



CERAMIC

Bandpass Filter

BFCQ-2552+

50Ω 25.2 to 26.6 GHz

THE BIG DEAL

- Innovative and industry leading
- 5G n258 bandpass filter
- Low Insertion Loss – Mid band 2.5dB typical
- Surface mountable pick and place standard case style
- Small size 2.5mm x 2.0mm
- High quality distributed filter topology
- Wide rejection band



Generic photo used for illustration purposes only

CASE STYLE: NL1008C-6

+RoHS Compliant

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

APPLICATIONS

- 5G Telecommunications

PRODUCT OVERVIEW

The BFCQ-2552+ LTCC Bandpass Filter covers the 5G n258 band. This corresponds to a passband of 25.2 to 26.6 GHz, with as low as 2.5dB passband loss, and up to 40dB stopband rejection. 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, up to mmWave frequencies.

KEY FEATURES

Feature	Advantages
5G n258 band compatible	Designed for 5G Telecommunications, n258 band, 25.2 – 26.6 GHz
Proprietary mmWave compatible LTCC material system	Low loss and repeatable performance on a lot-to-lot basis up to mmWave frequencies.
Cost effective	LTCC is scalable technology that allows for cost reduction at volume.
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 (GHz)	Min.	Typ.	Max.	Units	
Passband	Center Frequency	—	—	25.8	—	GHz	
	Insertion Loss	F1-F2	25.2 - 26.6	—	2.5	3.3	dB
	Return Loss (In)	F1-F2	25.2 - 26.6	—	13	—	dB
	Return Loss (Out)	F1-F2	25.2 - 26.6	—	13	—	dB
Stop Band, Lower	Insertion Loss	DC-F3	0.1 - 18	40	55	—	dB
		18 - 22.2	20	35	—		
Stop Band, Upper	Insertion Loss	F4-F5	29.5 - 32	20	35	—	dB
		32 - 45	35	44	—		
		45 - 50	30	40	—		

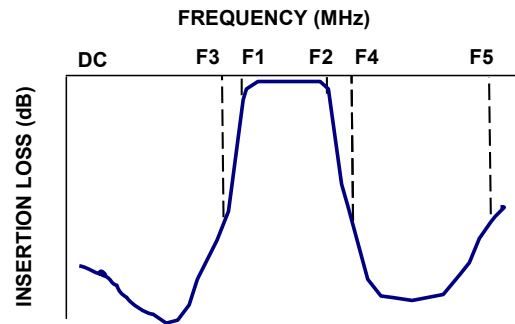
1. Measured on Mini-Circuits Test Board TB-BFCQ-2552C+ with feedline losses removed by normalization of S12 and S21 traces to measurement of TB thru-line.

MAXIMUM RATINGS

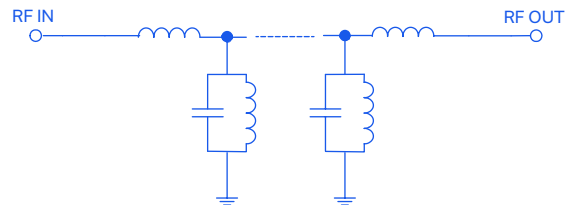
Parameter	Ratings
Operating Temperature	-55°C to +125°C
Storage Temperature	-55°C to +125°C
RF Power Input	1W

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

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC





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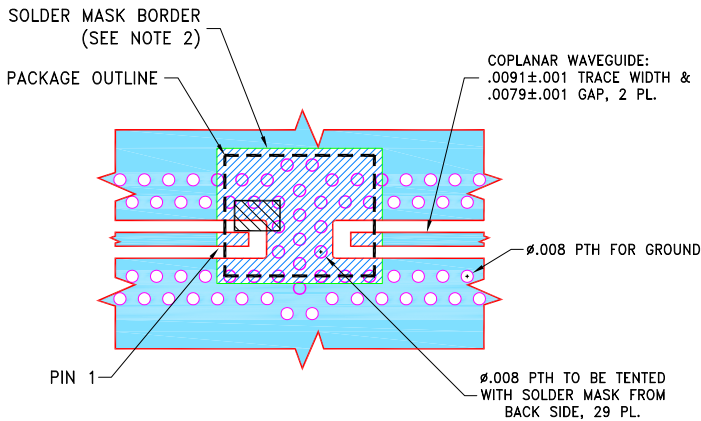
50Ω 25.2 to 26.6 GHz

PAD CONNECTIONS

INPUT	1
OUTPUT	2
GROUND	3

PRODUCT MARKING: NV

EVALUATION BOARD MCL P/N: TB-BFCQ-2552C+ SUGGESTED PCB LAYOUT (PL-707)

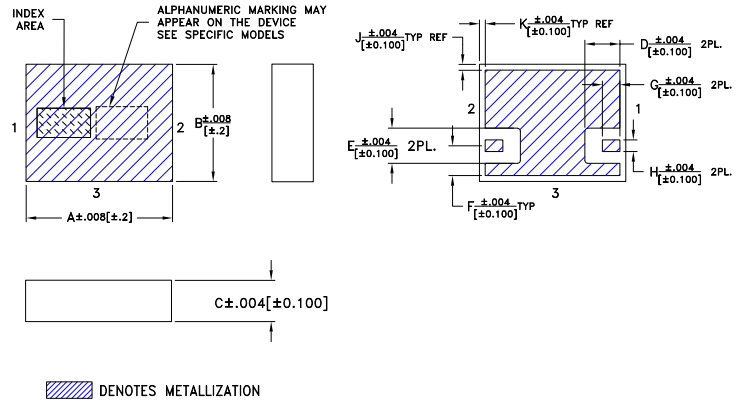


NOTES:

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	.024	.024	.020	.012	.008	.004	.004	grams
2.49	2.01	0.71	0.6	0.6	0.51	0.3	0.2	0.1	0.1	.019

TAPE & REEL INFORMATION: F75

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Bandpass Filter

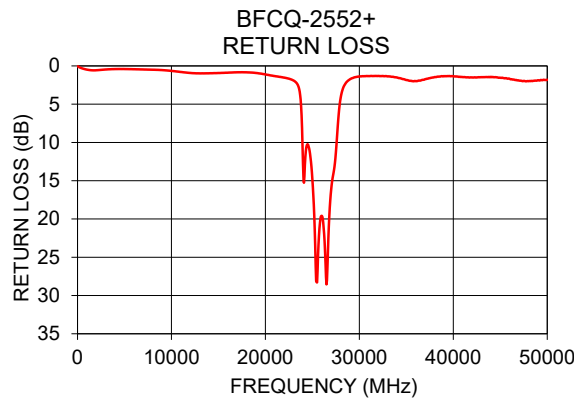
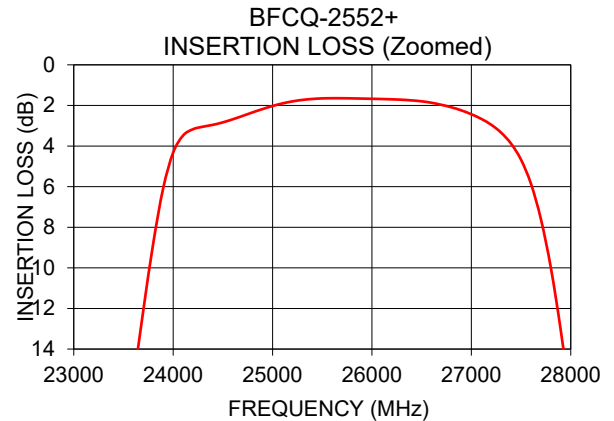
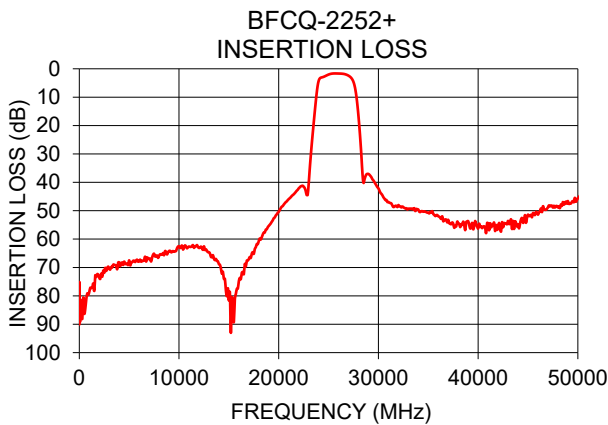
BFCQ-2552+

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50Ω 25.2 to 26.6 GHz

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	90.06	0.06
3000	70.46	0.47
6000	67.83	0.43
9000	64.21	0.55
15000	81.63	0.93
21400	44.52	1.41
23000	40.72	1.91
25200	1.80	19.62
25800	1.65	20.57
26600	1.87	26.38
30500	45.26	1.34
33000	49.27	1.37
40000	56.27	1.35
45000	51.38	1.54
50000	45.61	1.82



NOTES

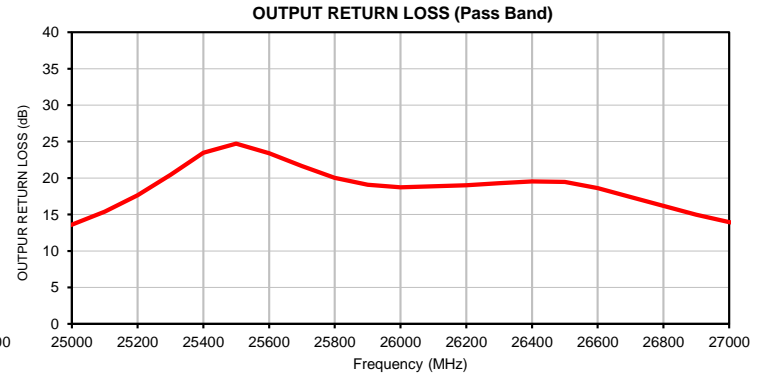
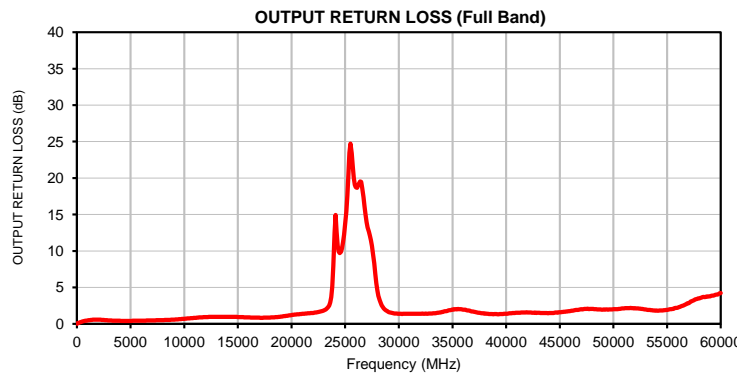
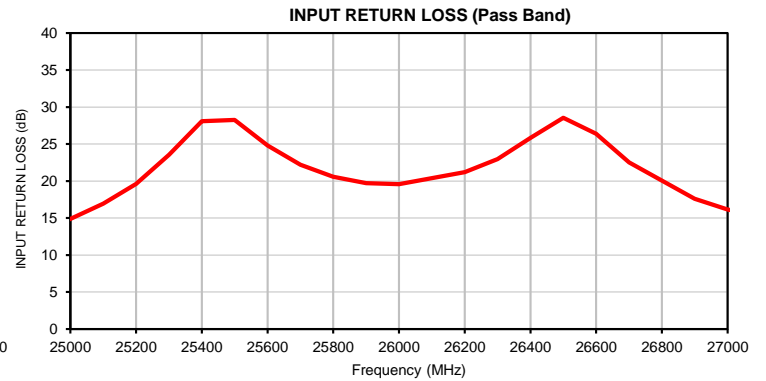
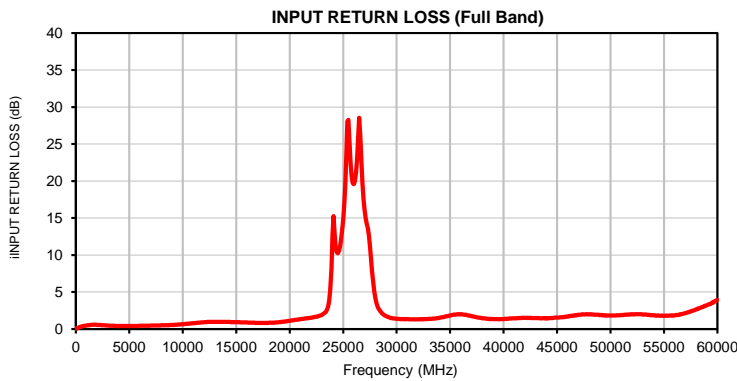
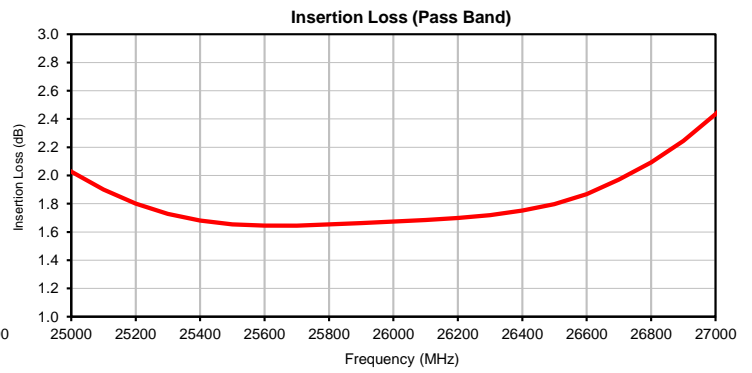
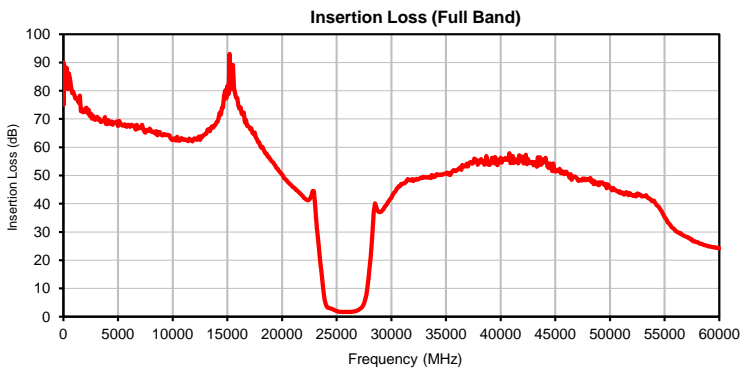
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	OUTPUT RETURN LOSS (dB)
10	90.06	0.06	0.03
1700	73.34	0.58	0.58
3400	68.97	0.44	0.45
5100	69.27	0.41	0.42
6800	66.53	0.46	0.47
8500	65.70	0.51	0.54
10300	62.29	0.69	0.74
12000	63.12	0.92	0.93
13700	66.98	0.97	0.97
15400	86.97	0.91	0.92
17100	66.29	0.83	0.84
18900	55.81	0.91	0.97
20600	47.41	1.25	1.32
22300	41.30	1.61	1.57
22500	41.53	1.67	1.62
22600	42.00	1.71	1.66
22700	42.95	1.75	1.69
22800	44.45	1.79	1.74
22900	44.44	1.85	1.77
23000	40.72	1.91	1.84
23200	31.22	2.09	2.00
23400	23.13	2.38	2.26
23500	19.35	2.65	2.52
23600	15.65	3.07	2.91
23700	12.08	3.84	3.66
23800	8.78	5.30	5.10
23900	6.07	8.15	7.92
24000	4.32	12.79	12.52
24100	3.48	15.27	14.94
24200	3.17	12.94	12.57
24300	3.05	11.16	10.77
24400	2.96	10.40	9.90
24500	2.83	10.23	9.69
24600	2.68	10.55	9.89
24700	2.51	11.07	10.37
24800	2.34	12.00	11.18
24900	2.18	13.18	12.21
25000	2.03	14.86	13.61
25100	1.90	16.95	15.41
25200	1.80	19.62	17.64
25300	1.73	23.55	20.43
25400	1.68	28.08	23.46
25500	1.65	28.28	24.72
25600	1.64	24.81	23.41
25700	1.65	22.20	21.64
25800	1.65	20.57	20.02
25900	1.66	19.71	19.09
26000	1.67	19.59	18.71
26200	1.70	21.20	19.00
26300	1.72	22.97	19.29
26400	1.75	25.83	19.55
26500	1.80	28.55	19.47
26600	1.87	26.38	18.61
26700	1.97	22.52	17.39
26900	2.24	17.60	14.98
27000	2.43	16.16	13.95
27200	2.95	14.31	12.67
27300	3.34	13.61	12.09
27500	4.68	11.32	10.69
27700	7.61	7.87	8.28
27800	10.00	6.32	6.87
28000	16.77	4.23	4.60
28600	39.01	2.16	2.13
28900	37.03	1.84	1.77
29000	37.07	1.74	1.68
32600	49.02	1.34	1.39
34300	50.17	1.60	1.72
36000	51.96	1.99	1.95
39500	56.55	1.33	1.35
41200	54.40	1.46	1.53
44600	53.76	1.49	1.54
46300	49.20	1.78	1.84
49800	46.81	1.84	1.98
51500	44.14	1.94	2.14
56600	28.93	1.99	2.56
60000	24.13	3.94	4.23

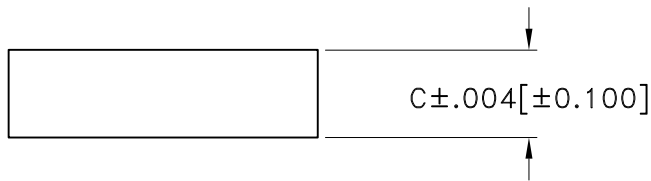
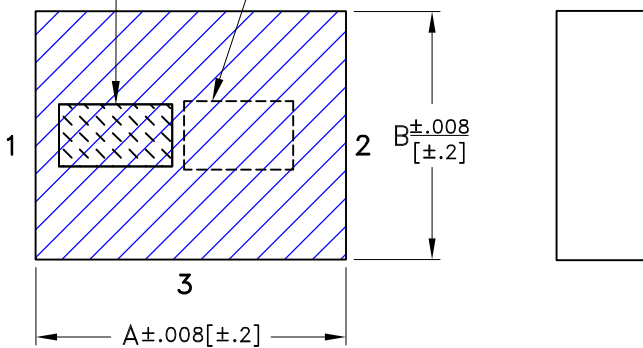
Typical Performance Curves



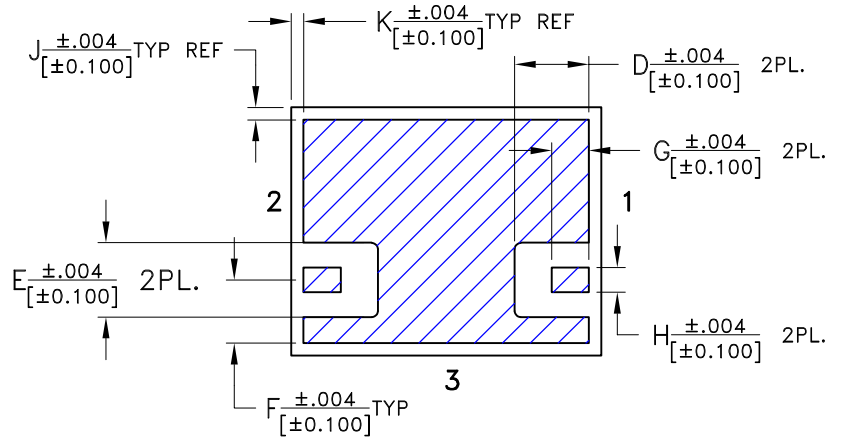
Outline Dimensions

NL1008C-6

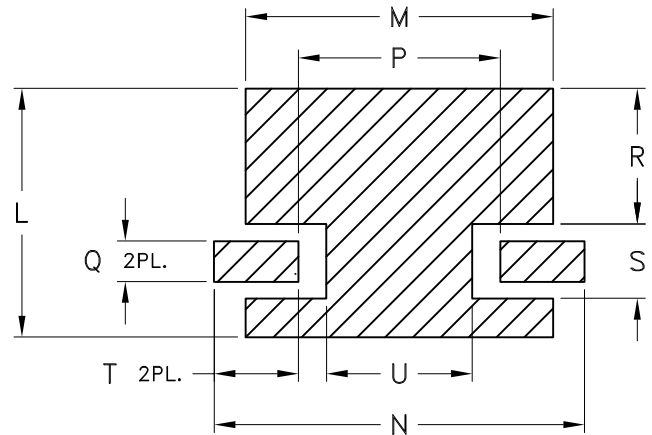
INDEX AREA
ALPHANUMERIC MARKING MAY APPEAR ON THE DEVICE SEE SPECIFIC MODELS



DENOTES METALLIZATION



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
NL1008C-6	.098 (2.50)	.079 (2.00)	.028 (.705)	.024 (.60)	.024 (.60)	.020 (.51)	.012 (.30)	.008 (.20)	.004 (.10)	.004 (.10)	.079 (2.0)	.098 (2.5)	.118 (3.0)

CASE #	P	Q	R	S	T	U	WT, GRAM
NL1008C-6	.064 (1.63)	.013 (.3)	.043 (1.09)	.024 (.60)	.027 (.7)	.046 (1.2)	.019

Dimensions are in inches (mm). Tolerances: 2 Pl. ± 0.01 ; 3 Pl. ± 0.005

Notes:

- Open style, ceramic base.
- 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.
- Pad tolerance is non-cumulative. Minimum spacing between each pad is .004.
- Line width should be designed to match 50Ω characteristic depending on PCB material and thickness.



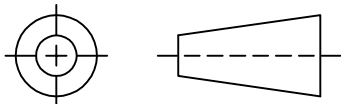
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

THIRD ANGLE PROJECTION



REVISIONS

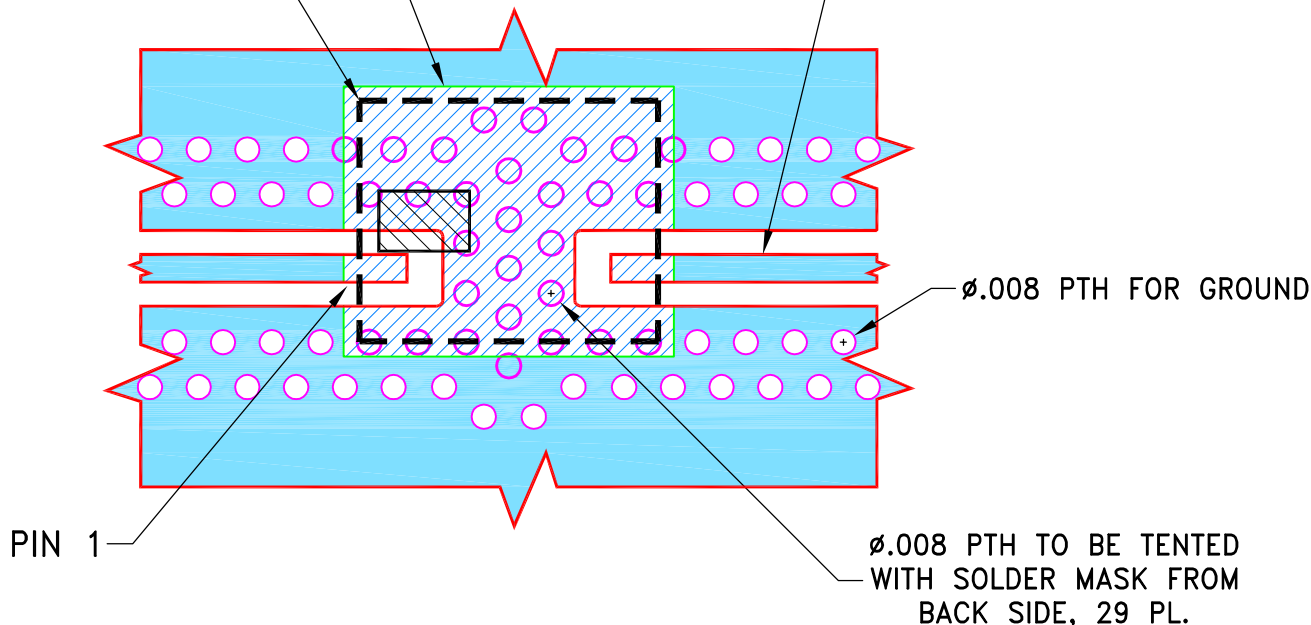
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-007756	NEW RELEASE	05/12/21	ITG	IL

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

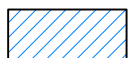
Ø.008 PTH TO BE TENTED
WITH SOLDER MASK FROM
BACK SIDE, 29 PL.

NOTES:

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

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±



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

INITIALS

DATE

DRAWN

ITG

05/12/21

CHECKED

GF

05/12/21

APPROVED

IL

05/12/21



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

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

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-707

REV:

OR

FILE:

98PL707

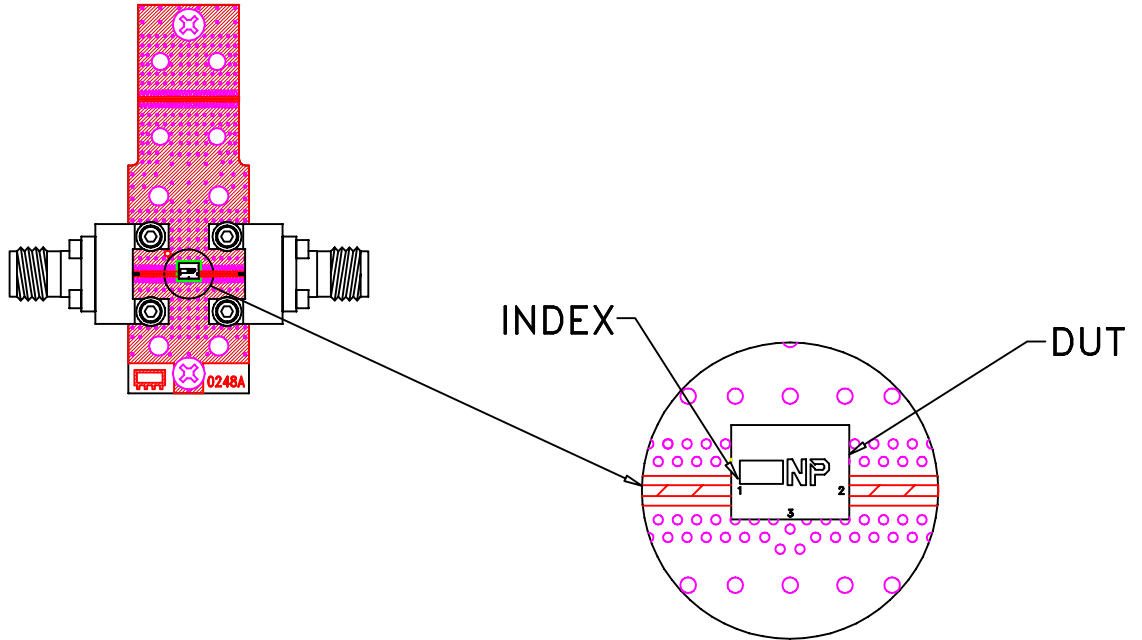
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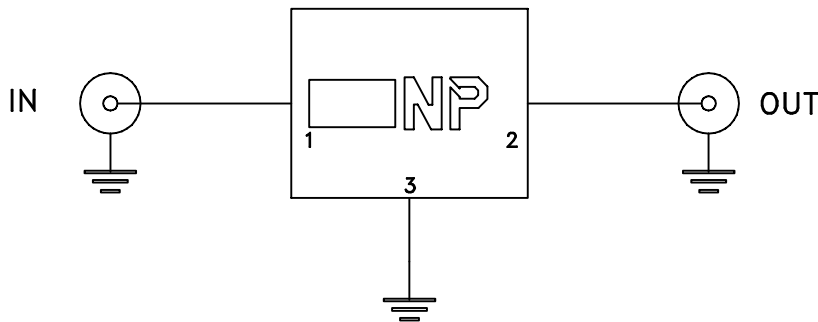
SHEET:

1 OF 1

Evaluation Board and Circuit



TB-BFCQ-2552C+



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®**



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	