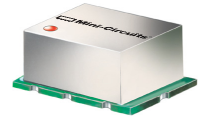


Surface Mount High Power Splitter

SYPJ-2-5W-52+

2 Way-180° 50Ω 10 to 520 MHz



CASE STYLE: AH202-1

Maximum Ratings

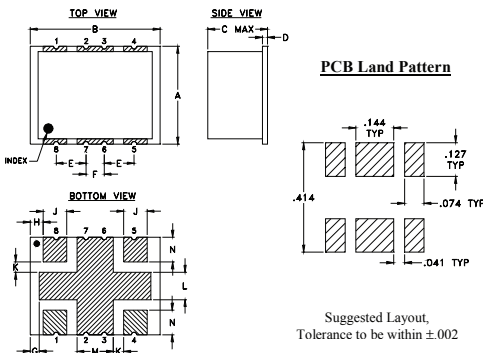
| | |
|-----------------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 5.0W max. |
| Internal Dissipation | 1.0W max. |

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

Pin Connections

| | |
|---------------|-----------|
| SUM PORT | 8 |
| PORT 1 (0°) | 5 |
| PORT 2 (180°) | 4 |
| GROUND | 1,2,3,6,7 |

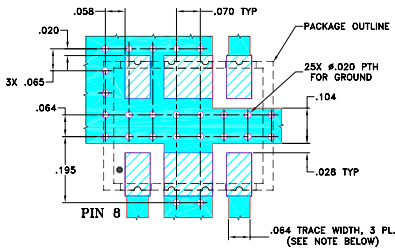
Outline Drawing



Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G |
|------|-------|------|------|------|------|-------|
| .38 | .50 | .25 | .020 | .115 | .070 | .035 |
| 9.65 | 12.70 | 6.35 | 0.51 | 2.92 | 1.78 | 0.89 |
| H | J | K | L | M | N | wt |
| .050 | .090 | .040 | .105 | .140 | .095 | grams |
| 1.27 | 2.29 | 1.02 | 2.67 | 3.56 | 2.41 | 0.80 |

Demo Board MCL P/N: TB-427+ Suggested PCB Layout (PL-274)



Notes:
 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .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.

Features

- wideband, 10 to 500 MHz
- low phase unbalance, 2 deg. typ.
- low amplitude unbalance, 0.1 dB typ.
- high isolation, 23 dB typ.
- high input power as a splitter, 5.0 W

Applications

- VHF/UHF
- communication systems
- receivers & transmitters

- instrumentation
- CATV

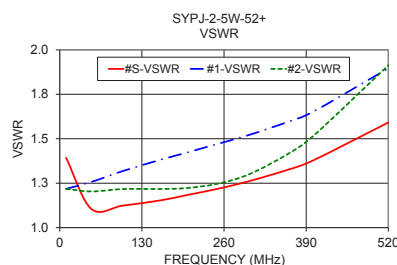
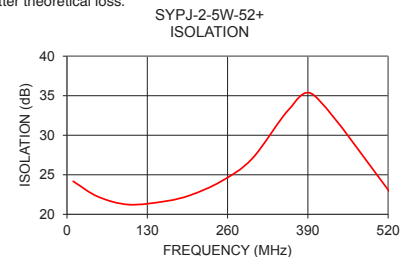
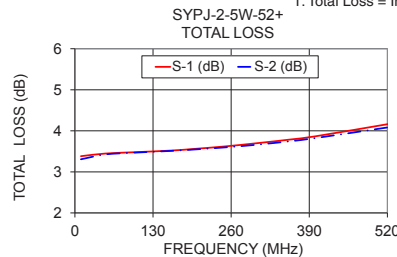
Electrical Specifications at 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|--|-----------------------|----------|-------------|--------------|--------|
| Frequency | | 10 | | 520 | MHz |
| Insertion Loss (above theoretical 3.0 dB) | 10 - 250 250 - 520 | — | 0.5 0.9 | 0.9 1.5 | dB |
| Isolation | 10 - 250 250 - 520 | 18 19 | 22 24 | — | dB |
| Phase Unbalance | 10 - 250 250 - 520 | — | 2.0 2.0 | 8.0 10 | Degree |
| Amplitude Unbalance | 10 - 250 250 - 520 | — | 0.05 0.1 | 0.2 0.3 | dB |
| VSWR (Port S) | 10 - 250 250 - 520 | — | 1.4 1.5 | 1.55 1.95 | :1 |
| VSWR (Port 1-2) | 10 - 250 250 - 520 | — | 1.35 1.6 | 1.65 2.3 | :1 |
| Input Power | | | | 5.0 | W |
| | as splitter | | | 1.0 | |
| | as combiner | | | | |

