



Mini-Circuits®

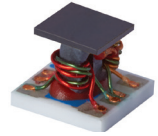
SURFACE MOUNT 

# Power Splitter/Combiner **SBTC-2-10-75X+**

2 Way-0° 75Ω 10 to 1000 MHz

## FEATURES

- Low insertion loss, 0.8 dB typ.
- Excellent amplitude unbalance, 0.15 dB typ.
- Very good phase unbalance, 1.0 deg. typ.
- Temperature stable LTCC base
- Small size
- Low cost
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: AT1667

### +RoHS Compliant

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

## APPLICATIONS

- UHF/VHF receivers/transmitters
- Cellular

## ELECTRICAL SPECIFICATIONS AT 25°C

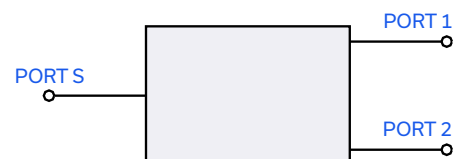
| Parameter                    | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range              |                 | 10   |      | 1000 | MHz    |
| Insertion Loss, above 3.0 dB | 10 - 100        | —    | 0.7  | 1.2  | dB     |
|                              | 100-500         | —    | 0.6  | 1.2  |        |
|                              | 500-1000        | —    | 0.7  | 1.4  |        |
| Isolation                    | 10 - 100        | 20   | 35   | —    | dB     |
|                              | 100-500         | 20   | 28   | —    |        |
|                              | 500-1000        | 21   | 21   | —    |        |
| Phase Unbalance              | 10 - 100        | —    | —    | 3    | Degree |
|                              | 100-500         | —    | —    | 3    |        |
|                              | 500-1000        | —    | —    | 5    |        |
| Amplitude Unbalance          | 10 - 100        | —    | —    | 0.7  | dB     |
|                              | 100-500         | —    | —    | 0.6  |        |
|                              | 500-1000        | —    | —    | 0.6  |        |

## 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.

## ELECTRICAL SCHEMATIC

REV. B  
ECO-015187  
SBTC-2-10-75X+  
WZ/CP/AM  
220922



Mini-Circuits

top hat

SURFACE MOUNT

Power Splitter/Combiner **SBTC-2-10-75X+**

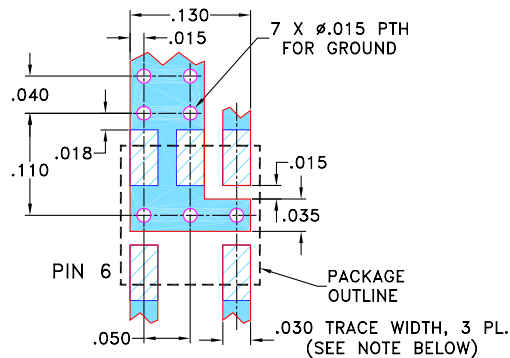
2 Way-0° 75Ω 10 to 1000 MHz

## PIN CONNECTIONS

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

## PRODUCT MARKING: PQ

DEMO BOARD MCL P/N: TB-277+  
SUGGESTED PCB LAYOUT (PL-153)

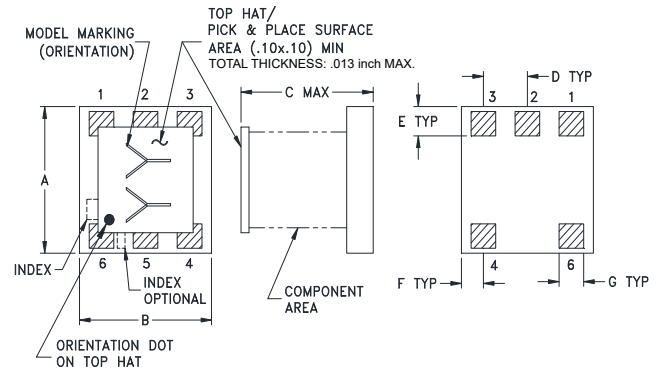


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $0.030" \pm 0.002"$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

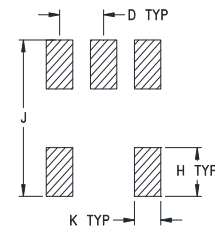
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

## OUTLINE DRAWING



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

## OUTLINE DIMENSIONS (Inches 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  |      |

## TAPE &amp; REEL INFORMATION: F15



Mini-Circuits

top hat

SURFACE MOUNT

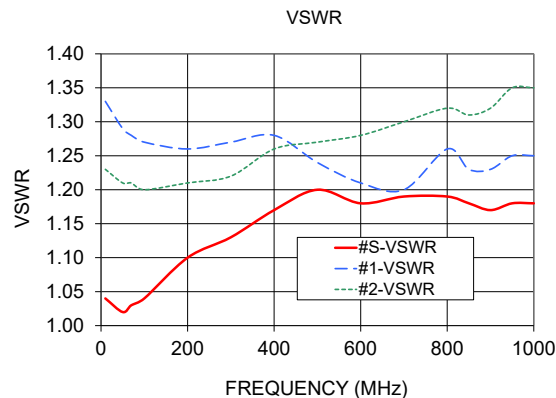
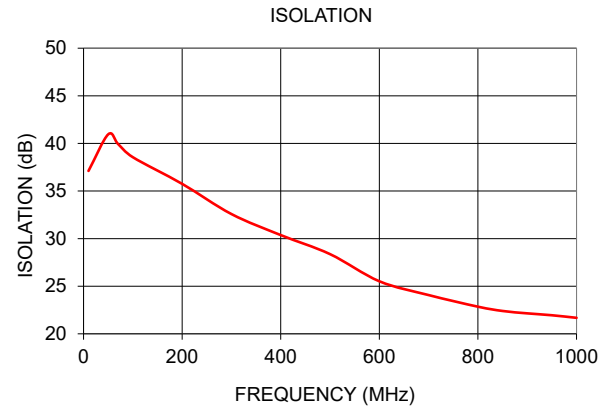
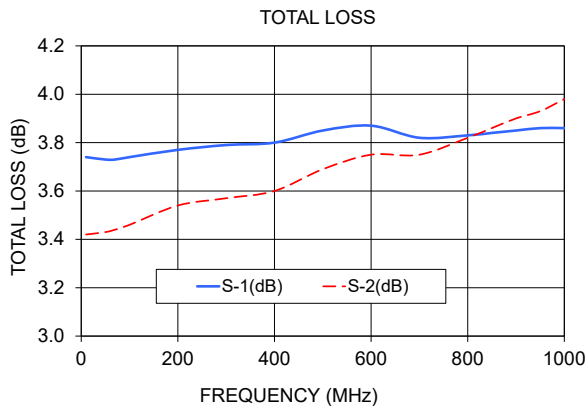
# Power Splitter/Combiner SBTC-2-10-75X+

