

# Bi-Directional Coupler

## SYDC-20-61HP+

50Ω 20 dB Coupling 1.5 to 60 MHz 15 Watt

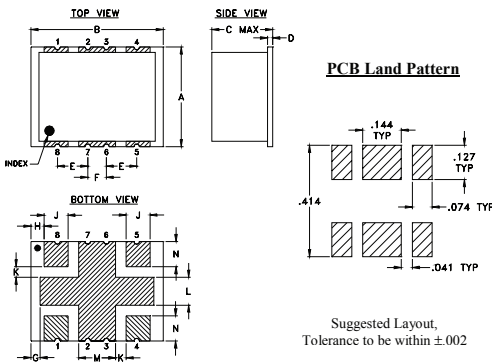
### Maximum Ratings

\*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.

### Pad Connections

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

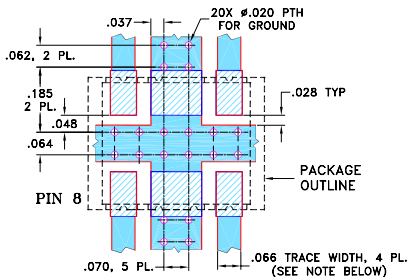
### Outline Drawing



### 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:

- 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

#### Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)

### Features

- high power handling, 15 Watt max.
- low mainline loss, 0.1 dB typ.
- good return loss, 32 dB typ.

### Applications

- military mobile



Generic photo used for illustration purposes only

CASE STYLE: AH202-1

### +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

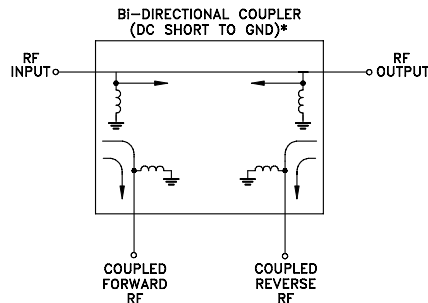
### Electrical Specifications

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		1.5		60	MHz
Mainline Loss <sup>1</sup>	1.5 - 60	—	0.1	0.4	dB
Nominal Coupling	1.5 - 60	—	20±0.5	—	dB
Coupling Flatness (±)	1.5 - 60	—	±0.3	—	dB
Directivity	1.5 - 60	20	35	—	dB
Return Loss	1.5 - 60	—	32	—	dB
Input Power <sup>2</sup>	1.5 - 60	—	—	15	W

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 40°C/W or less when the unit is driven at maximum specified RF input power, 15W. At higher ambient temperature, with the same heat sink. Input power in watts must not exceed 15W x (85°C - T<sub>AMBIENT</sub>) ÷ 60°C.

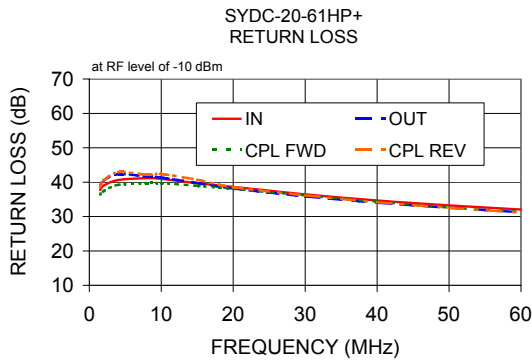
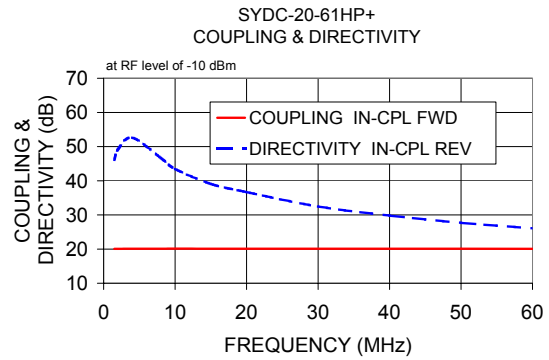
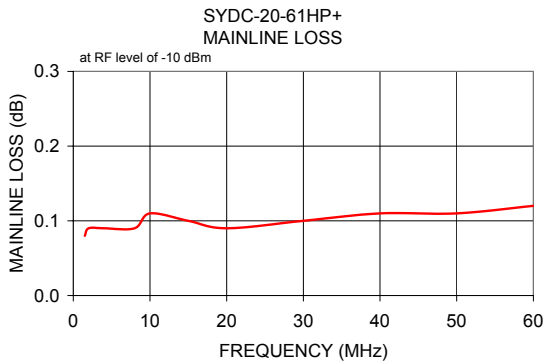
### Electrical Schematic



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

## 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	Cpl Rev
1.50	0.08	20.06	20.06	19.94	43.29	46.09	37.74	38.71	36.46	38.64
2.00	0.09	20.07	20.07	19.94	45.39	49.18	39.02	40.51	37.41	40.45
4.00	0.09	20.10	20.10	19.96	47.26	52.62	40.63	42.30	39.20	42.92
8.00	0.09	20.10	20.10	19.98	43.88	46.67	41.17	41.69	39.76	42.18
10.00	0.11	20.12	20.12	20.02	41.51	43.47	40.96	41.34	39.70	42.36
15.00	0.10	20.11	20.11	20.04	38.56	39.06	39.69	39.72	38.91	40.69
20.00	0.09	20.10	20.10	20.05	36.40	36.70	38.63	38.17	38.03	38.54
30.00	0.10	20.10	20.10	20.11	32.62	32.46	36.47	35.84	36.17	36.17
40.00	0.11	20.10	20.10	20.13	29.91	29.79	34.69	34.03	34.31	34.17
50.00	0.11	20.09	20.09	20.10	27.59	27.69	33.23	32.55	32.59	32.55
60.00	0.12	20.07	20.07	20.03	25.78	26.07	32.03	31.24	31.36	31.12



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