Ceramic

LTCC Bandpass Filter

BFCV-3350+

50Ω 2570 to 4130 MHz

The Big Deal

- Small size 3.2mm x 2.5mm
- Wide passband (2570-4130 MHz)
- Low Insertion Loss (1.5 dB typical)
- Wide stopband rejection up to 8 GHz



Generic photo used for illustration purposes only

CASE STYLE: JV1210C

Product Overview

The BFCV-3350+ LTCC Band Pass Filter is constructed with multiple layers in order to achieve a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. These units offer low insertion loss and very good wide band rejection.

Key Features

Feature	Advantages
Small Size (3.20mm x2.5 mm)	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Wrap around termination	Provides excellent solderability and easy visual inspection capability.
Wide bandwidth	Enables high data rate in communication systems.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.

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

Ceramic

Bandpass Filter

BFCV-3350+

50Ω 2570 to 4130 MHz



Generic photo used for illustration purposes only

CASE STYLE: JV1210C

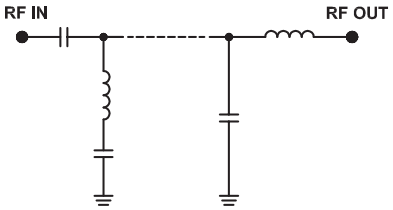
Features

- Small size
- Temperature stable
- Hermetically sealed
- LTCC construction

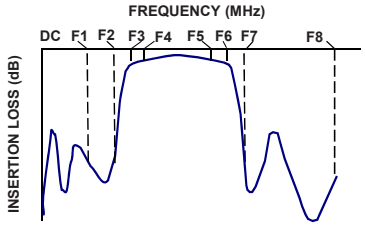
Applications

- Software defined radio
- WLAN
- Cellular network
- Satellite television broadcast
- Aircraft radar altimeters

Functional Schematic



Typical Frequency Response



Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	3350	—	MHz
	Insertion Loss	F3-F6	2570-4130	—	1.5	—	dB
		F4-F5	2650-4030	—	1.5	3.5	dB
	VSWR	F3-F6	2570-4130	—	2.3	—	:1
Stop Band, Lower	Insertion Loss	DC-F1	DC-1900	14	17	—	dB
		F2	2065	—	17	—	dB
	VSWR	DC-F1	DC-1900	—	20	—	:1
Stop Band, Upper	Insertion Loss	F7-F8	5140-8000	15	20	—	dB
	VSWR	F7-F8	5140-8000	—	20	—	:1

1. Measured on Mini-Circuits Characterization Test Board TB-946+

2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

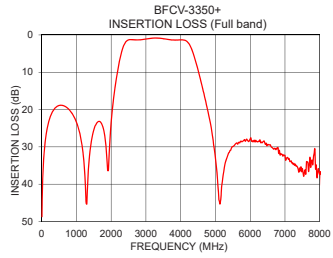
Maximum Ratings	
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	4 W max @ +25°C

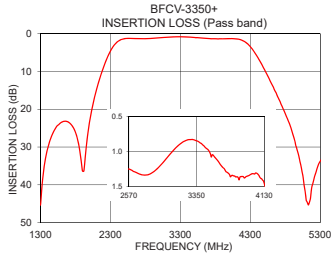
*Passband rating, derate linearly to 0.25W at 100°C ambient

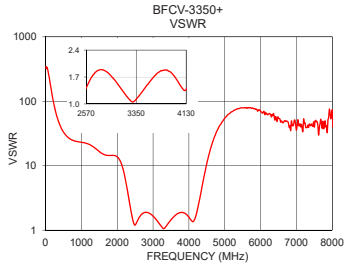
Permanent damage may occur if any of these limits are exceeded.

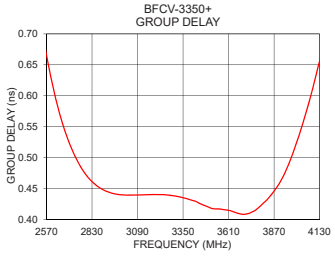
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
10	48.70	345.89	2570	0.67
1900	36.32	14.43	2580	0.65
1960	29.02	14.17	2600	0.62
2000	23.59	13.72	2650	0.57
2040	19.59	12.99	2700	0.52
2065	17.49	12.34	2750	0.49
2200	8.96	7.24	2800	0.47
2340	3.39	2.70	2900	0.45
2570	1.25	1.42	3000	0.44
2650	1.30	1.69	3350	0.44
3350	0.85	1.12	3500	0.42
4030	1.31	1.50	3600	0.42
4130	1.46	1.37	3700	0.41
4280	3.06	2.67	3800	0.42
4600	13.12	18.05	3900	0.46
4780	20.31	34.49	3950	0.49
4960	30.12	50.63	4000	0.53
5140	44.89	64.88	4030	0.55
7000	32.29	35.51	4100	0.62
8000	37.45	72.31	4130	0.66









+RoHS Compliant

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

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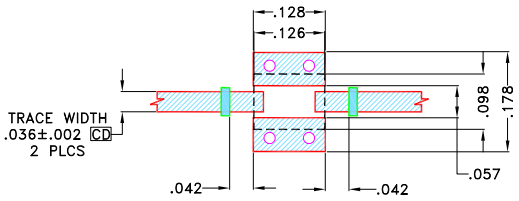
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Pad Connections

RF IN	1
RF OUT	3
GROUND	2,4

Product Marking: HS

Demo Board MCL P/N: TB-946+
Suggested PCB Layout (PL-502)



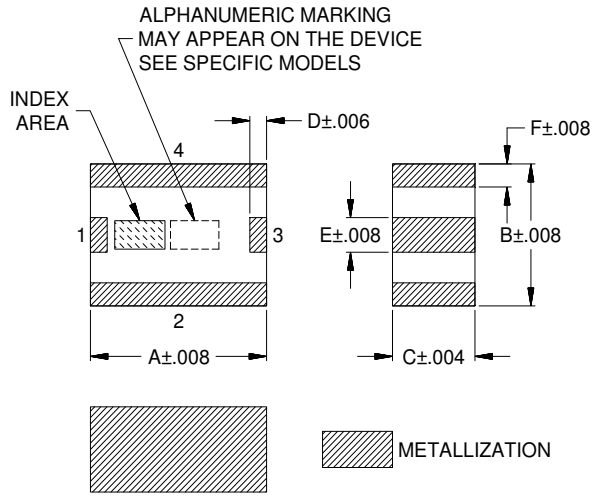
NOTES:

1. TRACE WIDTH & SPACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .0166"±.0015". COPPER 1/2 Oz. EACH SIDE
   FOR OTHER MATERIALS TRACE WIDTH & SPACE 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

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	Wt.
.126	**.098**	**.059**	**.012**	**.024**	**.016**	grams
3.2	2.5	1.5	.3	.6	.4	.03

Note: Please refer to case style drawing for details

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Surface Mount Band Pass Filter BFCV-3350+

Typical Performance Data

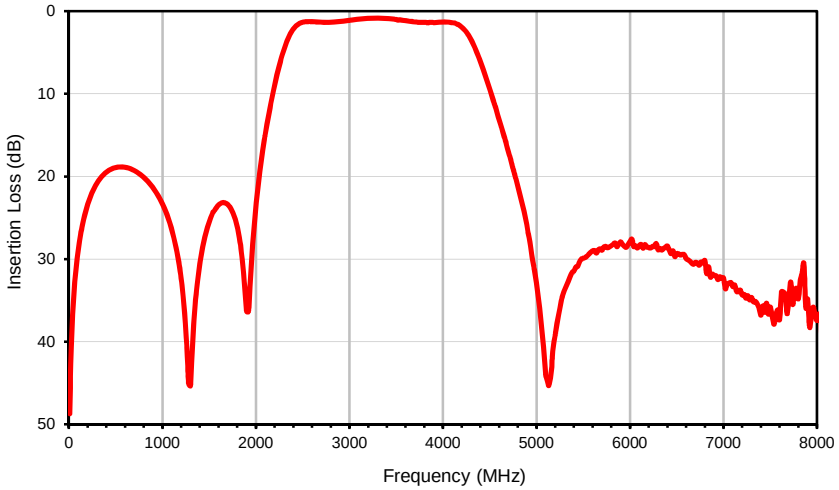
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
10	48.70	0.05
20	42.63	0.05
40	36.64	0.05
120	27.37	0.06
160	25.09	0.06
200	23.43	0.08
500	18.92	0.15
800	20.10	0.20
1500	25.51	0.33
1840	28.73	0.41
1860	30.77	0.42
1900	36.32	0.43
2000	23.59	0.53
2065	17.49	0.67
2100	14.88	0.80
2200	8.96	1.58
2340	3.39	5.22
2570	1.25	12.53
2650	1.30	10.75
3350	0.85	19.28
4030	1.31	15.53
4130	1.46	36.06
4280	3.06	7.69
4500	9.43	1.76
4600	13.12	1.06
4700	17.00	0.72
4780	20.31	0.54
4900	26.12	0.47
4960	30.12	0.38
5000	32.96	0.34
5100	44.13	0.26
5140	44.89	0.25
5200	39.21	0.25
5240	36.61	0.23
5400	31.45	0.16
5600	29.00	0.11
5800	28.40	0.08
5920	28.23	0.11
6000	27.88	0.06
6200	28.59	0.05
6320	28.71	0.06
6420	28.94	0.06
6500	29.35	0.08
6800	30.19	0.14
6900	32.00	0.18
7000	32.29	0.22
7100	33.33	0.28
7140	33.92	0.31
7200	34.35	0.37
7260	34.44	0.43
7300	34.65	0.49
7340	35.12	0.56
7380	35.94	0.64
7420	35.67	0.74
7480	36.66	0.95
7520	36.87	1.13
7540	37.89	1.26
7600	37.31	1.76
7800	34.82	9.62
8000	37.45	3.48

FREQUENCY (MHz)	GROUP DELAY (nsec)
2570	0.67
2600	0.62
2630	0.59
2650	0.57
2690	0.53
2720	0.51
2750	0.49
2780	0.48
2810	0.47
2840	0.46
2870	0.45
2900	0.45
2930	0.44
2960	0.44
2990	0.44
3020	0.44
3050	0.44
3080	0.44
3110	0.44
3140	0.44
3170	0.44
3200	0.44
3250	0.44
3300	0.44
3350	0.44
3400	0.43
3450	0.43
3500	0.42
3600	0.42
3700	0.41
3720	0.41
3740	0.41
3760	0.41
3780	0.42
3800	0.42
3820	0.43
3840	0.44
3850	0.44
3860	0.44
3870	0.45
3880	0.45
3890	0.45
3900	0.46
3910	0.46
3920	0.47
3930	0.47
3940	0.48
3950	0.49
3960	0.49
3970	0.50
3980	0.51
3990	0.52
4000	0.53
4010	0.53
4020	0.54
4030	0.55
4040	0.56
4050	0.57
4100	0.62
4130	0.66

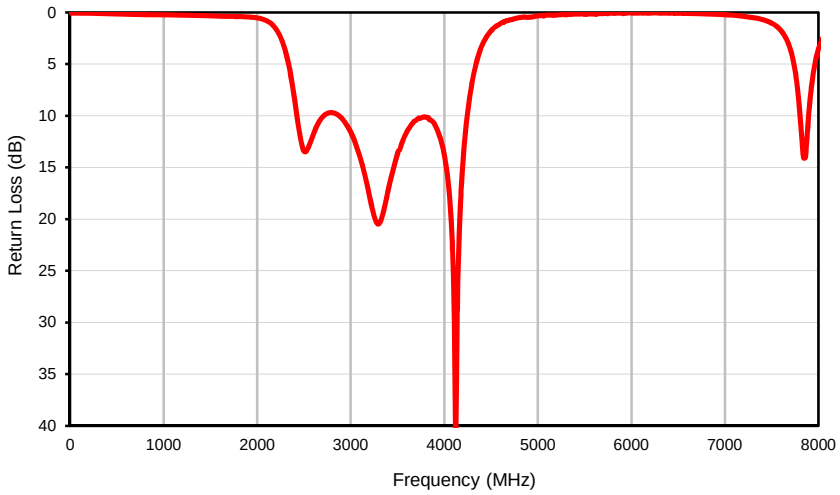
Surface Mount Band Pass Filter BFCV-3350+

Typical Performance Curves

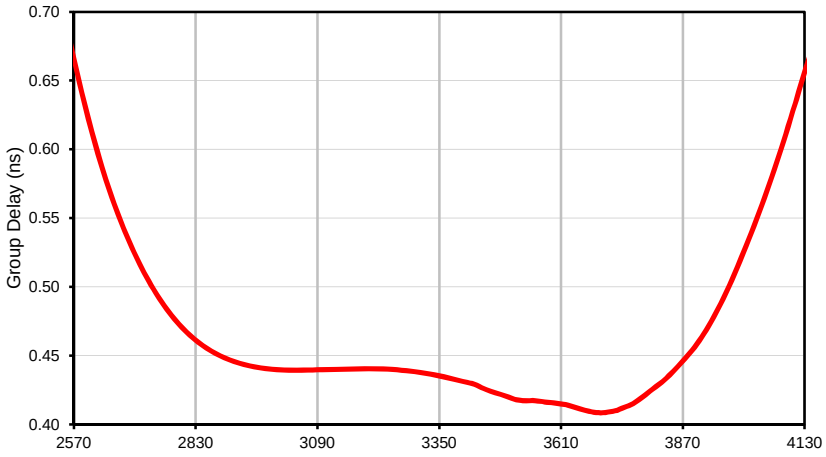
Insertion Loss



Return Loss



Group Delay

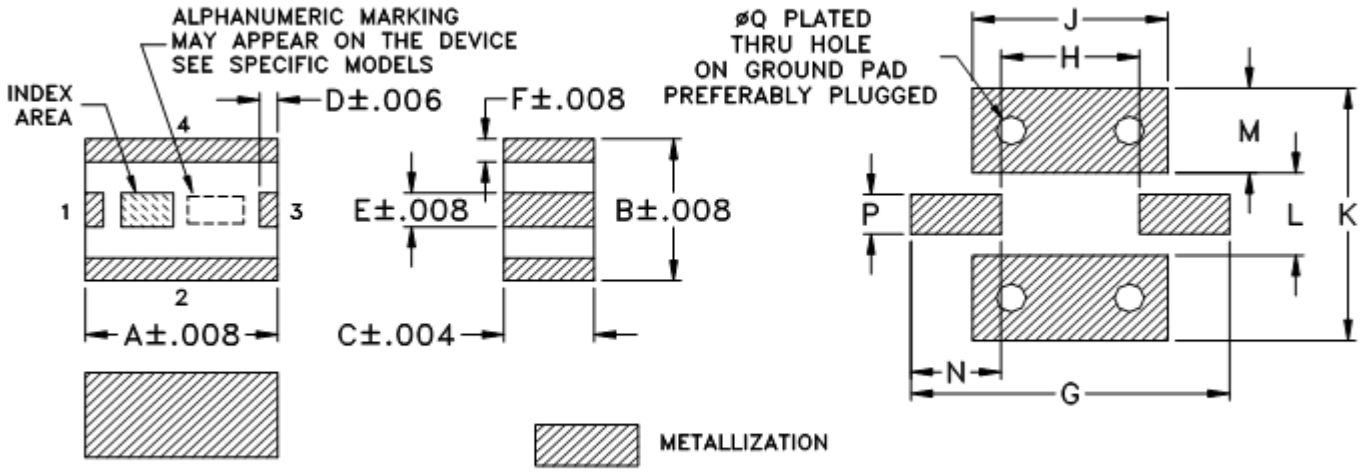


Case Style JV

Outline Dimensions

JV1210C

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	WT. GRAM
JV1210C	.126 (3.2)	.098 (2.5)	.059 (1.5)	.012 (.3)	.024 (.6)	.016 (.4)	.209 (5.3)	.091 (2.3)	.128 (3.25)	.175 (4.45)	.057 (1.45)	.059 (1.5)	.059 (1.5)	.028 (.7)	.020 (.5)	.03

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Open style, ceramic base.
2. Termination finish: **as shown below or indicated on Data Sheet.**
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.
3. Pad tolerance is non-cumulative. Minimum spacing between each pad is .004.

