

# Frequency Tripler 213A

## High-Efficiency 200 – 235 GHz

### Bias-able Frequency Tripler in WR-4.3 Based on ACST's High-Power Multiplier Technology.

213x series is a family of passive frequency triplers which require bias. These triplers are based on ACST high-power multiplier technology, covering frequency range between 200 GHz and 300 GHz. This series allows for building cost-effective high-power MM-Wave sources in combination with most powerful commercially-available High-Power Amplifier MMIC technology developed for fixed service in telecommunications within frequency bands of 71 – 76 GHz; 81 – 86 GHz and 92 – 95 GHz.

All multiplier designs within this series are based on balanced configuration to suppress undesired harmonics. These triplers provide a conversion efficiency of typically >15 % within frequency bandwidth of about 12-17 %, and they can reliably handle up to 350 mW of input power. For even higher power level requirements please ask ACST for availability of ultrahigh-power versions.

Model 213B is a standard version of this family. It requires input signal within frequency range of 66.66 to 78.33 GHz generating output signal within frequency range of 200 to 235 GHz. Bias control is required for optimal operation at specified input power levels. ACST usually provides a bias box (711B) calibrated according to customer specification for typically available input power.

Various options can optionally be offered and integrated on customer request:

- Horn antenna (for coupling the output signal to free space),
- Waveguide sections compatible with the output RF-port
- Waveguide Variable or fixed Attenuator
- Dedicated Source to provide optimal input RF power

Please consult [sales@acst.de](mailto:sales@acst.de) for available options for this product type



#### Product Features

- > Compactness & High-Efficiency
- > Large bandwidth
- > Flat response

### Technical Specification

	Minimum	Typ	Maximum
Input Port (UG 387/U-M)		WR-12	
Input Frequency (GHz)	66.66		78.33
Input Power (dBm)	+18	+24	+25.5
Output Port (UG 387/U-M)		WR-4.3	
Output Frequency (GHz)	200		235
Output Power (dBm)	+11	+16.5	+18.5
Conversion Efficiency* (%)	10	18	24
Input VSWR	1.45:1	1.6:1	1.9:1
Material		Brass	
Finishing		Gold-Plated	

#### Application Areas

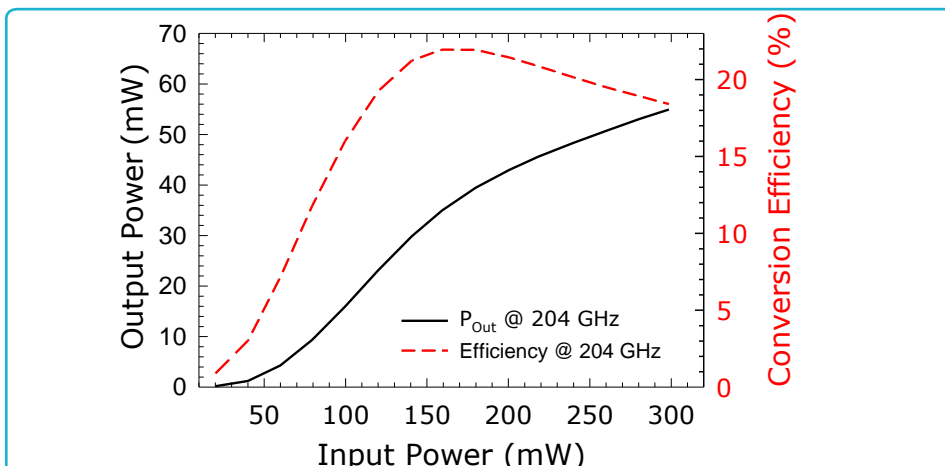
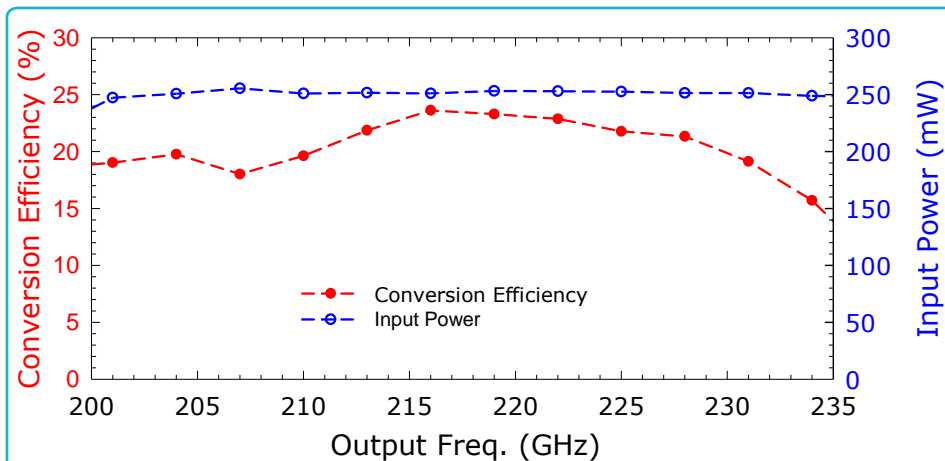
- > Laboratory instrumentation
- > MM-wave FMCW-Radar
- > Active imaging
- > 5G Telecommunications
- > LO Source for MM/SubMM wave heterodyne receivers

\* Lower Efficiency may be expected at input power lower than specified and near the band edges.

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### Typical Performance



### Absolute Maximum Ratings

	Maximum
Input Power (dBm)	+26
Operational Temperature and Humidity	5 °C to 45 °C // 0% to 80%
Storage Temperature and Humidity	5 °C to 65 °C // 0% to 80%

### Order information

- Please indicate product name and type.
- Please indicate expected input power requirements

### Notes

- > All plotted data represent typical values. The actual data may vary from unit to unit.
- > All tests are carried out at a room temperature of 24 °C.
- > All tests are carrier out using the included Bias Box 711B

### Caution

- > Absolute maximum ratings should not be used under normal operating conditions. Exceeding maximum ratings may lead to permanent failure.
- > Any foreign body inserted into the waveguide will cause a loss of performance and may damage the device.

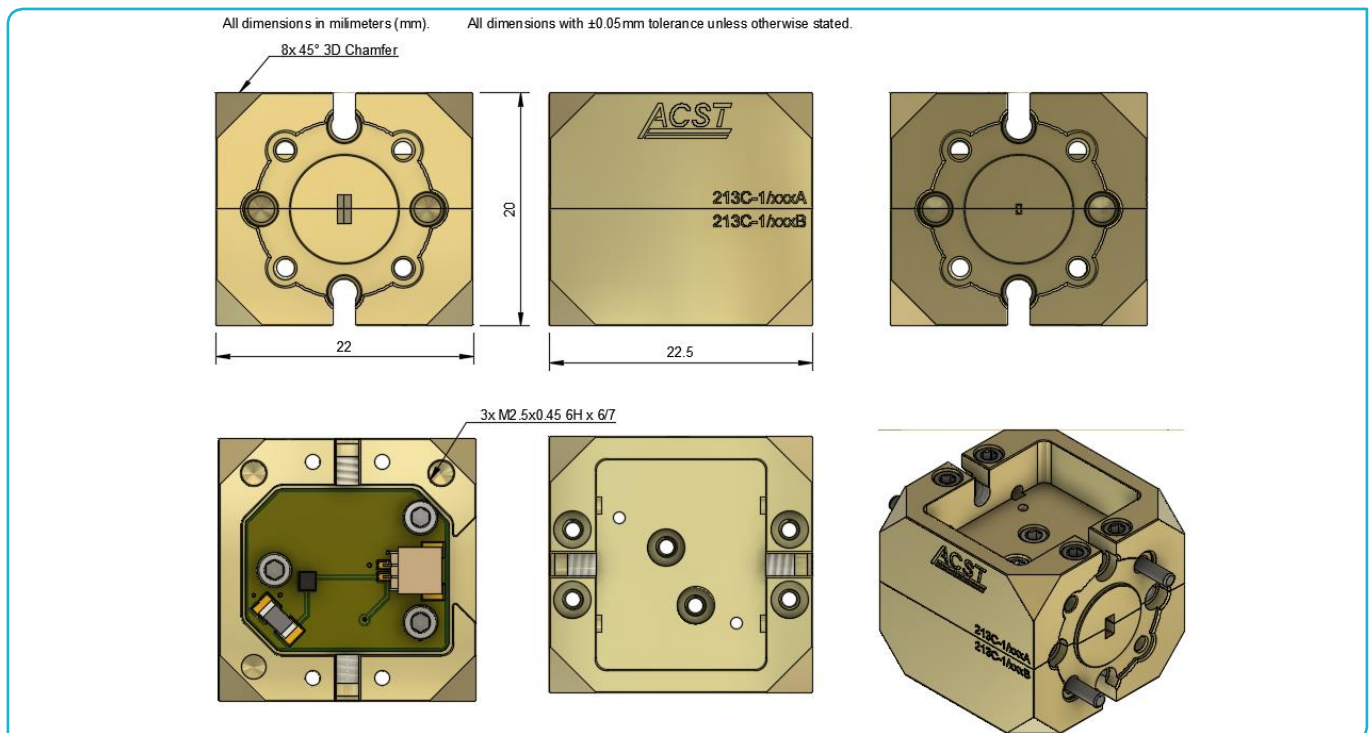


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### Outline Dimensions



### Mechanical Description

	Maximum
Size (without dowel pin)	22.5 mm x 22 mm x 20 mm
Output Waveguide Orientation	E-Plane