2 Way-0° 75Ω 10 to 1000 MHz

## 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>(:1) |      |      |
|--------------------|---------------------------------|------|--------------------------------|-------------------|------------------------------|--------------|------|------|
|                    | S-1                             | S-2  |                                |                   |                              | S            | 1    | 2    |
| 10                 | 3.74                            | 3.42 | 0.31                           | 37.11             | 0.66                         | 1.04         | 1.33 | 1.23 |
| 50                 | 3.73                            | 3.43 | 0.3                            | 40.95             | 0.14                         | 1.02         | 1.29 | 1.21 |
| 70                 | 3.73                            | 3.44 | 0.29                           | 39.94             | 0.14                         | 1.03         | 1.28 | 1.21 |
| 100                | 3.74                            | 3.46 | 0.29                           | 38.55             | 0.13                         | 1.04         | 1.27 | 1.2  |
| 200                | 3.77                            | 3.54 | 0.22                           | 35.75             | 0.09                         | 1.1          | 1.26 | 1.21 |
| 300                | 3.79                            | 3.57 | 0.22                           | 32.58             | 0.54                         | 1.13         | 1.27 | 1.22 |
| 400                | 3.8                             | 3.6  | 0.2                            | 30.37             | 0.6                          | 1.17         | 1.28 | 1.26 |
| 500                | 3.85                            | 3.69 | 0.16                           | 28.37             | 0.64                         | 1.2          | 1.24 | 1.27 |
| 600                | 3.87                            | 3.75 | 0.12                           | 25.52             | 0.74                         | 1.18         | 1.21 | 1.28 |
| 700                | 3.82                            | 3.75 | 0.07                           | 24.07             | 0.75                         | 1.19         | 1.2  | 1.3  |
| 800                | 3.83                            | 3.82 | 0.03                           | 22.85             | 0.77                         | 1.19         | 1.26 | 1.32 |
| 850                | 3.84                            | 3.86 | 0.03                           | 22.4              | 0.73                         | 1.18         | 1.23 | 1.31 |
| 900                | 3.85                            | 3.9  | 0.06                           | 22.15             | 0.69                         | 1.17         | 1.23 | 1.32 |
| 950                | 3.86                            | 3.93 | 0.08                           | 21.95             | 0.64                         | 1.18         | 1.25 | 1.35 |
| 1000               | 3.86                            | 3.98 | 0.11                           | 21.68             | 0.58                         | 1.18         | 1.25 | 1.35 |

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



- 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# 2 Way-0° Power Splitter/Combiner

SBTC-2-10-75X+

## 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    |
| 10.0               | 3.74                            | 3.43 | 0.31                           | 38.17             | 0.40                        | 10.0               | 1.04         | 1.33 | 1.25 |
| 20.0               | 3.74                            | 3.43 | 0.31                           | 40.42             | 0.14                        | 20.0               | 1.01         | 1.32 | 1.24 |
| 30.0               | 3.75                            | 3.44 | 0.31                           | 40.25             | 0.07                        | 30.0               | 1.01         | 1.32 | 1.24 |
| 40.0               | 3.75                            | 3.44 | 0.31                           | 39.82             | 0.04                        | 40.0               | 1.01         | 1.31 | 1.24 |
| 50.0               | 3.76                            | 3.45 | 0.31                           | 39.20             | 0.01                        | 50.0               | 1.02         | 1.31 | 1.24 |
| 60.0               | 3.76                            | 3.45 | 0.31                           | 38.60             | 0.00                        | 60.0               | 1.02         | 1.31 | 1.24 |
| 70.0               | 3.77                            | 3.46 | 0.31                           | 38.09             | 0.04                        | 70.0               | 1.03         | 1.31 | 1.24 |
| 80.0               | 3.77                            | 3.46 | 0.31                           | 37.71             | 0.10                        | 80.0               | 1.04         | 1.31 | 1.24 |
| 90.0               | 3.78                            | 3.47 | 0.31                           | 37.33             | 0.06                        | 90.0               | 1.05         | 1.31 | 1.24 |
| 100.0              | 3.78                            | 3.47 | 0.31                           | 36.86             | 0.09                        | 100.0              | 1.05         | 1.31 | 1.24 |
| 150.0              | 3.80                            | 3.49 | 0.31                           | 35.41             | 0.16                        | 150.0              | 1.08         | 1.30 | 1.22 |
| 200.0              | 3.81                            | 3.51 | 0.30                           | 34.69             | 0.23                        | 200.0              | 1.11         | 1.28 | 1.23 |
| 250.0              | 3.82                            | 3.52 | 0.30                           | 33.78             | 0.33                        | 250.0              | 1.14         | 1.27 | 1.25 |
| 300.0              | 3.83                            | 3.54 | 0.29                           | 31.91             | 0.42                        | 300.0              | 1.16         | 1.26 | 1.25 |
| 350.0              | 3.83                            | 3.57 | 0.26                           | 30.17             | 0.52                        | 350.0              | 1.18         | 1.25 | 1.23 |
| 400.0              | 3.84                            | 3.59 | 0.25                           | 29.14             | 0.62                        | 400.0              | 1.19         | 1.24 | 1.24 |
| 450.0              | 3.86                            | 3.61 | 0.25                           | 28.73             | 0.69                        | 450.0              | 1.20         | 1.23 | 1.26 |
| 475.0              | 3.89                            | 3.62 | 0.27                           | 28.37             | 0.76                        | 475.0              | 1.20         | 1.23 | 1.27 |
| 500.0              | 3.88                            | 3.64 | 0.24                           | 28.42             | 0.77                        | 500.0              | 1.21         | 1.22 | 1.27 |
