$50 \Omega$ DC to 500 MHz ( 40 dB Typ. Isolation up to 20 GHz )

## The Big Deal

- Very good rejection, 40 dB typ. up to 20 GHz
- Excellent power handling, 10W
- Rugged unibody construction


## Product Overview

VLFX-500+ is a $50 \Omega$ low pass filter built in rugged unibody construction. Covering DC-500 MHz bandwidth, these units offer good matching within the passband and high rejection in stopband, 40 dB typ. up to 20 GHz . This will find its applications in harmonic rejection, transmitters / receivers and test instrumentation.

## Key Features

| Feature | Advantages |
| :--- | :--- |
| Low passband insertion loss | Suitable for high performance application |
| Fast roll-off | Provides very good adjacent band rejection |
| Connectorized package | The connectorized package is easy to interface with other devices and well suited for test setups |

[^0]
## Features

- Very good isolation, 40 dB typ. up to 20 GHz
- Excellent power handling, 10W
- Temperature stable LTCC internal structure
- Re-entry frequency > 20 GHz
- Protected by US patent 6,943,646
- Rugged unibody construction


## Applications

- Harmonic rejection
- Transmitters/receivers
- Lab use
- Test instrumentation


## Functional Schematic



## Typical Frequency Response


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


Generic photo used for illustration purposes only CASE STYLE: FF1118
Connectors Model
SMA VLFX-500+
Electrical Specifications ${ }^{(1)}$ at $25^{\circ} \mathrm{C}$

| Parameter |  | F\# | Frequency (MHz) | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Pass Band | Insertion Loss | DC-F1 | DC-500 | - | 1.1 | 1.6 | dB |
|  | Freq. Cut-Off | F2 | 750 | - | 3.0 | - | dB |
|  | VSWR | DC-F1 | DC-500 | - | 1.15 | - | $: 1$ |
| Stop Band | Insertion Loss | F3 | 900 | 20 | 33 | - | dB |
|  | VSWR | F4-F5 | $1100-20000$ | - | 40 | - | dB |
|  | F3-F5 | $900-20000$ | - | 10 | - | $: 1$ |  |

(1) In Application where DC voltage is present at either input or output ports, coupling capacitors are required.

| Maximum Ratings |  |
| :--- | :---: |
| Operating Temperature | $-55^{\circ} \mathrm{C}$ to $100^{\circ} \mathrm{C}$ |
| Storage Temperature | $-55^{\circ} \mathrm{C}$ to $100^{\circ} \mathrm{C}$ |
| RF Power Input* | 10 W max. |

Passband rating, derate linearly to 3.5 W at 100 Cambie exceed
Typical Performance Data at $25^{\circ} \mathrm{C}$

| Frequency <br> $(\mathbf{M H z})$ | Insertion Loss <br> $(\mathbf{d B})$ | VSWR <br> $(: 1)$ |
| :---: | :---: | :---: |
| 10 | 0.13 | 1.04 |
| 250 | 0.53 | 1.15 |
| 500 | 0.94 | 1.05 |
| 730 | 2.99 | 1.62 |
| 750 | 3.73 | 1.65 |
| 840 | 19.87 | 4.87 |
| 865 | 30.17 | 6.37 |
| 900 | 37.15 | 8.08 |
| 1100 | 40.78 | 14.50 |
| 1500 | 49.60 | 23.81 |
| 2000 | 63.15 | 30.49 |
| 4000 | 82.68 | 42.38 |
| 5000 | 59.06 | 9.13 |
| 8000 | 51.44 | 34.07 |
| 10000 | 83.79 | 13.49 |
| 12500 | 55.46 | 7.66 |
| 15000 | 45.93 | 23.18 |
| 17500 | 63.27 | 10.56 |
| 18500 | 51.77 | 4.08 |
| 20000 | 52.75 | 5.61 |



## Coaxial Connections

| INPUT | SMA-Male |
| :--- | ---: |
| OUTPUT | SMA-Female |

## Outline Drawing



## Outline Dimensions ( ${ }^{\text {inch }} \mathrm{mm}$ )

| B | D | $E$ | wt. |
| ---: | ---: | ---: | ---: |
| .410 | 2.67 | .312 | grams |
| 10.41 | 67.82 | 7.92 | 17.0 |

[^1]
## 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/MCLStore/terms.jsp

| FREQ. | INSERTION LOSS | INPUT RETURN LOSS | OUTPUT RETURN LOSS |
| :---: | :---: | :---: | :---: |
| (MHz) | (dB) | (dB) | (dB) |
| 10 | 0.13 | 34.12 | 34.17 |
| 50 | 0.23 | 29.21 | 30.47 |
| 75 | 0.27 | 28.37 | 30.60 |
| 100 | 0.31 | 26.82 | 30.28 |
| 200 | 0.46 | 24.00 | 34.90 |
| 300 | 0.60 | 23.19 | 26.66 |
| 500 | 0.94 | 32.52 | 25.97 |
| 525 | 1.00 | 30.44 | 26.90 |
| 550 | 1.08 | 26.43 | 26.39 |
| 575 | 1.17 | 22.94 | 23.69 |
| 600 | 1.29 | 20.05 | 20.48 |
| 625 | 1.45 | 17.72 | 17.66 |
| 650 | 1.66 | 15.83 | 15.29 |
| 675 | 1.94 | 14.33 | 13.27 |
| 700 | 2.31 | 13.25 | 11.53 |
| 725 | 2.85 | 12.63 | 9.92 |
| 750 | 3.73 | 12.23 | 8.18 |
| 775 | 5.46 | 10.57 | 6.07 |
| 800 | 9.00 | 7.11 | 3.99 |
| 825 | 15.06 | 4.51 | 2.74 |
| 850 | 23.61 | 3.20 | 2.22 |
| 875 | 34.90 | 2.54 | 1.98 |
| 900 | 37.15 | 2.16 | 1.83 |
| 925 | 36.22 | 1.91 | 1.72 |
| 950 | 37.99 | 1.73 | 1.62 |
| 975 | 41.75 | 1.60 | 1.53 |
| 1000 | 47.97 | 1.49 | 1.46 |
| 1100 | 40.78 | 1.20 | 1.25 |
| 1200 | 39.23 | 1.01 | 1.23 |
| 1250 | 39.80 | 0.94 | 1.28 |
| 1500 | 49.60 | 0.73 | 1.88 |
| 1750 | 63.96 | 0.64 | 1.94 |
| 2000 | 63.15 | 0.57 | 2.72 |
| 2500 | 88.82 | 0.48 | 1.04 |
| 2750 | 73.96 | 0.43 | 0.93 |
| 3000 | 76.71 | 0.38 | 0.89 |
| 3500 | 71.73 | 0.30 | 0.95 |
| 4000 | 82.68 | 0.41 | 1.05 |
| 5000 | 59.06 | 1.91 | 1.73 |
| 7500 | 59.29 | 0.46 | 0.55 |
| 8000 | 51.44 | 0.51 | 0.54 |
| 9000 | 55.88 | 0.57 | 0.58 |
| 10000 | 83.79 | 1.29 | 0.60 |
| 11000 | 50.49 | 1.64 | 1.11 |
| 11500 | 52.12 | 4.17 | 0.67 |
| 12000 | 60.56 | 8.98 | 0.44 |
| 12500 | 55.46 | 2.28 | 0.49 |
| 13000 | 46.96 | 1.59 | 1.87 |
| 13500 | 39.56 | 1.78 | 1.72 |
| 14000 | 52.65 | 0.79 | 0.41 |
| 14500 | 57.66 | 0.72 | 0.37 |
| 15000 | 45.93 | 0.75 | 0.24 |
| 15500 | 45.85 | 0.73 | 0.39 |
| 16000 | 58.06 | 0.80 | 0.34 |
| 16500 | 60.12 | 0.88 | 0.58 |
| 17000 | 63.73 | 1.20 | 0.57 |
| 18500 | 51.77 | 4.35 | 1.41 |
| 19000 | 46.12 | 5.19 | 1.87 |
| 19500 | 55.38 | 3.20 | 2.45 |
| 20000 | 52.75 | 3.13 | 2.21 |

## Typical Performance Curves



## Case Style

## Outline Dimensions



Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .04 ; 3 P 1 . \pm .030$

## Notes:

1. Case material: Stainless steel.
2. Case finish: Gold plated.
3. Round Flange may have . 312 Across Flats in some models.
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs \& shopping online see Mini-Circuits web site The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

## $\square$ 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 | $-55^{\circ} \text { to } 100^{\circ} \mathrm{C}$ <br> Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | $-55^{\circ} \text { to } 100^{\circ} \mathrm{C}$ <br> Ambient Environment | Individual Model Data Sheet |
| Barometric Pressure | 100,000 Feet | MIL-STD-202, Method 105, Condition D |
| Humidity | $90 \% \mathrm{RH}, 65^{\circ} \mathrm{C}$ <br> Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103 |
| Thermal Shock | $-65^{\circ}$ to $125^{\circ} \mathrm{C}, 5$ cycles | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20 g peak, $10-2000 \mathrm{~Hz}, 12$ times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock | $100 \mathrm{~g}, 6 \mathrm{~ms}$ sawtooth, 3 shocks each direction 3 axes (total 18) | MIL-STD-202, Method 213, Condition I |
| ENV28 Rev: B 09/26/13 M143494 File: ENV28.pdf |  |  |
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[^1]:    Note: Please refer to case style drawing for details

