

MOSFET – BJT comparison

		Cut-off	Active	Ohmic
MOSFET (DC)	<p>Parameters: K, V_t</p>	<p><u>Equations:</u> $I_G = 0$ $I_D = 0$</p> <p><u>Condition:</u> $V_{GS} < V_t$</p>	<p><u>Equations:</u> $I_G = 0$ $I_D = K(V_{GS} - V_t)^2$</p> <p><u>Conditions:</u> $V_{GS} > V_t$ $V_{DS} > V_{GS} - V_t$</p>	<p><u>Equations:</u> $I_G = 0$ $I_D = K(2(V_{GS} - V_t)V_{DS} - V_{DS}^2)$</p> <p><u>Conditions:</u> $V_{GS} > V_t$ $0 < V_{DS} < V_{GS} - V_t$</p>
MOSFET (AC)				
			$g_m = 2K(V_{GS} - V_t)$	
BJT (DC)	<p>Parameter: β</p>	<p><u>Equations:</u> $I_C = I_B = I_E = 0$</p> <p><u>Condition:</u> $V_{BE} < 0.7 \text{ V}$</p>	<p><u>Equations:</u> $I_C = \beta I_B$ $V_{BE} = 0.7 \text{ V}$</p> <p><u>Conditions:</u> $I_B > 0$ $V_{CE} > 0.2 \text{ V}$</p>	<p><u>Equations:</u> $V_{CE} = 0.2 \text{ V}$ $V_{BE} = 0.7 \text{ V}$</p> <p><u>Conditions:</u> $I_B > 0$ $0 < I_C < \beta I_B$</p>
BJT (AC)				
			$h_{ie} = \frac{nV_T}{I_B}$ $h_{fe} \gtrsim \beta$	