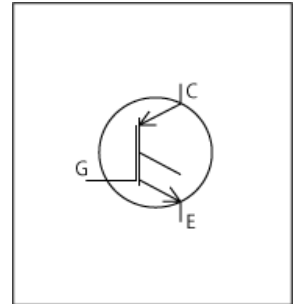


LTspice Model

Nch IGBT

TOSHIBA

GT50N324



Model Information

Model An original macro model based on BSIM3 and Gummel-Poon model
Call Name MDC_GT50N324_LT
Pin Assign 1:G 2:C 3:E
File List Model Library MDC_GT50N324_LT01.lib
 Model Report MDC_GT50N324_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 2019-11-18 Rev.1.0
- Product name GT50N324
- Company name Toshiba Corporation
- Characteristics IcVce[Vge],IcVce[Vge]2,IcVce[Vge]3,IcVce[Temp],VcesatTemp[Ic],IcVge[Temp],SwitchingIcc[Tname],SwitchingRg[Tname],VgeQg[Vcc],VceQg[Vcc],CapacitanceVce[Cname],IfVf[Temp],TrrDidt[Temp],TrrIf[Temp],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	1,000	V
Gate-emitter voltage (DC)	-25	to	25	V
Temperature	-55	to	150	deg C

IGBT

○ : Implemented
× : Not Implemented
— : Not applicable

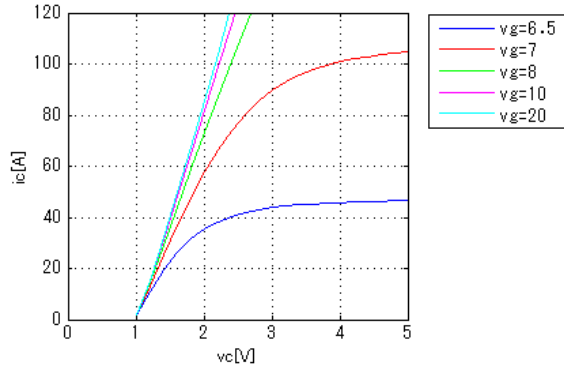
Model Functions Table
RANK=1

Functions	RANK	Implemented
IC-VCE-VGE	1	○
IC-VGE(Temp)	1	○
Vce(sat)	1	○
Capacitance	1	○
Gate Charge	1	○
IE-VEC(Diode Forward)	1	○
Reverse recovery	1	○
Switching(Typ.)	1	○
Vth	1	—

Simulation results are following.
 Explanatory notes — : simulated

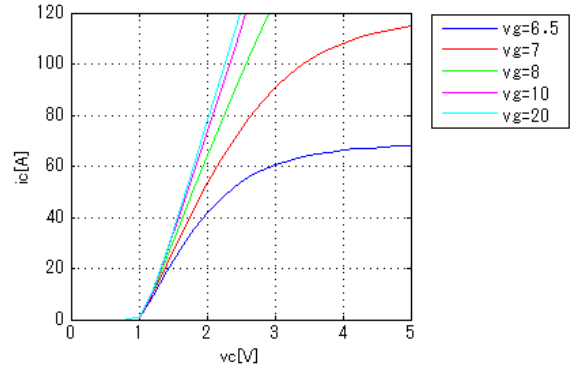
IcVce[Vge]

