

If the strip width is wide enough so that the fringe fields do not interact, i.e.: w/b greater than or equal to 0.35, then another relation is applicable

$$Z_0 \sqrt{\epsilon} = \frac{94.15}{\left(\frac{w/b}{1-t/b} + \frac{C_f}{0.0885 \epsilon_r} \right)} \quad (2-4)$$

where,

$$C_f = \frac{0.0885 \epsilon}{\pi} \left[\frac{2}{1-t/b} \log_e \left(\frac{1}{1-t/b} + 1 \right) - \left(\frac{1}{1-t/b} - 1 \right) \log_e \left(\frac{1}{(1-t/b)^2} - 1 \right) \right] \text{ Pf/cm} \quad (2-5)$$

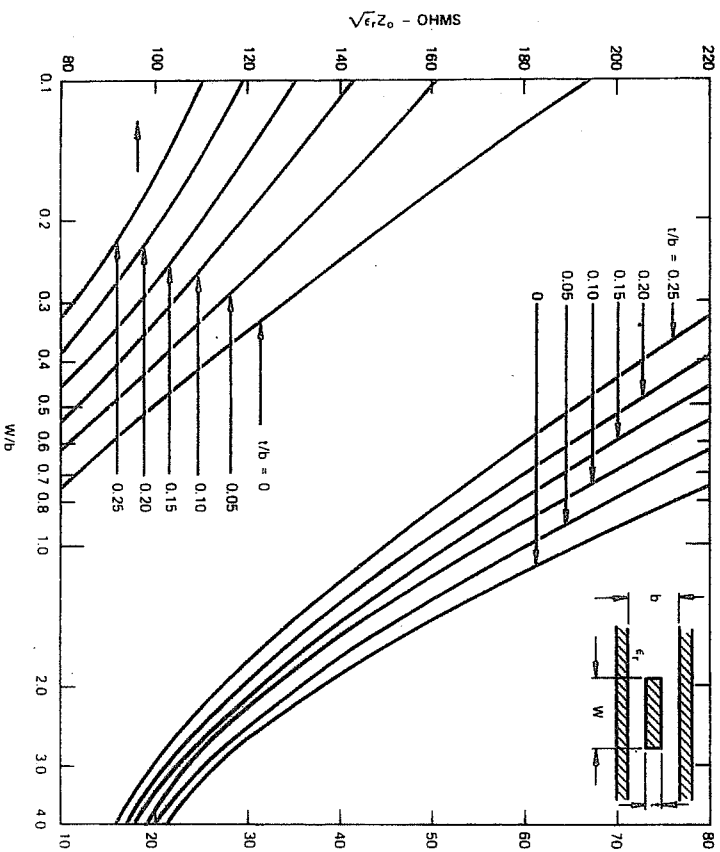


FIG. 2-3 General Curves for Characteristic Impedance of Dielectrically Loaded Stripline

Stripline ckt Design by Haskins House Jr, 1985

and

$$Z_{ocp} = \frac{1}{C \sqrt{\epsilon_r}} = \frac{30\pi}{\sqrt{\epsilon_r + 1}} \frac{K'(k)}{K(k)} \text{ (ohm)} \quad (7.6)$$

where c is the velocity of electromagnetic waves in free space. Values of characteristic impedance Z_{ocp} computed from Equation (7.6) are shown in Figure 7.4. Measured values of Z_{ocp} for $\epsilon_r = 9, 6, 16$ and 130

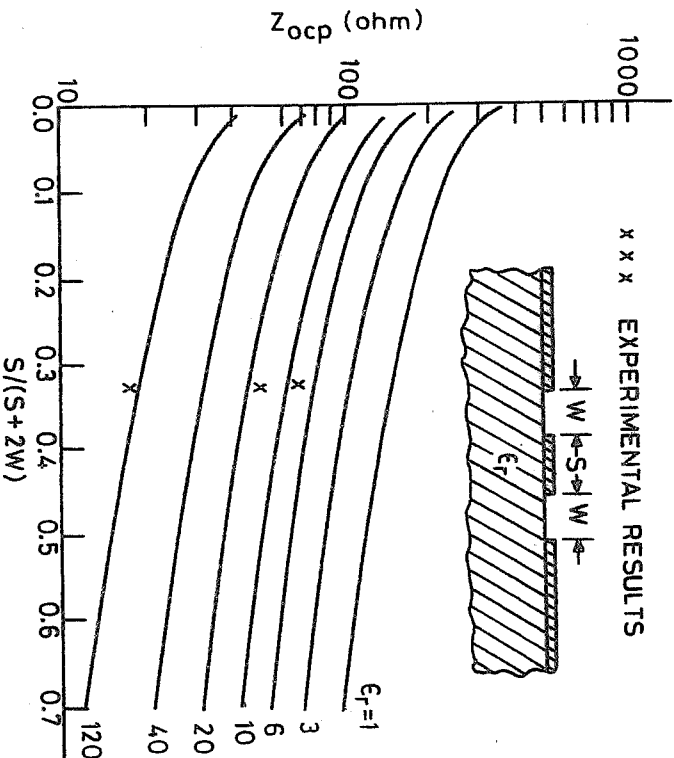


Figure 7.4 Characteristic Impedance of Coplanar Waveguides (from [11])

are also shown in this figure. When [1] points out that Z_{ocp} increases by less than 10 percent, for large values of ϵ_r , when the thickness of the substrate is reduced from infinite to W , the width of the slots (that is, when $W/h \rightarrow 1$).

Microstrip lines & slotlines K. Gupta