

Surface Mount Power Splitter/Combiner

SYPQ-70+

2 Way-90° 50Ω 65 to 75 MHz

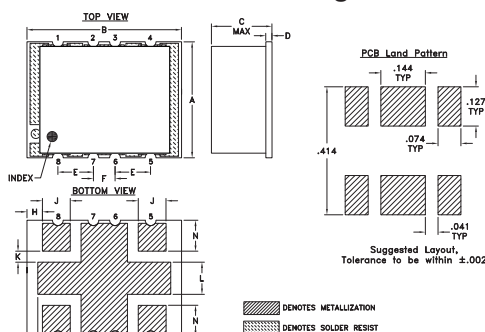
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

SUMPORT	1
PORT 1 (0°)	5
PORT 2 (+90°)	8
GROUND	2,3,6,7
50 OHM TERM EXTERNAL	4

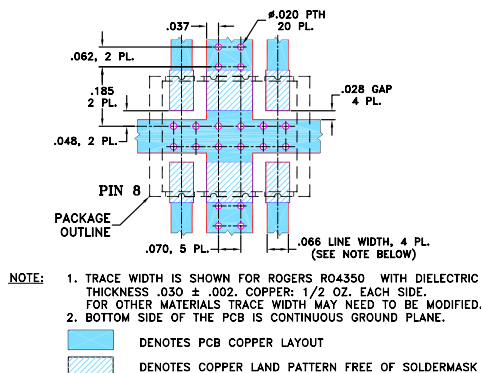
Outline Drawing



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			
.090	.040	.105	.140	.095			
2.29	1.02	2.67	3.56	2.41			
					wt		
					grams		
					0.80		

Demo Board MCL P/N: TB-265 Suggested PCB Layout (PL-138)



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-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, 0.1 dB typ.
- high isolation, 31 dB typ.
- good amplitude balance, 1.1 dB max.
- excellent VSWR, 1.06:1 typ.

Applications

- VHF
- balanced amplifiers
- I&Q modulators



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

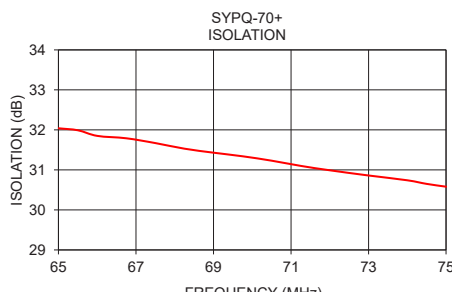
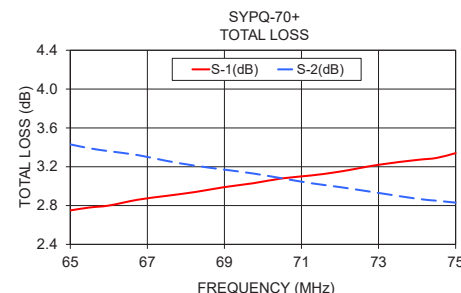
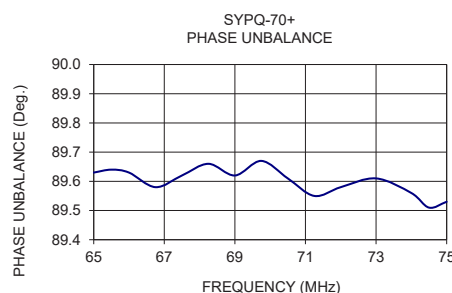
Splitter Electrical Specifications

FREQ. RANGE (MHz)	ISOLATION (dB)		INSERTION LOSS (dB) Avg. of Coupled Outputs ABOVE 3 dB		PHASE UNBALANCE (Degrees)	AMPLITUDE UNBALANCE (dB)
f_L - f_U	Typ.	Min.	Typ.	Max.	Max.	Max.
65-75	31	24	0.1	0.4	3	1.1

