

Ceramic

Diplexer

DPGE-252-492R+

50Ω 2400 to 2500 MHz (4900-5950 MHz)

The Big Deal

- Optimized for diplexing Wi-Fi high band and low band
- Tiny size, 0805
- Low passband insertion loss, 0.5 dB
- High rejection, 25 dB high pass, 36 dB low pass
- Low cost



CASE STYLE: GE0805C-10

Product Overview

Mini-Circuits' DPGE-252-492R+ is an LTCC diplexer with a low passband from 2400 to 2500 MHz and a high passband from 4900 to 5950 MHz, optimized for diplexing Wi-Fi low band and high band signals. This model provides 0.5 dB typical passband insertion loss, 25 dB rejection in the high channel, and 36 dB rejection in the low channel. The filter is capable of handling up to 2W 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 0.03") with excellent repeatability and low cost, suitable for volume production.

Key Features

Feature	Advantages
Optimized for diplexing 2400 to 2500 MHz and 4900 to 5950 MHz bands	The DPGE-252-492R+ diplexer is specifically designed for splitting low channel and high channel signals in Wi-Fi applications.
Tiny size (0.08 x 0.05 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.
Good return loss, 23 dB typ.	Ensures good matching in 50Ω systems and minimizes in-band reflection.
Wraparound terminations	Excellent solderability and easy visual inspection.
Wide operating temperature range, -55 to +100°C	Reliable performance in extreme environments.

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 Diplexer

DPGE-252-492R+

50Ω 2400 to 2500 MHz (4900-5950 MHz)



CASE STYLE: GE0805C-10

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

Maximum Ratings

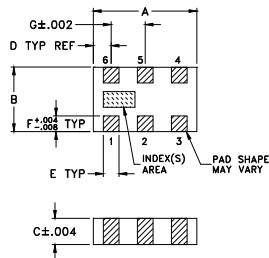
Operating Temperature	-55°C to 100°C
Storage Temperature*	-55°C to 100°C
RF Power Input**	2W at 25°C

*Refer to product storage temperature after installation.
** Passband rating, derate linearly to 1W at 100°C.
Suggestion for T&R unused product storage condition: +5~+35°C, Humidity 45-75%RH, 12 month max.

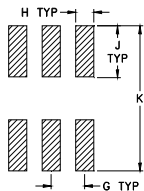
Pad Connections

Low Pass Port	6
High Pass Port	4
Common Port	2
Ground	1,3,5

Outline Drawing



PCB Land Pattern

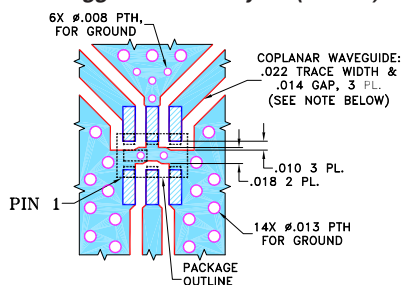


Suggested Layout, Tolerance to be within ±.002

Outline Dimensions (inch mm)

A	B	C	D	E	F
.079	.049	.020	.014	.012	.012
2.01	1.24	0.51	0.36	0.30	0.30
G	H	J	K	wt	
.026	.014	.039	.110	grams	
0.66	0.36	1.00	2.80	.005	

Evaluation Board MCL P/N: TB-DPGE252492R+ Suggested PCB Layout (PL-441)



NOTES:

1. COPLANAR WAVEGUIDE 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.

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Features

- small size 0805 (2.0 x 1.25 mm)
- low insertion loss, 0.5 dB typ.
- high rejection
- temperature stable
- LTCC construction

Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee

Electrical Specifications¹ at 25°C

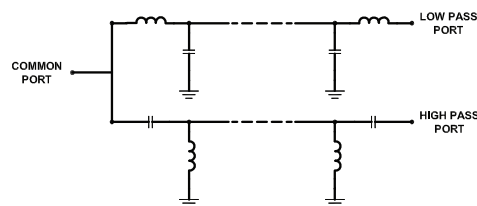
Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Insertion Loss	Low Pass	2400 - 2500	-	0.4	0.5	dB
		High Pass	4900 - 5950	-	0.5	0.65	
	Return Loss	Low Pass	2400 - 2500	10	33	-	dB
		High Pass	4900 - 5950	10	25	-	
Stop Band Rejection	High Pass	2400 - 2500	-	25	-	dB	
		4900 - 5950	-	23	-		
	Low Pass	800 - 2500	20	25	-	dB	
		9800 - 11900	12	19	-		
Low Pass	4800 - 6000	20	36	-	dB		
	7200 - 7500	20	33	-			

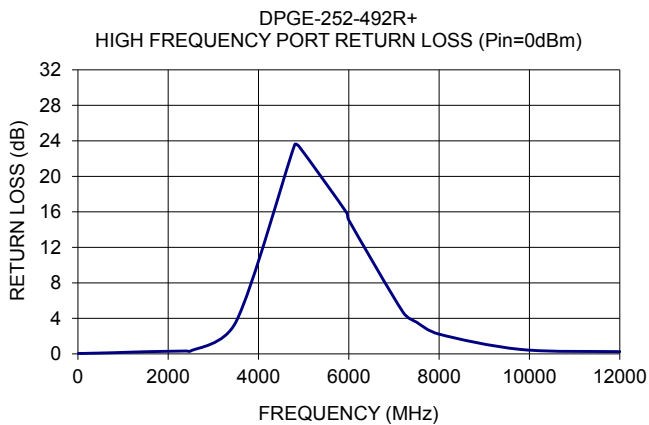
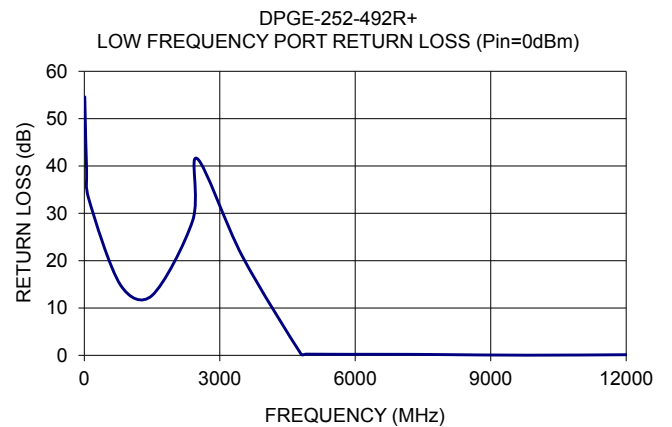
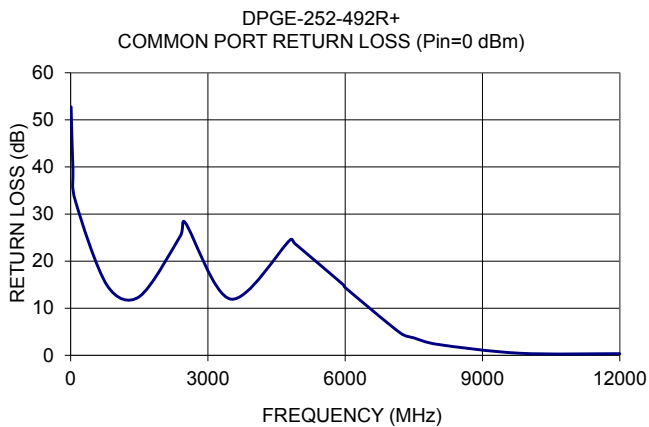
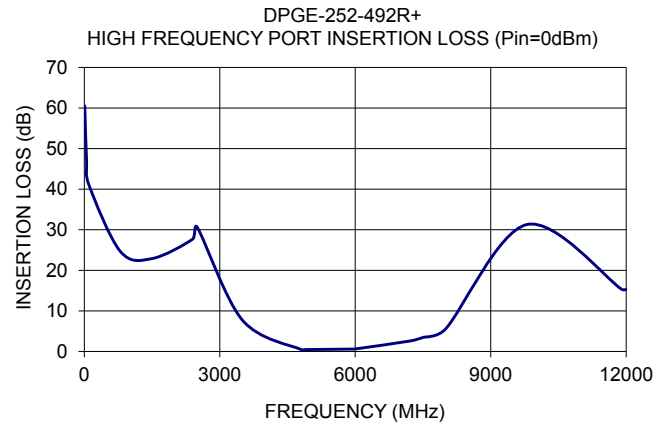
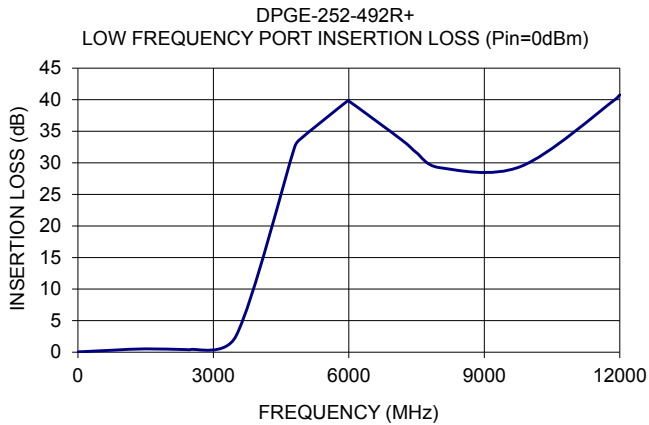
¹ Tested on Evaluation Board TB-DPGE252492R+

