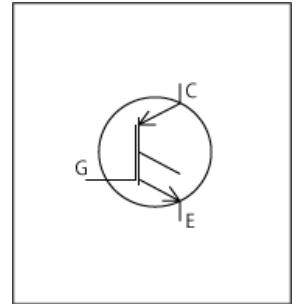


PSpice Model

Nch IGBT

TOSHIBA

GT30J341



Model Information

Model An original macro model based on BSIM3 and Gummel-Poon model
Call Name MDC_GT30J341_PS
Pin Assign 1:G 2:C 3:E
File List Model Library MDC_GT30J341_PS01.lib
 Model Report MDC_GT30J341_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 2014-01-07 Rev.2.0
- Product name GT30J341
- Company name Toshiba Corporation
- Characteristics IcVce[Vge],IcVce[Vge]2,IcVce[Vge]3,IcVce[Vge]4,Vce(sat)Vge[Ic],Vce(sat)Vge[Ic]2,Vce(sat)Vge[Ic]3,Vce(sat)Vge[Ic]4,Vce(sat)Temp[Ic],SwitchingRg[Tname],SwitchingRg[Tname]2,Switchinglcc[Tname],Switchinglcc[Tname]2,SwitchingRg[Tname]3,SwitchingRg[Tname]4,Switchinglcc[Tname]3,Switchinglcc[Tname]4,VgeQg[Vcc],VceQg[Vcc],IfVf[Temp],Trrlf,Trrlf2,CapacitanceVce[Cname],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.	
Collector-emitter voltage (DC)	0	to	600	V
Gate-emitter voltage (DC)	-25	to	25	V
Temperature	-55	to	175	deg C

IGBT

○ : Implemented
 × : Not Implemented
 — : Not applicable

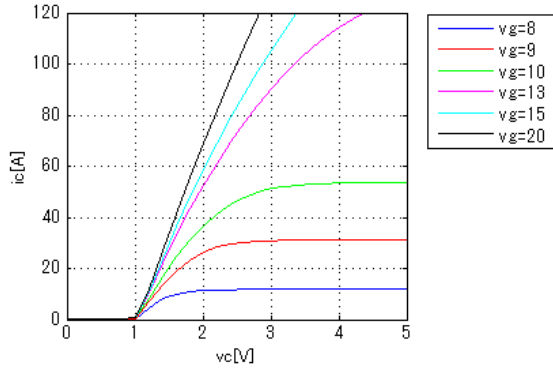
Model Functions Table
RANK=1

Functions	RANK	Implemented
DC Characteristics(with Temperature)	1	○
Capacitance	1	○
Gate Charge	1	○
Reverse recovery characteristics	1	○
Switching(Typ.) Inductor Load	1	○
trr	1	○

Simulation results are following.
 Explanatory notes — : simulated

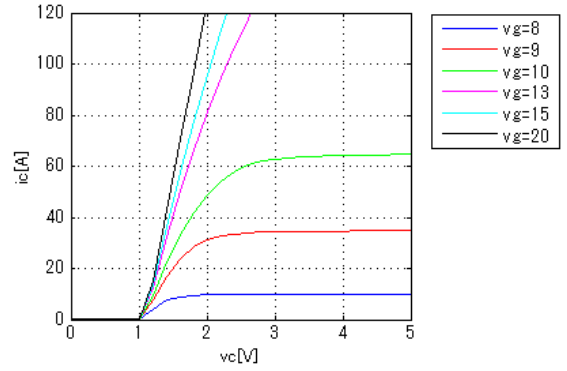
IcVce[Vge]

