

# LTCC Diplexer

## DPJC-252-492R+

50Ω 2400 to 2500 MHz (4900 to 5950 MHz)

### Maximum Ratings

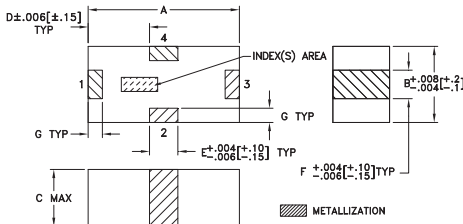
Operating Temperature	-40°C to 85°C
Storage Temperature*	-40°C to 85°C
RF Power Input**	2W

\*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. Permanent damage may occur if any of these limits are exceeded.  
\*\* Derate linearly to 1W at 85°C.

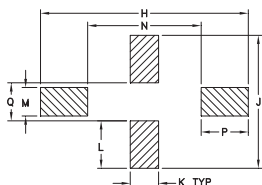
### Pad Connections

Low Pass Port	1
Band Pass Port	3
Common Port	2
Ground	4

### Outline Drawing



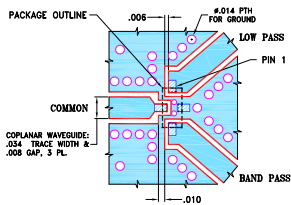
### PCB Land Pattern



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
0.63	.032	.024	.026	.012	.012	.006	.087
1.60	0.81	0.61	0.66	0.30	0.30	0.15	2.21
J	K	L	M	N	P	Q	wt
.055	.012	.020	.012	.047	.020	.016	grams
1.40	0.30	0.51	0.30	1.19	0.51	0.41	.005

Evaluation Board MCL P/N: TB-1030+  
Suggested PCB Layout (PL-570)



- NOTES:  
1. TRACE WIDTH & GAP ARE SHOWN FOR ROGERS RO4235 WITH DIELECTRIC THICKNESS .020±.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.

### 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-Circuit's 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-Circuit's website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)

### Features

- low insertion loss, 0.7 dB typ.
- miniature size 0603
- low cost
- aqueous washable

### Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee



Generic photo used for illustration purposes only

CASE STYLE: JC0603C-3

+RoHS Compliant

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

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

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

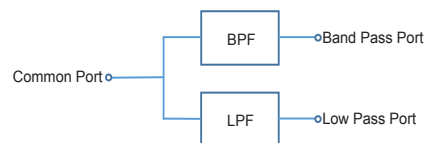
Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Insertion Loss	Low Pass	2400 - 2500	-	0.7	0.9	dB
		Band Pass	4900 - 5950	-	0.7	1.1	
	Return Loss	Low Pass	2400 - 2500	9.5	18	-	dB
		Band Pass	4900 - 5950	9.5	26	-	
Stop Band Rejection	Band Pass	800 - 2500	20	34	-	dB	
		9800 - 11900	20	37	-		
	Low Pass	4800 - 6000	20	28	-	dB	
		7200 - 7500	20	28	-	dB	

<sup>1</sup> Tested on Evaluation Board TB-1030+

### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)		
	Low Pass Port	Band Pass Port	Common Port	Low Pass Port	Band Pass Port
500	0.26	33.38	23.46	23.58	0.07
1000	0.38	29.27	17.05	17.21	0.07
1800	0.59	31.50	14.37	14.62	0.25
2000	0.62	33.60	14.69	15.26	0.30
2400	0.71	32.51	16.13	18.02	0.43
2450	0.71	31.27	16.54	18.21	0.45
2500	0.73	29.95	16.62	18.44	0.47
3000	1.11	19.31	16.90	16.20	0.85
3500	3.15	9.11	13.57	8.92	2.60
4000	16.50	1.80	13.49	1.42	11.64
4800	29.14	0.82	29.22	0.73	44.73
4900	29.23	0.79	32.17	0.70	48.76
5400	28.29	0.75	24.25	0.59	22.20
5950	27.98	0.91	14.69	0.54	14.37
6000	28.02	0.94	14.23	0.54	13.95
7200	27.60	1.82	8.67	0.23	8.88
7500	27.52	2.40	7.24	0.18	7.23
9000	24.57	17.45	0.93	0.26	0.89
9800	20.29	36.44	0.48	0.30	0.44
11000	14.27	37.30	0.59	0.74	0.54
11900	10.19	30.74	1.08	1.29	1.13
12000	9.86	29.67	1.16	1.30	1.22

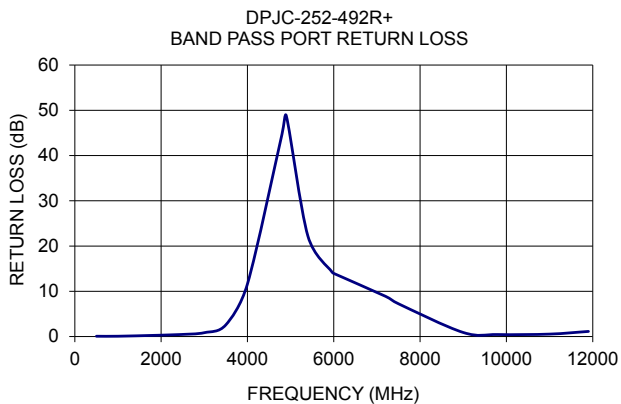
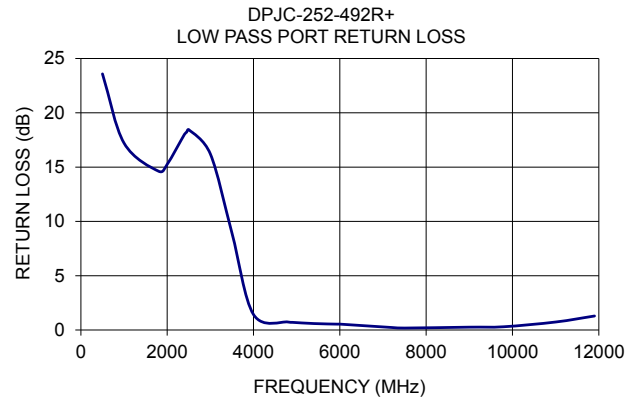
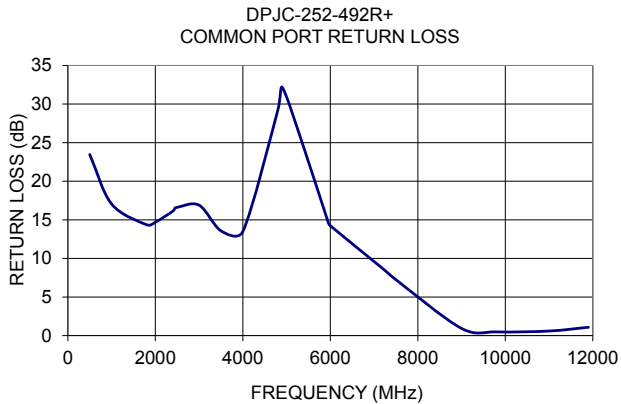
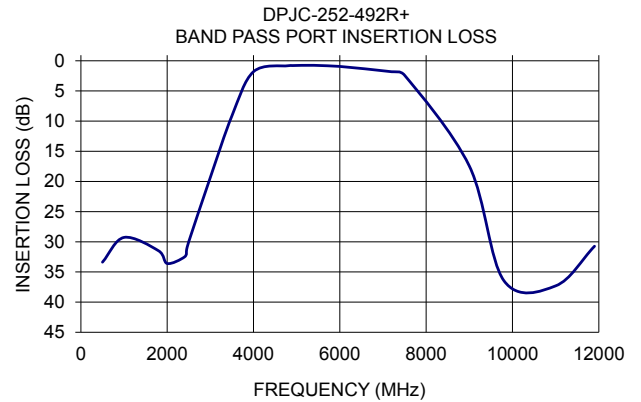
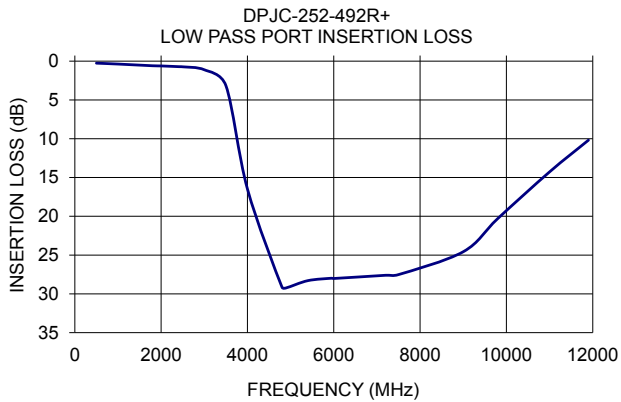
### Block Diagram



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REV. OR  
M172548  
DPJC-252-492R+  
AVB/CP/AM  
190514  
Page 1 of 2



**Notes**

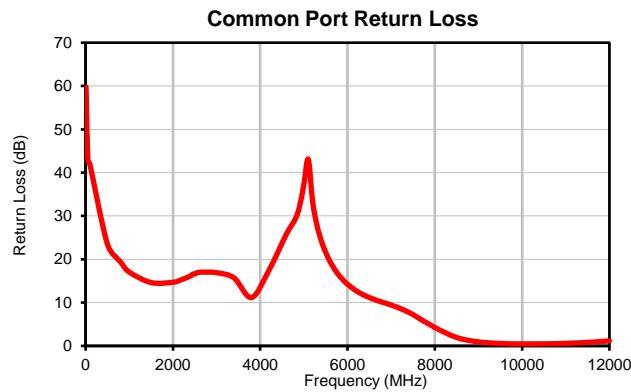
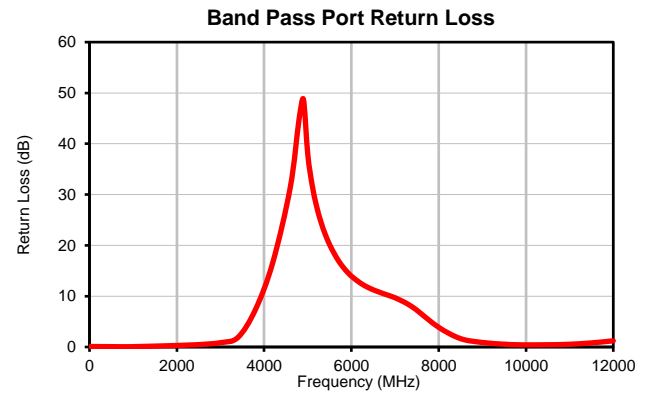
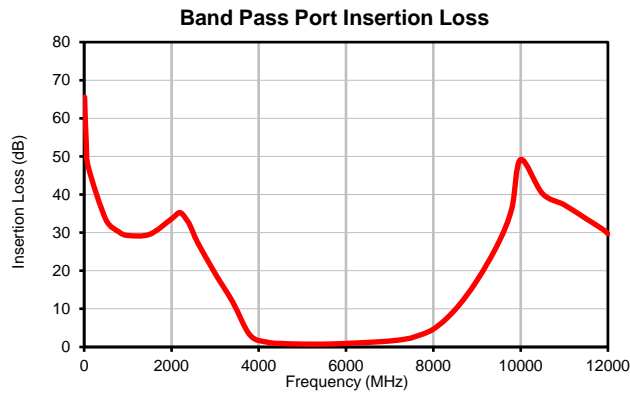
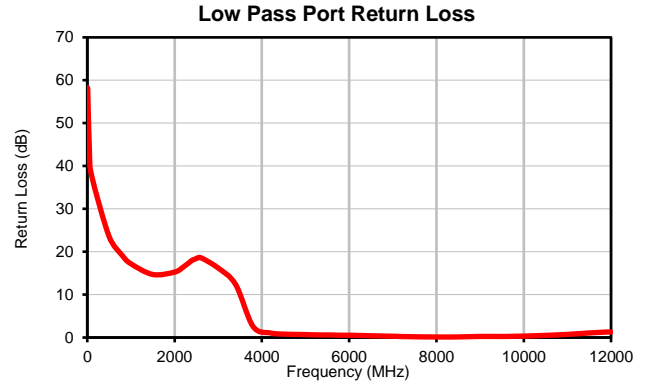
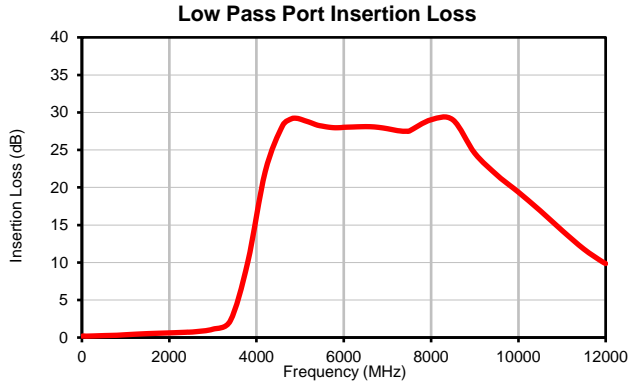
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## Typical Performance Data

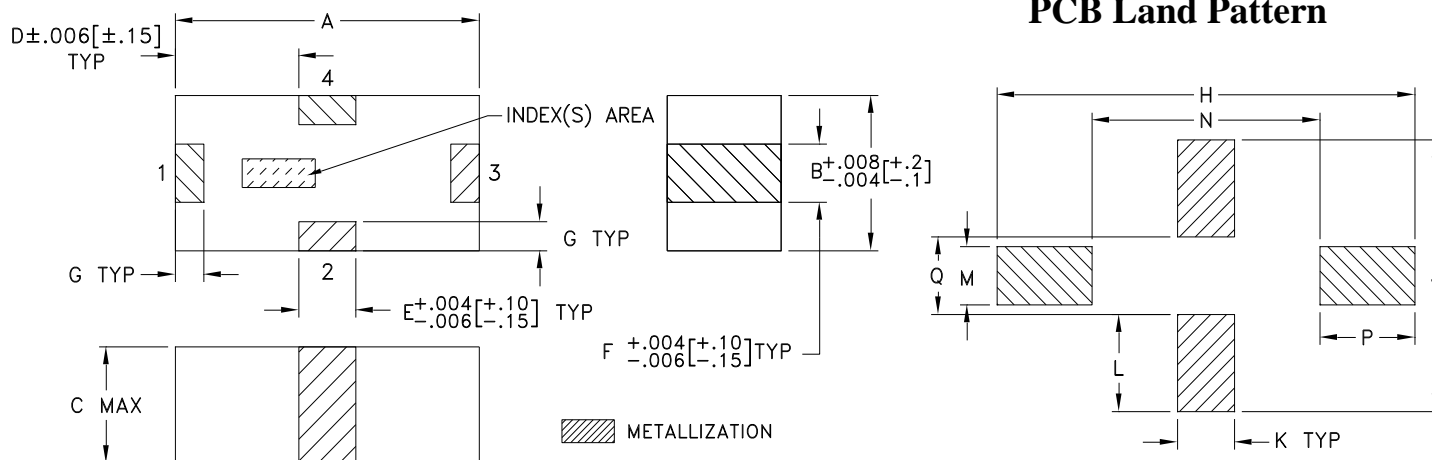
FREQUENCY (MHz)	INSERTION LOSS (dB)		RETURN LOSS (dB)		
	Low Pass port	Band Pass port	Common port	Low Pass port	Band Pass port
	10	0.19	65.59	59.79	58.22
50	0.21	53.10	43.07	43.13	0.10
100	0.18	47.01	41.80	37.75	0.10
500	0.26	33.38	23.46	23.58	0.07
800	0.30	30.19	19.40	19.17	0.05
1000	0.38	29.27	17.05	17.21	0.07
1500	0.52	29.57	14.62	14.71	0.18
2000	0.62	33.60	14.69	15.26	0.30
2200	0.66	35.27	15.30	16.44	0.36
2400	0.71	32.51	16.13	18.02	0.43
2410	0.72	32.28	16.19	18.07	0.44
2420	0.72	32.02	16.28	18.12	0.44
2430	0.72	31.79	16.39	18.14	0.44
2440	0.72	31.53	16.48	18.18	0.45
2450	0.71	31.27	16.54	18.21	0.45
2460	0.72	31.00	16.57	18.26	0.45
2470	0.72	30.74	16.58	18.31	0.46
2480	0.72	30.48	16.61	18.35	0.46
2490	0.73	30.20	16.61	18.40	0.46
2500	0.73	29.95	16.62	18.44	0.47
2600	0.77	27.41	16.99	18.62	0.52
3000	1.11	19.31	16.90	16.20	0.85
3400	2.23	11.88	15.70	12.34	1.88
3800	10.06	3.12	11.15	2.55	7.34
4200	22.10	1.26	17.44	1.06	16.65
4600	28.27	0.89	25.81	0.77	31.43
4800	29.14	0.82	29.22	0.73	44.73
4900	29.23	0.79	32.17	0.70	48.76
5000	29.11	0.77	37.26	0.70	37.95
5100	28.91	0.76	43.10	0.65	31.93
5200	28.73	0.75	33.35	0.63	27.78
5300	28.51	0.75	27.85	0.62	24.67
5400	28.29	0.75	24.25	0.59	22.20
5500	28.18	0.77	21.59	0.61	20.16
5600	28.08	0.78	19.47	0.59	18.50
5700	28.00	0.82	17.74	0.57	17.03
5800	27.96	0.85	16.35	0.54	15.83
5900	27.97	0.89	15.20	0.54	14.81
5950	27.98	0.91	14.69	0.54	14.37
6000	28.02	0.94	14.23	0.54	13.95
6200	28.06	1.04	12.71	0.49	12.62
6400	28.10	1.15	11.62	0.44	11.64
6600	28.10	1.27	10.78	0.39	10.92
6800	28.01	1.41	10.08	0.34	10.31
7000	27.83	1.58	9.44	0.31	9.69
7200	27.60	1.82	8.67	0.23	8.88
7250	27.56	1.89	8.47	0.23	8.66
7300	27.53	1.97	8.24	0.22	8.41
7350	27.49	2.06	8.01	0.21	8.14
7400	27.49	2.16	7.77	0.21	7.86
7450	27.49	2.28	7.51	0.20	7.56
7500	27.52	2.40	7.24	0.18	7.23
8000	29.02	4.69	4.26	0.13	3.88
8500	29.00	9.81	1.94	0.14	1.65
9000	24.57	17.45	0.93	0.26	0.89
9500	21.71	27.52	0.57	0.25	0.55
9800	20.29	36.44	0.48	0.30	0.44
10000	19.38	49.19	0.46	0.34	0.42
10500	16.90	40.26	0.49	0.50	0.44
11000	14.27	37.30	0.59	0.74	0.54
11500	11.79	33.67	0.81	1.07	0.80
11900	10.19	30.74	1.08	1.29	1.13
12000	9.86	29.67	1.16	1.30	1.22

## Typical Performance Curves



## Outline Dimensions

JC0603C-3



CASE #	A	B	C	D	E	F	G	H	J	K	L
JC0603C-3	.063 (1.60)	.032 (.80)	.024 (.60)	.026 (.65)	.012 (.30)	.012 (.30)	.006 (.15)	.087 (2.20)	.055 (1.40)	.012 (.30)	.020 (.50)

CASE #	M*	N	P	Q	WT. GRAMS
JC0603C-3	.012 (.30)	.047 (1.20)	.020 (.50)	.016 (.40)	.005

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

### Notes:

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



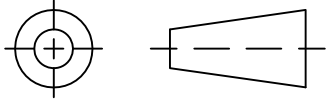
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

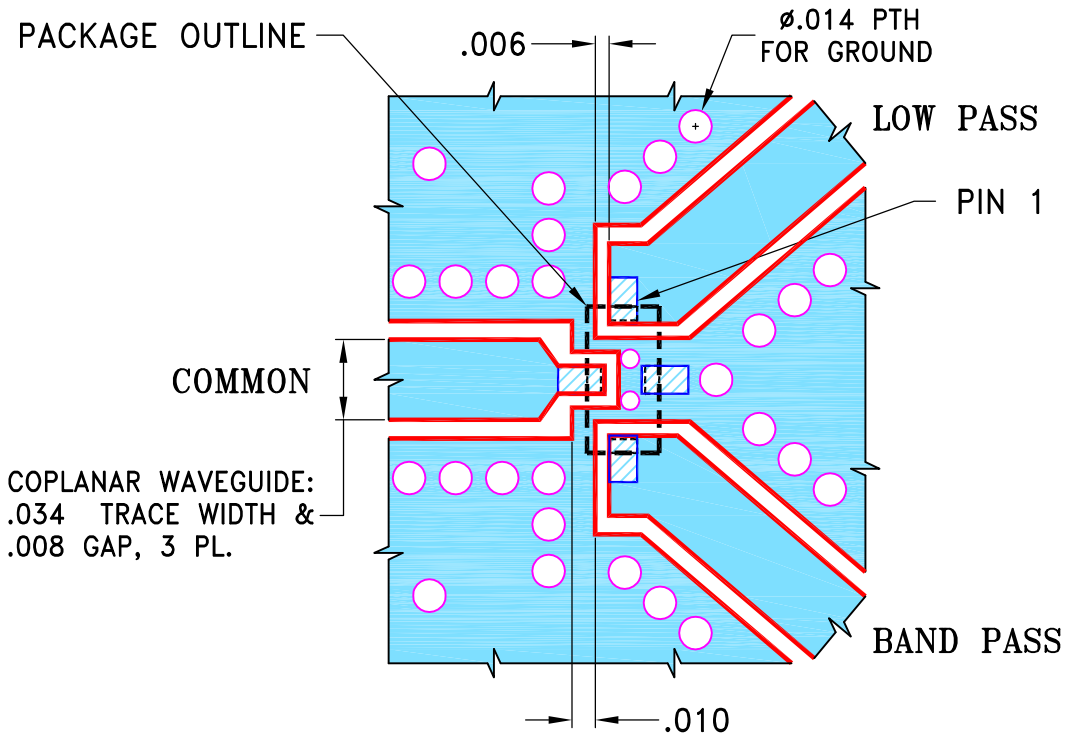
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M168200	NEW RELEASE	05/31/18	NP	SL
A	M174015	UPDATED DESCRIPTION OF THE PORTS	04/25/19	ITG	SL

SUGGESTED MOUNTING CONFIGURATION  
FOR JC0603C-3 CASE STYLE, "04DP01" PIN CODE



NOTES:

- TRACE WIDTH & GAP ARE SHOWN FOR ROGERS RO4233 WITH DIELECTRIC THICKNESS  $.020 \pm .0015$ .  
COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & 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.

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	NP 05/30/18
	CHECKED	GF 05/30/18
	APPROVED	SL 05/31/18

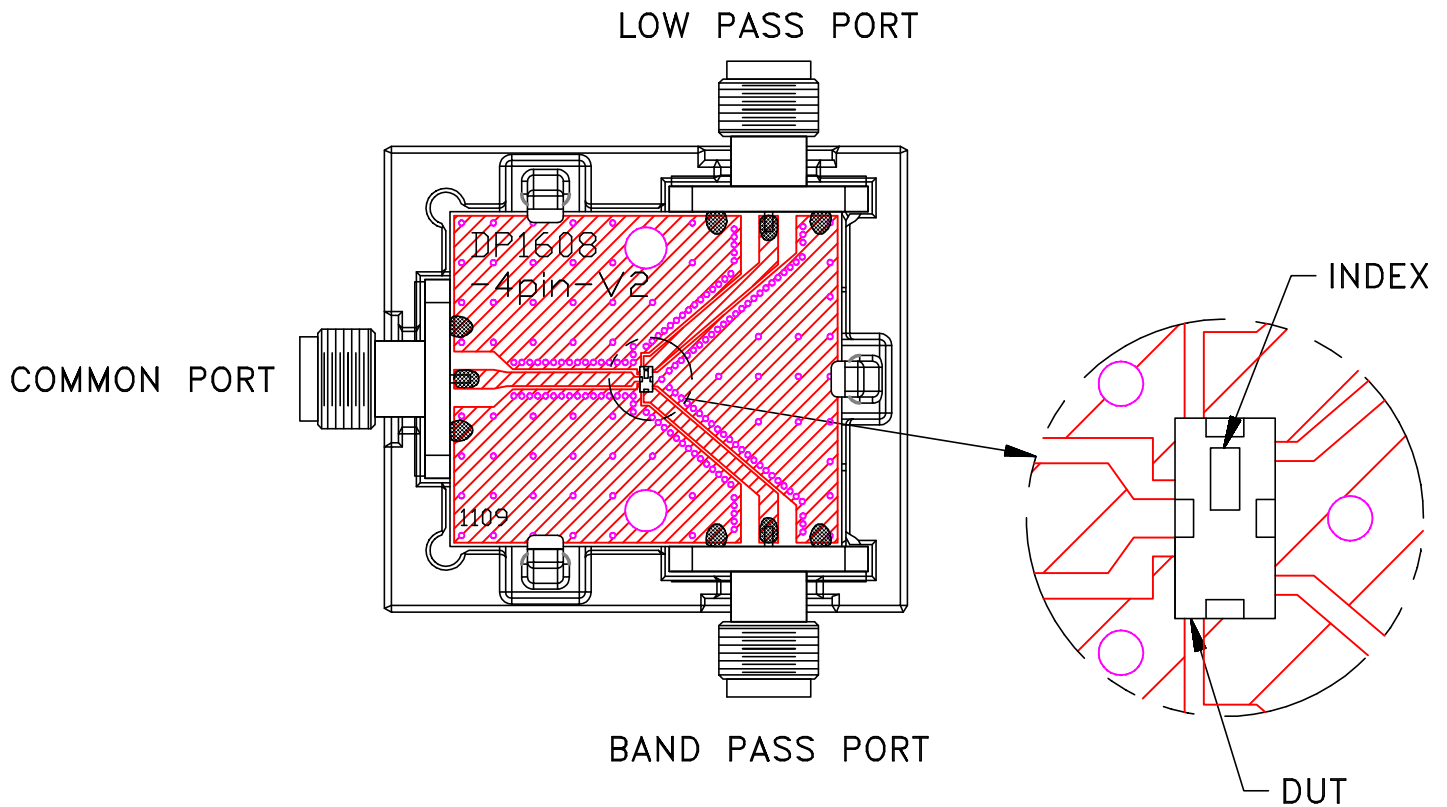
**Mini-Circuits<sup>®</sup>** 13 Neptune Avenue  
Brooklyn NY 11235

PL, 04DP01 JC0603C-3, TB-1030+

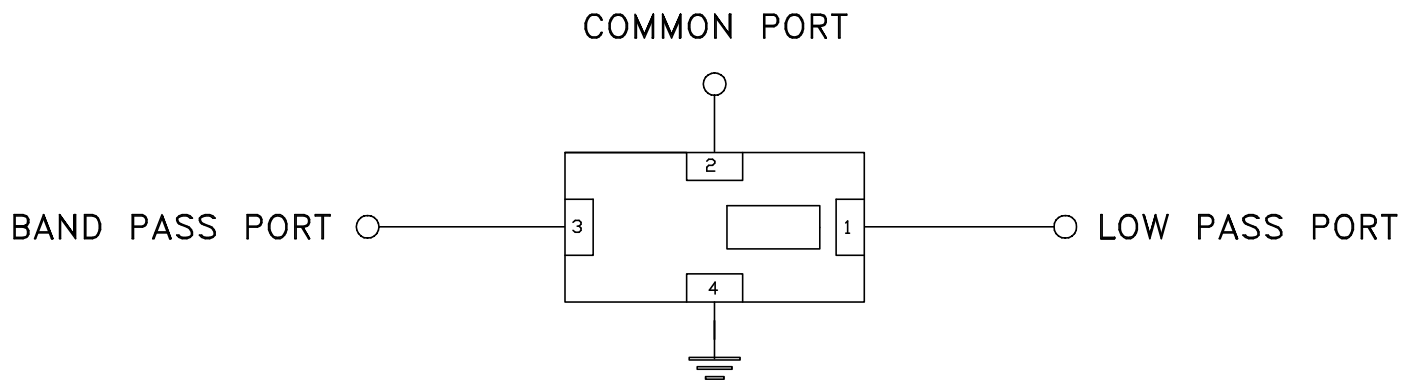
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-570	A
FILE:	98PL570	SCALE: 12:1	SHEET: 1 OF 1

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# Evaluation Board and Circuit




TB-1030+



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04233 or equivalent,  
Dielectric Constant=3.5, Thickness=.020 inch.

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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	-40° to 85° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-40° to 85° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-40° to 125°C, 100 cycles	MIL-STD-202 Method 107, Condition A-3 except -40°C instead of -55° C and +125° C instead of -85° C
Solder Reflow Heat	Pb-Free Process 245° -250°C peak,	J-STD-020, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Shelf Life	Shelf life is 12 months when kept in sealed bags. Unused parts are to be resealed to preserve shelf life for proper solderability.	