

Surface Mount

# Bi-Directional Coupler

## SYDC-20-22HP+

50Ω 20 dB Coupling 3 to 200 MHz



CASE STYLE: AH202-1  
PRICE: \$34.95 ea. QTY (1-9)

### Maximum Ratings

\*Operating Temperature, Case -40°C to 65°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.

### Pad Connections

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

### Features

- high power, 30W max.
- wideband multi-octave
- excellent VSWR, 1.10:1 typ.

### Applications

- VHF/UHF
- signal monitoring
- communications
- military mobile

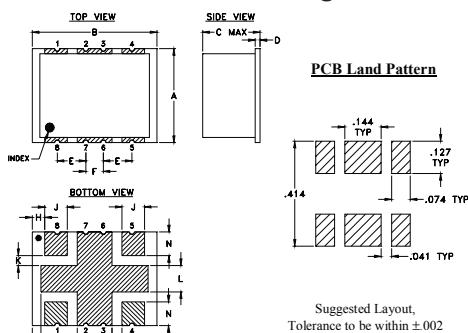
**+RoHS Compliant**  
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
<b>Frequency Range</b>		3		200	MHz
<b>Mainline Loss</b> (above theoretical loss, 0.04 dB)	3	—	0.1	0.2	dB
	30	—	0.1	0.2	
	100	—	0.15	0.3	
	200	—	0.30	0.5	
<b>Nominal Coupling</b>	3-200	—	20.3	—	dB
<b>Coupling Flatness (±)</b>	3-30	—	0.2	0.4	dB
	30-100	—	0.3	0.5	
	100-200	—	0.3	0.5	
<b>Directivity</b>	3	16	27	—	dB
	30	20	30	—	
	100	19	24	—	
	200	11	15	—	
<b>Return Loss (Input)</b>	3	20	26	—	dB
	30	23	31	—	
	100	18	22	—	
	200	13	17	—	
<b>Return Loss (Output)</b>	3	20	27	—	dB
	30	23	31	—	
	100	15	22	—	
	200	12	16	—	
<b>Return Loss (Coupling)</b>	3	20	27	—	dB
	30	23	30	—	
	100	18	22	—	
	200	12	16	—	
<b>Input Power<sup>1</sup></b>	3-30	—	—	25	W
	30-100	—	—	30	
	100-200	—	—	25	

1. The user must provide adequate means of heat removal to limit the temperature of ground connections 2,3,6,7 to 65°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 8°C/W.

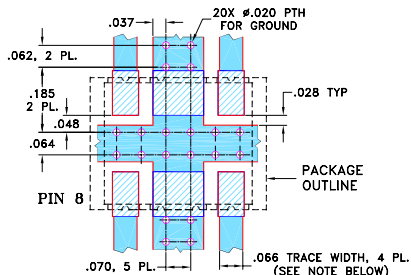
### Outline Drawing



### Outline Dimensions (inch/mm)

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

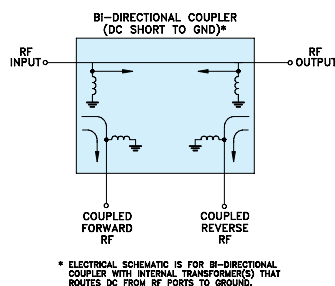
**Demo Board MCL P/N: TB-349**  
**Suggested PCB Layout (PL-246)**



#### NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .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

### Electrical Schematic



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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).

REV. A  
M139158  
ED-12278/4  
SYDC-20-22HP+  
WP/CP/AM  
121016

## Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)		Directivity (dB)		Return Loss (dB)		
	In-Out	In-Cpl Fwd	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd
3.00	0.06	20.21	20.15	29.46	29.32	26.44	26.52	26.48	26.54
5.00	0.06	20.18	20.16	34.16	33.65	30.10	29.98	30.02	30.02
10.00	0.06	20.18	20.16	42.60	38.34	33.46	33.36	32.87	32.68
50.00	0.11	20.22	20.18	32.63	34.35	28.99	28.64	27.32	27.00
80.00	0.14	20.25	20.26	27.99	28.98	25.53	25.15	23.79	23.50
100.00	0.15	20.25	20.31	25.49	26.11	23.73	23.42	21.97	21.72
120.00	0.17	20.26	20.36	23.39	23.61	22.30	21.99	20.51	20.29
150.00	0.20	20.25	20.44	20.80	20.50	20.64	20.31	18.81	18.57
180.00	0.24	20.24	20.53	18.58	17.78	19.22	18.88	17.32	17.10
200.00	0.26	20.24	20.60	17.21	16.08	18.37	18.03	16.42	16.23