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Tape & Reel Packaging TR-F74

DEVICE ORIENTATION IN T&R

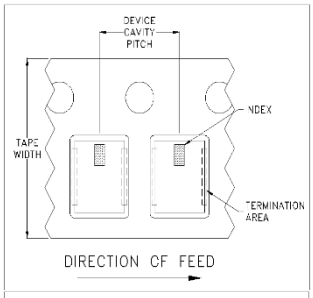


ILLUSTRATION 1

Applicable Case Styles
GE0805C-1
GE0805C-1AP
JV1210C-1
GU2939

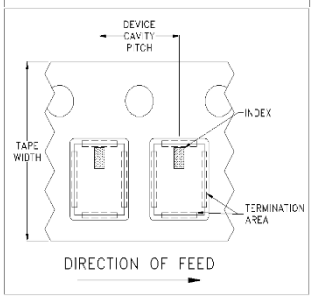


ILLUSTRATION 2

Applicable Case Styles
JV1210C
JV1210C-2
JV1210C-3
JV1210C-4
JV1210C-5
JV1210C-6
JV1210C-11

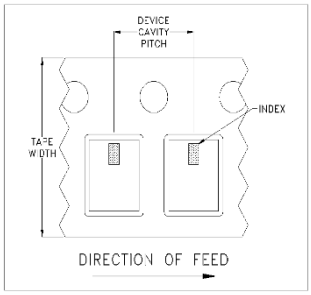


ILLUSTRATION 3

Applicable Case Styles
JC0603C-8
JC0603C-9
JV1210C-7
JV1210C-8
JV1210C-9
JV1210C-10
JV1210C-13
GE0805C-13
GE0805C-19
GE0805C-20

Tape Width, mm	Device Cavity Pitch, mm	Real Size, inches	Devices per Reel	
8	4	7	Small quantity standards **(see note)**	20
				50
				100
				200
				500
				1000
			Standard	2000
				4000

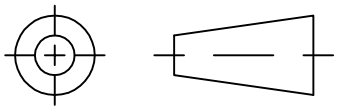
Note: Small reel availability varies by model. Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.
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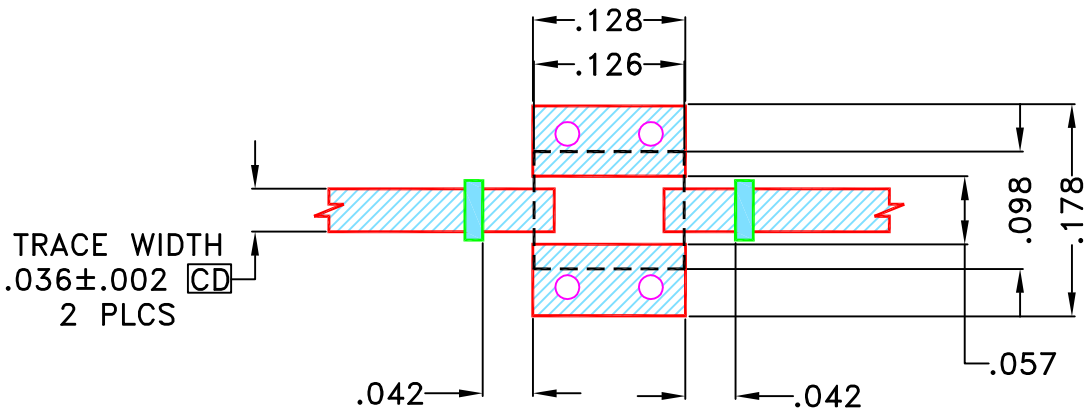
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M160679	NEW RELEASE	MAR 17	TM	MD

SUGGESTED MOUNTING CONFIGURATION FOR JV1210C CASE STYLE



NOTES:

1. TRACE WIDTH & SPACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .0166"±.0015". COPPER 1/2 Oz. EACH SIDE
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DENOTES PCB COPPER LAYOUT WITH SMOBC
(SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	TM	8 MAR 17
TOLERANCES ON:	CHECKED	MD	8 MAR 17
2 PL DECIMALS ±	APPROVED	RV	8 MAR 17
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

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ASHEETA1.DWG REV:A DATE:01/12/95

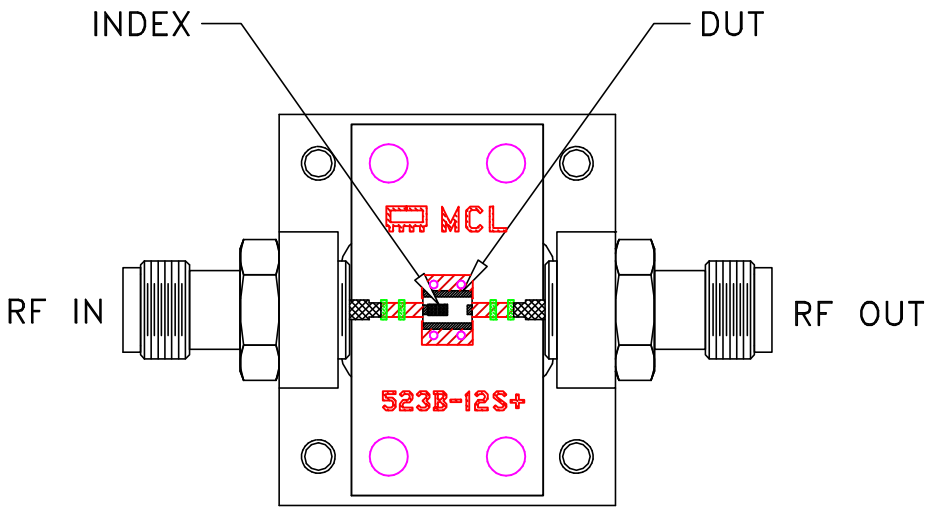
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, JV1210C, BFCV-4085+, BFCV-2895+, BFCV-3350+, BFCV-2610+, TB-946+
50 OHM

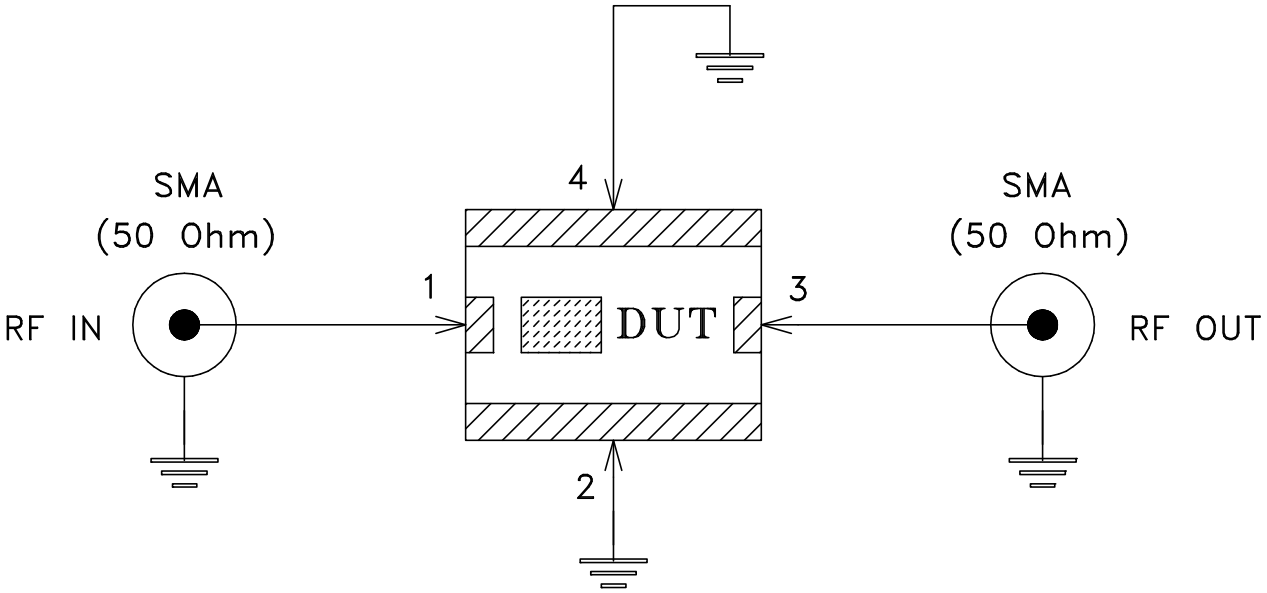
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-502	OR

FILE:	SCALE:	SHEET:
98PL502	6:1	1 OF 1

Evaluation Board and Circuit



TB-946+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.48, Thickness=.0166 inch.

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Environmental Specifications ENV02T1

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215

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