TABLE 9.1 Z_i, Z_0, and A_v for various FET configurations

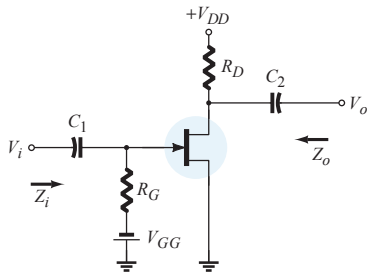
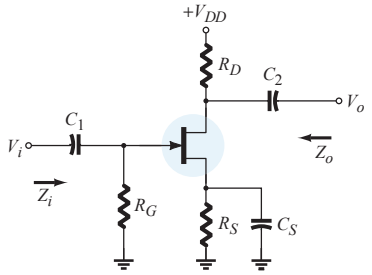
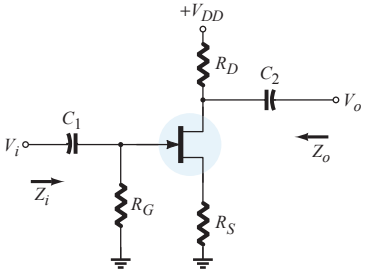
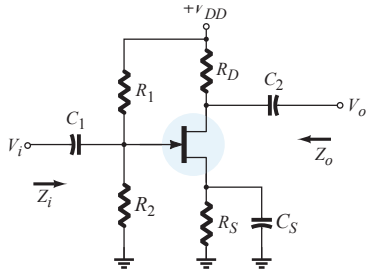
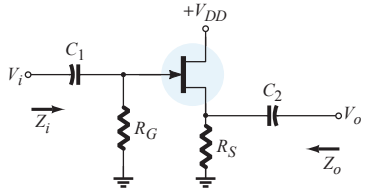
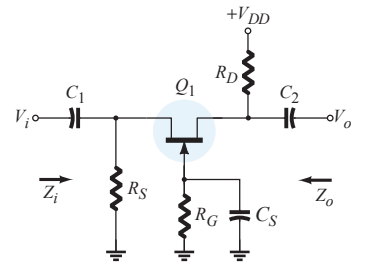
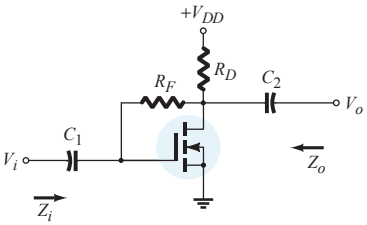
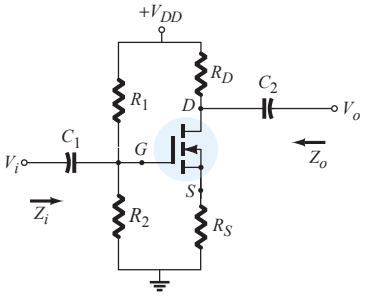
Configuration	Z_i	Z_o	$A_v = \frac{V_o}{V_i}$
Fixed-bias [JFET or D-MOSFET]	 High (10 MΩ) $= R_G$	Medium (2 kΩ) $= R_D \| r_d$ $\cong R_D$ $(r_d \geq 10\,R_D)$	Medium (−10) $= -g_m(r_d \| R_D)$ $\cong -g_m R_D$ $(r_d \geq 10\,R_D)$
Self-bias bypassed R_s [JFET or D-MOSFET]	 High (10 MΩ) $= R_G$	Medium (2 kΩ) $= R_D \| r_d$ $\cong R_D$ $(r_d \geq 10\,R_D)$	Medium (−10) $= -g_m(r_d \| R_D)$ $\cong -g_m R_D$ $(r_d \geq 10\,R_D)$
Self-bias unbypassed R_S [JFET or D-MOSFET]	 High (10 MΩ) $= R_G$	$= \dfrac{\left[1 + g_m R_S + \frac{R_S}{r_d}\right] R_D}{\left[1 + g_m R_S + \frac{R_S}{r_d} + \frac{R_D}{r_d}\right]}$ $= R_D$ $r_d \geq 10\,R_D$ or $r_d = \infty\Omega$	Low (−2) $= \dfrac{g_m R_D}{1 + g_m R_s + \frac{R_D + R_S}{r_d}}$ $\cong -\dfrac{g_m R_D}{1 + g_m R_S}$ $[r_d \geq 10(R_d + R_S)]$
Voltage-divider bias [JFET or D-MOSFET]	 High (10 MΩ) $= R_1 \| R_2$	Medium (2 kΩ) $= R_D \| r$ $\cong R_D$ $(r_d \geq 10\,R_D)$	Medium (−10) $= -g_m(r_d \| R_D)$ $\cong -g_m R_D$ $(r_d \geq 10\,R_D)$

TABLE 9.1 (Continued)

Configuration	Z_i	Z_o	$A_v = \frac{V_o}{V_i}$
Source-follower [JFET or D-MOSFET] 	High (10 MΩ) $= R_G$	Low (100 kΩ) $= r_d \| R_S \| 1/g_m$ $\cong R_S \| 1/g_m \quad (r_d \geq 10\ R_S)$	Low (< 1) $= \frac{g_m(r_d \| R_S)}{1 + g_m(r_d \| R_S)}$ $\cong \frac{g_m R_S}{1 + g_m R_S} \quad (r_d \geq 10\ R_S)$
Common-gate [JFET or D-MOSFET] 	Low (1 kΩ) $= R_S \left\| \left[\frac{r_d + R_D}{1 + g_m r_d} \right] \right.$ $\cong R_S \| \frac{1}{g_m} \quad (r_d \geq 10\ R_D)$	Medium (2 kΩ) $= R_D \| r_d$ $\cong R_D \quad (r_d \geq 10\ R_D)$	Medium (+10) $= \frac{g_m R_D + \frac{R_D}{r_d}}{1 + \frac{R_D}{r_d}}$ $\cong g_m R_D \quad (r_d \geq 10\ R_S)$
Drain-feedback bias E-MOSFET 	Medium (1 MΩ) $= \frac{R_F + r_d \| R_D}{1 + g_m(r_d \| R_D)}$ $\cong \frac{R_F}{1 + g_m R_D} \quad (r_d \geq 10\ R_D)$	Medium (2 kΩ) $= R_F \| r_d \| R_D$ $\cong R_D \quad (R_F, r_d \geq 10\ R_D)$	Medium (−10) $= -g_m(R_F \| r_d \| R_D)$ $\cong -g_m R_D \quad (R_F, r_d \geq 10\ R_D)$
Voltage-divider bias E-MOSFET 	Medium (1 MΩ) $= R_1 \| R_2$	Medium (2 kΩ) $= R_D \| r_d$ $\cong R_D \quad (R_d \geq 10\ R_D)$	Medium (−10) $= -g_m(r_d \| R_D)$ $\cong -g_m R_D \quad (r_d \geq 10\ R_D)$