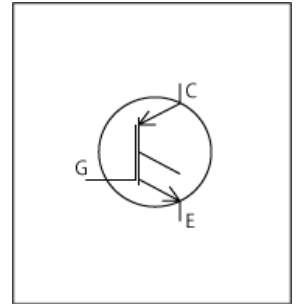


LTspice Model

Nch IGBT

SanKen

MGD623S



Model Information

Model An original macro model based on BSIM3 and Gummel-Poon model
Call Name MDC_MGD623S_LT
Pin Assign 1:G 2:C 3:E
File List Model Library MDC_MGD623S_LT02.lib
 Model Report MDC_MGD623S_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 Jul. 05, 2017 Rev.1.1
- Product name MGD623S
- Company name Sanken Electric Co., Ltd.
- Characteristics IcVce[Vge],IcVce[Vge]2,IcVge[Temp],VcesatTemp[Ic],VthTemp[Ic],CapacitanceVce[Cname],VgeQg[Vcc],SwitchingTemp[Tname],SwitchingIcc[Tname],SwitchingRg[Tname],IfVf[Temp],VfTemp[If],TrrIf[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.	
Collector-emitter voltage (DC)	0	to	600	V
Gate-emitter voltage (DC)	-30	to	30	V
Temperature	-55	to	150	deg C

IGBT

○ : Implemented
× : Not Implemented
— : Not applicable

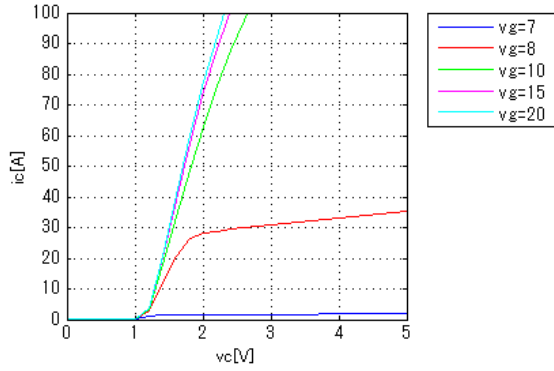
Model Functions Table
RANK=1

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

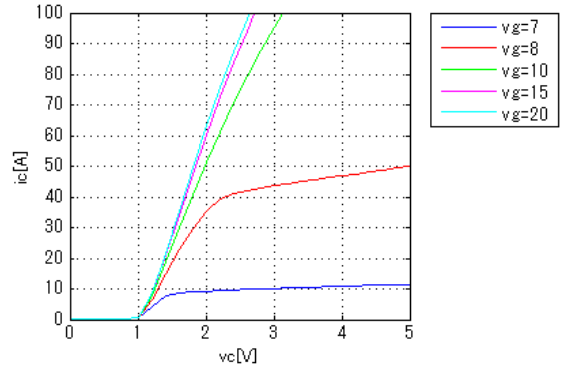
IcVce[Vge]

Temp. = 25deg C



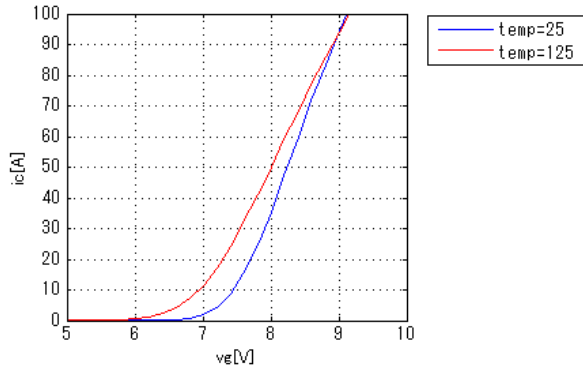
IcVce[Vge]2

Temp. = 125deg C



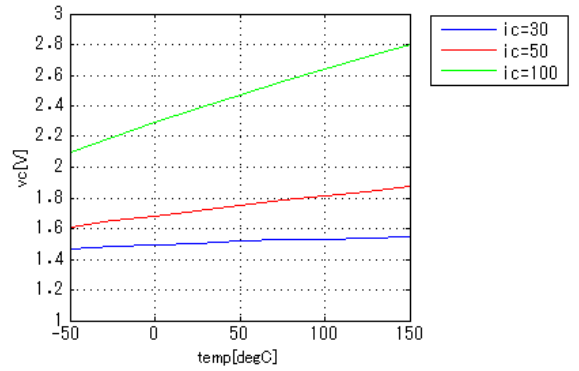
IcVge[Temp]

