Abstracts

Pulse Waveform Degradation Due to Dispersion in Waveguide

R.S. Elliott. "Pulse Waveform Degradation Due to Dispersion in Waveguide." 1957 Transactions on Microwave Theory and Techniques 5.4 (Oct. 1957 [T-MTT]): 254-257.

Phase velocity in a waveguide is a nonlinear function of frequency and thus causes dispersion of the spectral components in a pulse waveform. For most practical cases, it is a good assumption to consider the phase constant to be a quadratic function of frequency. An expression can then be derived for the exit waveform shape as a function of guide length, dispersion, and width of the input rectangular pulse. The derived expression is given in terms of tabulated error functions and Fresnel integrals. It is universal in form and applicable to a wide range of practical problems, A family of degraded shapes has been computed from this expression and is presented graphically. The results apply for any mode in a straight waveguide of arbitrary but constant cross section.

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