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| **Radiocommunication Study Groups** |  |
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| Received: 01 May 2020  Subject: Submission on SM.2352, Technology trends, 275-3 000 GHz | **Document 1A/\_\_\_\_\_\_\_\_\_** |
| **01 May 2020** |
| **English only** |
| Institute of Electrical and Electronics Engineers, Inc. | |
| CONTRIBUTION to working party 1A  WORKING DOCUMENT TOWARD A PRELIMINARY DRAFT  REVISION OF REPORT ITU-R SM.2352-0 | |
| Technology trends of active services in the frequency range 275-3 000 GHz | |

# Source Information

IEEE 802 LAN/MAN Standards Committee (LMSC) respectfully submits these responses to the Singapore Info-communications Media Development Authority (IMDA). IEEE 802 is a committee of the IEEE Standards Association and Technical Activities, two of the Major Organizational Units of the Institute of Electrical and Electronics Engineers (IEEE). IEEE has about 420,000 members in about 190 countries and supports the needs and interests of engineers and scientists broadly. In submitting this document, IEEE 802 acknowledges and respects that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802. Therefore, this submission should not be construed as representing the views of IEEE as a whole[[1]](#footnote-1).

# Background

ITU-R WP 1A is currently working toward a draft WORKING DOCUMENT TOWARD A PRELIMINARY DRAFT REVISION OF REPORT ITU-R SM.2352-0 “Technology trends of active services in the frequency range 275-3 000 GHz” [1]. In 2015 IEEE 802 has contributed [2] to section 6 of the current Report ITU-R SM.2352 [3]. The corresponding text refers to the standardization efforts in IEEE 802.15 TG3d, which were ongoing in 2015. In the meantime the standard has been finalized. As a consequence the current information in section 6 of the current Report ITU-R SM.2352 is outdated. With this contribution IEEE 802 proposes to modify section 6 as described in section 3 of this document.

# Proposal for a modification of section 6

Section 6 of ITU-R SM.2352 shall be replaced by the following text:

# 6 THz related activities within the international standard organization

In 2008 IEEE 802.15 created the THz Interest Group (IG THz). The focus was primarily concerned with THz communications and related network applications operating in the THz frequency bands between 275-3 000 GHz. Such THz communication applications would include: component to component, board to board, machine to machine, human to machine and human to human, (indoor and outdoor) wireless communications. THz communication applications cover multiple categories with varying requirements. As envisioned, THz communications would overall employ wireless modulation methods of limited complexity, omni and/or directional antenna systems, and would typically offer very high data transfer rates in multiples of 10 Gbit/s, and up to 100 Gbit/s, for parity with future fiber optic capacities. THz wireless systems could support transmission distances ranging from the very short (few centimeters or less) to relatively long distances of several hundred meters.

The IG THz has focused on open spectrum issues, channel modelling and monitoring the development of technology. With the development of more mature transceiver technologies 802.15 made a step forward towards the development of the first wireless 300 GHz standard by establishing Task Group 3d in 2014, which completed its work in October 2017, when the amendment IEEE Std 802.15.3d-2017 was published. This amendment is based on IEEE Std 802.15.3c and defines a wireless switched point-to-point physical layer to IEEE Std 802.15.3-2016 operating at PHY data rates typically in the range of up to of 100 Gbit/s. Operation is considered in bands 252-321 GHz at ranges as short as a few centimeters and up to several hundred meters. The development of IEEE Std 802.15.3d-2017 was in parallel to IEEE Std 802.15.3e-2017, which developed an amendment for 60 GHz high-rate close-proximity (HRCP) communications. Large parts of the MAC layer as well as the defined modulation and coding schemes are identical in both amendments.

Potential applications of interest include wireless data centers, kiosk downloading, wireless intra-device communication and wireless backhauling and fronthauling.

Prospective opportunities to develop further amendments in the THz frequency range are evaluated in the Technical Advisory Group THz, which replaced the IG THz in 2018.

# Summary

We applaud the efforts of the participants in ITU-R WP 1A for undertaking this work and giving IEEE 802 the opportunity to contribute to terahertz related matters.

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# References

[1] WORKING DOCUMENT TOWARD A PRELIMINARY DRAFT REVISION OF REPORT ITU-R SM.2352-0 “Technology trends of active services in the frequency range 275-3 000 GHz”

[2] IEEE 802, Draft liaison statement to Working Party 1A on new Report ITU-R SM.2352-0 - Copy for information to Working Parties 5A, 5C, 7C and 7D - Technology trends of active services in the band above 275 GHz; <https://mentor.ieee.org/802.18/dcn/16/18-16-0008-04-0000-draft-liaison-statement-to-itu-r-wp1a-sm-2352-0-docx.docx>;

[3] <https://www.itu.int/pub/R-REP-SM.2352-2015>

1. This document solely represents the views of the IEEE 802 LAN/MAN Standards Committee and does not necessarily represent a position of either the IEEE, the IEEE Standards Association or IEEE Technical Activities. [↑](#footnote-ref-1)