

RADIO SPECTRUM AND TECHNICAL STANDARDS ADVISORY COMMITTEE

Overview of 60 GHz Multiple Gigabit Wireless Systems

Introduction

This paper briefs Members on the overseas development of Multiple Gigabit Wireless Systems (MGWS) operating in the 60 GHz band.

Background

2. New short range radiocommunications technologies that achieve a data rate of multiple gigabits are being developed using the 60 GHz band. Such technologies allow for a multitude of new applications such as video link and high speed local area networking. The industry has been taking the lead in developing standards for 60 GHz MGWS. There are now two major industry standards –

- (a) IEEE 802.11ad supported by the Wireless Gigabit (WiGig) Alliance (formed in 2009, now unified with the Wi-Fi Alliance); and
- (b) IEEE 802.15.3c supported by the WirelessHD Consortium (formed in 2006).

3. In November 2011, the ITU published ITU-R Report M.2227 which describes some typical applications of the 60 MHz MGWS and gives an overview of the IEEE 802.11ad and the IEEE 802.15.3c standards. In March 2012, the ITU published ITU-R Recommendation M.2003 recommending the use of these standards.

Characteristics of WiGig and WirelessHD

WiGig

4. WiGig is developed by the IEEE 802.11ad working group with inputs from the WiGig Alliance, the members of which include Cisco, Huawei, Intel, Microsoft, NEC, Nokia, Panasonic and Samsung. It is one of the 802.11 series

standards and serves to extend Wi-Fi to support gigabit rate applications ranging from high-definition WiGig display, peripheral connectivity to gigabit local area network operating in the 60 GHz band. Interoperability with 2.4 GHz or 5 GHz Wi-Fi based on the 802.11a/b/g/n standards is provided as WiGig and Wi-Fi shares the same Media Access Control (MAC) approach, thus allowing session switching between the two.

5. The Wi-Fi Alliance is now operating product certification programs to ensure the interoperability of Wi-Fi products from different vendors. It is expected that the programs will embrace WiGig products in the near future.

WirelessHD

6. The WirelessHD Consortium has been developing the WirelessHD specifications based on the IEEE 802.15.3c standard, with extensions to cover requirements on application layer, power management, etc. Members of the WirelessHD Consortium include Hitachi, LG Electronics, Panasonic, Samsung, Sharp, Sony and Toshiba. WirelessHD Consortium published the WirelessHD specification version 1.1 in 2010.

7. The WirelessHD Consortium is running a compliance testing program to verify the interoperability of WirelessHD products from different vendors. There have already been some audio/video products certified to be WirelessHD-compliant under the program.

Frequency Planning

CEPT

8. Among other applications (e.g. fixed, non-specific short range devices), the European Conference of Postal and Telecommunications Administrations (CEPT) has allocated the band 57 – 66 GHz to wideband data transmission systems. CEPT recommends that the European harmonised standard EN 302 567 be used as the conformity standard. Most CEPT countries, including the UK, have implemented the CEPT recommendation.

FCC

9. The Federal Communications Commission (FCC) has allocated the band 57 – 64 GHz for operation of MGWS under the provisions of the Code of Federal Regulations (CFR) Title 47 Part 15.

MIIT

10. In 2006, the Ministry of Industry and Information Technology (MIIT) issued a notice that covered the use of the frequency band 59 – 64 GHz for short range communications. According to MIIT, it is reviewing the frequency planning for the 60 GHz band at present.

Way Forward

11. According to the ITU Region 3 allocation, the band 57 – 66 GHz is now allocated to primary services like earth exploration-satellite, fixed, mobile, radiolocation, space research, etc. In Hong Kong, the allocation of the band 57 – 66 GHz remains to be planned, except for 61 – 61.5 GHz which is allocated to radiolocation and ISM on a primary basis. The detailed frequency allocation table for the band 57 – 66 GHz is given at the Annex.

12. In considering the allocation of the 60 GHz band to services like MGWS, OFCA will keep in view the development of international standardisation for MGWS, frequency planning, the regulatory arrangements in other administrations, and the availability of relevant products on the mass market. Comments from Members about this subject are welcome.

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Region 3 and Hong Kong Allocation of the 60 GHz Band

Region 3 Allocation	Hong Kong Allocation	Band Plan and Existing Utilisation
57-58.2 GHz EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE SPACE RESEARCH (passive)	57-61 GHz TO BE PLANNED	57-61 GHz
58.2-59 GHz EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)		
59-59.3 GHz EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE RADIOLOCATION SPACE RESEARCH (passive)		
59.3-64 GHz FIXED INTER-SATELLITE MOBILE RADIOLOCATION [1]		
61-61.5 GHz RADIOLOCATION INDUSTRIAL, SCIENTIFIC AND MEDICAL (ISM)	61-61.5 GHz Industrial, Scientific and Medical (ISM) Equipment	
64-65 GHz FIXED INTER-SATELLITE MOBILE except aeronautical mobile	61.5-66 GHz TO BE PLANNED	61.5-66 GHz
65-66 GHz EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH		