S U M M A R Y

A general method of analysis applicable to both symmetric as well as asymmetric stripline using conformal mapping technique is presented. The method has been used for the determination of the characteristic impedance, potential and field distributions in the cross-section of a planar stripline with an offset strip. The general approach when applied to the case of a perfectly symmetric stripline leads to simple closed form expressions for the impedance and field distributions.

The results of the general formulation can be used for the analysis of non-planar structures for which the transformations required for transforming them into planar structures are known. In the particular case of a cylindrical stripline, the analysis has been used for the determination of the characteristic impedance and field configurations. The characteristic impedance of a cylindrical microstrip line for small strip angles has also been determined by applying Wheeler's formula to the planar structure obtained through conformal mapping.

The closed form expression obtained for the field distribution in a planar stripline is used for the formulation of coupling between two dissimilar transmission lines. Expressions for coupling between a stripline and a rectangular waveguide forming a T-junction and coupled through apertures in the form of small circular hole

and narrow rectangular slot are derived. Investigations are carried out to determine the impedance loading on the transmission line due to a radiating slot etched in the ground planes of symmetric as well as asymmetric striplines. Effect of the dissimilar dielectric media on the two sides of the radiating aperture is taken into consideration in the analysis. Comparison between the theoretical and experimental results on coupling through the T-junction and impedance loading due to the radiating slot is presented.

Using the method of loaded line analysis, studies have been made to determine the variation of input reflection coefficient and insertion loss with frequency of a stripline fed linear slot array, with inter slot spacing and number of slots as parameters. The analysis is also used to determine the amplitude and phase of the excitation distribution and the radiation pattern of the array.

Possible configurations of exciting linear as well as two dimensional slot arrays in stripline are discussed. For a two dimensional array, analysis is carried out to determine the optimum grid size suitable for a particular application.