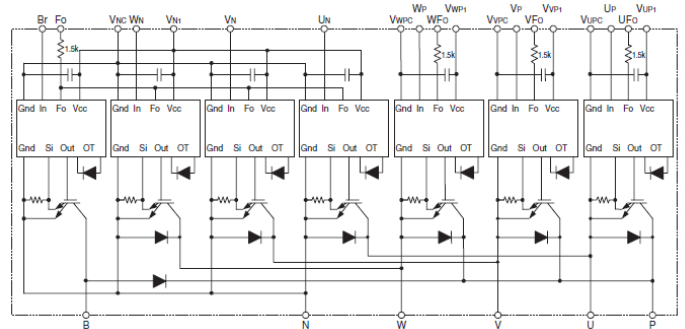


LTspice Model

IPM

Mitsubishi

PM150RL1E120



Model Information

Model An original macro model based on BSIM3 and Gummel-Poon model
Call Name MDC_PM150RL1E120_LT
Pin Assign 1:VUP1 2:UFO 3:UP 4:VUPC 5:VVP1 6:VFO 7:VP 8:VVPC 9:VWP1 10:WFO 11:WP 12:VWPC 13:UN 14:VN 15:VN1 16:WN 17:VNC 18:FO 19:BR 20:B 21:N 22:W 23:V 24:U 25:P
File List Model Library MDC_PM150RL1E120_LT01.lib
 Model Report MDC_PM150RL1E120_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 May 2009
- Product name PM150RL1E120
- Company name Mitsubishi Electric Corporation
- Characteristics $I_{cV_{ce}[V_{ge}], V_{ce}(sat)I_{c}[TEMP], V_{ce}(sat)V_{ge}[I_{c}], I_{fV_{f}[Temp], SwitchingLoadI_{cc}[Tname], SwitchingLoadI_{cc}[Tname]2, TrrI_{f}[Temp], SwitchingWaveform, TrrWaveform}$

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.	
Temperature	-40	to	125	deg C

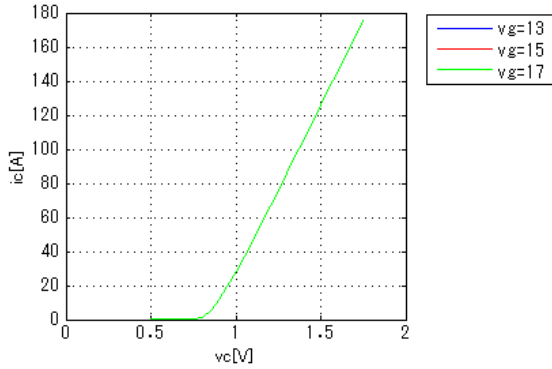
Model Functions Table

Functions	Implemented
IcVce[Vge]	○
Vce(sat)Ic[Temp]	○
Vce(sat)Vge[Ic]	○
IfVf[Temp]	○
スイッチング特性	○
Trr特性	○

Simulation results are following.
 Explanatory notes — : simulated

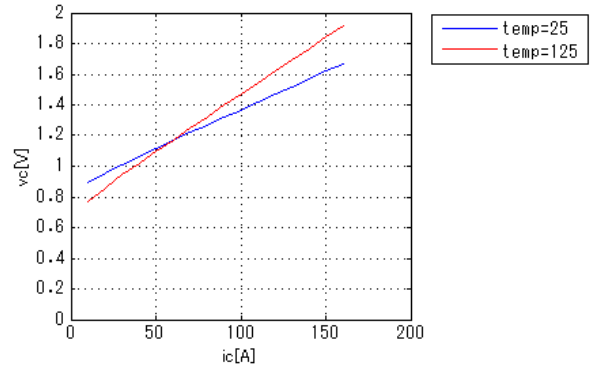
IcVce[Vge]

Temp. = 25deg C



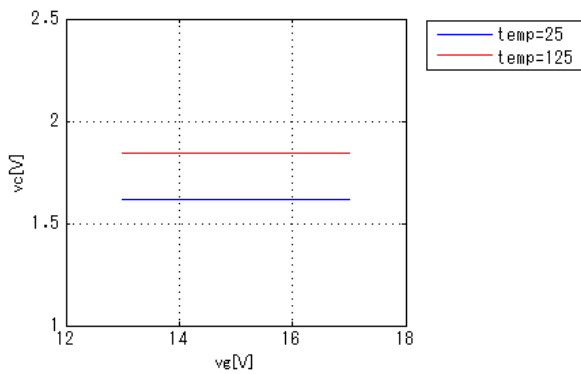
Vce(sat)Ic[TEMP]

Vge = 15V

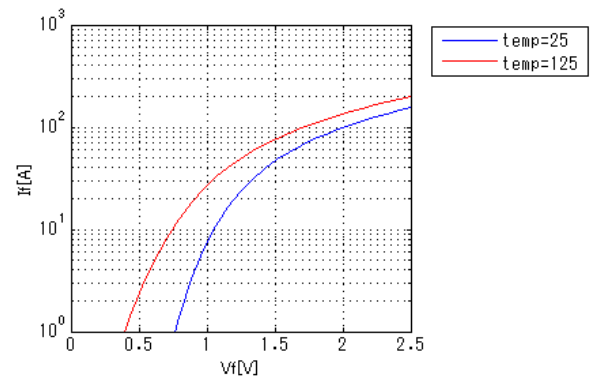


Vce(sat)Vge[Ic]

Ic = 150A

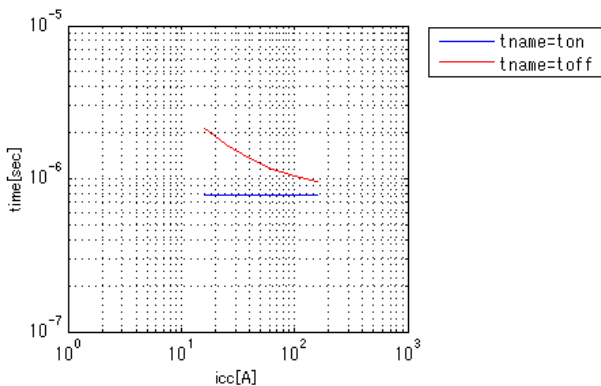


IfVf[Temp]



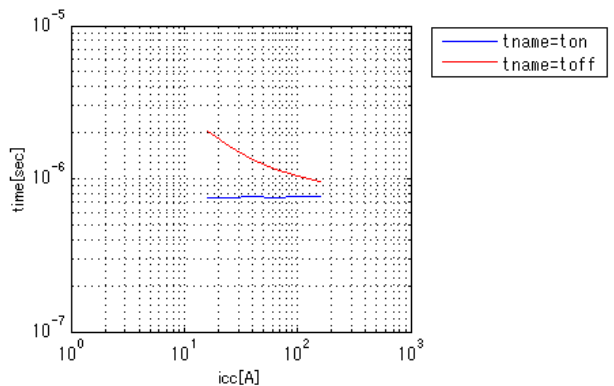
SwitchingLoadIcc[Tname]

v_{gg} = 15V, v_{cc} = 600V, R_{GG} = 1ohm, Temp = 25degC



SwitchingLoadIcc[Tname]2

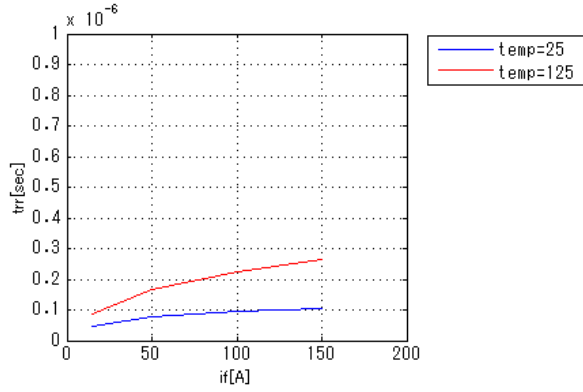
v_{gg} = 15V, v_{cc} = 600V, R_{GG} = 1ohm, Temp = 125degC



Simulation results are following.
 Explanatory notes — : simulated

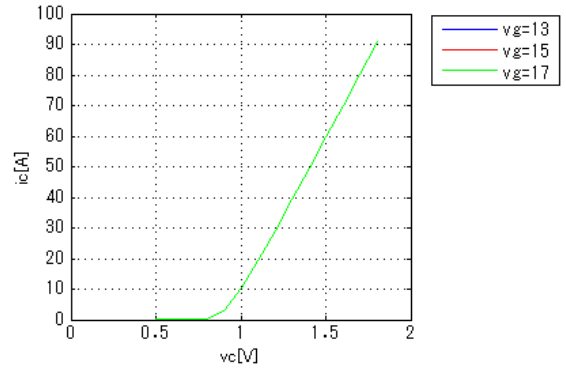
Trrlf[Temp]

Vcc = 600V, didt = 1000A/us



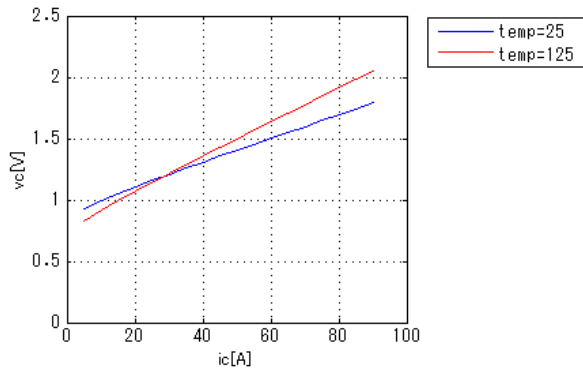
IcVce[Vge] BR

Temp. = 25deg C



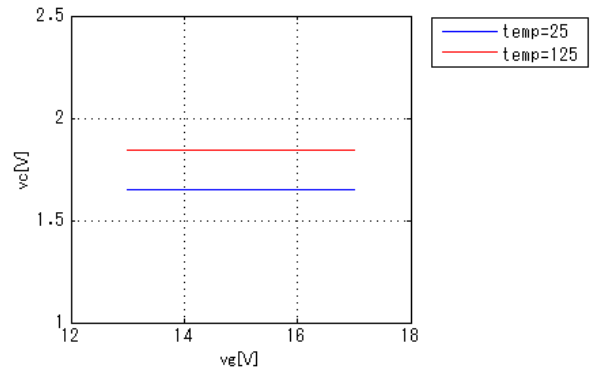
Vce(sat)Ic[TEMP] BR

Vge = 15V

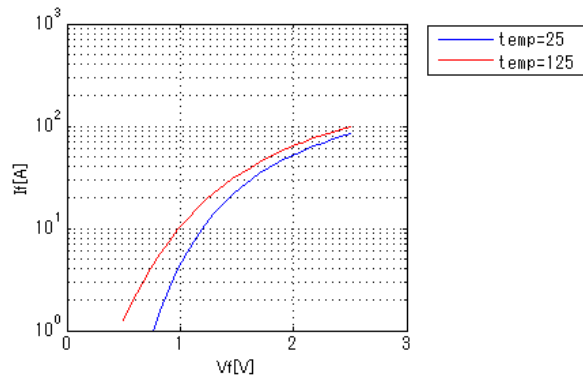


Vce(sat)Vge[Ic] BR

Ic = 75A



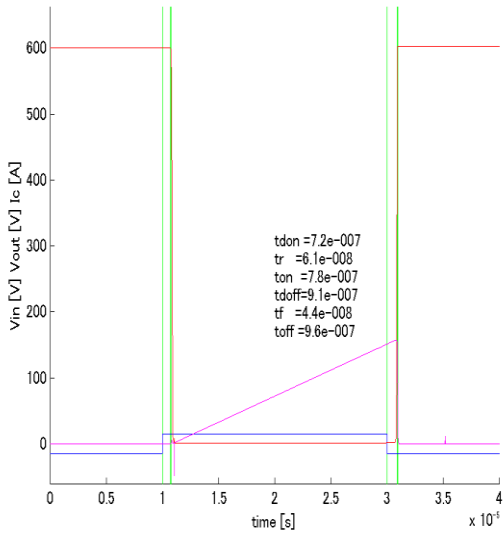
IfVf[Temp] BR



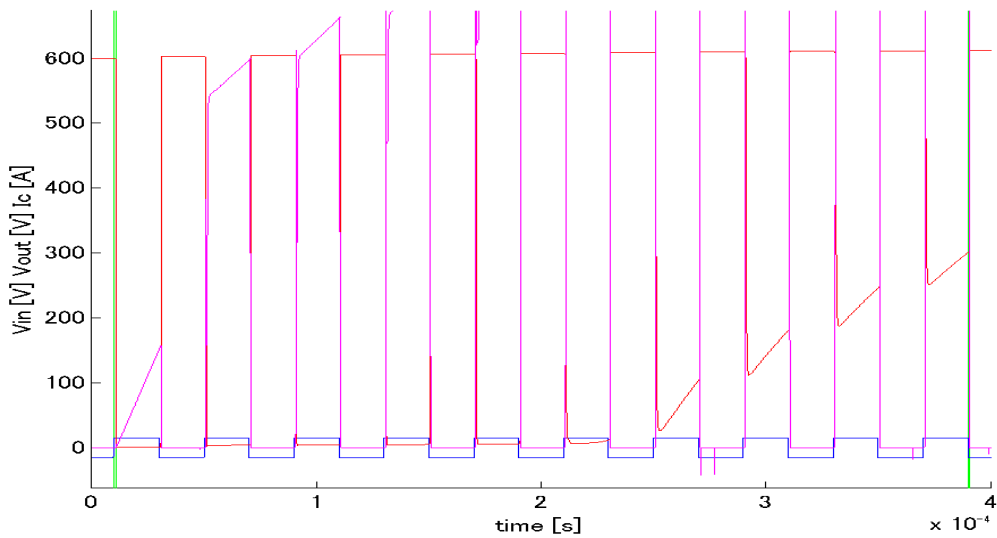
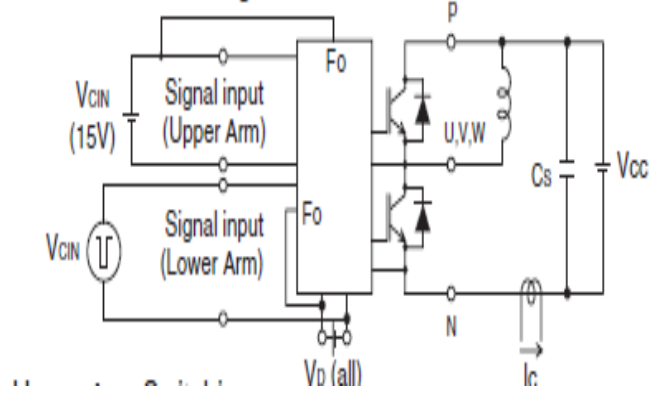
Simulation results are following.
 Explanatory notes — : simulated

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

v_{gg} = 15V, v_{cc} = 600V, R_{GG} = 1ohm, Temp = 25degC, I_c = 150A, Load = 0.0012/150 H



Lower Arm Switching

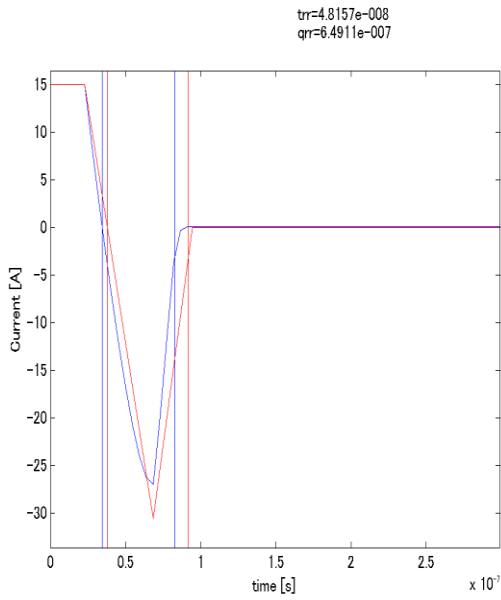


Simulation results are following.

Explanatory notes — : simulated

Trr Waveform (Red : Datasheet Blue : Simulation)

didt = 1000A/us, vcc = 600V, if = 15A, ir = 30.54A, Temp = 25degC



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