Vce = 5V



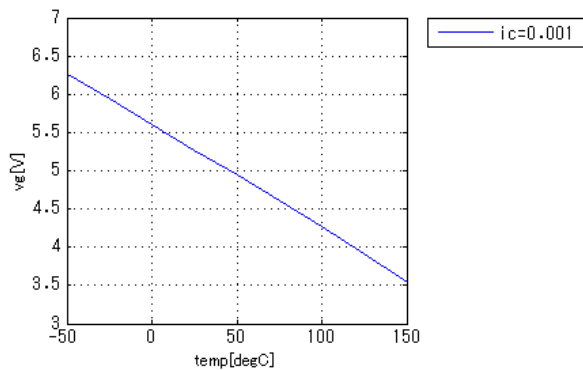
VcesatTemp[Ic]

vg = 15V



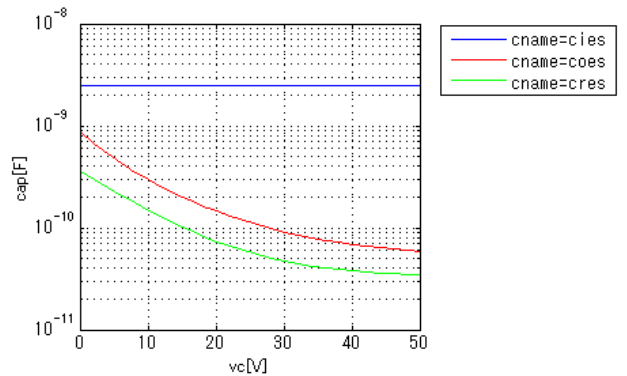
VthTemp[Ic]

Vce = 10V



CapacitanceVce[Cname]

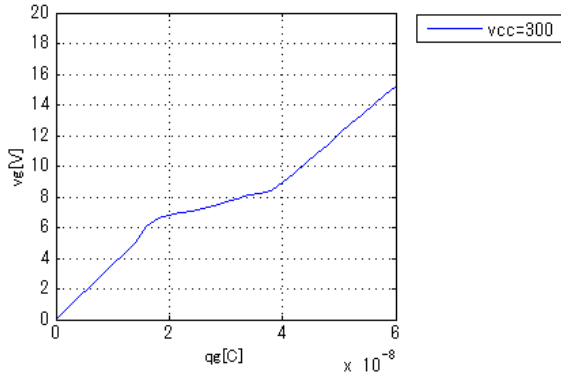
freq = 1000000Hz



Simulation results are following.
 Explanatory notes — : simulated

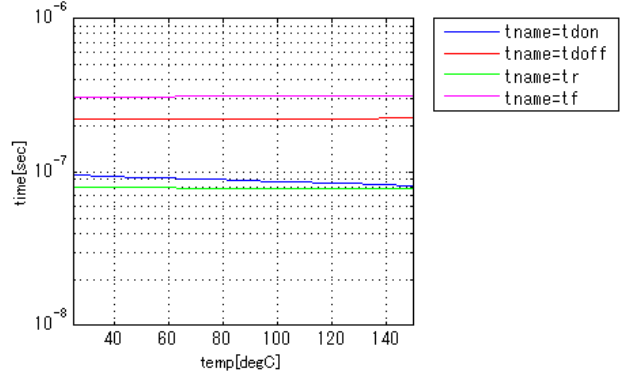
VgeQg[Vcc]

Ic = 50A



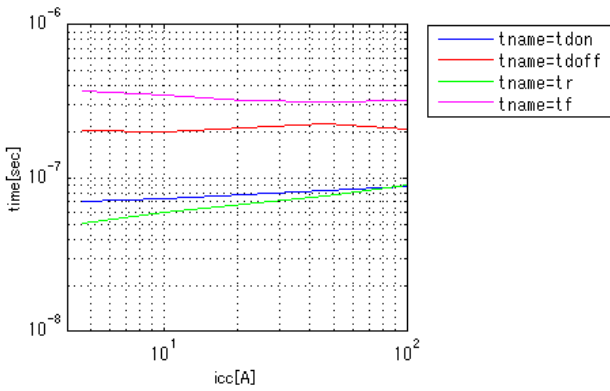
SwitchingTemp[Tname]

v_{gg} = 15V, v_{cc} = 300V, R_{GG} = 39ohm, icc = 50A



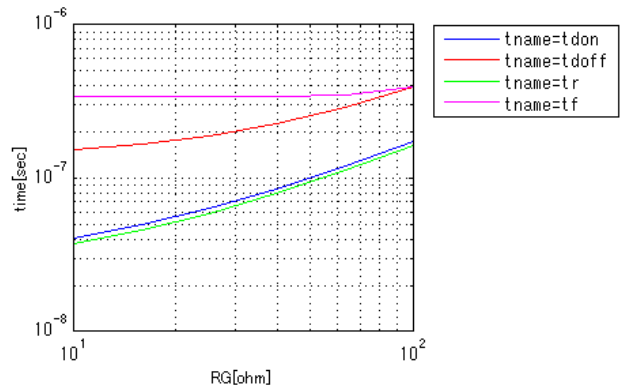
SwitchingIcc[Tname]

v_{gg} = 15V, v_{cc} = 300V, R_{GG} = 39ohm, Temp = 125degC

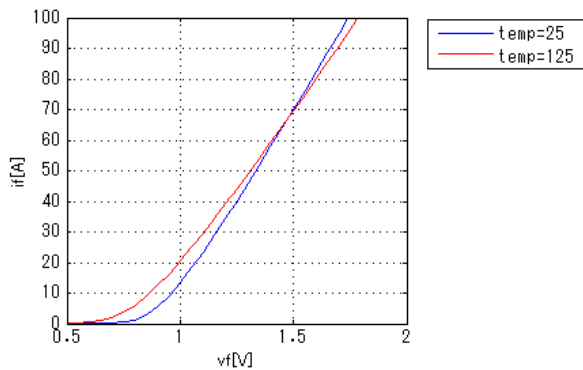


SwitchingRg[Tname]

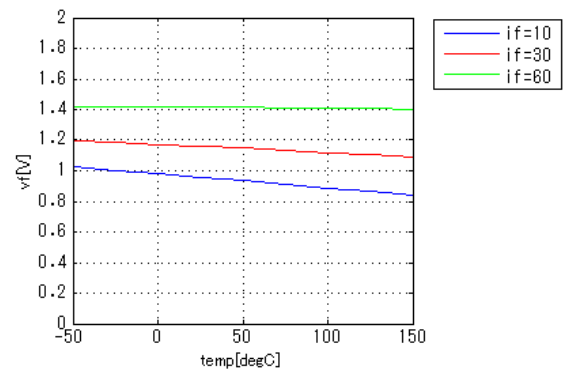
v_{gg} = 15V, v_{cc} = 300V, icc = 50A, Temp = 125degC



IfVf[Temp]



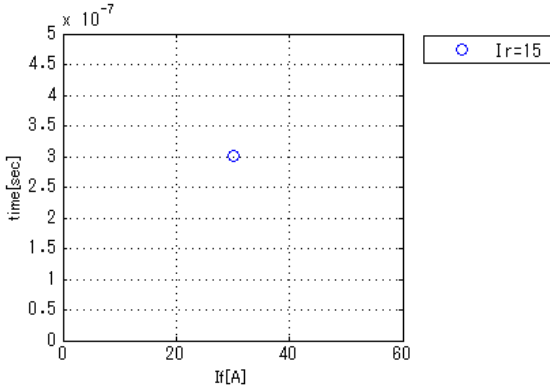
VfTemp[If]



Simulation results are following.
 Explanatory notes — : simulated

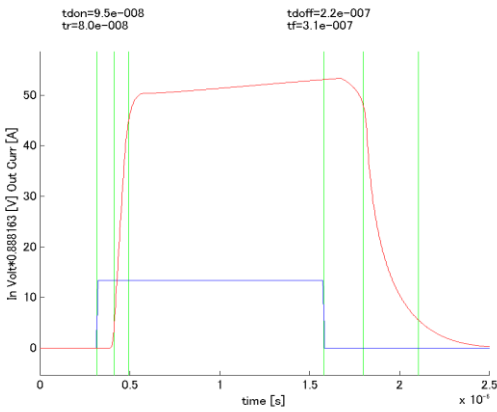
Trrlf[Ir]

irr = 1.5A, didt = 100A/us, vcc = 300V



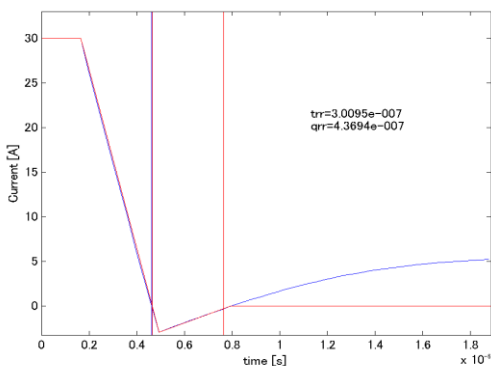
Switching Waveform (Blue : INPUT Red : OUTPUT

v_{gg} = 15V, v_{cc} = 300V, R_{GG} = 39ohm, i_{cc} = 50A, Temp = 25degC



Trr Waveform (Red : Datasheet Blue : Simulation)

I_f = 30A, i_r = 15A, irr = 1.5A, didt = 100A/us, v_{cc} = 300V



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/>