

Power Splitter/Combiner

SYPS-2-282-75+

2 Way-0° 75Ω 5 to 2750 MHz

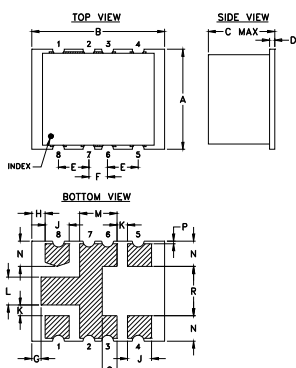
Maximum Ratings

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.	

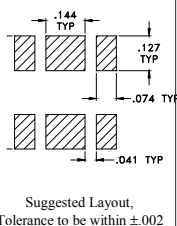
Pin Connections

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

Outline Drawing



PCB Land Pattern

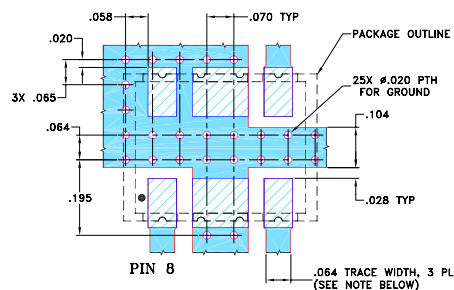


Suggested Layout, Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	.38	B	.50	C	.25	D	.020	E	.115	F	.070	G	.035	H	.050	J	.090	K	.040	wt	
	9.65	12.70	6.35	0.51	2.92	1.78	0.89	1.27	2.29	1.02											grams
L	.105	M	.140	N	.095	O	.010	P	.055	Q	.185	R	--	S	--	T	--				0.52
	2.67	3.56	2.41	0.25	1.40	4.70	--	--	--	--	--	--	--	--	--	--	--				

Demo Board MCL P/N: TB-426+ Suggested PCB Layout (PL-268)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .060 ± .004"; 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

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-Circuits' applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits' 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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- wideband, 5 to 2750 MHz. useable 0.5 to 3000 MHz
- low insertion loss, 0.8 dB typ.
- high isolation, 25 dB typ.

Applications

- VHF/UHF
- communications systems
- receivers & transmitters
- instrumentation
- CATV



Generic photo used for illustration purposes only

CASE STYLE: AH202

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
13"	200

Electrical Specifications

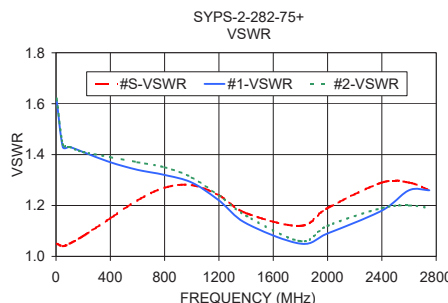
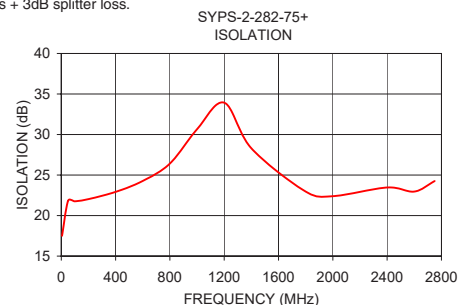
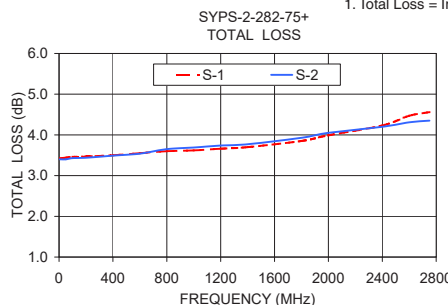
FREQ. RANGE (MHz)	ISOLATION (dB)			INSERTION LOSS (dB) ABOVE 3.0 dB			PHASE UNBALANCE (Degrees)			AMPLITUDE UNBALANCE (dB)								
	L	M	U	L	M	U	L	M	U	L	M	U						
	Typ. Min.	Typ. Min.	Typ. Min.	Typ. Max.	Typ. Max.	Typ. Max.	Max. Max.	Max. Max.	Max. Max.	Max. Max.	Max. Max.	Max. Max.						
f _L -f _U	20	12	25	18	22	13	0.5	0.7	0.8	1.1	1.5	2.7	2.0	4.0	6.0	0.2	0.4	1.0

L = low range [f_L to 10 f_L] M = mid range [10 f_L to f_U/2] U = upper range [f_U/2 to f_U]

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						
5.00	3.43	3.40	0.03	17.50	0.12	1.05	1.61	1.62
50.00	3.44	3.40	0.04	21.82	0.01	1.04	1.43	1.44
100.00	3.46	3.43	0.03	21.76	0.06	1.05	1.43	1.43
200.00	3.47	3.44	0.03	22.03	0.23	1.08	1.41	1.41
400.00	3.50	3.49	0.02	22.92	0.48	1.15	1.37	1.39
600.00	3.55	3.54	0.02	24.27	0.70	1.22	1.34	1.37
800.00	3.60	3.65	0.05	26.42	0.83	1.27	1.32	1.35
1000.00	3.62	3.69	0.07	30.66	0.96	1.28	1.29	1.31
1200.00	3.66	3.74	0.08	33.93	1.24	1.24	1.22	1.24
1400.00	3.70	3.77	0.06	28.30	0.92	1.17	1.13	1.16
1800.00	3.85	3.93	0.08	22.96	0.63	1.12	1.05	1.06
2000.00	3.99	4.05	0.06	22.39	0.42	1.19	1.09	1.12
2400.00	4.23	4.20	0.04	23.46	0.16	1.29	1.18	1.19
2600.00	4.47	4.31	0.16	22.96	0.39	1.29	1.26	1.20
2750.00	4.56	4.35	0.21	24.26	0.54	1.26	1.26	1.19

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



electrical schematic



2 Way-0° Power Splitter/Combiner

SYPS-2-282-75+

Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS ¹ (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB)	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2					S	1	2
	3.0	3.47					3.43	0.03	15.34
4.0	3.44	3.41	0.03	16.53	0.12	4.0	1.06	1.67	1.68
5.0	3.43	3.40	0.03	17.50	0.12	5.0	1.05	1.61	1.62
6.0	3.42	3.39	0.03	18.29	0.12	6.0	1.04	1.56	1.57
7.0	3.42	3.38	0.03	18.93	0.11	7.0	1.04	1.53	1.54
8.0	3.41	3.38	0.03	19.46	0.12	8.0	1.04	1.51	1.52
9.0	3.41	3.38	0.03	19.89	0.10	9.0	1.04	1.49	1.50
10.0	3.41	3.38	0.03	20.25	0.10	10.0	1.04	1.48	1.49
20.0	3.42	3.38	0.03	21.68	0.09	20.0	1.03	1.44	1.45
30.0	3.43	3.39	0.04	21.87	0.05	30.0	1.03	1.43	1.44
40.0	3.43	3.40	0.04	21.87	0.05	40.0	1.03	1.43	1.44
50.0	3.44	3.40	0.04	21.82	0.01	50.0	1.04	1.43	1.44
60.0	3.45	3.41	0.04	21.80	0.02	60.0	1.04	1.43	1.44
70.0	3.45	3.41	0.04	21.80	0.01	70.0	1.04	1.43	1.44
80.0	3.45	3.42	0.04	21.79	0.01	80.0	1.04	1.43	1.43
90.0	3.45	3.42	0.03	21.78	0.03	90.0	1.05	1.43	1.43
100.0	3.46	3.43	0.03	21.76	0.06	100.0	1.05	1.43	1.43
150.0	3.47	3.44	0.04	21.79	0.10	150.0	1.07	1.42	1.43
200.0	3.47	3.44	0.03	22.03	0.23	200.0	1.08	1.41	1.41
250.0	3.49	3.46	0.03	22.17	0.26	250.0	1.11	1.39	1.41
300.0	3.49	3.45	0.03	22.45	0.33	300.0	1.12	1.39	1.40
350.0	3.50	3.48	0.03	22.52	0.44	350.0	1.14	1.37	1.39
400.0	3.50	3.49	0.02	22.92	0.48	400.0	1.15	1.37	1.39
450.0	3.52	3.49	0.03	22.96	0.47	450.0	1.18	1.35	1.38
500.0	3.53	3.52	0.01	23.47	0.74	500.0	1.19	1.35	1.38
550.0	3.54	3.54	0.00	23.60	0.55	550.0	1.21	1.34	1.37
600.0	3.55	3.54	0.02	24.27	0.70	600.0	1.22	1.34	1.37
650.0	3.56	3.57	0.02	24.44	0.78	650.0	1.24	1.33	1.36
700.0	3.58	3.59	0.01	25.27	0.67	700.0	1.25	1.33	1.36
750.0	3.59	3.59	0.01	25.76	0.89	750.0	1.26	1.33	1.35
800.0	3.60	3.65	0.05	26.42	0.83	800.0	1.27	1.32	1.35
850.0	3.60	3.62	0.02	27.56	0.82	850.0	1.27	1.32	1.33
900.0	3.62	3.67	0.06	28.12	0.96	900.0	1.28	1.31	1.33
950.0	3.62	3.67	0.05	29.55	0.92	950.0	1.28	1.30	1.31
1000.0	3.62	3.69	0.07	30.66	0.96	1000.0	1.28	1.29	1.31
1100.0	3.63	3.72	0.09	33.27	1.09	1100.0	1.27	1.26	1.28
1200.0	3.66	3.74	0.08	33.93	1.24	1200.0	1.24	1.22	1.24
1300.0	3.68	3.74	0.06	31.56	1.08	1300.0	1.21	1.18	1.20
1375.0	3.68	3.76	0.07	29.37	1.05	1375.0	1.19	1.14	1.17
1400.0	3.70	3.77	0.06	28.30	0.92	1400.0	1.17	1.13	1.16
1500.0	3.71	3.80	0.08	26.27	0.81	1500.0	1.14	1.08	1.12
1600.0	3.74	3.83	0.09	25.14	0.78	1600.0	1.11	1.03	1.08
1700.0	3.78	3.87	0.09	24.12	0.73	1700.0	1.10	1.02	1.06
1800.0	3.85	3.93	0.08	22.96	0.63	1800.0	1.12	1.05	1.06
1900.0	3.92	3.99	0.07	22.55	0.52	1900.0	1.15	1.08	1.09
2000.0	3.99	4.05	0.06	22.39	0.42	2000.0	1.19	1.09	1.12
2100.0	4.07	4.10	0.03	22.12	0.33	2100.0	1.23	1.10	1.15
2200.0	4.13	4.15	0.02	22.05	0.20	2200.0	1.26	1.11	1.17
2300.0	4.18	4.18	0.00	22.81	0.11	2300.0	1.28	1.14	1.18
2400.0	4.23	4.20	0.04	23.46	0.16	2400.0	1.29	1.18	1.19
2500.0	4.33	4.25	0.08	23.15	0.23	2500.0	1.30	1.22	1.20
2600.0	4.47	4.31	0.16	22.96	0.39	2600.0	1.29	1.26	1.20
2700.0	4.57	4.35	0.22	23.50	0.21	2700.0	1.28	1.25	1.19
2750.0	4.56	4.35	0.21	24.26	0.54	2750.0	1.26	1.26	1.19
2800.0	4.61	4.34	0.27	23.29	0.24	2800.0	1.26	1.26	1.19
2900.0	4.74	4.45	0.29	23.57	0.29	2900.0	1.26	1.26	1.21
3000.0	4.92	4.57	0.35	24.32	0.37	3000.0	1.26	1.28	1.22
3020.0	4.97	4.59	0.38	25.60	0.65	3020.0	1.27	1.30	1.23
3040.0	5.03	4.59	0.44	25.36	0.54	3040.0	1.29	1.28	1.23
3060.0	5.08	4.63	0.45	24.35	0.24	3060.0	1.29	1.27	1.23
3080.0	5.12	4.69	0.43	24.43	0.34	3080.0	1.29	1.29	1.24
3100.0	5.17	4.72	0.45	25.22	0.76	3100.0	1.29	1.32	1.25
3120.0	5.24	4.72	0.51	24.92	0.86	3120.0	1.31	1.33	1.27
3140.0	5.30	4.76	0.54	24.05	0.71	3140.0	1.33	1.33	1.26
3160.0	5.35	4.83	0.52	23.90	0.72	3160.0	1.34	1.33	1.26
3180.0	5.41	4.89	0.52	24.27	1.06	3180.0	1.34	1.35	1.29
3200.0	5.50	4.92	0.58	23.99	1.23	3200.0	1.33	1.38	1.30

¹Total Loss = Insertion Loss + 3dB Solitler Loss



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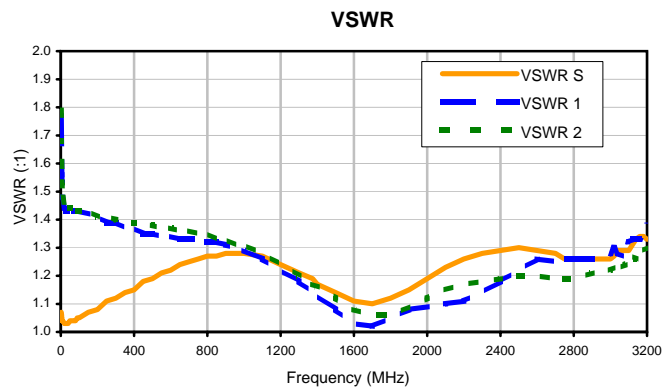
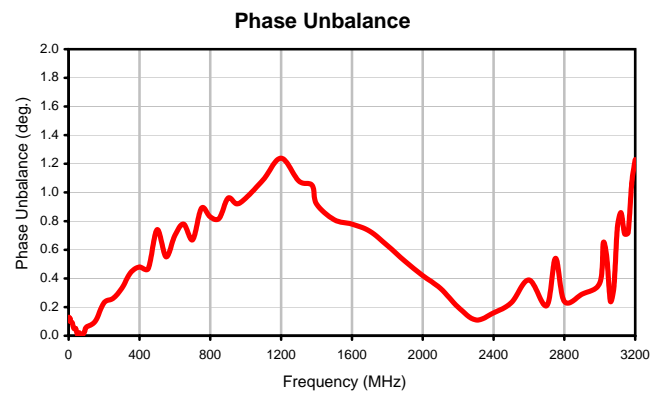
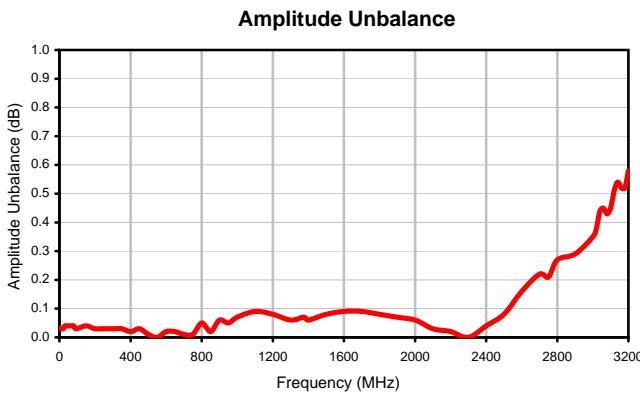
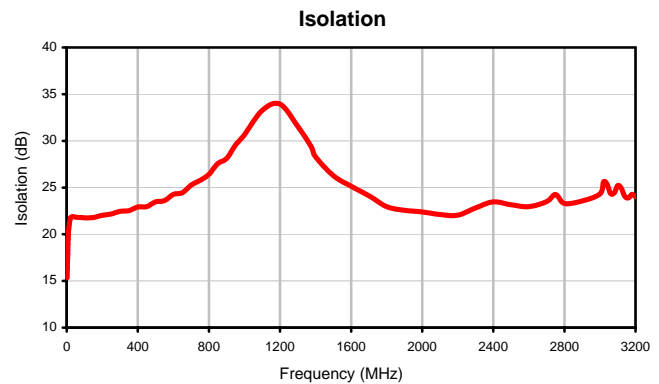
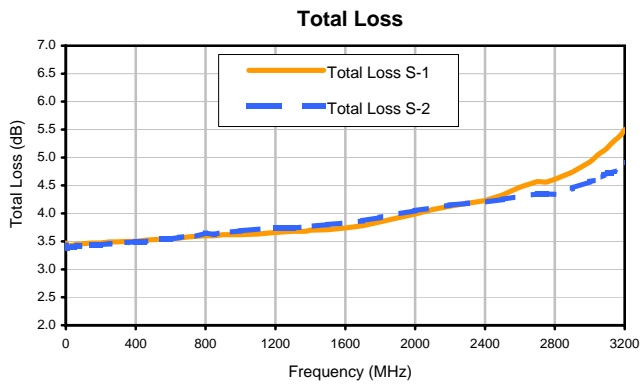
IF/RF MICROWAVE COMPONENTS

