

# Directional Couplers

50Ω, 13dB coupling, 5 to 1000 MHz

DBTC-13-4+

DBTC-13-4L+

## Maximum Ratings

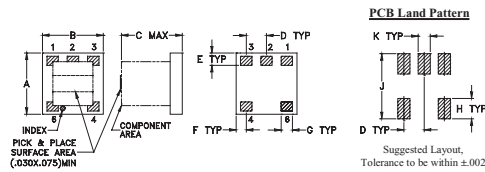
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

## Pin Connections

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

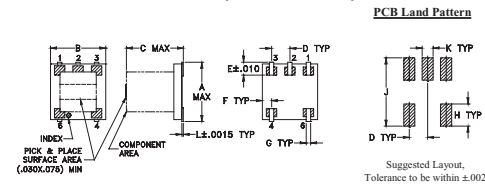
## Outline Drawing / Dimensions (inch / mm)

### AT790-1 (DBTC-13-4)



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

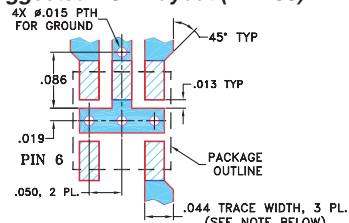
### AT1030 (DBTC-13-4L)



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

## 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

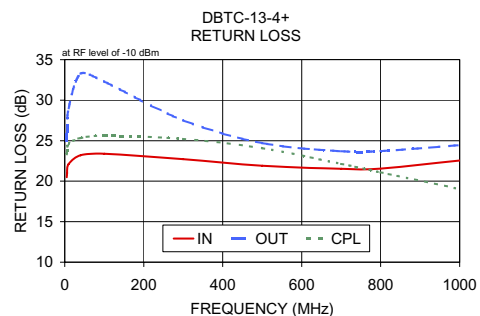
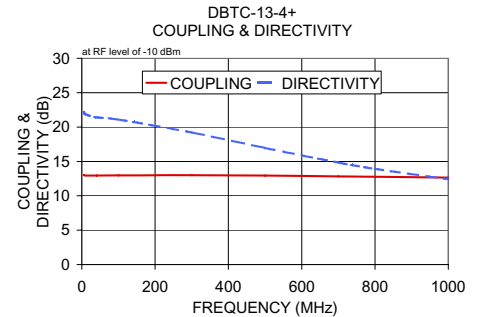
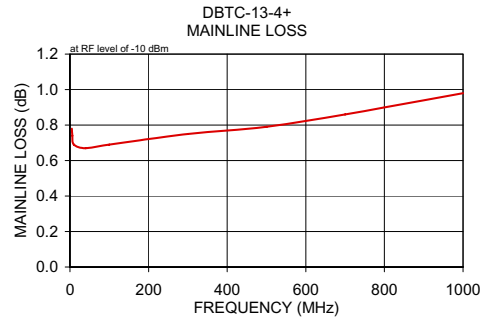
## Electrical Specifications

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						
5-1000	13.0±0.5	±0.6	0.7	1.3	0.7	1.3	1.1	1.6	21	17	18	13	13	—	1.2	0.5	1.0

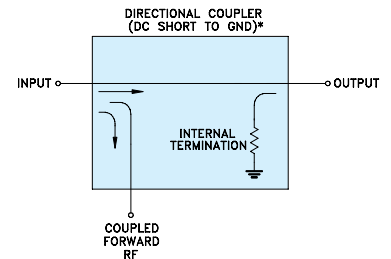
L = low range [f<sub>l</sub> to 10 f<sub>l</sub>] M = mid range [10 f<sub>l</sub> to f<sub>u</sub>/2] U = upper range [f<sub>u</sub>/2 to f<sub>u</sub>]  
 \* Includes theoretical coupled power loss of 0.22 dB at 13 dB coupling  
 \*\* For coupled port VSWR above 500 MHz, 1.4:1 typ.

## Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
				In	Out	Cpl
5.00	0.77	13.08	22.34	19.78	23.72	22.27
10.00	0.70	13.00	21.94	21.65	27.70	23.92
50.00	0.65	12.95	21.49	23.18	32.43	25.26
100.00	0.67	12.98	21.06	23.12	31.88	25.46
300.00	0.74	13.04	19.82	22.41	26.20	24.99
500.00	0.79	13.05	18.10	21.80	23.68	24.06
600.00	0.82	13.03	16.98	21.37	22.90	23.20
800.00	0.89	13.01	15.16	21.11	22.22	21.19
900.00	0.93	12.99	14.48	21.34	22.35	20.16
1000.00	0.98	12.97	13.82	21.62	22.42	19.03



## Electrical Schematic



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



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IF/RF MICROWAVE COMPONENTS

REV. J  
 M119986  
 DBTC-13-4+  
 DBTC-13-4L+  
 WZ/TD/CP/AM  
 081113

ED-8658/1  
 ED-8658A