

top hat®

# Surface Mount Power Splitter/Combiner

## SBTC-2-15-75LX+

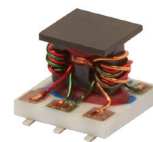
2 Way-0° 75Ω 500 to 1500 MHz

### 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



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            |

### 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

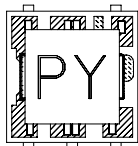
| Parameter                   | Ratings        |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 0.5W max.      |
| Internal Dissipation        | 0.125W max     |

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          |

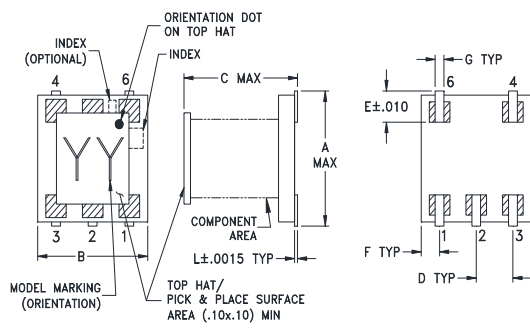
### Product Marking



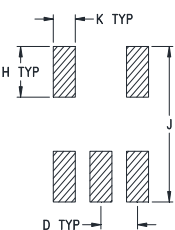
### Electrical Schematic



## Outline Drawing



## PCB Land Pattern

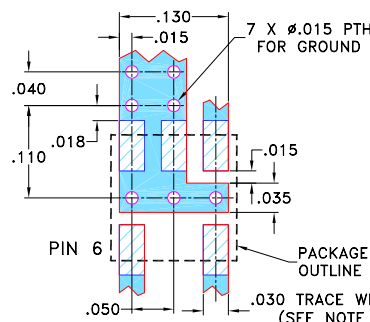


Suggested Layout,  
Tolerance to be within ±.002

## 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.

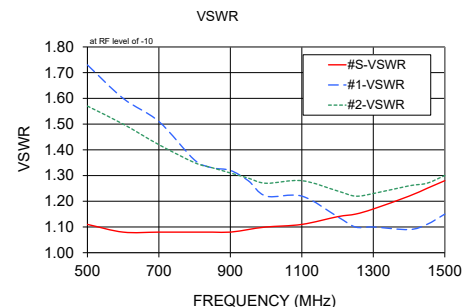
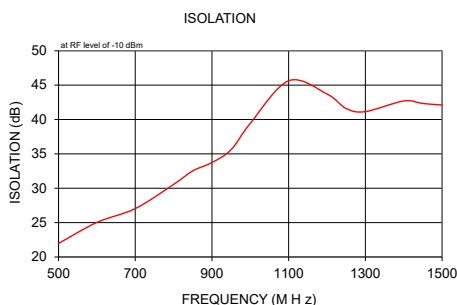
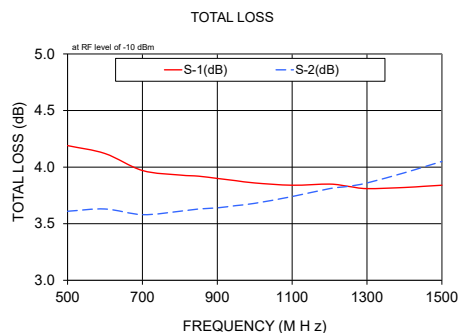
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Typical Performance Data

| Frequency<br>(MHz) | Total Loss <sup>1</sup><br>(dB) |      | Amplitude<br>Unbalance<br>(dB) | Isolation<br>(dB) | Phase<br>Unbalance<br>(deg.) | VSWR<br>S | VSWR<br>1 | VSWR<br>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.



