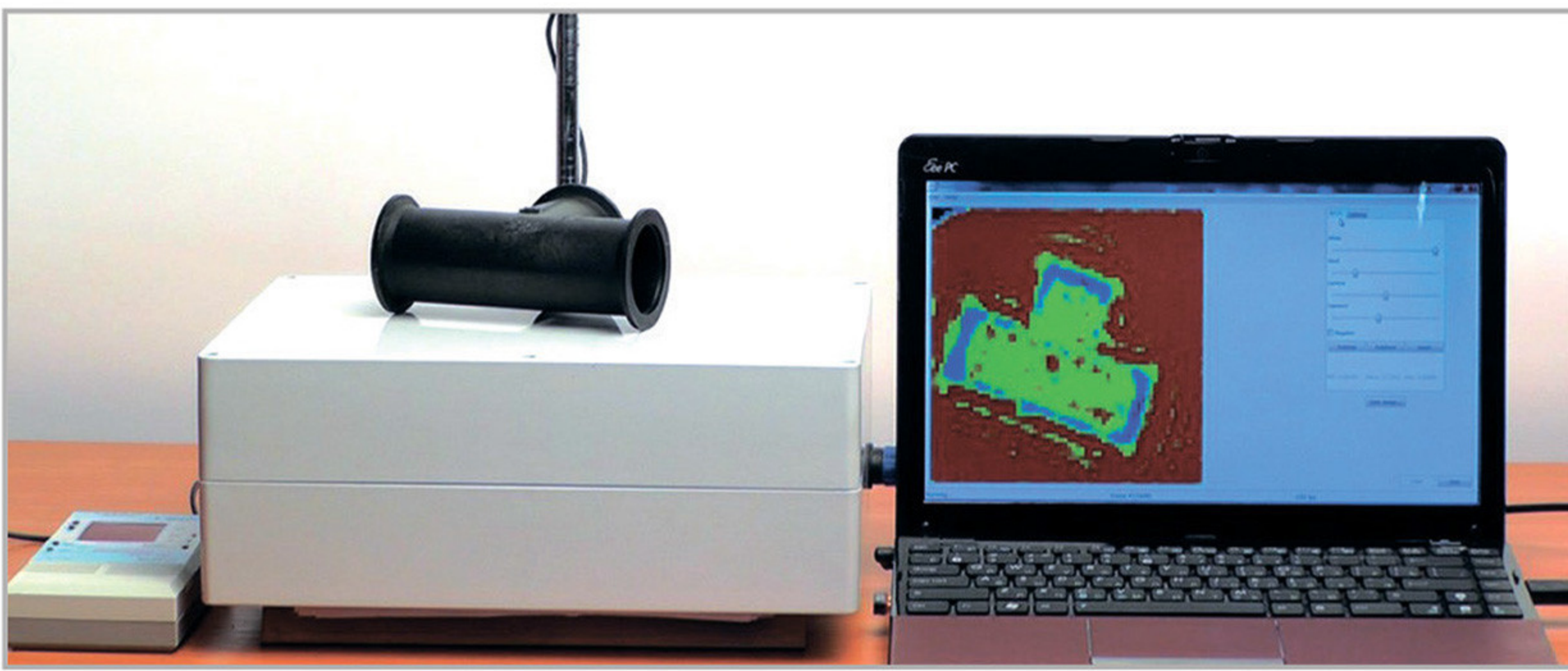


TeraSense
Sub-THz imaging systems

The world's first high speed sub-THz semiconductor imaging camera

- Operates at 50 GHz – 0.7 THz
- Image acquisition rate up to 5000 frames per second
- Low-cost





TeraSense has developed an original patent-protected technology for manufacturing a new type of semiconductor detector arrays for THz imaging. The detectors operate at room temperature and the arrays are scalable in a number of pixels. The company is developing flexible THz imaging solutions for science and industry.

Known types of terahertz detectors

Cryogenic superconducting and semiconducting

Have excellent detecting properties but are expensive in production and especially in operation

Heterodyne detectors

Require local oscillators for functioning, which makes them rather complicated and expensive solution

Room-temperature bolometers and several kinds of

They are simpler and less expensive but have low responsivity and are difficult for mass production



All of them exist only as a single detector or short lines, therefore, for imaging applications it is necessary to perform mechanical scan over imaging surface, which leads to complexity of the device or reduces its capabilities.

