Abstracts

Computer Analysis of Microwave Integrated Switches

The circuit analysis of microwave networks composed of distributed transmission lines and lumped circuit elements soon become complex when the transmission lines employed have significant loss that must be considered. The many possible combinations of lumped circuit parameters and the use of shorted and open stubs to form resonant circuits useful for the control of microwave energy make it very necessary to use the computer to do the complex calculations for circuit analysis. Such a program must contain the possibility then for the user to specify not only the network numerical values but the way in which these network components are connected. In general the characteristics of a network can be computed from its ABCD matrix. The specification of a network is then broken down into its simplest form called a SECTION, each SECTION being specified by eleven parameter values or circuit TYPE designations. When each SECTION is so specified the computer calculates the transfer ABCD matrix for this section of the network and combines this matrix to the preceding SECTIONS by matrix multiplication before considering the next section of the network. A Flow Diagram for the computer program is shown in Fig. 1. After the first data card containing a name and number for indentification is read the input data for the first case or problem is read. The computer then prints out the titles and input data so specified for the user to check the PARAMETER values and control TYPE numbers given in the data. The specified PARAMETER changes are made in the SECTIONS designated and a set of changes called the VARIABLE is made to the network. The VARIABLE becomes the horizontal axis for plotting the characteristics of the network and the PARAMETER changes generate a family of curves for the network analysis. After each change in the VARIABLE the ABCD matrix is calculated and/or stored in core for later plotting. After all changes in the VARIABLE and PARAMETER are complete, a tape is generated to control the plotting of the network characteristics by the High Speed Microfilm Recorder SC-4020.

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