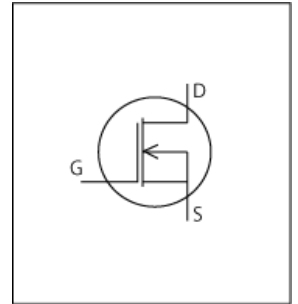


# PSpice Model

## NMOS

### TOSHIBA

### 2SK4207



### Model Information

**Model** A macro model based on BSIM3 model  
**Call Name** MDC\_2SK4207\_PS  
**Pin Assign** 1:G 2:D 3:S  
**File List** Model Library MDC\_2SK4207\_PS02.lib  
 Model Report MDC\_2SK4207\_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 2013-11-01
- Product name 2SK4207
- Company name Toshiba Corporation
- Characteristics IdVds[Vgs], IdVds[Vgs]2, IdVgs[Temp], VdsVgs[Id], YfsId[Temp], Rds(on)Id[Vgs], Rds(on)Temp[Id], IsVsd[Vgs], CapacitanceVds[Cname], VthTemp[Id], VgsQg[Vdd], VdsQg[Vdd], SwitchingIdd[Tname]Rs, Trrlf[Ir], Qrrlf[Ir], SwitchingWaveform, 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	900	V
Gate-source voltage (DC)	-30	to	30	V
Temperature	-55	to	150	deg C

