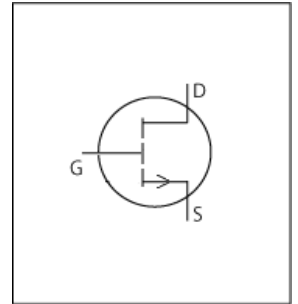


PSpice Model

GaN

Nexperia

GAN140-650FBE



Model Information

Model A macro model based on BSIM3 model
Call Name MDC_GAN140-650FBE_PS
Pin Assign 1:D 2:G 3:S
File List Model Library MDC_GAN140-650FBE_PS02.lib
 Model Report MDC_GAN140-650FBE_PS.pdf (this file)

Verified Simulator Version PSpice version 17.2
Note

References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 28 April 2023
- Product name GAN140-650FBE
- Company name Nexperia B.V.
- Characteristics IdVds[Vgs], IdVds[Vgs]2, IdVgs[Temp], VthTemp[Id], IdVds[tem p], NormRds(on)Temp[Vgs], Rds(on)Id[Vgs], Rds(on)Vgs[Id], R ds(on)Vgs[Id]2, VgsQg[Vdd], CapacitanceVds[Cname], IdVds[Vgs]3, IdVds[Vgs]4, IdVds[Vgs]5, IdVds[Vgs]6, SwitchingLoad[Tname], SwitchingWaveform

Simulation Range

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

Item	Range			Unit
	Min.		Max.	
Drain-source voltage (DC)	0	to	650	V
Gate-source voltage (DC)	-1	to	7	V
Temperature	-55	to	150	deg C

MOSFET

○ : Implemented
× : Not Implemented
— : Not applicable

Model Functions Table

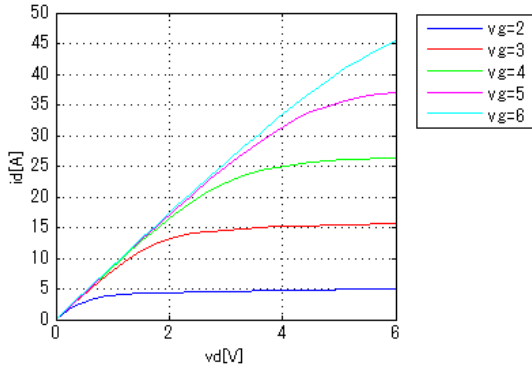
RANK=1

Functions	RANK	Implemented
ID-VDS-VGS	1	○
ID-VGS(Temp)	1	○
RDS(on)	1	○
Capacitance	1	○
Gate Charge	1	○
IS-VSD	1	○
Reverse recovery	1	—
Switching(Typ.)	1	○
Bv	1	—
Yfs	1	—
Vth	1	○

Simulation results are following.
 Explanatory notes — : simulated

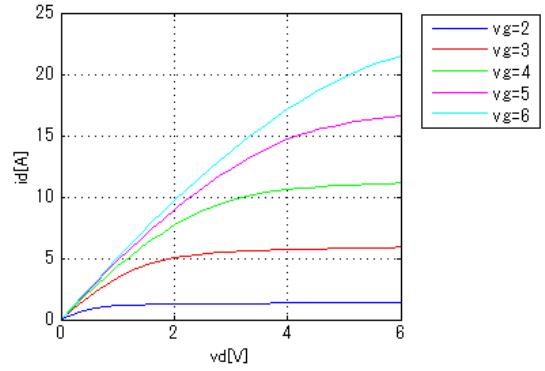
IdVds[Vgs]

Temp = 25degC



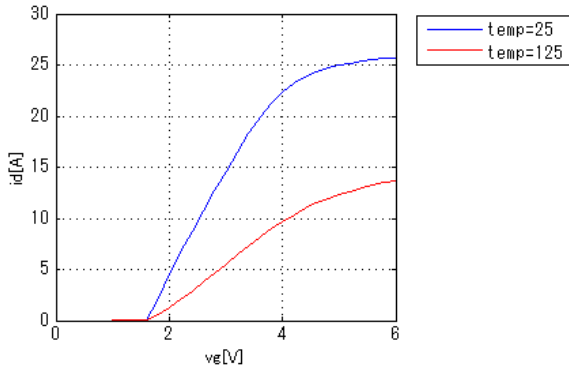
IdVds[Vgs]2

Temp = 125degC



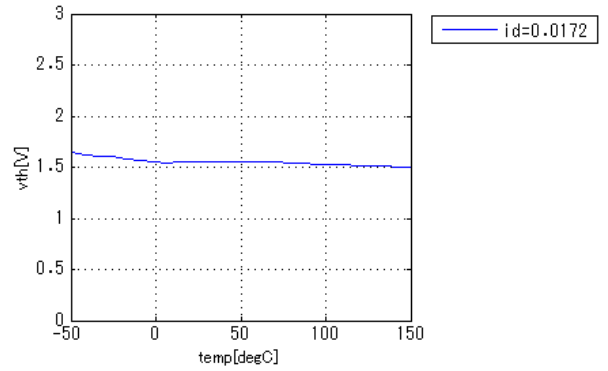
IdVgs[Temp]

Vds = 3V



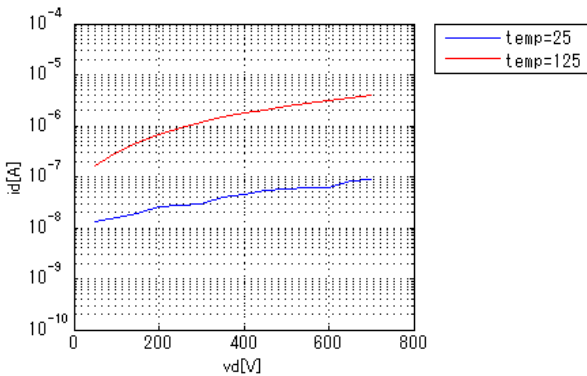
VthTemp[Id]

Vd = Vg



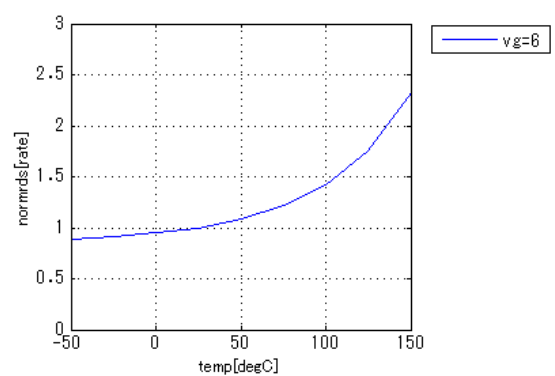
IdVds[temp]

vg = 0V



NormRds(on)Temp[Vgs]

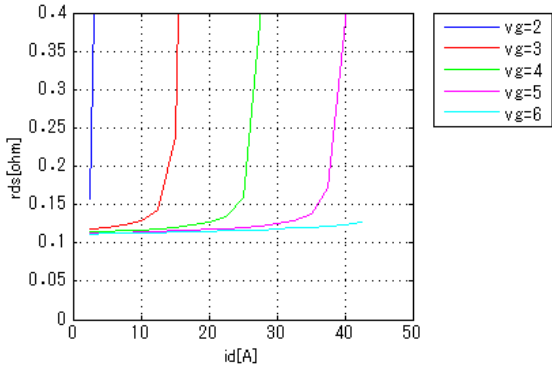
Id = 5A



Simulation results are following.
 Explanatory notes — : simulated

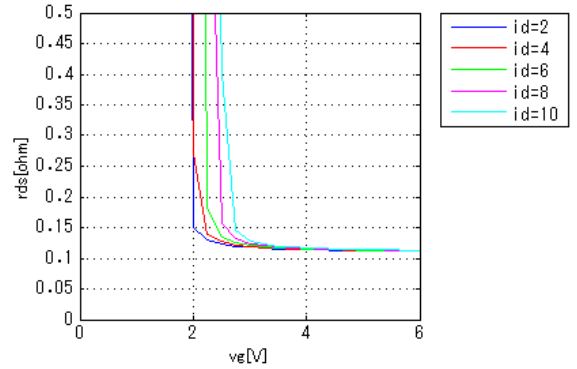
Rds(on)Id[Vgs]

Temp = 25degC



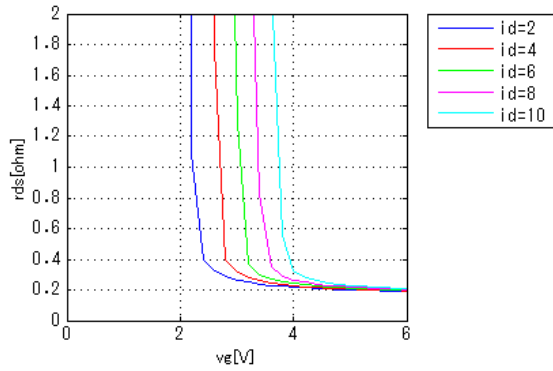
Rds(on)Vgs[Id]

Temp = 25degC



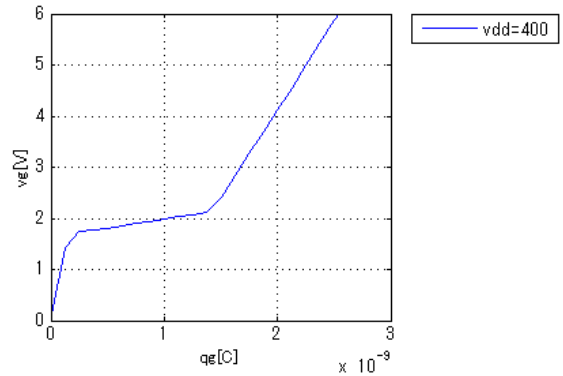
Rds(on)Vgs[Id]2

Temp = 125degC



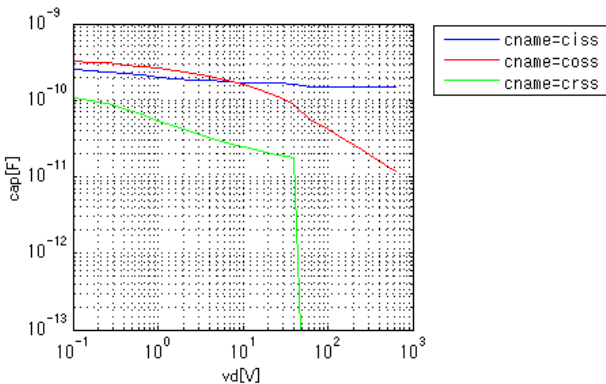
VgsQg[Vdd]

Id = 5A



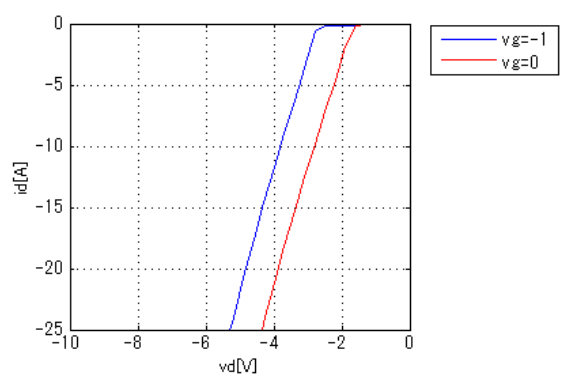
CapacitanceVds[Cname]

freq = 1000000Hz



IdVds[Vgs]3

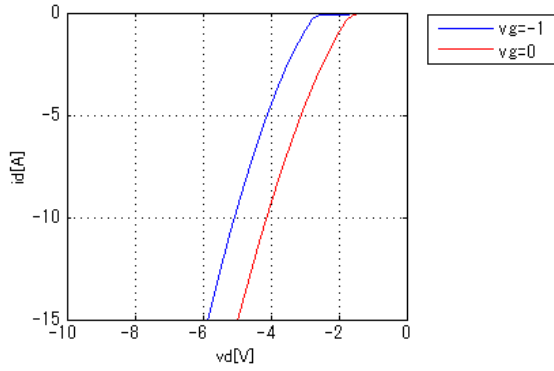
Temp = 25degC



Simulation results are following.
 Explanatory notes — : simulated

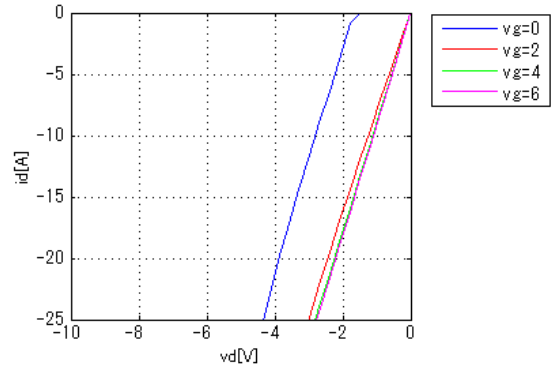
IdVds[Vgs]4

Temp = 125degC



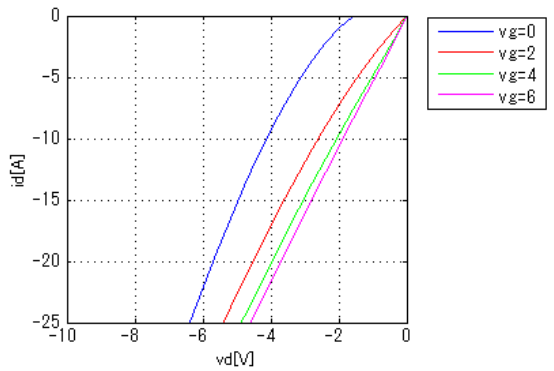
IdVds[Vgs]5

Temp = 25degC



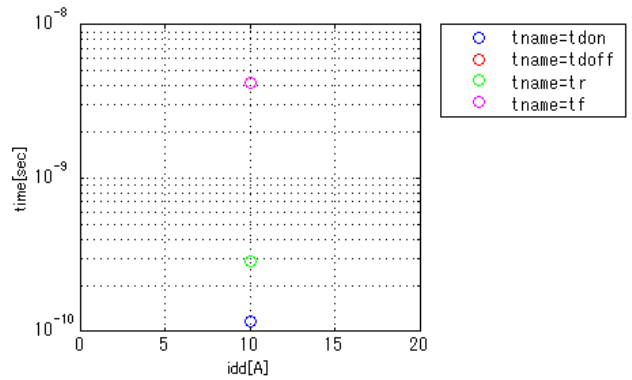
IdVds[Vgs]6

Temp = 125degC



SwitchingLload[Tname]

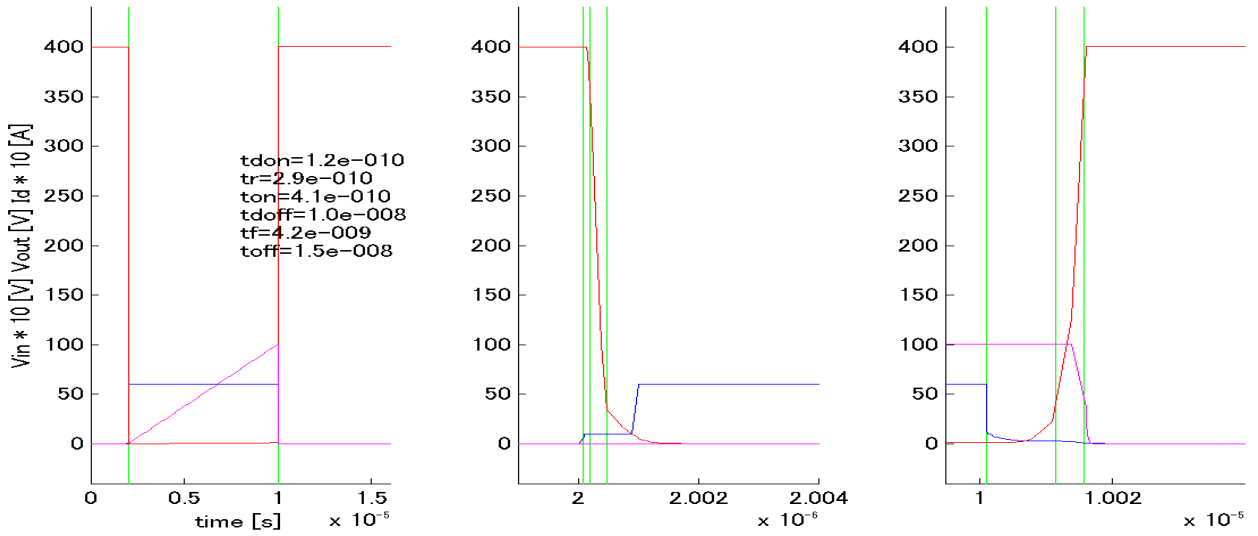
v_{gg} = 6V, v_{dd} = 400V, L_{load} = 0.000318H, R_{Gon} = 10ohm, R_{Goff} = 2ohm, Temp = 25degC



Simulation results are following.
 Explanatory notes — : simulated

Switching Waveform (Blue : INPUT Red : OUTPUT Magenta : ID)

vgg = 6V, vdd = 400V, Load = 0.000318H, RGon = 10ohm, RGon = 2ohm, Temp = 25degC, Id = 10A



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