



CERAMIC

Bandpass Filter

BFCQ-1892+

50Ω 17.7 to 20.2 GHz

THE BIG DEAL

- Standard small 1008 (2.5mm x 2.0mm) case style
- Low Insertion Loss – Mid band 1.4 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-1892+ 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 – 20.2 GHz is as low as 1.4 dB, with typical stopband rejections at 45 dB up to 40 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.





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ELECTRICAL SPECIFICATIONS¹ AT 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units	
Center Frequency	—	—	—	18.95	—	GHz	
Passband	Insertion Loss	F1-F2	17.7 - 20.2	—	1.4	3.0	dB
	Return Loss	F1-F2	17.7 - 20.2	—	13	—	dB
Stop Band, Lower	Insertion Loss	DC-F3	0.1 - 10	45	55	—	dB
			10 - 14.5	30	40	—	
Stop Band, Upper	Insertion Loss		24 - 26	35	45	—	dB
		F4-F5	26 - 32	40	50	—	
			32 - 40	35	45	—	

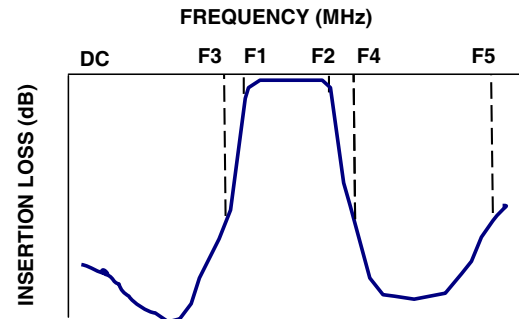
1. Measured on Mini-Circuits Test Board TB-BFCQ-1892C+ with connectors and feedline de-embedded with 2xThru.

MAXIMUM RATINGS

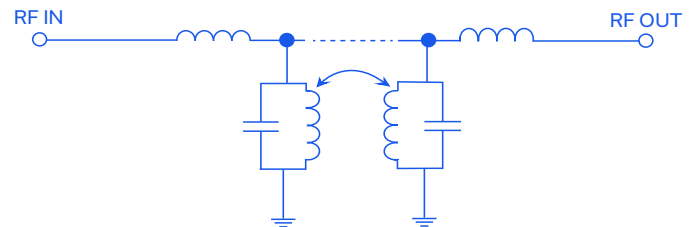
Parameter	Ratings
Operating temperature	-55°C to +125°C
Storage temperature	-55°C to +125°C
RF Power Input	1W

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

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC





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Bandpass Filter

BFCQ-1892+

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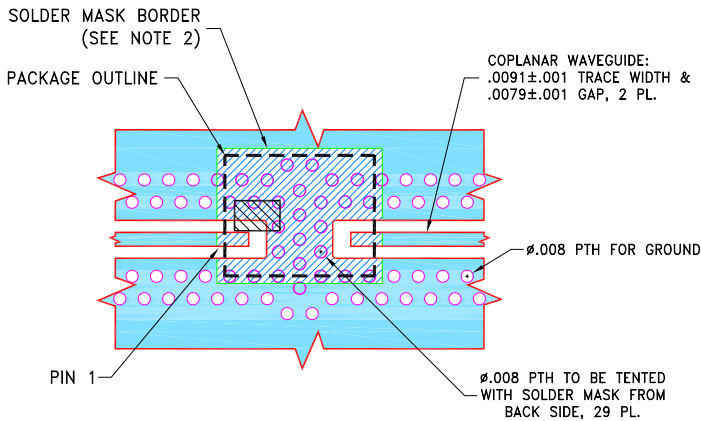
50Ω 17.7 to 20.2 GHz

PAD CONNECTIONS

INPUT	1
OUTPUT	2
GROUND	3

PRODUCT MARKING: UE

DEMO BOARD MCL P/N: TB-BFCQ-1892C+ SUGGESTED PCB LAYOUT (PL-707)

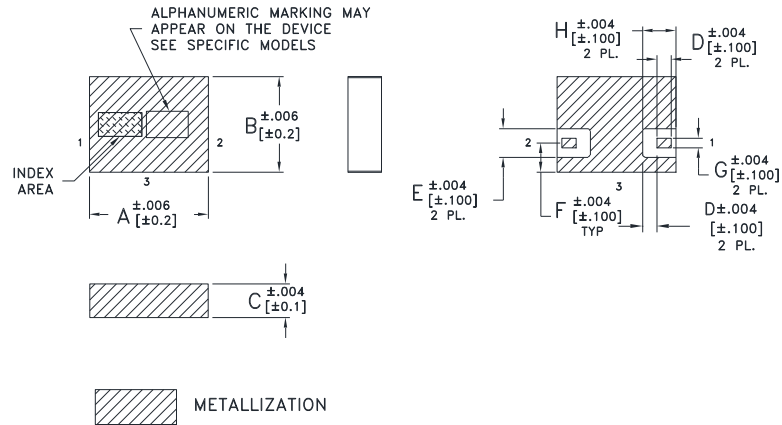


NOTES:

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 DRAWING



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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Bandpass Filter

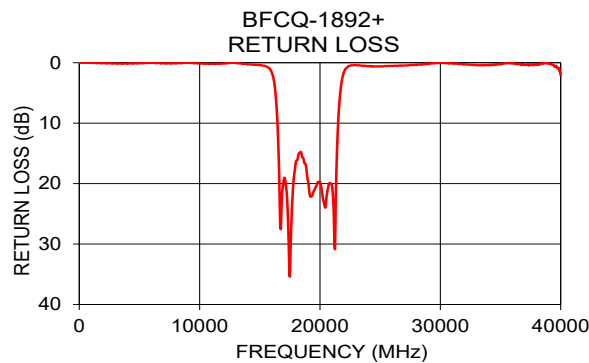
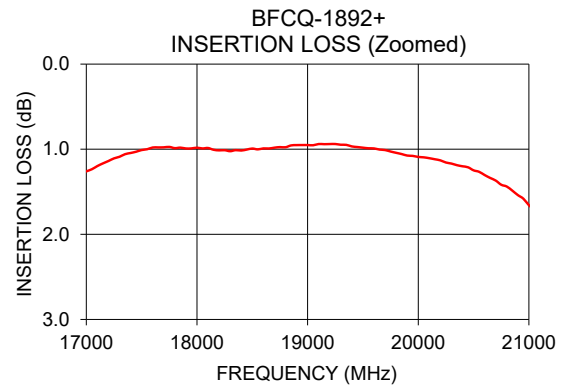
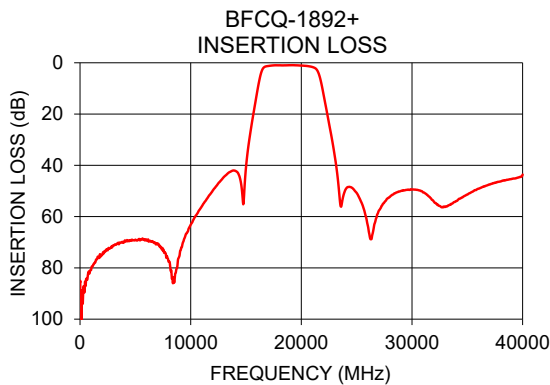
BFCQ-1892+

Mini-Circuits

50Ω 17.7 to 20.2 GHz

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	85.67	0.01
1000	80.83	0.04
2000	74.97	0.07
3000	71.27	0.13
4000	69.97	0.18
7000	70.56	0.09
8800	79.27	0.02
9200	71.94	0.04
10200	61.60	0.12
10700	57.97	0.18
14500	45.85	0.32
15100	36.58	0.40
17700	0.98	22.97
18950	0.95	18.99
20200	1.13	21.84
26000	63.35	0.51
30000	49.45	0.01
32000	54.28	0.21
36000	49.10	0.05
40000	43.60	2.06



NOTES

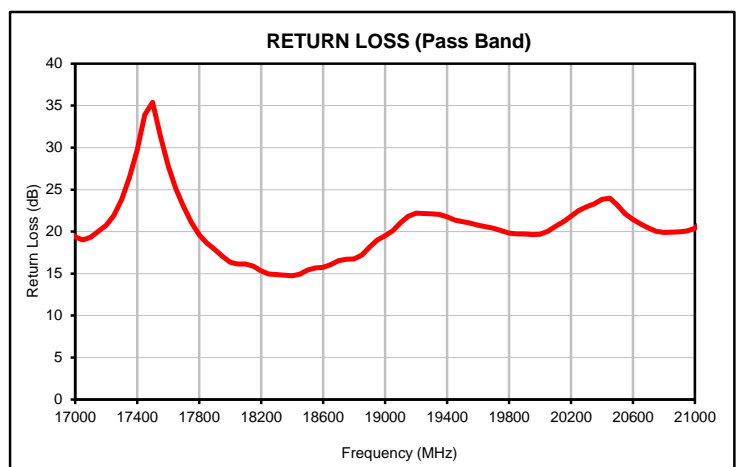
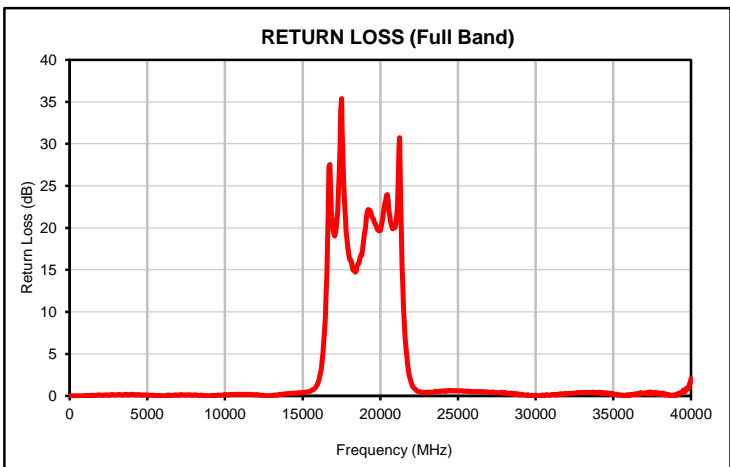
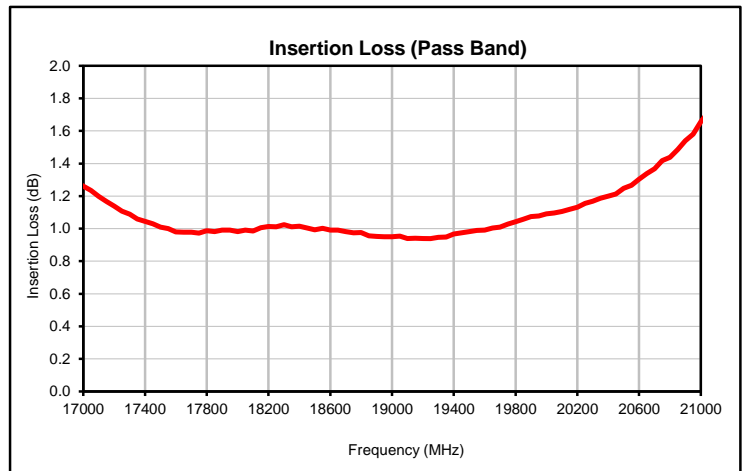
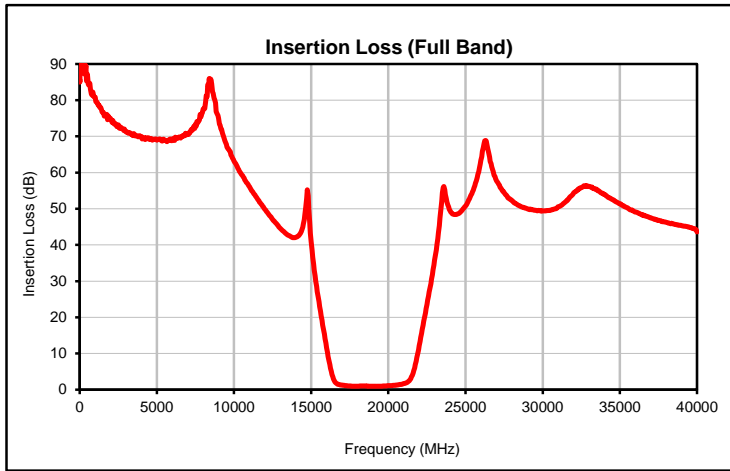
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document 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



Typical Performance Data

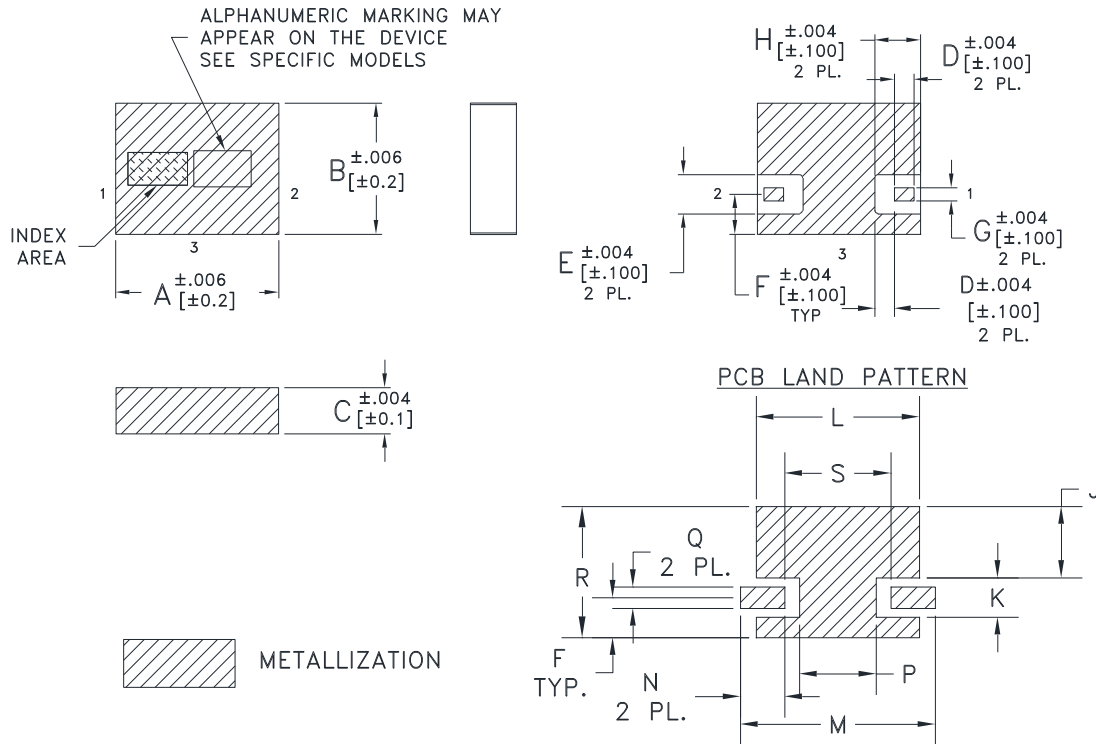
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
100	103.77	0.01
500	87.11	0.01
1000	80.83	0.04
2000	74.97	0.07
3000	71.27	0.13
4000	69.97	0.18
5000	68.97	0.10
6000	69.27	0.01
7000	70.56	0.09
8000	77.58	0.13
9000	75.03	0.01
10000	63.18	0.14
11000	56.04	0.18
12000	49.80	0.16
13000	44.55	0.04
14000	42.10	0.27
15000	40.78	0.40
16000	11.58	1.62
17000	1.26	19.36
17700	0.98	22.97
18000	0.98	16.37
18200	1.01	15.30
18400	1.02	14.73
18600	0.99	15.75
18800	0.98	16.75
19000	0.95	19.50
19200	0.94	22.19
19400	0.97	21.76
19600	0.99	20.75
19800	1.04	19.83
20000	1.09	19.68
20200	1.13	21.84
21000	1.66	20.40
22000	12.19	1.50
23000	35.80	0.41
24000	49.41	0.58
25000	50.75	0.62
26000	63.35	0.51
27000	57.73	0.45
28000	52.33	0.40
29000	50.01	0.10
30000	49.45	0.01
31000	50.56	0.14
32000	54.28	0.21
33000	56.26	0.40
34000	53.98	0.35
35000	51.43	0.27
36000	49.10	0.05
37000	47.41	0.31
38000	46.29	0.31
39000	45.31	0.05
40000	43.60	2.06

Typical Performance Curves



Outline Dimensions

NL1008C-7



SUGGESTED LAYOUT FOR PCB LAND PATTERN
TOLERANCE TO BE WITHIN $\pm .002$

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. $\pm .01$; 3 Pl. $\pm .005$

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 50 Ω characteristic depending on PCB material and thickness.



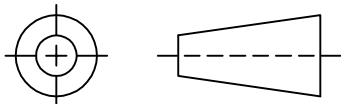
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THIRD ANGLE PROJECTION



REVISIONS

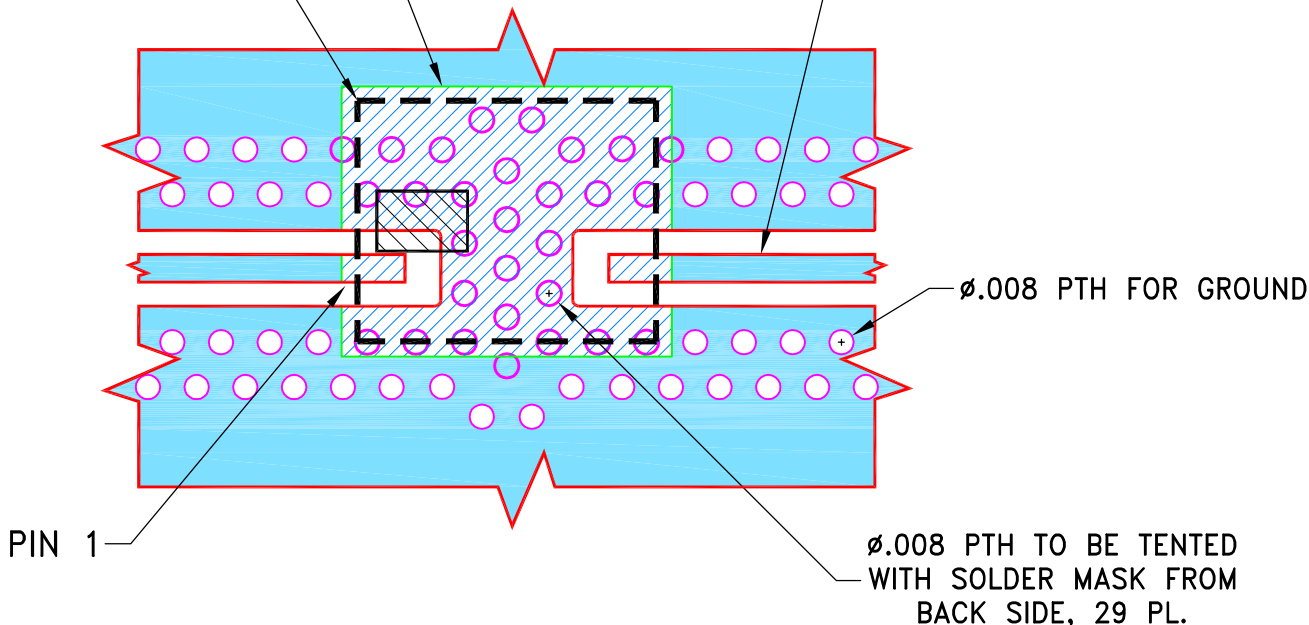
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-007756	NEW RELEASE	05/12/21	ITG	IL

SUGGESTED MOUNTING CONFIGURATION
FOR NL1008C-6 CASE STYLE

SOLDER MASK BORDER
(SEE NOTE 2)

PACKAGE OUTLINE

COPLANAR WAVEGUIDE:
.0091±.001 TRACE WIDTH &
.0079±.001 GAP, 2 PL.



Ø.008 PTH FOR GROUND

Ø.008 PTH TO BE TENTED
WITH SOLDER MASK FROM
BACK SIDE, 29 PL.

NOTES:

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DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).



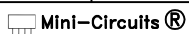
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

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 ±		



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Brooklyn NY 11235

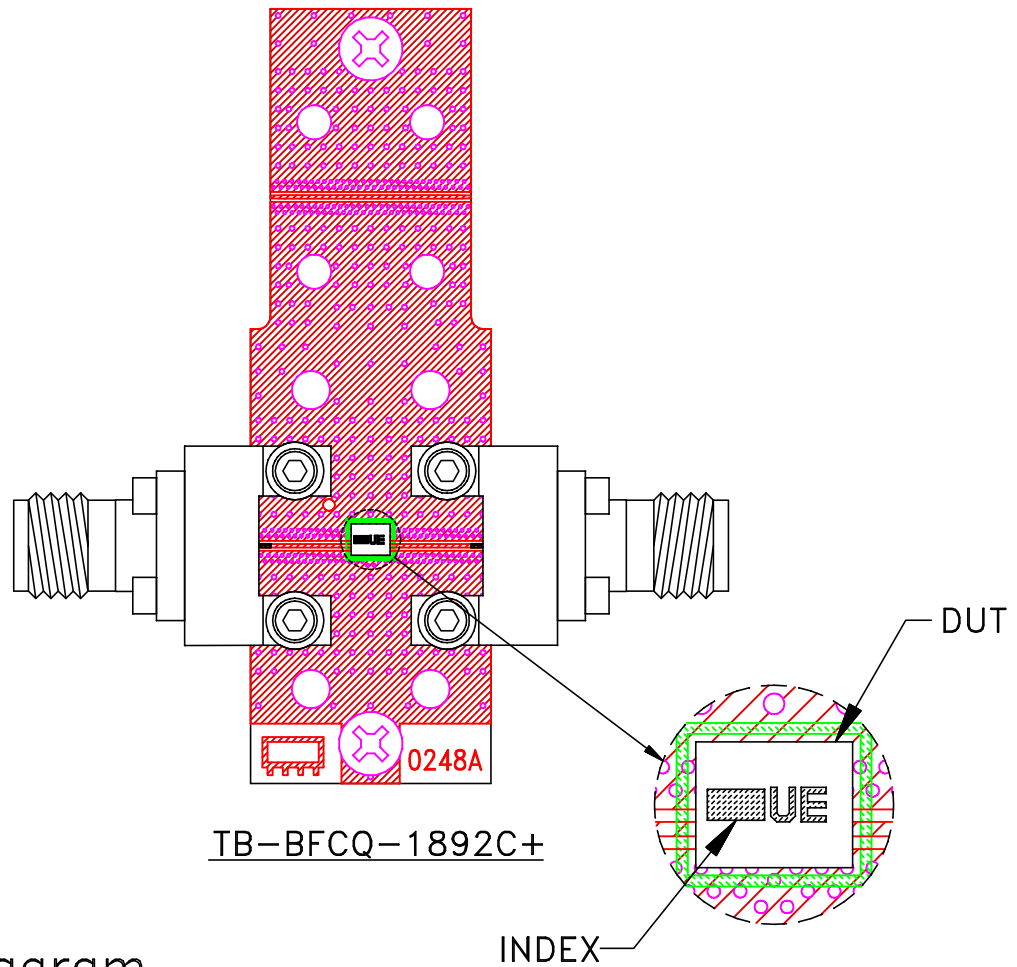
PL, NL1008C-6, TB-BFCQ-XXXX+



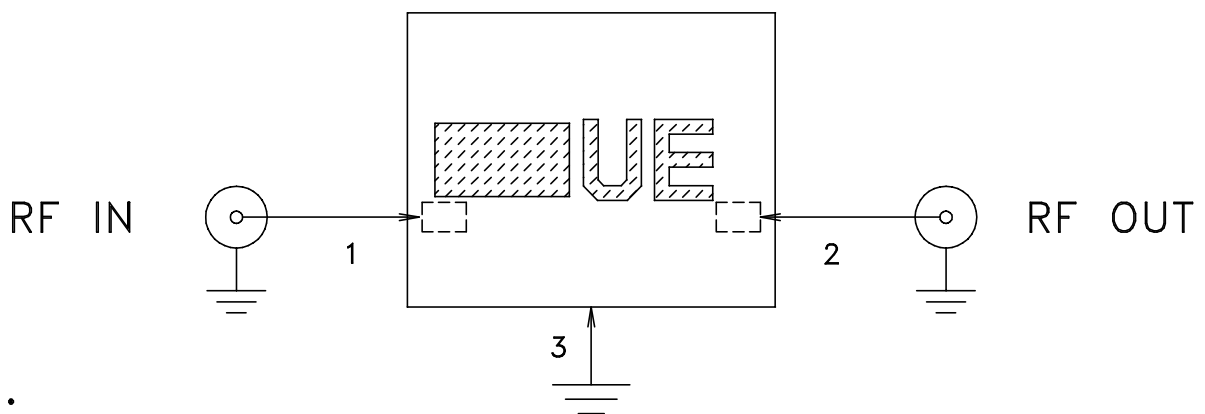
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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-707	OR
FILE:	98PL707	SCALE: 15:1	SHEET: 1 OF 1

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.

 Mini-Circuits®



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	