CERAMIC

Bandpass Filter

BFCQ-1932+

50Ω 17.7 to 21 GHz

THE BIG DEAL

- Standard Small 1008 (2.5x2.0 mm) Case Style
- Low Insertion Loss – Mid Band 1.6 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-1932+ 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 17.7 to 21 GHz is as low as 1.6 dB, with typical stopband rejections at 43 dB up to 40 GHz. This model handles up to 1 W 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 (2.5x2.0 mm)	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-1932+
MCL NY
250721

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50Ω 17.7 to 21 GHz

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
	Center Frequency				19.3		GHz
Passband	Insertion Loss	F1-F2	17.7-21		1.6	3.0	dB
	Return Loss	F1-F2	17.7-21		12		dB
Stopband, Lower	Insertion Loss	DC-F3	0.1-11	40	46		dB
			11-14.6	20	30		
Stopband, Upper	Insertion Loss	F4-F5	25.6-28	30	40		dB
			28-35	40	50		
			35-40	30	43		

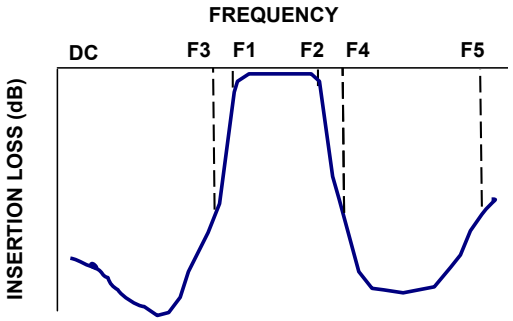
1. Measured on Mini-Circuits Test Board TB-BFCQ-1932C+ with feedline losses removed by normalization of S12 and S21 traces to measurement of the thru-line.

ABSOLUTE MAXIMUM RATINGS

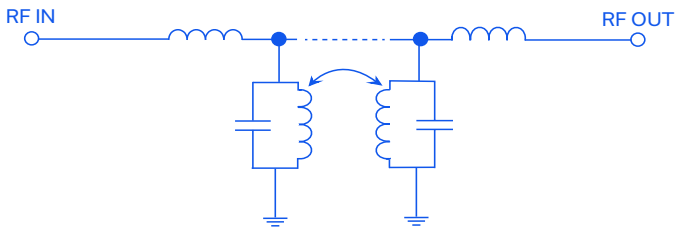
Parameter	Ratings
Operating Temperature	-55°C to +125°C
Storage Temperature	-55°C to +125°C
RF Power Input	1 W

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

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



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Bandpass Filter

BFCQ-1932+

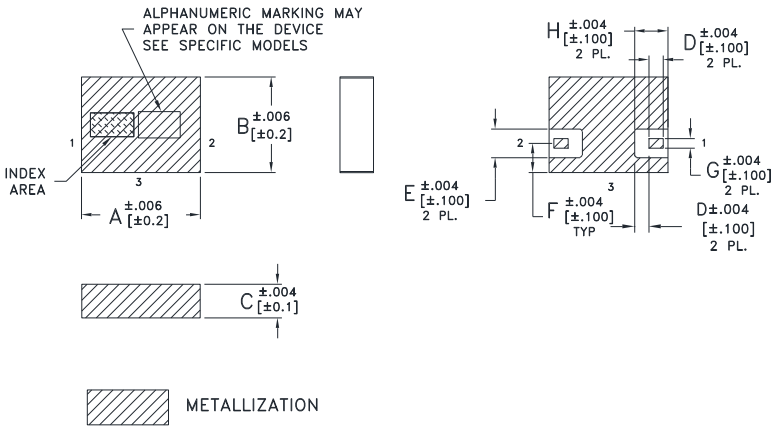
50Ω 17.7 to 21 GHz

PAD CONNECTIONS

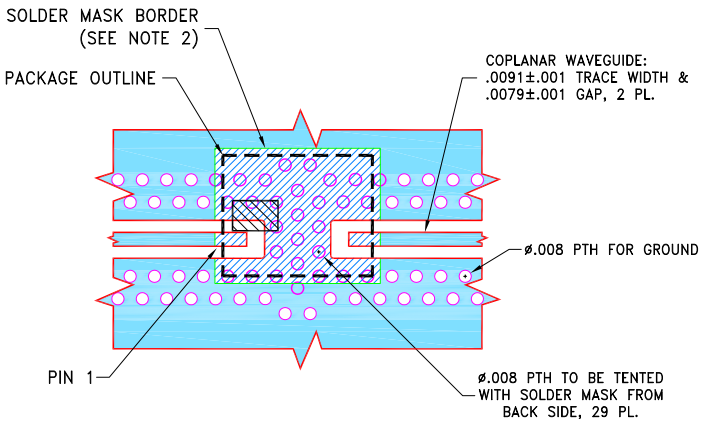
INPUT	1
OUTPUT	2
GROUND	3

PRODUCT MARKING: UD

OUTLINE DRAWING



DEMO BOARD MCL P/N: TB-BFCQ-1932C+
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

CERAMIC

Bandpass Filter

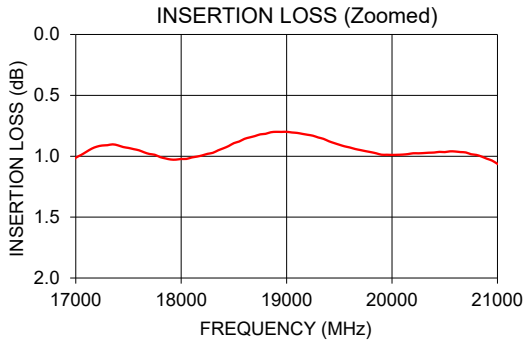
BFCQ-1932+

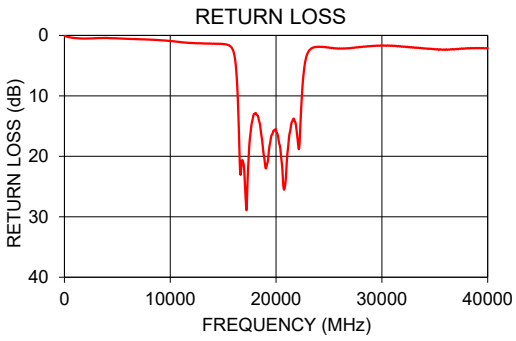
50Ω 17.7 to 21 GHz

TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	87.66	0.06
1000	78.83	0.43
2000	73.60	0.52
3000	70.89	0.45
4000	70.29	0.41
7000	72.09	0.63
8800	78.39	0.76
9200	71.16	0.81
10200	59.46	0.95
10700	55.29	1.06
14500	57.54	1.37
15100	33.62	1.44
17700	0.98	14.54
19300	0.85	19.48
21000	1.06	21.33
26000	45.91	2.15
30000	54.32	1.70
32000	54.76	1.84
36000	51.33	2.38
40000	46.89	2.11







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

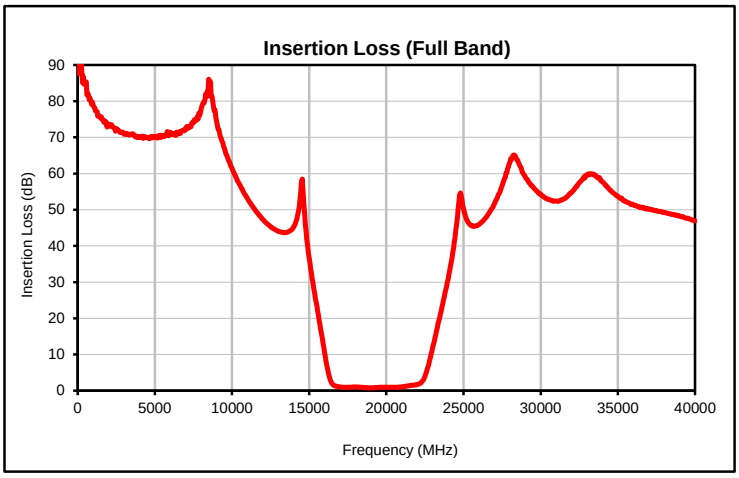
Ceramic Bandpass Filter BFCQ-1932+

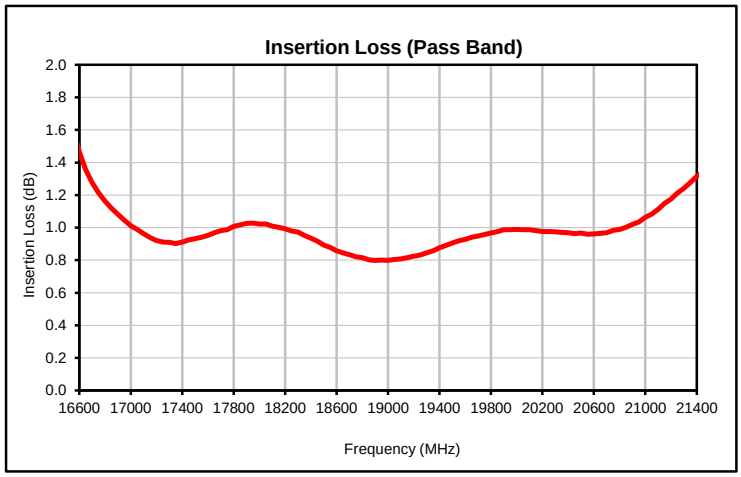
Typical Performance Data

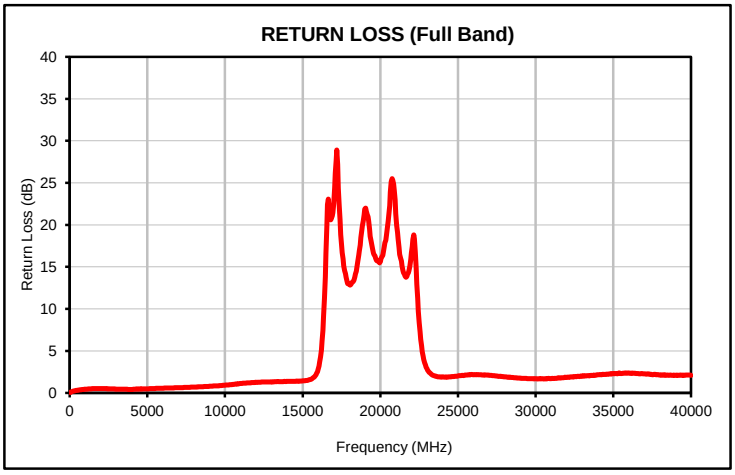
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
100	95.48	0.13
500	85.43	0.31
1000	78.83	0.43
2000	73.60	0.52
3000	70.89	0.45
4000	70.29	0.41
5000	70.08	0.49
6000	71.41	0.57
7000	72.09	0.63
8000	77.96	0.69
9000	74.51	0.79
10000	61.52	0.92
11000	53.06	1.11
12000	47.31	1.25
13000	44.05	1.33
14000	45.33	1.38
15000	36.58	1.43
16000	10.48	2.82
16600	1.46	22.44
17000	1.01	22.56
17700	0.98	14.54
18200	0.99	13.18
18600	0.86	16.39
19000	0.80	21.88
19300	0.85	19.48
19800	0.97	15.71
20200	0.98	16.82
20600	0.96	22.29
21000	1.06	21.33
21400	1.32	15.09
22000	1.70	16.66
23000	11.86	2.89
24000	30.91	1.90
25000	50.23	2.02
26000	45.91	2.15
27000	51.67	2.09
28000	63.02	1.91
29000	59.11	1.77
30000	54.32	1.70
31000	52.39	1.71
32000	54.76	1.84
33000	59.64	1.98
34000	57.70	2.16
35000	53.74	2.29
36000	51.33	2.38
37000	50.28	2.27
38000	49.33	2.14
39000	48.21	2.08
40000	46.89	2.11

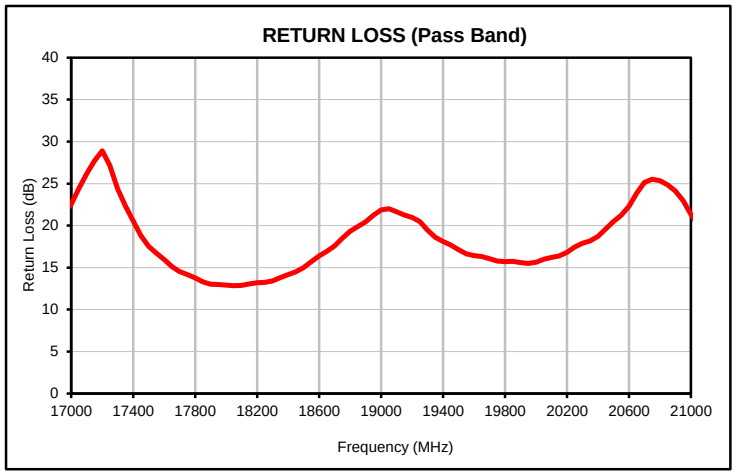
Ceramic Bandpass Filter BFCQ-1932+

Typical Performance Curves



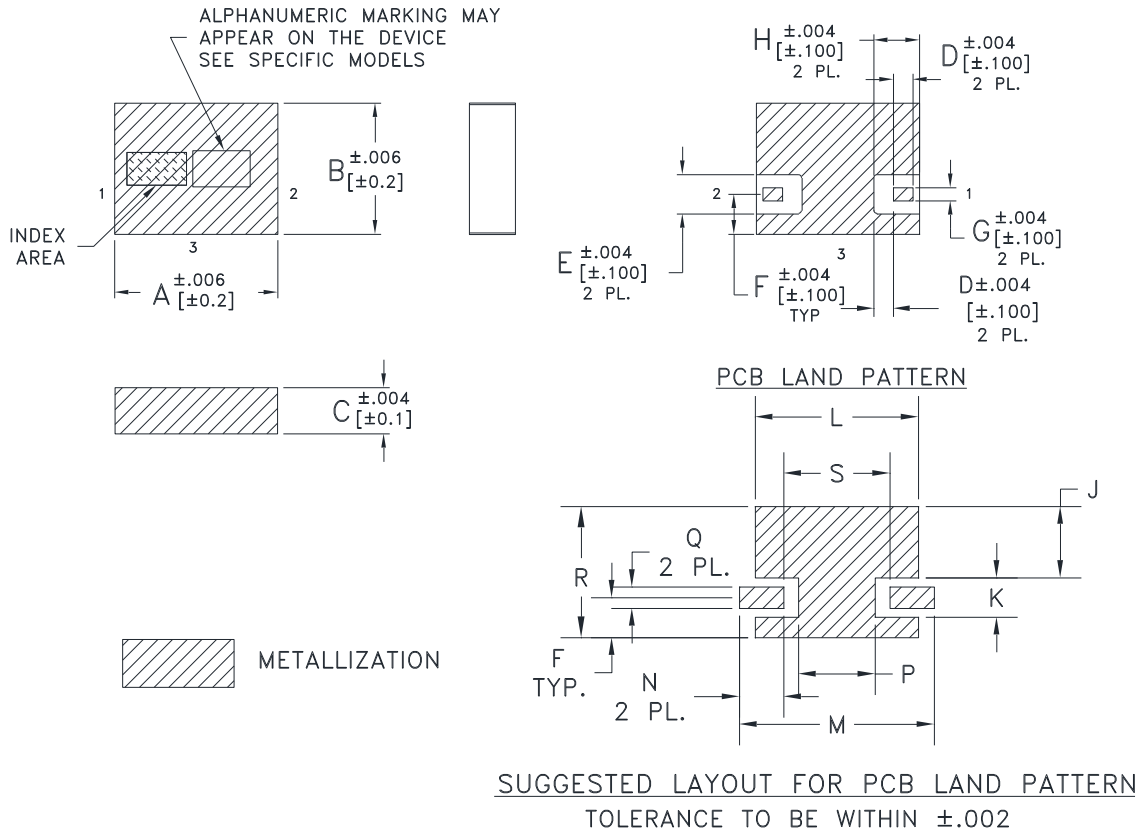






Case Style NL

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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Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

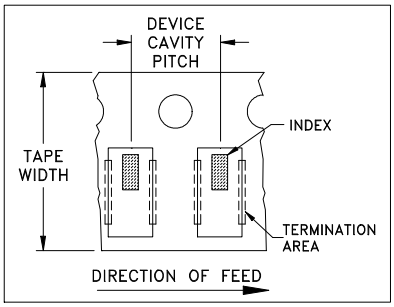


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

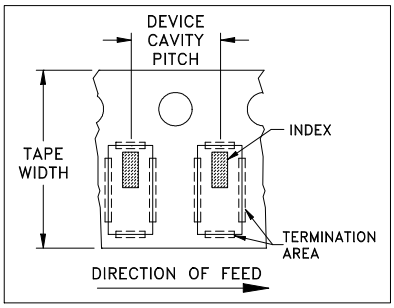


ILLUSTRATION 2

Applicable Case Styles
FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9

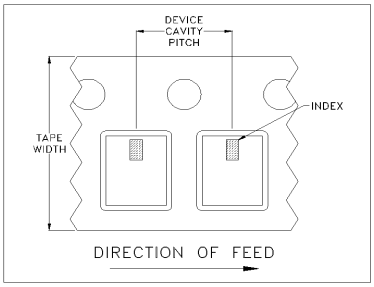


ILLUSTRATION 3

Applicable Case Styles
FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10
NL1008C-12

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	3000

Note: Please consult individual model data sheet to determine device per reel availability.

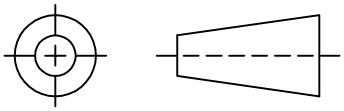
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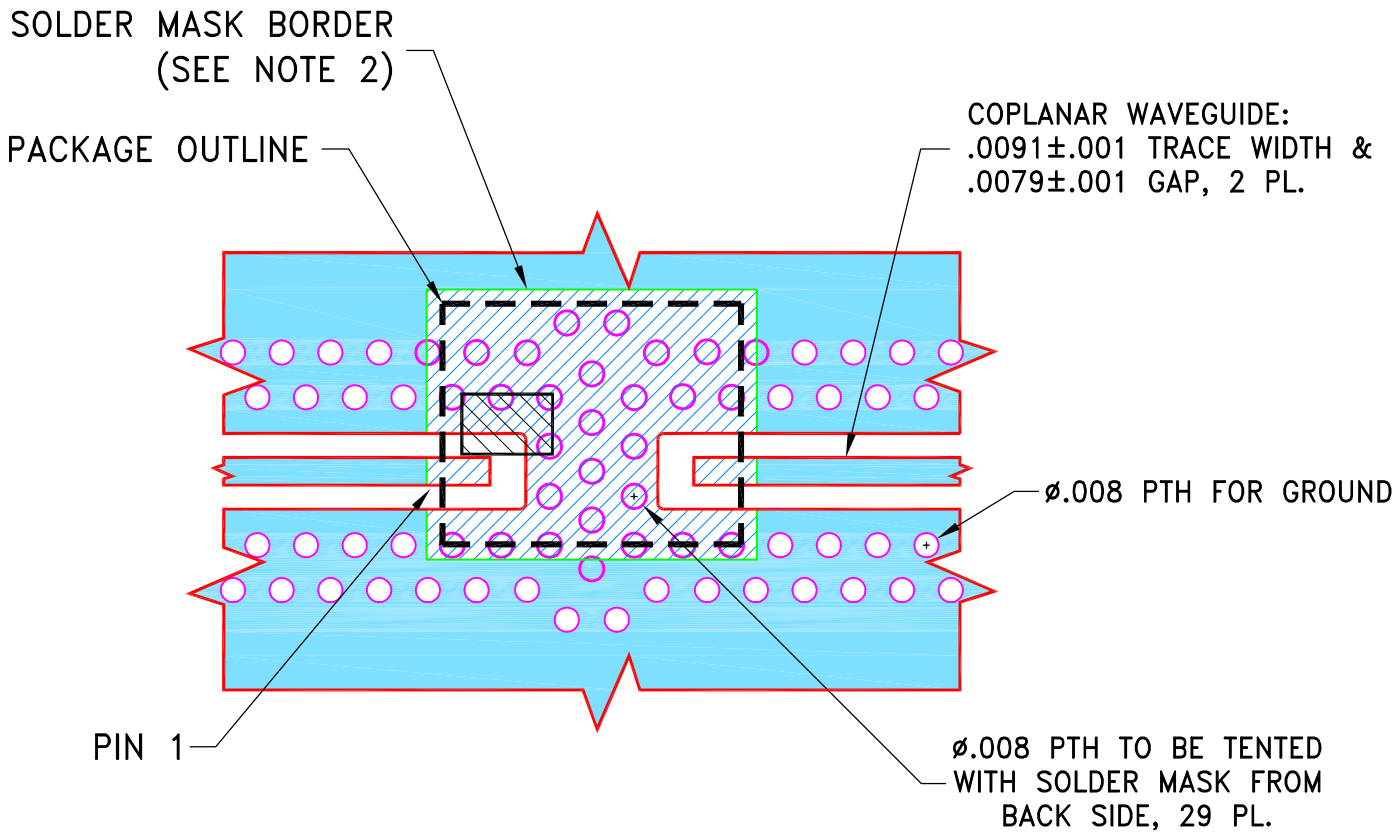
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THIRD ANGLE PROJECTION



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:

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.

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 ±			

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

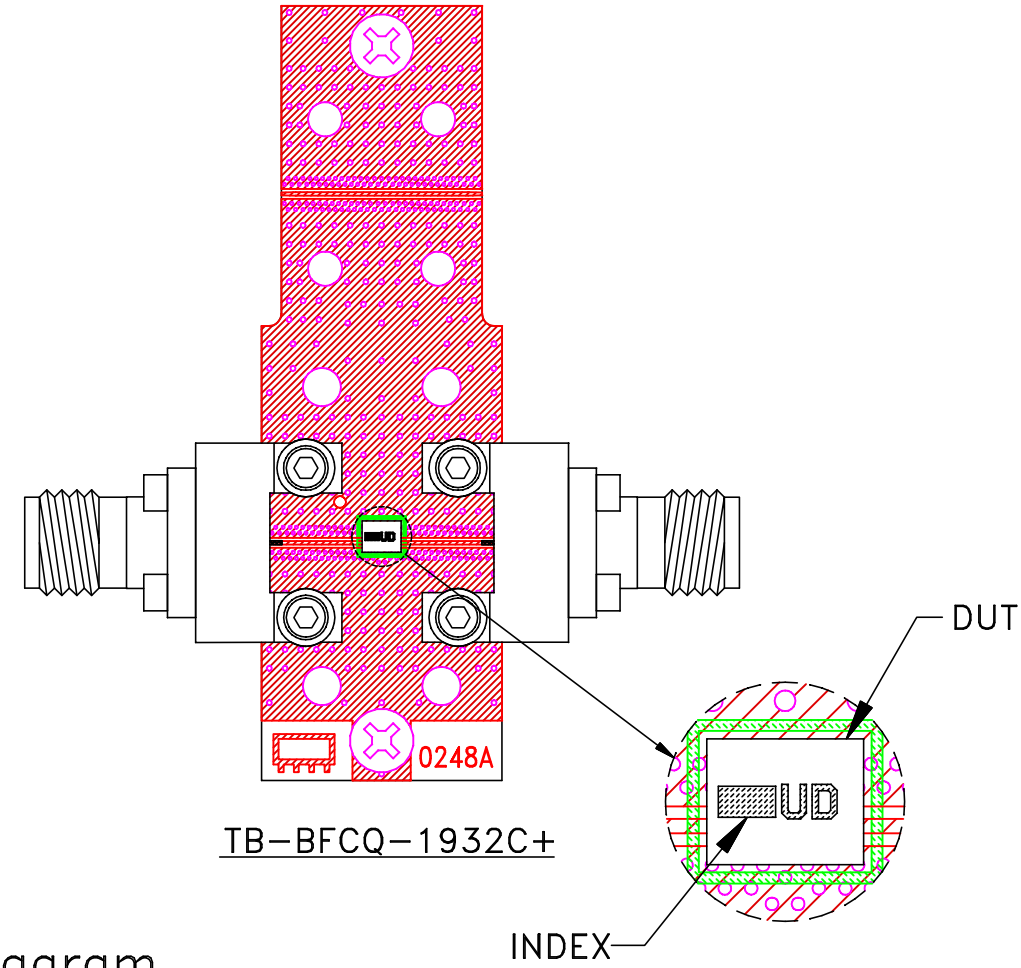
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PL, NL1008C-6, TB-BFCQ-XXXX+

SIZE	CODE IDENT	DRAWING NO:	REV:
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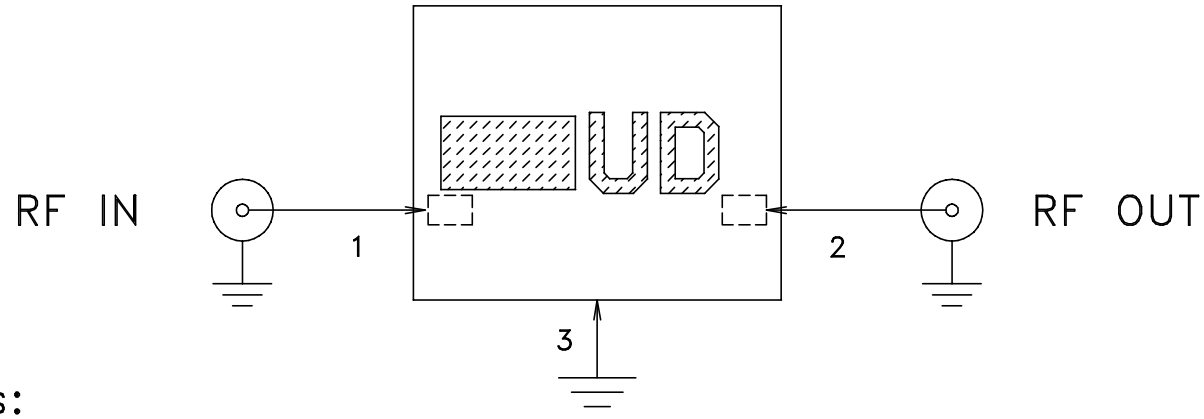
FILE:	SCALE:	SHEET:
98PL707	15:1	1 OF 1

Evaluation Board and Circuit



TB-BFCQ-1932C+

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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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	

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