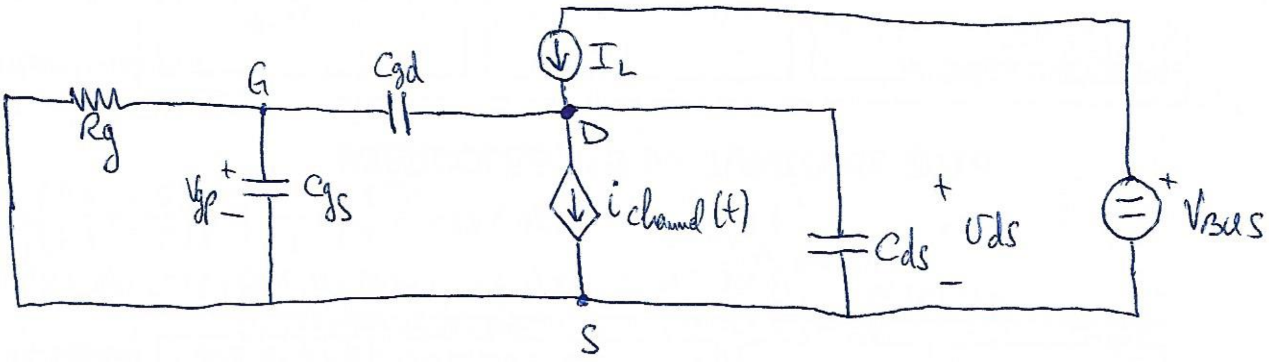
Turn OFF Miller Plateau equivalent circuit:



$$V_{gp} = V_{gd} + v_{ds} \iff 0 = \frac{dv_{gd}}{dt} + \frac{dv_{ds}}{dt} \iff \boxed{\frac{dv_{dg}}{dt} = \frac{dv_{ds}}{dt}}$$

KCL at node "D": $I_L - C_{gd}\frac{dv_{dg}}{dt} = i_{channel}(t) + C_{ds}\frac{dv_{ds}}{dt} \iff \boxed{i_{channel}(t) = I_L - \underbrace{(C_{gd}+C_{ds})}_{C_{oss}}\frac{dv_{ds}}{dt}}$

$$E_{sw \text{ during Miller Plateau for turn OFF}} = \int_{t_1}^{t_2} v_{ds}(t)\cdot i_{channel}(t)\,dt = \int_{t_1}^{t_2} v_{ds}(t)\cdot\left[I_L - C_{oss}\frac{dv_{ds}}{dt}\right]dt =$$

$$= \int_{t_1}^{t_2} v_{ds}(t)\cdot I_L\,dt + \int_0^{V_{Bus}} -v_{ds}\cdot C_{oss}\cdot dv_{ds} = \underbrace{\int_{t_1}^{t_2} v_{ds}(t)\cdot I_L\,dt}_{\text{Overlap between drain voltage and "}I_L\text{"}} - \underbrace{\int_0^{V_{Bus}} v_{ds}(t)\cdot C_{oss}\,dv_{ds}}_{E_{OSS}@V_{Bus}}$$

$I_L \neq$ Channel current

$$\Rightarrow E_{sw \text{ Miller Plateau for turn OFF}} = \underbrace{\int_{t_1}^{t_2} v_{ds}(t)\cdot I_L\,dt}_{\frac{1}{2}\cdot V_{Bus}\cdot I_L\cdot(t_2-t_1)} - E_{OSS}@V_{Bus}$$

$\Uparrow$

Assuming $v_{ds}(t)$ rises <u>linearly</u> and I_L is constant