Evaluation items for PHY

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Evaluation items for PHY

Following subjects should be taken into account

- Frame Error Rate

  (we should establish data frame model for evaluation)

- Power consumption (including microwave section)

- Hardware size (e.g. gate number of baseband digital circuit)

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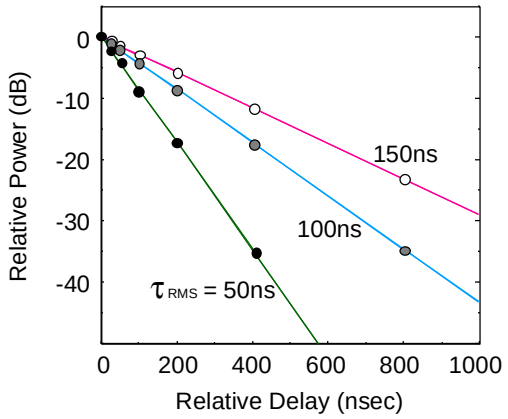
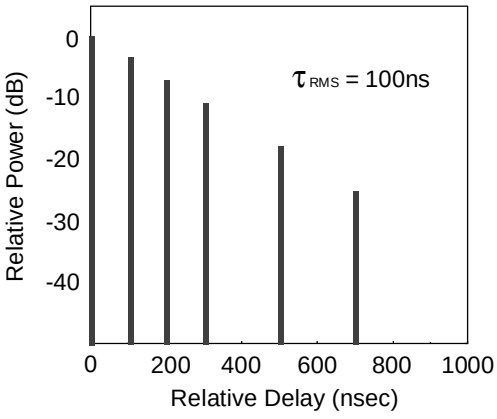
Examples of Multipath Channel Model



HIPERLAN model



IMT-2000/FPLMTS model
(Indoor channel B)

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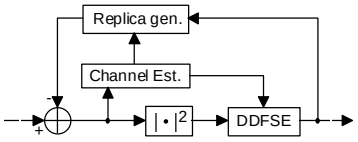
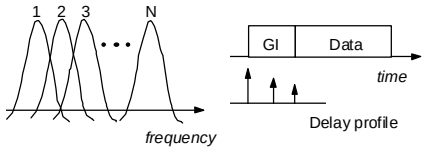
Multipath countermeasure

Equalizer



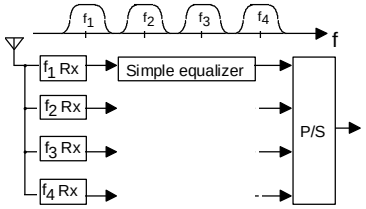
○ Power efficiency of power amplifier
× Baseband hardware size

OFDM



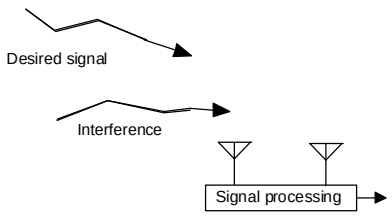
○ High frequency efficiency
× Inefficient operation of power amplifier

Multicarrier + simple equalizer



○ Small scale equalizer
× Hardware size of microwave circuit

Smart antenna



○ Robustness against co-channel interference
× Complicated antenna system

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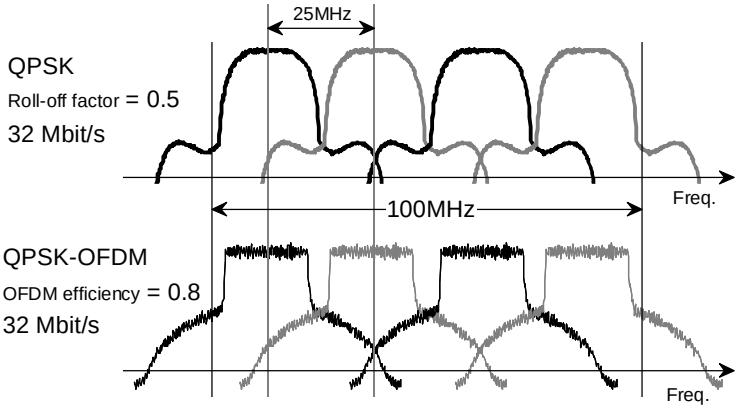
Examples of Frequency Allocation Plan

U-NII bands 5.15 - 5.25 GHz (100MHz)
5.25 - 5.35 GHz (100MHz)
5.725 - 5.825 GHz (100MHz)

Four carriers in each 100 MHz band



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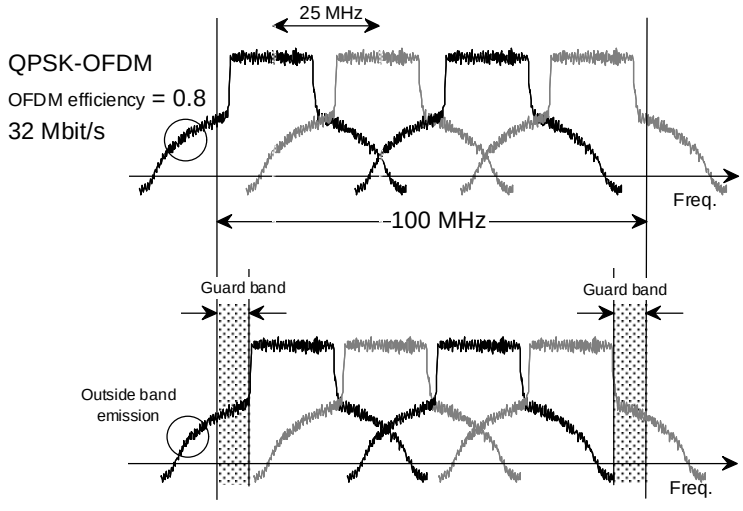

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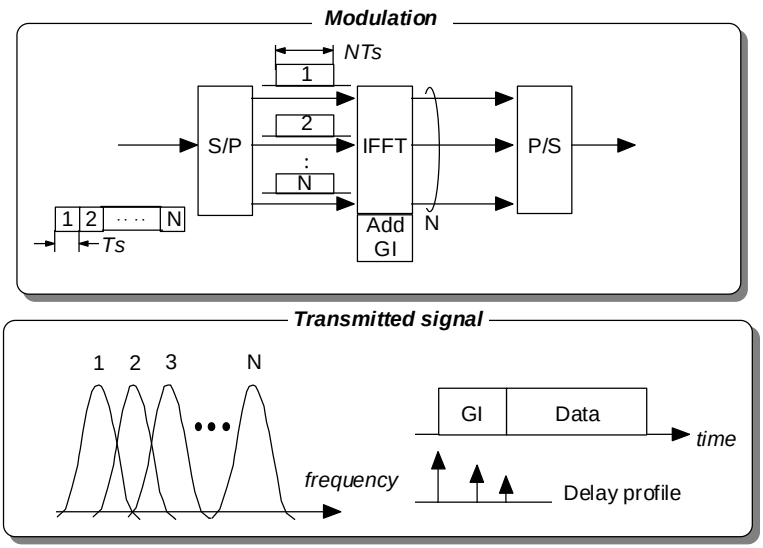
OFDM



P/S: Parallel serial conversion
S/P: Serial parallel conversion

GI: Guard interval
IFFT: Inverse fast Fourier transform

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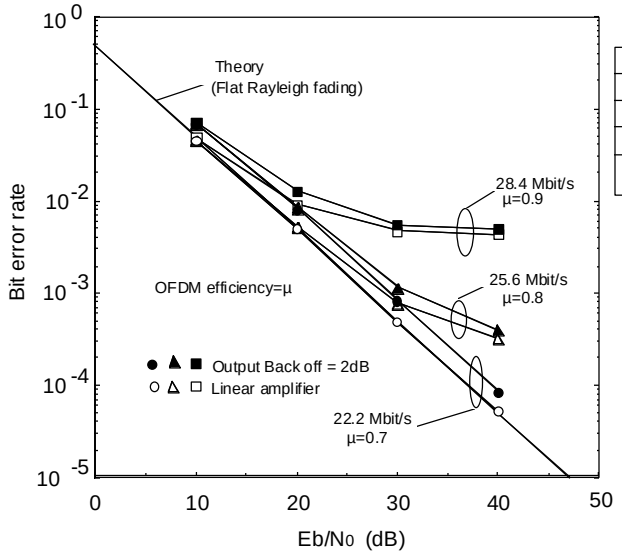
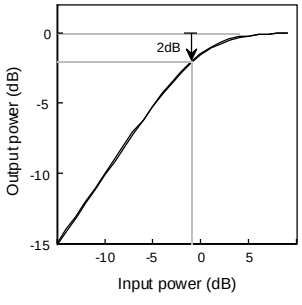
Bit error rate performance using non-linear amplifier



Modulation scheme	DQPSK
Bit rate (OFDM efficiency μ=1)	32M bits/s
Maximum Doppler frequency	20Hz
Number of sub carrier	32
Delay profile	IMT-2000 channel B model



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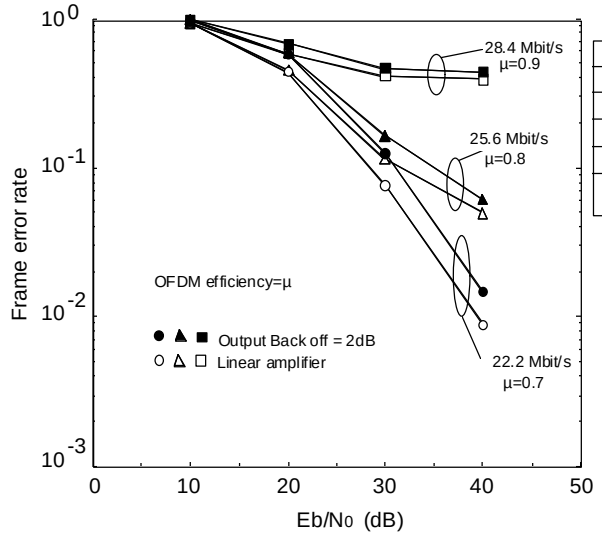
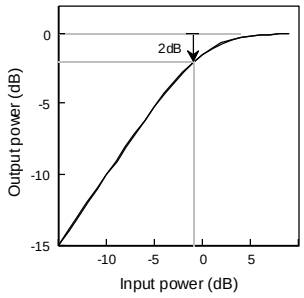
Frame error rate performance using non-linear amplifier



