top hat®

*Surface Mount*

# Power Splitter/Combiner

# SBTC-2-15-75LX+

## 2 Way-0°  75Ω  500 to 1500 MHz

*Generic photo used for illustration purposes only*

CASE STYLE: AT1739

***+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, 500 |
| 13" | 1000, 2000 |

### Features

- low insertion loss, 0.8 dB typ.
- excellent isolation 28 dB typ.
- very good phase unbalance, 1 deg. typ.
- small size, 0.166”x0.150”x0.155”
- temperature stable LTCC base
- small size
- low cost
- aqueous washable
- protected by US patent 6,963,255

### Applications

- internet over satellite modems
- VSAT

### Electrical Specifications

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Frequency Range** | | 500 | | 1500 | MHz |
| **Insertion Loss Above 3.0 dB** | 50 - 1500 | — | 0.8 | 1.5 | dB |
| | 700 - 1500 | — | 0.8 | 1.5 | |
| **Isolation** | 50 - 1500 | 18 | 28 | — | dB |
| | 700 - 1500 | 20 | 28 | — | |
| **Phase Unbalance** | 50 - 1500 | — | — | 5 | Degree |
| | 700 - 1500 | — | — | 4 | |
| **Amplitude Unbalance** | 50 - 1500 | — | — | 0.9 | dB |
| | 700 - 1500 | — | — | 0.7 | |

### Maximum Ratings

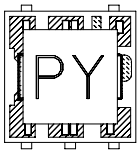
| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 0.5W max. |
| Internal Dissipation | 0.125W max |

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

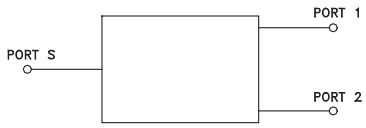
### Pin Connections

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

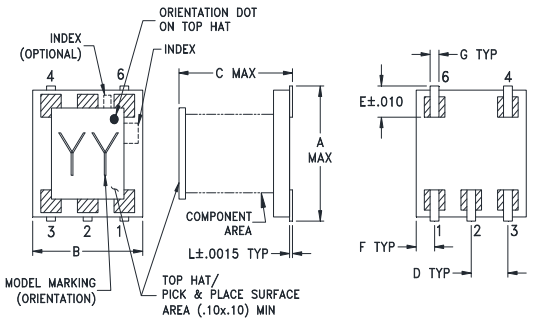
### Product Marking



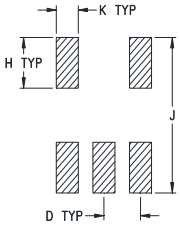

### Electrical Schematic



## Outline Drawing




PCB Land Pattern



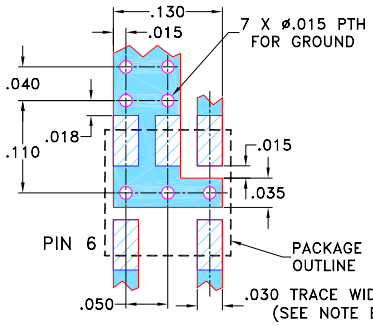

Suggested Layout,
Tolerance to be within±.002

## Outline Dimensions (inch / mm)

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| .166 | .150 | .155 | .050 | .037 | .025 |
| 4.22 | 3.81 | 3.94 | 1.27 | 0.94 | 0.64 |

| G | H | J | K | K | wt |
|---|---|---|---|---|---|
| .012 | .060 | .184 | .030 | .004 | grams |
| 0.30 | 1.52 | 4.67 | 0.76 | 0.10 | 0.10 |

***Demo Board MCL P/N: TB-277***
***Suggested PCB Layout (PL-153)***




NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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)

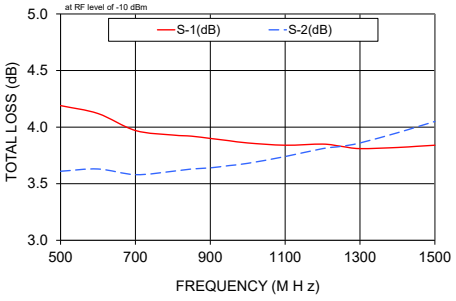
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Typical Performance Data

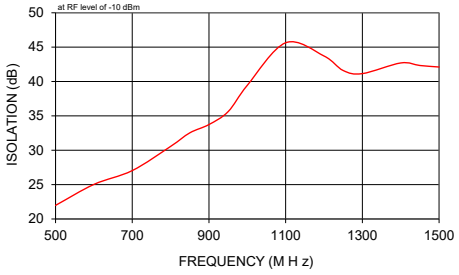
| Frequency (MHz) | Total Loss[1] (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|---|---|---|---|---|---|---|---|---|
| | S-1 | S-2 | | | | | | |
| 500.00 | 4.19 | 3.61 | 0.58 | 21.98 | 1.92 | 1.11 | 1.73 | 1.57 |
| 600.00 | 4.12 | 3.63 | 0.49 | 25.03 | 1.30 | 1.08 | 1.60 | 1.50 |
| 700.00 | 3.97 | 3.58 | 0.39 | 27.04 | 0.91 | 1.08 | 1.51 | 1.42 |
| 800.00 | 3.93 | 3.61 | 0.32 | 30.56 | 0.59 | 1.08 | 1.36 | 1.35 |
| 850.00 | 3.92 | 3.63 | 0.29 | 32.53 | 0.44 | 1.08 | 1.33 | 1.33 |
| 900.00 | 3.90 | 3.64 | 0.25 | 33.74 | 0.29 | 1.08 | 1.32 | 1.31 |
| 950.00 | 3.88 | 3.66 | 0.22 | 35.62 | 0.20 | 1.09 | 1.28 | 1.29 |
| 1000.00 | 3.86 | 3.68 | 0.18 | 39.45 | 0.15 | 1.10 | 1.22 | 1.27 |
| 1100.00 | 3.84 | 3.74 | 0.10 | 45.64 | 0.17 | 1.11 | 1.22 | 1.28 |
| 1200.00 | 3.85 | 3.81 | 0.04 | 43.71 | 0.19 | 1.14 | 1.14 | 1.24 |
| 1250.00 | 3.83 | 3.83 | 0.03 | 41.60 | 0.21 | 1.15 | 1.10 | 1.22 |
| 1300.00 | 3.81 | 3.86 | 0.05 | 41.15 | 0.19 | 1.17 | 1.10 | 1.23 |
| 1400.00 | 3.82 | 3.95 | 0.13 | 42.70 | 0.21 | 1.22 | 1.09 | 1.26 |
| 1450.00 | 3.83 | 4.00 | 0.17 | 42.33 | 0.24 | 1.25 | 1.11 | 1.27 |
| 1500.00 | 3.84 | 4.05 | 0.21 | 42.11 | 0.30 | 1.28 | 1.15 | 1.30 |

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

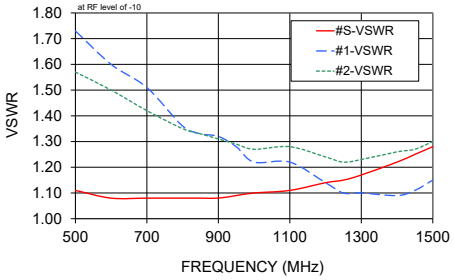
TOTAL LOSS




ISOLATION




VSWR




## Additional 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-Circuits 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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

# 2 Way-0° Power Splitter/Combiner SBTC-2-15-75LX+

## *Typical Performance Data*

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

| FREQUENCY (MHz) | TOTAL LOSS[1] (dB) S-1 | TOTAL LOSS[1] (dB) S-2 | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (Deg) | FREQUENCY (MHz) | VSWR (:1) S | VSWR (:1) 1 | VSWR (:1) 2 |
|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 8.30 | 6.45 | 1.85 | 16.46 | 3.29 | 50.0 | 5.91 | 12.71 | 8.23 |
| 100.0 | 5.98 | 4.48 | 1.50 | 15.77 | 4.53 | 100.0 | 2.60 | 5.44 | 3.78 |
| 150.0 | 5.25 | 4.00 | 1.25 | 16.61 | 4.65 | 150.0 | 1.88 | 3.71 | 2.76 |
| 200.0 | 4.87 | 3.79 | 1.08 | 17.57 | 4.34 | 200.0 | 1.57 | 2.94 | 2.29 |
| 250.0 | 4.65 | 3.69 | 0.96 | 18.54 | 4.01 | 250.0 | 1.39 | 2.50 | 2.01 |
| 300.0 | 4.48 | 3.63 | 0.85 | 19.48 | 3.62 | 300.0 | 1.27 | 2.21 | 1.84 |
| 350.0 | 4.36 | 3.58 | 0.78 | 20.28 | 3.29 | 350.0 | 1.19 | 2.00 | 1.72 |
| 400.0 | 4.26 | 3.56 | 0.70 | 21.03 | 2.97 | 400.0 | 1.13 | 1.84 | 1.61 |
| 425.0 | 4.22 | 3.55 | 0.67 | 21.55 | 3.09 | 425.0 | 1.11 | 1.78 | 1.56 |
| 450.0 | 4.18 | 3.54 | 0.64 | 21.96 | 2.70 | 450.0 | 1.10 | 1.72 | 1.53 |
| 475.0 | 4.16 | 3.53 | 0.63 | 22.57 | 2.83 | 475.0 | 1.10 | 1.66 | 1.50 |
| 500.0 | 4.12 | 3.53 | 0.59 | 22.83 | 2.46 | 500.0 | 1.10 | 1.61 | 1.48 |
| 525.0 | 4.12 | 3.52 | 0.60 | 23.43 | 2.54 | 525.0 | 1.10 | 1.57 | 1.45 |
| 550.0 | 4.07 | 3.52 | 0.55 | 23.56 | 2.29 | 550.0 | 1.11 | 1.53 | 1.42 |
| 575.0 | 4.08 | 3.52 | 0.56 | 24.16 | 2.27 | 575.0 | 1.12 | 1.49 | 1.39 |
| 600.0 | 4.03 | 3.53 | 0.50 | 24.62 | 2.09 | 600.0 | 1.13 | 1.46 | 1.37 |
| 625.0 | 4.04 | 3.52 | 0.52 | 25.27 | 1.98 | 625.0 | 1.14 | 1.43 | 1.36 |
| 650.0 | 4.01 | 3.53 | 0.48 | 25.82 | 1.95 | 650.0 | 1.15 | 1.40 | 1.35 |
| 675.0 | 4.01 | 3.52 | 0.49 | 26.37 | 1.68 | 675.0 | 1.16 | 1.37 | 1.34 |
| 700.0 | 3.99 | 3.53 | 0.46 | 26.75 | 1.80 | 700.0 | 1.16 | 1.35 | 1.32 |
| 725.0 | 3.98 | 3.52 | 0.46 | 27.00 | 1.42 | 725.0 | 1.17 | 1.33 | 1.31 |
| 750.0 | 3.97 | 3.54 | 0.43 | 27.91 | 1.59 | 750.0 | 1.18 | 1.31 | 1.29 |
| 775.0 | 3.95 | 3.52 | 0.43 | 27.82 | 1.25 | 775.0 | 1.18 | 1.29 | 1.28 |
| 800.0 | 3.95 | 3.53 | 0.43 | 29.39 | 1.36 | 800.0 | 1.18 | 1.27 | 1.27 |
| 850.0 | 3.94 | 3.52 | 0.42 | 29.76 | 1.15 | 850.0 | 1.19 | 1.23 | 1.26 |
| 900.0 | 3.92 | 3.53 | 0.39 | 29.30 | 0.86 | 900.0 | 1.19 | 1.20 | 1.24 |
| 950.0 | 3.90 | 3.52 | 0.38 | 29.93 | 0.68 | 950.0 | 1.19 | 1.18 | 1.23 |
| 1000.0 | 3.88 | 3.52 | 0.36 | 29.52 | 0.58 | 1000.0 | 1.18 | 1.15 | 1.21 |
| 1050.0 | 3.87 | 3.52 | 0.35 | 28.07 | 0.52 | 1050.0 | 1.17 | 1.13 | 1.20 |
| 1100.0 | 3.87 | 3.53 | 0.34 | 27.41 | 0.43 | 1100.0 | 1.16 | 1.11 | 1.19 |
| 1150.0 | 3.87 | 3.54 | 0.33 | 26.78 | 0.36 | 1150.0 | 1.15 | 1.09 | 1.18 |
| 1200.0 | 3.87 | 3.56 | 0.31 | 25.76 | 0.40 | 1200.0 | 1.14 | 1.07 | 1.16 |
| 1250.0 | 3.88 | 3.58 | 0.30 | 25.79 | 0.42 | 1250.0 | 1.13 | 1.06 | 1.16 |
| 1300.0 | 3.90 | 3.61 | 0.29 | 26.16 | 0.45 | 1300.0 | 1.12 | 1.05 | 1.16 |
| 1350.0 | 3.91 | 3.65 | 0.26 | 25.74 | 0.49 | 1350.0 | 1.11 | 1.04 | 1.14 |
| 1400.0 | 3.93 | 3.69 | 0.24 | 25.36 | 0.52 | 1400.0 | 1.11 | 1.05 | 1.14 |
| 1425.0 | 3.91 | 3.71 | 0.20 | 25.70 | 0.53 | 1425.0 | 1.11 | 1.05 | 1.15 |
| 1450.0 | 3.93 | 3.72 | 0.21 | 25.90 | 0.58 | 1450.0 | 1.10 | 1.06 | 1.16 |
| 1475.0 | 3.91 | 3.74 | 0.17 | 27.08 | 0.55 | 1475.0 | 1.10 | 1.06 | 1.16 |
| 1500.0 | 3.92 | 3.75 | 0.16 | 26.91 | 0.52 | 1500.0 | 1.10 | 1.07 | 1.16 |
| 1525.0 | 3.90 | 3.77 | 0.13 | 28.03 | 0.56 | 1525.0 | 1.10 | 1.08 | 1.16 |
| 1550.0 | 3.91 | 3.78 | 0.13 | 28.26 | 0.47 | 1550.0 | 1.11 | 1.09 | 1.16 |
| 1575.0 | 3.90 | 3.80 | 0.10 | 28.66 | 0.51 | 1575.0 | 1.11 | 1.10 | 1.17 |
| 1600.0 | 3.90 | 3.81 | 0.09 | 30.44 | 0.43 | 1600.0 | 1.11 | 1.11 | 1.18 |
| 1700.0 | 3.91 | 3.88 | 0.03 | 36.05 | 0.09 | 1700.0 | 1.14 | 1.15 | 1.21 |
| 1800.0 | 4.02 | 4.03 | 0.01 | 31.53 | 0.15 | 1800.0 | 1.19 | 1.20 | 1.27 |
| 1900.0 | 4.17 | 4.18 | 0.01 | 26.60 | 0.13 | 1900.0 | 1.24 | 1.26 | 1.33 |
| 2000.0 | 4.30 | 4.23 | 0.07 | 23.01 | 0.21 | 2000.0 | 1.31 | 1.33 | 1.41 |
| 2100.0 | 4.28 | 4.21 | 0.07 | 21.89 | 0.01 | 2100.0 | 1.40 | 1.41 | 1.50 |
| 2200.0 | 4.15 | 4.06 | 0.09 | 21.54 | 1.24 | 2200.0 | 1.49 | 1.50 | 1.60 |
| 2300.0 | 4.06 | 3.95 | 0.11 | 22.61 | 2.48 | 2300.0 | 1.58 | 1.59 | 1.71 |
| 2400.0 | 3.98 | 4.03 | 0.05 | 25.93 | 2.96 | 2400.0 | 1.64 | 1.67 | 1.80 |
| 2500.0 | 4.11 | 4.46 | 0.35 | 28.68 | 3.53 | 2500.0 | 1.68 | 1.74 | 1.88 |

[1]Total Loss = Insertion Loss + 3dB Splitter Loss

# 2 Way-0° Power Splitter/Combiner SBTC-2-15-75LX+

## *Typical Performance Data*

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

| FREQUENCY (MHz) | TOTAL LOSS[1] (dB) S-1 | TOTAL LOSS[1] (dB) S-2 | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (Deg) | FREQUENCY (MHz) | VSWR (:1) S | VSWR (:1) 1 | VSWR (:1) 2 |
|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 8.49 | 6.63 | 1.86 | 16.65 | 3.29 | 50.0 | 5.70 | 12.44 | 7.87 |
| 100.0 | 6.12 | 4.60 | 1.52 | 15.87 | 4.62 | 100.0 | 2.73 | 5.45 | 3.92 |
| 150.0 | 5.35 | 4.06 | 1.28 | 16.59 | 4.80 | 150.0 | 1.94 | 3.75 | 2.85 |
| 200.0 | 4.94 | 3.83 | 1.11 | 17.49 | 4.66 | 200.0 | 1.64 | 3.03 | 2.38 |
| 250.0 | 4.71 | 3.71 | 1.00 | 18.39 | 4.43 | 250.0 | 1.44 | 2.62 | 2.12 |
| 300.0 | 4.53 | 3.63 | 0.90 | 19.30 | 4.18 | 300.0 | 1.30 | 2.34 | 1.93 |
| 350.0 | 4.39 | 3.57 | 0.82 | 20.04 | 3.97 | 350.0 | 1.21 | 2.13 | 1.81 |
| 400.0 | 4.29 | 3.53 | 0.76 | 20.73 | 3.78 | 400.0 | 1.13 | 1.96 | 1.69 |
| 425.0 | 4.24 | 3.52 | 0.72 | 21.19 | 3.97 | 425.0 | 1.10 | 1.88 | 1.64 |
| 450.0 | 4.19 | 3.50 | 0.69 | 21.58 | 3.63 | 450.0 | 1.08 | 1.82 | 1.60 |
| 475.0 | 4.17 | 3.49 | 0.68 | 22.16 | 3.84 | 475.0 | 1.06 | 1.76 | 1.58 |
| 500.0 | 4.12 | 3.48 | 0.64 | 22.37 | 3.52 | 500.0 | 1.06 | 1.70 | 1.55 |
| 525.0 | 4.11 | 3.47 | 0.64 | 22.94 | 3.67 | 525.0 | 1.07 | 1.65 | 1.52 |
| 550.0 | 4.07 | 3.47 | 0.60 | 23.02 | 3.47 | 550.0 | 1.09 | 1.60 | 1.49 |
| 575.0 | 4.07 | 3.45 | 0.62 | 23.59 | 3.53 | 575.0 | 1.10 | 1.56 | 1.45 |
| 600.0 | 4.01 | 3.46 | 0.55 | 23.97 | 3.40 | 600.0 | 1.12 | 1.52 | 1.43 |
| 625.0 | 4.03 | 3.44 | 0.59 | 24.62 | 3.35 | 625.0 | 1.14 | 1.48 | 1.40 |
| 650.0 | 3.98 | 3.45 | 0.53 | 25.10 | 3.37 | 650.0 | 1.16 | 1.45 | 1.38 |
| 675.0 | 3.99 | 3.43 | 0.56 | 25.74 | 3.15 | 675.0 | 1.17 | 1.42 | 1.37 |
| 700.0 | 3.96 | 3.44 | 0.52 | 26.07 | 3.35 | 700.0 | 1.19 | 1.39 | 1.35 |
| 725.0 | 3.94 | 3.42 | 0.52 | 26.41 | 3.03 | 725.0 | 1.20 | 1.36 | 1.33 |
| 750.0 | 3.93 | 3.43 | 0.50 | 27.23 | 3.28 | 750.0 | 1.21 | 1.33 | 1.31 |
| 775.0 | 3.90 | 3.42 | 0.49 | 27.31 | 2.98 | 775.0 | 1.21 | 1.30 | 1.29 |
| 800.0 | 3.90 | 3.42 | 0.49 | 28.90 | 3.16 | 800.0 | 1.21 | 1.28 | 1.28 |
| 850.0 | 3.88 | 3.41 | 0.47 | 29.89 | 3.09 | 850.0 | 1.21 | 1.24 | 1.24 |
| 900.0 | 3.84 | 3.39 | 0.45 | 29.77 | 2.91 | 900.0 | 1.21 | 1.20 | 1.21 |
| 950.0 | 3.82 | 3.38 | 0.44 | 30.75 | 2.84 | 950.0 | 1.19 | 1.17 | 1.19 |
| 1000.0 | 3.80 | 3.37 | 0.43 | 30.78 | 2.89 | 1000.0 | 1.16 | 1.15 | 1.17 |
| 1050.0 | 3.78 | 3.36 | 0.42 | 29.23 | 2.94 | 1050.0 | 1.13 | 1.13 | 1.16 |
| 1100.0 | 3.77 | 3.36 | 0.41 | 28.43 | 2.98 | 1100.0 | 1.10 | 1.12 | 1.17 |
| 1150.0 | 3.77 | 3.37 | 0.40 | 27.62 | 3.05 | 1150.0 | 1.07 | 1.10 | 1.17 |
| 1200.0 | 3.77 | 3.38 | 0.39 | 26.41 | 3.17 | 1200.0 | 1.05 | 1.09 | 1.17 |
| 1250.0 | 3.77 | 3.40 | 0.37 | 26.31 | 3.33 | 1250.0 | 1.04 | 1.09 | 1.19 |
| 1300.0 | 3.79 | 3.42 | 0.37 | 26.68 | 3.45 | 1300.0 | 1.05 | 1.07 | 1.21 |
| 1350.0 | 3.79 | 3.46 | 0.33 | 26.08 | 3.68 | 1350.0 | 1.07 | 1.06 | 1.2 |
| 1400.0 | 3.80 | 3.49 | 0.31 | 25.62 | 3.87 | 1400.0 | 1.1 | 1.05 | 1.21 |
| 1425.0 | 3.78 | 3.50 | 0.28 | 26.10 | 3.90 | 1425.0 | 1.11 | 1.04 | 1.23 |
| 1450.0 | 3.79 | 3.52 | 0.27 | 26.24 | 4.11 | 1450.0 | 1.12 | 1.04 | 1.24 |
| 1475.0 | 3.76 | 3.52 | 0.24 | 27.47 | 4.07 | 1475.0 | 1.14 | 1.05 | 1.25 |
| 1500.0 | 3.76 | 3.53 | 0.23 | 27.32 | 4.16 | 1500.0 | 1.16 | 1.05 | 1.25 |
| 1525.0 | 3.74 | 3.54 | 0.20 | 28.39 | 4.19 | 1525.0 | 1.17 | 1.06 | 1.25 |
| 1550.0 | 3.74 | 3.54 | 0.19 | 28.83 | 4.22 | 1550.0 | 1.19 | 1.08 | 1.25 |
| 1575.0 | 3.72 | 3.56 | 0.16 | 29.27 | 4.23 | 1575.0 | 1.21 | 1.09 | 1.27 |
| 1600.0 | 3.71 | 3.56 | 0.15 | 31.51 | 4.30 | 1600.0 | 1.23 | 1.11 | 1.29 |
| 1700.0 | 3.71 | 3.63 | 0.08 | 43.52 | 4.13 | 1700.0 | 1.29 | 1.18 | 1.36 |
| 1800.0 | 3.83 | 3.79 | 0.04 | 32.02 | 4.04 | 1800.0 | 1.32 | 1.26 | 1.41 |
| 1900.0 | 3.98 | 3.93 | 0.04 | 26.16 | 4.47 | 1900.0 | 1.3 | 1.31 | 1.45 |
| 2000.0 | 4.07 | 3.94 | 0.13 | 22.60 | 4.60 | 2000.0 | 1.23 | 1.35 | 1.39 |
| 2100.0 | 4.00 | 3.87 | 0.13 | 21.38 | 5.04 | 2100.0 | 1.21 | 1.38 | 1.38 |
| 2200.0 | 3.84 | 3.67 | 0.18 | 21.28 | 6.55 | 2200.0 | 1.31 | 1.41 | 1.33 |
| 2300.0 | 3.75 | 3.60 | 0.15 | 22.59 | 8.10 | 2300.0 | 1.53 | 1.46 | 1.36 |
| 2400.0 | 3.65 | 3.65 | 0.00 | 27.22 | 9.40 | 2400.0 | 1.8 | 1.53 | 1.58 |
| 2500.0 | 3.70 | 4.02 | 0.32 | 31.52 | 9.86 | 2500.0 | 2.07 | 1.65 | 1.81 |

[1]Total Loss = Insertion Loss + 3dB Splitter Loss

# 2 Way-0° Power Splitter/Combiner SBTC-2-15-75LX+

## *Typical Performance Data*

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

| FREQUENCY (MHz) | TOTAL LOSS[1] (dB) S-1 | TOTAL LOSS[1] (dB) S-2 | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (Deg) |
|---|---|---|---|---|---|
| 50.0 | 8.14 | 6.31 | 1.83 | 16.32 | 3.30 |
| 100.0 | 5.89 | 4.41 | 1.48 | 15.73 | 4.49 |
| 150.0 | 5.17 | 3.96 | 1.21 | 16.64 | 4.56 |
| 200.0 | 4.81 | 3.77 | 1.04 | 17.60 | 4.21 |
| 250.0 | 4.60 | 3.68 | 0.92 | 18.61 | 3.82 |
| 300.0 | 4.44 | 3.63 | 0.81 | 19.61 | 3.40 |
| 350.0 | 4.33 | 3.59 | 0.74 | 20.44 | 3.00 |
| 400.0 | 4.24 | 3.58 | 0.66 | 21.30 | 2.63 |
| 425.0 | 4.20 | 3.58 | 0.62 | 21.87 | 2.71 |
| 450.0 | 4.17 | 3.58 | 0.59 | 22.33 | 2.31 |
| 475.0 | 4.16 | 3.58 | 0.58 | 22.98 | 2.41 |
| 500.0 | 4.12 | 3.57 | 0.55 | 23.27 | 2.02 |
| 525.0 | 4.12 | 3.57 | 0.55 | 23.92 | 2.06 |
| 550.0 | 4.09 | 3.58 | 0.51 | 24.11 | 1.79 |
| 575.0 | 4.09 | 3.58 | 0.51 | 24.76 | 1.73 |
| 600.0 | 4.05 | 3.60 | 0.45 | 25.27 | 1.53 |
| 625.0 | 4.07 | 3.59 | 0.48 | 25.94 | 1.40 |
| 650.0 | 4.04 | 3.61 | 0.43 | 26.53 | 1.32 |
| 675.0 | 4.05 | 3.60 | 0.45 | 27.04 | 1.05 |
| 700.0 | 4.03 | 3.62 | 0.41 | 27.43 | 1.13 |
| 725.0 | 4.03 | 3.61 | 0.41 | 27.62 | 0.75 |
| 750.0 | 4.02 | 3.63 | 0.39 | 28.59 | 0.87 |
| 775.0 | 4.01 | 3.62 | 0.39 | 28.37 | 0.51 |
| 800.0 | 4.01 | 3.63 | 0.38 | 29.82 | 0.63 |
| 850.0 | 4.00 | 3.63 | 0.37 | 29.65 | 0.36 |
| 900.0 | 4.00 | 3.64 | 0.35 | 29.20 | 0.11 |
| 950.0 | 3.99 | 3.66 | 0.33 | 29.35 | 0.22 |
| 1000.0 | 3.97 | 3.66 | 0.31 | 28.66 | 0.32 |
| 1050.0 | 3.97 | 3.67 | 0.30 | 27.29 | 0.45 |
| 1100.0 | 3.98 | 3.68 | 0.30 | 26.70 | 0.57 |
| 1150.0 | 3.98 | 3.70 | 0.28 | 26.12 | 0.63 |
| 1200.0 | 3.98 | 3.73 | 0.25 | 25.23 | 0.69 |
| 1250.0 | 3.99 | 3.75 | 0.24 | 25.26 | 0.71 |
| 1300.0 | 4.03 | 3.78 | 0.24 | 25.67 | 0.72 |
| 1350.0 | 4.05 | 3.84 | 0.21 | 25.41 | 0.71 |
| 1400.0 | 4.07 | 3.88 | 0.19 | 25.12 | 0.79 |
| 1425.0 | 4.05 | 3.90 | 0.15 | 25.33 | 0.79 |
| 1450.0 | 4.07 | 3.92 | 0.15 | 25.60 | 0.79 |
| 1475.0 | 4.06 | 3.95 | 0.11 | 26.69 | 0.79 |
| 1500.0 | 4.07 | 3.96 | 0.11 | 26.52 | 0.90 |
| 1525.0 | 4.07 | 3.99 | 0.08 | 27.63 | 0.81 |
| 1550.0 | 4.07 | 4.00 | 0.07 | 27.78 | 1.02 |
| 1575.0 | 4.08 | 4.03 | 0.05 | 28.06 | 0.95 |
| 1600.0 | 4.07 | 4.04 | 0.03 | 29.48 | 1.09 |
| 1700.0 | 4.12 | 4.15 | 0.03 | 32.82 | 1.55 |
| 1800.0 | 4.23 | 4.30 | 0.07 | 29.92 | 1.85 |
| 1900.0 | 4.40 | 4.46 | 0.06 | 26.16 | 1.95 |
| 2000.0 | 4.52 | 4.52 | 0.00 | 22.99 | 2.05 |
| 2100.0 | 4.53 | 4.50 | 0.03 | 21.93 | 1.99 |
| 2200.0 | 4.40 | 4.39 | 0.01 | 21.70 | 0.86 |
| 2300.0 | 4.33 | 4.28 | 0.06 | 22.72 | 0.30 |
| 2400.0 | 4.26 | 4.39 | 0.13 | 25.71 | 0.45 |
| 2500.0 | 4.44 | 4.88 | 0.44 | 27.11 | 1.02 |

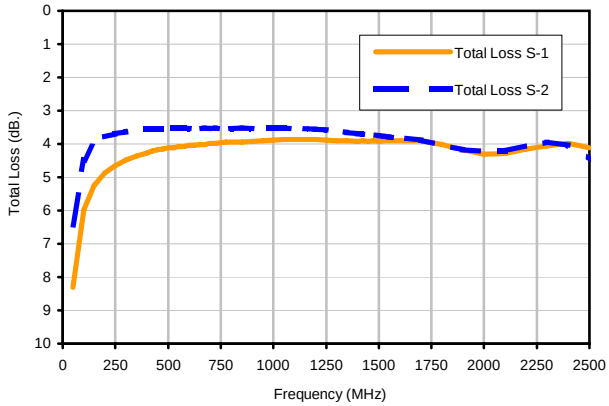
| FREQUENCY (MHz) | VSWR (:1) S | VSWR (:1) 1 | VSWR (:1) 2 |
|---|---|---|---|
| 50.0 | 6.03 | 12.35 | 8.51 |
| 100.0 | 2.47 | 5.35 | 3.63 |
| 150.0 | 1.83 | 3.63 | 2.67 |
| 200.0 | 1.51 | 2.84 | 2.22 |
| 250.0 | 1.33 | 2.39 | 1.90 |
| 300.0 | 1.25 | 2.10 | 1.77 |
| 350.0 | 1.18 | 1.90 | 1.63 |
| 400.0 | 1.16 | 1.75 | 1.52 |
| 425.0 | 1.15 | 1.70 | 1.49 |
| 450.0 | 1.14 | 1.64 | 1.47 |
| 475.0 | 1.13 | 1.60 | 1.45 |
| 500.0 | 1.13 | 1.56 | 1.43 |
| 525.0 | 1.13 | 1.52 | 1.40 |
| 550.0 | 1.13 | 1.49 | 1.38 |
| 575.0 | 1.12 | 1.46 | 1.36 |
| 600.0 | 1.12 | 1.43 | 1.35 |
| 625.0 | 1.12 | 1.41 | 1.34 |
| 650.0 | 1.13 | 1.39 | 1.33 |
| 675.0 | 1.13 | 1.36 | 1.33 |
| 700.0 | 1.13 | 1.34 | 1.32 |
| 725.0 | 1.13 | 1.33 | 1.31 |
| 750.0 | 1.14 | 1.31 | 1.30 |
| 775.0 | 1.14 | 1.29 | 1.29 |
| 800.0 | 1.15 | 1.28 | 1.29 |
| 850.0 | 1.16 | 1.25 | 1.28 |
| 900.0 | 1.17 | 1.23 | 1.26 |
| 950.0 | 1.20 | 1.20 | 1.26 |
| 1000.0 | 1.21 | 1.18 | 1.24 |
| 1050.0 | 1.22 | 1.16 | 1.23 |
| 1100.0 | 1.22 | 1.14 | 1.23 |
| 1150.0 | 1.22 | 1.12 | 1.21 |
| 1200.0 | 1.22 | 1.11 | 1.20 |
| 1250.0 | 1.21 | 1.10 | 1.20 |
| 1300.0 | 1.2 | 1.1 | 1.18 |
| 1350.0 | 1.19 | 1.11 | 1.17 |
| 1400.0 | 1.17 | 1.11 | 1.15 |
| 1425.0 | 1.15 | 1.11 | 1.15 |
| 1450.0 | 1.14 | 1.12 | 1.15 |
| 1475.0 | 1.13 | 1.12 | 1.15 |
| 1500.0 | 1.12 | 1.12 | 1.14 |
| 1525.0 | 1.11 | 1.12 | 1.13 |
| 1550.0 | 1.09 | 1.12 | 1.12 |
| 1575.0 | 1.07 | 1.12 | 1.12 |
| 1600.0 | 1.06 | 1.12 | 1.12 |
| 1700.0 | 1.06 | 1.12 | 1.13 |
| 1800.0 | 1.16 | 1.15 | 1.2 |
| 1900.0 | 1.28 | 1.22 | 1.31 |
| 2000.0 | 1.41 | 1.32 | 1.46 |
| 2100.0 | 1.54 | 1.46 | 1.63 |
| 2200.0 | 1.63 | 1.6 | 1.8 |
| 2300.0 | 1.66 | 1.72 | 1.93 |
| 2400.0 | 1.59 | 1.78 | 1.96 |
| 2500.0 | 1.52 | 1.81 | 1.92 |

[1]Total Loss = Insertion Loss + 3dB Splitter Loss

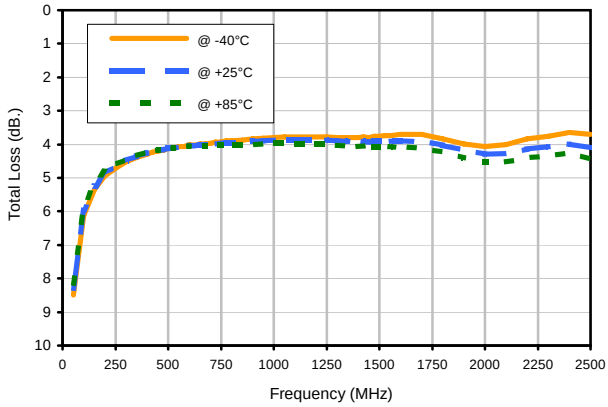
# 2 Way-0° Power Splitter/Combiner SBTC-2-15-75LX+

## *Typical Performance Curves*

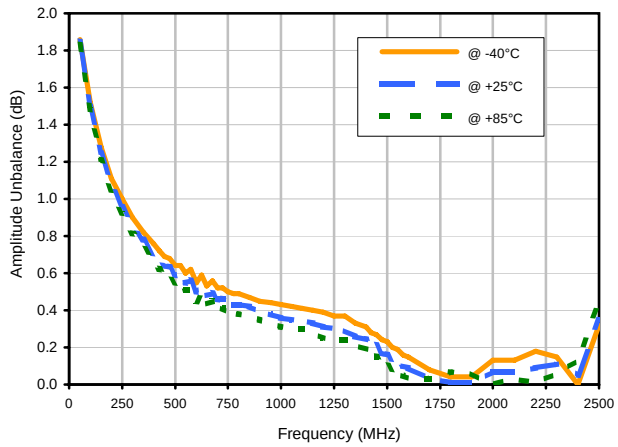
**Total Loss**



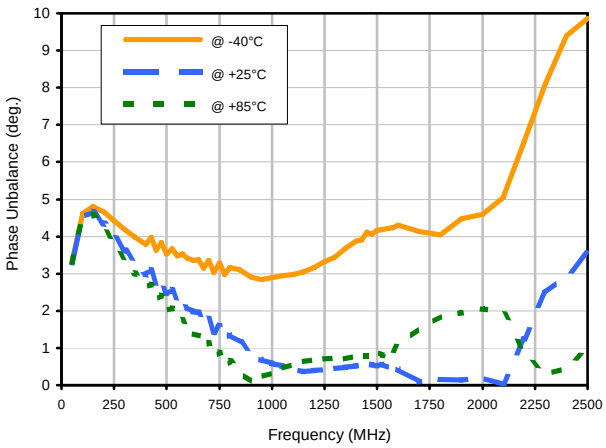

**Total Loss S-1 vs. TEMPERATURE**



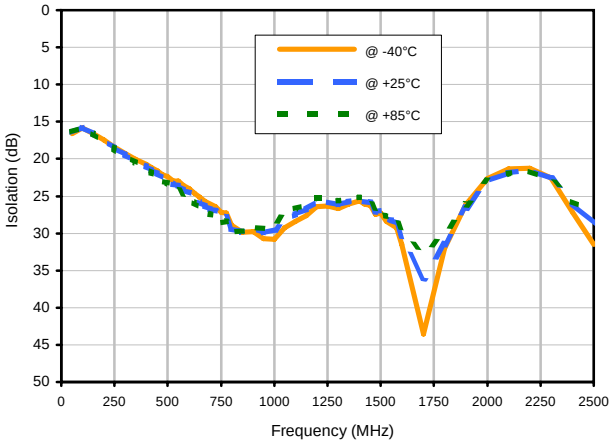

**Amplitude Unbalance vs. TEMPERATURE**




**Phase Unbalance vs. TEMPERATURE**



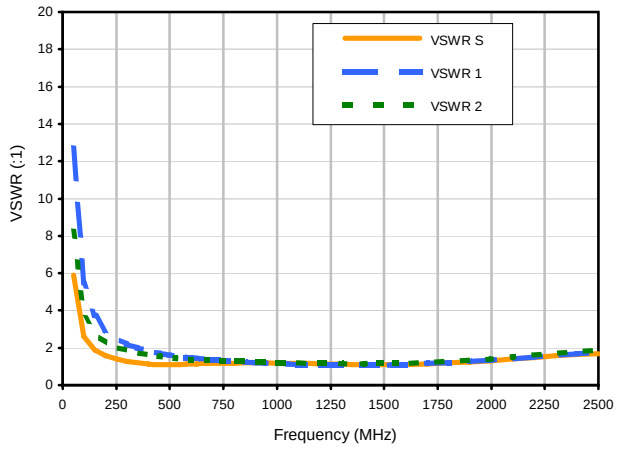

**Isolation 1-2 vs. TEMPERATURE**



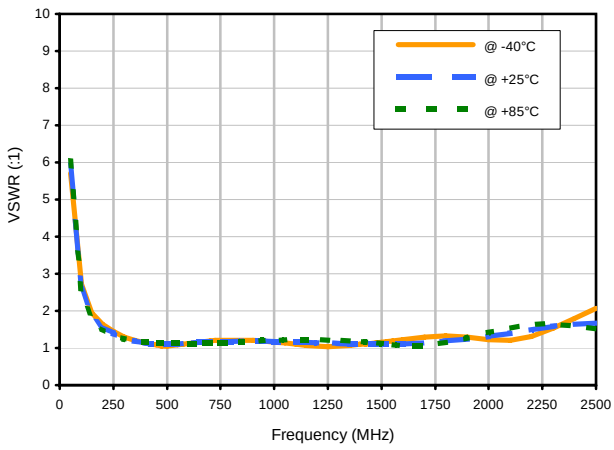
# 2 Way-0° Power Splitter/Combiner SBTC-2-15-75LX+

## *Typical Performance Curves*

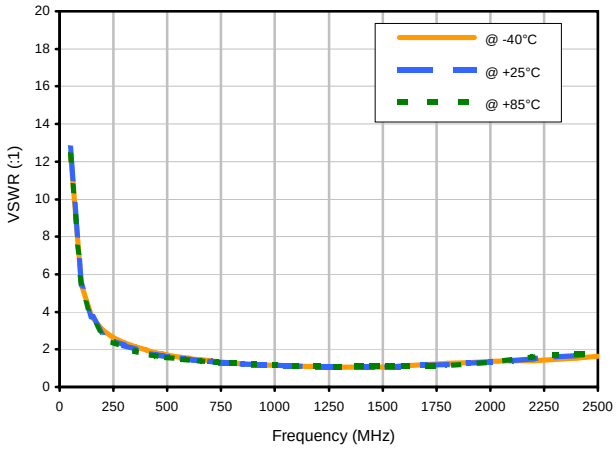
**VSWR**




**VSWR SUM vs. TEMPERATURE**



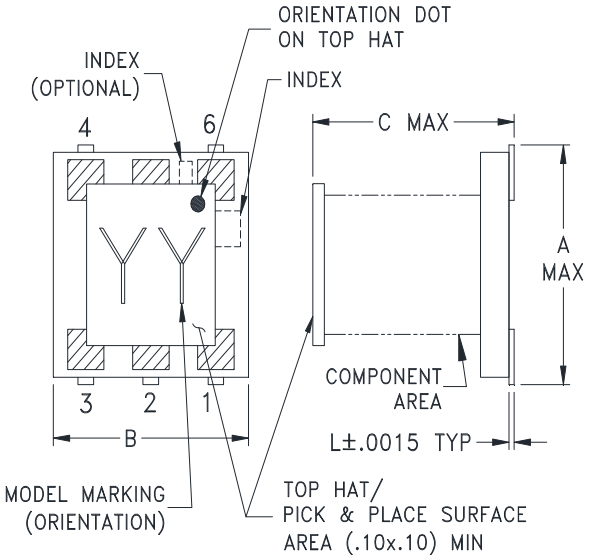

**VSWR OUT1 vs. TEMPERATURE**



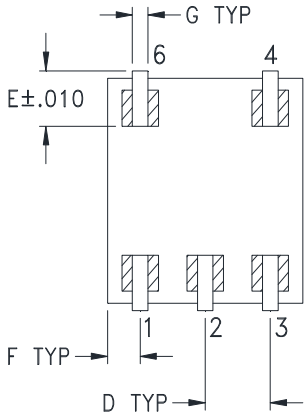
# Case Style AT

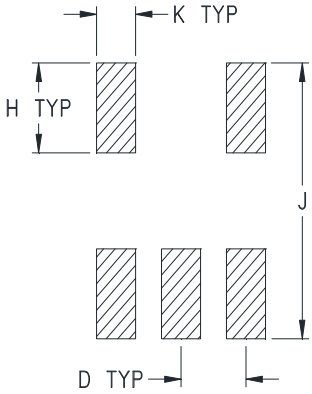
## Outline Dimensions

**AT1739**




### PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.002

| CASE # | A | B | C | D | E | F | G | H | J | K | L | WT. GRAMS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT1739 | .166 (4.22) | .150 (3.81) | .155 (3.94) | .050 (1.27) | .037 (0.94) | .025 (0.64) | .012 (0.30) | .060 (1.52) | .184 (4.67) | .030 (0.76) | .004 (0.10) | .10 |

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005**

**Notes:**

1. Open style, Ceramic base.
2. Termination finish:
   For RoHS Case Styles: Tin plate.
   For RoHS-5 Case Styles: Tin-Lead plate.
1. Top-hat thickness .013 max.
2. Orientation Dot on Top Hat & Marking on the Substrate both refers to Pin #6 of the Unit.



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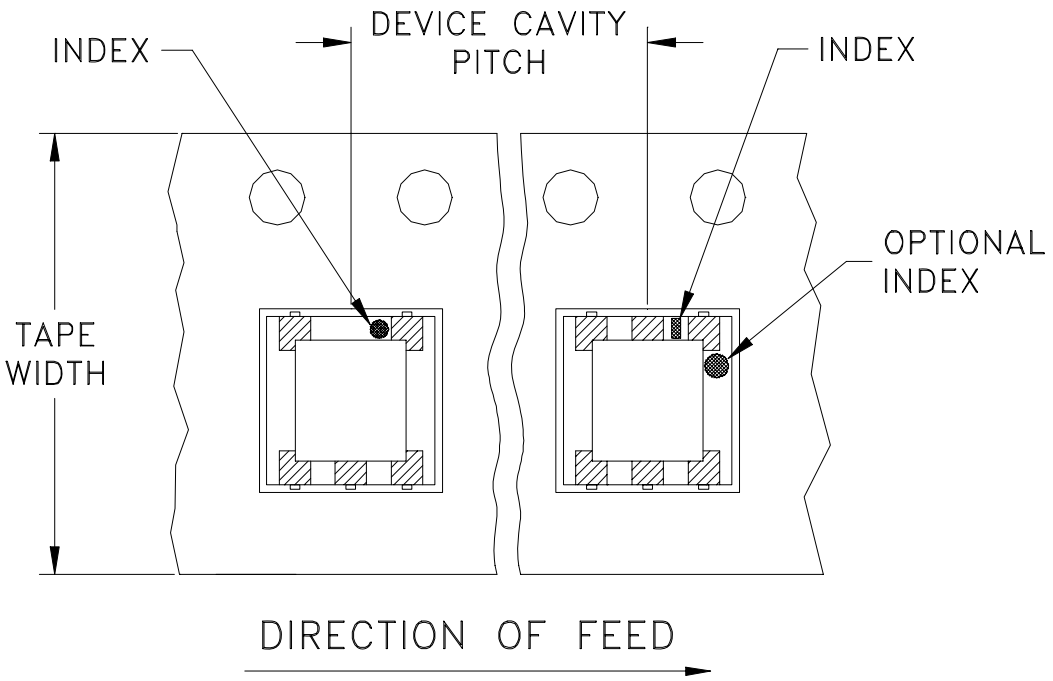
# Tape & Reel Packaging TR-F76

DEVICE ORIENTATION IN T&R




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel |
|---|---|---|---|
| 12 | 8 | 7 | 20 |
| | | | 50 |
| | | | 100 |
| | | | 200 |
| | | | 500 |
| | | 13 | 1000 |
| | | | 2000 |

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

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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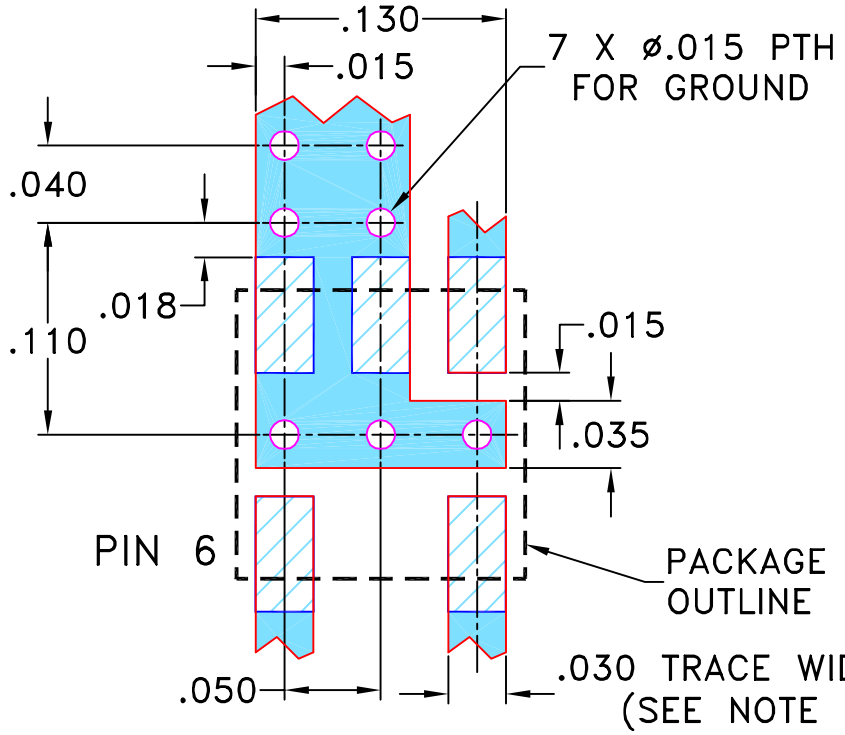
THIRD ANGLE PROJECTION

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| OR | M90457 | NEW RELEASE | 01/16/04 | AV | WP |
| A | M102713 | ADDED "...WITH SMOBC" | 01/12/06 | GF | IL |
| | | | | | |
| | | | | | |

## SUGGESTED MOUNTING CONFIGURATION FOR AT1029 CASE STYLE, "nc" PIN CONNECTION




NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | AV | 01/07/04 |
| TOLERANCES ON: | CHECKED | IL | 01/16/04 |
| 2 PL DECIMALS ± | APPROVED | WP | 01/16/04 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

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

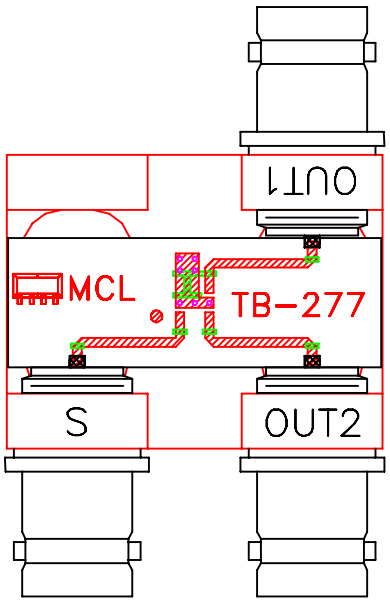
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, nc, 75, AT1029, SBTC, TB-277

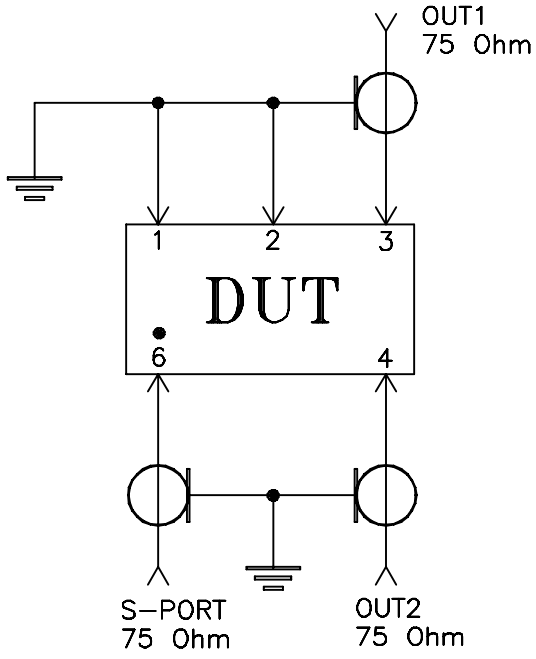
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-153 | A |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL153 | 10:1 | 1 OF 1 |

# Evaluation Board and Circuit




TB-277




Schematic Diagram

## Notes:

1. 75 Ohm BNC Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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# Environmental Specifications ENV02T1

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 |


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