

Engineering Development Model

Power Splitter/Combiner

JYPQ-ED7748/5

2 Way-90°

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.

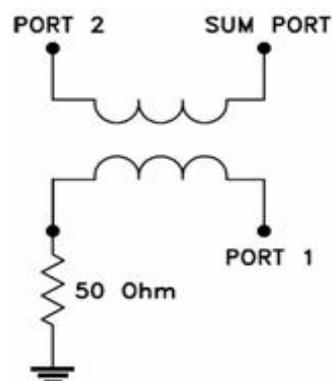
CASE STYLE : BJ293

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C | | | | | |
|---|---------------|------|-------|------|-------|
| Parameter | | Min. | Typ. | Max. | Units |
| Frequency | | 110 | | 175 | MHz |
| Isolation | 110 - 175 MHz | | 23 | | dB |
| Insertion Loss | | | | | |
| Average of Coupled Outputs above 3.0 dB | 110 - 175 MHz | | 0.28 | | dB |
| Phase Unbalance | 110 - 175 MHz | | 0.650 | | deg. |
| Amplitude Unbalance | 110 - 175 MHz | | 0.244 | | dB |
| VSWR | SUM Port | | 1.18 | | (:1) |
| | OUT Ports | | 1.19 | | (:1) |

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

| PIN CONNECTIONS | |
|-----------------|------------|
| SUM PORT | 8 |
| PORT 1 | 1 |
| PORT 2 | 4 |
| GND EXT | 2, 3, 6, 7 |
| 50Ω TERMINATION | 5 |

Functional Diagram



2 Way-90° Power Splitter/Combiner

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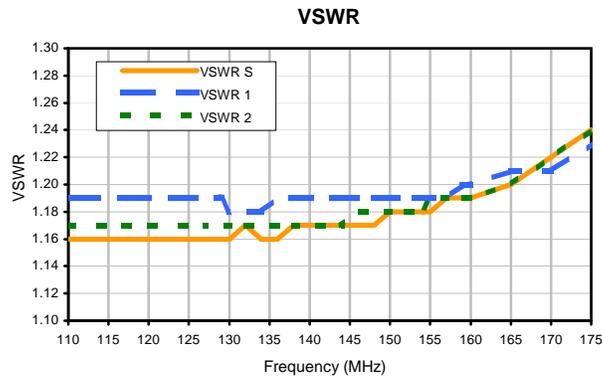
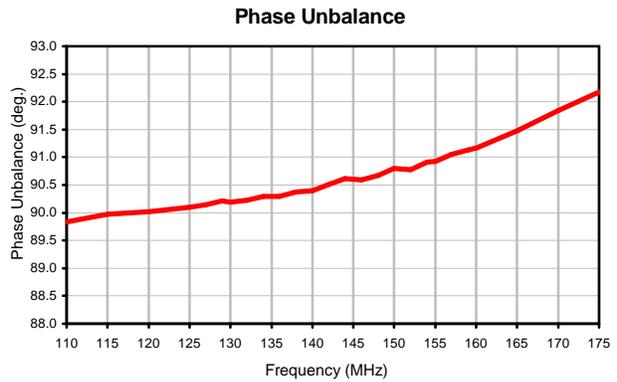
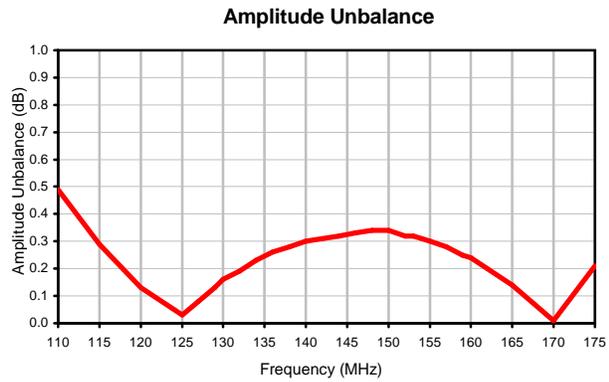
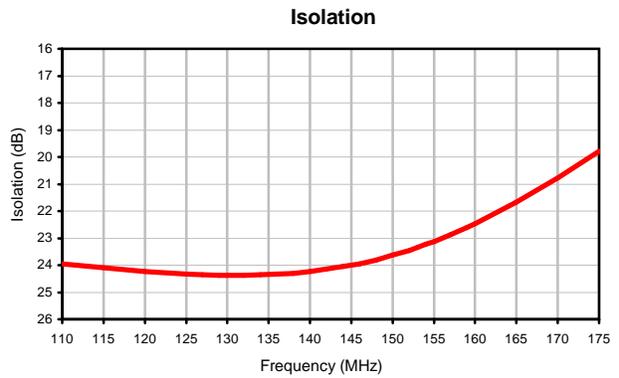
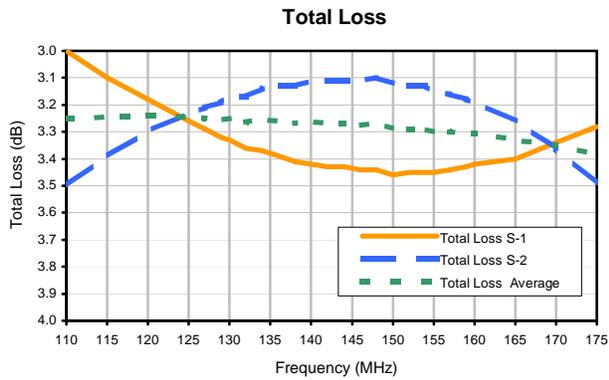
Typical Performance Data

