CERAMIC

Bandpass Filter

BFCQ-1162+

50Ω 10.7 to 12.7 GHz

THE BIG DEAL

- Standard small 1008 (2.5mm x 2.0mm) case style
- Low Insertion Loss – Mid band 1.3 dB typical
- Wide rejection band
- Shielded construction preventing filter from de-tuning
- Reduced footprint area by employing LGA (land grid array)
- Surface mountable pick and place standard case style

Generic photo used for illustration purposes only

CASE STYLE: NL1008C-7

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

APPLICATIONS

- Satellite Communications

PRODUCT OVERVIEW

The BFCQ-1162+ LTCC Band Pass Filter achieves a miniature size and high repeatability of performance by utilizing a proprietary LTCC material system and distributed filter topology. The typical passband loss at 10.7 – 12.7 GHz is as low as 1.3 dB, with typical stopband rejections at 40 dB up to 27 GHz. This model handles up to 1W RF input power, and provides a wide operating temperature range from -55 to +125°C. Utilizing a proprietary LTCC material system and a distributed filter topology, this filter is able to achieve repeatable performance on a lot-to-lot basis.

KEY FEATURES

Feature	Advantages
Cost effective	LTCC is scalable technology that is cost effective due to ease of production in high quantities.
Small size (2.5mm x 2.0mm)	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Surface Mountable	Suitable for very high volume automated assembly process.

REV. A
ECO-015831
BFCQ-1162+
CG/CP/AM
230712

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ELECTRICAL SPECIFICATIONS[1] AT 25°C

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	11.6	—	GHz
	Insertion Loss	F1-F2	10.7 - 12.7	—	1.3	3.0	dB
	Return Loss	F1-F2	10.7 - 12.7	—	13.0	—	dB
Stop Band, Lower	Insertion Loss	DC-F3	0.1 - 7.0	40	46	—	dB
			7.0 - 8.8	20	40	—	
Stop Band, Upper	Insertion Loss	F4-F5	15.1 - 17.0	25	38	—	dB
			17.0 - 27.0	35	40	—	

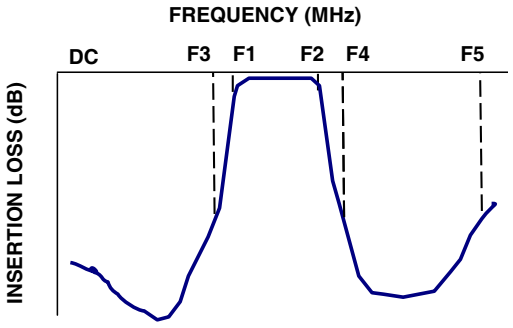
1. Measured on Mini-Circuits Evaluation Board TB-BFCQ-1162C+ with connectors and feedline de-embedded with 2xThru.

MAXIMUM RATINGS

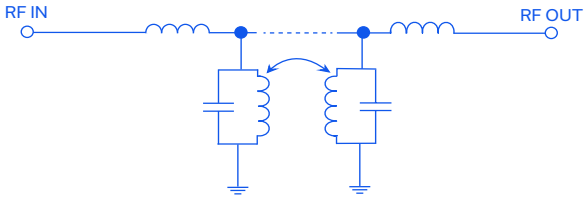
Parameter	Ratings
Operating temperature	-55°C to +125°C
Storage temperature	-55°C to +125°C
RF Power Input	1W max.

Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



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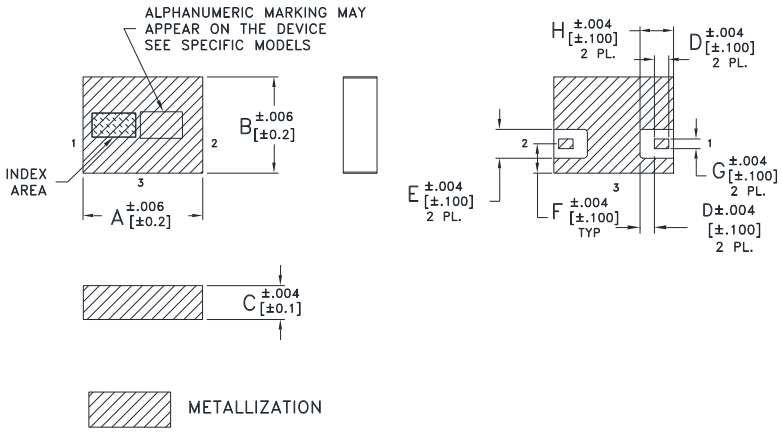
PAD CONNECTIONS

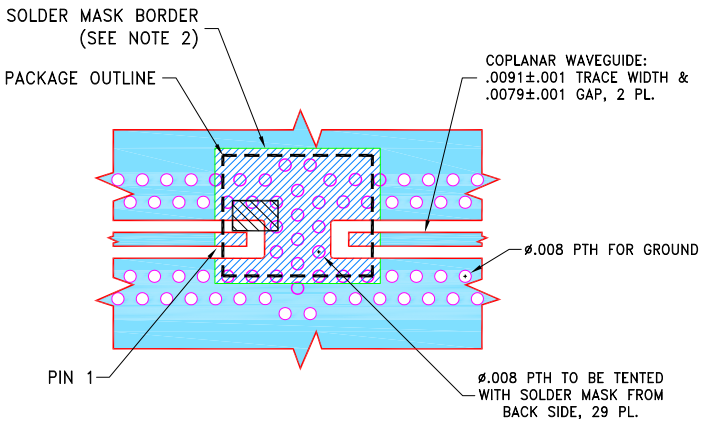
INPUT	1
OUTPUT	2
GROUND	3

PRODUCT MARKING: UA

OUTLINE DRAWING



EVALUATION BOARD MCL P/N: TB-BFCQ-1162C+
SUGGESTED PCB LAYOUT (PL-707)



NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR MEGTRON-7 R5785(N); DIELECTRIC THICKNESS: .0049±.001; CLOTH STYLE: 2116; COPPER: HVLP/HVLP. FOR OTHER MATERIALS LINE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. SOLDER MASK OPENING FOR COMPONENT SOLDERING HAS BEEN INCREASED AGAINST PCB LAND PATTERN RECOMMENDATIONS PER NL1008C-6 AND CAN BE DEVIATED FROM THIS DRAWING TO COMPLY WITH CUSTOMERS' DESIGN RULES.
3. 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.

OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F	G	H	J	K	wt
.098	.079	.028	.012	.024	.024	.008	.028	.043	.024	grams
2.49	2.01	0.71	0.30	0.61	0.61	0.20	0.71	1.09	0.61	.019

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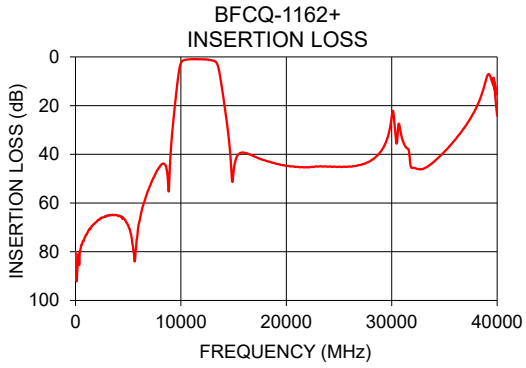
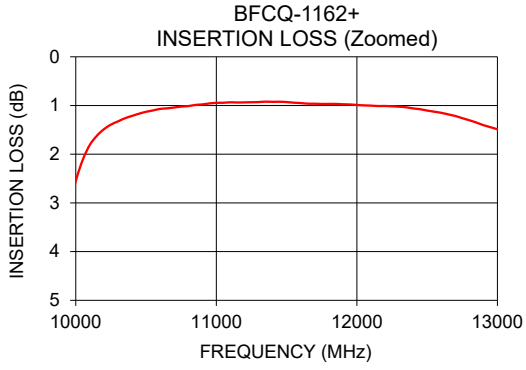
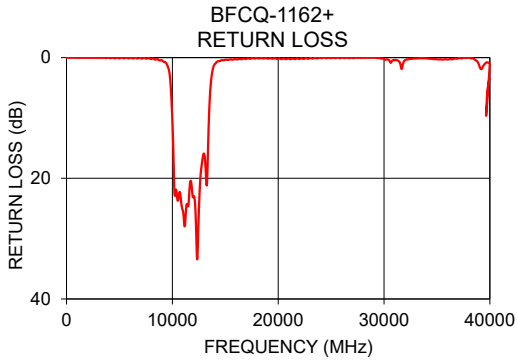
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	79.96	0.02
1000	72.99	0.00
2000	67.82	0.02
3000	65.21	0.01
4000	65.11	0.00
7000	53.68	0.05
8800	52.98	0.46
9200	29.94	0.70
10200	1.49	22.55
10700	1.04	22.26
11600	0.95	22.45
12700	1.21	18.86
15100	44.00	0.33
17000	40.93	0.20
20000	44.75	0.16
22000	45.29	0.22
27000	44.39	0.03
30000	24.44	0.23
32000	45.53	0.41
36000	34.07	0.32
40000	15.37	1.00







