UK Interface Requirement (IR) 2103

Shared Access Low Power

Published 14 January 2025

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Section

1. References

1800 MHz

Directive 2009/114/EC of the European Parliament and of the Council of 16 September 2009 amending Council Directive 87/372/EEC on the frequency bands to be reserved for the coordinated introduction of public pan-European cellular digital land-based mobile communications in the Community

Commission Decision 2009/766/EC of 16 October 2009 on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community

Decision 2011/251/EU: Commission implementing decision of 18 April 2011 amending Decision 2009/766/EC on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community.

COMMISSION IMPLEMENTING DECISION of 20 April 2018 amending Decision 2009/766/EC on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community as regards relevant technical conditions for the Internet of Things.

Recommendation ITU-R M.1457 – Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000).

Resolution ITU-R 56 – Naming for International Mobile Telecommunications

ETSI TS 136 101: LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception ETSI TS 136 104: LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception

ETSI TS 136 106: LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); FDD repeater radio transmission and reception

ETSI EN 301 908-13: IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the Radio Equipment Directive (Directive 2014/53/EU); Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)

ETSI EN 301 908-14: IMT cellular networks; Harmonized Standard for access to radio spectrum; Part 14: Evolved Universal Terrestrial Radio Access (E-UTRA) Base Stations (BS)

ETSI EN 301 908-15: IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 15: Evolved Universal Terrestrial Radio Access (E-UTRA FDD) (Repeaters)

ETSI EN 301 908-21: IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 21: OFDMA TDD WMAN (Mobile WiMAX) FDD User Equipment (UE)

ETSI EN 301 908-22: IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive ; Part 22: OFDMA TDD WMAN (Mobile WiMAX) FDD Base Stations (BS)

IEEE Std 802.16: Standard for local and metropolitan area networks – Air interface for broadband wireless access systems

CEPT Report 40: Report from CEPT to European Commission in response to Task 2 of the Mandate to CEPT on the 900/1800 MHz bands - Compatibility study for LTE and WiMAX operating within the bands 880-915 MHz / 925-960 MHz and 1710-1785 MHz / 1805-1880 MHz (900/1800 MHz bands)

CEPT Report 41: Report from CEPT to European Commission in response to Task 2 of the Mandate to CEPT on the 900/1800 MHz bands - Compatibility between LTE and WiMAX operating within the bands 880-915 MHz / 925-960 MHz and 1710-1785 MHz / 1805-1880 MHz (900/1800 MHz bands) and systems operating in adjacent bands

2.3 GHz

EEC/DECC (14)02 (June 2014) harmonised technical and regulatory conditions for the use of the band 2300-2400 MHz for Mobile/Fixed Communications Networks (MFCN)

CEPT Report 55: Technical conditions for wireless broadband usage of the 2300- 2400 MHz frequency band

CEPT Report 56 Report B1 from CEPT to the European Commission in response to the Mandate on 'Harmonised technical conditions for the 2300-2400 MHz ('2.3 GHz') frequency band in the EU for the provision of wireless broadband electronic communications services'. Technological and regulatory options facilitating sharing between Wireless broadband applications (WBB) and the relevant incumbent services/applications in the 2.3 GHz band

ECC Report 216 on Practical guidance for TDD networks synchronisation

ETSI EN 301 908: IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the Radio Equipment Directive (Directive 2014/53/EU)

3.8-4.2 GHz

Commission decision 2008/411/EC of 21 May 2008 on the harmonisation of the 3400-3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community

Commission Implementing Decision (EU) 2019/235 on amending Decision 2008/411/EC as regards an update of relevant technical conditions applicable to the 3400-3800 MHz frequency band

ETSI EN 302 326: Fixed Radio Systems; Multipoint Equipment and Antennas; Harmonized EN covering the essential requirements of article 3.2 of the Radio Equipment Directive (Directive 2014/53/EU)

ETSI EN 302 623: Broadband Wireless Access Systems (BWA) in the 3400 MHz to 3800 MHz frequency band; Mobile Terminal Stations; Harmonized EN covering the essential requirements of article 3.2 of the Radio Equipment Directive (Directive 2014/53/EU)

26 GHz

ECC Decision (18)06 on the harmonised technical conditions for Mobile/Fixed Communications Networks (MFCN) in the band 24.25-27.5 GHz, as amended on 20 November 2020.

ETSI EN 301 908: IMT cellular networks; Harmonised Standard for access to radio spectrum (25 March 2022)

ECC Report 307 Toolbox for the most appropriate synchronisation regulatory framework including coexistence of MFCN in 24.25-27.5 GHz in unsynchronised and semi-synchronised mode. (6 March 2020).

ECC/REC/(20)01 ECC Recommendation of 6 March 2020 on guidelines to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned FSS transmitting earth stations in the frequency band 24.65-25.25 GHz and the possibility for future deployment of these earth stations.

ECC/REC/(19)01 ECC Recommendation of 8 March 2019 on technical toolkit to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned EESS/SRS receiving earth stations in the 26 GHz band and the possibility for future deployment of these earth stations.

CEPT Report 068 Report B from CEPT to the European Commission in response to the Mandate “to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union” Harmonised technical conditions for the 24.25-27.5 GHz ('26 GHz') frequency band (6 July 2018).

40 GHz

ECC/DEC/(22)06 ECC Decision of 18 November 2022 on harmonised technical conditions for Mobile/Fixed Communications Networks (MFCN) in the band 40.5-43.5 GHz.

ECC/REC/(22)01 ECC Recommendation of 18 November 2022 on guidelines to support the introduction of MFCN in 40.5-43.5 GHz while ensuring, in a proportionate way, the use of FSS receiving earth stations in the frequency band 40.5-42.5 GHz and the use of FSS transmitting earth stations in the frequency band 42.5-43.5 GHz and the possibility for future deployment of these earth stations.

CEPT Report 80, Report from CEPT to the European Commission in response to the Mandate “to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems for priority frequency bands above 24 GHz” Harmonised least restrictive technical conditions for the 40.5-43.5 GHz frequency band, Report approved on 18 November 2022 by the ECC.

2. Foreword

2.1 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 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.

2.3 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 Radio Equipment Regulations 2017 (SI 2017/1206).

2.4 The requirements given in the main body of this UK Radio Interface Requirement will apply to the licensing of low power terrestrial systems capable of providing electronic communications services in the 1781.7-1785 MHz and 1876.7-1880 MHz, 2390-2400 MHz, 3.8-4.2 GHz, 24.45-27.5 GHz and 40.5-43.5 GHz bands (the "Shared Access 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 low power terrestrial systems capable of providing electronic communications services in the Shared Access bands.

2.6 All UK Radio Interface Requirements will be published and will be made available free of charge from the Ofcom website.

2.7 Further information on this UK Radio Interface Requirement can be obtained from the technical enquiry contact given at the back of this document.

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 Shared Access Low Power licence product in the Shared Access bands. It does not prescribe technical interpretation of the 'essential requirements' of Radio Equipment Regulations 2017 (SI 2017/1206).

3.3 This UK Radio Interface Requirement therefore stipulates the necessary equipment parameters for the authorisation of low power terrestrial systems capable of providing electronic communications services in the Shared Access bands in the UK. Tables 3.1 to 3.5 contain the relevant equipment parameters. These taken together with the 'essential requirements' detailed in the Radio Equipment Regulations 2017 (SI 2017/1206) constitute the minimum requirements for terrestrial systems capable of providing electronic communications services in the Shared Access frequency bands within the UK.

3.4 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 Radio Equipment Regulations 2017 (SI 2017/1206).

3.5 The technical parameters specified in the UK Radio Interface Requirement are applied to achieve the desired level of compatibility within the spectrum for low power terrestrial systems capable of providing electronic communications services in the Shared Access bands and with other radiocommunications services, whilst promoting enterprise, innovation and competition.

3.6 This UK Radio Interface requirement provides the necessary technical information which facilitates access to the Shared Access 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 Shared Access 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 Radio Equipment Regulations 2017 (SI 2017/1206). 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 Low Power Shared Access equipment operating in the 1781.7-1785 MHz and 1876.7-1880 MHz bands

