

Surface Mount, High Power

Bi-Directional Coupler SYDC-19-52VHP+

50Ω 19 dB Coupling 30 to 512 MHz 60 Watt

The Big Deal

- High power handling, 60W
- Very low mainline loss, 0.3 dB
- Excellent VSWR, 1.05



CASE STYLE: PD1647-1

Product Overview

Mini-Circuits' SYDC-19-52VHP+ surface mount bi-directional coupler provides exceptionally high power handling up to 60W and low mainline loss of 0.3 dB for applications from 30 to 512 MHz. This model features a unique heat sinking design that enables reliable operation at high power without overheating, making it an ideal choice for systems where high power capability and small size are desired. The coupler features core and wire construction mounted on an 8-lead printed laminate base with wraparound terminations for excellent solderability. The unit measures 0.75 x 0.52 x 0.49", accommodating dense circuit board layouts.

Key Features

Feature	Advantages
High power handling, 60W	Usable in many systems with high-power requirements
Low mainline loss, 0.08 dB	Provides excellent through-path signal power transmission.
Good directivity, up to 35 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Excellent return loss, up to 35 dB (input/output/coupling)	Provides excellent matching in 50Ω systems with minimal signal reflection.
Small size, 0.75 x 0.52 x 0.43"	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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SYDC-19-52VHP+

50Ω 19 dB Coupling 30 to 512 MHz 60 Watt



Generic photo used for illustration purposes only

CASE STYLE: PD1647-1**

**This model is not intended for pick & place use.
Please contact Applications Dept. for assistance

+RoHS Compliant

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

Maximum Ratings

Operating Temperature -40°C to 65°C Case*
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	1
OUTPUT	8
COUPLED (FORWARD)	4
COUPLED (REVERSE)	5
GROUND	2,3,6,7

Features

- high power, 60W max. with output load VSWR 2.0 max
- high power, 20W max. with output open or short
- low mainline loss, 0.3 dB typ.
- good VSWR, 1.05 typ.

Applications

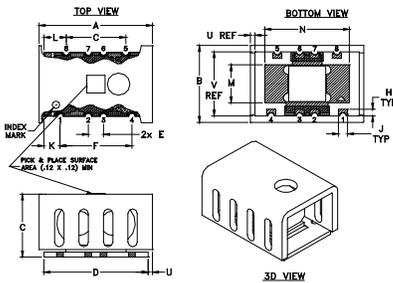
- military mobile

Electrical Specifications at 25°C

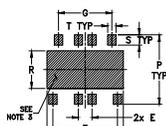
Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		30	—	512	MHz
Mainline Loss ¹ (above theoretical 0.05 dB)	30		0.2	0.4	dB
	450		0.35	0.6	
	512		0.4	0.6	
Coupling	30-512		19.5±1.5		dB
Coupling Flatness(±)	30-512		0.4	0.6	dB
Directivity	30	22	35	—	dB
	450	18	25	—	
	512	16	22	—	
Return Loss (Input)	30	20	30	—	dB
	450	20	23	—	
	512	17	22	—	
Return Loss (Output)	30	26	31	—	dB
	450	23	26	—	
	512	18	24	—	
Return Loss (Coupling)	30	20	30	—	dB
	450	20	25	—	
	512	17	22	—	

1. The user must provide adequate means of heat removal to limit the temperature of ground connections under the PCB to 65°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 3.5°C/W.

Outline Drawing



PCB Land Pattern



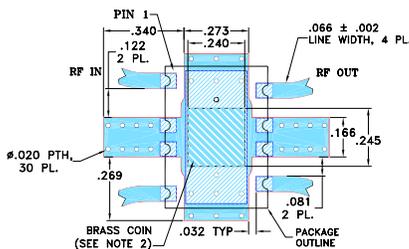
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L
.750	.520	.43	.690	.100	.476	.394	.045	.060	.107	.148
19.05	13.21	10.92	17.53	2.54	12.09	10.01	1.14	1.52	2.72	3.76
M	N	P	Q	R	S	T	U	V	wt	
.257	.560	.475	.561	.258	.069	.061	.03	.433	grams	
6.53	14.22	12.07	14.25	6.55	1.75	1.55	0.76	11.00	3.00	

Demo Board MCL P/N: TB-630+ Suggested PCB Layout (PL-351)

