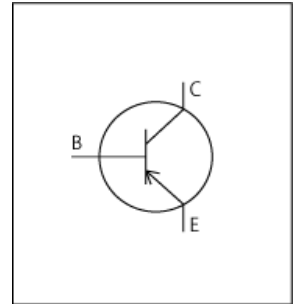


# LTspice Model

## PNP

## TOSHIBA

## 2SA2142



### Model Information

<b>Model</b>	Gummel-Poon model		
<b>Call Name</b>	MDC_2SA2142_LT		
<b>Pin Assign</b>	1:B 2:C 3:E		
<b>File List</b>	Model Library	MDC_2SA2142_LT01.lib	
	Model Report	MDC_2SA2142_LT.pdf (this file)	
<b>Verified Simulator Version</b>	LTspice version XVII		
<b>Note</b>			

### References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version 2013-11-01
- Product name 2SA2142
- Company name Toshiba Corporation
- Characteristics  $I_{cV_{ce}[ib], h_{FE}I_{c}[Temp], V_{ce}(sat)I_{c}[Temp], V_{be}(sat)I_{c}[Temp], I_{c}V_{be}[Temp], f_{T}I_{c}[V_{ce}], C_{ob}V_{cb}, SwitchingRI[Tname]$

### 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
Temperature	-55	to	150	deg C

**BJT**

○ : Implemented  
 × : Not Implemented  
 — : Not applicable

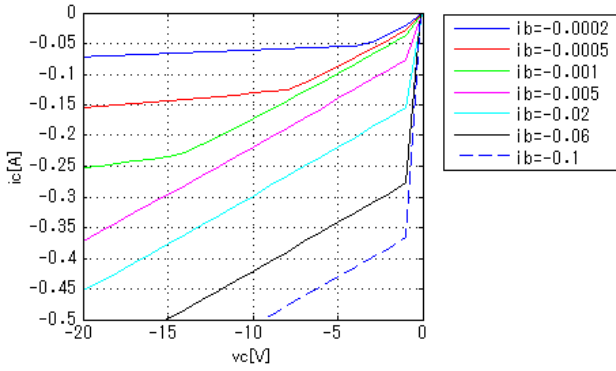
**Model Functions Table**
**RANK=1**

Functions	RANK	Implemented
IC-VBE(Temp)	1	○
IC-VCE-IB(Temp)	1	○
hFE-IC(Temp)	1	○
VCE(sat)-IC	1	○
VBE(sat)-IC	1	○
Capacitance	1	○
Transition	1	○
Switching	1	○

