

Frequency Multipliers Offered in Carrier or Packaged Form

These new frequency multipliers include a 6 to 12 GHz doubler and a 4.2 to 7 GHz tripler, offered in either connectorized machined packages or on carrier substrates

MITEQ has introduced two new multiplier models, SYS2XA4509H and SYS3XA1957H, which are available in either carrier form or standard SMA housing form.

Multipliers are used to extend the range of fundamental-frequency oscillators and synthesizers for numerous microwave applications, such as receiver local oscillator chains, radar systems, instrumentation, interferometers, radiometers and general purpose signal sources. They are constructed using typical building block circuits: passive multipliers, bandpass filters and amplifiers.

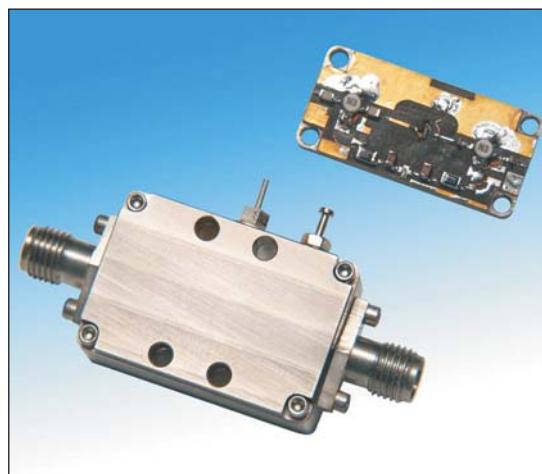
New Model Specifications

Model SYS2XA4509H is a doubler with 10 dBm output from 6 to 12 GHz, for a +5 dBm input. Model SYS3XA1957H is a tripler with 12 dBm output from 4.2 to 7 GHz, for a +4 dBm input. Both units operate on +5 volts and have typical input harmonic suppression of 15 dBc. In carrier form, the multipliers both measure 0.920 × 0.444 × 0.125 inches.

Multiplier Performance Notes

Multipliers generate harmonic energy by using some of the energy contained in the fundamental frequency. The output of a passive multiplier exhibits a typical loss relative to the fundamental of 12 dB (×2), 15 dB (×3), 22 dB (×4) or 23 dB (×5).

Losses may be overcome by using an amplifier, but the signal-to-noise ratio will remain reduced, which affects both the noise floor and phase noise. Phase noise increases



MITEQ's new multipliers are offered in carrier form or in machined packages with SMA connectors.

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by approximately $20 \log(N) + 3$ dB, where N is the multiplication factor.

Although unwanted harmonics can be filtered in a narrow band application, a wide band multiplier may pass more than one harmonic. The architecture of the multiplier can create predominantly odd or even harmonics, which reduces level of the next-order products. See the manufacturer's specifications for each particular model's unwanted harmonic and spurious performance.