Date: 15.04.2019

Attendees: Mesut Uğur, Furkan Karakaya

Location: Electrical Machines Laboratory

Target: V1.3 Gate Driver Board (#1)

Test type: Double Pulse Test

Aims before the test:

1. To apply the remaining DPTs for load bottom case.

2. To observe and investigate the secondary peaks on V_{gs}

3. To apply DPTs with load top case to verify the design before inverter tests.

Conditions: All-phases, 22 Ohm Ron, 2 Ohm Roff. 0-300V VDC. Load: Stage-2

Steps:

1. The remaining DPTs are applied by observing Vds (turn-off) and Vgs (false-turn-on region) separately. The load is connected to bottom switch and Vds and Vgs are observed from the bottom switch for all tests.

2. The weird peaks which had emerged 100ns after the top switch turn-off are investigated. They seem to be absent and it is concluded that they are measurement noise or such.

3. DPTs are applied with load connected to top switch for all phases, from 0V to 300V.

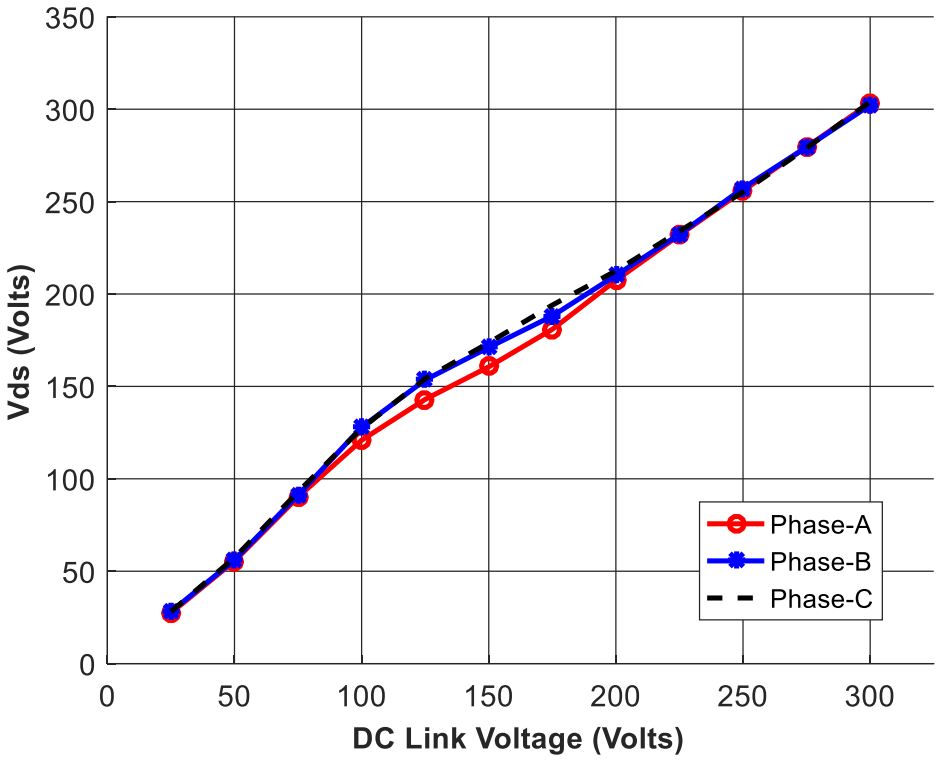
4. Phase-B is indirectly tested for isolation, and no problem occured.

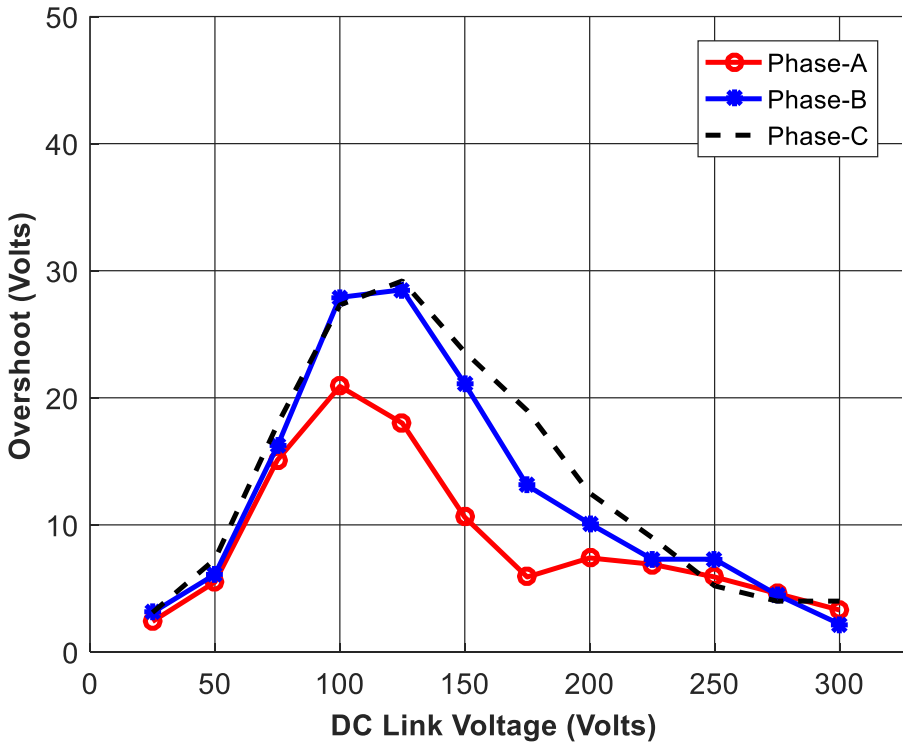
What to do next:

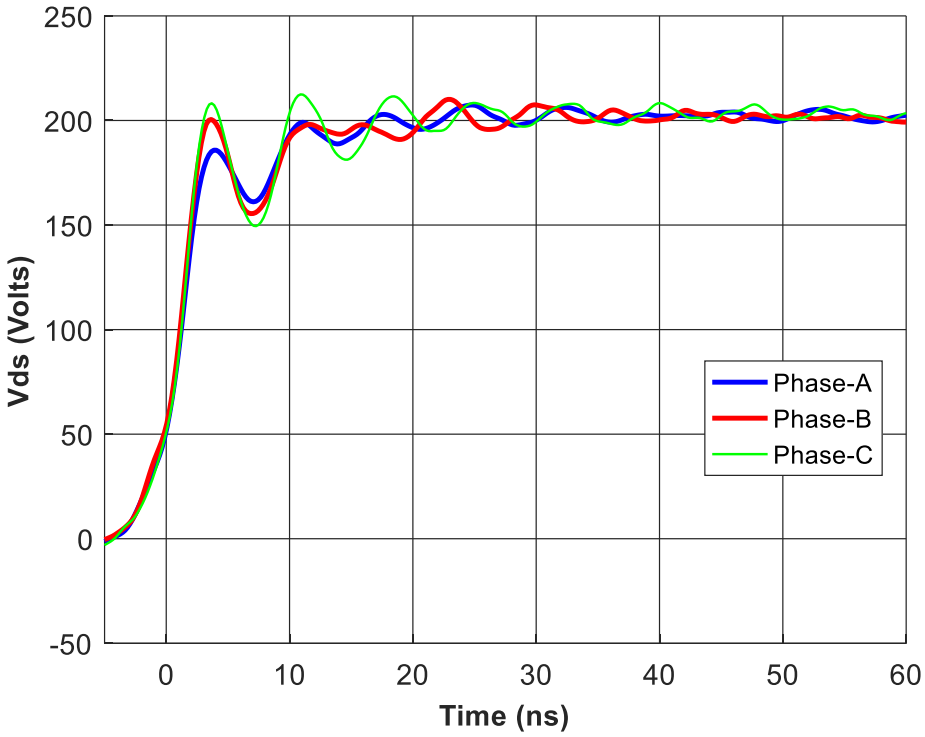
1. Inverter tests will be applied.

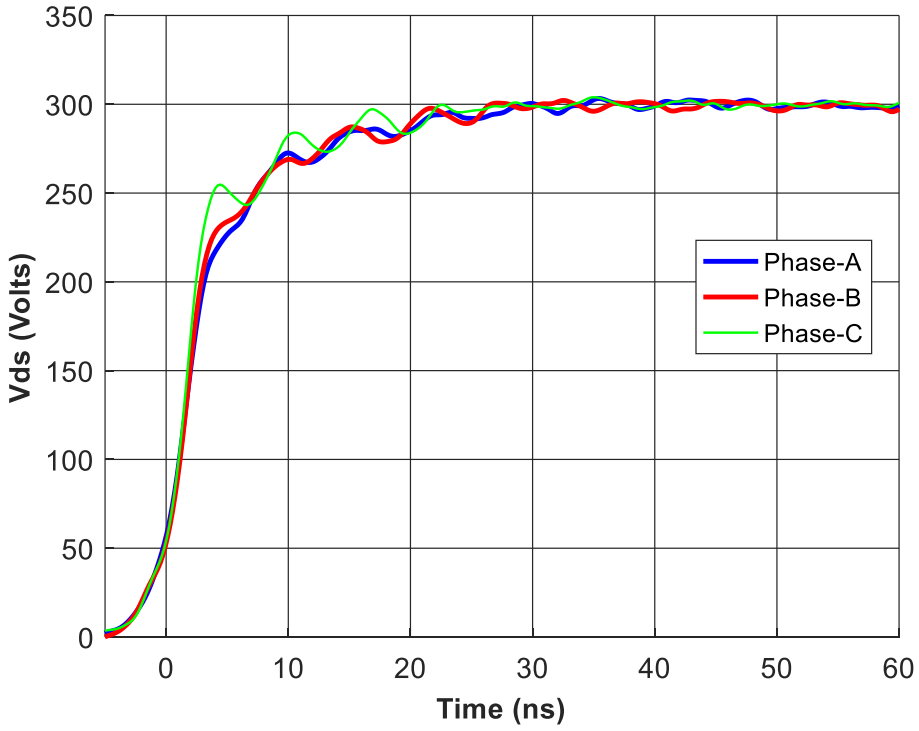
Results:

1. Vds Overshoot

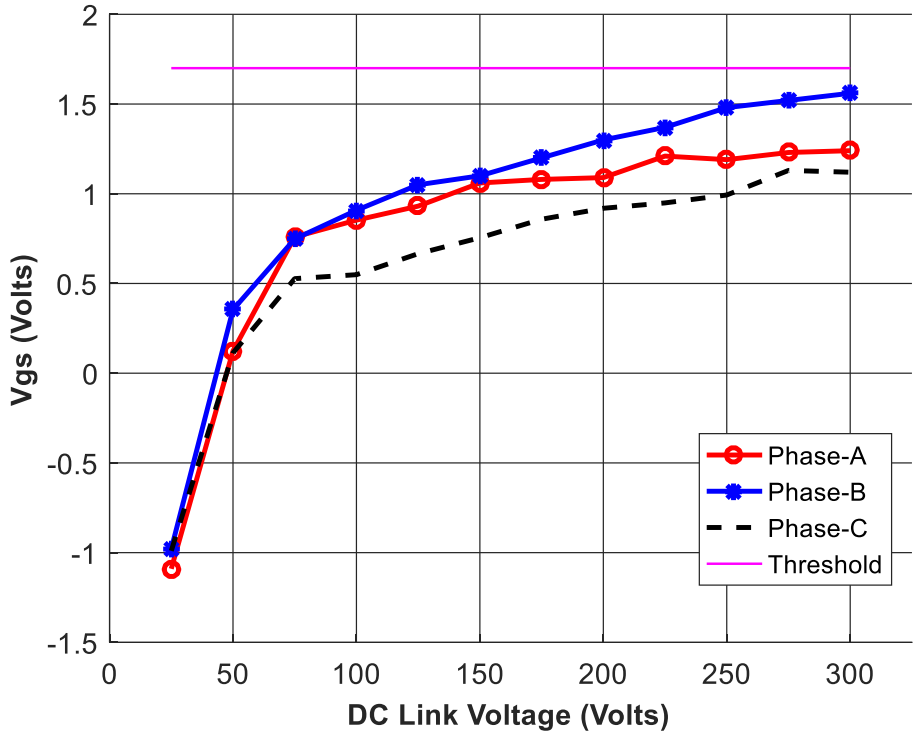


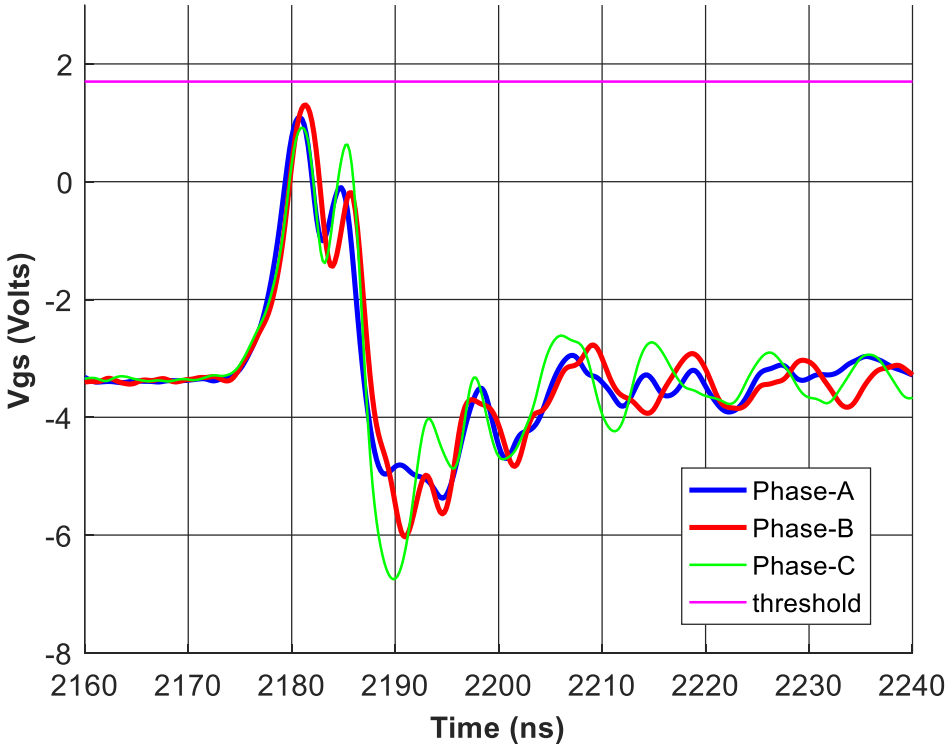


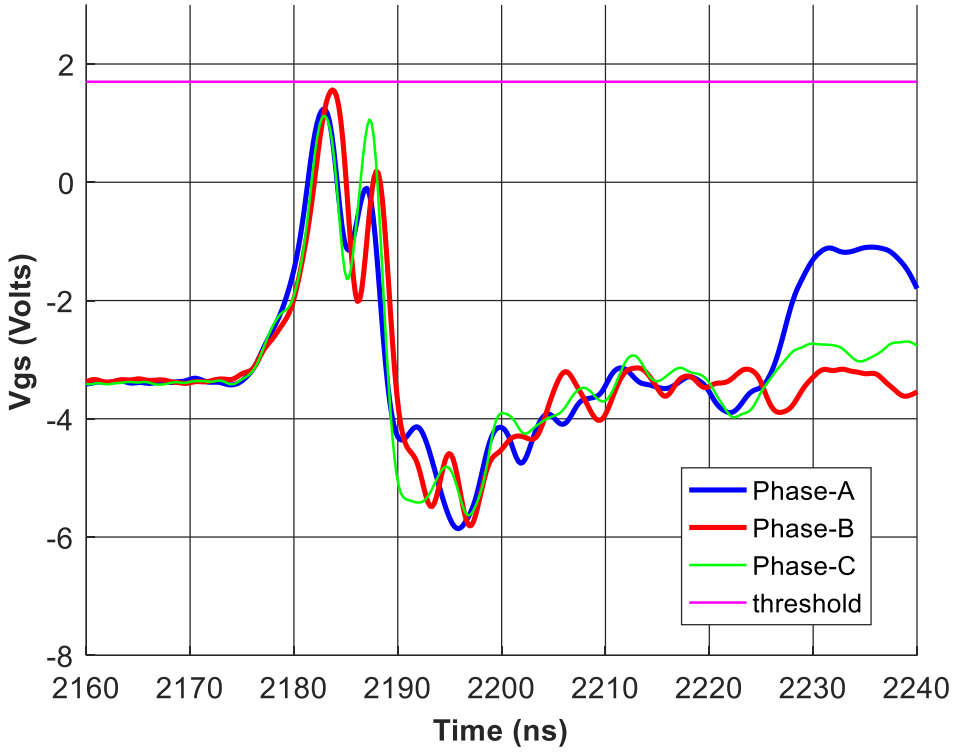

250
200
150
100
50
0
-50
Vds (Volts)
0
10
20
30
40
50
60
Time (ns)
Phase-A
Phase-B
Phase-C


350
300
250
200
150
100
50
0
Vds (Volts)
0
10
20
30
40
50
60
Time (ns)
Phase-A
Phase-B
Phase-C

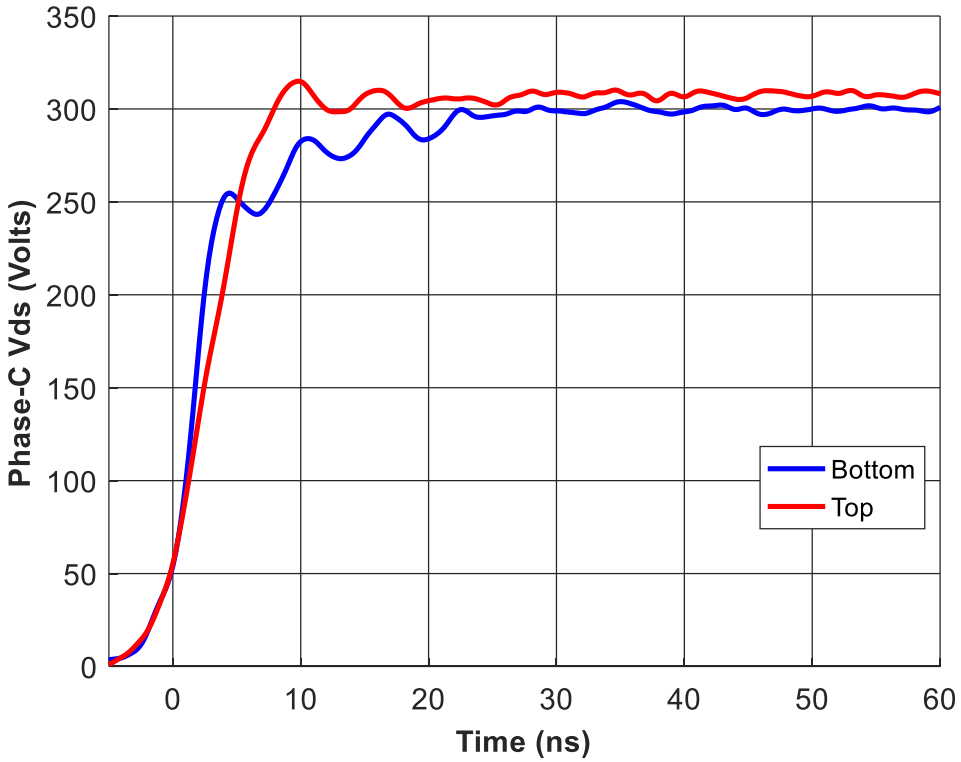
2. Vgs False-Turn-On

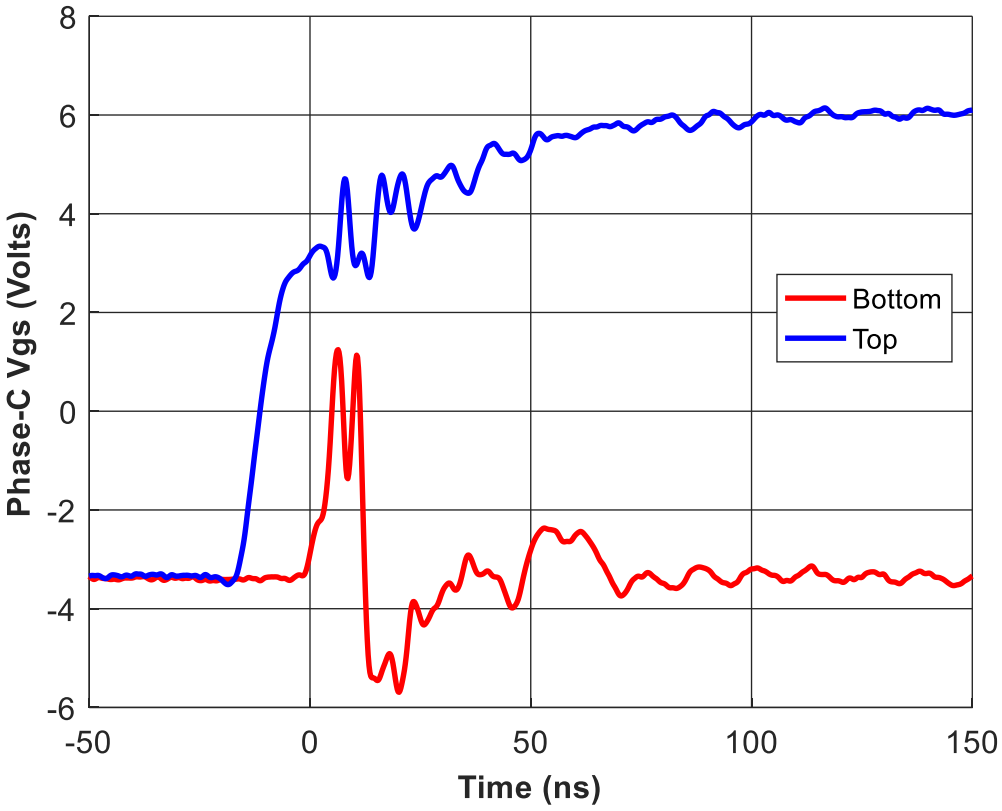


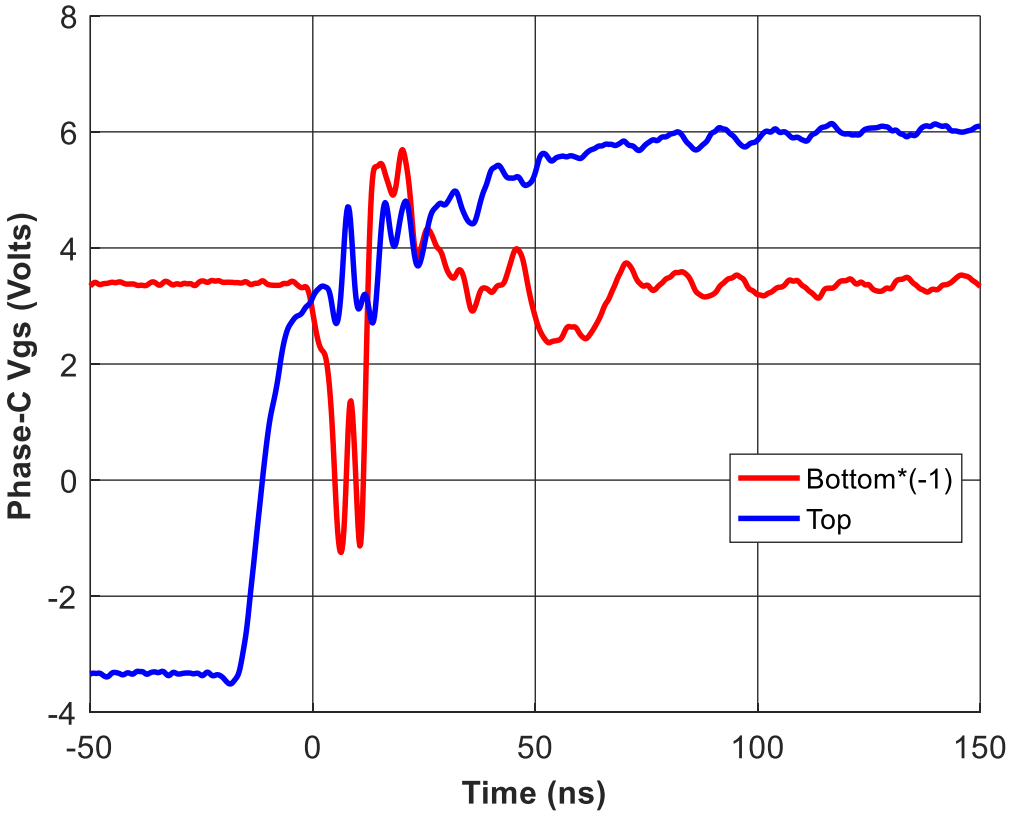




3. Load top case




8
6
4
2
0
-2
-4
-6
-50
0
50
100
150
Phase-C Vgs (Volts)
Time (ns)
Bottom
Top


8
6
4
2
0
-2
-4
-50
0
50
100
150
Phase-C Vgs (Volts)
Time (ns)
Bottom*(-1)
Top