

# Surface Mount High Pass Filter

## THP-1050+

50Ω 1050 to 4000 MHz

### The Big Deal

- Small size (0.25" x 0.25" x 0.10")
- Good matching
- Low insertion loss



Generic photo used for illustration purposes only  
CASE STYLE: GQ1018

### Product Overview

THP-1050+ is a 50Ω high pass filter fabricated using SMT technology. This high pass filter covers from 1050-4000 MHz. This series of filters are constructed in a tiny package offering dual advantage of superior lumped element filter performance in a space saving SMT package. These models are suitable for mass production without losing flexibility of small volume requirements. It has repeatable performance across lots and consistent performance across temperature.

### Key Features

| Feature                           | Advantages                                                                                           |
|-----------------------------------|------------------------------------------------------------------------------------------------------|
| Low insertion loss                | Can be used in high performance applications.                                                        |
| Good rejection                    | This enables the filter to attenuate spurious signals and reject harmonics for broad frequency band. |
| Small size, 0.25" x 0.25" x 0.10" | The small surface mount package enables the THP-1050+ 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-Circuit's applicable established test performance criteria and measurement instructions.  
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## THP-1050+



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### Features

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- Small size (0.25" x 0.25" x 0.10")

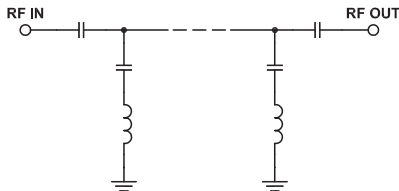
### Electrical Specifications at 25°C

| Parameter | F#             | Frequency (MHz) | Min.      | Typ. | Max. | Unit    |
|-----------|----------------|-----------------|-----------|------|------|---------|
| Stop Band | Rejection Loss | DC-F1           | DC-620    | 20   | 30   | - dB    |
|           | VSWR           | DC-F1           | DC-620    | -    | 20   | - :1    |
| Pass Band | Insertion Loss | F2-F3           | 1050-4000 | -    | 0.6  | 2.0 dB  |
|           | VSWR           | F2-F3           | 1050-4000 | -    | 1.2  | 1.67 :1 |

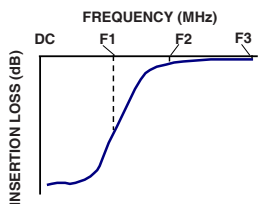
### Applications

- Radio navigation satellite
- Space research

### Functional Schematic



### Typical Frequency Response

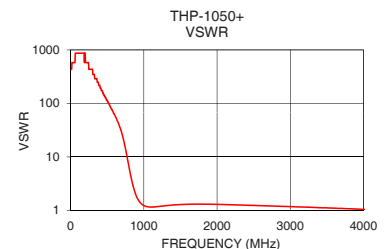
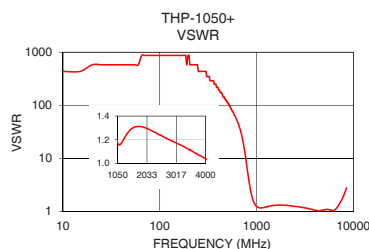
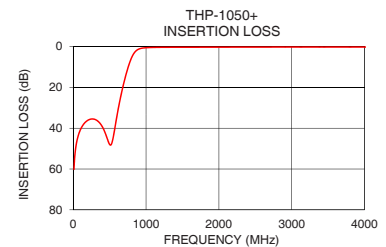
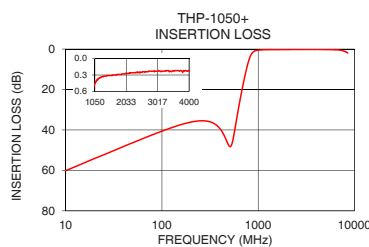


### Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) |
|-----------------|---------------------|-----------|
| 10              | 60.15               | 434.30    |
| 620             | 30.10               | 51.10     |
| 710             | 15.63               | 23.81     |
| 770             | 8.31                | 10.19     |
| 810             | 4.75                | 5.30      |
| 840             | 2.97                | 3.40      |
| 915             | 1.02                | 1.66      |
| 1050            | 0.46                | 1.17      |
| 1150            | 0.37                | 1.16      |
| 1300            | 0.33                | 1.22      |
| 1550            | 0.31                | 1.30      |
| 1620            | 0.30                | 1.31      |
| 1830            | 0.29                | 1.31      |
| 2000            | 0.28                | 1.30      |
| 2220            | 0.26                | 1.27      |
| 2500            | 0.25                | 1.24      |
| 2860            | 0.23                | 1.19      |
| 3100            | 0.23                | 1.16      |
| 3600            | 0.22                | 1.10      |
| 4000            | 0.23                | 1.04      |

#### +RoHS Compliant

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



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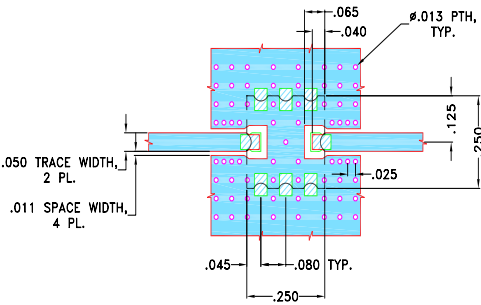
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Pad Connections

|        |                  |
|--------|------------------|
| INPUT  | 8                |
| OUTPUT | 4                |
| GROUND | 1, 2, 3, 5, 6, 7 |

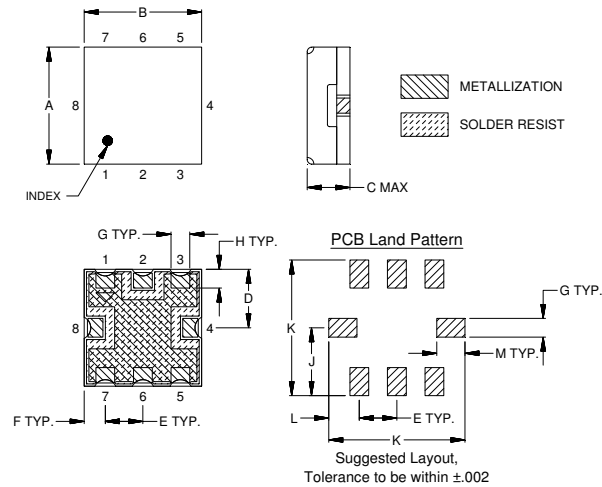
Demo Board MCL P/N: TB-680  
Suggested PCB Layout (PL-372)



- NOTES:
- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022"±.0015". COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH 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 SOLDERMASK

Outline Drawing



Outline Dimensions ( inch )

| A    | B    | C    | D    | E    | F    | G     |
|------|------|------|------|------|------|-------|
| .25  | .25  | .10  | .125 | .080 | .045 | .040  |
| 6.35 | 6.35 | 2.54 | 3.18 | 2.03 | 1.14 | 1.02  |
| H    | J    | K    | L    | M    |      | Wt.   |
| .040 | .145 | .290 | .065 | .060 |      | grams |
| 1.02 | 3.68 | 7.37 | 1.65 | 1.52 |      | .25   |

Note: Please refer to case style drawing for details

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## Typical Performance Data

| FREQ. | INSERTION LOSS |        |        | INPUT RETURN LOSS |        |        | OUTPUT RETURN LOSS |        |        |
|-------|----------------|--------|--------|-------------------|--------|--------|--------------------|--------|--------|
| (MHz) | (dB)           |        |        | (dB)              |        |        | (dB)               |        |        |
|       | @-40°C         | @+25°C | @+85°C | @-40°C            | @+25°C | @+85°C | @-40°C             | @+25°C | @+85°C |
| 10    | 60.20          | 60.15  | 60.06  | 0.04              | 0.04   | 0.04   | 0.04               | 0.04   | 0.04   |
| 25    | 52.22          | 52.25  | 52.21  | 0.03              | 0.03   | 0.03   | 0.03               | 0.03   | 0.03   |
| 50    | 46.33          | 46.28  | 46.26  | 0.03              | 0.03   | 0.03   | 0.02               | 0.03   | 0.03   |
| 70    | 43.55          | 43.45  | 43.43  | 0.02              | 0.03   | 0.03   | 0.02               | 0.02   | 0.02   |
| 100   | 40.71          | 40.62  | 40.56  | 0.02              | 0.02   | 0.02   | 0.02               | 0.02   | 0.02   |
| 180   | 36.75          | 36.63  | 36.53  | 0.01              | 0.03   | 0.03   | 0.01               | 0.02   | 0.03   |
| 250   | 35.50          | 35.49  | 35.42  | 0.02              | 0.04   | 0.04   | 0.02               | 0.04   | 0.04   |
| 325   | 36.07          | 36.19  | 36.22  | 0.04              | 0.06   | 0.07   | 0.03               | 0.05   | 0.07   |
| 395   | 38.85          | 39.04  | 39.16  | 0.06              | 0.08   | 0.10   | 0.05               | 0.08   | 0.09   |
| 415   | 40.19          | 40.38  | 40.52  | 0.07              | 0.10   | 0.11   | 0.06               | 0.09   | 0.11   |
| 480   | 46.27          | 46.46  | 46.65  | 0.11              | 0.15   | 0.16   | 0.10               | 0.14   | 0.16   |
| 500   | 47.81          | 47.99  | 48.18  | 0.12              | 0.16   | 0.18   | 0.12               | 0.15   | 0.18   |
| 510   | 48.17          | 48.27  | 48.38  | 0.13              | 0.17   | 0.19   | 0.13               | 0.16   | 0.19   |
| 550   | 44.36          | 44.25  | 44.16  | 0.17              | 0.22   | 0.24   | 0.17               | 0.21   | 0.23   |
| 570   | 40.40          | 40.22  | 40.09  | 0.20              | 0.25   | 0.27   | 0.19               | 0.23   | 0.26   |
| 620   | 30.27          | 30.10  | 29.96  | 0.27              | 0.34   | 0.37   | 0.26               | 0.32   | 0.36   |
| 675   | 20.89          | 20.74  | 20.61  | 0.43              | 0.51   | 0.55   | 0.41               | 0.49   | 0.54   |
| 725   | 13.77          | 13.62  | 13.51  | 0.75              | 0.87   | 0.95   | 0.74               | 0.85   | 0.93   |
| 750   | 10.65          | 10.53  | 10.42  | 1.09              | 1.25   | 1.34   | 1.07               | 1.22   | 1.32   |
| 775   | 7.89           | 7.80   | 7.71   | 1.66              | 1.86   | 1.99   | 1.64               | 1.83   | 1.96   |
| 810   | 4.78           | 4.75   | 4.70   | 3.04              | 3.32   | 3.52   | 3.02               | 3.28   | 3.50   |
| 840   | 2.93           | 2.97   | 2.94   | 4.94              | 5.26   | 5.56   | 4.90               | 5.22   | 5.53   |
| 855   | 2.27           | 2.34   | 2.33   | 6.12              | 6.46   | 6.81   | 6.08               | 6.42   | 6.78   |
| 885   | 1.40           | 1.49   | 1.51   | 8.84              | 9.19   | 9.65   | 8.79               | 9.15   | 9.61   |
| 930   | 0.77           | 0.88   | 0.92   | 13.27             | 13.61  | 14.24  | 13.23              | 13.58  | 14.21  |
| 1000  | 0.45           | 0.55   | 0.60   | 19.17             | 19.58  | 20.25  | 19.19              | 19.60  | 20.28  |
| 1015  | 0.42           | 0.51   | 0.56   | 20.08             | 20.51  | 21.12  | 20.10              | 20.53  | 21.16  |
| 1050  | 0.36           | 0.46   | 0.51   | 21.54             | 22.00  | 22.39  | 21.58              | 22.05  | 22.44  |
| 1100  | 0.31           | 0.40   | 0.46   | 22.35             | 22.77  | 22.75  | 22.29              | 22.76  | 22.71  |
| 1200  | 0.27           | 0.35   | 0.41   | 21.49             | 21.61  | 21.00  | 21.36              | 21.54  | 20.91  |
| 1260  | 0.25           | 0.34   | 0.39   | 20.70             | 20.58  | 19.83  | 20.60              | 20.51  | 19.74  |
| 1300  | 0.24           | 0.33   | 0.39   | 20.23             | 19.94  | 19.15  | 20.15              | 19.88  | 19.08  |
| 1400  | 0.22           | 0.32   | 0.38   | 19.24             | 18.71  | 17.91  | 19.28              | 18.74  | 17.92  |
| 1500  | 0.21           | 0.31   | 0.37   | 18.47             | 17.96  | 17.16  | 18.56              | 18.01  | 17.19  |
| 1600  | 0.20           | 0.30   | 0.37   | 18.26             | 17.55  | 16.77  | 18.40              | 17.64  | 16.84  |
| 1700  | 0.19           | 0.30   | 0.37   | 18.49             | 17.41  | 16.65  | 18.61              | 17.48  | 16.70  |
| 1800  | 0.18           | 0.29   | 0.36   | 18.42             | 17.41  | 16.71  | 18.52              | 17.46  | 16.75  |
| 1900  | 0.18           | 0.28   | 0.35   | 18.09             | 17.50  | 16.91  | 18.19              | 17.56  | 16.95  |
| 2000  | 0.17           | 0.28   | 0.34   | 18.28             | 17.73  | 17.23  | 18.37              | 17.76  | 17.25  |
| 2100  | 0.16           | 0.27   | 0.33   | 18.87             | 18.00  | 17.59  | 18.96              | 18.03  | 17.61  |
| 2200  | 0.15           | 0.26   | 0.33   | 19.20             | 18.36  | 18.05  | 19.26              | 18.36  | 18.04  |
| 2300  | 0.15           | 0.26   | 0.32   | 19.07             | 18.71  | 18.52  | 19.12              | 18.71  | 18.51  |
| 2400  | 0.15           | 0.25   | 0.31   | 19.07             | 19.11  | 19.06  | 19.10              | 19.09  | 19.05  |
| 2500  | 0.14           | 0.25   | 0.31   | 19.19             | 19.45  | 19.58  | 19.19              | 19.37  | 19.50  |
| 2600  | 0.14           | 0.24   | 0.30   | 19.32             | 19.98  | 20.29  | 19.25              | 19.84  | 20.13  |
| 2700  | 0.14           | 0.24   | 0.30   | 19.28             | 20.43  | 20.91  | 19.18              | 20.26  | 20.74  |
| 2800  | 0.13           | 0.23   | 0.30   | 19.40             | 20.89  | 21.52  | 19.29              | 20.73  | 21.36  |
| 2900  | 0.13           | 0.23   | 0.30   | 19.78             | 21.39  | 22.19  | 19.66              | 21.25  | 22.04  |
| 3000  | 0.12           | 0.23   | 0.30   | 20.17             | 21.87  | 22.81  | 20.01              | 21.70  | 22.68  |
| 3100  | 0.12           | 0.23   | 0.30   | 20.79             | 22.52  | 23.47  | 20.65              | 22.36  | 23.36  |
| 3200  | 0.11           | 0.23   | 0.31   | 21.52             | 23.07  | 24.03  | 21.33              | 22.89  | 23.92  |
| 3300  | 0.09           | 0.22   | 0.30   | 22.59             | 23.78  | 24.60  | 22.43              | 23.64  | 24.59  |
| 3400  | 0.10           | 0.23   | 0.31   | 24.00             | 24.76  | 25.20  | 23.87              | 24.68  | 25.32  |
| 3450  | 0.11           | 0.24   | 0.32   | 24.90             | 25.40  | 25.83  | 24.59              | 25.11  | 25.68  |
| 3500  | 0.08           | 0.22   | 0.31   | 25.51             | 25.62  | 25.81  | 24.95              | 25.24  | 25.65  |
| 3600  | 0.08           | 0.22   | 0.31   | 27.25             | 26.79  | 26.52  | 26.40              | 26.20  | 26.25  |
| 3700  | 0.08           | 0.23   | 0.33   | 29.40             | 27.84  | 27.33  | 28.33              | 27.17  | 27.05  |
| 3800  | 0.09           | 0.25   | 0.32   | 33.78             | 30.05  | 28.25  | 32.06              | 29.12  | 27.91  |
| 3900  | 0.06           | 0.22   | 0.32   | 49.96             | 31.60  | 28.83  | 38.78              | 30.48  | 28.57  |
| 4000  | 0.08           | 0.23   | 0.33   | 39.64             | 34.61  | 29.99  | 39.98              | 33.15  | 29.83  |

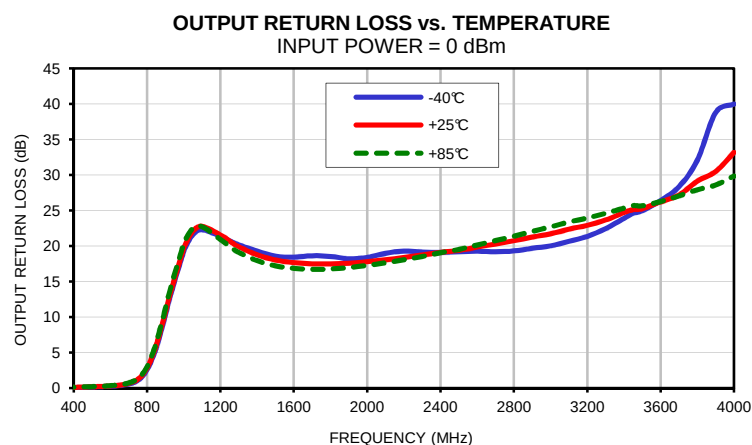
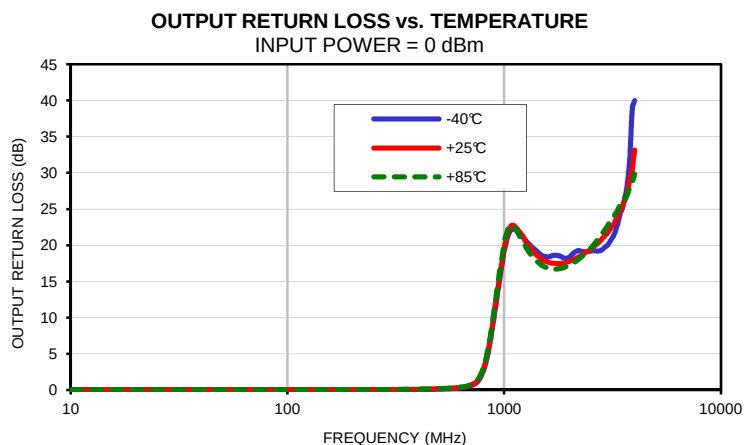
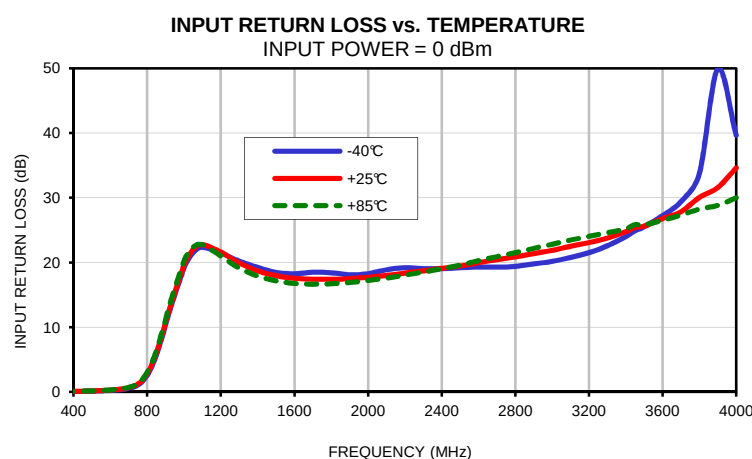
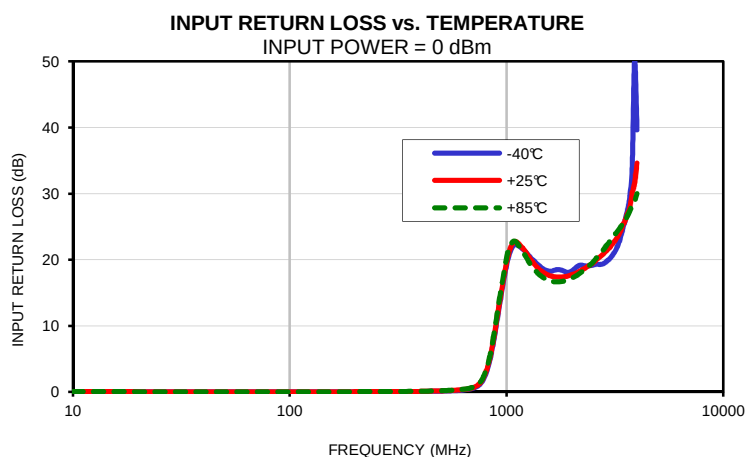
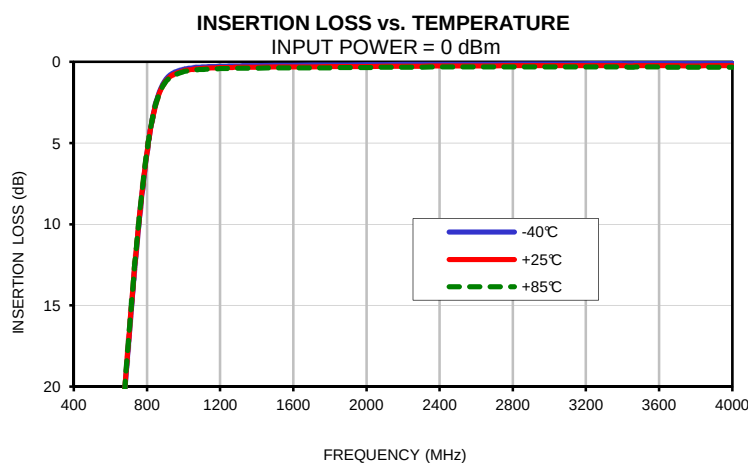
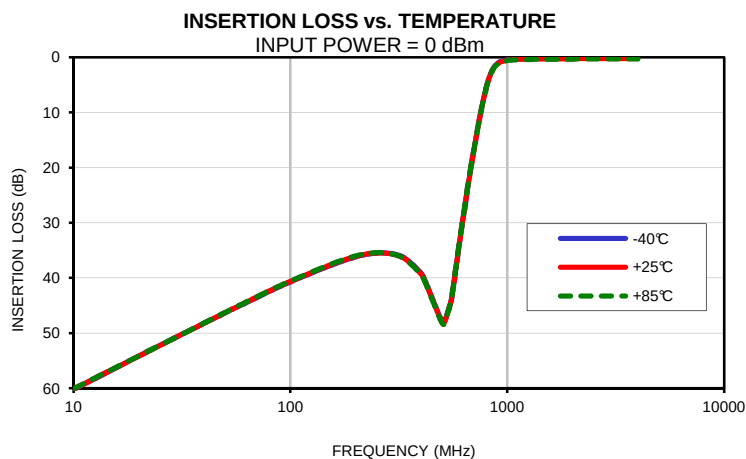
## Typical Performance Data

| FREQ. | GROUP DELAY |        |        |
|-------|-------------|--------|--------|
| (MHz) | (nsec)      |        |        |
|       | @-40°C      | @+25°C | @+85°C |
| 1050  | 0.73        | 0.71   | 0.70   |
| 1055  | 0.71        | 0.70   | 0.69   |
| 1060  | 0.70        | 0.69   | 0.68   |
| 1065  | 0.69        | 0.67   | 0.67   |
| 1070  | 0.68        | 0.66   | 0.65   |
| 1075  | 0.67        | 0.65   | 0.64   |
| 1080  | 0.66        | 0.64   | 0.63   |
| 1085  | 0.65        | 0.63   | 0.62   |
| 1090  | 0.64        | 0.62   | 0.61   |
| 1095  | 0.63        | 0.61   | 0.61   |
| 1100  | 0.62        | 0.60   | 0.59   |
| 1110  | 0.60        | 0.58   | 0.58   |
| 1115  | 0.59        | 0.58   | 0.57   |
| 1120  | 0.58        | 0.57   | 0.56   |
| 1125  | 0.57        | 0.56   | 0.55   |
| 1130  | 0.56        | 0.55   | 0.54   |
| 1140  | 0.55        | 0.53   | 0.53   |
| 1145  | 0.54        | 0.52   | 0.52   |
| 1150  | 0.53        | 0.51   | 0.51   |
| 1160  | 0.52        | 0.50   | 0.50   |
| 1170  | 0.51        | 0.49   | 0.49   |
| 1180  | 0.50        | 0.48   | 0.48   |
| 1190  | 0.49        | 0.47   | 0.47   |
| 1200  | 0.48        | 0.46   | 0.46   |
| 1210  | 0.47        | 0.45   | 0.45   |
| 1220  | 0.46        | 0.44   | 0.44   |
| 1230  | 0.45        | 0.43   | 0.43   |
| 1240  | 0.44        | 0.42   | 0.42   |
| 1250  | 0.43        | 0.41   | 0.41   |
| 1260  | 0.42        | 0.41   | 0.40   |
| 1270  | 0.41        | 0.40   | 0.39   |
| 1280  | 0.40        | 0.39   | 0.38   |
| 1290  | 0.39        | 0.38   | 0.38   |
| 1320  | 0.37        | 0.36   | 0.35   |
| 1330  | 0.36        | 0.35   | 0.35   |
| 1350  | 0.35        | 0.34   | 0.33   |
| 1370  | 0.34        | 0.33   | 0.32   |
| 1380  | 0.33        | 0.32   | 0.32   |
| 1410  | 0.32        | 0.31   | 0.30   |
| 1450  | 0.30        | 0.29   | 0.28   |
| 1460  | 0.29        | 0.28   | 0.28   |
| 1500  | 0.28        | 0.27   | 0.26   |
| 1510  | 0.27        | 0.26   | 0.26   |
| 1560  | 0.26        | 0.25   | 0.24   |
| 1570  | 0.25        | 0.24   | 0.24   |
| 1610  | 0.24        | 0.23   | 0.22   |
| 1670  | 0.23        | 0.22   | 0.21   |
| 1770  | 0.21        | 0.20   | 0.19   |
| 1880  | 0.19        | 0.18   | 0.17   |
| 1890  | 0.18        | 0.17   | 0.17   |
| 2040  | 0.17        | 0.15   | 0.15   |
| 2050  | 0.16        | 0.15   | 0.15   |
| 2280  | 0.15        | 0.13   | 0.13   |
| 2290  | 0.14        | 0.13   | 0.13   |
| 2590  | 0.13        | 0.12   | 0.11   |
| 2600  | 0.12        | 0.11   | 0.11   |
| 2620  | 0.13        | 0.11   | 0.11   |
| 2840  | 0.12        | 0.11   | 0.10   |
| 2850  | 0.11        | 0.11   | 0.10   |
| 4000  | 0.10        | 0.08   | 0.08   |

# High Pass Filter

THP-1050+

## Typical Performance Curves



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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)



IF/RF MICROWAVE COMPONENTS

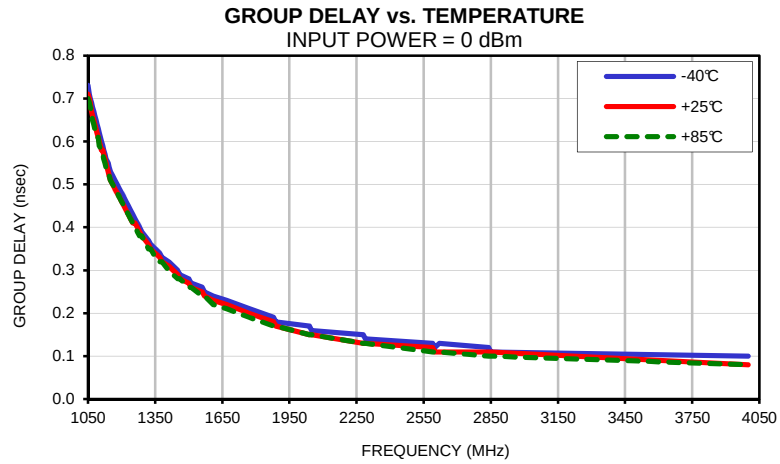


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# High Pass Filter

## THP-1050+

### Typical Performance Curves



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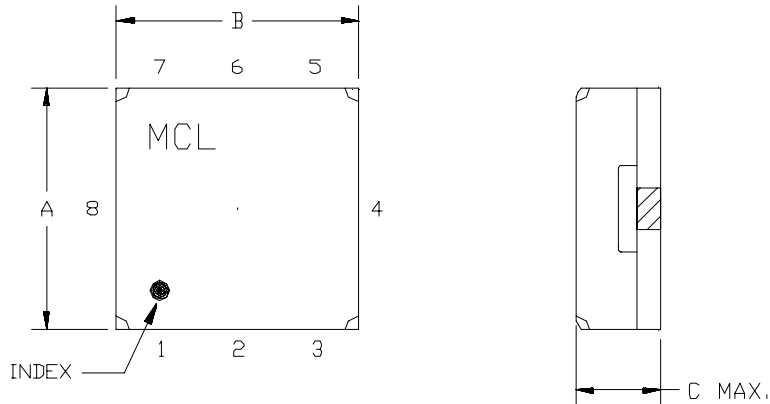
IF/RF MICROWAVE COMPONENTS



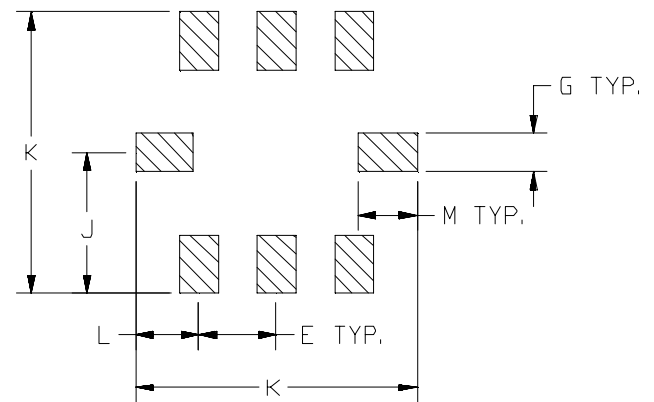
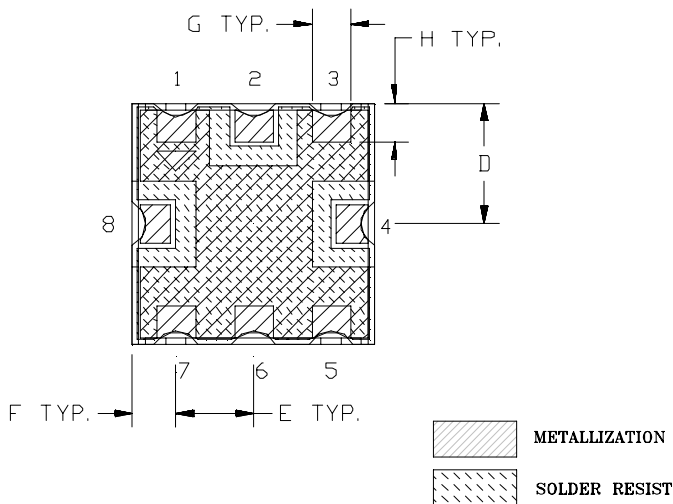
REV. OR  
THP-1050+  
130408  
Page 2 of 2

## Outline Dimensions

GQ1018



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

| CASE # | A             | B             | C             | D              | E              | F              | G              | H              | J              | K              | L              | M              | WT. GRAMS |
|--------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------|
| GQ1018 | .25<br>(6.35) | .25<br>(6.35) | .10<br>(2.54) | .125<br>(3.18) | .080<br>(2.03) | .045<br>(1.14) | .040<br>(1.02) | .040<br>(1.02) | .145<br>(3.68) | .290<br>(7.37) | .065<br>(1.65) | .060<br>(1.52) | .25       |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm 0.01$ "; 3 Pl.  $\pm 0.005$ "

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:  
For RoHS Case Styles: 3-5  $\mu$  inch Gold over 120-240  $\mu$  inch Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.



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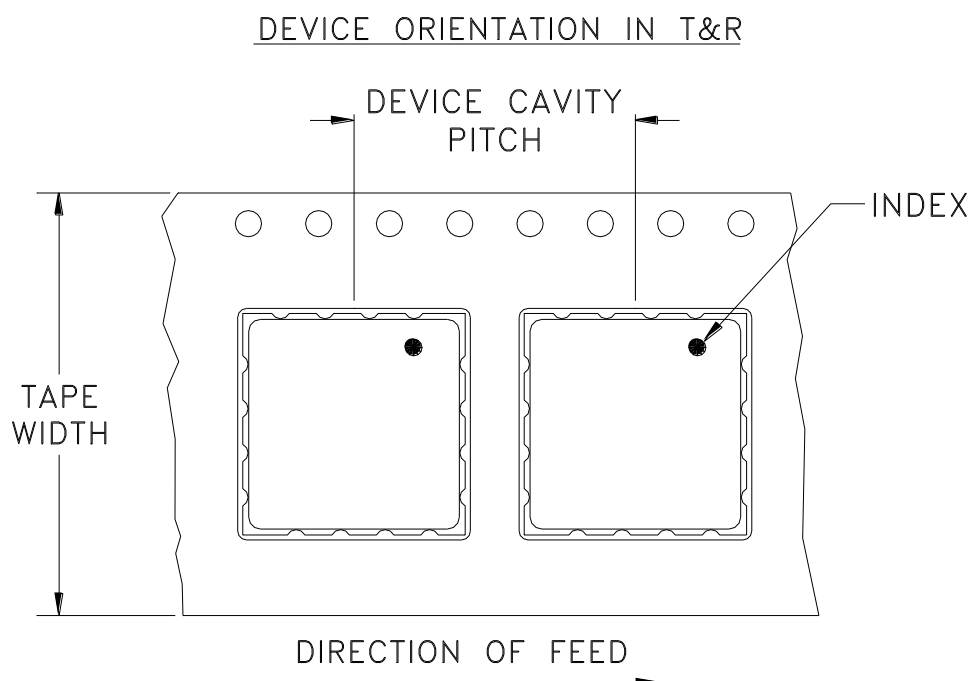


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RF/IF MICROWAVE COMPONENTS



# 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                    |

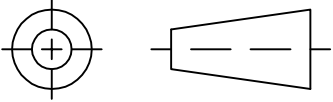
Note: Please consult individual model data sheet to determine device per reel availability.

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.

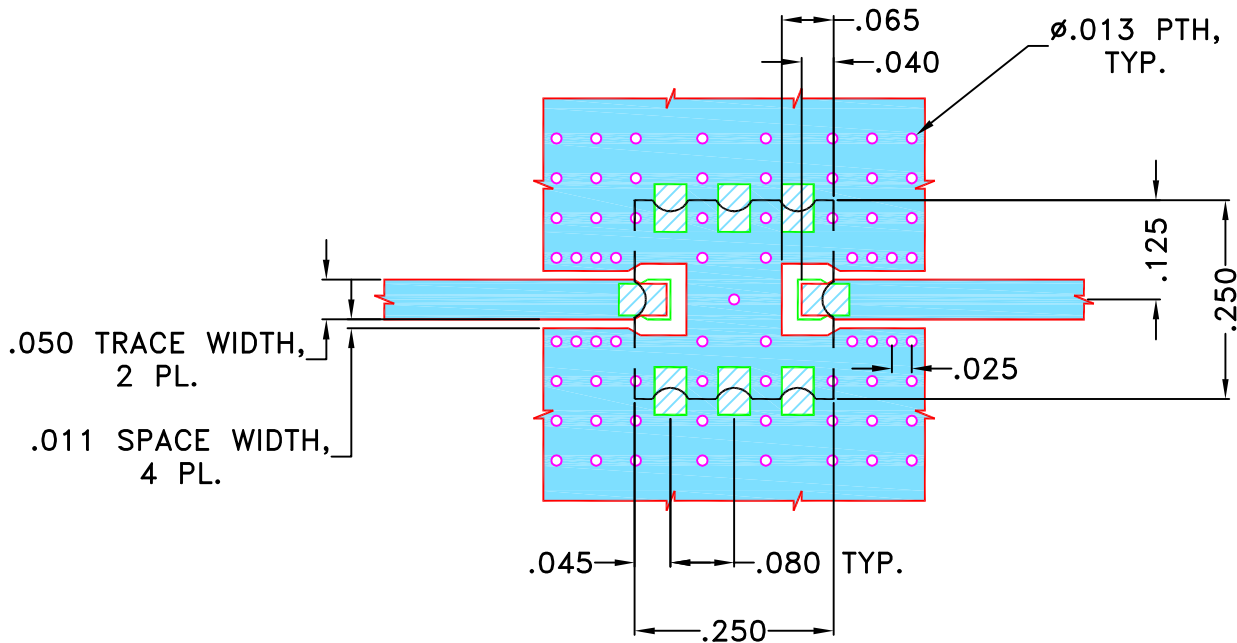
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| THIRD ANGLE PROJECTION                                                            |  | REVISIONS |         |             |        |     |      |
|-----------------------------------------------------------------------------------|--|-----------|---------|-------------|--------|-----|------|
|  |  | REV       | ECN No. | DESCRIPTION | DATE   | DR  | AUTH |
|                                                                                   |  | OR        | M135450 | NEW RELEASE | JUN 12 | DDR | KG   |
|                                                                                   |  |           |         |             |        |     |      |
|                                                                                   |  |           |         |             |        |     |      |

SUGGESTED MOUNTING CONFIGURATION FOR  
GQ1018 CASE STYLE "08FL04" PIN CODE



NOTES:

- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022"±.0015". COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



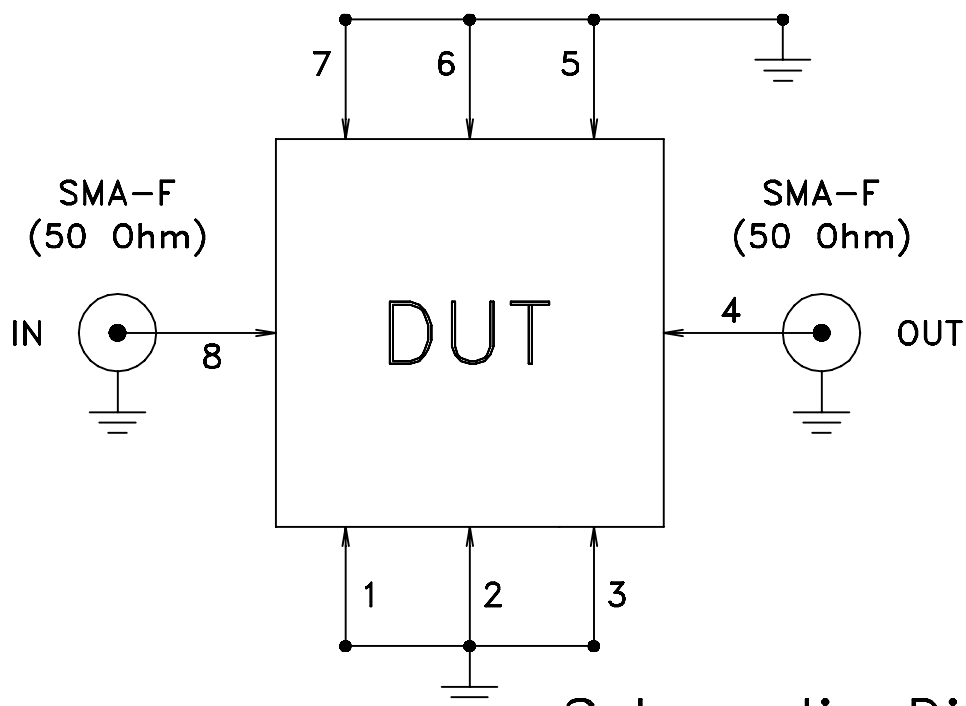
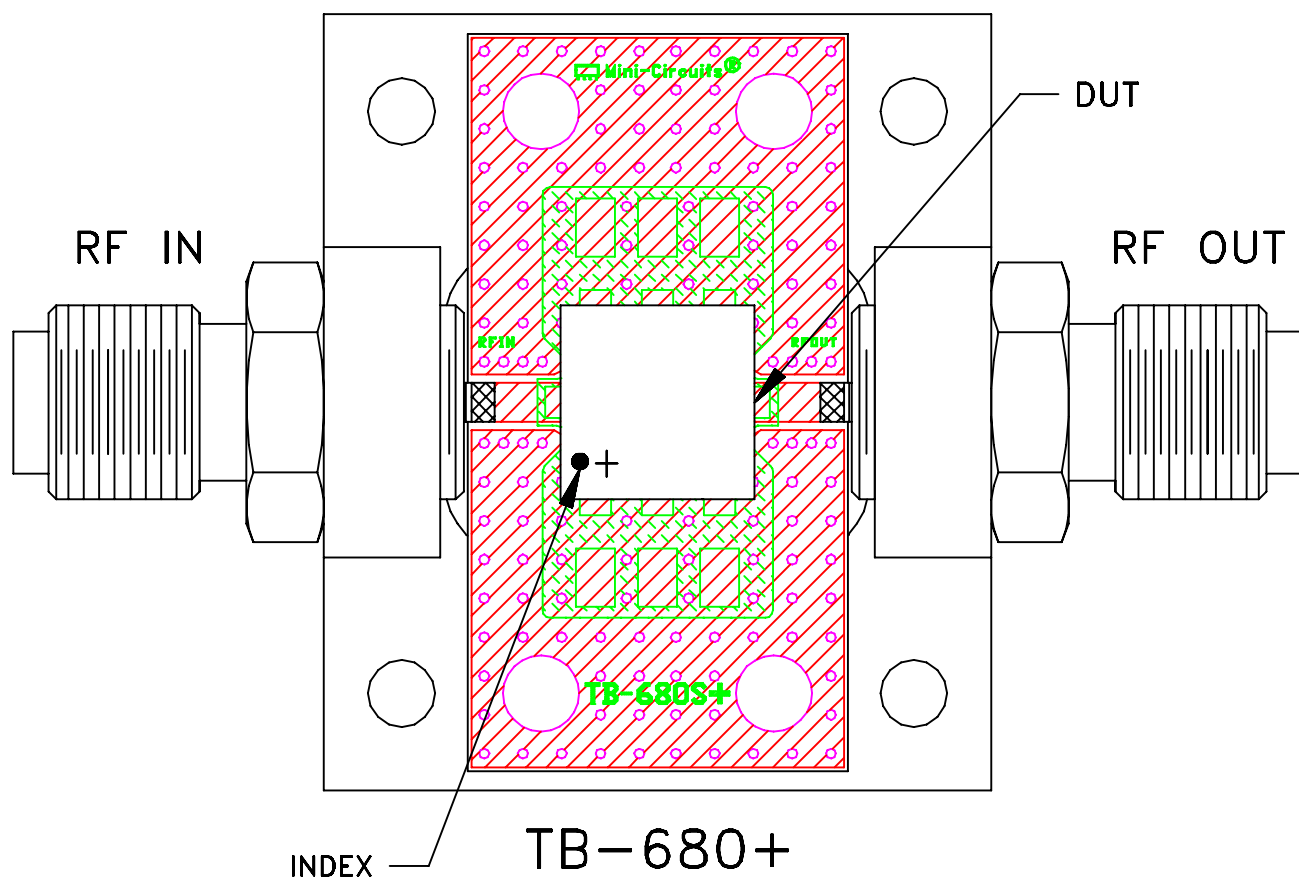
DENOTES PCB COPPER LAYOUT WITH SMOBC  
(SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |          |     |           |  |                                                                                                   |  |                     |  |                          |  |            |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|-----|-----------|--|---------------------------------------------------------------------------------------------------|--|---------------------|--|--------------------------|--|------------|--|
| UNLESS OTHERWISE SPECIFIED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | INITIALS |     | DATE      |  | <div><div></div><div>Mini-Circuits®</div><div>13 Neptune Avenue<br/>Brooklyn NY 11235</div></div> |  |                     |  |                          |  |            |  |
| <div>DIMENSIONS ARE IN INCHES</div> <div>TOLERANCES ON:</div> <div>2 PL DECIMALS ±</div> <div>3 PL DECIMALS ± .005"</div> <div>ANGLES ±</div> <div>FRACTIONS ±</div> <div></div>                                                                                                                                                                                                                                                                                              |  | DRAWN    | DDR | 07 JUN 12 |  |                                                                                                   |  |                     |  |                          |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | CHECKED  | MD  | 07 JUN 12 |  |                                                                                                   |  |                     |  |                          |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | APPROVED | GM  | 07 JUN 12 |  |                                                                                                   |  |                     |  |                          |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |          |     |           |  | <div>PL, 08FL04, GQ1018, THP,</div> <div>TB-680+, 50 Ohm</div>                                    |  |                     |  |                          |  |            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |          |     |           |  |                                                                                                   |  |                     |  |                          |  |            |  |
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| <div>ASHEETA1.DWG REV:A DATE:01/12/95</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |          |     |           |  | FILE:<br>98PL372                                                                                  |  | SCALE:<br>4:1       |  | SHEET:<br>1 OF 1         |  |            |  |

# Evaluation Board and Circuit



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: OAK-602 OR Equivalent  
Dielectric Constant=2.50±.04, Thickness=.022 inch.

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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                                                                              |