



## SUSPENDED SUBSTRATE STRIPLINE COAXIAL

# High Power Low Pass Filter **ZLSS252-100W-S+**

50Ω DC to 2500 MHz SMA Female

### KEY FEATURES

- High Power Handling up to 100W
- Very Low Passband Insertion loss, 0.2 dB Typ.
- High Rejection Floor, 90 dB Typ.
- Excellent Return Loss >20 dB Typ.

### APPLICATIONS

- Tubular Replacement
- ISM Band
- High Power Transmitter / Receiver
- Industrial Heating
- Test and Instrumentation
- Harmonic Rejection

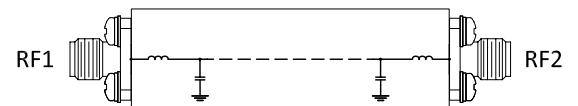
### PRODUCT OVERVIEW

Mini-Circuits' Suspended Substrate Stripline filters offer low insertion loss combined with wide stopband, good power handling & temperature stability, small form factor with rugged build ideal for harsh operating environments making them an excellent choice for wideband instruments and systems like ECM, ECCM, ELINT and ultra-broadband receivers. Low pass, high pass, band pass, diplexer and multiplexer designs can be realized with this technology with passband, stopband up to 40GHz and stopband width greater than 6x cutoff frequency.



Generic photo used for illustration purposes only

### FUNCTIONAL DIAGRAM



### ELECTRICAL SPECIFICATIONS<sup>1</sup> AT +25°C

| Parameter |                | F#    | Frequency (MHz) | Min. | Typ. | Max. | Units |
|-----------|----------------|-------|-----------------|------|------|------|-------|
| Pass Band | Insertion Loss | DC-F1 | DC - 2500       | —    | 0.2  | 0.4  | dB    |
|           | Return Loss    | DC-F1 | DC - 2500       | —    | 24   | —    | dB    |
| Stop Band | Rejection      | F2-F3 | 3900 - 4700     | 20   | 35   | —    | dB    |
|           |                | F3-F4 | 4700 - 6000     | 40   | 55   | —    |       |
|           |                | F4-F5 | 6000 - 9000     | 60   | 90   | —    |       |

1. This filter is bi-directional, RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

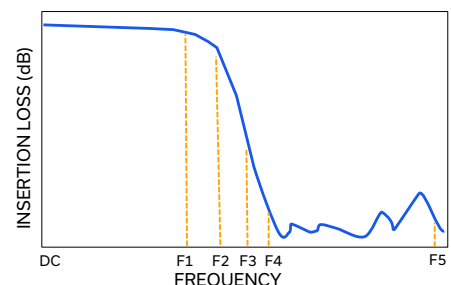
### ABSOLUTE MAXIMUM RATINGS<sup>2</sup>

| Parameter                | Ratings         |
|--------------------------|-----------------|
| Operating Temperature    | -40°C to +85°C  |
| Storage Temperature      | -55°C to +100°C |
| Input Power <sup>3</sup> | 100W @25°C      |

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

3. Power rating applies only to signals within the passband.

### TYPICAL FREQUENCY RESPONSE



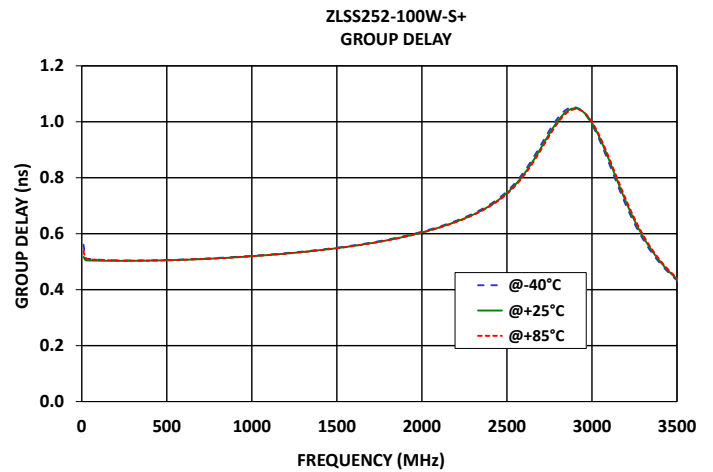
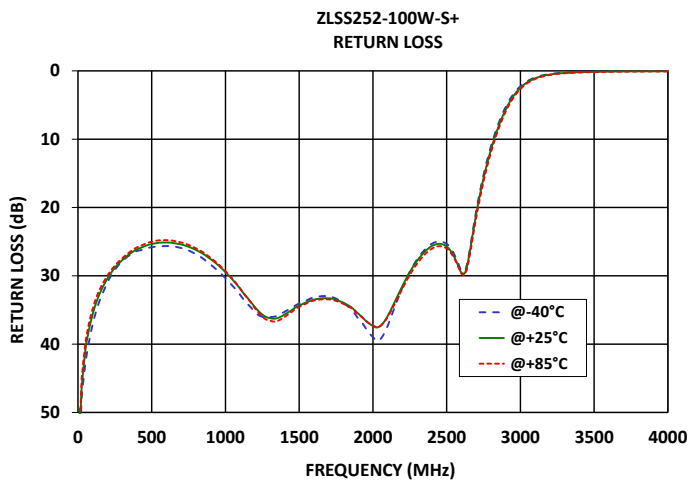
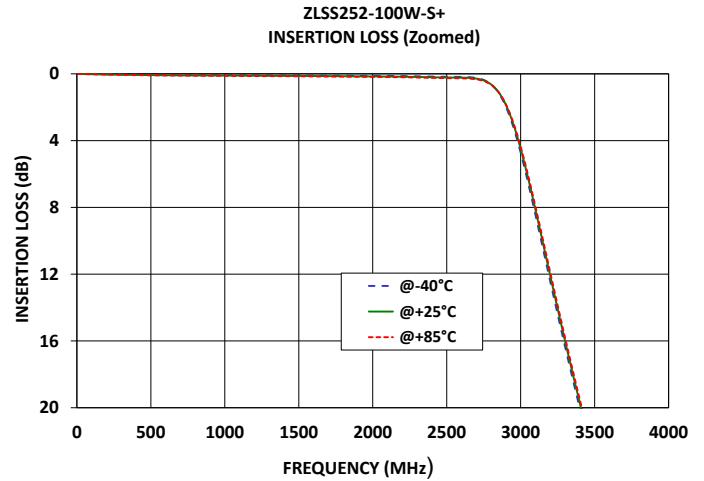
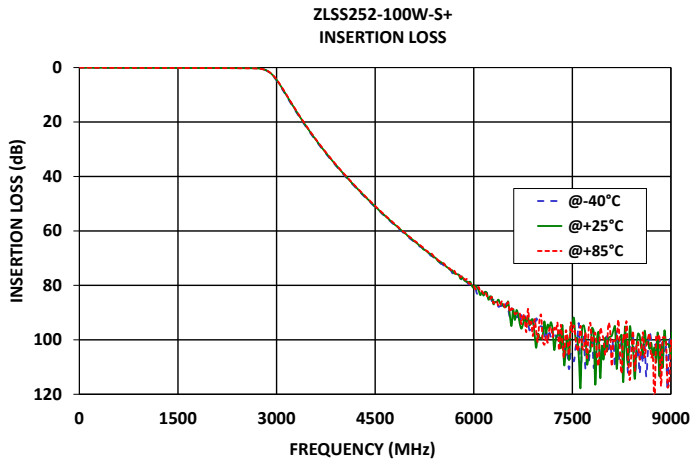


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50Ω DC to 2500 MHz SMA Female

### TYPICAL PERFORMANCE GRAPHS





## SUSPENDED SUBSTRATE STRIPLINE COAXIAL

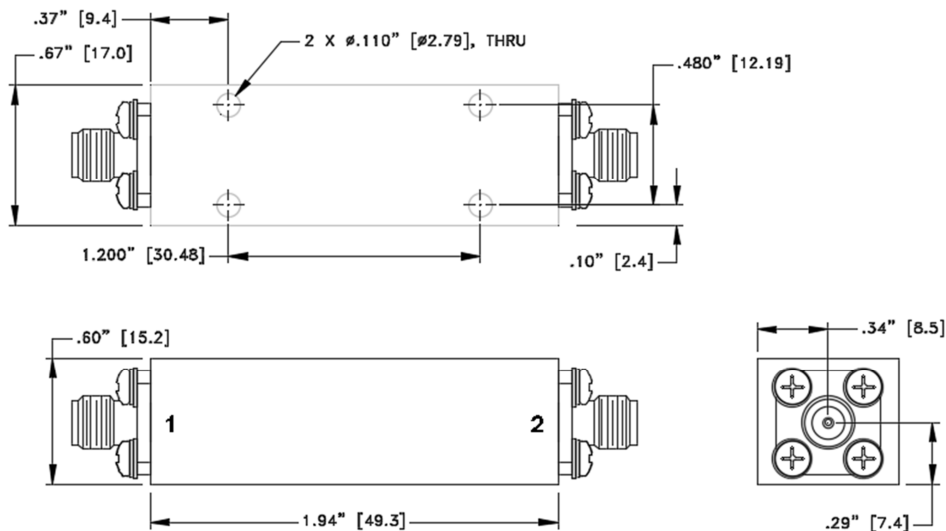
# High Power Low Pass Filter **ZLSS252-100W-S+**

50Ω DC to 2500 MHz SMA Female

### CONNECTOR DESCRIPTION

| Function         | Marking on Unit | Connector  |
|------------------|-----------------|------------|
| RF1 <sup>1</sup> | 1               | SMA Female |
| RF2 <sup>1</sup> | 2               | SMA Female |

### CASE STYLE DRAWING



Weight: 40 grams

Dimensions are in inches[mm]. Tolerance: 2PL ±.050; 3PL ±.015

### PRODUCT MARKING\*: ZLSS252-100W-S+

\*Marking may contain other features or characters for internal lot control.



Mini-Circuits

## SUSPENDED SUBSTRATE STRIPLINE COAXIAL

# High Power Low Pass Filter **ZLSS252-100W-S+**

50Ω DC to 2500 MHz SMA Female

ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

|                           |                                                                                                                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Performance Data & Graphs | Data                                                                                                                                                                                             |
|                           | Graphs                                                                                                                                                                                           |
|                           | S-Parameter (S2P Files) Data Set (.zip file)                                                                                                                                                     |
| Case Style                | ZG3525                                                                                                                                                                                           |
| RoHS Status               | Compliant                                                                                                                                                                                        |
| Environmental Ratings     | ENV001                                                                                                                                                                                           |
| Application note          | This is a high-power model with silver finish outer. This will not affect the performance. If customer has any specific outer coating or finish requirement, please <a href="#">Contact Us</a> . |

### NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits' standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# Suspended substrate stripline Low Pass Filter

## ZLSS252-100W-S+

### 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 |
| 25    | 0.00           | 0.01   | 0.01   | 47.79             | 46.41  | 45.09  | 47.59              | 46.18  | 44.78  |
| 50    | 0.01           | 0.02   | 0.02   | 42.87             | 40.93  | 39.94  | 43.00              | 40.90  | 39.90  |
| 100   | 0.01           | 0.02   | 0.03   | 37.08             | 35.62  | 34.81  | 37.28              | 35.71  | 34.90  |
| 150   | 0.02           | 0.03   | 0.04   | 33.46             | 32.49  | 31.90  | 33.60              | 32.59  | 31.96  |
| 200   | 0.03           | 0.04   | 0.04   | 30.96             | 30.39  | 29.95  | 31.04              | 30.49  | 30.03  |
| 250   | 0.03           | 0.05   | 0.05   | 29.17             | 28.84  | 28.53  | 29.24              | 28.95  | 28.60  |
| 300   | 0.04           | 0.05   | 0.06   | 27.89             | 27.71  | 27.44  | 27.96              | 27.81  | 27.52  |
| 350   | 0.04           | 0.06   | 0.07   | 26.99             | 26.80  | 26.54  | 27.13              | 26.93  | 26.65  |
| 400   | 0.05           | 0.07   | 0.08   | 26.37             | 26.12  | 25.83  | 26.55              | 26.26  | 25.95  |
| 450   | 0.05           | 0.07   | 0.08   | 26.07             | 25.68  | 25.37  | 26.23              | 25.80  | 25.47  |
| 500   | 0.06           | 0.08   | 0.09   | 25.83             | 25.35  | 25.01  | 26.00              | 25.46  | 25.11  |
| 550   | 0.06           | 0.08   | 0.09   | 25.68             | 25.16  | 24.81  | 25.92              | 25.30  | 24.95  |
| 600   | 0.06           | 0.09   | 0.10   | 25.64             | 25.12  | 24.78  | 25.83              | 25.22  | 24.87  |
| 650   | 0.06           | 0.09   | 0.10   | 25.71             | 25.21  | 24.89  | 25.84              | 25.25  | 24.92  |
| 700   | 0.06           | 0.09   | 0.11   | 25.92             | 25.41  | 25.11  | 26.04              | 25.43  | 25.15  |
| 750   | 0.07           | 0.09   | 0.11   | 26.29             | 25.75  | 25.48  | 26.29              | 25.69  | 25.43  |
| 800   | 0.07           | 0.10   | 0.11   | 26.84             | 26.22  | 25.98  | 26.76              | 26.09  | 25.87  |
| 900   | 0.07           | 0.10   | 0.12   | 28.37             | 27.57  | 27.38  | 28.03              | 27.26  | 27.08  |
| 1000  | 0.07           | 0.10   | 0.12   | 30.33             | 29.47  | 29.32  | 29.75              | 29.02  | 28.87  |
| 1100  | 0.08           | 0.11   | 0.13   | 32.79             | 31.90  | 31.85  | 32.16              | 31.52  | 31.46  |
| 1200  | 0.08           | 0.11   | 0.13   | 35.30             | 34.58  | 34.75  | 35.81              | 35.15  | 35.37  |
| 1300  | 0.08           | 0.12   | 0.14   | 36.06             | 36.18  | 36.55  | 39.29              | 39.60  | 40.60  |
| 1400  | 0.09           | 0.12   | 0.14   | 35.28             | 35.68  | 36.05  | 38.26              | 39.38  | 40.14  |
| 1500  | 0.09           | 0.13   | 0.15   | 34.07             | 34.36  | 34.56  | 35.02              | 35.41  | 35.63  |
| 1600  | 0.10           | 0.13   | 0.16   | 33.16             | 33.48  | 33.62  | 32.36              | 32.67  | 32.74  |
| 1700  | 0.10           | 0.14   | 0.16   | 32.97             | 33.30  | 33.45  | 30.81              | 31.03  | 31.07  |
| 2000  | 0.12           | 0.15   | 0.18   | 38.96             | 37.34  | 37.25  | 32.59              | 32.03  | 31.96  |
| 2500  | 0.18           | 0.22   | 0.26   | 25.31             | 25.70  | 26.00  | 24.61              | 25.02  | 25.32  |
| 2700  | 0.25           | 0.29   | 0.33   | 20.54             | 20.98  | 21.51  | 20.35              | 20.79  | 21.35  |
| 2750  | 0.37           | 0.39   | 0.43   | 15.23             | 15.71  | 16.19  | 15.21              | 15.71  | 16.22  |
| 2800  | 0.63           | 0.63   | 0.66   | 11.06             | 11.54  | 11.97  | 11.06              | 11.56  | 12.01  |
| 2850  | 1.13           | 1.09   | 1.09   | 7.79              | 8.23   | 8.60   | 7.79               | 8.25   | 8.63   |
| 2900  | 1.97           | 1.86   | 1.82   | 5.29              | 5.66   | 5.97   | 5.28               | 5.66   | 5.98   |
| 3000  | 4.73           | 4.49   | 4.36   | 2.25              | 2.47   | 2.66   | 2.24               | 2.46   | 2.65   |
| 3100  | 8.45           | 8.14   | 7.95   | 0.97              | 1.08   | 1.19   | 0.94               | 1.07   | 1.17   |
| 3500  | 23.55          | 23.25  | 23.05  | 0.09              | 0.14   | 0.17   | 0.07               | 0.12   | 0.16   |
| 3900  | 35.96          | 35.68  | 35.50  | 0.02              | 0.06   | 0.09   | 0.00               | 0.05   | 0.09   |
| 4000  | 38.72          | 38.47  | 38.29  | 0.01              | 0.05   | 0.08   | 0.00               | 0.05   | 0.09   |
| 4300  | 46.50          | 46.24  | 46.06  | 0.02              | 0.06   | 0.10   | 0.00               | 0.05   | 0.09   |
| 4500  | 51.27          | 51.02  | 50.79  | 0.03              | 0.08   | 0.11   | 0.00               | 0.05   | 0.09   |
| 4600  | 53.57          | 53.31  | 53.13  | 0.04              | 0.09   | 0.12   | 0.01               | 0.06   | 0.10   |
| 4700  | 55.79          | 55.49  | 55.32  | 0.05              | 0.10   | 0.13   | 0.01               | 0.07   | 0.11   |
| 4800  | 57.86          | 57.74  | 57.49  | 0.06              | 0.10   | 0.14   | 0.02               | 0.07   | 0.11   |
| 4900  | 60.05          | 59.80  | 59.67  | 0.07              | 0.11   | 0.15   | 0.03               | 0.08   | 0.12   |
| 5000  | 62.12          | 61.95  | 61.67  | 0.07              | 0.12   | 0.15   | 0.04               | 0.09   | 0.13   |
| 5200  | 65.95          | 65.66  | 65.59  | 0.10              | 0.14   | 0.18   | 0.05               | 0.10   | 0.14   |
| 5300  | 68.11          | 67.87  | 67.52  | 0.11              | 0.16   | 0.19   | 0.06               | 0.11   | 0.15   |
| 5400  | 69.95          | 69.69  | 69.60  | 0.12              | 0.17   | 0.20   | 0.06               | 0.11   | 0.16   |
| 5500  | 72.08          | 71.41  | 71.27  | 0.13              | 0.18   | 0.21   | 0.07               | 0.12   | 0.16   |
| 5600  | 74.07          | 73.40  | 73.43  | 0.14              | 0.19   | 0.22   | 0.08               | 0.13   | 0.17   |
| 5800  | 76.96          | 77.64  | 77.01  | 0.16              | 0.21   | 0.24   | 0.09               | 0.14   | 0.19   |
| 5900  | 78.85          | 78.75  | 77.65  | 0.17              | 0.21   | 0.24   | 0.10               | 0.15   | 0.19   |
| 6000  | 79.96          | 80.95  | 80.11  | 0.18              | 0.22   | 0.25   | 0.11               | 0.16   | 0.20   |
| 6200  | 82.81          | 82.84  | 83.89  | 0.19              | 0.23   | 0.26   | 0.12               | 0.17   | 0.21   |
| 6500  | 86.59          | 87.63  | 87.10  | 0.20              | 0.25   | 0.28   | 0.13               | 0.18   | 0.23   |
| 7000  | 94.97          | 99.08  | 92.86  | 0.23              | 0.28   | 0.31   | 0.15               | 0.20   | 0.25   |
| 7500  | 105.24         | 94.59  | 97.19  | 0.23              | 0.28   | 0.32   | 0.17               | 0.22   | 0.27   |
| 8000  | 100.23         | 99.24  | 105.49 | 0.21              | 0.27   | 0.31   | 0.17               | 0.23   | 0.28   |
| 8500  | 102.84         | 97.77  | 100.83 | 0.21              | 0.28   | 0.31   | 0.17               | 0.23   | 0.28   |
| 9000  | 104.18         | 106.26 | 100.39 | 0.21              | 0.27   | 0.30   | 0.16               | 0.23   | 0.28   |

## Suspended substrate stripline

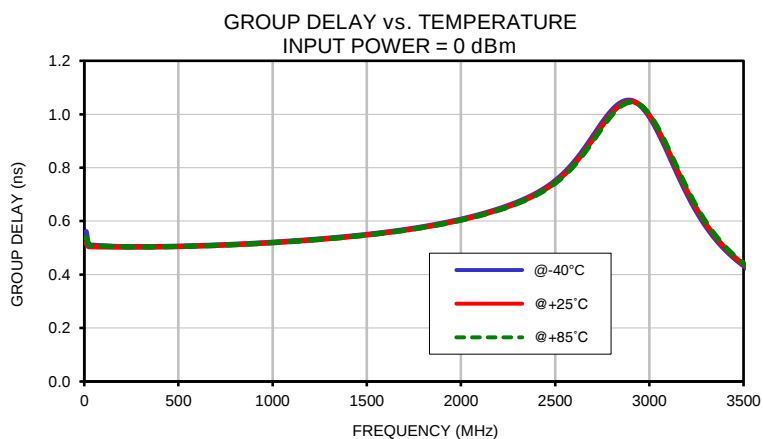
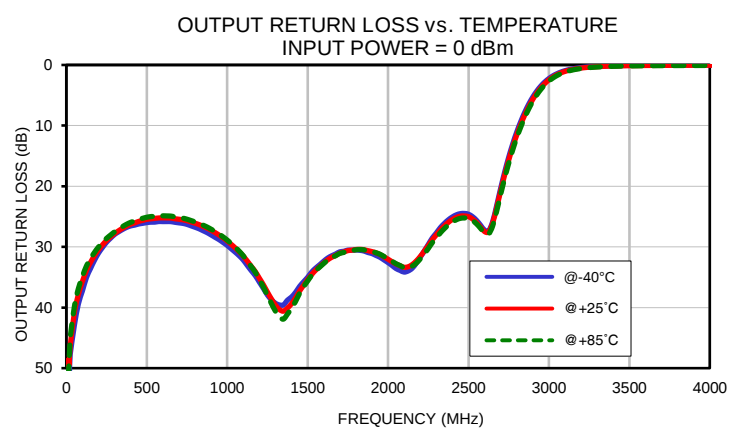
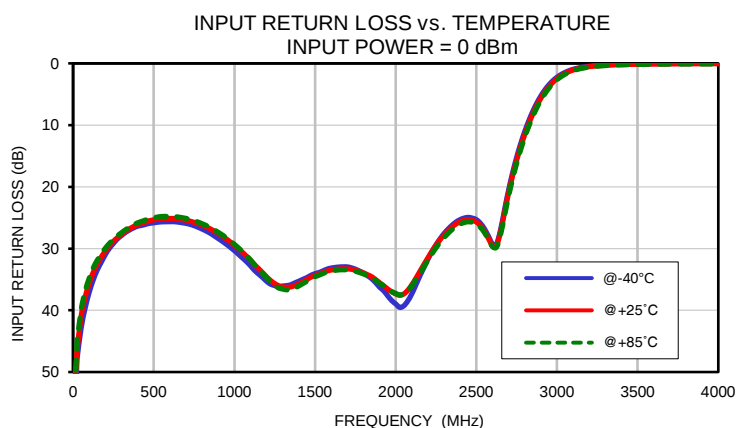
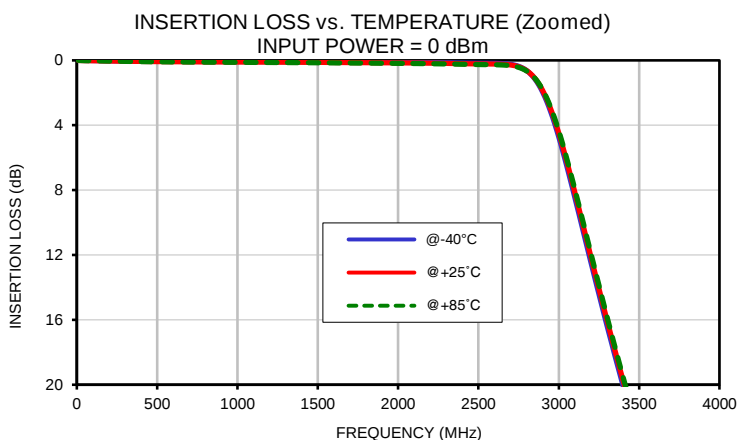
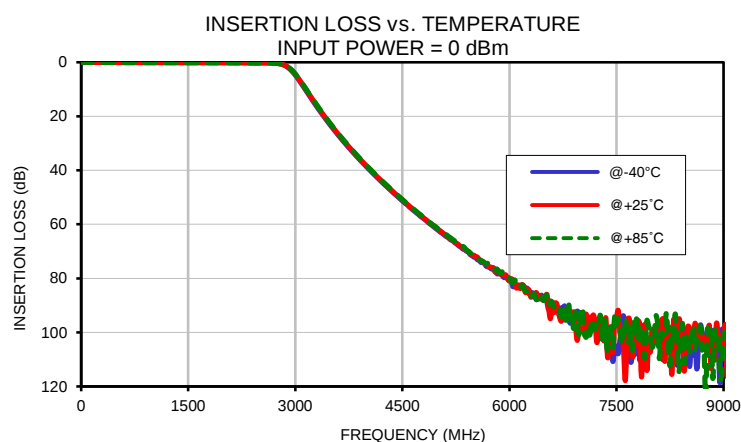
**Low Pass Filter****ZLSS252-100W-S+***Typical Performance Data*

| FREQ. | GROUP DELAY |        |        |
|-------|-------------|--------|--------|
| (MHz) | (nsec)      |        |        |
|       | @-40°C      | @+25°C | @+85°C |
| 25    | 0.51        | 0.50   | 0.51   |
| 50    | 0.51        | 0.50   | 0.51   |
| 100   | 0.51        | 0.50   | 0.51   |
| 150   | 0.51        | 0.50   | 0.51   |
| 200   | 0.50        | 0.50   | 0.50   |
| 250   | 0.50        | 0.50   | 0.50   |
| 300   | 0.50        | 0.50   | 0.50   |
| 350   | 0.50        | 0.50   | 0.50   |
| 400   | 0.50        | 0.50   | 0.50   |
| 450   | 0.51        | 0.50   | 0.50   |
| 500   | 0.51        | 0.50   | 0.51   |
| 550   | 0.51        | 0.51   | 0.51   |
| 600   | 0.51        | 0.51   | 0.51   |
| 650   | 0.51        | 0.51   | 0.51   |
| 700   | 0.51        | 0.51   | 0.51   |
| 750   | 0.51        | 0.51   | 0.51   |
| 800   | 0.51        | 0.51   | 0.51   |
| 850   | 0.52        | 0.51   | 0.51   |
| 900   | 0.52        | 0.52   | 0.52   |
| 950   | 0.52        | 0.52   | 0.52   |
| 1000  | 0.52        | 0.52   | 0.52   |
| 1050  | 0.52        | 0.52   | 0.52   |
| 1100  | 0.53        | 0.52   | 0.52   |
| 1150  | 0.53        | 0.53   | 0.53   |
| 1200  | 0.53        | 0.53   | 0.53   |
| 1250  | 0.53        | 0.53   | 0.53   |
| 1300  | 0.54        | 0.53   | 0.53   |
| 1350  | 0.54        | 0.54   | 0.54   |
| 1400  | 0.54        | 0.54   | 0.54   |
| 1500  | 0.55        | 0.55   | 0.55   |
| 1600  | 0.56        | 0.56   | 0.56   |
| 1700  | 0.57        | 0.57   | 0.57   |
| 1800  | 0.58        | 0.58   | 0.58   |
| 1900  | 0.59        | 0.59   | 0.59   |
| 2000  | 0.61        | 0.60   | 0.60   |
| 2100  | 0.62        | 0.62   | 0.62   |
| 2200  | 0.65        | 0.64   | 0.64   |
| 2300  | 0.67        | 0.67   | 0.67   |
| 2400  | 0.70        | 0.70   | 0.70   |
| 2500  | 0.75        | 0.75   | 0.74   |

# Suspended substrate stripline Low Pass Filter

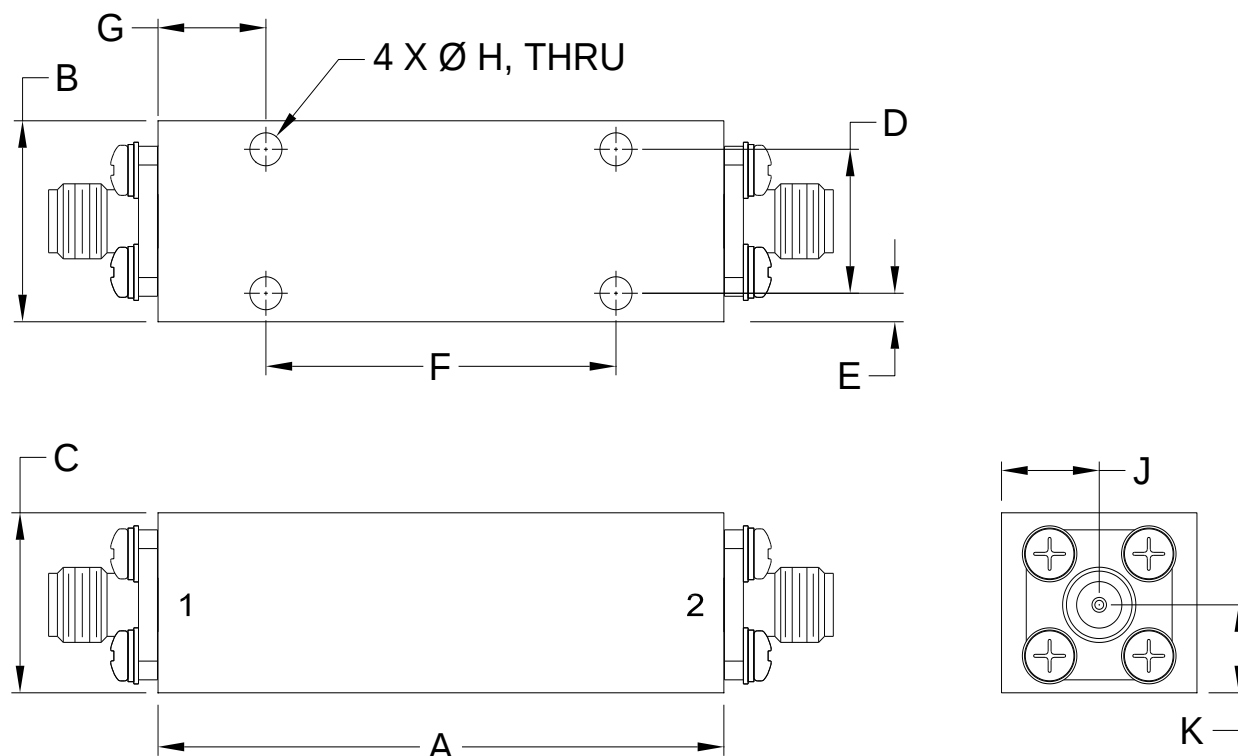
## ZLSS252-100W-S+

### Typical Performance Curves



## Outline Dimensions

ZG3525



| CASE#  | A              | B             | C             | D               | E            | F                |
|--------|----------------|---------------|---------------|-----------------|--------------|------------------|
| ZG3525 | 1.94<br>(49.3) | .67<br>(17.0) | .60<br>(15.2) | .480<br>(12.19) | .10<br>(2.4) | 1.200<br>(30.48) |

| CASE#  | G            | H              | J            | K            | WT. GRAMS |
|--------|--------------|----------------|--------------|--------------|-----------|
| ZG3525 | .37<br>(9.4) | .110<br>(2.79) | .34<br>(8.5) | .29<br>(7.4) | 40        |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .050$ ; 3 Pl.  $\pm .015$

### Notes:

- Case material: Aluminum.
- Case Finish:
  - Case & Cover of the units - Silver plating.
- Refer to the individual model data sheet for the type of connectors available.



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

RF/IF MICROWAVE COMPONENTS



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 Temperature  | Individual Model Data Sheet |
| Storage Temperature   | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |