

Engineering Development Model

Bi-Directional Coupler

SYDC-ED12537/2

Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : AH202-1

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C				
Parameter		Min.	Typ.	Max. Units
Frequency		5		700 MHz
Coupling	Nominal		20±0.5	dB
	Flatness		±0.595	dB
Mainline Loss **	5-50 MHz		0.1	dB
	50-350 MHz		0.2	dB
	350-700 MHz		0.3	dB
Directivity	5-50 MHz		37	dB
	50-350 MHz		40	dB
	350-700 MHz		24	dB
VSWR	5-700 MHz		1.05	(:1)
RF Power Input***	5-700 MHz			25 W

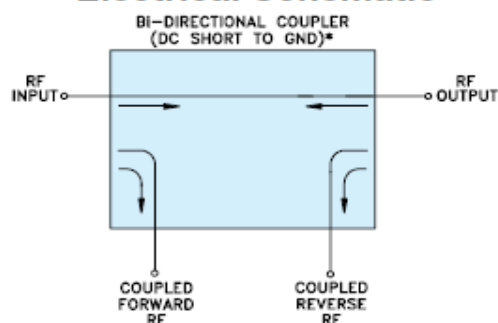
** Mainline loss includes theoretical coupled power loss of 0.0436 dB at 20 dB coupling.

***The user must provide adequate means of heat removal to limit the temperature of ground connections 2,3,6,7 to 85°C, in order to ensure proper performance. At 25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 20°C/W or less when the unit is driven at maximum specified RF input power, 25W. At higher ambient temperature, with the same heat sink, input power in watts must not exceed $25W \times (85^{\circ}\text{C} - T_{\text{ambient}}) \div 60^{\circ}\text{C}$.

MAXIMUM RATINGS	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

PIN CONNECTIONS	
INPUT	8
OUTPUT	1
COUPLED FORWARD	5
COUPLED REVERSE	4
GROUND	2,3,6,7

Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.