Modulation scheme	DQPSK
Bit rate (OFDM efficiency É =1)	32M bits/s
1 frame	448bits
Maximum Doppler frequency	20Hz
Number of sub carrier	32
Delay profile	IMT-2000 channel B model



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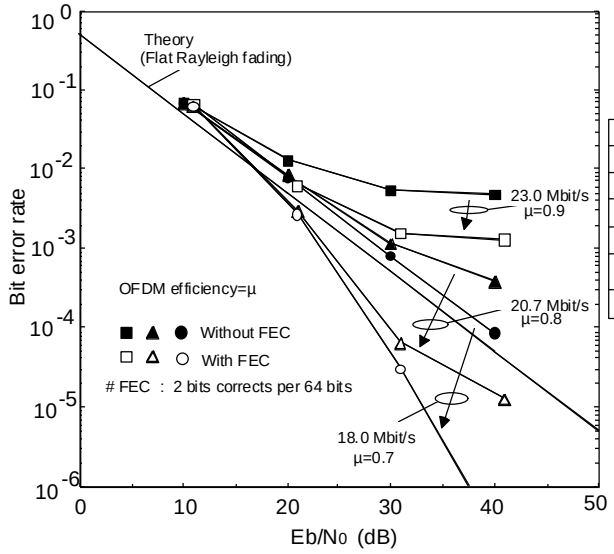
Bit error rate performance of OFDM with forward error correction



Modulation scheme	DQPSK
Bit rate (OFDM efficiency μ=1)	32 Mbit/s
1 frame	448bits
Maximum Doppler frequency	20Hz
Number of sub carrier	32
Delay profile	IMT-2000 channel B model
Back off of power amp	2dB

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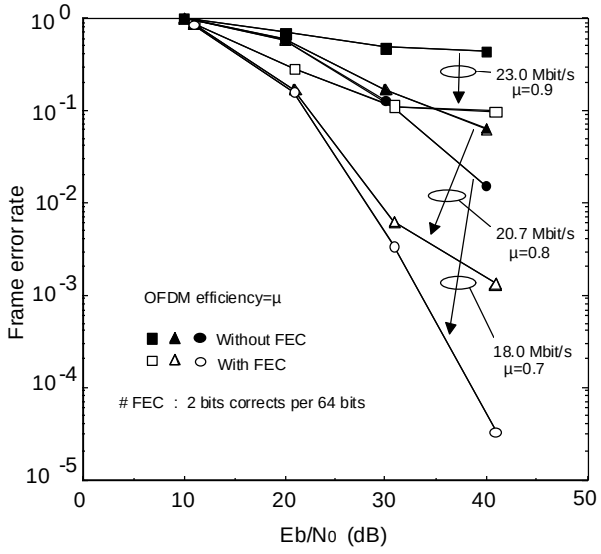
Frame error rate performance with forward error correction



Modulation scheme	DQPSK
Bit rate (OFDM efficiency μ=1)	32 Mbit/s
1 frame	448 bits
Maximum Doppler frequency	20 Hz
Number of sub carrier	32
Delay profile	IMT-2000 channel B model
Back off of power amp	2 dB

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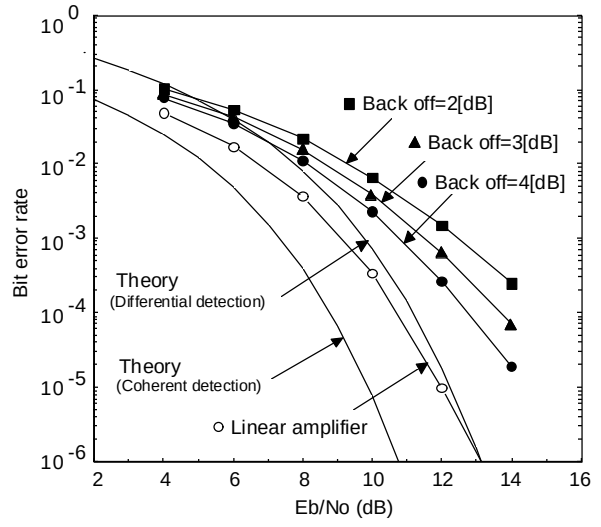
Bit error rate performance using non-linear amplifier



Modulation scheme	DQPSK
Bit rate (OFDM efficiency μ=0.8)	25.6 Mbit/s
Number of sub carrier	32

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