



## SURFACE MOUNT

# Bi-Directional Coupler

## SYDC-20-22HP+

50Ω 20 dB Coupling 3 to 200 MHz 30 Watt

### FEATURES

- High power, 30W max.
- Wideband multi-octave
- Excellent VSWR, 1.10:1 typ.

### APPLICATIONS

- VHF/UHF reverse
- Signal monitoring
- Communications
- Military mobile



Generic photo used for illustration purposes only

CASE STYLE: AH202-1

### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our website for methodologies and qualifications

### ELECTRICAL SPECIFICATIONS<sup>1</sup> AT +25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		3		200	MHz
Mainline Loss (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	
Nominal Coupling	3-200	—	20.3	—	dB
Coupling Flatness (±)	3-30	—	0.2	0.4	dB
	30-100	—	0.3	0.5	
	100-200	—	0.3	0.5	
Directivity	3	16	27	—	dB
	30	20	30	—	
	100	19	24	—	
	200	11	15	—	
Return Loss (Input)	3	20	26	—	dB
	30	23	31	—	
	100	18	22	—	
	200	13	17	—	
Return Loss (Output)	3	20	27	—	dB
	30	23	31	—	
	100	15	22	—	
	200	12	16	—	
Return Loss (Coupling)	3	20	27	—	dB
	30	23	30	—	
	100	18	22	—	
	200	12	16	—	
Input Power <sup>2</sup>	3-30	—	—	25	W
	30-100	—	—	30	
	100-200	—	—	25	

1. Tested on Evaluation Board TB-SYDC20-22HP+

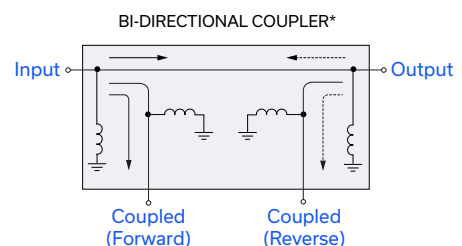
2. The user must provide adequate means of heat removal to limit the temperature of ground connections 2,3,6,7 to 85°C, in order to ensure proper performance. At 25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 8°C/W or less when the unit is driven at maximum specified RF input power, # W. At higher ambient temperature, with the same heat sink. Input power in watts must not exceed # W x (85°C - Tambient) ÷ 60°C. \*Where # = 25 W over 3-30 MHz & 100-200 MHz, 30 W over 30 to 100 MHz.

### MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to 85°C Case*
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.

### ELECTRICAL SCHEMATIC



\*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all ports to ground





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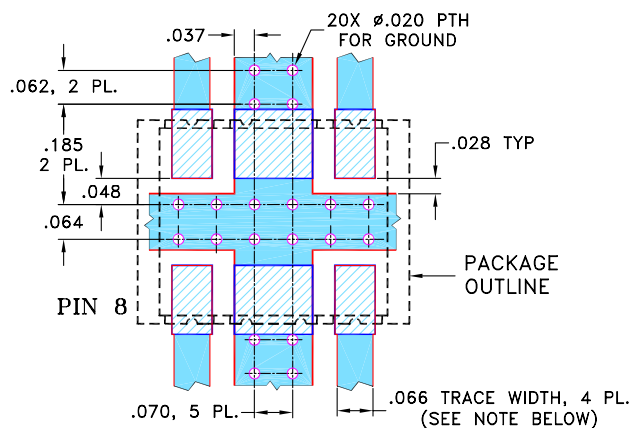
### PAD CONNECTIONS

INPUT	8
OUTPUT	1
COUPLED (FORWARD)	5
COUPLED (REVERSE)	4
GROUND	2, 3, 6, 7

**\*PRODUCT MARKING:** SYDC-20-22HP



\*Marking may contain other features or characters for internal lot control

### SUGGESTED PCB LAYOUT (PL-246)

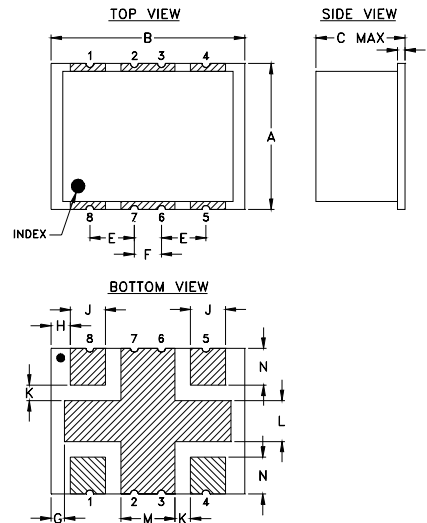


#### NOTES:

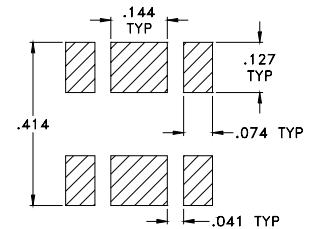
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

### OUTLINE DRAWING



### PCB Land Pattern



Suggested Layout,  
Tolerance to be within ±.002

### OUTLINE DIMENSIONS (Inches/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

### TAPE & REEL INFORMATION: F61



**SURFACE MOUNT**

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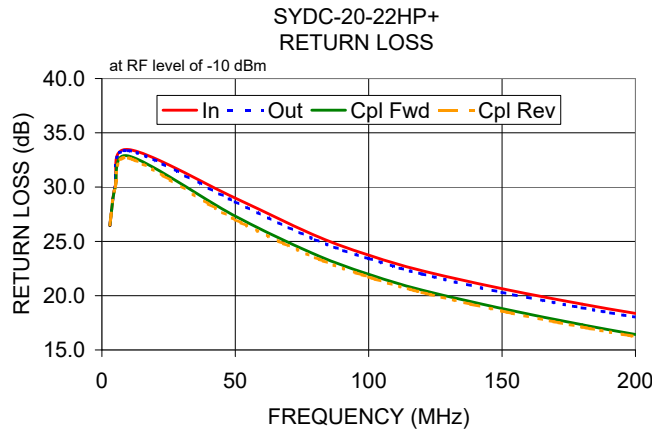
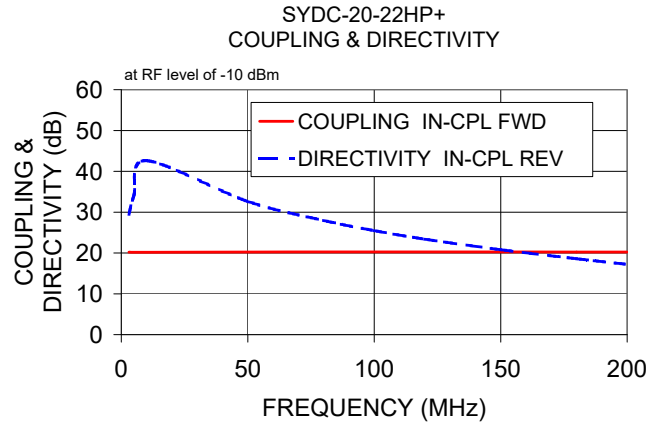
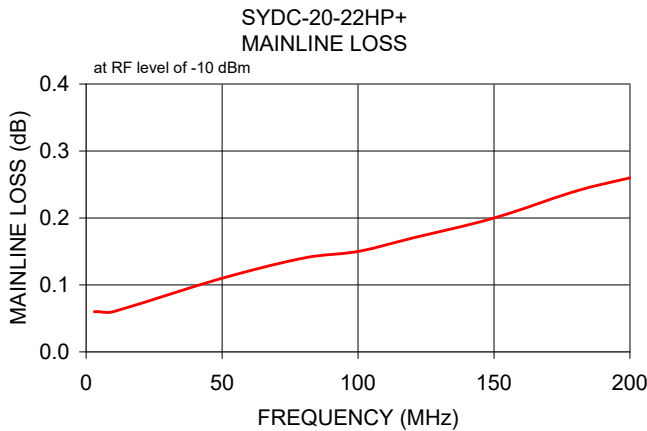
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**TYPICAL PERFORMANCE DATA**

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
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	30.12	29.98	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



- 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

