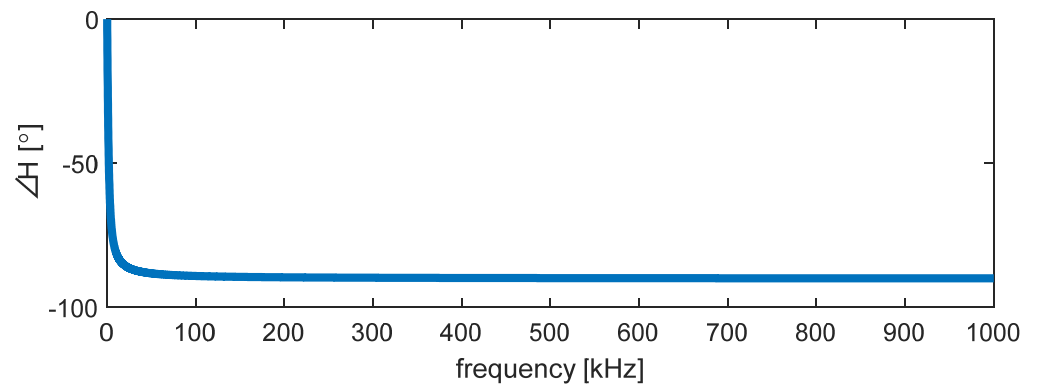
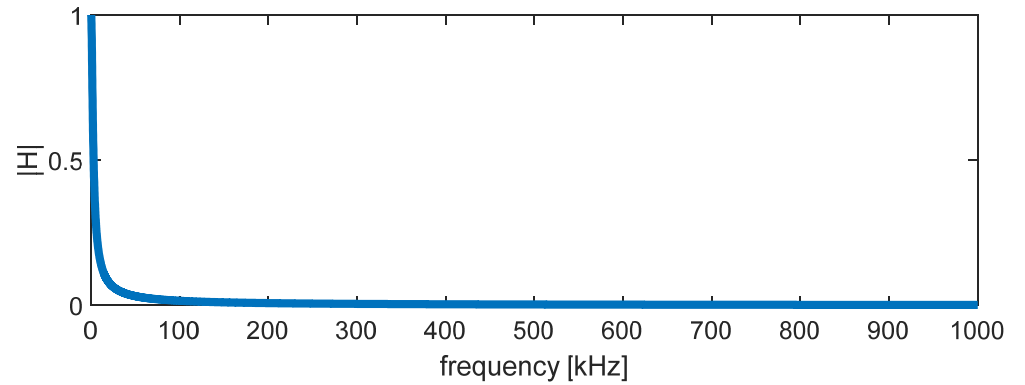
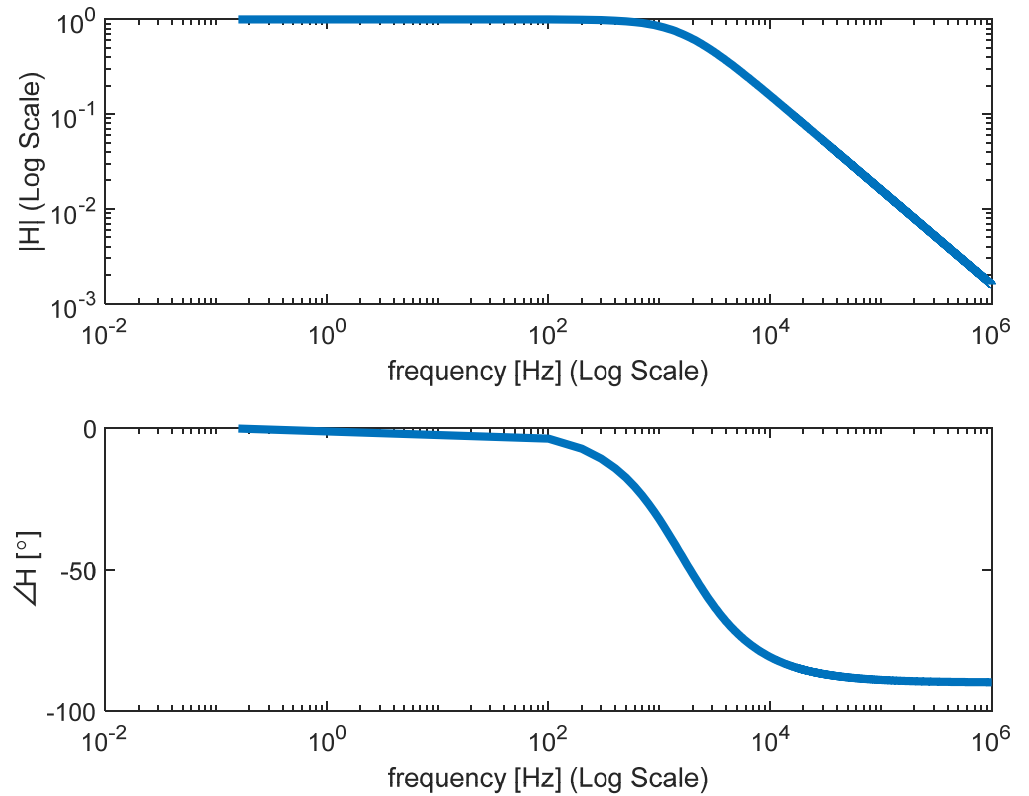