| FREQ. (MHz) | TOTAL LOSS ¹ (dB) | | | AMP. UNBAL. (dB) | ISOLATION (dB) 1-2 | PHASE UNBAL. (deg.) | FREQ. (MHz) | VSWR (:1) | | |
|----------------|---------------------------------|------|------|------------------------|--------------------------|---------------------------|----------------|--------------|------|------|
| | S-1 | S-2 | AVG. | | | | | S | 1 | 2 |
| 110.0 | 3.00 | 3.50 | 3.25 | 0.49 | 23.95 | 89.83 | 110.0 | 1.16 | 1.19 | 1.17 |
| 115.0 | 3.10 | 3.39 | 3.25 | 0.29 | 24.10 | 89.97 | 115.0 | 1.16 | 1.19 | 1.17 |
| 120.0 | 3.18 | 3.30 | 3.24 | 0.13 | 24.23 | 90.02 | 120.0 | 1.16 | 1.19 | 1.17 |
| 125.0 | 3.26 | 3.23 | 3.25 | 0.03 | 24.33 | 90.10 | 125.0 | 1.16 | 1.19 | 1.17 |
| 127.0 | 3.29 | 3.21 | 3.25 | 0.08 | 24.35 | 90.15 | 127.0 | 1.16 | 1.19 | 1.17 |
| 129.0 | 3.32 | 3.19 | 3.26 | 0.13 | 24.37 | 90.21 | 129.0 | 1.16 | 1.19 | 1.17 |
| 130.0 | 3.33 | 3.17 | 3.25 | 0.16 | 24.38 | 90.19 | 130.0 | 1.16 | 1.18 | 1.17 |
| 132.0 | 3.36 | 3.17 | 3.27 | 0.19 | 24.37 | 90.23 | 132.0 | 1.17 | 1.18 | 1.17 |
| 134.0 | 3.37 | 3.14 | 3.26 | 0.23 | 24.36 | 90.29 | 134.0 | 1.16 | 1.18 | 1.17 |
| 136.0 | 3.39 | 3.13 | 3.26 | 0.26 | 24.34 | 90.29 | 136.0 | 1.16 | 1.19 | 1.17 |
| 138.0 | 3.41 | 3.13 | 3.27 | 0.28 | 24.30 | 90.37 | 138.0 | 1.17 | 1.19 | 1.17 |
| 140.0 | 3.42 | 3.11 | 3.27 | 0.30 | 24.24 | 90.40 | 140.0 | 1.17 | 1.19 | 1.17 |
| 142.0 | 3.43 | 3.11 | 3.27 | 0.31 | 24.15 | 90.51 | 142.0 | 1.17 | 1.19 | 1.17 |
| 144.0 | 3.43 | 3.11 | 3.27 | 0.32 | 24.05 | 90.61 | 144.0 | 1.17 | 1.19 | 1.17 |
| 146.0 | 3.44 | 3.11 | 3.28 | 0.33 | 23.95 | 90.59 | 146.0 | 1.17 | 1.19 | 1.18 |
| 148.0 | 3.44 | 3.10 | 3.27 | 0.34 | 23.80 | 90.67 | 148.0 | 1.17 | 1.19 | 1.18 |
| 150.0 | 3.46 | 3.12 | 3.29 | 0.34 | 23.63 | 90.80 | 150.0 | 1.18 | 1.19 | 1.18 |
| 152.0 | 3.45 | 3.13 | 3.29 | 0.32 | 23.45 | 90.78 | 152.0 | 1.18 | 1.19 | 1.18 |
| 153.0 | 3.45 | 3.13 | 3.29 | 0.32 | 23.34 | 90.84 | 153.0 | 1.18 | 1.19 | 1.18 |
| 154.0 | 3.45 | 3.13 | 3.29 | 0.31 | 23.23 | 90.91 | 154.0 | 1.18 | 1.19 | 1.18 |
| 155.0 | 3.45 | 3.15 | 3.30 | 0.30 | 23.12 | 90.93 | 155.0 | 1.18 | 1.19 | 1.19 |
| 157.0 | 3.44 | 3.16 | 3.30 | 0.28 | 22.87 | 91.05 | 157.0 | 1.19 | 1.19 | 1.19 |
| 159.0 | 3.43 | 3.18 | 3.31 | 0.25 | 22.62 | 91.13 | 159.0 | 1.19 | 1.20 | 1.19 |
| 160.0 | 3.42 | 3.19 | 3.31 | 0.24 | 22.48 | 91.17 | 160.0 | 1.19 | 1.20 | 1.19 |
| 165.0 | 3.40 | 3.26 | 3.33 | 0.14 | 21.68 | 91.48 | 165.0 | 1.20 | 1.21 | 1.20 |
| 170.0 | 3.34 | 3.36 | 3.35 | 0.01 | 20.78 | 91.84 | 170.0 | 1.22 | 1.21 | 1.22 |
| 175.0 | 3.28 | 3.49 | 3.39 | 0.21 | 19.79 | 92.18 | 175.0 | 1.24 | 1.23 | 1.24 |

