THz TIP

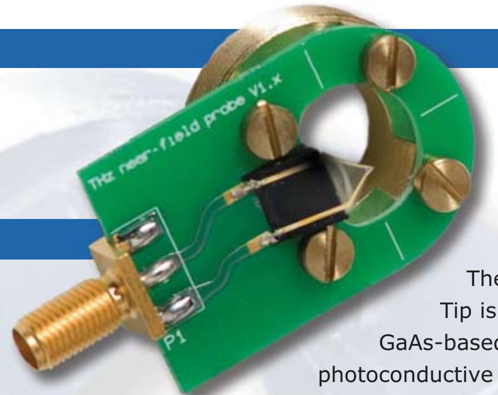
Near Field Photoconductive electric-field probe-tip

Applications

- Terahertz near-field microscopy (THz-SNOM)
- On-chip MMIC/MMMIC testing
- THz time- and frequency-domain spectroscopy

Key features

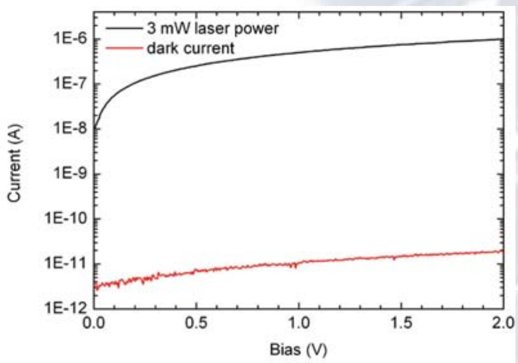
- Tapered electrodes for field-singularity enhanced sensitivity
- PC probe-tip with unprecedented near-field spatial resolution
- Low-invasive probing through ultra-thin (1.3 µm) probe design
- Easy to integrate into existing optical systems (cw or pulsed)
- Convenient tip-sample approximation through probe mounting with built-in tilt angle
- Versatilely applicable for near- and far-field measurements
- Polarization sensitive (10:1)



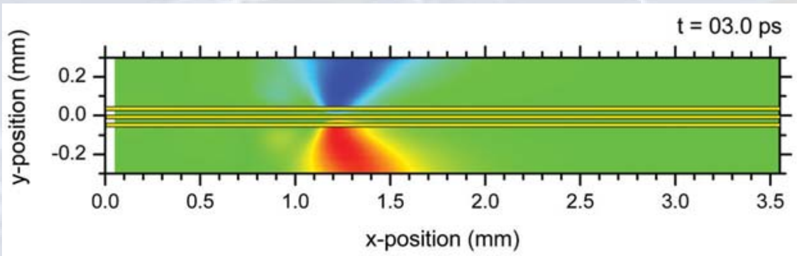
The THz Tip is a LT-GaAs-based photoconductive probe-tip designed for the detection of electro-magnetic fields from dc to terahertz frequencies

Specifications

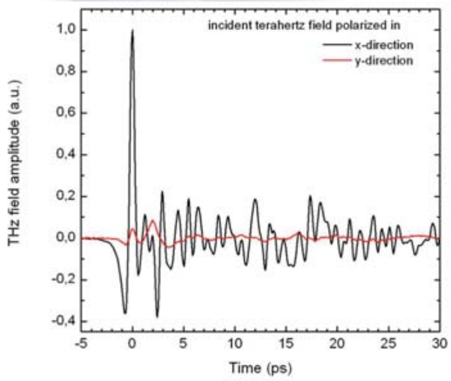
Typical current – voltage characteristics

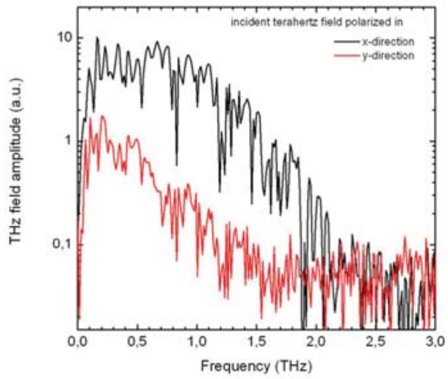


2D near-field amplitude distribution on coplanar waveguide measured with THz Tip



Typical THz field amplitude detected in the far-field





Test conditions

- Optical source: Ti:Sa oscillator at λ = 800 nm, τ_{FWHM} = 150 fs and f_{rep} = 80 MHz
- THz emitter: InAs surface field emmiter, excitation power P = 300 mW
- THz detector: THZ Tip, excitation power P = 3 mW
- Lock-in detection with mechanical chopper at 1.5 kHz and 100 ms integration time in ambient air

References:

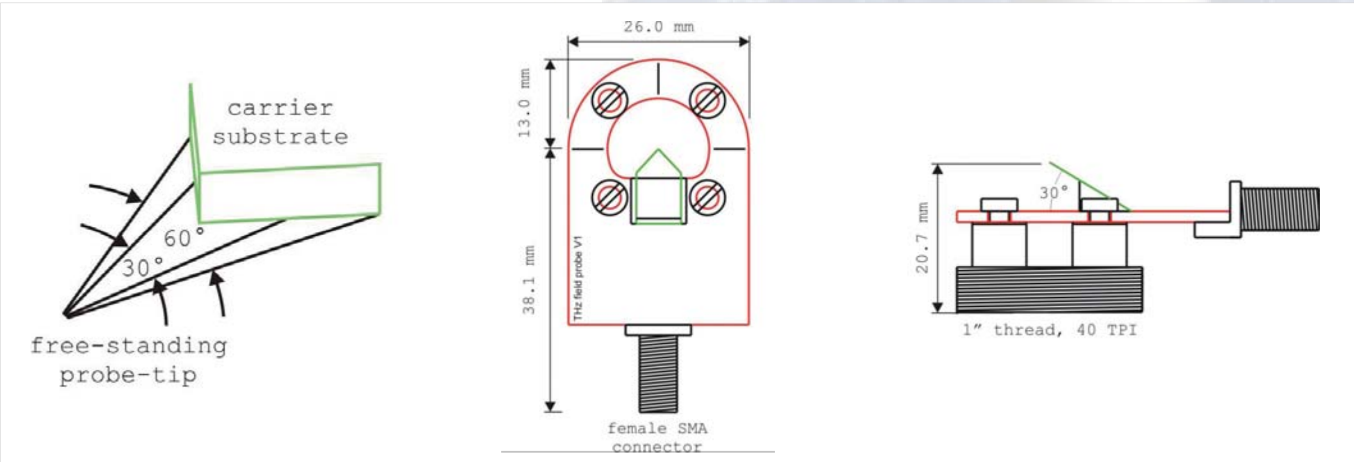
[1] M. Wächter, M. Nagel, H. Kurz, "Tapered photoconductive terahertz field probe-tip with subwavelength spatial resolution", Appl. Phys. Lett 95, 041112 (2009)

[2] German patent application No. 10 2009 000 823.3

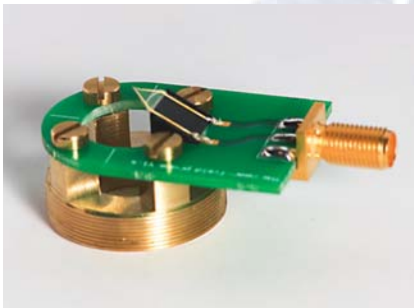
Technical data

	Min.	Standard	Max.
Gap size at apex [µm]	1.5	3	4.5
Spatial resolution [µm] @100 GHz - 3 THz	5		
Dark resistivity [MΩ]	50	100	
Photocurrent ratio I_{power}/I_{dark} (U_{Bias} = 1 V, P = 5 mW)	5e4	1e5	
Bias [V]		1	1.5
Excitation wavelength [nm]	700	800	850
Excitation power (λ = 800 nm, f_{rep} = 80 MHz, T_{FWHM} = 150 fs) [mW]		5	10

Schematic



Pictures



Mounted THz probe-tip
(article no.: THz Tip)

Mounted THz probe-tip with translation and focusing mechanics for free-space excitation on a magnetic baseplate
(article no.: THz Tip+Mount free1)

Mounted THz probe-tip with translation and focusing mechanics for fiber-coupled excitation on a magnetic baseplate
(article no.: THz Tip+Mount fiber1)

THz Tip*	**on request**
THz Tip+Mount free1	**on request**
THz Tip+Mount fiber1	**on request**
Discount:	**10% for 3-5 pieces**
	20% for more than 6 pieces

each device is tested before delivery to ensure optimal results

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