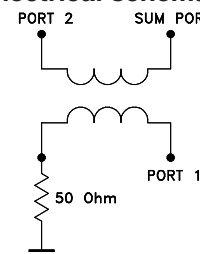
Typical Performance Data

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
65.00	2.75	3.43	0.68	32.04	89.63	1.04	1.03	1.05
65.50	2.78	3.39	0.61	31.99	89.64	1.04	1.03	1.05
66.00	2.80	3.36	0.56	31.85	89.63	1.04	1.03	1.05
66.75	2.86	3.32	0.46	31.79	89.58	1.04	1.03	1.05
67.50	2.90	3.26	0.36	31.67	89.62	1.04	1.03	1.05
68.25	2.94	3.21	0.27	31.53	89.66	1.04	1.03	1.05
69.00	2.99	3.17	0.19	31.43	89.62	1.04	1.03	1.06
69.75	3.03	3.13	0.10	31.34	89.67	1.04	1.03	1.06
70.50	3.08	3.08	0.00	31.23	89.61	1.04	1.03	1.06
71.25	3.11	3.03	0.08	31.10	89.55	1.04	1.03	1.06
72.00	3.15	2.99	0.16	30.99	89.58	1.04	1.04	1.06
73.00	3.22	2.93	0.29	30.86	89.61	1.04	1.04	1.06
74.00	3.27	2.87	0.40	30.74	89.56	1.04	1.04	1.06
74.50	3.29	2.85	0.45	30.65	89.51	1.04	1.04	1.06
75.00	3.34	2.83	0.51	30.58	89.53	1.04	1.04	1.06

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



electrical schematic



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REV. E
M151107
SYPQ-70+
HY/CP/AM
200406

2 Way-90° Power Splitter/Combiner

SYPQ-70+

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
65.00	2.75	3.43	0.68	32.04	89.63	65.00	1.04	1.03	1.05
65.25	2.77	3.41	0.64	31.99	89.56	65.25	1.04	1.03	1.05
65.50	2.78	3.39	0.61	31.99	89.64	65.50	1.04	1.03	1.05
65.75	2.79	3.38	0.60	31.91	89.66	65.75	1.04	1.03	1.05
66.00	2.80	3.36	0.56	31.85	89.63	66.00	1.04	1.03	1.05
66.25	2.83	3.34	0.52	31.82	89.58	66.25	1.04	1.03	1.05
66.50	2.84	3.33	0.49	31.80	89.61	66.50	1.04	1.03	1.05
66.75	2.86	3.32	0.46	31.79	89.58	66.75	1.04	1.03	1.05
67.00	2.86	3.29	0.43	31.75	89.57	67.00	1.04	1.03	1.05
67.25	2.88	3.28	0.40	31.71	89.64	67.25	1.04	1.03	1.05
67.50	2.90	3.26	0.36	31.67	89.62	67.50	1.04	1.03	1.05
67.75	2.91	3.24	0.33	31.62	89.60	67.75	1.04	1.03	1.05
68.00	2.92	3.23	0.31	31.58	89.58	68.00	1.04	1.03	1.05
68.25	2.94	3.21	0.27	31.53	89.66	68.25	1.04	1.03	1.05
68.50	2.95	3.20	0.25	31.50	89.60	68.50	1.04	1.03	1.05
68.75	2.97	3.18	0.22	31.48	89.58	68.75	1.04	1.03	1.06
69.00	2.99	3.17	0.19	31.43	89.62	69.00	1.04	1.03	1.06
69.25	3.00	3.15	0.16	31.39	89.60	69.25	1.04	1.03	1.06
69.50	3.00	3.13	0.13	31.35	89.68	69.50	1.04	1.03	1.06
69.75	3.03	3.13	0.10	31.34	89.67	69.75	1.04	1.03	1.06
70.00	3.05	3.11	0.06	31.28	89.60	70.00	1.04	1.03	1.06
70.25	3.05	3.09	0.04	31.25	89.65	70.25	1.04	1.03	1.06
70.50	3.08	3.08	0.00	31.23	89.61	70.50	1.04	1.03	1.06
70.75	3.08	3.06	0.03	31.20	89.64	70.75	1.04	1.03	1.06
71.00	3.10	3.05	0.06	31.13	89.62	71.00	1.04	1.03	1.06
71.25	3.11	3.03	0.08	31.10	89.55	71.25	1.04	1.03	1.06
71.50	3.12	3.01	0.11	31.07	89.60	71.50	1.04	1.03	1.06
71.75	3.14	3.01	0.14	31.04	89.63	71.75	1.04	1.04	1.06
72.00	3.15	2.99	0.16	30.99	89.58	72.00	1.04	1.04	1.06
72.25	3.17	2.97	0.20	30.95	89.60	72.25	1.04	1.03	1.06
72.50	3.18	2.95	0.23	30.97	89.57	72.50	1.04	1.04	1.06
72.75	3.21	2.95	0.26	30.88	89.54	72.75	1.04	1.03	1.06
73.00	3.22	2.93	0.29	30.86	89.61	73.00	1.04	1.04	1.06
73.25	3.23	2.92	0.31	30.82	89.60	73.25	1.04	1.04	1.06
73.50	3.25	2.91	0.34	30.78	89.55	73.50	1.04	1.04	1.06
73.75	3.26	2.89	0.36	30.76	89.56	73.75	1.04	1.04	1.06
74.00	3.27	2.87	0.40	30.74	89.56	74.00	1.04	1.04	1.06
74.25	3.29	2.87	0.42	30.69	89.54	74.25	1.04	1.04	1.06
74.50	3.29	2.85	0.45	30.65	89.51	74.50	1.04	1.04	1.06
74.75	3.32	2.84	0.48	30.61	89.56	74.75	1.04	1.04	1.06
75.00	3.34	2.83	0.51	30.58	89.53	75.00	1.04	1.04	1.06

