Ceramic

Bandpass Filter

BPJC-542R+

50Ω 4900 to 5900 MHz

The Big Deal

- Passband optimized for high band Wi-Fi
- Tiny size, 0603
- High rejection, 40 dB in lower stopband; 34 dB in upper stopband
- Low cost

CASE STYLE: JC0603C-1

Product Overview

Mini-Circuits' BPJC-542R+ is an LTCC bandpass filter with a passband from 4900 to 5900 MHz, optimized for use in Wi-Fi high-band applications. This model provides 1.0 dB passband insertion loss, 40 dB lower stopband rejection and 34 dB upper stopband rejection. The filter is capable of handling up to 1W RF input power and provides a wide operating temperature range from -55 to +100°C. Utilizing LTCC construction, the unit is fabricated in a tiny ceramic monolith (0.08 x 0.05 x 0.02") with excellent repeatability and low cost, suitable for volume production.

Key Features

Feature	Advantages
Passband optimized for high band Wi-Fi.	Optimized for the 4900 to 5900 MHz passband, this model is ideal for cleaning signal in high band Wi-Fi applications.
Tiny size (0.06 x 0.04 x 0.02")	Minimizes performance variations due to parasitics and saves space in dense circuit board layouts.
High stopband rejection	Effective suppression of unwanted out-of-band spurs over a wide stopband range results in better receiver sensitivity and dynamic range.
Wraparound terminations	Excellent solderability and easy visual inspection.
Wide operating temperature range, -55 to +100°C	Reliable performance in extreme environments.

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50Ω 4900 to 5900 MHz

CASE STYLE: JC0603C-1

+RoHS Compliant

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

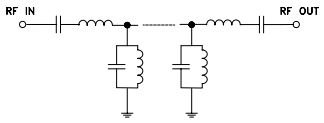
Features

- High Rejection.
- miniature size 0603 (1.6x0.8mm)
- LTCC construction
- low cost
- aqueous washable

Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee

Functional Schematic



Pad Connections

Input	1
Output	3
Ground	2,4

Electrical Specifications at 25°C

Parameter		Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	5400	—	MHz
	Insertion Loss	4900 – 5900	—	1.0	1.5	dB
	VSWR	4900 – 5900	—	1.4	2	:1
Stop Band, Lower	Rejection	DC – 2700	29	40	—	dB
Stop Band, Upper	Rejection	9800 - 12000	30	34	—	dB dB

1. Tested on Evaluation Board TB-BPJC-542R+

Maximum Ratings

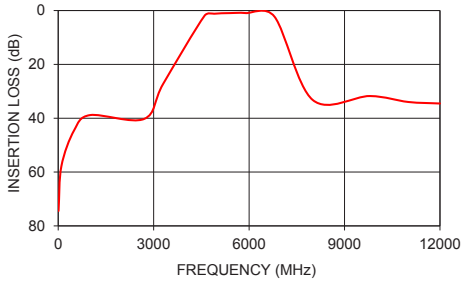
Operating Temperature	-55°C to +100°C
Storage Temperature*	-55°C to +100°C
RF Power Input	1W

* Refer to product storage temperature after installation
Suggestion for T&R unused product storage condition:
+5 ~ +35 °C, Humidity 45~75%RH, 12 month Max

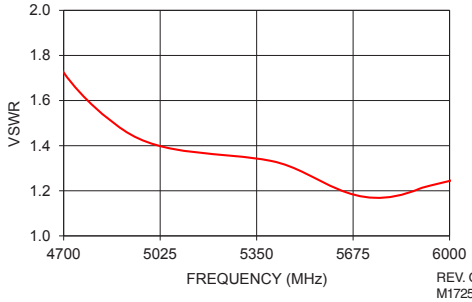
Typical Performance Data at 25°C

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)
10	74.45	252.64
100	57.82	226.98
500	44.50	128.68
1000	38.84	96.27
2700	40.27	65.23
3300	27.22	41.86
4600	1.93	2.07
4900	1.19	1.47
5400	0.95	1.33
5900	0.95	1.21
6800	2.30	2.10
8000	33.22	15.80
9800	31.76	29.52
11000	33.96	34.59
12000	34.54	38.23

