

# Surface Mount Low Pass Filter

## SCLF-27+

50Ω      DC to 27 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.

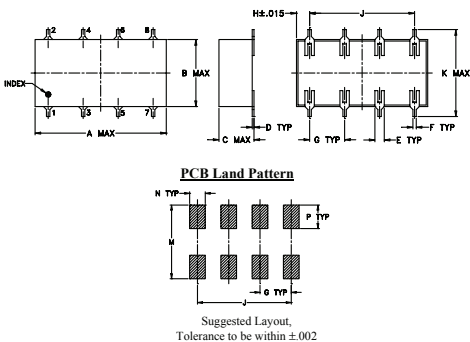
## Pin Connections

| INPUT | 1 |
|-------|---|
|-------|---|

OUTPUT 8

GROUND 2.3.4.5.6.7

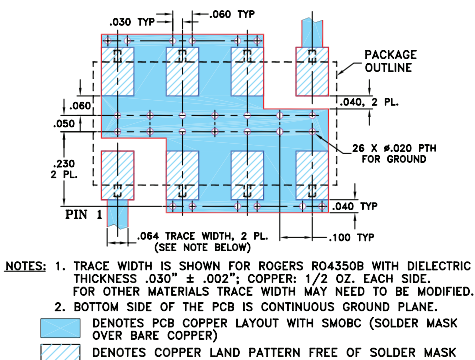
## Outline Drawing



### Outline Dimensions (inch)

|       |       |       |       |      |      |       |
|-------|-------|-------|-------|------|------|-------|
| A     | B     | C     | D     | E    | F    | G     |
| 0.75  | 0.38  | 0.28  | 0.01  | 0.05 | 0.02 | 0.2   |
| 19.05 | 9.65  | 7.11  | 0.25  | 1.27 | 0.51 | 5.08  |
| H     | J     | K     | M     | N    | P    | wt    |
| 0.075 | 0.6   | 0.45  | 0.47  | 0.1  | 0.15 | grams |
| 1.91  | 15.24 | 11.43 | 11.94 | 2.54 | 3.81 | 1.60  |

**Demo Board MCL P/N: TB-187+**  
**Suggested PCB Layout (PL-049)**



## 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.

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/MC\\_Store/terms.iso](http://www.minicircuits.com/MC_Store/terms.iso)

## Features

- wide selection of cut-off frequencies
- excellent rejection
- custom models available

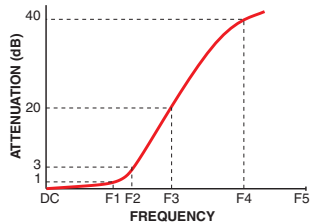
## Applications

- defense communications
- receivers/transmitters
- harmonic rejection of VCOs

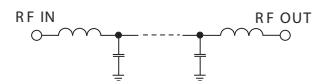
## Electrical Specifications

| Parameter | F#             | Frequency (MHz) | Min.   | Typ. | Max. | Unit |    |
|-----------|----------------|-----------------|--------|------|------|------|----|
| Pass Band | Insertion Loss | DC-F1           | DC-27  | —    | —    | 1.0  | dB |
|           | Freq. Cut-Off  | F2              | 30     | —    | 3.0  | —    | dB |
|           | VSWR           | DC-F1           | DC-27  | —    | 1.3  | —    | :1 |
| Stop Band | Rejection Loss | F3-F4           | 36-41  | 20   | —    | —    | dB |
|           |                | F4-F5           | 41-480 | 40   | —    | —    | dB |
|           | VSWR           | F3-F5           | 36-480 | —    | 18   | —    | :1 |

## Typical Frequency Response



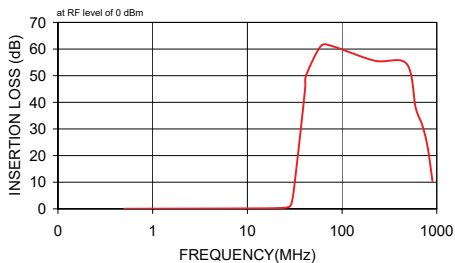
### Electrical Schematic



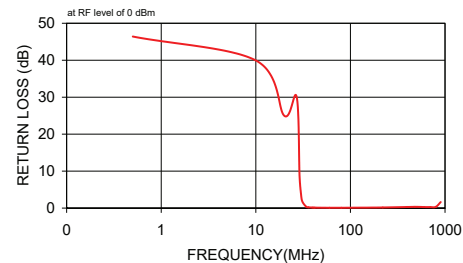
## Typical Performance Data

| Frequency<br>(MHz) | Insertion Loss<br>(dB) |          | Return Loss<br>(dB) |
|--------------------|------------------------|----------|---------------------|
|                    | $\bar{x}$              | $\sigma$ |                     |
| 0.50               | 0.03                   | 0.00     | 46.41               |
| 10.00              | 0.15                   | 0.00     | 39.95               |
| 20.00              | 0.27                   | 0.01     | 24.98               |
| 27.00              | 0.62                   | 0.02     | 30.13               |
| 29.00              | 1.75                   | 0.09     | 8.55                |
| 30.00              | 3.87                   | 0.16     | 3.96                |
| 31.00              | 7.25                   | 0.19     | 1.80                |
| 34.20              | 20.29                  | 0.19     | 0.34                |
| 36.00              | 27.33                  | 0.19     | 0.22                |
| 39.50              | 40.62                  | 0.28     | 0.14                |
| 40.90              | 46.01                  | 0.35     | 0.13                |
| 42.00              | 50.35                  | 0.42     | 0.12                |
| 60.00              | 61.20                  | 0.53     | 0.09                |
| 80.00              | 61.03                  | 0.47     | 0.09                |
| 220.00             | 55.63                  | 0.51     | 0.17                |
| 480.00             | 54.46                  | 0.77     | 0.33                |
| 600.00             | 37.81                  | 0.43     | 0.28                |
| 700.00             | 31.66                  | 0.36     | 0.27                |
| 800.00             | 23.28                  | 0.43     | 0.34                |
| 900.00             | 10.48                  | 0.79     | 1.63                |

### INSERTION LOSS



## RETURN LOSS



Generic photo used for illustration purposes only

CASE STYLE:YY161

**+RoHS Compliant**

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


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200813

# Surface Mount Low Pass Filter

SCLF-27+

## 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 |
| 0.1            | 0.02                   | 0.03     | 0.03     | 50.88                     | 48.93    | 47.26    | 51.47                      | 49.41    | 47.65    |
| 0.6            | 0.02                   | 0.03     | 0.04     | 43.60                     | 43.31    | 42.86    | 43.65                      | 43.40    | 43.24    |
| 10.1           | 0.09                   | 0.10     | 0.12     | 29.26                     | 29.61    | 29.96    | 29.95                      | 30.40    | 30.95    |
| 20.1           | 0.19                   | 0.21     | 0.23     | 29.34                     | 30.00    | 30.72    | 28.99                      | 29.61    | 30.20    |
| 27.1           | 0.42                   | 0.46     | 0.52     | 26.74                     | 27.88    | 29.53    | 25.01                      | 25.36    | 25.69    |
| 29.1           | 1.07                   | 1.18     | 1.33     | 11.19                     | 10.80    | 10.36    | 10.85                      | 10.43    | 9.97     |
| 30.1           | 2.62                   | 2.80     | 3.05     | 5.30                      | 5.14     | 4.97     | 5.16                       | 4.98     | 4.79     |
| 31.1           | 5.58                   | 5.81     | 6.11     | 2.35                      | 2.31     | 2.28     | 2.27                       | 2.22     | 2.18     |
| 34.1           | 17.60                  | 17.80    | 18.07    | 0.37                      | 0.39     | 0.42     | 0.35                       | 0.36     | 0.39     |
| 36.1           | 25.39                  | 25.56    | 25.80    | 0.21                      | 0.22     | 0.25     | 0.19                       | 0.21     | 0.23     |
| 39.6           | 38.31                  | 38.48    | 38.71    | 0.12                      | 0.13     | 0.15     | 0.11                       | 0.13     | 0.14     |
| 42.1           | 47.49                  | 47.64    | 47.88    | 0.10                      | 0.11     | 0.12     | 0.09                       | 0.10     | 0.12     |
| 60.1           | 61.66                  | 61.51    | 61.37    | 0.06                      | 0.07     | 0.08     | 0.05                       | 0.07     | 0.08     |
| 80.1           | 62.05                  | 61.79    | 61.59    | 0.06                      | 0.08     | 0.09     | 0.06                       | 0.08     | 0.09     |
| 90.1           | 62.89                  | 62.72    | 62.61    | 0.07                      | 0.08     | 0.10     | 0.06                       | 0.08     | 0.10     |
| 100.1          | 63.57                  | 63.16    | 63.17    | 0.07                      | 0.09     | 0.10     | 0.07                       | 0.09     | 0.10     |
| 120.1          | 63.35                  | 62.89    | 62.87    | 0.08                      | 0.10     | 0.11     | 0.08                       | 0.10     | 0.12     |
| 140.1          | 62.40                  | 62.07    | 61.90    | 0.10                      | 0.11     | 0.12     | 0.09                       | 0.11     | 0.13     |
| 150.1          | 61.45                  | 60.95    | 60.97    | 0.10                      | 0.12     | 0.13     | 0.09                       | 0.12     | 0.13     |
| 160.1          | 60.95                  | 60.46    | 60.45    | 0.11                      | 0.12     | 0.14     | 0.10                       | 0.12     | 0.14     |
| 180.1          | 59.81                  | 59.46    | 59.32    | 0.12                      | 0.13     | 0.15     | 0.11                       | 0.13     | 0.15     |
| 200.1          | 58.80                  | 58.45    | 58.43    | 0.12                      | 0.14     | 0.16     | 0.12                       | 0.14     | 0.15     |
| 220.1          | 57.92                  | 57.54    | 57.65    | 0.13                      | 0.15     | 0.16     | 0.12                       | 0.15     | 0.16     |
| 240.1          | 57.40                  | 57.03    | 56.96    | 0.14                      | 0.16     | 0.17     | 0.13                       | 0.16     | 0.17     |
| 250.1          | 57.15                  | 56.75    | 56.82    | 0.14                      | 0.16     | 0.17     | 0.13                       | 0.16     | 0.17     |
| 260.1          | 56.92                  | 56.54    | 56.54    | 0.14                      | 0.16     | 0.18     | 0.13                       | 0.16     | 0.18     |
| 280.1          | 56.62                  | 56.22    | 56.19    | 0.14                      | 0.16     | 0.18     | 0.14                       | 0.17     | 0.18     |
| 300.1          | 56.39                  | 55.90    | 55.91    | 0.14                      | 0.17     | 0.18     | 0.14                       | 0.17     | 0.19     |
| 320.1          | 56.30                  | 55.88    | 55.77    | 0.14                      | 0.17     | 0.19     | 0.14                       | 0.18     | 0.19     |
| 340.1          | 56.41                  | 55.96    | 55.89    | 0.15                      | 0.18     | 0.20     | 0.15                       | 0.18     | 0.20     |
| 350.1          | 56.57                  | 56.08    | 56.00    | 0.15                      | 0.18     | 0.20     | 0.15                       | 0.19     | 0.20     |
| 360.1          | 56.70                  | 56.17    | 56.16    | 0.15                      | 0.18     | 0.20     | 0.15                       | 0.19     | 0.21     |
| 380.1          | 57.12                  | 56.51    | 56.39    | 0.15                      | 0.18     | 0.20     | 0.15                       | 0.19     | 0.21     |
| 400.1          | 57.53                  | 56.87    | 56.72    | 0.15                      | 0.18     | 0.21     | 0.16                       | 0.20     | 0.22     |
| 440.1          | 58.59                  | 57.88    | 57.68    | 0.16                      | 0.20     | 0.23     | 0.17                       | 0.22     | 0.25     |
| 450.1          | 58.86                  | 57.99    | 57.81    | 0.17                      | 0.21     | 0.24     | 0.17                       | 0.23     | 0.26     |
| 460.1          | 58.54                  | 57.86    | 57.43    | 0.18                      | 0.22     | 0.26     | 0.18                       | 0.24     | 0.27     |
| 480.1          | 59.26                  | 58.23    | 57.35    | 0.22                      | 0.28     | 0.33     | 0.22                       | 0.30     | 0.35     |
| 500.1          | 44.25                  | 41.92    | 40.29    | 0.55                      | 0.70     | 0.84     | 0.52                       | 0.69     | 0.83     |
| 540.1          | 36.07                  | 36.47    | 36.88    | 0.26                      | 0.29     | 0.32     | 0.25                       | 0.30     | 0.33     |
| 550.1          | 38.09                  | 38.29    | 38.43    | 0.21                      | 0.24     | 0.27     | 0.20                       | 0.26     | 0.29     |
| 560.1          | 39.17                  | 39.26    | 39.28    | 0.19                      | 0.22     | 0.25     | 0.19                       | 0.24     | 0.27     |
| 580.1          | 39.72                  | 39.65    | 39.57    | 0.17                      | 0.20     | 0.23     | 0.17                       | 0.22     | 0.25     |
| 600.1          | 39.40                  | 39.19    | 39.32    | 0.16                      | 0.20     | 0.23     | 0.16                       | 0.21     | 0.25     |
| 640.1          | 36.74                  | 36.66    | 36.41    | 0.16                      | 0.19     | 0.22     | 0.16                       | 0.21     | 0.25     |
| 650.1          | 36.16                  | 36.05    | 35.81    | 0.16                      | 0.19     | 0.22     | 0.16                       | 0.22     | 0.25     |
| 660.1          | 35.55                  | 35.39    | 35.18    | 0.16                      | 0.19     | 0.23     | 0.16                       | 0.22     | 0.26     |
| 680.1          | 34.17                  | 33.98    | 33.78    | 0.16                      | 0.19     | 0.23     | 0.16                       | 0.23     | 0.26     |
| 700.1          | 32.73                  | 32.52    | 32.31    | 0.16                      | 0.19     | 0.23     | 0.16                       | 0.23     | 0.27     |
| 740.1          | 29.60                  | 29.45    | 29.18    | 0.16                      | 0.20     | 0.24     | 0.17                       | 0.24     | 0.29     |
| 750.1          | 28.82                  | 28.63    | 28.41    | 0.16                      | 0.21     | 0.25     | 0.18                       | 0.25     | 0.30     |
| 760.1          | 28.02                  | 27.79    | 27.42    | 0.18                      | 0.22     | 0.26     | 0.19                       | 0.27     | 0.31     |
| 780.1          | 26.08                  | 26.03    | 25.60    | 0.19                      | 0.24     | 0.28     | 0.20                       | 0.29     | 0.34     |
| 800.1          | 24.12                  | 24.15    | 23.63    | 0.21                      | 0.25     | 0.32     | 0.24                       | 0.31     | 0.39     |

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# Surface Mount Low Pass Filter

# SCLF-27+

## Typical Performance Data

| FREQ.<br>(MHz) | GROUP DELAY<br>(nsec) |          |          |
|----------------|-----------------------|----------|----------|
|                | @ -40° C              | @ +25° C | @ +85° C |
| 0.10           | 23.11                 | 23.59    | 22.92    |
| 0.15           | 23.19                 | 23.55    | 23.21    |
| 0.20           | 23.33                 | 23.41    | 23.32    |
| 0.25           | 23.28                 | 23.36    | 23.29    |
| 0.30           | 23.33                 | 23.40    | 23.33    |
| 0.35           | 23.33                 | 23.39    | 23.35    |
| 0.40           | 23.33                 | 23.39    | 23.33    |
| 0.45           | 23.36                 | 23.39    | 23.41    |
| 0.50           | 23.37                 | 23.41    | 23.39    |
| 0.55           | 23.38                 | 23.40    | 23.40    |
| 0.60           | 23.35                 | 23.39    | 23.38    |
| 0.65           | 23.41                 | 23.41    | 23.42    |
| 0.70           | 23.34                 | 23.36    | 23.37    |
| 0.80           | 23.30                 | 23.35    | 23.35    |
| 0.90           | 23.33                 | 23.36    | 23.34    |
| 2.00           | 23.28                 | 23.32    | 23.35    |
| 3.00           | 23.34                 | 23.37    | 23.39    |
| 4.00           | 23.42                 | 23.46    | 23.48    |
| 5.00           | 23.54                 | 23.59    | 23.59    |
| 6.00           | 23.73                 | 23.76    | 23.79    |
| 7.00           | 23.92                 | 23.97    | 23.98    |
| 8.00           | 24.18                 | 24.24    | 24.25    |
| 9.00           | 24.54                 | 24.58    | 24.57    |
| 10.00          | 24.93                 | 24.96    | 24.98    |
| 11.00          | 25.37                 | 25.40    | 25.41    |
| 12.00          | 25.90                 | 25.93    | 25.95    |
| 13.00          | 26.46                 | 26.48    | 26.49    |
| 14.00          | 27.08                 | 27.12    | 27.13    |
| 15.00          | 27.78                 | 27.82    | 27.83    |
| 16.00          | 28.55                 | 28.60    | 28.62    |
| 17.00          | 29.45                 | 29.49    | 29.53    |
| 18.00          | 30.48                 | 30.54    | 30.59    |
| 19.00          | 31.71                 | 31.78    | 31.81    |
| 20.00          | 33.14                 | 33.21    | 33.26    |
| 21.00          | 34.83                 | 34.91    | 34.97    |
| 22.00          | 36.78                 | 36.88    | 36.94    |
| 23.00          | 39.05                 | 39.15    | 39.23    |
| 24.00          | 41.72                 | 41.87    | 41.95    |
| 25.00          | 45.03                 | 45.23    | 45.35    |
| 26.00          | 49.63                 | 49.94    | 50.14    |
| 27.00          | 56.71                 | 57.19    | 57.50    |
| 28.00          | 67.84                 | 68.45    | 68.78    |
| 29.00          | 82.03                 | 82.27    | 82.32    |
| 30.00          | 88.85                 | 88.05    | 87.41    |
| 31.00          | 78.13                 | 76.84    | 75.92    |
| 32.00          | 59.85                 | 58.89    | 58.28    |
| 33.00          | 44.96                 | 44.47    | 44.09    |
| 34.00          | 34.87                 | 34.60    | 34.46    |
| 35.00          | 28.15                 | 27.97    | 27.87    |
| 36.00          | 23.34                 | 23.27    | 23.13    |
| 37.00          | 19.89                 | 19.81    | 19.63    |
| 38.00          | 17.01                 | 17.30    | 16.94    |
| 39.00          | 15.22                 | 14.97    | 15.05    |
| 40.00          | 13.65                 | 13.54    | 12.59    |

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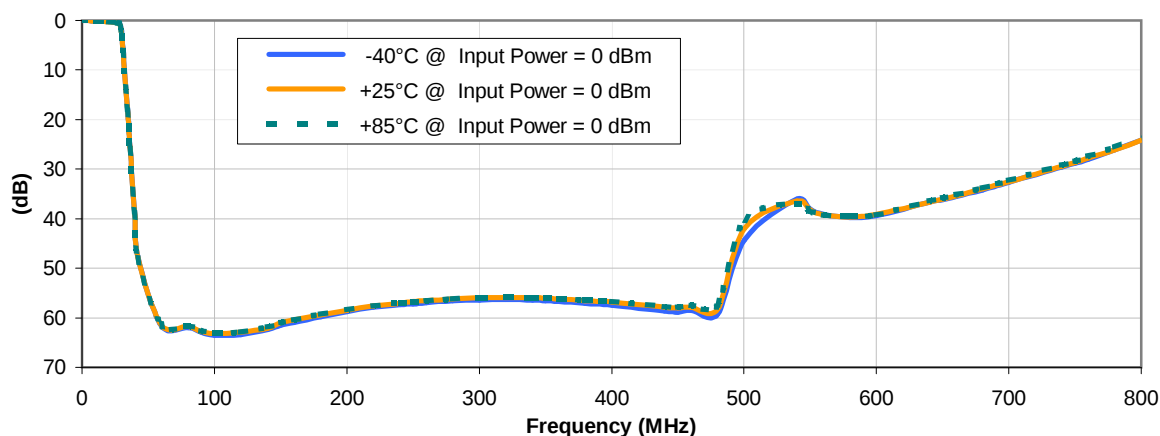


# Surface Mount Low Pass Filter

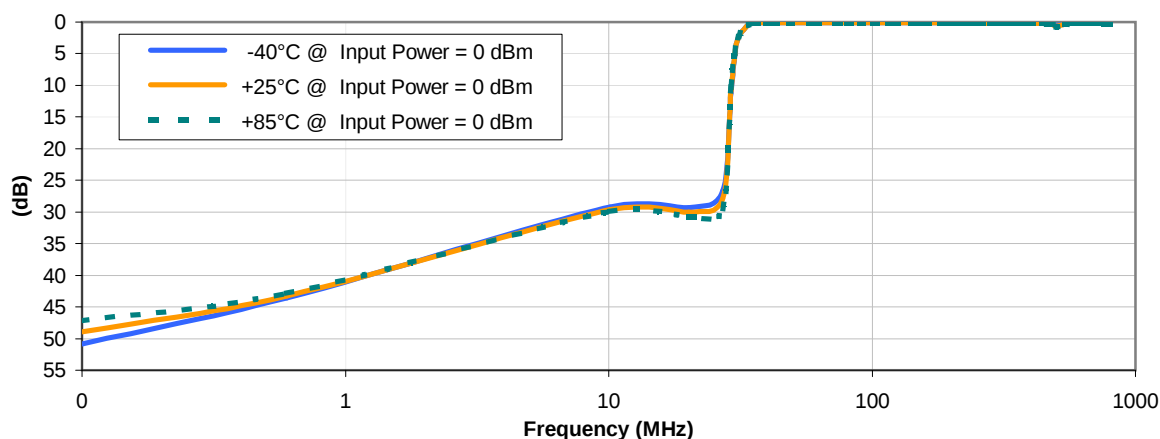
## Typical Performance Curves

**SCLF-27+**

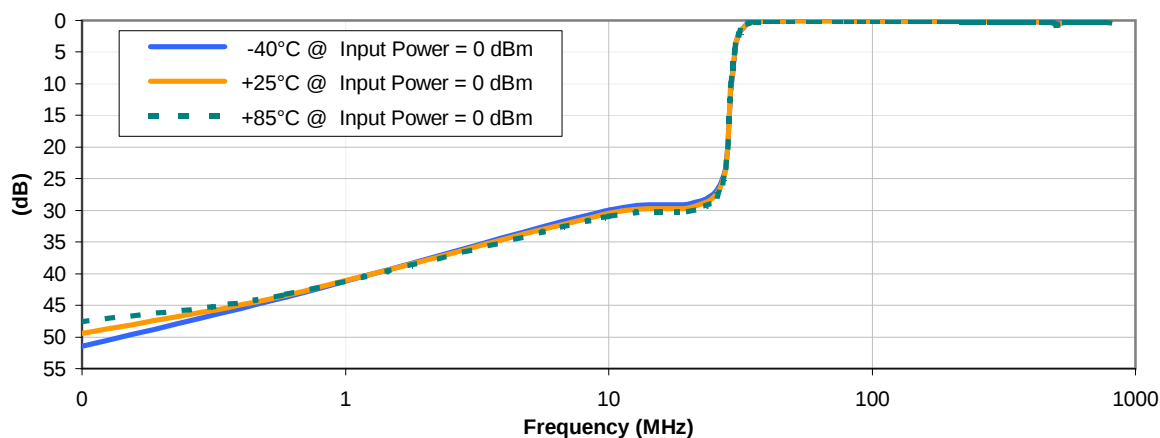
**INSERTION LOSS vs. TEMPERATURE**



**INPUT RETURN LOSS vs. TEMPERATURE**

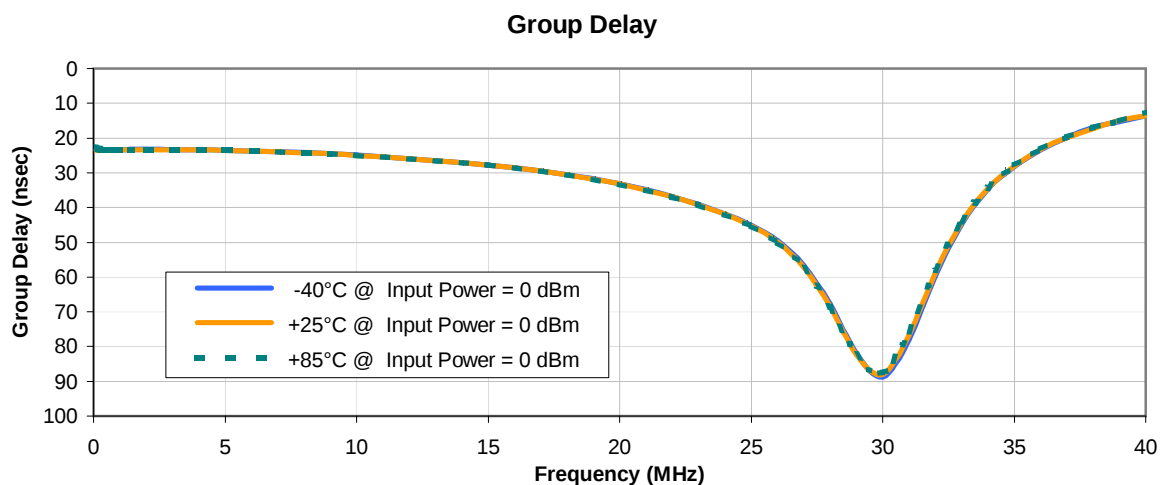


**OUTPUT RETURN LOSS vs. TEMPERATURE**



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## Typical Performance Curves



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# Case Style

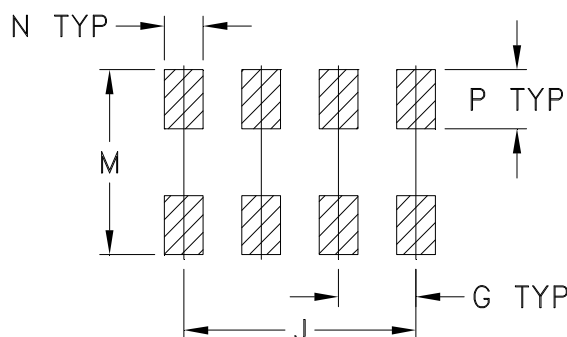
YY

## Outline Dimensions

YY101  
YY109  
YY161



## 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              | Q              | WT.<br>GRAM<br>S |
|--------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|----|-----------------|----------------|----------------|----------------|------------------|
| YY101* |                |               | .20<br>(5.08) |                |                |                |                |                |                 | .450<br>(11.43) | -- | .470<br>(11.94) |                |                |                | 1.6              |
| YY109* | .75<br>(19.05) | .38<br>(9.65) | .20<br>(5.08) | .010<br>(0.25) | .050<br>(1.27) | .020<br>(0.51) | .200<br>(5.08) | .075<br>(1.91) | .600<br>(15.24) | .720<br>(18.29) | -- | .740<br>(18.80) | .100<br>(2.54) | .150<br>(3.81) | .148<br>(3.76) | 1.6              |
| YY161  |                |               | .28<br>(7.11) |                |                |                |                |                |                 | .450<br>(11.43) | -- | .470<br>(11.94) |                |                |                | 1.6              |

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

### Notes:

- Case material: Plastic.
- Termination finish:  
For RoHS Case Styles: Tin plate over Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.
- Special Tolerances: Termination thickness  $\pm .003$  inch.
- \* Denotes: For SCM mixers, long termination version (case YY109) is available upon request, consult factory. To order short termination version (case YY101) add -NL suffix.

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# Tape & Reel Packaging TR-F5



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 32                | 16                         | 13                   | 500              |

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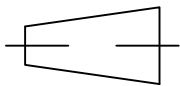


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| REV | ECN No. | DESCRIPTION                     | DATE     | DR  | AUTH |
|-----|---------|---------------------------------|----------|-----|------|
| OR  | M81561  | NEW RELEASE                     | 09/11/02 | GF  | ABD  |
| A   | M101145 | ADDED YY101 CASE STYLE & NOTE 2 | 10/07/05 | MMG | ABD  |
| B   | M102713 | ADDED "...WITH SMOBC"           | 01/16/06 | GT  | IL   |
| C   | M165986 | TB-187+ ( WAS TB-187)           | 02/01/18 | ITG | IL   |

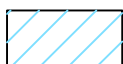
Figure 1: PCB layout for the 74VHC04. The diagram shows a rectangular PCB with a blue solder mask and red copper traces. It features a 4x4 grid of vias (26 x 0.020 PTH for ground) and four rectangular pads (0.060 x 0.060) for components. Dimensions include .030 TYP for pad spacing, .060 TYP for pad width, .040 TYP for pad length, .040 TYP for pad spacing, .064 TRACE WIDTH, 2 PL. for the main traces, .100 TYP for the overall width, .050 TYP for the overall height, .060 TYP for the overall width, .040 TYP for the overall height, .040 TYP for the overall width, .040 TYP for the overall height, .040 TYP for the overall width, .040 TYP for the overall height. The package outline is shown as a dashed line. Pin 1 is indicated at the bottom left.

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .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   | DRAWN    | GF  | 08/12/02 |
| TOLERANCES ON:             | CHECKED  | AV  | 09/11/02 |
| 2 PL DECIMALS ±            | APPROVED | ABD | 09/11/02 |
| 3 PL DECIMALS ± .005       |          |     |          |
| ANGLES ±                   |          |     |          |
| FRACTIONS ±                |          |     |          |



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PL, cr, YY101/YY161, SCLF, TB-187+

|               |                     |                          |               |           |
|---------------|---------------------|--------------------------|---------------|-----------|
| SIZE<br>A     | CODE IDENT<br>15542 | DRAWING NO:<br>98-PL-049 |               | REV:<br>C |
| FILE: 98PL049 |                     | SCALE: 5:1               | SHEET: 1 OF 1 |           |

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

# Evaluation Board and Circuit



TB-187+



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 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                                                                          |
| Humidity                       | 90 to 95% RH, 240 hours, 50°C                                                                                                                                   | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak                                                                                          | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1                                                        |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                                                                 |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |