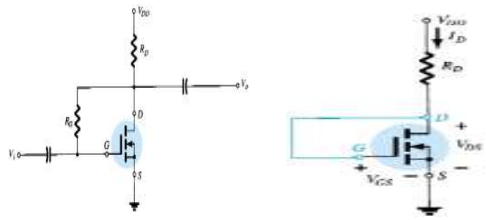
MOSFET.....

Feedback Biasing of n-Channel e-MOSFET

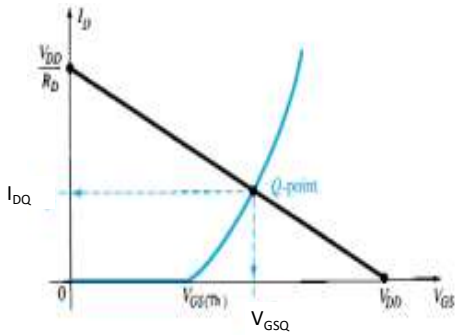
$I_G = 0$



Equations: $V_{DS} = V_{GS}$ $V_{GS} = V_{DD} - I_D R_D$

From the above equations, we get $V_{GS} = V_{DD}|_{I_D=0}$ $I_D = \frac{V_{DD}}{R_D}\Big|_{V_{GS}=0}$

Feedback Biasing of n-Channel e-MOSFET



Example:

Determine I_{DQ} and V_{DSQ} for the enhancement-type MOSFET of the following (I_{Don} = 6mA, $V_{GS(on)}$ = 8V and V_{Gth} = 3V).

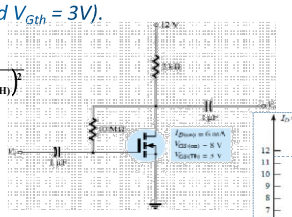
Solution:

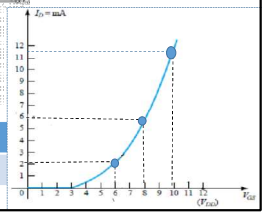
We know, $k = \frac{I_{D(on)}}{(V_{GS(on)} - V_{GS(TH)})^2}$

$= \frac{6mA}{(8-3)^2}$

$= 0.24 \times 10^{-3}$

$I_D = k(V_{GS} - V_T)^2$





V_{GS}	3	6	8	10
I_D	0	2.16mA	6	11.76mA

For the network bias line:

$$V_{GS} = V_{DD} - I_D R_D$$

For $I_D = 0$, $V_{GS} = V_{DD} = 12$ v,

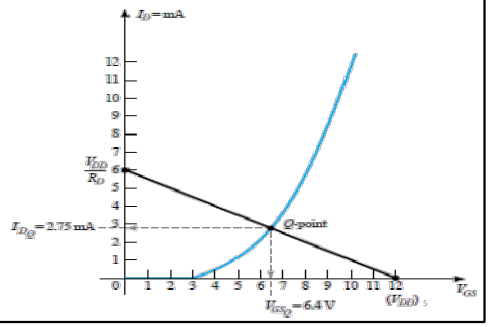
and for $V_{GS} = 0$

$I_D = V_{DD} / I_D = 12$ v / 2k = 6 mA

From the graph

$V_{GSQ} = 6.4$ v

$I_{DQ} = 2.75$ mA



Summary Table