## MOSFET

○ : Implemented  
× : Not Implemented  
— : Not applicable

Model Functions Table

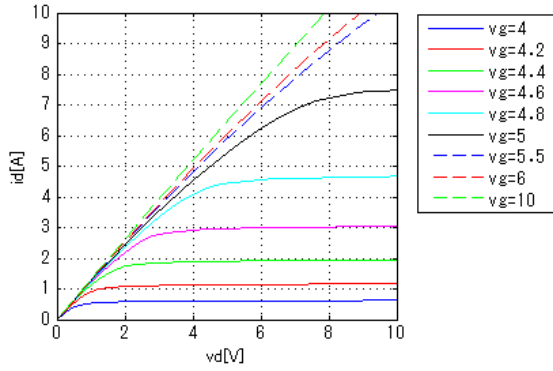
RANK=1

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

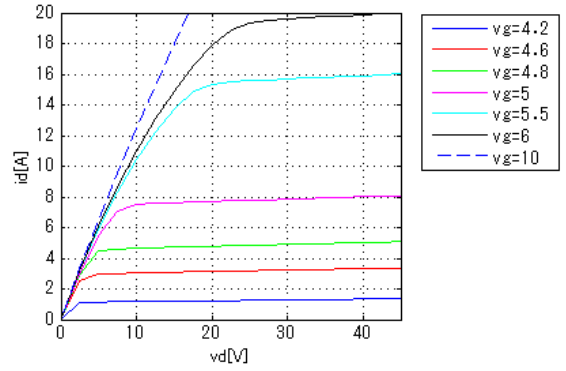
**IdVds[Vgs]**

Temp = 25degC



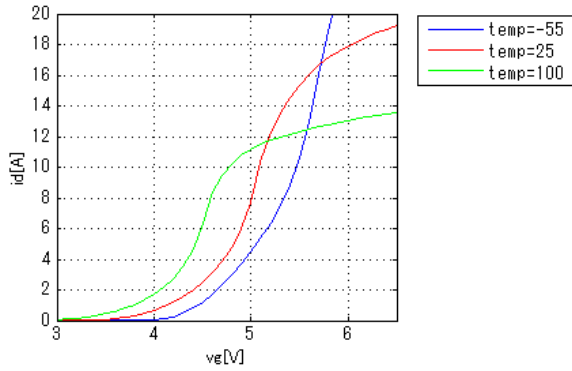
**IdVds[Vgs]2**

Temp = 25degC

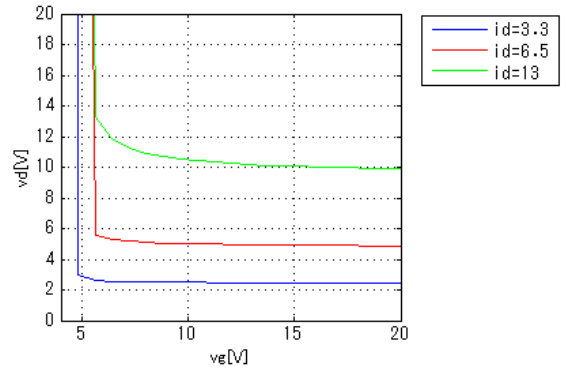


**IdVgs[Temp]**

Vds = 20V

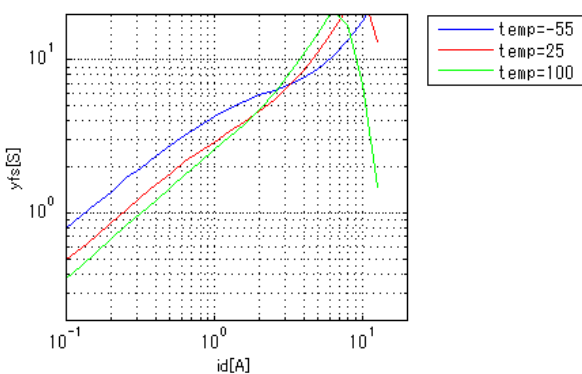


**VdsVgs[Id]**



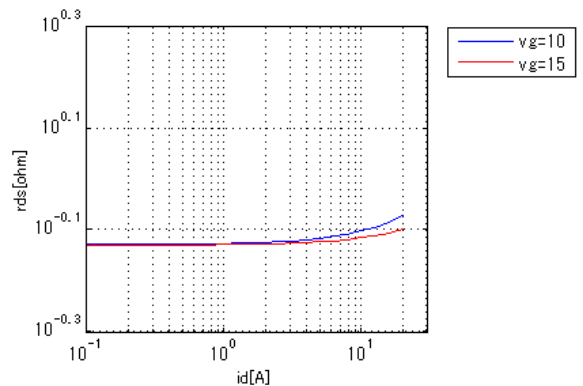
**YfsId[Temp]**

Vds = 20V



**Rds(on)Id[Vgs]**

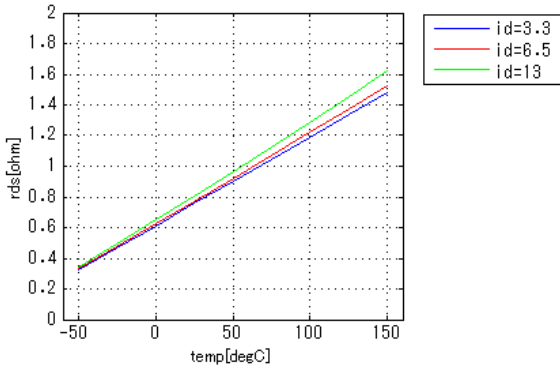
Temp = 25degC



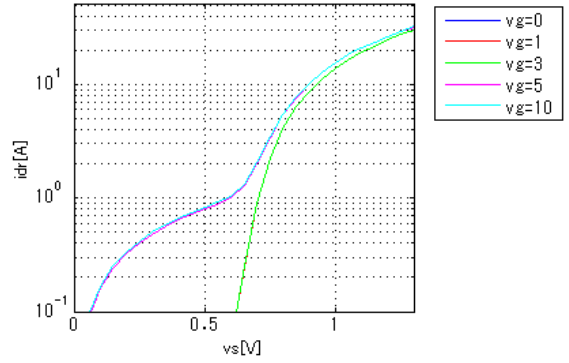
Simulation results are following.  
 Explanatory notes — : simulated

**Rds(on)Temp[Id]**

Vgs = 10V

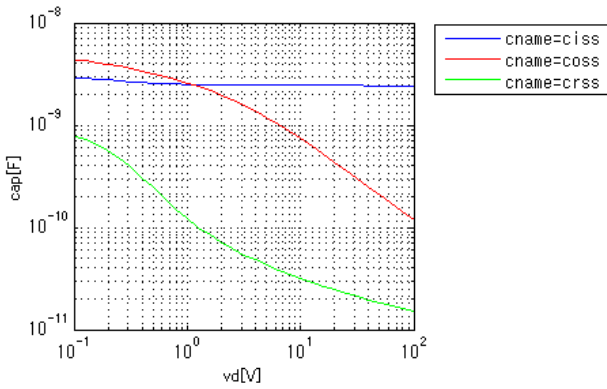


**IsVsd[Vgs]**



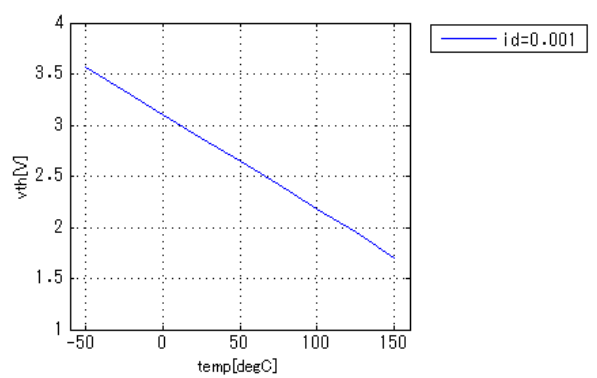
**CapacitanceVds[Cname]**

freq = 1000000Hz



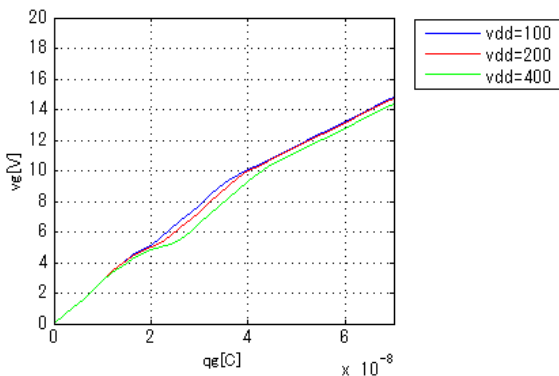
**VthTemp[Id]**

Vds = 10V



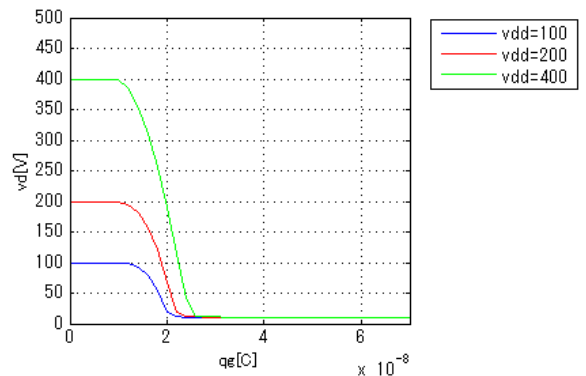
**VgsQg[Vdd]**

Id = 13A



**VdsQg[Vdd]**

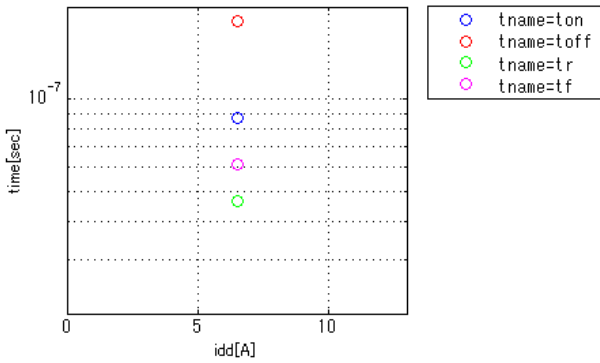
Id = 13A



Simulation results are following.  
 Explanatory notes — : simulated

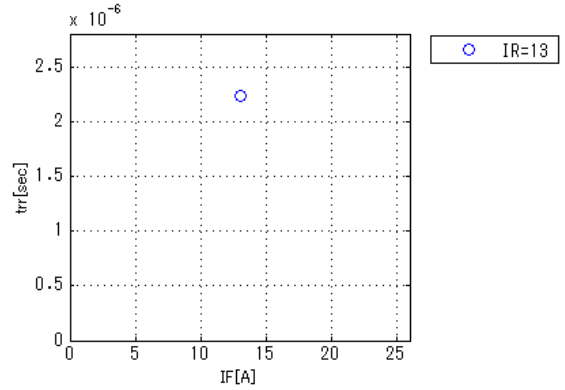
**SwitchingIdd[Tname]Rs**

v<sub>gg</sub> = 10V, v<sub>dd</sub> = 400V, R<sub>GS</sub> = 50ohm



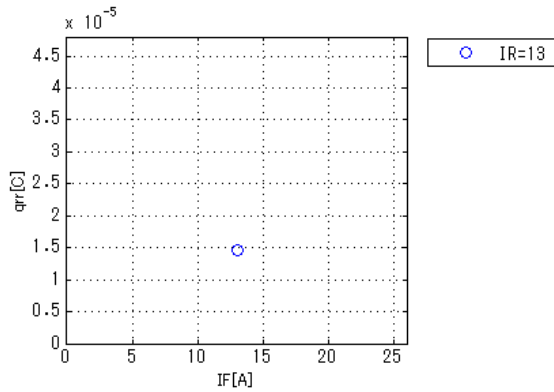
**Trrlf[Ir]**

v<sub>dd</sub> = 400V, didt = 100A/us, Temp = 25degC



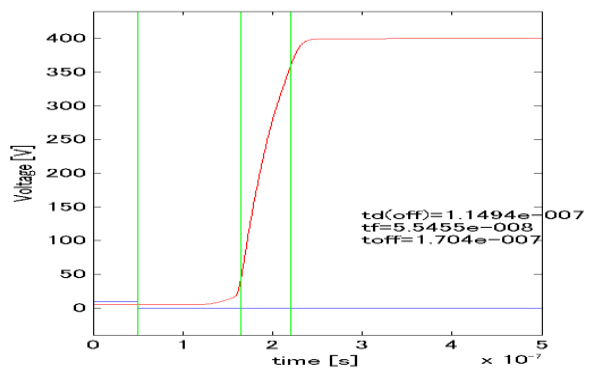
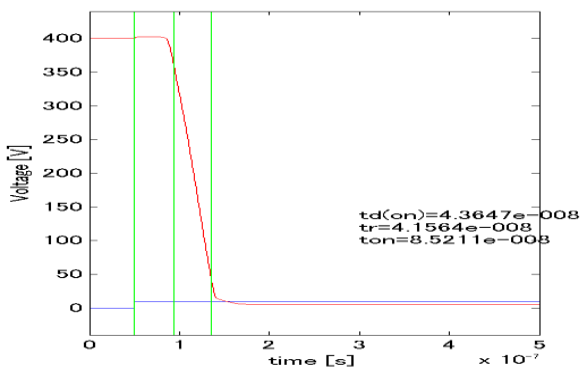
**Qrrlf[Ir]**

v<sub>dd</sub> = 400V, didt = 100A/us, Temp = 25degC



**SwitchingWaveform (Blue : INPUT Red : OUTPUT)**

v<sub>gg</sub> = 10V, v<sub>dd</sub> = 400V, R<sub>GS</sub> = 50ohm, I<sub>dd</sub> = 6.5A

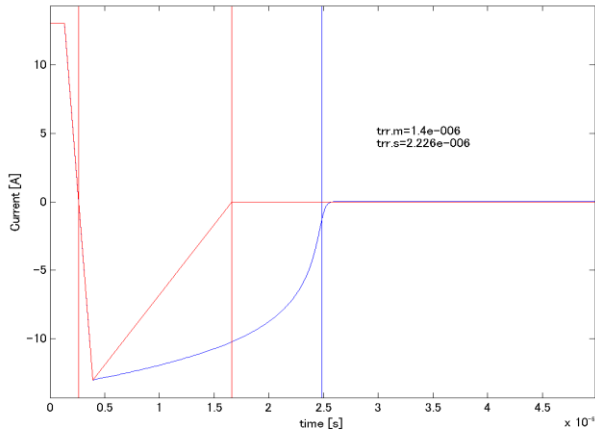


Simulation results are following.

Explanatory notes — : simulated

### TrrWaveform (Red : Datasheet Blue : Simulation)

vdd = 400V, didt = 100A/us, Temp = 25degC



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