

Agenda Item: 8.2
Source: Ericsson
Title: Revised UE Spectrum Emission Mask (based on TS 25.101v2.1.0)
Document for: Discussion and Approval

1 Introduction

The definition of a spectrum emission mask for the UE has been an item for further study in WG4 until this point.

The spectrum emission mask does however have implication beyond that of adjacent channel performance between WCDMA based systems. Such examples are co-existence with other (non-WCDMA) systems in frequency bands adjacent to the UMTS bands or co-existence with other systems in the PCS bands. The mask should be determined also based on the need for co-existence considerations, implying that a measurement bandwidth narrower than the chip rate is needed close to the carrier. A measurement bandwidth of 30 kHz is proposed here, since it is in line with the most narrowband PCS systems as well as satellite systems considered. Further away from the carrier, wider measurement bandwidths should be used.

The draft spectrum mask [1] has been updated and is provided below based on the above considerations, 21 dBm terminal and chiprate 3.84 Mcps. The basis for the values used in defining the masks are taken from the ACLR requirements in TS 25.101v2.1.0 as well as FCC part 24.

2 Proposed UE Spectrum Emission Mask

Based on the discussion in the introduction, the mask in Table 1 is proposed. The rationale for each specification point is outlined in the table together with the proposed mask and the corresponding mask values, measured in 30 kHz (the smallest measurement bandwidth used):

Table 1. Proposed spectrum emission mask values and rationale.

Frequency offset Δf	Minimum requirement (whichever is lower)	Measurement bandwidth	Comments for rationale	Corresponding value in 30 kHz
2.5 MHz	-15 dBm	30 kHz	Based on FCC part 24: -13 dBm/45 kHz	-15 dBm
2.5-3.5 MHz	$-15 - 18*(\Delta f - 2.5)$ dBm	30 kHz	Dropping linearly from 2.5 to 3.5 MHz	
3.5 MHz	(-28 dBm) or -33 dBm	30 kHz	Based on FCC part 24: -13 dBm/1 MHz -33 dBc/4.096 MHz for 21 dBm UE	-33 dBm
3.5-7.5 MHz	(-23 dBm) or -49 dBc = -28 dBm	100 kHz	Based on FCC part 24: -13 dBm/1 MHz -33 dBc/4.096 MHz for 21 dBm UE	-33 dBm
7.5-8.0 MHz	$-28 - 20*(\Delta f - 7.5)$ dBm	100 kHz	Dropping linearly from 7.5 to 8.0 MHz	
8.0-12.5 MHz	(-23 dBm) or -54 dBc = -33 dBm	300 kHz	Based on ACLR @ 10 MHz: -43 dBc/4.096 MHz for 21 dBm UE	-43 dBm

The mask is also illustrated in Figure 1.

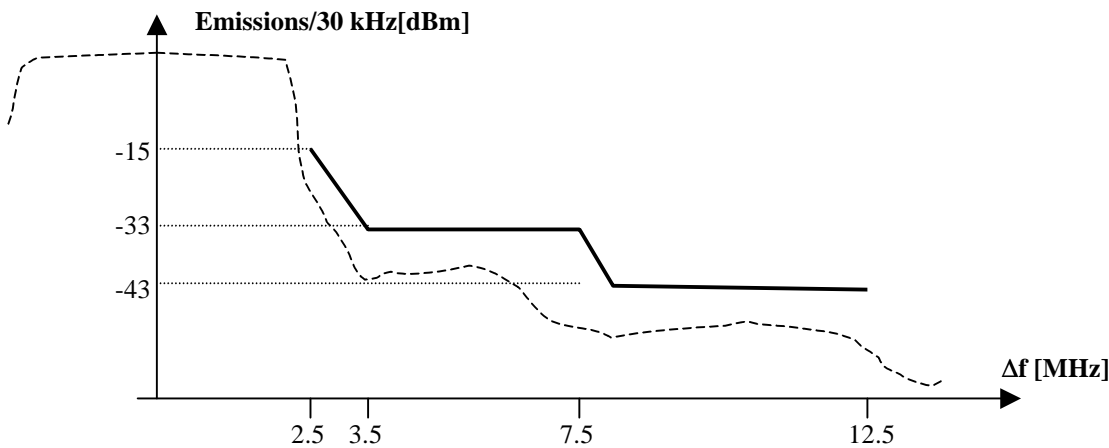


Figure 1. Proposed spectrum emission mask measured in 30 kHz bandwidth.

3 Proposed text for “Spectrum emission mask”

6.6.2.1 Spectrum emission mask

The emission mask of the terminal is a requirement that applies for frequencies which are between 2.5 and 12.5 MHz from a carrier frequency.

The power of any emission for UE power class 4 (21 dBm) shall not exceed the levels in table 2.

Table 2. Spectrum emission mask requirement

Frequency offset from carrier Δf	Minimum requirement	Measurement Bandwidth
2.5 – 3.5 MHz	-15 - 18(Δf - 2.5) dBm	30 kHz
3.5 – 7.5 MHz	- 28 dBm	100 kHz
7.5 – 8.0 MHz	-28 - 20*(Δf -7.5) dBm	100 kHz
8.0 – 12.5 MHz	- 33 dBm	300 kHz

4 Conclusions

It is urgent to agree on a spectrum mask for the UE by 3GPP RAN WG4.

The draft spectrum mask for UE power class 4 has been updated based on the TS25.101v2.1.0, no comments were received since the last meeting. Considering the next meeting of ERC TG1 is first week of September, the spectrum mask should be finalised at the RAN4#6 meeting in July.

The spectrum mask for higher UE maximum output power than 21 dBm is still for further study.

References

- [1] TSGR4#5 (99)302; DRAFT UE Spectrum Emission Mask; Ericsson