

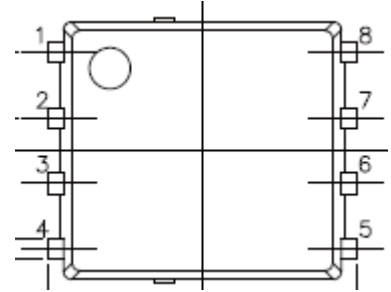
LTspice Model

NMOS

RENESAS

NP75N04YLG

1, 2, 3 : Source
 4 : Gate
 5, 6, 7, 8: Drain



Model Information

Model A macro model based on BSIM3 model
Call Name MDC_NP75N04YLG_LT
Pin Assign 1:S 2:S 3:S 4:G 5:D 6:D 7:D 8:D
File List Model Library MDC_NP75N04YLG_LT01.lib
 Model Report MDC_NP75N04YLG_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 Mar 02, 2015
- Product name NP75N04YLG
- Company name Renesas Electronics Corporation
- Characteristics IdVds[Vgs], IdVgs[Temp], VthTemp[Id], YfslD[Temp], Rds(on)Id [Vgs], Rds(on)Vgs[Id], CapacitanceVds[Cname], SwitchingIdd[Tname], VgsQg[Vdd], VdsQg[Vdd], IsVsd[Vgs], TrrIf[Ir], Switchi ngWaveform, TrrWaveform

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	40	V
Gate-source voltage (DC)	-20	to	20	V
Temperature	-55	to	175	deg C

MOSFET

○ : Implemented
× : Not Implemented
— : Not applicable

Model Functions Table

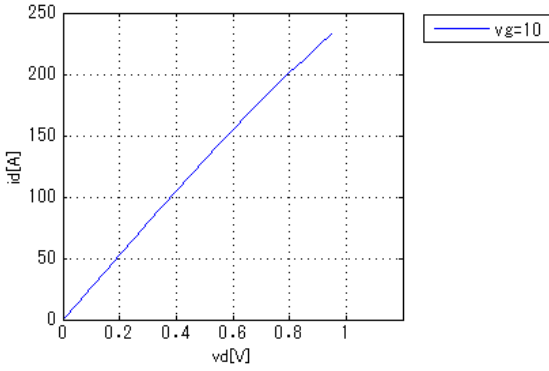
RANK=1

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

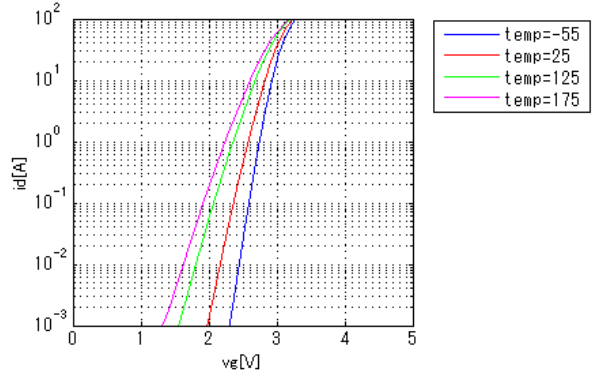
IdVds[Vgs]

Temp = 25degC



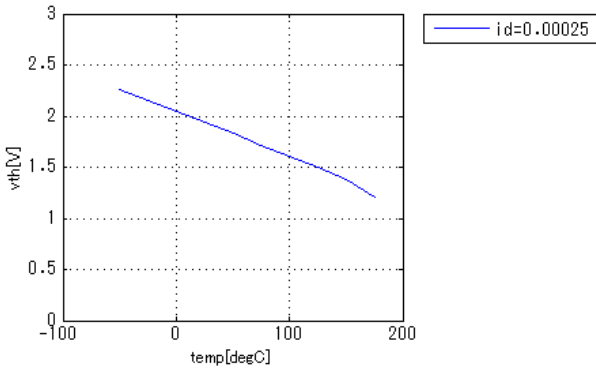
IdVgs[Temp]

Vds = 10V



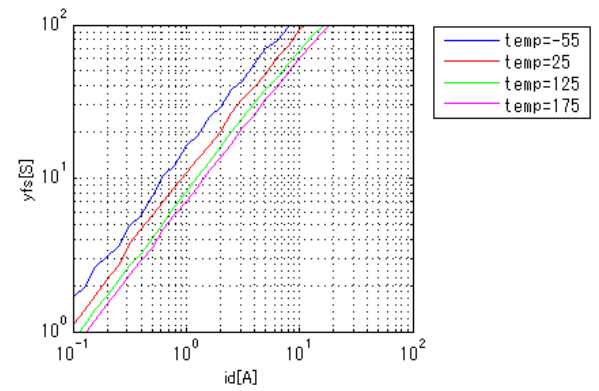
VthTemp[Id]

Vd = Vg



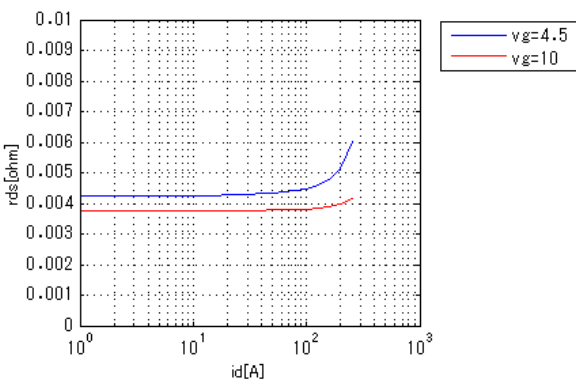
YfsId[Temp]

Vds = 5V



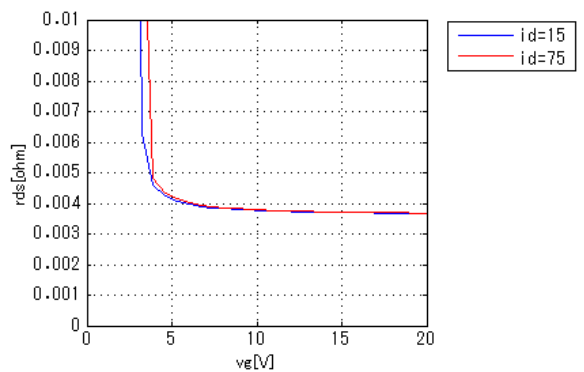
Rds(on)Id[Vgs]

Temp = 25degC



Rds(on)Vgs[Id]

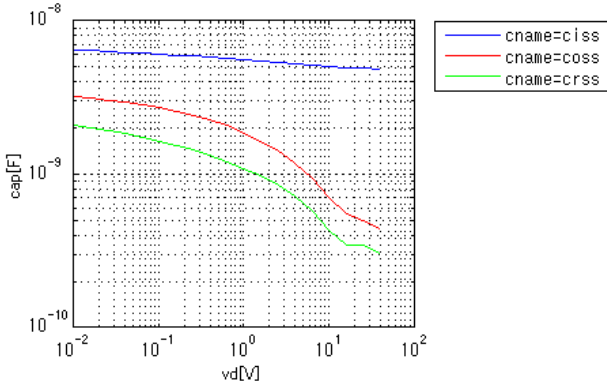
Temp = 25degC



Simulation results are following.
 Explanatory notes — : simulated

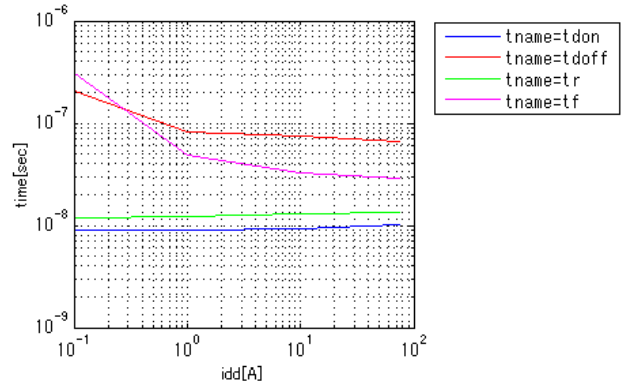
CapacitanceVds[Cname]

freq = 1000000Hz



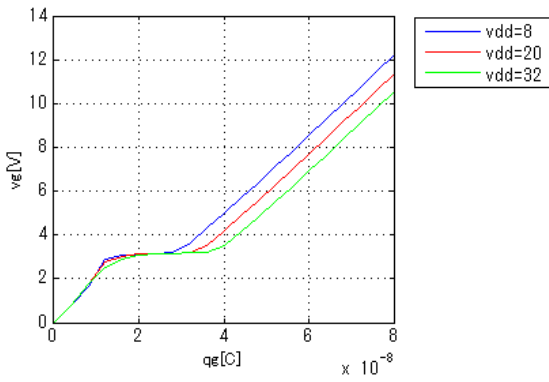
SwitchingIdd[Tname]

v_{gg} = 10V, v_{dd} = 20V, R_{GG} = 0.1ohm



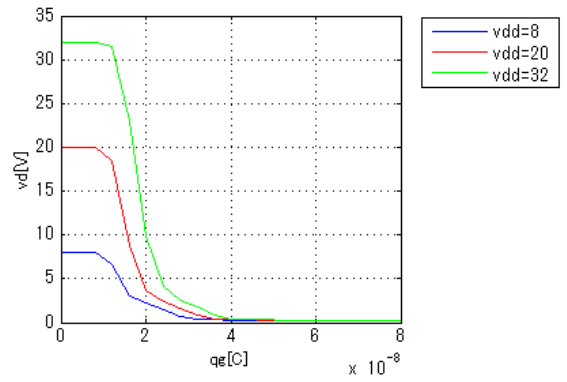
VgsQg[Vdd]

I_d = 75A

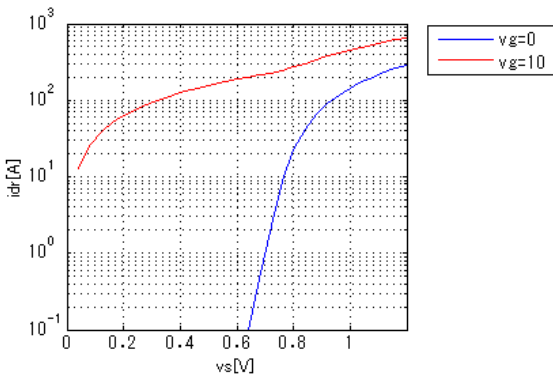


VdsQg[Vdd]

I_d = 75A

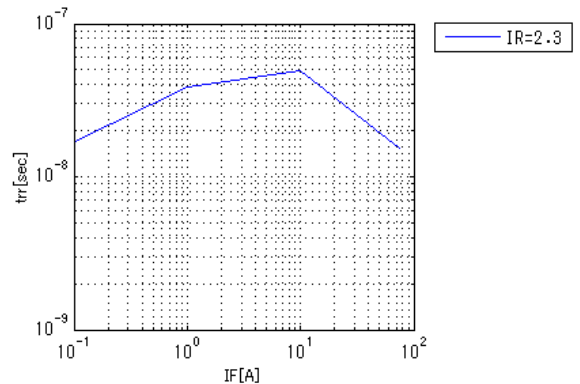


IsVsd[Vgs]



TrrIf[Ir]

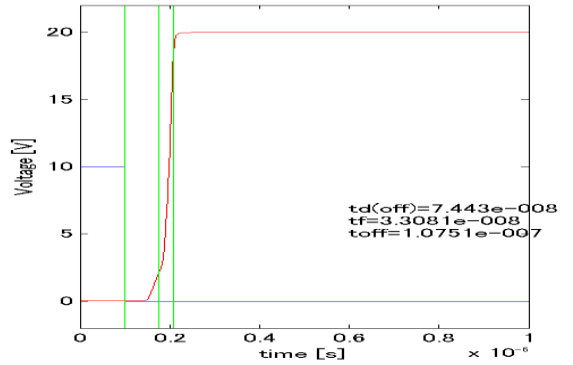
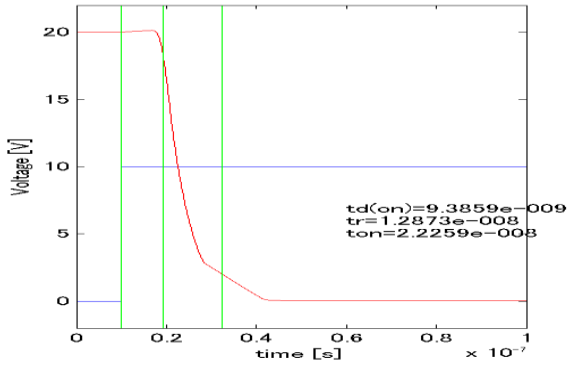
v_{dd} = 20V, didt = 100A/us, Temp = 25degC



Simulation results are following.
 Explanatory notes — : simulated

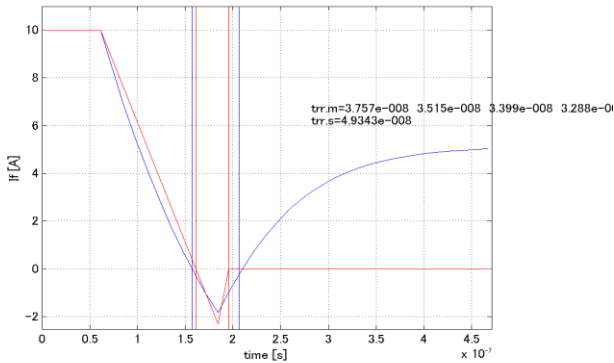
Switching Waveform (Blue : INPUT Red : OUTPUT)

vgg = 10V, vcc = 20V, RGG = 0.1ohm, Temp = 25degC, Ic = 10A



Trr Waveform (Red : Datasheet Blue : Simulation)

didt = 100A/us, vcc = 20V, if = 10A, ir = 2.3A



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