
UK Interface Requirement (IR) 2106

Spectrum Access: Extremely High Frequencies (EHF)
in the bands 116-122 GHz, 174.8-182 GHz and
185-190 GHz

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1. References

Recommendation ITU-R RS.1861: Typical technical and operational characteristics of Earth exploration-satellite service (passive) systems using allocations between 1.4 and 275 GHz.

Recommendation ITU-R RS.2017: Performance and interference criteria for satellite passive remote sensing.

ETSI EN 305 550: Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Harmonised Standard for access to radio spectrum.

ECC Report 190: Compatibility between Short-Range Devices (SRD) and EESS (passive) in the 122 to 122.25 GHz band.

2. Foreword

- 2.1 The Radio Equipment Directive (Directive 2014/53/EU) was implemented in the United Kingdom (UK) by the Radio Equipment Regulations 2017. In accordance with Articles 8 and 7 of Directive 2014/53/EU, this UK Interface Requirement contains the requirements for the licensing and use of terrestrial systems capable of providing electronic communications services in the specified frequency bands.
- 2.2 Nothing in this UK Radio Interface Requirement shall preclude the need for equipment to comply with Directive 2014/53/EU.
- 2.3 It is required by the Wireless Telegraphy Act 2006 that no radio equipment is installed or used in the UK except under the authority of a licence granted by or otherwise exempted by regulations made by Ofcom. It is a condition of such a licence or exemption regulations as appropriate that, in order to be installed or used in the UK, the equipment must meet the minimum requirements specified in this UK Interface Requirement for the stated equipment types and for the stated frequency bands. Nothing in this UK Interface Requirement shall preclude equipment from being placed on the market in the UK that complies with the 'essential requirements' specified in Directive 2014/53/EU.
- 2.4 The requirements given in the main body of this UK Radio Interface Requirement will apply to the licensing of terrestrial systems capable of providing electronic communications services in the 116-122 GHz, 174.8-182 GHz and 185-190 GHz bands (the "EHF Bands").
- 2.5 This UK Radio Interface Requirement will be revised as necessary, for example to follow:
- a) current technology developments for reasons related to the effective and appropriate use of the spectrum in particular maximising spectrum utilisation; and
 - b) changes to the available spectrum allocated for terrestrial systems capable of providing electronic communications services in the EHF bands.
- 2.6 All UK Radio Interface Requirements notified under Directive 2015/1535/EU will be published and will be made available free of charge from the [Ofcom website](#).

3. Minimum requirements for operation within the UK

- 3.1 The minimum requirements in this document are made for reasons related to the effective and appropriate use of the radio spectrum, in particular maximising spectrum utilisation.
- 3.2 This UK Radio Interface Requirement gives a high-level description of how the spectrum in the UK is used for technologies covered by the Spectrum Access: EHF licence product in the EHF Bands. It does not prescribe technical interpretation of the 'essential requirements' of Directive 2014/53/EU.
- 3.3 This UK Radio Interface Requirement therefore stipulates the necessary equipment parameters for the authorisation of terrestrial systems capable of providing electronic communications services in the EHF Bands in the UK. Tables 3.1 to 3.2 contain the relevant equipment parameters. These taken together with the 'essential requirements' detailed in Article 3.2 of Directive 2014/53/EU constitute the minimum requirements for terrestrial systems capable of providing electronic communications services in the EHF Bands within the UK. Nothing in this UK Interface Requirement shall preclude equipment from being placed on the market in the UK that complies with the 'essential requirements' specified in Directive 2014/53/EU.
- 3.4 The technical parameters specified in the UK Radio Interface Requirement are applied to achieve the desired level of compatibility within the spectrum for terrestrial systems capable of providing electronic communications services in the EHF Bands and with other radiocommunications services, whilst promoting enterprise, innovation and competition.
- 3.5 This UK Radio Interface requirement provides the necessary technical information which facilitates access to EHF spectrum by making clear the assumptions that are made in planning the use of the spectrum for terrestrial systems capable of providing electronic communications services in the EHF Bands in the UK. It is not the intention of this UK Radio Interface Requirement to duplicate or impose any additional 'essential requirements' of the Directive 2014/53/EU on products. Any specified parameters within this document are for the purpose of identifying product options and not as a national de facto product requirement.

