



# Directional Coupler

**DBTC-17-5LX+**

## 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



Generic photo used for illustration purposes only

CASE STYLE: AT1642

### +RoHS Compliant

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

## APPLICATIONS

- Cellular
- PCS
- DECT/PHS
- GSM

## ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		50		2000	MHz
Mainline Loss <sup>1</sup>	50-1000		0.9	1.4	dB
	1000-1500		1.0	1.5	
	1500-2000		1.1	1.6	
Nominal Coupling	50-1000		17.0±0.7		dB
	1000-1500		17.2±0.9		
	1500-2000		17.0±1.0		
Coupling Flatness	50-1000			±0.9	dB
	1000-1500			±1.0	
	1500-2000			±0.8	
Directivity	50-1000	13	20		dB
	1000-1500	10	20		
	1500-2000		14		
VSWR <sup>2</sup>	50-1000		1.2		:1
	1000-1500		1.2		
	1500-2000		1.2		
Input Power	50-1000			2.0	W
	1000-1500			2.0	
	1500-2000			2.0	

1. Includes theoretical coupled power loss of 0.07 dB at 17 dB coupling.

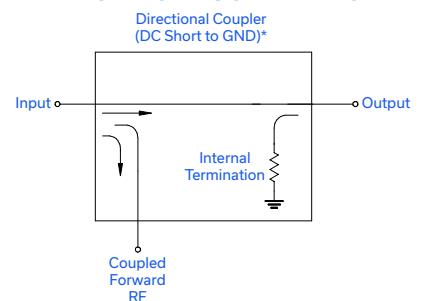
2. For coupled port VSWR above 500 MHz, 1.6:1 typ.

## ABSOLUTE MAXIMUM RATINGS

Parameter	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.

## ELECTRICAL SCHEMATIC



\* Electrical schematic is for directional coupler with internal transformer(s) that routes DC from RF ports to ground.

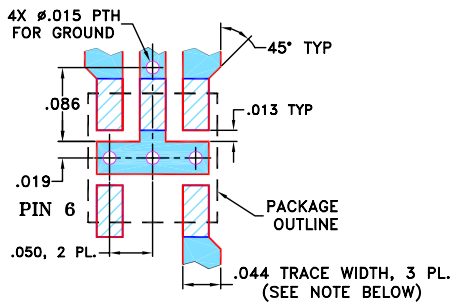


**PIN CONNECTIONS**

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

**PRODUCT MARKING:** DW

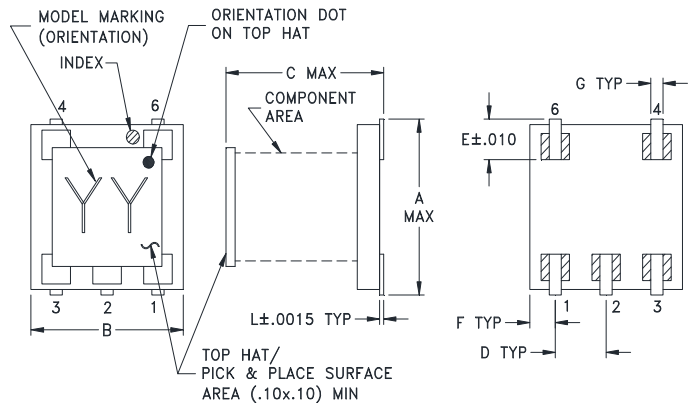
**DEMO BOARD MCL P/N:** TB-DBTC-17-5LX+  
**SUGGESTED PCB LAYOUT (PL-150)**



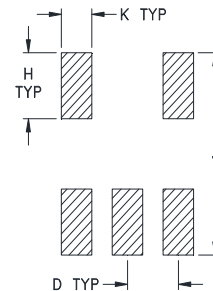
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

**OUTLINE DRAWING**



**PCB Land Pattern**



Suggested Layout,  
Tolerance to be within ±.002

**OUTLINE DIMENSIONS (Inches/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

**TAPE & REEL INFORMATION: F76**

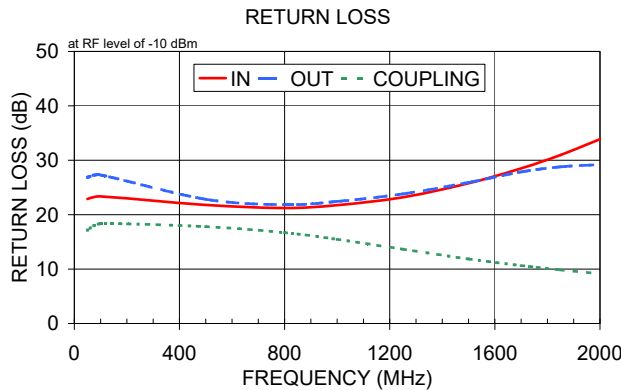
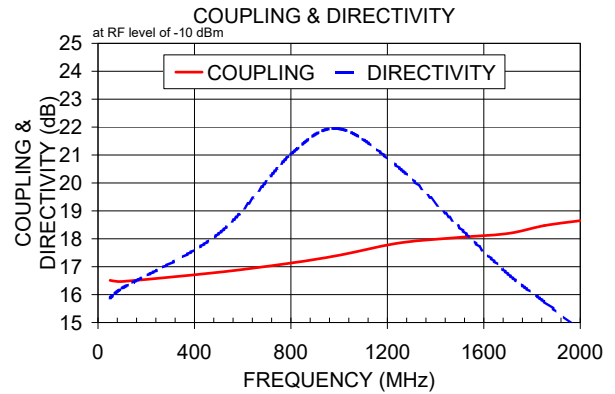
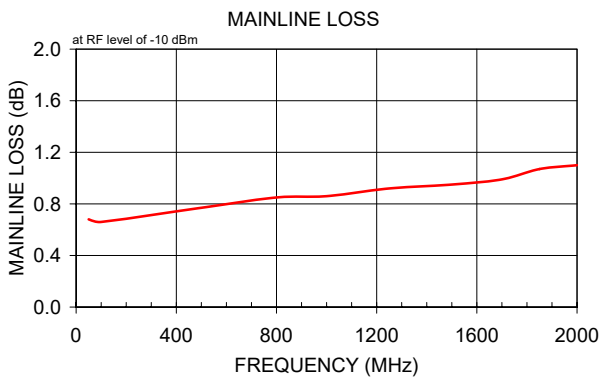


# Directional Coupler

**DBTC-17-5LX+**

**TYPICAL PERFORMANCE DATA**

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)	Directivity (dB)	Return Loss (dB)		
	In-Out	In-Cpl			In	Out	Cpl
50	0.68	16.51	15.88	22.89	26.86	17.13	
100	0.66	16.47	16.23	23.35	27.29	18.32	
500	0.77	16.80	18.18	21.79	22.83	17.80	
800	0.85	17.13	21.03	21.23	21.84	16.69	
1000	0.86	17.41	21.94	21.75	22.43	15.47	
1250	0.92	17.85	20.53	23.20	23.81	13.65	
1500	0.95	18.05	18.40	25.78	25.92	11.86	
1700	0.99	18.19	16.74	28.51	27.86	10.64	
1850	1.07	18.47	15.75	30.97	28.79	9.85	
2000	1.10	18.65	14.74	33.87	29.20	9.16	



- 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.
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