Simulation results are following.  
 Explanatory notes — : simulated

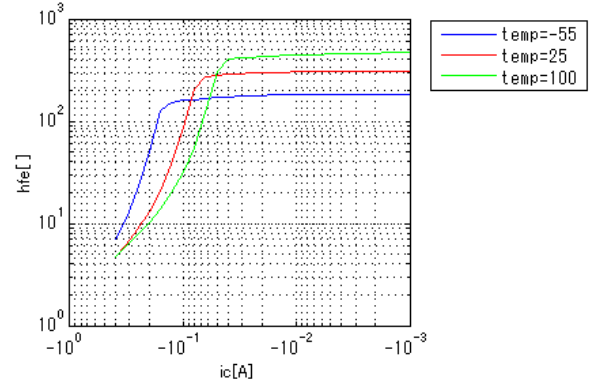
**IcVce[ib]**

Temp = 25degC



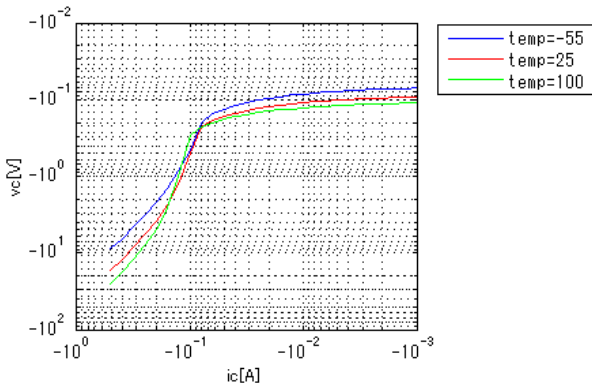
**hFEIc[Temp]**

Vce = -5V



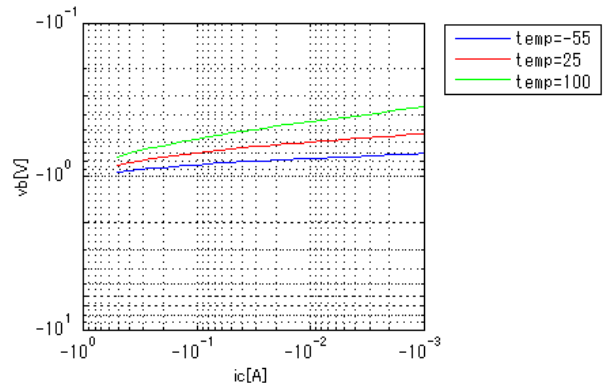
**Vce(sat)Ic[Temp]**

IC/IB = 10



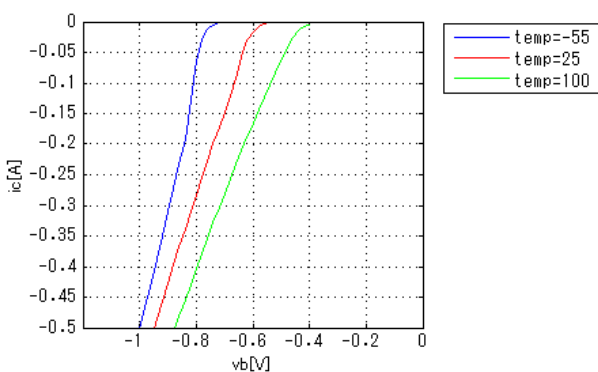
**Vbe(sat)Ic[Temp]**

IC/IB = 10



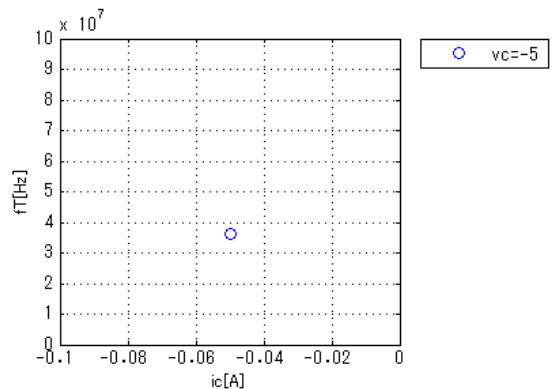
**IcVbe[Temp]**

Vce = -5V



**fT Ic [Vce]**

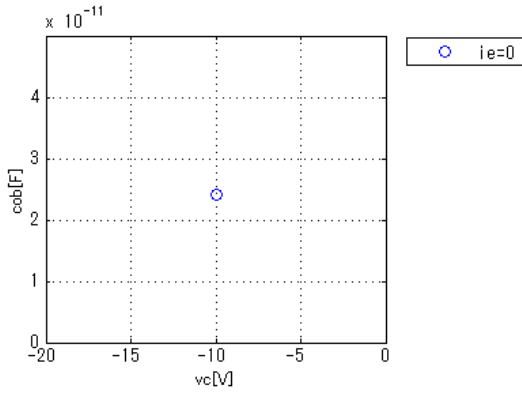
Freq = 10000000Hz



Simulation results are following.  
 Explanatory notes — : simulated

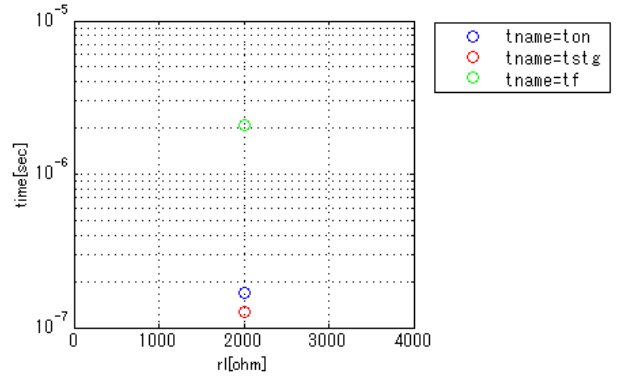
**CobVcb**

Freq = 1000000Hz



**SwitchingRI[Tname]**

ib1 = -0.01, ib2 = 0.02, vcc = -200V, Temp = 25degC



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