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# TERAHERTZ RANGE TELECOMMUNICATION SYSTEMS

**Volume 70, Issue 16, 2011, pp. 1477-1487****DOI:** 10.1615/TelecomRadEng.v70.i16.60[Get access](#)**Mikhail E. Ilchenko**

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**ABSTRACT**

This research paper delves into the level of development and advantages of application of telecommunication systems of terahertz range (100GHz to 3000GHz), including the fields of application for the developed technologies as well as the outstanding problems and feasible methods of their solution. Unfortunately, the frequency resource of the currently used radio-frequency band is physically incapable of transmitting very high-speed and high-speed data torrents via a radio channel. The application of multilevel modulations that could allow for the increase in speed is rather limited whereas the application of higher frequencies allows for the use of broader frequency band to transfer the gigabit torrents. This innovative approach has many advantages, in particular, confidentiality of data transmission and narrow-beam radio emission. This

paper also gives examples of available systems using the state-of-the-art semiconductor CMOS, SiGe and GaAs technologies and it also describes their specific features.

**KEY WORDS:** [terahertz range](#), [radio channel](#), [telecommunication system gigabit data flow](#), [semiconductor and nanotechnologies](#)

## CITED BY

1. Narytnik T., Uryvsky L., Lutchak O., Osypchuk S., Gigabit wireless system in 130 GHz band based on 802.11n transceivers, 2016 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom), 2016. [Crossref](#)
2. Narytnik T., Uryvsky L., Lutchak O., Osypchuk S., 1.2 Gbps radio link implementation in THz band based on IEEE 802.11n standard, 2016 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom), 2016. [Crossref](#)
3. Narytnik Teodor, The ways of creation and use of telecommunication systems in the terahertz band transport distribution 5G mobile networks, 2016 Third International Scientific-Practical Conference Problems of Infocommunications Science and Technology (PIC S&T), 2016. [Crossref](#)
4. Narytnik T., Uryvsky L., Lutchak O., Osypchuk S., Gigabit wireless system in 130 GHz band based on 802.11n transceivers, 2016 IEEE International Black Sea

Conference on Communications and Networking (BlackSeaCom), 2016. [Crossref](#)

5. Avdieienko Hlib, Yakornov Yevhenii, Application of Spatial Signal Processing by the Form of the Electromagnetic Wave Phase Front in Wireless Communication Systems, in Advances in Information and Communication Technologies, 560, 2019. [Crossref](#)
6. Avdeyenko Gleb, Application of Spatial Signal Processing for Bandwidth Capability Improvement of Radio Relay Link, 2019 IEEE International Scientific-Practical Conference Problems of Infocommunications, Science and Technology (PIC S&T), 2019. [Crossref](#)
7. Avdeyenko Gleb, Prototype of unidirectional microwave wireless communication system with spatial signals processing, 2018 International Conference on Information and Telecommunication Technologies and Radio Electronics (UkrMiCo), 2018. [Crossref](#)
8. Ilchenko M., Narytnyk T., Avdeyenko G., Wireless Communication Systems of Terahertz Frequency Range, in Current Trends in Communication and Information Technologies, 212, 2021. [Crossref](#)
9. Feng Jianxin, Xu Jingjing, Pan Chengsheng, Ding Yuanming, Fang Hui, A Novel Adaptive Terahertz System for Reliable and Efficient Maritime Communications Under Hostile Sea Conditions, IEEE Access, 10, 2022. [Crossref](#)
10. Ilchenko M.Yu., Narytnyk T.M., Prysiashnyi V.I., Kapshtyk S.V., Matvienko S.A., Space infrastructure of the Internet of things. State and prospects of development, Kosmìčna nauka ì tehnologiâ, 27, 6, 2021. [Crossref](#)

11. Sergienko Ivan V., Information Technologies as Tools for Studying Complex Processes, in Topical Directions of Informatics, 78, 2014. [Crossref](#)
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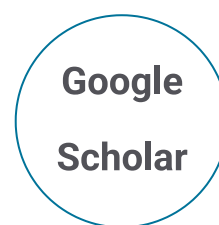
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