| 550.0              | 3.90                            | 3.66 | 0.24                           | 27.43             | 0.84                        | 550.0              | 1.21         | 1.22 | 1.25 |
| 600.0              | 3.93                            | 3.70 | 0.23                           | 26.12             | 0.91                        | 600.0              | 1.22         | 1.22 | 1.25 |
| 650.0              | 3.96                            | 3.73 | 0.23                           | 25.28             | 1.01                        | 650.0              | 1.22         | 1.21 | 1.26 |
| 700.0              | 3.99                            | 3.75 | 0.24                           | 24.90             | 1.12                        | 700.0              | 1.21         | 1.22 | 1.28 |
| 750.0              | 4.02                            | 3.77 | 0.25                           | 24.43             | 1.27                        | 750.0              | 1.20         | 1.22 | 1.27 |
| 800.0              | 4.04                            | 3.81 | 0.23                           | 23.64             | 1.42                        | 800.0              | 1.17         | 1.22 | 1.25 |
| 850.0              | 4.05                            | 3.83 | 0.22                           | 22.66             | 1.50                        | 850.0              | 1.16         | 1.23 | 1.25 |
| 900.0              | 4.08                            | 3.87 | 0.21                           | 21.80             | 1.55                        | 900.0              | 1.14         | 1.24 | 1.26 |
| 925.0              | 4.11                            | 3.88 | 0.23                           | 21.56             | 1.37                        | 925.0              | 1.13         | 1.25 | 1.26 |
| 950.0              | 4.11                            | 3.90 | 0.21                           | 21.36             | 1.53                        | 950.0              | 1.12         | 1.26 | 1.26 |
| 975.0              | 4.14                            | 3.91 | 0.23                           | 21.01             | 1.44                        | 975.0              | 1.10         | 1.26 | 1.25 |
| 1000.0             | 4.14                            | 3.93 | 0.21                           | 20.93             | 1.51                        | 1000.0             | 1.09         | 1.27 | 1.24 |
| 1025.0             | 4.17                            | 3.94 | 0.23                           | 20.67             | 1.49                        | 1025.0             | 1.08         | 1.28 | 1.24 |
| 1050.0             | 4.17                            | 3.96 | 0.21                           | 20.27             | 1.40                        | 1050.0             | 1.07         | 1.29 | 1.24 |
| 1075.0             | 4.19                            | 3.97 | 0.22                           | 20.21             | 1.42                        | 1075.0             | 1.06         | 1.30 | 1.24 |
| 1100.0             | 4.20                            | 4.00 | 0.20                           | 19.64             | 1.36                        | 1100.0             | 1.05         | 1.30 | 1.24 |
| 1200.0             | 4.25                            | 4.07 | 0.18                           | 19.05             | 1.17                        | 1200.0             | 1.00         | 1.34 | 1.26 |
| 1300.0             | 4.31                            | 4.16 | 0.16                           | 19.18             | 1.02                        | 1300.0             | 1.02         | 1.38 | 1.29 |
| 1400.0             | 4.37                            | 4.23 | 0.14                           | 19.44             | 1.15                        | 1400.0             | 1.04         | 1.42 | 1.32 |
| 1500.0             | 4.41                            | 4.32 | 0.08                           | 20.37             | 1.37                        | 1500.0             | 1.04         | 1.46 | 1.34 |
| 1600.0             | 4.49                            | 4.47 | 0.02                           | 22.35             | 1.65                        | 1600.0             | 1.06         | 1.50 | 1.36 |
| 1700.0             | 4.68                            | 4.68 | 0.00                           | 24.09             | 1.87                        | 1700.0             | 1.07         | 1.55 | 1.39 |
| 1800.0             | 4.99                            | 4.95 | 0.04                           | 23.16             | 1.95                        | 1800.0             | 1.09         | 1.61 | 1.44 |
| 1900.0             | 5.27                            | 5.12 | 0.15                           | 21.07             | 1.44                        | 1900.0             | 1.11         | 1.68 | 1.52 |
| 2000.0             | 5.47                            | 5.13 | 0.34                           | 19.25             | 1.42                        | 2000.0             | 1.15         | 1.77 | 1.63 |
| 2100.0             | 5.42                            | 5.10 | 0.33                           | 18.21             | 1.14                        | 2100.0             | 1.19         | 1.87 | 1.77 |
| 2200.0             | 5.32                            | 4.95 | 0.37                           | 17.84             | 0.90                        | 2200.0             | 1.20         | 1.95 | 1.87 |
| 2300.0             | 5.31                            | 4.90 | 0.42                           | 17.92             | 1.42                        | 2300.0             | 1.19         | 2.01 | 1.94 |
| 2400.0             | 5.33                            | 5.09 | 0.25                           | 17.27             | 1.29                        | 2400.0             | 1.16         | 2.04 | 1.93 |
| 2500.0             | 5.72                            | 5.67 | 0.06                           | 15.76             | 0.76                        | 2500.0             | 1.16         | 2.07 | 1.92 |
| 2600.0             | 6.26                            | 6.20 | 0.06                           | 14.03             | 0.39                        | 2600.0             | 1.17         | 2.09 | 1.84 |
| 2700.0             | 7.25                            | 6.85 | 0.40                           | 12.30             | 2.05                        | 2700.0             | 1.19         | 2.09 | 1.76 |
| 2800.0             | 8.14                            | 7.49 | 0.65                           | 11.31             | 5.41                        | 2800.0             | 1.23         | 2.08 | 1.68 |
| 2900.0             | 8.80                            | 7.68 | 1.12                           | 10.84             | 5.96                        | 2900.0             | 1.25         | 2.09 | 1.65 |
| 3000.0             | 9.09                            | 7.36 | 1.73                           | 10.47             | 5.76                        | 3000.0             | 1.28         | 2.08 | 1.64 |

