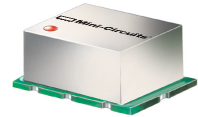


# Surface Mount High Power Splitter

## SYPJ-2-5W-52+

2 Way-180° 50Ω 10 to 520 MHz



CASE STYLE: AH202-1

### Maximum Ratings

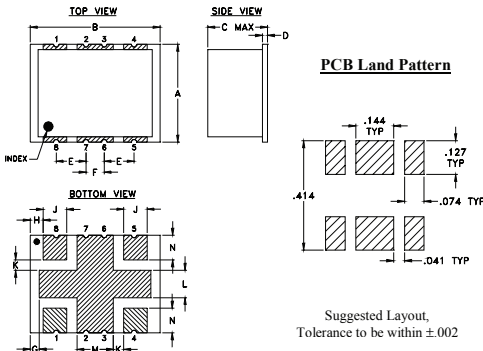
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	5.0W max.
Internal Dissipation	1.0W max.

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

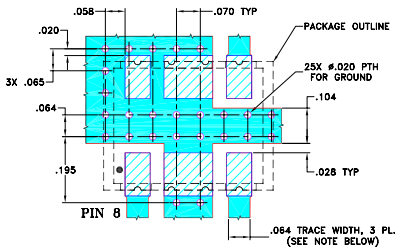
### Outline Drawing



### 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.
- Legend:  
 [Blue shaded area] DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 [Hatched area] DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### 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

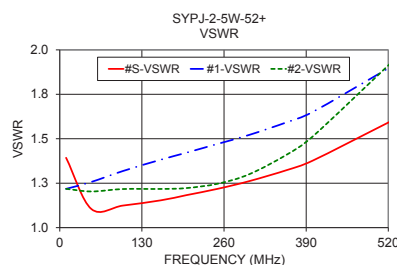
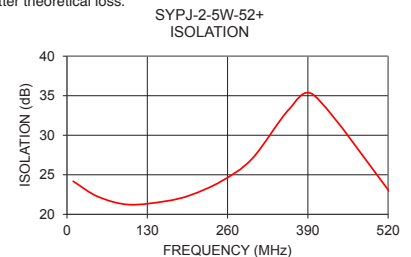
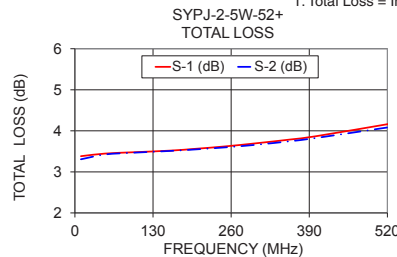
### Electrical Specifications at 25°C

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

### Typical Performance Data

Frequency (MHz)	Total Loss <sup>1</sup> (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.
- The parts covered by this specification document are subject to Mini-Circuit's 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-Circuit's website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# 2 Way-180° Power Splitter/Combiner