Temp. = 25deg C



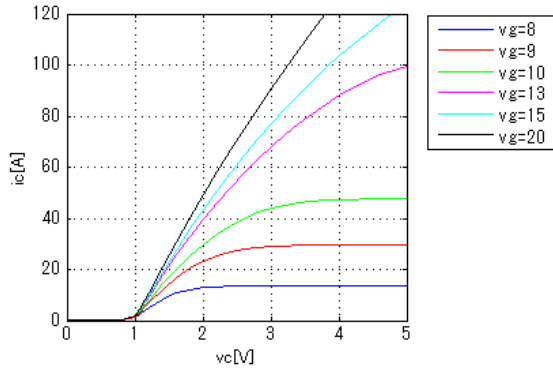
IcVce[Vge]2

Temp. = -40deg C



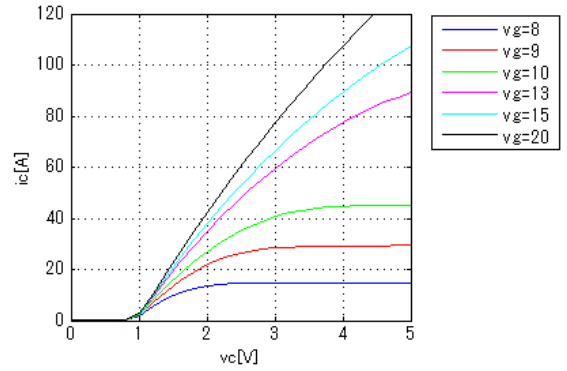
IcVce[Vge]3

Temp. = 100deg C



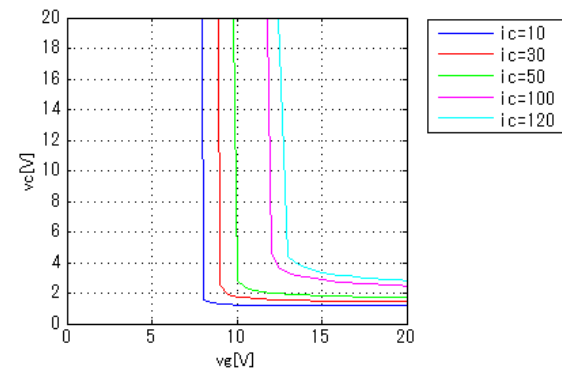
IcVce[Vge]4

Temp. = 150deg C



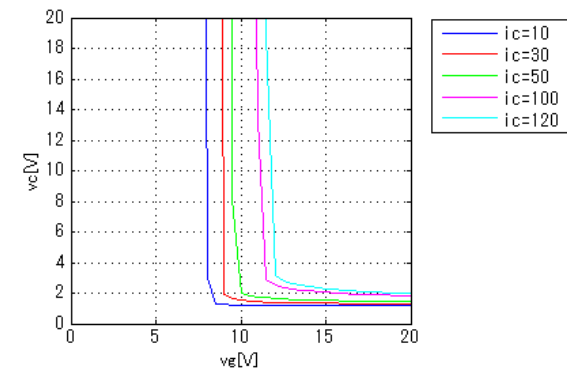
Vce(sat)Vge[Ic]

Temp. = 25deg C



Vce(sat)Vge[Ic]2

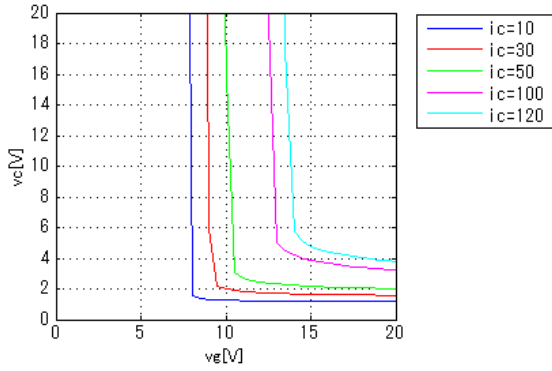
Temp. = -40deg C



Simulation results are following.
 Explanatory notes — : simulated

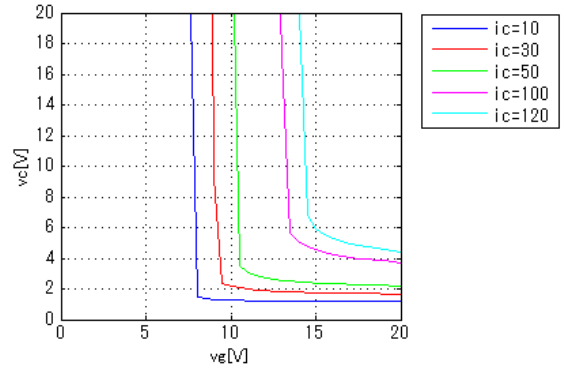
Vce(sat)Vge[Ic]3

Temp. = 100deg C



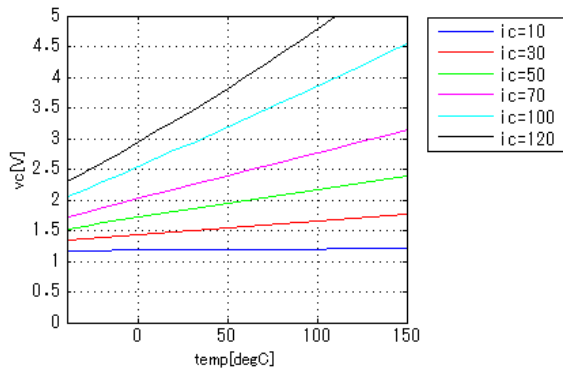
Vce(sat)Vge[Ic]4

Temp. = 150deg C



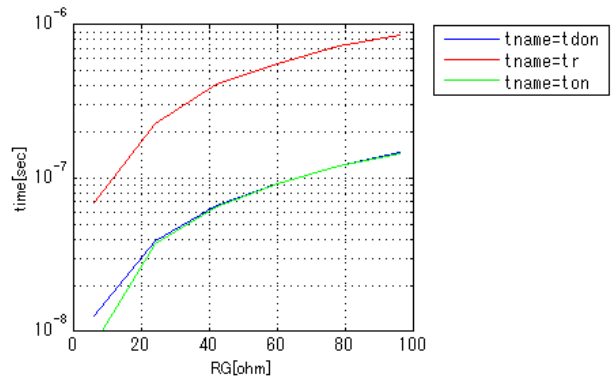
VcesatTemp[Ic]

vg = 15V



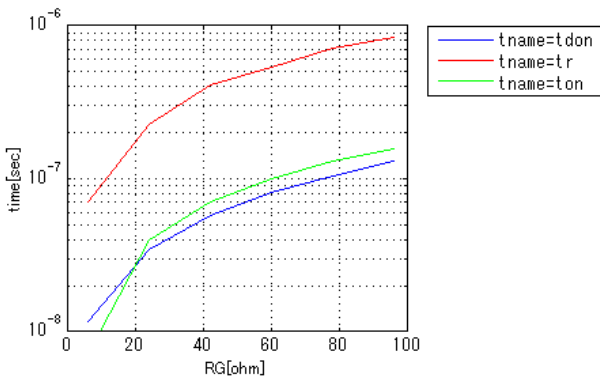
SwitchingRg[Tname]

vgg = 15V, vcc = 300V, icc = 30A, Temp = 25degC



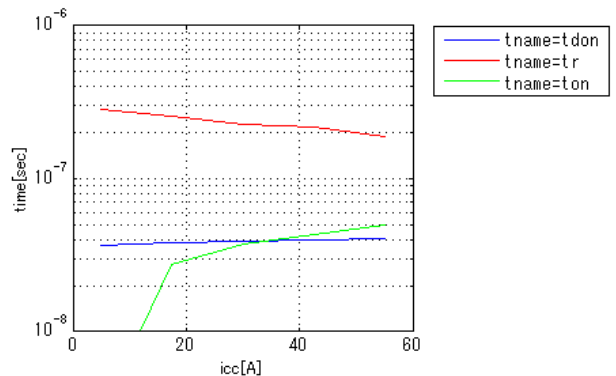
SwitchingRg[Tname]2

vgg = 15V, vcc = 300V, icc = 30A, Temp = 150degC



SwitchingIcc[Tname]

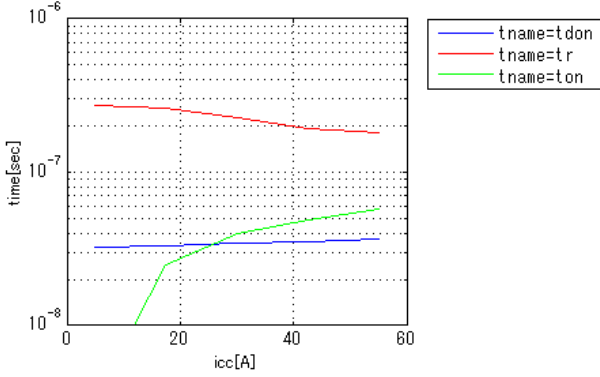
vgg = 15V, vcc = 300V, RGG = 24ohm, Temp = 25degC



Simulation results are following.
 Explanatory notes — : simulated

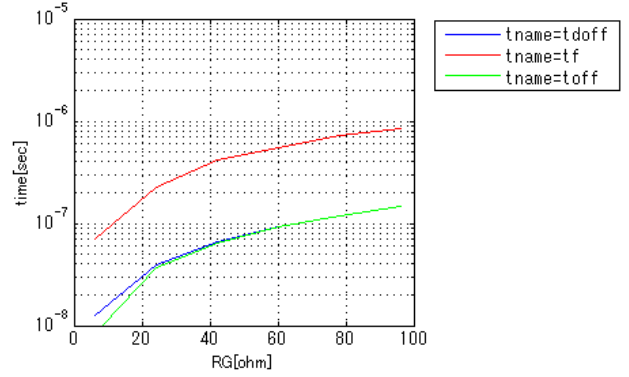
SwitchingIcc[Tname]2

vgg = 15V, vcc = 300V, RGG = 24ohm, Temp = 150degC



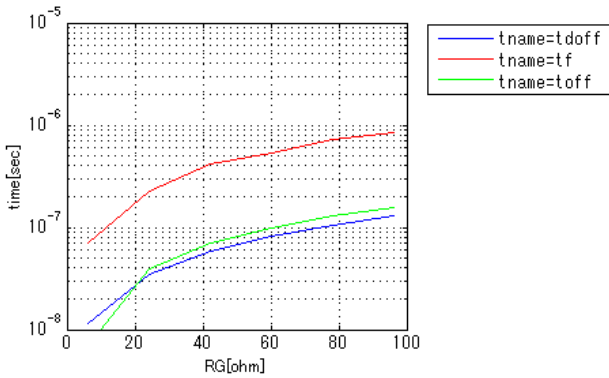
SwitchingRg[Tname]3

vgg = 15V, vcc = 300V, icc = 30A, Temp = 25degC



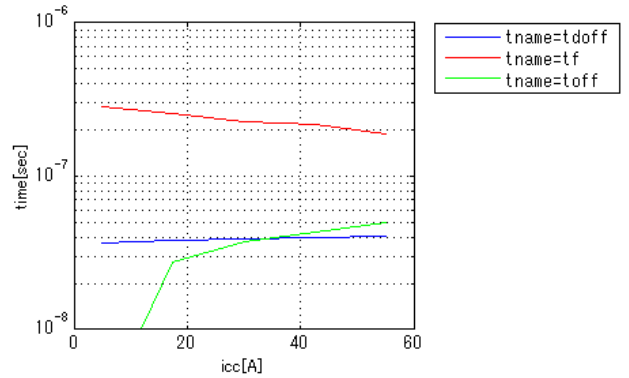
SwitchingRg[Tname]4

vgg = 15V, vcc = 300V, icc = 30A, Temp = 150degC



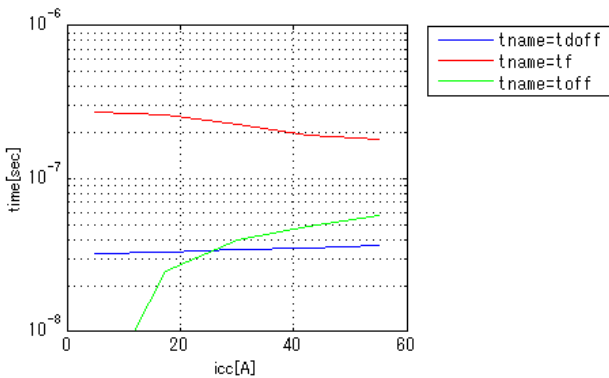
SwitchingIcc[Tname]3

vgg = 15V, vcc = 300V, RGG = 24ohm, Temp = 25degC



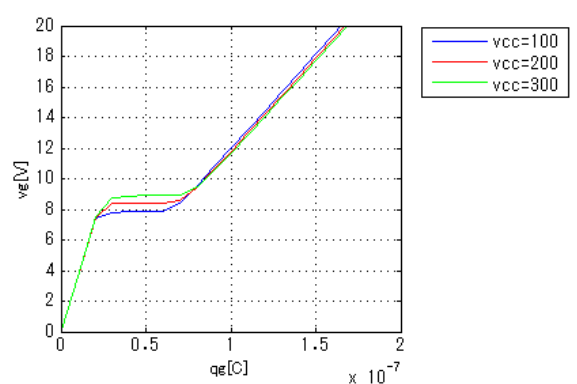
SwitchingIcc[Tname]4

vgg = 15V, vcc = 300V, RGG = 24ohm, Temp = 150degC



VgeQg[Vcc]

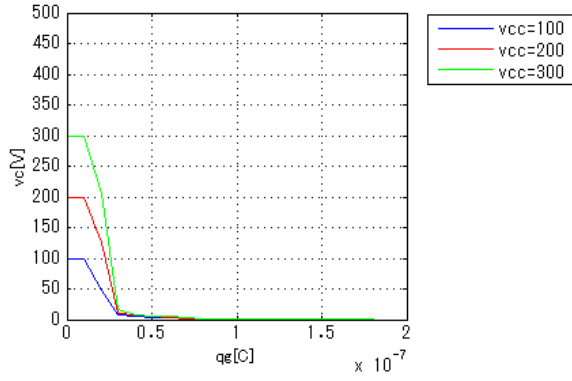
RL = 10ohm



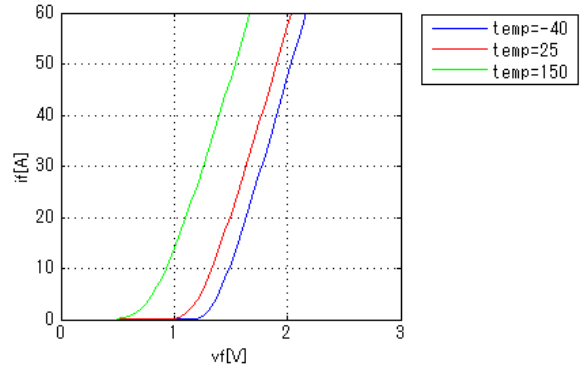
Simulation results are following.
 Explanatory notes — : simulated

VceQg[Vcc]

RL = 10ohm

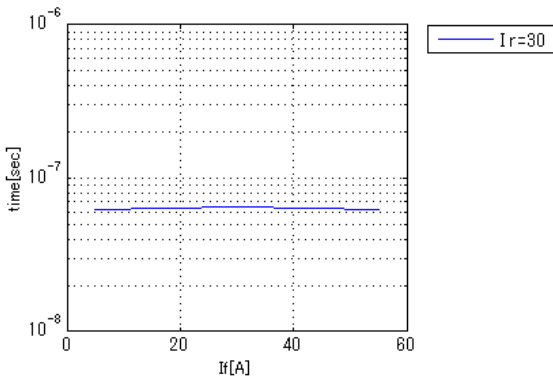


IfVf[Temp]



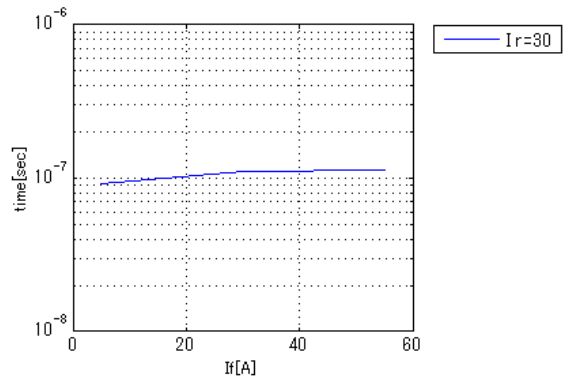
Trrlf

didt = 100A/us, vcc = 300V, temp = 25degC



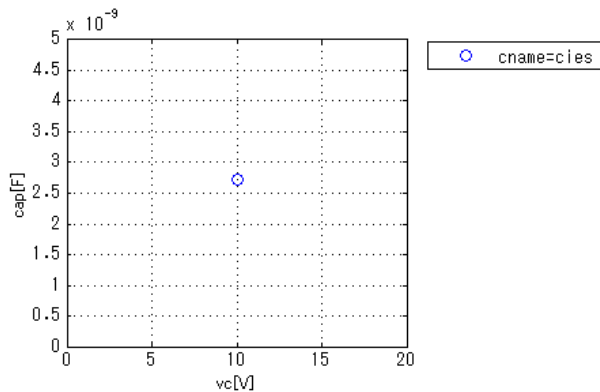
Trrlf2

didt = 100A/us, vcc = 300V, temp = 150degC



CapacitanceVce[Cname]

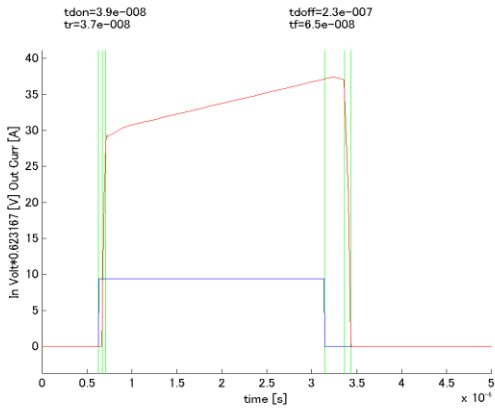
freq = 1000000Hz



Simulation results are following.
 Explanatory notes — : simulated

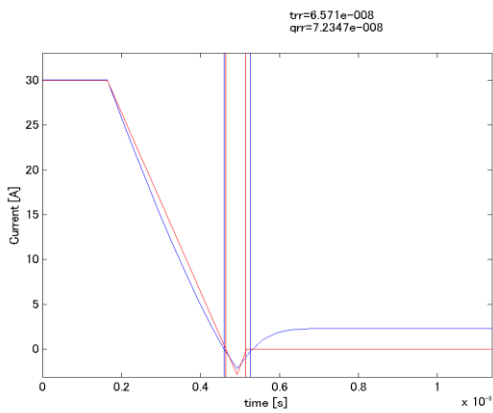
Switching Waveform (Blue : INPUT Red : OUTPUT)

vgg = 15V, vcc = 300V, RGG = 24ohm, Temp = 25degC, Ic = 30A



Trr Waveform (Red : Datasheet Blue : Simulation)

didt = 100A/us, vcc = 300V, if = 30A, ir = 2.839A



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