

# **Asia Pacific Terahertz Technology Market Forecast to 2030 – COVID-19 Impact and Regional Analysis – by Component (Terahertz Sources and Terahertz Detectors), Type (Terahertz Imaging Systems, Terahertz Spectroscopy Systems, and Terahertz Communication System), and Application (Medical & Healthcare, Defense & Security, Food & Agriculture, Industrial, Semiconductor, and Others)**

<https://marketpublishers.com/r/A45F33C10AF8EN.html>

Date: August 2023

Pages: 134

Price: US\$ 3,000.00 (Single User License)

ID: A45F33C10AF8EN

## **Abstracts**

The Asia Pacific terahertz technology market is expected to grow from US\$ 155.78 million in 2023 to US\$ 861.86 million by 2030; it is estimated to grow at a CAGR of 27.7% from 2023 to 2030.

**Rising Demand of Terahertz Technology from the Defense, Homeland Security, and Medical Sectors**

With the growing technological advancement across various industries, the demand for the implementation of terahertz technology across military & defense, as well as the medical and healthcare sector, is also boosting. The growing focus of the manufacturers on the development of THz sources, transmission, or reflection, as well as detectors technologies, owing to increasing exploration of the “THz gap,” which lie between photonics and electronics. This technology is constantly being utilized in various applications such as chemistry, biomedicine, materials science, security screening, and communication. The exclusive properties of THz radiation are well-suited for medical and healthcare applications particularly that can stimulate low-frequency molecular vibrations, which includes van der Waals or other non-bonded interaction and hydrogen

bonds. The propagation of THz radiation from biomolecule that produces spectral vibrational signature along the THz range is one of the essential features of terahertz technology. Similarly, the THz imaging also comprises of crucial advantages for tissue detection as well as to distinguish pathological and normal tissues. Thus, terahertz technology has wide applications across the medical and healthcare sectors. Similarly, the terahertz spectrum ranges are highly dependent on characteristics of generating as well as detecting methods of long wave's side and infrared on the short-wave edge range. The THz frequency range lies on the margin of the electronic world, where microwave, as well as radio radiations, are easily generated from the photonic world and electron-based devices, where the applications of optical techniques are very easy. The in-built potential benefits and advantages of the terahertz (THz) phenomenon, of encompassing many aspects which include THz imaging, sensing, as well as investigating material properties with the help of THz radiation is boosting its application in defense and security sector. The incorporation of terahertz technology in handheld scanners, which are deployed majorly in airports and other public spaces for security screening, is also increasing, especially for package scanning in airports. Furthermore, the rising terrorist activities globally, as well as mounting criminal activities, are also the primary factor for driving government investments across several countries to establish enhanced security infrastructure. Thus, it is anticipated to aid the growth of Asia Pacific terahertz technology market in the forecast period.

In defense applications, the terahertz imaging technique detects concealed hidden metallic objects like arms and ammunition, which may be potential threats. The terahertz imaging technique is also used for defense and homeland security applications. In April 2023, A research team from the University of Hyderabad (UoH) designed and developed a proprietary pulsed terahertz (THz) imaging system capable of detecting and identifying hidden samples of metals, explosives, and drugs in a paper envelope. Such applications are driving terahertz technologies' adoption in defense applications.

### Asia Pacific Terahertz Technology Market Overview

Australia, China, South Korea, Japan, India, and the Rest of Asia Pacific make up the Asia Pacific medical terahertz technology market. Terahertz technology applications are in the early commercialization phases in Asia Pacific's developing economies. Also, countries such as China, India, and Japan are progressively taking measures to stimulate the adoption of terahertz technology, such as significant investment in R&D, which is growing demand for terahertz-based products in the region. One of the primary elements fueling the expansion of Asia Pacific terahertz technology is an increase in

product introductions.

The Asia Pacific countries are witnessing an upsurge in the middle-class population and urbanization that offers ample opportunities for key players in the terahertz technology market. APAC is the largest continent in the world and is known for its technological innovations. Rapid technological advances, policy support, economic digitization, and the middle-income class community's growing disposable income are among the factors that help the economy transition from growth to the developed phase. The commercialization of terahertz technology applications in APAC's developing economies is in its introductory stages. However, countries like China, India, and Japan are increasingly taking initiatives to encourage the adoption of terahertz technology, such as substantial investment in R&D, which is expected to boost demand for terahertz-based products in the region shortly. Increased product launches are one of the major driving factors for the growth of Asia Pacific terahertz technology market.

Asia Pacific Terahertz Technology Market Revenue and Forecast to 2030 (US\$ Million)

Asia Pacific Terahertz Technology Market Segmentation

The Asia Pacific terahertz technology market is segmented based on component, type, application, and country. Based on component, the Asia Pacific terahertz technology market is bifurcated into terahertz sources and terahertz detectors. The terahertz detectors segment held a larger market share in 2023.

Based on type, the Asia Pacific terahertz technology market is segmented into terahertz imaging systems, terahertz spectroscopy systems, and terahertz communication system. The terahertz imaging systems segment held the largest market share in 2023.

Based on application, the Asia Pacific terahertz technology market is segmented into medical & healthcare, defense & security, food & agriculture, industrial, semiconductor, and others. The medical & healthcare segment held the largest market share in 2023.

Based on country, the Asia Pacific terahertz technology market is segmented into Australia, China, India, Japan, South Korea, and the Rest of Asia Pacific. China dominated the Asia Pacific terahertz technology market share in 2023.

Advanced Photonix Inc.; Advantest Corporation; H?BNER GmbH & Co. KG; Luna Innovations Inc.; Menlo Systems GmbH; NTT Electric Co.; Terasense Group Inc.; Teraview limited.; and Toptica Photonics AG are the leading companies operating in the

Asia Pacific terahertz technology market.

## Contents

### **1. INTRODUCTION**

- 1.1 Study Scope
- 1.2 The Insight Partners Research Report Guidance
- 1.3 Market Segmentation

### **2. KEY TAKEAWAYS**

### **3. RESEARCH METHODOLOGY**

- 3.1 Coverage
- 3.2 Secondary Research
- 3.3 Primary Research

### **4. ASIA PACIFIC TERAHERTZ TECHNOLOGY MARKET LANDSCAPE**

- 4.1 Market Overview
- 4.2 PEST Analysis
  - 4.2.1 Asia-Pacific – PEST Analysis
- 4.3 Ecosystem Analysis
- 4.4 Expert Opinion
- 4.5 Premium Insights

### **5. ASIA PACIFIC TERAHERTZ TECHNOLOGY MARKET – KEY MARKET DYNAMICS**

- 5.1 Market Drivers
  - 5.1.1 Rising Demand of Terahertz Technology from the Defense, Homeland Security, and Medical Sectors
  - 5.1.2 Growing use of terahertz system in semiconductor industry
- 5.2 Market Restraints
  - 5.2.1 Lack of Awareness and Unavailability of Skilled Professionals
- 5.3 Market Opportunities
  - 5.3.1 Processing Applications of Terahertz Technology in the Food Industry
  - 5.3.2 Expansion of the 6G technology
- 5.4 Future Trends
  - 5.4.1 Use of Terahertz Technology for Satellite Communication

## 5.5 Impact Analysis of Drivers and Restraints

## **6. TERAHERTZ TECHNOLOGY MARKET – ASIA PACIFIC ANALYSIS**

### 6.1 Terahertz Technology Market Asia Pacific Overview

### 6.2 Terahertz Technology Market – Asia Pacific Revenue and Forecast to 2030 (US\$ Million)

## **7. ASIA PACIFIC TERAHERTZ TECHNOLOGY MARKET ANALYSIS – BY COMPONENT**

### 7.1 Overview

### 7.2 Terahertz Technology Market, By Component (2022 and 2030)

### 7.3 Terahertz Sources

#### 7.3.1 Overview

#### 7.3.2 Terahertz Sources: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 7.4 Terahertz Detectors

#### 7.4.1 Overview

#### 7.4.2 Terahertz Detectors: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

## **8. ASIA PACIFIC TERAHERTZ TECHNOLOGY MARKET – BY TYPE**

### 8.1 Overview

### 8.2 Terahertz Technology Market, by Type (2022 and 2030)

### 8.3 Terahertz Imaging Systems

#### 8.3.1 Overview

#### 8.3.2 Terahertz Imaging Systems: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 8.4 Terahertz Spectroscopy Systems

#### 8.4.1 Overview

#### 8.4.2 Terahertz Spectroscopy Systems: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 8.5 Terahertz Communication Systems

#### 8.5.1 Overview

#### 8.5.2 Terahertz Communication Systems: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

## **9. ASIA PACIFIC TERAHERTZ TECHNOLOGY MARKET – BY APPLICATION**

### 9.1 Overview

### 9.2 Terahertz Technology Market, by Application (2022 and 2030)

### 9.3 Medical and Healthcare

#### 9.3.1 Overview

#### 9.3.2 Medical and Healthcare: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 9.4 Defense and Security

#### 9.4.1 Overview

#### 9.4.2 Defense and Security: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 9.5 Food and Agriculture

#### 9.5.1 Overview

#### 9.5.2 Food and Agriculture: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 9.6 Industrial

#### 9.6.1 Overview

#### 9.6.2 Industrial: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 9.7 Semiconductor

#### 9.7.1 Overview

#### 9.7.2 Semiconductor: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

### 9.8 Other Applications

#### 9.8.1 Overview

#### 9.8.2 Other Applications: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

## **10. ASIA PACIFIC TERAHERTZ TECHNOLOGY MARKET – BY COUNTRY ANALYSIS**

### 10.1 Asia Pacific: Terahertz Technology Market

#### 10.1.1 Asia Pacific: Terahertz Technology Market- by Key Country

#### 10.1.1.1 Australia: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

##### 10.1.1.1.1 Australia: Terahertz Technology Market- by Component

##### 10.1.1.1.2 Australia: Terahertz Technology Market- By Type

##### 10.1.1.1.3 Australia: Terahertz Technology Market- By Application

10.1.1.2 China: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

10.1.1.2.1 China: Terahertz Technology Market- by Component

10.1.1.2.2 China: Terahertz Technology Market- By Type

10.1.1.2.3 China: Terahertz Technology Market- By Application

10.1.1.3 India: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

10.1.1.3.1 India: Terahertz Technology Market- by Component

10.1.1.3.2 India: Terahertz Technology Market- By Type

10.1.1.3.3 India: Terahertz Technology Market- By Application

10.1.1.4 Japan: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

10.1.1.4.1 Japan: Terahertz Technology Market- by Component

10.1.1.4.2 Japan: Terahertz Technology Market- By Type

10.1.1.4.3 Japan: Terahertz Technology Market- By Application

10.1.1.5 South Korea: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

10.1.1.5.1 South Korea: Terahertz Technology Market- by Component

10.1.1.5.2 South Korea: Terahertz Technology Market- By Type

10.1.1.5.3 South Korea: Terahertz Technology Market- By Application

10.1.1.6 Rest of Asia Pacific: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

10.1.1.6.1 Rest of Asia Pacific: Terahertz Technology Market- by Component

10.1.1.6.2 Rest of Asia Pacific: Terahertz Technology Market- By Type

10.1.1.6.3 Rest of Asia Pacific: Terahertz Technology Market- By Application

## **11. INDUSTRY LANDSCAPE**

11.1 Overview

11.2 Market Initiative

11.3 Product Development

11.4 Mergers & Acquisitions

## **12. COMPANY PROFILES**

12.1 Terasense Group Inc

12.1.1 Key Facts

12.1.2 Business Description

12.1.3 Products and Services



- 12.1.4 Financial Overview
- 12.1.5 SWOT Analysis
- 12.1.6 Key Developments
- 12.2 TeraView Ltd
  - 12.2.1 Key Facts
  - 12.2.2 Business Description
  - 12.2.3 Products and Services
  - 12.2.4 Financial Overview
  - 12.2.5 SWOT Analysis
  - 12.2.6 Key Developments
- 12.3 Advantest Corp
  - 12.3.1 Key Facts
  - 12.3.2 Business Description
  - 12.3.3 Products and Services
  - 12.3.4 Financial Overview
  - 12.3.5 SWOT Analysis
  - 12.3.6 Key Developments
- 12.4 Toptica Photonics AG
  - 12.4.1 Key Facts
  - 12.4.2 Business Description
  - 12.4.3 Products and Services
  - 12.4.4 Financial Overview
  - 12.4.5 SWOT Analysis
  - 12.4.6 Key Developments
- 12.5 Luna Innovations Inc
  - 12.5.1 Key Facts
  - 12.5.2 Business Description
  - 12.5.3 Products and Services
  - 12.5.4 Financial Overview
  - 12.5.5 SWOT Analysis
  - 12.5.6 Key Developments
- 12.6 H?BNER GmbH & Co KG
  - 12.6.1 Key Facts
  - 12.6.2 Business Description
  - 12.6.3 Products and Services
  - 12.6.4 Financial Overview
  - 12.6.5 SWOT Analysis
  - 12.6.6 Key Developments
- 12.7 Menlo Systems GmbH

- 12.7.1 Key Facts
- 12.7.2 Business Description
- 12.7.3 Products and Services
- 12.7.4 Financial Overview
- 12.7.5 SWOT Analysis
- 12.7.6 Key Developments
- 12.8 Advanced Photonix Inc
  - 12.8.1 Key Facts
  - 12.8.2 Business Description
  - 12.8.3 Products and Services
  - 12.8.4 Financial Overview
  - 12.8.5 SWOT Analysis
  - 12.8.6 Key Developments
- 12.9 NTT Electronics Corp
  - 12.9.1 Key Facts
  - 12.9.2 Business Description
  - 12.9.3 Products and Services
  - 12.9.4 Financial Overview
  - 12.9.5 SWOT Analysis
  - 12.9.6 Key Developments

## **13. APPENDIX**

- 13.1 About The Insight Partners
- 13.2 Word Index

## List Of Tables

### LIST OF TABLES

Table 1. Asia Pacific Terahertz Technology Market – Revenue, and Forecast to 2030 (US\$ Million)

Table 2. Asia Pacific: Terahertz Technology Market- By Key Country – Revenue and Forecast to 2030 (US\$ Million)

Table 3. Australia: Terahertz Technology Market- by Component –Revenue and Forecast to 2030 (US\$ Million)

Table 4. Australia: Terahertz Technology Market- By Type –Revenue and Forecast to 2030 (US\$ Million)

Table 5. Australia: Terahertz Technology Market- By Application –Revenue and Forecast to 2030 (US\$ Million)

Table 6. China: Terahertz Technology Market- by Component –Revenue and Forecast to 2030 (US\$ Million)

Table 7. China: Terahertz Technology Market- By Type –Revenue and Forecast to 2030 (US\$ Million)

Table 8. China: Terahertz Technology Market- By Application –Revenue and Forecast to 2030 (US\$ Million)

Table 9. India: Terahertz Technology Market- by Component –Revenue and Forecast to 2030 (US\$ Million)

Table 10. India: Terahertz Technology Market- By Type –Revenue and Forecast to 2030 (US\$ Million)

Table 11. India: Terahertz Technology Market- By Application –Revenue and Forecast to 2030 (US\$ Million)

Table 12. Japan: Terahertz Technology Market- by Component –Revenue and Forecast to 2030 (US\$ Million)

Table 13. Japan: Terahertz Technology Market- By Type –Revenue and Forecast to 2030 (US\$ Million)

Table 14. Japan: Terahertz Technology Market- By Application –Revenue and Forecast to 2030 (US\$ Million)

Table 15. South Korea: Terahertz Technology Market- by Component –Revenue and Forecast to 2030 (US\$ Million)

Table 16. South Korea: Terahertz Technology Market- By Type –Revenue and Forecast to 2030 (US\$ Million)

Table 17. South Korea: Terahertz Technology Market- By Application –Revenue and Forecast to 2030 (US\$ Million)

Table 18. Rest of Asia Pacific: Terahertz Technology Market- by Component –Revenue

and Forecast to 2030 (US\$ Million)

Table 19. Rest of Asia Pacific: Terahertz Technology Market- By Type –Revenue and Forecast to 2030 (US\$ Million)

Table 20. Rest of Asia Pacific: Terahertz Technology Market- By Application –Revenue and Forecast to 2030 (US\$ Million)

Table 21. List of Abbreviation

## List Of Figures

### LIST OF FIGURES

- Figure 1. Asia Pacific Terahertz Technology Market Segmentation
- Figure 2. Asia Pacific Terahertz Technology Market Segmentation – By Country
- Figure 3. Asia Pacific Terahertz Technology Market Overview
- Figure 4. Terahertz Detectors Segment Held the Largest Market Share in 2022
- Figure 5. Terahertz Imaging Systems Segment Held the Largest Market Share in 2022
- Figure 6. Medical and Healthcare Segment Held the Largest Market Share in 2022
- Figure 7. China was the Largest Revenue Contributor in 2022
- Figure 8. Asia-Pacific – PEST Analysis
- Figure 9. Asia Pacific Terahertz Technology Market– Ecosystem Analysis
- Figure 10. Asia Pacific Expert Opinion
- Figure 11. Asia Pacific Terahertz Technology Market Impact Analysis of Drivers and Restraints
- Figure 12. Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 13. Asia Pacific Terahertz Technology Market Revenue Share, by Component (2022 and 2030)
- Figure 14. Terahertz Sources: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 15. Terahertz Detectors: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 16. Asia Pacific Terahertz Technology Market Revenue Share, by Type (2022 and 2030)
- Figure 17. Terahertz Imaging Systems: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 18. Terahertz Spectroscopy Systems: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 19. Terahertz Communication Systems: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 20. Asia Pacific Terahertz Technology Market Revenue Share, by Application (2022 and 2030)
- Figure 21. Medical and Healthcare: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 22. Defense and Security: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)
- Figure 23. Food and Agriculture: Asia Pacific Terahertz Technology Market – Revenue

and Forecast to 2030 (US\$ Million)

Figure 24. Industrial: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 25. Semiconductor: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 26. Other Applications: Asia Pacific Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 27. Asia Pacific: Terahertz Technology Market, By Key Country – Revenue (2022) (US\$ Million)

Figure 28. Asia Pacific: Terahertz Technology Market Revenue Share, By Key Country (2022 and 2030)

Figure 29. Australia: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 30. China: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 31. India: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 32. Japan: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 33. South Korea: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

Figure 34. Rest of Asia Pacific: Terahertz Technology Market – Revenue and Forecast to 2030 (US\$ Million)

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