

# PULSED TERAHERTZ EMITTER AND RECEIVER MODULES

## AT A GLANCE

- Photoconductive switches for 1.5  $\mu\text{m}$  optical wavelength
- Emitted THz power confirmed

by 



## Features

- Up to 100  $\mu\text{W}$  THz power
- Photoconductive Emitter and Receiver
- Mesa-structured InGaAs chips
- Small module footprint
- Plug and play design

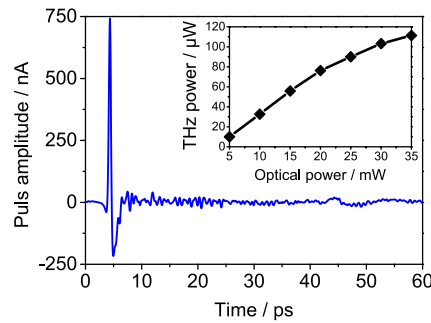
## Applications

- High-bandwidth terahertz spectroscopy
- Industrial process control
- Non-contact coating film thickness measurement
- High-speed measurements

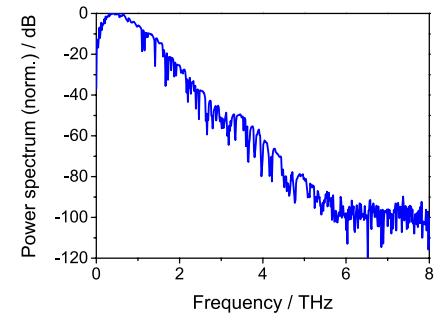
## Specifications

- THz power (typ.)                    30  $\mu$ W
- Spectral range                    0.1 - 5.0 THz
- Dynamic range (peak)            >90 dB
- Optical wavelength                1.5  $\mu$ m
- Maximum optical power          30 mW
- Optical pulse duration            100 fs\*
- Emitter bias voltage                100 V
- Measuring head diameter 25 mm

\* at emitter position



Trace of electrical THz pulse for 30mW optical power. The inset shows the emitted THz power vs. optical illumination power.



Frequency spectrum recorded with HHI's pulsed Terahertz modules. Operation conditions are given in the specifications.

## Technical background

In terahertz time domain spectroscopy (THz-TDS), a device under test (DUT) is probed with a short THz pulse. The frequency dependence of loss and refractive index is extracted from the detected pulse via a Fourier transform. Typical applications for pulsed THz radiation are depth-resolved imaging

for e.g. 3D quality inspection and spectroscopic measurements beyond 3 THz. HHI's High Power THz modules allow for faster measurements and therefore facilitate the transfer of THz technologies to industrial applications and environments.

## The Fraunhofer HHI

One of the prime research and development foci of the Fraunhofer Heinrich Hertz Institute lies in photonic networks, components and systems and their application in fields such as digital media.

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