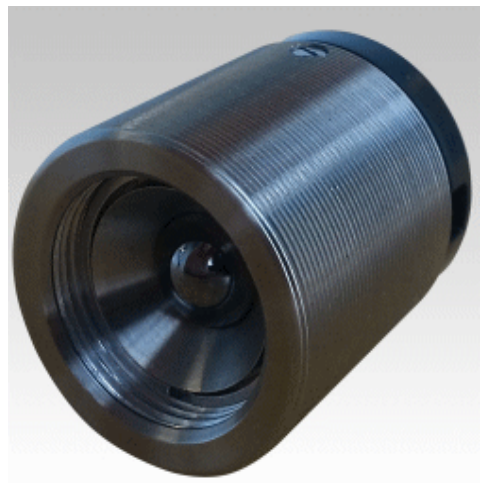
Product Overview

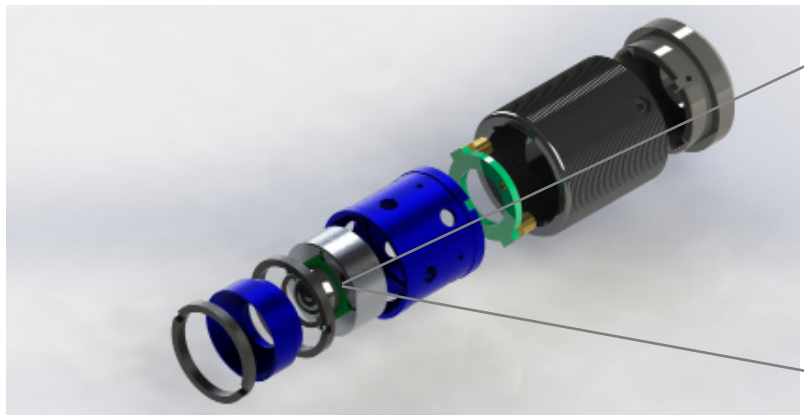
The T-Era-20D40P-1550-air terahertz photoconductive antenna (THz-PCA) is used to detect wideband THz pulses in terahertz time-domain systems. The T-Era-20D40P-1550-air THz-PCA is made on high resistive ultra-fast epitaxially grown multi-quantum well InGaAs-InAlAs substrates packaged in TeTechS' patent pending THz chip enclosure module. The enclosure module houses the THz-PCA chip 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 using our silicon lens setting fixtures.

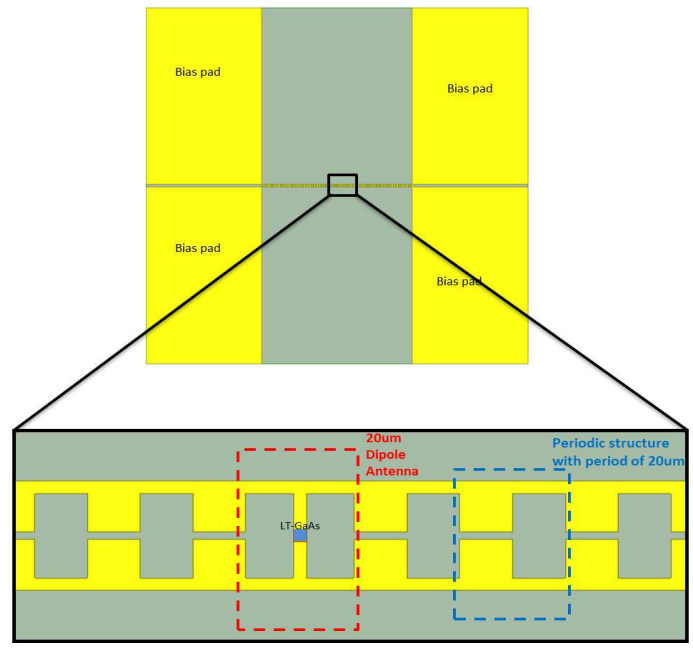
The detected terahertz photocurrent can be measured through a MMCX connector. The standard Ø1" treaded body makes it convenient to attach the module to other standard optical components or mount it on an optical bench. When excited by optical pulses with 18 mW average optical power, the T-Era-20D40P-1550-air THz-PCA generates 250 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-20 mW
Bias Voltage for Optical Alignment	5 V
Dark Resistance	150 KΩ
Spectrum Bandwidth	>3 THz
Power Spectrum Dynamic Range	>50 dB
Size (O.D.)	1"







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I-V Curves

I. Dark current versus bias voltage

Figure 1 shows the dark current versus applied bias voltage across the T-Era-20D40P-1550-air THz-PCA. A dark resistance around 150 KΩ is measured.

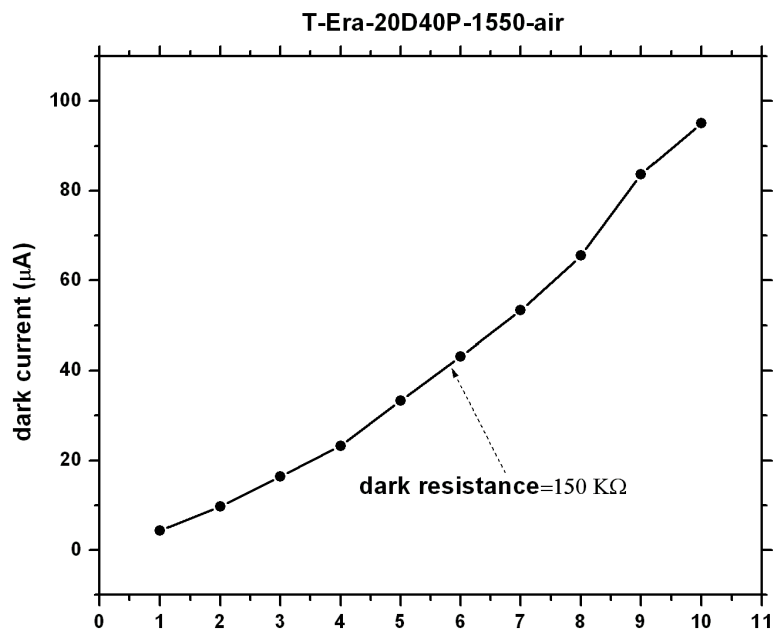

Figure 1. Dark current versus applied bias voltage across the T-Era-20D40P-1550-air THz-PCA.

Dark current versus bias voltage measurement settings

THz-PCA Under Test	T-Era-20D40P-1550-air
Average Optical Power on THz-PCA	0 mW
Bias Voltage on THz-PCA	1V-10V

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II. Photocurrent versus bias voltage

Figure 2 shows the photocurrent versus bias voltage across the T-Era-20D40P-1550-air THz-PCA. The average optical power on the device is fixed at 18 mW. The photocurrent shows a linear increase with bias voltage.

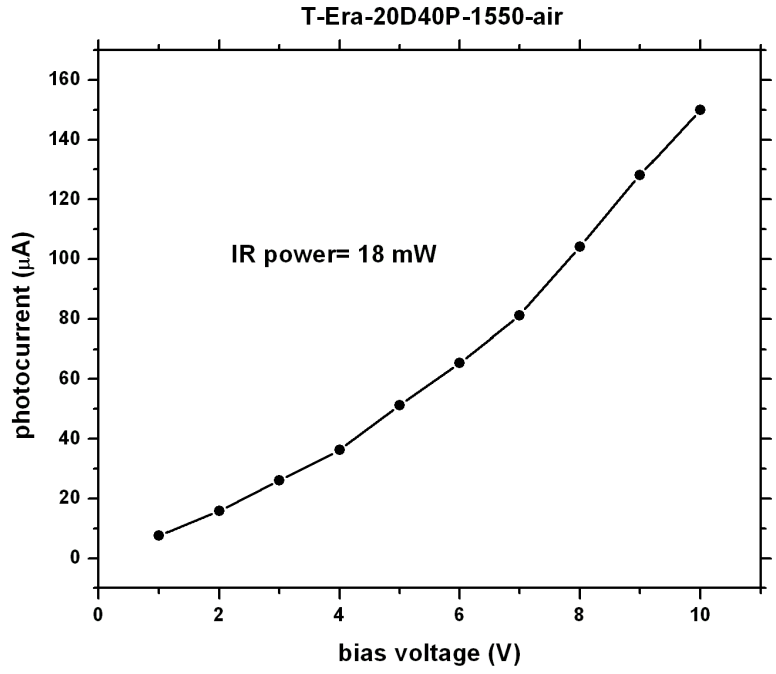

Figure 2. Photocurrent versus applied bias voltage across the T-Era-20D40P-1550-air THz-PCA.

Photocurrent versus bias voltage measurement settings

THz-PCA Under Test	T-Era-20D40P-1550-air
Optical Excitation Wavelength	1550 nm
Optical Pulse Duration	100 fs
Average Optical Power on THz-PCA	18 mW
Bias Voltage on THz-PCA	1V-10V

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III. Terahertz Measurement Setup

Figure 3 shows a terahertz response measurement setup for T-Era-20D40P-1550-air THz-PCA.

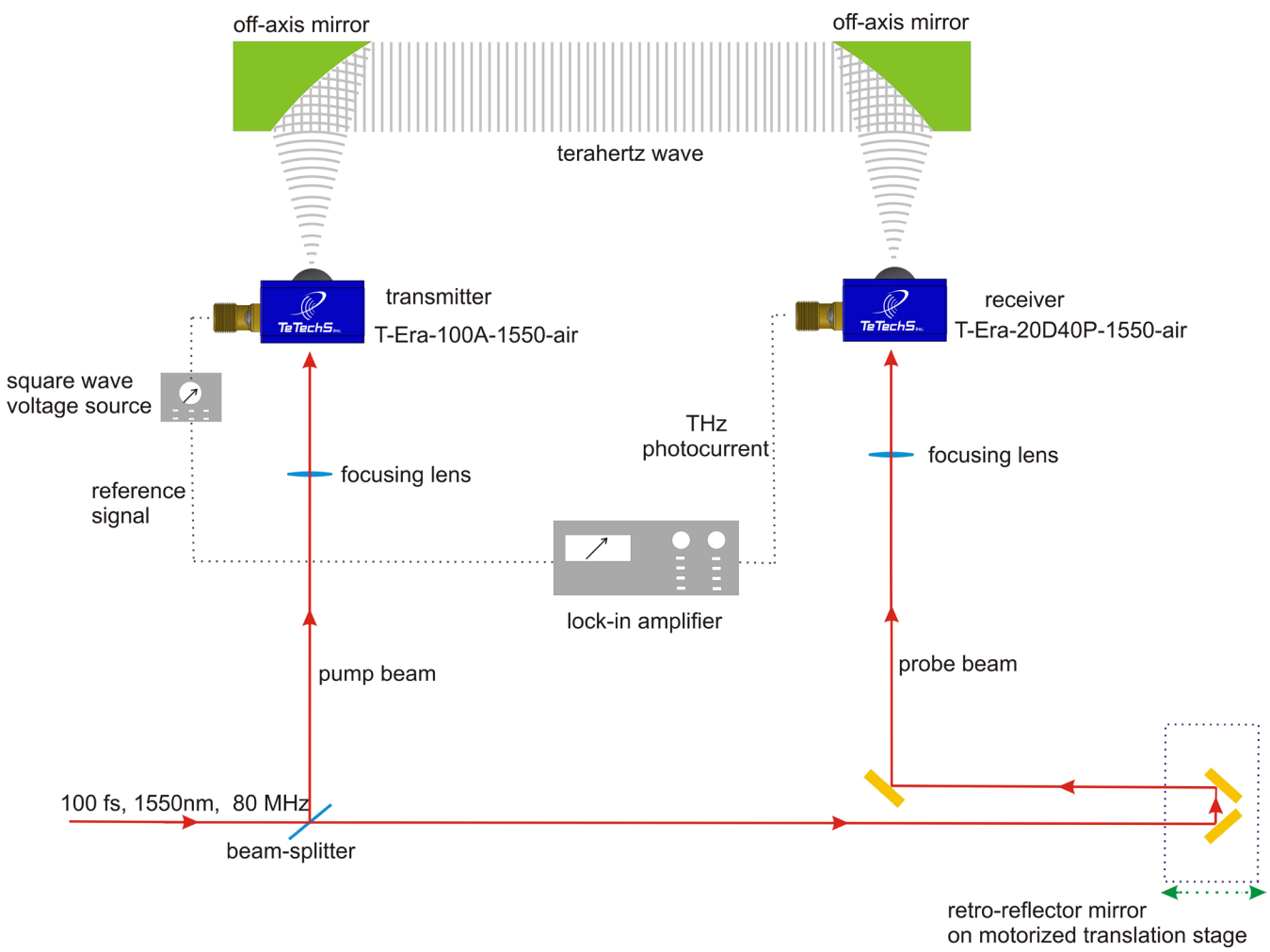

Figure 3. A terahertz response measurement setup for T-Era-20D40P-1550-air THz-PCA.

Typical THz Time-Domain Measurement Settings

Transmitter Module	T-Era-100A-1550-air
Receiver Module	T-Era-20D40P-1550-air
Optical Excitation Wavelength	1550 nm
Optical Pulse Duration	100 fs
Average Optical Power on Transmitter	20 mW
Average Optical Power on Receiver	18 mW
Bias Voltage on Transmitter	60 V

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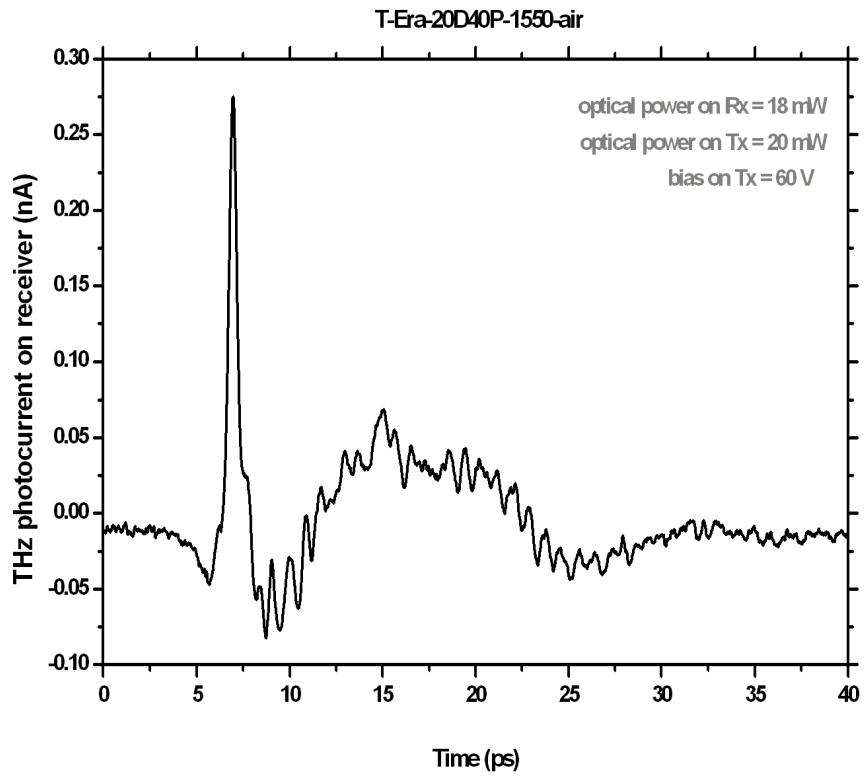
IV. Terahertz Response

Figure 4 shows a typical THz pulse and its corresponding normalized power spectrum generated by a T-Era-100A-1550-air transmitter module and detected by a T-Era-20D40P-1550-air receiver module in a terahertz time-domain system.



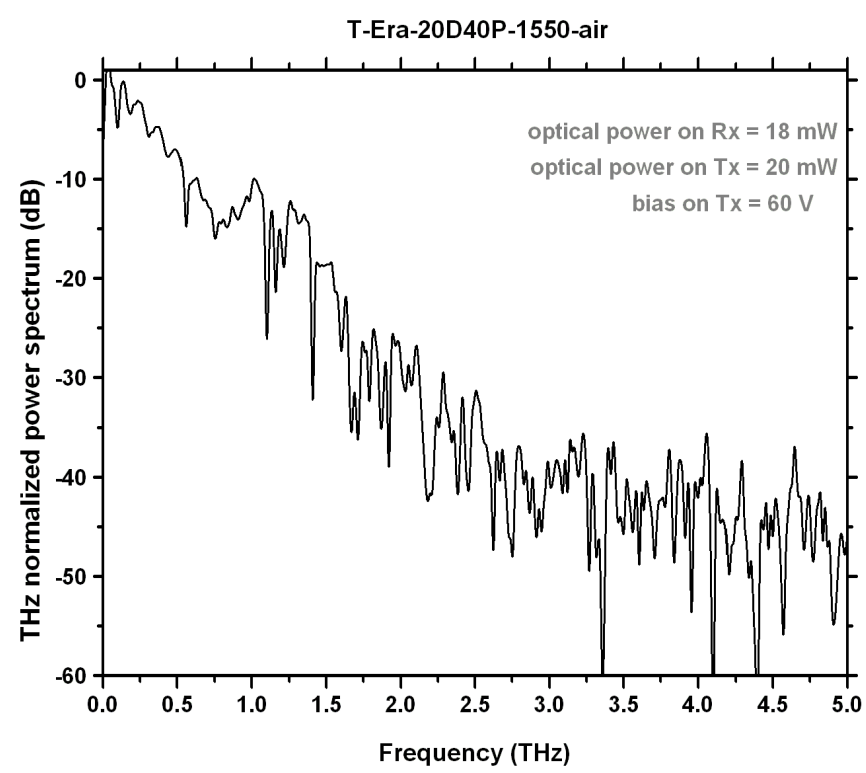


Figure 4. Typical THz pulse and its corresponding normalized power spectrum generated by a T-Era-100A-1550-air transmitter module and detected by a T-Era-20D40P-1550-air receiver module.

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V. Terahertz peak photocurrent versus bias voltage

Figure 5 shows the terahertz peak photocurrent on the T-Era-20D40P-1550-air receiver versus bias voltage on the transmitter T-Era-100A-1550-air. The average optical power on the transmitter is 20 mW and on the receiver devices is 18 mW.

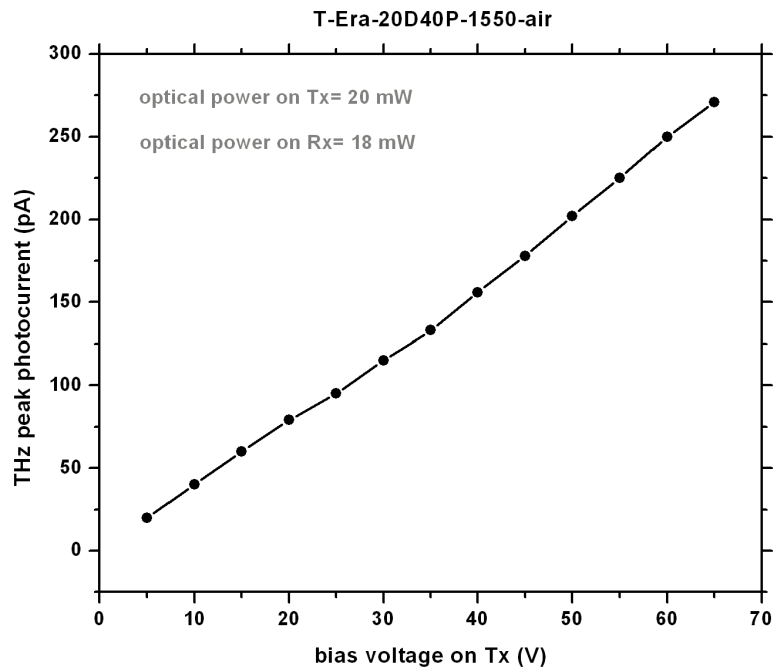

Figure 5. Terahertz peak photocurrent on T-Era-20D40P-1550-air receiver versus bias voltage over the transmitter T-Era-100A-1550-air.

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