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



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IF/RF MICROWAVE COMPONENTS

REV. OR  
 SBTC-2-10-75X+  
 6/4/2012  
 Page 1 of 3

# 2 Way-0° Power Splitter/Combiner

SBTC-2-10-75X+

## 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    |
| 10.0               | 3.59                            | 3.36 | 0.23                           | 32.58             | 1.51                        | 10.0               | 1.08         | 1.33 | 1.24 |
| 20.0               | 3.53                            | 3.33 | 0.20                           | 39.16             | 0.73                        | 20.0               | 1.05         | 1.26 | 1.20 |
| 30.0               | 3.52                            | 3.32 | 0.20                           | 44.50             | 0.45                        | 30.0               | 1.05         | 1.24 | 1.18 |
| 40.0               | 3.52                            | 3.33 | 0.19                           | 50.02             | 0.33                        | 40.0               | 1.05         | 1.23 | 1.17 |
| 50.0               | 3.53                            | 3.33 | 0.20                           | 54.11             | 0.24                        | 50.0               | 1.06         | 1.23 | 1.16 |
| 60.0               | 3.53                            | 3.33 | 0.20                           | 52.55             | 0.23                        | 60.0               | 1.07         | 1.22 | 1.16 |
| 70.0               | 3.53                            | 3.33 | 0.20                           | 48.97             | 0.19                        | 70.0               | 1.07         | 1.22 | 1.15 |
| 80.0               | 3.53                            | 3.33 | 0.20                           | 46.41             | 0.13                        | 80.0               | 1.07         | 1.22 | 1.16 |
| 90.0               | 3.54                            | 3.34 | 0.20                           | 44.29             | 0.17                        | 90.0               | 1.06         | 1.21 | 1.16 |
| 100.0              | 3.54                            | 3.34 | 0.20                           | 42.54             | 0.12                        | 100.0              | 1.06         | 1.21 | 1.16 |
| 150.0              | 3.56                            | 3.36 | 0.20                           | 38.32             | 0.09                        | 150.0              | 1.08         | 1.20 | 1.18 |
| 200.0              | 3.57                            | 3.36 | 0.21                           | 36.49             | 0.09                        | 200.0              | 1.10         | 1.20 | 1.17 |
| 250.0              | 3.58                            | 3.38 | 0.20                           | 35.13             | 0.07                        | 250.0              | 1.11         | 1.21 | 1.21 |
| 300.0              | 3.59                            | 3.39 | 0.20                           | 33.05             | 0.08                        | 300.0              | 1.14         | 1.22 | 1.22 |
| 350.0              | 3.60                            | 3.41 | 0.19                           | 30.81             | 0.09                        | 350.0              | 1.16         | 1.24 | 1.21 |
| 400.0              | 3.61                            | 3.43 | 0.18                           | 29.35             | 0.11                        | 400.0              | 1.17         | 1.25 | 1.23 |
| 450.0              | 3.63                            | 3.44 | 0.19                           | 28.71             | 0.17                        | 450.0              | 1.20         | 1.25 | 1.27 |
| 475.0              | 3.65                            | 3.45 | 0.20                           | 28.30             | 0.15                        | 475.0              | 1.21         | 1.26 | 1.28 |
| 500.0              | 3.64                            | 3.46 | 0.18                           | 28.43             | 0.22                        | 500.0              | 1.21         | 1.26 | 1.29 |
| 550.0              | 3.66                            | 3.48 | 0.18                           | 27.50             | 0.29                        | 550.0              | 1.24         | 1.26 | 1.28 |
| 600.0              | 3.68                            | 3.50 | 0.18                           | 26.04             | 0.35                        | 600.0              | 1.24         | 1.27 | 1.27 |
| 650.0              | 3.70                            | 3.52 | 0.18                           | 24.95             | 0.38                        | 650.0              | 1.25         | 1.27 | 1.30 |
| 700.0              | 3.74                            | 3.54 | 0.20                           | 24.30             | 0.37                        | 700.0              | 1.25         | 1.27 | 1.31 |
| 750.0              | 3.75                            | 3.55 | 0.20                           | 23.71             | 0.34                        | 750.0              | 1.22         | 1.28 | 1.30 |
| 800.0              | 3.76                            | 3.58 | 0.18                           | 22.91             | 0.30                        | 800.0              | 1.19         | 1.28 | 1.28 |
| 850.0              | 3.77                            | 3.60 | 0.17                           | 21.80             | 0.32                        | 850.0              | 1.15         | 1.28 | 1.27 |
| 900.0              | 3.79                            | 3.63 | 0.16                           | 20.82             | 0.43                        | 900.0              | 1.12         | 1.28 | 1.27 |
| 925.0              | 3.82                            | 3.63 | 0.19                           | 20.57             | 0.68                        | 925.0              | 1.11         | 1.28 | 1.26 |
| 950.0              | 3.81                            | 3.65 | 0.16                           | 20.29             | 0.57                        | 950.0              | 1.09         | 1.28 | 1.25 |
| 975.0              | 3.84                            | 3.65 | 0.19                           | 19.91             | 0.73                        | 975.0              | 1.07         | 1.28 | 1.24 |
| 1000.0             | 3.84                            | 3.67 | 0.17                           | 19.82             | 0.76                        | 1000.0             | 1.05         | 1.28 | 1.22 |
| 1025.0             | 3.87                            | 3.68 | 0.19                           | 19.58             | 0.81                        | 1025.0             | 1.03         | 1.28 | 1.21 |
| 1050.0             | 3.87                            | 3.69 | 0.18                           | 19.21             | 0.98                        | 1050.0             | 1.02         | 1.28 | 1.20 |
| 1075.0             | 3.89                            | 3.70 | 0.19                           | 19.14             | 0.98                        | 1075.0             | 1.02         | 1.29 | 1.19 |
| 1100.0             | 3.90                            | 3.72 | 0.18                           | 18.60             | 1.13                        | 1100.0             | 1.03         | 1.29 | 1.19 |
| 1200.0             | 3.95                            | 3.79 | 0.16                           | 18.04             | 1.58                        | 1200.0             | 1.09         | 1.31 | 1.18 |
| 1300.0             | 4.01                            | 3.86 | 0.15                           | 18.26             | 2.05                        | 1300.0             | 1.1          | 1.33 | 1.21 |
| 1400.0             | 4.05                            | 3.92 | 0.13                           | 18.67             | 2.31                        | 1400.0             | 1.09         | 1.38 | 1.28 |
| 1500.0             | 4.06                            | 3.99 | 0.07                           | 19.81             | 2.45                        | 1500.0             | 1.06         | 1.47 | 1.39 |
| 1600.0             | 4.13                            | 4.12 | 0.01                           | 22.10             | 2.45                        | 1600.0             | 1.02         | 1.58 | 1.52 |
| 1700.0             | 4.31                            | 4.33 | 0.02                           | 24.23             | 2.42                        | 1700.0             | 1.02         | 1.69 | 1.64 |
| 1800.0             | 4.65                            | 4.66 | 0.01                           | 22.90             | 2.63                        | 1800.0             | 1.02         | 1.79 | 1.71 |
| 1900.0             | 4.92                            | 4.78 | 0.14                           | 20.52             | 3.48                        | 1900.0             | 1.04         | 1.84 | 1.73 |
| 2000.0             | 5.09                            | 4.75 | 0.35                           | 18.74             | 3.63                        | 2000.0             | 1.06         | 1.87 | 1.69 |
| 2100.0             | 5.00                            | 4.65 | 0.35                           | 17.87             | 4.37                        | 2100.0             | 1.14         | 1.88 | 1.64 |
| 2200.0             | 4.89                            | 4.46 | 0.43                           | 17.83             | 6.68                        | 2200.0             | 1.24         | 1.91 | 1.59 |
| 2300.0             | 4.89                            | 4.46 | 0.43                           | 18.20             | 7.81                        | 2300.0             | 1.3          | 1.94 | 1.63 |
| 2400.0             | 4.88                            | 4.61 | 0.28                           | 17.35             | 8.29                        | 2400.0             | 1.36         | 1.99 | 1.75 |
| 2500.0             | 5.27                            | 5.21 | 0.06                           | 15.03             | 7.63                        | 2500.0             | 1.37         | 2.1  | 1.99 |
| 2600.0             | 5.87                            | 5.92 | 0.05                           | 12.92             | 7.90                        | 2600.0             | 1.39         | 2.25 | 2.26 |
| 2700.0             | 6.99                            | 6.66 | 0.33                           | 11.17             | 5.86                        | 2700.0             | 1.3          | 2.33 | 2.48 |
| 2800.0             | 7.93                            | 7.38 | 0.55                           | 10.21             | 2.37                        | 2800.0             | 1.17         | 2.37 | 2.5  |
| 2900.0             | 8.43                            | 7.51 | 0.92                           | 9.87              | 2.21                        | 2900.0             | 1.05         | 2.34 | 2.35 |
| 3000.0             | 8.56                            | 6.98 | 1.58                           | 9.60              | 2.82                        | 3000.0             | 1.23         | 2.25 | 2.16 |

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



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# 2 Way-0° Power Splitter/Combiner

