Abstracts

Low Cost Design Techniques for Semiconductor Phase Shifters

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The design and performance of two microstrip semiconductor phase shifters operating at S band and UHF are described. The S-band diode phase shifter uses thick-film metallization on a 99.5-percent alumina substrate and uses series coupled diodes for the small bits and constant phase frequency switched life bits for the three large bits. The 4-bit UHF phase shifter uses eight p-i-n diodes mounted in a low dielectric constant microstrip circuit and operates at a power level of 8 kW peak, 240 W average, and has an average insertion loss of 0.7 dB. Phase and VSWR distributions on 800 units produced are also given. The characteristics of two new microwave semiconductor switching devices, the field-effect diode (FED) and the resistive gate switch are described. These devices operate with only a voltage change. Design and performance of an SP2T switch and 3-bit phase shifter using the field-effect diode are presented.

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