

LTspice Model

GaN

Innoscence

INN650DA140A

Model Information

Model An original macro model
Call Name MDC_INN650DA140A_LT
Pin Assign 1:D 2:D 3:D 4:D 5:S 6:S 7:S 8:G 9:S
File List Model Library MDC_INN650DA140A_LT01.lib
 Model Report MDC_INN650DA140A_LT.pdf (this file)

Verified Simulator Version LTspice version XVII
Note

References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 2021/10/26
- Product name INN650DA140A
- Company name Innoscence
- Characteristics IdVds[Vgs], IdVds[Vgs]2, Rds(on)Vgs[Id], Rds(on)Vgs[Id]2, IdVgs[Temp], IdVds[temp], NormVthTemp[ID], NormRds(on)Temp[Id], VgsQg[Vdd], CapacitanceVds[Cname], SwitchingLload[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)	-20	to	10	V
Temperature	-55	to	150	deg C

MOSFET

○ : Implemented
× : Not Implemented
— : Not applicable

Model Functions Table

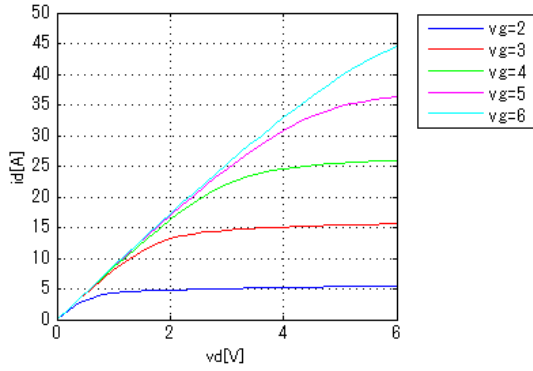
RANK=1

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

Simulation results are following.
 Explanatory notes — : simulated

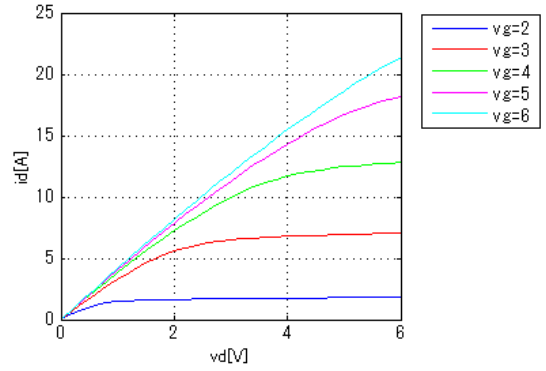
IdVds[Vgs]

Temp = 25degC



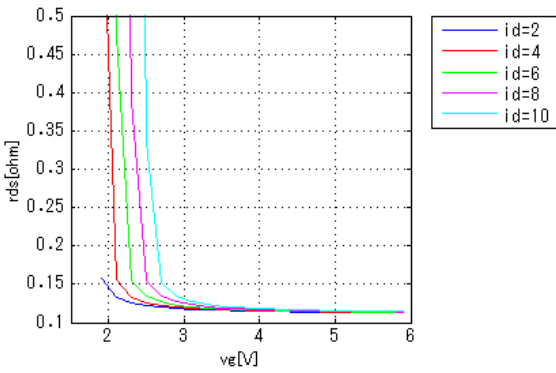
IdVds[Vgs]2

Temp = 125degC



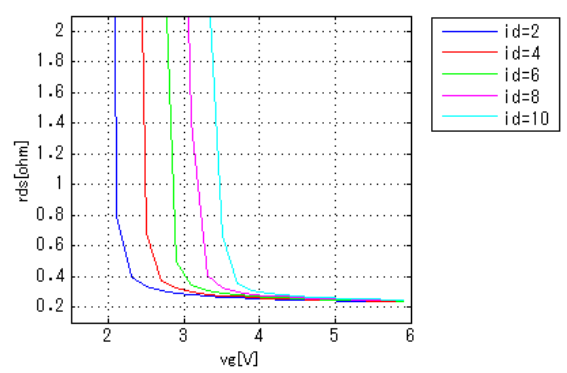
Rds(on)Vgs[Id]

Temp = 25degC



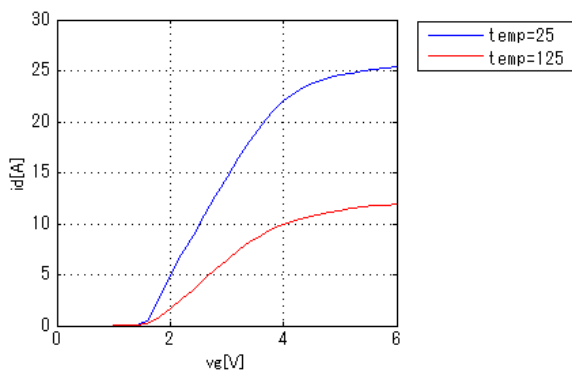
Rds(on)Vgs[Id]2

Temp = 125degC



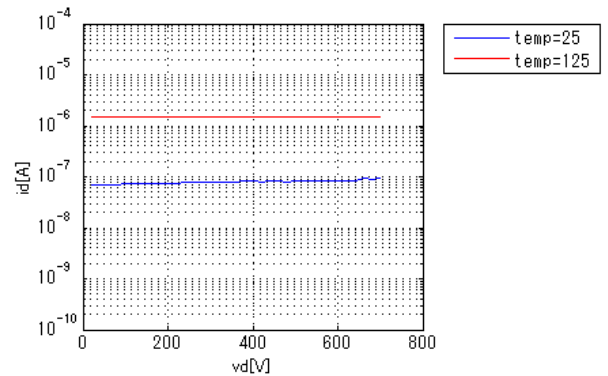
IdVgs[Temp]

$V_{ds} = 3V$



IdVds[temp]

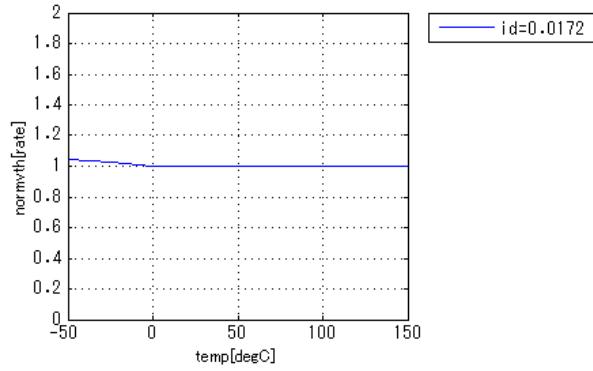
$v_g = 0V$



Simulation results are following.
 Explanatory notes — : simulated

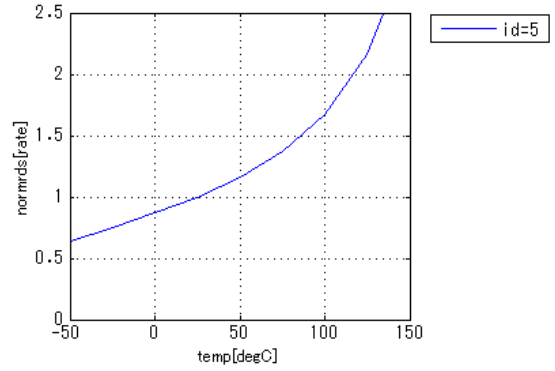
NormVthTemp[Id]

Vd = Vg



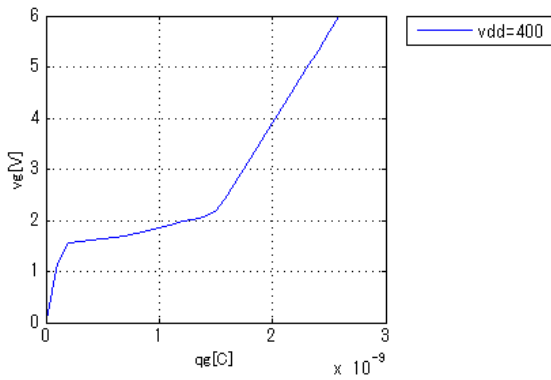
NormRds(on)Temp[Id]

Vgs = 6V



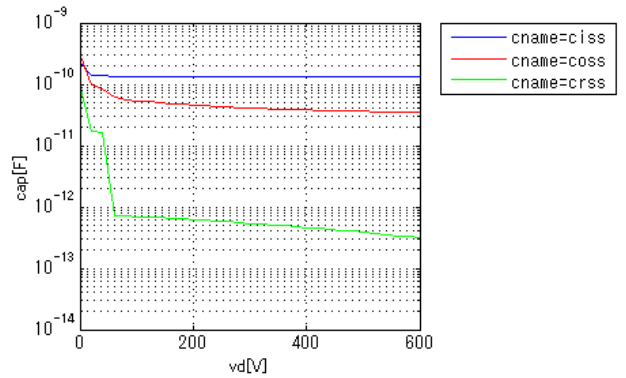
VgsQg[Vdd]

Id = 5A



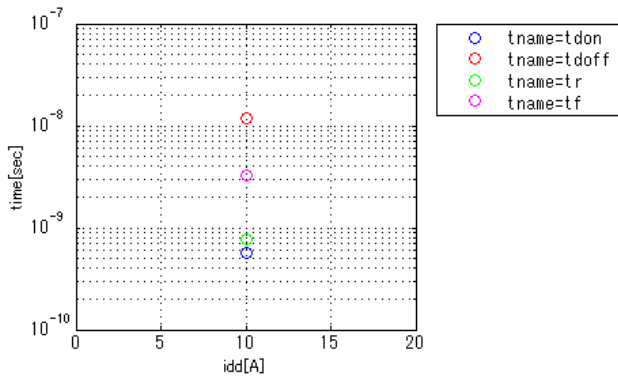
CapacitanceVds[Cname]

freq = 100000Hz



SwitchingLoad[Tname]

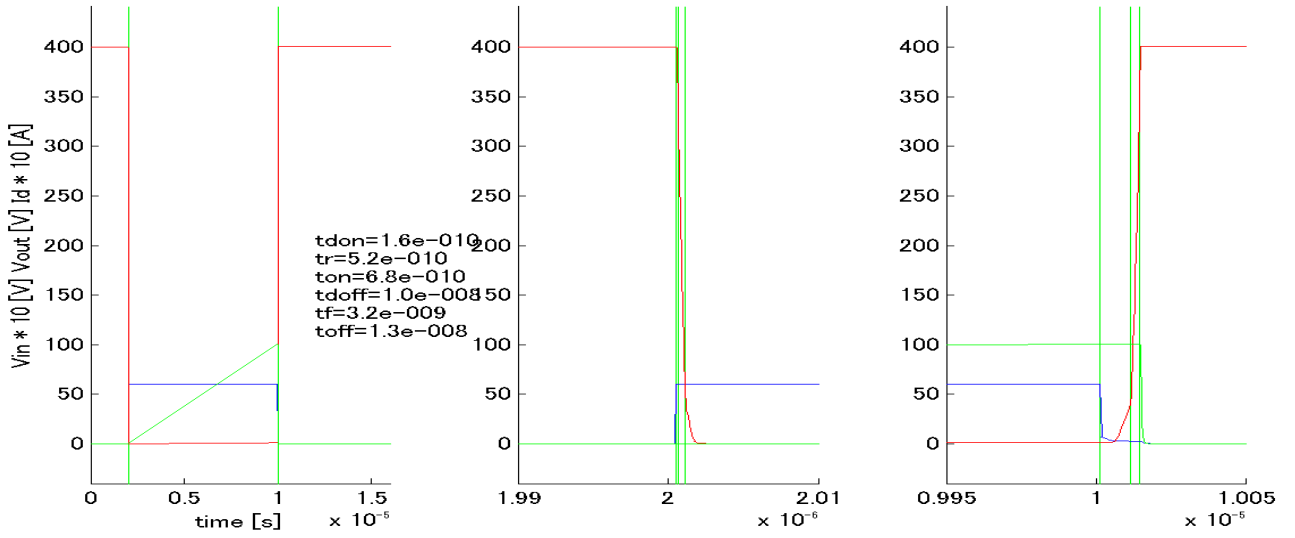
v_{gg} = 6V, v_{dd} = 400V, L_{load} = 318e-6H, R_{Gon} = 10ohm,
 R_{Gon} = 2ohm



Simulation results are following.
 Explanatory notes — : simulated

Switching Waveform (Blue : INPUT Red : OUTPUT Green : Current)

vgg = 6V, vcc = 400V, Lload = 318uH, Rgon = 10ohm, Rgoff = 2ohm, Temp = 25degC, Id = 10A



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