

# Coaxial Bandpass Filter

## SBP-27R5+

50Ω 24 to 31 MHz



Generic photo used for illustration purposes only  
CASE STYLE: FF99

### The Big Deal

- Good VSWR 1.3:1 typ in passband
- Good rejection, 30 dB typical
- Connectorized package

### Product Overview

SBP-27R5+ is a 50Ω bandpass filter in a connectorized package. The bandpass filter covers from 24 to 31 MHz, offering good matching within the passband. It uses miniature high Q capacitors and wire welded inductors for high reliability. It has repeatable performance across production lots and consistent performance across temperature.

### Key Features

| Feature                                | Advantages                                                                                     |
|----------------------------------------|------------------------------------------------------------------------------------------------|
| Good rejection, 30 dB typical          | Rejects unwanted spurious signals.                                                             |
| Good VSWR, 1.3:1 typical over passband | This provides well matched input and output ports.                                             |
| Connectorized package                  | Connectorized package is easy to interface with other devices and well suited for test setups. |

#### 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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50Ω 24 to 31 MHz

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| Connectors | Model     |
|------------|-----------|
| SMA        | SBP-27R5+ |

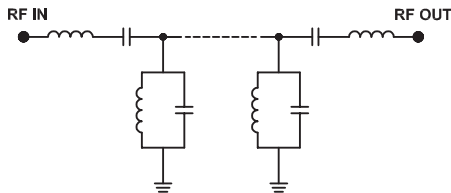
## Features

- Good VSWR, 1.3:1 typical over passband
- Good rejection, 30 dB typical
- Connectorized package

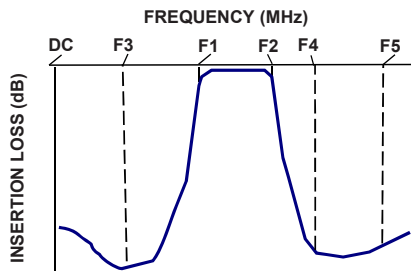
## Applications

- Transmitters / Receivers
- Harmonic rejection
- Test equipment
- Military communication

## Functional Schematic



## Typical Frequency Response



### +RoHS Compliant

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

## Electrical Specifications at 25°C

| Parameter        | F#             | Frequency (MHz) | Min.     | Typ. | Max. | Unit   |
|------------------|----------------|-----------------|----------|------|------|--------|
| Pass Band        | Insertion Loss | F1-F2           | 24 - 31  | -    | 1.3  | 2.5 dB |
|                  | VSWR           | F1-F2           | 24 - 31  | -    | 1.3  | 1.7 :1 |
| Stop Band, Lower | Insertion Loss | DC-F3           | 20       | 30   | -    | dB     |
| Stop Band, Upper | Insertion Loss | F4-F5           | 39 - 900 | 20   | 30   | - dB   |

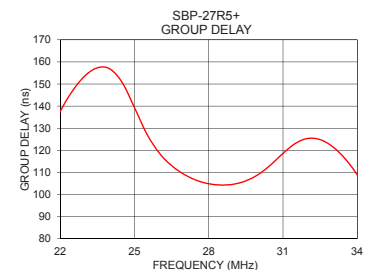
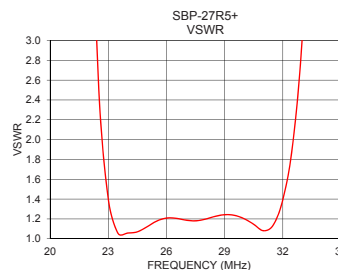
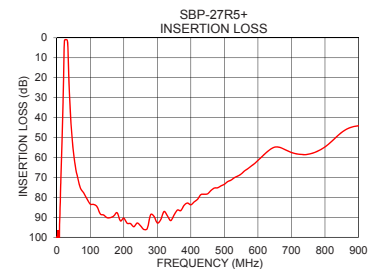
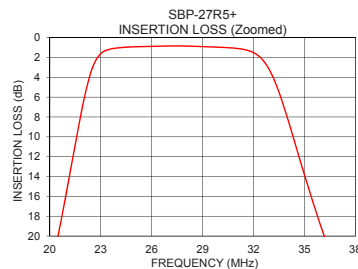
## Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power Input        | 0.25 W max.    |

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

## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (ns) |
|-----------------|---------------------|-----------|-----------------|------------------|
| 1.0             | 112.66              | 2722.55   | 24.0            | 156.85           |
| 10.0            | 85.06               | 1848.77   | 24.5            | 150.72           |
| 15.0            | 56.37               | 463.07    | 25.0            | 139.26           |
| 19.0            | 31.57               | 94.23     | 25.5            | 127.35           |
| 20.5            | 19.84               | 37.40     | 26.0            | 118.77           |
| 22.5            | 3.08                | 2.56      | 26.5            | 113.05           |
| 24.0            | 1.04                | 1.06      | 27.0            | 109.13           |
| 26.0            | 0.89                | 1.21      | 27.5            | 106.45           |
| 27.5            | 0.84                | 1.18      | 28.0            | 104.86           |
| 29.0            | 0.91                | 1.24      | 28.5            | 104.29           |
| 31.0            | 1.09                | 1.08      | 29.0            | 104.67           |
| 33.0            | 3.47                | 3.03      | 29.5            | 106.19           |
| 36.5            | 21.66               | 34.17     | 30.0            | 109.05           |
| 39.0            | 31.95               | 55.93     | 30.5            | 113.40           |
| 100.0           | 83.37               | 199.07    | 31.0            | 118.62           |
| 200.0           | 90.44               | 176.78    | 31.5            | 123.13           |
| 500.0           | 73.44               | 102.72    | 32.0            | 125.38           |
| 600.0           | 61.46               | 80.16     | 32.5            | 124.85           |
| 700.0           | 57.50               | 59.08     | 33.0            | 121.73           |
| 900.0           | 44.07               | 18.22     | 33.5            | 116.36           |



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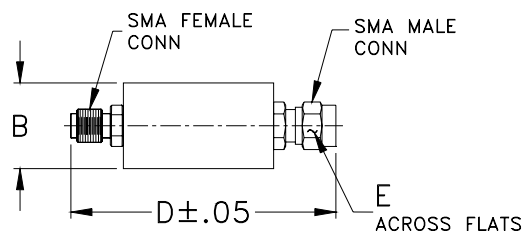


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Coaxial Connections

|          |            |
|----------|------------|
| PORT - 1 | SMA-Male   |
| PORT - 2 | SMA-Female |

Outline Drawing



Outline Dimensions ( <sup>inch</sup><sub>mm</sub> )

| B     | D     | E    | Wt.   |
|-------|-------|------|-------|
| .70   | 1.98  | .312 | grams |
| 17.78 | 50.29 | 7.92 | 42.0  |

Note: Please refer to case style drawing for details

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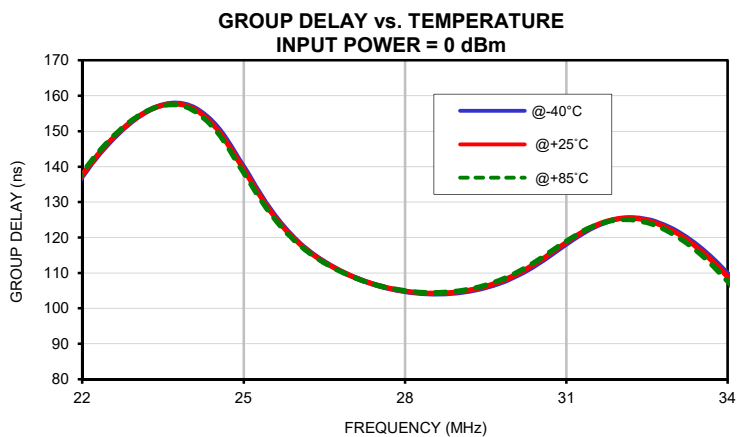
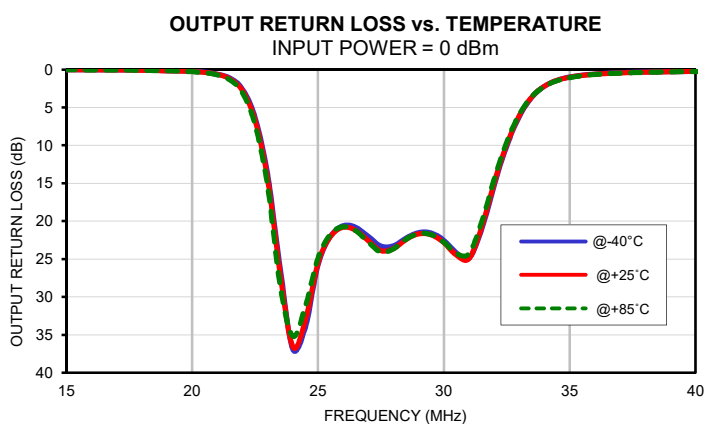
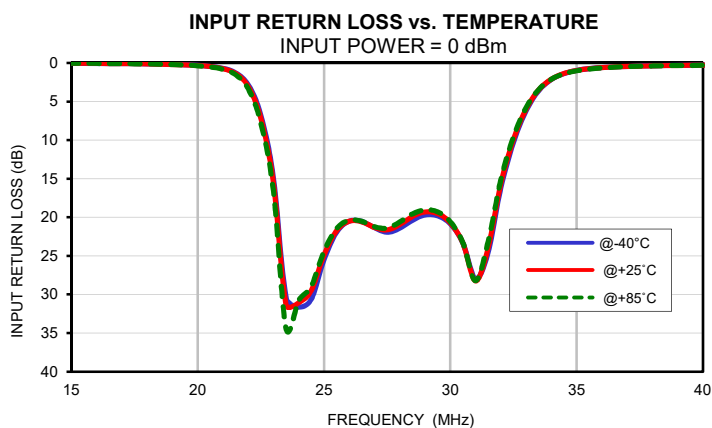
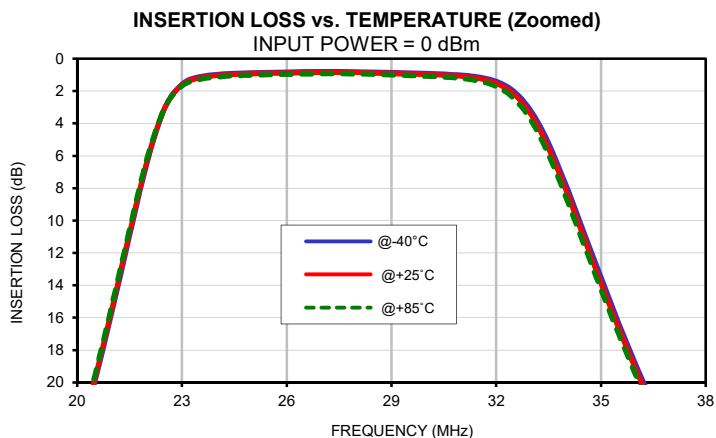
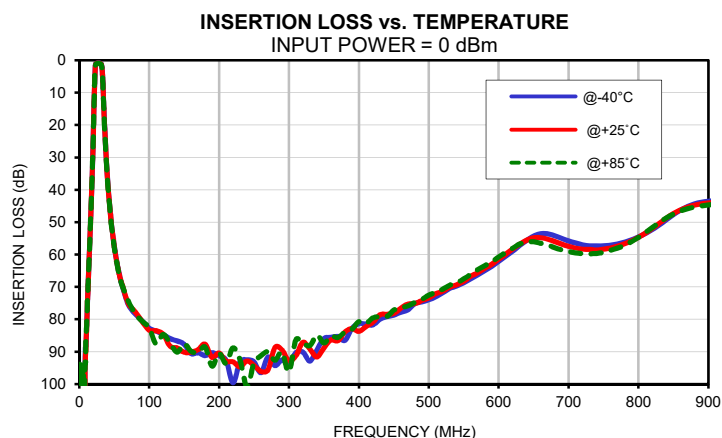
## Typical Performance Data

| 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 |
| 1.0   | 99.59          | 112.66 | 93.75  | 0.01              | 0.01   | 0.01   | 0.00               | 0.00   | 0.00   |
| 10.0  | 86.10          | 85.06  | 84.40  | 0.01              | 0.01   | 0.01   | 0.01               | 0.01   | 0.01   |
| 15.0  | 56.46          | 56.37  | 56.21  | 0.04              | 0.04   | 0.04   | 0.03               | 0.03   | 0.03   |
| 16.0  | 50.75          | 50.67  | 50.53  | 0.05              | 0.05   | 0.06   | 0.04               | 0.04   | 0.05   |
| 17.0  | 44.82          | 44.70  | 44.58  | 0.07              | 0.08   | 0.08   | 0.05               | 0.06   | 0.07   |
| 18.0  | 38.53          | 38.40  | 38.25  | 0.11              | 0.12   | 0.13   | 0.08               | 0.09   | 0.10   |
| 18.5  | 35.20          | 35.05  | 34.90  | 0.14              | 0.15   | 0.16   | 0.11               | 0.11   | 0.13   |
| 19.0  | 31.73          | 31.57  | 31.39  | 0.18              | 0.18   | 0.20   | 0.14               | 0.15   | 0.16   |
| 20.0  | 24.18          | 24.00  | 23.79  | 0.30              | 0.32   | 0.35   | 0.24               | 0.26   | 0.29   |
| 20.5  | 20.04          | 19.84  | 19.62  | 0.44              | 0.46   | 0.51   | 0.35               | 0.39   | 0.43   |
| 21.0  | 15.60          | 15.40  | 15.17  | 0.69              | 0.74   | 0.82   | 0.58               | 0.64   | 0.71   |
| 22.0  | 6.45           | 6.32   | 6.16   | 2.82              | 3.02   | 3.33   | 2.56               | 2.78   | 3.07   |
| 22.5  | 3.10           | 3.08   | 3.06   | 6.75              | 7.16   | 7.76   | 6.28               | 6.70   | 7.27   |
| 24.0  | 0.98           | 1.04   | 1.14   | 31.65             | 31.07  | 30.77  | 36.88              | 36.55  | 35.16  |
| 26.0  | 0.84           | 0.89   | 0.97   | 20.51             | 20.50  | 20.38  | 20.60              | 20.82  | 20.74  |
| 27.0  | 0.80           | 0.85   | 0.93   | 21.36             | 21.33  | 21.23  | 22.00              | 22.57  | 22.76  |
| 27.5  | 0.80           | 0.84   | 0.93   | 21.94             | 21.65  | 21.40  | 23.28              | 23.89  | 24.07  |
| 28.0  | 0.80           | 0.85   | 0.94   | 21.44             | 20.94  | 20.60  | 23.26              | 23.62  | 23.66  |
| 29.0  | 0.85           | 0.91   | 1.01   | 19.70             | 19.31  | 19.04  | 21.50              | 21.67  | 21.64  |
| 31.0  | 1.01           | 1.09   | 1.22   | 27.97             | 28.24  | 28.22  | 24.91              | 24.94  | 24.28  |
| 32.0  | 1.40           | 1.52   | 1.72   | 16.19             | 15.67  | 15.15  | 15.30              | 14.98  | 14.49  |
| 33.0  | 3.23           | 3.47   | 3.83   | 6.19              | 5.96   | 5.79   | 6.19               | 6.04   | 5.90   |
| 36.5  | 21.38          | 21.66  | 21.99  | 0.50              | 0.51   | 0.54   | 0.49               | 0.51   | 0.55   |
| 39.0  | 31.73          | 31.95  | 32.21  | 0.31              | 0.31   | 0.34   | 0.27               | 0.28   | 0.31   |
| 50.0  | 57.32          | 57.46  | 57.70  | 0.14              | 0.15   | 0.16   | 0.11               | 0.12   | 0.13   |
| 60.0  | 68.55          | 68.22  | 68.67  | 0.11              | 0.12   | 0.13   | 0.09               | 0.09   | 0.10   |
| 70.0  | 75.33          | 75.05  | 74.29  | 0.09              | 0.10   | 0.11   | 0.08               | 0.09   | 0.09   |
| 80.0  | 78.32          | 77.67  | 78.23  | 0.08              | 0.09   | 0.10   | 0.08               | 0.08   | 0.09   |
| 90.0  | 80.51          | 80.68  | 80.62  | 0.08              | 0.09   | 0.10   | 0.07               | 0.08   | 0.09   |
| 100.0 | 82.72          | 83.37  | 82.63  | 0.08              | 0.09   | 0.09   | 0.08               | 0.08   | 0.09   |
| 130.0 | 85.99          | 88.32  | 87.33  | 0.08              | 0.09   | 0.10   | 0.07               | 0.08   | 0.09   |
| 150.0 | 87.73          | 90.20  | 87.56  | 0.08              | 0.09   | 0.10   | 0.07               | 0.08   | 0.09   |
| 200.0 | 91.25          | 90.44  | 90.55  | 0.08              | 0.10   | 0.11   | 0.07               | 0.08   | 0.09   |
| 240.0 | 92.53          | 92.88  | 100.82 | 0.08              | 0.10   | 0.12   | 0.07               | 0.09   | 0.10   |
| 250.0 | 93.16          | 94.28  | 93.44  | 0.08              | 0.10   | 0.13   | 0.07               | 0.09   | 0.10   |
| 300.0 | 93.37          | 92.85  | 96.25  | 0.08              | 0.11   | 0.14   | 0.07               | 0.10   | 0.11   |
| 320.0 | 90.14          | 87.11  | 87.40  | 0.08              | 0.12   | 0.14   | 0.07               | 0.10   | 0.12   |
| 370.0 | 85.30          | 86.64  | 85.63  | 0.09              | 0.13   | 0.16   | 0.08               | 0.11   | 0.13   |
| 400.0 | 81.36          | 83.73  | 80.76  | 0.09              | 0.14   | 0.16   | 0.08               | 0.11   | 0.13   |
| 410.0 | 81.48          | 82.28  | 81.32  | 0.09              | 0.14   | 0.17   | 0.09               | 0.11   | 0.14   |
| 480.0 | 75.19          | 75.20  | 74.87  | 0.11              | 0.16   | 0.20   | 0.10               | 0.13   | 0.16   |
| 500.0 | 74.01          | 73.44  | 72.54  | 0.11              | 0.17   | 0.21   | 0.10               | 0.14   | 0.16   |
| 520.0 | 71.82          | 71.36  | 70.71  | 0.12              | 0.18   | 0.22   | 0.11               | 0.15   | 0.17   |
| 550.0 | 68.79          | 68.29  | 67.55  | 0.12              | 0.19   | 0.23   | 0.11               | 0.16   | 0.19   |
| 600.0 | 62.09          | 61.46  | 60.76  | 0.14              | 0.22   | 0.27   | 0.14               | 0.19   | 0.23   |
| 620.0 | 58.98          | 58.28  | 58.07  | 0.16              | 0.23   | 0.29   | 0.15               | 0.21   | 0.25   |
| 640.0 | 55.66          | 55.60  | 56.20  | 0.17              | 0.25   | 0.31   | 0.17               | 0.23   | 0.27   |
| 680.0 | 54.20          | 56.02  | 57.88  | 0.20              | 0.28   | 0.35   | 0.22               | 0.28   | 0.33   |
| 700.0 | 55.77          | 57.50  | 59.06  | 0.21              | 0.29   | 0.37   | 0.25               | 0.32   | 0.39   |
| 720.0 | 57.00          | 58.33  | 59.74  | 0.22              | 0.32   | 0.39   | 0.29               | 0.38   | 0.46   |
| 740.0 | 57.38          | 58.61  | 59.65  | 0.24              | 0.34   | 0.43   | 0.36               | 0.46   | 0.56   |
| 760.0 | 57.12          | 57.98  | 58.72  | 0.27              | 0.38   | 0.47   | 0.46               | 0.59   | 0.71   |
| 780.0 | 56.19          | 56.69  | 57.13  | 0.30              | 0.42   | 0.52   | 0.62               | 0.80   | 0.97   |
| 800.0 | 54.61          | 54.71  | 54.72  | 0.34              | 0.47   | 0.58   | 0.89               | 1.13   | 1.36   |
| 820.0 | 52.29          | 51.93  | 51.65  | 0.39              | 0.53   | 0.65   | 1.34               | 1.67   | 1.97   |
| 840.0 | 49.27          | 48.76  | 48.68  | 0.46              | 0.60   | 0.73   | 2.08               | 2.49   | 2.77   |
| 860.0 | 46.31          | 46.24  | 46.54  | 0.53              | 0.68   | 0.84   | 3.10               | 3.36   | 3.35   |
| 880.0 | 44.40          | 44.75  | 45.33  | 0.61              | 0.80   | 0.98   | 3.76               | 3.56   | 3.21   |
| 890.0 | 43.86          | 44.33  | 44.98  | 0.67              | 0.87   | 1.07   | 3.67               | 3.32   | 2.94   |
| 900.0 | 43.54          | 44.07  | 44.70  | 0.73              | 0.95   | 1.18   | 3.36               | 2.97   | 2.62   |

*Typical Performance Data*

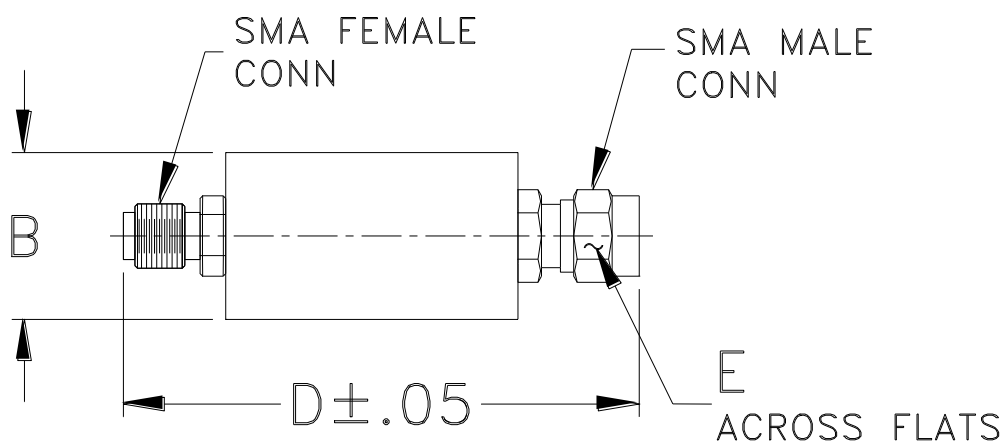
| FREQ. | GROUP DELAY |        |        |
|-------|-------------|--------|--------|
| (MHz) | (nsec)      |        |        |
|       | @-40°C      | @+25°C | @+85°C |
| 17.00 | 23.36       | 23.98  | 23.99  |
| 17.50 | 26.38       | 26.51  | 26.69  |
| 18.00 | 30.39       | 30.58  | 30.97  |
| 18.50 | 35.50       | 36.04  | 36.47  |
| 19.00 | 42.70       | 43.31  | 43.95  |
| 19.50 | 53.02       | 53.88  | 55.00  |
| 20.00 | 68.22       | 69.37  | 70.80  |
| 20.50 | 88.32       | 89.60  | 91.07  |
| 21.00 | 108.60      | 109.55 | 110.70 |
| 21.50 | 124.80      | 125.46 | 126.32 |
| 22.00 | 137.20      | 137.67 | 138.28 |
| 22.50 | 146.69      | 147.02 | 147.43 |
| 23.00 | 153.59      | 153.74 | 153.94 |
| 23.50 | 157.44      | 157.36 | 157.28 |
| 24.00 | 157.22      | 156.85 | 156.41 |
| 24.50 | 151.40      | 150.72 | 149.88 |
| 25.00 | 140.02      | 139.26 | 138.30 |
| 25.50 | 127.87      | 127.35 | 126.69 |
| 26.00 | 119.03      | 118.77 | 118.41 |
| 26.50 | 113.17      | 113.05 | 112.86 |
| 27.00 | 109.16      | 109.13 | 109.05 |
| 27.50 | 106.42      | 106.45 | 106.47 |
| 28.00 | 104.75      | 104.86 | 104.97 |
| 28.50 | 104.10      | 104.29 | 104.46 |
| 29.00 | 104.42      | 104.67 | 104.93 |
| 29.50 | 105.85      | 106.19 | 106.54 |
| 30.00 | 108.61      | 109.05 | 109.51 |
| 30.50 | 112.88      | 113.40 | 113.89 |
| 31.00 | 118.13      | 118.62 | 118.98 |
| 31.50 | 122.84      | 123.13 | 123.17 |
| 32.00 | 125.38      | 125.38 | 125.06 |
| 32.50 | 125.11      | 124.85 | 124.20 |
| 33.00 | 122.22      | 121.73 | 120.85 |
| 33.50 | 117.05      | 116.36 | 115.27 |
| 34.00 | 109.80      | 108.91 | 107.63 |
| 39.50 | 21.42       | 21.19  | 21.05  |
| 40.00 | 19.17       | 19.03  | 18.85  |
| 10.50 | 24.04       | -6.76  | 3.31   |
| 41.00 | 15.80       | 15.65  | 15.49  |
| 41.50 | 14.52       | 14.46  | 14.24  |
| 42.00 | 13.33       | 13.20  | 13.11  |

## Typical Performance Curves



**FF56**  
**FF99**

## Outline Dimensions



| CASE #. | A  | B              | C  | D               | E              | WT GRAMS |
|---------|----|----------------|----|-----------------|----------------|----------|
| FF56    | -- | .46<br>(11.68) | -- | 1.70<br>(43.18) | .312<br>(7.92) | 18.0     |
| FF99    | -- | .70<br>(17.78) | -- | 1.98<br>(50.29) |                | 42.0     |

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

### Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.



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                           |
| Thermal Shock         | -55° to 100°C, 100 cycles             | MIL-STD-202, Method 107, Condition A-3, except +100°C |