

Ceramic

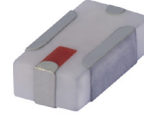
Bandpass Filter

BFCN-2500+

50Ω 2100 to 2900 MHz

The Big Deal

- LTCC construction
- Temperature stable from -55 to +100°C
- Small size (0.126 x .063 X .037")



CASE STYLE: FV1206-4

Product Overview

The BFCN-2500+ LTCC bandpass filter covers the 2100 to 2900 MHz passband with 2 dB passband insertion loss and 20 dB upper/lower stopband rejection. This model handles up to 2.5W RF input power and provides a wide operating temperature range from -55 to +100°C. Utilizing LTCC multi-layer construction, the filter achieves excellent repeatability of performance and comes in a tiny 1206 ceramic package with wraparound terminations, minimizing performance variations due to parasitics and saving space in dense PCB layouts.

Key Features

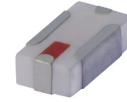
| Feature | Advantages |
|---|--|
| LTCC Construction | Provides a rugged package well suited for tough environments such as high humidity and temperature extremes. |
| Tiny size (0.126 x .063 x .037") | Saves space in dense circuit boards and minimizes the effects of parasitics. |
| Wrap-around terminations | Provides excellent solderability and easy visual inspection |
| Wide operating temperature range, -55 to +100°C | Enables reliable performance in extreme environments |



Ceramic Bandpass Filter

50Ω 2100 to 2900 MHz

BFCN-2500+



Generic photo used for illustration purposes only

CASE STYLE: FV1206-4

Features

- Good VSWR, 1.8:1 typ. @ passband
- Small size(0.126 x .063 x .037)
- Temperature stable
- LTCC construction

Applications

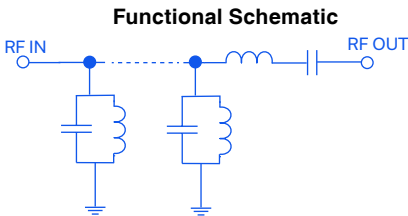
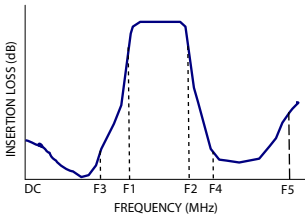
- Harmonic rejection
- Transmitters / Receivers

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

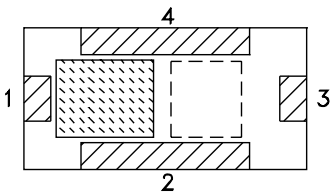
Available Tape and Reel at no extra cost

| Reel Size | Devices/Reel |
|-----------|-----------------------------------|
| 7" | 20, 50, 100, 200, 500, 1000, 3000 |

Specification Definition



Top View



Pad Connections

| | |
|--------|-----|
| Input | 1 |
| Output | 3 |
| Ground | 2,4 |

Electrical Specifications^{1,2} at 25°C

| Parameter | F# | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|------------------|------------------|-----------------|-------------|------|------|------|
| Pass Band | Center Frequency | — | — | 2500 | — | MHz |
| | Insertion Loss | F1 - F2 | 2100 - 2900 | — | 2 | dB |
| | VSWR | F1 - F2 | 2100 - 2900 | — | 1.8 | 2.6 |
| Stop Band, Lower | Insertion Loss | DC - F3 | 1600 | — | 20 | dB |
| | VSWR | DC - F3 | 1600 | — | 20 | :1 |
| Stop Band, Upper | Insertion Loss | F4 - F5 | 3700 - 5200 | — | 20 | dB |
| | VSWR | F4 - F5 | 3700 - 5200 | — | 15 | :1 |

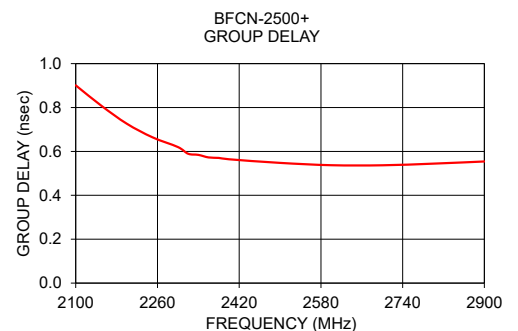
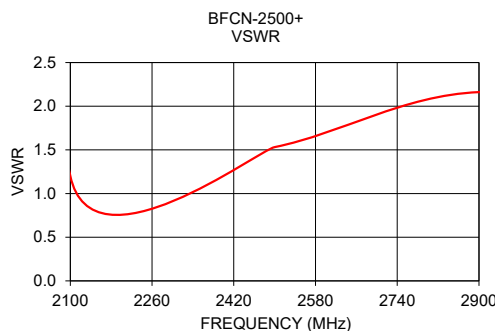
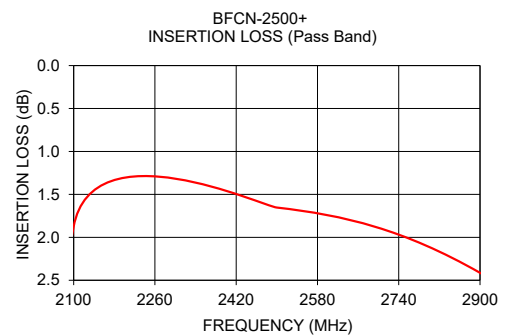
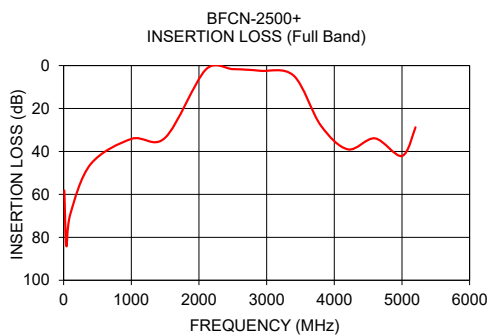
1. Measured on Mini-Circuits Characterization Test Board TB-824+.

2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

Maximum Ratings

| | |
|-----------------------|-----------------|
| Operating Temperature | -55°C to +100°C |
| Storage Temperature | -55°C to +100°C |
| RF Power Input* | 2.5W at 25°C |

*Passband rating, derate linearly to 0.7W at 100°C ambient
Permanent damage may occur if any of these limits are exceeded.



Full Band Performance

Pass Band Performance

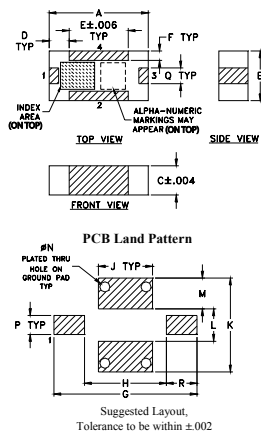
| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Insertion Loss (dB) | Group Delay (nsec) |
|-----------------|---------------------|-----------|-----------------|---------------------|--------------------|
| 10 | 58.18 | 79.99 | 2100 | 1.88 | 0.90 |
| 40 | 84.01 | 78.80 | 2150 | 1.70 | 0.81 |
| 100 | 69.04 | 74.42 | 2200 | 1.63 | 0.73 |
| 400 | 45.88 | 61.11 | 2250 | 1.60 | 0.66 |
| 1000 | 34.16 | 43.74 | 2300 | 1.60 | 0.62 |
| 1500 | 33.62 | 29.10 | 2320 | 1.60 | 0.59 |
| 2100 | 1.88 | 1.20 | 2340 | 1.60 | 0.58 |
| 2500 | 1.65 | 1.53 | 2360 | 1.61 | 0.57 |
| 2900 | 2.41 | 2.16 | 2380 | 1.61 | 0.57 |
| 3400 | 4.69 | 1.76 | 2400 | 1.62 | 0.56 |
| 3800 | 27.88 | 14.98 | 2500 | 1.65 | 0.55 |
| 4200 | 39.01 | 20.59 | 2600 | 1.74 | 0.54 |
| 4600 | 33.90 | 20.73 | 2700 | 1.89 | 0.54 |
| 5000 | 42.09 | 11.56 | 2800 | 2.11 | 0.54 |
| 5200 | 28.75 | 6.04 | 2900 | 2.41 | 0.55 |

Pad Connections

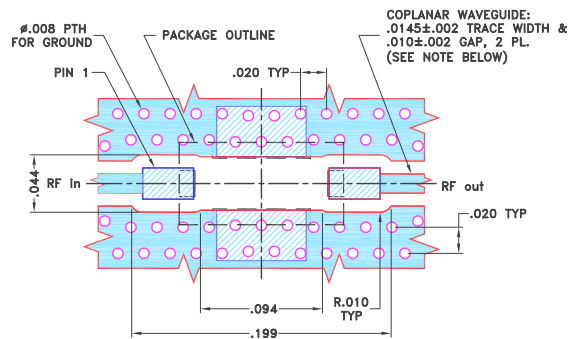
| | |
|--------|-----|
| Input | 1 |
| Output | 3 |
| Ground | 2,4 |

Product Marking: GM

Outline Drawing



Demo Board MCL P/N: TB-824+ Suggested PCB Layout (PL-454)



NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .0066±.0007". 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 Dimensions (inch mm)

| A | B | C | D | E | F | G | H | J | |
|------|------|------|------|------|------|------|------|-------|--|
| .126 | .063 | .037 | .026 | .075 | .012 | .182 | .104 | .069 | |
| 3.20 | 1.60 | 0.94 | 0.66 | 1.91 | 0.30 | 4.62 | 2.64 | 1.75 | |
| K | L | M | N | P | Q | R | | wt | |
| .119 | .041 | .039 | .013 | .024 | .020 | .039 | | grams | |
| 3.02 | 1.04 | 0.99 | 0.33 | 0.61 | 0.51 | 0.99 | | .020 | |

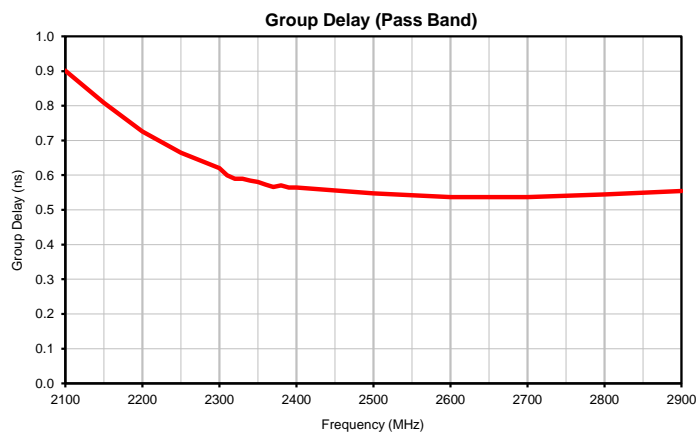
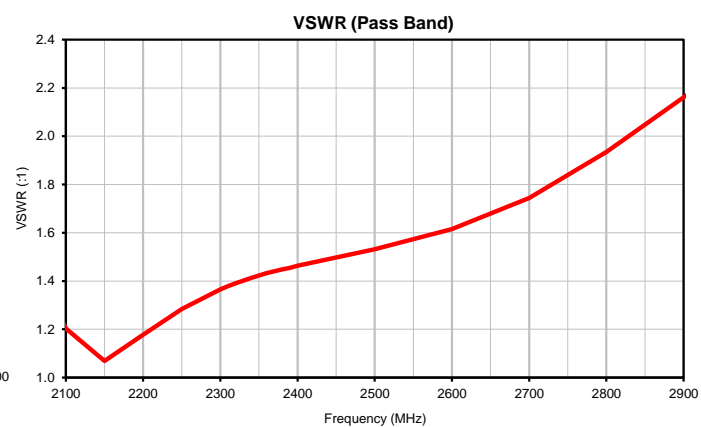
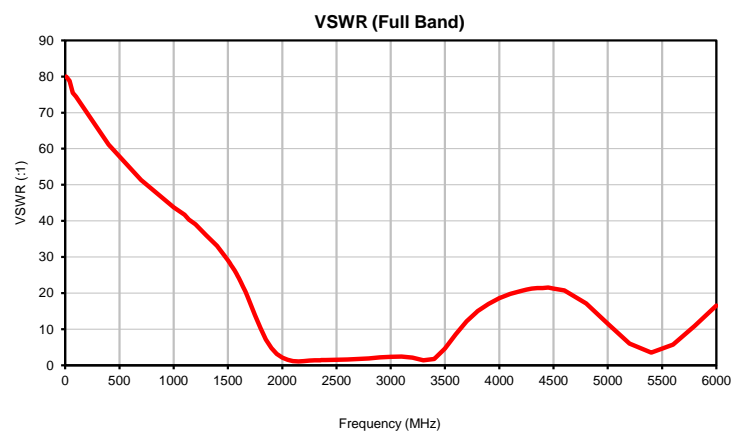
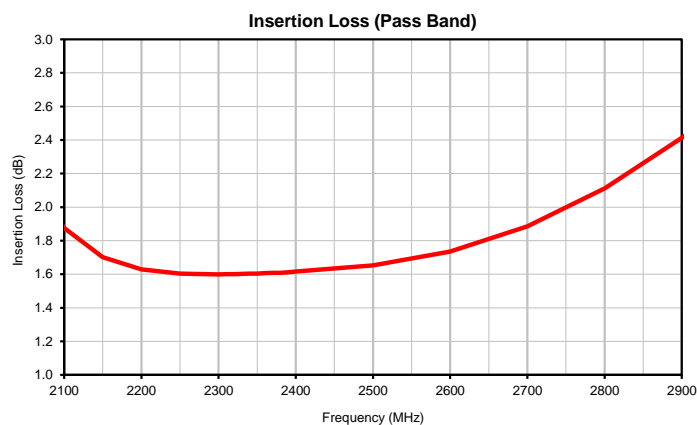
Additional Notes

- 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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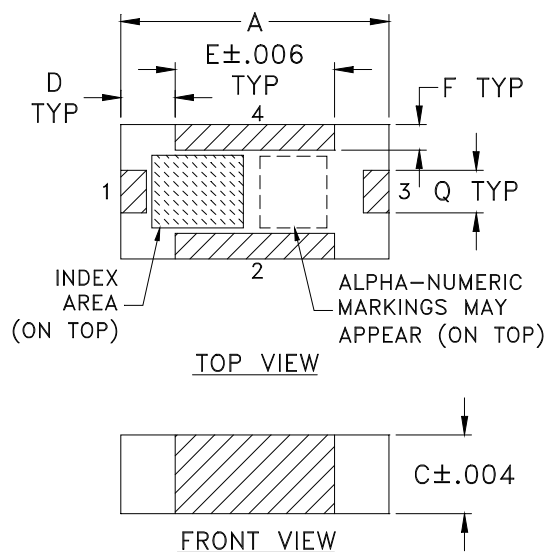
Typical Performance Data

| FREQUENCY (MHz) | INSERTION LOSS (dB) | VSWR (:1) | FREQUENCY (MHz) | GROUP DELAY (ns) |
|--------------------|---------------------------|--------------|--------------------|---------------------|
| 10 | 58.18 | 79.99 | 2100 | 0.90 |
| 40 | 84.01 | 78.80 | 2150 | 0.81 |
| 70 | 74.15 | 75.47 | 2200 | 0.73 |
| 100 | 69.04 | 74.42 | 2250 | 0.66 |
| 400 | 45.88 | 61.11 | 2300 | 0.62 |
| 700 | 37.83 | 51.38 | 2310 | 0.60 |
| 1000 | 34.16 | 43.74 | 2320 | 0.59 |
| 1100 | 33.94 | 41.71 | 2330 | 0.59 |
| 1140 | 34.09 | 40.41 | 2340 | 0.58 |
| 1200 | 34.67 | 39.04 | 2350 | 0.58 |
| 1300 | 37.56 | 36.07 | 2360 | 0.57 |
| 1400 | 53.82 | 33.11 | 2370 | 0.57 |
| 1500 | 33.62 | 29.10 | 2380 | 0.57 |
| 1510 | 32.40 | 28.72 | 2390 | 0.56 |
| 1520 | 31.26 | 28.21 | 2400 | 0.56 |
| 1530 | 30.20 | 27.76 | 2500 | 0.55 |
| 1540 | 29.19 | 27.23 | 2600 | 0.54 |
| 1550 | 28.24 | 26.76 | 2700 | 0.54 |
| 1560 | 27.33 | 26.33 | 2800 | 0.54 |
| 1570 | 26.45 | 25.84 | 2900 | 0.55 |
| 1580 | 25.60 | 25.28 | | |
| 1590 | 24.78 | 24.75 | | |
| 1600 | 23.98 | 24.20 | | |
| 1620 | 22.45 | 23.00 | | |
| 1640 | 21.00 | 21.77 | | |
| 1660 | 19.60 | 20.45 | | |
| 1680 | 18.25 | 19.04 | | |
| 1700 | 16.96 | 17.59 | | |
| 1750 | 13.86 | 13.89 | | |
| 1800 | 10.97 | 10.32 | | |
| 1850 | 8.32 | 7.16 | | |
| 1900 | 6.03 | 4.77 | | |
| 1950 | 4.24 | 3.14 | | |
| 2000 | 3.00 | 2.13 | | |
| 2050 | 2.26 | 1.54 | | |
| 2100 | 1.88 | 1.20 | | |
| 2150 | 1.70 | 1.07 | | |
| 2200 | 1.63 | 1.18 | | |
| 2250 | 1.60 | 1.28 | | |
| 2300 | 1.60 | 1.37 | | |
| 2310 | 1.60 | 1.38 | | |
| 2320 | 1.60 | 1.39 | | |
| 2330 | 1.60 | 1.40 | | |
| 2340 | 1.60 | 1.41 | | |
| 2350 | 1.60 | 1.42 | | |
| 2360 | 1.61 | 1.43 | | |
| 2370 | 1.61 | 1.44 | | |
| 2380 | 1.61 | 1.45 | | |
| 2390 | 1.61 | 1.46 | | |
| 2400 | 1.62 | 1.46 | | |
| 2500 | 1.65 | 1.53 | | |
| 2600 | 1.74 | 1.61 | | |
| 2700 | 1.89 | 1.74 | | |
| 2800 | 2.11 | 1.93 | | |
| 2900 | 2.41 | 2.16 | | |
| 3000 | 2.74 | 2.38 | | |
| 3100 | 2.99 | 2.44 | | |
| 3200 | 3.06 | 2.15 | | |
| 3300 | 3.14 | 1.42 | | |
| 3400 | 4.69 | 1.76 | | |
| 3500 | 9.37 | 4.60 | | |
| 3600 | 15.42 | 8.62 | | |
| 3700 | 21.53 | 12.21 | | |
| 3790 | 27.22 | 14.71 | | |
| 3800 | 27.88 | 14.98 | | |
| 3900 | 35.34 | 16.96 | | |
| 4000 | 47.47 | 18.59 | | |
| 4100 | 44.56 | 19.79 | | |
| 4200 | 39.01 | 20.59 | | |
| 4250 | 37.54 | 20.93 | | |
| 4300 | 36.44 | 21.25 | | |
| 4350 | 35.62 | 21.42 | | |
| 4400 | 35.02 | 21.41 | | |
| 4450 | 34.54 | 21.55 | | |
| 4500 | 34.21 | 21.22 | | |
| 4600 | 33.90 | 20.73 | | |
| 4800 | 35.08 | 17.16 | | |
| 5000 | 42.09 | 11.56 | | |
| 5200 | 28.75 | 6.04 | | |
| 5400 | 19.80 | 3.53 | | |
| 5600 | 16.80 | 5.76 | | |
| 5800 | 16.08 | 10.89 | | |
| 6000 | 15.53 | 16.54 | | |

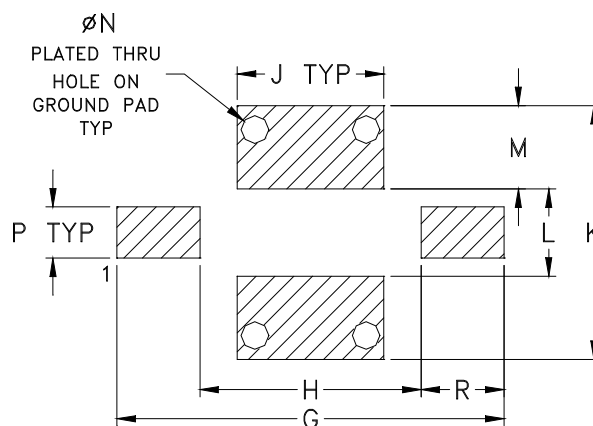
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



| CASE # | A | B | C | D | E | F | G | H | J | K | L | M |
|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| FV1206-4 | .126 (3.20) | .063 (1.60) | .037 (0.94) | .026 (0.66) | .075 (1.91) | .012 (0.30) | .182 (4.62) | .104 (2.64) | .069 (1.75) | .119 (3.02) | .041 (1.04) | .039 (0.99) |

| CASE # | N | P | Q | R | WT. GRAM |
|----------|----------------|----------------|----------------|----------------|----------|
| FV1206-4 | .013 (0.33) | .024 (0.61) | .020 (0.51) | .039 (0.99) | .020 |

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Open style, ceramic base.
- Termination finish: **as shown below or indicated on Data Sheet.**
 For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
 For RoHS-5 Case Styles: 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



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

DEVICE ORIENTATION IN T&R

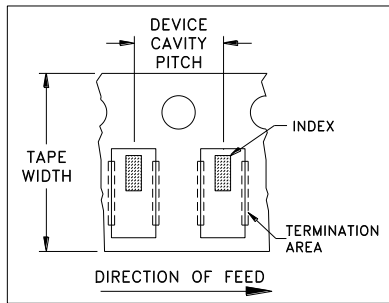


ILLUSTRATION 1

| Applicable Case Styles |
|------------------------|
| FV1206-1 FV1206-3 |

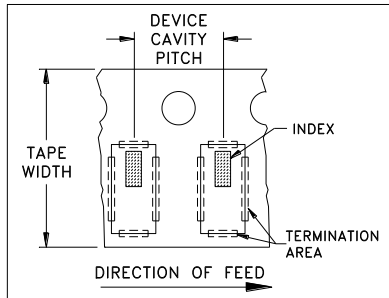


ILLUSTRATION 2

| Applicable Case Styles |
|--|
| FV1206-4 FV1206-5 FV1206-6 FV1206-7 FV1206-9 |

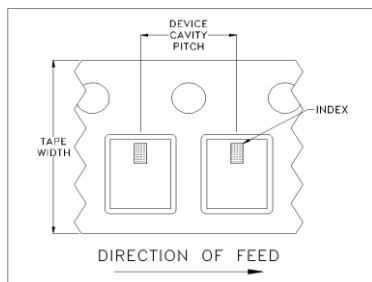


ILLUSTRATION 3

| Applicable Case Styles |
|--|
| FV1206-12 GE0805C-18 NL1008C-6 NL1008C-7 NL1008C-9 NL1008C-10 |