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

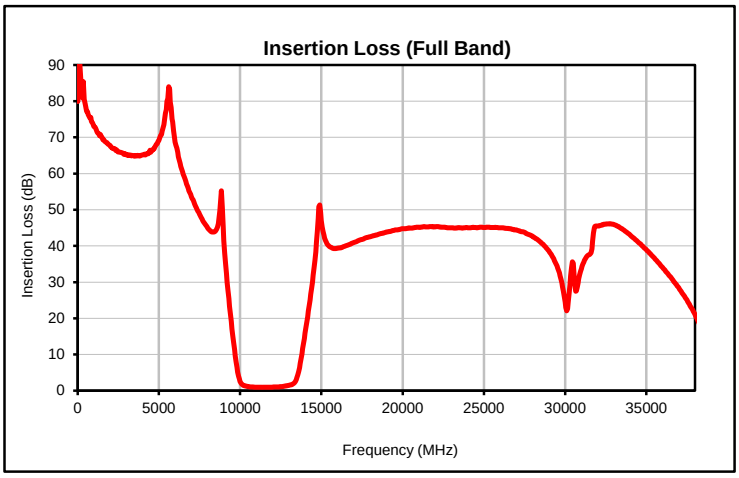
Ceramic Bandpass Filter BFCQ-1162+

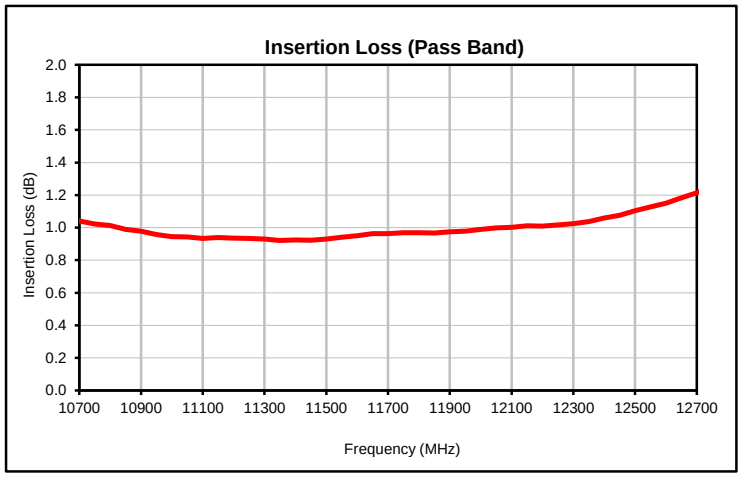
Typical Performance Data

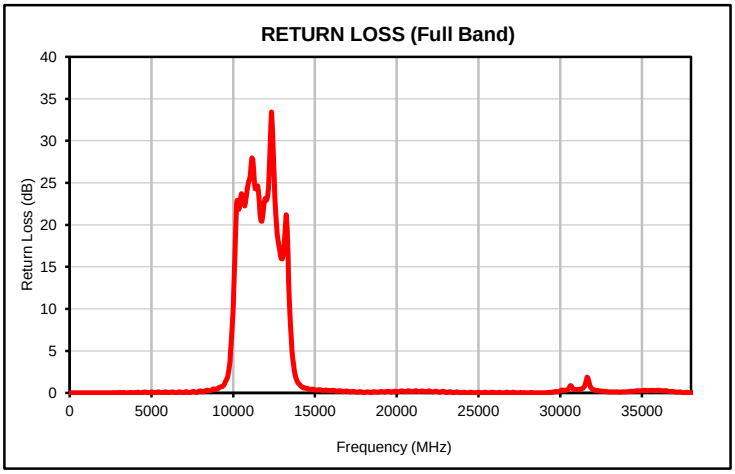
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
100	92.13	0.00
500	78.54	0.01
1000	72.99	0.00
2000	67.82	0.02
3000	65.21	0.01
4000	65.11	0.00
5000	69.14	0.11
6000	68.70	0.02
7000	53.68	0.05
8000	45.03	0.23
8800	52.98	0.46
10000	2.55	10.34
10700	1.04	22.26
11600	0.95	22.45
12200	1.01	26.06
12700	1.21	18.86
13000	1.49	15.93
13200	1.73	20.28
13400	2.55	13.20
13600	5.27	5.01
13800	10.21	2.10
14000	15.89	1.11
14200	21.95	0.72
14400	28.31	0.58
14600	35.98	0.46
14800	47.57	0.44
15000	47.04	0.37
15100	44.00	0.33
15500	39.83	0.29
16000	39.35	0.27
16500	40.00	0.26
17000	40.93	0.20
17500	41.80	0.11
18000	42.53	0.06
18500	43.15	0.10
19000	43.81	0.16
19500	44.37	0.17
20000	44.75	0.16
20500	44.96	0.14
21000	45.14	0.16
21500	45.24	0.21
22000	45.29	0.22
22500	45.18	0.16
23000	45.04	0.07
23500	45.03	0.03
24000	45.05	0.03
24500	45.08	0.07
25000	45.07	0.07
25500	45.09	0.03
26000	44.99	0.01
26500	44.83	0.01
27000	44.39	0.03
28000	42.66	0.03
29000	38.58	0.00
30000	24.44	0.23
30500	35.20	0.48
31000	33.69	0.40
31500	37.64	0.84
32000	45.53	0.41
32500	46.04	0.22
33000	45.93	0.14
33500	44.75	0.11
34000	43.01	0.13
35000	38.92	0.27
36000	34.07	0.32
37000	28.39	0.12
38000	21.02	0.00
39000	8.54	1.32
40000	15.37	1.00

