LTCC SURFACE MOUNT

Low Pass Filter

LFCV-1800-75+

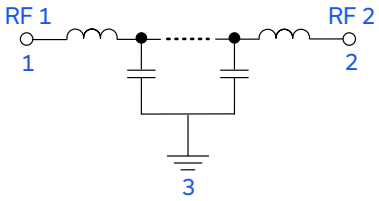
75Ω 10 to 1800 MHz

THE BIG DEAL

- Stop Band Rejection, 25 dB Min.
- Low Insertion Loss, 1.5 dB Max.
- Pass Band Return Loss, 15 dB Typ.
- Rugged Ceramic Construction
- Small Size, 1210 Surface Mount Footprint

Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



APPLICATIONS

- Cable / CATV Systems
- Broadband Fiber Networks
- Harmonic Rejection
- Test & Measurement Equipment

PRODUCT OVERVIEW

Mini-Circuits' LFCV-1800-75+ is a miniature low-temperature co-fired ceramic (LTCC) 75Ω low pass filter with a 10 to 1800 MHz passband that supports a variety of applications. This model provides 1.5 dB maximum insertion loss over a wide band, due to its rugged monolithic construction. Housed in a small 1210 ceramic form factor with excellent passband return loss of 15 dB typical, this filter is ideal for CATV and Broadband Fiber Network applications. The LTCC fabrication process assures minimal RF performance variation, while delivering a product that is well-suited for environmental extremes of high humidity and temperature.

KEY FEATURES

Feature	Advantages
High Rejection	With 25 dB minimum stopband rejection, this filter is ideally suited for CATV applications to enhance the system dynamic range.
LTCC Construction	The use of LTCC technology allows for repeatable performance in a rugged ceramic package, well suited for tough environments such as high humidity and temperature extremes.
Excellent Performance for Size	Offers best in class performance relative to larger-size alternative technologies. This multi-layer surface mount LTCC filter in a 1210 package allows for space to be saved in dense circuit board layouts, while also minimizing the effects of parasitics.

REV. A
ECO-021994
LFCV-1800-75+
MCL NY
250610

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ELECTRICAL SPECIFICATIONS[1,2,3] AT 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	F1-F2	10 – 1800	—	—	1.5	dB
	Freq. Cut-Off[4]	Fc	2200	—	3	—	
	Return Loss	F1-F2	10 – 1800	—	15	—	
Stopband	Rejection	F3-F4	2750 – 4000	32	—	—	dB
		F4-F5	4000 – 5000	25	—	—	

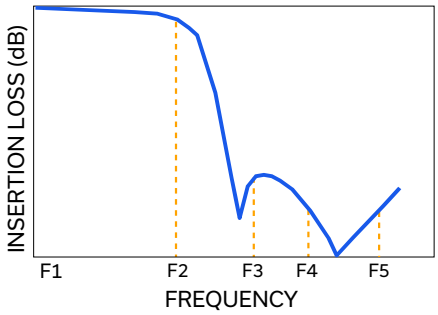
1. Tested on Evaluation Board P/N TB-LFCV180075C+ with Port Extension performed.
2. Bi-directional RF1 and RF2 ports can be interchanged.
3. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.
4. Typical variation ±5%.

ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-55°C to +105°C
RF Power Input[6]	2 W

5. Permanent damage may occur if any of these limits are exceeded.
6. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 1 W at +105°C.

