



Mini-Circuits

SURFACE MOUNT

Bi-Directional Coupler **SYBDC-27-82VHP+**

50Ω 27 dB Coupling 30 to 840 MHz 100 Watt

THE BIG DEAL

- High power handling, up to 100 W
- Low mainline loss, 0.14 dB typ.
- High directivity, 20 dB typ.
- Excellent VSWR, 1.12:1 typ.



Generic photo used for illustration purposes only

CASE STYLE: AH202-1

APPLICATIONS

- VHF/UHF
- Signal monitoring
- Communications

+RoHS Compliant

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

PRODUCT OVERVIEW

Mini-Circuits' SYBDC-27-82VHP+ surface mount bi-directional coupler provides high power handling up to 100W and low mainline loss of 0.14 dB typically for applications from 30 to 840 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, 100W	Usable in many systems with high-power requirements
Low mainline loss, 0.14 dB typ.	Provides excellent through-path signal power transmission.
Good directivity, 20 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.





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ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		30		840	MHz
Mainline Loss ¹	30-50	—	0.25	0.35	dB
	50-512	—	0.15	0.30	
	512-700	—	0.25	0.35	
	700-840	—	0.4	0.5	
Nominal Coupling	30-512	—	26.5±1	—	dB
	512-700	—	25.2±0.9	—	
	700-840	—	23.5±1.3	—	
Coupling Flatness(±)	30-260	—	0.4	0.6	dB
	260-512	—	0.7	1	
	512-700	—	0.7	1	
	700-840	—	1	1.5	
Directivity	30-512	15	22	—	dB
	512-700	13	20	—	
	700-840	10	16	—	
Return Loss (Input)	30-100	12	18	—	dB
	100-840	17	24	—	
Return Loss (Output)	30-100	12	18	—	dB
	100-840	17	24	—	
Return Loss (Coupled)	30-100	12	18	—	dB
	100-840	17	24	—	
Input Power ^{2,3}	30-512	—	—	100	W
	512-600	—	—	90	
	600-700	—	—	60	
	700-800	—	—	30	
	800-840	—	—	20	

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

2. At 25°C case temperature. Derate linearly to 75W from 30-512MHz, 60W from 512-600MHz, 35W from 600-700MHz, 20W from 700-800MHz, 15W from 800-840MHz, at 85°C case temperature.

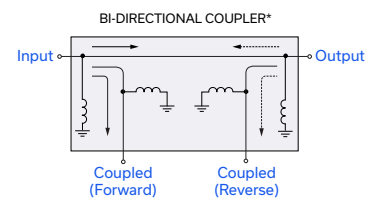
3. Output load VSWR 2.0 max. Max 500ms duration with any VSWR, including output open or short.

MAXIMUM RATINGS

Parameter	Ratings
Operating temperature	-40°C to 85°C
Storage temperature	-55°C to 100°C

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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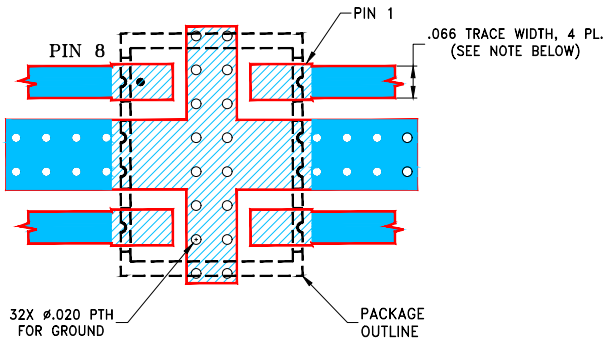
50Ω 27 dB Coupling 30 to 840 MHz 100 Watt

PAD CONNECTIONS

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

PRODUCT MARKING: N/A

SUGGESTED PCB LAYOUT (PL-723)

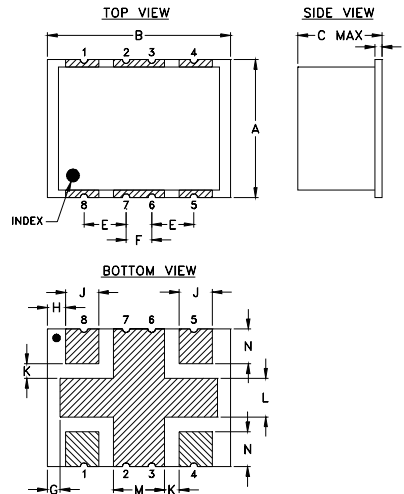


NOTES:

