Channel Simulator Gaussian Noise Generator Formulas

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$$\text{Fourier:}\quad e^{-at^2} \quad \circ\cdots\bullet \quad \sqrt{\frac{\pi}{a}}e^{-\frac{\omega^2}{4a}} \tag{1}$$

$$S_{xx}(f) = \frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{1}{2}\left(\frac{f}{\sigma}\right)^2} \tag{2}$$

$$f_{3dB} = 2\sigma\sqrt{\ln 2} \quad \longrightarrow \quad \sigma = \frac{f_{3dB}}{2\sqrt{\ln 2}} \tag{3}$$

$$H(\omega) = \frac{1}{\sqrt{\sigma}\sqrt{\sqrt{2\pi}}}e^{-\frac{1}{4}\left(\frac{\omega}{2\pi\sigma}\right)^2} \tag{4}$$

$$h(t) = \frac{1}{\sqrt{2\sigma}\sqrt{\sqrt{2\pi}}}e^{-(2\pi\sigma t)^2} \tag{5}$$