

# Power Splitter/Combiner

# SCP-ED10471/1

## 3 Way-0°

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : YY101

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |                 |      |       |            |
|---------------------------------------|-----------------|------|-------|------------|
| Parameter                             |                 | Min. | Typ.  | Max. Units |
| Frequency                             |                 | 2345 |       | 4300 MHz   |
| Isolation                             | 2345 - 4300 MHz |      | 20    | dB         |
| Insertion Loss Above 4.8 dB           | 2345 - 4300 MHz |      | 0.80  | dB         |
| Phase Unbalance                       | 2345 - 4300 MHz |      | 4.711 | deg.       |
| Amplitude Unbalance                   | 2345 - 4300 MHz |      | 0.615 | dB         |
| VSWR                                  | SUM Port        |      | 1.60  | (:1)       |
|                                       | OUT Ports       |      | 1.50  | (:1)       |

| MAXIMUM RATINGS       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

| PIN CONNECTIONS |            |
|-----------------|------------|
| SUM PORT        | 6          |
| PORT 1          | 1          |
| PORT 2          | 2          |
| PORT 3          | 5          |
| GND EXT         | 3, 4, 7, 8 |
| CASE GND        | 3, 4, 7, 8 |

### Functional Diagram



# 3 Way-0° Power Splitter/Combiner

SCP-ED10471/1

## Typical Performance Data

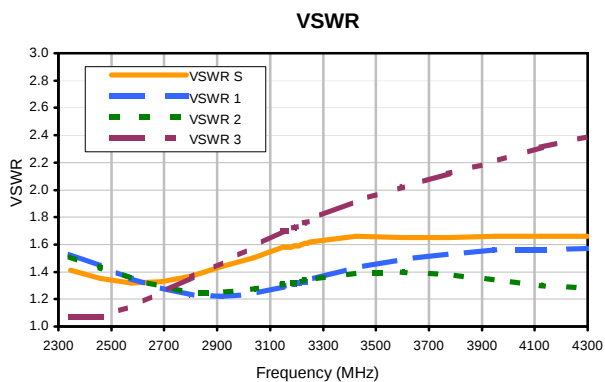
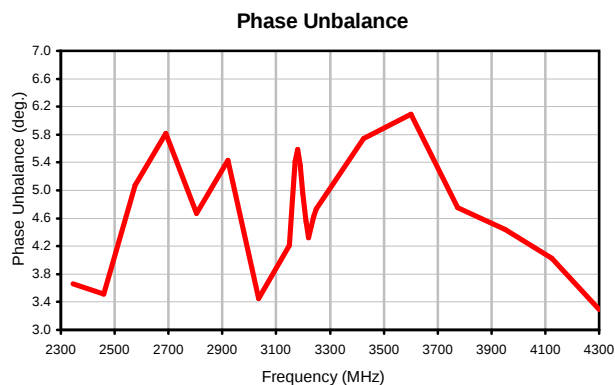
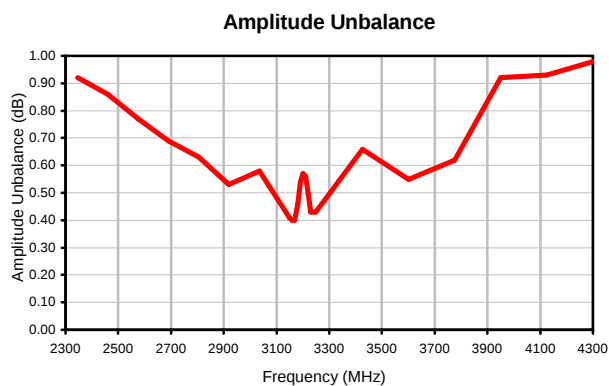
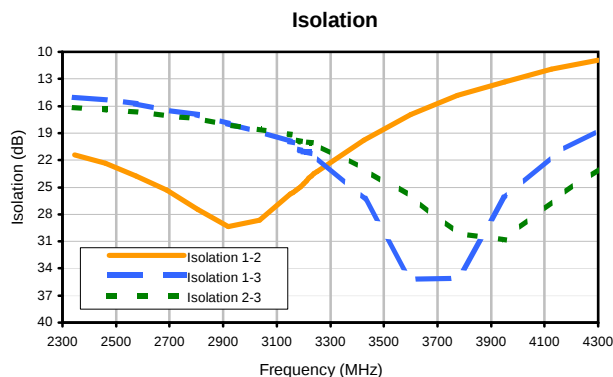
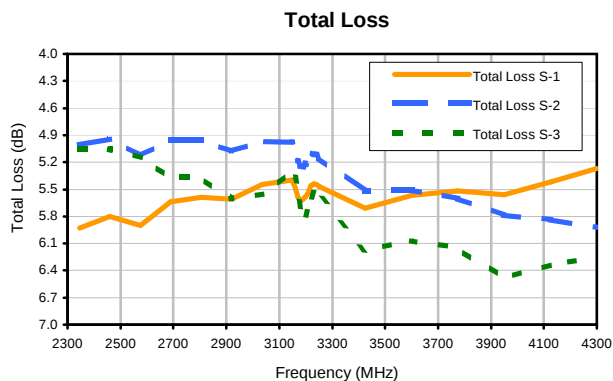
| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      |      | AMP.<br>UNBAL.<br>(dB) | ISOLATION<br>(dB) |       |       | PHASE<br>UNBAL.<br>(deg.) | FREQ.<br>(MHz) | VSWR<br>(:1) |      |      |      |
|----------------|---------------------------------|------|------|------------------------|-------------------|-------|-------|---------------------------|----------------|--------------|------|------|------|
|                | S-1                             | S-2  | S-3  |                        | 1-2               | 1-3   | 2-3   |                           |                | S            | 1    | 2    | 3    |
| 2345.0         | 5.93                            | 5.01 | 5.05 | 0.92                   | 21.40             | 15.04 | 16.16 | 3.66                      | 2345.0         | 1.41         | 1.53 | 1.51 | 1.07 |
