

CM- AND MM-WAVE DIODE FREQUENCY MULTIPLIERS

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Diode frequency multipliers are widely used in small-size solid-state signal sources for cm- and mm-wave range.

Microwave signal generation method using frequency multiplier provides:

- operation in a high frequency range up to 200 GHz and more;
- wide-band;
- large enough output power;
- low phase noise;
- AM/FM possibility.

Step-recovery diodes (SRD) and Schottky-barrier diodes are used as nonlin-ear elements in frequency multipliers.

A set of SRD frequency multipliers (narrow- and wide-band) is designed and manufactured for use in cm-wave range from 0.1 to 26 GHz. There are doublers and triplers in frequency range 2-26 GHz; multi-pliers with multiplication factor 15 and more; super components on the base of mul-

tipliers, band-pass filters and switches (2 - 6.6/2 - 26.4 GHz) with $P_{out} \approx 10$ dBm.

Set of mm-wave multipliers are de-signed and manufactured:

1. SRD FREQUENCY MULTIPLI-ERS are used in the range up to 50-60 GHz. They are manufactured on the base of coaxial-to-waveguide adapters which provide ~ 7 -13 dB loss in 50-250 mW input power dy-namic range.

2. WIDE-BAND PHASESTABILITY PASSIVE SCHOTTKY VARAC-TOR DOUBLERS and TRIPLERS with waveguide output are used in 18-180 GHz frequency range.

3. MULTICASCADE WIDE-BAND PASSIVE AND ACTIVE FRE-QUENCY MULTIPLIERS ($\times 4, \times 6, \times 9, \times 12 \dots$) are used in 50-180 GHz frequency range with $P_{out} \approx 2$ dBm up to 75 GHz, 0 dBm up to 110 GHz, -7 dBm up to 180 GHz.

Design principles of frequency multipliers for operation in severe condi-tions are presented.