



## SURFACE MOUNT

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

Mini-Circuits

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 web site for RoHS Compliance 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 or better 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.

REV. OR  
ECO-010277  
SYBDC-27-82VHP+  
YL/CP/AM  
211025





# SURFACE MOUNT

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

Mini-Circuits

## ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		30		840	MHz
Mainline Loss <sup>1</sup>	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 <sup>2,3</sup>	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.

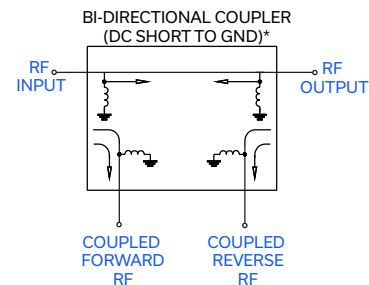
3. Output load VSWR 2.0 max. Max 500ms duration with any VSWR, including output open or short.

## MAXIMUM RATINGS

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

\*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 RF ports to ground



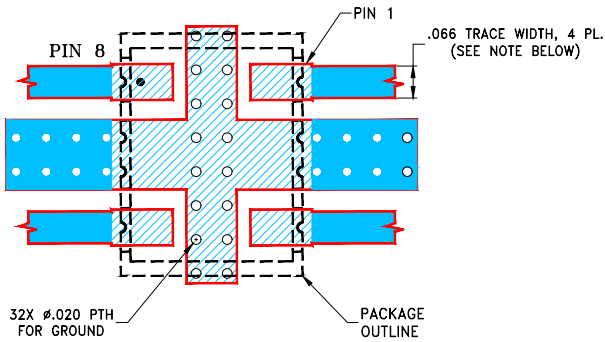
# SURFACE MOUNT

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

## PAD CONNECTIONS

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

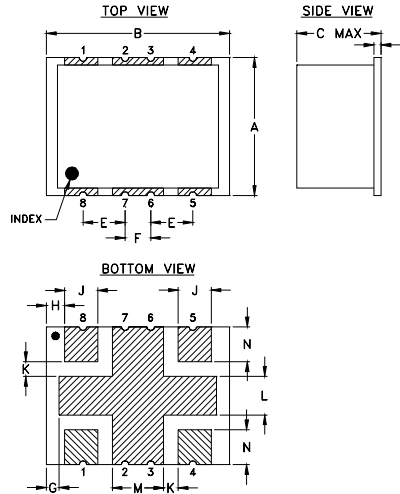
## DEMO BOARD MCL P/N: TB-SYBDC-27-82VHP+ SUGGESTED PCB LAYOUT (PL-723)



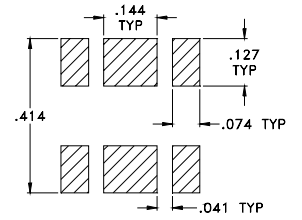
- NOTES:
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.030 \pm .002$ ”; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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  $\pm .002$

## 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

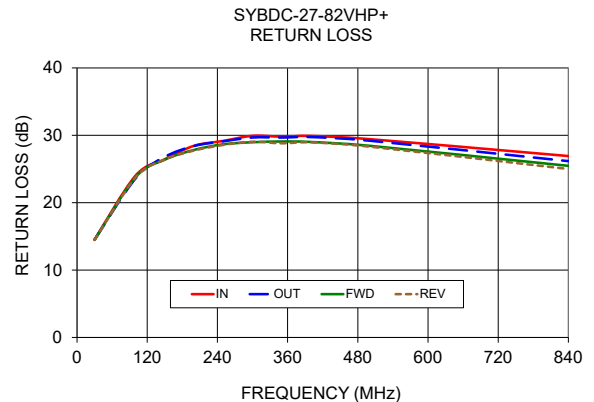
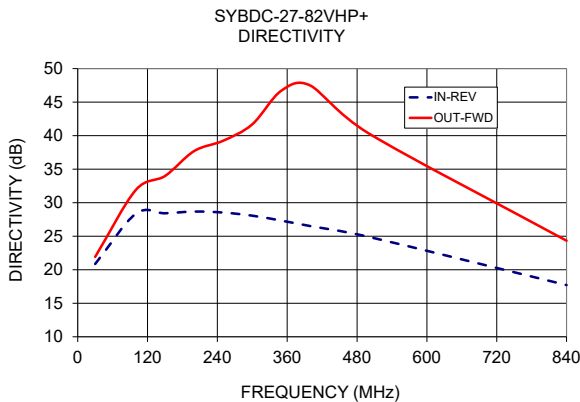
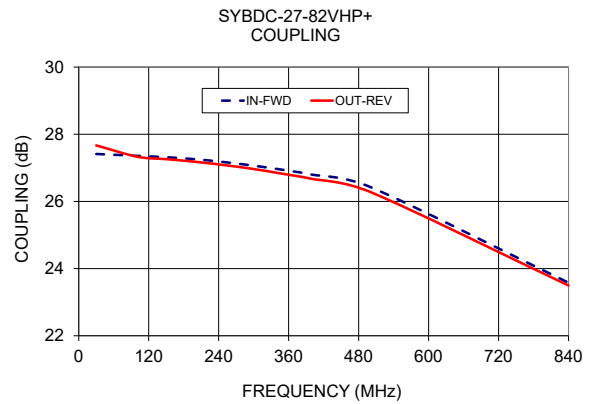
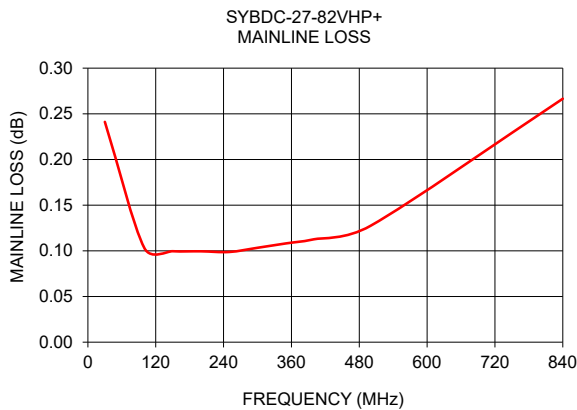


**SURFACE MOUNT**

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

**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
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



- 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)

