Abstracts

The Intrinsic Noise Figure of the MESFET Distributed Amplifier

C.S. Aitchison. "The Intrinsic Noise Figure of the MESFET Distributed Amplifier." 1985 Transactions on Microwave Theory and Techniques 33.6 (Jun. 1985 [T-MTT]): 460-466.

This paper calculates the intrinsic noise figure of the MESFET distributed amplifier assuming, for simplicity, only the Van der Ziel gate and drain noise sources, and produces an expression for the noise figure of a distributed amplifier containing n identical devices. For large gain and Iarge n, a simple expression exists for the product nZ/sub pi g/, where Z/sub pi g/ is the pi-characteristic impedance of the gate line, which minimizes the overall noise figure of the amplifier. This approximate expression is compared with the corresponding expression for a resonant ampfifier using the same MESFET with the same noise sources and with the optimum source impedance for minimum noise figure. Although the resonant amplifier has a slightly lower noise figure, the need to use a circulator to remove the mismatch associated with the optimum source impedance removes this slight advantage.

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