<table>
<tr><th colspan="2">Mandatory (1 – 10)</th></tr>
<tr><td>1. Radiocommunication Service</td><td>Fixed or Mobile Service</td></tr>
<tr><td>2. Application</td><td>TRA-ECS (Terrestrial radio applications capable of providing electronic communication services)</td></tr>
<tr><td>3. Frequency band(s)</td><td>1781.7-1785 MHz and 1876.7-1880 MHz</td></tr>
<tr><td>4. Channelling</td><td></td></tr>
<tr><td>5. Modulation / Occupied bandwidth</td><td></td></tr>
<tr><td>6. Direction / Separation</td><td>Frequency-division duplex (FDD)</td></tr>
<tr><td>7. Maximum Mean Transmit Power</td><td>Base & repeater stations in 1876.7-1880 MHz:
24 dBm / carrier (up to 3 MHz) EIRP
<table>
<tr><th>Frequency offset from the lower frequency of the band edge</th><th>Maximum Mean EIRP density</th></tr>
<tr><td>0 to 0.05 MHz</td><td>-33.6 + 153.3 x Δ_{FL}* dBm / kHz</td></tr>
<tr><td>0.05 to 0.1 MHz</td><td>-26 + 60 x (Δ_{FL}*- 0.05) dBm / kHz</td></tr>
<tr><td>0.1 to 0.2 MHz</td><td>-23 + 230 x (Δ_{FL}*- 0.1) dBm / kHz</td></tr>
<tr><td>0.2 to 3.2 MHz</td><td>24 dBm / carrier</td></tr>
<tr><td>3.2 to 3.3 MHz</td><td>-23 + 230 x (3.3 - Δ_{FL}*) dBm / kHz</td></tr>
</table>
* Note: ΔFL in MHz is the offset from the lower edge of the permitted frequency band at 1876.7 MHz (it has values in the range 0 to +0.2 MHz and +3.2 to +3.3MHz)
Mobile or nomadic terminal stations in 1781.7-1785 MHz:
23 dBm / carrier (up to 3 MHz) TRP
Fixed or installed terminal stations in 1781.7-1785 MHz:
23 dBm / carrier (up to 3 MHz) EIRP</td></tr>
<tr><td>8. Channel access and occupation rules</td><td></td></tr>
</table>

Mandatory (1 – 10)	
9. Authorisation regime	WT Act licence required for base station, repeaters and fixed installations. The use of mobile / nomadic terminal stations meeting the minimum requirements outlined in this Interface Requirement is exempt from licensing provided that it meets the requirements of the relevant exemption regulations.
10. Additional essential requirements	None
Informative (11 – 15)	
11. Frequency planning assumptions	Outdoor antenna systems will be limited to 10m above ground
12. Planned changes	-
13. Reference	-
14. Remarks	The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere.

Table 3.2: Minimum requirements for the use of Low Power Shared Access equipment operating in the 2390-2400 MHz band

Mandatory (1 – 10)	
1. Radiocommunication Service	Fixed or Mobile Service
2. Application	TRA-ECS (Terrestrial radio applications capable of providing electronic communication services)
3. Frequency band(s)	2320-2340 MHz 2390-2400 MHz
4. Channelling	
5. Modulation / Occupied bandwidth	
6. Direction / Separation	Time-division duplex (TDD)
7. Maximum Mean Transmit Power	**Base & repeater stations:** 24 dBm / carrier (up to 10 MHz) EIRP **Mobile or nomadic terminal stations:** 25 dBm TRP (25 dBm includes a 2 dB tolerance) **Fixed or installed terminal stations:** 25 dBm TRP (25 dBm includes a 2 dB tolerance)
8. Channel access and occupation rules	In 2390-2400 MHz band licensees shall ensure that the Radio Equipment is operated in compliance with any Synchronisation Procedures as notified under the Licence.
9. Authorisation regime	WT Act licence for all equipment.
10. Additional essential requirements	None
Informative (11 – 15)	
11. Frequency planning assumptions	Outdoor antenna systems will be limited to 10m above ground.
12. Planned changes	-
13. Reference	-
14. Remarks	The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere.