Bi-Directional Coupler

SYDC-ED12537/2

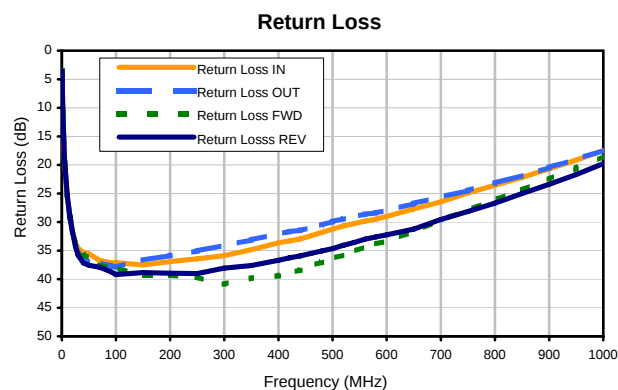
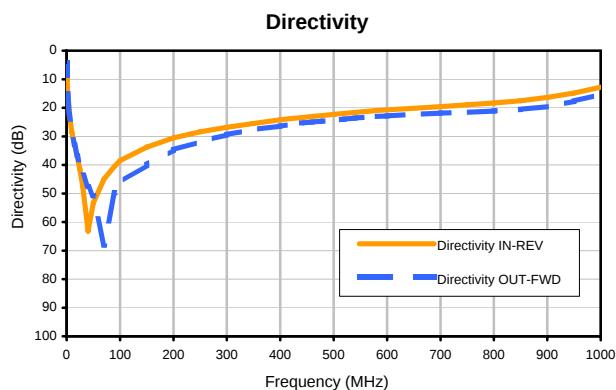
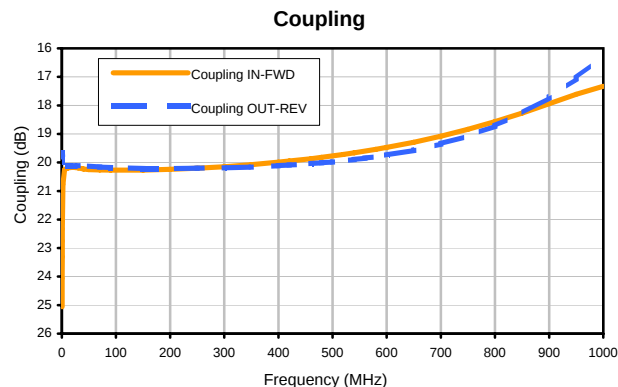
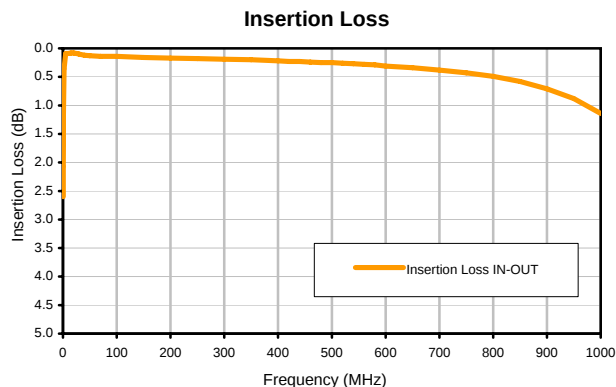
Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB) IN-OUT	COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
		IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
0.6	2.60	25.06	20.01	9.06	4.30	3.56	3.63	3.46	3.53
0.7	2.07	24.06	19.81	9.50	5.55	4.34	4.43	4.23	4.31
0.8	1.68	23.31	19.72	9.96	6.65	5.10	5.19	4.97	5.06
0.9	1.38	22.75	19.68	10.42	7.64	5.82	5.91	5.69	5.78
1.0	1.16	22.33	19.68	10.88	8.51	6.50	6.60	6.36	6.46
2.0	0.36	20.77	19.91	15.02	14.42	11.66	11.78	11.50	11.61
5.0	0.09	20.25	20.09	22.27	22.37	19.35	19.46	19.17	19.27
10.0	0.09	20.20	20.14	28.70	28.62	25.50	25.62	25.37	25.44
15.0	0.08	20.18	20.14	33.14	32.92	29.11	29.33	29.02	29.18
20.0	0.08	20.17	20.13	37.20	36.82	31.73	32.15	31.73	31.94
25.0	0.09	20.18	20.12	41.60	40.53	33.56	34.22	33.72	34.22
30.0	0.10	20.19	20.11	47.26	42.91	34.61	35.50	34.93	35.83
40.0	0.12	20.23	20.12	63.17	47.64	35.31	36.63	35.76	37.16
50.0	0.13	20.25	20.13	53.28	50.83	35.57	37.01	36.18	37.56
70.0	0.14	20.26	20.16	44.91	68.04	36.73	37.14	37.56	37.94
90.0	0.14	20.27	20.18	40.43	49.70	37.12	37.68	37.97	38.69
100.0	0.14	20.27	20.18	38.46	46.21	37.12	37.90	38.04	39.19
150.0	0.16	20.27	20.21	33.77	39.96	37.50	36.66	39.32	38.85
200.0	0.17	20.24	20.21	30.56	34.73	36.91	35.85	39.32	38.95
250.0	0.18	20.20	20.20	28.39	31.88	36.44	35.07	39.66	39.02
300.0	0.19	20.15	20.19	26.82	29.42	35.89	34.07	40.90	38.08
350.0	0.20	20.08	20.16	25.49	27.64	34.85	33.15	39.79	37.63
400.0	0.22	19.99	20.11	24.19	26.41	33.65	32.06	39.42	36.70
420.0	0.23	19.95	20.09	23.78	25.88	33.30	31.69	38.83	36.28
440.0	0.23	19.91	20.07	23.45	25.33	32.98	31.47	38.43	35.93
460.0	0.24	19.87	20.04	23.01	24.96	32.41	31.00	37.55	35.49
480.0	0.25	19.82	20.01	22.68	24.63	31.83	30.52	37.02	35.06
500.0	0.25	19.77	19.98	22.30	24.32	31.23	29.92	36.36	34.64
520.0	0.26	19.72	19.94	21.94	23.97	30.67	29.42	35.77	34.06
540.0	0.27	19.66	19.90	21.60	23.60	30.27	29.01	35.11	33.59
560.0	0.28	19.60	19.85	21.28	23.28	29.83	28.63	34.33	33.00
580.0	0.29	19.54	19.80	20.97	23.02	29.50	28.39	33.85	32.60
600.0	0.31	19.47	19.74	20.75	22.83	29.02	27.99	33.32	32.24
650.0	0.34	19.29	19.57	20.18	22.32	27.70	26.76	31.66	31.23
700.0	0.38	19.08	19.35	19.59	21.87	26.46	25.64	29.66	29.56
750.0	0.43	18.84	19.07	18.92	21.61	24.91	24.49	27.92	28.16
800.0	0.49	18.57	18.72	18.31	21.12	23.56	23.19	26.13	26.70
850.0	0.58	18.27	18.28	17.55	20.56	22.18	21.85	24.40	25.01
900.0	0.71	17.94	17.72	16.37	19.53	20.67	20.44	22.51	23.38
950.0	0.88	17.61	17.05	14.83	17.73	19.16	19.01	20.55	21.67
1000.0	1.14	17.33	16.25	12.78	15.22	17.49	17.45	18.50	19.77

