

# LTspice Model

## NMOS

### TOSHIBA

### TK5A90E



### Model Information

**Model** A macro model based on BSIM3 model  
**Call Name** MDC\_TK5A90E\_LT  
**Pin Assign** 1:G 2:D 3:S  
**File List** Model Library MDC\_TK5A90E\_LT01.lib  
 Model Report MDC\_TK5A90E\_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 Rev.2.0
- Product name TK5A90E
- Company name Toshiba Corporation
- Characteristics IdVds[Vgs], IdVgs[Temp], VthTemp[Id], VdsVgs[Id], Rds(on)Id[Vgs], Rds(on)Temp[Id], IsVsd[Temp], Crss, Ciss, Coss, VgsQg[Vdd], VdsQg[Vdd], ton, toff, tf, tr

### Simulation Range

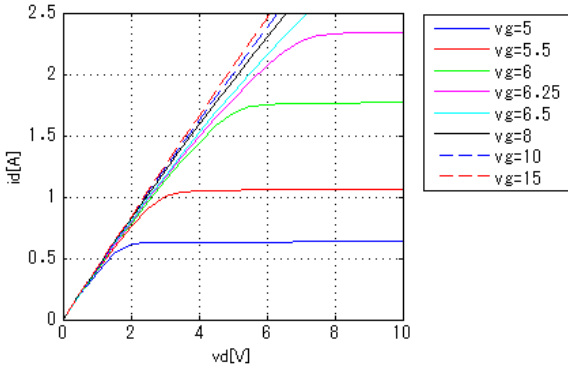
This table shows the range of evaluated simulation range that was not occurs any convergence problems in this area.

Item	Range			Unit
	Min.		Max.	
Drain-source voltage (DC)	0	to	900	V
Gate-source voltage (DC)	0	to	30	V
Temperature	-55	to	150	deg C

Simulation results are following.  
 Explanatory notes — : simulated

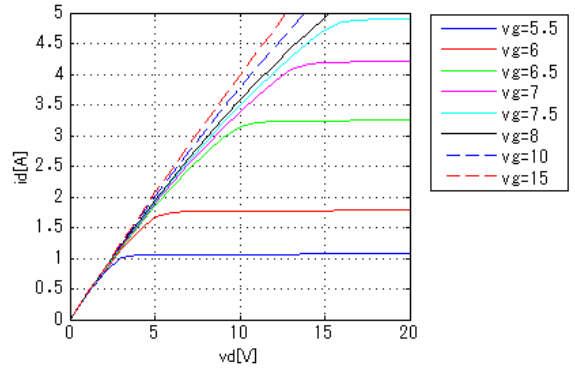
**IdVds[Vgs]**

Temp. = 25deg C



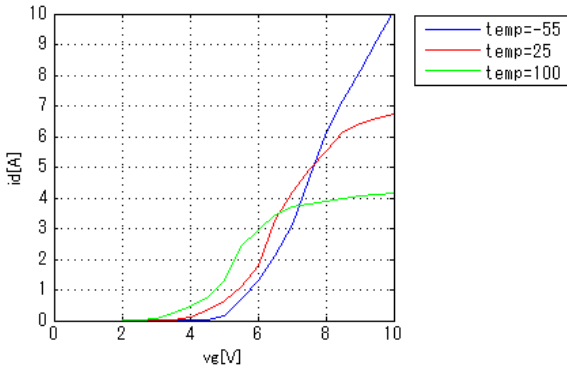
**IdVds[Vgs]**

Temp. = 25deg C



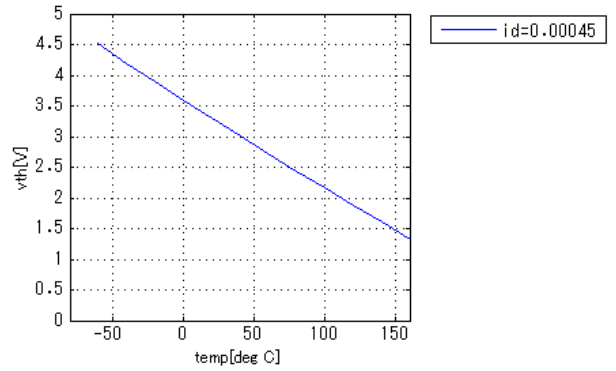
**IdVgs[Temp]**

Vds = 20V

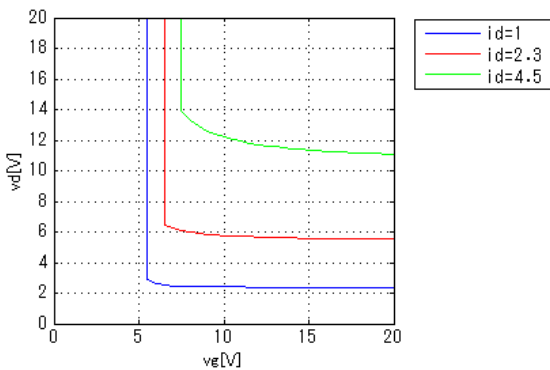


**VthTemp[Id]**

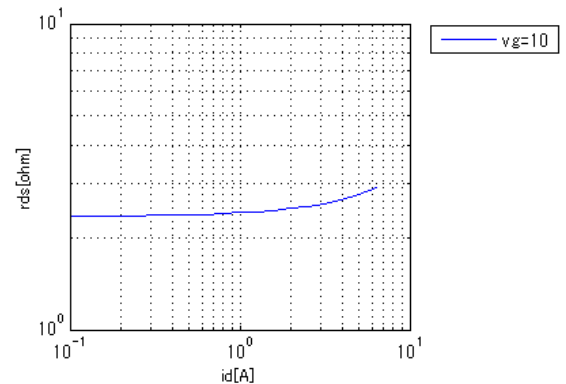
Vds = 10V



**VdsVgs[Id]**



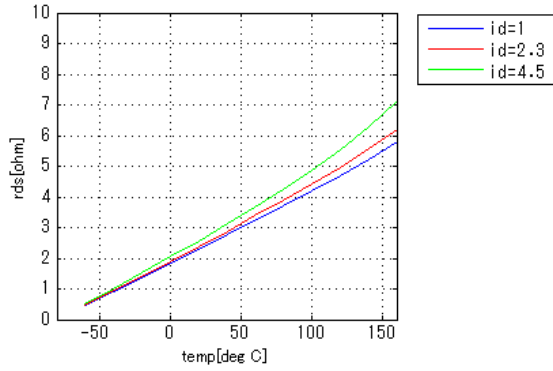
**Rds(on)Id[Vgs]**



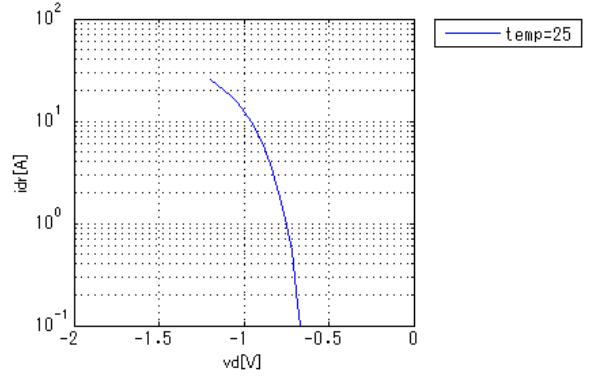
Simulation results are following.  
 Explanatory notes — : simulated

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

Vgs = 10V

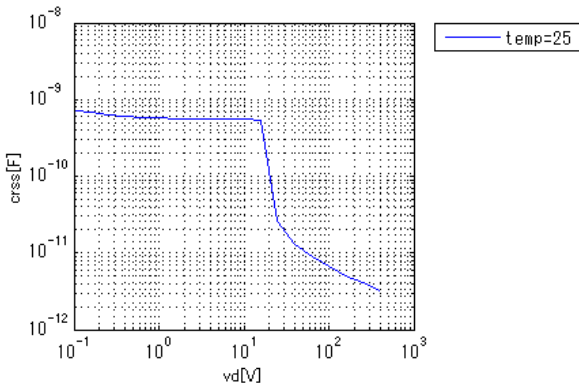


**IsVsd[Temp]**



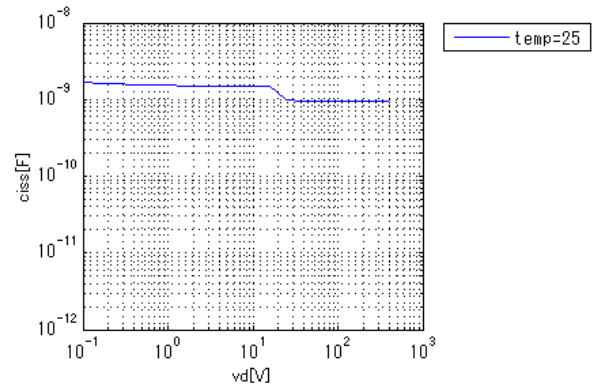
**Crss**

Freq. = 1MHz



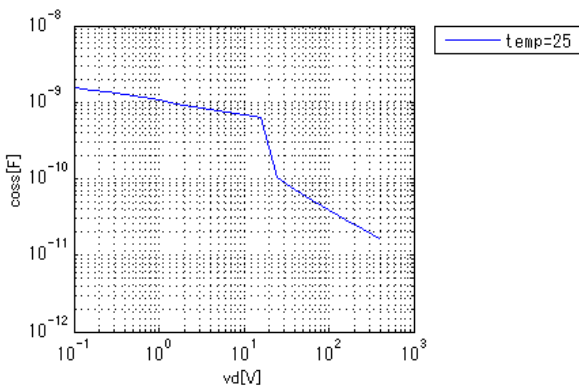
**Ciss**

Freq. = 1MHz



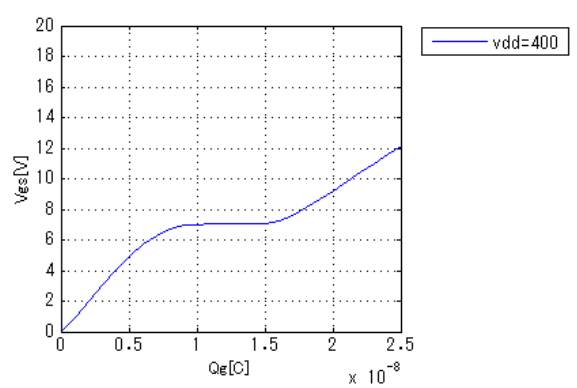
**Coss**

Freq. = 1MHz



**VgsQg[Vdd]**

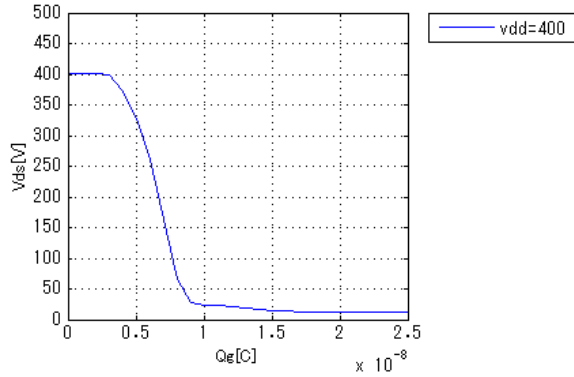
Id = 4.5A



Simulation results are following.  
 Explanatory notes — : simulated

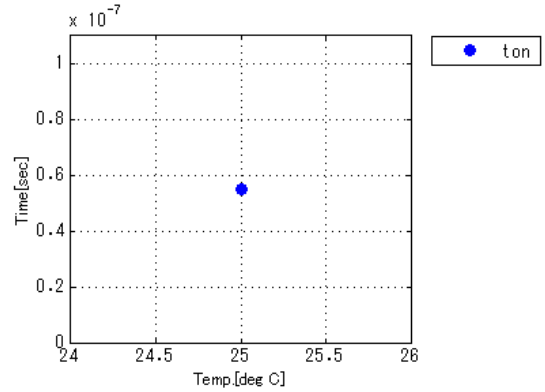
**VdsQg[Vdd]**

Id = 4.5A



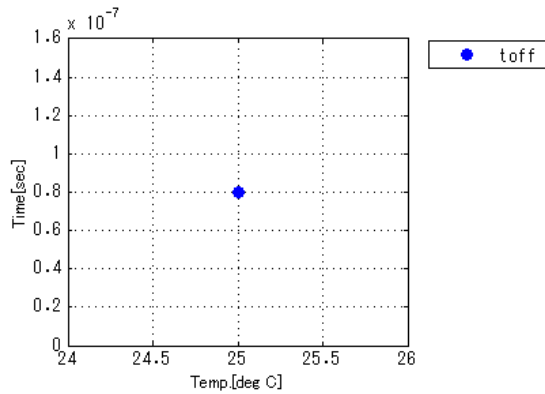
**ton**

Vdd = 400V, Id = 2.3A, +Vg = 10V, -Vg = 0V, Rg = 0.001ohm



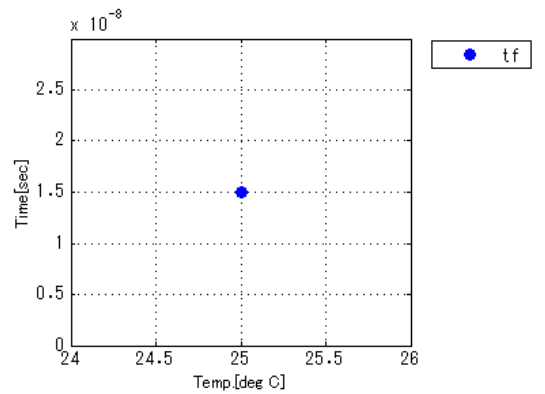
**toff**

Vdd = 400V, Id = 2.3A, +Vg = 10V, -Vg = 0V, Rg = 0.001ohm



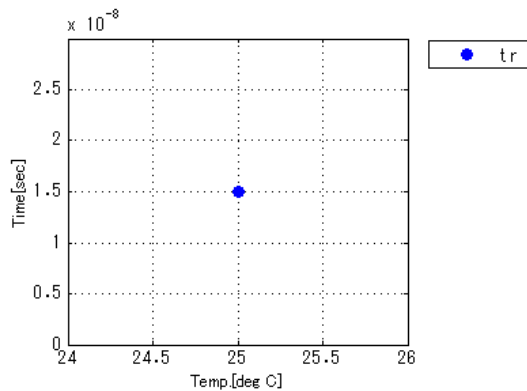
**tf**

Vdd = 400V, Id = 2.3A, +Vg = 10V, -Vg = 0V, Rg = 0.001ohm



**tr**

Vdd = 400V, Id = 2.3A, +Vg = 10V, -Vg = 0V, Rg = 0.001ohm



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