



Mini-Circuits

LTCC SURFACE MOUNT

Low Pass Filter

LFCW-482+

50Ω DC to 4.8 GHz

THE BIG DEAL

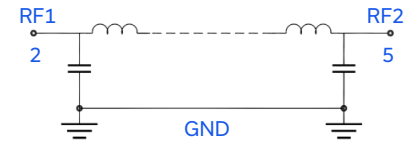
- Low Insertion Loss, Typ. 0.4 dB
- Passband Return Loss, Typ. 13.5 dB
- Stopband Rejection, Typ. 31.5 dB
- 0603 Surface Mount Footprint
- Power Handling: 5 W

*Generic photo used for illustration purposes only*

APPLICATIONS

- Wideband Receiver and Transmitter Chains
- Test and Measurement Instrumentation
- RF Front-End Filtering
- Harmonic and Spurious Signal Suppression

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' LFCW-482+ is a high-performance low pass filter designed for operation from DC to 4800 MHz. Utilizing low temperature co-fired ceramic (LTCC) technology, the filter delivers excellent insertion loss, return loss and stopband attenuation in a compact 0603 surface-mount package. With a typical insertion loss of as low as 0.4 dB and strong rejection beyond the cutoff band, this filter provides effective suppression of harmonics and spurious signals while preserving signal integrity across a wide frequency range. The small footprint makes this component ideal for densely populated RF and microwave signal chains, where size, efficiency and performance are critical.

ELECTRICAL SPECIFICATIONS^{1,2,3} AT +25 °C

Parameter	F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	DC-F1	DC-2.5	-	0.4	0.5	dB
	F1-F2	2.5-4.8	-	1.4	1.7	
	Freq. Cutoff ⁴	Fc	-	3	-	
	DC-F1	DC-2.5	11	13.5	-	
	F1-F2	2.5-4.8	10	13	-	
Stopband	F3-F4	6.6-8	23	30	-	dB
	F4-F5	8-12	25	31.5	-	
	F5-F6	12-14	21	28	-	

1. Tested in Evaluation Board P/N TB-LFCW-482C+.

2. This filter is bi-directional. RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

3. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

4. Typical variation ±5%.

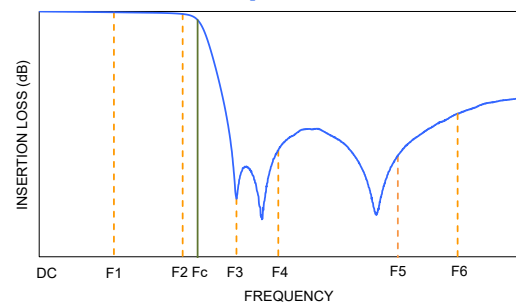
ABSOLUTE MAXIMUM RATINGS⁵

Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power ⁶	5 W

5. Permanent damage may occur if any of these limits are exceeded.

6. Power rating applies only to signals within the passband. Power rating above +25 °C operating temperature decreases linearly to 1.25 W at +125 °C.

TYPICAL FREQUENCY RESPONSE



Mini-Circuits

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

 REV. OR
ECO-030181
LFCW-482+
MCL NY
260623

PAGE 1 OF 4



LTCC SURFACE MOUNT

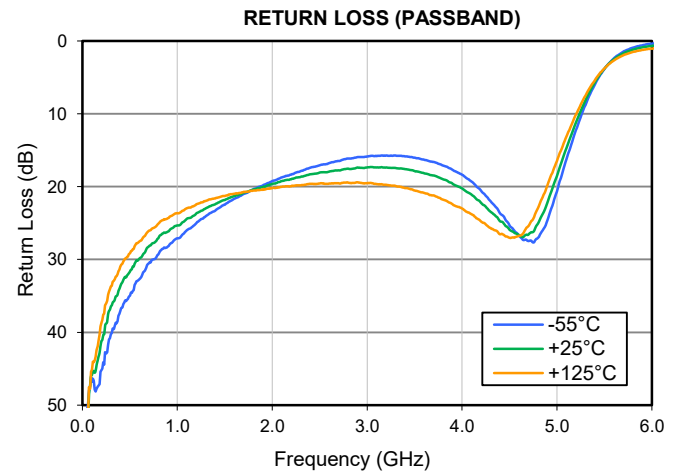
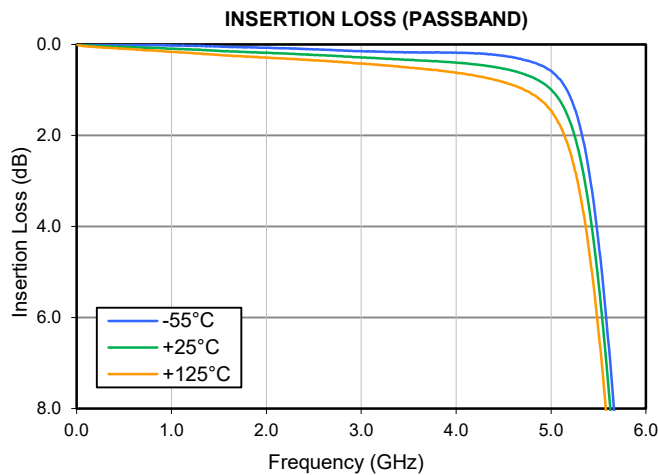
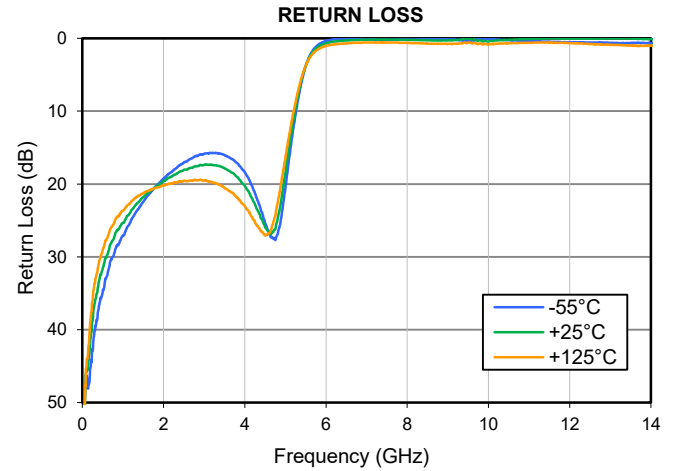
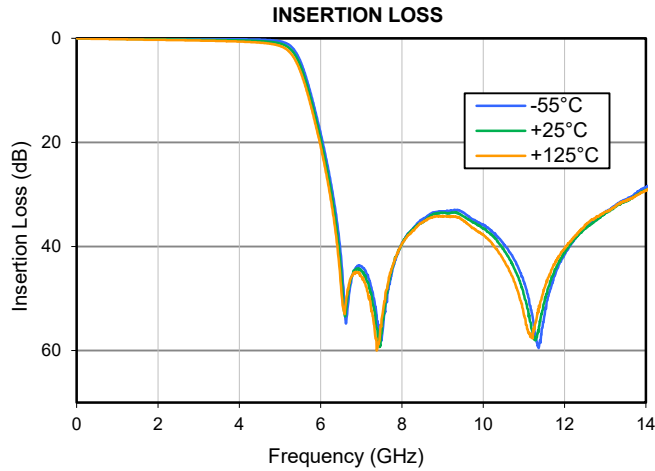
Low Pass Filter

LFCW-482+

Mini-Circuits

50Ω DC to 4.8 GHz

TYPICAL PERFORMANCE GRAPHS

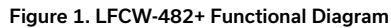




Low Pass Filter

LFCW-482+

FUNCTIONAL DIAGRAM



Function	Pad Number	Description
RF1	2	Connects to RF Input Port
RF2	5	Connects to RF Output Port
GROUND	1, 3, 4, 6	Connects to Ground on PCB, (See drawing PL-554)

Figure 1 is a technical drawing showing the dimensions of the test board. The board is rectangular with a central vertical slot. The dimensions are as follows:

- Top width: .012 2 PL. and .046 4 PL.
- Central slot width: .072
- Bottom width: .028 TRACE WIDTH 2 PL.
- Hole diameter: Ø.014 PTH FOR GROUND
- Labels: PACKAGE OUTLINE, OUT, IN, PIN 1

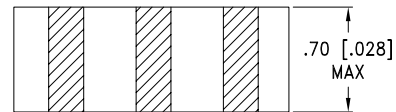
NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.)
WITH DIELECTRIC THICKNESS .016±.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.

Figure 2. Suggested PCB Layout

[illegible] METALLIZATION

Weight: .005 grams
Dimensions are in mm [inch]. Tolerances: ± 0.13 mm

*Marking may contain other features or characters for internal lot control.



ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	JC0603C Lead Finish: Tin Plate over Nickel Plate
RoHS/REACH Status	Compliant
Tape and Reel	F114
Suggested Layout for PCB Design	PL-554
Evaluation Board	TB-LFCW-482C+ Gerber File
Environmental Rating	ENV166

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-Circuits' 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/terms/viewterm.html

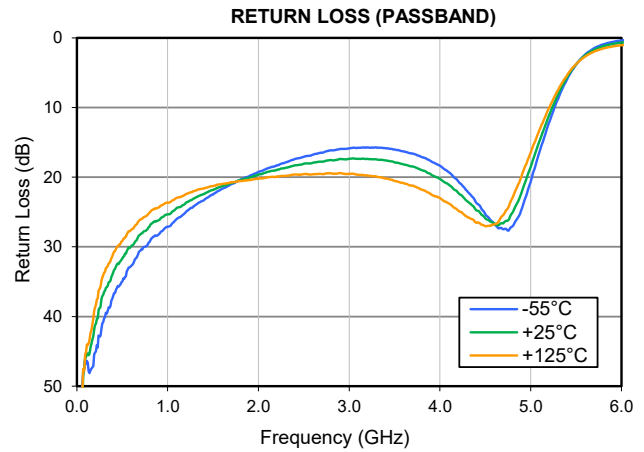
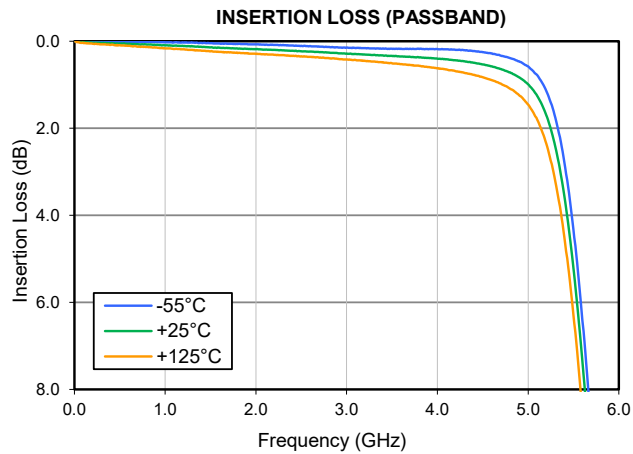
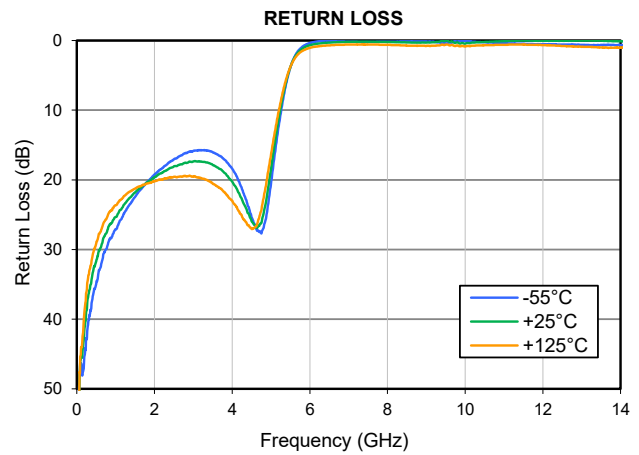
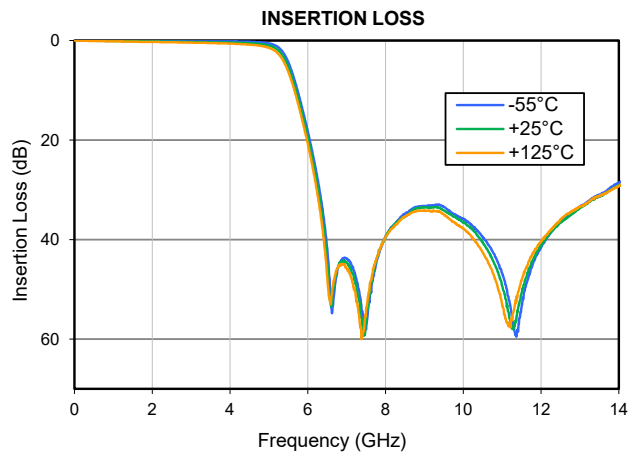
LTCC Low Pass Filter

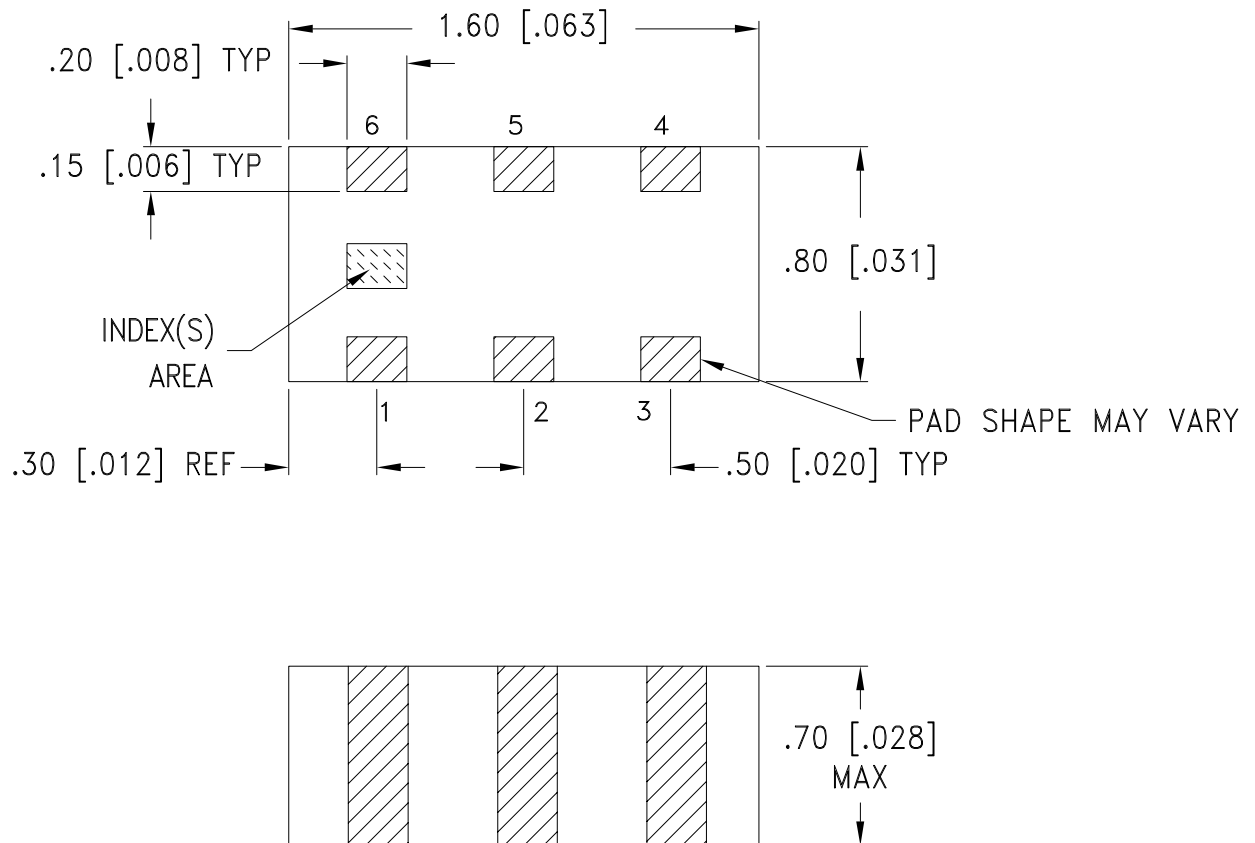
Typical Performance Data

LFCW-482+

FREQUENCY (GHz)	INSERTION LOSS (dB)			RETURN LOSS (dB)		
	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C
0.50	0.01	0.05	0.09	34.95	31.67	29.13
1.00	0.02	0.09	0.16	27.08	25.32	23.64
1.20	0.03	0.11	0.19	24.99	23.68	22.43
1.40	0.04	0.13	0.22	23.27	22.41	21.62
1.60	0.05	0.15	0.24	21.66	21.29	20.97
1.80	0.06	0.17	0.27	20.36	20.40	20.53
2.00	0.07	0.18	0.29	19.25	19.63	20.19
2.20	0.09	0.20	0.31	18.34	18.99	19.95
2.40	0.10	0.22	0.34	17.40	18.30	19.61
2.60	0.12	0.24	0.36	16.77	17.94	19.58
2.80	0.13	0.26	0.38	16.14	17.53	19.43
3.00	0.15	0.28	0.42	15.85	17.36	19.51
3.20	0.16	0.31	0.45	15.72	17.37	19.73
3.40	0.17	0.33	0.48	15.84	17.60	20.18
3.60	0.17	0.35	0.53	16.31	18.16	20.88
3.80	0.18	0.37	0.57	17.09	18.99	21.78
4.00	0.18	0.40	0.62	18.36	20.24	23.00
4.20	0.20	0.44	0.68	20.56	22.23	24.81
4.40	0.22	0.49	0.77	23.65	24.75	26.54
4.60	0.28	0.58	0.89	26.73	26.65	26.74
4.80	0.38	0.71	1.09	27.02	25.06	22.90
5.00	0.58	0.99	1.45	20.65	18.52	16.46
5.20	1.14	1.70	2.36	12.24	11.19	10.10
5.40	2.78	3.56	4.50	5.95	5.67	5.36
5.60	6.42	7.39	8.54	2.39	2.52	2.67
5.80	11.83	12.88	14.13	0.92	1.19	1.51
6.00	18.24	19.37	20.78	0.36	0.67	1.05
6.20	25.63	26.93	28.67	0.13	0.45	0.84
6.40	35.06	36.94	39.24	0.01	0.35	0.73
6.60	52.85	53.45	52.07	0.08	0.26	0.65
6.80	45.29	45.09	45.32	0.12	0.23	0.61
7.00	43.79	44.54	45.74	0.16	0.19	0.57
7.20	46.66	48.07	49.63	0.18	0.18	0.56
7.40	54.34	56.18	59.36	0.20	0.17	0.56
7.60	51.12	49.82	48.84	0.19	0.18	0.57
7.80	43.42	43.17	43.16	0.18	0.20	0.60
8.00	39.29	39.68	39.50	0.17	0.21	0.62
8.20	37.12	37.34	37.52	0.15	0.23	0.67
8.40	35.42	35.81	35.97	0.12	0.27	0.71
8.60	34.37	34.78	35.00	0.10	0.29	0.75
8.80	33.45	33.79	34.35	0.12	0.29	0.75
9.00	33.26	33.55	34.22	0.13	0.29	0.77
9.20	33.15	33.55	34.29	0.18	0.25	0.74
9.40	33.10	33.68	34.46	0.41	0.03	0.60
9.60	34.04	34.63	35.54	0.24	0.19	0.71
9.80	34.94	35.59	36.68	0.17	0.25	0.70
10.00	35.83	36.53	37.81	0.01	0.44	0.84
10.20	37.03	37.66	39.27	0.15	0.29	0.74
10.40	38.50	39.52	41.37	0.23	0.21	0.69
10.60	40.50	41.84	43.84	0.27	0.18	0.67
10.80	42.98	44.93	47.57	0.33	0.12	0.63
11.00	46.83	49.32	53.28	0.38	0.08	0.60
11.20	52.82	56.12	56.83	0.41	0.05	0.59
11.40	58.00	54.47	50.81	0.45	0.02	0.59
11.60	49.56	47.91	45.92	0.49	0.01	0.60
11.80	44.69	43.90	42.59	0.52	0.04	0.61
12.00	41.45	41.24	40.40	0.54	0.04	0.65
12.20	39.17	39.09	38.53	0.54	0.03	0.70
12.40	37.27	37.34	36.74	0.57	0.04	0.74
12.60	35.51	35.98	35.31	0.57	0.03	0.82
12.80	34.39	34.85	34.35	0.60	0.03	0.85
13.00	33.43	33.67	33.43	0.61	0.01	0.90
13.20	32.35	32.77	32.50	0.65	0.01	0.93
13.40	31.30	31.72	31.46	0.65	0.01	0.97
13.60	30.67	30.89	30.84	0.63	0.05	1.02
13.80	29.59	30.00	30.06	0.63	0.09	1.03
14.00	28.66	29.22	29.30	0.66	0.11	1.03

Typical Performance Data





METALLIZATION

Weight: .005 grams

Dimensions are in mm [inch]. Tolerances: ± 0.13 mm

Notes:

1. Open style, ceramic base.
2. Termination finish:

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.



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

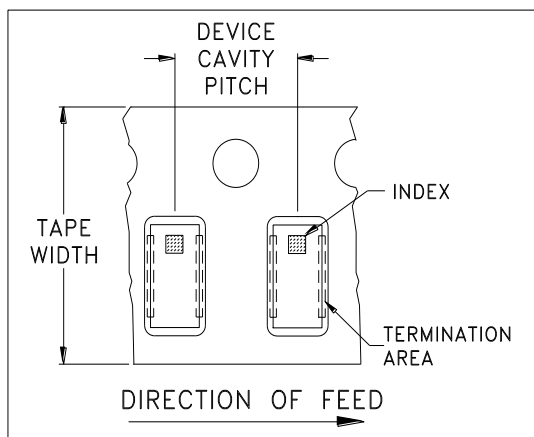


ILLUSTRATION 1

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

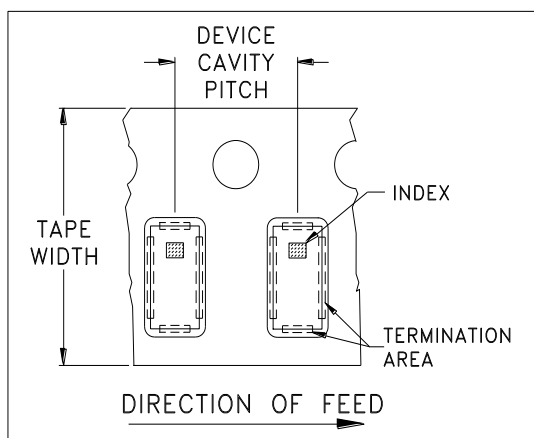


ILLUSTRATION 2

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
				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



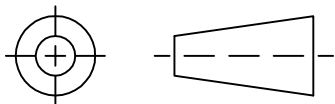
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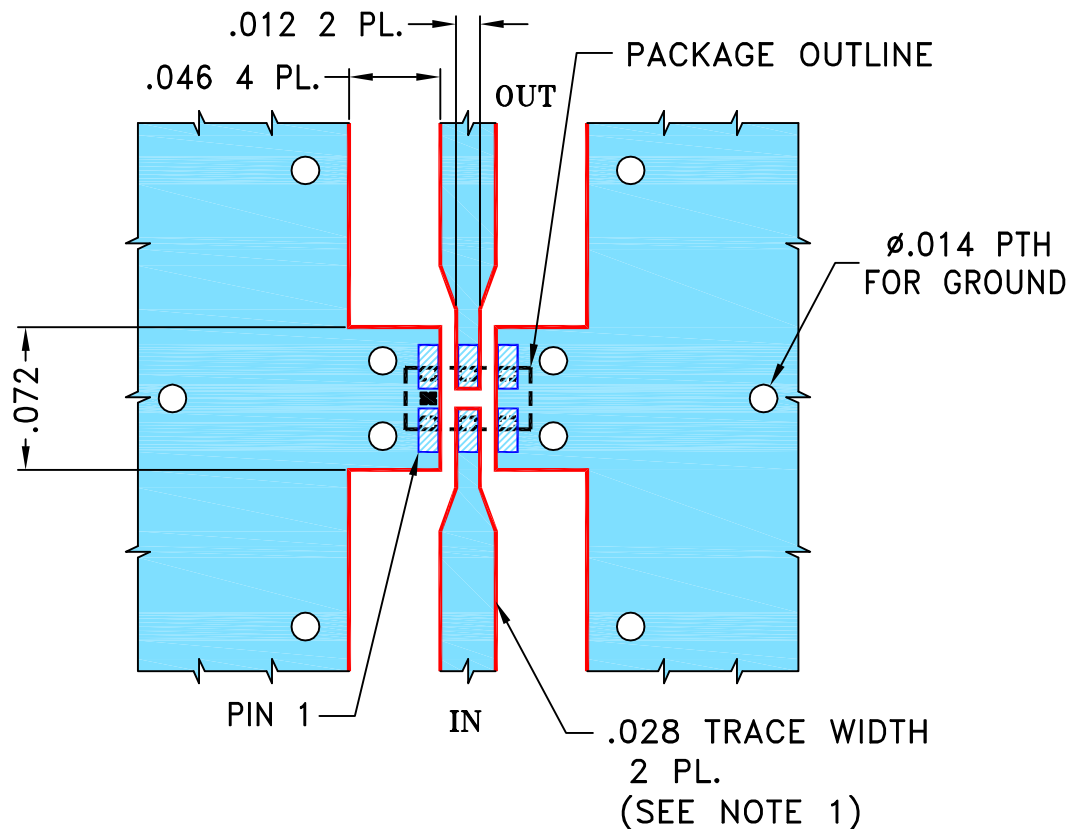
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M168200	NEW RELEASE	05/31/18	NP	SL

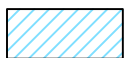
SUGGESTED MOUNTING CONFIGURATION
FOR JC0603C CASE STYLE, "06FL12" PIN CODE

**NOTES:**

- TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS $.016 \pm .0015$. 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

DIMENSIONS ARE IN INCHES
 TOLERANCES ON:
 2 PL DECIMALS $\pm$
 3 PL DECIMALS $\pm$.005
 ANGLES $\pm$
 FRACTIONS $\pm$



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

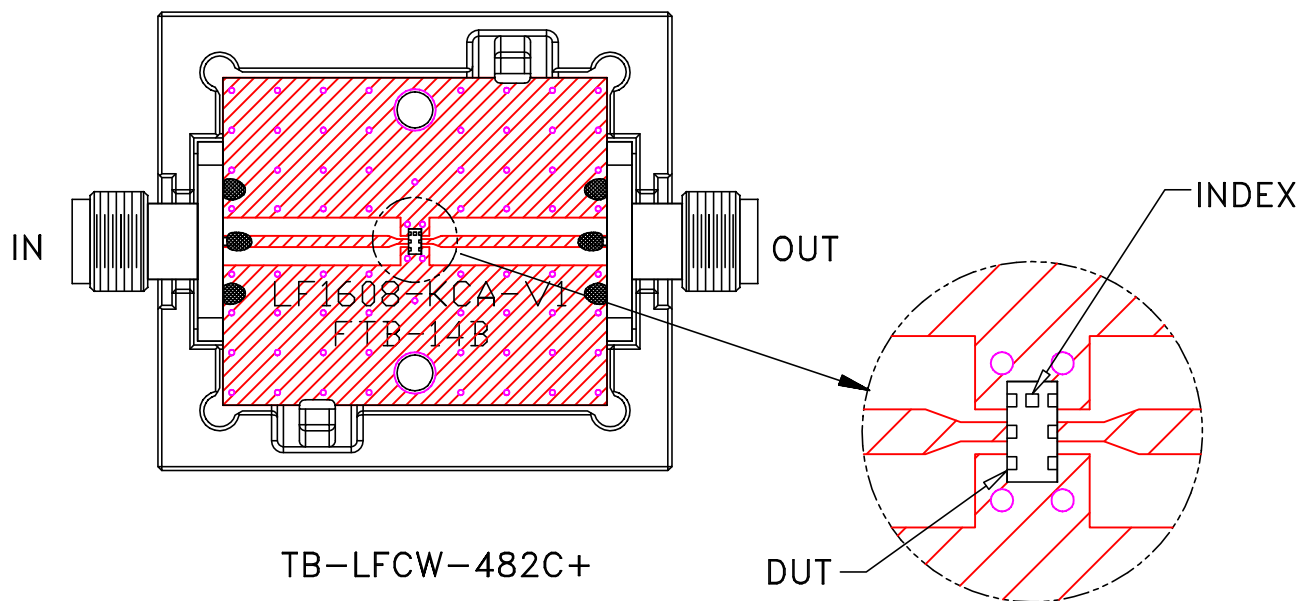


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 Brooklyn NY 11235

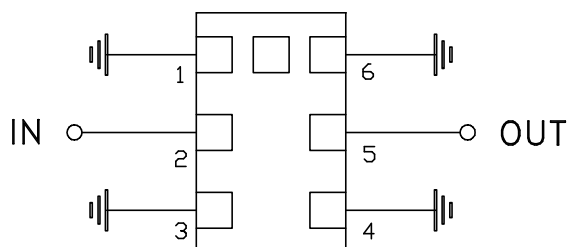
PL, 06FL12, JC0603C, TB-1020+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-554	OR
FILE:	98PL554	SCALE: 10:1	SHEET: 1 OF 1

Evaluation Board and Circuit



TB-LFCW-482C+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: FR4 or equivalent,
Dielectric Constant=4.5, Thickness=.016 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 125° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 125° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 1000 hours, 85 +/- 2°C	JESD22-A101
Solderability	10X Magnification	MIL-STD-883 Method 2003:> 95% coverage
Thermal Shock	-40°C to 125°C ± 5°C, dwell time 30 min, 100 cycles	JESD22-A104