

## **SPECTRUM ACCESS 800 MHz / 2.6 GHz LICENCE**

This Licence replaces the Licence issued by the Office of Communications (Ofcom) on 01 March 2013 to Vodafone Limited.

Licence no: **0943538**

Date of issue: **23 March 2015**

Fee payment date  
(from 1 March 2033) **1 March (annually)**

1. The Office of Communications (Ofcom) grants this wireless telegraphy licence ("the Licence") to

**Vodafone Limited**  
(Company registration number 1471587)  
("the Licensee")  
**The Connection**  
**Newbury**  
**Berkshire**  
**RG14 2FN**

to establish, install and use wireless telegraphy stations and/or wireless telegraphy apparatus as described in the Schedules to this Licence (together "the Radio Equipment") subject to the terms set out below.

### **Licence Term**

2. This Licence shall continue in force until revoked by Ofcom or surrendered by the Licensee.

### **Licence Variation and Revocation**

3. Pursuant to Schedule 1 paragraph 8 of the Wireless Telegraphy Act 2006 ("the Act"), Ofcom may not revoke this Licence under schedule 1 paragraph 6 of the Act except:
  - (a) at the request, or with the consent, of the Licensee;
  - (b) if there has been a breach of any of the terms of this Licence;
  - (c) in accordance with schedule 1 paragraph 8(5) of the Act;
  - (d) if it appears to Ofcom to be necessary or expedient to revoke the Licence for the purpose of complying with a direction by the Secretary of State given to Ofcom under section 5 of the Act or section 5 of the Communications Act 2003;

- (e) if, in connection with the transfer or proposed transfer of rights and obligations arising by virtue of the Licence, there has been a breach of any provision of regulations made by Ofcom under the powers conferred by section 30(1) and 30(3) of the Act<sup>1</sup>;
  - (f) for reasons related to the management of the radio spectrum, provided that in such a case the power to revoke may only be exercised after at least five years' notice is given in writing (such notice not to be given before 1 March 2028);
  - (g) if the Licensee has been found to the reasonable satisfaction of Ofcom to have been involved in any act, or omission of any act, constituting a breach of the Wireless Telegraphy (Licence Award) Regulations 2012 (“the Regulations”).
4. Ofcom may only revoke or vary this Licence by notification in writing to the Licensee and in accordance with schedule 1 paragraphs 6, 6A and 7 of the Act.

### **Transfer**

5. This Licence may not be transferred. The transfer of rights and obligations arising by virtue of this Licence may however be authorised in accordance with regulations made by Ofcom under powers conferred by section 30 of the Act<sup>2</sup>.

### **Changes to Licensee details**

6. The Licensee shall give prior notice to Ofcom in writing of any changes to the Licensee's name and/or address as recorded in paragraph 1 of this Licence.

### **Fees**

7. In accordance with the Regulations, the sum payable in respect of this Licence is £802,860,143.
8. From 1 March 2033, the Licensee shall each year pay to Ofcom the relevant fee(s) as provided in section 12 of the Act and the regulations made thereunder on or before the fee payment date shown above, or on or before such dates as are notified in writing to the Licensee.
9. The Licensee shall also pay interest to Ofcom on any amount which is due to Ofcom under the terms of this Licence or provided for in any regulations made by Ofcom under sections 12 and 13(2) of the Act from the date such amount falls due until the date of payment, calculated with reference to the Bank of England base rate from time to time. In accordance with section 15 of the Act any such amount and any such interest is recoverable by Ofcom.
10. If the Licence is surrendered, revoked or varied, no refund, whether in whole or in part, of any amount which is due under the terms of this Licence, payable in accordance with the Regulations, or provided for in any regulations made by Ofcom under sections 12 and 13(2) of the Act will be made, except at the absolute discretion of Ofcom.

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<sup>1</sup> These are regulations on spectrum trading.

<sup>2</sup> See Ofcom's website for the latest position on spectrum trading and the types of trade which are permitted.

## Radio Equipment Use

11. The Licensee shall ensure that the Radio Equipment is established, installed and used only in accordance with the provisions specified in the Schedules to this Licence. Any proposal to amend any detail specified in any of the Schedules to this Licence must be agreed with Ofcom in advance and implemented only after this Licence has been varied or reissued accordingly.
12. The Licensee shall ensure that the Radio Equipment is operated in compliance with the terms of this Licence and is used only by persons who have been authorised in writing by the Licensee to do so and that such persons are made aware of, and of the requirement to comply with, the terms of this Licence.

## Access and Inspection

13. The Licensee shall permit any person authorised by Ofcom:
  - (a) to have access to the Radio Equipment; and
  - (b) to inspect this Licence and to inspect, examine and test the Radio Equipment, at any and all reasonable times or, when in the opinion of that person an urgent situation exists, at any time, to ensure the Radio Equipment is being used in accordance with the terms of this Licence.

## Modification, Restriction and Closedown

14. Any person authorised by Ofcom may require the Radio Equipment or any part thereof, to be modified or restricted in use, or temporarily or permanently closed down immediately if in the opinion of the person authorised by Ofcom:
  - (a) a breach of this Licence has occurred; and/or
  - (b) the use of the Radio Equipment is, or may be, causing or contributing to undue interference to the use of other authorised radio equipment.
15. Ofcom may require any of the Radio Equipment to be modified or restricted in use, or temporarily closed down either immediately or on the expiry of such period as may be specified in the event of a national or local state of emergency being declared. Ofcom may only exercise this power after a written notice has been served on the Licensee or a general notice applicable to holders of a named class of licence has been published.

## Geographical Boundaries

16. Subject to the requirements of any coordination procedures notified to the Licensee pursuant to paragraph 4 of Schedules 1, 2 and/or 3 to this Licence, the Licensee is authorised to establish, install and use the Radio Equipment in the United Kingdom. For the avoidance of doubt, the United Kingdom includes the United Kingdom territorial sea (measured in accordance with section 1 of the Territorial Sea Act 1987) and does not include the Channel Islands or the Isle of Man.

## Interpretation

17. In this Licence:

- (a) the establishment, installation and use of the Radio Equipment shall be interpreted as establishment and use of wireless telegraphy stations and installation and use of wireless telegraphy apparatus for wireless telegraphy as specified in section 8(1) of the Act;
- (b) the expression “interference” shall have the meaning given by section 115 of the Act;
- (c) the expressions “wireless telegraphy station” and “wireless telegraphy apparatus” shall have the meanings given by section 117 of the Act;
- (d) the Schedule(s) form part of this Licence together with any subsequent Schedule(s) which Ofcom may issue as a variation to this Licence; and
- (e) the Interpretation Act 1978 shall apply to the Licence as it applies to an Act of Parliament.

**Issued by Ofcom**

**Office of Communications**

## **SCHEDULE 1 TO LICENCE NUMBER: 0943538**

**Schedule Date: 23 March 2015**

**Licence category: Spectrum Access Licence (790 – 862 MHz)**

### **Description of Radio Equipment**

1. References in this Schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this Schedule.

### **Interface Requirements for the Radio Equipment**

2. Use of the Radio Equipment shall be in accordance with the following Interface Requirement:

IR 2090: Terrestrial systems capable of providing electronic communications services in the 800 MHz band

### **Special conditions relating to the Radio Equipment**

3.
  - a) Subject to paragraph 3(b) of this Schedule, during the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of the following details relating to the Radio Equipment:
    - i) postal address (including post code);
    - ii) National Grid Reference, to at least 1 metre resolution;
    - iii) antenna height (above ground level), type, and boresight bearing east of true north (if applicable); and
    - iv) radio frequencies which the Radio Equipment usesand the Licensee must produce these records if requested by any person authorised by Ofcom.
  - b) The conditions relating to the keeping of records contained in sub-paragraphs 3(a)(ii) and (iii) of this Schedule shall not apply in respect of femtocell equipment and smart/intelligent low power repeater equipment.
  - c) The Licensee shall submit to Ofcom copies of the records detailed in sub-paragraph 3(a) above at such intervals as Ofcom may notify to the Licensee.

- d) The Licensee shall provide to:
- i) Ofcom;
  - ii) the entity established in accordance with paragraphs 2.1 – 2.2 of the “*Notice of DTT interference mitigation procedures required under spectrum access licences for the 800 MHz band*” notified to it by Ofcom in accordance with paragraph 4 of this Schedule; and/or
  - iii) the Oversight Board

in such manner and at such times as they may reasonably require, such documents or other information as they may require for the purposes of taking steps to mitigate interference to users of the electromagnetic spectrum in the 470-790 MHz band, or to make recommendations to Ofcom or Government with respect to such steps being taken.

### **Co-ordination at frequency and geographical boundaries and compliance with other procedures relating to interference**

4. The Licensee shall ensure that the Radio Equipment is operated in compliance with such co-ordination procedures as may be notified to the Licensee by Ofcom from time to time. The Licensee shall also ensure that it complies with any other procedures relating to the mitigation of interference as may be notified to the Licensee by Ofcom from time to time.

### **International cross-border coordination**

5. The Licensee shall ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

### **Permitted Frequency Blocks**

6. Subject to the emissions permitted under paragraph 8 of this Schedule, the Radio Equipment may only transmit within the following frequency bands (the “Permitted Frequency Blocks”):

<b>Downlink frequencies</b>	<b>Uplink frequencies</b>
<b>801 – 811 MHz</b>	<b>842 – 852 MHz</b>

### **Maximum power within the Permitted Frequency Blocks**

7. The power transmitted in the Permitted Frequency Blocks shall not exceed:

- a) Downlink frequencies

	<b>Maximum EIRP</b>
Radio Equipment	61dBm/(5 MHz) EIRP*

\* The maximum EIRP relates to the EIRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

b) Uplink frequencies<sup>3</sup>

Radio Equipment	Maximum mean power
Fixed or installed Radio Equipment	23dBm EIRP*
Mobile or nomadic Radio Equipment	23dBm TRP*

\* The maximum mean power relates to the EIRP or TRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

## Maximum power outside the Permitted Frequency Blocks

8. For transmissions on the downlink frequencies, the EIRP emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks shall not exceed the higher (least stringent) of (a) the baseline requirements and (b) the transition requirements for that frequency.

Baseline requirements

Frequency range	Maximum mean EIRP	Measurement bandwidth
832 to 862 MHz	-49.5 dBm*	5 MHz

\* The maximum EIRP relates to the EIRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

Baseline requirements

Frequency range	In-block EIRP, P, dBm/(10 MHz)**	Maximum mean EIRP in frequency range	Measurement bandwidth
470 to 790 MHz	$P \geq 59$	0 dBm*	8 MHz
	$36 \leq P < 59$	(P-59) dBm*	8 MHz
	$P < 36$	-23 dBm*	8 MHz

\* The maximum EIRP relates to the EIRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

\*\* This is the in-block EIRP measured in a bandwidth of 10MHz.

## Interpretation of terms in this schedule

9. In this Schedule:
- “dBm” means the power level in decibels (logarithmic scale) referenced against 1milliwatt (i.e. a value of 0 dBm is 1 milliwatt);
  - “EIRP” means the equivalent isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

<sup>3</sup> Consumer user equipment will be authorised by means of a licence exemption under section 8 of the Wireless Telegraphy Act 2006

- c) “femtocell” means Radio Equipment transmitting on the downlink frequencies, which operates at a power not exceeding 24 dBm EIRP per carrier, and which is or will be used only by and under the control of the Licensee, following the establishment of a telecommunications link between the femtocell and a network of the Licensee;
- d) “Fixed or installed” means used or installed at specific fixed points;
- e) “IR” means a United Kingdom Radio Interface Requirement published by Ofcom in accordance with Article 4.1 of Directive 1995/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment (RTTE) and the mutual recognition of their conformity.
- f) “lower block edge” means, in relation to each Permitted Frequency Block, the lowest frequency in that Permitted Frequency Block;
- g) “measurement bandwidth” means the size of an individual spectrum segment within the specified frequency range that is used to measure compliance with the specified power limit;
- h) “mobile or nomadic” means intended to be used while in motion or during halts at unspecified points;
- i) “Oversight Board” has the meaning given to it in the “*Notice of DTT interference mitigation procedures required under spectrum access licences for the 800 MHz band*” notified to the Licensee under paragraph 4 of this Schedule;
- j) “Permitted Frequency Blocks” has the meaning given to it in paragraph 6 of this Schedule;
- k) “smart/intelligent low power repeater” means a repeater which operates with power not exceeding 24 dBm EIRP per carrier, which may be established by customers of the Licensee who have written agreements with the Licensee and:
- The Licensee has ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensee;
  - The repeater operates only on the Licensee’s frequencies and with their valid Public Land Mobile Network Identifier;
  - Must not cause undue interference to other spectrum users; and
  - The repeater only transmits on the uplink frequencies when actively carrying a call (voice, video or data) or signalling from serviced handsets.
- l) “TRP” means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere;
- m) “upper block edge” means, in relation to each Permitted Frequency Block, the highest frequency in that Permitted Frequency Block.



## **SCHEDULE 2 TO LICENCE NUMBER: 0943538**

**Schedule Date: 23 March 2015**

**Licence category: Spectrum Access Licence (2500 MHz – 2690 MHz)**

### **Description of Radio Equipment**

1. References in this Schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this Schedule.

### **Interface Requirements for the Radio Equipment**

2. Use of the Radio Equipment shall be in accordance with the following Interface Requirement:

IR 2072: Terrestrial systems capable of providing electronic communications services in the band 2500 to 2690 MHz

### **Special conditions relating to the Radio Equipment**

3.
  - a) Subject to paragraph 3(b) of this Schedule, during the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of the following details relating to the Radio Equipment:
    - i) postal address (including post code);
    - ii) National Grid Reference, to at least 1 metre resolution;
    - iii) antenna height (above ground level), type, and boresight bearing east of true north (if applicable); and
    - iv) radio frequencies which the Radio Equipment uses

and the Licensee must produce these records if requested by any person authorised by Ofcom.

- b) The conditions relating to the keeping of records contained in sub-paragraphs 3(a)(ii) and (iii) of this Schedule shall not apply in respect of femtocell equipment and smart/intelligent low power repeater equipment.
  - c) The Licensee shall submit to Ofcom copies of the records detailed in sub-paragraph 3(a) above at such intervals as Ofcom may notify to the Licensee.

### **Co-ordination at frequency and geographical boundaries**

4. The Licensee shall ensure that the Radio Equipment is operated in compliance with such co-ordination procedures as may be notified to the Licensee by Ofcom from time to time.

## International cross-border coordination

5. The Licensee shall ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

## Permitted Frequency Blocks

6. Subject to the emissions permitted under paragraph 8 of this Schedule, the Radio Equipment may only transmit within the following frequency bands (the “Permitted Frequency Blocks”):

Downlink frequencies	Uplink frequencies
2620 - 2640 MHz	2500 – 2520 MHz

## Maximum power within the Permitted Frequency Blocks

7. The power transmitted in the Permitted Frequency Blocks shall not exceed:

- a) Downlink frequencies

	Maximum EIRP
Radio Equipment	61dBm/(5 MHz) EIRP

- b) Uplink frequencies<sup>4</sup>

Radio Equipment	Maximum mean power
Mobile or nomadic Radio Equipment	31dBm/(5 MHz) TRP
Fixed or installed Radio Equipment	35dBm/(5 MHz) EIRP

## Maximum power outside the Permitted Frequency Blocks

8. For transmissions on the downlink frequencies, the EIRP emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks shall not exceed the higher (least stringent) of (a) the baseline requirements and (b) the block specific requirements for that frequency.

