LTspice Model
DCDC converter
TEXAS INSTRUMENTS
TPS55340PWPR

Model Information

Model	A macro model
Call Name	MDC_TPS55340PWPR_LT
Pin Assign	1:SW 2:SW 3:VIN 4:EN 5:SS 6:SYNC 7:AGND 8:COMP 9:FB 10:FREQ 11:NC 12:PGND 13:PGND 14:PGND 15:PowerPAD
File List	Model Library MDC_TPS55340PWPR_LT.lib Model Report MDC_TPS55340PWPR_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 2021
- ●Product name TPS55340PWPR
- ●Company name TEXAS INSTRUMENTS

[Characteristics listed]

- ●Characteristics
  - Boost Fixed frequency current mode PWM control
  - Boost Pulse skipping
  - Boost Synchronization capability to external clock
  - SEPIC Fixed frequency current mode PWM control

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

○ : Implemented
× : Not Implemented
— : Not applicable

Model Functions Table

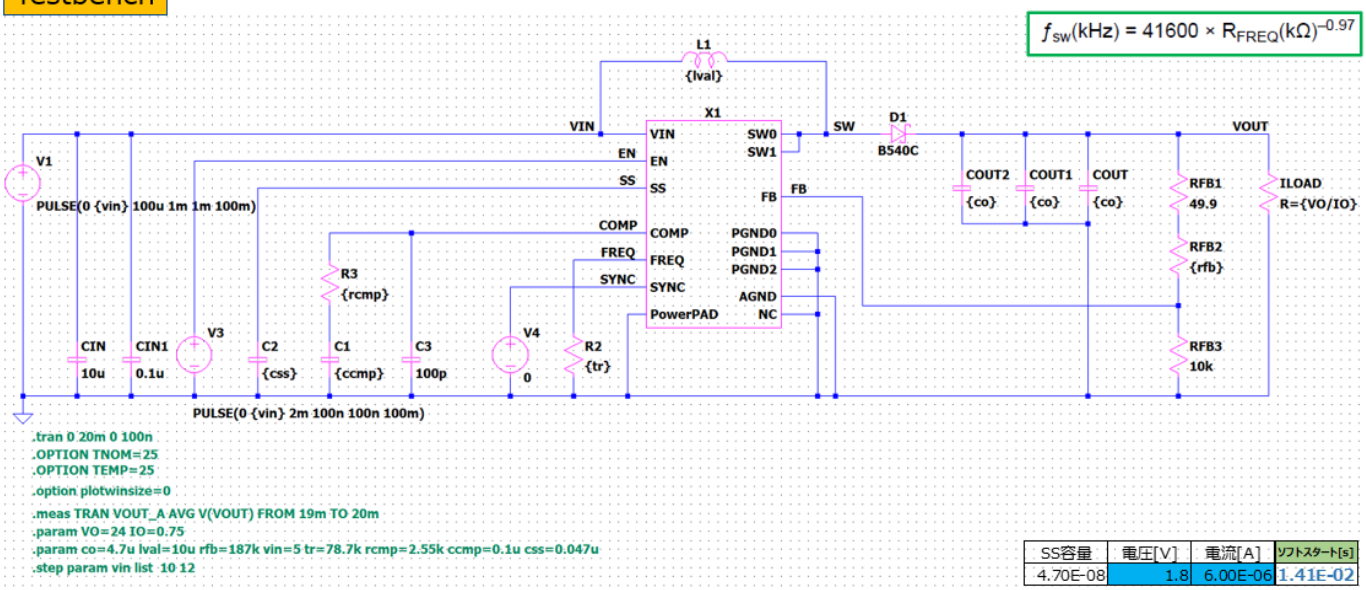
	RANK=2	
Functions	**RANK**	**Implemented**
Fixed frequency current mode PWM control	1	○
Frequency adjustable from 100 kHz to 1.2 MHz	2	○
Synchronization capability to external clock	1	○
Adjustable soft-start time	1	○
Pulse skipping for higher efficiency at light loads	2	○
Cycle-by-cycle current limit protection	2	—
UVLO	1	○

Boost Fixed frequency current mode PWM control(Input=12V Output=24V IOUT=0.75A f_{SW}=603kHz)

Simulation results are following.

