

HICUM/Level0 - Update

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Overview

- HICUM Level0 Version 1.11
- HICUM Level0 Version 1.12
- General code related issues

HICUM Level0 Version 1.11

- version control mechanism will remain as in L2
- released in November 2005
- some key features
 - parameters given proper ranges
 - temperature related equations like in L2v2.22: including non-ideal base currents
 - current crowding in base resistance equation: discontinuity avoided
 - total base charge and forward transfer current limited to 1e-20
 - diode currents limited to avoid convergence problem
 - thermal, shot and flicker noise included
 - implemented for NPN and PNP

v1.11:

$$I_{RES}(T) = I_{RES}(T_0) \left(\frac{T}{T_0} \right)^{m_g/2} \exp \left[\frac{V_{gBE}(0)}{2V_T} \left(\frac{T}{T_0} - 1 \right) \right]$$

HICUM Level0 Version 1.12

- to be released soon
- new changes
 - five-terminal model : thermal node as external
 - introduction of flag FLSH (0,1,2): control of SH calculations
 - all series resistors and RTH will be allowed a minimum value : convergence
 - increase of code clarity
 - substrate transistor currents
- correlated noise/NQS effect will be included in different version

General code related issues

- related more to EDA vendors and compiler developers
 - all if-then-else within begin-end statements
 - supporting switch-branch and flow-branch
 - use of ddt() operator in separate line
 - allowed minimum value of resistors for convergence: 10 milli-Ohm ??
 - code arranging: initial steps, bias related equations, etc: optimality ??
- triangular relation: EDA vendors, model developers & compiler developers