

# Directional Couplers

50Ω, 12dB coupling, 5 to 1000 MHz

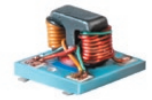
DBTC-12-4+

DBTC-12-4L+



No Leads

CASE STYLE:AT790-1  
PRICE:\$1.99 ea. QTY (25)  
\$1.69 ea. QTY (1000)



Leads

CASE STYLE:AT1030  
PRICE:\$2.14 ea. QTY (25)  
\$1.84 ea. QTY (1000)

## 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	Typ.	Min.	Max.		L	MU			
5-1000	12.2±0.5	±0.9	0.9	1.8	0.7	1.3	1.1	1.6	33	22	21	14	15	—	1.2	0.5	1.0

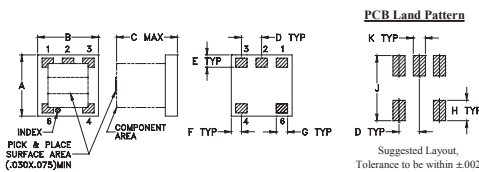
L = low range [f<sub>l</sub> to 10 f<sub>l</sub>] M = mid range [10 f<sub>l</sub> to f<sub>u</sub>/2] U = upper range [f<sub>u</sub>/2 to f<sub>u</sub>]  
\* Includes theoretical coupled power loss of 0.27 dB at 12 dB coupling  
\*\* For coupled port VSWR above 500 MHz, 1.5:1 typ.

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

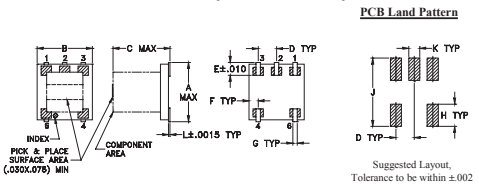
## Outline Drawing / Dimensions (inch/mm)

### AT790-1 (DBTC-12-4)



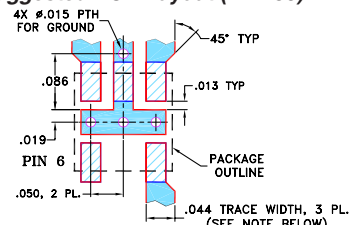
A	B	C	D	E	F	G	H	J	K	wt
.150	.150	.150	.050	.030	.025	.028	.050	.160	.030	grams
3.81	3.81	3.81	1.27	0.76	0.64	0.71	1.27	4.06	0.76	0.10

### AT1030 (DBTC-12-4L)



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

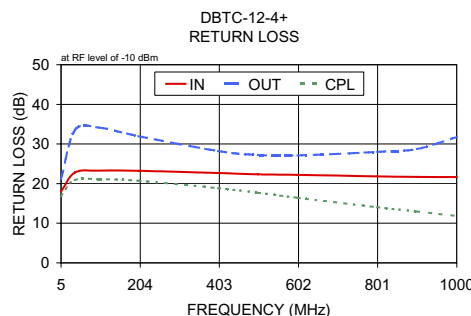
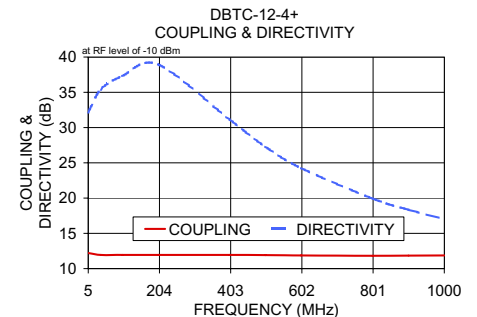
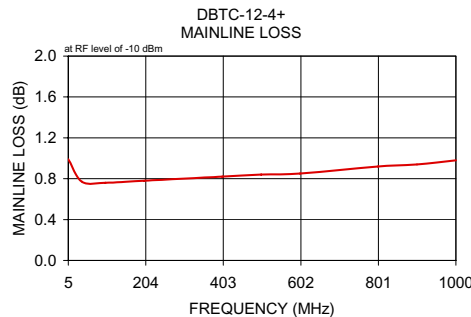
## Demo Board MCL P/N: TB-278 Suggested PCB Layout (PL-150)



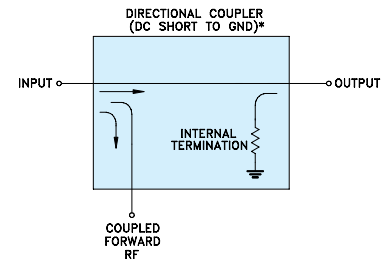
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
  - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
				In	Out	Cpl
5.00	0.88	12.07	34.34	19.19	23.31	17.81
10.00	0.79	11.96	34.86	21.25	27.96	19.68
50.00	0.73	11.90	35.53	22.99	35.09	21.01
100.00	0.75	11.93	37.41	22.94	34.58	21.11
500.00	0.85	11.99	25.82	22.00	26.19	18.96
600.00	0.88	11.99	22.32	21.56	25.58	17.94
800.00	0.95	12.03	17.75	20.94	25.46	15.62
900.00	1.00	12.07	16.15	20.79	26.14	14.55
1000.00	1.06	12.13	14.74	20.48	26.70	13.43



## Electrical Schematic



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

For detailed performance specs & shopping online see web site



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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).

REV. J  
M11996  
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DBTC-12-4L+  
WZ/TD/CP/AM  
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ED-8654A  
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