

2 Way-180° 50Ω 500 to 2250 MHz

Maximum Ratings

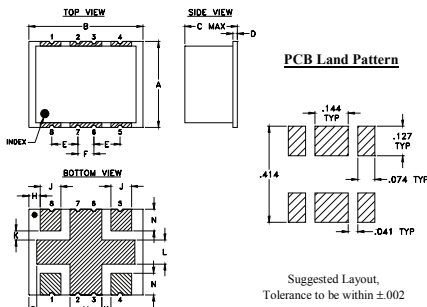
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Internal Dissipation	0.05W max.

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

Pin Connections

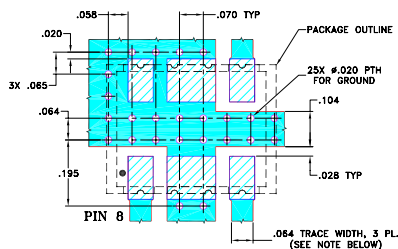
SUM PORT	8
PORT 1	4
PORT 2	5
GROUND	1,2,3,6,7

Outline Drawing



Outline Dimensions (inch)

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

Notes

- A. 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.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. 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

Features

- wideband, 500 to 2200 MHz
- low phase unbalance, 3.0 deg. typ.
- low amplitude unbalance, 0.6 dB typ.
- good isolation, 22 dB typ.

Applications

- VHF/UHF
- communication systems
- receivers & transmitters
- instrumentation
- CATV
- cellular, GPS, PCS

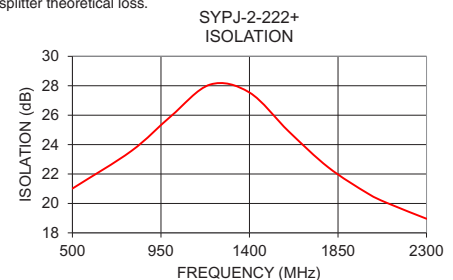
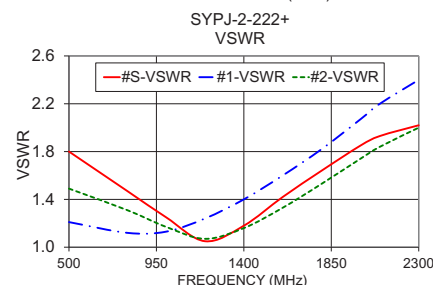
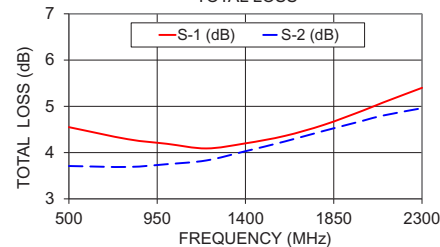
Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency		500		2250	MHz
Insertion Loss (above theoretical 3.0 dB)	500-900 900-1600 1600-2250	— — —	1.5 1.7 2.0	1.9 2.3 2.6	dB
Isolation	500-900 900-1600 1600-2250	18 20 15	22 25 19	— — —	dB
Phase Unbalance	500-900 900-1600 1600-2250	— — —	3.0 3.0 5.0	7.0 9.0 14.0	Degree
Amplitude Unbalance	500-900 900-1600 1600-2250	— — —	0.8 0.5 0.4	1.2 0.9 0.9	dB
VSWR (Port S)	500-2250	—	1.5	—	:1
VSWR (Port 1-2)	500-2250	—	1.5	—	:1

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						
500	4.55 3.71	0.84	21.01	0.53	1.80	1.21	1.49
800	4.29 3.69	0.60	23.57	0.52	1.47	1.12	1.31
1000	4.19 3.75	0.44	25.92	1.19	1.25	1.13	1.17
1200	4.09 3.83	0.26	28.08	1.81	1.05	1.24	1.07
1400	4.20 4.03	0.17	27.54	2.58	1.18	1.40	1.16
1600	4.36 4.24	0.12	24.89	3.28	1.42	1.60	1.33
1800	4.60 4.47	0.14	22.46	4.07	1.64	1.82	1.53
2000	4.91 4.69	0.23	20.69	4.99	1.85	2.07	1.74
2100	5.08 4.80	0.29	20.03	5.32	1.93	2.20	1.84
2300	5.40 4.96	0.44	18.96	5.72	2.02	2.40	2.00

SYPJ-2-222+ TOTAL LOSS 1. Total Loss = Insertion Loss + 3dB splitter theoretical loss.



