Abstracts

RF noise in 0.18-/spl mu/m and 0.13-/spl mu/m MOSFETs

C.H. Huang, C.H. Lai, J.C. Hsieh, J. Liu and A. Chin. "RF noise in 0.18-/spl mu/m and 0.13-/spl mu/m MOSFETs." 2002 Microwave and Wireless Components Letters 12.12 (Dec. 2002 [MWCL]): 464-466.

Studied the gate finger number and gate length dependence on minimum noise figure (NF/sub min/) in deep submicrometer MOSFETs. A lowest NF/sub min/ of 0.93 dB is measured in 0.18-/spl mu/m MOSFET at 5.8 GHz as increasing finger number to 50 fingers, but increases abnormally when above 50. The scaling gate length to 0.13 /spl mu/m shows larger NFmin than the 0.18-/spl mu/m case at the same finger number. From the analysis of a well-calibrated device model, the abnormal finger number dependence is due to the combined effect of reducing gate resistance and increasing substrate loss as increasing finger number. The scaling to 0.13-/spl mu/m MOSFET gives higher NF/sub min/ due to the higher gate resistance and a modified T-gate structure proposed to optimize the NF/sub min/ for further scaling down of the MOSFET.

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