

# Surface Mount Directional Coupler

## SYD-20-33+

50Ω 30 to 3000 MHz

### Maximum Ratings

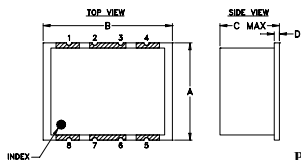
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

Permanent damage may occur if any of these limits are exceeded.

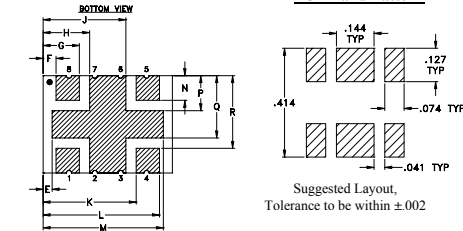
### Pin Connections

INPUT	8
OUTPUT	1
COUPLED	5
GROUND	2,3,4,6,7

### Outline Drawing



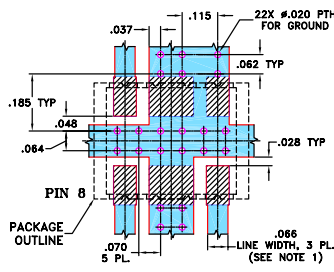
### PCB Land Pattern



### Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	
.38	.50	.25	.020	.035	.050	.140	.180	
9.65	12.70	6.35	0.51	0.89	1.27	3.56	4.57	
J	K	L	M	N	P	Q	R	wt
.320	.360	.450	.465	.095	.135	.240	.280	grams
8.13	9.14	11.43	11.81	2.41	3.43	6.10	7.11	0.80

### Demo Board MCL P/N: TB-296 Suggested PCB Layout (PL-160)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS .030 ± .002. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED. 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

### Features

- wideband, 30-3000 MHz
- low mainline loss, 1.6 dB typ.
- excellent VSWR, 1.15:1 typ; all ports
- good flatness, ±0.6 dB typ.

### Applications

- VHF/UHF receivers/transmitters
- cellular, PCS, PCN, UMTS
- ISM
- GPS
- instrumentation



CASE STYLE: AH202  
PRICE: \$16.95 ea. QTY. (10-49)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

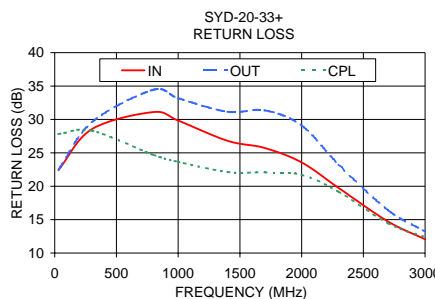
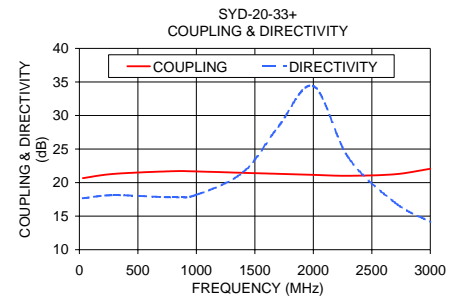
### Directional Coupler Electrical Specifications

FREQ. (MHz)	COUPLING (dB)		MAINLINE LOSS <sup>1</sup> (dB)		DIRECTIVITY (dB)		VSWR (:1)	POWER INPUT (W)
	Nom.	Flatness	Typ.	Max.	Typ.	Min.		
$f_c - f_u$								
30-3000	20.8±0.8	±1.4	1.6	2.5	15	9	1.20	1
800-1000	21.5±0.5	±0.3	1.1	1.5	17	14	1.10	1
1700-2000	21.1±0.6	±0.5	1.3	1.8	20	15	1.15	1
2300-2700	20.8±0.7	±0.5	1.5	2.1	16	11	1.20	1

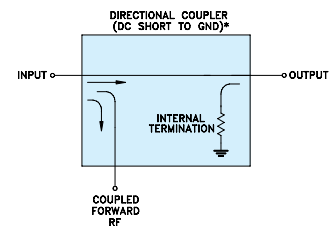
1. Mainline loss includes theoretical power loss at coupled port.

### Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)	Directivity (dB)	Return Loss (dB)		
	In-Out	In-Cpl			In	Out	Cpl
30.00	0.90	20.67	17.67	22.43	22.47	27.83	
300.00	0.99	21.31	18.13	28.54	29.57	28.33	
800.00	1.11	21.70	17.81	31.11	34.45	24.69	
1000.00	1.16	21.66	18.18	29.83	33.18	23.65	
1400.00	1.25	21.45	21.56	26.80	31.14	22.13	
1700.00	1.33	21.30	28.32	25.73	31.37	22.07	
2000.00	1.44	21.15	34.38	23.57	29.10	21.71	
2300.00	1.53	21.02	23.71	19.74	23.26	19.17	
2700.00	1.74	21.25	17.00	14.71	16.41	14.45	
3000.00	1.97	22.06	14.14	12.06	13.23	12.37	



### Electrical Schematic



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

**Mini-Circuits**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED  
IF/RF MICROWAVE COMPONENTS

For detailed performance specs & shopping info see web site

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Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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).

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