



SURFACE MOUNT

# Directional Coupler

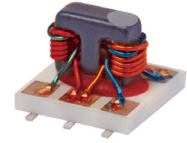
## DBTC-12-4L+

Mini-Circuits

50Ω 12 dB 5 to 1000 MHz

### 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: AT1030

### +RoHS Compliant

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

### APPLICATIONS

- VHF/UHF Receivers/Transmitters
- Cellular

### ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1000	MHz
Mainline Loss <sup>1</sup>	5-50		0.9	1.8	dB
	50-500		0.7	1.3	
	500-1000		1.1	1.6	
Nominal Coupling	5-1000		12.2±0.5		dB
Coupling Flatness	5-1000			±0.9	dB
Directivity	5-50	22	33		dB
	50-500	14	21		
	500-1000		15		
VSWR <sup>2</sup>	5-1000		1.2		:1
Input Power	5-50			0.5	W
	50-500			1.0	
	500-1000			1.0	

1. Includes theoretical coupled power loss of 0.27 dB at 12 dB coupling.

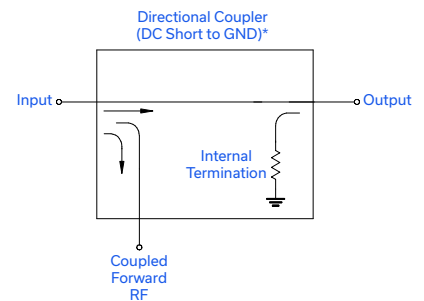
2. For coupled port VSWR above 500 MHz, 1.5:1 typ.

### 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.

Mini-Circuits

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251010  
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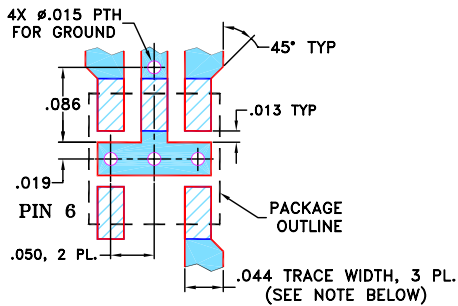
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### PIN CONNECTIONS

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

PRODUCT MARKING: N/A

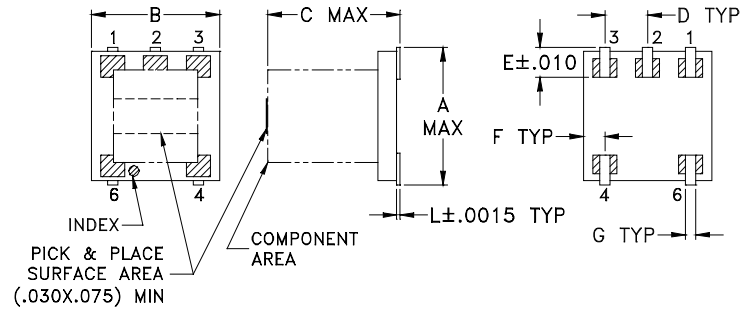
### DEMO BOARD MCL P/N: TB-DBTC-12-4L+ SUGGESTED PCB LAYOUT (PL-150)



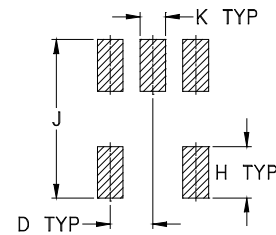
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $0.020 \pm 0.0015$ ”; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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  $\square 002$

### OUTLINE DIMENSIONS (Inches/mm)

A	B	C	D	E	F	G	H	J	K	L	wt
.166	.150	.155	.050	.037	.025	.012	.060	.184	.030	.004	grams
4.22	3.81	3.94	1.27	0.94	0.64	0.30	1.52	4.67	0.76	0.10	0.10

### TAPE & REEL INFORMATION: F76



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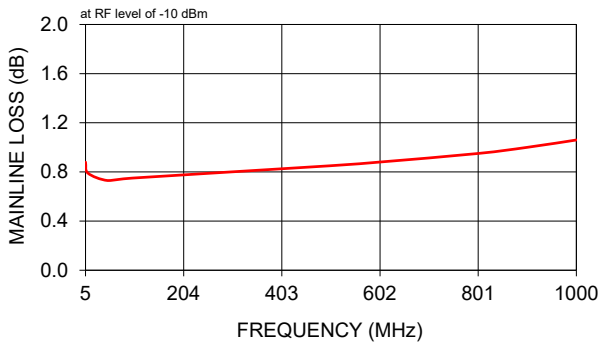
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50Ω 12 dB 5 to 1000 MHz

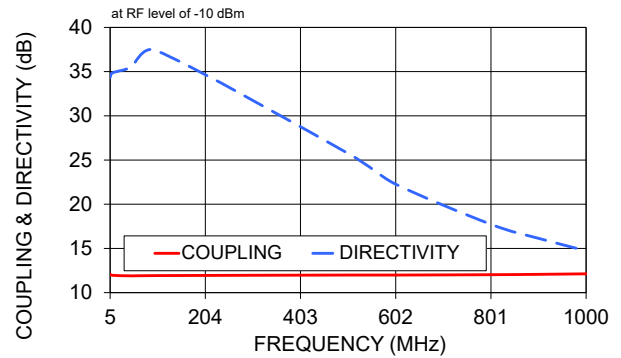
### TYPICAL PERFORMANCE DATA

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)	Directivity (dB)	Return Loss (dB)		
	In-Out	In-Cpl			In	Out	Cpl
5	0.88	12.07	34.34	19.19	23.31	17.81	
10	0.79	11.96	34.86	21.25	27.96	19.68	
50	0.73	11.90	35.53	22.99	35.09	21.01	
100	0.75	11.93	37.41	22.94	34.58	21.11	
500	0.85	11.99	25.82	22.00	26.19	18.96	
600	0.88	11.99	22.32	21.56	25.58	17.94	
800	0.95	12.03	17.75	20.94	25.46	15.62	
900	1.00	12.07	16.15	20.79	26.14	14.55	
1000	1.06	12.13	14.74	20.48	26.70	13.43	

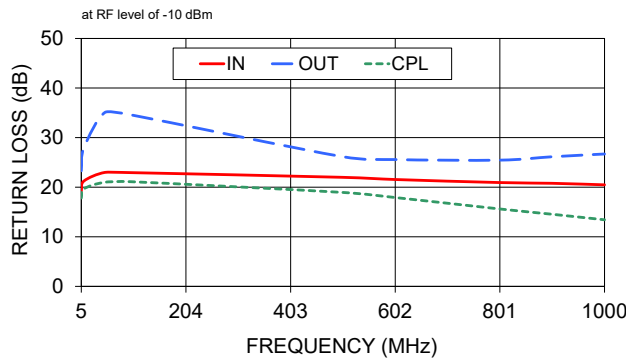
MAINLINE LOSS



COUPLING & DIRECTIVITY



RETURN LOSS



- 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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