# SYPJ-2-5W-52+

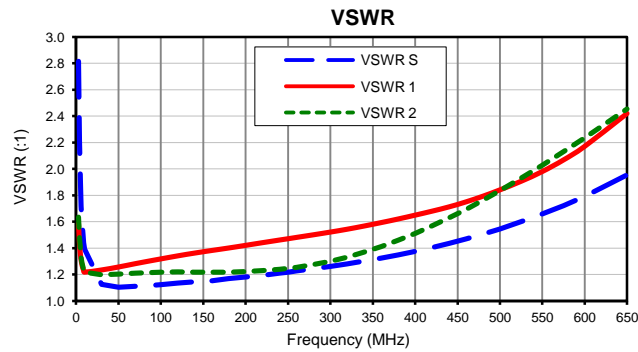
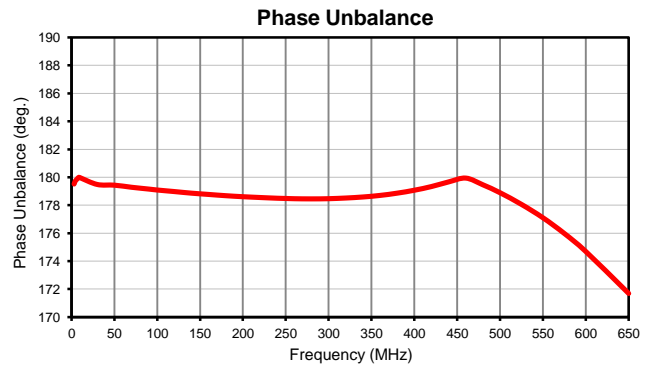
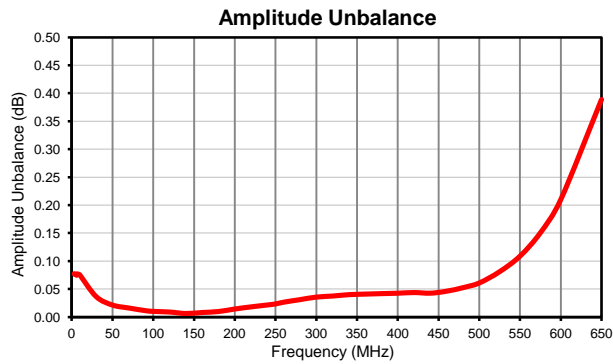
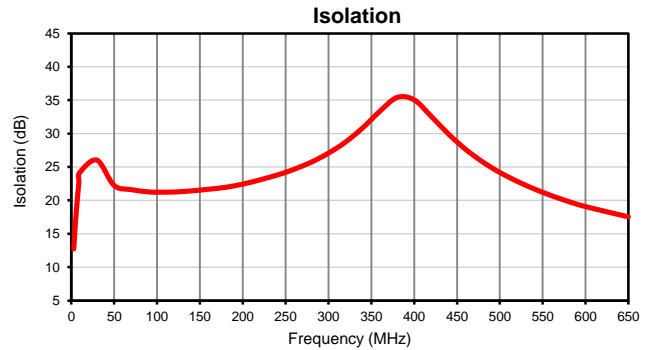
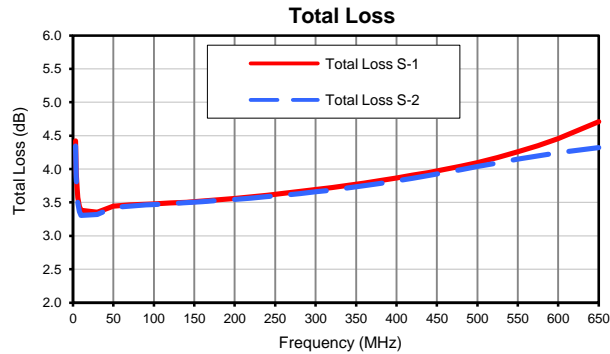
## Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS <sup>1</sup> (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

