

# Ultra-Reliable Low Pass Filter

50Ω DC to 2000 MHz

VLP-24



Generic photo used for illustration purposes only

CASE STYLE: FF704

| Connectors | Model  |
|------------|--------|
| SMA        | VLP-24 |

## Maximum Ratings

|                       |                  |
|-----------------------|------------------|
| Operating Temperature | -55°C to 100°C   |
| Storage Temperature   | -55°C to 100°C   |
| RF Power Input*       | 10W max. at 25°C |

\* Passband rating, derate linearly to 0.4xPmax at 100°C ambient. Permanent damage may occur if any of these limits are exceeded.

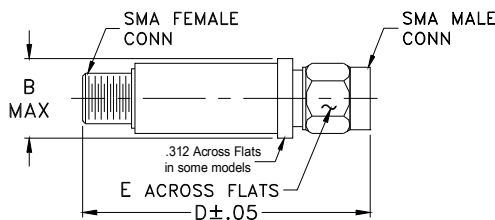
## Features

- rugged unibody construction
- low insertion loss passband, less than 1 dB typ.
- excellent power handling, 10W
- low cost

## Applications

- harmonic rejection
- transmitters/receivers
- lab use

## Outline Drawing



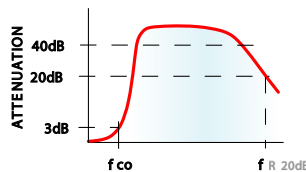
## Outline Dimensions (inch/mm)

| B     | D     | E    | wt    |
|-------|-------|------|-------|
| .410  | 1.43  | .312 | grams |
| 10.41 | 36.32 | 7.92 | 10.0  |

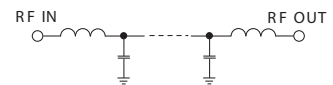
## Electrical Specifications (T<sub>AMB</sub>=25°C)

| PASSBAND<br>(MHz)<br>(loss < 1 dB) | f <sub>co</sub> , MHz<br>Nom.<br>(loss 3 dB) | STOP BAND (MHz) |                |                 | VSWR<br>(:1)<br>Passband<br>Typ. |
|------------------------------------|----------------------------------------------|-----------------|----------------|-----------------|----------------------------------|
|                                    |                                              | (loss > 20 dB)  | (loss > 40 dB) | fr20 dB<br>Typ. |                                  |
| DC-2000                            | 2430                                         | 3450            | 4400           | 8000            | 1.2                              |

## typical frequency response

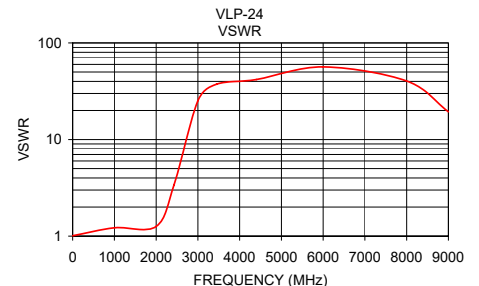


## electrical schematic



## Typical Performance Data

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | VSWR<br>(:1) |
|--------------------|------------------------|--------------|
| 1.00               | 0.04                   | 1.01         |
| 1000.00            | 0.38                   | 1.22         |
| 2000.00            | 0.76                   | 1.26         |
| 2430.00            | 2.99                   | 3.41         |
| 3000.00            | 15.69                  | 25.23        |
| 3450.00            | 25.14                  | 37.40        |
| 4400.00            | 44.45                  | 41.80        |
| 6000.00            | 36.71                  | 56.48        |
| 8000.00            | 21.96                  | 40.32        |
| 9000.00            | 21.54                  | 19.37        |



## Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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REV. D  
M173538  
VLP-24  
ED-10545B/8  
WZ/AD/CP/AM  
200522

# Coaxial Low Pass Filter (Ultra Reliable)

## VLP-24

### Typical Performance Data

| FREQ.<br>(MHz) | INSERTION LOSS<br>(dB) |          |           | INPUT RETURN LOSS<br>(dB) |          |           | OUTPUT RETURNLOSS<br>(dB) |          |           |
|----------------|------------------------|----------|-----------|---------------------------|----------|-----------|---------------------------|----------|-----------|
|                | @ -55° C               | @ +25° C | @ +100° C | @ -55° C                  | @ +25° C | @ +100° C | @ -55° C                  | @ +25° C | @ +100° C |
| 1              | 0.02                   | 0.04     | 0.08      | 48.31                     | 46.06    | 44.87     | 48.21                     | 46.06    | 44.86     |
| 50             | 0.08                   | 0.10     | 0.13      | 38.31                     | 36.05    | 34.86     | 38.52                     | 36.35    | 35.26     |
| 100            | 0.10                   | 0.12     | 0.15      | 38.54                     | 36.76    | 35.12     | 38.67                     | 37.19    | 36.05     |
| 500            | 0.19                   | 0.25     | 0.31      | 31.90                     | 30.00    | 27.98     | 36.27                     | 32.94    | 30.28     |
| 1000           | 0.33                   | 0.43     | 0.52      | 20.40                     | 19.87    | 19.83     | 20.40                     | 19.96    | 20.01     |
| 1200           | 0.40                   | 0.51     | 0.61      | 17.96                     | 18.04    | 18.27     | 17.90                     | 18.03    | 18.31     |
| 1500           | 0.47                   | 0.60     | 0.72      | 17.32                     | 17.72    | 18.05     | 17.22                     | 17.61    | 17.91     |
| 2000           | 0.64                   | 0.82     | 0.99      | 18.52                     | 18.71    | 18.69     | 18.12                     | 18.16    | 17.92     |
| 2130           | 0.80                   | 1.01     | 1.23      | 15.28                     | 15.10    | 14.79     | 14.85                     | 14.60    | 14.20     |
| 2430           | 2.71                   | 3.21     | 3.70      | 5.45                      | 5.16     | 4.90      | 5.28                      | 5.02     | 4.77      |
| 2540           | 4.53                   | 5.16     | 5.77      | 3.22                      | 3.10     | 3.01      | 3.11                      | 3.02     | 2.93      |
| 2755           | 9.54                   | 10.29    | 11.02     | 1.19                      | 1.28     | 1.38      | 1.15                      | 1.24     | 1.32      |
| 2955           | 14.59                  | 15.32    | 16.08     | 0.60                      | 0.77     | 0.92      | 0.57                      | 0.72     | 0.85      |
| 3165           | 19.56                  | 20.26    | 21.00     | 0.39                      | 0.57     | 0.75      | 0.36                      | 0.53     | 0.67      |
| 3400           | 24.74                  | 25.43    | 26.19     | 0.30                      | 0.47     | 0.66      | 0.25                      | 0.44     | 0.59      |
| 3630           | 29.59                  | 30.30    | 31.11     | 0.27                      | 0.44     | 0.61      | 0.20                      | 0.40     | 0.55      |
| 3855           | 34.42                  | 35.23    | 36.16     | 0.25                      | 0.42     | 0.57      | 0.17                      | 0.37     | 0.52      |
| 4045           | 38.97                  | 39.93    | 41.02     | 0.24                      | 0.40     | 0.54      | 0.16                      | 0.36     | 0.52      |
| 4200           | 43.56                  | 44.81    | 46.22     | 0.24                      | 0.40     | 0.53      | 0.15                      | 0.35     | 0.51      |
| 4305           | 47.74                  | 49.45    | 51.44     | 0.23                      | 0.39     | 0.50      | 0.14                      | 0.34     | 0.50      |
| 4375           | 51.57                  | 53.90    | 56.67     | 0.22                      | 0.38     | 0.50      | 0.14                      | 0.34     | 0.49      |
| 4400           | 53.36                  | 56.12    | 59.33     | 0.22                      | 0.38     | 0.49      | 0.14                      | 0.34     | 0.49      |
| 4465           | 59.74                  | 63.45    | 62.90     | 0.22                      | 0.37     | 0.48      | 0.14                      | 0.34     | 0.48      |
| 4595           | 57.05                  | 54.68    | 52.89     | 0.22                      | 0.37     | 0.48      | 0.14                      | 0.34     | 0.48      |
| 4970           | 44.04                  | 43.66    | 43.33     | 0.17                      | 0.34     | 0.43      | 0.12                      | 0.32     | 0.45      |
| 5400           | 39.14                  | 38.99    | 38.81     | 0.15                      | 0.32     | 0.43      | 0.09                      | 0.28     | 0.39      |
| 6200           | 33.50                  | 33.41    | 33.23     | 0.11                      | 0.30     | 0.45      | 0.08                      | 0.27     | 0.39      |
| 7000           | 28.55                  | 28.60    | 28.55     | 0.09                      | 0.31     | 0.55      | 0.10                      | 0.34     | 0.49      |
| 7500           | 25.60                  | 25.63    | 25.55     | 0.09                      | 0.36     | 0.65      | 0.10                      | 0.38     | 0.60      |
| 8000           | 22.31                  | 22.26    | 22.17     | 0.13                      | 0.41     | 0.76      | 0.13                      | 0.41     | 0.65      |
| 8500           | 17.22                  | 16.64    | 15.93     | 0.32                      | 0.66     | 1.11      | 0.29                      | 0.71     | 1.17      |
| 8780           | 10.58                  | 10.65    | 13.54     | 1.78                      | 3.00     | 3.08      | 2.18                      | 3.97     | 3.18      |
| 9030           | 16.43                  | 21.18    | 25.94     | 1.77                      | 1.17     | 1.16      | 0.94                      | 0.97     | 1.22      |
| 9170           | 26.74                  | 31.56    | 32.06     | 0.52                      | 0.68     | 0.92      | 0.52                      | 1.01     | 1.70      |
| 9210           | 29.99                  | 33.16    | 29.99     | 0.42                      | 0.63     | 0.89      | 0.49                      | 1.19     | 1.57      |
| 9360           | 28.15                  | 26.10    | 24.42     | 0.34                      | 0.61     | 0.88      | 0.82                      | 0.85     | 1.16      |
| 9950           | 20.27                  | 19.15    | 18.07     | 0.67                      | 0.98     | 1.17      | 0.76                      | 1.18     | 1.59      |
| 10200          | 14.42                  | 12.41    | 10.45     | 0.75                      | 1.42     | 2.30      | 1.10                      | 2.17     | 4.11      |
| 10370          | 8.52                   | 7.36     | 7.96      | 2.17                      | 3.62     | 3.48      | 4.15                      | 8.43     | 7.83      |
| 10700          | 10.91                  | 12.50    | 13.93     | 0.98                      | 1.05     | 1.15      | 1.39                      | 1.29     | 1.35      |
| 11000          | 15.21                  | 15.57    | 15.68     | 0.42                      | 0.77     | 1.11      | 0.37                      | 0.68     | 1.02      |

REV. X1

VLP-24

071002

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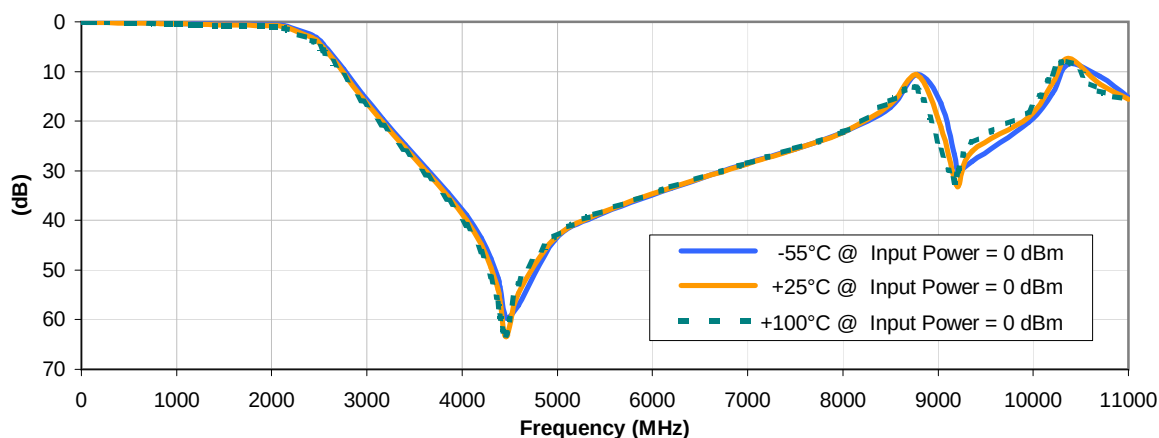
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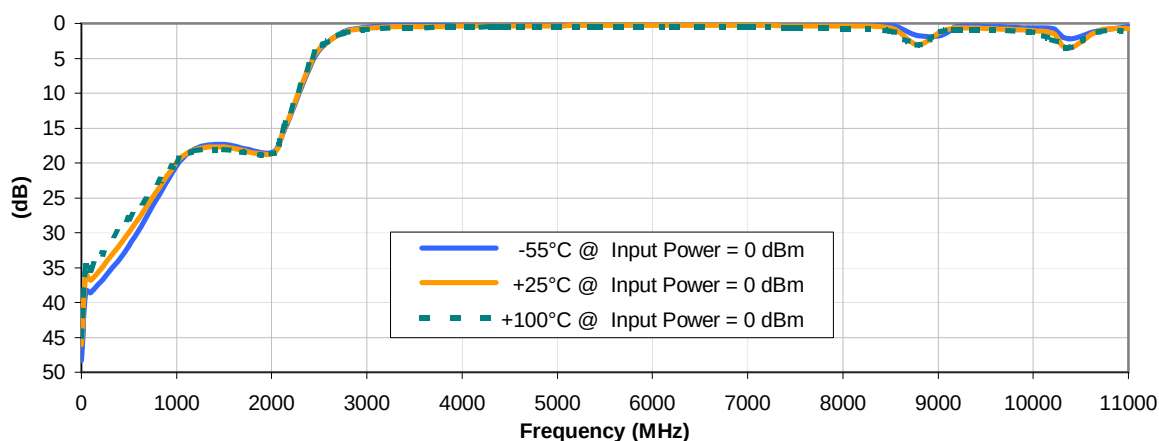


## Typical Performance Curves

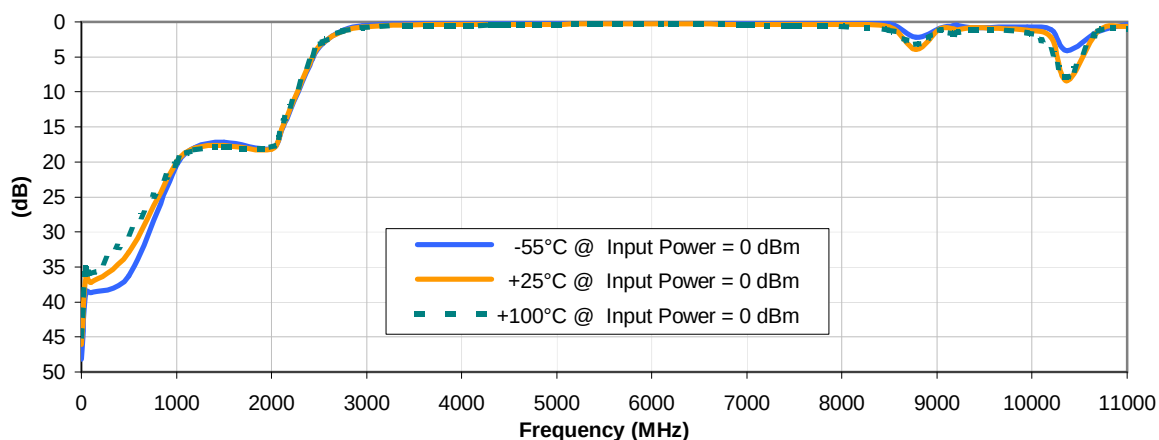
### INSERTION LOSS vs. TEMPERATURE



### INPUT RETURN LOSS vs. TEMPERATURE



### OUTPUT RETURN LOSS vs. TEMPERATURE



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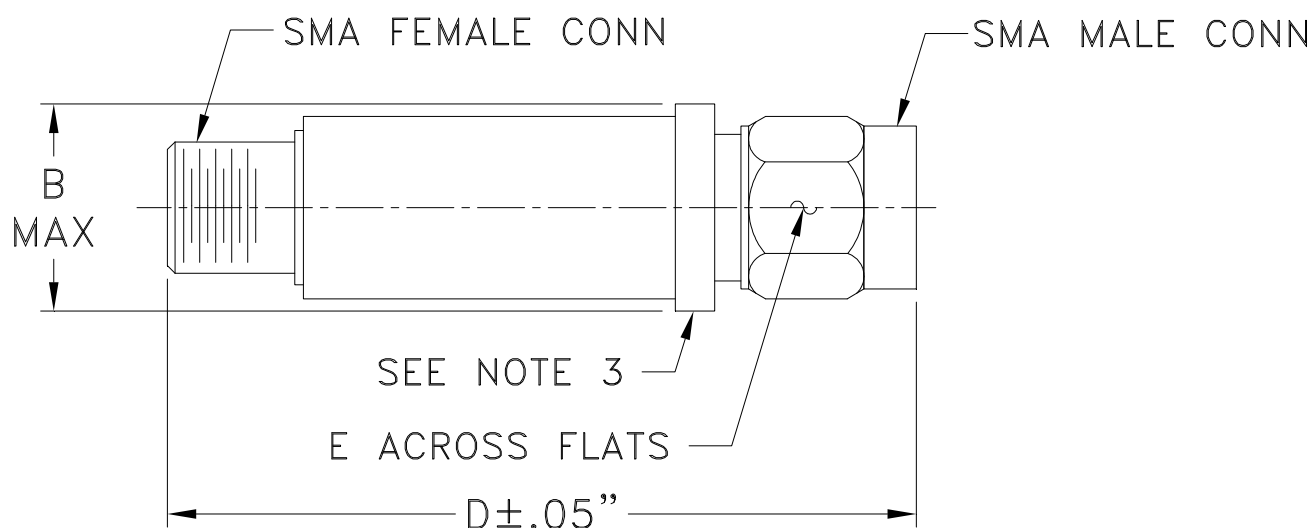
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### Outline Dimensions



| CASE #. | A  | B               | C  | D               | E              | WT GRAMS |
|---------|----|-----------------|----|-----------------|----------------|----------|
| FF704   | -- | .410<br>(10.41) | -- | 1.43<br>(36.32) | .312<br>(7.92) | 10.0     |

Dimensions are in inches (mm). Tolerances: 2Pl. ± .04; 3Pl. ± .030

#### Notes:

1. Case material: Stainless steel.
2. Case finish: Gold plated.
3. Round Flange may have .312 Across Flats in some models.



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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      | -55° to 100°C<br>Ambient Environment                                                   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment                                                  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| 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           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |