Structured Electronic Design

EE4109
Poll: MOS modeling

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An NMOS transistor is biased in its forward saturation region with a drain current I_{DS}. The transistor has a width W and a length L. Under the given conditions, the small-signal transconductance and the cut-off frequency of this transistor equal g_m and f_T, respectively.

Select in which way the transconductance and the cut-off frequency change if the width and the drain current are changed to $2W$ and $2I_{DS}$, respectively.

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An NMOS transistor is biased in its forward saturation region with a drain current I_{DS}. The transistor has a width W and a length L. Under the given conditions, the small-signal transconductance and the cut-off frequency of this transistor equal g_m and f_T, respectively.

Select in which way the transconductance and the cut-off frequency change if both the width and the length are taken twice as large, while the operating current is kept at the same value.