

Ceramic

# Low Pass Filter

LFCG-3800+

50Ω DC to 3900 MHz



Generic photo used for illustration purposes only

CASE STYLE: GE0805C-2

## The Big Deal

- Very good rejection, 50 dB typical
- Rugged, ceramic construction
- Tiny size, 0.079" x 0.049" x 0.037" (0805)
- Excellent power handling, 4.5W

## Product Overview

Mini-Circuits' LFCG-3800+ is an LTCC low pass filter with a passband from DC to 3900 MHz, supporting a variety of applications. This model provides 1.3 dB typical passband insertion loss and provides a very good stopband rejection due to strategically constructed layout with minimal interaction between components. It handles up to 4.5W RF input power and provides a wide operating temperature range from -55 to +125°C. Housed in a tiny 0805 ceramic form factor with wraparound terminations, the filter is ideal for dense PCB layouts and with minimal performance variation due to parasitics.

## Key Features

Feature	Advantages
Ultra-wide stopband	The LTCC lowpass filter provides a very good stopband rejection until 18 GHz suitable for high end applications.
LTCC Construction	Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.
Tiny size (0.079" x 0.049" x 0.037")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Excellent power handling, 4.5W	Supports a wide range of system power requirements.
Wrap-around terminations	Provides excellent solderability and easy visual inspection

### 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](http://www.minicircuits.com/MCLStore/terms.jsp)



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# Low Pass Filter

50Ω

DC to 3900 MHz

LFCG-3800+



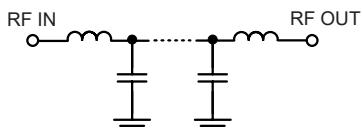
## Features

- Low loss, 1.3 dB typical
- High rejection 50 dB typical
- Excellent power handling, 4.5W
- Extremely small size 0805 (2.0 mm x 1.25 mm)
- Temperature stable
- LTCC construction

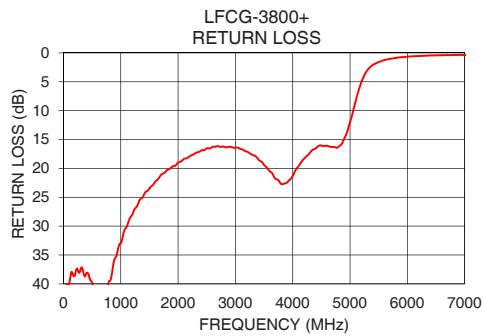
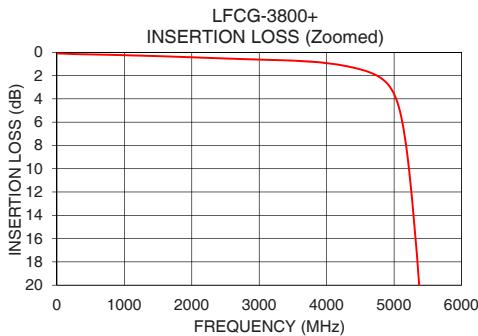
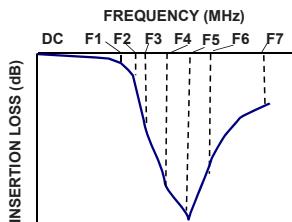
## Applications

- Harmonic Rejection
- VHF/ UHF transmitters / receivers
- Military radar applications
- Test and measurement
- Telecommunications & broadband wireless applications
- Public safety communication
- Satcom modems

## Functional Schematic



## Typical Frequency Response



Generic photo used for illustration purposes only  
CASE STYLE: GE0805C-2

+RoHS Compliant

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

## Electrical Specifications<sup>1,2</sup> at 25°C

	Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC - 3900	—	1.3	1.8	dB
	Freq. Cut-Off	F2	5000	—	3.0	—	dB
	Return Loss	DC-F1	DC - 3900	—	14	—	dB
Stop Band	Rejection Loss	F3-F4	5800 - 6200	20	40	—	dB
		F4-F5	6200 - 8400	35	42	—	dB
		F5-F6	8400 - 12000	25	48	—	dB
		F6-F7	12000 - 18000	—	20	—	dB

1 DC de-coupling capacitors are required in Applications where DC voltage and/or current is present at either input or output ports.  
Please contact Mini-Circuits for alternatives if DC pass from IN-OUT is required.

2 Measured on Mini-Circuits Characterization Test Board TB-799+

Maximum Ratings	
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input*	4.5W max.@25°C

\*Passband rating, derate linearly to 1W at 125°C ambient  
Permanent damage may occur if any of these limits are exceeded.

## Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	0.09	46.99
100	0.12	39.94
500	0.18	39.75
1000	0.25	32.99
1500	0.33	23.47
3800	0.82	22.72
3900	0.87	22.44
5000	3.58	11.97
5380	20.59	2.19
5490	30.36	1.61
5800	39.45	0.86
6000	42.37	0.66
6200	48.44	0.53
8000	59.93	0.42
8400	53.65	0.49
9000	46.61	0.64
10000	40.21	0.83
12000	33.47	0.74
15000	31.92	0.37
18000	29.42	0.77

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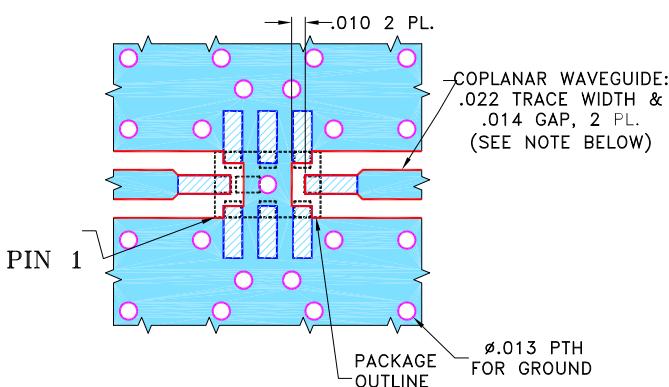


**Pad Connections**

INPUT	8
OUTPUT	4
GROUND	1,2,3,5,6,7

Product Marking: LS

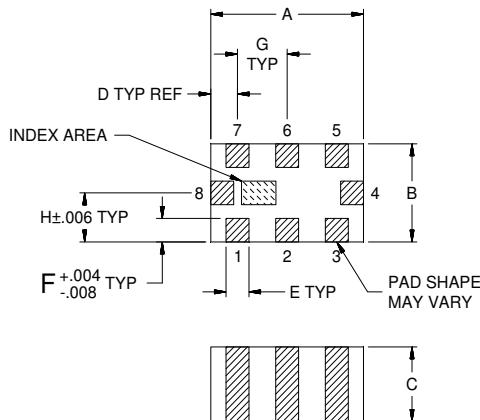
**Demo Board MCL P/N: TB-799+  
Suggested PCB Layout (PL-429)**

**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.

[Solid Blue Box] DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

[Hatched Box] DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

**Outline Drawing****Outline Dimensions (inch mm)**

A	B	C	D	E	F	G	Wt.
.079 2.00	.049 1.25	.037 0.95	.014 0.35	.012 0.30	.012 0.30	.026 0.65	grams .008

Note: Please refer to case style drawing for details

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# Ceramic Low Pass Filter

LFCG-3800+

## Typical Performance Data

FREQ. (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C
10	0.08	0.09	0.10	38.42	47.21	42.58	38.75	45.96	42.48
40	0.08	0.10	0.12	48.24	42.76	40.95	49.60	42.47	41.04
100	0.11	0.13	0.15	43.38	40.02	38.41	40.97	38.76	37.04
400	0.15	0.20	0.25	38.45	38.85	38.90	33.28	32.55	31.97
700	0.18	0.24	0.31	38.03	43.24	54.16	29.17	28.68	28.20
1000	0.21	0.29	0.37	31.87	32.87	33.58	25.81	25.32	24.92
1300	0.24	0.33	0.42	26.06	26.45	26.81	23.03	22.65	22.33
1600	0.28	0.38	0.48	22.15	22.41	22.69	20.73	20.47	20.13
1900	0.33	0.44	0.55	19.42	19.68	19.95	18.98	18.77	18.43
2200	0.38	0.50	0.62	17.57	17.83	18.10	17.66	17.52	17.17
2500	0.44	0.56	0.70	16.38	16.66	16.92	16.79	16.71	16.42
2800	0.49	0.62	0.77	15.92	16.20	16.51	16.48	16.48	16.39
3100	0.53	0.67	0.83	16.25	16.60	16.96	16.93	17.15	17.44
3400	0.56	0.71	0.89	17.95	18.30	18.74	18.95	19.47	20.59
3800	0.64	0.82	1.04	22.70	22.62	21.63	26.98	29.40	30.67
3900	0.68	0.86	1.10	22.99	22.61	21.05	28.34	29.68	26.95
4000	0.72	0.92	1.17	22.04	21.57	19.97	26.08	25.84	23.31
4600	1.33	1.61	1.97	15.86	16.26	17.01	15.72	16.12	16.81
4900	2.08	2.60	3.33	15.64	15.13	14.70	15.81	16.49	17.91
5000	2.66	3.46	4.66	13.41	12.16	10.74	16.03	16.37	15.89
5380	15.73	20.22	25.56	2.28	2.14	2.11	3.32	2.85	2.54
5490	24.34	29.95	36.34	1.49	1.54	1.63	2.02	1.91	1.83
5800	40.09	39.41	39.72	0.71	0.85	0.98	0.85	0.94	1.03
6000	41.31	42.24	43.69	0.50	0.64	0.76	0.61	0.72	0.84
6100	43.49	44.88	46.79	0.43	0.57	0.69	0.53	0.65	0.78
6200	46.36	48.28	50.76	0.36	0.51	0.62	0.47	0.60	0.74
6500	60.85	61.97	59.99	0.24	0.38	0.49	0.37	0.51	0.69
7000	53.58	53.41	53.49	0.12	0.27	0.39	0.30	0.47	0.71
7500	54.47	55.83	55.82	0.05	0.22	0.38	0.26	0.47	0.77
8000	60.06	58.00	56.88	0.03	0.21	0.43	0.23	0.47	0.81
8400	55.43	55.21	51.62	0.03	0.23	0.50	0.18	0.42	0.79
8800	49.81	49.47	48.50	0.04	0.25	0.58	0.12	0.36	0.73
9000	46.16	46.83	47.10	0.04	0.27	0.62	0.10	0.34	0.70
9400	44.47	42.11	41.52	0.05	0.30	0.70	0.03	0.27	0.60
9700	43.53	42.52	43.11	0.05	0.33	0.75	0.02	0.22	0.51
10000	41.14	40.34	40.15	0.08	0.35	0.80	0.02	0.19	0.45
10300	39.23	39.84	39.85	0.07	0.36	0.82	0.04	0.17	0.39
10600	39.67	38.62	38.95	0.08	0.36	0.82	0.04	0.14	0.33
10900	37.49	38.20	38.87	0.08	0.38	0.80	0.04	0.15	0.29
11000	37.77	37.60	36.90	0.09	0.36	0.80	0.03	0.13	0.30
11500	34.81	34.03	34.52	0.09	0.37	0.75	0.03	0.15	0.28
11800	32.50	33.82	34.30	0.12	0.35	0.68	0.01	0.14	0.26
12000	32.43	32.61	33.52	0.08	0.35	0.66	0.03	0.14	0.28
12400	32.84	32.87	32.58	0.10	0.31	0.57	0.06	0.11	0.29
12700	31.82	32.48	31.99	0.08	0.27	0.50	0.09	0.09	0.31
13000	31.62	31.81	31.10	0.07	0.27	0.47	0.14	0.07	0.34
13300	30.97	30.74	31.49	0.11	0.34	0.64	0.16	0.07	0.44
13600	31.31	33.58	33.57	0.28	0.33	0.46	0.16	0.08	0.48
13900	33.54	32.95	32.85	0.07	0.26	0.42	0.24	0.05	0.51
14000	32.83	32.35	31.96	0.06	0.25	0.45	0.25	0.05	0.54
14500	31.57	31.81	32.18	0.05	0.28	0.48	0.29	0.04	0.59
14800	31.65	31.85	32.10	0.05	0.28	0.55	0.31	0.04	0.64
15000	31.59	31.84	32.13	0.05	0.30	0.61	0.31	0.04	0.67
15400	31.90	30.33	29.85	0.03	0.31	0.68	0.24	0.21	0.72
15700	29.39	30.01	30.64	0.02	0.29	0.72	0.31	0.03	0.64
16000	30.15	30.45	30.91	0.07	0.26	0.76	0.39	0.02	0.60
16300	30.42	30.59	31.02	0.11	0.23	0.78	0.40	0.04	0.58
16600	30.15	30.45	30.91	0.07	0.26	0.76	0.39	0.02	0.60
17000	30.22	30.38	30.76	0.20	0.16	0.80	0.43	0.07	0.51
18000	28.41	28.56	28.83	0.33	0.08	0.75	0.42	0.07	0.42



