Problem 2.17

Repeat Problem 2.16 for the double exponential pulse

$$g(t) = \begin{cases} \exp(-at), & t > 0 \\ 1, & t = 0 \\ \exp(at), & t < 0 \end{cases}$$

Solution

The Fourier transform of $g(t)$ is (see Eq. (2.16))

$$G(f) = \frac{2a}{a^2 + 4\pi^2 f^2}$$

The energy spectral density of the double exponential pulse is

$$E_g(f) = \frac{4a^2}{(a^2 + 4\pi^2 f^2)^2}, \qquad -\infty < f < \infty$$