Abstracts

Dual Polarization Phased Array Diode Phase Shifter Module

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A phased array module has been designed containing a matched power divider and four 3-bit phase shifter channels, each of which has a 3 dB splitter and two 180 degree phase shifter bits. In this way, 3-bit phase control is accomplished along with electronic switching between two radiative polarizations on both transmit and receive. Three thousand modules (containing 12000 phase shifters) have been completed for use in a phased array antenna. Each phase shifter channel was tested using a Hewlett-Packard 1000 automated network analyzer. Average insertion loss of less than 1.7 dB (after allowance for power division) was realized with 13 degrees RMS error for the entire 12000 phase shifter assembly. This insertion loss includes the ohmic dissipation in the absorptive 8 to 1 overall power division inherent in the module's design as well as ohmic and reflective losses of a push-on simultaneous connection of the eight RF output ports of the module. Special considerations encountered in the design, manufacture and automated measurement of these modules will be high-lighted in the talk.

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