

# Surface Mount Directional Coupler

50Ω 450 to 1000 MHz

## ADC-20-13+



CASE STYLE: CD542

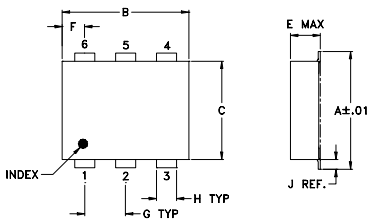
### Maximum Ratings

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

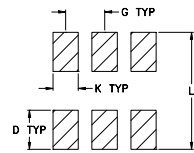
### Pin Connections

INPUT	1
OUTPUT	6
COUPLED	3
GROUND	2
50Ω TERM EXTERNAL	4
ISOLATE (DO NOT USE)	5

### Outline Drawing



### PCB Land Pattern



Suggested Layout,  
Tolerance to be within ±0.02

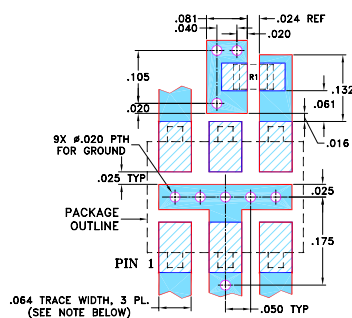
### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.272	.310	.220	.100	.112	.055	.100
6.91	7.87	5.59	2.54	2.84	1.40	2.54

H	J	K	L	wt
.030	.026	.065	.300	grams
0.76	0.66	1.65	7.62	0.20

### Demo Board MCL P/N: TB-05 Suggested PCB Layout (PL-095)



- 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. 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

### 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](http://www.minicircuits.com/MCLStore/terms.jsp)

### Features

- power handling up to 4 Watt.
- low mainline loss, 0.20 dB typ.
- high directivity, 25 dB typ.
- excellent VSWR, 1.2:1 typ.
- aqueous washable

### Applications

- cable tv
- VHF/UHF receivers
- cellular

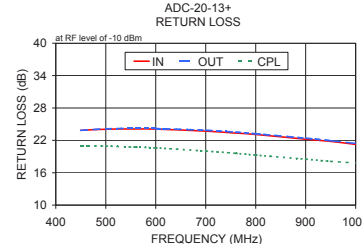
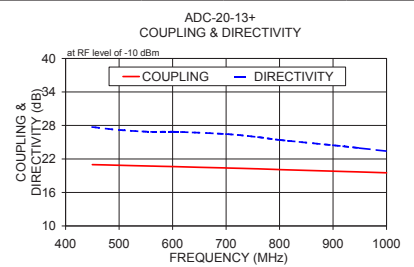
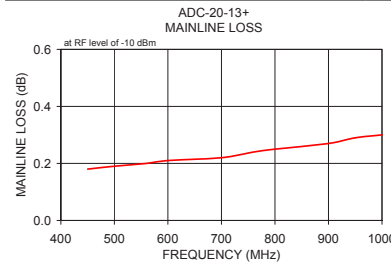
### Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		450	—	1000	MHz
Mainline Loss (above theoretical 0.05 dB)	450	—	0.2	0.3	dB
	700	—	0.2	0.4	
	1000	—	0.3	0.5	
Coupling	450-1000	19.0	19.7	22.2	dB
	450	18.4	20.7	21.6	
	700	17.0	20.0	21.0	
	1000	—	19.0	—	
Coupling Flatness(±)	450-700	—	0.4	0.6	dB
700-1000	—	0.5	0.7		
Directivity	450	18	22	—	dB
	700	16	20	—	
	1000	13	18	—	
Return Loss (Input)	450	20	24	—	dB
	700	19	25	—	
	1000	16	23	—	
Return Loss (Output)	450	20	24	—	dB
	700	18	25	—	
	1000	15	23	—	
Return Loss (Coupling)	450	18	21	—	dB
	700	17	20	—	
	1000	14	18	—	
Input Power <sup>1</sup>	450-1000	—	—	4.0	W

1. Maximum input power with 2:1 VSWR (maximum) load at output port.

### Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
	In-Out	Out			In	Out	Cpl
450.00	0.18	0.20	20.98	27.72	23.85	23.86	20.98
500.00	0.19	0.21	20.87	27.19	24.06	24.14	20.94
560.00	0.20	0.22	20.72	26.86	24.11	24.24	20.73
600.00	0.21	0.23	20.63	26.88	24.09	24.19	20.61
700.00	0.22	0.24	20.38	26.45	23.71	23.87	20.01
760.00	0.24	0.26	20.23	25.91	23.35	23.52	19.59
800.00	0.25	0.27	20.10	25.41	23.09	23.23	19.26
900.00	0.27	0.29	19.81	24.46	22.21	22.40	18.51
950.00	0.29	0.30	19.67	23.94	21.81	21.94	18.11
1000.00	0.30	0.31	19.52	23.40	21.25	21.43	17.82



### Electrical Schematic