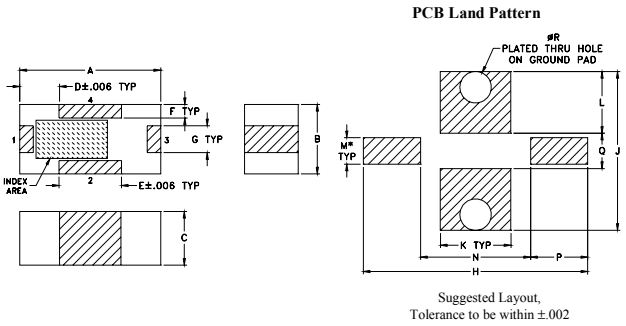
BPJC-542R+
INSERTION LOSS (Full Band)



BPJC-542R+
VSWR



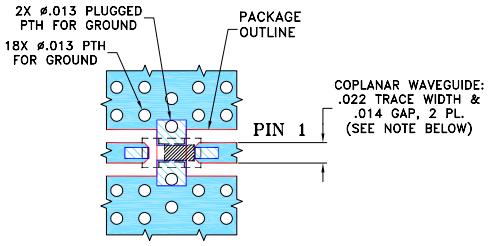
Outline Drawing



Pad Connections

Input	1
Output	3
Ground	2,4

Evaluation Board MCL P/N: TB-BPJC-542R+
Suggested PCB Layout (PL-412)



NOTES:

1. 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.
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 Dimensions (inch / 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

