

# Engineering Development Model

## Directional Coupler

## ADC-ED10779/2

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : CD542

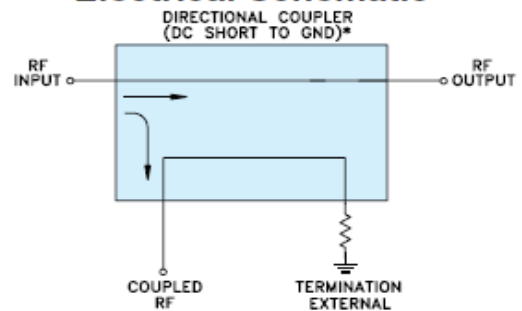
ELECTRICAL SPECIFICATIONS 75Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency		40		1000	MHz
Coupling	Nominal		10.5 ± 0.5		dB
	Flatness		± 0.5		dB
Mainline Loss **	40-400 MHz		1.13		dB
	400-500 MHz		1.15		dB
	500-1000 MHz		1.17		dB
Directivity	40-400 MHz		22		dB
	400-500 MHz		22		dB
	500-1000 MHz		23		dB
VSWR	40-1000 MHz		1.2		(:1)
RF Power Input	40-1000 MHz			1.0	W

Notes: \*\* Mainline loss includes theoretical coupled power loss of 0.405 dB at 10.5 dB coupling.

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

PIN CONNECTIONS	
INPUT	1
OUTPUT	6
COUPLED FORWARD	3
75Ω TERM. EXTERNAL	4
GROUND	2
NOT USED	5

### Electrical Schematic



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

# Directional Coupler

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## Typical Performance Data

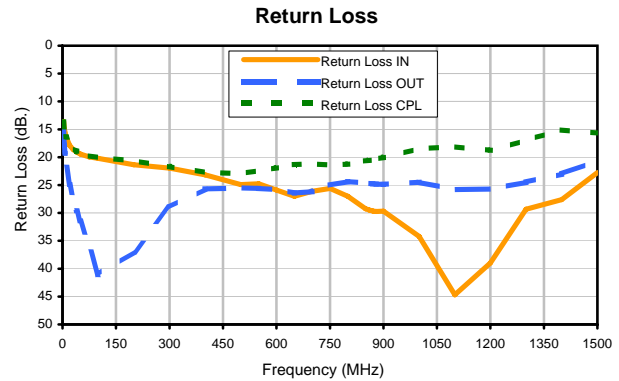
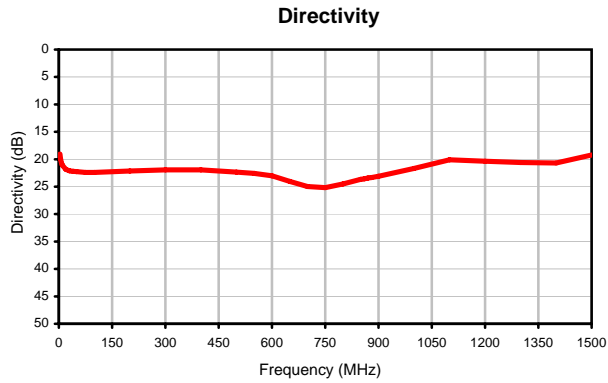
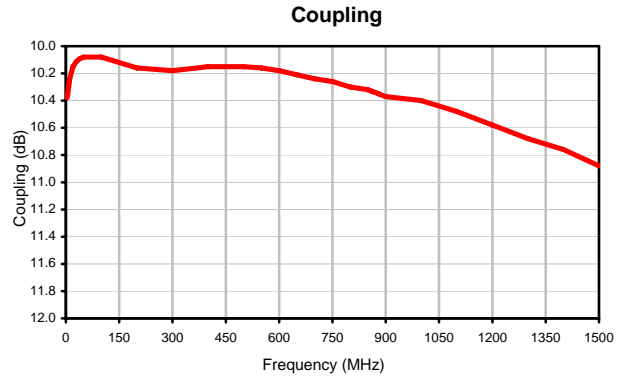
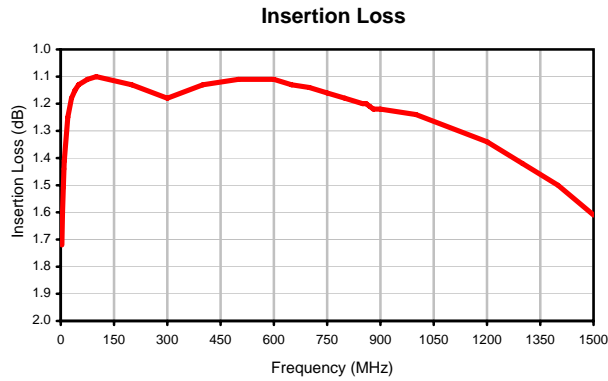
FREQUENCY (MHz)	INSERTION LOSS (dB)	COUPLING (dB)	DIRECTIVITY (dB)	RETURN LOSS		
				IN	(dB) OUT	CPL
3.0	1.72	10.38	19.05	13.57	15.39	13.65
5.0	1.60	10.36	20.02	14.82	17.81	14.90
7.0	1.51	10.31	20.61	15.58	19.32	15.60
9.0	1.44	10.27	20.95	16.14	20.51	16.14
10.0	1.41	10.25	21.09	16.37	21.02	16.36
20.0	1.25	10.15	21.84	17.90	24.90	17.80
30.0	1.18	10.11	22.10	18.64	27.51	18.50
40.0	1.15	10.09	22.21	19.10	29.63	18.95
50.0	1.13	10.08	22.26	19.44	31.44	19.27
75.0	1.11	10.08	22.39	19.95	35.95	19.76
100.0	1.10	10.08	22.40	20.20	41.07	20.05
200.0	1.13	10.16	22.13	21.36	36.93	20.64
300.0	1.18	10.18	21.95	21.97	28.99	21.67
400.0	1.13	10.15	21.93	23.17	25.70	22.73
500.0	1.11	10.15	22.34	24.92	25.52	22.93
550.0	1.11	10.16	22.59	24.77	25.60	22.41
600.0	1.11	10.18	23.02	25.88	25.80	21.90
650.0	1.13	10.21	24.03	27.02	26.43	21.32
700.0	1.14	10.24	24.97	26.12	26.18	21.21
750.0	1.16	10.26	25.18	25.60	25.00	21.42
800.0	1.18	10.30	24.50	27.01	24.36	21.24
850.0	1.20	10.32	23.67	29.26	24.61	20.68
860.0	1.20	10.33	23.57	29.48	24.70	20.56
870.0	1.21	10.34	23.43	29.65	24.76	20.43
880.0	1.22	10.35	23.34	29.73	24.84	20.31
900.0	1.22	10.37	23.11	29.68	24.88	20.04
1000.0	1.24	10.40	21.68	34.21	24.47	18.45
1100.0	1.29	10.48	20.10	44.68	25.80	18.14
1200.0	1.34	10.58	20.35	38.99	25.71	18.76
1300.0	1.42	10.68	20.59	29.34	24.47	16.96
1400.0	1.50	10.76	20.68	27.61	23.03	15.14
1500.0	1.61	10.88	19.21	22.75	20.61	15.66



# Directional Coupler

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## Typical Performance Curves



# Case Style

# CD

CD541  
CD542  
CD636  
CD637

## Outline Dimensions



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	WT, GRAM
CD541					.082 (2.08)							.15
CD542	.272 (6.91)	.310 (7.87)	.220 (5.58)	.100 (2.54)	.112 (2.84)	.055 (1.40)	.100 (2.54)	.030 (0.76)	.026 (0.66)	.065 (1.65)	.300 (7.62)	.20
CD636					.162 (4.11)							.25
CD637					.206 (5.23)							.40

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

### Notes:

- Case material: Plastic.
- Termination finish:
  - For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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# Tape & Reel Packaging TR-F34



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
16	12	7	Small quantity standard (see note)	20
				50
			100	
			200	
		13	Standard	500
				1000

Note: Availability of small reel quantity varies by model.  
Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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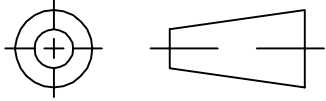
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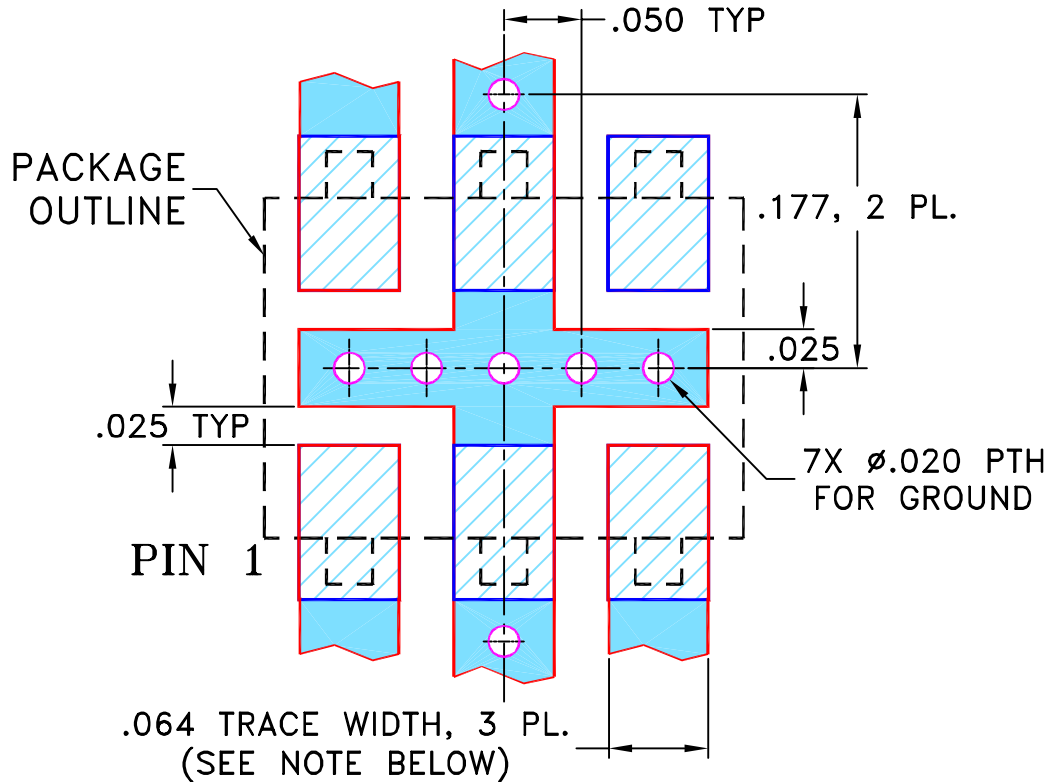
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/05/02	MMG	DJ
A	M102713	ADDED NOTE 2 & "...WITH SMOBC"	01/17/06	MMG	IL

SUGGESTED MOUNTING CONFIGURATION  
FOR CD542 CASE STYLE "hz" PIN CONNECTION



- 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

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN MMG	07/23/02
TOLERANCES ON:	CHECKED LC	08/02/02
2 PL DECIMALS ±	APPROVED DJ	08/05/02
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

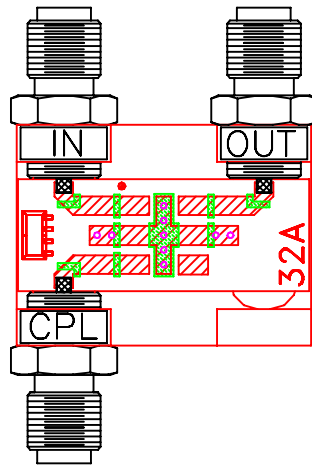
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PL, hz, CD542, ADC, TB-32

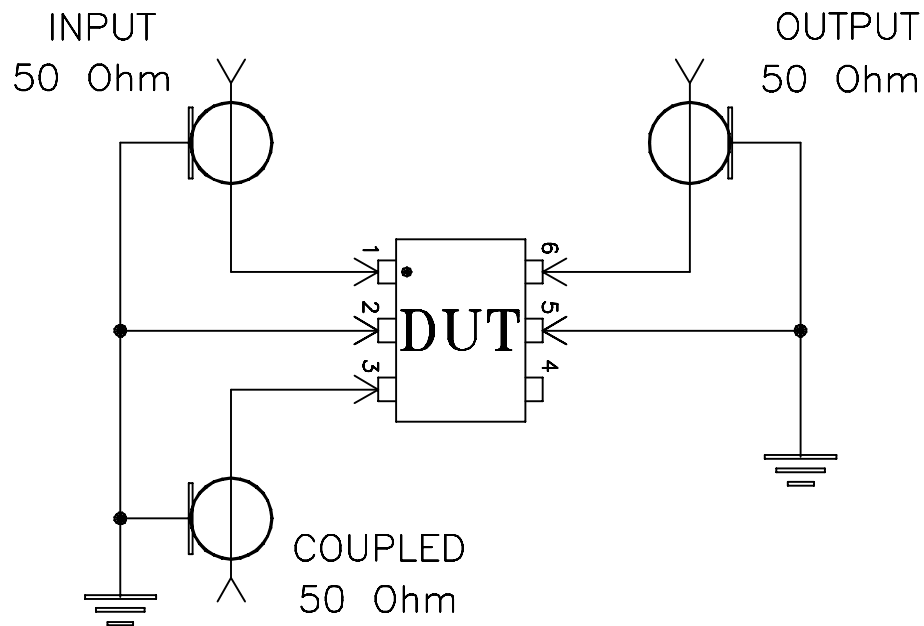
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FILE: 98PL094	SCALE: 8:1	SHEET: 1 OF 1	

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# Evaluation Board and Circuit




TB-32



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

 Mini-Circuits®



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215