

# PSpice Model

## NPN

## RENESAS

## 2SC4178



### Model Information

**Model** Mextram model  
**Call Name** MDC\_2SC4178\_PS  
**Pin Assign** 1:C 2:B 3:E  
**File List** Model Library MDC\_2SC4178\_PS01.lib  
 Model Report MDC\_2SC4178\_PS.pdf (this file)

**Verified Simulator Version** PSpice version 16.6  
**Note**

### References

The information which was used for modeling is as follow:

[Data Sheet]

- Date/Version Unknown
- Product name 2SC4178
- Company name Renesas Electronics Corporation
- Characteristics  $I_c V_{be}[Temp]$ ,  $I_c V_{ce}[ib]$ ,  $V_{be}(sat) I_c[Temp]$ ,  $V_{ce}(sat) I_c[Temp]$ ,  $h_{FE} I_c[Temp]$ ,  $h_{FE} V_{ce}[Temp]$ ,  $f_T I_c[V_{ce}]$ ,  $C_{ob}$ ,  $C_{ib}$

### Simulation Range

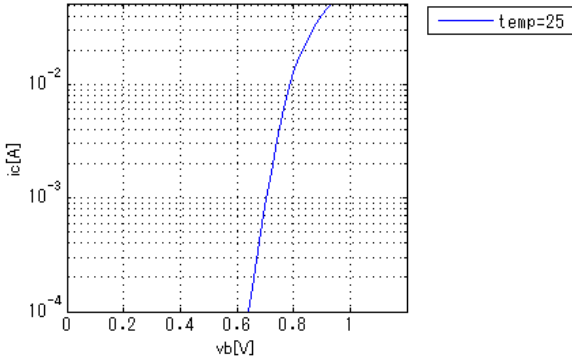
This table shows the range of evaluated simulation range that was not occurs any convergence problems in this area.

Item	Range			Unit
	Min.		Max.	
Collector-emitter voltage (DC)	0	to	20	V
Base current (DC)	0	to	2	A
Temperature	-55	to	150	deg C

