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.

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	Devices/Reel
7"	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

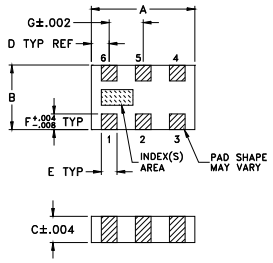
Features

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

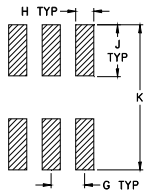
Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee

Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

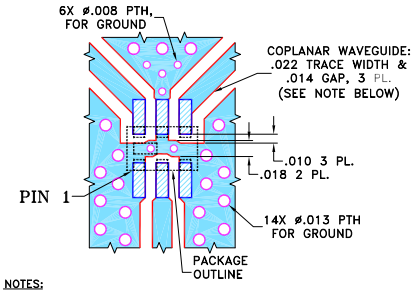
Outline Dimensions (inch / mm)

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 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.

Electrical Specifications[1] at 25°C

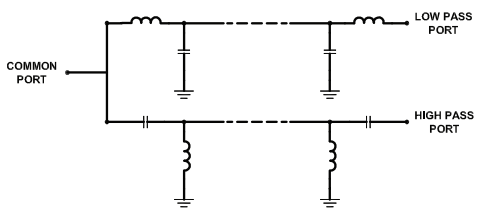
Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	2400 - 2500	-	0.4	0.5	dB
		High Pass	4900 - 5950	-	0.5	0.65	
	Return Loss	Low Pass	2400 - 2500	10	33	-	dB
		High Pass	4900 - 5950	10	25	-	
		Common	2400 - 2500	-	25	-	
			4900 - 5950	-	23	-	
Stop Band Rejection		High 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

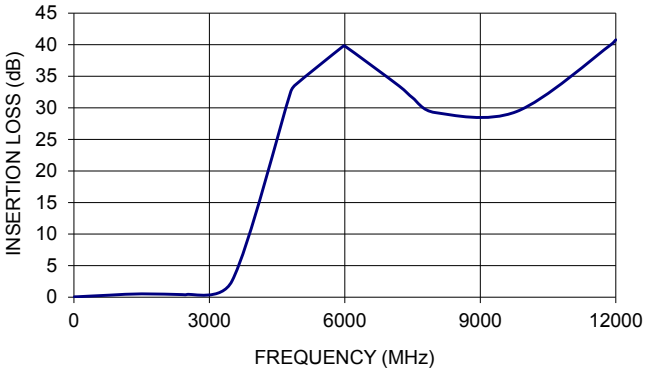
Functional Schematic



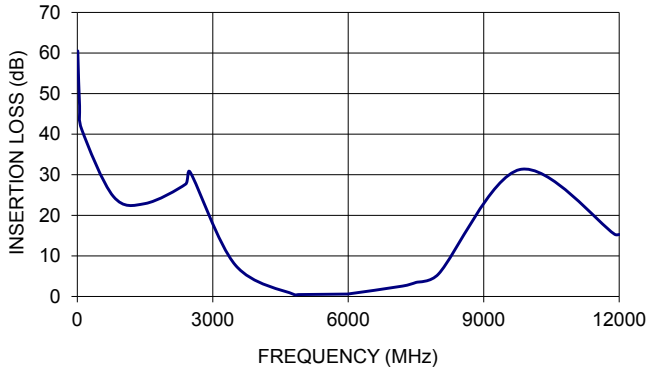
Notes

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

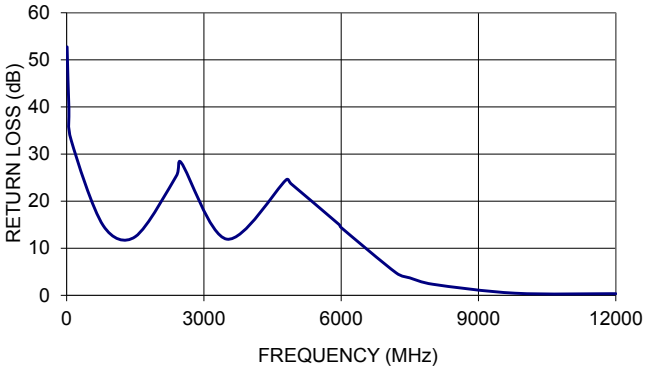
DPGE-252-492R+
LOW FREQUENCY PORT INSERTION LOSS (Pin=0dBm)



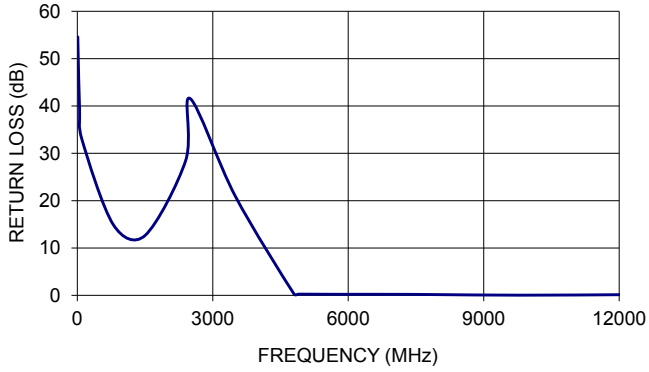
DPGE-252-492R+
HIGH FREQUENCY PORT INSERTION LOSS (Pin=0dBm)



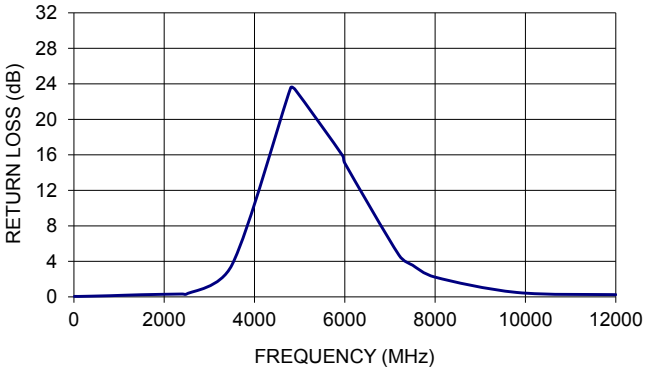
DPGE-252-492R+
COMMON PORT RETURN LOSS (Pin=0 dBm)



DPGE-252-492R+
LOW FREQUENCY PORT RETURN LOSS (Pin=0dBm)



DPGE-252-492R+
HIGH FREQUENCY PORT RETURN LOSS (Pin=0dBm)



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+

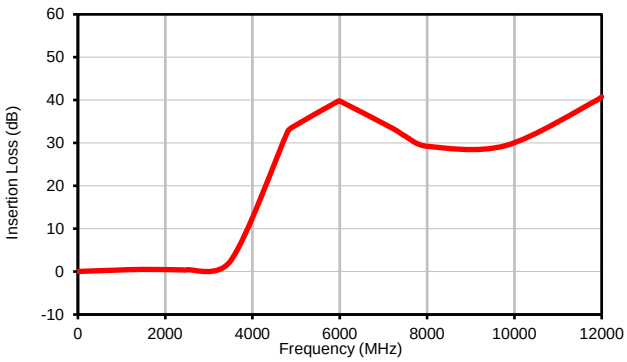
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		RETURN LOSS (dB)		
	Low Pass port	High Pass port	Common port	Low Pass port	High Pass port
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

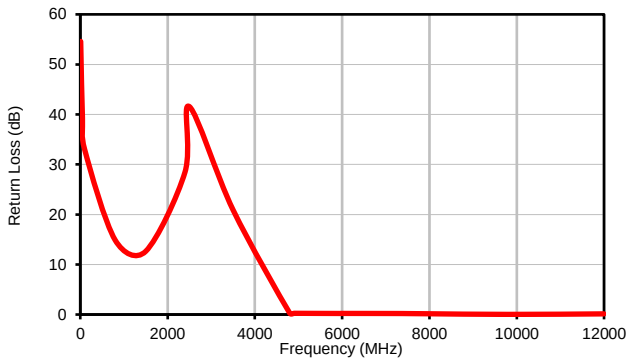
Ceramic Diplexer DPGE-252-492R+

Typical Performance Curves

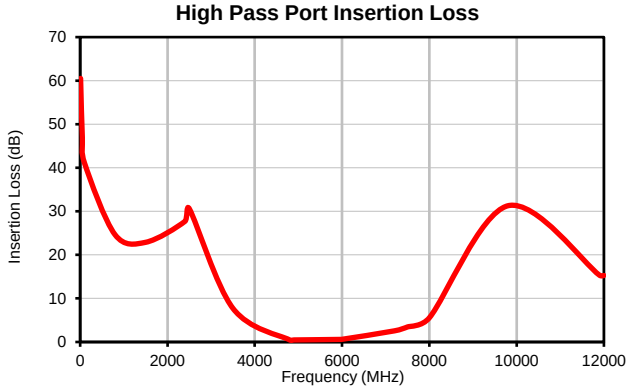
Low Pass Port Insertion Loss



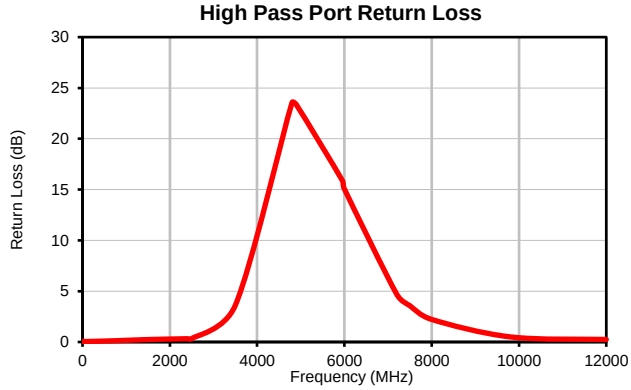
Low Pass Port Return Loss



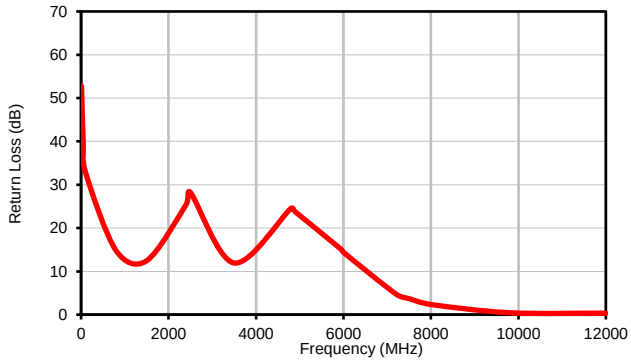
High Pass Port Insertion Loss



High Pass Port Return Loss

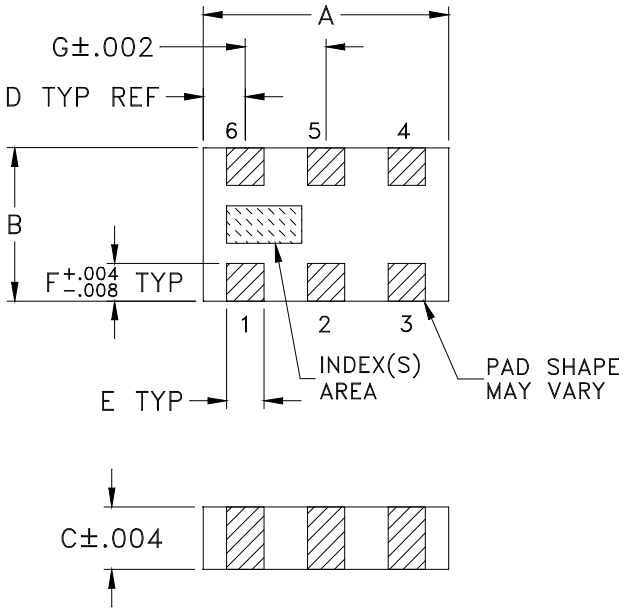


Common Port Return Loss

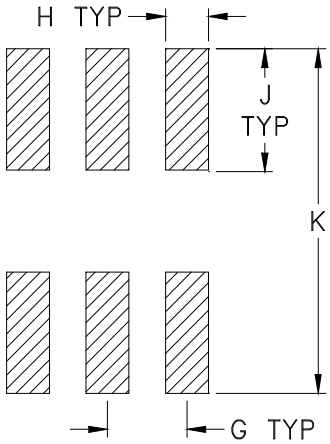


GE0805C-10

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.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. ± .01; 3 Pl. ± .005

Notes:

1. Open style, ceramic base.
2. 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.
3. Line width should be designed to match 50Ω characteristic depending on PCB material and thickness.

