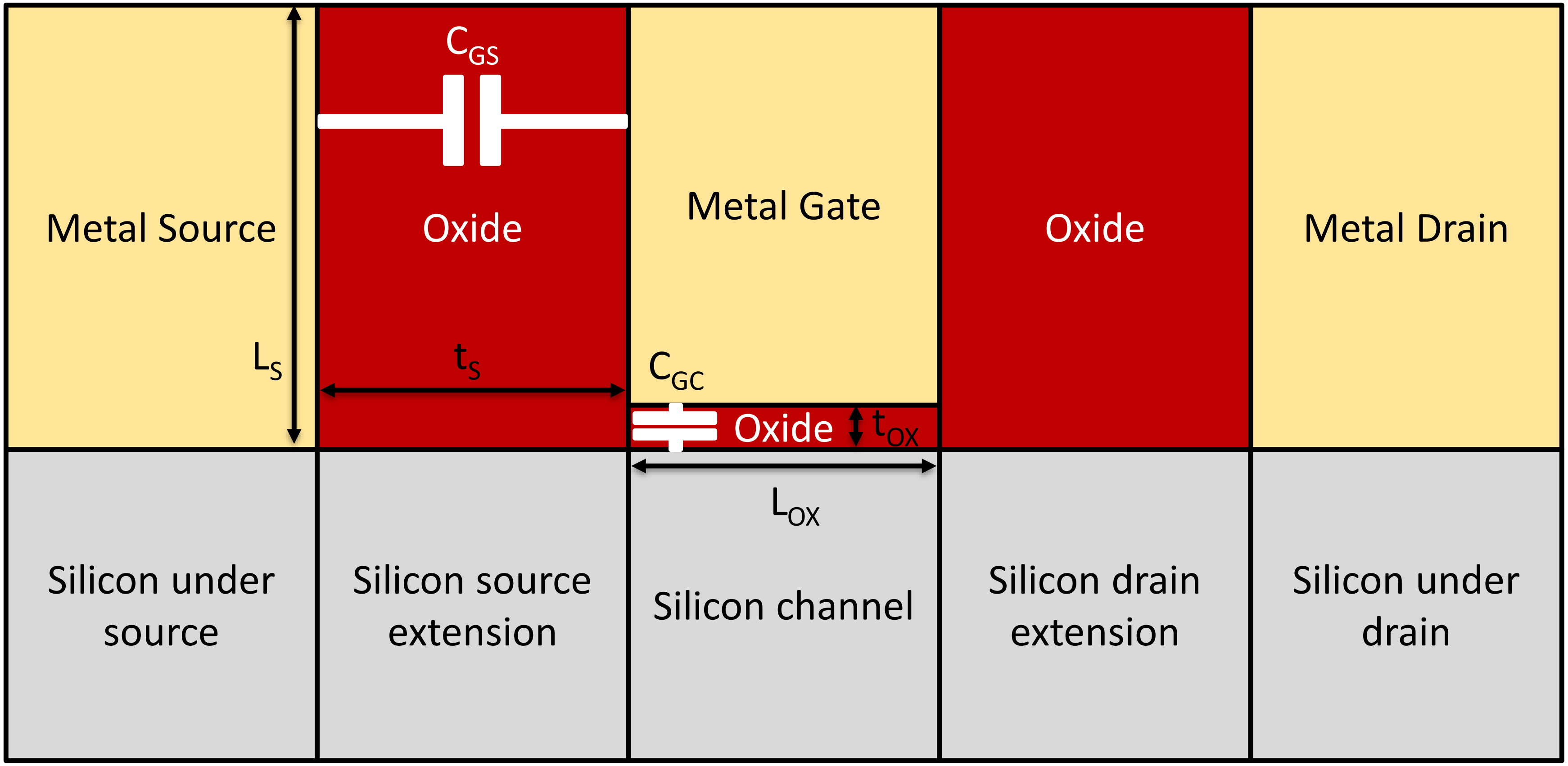
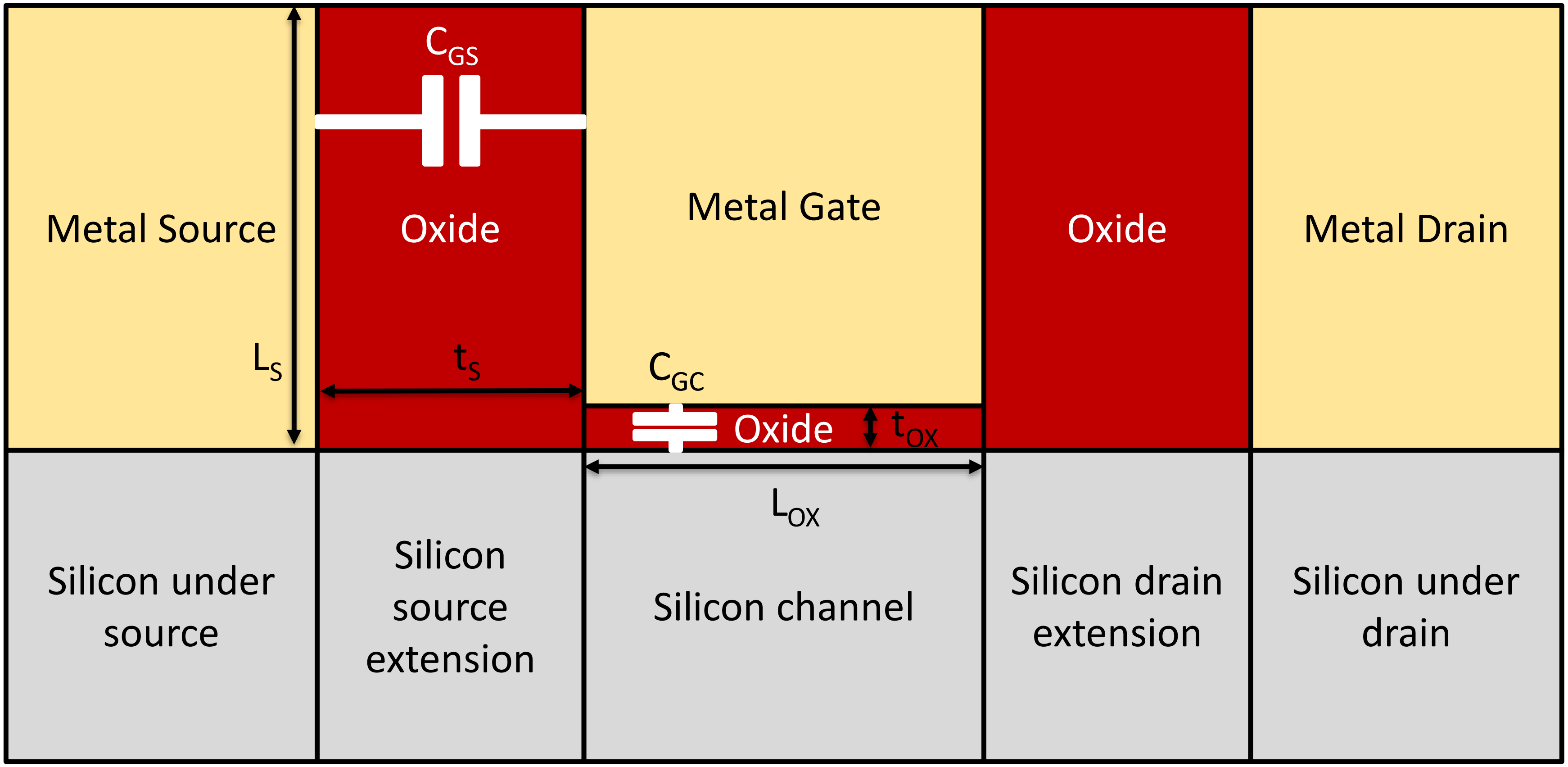



$$L_S = 50\ nm, \qquad t_S = 35\ nm, \qquad C_{GS} = \frac{L_S \epsilon_{OX}}{t_S} = \frac{5 \times 10^{-6}\ cm \times 3.9 \times 8.854 \times 10^{-14}\ \ F/cm}{3.5 \times 10^{-6}\ cm} = 4.93 \times 10^{-13}\ F/cm$$

$$L_{OX} = 35\ nm, \qquad t_{OX} = 5\ nm, \qquad C_{GC} = \frac{L_{OX} \epsilon_{OX}}{t_{OX}} = \frac{3.5 \times 10^{-6}\ cm \times 3.9 \times 8.854 \times 10^{-14}\ \ F/cm}{0.5 \times 10^{-6}\ cm} = 2.42 \times 10^{-12}\ F/cm$$

$$C_{Gate} = C_{GS} + C_{GC} = 2.91 \times 10^{-12}\ F/cm$$

The input for the “normalized” Cgs capacitance would be “1” because this is the initial transistor




$L_S = 50\ nm,$ $\boxed{t_S = 30\ nm,}$ $C_{GS} = \frac{L_S \epsilon_{OX}}{t_S} = \frac{5 \times 10^{-6}\ cm \times 3.9 \times 8.854 \times 10^{-14}\ \ F/cm}{3 \times 10^{-6}\ cm} = 5.76 \times 10^{-13}\ F/cm$

$\boxed{L_{OX} = 45\ nm,}$ $t_{OX} = 5\ nm,$ $C_{GC} = \frac{L_{OX} \epsilon_{OX}}{t_{OX}} = \frac{4.5 \times 10^{-6}\ cm \times 3.9 \times 8.854 \times 10^{-14}\ \ F/cm}{0.5 \times 10^{-6}\ cm} = 3.11 \times 10^{-12}\ F/cm$

$C_{Gate} = C_{GS} + C_{GC} = 3.68 \times 10^{-12}\ F/cm$

The gate capacitance for this structure has increased, so the new “normalized” Cgs capacitance
= new capacitance / original capacitance = 3.68e-12/2.91e-12 = 1.265