## 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-Circuits' applicable established test performance criteria and measurement instructions.
- 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](http://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<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      | AMPLITUDE<br>UNBALANCE<br>(dB) | ISOLATION<br>(dB) | PHASE<br>UNBALANCE<br>(Deg) | FREQUENCY<br>(MHz) | VSWR<br>(:1) |       |      |
|--------------------|---------------------------------|------|--------------------------------|-------------------|-----------------------------|--------------------|--------------|-------|------|
|                    | S-1                             | S-2  |                                |                   |                             |                    | S            | 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 |

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site  
 The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

REV. OR  
SBTC-2-15-75LX+  
7/19/2012  
Page 1 of 3

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

### Typical Performance Data

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

| FREQUENCY<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      | AMPLITUDE<br>UNBALANCE<br>(dB) | ISOLATION<br>(dB) | PHASE<br>UNBALANCE<br>(Deg) | FREQUENCY<br>(MHz) | VSWR<br>(:1) |       |      |
|--------------------|---------------------------------|------|--------------------------------|-------------------|-----------------------------|--------------------|--------------|-------|------|
|                    | S-1                             | S-2  |                                |                   |                             |                    | S            | 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 |

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site  
 The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

REV. OR  
 SBTC-2-15-75LX+  
 7/19/2012  
 Page 2 of 3

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

## Typical Performance Data

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

| FREQUENCY<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      | AMPLITUDE<br>UNBALANCE<br>(dB) | ISOLATION<br>(dB) | PHASE<br>UNBALANCE<br>(Deg) | FREQUENCY<br>(MHz) | VSWR<br>(:1) |       |      |
|--------------------|---------------------------------|------|--------------------------------|-------------------|-----------------------------|--------------------|--------------|-------|------|
|                    | S-1                             | S-2  |                                |                   |                             |                    | S            | 1     | 2    |
| 50.0               | 8.14                            | 6.31 | 1.83                           | 16.32             | 3.30                        | 50.0               | 6.03         | 12.35 | 8.51 |
| 100.0              | 5.89                            | 4.41 | 1.48                           | 15.73             | 4.49                        | 100.0              | 2.47         | 5.35  | 3.63 |
| 150.0              | 5.17                            | 3.96 | 1.21                           | 16.64             | 4.56                        | 150.0              | 1.83         | 3.63  | 2.67 |
| 200.0              | 4.81                            | 3.77 | 1.04                           | 17.60             | 4.21                        | 200.0              | 1.51         | 2.84  | 2.22 |
| 250.0              | 4.60                            | 3.68 | 0.92                           | 18.61             | 3.82                        | 250.0              | 1.33         | 2.39  | 1.90 |
| 300.0              | 4.44                            | 3.63 | 0.81                           | 19.61             | 3.40                        | 300.0              | 1.25         | 2.10  | 1.77 |
| 350.0              | 4.33                            | 3.59 | 0.74                           | 20.44             | 3.00                        | 350.0              | 1.18         | 1.90  | 1.63 |
| 400.0              | 4.24                            | 3.58 | 0.66                           | 21.30             | 2.63                        | 400.0              | 1.16         | 1.75  | 1.52 |
| 425.0              | 4.20                            | 3.58 | 0.62                           | 21.87             | 2.71                        | 425.0              | 1.15         | 1.70  | 1.49 |
| 450.0              | 4.17                            | 3.58 | 0.59                           | 22.33             | 2.31                        | 450.0              | 1.14         | 1.64  | 1.47 |
| 475.0              | 4.16                            | 3.58 | 0.58                           | 22.98             | 2.41                        | 475.0              | 1.13         | 1.60  | 1.45 |
| 500.0              | 4.12                            | 3.57 | 0.55                           | 23.27             | 2.02                        | 500.0              | 1.13         | 1.56  | 1.43 |
| 525.0              | 4.12                            | 3.57 | 0.55                           | 23.92             | 2.06                        | 525.0              | 1.13         | 1.52  | 1.40 |
| 550.0              | 4.09                            | 3.58 | 0.51                           | 24.11             | 1.79                        | 550.0              | 1.13         | 1.49  | 1.38 |
| 575.0              | 4.09                            | 3.58 | 0.51                           | 24.76             | 1.73                        | 575.0              | 1.12         | 1.46  | 1.36 |
| 600.0              | 4.05                            | 3.60 | 0.45                           | 25.27             | 1.53                        | 600.0              | 1.12         | 1.43  | 1.35 |
| 625.0              | 4.07                            | 3.59 | 0.48                           | 25.94             | 1.40                        | 625.0              | 1.12         | 1.41  | 1.34 |
| 650.0              | 4.04                            | 3.61 | 0.43                           | 26.53             | 1.32                        | 650.0              | 1.13         | 1.39  | 1.33 |
| 675.0              | 4.05                            | 3.60 | 0.45                           | 27.04             | 1.05                        | 675.0              | 1.13         | 1.36  | 1.33 |
| 700.0              | 4.03                            | 3.62 | 0.41                           | 27.43             | 1.13                        | 700.0              | 1.13         | 1.34  | 1.32 |
| 725.0              | 4.03                            | 3.61 | 0.41                           | 27.62             | 0.75                        | 725.0              | 1.13         | 1.33  | 1.31 |
| 750.0              | 4.02                            | 3.63 | 0.39                           | 28.59             | 0.87                        | 750.0              | 1.14         | 1.31  | 1.30 |
| 775.0              | 4.01                            | 3.62 | 0.39                           | 28.37             | 0.51                        | 775.0              | 1.14         | 1.29  | 1.29 |
| 800.0              | 4.01                            | 3.63 | 0.38                           | 29.82             | 0.63                        | 800.0              | 1.15         | 1.28  | 1.29 |
| 850.0              | 4.00                            | 3.63 | 0.37                           | 29.65             | 0.36                        | 850.0              | 1.16         | 1.25  | 1.28 |
| 900.0              | 4.00                            | 3.64 | 0.35                           | 29.20             | 0.11                        | 900.0              | 1.17         | 1.23  | 1.26 |
| 950.0              | 3.99                            | 3.66 | 0.33                           | 29.35             | 0.22                        | 950.0              | 1.20         | 1.20  | 1.26 |
| 1000.0             | 3.97                            | 3.66 | 0.31                           | 28.66             | 0.32                        | 1000.0             | 1.21         | 1.18  | 1.24 |
| 1050.0             | 3.97                            | 3.67 | 0.30                           | 27.29             | 0.45                        | 1050.0             | 1.22         | 1.16  | 1.23 |
| 1100.0             | 3.98                            | 3.68 | 0.30                           | 26.70             | 0.57                        | 1100.0             | 1.22         | 1.14  | 1.23 |
| 1150.0             | 3.98                            | 3.70 | 0.28                           | 26.12             | 0.63                        | 1150.0             | 1.22         | 1.12  | 1.21 |
| 1200.0             | 3.98                            | 3.73 | 0.25                           | 25.23             | 0.69                        | 1200.0             | 1.22         | 1.11  | 1.20 |
| 1250.0             | 3.99                            | 3.75 | 0.24                           | 25.26             | 0.71                        | 1250.0             | 1.21         | 1.10  | 1.20 |
| 1300.0             | 4.03                            | 3.78 | 0.24                           | 25.67             | 0.72                        | 1300.0             | 1.2          | 1.1   | 1.18 |
| 1350.0             | 4.05                            | 3.84 | 0.21                           | 25.41             | 0.71                        | 1350.0             | 1.19         | 1.11  | 1.17 |
| 1400.0             | 4.07                            | 3.88 | 0.19                           | 25.12             | 0.79                        | 1400.0             | 1.17         | 1.11  | 1.15 |
| 1425.0             | 4.05                            | 3.90 | 0.15                           | 25.33             | 0.79                        | 1425.0             | 1.15         | 1.11  | 1.15 |
| 1450.0             | 4.07                            | 3.92 | 0.15                           | 25.60             | 0.79                        | 1450.0             | 1.14         | 1.12  | 1.15 |
| 1475.0             | 4.06                            | 3.95 | 0.11                           | 26.69             | 0.79                        | 1475.0             | 1.13         | 1.12  | 1.15 |
| 1500.0             | 4.07                            | 3.96 | 0.11                           | 26.52             | 0.90                        | 1500.0             | 1.12         | 1.12  | 1.14 |
| 1525.0             | 4.07                            | 3.99 | 0.08                           | 27.63             | 0.81                        | 1525.0             | 1.11         | 1.12  | 1.13 |
| 1550.0             | 4.07                            | 4.00 | 0.07                           | 27.78             | 1.02                        | 1550.0             | 1.09         | 1.12  | 1.12 |
| 1575.0             | 4.08                            | 4.03 | 0.05                           | 28.06             | 0.95                        | 1575.0             | 1.07         | 1.12  | 1.12 |
| 1600.0             | 4.07                            | 4.04 | 0.03                           | 29.48             | 1.09                        | 1600.0             | 1.06         | 1.12  | 1.12 |
| 1700.0             | 4.12                            | 4.15 | 0.03                           | 32.82             | 1.55                        | 1700.0             | 1.06         | 1.12  | 1.13 |
| 1800.0             | 4.23                            | 4.30 | 0.07                           | 29.92             | 1.85                        | 1800.0             | 1.16         | 1.15  | 1.2  |
| 1900.0             | 4.40                            | 4.46 | 0.06                           | 26.16             | 1.95                        | 1900.0             | 1.28         | 1.22  | 1.31 |
| 2000.0             | 4.52                            | 4.52 | 0.00                           | 22.99             | 2.05                        | 2000.0             | 1.41         | 1.32  | 1.46 |
| 2100.0             | 4.53                            | 4.50 | 0.03                           | 21.93             | 1.99                        | 2100.0             | 1.54         | 1.46  | 1.63 |
| 2200.0             | 4.40                            | 4.39 | 0.01                           | 21.70             | 0.86                        | 2200.0             | 1.63         | 1.6   | 1.8  |
| 2300.0             | 4.33                            | 4.28 | 0.06                           | 22.72             | 0.30                        | 2300.0             | 1.66         | 1.72  | 1.93 |
| 2400.0             | 4.26                            | 4.39 | 0.13                           | 25.71             | 0.45                        | 2400.0             | 1.59         | 1.78  | 1.96 |
| 2500.0             | 4.44                            | 4.88 | 0.44                           | 27.11             | 1.02                        | 2500.0             | 1.52         | 1.81  | 1.92 |

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss



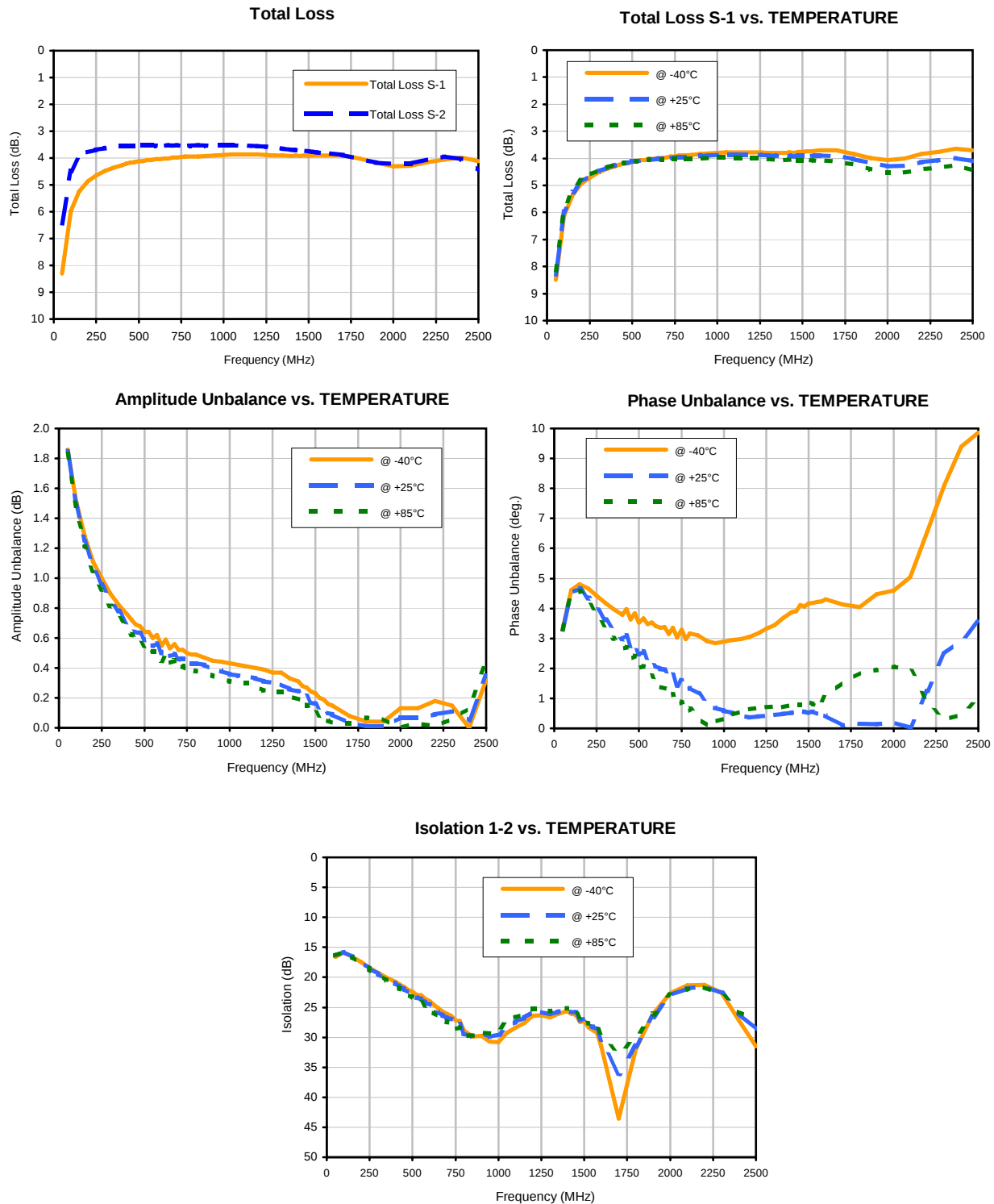
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site  
 The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

REV. OR  
 SBTC-2-15-75LX+  
 7/19/2012  
 Page 3 of 3

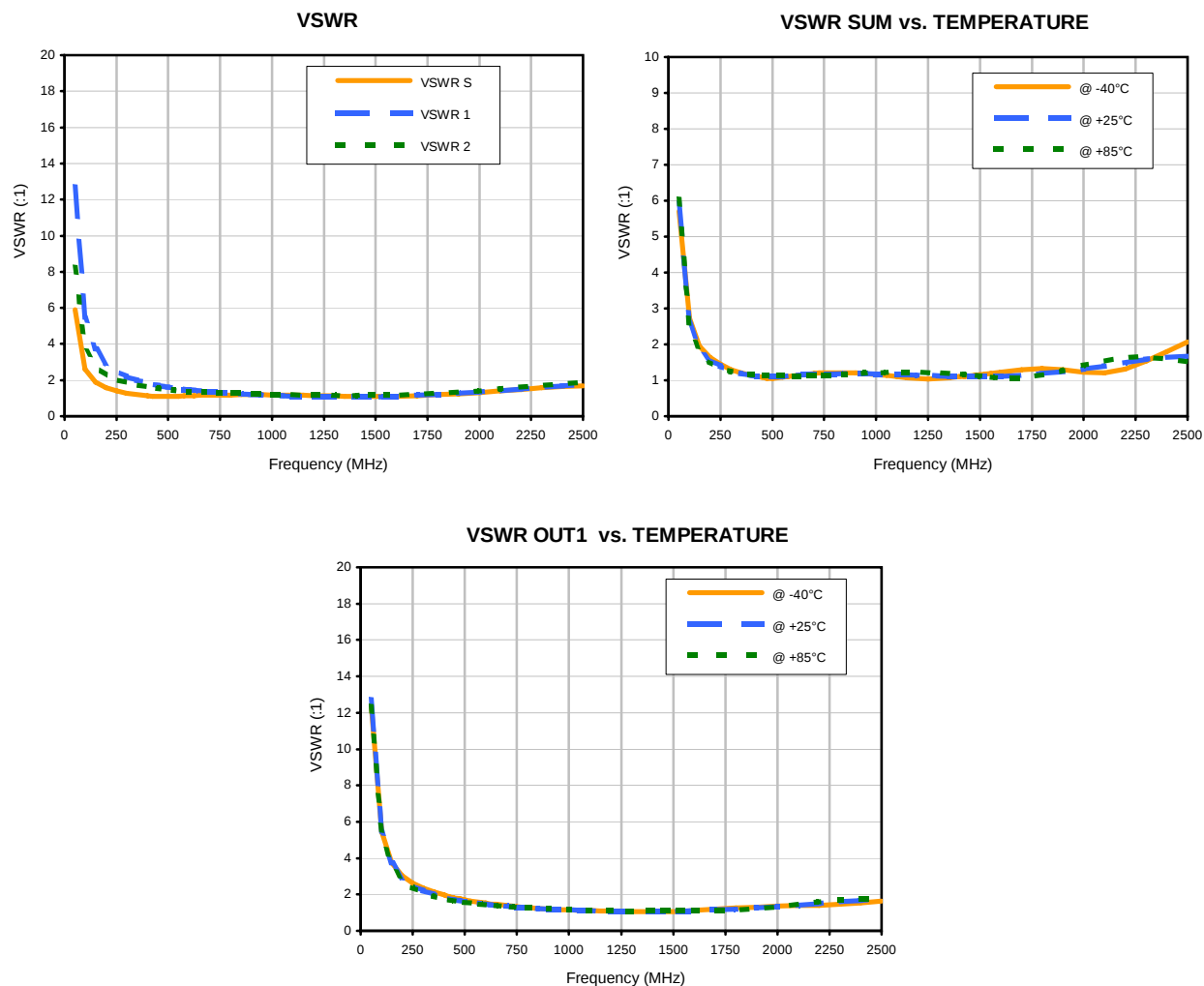
# 2 Way-0° Power Splitter/Combiner SBTC-2-15-75LX+

## Typical Performance Curves



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

## Typical Performance Curves



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site  
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)



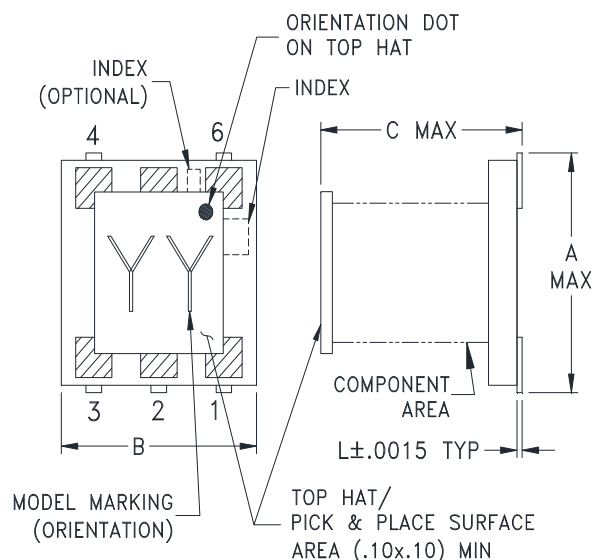
IF/RF MICROWAVE COMPONENTS



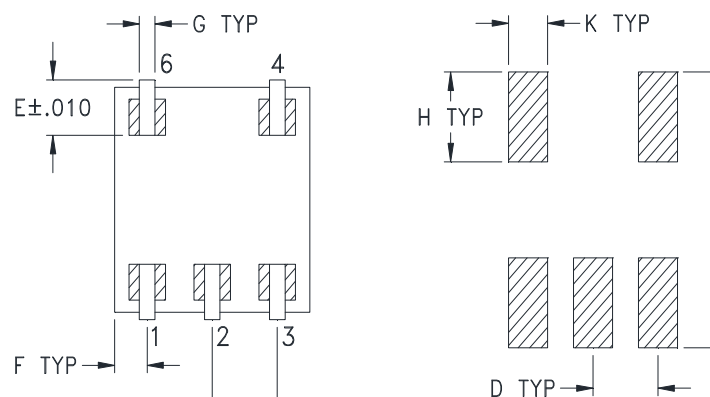
REV. OR  
SBTC-2-15-75LX+  
7/19/2012  
Page 2 of 2

