

Terahertz photonics: a field in rapid growth

A concise, evidence-based view of the spectrum, research activity and applications shaping THz technology.



0.1–10 THz

COMMONLY USED THZ BAND



90,993

SCHOLARLY WORKS · 2000–2025

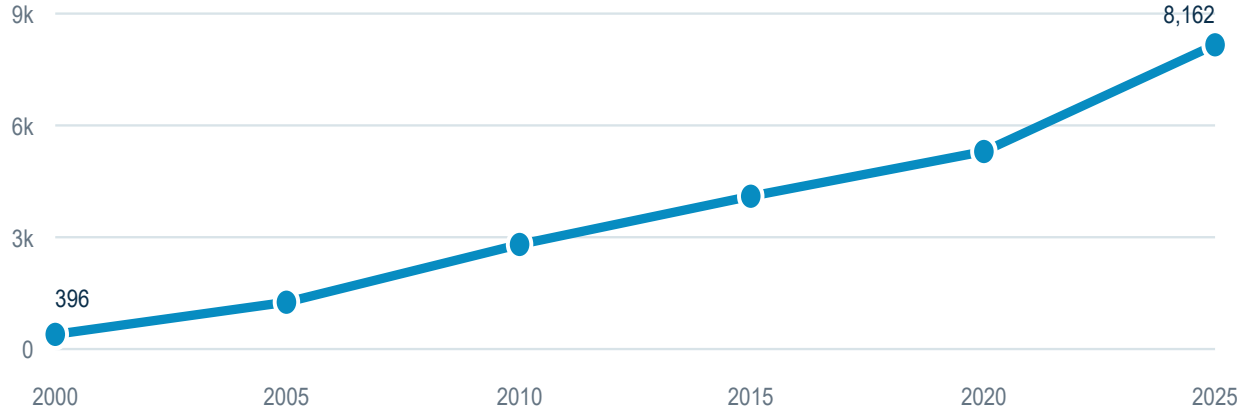


≈US\$1bn

EST. GLOBAL THZ MARKET · 2025

Research activity

Selected annual publication counts for works containing “terahertz” in the title or abstract



Why this spectral region matters

- λ** **3 mm–30 μm**
Wavelength span across 0.1–10 THz
- hν** **0.4–41 meV**
Low photon energy; non-ionising radiation
- MATERIAL-SENSITIVE**
Spectral fingerprints and transmission through many dielectric materials

Where THz photonics is advancing

- **6G AND METAMATERIALS**
- **SPECTROSCOPY AND MOLECULAR PHYSICS**
- **INSTRUMENTATION AND METROLOGY**
- **SPINTRONICS AND ULTRAFAST DYNAMICS**
- **SPACE-BASED SENSING AND ASTROPHYSICS**

Sources: OpenAlex Works API, title_and_abstract.search:“terahertz”, publication years 2000-2025 (retrieved 8 Sep 2026);

UK National Physical Laboratory, “Terahertz technologies”; IEEE JSAC, “Terahertz Communications and Networking”.

Market estimate: 2025 market estimates from Mordor Intelligence, MarketsandMarkets, IMARC and Fortune Business Insights range from US\$0.78bn to US\$1.27bn.