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$$H(w) = \frac{\tilde{V}_o(w)}{\tilde{V}_i(w)}$$

$$= \frac{\frac{1}{jwC}}{R + \frac{1}{jwC} \parallel \left[R + \frac{1}{jwC} \parallel \left(R + \frac{1}{jwC}\right)\right]}$$

$$\frac{1}{jwC} \parallel \left(R + \frac{1}{jwC}\right) = \frac{\left(R + \frac{1}{jwC}\right) \cdot \frac{1}{jwC}}{R + \frac{2}{jwC}} = \frac{R + \frac{1}{jwC}}{jwRC + 2}$$

$$= \frac{\frac{1}{jwC}}{R + \frac{1}{jwC} \parallel \frac{jwR^2C + 3R + \frac{1}{jwC}}{jwRC + 2}}$$

$$= \frac{\frac{1}{jwC}}{R + \frac{\frac{jwR^2C + 3R + \frac{1}{jwC}}{jwRC + 2} \cdot \frac{1}{jwC}}{\frac{jwR^2C + 3R + \frac{1}{jwC}}{jwRC + 2} + \frac{1}{jwC}}}$$

$$= \frac{1}{jwRC + \frac{jwR^2C + 3R + \frac{1}{jwC}}{jwR^2C + 3R + \frac{1}{jwC} + R + \frac{2}{jwC}}}$$

$$= \frac{\frac{1}{jwC}}{-w^2R^3C^2 + 3jwR^2C + 6R + \frac{1}{jwC}}$$

$$= \frac{1}{6jwRC - 3R^2w^2C^2 - jw^3R^3C^3 + 1}$$