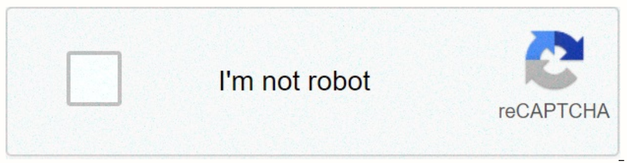

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Guide wavelength microstrip

Skip to main content Microstrip is a transmission line used for microwave range signals. It was invented because of the undesirable effect on coaxial cables when microwave range signals propagate. The wavelength of a signal that can be effectively propagated within a microstrip is called a guide wavelength. This calculator will help you calculate the guided wavelength if given the dimensions of the microstrip and the speed of propagation, the dielectric rate of the microstrip material, and the input frequency. To use the calculator, place the value in the constant field of velocity or dielectric constant in the propagation field. Then enter the width, height, and input frequency values. The propagation rate is calculated using the following formula: Equation $$\lambda_{g} = \frac{300}{f_{GHz}\sqrt{\epsilon_{eff}}$$$$$$$$$$$$$$$$epsilon_eff} = \frac{\epsilon_{R} + 1}{2} + \frac{{{epsilon_ R} - 1}{2}\left\frac{1}{{\sqlt{1+12(\frac{H}{W})}}+0.04\left[1-\left (\frac{W}H}\right)] {2}\right\\$$$1}H} < 1$$$$$$\epsilon_{eff} = \frac{\epsilon_{R}+1}{2}+\frac{\epsilon_{R}-1}2\\1\1\1\1\1 sqrt{1+12(\frac) {H} {W}}}} \right)\right]$$$ $$$$$$$$$$$$$$$1$$1$$$ Application >1$$ Application 1$$ Application Microstrip is built using a wide ground surface separated by conductors and dielectric layers. Microstriping is widely used not only for the characteristics of microwave circuits, but also for convenience. Microstrips are created by etching paths on printed circuit boards, allowing for low production costs. You may notice that the equations that solve the guided wavelengths of microstrips are related to valid dielectric rates. Note that this is not the dielectric constant of the material between the conductor and the ground surface (substrate). This is because some of the fields from microstrip conductors are present in the air. Therefore, it is necessary to calculate an effective dielectric rate smaller than the dielectric rate of the substrate. The effective dielectric rate can be calculated using the above equation, but the formula used varies depending on the ratio of width to the height (W/H) of the microstrip line and the dielectricte of the substrate material. When the effective dielectric rate is calculated, the conductive wavelength through the microstrip can be calculated by the free space wavelength (wavelength of light) by the square root of the effective dielectric rate. Read more You can work with these formulas manually or download this awesome free microstrip calculator (TX line) from NI/AWR. Before inserting a dimension, give an expression to calculate a valid width and height,Calculate the equation for the effective dielectric rate, and then calculate the impedance. Here's a really nice summary of many controlled impedance line equations by Rick Hartley. RF/Microwave PC Board Design and Layout Note that there are many microstrip impedance calculators on the Internet, sometimes giving significantly changing results. See which one you want to use in the end. In most cases, we claim to use some or all of these formulas, but for example, we found an expression that seems to accidentally replace 0.4 with 0.04 in the ε equation for W/H<1. For