



**THE DATASHEET OF  
SYD-20-33+**





## SURFACE MOUNT

# Directional Coupler

# SYD-20-33+

50Ω

30 to 3000 MHz

### 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



Generic photo used for illustration purposes only  
CASE STYLE: AH202

**+RoHS Compliant**

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

### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		30		3000	MHz
Mainline Loss <sup>1</sup>	30-3000	—	1.6	2.5	dB
	800-1000	—	1.1	1.5	
	1700-2000	—	1.3	1.8	
	2300-2700	—	1.5	2.1	
Coupling Nominal	30-3000	—	20.8±0.8	—	dB
	800-1000	—	21.5±0.5	—	
	1700-2000	—	21.1±0.6	—	
	2300-2700	—	20.8±0.7	—	
Coupling Flatness(±)	30-3000	—	1.4	—	dB
	800-1000	—	0.3	—	
	1700-2000	—	0.5	—	
	2300-2700	—	0.5	—	
Directivity	30-3000	9	15	—	dB
	800-1000	14	17	—	
	1700-2000	15	20	—	
	2300-2700	11	16	—	
VSWR	30-3000	—	1.20	—	:1
	800-1000	—	1.10	—	
	1700-2000	—	1.15	—	
	2300-2700	—	1.20	—	
Input Power	30-3000	—	—	1	W

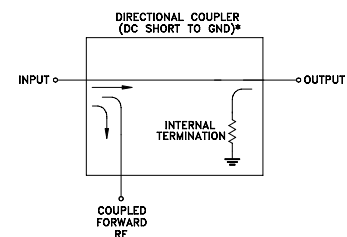
1. Mainline loss includes theoretical power loss at coupled port.

### MAXIMUM RATINGS

Parameter	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.

### ELECTRICAL SCHEMATIC



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





# SURFACE MOUNT

# Directional Coupler

# SYD-20-33+

Mini-Circuits

50Ω

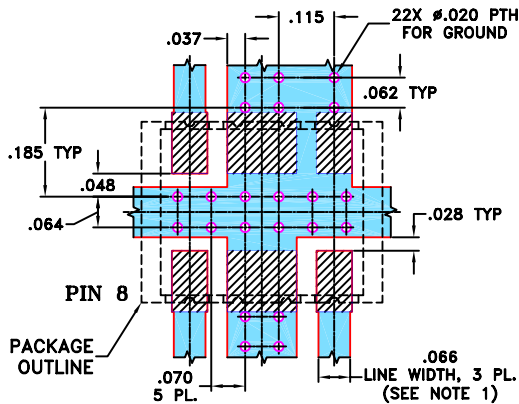
30 to 3000 MHz

### PAD CONNECTIONS

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

PRODUCT MARKING: N/A

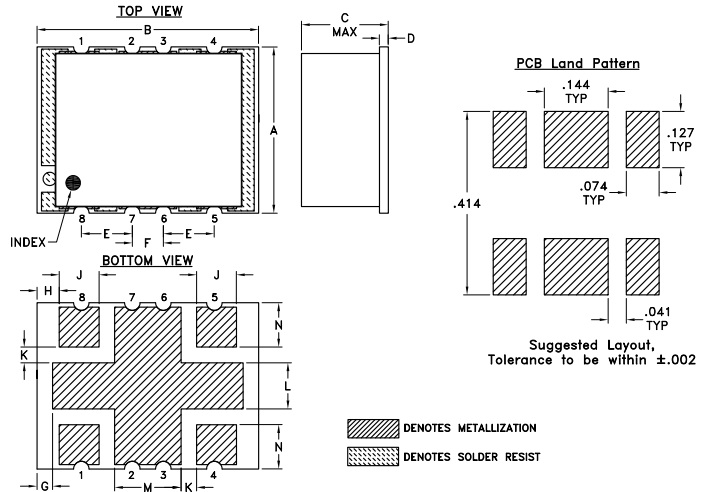
### SUGGESTED PCB LAYOUT (PL-160)



- NOTE:**
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS  $.030 \pm .002$ . 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
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inches/mm)

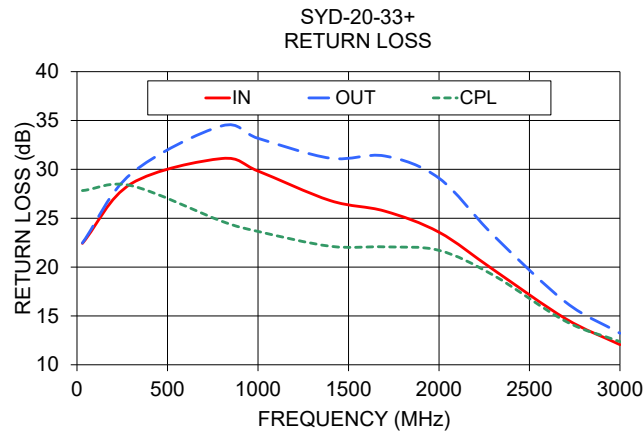
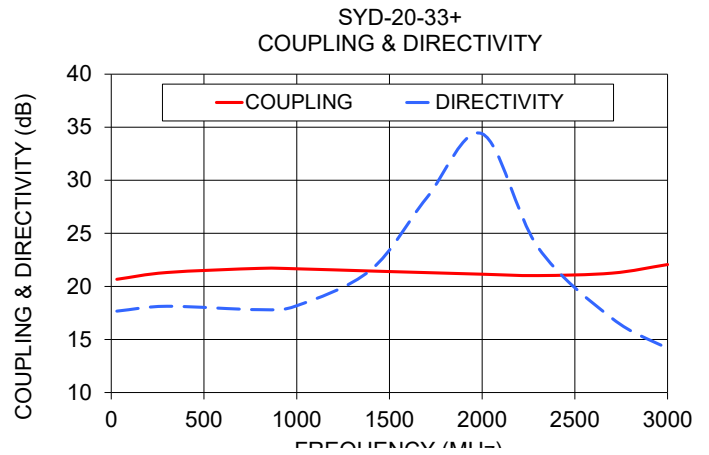
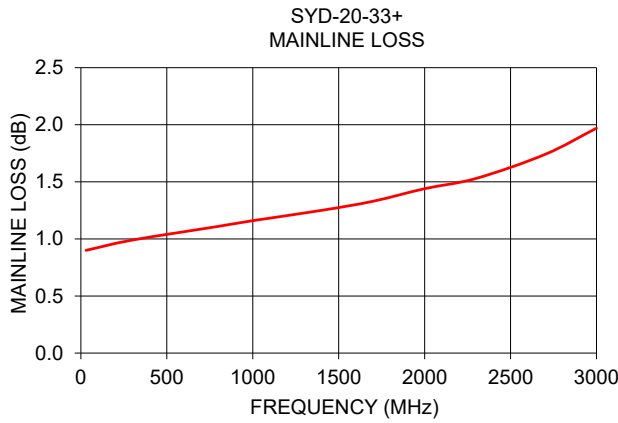
A	B	C	D	E	F	G	H
.38	.50	.25	.020	.115	.070	.035	.050
9.65	12.70	6.35	0.51	2.92	1.78	0.89	1.27
J	K	L	M	N	wt		
.090	.040	.105	.140	.095	grams		
2.29	1.02	2.67	3.56	2.41	0.80		

### TAPE & REEL INFORMATION: F61



### 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	



- 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

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