



**IDA'S DECISION AND EXPLANATORY MEMORANDUM ON  
THE REGULATORY FRAMEWORK FOR 60 GHz FREQUENCY BAND**

**30 March 2011**

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# IDA'S DECISION AND EXPLANATORY MEMORANDUM ON THE REGULATORY FRAMEWORK FOR 60 GHz FREQUENCY BAND

## PART I: INTRODUCTION

1. On 19 February 2010, IDA issued a public consultation on "Proposed Regulatory Framework for 60 GHz Frequency Band" ("Consultation"). The Consultation sought views and comments from the industry on the following:
  - i) To open up the 60GHz band for Multi-Gigabit Wireless Systems ("MGWS") technology subject to the following operating parameters:
    - a) low radiation equipment ( $\leq 40\text{dBm}$  EIRP) may be permitted to operate in the 57 - 66 GHz band; and
    - b) high radiation equipment ( $> 40\text{dBm}$  EIRP) may be permitted to operate only in the 57 - 63 GHz frequency band in view of future Intelligent Transport System ("ITS") deployment in the 63 - 64 GHz band;
  - ii) Not to mandate any channelling plan in the frequencies 57 - 63GHz but to impose a 100MHz guard band at each end to safeguard operation of services in adjacent bands;
  - iii) A proposed technical framework on RF output power for MGWS systems in the 60GHz band; and
  - iv) To exempt only low radiation power devices in the 60GHz band from licensing.
2. The Consultation closed on 31 March 2010. At the close of the Consultation, IDA has received comments from six respondents:
  - i. Association of Telecommunications Industry of Singapore;
  - ii. HUBER+SUHNER Singapore;
  - iii. IDA Telecommunications Standards Technical Committee; Working Group 2 - Home Networking;
  - iv. Intel Corporation;
  - v. Philips International B.V.; and
  - vi. WirelessHD, LLC

IDA would like to thank all the respondents for their valuable inputs.

3. Taking into consideration the comments received, as well as IDA's policy objectives, IDA has finalised the regulatory framework to allow use of 60 GHz frequency band. This document sets out IDA's response to the comments received from the Consultation and IDA's decision on the final framework.

## **PART II: SUMMARY OF COMMENTS RECEIVED ON THE PROPOSED FRAMEWORK FOR THE 60 GHz FREQUENCY BAND**

4. In general, the industry welcomed IDA's efforts and was supportive of IDA's proposal to open up the 60GHz band in Singapore. The full responses are published on IDA's website<sup>1</sup> while the summary to the key issues in the proposed framework for the 60 GHz band are set out in the paragraphs below.

### **Issue 1: Opening of 63-66 GHz frequency band for high radiation fixed wireless services**

5. **Summary:** One respondent commented that the 63 - 66 GHz band should only be opened up for higher radiation fixed wireless services with proper implementation of mitigation techniques to reduce the possibilities of mutual interference of high radiation fixed wireless services with ITS as recommended in the CEPT ECC Report 113. However, the general industry feedback was that it would be prudent to reserve the 63 - 66 GHz band to protect the possibility of ITS deployment in the 63 - 64 GHz band.

### **Issue 2: Preferred channelling plan for high radiation fixed wireless services**

6. **Summary:** All except one respondent were supportive of IDA's proposal not to impose any channelling plan in view of the low risk for high radiation equipments in the band to interfere with low radiation equipments operating in the same band.

### **Issue 3: Proposed full licensing approach for high radiation equipment (> 40dBm EIRP)**

7. **Summary:** Only three responded to this question. One respondent<sup>2</sup> strongly considers that licence-exempt should be the correct approach while the remaining two respondents are supportive of a full licensing approach for high radiation equipment.

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<sup>1</sup> <http://www.ida.gov.sg/Policies%20and%20Regulation/20090312101754.aspx>

<sup>2</sup> The respondent further commented that if licence-exempt approach is not possible for high radiation equipment, then a light licensing scheme as an alternative to the licence exempt approach should be adopted.

### PART III: IDA'S VIEWS AND DECISIONS ON THE FRAMEWORK FOR THE 60 GHz FREQUENCY BAND

8. While developing the regulatory framework in the 60 GHz band to better manage equipment operating in the band, IDA is mindful that there is a fine balance between allowing maximum flexibility and minimum restrictions for adoption of new technology and services, and retaining regulatory control over the use of high radiation equipment to ensure co-existence without causing interference to other authorised services. The following paragraphs set out IDA's assessments of the key issues in the proposed framework allocation for the 60 GHz band.

**Issue 1: Opening of 63-66 GHz frequency band for high radiation fixed wireless services**

9. **Assessment:** In view of the industry support, IDA will maintain its earlier position to limit the operation of high radiation equipment only to the 57 - 63 GHz band at this juncture so as to protect possible deployment of ITS system in adjacent band. IDA will review whether to open up the 63 - 66 GHz band for high radiation fixed wireless services in the future after ITS has been deployed.

**Issue 2: Preferred channelling plan for high radiation fixed wireless services**

10. **Assessment:** IDA notes that currently there are only limited services that can be deployed in the 60 GHz band. Adopting a channeling plan at this juncture may therefore favours the development of a specific technology and stifle innovation and growth of other competing technologies. On balance, IDA will not adopt any channelling plan at this juncture but will continue to monitor the market and technological developments in the 60GHz band. Nevertheless, users may adopt internationally adopted channelling plans<sup>3</sup> as a guide, on the conditions that the equipment and channelling plans are compliant with international standards.

**Issue 3: Proposed full licensing approach for high radiation equipment (> 40dBm EIRP)**

11. **Assessment:** The industry expressed concerns with the proposal for a full licensing approach for high radiation equipment because of the concern with the high spectrum fees that might be payable. Equipment operating in this band are likely to utilise bandwidths exceeding more

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<sup>3</sup> The channelling plans that are currently available can be found from ECMA, IEEE 802.15.3c, WirelessHD and ECC Recommendation 09-01.

than 20 MHz. Under the existing framework<sup>4</sup>, the frequency fee payable for a shared frequency with an occupied bandwidth of  $\geq 20$  MHz is S\$6, 200 annually while application fee is a one-time payment of S\$4, 650.

12. IDA is aware that some administrations have chosen to exempt licensing in this band. However, IDA is of the view that a user should pay for the use of spectrum given that another user will be deprived of the opportunity to use the same spectrum for that time and space. From a spectrum management perspective, it would be prudent to license the use of high radiation equipment given the high RF output power<sup>5</sup>.
13. Nonetheless, IDA is mindful that the licence fees payable may discourage the adoption of high radiation equipment in the 60 GHz band. To promote the adoption of 60 GHz technology, IDA will consider the waiver of licence fees<sup>6</sup> for experimental licence which is applicable for R&D activities that focus on areas of scientific or technological research and development, and for the purpose of creating new or improving existing devices or applications.

#### **PART IV: CONCLUSION**

14. After careful assessments of all the responses to the public consultation, IDA has considered the appropriateness to open the 60 GHz band in accordance with the European's harmonised frequencies and regulations (EN 302 567 and EN 302 217).
15. Within the 60 GHz band, there are equipment capable of either low or high power applications, hence the 60 GHz band will be available for new wireless applications under two categories of licensing framework<sup>7</sup> as follows;
  - i) **Licence – exempt** (low power devices)
  - ii) **Licence** (high power devices)

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<sup>4</sup>[http://www.ida.gov.sg/doc/Policies%20and%20Regulation/Policies\\_and\\_Regulation\\_Level2/20060421164253/SpectrumMgmtHB140207.pdf](http://www.ida.gov.sg/doc/Policies%20and%20Regulation/Policies_and_Regulation_Level2/20060421164253/SpectrumMgmtHB140207.pdf)

<sup>5</sup> As an illustration, the maximum transmitter output power of high radiation equipment that is available on the market is capped at 10dBm (EIRP), with the aid of a high gain antenna (45dBi), the maximum RF output power will increase to 55dBm (EIRP).

<sup>6</sup> The licence fee for experimental license will be renewable on an annual basis, therefore allowing IDA to retain control over the experimental licensee.

<sup>7</sup> Detailed sub-allocations of bands and the technical requirements are shown in Annex.

16. To give effect to the opening up of the 57 – 66 GHz band for the operation of low power devices on a spectrum licence exempt basis and to be registered under the ESER<sup>8</sup> (“Enhanced Simplified Equipment Registration”) scheme, IDA will be amending the following Notification and Regulations for publication in the *Government Gazette*:
  - (a) Telecommunications (Exemption From Section 33, 34(1)(b) and 35) (Amendment) Notification 2011; and
  - (a) Telecommunications (Dealers) (Amendment) Regulations 2011.
17. Subject to administrative and gazetting process, the above amendments for publication in the *Government Gazette* are expected to take effect by **1 April 2011**.

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<sup>8</sup> The ESER scheme was introduced in August 2007 for equipment whose approval can be based on a declaration of conformity that does not need prior verification by IDA. Under the ESER scheme, no fee is payable for equipment registered under ESER and the Telecommunication (Dealers) Regulations specify the harmonised frequency bands authorised for ESER.

**SUMMARY OF FREQUENCY ALLOCATIONS AND REGULATORY FRAMEWORK**

Applications	Authorised Frequency Band	RF Output Power	Key Requirements
MGWS WPAN/WLAN	57 – 66 GHz	Not to exceed 40dBm EIRP	Indoor use is restricted to a maximum mean EIRP density limit of 13 dBm/MHz  Outdoor use is restricted to a maximum EIRP of 25 dBm and a maximum EIRP power spectral density of -2 dBm/MHz
POINT-TO-POINT FIXED WIRELESS SYSTEMS INCLUDING FIXED LAN EXTENSION (FLANE) APPLICATIONS	57.1 – 62.9 GHz  (Excluding guard bands of 100 MHz at each end of the spectrum)	Not to exceed 55dBm EIRP	Equipment is not allowed on aircraft or satellites  Minimum antenna gain of +30 dBi and maximum transmitter output power of +10 dBm  Maximum transmit output power density is limited to -10dBm/MHz

Description	Key Requirements
Spectrum	Low Radiation Equipment (<= 40dBm EIRP): 57 – 66 GHz High Radiation Equipment (<= 55dBm EIRP): 57.1 – 62.9 GHz
Channel Plan	No mandatory channel plan. Flexible approach. Users can utilise the channel plans as recommended in ECC Recommendation 09-01 or IEEE 802.15(3)c
Licence Approach <sup>9</sup>	Low Radiation Equipment: Licence-exempt High Radiation Equipment: General Radio-communication Station Licence
Technical Requirement	Low Radiation Equipment must conform to EN 302 567 High Radiation Equipment must conform to EN 302 217

**SUMMARY OF EQUIPMENT REGISTRATION SCHEME**

Description	Type of Equipment Registration Scheme
Low Radiation Equipment	Enhanced Simplified Equipment Registration (“ESER”) scheme
High Radiation Equipment	General Equipment Registration (“GER”) scheme

<sup>9</sup> Where these devices are used to form a wide area network for service provisioning to third parties, applications shall have to apply for FBO or SBO licences.