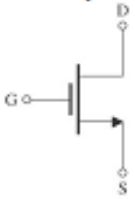
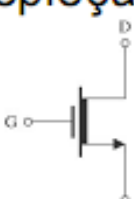
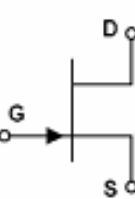

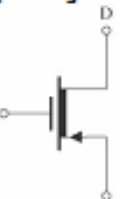
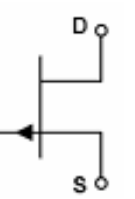


# Expressões úteis

	Emissor Comum	Emissor Comum c/ $R_E$	Colector comum	Base Comum
Impedância de Entrada	$R_{ent} = R_1 // R_2 // r'_b$	$R_{ent} \approx R_1 // R_2 // (r'_b + \beta r'_e)$	$R_{ent} \approx R_1 // R_2 // \beta R_E$	$R_{ent} = r'_e$
Ganho de Tensão em c.a.	$A = -\beta \frac{R_C}{r'_b}$	$A = -\beta \frac{R_C}{r'_b + \beta r'_e}$ $= -\frac{R_C}{r'_e + r_E} \approx -\frac{R_C}{r_E}$	$A \approx 1$	$A = \frac{R_C}{r'_e}$
Impedância de Saída	$R_{saída} = R_C$	$R_{saída} = R_C$	$R_E // (r'_e + \frac{R_1 // R_2 // R_f}{(\beta + 1)})$	$R_{saída} = R_C$

$$\rightarrow r'_e \approx \frac{25\text{mV}}{I_E}, \quad r'_b \approx \frac{25\text{mV}}{I_E / (\beta + 1)} \approx \beta r'_e$$

# Expressões úteis

	NMOS reforço	NMOS depleção	JFET canal N	PMOS reforço	PMOS depleção	JFET canal P
						
	(c)	(b)		(c)	(b)	
$V_t$	+	-	-	-	+	+
ON	$V_{GS} > V_t$			$V_{GS} < V_t$		
Tríodo	$V_{DS} < V_{GS} - V_t$			$V_{DS} > V_{GS} - V_t$		
	$i_D \approx k'_n \frac{W}{L} (v_{GS} - V_t) v_{DS}$					
Saturação	$V_{DS} > V_{GS} - V_t$			$V_{DS} < V_{GS} - V_t$		
	$i_D = \frac{1}{2} k'_n \frac{W}{L} (v_{GS} - V_T)^2$					

## MOSFET de depleção

$$i_D = i_{DSS} \left( 1 - \frac{V_{GS}}{V_t} \right)$$

$$i_{DSS} = \frac{1}{2} K'_n \frac{w}{L} V_t^2$$

## JFET

$$i_D = i_{DSS} \left( 1 - \frac{V_{GS}}{V_p} \right)$$

$$i_{DSS} = \frac{1}{2} K'_n \frac{w}{L} V_p^2$$