Surface Mount top hat®

Directional Coupler

TCD-6-122-75X+

75Ω 6.7 dB 5 to 1250 MHz

Generic photo used for illustration purposes only

CASE STYLE: AT1521

+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

Features

- wideband, 5 to 1250 MHz
- low mainline loss, 2.5 dB typ.
- aqueous washable
- leads for excellent solderability
- protected by US Patent 6,140,887

Applications

- DOCSIS® 3.1 Systems
- VHF/UHF
- CATV
- cellular

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1250	MHz
Mainline Loss[1] (above theoretical 0.1 dB)	5-100 100-1000 1000-1250	— — —	2.2 2.3 2.8	2.8 2.9 3.5	dB
Nominal Coupling	5-1250	—	6.7±0.3	—	dB
Coupling Flatness(±)	5-1250	—	±0.2	±0.5	dB
Directivity	5-100 100-1000 1000-1250	13 10 8	15 13 12	— — —	dB
Return Loss (Input)	5-100 100-1000 1000-1250	10 14 13	15 16 15	— — —	dB
Return Loss (Output)	5-100 100-1000 1000-1250	15 15 13	20 18 18	— — —	dB
Return Loss (Coupling)	5-100 100-1000 1000-1250	10 13 13	14 15 16	— — —	dB
Input Power	5-500 500-1250	— —	— —	0.3 0.5	W

1. Mainline loss includes theoretical power loss 1.1dB at coupled port.

Maximum Ratings

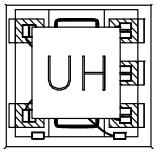
Parameter	Ratings
Operating Temperature	-40°C to 85°C*
Storage Temperature	-55°C to 100°C

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

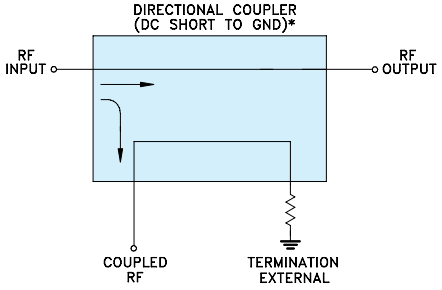
Pin Connections

Function	Pin Number
INPUT	3
OUTPUT	4
COUPLED	1
GROUND	2
75Ω TERM EXTERNAL	6

Product Marking

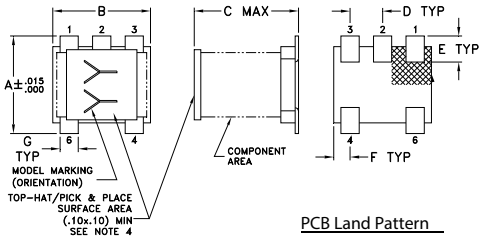


Electrical Schematic

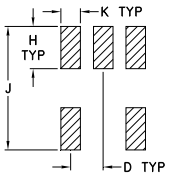


* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.

Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within±.002

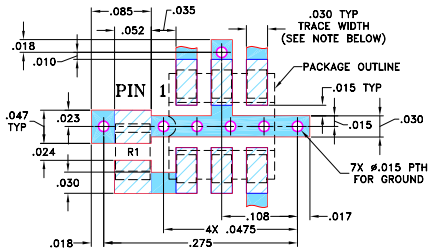
Note:
1. Case Material Plastic
2. Termination Finish: Tin plate over Nickel plate.
3. Lead #1 identifier shall be located in the cross-hatched area shown, on bottom view. Identifier may be either a molded or marked feature.
4.Top-Hat total thickness: 0.13 inches max.

Outline Dimensions (inch / mm)

A	B	C	D	E	F
.150	.150	.160	.050	.040	.025
3.81	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

Demo Board MCL P/N: TB-72
Suggested PCB Layout (PL-010)



RESISTOR R1: 75 ± 1% Ohm, 0805 SIZE

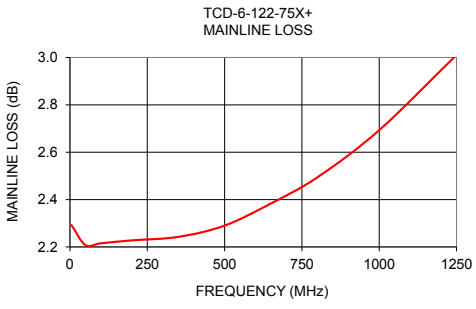
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

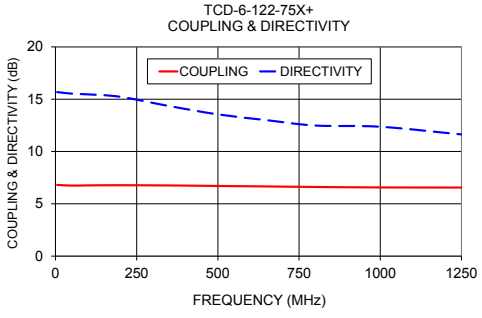
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

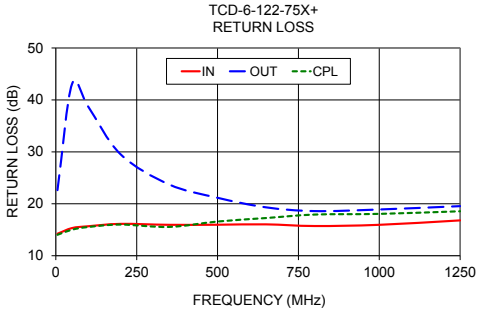
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB) In	Return Loss (dB) Out	Return Loss (dB) Cpl
5	2.29	6.81	15.68	14.24	22.63	14.03
50	2.21	6.74	15.53	15.33	43.05	15.02
100	2.22	6.76	15.46	15.68	38.71	15.53
200	2.23	6.78	15.23	16.14	29.54	16.00
350	2.24	6.76	14.34	15.95	23.73	15.55
500	2.29	6.71	13.55	15.97	21.16	16.59
650	2.38	6.66	13.00	16.04	19.32	17.26
800	2.49	6.61	12.48	15.72	18.60	17.93
1000	2.69	6.57	12.37	15.96	18.91	18.06
1250	3.01	6.56	11.63	16.81	19.55	18.56







Additional 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.
C. The parts covered by this specification document are subject to Mini-Circuits 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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp