

# Terahertz Photoconductive Antennas (THz-PCAs)

T-Era-20D-800-air



## Key Features

- Rugged Packaging
- Large THz Signal
- Integrated Silicon Lens
- Standard Ø1/2" Adaptor
- Easy to Mount
- Built-in Protection Circuit
- Ready to Use

## Applications

- Terahertz Spectroscopy
- Terahertz Imaging
- Material characterization
- Material sensing
- Non-destructive test
- Terahertz spectroscopy
- Hidden object detection
- Product inspection
- Manufacturing quality control
- Material identification, such as: plastics; pulp and paper; gels organic powders; adhesives
- Thickness measurement and uniformity analysis
- Coating and thin film analysis
- Additives analysis
- Electronic chip fault analysis
- THz Time-domain Systems

## Product Overview

The T-Era-20D-800-air terahertz photoconductive antenna (THz-PCA) is used to generate and detect high power and wideband terahertz pulses in THz time-domain systems. The T-Era-20D-800-air THz-PCA is made on high resistive ultra-fast epitaxially grown low-temperature GaAs (LT-GaAs) substrates and is packaged in TeTechS' patent pending THz chip enclosure module. The enclosure module houses the THz-PCA with a collimating high-resistive silicon lens attach to the back side of the THz-PCA chip. The device is packaged in a modular format so that it is easy to change the THz-PCA chip inside the enclosure at a fraction of cost. The device is shipped with the silicon lens aligned and packaged on the back side of the THz-PCA chip. The silicon lens can be re-aligned after changing the THz-PCA chip. An input bias voltage can be applied to the chip through an isolated SMA connector. A built-in voltage limit circuit prevents overvoltage damage to the chip. In the receiving operation mode, the detected terahertz photocurrent can be measured through the SMA connector. A standard Ø1/2" treaded hole on the front plate and a tapped hole on the side of the enclosure make it convenient to attach the module to other standard optical components or mount it on an optical bench. When excited by optical pulses with 15 mW average optical power, a pair of transmitter and receiver T-Era-20D-800-air THz-PCAs generate unprecedented 100 nA peak terahertz photocurrent on the receiver antenna with more than 75dB terahertz power spectrum dynamic range.

## Product Specifications

Optical Excitation Wavelength	750 nm-850 nm
Average Optical Power	1 mW-15 mW
Bias Voltage	1 V-15 V
Dark Resistance	9.6 MΩ
Spectrum Bandwidth	>2.5 THz
Power Spectrum Dynamic Range	>75 dB
Size (W X L X H)	1" X 1" X 0.4"

## Typical THz Time-Domain Measurement Settings

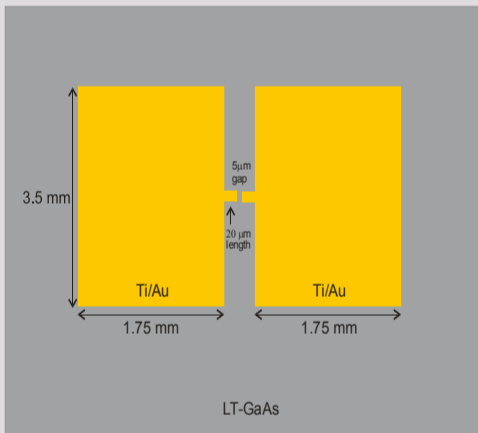
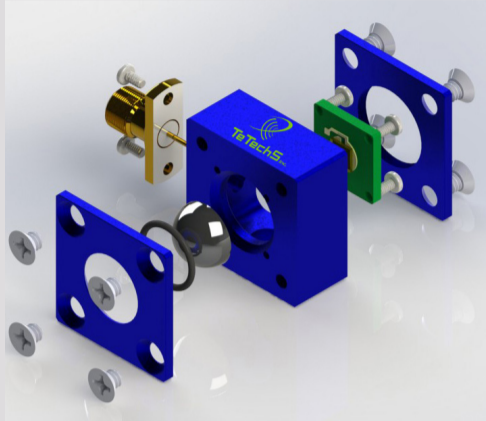
Transmitter Module	T-Era-20D-800-air
Receiver Module	T-Era-20D-800-air
Optical Excitation Wavelength	800 nm
Optical Pulse Duration	100 fs
Average Optical Power on Transmitter	10 mW
Average Optical Power on Receiver	10 mW
Bias Voltage on Transmitter	10 V

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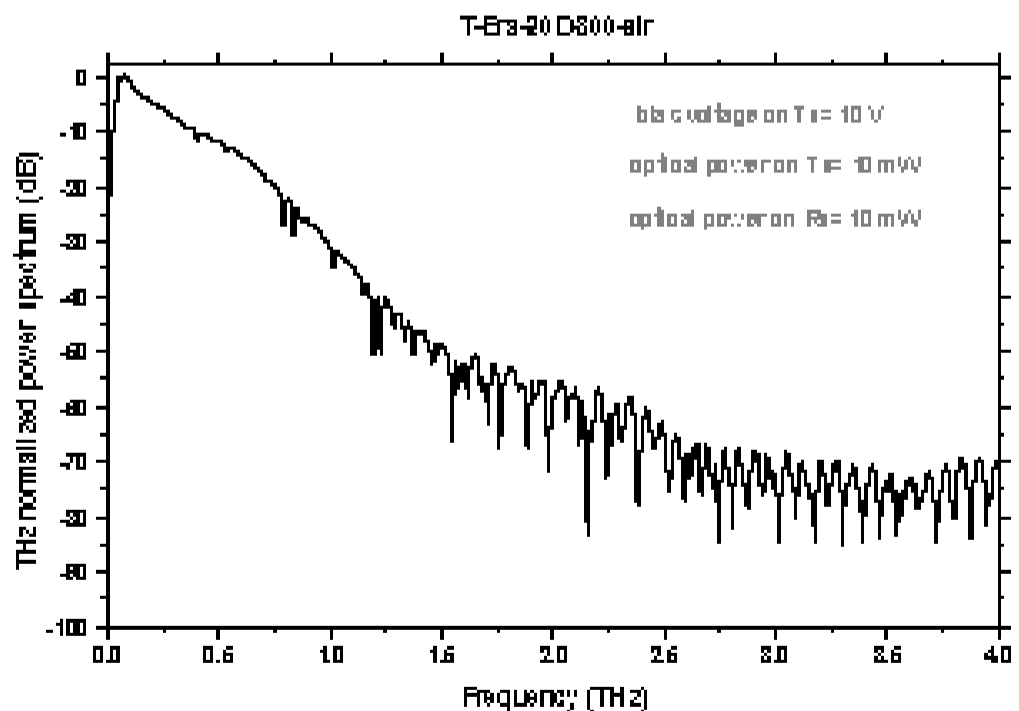
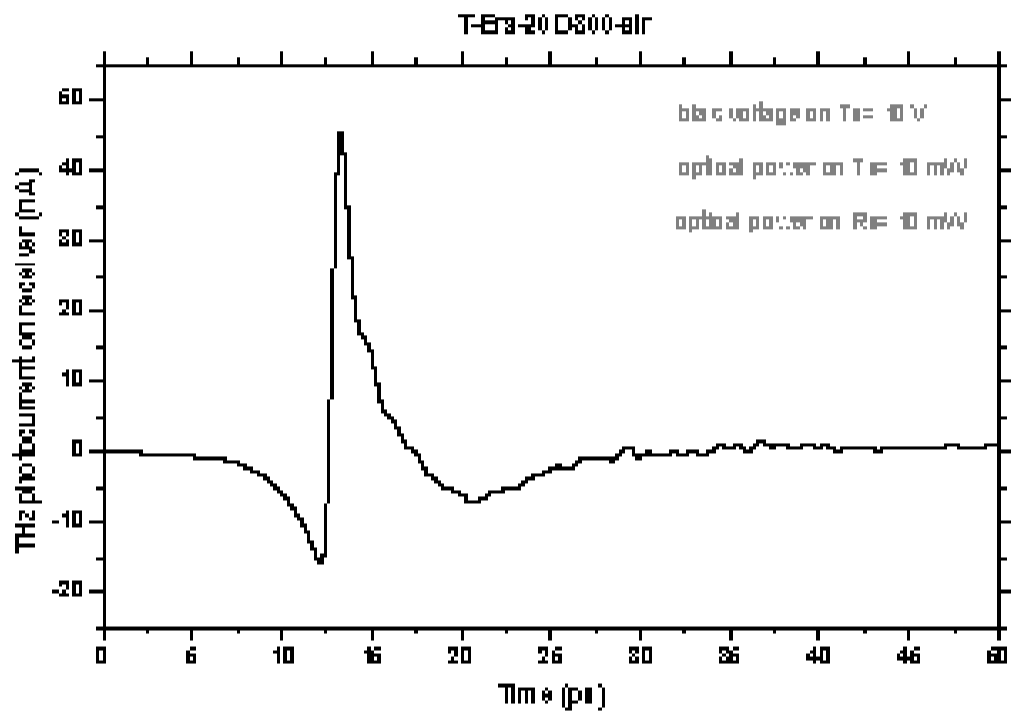
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T-Era-20D-800-air



Excited by 100fs optical pulses with 15mW average power the T-Era-20D-800-air THz-PCAs generate 100nA peak terahertz photocurrent with more than 75dB THz power spectrum dynamic range.

A typical THz pulse and its corresponding power spectrum generated by a T-Era-20D-800-air transmitter module and detected by a T-Era-20D-800-air receiver module in a terahertz time-domain system.



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