

Surface Mount Directional Coupler

SYDC-7-651HP+

50Ω 7 dB Coupling 10 to 650 MHz

The Big Deal

- High power handling, 15W
- Multi-octave bandwidth
- Very low mainline loss, 0.6 dB
- Excellent VSWR, 1.15:1



CASE STYLE: AH202-1

Product Overview

Mini-Circuits' SYDC-7-651HP+ surface mount directional coupler provides high power handling up to 15W and low mainline loss of 0.5 dB or better for applications from 10 to 650 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, 15W	Usable in many systems with high-power requirements
Low mainline loss, ≤ 0.8 dB	Provides excellent through-path signal power transmission.
Good directivity, 21 to 25 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Excellent VSWR, 1.15:1 (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.

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



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Generic photo used for illustration purposes only

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+RoHS Compliant

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



Available Tape and Reel
at no extra cost

Reel Size	Devices/Reel
13"	200

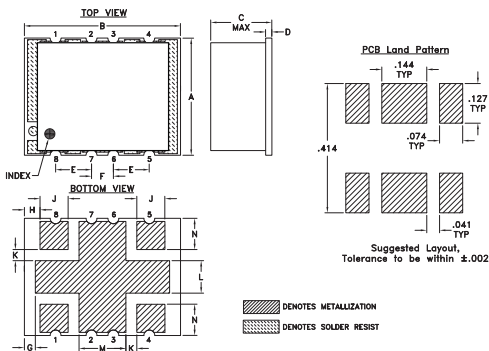
Maximum Ratings

*Operating Temperature, case -40°C to 65°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.

Pin Connections

INPUT	8
OUTPUT	1
COUPLED (forward)	5
EXTERNAL (50Ω)	4
GROUND	2,3,6,7

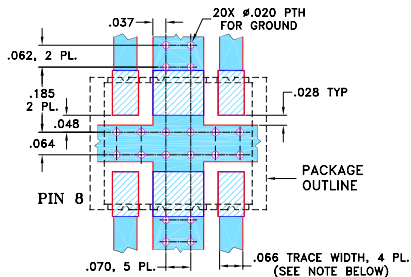
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
.38	.50	.25	.020	.115	.070	.035	.050
9.65	12.70	6.35	0.51	2.92	1.78	0.89	1.27
J	K	L	M	N			wt
.090	.040	.105	.140	.095			grams
2.29	1.02	2.67	3.56	2.41			0.80

Demo Board MCL P/N: TB-349 Suggested PCB Layout (PL-246)



NOTES:

- 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.
- 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

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Features

- high power, 15W max.
- wideband multi octave
- excellent matching VSWR, 1.15:1typ.

Applications

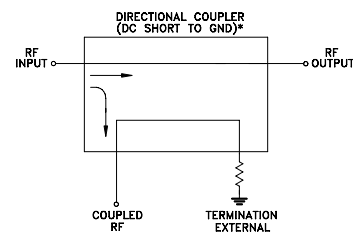
- VHF/UHF
- signal monitoring
- communications
- military mobile

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		10	—	650	MHz
Mainline Loss (above theoretical 0.85 dB)	10	—	0.4	0.8	dB
	30	—	0.5	0.8	
	520	—	0.6	0.9	
	650	—	0.7	1.2	
Coupling nominal	10 - 650	7.0	7.3	7.6	dB
Coupling Flatness(±)	30 - 520	—	0.1	0.3	dB
	10 - 650	—	0.2	0.5	
Directivity	10	11	15	—	dB
	30	20	25	—	
	520	17	21	—	
	650	12	15	—	
Return Loss (Input)	30-520 10-650	17 —	20 15	— —	dB
Return Loss (Output)	30-520 10-650	16 —	20 14	— —	dB
Return Loss (Coupling)	30-520 10-650	14 —	17 12	— —	dB
Input Power¹	30 -520	—	—	15	W
	10-650	—	—	10	

1. The user must provide adequate means of heat removal to limit the temperature of ground connections 2,3,6,7 to 85°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 20°C/W or less when the unit is driven at maximum specified RF input power, 20W. At higher ambient temperature, with the same heat sink. Input power in watts must not exceed 20W x (85°C - T_{AMBIENT}) ÷ 60°C.

Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.



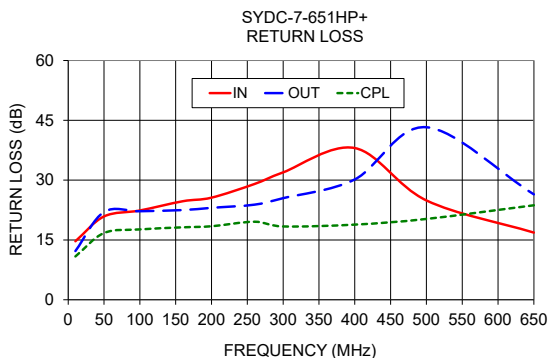
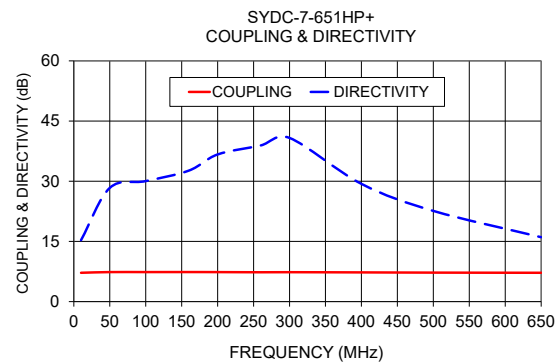
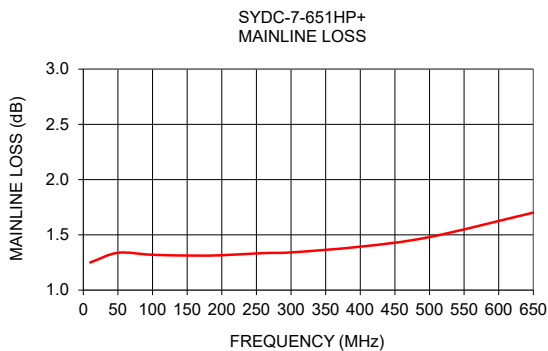
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REV. OR)
M164909
ED-17071202
SYDC-7-651HP+
WP/CP/AM
200505

Typical Performance Data

Frequency (MHz)	Total Loss* (dB)		Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
	In-Out				In	Out	Cpl
10	1.25		7.19	15.31	14.67	12.22	10.86
50	1.34		7.36	28.34	20.90	22.02	16.74
100	1.32		7.36	30.04	22.39	22.20	17.64
160	1.31		7.37	32.65	24.71	22.49	18.17
200	1.32		7.35	36.68	25.60	23.06	18.43
260	1.34		7.32	38.93	29.03	23.85	19.57
300	1.34		7.33	40.80	31.95	25.48	18.38
400	1.39		7.28	29.35	38.05	30.18	18.84
500	1.48		7.23	22.61	24.91	43.26	20.27
650	1.70		7.19	16.05	16.84	26.43	23.69

* Total Loss = theoretical loss + insertion loss



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