

THz-ANTENNAS FOR 800 nm

THE SOLUTION FOR FREE-SPACE THz SYSTEMS



The Tera8 comprises six dipole structures on one single chip. With the "6 in 1" approach highest bandwidth and highest sensitivity on one chip become reality. Each chip can be used as emitter or as detector.

Make no compromise in performance and flexibility!

We bring Tera8 to the market with our collaborator the IPM, the Fraunhofer Institute for Physical Measurement Techniques IPM.



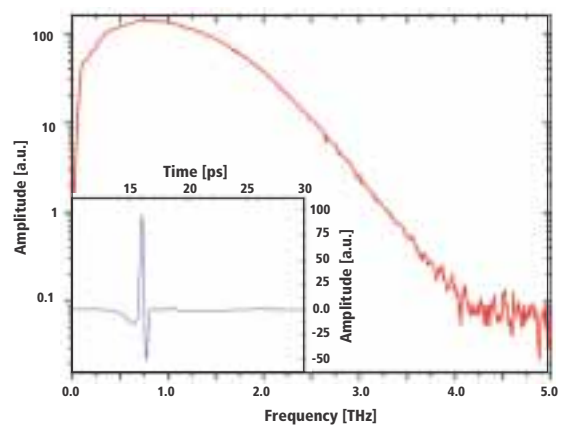
Features

Photoconductive switch optimized for lasers around 800 nm and pulse width <150 fs

6 dipole structures on each chip

Low temperature (LT) grown GaAs dipole structure

We test each device and include the individual test report in the shipment



Spectrum of emitted THz radiation (insert shows data plot of electrical field as function of time)

Test Conditions for Data Plots

Optical source: fs fiber laser operating at 780 nm and 130 fs pulse width

Data recorded with 20 μm dipole used on emitter and detector side

Mechanical chopper with 1 kHz

Lock-in detection with 30 ms integration time

10 mW of optical input power at emitter and detector side

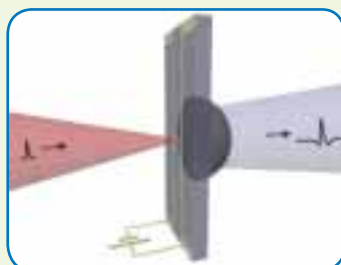
Up to 45 V bias for emitter

The THz region of the electromagnetic spectrum lies between the microwave and the infrared part. THz waves are of major interest in spectroscopy, quality control and security applications.

Photoconductive switches are used as emitters and detectors for THz radiation. Simply illuminate the antenna with femtosecond optical pulses and get THz waves.

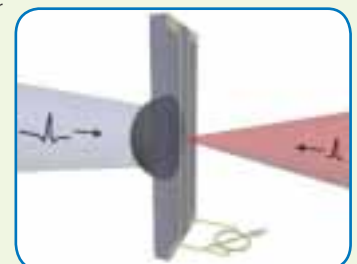
THz Generation

A photoconductive antenna, e.g. a low temperature grown GaAs layer with metallic contacts can be used as an optical excited broadband terahertz emitter. Typically, an alternating voltage is supplied to the contacts to allow a lock-in measurement. Two important antenna parameters are the dipole length and the gap distance of the antenna structure. The dipole length determines the preferred emitted frequency at the resonance condition. Typically, a silicon lens aligned with the antenna is used to increase the extraction efficiency for the THz waves.



THz Detection

The detector has a similar or even exactly same design as the emitter. The optimal gap between the metallic contacts is about equal to the laser spot diameter. A current amplifier connected to the detector contacts delivers a signal proportional to the terahertz electric field strength.



TERA8

THz-ANTENNAS

SPECIFICATIONS

Bonded Structure

6 Dipole Structures

- 10 μm : Generation of THz radiation with highest bandwidth
- 20 μm : Our standard length for high bandwidth and high sensitivity, there are 3 dipole structures of this length on each chip
- 40 μm : High dynamic range at medium bandwidth
- 60 μm : Generation of THz waves with highest dynamic range

Gap Size: 5 μm

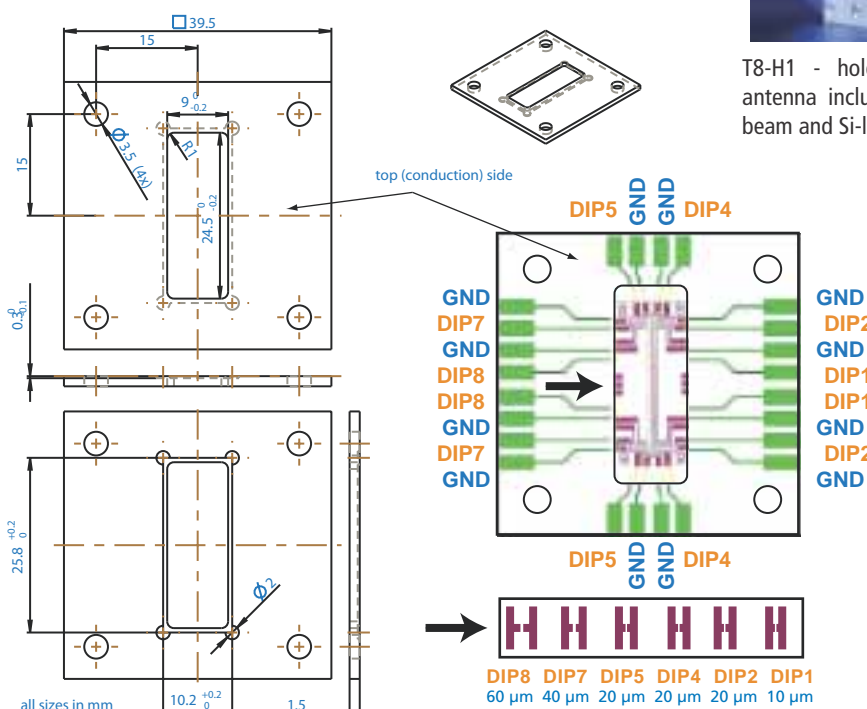
Substrate Size: 25.8 x 10.2 x 0.35 mm³

The chip comes mounted on a 40 x 40 mm² PCB.

Optional alignment package T8-H1 can be ordered separately.



T8-H1 - holder for photoconductive THz antenna including focusing lens for optical beam and Si-lens for THz waves



Tera8 - 6 dipole structures on each chip

RECOMMENDED OPTICAL LIGHT SOURCES

Menlo Systems Femtosecond Fiber Lasers

- C-Fiber 780
- C-Fiber A 780
- T-Light 780
- M-Fiber A 780

ORDERING INFORMATION

Tera8	€ 2,000
Package of Tera8 and T8-H1 Holder	€ 5,250

For OEM quantities please call for pricing. Prices and Specifications are subject to change without notice.

Last updated: January 12, 2009

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