Simulation results are following.  
 Explanatory notes — : simulated

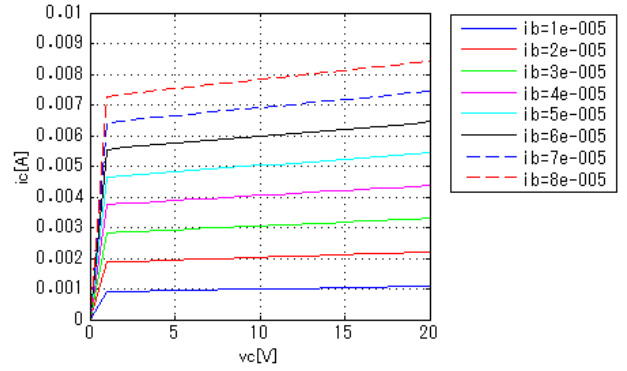
**IcVbe[Temp]**

Vce = 6V



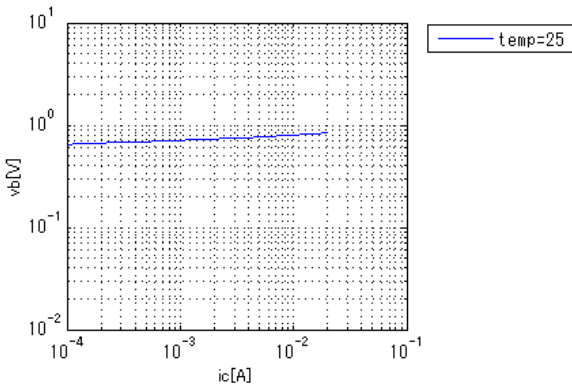
**IcVce[ib]**

Temp. = 25deg C



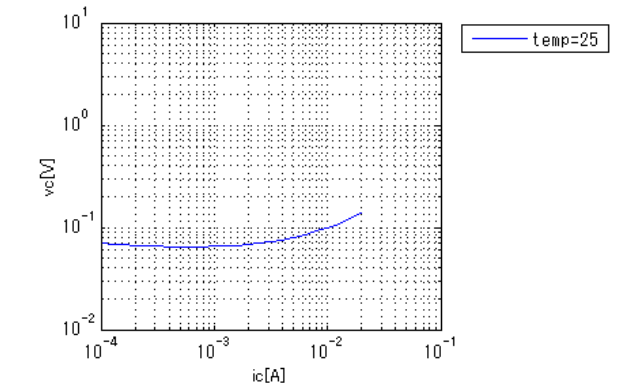
**Vbe(sat)Ic[Temp]**

IC/IB = 10



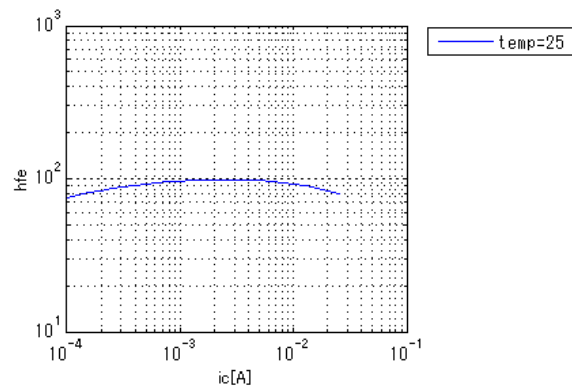
**Vce(sat)Ic[Temp]**

IC/IB = 10



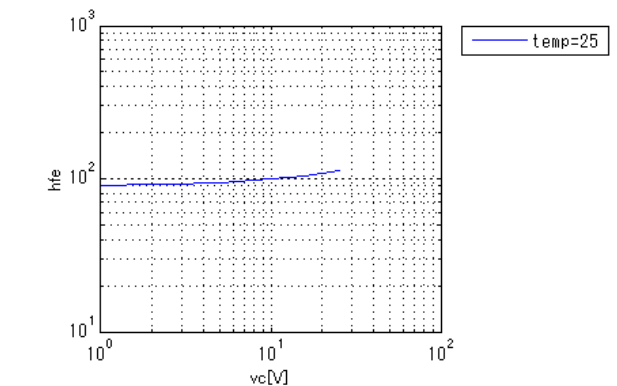
**hFEIc[Temp]**

Vce = 6V



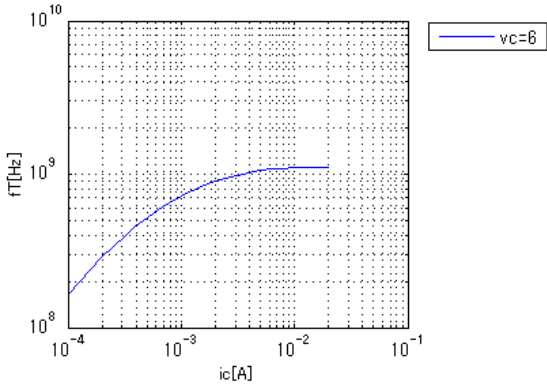
**hFEVce[Temp]**

Ic = 0.001A



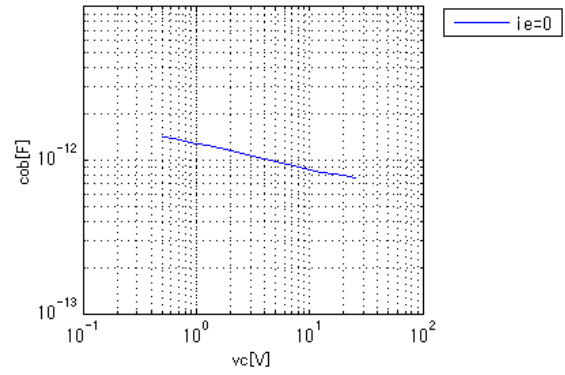
Simulation results are following.  
 Explanatory notes — : simulated

**fTlc[Vce]**



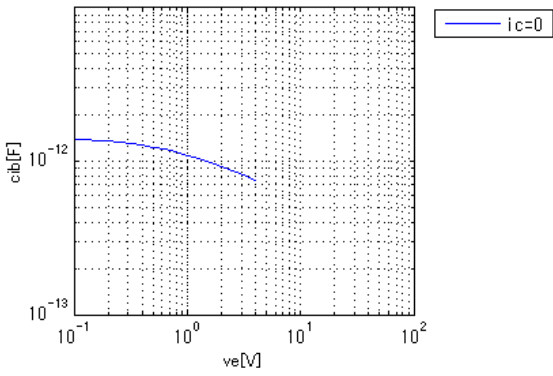
**Cob**

Freq. = 1MHz



**Cib**

Freq. = 1MHz



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