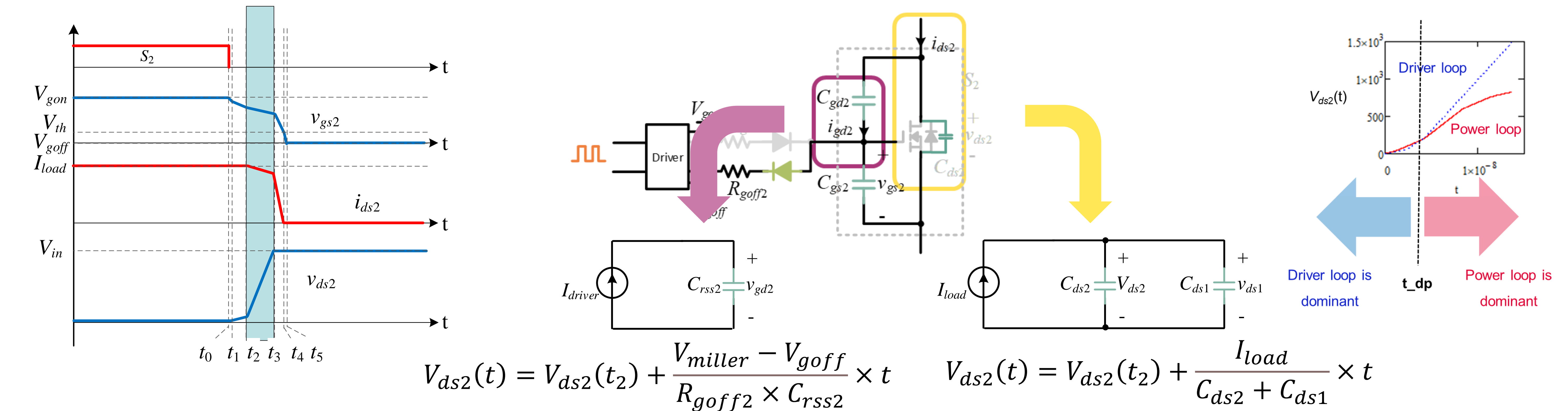


The Impact of Gate Driver Loop Output Capability and Stray Parameters on Switching Performance

Dong Jie

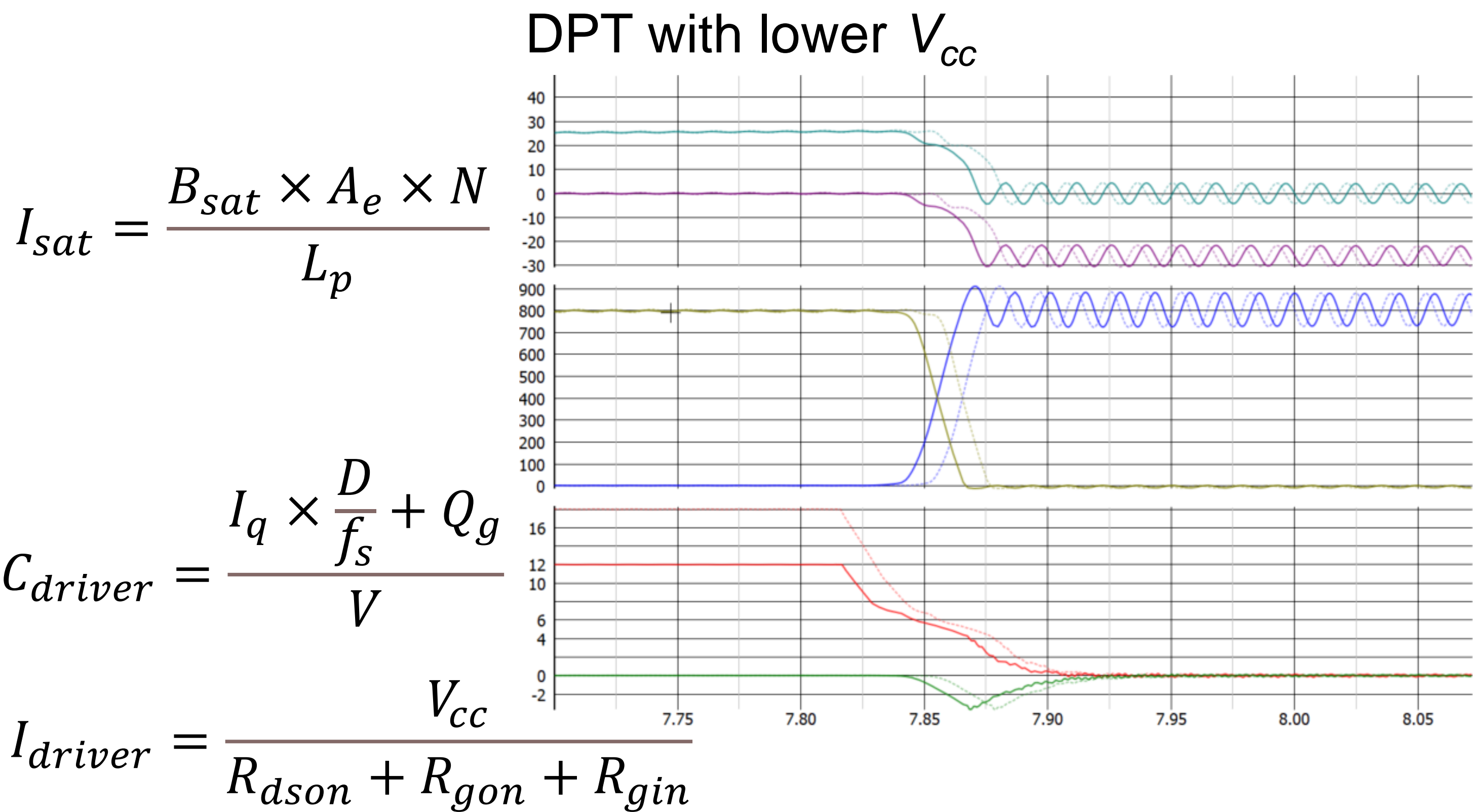
Infineon Technology, China

➤ t_2 - t_3 v_{ds} is limited by driver loop and power loop during turn-off



➤ Gate driver output capability

Item	Priority	Effort to adjust
Driver aux power: transformer	High	Hard
Driver aux power: modulation ratio	Medium	Hard
Aux power supply capacitance	Medium	Easy
Driver IC Rgon/Rgoff	High Medium	medium Easy



➤ Gate driver stray parameters

Item	Priority	Effort to adjust
Layout: driver loop length	Medium	Hard
Layout: driver loop lamination	High	Hard
Layout: driver loop and power loop lamination	High	Hard
Kelvin source	High	Hard
Gate capacitance	Medium	Easy

Driver loop length:

$$L_{driver} = 0.0002l \left[\ln \frac{2l}{W + H} + 0.2235 \frac{W + H}{l} + 0.5 \right] \mu H$$

Kelvin source:

$$V_{gs}(t) = V_{gon} - R_{gon} \times i_{gs}(t) - L_s \frac{di_{ds}(t)}{dt}$$

