

Performance Comparison for Secondary Fast Feedback Channels

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Performance Comparison for Secondary-FBCH

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Samsung Electronics

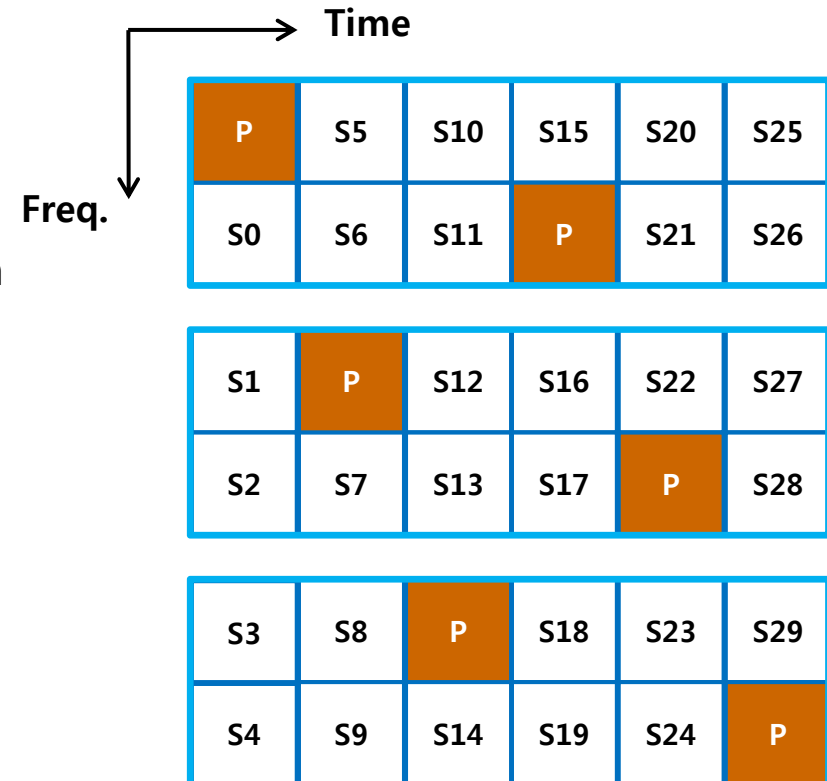
Physical Structure of S-FBCH

■ Structure

- 3 FMTs
- 2 pilots per FMT
- QPSK
- Frequency-first mapping for diversity gain

■ Channel Coding

- Linear Block Code
- (60,12) for 7~12 bit information
- (30,12) for 13~24 bit information



Channel Coding for S-FBCH (i)

▪ Linear Block Codes

- (60,12) for 7~12 bit information
- (30,12) punctured from (60,12) for 13~24 bit information

▪ Intel

- (59,12) + 1 parity bits: minimum distance 24
- (30,12): minimum distance 7

▪ LGE

- (48,12) and (24,12) for 4 pilots: minimum distance 15 and 5
- (60,12) and (30,12) for 2 pilots: minimum distance 21 and 7

▪ Samsung

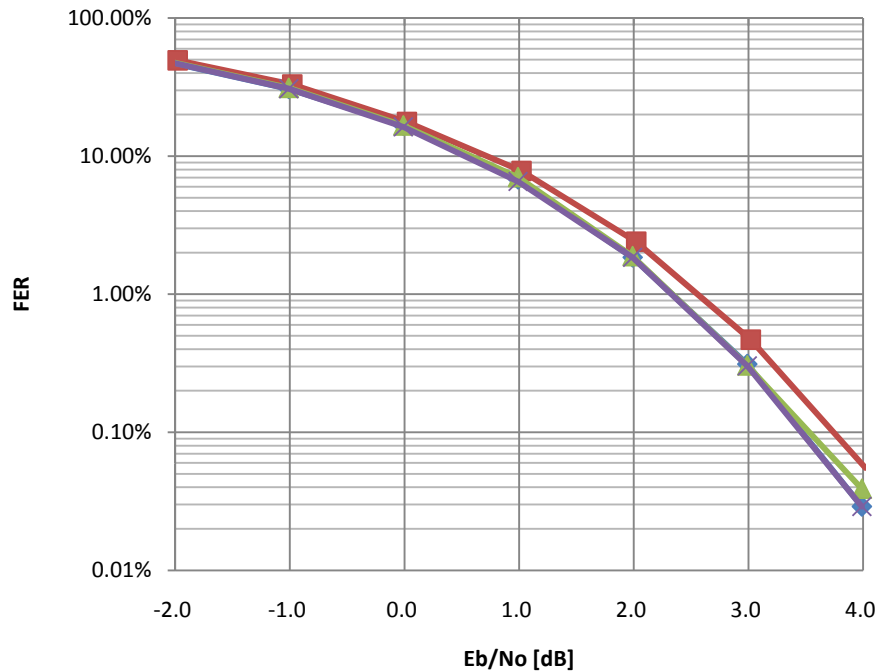
- (60,12) and (30,12): minimum distance 24 and 8

Channel Coding for S-FBCH (ii)

Performance comparison in AWGN

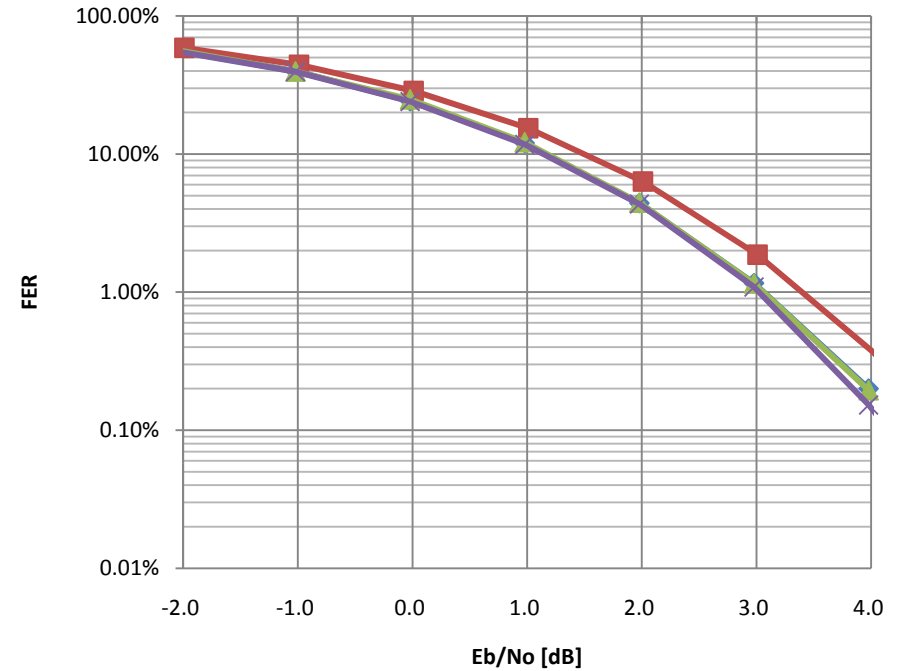
- MLD is used.
- For (60,12), Intel and Samsung show slightly better performance.
- For (30,12), Samsung is slightly better than the rest.

(60, 12) and (48,12), AWGN



Intel (60,12) LGE (48,12) LGE (60,12) Samsung (60,12)

(30, 12) and (24,12), AWGN

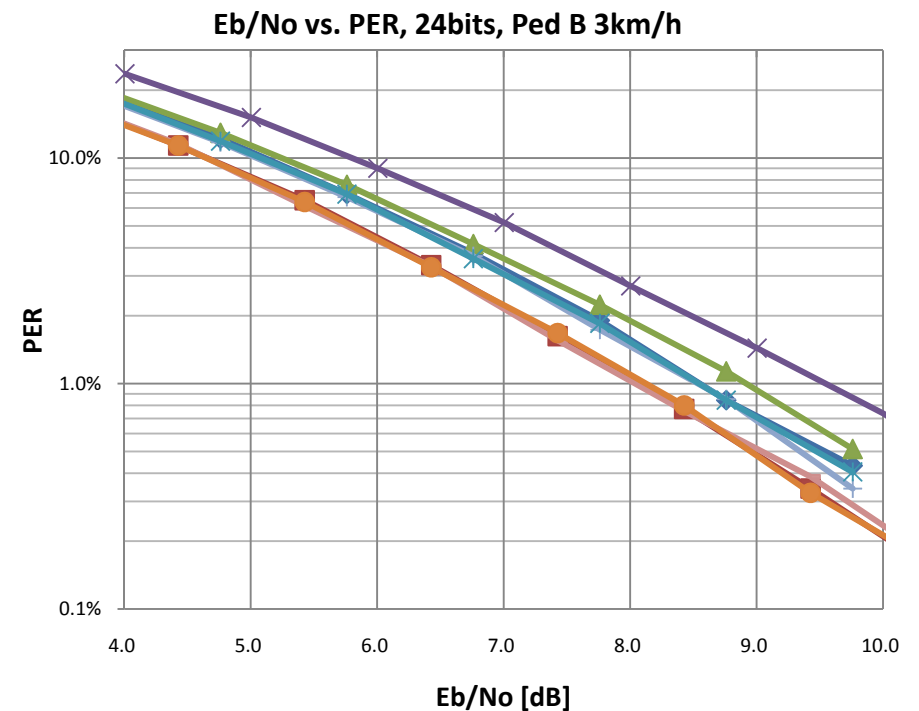
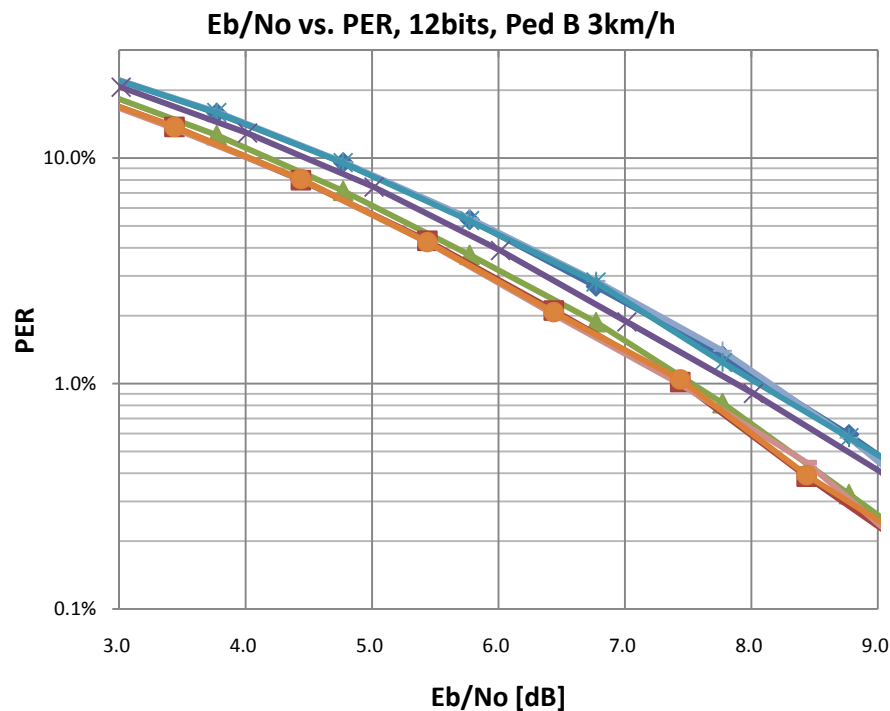


Intel (30,12) LGE (24,12) LGE (30,12) Samsung (30,12)

Performance Comparison of S-FBCH (i)

- Ped B 3km/h, 2D-MMSE channel estimation
- Eb/No vs. Error rate

* INTEL and LGE_opt1: fixed pilot
 * LGE_opt2 and Samsung: shifted pilot



◆ INTEL, PB 0dB ▲ LGE_opt1, PB 0dB □ LGE_opt2, PB 0dB * Samsung, PB 0dB
 ■ INTEL, PB 3dB × LGE_opt1, PB 3dB □ LGE_opt2, PB 3dB ● Samsung, PB 3dB

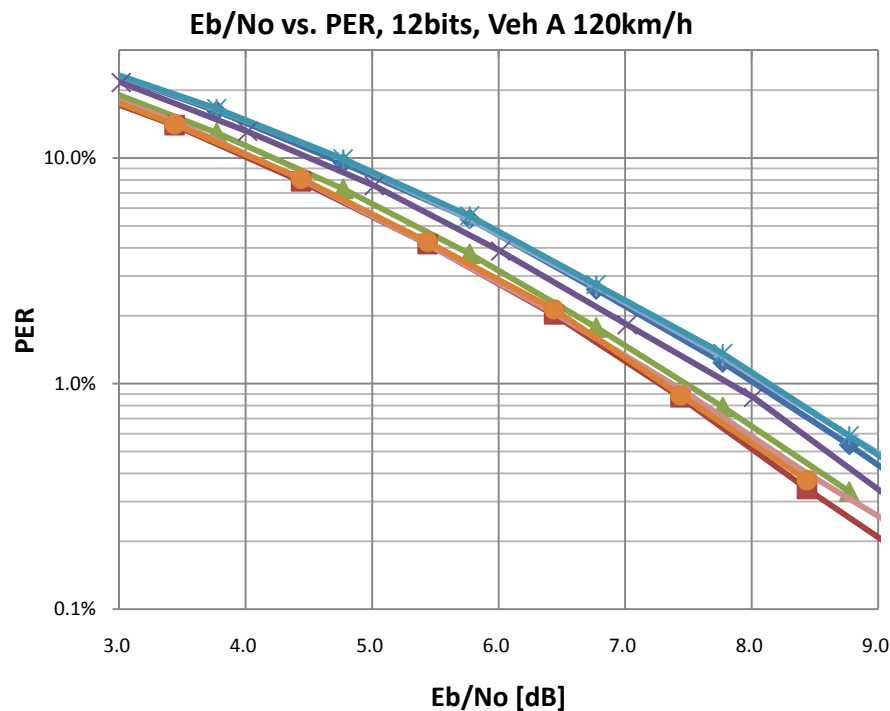
◆ INTEL, PB 0dB ▲ LGE_opt1, PB 0dB □ LGE_opt2, PB 0dB * Samsung, PB 0dB
 ■ INTEL, PB 3dB × LGE_opt1, PB 3dB □ LGE_opt2, PB 3dB ● Samsung, PB 3dB

- **Remark: 2 pilots with boosting outperform 4 pilots.**

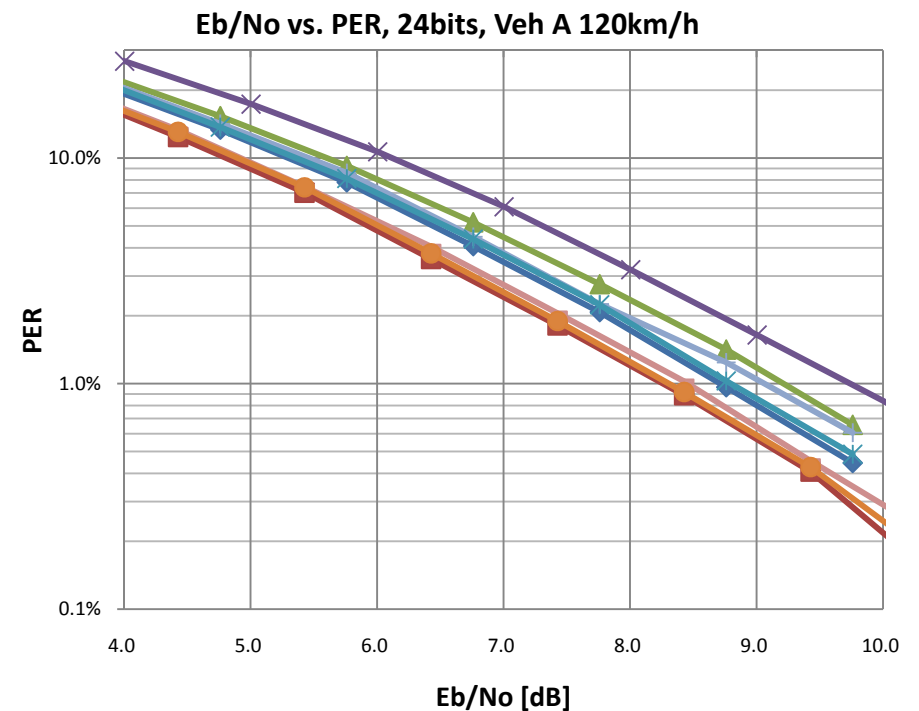
Performance Comparison of S-FBCH (ii)

- Veh A 120km/h, 2D-MMSE channel estimation
- Eb/No vs. Error rate

* INTEL and LGE_opt1: fixed pilot
 * LGE_opt2 and Samsung: shifted pilot



◆ INTEL, PB 0dB ▲ LGE_opt1, PB 0dB ◆ LGE_opt2, PB 0dB * Samsung, PB 0dB
 ■ INTEL, PB 3dB × LGE_opt1, PB 3dB — LGE_opt2, PB 3dB ● Samsung, PB 3dB



◆ INTEL, PB 0dB ▲ LGE_opt1, PB 0dB ◆ LGE_opt2, PB 0dB * Samsung, PB 0dB
 ■ INTEL, PB 3dB × LGE_opt1, PB 3dB — LGE_opt2, PB 3dB ● Samsung, PB 3dB

- **Remark: 2 pilots with boosting outperform 4 pilots.**

Summary of Results

▪ Physical Structure

- **2 pilots** with pilot boosing show better performance than 4 pilots.

▪ Channel Coding

- **Samsung's code has large minimum distance** in both cases of (60,12) and (30,12).

▪ Overall Comparison

- Performances in fading channel are similar, except 4 pilots cases.

Appendix - Simulation Environment

Parameters		Values
Structure	Pilot OH	2 pilots and 4 pilots per FMT
	Pilot Boosting	0, 3dB over data tone
Channel Coding		Linear Block Code - Intel, LGE, and Samsung
Information Bits		12 and 24 bits
Antenna Configuration		1 Tx. and 2 Rx.
Channel Model		ITU Ped B 3km/h and Veh A 120km/h
Detection		MLD
Channel Estimation		2D-MMSE