CERAMIC

# Bandpass Filter & Balun BBFCG2-43+

50Ω 3600 to 4400 MHz

## THE BIG DEAL

- Tiny size, (0805)
- Compact design includes Balun & Filter in one package
- Low cost
- Temperature stable
- Hermetically sealed

*Generic photo used for illustration purposes only*

CASE STYLE: GE0805C-15

**+RoHS Compliant**
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

## APPLICATIONS

- Telecommunications
- 5G sub 6GHz
- Satellite C-band

## PRODUCT OVERVIEW

Mini-Circuits' BBFCG2-43+ is a tiny ceramic RF balun filter with an impedance ratio of 1:2, covering a variety of wireless communications applications from 3600 to 4400 MHz. This model provides low insertion loss, low phase unbalance (relative to 180°), low amplitude unbalance. Fabricated using LTCC technology, the unit comes housed in a tiny, rugged ceramic package (0.079" x 0.049" x 0.037") suitable for harsh operating environments.

## KEY FEATURES

| Feature | Advantages |
|---|---|
| Compact Design | Integrates filter and balun in one tiny package |
| Tiny size, 0805 | Accommodates tight space requirements for dense PCB layouts. |
| LTCC construction | LTCC process enables tiny size and low cost, suitable for high-volume production. Rugged ceramic package provides excellent reliability in harsh operating environments. |

# Bandpass Filter & Balun BBFCG2-43+

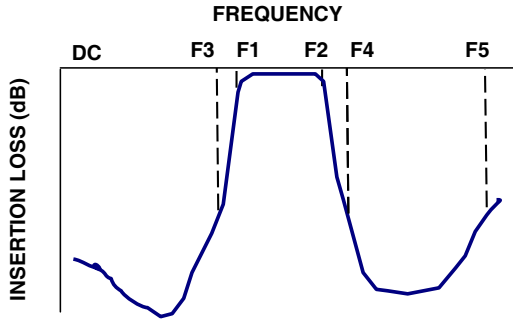
## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter | | F# | Frequency (MHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|---|
| Impedance Ratio | | — | — | | 2 | | |
| Insertion Loss | | F1-F2 | 3600 - 4400 | — | — | 3.4 | dB |
| Return Loss | Unbalanced Port | F1-F2 | 3600 - 4400 | 8.5 | — | — | dB |
| | Balanced Port | F1-F2 | 3600 - 4400 | 8.5 | — | — | |
| Stopband Rejection | | DC-F3 | DC - 2668 | 27 | — | — | dB |
| | | F4-F5 | 7296 - 8196 | 33 | — | — | |
| Amplitude Unbalance ± | | F1-F2 | 3600 - 4400 | -1.5 | — | 1.5 | dB |
| Phase Unbalance | | F1-F2 | 3600 - 4400 | -13 | — | 13 | Degree |

## MAXIMUM RATINGS

| Parameter | Ratings |
|---|---|
| Operating Temperature | -55°C to 125°C |
| Storage Temperature | -55°C to 125°C |
| RF Power Input | 0.5W at 25°C |

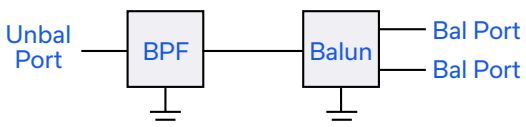
## TYPICAL FREQUENCY RESPONSE




## DC INTERFACE TABLE

| | |
|---|---|
| Unbalance Port - GND | DC short |
| Unbalance Port - Balance Ports | DC open |
| Balance port - GND | DC open |
| Balance port-Balance Port | DC short |

## FUNCTIONAL SCHEMATIC



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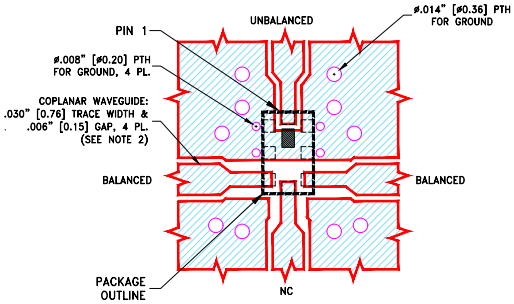
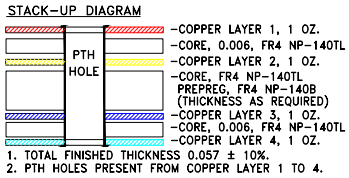
## PAD CONNECTIONS

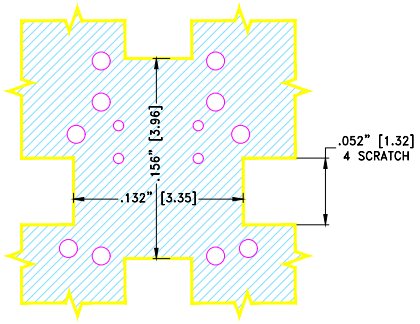
| | |
|---|---|
| UNBALANCED PORT | 1 |
| BALANCED PORT | 4,6 |
| GROUND | 2,3,7,8 |
| NOT CONNECT OR GND | 5 |

## PRODUCT MARKING: N/A

## DEMO BOARD MCL P/N: TB-BBFCG2-43+
## SUGGESTED PCB LAYOUT (PL-724)



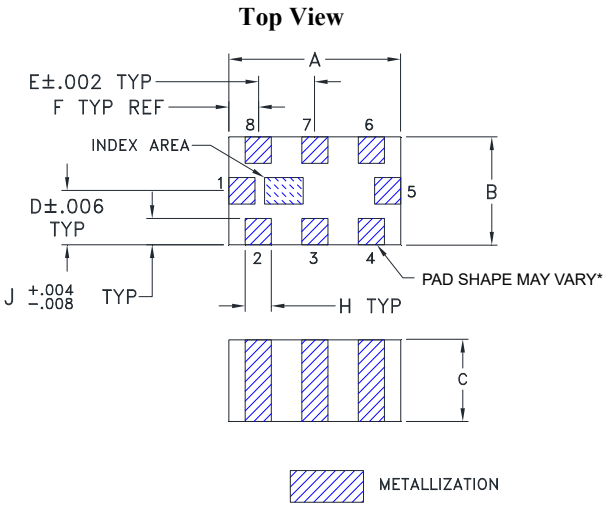




TOP VIEW TO LAYER 2

NOTES:
1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR FR4 NP-140TL WITH DIELECTRIC THICKNESS .006"±.0005"; COPPER: 1 OZ. 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 COPPER LAND PATTERN FREE OF SOLDER MASK.

## OUTLINE DRAWING




*During the manufacturing process, the pad shape may not be rectangular and may take on a more semi-circle shape. However, the pad dimensions reflect this, with the pad shape being within the specified lengths. The metallization compensates accordingly and so performance will not be affected. In addition, solderability will not be influenced by the pad shape.

## OUTLINE DIMENSIONS (Inches / mm)

| A | B | C | D | E | F | G | H | J | wt |
|---|---|---|---|---|---|---|---|---|---|
| .079 | .049 | .037 | .025 | .026 | .014 | .110 | .012 | .010 | grams |
| 2.00 | 1.25 | 0.95 | 0.63 | 0.65 | 0.35 | 2.80 | 0.30 | 0.25 | .008 |

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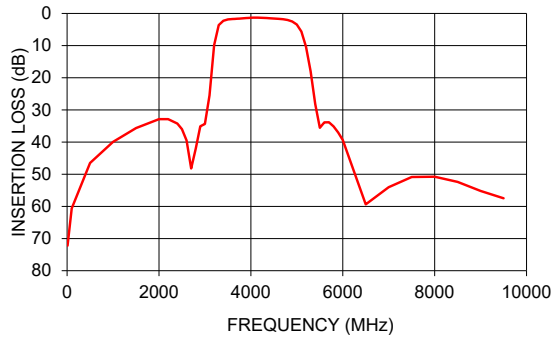
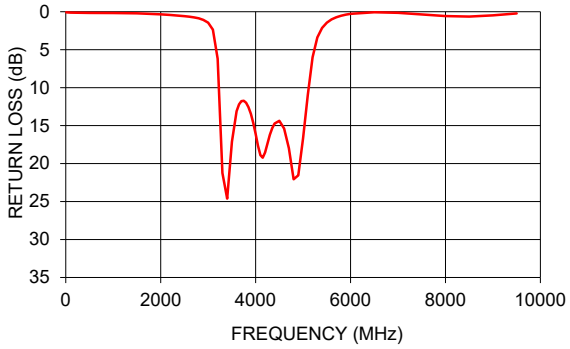
## TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) | Amplitude Unbalance (dB) | Phase Unbalance (Deg.) |
|---|---|---|---|---|
| 10 | 72.21 | 0.08 | 6.32 | 167.31 |
| 100 | 60.61 | 0.12 | 0.95 | 0.60 |
| 1000 | 39.94 | 0.17 | 2.18 | 2.21 |
| 2000 | 32.87 | 0.35 | 1.58 | 115.16 |
| 2500 | 35.98 | 0.59 | 6.48 | 104.07 |
| 2600 | 39.49 | 0.66 | 7.08 | 117.33 |
| 3600 | 1.74 | 13.10 | 0.94 | 4.19 |
| 4400 | 1.49 | 14.73 | 0.36 | 2.95 |
| 5000 | 3.43 | 16.69 | 0.01 | 10.50 |
| 7500 | 50.88 | 0.36 | 5.86 | 82.46 |
| 8500 | 52.40 | 0.64 | 3.58 | 168.04 |
| 9500 | 57.50 | 0.22 | 0.90 | 175.01 |

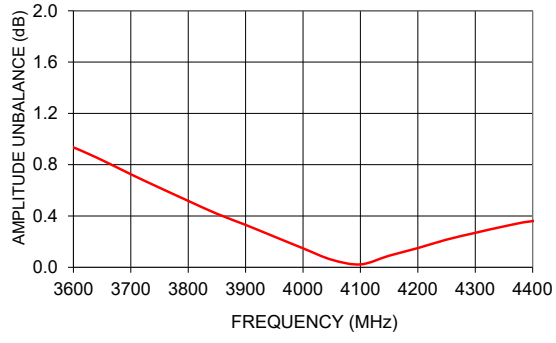
BBFCG2-43+
INSERTION LOSS



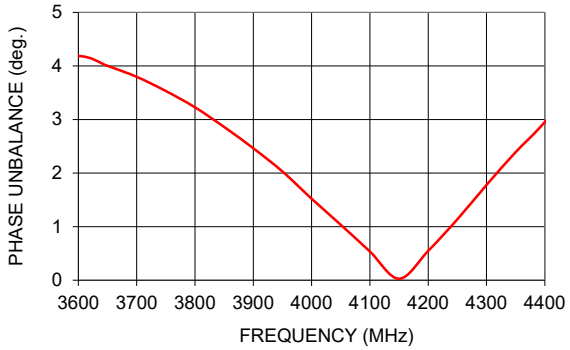

BBFCG2-43+
RETURN LOSS




BBFCG2-43+
AMPLITUDE UNBALANCE




BBFCG2-43+
PHASE UNBALANCE




**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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