Surface Mount top hat®

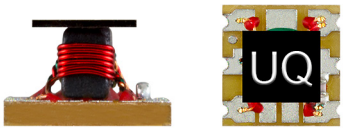
Directional Coupler

RDC-17-122-75X+

75Ω 17dB 5 to 1250 MHz

The Big Deal

- Low mainline loss, 0.8 dB
- High directivity, 20 dB
- Good Return Loss, 24 dB
- Excellent coupling flatness, ±0.25 dB
- Supports DOCSIS® 3.1 Systems



CASE STYLE: TT2315

Product Overview

Mini-Circuits RDC-17-122-75X+ surface-mount directional coupler provides 17 dB coupling with excellent flatness, low mainline loss, high directivity, and good return loss for 75Ω applications from 5 to 1250 MHz, supporting a variety of broadband applications including DOCSIS 3.1 systems and equipment. This model features core and wire construction with wrap-around terminations for good solderability and easy visual inspection.

Key Features

Feature	Advantages
Broadband, 5 to 1250 MHz	Supports bandwidth requirements for DOCSIS 3.1 systems and equipment.
Low mainline loss, 0.8 dB	Provides excellent through-path signal transmission and maintains low heat dissipation, avoiding the need for special heat sinking methods.
Power handling, up to 1W	Usable in systems with a variety of signal power requirements.
Excellent return loss, 24 dB typ.	Provides excellent matching for 50Ω systems.
High directivity, 20 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Top Hat feature	Improves speed and accuracy of pick and place assembly.

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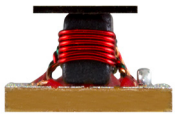


CASE STYLE: TT2315

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Features

- wideband, 5-1250 MHz
- excellent return loss, 24 dB typ.
- low mainline loss, 0.8 dB typ.
- high directivity, 20 dB typ.
- excellent coupling flatness, ±0.25 dB typ.
- aqueous washable

Applications

- DOCSIS 3.1
- cable tv

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1250	MHz
Mainline Loss[1]	5 - 1000 1000 - 1250	— —	0.8 0.9	1.0 1.2	dB
Coupling	5 - 1250	—	17.6	—	dB
Coupling Flatness (±)	5 - 1000 1000 - 1250	— —	0.45 0.25	0.9 0.6	dB
Directivity	5 - 50 50 - 870 870 - 1250	25 18 14	30 25 22	— — —	dB
Return Loss (Input)	5 - 1250	18	24	—	dB
Return Loss (Output)	5 - 1250	20	25	—	dB
Return Loss (Coupling)	5 - 1250	18	24	—	dB
Input Power	5 - 1250	—	—	1.0	W

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

Maximum Ratings

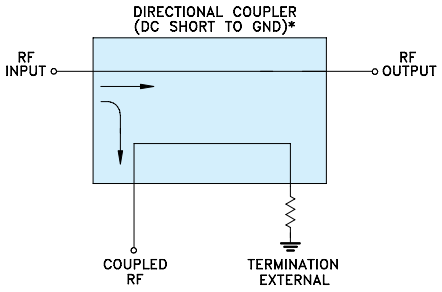
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

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

Pin Connections

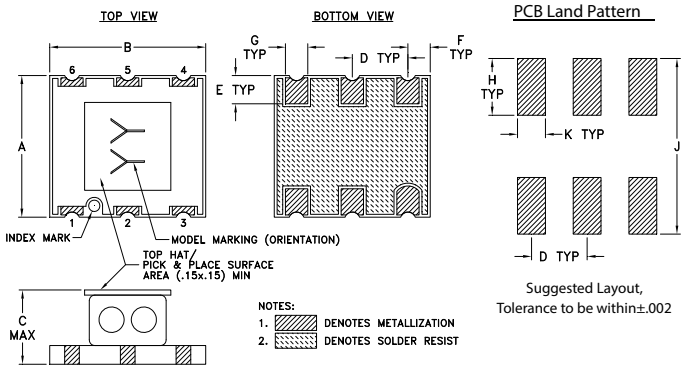
Function	Pin Number
INPUT	1
OUTPUT	6
COUPLED	3
GROUND	2
75Ω TERM EXTERNAL	4
ISOLATE (DO NOT USE)	5

Electrical Schematic



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

Outline Drawing

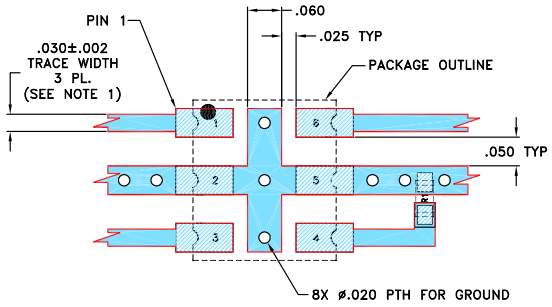


Outline Dimensions (inch / mm)

A	B	C	D	E	F
.250	.280	.140	.100	.050	.040
6.35	7.11	3.56	2.54	1.27	1.02

G	H	J	K	wt.
.040	.100	.310	.050	grams
1.02	2.54	7.87	1.27	0.35

Demo Board MCL P/N: TB-917+
Suggested PCB Layout (PL-452)



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. 0603 SIZE CHIP RESISTOR FOOT PRINT SHOWN FOR REFERENCE, FOR RESISTOR VALUE REFER TO TB-917+.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

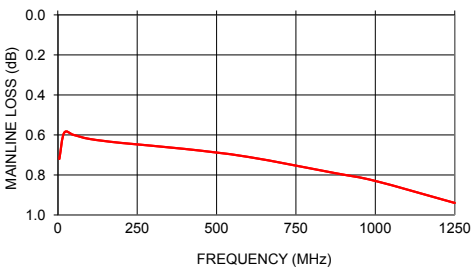
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

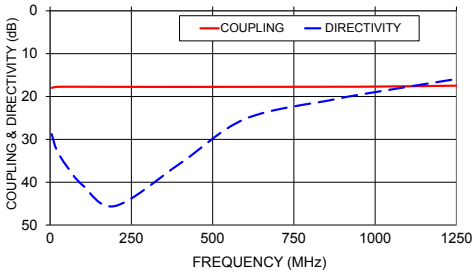
Typical Performance Data

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	0.72	17.98	28.79	20.90	22.55	20.74
20	0.59	17.75	32.44	24.13	27.41	23.94
50	0.60	17.72	36.13	24.60	28.37	24.18
100	0.62	17.72	40.69	25.14	29.38	24.52
200	0.64	17.74	45.55	25.90	31.66	25.31
400	0.67	17.75	35.63	26.23	30.64	25.95
600	0.71	17.74	25.23	27.35	28.80	27.49
870	0.79	17.72	20.73	27.88	27.88	24.20
1000	0.83	17.68	18.97	26.85	29.23	22.65
1250	0.94	17.47	15.91	26.17	46.02	20.26

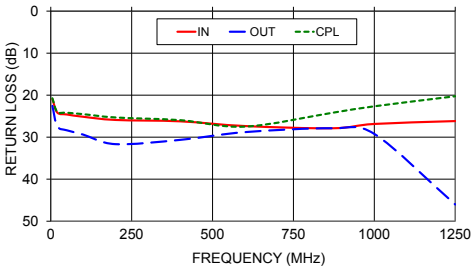
RDC-17-122-75X+
MAINLINE LOSS



RDC-17-122-75X+
COUPLING & DIRECTIVITY



RDC-17-122-75X+
RETURN LOSS



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