

# Surface Mount Directional Coupler

## TCD-13-4+

50Ω 5 to 1000 MHz

### Features

- wideband, 5 to 1000 MHz
- low mainline loss, 0.7 dB typ.
- aqueous washable
- leads for excellent solderability
- protected by US Patent 6,140,887

### Applications

- VHF/UHF
- CATV
- cellular



Generic photo used for illustration purposes only

CASE STYLE: DB714

**+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 Specifications

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1000	MHz
Mainline Loss <sup>1</sup>	5 - 50	—	0.7	1.3	dB
	50 - 500	—	0.7	1.3	
	500 - 1000	—	0.8	1.5	
Nominal Coupling		—	13±0.5	—	dB
Coupling Flatness(±)		—	±0.6	—	dB
Directivity	5 - 50	17	21	—	dB
	50 - 500	12	18	—	
	500 - 1000	—	15	—	
VSWR	5 - 1000		1.2		:1
Input Power	5 - 50	—	—	0.5	W
	50 - 1000	—	—	1.0	

1. Mainline loss includes theoretical power loss at coupled port.

### Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C*
Storage Temperature	-55°C to 100°C

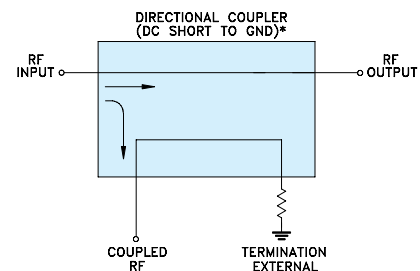
Permanent damage may occur if any of these limits are exceeded.

\* Case temperature is defined as temperature on ground leads.

### Pin Connections

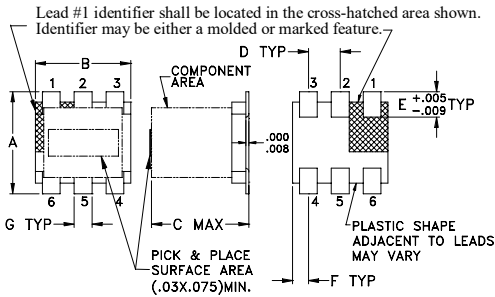
Function	Pin Number
INPUT	3
OUTPUT	4
COUPLED	1
GROUND	2
50Ω TERM EXTERNAL	6
NOT USED	5

### Electrical Schematic

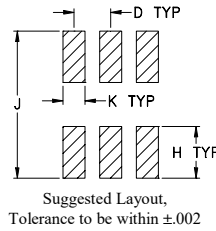


\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.

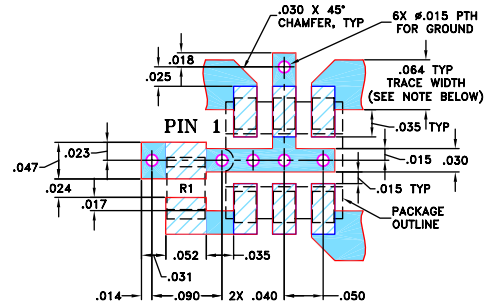
## Outline Drawing



## PCB Land Pattern



## Demo Board MCL P/N: TB-71 Suggested PCB Layout (PL-009)



- NOTES:**
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

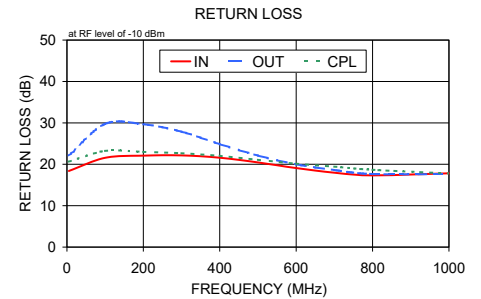
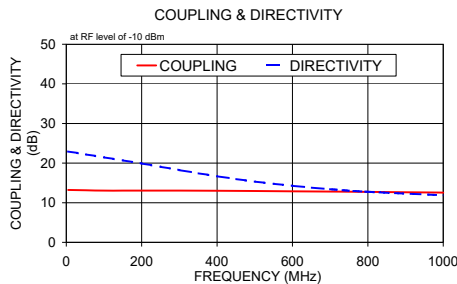
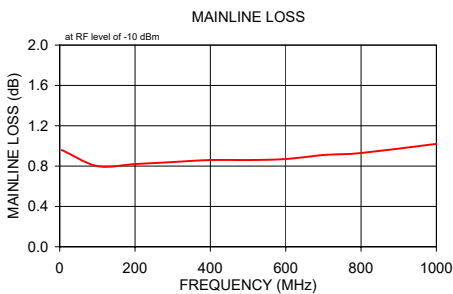
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Outline Dimensions (inch/mm)

A	B	C	D	E	F
.160	.150	.160	.050	.040	.025
4.06	3.81	4.06	1.27	1.02	0.64
G	H	J	K	wt	
.028	.065	.190	.030	grams	
0.71	1.65	4.83	0.76	0.15	

## Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
				In	Out	Cpl
5.00	0.96	13.23	22.93	18.39	22.11	20.63
100.00	0.80	13.07	21.46	21.56	29.75	23.23
200.00	0.82	13.07	19.90	22.09	29.67	22.99
300.00	0.84	13.06	18.25	22.15	27.88	22.67
400.00	0.86	13.03	16.68	21.58	24.86	22.04
500.00	0.86	12.96	15.34	20.44	22.11	21.08
600.00	0.87	12.88	14.27	19.08	19.99	20.15
700.00	0.91	12.82	13.42	17.97	18.61	19.42
800.00	0.93	12.73	12.75	17.33	17.64	18.67
1000.00	1.02	12.56	11.88	17.83	17.63	17.78



## Additional Notes

- 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.
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