Abstracts

Transmission-Type Injection Locking of GaAs Schottky-Barrier FET Oscillators

Y. Tajima and K. Mishima. "Transmission-Type Injection Locking of GaAs Schottky-Barrier FET Oscillators." 1979 Transactions on Microwave Theory and Techniques 27.5 (May 1979 [T-MTT] (Special Issue on Solid-State Microwave/Millimeter-Wave Power Generation, Amplification, and Control)): 386-391.

Transmission-type injection-locked oscillators equipped with both signal-input and power-output ports are studied. A comparison with traditional reflection-type injection-locked oscillators, in which a signal is injected into the output port of the oscillator, is presented theoretically. It is shown that the locking range of transmission types always differs from the reflection type by a factor of G/sub s// G/sub p/ where G/sub s/ represents the maximum stable gain of the two-port oscillator and G/sub p/ represents the square root of the output power ratio of the two ports. Experiments on common-source injection-locked oscillators using GaAs FET chips are described and show that, with transmission types, a 1.8 times wider locking range can be obtained than with reflection types. Furthermore, investigation of FM noise for both types of injection revealed lower off-carrier FM noise for transmission types than reflection types, even though the locking gain of the transmission types was kept the same as that of reflection types. Thus overall features of transmission-type injection locking were found to be advantageous for FM signal amplification even though there is a minimal power loss at the signal input port.

❑ Return to main document.