Tape & Reel Packaging TR-F114

DEVICE ORIENTATION IN T&R

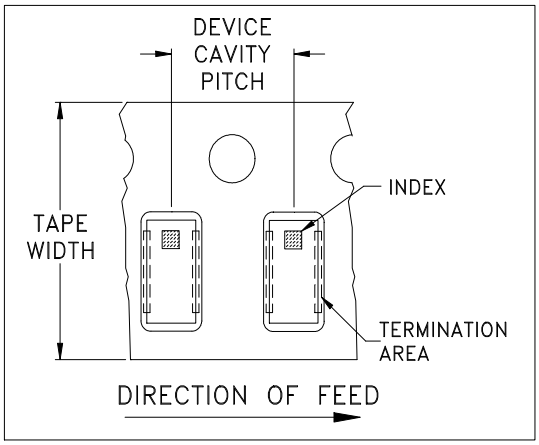


ILLUSTRATION 1

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

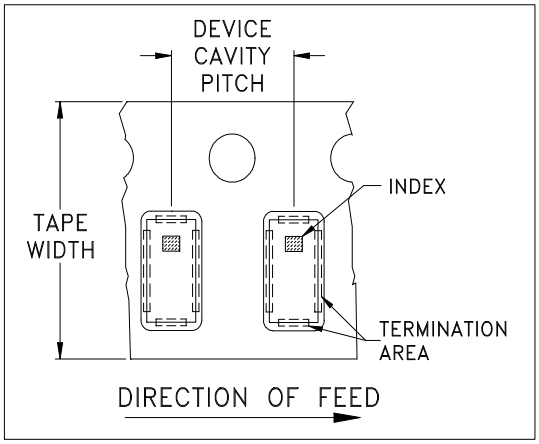


ILLUSTRATION 2

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	JV1210C-1
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
				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.

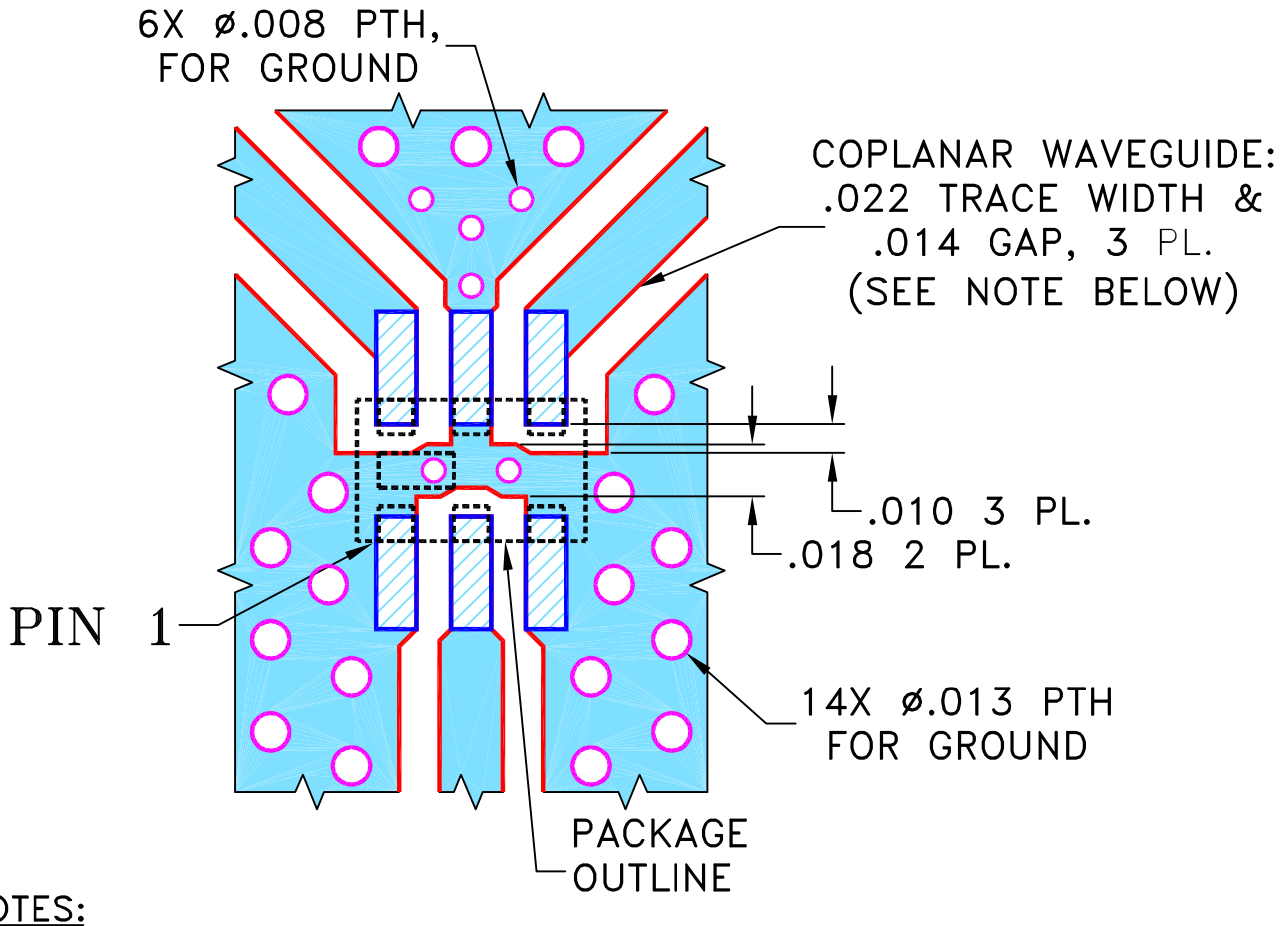
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M148538	NEW RELEASE	10/14/14	GF	MY

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



NOTES:

1. COPLANAR WAVEGUIDE 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.

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	GF	10/07/14
TOLERANCES ON:	CHECKED	AV	10/14/14
2 PL DECIMALS ±	APPROVED	MY	10/14/14
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

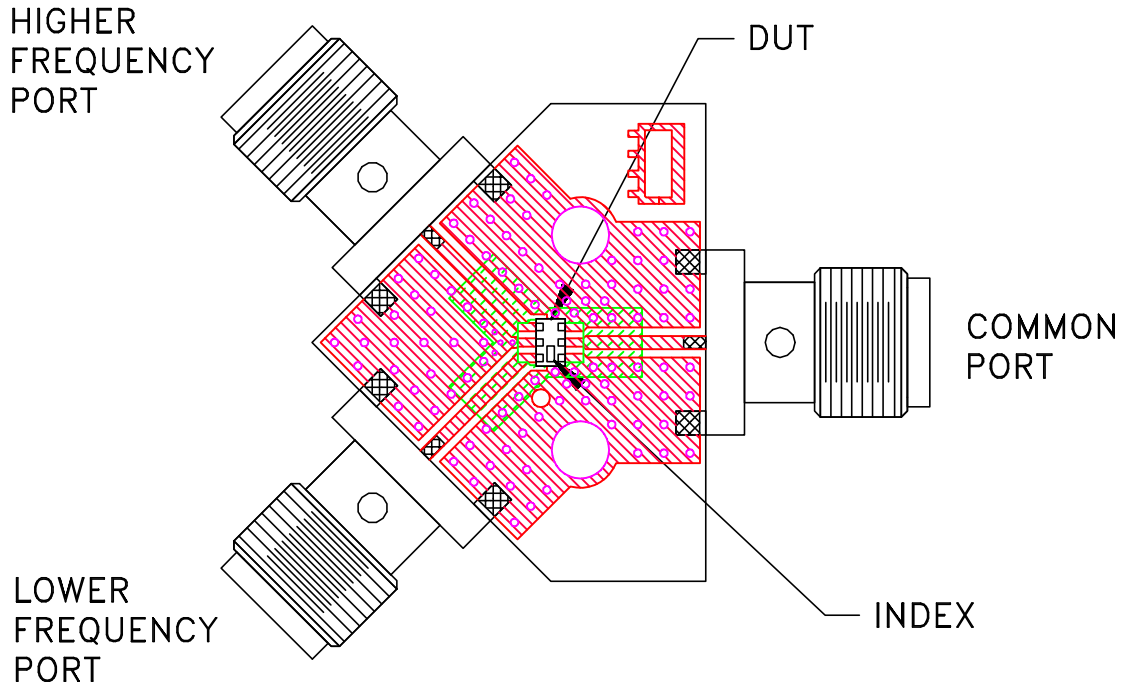
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

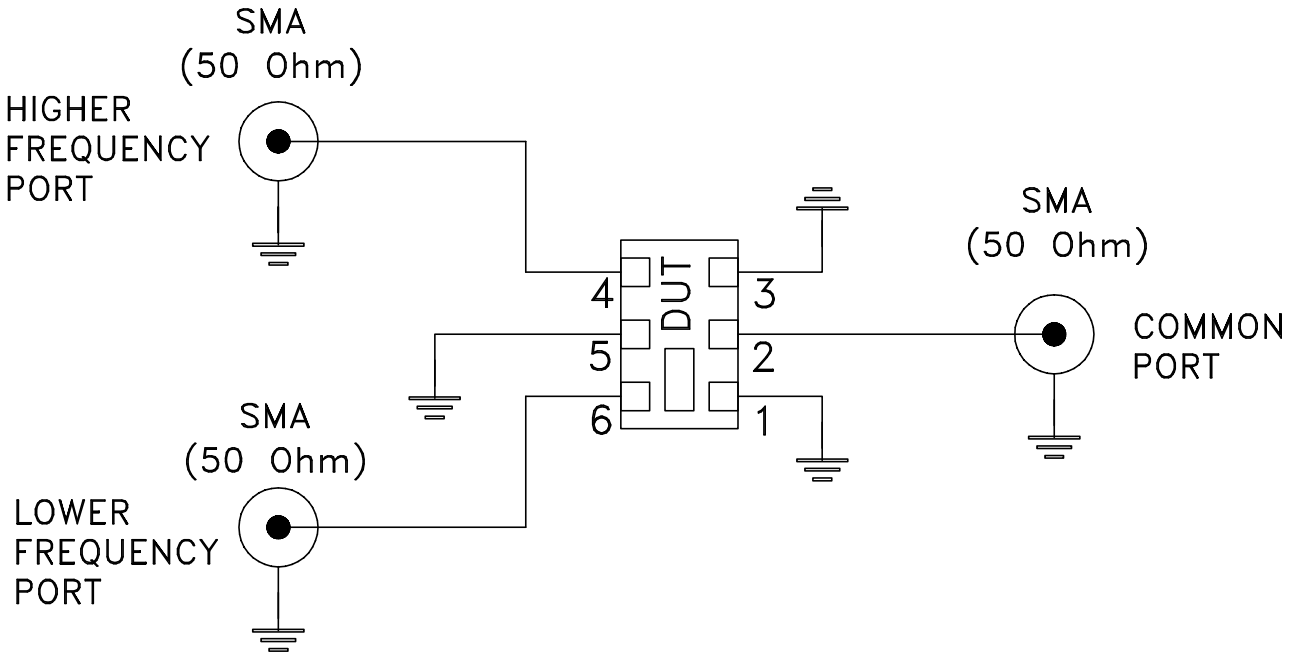
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-441	OR

FILE:	SCALE:	SHEET:
98PL441	15:1	1 OF 1

Evaluation Board and Circuit



TB-DPGE252492R+



Schematic Diagram

Notes:

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

Mini-Circuits®

Mini-Circuits

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