Frequency Response



Bode Plot – Frequency Response



Fourier Series

Assume we have some function $f(t)$ which is periodic with period $T_0 = \frac{2\pi}{\omega_0}$

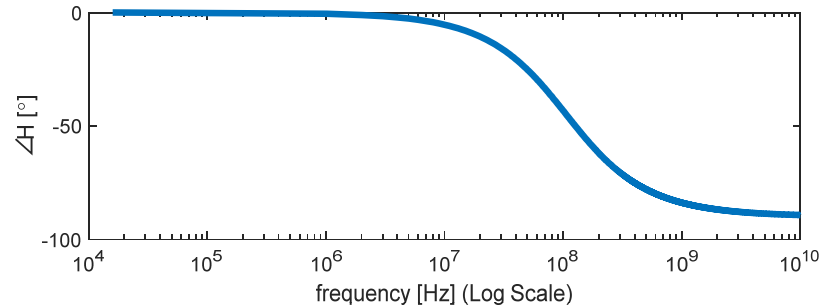
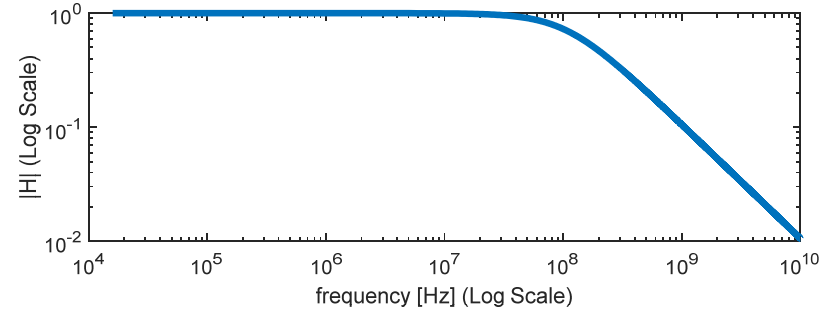
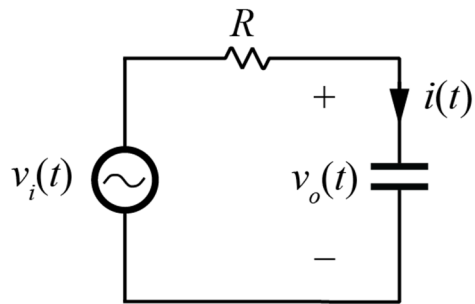
$$f(t) = a_0 + \sum_{k=1}^{\infty} a_k \cos(k\omega_0 t) + b_k \sin(k\omega_0 t)$$

$f(t)$ can be expressed this way if

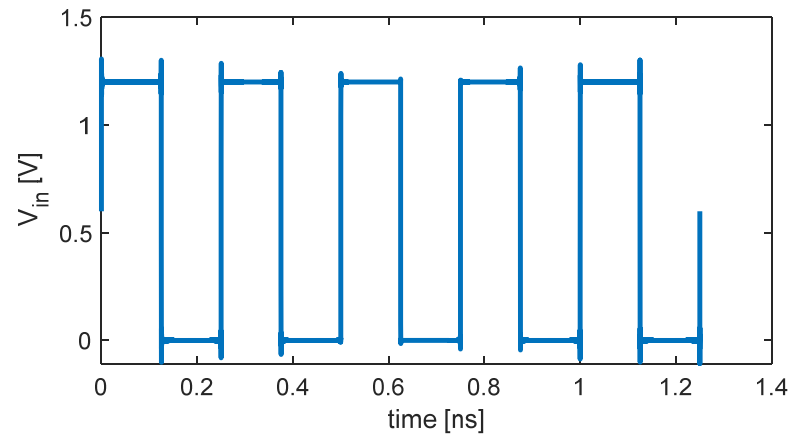
1. $f(t)$ is single-valued
2. $\int_{t_0}^{t_0+T_0} |f(t)| dt$ exists
3. $f(t)$ had finite discontinuities and max/min per period



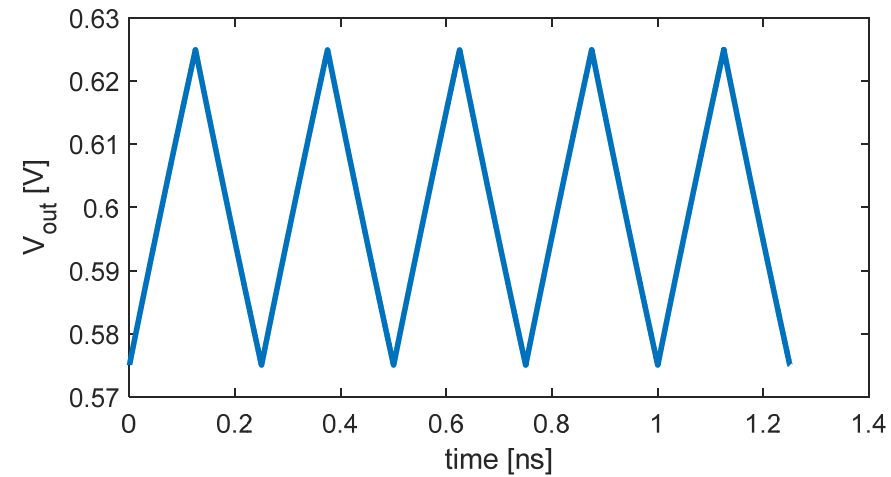
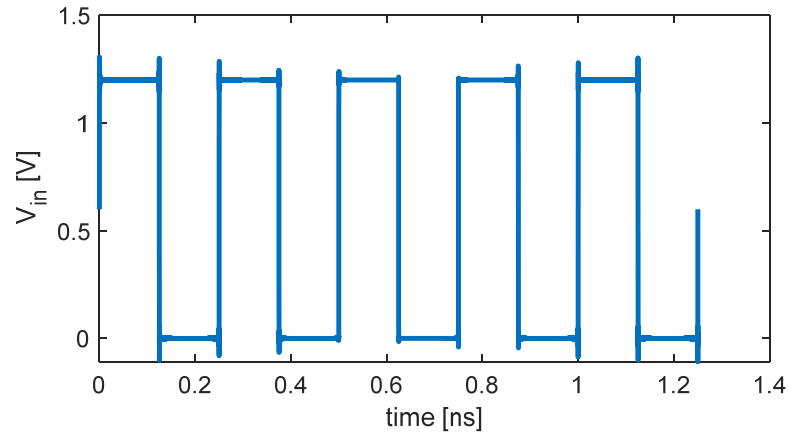
Application: Digital Communication



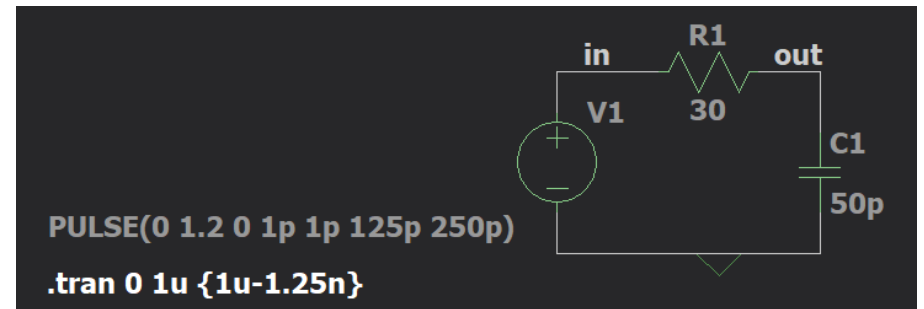
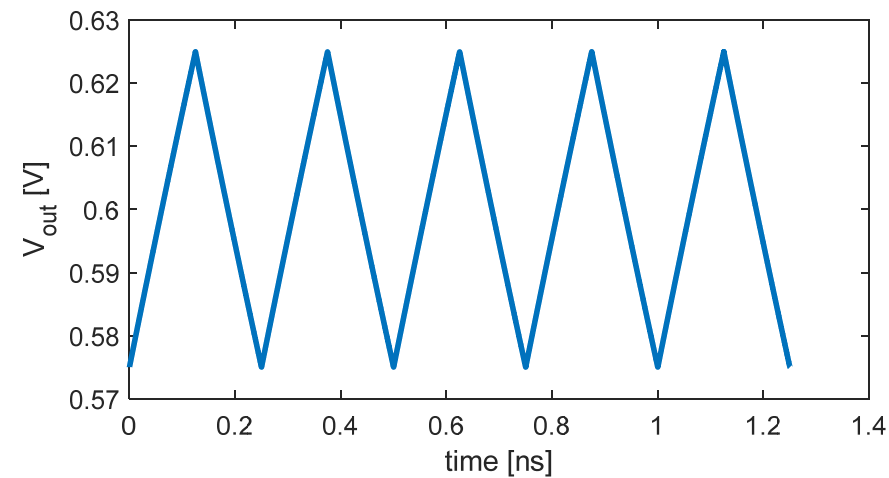
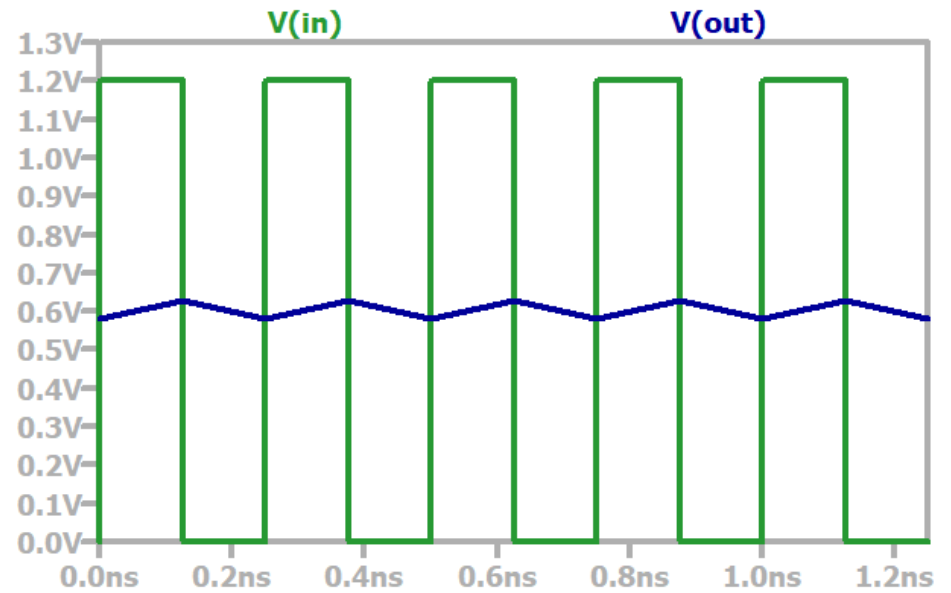
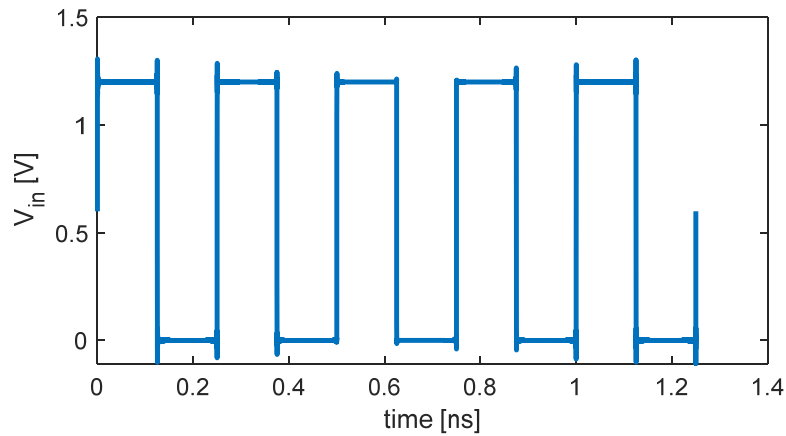
Applying Superposition



Calculated Output Voltage



Simulation Verification



Frequency Domain Interpretation

