

Proposal for Physical Structure of UL Feedback Channel

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None

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Proposal for Physical Structure of UL Fast Feedback Channel

Jan, 2009

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Objective

- **According to the SDD,**
 - Physical tile structure for Fast Feedback Channel (FFBCH) is (2X6)
 - Two types of FFBCHs : Primary and Secondary

Sequence for Primary FF BCH

- **64 Binary Semi-orthogonal Sequences**
 - Binary orthogonal subsequences with length 4
 - Reed-Solomon mapping for minimum distance 8
 - Binary Phase semi-orthogonal vector

Advanced Receiver for High Mobility

- **Wiener Filter Receiver**
 - Provides significant performance gain in high mobility,
 - Can be applied to all kinds of semi-orthogonal sequences (Intel, LGE, Samsung)
 - Requires Prior-knowledge about channel statistics such as Doppler frequency and SNR
- **Enhanced Receiver for supporting High Mobility**
 - Can improve the detection performance in high mobility,
 - Doesn't need any prior knowledge on channel statistics
 - In high mobility case, most of misdetection occur between different phase vectors, not between RS mapping

Sequence Mapping to FMTs

- **Cyclic Shifted Mapping by 4**
 - Cyclic shifted mapping on Different tiles

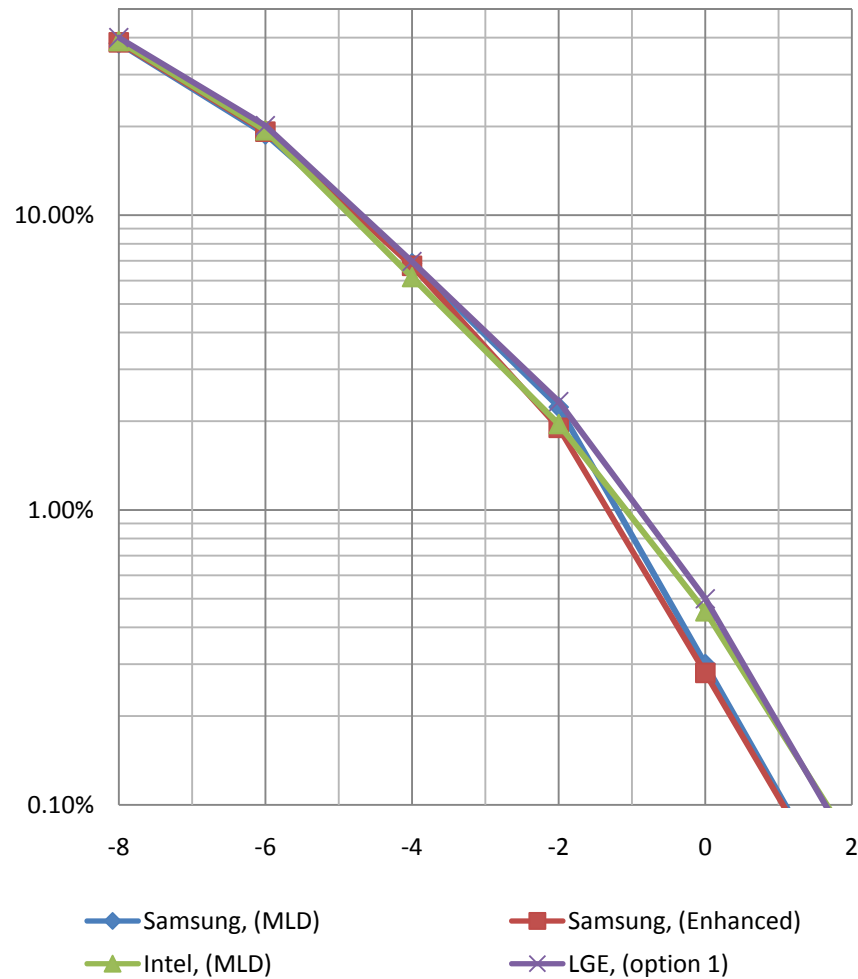
S1	S3	S5	S7	S9	S11
S2	S4	S6	S8	S10	S12

S9	S11	S1	S3	S5	S7
S10	S12	S2	S4	S6	S8

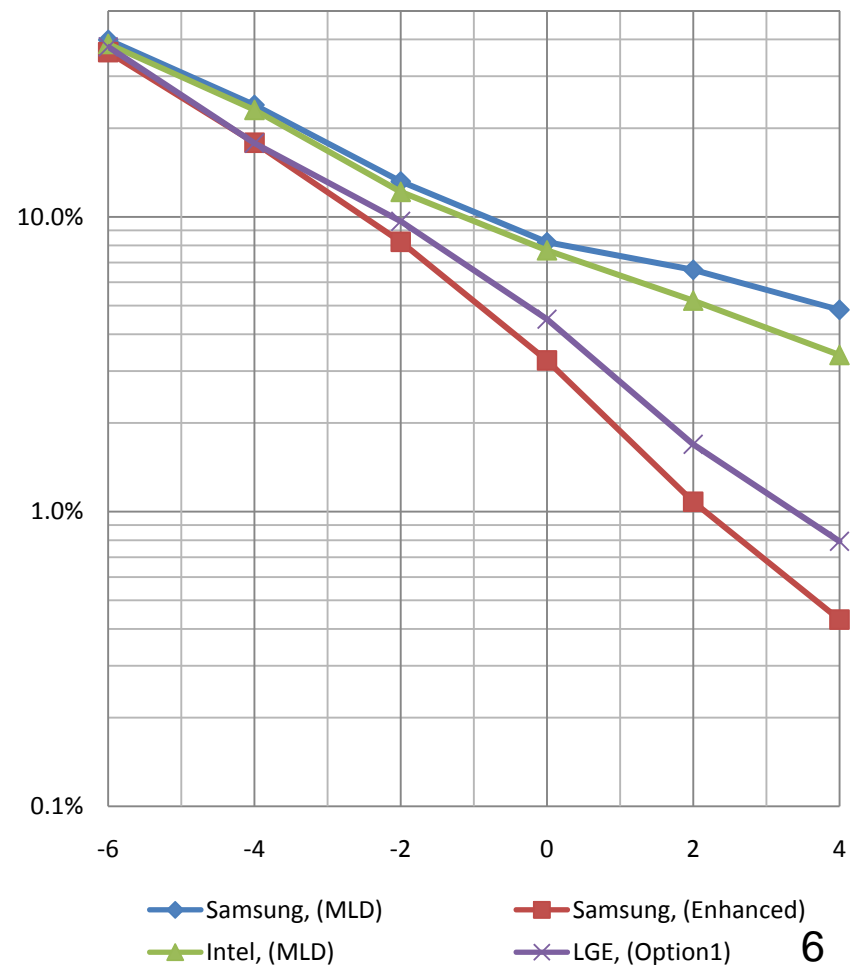
S5	S7	S9	S11	S1	S3
S6	S8	S10	S12	S2	S4

Detection Performance of Primary FF BCH

- Ped B 3km/h



- Veh A 350km/h



Appendix #1

Enhanced Receiver for High Mobility

- **General ML Detection**

- Single Full length correlator

$$\hat{l} = \arg_l Z_l$$

$$Z_l = \max_t \sum \left| \sum_{k=1}^{12} s_l^*[k] \cdot y_t[k] \right|^2$$

- **Phase Vector Correction**

- Two Short length correlators

