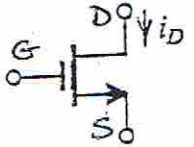
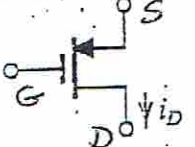


MOSFET

	n-Channel	p-Channel
	Enhancement MOSFET	Enhancement MOSFET
Circuit Symbol		
V_t	+	-
To turn transistor on	$v_{GS} > V_t$	$v_{GS} < V_t$
v_{DS}	+	-
To operate in the triode region	$v_{DS} \leq v_{GS} - V_t$	$v_{DS} \geq v_{GS} - V_t$
To operate in the saturation region	$v_{DS} \geq v_{GS} - V_t$	$v_{DS} \leq v_{GS} - V_t$

MOS Transistor EQUATIONS

$$V_T = V_{T0} + \gamma(\sqrt{-2\phi_F + V_{SB}} - \sqrt{-2\phi_F})$$

$$I_D = \frac{k'_n W}{2L} (V_{GS} - V_T)^2 (1 + \lambda V_{DS}) (\text{sat})$$

$$I_D = k'_n \frac{W}{L} \left((V_{GS} - V_T) V_{DS} - \frac{V_{DS}^2}{2} \right) (\text{triode})$$