

Power Splitter/Combiner

SYPS-3-12W-75+

3 Way-0° 75Ω 5 to 1200 MHz

Maximum Ratings

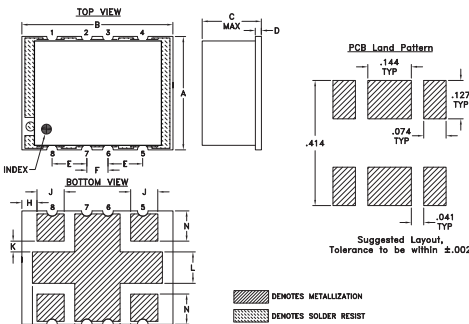
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.
Internal Dissipation	0.15W max.

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

Pin Connections

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

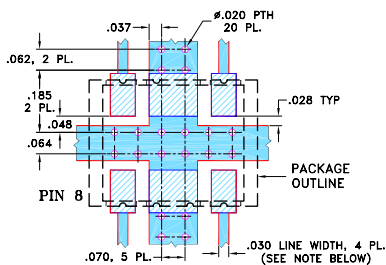
Outline Drawing



Outline Dimensions (inch/mm)

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

Demo Board MCL P/N: TB-361+ Suggested PCB Layout (PL-229)



NOTE:

- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .050" ± .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.

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

Notes

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- 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-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

- low insertion loss 0.7 dB typ.
- good isolation, 25 dB typ.
- wide frequency band, 5 to 1200 MHz, usable 5-1300 MHz
- low amplitude unbalance, 0.2 dB typ.
- low phase unbalance, 2.0 deg. typ.

Applications

- CATV
- VHF/UHF
- cellular
- DOCSIS 3.1 system



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 at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1200	MHz
Insertion Loss, above 4.8 dB	5-20	—	0.6	1.0	dB
	20-860	—	0.7	1.5	
	860-1200	—	1.2	2.2	
Isolation	5-20	20	26	—	dB
	20-860	18	25	—	
Isolation	860-1200	17	20	—	dB
	5-20	—	—	—	
Phase Unbalance	20-860	—	1.5	3.0	Degree
	860-1200	—	3.0	5.0	
Amplitude Unbalance	5-860	—	0.1	0.1	dB
	860-1200	—	0.3	0.8	
VSWR (Port S)	5-20	—	1.0	1.7	:1
	20-860	—	1.2	1.3	
VSWR (Port S)	860-1200	—	1.25	1.5	:1
	5-20	—	1.3	1.3	
VSWR (Port 1 and Port 2)	20-860	—	1.2	1.3	:1
	860-1200	—	1.25	1.4	

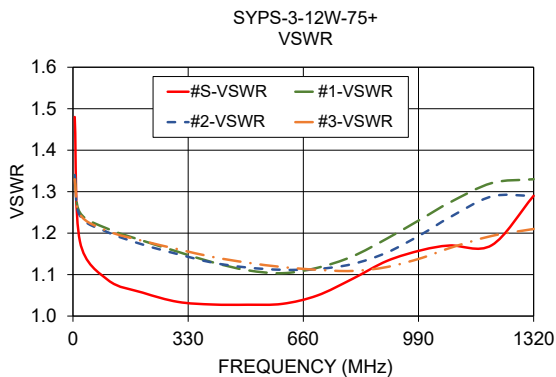
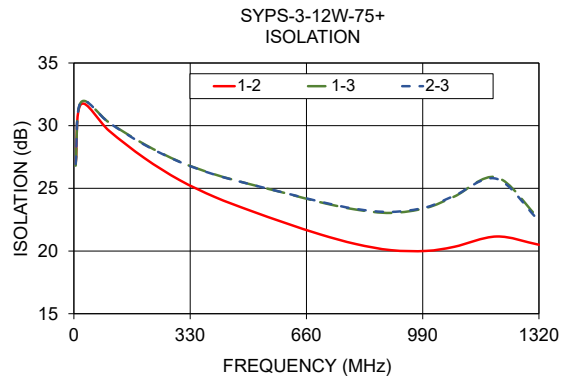
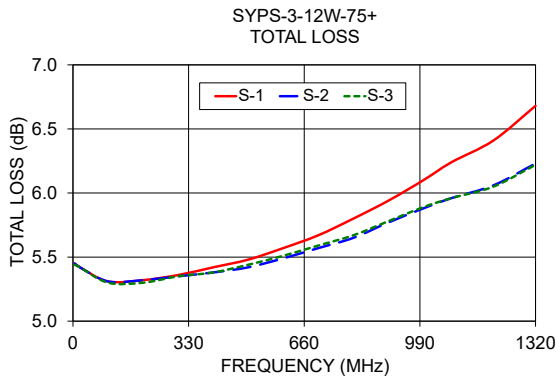
electrical schematic



Typical Performance Data

Freq. (MHz)	Total Loss ¹ (dB)			Amp. Unbal. (dB)	Isolation (dB)			Phase Unbal. (deg.)	VSWR	VSWR	VSWR	VSWR
	S-1	S-2	S-3		S	1	2		3			
5.00	5.45	5.45	5.44	0.01	26.93	26.81	26.95	0.02	1.48	1.34	1.34	1.33
20.00	5.42	5.42	5.42	0.01	31.70	31.86	31.88	0.11	1.18	1.25	1.24	1.25
100.00	5.31	5.31	5.30	0.01	29.59	30.25	30.23	0.12	1.09	1.21	1.20	1.20
200.00	5.32	5.32	5.30	0.02	27.42	28.52	28.48	0.23	1.06	1.18	1.17	1.18
300.00	5.36	5.35	5.35	0.02	25.66	27.13	27.11	0.22	1.03	1.16	1.15	1.16
400.00	5.42	5.38	5.38	0.04	24.31	26.11	26.09	0.36	1.03	1.13	1.13	1.14
500.00	5.48	5.42	5.44	0.06	23.23	25.33	25.33	0.27	1.03	1.11	1.12	1.13
600.00	5.57	5.49	5.51	0.07	22.24	24.62	24.63	0.34	1.03	1.10	1.11	1.12
700.00	5.67	5.57	5.59	0.10	21.32	23.89	23.93	0.23	1.05	1.12	1.11	1.11
800.00	5.80	5.65	5.67	0.14	20.56	23.31	23.36	0.17	1.09	1.14	1.13	1.11
900.00	5.94	5.77	5.78	0.17	20.07	23.04	23.12	0.12	1.13	1.19	1.15	1.12
1000.00	6.10	5.88	5.89	0.22	20.01	23.44	23.49	0.38	1.16	1.24	1.20	1.14
1080.00	6.24	5.96	5.96	0.28	20.34	24.35	24.41	0.72	1.17	1.27	1.24	1.16
1200.00	6.41	6.06	6.05	0.36	21.16	25.88	25.76	1.60	1.17	1.32	1.29	1.19
1320.00	6.68	6.23	6.22	0.46	20.50	22.58	22.41	2.83	1.29	1.33	1.29	1.21

1. Total Loss = Insertion Loss + 4.8dB splitter loss.



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3 Way-0° Power Splitter/Combiner

