Ceramic

LTCC Bandpass Filter BPNL-1891+

50Ω 1790 to 2000 MHz

The Big Deal

- Small size 2.5mm x 2.0mm
- Low loss in passband (2.6 dB typ)
- Very high rejection over wide band

CASE STYLE: NL1008C-3

Product Overview

The BPNL-1891+ LTCC bandpass filter achieves a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Passing 1790-2000 MHz, these units offer excellent rejection over a wide stopband.

Key Features

Feature	Advantages
Small Size (2.5mm x2.0 mm)	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Transmission zero at 2nd harmonic within wide stopband	Provides good rejection of harmonic signals, for improved system performance.
Wrap around termination	Provides excellent solderability and easy visual inspection capability.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.

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BPNL-1891+

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Generic photo used for illustration purposes only

CASE STYLE: NL1008C-3

+RoHS Compliant

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

Features

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

Applications

- Harmonic Rejection
- Transmitters / Receivers
- Test and Measurement

Electrical Specifications at 25°C

Parameter		Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	1890	—	MHz
	Insertion Loss	1790 - 2000	—	2.6	3.5	dB
	VSWR	1790 - 2000	—	1.5	—	:1
Stop Band, Lower	Insertion Loss	DC - 1090	27	36	—	dB
Stop Band, Upper	Insertion Loss	2615 - 5935	27	33	—	dB

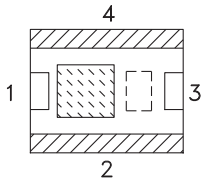
1. Measured on Mini-Circuits Characterization Test Board TB-1086+ with feedline losses removed using Auto Port Extension feature of VNA.
2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors 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 0.5W at 100°C ambient
Permanent damage may occur if any of these limits are exceeded.

Top View



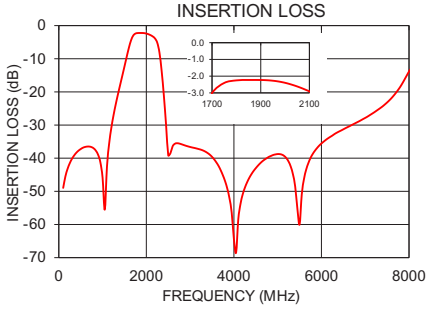
Pad Connections

Input	1
Output	3
Ground	2,4

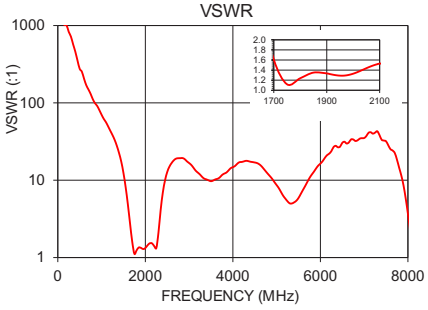
Typical Performance Data at 25°C

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)
400	-38.36	459.57
600	-36.61	205.12
1200	-30.84	43.55
1500	-12.33	12.42
1700	-3.01	1.61
1750	-2.41	1.12
1900	-2.23	1.33
2000	-2.40	1.33
2100	-2.91	1.53
2600	-36.41	16.66
3500	-39.59	9.71
4500	-43.01	16.95
5000	-38.75	8.65
6000	-35.56	16.38
7000	-27.84	35.08

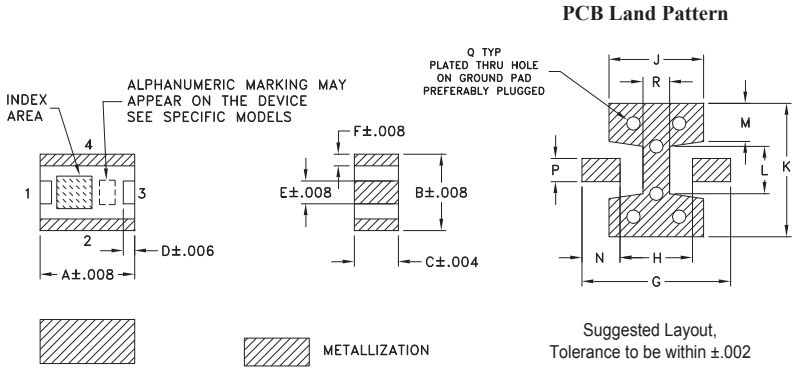
BPNL-1891+
INSERTION LOSS



BPNL-1891+
VSWR



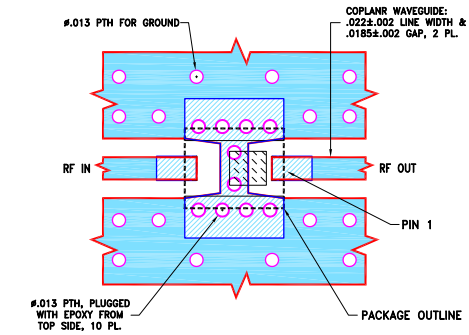
Outline Drawing



PCB Land Pattern

Suggested Layout,
Tolerance to be within ±.002

Demo Board MCL P/N: TB-1086+
Suggested PCB Layout (PL-617)



NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010±.001. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH & 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.

Product Marking: KW

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J
.098	.079	.046	.012	.024	.012	.154	.075	.098
2.49	2.01	1.17	0.30	0.61	0.30	3.91	1.91	2.49

K	L	M	N	P	Q	R		wt
.138	.055	.041	0.039	0.024	0.014	0.028		grams
3.51	1.40	1.04	0.99	0.61	0.36	0.71		.019

Additional 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

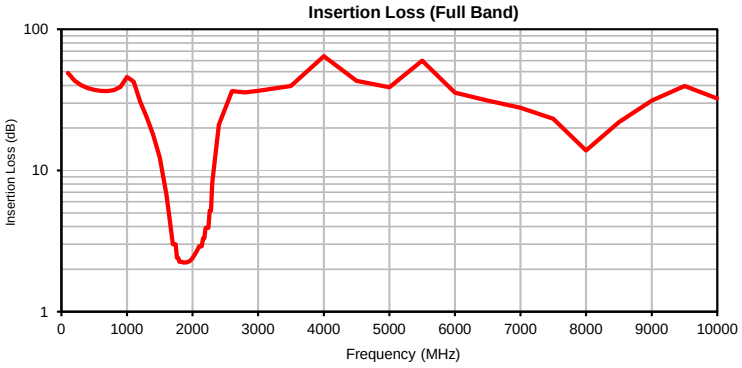
Ceramic Bandpass Filter BPNL-1891+

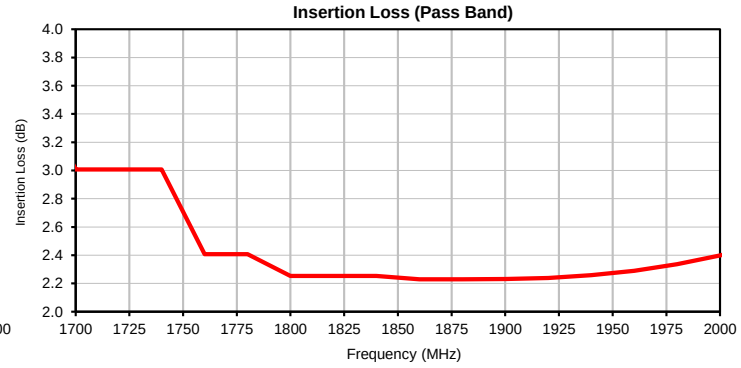
Typical Performance Data

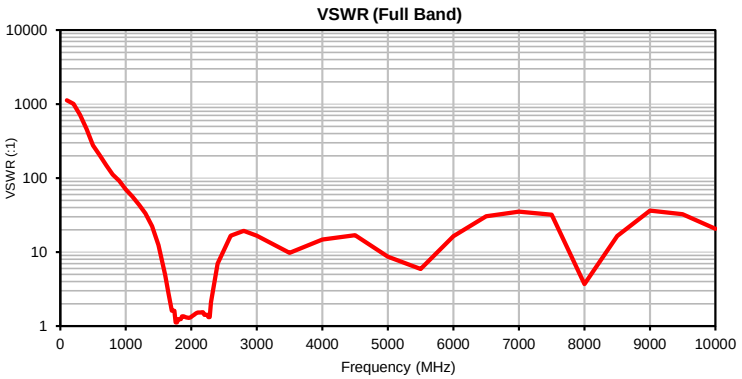
FREQUENCY (MHz)	INSERTION LOSS (dB)	VSWR (:1)
100	48.97	1123.66
200	43.23	1008.23
300	40.20	719.63
400	38.36	459.57
500	37.25	275.83
600	36.61	205.12
700	36.50	149.08
800	37.06	111.50
900	39.04	91.31
1000	45.89	70.29
1100	42.59	56.32
1200	30.84	43.55
1300	23.78	33.13
1400	17.95	22.37
1500	12.33	12.42
1600	6.74	4.92
1650	4.45	2.78
1700	3.01	1.61
1720	3.01	1.61
1740	3.01	1.61
1760	2.41	1.12
1780	2.41	1.12
1800	2.25	1.24
1820	2.25	1.24
1840	2.25	1.24
1860	2.23	1.35
1880	2.23	1.35
1900	2.23	1.33
1920	2.24	1.31
1940	2.26	1.29
1960	2.29	1.29
1980	2.34	1.30
2000	2.40	1.33
2020	2.48	1.37
2040	2.57	1.41
2060	2.67	1.46
2080	2.79	1.50
2100	2.91	1.53
2120	2.91	1.53
2140	2.91	1.53
2160	3.31	1.53
2180	3.31	1.53
2200	3.93	1.41
2220	3.93	1.41
2240	3.93	1.41
2260	5.20	1.32
2280	5.20	1.32
2300	8.21	2.10
2400	21.14	6.95
2600	36.41	16.66
2800	35.78	19.275
3000	36.61	16.68
3500	39.59	9.71
4000	64.43	14.75
4500	43.01	16.95
5000	38.75	8.65
5500	60.02	5.89
6000	35.56	16.38
6500	31.29	30.44
7000	27.84	35.08
7500	23.19	31.89
8000	13.85	3.69
8500	21.97	16.46
9000	31.21	36.35
9500	39.65	32.49
10000	32.29	20.56

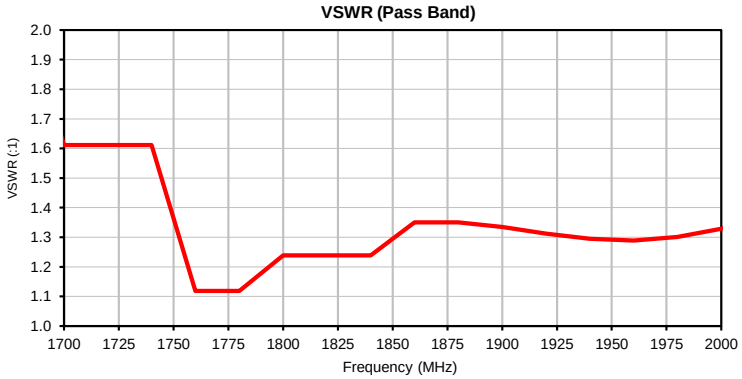
Ceramic Bandpass Filter BPNL-1891+

Typical Performance Curves







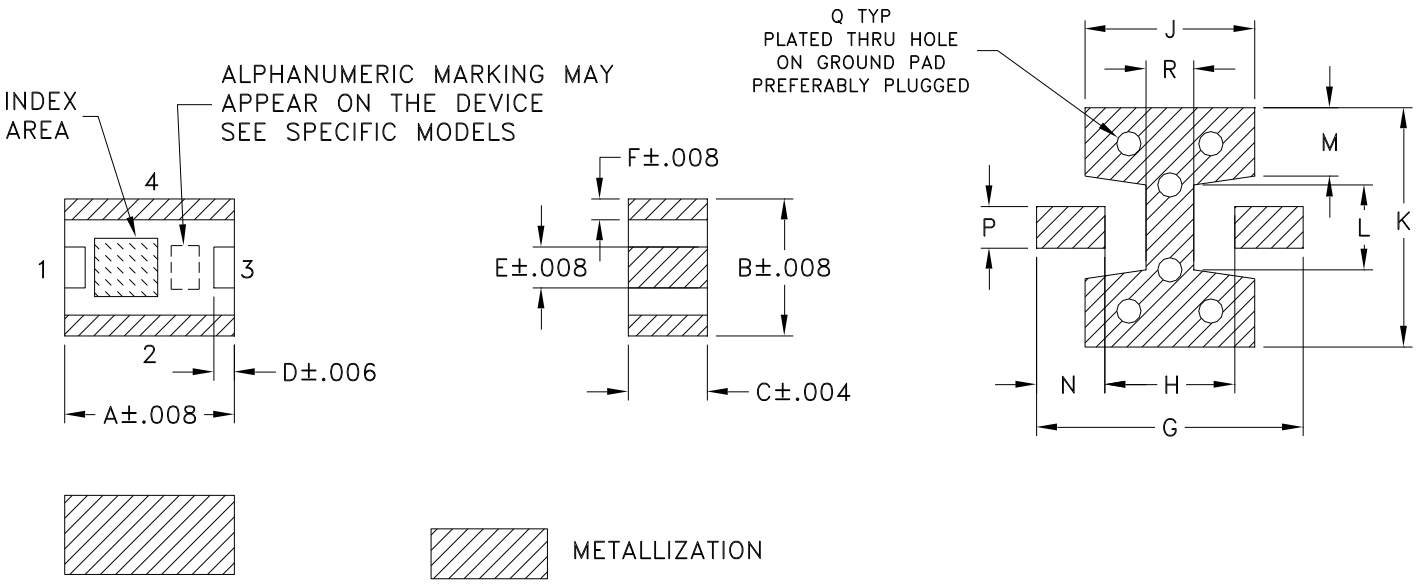


Case Style NL

Outline Dimensions

NL1008C-3

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N
NL1008C-3	.098 (2.50)	.079 (2.00)	.046 (1.16)	.012 (0.30)	.024 (0.60)	.012 (0.30)	.154 (3.90)	.075 (1.90)	.098 (2.50)	.138 (3.50)	.055 (1.40)	.041 (1.05)	.039 (1.00)

