



IR 2019

**Third Generation Mobile**

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# Contents

| <b>Section</b> |  | <b>Page</b> |
|----------------|--|-------------|
| 1              | References                                       | 3           |
| 2              | Foreword   | 4           |
| 3              | Minimum requirements for operation within the UK | 5           |
| 4              | Additional performance parameters                | 8           |
| 5              | Contact details                                  | 9           |
| 6              | Document history                                 | 10          |

## Section 1

# References

- 1.1 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
- 1.2 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
- 1.3 Recommendation ITU-R M.1457 – Detailed specifications of the radio interfaces of International Mobile Telecommunications-2000 (IMT-2000).
- 1.4 Resolution ITU-R 56 – Naming for International Mobile Telecommunications
- 1.5 ETSI EN 301 908-01 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third Generation cellular networks; Part 1: Harmonized standard for IMT-2000, introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive.
- 1.6 ETSI EN 301 908-02 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 2: Harmonized standard for IMT-2000, CDMA Direct Spread (UTRA FDD and E-UTRA FDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive.
- 1.7 ETSI EN 301 908-03 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 3: Harmonized standard for IMT-2000, CDMA Direct Spread (UTRA FDD and E-UTRA FDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive.
- 1.8 ETSI EN 301 908-06 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 6: Harmonized standard for IMT-2000, CDMA TDD (UTRA TDD and E-UTRA TDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive.
- 1.9 ETSI EN 301 908-07 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third Generation cellular networks; Part 7: Harmonized standard for IMT-2000, CDMA TDD (UTRA TDD and E-UTRA TDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive.

- 1.10 ETSI EN 301 908-11 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 11: Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD and E-UTRA FDD) (Repeaters) covering essential requirements of article 3.2 of the R&TTE Directive.
- 1.11 Note 1 - These references are included for information purposes only. Compliance with referenced standards is not mandatory.
- 1.12 Note 2 - Documents listed above are not produced by Ofcom, therefore interested parties should source the documentation by their own means. For information:
- The ITU website is located at <http://www.itu.int>
  - The ETSI website for technical standard documentation is located at <http://www.etsi.org>
- 1.13 Note 3 - Ofcom is not responsible for the content of external internet sites.

## Section 2

# Foreword

- 2.1 The Radio Equipment and Telecommunications Terminal Equipment Directive 99/5/EC (R&TTE Directive) was implemented in the United Kingdom (UK) on the 8 April 2000 by The Radio Equipment and Telecommunications Terminal Equipment Regulations 2000, Statutory Instrument 2000 No. 730. In accordance with Articles 4.1 and 7.2 of Directive 1999/5/EC, this UK Interface Requirement contains the requirements for the licensing and use of third generation mobile in the specified frequency bands.
- 2.2 Nothing in this UK Radio Interface Requirement shall preclude the need for equipment to comply with Directive 1999/5/EC.
- 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 1999/5/EC.
- 2.4 The requirements given in the main body of this UK Radio Interface Requirement will apply to the licensing of third generation mobile.
- 2.5 This UK Radio Interface Requirement will be revised as necessary, for example to follow:
  - i) current technology developments for reasons related to the effective and appropriate use of the spectrum in particular maximising spectrum utilisation; and
  - ii) changes to the available spectrum allocated for third generation mobile.
- 2.6 All UK Radio Interface Requirements notified under Directive 1998/34/EC will be published and will be made available free of charge from the Ofcom web-site at [http://www.ofcom.org.uk/radiocomms/ifi/tech/interface\\_req/](http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/).
- 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.

## Section 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 third generation mobile. It does not prescribe technical interpretation of the 'essential requirements' of Directive 1999/5/EC.
- 3.3 This UK Radio Interface Requirement therefore stipulates the necessary equipment parameters for the licensing or licence exemption of third generation mobile in the UK. Tables 3.1 to 3.4 contain the relevant equipment parameters. These taken together with the 'essential requirements' detailed in Article 3.2 of Directive 1999/5/EC constitute the minimum requirements for third generation mobile 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 1999/5/EC.
- 3.4 The technical parameters specified in the UK Radio Interface Requirement are applied to achieve the desired level of compatibility within the third generation mobile 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 the third generation mobile spectrum by making clear the assumptions that are made in planning the use of the third generation mobile spectrum 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 1999/5/EC 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: - third generation mobile (mobile stations) operating in the 1899.9 to 1920 MHz band**

| Mandatory (1-10)    |  |   |
|---------------------|--|---|
| 1                   | Frequency band(s)                      | 1899.9 to 1920 MHz  |
| 2                   | Radiocommunication Service             | Mobile Service  |
| 3                   | Application                            | IMT   |
| 4                   | Channelling                            | 200 kHz channel raster  |
| 5                   | Modulation / Occupied bandwidth        | QPSK<br>8-PSK<br>16QAM  |
| 6                   | Direction / Separation                 | Time-division duplex (TDD)  |
| 7                   | Maximum Transmit Power / Power Density | 24 dBm      Power class 2<br>21 dBm      Power class 3  |
| 8                   | Channel access and occupation rules    | CDMA/TDMA   |
| 9                   | Authorisation regime                   | Network user equipment 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      |   |
| Informative (11-13) |  |   |
| 11                  | Frequency planning assumptions         | ETSI TS 125 102   |
| 12                  | Planned changes                        |   |
| 13                  | Reference                              |   |
| 14                  | Notification                           | 2010/165/UK   |
| 15                  | Remarks                                |   |

**Table 3.2: Minimum requirements for the use of: - third generation mobile (base stations) operating in the 1899.9 to 1920 MHz band**

| Mandatory (1-10)    |  |   |
|---------------------|--|---|
| 1                   | Frequency band(s)                      | 1899.9 to 1920 MHz  |
| 2                   | Radiocommunication Service             | Mobile Service  |
| 3                   | Application                            | IMT   |
| 4                   | Channelling                            | 200 kHz channel raster  |
| 5                   | Modulation / Occupied bandwidth        | QPSK<br>8-PSK<br>16QAM<br>64QAM   |
| 6                   | Direction / Separation                 | Time-division duplex (TDD)  |
| 7                   | Maximum Transmit Power / Power Density | 62 dBm EIRP<br>58 dBm/MHz EIRP  |
| 8                   | Channel access and occupation rules    | CDMA/TDMA   |
| 9                   | Authorisation regime                   | WT Act licence  |
| 10                  | Additional essential requirements      |   |
| Informative (11-13) |  |   |
| 11                  | Frequency planning assumptions         | ETSI TS 125 105   |
| 12                  | Planned changes                        |   |
| 13                  | Reference                              |   |
| 14                  | Notification                           | 2010/165/UK   |
| 15                  | Remarks                                | Not all frequencies within this range are available for licensing.<br>Ofcom may impose additional restrictions on the maximum power used for specific frequencies and locations |

**Table 3.3: Minimum requirements for the use of: - third generation mobile (mobile stations and repeaters) operating in the 880.1 to 914.9 MHz, 1710.1 to 1785 MHz or 1920 to 1980 MHz bands**

| Mandatory (1-10)    |  |   |                |            |                    |        |                    |        |                  |         |
|---------------------|--|---|----------------|------------|--------------------|--------|--------------------|--------|------------------|---------|
| 1                   | Frequency band(s)                      | 880.1 to 914.9 MHz<br>1710.1 to 1785 MHz<br>1920 to 1980 MHz  |                |            |                    |        |                    |        |                  |         |
| 2                   | Radiocommunication Service             | Mobile Service  |                |            |                    |        |                    |        |                  |         |
| 3                   | Application                            | IMT   |                |            |                    |        |                    |        |                  |         |
| 4                   | Channelling                            | 200 kHz channel raster  |                |            |                    |        |                    |        |                  |         |
| 5                   | Modulation / Occupied bandwidth        | QPSK<br>16QAM   |                |            |                    |        |                    |        |                  |         |
| 6                   | Direction / Separation                 | Mobile transmit<br>Repeater transmit/receive<br><br><u>Uplink/downlink separation</u><br><br><table border="1"> <thead> <tr> <th>Frequency band</th> <th>Separation</th> </tr> </thead> <tbody> <tr> <td>880.1 to 914.9 MHz</td> <td>45 MHz</td> </tr> <tr> <td>1710.1 to 1785 MHz</td> <td>95 MHz</td> </tr> <tr> <td>1920 to 1980 MHz</td> <td>190 MHz</td> </tr> </tbody> </table> | Frequency band | Separation | 880.1 to 914.9 MHz | 45 MHz | 1710.1 to 1785 MHz | 95 MHz | 1920 to 1980 MHz | 190 MHz |
| Frequency band      | Separation                             |   |                |            |                    |        |                    |        |                  |         |
| 880.1 to 914.9 MHz  | 45 MHz                                 |   |                |            |                    |        |                    |        |                  |         |
| 1710.1 to 1785 MHz  | 95 MHz                                 |   |                |            |                    |        |                    |        |                  |         |
| 1920 to 1980 MHz    | 190 MHz                                |   |                |            |                    |        |                    |        |                  |         |
| 7                   | Maximum Transmit Power / Power Density | 24 dBm      Power class 3<br>23 dBm      Power class 3bis<br>21 dBm      Power class 4  |                |            |                    |        |                    |        |                  |         |
| 8                   | Channel access and occupation rules    | CDMA  |                |            |                    |        |                    |        |                  |         |
| 9                   | Authorisation regime                   | Network user equipment meeting the minimum requirements outlined in this Interface Requirement is exempt from licensing provided that it meets the requirements of the relevant exemption regulations<br>WT Act licence required for repeaters  |                |            |                    |        |                    |        |                  |         |
| 10                  | Additional essential requirements      |   |                |            |                    |        |                    |        |                  |         |
| Informative (11-13) |  |   |                |            |                    |        |                    |        |                  |         |
| 11                  | Frequency planning assumptions         | ETSI TS 125 101<br>ETSI TS 125 106  |                |            |                    |        |                    |        |                  |         |
| 12                  | Planned changes                        |   |                |            |                    |        |                    |        |                  |         |
| 13                  | Reference                              |   |                |            |                    |        |                    |        |                  |         |
| 14                  | Notification                           | 2010/165/UK   |                |            |                    |        |                    |        |                  |         |
| 15                  | Remarks                                |   |                |            |                    |        |                    |        |                  |         |

**Table 3.4: Minimum requirements for the use of: - third generation mobile (base stations and repeaters) operating in the 925.1 to 959.9 MHz, 1805.1 to 1880 MHz or 2110 to 2170 MHz bands**

| Mandatory (1-10)    |  |   |                |                        |                    |             |                    |             |                  |                                |
|---------------------|--|---|----------------|------------------------|--------------------|-------------|--------------------|-------------|------------------|--------------------------------|
| 1                   | Frequency band(s)                      | 925.1 to 959.9 MHz<br>1805.1 to 1880 MHz<br>2110 to 2170 MHz  |                |                        |                    |             |                    |             |                  |                                |
| 2                   | Radiocommunication Service             | Mobile Service  |                |                        |                    |             |                    |             |                  |                                |
| 3                   | Application                            | IMT   |                |                        |                    |             |                    |             |                  |                                |
| 4                   | Channelling                            | 200 kHz channel raster  |                |                        |                    |             |                    |             |                  |                                |
| 5                   | Modulation / Occupied bandwidth        | QPSK<br>16QAM<br>64QAM  |                |                        |                    |             |                    |             |                  |                                |
| 6                   | Direction / Separation                 | Base station transmit<br>Repeater transmit/receive<br><br><u>Uplink/downlink separation</u><br><br><table border="1"> <thead> <tr> <th>Frequency band</th> <th>Separation</th> </tr> </thead> <tbody> <tr> <td>925.1 to 959.9 MHz</td> <td>45 MHz</td> </tr> <tr> <td>1805.1 to 1880 MHz</td> <td>95 MHz</td> </tr> <tr> <td>2110 to 2170 MHz</td> <td>190 MHz</td> </tr> </tbody> </table> | Frequency band | Separation             | 925.1 to 959.9 MHz | 45 MHz      | 1805.1 to 1880 MHz | 95 MHz      | 2110 to 2170 MHz | 190 MHz                        |
| Frequency band      | Separation                             |   |                |                        |                    |             |                    |             |                  |                                |
| 925.1 to 959.9 MHz  | 45 MHz                                 |   |                |                        |                    |             |                    |             |                  |                                |
| 1805.1 to 1880 MHz  | 95 MHz                                 |   |                |                        |                    |             |                    |             |                  |                                |
| 2110 to 2170 MHz    | 190 MHz                                |   |                |                        |                    |             |                    |             |                  |                                |
| 7                   | Maximum Transmit Power / Power Density | <table border="1"> <thead> <tr> <th>Frequency band</th> <th>Maximum Transmit Power</th> </tr> </thead> <tbody> <tr> <td>925.1 to 959.9 MHz</td> <td>62 dBm EIRP</td> </tr> <tr> <td>1805.1 to 1880 MHz</td> <td>62 dBm EIRP</td> </tr> <tr> <td>2110 to 2170 MHz</td> <td>62 dBm EIRP<br/>58 dBm/MHz EIRP</td> </tr> </tbody> </table>  | Frequency band | Maximum Transmit Power | 925.1 to 959.9 MHz | 62 dBm EIRP | 1805.1 to 1880 MHz | 62 dBm EIRP | 2110 to 2170 MHz | 62 dBm EIRP<br>58 dBm/MHz EIRP |
| Frequency band      | Maximum Transmit Power                 |   |                |                        |                    |             |                    |             |                  |                                |
| 925.1 to 959.9 MHz  | 62 dBm EIRP                            |   |                |                        |                    |             |                    |             |                  |                                |
| 1805.1 to 1880 MHz  | 62 dBm EIRP                            |   |                |                        |                    |             |                    |             |                  |                                |
| 2110 to 2170 MHz    | 62 dBm EIRP<br>58 dBm/MHz EIRP         |   |                |                        |                    |             |                    |             |                  |                                |
| 8                   | Channel access and occupation rules    | CDMA  |                |                        |                    |             |                    |             |                  |                                |
| 9                   | Authorisation regime                   | WT Act licence  |                |                        |                    |             |                    |             |                  |                                |
| 10                  | Additional essential requirements      |   |                |                        |                    |             |                    |             |                  |                                |
| Informative (11-13) |  |   |                |                        |                    |             |                    |             |                  |                                |
| 11                  | Frequency planning assumptions         | ETSI TS 125 104<br>ETSI TS 125 106  |                |                        |                    |             |                    |             |                  |                                |
| 12                  | Planned changes                        |   |                |                        |                    |             |                    |             |                  |                                |
| 13                  | Reference                              |   |                |                        |                    |             |                    |             |                  |                                |
| 14                  | Notification                           | 2010/165/UK   |                |                        |                    |             |                    |             |                  |                                |
| 15                  | Remarks                                | Not all frequencies within this range are available for licensing.<br>Ofcom may impose additional restrictions on the maximum power used for specific frequencies and locations   |                |                        |                    |             |                    |             |                  |                                |

**Section 4**

# Additional performance parameters

**(informative)**

None specified

## Section 5

# Contact details

**Ofcom, Riverside House, 2a Southwark Bridge Road, London, SE1 9HA**

- Technical enquiries to Steve Green
- Tel: 020 7783 4384
- Fax: 020 7783 4303
- Email: [mbt.enquiry@ofcom.org.uk](mailto:mbt.enquiry@ofcom.org.uk)
- Website: <http://www.ofcom.org.uk/radiocomms/>

## Section 6

# Document history

| <b>Version</b> | <b>Date</b> | <b>Changes</b>  |
|----------------|-------------|---|
| 1.0            | 21 May 2001 | Publication   |
| 1.1            | 20 Jun 2005 | Rebranding to Ofcom format  |
| 2.0            | 12 Mar 2010 | Addition of 900 MHz and 1800 MHz bands;<br>reformat to TCAM template. |
|                |             |   |