

# High Power Bi-Directional Coupler

## BDCA1-10-40+

50Ω 10dB Coupling DC Pass 1600 to 4000 MHz



CASE STYLE: DZ944

### Maximum Ratings

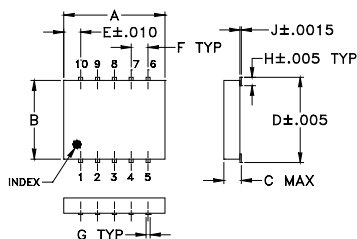
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	0.25A

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

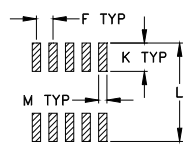
### Pin Connections

INPUT	1
OUTPUT	6
COUPLED (forward)	10
COUPLED (reverse)	5
GROUND	2,3,4,7,8,9

### Outline Drawing



### PCB Land Pattern

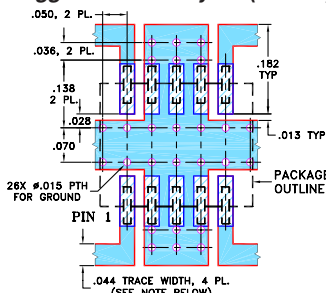


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.30	.250	.052	.266	.050	.050	.012
7.62	6.35	1.32	6.76	1.27	1.27	0.30
H	J	K	L	M	wt	
.029	.004	.085	.296	.030	grams	
0.74	0.10	2.16	7.52	0.76	0.25	

### Demo Board MCL P/N: TB-115+ Suggested PCB Layout (PL-004)



- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± .0015; 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 WITH SMOBC (SOLDER MASK OVER BARE COPPER)
  - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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

- four-port
- wideband, 1600 to 4000 MHz
- excellent VSWR 1.2:1 typ. all ports
- good flatness, ±0.5 dB
- excellent power handling capability
- hermetically sealed
- minimal variation with temperature
- protected by US Patent 7,049,905
- DC current through input to output 0.25A Max. at 1.0 watt RF input power.

### Applications

- wireless communication
- ISM, PCS
- mobile satellite

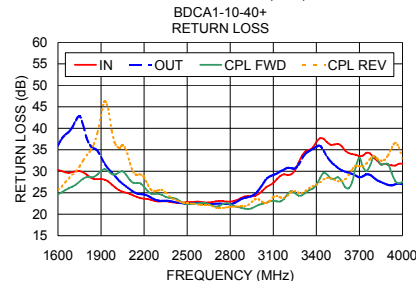
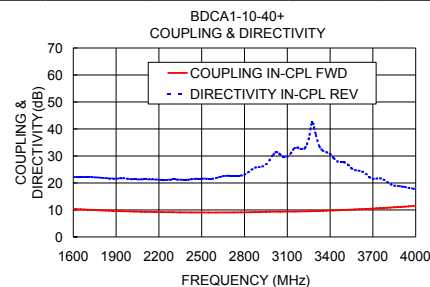
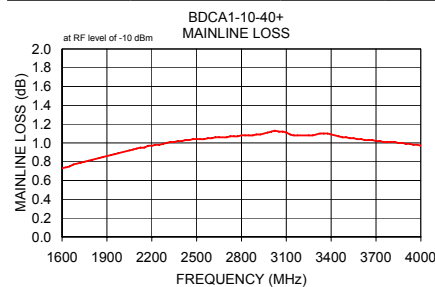
### Bi-Directional Coupler Electrical Specifications

FREQUENCY (MHz)	COUPLING (dB)		MAINLINE LOSS <sup>1</sup> (dB)		DIRECTIVITY (dB)		VSWR (:1)	POWER INPUT <sup>2</sup> (W)
	Nom.	Max. Flatness	Typ.	Max.	Typ.	Min.		
$f_c$ - $f_u$								
1600-4000								
1600-1800	10.1±0.7	±0.7	0.8	1.1	21	18	1.1	24
1800-2200	9.5±0.7	±0.8	1.0	1.3	20	17	1.1	20
2200-2900	9.1±0.5	±0.5	1.05	1.4	20	16	1.2	16
2900-3500	9.6±0.9	±1.0	1.15	1.4	22	16	1.2	14
3500-4000	10.8±1.0	±1.5	1.05	1.4	18	11	1.25	12

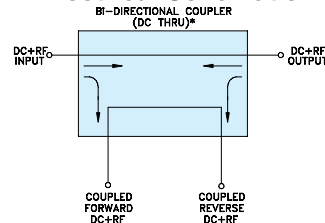
- Includes theoretical coupled power loss of 0.46 dB at 10 dB coupling.
- Derate linearly 1/3 at 100°C

### Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev	
1600.00	0.73	10.38	10.35	22.15	22.21	30.29	35.96	24.62	25.69	
1800.00	0.82	9.83	9.82	21.29	21.91	29.24	37.69	28.63	33.72	
2000.00	0.90	9.45	9.44	20.61	21.43	26.20	28.78	29.26	36.30	
2200.00	0.97	9.22	9.21	20.25	21.19	23.61	24.59	26.38	28.57	
2500.00	1.04	9.06	9.09	20.09	21.66	22.81	22.48	22.34	22.52	
2900.00	1.09	9.23	9.17	21.21	25.85	24.12	23.79	21.32	21.84	
3200.00	1.08	9.47	9.53	22.68	33.09	29.13	30.80	24.69	24.37	
3500.00	1.06	10.01	10.17	24.81	27.65	36.17	32.26	28.32	28.37	
3800.00	1.01	10.82	10.91	22.98	20.42	33.18	28.51	33.41	33.47	
4000.00	0.97	11.51	11.60	20.98	17.71	31.77	26.97	27.56	32.91	



### Electrical Schematic



\* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

