# C_comp in IBIS

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IBIS Describes How to Hook Up C_comp When Deriving IV Curves

- For example, the following pictures on page 61 (in IBIS 6.0) relate to the method of "Data Collection" to determine the models IV curves.

IBIS 5.0

```
|              |<-------------TERMINATOR Model--------------->|
|
|                 [Voltage Range] or
|                 [POWER Clamp Reference]
|                        o
|                        |
|              POWER_ o---o---o
|              clamp  |       |
|                |--o--|      \
|                |     |      /
|                | I-V |      \ Rpower      [Package] Keyword
|                |     |      /                Subparameters *
|                |--o--|      |          |<----------------->|
|                   |         |
|                   |         |                                    PIN
|           o-----o-------o-----o-----/\/\/\--@@@@@@---o--o
|           |     |GND_   |     |        R_pkg   L_pkg   |
|           |     |clamp   |     |                        |
|           |     |--o--|   |     |                        |
|           |     |     |   \     |                        |
|           |     | I-V |   /Rgnd |                        |
|           |     |     |   \     \                        |
|           |     |--o--|   /      / Rac                   |
|           |     |     |   |      \                        |
|           |     o---o---o      /                        |
|           |         |         |                          |
|  C_comp ===         o       === Cac       C_pkg ===
|           |      GND or        |                        |
|           |     [GND Clamp      |                        |
|           |     Reference]      |                        |
|           o-----------------o--------------------o
|           |                    |
|           |                    o
|           |                   GND
|
```

IBIS 5.1 Incorrectly Replaced GND with GND Symbol
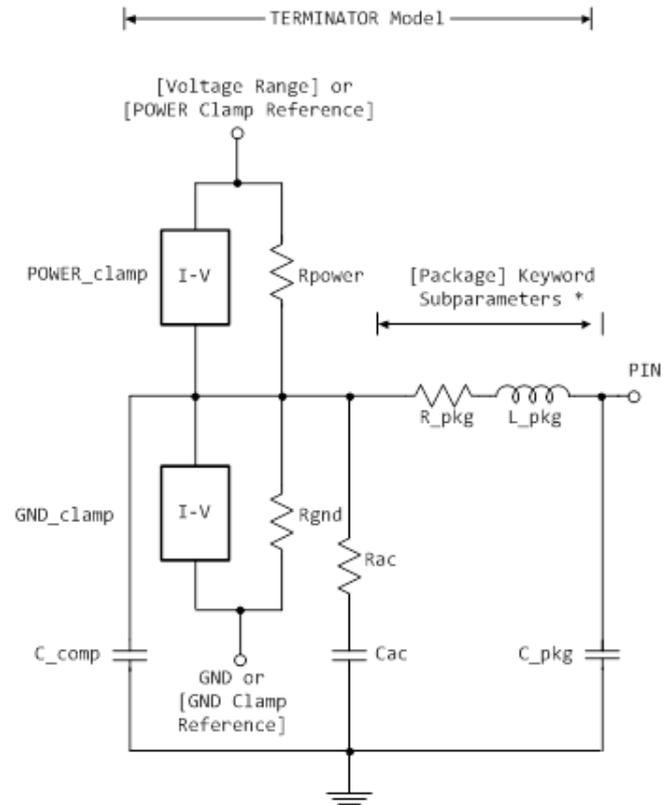
IBIS Describes How to Hook Up C_comp_* When Simulating

IBIS 6.0 page 32:

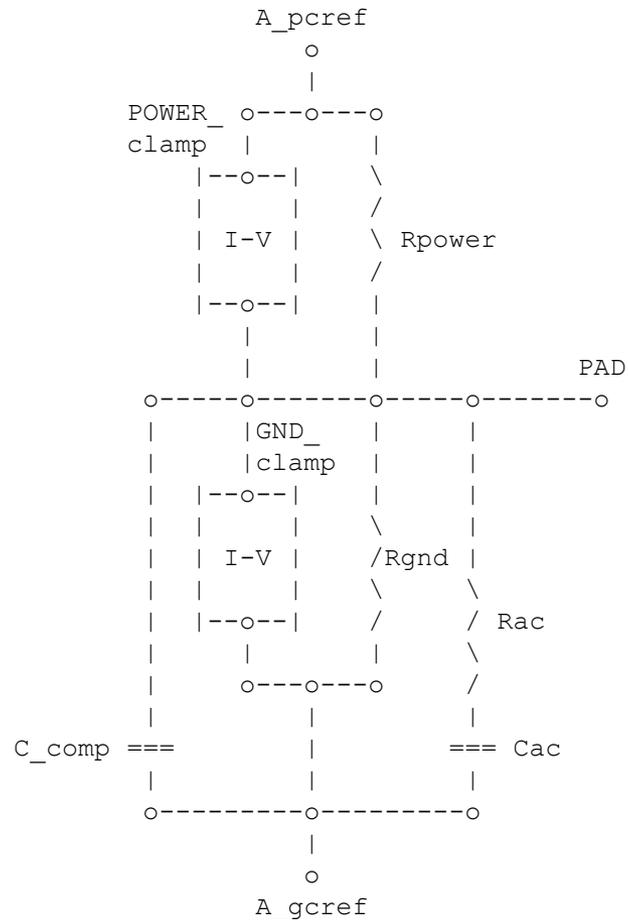C_comp_pullup, C_comp_pulldown, C_comp_power_clamp, and C_comp_gnd_clamp are intended to represent the parasitic capacitances of those structures whose I-V characteristics are described by the [Pullup], [Pulldown], [POWER Clamp] and [GND Clamp] I-V tables. For this reason, the simulator should generate a circuit netlist so that, if defined, each of the C_comp_* capacitors are connected in parallel with their corresponding I-V tables, whether or not the I-V table exists. That is, the C_comp_* capacitors are positioned between the signal pad and the nodes defined by the [Pullup Reference], [Pulldown Reference], [POWER Clamp Reference] and [GND Clamp Reference] keywords, or the [Voltage Range] keyword and GND.

IBIS Does not Describe How to Hook Up C_comp When Simulating

- Cannot give a reference page because there is none.

- On page 70 it leaves it up to the simulator

  - All tables assume that the die capacitance is included. Potential numerical problems associated with processing the data using the effective C_comp (or C_comp_* values as appropriate) for effective die capacitance may be handled differently among simulators.

Correct Picture of the Terminator Model for Simulation

```
|       |<-------------TERMINATOR Model-------------->|
|
|
|                         A_pcref
|                            o
|                            |
|             POWER_ o---o---o
|             clamp  |       |
|                 |--o--|     \
|                 |     |     /
|                 | I-V |     \ Rpower
|                 |     |     /
|                 |--o--|     |
|                   |         |
|                   |         |                   PAD
|         o-----o-------o-----o-------o
|         |     |GND_   |     |
|         |     |clamp  |     |
|         |   |--o--|   |     |
|         |   |     |    \    |
|         |   | I-V |    /Rgnd |
|         |   |     |    \     \
|         |   |--o--|    /      / Rac
|         |     |        |      \
|         |     o---o---o       /
|         |         |           |
|   C_comp ===      |        === Cac
|         |         |           |
|         o---------o---------o
|                   |
|                   o
|                 A_gcref
```

Connecting C_comp to Node 0 is Wrong

- Results are significantly different when simulating with C_comp connected between model pad and Node 0 and between model pad and A_pdref when A_pdref is connected to a power delivery network.

Conclusion

IBIS should do one of the following:

1. Recommend that model makers use C_comp_* instead of C_comp. (Informative).

2. Recommend (or require?) that EDA tools connect C_comp to A_pdref, or split C_comp between A_pdref and A_puref. (Informative or Normative).