CASE #	P	Q	R	WT. GRAM
NL1008C-3	.024 (0.60)	.014 (0.35)	.028 (0.70)	.019

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

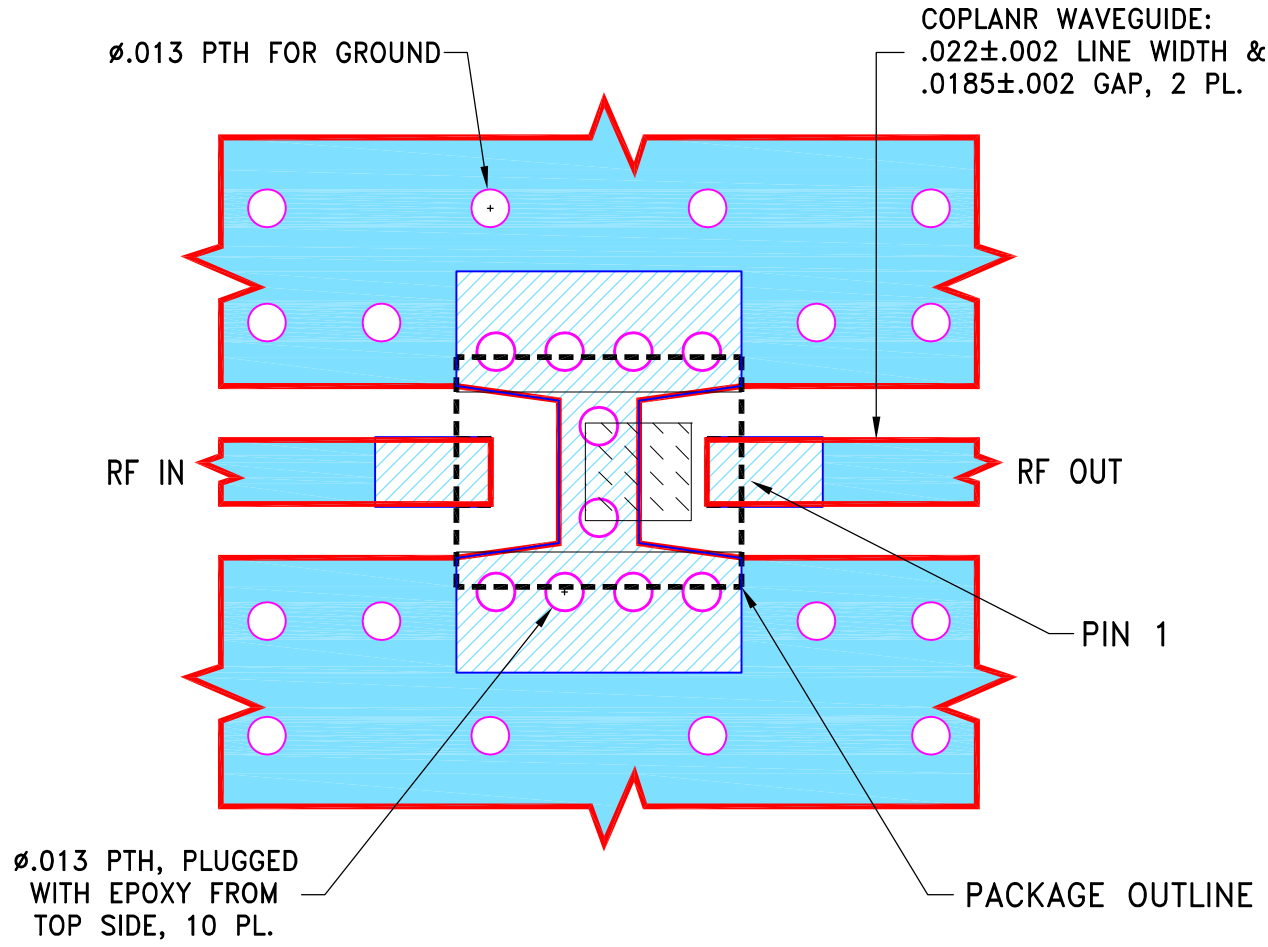
Notes:

1. Open style, ceramic base.
2. Termination finish:
   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.
4. Line width should be designed to match 50Ω characteristic depending on PCB material and thickness.

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
0R	M175214	NEW RELEASE	07/10/19	ITG	BK

SUGGESTED MOUNTING CONFIGURATION FOR NL1008C-3 CASE STYLE



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UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	07/09/19
TOLERANCES ON:	CHECKED	GF	07/10/19
2 PL DECIMALS ±	APPROVED	BK	07/10/19
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, NL1008C-3, TB-1086+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-617	0R

FILE:	SCALE:	SHEET:
98PL617	15:1	1 OF 1

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