CERAMIC

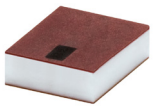
Low Pass Filter

LFCV-1552+

50Ω DC to 15500 MHz

THE BIG DEAL

- Low loss, 0.9 dB typical
- Return loss, 15 dB typical
- Stop Band Rejection 36 dB typical
- Small size 1210 (0.126" x 0.098" x 0.037")



Generic photo used for illustration purposes only

CASE STYLE: JV1210C-7

+RoHS Compliant

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

APPLICATIONS

- 5G MIMO and Back Haul Radio Systems
- Test and Measurement Equipment
- Radar, EW, and ECM Defense Systems

PRODUCT OVERVIEW

Mini-Circuits' LFCV-1552+ is an LTCC low pass filter with a passband from DC to 15500 MHz, supporting a variety of applications. This model provides 0.9 dB typical passband insertion loss and provides a very good stopband rejection due to strategically constructed layout with minimal interaction between components. It handles up to 6.5W RF input power and provides a wide operating temperature range from -55 to +125°C. Housed in a small 1210 ceramic form factor, the filter is ideal for dense PCB layouts and with minimal performance variation due to parasitics.

KEY FEATURES

Feature	Advantages
Ultra-wide stopband	The LTCC lowpass filter provides a very good stopband rejection until 40 GHz suitable for high end applications.
LTCC Construction	Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.
Small size (0.126" x 0.098" x 0.037")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Good power handling, 6.5W	Supports a wide range of system power requirements.

REV. A
ECO-015160
LFCV-1552+
EDU4123
URJ
220924

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	DC-F1	DC - 15500	—	0.9	1.9	dB
	Freq. Cut-Off	F2*	16900	—	3	—	dB
	Return Loss	DC-F1	DC - 15500	—	15	—	dB
Stop Band	Rejection Loss	F3-F4	21200 - 23000	20	36	—	dB
		F4-F5	23000 - 26500	25	33	—	
		F5-F6	26500 - 40000	—	30	—	

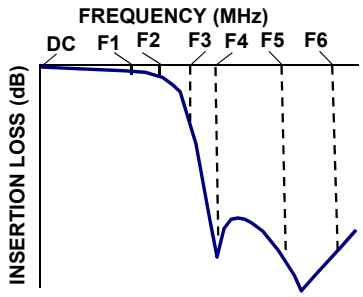
1 DC de-coupling capacitors are required in Applications where DC voltage and/or current is present at either input or output ports. Please contact Mini-Circuits for alternatives if DC pass from IN-OUT is required.
2 Measured on Mini-Circuits Characterization Test Board TB-LFCV-1552+
* Typically, a ±5% frequency deviation from the stated value may occur on a unit-to-unit basis.

MAXIMUM RATINGS

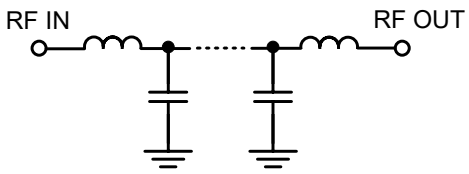
Parameter	Ratings
Operating temperature	-55°C to 125°C
Storage temperature	-55°C to 125°C
RF Power Input*	6.5 W @25°C

*Passband rating, derate linearly to 1.4W at 125°C ambient
Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



CERAMIC

Low Pass Filter

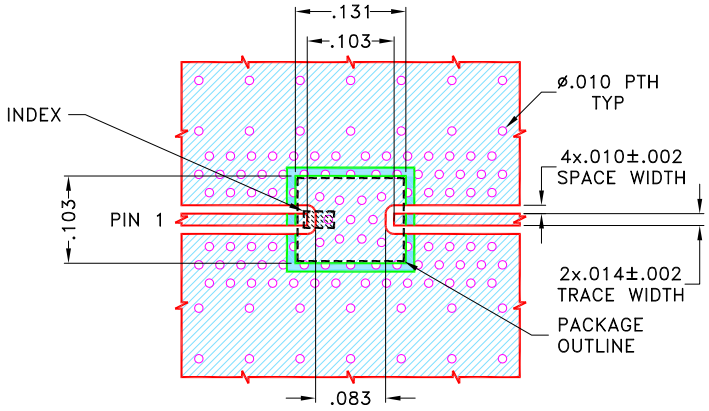
LFCV-1552+

PAD CONNECTIONS

INPUT	1
OUTPUT	2
GROUND	3

PRODUCT MARKING: UH

DEMO BOARD MCL P/N: TB-LFCV-1552+
SUGGESTED PCB LAYOUT (PL-679)



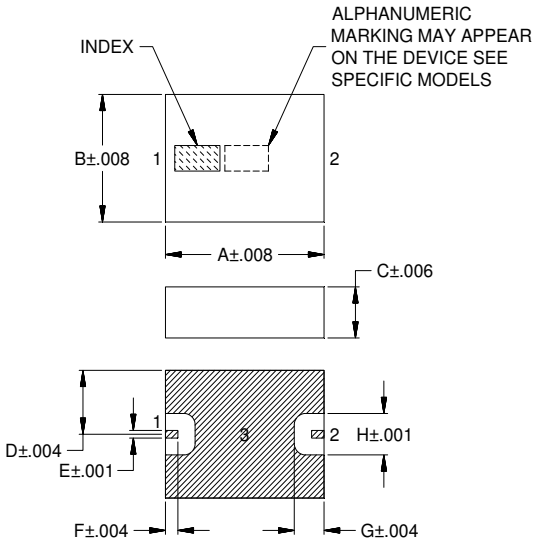
NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (RO4835 Lo Pro) WITH DIELECTRIC THICKNESS .0073±.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 PATTERN WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES PCB COPPER PATTERN FREE OF SOLDERMASK

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E
.126	**.098**	**.037**	**.049**	**.006**
3.20	2.50	0.95	1.25	0.15

F	G	H	Wt.
.010	**.024**	**.032**	grams
0.25	0.60	0.81	0.03

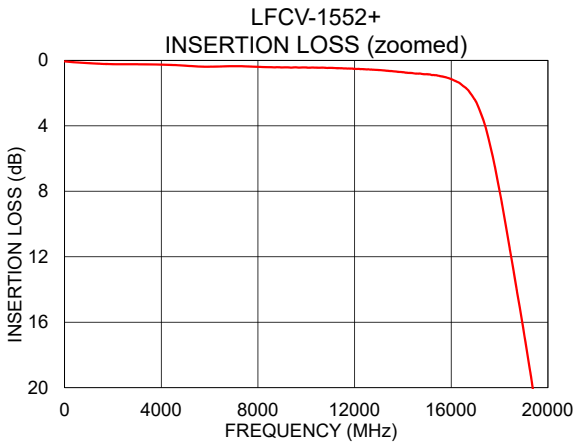
Note: Please refer to case style drawing for details

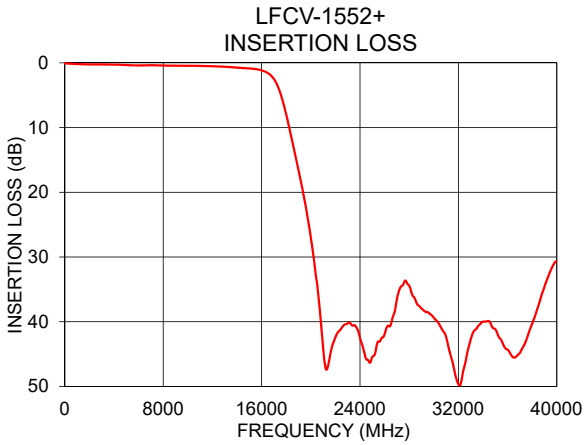
Low Pass Filter

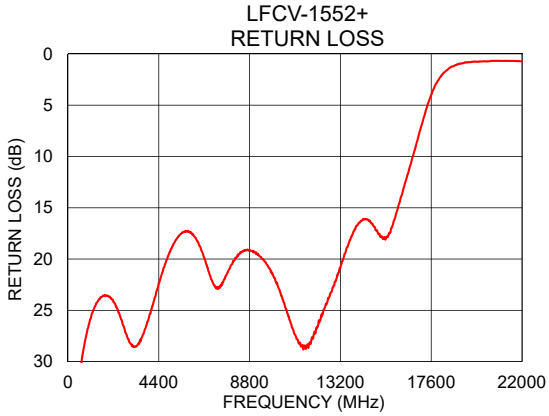
LFCV-1552+

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	0.07	38.27
100	0.08	45.73
2000	0.24	23.71
5000	0.33	19.01
10000	0.44	21.86
15500	0.95	17.85
16900	2.24	8.60
17200	3.14	6.48
19400	20.30	0.81
20250	30.36	0.73
21200	47.16	0.68
23000	40.26	1.15
26500	40.49	2.92
32000	49.66	0.73
40000	30.66	1.45







