

Agenda Item: 7.2
Source: Ericsson
Title: Time mask for UE transmit On/Off scenarios
Document for: Approval

1. Introduction

This document provides input for the specification of the output power time mask for the UE specifications S4.01A v0.0.3 UTRA (UE) FDD Radio Transmission and Reception [1].

Current specification includes some requirements for DTX, but does not include requirements for other similar power on/off ramping scenarios. The main scenarios to consider are power on/off for random access and uplink slotted mode.

2. Discussion of requirements for time mask

A time mask should be included for relevant UE transmit power on/off scenarios. Although in a WCDMA system these scenarios occur much less frequently than in TDMA based systems like eg. GSM, requirements should be specified to limit impact on system performance and allow reasonable implementation.

To limit impact on the system performance, the time allowed for ramping should be small compared to the time period of continuous transmission. Consider following scenarios and time periods for continuous transmission.

Random access: On period: minimum 1 ms (ie. preamble, AI), followed by On period, which is much longer

Uplink slotted mode: On period minimum one frame (10 ms).

DTX: On period: minimum one frame (10 ms)

Note that these are minimum periods for certain scenarios that in a WCDMA system typically do not occur repetitively but rather only in some situations (Uplink slotted mode). Furthermore these scenarios cover only a small portion of average time of UE transmission (Uplink slotted mode, Random Access). The timing of current Random Access scenario in RAN WG1 has been explained in[2].

Only DTX can be assumed to occur repetitively in some scenarios during a longer period of a connection. Based on the above, We can take 10 ms as the reference time for the "On period".

Assuming the time allowed for ramping in these scenarios is less than 1% of the "On period", the total system performance impact should be negligible. The ramping time should then be smaller than 100 μ s.

From implementation point of view ramping time should be as long as possible. Shorter ramping time will require more current and introduce more ripples in output power. As in a WCDMA system these power on/off scenarios are much less common than in TDMA based systems, ramping time is less critical.

Based on above reasoning we propose maximum time allowed for power on/off ramping of 50 μ s. This will allow reasonable implementation and in practice will eliminate potential emissions due to transients. From system performance point of view it will have insignificant impact. This value should also be used for the DTX specification, as shown above, although DTX "Off" means that only the data channel is turned off.

3. Proposal for specification

A requirement for a time mask should be included in the specification for power on/off scenarios (ie 6.5.2)

6.5.2 Transmit On/Off Time Mask

The time mask for transmit On/Off defines the ramping time allowed for the UE between Transmit Off power and transmit On Power. Possible transmit On/Off scenarios are Random Access or Slotted Mode.

1. 6.5.2.1 Minimum requirement

The timing shall be in the range indicated in figure x.

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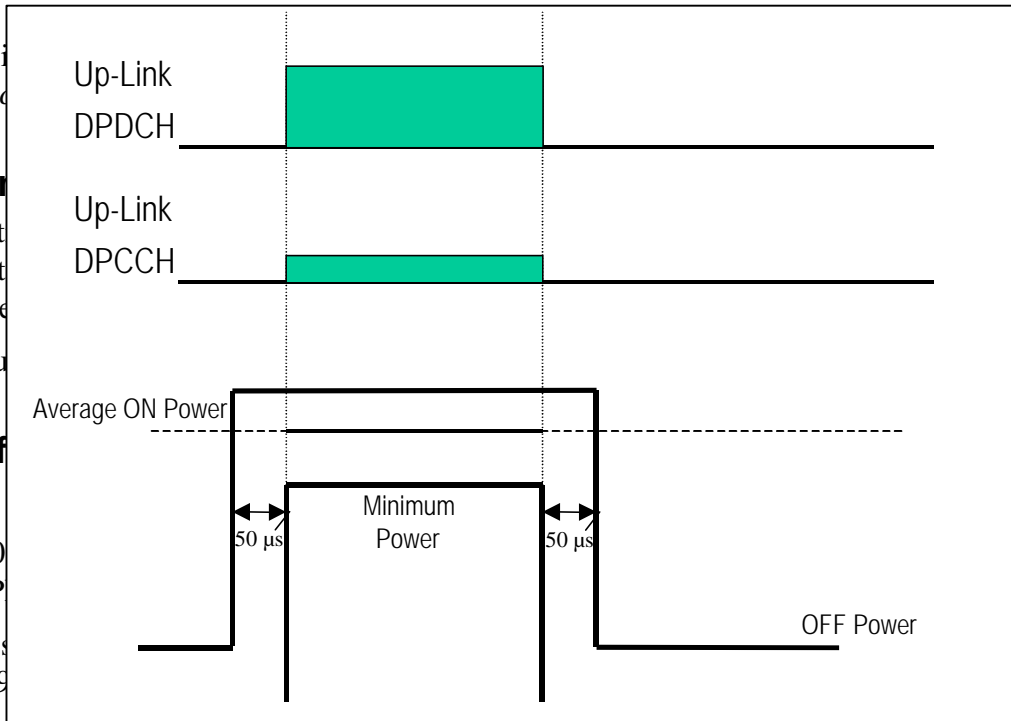
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1. Ref

[1] S4.0
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