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

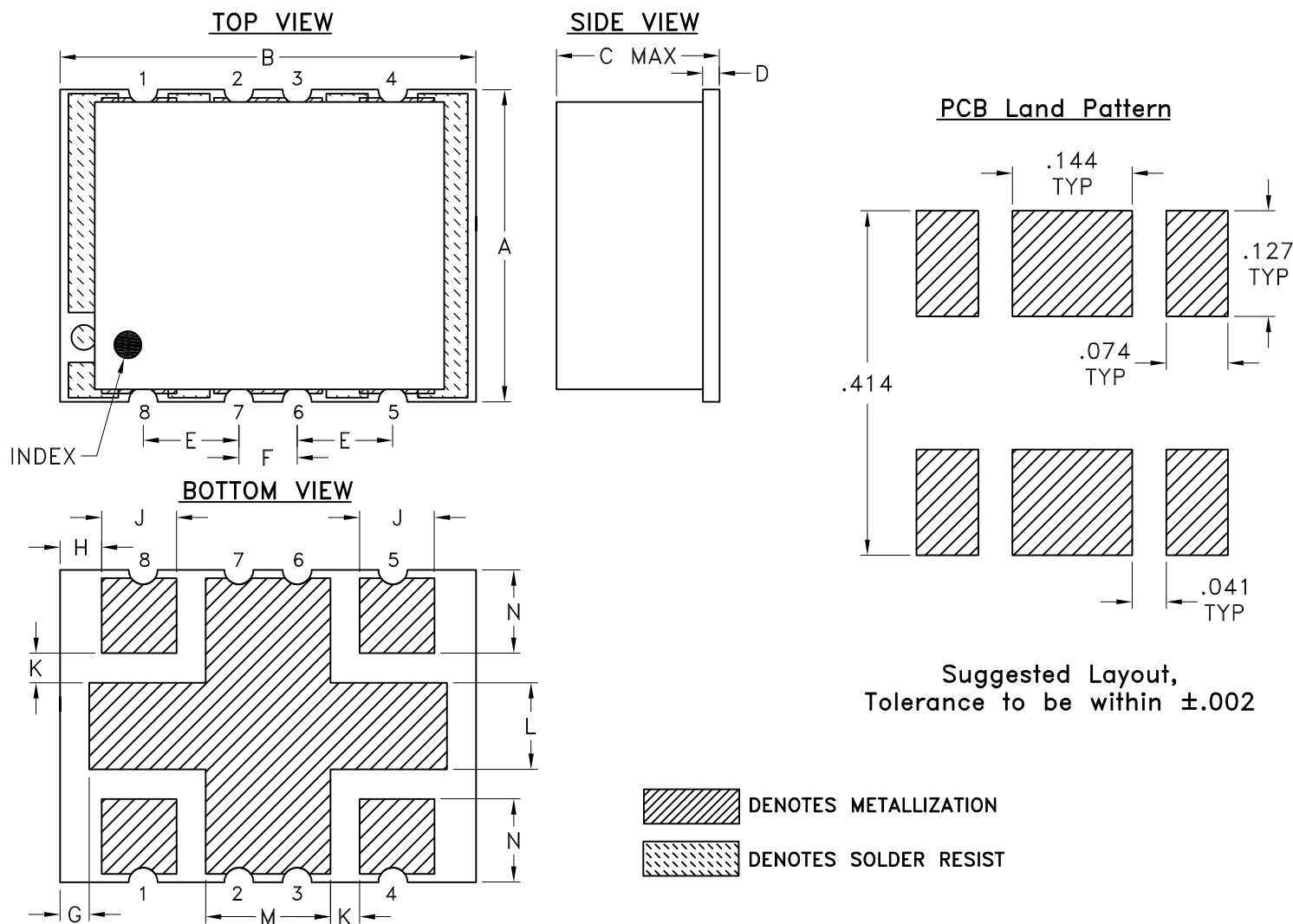


## Typical Performance Curves



## Outline Dimensions

AH202-1



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

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.  $\pm 0.01$ ; 3 Pl.  $\pm 0.005$

### Notes:

- Case material: Nickel Silver alloy.
- Base material: Printed wiring laminate.
- Termination finish:  
 For RoHS 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  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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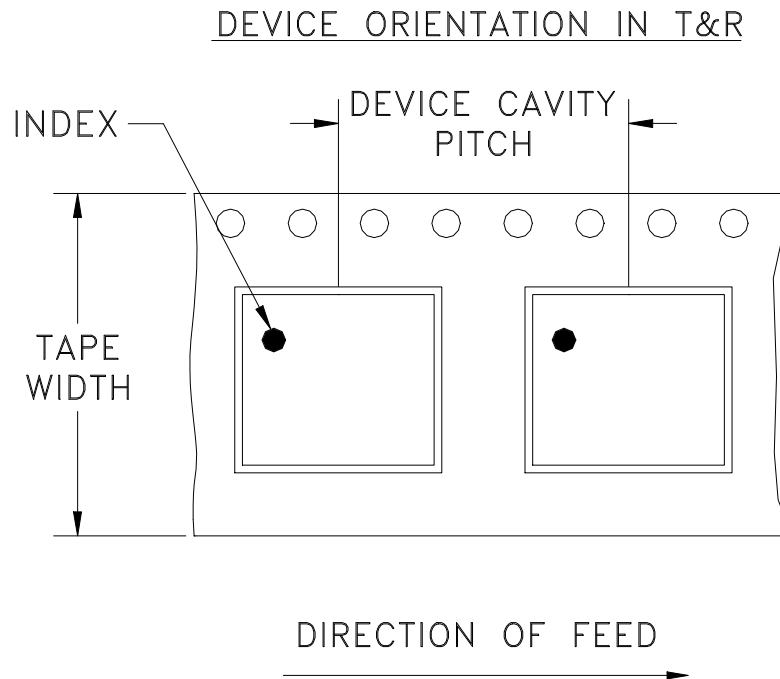
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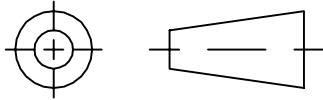
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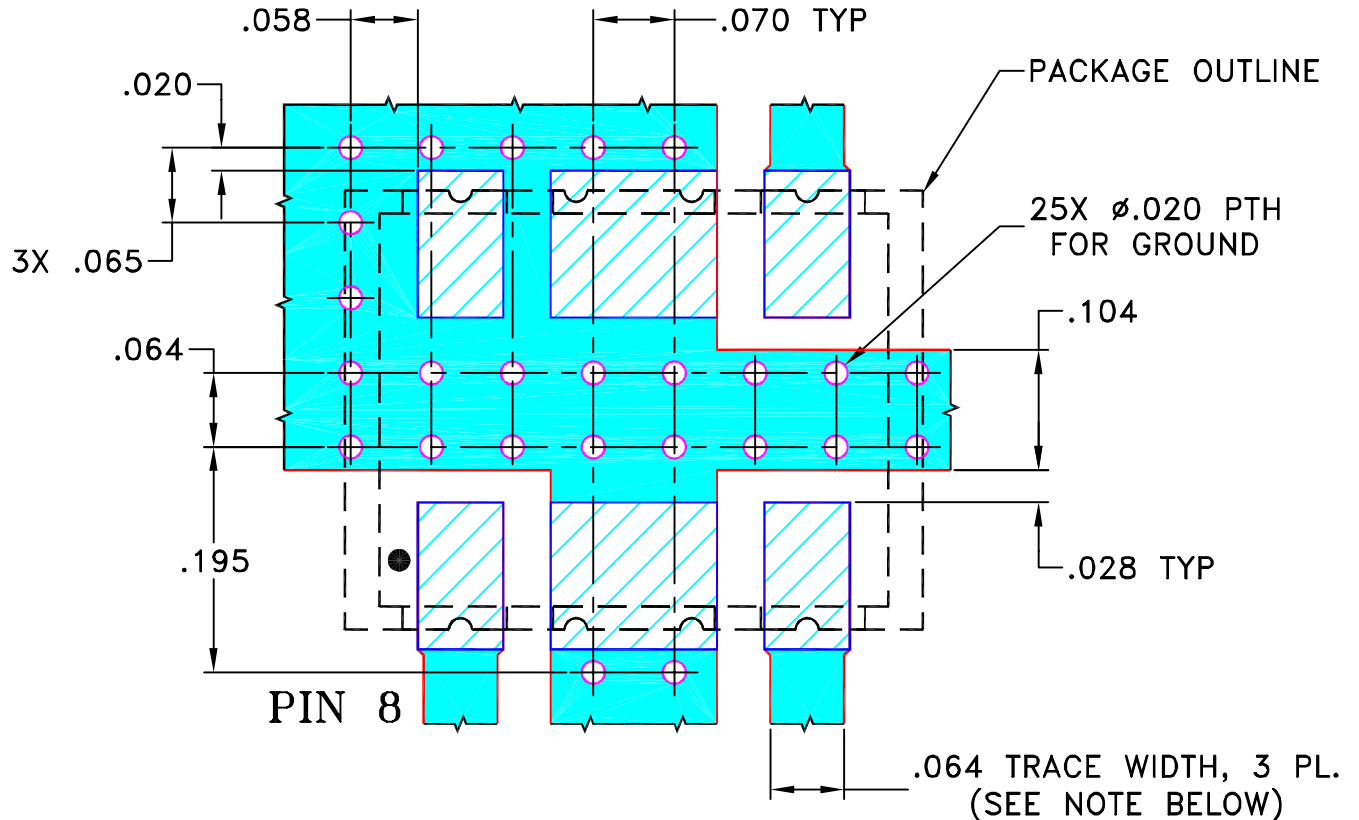
THIRD ANGLE PROJECTION



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

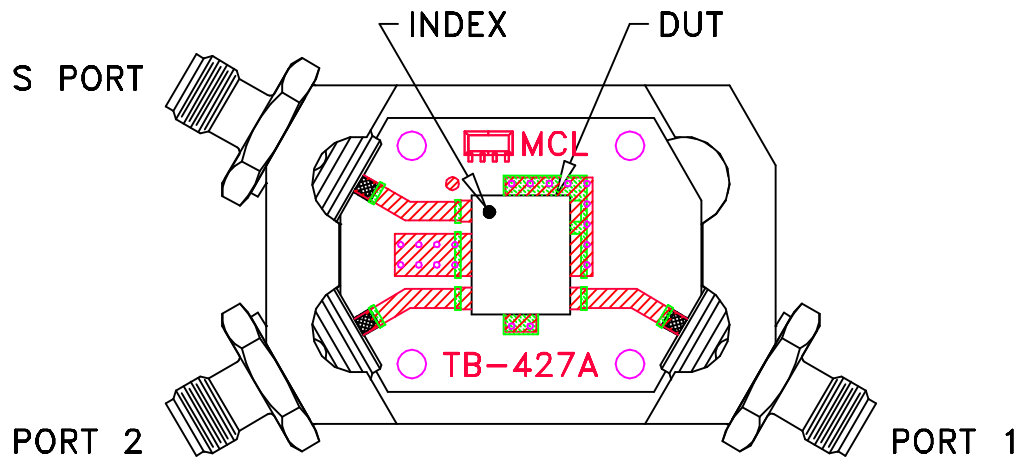
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PL, sb, AH202-2, SYPS-2, TB-427+

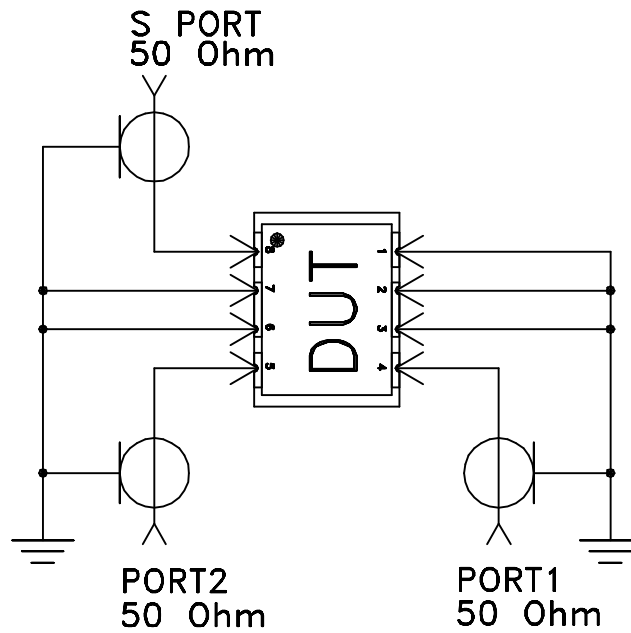
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-274	REV: OR
FILE: 98PL274	SCALE: 6:1	SHEET: 1 OF 1	

# 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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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