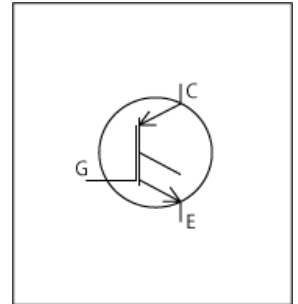


# ADS Model

## Nch IGBT

### ROHM

### RGCL60TS60D



### Model Information

**Model** An original macro model based on BSIM3 and Gummel-Poon model  
**Call Name** MDC\_RGCL60TS60D\_AD  
**Pin Assign** 1:G 2:C 3:E  
**File List** Model Library MDC\_RGCL60TS60D\_AD01.lib  
 Model Report MDC\_RGCL60TS60D\_AD.pdf (this file)  
**Verified Simulator Version** ADS version 2016  
**Note**

### References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 2021.09 - Rev.A
- Product name RGCL60TS60D
- Company name ROHM Co., Ltd.
- Characteristics  $I_c V_{ce}[V_{ge}], I_c V_{ce}[V_{ge}]^2, I_c V_{ge}[Temp], V_{cesat} Temp[I_c], V_{ce}(sat) V_{ge}[I_c], V_{ce}(sat) V_{ge}[I_c]^2, SwitchingLoadI_{cc}[Tname], Capacitance V_{ce}[Cname], V_{ge} Q_g[V_{cc}], I_f V_f[Temp], T_{rr} I_f, Q_{rr} I_f, SwitchingWaveform, T_{rr} Waveform$

### 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	175	deg C

**IGBT**

○ : Implemented  
 × : Not Implemented  
 — : Not applicable

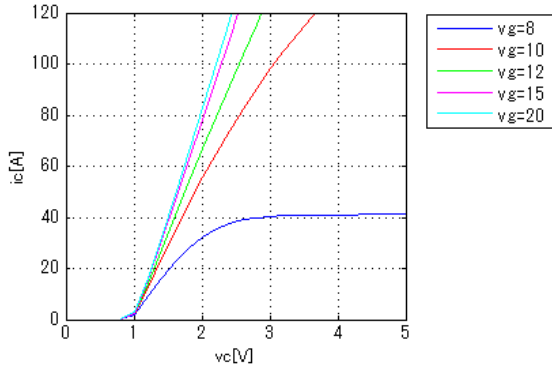
**Model Functions Table**
**RANK=1**

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

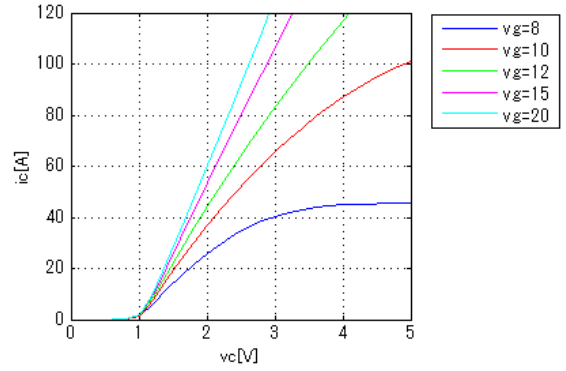
**IcVce[Vge]**

Temp. = 25deg C



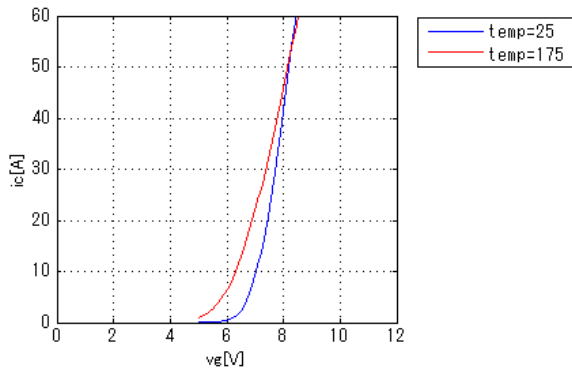
**IcVce[Vge]2**

Temp. = 175deg C



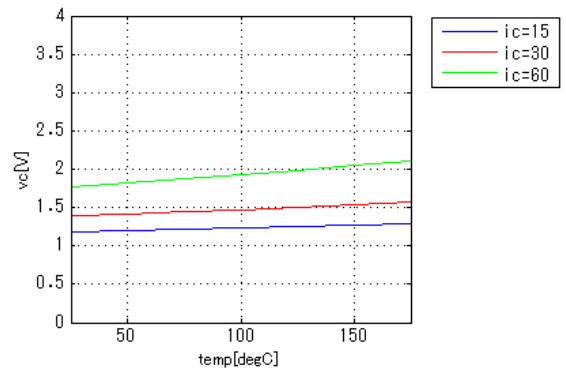
**IcVge[Temp]**

Vce = 10V



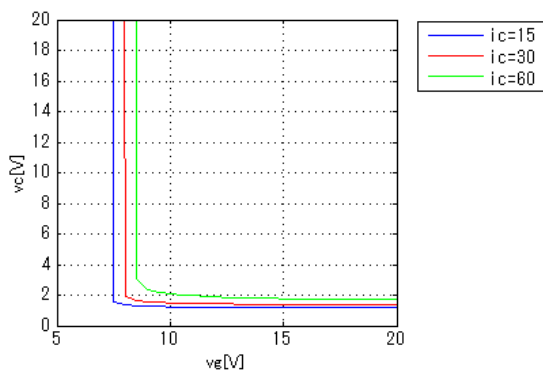
**VcesatTemp[Ic]**

vg = 15V



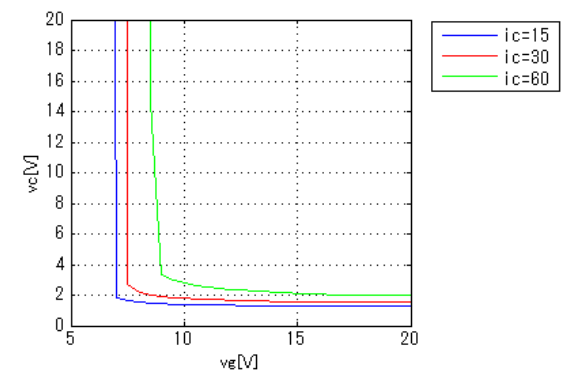
**Vce(sat)Vge[Ic]**

Temp. = 25deg C



**Vce(sat)Vge[Ic]2**

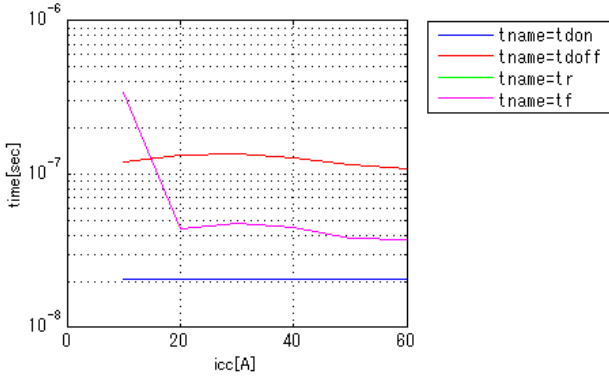
Temp. = 175deg C



Simulation results are following.  
 Explanatory notes — : simulated

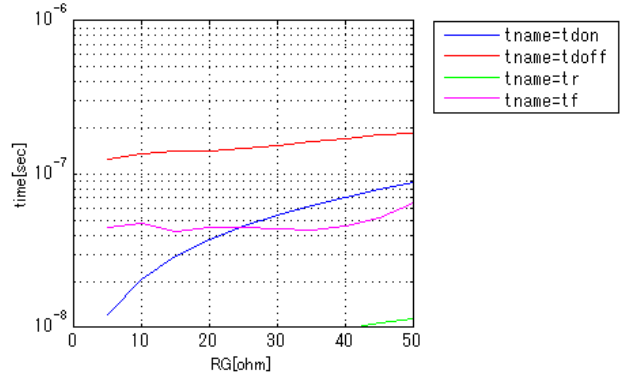
**SwitchingLoadIcc[Tname]**

v<sub>gg</sub> = 15V, v<sub>cc</sub> = 400V, R<sub>GG</sub> = 10ohm, Temp = 175degC



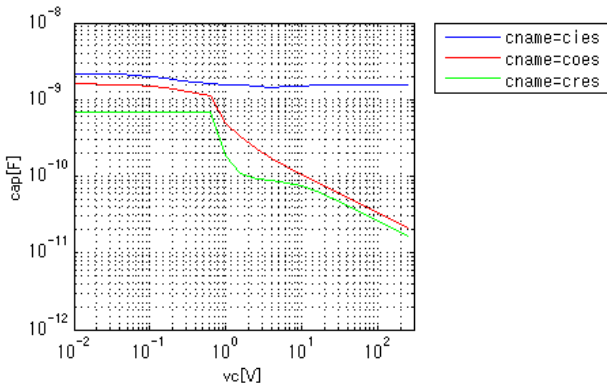
**SwitchingLoadIcc[Tname]**

icc = 30A, v<sub>gg</sub> = 15V, v<sub>cc</sub> = 400V, Temp = 175degC



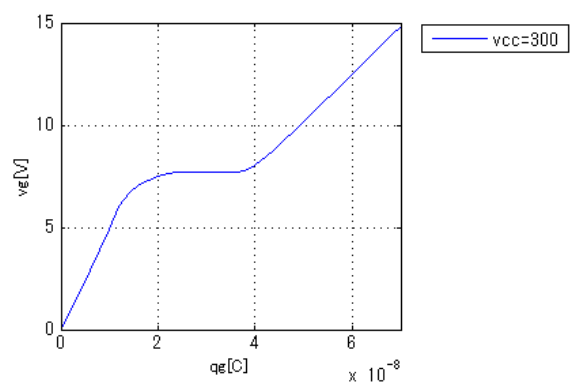
**CapacitanceVce[Cname]**

freq = 1000000Hz

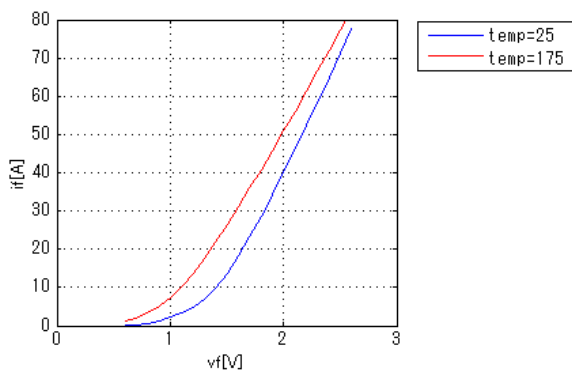


**VgeQg[Vcc]**

I<sub>c</sub> = 30A

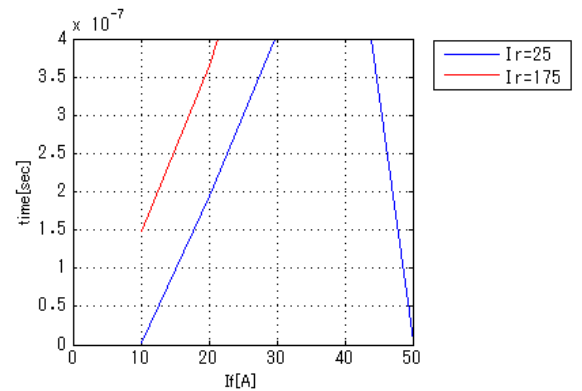


**IfVf[Temp]**



**TrrIf**

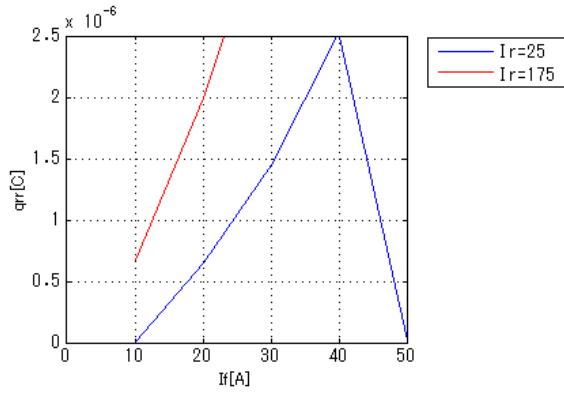
didt = 200A/us, v<sub>cc</sub> = 400V, temp = 25degC



Simulation results are following.  
 Explanatory notes — : simulated

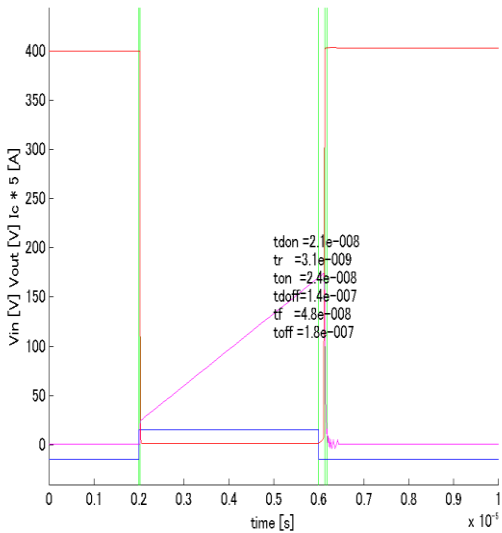
**Qrrlf**

didt = 200A/us, vcc = 400V, temp = 25degC



**Switching Waveform ( Blue : INPUT Red : OUTPUT Mazenta : ICC)**

v<sub>gg</sub> = 15V, v<sub>cc</sub> = 400V, R<sub>GG</sub> = 1ohm, Temp = 25degC, I<sub>c</sub> = 30A, L<sub>load</sub> = 0.0063/30 H

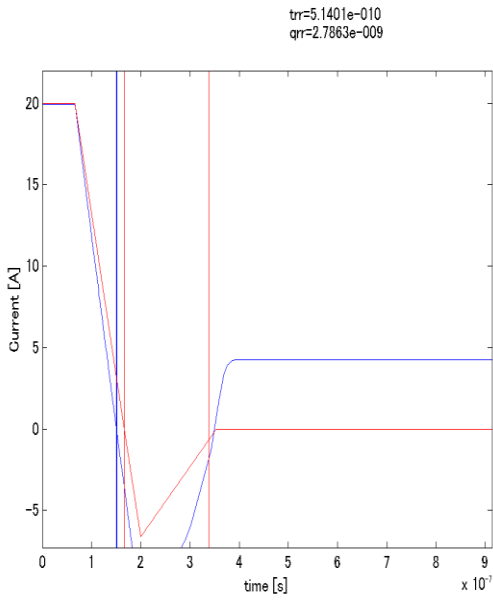


Simulation results are following.

Explanatory notes — : simulated

**Trr Waveform ( Red : Datasheet Blue : Simulation )**

didt = 200A/us, vcc = 400V, if = 20A, ir = 6.615A, Temp = 25degC



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