Typical Performance Data

| Frequency (MHz) | Total Loss ¹ (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
| | S-1 | S-2 | | | | | | |
| 10 | 3.38 | 3.31 | 0.08 | 24.18 | 179.96 | 1.39 | 1.22 | 1.22 |
| 50 | 3.45 | 3.42 | 0.02 | 22.24 | 179.43 | 1.10 | 1.26 | 1.20 |
| 100 | 3.48 | 3.47 | 0.01 | 21.23 | 179.08 | 1.12 | 1.32 | 1.22 |
| 160 | 3.52 | 3.51 | 0.01 | 21.67 | 178.76 | 1.15 | 1.38 | 1.22 |
| 200 | 3.56 | 3.55 | 0.01 | 22.43 | 178.60 | 1.18 | 1.42 | 1.22 |
| 250 | 3.62 | 3.60 | 0.02 | 24.19 | 178.48 | 1.22 | 1.47 | 1.25 |
| 300 | 3.69 | 3.66 | 0.04 | 27.05 | 178.46 | 1.26 | 1.52 | 1.30 |
| 360 | 3.79 | 3.75 | 0.04 | 33.32 | 178.69 | 1.32 | 1.59 | 1.41 |
| 400 | 3.87 | 3.82 | 0.04 | 35.05 | 179.07 | 1.38 | 1.65 | 1.51 |
| 525 | 4.17 | 4.09 | 0.08 | 22.57 | 178.05 | 1.60 | 1.91 | 1.93 |

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



Electrical Schematic



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-Circuit's applicable established test performance criteria and measurement instructions.
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2 Way-180° Power Splitter/Combiner

SYPJ-2-5W-52+

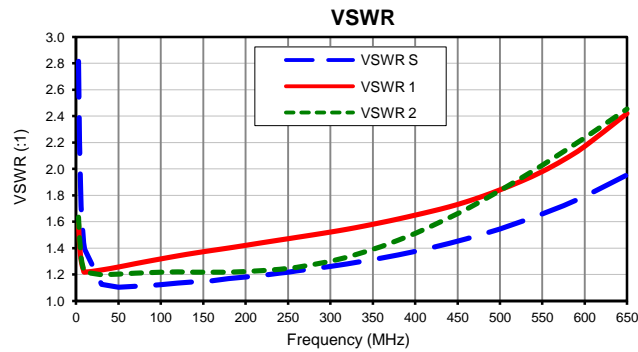
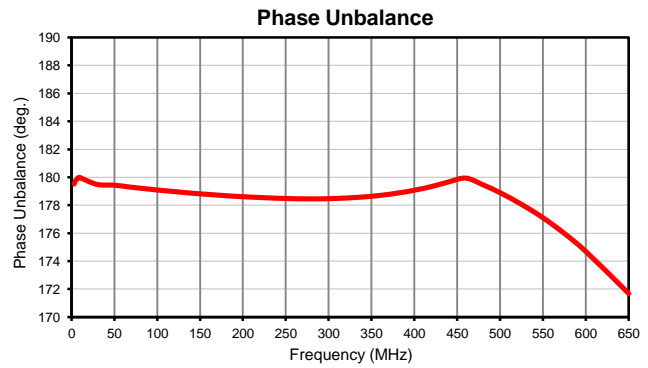
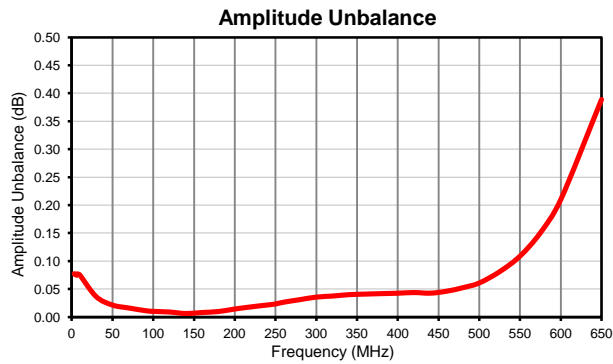
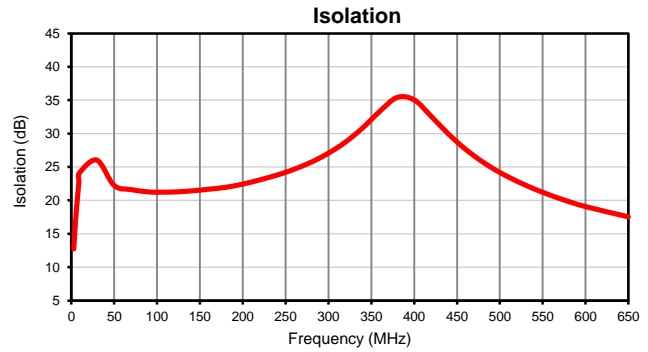
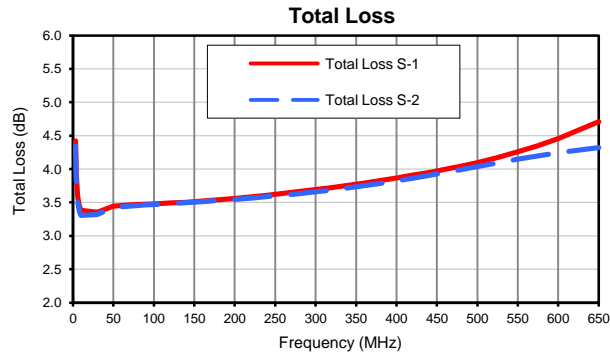
Typical Performance Data

