Ceramic

LTCC Bandpass Filter

BFCV-4085+

50Ω 3130 to 5040 MHz

Generic photo used for illustration purposes only

CASE STYLE: JV1210C

The Big Deal

- Small size 3.2mm x 2.5mm
- Wide passband (3130-5040 MHz)
- Low Insertion Loss (1.5 dB typical)
- Wide stopband rejection up to 11 GHz

Product Overview

The BFCV-4085+ 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 the 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.

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Generic photo used for illustration purposes only
CASE STYLE: JV1210C

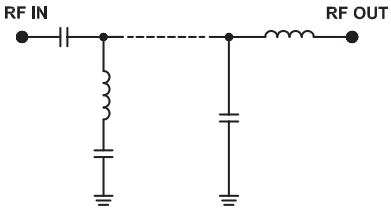
Features

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

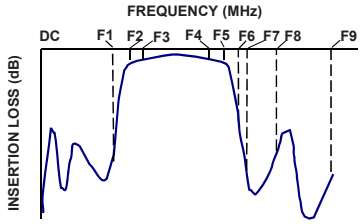
Applications

- Software defined radio
- WLAN
- Satellite television broadcast

Functional Schematic



Typical Frequency Response



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

Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	4085	—	MHz
	Insertion Loss	F2-F5	3130-5040	—	1.5	—	dB
		F3-F4	3330-4840	—	1.5	4.0	dB
	VSWR	F2-F5	3130-5040	—	2.1	—	:1
Stop Band, Lower	Insertion Loss	DC-F1	DC-2520	15	17	—	dB
	VSWR	DC-F1	DC-2520	—	20	—	:1
Stop Band, Upper	Insertion Loss	F6	6260	—	17	—	dB
		F7-F8	6380-8000	15	20	—	dB
		F8-F9	8000-11000	—	14	—	dB
	VSWR	F7-F8	6380-8000	—	20	—	:1

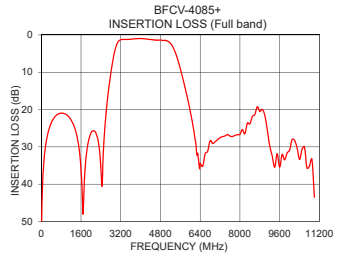
1. Measured on Mini-Circuits Characterization Test Board TB-946+
2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

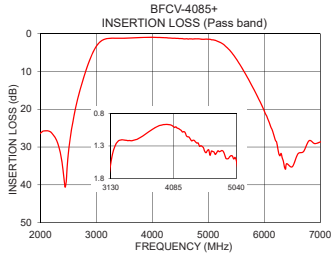
Maximum Ratings	
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	5 W max @ +25°C

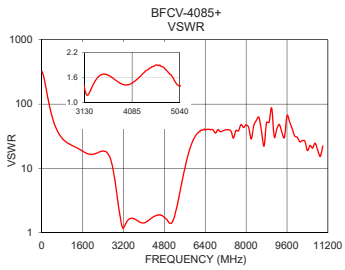
*Passband rating, derate linearly to 0.25W at 100°C ambient
Permanent damage may occur if any of these limits are exceeded.

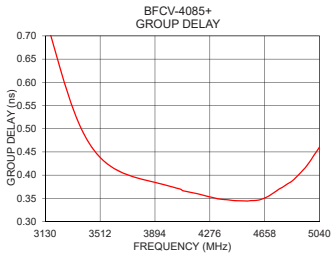
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
10	54.23	319.29	3130	0.74
680	21.19	34.38	3330	0.54
2440	40.62	18.55	3430	0.47
2520	28.88	18.18	3550	0.43
2620	20.21	16.09	3650	0.41
2800	10.32	9.33	3710	0.40
3000	3.30	2.73	3810	0.39
3130	1.57	1.33	3850	0.39
3330	1.21	1.49	3950	0.38
4085	1.00	1.47	4085	0.37
4840	1.38	1.68	4160	0.36
5040	1.53	1.40	4220	0.36
5300	3.25	2.60	4440	0.35
5640	10.10	11.77	4540	0.34
6000	20.46	31.21	4640	0.35
6260	31.80	39.57	4840	0.39
6380	35.84	40.68	4940	0.42
8000	26.64	47.60	4980	0.43
10000	30.89	30.46	5000	0.44
11000	43.50	22.32	5040	0.46









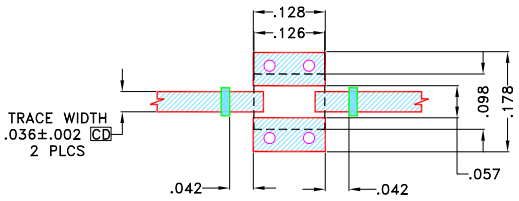
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Pad Connections

RF IN	1
RF OUT	3
GROUND	2,4

Product Marking: JC

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



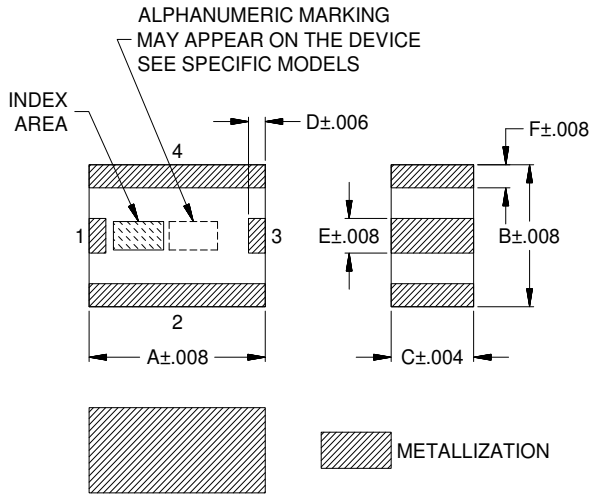
NOTES:

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

Surface Mount Band Pass Filter BFCV-4085+

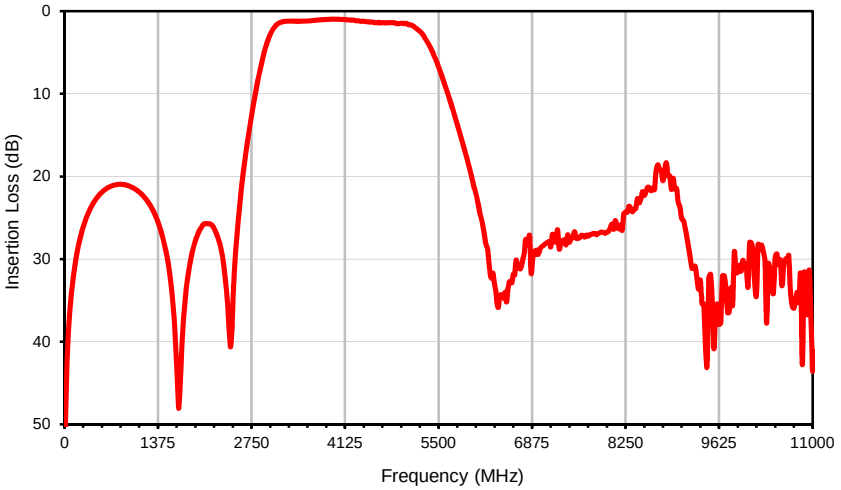
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
10	54.23	0.05
20	48.07	0.05
40	42.16	0.05
120	32.77	0.05
160	30.38	0.05
200	28.58	0.05
500	22.35	0.08
800	20.96	0.12
940	21.12	0.13
1500	29.37	0.20
1680	48.06	0.23
1900	28.50	0.28
2000	26.31	0.31
2080	25.72	0.34
2100	25.71	0.33
2200	26.28	0.36
2340	30.61	0.40
2520	28.88	0.50
2620	20.21	0.66
2700	15.29	0.86
2800	10.32	1.48
3000	3.30	6.19
3130	1.57	16.69
3330	1.21	15.42
4085	1.00	18.60
4840	1.38	14.59
5040	1.53	31.47
5300	3.25	7.96
5600	9.05	2.24
5800	14.38	1.18
6000	20.46	0.71
6240	30.30	0.41
6380	35.84	0.38
6400	34.41	0.45
6500	35.21	0.34
7000	28.66	0.32
7250	26.45	0.34
7500	26.69	0.42
8000	26.64	0.67
8500	21.84	1.84
8100	25.35	0.76
8250	24.32	0.96
8500	21.84	1.84
8600	21.36	2.68
8800	20.51	7.93
9000	21.46	5.26
9200	29.73	1.82
9400	35.45	0.93
9600	35.44	0.55
9800	33.48	0.37
9900	31.61	0.45
10000	30.89	0.38
10200	28.25	0.32
10300	30.18	0.36
10400	33.38	0.33
10500	30.66	0.37
10600	30.02	0.51
10700	35.66	0.49
10800	35.20	0.77
11000	43.50	0.88

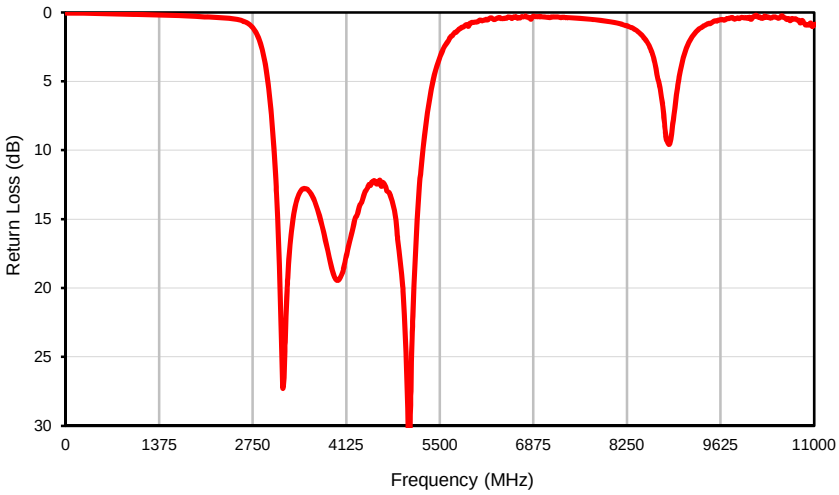
FREQUENCY (MHz)	GROUP DELAY (nsec)
3130	0.74
3150	0.72
3190	0.68
3210	0.66
3250	0.61
3290	0.57
3330	0.54
3370	0.51
3410	0.48
3450	0.46
3490	0.45
3530	0.43
3570	0.42
3610	0.41
3650	0.41
3690	0.40
3730	0.40
3770	0.39
3810	0.39
3850	0.39
3890	0.38
3930	0.38
3970	0.38
4010	0.38
4030	0.37
4050	0.37
4070	0.37
4100	0.37
4120	0.36
4140	0.36
4160	0.36
4180	0.36
4200	0.36
4220	0.36
4240	0.36
4260	0.35
4280	0.35
4300	0.35
4320	0.35
4340	0.35
4360	0.35
4380	0.35
4400	0.35
4440	0.35
4480	0.34
4520	0.34
4560	0.35
4600	0.35
4640	0.35
4680	0.35
4720	0.36
4760	0.37
4800	0.38
4840	0.39
4880	0.40
4920	0.41
4960	0.42
5000	0.44
5020	0.45
5040	0.46

Typical Performance Curves

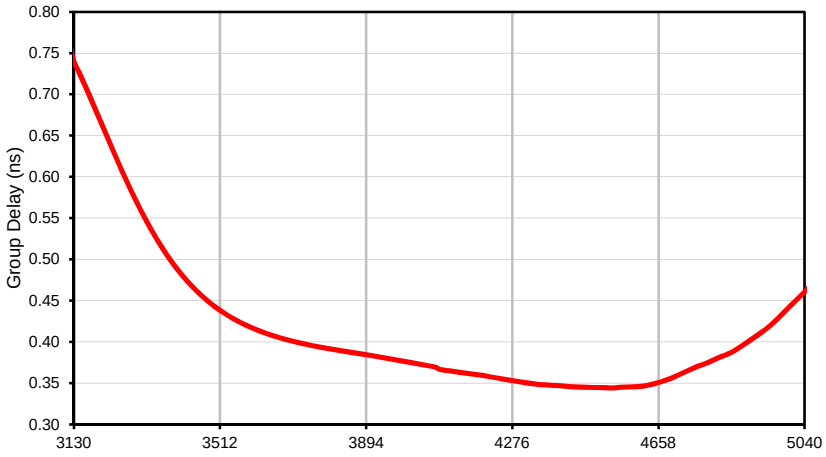
Insertion Loss



Return Loss



Group Delay

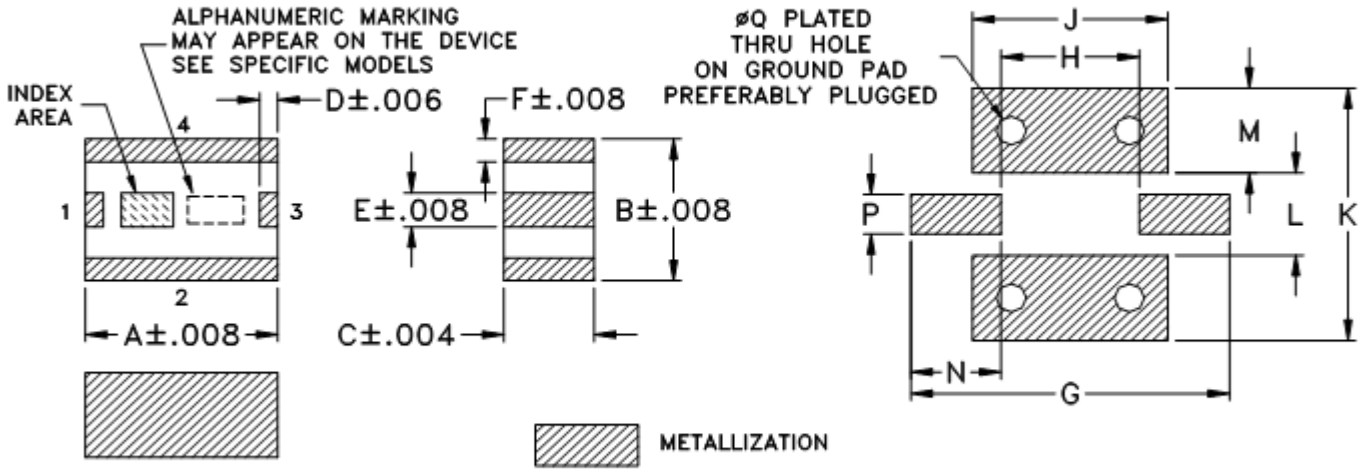


Case Style JV

Outline Dimensions

JV1210C

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

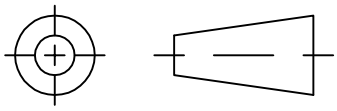
CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	WT. GRAM
JV1210C	.126 (3.2)	.098 (2.5)	.059 (1.5)	.012 (.3)	.024 (.6)	.016 (.4)	.209 (5.3)	.091 (2.3)	.128 (3.25)	.175 (4.45)	.057 (1.45)	.059 (1.5)	.059 (1.5)	.028 (.7)	.020 (.5)	.03

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.

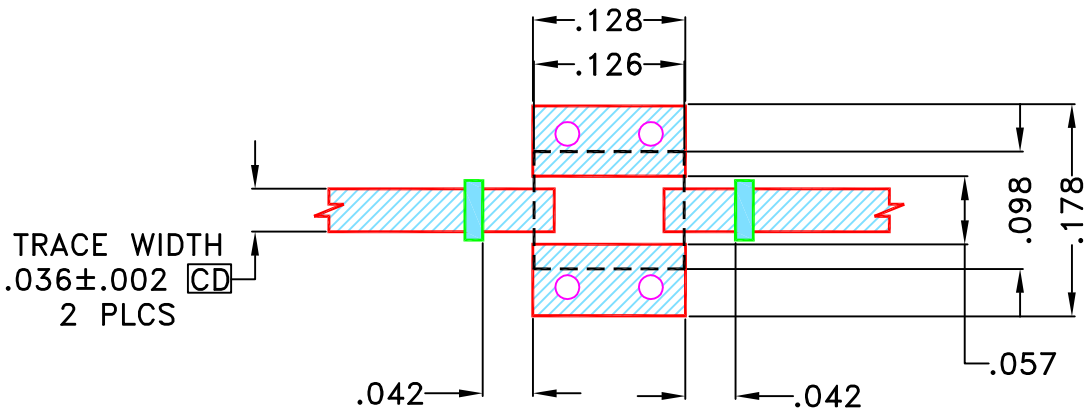
THIRD ANGLE PROJECTION



REVISIONS

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

SUGGESTED MOUNTING CONFIGURATION FOR JV1210C CASE STYLE



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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 ± 3 PL DECIMALS ± .005"	APPROVED	RV	8 MAR 17
ANGLES ±			
FRACTIONS ±			

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

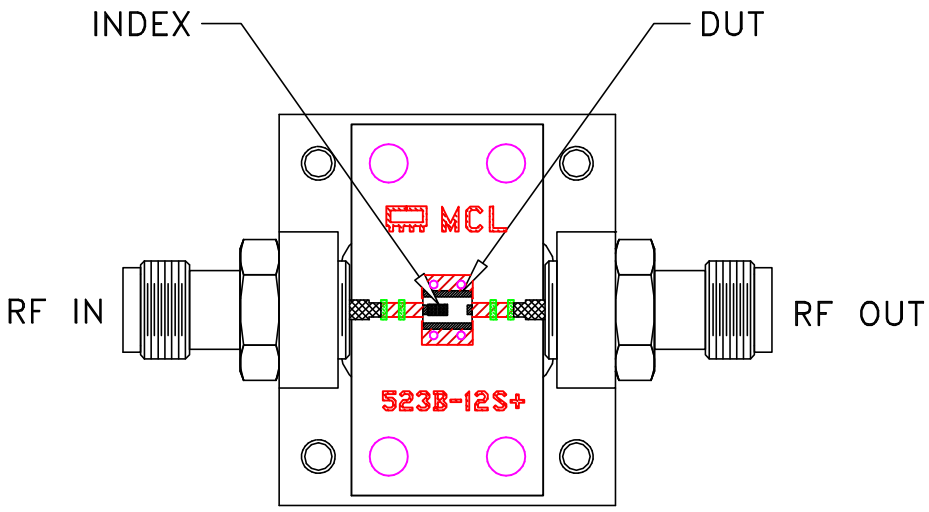
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

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

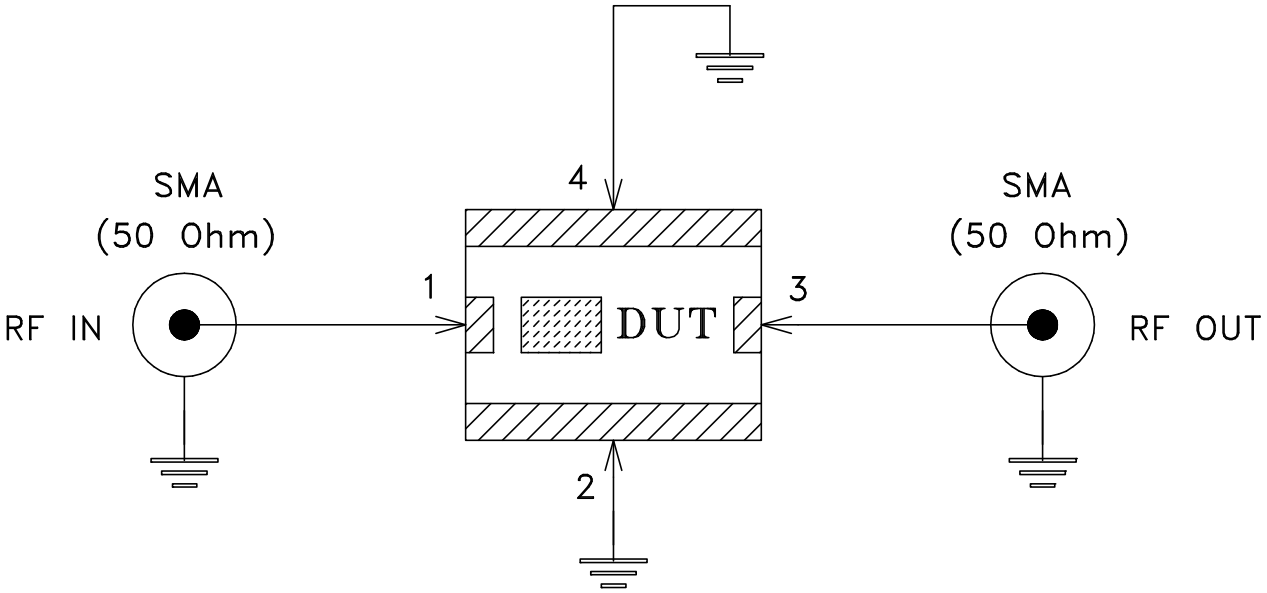
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-502	OR

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.

Mini-Circuits®

Mini-Circuits

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