| 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 | 3000 |

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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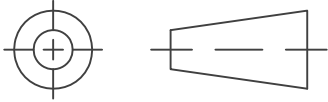
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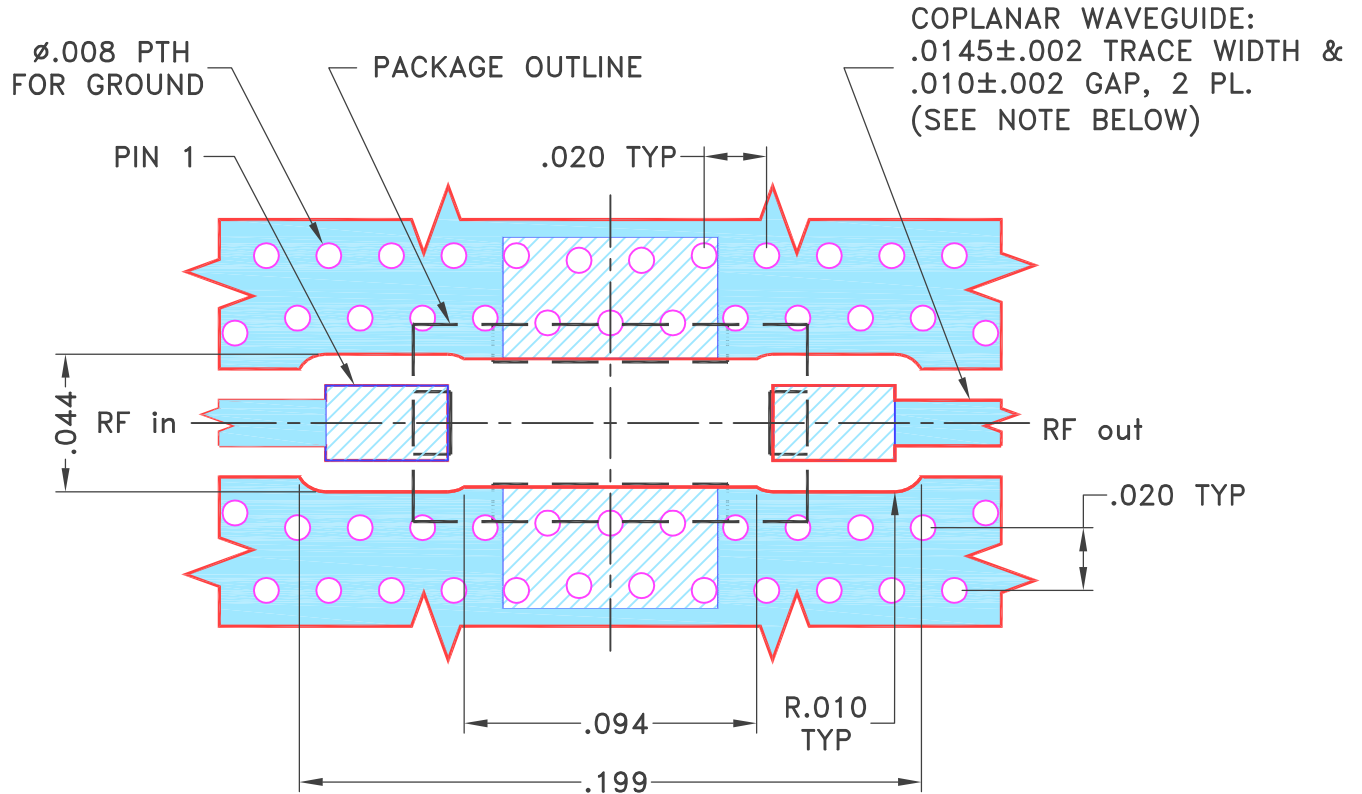
THIRD ANGLE PROJECTION



REVISIONS

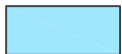
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-------------|----------|-----|------|
| OR | M152168 | NEW RELEASE | 07/31/15 | ITG | AVB |
| | | | | | |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION
FOR FV1206-4 CASE STYLE, "04FL01" PIN CODE



NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.0066 \pm .0007$ ". 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 TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ± | DRAWN | ITG | 07/30/15 |
| | CHECKED | GF | 07/31/15 |
| | APPROVED | AVB | 07/31/15 |



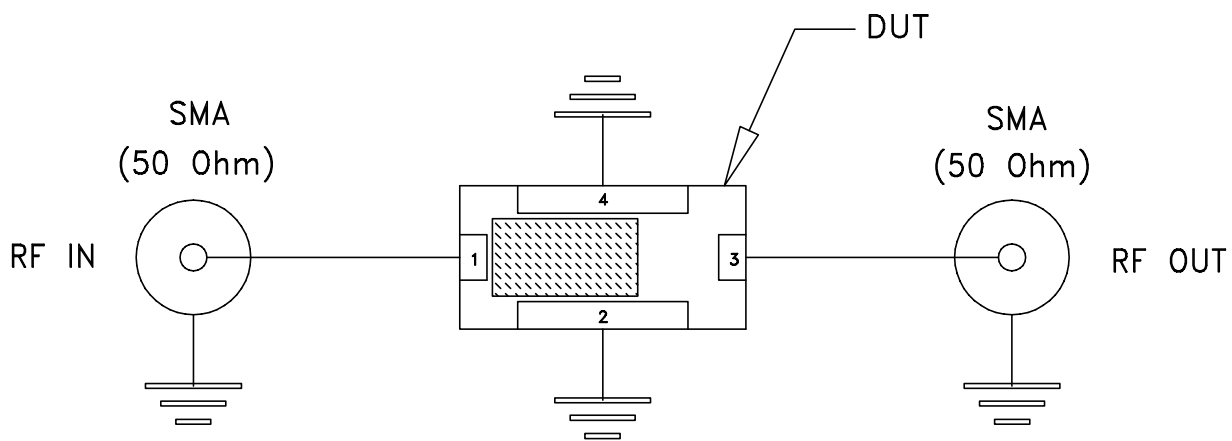
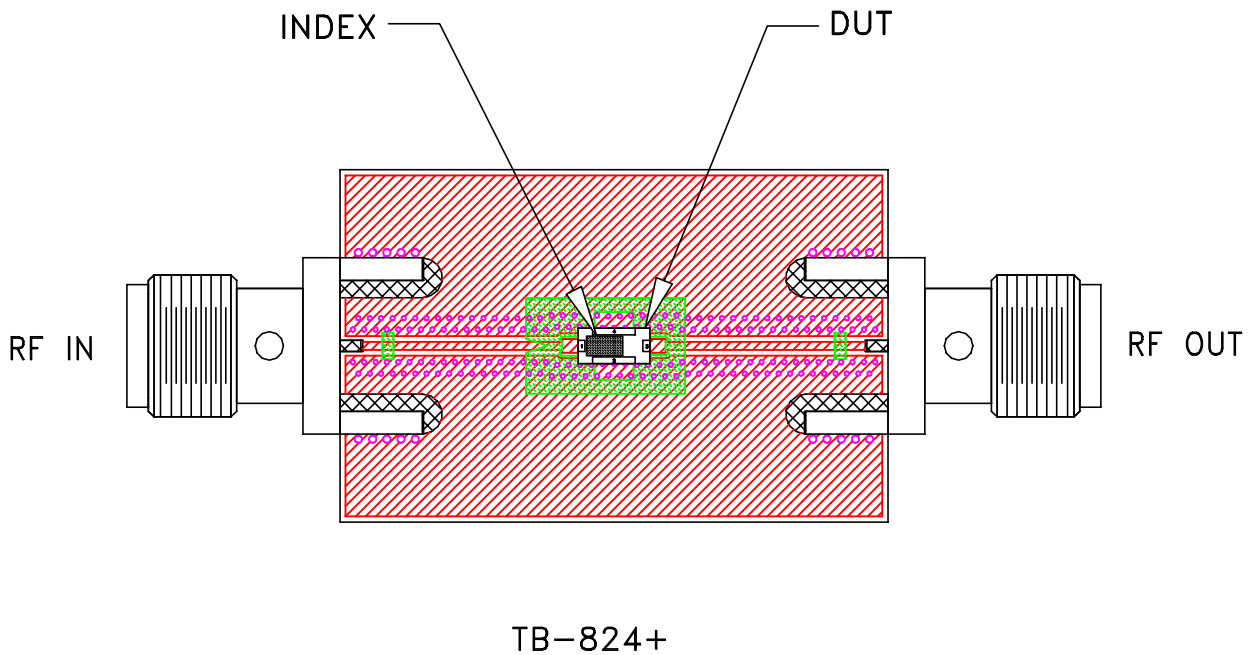
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PL, 04FL01, FV1206-4, TB-824+

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| | | | |
|------------------|---------------------|--------------------------|------------|
| SIZE A | CODE IDENT 15542 | DRAWING NO: 98-PL-454 | REV: OR |
| FILE: 98PL454 | SCALE: 16:1 | SHEET: 1 OF 1 | |


Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.0066 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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C 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 Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, 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 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |