# Weekly Report – 07.11.2017

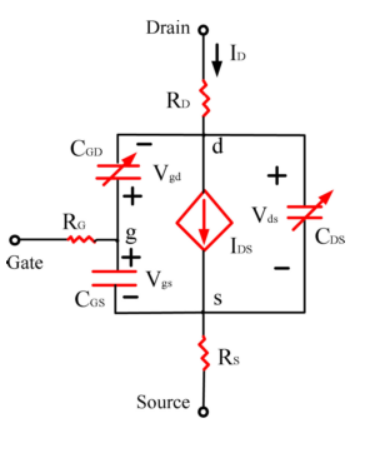


Figure 1: The circuit in GaNFET

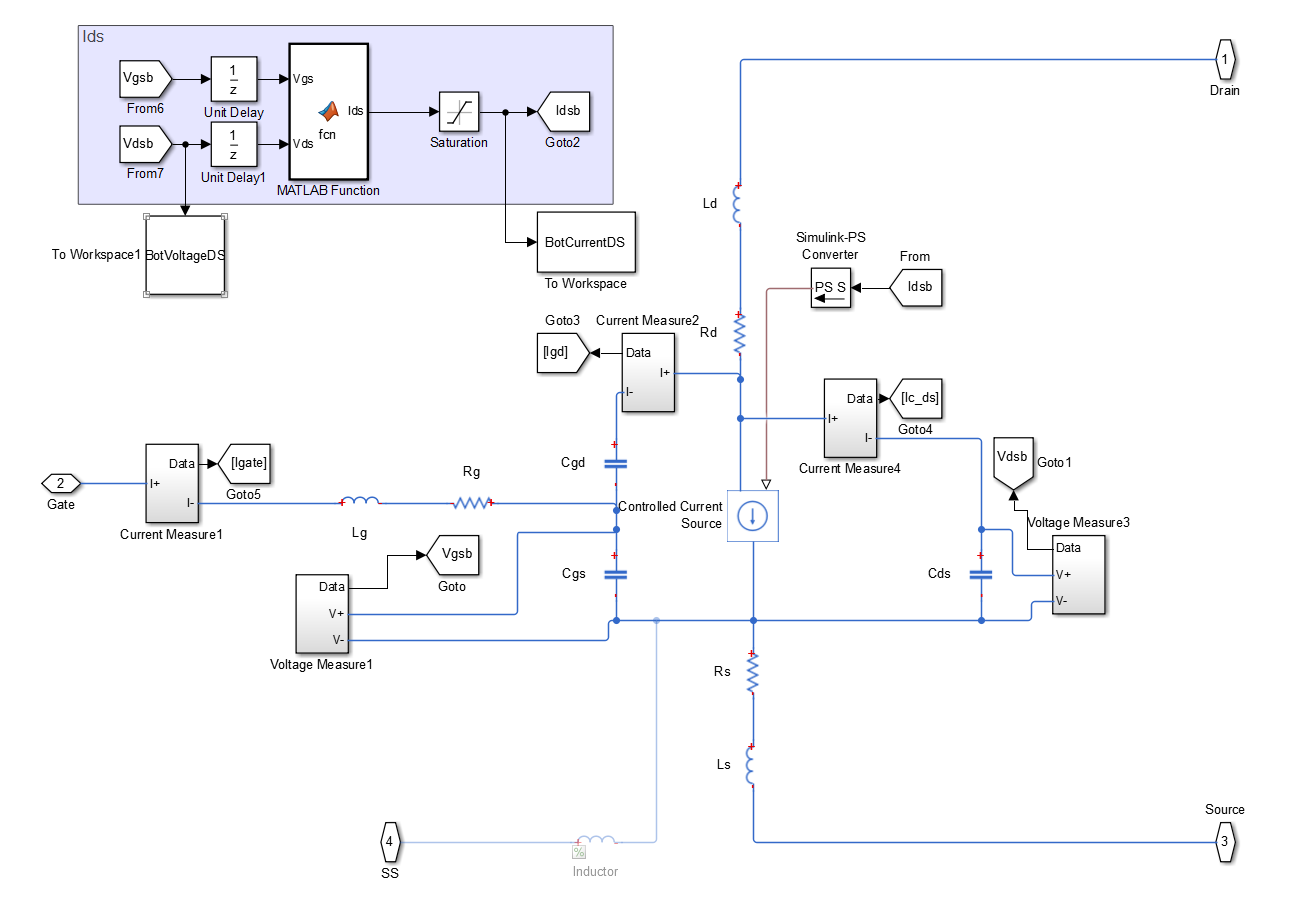


Figure 2: GaN Model

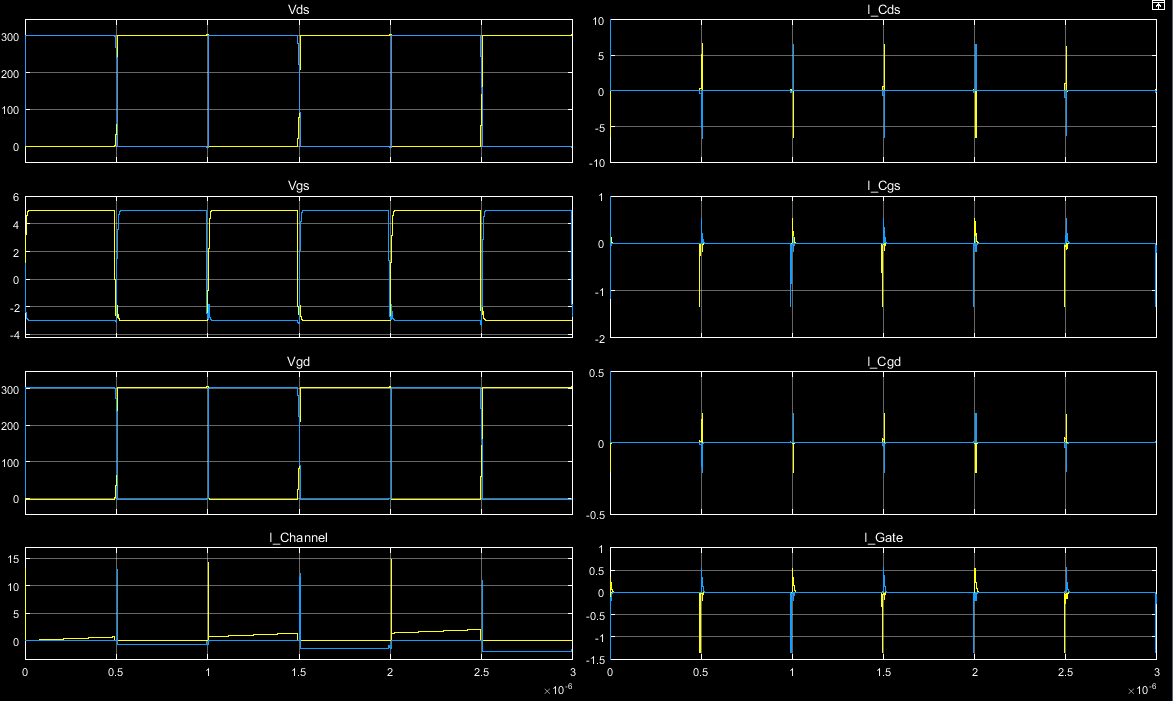


Figure 3: Top and Bottom Switch Characteristics (Yellow-> TOP, Blue-> BOTTOM)

