Ceramic

High Pass Filter

HFCW-242+

50Ω 2400 to 3300 MHz

The Big Deal

- Very good rejection, 20 dB typical
- Rugged, ceramic construction
- Tiny size, 0.063" x 0.032" x 0.024" (0603)
- Good power handling, 2W

CASE STYLE: JC0603C-4

Product Overview

Mini-Circuits' HFCW-242+ is a LTCC High Pass Filter with a passband from 2400 to 3300 MHz, supporting a variety of applications. This model provides 1.5 dB typical passband insertion loss and provides a very good stopband rejection due to strategically constructed layout with minimal interaction between components. It provides a wide operating temperature range from -55 to +125°C. Housed in a tiny 0603 ceramic form factor with wrap-around terminations, the filter is ideal for dense PCB layouts and with minimal performance variation due to parasitics.

Key Features

Feature	Advantages
LTCC Construction	Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.
Tiny size (0.063 x 0.032 x 0.024")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Good power handling	Supports a wide range of system power requirements.
Wrap-around terminations	Provides excellent solderability and easy visual inspection

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Generic photo used for illustration purposes only

CASE STYLE: JC0603C-4

+RoHS Compliant

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

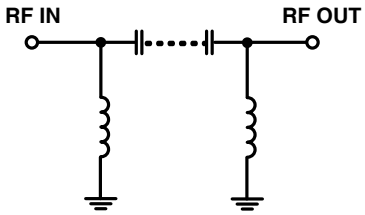
Features

- Miniature size 0603
- High stop band rejections
- Low cost
- Aqueous washable

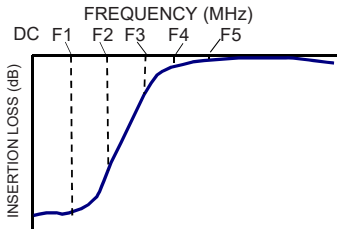
Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee

Functional Schematic



Typical Frequency Response



Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection Loss	DC-F1	10 - 1650	20	25	—	dB
	Freq. Cut-Off	F2	2200	—	2.5	—	dB
Pass Band	Insertion Loss	F4-F5	2400 - 3300	—	1.5	2.5	dB
	Return Loss	F4-F5	2400 - 3300	—	9.5	—	

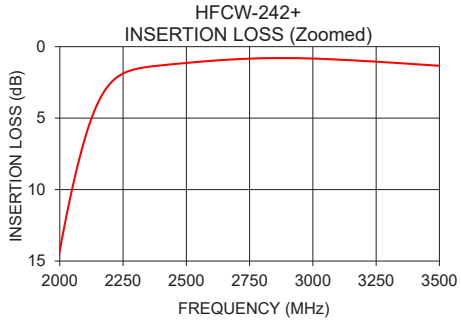
1. Tested on Evaluation Board TB-HFCW-242+
2. In Application where DC voltage is present at either input or output ports, coupling capacitors are required.

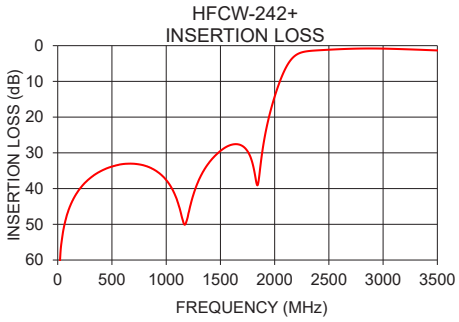
Maximum Ratings	
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input[3]	2W at 25°C

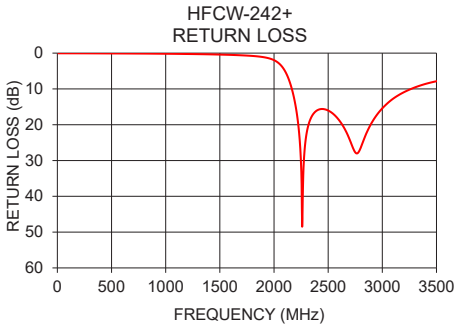
3. Passband rating, derate linearly to 0.5W at 125°C ambient. Permanent damage may occur if any of these limits exceeded.

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	64.90	0.05
100	45.98	0.05
200	40.21	0.05
500	33.83	0.09
1000	37.59	0.18
1200	47.78	0.24
1650	27.57	0.55
1700	28.03	0.61
1800	33.42	0.78
2000	14.27	1.96
2200	2.56	14.86
2400	1.31	15.96
2500	1.14	16.04
2600	0.99	18.70
2700	0.88	24.27
2800	0.81	26.49
3000	0.83	15.42
3100	0.91	12.72
3300	1.11	9.59
3400	1.22	8.59







Notes

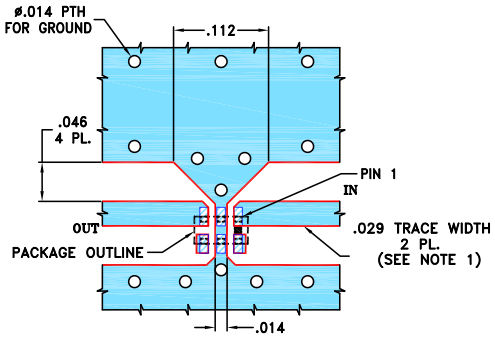
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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/MCLStore/terms.jsp

Pad Connections

INPUT	1
OUTPUT	3
GROUND	2,5
NO CONNECTION	4,6

Product Marking: N/A

Evaluation Board MCL P/N: TB-HFCW-242+
Suggested PCB Layout (PL-553)

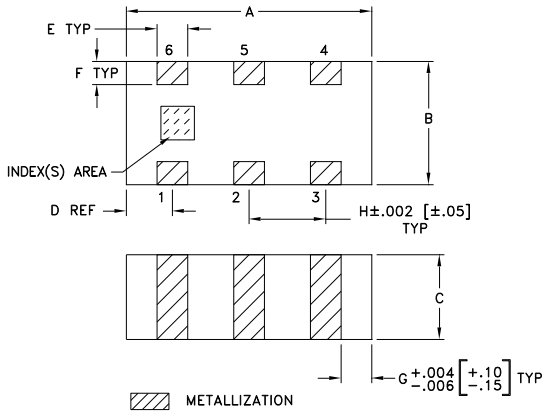


NOTES:
1. TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .016±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E
.063	.032	.022	.012	.008
1.60	0.81	0.56	0.30	0.20

F	G	H		wt
.006	.008	.020		grams
0.15	0.20	0.51		.005

Ceramic High Pass Filter HFCW-242+

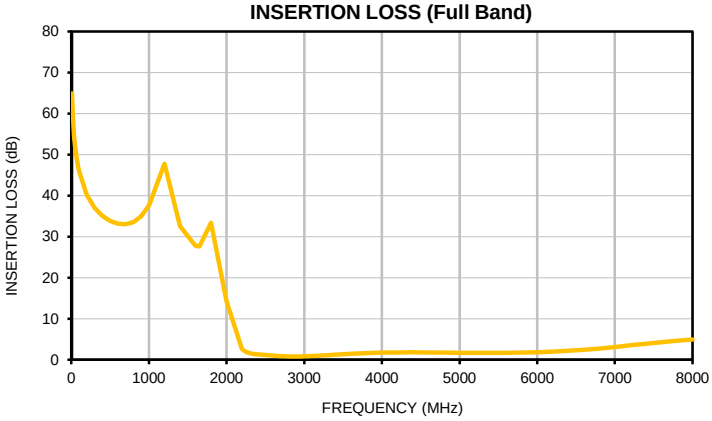
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	OUTPUT RETURN LOSS (dB)
10	64.90	0.05	0.05
20	60.62	0.05	0.04
30	56.26	0.05	0.04
40	53.96	0.04	0.04
50	51.93	0.05	0.05
60	50.40	0.05	0.05
70	49.08	0.05	0.05
80	47.93	0.05	0.05
90	46.92	0.05	0.05
100	45.98	0.05	0.05
200	40.21	0.05	0.05
300	37.05	0.06	0.06
400	35.07	0.07	0.07
500	33.83	0.09	0.08
600	33.15	0.10	0.08
700	33.05	0.11	0.09
800	33.57	0.13	0.09
900	34.92	0.15	0.11
1000	37.59	0.18	0.13
1200	47.78	0.24	0.17
1400	32.55	0.34	0.23
1600	27.75	0.49	0.34
1650	27.57	0.55	0.37
1800	33.42	0.78	0.54
2000	14.27	1.96	1.50
2200	2.56	14.86	11.90
2250	1.88	31.34	17.30
2300	1.57	22.59	18.10
2350	1.41	17.59	16.24
2400	1.31	15.96	15.18
2450	1.22	15.61	14.95
2500	1.14	16.04	15.32
2550	1.06	17.07	16.18
2600	0.99	18.70	17.47
2650	0.93	21.02	19.13
2700	0.88	24.27	21.05
2750	0.84	27.72	22.67
2800	0.81	26.49	22.69
2850	0.80	22.60	21.00
2900	0.80	19.56	18.89
2950	0.81	17.24	16.97
3000	0.83	15.42	15.30
3050	0.87	13.94	13.89
3100	0.91	12.72	12.73
3150	0.95	11.74	11.78
3200	1.00	10.91	10.97
3250	1.05	10.20	10.27
3300	1.11	9.59	9.65
3350	1.16	9.06	9.11
3380	1.20	8.77	8.82
3400	1.22	8.59	8.64
3600	1.44	7.26	7.31
3800	1.61	6.49	6.50
4000	1.72	6.07	6.06
4200	1.77	5.92	5.88
4400	1.78	5.88	5.81
4600	1.77	5.98	5.91
4800	1.72	6.20	6.05
5000	1.69	6.40	6.20
5200	1.65	6.64	6.44
5400	1.64	6.81	6.53
5600	1.67	6.84	6.56
5800	1.71	6.81	6.50
6000	1.82	6.56	6.21
6200	1.98	6.16	5.92
6400	2.17	5.71	5.47
6600	2.44	5.15	4.91
6800	2.74	4.62	4.46
7000	3.09	4.11	3.92
7200	3.50	3.62	3.47
7400	3.90	3.25	3.17
7600	4.23	2.98	2.79
7800	4.60	2.71	2.59
8000	4.93	2.59	2.38

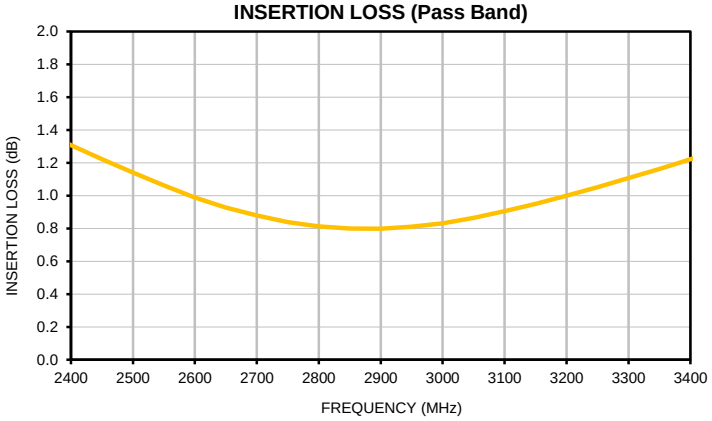
Ceramic High Pass Filter HFCW-242+

Typical Performance Curves

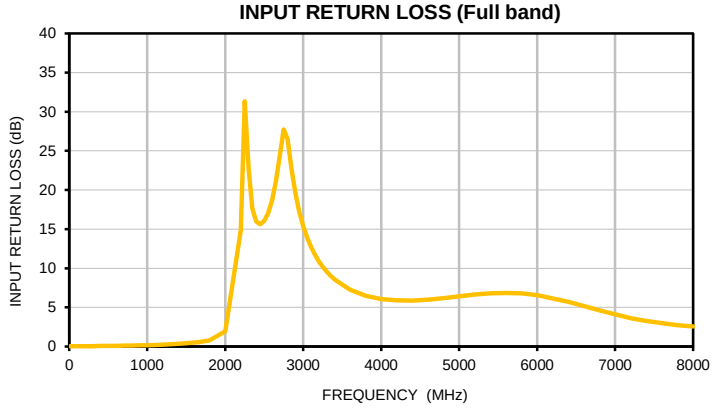
INSERTION LOSS (Full Band)



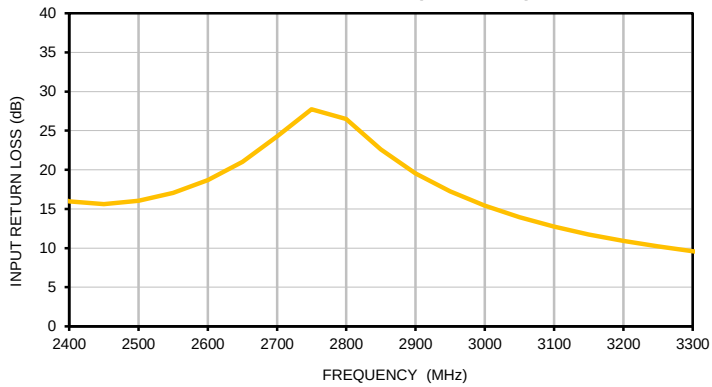
INSERTION LOSS (Pass Band)



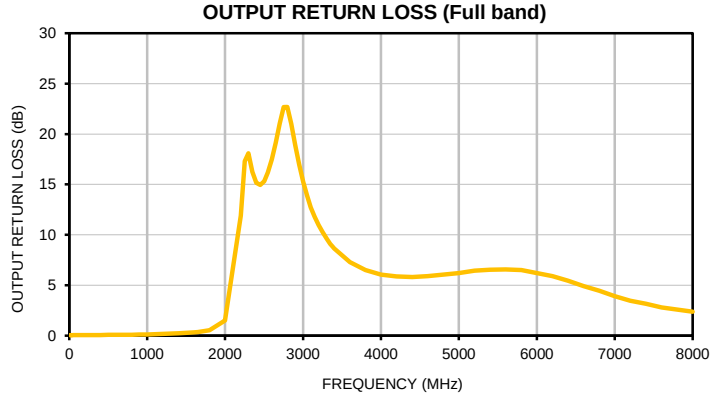
INPUT RETURN LOSS (Full band)



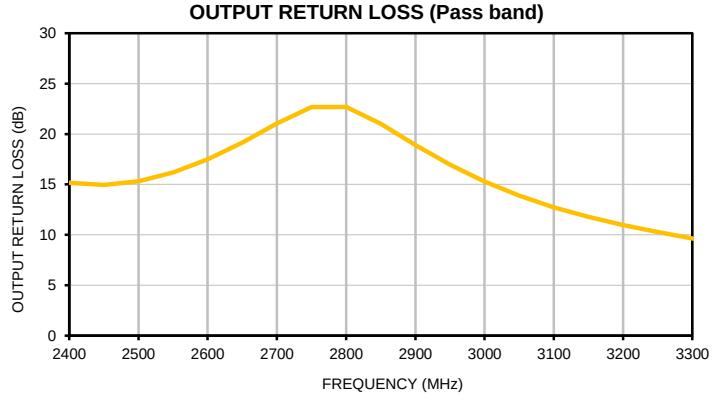
INPUT RETURN LOSS (Pass band)



OUTPUT RETURN LOSS (Full band)



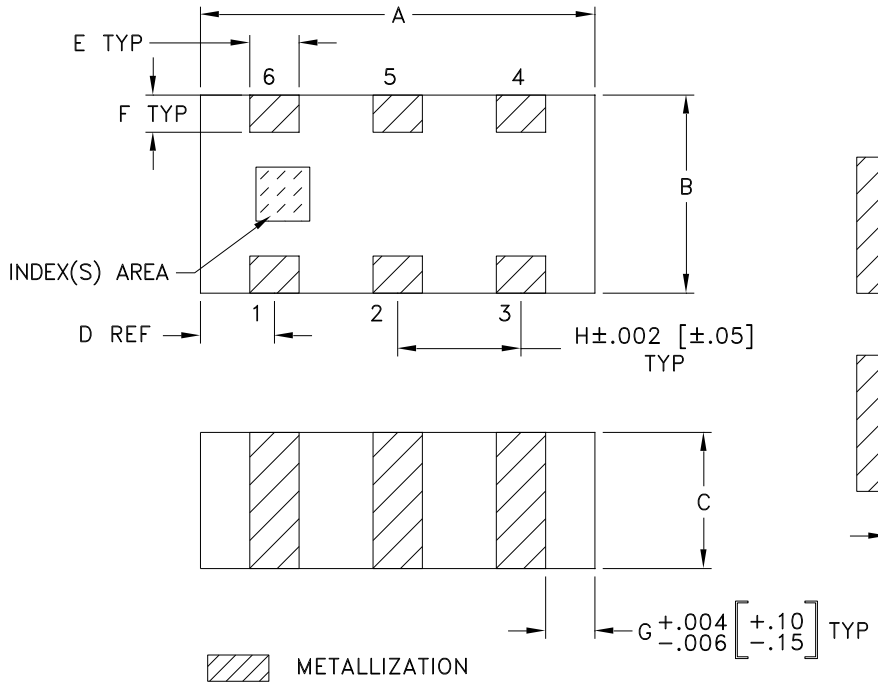
OUTPUT RETURN LOSS (Pass band)



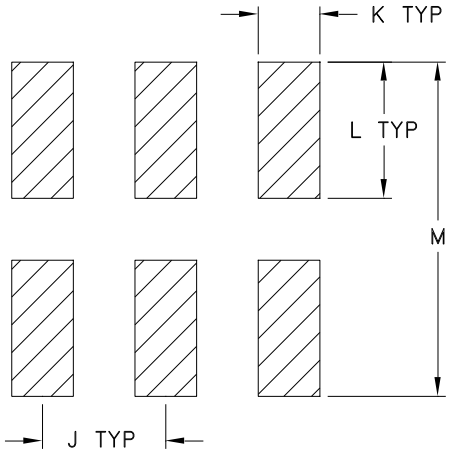
Case Style JC

Outline Dimensions

JC0603C-4



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
JC0603C-4	.063 (1.60)	.032 (0.80)	.022 (0.55)	.012 (0.30)	.008 (0.20)	.006 (0.15)	.008 (0.20)	.020 (0.50)	.020 (0.50)	.010 (0.25)	.022 (0.55)	.053 (1.35)	.005

Dimensions are in inches (mm). Tolerances: 3 Pl. ± .004

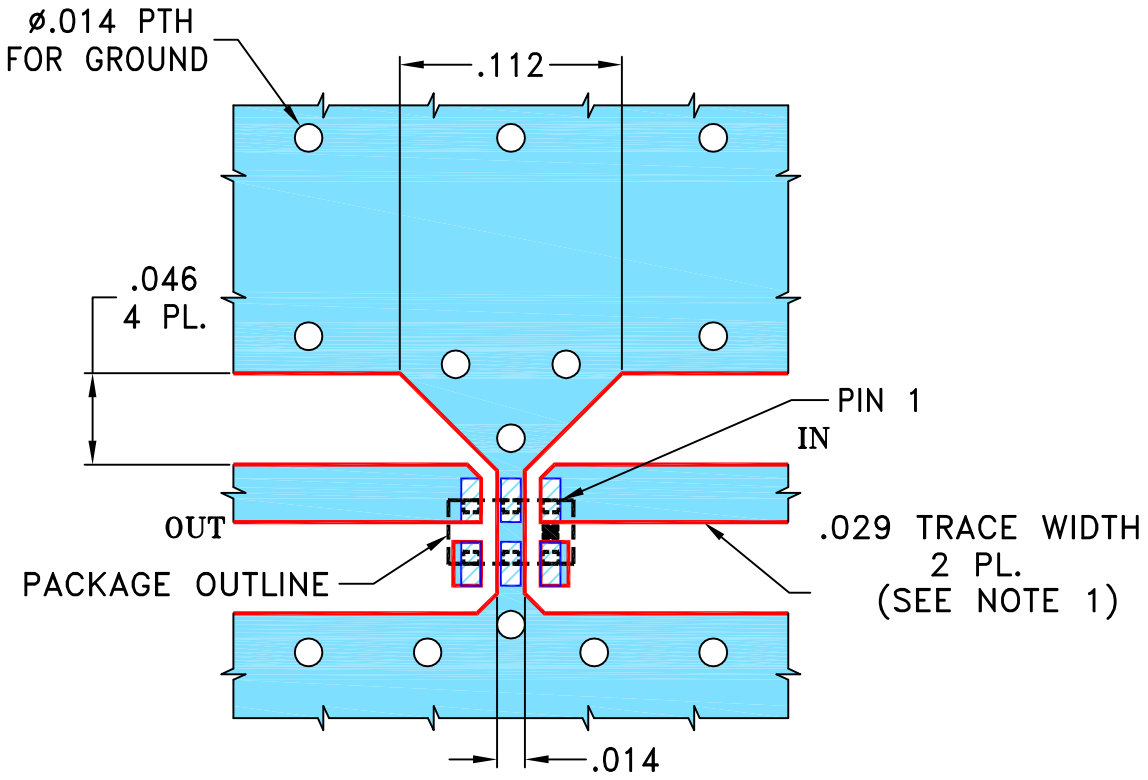
Notes:

1. Open style, ceramic base.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
3. - Line width should be designed to match 50 OHMS characteristic impedance, depending on PCB material & thickness.

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M168200	NEW RELEASE	05/31/18	NP	SL

SUGGESTED MOUNTING CONFIGURATION
FOR JC0603C-4 CASE STYLE, "06FL13" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .016±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. 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	NP	05/30/18
TOLERANCES ON:	CHECKED	GF	05/30/18
2 PL DECIMALS ±	APPROVED	SL	05/31/18
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

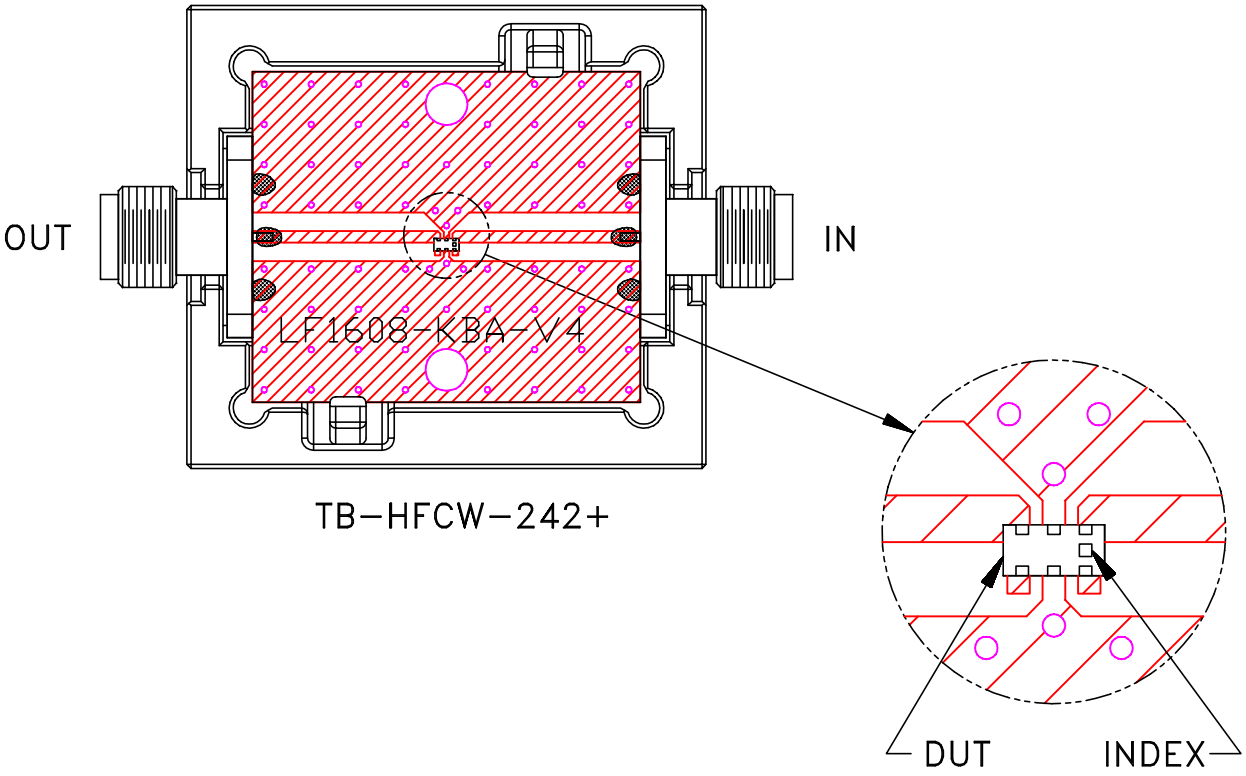
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

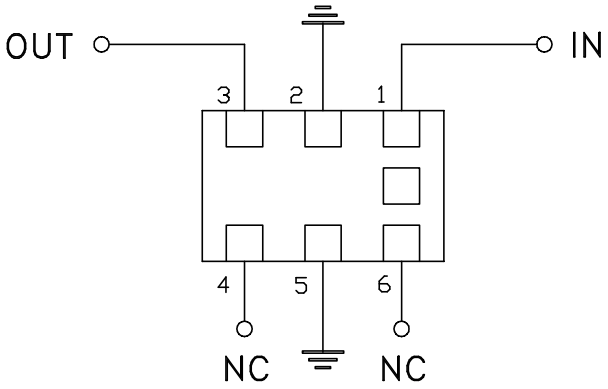
PL, 06FL13, JC0603C-4, TB-1025+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-553	OR
FILE: 98PL553		SCALE: 10:1	SHEET: 1 OF 1

Evaluation Board and Circuit



TB-HFCW-242+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: FR4 or equivalent,
   Dielectric Constant=4.5, Thickness=.016 inch.

Mini-Circuits®

Environmental Specifications ENV06T9

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
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process: 250°C peak	J-STD-020C, Table 4-1, 4-2 and 5-2; Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A