

LTspice Model

Bridge Driver IC

Infineon Technologies AG

MDC_TLE9180D-21QK_LT

Model Information

Model A macro model
Call Name MDC_TLE9180D-21QK_LT
Pin Assign 1:GND 2:APC 3:_ERR 4:_IH1 5:IL1 6:IL2 7:_IH2 8:_IH3 9:IL3 10:MISO 11:MOSI
 12:CSN 13:CLK_SPI 14:VCC 15:NC1
 16:_SOFF 17:VDHP 18:NC2 19:NC3 20:CH2 21:NC4 22:CL2 23:NC5 24:_INH
 25:VS 26:NC6 27:CH1 28:CL1 29:CP_GND 30:CB 31:GL1 32:SL1
 33:BH1 34:SH1 35:GH1 36:VDH1 37:SL2 38:GL2 39:NC7 40:VDH2 41:BH2
 42:SH2 43:GH2 44:NC8 45:VDH3 46:BH3 47:SH3 48:GH3
 49:SL3 50:GL3 51:GND_2 52:NC9 53:PFB3 54:PFB2 55:PFB1 56:ISN2 57:ISP2
 58:VO2 59:VRO 60:VO1 61:ISP1 62:ISN1 63:AGND 64:ENA

Verified Simulator Version LTspice(x64) 17.1

Note SPI function is not used.
 Specify the command using the parameters shown on page 3.

File List Model Library MDC_TLE9180D-21QK_LT.lib

References Model Report MDC_TLE9180D-21QK_LT.pdf(this file)

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 2023-04-30 / Rev. 1.31
- Product name TLE9180D-21QK
- Company name Infineon Technologies AG

[Characteristics listed]

- Characteristics Transient

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=1

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	—

SPI command specification method.

SPI commands are specified in .PARAM.

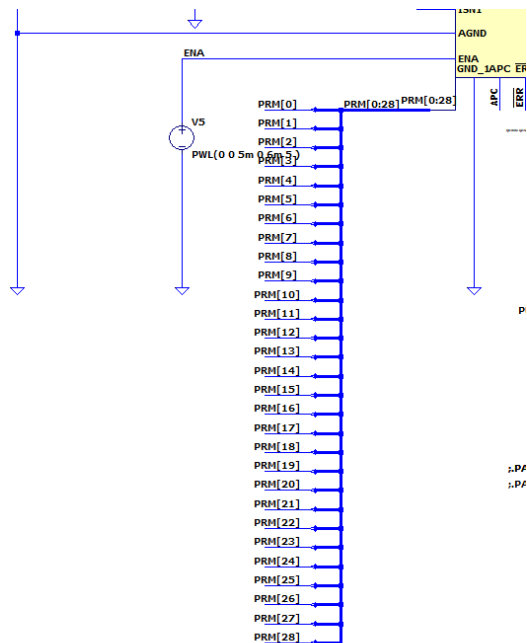
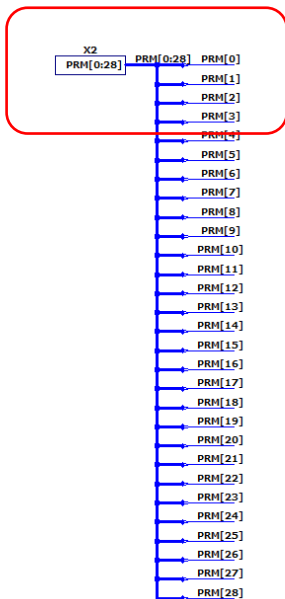
Also, due to LTspice limitations, it was not possible to specify everything using parameters, so we parameterized it using an external circuit called PRM_Box, so be sure to connect PRM_Box.

```
.PARAM tl_ov_vdh=56.11 tl_uv_vdh=3.96 tl_uv_cb=9.07 VCBOVR=17 vcc_select=3.3
tl_ov_vcc=0.04 tl_uv_vs=5.18 tl_ov_vs=18 en_hb1=1 dis_hb1=0 sh_op_gain=0 en_hb2=1
dis_hb2=0 en_hb3=1 dis_hb3=0 ofs=31 zcl=1.65 tl_oc_op=0 op_gain1=26.9 op_gain2=26.9
op_gain3=26.9
```

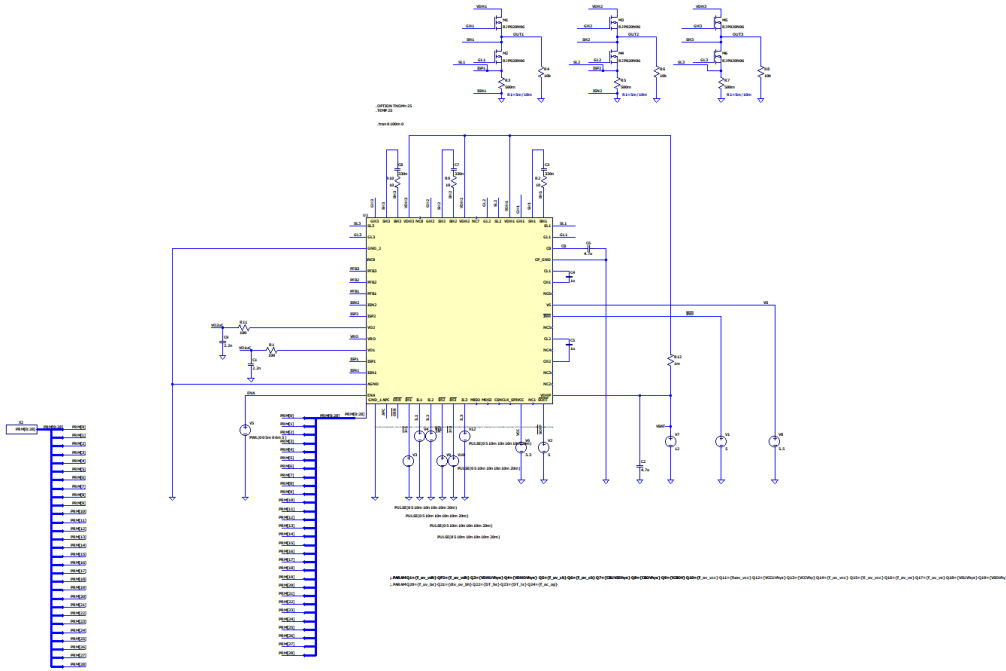
```
.PARAM f_ov_vdh=10u f_uv_vdh=25u VDHUVhys=0.1 VDHOVhys=1.8 f_uv_cb=10u
f_ov_cb=1.2u CBUVSDhys=0.1 CBOVhys=1.8 tCBOV=100n f_ov_vcc=25u fuov_vcc=25u
VCCUVhys=0.05 VCCVhy=0.05 f_uv_vcc=25u tl_uv_vcc=0.1 f_ov_vs=10u f_uv_vs=12.5u
VSUVhys=12.5u VSOVhy=2
```

```
.PARAM f_uv_bs =1.3u dis_ov_bh=0 DT_hs=300n DT_ls=300n f_oc_op=5u
```

PRM_Box

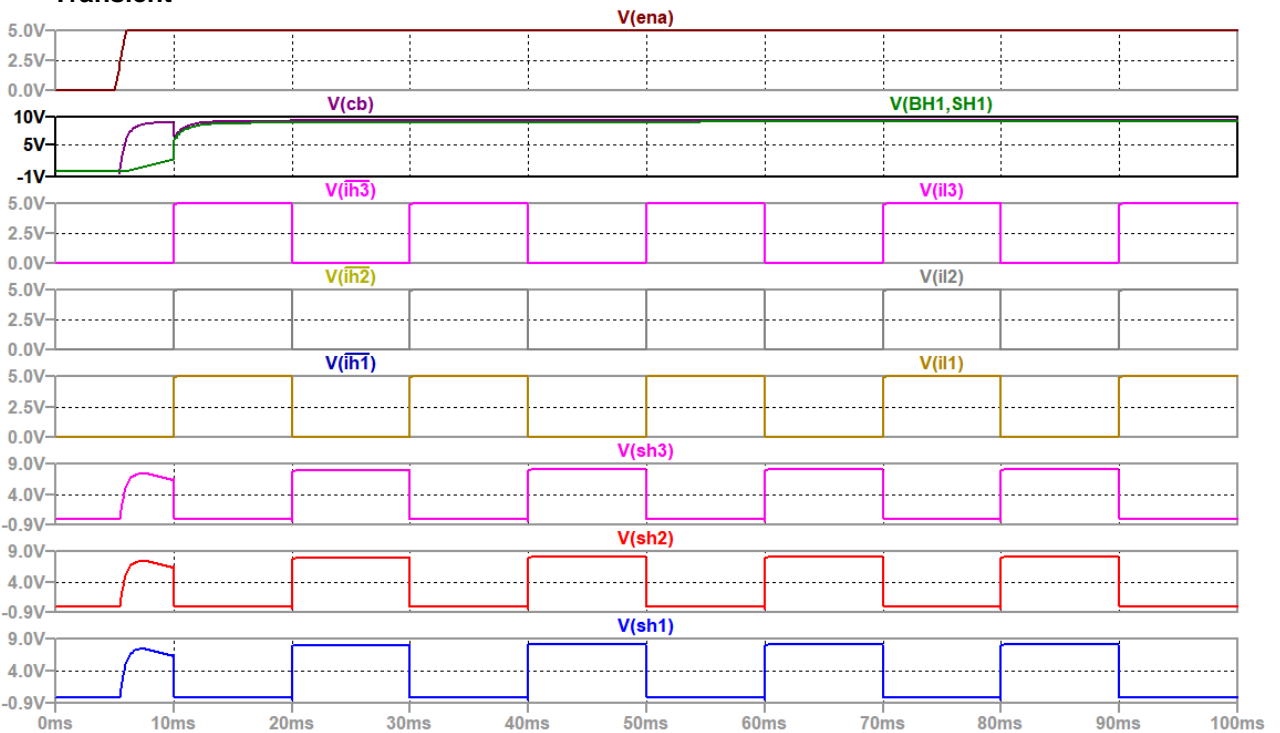


Transient Testbench
Referred to Data Sheet



Simulation results are following.
 Explanatory notes — : simulated

Transient



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