Surface Mount

Bi-Directional Coupler

SYDC-19-52HP+

50Ω 19 dB Coupling 30 to 512 MHz 50 Watt

Generic photo used for illustration purposes only

CASE STYLE: AH1647

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

Maximum Ratings

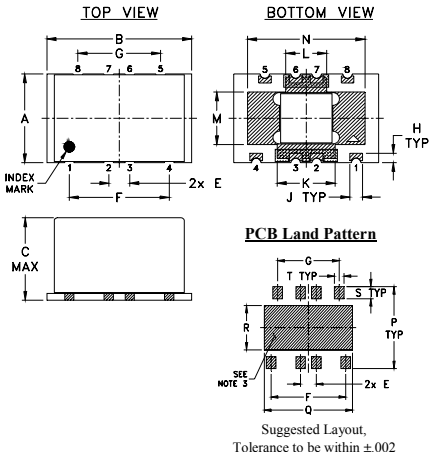
Operating Temperature	-40°C to 65°C Case*
Storage Temperature	-55°C to 100°C

* 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

Outline Drawing



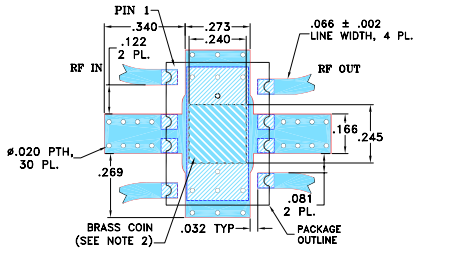
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	E	F	G	H	J	K
.433	.690	.415	.100	.476	.394	.045	.060	.276
11.00	17.53	10.54	2.54	12.09	10.01	1.14	1.52	7.01

L	M	N	P	Q	R	S	T	wt
.194	.257	.560	.475	.561	.258	.069	.061	grams
4.93	6.53	14.22	12.07	14.25	6.55	1.75	1.55	2.80

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.

Features

- high power, 50W 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

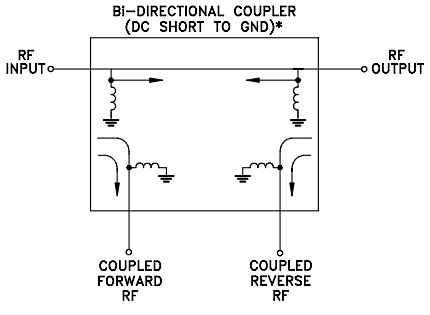
- military mobile

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		dB
	30	19	19.5	20	
	450	19	19.9	20.8	
	512	19	20.0	21	
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	—	
Input Power[1]	30-100	—	—	30	W
	100-450	—	—	50	
	450-512	—	—	40	

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 10°C/W.

Electrical Schematic



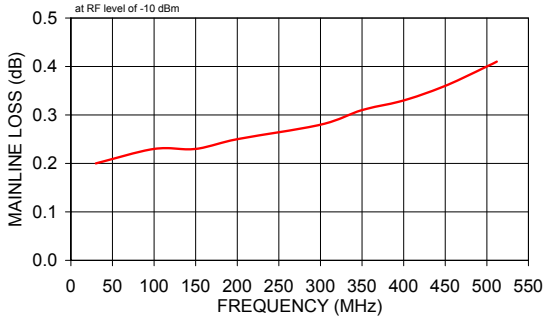
* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.

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

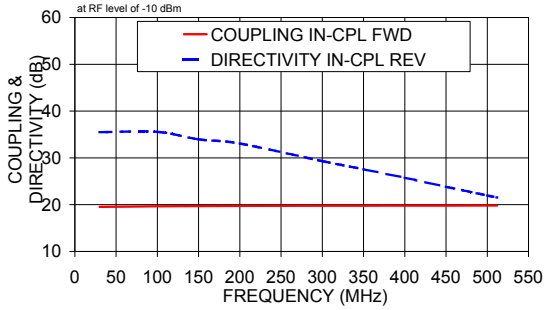
Typical Performance Data

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

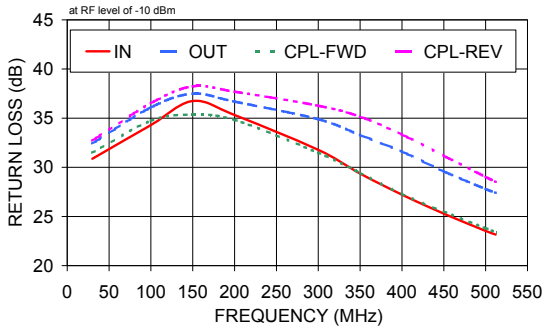
SYDC-19-52HP+
MAINLINE LOSS



SYDC-19-52HP+
COUPLING & DIRECTIVITY



SYDC-19-52HP+
RETURN LOSS



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