

Figure 4.13 In-phase and quadrature components of the received signal vector r .

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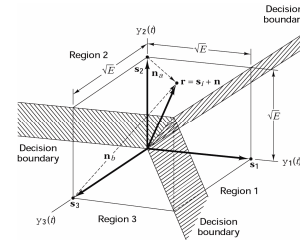


Figure 4.14 Partitioning the signal space for a 3-ary FSK signal.

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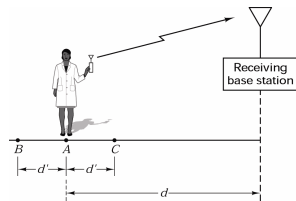


Figure 4.15 Mobile radio link.

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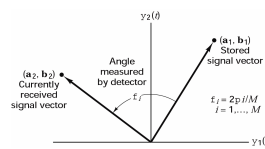


Figure 4.16 Signal space for DPSK.

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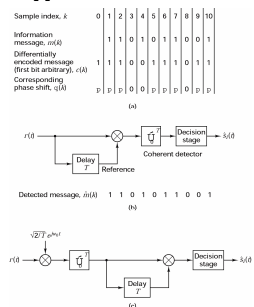


Figure 4.17 Differential PSK (DPSK). (a) Differential encoding. (b) Differentially coherent detection. (c) Optimum differentially coherent detection.

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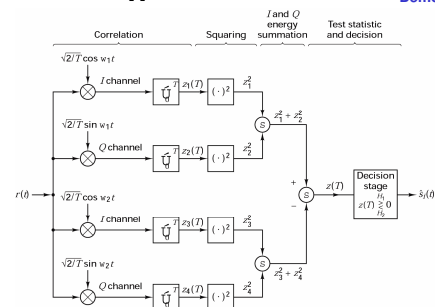


Figure 4.18 Quadrature receiver.

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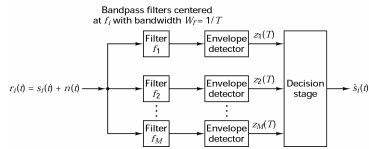


Figure 4.19 Noncoherent detection of FSK using envelope detectors.

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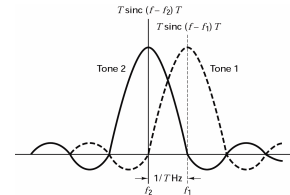


Figure 4.20 Minimum tone spacing for noncoherently detected orthogonal FSK signaling.

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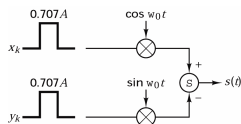


Figure 4.21 Quadrature type modulator.

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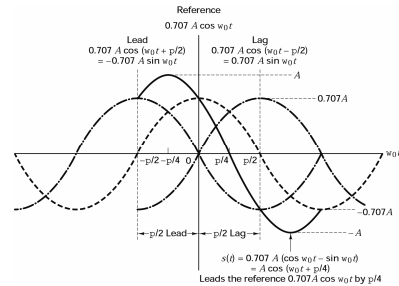


Figure 4.22 Lead/Lag relationships of sinusoids.

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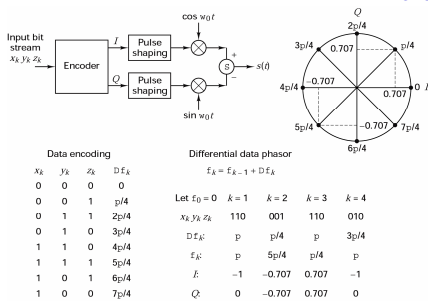


Figure 4.23 Quadrature implementation of a D8PSK modulator.

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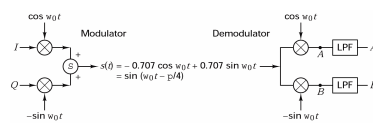
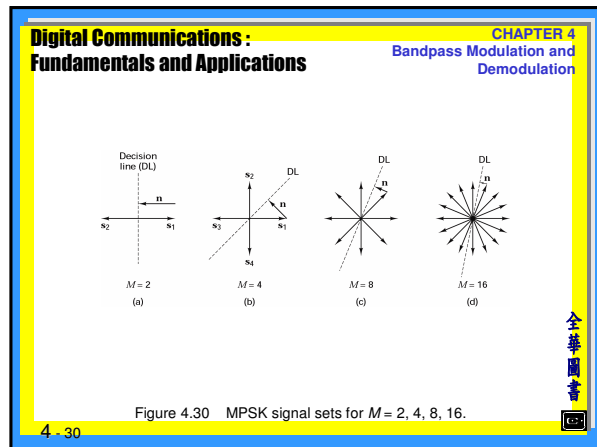
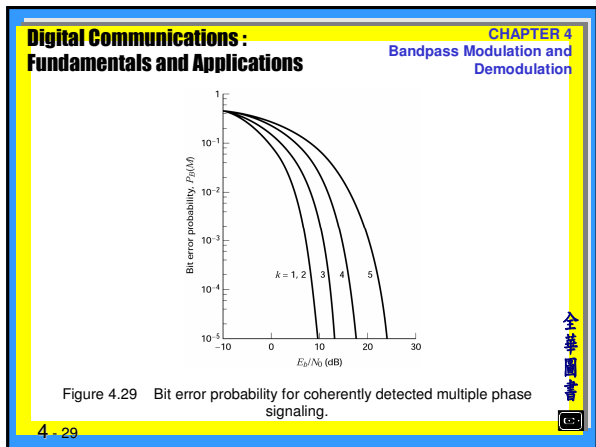
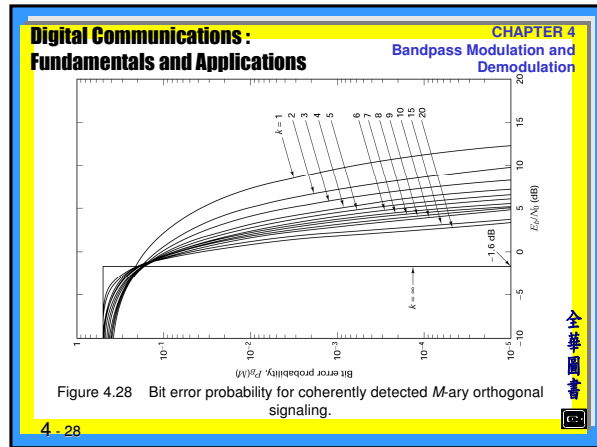
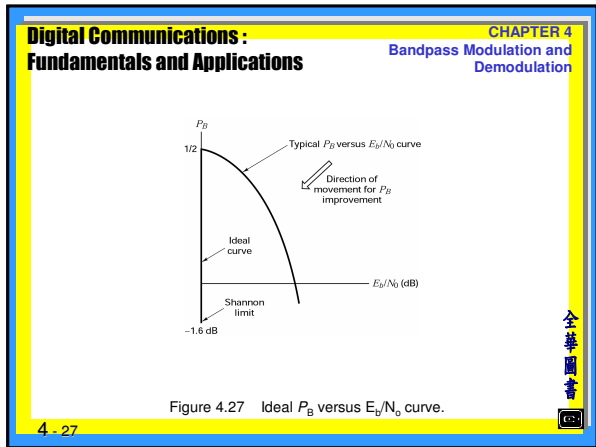
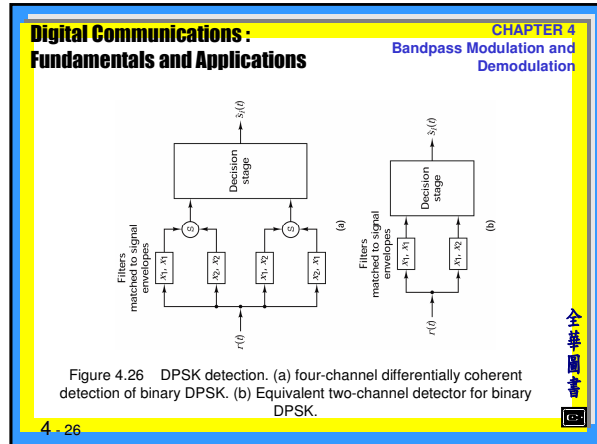
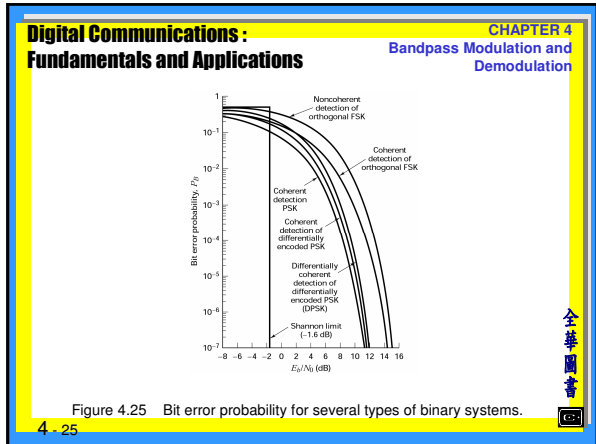


Figure 4.24 Modulator/demodulator example.

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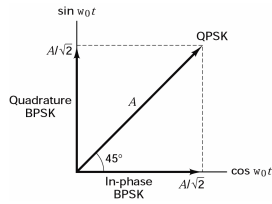


Figure 4.31 In-phase and quadrature BPSK components of QPSK signaling.

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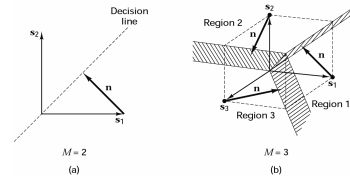


Figure 4.32 MFSK signal sets for $M = 2, 3$.

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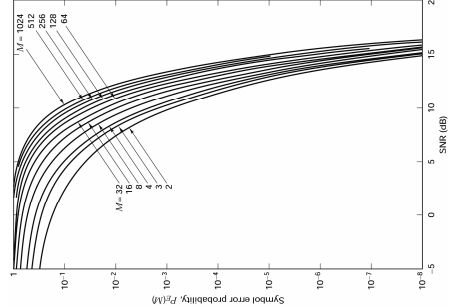


Figure 4.33 Symbol error probability versus SNR for coherent FSK signaling.

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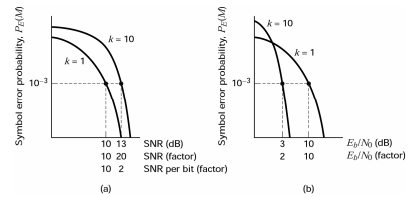


Figure 4.34 Mapping P_E versus SNR into P_E versus E_b/N_0 for orthogonal signaling. (a) Unnormalized. (b) Normalized.

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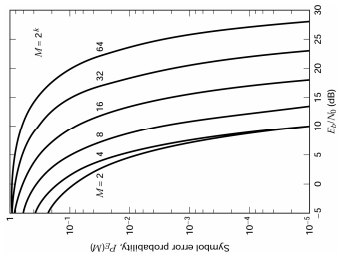


Figure 4.35 Symbol error probability for coherently detected multiple phase signaling.

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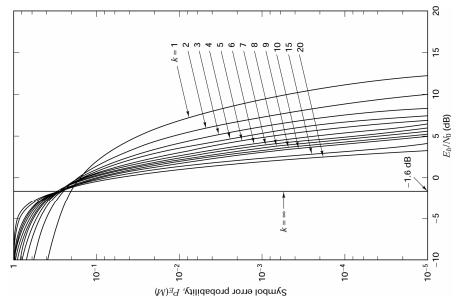


Figure 4.36 Symbol error probability for coherently detected M -ary orthogonal signaling.

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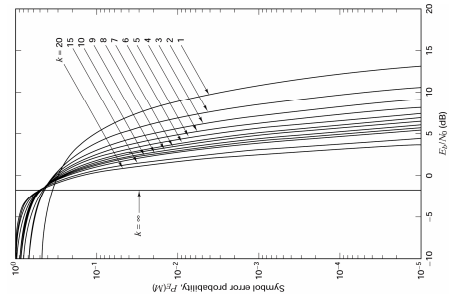


Figure 4.37 Symbol error probability for noncoherently detected M -ary orthogonal signaling.

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	Bit position		
	0	0	0
	0	0	1
	0	1	0
Transmitted symbol	0	1	1
	1	0	0
	1	0	1
	1	1	0
	1	1	1

Figure 4.38 Example of P_B versus P_E .

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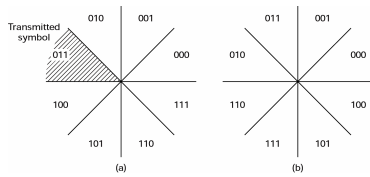


Figure 4.39 Binary-coded versus Gray-coded decision regions in an MPSK signal space. (a) Binary coded. (b) Gray coded.

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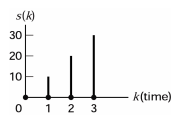


Figure P4.1

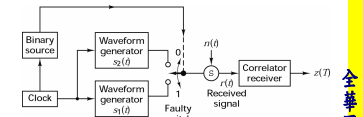


Figure P4.2

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