

# Ceramic Bandpass Filter

50Ω 4900 to 5920 MHz

## BPGE-542R+



Generic photo used for illustration purposes only

CASE STYLE: GE0805C-3

**+RoHS Compliant**

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

### Features

- Miniature size 0805 (0.079"[2.0mm] x 0.049"[1.25mm] x 0.037"[0.95mm])
- Low cost
- Aqueous washable

### Applications

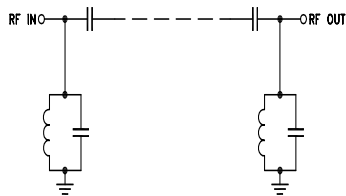
- ISM Band
- WLAN
- Bluetooth
- Zigbee

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

| Parameter        | F#             | Frequency (MHz) | Min.          | Typ. | Max. | Unit |    |
|------------------|----------------|-----------------|---------------|------|------|------|----|
| Center Frequency | —              | —               | —             | 5400 | —    | dB   |    |
| Pass Band        | Insertion Loss | F1-F2           | 4900 - 5920   | —    | 0.9  | 1.9  | dB |
|                  | VSWR           | F1-F2           | 4900 - 5920   | —    | 1.2  | 2.0  | :1 |
|                  | Insertion Loss | DC-F3           | 3500          | 30   | 49   | —    | dB |
| Stop Band, Lower | Insertion Loss | F4-F5           | 9800 - 11840  | 25   | 32   | —    | dB |
| Stop Band, Upper | Insertion Loss | F6-F7           | 14700 - 17760 | 5    | 30   | —    | dB |

1. Tested on Evaluation Board TB-1028+.

### Functional Schematic



### Maximum Ratings

|                                  |               |
|----------------------------------|---------------|
| Operating Temperature            | -40°C to 85°C |
| Storage Temperature <sup>2</sup> | -40°C to 85°C |
| RF Power Input <sup>3</sup>      | 2W at 25°C    |

2. Refer to product storage temperature after installation

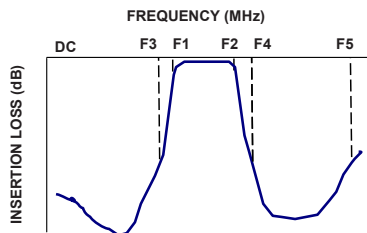
Suggestion for T&R unused product storage condition:

+5 ~ +35 °C, Humidity 45~75%RH, 12 month Max

3. Derate linearly to 1W at 85°C

Permanent damage may occur if any of these limits exceeded.

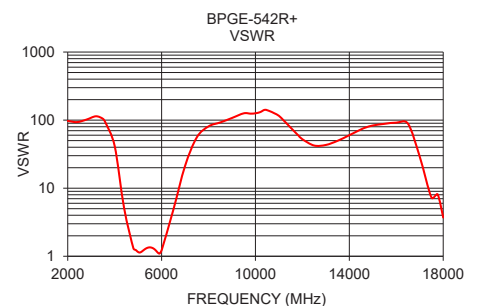
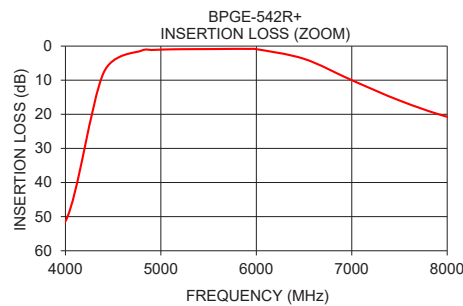
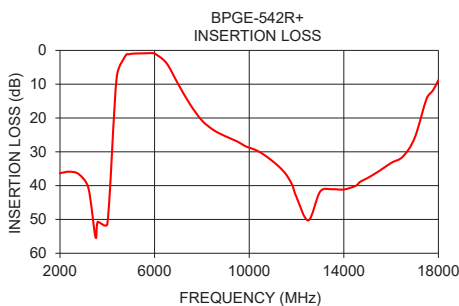
### Typical Frequency Response



### Typical Performance Data<sup>4</sup> at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) |
|-----------------|---------------------|-----------|
| 2000            | 36.30               | 97.37     |
| 3500            | 55.21               | 104.57    |
| 4000            | 51.38               | 41.74     |
| 4900            | 1.15                | 1.24      |
| 5920            | 0.83                | 1.10      |
| 7000            | 9.99                | 21.26     |
| 8000            | 20.71               | 80.91     |
| 9800            | 28.19               | 124.41    |
| 10000           | 28.76               | 126.10    |
| 11000           | 32.84               | 115.63    |
| 11840           | 40.13               | 59.03     |
| 13000           | 41.76               | 43.18     |
| 14000           | 41.14               | 60.10     |
| 14700           | 38.82               | 77.89     |
| 16000           | 33.28               | 91.79     |
| 17760           | 11.93               | 8.14      |
| 18000           | 8.81                | 3.71      |

4. Measured with Agilent E5071B network analyzer using impedance conversion and port extension.



### 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.

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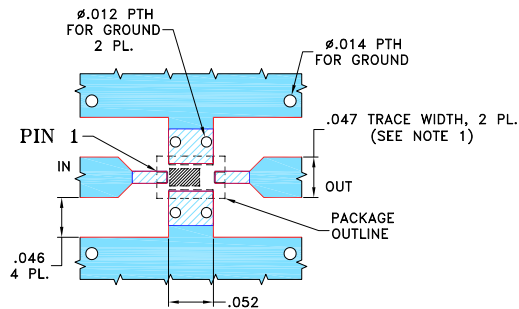
REV. A  
M175714  
BPGE-542R+  
SL/CP/AM  
201109  
Page 1 of 2

## Pad Connections

|        |     |
|--------|-----|
| INPUT  | 1   |
| OUTPUT | 3   |
| GROUND | 2,4 |

## Product Marking: N/A

Evaluation Board MCL P/N: TB-BPGE-542R+  
Suggested PCB Layout (PL-566)

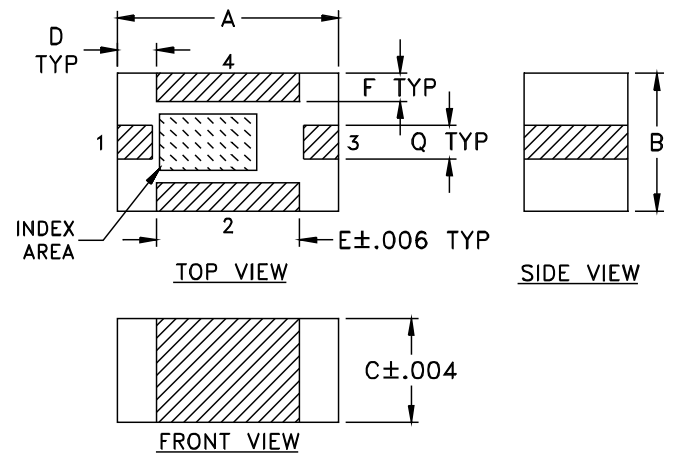


### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS R04233 WITH DIELECTRIC THICKNESS  $.020 \pm .0015$ . COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND 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.

## Outline Drawing



### Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E    | F    | Q    | wt    |
|------|------|------|------|------|------|------|-------|
| .079 | .049 | .037 | .014 | .051 | .010 | .012 | grams |
| 2.01 | 1.24 | 0.94 | 0.36 | 1.30 | 0.25 | 0.30 | .020  |

