIFIED | INITIALS | | DATE |
|--|----------|-----|----------|
| DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ± | DRAWN | MMG | 04/12/00 |
| | CHECKED | WP | 04/27/00 |
| | APPROVED | DB | 04/27/00 |



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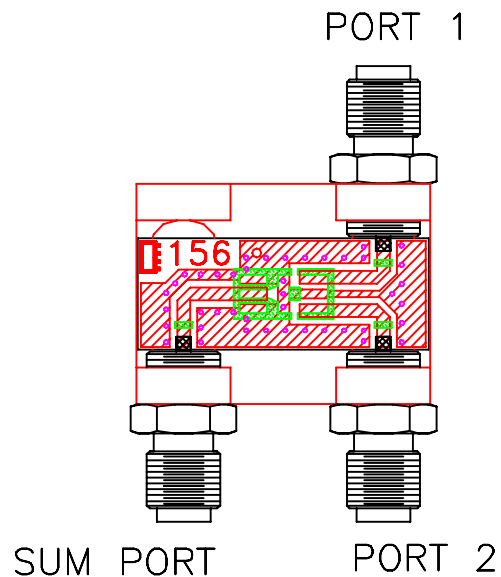
13 Neptune Avenue
Brooklyn NY 11235

PL, mu, SM31, SBB, TB-156

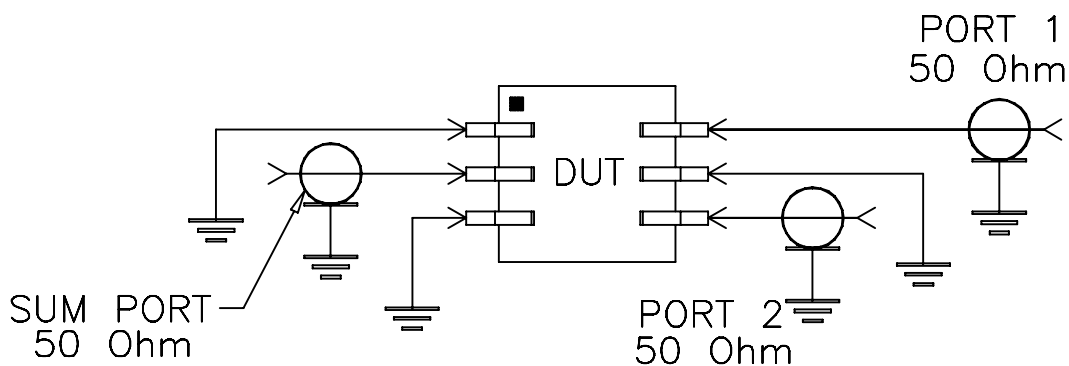
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| SIZE | CODE IDENT | DRAWING NO: | REV: |
|--------|------------|-------------|------|
| A | 15542 | 98-PL-003 | B |
| FILE: | 98PL003 | SCALE: | 10:1 |
| SHEET: | | 1 OF 1 | |

Evaluation Board and Circuit



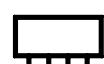
TB-156



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C 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 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |