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| **Title\*:** | A New approach to exclusion bands in the EN 301 489 series | | |
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| input for **Committee**\***:** | ERM WGEMC | | |
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| Contribution **For\*:** | Decision | **X** |  |
|  | Discussion |  |  |
|  | Information |  |  |
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| Relevant WI(s), or deliverable(s): |  | | |
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**Decision/action requested:** Please approve the proposals in this document to be included as part of the work on EN 301 489-1 for the Radio Equipment Directive

**Background and Proposal**

The majority of the EN 301 489 series contains receiver exclusion bands. Within these bands the EUT is not subject to the relevant test procedures. The justification for this is to protect the receiver front end from damage/undue stress during the test programme.

As a consequence the actual exclusion band is directly linked to both the technology employed by the EUT, the service it is intended to deliver and the expected operating environment. This leads to very specific exclusion bands. However, in certain cases these exclusion bands would appear to bear little resemblance to the allocated spectrum for the devices and have resulted in exclusion bands that extend well into adjacent bands which sometimes contain higher power services.

This discussion document is the start of the process to harmonising the methodology behind determining appropriate exclusion bands.

**Bandwidth and Tuned band**

The starting point for determining the size of the exclusion band should be the bandwidth of the receiver under test as this defines the wanted signal and as such a receiver with high selectivity will have a good rejection of signals outside of the wanted, whether they be regarded as EMC or RX performance parameters. For the purposes of this document receiver bandwidth will be known as *BWRX.*

Whilst the above sounds good for simple tuned receivers, there are products that operate by listening across a designated band in order to monitor “free” channels. In this case the Tuned band would be a more representative exclusion band. For the purposes of this document the range of receiver band will be known as *BandRX(lower)*and *BandRX(upper)*.

**Receiver parameters**

There are several receiver parameters that will be covered under the RED that are relevant to how well a receiver will perform when subjected to a radiated immunity test. These include receiver selectivity and receiver sensitivity, adjacent channel rejection and blocking. These parameters determine the quality of the receiver or more accurately the ability of the receiver to reject unwanted signals in favour of the wanted signal. However these parameters are typically concerned with in band effects where the EMC immunity test are looking at the much larger range of out of band impact on the ability of the receiver to reject unwanted signals in favour of the wanted signal.

**Formulation of Exclusion band range**

From the above we would propose that for all radio EMC standards the exclusion band is calculated using the formulae below:-

For the lower edge for the exclusion band, known as *EXband(lower)*:-

*EXband(lower) = BandRX(lower) – BWRX*

and for the upper edge of the exclusion band, known as *EXband(upper)*:-

*EXband(upper) = BandRX(upper) + BWRX*

**Proposal for modification of EN 301 489-1 and others**

The above formulae should be inserted into the text currently in sub-clause 4.3 as follows:

## 4.3 RF exclusion band of radio communications equipment

The RF exclusion band applies to radio equipment with an operating frequency up to 6 GHz, or for equipment operating above 6 GHz, but whose RF bandwidth extends to a frequency below 6 GHz.

For equipment operating at frequencies above 6 GHz and whose RF bandwidth does not extend to a frequency below 6 GHz, there is no exclusion band.

The specific exclusion band shall be calculated by using the following formulae:

For the lower edge for the exclusion band:-

*EXband(lower) = BandRX(lower) – BWRX*

and for the upper edge of the exclusion band:-

*EXband(upper) = BandRX(upper) + BWRX*

The actual values of the exclusion band will always be product dependent and may be specified in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment for clarity.

We will also need to add the above abbreviations into the relevant part of clause 3.