

# PSpice Model

## High-Side Power Switch

### Infineon

### BTS7040-1EPA

#### Model Information

**Model** A macro model  
**Call Name** MDC\_BTS7040-1EPA\_PS  
**Pin Assign** 1:GND 2:IN 3:DEN 4:IS 5:NC 6:NC 7:NC 8:NC 9:NC 10:NC 11:NC 12:OUT 13:OUT  
 14:OUT 15:VS  
**File List** Model Library MDC\_MDC\_BTS7040-1EPA\_PS.lib  
 Model Report MDC\_MDC\_BTS7040-1EPA\_PS.pdf(this file)  
**Verified Simulator Version** PSpice V17.2  
**Note**

#### References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 2020-12-14 Rev.1.10
- Product name BTS7040-1EPA
- Company name Infineon Technologies AG

[Characteristics listed]

- Characteristics
  - UVLO
  - VDS Clamp
  - Switching
  - Propagation Delay

#### 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**

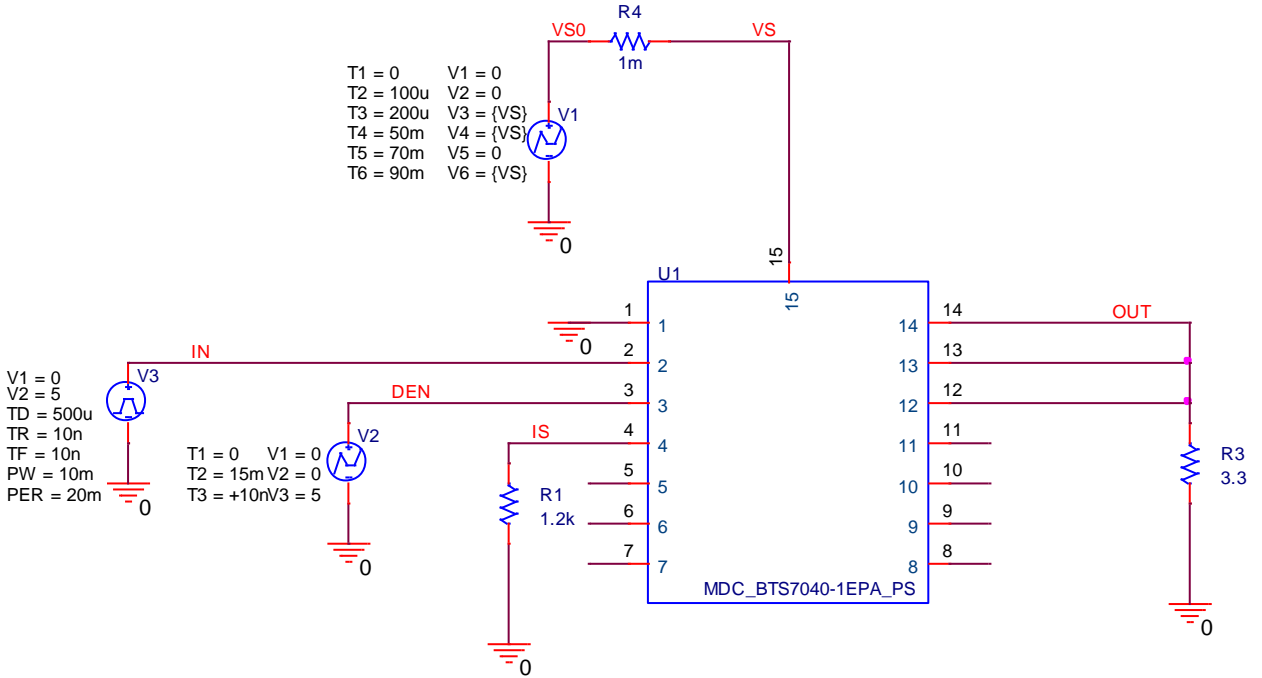
Functions	RANK	Implemented
Truth Table	1	○
On Resistance	1	○
Switching(Typ.)	1	○
UVLO	1	○
VH/VIL-VDD	1	—
Clamp Voltage	1	○
Propagation delay	1	○
Over Current Protection	2	○
Over Voltage Protection	2	○
Retry strategy	2	×
Reverse Polarity Protection	2	×

UVLO Testbench

PARAMETERS:

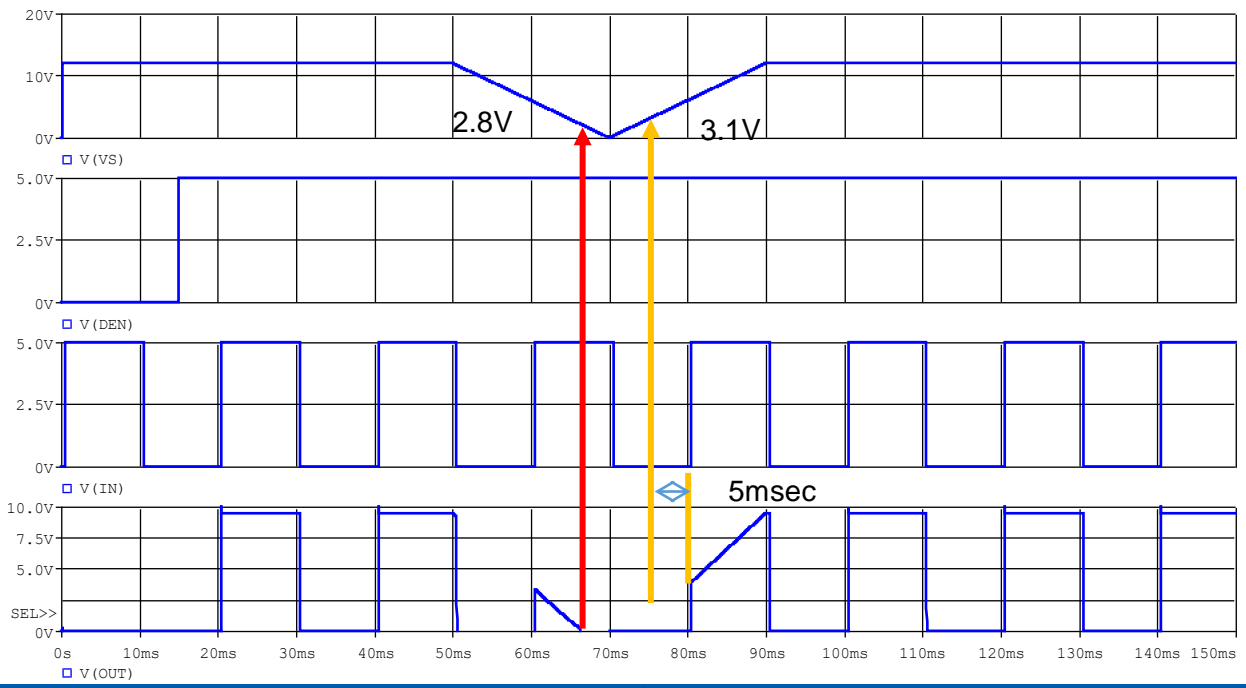
VS = 12

T1 = 0 V1 = 0  
T2 = 100u V2 = 0  
T3 = 200u V3 = {VS}  
T4 = 50m V4 = {VS}  
T5 = 70m V5 = 0  
T6 = 90m V6 = {VS}



Simulation results are following.  
Explanatory notes — : simulated

UVLO

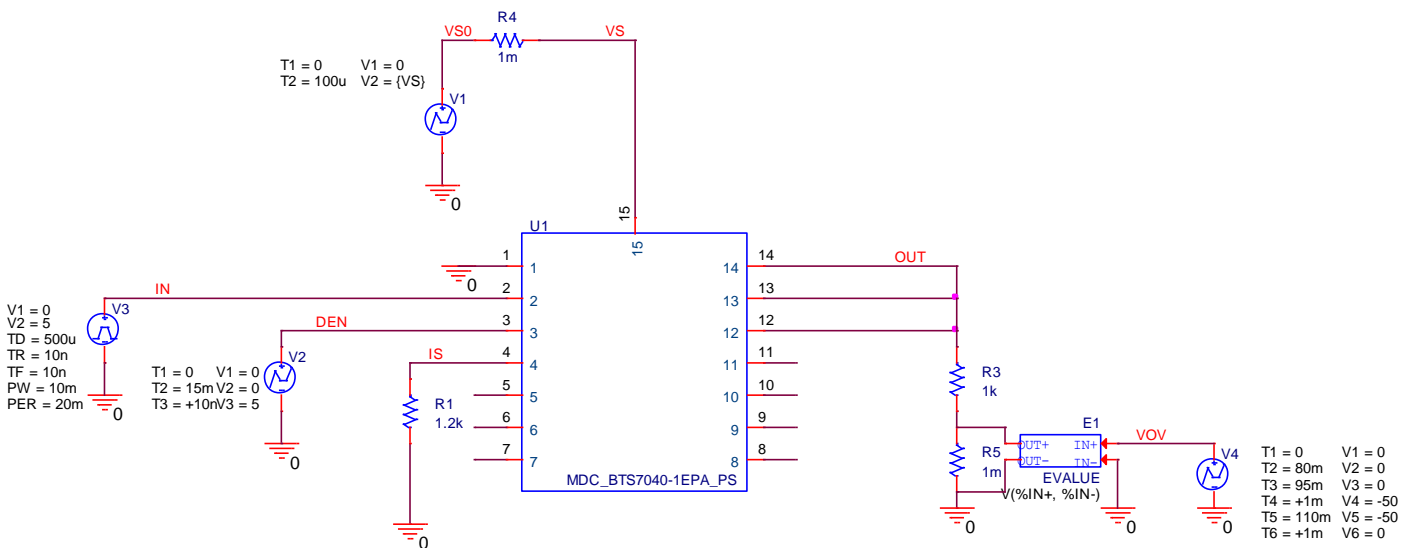


### VDS Clamp Testbench

PARAMETERS:

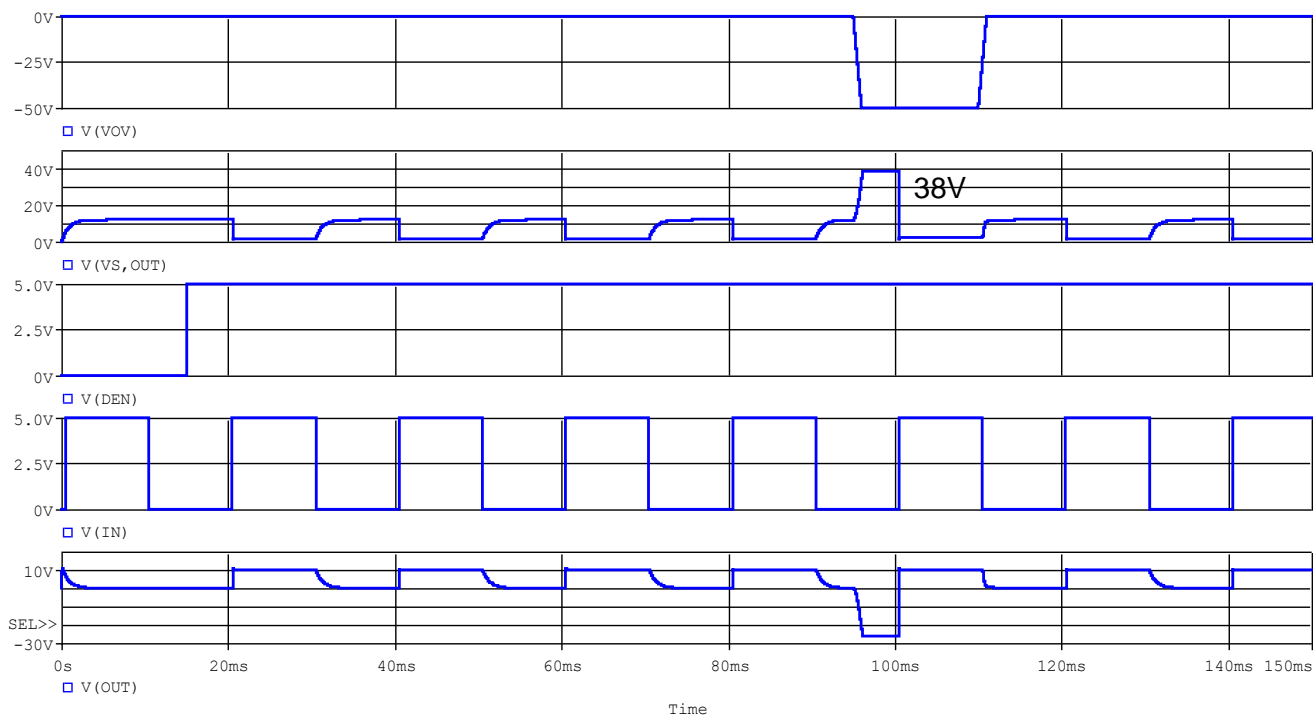
VS = 12

T1 = 0 V1 = 0  
T2 = 100u V2 = (VS)



Simulation results are following.  
Explanatory notes — : simulated

### VDS Clamp



Switching Testbench

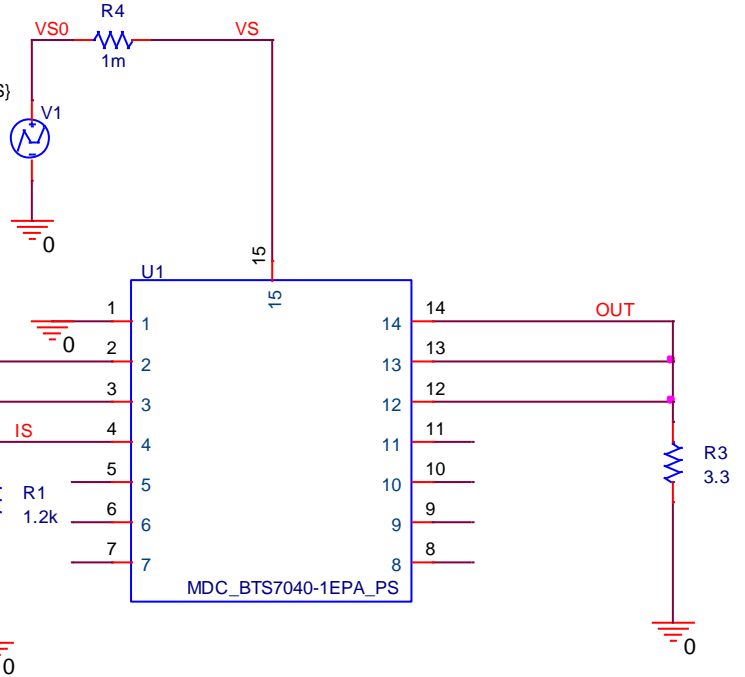
PARAMETERS:

VS = 28

T1 = 0 V1 = 0  
T2 = 100u V2 = {VS}

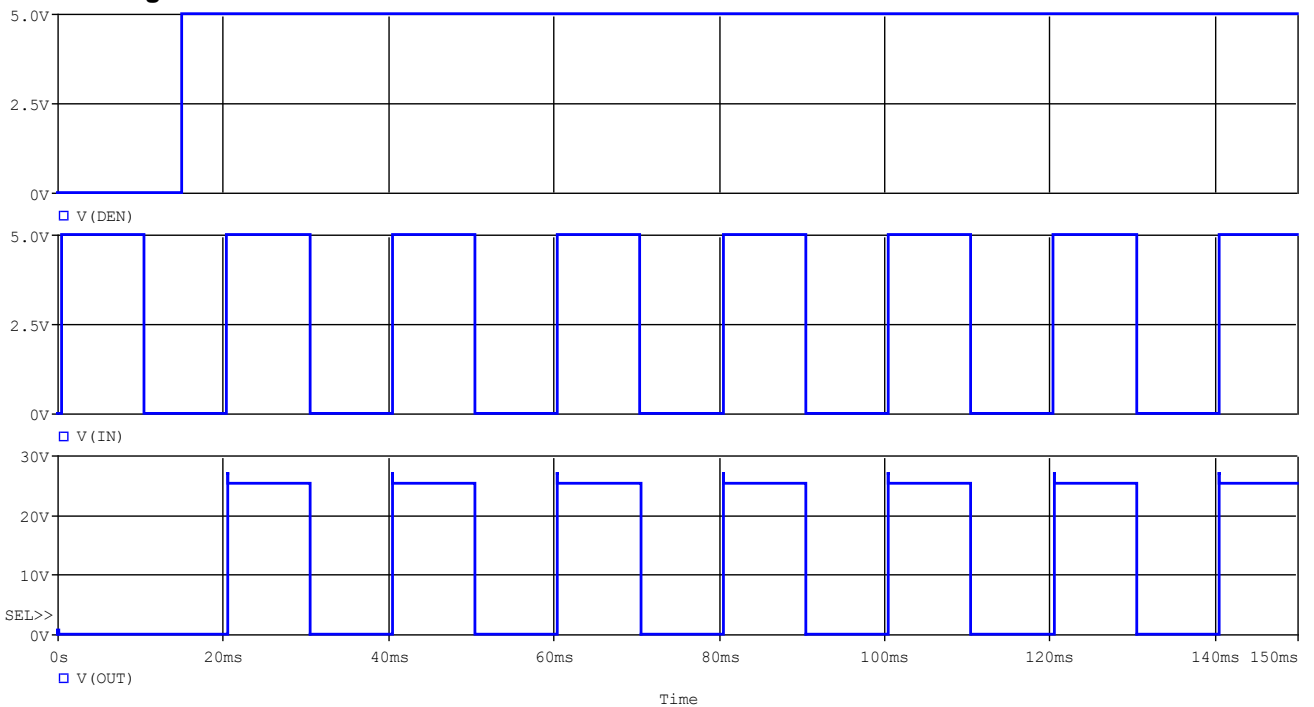
V1 = 0  
V2 = 5  
TD = 500u  
TR = 10n  
TF = 10n  
PW = 10m  
PER = 20m

T1 = 0 V1 = 0  
T2 = 15m V2 = 0  
T3 = +10nV3 = 5



Simulation results are following.  
Explanatory notes — : simulated

Switching



Propagation Delay Testbench

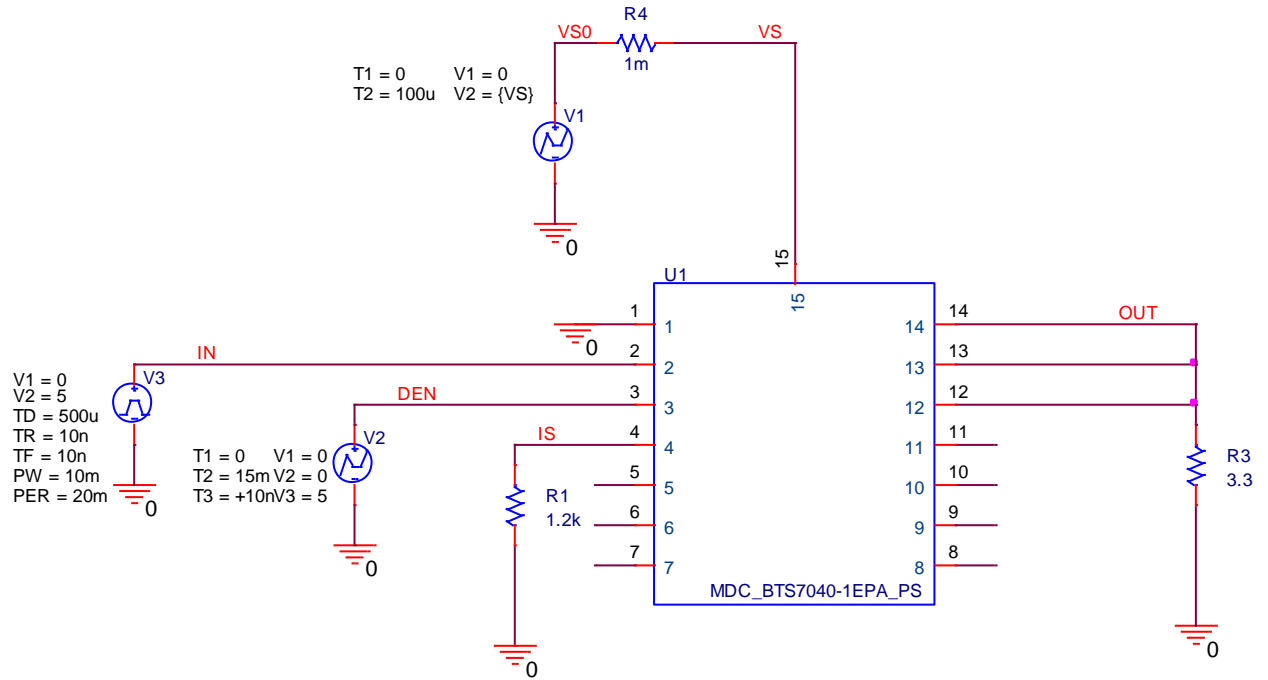
PARAMETERS:

VS = 28

T1 = 0 V1 = 0  
T2 = 100u V2 = {VS}

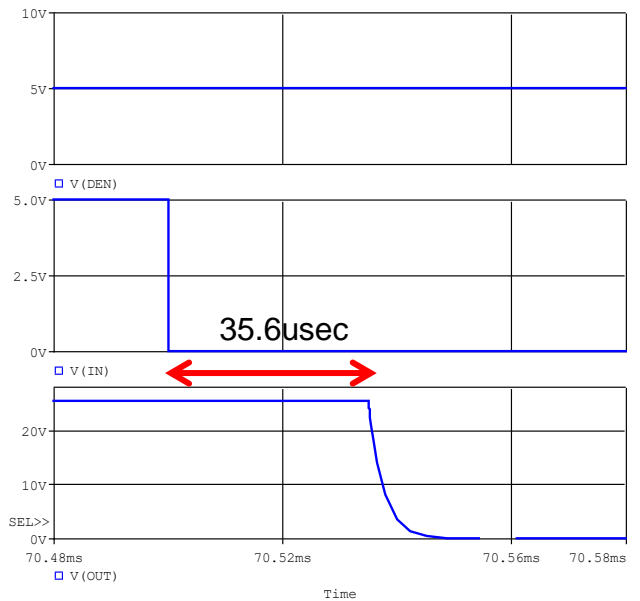
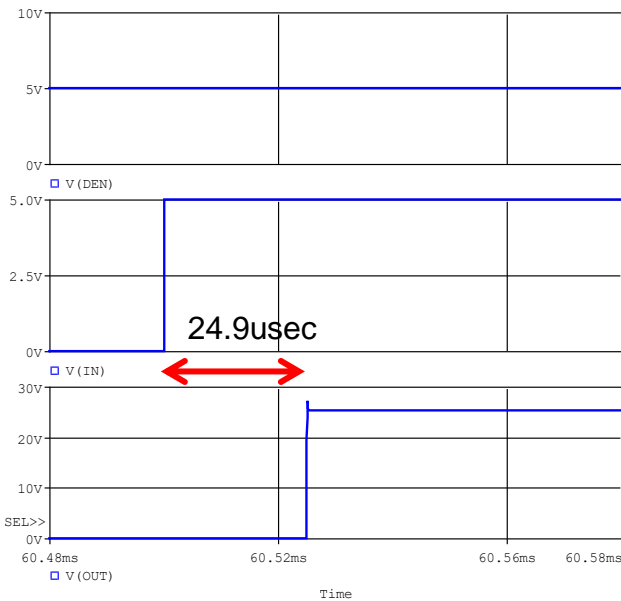
V1 = 0  
V2 = 5  
TD = 500u  
TR = 10n  
TF = 10n  
PW = 10m  
PER = 20m

T1 = 0 V1 = 0  
T2 = 15m V2 = 0  
T3 = +10nV3 = 5



Simulation results are following.  
Explanatory notes — : simulated

Propagation Delay



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