| 2460.0         | 5.80                            | 4.94 | 5.06 | 0.86                   | 22.36             | 15.35 | 16.36 | 3.51                      | 2460.0         | 1.35         | 1.44 | 1.43 | 1.07 |
| 2575.0         | 5.90                            | 5.13 | 5.15 | 0.77                   | 23.79             | 15.78 | 16.64 | 5.07                      | 2575.0         | 1.32         | 1.35 | 1.35 | 1.15 |
| 2690.0         | 5.64                            | 4.96 | 5.37 | 0.69                   | 25.29             | 16.42 | 17.08 | 5.82                      | 2690.0         | 1.33         | 1.28 | 1.29 | 1.25 |
| 2805.0         | 5.59                            | 4.96 | 5.37 | 0.63                   | 27.42             | 16.97 | 17.40 | 4.67                      | 2805.0         | 1.37         | 1.23 | 1.25 | 1.36 |
| 2920.0         | 5.61                            | 5.08 | 5.60 | 0.53                   | 29.34             | 17.93 | 18.08 | 5.43                      | 2920.0         | 1.44         | 1.22 | 1.25 | 1.47 |
| 3035.0         | 5.45                            | 4.97 | 5.55 | 0.58                   | 28.62             | 18.83 | 18.60 | 3.45                      | 3035.0         | 1.50         | 1.24 | 1.27 | 1.58 |
| 3150.0         | 5.40                            | 4.98 | 5.30 | 0.41                   | 25.76             | 19.90 | 19.15 | 4.21                      | 3150.0         | 1.58         | 1.29 | 1.31 | 1.70 |
| 3160.0         | 5.49                            | 5.09 | 5.37 | 0.40                   | 25.58             | 20.10 | 19.31 | 4.89                      | 3160.0         | 1.58         | 1.30 | 1.31 | 1.70 |
| 3170.0         | 5.59                            | 5.19 | 5.55 | 0.40                   | 25.42             | 20.40 | 19.56 | 5.41                      | 3170.0         | 1.58         | 1.30 | 1.31 | 1.71 |
| 3180.0         | 5.63                            | 5.24 | 5.70 | 0.46                   | 25.19             | 20.71 | 19.79 | 5.59                      | 3180.0         | 1.58         | 1.31 | 1.32 | 1.72 |
| 3190.0         | 5.61                            | 5.25 | 5.80 | 0.54                   | 24.96             | 20.92 | 19.96 | 5.36                      | 3190.0         | 1.59         | 1.31 | 1.32 | 1.72 |
| 3200.0         | 5.58                            | 5.22 | 5.78 | 0.57                   | 24.62             | 21.06 | 20.04 | 4.95                      | 3200.0         | 1.59         | 1.32 | 1.33 | 1.73 |
| 3210.0         | 5.54                            | 5.18 | 5.73 | 0.56                   | 24.30             | 21.14 | 20.06 | 4.56                      | 3210.0         | 1.59         | 1.32 | 1.33 | 1.74 |
| 3220.0         | 5.46                            | 5.10 | 5.61 | 0.50                   | 23.98             | 21.17 | 20.03 | 4.32                      | 3220.0         | 1.60         | 1.33 | 1.33 | 1.75 |
| 3230.0         | 5.44                            | 5.11 | 5.54 | 0.43                   | 23.76             | 21.27 | 20.08 | 4.48                      | 3230.0         | 1.61         | 1.33 | 1.34 | 1.76 |
| 3240.0         | 5.45                            | 5.12 | 5.54 | 0.43                   | 23.48             | 21.44 | 20.17 | 4.62                      | 3240.0         | 1.61         | 1.34 | 1.34 | 1.77 |
| 3250.0         | 5.47                            | 5.15 | 5.58 | 0.43                   | 23.25             | 21.65 | 20.30 | 4.73                      | 3250.0         | 1.62         | 1.34 | 1.34 | 1.78 |
| 3425.0         | 5.71                            | 5.52 | 6.18 | 0.66                   | 19.81             | 26.29 | 23.01 | 5.74                      | 3425.0         | 1.66         | 1.43 | 1.39 | 1.92 |
| 3600.0         | 5.57                            | 5.51 | 6.07 | 0.55                   | 16.92             | 35.17 | 25.98 | 6.09                      | 3600.0         | 1.65         | 1.49 | 1.40 | 2.02 |
| 3775.0         | 5.52                            | 5.60 | 6.15 | 0.62                   | 14.79             | 35.08 | 30.09 | 4.75                      | 3775.0         | 1.65         | 1.53 | 1.38 | 2.12 |
| 3950.0         | 5.56                            | 5.79 | 6.48 | 0.92                   | 13.31             | 26.22 | 30.82 | 4.44                      | 3950.0         | 1.66         | 1.56 | 1.34 | 2.21 |
| 4125.0         | 5.42                            | 5.84 | 6.34 | 0.93                   | 11.95             | 21.59 | 26.56 | 4.03                      | 4125.0         | 1.66         | 1.56 | 1.30 | 2.31 |
| 4300.0         | 5.27                            | 5.92 | 6.25 | 0.98                   | 10.91             | 18.68 | 22.97 | 3.29                      | 4300.0         | 1.66         | 1.57 | 1.28 | 2.39 |

<sup>1</sup> Total Loss = Insertion Loss + 4.8dB Splitter Loss

# 3 Way-0° Power Splitter/Combiner

SCP-ED10471/1

## Typical Performance Curves

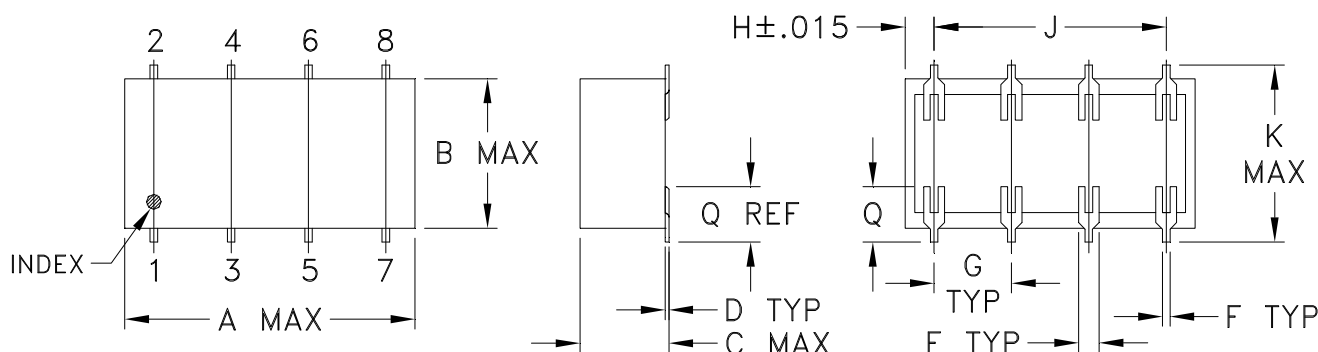


# Case Style

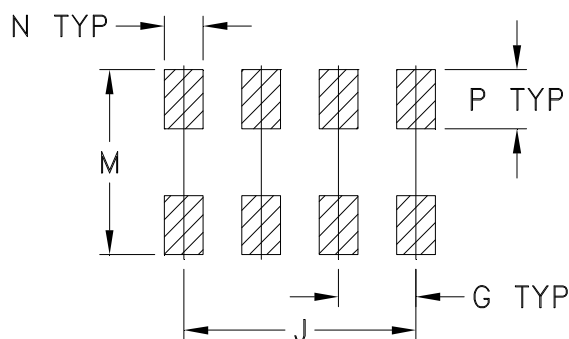
YY

## Outline Dimensions

YY101  
YY109  
YY161



## PCB Land Pattern



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

| CASE#  | A              | B             | C             | D              | E              | F              | G              | H              | J               | K               | L  | M               | N              | P              | Q              | WT.<br>GRAM<br>S |
|--------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|----|-----------------|----------------|----------------|----------------|------------------|
| YY101* |                |               | .20<br>(5.08) |                |                |                |                |                |                 | .450<br>(11.43) | -- | .470<br>(11.94) |                |                |                | 1.6              |
| YY109* | .75<br>(19.05) | .38<br>(9.65) | .20<br>(5.08) | .010<br>(0.25) | .050<br>(1.27) | .020<br>(0.51) | .200<br>(5.08) | .075<br>(1.91) | .600<br>(15.24) | .720<br>(18.29) | -- | .740<br>(18.80) | .100<br>(2.54) | .150<br>(3.81) | .148<br>(3.76) | 1.6              |
| YY161  |                |               | .28<br>(7.11) |                |                |                |                |                |                 | .450<br>(11.43) | -- | .470<br>(11.94) |                |                |                | 1.6              |

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

### Notes:

- Case material: Plastic.
- Termination finish:  
For RoHS Case Styles: Tin plate over Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.
- Special Tolerances: Termination thickness  $\pm .003$  inch.
- \* Denotes: For SCM mixers, long termination version (case YY109) is available upon request, consult factory. To order short termination version (case YY101) add -NL suffix.



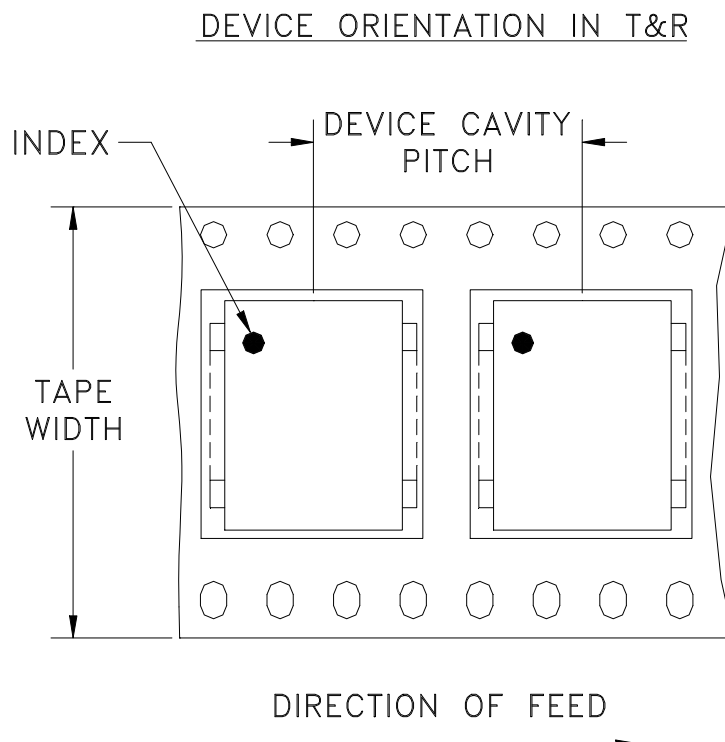
INTERNET <http://www.minicircuits.com>

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

# Tape & Reel Packaging TR-F5



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 32                | 16                         | 13                   | 500              |

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)



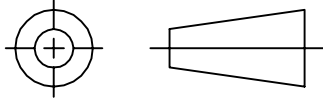
**Distribution Centers** NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

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

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

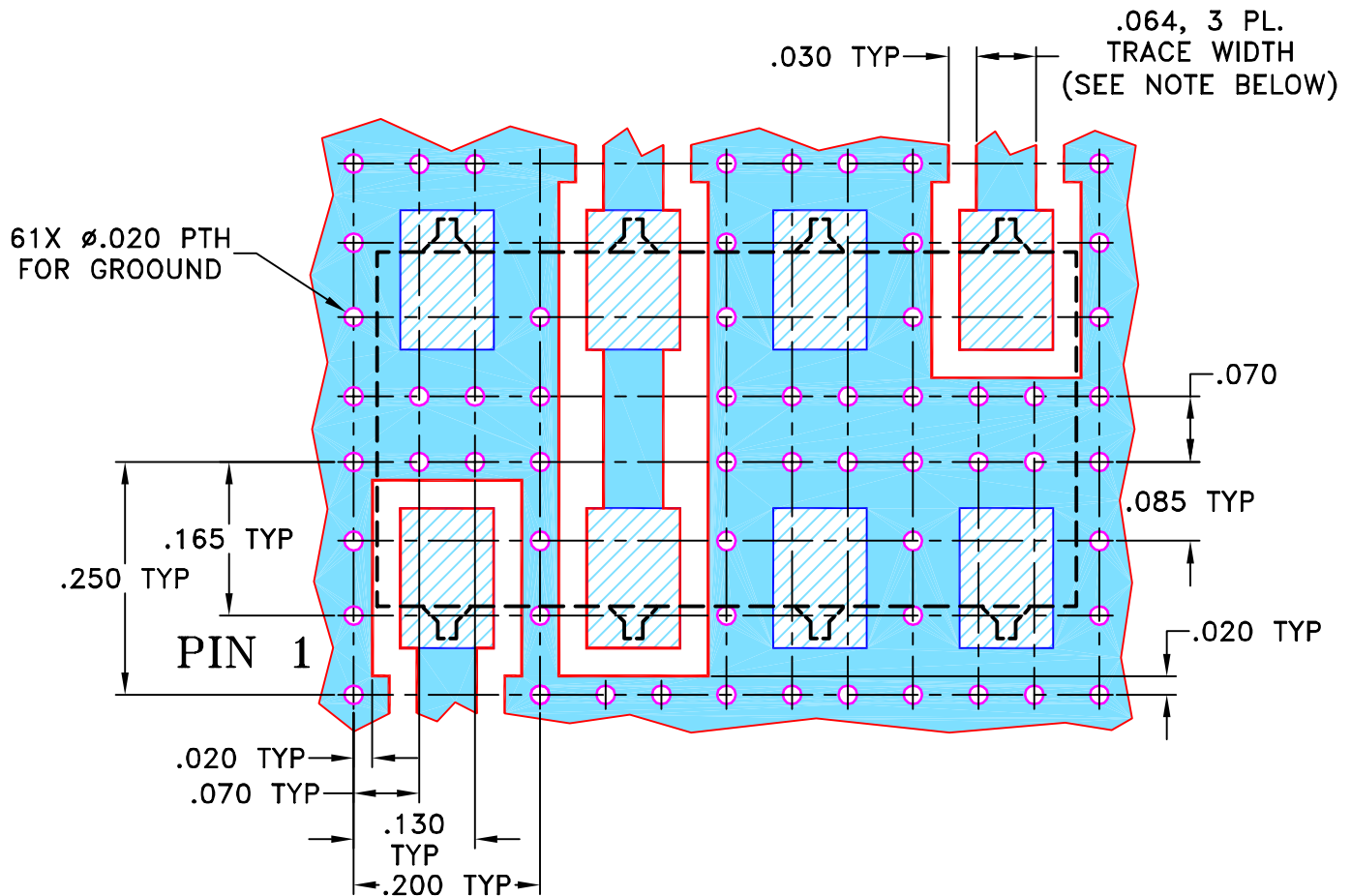
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION   | DATE     | DR | AUTH |
|-----|---------|---------------|----------|----|------|
| OR  | M82272  | NEW RELEASE   | 08/02/02 | AV | DJ   |
| A   | M102713 | UPDATED NOTES | 01/14/06 | GF | IL   |
|     |         |               |          |    |      |

## SUGGESTED MOUNTING CONFIGURATION FOR YY101 CASE STYLE, "d" PIN CONNECTION



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B 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

TOLERANCES ON:  
2 PL DECIMALS  $\pm$   
3 PL DECIMALS  $\pm$  .005  
ANGLES  $\pm$   
FRACTIONS  $\pm$

DRAWN

AV

07/22/02

CHECKED

WL

08/02/02

APPROVED

DJ

08/02/02



**Mini-Circuits®**

13 Neptune Avenue  
Brooklyn NY 11235

PL, d, YY101, SCM, TB-170

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.

Mini-Circuits®

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-084

REV:

A

FILE:

98PL084

SCALE:

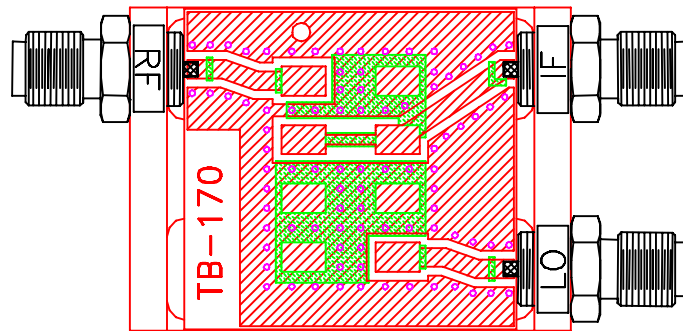
5:1

SHEET:

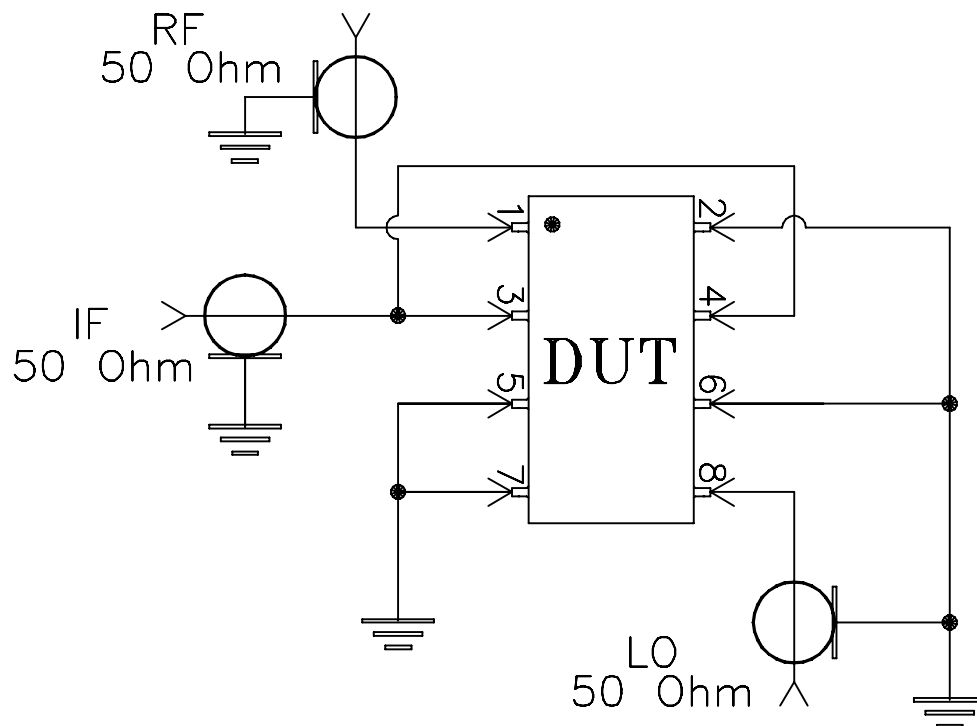
1 OF 1

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

# Evaluation Board and Circuit



TB-170



Schematic Diagram

## Notes:

1. SMA 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                                                                              |