

Ceramic Low Pass Filter

LFCN-3400D-1+

50Ω DC to 3400 MHz



CASE STYLE: FV1206

Maximum Ratings

| | |
|-------------------------------|-------------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| RF Power Input* | 8W max. at 25°C |
| Max. DC Voltage at pins 1 & 3 | 25 VDC |
| DC Current Input to Output | 0.5A max. at 25°C |

* Passband rating, derate linearly to 3W at 100°C ambient. Permanent damage may occur if any of these limits are exceeded.

Pin Connections

| | |
|--------|-----|
| RF IN | 1 |
| RF OUT | 3 |
| GROUND | 2,4 |

Features

- excellent power handling, 8W
- small size
- 5 sections
- temperature stable
- hermetically sealed
- LTCC construction
- protected by U.S. Patent 6,943,646

Applications

- harmonic rejection
- point to point
- transmitters/receivers

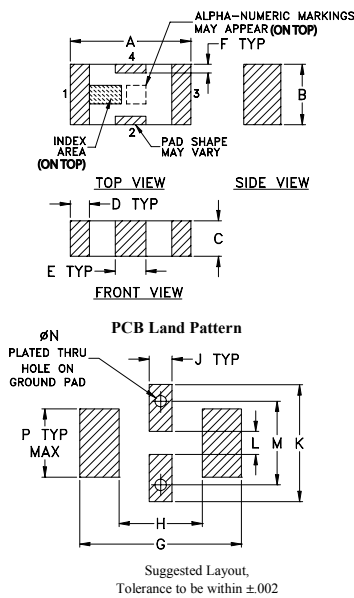
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications¹ at 25°C

| Parameter | F# | Frequency (MHz) | Min. | Typ. | Max. | Unit | |
|-----------|----------------|-----------------|-----------|------|------|------|----|
| Pass Band | Insertion Loss | DC-F1 | DC-3400 | — | — | 1.5 | dB |
| | Freq. Cut-Off | F2 | 3950 | — | 3.0 | — | dB |
| | VSWR | DC-F1 | DC-3400 | — | 1.2 | — | :1 |
| Stop Band | Rejection Loss | F3-F4 | 4300-4600 | 20 | — | — | dB |
| | | F4-F5 | 4600-7800 | — | 25 | — | dB |
| | VSWR | F5-F6 | 7800-8300 | — | 20 | — | dB |
| | | F3-F6 | 4300-8300 | — | 17 | — | :1 |

1. DC Resistance to ground is 100 Mohms min.

Outline Drawing

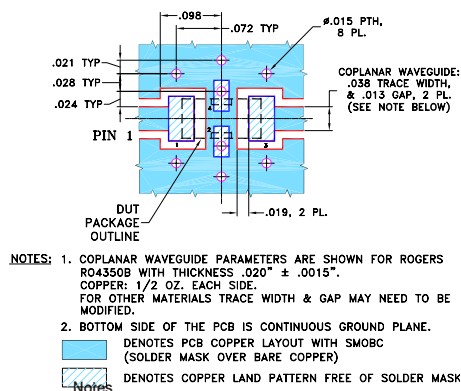


Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G |
|------|------|------|------|------|------|------|
| .126 | .063 | .037 | .020 | .032 | .009 | .169 |
| 3.20 | 1.60 | 0.94 | 0.51 | 0.81 | 0.23 | 4.29 |

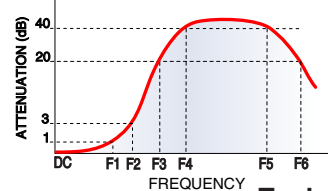
| H | J | K | L | M | N | P | wt |
|------|------|------|------|------|------|------|-------|
| .087 | .024 | .122 | .024 | .087 | .012 | .071 | grams |
| 2.21 | 0.61 | 3.10 | 0.61 | 2.21 | 0.30 | 1.80 | .020 |

Demo Board MCL P/N: TB-270 Suggested PCB Layout (PL-137)

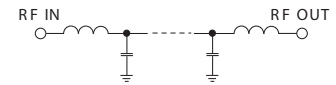


- NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Typical Frequency Response

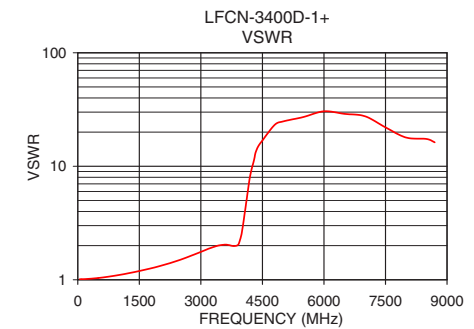
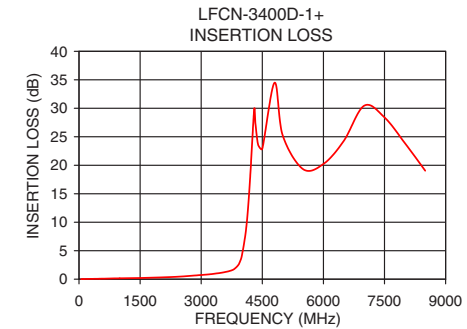


Electrical Schematic



Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) |
|-----------------|---------------------|-----------|
| 40 | 0.01 | 1.01 |
| 100 | 0.03 | 1.01 |
| 500 | 0.08 | 1.04 |
| 1000 | 0.15 | 1.10 |
| 2000 | 0.31 | 1.32 |
| 3000 | 0.73 | 1.76 |
| 3400 | 1.03 | 1.99 |
| 3800 | 1.73 | 1.98 |
| 3950 | 3.04 | 2.21 |
| 4050 | 6.01 | 3.38 |
| 4150 | 12.50 | 6.26 |
| 4300 | 29.75 | 11.53 |
| 4600 | 25.02 | 19.32 |
| 5050 | 23.78 | 26.33 |
| 6500 | 24.27 | 28.96 |
| 7800 | 25.25 | 19.32 |
| 8300 | 21.39 | 18.11 |



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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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Ceramic Low Pass Filter

LFCN-3400D-1+

Typical Performance Data

| FREQ. (MHz) | INSERTION LOSS (dB) | | | INPUT RETURN LOSS (dB) | | | OUTPUT RETURN LOSS (dB) | | |
|----------------|------------------------|----------|-----------|---------------------------|----------|-----------|----------------------------|----------|-----------|
| | @ -55° C | @ +25° C | @ +100° C | @ -55° C | @ +25° C | @ +100° C | @ -55° C | @ +25° C | @ +100° C |
| 40 | 0.03 | 0.03 | 0.04 | 53.18 | 42.74 | 37.82 | 48.23 | 40.56 | 36.60 |
| 100 | 0.00 | 0.02 | 0.03 | 46.05 | 47.47 | 37.74 | 44.61 | 45.67 | 37.82 |
| 500 | 0.04 | 0.08 | 0.10 | 36.62 | 33.82 | 28.67 | 35.66 | 33.17 | 28.32 |
| 1000 | 0.09 | 0.14 | 0.18 | 26.11 | 26.27 | 25.24 | 25.89 | 26.08 | 25.01 |
| 1500 | 0.14 | 0.22 | 0.25 | 22.05 | 21.81 | 22.73 | 21.89 | 21.68 | 22.66 |
| 2000 | 0.20 | 0.30 | 0.33 | 18.36 | 18.07 | 18.69 | 18.33 | 18.04 | 18.59 |
| 2500 | 0.32 | 0.42 | 0.49 | 15.10 | 15.14 | 15.13 | 15.01 | 15.12 | 15.05 |
| 3000 | 0.48 | 0.62 | 0.72 | 12.68 | 12.59 | 12.46 | 12.75 | 12.66 | 12.53 |
| 3200 | 0.58 | 0.73 | 0.84 | 11.68 | 11.64 | 11.59 | 11.72 | 11.73 | 11.73 |
| 3400 | 0.74 | 0.90 | 1.07 | 10.77 | 10.86 | 10.71 | 10.73 | 10.86 | 10.98 |
| 3500 | 0.84 | 1.02 | 1.22 | 10.37 | 10.50 | 10.31 | 10.30 | 10.43 | 10.60 |
| 3600 | 0.95 | 1.13 | 1.35 | 10.03 | 10.22 | 10.18 | 9.87 | 10.02 | 10.16 |
| 3675 | 1.07 | 1.27 | 1.47 | 9.83 | 10.10 | 10.24 | 9.50 | 9.66 | 9.72 |
| 3800 | 1.37 | 1.62 | 1.84 | 9.61 | 9.96 | 10.24 | 8.71 | 8.83 | 8.76 |
| 3900 | 1.86 | 2.22 | 2.56 | 9.27 | 9.53 | 9.80 | 7.57 | 7.56 | 7.34 |
| 3950 | 2.33 | 2.80 | 3.26 | 8.67 | 8.80 | 8.93 | 6.64 | 6.54 | 6.24 |
| 4000 | 3.08 | 3.73 | 4.39 | 7.58 | 7.58 | 7.49 | 5.48 | 5.34 | 4.98 |
| 4110 | 6.90 | 8.21 | 9.59 | 4.38 | 4.31 | 4.18 | 2.78 | 2.77 | 2.58 |
| 4200 | 13.61 | 15.76 | 17.94 | 2.45 | 2.54 | 2.60 | 1.51 | 1.69 | 1.66 |
| 4300 | 27.96 | 29.03 | 28.35 | 1.48 | 1.69 | 1.83 | 1.05 | 1.28 | 1.33 |
| 4330 | 29.85 | 27.78 | 26.41 | 1.38 | 1.58 | 1.74 | 1.07 | 1.29 | 1.35 |
| 4400 | 24.26 | 23.67 | 23.32 | 1.14 | 1.36 | 1.52 | 0.99 | 1.20 | 1.28 |
| 4600 | 24.41 | 25.37 | 25.99 | 0.70 | 0.90 | 1.07 | 0.80 | 1.03 | 1.11 |
| 4800 | 35.82 | 34.96 | 32.67 | 0.60 | 0.77 | 0.95 | 0.70 | 0.98 | 1.04 |
| 5000 | 24.99 | 24.24 | 23.53 | 0.47 | 0.65 | 0.80 | 0.66 | 0.92 | 1.04 |
| 5500 | 18.69 | 18.86 | 18.96 | 0.40 | 0.55 | 0.64 | 0.55 | 0.86 | 0.92 |
| 6000 | 19.58 | 20.10 | 20.25 | 0.36 | 0.50 | 0.58 | 0.55 | 0.78 | 0.98 |
| 6500 | 22.92 | 23.45 | 23.66 | 0.39 | 0.54 | 0.66 | 0.65 | 0.56 | 0.62 |
| 7000 | 28.92 | 29.04 | 28.02 | 0.42 | 0.62 | 0.79 | 0.61 | 0.66 | 0.83 |
| 7400 | 30.50 | 30.55 | 30.04 | 0.46 | 0.68 | 0.95 | 0.59 | 0.68 | 0.74 |
| 7800 | 27.13 | 26.35 | 27.15 | 0.54 | 0.79 | 1.04 | 0.49 | 0.68 | 0.74 |
| 8000 | 24.21 | 23.76 | 24.90 | 0.61 | 0.88 | 1.12 | 0.56 | 0.72 | 0.75 |
| 8300 | 21.21 | 20.92 | 20.91 | 0.72 | 0.96 | 1.23 | 0.56 | 0.75 | 0.81 |
| 9000 | 10.32 | 9.99 | 9.52 | 1.56 | 1.92 | 2.31 | 1.34 | 1.84 | 2.40 |
| 9250 | 4.48 | 4.44 | 4.58 | 5.65 | 7.15 | 8.24 | 6.34 | 8.90 | 11.72 |
| 9500 | 5.07 | 6.40 | 7.40 | 4.86 | 3.96 | 3.57 | 4.53 | 3.71 | 3.42 |
| 10000 | 12.50 | 13.35 | 14.33 | 1.26 | 1.42 | 1.56 | 0.89 | 1.14 | 1.29 |
| 11000 | 16.14 | 15.82 | 16.10 | 0.97 | 1.27 | 1.40 | 0.85 | 1.16 | 1.38 |
| 12000 | 11.85 | 12.06 | 12.17 | 1.18 | 1.46 | 1.76 | 1.21 | 1.32 | 1.55 |
| 14000 | 7.38 | 7.30 | 7.30 | 2.93 | 3.63 | 4.59 | 1.88 | 2.30 | 2.72 |
| 15000 | 12.91 | 14.57 | 14.97 | 2.98 | 3.43 | 3.82 | 1.67 | 1.96 | 2.23 |
| 16000 | 17.41 | 17.72 | 17.12 | 3.22 | 3.21 | 3.14 | 1.43 | 2.21 | 2.71 |
| 18000 | 15.11 | 15.28 | 16.77 | 3.5 | 3.920 | 4.0 | 2.26 | 2.49 | 2.37 |
| 20000 | 8.10 | 8.02 | 7.90 | 2.0 | 2.570 | 3.1 | 3.63 | 4.63 | 5.71 |

REV. X1
LFCN-3400D-1+
100427
Page 1 of 1



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

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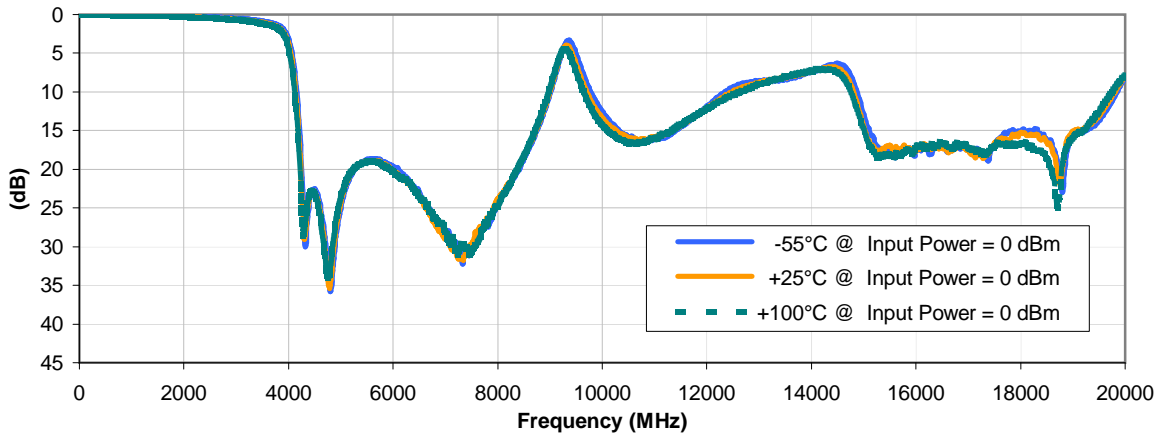


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

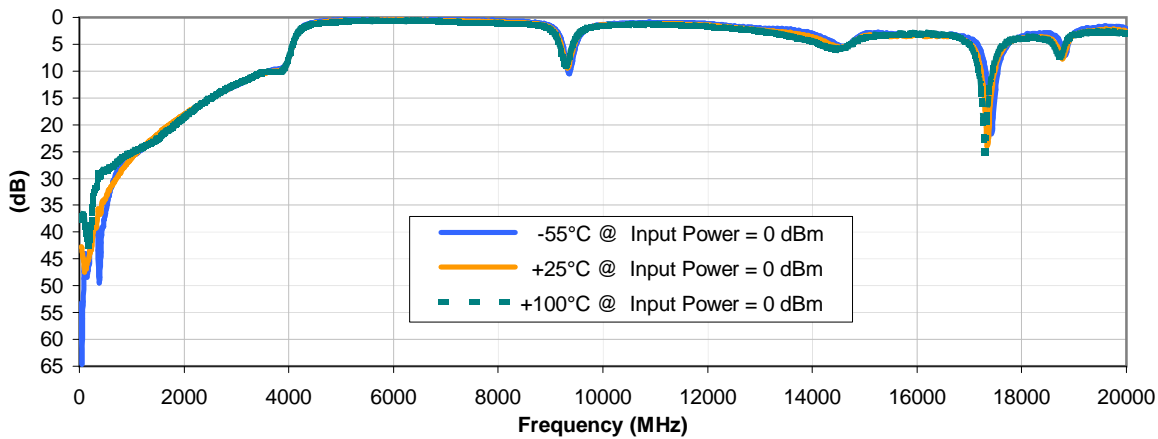


Typical Performance Curves

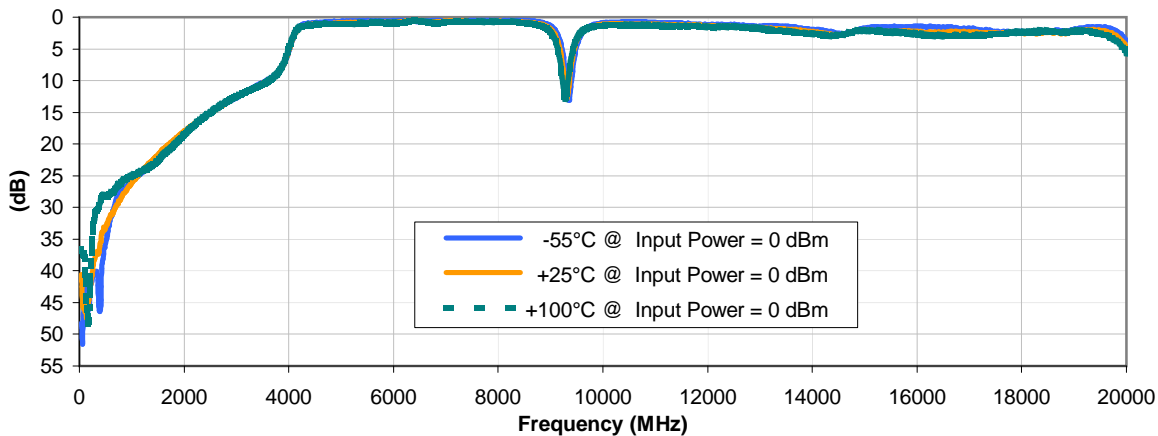
INSERTION LOSS vs. TEMPERATURE



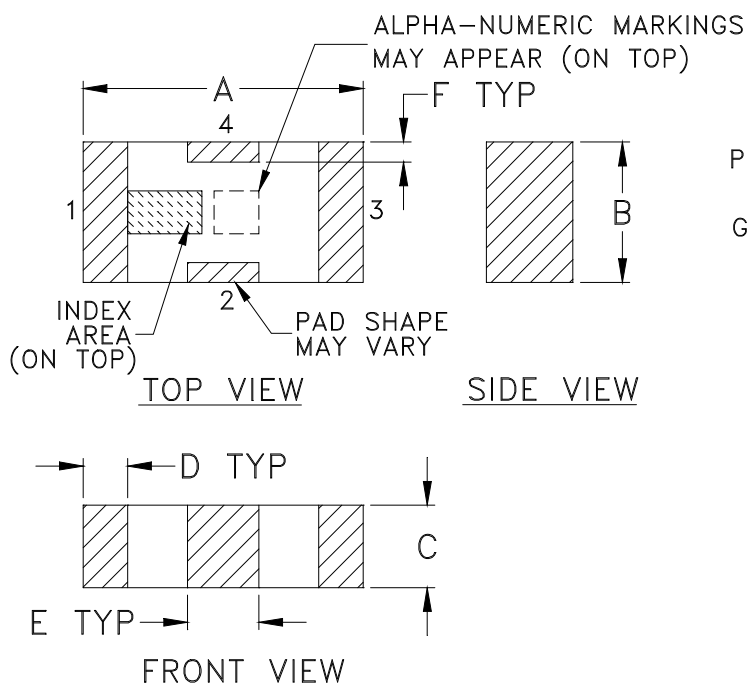
INPUT RETURN LOSS vs. TEMPERATURE



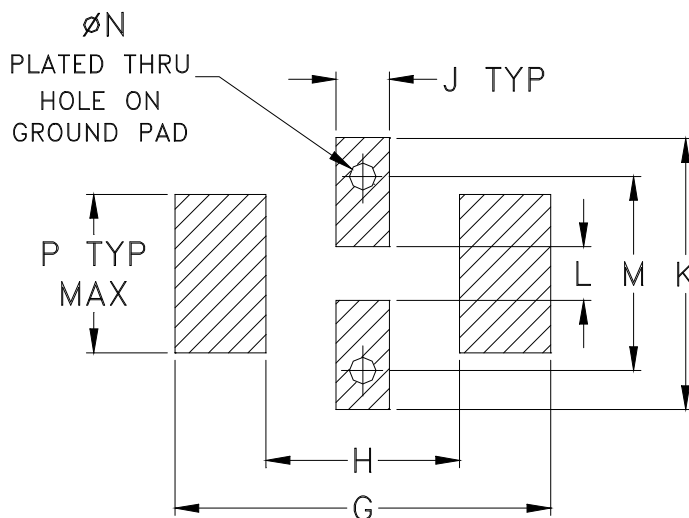
OUTPUT RETURN LOSS vs. TEMPERATURE



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 | M | N | P | WT. GRAM |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| FV1206 | .126 (3.20) | .063 (1.60) | .037 (0.94) | .020 (0.51) | .032 (0.81) | .009 (0.23) | .169 (4.29) | .087 (2.21) | .024 (0.61) | .122 (3.10) | .024 (0.61) | .087 (2.21) | .012 (0.30) | .071 (1.80) | .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.

Tape & Reel Packaging TR-F71

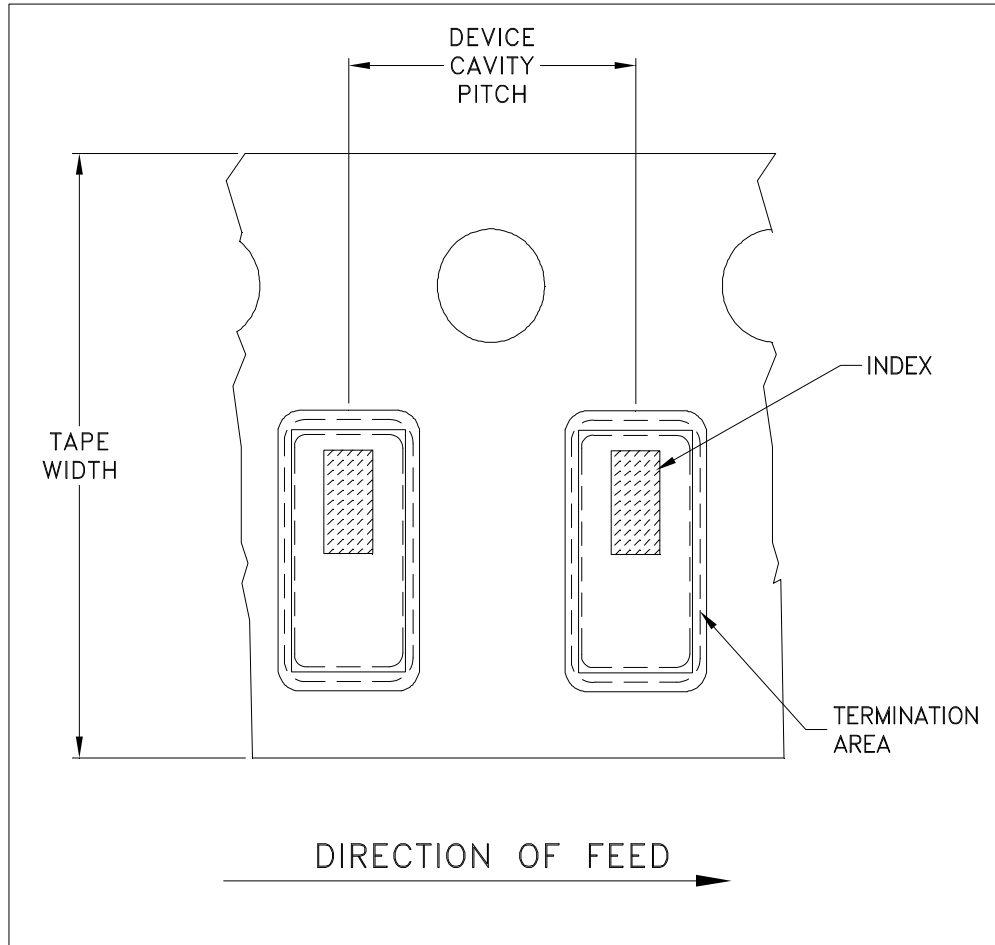


ILLUSTRATION 1

| 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



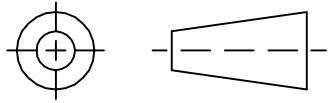
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RF/IF MICROWAVE COMPONENTS

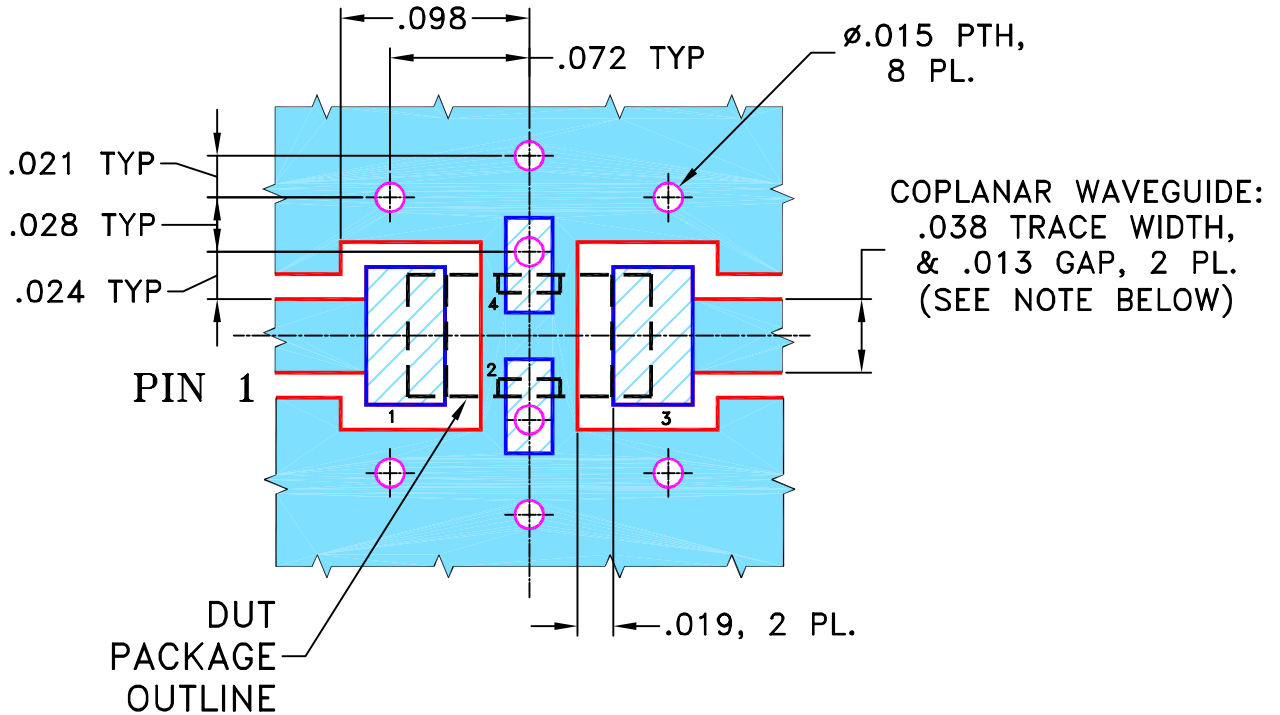
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-----------------------|----------|-----|------|
| OR | M88634 | NEW RELEASE | 08/28/03 | GF | ABD |
| A | M102713 | ADDED "...WITH SMOBC" | 01/17/06 | MMG | IL |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION
FOR FV1206 CASE STYLE, "nx" PIN CONNECTION



- NOTES:**
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH THICKNESS .020" ± .0015".
 COPPER: 1/2 OZ. EACH SIDE.
 FOR OTHER MATERIALS TRACE WIDTH & GAP 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 TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ± | DRAWN | GF 08/27/03 |
| | CHECKED | AV 08/28/03 |
| | APPROVED | ABD 08/28/03 |

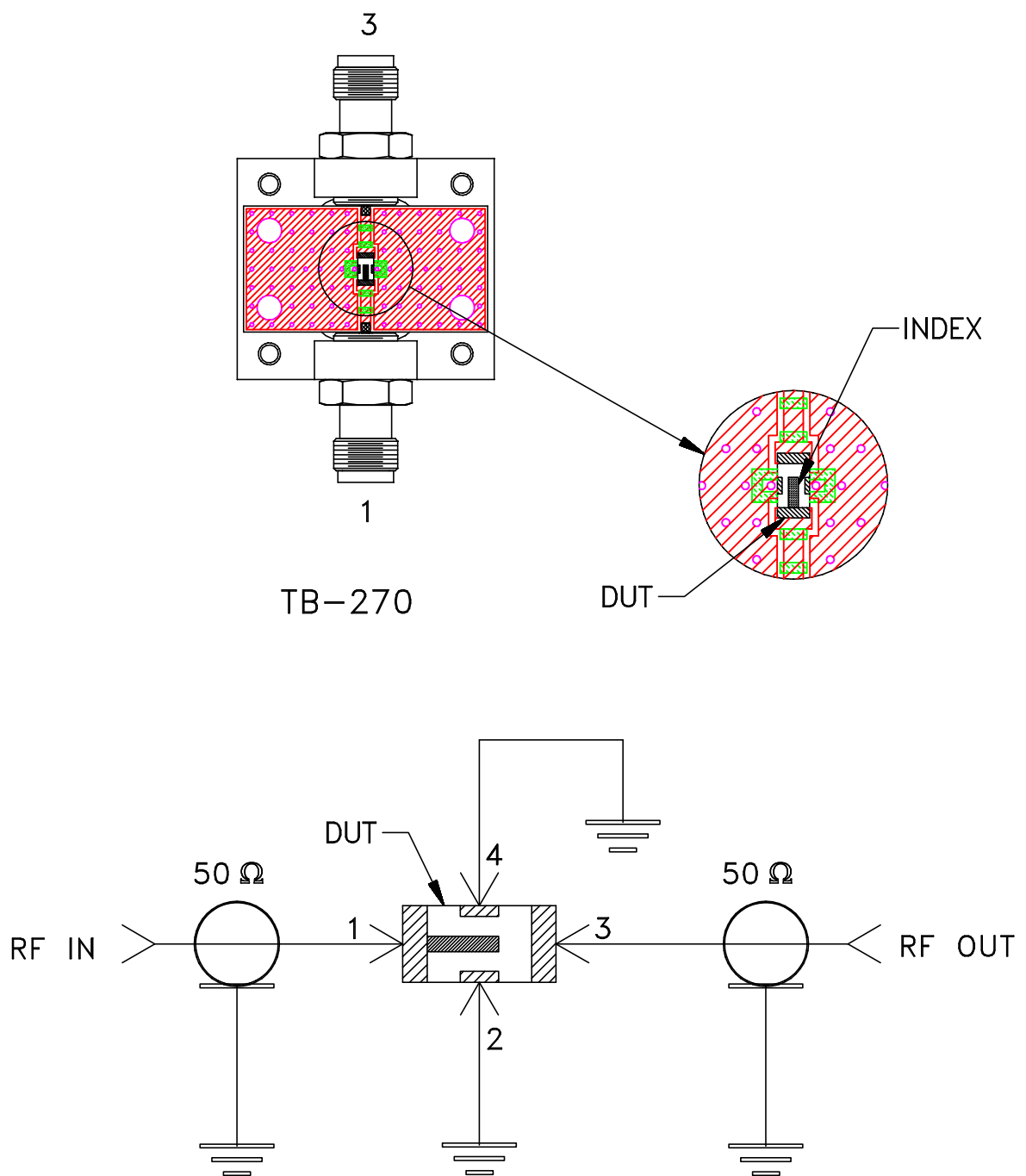
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 Brooklyn NY 11235

PL, nx, FV1206, LFCN/HFCN, TB-270

| | | | |
|-----------|---------------------|--------------------------|------------------|
| SIZE A | CODE IDENT 15542 | DRAWING NO: 98-PL-137 | REV: A |
| FILE: | 98PL137 | SCALE: 10:1 | SHEET: 1 OF 1 |

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Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: ROGERS R04350 or equivalent, Dielectric Constant=3.5, Thickness=.020 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 | -55° to 100°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 |
| 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, 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 |