

Surface Mount

Bi-Directional Coupler

ADCB-20-82+

50Ω, 20dB Coupling, 1 to 800 MHz



CASE STYLE: CD636

The Big Deal

- Very Flat Coupling, 0.2 dB
- Very Low Loss, 0.3 dB
- Small Size

Product Overview

ADCB-20-82+ is a surface mount, bi-directional coupler, operating over a wide frequency range, 1-800 MHz housed in a small case measuring 0.31" x 0.27" x 0.16" (7.9 mm x 6.9 mm x 4.1 mm). It uses square cores and a unique patented circuit design to achieve very flat coupling making it ideal for use in wideband applications.

Feature	Advantages
Wide Bandwidth: 1-800 MHz	Ideal for use in CATV and instrumentation applications.
Very Flat Coupling: ± 0.2 dB	Coupled port output is flat over frequency range eliminating need for compensation circuits.
Very Low Loss: 0.3 dB typ.	When used at the output of the amplifiers, low loss minimizes the gain reduction and temperature rise of surrounding components, thus preserving performance and improving reliability.
Bi-Directional	ADCB has two coupled ports; one to sample power traveling from in-out port & the other for sampling power traveling from out to In-Port. Ideal for use in instrumentation applications for measuring ratio of the two powers (return loss).
High Directivity: 16-24 dB typ. to 400 MHz 15-24 dB typ. to 800 MHz	Minimizes the undesired power entering the coupled ports due to imperfect source and load impedances resulting in improved system performance.
Excellent Return Loss: 20-40 dB typ. to 400 MHz	Excellent Return loss of ADCB minimizes interaction effects with adjacent circuits and resulting gain ripple.

Note:

1) US patent 6,133,525 and 6,140,887

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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Maximum Ratings

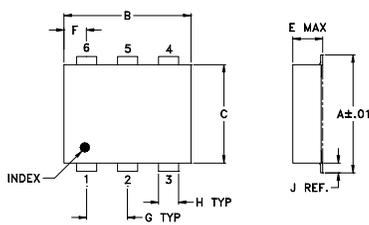
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

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

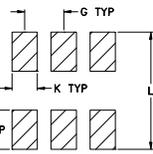
Pin Connections

INPUT	1
OUTPUT	6
COUPLED (forward)	3
COUPLED (reverse)	4
GROUND	2,5

Outline Drawing



PCB Land Pattern

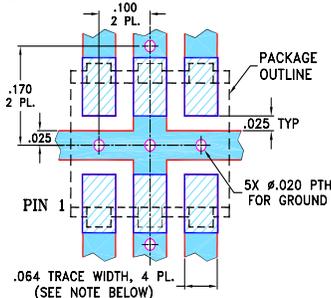


Suggested Layout.

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	wt
.272	.310	.220	.100	.162	.055	.100					grams
6.91	7.87	5.59	2.54	4.11	1.40	2.54					0.25
.030	.026	.065	.300								
0.76	0.66	1.65	7.62								

Demo Board MCL P/N: TB-211 Suggested PCB Layout (PL-097)



- 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

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Features

- low mainline loss, 0.5 dB typ.
- aqueous washable
- protected by US Patents, 6,133,525 & 6,140,887

Applications

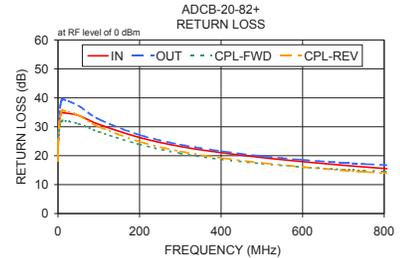
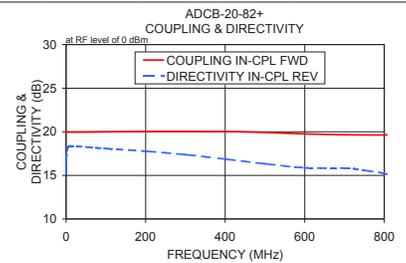
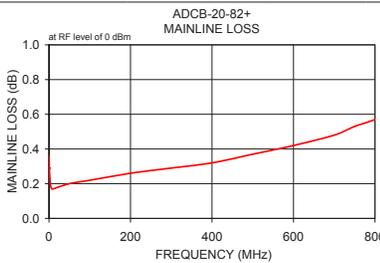
- cable tv
- communications

Electrical Specifications at 25°C

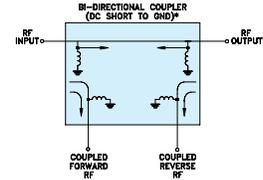
Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		1	—	800	MHz
Mainline Loss (above theoretical 0.05 dB)	1	—	0.2	0.4	dB
	400	—	0.3	0.6	
	800	—	0.6	0.9	
Coupling	1-800	—	20.2	—	dB
	1	19.5	20.2	20.9	
	400	19.5	20.4	21.6	
Coupling Flatness(±)	1-400	—	0.2	0.6	dB
	400-800	—	0.2	0.7	
	800	18.5	20.2	21.8	
Directivity	1	15	20	—	dB
	400	14	24.4	—	
	800	10	15	—	
Return Loss (Input)	1	21	28	—	dB
	400	15	21	—	
	800	11	16	—	
Return Loss (Output)	1	21	27	—	dB
	400	15	22	—	
	800	11	17	—	
Return Loss (Coupling)	1	18	24	—	dB
	400	14	19	—	
	800	11	15	—	
Input Power	1-10	—	—	0.5	W
	10-800	—	—	1.0	

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	In-Cpl Rev	Out-Cpl Rev	In-Cpl Rev	In-Cpl Fwd	In	Out	Cpl-Fwd	Cpl-Rev
1.00	0.28	19.95	20.51	20.51	23.31	17.11	26.99	27.95	24.36	25.10
5.00	0.18	19.96	20.26	20.26	22.64	18.23	33.33	36.56	30.77	33.21
7.00	0.17	19.96	20.24	20.24	22.53	18.31	34.26	38.32	31.63	34.62
10.00	0.17	19.96	20.24	20.24	22.52	18.36	34.90	39.65	32.20	35.65
50.00	0.20	19.97	20.27	20.27	22.96	18.25	33.92	37.31	31.06	33.96
100.00	0.22	19.99	20.32	20.32	23.46	18.07	30.86	32.63	28.26	30.05
500.00	0.37	19.92	20.90	20.90	33.83	16.33	19.37	19.85	17.25	17.50
600.00	0.42	19.76	20.95	20.95	24.49	15.87	17.94	18.54	16.02	16.09
700.00	0.48	19.66	20.81	20.81	19.60	15.83	16.69	17.53	15.18	14.93
800.00	0.57	19.64	20.63	20.63	15.95	15.21	15.57	16.79	14.51	13.99



Electrical Schematic



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