Bi-Directional Coupler

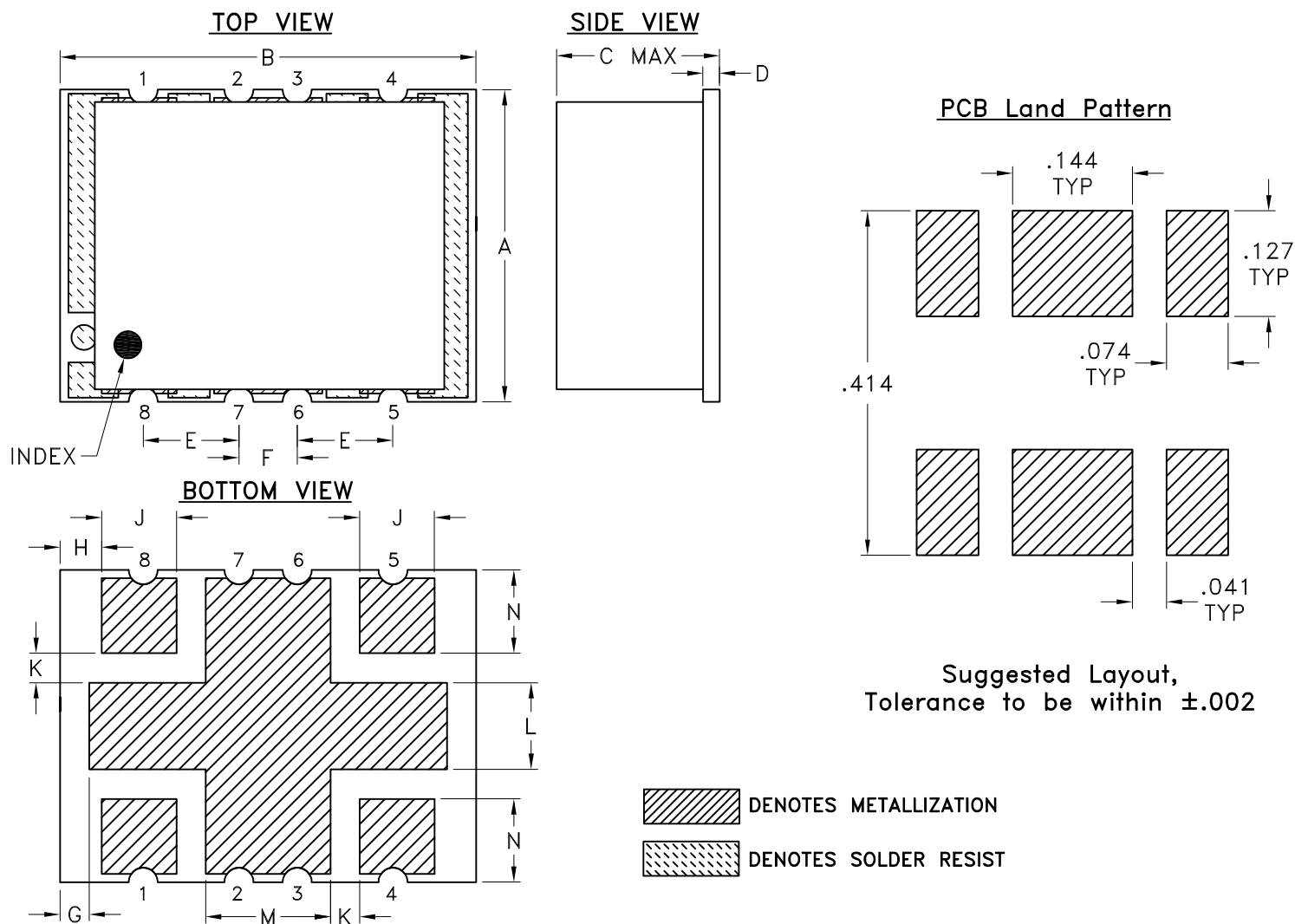
Typical Performance Curves

SYDC-ED12537/2



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.

