Ceramic

Diplexer

LDPG-212-322+

50Ω DC to 5000 MHz (DC-2100, 2600-5000 MHz)

The Big Deal

- Low insertion loss, 0.8 dB
- High stopband isolation, 18-22 dB
- Very small size, 0805
- Low cost

CASE STYLE: GE0805C-10

Product Overview

Mini-Circuits' LDPG-212-322+ is a tiny, surface-mount diplexer with a low pass channel from DC to 2100 MHz and a high pass channel from 2600 to 5000 MHz. This model provides low passband insertion loss, high stopband rejection, and RF input power handling up to 2W. Fabricated using LTCC technology, the unit comes housed in a tiny, 0805 ceramic package with excellent thermal stability from -55 to +100°C.

Key Features

Feature	Advantages
Low passband insertion loss, 0.8 dB	Ensures low signal loss through both channels
Good stopband isolation, 18-22	Eliminates unwanted spurious signals out of band.
Good return loss, 16 dB typ.	Ensures good matching in 50Ω systems and minimizes in-band reflection.
Tiny size, 0.08 x 0.05 x 0.02"	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Wrap-around terminations	Provides excellent solderability and easy visual inspection.
Wide operating temperature range, -55 to +100°C	Enables reliable performance in extreme environments.

Ceramic

Diplexer

LDPG-212-322+

50Ω DC to 5000 MHz (DC-2100, 2600-5000 MHz)

Generic photo used for illustration purposes only

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

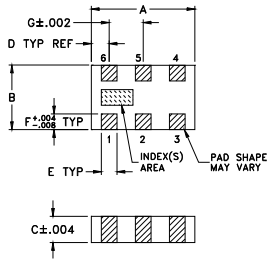
Operating Temperature	-55°C to 100°C
Storage Temperature*	-55°C to 100°C
RF Power Input**	2W at 25°C

* passband rating, derate linearly to 1W at 100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

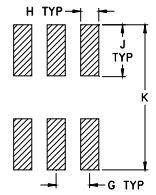
Pad Connections

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

Outline Drawing



PCB Land Pattern



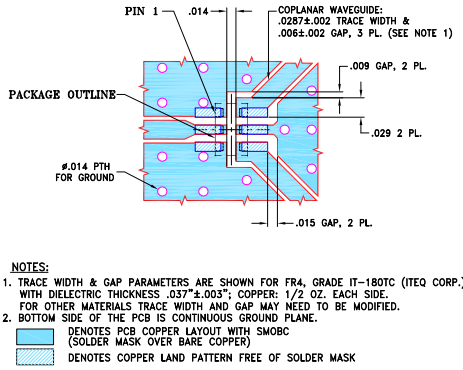
Suggested Layout,
Tolerance to be within ±.002

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

Demo Board MCL P/N: TB-871+
Suggested PCB Layout (PL-489)



NOTES:
1. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .037"±.003"; 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

Features

- small size 0805(2.0 x 1.25 mm)
- low insertion loss, 0.8 dB typ.
- high rejection
- temperature stable
- LTCC construction

Applications

- communication systems
- ISM
- WiFi

Electrical Specifications[1,2] at 25°C

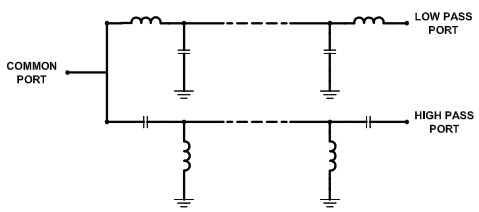
Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC - 2100	—	0.5	2.5	dB
		High Pass	2600 - 5000	—	0.8	3.0	
	Return Loss	Low Pass	DC - 2100	—	16	—	dB
		High Pass	2600 - 5000	—	14	—	
		Common	DC - 5000	—	16	—	
Stop Band Isolation		High Pass	DC - 2040	10	18	—	dB
		Low Pass	3200 - 5000	17	22	—	dB

[1] *In Application where DC voltage is present at either input or output port, coupling capacitors are required.*
[2] *Measured on Mini-Circuits Characterization Test Board TB-871+ with auto port extension*

Typical Performance Data at 25°C

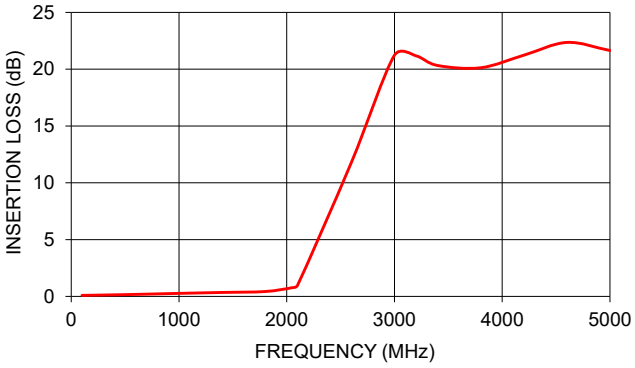
Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)		
	Low Pass Port	High Pass Port	Common Port	Low Pass Port	High Pass Port
100	0.09	35.93	42.56	43.84	0.03
200	0.11	29.93	40.50	43.25	0.04
400	0.14	24.02	37.51	46.43	0.06
600	0.18	20.73	35.09	57.73	0.11
1000	0.27	17.26	33.03	35.97	0.27
1400	0.35	16.59	33.22	31.28	0.43
1800	0.43	22.54	26.47	26.83	0.58
2050	0.77	19.99	17.79	17.39	1.07
2100	0.97	15.81	16.27	15.15	1.35
2600	11.78	1.24	15.00	1.79	16.88
3000	21.22	0.50	19.86	0.72	23.10
3200	21.17	0.43	20.31	0.60	21.88
3400	20.32	0.40	20.63	0.53	21.14
3800	20.12	0.34	23.23	0.42	22.79
4200	21.23	0.30	31.23	0.33	30.26
4600	22.35	0.29	29.55	0.29	29.44
5000	21.64	0.35	19.85	0.30	19.05

Functional Schematic

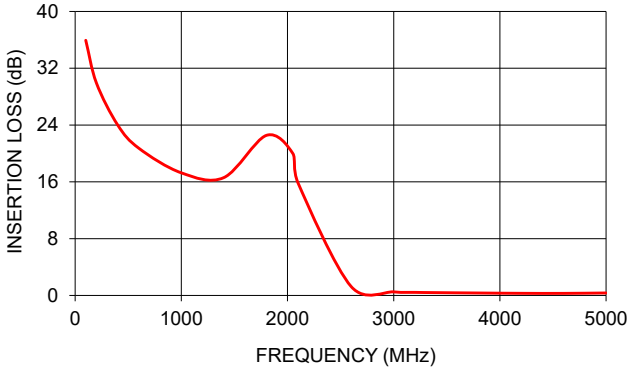


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

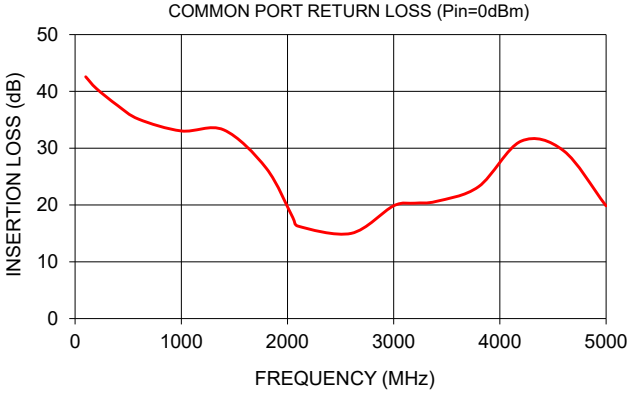
LDPG-212-322+
LOW FREQUENCY PORT INSERTION LOSS (Pin=0dBm)



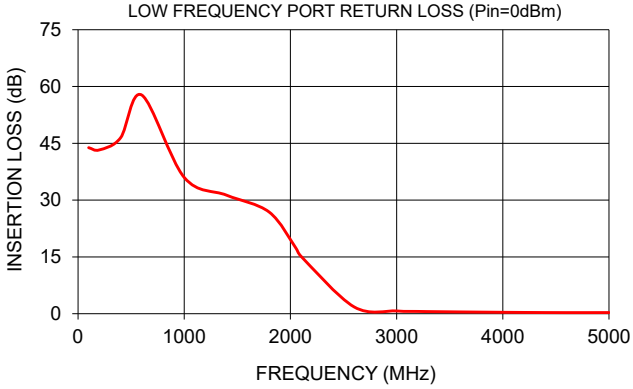
LDPG-212-322+
HIGH FREQUENCY PORT INSERTION LOSS (Pin=0dBm)



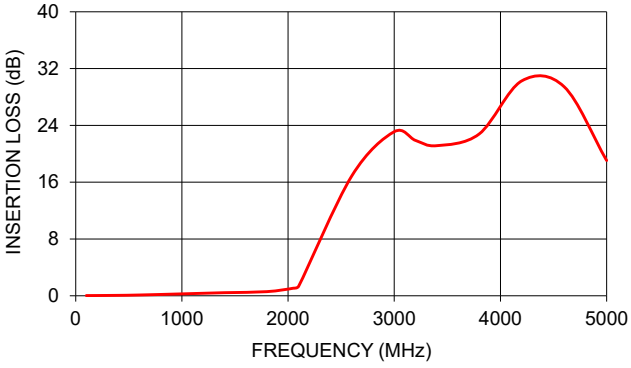
LDPG-212-322+
COMMON PORT RETURN LOSS (Pin=0dBm)



LDPG-212-322+
LOW FREQUENCY PORT RETURN LOSS (Pin=0dBm)



LDPG-212-322+
HIGH FREQUENCY PORT RETURN LOSS (Pin=0dBm)



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Ceramic Diplexer LDPG-212-322+

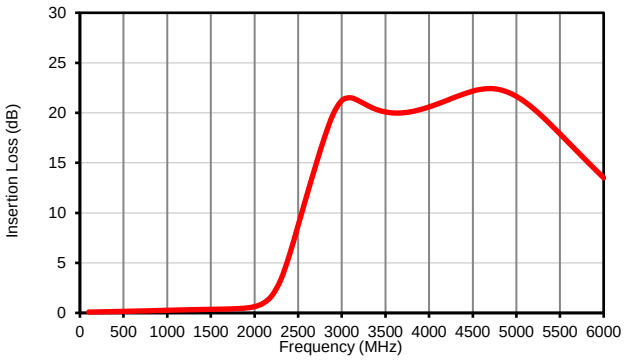
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		RETURN LOSS (dB)		
	Low Pass port	High Pass port	Common port	Low Pass port	High Pass port
100	0.09	35.93	42.56	43.84	0.03
200	0.11	29.93	40.50	43.25	0.04
300	0.12	26.45	38.98	44.64	0.04
400	0.14	24.02	37.51	46.43	0.06
500	0.16	22.18	36.13	55.11	0.08
600	0.18	20.73	35.09	57.73	0.11
700	0.20	19.56	34.45	47.38	0.14
800	0.22	18.61	33.66	41.89	0.18
900	0.24	17.86	33.23	38.38	0.23
1000	0.27	17.26	33.03	35.97	0.27
1100	0.29	16.82	32.80	34.25	0.31
1200	0.31	16.55	32.49	32.62	0.35
1300	0.33	16.47	32.85	31.79	0.40
1400	0.35	16.59	33.22	31.28	0.43
1500	0.36	17.01	32.92	30.64	0.47
1600	0.38	17.85	32.19	30.23	0.50
1700	0.40	19.41	29.76	28.97	0.53
1800	0.43	22.54	26.47	26.83	0.58
1900	0.49	31.55	22.81	23.43	0.68
2000	0.63	26.06	19.39	19.51	0.88
2100	0.97	15.81	16.27	15.15	1.35
2200	1.74	9.80	13.72	10.68	2.42
2300	3.30	5.71	12.29	6.85	4.58
2400	5.79	3.22	12.22	4.19	8.13
2500	8.76	1.91	13.33	2.64	12.58
2600	11.78	1.24	15.00	1.79	16.88
2700	14.71	0.89	16.71	1.29	20.15
2800	17.50	0.69	18.23	1.01	22.25
2900	19.85	0.57	19.21	0.84	23.06
3000	21.22	0.50	19.86	0.72	23.10
3100	21.50	0.46	20.04	0.66	22.29
3200	21.17	0.43	20.31	0.60	21.88
3300	20.71	0.41	20.44	0.56	21.45
3400	20.32	0.40	20.63	0.53	21.14
3500	20.09	0.38	21.11	0.50	21.31
3600	19.98	0.37	21.58	0.47	21.54
3700	20.00	0.35	22.33	0.44	22.08
3800	20.12	0.34	23.23	0.42	22.79
3900	20.33	0.33	24.40	0.40	23.90
4000	20.59	0.32	26.04	0.37	25.35
4100	20.90	0.31	28.04	0.35	27.45
4200	21.23	0.30	31.23	0.33	30.26
4300	21.58	0.29	35.68	0.32	35.74
4500	22.18	0.29	33.70	0.29	34.91
4600	22.35	0.29	29.55	0.29	29.44
4700	22.43	0.30	26.05	0.29	25.63
4800	22.33	0.31	23.52	0.28	23.00
4900	22.07	0.32	21.54	0.29	20.82
5000	21.64	0.35	19.85	0.30	19.05
5100	21.07	0.38	18.29	0.31	17.39
5200	20.38	0.41	17.10	0.33	16.14
5300	19.60	0.46	15.92	0.35	14.86
5400	18.75	0.51	14.89	0.38	13.79
5500	17.89	0.58	13.93	0.42	12.77
5600	17.00	0.65	13.08	0.47	11.84
5700	16.11	0.74	12.30	0.53	11.02
5800	15.23	0.84	11.55	0.59	10.20
5900	14.36	0.96	10.88	0.67	9.49
6000	13.50	1.09	10.21	0.75	8.78

