

Surface Mount

# Bi-Directional Coupler

**SYDC-10-62HP+**

50Ω    10 dB Coupling    10 to 600 MHz

## The Big Deal

- High power handling, 20W
- Multi-octave bandwidth
- Very low mainline loss, 0.5 dB
- Excellent VSWR, 1.10:1



CASE STYLE: AH202-1

## Product Overview

Mini-Circuits' SYDC-10-62HP+ surface mount bi-directional coupler provides high power handling up to 20W and low mainline loss of 0.5 dB or better for applications from 10 to 600 MHz. The coupler features core and wire construction mounted on an 8-lead printed laminate base with wraparound terminations for excellent solderability. The unit measures 0.38 x 0.50 x 0.25", accommodating dense circuit board layouts.

## Key Features

Feature	Advantages
High power handling, 20W	Usable in many systems with high-power requirements
Low mainline loss, $\leq 0.5$ dB	Provides excellent through-path signal power transmission.
Good directivity, 21 to 25 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Excellent VSWR, 1.10:1 (input/output/coupling)	Provides excellent matching in 50Ω systems with minimal signal reflection.
Small size, 0.38 x 0.50 x 0.25"	Provides high power capability while saving space in systems with tight layouts.

### 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



50Ω 10 dB Coupling 10 to 600 MHz

### Maximum Ratings

\*Operating Temperature, case -40°C to 85°C

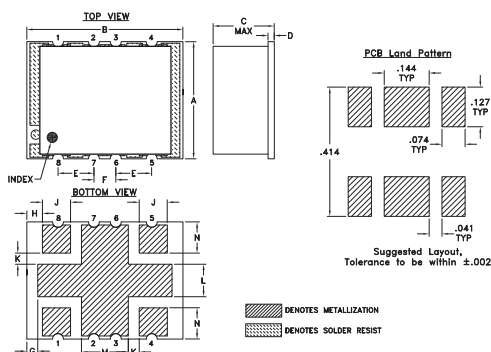
Storage Temperature -55°C to 100°C

\*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

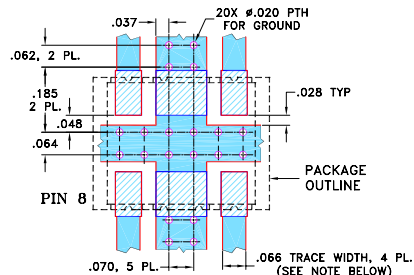


### Outline Dimensions (inch/mm)

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

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### Features

- high power, 20W max.
- wideband multioctave
- excellent matching VSWR, 1.10:1typ.

### Applications

- VHF/UHF
- 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 web site for RoHS Compliance methodologies and qualifications



Available Tape and Reel at no extra cost

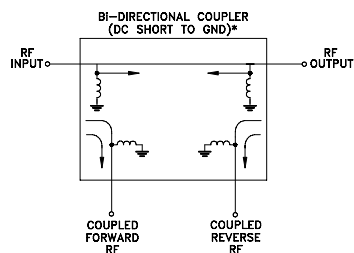
Reel Size	Devices/Reel
13"	200

### Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		10	—	600	MHz
Mainline Loss (above theoretical 0.5 dB)	10 50 340 600	— — — —	0.2 0.2 0.3 0.5	0.8 0.6 0.7 0.9	dB
Coupling	10 - 600 10 50 340 600	— 9.2 9.3 9.2 8.6	9.6 9.7 9.8 9.7 9.4	— 10.2 10.5 10.2 10.4	dB
Coupling Flatness(±)	10 - 340 340 - 600	— —	0.2 0.3	0.4 0.5	dB
Directivity	10 50 340 600	15 18 16 14	21 22.8 24.5 25.6	— — — —	dB
Return Loss (Input)	10 50 340 600	12 20 19 13	15 23 25 17	— — — —	dB
Return Loss (Output)	10 50 340 600	12 20 19 15	15 26 28 19	— — — —	dB
Return Loss (Coupling)	10 50 340 600	12 20 19 15	15 23 27 30	— — — —	dB
Input Power**	10 - 600	—	—	20	W

\*\*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, 20W. At higher ambient temperature, with the same heat sink. Input power in watts must not exceed 20W x (85°C - T<sub>AMBIENT</sub>) ÷ 60°C.

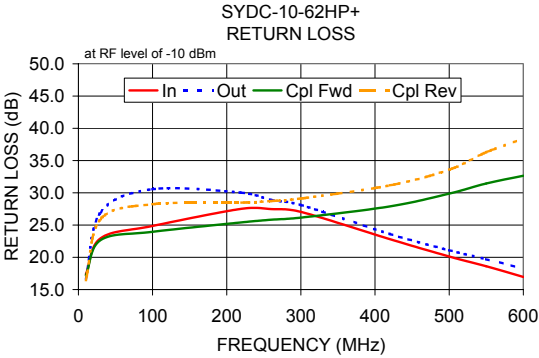
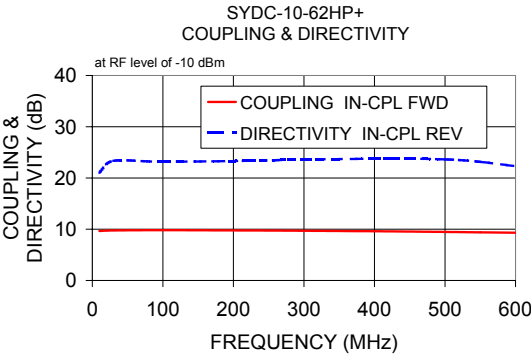
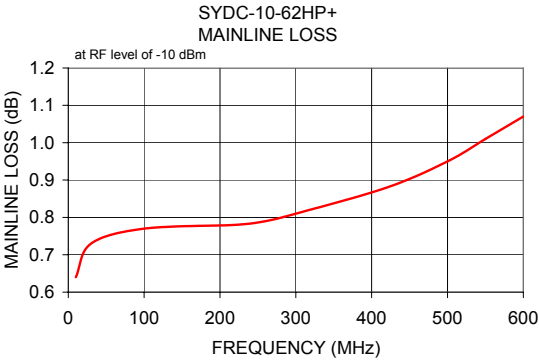
### Electrical Schematic



\* 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	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
10.00	0.64	9.66	9.81	21.07	21.37	17.37	16.72	17.18	16.46
30.00	0.73	9.75	9.89	23.34	23.55	22.96	26.98	22.68	25.93
100.00	0.77	9.81	9.91	23.17	23.76	24.86	30.56	23.95	28.23
220.00	0.78	9.76	9.81	23.33	24.25	27.52	30.01	25.41	28.47
260.00	0.79	9.74	9.77	23.47	24.44	27.47	28.89	25.83	28.73
300.00	0.81	9.70	9.72	23.60	24.43	27.05	28.11	26.16	29.10
420.00	0.88	9.58	9.55	23.76	25.83	22.81	23.61	27.89	31.16
500.00	0.95	9.47	9.43	23.62	26.73	20.12	21.09	29.87	33.58
550.00	1.01	9.39	9.34	23.15	27.81	18.62	19.71	31.45	36.30
600.00	1.07	9.31	9.23	22.30	28.25	16.96	18.25	32.64	38.36



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