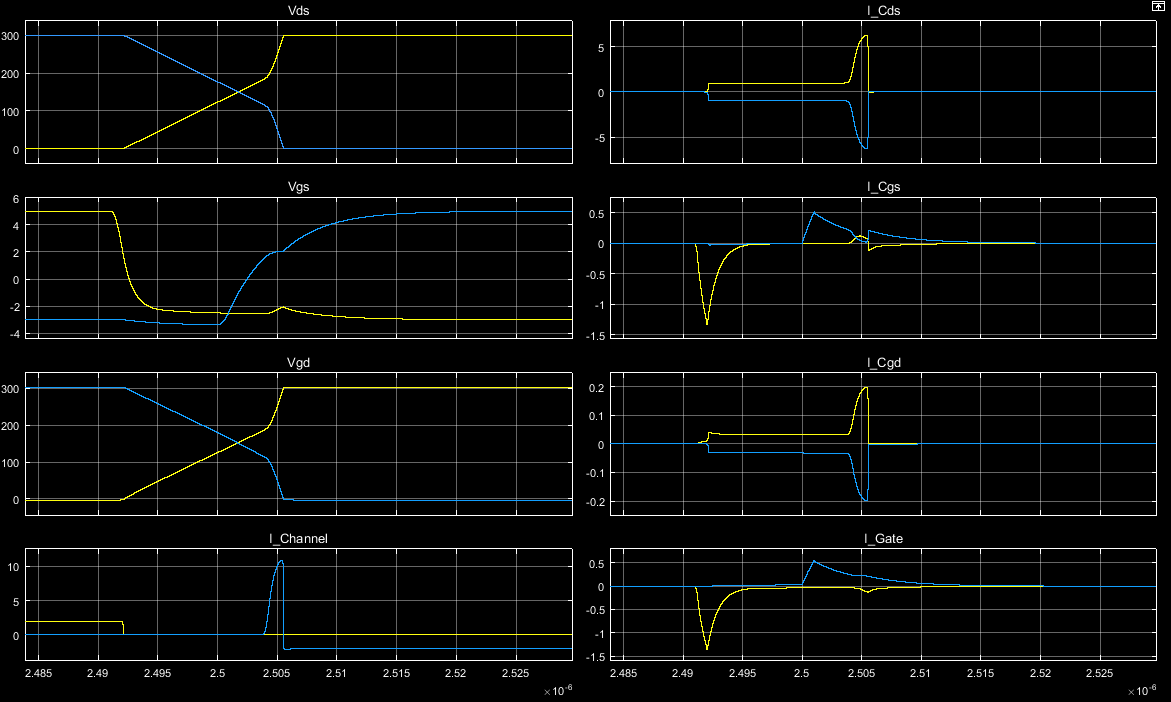


Figure 4: Top Switch Turn OFF, Bottom Switch Turn ON

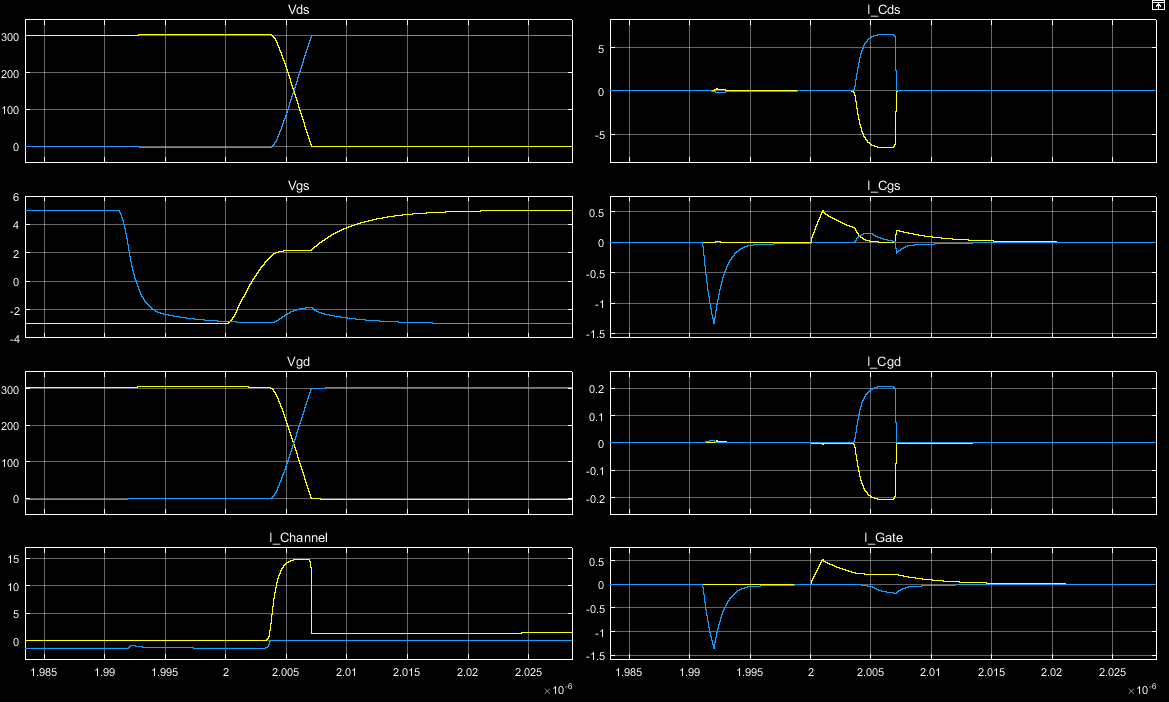


Figure 5: Top Switch Turn ON, Bottom Switch Turn OFF

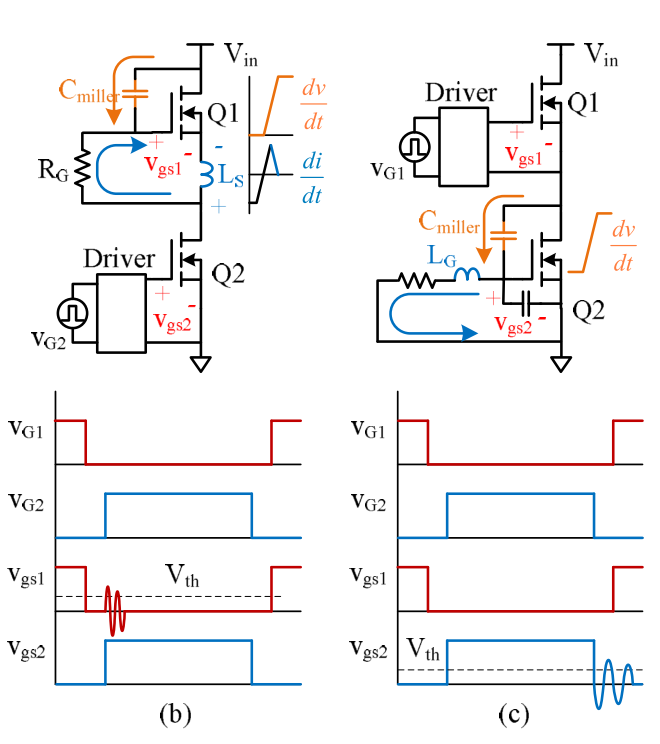


Figure 6: Reasons for Oscillation

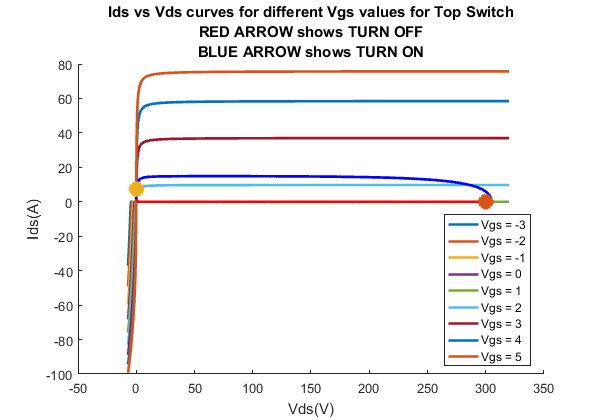


Figure 7: Top Switch Turn ON/OFF Curves

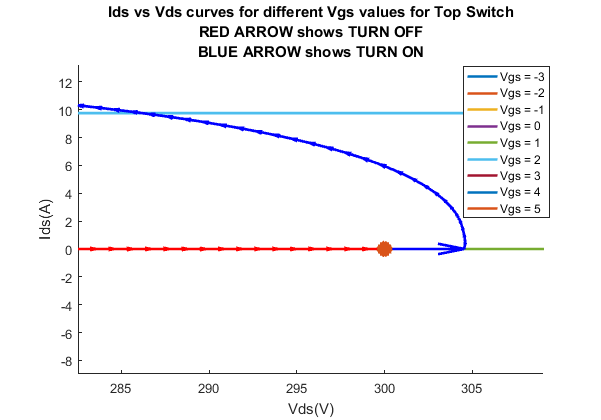


Figure 8: Top Switch Turn ON/OFF

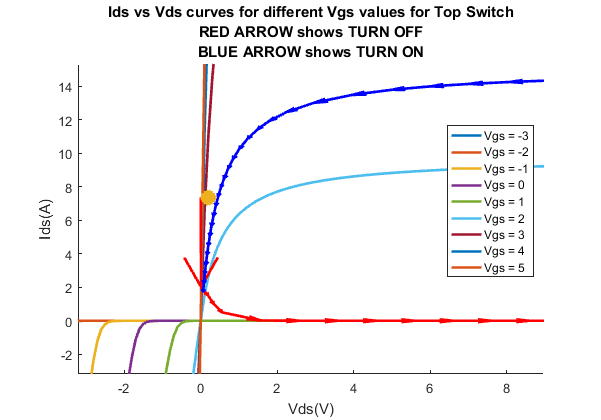


Figure 9: Top Switch Turn ON / OFF

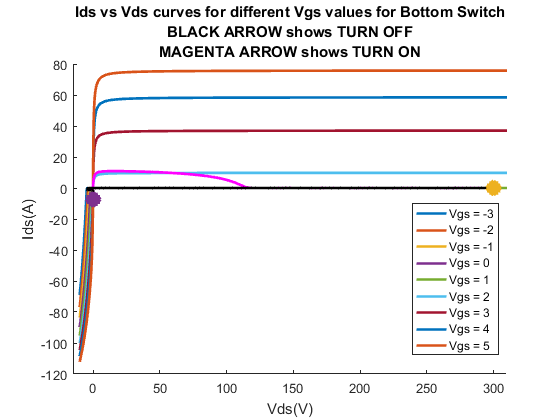


Figure 10: Bottom Switch Turn ON/OFF Curves

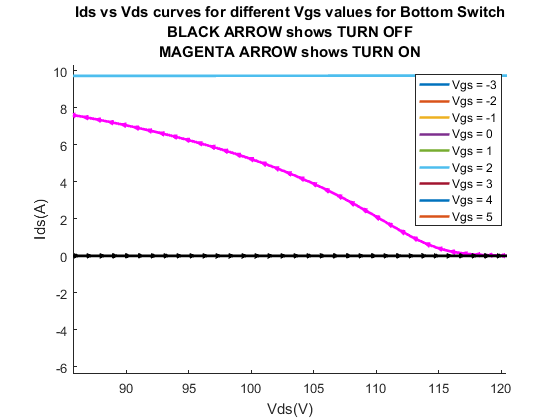


Figure 11: Bottom Switch Turn ON/OFF

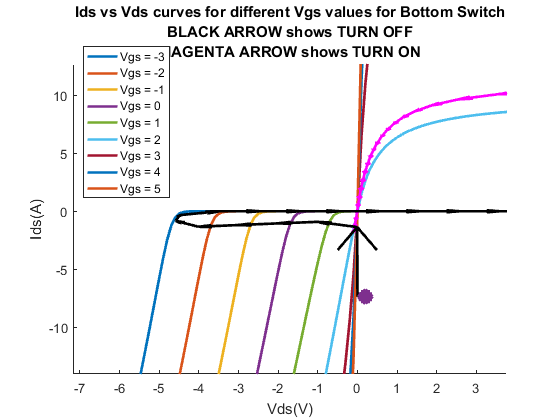


Figure 12: Bottom Switch Turn ON/OFF

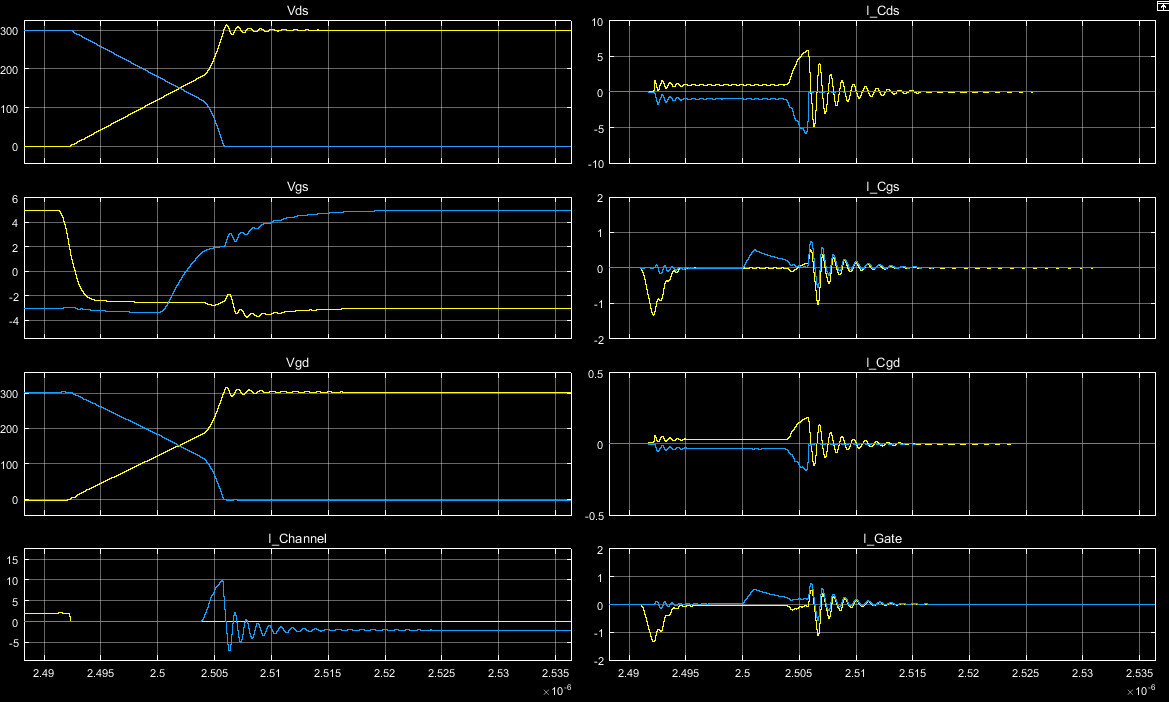


Figure 13: Top Switch Turn OFF, Bottom Switch Turn ON when Ls and Lg are connected

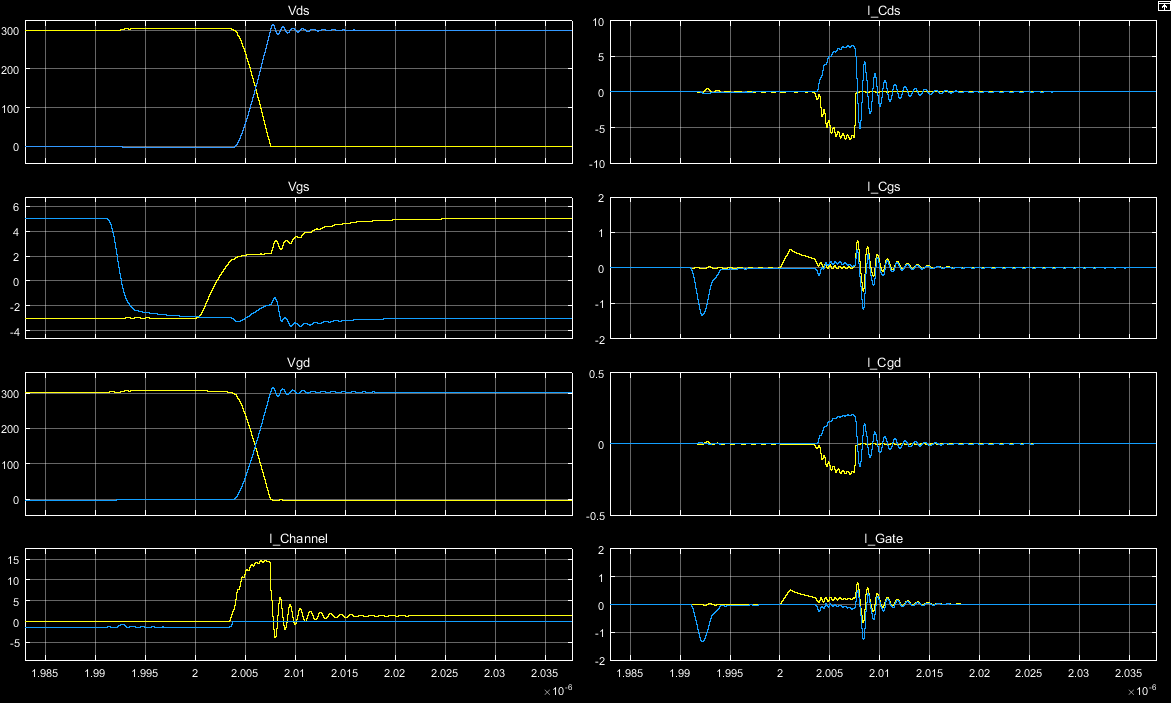


Figure 14: Top Switch Turn ON, Bottom Switch Turn ON when Ls and Lg are connected

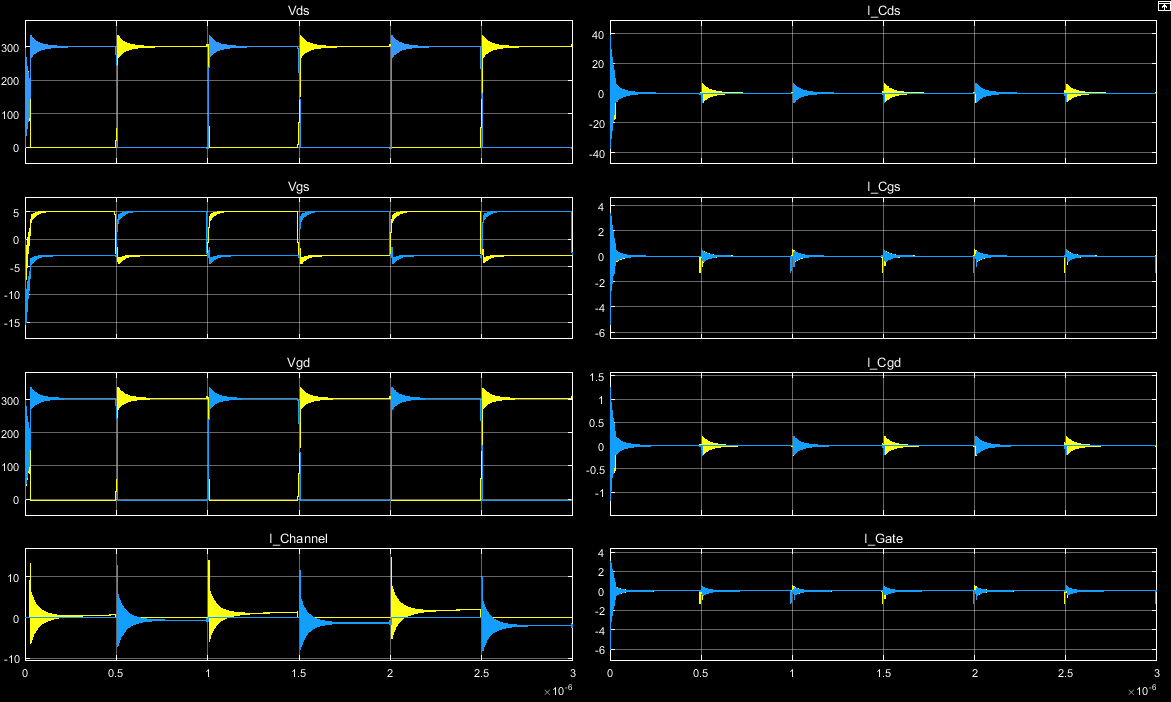


Figure 15: Switch Characteristics when Ld is connected too

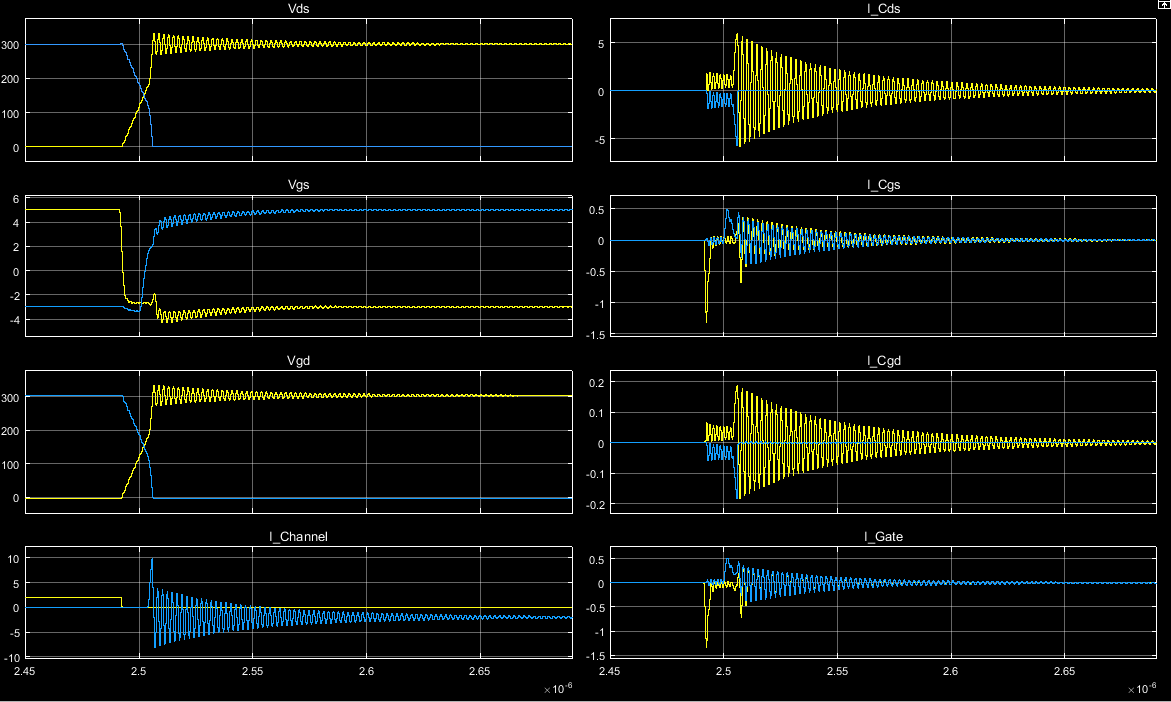


Figure 16: Top Switch Turn OFF, Bottom Switch Turn ON when all parasitic exist

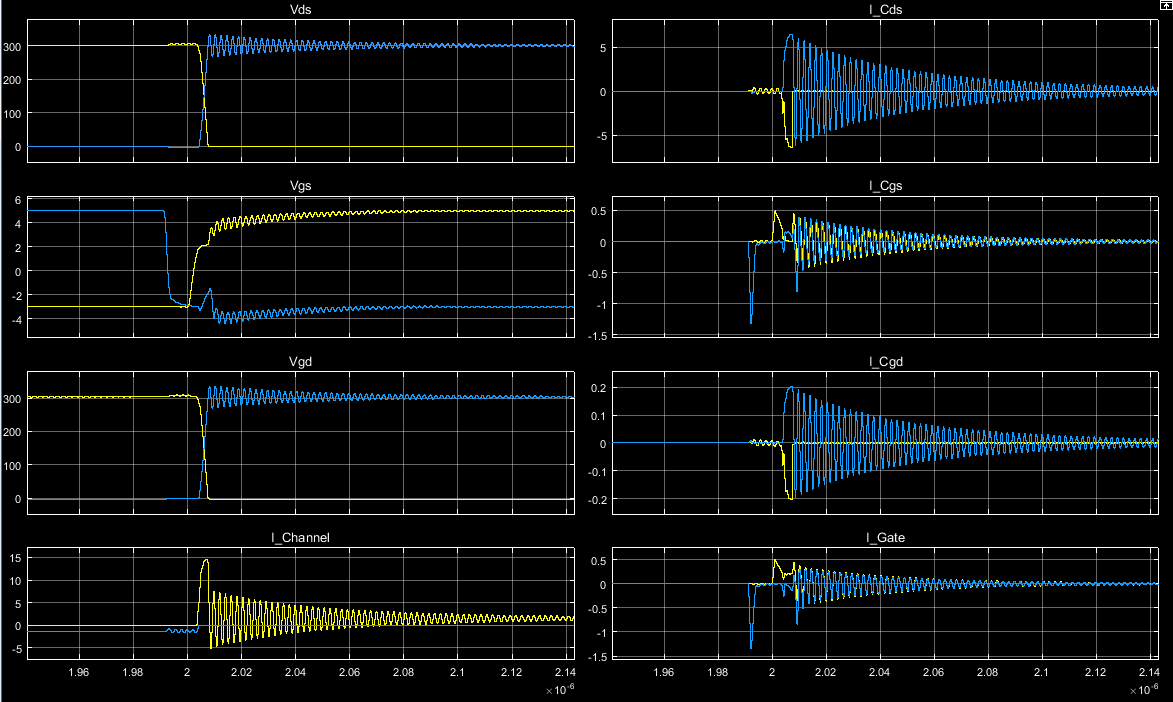


Figure 17: Top Switch Turn ON, Bottom Switch Turn OFF when all parasitic exist

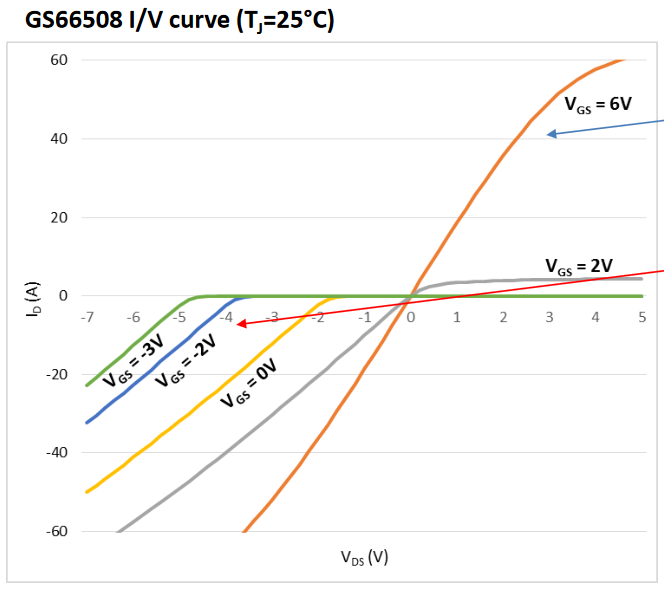


Figure 18: I-V Curve for GaNFET

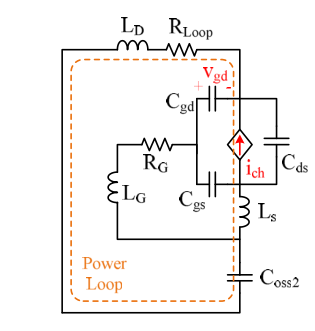


Figure 19: Small Signal Equivalent Circuit for Reverse Conduction

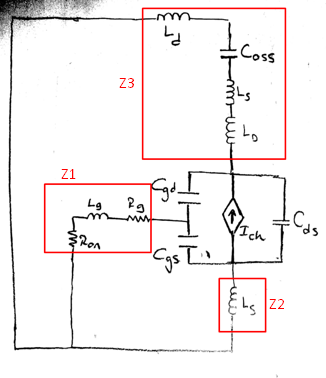


Figure 20: Our Small Signal Circuit for Reverse Conduction

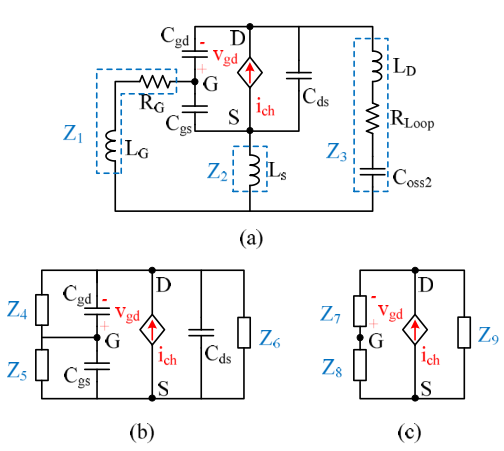


Figure 21: Simplification

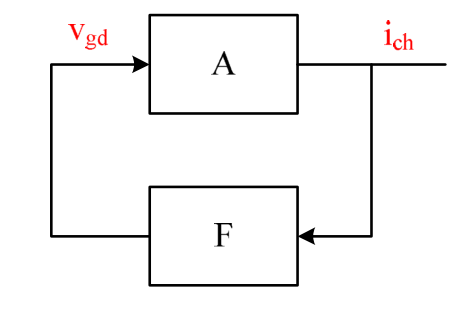


Figure 22: Block Diagram for Reverse Conduction

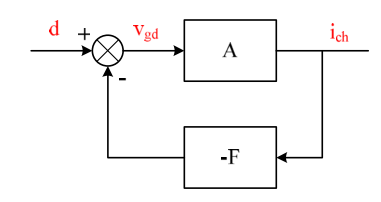


Figure 23: Proper Block Diagram for Reverse Conduction

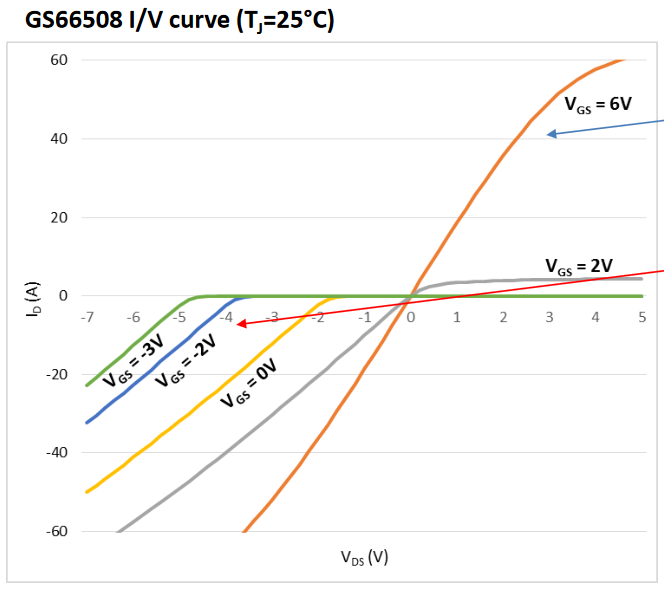


Figure 24: I-V Curve for GaNFET

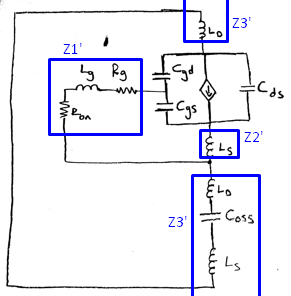


Figure 25: Small Signal Circuit for Forward Conduction

Same characteristic equations for open loop transfer functions!



Figure 26: Pole Zero Map for Closed Loop Transfer Function



Figure 27: Pole Zero Map - Zoomed

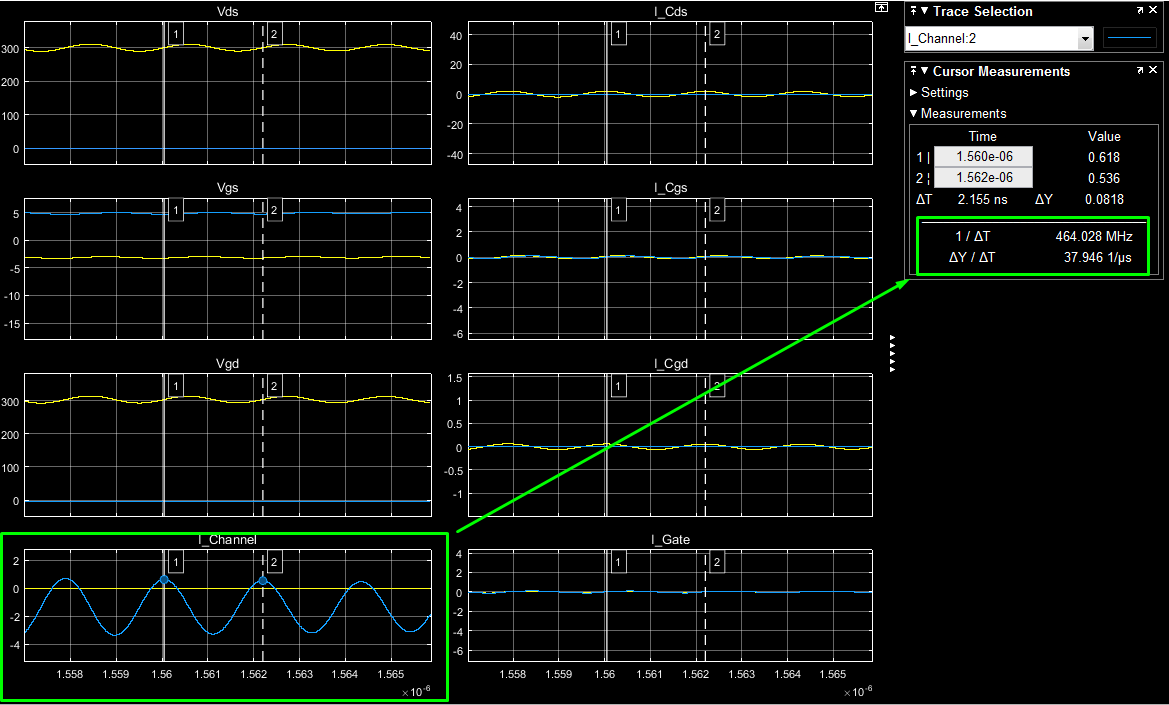


Figure 28: Reverse Conduction Oscillation

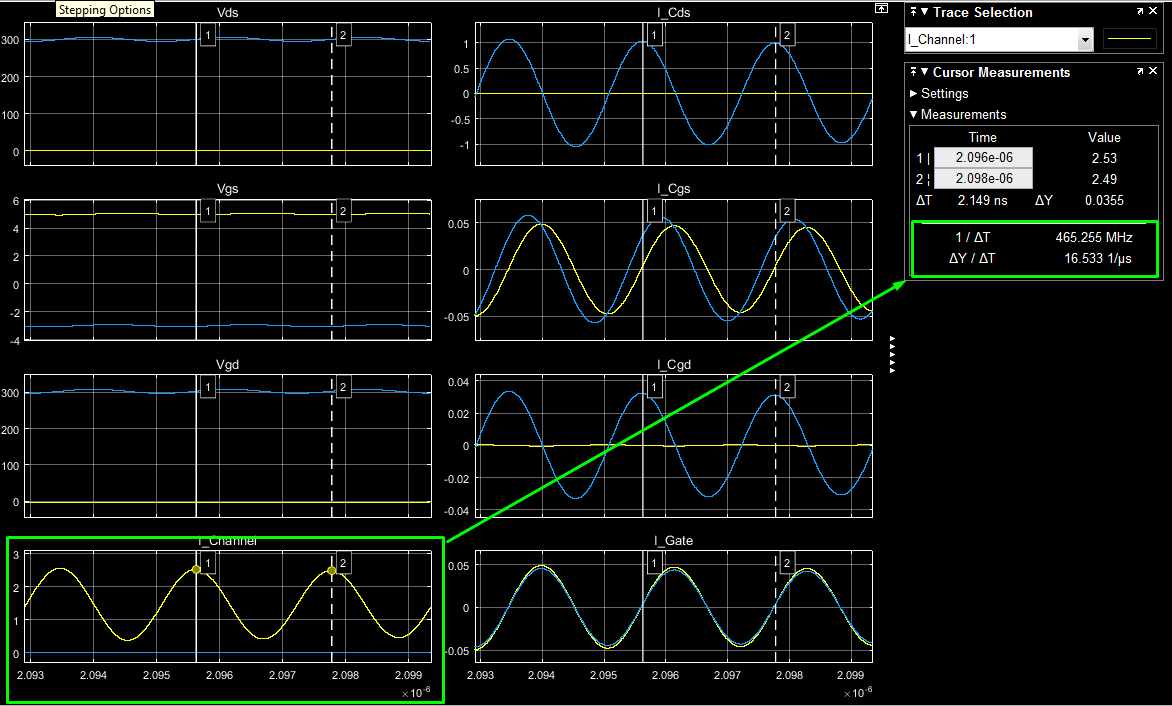


Figure 29: Forward Conduction Oscillation

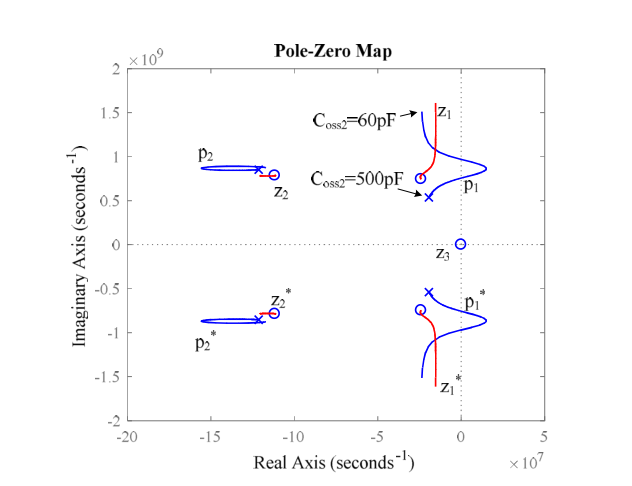


Figure 30: Root-Locus

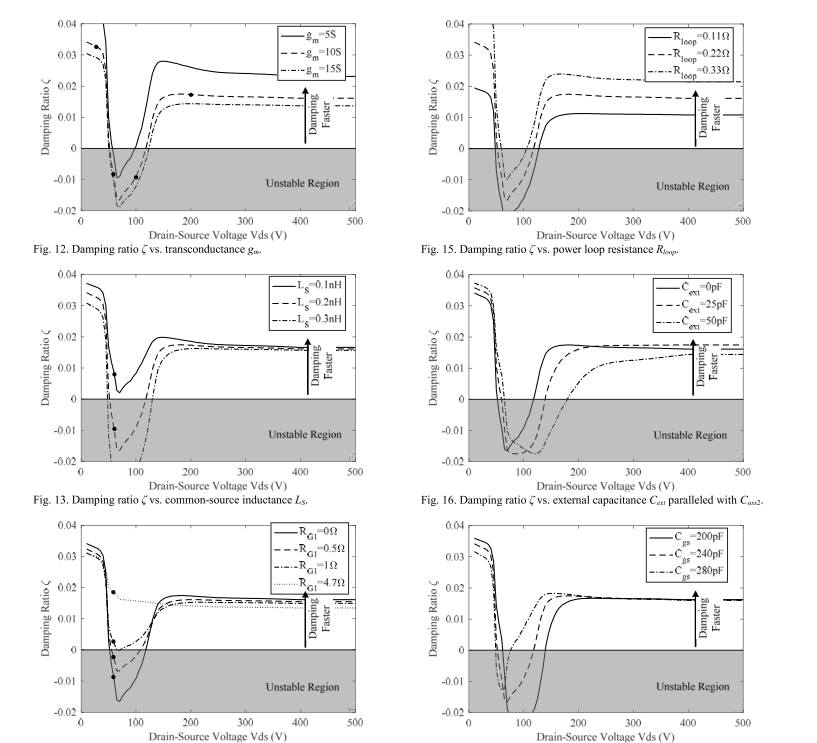


Figure : Damping Control

Next Week

* Capacitance Modelling

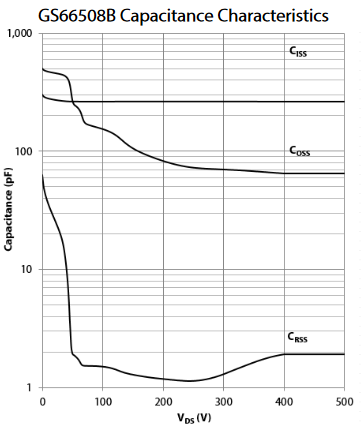


Figure 32: Ciss, Coss, Crss vs Vds Graph

* Loss Analyzation
* Stability Analyzation