¹Total Loss = Insertion Loss + 3dB Splitter Loss

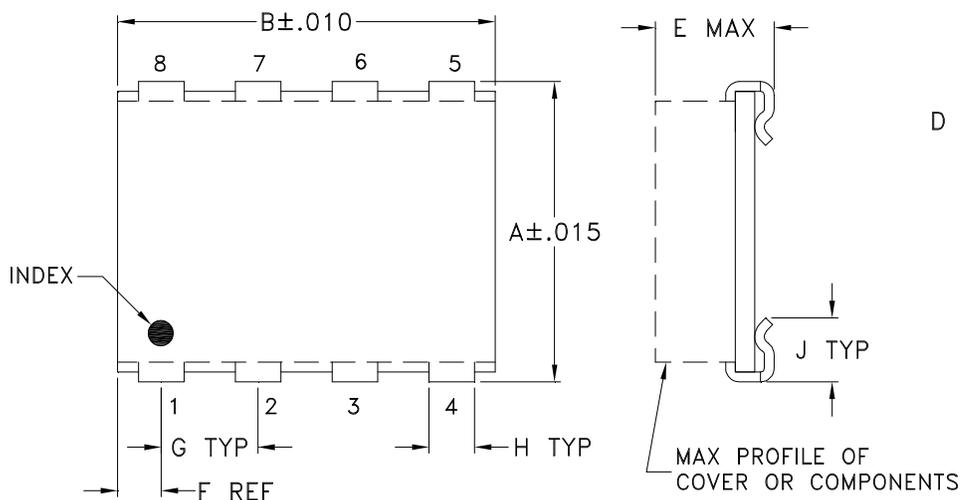


Typical Performance Curves

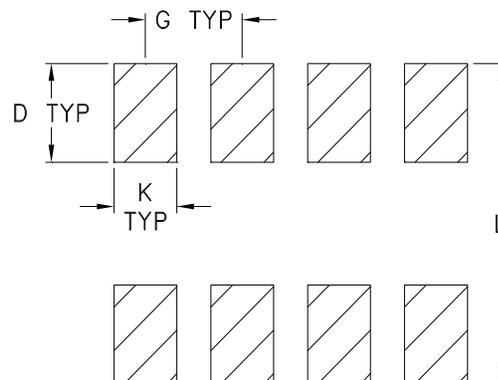


Outline Dimensions

BJ293
BJ398



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 |
|-------|-----------------|-----------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|--------------|
| BJ293 | .395 (10.03) | .500 (12.70) | -- -- | .100 (2.54) | .230 (5.84) | .100 (2.54) | .100 (2.54) | .047 (1.19) | .065 (1.65) | .065 (1.65) | .425 (10.80) | .80 |
| BJ398 | .305 (7.75) | .390 (9.91) | -- -- | .100 (2.54) | .105 (2.67) | .045 (1.14) | .100 (2.54) | .047 (1.19) | .065 (1.65) | .065 (1.65) | .325 (8.26) | .20 |

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

Notes:

- Case material: Plastic.
- Base material: Printed wiring laminate.
- Termination finish:
 - For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
 - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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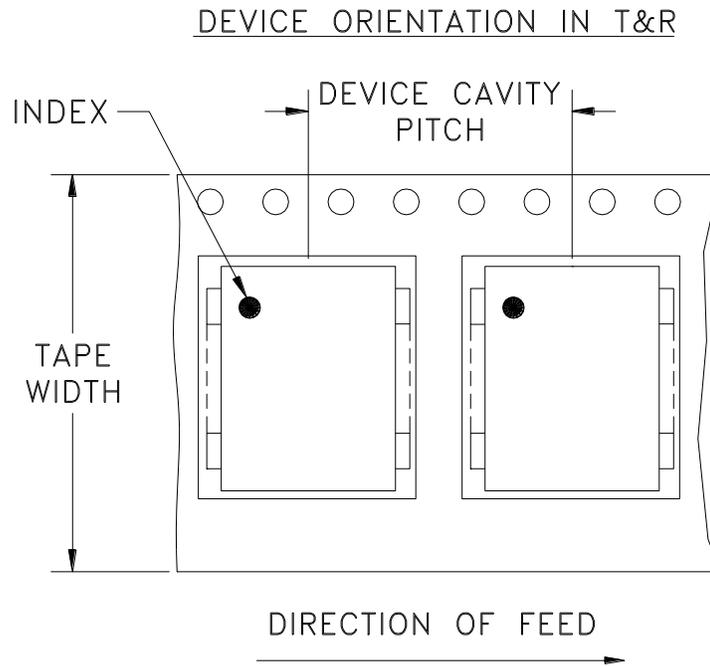
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Tape & Reel Packaging TR-F10



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel |
|----------------|-------------------------|-------------------|------------------|
| 24 | 16 | 7 | 10,20,50,100 |
| | | 13 | 200,500 |