Table 3.3: Minimum requirements for the use of Low Power Shared Access equipment operating in the 3.8-4.2 GHz band

Mandatory (1 – 10)	
1. Radiocommunication Service	Fixed or Mobile Service
2. Application	TRA-ECS (Terrestrial radio applications capable of providing electronic communication services)
3. Frequency band(s)	3.8-4.2 GHz
4. Channelling	10, 20, 30, 40, 50, 60, 80, 100 MHz
5. Modulation / Occupied bandwidth	
6. Direction / Separation	Time-division duplex (TDD)
7. Maximum Mean Transmit Power	**Base & repeater stations:** 24 dBm / carrier for carriers ≤ 20 MHz EIRP; or 18 dBm / 5 MHz for carriers > 20 MHz EIRP **Mobile or nomadic terminal stations:** 28 dBm TRP (28 dBm includes a 2 dB tolerance) **Fixed or installed terminal stations:** 28 dBm TRP (28 dBm includes a 2 dB tolerance)
8. Channel access and occupation rules	Licensee shall ensure that the Radio Equipment is operated in compliance with any Synchronisation Procedures as notified under the Licence
9. Authorisation regime	WT Act licence for all equipment.
10. Additional essential requirements	None
Informative (11 – 15)	
11. Frequency planning assumptions	Outdoor antenna systems will be limited to 10m above ground.
12. Planned changes	-
13. Reference	-
14. Remarks	The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere.

Table 3.4: Minimum requirements for the use of Low Power Shared Access equipment operating in the 24.45-27.5 GHz band

Mandatory (1 – 10)	
1. Radiocommunication Service	Fixed or Mobile Service
2. Application	TRA-ECS (Terrestrial radio applications capable of providing electronic communication services)
3. Frequency band(s)	24.45-27.5 GHz
4. Channelling	50, 100, 200, 400 & 800 MHz
5. Modulation / Occupied bandwidth	
6. Direction / Separation	Time-division duplex (TDD)
7. Maximum Mean Transmit Power	**Base & repeater stations:** 25 dBm / 200 MHz TRP **Mobile or nomadic terminal stations:** 23 dBm TRP **Fixed or installed terminal stations:** 23 dBm TRP
8. Channel access and occupation rules	Licensee shall ensure that the Radio Equipment is operated in compliance with any Synchronisation Procedures as notified under the Licence.
9. Authorisation regime	WT Act licence for all equipment.
10. Additional essential requirements	None
Informative (11 – 15)	
11. Frequency planning assumptions	Deployments in 24.45-25.05 GHz restricted to 3 outdoor base stations (sector antenna equates to a base station). Outdoor antennas limited to 10 metres height above ground. When deploying Active Antenna System (AAS) outdoor base stations, Licensees shall ensure that each antenna is normally transmitting only with main beam pointing below the horizon and in addition the antenna shall have mechanical pointing below the horizon except when the base station is only receiving.
12. Planned changes	-
13. Reference	-
14. Remarks	The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere.

Table 3.5: Minimum requirements for the use of Low Power Shared Access equipment operating in the 40.5-43.5 GHz band

Mandatory (1 – 10)	
1. Radiocommunication Service	Fixed or Mobile Service
2. Application	TRA-ECS (Terrestrial radio applications capable of providing electronic communication services)
3. Frequency band(s)	40.5-43.5 GHz
4. Channelling	50, 100, 200, 400 & 800 MHz
5. Modulation / Occupied bandwidth	
6. Direction / Separation	Time-division duplex (TDD)
7. Maximum Mean Transmit Power	**Base & repeater stations:** 25 dBm / 200 MHz TRP **Mobile or nomadic terminal stations:** 23 dBm TRP **Fixed or installed terminal stations:** 23 dBm TRP
8. Channel access and occupation rules	Licensee shall ensure that the Radio Equipment is operated in compliance with any Synchronisation Procedures as notified under the Licence.
9. Authorisation regime	WT Act licence for all equipment.
10. Additional essential requirements	None
Informative (11 – 15)	
11. Frequency planning assumptions	Outdoor antennas limited to 10 metres height above ground. When deploying Active Antenna System (AAS) outdoor base stations, Licensees transmitting in 42.5-43.5 GHz, shall ensure that each antenna is normally transmitting only with main beam pointing below the horizon and in addition the antenna shall have mechanical pointing below the horizon except when the base station is only receiving.
12. Planned changes	Not available until 2028.
13. Reference	-
14. Remarks	The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere.

4. Additional performance parameters

Informative

4.1 None specified

5. Contact details

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Licensing and technical enquiries to **Spectrum Licensing Team**: spectrum.licensing@ofcom.org.uk

6. Document history

Version	Date	Changes
0.1	25 July 2019	Draft Published
1.0	9 December 2019	Published
2.0	**14 January 2025**	**Updated to include 26 GHz and 40 GHz bands**