

# Low Pass Filter

**50Ω DC to 70 MHz**

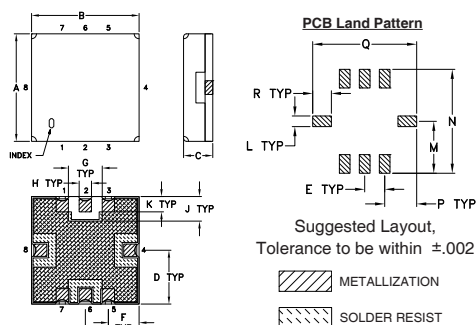
## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| RF Power Input                                                  | 0.5W Max       |
| Permanent damage may occur if any of these limits are exceeded. |                |

## Pin Connections

|        |                  |
|--------|------------------|
| RF IN  | 2                |
| RF OUT | 6                |
| GROUND | 1, 3, 4, 5, 7, 8 |

## Outline Drawing

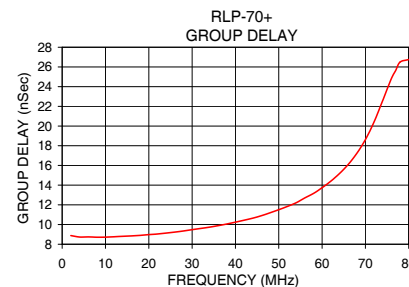
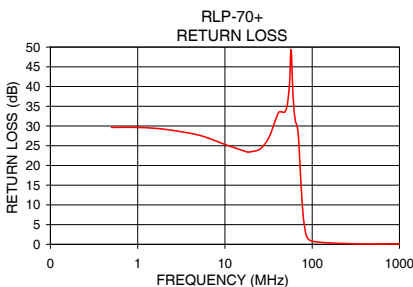
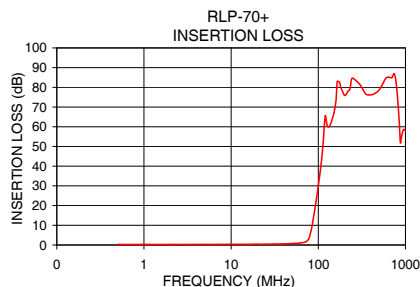
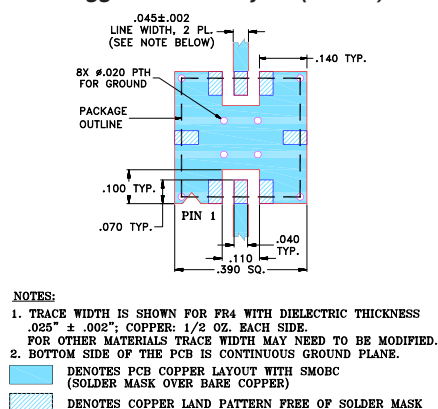


## Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E    | F    | G    | H    | J     |
|------|------|------|------|------|------|------|------|-------|
| .350 | .350 | .100 | .175 | .075 | .100 | .110 | .040 | .080  |
| 8.89 | 8.89 | 2.54 | 4.45 | 1.91 | 2.54 | 2.79 | 1.02 | 2.03  |
| K    | L    | M    | N    | P    | Q    | R    |      |       |
| .050 | .040 | .195 | .390 | .120 | .390 | .070 |      | wt.   |
| 1.27 | 1.02 | 4.95 | 9.91 | 3.05 | 9.91 | 1.78 |      | grams |
|      |      |      |      |      |      |      |      | 0.25  |

Note: Please refer to case style drawing for details

## Demo Board MCL P/N: TB-332 Suggested PCB Layout (PL-176)



### 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-Circuits' applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)



[www.minicircuits.com](http://www.minicircuits.com) P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

**RLP-70+**


Generic photo used for illustration purposes only  
CASE STYLE: GP731

### +RoHS Compliant

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

| Reel Size | Devices/Reel         |
|-----------|----------------------|
| 7"        | 10, 20, 50, 100, 200 |
| 13"       | 500, 1000            |

## Features

- high rejection
- sharp insertion loss roll off
- excellent VSWR, 1.1:1 typ. @ passband
- aqueous washable

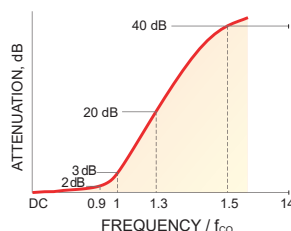
## Applications

- wireless communications
- receivers / transmitters

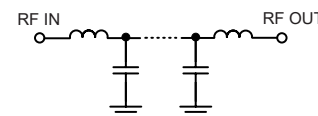
## Low Pass Filter Electrical Specifications (T<sub>AMB</sub> = 25°C)

| PASSBAND (MHz) | f <sub>co</sub> , MHz<br>Nom. | STOPBAND (MHz) |               | VSWR (:1)     |               |
|----------------|-------------------------------|----------------|---------------|---------------|---------------|
|                |                               | (Loss > 20dB)  | (Loss > 40dB) | Passband Typ. | Stopband Typ. |
| DC - 70        | 77                            | 100 - 115      | 115 - 1000    | 1.1           | 20            |

## Typical Frequency Response



## Functional Schematic



## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) |          | Return Loss (dB) | Frequency (MHz) | Group Delay (nSec) |
|-----------------|---------------------|----------|------------------|-----------------|--------------------|
|                 | $\bar{x}$           | $\sigma$ |                  |                 |                    |
| 0.5             | 0.26                | 0.01     | 29.63            | 2.0             | 8.88               |
| 30.0            | 0.46                | 0.00     | 26.01            | 4.0             | 8.73               |
| 50.0            | 0.73                | 0.01     | 34.05            | 10.0            | 8.72               |
| 70.0            | 1.44                | 0.03     | 26.46            | 16.0            | 8.84               |
| 74.0            | 1.96                | 0.07     | 16.38            | 20.0            | 8.98               |
| 77.0            | 2.86                | 0.13     | 10.21            | 26.0            | 9.24               |
| 80.0            | 4.64                | 0.23     | 5.93             | 30.0            | 9.48               |
| 84.0            | 8.66                | 0.34     | 2.87             | 36.0            | 9.88               |
| 86.0            | 11.14               | 0.36     | 2.12             | 40.0            | 10.24              |
| 92.0            | 19.15               | 0.38     | 1.17             | 46.0            | 10.90              |
| 100.0           | 29.98               | 0.41     | 0.81             | 50.0            | 11.51              |
| 110.0           | 44.80               | 0.63     | 0.64             | 56.0            | 12.70              |
| 115.0           | 54.65               | 1.12     | 0.58             | 60.0            | 13.75              |
| 200.0           | 75.92               | 2.39     | 0.26             | 66.0            | 16.08              |
| 400.0           | 76.19               | 1.55     | 0.12             | 70.0            | 18.62              |
| 600.0           | 84.79               | 4.15     | 0.09             | 76.0            | 24.82              |
| 800.0           | 78.30               | 3.25     | 0.13             | 77.0            | 25.65              |
| 1000.0          | 58.09               | 0.60     | 0.14             | 80.0            | 26.75              |

# Metal Shield Low Pass Filter

RLP-70+

## Typical Performance Data

| FREQ.<br>(MHz) | INSERTION LOSS<br>(dB) |          |          | INPUT RETURN LOSS<br>(dB) |          |          | OUTPUT RETURN LOSS<br>(dB) |          |          |
|----------------|------------------------|----------|----------|---------------------------|----------|----------|----------------------------|----------|----------|
|                | @ -40° C               | @ +25° C | @ +85° C | @ -40° C                  | @ +25° C | @ +85° C | @ -40° C                   | @ +25° C | @ +85° C |
| 0.5            | 0.22                   | 0.30     | 0.35     | 31.68                     | 29.24    | 27.86    | 31.84                      | 29.23    | 27.80    |
| 30             | 0.39                   | 0.47     | 0.52     | 28.36                     | 27.94    | 27.51    | 28.33                      | 28.24    | 28.04    |
| 40             | 0.49                   | 0.58     | 0.64     | 36.21                     | 35.92    | 35.65    | 41.43                      | 38.92    | 37.78    |
| 50             | 0.63                   | 0.74     | 0.81     | 35.56                     | 35.87    | 36.48    | 35.52                      | 35.37    | 35.49    |
| 70             | 1.22                   | 1.44     | 1.57     | 25.40                     | 24.95    | 24.62    | 29.79                      | 28.36    | 27.46    |
| 74             | 1.65                   | 1.93     | 2.11     | 18.19                     | 17.86    | 17.55    | 20.45                      | 19.72    | 19.12    |
| 77             | 2.44                   | 2.81     | 3.05     | 11.69                     | 11.48    | 11.28    | 12.28                      | 12.04    | 11.79    |
| 80             | 3.94                   | 4.41     | 4.72     | 6.69                      | 6.64     | 6.56     | 6.94                       | 6.89     | 6.80     |
| 84             | 7.67                   | 8.22     | 8.60     | 3.09                      | 3.18     | 3.22     | 3.22                       | 3.31     | 3.34     |
| 86             | 10.09                  | 10.65    | 11.04    | 2.19                      | 2.31     | 2.36     | 2.28                       | 2.40     | 2.46     |
| 90             | 15.37                  | 15.92    | 16.31    | 1.27                      | 1.40     | 1.47     | 1.32                       | 1.46     | 1.54     |
| 92             | 18.10                  | 18.63    | 19.01    | 1.07                      | 1.19     | 1.26     | 1.11                       | 1.24     | 1.32     |
| 100            | 29.01                  | 29.51    | 29.87    | 0.69                      | 0.79     | 0.85     | 0.71                       | 0.83     | 0.89     |
| 110            | 43.83                  | 44.38    | 44.79    | 0.52                      | 0.61     | 0.65     | 0.52                       | 0.63     | 0.69     |
| 115            | 53.80                  | 54.43    | 54.95    | 0.47                      | 0.55     | 0.59     | 0.47                       | 0.57     | 0.63     |
| 200            | 82.03                  | 83.81    | 81.65    | 0.18                      | 0.23     | 0.26     | 0.16                       | 0.24     | 0.29     |
| 300            | 77.33                  | 75.93    | 76.51    | 0.11                      | 0.15     | 0.19     | 0.07                       | 0.16     | 0.21     |
| 400            | 73.64                  | 73.65    | 74.00    | 0.08                      | 0.13     | 0.18     | 0.04                       | 0.14     | 0.20     |
| 500            | 76.66                  | 74.53    | 75.05    | 0.06                      | 0.13     | 0.18     | 0.02                       | 0.14     | 0.21     |
| 600            | 79.28                  | 78.60    | 79.34    | 0.06                      | 0.14     | 0.20     | 0.01                       | 0.15     | 0.23     |
| 700            | 82.91                  | 84.05    | 85.11    | 0.06                      | 0.15     | 0.21     | 0.01                       | 0.16     | 0.25     |
| 800            | 76.75                  | 76.43    | 74.67    | 0.07                      | 0.16     | 0.24     | 0.01                       | 0.18     | 0.28     |
| 900            | 53.42                  | 53.97    | 54.42    | 0.08                      | 0.18     | 0.26     | 0.04                       | 0.23     | 0.33     |
| 1000           | 57.84                  | 58.06    | 58.26    | 0.08                      | 0.19     | 0.28     | 0.01                       | 0.21     | 0.33     |
| 1200           | 43.46                  | 44.45    | 45.28    | 0.13                      | 0.25     | 0.35     | 0.03                       | 0.25     | 0.39     |
| 1400           | 63.06                  | 63.62    | 64.28    | 0.11                      | 0.25     | 0.36     | 0.02                       | 0.27     | 0.42     |
| 1500           | 67.13                  | 69.12    | 69.46    | 0.12                      | 0.27     | 0.38     | 0.03                       | 0.29     | 0.44     |
| 1600           | 68.82                  | 68.90    | 69.03    | 0.12                      | 0.28     | 0.39     | 0.02                       | 0.29     | 0.46     |
| 1800           | 75.33                  | 75.27    | 73.86    | 0.14                      | 0.30     | 0.42     | 0.03                       | 0.32     | 0.48     |
| 2000           | 76.78                  | 74.72    | 72.42    | 0.15                      | 0.32     | 0.44     | 0.03                       | 0.33     | 0.51     |
| 2200           | 77.27                  | 75.31    | 77.11    | 0.16                      | 0.33     | 0.45     | 0.03                       | 0.35     | 0.53     |
| 2400           | 58.88                  | 60.74    | 63.95    | 0.18                      | 0.35     | 0.47     | 0.04                       | 0.36     | 0.54     |
| 2500           | 60.92                  | 54.71    | 56.24    | 0.18                      | 0.36     | 0.47     | 0.04                       | 0.37     | 0.56     |
| 2600           | 56.79                  | 55.34    | 53.53    | 0.19                      | 0.36     | 0.49     | 0.03                       | 0.37     | 0.56     |
| 2800           | 53.36                  | 53.60    | 52.13    | 0.19                      | 0.36     | 0.48     | 0.03                       | 0.38     | 0.58     |
| 3000           | 53.68                  | 54.49    | 56.04    | 0.19                      | 0.37     | 0.48     | 0.02                       | 0.38     | 0.58     |
| 3200           | 44.37                  | 44.34    | 45.75    | 0.23                      | 0.43     | 0.53     | 0.03                       | 0.41     | 0.61     |
| 3400           | 48.38                  | 47.72    | 45.77    | 0.20                      | 0.39     | 0.52     | 0.03                       | 0.41     | 0.64     |
| 3500           | 50.54                  | 50.33    | 48.69    | 0.20                      | 0.39     | 0.51     | 0.05                       | 0.42     | 0.64     |
| 3600           | 43.68                  | 43.74    | 43.08    | 0.22                      | 0.42     | 0.55     | 0.04                       | 0.44     | 0.67     |
| 3800           | 44.88                  | 43.99    | 45.95    | 0.21                      | 0.44     | 0.58     | 0.02                       | 0.44     | 0.67     |
| 4000           | 39.67                  | 39.00    | 41.47    | 0.31                      | 0.57     | 0.71     | 0.08                       | 0.52     | 0.72     |
| 4200           | 40.37                  | 39.01    | 37.37    | 0.82                      | 1.98     | 2.28     | 0.11                       | 0.54     | 0.80     |
| 4400           | 35.36                  | 35.15    | 34.28    | 0.65                      | 0.78     | 0.93     | 0.11                       | 0.58     | 0.87     |
| 4500           | 34.31                  | 34.17    | 35.68    | 0.38                      | 0.62     | 0.82     | 0.19                       | 0.67     | 0.94     |
| 4600           | 32.73                  | 32.89    | 33.30    | 0.33                      | 0.57     | 0.77     | 0.23                       | 0.69     | 0.97     |
| 4800           | 28.68                  | 28.01    | 27.01    | 0.34                      | 0.64     | 0.89     | 0.20                       | 0.83     | 1.26     |
| 5000           | 24.87                  | 23.45    | 22.15    | 0.42                      | 0.82     | 1.13     | 0.48                       | 1.35     | 2.16     |
| 5200           | 19.76                  | 19.06    | 20.17    | 0.80                      | 1.27     | 1.46     | 1.82                       | 3.45     | 3.45     |
| 5400           | 19.02                  | 21.84    | 23.58    | 1.04                      | 1.24     | 1.47     | 2.22                       | 1.99     | 2.11     |
| 5500           | 18.65                  | 21.02    | 22.90    | 1.19                      | 1.39     | 1.59     | 2.10                       | 1.97     | 2.10     |
| 5600           | 18.36                  | 21.02    | 22.89    | 1.13                      | 1.40     | 1.63     | 1.48                       | 1.65     | 1.92     |
| 5800           | 18.94                  | 20.06    | 20.87    | 1.04                      | 1.87     | 2.41     | 0.79                       | 1.54     | 2.00     |
| 6000           | 15.94                  | 15.97    | 17.35    | 3.11                      | 7.20     | 8.15     | 1.20                       | 2.15     | 2.93     |

REV. X2

RLP-70+

100927

Page 1 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



Patent Pending

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



## Typical Performance Data

| FREQ.<br>(MHz) | GROUP DELAY<br>(nsec) |          |          |
|----------------|-----------------------|----------|----------|
|                | @ -40° C              | @ +25° C | @ +85° C |
| 0.5            | 8.87                  | 8.87     | 8.93     |
| 10             | 8.98                  | 8.99     | 9.02     |
| 12             | 9.02                  | 9.03     | 9.06     |
| 14             | 9.07                  | 9.09     | 9.12     |
| 16             | 9.14                  | 9.16     | 9.19     |
| 18             | 9.22                  | 9.24     | 9.27     |
| 20             | 9.31                  | 9.34     | 9.37     |
| 22             | 9.42                  | 9.45     | 9.48     |
| 24             | 9.55                  | 9.58     | 9.61     |
| 26             | 9.70                  | 9.73     | 9.77     |
| 28             | 9.89                  | 9.92     | 9.95     |
| 30             | 10.09                 | 10.13    | 10.16    |
| 32             | 10.37                 | 10.41    | 10.44    |
| 34             | 10.66                 | 10.71    | 10.75    |
| 36             | 11.12                 | 11.17    | 11.22    |
| 38             | 11.61                 | 11.66    | 11.72    |
| 40             | 12.31                 | 12.35    | 12.39    |
| 42             | 12.96                 | 12.98    | 13.00    |
| 44             | 13.24                 | 13.24    | 13.25    |
| 46             | 13.47                 | 13.45    | 13.45    |
| 48             | 13.55                 | 13.52    | 13.51    |
| 50             | 13.60                 | 13.56    | 13.55    |
| 52             | 13.61                 | 13.57    | 13.56    |
| 54             | 13.60                 | 13.56    | 13.54    |
| 56             | 13.57                 | 13.53    | 13.50    |
| 58             | 13.52                 | 13.47    | 13.44    |
| 60             | 13.45                 | 13.39    | 13.36    |
| 62             | 13.35                 | 13.29    | 13.25    |
| 64             | 13.25                 | 13.17    | 13.13    |
| 66             | 13.09                 | 13.01    | 12.95    |
| 70             | 12.59                 | 12.47    | 12.34    |
| 72             | 12.11                 | 11.97    | 11.80    |
| 74             | 10.78                 | 10.59    | 10.45    |
| 76             | 9.56                  | 9.36     | 9.26     |
| 80             | 7.99                  | 7.95     | 7.93     |
| 82             | 7.67                  | 7.64     | 7.64     |
| 84             | 7.42                  | 7.39     | 7.39     |
| 86             | 7.23                  | 7.18     | 7.19     |
| 90             | 6.84                  | 6.76     | 6.78     |
| 92             | 6.63                  | 6.58     | 6.57     |
| 94             | 6.42                  | 6.41     | 6.35     |
| 96             | 6.25                  | 6.19     | 6.17     |
| 100            | 5.85                  | 5.79     | 5.74     |
| 102            | 5.62                  | 5.61     | 5.50     |
| 104            | 5.42                  | 5.39     | 5.28     |
| 106            | 5.19                  | 5.17     | 5.04     |
| 110            | 4.67                  | 4.71     | 4.50     |
| 112            | 4.47                  | 4.46     | 4.23     |
| 114            | 4.20                  | 4.13     | 3.93     |
| 116            | 3.87                  | 3.73     | 3.60     |
| 120            | 3.30                  | 3.15     | 2.96     |
| 122            | 2.90                  | 2.76     | 2.52     |
| 124            | 2.47                  | 2.33     | 2.05     |
| 126            | 1.94                  | 1.70     | 1.47     |
| 130            | 1.32                  | 0.98     | 0.97     |

REV. X2

RLP-70+

100927

Page 2 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

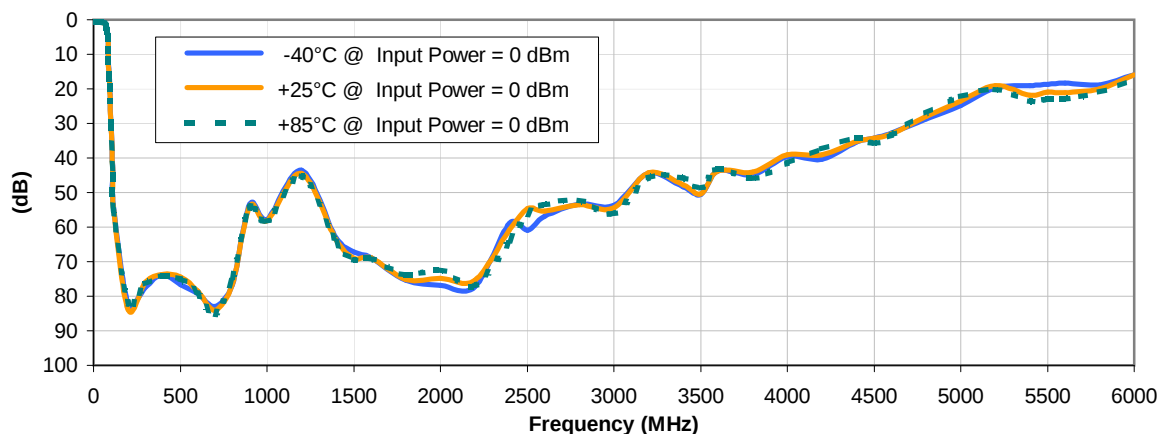


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

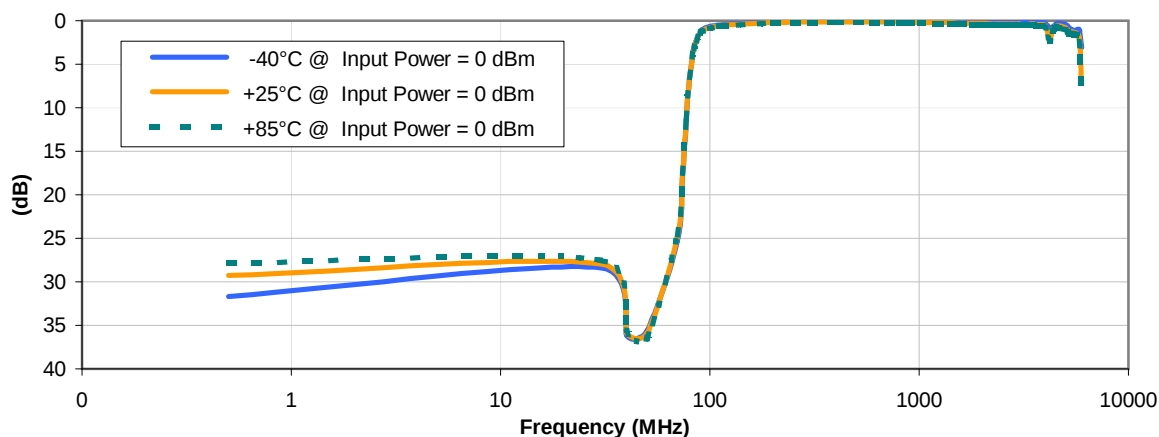


## Typical Performance Curves

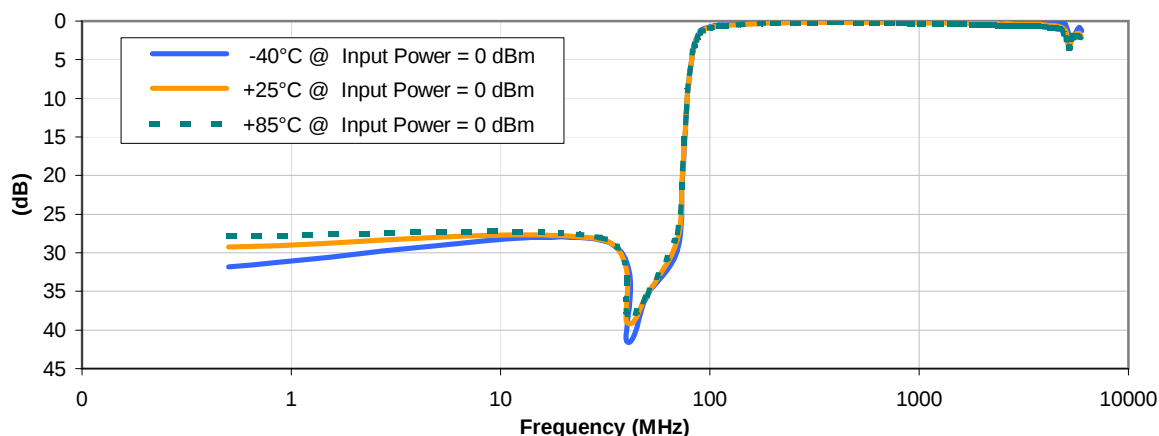
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



REV. X2  
RLP-70+  
100927  
Page 1 of 2



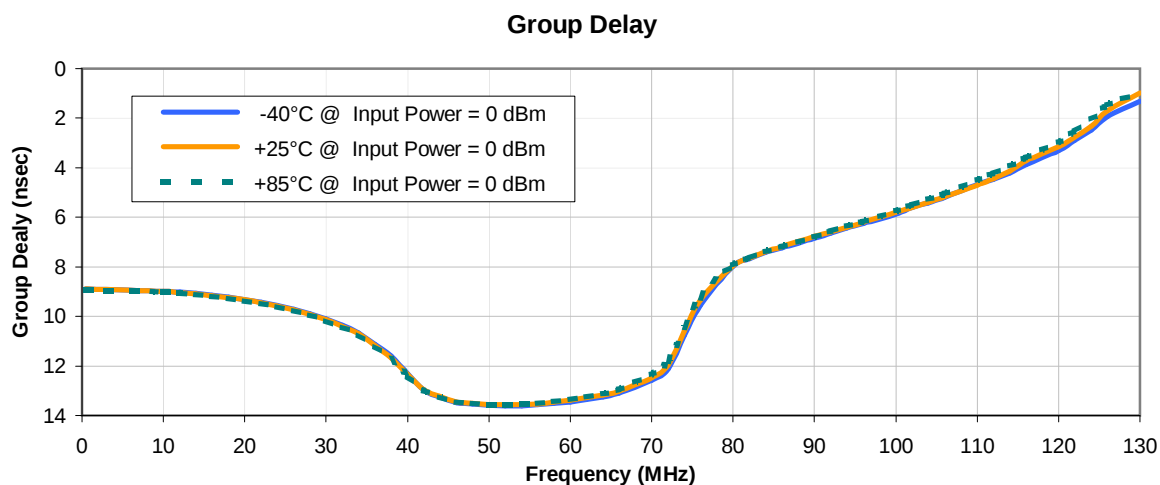
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



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



## Typical Performance Curves



REV. X2

RLP-70+

100927

Page 2 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



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



## Outline Dimensions

GP731



METALLIZATION  
 SOLDER RESIST

| CASE # | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | M              |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| GP731  | .350<br>(8.89) | .350<br>(8.89) | .100<br>(2.54) | .175<br>(4.45) | .075<br>(1.91) | .100<br>(2.54) | .110<br>(2.79) | .040<br>(1.02) | .080<br>(2.03) | .050<br>(1.27) | .040<br>(1.02) | .195<br>(4.95) |

| CASE # | N              | P              | Q              | R              | WT. GRAM           |
|--------|----------------|----------------|----------------|----------------|--------------------|
| GP731  | .390<br>(9.91) | .120<br>(3.05) | .390<br>(9.91) | .070<br>(1.78) | .4<br>+0.3<br>-0.0 |

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

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:

For RoHS Case Styles: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
 For RoHS-5 Case Styles: Tin-Lead plate.

**Mini-Circuits®**  
 ISO 9001 ISO 14001 CERTIFIED

ALL NEW  
[minicircuits.com](http://minicircuits.com)

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](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F78



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel<br>see note |
|-------------------|----------------------------|----------------------|------------------------------|
| 16                | 12                         | 7                    | 10                           |
|                   |                            |                      | 20                           |
|                   |                            |                      | 50                           |
|                   |                            |                      | 100                          |
|                   |                            |                      | 200                          |
|                   |                            | 13                   | 500, 1000                    |

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



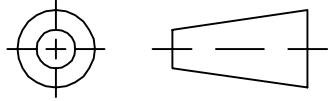
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

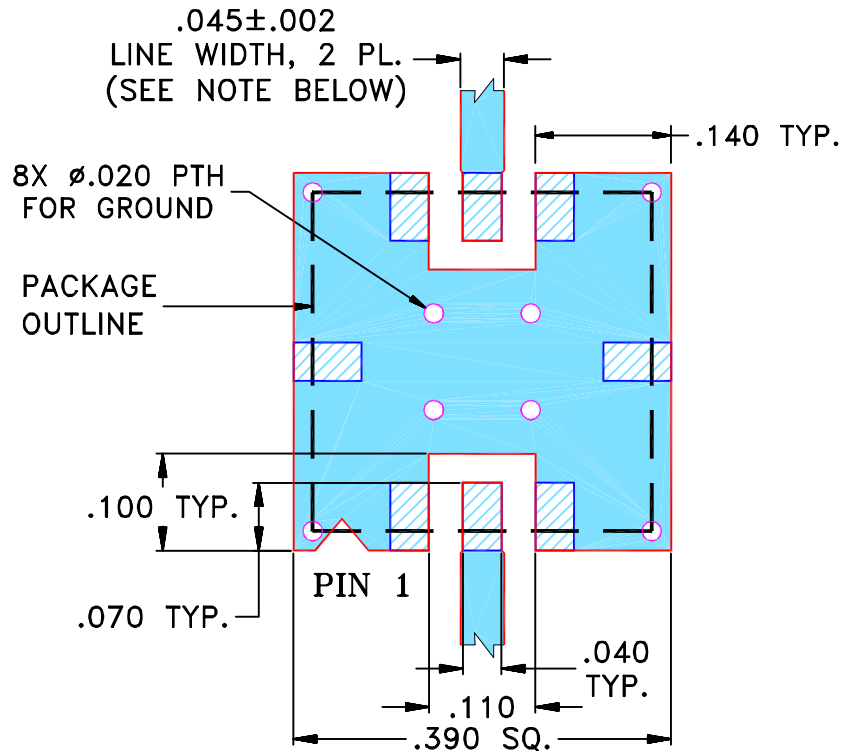
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION                          | DATE     | DR  | AUTH |
|-----|---------|--------------------------------------|----------|-----|------|
| OR  | R59289  | NEW RELEASE (FROM RAVON)             | 02/05    | DK  | HH   |
| A   | M101151 | ADDED "RBP" & CORRECTED PIN          | 10/10/05 | MMG | DJ   |
|     |         | CONNECTION TO DESCRIPTION OF PL-DWG. |          |     |      |
| B   | M102713 | UPDATED NOTES, ADDED "...WITH SMOBC" | 01/20/06 | GT  | IL   |

**SUGGESTED MOUNTING CONFIGURATION  
FOR GP731 CASE STYLE, "qf" PIN CONNECTION.**



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .025" ± .002"; 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 SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±

DRAWN

DK (RAVON)

10 FEB 05

CHECKED

RZ (RAVON)

10 FEB 05

APPROVED

HH (RAVON)

10 FEB 05



**Mini-Circuits®**

13 Neptune Avenue  
Brooklyn NY 11235

PL, qf, GP731, RBP, TB-332

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

ASHEETA1.DWG REV:A DATE:01/12/95

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-176

REV:

B

FILE: 98PL176

SCALE:

5:1

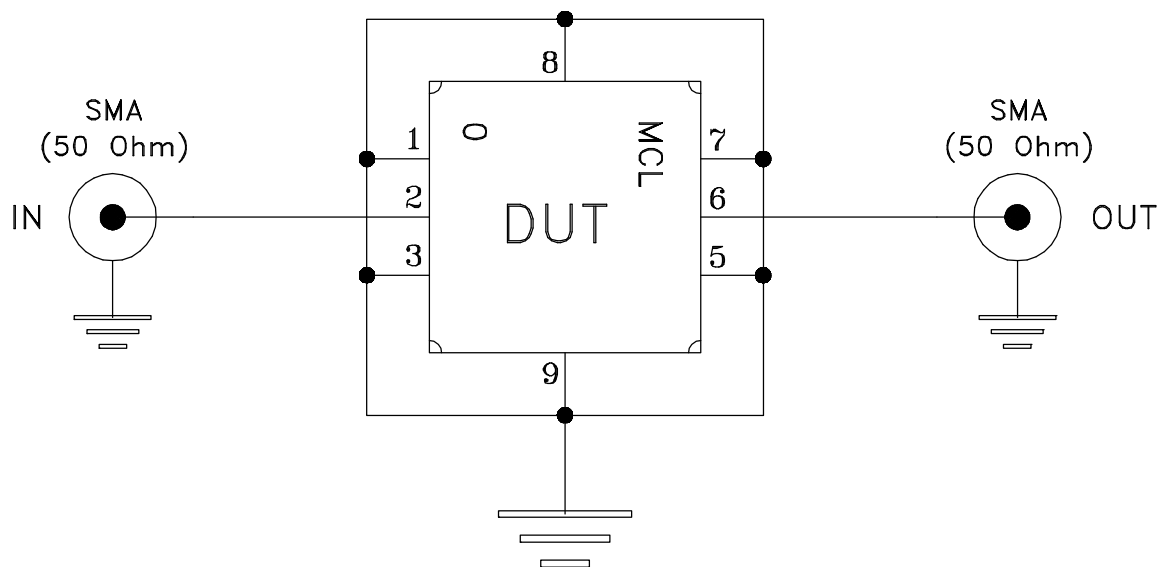
SHEET:

1 OF 1

# Evaluation Board and Circuit



TB-332



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: 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          | -40° to 85° C<br>Ambient Environment                                                                                                                            | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>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<br>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;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |