

# Low-pass filter achieves high rejection up to 20 GHz

Implementing a 21-section cascaded Butterworth filter in its proprietary low-temperature, co-fired ceramic (LTCC) technology and combining it with a novel patented construction technique, **Mini-Circuits** has developed an unprecedented low-pass passive filter with very high rejection from low frequency to 20 GHz at low cost. This low-pass filter, labeled VLFX, achieves 40 dB (typical) rejection from low frequency all the way up to 20 GHz.

To achieve high performance with ruggedness and low electrical resistance at the interconnects between the filter and the connectors, this low-pass filter exploits the benefits of patented construction technology called Unibody. In this scheme, the 21-section LTCC filter, shielding, the body of the unit and the SMA connectors are all integrated in a single patented methodology called Unibody (Figure 1). As a result, the interconnect losses are significantly minimized and the reliability of the product substantially improved, according to the manufacturer.

Besides offering good isolation in the stopband, the VLFX family is also designed to offer less than 1.1 dB maximum insertion loss in the passband (Figure 2). In addition, a typical voltage standing wave ratio (VSWR) in the passband is rated at 1.2. Temperature stable, the maximum input power for the unit is 5 W at 25° C. The operating temperature range for the unit is -55° C to +100° C.

According to the company, this low-pass filter family offers 19 different models. However, only three are described here. While VLFX-80 offers a cut-off frequency of 80 MHz, VLFX-400 spans a passband of dc to 400 MHz. Likewise, VLFX-800 is rated to offer a passband of dc to 800 MHz. The filters come with SMA male/female connectors. Target applications for these filters include harmonic rejection, transmitters/receivers, Lab use, and test instrumentation. Available now, the VLFX low-pass filter starts at \$39.95 in quantities of 1-9.

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Figure 1. This low-pass filter exploits the benefits of patented construction technology called Unibody.

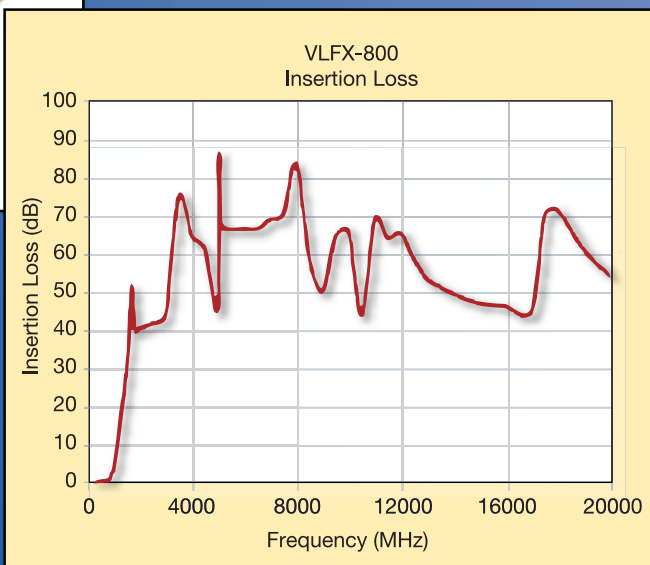


Figure 2. The maximum passband insertion loss is less than 1.1 dB.