



Commission for  
**Communications Regulation**

## Guidelines

### **Guidelines for National Point-to-Point and Point-to-Multipoint Block Licences in the 26 GHz Band**

<b>Document No:</b>	<b>06/37cR1</b>
<b>Date:</b>	<b>6 June 2008</b>

## Contents

1	INTRODUCTION .....	3
2	THE STATUTORY REGULATIONS.....	4
3	SPECTRUM BAND PLAN.....	5
4	POINT-TO-MULTIPOINT SYSTEMS OPERATING IN ADJACENT FREQUENCY BLOCKS...7	
5	POINT-TO-POINT SYSTEMS OPERATING IN ADJACENT FREQUENCY BLOCKS.....9	
6	GENERAL REQUIREMENTS .....	10
6.1	<i>EQUIPMENT REQUIREMENTS.....</i>	<i>10</i>
6.2	<i>ANTENNA REQUIREMENTS .....</i>	<i>11</i>
6.3	<i>REGISTRATION OF TRANSMIT HIGH / TRANSMIT LOW CO-ORDINATES. ....</i>	<i>11</i>
6.4	<i>POWER CONTROL REQUIREMENTS.....</i>	<i>11</i>
6.5	<i>GUARD BANDS.....</i>	<i>12</i>
6.6	<i>CO-ORDINATION WITH THE UK.....</i>	<i>12</i>
6.7	<i>COMMISSIONING/SITE INSPECTIONS .....</i>	<i>12</i>

## 1 Introduction

Following an internal review by ComReg and consultation with the industry, ComReg has published ComReg Document 07/93R outlining the process for obtaining a National Point-to-Point or Point-to-Multipoint Block licence.

This document sets out the relevant guidelines that are associated with these licences and should be read in conjunction with the Information Memorandum.

All licensees who are awarded a National Point-to-Point or Point-to-Multipoint Block licence in the 26 GHz band are obliged under the conditions of their licence to comply with the conditions contained in Statutory Instrument S.I 762 of 2007 and the guidelines as set out in this document.

ComReg may update and revise these guidelines from time to time, and Licensees are obliged to comply with any future revisions of this document.

## **2 The Statutory Regulations**

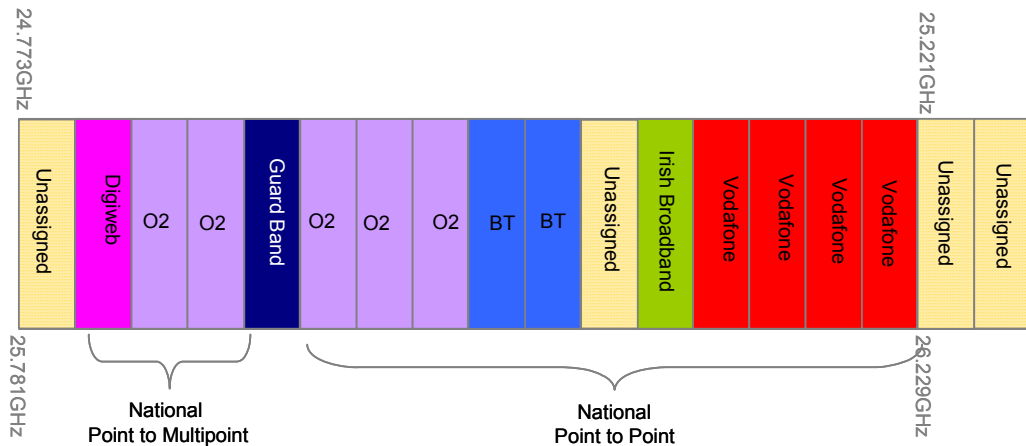
A Wireless Telegraphy Licence is required under Section 3 of the Wireless Telegraphy Act 1926 to keep and operate apparatus for wireless telegraphy. The specific regulations governing the issue of National Point-to-Point and Point-to-Multipoint Block Licences are contained in the Wireless Telegraphy (National Point-to-Point and Point-to-Multipoint Block Licences ) Regulations, 2007 (Statutory Instrument No. 762 of 2007).

The applicant should be aware that any National Point-to-Point and Point-to-Multipoint Block Licences granted by the Commission is for the keeping and operating of the apparatus for wireless telegraphy which is specified in the licence. Any licence issued by the Commission does not absolve the Licensee from complying with any other statutory obligations.

The licence does not confer any right of ownership of the frequency spectrum. It allows the assigned frequency block to be used during the term of the licence in accordance with the licence conditions.

### 3 Spectrum Band Plan

The band plan shown in Figure 1 below shows the outcome of the 26 GHz National Point – to – Point and Point – to- Multipoint award process. The Point to Point (P2P) allocations are in the upper part of the band with the Point – to – Multipoint (PMP) allocations in the lower part of the band. The 24.773 GHz – 25.221 GHz part of the band is for base station transmit and the 25.781 GHz – 26.229 GHz part of the band for base station receive.



**Figure 1: Spectrum Band Plan for 26 GHz National Block licences.**

National block channel assignments in the Point-to-Multipoint (PMP) section may only be used for Point-to-Multipoint applications.

The Licensee is not permitted to operate Time Division Duplex (TDD) PMP systems as these systems increase the risk of interference between Point-to-Multipoint operators.

The Licensee is permitted to operate Frequency Division Duplex (FDD) systems as follows<sup>1</sup>:

- Terminals are required to operate in the upper frequency of the duplex channel of an assigned block,
- Base stations are required to operate in the lower frequency of the duplex channel of an assigned block.

National block channel assignments in the Point-to-Point (P2P) section may only be used for Point-to-Point applications.

<sup>1</sup> ECC Recommendation (00)05 recommends that for deployment of point to multipoint systems in the 26 GHz band:

“...in the case of deployment of FDD systems the upper sub band should be used for the transmission from the terminals to the central station (hub) and the lower for the transmission from the central station to the terminals”.

There is a guard band between the PMP and P2P sub-bands, which is designed to minimise the interference potential between these systems.

Changes in the part of the 26 GHz frequency band allocated to national block licences may arise for a number of reasons, including:

- Changes in spectrum allocations in accordance with the requirements of international treaties or regionally negotiated agreements;
- Changes necessitated by EU legislation;
- Changes in order to meet national requirements;

In the interests of the efficient use of the radio spectrum, it is the policy of ComReg to review the use of the spectrum on an ongoing basis in order to reflect the changes outlined above and changes in the market place. ComReg would endeavour to provide as much notice as possible in the event that any such changes were required.

#### 4 Point-to-Multipoint systems operating in adjacent frequency blocks

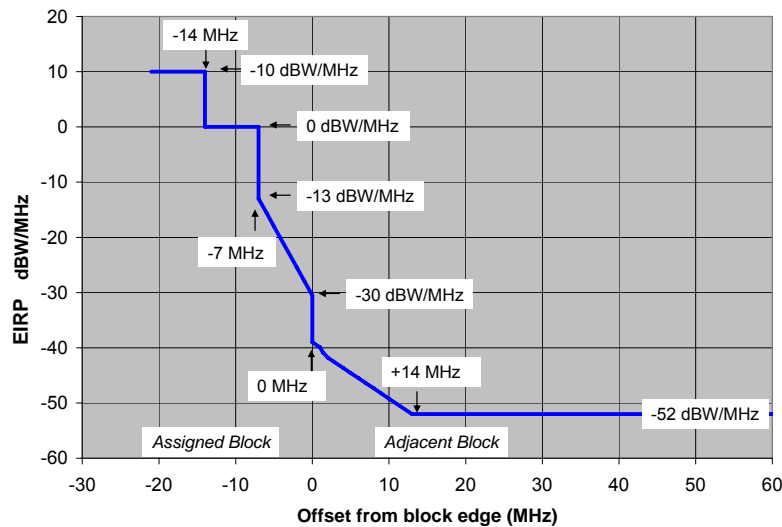
In order to minimise the interference potential between Licensees operating PMP systems in directly adjacent frequency blocks, ComReg requires that all PMP operations in this band adhere to the Block Edge Mask (BEM) specified in this section.

A block edge mask is a transmitter spectrum mask that applies at the edge of a contiguous licensed block of spectrum and is designed to offer sufficient protection from interference to any anticipated receiving system in an adjacent frequency block.

The emissions of all transmitters operating within a licensed block must comply with this block edge mask, regardless of the bandwidth of such transmitters.

ComReg is adopting two Point-to-Multipoint (PMP) Block Edge Masks; one for base station operations and one for terminal station operations.

The Block Edge Mask limits for base station operations is shown in Figure 2 below<sup>2</sup>.



**Figure 2: Block Edge Mask limits for Point-to-Multipoint base station operations.**

<sup>2</sup> This block edge mask was derived using data from ECC Report 32 and ETSI EN 301 213.

Defining a block edge mask requires assumptions to be made about both typical transmitters and receivers. In the case of transmitters, it is generally assumed that these will be compliant with relevant publicly available standards, however since these standards do not generally include detailed specifications for receiver selectivity, a more generalised filter selectivity characteristic is assumed, based on the specified adjacent channel selectivity. The floor of the block edge mask is based on the spurious emission limits defined in the transmitter equipment standard.

The Block Edge Mask limits for terminal station operations are 20 dB higher than those specified in Figure 2 above. This reflects the different antenna characteristics of base and terminal stations.

In addition to the Block Edge Mask requirement, it is recommended that operators of Point-to-Multipoint systems in adjacent frequency blocks co-operate with each other to establish mutually agreed co-ordination processes to avoid interference between frequency blocks.

In addition to the exchange of geographic site co-ordinate information, ideally the co-ordination process should take full account of the transmitter, receiver and antenna characteristics for the type of equipment deployed<sup>3</sup> and the polarisation of the transmissions.

---

<sup>3</sup> For example, the modulation scheme can make a significant difference to the level of adjacent channel interference that can be tolerated.



## 5 Point-to-Point systems operating in adjacent frequency blocks

Compared to Point-to-Multipoint systems, Point-to-Point links generally use antennas of higher gain<sup>4</sup>, thus necessitating a higher net frequency discrimination between frequency blocks. The net effect of this is that up to 28 MHz frequency separation between two adjacent blocks would be required in order to avoid interference.

In line with ComReg's policy of maximising spectrum efficiency, there will be no Guard Band assigned between adjacent P2P frequency blocks.

ComReg believes that the interference potential between Licensees operating Point-to-Point systems in directly adjacent frequency blocks can be practically resolved via inter-operator co-ordination.

Licensees of adjacent blocks are therefore recommended to establish mutually agreed co-ordination processes to avoid interference between blocks.

It is recommended that any such processes be based on criteria such as those defined in ETSI technical report TR 101 854<sup>5</sup>. In addition to the exchange of geographic site co-ordinate information, ideally the co-ordination process should take full account of the transmitter, receiver and antenna characteristics for the type of equipment deployed<sup>6</sup> and the polarisation of the transmissions.

---

<sup>4</sup> The typical gain of a P2P antenna is 40 dBi, compared to 18 dBi for a PMP antenna.

<sup>5</sup> Point to point equipment; Derivation of receiver interference parameters useful for planning fixed service point to point systems operating different equipment classes and/or capacities.

<sup>6</sup> For example, the modulation scheme can make a significant difference to the level of adjacent channel interference that can be tolerated.

## 6 General Requirements

### 6.1 Equipment Requirements

All equipment must comply with the Radio Equipment and Telecommunications Terminal Directive<sup>7</sup> (Directive 1999/5/EC, R&TTE Directive) which was enacted into Irish law on 5 June 2001 by Statutory Instrument 240 of 2001. Information on the R&TTE Directive may be found in ComReg Documents 00/61 and 00/62R – please note that these documents are subject to revision and updates<sup>8</sup>

For information purposes, the table 1 below lists the reference standards that relate to the essential requirement of the R&TTE Directive for Point-to-Point and Point-to-Multipoint operation within this band.

**Table 1: National interface requirements for P2P and PMP equipment in the 26 GHz band**

	Point to Point Equipment	Point to Multipoint Equipment
<b>Frequency Band (MHz)</b>	26 GHz (Upper half of band 24.5 – 26.5 GHz)	26 GHz (Upper half of band 24.5 – 26.5 GHz)
<b>Maximum Transmit Power/ Maximum ERP</b>	Minimum required to obtain required availability level	Minimum required to obtain desired service
<b>Channel Size</b>	3.5 MHz, 7 MHz, 14 MHz, 28 MHz	3.5MHz, 7MHz, 14MHz, 28 MHz
<b>Transmit/receive spacing (duplex direction)</b>	1008 MHz	1008 MHz
<b>Transmission capacity/duty cycle/channel access protocol</b>	≥ 4 Mbit/s	
<b>Licensing Regime</b>	Wireless Telegraphy Licence required. See S.I. 762 of 2007	Wireless Telegraphy Licence required. See S.I. 762 of 2007
<b>(Harmonised) standard representing state of the art</b>	EN 300 431 EN 301 785 TS 101 785 TR 101 854	EN 301 213
<b>Comment on Harmonised standard</b>	Class B equipment applicable, (PDH and SDH)	
<b>Minimum antenna requirements</b>	Class 3 EN 302 217-4-2	EN 301 215
<b>Typical capacity</b>	≥4Mbit/s	
<b>Band plan</b>	CEPT/ERC/REC 13-02 E, Annex B	CEPT/ERC/REC 13-02 E, Annex B
<b>Notes</b>	Wherever possible all relevant CEPT/ERC Decisions apply.	Wherever possible all relevant CEPT/ERC Decisions apply.

As indicated in the above table, the maximum channel size that can be used is 28 MHz. However ComReg will consider all written requests for channel sizes greater than 28MHz from operators with contiguous block assignments.

<sup>7</sup> O.J. No. L91/10 of 7 April 1999.

<sup>8</sup> Further information on the R&TTE Directive can be found at <http://europa.eu.int/comm/enterprise/rtte/>

## 6.2 Antenna Requirements

All antennas for Point-to-Point systems are required to be of at least 'class 3' standard as defined by ETSI EN302 317-4-2: *"Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4-2: Harmonised EN covering essential requirements of Article 3.2 of R&TTE Directive for antennas."*

All antennas for Point-to-Multipoint systems are required to comply with ETSI EN 301 215-2: *"Fixed Radio Systems; Point-to-Multipoint Antennas; Antennas for point-to-multipoint fixed radio systems in the 11 GHz to 60 GHz band; part 2: 24 Hz to 30 GHz."*

## 6.3 Registration of Transmit High / Transmit Low Co-ordinates.

Licensees are required to have regard to compatibility with other existing radio users at the same general location. Currently specific transmission sites and the immediate surrounding area may be designated "transmit high" or "transmit low". This ensures that all the transmit frequencies from the site are sufficiently separated from the receive frequencies to enable effective filtering between the two, and hence avoid inter-system interference.

Licensees are required to successfully register the co-ordinates of their P2P and PMP sites with ComReg in order to be allowed to put P2P or P2M equipment into operation using their national block licences. Any P2P or P2M equipment at sites which have not been successfully registered with ComReg will be deemed unlicensed.

For Point-to-Point Links a web based tool for the registration of transmit high and transmit low sites for the 26 GHz band is currently under development. This tool will access information on transmit high and transmit low sites from ComReg's database<sup>9</sup>. Both sites of a P2P link need to be registered with ComReg.

For Point-to-Multipoint systems, a web based tool for registration of sites is currently under development. Base station sites need to be successfully registered with ComReg and can only be registered at transmit low designated sites or sites of no current designation.

## 6.4 Power Control Requirements

As indicated in Table 1 above, any system operating in this band is required to use the minimum EIRP necessary to obtain the desired service or service availability. This is to reduce the likelihood of interference between systems.

---

<sup>9</sup> Currently transmit high and transmit low sites can be queried on ComReg's website at the following web address: [http://www.comreg.ie/licences/lic\\_site\\_designation.asp](http://www.comreg.ie/licences/lic_site_designation.asp)

In addition, ComReg requires the use of Automatic Transmitter Power Control (ATPC) for all P2P and PMP radio links in this band.

## **6.5 Guard Bands**

There is a guard band between the P2P and PMP allocations to minimise the potential for interference between the two different technologies..

In the event that any other guard band(s) should prove necessary between adjacent frequency blocks to prevent interference these must be accommodated within the Licensees' assigned spectrum blocks. The use of guard bands can be minimised by co-ordination between licensees operating in adjacent bands and by compliance with the block edge mask in the case of point to multipoint systems.

## **6.6 Co-ordination with the UK**

There are no deployment restrictions on the usage of any lots in this band. However, Licensees are reminded that spillage of signals across national borders where no agreement exists is not acceptable and subject to enforcement under international treaty obligations.

Bilateral negotiations between ComReg and Ofcom the regulator in the UK are on-going. It is ComReg's objective to develop a mechanism for cross-border co-ordination in the form of a Memorandum of Understanding (MoU) between the two administrations in order to facilitate operations near national borders. The MoU will define a threshold of signal level permitted to cross the border for which no co-ordination with the UK is required.

Licensees are obliged to comply with any such bilateral MoU. Where changes arising from international co-ordination are required to be made to a licence, the Licensee will be informed of this change and in this event all expenses must be borne by the Licensee.

## **6.7 Commissioning/Site Inspections**

ComReg reserves the right to inspect the radio link installation at any time to ensure that the link is operating in accordance with the licences conditions. In addition ComReg may attend the commissioning of the radio link and may carry out measurements on the link at that time.