

Characteristics Of Millimeter-Wave Semiconductor Phase Shifters

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Summary

Magnetized ferrite phase shifters have been widely used for phased array antennas due to their lightweight and small size. But high cost and frequency limitations have limited their use to military applications and made them impractical for mobile satellite communication devices. Recently, ceramic phase shifters have received attention due to their low cost and reliable performance. Ceramic materials, however, have very high dielectric constants that cause complex impedance matching problems and subsequent low efficiency. In this study, a semiconductor circular waveguide geometry is used to characterize potentially low-cost and miniaturized rotary field phase shifters, where rotation required for phase shift action is achieved by changing the applied DC bias field. The results obtained for magnetized semiconductors are compared with that of magnetized ferrite devices.

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