REV. X2
 SYPS-2-282-75+
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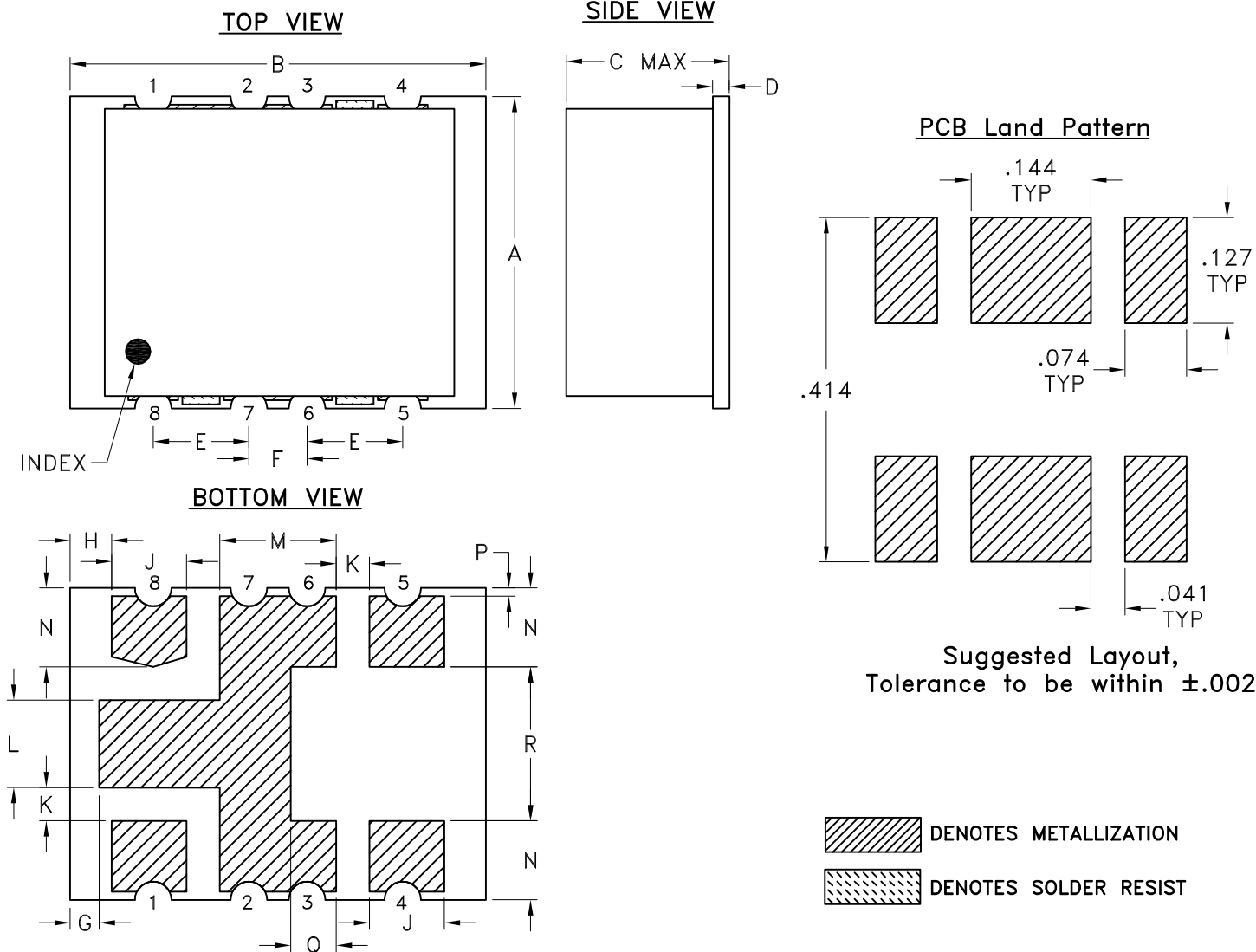
2 Way-0° Power Splitter/Combiner

SYPS-2-282-75+



Typical Performance Curves



Outline Dimensions



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

 DENOTES METALLIZATION
 DENOTES SOLDER RESIST

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P
AH202-2	.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)	.010 (0.25)
CASE#	Q	R	WT, GRAM											
AH202-2	.055 (1.40)	.185 (4.70)	.52											

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

Notes:

- Case material: Plastic.
- 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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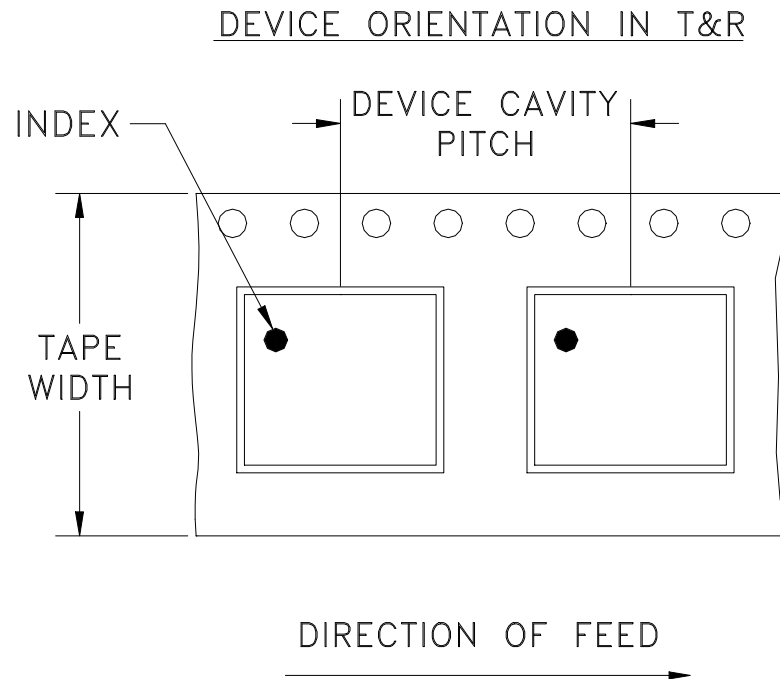
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F61



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

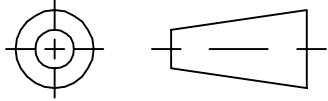
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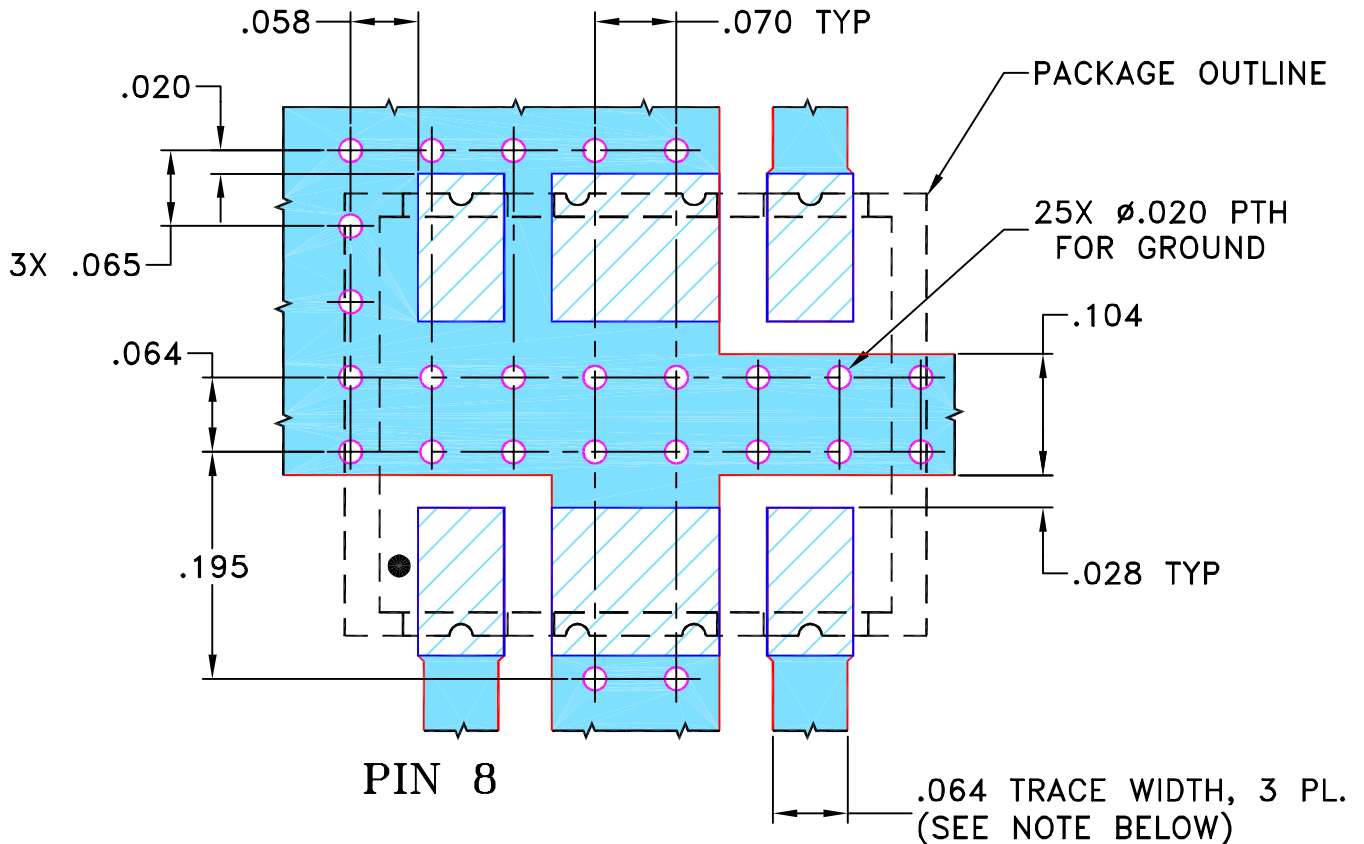
THIRD ANGLE PROJECTION



REVISIONS

REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M109780	NEW RELEASE	04/17/07	PW	HY

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



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .060" ± .004"; 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 ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	PW	02/09/07
	CHECKED	IL	02/16/07
	APPROVED	HY	04/17/07



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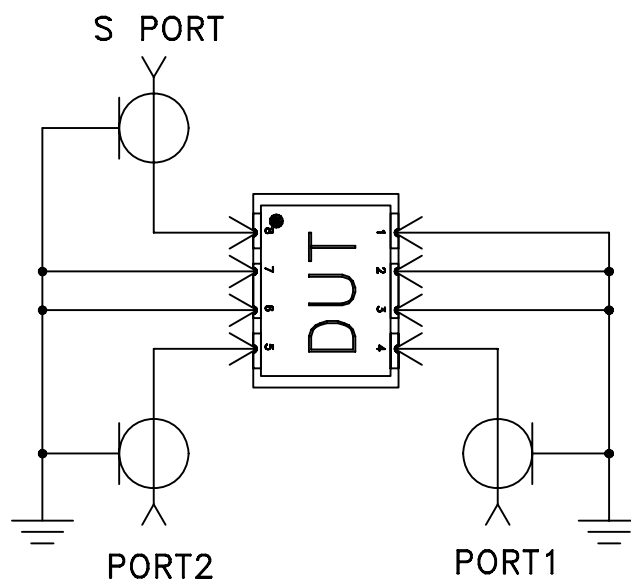
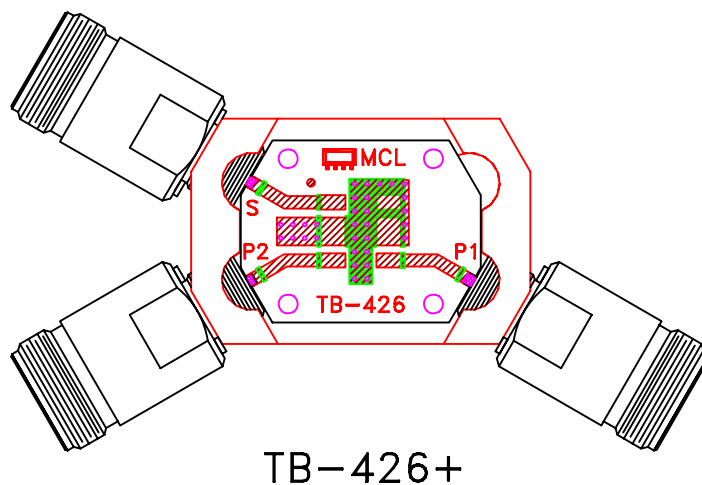
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PL, sb, 75, AH202-2, SYPS-2, TB-426+

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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-268	OR
FILE:	98PL268	SCALE:	SHEET:
		6:1	1 OF 1


Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 75 Ohm N-type Female connectors.
2. PCB Material: Rogers R04350 or its equivalent, Dielectric Constant=3.5, Thickness=.060"

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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