

Surface Mount  **Directional Coupler**

**DBTC-20-4LX+**

50Ω, 20dB coupling, 20 to 1000 MHz

**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

**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**

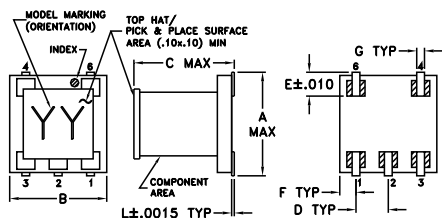
FREQ. RANGE (MHz)	COUPLING (dB)		MAINLINE LOSS* (dB)				DIRECTIVITY (dB)			VSWR** (:1)	POWER INPUT (W)						
	Nom.	Flatness	L	M	U	L	M	U	L		MU						
20-1000	20.4±0.5	±0.8	0.3	1.0	0.4	1.0	0.7	1.3	21	13	21	14	16	—	1.2	1.0	1.0

L = low range [f<sub>l</sub> to 10 f<sub>l</sub>] M = mid range [10 f<sub>l</sub> to f<sub>u</sub>/2] U = upper range [f<sub>u</sub>/2 to f<sub>u</sub>]  
 \* Includes theoretical coupled power loss of 0.04 dB at 20 dB coupling  
 \*\* For coupled port VSWR above 500 MHz, 1.6:1 typ.

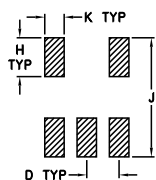
**Typical Performance Data**

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
	In-Out				In	Out	Cpl
20.00	0.33	20.30	19.79	28.00	30.48	26.85	
100.00	0.35	20.25	22.11	29.28	31.80	27.18	
200.00	0.38	20.28	23.36	29.12	30.13	24.16	
300.00	0.41	20.32	24.66	27.95	28.09	21.44	
400.00	0.43	20.36	25.00	27.01	26.54	19.23	
500.00	0.48	20.40	23.74	26.41	25.97	17.30	
600.00	0.53	20.43	21.33	25.99	25.74	15.69	
700.00	0.58	20.50	19.06	25.78	26.00	14.31	
800.00	0.63	20.59	17.10	26.16	26.88	13.07	
1000.00	0.70	20.94	14.20	28.41	29.64	11.03	

**Outline Drawing**



**PCB Land Pattern**

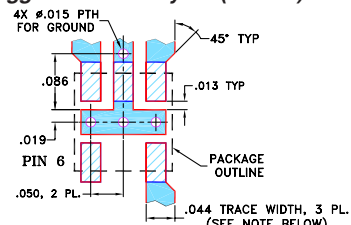


Suggested Layout, Tolerance to be within .002



**Outline Dimensions (inch/mm)**

A	B	C	D	E	F
.166	.150	.155	.050	.037	.025
4.22	3.81	3.94	1.27	0.94	0.64
G	H	J	K	L	wt
.012	.060	.184	.030	.004	grams
0.30	1.52	4.67	0.76	0.10	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-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](http://www.minicircuits.com/MCLStore/terms.jsp)



CASE STYLE: AT1642

**+RoHS Compliant**

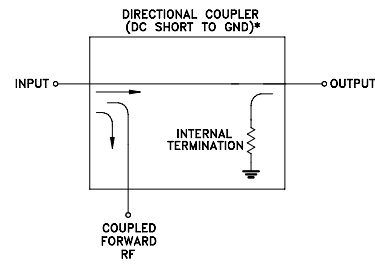
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

**Available Tape and Reel at no extra cost**

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	1000, 2000



**Electrical Schematic**



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