SBTC-2-10-75X+

## 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    |
| 10.0               | 3.86                            | 3.51 | 0.35                           | 35.73             | 0.40                        | 10.0               | 1.05         | 1.38 | 1.28 |
| 20.0               | 3.86                            | 3.50 | 0.36                           | 36.56             | 0.16                        | 20.0               | 1.04         | 1.36 | 1.27 |
| 30.0               | 3.88                            | 3.52 | 0.36                           | 36.31             | 0.10                        | 30.0               | 1.04         | 1.36 | 1.28 |
| 40.0               | 3.88                            | 3.53 | 0.35                           | 35.98             | 0.07                        | 40.0               | 1.04         | 1.36 | 1.29 |
| 50.0               | 3.88                            | 3.53 | 0.35                           | 35.59             | 0.02                        | 50.0               | 1.05         | 1.36 | 1.30 |
| 60.0               | 3.89                            | 3.54 | 0.35                           | 35.31             | 0.05                        | 60.0               | 1.06         | 1.36 | 1.30 |
| 70.0               | 3.89                            | 3.54 | 0.35                           | 35.03             | 0.01                        | 70.0               | 1.06         | 1.36 | 1.30 |
| 80.0               | 3.90                            | 3.54 | 0.36                           | 34.82             | 0.06                        | 80.0               | 1.07         | 1.36 | 1.30 |
| 90.0               | 3.91                            | 3.55 | 0.36                           | 34.71             | 0.01                        | 90.0               | 1.08         | 1.36 | 1.30 |
| 100.0              | 3.91                            | 3.56 | 0.35                           | 34.51             | 0.06                        | 100.0              | 1.08         | 1.35 | 1.29 |
| 150.0              | 3.92                            | 3.58 | 0.34                           | 33.74             | 0.10                        | 150.0              | 1.09         | 1.34 | 1.25 |
| 200.0              | 3.92                            | 3.59 | 0.33                           | 33.30             | 0.18                        | 200.0              | 1.11         | 1.32 | 1.26 |
| 250.0              | 3.93                            | 3.62 | 0.31                           | 32.61             | 0.29                        | 250.0              | 1.15         | 1.30 | 1.27 |
| 300.0              | 3.94                            | 3.64 | 0.30                           | 30.96             | 0.41                        | 300.0              | 1.17         | 1.27 | 1.25 |
| 350.0              | 3.95                            | 3.66 | 0.29                           | 29.46             | 0.52                        | 350.0              | 1.17         | 1.25 | 1.24 |
| 400.0              | 3.96                            | 3.69 | 0.27                           | 28.68             | 0.64                        | 400.0              | 1.19         | 1.24 | 1.25 |
| 450.0              | 3.98                            | 3.72 | 0.26                           | 28.39             | 0.73                        | 450.0              | 1.19         | 1.22 | 1.26 |
| 475.0              | 4.01                            | 3.72 | 0.29                           | 28.05             | 0.78                        | 475.0              | 1.19         | 1.22 | 1.26 |
| 500.0              | 4.01                            | 3.75 | 0.26                           | 28.06             | 0.81                        | 500.0              | 1.19         | 1.21 | 1.26 |
| 550.0              | 4.03                            | 3.78 | 0.25                           | 27.15             | 0.92                        | 550.0              | 1.20         | 1.20 | 1.25 |
| 600.0              | 4.06                            | 3.82 | 0.24                           | 26.03             | 0.99                        | 600.0              | 1.20         | 1.20 | 1.24 |
| 650.0              | 4.08                            | 3.85 | 0.23                           | 25.37             | 1.11                        | 650.0              | 1.20         | 1.20 | 1.25 |
| 700.0              | 4.12                            | 3.87 | 0.24                           | 25.11             | 1.24                        | 700.0              | 1.20         | 1.20 | 1.27 |
| 750.0              | 4.14                            | 3.90 | 0.24                           | 24.72             | 1.39                        | 750.0              | 1.19         | 1.20 | 1.25 |
| 800.0              | 4.17                            | 3.94 | 0.23                           | 24.01             | 1.59                        | 800.0              | 1.17         | 1.21 | 1.24 |
| 850.0              | 4.18                            | 3.97 | 0.21                           | 23.09             | 1.70                        | 850.0              | 1.17         | 1.22 | 1.25 |
| 900.0              | 4.21                            | 4.01 | 0.20                           | 22.26             | 1.79                        | 900.0              | 1.16         | 1.23 | 1.27 |
| 925.0              | 4.24                            | 4.02 | 0.22                           | 22.03             | 1.61                        | 925.0              | 1.15         | 1.24 | 1.27 |
| 950.0              | 4.24                            | 4.04 | 0.20                           | 21.85             | 1.81                        | 950.0              | 1.14         | 1.25 | 1.26 |
| 975.0              | 4.26                            | 4.05 | 0.21                           | 21.48             | 1.69                        | 975.0              | 1.13         | 1.26 | 1.25 |
| 1000.0             | 4.27                            | 4.08 | 0.19                           | 21.41             | 1.77                        | 1000.0             | 1.12         | 1.27 | 1.25 |
| 1025.0             | 4.30                            | 4.09 | 0.21                           | 21.16             | 1.77                        | 1025.0             | 1.11         | 1.28 | 1.25 |
| 1050.0             | 4.30                            | 4.11 | 0.19                           | 20.73             | 1.74                        | 1050.0             | 1.11         | 1.29 | 1.25 |
| 1075.0             | 4.32                            | 4.12 | 0.20                           | 20.66             | 1.77                        | 1075.0             | 1.1          | 1.3  | 1.26 |
| 1100.0             | 4.32                            | 4.15 | 0.17                           | 20.08             | 1.75                        | 1100.0             | 1.09         | 1.31 | 1.26 |
| 1200.0             | 4.37                            | 4.23 | 0.14                           | 19.47             | 1.64                        | 1200.0             | 1.03         | 1.35 | 1.28 |
| 1300.0             | 4.44                            | 4.31 | 0.13                           | 19.54             | 1.57                        | 1300.0             | 1.02         | 1.39 | 1.3  |
| 1400.0             | 4.50                            | 4.39 | 0.11                           | 19.72             | 1.82                        | 1400.0             | 1.01         | 1.42 | 1.33 |
| 1500.0             | 4.55                            | 4.49 | 0.05                           | 20.60             | 2.08                        | 1500.0             | 1.03         | 1.45 | 1.32 |
| 1600.0             | 4.64                            | 4.64 | 0.00                           | 22.49             | 2.42                        | 1600.0             | 1.06         | 1.47 | 1.33 |
| 1700.0             | 4.83                            | 4.85 | 0.02                           | 24.10             | 2.70                        | 1700.0             | 1.09         | 1.5  | 1.33 |
| 1800.0             | 5.13                            | 5.11 | 0.02                           | 23.29             | 2.89                        | 1800.0             | 1.13         | 1.54 | 1.38 |
| 1900.0             | 5.41                            | 5.28 | 0.13                           | 21.29             | 2.48                        | 1900.0             | 1.17         | 1.62 | 1.47 |
| 2000.0             | 5.61                            | 5.30 | 0.31                           | 19.50             | 2.45                        | 2000.0             | 1.22         | 1.72 | 1.61 |
| 2100.0             | 5.57                            | 5.27 | 0.31                           | 18.44             | 2.37                        | 2100.0             | 1.27         | 1.83 | 1.8  |
| 2200.0             | 5.47                            | 5.15 | 0.32                           | 18.10             | 0.69                        | 2200.0             | 1.27         | 1.94 | 1.93 |
| 2300.0             | 5.48                            | 5.12 | 0.37                           | 18.22             | 0.12                        | 2300.0             | 1.24         | 2.01 | 2    |
| 2400.0             | 5.50                            | 5.32 | 0.19                           | 17.65             | 0.24                        | 2400.0             | 1.18         | 2.03 | 1.96 |
| 2500.0             | 5.87                            | 5.89 | 0.01                           | 16.27             | 0.68                        | 2500.0             | 1.15         | 2.05 | 1.9  |
| 2600.0             | 6.39                            | 6.39 | 0.00                           | 14.59             | 1.30                        | 2600.0             | 1.17         | 2.05 | 1.75 |
| 2700.0             | 7.33                            | 7.01 | 0.32                           | 12.82             | 3.88                        | 2700.0             | 1.24         | 2.03 | 1.64 |
| 2800.0             | 8.19                            | 7.60 | 0.59                           | 11.80             | 7.32                        | 2800.0             | 1.3          | 2.02 | 1.57 |
| 2900.0             | 8.83                            | 7.75 | 1.08                           | 11.30             | 8.20                        | 2900.0             | 1.34         | 2.04 | 1.58 |
| 3000.0             | 9.13                            | 7.44 | 1.69                           | 10.89             | 8.11                        | 3000.0             | 1.35         | 2.06 | 1.63 |

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



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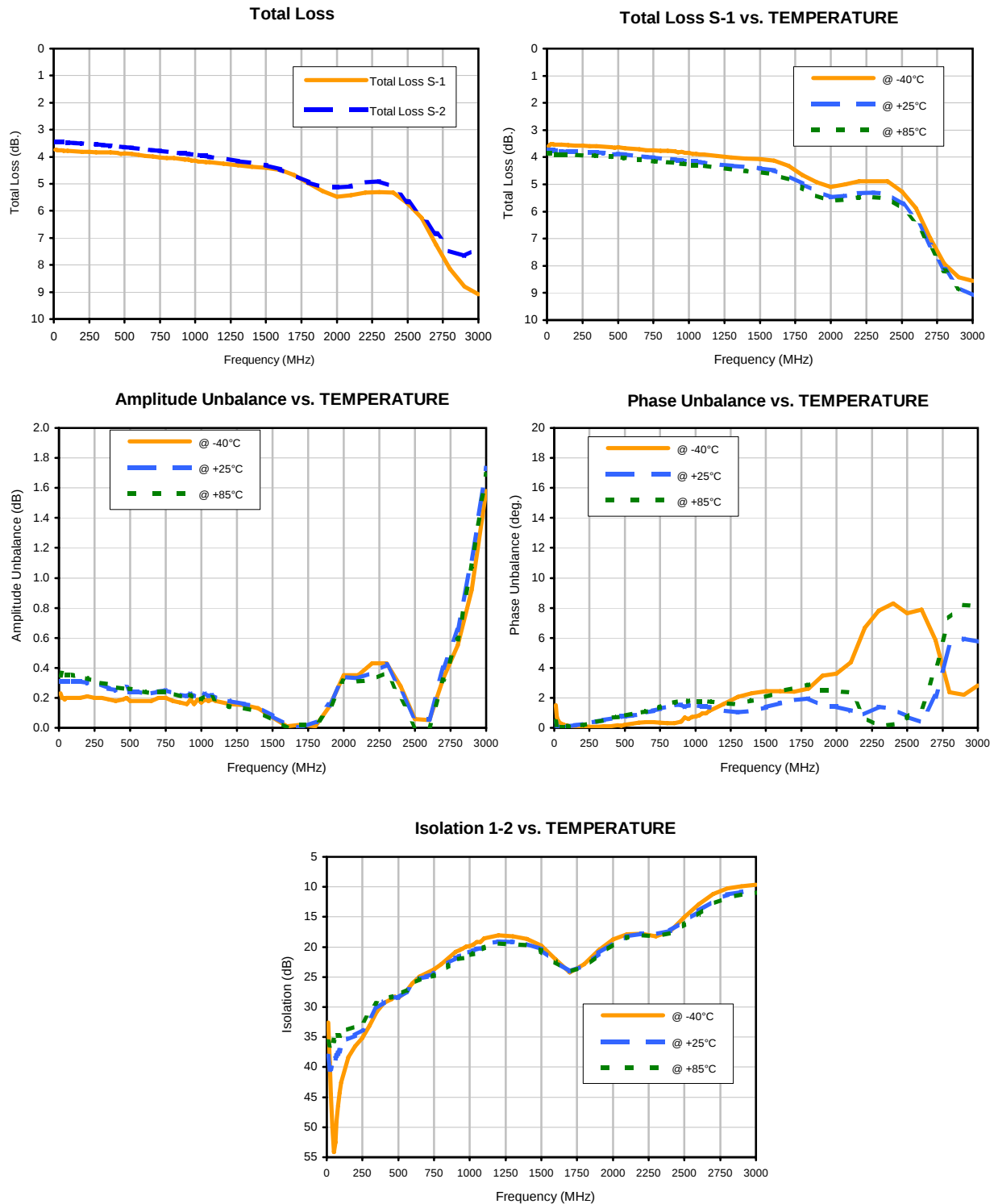
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# 2 Way-0° Power Splitter/Combiner

SBTC-2-10-75X+

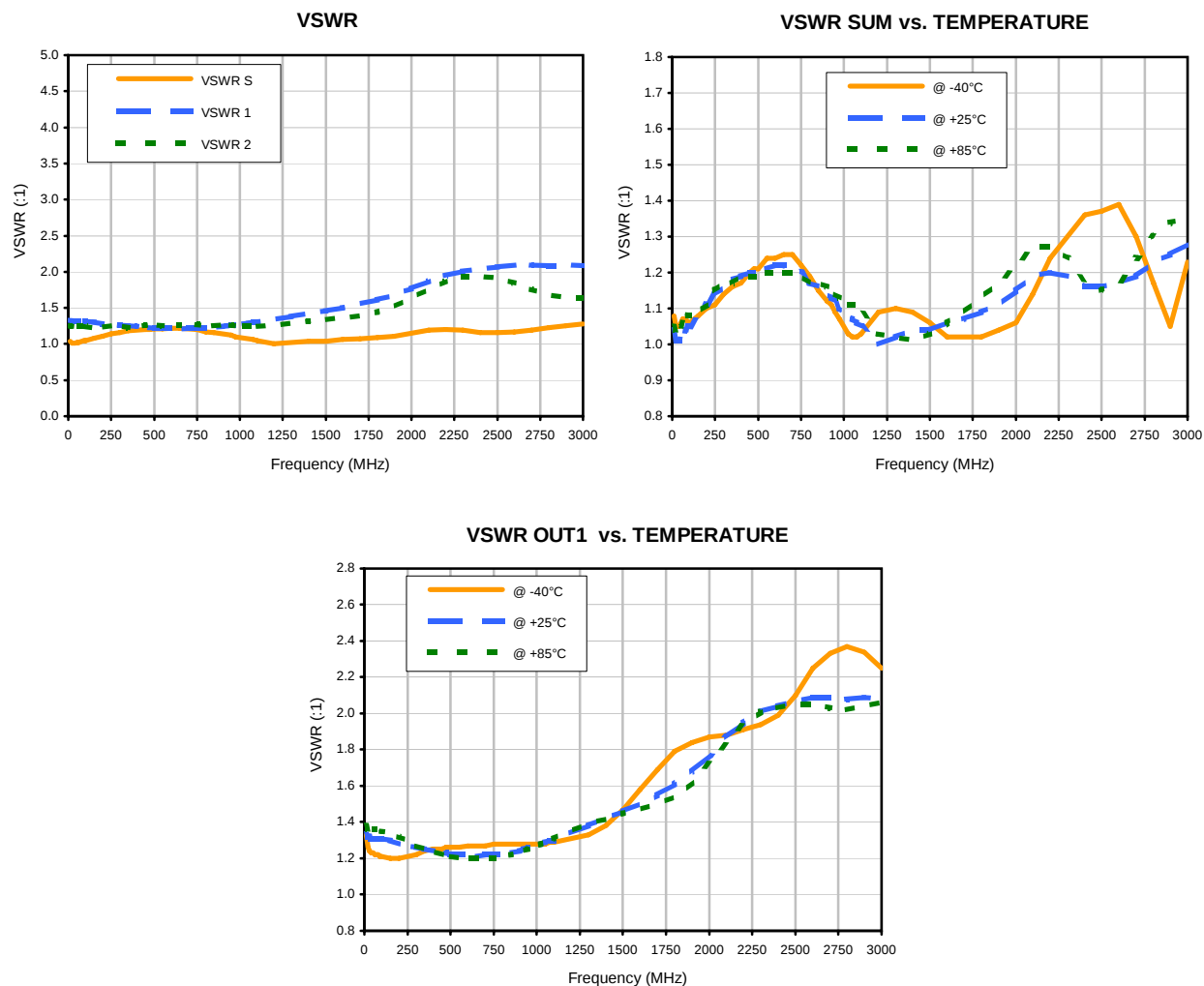
## Typical Performance Curves



# 2 Way-0° Power Splitter/Combiner

SBTC-2-10-75X+

## Typical Performance Curves



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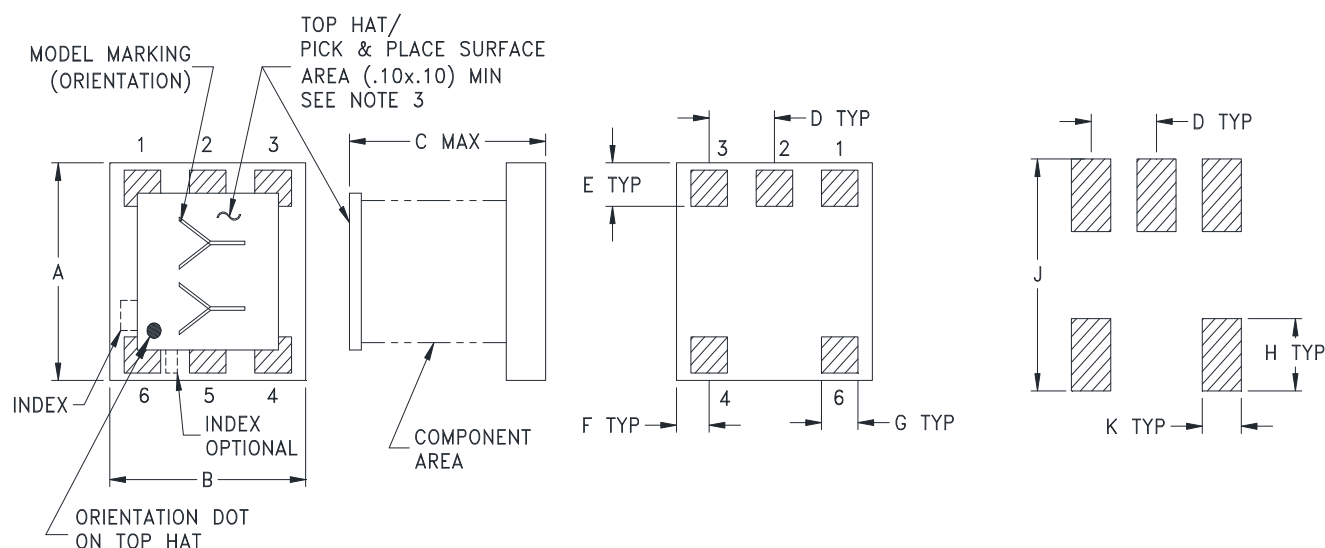


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## Outline Dimensions

AT1667

## 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 |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|-----------|
| AT1667 | .150<br>(3.81) | .150<br>(3.81) | .150<br>(3.81) | .050<br>(1.27) | .030<br>(0.76) | .025<br>(0.64) | .028<br>(0.71) | .050<br>(1.27) | .160<br>(4.06) | .030<br>(0.76) | --<br>-- | .10       |

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

### Notes:

1. Open style, Ceramic base.
2. Termination finish: Silver Palladium or Gold Over Nickel based on stock availability.
3. Top-hat total thickness: .013 inches MAX.
4. Orientation Dot on Top Hat & Marking on the Substrate both refers to Pin #6 of the Unit.



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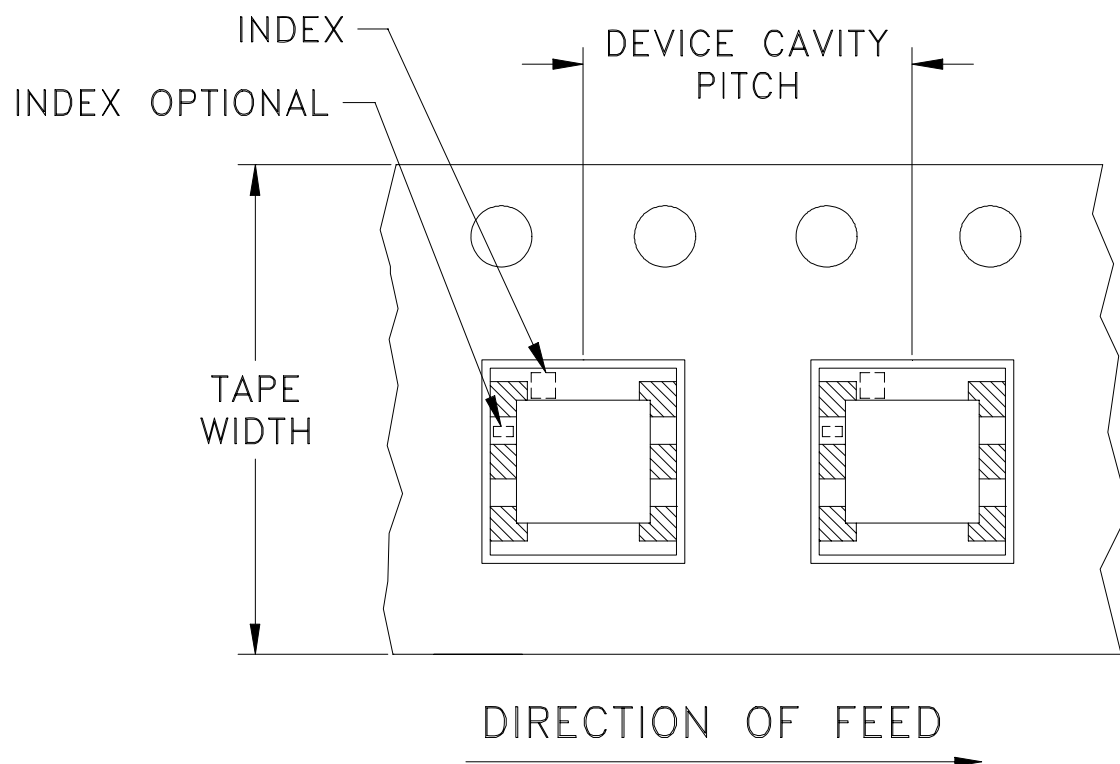


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# Tape & Reel Packaging TR-F15

## 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              |
|                   |                            | 13                   | 500              |
|                   |                            |                      | 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)



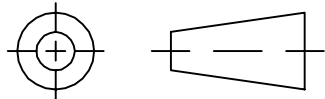
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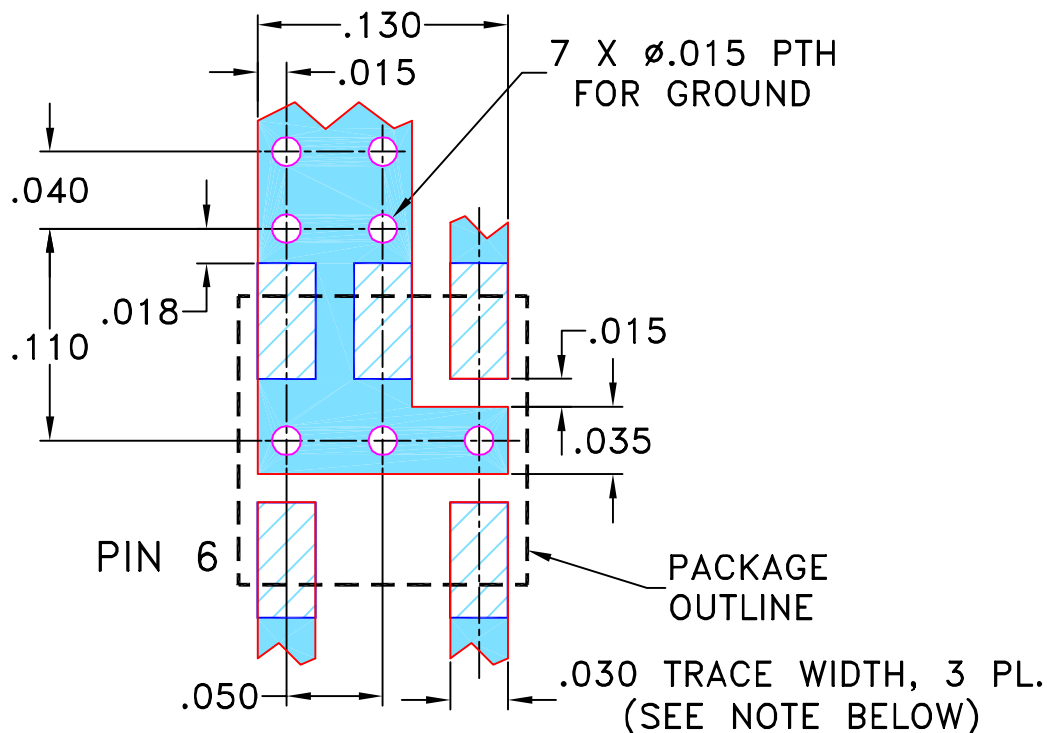
## THIRD ANGLE PROJECTION



## 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

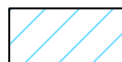


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030"  $\pm$  0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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  $\pm$ 

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

SIZE  
A

CODE IDENT  
15542

DRAWING NO:  
98-PL-153

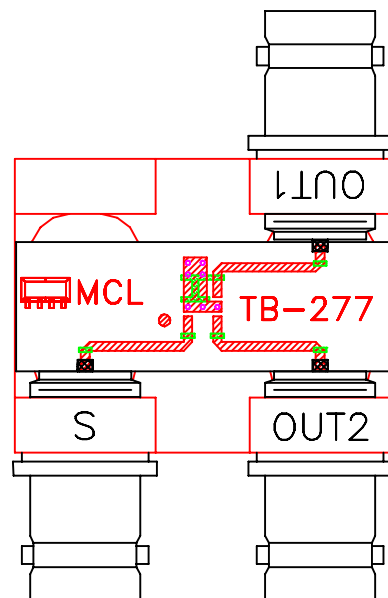
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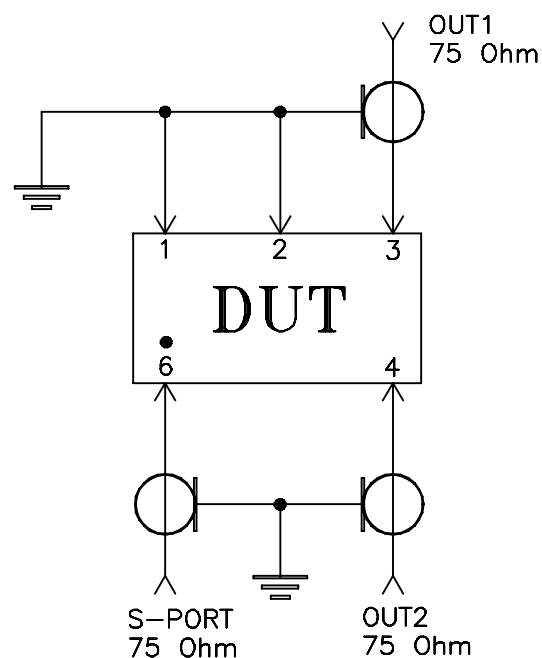
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SHEET: 1 OF 1

# 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.

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

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