

Surface Mount, Micro-Miniature Power Splitter/Combiner

SBTCJ-1W+

2 Way-180° 50Ω 1 to 750 MHz

Features

- low insertion loss, 0.7 dB typ.
- good isolation, 23 dB typ.
- good VSWR, 1.25 typ. all ports
- small size, 0.15X0.15"X0.15"
- temperature stable, LTCC base
- low cost
- protected by US Patent, 6,806,790

Applications

- cellular
- UHF/VHF receivers/transmitters



Generic photo used for illustration purposes only

CASE STYLE: AT790

+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, 2000 |

Electrical Specifications

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------------------------|-----------------|------|------|------|--------|
| Frequency Range | | 1 | | 750 | MHz |
| Insertion Loss Above 3.0 dB | 1 - 100 | — | 0.6 | 1.7 | dB |
| | 100 - 375 | — | 0.6 | 1.2 | |
| | 375 - 750 | — | 0.9 | 1.8 | |
| Isolation ¹ | 1 - 100 | 20 | 23 | — | dB |
| | 100 - 375 | 20 | 22 | — | |
| | 375 - 750 | 20 | 24 | — | |
| Phase Unbalance | 1 - 100 | — | — | 3 | Degree |
| | 100 - 375 | — | — | 7 | |
| | 375 - 750 | — | — | 10 | |
| Amplitude Unbalance | 1 - 100 | — | — | 0.2 | dB |
| | 100 - 375 | — | — | 0.4 | |
| | 375 - 750 | — | — | 0.9 | |

1. Isolation, 17 dB min. at 1 - 3 MHz

Maximum Ratings

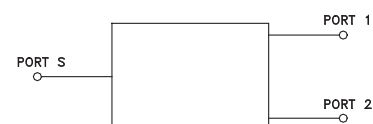
| Parameter | Ratings |
|-----------------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 0.5W max. |
| Internal Dissipation | 0.125W max |

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

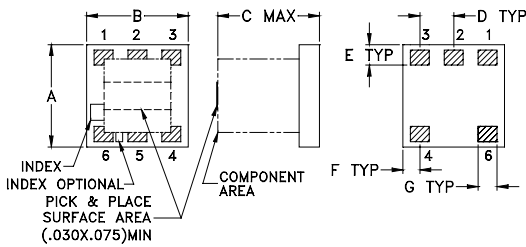
Pin Connections

| Function | Pin Number |
|----------|------------|
| SUM PORT | 6 |
| PORT 1 | 1 |
| PORT 2 | 3 |
| GROUND | 2,4 |
| NOT USED | 5 |

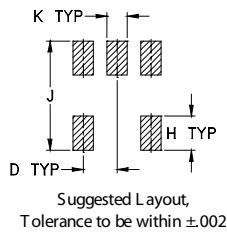
Electrical Schematic



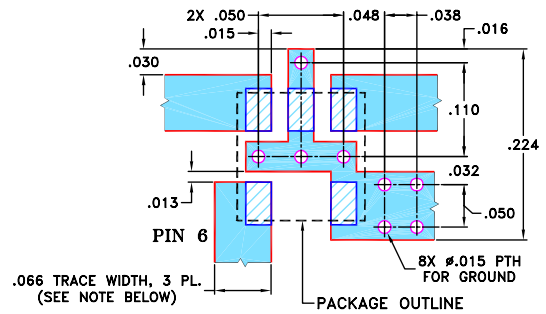
Outline Drawing



PCB Land Pattern



Demo Board MCL P/N: TB-227 Suggested PCB Layout (PL-117)



Outline Dimensions (inch mm)

| A | B | C | D | E | F |
|------|------|------|------|-------|------|
| .150 | .150 | .150 | .050 | .030 | .025 |
| 3.81 | 3.81 | 3.81 | 1.27 | 0.76 | 0.64 |
| G | H | J | K | wt | |
| .028 | .050 | .160 | .030 | grams | |
| 0.71 | 1.27 | 4.06 | 0.76 | 0.10 | |

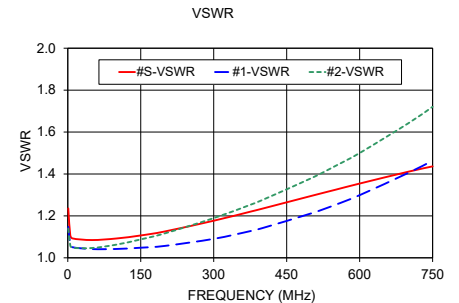
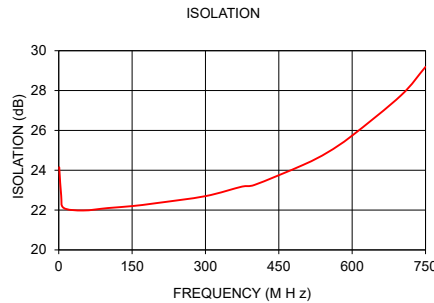
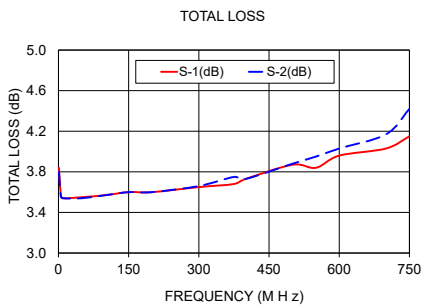
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

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 | | | | | | |
| 1.00 | 3.84 | 3.80 | 0.04 | 24.15 | 179.96 | 1.24 | 1.15 | 1.14 |
| 5.00 | 3.57 | 3.56 | 0.01 | 22.73 | 179.96 | 1.11 | 1.07 | 1.06 |
| 10.00 | 3.54 | 3.54 | 0.00 | 22.11 | 179.95 | 1.09 | 1.05 | 1.05 |
| 50.00 | 3.55 | 3.54 | 0.00 | 21.98 | 179.53 | 1.08 | 1.04 | 1.05 |
| 100.00 | 3.57 | 3.57 | 0.00 | 22.10 | 179.01 | 1.09 | 1.04 | 1.06 |
| 150.00 | 3.60 | 3.60 | 0.01 | 22.20 | 178.54 | 1.11 | 1.05 | 1.09 |
| 200.00 | 3.60 | 3.60 | 0.00 | 22.35 | 178.04 | 1.13 | 1.06 | 1.12 |
| 300.00 | 3.65 | 3.66 | 0.01 | 22.70 | 177.08 | 1.18 | 1.09 | 1.19 |
| 375.00 | 3.68 | 3.75 | 0.07 | 23.18 | 176.60 | 1.22 | 1.13 | 1.25 |
| 400.00 | 3.73 | 3.73 | 0.01 | 23.26 | 176.18 | 1.23 | 1.14 | 1.28 |
| 500.00 | 3.87 | 3.88 | 0.01 | 24.27 | 175.75 | 1.29 | 1.21 | 1.38 |
| 550.00 | 3.84 | 3.95 | 0.11 | 24.90 | 175.68 | 1.32 | 1.25 | 1.44 |
| 600.00 | 3.96 | 4.03 | 0.07 | 25.74 | 175.59 | 1.35 | 1.30 | 1.50 |
| 700.00 | 4.03 | 4.17 | 0.14 | 27.76 | 175.20 | 1.41 | 1.41 | 1.64 |
| 750.00 | 4.15 | 4.42 | 0.27 | 29.19 | 175.46 | 1.44 | 1.46 | 1.72 |

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



Additional 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.
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