Abstracts

An MMIC active phase shifter using a variable resonant circuit [and MESFETs]

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This paper describes a monolithic-microwave integrated-circuit (MMIC) active phase shifter using a variable resonant circuit with a large amount of variable phase. We first propose a novel active phase-shifter configuration that uses a variable resonant circuit with second-order all-pass network characteristics. Phase can be changed with a constant amplitude by varying the capacitance or the inductance of the resonant circuit. Next, an experimental MMIC active phase shifter with input active matching is presented. A phase shift of over 100/spl deg/ and an insertion loss of 4/spl plusmn/1 dB are obtained from 2.2 to 2.8 GHz. The chip size is less than 1.0 mm/sup 2/. Finally, an experimental 360/spl deg/ MMIC active phase shifter is presented. Over the bandwidth of 40 MHz at 2.44 GHz, the insertion gain is 2.0/spl plusmn/0.7 dB and the phase error is within /spl plusmn/4/spl deg/ when measured in 30/spl deg/ steps.

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