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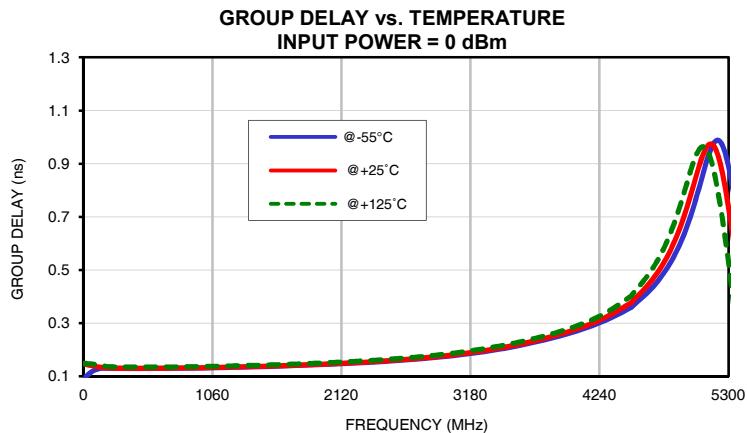
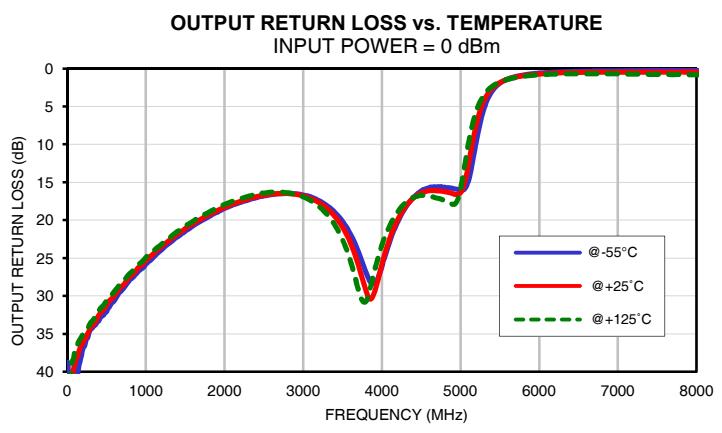
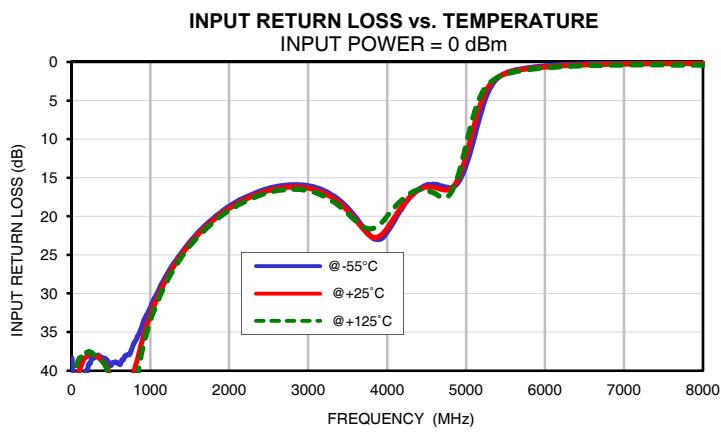
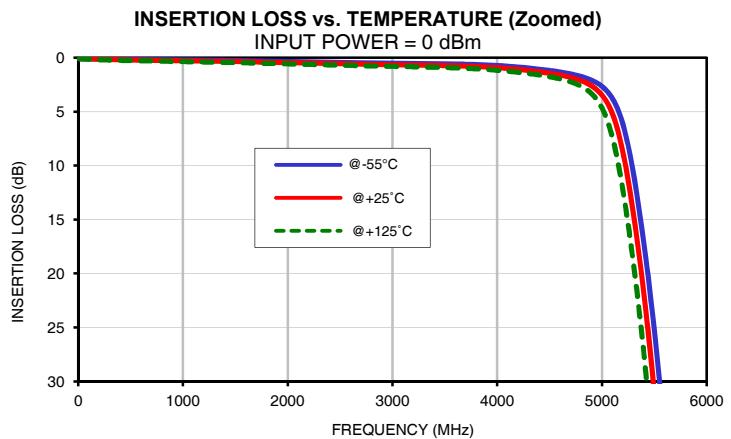
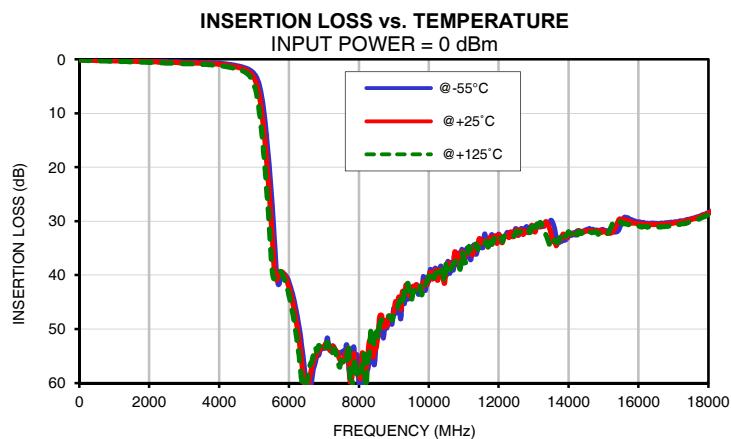
IF/RF MICROWAVE COMPONENTS

REV. A  
LFCG-3800+  
210317  
Page 1 of 2

*Typical Performance Data*

FREQ. (MHz)	GROUP DELAY		
	(nsec)		
	@-55°C	@+25°C	@+125°C
10	0.05	0.15	0.15
20	0.10	0.14	0.15
100	0.12	0.14	0.14
200	0.13	0.13	0.14
300	0.13	0.13	0.13
400	0.13	0.13	0.13
500	0.13	0.13	0.13
600	0.13	0.13	0.13
700	0.13	0.13	0.14
800	0.13	0.13	0.14
900	0.13	0.13	0.14
1000	0.13	0.13	0.14
1100	0.13	0.13	0.14
1200	0.13	0.13	0.14
1300	0.13	0.14	0.14
1400	0.14	0.14	0.14
1500	0.14	0.14	0.14
1600	0.14	0.14	0.14
1700	0.14	0.14	0.15
1800	0.14	0.14	0.15
1900	0.14	0.14	0.15
2000	0.14	0.15	0.15
2100	0.15	0.15	0.15
2200	0.15	0.15	0.16
2300	0.15	0.15	0.16
2400	0.15	0.16	0.16
2500	0.16	0.16	0.16
2600	0.16	0.16	0.17
2700	0.16	0.17	0.17
2800	0.17	0.17	0.17
2900	0.17	0.17	0.18
3000	0.18	0.18	0.18
3100	0.18	0.18	0.19
3200	0.19	0.19	0.20
3300	0.19	0.20	0.20
3400	0.20	0.20	0.21
3500	0.21	0.21	0.22
3600	0.22	0.22	0.23
3700	0.23	0.23	0.24
3760	0.23	0.24	0.25
3800	0.24	0.24	0.25

## Typical Performance Curves

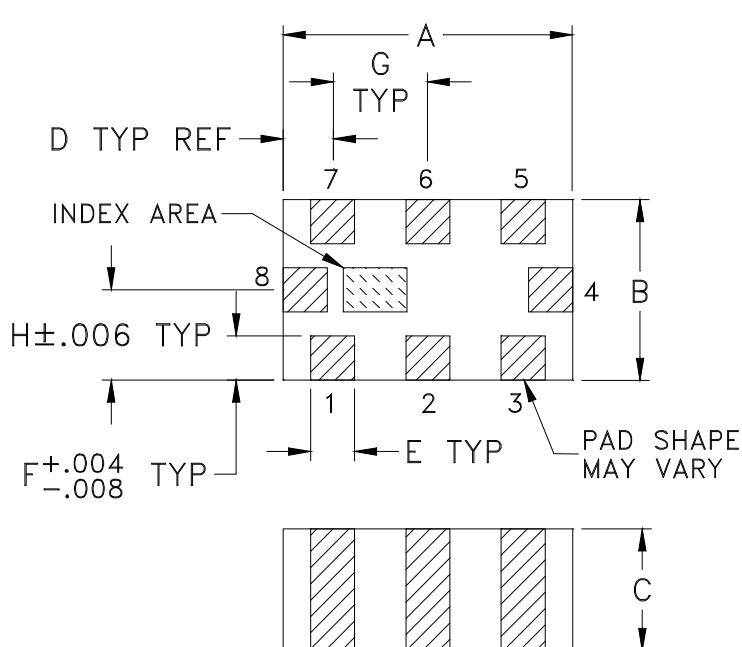


# Case Style

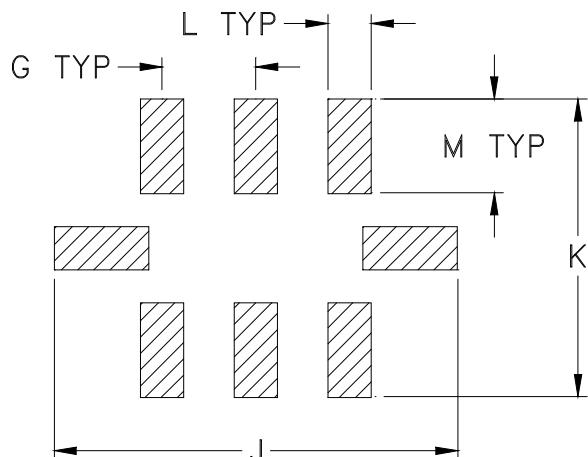
GE

GE0805C-2

## Outline Dimensions



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L
GE0805C-2	.079 (2.00)	.049 (1.25)	.037 (0.95)	.014 (0.35)	.012 (0.30)	.012 (0.30)	.026 (0.65)	.025 (0.63)	.134 (3.40)	.110 (2.80)	.014 (0.35)

CASE #	M	WT. GRAM
GE0805C-2	.039 (1.00)	.008

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. Pad tolerance to be non-cumulative. Minimum spacing between each pad is .004 (0.1).

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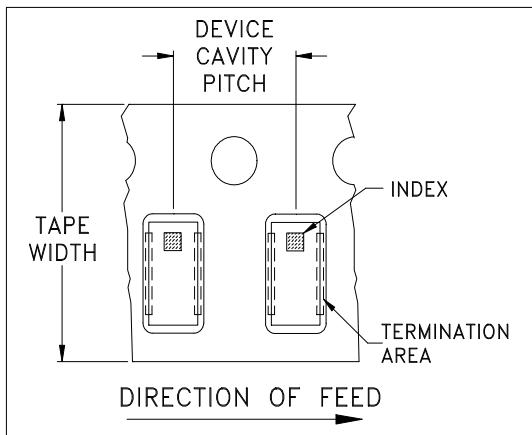


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

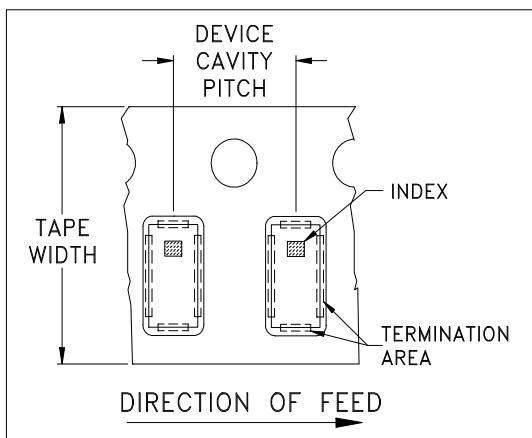
# Tape & Reel Packaging TR-F114

## DEVICE ORIENTATION IN T&R



### Applicable Case Styles

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



### 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) <table border="1" style="margin-left: 20px;"> <tr><td>20</td></tr> <tr><td>50</td></tr> <tr><td>100</td></tr> <tr><td>200</td></tr> <tr><td>500</td></tr> <tr><td>1000</td></tr> <tr><td>Standard</td><td>4000</td></tr> </table>	20	50	100	200	500	1000	Standard	4000
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](http://www.minicircuits.com/pages/pdfs/tape.pdf)

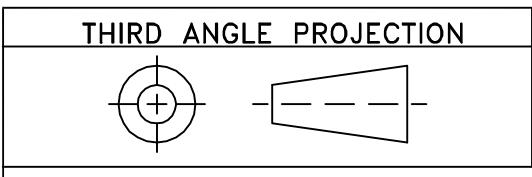


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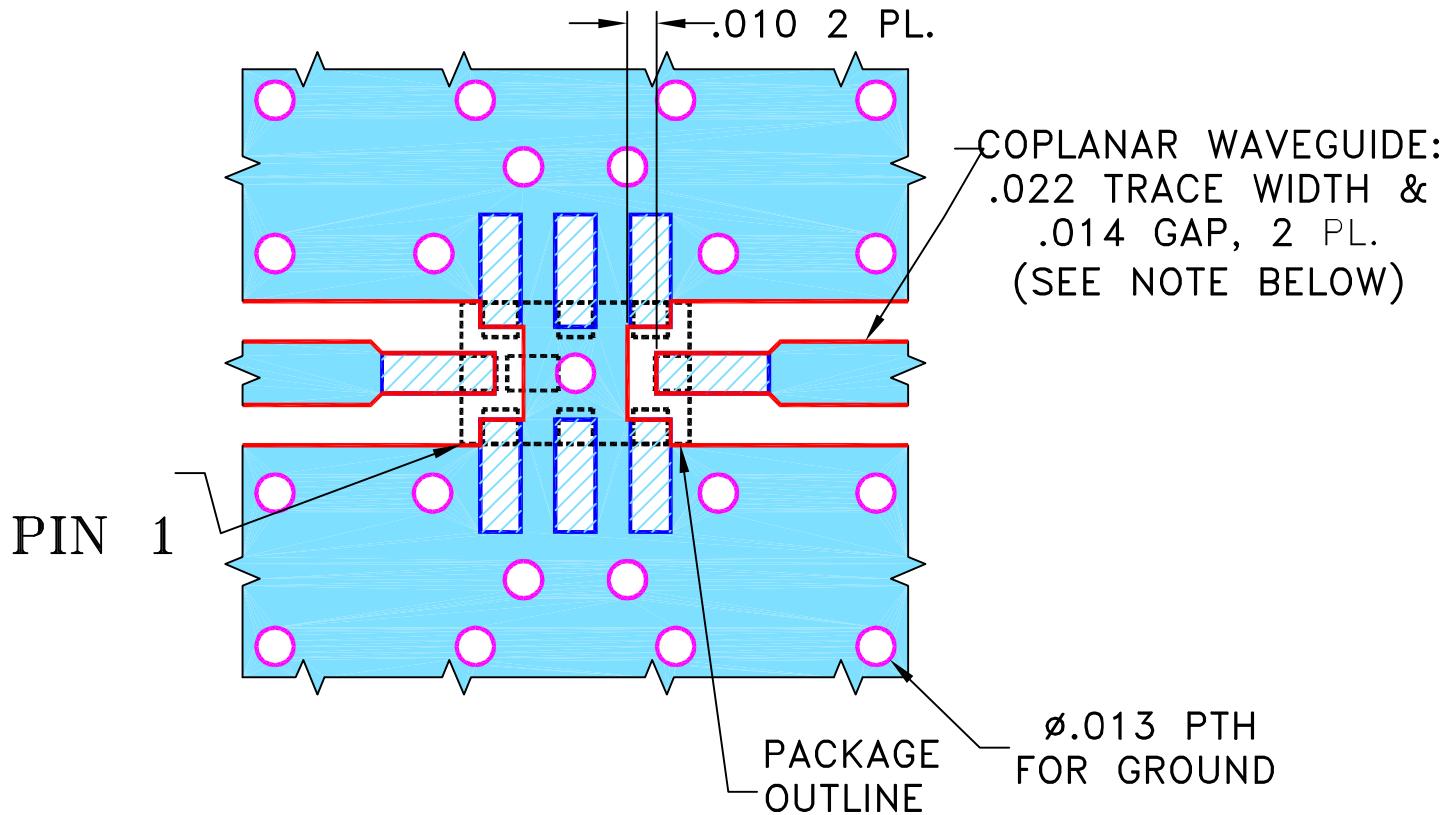
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REVISIONS					
REV OR	ECN No.	DESCRIPTION		DATE	DR AUTH
	M148457	NEW RELEASE		10/14/14	GF MY

SUGGESTED MOUNTING CONFIGURATION  
FOR GE0805C-4 CASE STYLE, "08FL07" PIN CODE



NOTES:

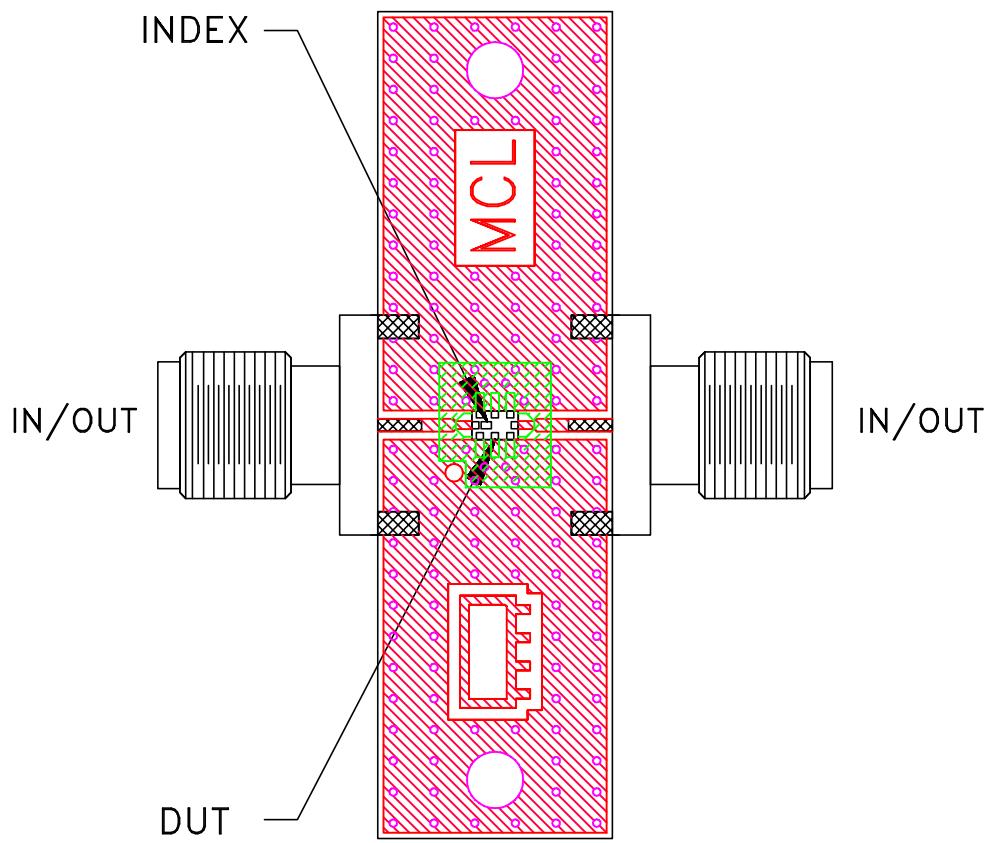
1. COPLANAR WAVEGUIDE IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.010" \pm .001"$ . COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

[Solid Blue Box] DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

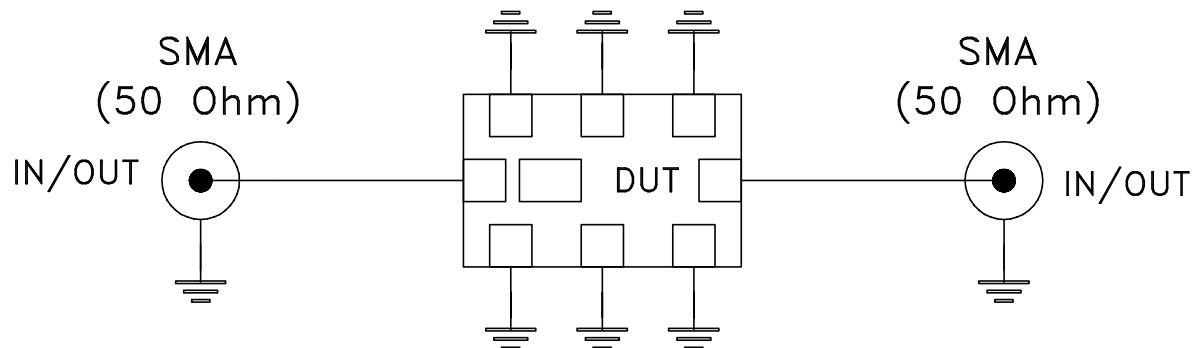
[Hatched Box] DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE	 Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235
DIMENSIONS ARE IN INCHES	DRAWN	GF	10/01/14	
TOLERANCES ON: 2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm .005$	CHECKED	IL	10/14/14	
ANGLES $\pm$ FRACTIONS $\pm$	APPROVED	MY	10/14/14	
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FILE: 98PL429    DRAWING NO: 98-PL-429    REV: OR FILE: 98PL429    SCALE: 15:1    SHEET: 1 OF 1				
ASHEETA1.DWG REV:A DATE:01/12/95				

# Evaluation Board and Circuit



TB-799+



Schematic Diagram

Notes:

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

 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