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)			Return Loss (dB)	
	Low Pass Port	High Pass Port	Common Port	Low Pass Port	High Pass Port
10	0.06	60.52	52.76	54.59	0.05
50	0.07	46.96	39.69	39.28	0.05
100	0.08	41.09	32.91	32.99	0.05
800	0.33	24.63	14.80	14.88	0.13
1500	0.53	22.89	12.45	12.65	0.24
2400	0.41	27.70	25.40	28.49	0.32
2500	0.43	30.61	28.21	41.56	0.33
3500	2.55	7.73	11.93	20.92	3.60
4800	32.53	0.48	24.55	0.27	23.55
4900	33.61	0.47	23.73	0.25	23.35
5950	39.69	0.59	15.07	0.21	15.91
6000	39.79	0.62	14.38	0.22	15.06
7200	33.47	2.56	4.77	0.21	4.69
7500	31.60	3.46	3.71	0.19	3.57
8000	29.25	5.55	2.35	0.15	2.22
9800	29.40	31.28	0.45	0.03	0.50
11900	40.05	15.32	0.36	0.13	0.26
12000	40.77	15.29	0.35	0.14	0.25

Functional Schematic





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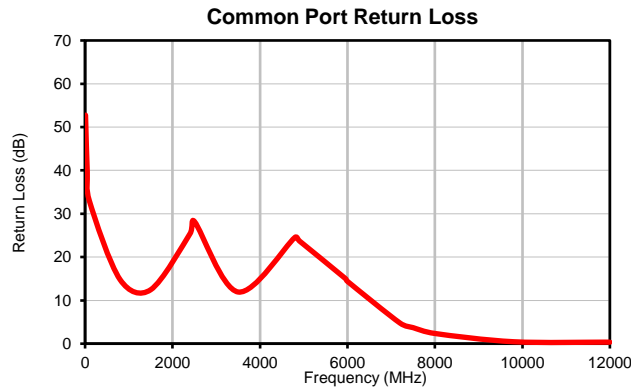
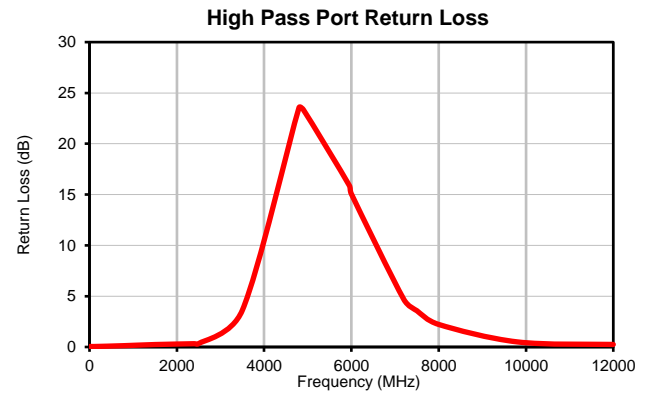
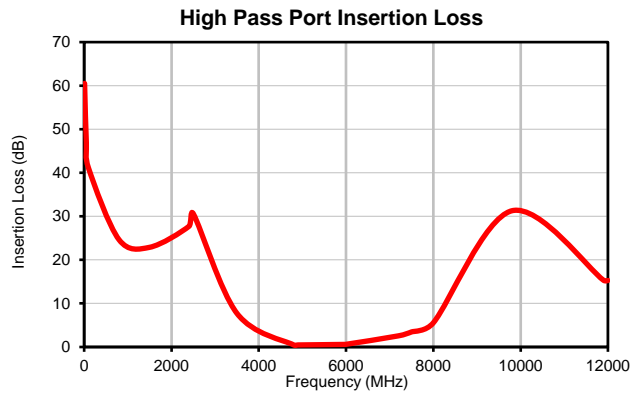
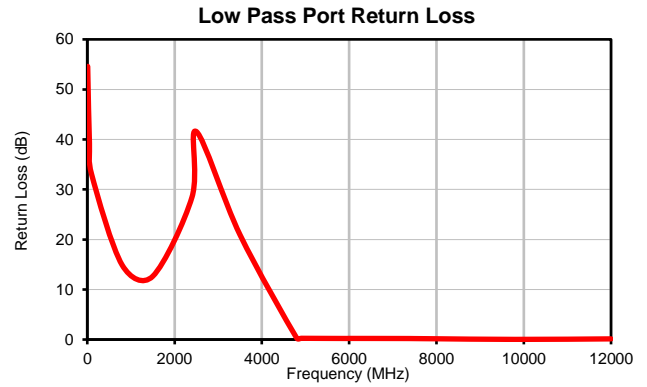
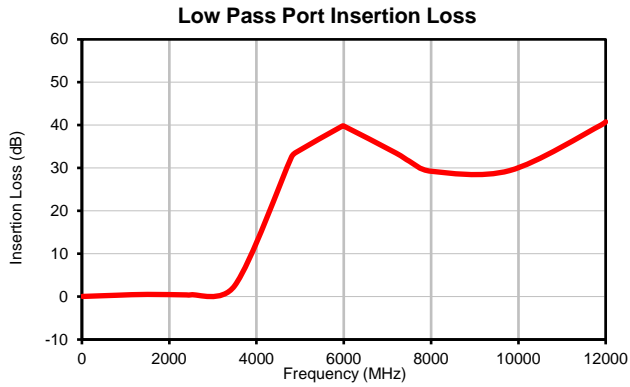
Ceramic Diplexer

DPGE-252-492R+

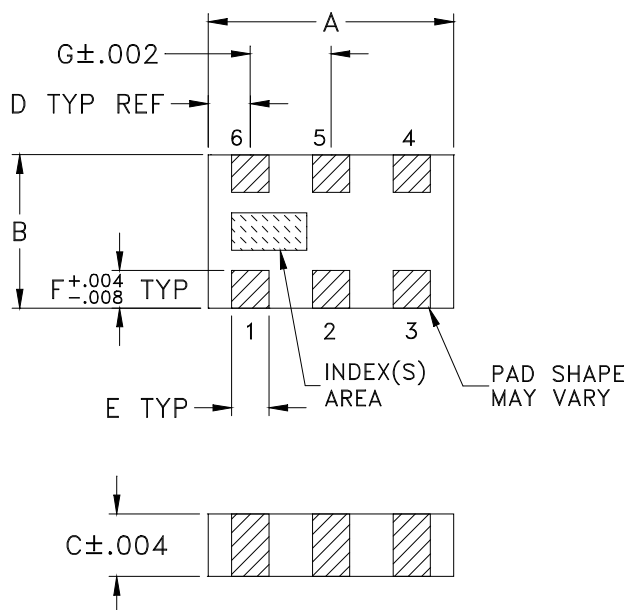
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		RETURN LOSS (dB)			
	Low Pass port	High Pass port	Common port	Low Pass port		High Pass port
				Low Pass port	High Pass port	
10	0.06	60.52	52.76	54.59	0.05	
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12000	40.77	15.29	0.35	0.14	0.25	

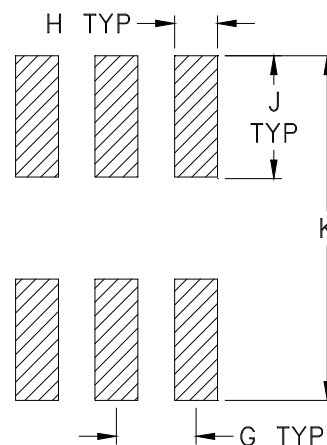
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

CASE #	A	B	C	D	E	F	G	H	J	K	WT.GRAM
GE0805C-10	.079 (2.00)	.049 (1.25)	.020 (0.50)	.014 (0.35)	.012 (0.30)	.012 (0.30)	.026 (0.65)	.014 (0.35)	.039 (1.00)	.110 (2.80)	.005

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .01$; 3 Pl. $\pm .005$

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 over Nickel plate. All models, no (+) suffix.
- Line width should be designed to match 50 Ω 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

Tape & Reel Packaging TR-F114

DEVICE ORIENTATION IN T&R



ILLUSTRATION 1

Applicable Case Styles	
GE0805C	JC0603C
GE0805C-1	JC0603C-4
GE0805C-1AP	JC0603C-6
GE0805C-7	
GE0805C-9	
GE0805C-10	
GE0805C-11	
GE0805C-12	



ILLUSTRATION 2

Applicable Case Styles	
GE0805C-2	JC0603C-1
GE0805C-3	JC0603C-2
GE0805C-4	JC0603C-3
GE0805C-5	JC0603C-5
GE0805C-6	JC0603C-7
GE0805C-8	
GE0805C-15	

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

Note: Please Consult individual model data sheet to determine device per reel availability.

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



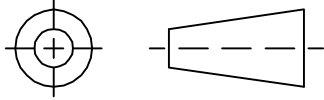
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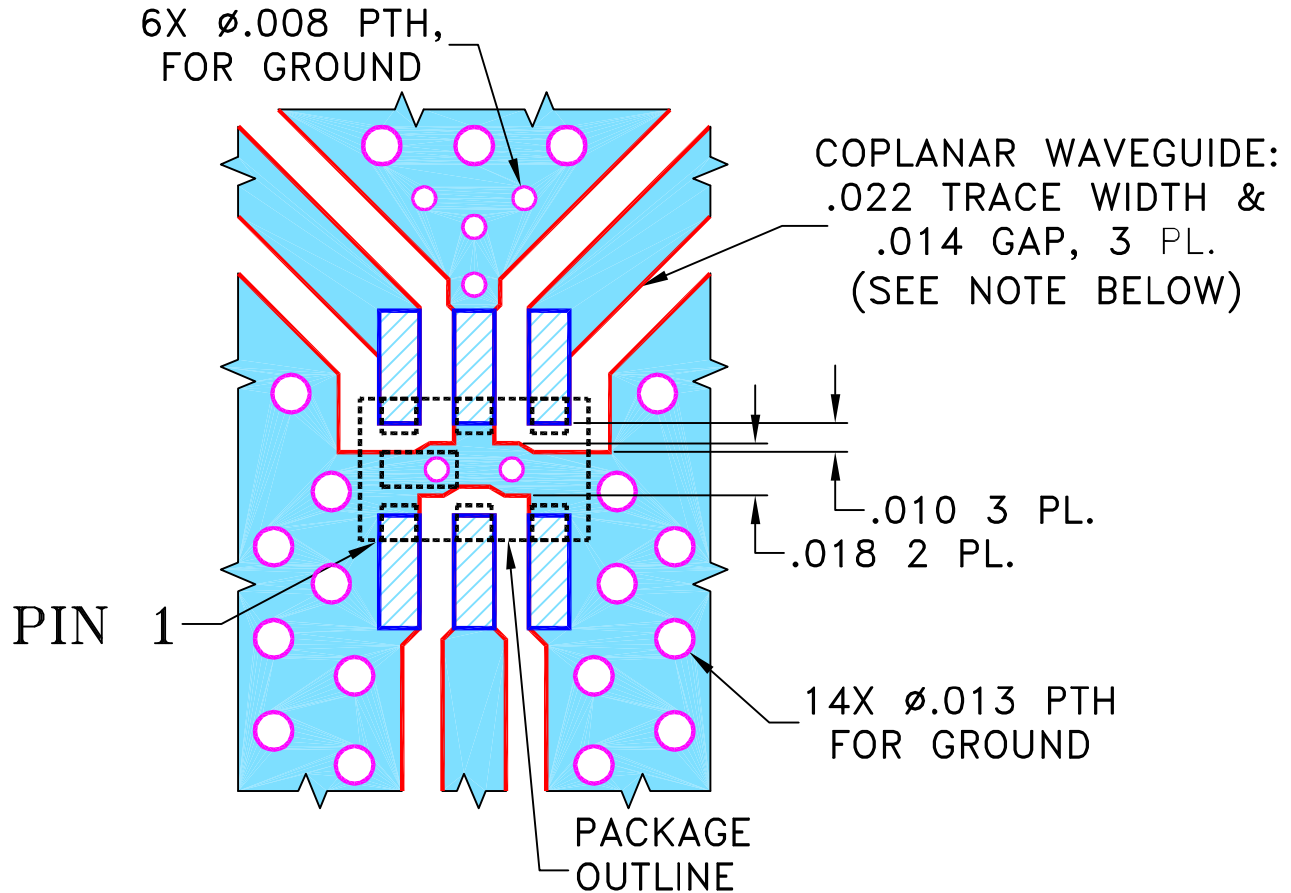
THIRD ANGLE PROJECTION



REVISIONS


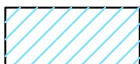
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**SUGGESTED MOUNTING CONFIGURATION
FOR GE0805C-10 CASE STYLE, "06DP03" PIN CODE**



NOTES:

1. COPLANAR WAVEGUIDE 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 TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	GF 10/07/14
	CHECKED	AV 10/14/14
	APPROVED	MY 10/14/14

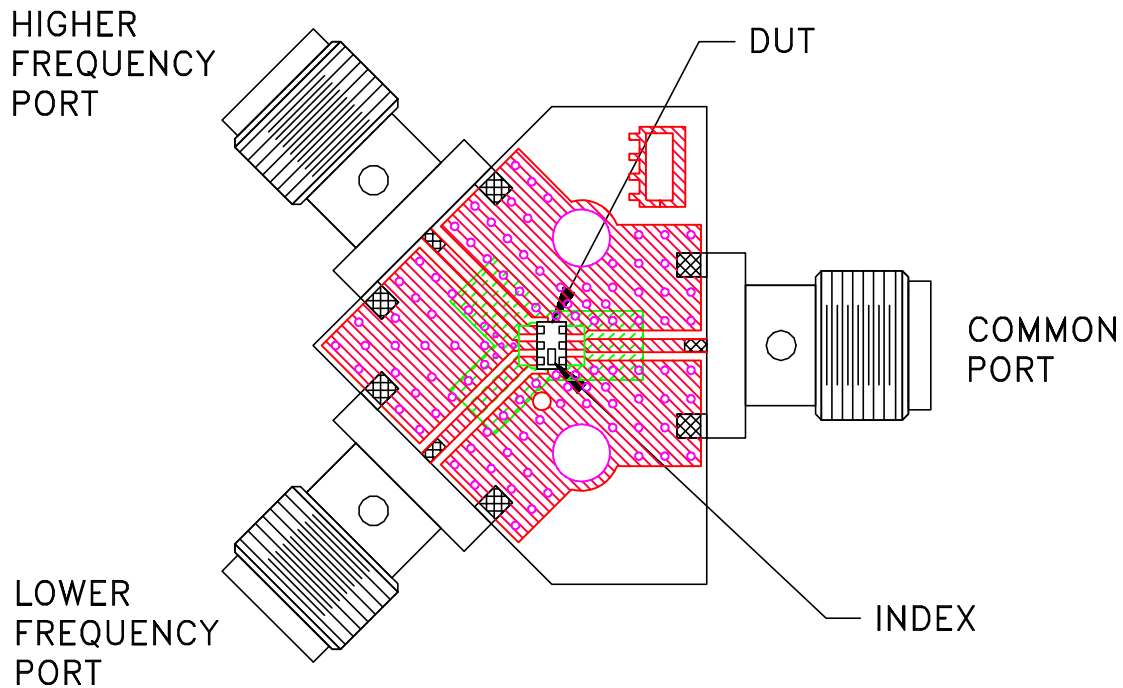
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Brooklyn NY 11235

PL, 06DP03, GE0805C-10, TB-798+

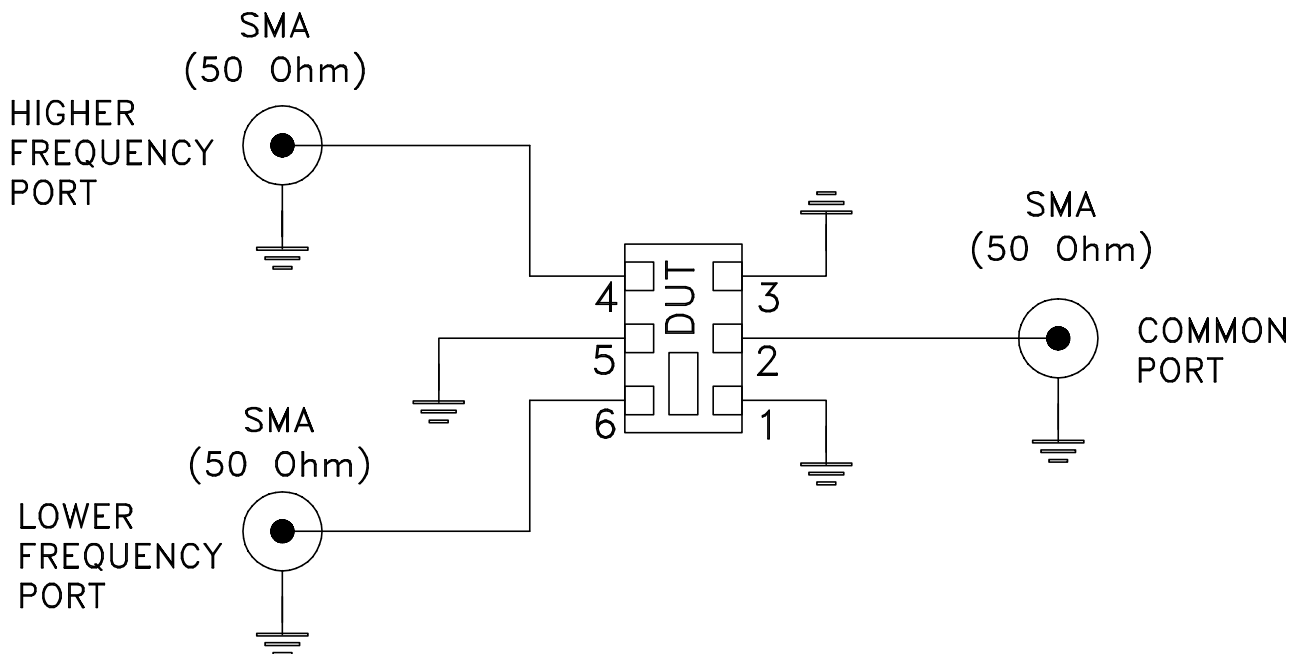
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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-441	OR
FILE:	98PL441	SCALE: 15:1	SHEET: 1 OF 1

Evaluation Board and Circuit




TB-DPGE252492R+



Schematic Diagram

Notes:

1. 50 Ohm SMA 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