

Fundamentals of Nanotransistors

L4.6 Quiz

ANSWERS

Mark Lundstrom

Purdue University

Lecture 4.6: Connection to the VS Model

1) How is the “apparent mobility” defined?

a) $m_{app} = m_h + m_b$.

b) $m_{app} = \sqrt{m_h m_b}$.

c) $1/m_{app} = 1/m_h + 1/m_b$.

d) $m_{app} = m_h^2 / m_b$.

e) $m_{app} = m_b^2 / m_h$.

2) The injection velocity is given by $u_{inj} = [1/u_T + 1/(D_n/\ell)]^{-1}$. How is the term, (D_n/ℓ) , to be interpreted?

a) It is the velocity at which electrons are injected to the VS from the source.

b) It is the velocity of electrons in the source.

c) It is the average velocity of electrons in the high-field part of the channel.

d) It is the maximum velocity of electrons in the high-field part of the channel..

e) It is the velocity at which electrons diffuse across the low-field part of the channel.

3) Where is the “bottleneck” that limits the on-current of a MOSFET located?

a) In a very short region near the top of the source to channel barrier.

b) In a very short region near the drain (i.e. the pinch-off region).

c) Approximately the first half of the channel.

d) Approximately the last half of the channel.

e) In the source, just before the top of the source to channel barrier.