CERAMIC

Bandpass Filter

BFCQ-2872+

50Ω 27.5 to 30.0 GHz

THE BIG DEAL

- Standard small 1008 (2.5mm x 2.0mm) case style
- Low Insertion Loss – Mid band 1.2 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-2872+ 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 27.5 –30.0 GHz is as low as 1.2 dB, with typical stopband rejections at 37 dB up to 55 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-2872+
CG/CP/AM
231004

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ELECTRICAL SPECIFICATIONS[1] AT 25°C

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	28.7	—	GHz
	Insertion Loss	F1-F2	27.5 - 30	—	1.2	3.0	dB
	Return Loss	F1-F2	27.5 - 30	—	12	—	dB
Stop Band, Lower	Insertion Loss	DC-F3	0.1 - 18	30	47	—	dB
			18 - 22.2	22	32	—	
Stop Band, Upper	Insertion Loss	F4-F5	35.3 - 38	20	28.4	—	dB
			38 - 55	27	37	—	

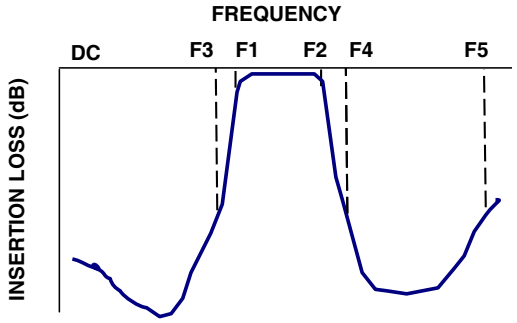
1.Measured on Mini-Circuits Test Board TB-BFCQ-2872C+ with connectors and feedline de-embedded with 2xThru.

MAXIMUM RATINGS

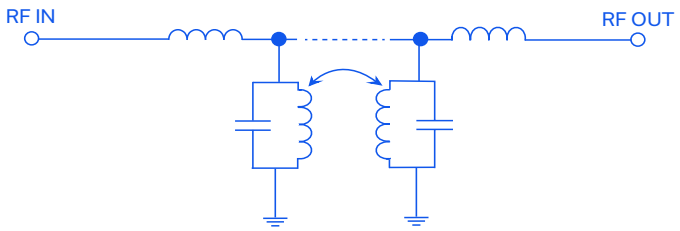
Parameter	Ratings
Operating temperature	-55°C to +125°C
Storage temperature	-55°C to +125°C
RF Power Input	1W

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

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



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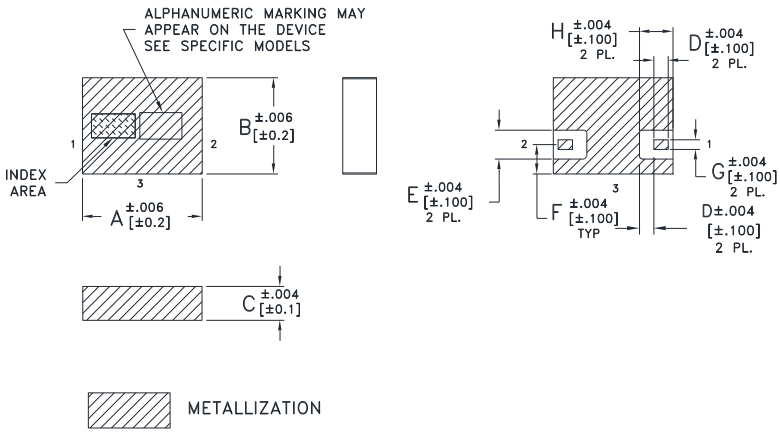
PAD CONNECTIONS

