



1 Terahertz waves can be used for earth observation, e. g. for the development of climate models.

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2 Detail of an integrated circuit with a transistor gate length of only 20 nm.

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INTEGRATED CIRCUITS FOR TERAHERTZ FREQUENCIES

Terahertz waves penetrate smoke, dust, fog and clothing – even from a distance of several hundreds of meters. Therefore, this high frequency spectral range offers a wide variety of application potential. Fraunhofer IAF develops integrated electronic circuits based on III/V semiconductors for high frequencies. With a transistor cut-off frequency of 0.66 THz the institute holds the European record.

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Features

- Integrated circuits for frequencies > 600 GHz
- Metamorphic high electron mobility transistor (mHEMT) technology
- Material system InAlAs/InGaAs on 4" GaAs substrates
- Transistor gate lengths of only 20 nm

Applications

- **Communication:** transmission of very high data rates
- **Security:** detection of concealed weapons
- **Air safety:** landing aid for helicopters
- **Medicine:** diagnostics
- **Astronautics:** climate and earth observation from space