

Terahertz Photoconductive Antennas (THz-PCAs)

T-Era-20D40P-1550-fiber



Key Features

- Fiber-coupled Enclosure
- Rugged Packaging
- Large THz Signal
- Integrated Silicon Lens
- Standard Ø1" Treaded Body
- Easy to Mount
- 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-20D40P-1550-fiber terahertz photoconductive antenna (THz-PCA) is used to detect wideband terahertz pulses in terahertz time-domain systems. The T-Era-20D40P-1550-fiber THz-PCA is made on high resistive ultra-fast epitaxially grown multi-quantum well InGaAs-InAlAs substrates and is packaged in TeTechS' patent pending terahertz chip fiber coupled enclosure module. The enclosure module houses the THz-PCA with a collimating high-resistive silicon lens attached to the back side of the THz-PCA chip, an FC/APC fiber connector and optical collimating and focusing lenses. 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 using our silicon lens setting fixtures.

In the receiving operation mode, the detected THz photocurrent can be measured through the MMCX connector. The standard Ø1" treaded body makes it convenient to attach the module to other standard optical components or mount it on an optical bench. When excited by optical pulses with 8 mW average optical power, the T-Era-20D40P-1550-fiber THz-PCA generates 200 pA peak terahertz photocurrent with more than 50dB terahertz power spectrum dynamic range.

Product Specifications

| | |
|------------------------------------|-----------------|
| Optical Excitation Wavelength | 1540 nm-1560 nm |
| Average Optical Power | 1 mW-15 mW |
| Bias Voltage for Optical Alignment | 5 V |
| Dark Resistance | 1 MΩ |
| Spectrum Bandwidth | >2.5 THz |
| Power Spectrum Dynamic Range | >50 dB |
| Size (O.D., L) | 1", 2.5" |

Typical THz Time-Domain Measurement Settings

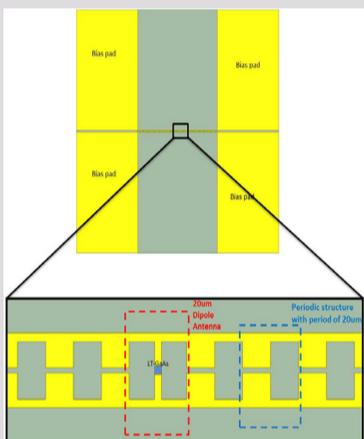
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|--------------------------------------|-------------------------|
| Transmitter Module | T-Era-100A-1550-fiber |
| Receiver Module | T-Era-20D40P-1550-fiber |
| Optical Excitation Wavelength | 1550 nm |
| Optical Pulse Duration | 100 fs |
| Average Optical Power on Transmitter | 14 mW |
| Average Optical Power on Receiver | 8 mW |
| Bias Voltage on Transmitter | 40 V |

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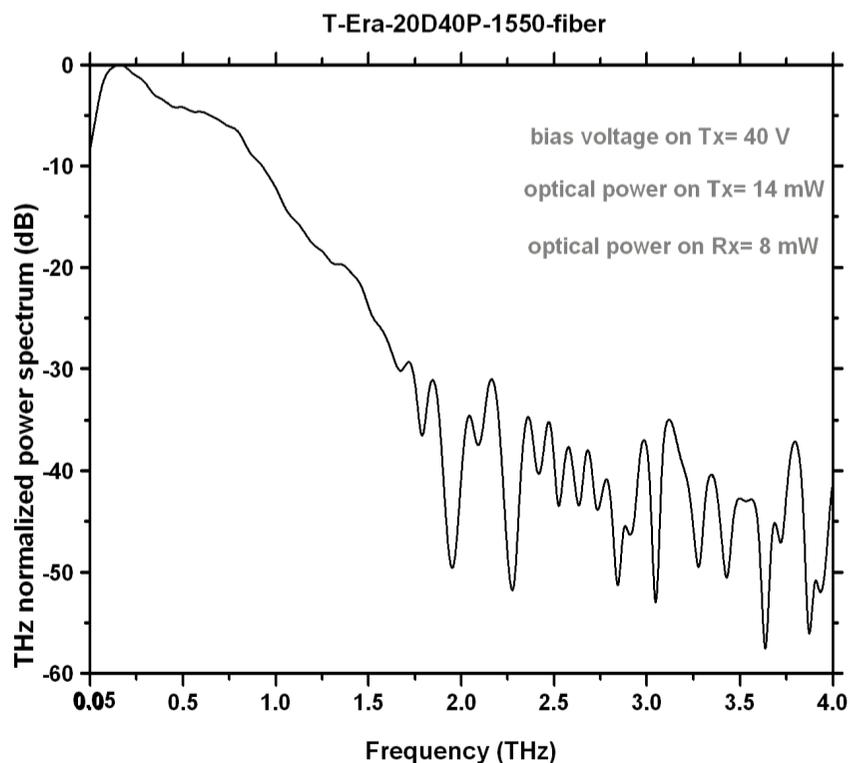
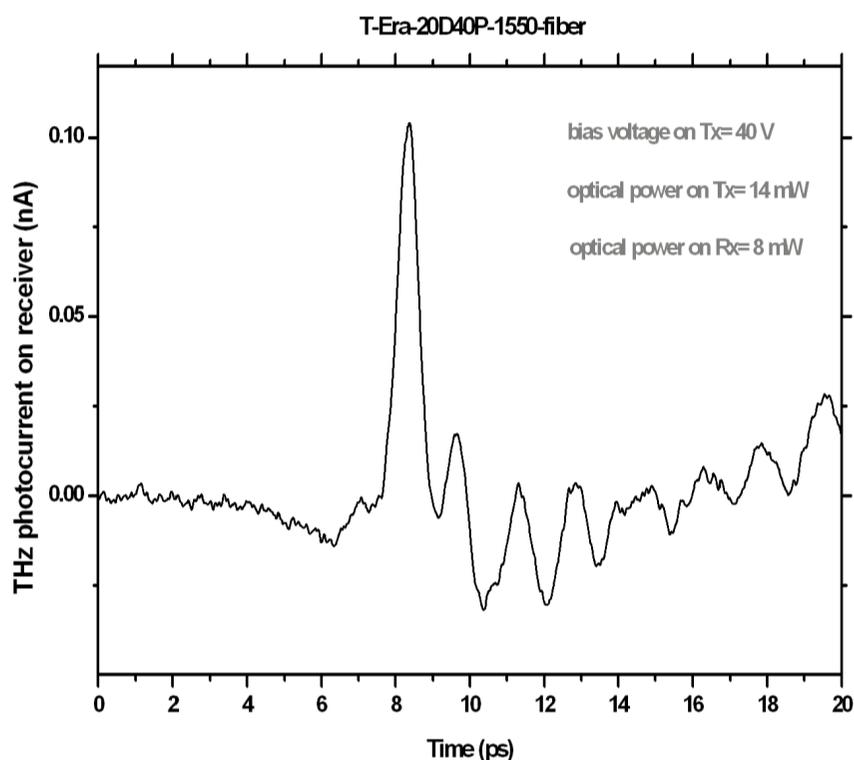
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Excited by 100fs optical pulses with 8mW average power the T-Era-20D40P-1550-fiber THz-PCAs generate 200 pA peak terahertz photocurrent with more than 50dB THz power spectrum dynamic range.

A typical THz pulse and its corresponding power spectrum generated by a T-Era-100A-1550-fiber transmitter module and detected by a T-Era-20D40P-1550-fiber receiver module in a fiber coupled terahertz time-domain system.



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