Temp. = -40deg C



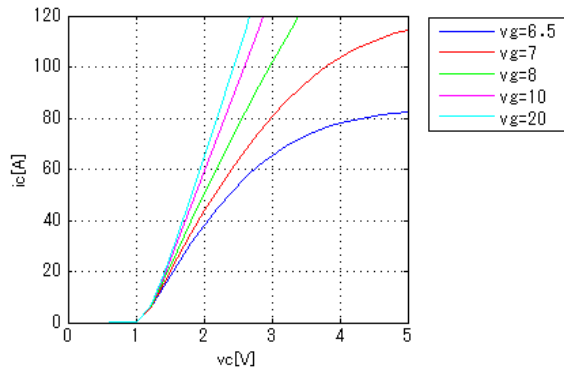
IcVce[Vge]2

Temp. = 25deg C



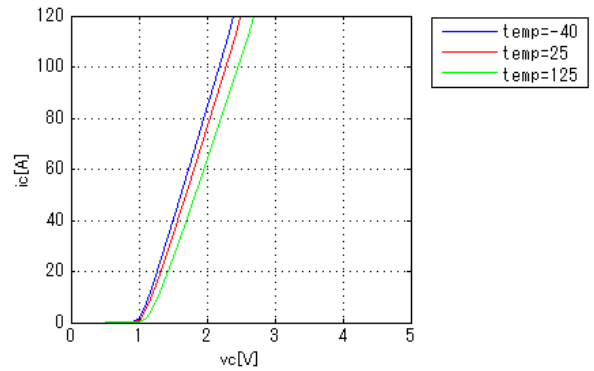
IcVce[Vge]3

Temp. = 125deg C



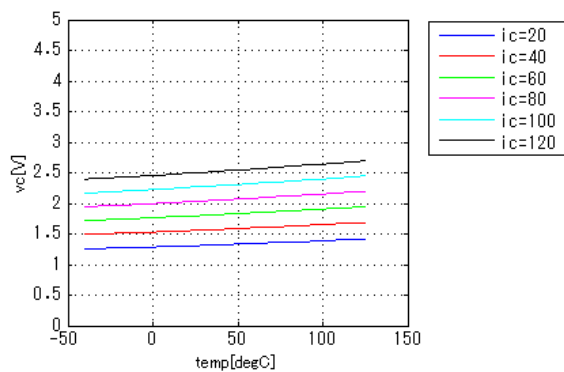
IcVce[Temp]

Vge = 15V



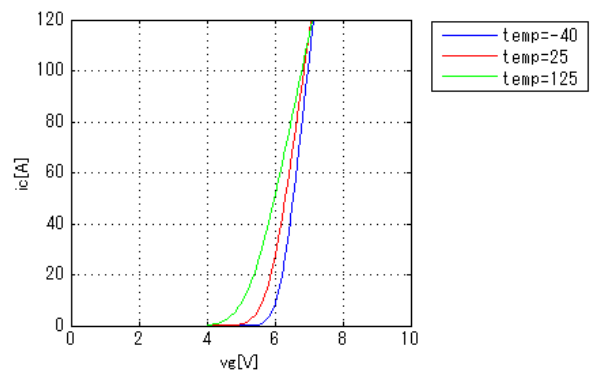
VcesatTemp[Ic]

Vg = 15V



IcVge[Temp]

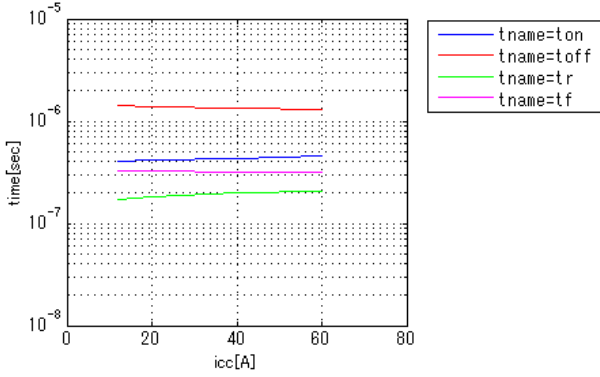
Vce = 5V



Simulation results are following.
 Explanatory notes — : simulated

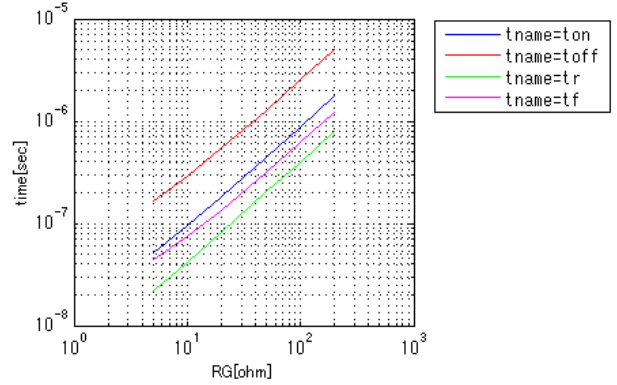
SwitchingIcc[Tname]

v_{gg} = 15V, v_{cc} = 600V, R_{GG} = 51ohm, Temp = 25degC



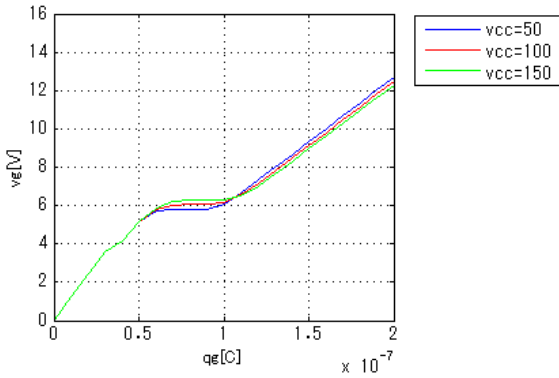
SwitchingRg[Tname]

