

Surface Mount Directional Coupler

75Ω 13 dB 5 to 1250 MHz

TCD-13-122-75X+

Maximum Ratings

Operating Temperature -40°C to 85°C*

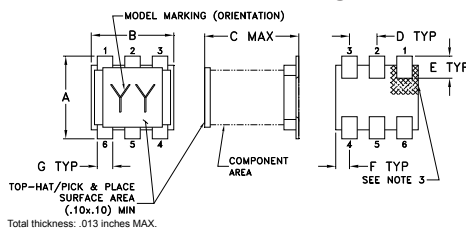
Storage Temperature -55°C to 100°C

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

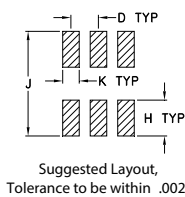
Pin Connections

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

Outline Drawing



PCB Land Pattern

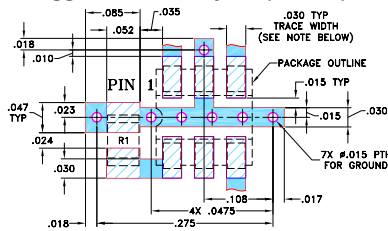


Outline Dimensions (inch mm)

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

Demo Board MCL P/N: TB-72

Suggested PCB Layout (PL-010)



- NOTES:
- 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.
 - 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

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



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Features

- wideband, 5 to 1250 MHz
- low mainline loss, 1.2 dB typ.
- aqueous washable
- leads for excellent solderability
- protected by US Patent 6,140,887

Applications

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

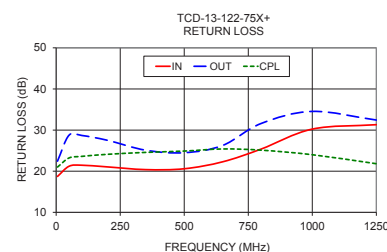
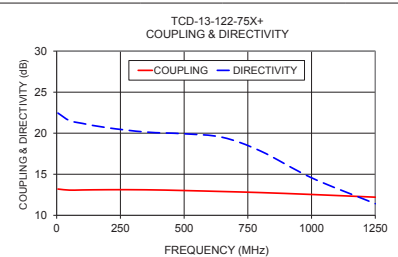
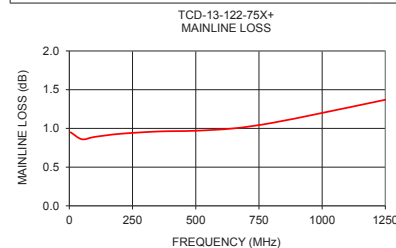
Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1250	MHz
Mainline Loss¹ (above theoretical 0.1 dB)	5 - 500	—	0.9	1.3	dB
	500 - 1000	—	1.0	1.4	
	1000 - 1250	—	1.2	1.6	
Nominal Coupling	5 - 1250	—	12.7±0.5	—	dB
Coupling Flatness(±)	5 - 1250	—	0.5	0.9	dB
Directivity	5 - 500	17	20	—	dB
	500 - 1000	11	15	—	
	1000 - 1250	8	11	—	
Return Loss (Input)	5 - 500	17	19	—	dB
	500 - 1000	18	22	—	
	1000 - 1250	17	20	—	
Return Loss (Output)	5 - 500	19	22	—	dB
	500 - 1000	20	24	—	
	1000 - 1250	18	20	—	
Return Loss (Coupling)	5 - 500	17	20	—	dB
	500 - 1000	18	23	—	
	1000 - 1250	17	20	—	
Input Power	50-200	—	—	0.5	W
	200 - 1250	—	—	1.0	

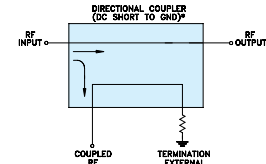
1. Mainline loss includes theoretical power loss at coupled port.

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB) In	Return Loss (dB) Out	Cpl
5	0.95	13.20	22.45	18.73	22.44	21.01
50	0.86	13.07	21.54	21.20	28.74	23.22
100	0.89	13.09	21.20	21.46	28.69	23.61
200	0.93	13.12	20.66	21.05	27.52	24.11
350	0.96	13.11	20.14	20.39	25.10	24.58
500	0.97	13.02	19.93	20.60	24.50	24.90
650	1.00	12.90	19.50	22.29	26.27	25.41
800	1.07	12.77	17.83	25.38	31.60	25.12
1000	1.20	12.54	14.57	30.24	34.54	24.01
1250	1.37	12.21	11.42	31.31	32.44	21.82



Electrical Schematic



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

REV. OR
M151380
TCD-13-122-75X+
WP/CP/AM
160202