## Outline Dimensions

AT1739



## PCB Land Pattern



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

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

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

### Notes:

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



P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

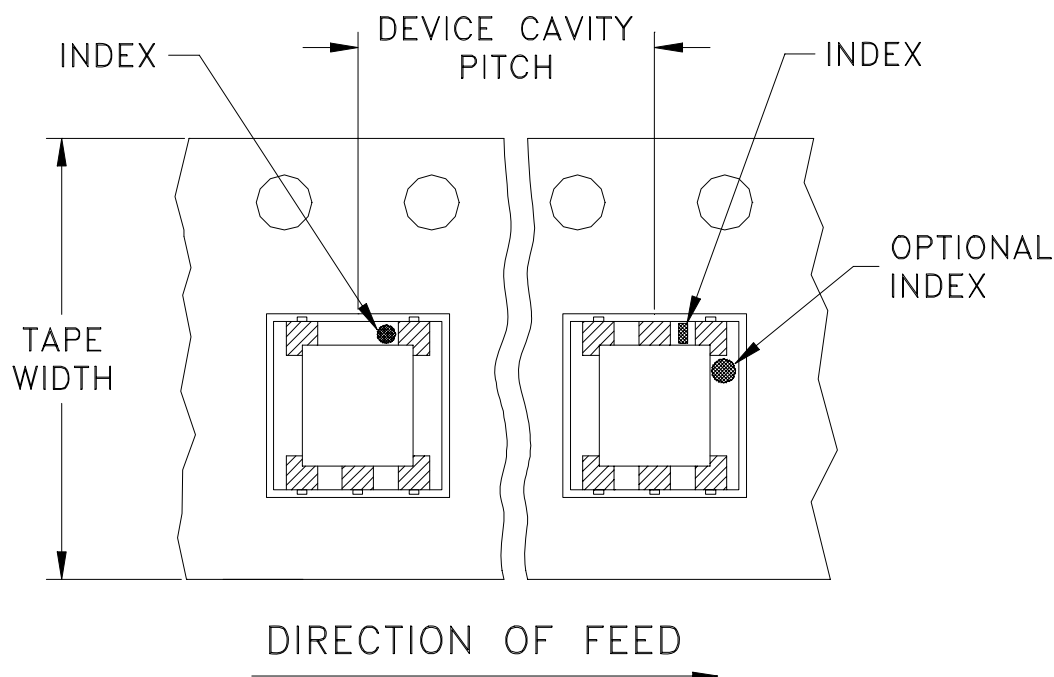


Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F76

## DEVICE ORIENTATION IN T&R



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



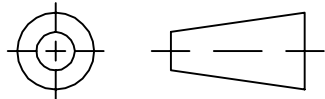
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

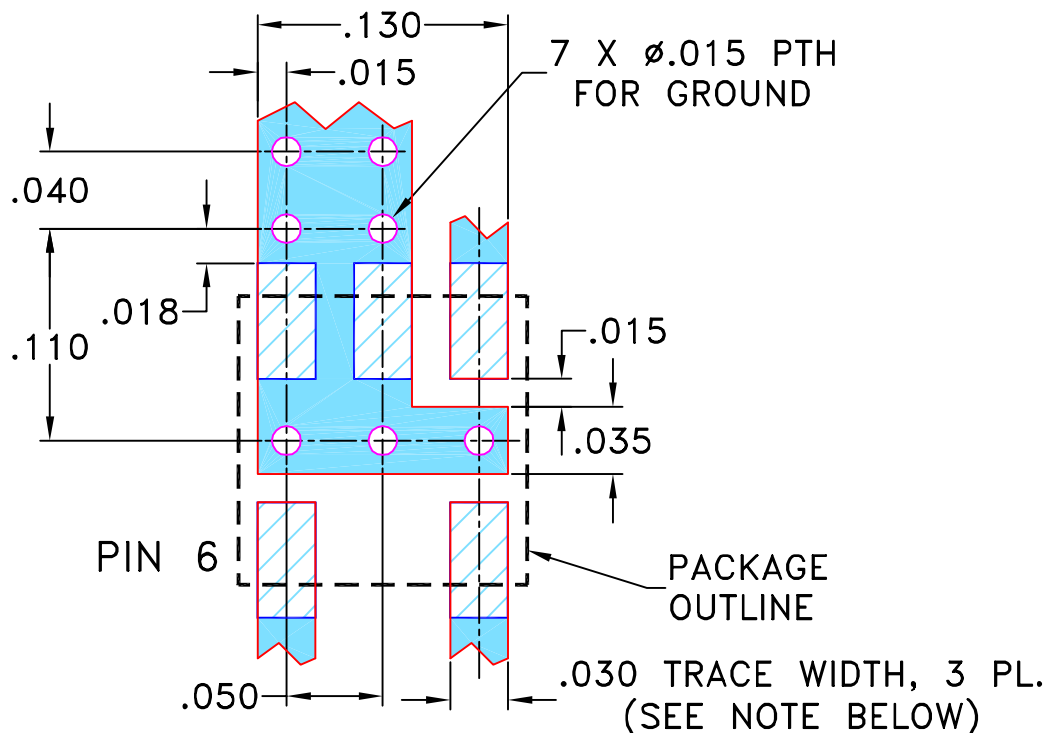
## THIRD ANGLE PROJECTION



## 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

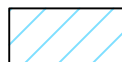


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030"  $\pm$  0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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  $\pm$ 

APPROVED

WP

01/16/04

3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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



**Mini-Circuits®** 13 Neptune Avenue  
Brooklyn NY 11235

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

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-153

REV:

A

FILE:

98PL153

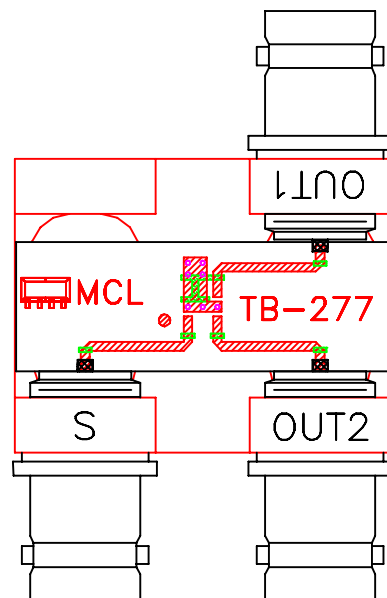
SCALE:

10:1

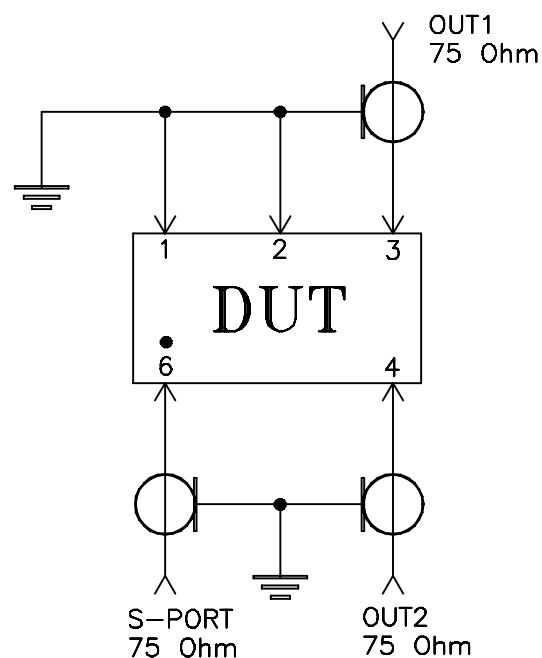
SHEET:

1 OF 1

# Evaluation Board and Circuit



TB-277



Schematic Diagram

## Notes:

1. 75 Ohm BNC Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

 **Mini-Circuits®**



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Operating Temperature          | -40° to 85°C<br>Ambient Environment                                                                                                                             | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Humidity                       | 90 to 95% RH, 240 hours, 50°C                                                                                                                                   | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak                                                                                          | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1                                                        |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                                                                 |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |