DC Pass, Ultra Broadband

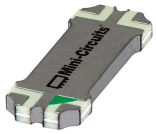
Bi-Directional Coupler

BDCH46-122-75+

75 Ω 2 W 40 to 1250 MHz

The Big Deal

- Ultra Broadband, 75 Ω model, 40 - 1250 MHz
- Low mainline loss, 0.15 dB
- Very good return loss, 25 dB



CASE STYLE: PQ2099-2

Product Overview

Mini-Circuits BDCH46-122-75+ wide band bi-directional 75 Ω coupler covers frequencies from 40 to 1250 MHz with mainline loss of 0.15 dB Typ. The coupler operates over the DOCSIS 3.1 CATV frequency range with very low insertion loss, and outstanding return loss. The coupler is fabricated using laminated PCB process (0.2 x 0.56 x 0.068”) and includes wrap-around terminations for good solderability and easy visual inspection.

Key Features

Feature	Advantages
Low Main Line Loss; 0.15 dB	Low insertion loss in the through path makes this coupler ideal for use high power forward path systems as part of level detection circuits after the high-linearity, power amplifier.
Very good return loss, 25 dB Typ.	Provides excellent matching for 75 Ω systems.
DC current passing up to 2 A	Suitable for use in systems requiring DC voltage on the RF line, such as supplying bias to remote circuit.

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Maximum Ratings

Operating Temperature, case*	-55°C to 105°C
Storage Temperature	-55°C to 105°C
DC Current	2 A
RF power	2 W

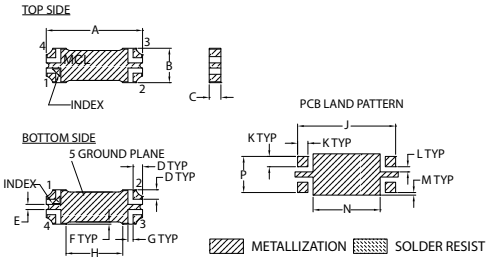
*Case temperature is defined as temperature on base plate. Permanent damage may occur if any of these limits are exceeded.

Pad Connections**

INPUT	1
OUTPUT	2
COUPLED FORWARD	4
COUPLED REVERSE	3
GROUND	5

**Model is Bi-directional and all ports are interchangeable, see port function table.

Outline Drawing



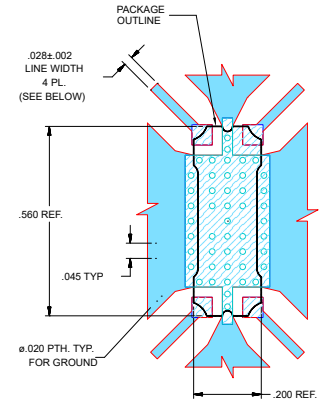
Base material: Printed wiring laminate.
Termination Finish: 2-5 µinch (0.05-0.13 microns) Gold

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
0.560	**0.200**	**0.068**	**0.055**	**0.030**	**0.013**	**0.030**	**0.330**
14.22	5.08	1.73	1.40	0.76	0.33	0.76	8.38

J	K	L	M	N	P	wt.
0.570	**.060**	**.030**	**.015**	**.390**	**.210**	grams
14.48	1.52	0.76	0.38	9.91	5.33	1.2

Demo Board MCL P/N: TB-957-1+
Suggested PCB Layout (PL-524)



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS. 0.030"±.0015". COPPER: 1 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)

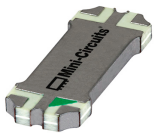
DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Features

- low mainline loss, 0.15 dB Typ.
- very good return loss, 25 dB Typ.
- DC current pass through input to output.

Applications

- CATV
- transmission signal monitoring
- broadband fibre networks
- DOCSIS 3.1



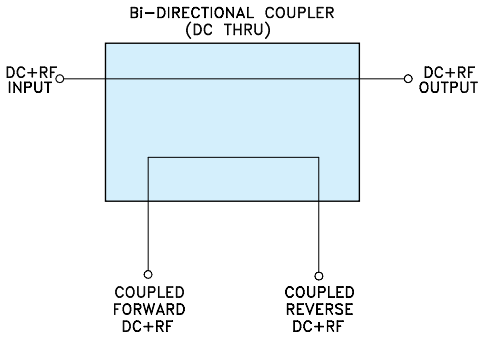
CASE STYLE: PQ2099-2

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

Electrical Specifications @ +25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		40		1250	MHz
Mainline Loss (Includes theoretical coupling loss)	40 - 1250	—	0.15	0.35	dB
Coupling	40 - 1250	14	—	46	dB
Directivity	40 - 1250	12	19	—	dB
Return Loss (Input)	40 - 1250	16	25	—	dB
Return Loss (Output)	40 - 1250	16	25	—	dB
Return Loss (Coupling)	40 - 1250	16	25	—	dB
Input RF Power	40 - 1250	—	—	2	W

Electrical Schematic



Port Function Configurations

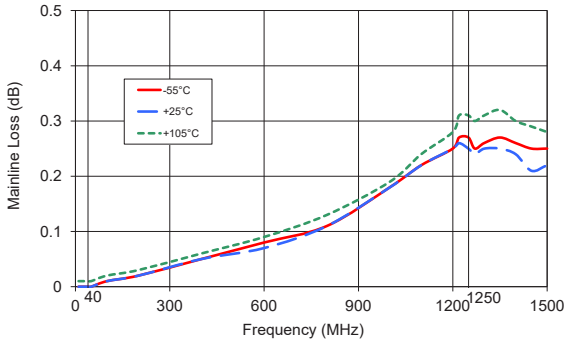
Input	Output	Coupled Forward	Coupled Reverse
1	2	4	3
2	1	3	4
3	4	2	1
4	3	1	2

Typical Performance Data[1]

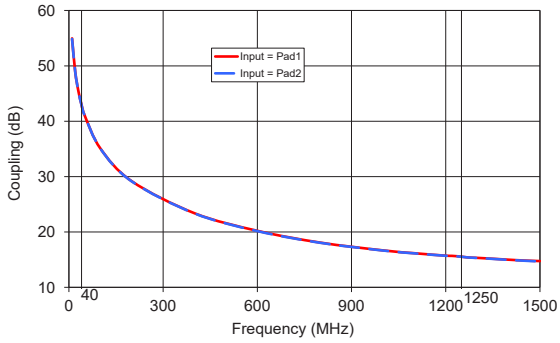
FREQUENCY (MHz)	Mainline Loss [2] (dB) Input = Pad 1			Coupling (dB)		Directivity (dB)						Return Loss (dB)			
				Input =	Input =	Input = Pad 1			Input = Pad 2			Pad 1	Pad 2	Pad 3	Pad 4
	-55°C	+25°C	+105°C	Pad 1	Pad 2	-55°C	+25°C	+105°C	-55°C	+25°C	+105°C				
10.0	0.00	0.00	0.01	54.97	54.85	18.26	18.36	19.64	18.38	18.29	19.75	53.64	50.09	57.62	59.77
20.0	0.00	0.00	0.01	48.95	48.94	17.81	18.74	18.96	18.39	17.86	19.46	48.91	47.16	52.82	54.30
30.0	0.00	0.00	0.01	45.49	45.47	17.71	18.46	19.11	18.31	18.06	19.43	45.95	44.24	48.29	50.18
40.0	0.00	0.00	0.01	43.02	42.97	17.77	18.22	19.10	18.41	18.05	19.15	43.82	42.42	46.03	46.67
50.0	0.00	0.00	0.01	41.07	41.06	17.73	18.50	18.78	18.40	17.96	19.08	41.86	40.82	44.30	44.76
100.0	0.01	0.01	0.02	35.10	35.07	17.95	18.40	18.65	18.66	17.88	18.85	35.55	36.60	38.92	38.10
200.0	0.02	0.02	0.03	29.17	29.14	17.91	18.82	18.67	19.01	18.18	19.00	30.19	31.37	32.54	33.11
400.0	0.05	0.05	0.06	23.38	23.35	18.89	20.33	19.79	19.88	19.12	20.29	26.48	27.59	28.87	27.97
600.0	0.08	0.07	0.09	20.21	20.16	21.72	24.43	21.34	23.84	21.54	22.79	29.96	31.29	33.50	31.29
800.0	0.11	0.11	0.13	18.08	18.05	29.37	44.71	27.76	39.68	30.60	33.96	33.90	36.18	34.87	36.76
1000.0	0.18	0.18	0.19	16.67	16.65	26.43	21.33	27.97	23.05	28.34	25.91	23.91	23.45	23.57	23.46
1100.0	0.22	0.22	0.24	16.16	16.14	21.63	18.09	22.64	19.59	22.53	20.93	21.40	20.63	20.89	20.84
1200.0	0.25	0.25	0.28	15.71	15.70	19.14	16.15	19.65	17.86	19.40	18.13	19.68	18.93	19.30	19.27
1220.0	0.27	0.26	0.31	15.68	15.65	18.67	15.43	18.91	16.94	18.30	17.18	19.44	18.70	19.10	19.13
1250.0	0.27	0.25	0.31	15.54	15.53	16.47	13.82	16.37	14.86	15.52	14.76	19.05	18.38	18.80	18.93
1270.0	0.25	0.24	0.30	15.40	15.40	16.48	13.91	16.28	15.18	15.53	14.72	18.88	18.21	18.59	18.74
1300.0	0.26	0.25	0.31	15.32	15.31	18.27	15.04	17.96	16.85	17.18	16.17	18.74	18.05	18.46	18.52
1350.0	0.27	0.25	0.32	15.16	15.14	15.18	12.81	14.85	13.77	14.23	13.49	18.61	17.97	18.36	18.41
1400.0	0.26	0.24	0.30	14.99	14.96	17.73	14.12	16.73	15.70	15.56	14.52	18.65	17.92	18.43	18.34
1450.0	0.25	0.21	0.29	14.84	14.81	14.95	12.25	14.14	12.97	13.27	12.46	18.89	18.31	18.73	18.58
1500.0	0.25	0.22	0.28	14.74	14.67	16.57	13.37	15.58	14.65	14.29	13.37	19.25	18.90	19.22	19.07

[1] Data at +25°C unless specified otherwise.
[2] Mainline loss is insertion loss + theoretical coupling loss

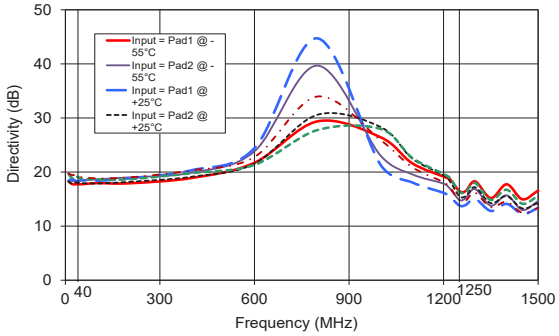
BDCH46-122-75+
Mainline Loss (dB)



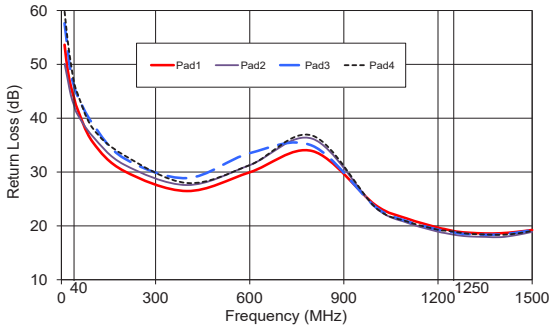
BDCH46-122-75+
Coupling (dB)



BDCH46-122-75+
Directivity (dB)



BDCH46-122-75+
Return Loss (dB)



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.

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