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

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



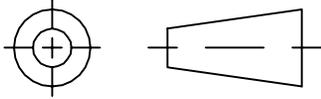
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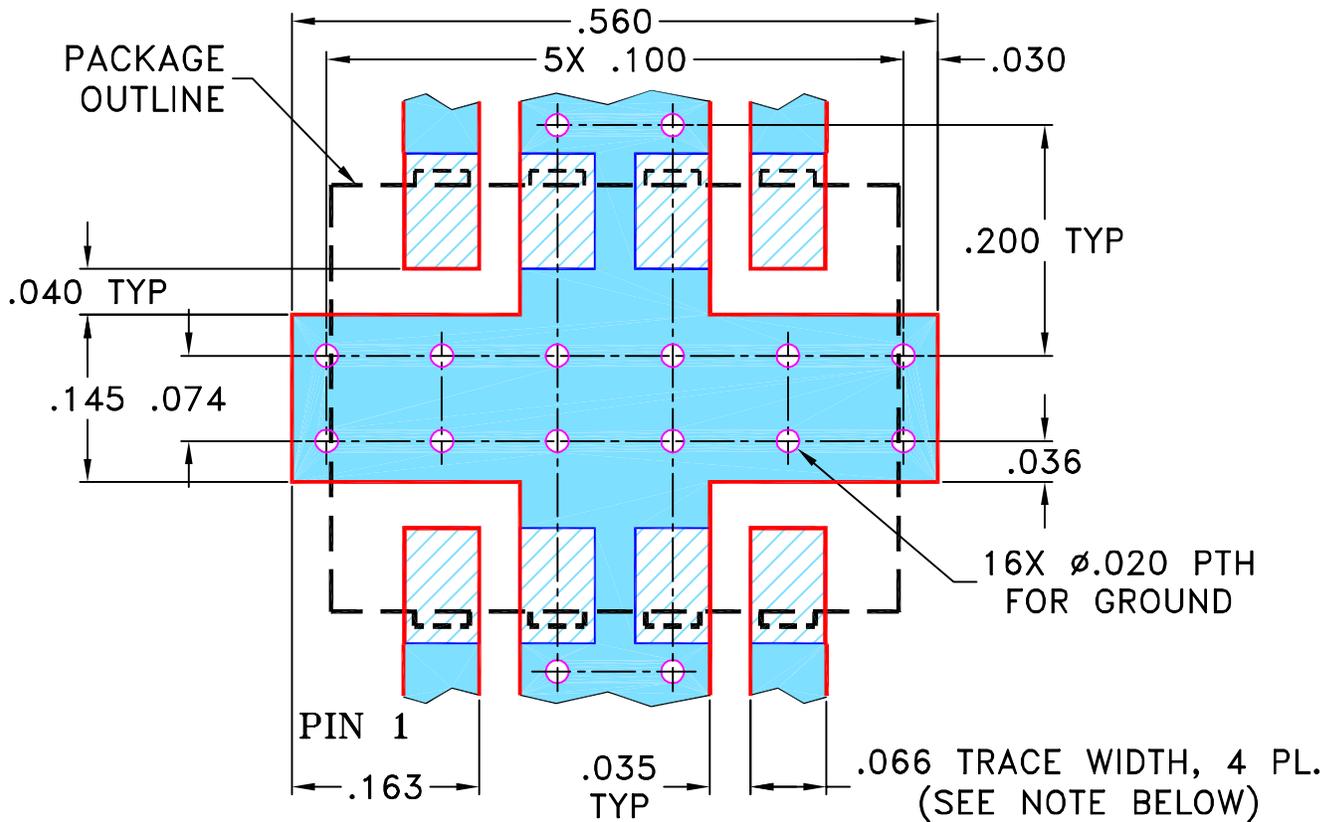
THIRD ANGLE PROJECTION



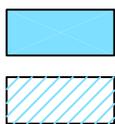
REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|---------------------------------------|----------|-----|------|
| OR | M82549 | NEW RELEASE | 11/15/02 | MMG | HY |
| A | M102713 | MODIFIED NOTES, ADDED "...WITH SMOBC" | 01/16/06 | GT | IL |
| | | | | | |

**SUGGESTED MOUNTING CONFIGURATION
FOR BJ293 CASE STYLE, "kx" PIN CONNECTION.**



- NOTES:**
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



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

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
 TOLERANCES ON:
 2 PL DECIMALS ±
 3 PL DECIMALS ± .005
 ANGLES ±
 FRACTIONS ±

| | INITIALS | DATE |
|----------|----------|----------|
| DRAWN | MMG | 11/05/02 |
| CHECKED | AV | 11/14/02 |
| APPROVED | HY | 11/15/02 |



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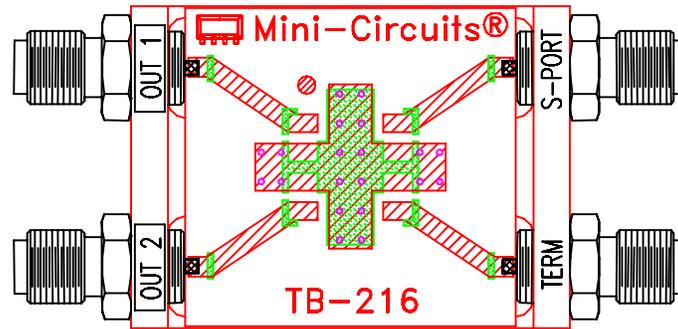
PL, kx, BJ293, JYPQ, TB-216

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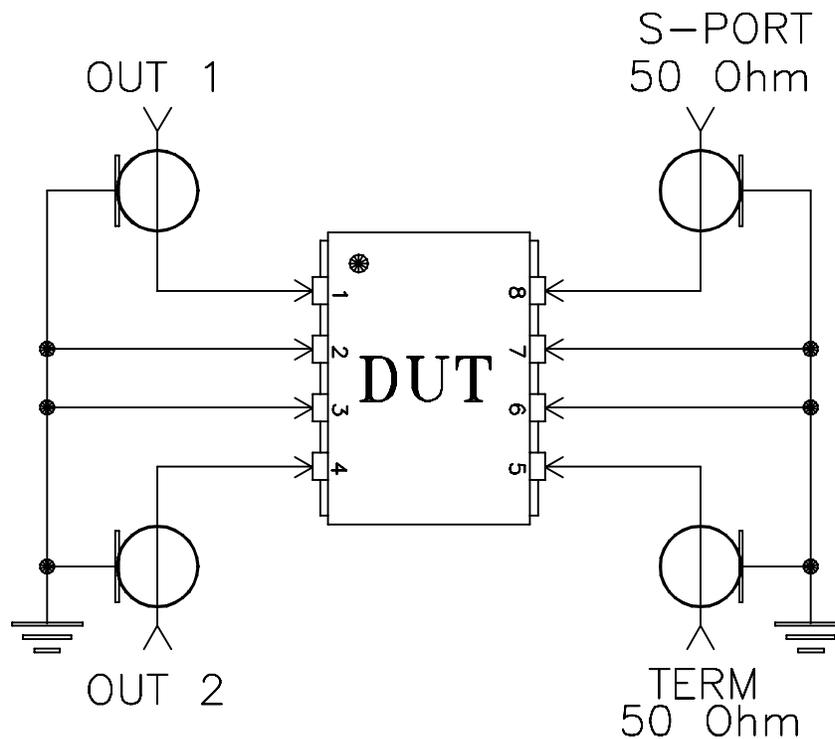
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|-------|------------|-------------|---------------|
| A | 15542 | 98-PL-100 | A |
| FILE: | 98PL100 | SCALE: 6:1 | SHEET: 1 OF 1 |

Evaluation Board and Circuit



TB-216



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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C 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 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |