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Technical Framework Development 700 MHz Spectrum Licence Band

**TLG-Discussion Paper No. 1  
Design Requirements for the Technical Framework  
Reference Technologies / Standard Trading Units / Core Condition**

Document Release Information

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| 1 | 12 October 2011 | Initial Release |
| 2 | 16 December 2011 | Changes to proposed out-of-area and out-of-band limits, following comments in response to version 1 |
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## Background

## The technical framework

The technical framework of a Spectrum Licence consists of the following 3 interlocking components:

* The Marketing or Conversion Plan including the Draft Licence;
* The Section 145 Determination of Unacceptable Interference; and
* The Section 262 Advisory Guidelines.

The technical framework defines the spectrum licence asset and its relationship to other spectrum users. In doing so the framework provides arrangements to manage interference and provide legal certainty about licensee rights.

The objectives of technical frameworks are to:

* minimise the negotiation necessary between licensees;
* maximise flexibility for the deployment of services;
* maximise the efficiency with which the spectrum is used; and to

The technical framework of the spectrum licence is developed by the ACMA to fulfil its requirements under the *Radiocommunications Act 1992 (the Act)*. The framework is developed by ACMA in consultation with industry through the Technical Liaison Group (TLG).

## The digital dividend

The transition from analogue to digital television will make available spectrum in the UHF band for new services. This block of spectrum is often known as the *digital dividend*. On 24 June 2010, after examining responses to a discussion paper[[1]](#footnote-1) on possible uses of this spectrum, The Minister for Broadband Communications and the Digital Economy identified 126 MHz – from 694 MHz to 820 MHz – to be reallocated from broadcasting services to support new services. The ACMA has identified the opportunity to provide support for the introduction of next generation mobile telecommunication or Wireless Access Services (WAS) within this spectrum.

Around the world, similar changes in spectrum use are occurring as a result of the adoption of digital television systems. The spectrum which will become available does not align internationally from region to region, mainly due to historical differences in the frequency bands used for television and other radiocommunications services.

The increasing demand for spectrum for mobile broadband telecommunications services around the world has seen a significant proportion of the world-wide digital dividend spectrum being allocated to support WAS – in particular next generation systems such as LTE. This demand has, particularly in high density areas, been for spectrum to support broad bandwidth, two-frequency systems.

## 1.3 Channelling arrangements

By aligning with a major established international set of arrangements in the band, Australia will be able to take advantage of economies of scale – providing lower costs for both service providers and end users – as well as easier and wider roaming capabilities for users.

The Asia Pacific Telecommunity (APT), through its Wireless Group (AWG), has developed a regionally harmonised arrangement for the digital dividend spectrum. This harmonised arrangement can provide participating countries with the same benefits mentioned above.

The AWG frequency division duplex (FDD) plan published in APT/AWF/REP-14[[2]](#footnote-2) consists of a pair of 45 MHz blocks with a 10 MHz mid-band gap, and uses *conventional duplex* – with the mobile transmit in the lower block and the base transmit in the upper block.

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| **Figure 1 AWG FDD proposed digital dividend arrangements** |
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The AWG also developed a time division duplex (TDD) arrangement for the band (see APT/AWF/REP-14) .These arrangements occupy 108 MHz of spectrum – from 698 to 806 MHz – which is wholly contained within the 126 MHz identified as the Australian digital dividend.

Following consideration of several established international band arrangements, including those from the USA and Europe, the ACMA intends for Australia to follow the plan developed by the AWG. Due to the difference in the exact frequency boundaries between Australia’s Digital Dividend and the AWG plan, the lower guard band (between proposed WAS and broadcast television services) in Australia will be 9 MHz wide, as opposed to 5 MHz in many other Asia-Pacific nations.

## Introduction

This is the first of three discussion papers[[3]](#footnote-3) which will provide information on the various aspects of the technical framework. This paper looks at the following basic items of the technical framework;

* the reference technologies;
* the standard trading unit and minimum contiguous bandwidth (MCB);
* the out-of-area emission limit; and
* the out-of-band emission limits.

The last two items, together with the frequency and geographic boundaries, make up the core conditions of the spectrum licence as defined in Section 66 of *the Act*. This discussion paper examines each of these four items of the framework, considering the specifications of the reference technologies, the arrangements in place overseas, and proposed arrangements to be put in place in Australia. An outline of the reasoning leading to selection of the proposed values for each item is provided.

This is a discussion paper and the views and suggestions of the members of the TLG are sought as to the relevance and suitability of the proposed values.

## Reference Technologies

The proposed reference technologies that will be specifically considered in the development of the framework are:

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| UMTS (UTRA) | New | Two frequency (FDD) | Fixed and mobile |
| LTE (E-UTRA) | New | Two frequency (FDD) | Fixed and mobile |

This does not exclude other technologies from being used under the framework; rather, it is proposed that the framework will be developed with specific reference to these technologies. As there has been little interest in the use of TDD systems in this band in Australia, only FDD technologies are being considered. The proposed framework will be optimised to support FDD in line with band arrangements developed by the AWG for FDD.

## Standard Trading Unit and Minimum Contiguous Bandwidth

Previously, spectrum licence technical frameworks were based on the use of a Standard Trading Unit (STU) that defined the minimum unit for the trading of spectrum under spectrum licences. The size of the STU was defined in terms of both geographic area and frequency bandwidth.

### 4.1 STU - Geographic

The geographic STU has previously been defined using the ACMA’s Spectrum Map Grid (SMG). The current SMG is referenced to the Australian Geodetic Datum 1966 (AGD66). See Figure 2.

Since 2000, all spatial data published by the Commonwealth and state surveying and mapping agencies – excepting unrevised historic data – has used the Geocentric Datum of Australia 1994 (GDA94). GDA94 is an Earth-centred datum compatible with satellite-based navigation systems and other major international geographic systems, such as the World Geodetic System 1984 (WGS84).

The ACMA is currently in the process of updating its systems to make use of GDA94 across its entire radiocommunications database. This new datum provides better alignment with the coordinates generated by the GPS system among other advantages. The change of datum however leads to a non uniform translation of points along a line so altering the shape and areas within the grid. It has been decided to minimise the impact of this by aligning old and new licence areas at the corners of the grid to minimise changes in licence areas.

The ACMA, in its ongoing review of spectrum license technical frameworks, has decided to move away from specifying an STU in each band to increase flexibility and better facilitate secondary trading particularly in remote and regional areas. As part of this move, the ACMA has decided to adopt a uniform 5 minutes of arc map grid and use existing coordinates specified using AGD66 datum used for mapping and surveying converted to GDA94; this results in coordinates that are no long accurate to two decimal places.

The ACMA will be conducting further consultation on issues surrounding the future of the SMG and the change of datum, however preliminary views or discussion are welcome during the current technical framework development process. Refer to the TLG Reference Paper on GDA94 adoption for more information.

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| Figure 2 |
| SMG new.png |
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***Left:*** *The original Spectrum Map Grid.* ***Right:*** *The new SMG (down to only the first two levels of resolution). The red squares are 3 degrees to a side, while the black are 1 degree. These are broken down into two further levels of resolution (not shown here), finishing with squares 5 minutes to a side.*

### 4.2 STU - Frequency

The bandwidths specified for STUs in previous spectrum licence frameworks were typically chosen to be the bandwidth necessary to support one radiocommunications channel using the most likely technology to operate in the band. Under the new spectrum licence arrangements, the ACMA is adopting a minimum tradable bandwidth of 1 Hz for all new spectrum licenses to maximise trading flexibility.

### 4.3 Auction lots

The geographic areas of the auction lots will be constructed from units in the ACMA’s new spectrum map grid specified in coordinates referenced to GDA94. The frequency limits of the auction lots will be constructed with bandwidths that are equal to or greater than the MCB.

### 4.4 Minimum Contiguous Bandwidth

Typically the MCB under a spectrum licence has been chosen based on both system technical requirements and marketing goals. From a technical perspective, the MCB should be at least the minimum bandwidth to support a service.

The proposed minimum contiguous bandwidth in the 700 MHz band is 5 MHz. This accommodates most current high speed wireless access systems and has been used overseas as a minimum licence block size. A smaller value of MCB would increase the opportunity for the band to be fragmented or broken into licence blocks that are not aligned with international arrangements, causing potential inefficiencies in the use of the band. A larger value may reduce the potential for competition in the band and place limitations on how spectrum can be traded.

To further enhance trading flexibility the amended *Radiocommunications (Trading Rules for Spectrum Licences) Determination 1998* will define the MCB as a ‘recommended’ value. Any spectrum trades where the resultant licences have a contiguous bandwidth of less than the recommended MCB will not be allowed unless approved by the ACMA.

***The proposed recommended minimum contiguous bandwidth for the new technical framework for the 700 MHz band is 5 MHz.***

## Out-of-Area Emission Limit (a licence core condition)

Emissions that fall outside the geographic area of a spectrum licence are limited by a core condition of the licence. The form of this condition (to be found in the draft licence in the marketing plan) places an overall cap on the horizontally radiated true mean power anywhere in the area of the licence and thus towards adjacent licences.

Expressing the limit this way helps to control the maximum level of radiated signal from stations within the licence area. The limit directly affects the risk of receiver overload and the levels of site generated intermodulation products that may cause interference to receivers in close proximity.

Another part of the technical framework helps to control the level of emissions across the geographic boundary between co-frequency areas; this part is found in the Determination of Unacceptable Interference made under Section 145 of *the Act*. The Out-of-Area emission limit in the licence is generally chosen to encompass transmitter powers likely to be implemented, while also allowing for likely technology developments.

### 5.1 Overseas limits

**Europe**

The European block edge mask (BEM) model is derived using studies described in CEPT Report 30 with the final values set out in decision 2010/267/EU. It sets out a set of common, least restrictive conditions optimised for, but not limited to, fixed/mobile communications networks. It suggests adoption of maximum in-block EIRP limits of 64dBm/5MHz for fixed base stations and 23dBm/10MHz for terminal stations.

The limits in the European model are based on an Urban Macro-cell model (an example is shown in figure 3) and current mobile equipment technology. The figure of 64dBm/5MHz allows for larger rural cells. In these cases base stations are likely to have greater antenna height and physical separation from user terminal units than in urban areas.

Note that radiated power mobile for mobile and nomadic devices are considered during development of licence conditions on exemption from registration requirements (aka class licensing) and development of a determination of unacceptable interference made under s145 of *the Act* - both are discussed in as part of the 2nd TLG paper on registration requirements.

This figure is a suitable starting point for consideration of the likely maximum horizontally radiated true mean power to feed into an Australian spectrum licence out-of-area emission limit. Note that radiated power mobile for mobile and nomadic devices are considered during development of licence conditions on exemption from registration requirements (class licensing) and development of a determination of unacceptable interference made under s145 of *the Act* - both are discussed in as part of the 2nd TLG paper on registration requirements.

The European figure for larger rural areas can be converted to the form used in Australian spectrum licences - that of a maximum horizontally radiated true mean power - by adjusting for bandwidth

64dBm/5MHz - 10log(5MHz/30kHz) = 42dBm EIRP/30kHz.

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| Figure 3 Urban macro-cell model |
| 20 km  Base Station  Maximum EIRP 64dBm/5MHz  Height 30 m  Terminal Station |
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*Note that CEPT Report 30 utilises a number of different values in its analysis in different sections of the report. It should also be noted that cell size is dependent on data rates and included losses, such as wall and body loss, and the values in Figure 3 are representative only.*

**USA**

In the US, the FCC has adopted a number of radiated emission limits across the digital dividend auction lots that depend upon antenna height, bandwidth and service type.

Effective radiated power (ERP) must not exceed 1000 W (measured per MHz when the emission bandwidth is greater than 1 MHz) for antennas up to 305m height above average terrain. The maximum allowed ERP is then reduced for antennas higher than 305m.

In any unpaired spectrum blocks, fixed or base stations may not exceed an ERP of up to a total of 50 kW within the 6 MHz spectrum block, and the power flux density that would be produced by such stations – through a combination of antenna height and vertical gain pattern – does not exceed 3000µW/m2 on the ground over the area extending to 1km from the base of the antenna. For control or mobile stations the limit is 30W ERP (47dBm EIRP) and for portable stations 3W ERP (4.7dBm EIRP). The 1000W ERP/MHz limit is equivalent to 62.15dBm EIRP/MHz or 47dBm EIRP/30kHz.

### 5.2 Proposed Out-of-Area Emission Limit

The value proposed for the Out-of-Area Emission limit is based on the maximum in-block limit identified in the European arrangements with an additional factor of 5dB added to cover future technological developments that may occur over the period of the licence.

***The proposed out-of-area limit is 47dBm EIRP per 30 kHz for licenses in the 700 MHz band.***

This limit is less than that found in the 800 MHz (59dBm EIRP/30kHz) allowing the framework to accommodate closer adjacent channel base station locations due to the reduced risk of intermodulation product interference and receiver overload.

**6** Out-of-Band Emission Limits (a licence core condition)

Out-of-band emission limits are another core condition of the licence. These limits control emissions affecting licensees in adjacent holdings across the frequency boundaries of the licence. These limits also include requirements for unwanted emissions – both spurious and non-spurious.

Non-spurious unwanted emissions are modulation-generated noise or intermodulation products caused by the transmission of information, or broadband noise generated by the transmitter. Spurious emissions are emissions including intermodulation products, harmonics and frequency conversion products not associated with the transmission of information by the transmitter.

The required values for out-of-band emissions to enable coexistence with adjacent broadcast services (520-694 MHz) given the use of the AWG FDD band plan has been discussed and studied within the AWG.

A new Report (AWG-11/OUT-10) developed by the AWG concluded that the average out of band emissions of IMT UE (or mobile handset), measured over the bandwidth of the applicable television channel in the country of deployment, must not exceed -34dBm/MHz in the broadcast band below 694 MHz.

The Report also provided guidance that if further reductions in emissions were required in certain circumstances, such as where digital television broadcasting services operate immediately below 694 MHz, administrations could implement, on a local basis, network and operational deployment measures that would have the effect of further lowering the emissions into the adjacent broadcast band below 694 MHz by up to 6dB. It was also noted that this extra reduction would have no impact on the equipment specifications or requirements but could be achieved solely through network implementation by operators.

### 6.1 Overseas Limits

**Europe**

The European baseline out-of-band emission levels for base station transmissions falling in the FDD uplink band, or in the mid-band gap, is ‑49.5dBm/5MHz. The baseline level for terminal station transmitters into the FDD downlink band is -37dBm/5MHz. These limits apply in these band segments independent of actual FDD or TDD use. The differences in these two figures primarily reflect the differences in interference risk due to transmitter antenna location and height. (See CEPT Report 30 Tables 10 and 16).

The shoulders of the European base station BEM falling on the 5 MHz blocks adjacent either side of the licence band limit the maximum emission level to

+22dBm/5MHz. Between 5 and 10MHz either side of the licence the limit is

+18dBm/5MHz and in the rest of the downlink segment the limit is +11dBm/MHz.

The shoulders of the European terminal station BEM are also specified for two 5 MHz blocks on both sides of the licence band or block. The first 5 MHz block on either side of the licence has a maximum level of +1.6dBm/5MHz and in the outer blocks either side of the licensed band a level of -6dBm/5MHz.

The European arrangements adopted reverse duplex arrangements where the downlink or base station transmit band is adjacent to the television broadcast band. These BEM emission limits are subject to additional limitations. Base station emissions in the guard band (between broadcasting and downlink) are limited to 17.4dBm/MHz.

Emissions from a base station which fall into the adjacent spectrum used by broadcasting are broken down into three cases depending on the level of protection given to the broadcasting service and the EIRP of the base station transmitter.

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| **Case A: Within a protected broadcasting channel:** | |
| WAS Tx power (P) | Required out-of-band level within broadcast channel |
| P > 59dBm/10MHz | 0dBm/8MHz (-9dBm/MHz or ‑24.2dBm/30kHz) |
| 36 < P < 59dBm/10MHz | P-59dBm/8MHz |
| P < 36dBm/10MHz | -23dBm/8MHz (-32dBm/MHz or ‑47.2dBm/30kHz) |

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| **Case B: Within a broadcasting channel with intermediate level of protection** | |
| WAS Tx power (P) | Required out-of-band level within broadcast channel |
| P > 59dBm/10MHz | 5dBm/8MHz (-4dBm/MHz or ‑19.2dBm/30kHz) |
| 36 < P < 59dBm/10MHz | P-49dBm/8MHz |
| P < 36dBm/10MHz | -13dBm/8MHz (-22dBm/MHz or ‑37.2 dBm/30kHz) |

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| **Case C: Within a broadcasting channel with no specific level of protection** |
| 22dBm/8MHz (13dBm/MHz or ‑2.2dBm/30kHz) |

The following table summarises the limits from base station and user equipment into various frequency ranges.

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|  | Base Station | Terminal |
| In-Band | +64dBm/5MHz | +23dBm/5MHz |
| 0-5MHz from edge | +22dBm/5MHz | +1.6dBm/5MHz |
| 5-10MHz from edge | +18dBm/5MHz | -6dBm/5MHz |
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| Uplink | -49.5dBm/5MHz | -6dBm/5MHz |
| Downlink | +18dBm/5MHz | -37dBm/5MHz |
| Guard Band | +22dBm/5MHz | -37dBm/5MHz |
| TV Broadcasting (CASE A)\* | 0dBm/8MHz or  -23dBm/8MHz,or  P-59dBm/8MHz | -50dBm/8MHz |
| TV Broadcasting (CASE B)\* | 5dBm/8MHz or  -33dBm/8MHz,or  P-49dBm/8MHz | -50dBm/8MHz |
| TV Broadcasting (CASE C)\* | 22dBm/8MHz | -50dBm/8MHz |
|  | | |

*\*See the previous tables for details of cases A, B and C*

**USA**

In the US, the FCC arrangements for operations in the range 698-746 MHz specify that the power of any emission outside a licensee’s frequency band(s) of operation must be below the in-band transmitter power (*P*) by at least

43 + 10 log (*P*)dB. The power, *P*, is measured in watts. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to a licensee’s frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in both halves of the paired spectrum in the upper band (746-758 MHz and 776-788 MHz), the power of any emission outside the licensee’s frequency band(s) of operation shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P)dB;

For operation in the public safely bands (763-775 MHz and 793-805 MHz), the power of any emission outside the licensee’s frequency band(s) of operation shall be attenuated below the transmitter power (P) by a factor not less than:

* Base and fixed stations: 76 + 10 log (P)dB in a 6.25 kHz band segment
* Mobile and portable stations: 65 + 10 log (P)dB in a 6.25 kHz band segment

**3GPP**

Out-of band limits for LTE equipment in the 3GPP standards are specified at the transmitter output rather than as radiated power levels from a station. Practical radiated limits can be calculated from the 3GPP standards limits by taking into account other factors such as antenna gain (See CEPT Report 30 Annexes 3 and 5).

**Proposed limits**

The proposed limits for the technical framework for the terminal stations are based on 3GPP values for a 5 MHz E-UTRA channel[[4]](#footnote-4), with an additional requirement for out-of-band emissions falling within the broadcasting band below 694 MHz. This additional requirement is based on the limit described in AWG-11/OUT-10. While the level of -34dBm/MHz gives a very low probability of interference, it is proposed to allow additional protection for broadcasting services operating below 694 MHz. The original proposal was to impose a simple single limit of -37dBm/MHz. A new more complex scheme is now proposed which more closely follows the AWG decision.

The proposed out-of-band emission levels are now designed to provide extra protection to broadcasting services by requiring the spectrum licensed devices to meet a stricter mask while operating in areas of Australia designated for use of the top three television broadcasting channels (49 to 51). All devices will be required to achieve a level of -40dBm/MHz for emissions falling below 673 MHz (ie from the top of TV channel 48 and below), while devices operating in an area designated for use of channels 49 to 51 will be required to meet the -40dBm/MHz limit from the 694 MHz boundary.

The exact wording of these restrictions, and the definition of the areas within which the more stringent criteria will apply, have yet to be determined. The ACMA currently seek comments on the general approach being proposed, and TLG members will have the opportunity to comment on the specifics of the wording and definitions once they are developed.

The proposed limits for base stations are based on a combination of the European values and the values currently being used, or proposed, in the 800 MHz band in Australia. In order to help preserve options for future planning of the frequencies above 803 MHz, an additional requirement is proposed for out-of-band emissions above 806 MHz. Since there is not yet any decision on what will eventually occupy this vacant spectrum, these values have been determined based on both the values given in 3GPP TS36.104 v10.3.0 and the European values, with an additional 10-15dB of filtering. It is also in line with the out-of-band values currently proposed for the 890 MHz boundary in the 800 MHz band[[5]](#footnote-5).

***Proposed non-spurious out-of-band emission limits***

For transmitters operating in the lower band (703-748 MHz) emissions falling:

(a) above 694 MHz, at frequencies offset from the upper and lower limits of the licence:

(i) between 0 MHz and 1 MHz – a radiated maximum true mean

power of -15dBm/30kHz;

(ii) between 1 MHz and 5 MHz – a radiated maximum true mean

power of -10dBm/MHz;

(iii) between 5 MHz and 10 MHz – a radiated maximum true mean

power of -13dBm/MHz;

(iv) greater than 10 MHz – a radiated maximum true mean power

-25dBm/MHz;

(b) between 673-694 MHz:

(i) while operating in an area designated for use of television broadcasting channels 49,  
 50 and 51, a radiated maximum true mean power of -40dBm/MHz (averaged over a  
 7 MHz bandwidth);

(ii) while operating in any other area, a radiated maximum true mean power of  
 -34dBm/MHz (averaged over a 7 MHz bandwidth)

(c) below 673 MHz

a radiated maximum true mean power of -40dBm/MHz (averaged over a 7 MHz  
 bandwidth).

For transmitters operating in the upper band (758-803 MHz) emissions falling:

(a) between 748-806 MHz, at frequencies offset from the upper and lower limits of the licence:

(i) between 0 MHz and 5 MHz – a radiated maximum true mean power of +15dBm/MHz;

(ii) between 5 MHz and 10 MHz – a radiated maximum true mean power of

+11dBm/MHz;

(iii) greater than 10 MHz – a radiated maximum true mean power of +9dBm/MHz.

(b) between 806-813 MHz – a radiated maximum true mean power of -6dBm/MHz

(c) above 813 MHz and below 748 MHz – a radiated maximum true mean power   
 of -15dBm/MHz.

Note that these limits would apply to all devices operating under a spectrum licence in the 700 MHz band. Devices which are exempt from registration (e.g. mobile handsets) are not exempt from the core conditions of the licence under which they operate.

Figures 4 and 5 illustrate these proposed out-of-band emission limits. In both figures, the blue lines indicate emission limits at the edge of the entire lower band block (703-748 MHz), while the red lines illustrate the limits for a hypothetical licence located somewhere within the band. In figure 4, the black dashed line between 673-694 MHz indicated the out-of-band requirement for devices operating in an area designated for use of broadcasting channels 49 to 51.

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| Figure 4 Proposed out-of-band lower band emission limits |
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| Figure 5 Proposed out-of-band upper band emission limits |
| graph2.png |
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### 6.3 Proposed Out-of-Band Spurious emission limits

The proposed limits for spurious emissions have been based on arrangements and limits found in CEPT/ERC/REC 74-01 and ITU-R Radio Regulations Appendix 3 and ITU-R Recommendation SM 329. These limits are applicable outside of the band 758-803 MHz.

***The proposed maximum permissible level of spurious emissions from a transmitter operated under a 700 MHz band spectrum licence is a radiated mean power of:***

-36dBm per 1 kHz within the band 9 kHz to 150 kHz;

-36dBm per 10 kHz within the band 150 kHz to 30 MHz;

-36dBm per 100 kHz within the band 30 MHz to 1 GHz; and

-30dBm per 1 MHz within the band 1 GHz to 12.5 GHz.

***The proposed maximum permissible level of spurious emissions from a receiver operated under a 700 MHz spectrum licence is a radiated mean power of:***

-57dBm per 100 kHz within the band 30 MHz to 1 GHz; and

-47dBm per 1 MHz within the band 1 GHz to 12.5 GHz.

The limits proposed are comparable with limits set out in the 2 GHz and 3.4 GHz spectrum licences. The limits for out-of band-emission limits in the band have not been matched to the level of the spurious emissions. The emission levels are based on the less demanding of the limits for fixed services and for mobile services specified in CEPT/ERC/REC 74-01.

1. <http://www.dbcde.gov.au/consultation_and_submissions/digital_dividend> [↑](#footnote-ref-1)
2. <http://www.apt.int/AWF-RECREP> [↑](#footnote-ref-2)
3. A second paper will look at system and propagation modelling leading to the development of the determination of unacceptable interference. A third paper will look at the interference protection to and from systems operating in adjacent spectrum. [↑](#footnote-ref-3)
4. 3GPP TS36.101 v10.3.0 [↑](#footnote-ref-4)
5. The current proposal for out-of-band emissions within the ongoing 800 MHz TLG discussion include values of:   
    -21.5dBm/30kHz (-6.3dBm/MHz) for offsets greater than 5 MHz and; -30dBm/30kHz (-14.8dBm/MHz) for offsets greater than 10 MHz. [↑](#footnote-ref-5)