Detectors developed by TeraSense have good sensitivity comparing with other detectors operating in the same THz range (50 GHz – 0.7 THz), but they are low cost and can be easily produced in large quantities in a shape of 2D arrays thanks to compatibility of the TeraSense technology to mass-production lines of semiconductor industry. Absence of any moving parts in the sensor arrays make them more useful for THz applications.

ADVANTAGES

- Low cost
- Wide frequency range : 50 GHz – 0.7 THz
- Room temperature responsivity is up to 50 kV/W. Noise equivalent power is $1 \text{ nW}/\sqrt{\text{Hz}}$
- High speed. Image acquisition rate is up to 5000 frames per second.
- Custom tailored solutions.

CE TeraSense Imaging Cameras and IMPATT diodes have EC Certificate of Compliance (EC Certificate of Conformity) and are 100% environmentally friendly products that can be safely used with no detriment to human health/safety.

FEATURED CLIENTS



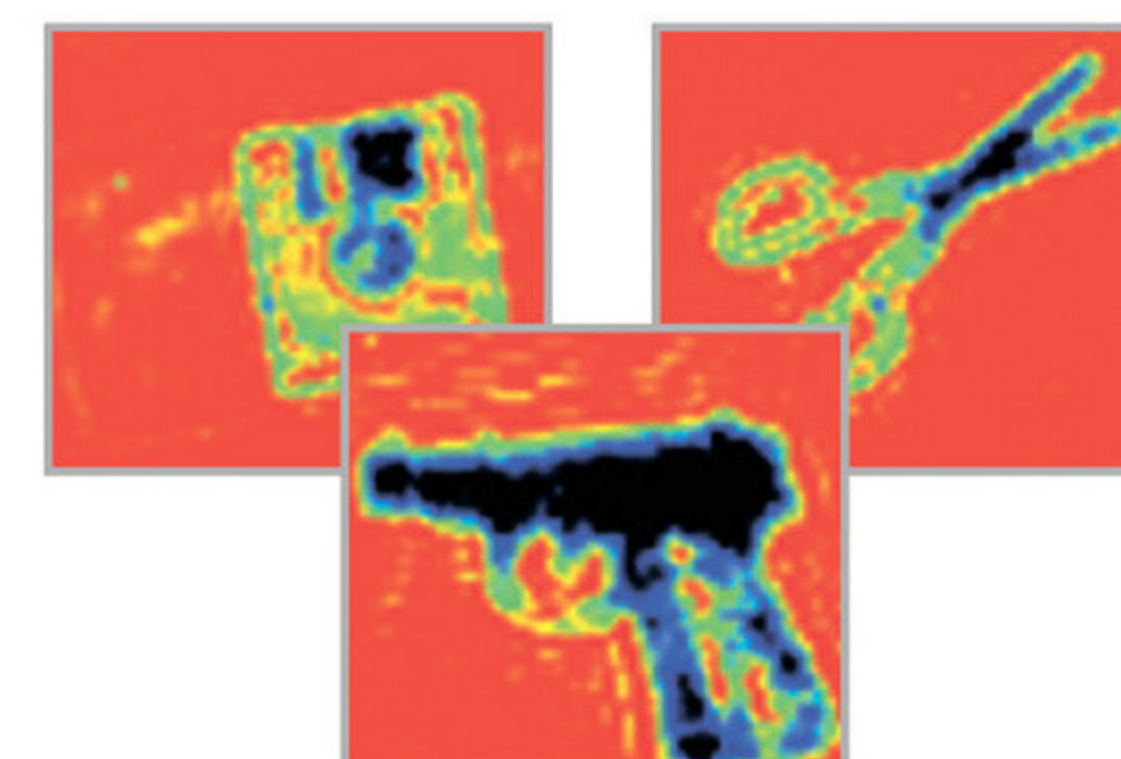
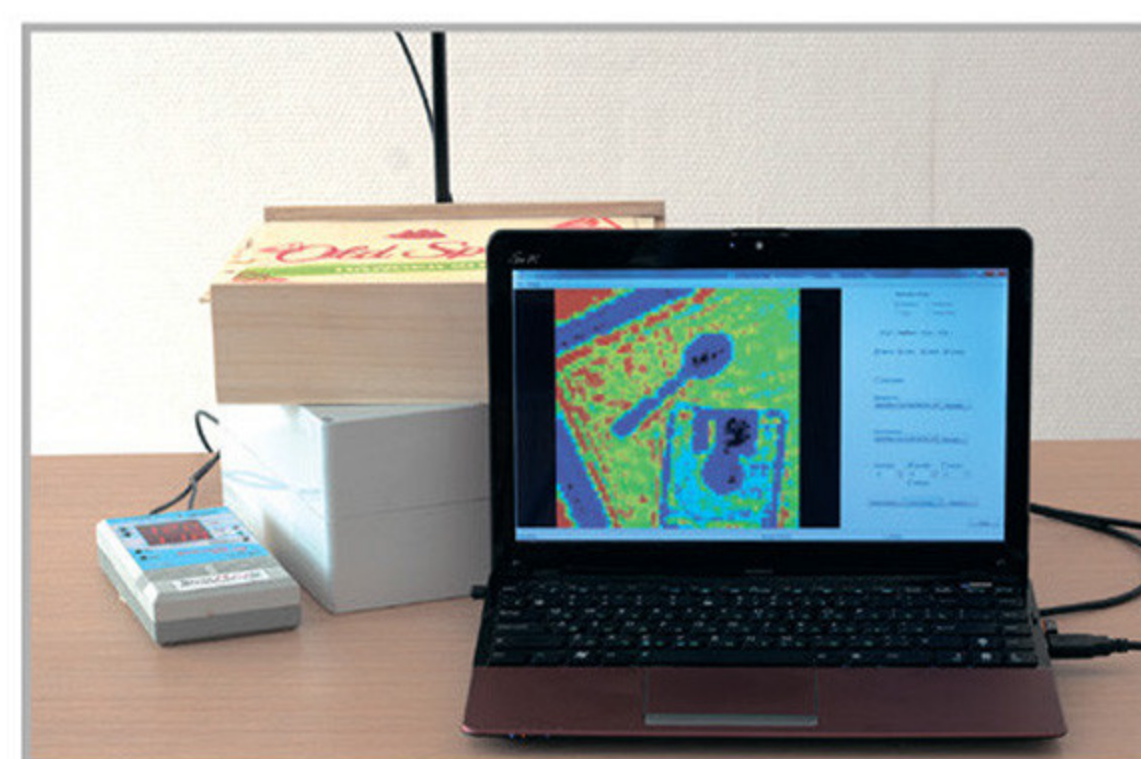
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APPLICATIONS

Hidden Objects and Defects Identification

Rapid non-destructive characterization of defects in uniform materials and coated surfaces or identification of hidden objects using TeraSense terahertz imaging technology.

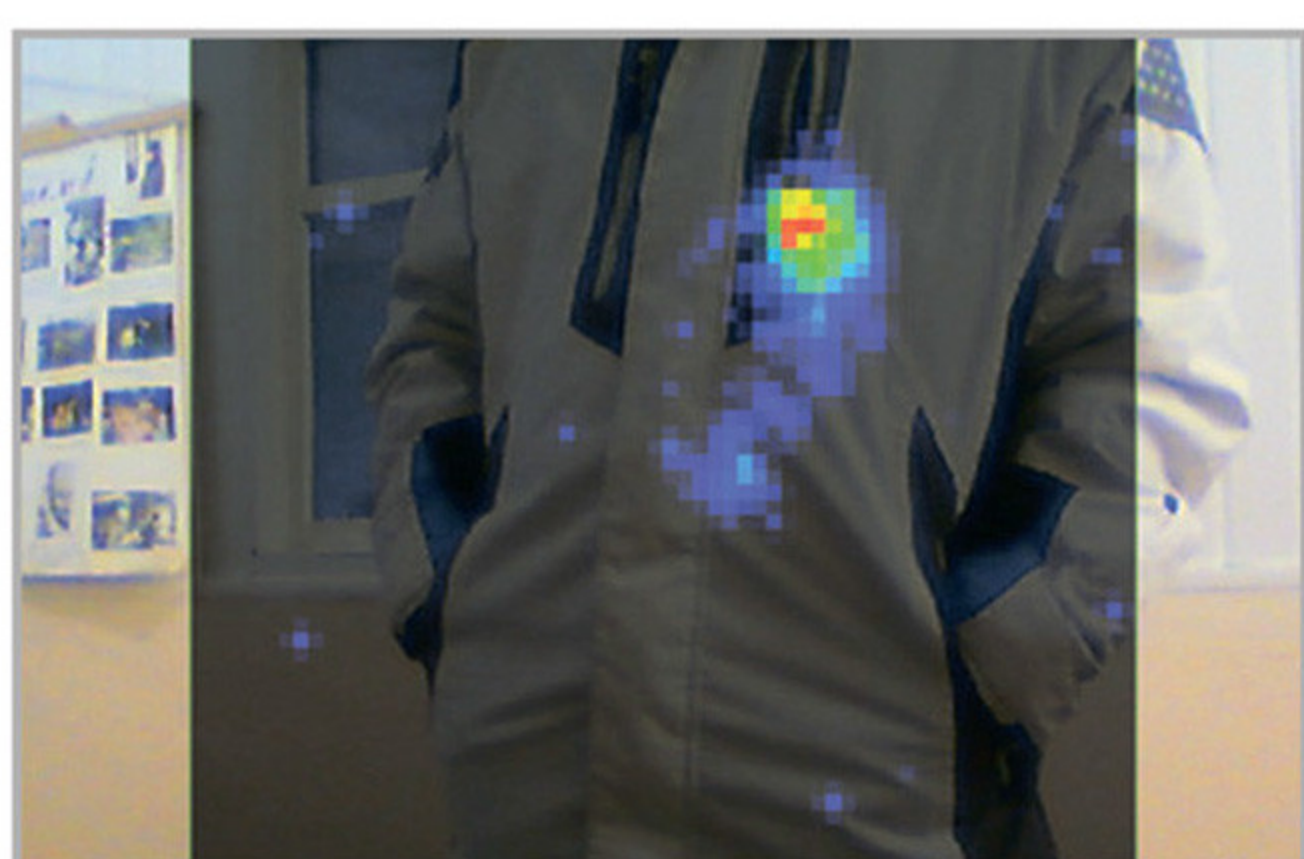
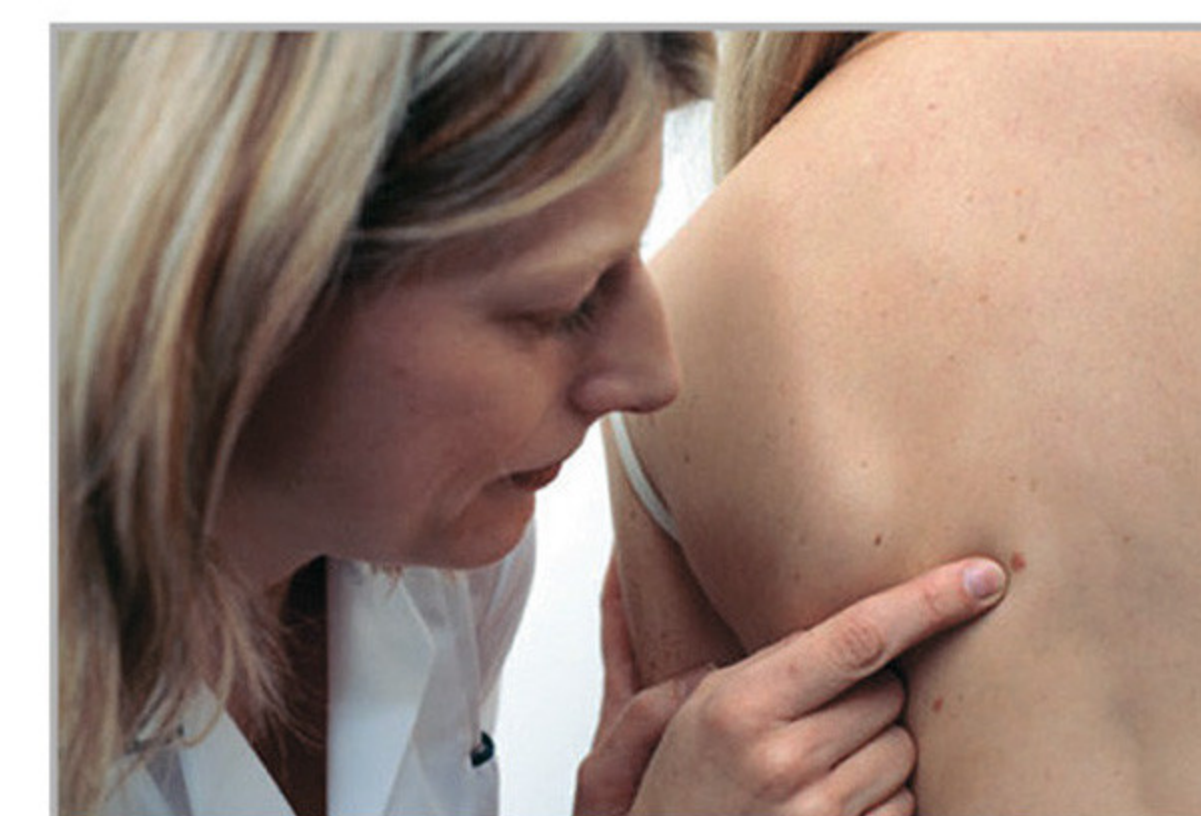


