

# Differential Low Pass Filter

## DLFCG-540+

100Ω DC to 540 MHz

### The Big Deal

- Differential operation
- Fast roll off
- Small size, 0805
- Very wide stopband, up to 8360 MHz without re-entry



CASE STYLE: GE0805C-1

### Product Overview

Mini-Circuits' DLFCG-540+ is an LTCC differential low pass filter with a passband from DC to 540 MHz. This model is ideal for applications requiring filtering of balanced signals on dual 50Ω lines such as DACs/ ADCs, systems with very low noise requirements and more. The filter provides low insertion loss in the passband, fast roll off in the transition, and a very wide stopband without re-entry up to 8360 MHz, making it suitable for use in wideband systems with many harmonics and spurious products. The unit comes housed in a tiny, rugged 0805 ceramic package, with wraparound terminations for excellent solderability.

### Key Features

Feature	Advantages
Differential filter	Allows filtering of balanced signals in a single, tiny component. Eliminates the need for binning and matching of separate discrete components.
Tiny size (0.08 x 0.05 x 0.03")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Fast roll off	Provides sharp rejection at frequencies close to the passband.
Ultra-wide stopband	Provides excellent rejection over more than a decade of bandwidth, ideal for blocking harmonics in wideband test and measurement or communications systems.
Wrap-around terminations	Provides excellent solderability and easy visual inspection.
Wide operating temperature range, -55 to +100°C	Enables reliable performance in extreme environments.



Differential

# Low Pass Filter

100Ω

DC to 540 MHz

## DLFCG-540+



CASE STYLE: GE0805C-1

### Features

- Low insertion loss
- Small size
- Excellent return loss
- High rejection

### Applications

- Military Applications
- VHF/UHF transmitters/receivers
- Harmonic rejection
- A/D and D/A conversion

**+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 - 540	—	1.2	2.2	dB
	Freq. Cut-Off	F2	590	—	3.0	—	dB
	VSWR	DC-F1	DC - 540	—	1.2	—	:1
Stop Band	Insertion Loss	F3-F4	720 - 8360	19	26	—	dB
			890 - 4560	26	31	—	dB
	VSWR	F3-F4	720 - 8360	—	20	—	:1

(1) In Application where DC voltage is present at either input or output ports, de-coupling capacitors are required.

(2) Measured on Mini-Circuits Characterization Test Board TB-939+.

### Maximum Ratings

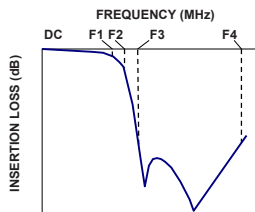
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	1W Max.

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

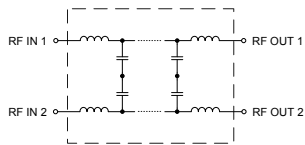
### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
25	0.13	1.02
50	0.16	1.05
100	0.21	1.11
150	0.27	1.15
200	0.33	1.18
250	0.39	1.18
300	0.44	1.14
400	0.59	1.04
500	0.97	1.13
540	1.35	1.18
720	36.83	26.82
1000	46.90	69.09
1500	30.18	97.20
2000	31.35	124.98
3000	48.91	143.98
4000	33.42	111.40
5000	28.46	116.79
6000	25.35	276.99
7000	23.27	145.65
8400	20.53	73.20

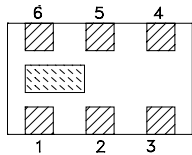
### Specification Definition



### Functional Schematic

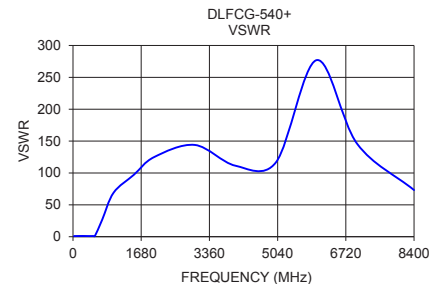
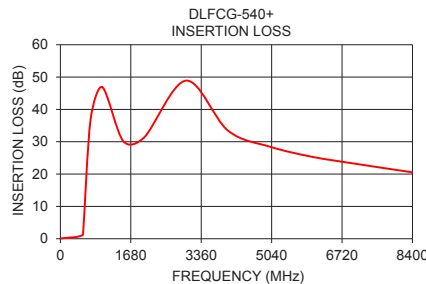


### Top View

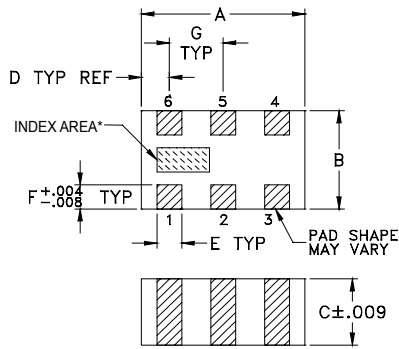


### Pad Connections

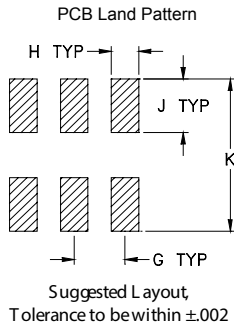
RF IN1, RF IN2	1, 6
RF OUT1, RF OUT2	3, 4
NO CONNECTION	2, 5



## Outline Drawing



\*Shape of index marking may vary



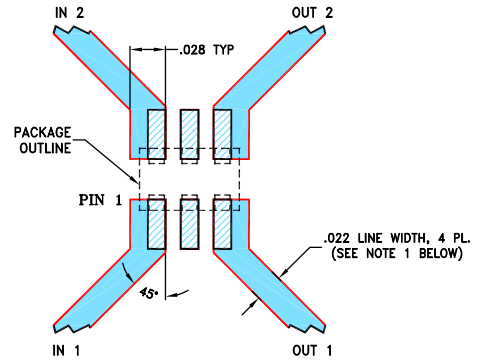
### Pad Connections

RF IN1, RF IN2	1, 6
RF OUT1, RF OUT2	3, 4
NO CONNECTION	2, 5

### Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

A	B	C	D	E	F
.079	.049	.033	.014	.012	.012
2.01	1.24	0.84	0.36	0.30	0.30
G	H	J	K		wt
.026	.014	.039	.110		grams
0.66	0.36	1.00	2.80		.008

### Demo Board MCL P/N: TB-939+ Suggested PCB Layout (PL-516)



#### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010" ± .001"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH 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

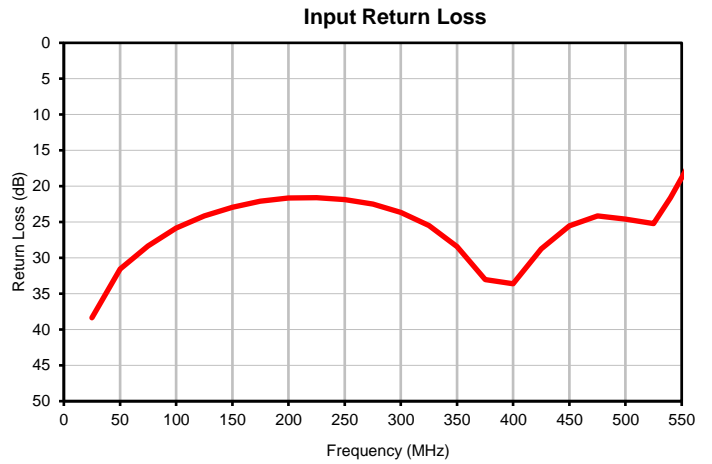
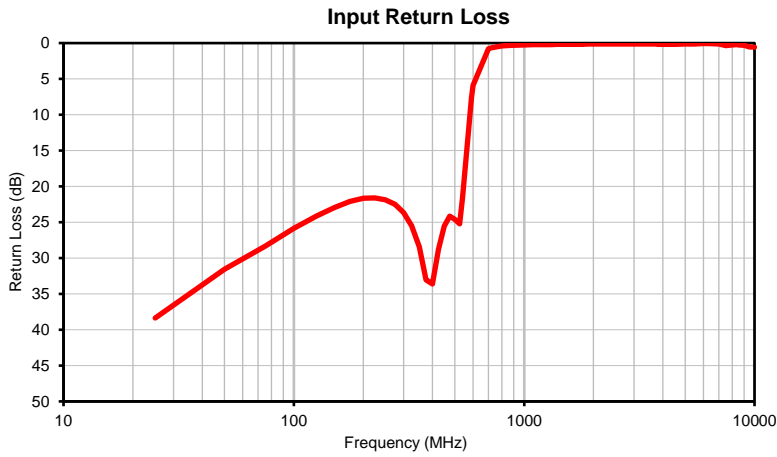
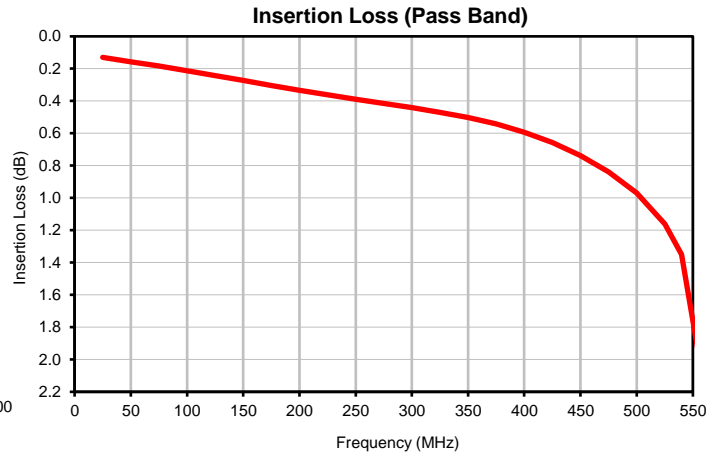
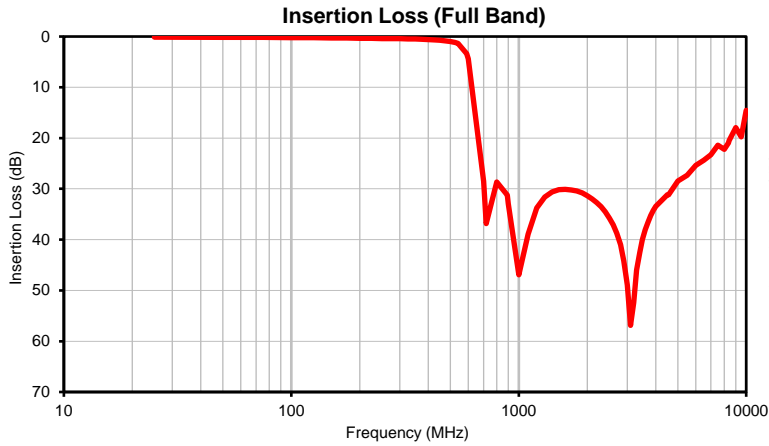
### Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)
25	0.13	38.36
50	0.16	31.57
75	0.18	28.34
100	0.21	25.86
125	0.24	24.17
150	0.27	22.93
175	0.30	22.11
200	0.33	21.67
225	0.36	21.59
250	0.39	21.86
275	0.42	22.51
300	0.44	23.68
325	0.47	25.50
350	0.50	28.46
375	0.54	33.02
400	0.59	33.64
425	0.66	28.76
450	0.74	25.54
475	0.84	24.14
500	0.97	24.58
525	1.16	25.22
540	1.35	21.60
590	3.39	7.61
600	4.36	5.89
700	28.52	0.78
720	36.83	0.65
800	28.67	0.42
890	31.20	0.32
900	32.90	0.30
1000	46.90	0.25
1100	38.93	0.22
1200	33.78	0.21
1300	31.61	0.20
1400	30.61	0.19
1500	30.18	0.18
1600	30.07	0.17
1700	30.21	0.16
1800	30.39	0.15
1900	30.81	0.15
2000	31.35	0.14
2100	32.02	0.13
2200	32.71	0.12
2300	33.53	0.11
2400	34.52	0.11
2500	35.77	0.11
2600	37.09	0.11
2700	38.74	0.11
2800	40.99	0.11
2900	44.23	0.11
3000	48.91	0.12
3100	56.89	0.12
3200	52.42	0.13
3300	45.98	0.13
3400	42.49	0.14
3500	39.97	0.14
3600	38.05	0.15
3700	36.51	0.15
3800	35.24	0.15
3900	34.27	0.15
4000	33.42	0.16
4500	31.15	0.17
4560	31.15	0.17
5000	28.46	0.15
5500	27.30	0.15
6000	25.35	0.06
6500	24.35	0.08
7000	23.27	0.12
7500	21.41	0.36
8000	22.25	0.24
8360	20.93	0.23
8400	20.53	0.24
8500	20.13	0.25
9000	17.91	0.33
9500	19.75	0.51
10000	14.52	0.58

## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
GE0805C-1	.079 (2.00)	.049 (1.25)	.033 (0.84)	.014 (0.35)	.012 (0.30)	.012 (0.30)	.026 (0.65)	.014 (0.35)	.039 (1.00)	.110 (2.80)	.008

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 Style: Tin-lead plate. All models, no (+) 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

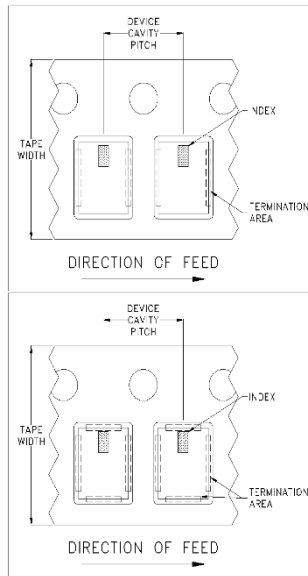


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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F74

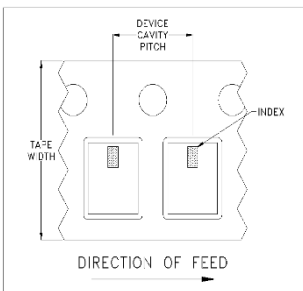
## **DEVICE ORIENTATION IN T&R**



**ILLUSTRATION 1**

### Applicable Case Styles

GE0805C-1  
 GE0805C-1AP  
 JV1210C-1  
 GU2939



**ILLUSTRATION 2**

### Applicable Case Styles

JV1210C  
 JV1210C-2  
 JV1210C-3  
 JV1210C-4  
 JV1210C-5  
 JV1210C-6  
 JV1210C-11

**ILLUSTRATION 3**

### Applicable Case Styles

JC0603C-8  
 JC0603C-9  
 JV1210C-7  
 JV1210C-8  
 JV1210C-9  
 JV1210C-10  
 JV1210C-13  
 GE0805C-13  
 GE0805C-19  
 GE0805C-20

Tape Width, mm	Device Cavity Pitch, mm	Real Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	2000
				4000

Note: Small reel availability varies by model. Refer to pricing and availability on individual model dashboard.

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)

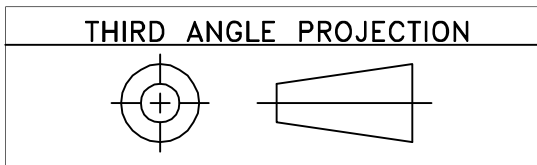


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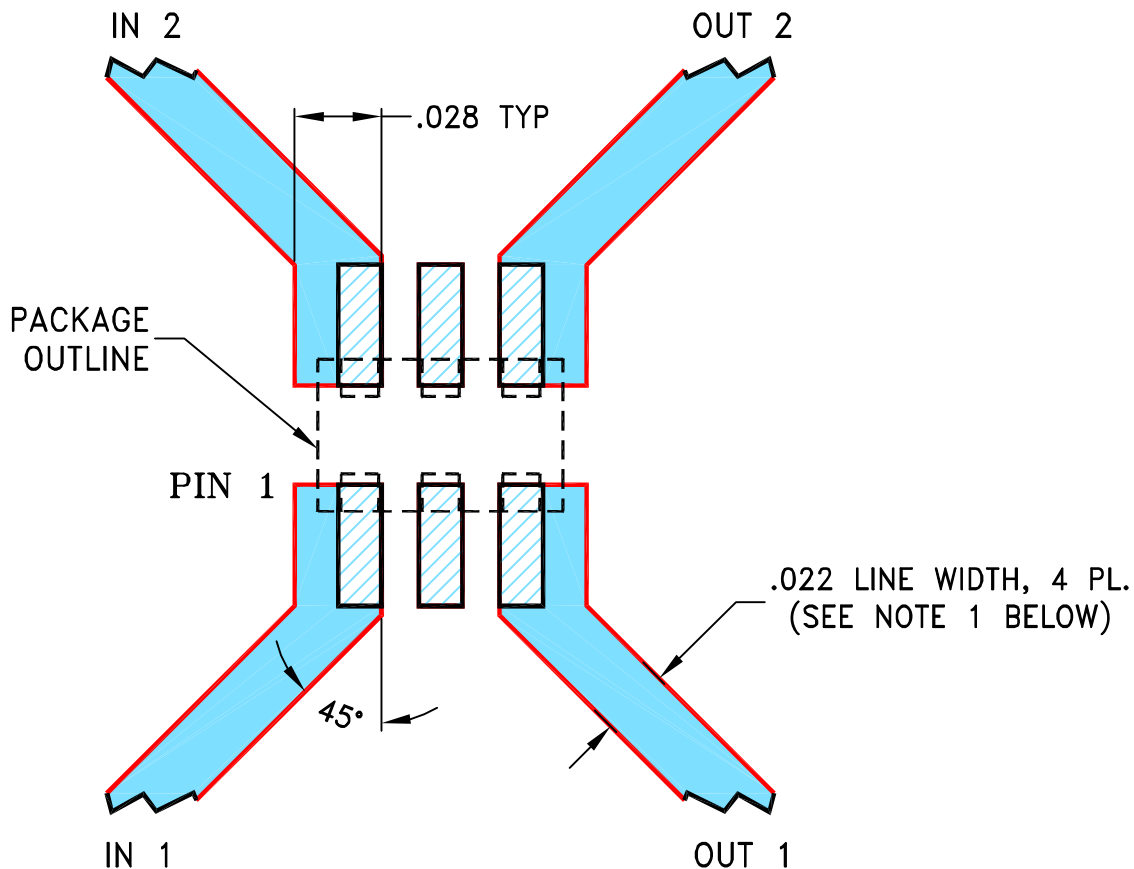
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REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M161974	NEW RELEASE	06/29/17	CA	IL

SUGGESTED MOUNTING CONFIGURATION FOR  
GE0805C-1 CASE STYLE, "06FL11" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.010'' \pm .001''$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH 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 CA	06/26/17
TOLERANCES ON:	CHECKED GF	06/29/17
2 PL DECIMALS $\pm$	APPROVED IL	06/29/17
3 PL DECIMALS $\pm$ .005		
ANGLES $\pm$		
FRACTIONS $\pm$		

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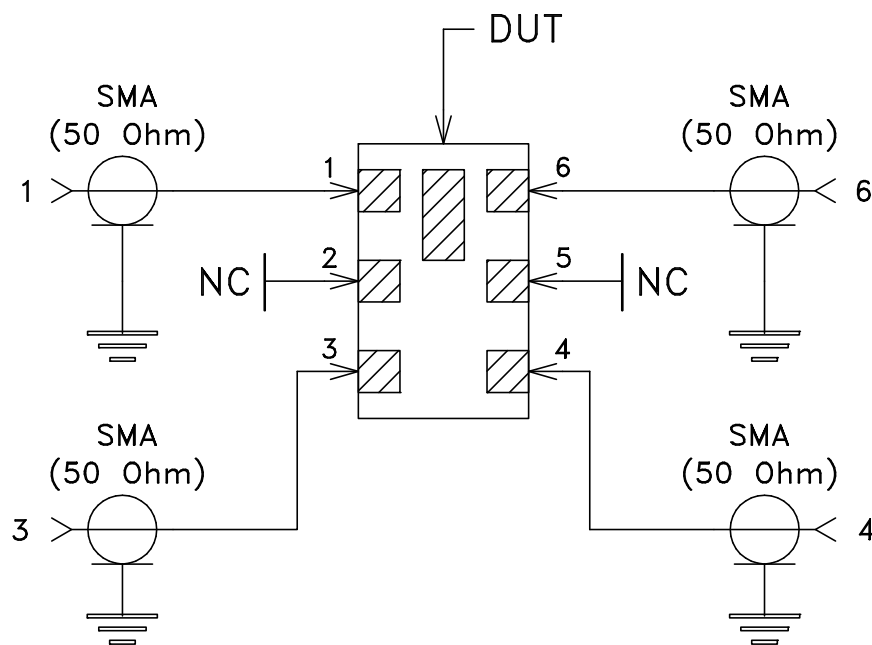
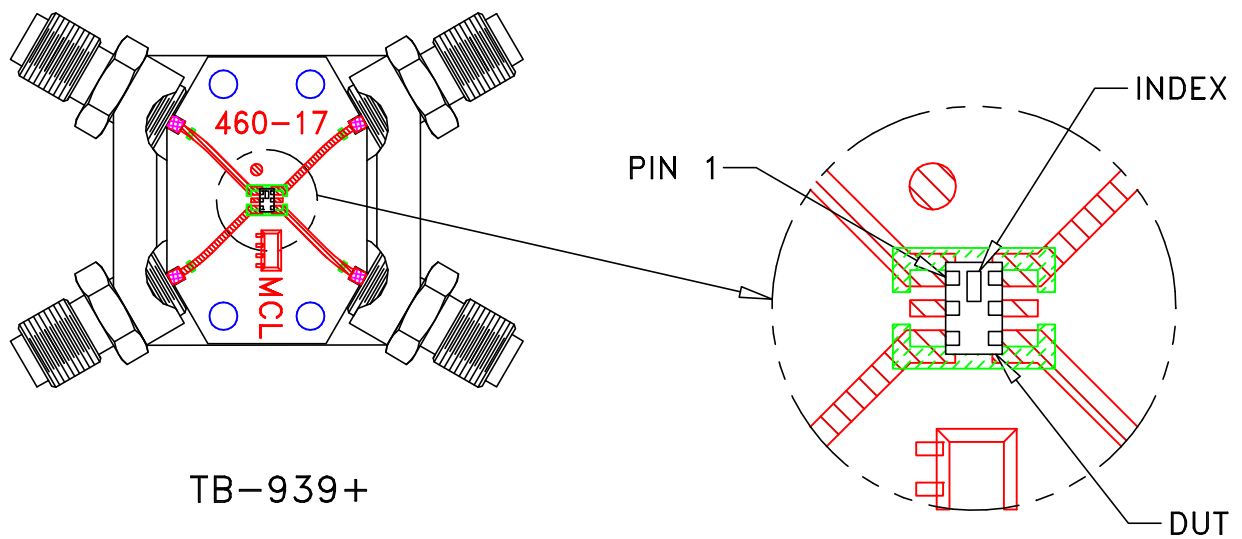
PL, 06FL11, GE0805C-1, TB-939+

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

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-516	REV: OR
FILE: 98PL516	SCALE: 16:1	SHEET: 1 OF 1	


# Evaluation Board and Circuit



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers 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	-40° to 85°C	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I