Refer to Application Note: [AN-00-017](#)



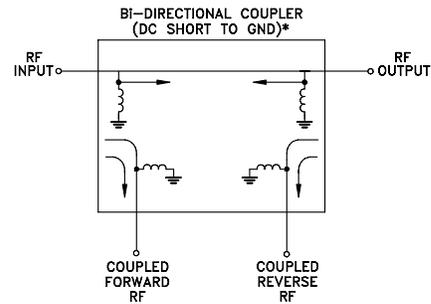
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. SUGGEST TO PROVIDE BRASS COIN FOR BETTER HEAT TRANSFER FROM THE UNIT. OTHERWISE PROVIDE ARRAY OF THERMAL VIAS ADEQUATE TO LIMIT TEMPERATURE OF GROUND CONNECTIONS UNDER THE UNIT TO 65°C.
3. 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
- DENOTES BRASS COIN.

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Electrical Schematic



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

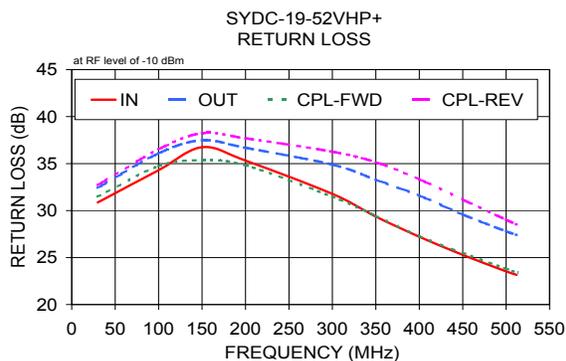
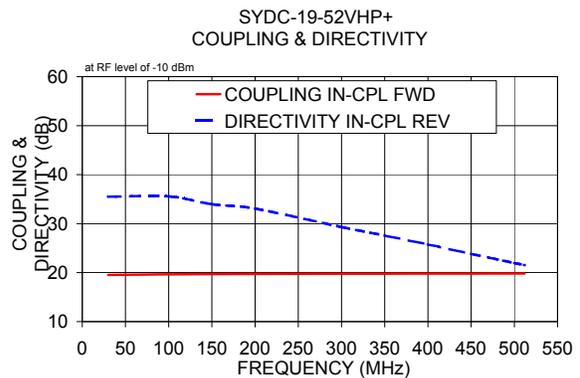
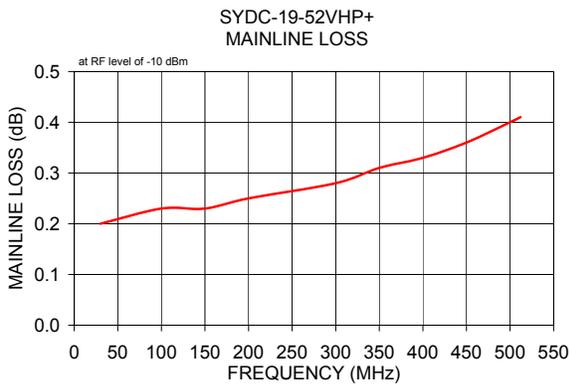


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M151107
ED-17181
SYDC-19-52VHP+
CH/CP/AM
151105
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Typical Performance Data

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
30.00	0.20	19.53	19.53	19.39	35.44	35.50	30.87	32.42	31.49	32.72
100.00	0.23	19.66	19.66	19.57	35.65	35.56	34.30	36.09	34.74	36.52
150.00	0.23	19.70	19.70	19.66	34.87	33.97	36.74	37.48	35.35	38.24
200.00	0.25	19.73	19.73	19.73	33.09	33.07	35.32	36.68	34.82	37.69
300.00	0.28	19.77	19.77	19.86	29.46	29.31	31.78	34.90	31.48	36.27
350.00	0.31	19.79	19.79	19.91	27.51	27.57	29.37	33.28	29.43	35.15
400.00	0.33	19.80	19.80	19.93	25.71	25.76	27.22	31.60	27.29	33.32
450.00	0.36	19.81	19.81	19.94	23.69	23.83	25.29	29.58	25.50	31.16
500.00	0.40	19.82	19.82	19.91	21.89	21.95	23.53	27.79	23.80	29.02
512.00	0.41	19.82	19.82	19.90	21.51	21.52	23.16	27.41	23.40	28.52



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