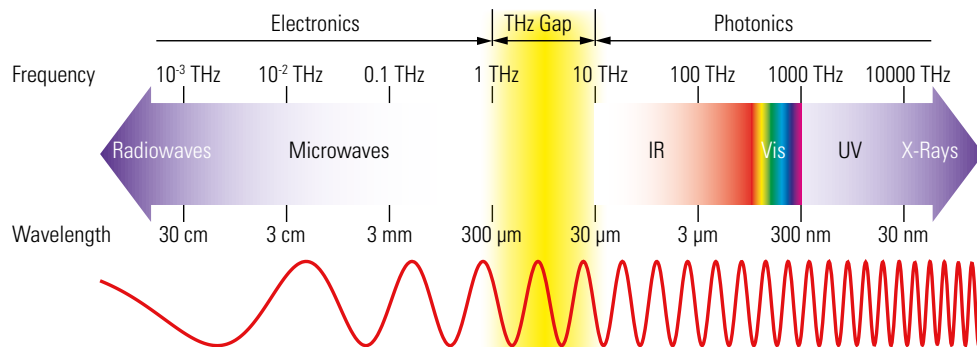


TERAHERTZ DETECTORS

Overview of the different models

WHAT IS TERAHERTZ RADIATION?

The THz portion of the electromagnetic spectrum fills the gap between the far infrared and the microwaves. More precisely, it is nestled between the high-frequency edge of the microwave band, 300 GHz (3×10^{11} Hz), and the long-wavelength edge of far-infrared light, 3000 GHz (3×10^{12} Hz or 3 THz). In wavelengths, this range corresponds to 0.1 mm (or 100 μm) infrared to 1.0 mm microwave. The THz band is set in the region where electromagnetic physics can best be described by its wave-like characteristics (microwave) and its particle-like characteristics (infrared).



WHAT IS IT USED FOR?

THz radiation is interesting because of the way it interacts with matter:

- It can penetrate things like wood, plastics, clothing, and other materials.
- It is also absorbed by water, or a material that contains water, like human skin.
- It is non-ionizing and therefore not harmful to humans like X-rays can be.

One of the first uses is the “full body scan” used at airports. It also has uses in medical applications for early detection of cancer cells.

HOW IS IT MEASURED?

THz sources range in power from nW to mW and in energy from nJ to mJ. Like most electromagnetic sources, they must be characterized for performance and/or control.

Older THz detection methods include:

- Golay cells
- Microbolometers
- Electronic antennas

Newer THz detection methods include:

- Pyroelectric detectors
- Schottky diode detectors
- Photoacoustic detectors

WHY ARE GENTEC-EO PRODUCTS BETTER?

Golay cells are large, fragile, costly and have a limited measurement range.

Pyroelectric detectors (like the ones used in our THz detectors) are small, sensitive, durable and less costly. Some of their advantages are:

- High performance in a small package
- Broad spectral response (from 0.25 to 3000 μm)
- Wide dynamic range (from nW to mW)
- Rugged and durable
- Very cost-effective

TERAHERTZ DETECTORS

Overview of the different models

We have designed a unique line of thermal sensors and meters for measurements in the THz region. These products are used to measure power (radiant flux or irradiance) and energy of CW, pulsed and quasi-CW THz sources from 30 THz to 0.1 THz. Our product line includes the QS series of miniature pyroelectric detector hybrids that include an operational amplifier and can be easily integrated into THz instrumentation.



T-Rad

THZ-B DETECTORS, WITH T-RAD RADIOMETERS

- Large area: 5 mm and 9 mm \varnothing
- Wide dynamic range: 10 nW to 20 mW
- Broad spectral response with BL coating: 0.1 μm to 3000 μm
- Two output options:
 - "DZ" models used with our digital T-RAD lock-in radiometer, for USB output to PC. Includes a powerful standalone LabVIEW software.
 - "DA" models used with our T-RAD-ANALOG power supply, for analog BNC output to your oscilloscope or lock-in amplifier.

■ CHOICE OF ANALOG OR DIGITAL OUTPUT

THZ5I-BNC: ANALOG RADIOMETER & JOULEMETER



- Very sensitive pyroelectric radiometer and joulemeter
- 5 mm \varnothing detector with BL broadband absorber
- Wide dynamic range: 10 nW to 63 μW and 10 nJ to 2 μJ
- Analog BNC output to your oscilloscope or lock-in amplifier

■ CAN BE USED BOTH FOR POWER AND ENERGY MEASUREMENTS

THZ-D: POWER DETECTORS FOR USE WITH GENTEC-EO METERS



Available with

integra

- THZ12D-3S-VP:
 - Large area: 12 mm \varnothing
 - Wide dynamic range: 0.1 mW to 3 W
 - Spectrally flat ($\pm 5\%$) from 30 THz to 0.7 THz

- THZ9D-20mS-BL:
 - Large area: 9 mm \varnothing
 - High sensitivity: 500 nW to 20 mW
 - Spectral correction factors provided from 0.25 μm to 3000 μm

■ COMPATIBLE WITH OUR STANDARD DISPLAYS & PC INTERFACES

QS-THZ: MINIATURE HYBRID PYROELECTRIC DETECTORS



- Standard sizes: 5 and 9 mm \varnothing active area (other sizes available)
- Wide dynamic range: nW to mW and nJ to mJ
- Broad spectral response with BL coating: 0.1 μm to 3000 μm
- Small packages: TO5 & TO8
- Includes integrated operational amplifier

■ TRY THEM WITH OUR EVALUATION TEST BOX QS-I-TEST