INPUT	1
OUTPUT	2
GROUND	3

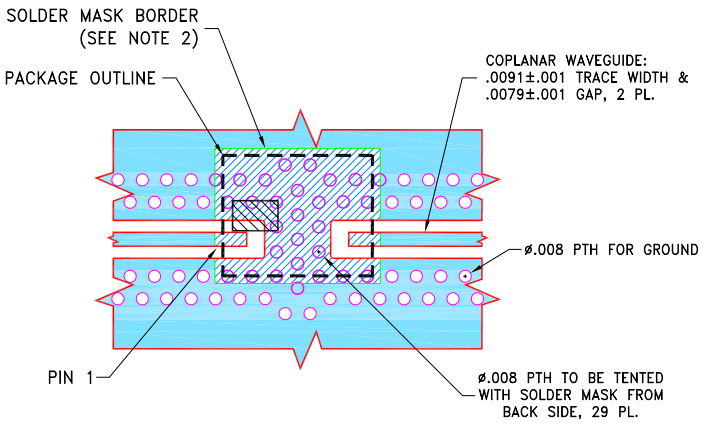
PRODUCT MARKING: UC

OUTLINE DRAWING



DEMO BOARD MCL P/N: TB-BFCQ-2872C+

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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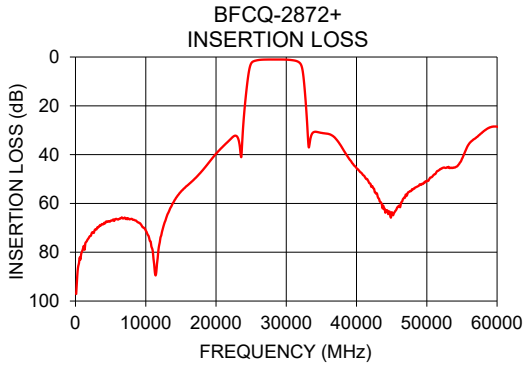
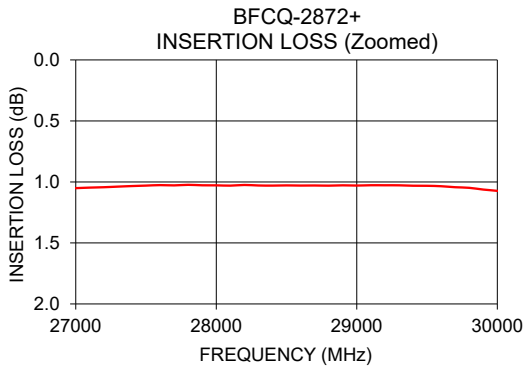
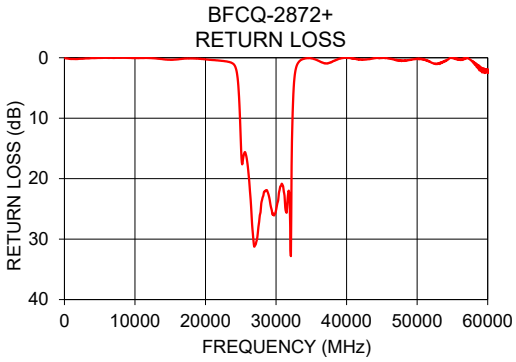
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
100	97.10	0.07
3000	70.63	0.11
6000	66.55	0.01
9000	67.80	0.02
12000	75.89	0.05
15000	55.18	0.34
18000	46.72	0.12
22200	33.28	0.50
24000	23.39	1.08
27500	1.03	27.95
28700	1.03	21.91
30000	1.07	25.18
35300	31.23	0.17
38000	37.43	0.59
42000	52.13	0.32
45000	63.65	0.05
48000	54.31	0.53
51000	48.28	0.24
55000	41.74	0.08
60000	28.54	2.52







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

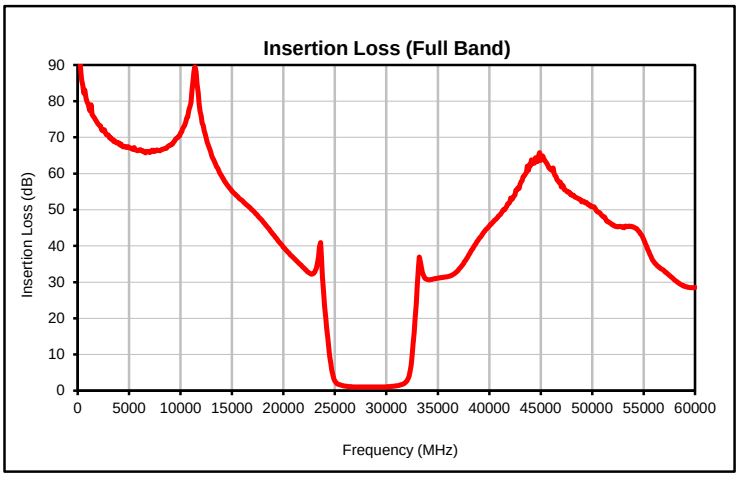
Ceramic Bandpass Filter BFCQ-2872+

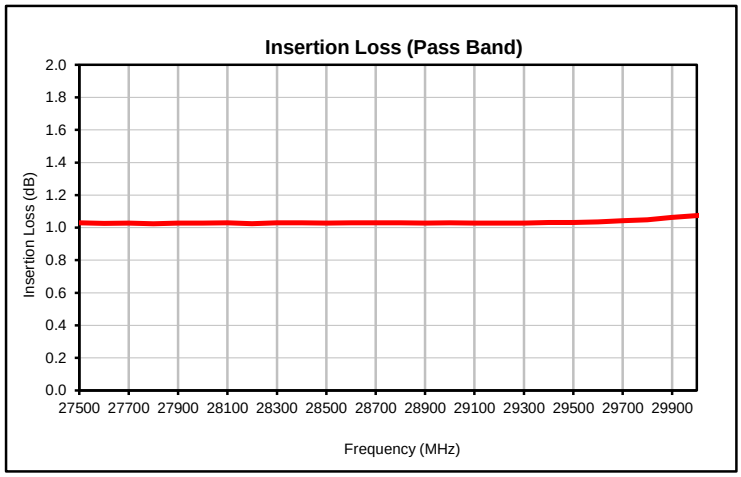
Typical Performance Data

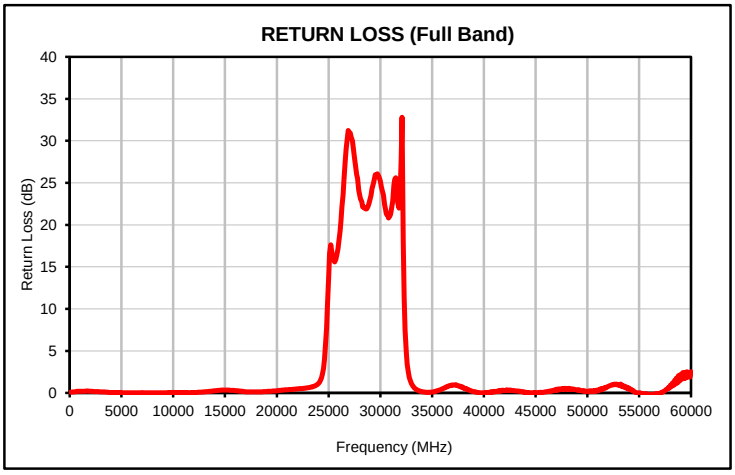
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
100	97.10	0.07
500	84.48	0.14
1000	79.18	0.21
2000	73.57	0.19
3000	70.63	0.11
4000	68.41	0.06
5000	67.12	0.03
6000	66.55	0.01
7000	65.79	0.04
8000	66.30	0.01
9000	67.80	0.02
10000	71.16	0.05
11000	79.55	0.04
12000	75.89	0.05
13000	65.24	0.12
14000	59.29	0.26
13000	65.24	0.12
14000	59.29	0.26
15000	55.18	0.34
16000	52.45	0.27
17000	49.79	0.14
18000	46.72	0.12
19000	43.20	0.17
20000	39.64	0.26
21000	36.63	0.38
22000	33.84	0.47
22200	33.28	0.50
23000	32.61	0.61
24000	23.39	1.08
25000	2.66	13.77
26000	1.26	18.05
27000	1.05	31.01
27500	1.03	27.95
28000	1.03	23.58
28500	1.03	21.97
29000	1.03	22.96
29500	1.03	25.96
30000	1.07	25.18
31000	1.35	21.29
32000	2.69	27.64
33000	28.71	1.11
34000	30.68	0.17
35000	31.09	0.10
35300	31.23	0.17
36000	31.52	0.49
37000	33.34	0.90
38000	37.43	0.59
39000	41.94	0.14
40000	45.51	0.01
41000	48.52	0.18
42000	52.13	0.32
43000	57.09	0.25
44000	62.10	0.03
45000	63.65	-0.05
46000	60.96	0.14
47000	56.35	0.43
48000	54.31	0.53
49000	52.15	0.39
50000	50.80	0.15
51000	48.28	0.24
52000	45.92	0.78
53000	45.26	1.01
54000	45.29	0.59
55000	41.74	-0.08
56000	35.63	-0.36
57000	33.11	-0.10
58000	30.66	0.92
59000	28.86	2.21
60000	28.54	2.52

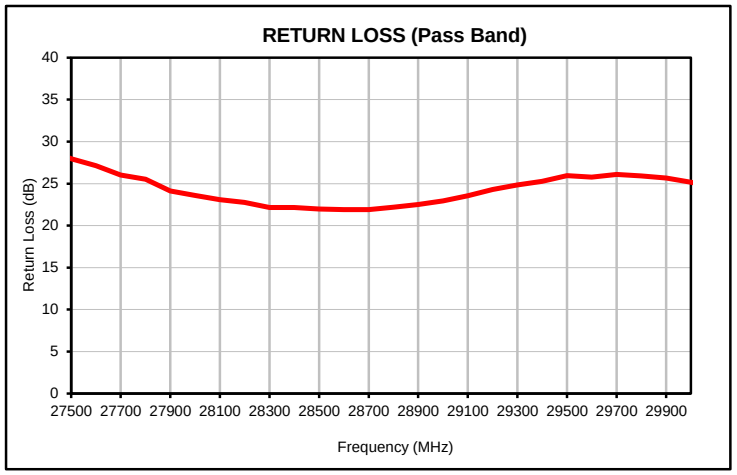
Ceramic Bandpass Filter BFCQ-2872+

Typical Performance Curves



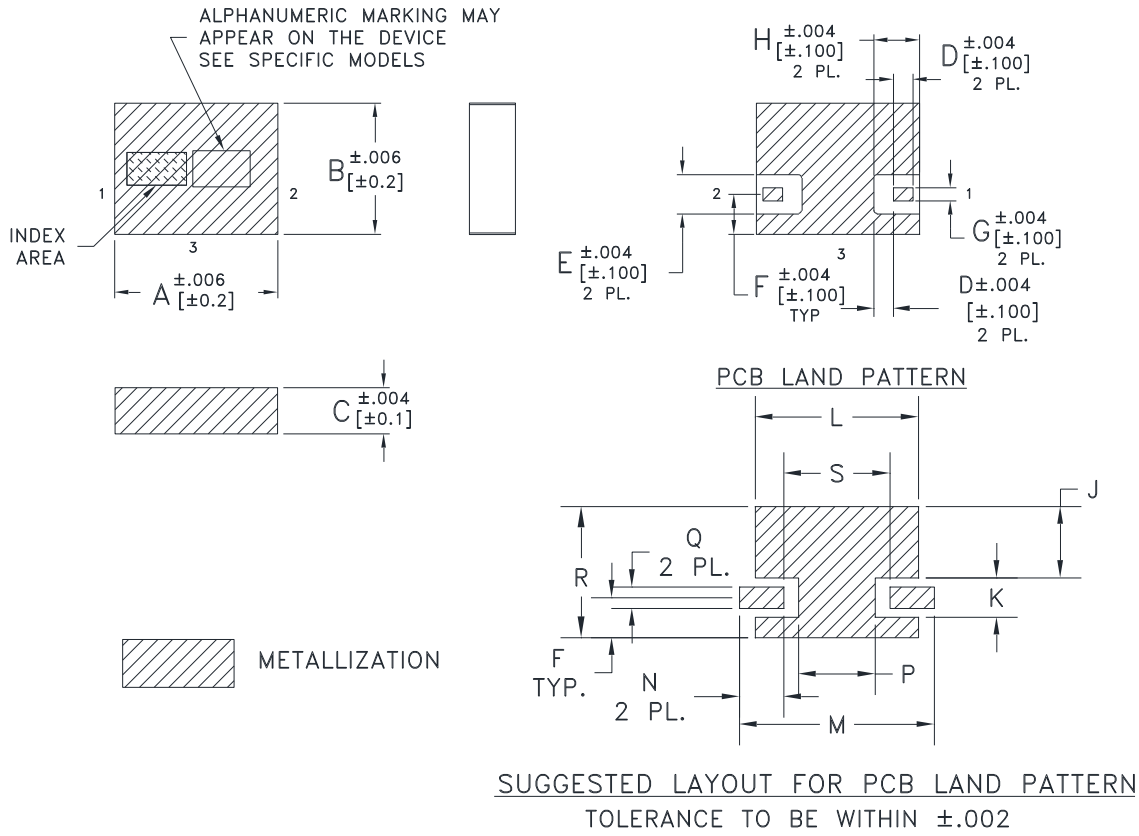






Case Style NL

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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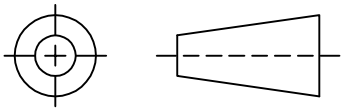
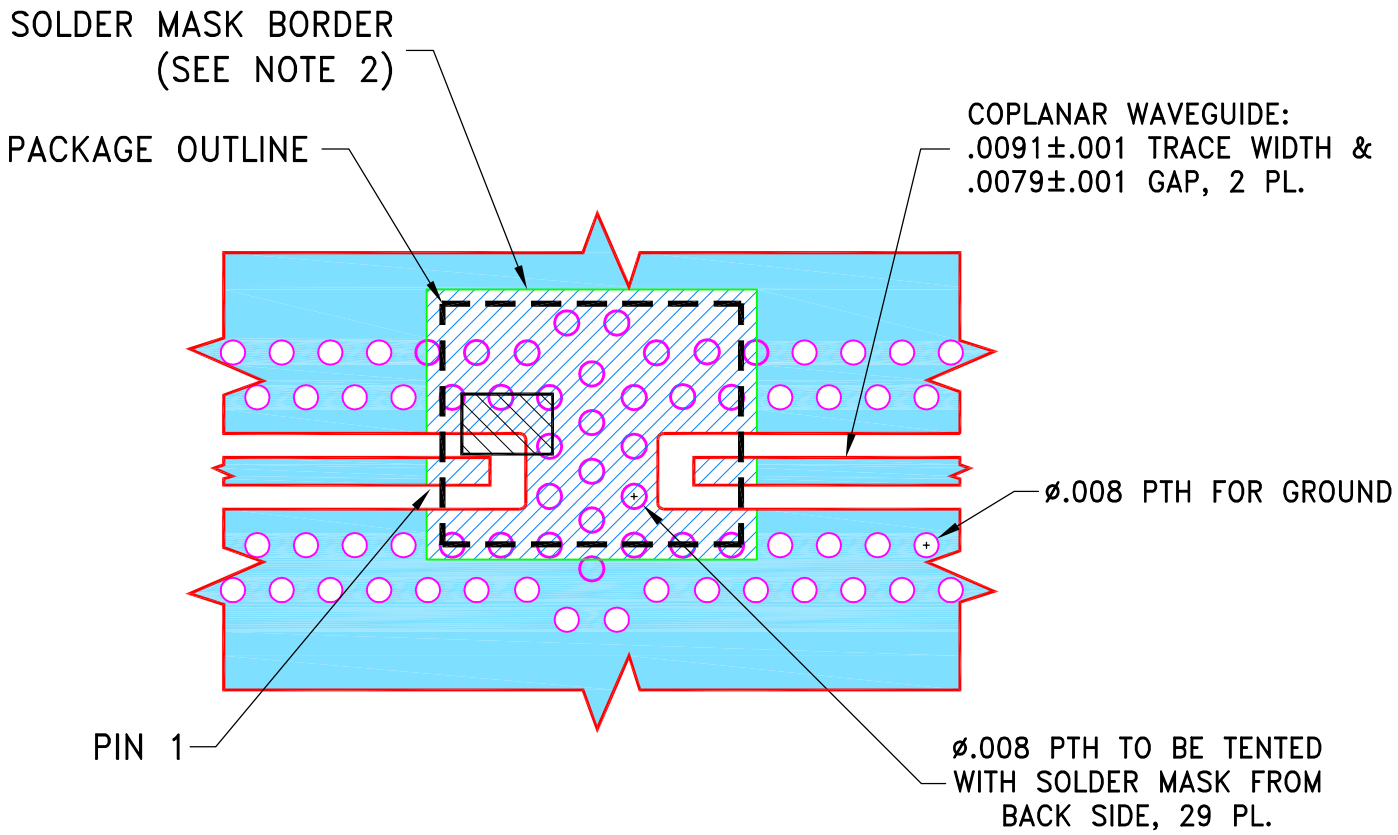
THIRD ANGLE PROJECTION



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



NOTES:

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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.

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

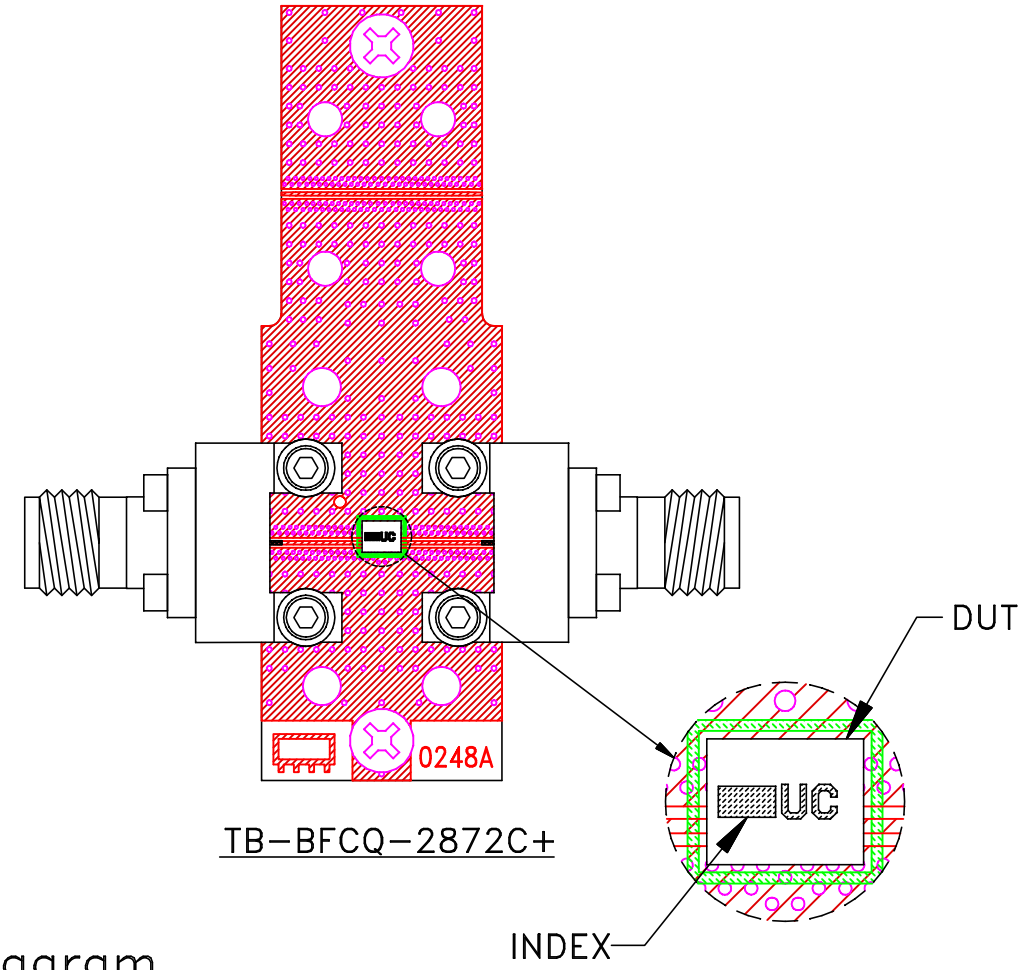
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

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

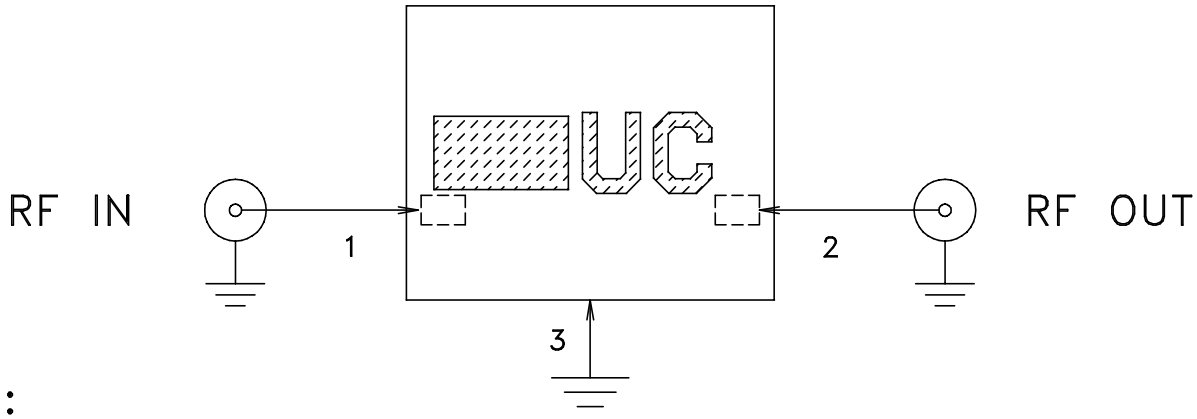
FILE:	SCALE:	SHEET:
98PL707	15:1	1 OF 1

Evaluation Board and Circuit



TB-BFCQ-2872C+

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.

Mini-Circuits®

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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	