- (a) Baseline requirements

Frequency range	Maximum mean EIRP	Measurement bandwidth
2500 to 2615 MHz	-45dBm	1 MHz
2615 to 2700 MHz	4dBm	1 MHz
2700 to 3100 MHz	-45dBm	1 MHz

<sup>4</sup> Consumer use equipment will be authorised by means of a licence exemption under section 8 of the Wireless Telegraphy Act 2006

(b) Block-specific requirements

Frequency range	Maximum mean EIRP	Measurement bandwidth
Start of band (2500 MHz) to -5 MHz from lower block edge	Baseline requirement level	
-5 MHz to -1 MHz from lower block edge	4dBm	1 MHz
-1 MHz to -0.2 MHz from lower block edge	$3 + 15(\Delta_F + 0.2)$ dBm	30 kHz
-0.2 MHz to 0 MHz from lower block edge	3dBm	30 kHz
0 MHz to 0.2 MHz from upper block edge	3dBm	30 kHz
0.2 MHz to 1 MHz from upper block edge	$3 - 15(\Delta_F - 0.2)$ dBm	30 kHz
1 MHz to 5 MHz from upper block edge	4dBm	1 MHz
5 MHz from upper block edge to end of band (2690 MHz)	Baseline requirement level	
Where: $\Delta_F$ is the frequency offset from the relevant block edge (in MHz)		

**Interpretation of terms in this Schedule**

9. In this Schedule:

- a) “dBm” means the power level in decibels (logarithmic scale) referenced against 1milliwatt (i.e. a value of 0 dBm is 1 milliwatt);
- b) “EIRP” means the equivalent isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);
- c) “femtocell” means Radio Equipment transmitting on the downlink frequencies, which operates at a power not exceeding 24 dBm EIRP per carrier, and which is or will be used only by and under the control of the Licensee, following the establishment of a telecommunications link between the femtocell and a network of the Licensee;
- d) “Fixed or installed” means used or installed at specific fixed points;
- e) "IR" means a United Kingdom Radio Interface Requirement published by Ofcom in accordance with Article 4.1 of Directive 1995/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment (RTTE) and the mutual recognition of their conformity;
- f) “lower block edge” means, in relation to each Permitted Frequency Block, the lowest frequency in that Permitted Frequency Block;

- g) “measurement bandwidth” means the size of an individual spectrum segment within the specified frequency range that is used to measure compliance with the specified power limit;
- h) “mobile or nomadic” means intended to be used while in motion or during halts at unspecified points;
- i) “Permitted Frequency Blocks” has the meaning given to it in paragraph 6 of this Schedule;
- j) “smart/intelligent low power repeater” means a repeater which operates with power not exceeding 24 dBm EIRP per carrier, which may be established by customers of the Licensee who have written agreements with the Licensee and:
- The Licensee has ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensee;
  - The repeater operates only on the Licensee’s frequencies and with their valid Public Land Mobile Network Identifier;
  - Must not cause undue interference to other spectrum users; and
  - The repeater only transmits on the uplink frequencies when actively carrying a call (voice, video or data) or signalling from serviced handsets.
- k) “TRP” means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere; and
- l) “upper block edge” means, in relation to each Permitted Frequency Block, the highest frequency in that Permitted Frequency Block.

### **SCHEDULE 3 TO LICENCE NUMBER: 0943538**

**Schedule Date:** 23 March 2015

**Licence category:** Spectrum Access Licence (2500 MHz – 2690 MHz)

#### **Description of Radio Equipment**

1. References in this Schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this Schedule.

#### **Interface Requirements for the Radio Equipment**

2. Use of the Radio Equipment shall be in accordance with the following Interface Requirement:

IR 2072: Terrestrial systems capable of providing electronic communications services in the band 2500 to 2690 MHz

#### **Special conditions relating to the Radio Equipment**

3.
  - a) Subject to paragraph 3(b) of this Schedule, during the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of the following details relating to the Radio Equipment:
    - i) postal address (including post code);
    - ii) National Grid Reference, to at least 1 metre resolution;
    - iii) antenna height (above ground level), type, and boresight bearing east of true north (if applicable); and
    - iv) radio frequencies which the Radio Equipment usesand the Licensee must produce these records if requested by any person authorised by Ofcom.
  - b) The conditions relating to the keeping of records contained in sub-paragraphs 3(a)(ii) and (iii) of this Schedule shall not apply in respect of femtocell equipment and smart/intelligent low power repeater equipment.
  - c) The Licensee shall submit to Ofcom copies of the records detailed in sub-paragraph 3(a) above at such intervals as Ofcom may notify to the Licensee.

#### **Co-ordination at frequency and geographical boundaries**

4. The Licensee shall ensure that the Radio Equipment is operated in compliance with such co-ordination procedures as may be notified to the Licensee by Ofcom from time to time.

## International cross-border coordination

5. The Licensee shall ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

## Permitted Frequency Blocks

6. Subject to the emissions permitted under paragraph 8 of this Schedule, the Radio Equipment may only transmit within the following frequency bands (the “Permitted Frequency Blocks”):

“Unrestricted frequencies” (uplink and downlink):	2575 – 2595 MHz
“Restricted frequencies” (uplink and downlink):	2570 – 2575 MHz

## Maximum power within the Permitted Frequency Blocks

7. For downlink transmissions, the power transmitted in the Permitted Frequency Blocks shall not exceed:

	Maximum EIRP
Radio Equipment in unrestricted frequencies	61dBm/(5 MHz) EIRP
Radio Equipment in restricted frequencies	25dBm/(5 MHz) EIRP

For uplink transmissions, the power transmitted in the Permitted Frequency Blocks shall not exceed<sup>5</sup>:

Radio Equipment	Maximum mean power
Mobile or nomadic Radio Equipment	31dBm/(5 MHz) TRP
Fixed or installed Radio Equipment	35dBm/(5 MHz) EIRP

<sup>5</sup> Consumer user equipment will be authorised by means of a licence exemption under section 8 of the Wireless Telegraphy Act 2006

## Maximum power outside the Permitted Frequency Blocks

### Unrestricted frequencies

8. For downlink transmissions on unrestricted frequencies, the EIRP emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks shall not exceed the higher (least stringent) of (a) the baseline requirements and (b) the block specific requirements.

#### (a) Baseline requirements

Frequency range	Maximum mean EIRP	Measurement bandwidth
2500 to 2615 MHz	-45dBm	1 MHz
2615 to 2700 MHz	4dBm	1 MHz
2700 to 3100 MHz	-45dBm	1 MHz

#### (b) Block-specific requirements

Frequency range	Maximum mean EIRP	Measurement bandwidth
Start of band (2500 MHz) to -5 MHz from lower boundary of unrestricted frequencies	Baseline requirement level	
-5 MHz to -1 MHz from lower boundary of unrestricted frequencies	4dBm	1 MHz
-1 MHz to -0.2 MHz from lower boundary of unrestricted frequencies	$3 + 15(\Delta_F + 0.2)$ dBm	30 kHz
-0.2 MHz to 0 MHz from lower boundary of unrestricted frequencies	3dBm	30 kHz
0 MHz to 0.2 MHz from upper boundary of unrestricted frequencies	3dBm	30 kHz
0.2 MHz to 1 MHz from upper boundary of unrestricted frequencies	$3 - 15(\Delta_F - 0.2)$ dBm	30 kHz
1 MHz to 5 MHz from upper boundary of unrestricted frequencies	4dBm	1 MHz
5 MHz from upper boundary of unrestricted frequencies to end of band (2690 MHz)	Baseline requirement level	
Where: $\Delta_F$ is the frequency offset from the relevant boundary of unrestricted frequencies (in MHz)		

## Restricted frequencies

9. For downlink transmissions on restricted frequencies, the EIRP emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks shall not exceed the higher (least stringent) of (a) the baseline requirements and (if applicable) (b) the alternative block-specific requirements:

(a) Baseline requirements

Frequency range	Maximum mean EIRP	Measurement bandwidth
2500 to 2615 MHz	-45dBm	1 MHz
2615 to 2700 MHz	4dBm	1 MHz
2700 to 3100 MHz	-45dBm	1 MHz

(b) Alternative block-specific requirements

The following block-specific requirements apply to base stations with outdoor antennas meeting the conditions in paragraph 9, and to base stations with indoor antennas, subject to the “*Notice of coordination procedure for the licences covering the 2.6 GHz band – Deployment of mobile electronic communication networks in unpaired restricted blocks and in spectrum adjacent to unpaired restricted blocks*” notified by Ofcom to the Licensee:

Frequency range	Maximum mean EIRP	Measurement bandwidth
Start of band (2500 MHz) to -5 MHz from lower edge of restricted frequencies	-22dBm	1 MHz
-5 MHz to -1 MHz from lower boundary of restricted frequencies	-18dBm	1 MHz
-1 MHz to -0.2 MHz from lower boundary of restricted frequencies	$-19 + 15(\Delta_F + 0.2)$ dBm	30 kHz
-0.2 MHz to 0 MHz from lower boundary of restricted frequencies	-19dBm	30 kHz
0 MHz to 0.2 MHz from upper boundary of restricted frequencies	-19dBm	30 kHz
0.2 MHz to 1 MHz from upper boundary of restricted frequencies	$-19 - 15(\Delta_F - 0.2)$ dBm	30 kHz
1 MHz to 5 MHz from upper boundary of restricted frequencies	-18dBm	1 MHz
5 MHz from upper boundary of restricted frequencies to end of band (2690 MHz)	-22dBm	1 MHz

Where:  $\Delta_F$  is the frequency offset from the relevant boundary of restricted frequencies (in MHz)



## Antenna height limit for base stations using alternative block specific EIRP limits

10. The highest point of outdoor antenna systems of base stations using the alternative block-specific EIRP limits shall be no more than 12m above ground level.

## Interpretation of terms in this schedule

11. In this Schedule:
- a) “dBm” means the power level in decibels (logarithmic scale) referenced against 1milliwatt (i.e. a value of 0 dBm is 1 milliwatt);
  - b) “downlink transmission” means transmission from a base station to a terminal station;
  - c) “EIRP” means the equivalent isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);
  - d) “femtocell” means Radio Equipment transmitting on the downlink frequencies, which operates at a power not exceeding 24 dBm EIRP per carrier, and which is or will be used only by and under the control of the Licensee, following the establishment of a telecommunications link between the femtocell and a network of the Licensee;
  - e) “Fixed or installed” means used or installed at specific fixed points;
  - f) “IR” means a United Kingdom Radio Interface Requirement published by Ofcom in accordance with Article 4.1 of Directive 1995/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment (RTTE) and the mutual recognition of their conformity.
  - g) “measurement bandwidth” means the size of an individual spectrum segment within the specified frequency range that is used to measure compliance with the specified power limit;
  - h) “mobile or nomadic” means intended to be used while in motion or during halts at unspecified points;
  - i) “Permitted Frequency Blocks” has the meaning given to it in paragraph 6 of this this Schedule;

- j) “smart/intelligent low power repeater” means a repeater which operates with power not exceeding 24 dBm EIRP per carrier, which may be established by customers of the Licensee who have written agreements with the Licensee and:
- The Licensee has ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensee;
  - The repeater operates only on the Licensee’s frequencies and with their valid Public Land Mobile Network Identifier;
  - Must not cause undue interference to other spectrum users; and
  - The repeater only transmits on the uplink frequencies when actively carrying a call (voice, video or data) or signalling from serviced handsets.
- k) “TRP” means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere; and
- l) “uplink transmission” means transmission from a terminal station to a base station.

**Ofcom**