

CONTINUOUS WAVE TERAHERTZ EMITTER MODULES



AT A GLANCE

Ultra-broadband photomixing for 1.5 μm optical wavelength, emitted THz power confirmed by PTB (Physikalisch Technische Bundesanstalt)



Features

- Up to 800 μW THz power
- Up to 5.5 THz bandwidth
- Photodiode-based emitter
- Robust housing and fiber coupling

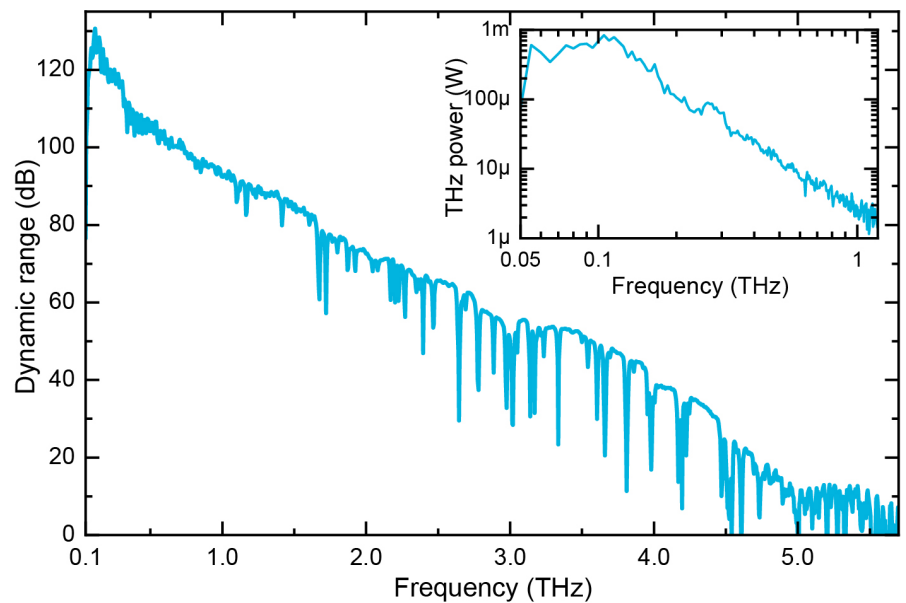
Applications

- High-bandwidth terahertz spectroscopy
- Industrial process control
- Non-contact thickness measurement
- High-speed measurements
- High-speed wireless communication

Technical background

The photoconductive generation of continuous wave (cw) terahertz radiation converts the beat frequency of two lasers into an electrical THz signal. The frequency resolution of cw THz systems is only limited by the linewidth of the lasers. Frequency-domain THz systems are particularly suited for applications in high-resolution spectroscopy, such as precise monitoring of specific spectral lines, non-destructive testing as well as (sub-) THz communications.

HHI's THz modules leverage mature telecom technology, thereby facilitating the integration of THz technology into industrial applications and environments.



Performance of cw THz emitter modules in a coherent spectrometer for operation conditions given in the specifications [Deumer et al., JIMT 45 (2024)].

Specifications

- Optical wavelength: 1.5 μm
- Optical power: 30 mW
- Bias voltage: -1.5 V
- Spectral range: 0.1 - 5.5 THz
- Output power:
 - >680 μW @ 100 GHz
 - >12 μW @ 500 GHz
 - >1 μW @ 1 THz
- Diameter of module: 25 mm



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Deumer, M. et al. Ultra-Wide-band PIN-PD THz Emitter with >5.5 THz Bandwidth. *J Infrared Milli Terahz Waves* 45, 831–840 (2024).