High-bandwidth telecommunication systems

TeraSense detectors are ideal building blocks for next generation of high-speed, point-to-point wireless local area networks and broadband Internet access. The system operates on 60 GHz - 300 GHz carrier frequencies with data transfer rates of up to 10 Gbit/s.

Medical Diagnostics

- A tool for early cancer identification.
- Safe in-vivo diagnostics of breast and skin cancers at early stages.
- Non-invasive methods for distinguishing tissue and basal cell carcinoma.



Homeland Security

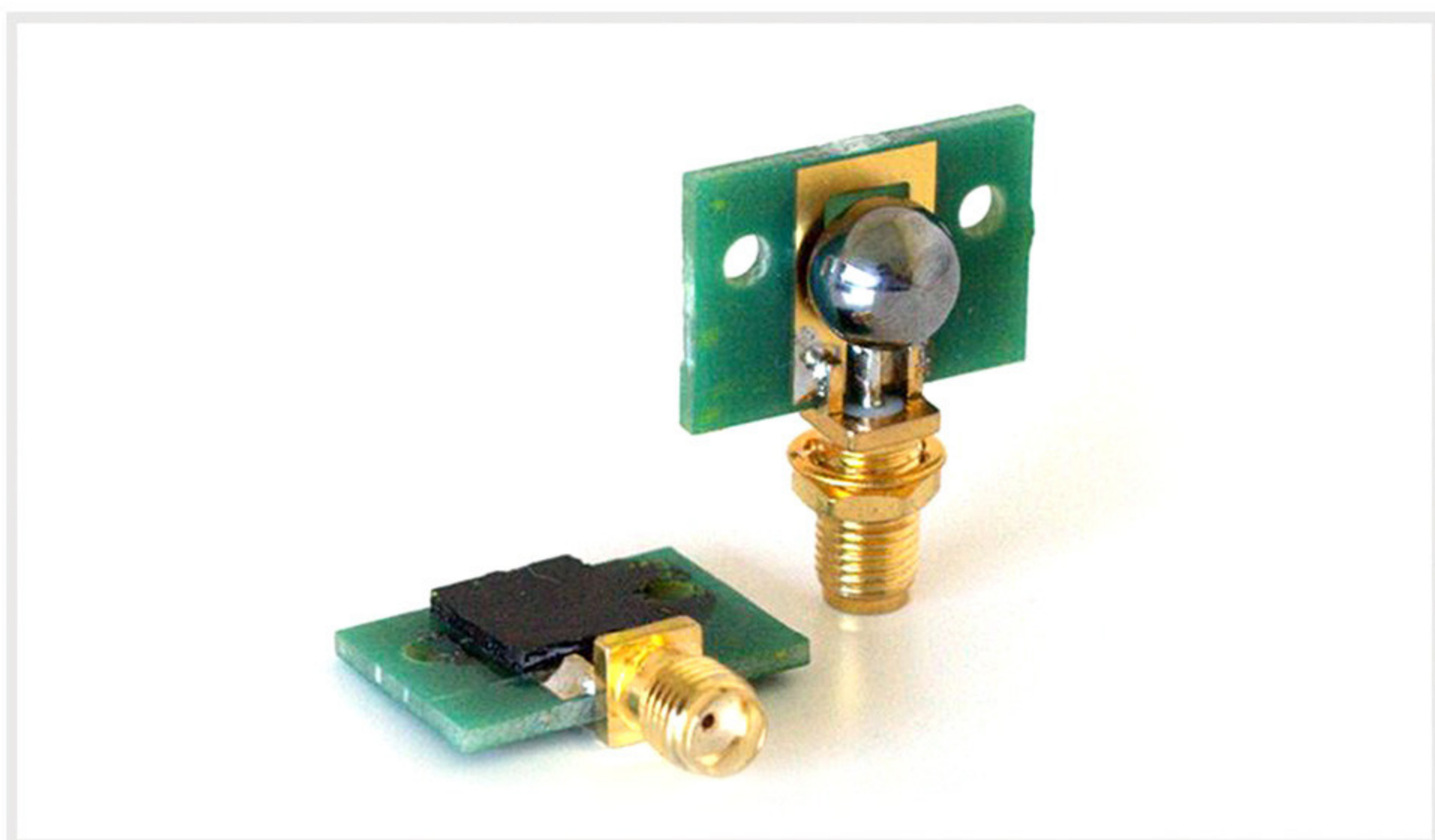
TeraSense develops active THz cameras for remote concealed object detection in high throughput places. Our solutions are compact and affordable, suitable even for private usage.



OEM Applications

Manufactured with mass-market semiconductor processes, cheap and high-performance TeraSense detector arrays are perfect core OEM parts for every product requiring a penetrating vision.

OTHER PRODUCTS



Ultrafast Sub-THz Detectors

	Ultrafast	Fast
Response time	150 ps	1 μ s
Spectral range	50 GHz - 0.7 THz	50 GHz - 0.7 THz
Impedance	50 Ω	1k Ω
Responsivity	0.5 V/W	10 V/W
Noise equivalent power	2 nW/ $\sqrt{\text{Hz}}$	1 nW/ $\sqrt{\text{Hz}}$
No power supply	✓	✓



Sub-THz Generators

TeraSense manufactures and distributes IMPATT (IMPact ionization Avalanche Transit-Time) generators:

- 80 – 140 GHz frequency range
- Typical output power 10 mW (50 mW high-power option available)
- 1 MHz line width (typical)
- TTL modulation option with 1 μ s rise and fall times

Ultrafast line camera for conveyor applications

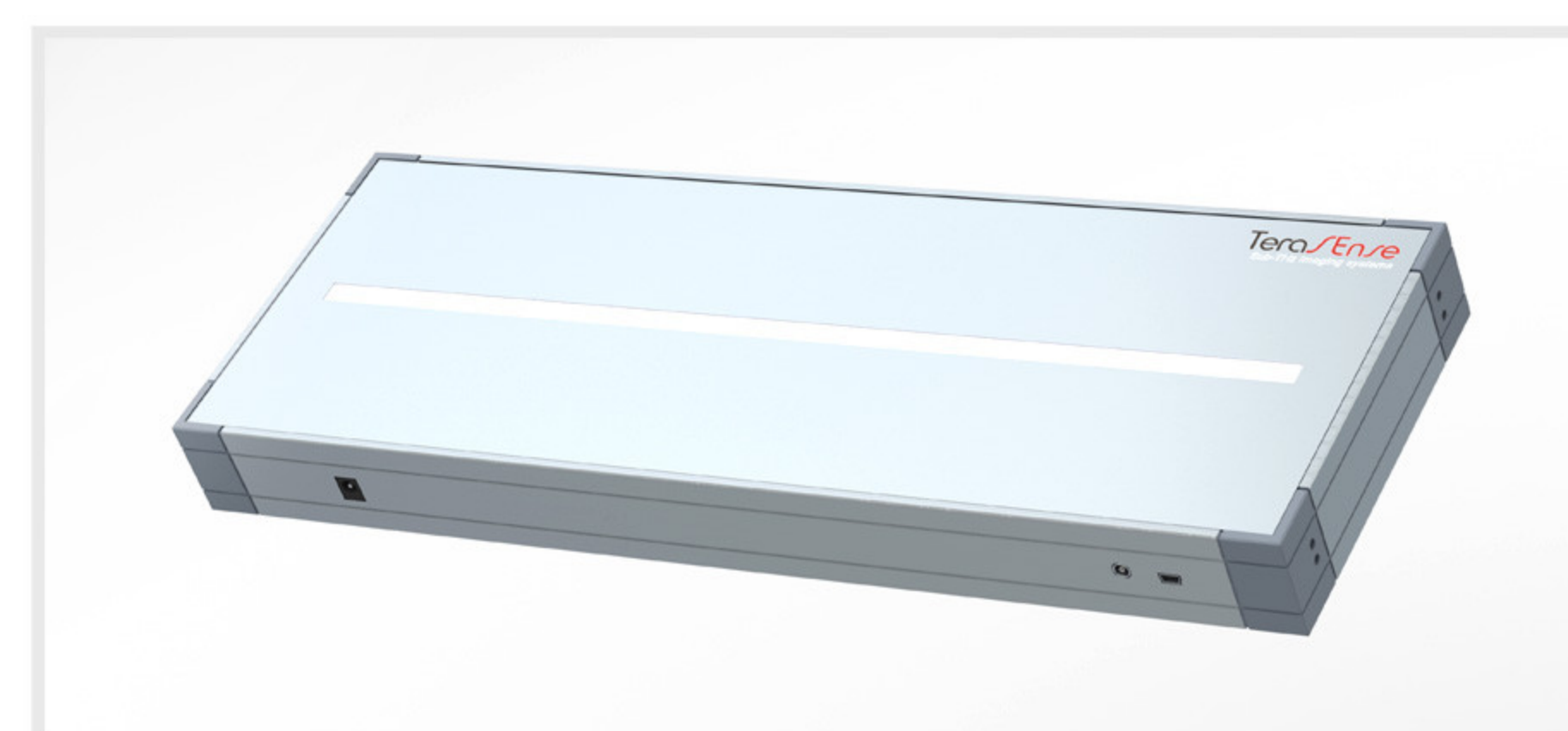
TeraSense has developed Terahertz camera optimized for high-speed conveyor industrial applications. The camera features 5 kHz (5000 frames per second) speed, custom pixel number and special software to stitch shots.

Number of pixels (scalable): 256 x 1

Min detectable power/pixel: 100 nW (@ 5000 fps)

Min detectable power/pixel: 45 nW (@ 1000 fps)

Min detectable power/pixel: 14 nW (@ 100 fps)



Optics for THz

TeraSense offers custom manufacturing of quasi-optical components for THz range: PTFE and TPX lenses, windows, prisms, attenuators, polarizers, beam splitters.

TEAM

TeraSense is a manufacturer of low-cost portable sub-terahertz imaging cameras, generators and ultrafast detectors. Our products balance at the cutting edge of scientific and technological knowledge. The company has a strong team of 20 skilled scientists and engineers. A wealth of experience in the technologies to detect, generate and manipulate sub-THz light allows TeraSense to meet a variety of end-user needs across a number of sciences and industries.



Prof. Igor Kukushkin
CEO



Prof. Vladimir Volkov
CTO



Dr. Viacheslav Muravev
Business Development
Manager



Dr. Yuri Nefyodov
Head of Testing
Department



Dr. Victor Solovyev
Head of Production
Department