TYPICAL FREQUENCY RESPONSE AT 25°C

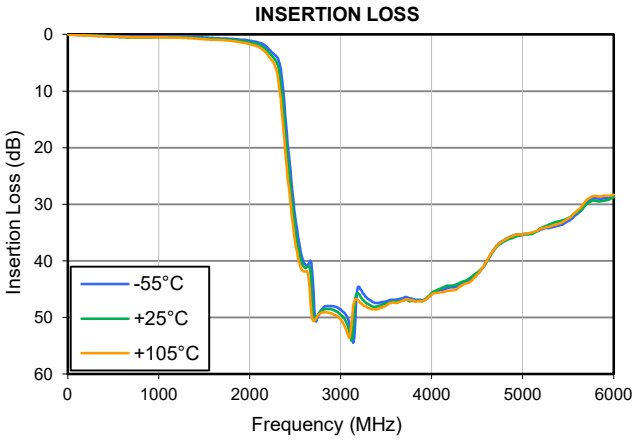


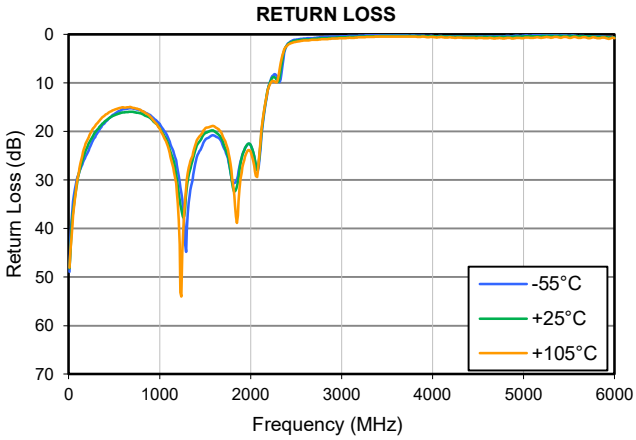
Low Pass Filter

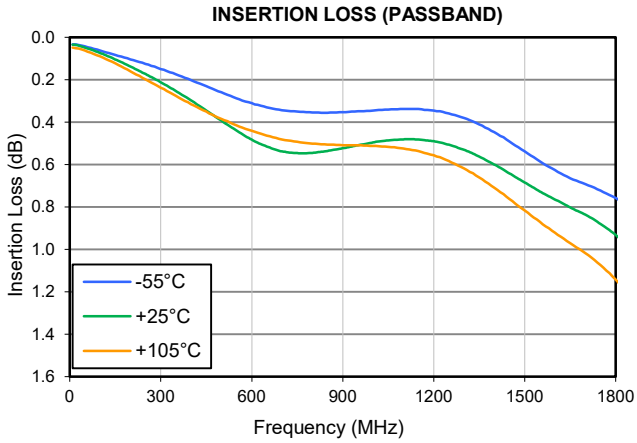
LFCV-1800-75+

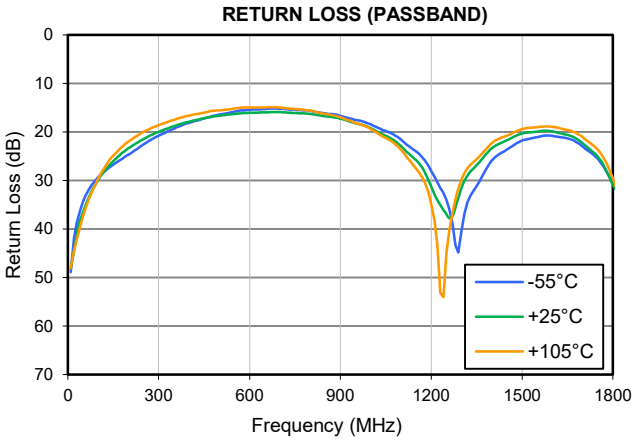
75Ω 10 to 1800 MHz

TYPICAL PERFORMANCE GRAPHS









Low Pass Filter

LFCV-1800-75+

75Ω 10 to 1800 MHz

FUNCTIONAL DIAGRAM

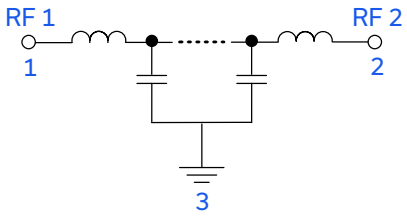
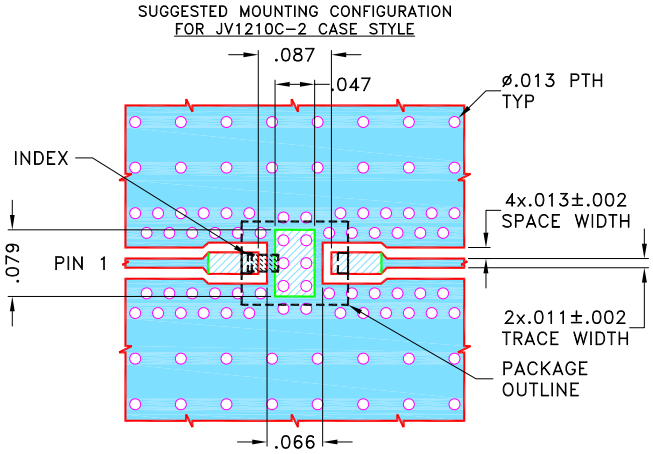


Figure 1. LFCV-1800-75+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1[2]	1	Connects to RF Input Port
RF2[2]	2	Connects to RF Output Port
GROUND	3	Connects to Ground on PCB, (See drawing PL-680)

SUGGESTED PCB LAYOUT (PL-680)



NOTES:

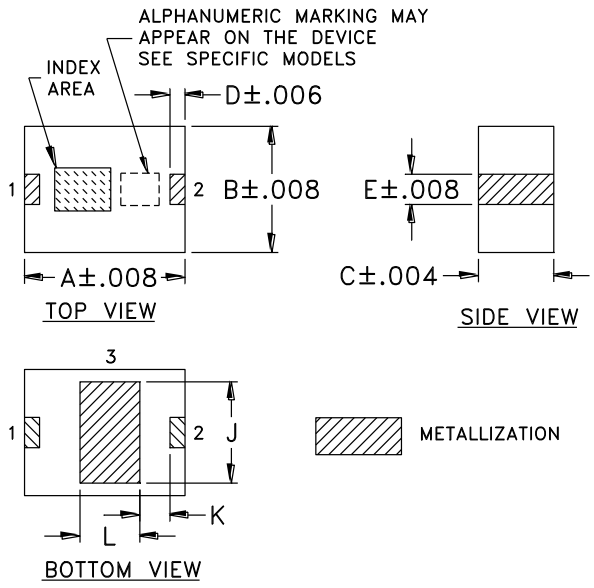
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .010±.001; COPPER: 1/2 Oz. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

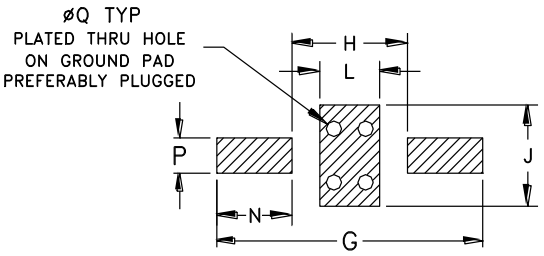
DENOTES PCB COPPER PATTERN WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES PCB COPPER PATTERN FREE OF SOLDERMASK

Figure 2. Suggested PCB Layout PL-680

CASE STYLE DRAWING





Suggested Layout,
Tolerance to be within ±.002

OUTLINE DIMENSIONS (Inch / mm)

A	B	C	D	E	G	H
.126	.098	.059	.012	.024	.205	.087
3.2	2.5	1.5	0.3	0.61	5.2	2.2

J	K	L	N	P	Q	wt
.079	.028	.047	.059	0.026	0.012	grams
2.0	0.7	1.2	1.5	0.7	0.3	0.045

PRODUCT MARKING*: N/A

*Marking may contain other features or characters for internal lot control.

Low Pass Filter

LFCV-1800-75+

75Ω 10 to 1800 MHz

ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	JV1210C-2 Lead Finish: Tin over Nickel Plating
RoHS Status	Compliant
Tape and Reel	F74
Suggested Layout for PCB Design	PL-680
Evaluation Board	TB-LFCV180075C+ Gerber File
Environmental Ratings	ENV06T13

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/terms/viewterm.html

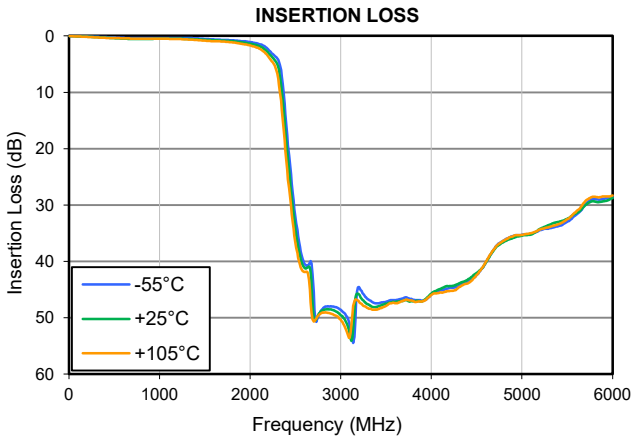
LTCC Lowpass Filter LFCV-1800-75+

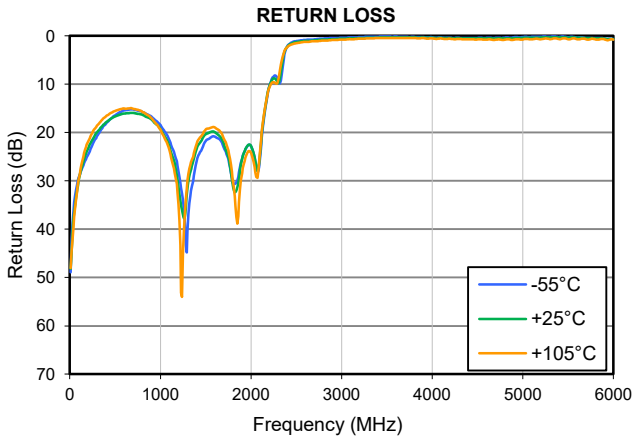
Typical Performance Data

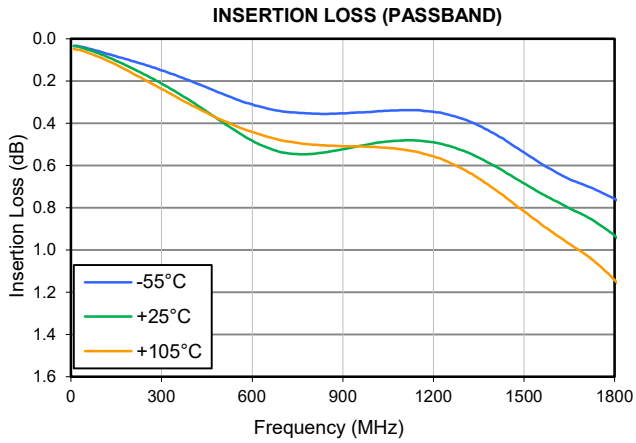
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
10.0	0.03	48.15
100.0	0.07	29.94
200.0	0.14	23.38
400.0	0.30	17.90
600.0	0.48	16.07
800.0	0.55	16.29
1000.0	0.50	19.25
1200.0	0.49	31.29
1250.0	0.51	36.99
1300.0	0.53	31.56
1400.0	0.60	23.38
1500.0	0.68	20.34
1600.0	0.76	19.89
1700.0	0.84	22.35
1800.0	0.93	30.95
1850.0	1.01	31.32
1900.0	1.11	25.69
2000.0	1.38	22.75
2100.0	1.79	24.34
2150.0	2.24	15.68
2200.0	2.97	10.66
2250.0	3.87	8.79
2300.0	5.04	9.75
2350.0	9.83	4.96
2700.0	49.46	0.91
3090.0	52.20	0.52
4000.0	45.73	0.36
4200.0	44.37	0.43
4600.0	40.28	0.52
4800.0	36.53	0.51
5000.0	35.44	0.40

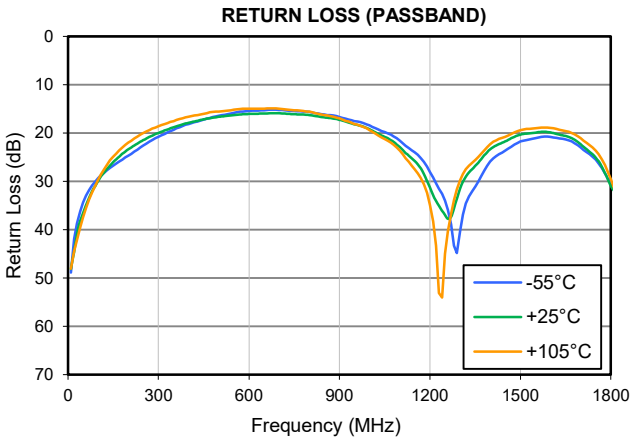
LTCC Lowpass Filter LFCV-1800-75+

Typical Performance Data





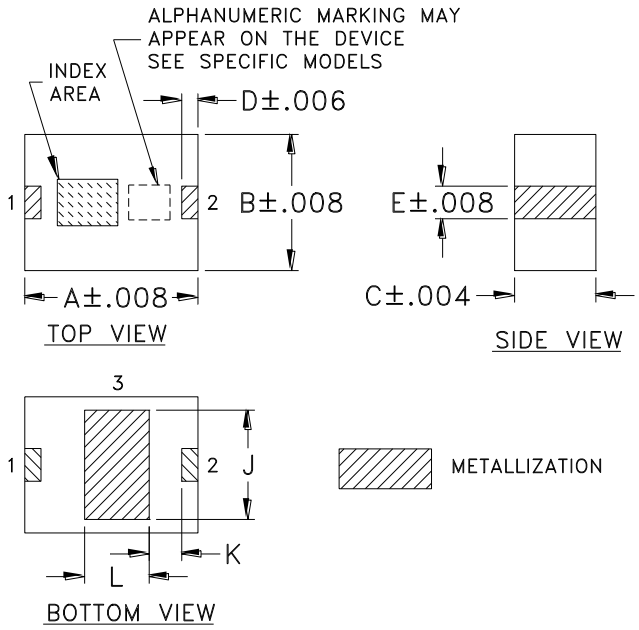


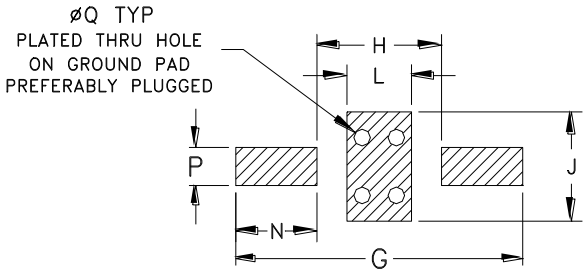


Case Style JV

Outline Dimensions JV1210C-2

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-2	.126 (3.2)	.098 (2.5)	.059 (1.5)	.012 (0.3)	.024 (0.6)	-- --	.205 (5.2)	.087 (2.2)	.079 (2.0)	.028 (0.70)	.047 (1.2)	-- --	.059 (1.5)	.026 (0.65)	.012 (0.3)	.045

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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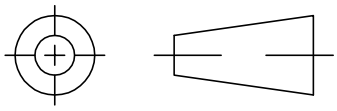
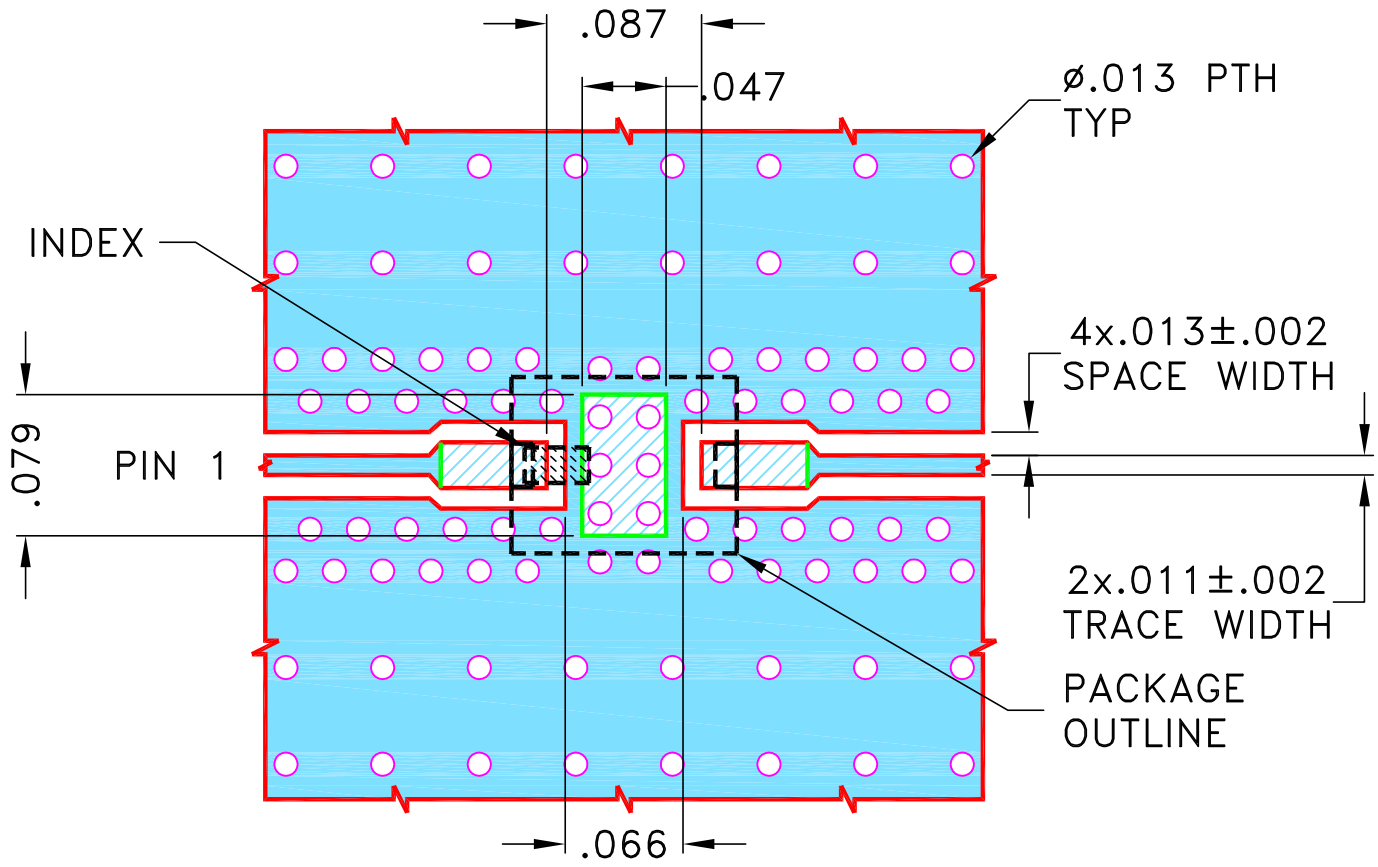
THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	NPO-003126	NEW RELEASE	OCT 22	DDR	VC

