SURFACE MOUNT top hat

Directional Coupler

TCD-13-4-75X+

75Ω 5 to 1000 MHz

FEATURES

- Wideband, 5 to 1000 MHz
- Low Mainline Loss, 0.8 dB Typ.
- Aqueous Washable
- Leads for Excellent Solderability
- Protected by US Patent 6,140,887



Generic photo used for illustration purposes only

CASE STYLE: DB1627

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

APPLICATIONS

- VHF/UHF
- CATV
- Cellular

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1000	MHz
Mainline Loss[1]	5-50		1.0	1.8	dB
	50-500		0.8	1.3	
	500-1000		1.1	1.5	
Coupling	5-1000		13±0.5		dB
Coupling Flatness (±)	5-1000		±0.9		dB
Directivity	5-50	17	22		dB
	50-500		15		
	500-1000		12		
VSWR	10-750		1.2		:1
Input Power	5-50			0.5	W
	50-1000			1.0	

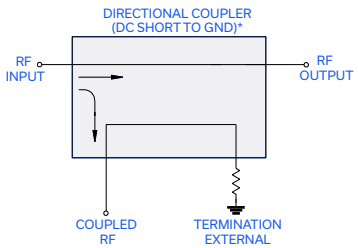
1. Mainline loss includes theoretical power loss at coupled port.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to +85°C[2]
Storage Temperature	-55°C to +100°C

2. Case temperature is defined as temperature on ground leads.
Permanent damage may occur if any of these limits are exceeded.

ELECTRICAL SCHEMATIC



*Electrical schematic is for Directional coupler with internal transformer(s) and external termination

REV. C
ECO-027946
TCD-13-4-75X+
MCL NY
260205

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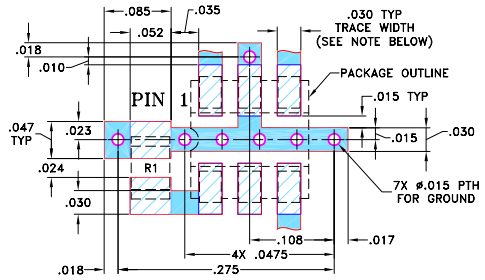
PIN CONNECTIONS

INPUT	3
OUTPUT	4
COUPLED	1
GROUND	2
75Ω TERM EXTERNAL	6
NOT USED	5

PRODUCT MARKING: DE

DEMO BOARD MCL P/N: TB-TCD13-4-75X+

SUGGESTED PCB LAYOUT (PL-010)



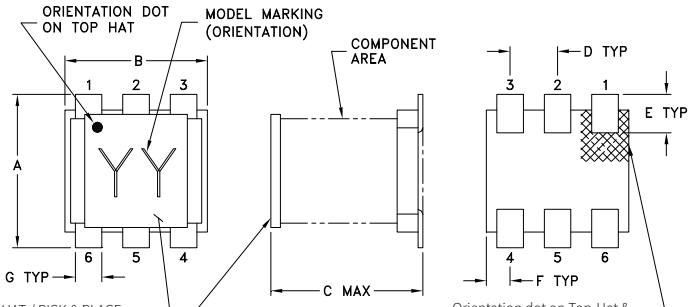
RESISTOR R1: 75 ± 1% Ohm, 0805 SIZE

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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

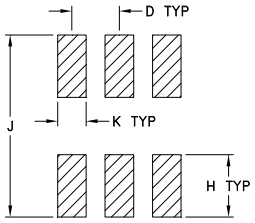
OUTLINE DRAWING



TOP-HAT / PICK & PLACE SURFACE AREA (.10X.10) MIN
TOP-HAT TOTAL THICKNESS: .013 inches MAX.

Orientation dot on Top-Hat & orientation feature on substrate corresponds to pin #1.

PCB Land Pattern



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

OUTLINE DIMENSIONS (Inches / 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

TAPE & REEL INFORMATION: F47

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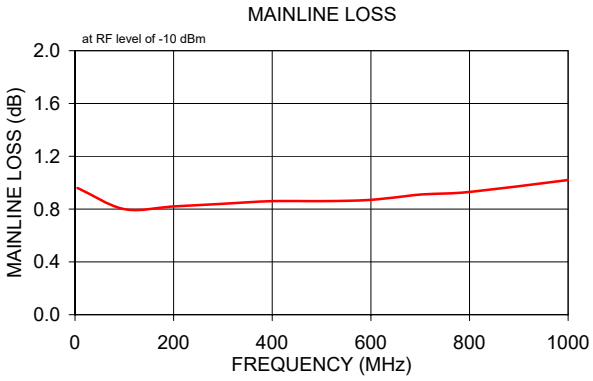
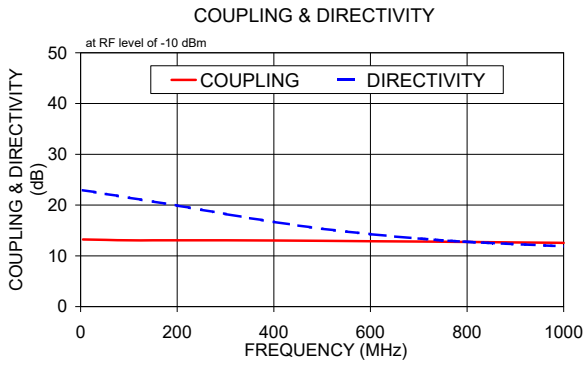
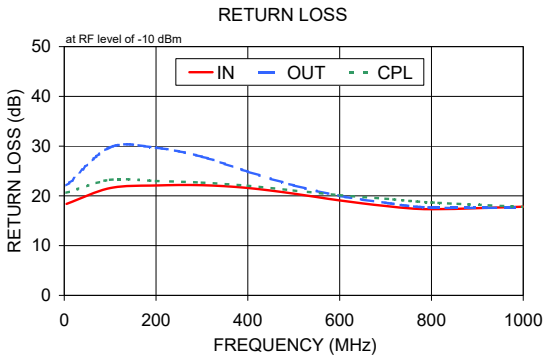
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB) In	Out	Cpl
5	0.96	13.23	22.93	18.39	22.11	20.63
100	0.80	13.07	21.46	21.56	29.75	23.23
200	0.82	13.07	19.90	22.09	29.67	22.99
300	0.84	13.06	18.25	22.15	27.88	22.67
400	0.86	13.03	16.68	21.58	24.86	22.04
500	0.86	12.96	15.34	20.44	22.11	21.08
600	0.87	12.88	14.27	19.08	19.99	20.15
700	0.91	12.82	13.42	17.97	18.61	19.42
800	0.93	12.73	12.75	17.33	17.64	18.67
1000	1.02	12.56	11.88	17.83	17.63	17.78







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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