Explanatory notes　　—：simulated

Testbench

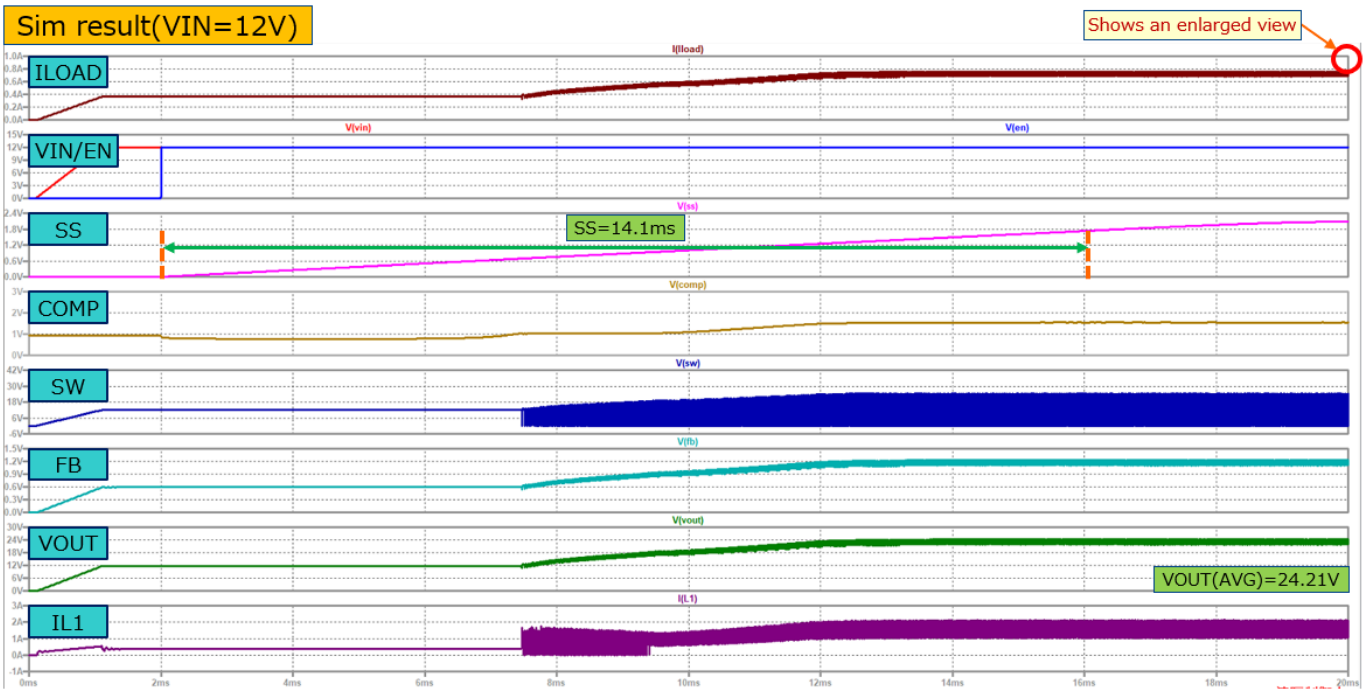


SS容量	電圧[V]	電流[A]	ソフトスタート[s]
4.70E-08	1.8	6.00E-06	1.41E-02

Boost Fixed frequency current mode PWM control(Input=12V Output=24V IOUT=0.75A f_{SW}=603kHz)

Simulation results are following.

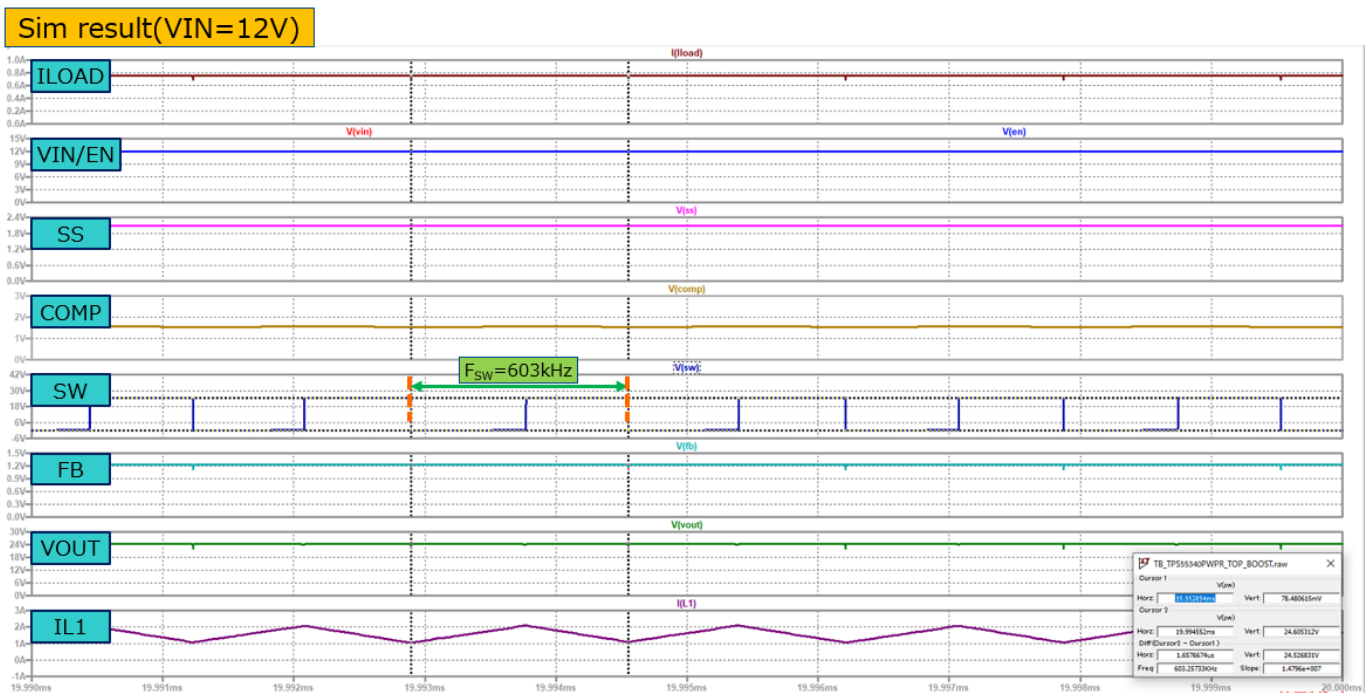
Explanatory notes — : simulated



Boost Fixed frequency current mode PWM control(Input=12V Output=24V IOUT=0.75A f_{SW}=603kHz)

Simulation results are following.

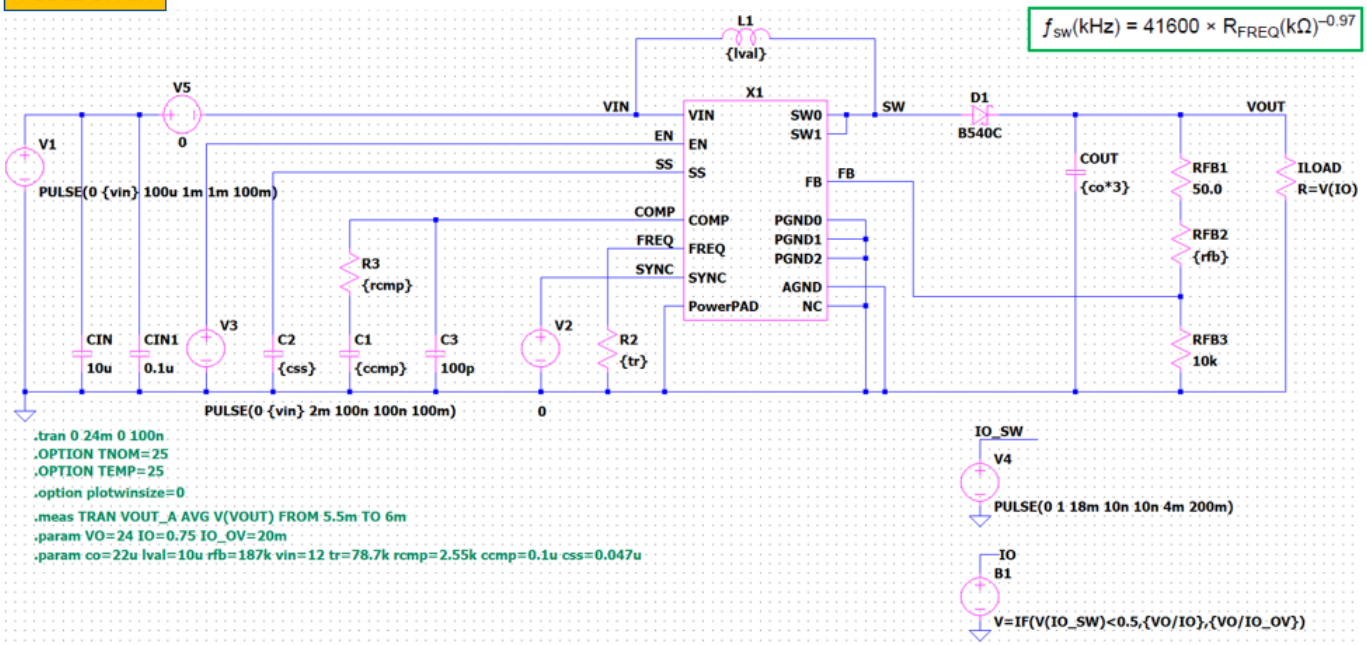
Explanatory notes — : simulated



Boost Pulse skipping (Input=12V Output=24V IOUT=0.75A⇒0.02A⇒0.75A f_{SW}=603kHz)

Simulation results are following.
Explanatory notes — : simulated

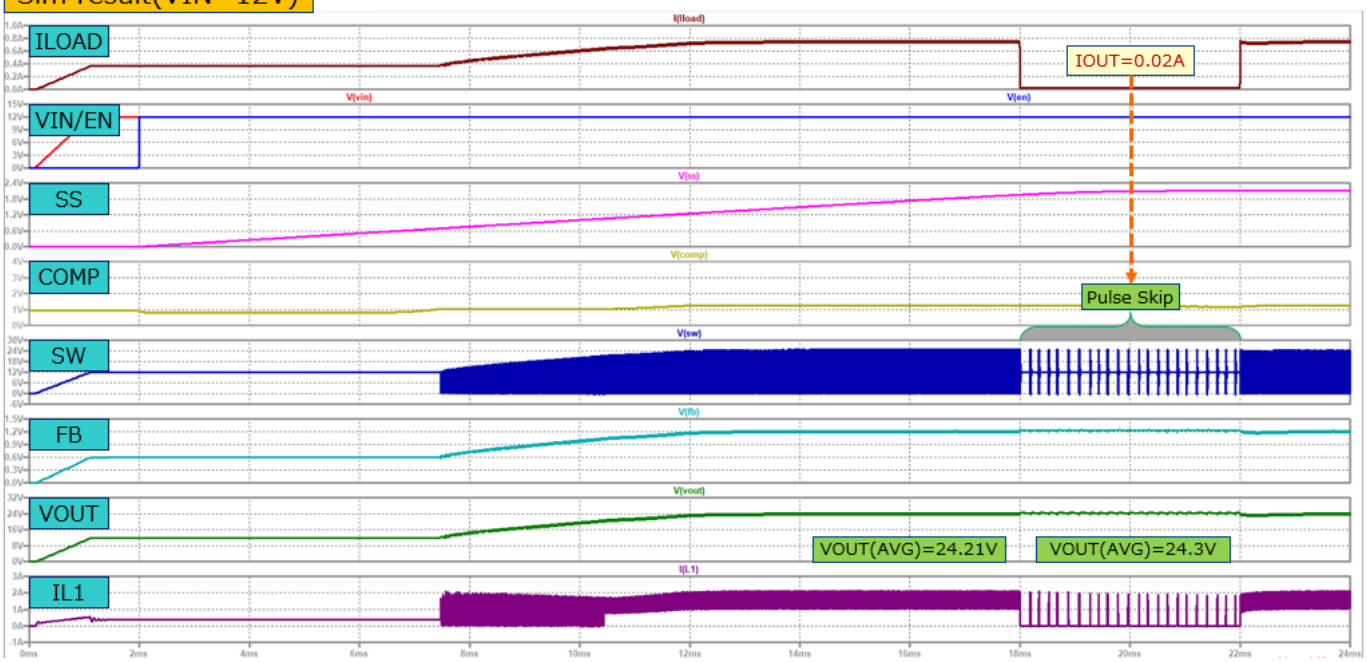
Testbench



Boost Pulse skipping (Input=12V Output=24V IOUT=0.75A⇒0.02A⇒0.75A) f_{SW}=603kHz

Simulation results are following.
Explanatory notes — : simulated

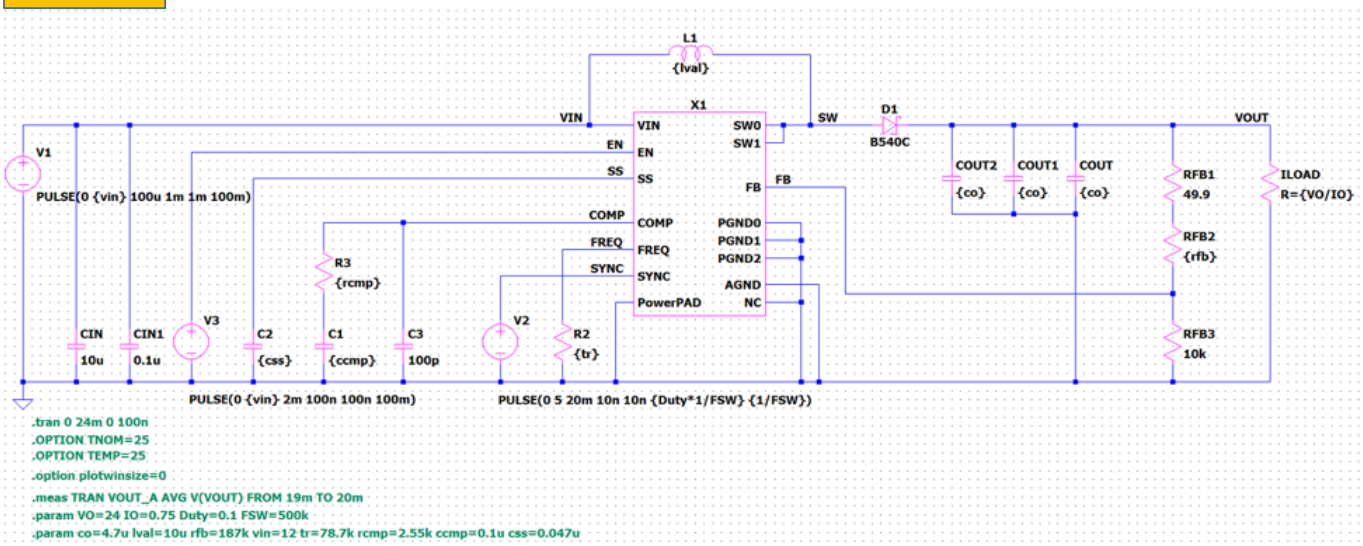