### Notes

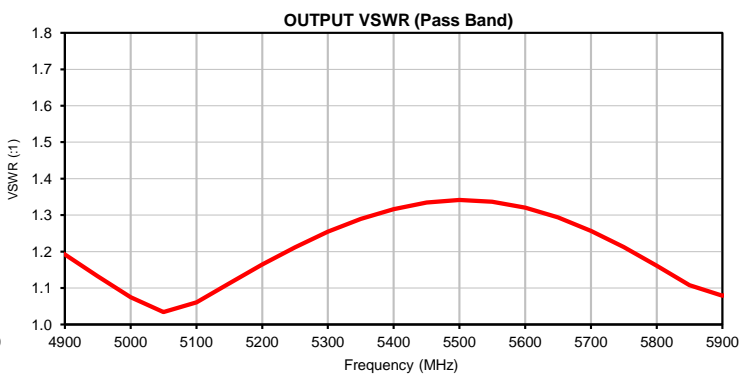
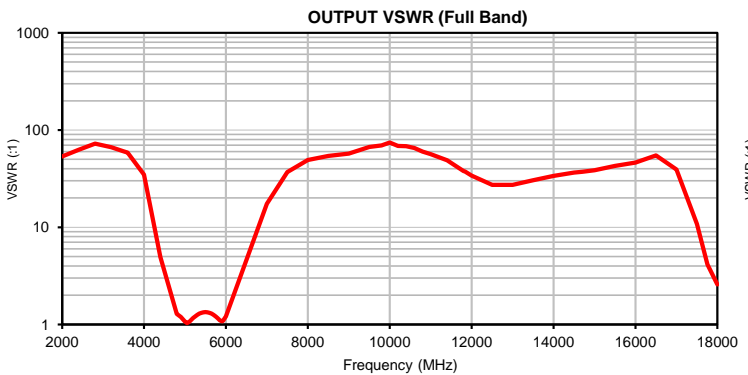
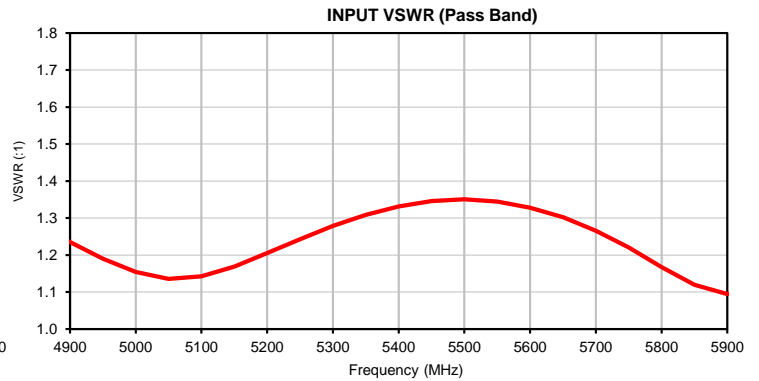
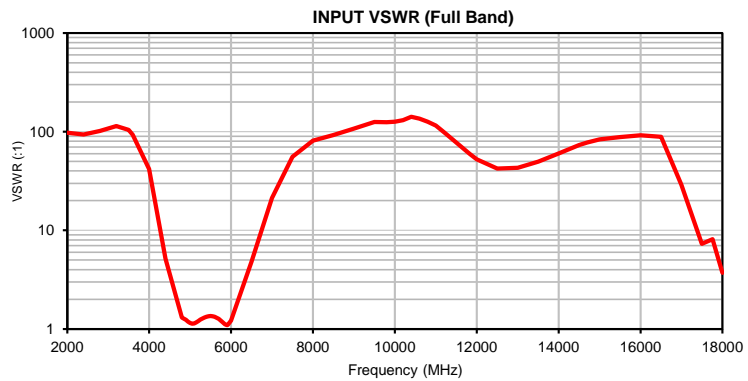
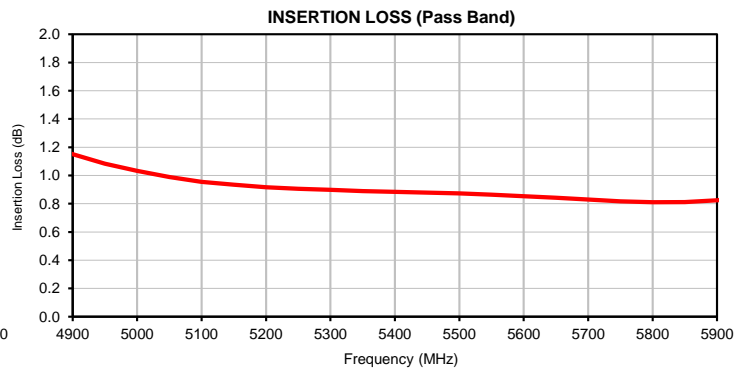
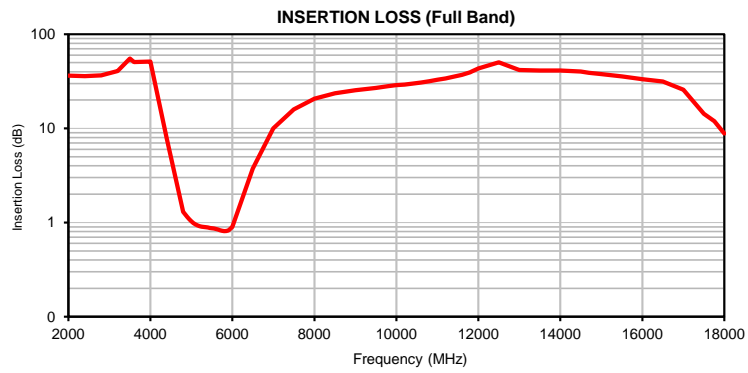
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Typical Performance Data

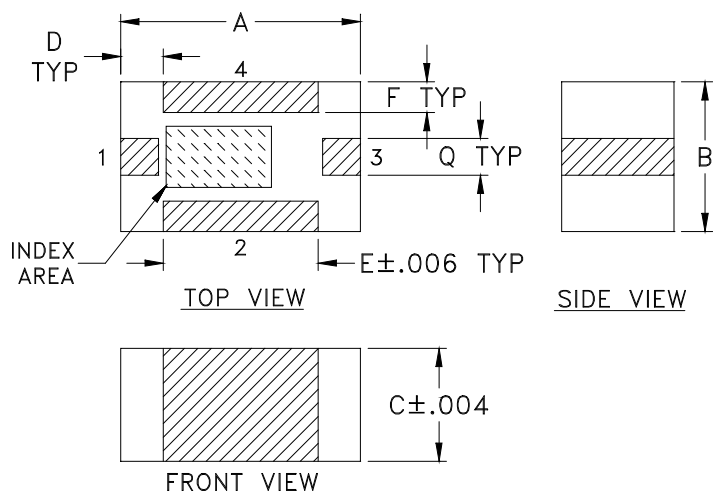
| FREQUENCY<br>(MHz) | INSERTION LOSS<br>(dB) | INPUT VSWR<br>(:1) | OUTPUT VSWR<br>(:1) |
|--------------------|------------------------|--------------------|---------------------|
| 2000               | 36.30                  | 97.37              | 53.38               |
| 2400               | 35.88                  | 93.53              | 62.82               |
| 2800               | 36.64                  | 101.80             | 72.51               |
| 3200               | 40.67                  | 113.86             | 66.77               |
| 3500               | 55.21                  | 104.57             | 60.58               |
| 3600               | 50.65                  | 93.06              | 58.74               |
| 4000               | 51.38                  | 41.74              | 34.86               |
| 4400               | 7.81                   | 5.15               | 4.92                |
| 4800               | 1.30                   | 1.30               | 1.28                |
| 4900               | 1.15                   | 1.24               | 1.19                |
| 4950               | 1.08                   | 1.19               | 1.13                |
| 5000               | 1.03                   | 1.15               | 1.07                |
| 5050               | 0.99                   | 1.14               | 1.03                |
| 5100               | 0.96                   | 1.14               | 1.06                |
| 5150               | 0.93                   | 1.17               | 1.11                |
| 5200               | 0.92                   | 1.21               | 1.16                |
| 5250               | 0.91                   | 1.24               | 1.21                |
| 5300               | 0.90                   | 1.28               | 1.25                |
| 5350               | 0.89                   | 1.31               | 1.29                |
| 5400               | 0.88                   | 1.33               | 1.32                |
| 5450               | 0.88                   | 1.35               | 1.33                |
| 5500               | 0.87                   | 1.35               | 1.34                |
| 5550               | 0.86                   | 1.34               | 1.34                |
| 5600               | 0.85                   | 1.33               | 1.32                |
| 5650               | 0.84                   | 1.30               | 1.29                |
| 5700               | 0.83                   | 1.27               | 1.26                |
| 5750               | 0.82                   | 1.22               | 1.21                |
| 5800               | 0.81                   | 1.17               | 1.16                |
| 5850               | 0.81                   | 1.12               | 1.11                |
| 5900               | 0.82                   | 1.09               | 1.08                |
| 5920               | 0.83                   | 1.10               | 1.09                |
| 6000               | 0.90                   | 1.22               | 1.21                |
| 6500               | 3.74                   | 4.81               | 4.59                |
| 7000               | 9.99                   | 21.26              | 17.48               |
| 7500               | 15.95                  | 55.80              | 37.03               |
| 8000               | 20.71                  | 80.91              | 49.22               |
| 8500               | 23.59                  | 92.44              | 54.22               |
| 9000               | 25.41                  | 107.53             | 57.37               |
| 9500               | 26.95                  | 125.87             | 66.92               |
| 9800               | 28.19                  | 124.41             | 69.37               |
| 10000              | 28.76                  | 126.10             | 74.37               |
| 10200              | 29.25                  | 131.03             | 68.57               |
| 10400              | 29.89                  | 141.70             | 68.26               |
| 10600              | 30.74                  | 135.76             | 65.28               |
| 10800              | 31.74                  | 126.23             | 60.17               |
| 11000              | 32.84                  | 115.63             | 56.35               |
| 11200              | 34.01                  | 99.01              | 52.58               |
| 11400              | 35.36                  | 84.21              | 48.87               |
| 11600              | 37.07                  | 71.43              | 42.94               |
| 11800              | 39.51                  | 60.76              | 37.99               |
| 11840              | 40.13                  | 59.03              | 37.40               |
| 12000              | 43.38                  | 52.34              | 33.89               |
| 12500              | 50.27                  | 42.33              | 27.30               |
| 13000              | 41.76                  | 43.18              | 27.25               |
| 13500              | 41.07                  | 49.68              | 30.40               |
| 14000              | 41.14                  | 60.10              | 33.69               |
| 14500              | 40.05                  | 73.12              | 36.50               |
| 14700              | 38.82                  | 77.89              | 37.27               |
| 15000              | 37.77                  | 83.42              | 38.54               |
| 15500              | 35.66                  | 88.24              | 42.81               |
| 16000              | 33.28                  | 91.79              | 46.35               |
| 16500              | 31.38                  | 88.56              | 54.95               |
| 17000              | 25.82                  | 29.04              | 39.29               |
| 17500              | 14.27                  | 7.28               | 10.77               |
| 17760              | 11.93                  | 8.14               | 4.13                |
| 18000              | 8.81                   | 3.71               | 2.58                |