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

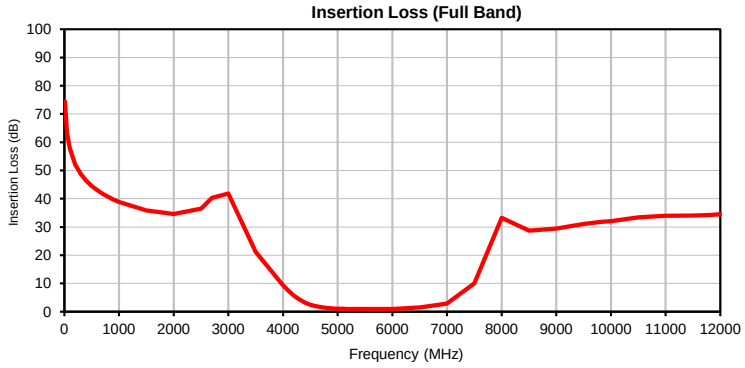
Ceramic Bandpass Filter BPJC-542R+

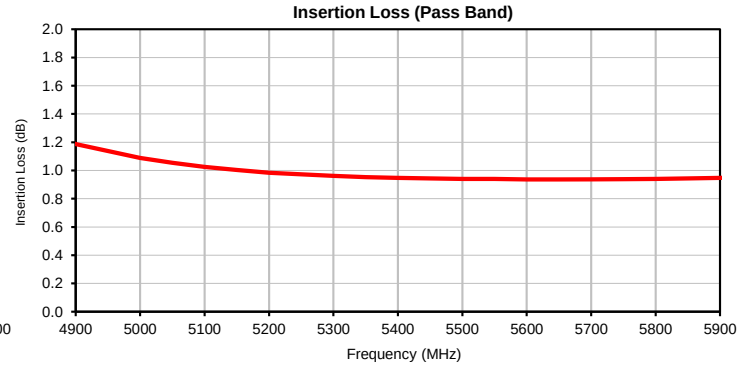
Typical Performance Data

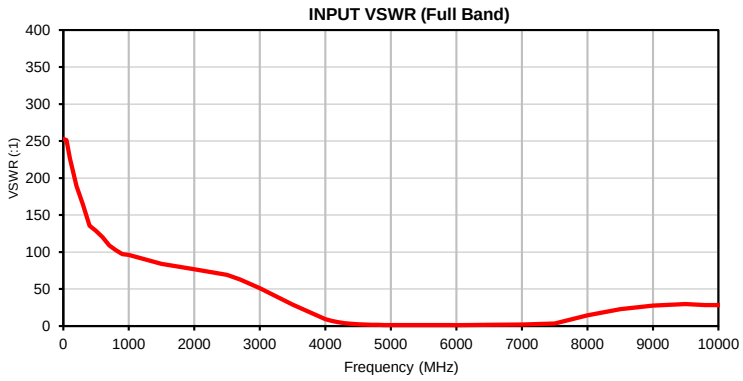
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT VSWR (:1)	OUTPUT VSWR (:1)
10	74.45	252.64	217.31
50	63.21	251.08	219.06
100	57.82	226.98	196.33
200	52.10	189.03	161.21
300	48.76	164.27	132.70
400	46.38	135.44	117.67
500	44.50	128.68	105.55
600	42.99	120.13	97.92
700	41.71	109.01	89.62
800	40.63	102.54	85.31
900	39.68	97.21	79.52
1000	38.84	96.27	77.36
1500	35.86	83.92	68.43
2000	34.60	76.62	66.47
2500	36.51	69.21	69.74
2700	40.27	62.97	65.23
3000	41.83	51.31	55.87
3500	21.18	29.14	32.31
4000	9.28	9.43	10.63
4100	7.36	6.99	7.84
4200	5.69	5.13	5.70
4300	4.30	3.82	4.21
4400	3.24	2.92	3.19
4500	2.45	2.32	2.51
4600	1.93	1.94	2.07
4700	1.57	1.69	1.78
4800	1.34	1.54	1.59
4900	1.19	1.45	1.47
5000	1.09	1.39	1.39
5050	1.05	1.37	1.37
5100	1.03	1.36	1.34
5150	1.00	1.35	1.33
5200	0.98	1.34	1.32
5250	0.97	1.33	1.31
5300	0.96	1.34	1.30
5350	0.95	1.34	1.30
5400	0.95	1.33	1.30
5450	0.94	1.33	1.30
5500	0.94	1.33	1.30
5550	0.94	1.33	1.30
5600	0.94	1.31	1.29
5650	0.94	1.30	1.28
5700	0.94	1.29	1.27
5750	0.94	1.28	1.25
5800	0.94	1.26	1.23
5850	0.94	1.24	1.21
5900	0.95	1.21	1.18
6000	0.97	1.16	1.12
6500	1.49	1.54	1.49
7000	2.87	2.18	2.28
7500	10.07	3.49	4.58
8000	33.22	14.46	15.80
8500	28.69	22.66	23.93
9000	29.46	27.73	30.70
9500	31.04	29.62	31.56
9800	31.76	28.40	29.52
10000	32.07	28.39	28.39
10500	33.42	30.07	27.10
11000	33.96	34.59	28.52
11500	34.00	38.49	33.14
11800	34.21	37.65	35.34
12000	34.54	35.64	38.23

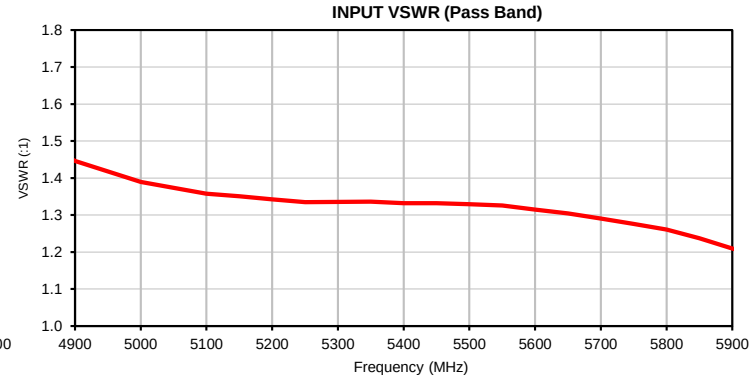
Ceramic Bandpass Filter BPJC-542R+

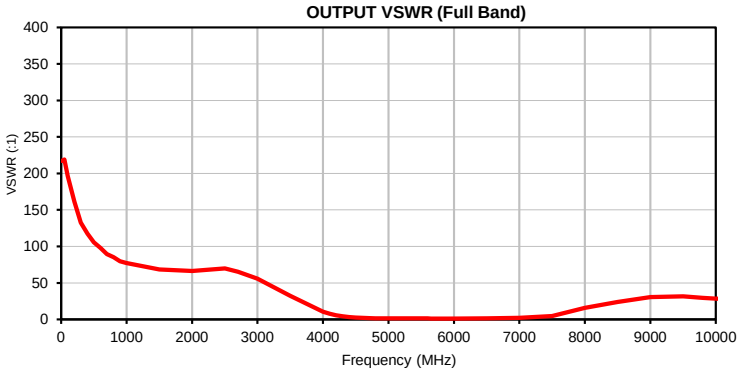
Typical Performance Curves

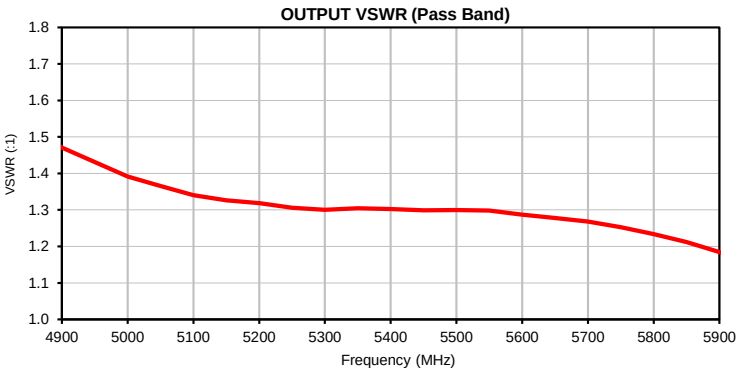








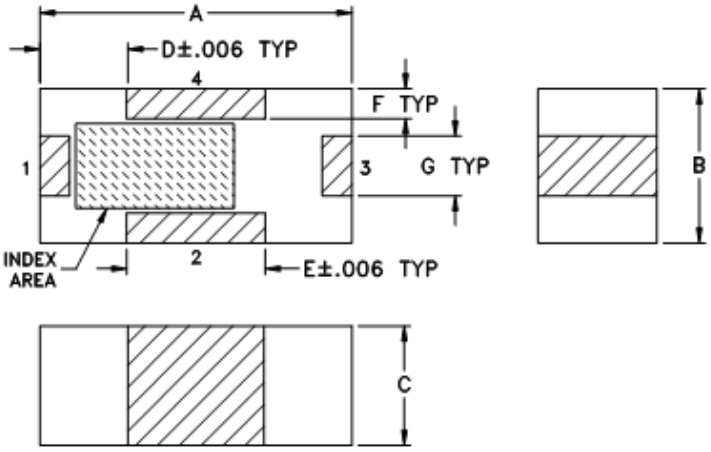




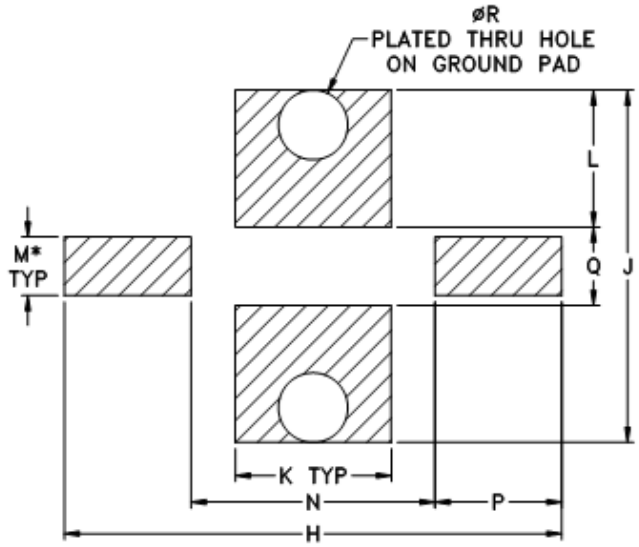
Case Style JC

Outline Dimensions

JC0603C-1



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.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. ± .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.

Tape & Reel Packaging TR-F74

DEVICE ORIENTATION IN T&R

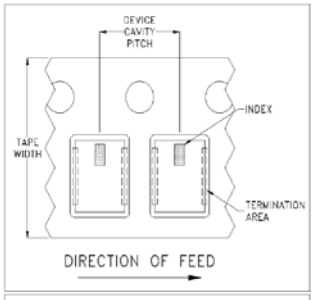


ILLUSTRATION 1

Applicable Case Styles
GE0805C-1
GE0805C-1AP
JV1210C-1
GU2939

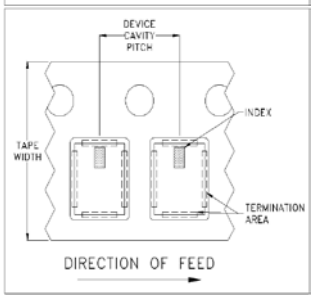


ILLUSTRATION 2

Applicable Case Styles
JV1210C
JV1210C-2
JV1210C-3
JV1210C-4
JV1210C-5
JV1210C-6
JV1210C-11

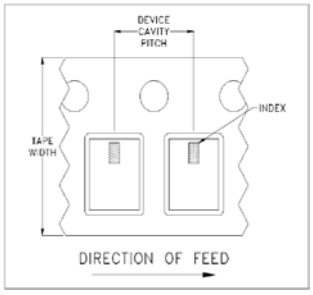


ILLUSTRATION 3

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
				1000
			Standard	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

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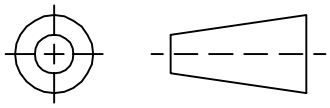
Mini-Circuits ISO 9001 & ISO 14001 Certified

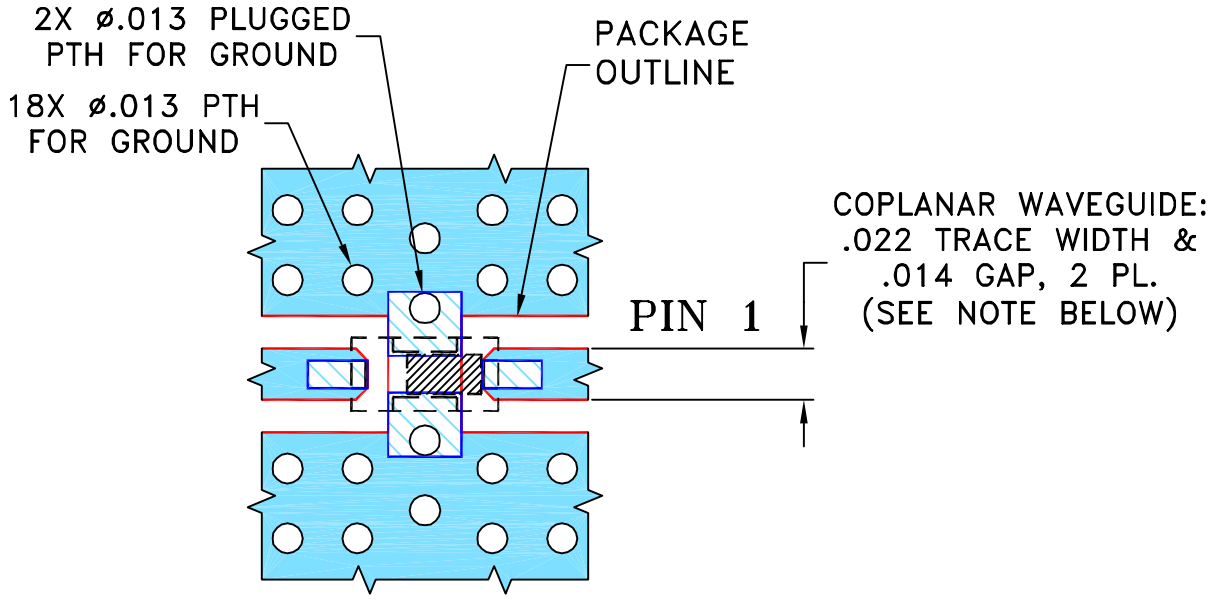
THIRD ANGLE PROJECTION



REVISIONS

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

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



NOTES:

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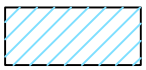
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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 ±			

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

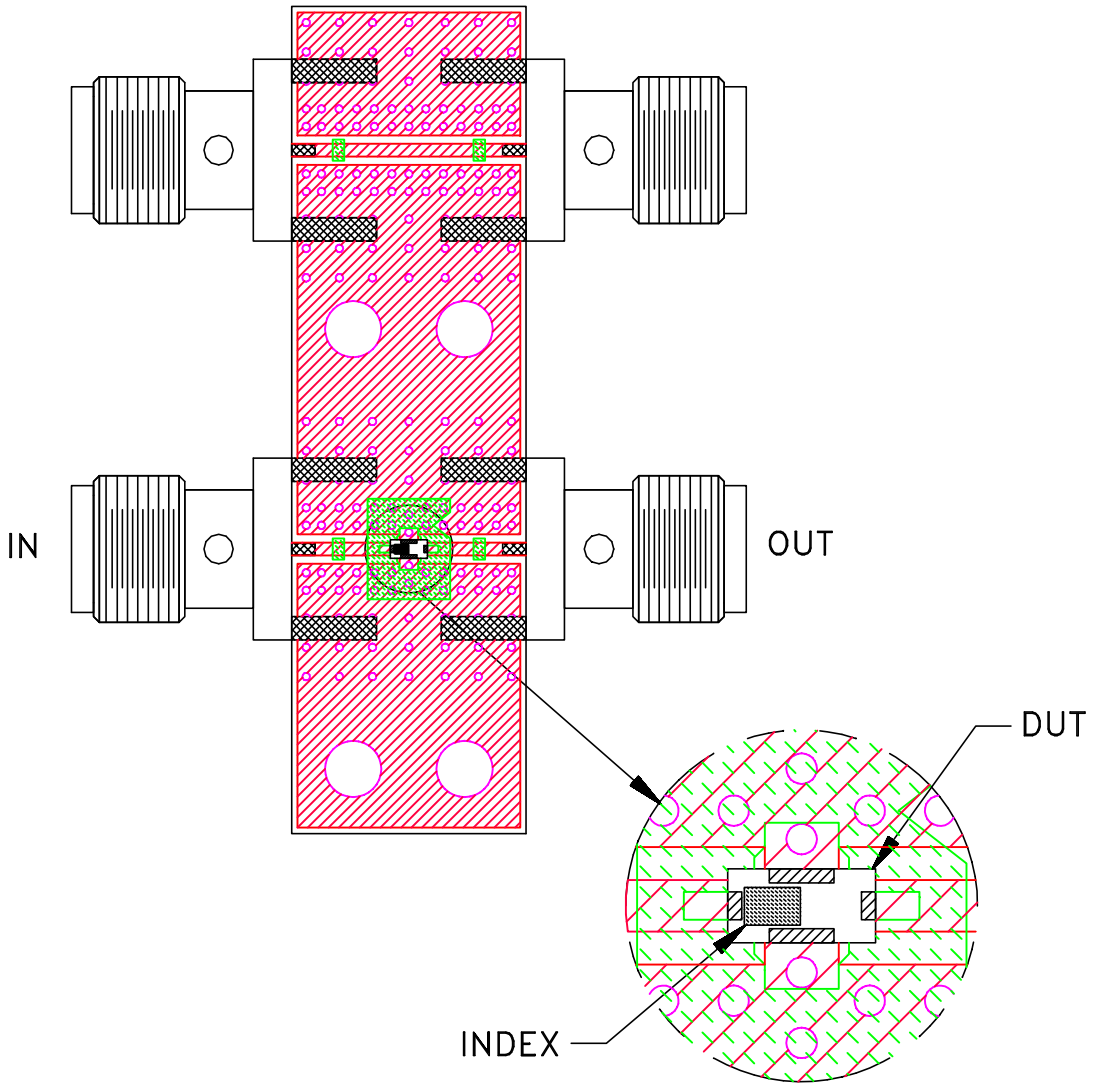
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

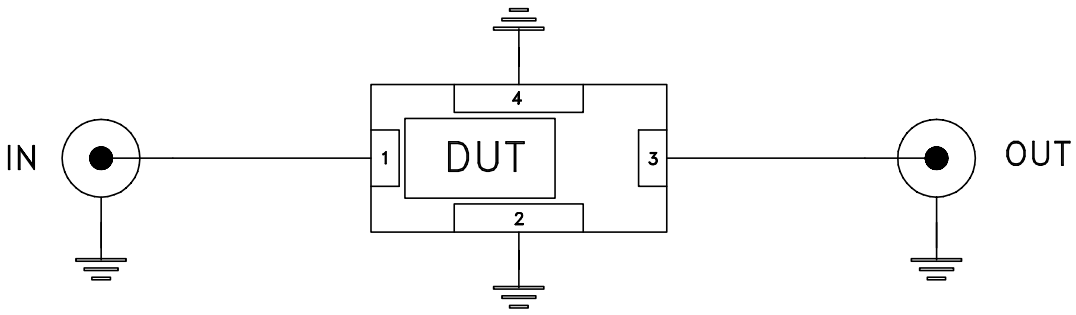
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-412	OR

FILE:	SCALE:	SHEET:
98PL412	12:1	1 OF 1

Evaluation Board and Circuit



TB-BPJC-542R+



Schematic Diagram

Notes:

1. 50 Ohm 2.92 mm End Launch Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.5, Thickness=.010 inch.

Mini-Circuits®

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Environmental Specifications ENV06

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