

# Ceramic Bandpass Filter

## BFCW-542+

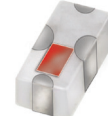
50Ω 4700 to 6000 MHz

### Features

- Wide passband, 4700-6000 MHz
- Low loss, 1.3 dB typ.
- Small size 0603(1.6 x 0.8 mm )
- Temperature stable
- LTCC construction

### Applications

- Wireless communication (ISM)
- Harmonic Rejection
- Transmitters / receivers



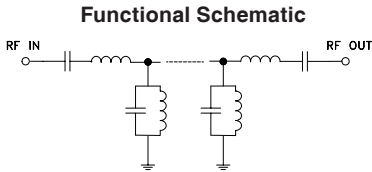
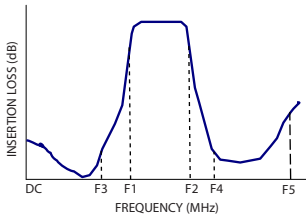
CASE STYLE:JC0603C-1

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

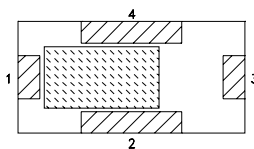
Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000, 4000

### Specification Definition



### Top View



### Pad Connections

Input	1
Output	3
Ground	2,4

### Electrical Specifications<sup>1,2</sup> at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—		5350		MHz
	Insertion Loss	F1 - F2	—	1.3	1.8	dB
	VSWR	F1 - F2	4700 - 6000	—	1.5	2.0
Stop Band, Lower	Insertion Loss	DC - F3	30	34	—	dB
Stop Band, Upper	Insertion Loss	F4 - F5	26	34	—	dB

1. Measured on Mini-Circuits Characterization Test Board TB-720+.

2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

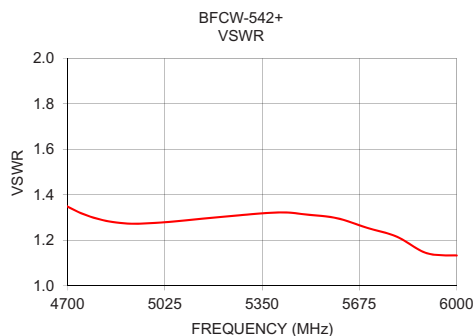
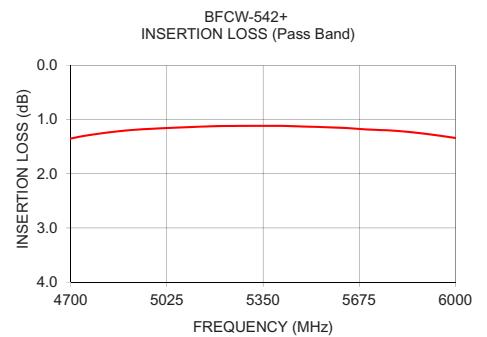
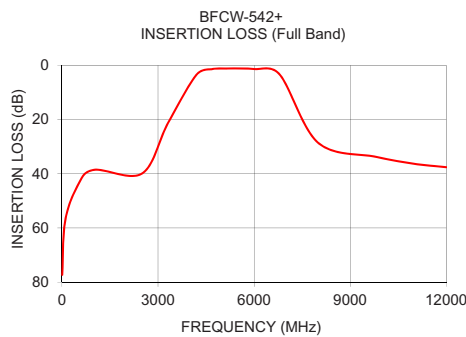
### Maximum Ratings

Operating Temperature	-55°C to +100°C
Storage Temperature*	-55°C to +100°C
RF Power Input**	1W at 25°C

\* 12 months max.

\*\*Passband rating, derate linearly to 0.5W at 100°C ambient

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



### Full Band Performance

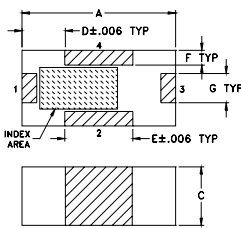
Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	77.28	508.40	4500	1.74	1.61
100	57.45	289.52	4600	1.51	1.45
500	44.18	127.06	4700	1.35	1.35
1000	38.54	85.51	4800	1.26	1.29
2500	39.92	55.73	4900	1.19	1.27
3300	21.56	31.19	5000	1.16	1.28
4200	3.47	2.94	5100	1.14	1.29
4700	1.35	1.35	5200	1.12	1.30
5000	1.16	1.28	5400	1.12	1.32
6000	1.34	1.13	5500	1.13	1.31
6800	3.36	2.06	5600	1.15	1.30
8000	28.56	17.19	5700	1.18	1.26
9800	33.73	23.08	5800	1.21	1.22
11000	36.32	20.32	5900	1.26	1.14
12000	37.56	25.90	6000	1.34	1.13

### Pass Band Performance

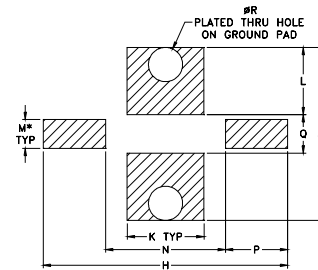
### Pad Connections

Input	1
Output	3
Ground	2,4

### Outline Drawing

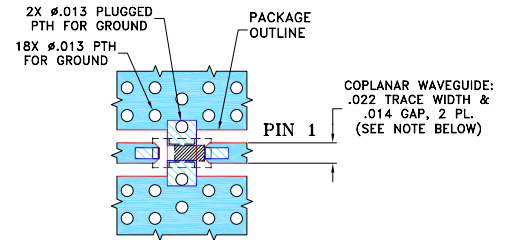


### PCB Land Pattern



Suggested Layout,  
Tolerance to be within ±0.002

### Demo Board MCL P/N: TB-720+ Suggested PCB Layout (PL-412)



### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
  - 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 ( $\frac{\text{inch}}{\text{mm}}$ )

A	B	C	D	E	F	G	H	J
.063	.031	.024	.018	.028	.006	.012	.100	.071
1.60	0.79	0.61	0.46	0.71	0.15	0.30	2.54	1.80
K	L	M	N	P	Q	R	wt	
.032	.028	.012	.049	.026	.016	.014	grams	
0.81	0.71	0.30	1.24	0.66	0.41	0.36	0.005	

### Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)

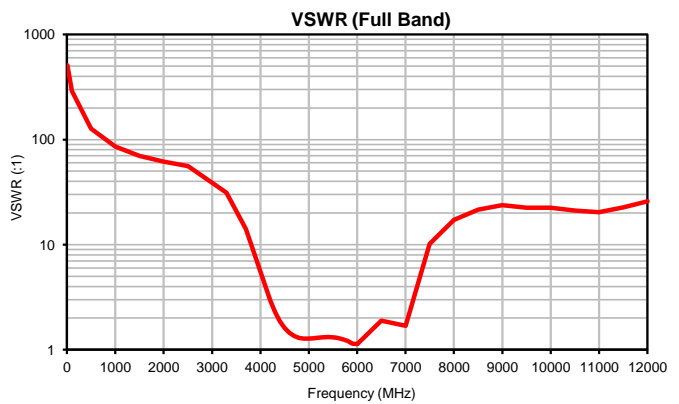
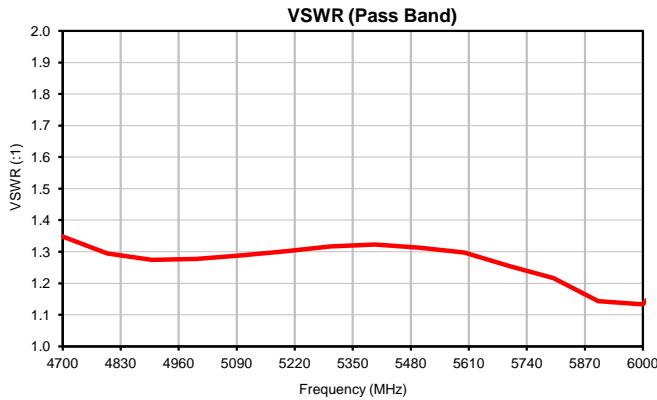
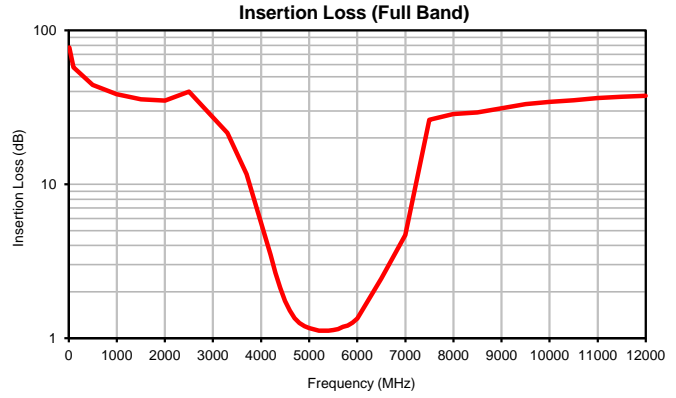
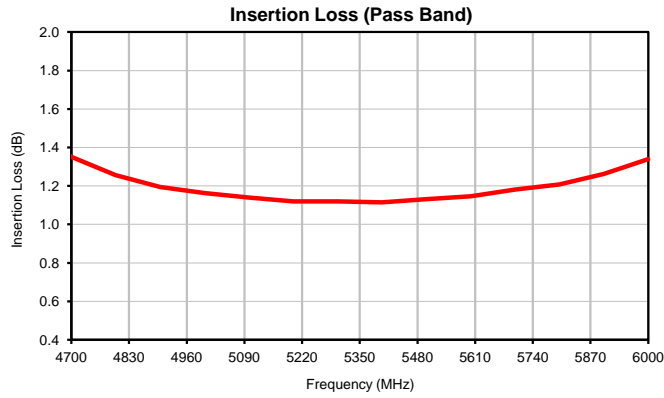
## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	VSWR (:1)
10.0	77.28	508.40
100.0	57.45	289.52
500.0	44.18	127.06
1000.0	38.54	85.51
1500.0	35.72	69.90
2000.0	34.97	61.55
2500.0	39.92	55.73
3300.0	21.56	31.19
3700.0	11.62	14.08
4200.0	3.47	2.94
4300.0	2.66	2.29
4400.0	2.12	1.87
4500.0	1.74	1.61
4600.0	1.51	1.45
4700.0	1.35	1.35
4800.0	1.26	1.29
4900.0	1.19	1.27
5000.0	1.16	1.28
5100.0	1.14	1.29
5200.0	1.12	1.30
5300.0	1.12	1.32
5400.0	1.12	1.32
5500.0	1.13	1.31
5600.0	1.15	1.30
5700.0	1.18	1.26
5800.0	1.21	1.22
5900.0	1.26	1.14
6000.0	1.34	1.13
6500.0	2.44	1.89
7000.0	4.68	1.69
7500.0	26.25	10.20
8000.0	28.56	17.19
8500.0	29.27	21.47
9000.0	31.16	23.71
9500.0	33.11	22.45
10000.0	34.30	22.41
10500.0	35.18	21.11
11000.0	36.32	20.32
11500.0	36.98	22.65
12000.0	37.56	25.90

# Ceramic Bandpass Filter

## Typical Performance Curves

**BFCW-542+**



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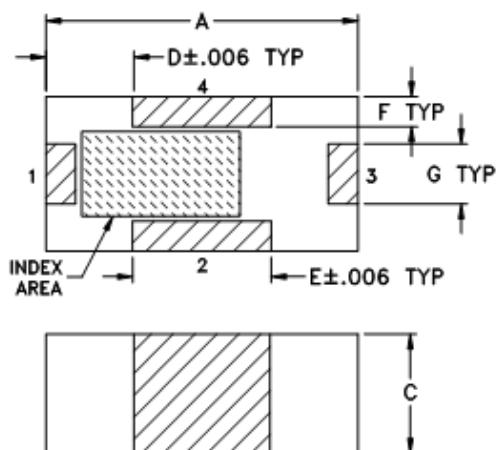
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IF/RF MICROWAVE COMPONENTS

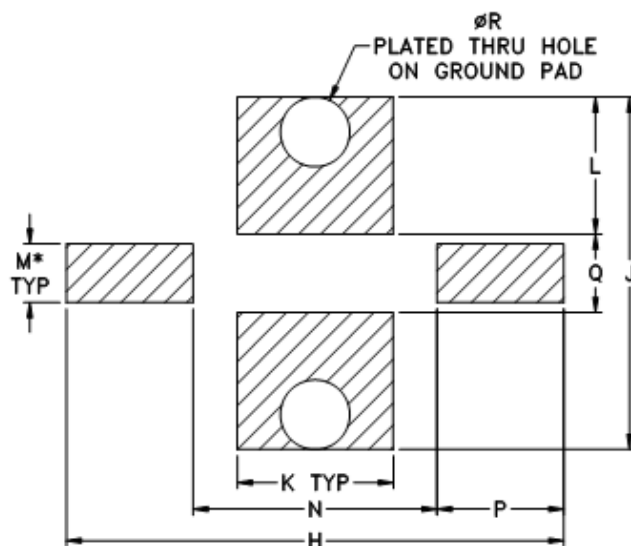
REV. OR  
BFCW-542+  
11/3/2014  
Page 1 of 1

## Outline Dimensions

JC0603C-1



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	L
JC0603C-1	.063 (1.60)	.031 (0.80)	.024 (0.60)	.018 (0.45)	.028 (0.70)	.006 (0.15)	.012 (0.30)	.100 (2.54)	.071 (1.80)	.032 (0.80)	.028 (0.70)

CASE #	M*	N	P	Q	R	WT. GRAMS
JC0603C-1	.012 (0.30)	.049 (1.24)	.026 (0.65)	.016 (0.40)	.014 (0.35)	.005

Dimensions are in inches (mm). Tolerances: 3 Pl.  $\pm .004$

### 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.



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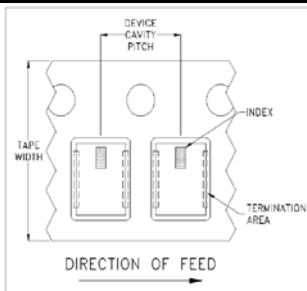


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RF/MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F74

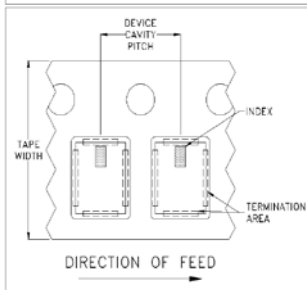
## DEVICE ORIENTATION IN T&R



**ILLUSTRATION 1**

### Applicable Case Styles

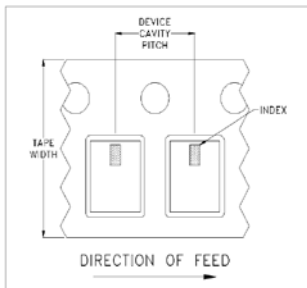
GE0805C-1  
 GE0805C-1AP  
 JV1210C-1  
 GU2939



**ILLUSTRATION 2**

### Applicable Case Styles

JV1210C  
 JV1210C-2  
 JV1210C-3  
 JV1210C-4  
 JV1210C-5  
 JV1210C-6  
 JV1210C-11



**ILLUSTRATION 3**

### Applicable Case Styles

JC0603C-8  
 JV1210C-7  
 JV1210C-8  
 JV1210C-9  
 JV1210C-10  
 JV1210C-13  
 GE0805C-13

Tape Width, mm	Device Cavity Pitch, mm	Real Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
			Standard	1000
				2000
			4000	

Note: Small reel availability varies by model. Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)

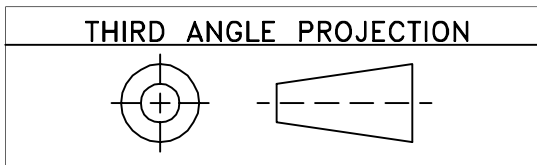


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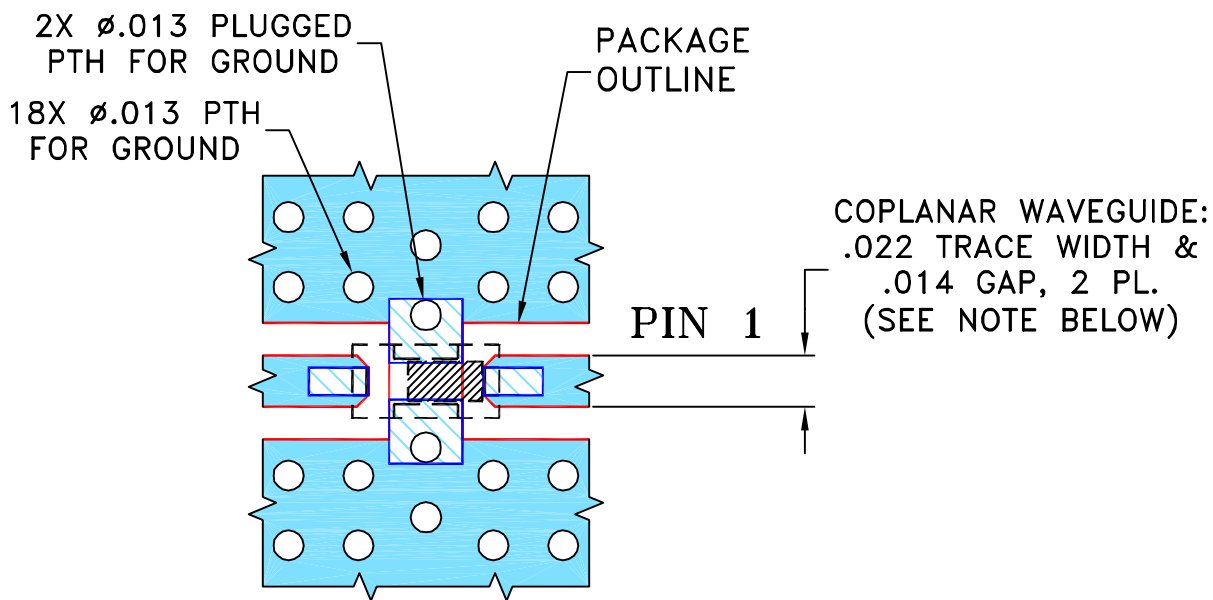
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REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M144975	NEW RELEASE	02/04/14	AV	RS

**SUGGESTED MOUNTING CONFIGURATION  
FOR JC0603C-1 CASE STYLE, "04FL01" PIN CODE**



**NOTES:**

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010" ± .001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

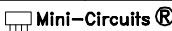
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN AV	01/24/14
TOLERANCES ON:	CHECKED IL	02/03/14
2 PL DECIMALS ±	APPROVED RS	02/04/14
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

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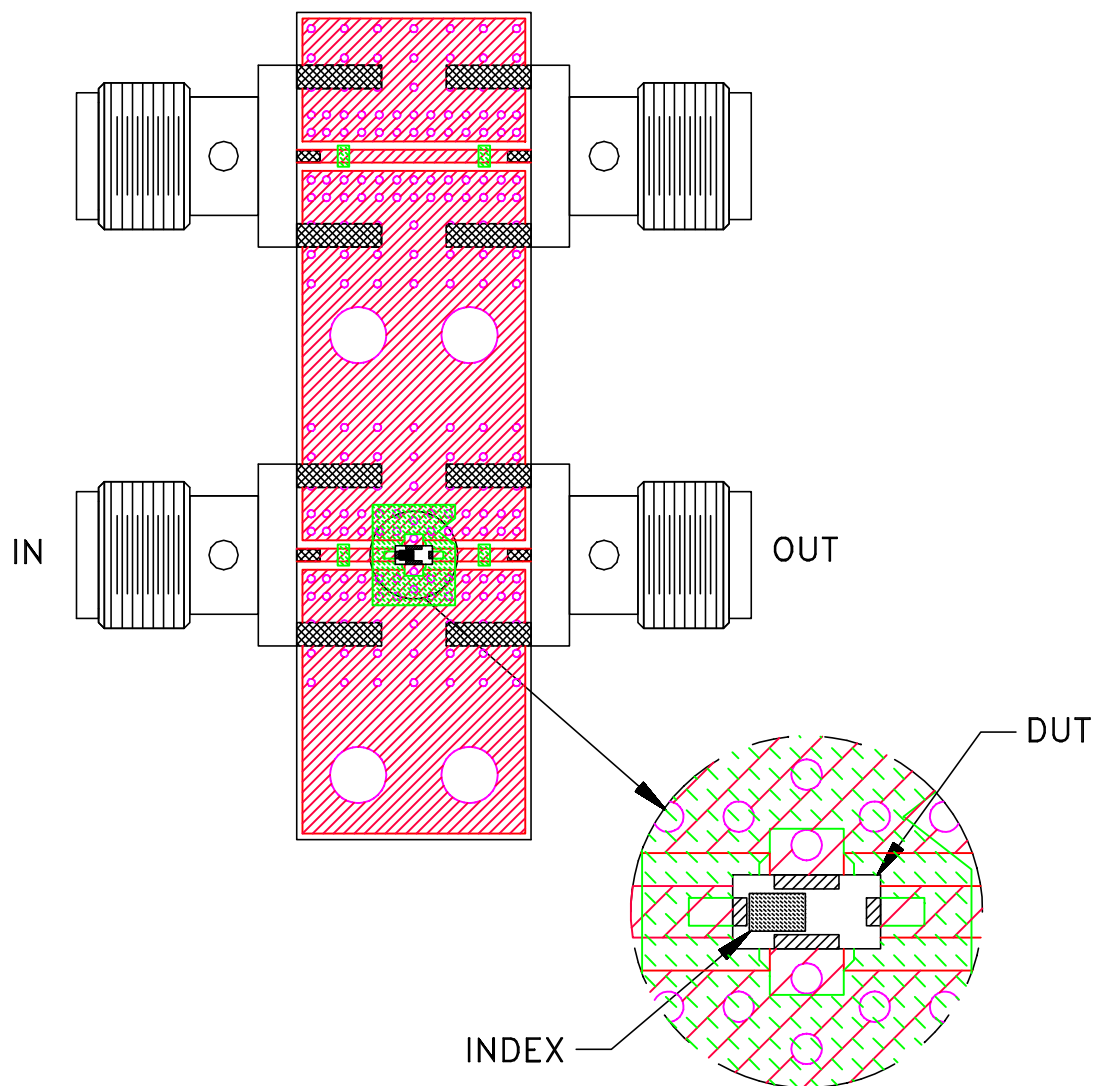
**PL, 04FL01, JC0603C-1, TB-720+**

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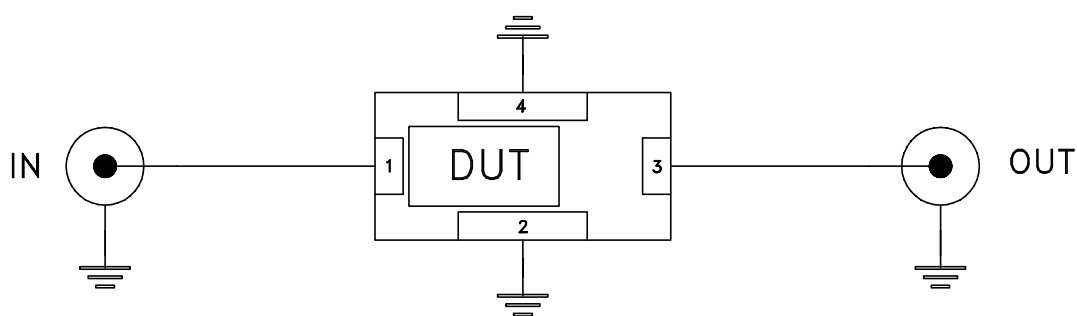
ASHEETA1.DWG REV:A DATE:01/12/95

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-412	OR
FILE:	98PL412	SCALE: 12:1	SHEET: 1 OF 1

# Evaluation Board and Circuit




TB-720+



Schematic Diagram

## Notes:

1. 50 Ohm 2.92 mm End Launch Female connectors.
2. PCB Material: R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.010 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 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° 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 Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, 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