LTCC SURFACE MOUNT

# Band Pass Filter

# BFCG-362+

50Ω 3.4 to 3.8 GHz

## THE BIG DEAL

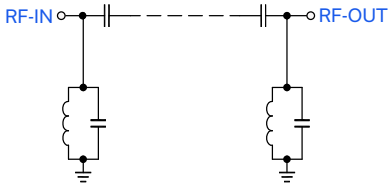
- Rugged, high-performance ceramic structure
- Compact 0805 footprint
- Robust 3 W continuous wave (CW) power handling

*Generic photo used for illustration purposes only*

## APPLICATIONS

- WiMAX and LTE bands 42/43
- Mobile and fixed broadband access
- Enhanced mobile broadband (eMBB) for 5G

## FUNCTIONAL DIAGRAM




## PRODUCT OVERVIEW

Mini Circuits' BFCG-362+ band pass filter delivers high selectivity and low insertion loss across the 3.4–3.8 GHz band. A precision multilayer ceramic design ensures excellent stopband suppression and stable performance over −55 °C to +105 °C. The ultra compact 0805 package minimizes board footprint and parasitics, making it a robust, space-efficient solution for demanding RF applications.

## ELECTRICAL SPECIFICATIONS[1,2,3] AT +25°C, $Z_0$ = 50Ω

| Parameter | | F# | Frequency (GHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|---|
| | Center Frequency[4] | — | — | — | 3.6 | — | GHz |
| Passband | Insertion Loss | F10-F11 | 3.4 – 3.8 | — | 1.5 | 1.8 | dB |
| | Return Loss | F10-F11 | 3.4 – 3.8 | 9.5 | 14.4 | — | dB |
| Stopband, Lower | Rejection | F1-F2 | 0.5 – 2.17 | — | 38 | — | dB |
| | | F3-F4 | 0.88 – 0.96 | — | 40 | — | |
| | | F5-F6 | 1.71 – 1.785 | — | 38 | — | |
| | | F7-F8 | 2.3 – 2.63 | — | 30 | — | |
| | | F8-F9 | 2.63 – 2.7 | — | 25 | — | |
| Stopband, Upper | Rejection | F12-F13 | 4.8 – 4.9 | — | 25 | — | dB |
| | | F13-F14 | 4.9 – 5.15 | — | 29 | — | |
| | | F14-F15 | 5.15 – 5.85 | — | 37 | — | |
| | | F16-F17 | 6.25 – 6.5 | — | 39 | — | |
| | | F18-F19 | 6.8 – 7.2 | — | 43 | — | |
| | | F19-F20 | 7.2 – 9 | — | 35 | — | |
| | | F21-F22 | 10.2– 10.8 | — | 32 | — | |

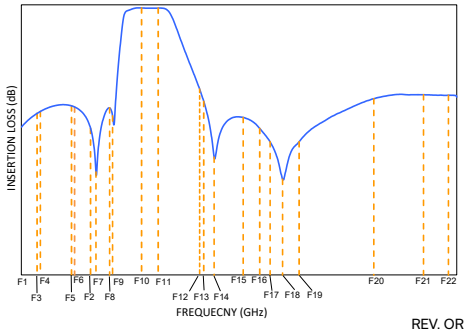
1. Tested in Evaluation Board P/N TB-BFCG-362C+. De-embedded to the device reference plane using TRL.
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.
4. Typical variation ± 3%

## ABSOLUTE MAXIMUM RATINGS[5]

| | |
|---|---|
| **Operating Temperature** | -55 °C to +105 °C |
| **Storage Temperature** | -55 °C to +105 °C |
| **Input Power[6]** | 3 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 1.7 W at +105°C.

## TYPICAL FREQUENCY RESPONSE



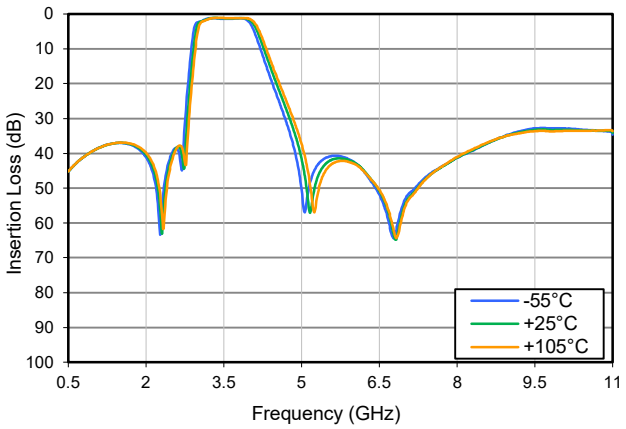
# Band Pass Filter

## BFCG-362+

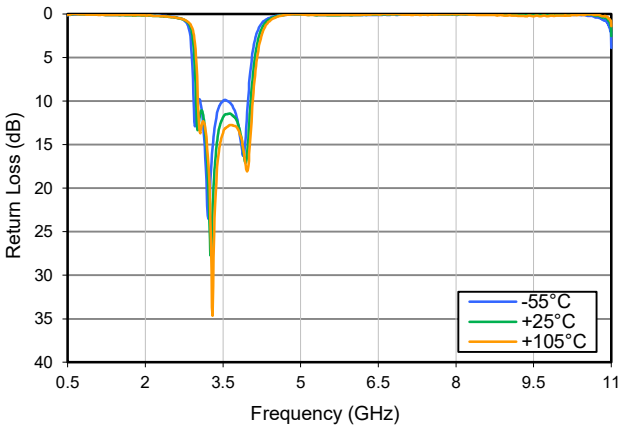
50Ω 3.4 to 3.8 GHz

### TYPICAL PERFORMANCE GRAPHS

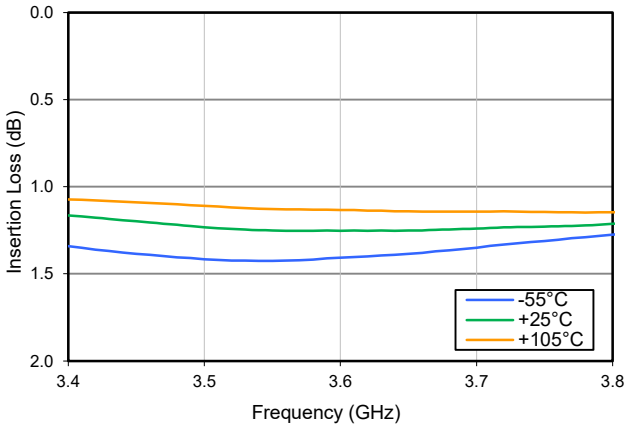
INSERTION LOSS



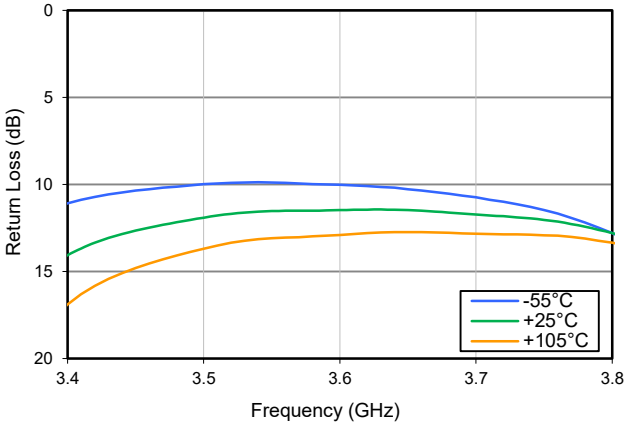

RETURN LOSS




INSERTION LOSS (PASSBAND)




RETURN LOSS (PASSBAND)



LTCC SURFACE MOUNT

# Band Pass Filter

# BFCG-362+

50Ω 3.4 to 3.8 GHz

## FUNCTIONAL DIAGRAM

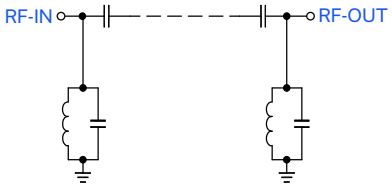
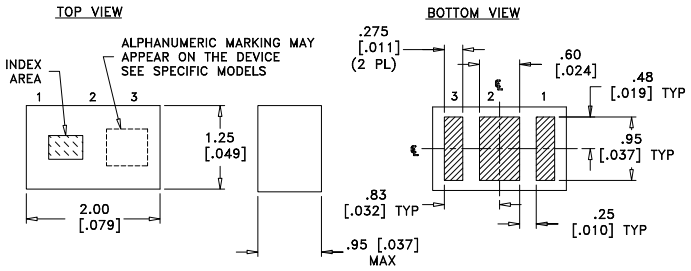



Figure 1. BFCG-362+ Functional Diagram

## PAD DESCRIPTION

| Function | Pad Number | Description |
|---|---|---|
| RF1[2] | 1 | Connects to RF Input Port |
| RF2[2] | 2 | Connects to RF Output Port |
| GROUND | 3 | Connects to Ground on PCB, (See drawing PL-853) |

## CASE STYLE DRAWING




Weight: .010 grams
Dimensions are in mm [inches]. Tolerances: 2 Pl.± 0.05 mm

## PRODUCT MARKING*: N/A

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

## SUGGESTED PCB LAYOUT: PL-853

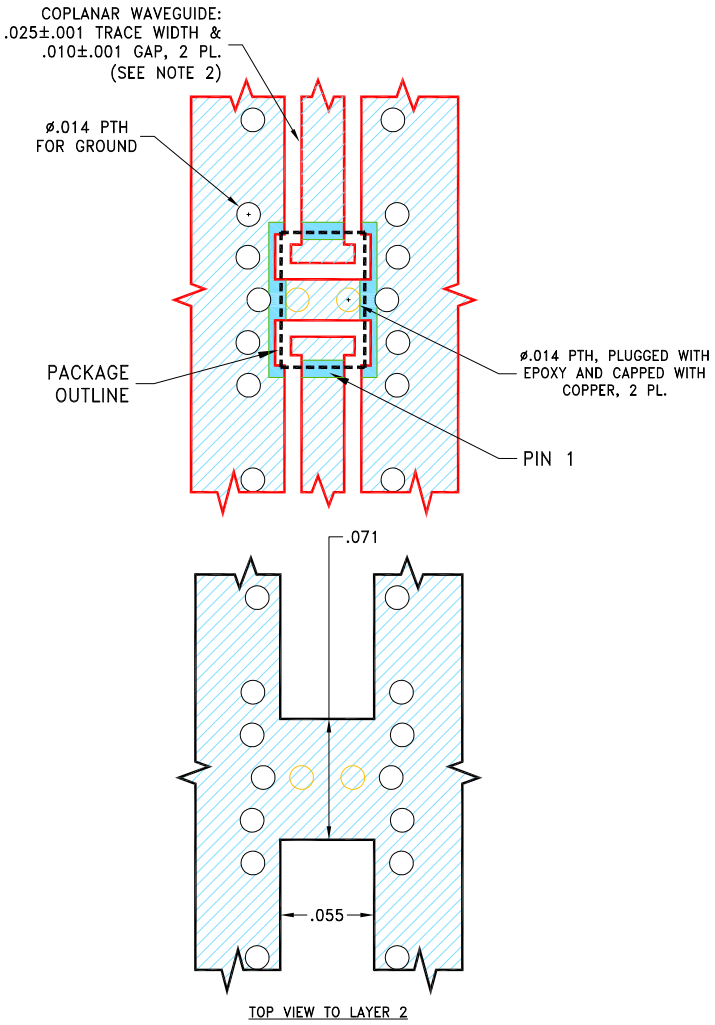



Figure 2. Suggested PCB Layout

# Band Pass Filter

## BFCG-362+

50Ω 3.4 to 3.8 GHz

**ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD** CLICK HERE

| | |
|---|---|
| **Performance Data & Graphs** | Data<br>Graphs<br>S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads |
| **Case Style** | GE0805C-20 Lead Finish: Tin over Nickel Plating |
| **RoHS/REACH Status** | Compliant |
| **Tape and Reel** | F74 |
| **Suggested Layout for PCB Design** | PL-853 |
| **Evaluation Board** | TB-BFCG-362C+<br>Gerber File |
| **Environmental Rating** | ENV-159 |

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

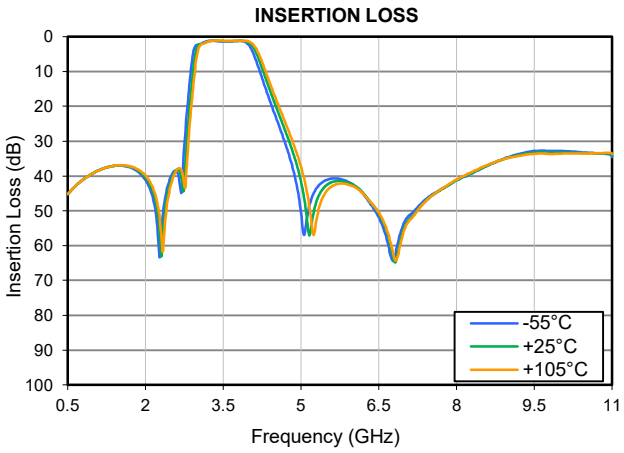
# LTCC Bandpass Filter BFCG-362+

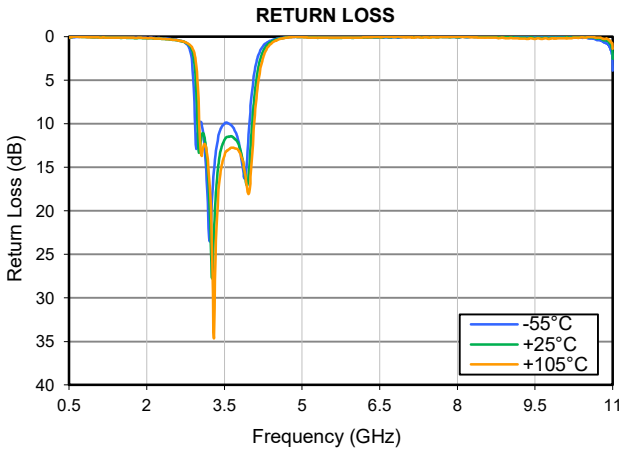
*Typical Performance Data*

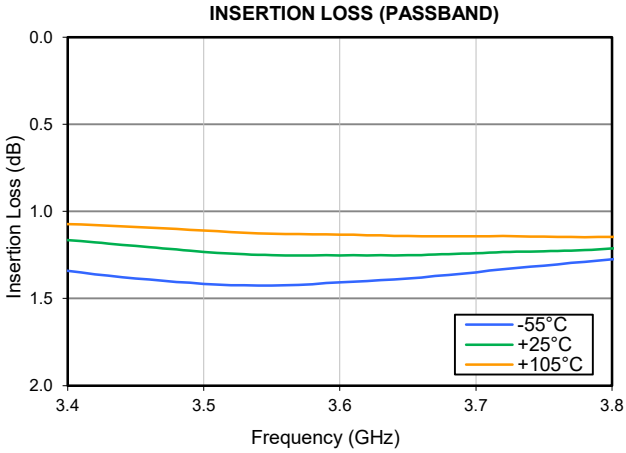
| FREQUENCY (GHz) | INSERTION LOSS (dB) | | | RETURN LOSS (dB) | | |
|---|---|---|---|---|---|---|
| | @-55°C | @+25°C | @+105°C | @-55°C | @+25°C | @+105°C |
| 0.50 | 45.25 | 45.23 | 45.21 | 0.17 | 0.12 | 0.11 |
| 1.00 | 39.08 | 39.13 | 39.12 | 0.05 | 0.06 | 0.06 |
| 2.00 | 41.08 | 40.34 | 39.81 | 0.15 | 0.19 | 0.17 |
| 3.00 | 2.39 | 2.94 | 4.91 | 10.59 | 12.67 | 7.13 |
| 3.40 | 1.34 | 1.16 | 1.07 | 11.08 | 14.06 | 16.90 |
| 3.41 | 1.35 | 1.17 | 1.08 | 10.87 | 13.67 | 16.31 |
| 3.42 | 1.36 | 1.18 | 1.08 | 10.71 | 13.34 | 15.82 |
| 3.43 | 1.37 | 1.18 | 1.08 | 10.56 | 13.07 | 15.41 |
| 3.44 | 1.38 | 1.19 | 1.08 | 10.46 | 12.84 | 15.08 |
| 3.45 | 1.38 | 1.20 | 1.09 | 10.35 | 12.65 | 14.79 |
| 3.46 | 1.39 | 1.20 | 1.09 | 10.27 | 12.47 | 14.53 |
| 3.47 | 1.40 | 1.21 | 1.10 | 10.19 | 12.32 | 14.30 |
| 3.48 | 1.40 | 1.22 | 1.10 | 10.12 | 12.17 | 14.08 |
| 3.49 | 1.41 | 1.23 | 1.11 | 10.05 | 12.03 | 13.87 |
| 3.50 | 1.42 | 1.23 | 1.11 | 9.99 | 11.90 | 13.67 |
| 3.51 | 1.42 | 1.24 | 1.11 | 9.94 | 11.78 | 13.50 |
| 3.52 | 1.42 | 1.24 | 1.12 | 9.90 | 11.68 | 13.35 |
| 3.53 | 1.42 | 1.25 | 1.12 | 9.88 | 11.61 | 13.24 |
| 3.54 | 1.43 | 1.25 | 1.12 | 9.87 | 11.56 | 13.15 |
| 3.55 | 1.43 | 1.25 | 1.13 | 9.88 | 11.52 | 13.09 |
| 3.56 | 1.42 | 1.25 | 1.13 | 9.90 | 11.51 | 13.05 |
| 3.57 | 1.42 | 1.25 | 1.13 | 9.93 | 11.51 | 13.02 |
| 3.58 | 1.42 | 1.25 | 1.13 | 9.96 | 11.50 | 12.99 |
| 3.59 | 1.41 | 1.25 | 1.13 | 9.99 | 11.49 | 12.95 |
| 3.60 | 1.41 | 1.25 | 1.13 | 10.02 | 11.47 | 12.89 |
| 3.61 | 1.40 | 1.25 | 1.13 | 10.06 | 11.46 | 12.84 |
| 3.62 | 1.40 | 1.25 | 1.14 | 10.09 | 11.44 | 12.79 |
| 3.63 | 1.39 | 1.25 | 1.14 | 10.14 | 11.44 | 12.75 |
| 3.64 | 1.39 | 1.25 | 1.14 | 10.19 | 11.44 | 12.73 |
| 3.65 | 1.38 | 1.25 | 1.14 | 10.26 | 11.47 | 12.72 |
| 3.66 | 1.38 | 1.25 | 1.14 | 10.34 | 11.50 | 12.72 |
| 3.67 | 1.37 | 1.25 | 1.14 | 10.43 | 11.55 | 12.75 |
| 3.68 | 1.36 | 1.25 | 1.14 | 10.52 | 11.60 | 12.77 |
| 3.69 | 1.36 | 1.24 | 1.14 | 10.63 | 11.67 | 12.81 |
| 3.70 | 1.35 | 1.24 | 1.14 | 10.74 | 11.72 | 12.82 |
| 3.71 | 1.34 | 1.24 | 1.14 | 10.87 | 11.78 | 12.85 |
| 3.72 | 1.33 | 1.23 | 1.14 | 10.99 | 11.82 | 12.85 |
| 3.73 | 1.32 | 1.23 | 1.14 | 11.13 | 11.88 | 12.86 |
| 3.74 | 1.32 | 1.23 | 1.14 | 11.29 | 11.94 | 12.87 |
| 3.75 | 1.31 | 1.23 | 1.14 | 11.48 | 12.04 | 12.91 |
| 3.76 | 1.30 | 1.23 | 1.15 | 11.68 | 12.13 | 12.95 |
| 3.77 | 1.30 | 1.22 | 1.15 | 11.92 | 12.27 | 13.02 |
| 3.78 | 1.29 | 1.22 | 1.15 | 12.18 | 12.42 | 13.10 |
| 3.79 | 1.28 | 1.22 | 1.15 | 12.48 | 12.60 | 13.22 |
| 3.80 | 1.27 | 1.21 | 1.15 | 12.80 | 12.79 | 13.35 |
| 4.00 | 2.48 | 1.70 | 1.44 | 8.70 | 13.36 | 16.87 |
| 5.00 | 50.34 | 41.49 | 37.27 | 0.01 | 0.03 | 0.03 |
| 6.00 | 42.38 | 42.51 | 42.91 | 0.13 | 0.13 | 0.11 |
| 7.00 | 53.08 | 54.54 | 55.27 | 0.02 | 0.02 | 0.06 |
| 8.00 | 41.26 | 41.23 | 41.05 | 0.08 | 0.07 | 0.04 |
| 9.00 | 34.60 | 34.77 | 34.84 | 0.02 | 0.07 | 0.18 |
| 10.00 | 32.89 | 33.28 | 33.57 | 0.00 | 0.11 | 0.19 |
| 11.00 | 34.67 | 34.16 | 33.61 | 3.89 | 2.52 | 1.41 |

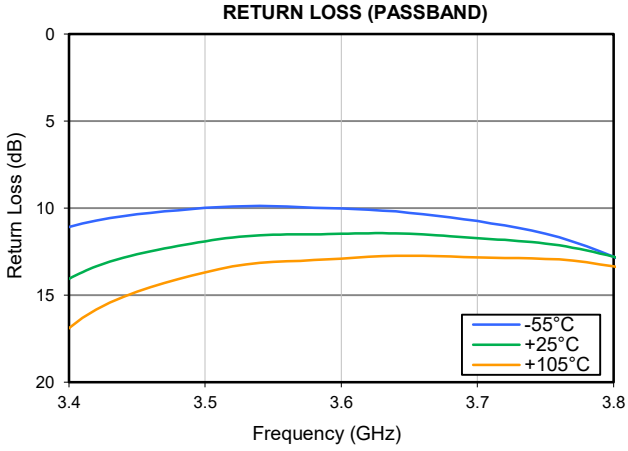
# LTCC High pass Filter BFCG-362+

*Typical Performance Data*



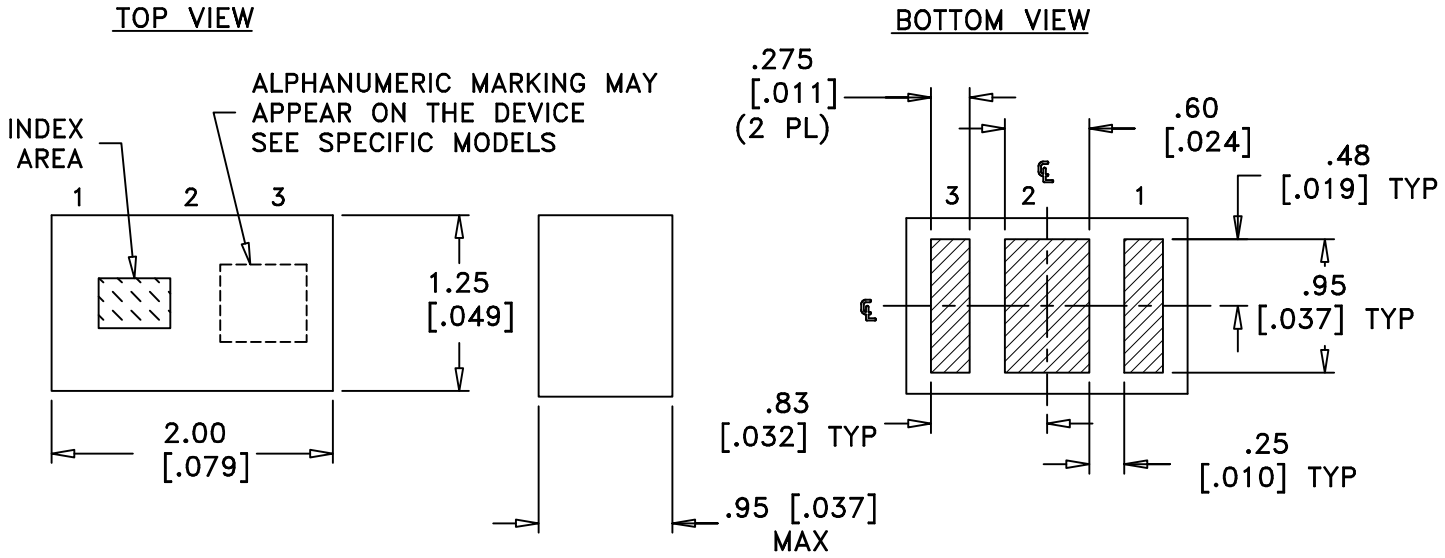



# Case Style

# GE

## Outline Dimensions

## GE0805C-20




Weight: .010 grams

Dimensions are in mm[inches]. Tolerances: 2 Pl.±0.05mm

**Notes:**

1. **Open style, ceramic base.**
2. **Termination finish:Tin plate over Nickel plate.**
3. **Pad tolerance is non-cumulative. Minimum spacing between each pad is 0.1mm.**

# Tape & Reel Packaging TR-F74

## DEVICE ORIENTATION IN T&R

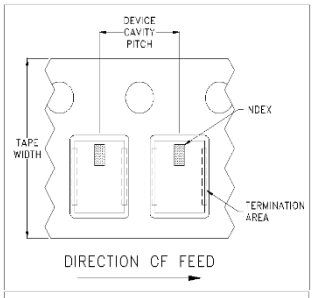



**ILLUSTRATION 1**

| Applicable Case Styles |
|---|
| GE0805C-1 |
| GE0805C-1AP |
| JV1210C-1 |
| GU2939 |

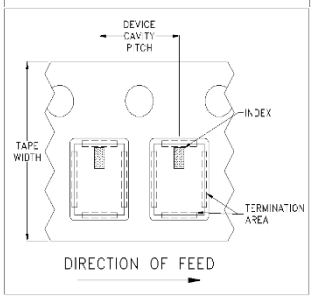



**ILLUSTRATION 2**

| Applicable Case Styles |
|---|
| JV1210C |
| JV1210C-2 |
| JV1210C-3 |
| JV1210C-4 |
| JV1210C-5 |
| JV1210C-6 |
| JV1210C-11 |

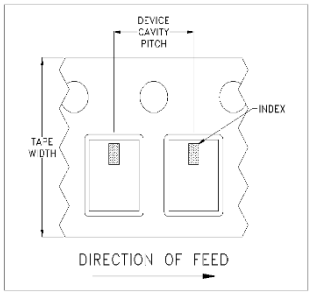



**ILLUSTRATION 3**

| 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

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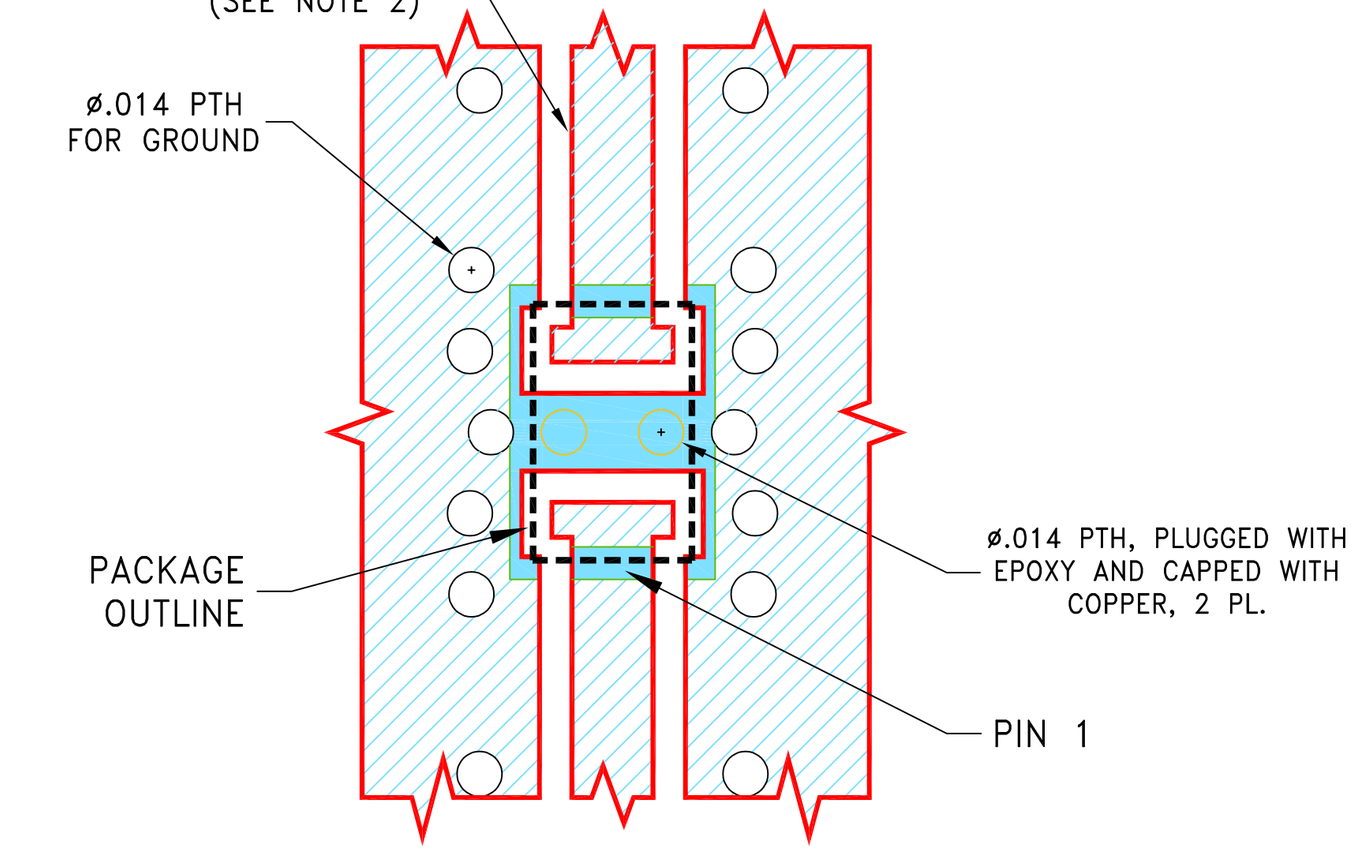
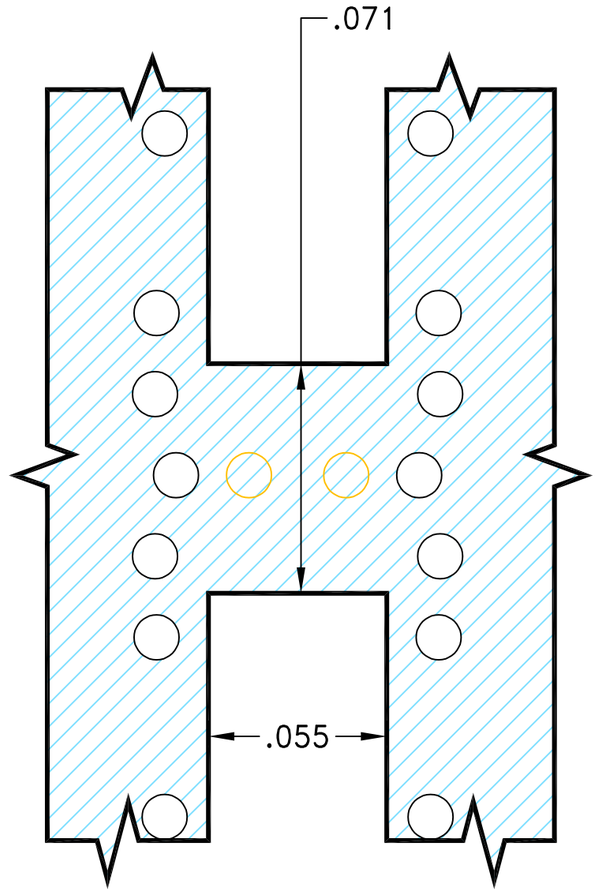
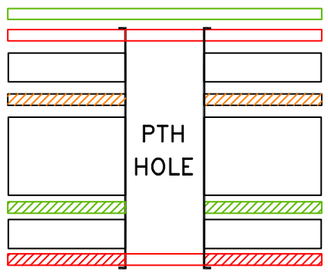
## SUGGESTED MOUNTING CONFIGURATION FOR GE0805C-20 CASE STYLE




TOP VIEW TO LAYER 2

## STACK-UP DIAGRAM




-SOLDER MASK (TOP-SLD)
-COPPER LAYER 1 (L1), 1 OZ.
-CORE FR4 IT-180A .006
-COPPER LAYER 2 (L2), 1 OZ.
-PREPREG IT-180A (1080H+2116) .008
-CORE FR4 IT-180A .020
-PREPREG IT-180A (2116+1080H) .008
-COPPER LAYER 3 (L3), 1 OZ.
-CORE FR4 IT-180A .006
-COPPER LAYER 4 (L4), 1 OZ.

1. TOTAL FINISHED THICKNESS 0.056±10% Ⓢ.
2. PTH PRESENT FROM COPPER LAYER 1 TO COPPER LAYER 4.

## NOTES:

1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR FR4 IT-180A WITH COMBINED DIELECTRIC THICKNESS .043"; FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
3. COPPER LAYERS 3,4 OF THE PCB IS CONTINUOUS GROUND PLANES.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

THIRD ANGLE PROJECTION

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 0R | ECO-028525 | NEW RELEASE | 12/18/26 | ITG | IL |

REVISIONS

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES ON:<br>2 PL DECIMALS ± .005<br>3 PL DECIMALS ±<br>ANGLES ± 1°<br>FRACTIONS ± | DRAWN | ITG | 12/17/26 |
| | CHECKED | NP | 12/17/26 |
| | APPROVED | IL | 12/17/26 |



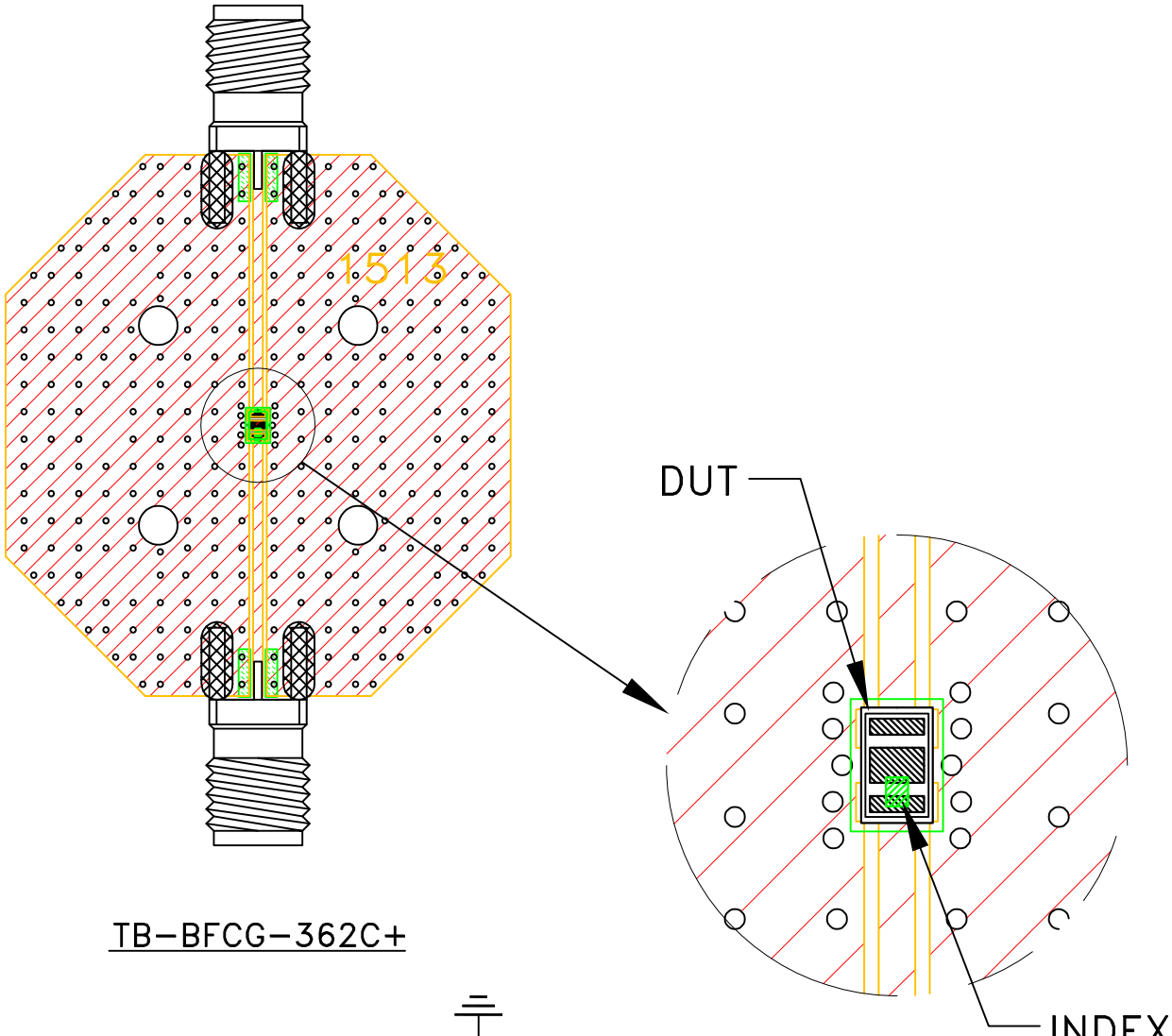
BSHEETA1.DWG REV:A DATE:01/12/94

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

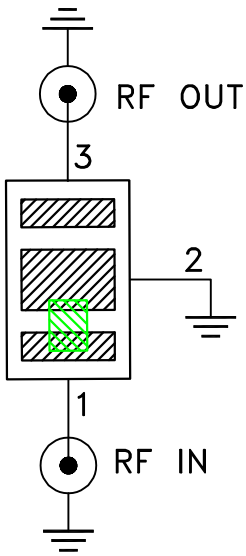
# PL, GE0805C-20, TB-BFCG-362C+

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| B | 15542 | 98-PL-853 | 0R |
| FILE: 98PL853 | SCALE: 20:1 | SHEET: 1 OF 1 | |

# Evaluation Board and Circuit




TB-BFCG-362C+




Schematic Diagram

1. 50 Ohm SMA Female end Launch connectors.
2. PCB Material: FR4 IT-180A or equivalent,
   Dielectric Constant= XXXX Thickness=.053 inch.

Mini-Circuits®

# Mini-Circuits

**Environmental Specifications** **ENV159**

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°C to 105°C<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 105°C<br>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, dwell time 30 min, 100 cycles | JESD22-A104 |