

Surface Mount ®

Low Pass Filter

ULP-137+

50Ω DC to 137 MHz



CASE STYLE: QA2224

The Big Deal

- Low Insertion loss, 1.5dB Typ.
- High rejection, > 40dB
- Sharp insertion loss roll-off
- Good VSWR
- Ultra miniature surface mount package

Product Overview

The ULP-137+ is a lowpass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 137 MHz band width, these units offer good matching within the passband and high rejection. This model uses a miniature high Q capacitors and chip inductors for high reliability. In addition it has repeatable performance across production lots and consistent performance across temperature.

Key Features

| Feature | Advantages |
|-------------------------------------|---|
| Low passband insertion loss | Passband insertion loss 1.5dB typical ensures low signal loss throughout the passband |
| Excellent stopband rejection | Rejection of 40 dB ensures unwanted spurious are eliminated |
| Excellent return loss at DC-137 MHz | This makes signal transmission with very less reflections and well-matched with the adjacent component used in the system |
| Small size, 0.25" x 0.25" | The Ultra miniature surface mount package enables the ULP-137+ to be used in compact designs. |

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/MCLStore/terms.jsp



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50Ω

DC to 137 MHz

ULP-137+

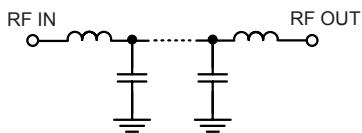
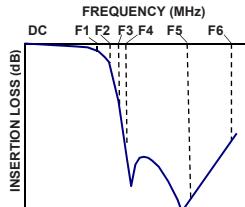
CASE STYLE: QA2224

Features

- High rejection
- Sharp insertion loss roll-off
- Good VSWR, 1.2:1 typ. at passband
- Ultra miniature surface mount package

Applications

- Wireless communications
- Receivers / Transformers
- Lab use

Functional Schematic**Typical Frequency Response****Electrical Specifications at 25°C**

| | Parameter | F# | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------|----------------|-------|-----------------|------|------|------|------|
| Pass Band | Insertion Loss | DC-F1 | DC-137 | — | 1.5 | 2.0 | dB |
| | Freq. Cut-Off | F2 | 150 | — | 3.0 | — | dB |
| | VSWR | DC-F1 | DC-137 | — | 1.2 | — | :1 |
| Stop Band | Rejection Loss | F3-F4 | 190-215 | 20 | 27 | — | dB |
| | | F4-F5 | 215-1000 | 40 | 47 | — | dB |
| | | F5-F6 | 1000-3000 | — | 20 | — | dB |
| | VSWR | F3-F5 | 190-1000 | — | 20 | — | :1 |

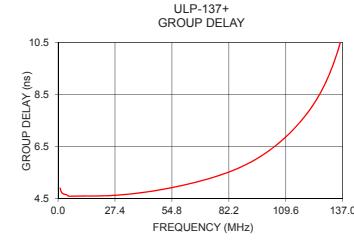
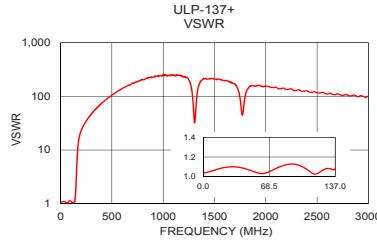
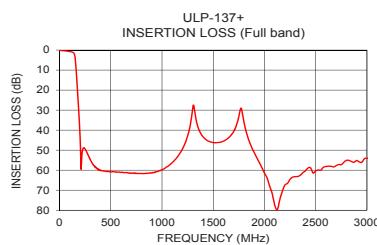
Maximum Ratings

| | |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power Input | 0.8W max. |

Permanent damage may occur if any of these limits are exceeded.

Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (nsec) |
|-----------------|---------------------|-----------|-----------------|--------------------|
| 1 | 0.21 | 1.04 | 1 | 4.90 |
| 10 | 0.23 | 1.06 | 5 | 4.60 |
| 75 | 0.55 | 1.08 | 10 | 4.60 |
| 137 | 1.39 | 1.08 | 20 | 4.60 |
| 150 | 3.10 | 2.16 | 30 | 4.64 |
| 160 | 8.33 | 6.00 | 40 | 4.73 |
| 170 | 15.99 | 11.96 | 50 | 4.85 |
| 175 | 19.99 | 14.51 | 60 | 5.01 |
| 176 | 20.80 | 14.97 | 70 | 5.21 |
| 180 | 24.04 | 16.62 | 80 | 5.46 |
| 188 | 30.73 | 19.35 | 90 | 5.79 |
| 190 | 32.49 | 19.97 | 100 | 6.26 |
| 200 | 42.64 | 22.71 | 105 | 6.55 |
| 215 | 55.47 | 26.42 | 110 | 6.90 |
| 250 | 49.48 | 34.69 | 115 | 7.31 |
| 300 | 54.73 | 46.72 | 120 | 7.79 |
| 500 | 60.86 | 104.94 | 125 | 8.39 |
| 1000 | 59.80 | 257.07 | 130 | 9.18 |
| 2000 | 61.52 | 154.70 | 135 | 10.28 |
| 3000 | 54.05 | 101.04 | 137 | 10.83 |

**+RoHS Compliant**

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

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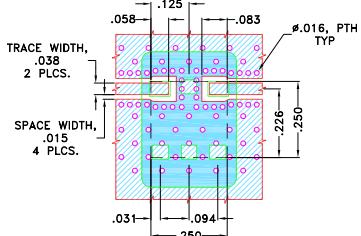
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Pad Connections

| | |
|--------|---------|
| INPUT | 1 |
| OUTPUT | 3 |
| GROUND | 2,4,5,6 |

**Demo Board MCL P/N: TB-894+
Suggested PCB Layout (PL-484)**

SUGGESTED MOUNTING CONFIGURATION FOR
QA2224 CASE STYLE "06FL09" PIN CODE

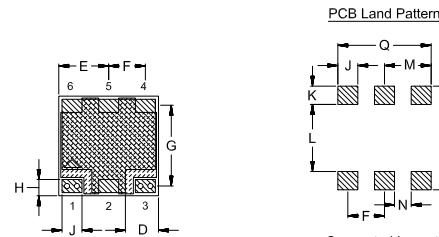
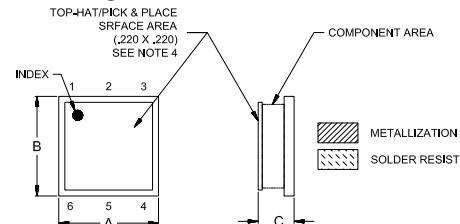


NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .020"±.0015". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

[Light Blue Box] DENOTES PCB COPPER LAYOUT WITH SMOBC
(SOLDER MASK OVER BARE COPPER)

[Hatched Box] DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Outline Drawing

Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch mm)

| A | B | C | D | E | F | G | H | J | K | |
|------|------|-----------|------|------|------|------|------|------|------|------|
| - | - | Min Max | - | - | - | - | - | - | - | |
| .250 | .250 | .075 .100 | .100 | .075 | .125 | .092 | .201 | .041 | .050 | .046 |
| 6.35 | 6.35 | 1.91 2.54 | 2.54 | 1.91 | 3.18 | 2.34 | 5.11 | 1.04 | 1.27 | 1.17 |
| L | M | N | P | Q | | | | | | |
| - | - | - | - | - | | | | | | |
| .168 | .117 | .042 | .260 | .234 | | | | | | |
| 4.27 | 2.97 | 1.07 | 6.60 | 5.94 | | | | | | |

Wt.
grams
0.25

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Low Pass Filter

ULP-137+

Typical Performance Data

| FREQ. (MHz) | INSERTION LOSS (dB) | | | INPUT RETURN LOSS (dB) | | | OUTPUT RETURN LOSS (dB) | | |
|----------------|------------------------|--------|--------|---------------------------|--------|--------|----------------------------|--------|--------|
| | @-40°C | @+25°C | @+85°C | @-40°C | @+25°C | @+85°C | @-40°C | @+25°C | @+85°C |
| | 0.17 | 0.21 | 0.25 | 36.53 | 34.07 | 32.58 | 36.37 | 33.94 | 32.46 |
| 2 | 0.17 | 0.22 | 0.25 | 36.29 | 33.91 | 32.45 | 36.18 | 33.83 | 32.38 |
| 5 | 0.18 | 0.22 | 0.25 | 34.70 | 32.76 | 31.53 | 34.58 | 32.67 | 31.46 |
| 10 | 0.19 | 0.23 | 0.26 | 31.81 | 30.43 | 29.55 | 31.77 | 30.39 | 29.52 |
| 15 | 0.21 | 0.25 | 0.28 | 29.75 | 28.60 | 27.87 | 29.74 | 28.58 | 27.87 |
| 20 | 0.23 | 0.27 | 0.30 | 28.38 | 27.34 | 26.69 | 28.39 | 27.34 | 26.71 |
| 25 | 0.25 | 0.29 | 0.32 | 27.58 | 26.62 | 26.01 | 27.58 | 26.61 | 26.03 |
| 50 | 0.35 | 0.40 | 0.42 | 30.74 | 30.57 | 30.36 | 30.81 | 30.58 | 30.57 |
| 75 | 0.48 | 0.55 | 0.59 | 30.21 | 28.13 | 26.60 | 29.99 | 27.99 | 26.47 |
| 100 | 0.65 | 0.74 | 0.80 | 26.15 | 25.34 | 24.40 | 26.09 | 25.26 | 24.31 |
| 125 | 0.92 | 1.05 | 1.14 | 31.60 | 29.24 | 27.79 | 32.96 | 30.22 | 28.62 |
| 137 | 1.20 | 1.39 | 1.51 | 29.08 | 28.38 | 27.63 | 30.90 | 30.44 | 29.61 |
| 150 | 2.71 | 3.10 | 3.37 | 8.89 | 8.69 | 8.57 | 8.93 | 8.74 | 8.62 |
| 160 | 7.69 | 8.33 | 8.79 | 2.89 | 2.92 | 2.92 | 2.89 | 2.93 | 2.92 |
| 170 | 15.32 | 15.99 | 16.51 | 1.36 | 1.46 | 1.49 | 1.35 | 1.45 | 1.49 |
| 175 | 19.35 | 19.99 | 20.51 | 1.10 | 1.20 | 1.24 | 1.09 | 1.19 | 1.23 |
| 180 | 23.41 | 24.04 | 24.55 | 0.95 | 1.05 | 1.09 | 0.94 | 1.04 | 1.08 |
| 185 | 27.55 | 28.17 | 28.69 | 0.86 | 0.95 | 0.98 | 0.84 | 0.94 | 0.97 |
| 186 | 28.40 | 29.01 | 29.53 | 0.84 | 0.93 | 0.97 | 0.83 | 0.92 | 0.96 |
| 187 | 29.25 | 29.87 | 30.39 | 0.82 | 0.91 | 0.95 | 0.81 | 0.90 | 0.94 |
| 188 | 30.11 | 30.73 | 31.25 | 0.81 | 0.90 | 0.94 | 0.80 | 0.89 | 0.93 |
| 190 | 31.87 | 32.49 | 33.02 | 0.79 | 0.87 | 0.91 | 0.77 | 0.86 | 0.90 |
| 200 | 41.92 | 42.64 | 43.23 | 0.68 | 0.77 | 0.80 | 0.67 | 0.76 | 0.79 |
| 205 | 48.82 | 49.69 | 50.41 | 0.65 | 0.72 | 0.76 | 0.63 | 0.71 | 0.75 |
| 210 | 59.01 | 58.99 | 58.77 | 0.61 | 0.69 | 0.72 | 0.60 | 0.68 | 0.71 |
| 215 | 56.41 | 55.47 | 54.91 | 0.58 | 0.66 | 0.69 | 0.57 | 0.65 | 0.68 |
| 220 | 52.06 | 51.70 | 51.53 | 0.56 | 0.63 | 0.66 | 0.54 | 0.62 | 0.65 |
| 225 | 50.16 | 50.00 | 49.91 | 0.53 | 0.60 | 0.64 | 0.52 | 0.59 | 0.63 |
| 250 | 49.48 | 49.48 | 49.47 | 0.43 | 0.50 | 0.53 | 0.42 | 0.49 | 0.52 |
| 300 | 54.70 | 54.73 | 54.70 | 0.31 | 0.37 | 0.40 | 0.30 | 0.36 | 0.39 |
| 350 | 58.52 | 58.42 | 58.41 | 0.24 | 0.29 | 0.31 | 0.23 | 0.29 | 0.30 |
| 375 | 59.33 | 59.48 | 59.41 | 0.21 | 0.26 | 0.28 | 0.20 | 0.26 | 0.27 |
| 400 | 60.01 | 60.08 | 60.03 | 0.19 | 0.23 | 0.25 | 0.18 | 0.23 | 0.24 |
| 450 | 60.57 | 60.62 | 60.45 | 0.15 | 0.19 | 0.21 | 0.14 | 0.20 | 0.20 |
| 500 | 60.72 | 60.86 | 60.81 | 0.12 | 0.17 | 0.18 | 0.12 | 0.17 | 0.17 |
| 550 | 60.83 | 60.88 | 60.82 | 0.10 | 0.14 | 0.15 | 0.09 | 0.15 | 0.15 |
| 600 | 60.99 | 61.11 | 61.00 | 0.08 | 0.12 | 0.14 | 0.07 | 0.13 | 0.13 |
| 650 | 61.20 | 61.18 | 61.34 | 0.07 | 0.11 | 0.12 | 0.06 | 0.12 | 0.12 |
| 700 | 61.41 | 61.43 | 61.34 | 0.05 | 0.10 | 0.11 | 0.05 | 0.11 | 0.11 |
| 750 | 61.54 | 61.61 | 61.68 | 0.04 | 0.09 | 0.10 | 0.04 | 0.11 | 0.10 |
| 800 | 61.61 | 61.69 | 61.57 | 0.03 | 0.08 | 0.09 | 0.03 | 0.10 | 0.09 |
| 850 | 61.56 | 61.68 | 61.65 | 0.03 | 0.08 | 0.09 | 0.02 | 0.10 | 0.09 |
| 900 | 61.27 | 61.29 | 61.42 | 0.02 | 0.08 | 0.09 | 0.02 | 0.10 | 0.09 |
| 950 | 60.78 | 60.82 | 60.71 | 0.01 | 0.07 | 0.08 | 0.01 | 0.10 | 0.09 |
| 1000 | 59.82 | 59.80 | 59.83 | 0.01 | 0.07 | 0.08 | 0.01 | 0.10 | 0.09 |
| 1200 | 49.48 | 49.43 | 49.20 | 0.00 | 0.07 | 0.08 | 0.00 | 0.10 | 0.09 |
| 1400 | 42.99 | 43.33 | 43.49 | 0.00 | 0.08 | 0.09 | 0.00 | 0.11 | 0.10 |
| 1500 | 46.01 | 46.22 | 46.23 | 0.00 | 0.08 | 0.09 | 0.00 | 0.11 | 0.10 |
| 1600 | 45.33 | 45.51 | 45.46 | 0.00 | 0.09 | 0.10 | 0.01 | 0.12 | 0.11 |
| 1700 | 40.59 | 40.64 | 40.43 | 0.01 | 0.10 | 0.12 | 0.02 | 0.14 | 0.14 |
| 1750 | 33.33 | 33.15 | 32.79 | 0.08 | 0.19 | 0.22 | 0.10 | 0.24 | 0.25 |
| 2000 | 61.09 | 61.52 | 61.31 | 0.01 | 0.11 | 0.13 | 0.02 | 0.14 | 0.15 |
| 2200 | 67.92 | 67.39 | 67.59 | 0.03 | 0.13 | 0.15 | 0.03 | 0.15 | 0.16 |
| 2400 | 60.19 | 60.33 | 60.25 | 0.04 | 0.14 | 0.16 | 0.04 | 0.16 | 0.17 |
| 2500 | 60.48 | 60.39 | 60.68 | 0.05 | 0.15 | 0.17 | 0.05 | 0.17 | 0.18 |
| 2600 | 58.23 | 58.19 | 58.49 | 0.06 | 0.16 | 0.18 | 0.05 | 0.18 | 0.19 |
| 2750 | 57.11 | 57.29 | 57.79 | 0.07 | 0.17 | 0.19 | 0.06 | 0.18 | 0.19 |
| 2800 | 55.06 | 55.10 | 55.47 | 0.07 | 0.16 | 0.18 | 0.07 | 0.19 | 0.20 |
| 2900 | 55.22 | 55.17 | 56.37 | 0.08 | 0.18 | 0.20 | 0.06 | 0.19 | 0.19 |
| 3000 | 54.74 | 54.05 | 53.87 | 0.08 | 0.17 | 0.19 | 0.07 | 0.19 | 0.20 |



ISO 9001 ISO 14001 AS 9100 CERTIFIED

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IF/RF MICROWAVE COMPONENTS



REV. OR

ULP-137+

170210

Page 1 of 2

Typical Performance Data

| FREQ. (MHz) | GROUP DELAY | | |
|----------------|-------------|--------|--------|
| | (nsec) | | |
| | @-40°C | @+25°C | @+85°C |
| 1.0 | 4.82 | 4.90 | 4.90 |
| 2.0 | 4.69 | 4.71 | 4.70 |
| 3.0 | 4.65 | 4.67 | 4.66 |
| 4.0 | 4.64 | 4.65 | 4.64 |
| 5.0 | 4.60 | 4.60 | 4.59 |
| 6.0 | 4.59 | 4.59 | 4.58 |
| 7.0 | 4.59 | 4.59 | 4.58 |
| 8.0 | 4.59 | 4.59 | 4.59 |
| 9.0 | 4.59 | 4.60 | 4.59 |
| 10.0 | 4.59 | 4.60 | 4.60 |
| 11.0 | 4.59 | 4.60 | 4.60 |
| 12.0 | 4.59 | 4.60 | 4.60 |
| 13.0 | 4.59 | 4.60 | 4.60 |
| 14.0 | 4.59 | 4.60 | 4.60 |
| 15.0 | 4.59 | 4.60 | 4.60 |
| 16.0 | 4.59 | 4.60 | 4.60 |
| 17.0 | 4.59 | 4.60 | 4.60 |
| 18.0 | 4.59 | 4.60 | 4.60 |
| 19.0 | 4.59 | 4.60 | 4.60 |
| 20.0 | 4.59 | 4.60 | 4.61 |
| 21.0 | 4.59 | 4.60 | 4.61 |
| 22.0 | 4.60 | 4.61 | 4.61 |
| 23.0 | 4.60 | 4.61 | 4.62 |
| 24.0 | 4.60 | 4.61 | 4.62 |
| 25.0 | 4.60 | 4.62 | 4.62 |
| 26.0 | 4.61 | 4.62 | 4.63 |
| 27.0 | 4.61 | 4.62 | 4.63 |
| 28.0 | 4.62 | 4.63 | 4.64 |
| 29.0 | 4.62 | 4.64 | 4.64 |
| 30.0 | 4.63 | 4.64 | 4.65 |
| 31.0 | 4.63 | 4.65 | 4.65 |
| 32.0 | 4.64 | 4.66 | 4.67 |
| 33.0 | 4.65 | 4.66 | 4.67 |
| 34.0 | 4.65 | 4.67 | 4.68 |
| 35.0 | 4.67 | 4.68 | 4.69 |
| 36.0 | 4.67 | 4.69 | 4.70 |
| 37.0 | 4.68 | 4.70 | 4.70 |
| 38.0 | 4.69 | 4.71 | 4.72 |
| 39.0 | 4.70 | 4.72 | 4.72 |
| 40.0 | 4.71 | 4.73 | 4.74 |
| 42.0 | 4.73 | 4.75 | 4.76 |
| 43.0 | 4.74 | 4.76 | 4.77 |
| 45.0 | 4.77 | 4.78 | 4.79 |
| 50.0 | 4.83 | 4.85 | 4.86 |
| 55.0 | 4.91 | 4.92 | 4.94 |
| 60.0 | 5.00 | 5.01 | 5.02 |
| 65.0 | 5.09 | 5.11 | 5.12 |
| 68.0 | 5.15 | 5.17 | 5.18 |
| 70.0 | 5.19 | 5.21 | 5.22 |
| 75.0 | 5.31 | 5.33 | 5.33 |
| 80.0 | 5.45 | 5.46 | 5.47 |
| 85.0 | 5.60 | 5.61 | 5.62 |
| 90.0 | 5.78 | 5.79 | 5.80 |
| 95.0 | 5.99 | 6.00 | 6.02 |
| 100.0 | 6.23 | 6.26 | 6.28 |
| 105.0 | 6.52 | 6.55 | 6.58 |
| 120.0 | 7.74 | 7.79 | 7.84 |
| 125.0 | 8.32 | 8.39 | 8.44 |
| 130.0 | 9.09 | 9.18 | 9.24 |
| 137.0 | 10.70 | 10.83 | 10.93 |

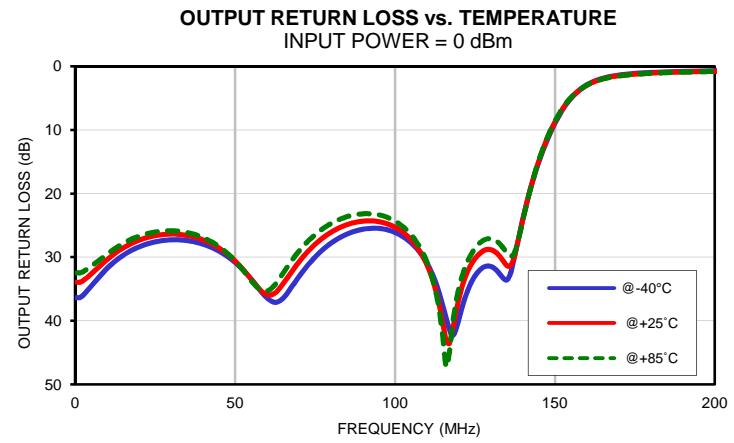
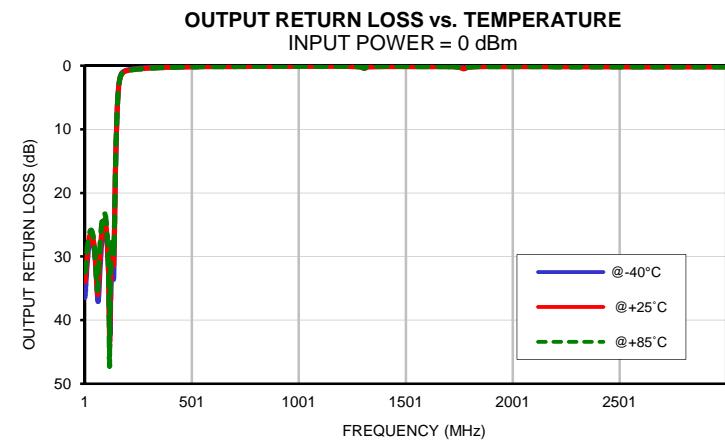
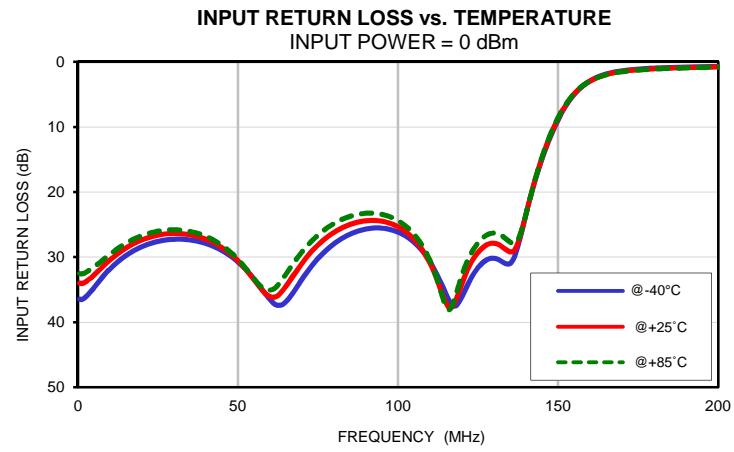
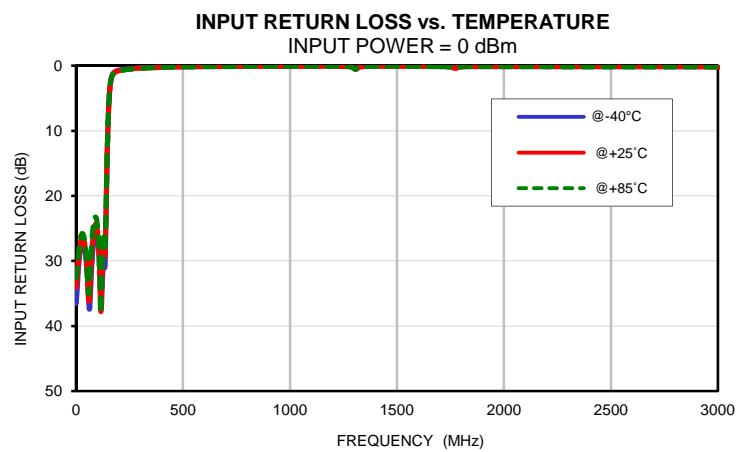
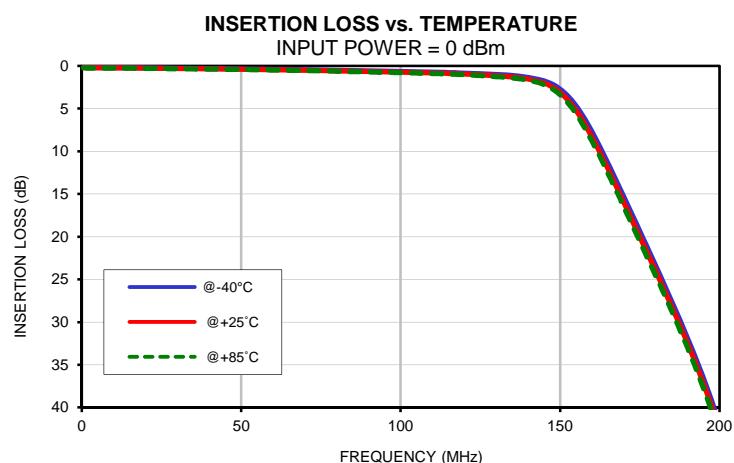
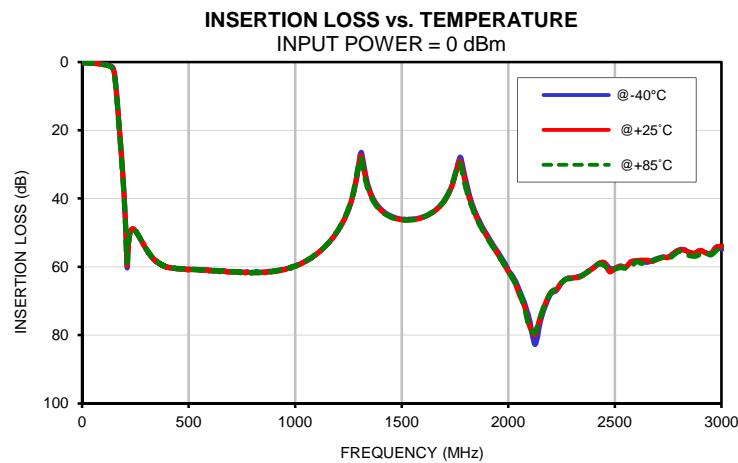


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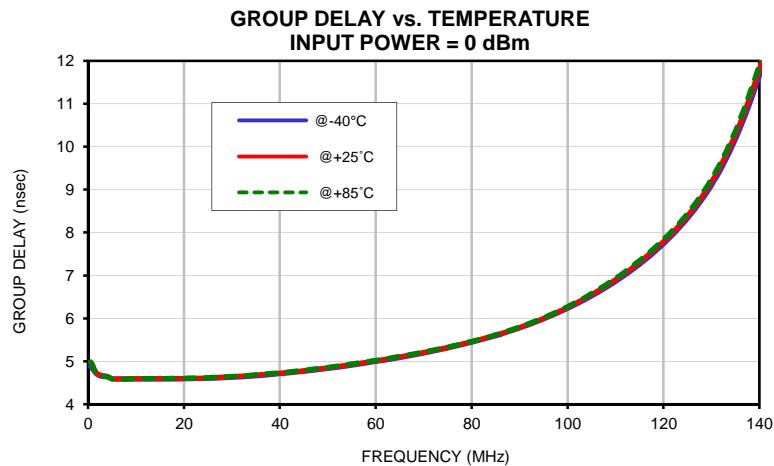
IF/RF MICROWAVE COMPONENTS



Typical Performance Curves



Typical Performance Curves

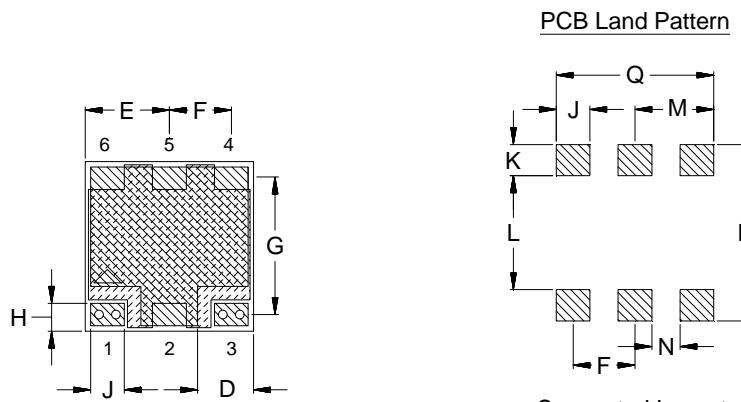
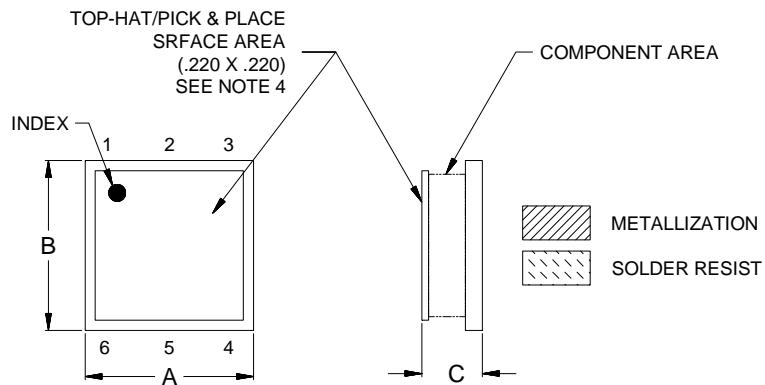


Case Style

QA

Outline Dimensions

QA2224



| CASE# | A | B | C | D | E | F | G | H | J | K | L | M |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| QA2224 | .250 (6.35) | .250 (6.35) | .070 (1.78) | .075 (1.91) | .125 (3.18) | .092 (2.34) | .201 (5.11) | .041 (1.04) | .050 (1.27) | .046 (1.17) | .168 (4.27) | .117 (2.97) |

| CASE# | N | P | Q | WT. GRAM |
|--------|----------------|----------------|----------------|----------|
| QA2224 | .042 (1.07) | .260 (6.60) | .234 (5.94) | 0.25 |

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3Pl. $\pm .015$

Notes:

1. Case material: Ceramic base.
2. Base: Printed wiring laminate.
3. Termination finish:
For RoHS Case Styles: 3-5 μ inch Gold over 120-240 μ inch Nickel plate.
For RoHS-5 Case Styles: Tin-Lead plate.
4. Top-Hat total thickness: .013 inches MAX

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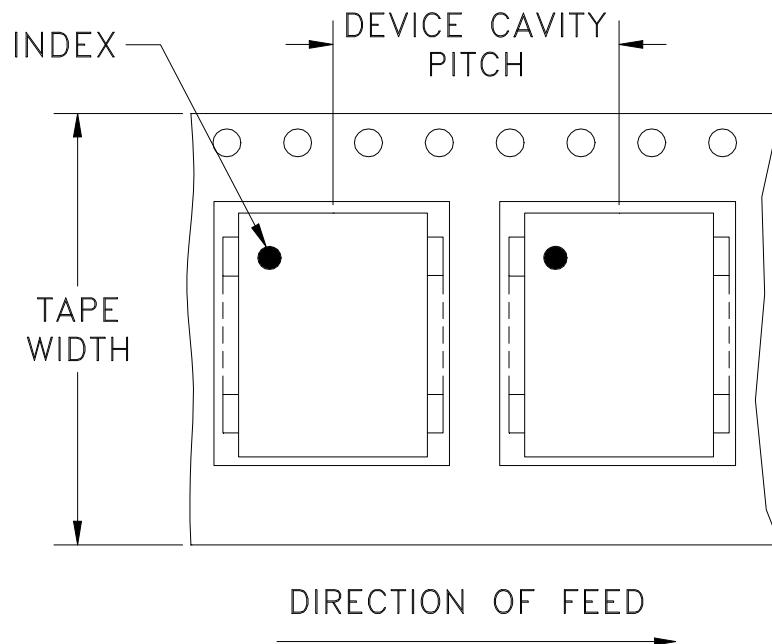


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/F MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F34

DEVICE ORIENTATION IN T&R



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note | |
|-------------------|----------------------------|----------------------|------------------------------------|------|
| 16 | 12 | 7 | Small quantity standard (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | 13 | Standard | 500 |
| | | | | 1000 |

Note: Availability of small reel quantity 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



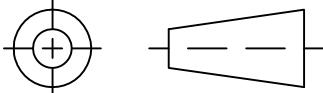
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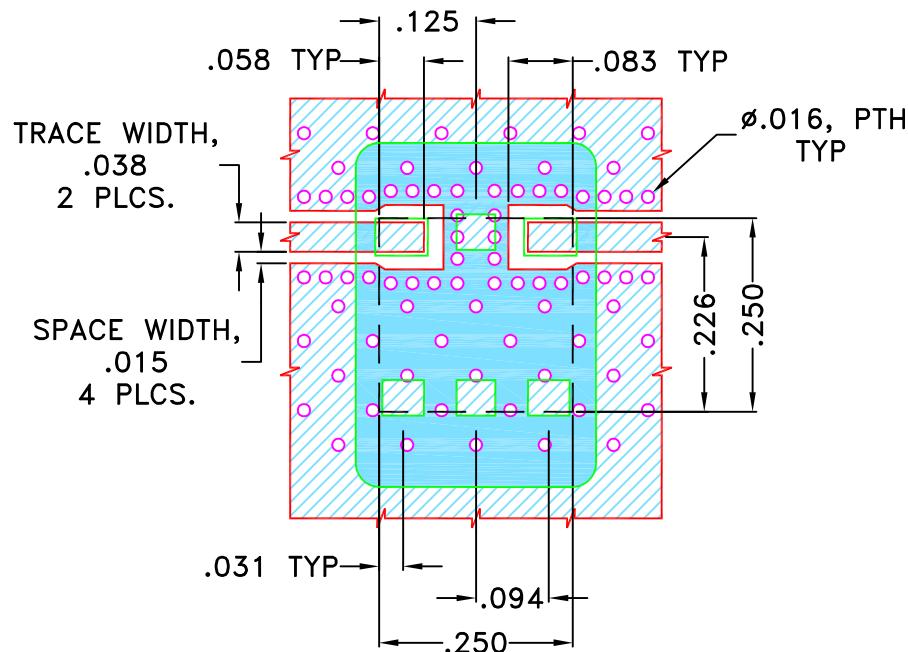
THIRD ANGLE PROJECTION



REVISONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-----------------------------|--------|----|------|
| OR | M156213 | NEW RELEASE | MAY 16 | TM | MD |
| A | M161508 | COPPER LAND PATTERN UPDATED | APR 17 | EJ | MD |
| | | | | | |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION FOR
QA2224 CASE STYLE "06FL09" PIN CODE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS $.020 \pm .0015$ ". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH 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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS \pm 3 PL DECIMALS $\pm .005$ "ANGLES \pm FRACTIONS \pm 

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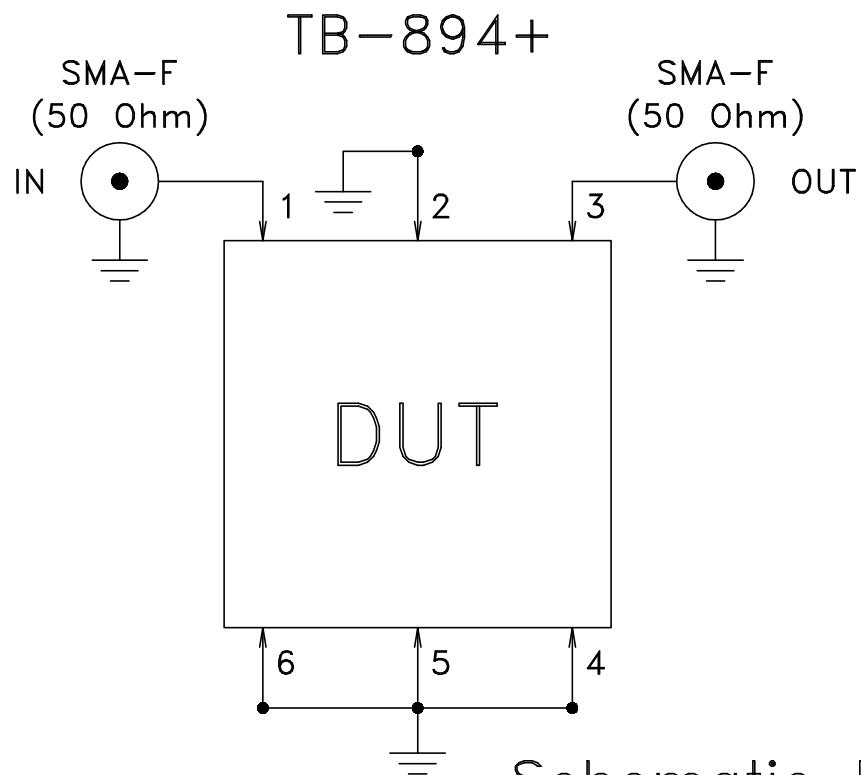
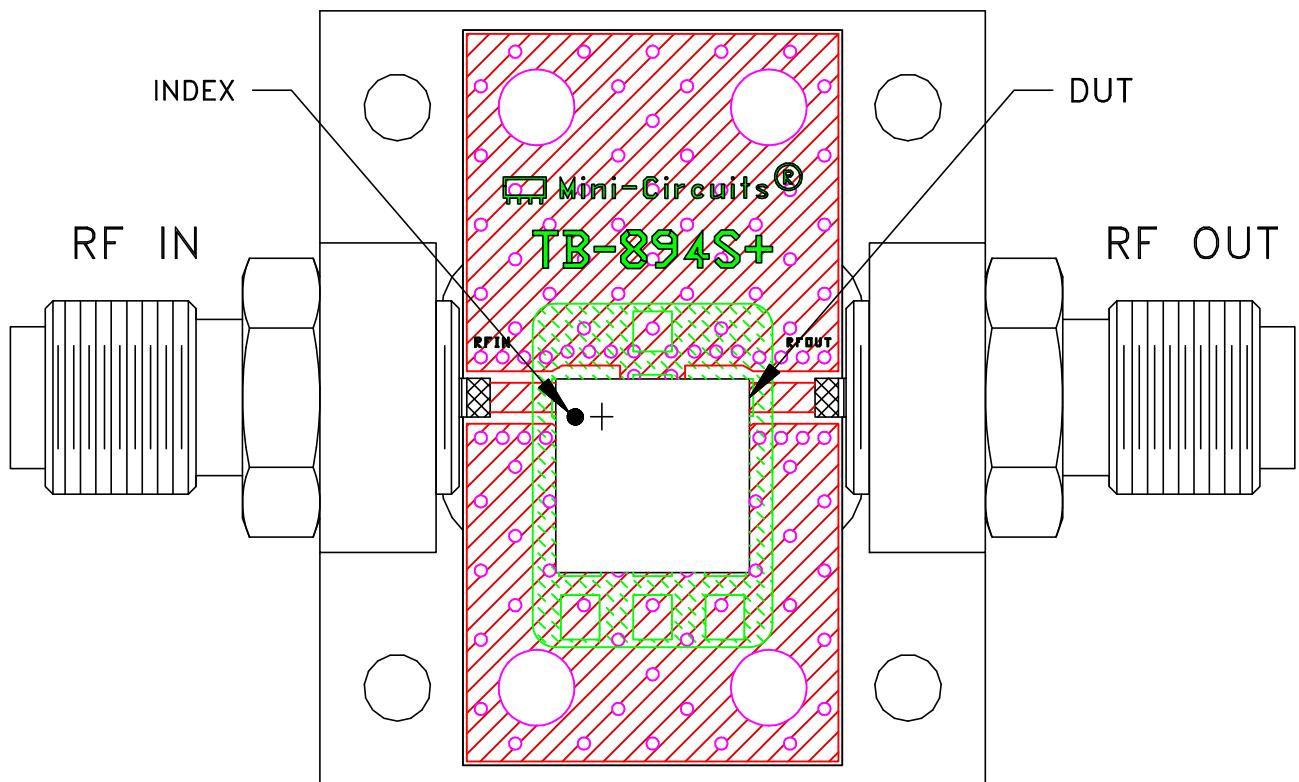
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PL, 06FL09, QA2224, ULP,
TB-894+, 50 Ohm

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|-------|------------|-------------|---------------|
| A | 15542 | 98-PL-484 | A |
| FILE: | 98PL484 | SCALE: 4:1 | SHEET: 1 OF 1 |

Evaluation Board and Circuit



NOTES:

1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS (R04350B) OR Equivalent
Dielectric Constant=3.48±.05, Thickness=.020 inch.

Schematic Diagram

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Environmental Specifications

ENV03T2

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 |
| HAST | 130°C, 85% RH, 96 hours | JESD22-A110 |
| 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 Pb-Free Process, 245°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, 20-2000 Hz, 4 times in each of three axes (total 12) | MIL-STD-883, Method 2007.3, Condition A |
| 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 + propylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |