Ceramic

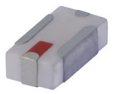
Bandpass Filter

BFCN-5540+

50Ω 4620 to 6640 MHz

The Big Deal

- LTCC construction
- Temperature stable from -55 to +100°C
- Small size (0.12 x .06 X .03”)



CASE STYLE: FV1206-4

Product Overview

The BFCN-5540+ LTCC bandpass filter covers the 4620 to 6640 MHz passband with 1.2 dB passband insertion loss, 22 dB lower stopband rejection, and 30 dB upper stopband rejection. This model handles up to 1W RF input power and provides a wide operating temperature range from -55 to +100°C. Utilizing LTCC construction, the filter achieves excellent repeatability of performance and comes in a tiny 1206 ceramic package with wraparound terminations, minimizing performance variations due to parasitics and saving space in dense PCB layouts.

Key Features

Feature	Advantages
LTCC Construction	Provides a rugged package well suited for tough environments such as high humidity and temperature extremes.
Tiny size (0.12 x .06 x .03”)	Saves space in dense circuit boards and minimizes the effects of parasitics.
Wrap-around terminations	Provides excellent solderability and easy visual inspection
Wide operating temperature range, -55 to +100°C	Enables reliable performance in extreme environments

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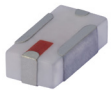
50Ω 4620 to 6640 MHz



Generic photo used for illustration purposes only

CASE STYLE: FV1206-4

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

Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500,1000, 3000

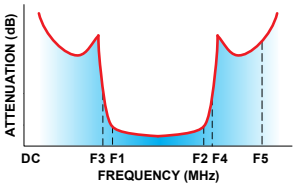
Features

- Small size
- Temperature stable
- LTCC construction

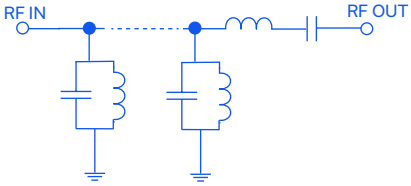
Applications

- Harmonic Rejection
- Transmitters / Receivers
- Aviation
- Communications
- W-LAN

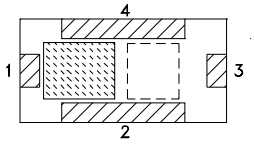
Specification Definition



Functional Schematic



Top View



Pad Connections

Input	1
Output	3
Ground	2,4

Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	5540	—	MHz
	Insertion Loss	F1-F2	4620-6640	—	1.2	4	dB
	VSWR	F1-F2	4620-6640	—	2.1	—	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-3470	17	22	—	dB
	VSWR	DC-F3	DC-3470	—	25	—	:1
Stop Band, Upper	Insertion Loss	F4-F5	8060-8820	13	30	—	dB
		F5-F6	8820-10990	—	17	—	dB
	VSWR	F4-F6	8060-10990	—	25	—	:1

1. Measured on Mini-Circuits Characterization Test Board TB-824+.
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

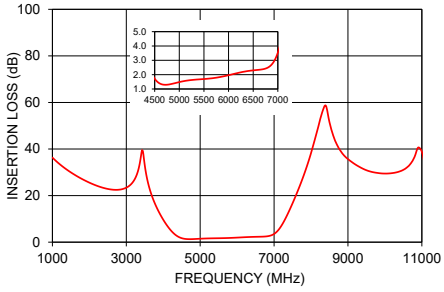
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input*	1W at 25°C

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

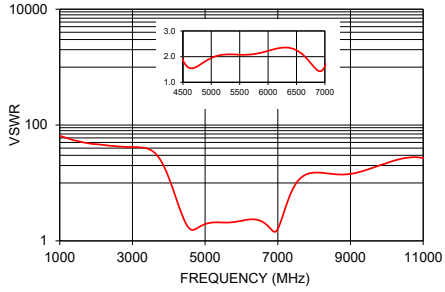
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1000	36.33	65.08
2000	25.57	46.87
3400	37.28	39.50
4600	1.39	1.58
5000	1.48	1.95
6600	2.33	2.10
7000	3.54	1.62
7500	16.69	9.78
8000	38.25	15.07
8600	45.83	14.11
9000	35.68	14.34
9500	30.89	17.30
10000	29.47	22.09
10900	40.64	27.46
11000	38.85	26.92

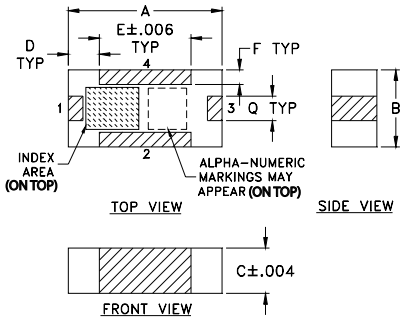
BFCN-5540+
INSERTION LOSS



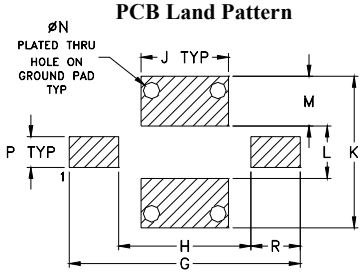
BFCN-5540+
VSWR



Outline Drawing

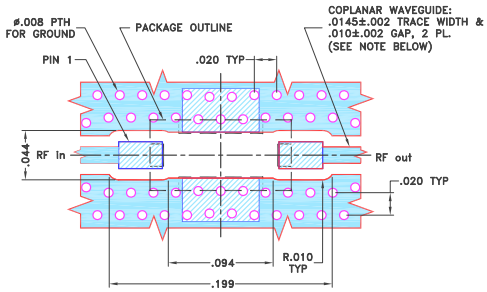


PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Demo Board MCL P/N: TB-824+
Suggested PCB Layout (PL-454)



NOTES:
1. TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066"±.0007". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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 SOLDER MASK.

Pad Connections

Input	1
Output	3
Ground	2,4

Product Marking: F6

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J
.126	.063	.037	.026	.075	.012	.182	.104	.069
3.20	1.60	0.94	0.66	1.91	0.30	4.62	2.64	1.75

K	L	M	N	P	Q	R		wt
.119	.041	.039	.013	.024	.020	.039		grams
3.02	1.04	0.99	0.33	0.61	0.51	0.99		.020

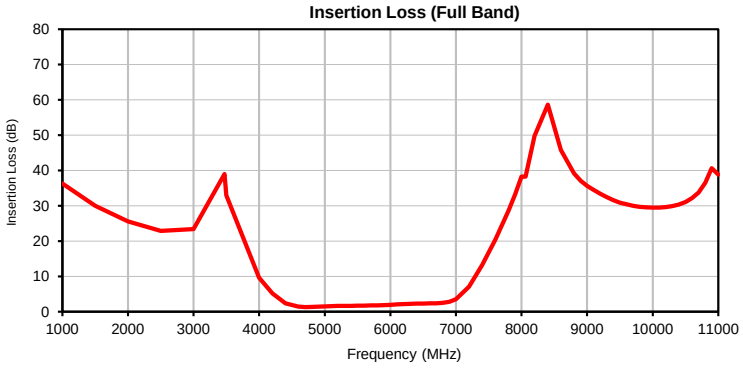
Ceramic Bandpass Filter BFCN-5540+

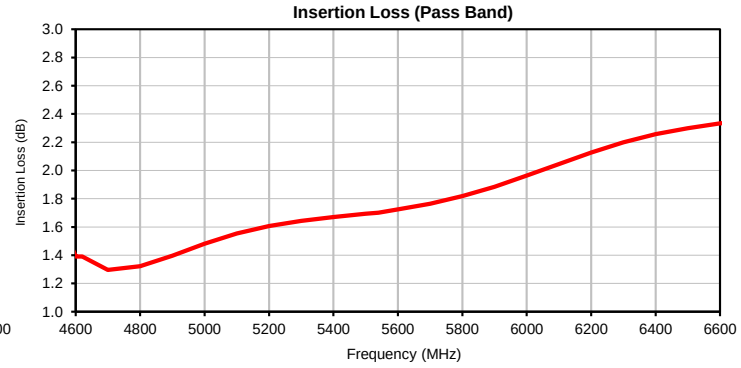
Typical Performance Data

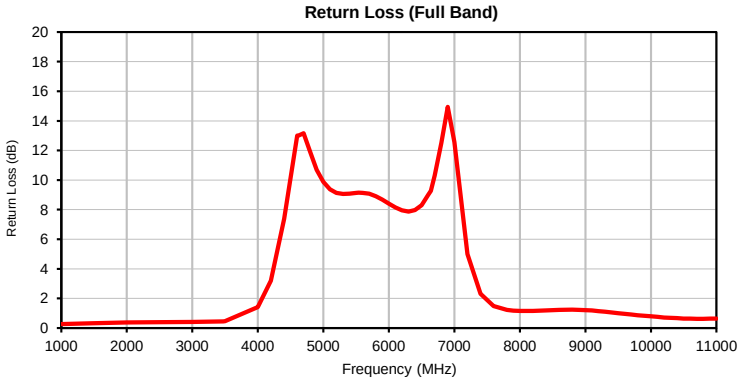
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
1000	36.33	0.27
1500	29.96	0.33
2000	25.57	0.37
2500	22.86	0.40
3000	23.40	0.42
3470	38.96	0.45
3500	32.97	0.47
4000	9.64	1.41
4000	9.64	1.41
4200	5.16	3.20
4400	2.40	7.38
4600	1.39	13.00
4620	1.39	13.00
4700	1.30	13.15
4800	1.32	11.88
4900	1.40	10.68
5000	1.48	9.87
5100	1.55	9.37
5200	1.61	9.14
5300	1.64	9.06
5400	1.67	9.07
5500	1.69	9.13
5540	1.70	9.14
5600	1.73	9.14
5700	1.76	9.08
5800	1.82	8.91
5900	1.88	8.68
6000	1.96	8.41
6100	2.05	8.15
6200	2.13	7.96
6300	2.20	7.87
6400	2.26	7.97
6500	2.30	8.31
6600	2.33	9.01
6640	2.34	9.26
6700	2.38	10.31
6800	2.50	12.51
6900	2.81	14.94
7000	3.54	12.55
7200	7.09	5.00
7400	13.17	2.31
7600	20.42	1.49
7800	28.58	1.23
7900	33.17	1.18
8000	38.25	1.15
8060	38.25	1.15
8200	49.77	1.16
8400	58.63	1.20
8600	45.83	1.23
8800	39.18	1.24
8900	37.13	1.23
9000	35.68	1.21
9100	34.47	1.18
9200	33.37	1.14
9300	32.43	1.10
9400	31.58	1.05
9500	30.89	1.01
9700	29.99	0.91
9800	29.73	0.87
9900	29.54	0.83
10000	29.47	0.79
10100	29.50	0.75
10200	29.66	0.71
10300	29.94	0.69
10400	30.39	0.66
10500	31.07	0.64
10600	32.14	0.63
10700	33.79	0.63
10800	36.53	0.62
10900	40.64	0.63
11000	38.85	0.65

