**Verification of PI4ULS5V202 IBIS model**

1. **Introduction: to verify the correlation between the ibis model and hspice model, we need to do some simulations:**
2. **The description of pi4uls5v202 ibis model:**

Using **[Driver Schedule]** to describe the relative model switching sequence for referenced models to produce amulti-staged driver. But if EDA tools not support [Driver Schedule] syntactic, it will just use top-level [Model] to simulation(top-level [Model] created by opening one-shot).

1. **Test circuits(Add 20pf capacitance to the IOA/IOB):**

PI4ULS5V202

**VOUT**

**SCL\_C**

**SDA\_C**

**Input Signals**

**SCL\_C**

**SDA\_C**

**VIN**

**SCL\_C**

**SDA\_C**

IOA/IOB

**SCL\_C**

**SDA\_C**

IN

**SCL\_C**

**SDA\_C**

**…..**

**SCL\_C**

**SDA\_C**

C=20p

**SCL\_C**

**SDA\_C**

1. Simulation **without** package data;
2. Simulation **with** package data.
3. **Simulation Result list**

Vcca=1.2 v, vccb=5.0 v. signals from IOB to IOA, test IOA

Vcca=1.2 v, vccb=5.0 v. signals from IOA to IOB, test IOB

Vcca=1.5 v, vccb=5.0 v. signals from IOB to IOA, test IOA

Vcca=1.5 v, vccb=5.0 v. signals from IOA to IOB, test IOB

Vcca=1.8 v, vccb=2.8 v. signals from IOB to IOA, test IOA

Vcca=1.8 v, vccb=2.8 v. signals from IOA to IOB, test IOB

Vcca=2.5 v, vccb=3.3 v. signals from IOB to IOA, test IOA

Vcca=2.5 v, vccb=3.3 v. signals from IOA to IOB, test IOB

1. **Top-level model Simulation Result list**

Vcca=1.2 v, vccb=5.0 v. signals from IOB to IOA, test IOA

Vcca=1.2 v, vccb=5.0 v. signals from IOA to IOB, test IOB

Vcca=1.5 v, vccb=5.0 v. signals from IOB to IOA, test IOA

Vcca=1.5 v, vccb=5.0 v. signals from IOA to IOB, test IOB

Vcca=1.8 v, vccb=2.8 v. signals from IOB to IOA, test IOA

Vcca=1.8 v, vccb=2.8 v. signals from IOA to IOB, test IOB

Vcca=2.5 v, vccb=3.3 v. signals from IOB to IOA, test IOA

Vcca=2.5 v, vccb=3.3 v. signals from IOA to IOB, test IOB

1. **Conclusion:**

For the verification, the simulation results of IBIS model can match very well with the HSPICE model at different simulating conditions.

1. **Simulation Result:**
2. **Vcca=1.2 v, vccb=5.0 v. signals from IOB to IOA, test IOA:**
3. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.2 v, vccb=5.0 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.5 v, vccb=5.0 v. signals from IOB to IOA, test IOA:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.5 v, vccb=5.0 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.8 v, vccb=2.8 v. signals from IOB to IOA, test IOA:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.8 v, vccb=2.8 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=2.5 v, vccb=3.3 v. signals from IOB to IOA, test IOA:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=2.5 v, vccb=3.3 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Top-level mode Simulation Result:**
2. **Vcca=1.2 v, vccb=5.0 v. signals from IOB to IOA, test IOA:**
3. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.2 v, vccb=5.0 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.5 v, vccb=5.0 v. signals from IOB to IOA, test IOA:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.5 v, vccb=5.0 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.8 v, vccb=2.8 v. signals from IOB to IOA, test IOA:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=1.8 v, vccb=2.8 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=2.5 v, vccb=3.3 v. signals from IOB to IOA, test IOA:**
2. Simulation **without** package data;



1. Simulation **with** package data.



1. **Vcca=2.5 v, vccb=3.3 v. signals from IOA to IOB, test IOB:**
2. Simulation **without** package data;



1. Simulation **with** package data.

