LTspice Model
DCDC converter
TEXAS INSTRUMENTS
LM34966QPWPRQ1

Model Information

Model	A macro model
Call Name	MDC_LM34966QPWPRQ1_LT
Pin Assign	1:BIAS 2:NC 3:VCC 4:GATE 5:PGND 6:AGND 7:CS 8:COMP 9:VDD 10:FB 11:SS 12:RT 13:PGOOD 14:EN_UVLO_SYNC 15:EP
File List	Model Library MDC_LM34966QPWPRQ1_LT01.lib Model Report MDC_LM34966QPWPRQ1_LT.pdf(this file)

Verified Simulator Version   LTspice

Note

References

The information which was used for modeling is as follow:

[Data Sheet]
- ●Date/Version   SEPTEMBER 2020
- ●Product name   LM34966QPWPRQ1
- ●Company name   TEXAS INSTRUMENTS

[Characteristics listed]
- ●Characteristics   PWM Operation(Input=6V Output=24V IOUT=2A)
  Overvoltage Protection
  Overload Protection
  UVLO Shutdown and Clock synchronization
  UVLO Standby and Clock synchronization

Simulation Condition

This table shows the range of evaluated simulation range that was not occurs any convergence problems in this area.

Item	Condition	Unit
Temperature	25	deg C

Model Functions Table

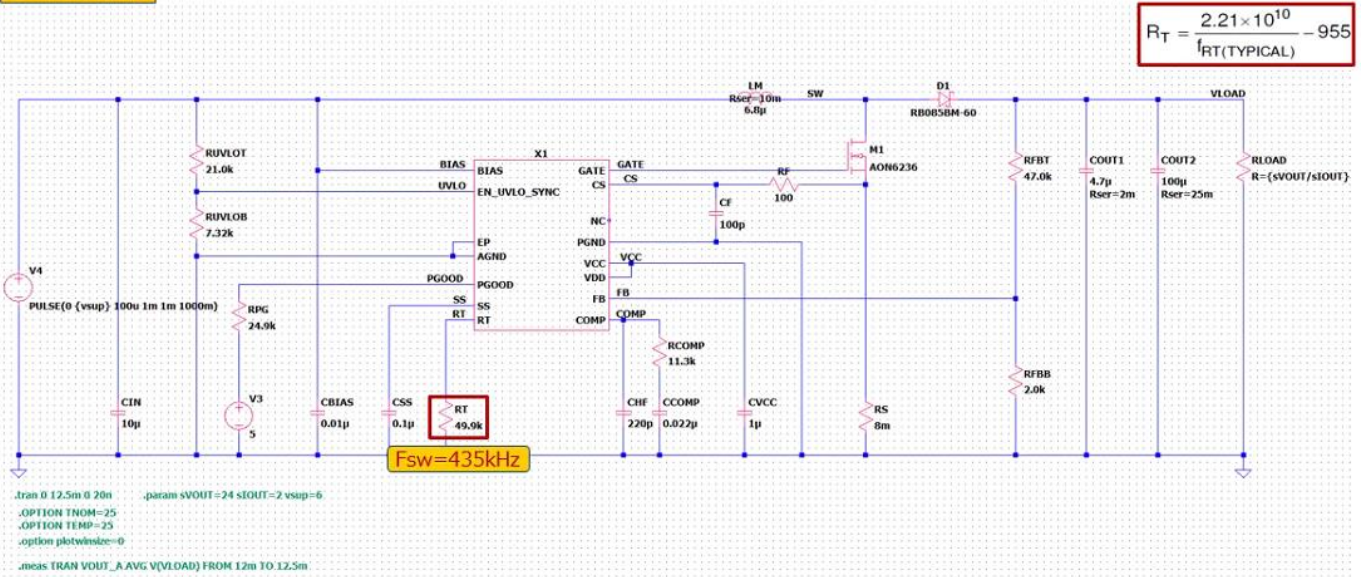| Function	Model
Dynamically programmable switching frequency from 100 kHz to 500 kHz	○
Optional clock synchronization	○
Hiccup mode overload protection	○note1
OVP protection	○
Adjustable soft start	○
PGOOD indicator	○

Note 1
This model does not have a function to count the waiting time after transition to Hiccup mode.
An OFF latch function is installed as an alternative function.

PWM Operation(Input=6V Output=24V IOUT=2A)

Simulation results are following.
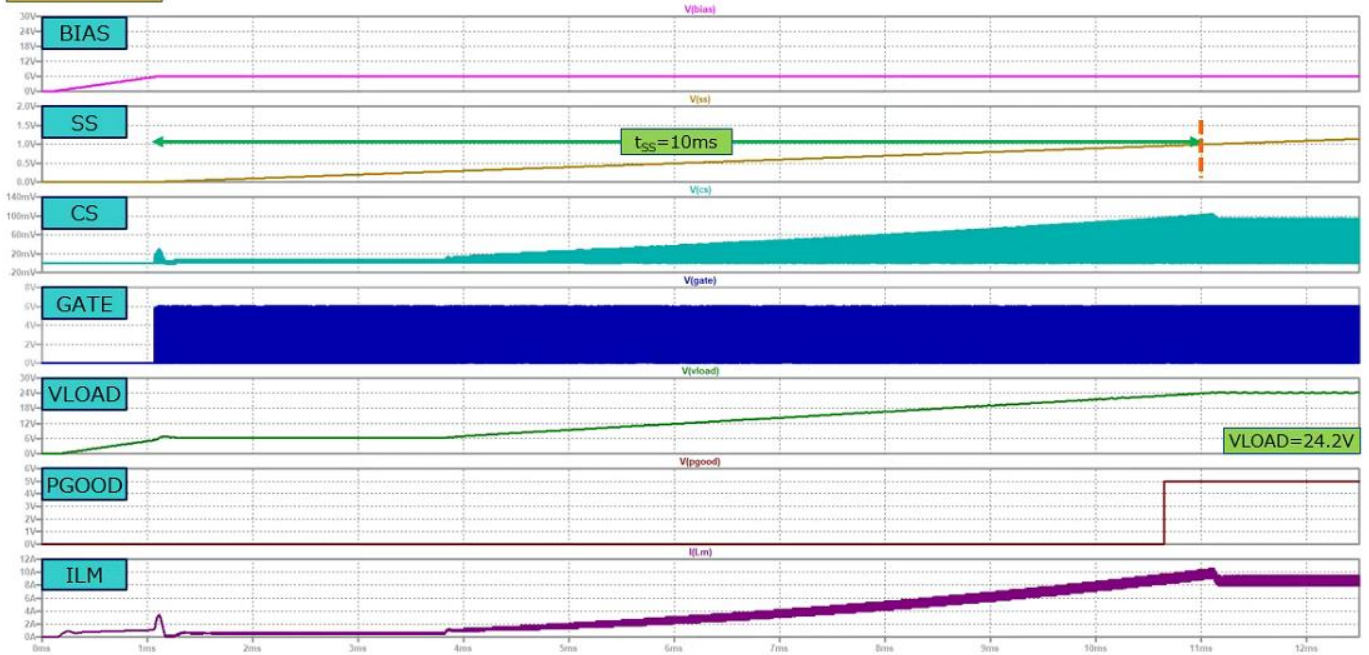Explanatory notes　　— : simulated

Testbench

$$R_T = \frac{2.21 \times 10^{10}}{f_{RT(TYPICAL)}} - 955$$

.tran 0 12.5m 0 20n   .param sVOUT=24 sIOUT=2 vsup=6
.OPTION TNOM=25
.OPTION TEMP=25
.option plotwinsize=0

.meas TRAN VOUT_A AVG V(VLOAD) FROM 12m TO 12.5m

PWM Operation(Input=6V Output=24V IOUT=2A)

Simulation results are following.
Explanatory notes　　─ : simulated

Sim result

PWM Operation(Input=6V Output=24V IOUT=2A)

Simulation results are following.
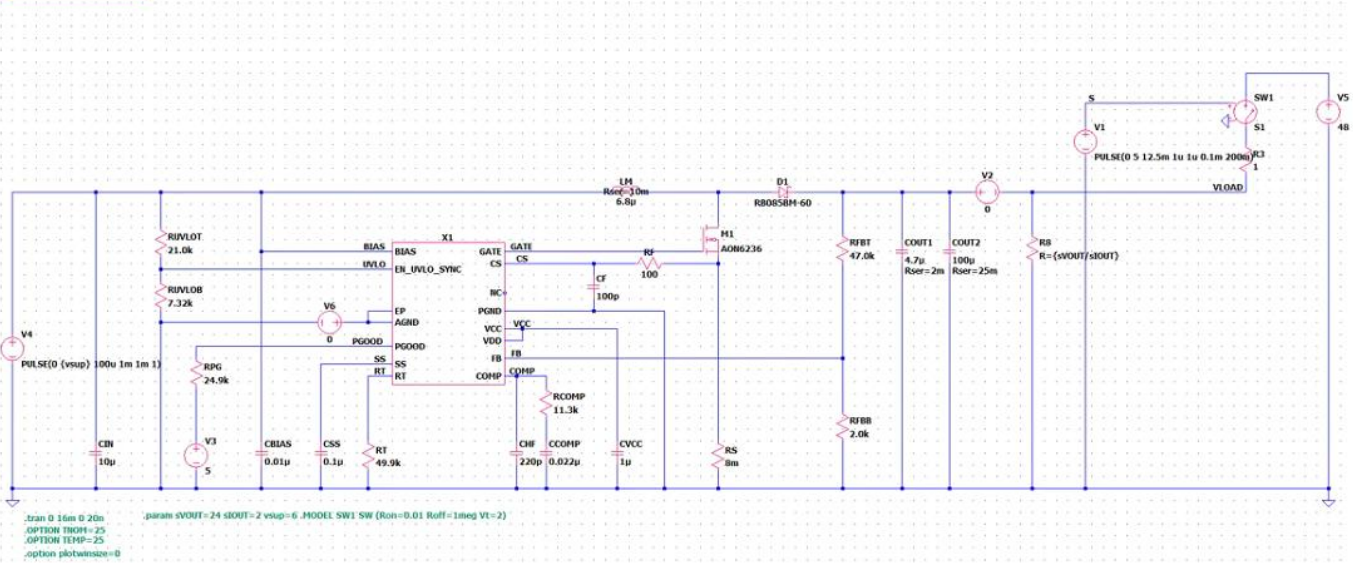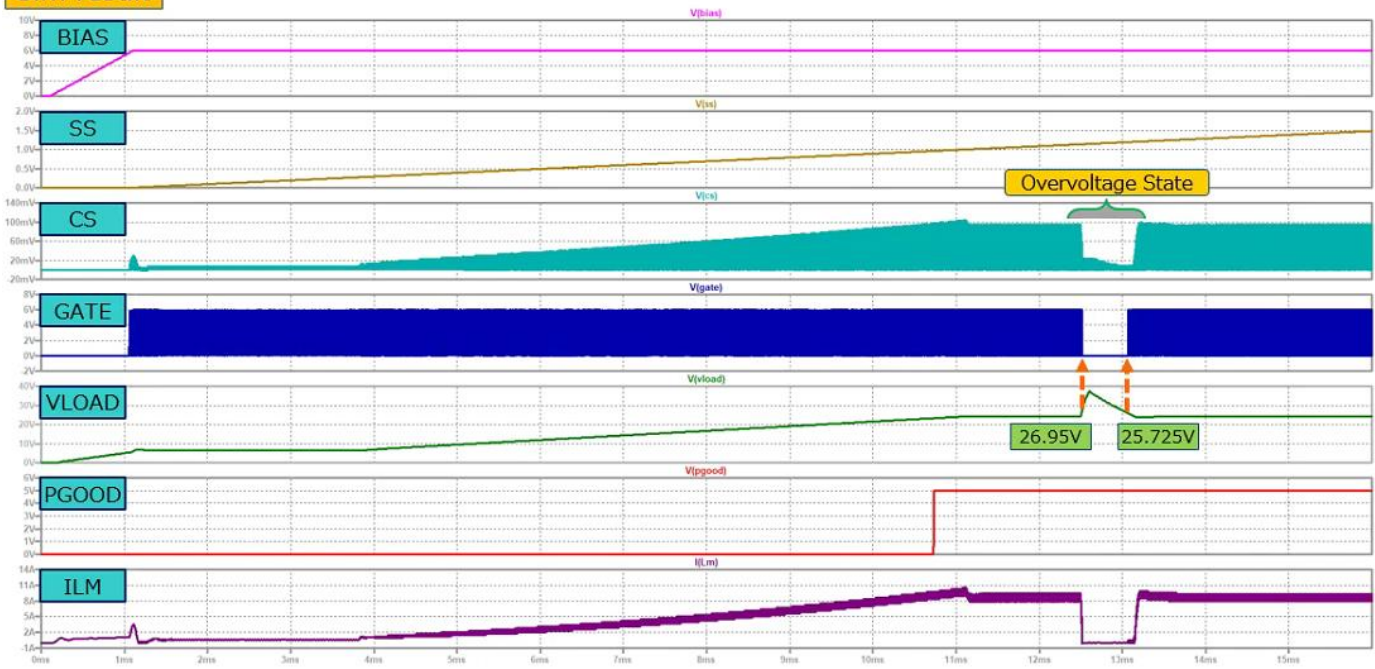Explanatory notes　　─ : simulated

Sim result

Apr 03,2023 Rev 1.0

Overvoltage Protection

Simulation results are following.
Explanatory notes 　 — : simulated

Overvoltage Protection

Simulation results are following.
Explanatory notes 　 — : simulated
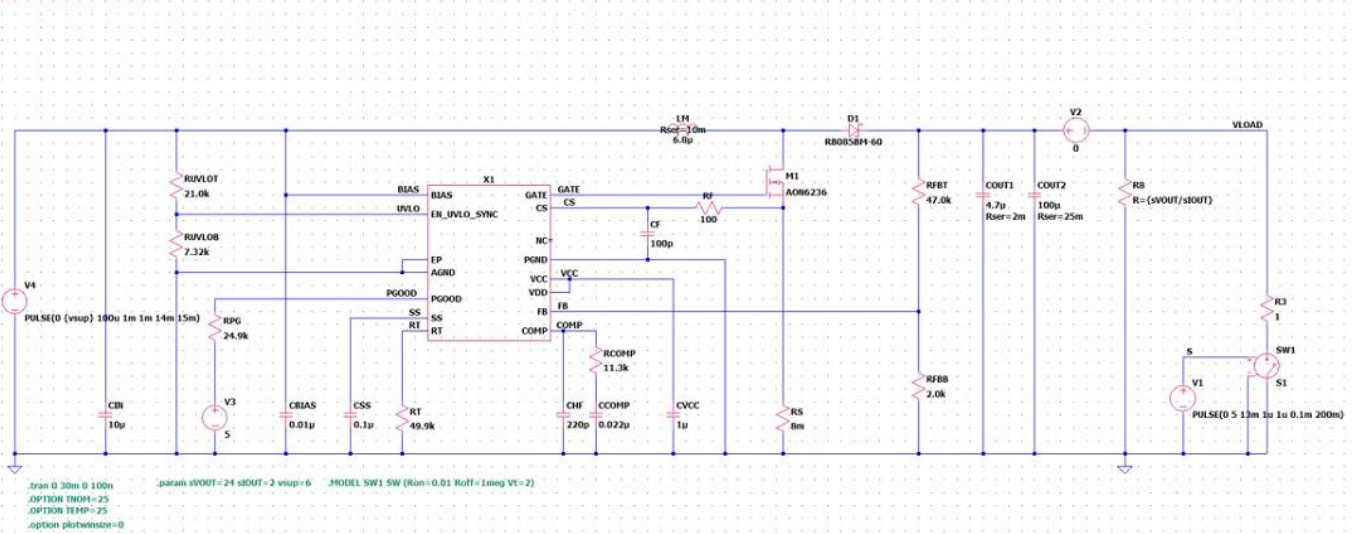
Overload Protection
Simulation results are following.
Explanatory notes   — : simulated

Overload Protection
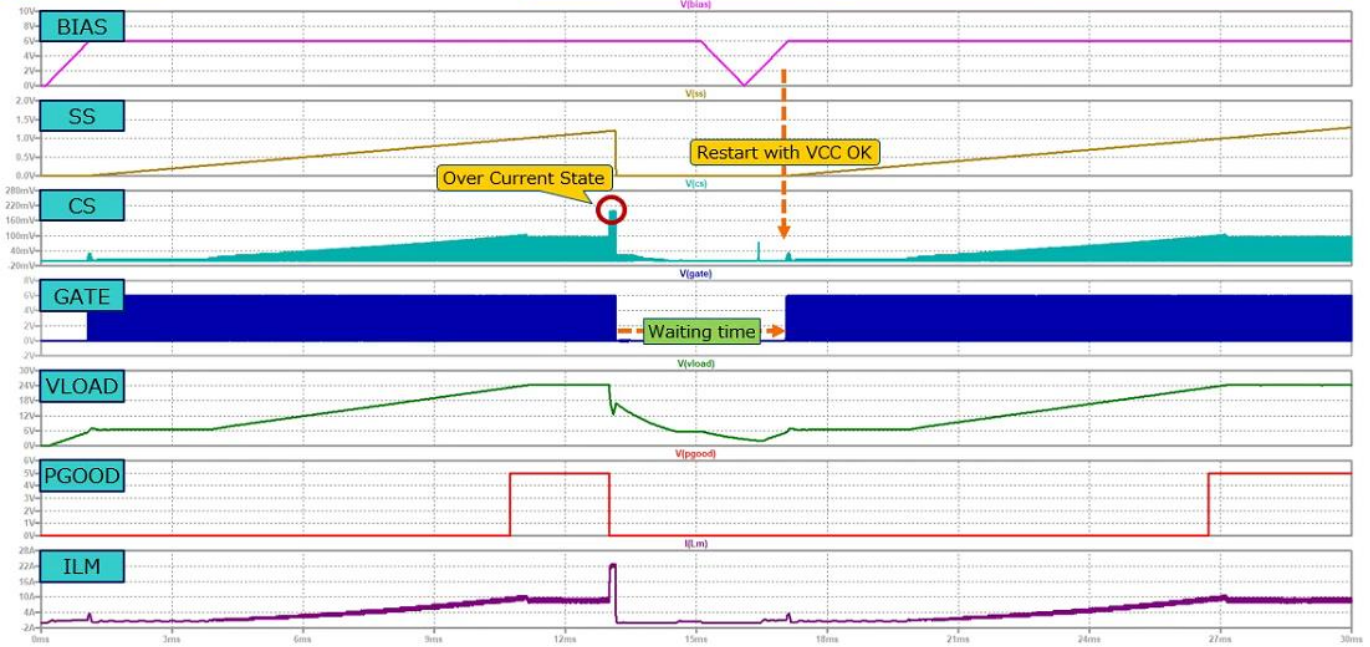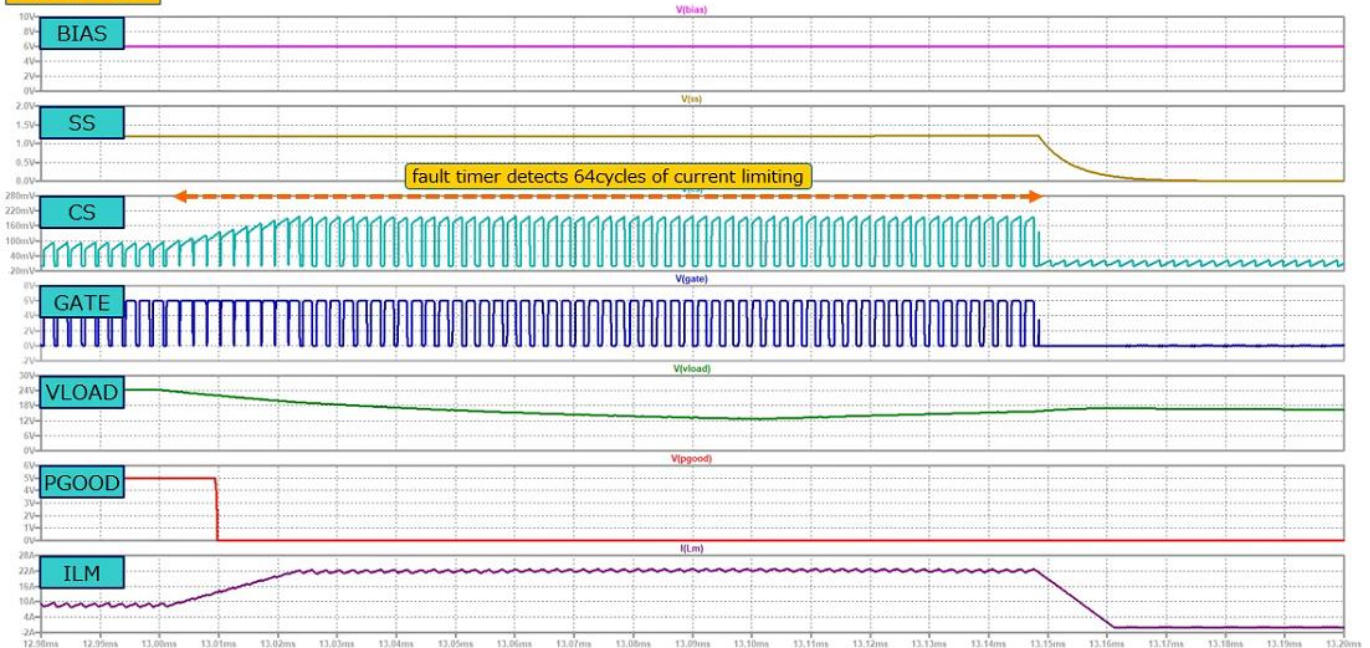
Simulation results are following.
Explanatory notes　　— : simulated

Overcurrent Protection(Input=12V Output=5.0V IOUT=2.1A⇒5.0A⇒2.1A)

Simulation results are following.
Explanatory notes　　— : simulated

UVLO Shutdown and Clock synchronization

Simulation results are following.

Explanatory notes　　− : simulated

Testbench

EXFsw=305kHz

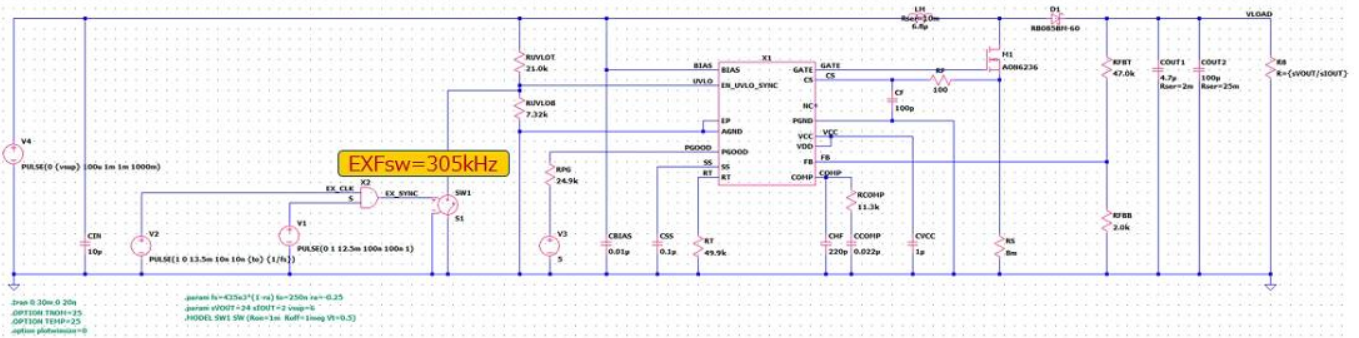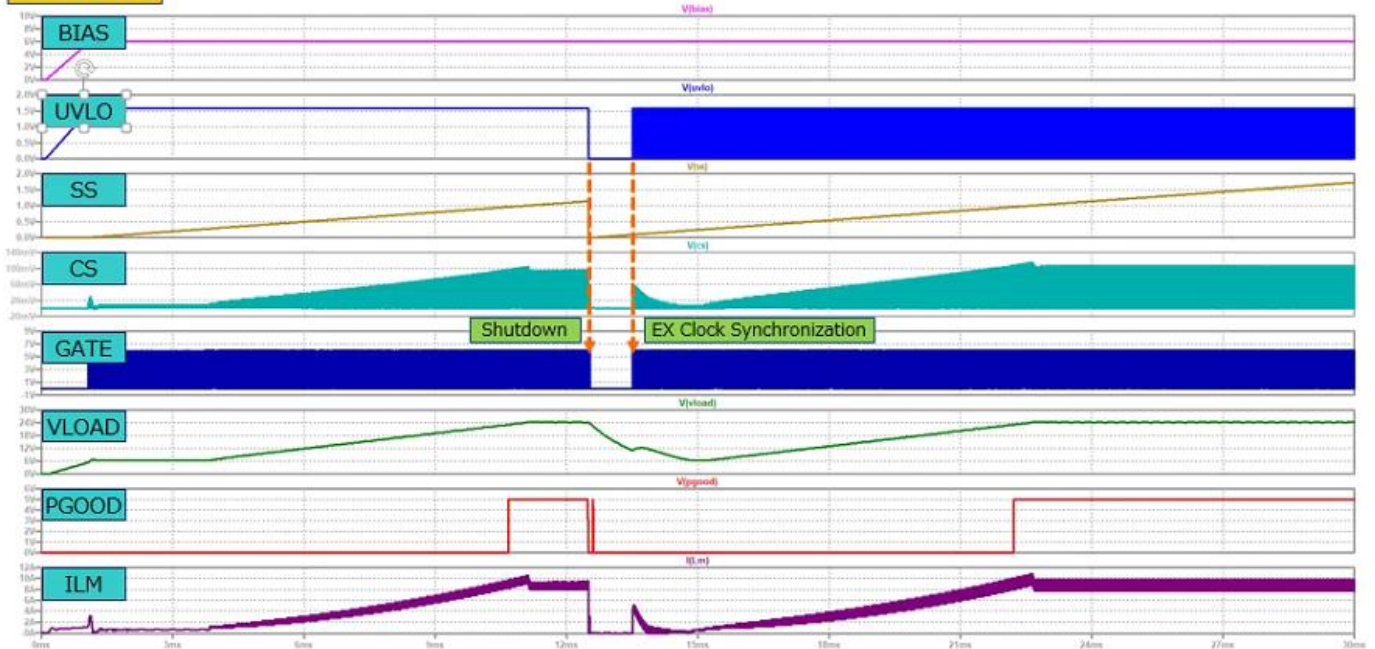UVLO Shutdown and Clock synchronization

Simulation results are following.
Explanatory notes　　— : simulated

UVLO Shutdown and Clock synchronization

Simulation results are following.
Explanatory notes　　— : simulated

UVLO Standby and Clock synchronization

Simulation results are following.
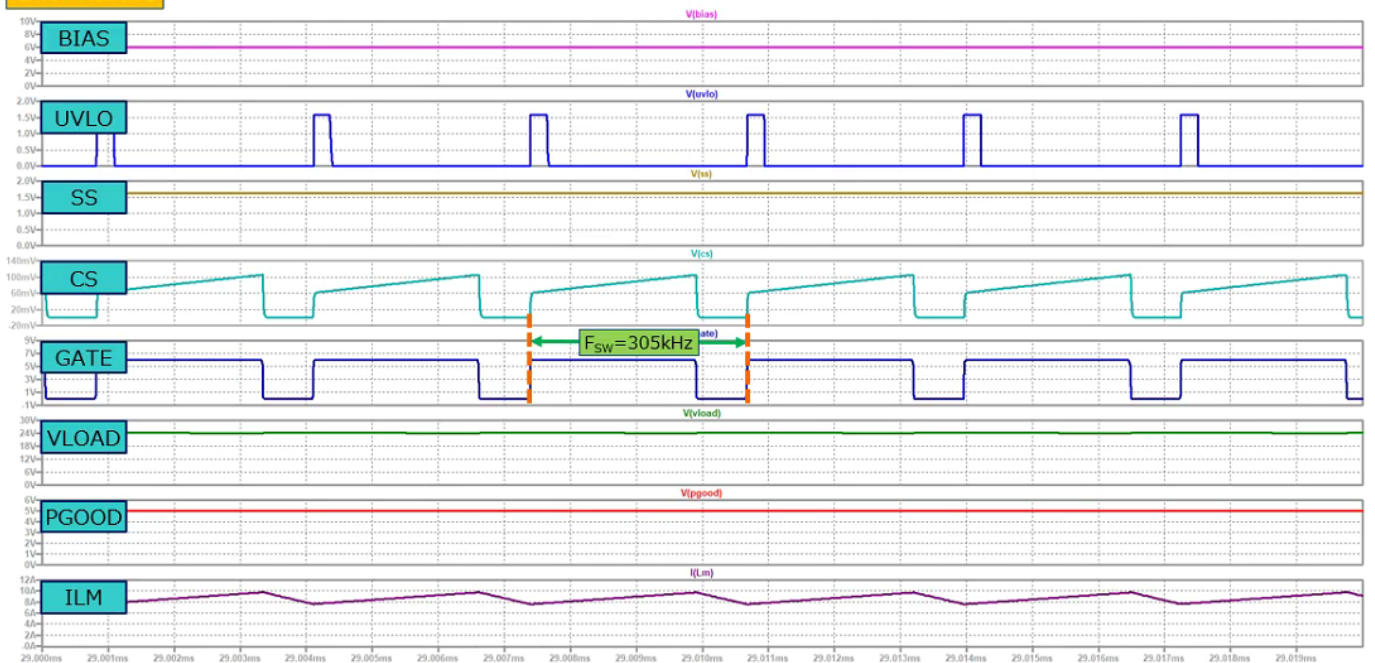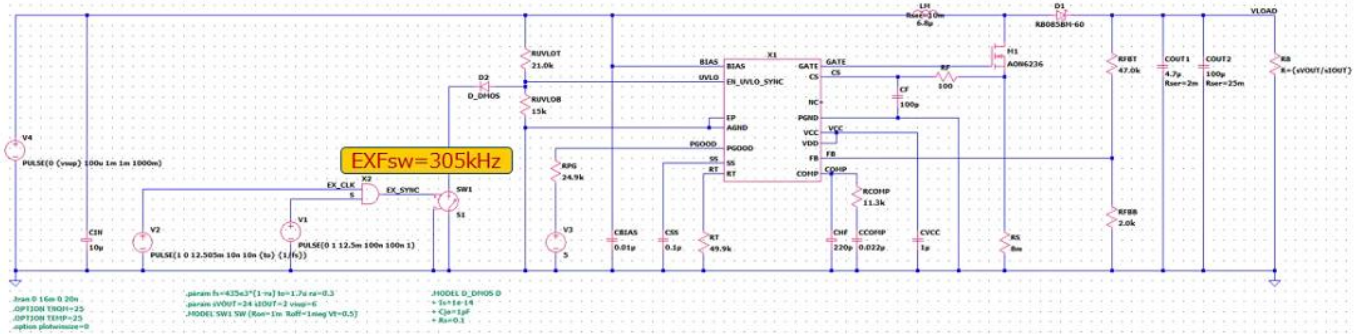Explanatory notes   ─ : simulated
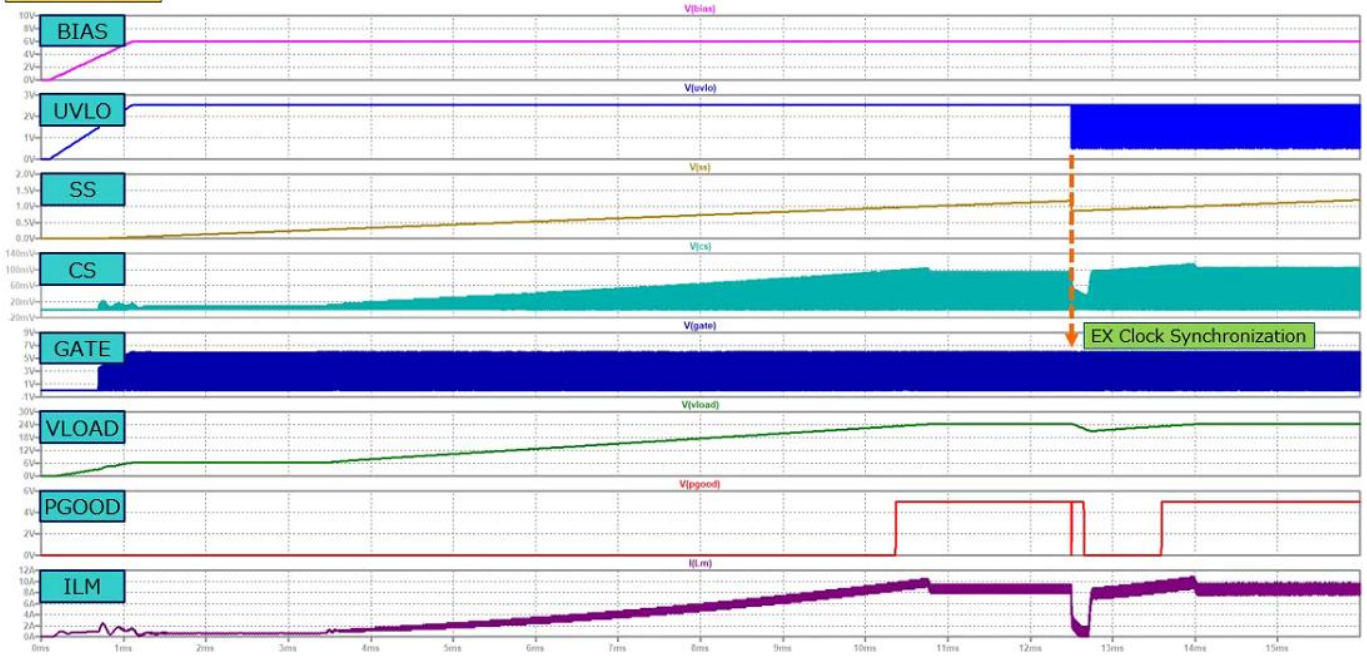
Testbench

UVLO Standby and Clock synchronization

Simulation results are following.
Explanatory notes　　— : simulated
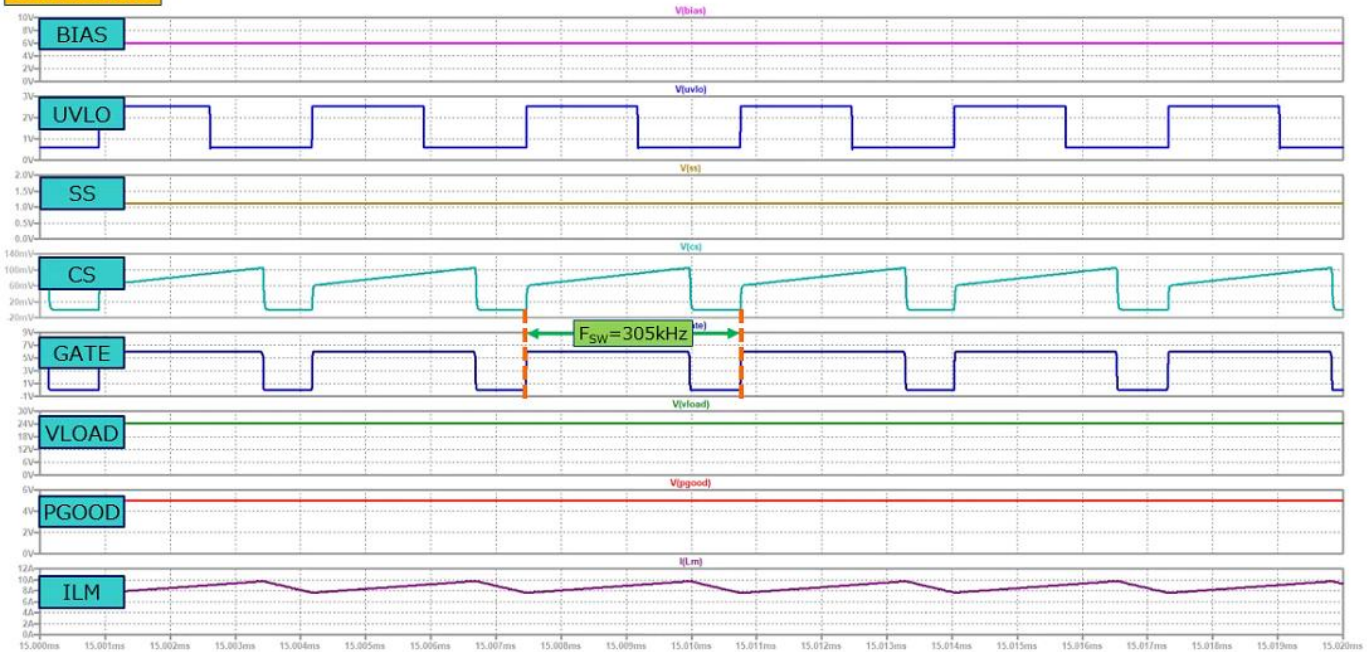
Sim result

UVLO Standby and Clock synchronization

Simulation results are following.
Explanatory notes　　— : simulated

Sim result

DISCLAIMER

1. This SPICE (Simulation Program with Integrated Circuit Emphasis) model and its content (the "Contents") are copyright of MoDeCH Inc. All rights reserved. Any redistribution or reproduction of any or all part of the Contents in any form is prohibited without express written permission made by MoDeCH Inc.

2. MoDeCH Inc. as licensor (the" Licensor") hereby grants to you, as licensee (the "Licensee"), a non-exclusive, non-transferable license to use the Contents as long as you abide by the terms and conditions of this DISCLAIMER.

3. The Licensee is not authorized to sell, loan, rent and redistribute or license the Contents in whole or in part, or in modified form, to anyone.

4. The Licensor shall in no way be liable to the Licensee or any third party for any loss or damage (including ,but not limited to, lost profits, or other incidental, consequential, or punitive damages), however caused (including through negligence) which may be directly or indirectly suffered from, arising out of, or in connection with, any use of the Contents .

5. Notwithstanding anything contained in this DISCLAIMER, in no event shall Licensor be liable for any claims, damages or loss which may arise from the modification, combination, operation or use of the Contents with the Licensee's computer programs.

6. The Licensor does not warrant that the Contents will function in any environment.

7. The Contents may be changed or updated without notice. MoDeCH Inc. may also make improvements and/or changes in the products, pricing and/or the programs related to the Contents at any time without notice.

MoDeCH

Modeling Design Technology

MoDeCH Inc.

Head Office
Location: 5-15 Yokoyama-cho, Hachioji-Shi, Tokyo 192-0081, Japan
Tel:+81-42-656-3360
E-Mail:model-on-support@modech.co.jp
URL:http://www.modech.com/en/