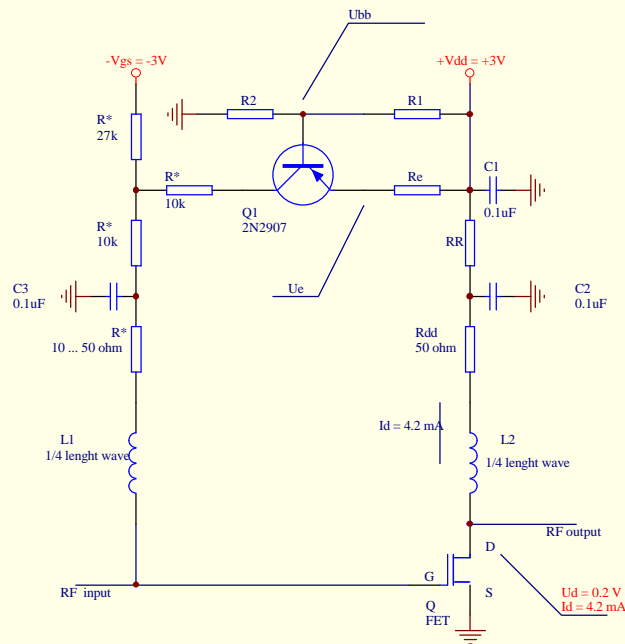


## Active Bias Circuit



## Equations

**First conditions**  $U_{gg} = -3V$  ,  $U_{dd} = +3V$

**Goal ...**  $U_d = 0.2 V$  ,  $I_d = 4.2 mA$

**Calculations** 1) Choose  $U_e = 1.2V$  ( $U_e > 2 \cdot U_{be}$ )

$$2) R_e = \frac{U_{dd} - 1.2 V}{I_d} = 428.57 \text{ ohm}$$

$$3) R_{dd} = \dots \begin{aligned} (R_{dd} + 50 \text{ ohm}) \cdot I_d &= 1.2 V - U_d \\ (R_{dd} + 50 \text{ ohm}) \cdot I_d &= 1 V \\ (R_{dd} + 50 \text{ ohm}) &= 238 \text{ ohm} \\ R_{dd} &= 188 \text{ ohm} \end{aligned}$$

$$4) U_{bb} = \frac{R_2}{R_1 + R_2} \cdot U_{dd} = U_e - 0.62 V = 0.58 V$$

$$5) R_1 = R_2 ( U_{dd} / (1.2V - 0.62V)) - R_2$$

6) Choose  $R_2 = 1 \text{ k ohm}$

$$R_1 = 1000 (3 / (1.2V - 0.62V)) - 1000$$

$$R_1 = 4.172 \text{ k ohm}$$