Electrical Schematic



2 Way-180° Power Splitter/Combiner

SYPJ-2-222+

Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS ¹ (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB) 1-2	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR		
	S-1	S-2					S	(:1) 1	2
100	5.00	3.73	1.28	16.83	3.59	100	2.18	1.40	1.55
200	4.84	3.74	1.10	18.49	2.21	200	2.08	1.30	1.57
300	4.74	3.74	1.00	19.49	1.47	300	1.99	1.26	1.57
400	4.64	3.72	0.92	20.29	0.95	400	1.90	1.24	1.54
500	4.55	3.71	0.84	21.01	0.53	500	1.80	1.21	1.49
600	4.46	3.70	0.76	21.74	0.18	600	1.69	1.17	1.44
700	4.37	3.69	0.68	22.58	0.17	700	1.58	1.14	1.38
800	4.29	3.69	0.60	23.57	0.52	800	1.47	1.12	1.31
825	4.28	3.69	0.58	23.81	0.61	825	1.44	1.11	1.29
850	4.26	3.70	0.56	24.09	0.71	850	1.41	1.11	1.27
875	4.25	3.70	0.54	24.40	0.79	875	1.39	1.11	1.26
900	4.24	3.72	0.52	24.70	0.88	900	1.36	1.11	1.24
925	4.23	3.73	0.49	24.96	0.92	925	1.34	1.11	1.22
950	4.21	3.74	0.47	25.25	0.98	950	1.31	1.12	1.21
975	4.20	3.74	0.46	25.59	1.11	975	1.28	1.13	1.19
1000	4.19	3.75	0.44	25.92	1.19	1000	1.25	1.13	1.17
1050	4.17	3.77	0.40	26.55	1.40	1050	1.19	1.15	1.14
1100	4.14	3.79	0.35	27.12	1.61	1100	1.13	1.18	1.11
1150	4.10	3.80	0.30	27.68	1.69	1150	1.09	1.21	1.08
1200	4.09	3.83	0.26	28.08	1.81	1200	1.05	1.24	1.07
1250	4.13	3.88	0.24	28.31	2.07	1250	1.03	1.28	1.08
1300	4.14	3.93	0.21	28.24	2.25	1300	1.08	1.31	1.10
1350	4.18	3.99	0.19	27.98	2.42	1350	1.13	1.35	1.13
1400	4.20	4.03	0.17	27.54	2.58	1400	1.18	1.40	1.16
1425	4.22	4.06	0.16	27.27	2.67	1425	1.22	1.42	1.18
1450	4.24	4.09	0.15	26.99	2.75	1450	1.24	1.44	1.20
1475	4.25	4.10	0.14	26.63	2.85	1475	1.27	1.47	1.22
1500	4.26	4.12	0.14	26.28	2.93	1500	1.30	1.49	1.24
1550	4.30	4.18	0.13	25.58	3.08	1550	1.35	1.54	1.28
1600	4.36	4.24	0.12	24.89	3.28	1600	1.42	1.60	1.33
1700	4.47	4.35	0.12	23.60	3.65	1700	1.53	1.71	1.42
1800	4.60	4.47	0.14	22.46	4.07	1800	1.64	1.82	1.53
1900	4.75	4.58	0.17	21.50	4.51	1900	1.75	1.95	1.63
2000	4.91	4.69	0.23	20.69	4.99	2000	1.85	2.07	1.74
2100	5.08	4.80	0.29	20.03	5.32	2100	1.93	2.20	1.84
2200	5.23	4.88	0.35	19.43	5.44	2200	1.98	2.30	1.92
2300	5.40	4.96	0.44	18.96	5.72	2300	2.02	2.40	2.00
2400	5.53	4.98	0.55	18.50	5.89	2400	2.04	2.48	2.08
2500	5.67	4.98	0.69	18.08	6.20	2500	2.03	2.52	2.12
2600	5.80	4.96	0.84	17.70	6.67	2600	1.99	2.53	2.15
2700	5.87	4.95	0.92	17.35	7.24	2700	1.94	2.49	2.14