SUGGESTED MOUNTING CONFIGURATION FOR JV1210C-2 CASE STYLE



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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	11 OCT 22
TOLERANCES ON:	CHECKED	DDR	11 OCT 22
2 PL DECIMALS ±	APPROVED	RKS	11 OCT 22
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

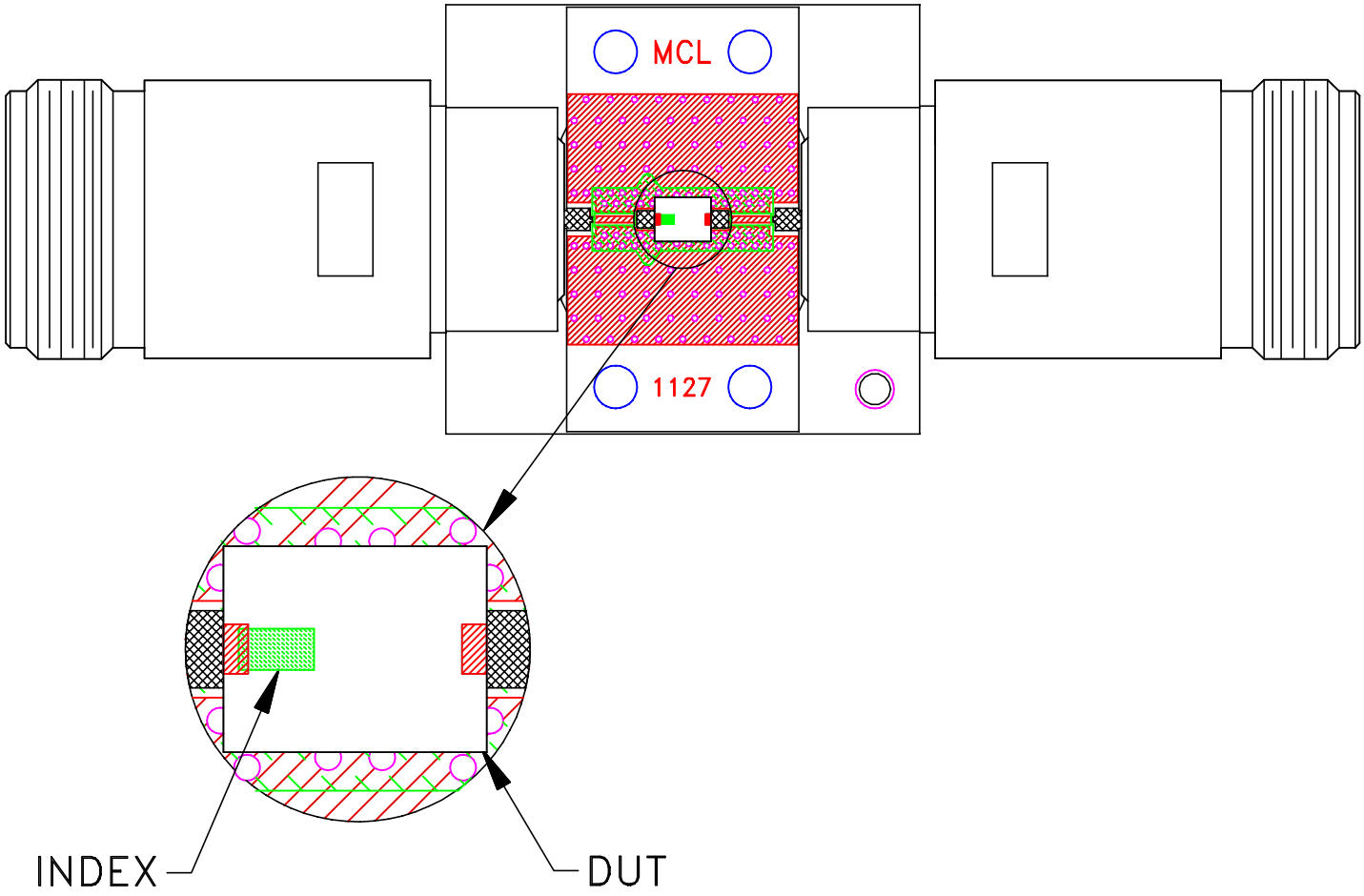
PL DWG JV1210C-2 C.S 75 OHM LFCV

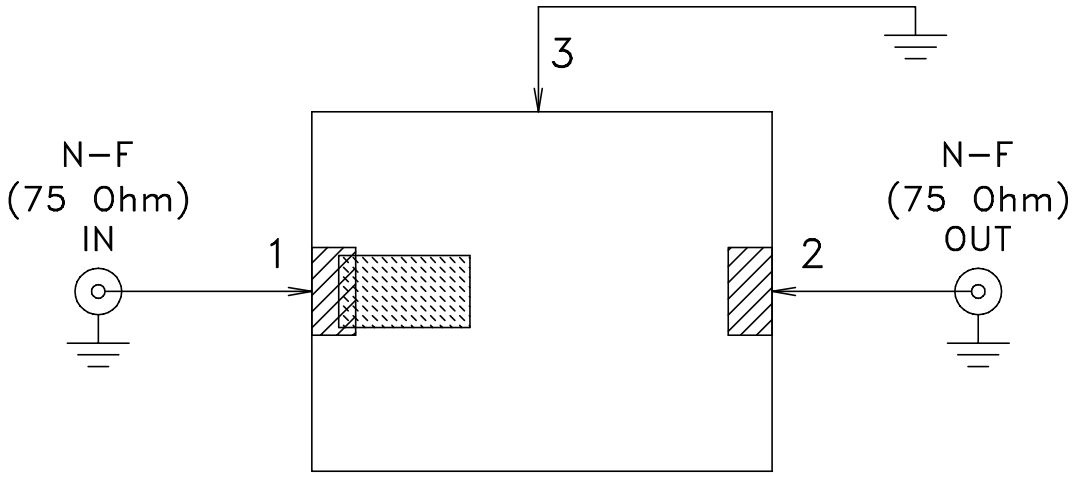
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-680	OR

FILE:	SCALE:	SHEET:
98-PL-680	9:1	1 OF 1

Evaluation Board and Circuit

TB-LFCV180075C+





Schematic Diagram

Notes:

1. PCB Material: FR4, GRADE IT-180A OR Equivalent, Dielectric Constant=3.48±0.05
   Dielectric Thickness: .039±.003 inch
2. 75 Ohm N Female Connectors.

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Environmental Specifications ENV06T9

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: 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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