ECE 351 - 52

Signals and Systems 1

Lab 9

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Contents

0.1 H(jw) Magnitude Calculation

0.1.1 Original H(jω) Function

$$\frac{\frac{j\omega}{RC}}{(j\omega)^2 + \frac{j\omega}{RC} + \frac{1}{LC}}$$

0.1.2 Hand Calculation

$$|H(j\omega)| = \frac{\sqrt{(\frac{\omega}{RC})^2}}{\sqrt{\omega^2 + (\frac{\omega}{RC})^2 + (\frac{1}{LC})^2}}$$

$$|H(j\omega)| = \frac{(\frac{\omega}{RC})}{\sqrt{\omega^2 + (\frac{\omega}{RC})^2 + (\frac{1}{LC})^2}}$$

0.2 H(jw) Phase Calculation

$$\angle H(j\omega) = \angle numerator(j\omega) - \angle denominator(j\omega)$$

$$\angle H(j\omega) = tan^{-1}(\frac{\omega}{RC}) - tan^{-1}(\frac{\frac{\omega}{RC}}{\omega^2 + \frac{1}{LC}})$$