Abstracts

Low flicker-noise GaN/AlGaN heterostructure field-effect transistors for microwave communications

A. Balandin, S.V. Morozov, S. Cai, R. Li, K.L. Wang, G. Wijeratne and C.R. Viswanathan. "Low flicker-noise GaN/AlGaN heterostructure field-effect transistors for microwave communications." 1999 Transactions on Microwave Theory and Techniques 47.8 (Aug. 1999 [T-MTT] (Mini-Special Issue on Low-Power/Low-Noise Technologies for Mobile Wireless Communications)): 1413-1417.

We report a detailed investigation of flicker noise in novel GaN/AlGaN heterostructure field-effect transistors (GaN HFET). Low values of 1/f noise found in these devices (i.e., the Hooge parameter is on the order of 10/sup -1/) open up the possibility for applications in communication systems. We have examined the scaling of the noise spectral density with the device dimensions in order to optimize their performance. It was also found that the slope /spl gamma/ of the 1/f/sup /spl gamma// noise density spectrum is in the 1.0-1.3 range for all devices and decreases with the decreasing (i.e., more negative) gate bias. The results are important for low-noise electronic technologies requiring a low phase-noise level.

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