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**Agenda item:**

**Source:** Samsung Electronics Co., Ltd.

**Title:** Power Control Parameters in Gated DPCCH Transmission

**Document for:** Discussion

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### 1. Introduction

In last WG1#13 Tokyo meeting, Philips presented a contribution [1] relevant to the power control parameters for gated DPCCH transmission. For the presentation, Samsung officially supported the contribution [2] and, in this contribution, we summarize and comment on that proposal.

### 2. Power Control Parameters in Gated DPCCH Transmission

#### ◆ Consider adding gating rate 0 or 1/15

The performance results may be required to show the benefit of adding gating rate 0 and 1/15. Especially for the gating rate 0, it seems to be unnecessary and Philips already has a concern on the possible problem in maintaining uplink synchronisation.

#### ◆ Same power control parameter and algorithm with non-gating mode

Although the optimum power control step size may be different from non-gating mode, Algorithm 1 is preferred since the Algorithm 2 cannot be used because the power control command would not be completed. Algorithm 2 can be automatically changed to Algorithm 1 if the gating is initiated.

#### ◆ Add power control parameters to gated mode parameters (e.g. step size 1dB or 2dB, offset between DPCCH power in gated mode and non-gated modes)

According to our simulation results, the maximum power offset of DPCCH between gating and non-gating mode to obtain 1% BER is 0.5dB. Thus it might be necessary to give power offset between DPCCH in gated mode and non-gated mode by applying an offset to the target Eb/No. But the decision should be made carefully before adding new power control parameters dedicated to gated mode in order not to have too many unnecessary parameters with negligible gain.

#### ◆ Independent power control parameters for uplink and downlink

Regardless of uplink/downlink gating or downlink only gating, the power control rate is reduced for both uplink and downlink. In that sense, it does not seem to be necessary to define independent power control parameters for uplink and downlink. Of course, further discussion is needed because the power control delay could be different.

#### ◆ Specify initial transmit power after a (long) gap (e.g. like compressed mode Initial Transmit Power mode 0 for short gaps and open loop estimate for long gaps)

#### ◆ Add a recovery period, possibly with a choice of power control mode, after a transmission gap

Although the transmission gap of gated mode is longer than compressed mode, the power control loop is still maintained during transmission gap with reduced power control rate. Thus it seems to be enough to define only one mode for both initial transmit power and recovery period.

#### ◆ Power control specifications and RF requirements should be updated to cover gated DPCCH transmission, particularly considering the time offset between uplink and downlink slots.

It will be covered in the Technical Report.

### 3. Conclusion

When the power control parameters for the gated DPCCH transmission are decided, the parameters should be chosen to maximize the performance gain and minimize the redundant and unnecessary parameters.

### 4. References

[1] R1-00-0691, "Power Control Issues for Gated DPCCH," Philips

[2] R1-00-0861, "Revised minutes of WG1 #13 meeting", WG1 Secretary