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# High-power and Broadband Photomixer for Terahertz-Wave Generation

## ~ Development of New Frequency Range Between Electric-Waves and Lightwaves ~

NTT

### Motivation

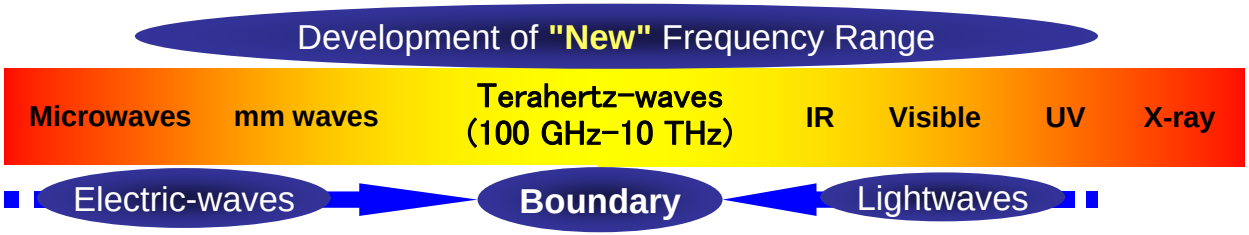
There have been many attempts to use a "new" frequency range, the terahertz (THz)-range, for various high-frequency applications. We have developed a photomixer module as a THz-wave generator that employs an ultra-high-speed photodiode (UTC-PD), which is original NTT technology.

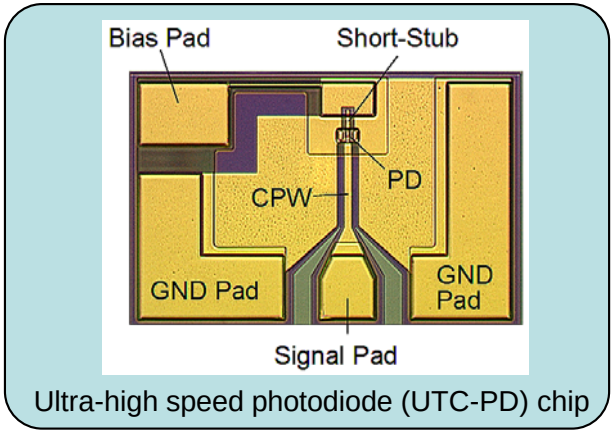
### Originality

The fabricated photomixer module simultaneously exhibits a high output power (-2.7 dBm@350 GHz) and an extremely wide bandwidth (120 GHz@3-dB down). The module package is compact, lightweight, and easy to use.

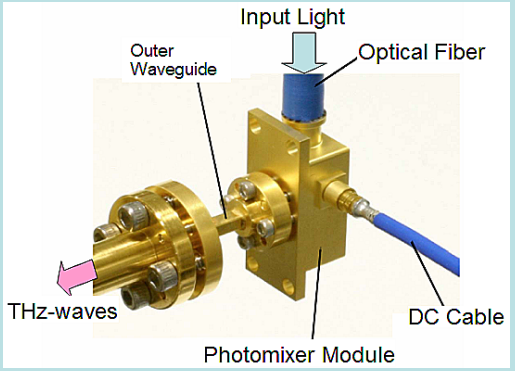
### Impact

Because THz-waves have singular features compared with electric waves and lightwaves, they are being actively investigated for application to various systems including ultra-high capacity wireless links, non-destructive inspection and imaging, a local signal supply for radio telescope, and spectroscopic sensing.
The photomixer module is the key to realizing these THz-wave systems.

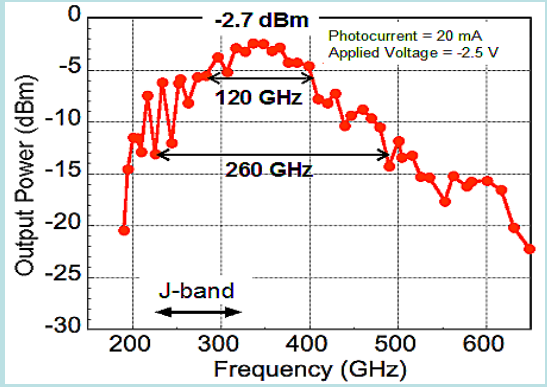


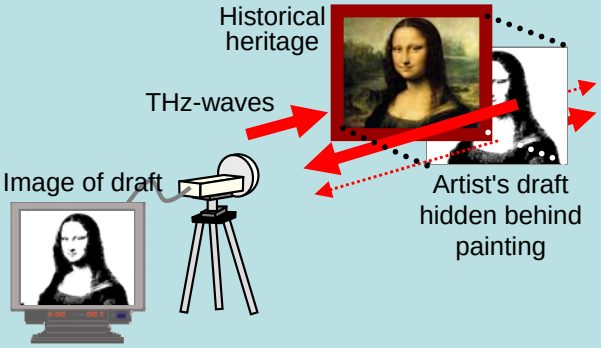
Ultra-high speed photodiode (UTC-PD) chip



Fabricated photomixer module



Output power dependence on frequency



Example of non-destructive inspection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