| FREQUENCY (MHz) | TOTAL LOSS ¹ (dB) | | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) 1-2 | PHASE UNBALANCE (deg.) | FREQUENCY (MHz) | VSWR (:1) | | |
|--------------------|---------------------------------|------|--------------------------------|--------------------------|------------------------------|--------------------|--------------|------|------|
| | S-1 | S-2 | | | | | S | 1 | 2 |
| 3.0 | 4.42 | 4.35 | 0.08 | 12.75 | 179.51 | 3.0 | 2.82 | 1.59 | 1.64 |
| 4.0 | 3.95 | 3.87 | 0.08 | 14.90 | 179.68 | 4.0 | 2.21 | 1.45 | 1.48 |
| 5.0 | 3.71 | 3.63 | 0.08 | 16.78 | 179.77 | 5.0 | 1.90 | 1.37 | 1.39 |
| 6.0 | 3.57 | 3.50 | 0.07 | 18.46 | 179.84 | 6.0 | 1.72 | 1.31 | 1.33 |
| 7.0 | 3.49 | 3.42 | 0.08 | 19.99 | 179.90 | 7.0 | 1.59 | 1.28 | 1.29 |
| 8.0 | 3.44 | 3.36 | 0.08 | 21.43 | 179.96 | 8.0 | 1.51 | 1.25 | 1.26 |
| 9.0 | 3.40 | 3.33 | 0.08 | 22.80 | 179.99 | 9.0 | 1.44 | 1.23 | 1.24 |
| 10.0 | 3.38 | 3.31 | 0.08 | 24.18 | 179.96 | 10.0 | 1.39 | 1.22 | 1.22 |
| 30.0 | 3.36 | 3.32 | 0.04 | 26.02 | 179.48 | 30.0 | 1.13 | 1.23 | 1.20 |
| 50.0 | 3.45 | 3.42 | 0.02 | 22.24 | 179.43 | 50.0 | 1.10 | 1.26 | 1.20 |
| 70.0 | 3.46 | 3.45 | 0.02 | 21.61 | 179.28 | 70.0 | 1.11 | 1.28 | 1.21 |
| 90.0 | 3.47 | 3.46 | 0.01 | 21.27 | 179.15 | 90.0 | 1.12 | 1.31 | 1.22 |
| 100.0 | 3.48 | 3.47 | 0.01 | 21.23 | 179.08 | 100.0 | 1.12 | 1.32 | 1.22 |
| 120.0 | 3.49 | 3.48 | 0.01 | 21.26 | 178.97 | 120.0 | 1.14 | 1.34 | 1.22 |
| 140.0 | 3.50 | 3.50 | 0.01 | 21.42 | 178.85 | 140.0 | 1.14 | 1.36 | 1.22 |
| 160.0 | 3.52 | 3.51 | 0.01 | 21.67 | 178.76 | 160.0 | 1.15 | 1.38 | 1.22 |
| 180.0 | 3.54 | 3.53 | 0.01 | 21.95 | 178.67 | 180.0 | 1.17 | 1.40 | 1.22 |
| 200.0 | 3.56 | 3.55 | 0.01 | 22.43 | 178.60 | 200.0 | 1.18 | 1.42 | 1.22 |
| 220.0 | 3.58 | 3.57 | 0.02 | 23.06 | 178.54 | 220.0 | 1.19 | 1.44 | 1.23 |
| 240.0 | 3.61 | 3.59 | 0.02 | 23.78 | 178.49 | 240.0 | 1.21 | 1.46 | 1.24 |
| 250.0 | 3.62 | 3.60 | 0.02 | 24.19 | 178.48 | 250.0 | 1.22 | 1.47 | 1.25 |
| 260.0 | 3.63 | 3.61 | 0.03 | 24.66 | 178.46 | 260.0 | 1.23 | 1.48 | 1.25 |
| 280.0 | 3.66 | 3.63 | 0.03 | 25.71 | 178.45 | 280.0 | 1.24 | 1.50 | 1.27 |
| 300.0 | 3.69 | 3.66 | 0.04 | 27.05 | 178.46 | 300.0 | 1.26 | 1.52 | 1.30 |
| 320.0 | 3.72 | 3.69 | 0.04 | 28.72 | 178.51 | 320.0 | 1.28 | 1.54 | 1.33 |
| 340.0 | 3.76 | 3.72 | 0.04 | 30.84 | 178.58 | 340.0 | 1.30 | 1.57 | 1.37 |
| 360.0 | 3.79 | 3.75 | 0.04 | 33.32 | 178.69 | 360.0 | 1.32 | 1.59 | 1.41 |
| 380.0 | 3.83 | 3.79 | 0.04 | 35.39 | 178.86 | 380.0 | 1.35 | 1.62 | 1.46 |
| 400.0 | 3.87 | 3.82 | 0.04 | 35.05 | 179.07 | 400.0 | 1.38 | 1.65 | 1.51 |
| 420.0 | 3.91 | 3.86 | 0.04 | 32.57 | 179.33 | 420.0 | 1.41 | 1.68 | 1.57 |
| 440.0 | 3.95 | 3.91 | 0.04 | 29.94 | 179.66 | 440.0 | 1.44 | 1.71 | 1.63 |
| 460.0 | 4.00 | 3.95 | 0.05 | 27.65 | 179.93 | 460.0 | 1.47 | 1.75 | 1.69 |
| 480.0 | 4.04 | 3.99 | 0.05 | 25.76 | 179.45 | 480.0 | 1.51 | 1.79 | 1.76 |
| 500.0 | 4.10 | 4.04 | 0.06 | 24.18 | 178.88 | 500.0 | 1.55 | 1.84 | 1.84 |
| 525.0 | 4.17 | 4.09 | 0.08 | 22.57 | 178.05 | 525.0 | 1.60 | 1.91 | 1.93 |
| 550.0 | 4.26 | 4.15 | 0.11 | 21.21 | 177.10 | 550.0 | 1.66 | 1.98 | 2.03 |
| 575.0 | 4.35 | 4.20 | 0.15 | 20.05 | 175.97 | 575.0 | 1.72 | 2.07 | 2.13 |
| 600.0 | 4.45 | 4.24 | 0.21 | 19.07 | 174.69 | 600.0 | 1.79 | 2.17 | 2.24 |
| 650.0 | 4.71 | 4.32 | 0.39 | 17.54 | 171.69 | 650.0 | 1.95 | 2.42 | 2.45 |

¹Total Loss = Insertion Loss + 3dB Splitter Loss

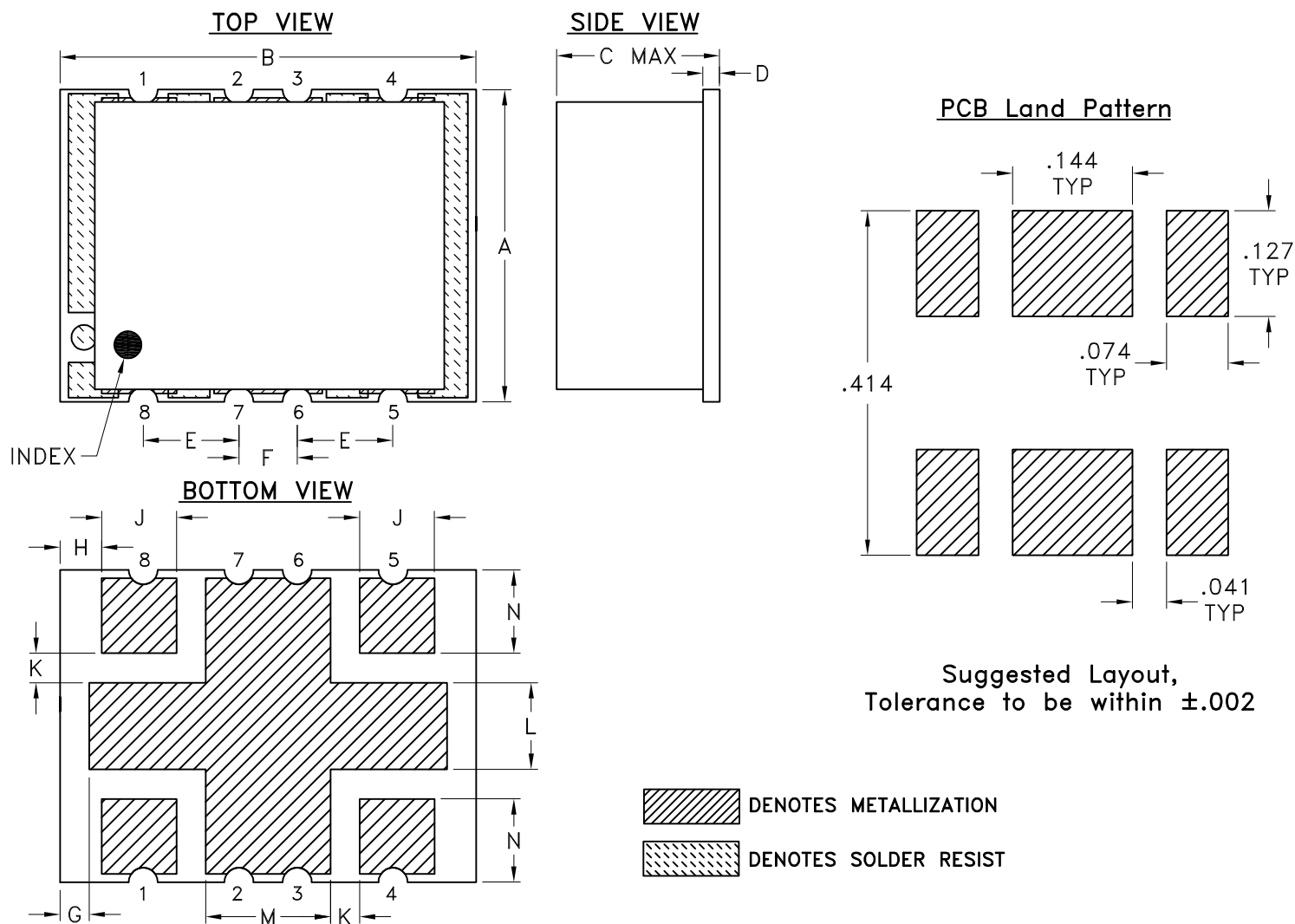


Typical Performance Curves



Outline Dimensions

AH202-1



Suggested Layout,
Tolerance to be within ± 0.002

| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N | WT, GRAM |
|---------|---------------|----------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| AH202-1 | .38 (9.65) | .50 (12.70) | .25 (6.35) | .020 (0.51) | .115 (2.92) | .070 (1.78) | .035 (0.89) | .050 (1.27) | .090 (2.29) | .040 (1.02) | .105 (2.67) | .140 (3.56) | .095 (2.41) | .80 |

Dimensions are in inches (mm). Tolerances: 2 Pl. ± 0.01 ; 3 Pl. ± 0.005

Notes:

- Case material: Nickel Silver alloy.
- Base material: Printed wiring laminate.
- Termination finish:
 For RoHS 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
 All models, (+) suffix.
 For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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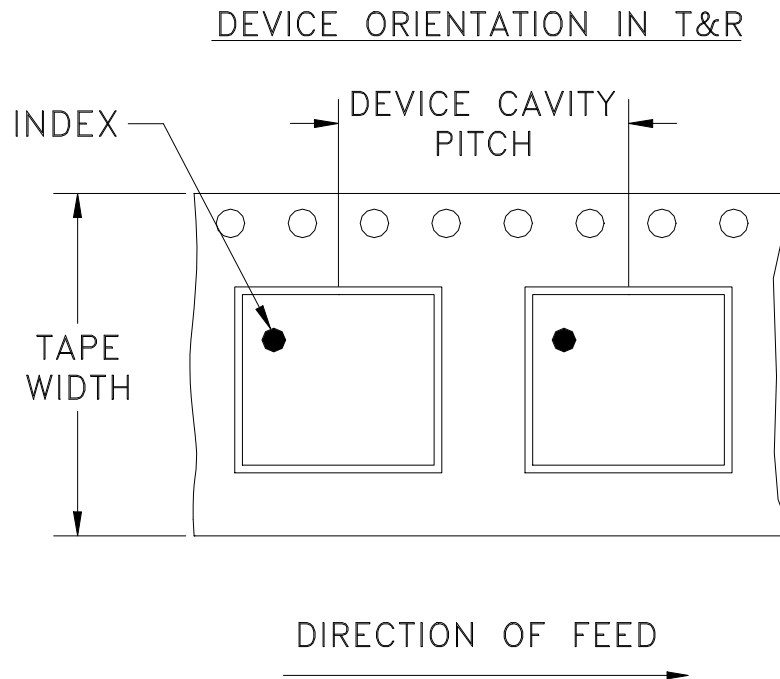
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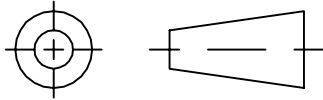
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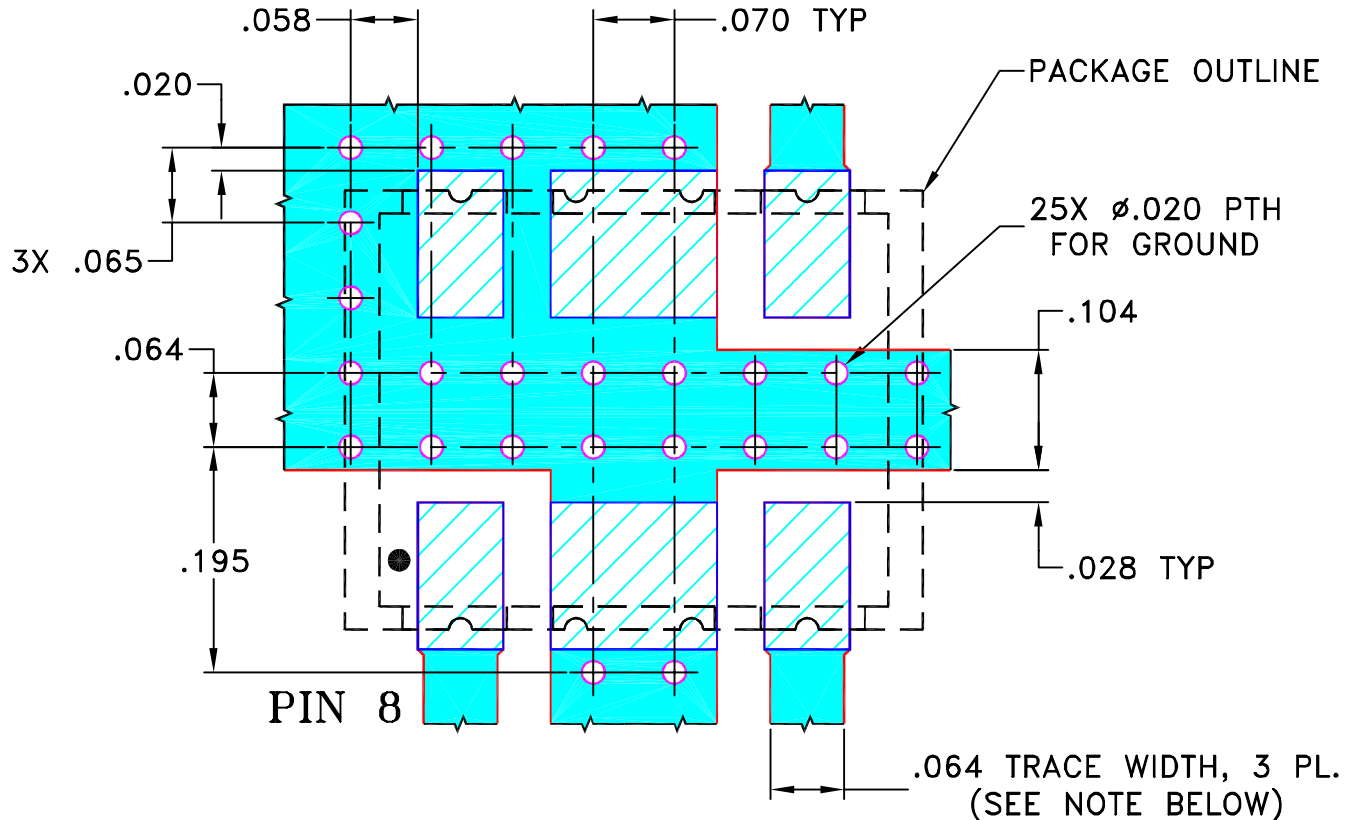
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-------------|----------|----|------|
| OR | M110938 | NEW RELEASE | 04/12/07 | AV | HY |
| | | | | | |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION FOR
AH202-2 CASE STYLE, "sb" PIN CONNECTION



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .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 |
|----------------------------|----------|----------|
| DRAWN | AV | 04/11/07 |
| CHECKED | IL | 04/12/07 |
| APPROVED | HY | 04/12/07 |

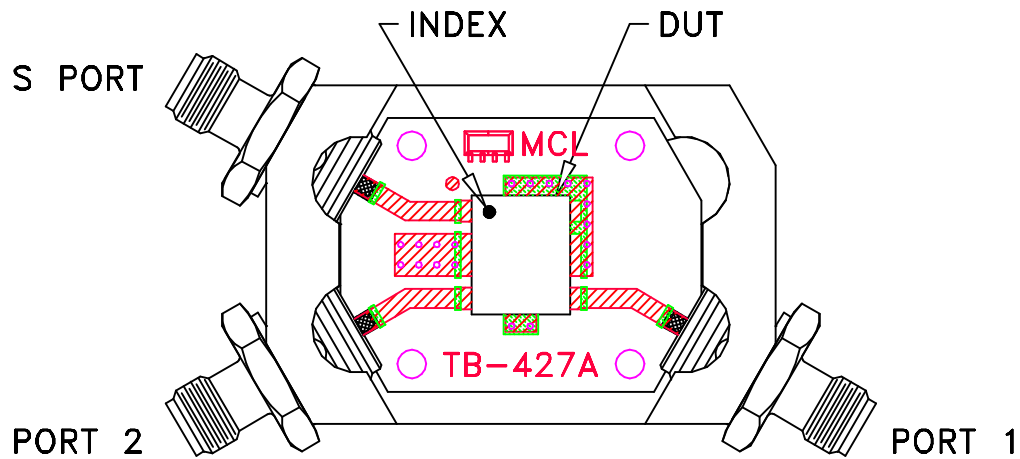
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PL, sb, AH202-2, SYPS-2, TB-427+

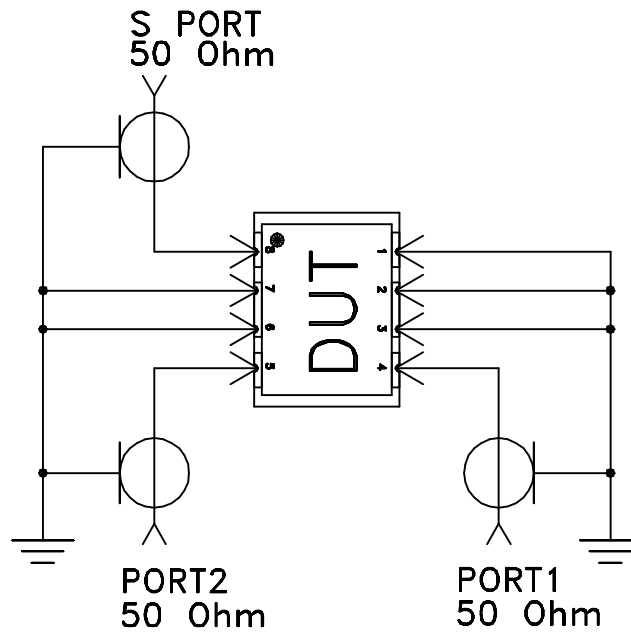
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| FILE: | 98PL274 | SCALE: | SHEET: |
| | | 6:1 | 1 OF 1 |

Evaluation Board and Circuit




TB-427+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or its equivalent, Dielectric Constant=3.5, Thickness=.030"

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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 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 |