¹Total Loss = Insertion Loss + 3dB Splitter Loss



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IF/RF MICROWAVE COMPONENTS



REV. X2

SYPQ-70+

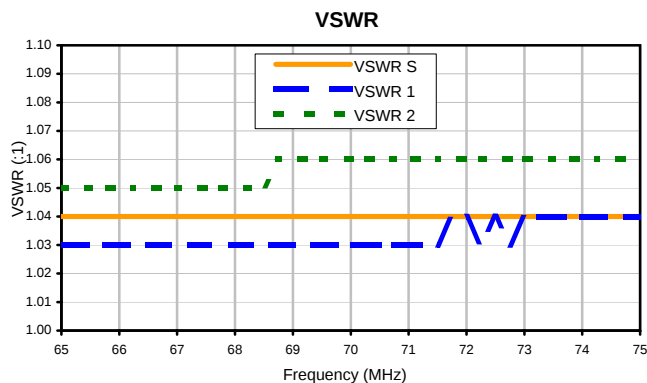
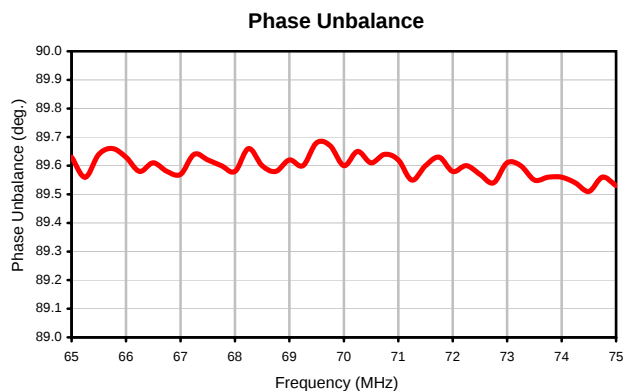
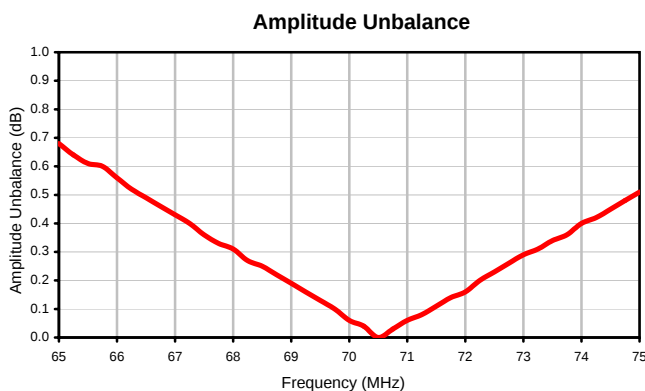
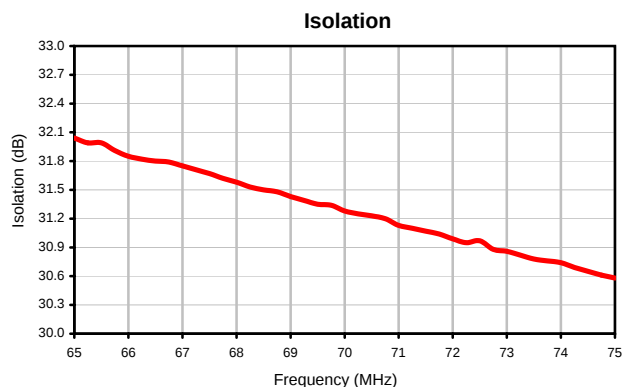
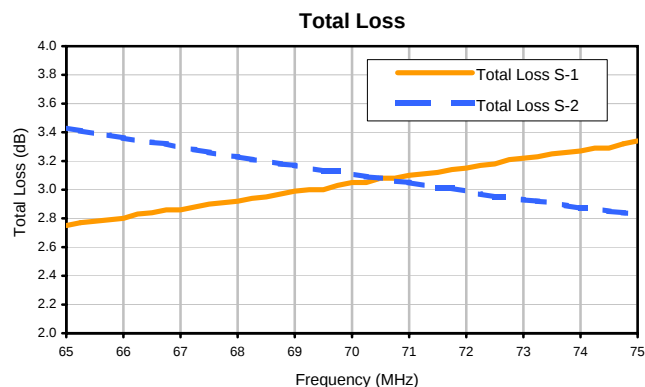
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2 Way-90° Power Splitter/Combiner

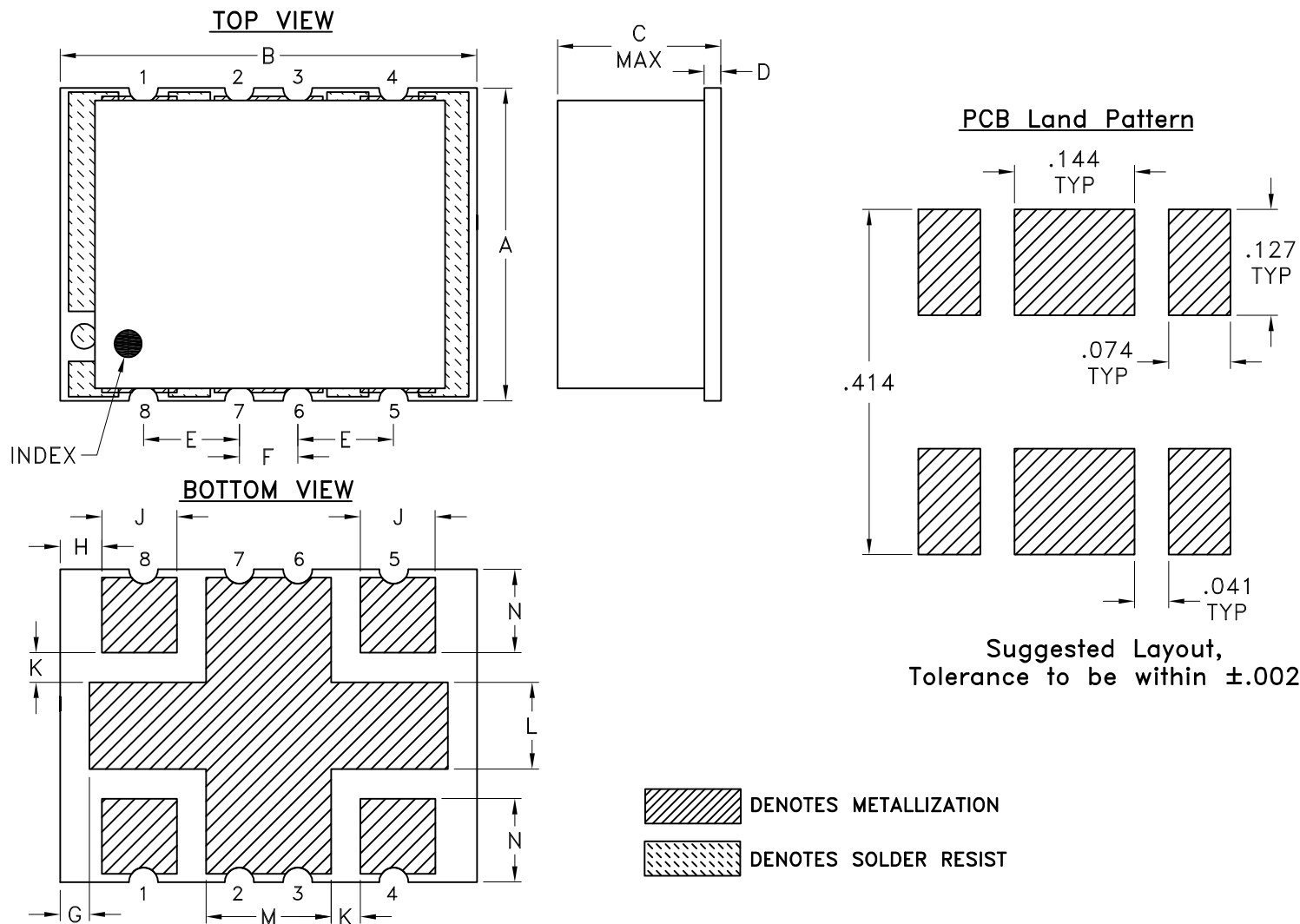
SYPQ-70+

Typical Performance Curves



Outline Dimensions

AH202



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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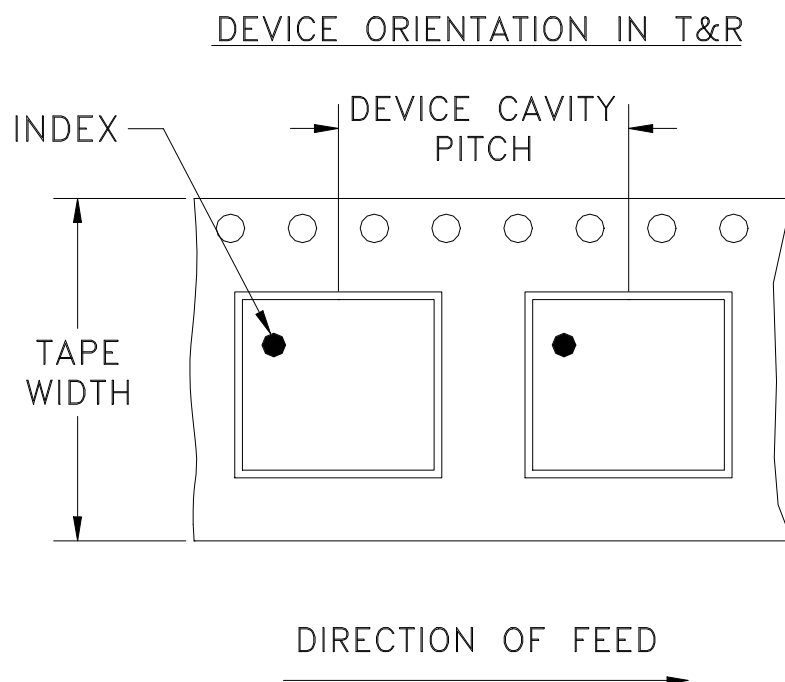
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F61



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

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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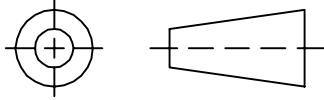
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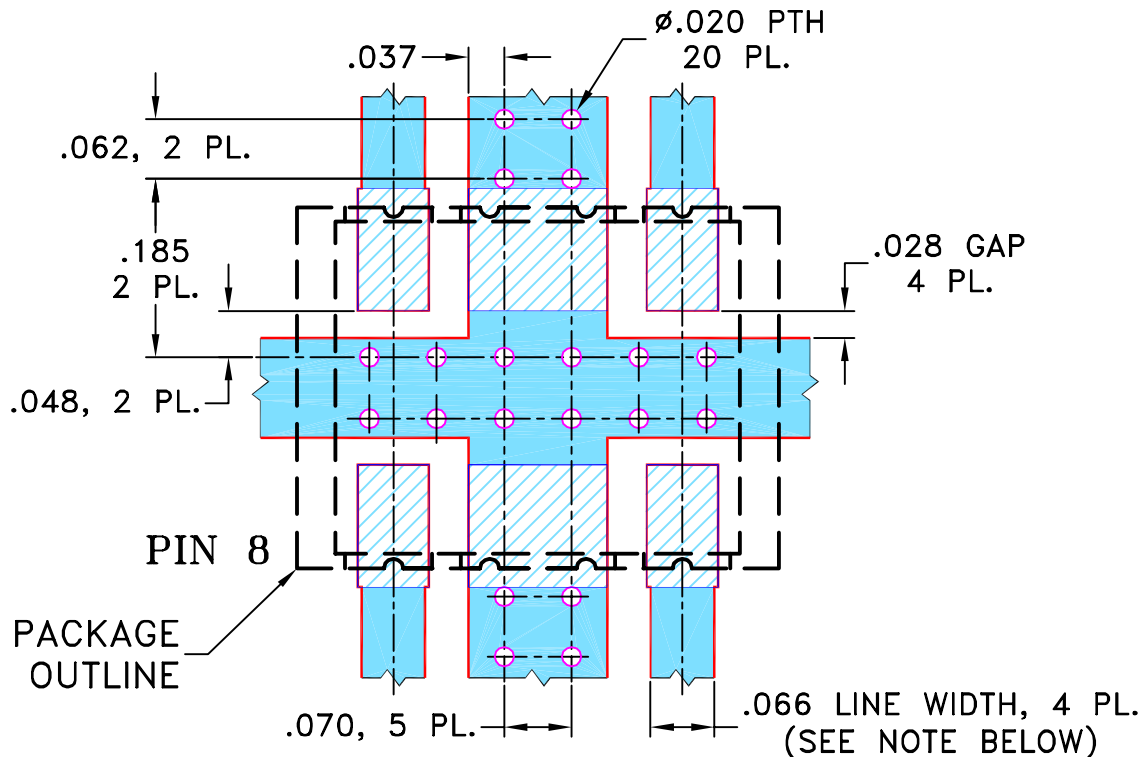
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M88784	NEW RELEASE	10/20/03	GF	HY
A	M93261	PIN 8 WAS PIN 1	07/19/04	MMG	HY
B	M102713	ADDED "...WITH SMOBC"	01/16/06	GF	IL

