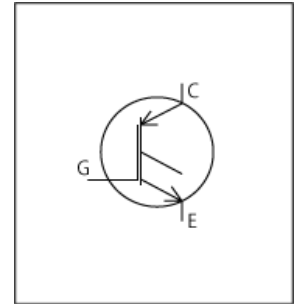


LTspice Model

Nch IGBT

FUJI ELECTRIC

7MBR35XMA120-50



Model Information

Model An original macro model based on BSIM3 and Gummel-Poon model
Call Name MDC_7MBR35XMA120-50_LT
Pin Assign 1:R 2:S 3:T 4:Gu 5:U 6:Gv 7:V 8:Gw 9:W 10:T1 11:T2 12:Gz 13:Gy 14:En 15:Gx 16:Gb 17:N1 18:P1 19:B 20:P_1 21:P_2 22:N_1 23:N_2
File List Model Library MDC_7MBR35XMA120-50_LT01.lib
 Model Report MDC_7MBR35XMA120-50_LT.pdf (this file)
Verified Simulator Version LTspice version XVII

Note :The thermistor function is not implemented.
 Please use by connecting terminals 10 and 11 to some voltage potential (example: GND).

References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 2018/2
- Product name 7MBR35XMA120-50
- Company name FUJI ELECTRIC CO., LTD.
- Characteristics IcVce[Vge],IcVce[Temp],Vce(sat)Vge[Ic],Cres,Coes,Cies, VgeQg[Vcc],VceQg[Vcc],IfVf[Temp],tdon,tr,tdoff,tf

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	1,200	V
Gate-emitter voltage (DC)	0	to	20	V
Temperature	-40	to	125	deg C

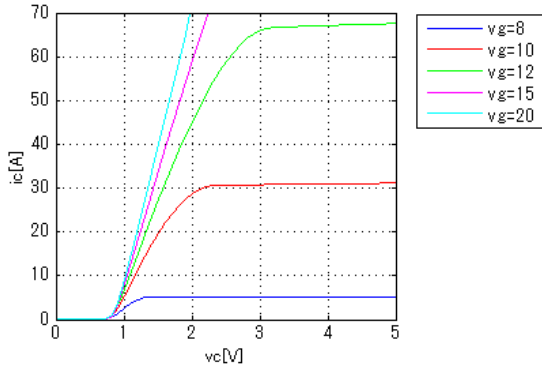
Model Functions Table

Functions	Implemented
Converter_Diode	○
Brake_IGBT	○
Brake_Diode	○
Inverter_IGBT	○
Terminal Impedance	○
Thermistor	-

Simulation results are following.
 Explanatory notes — : simulated

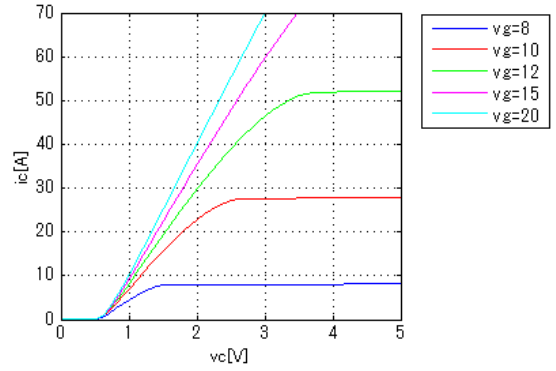
IcVce[Vge]_Inverter

Temp. = 25deg C



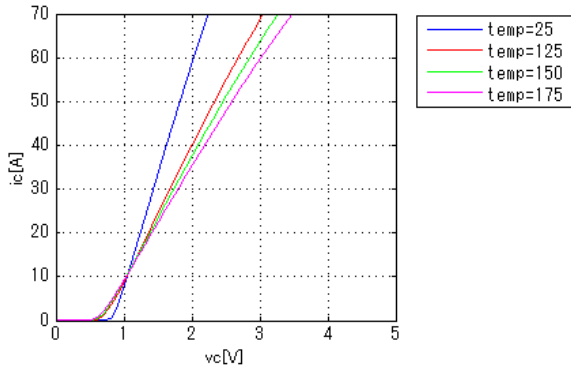
IcVce[Vge]_Inverter

Temp. = 175deg C



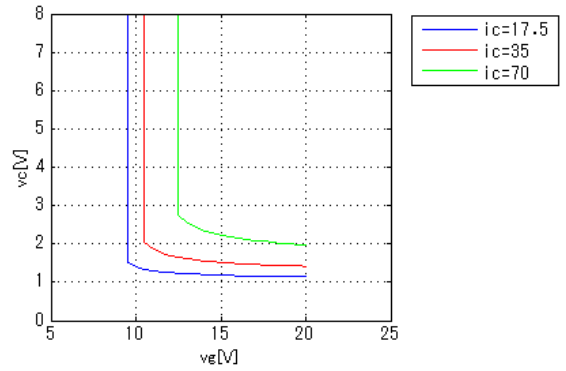
IcVce[Temp]_Inverter

Vge = 15V



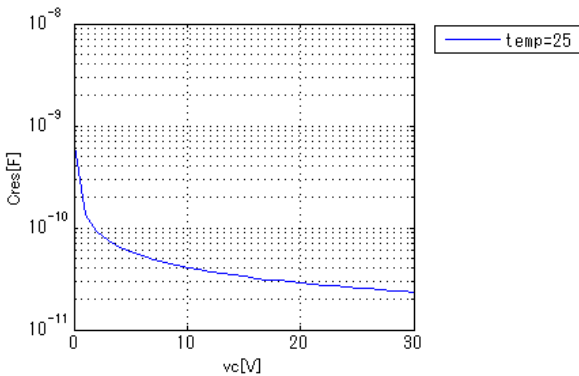
Vce(sat)Vge[Ic]_Inverter

Temp. = 25deg C



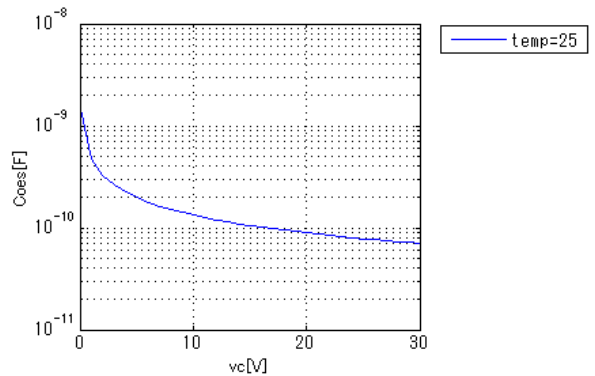
Cres_Inverter

Freq. = 1MHz



Coes_Inverter

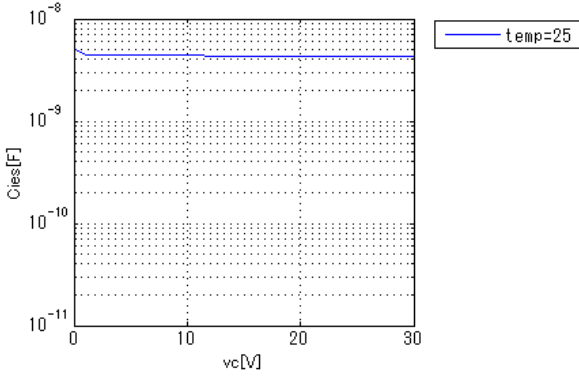
Freq. = 1MHz



Simulation results are following.
 Explanatory notes — : simulated

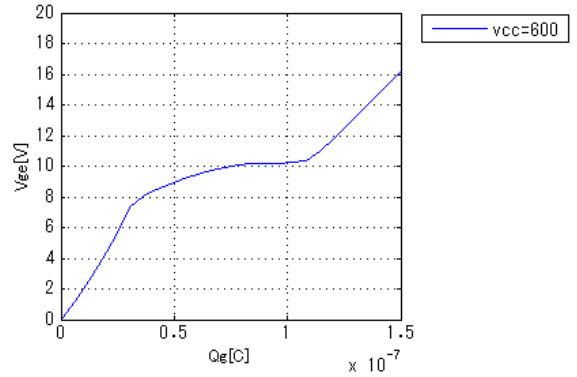
Cies_Inverter

Freq. = 1MHz



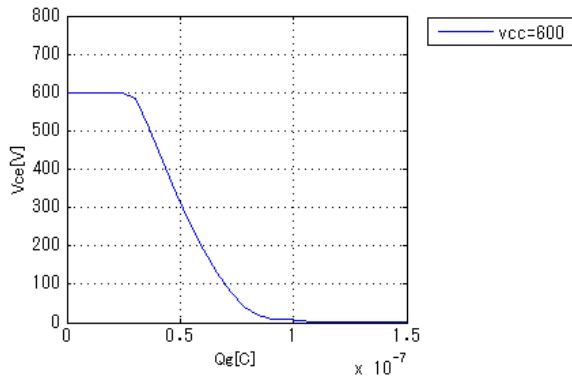
VgeQg[Vcc]_Inverter

Ic = 35A

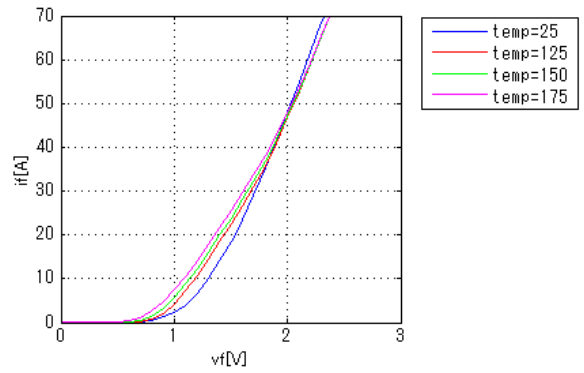


VceQg[Vcc]_Inverter

Ic = 35A

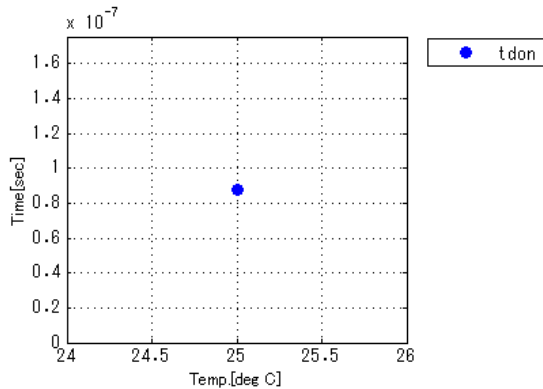


IfVf[Temp]_Inverter



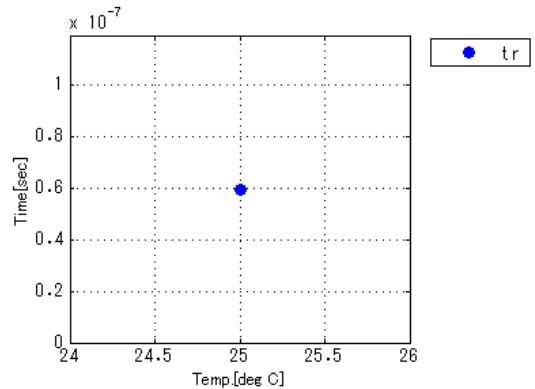
tdon_Inverter

Vcc = 600V, Ic = 35A, +Vg = 15V, -Vg = 0V,
 Rg = 30.0ohm, PARASITIC-L = 30nH



tr_Inverter

Vcc = 600V, Ic = 35A, +Vg = 15V, -Vg = 0V,
 Rg = 30.0ohm, PARASITIC-L = 30nH

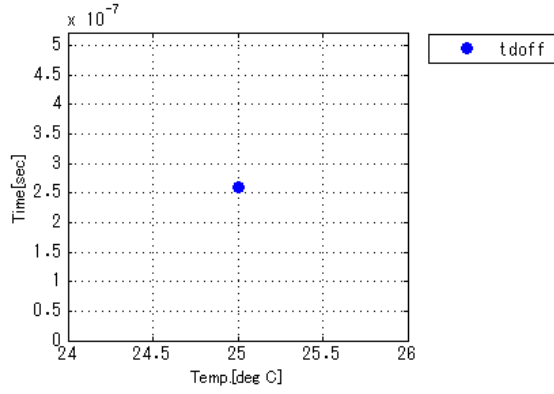


Simulation results are following.

Explanatory notes — : simulated

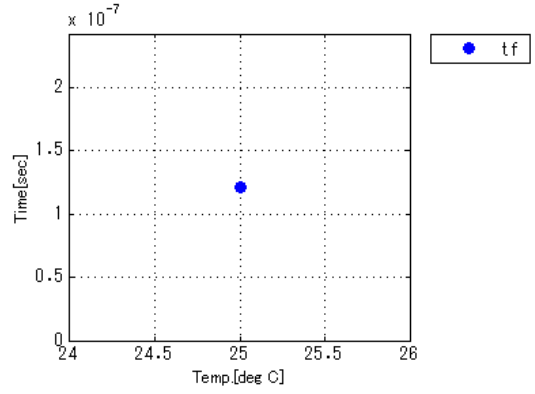
tdoff_Inverter

Vcc = 600V, Ic = 35A, +Vg = 15V, -Vg = 0V,
Rg = 30.0ohm, PARASITIC-L = 30nH



tf_Inverter

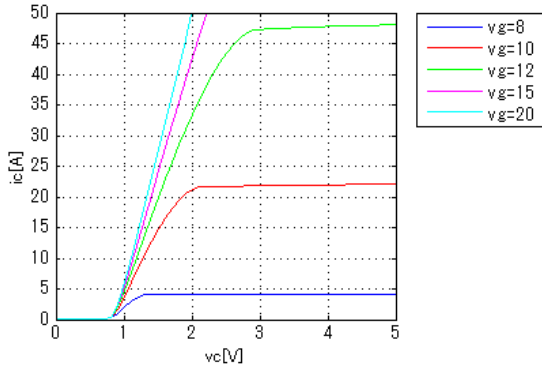
Vcc = 600V, Ic = 35A, +Vg = 15V, -Vg = 0V,
Rg = 30.0ohm, PARASITIC-L = 30nH



Simulation results are following.
 Explanatory notes — : simulated

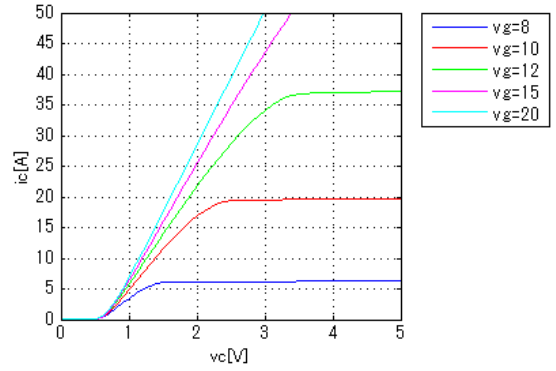
IcVce[Vge]_ Brake

Temp. = 25deg C



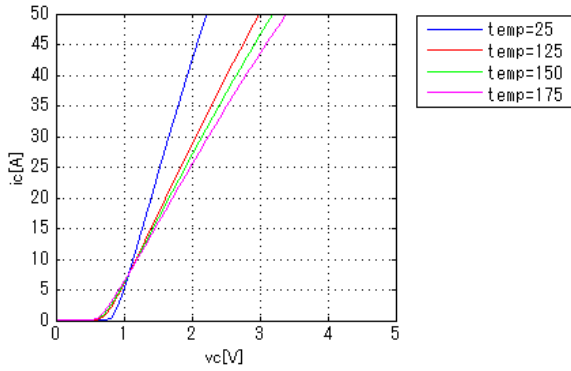
IcVce[Vge]_ Brake

Temp. = 175deg C



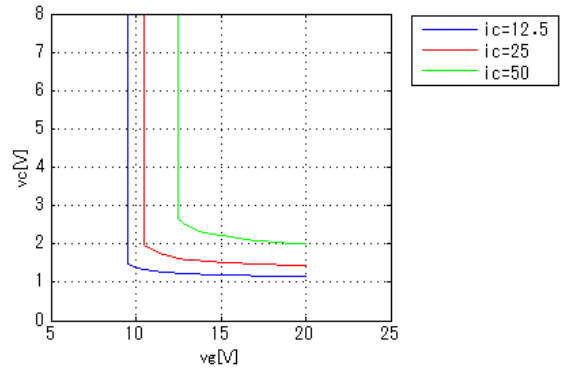
IcVce[Temp]_ Brake

Vge = 15V



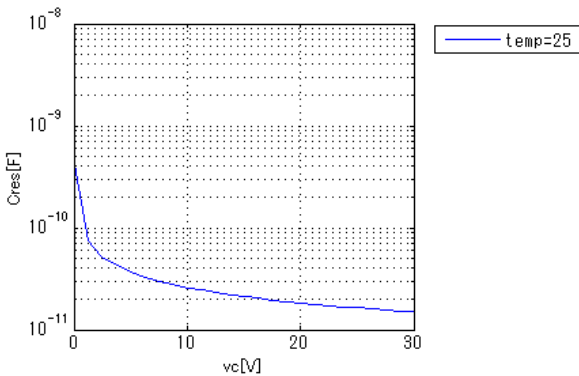
Vce(sat)Vge[Ic]_ Brake

Temp. = 25deg C



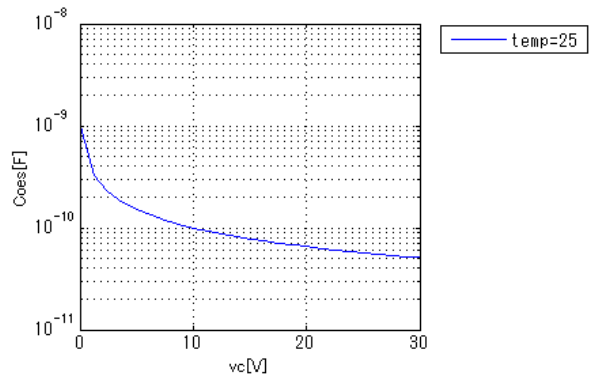
Cres_Brake

Freq. = 1MHz



Coes_Brake

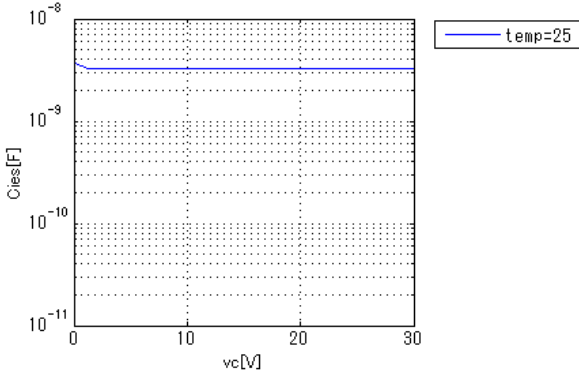
Freq. = 1MHz



Simulation results are following.
 Explanatory notes — : simulated

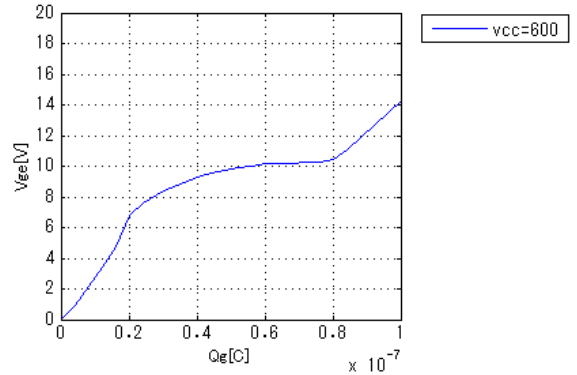
Cies_Brake

Freq. = 1MHz



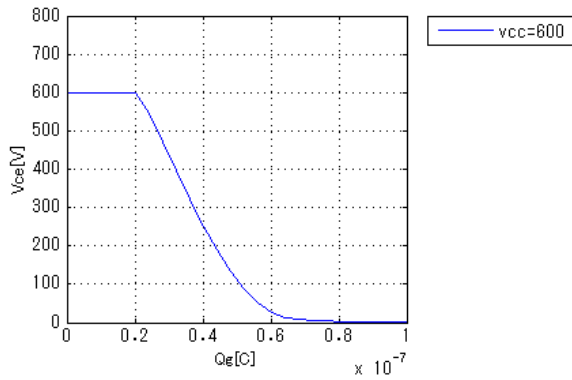
VgeQg[Vcc]_Brake

Ic = 25A

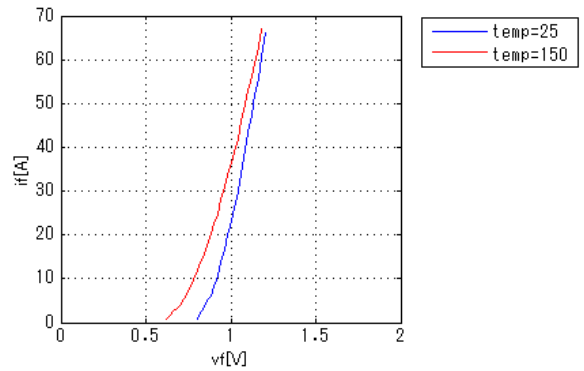


VceQg[Vcc]_Brake

Ic = 25A

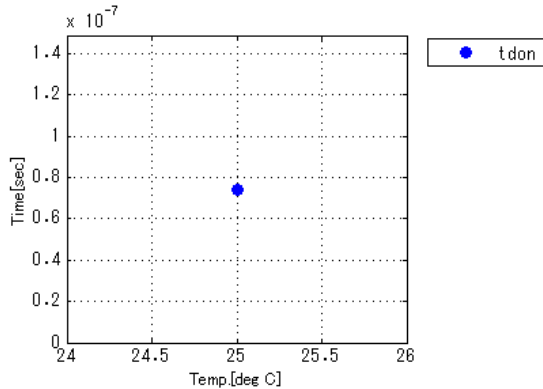


IfVf[Temp]_Converter



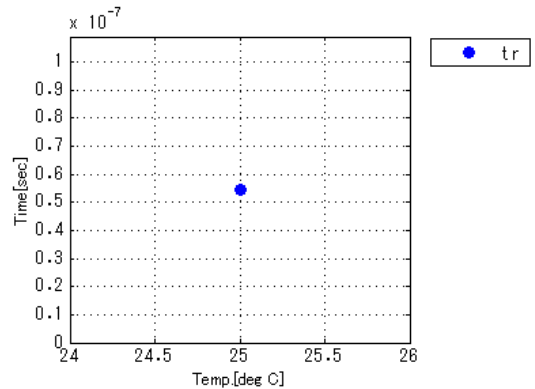
tdon_Brake

Vcc = 600V, Ic = 25A, +Vg = 15V, -Vg = 0V,
 Rg = 36.0ohm, PARASITIC-L = 30nH



tr_Brake

Vcc = 600V, Ic = 25A, +Vg = 15V, -Vg = 0V,
 Rg = 36.0ohm, PARASITIC-L = 30nH

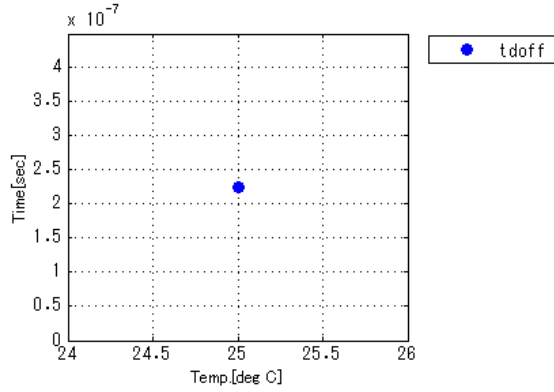


Simulation results are following.

Explanatory notes — : simulated

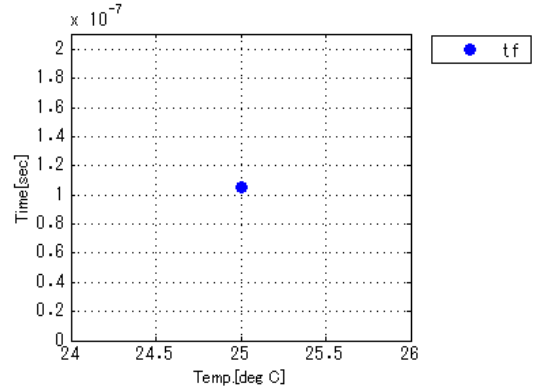
tdoff_Brake

Vcc = 600V, Ic = 25A, +Vg = 15V, -Vg = 0V,
Rg = 36.0ohm, PARASITIC-L = 30nH



tf_Brake

Vcc = 600V, Ic = 25A, +Vg = 15V, -Vg = 0V,
Rg = 36.0ohm, PARASITIC-L = 30nH



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