Sim result(VIN=12V)



Boost Synchronization capability to external clock (f_{SW}=603kHz EX_f_{SW}=500kHz)

Simulation results are following.
Explanatory notes — : simulated

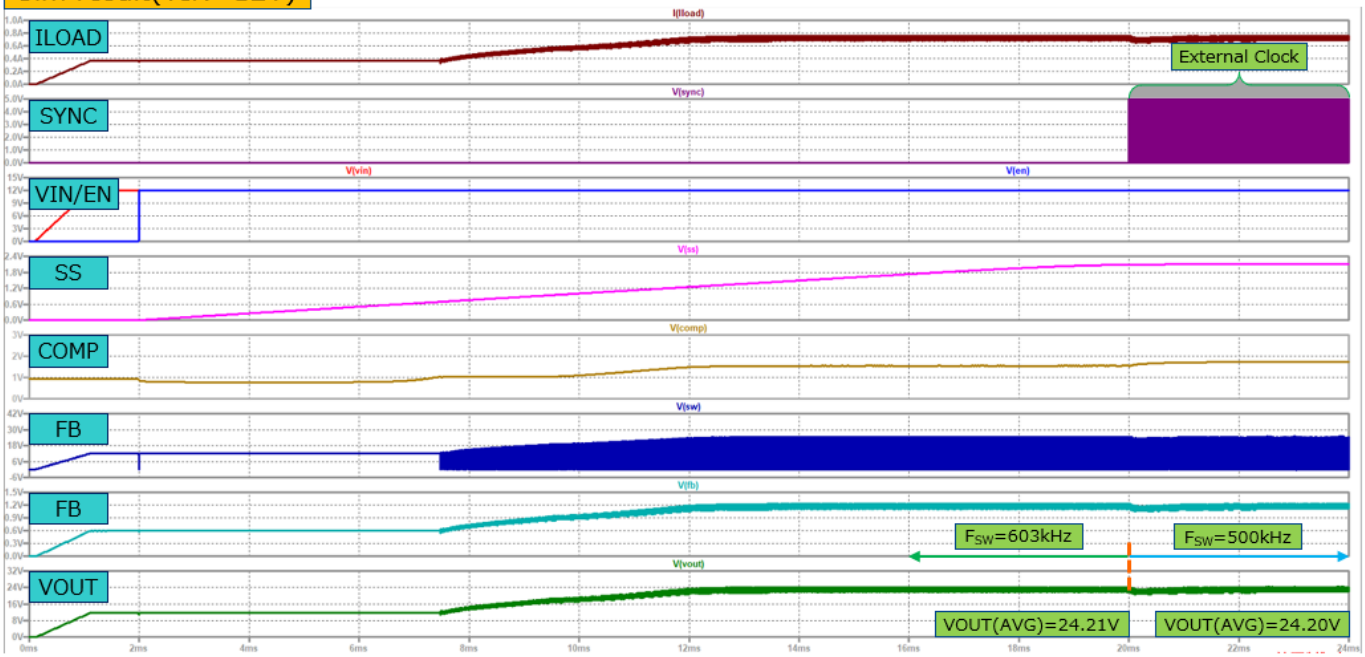
Testbench



Boost Synchronization capability to external clock (f_{SW}=603kHz EX_f_{SW}=500kHz)

Simulation results are following.
Explanatory notes — : simulated

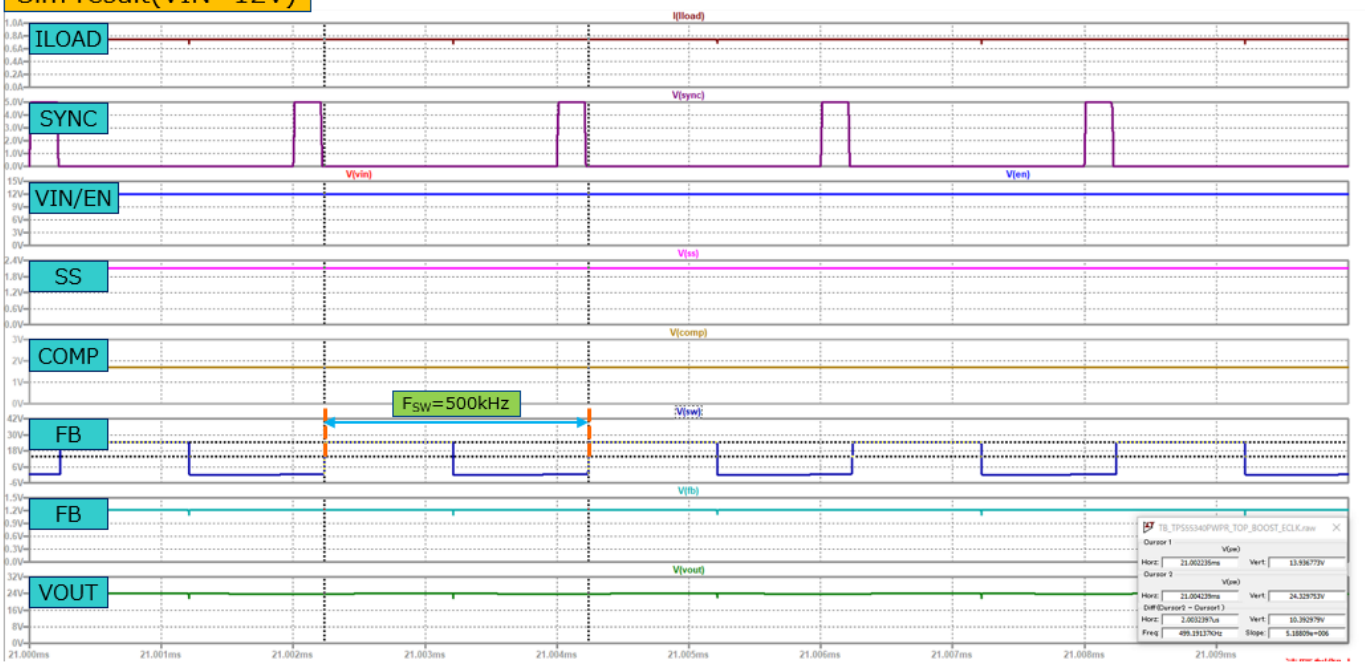
Sim result(VIN=12V)



Boost Synchronization capability to external clock (f_{SW}=603kHz EX_f_{SW}=500kHz)

Simulation results are following.
Explanatory notes — : simulated

Sim result(VIN=12V)

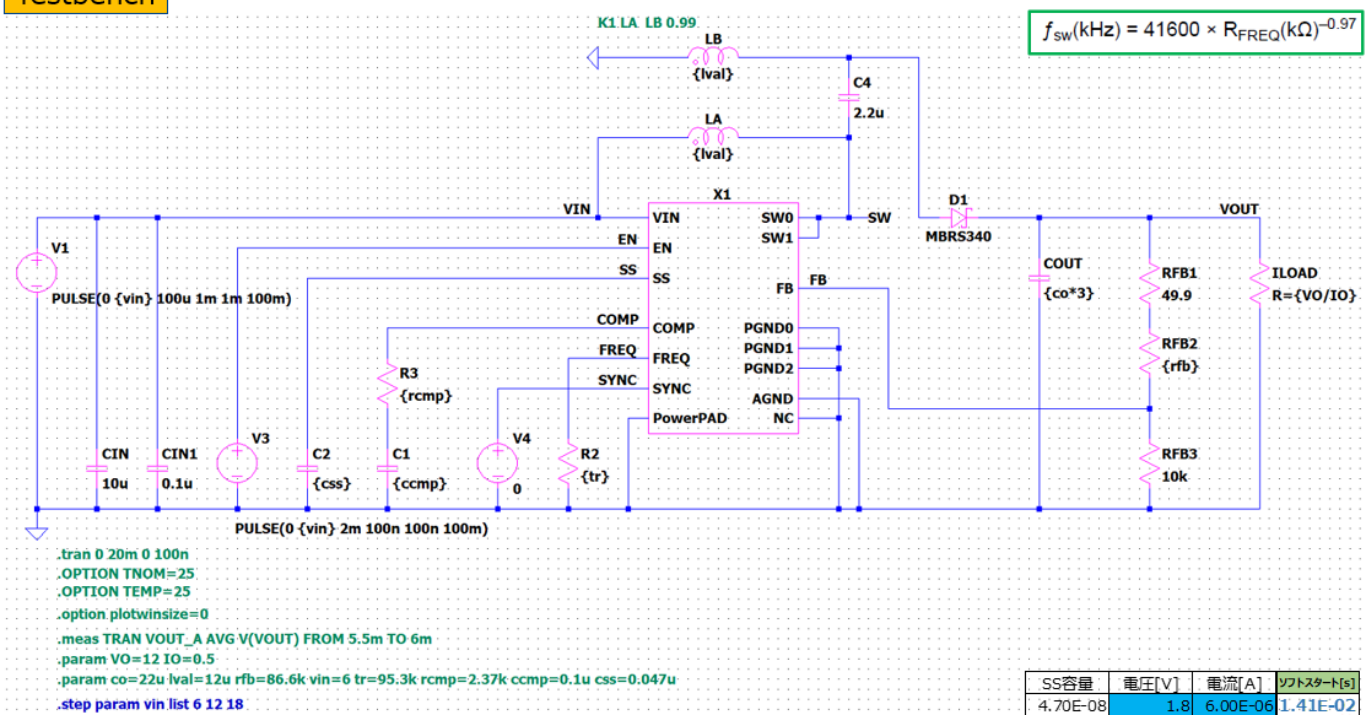


SEPIC Fixed frequency current mode PWM control(Input=6V/18V Output=12V IOUT=0.5A f_{SW}=500kHz)

Simulation results are following.

Explanatory notes　　—：simulated

Testbench

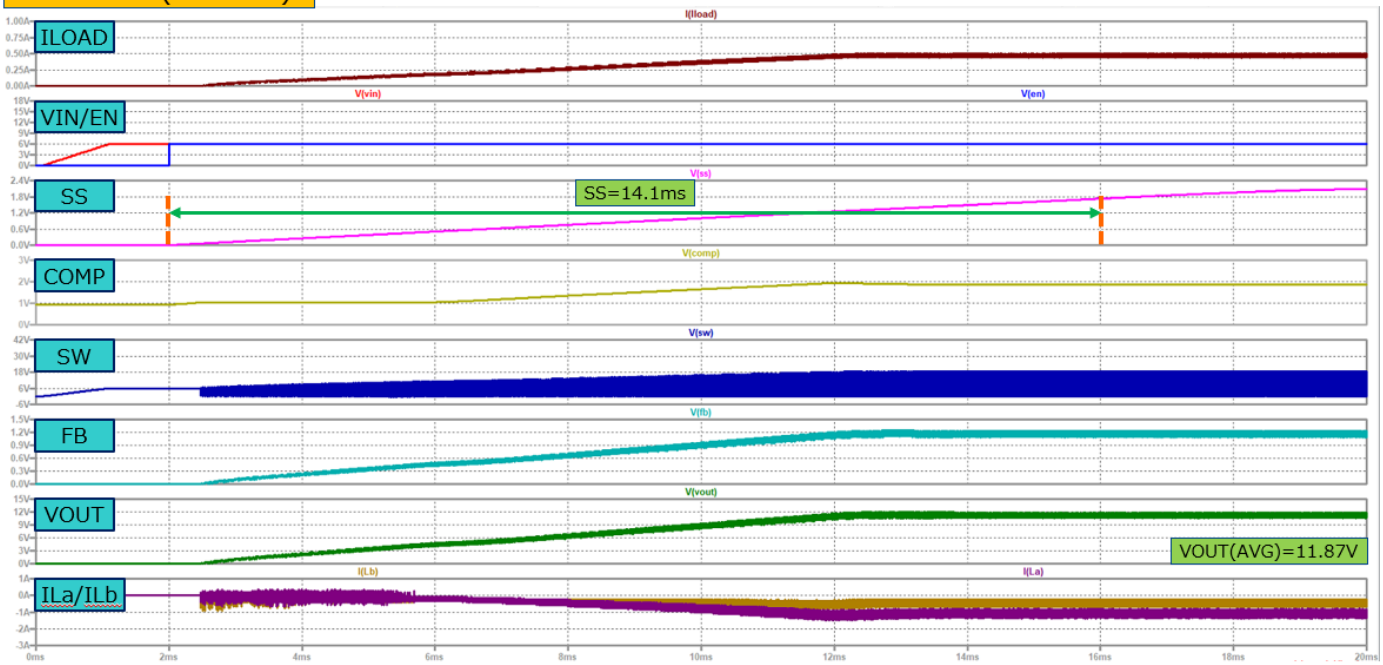


SS容量	電圧[V]	電流[A]	ソフトスタート[s]
4.70E-08	1.8	6.00E-06	1.41E-02

SEPIC Fixed frequency current mode PWM control(Input=6V Output=12V IOUT=0.5A f_{SW}=500kHz)

Simulation results are following.
Explanatory notes — : simulated

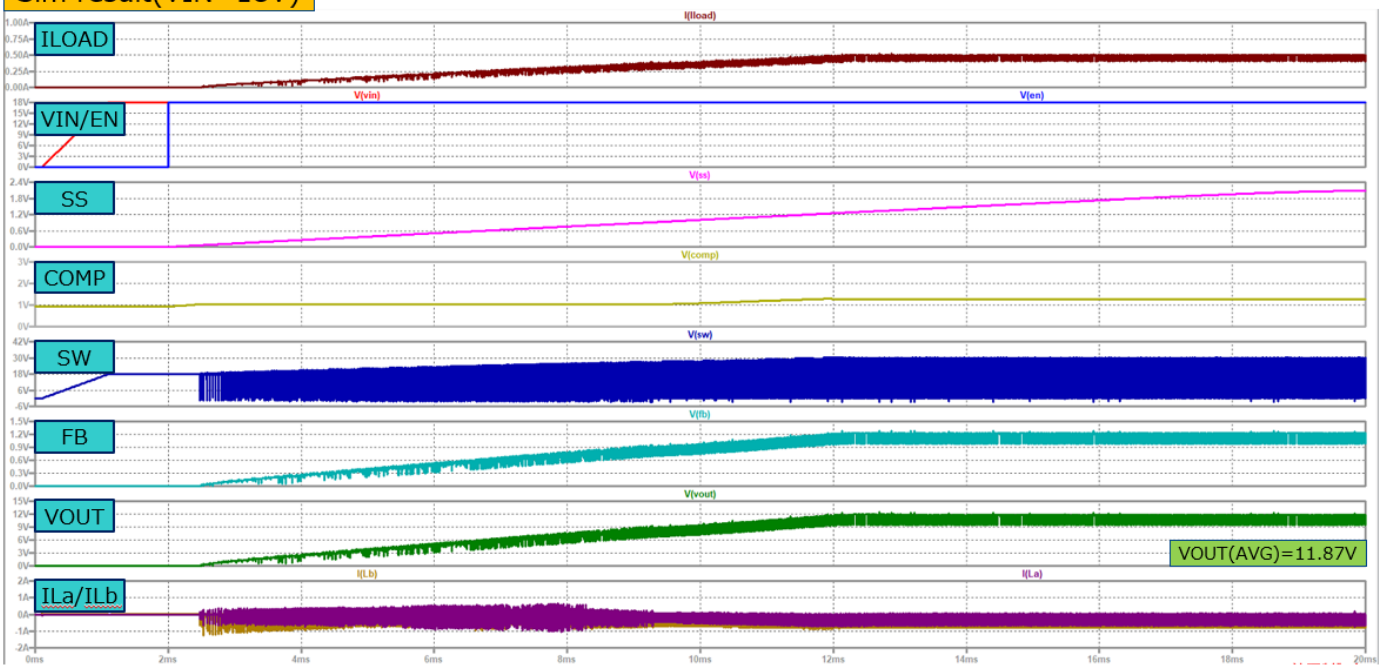
Sim result(VIN=6V)



SEPIC Fixed frequency current mode PWM control(Input=18V Output=12V IOUT=0.5A f_{SW}=500kHz)

Simulation results are following.
Explanatory notes — : simulated

Sim result(VIN=18V)



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