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



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" $\pm$ 0.002"; 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

TOLERANCES ON:

2 PL DECIMALS $\pm$

3 PL DECIMALS $\pm$.005

ANGLES $\pm$

FRACTIONS $\pm$

DRAWN

GF

09/18/03

CHECKED

IL

10/20/03

APPROVED

HY

10/20/03

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ASHEETA1.DWG REV:A DATE:01/12/95



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Brooklyn NY 11235

PL, av, AH202, SYPQ-70, TB-265

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-138

REV:

B

FILE:

98PL138

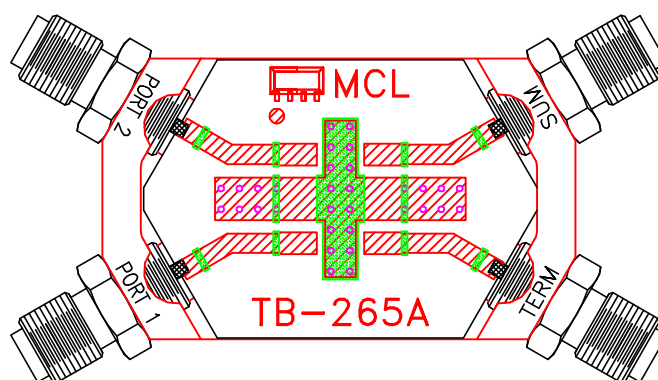
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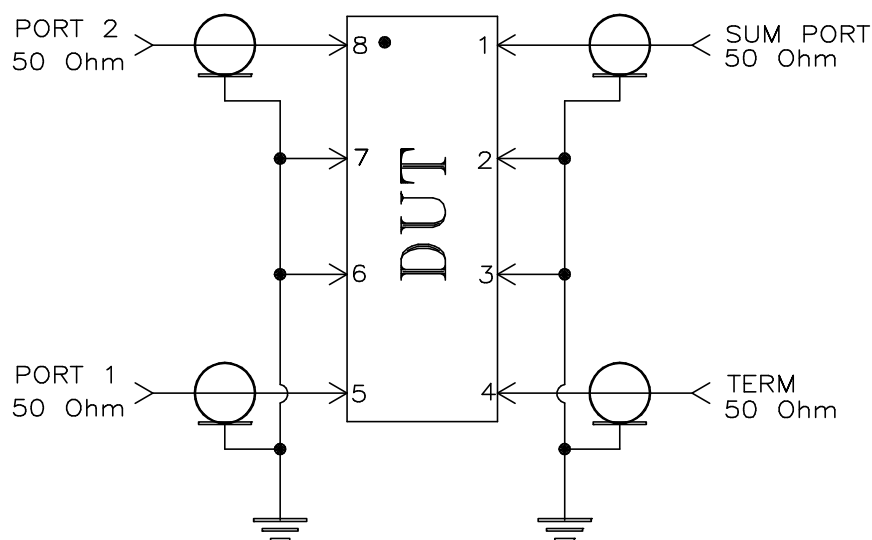
SHEET:

1 OF 1

Evaluation Board and Circuit



TB-265



Schematic Diagram

Notes:

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

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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