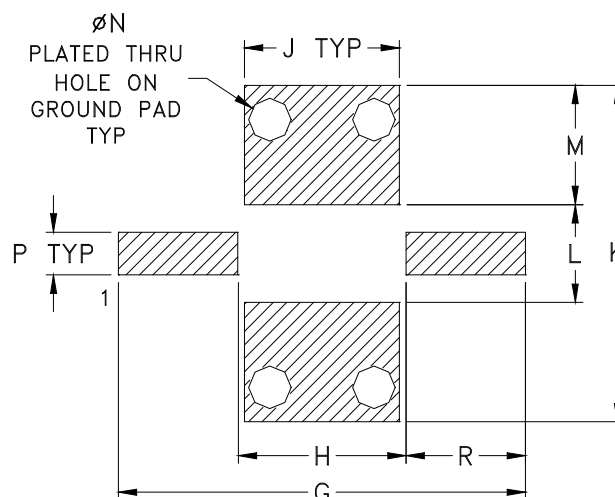
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



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

| CASE #    | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| GE0805C-3 | .079<br>(2.00) | .049<br>(1.25) | .037<br>(0.95) | .014<br>(0.35) | .051<br>(1.30) | .010<br>(0.25) | .134<br>(3.40) | .055<br>(1.40) | .051<br>(1.30) | .110<br>(2.80) | .032<br>(0.80) |

| CASE #    | M              | N              | P              | Q              | R              | WT. GRAM |
|-----------|----------------|----------------|----------------|----------------|----------------|----------|
| GE0805C-3 | .039<br>(1.00) | .014<br>(0.35) | .014<br>(0.35) | .012<br>(0.30) | .039<br>(1.00) | .020     |

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 Styles: Tin-Lead plate over Nickel plate. All models, no (+) suffix.



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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F114

## DEVICE ORIENTATION IN T&R

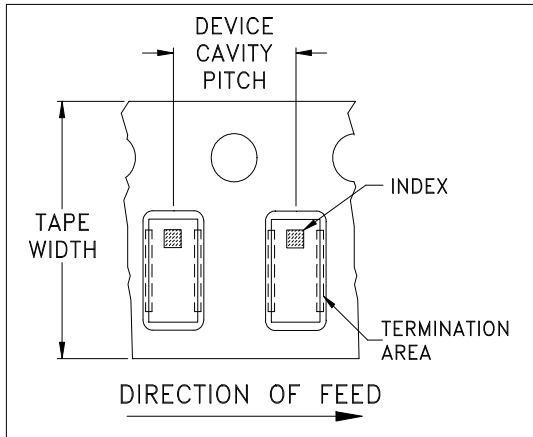


ILLUSTRATION 1

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

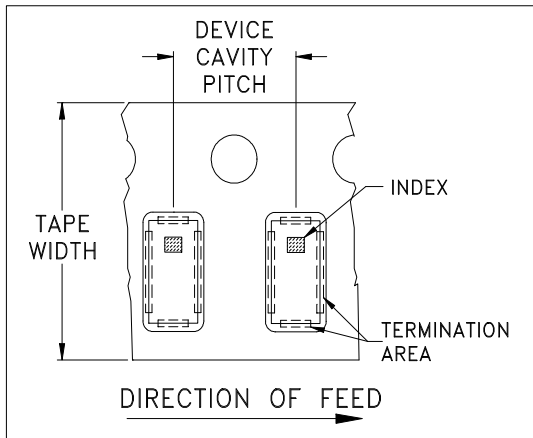


ILLUSTRATION 2

| 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              | 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.

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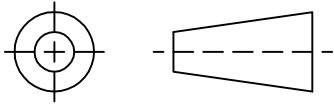
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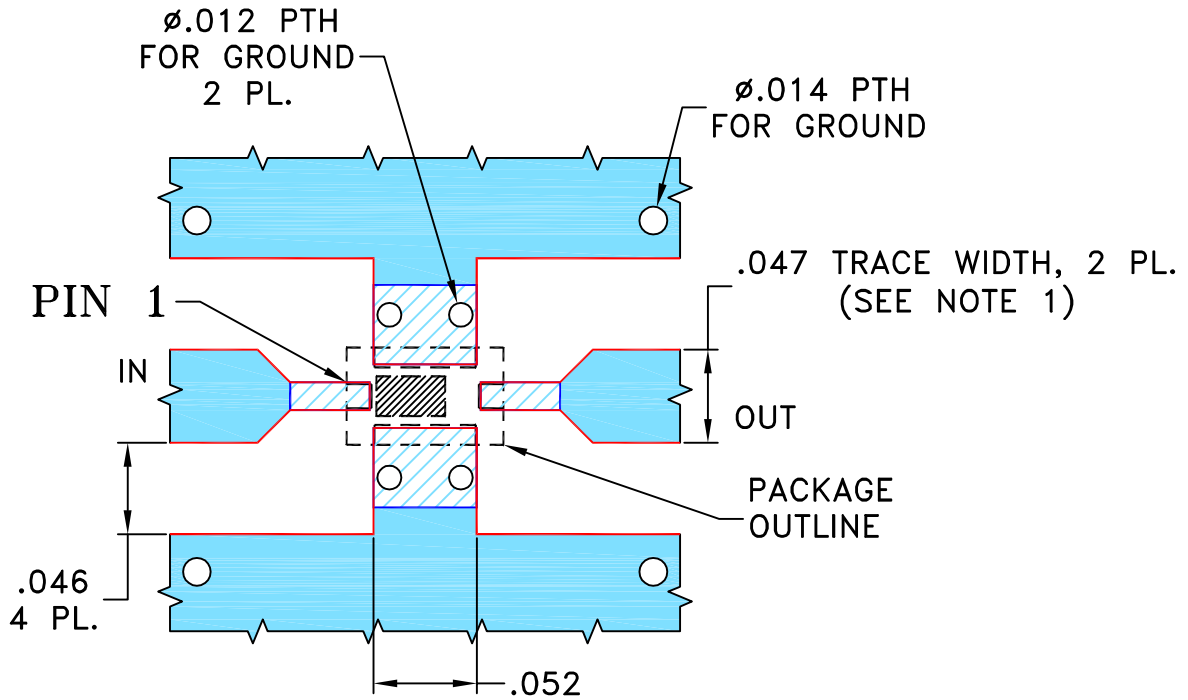
THIRD ANGLE PROJECTION



REVISIONS

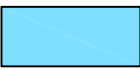
| REV | ECN No. | DESCRIPTION | DATE     | DR | AUTH |
|-----|---------|-------------|----------|----|------|
| OR  | M168200 | NEW RELEASE | 05/31/18 | NP | SL   |
|     |         |             |          |    |      |
|     |         |             |          |    |      |

SUGGESTED MOUNTING CONFIGURATION  
FOR GE0805C-3 CASE STYLE, "04FL01" PIN CODE




NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS R04233 WITH DIELECTRIC THICKNESS  $.020 \pm .0015$ . COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND 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).

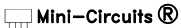
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

| UNLESS OTHERWISE SPECIFIED | INITIALS    | DATE     |
|----------------------------|-------------|----------|
| DIMENSIONS ARE IN INCHES   | DRAWN NP    | 05/30/18 |
| TOLERANCES ON:             | CHECKED GF  | 05/30/18 |
| 2 PL DECIMALS $\pm$        | APPROVED SL | 05/31/18 |
| 3 PL DECIMALS $\pm$ .005   |             |          |
| ANGLES $\pm$               |             |          |
| FRACTIONS $\pm$            |             |          |

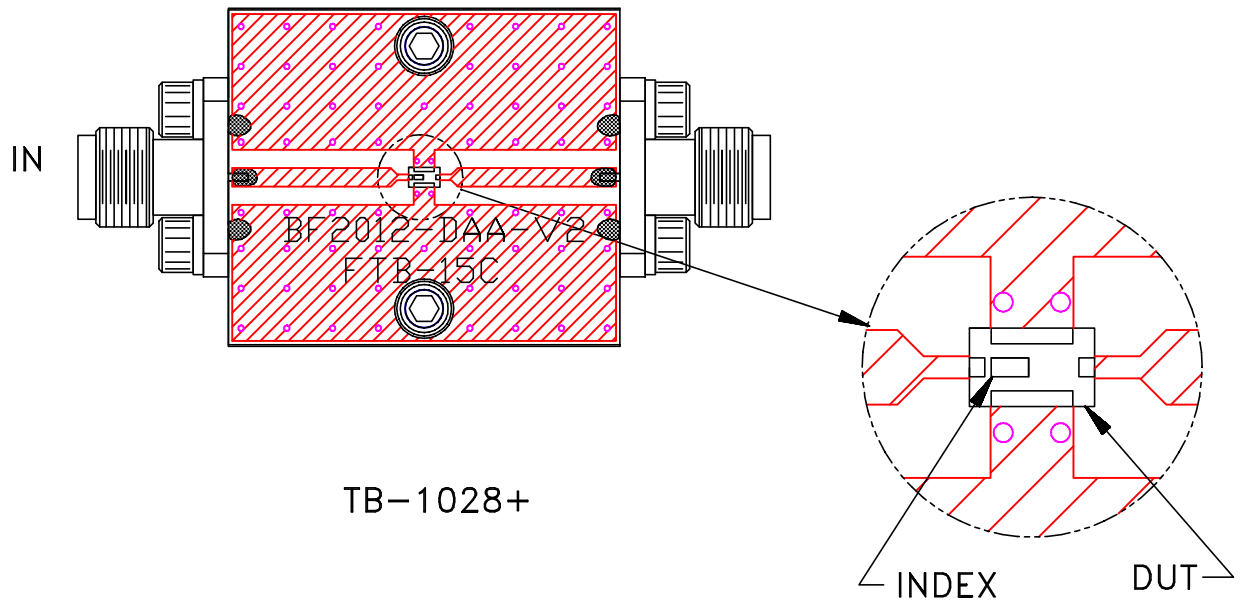
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PL, 04FL01, GE0805C-3, TB-1028+

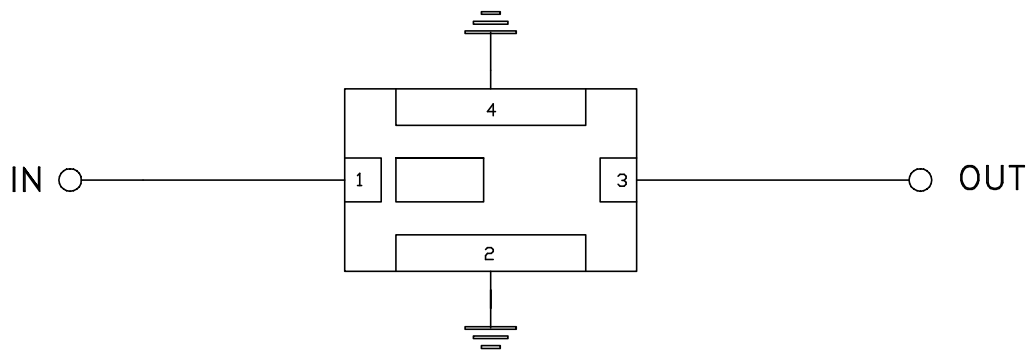
| SIZE  | CODE IDENT | DRAWING NO: | REV:          |
|-------|------------|-------------|---------------|
| A     | 15542      | 98-PL-566   | OR            |
| FILE: | 98PL566    | SCALE: 10:1 | SHEET: 1 OF 1 |

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

# Evaluation Board and Circuit




TB-1028+



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04233 or equivalent,  
Dielectric Constant=3.5, Thickness=.020 inch.

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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<br>Ambient Environment  | Individual Model Data Sheet  |
| Storage Temperature        | -40° to 85° C<br>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 |
| Thermal Shock              | -55° to 100°C, 100 cycles   | MIL-STD-202, Method 107, Condition A-3, except +100°C  |
| Solder Reflow Heat         | Sn-Pb Eutectic Process: 225°C peak<br>Pb-Free Process: 250°C peak                   | J-STD-020C, 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   |