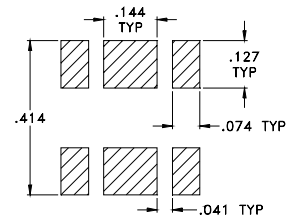
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"±.002";
COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-  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 AND REEL INFORMATION: F61



SURFACE MOUNT

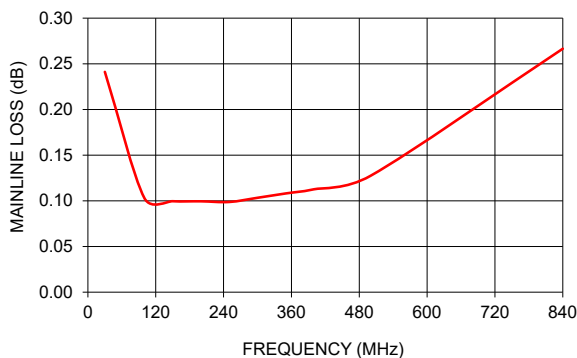
Bi-Directional Coupler SYBDC-27-82VHP+

50Ω 27 dB Coupling 30 to 840 MHz 100 Watt

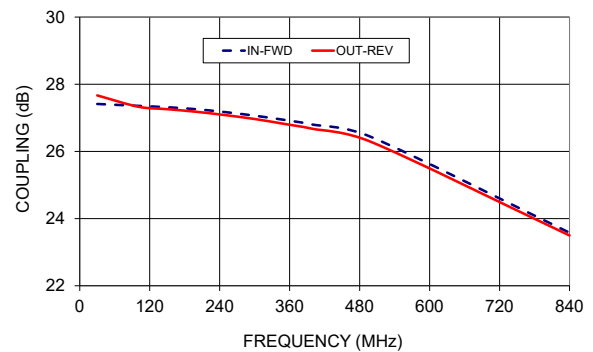
TYPICAL PERFORMANCE DATA

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
30	0.24	27.41	27.67	20.86	21.92	14.53	14.49	14.50	14.47
100	0.10	27.36	27.33	28.36	31.92	24.01	23.60	23.78	23.73
150	0.10	27.32	27.26	28.42	33.98	26.45	26.79	26.38	26.40
200	0.10	27.26	27.18	28.68	37.70	28.44	28.41	27.83	27.74
250	0.10	27.17	27.08	28.53	39.24	29.17	29.10	28.66	28.57
300	0.10	27.06	26.97	28.06	41.69	29.92	29.67	28.97	29.04
350	0.11	26.94	26.82	27.32	46.71	29.80	29.66	29.08	28.81
400	0.11	26.80	26.67	26.50	47.46	29.91	29.74	29.01	28.95
500	0.13	26.43	26.28	24.90	40.34	29.43	29.20	28.44	28.32
840	0.27	23.58	23.50	17.71	24.33	26.92	26.17	25.47	25.00

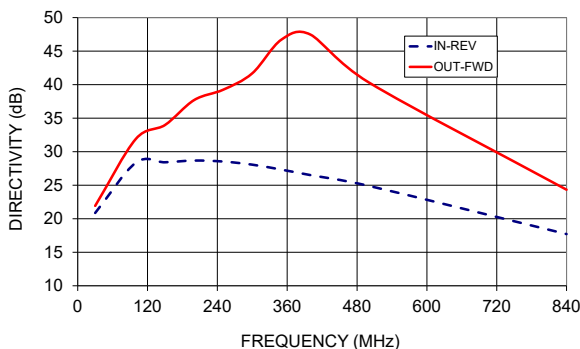
SYBDC-27-82VHP+
MAINLINE LOSS



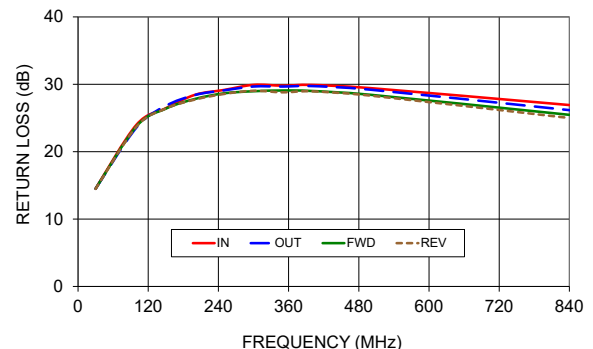
SYBDC-27-82VHP+
COUPLING



SYBDC-27-82VHP+
DIRECTIVITY



SYBDC-27-82VHP+
RETURN LOSS



- NOTES**
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