

Surface Mount Directional Coupler

50Ω 20 dB Coupling 30 to 174 MHz 100 Watt

SYDC20-171VHP+



Generic photo used for illustration purposes only

CASE STYLE: PD1647-3

+RoHS Compliant

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

Maximum Ratings

Operating Temperature -40°C to 50°C Case*

Storage Temperature -55°C to 100°C

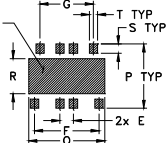
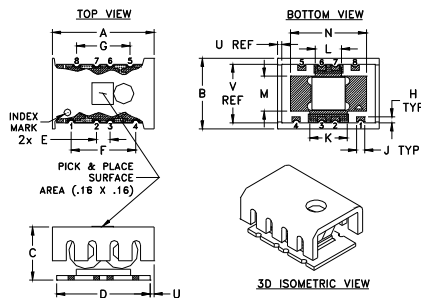
* Case temperature is defined as temperature on ground leads. Permanent damage may occur if any of these limits are exceeded.

Pad Connections

INPUT	1
OUTPUT	8
COUPLED	4
50Ω TERM EXTERNAL*	5
GROUND	2,3,6,7

* External termination must be able to handle 250 mW min.

Outline Drawing

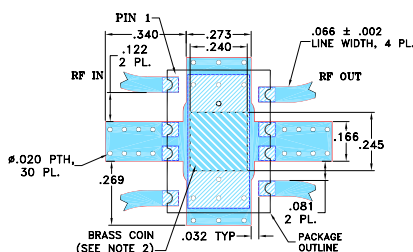


Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K	L
.750	.520	.39	.690	.100	.476	.394	.045	.060	.276	.194
19.05	13.21	9.91	17.53	2.54	12.09	10.01	1.14	1.52	7.01	4.93
M	N	P	Q	R	S	T	U	V	W	X
.257	.560	.475	.561	.258	.069	.061	.030	.433		
6.53	14.22	12.07	14.25	6.55	1.75	1.55	0.76	11.00		
									wt	
									grams	
									2.60	

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.

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-Circuit's 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-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp

Features

- high power, 100W max. with output load VSWR 1.5 max
- high power, 20W max. with output open or short
- low mainline loss, 0.25 dB typ.
- good VSWR, 1.05 typ.

Applications

- military mobile

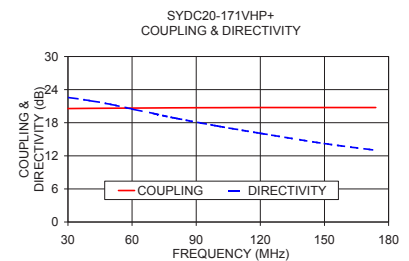
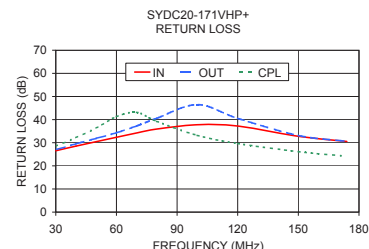
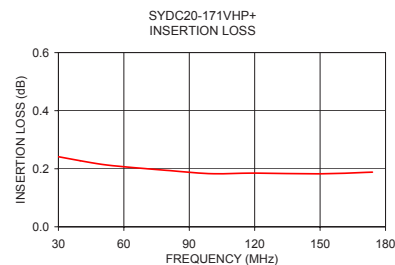
Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		30	—	174	MHz
Mainline Loss ¹ (above theoretical 0.04 dB)	30 100 174	— — —	0.24 .19 .20	0.4 .35 .4	dB
Coupling	30-174 30 100 174	— 20.2 20 19.8	20.7 20.5 20.6 20.7	— 21.3 21.5 21.5	dB
Coupling Flatness(±)	30-174	—	0.1	0.3	dB
Directivity	30 100 174	20 14 10	23 18 14	— — —	dB
Return Loss (Input)	30 100 174	20 22 20	26 35 30	— — —	dB
Return Loss (Output)	30 100 174	20 23 20	27 38 31	— — —	dB
Return Loss (Coupling)	30 100 174	20 22 18	29 31 22	— — —	dB
Input Power ¹	30-174	—	—	100	W

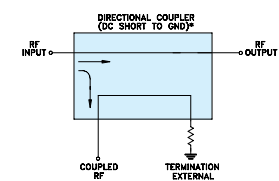
1. The user must provide adequate means of heat removal to limit the temperature of ground connections under the PCB to 50°C, in order to ensure proper performance. At 25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 3.5°C/W power derate linearly to 75 Watt at 50°C.

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB) In	Return Loss (dB) Out	Return Loss (dB) Cpl
30.00	0.24	20.57	22.60	26.52	26.99	28.53
40.00	0.23	20.60	22.01	28.55	29.54	32.23
50.00	0.21	20.63	21.32	30.47	31.88	36.38
60.00	0.21	20.66	20.49	32.36	34.30	41.29
70.00	0.20	20.68	19.66	34.22	37.26	43.12
80.00	0.19	20.70	18.84	35.93	40.59	39.23
100.00	0.18	20.73	17.39	37.79	46.50	33.19
120.00	0.18	20.75	16.07	37.22	40.53	29.63
150.00	0.18	20.76	14.22	32.78	33.13	26.14
174.00	0.19	20.75	13.01	30.56	30.60	24.13



Electrical Schematic



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ED-16350
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