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# Analysis of Scaling Effects on Analog/RF Performance of Nanowire Gate-All-Around MOSFET

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**Abstract :** We present a detailed analysis of analog and radiofrequency (RF) performance with different gate lengths for nanowire cylindrical gate (CylG) gate-all-around (GAA) MOSFET. CylG GAA MOSFET not only suppresses the short channel effects (SCEs), it is also a good candidate for analog/RF device due to its high transconductance (gm) and high cutoff frequency (fT ). The presented work would be beneficial for a new generation of RF circuits and systems in a broad range of applications and operating frequency covering the RF spectrum. For this purpose, the analog/RF figures of merit for CylG GAA MOSFET is analyzed in terms of gate to source capacitance (Cgs), gate to drain capacitance (Cgd), transconductance generation factor gm = Id (where Id represents drain current), intrinsic gain, output resistance, fT, maximum frequency of oscillation (fmax) and gain bandwidth (GBW) product.

**Keywords :** Gate-All-Around MOSFET, GAA, output resistance, transconductance generation factor, intrinsic gain, cutoff frequency, fT
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