SYPS-3-12W-75+

Typical Performance Data

FREQ. (MHz)	TOTAL LOSS ¹ (dB)			AMP. UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (deg.)	FREQ. (MHz)	VSWR (:1)			
	S-1	S-2	S-3		1-2	1-3	2-3			S	1	2	3
4	5.50	5.50	5.50	0.00	23.93	23.86	23.86	0.09	4	1.74	1.43	1.42	1.42
5	5.44	5.45	5.44	0.00	25.80	25.73	25.73	0.07	5	1.55	1.36	1.36	1.36
6	5.44	5.44	5.44	0.00	27.20	27.14	27.14	0.03	6	1.45	1.33	1.32	1.32
7	5.45	5.44	5.43	0.01	28.25	28.20	28.22	0.06	7	1.38	1.31	1.30	1.30
8	5.45	5.44	5.44	0.01	29.06	29.03	29.03	0.07	8	1.33	1.29	1.28	1.29
10	5.44	5.44	5.44	0.01	30.17	30.20	30.17	0.03	10	1.28	1.28	1.27	1.27
20	5.42	5.42	5.42	0.01	31.70	31.86	31.88	0.11	20	1.18	1.25	1.24	1.25
30	5.39	5.40	5.39	0.01	31.60	31.89	31.84	0.08	30	1.15	1.24	1.23	1.24
40	5.37	5.36	5.37	0.00	31.34	31.67	31.66	0.09	40	1.13	1.23	1.23	1.23
50	5.34	5.34	5.34	0.00	31.00	31.40	31.37	0.04	50	1.12	1.23	1.22	1.22
100	5.31	5.31	5.30	0.01	29.59	30.25	30.23	0.12	100	1.09	1.21	1.20	1.20
150	5.31	5.30	5.30	0.01	28.39	29.27	29.24	0.08	150	1.07	1.19	1.19	1.19
200	5.32	5.32	5.30	0.02	27.42	28.52	28.48	0.23	200	1.06	1.18	1.17	1.18
250	5.34	5.33	5.32	0.02	26.46	27.75	27.70	0.19	250	1.05	1.17	1.16	1.17
300	5.36	5.35	5.35	0.02	25.66	27.13	27.11	0.22	300	1.03	1.16	1.15	1.16
400	5.42	5.38	5.38	0.04	24.31	26.11	26.09	0.36	400	1.03	1.13	1.13	1.14
500	5.48	5.42	5.44	0.06	23.23	25.33	25.33	0.27	500	1.03	1.11	1.12	1.13
550	5.52	5.46	5.47	0.06	22.71	24.97	24.94	0.27	550	1.03	1.11	1.11	1.12
600	5.57	5.49	5.51	0.07	22.24	24.62	24.63	0.34	600	1.03	1.10	1.11	1.12
650	5.63	5.53	5.56	0.10	21.78	24.26	24.29	0.31	650	1.04	1.11	1.11	1.11
700	5.67	5.57	5.59	0.10	21.32	23.89	23.93	0.23	700	1.05	1.12	1.11	1.11
750	5.73	5.62	5.64	0.11	20.91	23.58	23.63	0.12	750	1.07	1.13	1.12	1.11
800	5.80	5.65	5.67	0.14	20.56	23.31	23.36	0.17	800	1.09	1.14	1.13	1.11
820	5.82	5.67	5.69	0.15	20.43	23.23	23.27	0.15	820	1.10	1.15	1.13	1.11
840	5.85	5.70	5.72	0.14	20.32	23.16	23.20	0.18	840	1.11	1.16	1.13	1.11
860	5.88	5.72	5.75	0.16	20.21	23.10	23.14	0.16	860	1.12	1.17	1.14	1.11
900	5.94	5.77	5.78	0.17	20.07	23.04	23.12	0.12	900	1.13	1.19	1.15	1.12
925	5.98	5.80	5.82	0.19	20.00	23.08	23.13	0.13	925	1.14	1.20	1.16	1.12
950	6.02	5.82	5.83	0.20	19.98	23.14	23.20	0.14	950	1.15	1.21	1.17	1.13
1000	6.10	5.88	5.89	0.22	20.01	23.44	23.49	0.38	1000	1.16	1.24	1.20	1.14
1080	6.24	5.96	5.96	0.28	20.34	24.35	24.41	0.72	1080	1.17	1.27	1.24	1.16
1140	6.33	6.02	6.02	0.31	20.77	25.33	25.33	1.01	1140	1.17	1.30	1.27	1.18
1200	6.41	6.06	6.05	0.36	21.16	25.88	25.76	1.60	1200	1.17	1.32	1.29	1.19
1260	6.52	6.13	6.11	0.42	21.22	24.95	24.79	2.09	1260	1.21	1.33	1.29	1.21
1320	6.68	6.23	6.22	0.46	20.50	22.58	22.41	2.83	1320	1.29	1.33	1.29	1.21
1380	6.93	6.42	6.40	0.53	19.09	19.90	19.79	3.48	1380	1.39	1.31	1.26	1.22
1440	7.31	6.77	6.74	0.57	17.40	17.51	17.47	4.23	1440	1.56	1.28	1.23	1.22
1500	7.84	7.24	7.21	0.63	15.76	15.53	15.56	5.17	1500	1.72	1.24	1.18	1.21

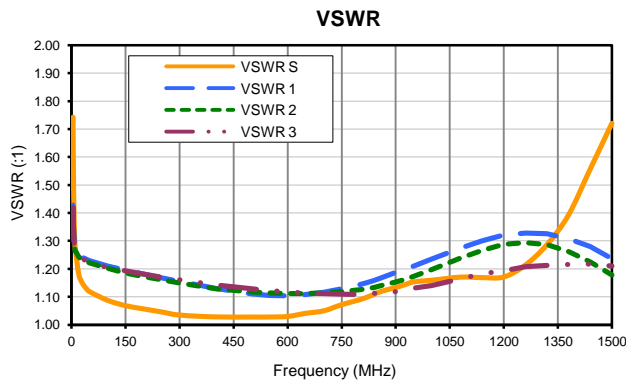
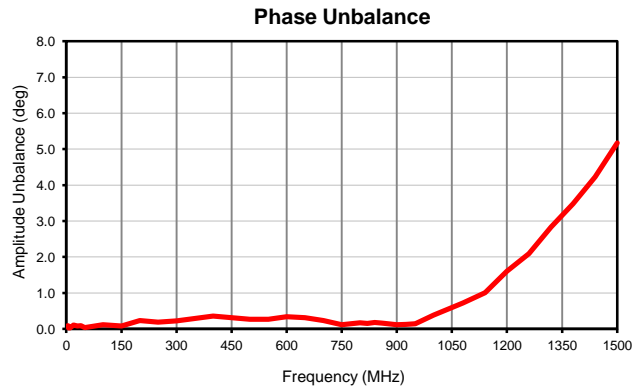
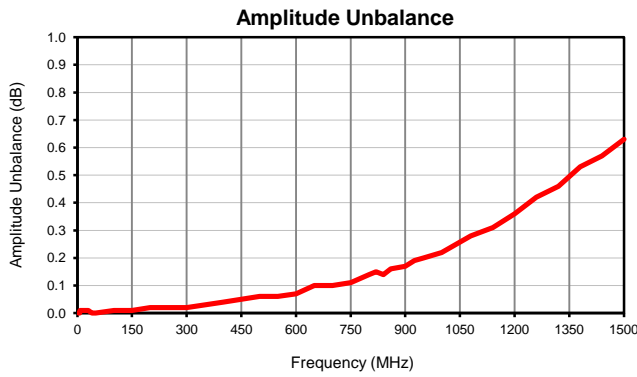
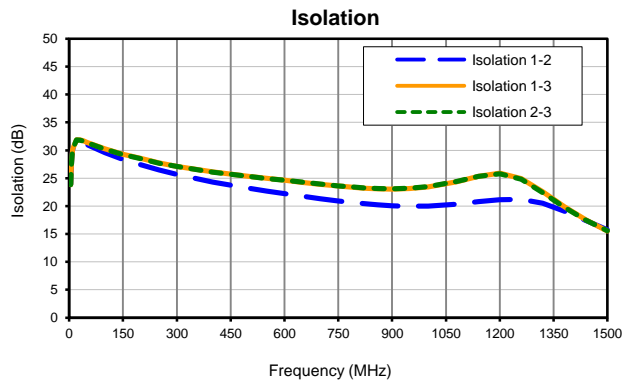
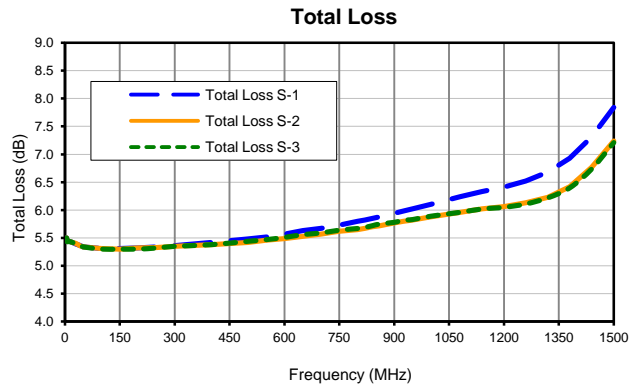
¹Total Loss = Insertion Loss + 4.8dB Splitter Loss



3 Way-0° Power Splitter/Combiner

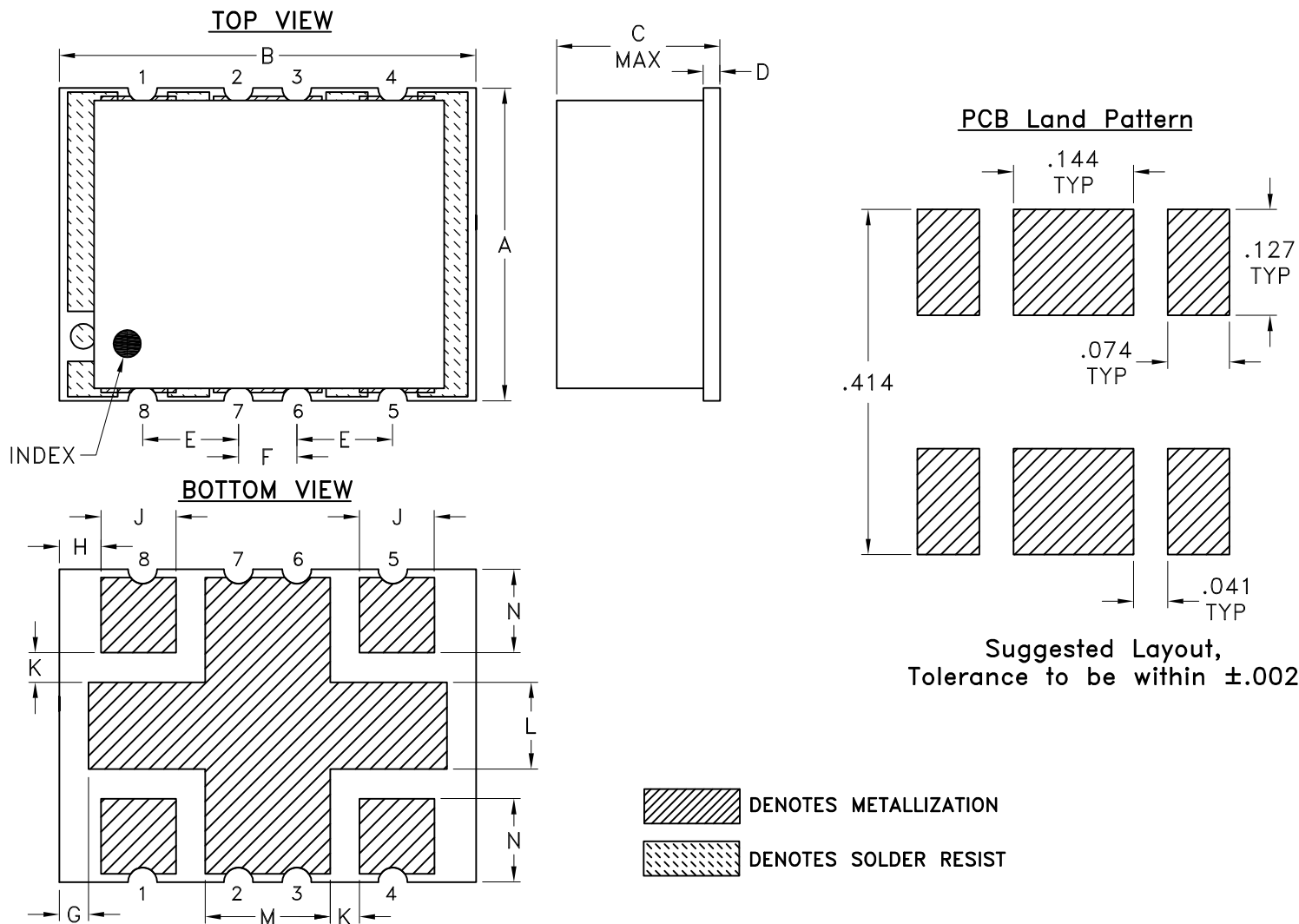
SYPS-3-12W-75+

Typical Performance Curves



Outline Dimensions

AH202



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

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT, GRAM
AH202	.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. $\pm .01$; 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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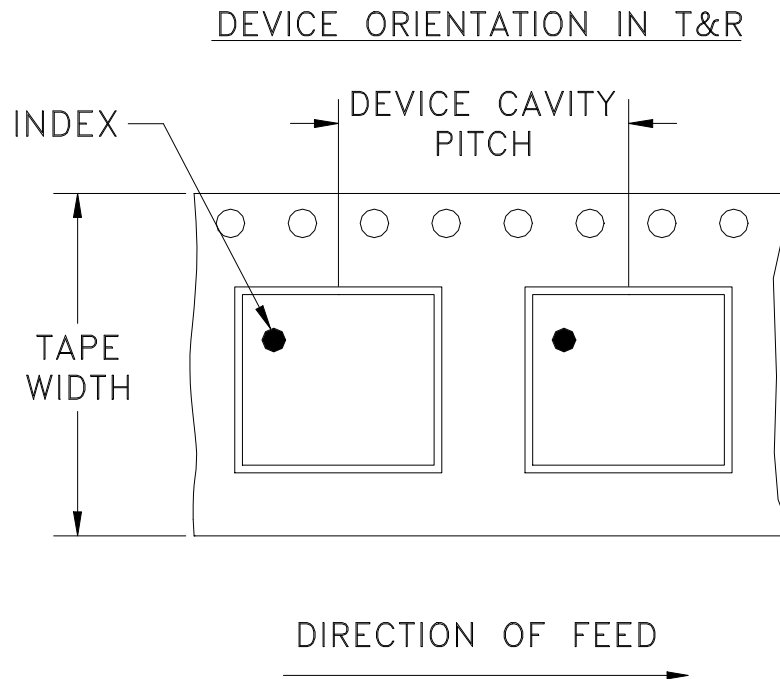
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F61



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

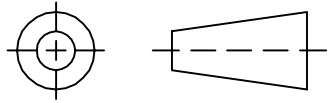
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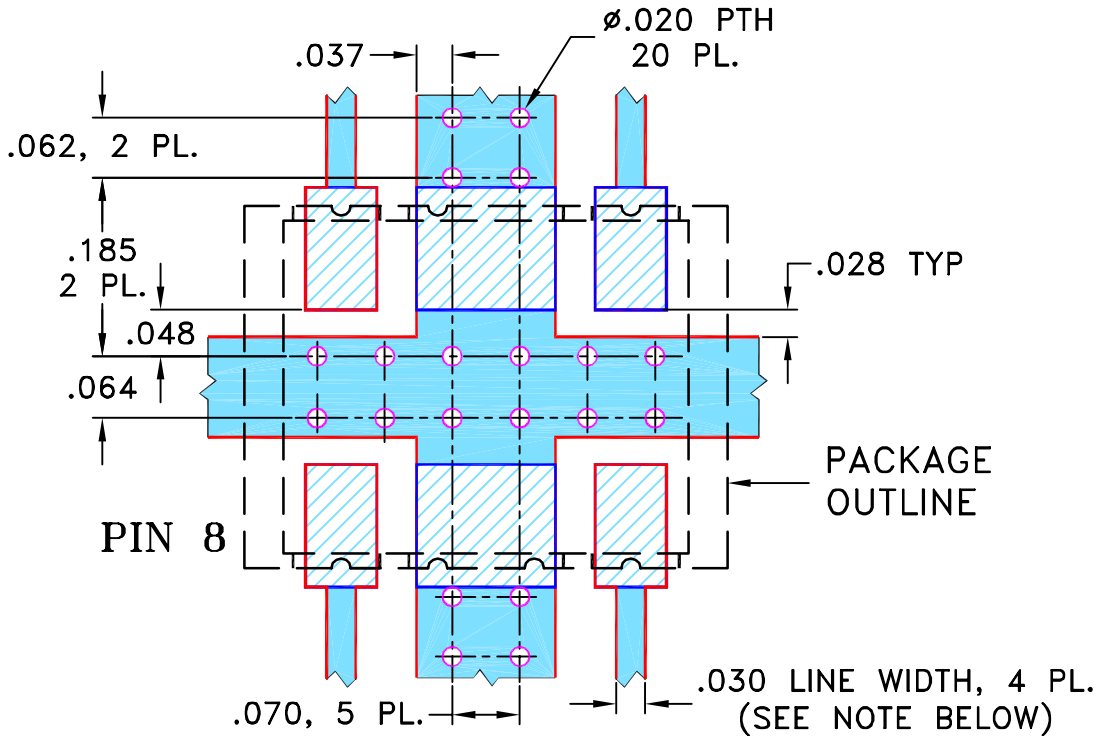
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101377	NEW RELEASE	10/18/05	MMG	HY
A	M102713	ADDED "...WITH SMOBC"	01/12/06	GT	IL

SUGGESTED MOUNTING CONFIGURATION
FOR AH202 CASE STYLE, "rd" PIN CONNECTION.

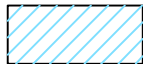


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2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



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

DRAWN

MMG

10/17/05

TOLERANCES ON:

CHECKED

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10/18/05

2 PL DECIMALS ±

APPROVED

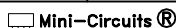
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10/18/05

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±



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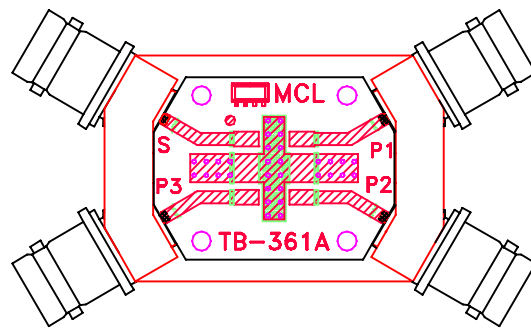
13 Neptune Avenue
Brooklyn NY 11235

PL, rd, 75, AH202, SYPS-3, TB-361

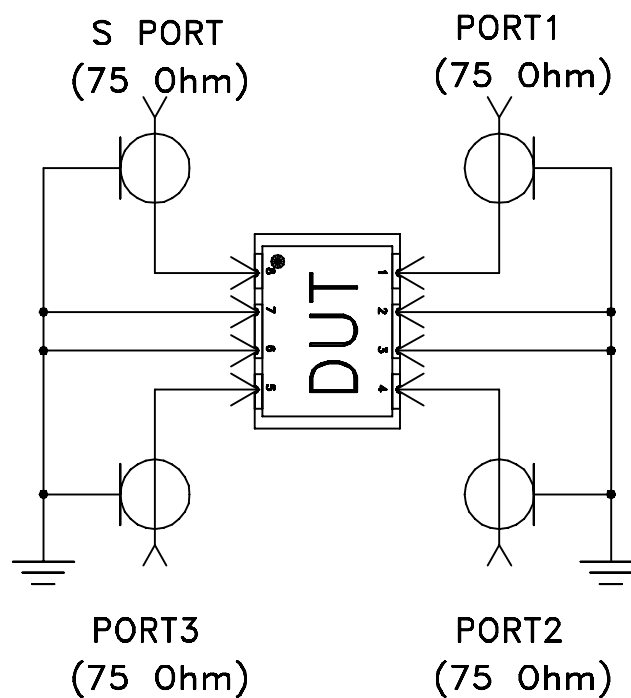
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-229	REV: A
FILE: 98PL229	SCALE: 5:1	SHEET: 1 OF 1	

Evaluation Board and Circuit




TB-361+



Schematic Diagram

Notes:

1. 75 Ohm BNC-type Female connectors.
2. PCB Material: Rogers RO4350 or its equivalent, Dielectric Constant=3.5, Thickness=.060"

 **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