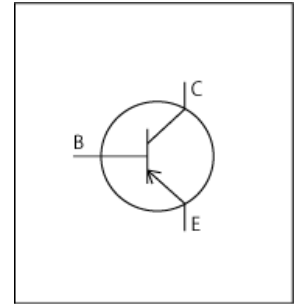


LTspice Model

PNP

ON

SMMBTA56LT1G



Model Information

Model Gummel-Poon model
Call Name MDC_SMMBTA56LT1G_LT
Pin Assign 1:B 2:E 3:C
File List Model Library MDC_SMMBTA56LT1G_LT01.lib
 Model Report MDC_SMMBTA56LT1G_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 October, 2016 - Rev. 8
- Product name SMMBTA56LT1G
- Company name ON Semiconductor.
- Characteristics f_T [Vce], Cob, SwitchingIcc[Tname], hFEIc[Temp], Vce(sat)Ic[Temp], Vbe(sat)Ic[Temp], Vbelc[Temp], Vcelb[Ic], Deltavbelc[Vce], SwitchingWaveform

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 | -80 | V |
| Temperature | -55 | to | 150 | deg C |

BJT

○ : Implemented
 × : Not Implemented
 — : Not applicable

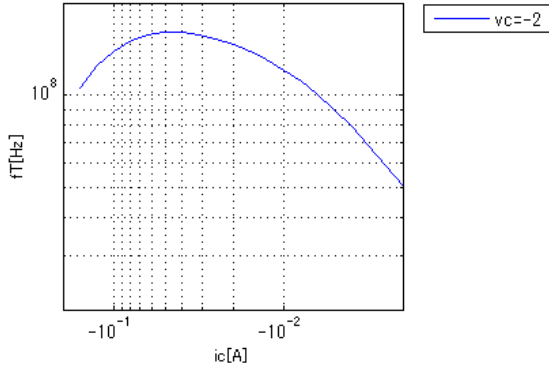
Model Functions Table
RANK=1

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

Simulation results are following.
 Explanatory notes — : simulated

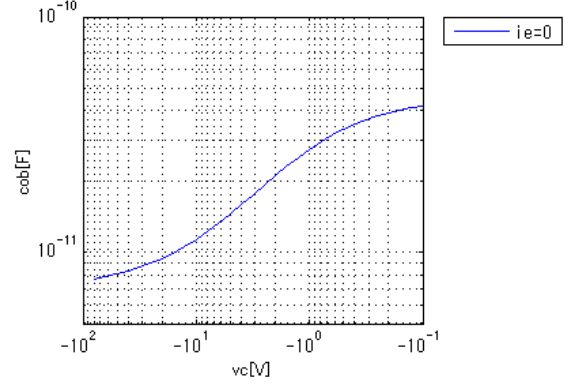
fTlc[Vce]

Freq = 50000000Hz



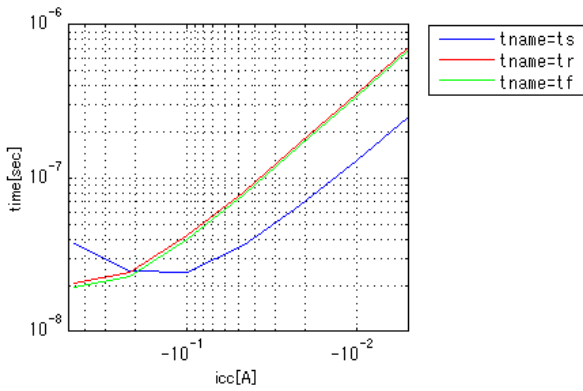
Cob

Freq = 10000000Hz



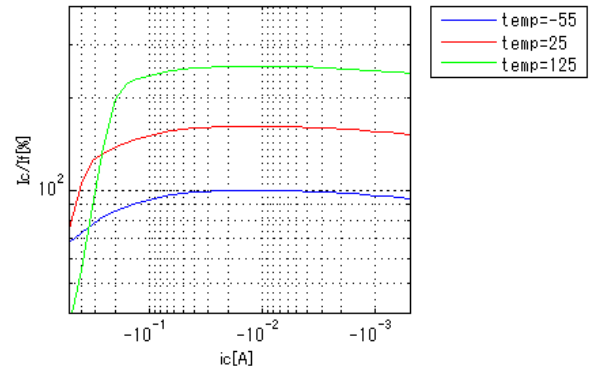
SwitchingIcc[Tname]

ic/ib = 10, vcc = -40V, Temp = 25degC



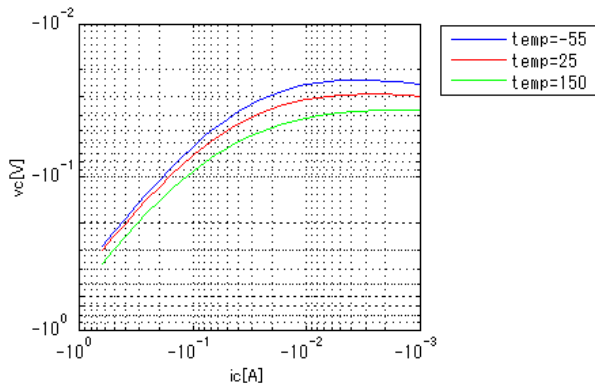
hFEIc[Temp]

Vce = -1V



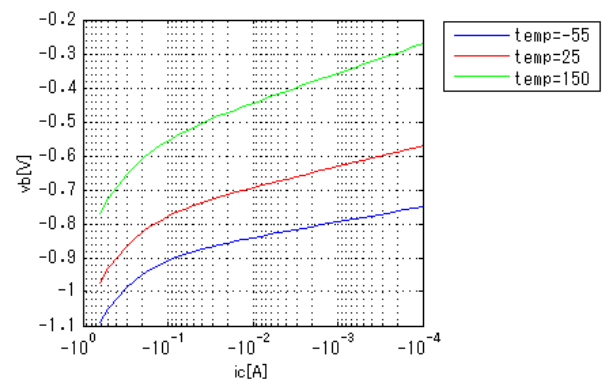
Vce(sat)Ic[Temp]

IC/IB = 10



Vbe(sat)Ic[Temp]

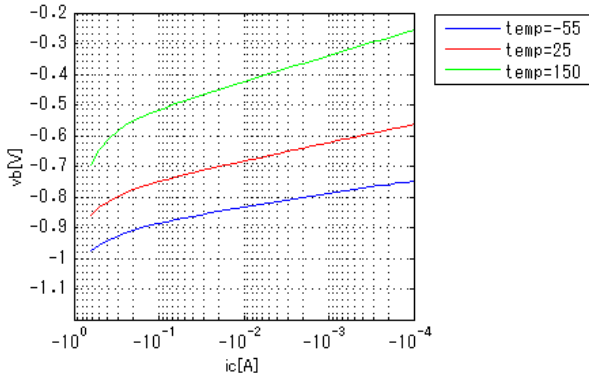
IC/IB = 10



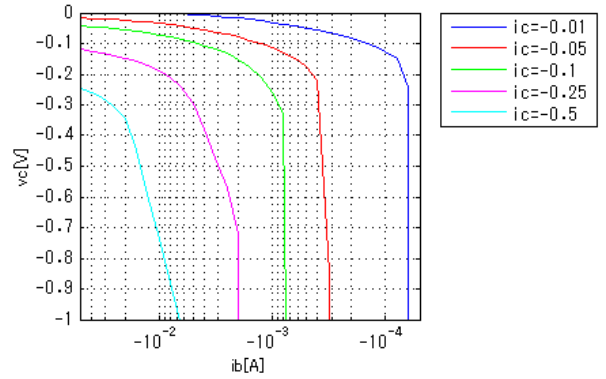
Simulation results are following.
 Explanatory notes — : simulated

Vbelc[Temp]

Vce = -1V

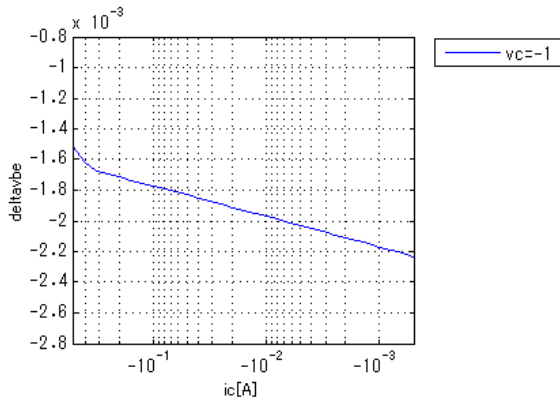


Vcelb[Ic]



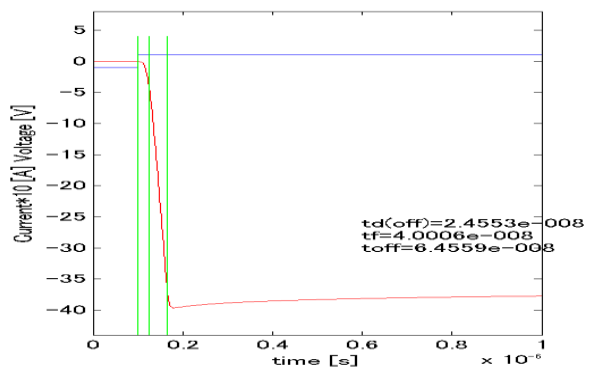
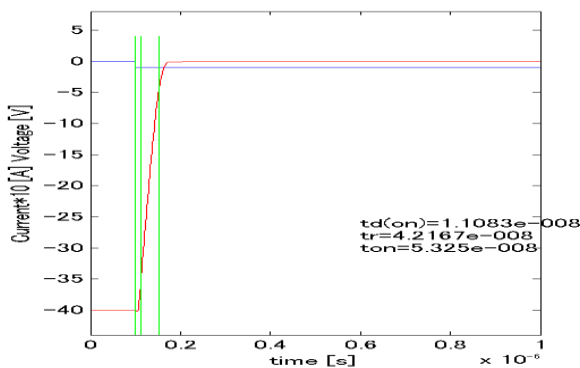
Deltavbelc[Vce]

TempL = 24.5degC, TempH = 25.5degC



Switching Waveform (Blue : INPUT Red : OUTPUT)

ic/ib = 10, vcc = -40V, Temp = 25degC, ic = -0.1A



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