

Surface Mount Directional Coupler

50Ω 10 dB coupling 5 to 1000 MHz

DBTC-10-13X+

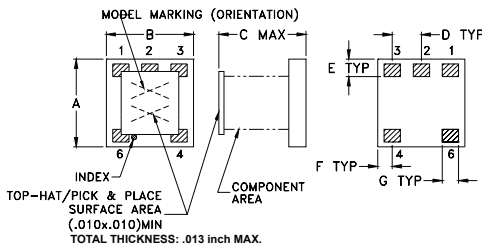
Maximum Ratings

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	3
OUTPUT	4
COUPLED	1
GROUND	2
ISOLATE (DO NOT USE)	6

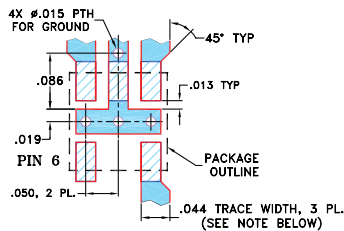
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F
.150	.150	.150	.050	.030	.025
3.81	3.81	3.81	1.27	0.76	0.64
G	H	J	K	wt	
.028	.050	.160	.030	grams	
0.71	1.27	4.06	0.76	0.10	

Demo Board MCL P/N: TB-278 Suggested PCB Layout (PL-150)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; 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-Circuits' 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

Features

- very flat coupling
- very broadband, multi octave
- temperature stable, LTCC base
- all welded construction
- leads attached for better solderability
- micro miniature coupler
- aqueous washable
- protected by US Patents 6,140,887 & 6,784,521

Applications

- VHF/UHF receivers/transmitters
- cellular

Electrical Specifications

FREQ. RANGE (MHz)	COUPLING (dB)		MAINLINE LOSS* (dB)						DIRECTIVITY (dB)						VSWR** (:1)	POWER INPUT (W)	
			L		M		U		L		M		U				
	f _L -f _U	Nom.	Flatness	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.		Min.	Typ.
5-1000	10.3±0.5	±0.8	1.3	2.0	1.4	1.8	1.6	2.0	21	17	18	13	15	10	1.3	0.5	1.0

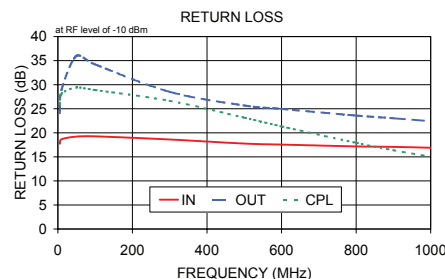
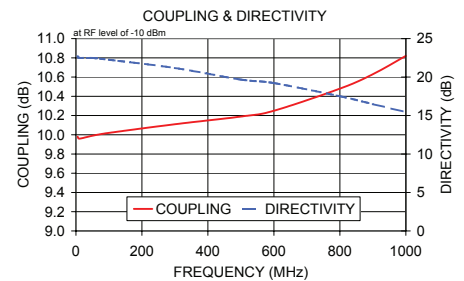
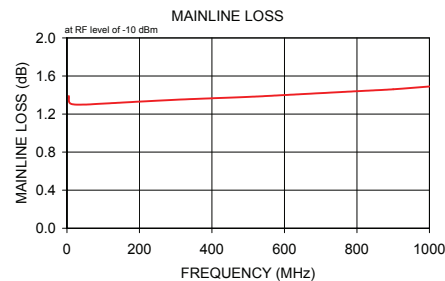
L = low range [f_L to 10 f_L] M = mid range [10 f_L to $f_U/2$] U = upper range [$f_U/2$ to f_U]

* Includes theoretical coupled power loss of 0.4 dB at 10 dB coupling

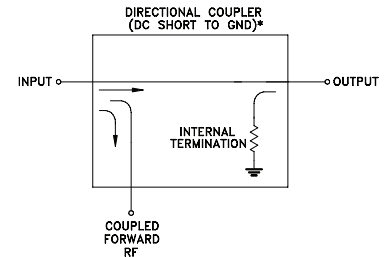
** For coupled port VSWR above 500 MHz, 1.6:1 typ.

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)	Directivity (dB)	Return Loss (dB)		
	In-Out	In-Cpl			In	Out	Cpl
5.00	1.39	9.98	22.65	17.72	24.12	25.96	
10.00	1.31	9.96	22.50	18.66	28.97	28.11	
50.00	1.30	9.99	22.49	19.21	35.99	29.42	
100.00	1.31	10.02	22.25	19.27	34.22	28.89	
300.00	1.35	10.11	21.18	18.61	28.51	26.63	
500.00	1.38	10.19	19.67	17.76	25.67	23.15	
600.00	1.40	10.25	19.22	17.56	24.97	21.33	
800.00	1.44	10.48	17.51	17.17	23.59	17.92	
900.00	1.46	10.63	16.49	17.08	23.03	16.39	
1000.00	1.49	10.82	15.45	16.89	22.42	15.06	



Electrical Schematic



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



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REV. OR
M135592
ED-12884/1
DBTC-10-13X+
WZ/TD/CP/AM
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