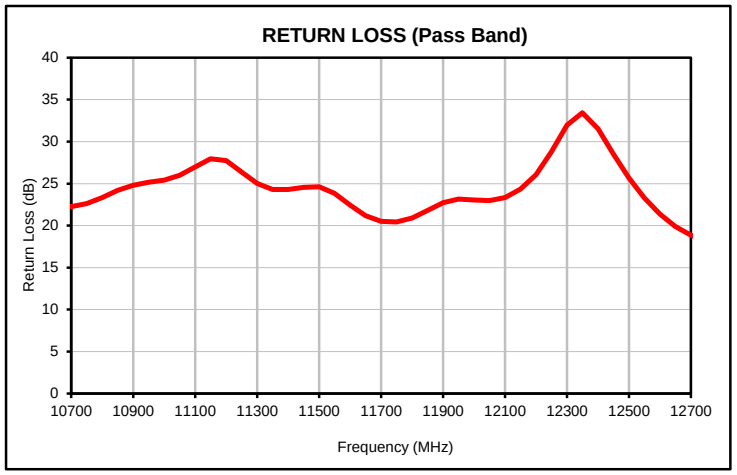
Ceramic Bandpass Filter BFCQ-1162+

Typical Performance Curves



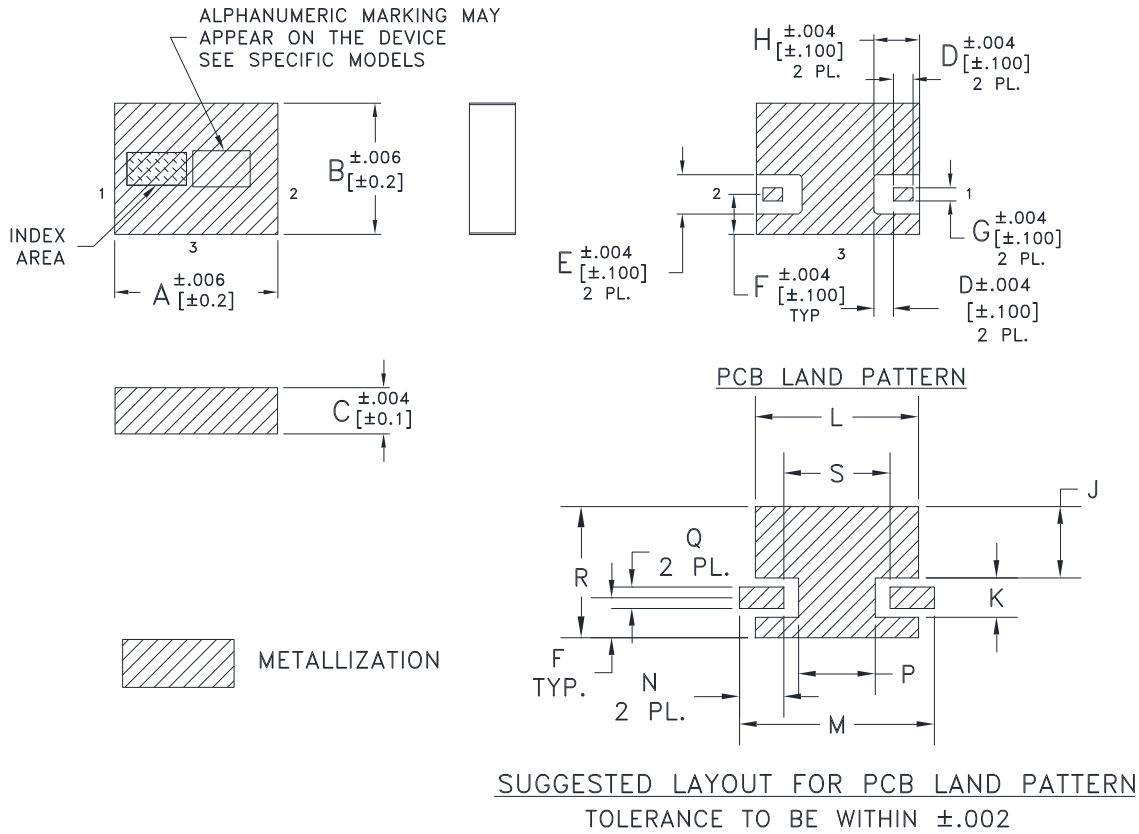






Case Style NL

Outline Dimensions NL1008C-7



CASE#	A	B	C	D	E	F	G	H	J	K	L
NL1008C-7	.098 (2.50)	.079 (2.00)	.028 (.70)	.012 (.30)	.024 (.61)	.024 (.61)	.008 (.20)	.028 (.70)	.043 (1.09)	.024 (.60)	.098 (2.50)

CASE#	M	N	P	Q	R	S	WT, GRAM
NL1008C-7	.118 (3.00)	.027 (.70)	.046 (1.20)	.013 (.30)	.079 (2.00)	.064 (1.63)	.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.**

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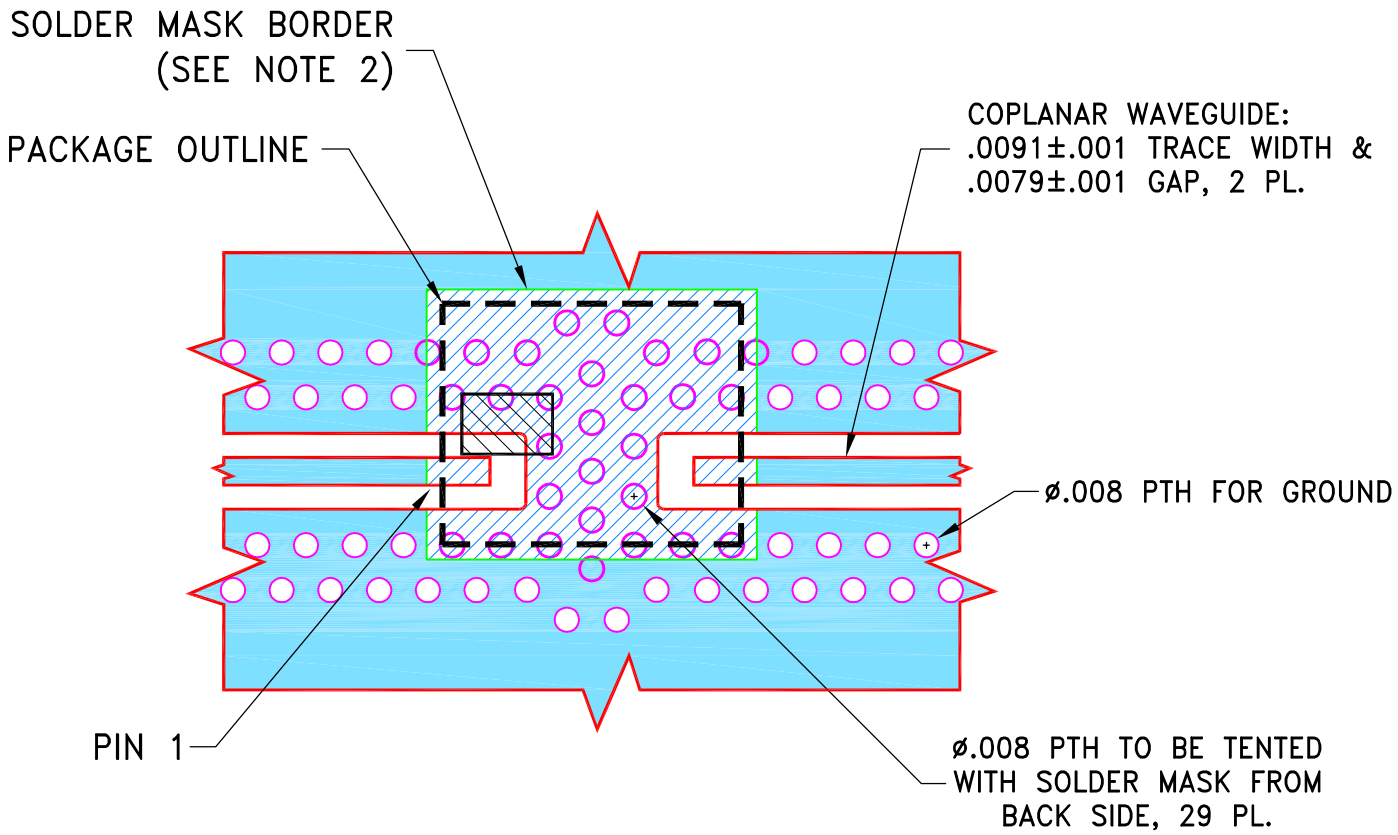
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
0R	ECO-007756	NEW RELEASE	05/12/21	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR NL1008C-6 CASE STYLE



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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	05/12/21
TOLERANCES ON:	CHECKED	GF	05/12/21
2 PL DECIMALS ±	APPROVED	IL	05/12/21
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

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

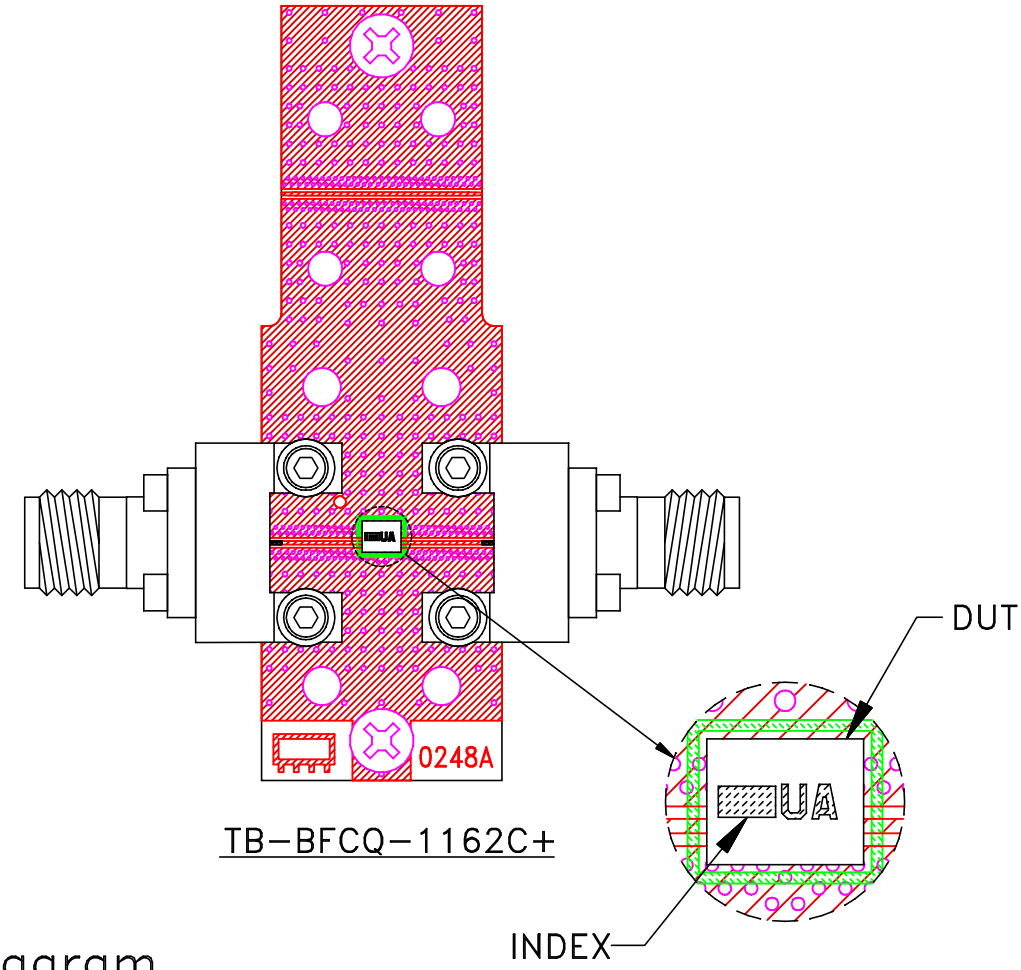
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, NL1008C-6, TB-BFCQ-XXXX+

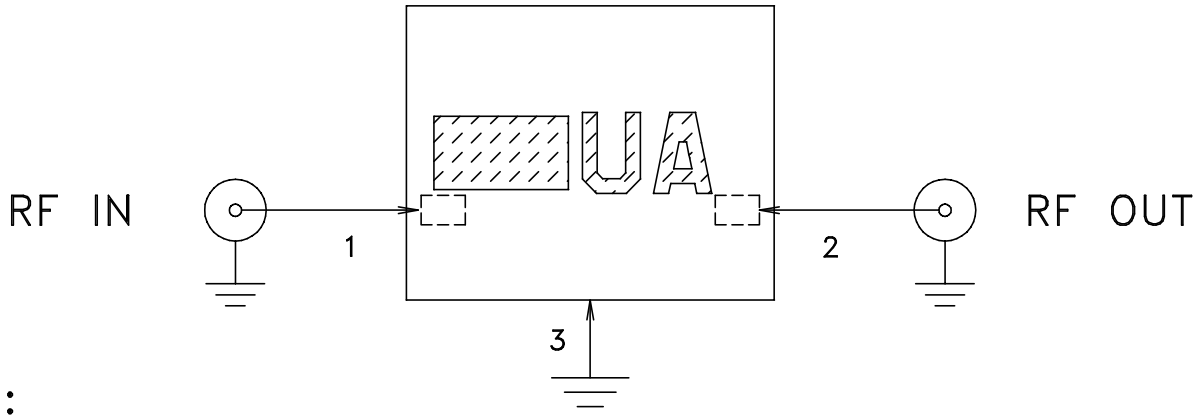
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-707	0R

FILE:	SCALE:	SHEET:
98PL707	15:1	1 OF 1

Evaluation Board and Circuit



Schematic diagram



Notes:

1. 50 Ohm 1.85 Female connectors.
2. PCB Material: Megtron 7(N) or equivalent,
   Dielectric Constant=3.4, Thickness=.005 inch.

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Environmental Specifications ENV06T8

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
Thermal Cycling	-55 to 125°C, 100 cycles, Dwell Time 15 minutes.	MIL-STD-202, Method 107, Condition A-3
Mechanical Shock	50g, 11ms half-sine, 18 shocks applied each to 3 axes	MIL-STD-202 Method 213, Condition A
Vibration	10-2000Hz sine, 20g, 12 cycles applied each to 3 axes	MIL-STD-202, Method 204, Condition D
Constant Acceleration	30Kg, Y1 Direction	MIL-STD-883, Method 2001, Condition E
Humidity	85°C, 90-95% Relative Humidity, 250hours	
Solderability	10X / 30X Magnification	J-STD-002C Test S, J-STD-002C Test S1
High Temp Storage	125°C, 250 hours	