

# Surface Mount Bi-Directional Coupler

## SYBDC-26-52VHP+

50Ω 26 dB Coupling 30 to 540 MHz 50 Watt

### The Big Deal

- High power handling, 50 W
- Low mainline loss, 0.12 dB typ.
- High directivity, 24 dB typ.
- Excellent VSWR, 1.12:1 typ.



CASE STYLE: AH202-1

### Product Overview

Mini-Circuits' SYBDC-26-52VHP+ surface mount bi-directional coupler provides high power handling up to 50W and low mainline loss of 0.12 dB or better for applications from 30 to 540 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, 50W	Usable in many systems with high-power requirements
Low mainline loss, 0.12 dB typ.	Provides excellent through-path signal power transmission.
Good directivity, 24 dB typ.	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Excellent VSWR, 1.12 dB typ. (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.  
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50Ω 26 dB Coupling 30 to 540 MHz 50 Watt

## Maximum Ratings

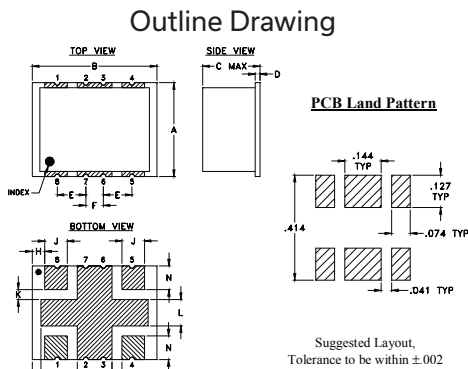
Operating Temperature -40°C to 85°C\*

Storage Temperature -55°C to 100°C

\*Case temperature is defined as temperature on ground  
Permanent damage may occur if any of these limits are exceeded.

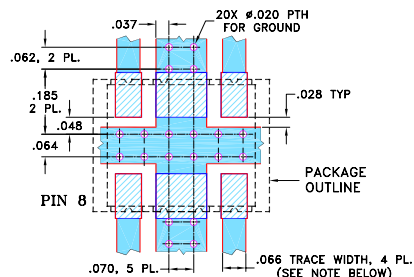
## Pad Connections

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



## Outline Dimensions (inch)

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

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## Features

- low mainline loss, 0.12 dB typ.
- excellent VSWR, 1.12:1 typ.
- high directivity, 24 dB typ.
- high power, 50W max with output load VSWR 2.0 max.
- high power, 30W max. with output open or short

## Applications

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



Generic photo used for illustration purposes

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 13" Devices/Reel 200

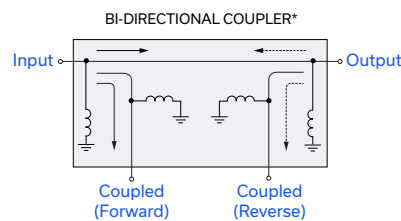
## Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		30		540	MHz
Mainline Loss <sup>1</sup>	30-50	—	0.25	0.45	
	50-540	—	0.12	0.25	
Nominal Coupling	30-540	—	26±1.0	—	dB
Coupling Flatness (±)	30-260	—	0.4	0.6	dB
	260-540	—	0.7	1.0	dB
Directivity	30-50	17	20	—	dB
	50-540	18	24	—	dB
Return Loss (Input)	30-100	12	15	—	dB
	100-540	18	25	—	dB
Return Loss (Output)	30-100	12	15	—	dB
	100-540	18	25	—	dB
Return Loss (Coupling)	30-100	12	15	—	dB
	100-540	18	25	—	dB
Input Power <sup>2</sup>	30-540	—	—	50	W

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

2. At 25°C case temperature. Derate to 25W linearly at 85°C case temperature.

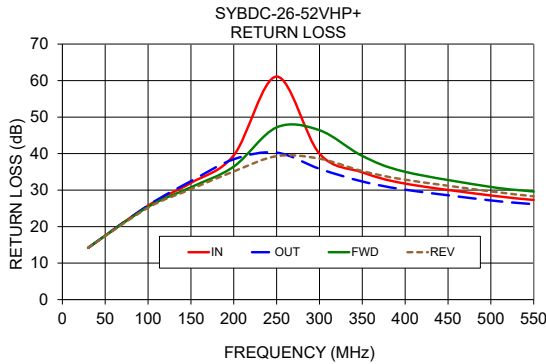
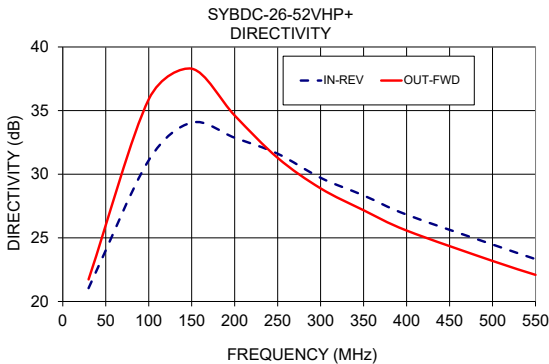
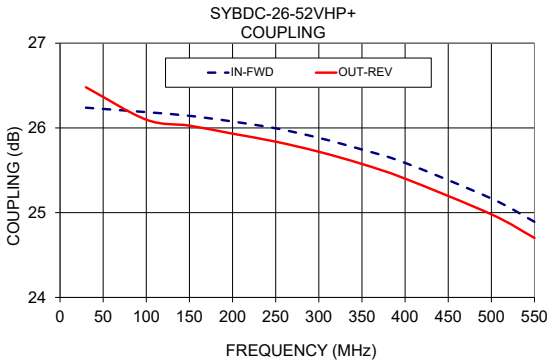
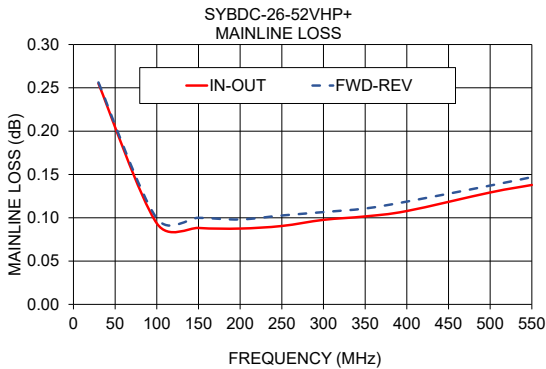
## Electrical Schematic



\*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all 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	In-Cpl Rev	Out-Cpl Fwd	In	Out	Cpl Fwd	Cpl Rev
30.00	0.25	26.24	26.48	21.05	21.73	14.18	14.16	14.21	14.16
100.00	0.09	26.19	26.10	31.10	35.89	25.75	25.79	25.41	25.17
150.00	0.09	26.14	26.03	34.06	38.29	31.96	32.45	30.79	30.23
200.00	0.09	26.08	25.93	32.87	34.61	39.54	38.45	36.45	35.12
250.00	0.09	26.00	25.84	31.61	31.29	61.10	40.27	47.19	39.30
300.00	0.10	25.88	25.72	29.72	28.89	39.98	35.84	46.41	38.62
350.00	0.10	25.75	25.57	28.33	27.17	34.88	32.36	39.36	35.21
400.00	0.11	25.59	25.40	26.83	25.58	31.78	30.11	35.01	32.85
500.00	0.13	25.17	24.98	24.48	23.19	28.53	27.17	30.87	29.64
550.00	0.14	24.89	24.70	23.33	22.09	27.30	26.13	29.61	28.30



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