v_{gg} = 15V, v_{cc} = 600V, icc = 60A, Temp = 25degC



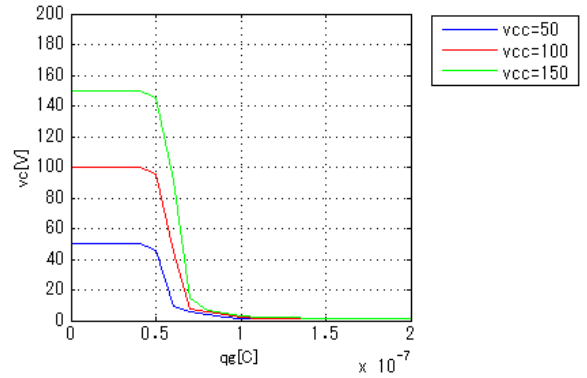
VgeQg[Vcc]

RL = 3ohm



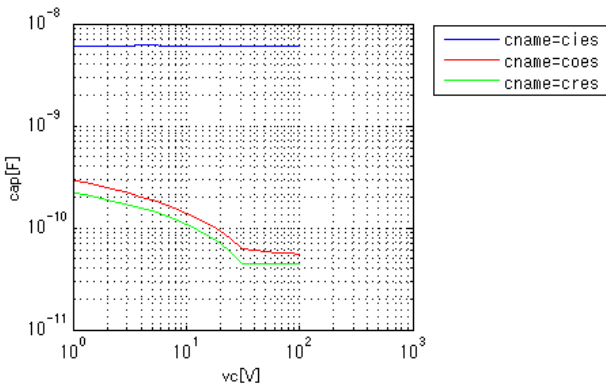
VceQg[Vcc]

RL = 3ohm

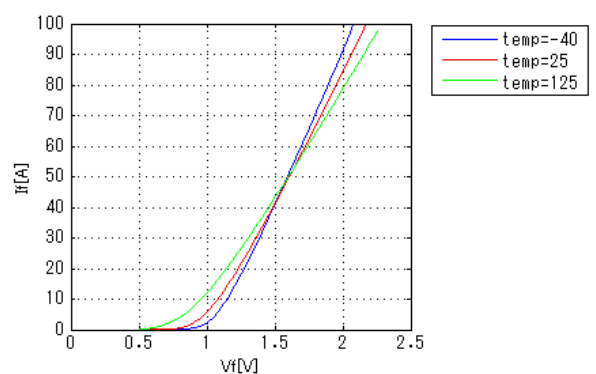


CapacitanceVce[Cname]

freq = 1000000Hz



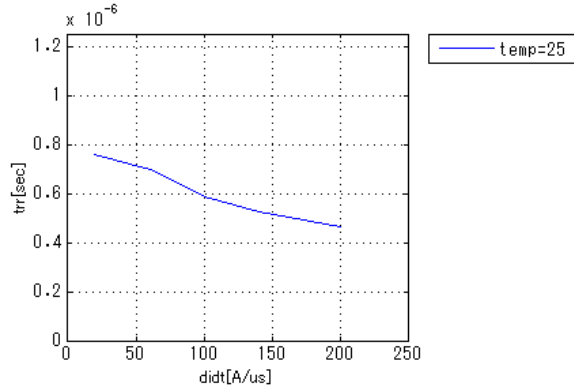
IfVf[Temp]



Simulation results are following.
 Explanatory notes — : simulated

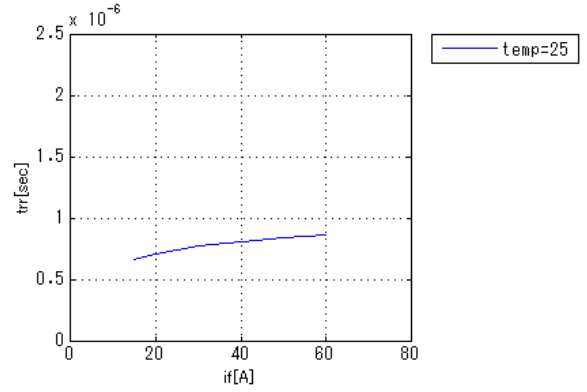
TrrDidt[Temp]

if = 15A, vcc = 500V



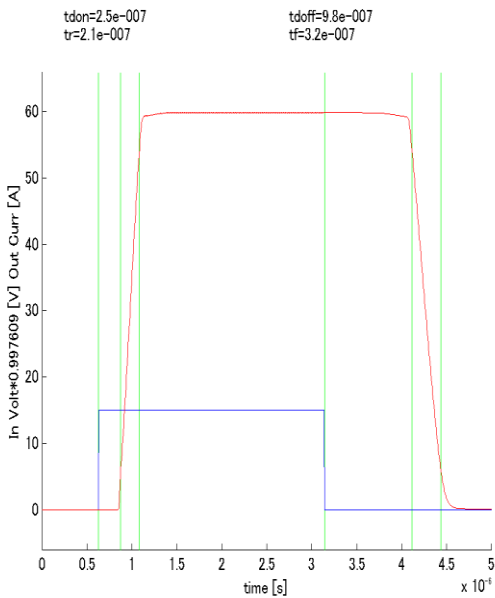
TrrIf[Temp]

Vcc = 500V, didt = 20A/us



Switching Waveform (Blue : INPUT Red : OUTPUT)

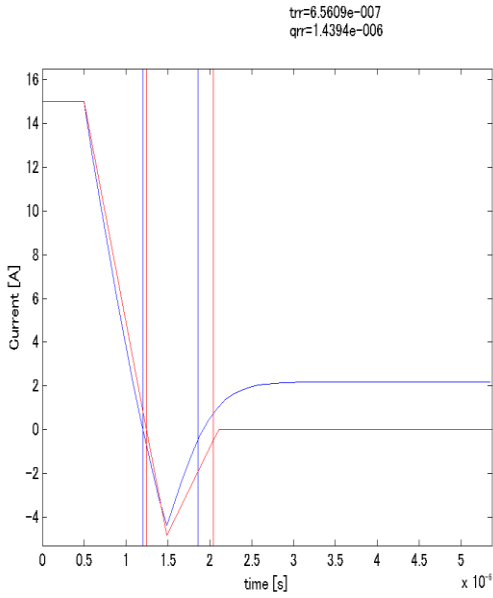
v_{gg} = 15V, v_{cc} = 600V, R_{GG} = 51ohm, Temp = 25degC, I_c = 60A



Simulation results are following.
Explanatory notes — : simulated

Trr Waveform (Red : Datasheet Blue : Simulation)

didt = 20A/us, vcc = 500V, if = 15A, ir = 4.808A, Temp = 25degC



DISCLAIMER

1. This SPICE (Simulation Program with Integrated Circuit Emphasis) model and its content (the "Contents") are copyright of MoDeCH Inc. All rights reserved. Any redistribution or reproduction of any or all part of the Contents in any form is prohibited without express written permission made by MoDeCH Inc.
2. MoDeCH Inc. as licensor (the "Licensor") hereby grants to you, as licensee (the "Licensee"), a non-exclusive, non-transferable license to use the Contents as long as you abide by the terms and conditions of this DISCLAIMER.
3. The Licensee is not authorized to sell, loan, rent and redistribute or license the Contents in whole or in part, or in modified form, to anyone.
4. The Licensor shall in no way be liable to the Licensee or any third party for any loss or damage (including, but not limited to, lost profits, or other incidental, consequential, or punitive damages), however caused (including through negligence) which may be directly or indirectly suffered from, arising out of, or in connection with, any use of the Contents .
5. Notwithstanding anything contained in this DISCLAIMER, in no event shall Licensor be liable for any claims, damages or loss which may arise from the modification, combination, operation or use of the Contents with the Licensee's computer programs.
6. The Licensor does not warrant that the Contents will function in any environment.
7. The Contents may be changed or updated without notice. MoDeCH Inc. may also make improvements and/or changes in the products, pricing and/or the programs related to the Contents at any time without notice.



MoDeCH Inc.

Head Office

Location: 5-15 Yokoyama-cho, Hachioji-Shi, Tokyo 192-0081, Japan

Tel:+81-42-656-3360

E-Mail:model-on-support@modech.co.jp

URL:<http://www.modech.com/en/>