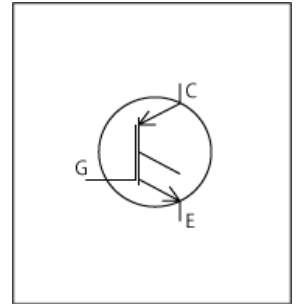


ADS Model

Nch IGBT

SanKen

MGD623S



Model Information

Model An original macro model based on BSIM3 and Gummel-Poon model
Call Name MDC_MGD623S_AD
Pin Assign 1:G 2:D 3:E
File List Model Library MDC_MGD623S_AD.zip
 Model Report MDC_MGD623S_AD.pdf (this file)

Verified Simulator Version ADS version 2020 Update 2
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

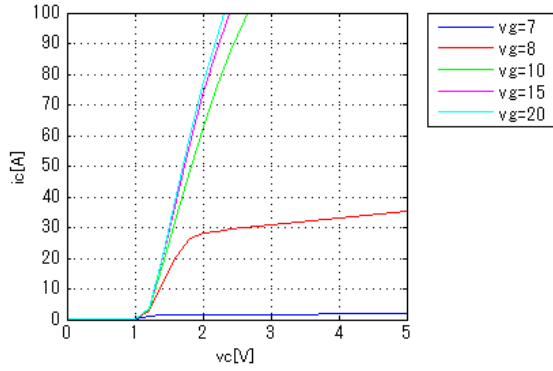
Model Functions Table
RANK=1

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

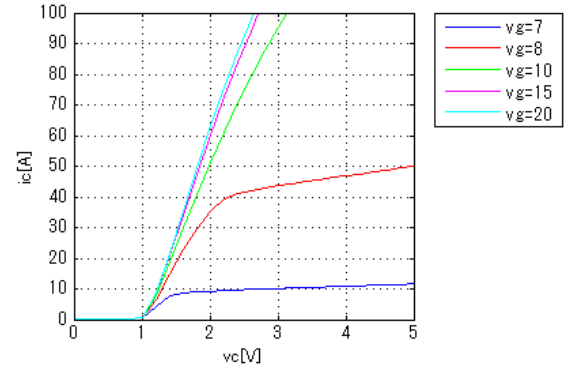
IcVce[Vge]

Temp. = 25deg C



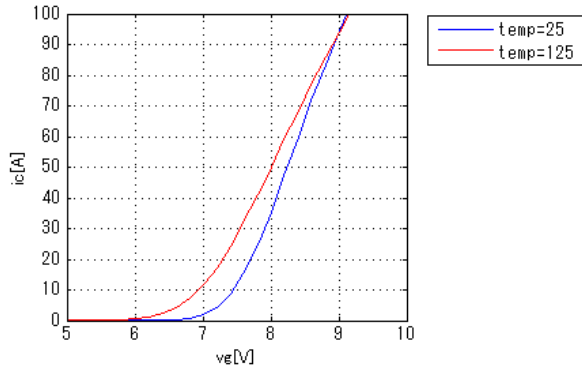
IcVce[Vge]2

Temp. = 125deg C



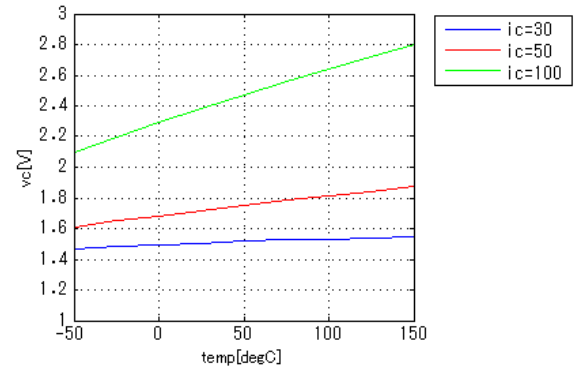
IcVge[Temp]

Vce = 5V



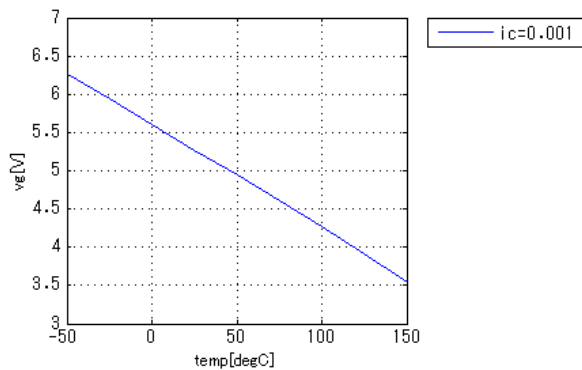
VcesatTemp[Ic]

vg = 15V



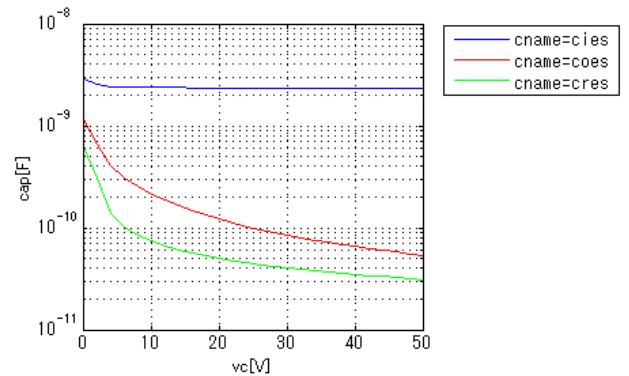
VthTemp[Ic]

Vce = 10V



CapacitanceVce[Cname]

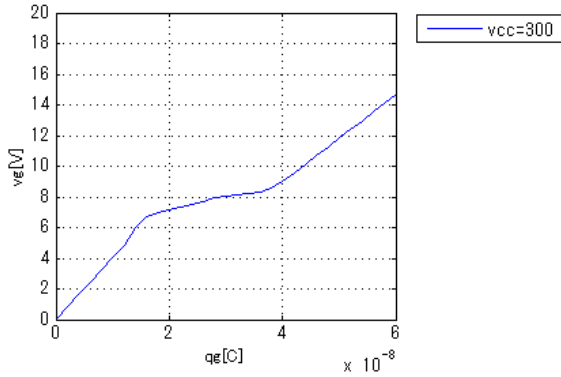
freq = 1000000Hz



Simulation results are following.
 Explanatory notes — : simulated

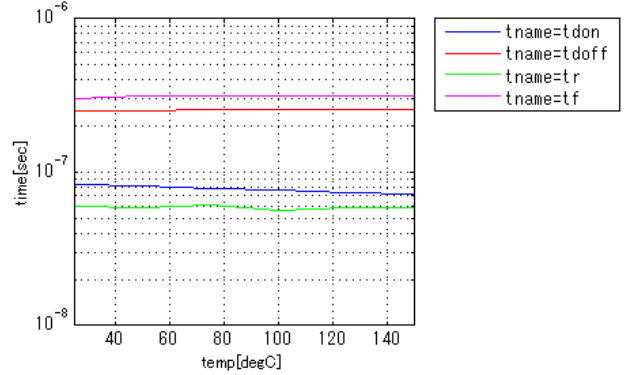
VgeQg[Vcc]

Ic = 50A



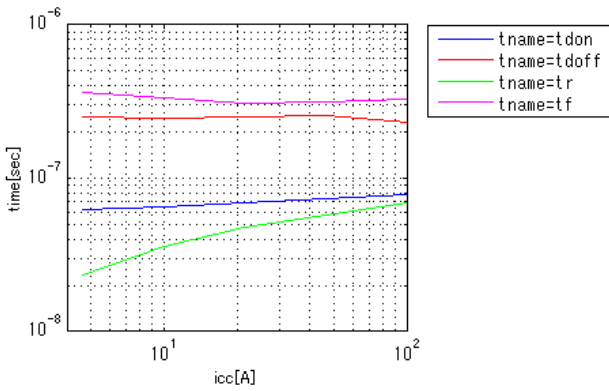
SwitchingTemp[Tname]

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



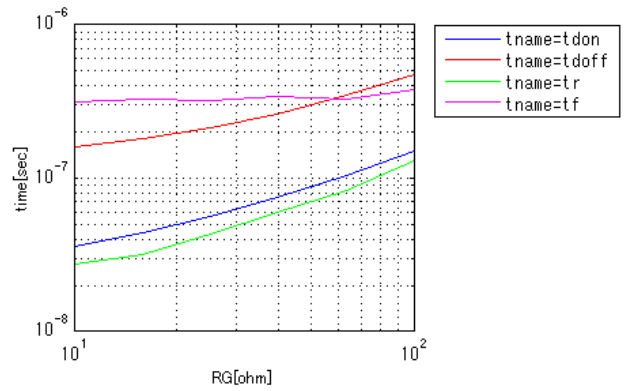
SwitchingIcc[Tname]

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

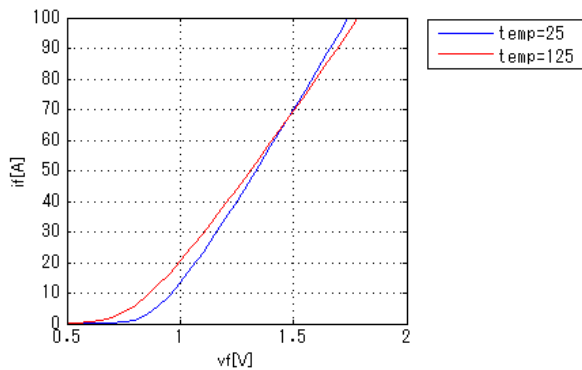


SwitchingRg[Tname]

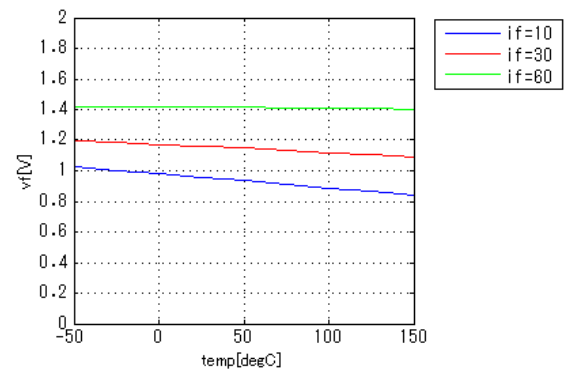
v_{gg} = 15V, v_{cc} = 300V, icc = 50A, Temp = 125degC



IfVf[Temp]



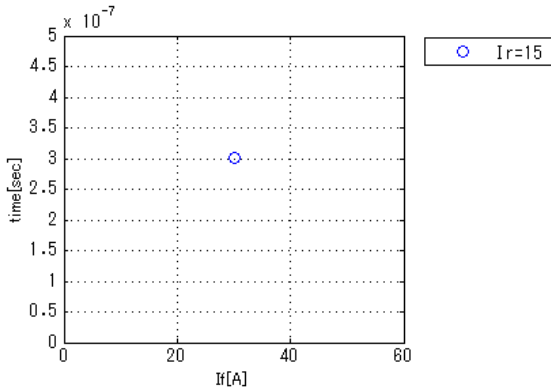
VfTemp[If]



Simulation results are following.
 Explanatory notes — : simulated

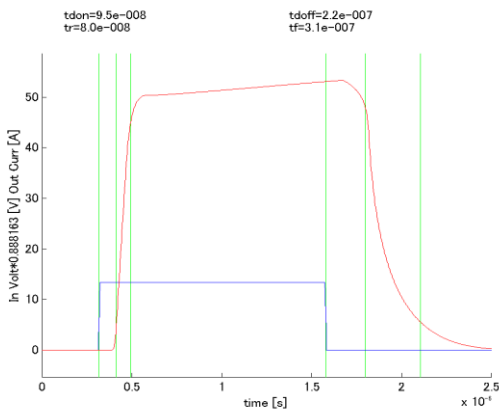
Trrlf[Ir]

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



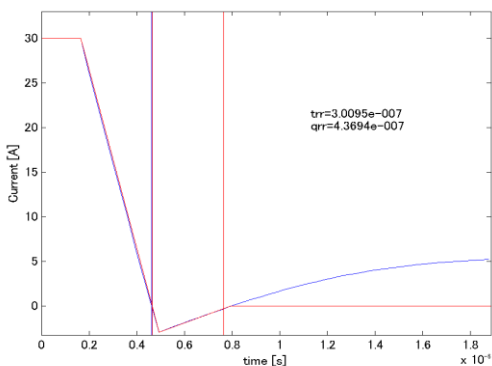
Switching Waveform (Blue : INPUT Red : OUTPUT

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



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