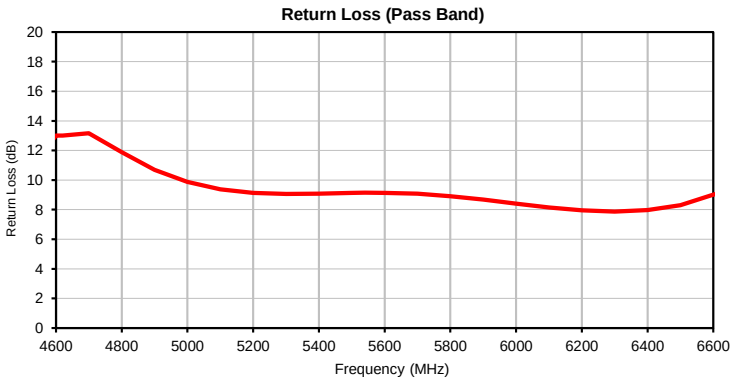
Ceramic Bandpass Filter BFCN-5540+

Typical Performance Curves





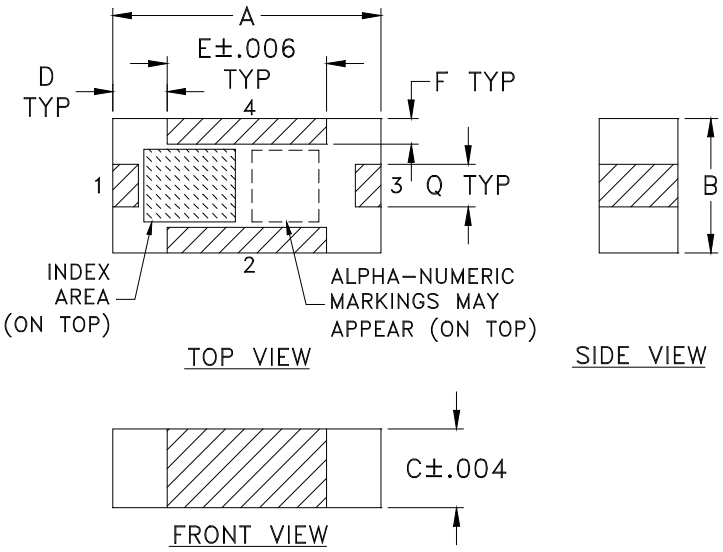




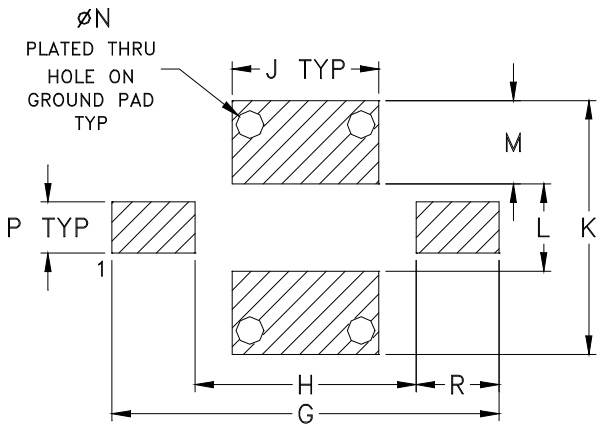
Case Style FV

FV1206-4

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M
FV1206-4	.126 (3.20)	.063 (1.60)	.037 (0.94)	.026 (0.66)	.075 (1.91)	.012 (0.30)	.182 (4.62)	.104 (2.64)	.069 (1.75)	.119 (3.02)	.041 (1.04)	.039 (0.99)

CASE #	N	P	Q	R	WT. GRAM
FV1206-4	.013 (0.33)	.024 (0.61)	.020 (0.51)	.039 (0.99)	.020

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.

Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

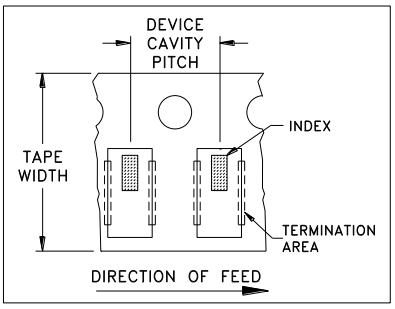


ILLUSTRATION 1

Applicable Case Styles
FV1206-1 FV1206-3

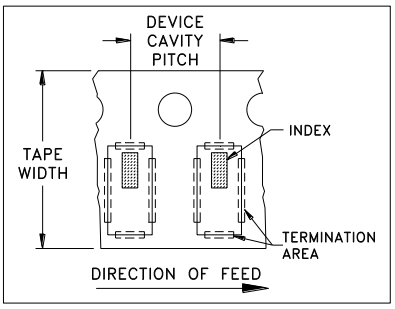


ILLUSTRATION 2

Applicable Case Styles
FV1206-4 FV1206-5 FV1206-6 FV1206-7 FV1206-9

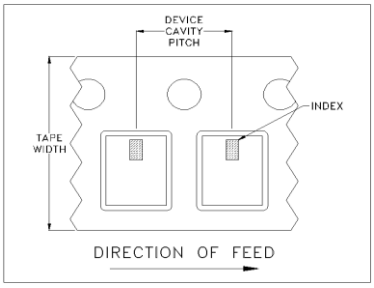


ILLUSTRATION 3

Applicable Case Styles
FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	3000

Note: Please consult individual model data sheet to determine device per reel availability.

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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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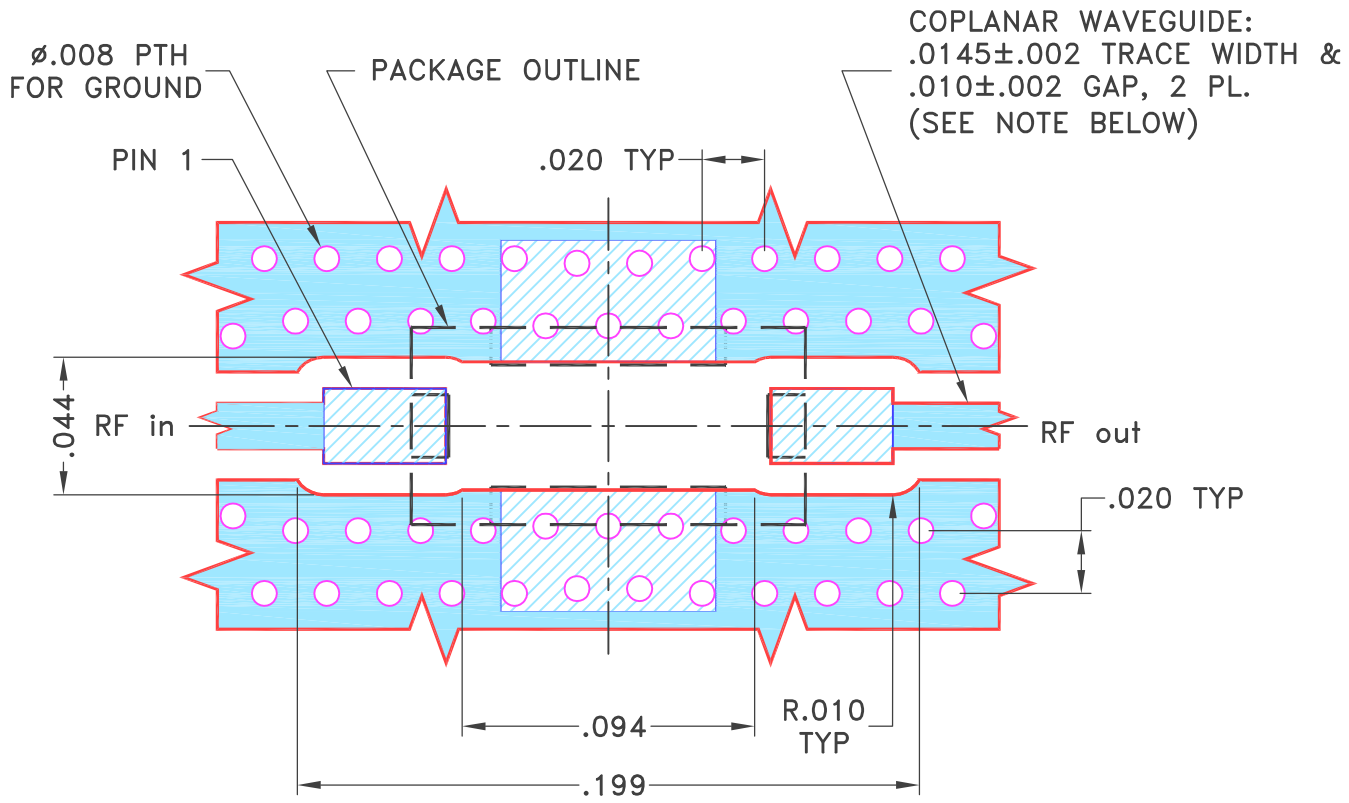
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M152168	NEW RELEASE	07/31/15	ITG	AVB

SUGGESTED MOUNTING CONFIGURATION
FOR FV1206-4 CASE STYLE, "04FL01" PIN CODE



NOTES:

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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 SOLDER MASK.

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	07/30/15
TOLERANCES ON:	CHECKED	GF	07/31/15
2 PL DECIMALS ±	APPROVED	AVB	07/31/15
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

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

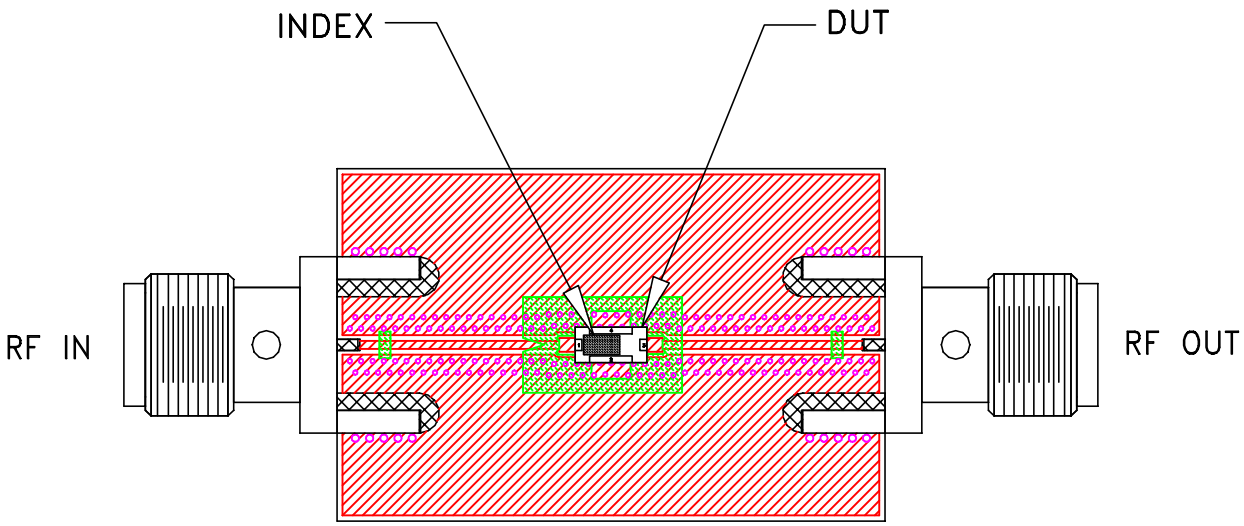
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, 04FL01, FV1206-4, TB-824+

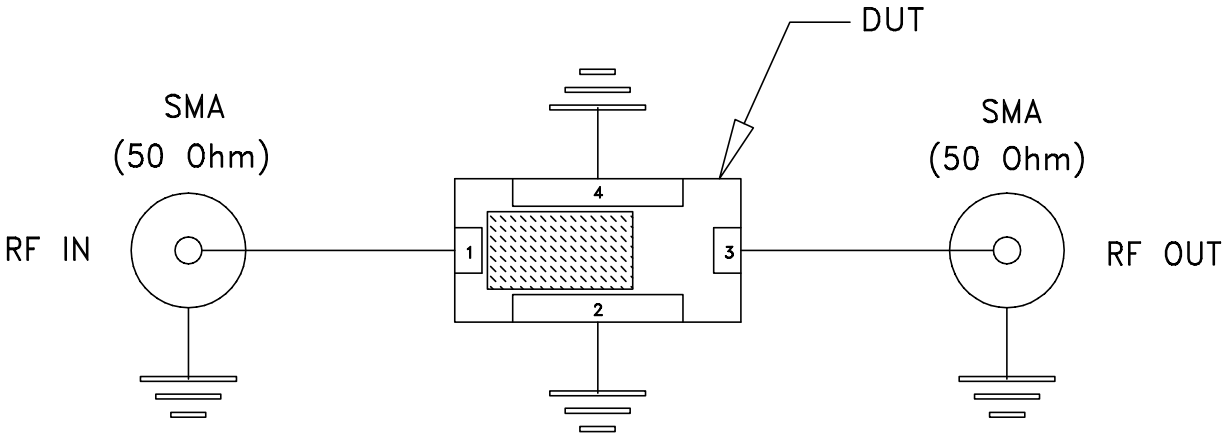
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-454	OR

FILE:	SCALE:	SHEET:
98PL454	16:1	1 OF 1

Evaluation Board and Circuit



TB-824+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.0066 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV06

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	-55° to 100°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
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, Para 4.2.5, Test S, 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