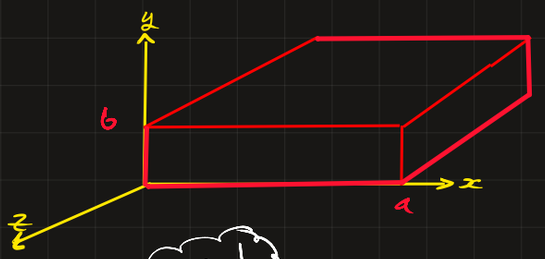
• The Dominant Mode:

→ it's the mode with the Lowest CuttoF Freq. ⇝ to have as Much Bandwidth as Possible.



$a > b$

TM_{mn}

- $F_c = \frac{V}{2}\sqrt{(\frac{m}{a})^2 + (\frac{n}{b})^2}$

$m = 1 \quad , n = 1$

→ $F_{c_{11}} = \frac{V}{2}\sqrt{\frac{1}{a^2} + \frac{1}{b^2}}$

TE_{mn}

- $F_c = \frac{V}{2}\sqrt{(\frac{m}{a})^2 + (\frac{n}{b})^2}$

- $m = 0 \quad , n = 1$

→ $F_{c_{01}} = \frac{V}{2b}$

$m = 1 \quad , n = 0$

→ $F_{c_{10}} = \frac{V}{2a}$

Lowest

∴ the dominate mode is TE_{10}

• dominate mode equations: $m = 1 \quad , n = 1$

- $E_z = 0 \quad , H_z = H_o \cos(\frac{\pi}{a}x)\, e^{-j\beta z}$
- $K_c = \frac{\pi}{a} \quad , f_c = \frac{V}{2a} \quad , \lambda_c = 2a$
- $E_x = 0 \quad , H_y = 0$ "From matrix"
- $E_y = \checkmark$
- $H_y = \checkmark$
- $\eta_{TE} = \frac{\eta}{\sqrt{1 - (F_c/F)^2}}$