Table 3.1: Minimum requirements for the use of: ECS equipment operating in the 116-122 GHz and 174.8-182 GHz bands

| Mandatory (1 – 10) | |
|---|---|
| 1. Radiocommunication Service | Fixed or Mobile Service |
| 2. Application | Electronic communications services |
| 3. Frequency band(s) | 116-122 GHz and 174.8-182 GHz |
| 4. Channelling | N/A |
| 5. Occupied bandwidth | N/A |
| 6. Direction / Separation | N/A |
| 7. Maximum Transmit Power / Power Density | <p>55 dBm EIRP</p> <p>The maximum permitted EIRP must be adjusted for systems using bandwidths of less than 100 MHz as follows:</p> $EIRP\ Reduction = 10 \times \log_{10} \left(\frac{BW_{MHz}}{100} \right)$ <p>This applies to the maximum permitted EIRP levels for both the main beam EIRP and, for outdoor use, the EIRPs at angles relative to main beam in the elevation plane.</p> <p><i>Additional requirements for outdoor use</i></p> <p>For outdoor use, EIRP at angles relative to main beam in the elevation plane shall not exceed:</p> <ul style="list-style-type: none"> • 13 dBm at >10 degrees • 1 dBm at >40 degrees • -3 dBm at >60 degrees <p>For outdoor use, the main beam elevation angle shall not exceed 20 degrees above horizontal</p> <p><i>Out of band emissions</i></p> <p>Out of band emissions must be limited to -10 dBm/MHz EIRP.</p> |
| 8. Channel access and occupation rules | N/A |
| 9. Authorisation regime | <p>A licence is required. These licences are issued on a non-protection and non-interference basis.</p> <p>Radio equipment is not permitted to be used airborne.</p> |
| 10. Additional essential requirements | None |

Informative (11 – 13)

| | |
|------------------------|---|
| 11. Frequency Planning | - |
| 12. Planned changes | - |
| 13. Reference | - |
| 14. Notification | 2020/71/UK |
| 15. Remarks | <p>Definition of outdoor use</p> <p>Any device operating in an environment which does not meet the definition of “indoor” is required to meet the technical conditions for outdoor use. “Indoor” means inside premises which: (i) have a ceiling or a roof; and (ii) except for any doors, windows or passageways, are wholly enclosed.</p> |

Table 3.2: Minimum requirements for the use of: ECS equipment operating in the 185-190 GHz band

| Mandatory (1 – 10) | |
|---|---|
| 1. Radiocommunication Service | Fixed or Mobile Service |
| 2. Application | Electronic communications services |
| 3. Frequency band(s) | 185-190 GHz |
| 4. Channelling | N/A |
| 5. Occupied bandwidth | N/A |
| 6. Direction / Separation | N/A |
| 7. Maximum Transmit Power / Power Density | <p>55 dBm EIRP</p> <p>The maximum permitted EIRP must be adjusted for systems using bandwidths of less than 100 MHz as follows:</p> $EIRP \text{ Reduction} = 10 \times \log_{10} \left(\frac{BW_{MHz}}{100} \right)$ <p>This applies to the maximum permitted EIRP levels for both the main beam EIRP and, for outdoor use, the EIRPs at angles relative to main beam in the elevation plane.</p> <p><i>Additional requirements for outdoor use</i></p> <p>For outdoor use, EIRP at angles relative to main beam in elevation shall not exceed:</p> <ul style="list-style-type: none"> • 25 dBm at >10 degrees • 14 dBm at >40 degrees • 10 dBm at >60 degrees <p>For outdoor use, the main beam elevation angle shall not exceed 20 degrees above horizontal</p> <p><i>Out of band emissions</i></p> <p>Out of band emissions must be limited to -10 dBm/MHz EIRP.</p> |
| 8. Channel access and occupation rules | N/A |
| 9. Authorisation regime | <p>A licence is required. These licences are issued on a non-protection and non-interference basis.</p> <p>Radio equipment is not permitted to be used airborne.</p> |
| 10. Additional essential requirements | None |

Informative (11 – 13)

| | |
|------------------------|---|
| 11. Frequency Planning | - |
| 12. Planned changes | - |
| 13. Reference | - |
| 14. Notification | 2020/71/UK |
| 15. Remarks | <p>Definition of outdoor use</p> <p>Any device operating in an environment which does not meet the definition of “indoor” is required to meet the technical conditions for outdoor use. “Indoor” means inside premises which: (i) have a ceiling or a roof; and (ii) except for any doors, windows or passageways, are wholly enclosed.</p> |

4. Additional performance parameters

Informative

4.1 None specified.

5. Contact details

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6. Document history

| Version | Date | Changes |
|---------|----------------|-----------|
| 1.0 | 1 October 2020 | Published |