$$\nabla \times \bar{E} = -j\omega\mu \bar{H} \qquad \bar{a} \times (\bar{b} \times \bar{c}) = (\bar{a}\bar{c})\bar{b} - (\bar{a}\bar{b})\bar{c}$$

$$\nabla \times \bar{H} = +j\omega\varepsilon \bar{E}$$

$$\nabla . \bar{E} = 0$$

$$\nabla . \bar{H} = 0$$

$$Z_{in}' = \frac{Z_L' + j\,tg\,kL}{1 + j Z_L'\,tg\,kL} \qquad K(x) = K e^{-2jk(L-x)}$$

$$Z_W = \sqrt{\frac{j\omega\mu}{\sigma + j\omega\varepsilon}} \qquad k_c = \sqrt{\left(\frac{m\pi}{a}\right)^2 + \left(\frac{n\pi}{b}\right)^2}$$

$$W_r = \int_{\phi}\int_{\theta} P_\Omega(\theta,\phi)\,\sin\theta\, d\theta\, d\phi \qquad A_{eff} = \frac{\lambda^2 G}{4\pi}$$

$$\bar{H}_\phi = j\frac{e^{-jkr}\, k\, I_m L \sin\theta}{4\pi r}\left(1 + \frac{1}{jkr}\right), \quad \bar{H}_r = \bar{H}_\theta = 0$$

$$\bar{E}_\theta = j\frac{e^{-jkr}\, k\, I_m L Z_0 \sin\theta}{4\pi r}\left(1 + \frac{1}{jkr} - \frac{1}{k^2 r^2}\right)$$

$$\bar{E}_r = \frac{e^{-jkr}\, I_m L Z_0 \cos\theta}{2\pi r^2}\left(1 + \frac{1}{jkr}\right)$$

$$\bar{E}_\theta = \frac{j Z_0 I_m e^{-jkr}}{2\pi r} \cdot \left(\frac{\cos\left(\frac{kL}{2}\cdot\cos\theta\right) - \cos\left(\frac{kL}{2}\right)}{\sin\theta}\right)$$

$$G = 6\left(\frac{D}{\lambda}\right)^2 \qquad \phi_{3dB} = \left(170\,\frac{\lambda}{D}\right)^\circ$$

3E – FORMULARIUM: - ANALOGE TRANSMISSIE
- HF_ONTWERPEN

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$$\varepsilon_{eff} = \frac{1}{2}(\varepsilon_r + 1) + \frac{1}{2}(\varepsilon_r - 1)\left(1 + 12\frac{H}{w}\right)^{-1/2} \quad \text{voor } \frac{w}{H} > 1$$

$$\varepsilon_{eff} = \frac{1}{2}(\varepsilon_r + 1) + \frac{1}{2}(\varepsilon_r - 1)\left[\left(1 + 12\frac{H}{w}\right)^{-1/2} + 0{,}04\left(1 - \frac{w}{H}\right)^2\right] \text{ el}$$

LPF ; $L_k = \frac{R}{\omega_p} \cdot g_k \qquad C_k = \frac{1}{R \cdot \omega_p} \cdot g_k$

BPF : serie : $L_k = \frac{R \cdot g_k}{\omega_0 \cdot B} \qquad C_k = \frac{B}{\omega_0 R g_k}$

parallel : $L_k = \frac{R \cdot B}{\omega_0 \cdot g_k} \qquad C_k = \frac{g_k}{\omega_0 \cdot R \cdot B}$

$$B = \frac{\omega_2 - \omega_1}{\omega_0}$$

BRF : serie : $L_k = \frac{R \cdot g_k \cdot B}{\omega_0} \qquad C_k = \frac{1}{\omega_0 B R g_k}$

parallel : $L_k = \frac{R}{\omega_0 B g_k} \qquad C_k = \frac{B \cdot g_k}{\omega_0 \cdot R}$

$$B = \frac{\omega_4 - \omega_3}{\omega_0}$$

Kuroda : $Z_c = 8 \cdot L \cdot f_0 \qquad 25 \leq Z_c \leq 85$

grafieken / Tabellen : Butterworth / Chebyshev → onbeschreven mee te brengen.

3E - extra Formularium HF-Ontwerpen