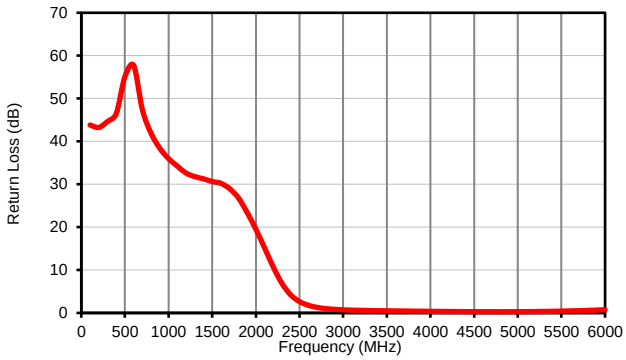
Ceramic Diplexer LDPG-212-322+

Typical Performance Curves

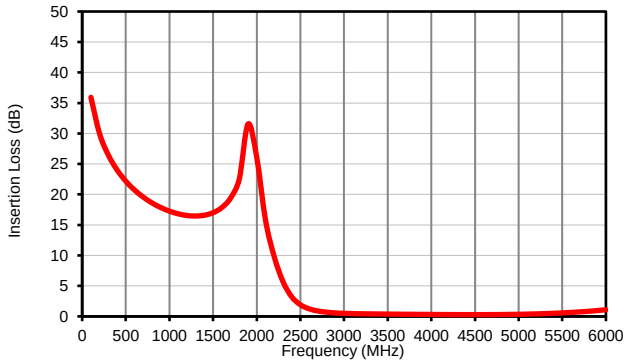
Low Pass Port Insertion Loss



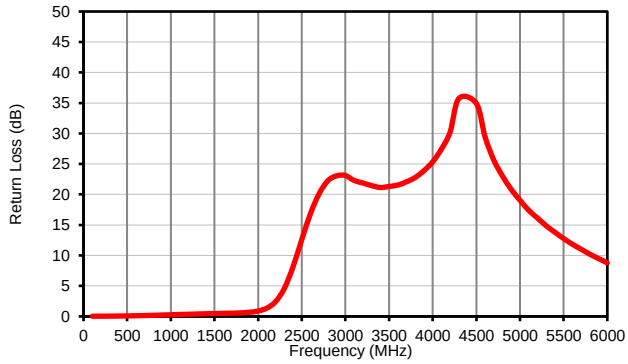
Low Pass Port Return Loss



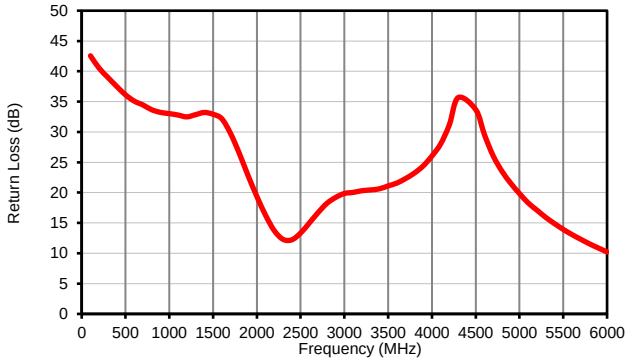
High Pass Port Insertion Loss



High Pass Port Return Loss

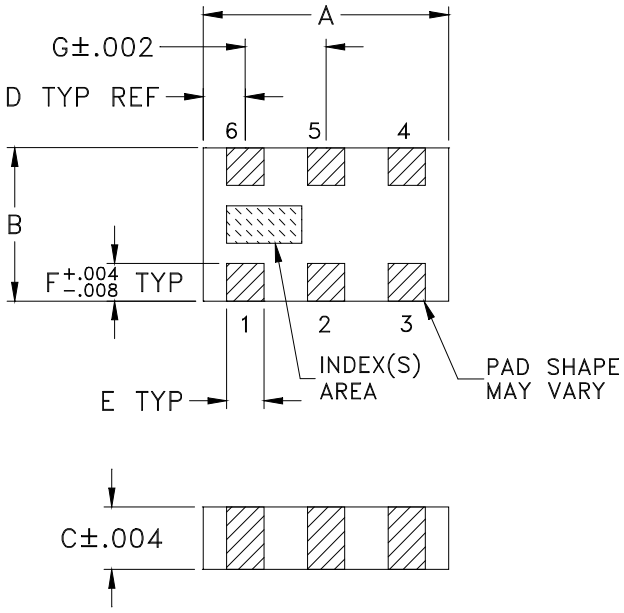


Common Port Return Loss

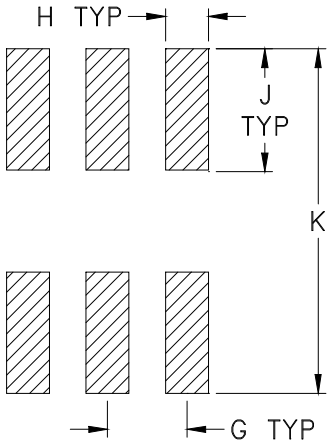


GE0805C-10

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

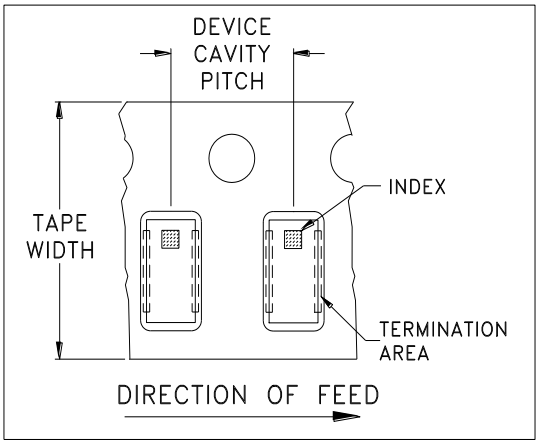


ILLUSTRATION 1

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

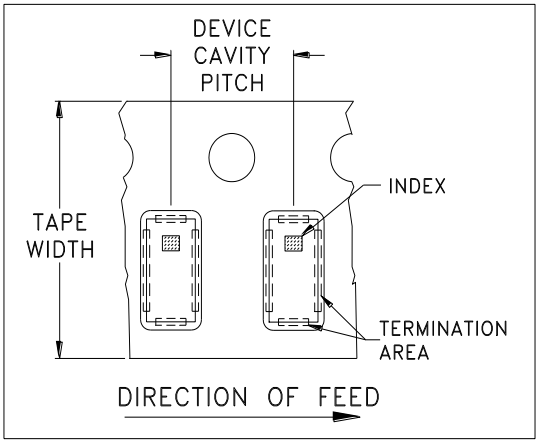


ILLUSTRATION 2

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	
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

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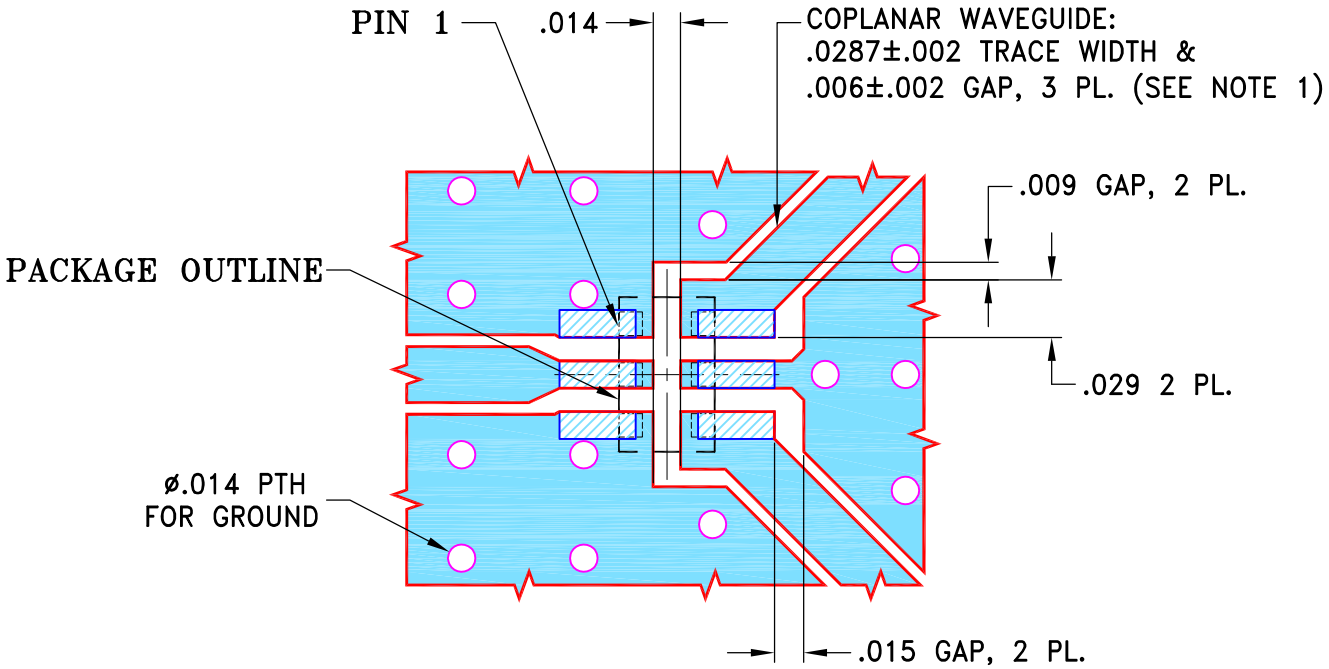
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M156591	NEW RELEASE	06/03/16	ITG	AVB

SUGGESTED MOUNTING CONFIGURATION FOR GE0805C-10 CASE STYLE, "06DP03" 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	ITG	06/03/16
TOLERANCES ON:	CHECKED	IL	06/03/16
2 PL DECIMALS ±	APPROVED	AVB	06/03/16
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

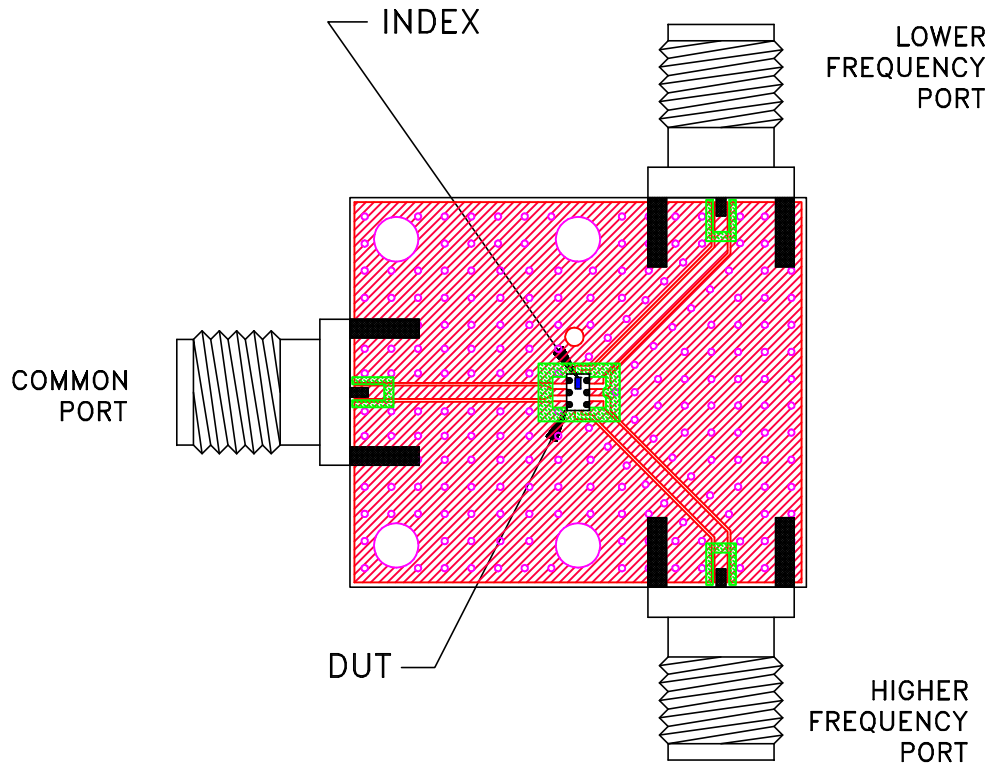
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 06DP03, GE0805C-10, TB-871+

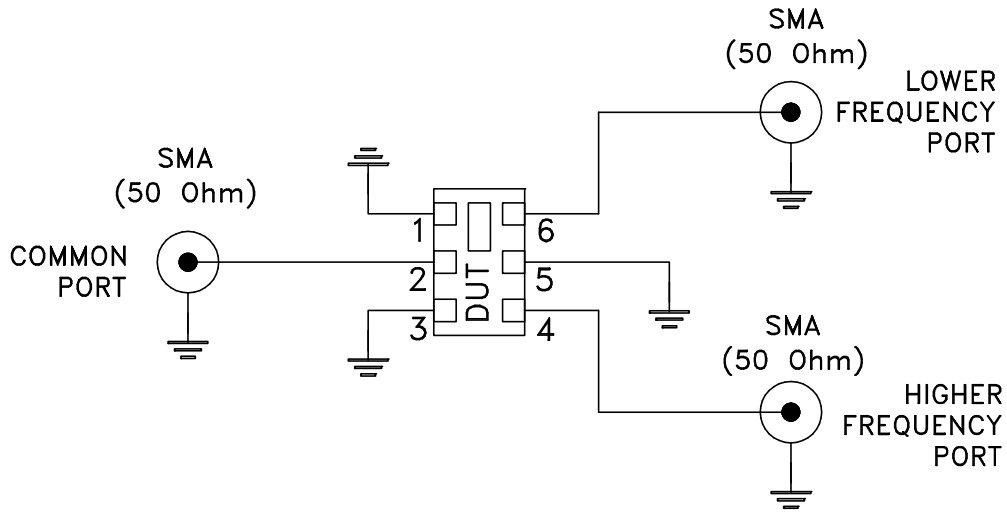
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-489	OR

FILE:	SCALE:	SHEET:
98PL489	10:1	1 OF 1

Evaluation Board and Circuit



TB-871+



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