Spectral Smoothing window の例

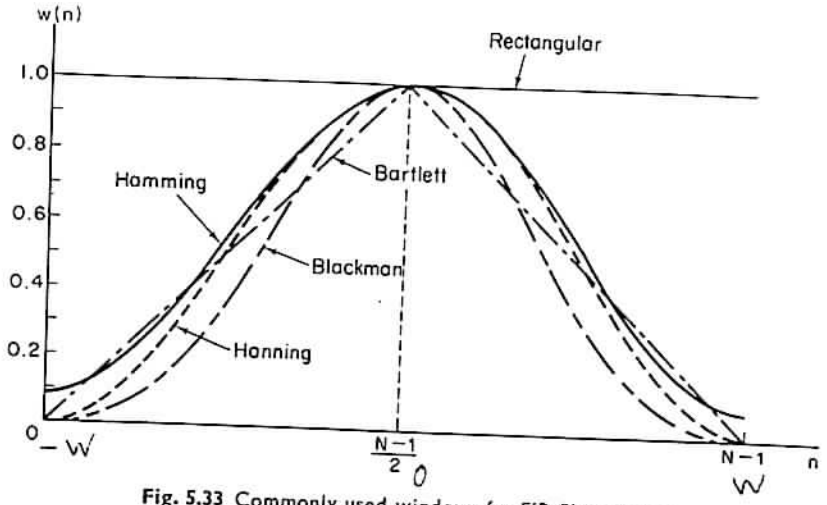


Fig. 5.33 Commonly used windows for FIR filter design.

Rectangular:

$$w(n) = 1, \qquad 0 \le n \le N-1$$

Bartlett:

$$w(n) = \begin{cases} \dfrac{2n}{N-1}, & 0 \le n \le \dfrac{N-1}{2} \\ 2 - \dfrac{2n}{N-1}, & \dfrac{N-1}{2} \le n \le N-1 \end{cases}$$

Hanning:

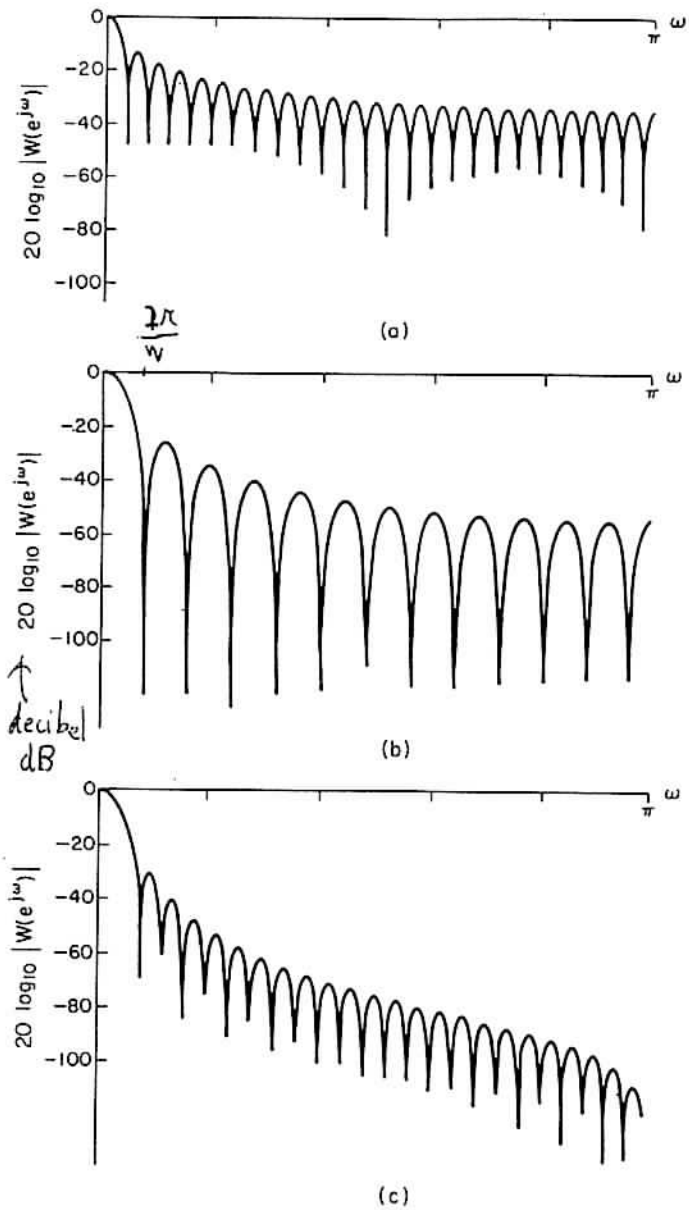
$$w(n) = \frac{1}{2}\left[1 - \cos\left(\frac{2\pi n}{N-1}\right)\right], \qquad 0 \le n \le N-1$$

Hamming:

$$w(n) = 0.54 - 0.46\cos\left(\frac{2\pi n}{N-1}\right), \qquad 0 \le n \le N-1$$

Blackman:

$$w(n) = 0.42 - 0.5\cos\left(\frac{2\pi n}{N-1}\right) + 0.08\cos\left(\frac{4\pi n}{N-1}\right), \qquad 0 \le n \le N-1$$



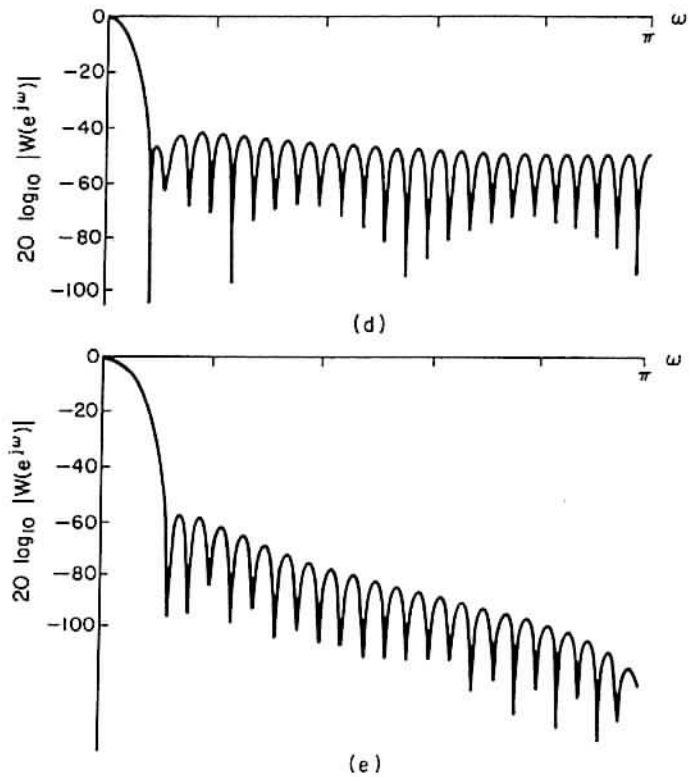


Fig. 5.34 Fourier transforms of windows of Fig. 5.33: (a) rectangular; (b) Bartlett (triangular); (c) Hanning; (d) Hamming; (e) Blackman.