**3.4 GHz TLG - Overview of unwanted emission limits**

**Receiver spurious emissions**

* There is no change to the actual receiver spurious emission limits currently on licences.
* However, similar to transmitters exempt from registration, the frequency range that the limits apply to for receivers exempt from registration has been expanded to cover the 3295-3905 MHz band. This has been done to support operation of devices with up to 100 MHz channel bandwidths within the 3400-3800 MHz band. Refer to transmitters exempt from registration for explanation.

**Transmitters exempt from registration**

* Unwanted emission limits are nominally based on those contained in 3GPP TS 38.101-1 V17.6.0. However, this document does not define limits for transmitters with AAS. Therefore, the unwanted emission limits proposed for 3.4 GHz spectrum licence are intended to apply to all transmitters exempt from registration (except in the spurious domain). To support possible AAS use, the limits are defined in terms of TRP.
* Separate unwanted emission limits are defined for transmitters with AAS and non-AAS in the spurious domain. The non-AAS limits are based on 3GPP TS 38.101-1 V17.6.0, the AAS limits are based on 3GPP TS 38.104 V17.6.0.
* The definition of the frequency range that spurious emission limits apply is in section 6.5.3.1 of 3GPP TS 38.101-1 (refer to table 6.5.3.1-1). In this case the spurious domain starts at +/- BWchannel + 5 MHz either side of the operating channel. To support a maximum 100 MHz channels anywhere within the 3400-3800 MHz band, spurious emission limits are defined to apply outside the 3295-3905 MHz frequency range.
* Unwanted emission limits within the 3295-3905 MHz band are based on:
  + All transmitters: Table 6.5.2.2-1 of 3GPP TS 38.101-1 , except the limits for 0-1 MHz offsets which are based on table 6.6.2.1.1-1 of 3GPP TS 36.101 V17.6.0 (this is to support the use of 5 MHz channel bandwidths by 4G devices)
* Unwanted emission limits outside the 3295-3905 MHz band are based on:
  + Non-AAS: Table 6.5.3.1-2 of 3GPP TS 38.101-1
  + AAS: section 9.7.5.2.1 of 3GPP TS 38.104

**Transmitters that are required to be registered**

* Unwanted emission limits are based on Category B limits (option 1) as detailed in 3GPP TS 38.104 V17.6.0. Different limits are defined for transmitters with AAS and non-AAS.
* The definition of the frequency range that spurious emission limits apply is in section 6.6.1 of 3GPP TS 38.104 (refer to the definition of definition of ΔfOBUE in table 6.6.1-1)
* Unwanted emission limits within the 3360-3840 MHz band are based on:
  + Non-AAS: Table 6.6.4.2.2.1-2 of 3GPP TS 38.104
  + AAS: section 9.7.4.2 of 3GPP TS 38.104
* Unwanted emission limits outside the 3360-3840 MHz band are based on:
  + Non-AAS: Table 6.6.5.2.1-2 of 3GPP TS 38.104
  + AAS: section 9.7.5.2.1 of 3GPP TS 38.104

**Summary of unwanted emission limits proposed**

* Note: the same table numbering as on the sample licence is used here.

**Table 3: Radiocommunications transmitter unwanted emission limits for registered devices with non-AAS (apply within the 3360-3840 MHz band)**

|  |  |  |
| --- | --- | --- |
| **Frequency offset range**  **(foffset)** | **Mean power per antenna port**  **(dBm)** | **Specified Bandwidth** |
| 0 kHz < foffset < 5 MHz | -7 - (7/5) f offset (MHz) | 100 kHz |
| 5 MHz < foffset < 10 MHz | -14 | 100 kHz |
| foffset > 10 MHz | -15 | 1 MHz |

**Table 4: Radiocommunications transmitter unwanted emission limits for registered devices with AAS (apply within the 3360-3840 MHz band)**

|  |  |  |
| --- | --- | --- |
| **Frequency offset range**  **(foffset)** | **Total radiated power**  **(dBm)** | **Specified Bandwidth** |
| 0 kHz < foffset < 5 MHz | 2 - (7/5) f offset (MHz) | 100 kHz |
| 5 MHz < foffset < 10 MHz | -5 | 100 kHz |
| foffset > 10 MHz | -6 | 1 MHz |

**Table 5: Radiocommunications transmitter unwanted emission limits for devices exempt from registration (apply within the 3295-3905 MHz band)**

|  |  |  |
| --- | --- | --- |
| **Frequency offset range**  **(foffset)** | **Total radiated power**  **(dBm)** | **Specified**  **Bandwidth** |
| 0 kHz < foffset < 1 MHz | -15 | 30 kHz |
| 1 MHz < foffset < 5 MHz | -10 | 1 MHz |
| 5 MHz < foffset < 100 MHz | -13 | 1 MHz |
| foffset > 100 MHz | -25 | 1 MHz |

**Table 6: Radiocommunications transmitter unwanted emission limits for registered non-AAS devices (outside the 3360-3840 MHz band) and non-AAS devices exempt from registration (outside the 3295-3905 MHz band)**

|  |  |  |
| --- | --- | --- |
| **Frequency range**  **(f)** | **Mean power per antenna port**  **(dBm)** | **Specified Bandwidth** |
| 9 kHz < f < 150 kHz | -36 | 1 kHz |
| 150 kHz < f < 30 MHz | -36 | 10 kHz |
| 30 MHz < f < 1 GHz | -36 | 100 kHz |
| 1 GHz < f < 19 GHz | -30 | 1 MHz |

**Table 7: Radiocommunications transmitter unwanted emission limits for registered AAS devices (outside the 3360-3840 MHz band) and AAS devices exempt from registration (apply within the 3295-3905 MHz band)**

|  |  |  |
| --- | --- | --- |
| **Frequency range**  **(f)** | **Total radiated power**  **(dBm)** | **Specified Bandwidth** |
| 9 kHz < f < 150 kHz | -27 | 1 kHz |
| 150 kHz < f < 30 MHz | -27 | 10 kHz |
| 30 MHz < f < 1 GHz | -27 | 100 kHz |
| 1 GHz < f < 19 GHz | -21 | 1 MHz |