¹Total Loss = Insertion Loss + 3dB Splitter Loss



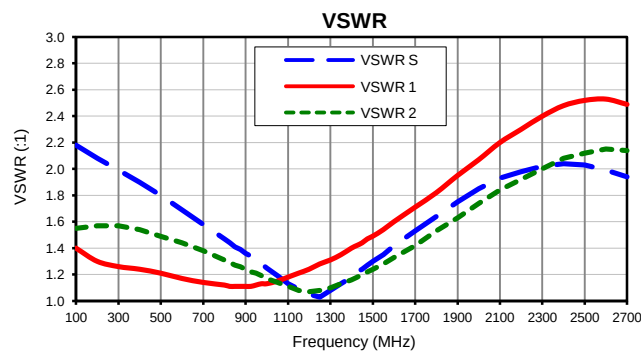
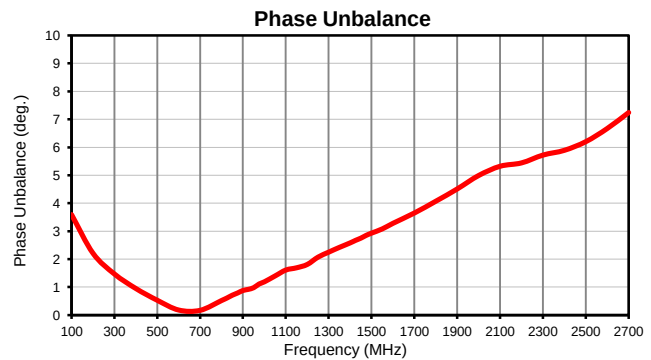
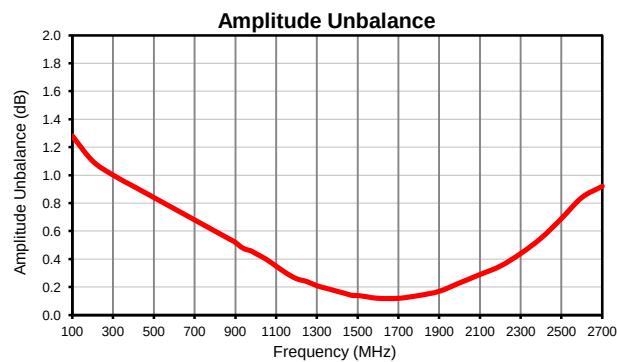
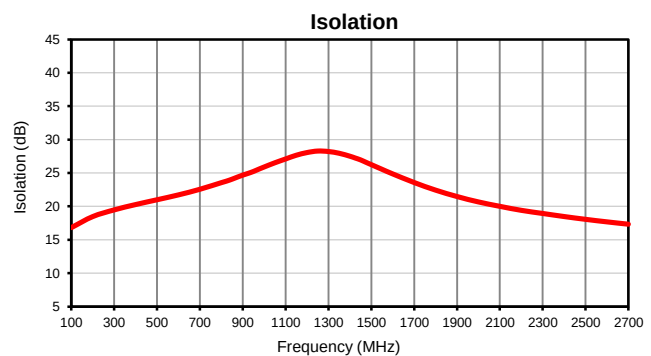
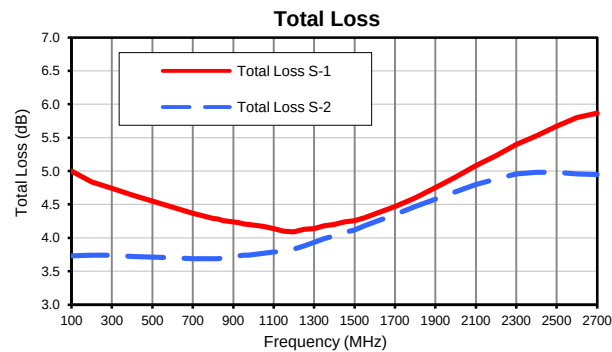
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IF/RF MICROWAVE COMPONENTS



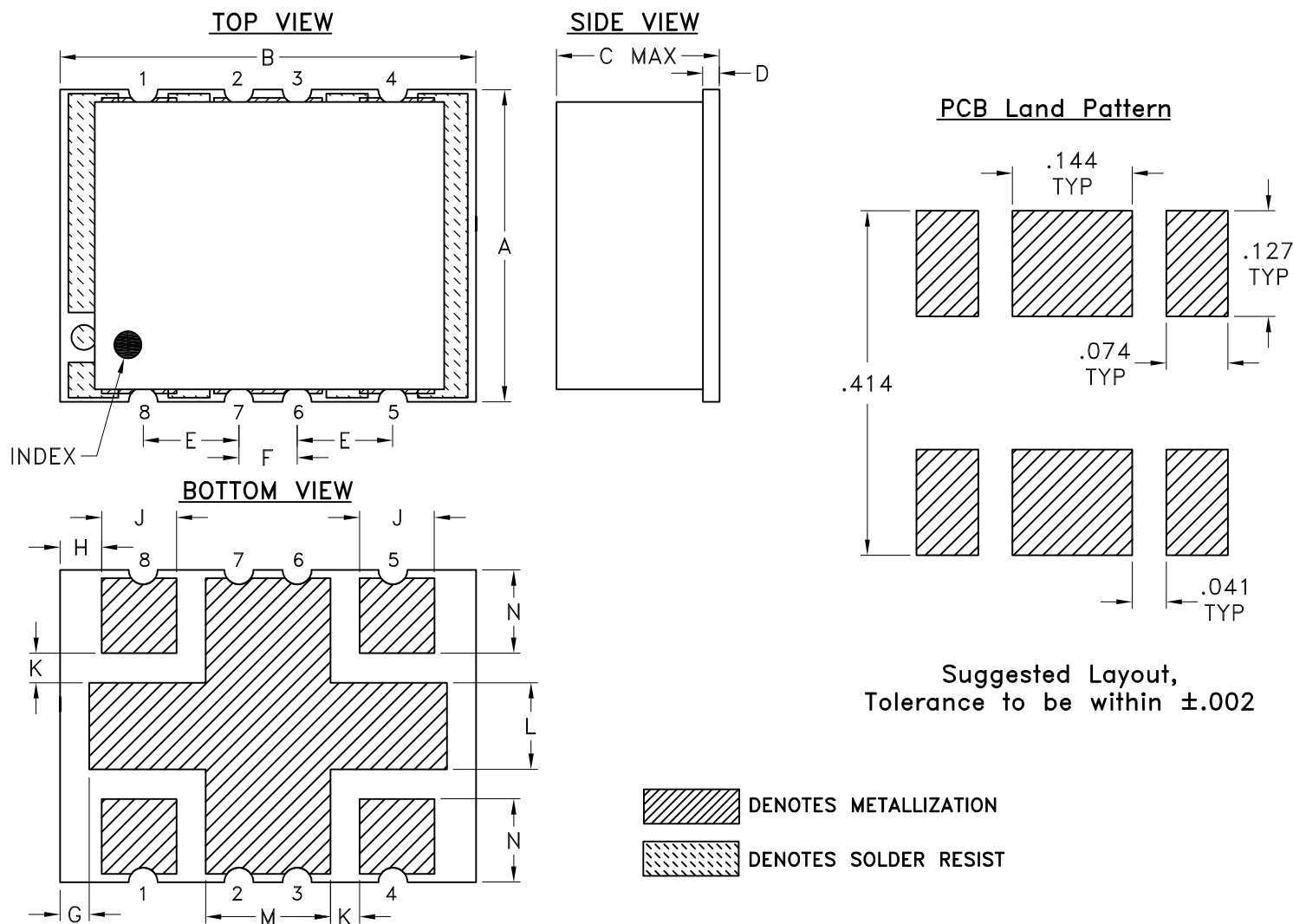
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 SYPJ-2-222+
 3/16/2015
 Page 1 of 1

Typical Performance Curves



Outline Dimensions

AH202-1



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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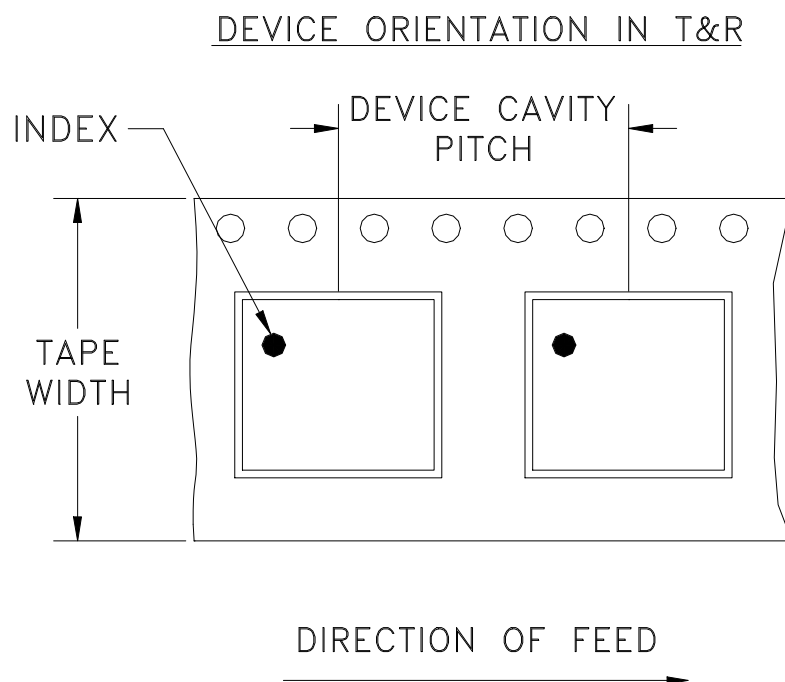
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Tape & Reel Packaging TR-F61



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
24	12	13	200

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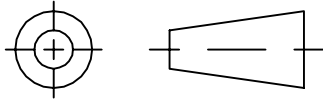
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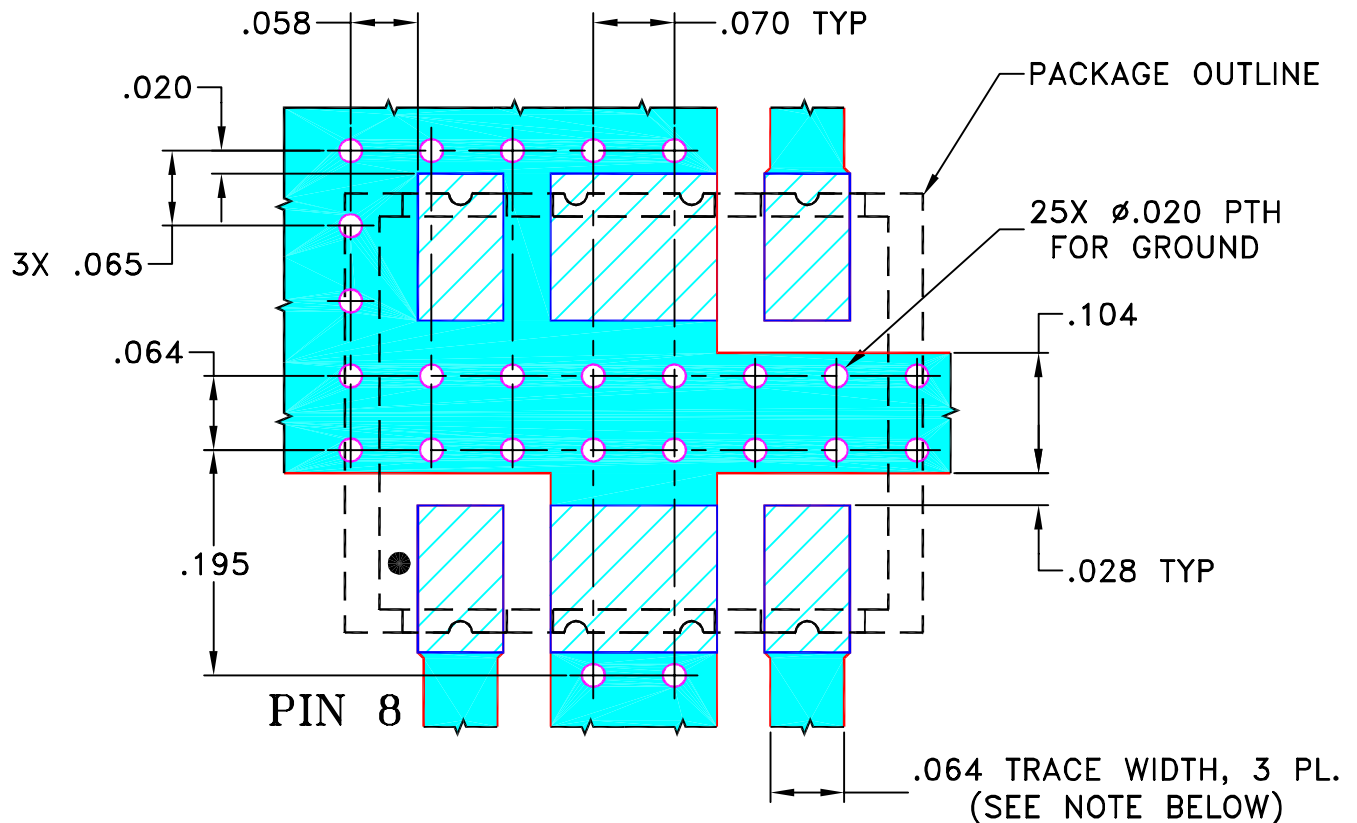
THIRD ANGLE PROJECTION



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" $\pm$.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

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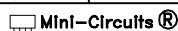
04/12/07

2 PL DECIMALS $\pm$

APPROVED

HY

04/12/07

3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$ 

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

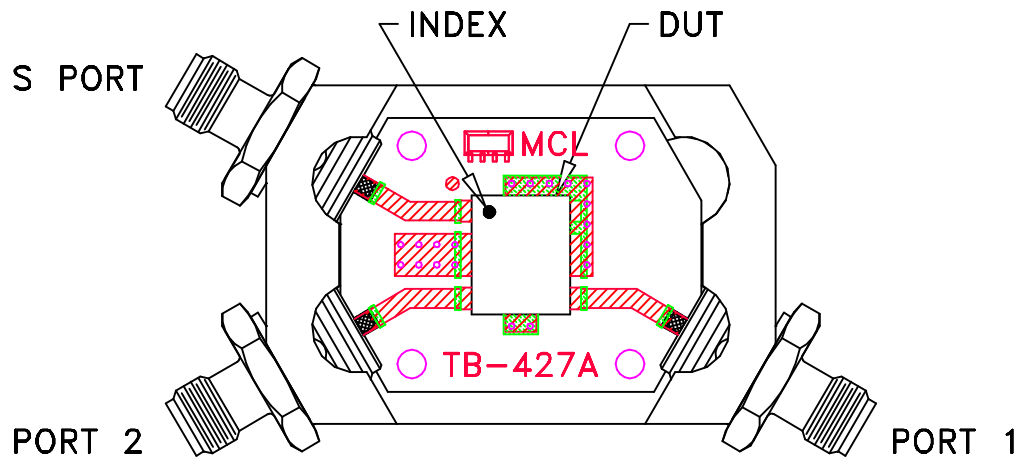
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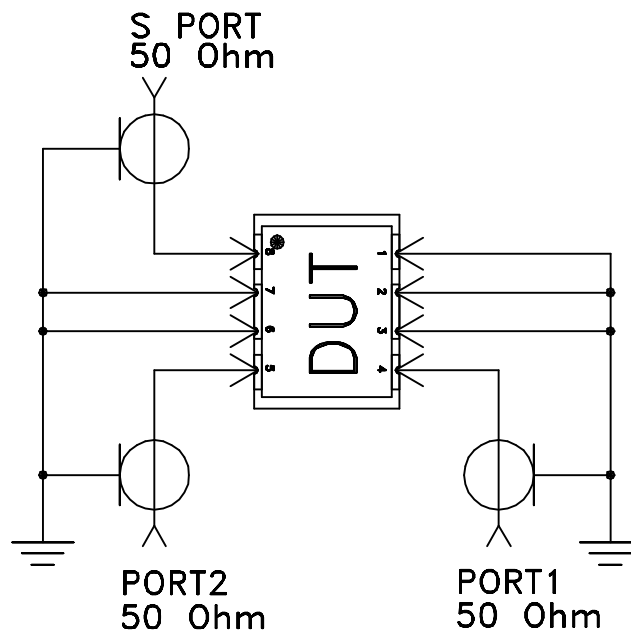
SCALE: 6:1

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