
EXERCISE 7.9: If $H_{\text{LP}}(e^{j\hat{\omega}})$ is an ideal LPF with its cutoff frequency at $\hat{\omega}_{\text{co}}$ as plotted in Fig. 7-5, show that the frequency response of an ideal HPF with cutoff frequency $\hat{\omega}_{\text{co}}$ can be represented by

$$H_{\text{HP}}(e^{j\hat{\omega}}) = 1 - H_{\text{LP}}(e^{j\hat{\omega}})$$

Hint: Make a plot of the function $1 - H_{\text{LP}}(e^{j\hat{\omega}})$.