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 Low Pass Filter LFCV-1552+

Typical Performance Data

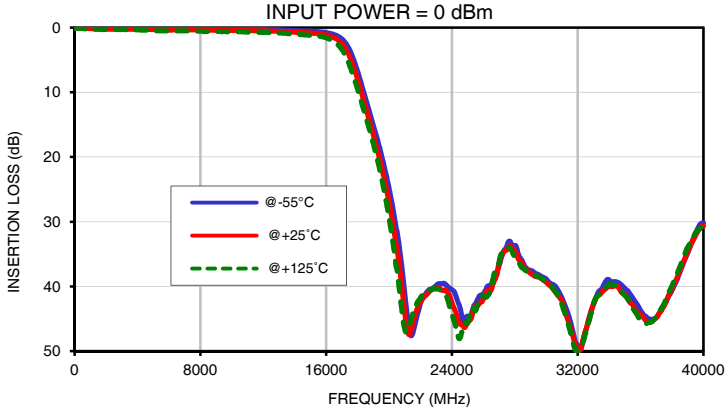
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C
10	0.06	0.07	0.09	41.23	38.27	36.04	42.37	39.61	37.88
50	0.06	0.08	0.10	49.76	47.22	44.04	49.08	46.98	44.17
100	0.07	0.08	0.11	46.77	45.73	43.04	45.54	45.10	43.04
500	0.10	0.13	0.18	33.02	32.33	31.88	33.36	32.40	31.86
1000	0.13	0.18	0.23	26.95	26.50	26.36	27.18	26.59	26.32
2000	0.18	0.24	0.31	23.97	23.71	23.28	23.57	23.37	22.94
2500	0.18	0.24	0.32	26.20	25.40	24.40	24.96	24.46	23.70
3000	0.18	0.24	0.33	30.33	28.16	26.16	26.91	26.19	25.11
3500	0.18	0.25	0.35	30.07	27.89	25.56	26.79	26.46	25.16
4000	0.19	0.27	0.38	26.65	25.30	23.20	25.62	25.27	23.51
4500	0.21	0.29	0.41	22.37	21.76	20.27	22.40	22.19	20.82
5000	0.24	0.33	0.46	19.25	19.01	18.36	19.29	19.23	18.73
5500	0.28	0.38	0.51	17.65	17.51	17.64	17.58	17.50	17.71
6000	0.28	0.39	0.53	17.64	17.49	17.97	17.46	17.37	17.88
6500	0.26	0.38	0.53	19.43	19.32	19.46	19.08	19.03	19.24
7000	0.24	0.36	0.53	22.11	22.25	21.80	22.28	22.53	22.10
7500	0.24	0.38	0.54	22.03	22.24	22.21	23.38	23.65	23.90
8000	0.26	0.40	0.58	20.01	20.19	20.29	21.23	21.55	21.96
8500	0.28	0.42	0.61	18.97	19.25	19.16	19.78	20.32	20.38
9000	0.29	0.44	0.63	19.13	19.24	19.30	19.80	20.33	20.40
9500	0.28	0.43	0.63	20.45	20.14	20.75	20.72	20.90	21.47
10000	0.28	0.44	0.65	22.03	21.86	22.15	22.07	22.30	22.81
11000	0.28	0.47	0.70	26.79	27.36	23.87	28.85	28.34	24.98
12000	0.33	0.52	0.76	25.54	27.15	26.25	27.51	28.92	26.89
13000	0.38	0.60	0.85	22.19	21.93	23.96	24.10	23.97	25.67
14000	0.47	0.73	1.02	17.54	16.75	16.70	18.39	17.51	17.53
15000	0.58	0.85	1.18	17.29	17.41	16.58	19.51	20.38	20.01
15500	0.65	0.95	1.31	18.32	17.85	17.05	25.44	26.47	27.61
16000	0.80	1.15	1.59	15.85	14.85	13.83	19.51	18.47	16.94
16500	1.11	1.58	2.17	12.71	11.46	10.38	14.25	12.82	11.39
16900	1.59	2.24	3.08	9.82	8.60	7.61	10.60	9.17	8.03
17200	2.29	3.14	4.24	7.41	6.48	5.63	7.85	6.75	5.83
18250	8.80	10.04	11.55	1.59	1.76	1.91	1.61	1.79	1.90
19400	18.59	20.30	21.89	0.52	0.81	1.23	0.58	0.84	1.22
20200	27.33	29.67	32.41	0.44	0.73	0.99	0.40	0.67	0.93
21200	45.40	47.16	46.77	0.28	0.68	0.96	0.02	0.58	0.54
22000	42.62	42.41	41.75	0.33	0.72	1.10	0.01	0.53	0.56
23000	39.83	40.26	40.36	0.64	1.15	1.83	0.11	0.66	0.80
24000	40.50	42.50	44.26	1.74	2.54	3.38	0.36	0.99	1.22
24500	43.17	45.75	48.03	2.37	3.15	3.81	0.49	1.17	1.38
25000	44.59	45.46	45.67	2.69	3.33	3.94	0.58	1.27	1.40
25500	42.69	43.07	43.75	2.86	3.47	4.13	0.65	1.32	1.44
26000	41.18	41.91	41.35	3.14	3.59	4.00	0.72	1.44	1.66
26500	39.65	40.49	40.35	2.65	2.92	3.01	1.01	1.84	2.35
27000	36.75	36.51	36.11	1.51	1.85	1.97	1.80	2.97	4.15
27500	33.65	34.31	34.16	0.71	1.09	1.35	3.71	5.21	6.61
28000	33.67	34.44	35.41	0.33	0.71	0.99	4.92	5.56	4.93
28500	36.21	36.60	37.18	0.21	0.56	0.85	3.06	3.33	2.78
29000	37.52	37.98	38.04	0.20	0.56	0.87	1.65	2.05	1.85
29500	38.16	38.53	38.51	0.27	0.63	1.02	1.05	1.50	1.54
30000	38.87	39.39	39.22	0.33	0.72	1.17	0.76	1.27	1.45
31000	41.80	42.33	42.85	0.27	0.77	1.30	0.40	1.09	1.28
32000	49.28	49.66	50.01	0.19	0.73	1.02	0.40	1.07	1.15
33000	42.74	42.73	42.66	0.34	0.80	1.14	0.55	1.17	1.27
34000	39.01	39.98	39.64	0.43	0.92	1.53	0.51	1.20	1.47
35000	40.30	41.16	41.42	0.49	1.08	1.68	0.45	1.18	1.47
36000	43.71	44.33	45.30	1.03	1.55	2.09	0.54	1.17	1.27
37000	44.74	44.83	44.70	1.55	2.10	2.69	0.45	1.15	1.22
39000	34.76	34.59	33.91	1.09	1.65	2.38	1.11	2.08	2.98
40000	30.16	30.66	30.80	0.74	1.45	2.46	1.77	2.68	2.77

Typical Performance Data

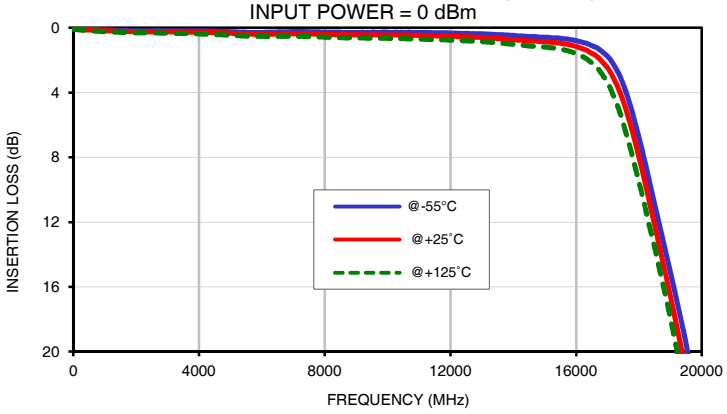
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-55°C	@+25°C	@+125°C
10	0.10	0.11	0.12
50	0.08	0.09	0.10
100	0.06	0.07	0.07
300	0.06	0.06	0.06
500	0.06	0.06	0.06
700	0.06	0.06	0.06
900	0.05	0.06	0.06
1000	0.05	0.05	0.06
1200	0.05	0.05	0.06
1400	0.05	0.05	0.06
1600	0.05	0.05	0.06
1800	0.05	0.05	0.06
2000	0.05	0.05	0.06
2500	0.05	0.05	0.06
3000	0.05	0.05	0.06
3500	0.05	0.05	0.06
4000	0.05	0.05	0.06
4500	0.05	0.06	0.06
5000	0.05	0.05	0.06
5500	0.05	0.05	0.06
6000	0.05	0.05	0.06
6500	0.06	0.06	0.06
7000	0.06	0.06	0.06
7500	0.06	0.06	0.06
8000	0.06	0.06	0.06
8500	0.06	0.06	0.06
9000	0.06	0.06	0.06
9500	0.06	0.06	0.06
10000	0.06	0.06	0.07
10500	0.06	0.06	0.07
11000	0.07	0.07	0.07
11500	0.07	0.07	0.07
12000	0.07	0.07	0.07
12500	0.07	0.07	0.08
13000	0.08	0.08	0.08
13500	0.08	0.08	0.08
14000	0.08	0.08	0.09
14500	0.09	0.09	0.09
15000	0.09	0.10	0.10
15500	0.11	0.11	0.12

Typical Performance Curves

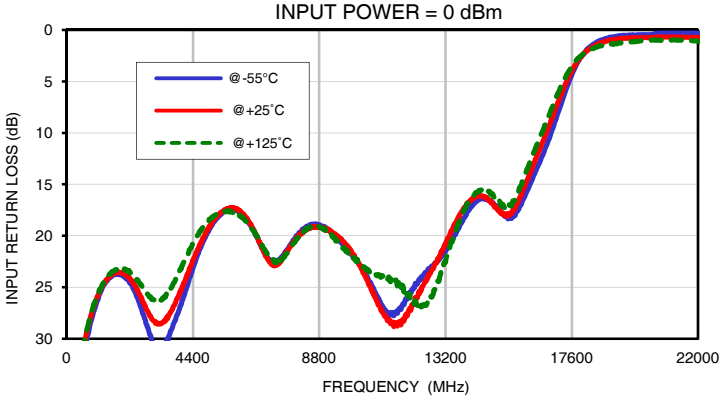
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



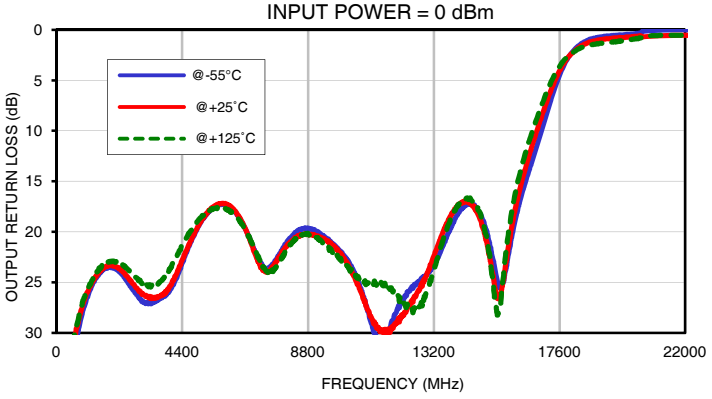
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



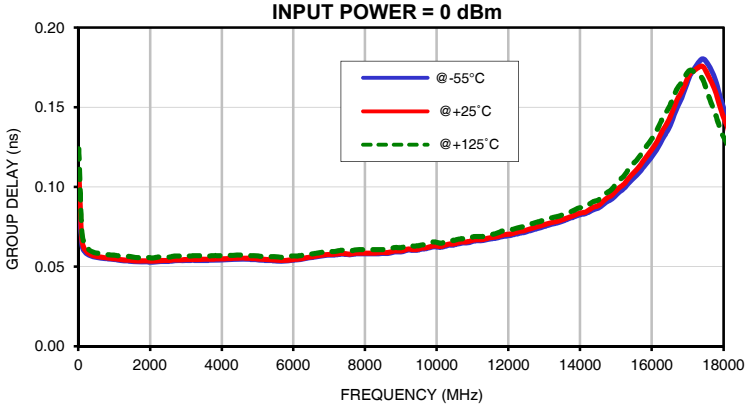
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm

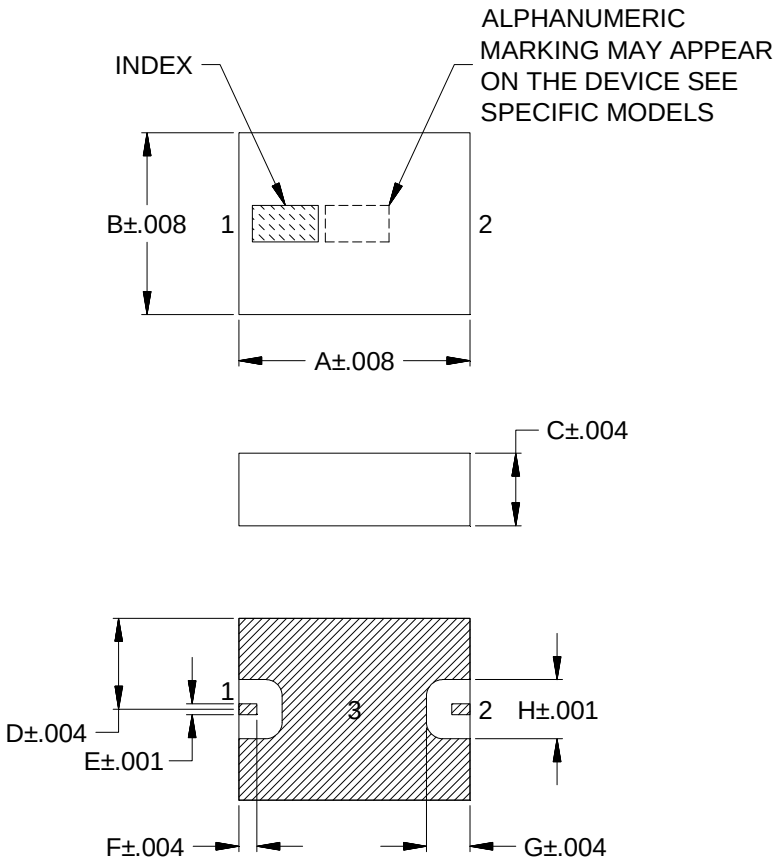


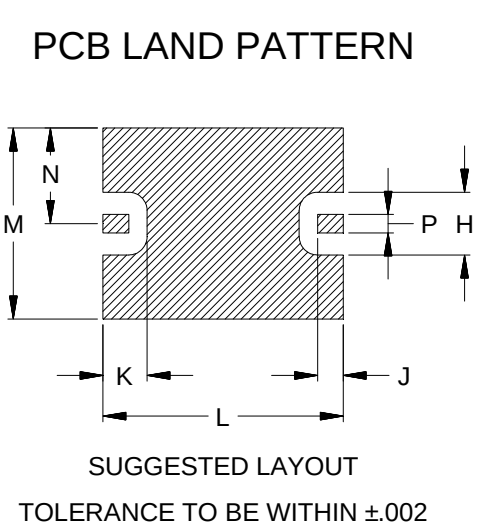
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style JV

Outline Dimensions JV1210C-7





CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT.GRAM
JV1210C-7	.126 (3.20)	.098 (2.50)	.039 (1.00)	.049 (1.25)	.006 (0.15)	.010 (0.25)	.024 (0.60)	.032 (0.81)	.014 (0.36)	.024 (0.61)	.131 (3.33)	.103 (2.63)	.052 (1.31)	.010 (0.25)	0.03

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

Notes:

1. Open style, Ceramic base.
2. Termination finish: **as shown below or indicated on Data Sheet.**
   For RoHS Case Styles: Gold plate over Nickel plate. All models, (+) 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

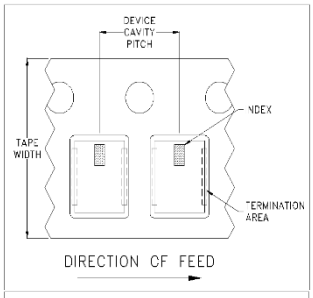


ILLUSTRATION 1

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

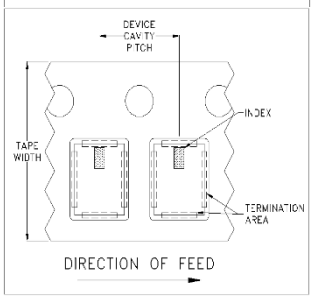


ILLUSTRATION 2

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

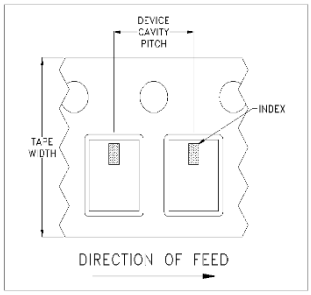


ILLUSTRATION 3

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

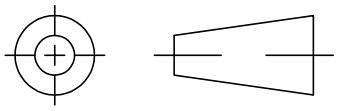
Note: Small reel availability varies by model. Refer to pricing and availability on individual model dashboard.