Mini-Circuits
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
minicircuits.com

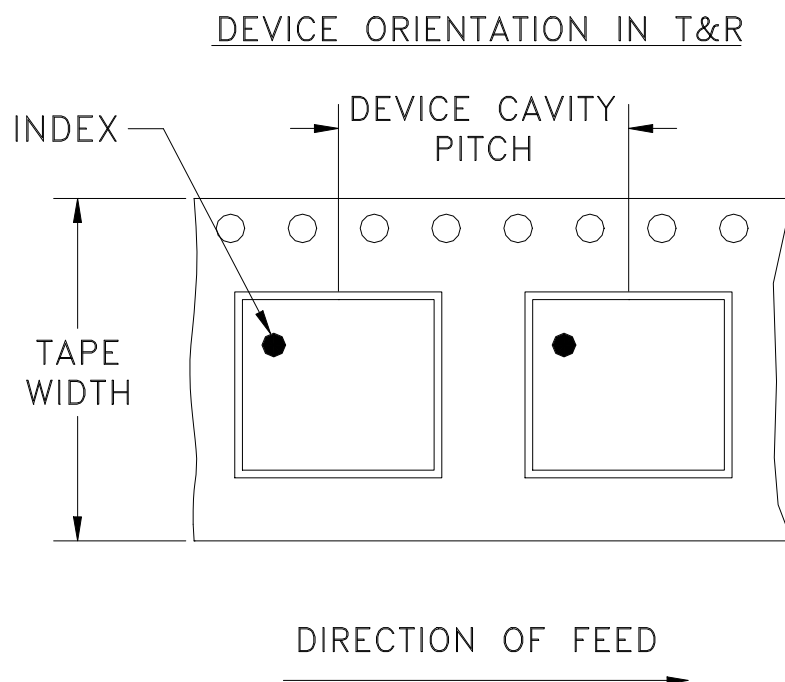
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

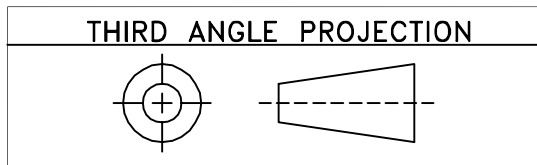


INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

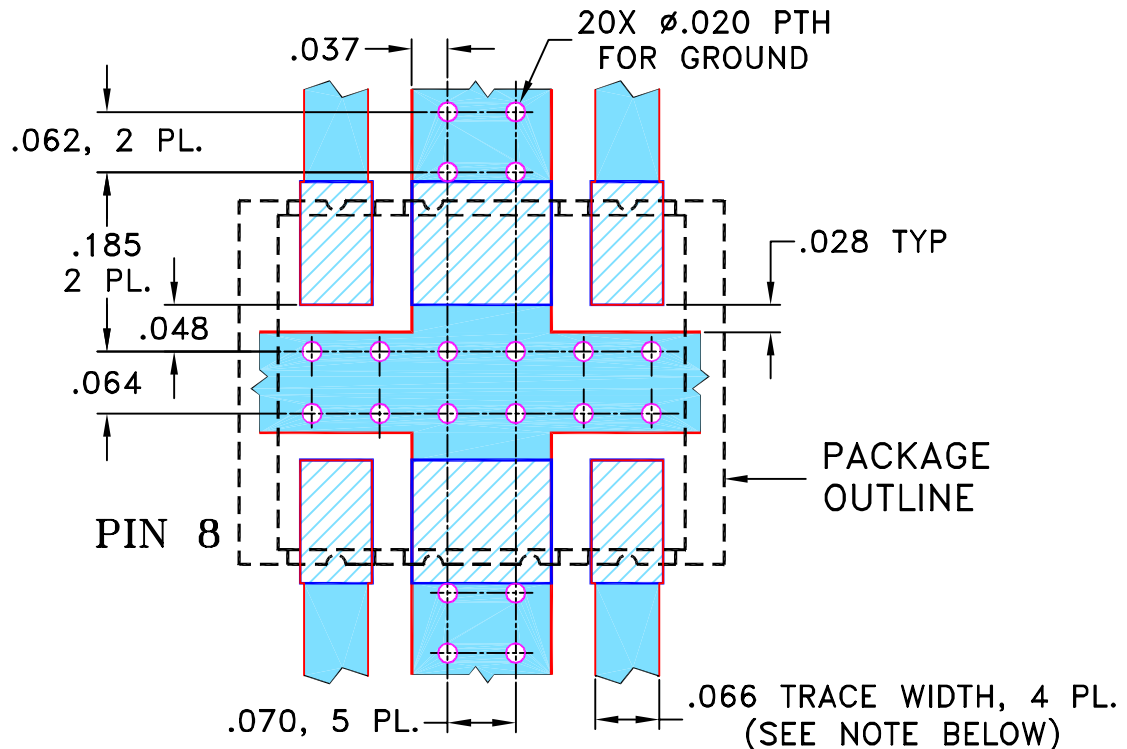
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified



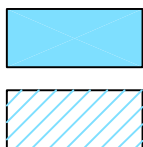
REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M107473	NEW RELEASE	09/25/06	AV	DY

**SUGGESTED MOUNTING CONFIGURATION
FOR AH202-1 CASE STYLE, "rr" PIN CONNECTION**



NOTES:

- 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.
- 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	AV	09/19/06
	CHECKED	IL	09/25/06
	APPROVED	DY	09/25/06



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

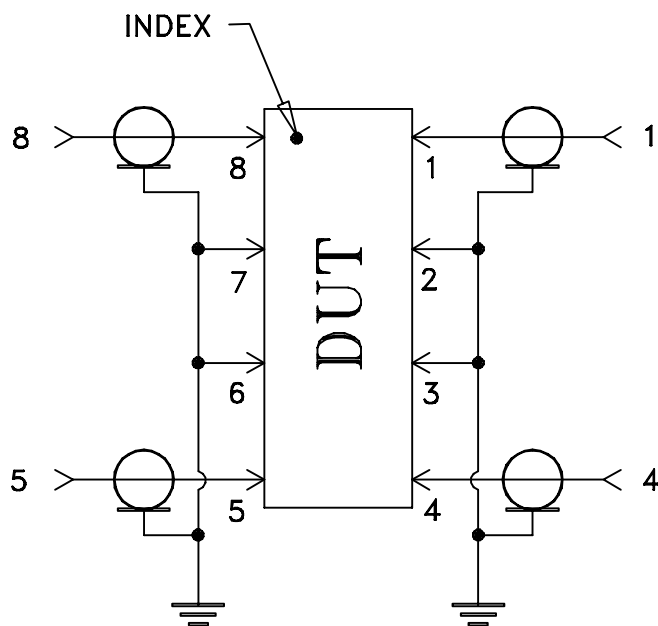
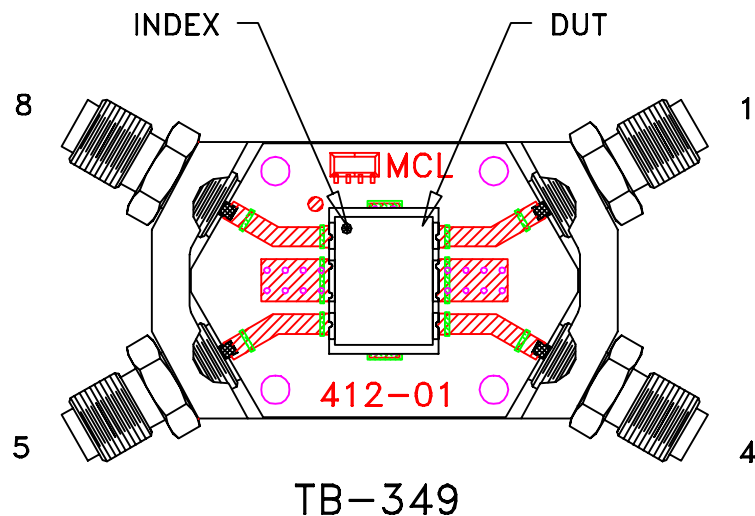
PL, rr, AH202-1, SYDC, TB-349

Mini-Circuits® THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.	
ASHEETA1.DWG REV:A	DATE:01/12/95

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-246	REV: OR
FILE: 98PL246	SCALE: 5:1	SHEET: 1 OF 1	

Evaluation Board and Circuit

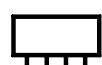
For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

Notes:

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

 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