$$\gamma = \sqrt{(R + j\omega L)(G + j\omega C)} \tag{1}$$
$$= \alpha + j\beta \tag{2}$$

$R = 0$ のもとで、 伝搬長さ L_{GHz} と波長 λ_{GHz} は

$$L_{GHz} = \frac{1}{2\alpha} \tag{3}$$
$$= \frac{1}{\sqrt{2\omega L(\sqrt{G^2 + \omega^2 C^2} - \omega C)}} \tag{4}$$

$$\lambda_{GHz} = \frac{2\pi}{\beta} \tag{5}$$
$$= \frac{2\pi}{\sqrt{\frac{\omega L}{2}(\sqrt{G^2 + \omega^2 C^2} + \omega C)}} \tag{6}$$

$$exp(-\frac{\lambda_{GHz}}{L_{GHz}}) = exp(-4\pi\frac{\sqrt{G^2 + \omega^2 C^2} - \omega C}{G}) \tag{7}$$
$$= exp(-4\pi\frac{G^3}{2C^3\omega^3}) + o[(\frac{G}{C\omega})^8] \tag{8}$$

参考文献

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