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

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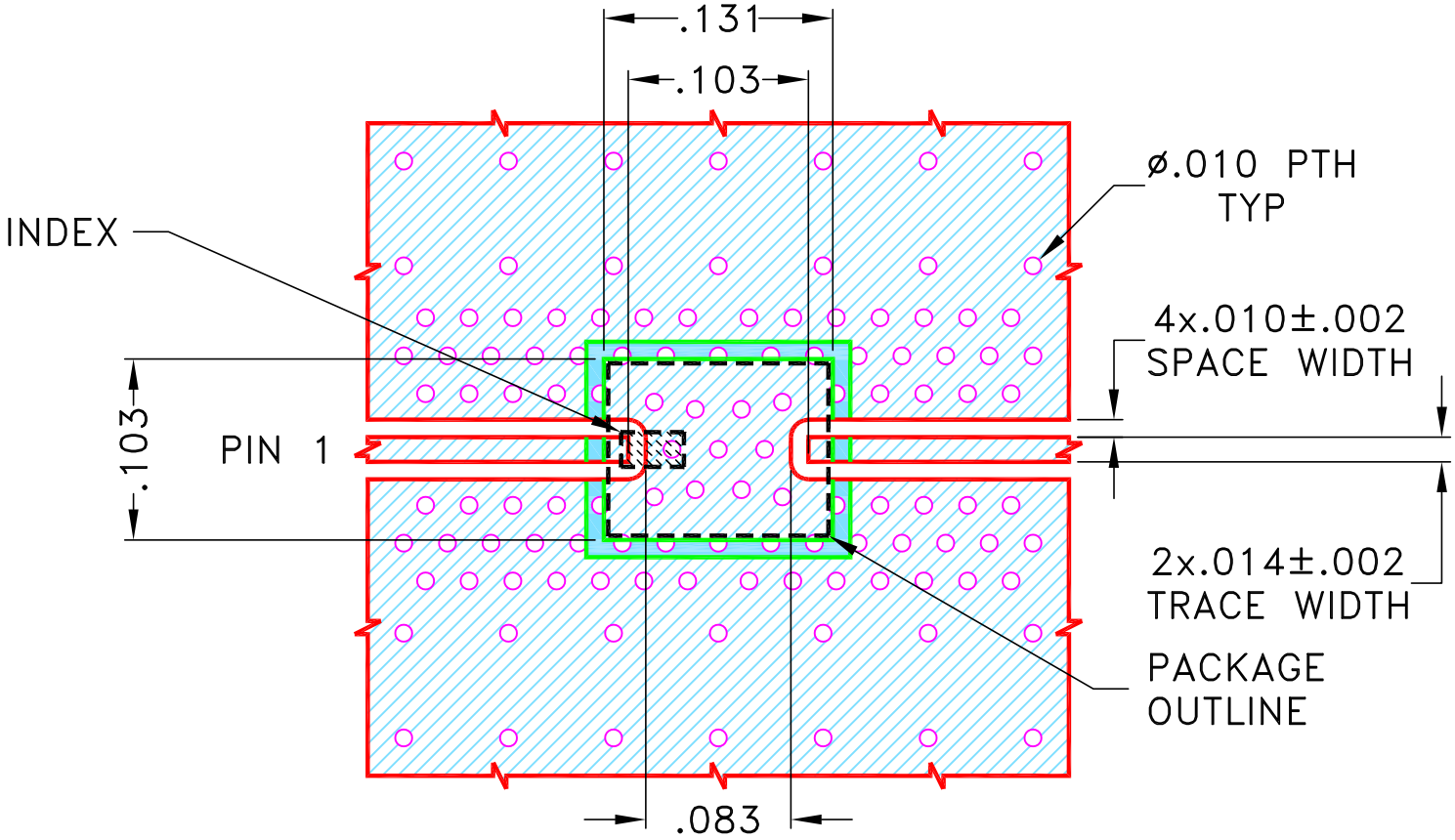
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-003129	NEW RELEASE	JUL 20	DDR	VC
OR1	ECO-019409	JV1210C-13 ADDED	OCT 23	AGS	VC

SUGGESTED MOUNTING CONFIGURATION FOR JV1210C-7, JV1210C-13 CASE STYLE



NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (RO4835 Lo Pro) WITH DIELECTRIC THICKNESS .0073±.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 PATTERN WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES PCB COPPER PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	DDR	02 JUL 20
TOLERANCES ON:	CHECKED	RV	02 JUL 20
2 PL DECIMALS ±	APPROVED	RKS	02 JUL 20
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

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

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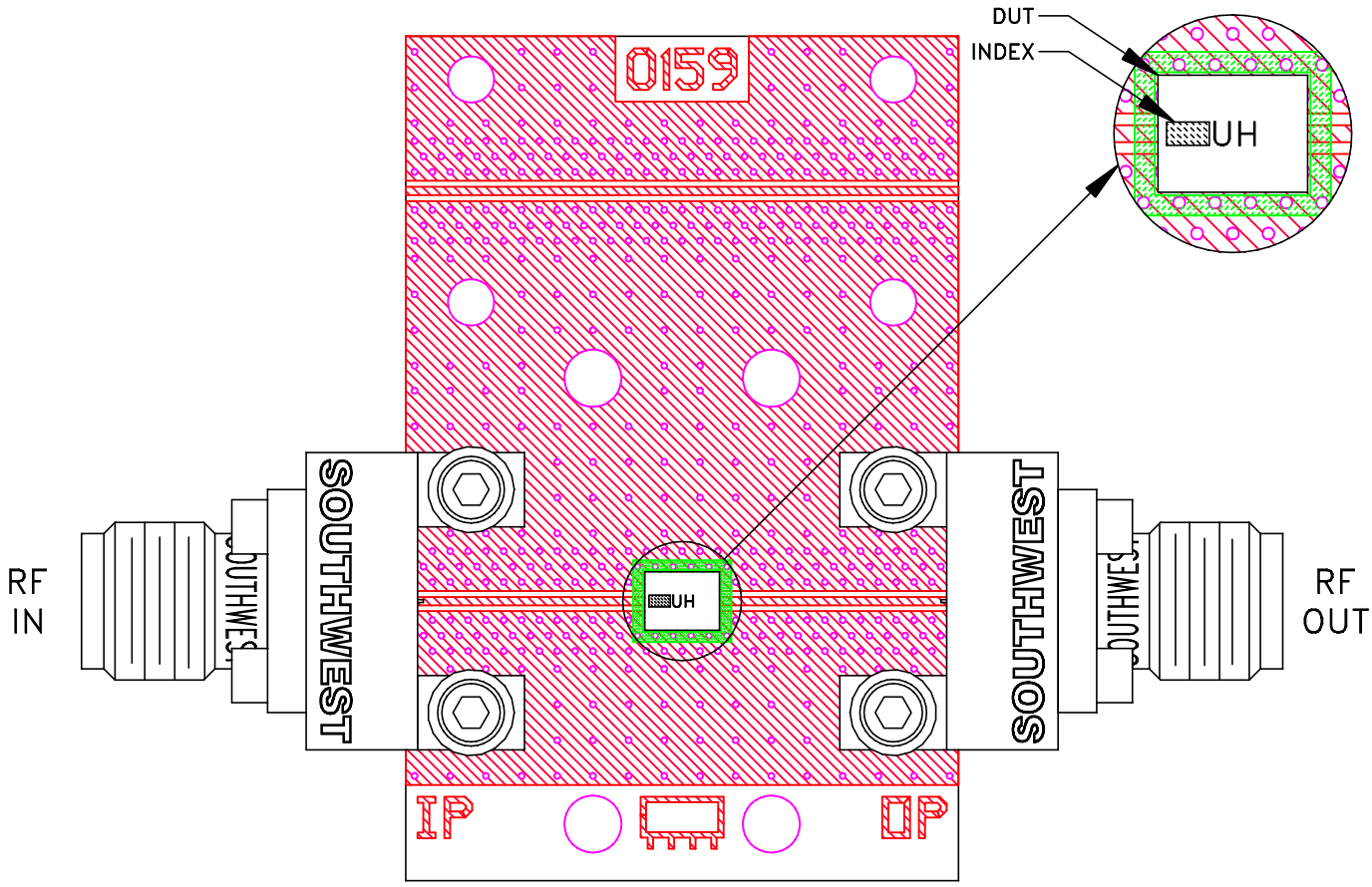
PL, JV1210C-7, JV1210C-13, TB-LFCV-X+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-679	OR1

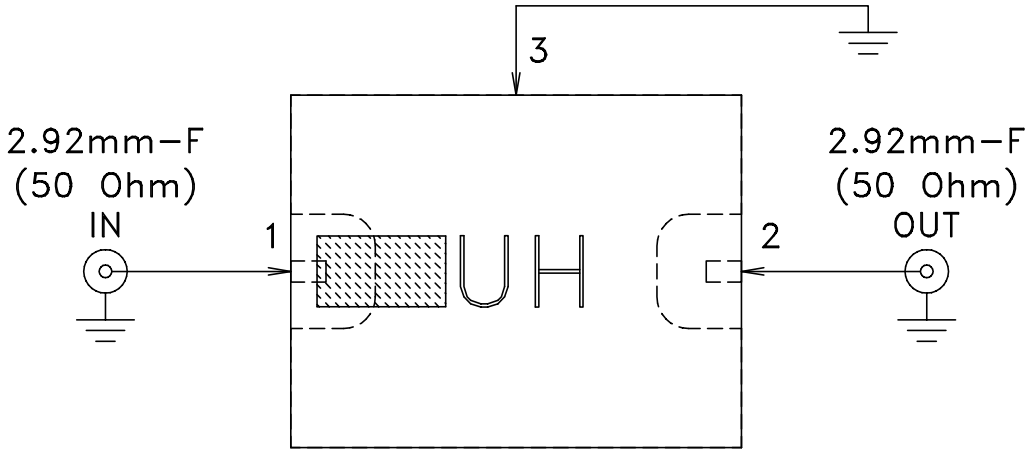
FILE:	SCALE:	SHEET:
98PL679	9:1	1 OF 1

Evaluation Board and Circuit

TB-LFCV-1552+



Schematic diagram



Notes:

1. PCB Material: ROGERS (RO4835 Lo Pro) OR Equivalent, Dielectric Constant=3.48±.05
Dielectric Thickness: .0073
2. 50 Ohm 2.92mm Female Connectors.
3. Connectors on the test board shall not be subjected to temperature greater than 200°C to avoid permanent damage to the connectors.

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Environmental Specifications ENV126

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 125° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 125° 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 Eutectic Process 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020C, 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

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