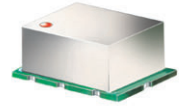


# Bi-Directional Coupler

## SYDC-20-13HP+

50Ω 20 dB Coupling 40 to 1000 MHz



CASE STYLE: AH202-1  
PRICE: \$29.95 ea. QTY (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The + suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

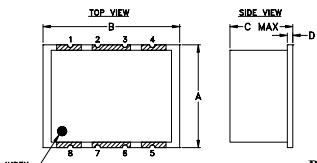
### Maximum Ratings

\*Operating Temperature, Case -40°C to 85°C  
Storage Temperature -55°C to 100°C  
\* Case temperature is defined as temperature on ground leads. Permanent damage may occur if any of these limits are exceeded.

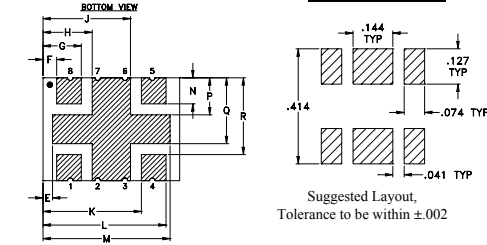
### Pin Connections

INPUT	8
OUTPUT	1
COUPLED (forward)	5
COUPLED (reverse)	4
GROUND	2,3,6,7

### Outline Drawing



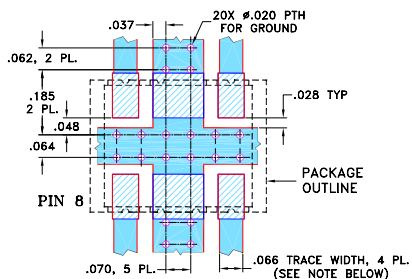
### PCB Land Pattern



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H			
.38	.50	.25	.020	.035	.050	.140	.180			
9.65	12.70	6.35	0.51	0.89	1.27	3.56	4.57			
J	K	L	M	N	P	Q	R	wt		
.320	.360	.450	.465	.095	.135	.240	.280	grams		
8.13	9.14	11.43	11.81	2.41	3.43	6.10	7.11	0.80		

### Demo Board MCL P/N: TB-349 Suggested PCB Layout (PL-246)



- NOTES:
- 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.
  - 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

### Features

- high power, 10W max.
- wideband multi-octave
- low mainline loss, 0.4 dB typ.

### Applications

- VHF/UHF receivers/transmitters
- cellular

### Bi-Directional Coupler Electrical Specifications

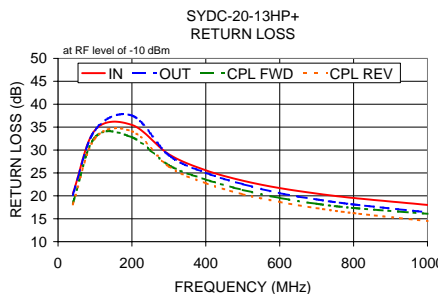
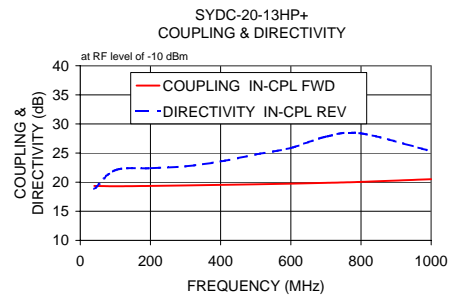
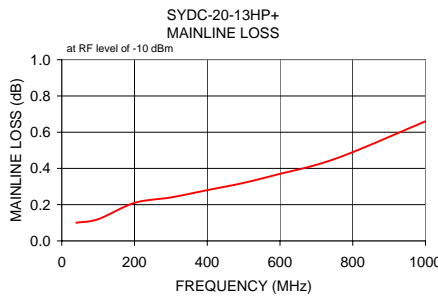
FREQ. (MHz)	COUPLING (dB)		MAINLINE LOSS <sup>1</sup> (dB)		DIRECTIVITY (dB)		VSWR (:1)	POWER <sup>2</sup> INPUT (W)
	Nom.	Flatness	Typ.	Max.	Typ.	Min.		
f <sub>i</sub> -f <sub>u</sub>								
40-1000	20±1.0	±0.9	0.4	1.1	28	14	1.55	10

1. Mainline loss includes theoretical power loss at coupled port.

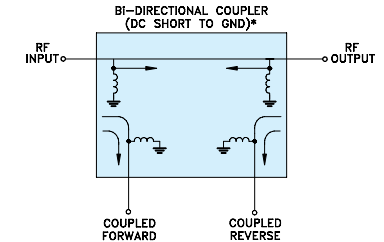
2. The user must provide adequate means of heat removal to limit the temperature of ground connections 2,3,6,7 to 85°C, in order to ensure proper performance. At 25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 27°C/W or less when the unit is driven at maximum specified RF input power, 10W. At higher ambient temperature, with the same heat sink, input power in watts must not exceed 10W x (85°C - T<sub>AMBIENT</sub>) ÷ 60°C.

### Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
		In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd
40.00	0.10	19.36	19.51	19.01	18.84	20.45	20.20	18.37	18.14
100.00	0.12	19.30	19.34	25.29	22.07	34.36	34.34	32.77	32.57
200.00	0.21	19.35	19.50	28.64	22.40	35.48	37.54	32.79	34.08
300.00	0.24	19.44	19.64	30.84	22.72	29.08	28.84	26.69	26.39
400.00	0.28	19.54	19.79	33.82	23.56	25.58	25.01	23.56	22.77
500.00	0.32	19.64	19.95	37.70	24.76	23.31	22.56	21.29	20.34
600.00	0.37	19.75	20.12	38.46	25.88	21.69	20.56	19.54	18.67
700.00	0.42	19.88	20.29	33.39	27.81	20.49	19.21	18.26	17.32
800.00	0.49	20.05	20.48	28.31	28.38	19.53	18.13	17.35	16.22
1000.00	0.66	20.51	20.83	20.87	25.33	18.01	16.40	16.08	14.50



### Electrical Schematic



\* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMERS THAT ROUTES DC FROM RF PORTS TO GROUND.  
For detailed performance specs & shopping online see web site



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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](http://www.minicircuits.com/MCLStore/terms.jsp).

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