

**TECH OFFER**

**Spectral Sensing using TeraHertz radiation method**



**KEY INFORMATION**

TECHNOLOGY CATEGORY:

Electronics - Radio Frequency

Electronics - Sensors & Instrumentation

TECHNOLOGY READINESS LEVEL (TRL): **TRL5**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174850**

**OVERVIEW**

Terahertz (THz) radiation is a form of electromagnetic radiation that lies in the frequency spectrum ranging between microwaves and infrared light. In the field of Non-Destructive Testing (NDT), THz radiation is utilised to inspect materials for imperfections or anomalies. THz radiation can penetrate numerous non-metallic materials and can reveal internal structures that are not visible in natural light or x-ray imaging. THz-based NDT finds applications in a variety of applications, including aerospace, electronics, and medical imaging. Each material possesses a unique fingerprint that enables its identification, differentiation, condition, quantification, and quality of materials through spectroscopy.

This technology offer is a spectral sensing technique that utilises accessible terahertz technology. It includes a portable device equipped with industrial-grade sensors and cloud-based data analytics.

The technology owner is keen to engage in R&D collaboration with industrial partners in various industries, including pharmaceuticals, food packaging quality inspection and public safety inspection.

## TECHNOLOGY FEATURES & SPECIFICATIONS

The technology offer is a reliable solution for non-disruptive inspection and measurement of materials:

- It boasts high accuracy and multi-layer penetration capabilities.
- The accuracy rate of 95% in laboratory conditions provides users with confidence in the results produced.
- The wide measurement range of 30µm to 100µm and beyond with an accuracy of approximately ±4µm makes it suitable for various applications.
- The multi-layer penetration capability of up to four layers of material allows for the inspection of layered materials or detection of defects within multiple layers.
- Designed to increase productivity and efficiency, the technology provides accurate measurements and multi-layer penetration capabilities for faster decision-making and efficient use of resources.
- The technology offer is versatile, suitable for quality control and inspection in the manufacturing, electronics, medical, and aerospace industries.

## POTENTIAL APPLICATIONS

This technology offer can be expanded and deployed in various industry such as:

- Package inspection
- Security and screening
- Spectroscopy, medical imaging
- Material science, chemical analysis
- Food quality control

## UNIQUE VALUE PROPOSITION

Terahertz (THz) technology offers numerous advantages over other radiation-based technologies. One key benefit is its ability to penetrate non-conductive materials, making it useful for imaging and inspecting plastic, paper, wood, cloth, ceramics, and other materials. THz technology is also safe and non-radioactive, making it a preferred choice for imaging and analysis.

THz technology is non-contact and non-destructive, making it an ideal tool for Non-Destructive Testing (NDT) applications. It can detect defects and flaws within materials without requiring physical contact and provides high-resolution images with sub-millimeter accuracy. THz technology is valuable for composition identification by analyzing the spectral fingerprints of materials, allowing for non-invasive identification and characterization of materials. This feature is useful for security, pharmaceuticals, and food analysis applications.

The technology owner is keen to engage in R&D collaboration with industrial partners in various industries, including pharmaceuticals, food packaging quality inspection and public safety inspection.