# IBIS/HSPICE Model Quality Report

**Design ID:** v69a
**Description:** 2Gb DDR-3 SDRAM
**Marketing device name(s):**
MT41J512M4HX,MT41J256M8HX,MT41J128M16HA,MT41J512M4V69A,MT41J256M8V69A,MT41J128M16V69A
**Valid Speed Grades:** DDR3-800, DDR3-1066, DDR3-1333, DDR3-1600,DDR3-2133
**Zip File Name:** v69a_ibis.zip
**IBIS File name:** v69a.ibs,v69a_it.ibs **File rev:** 2.1
**HSPICE File name:** v69a_hspice.zip **File rev:** 2.3
**EBD file name (if applicable):** **File rev:**
**Die Rev:** D
**Date:** May 11, 2010
**Datasheet Link:**

## Device Parameters

**VDDQ – Slow:** 1.425 **Typical:** 1.5 **Fast:** 1.575
**VDD – Slow:** 1.425 **Typical:** 1.5 **Fast:** 1.575
**Junction Temperature (Commercial) - Slow:** 110C **Typical:** 50C **Fast:** 0
**Junction Temperature (Industrial) - Slow:** 110C **Typical:** 50C **Fast:** -40C

**VDDQ/VSSQ Decoupling Capacitance:** 8.8nF
**Included in HSPICE DQ/DQS models?** YES **Amount per DQ/DQS model:** 440pF/880pF
**VDDQ/VSSQ Decoupling Capacitance Series Resistance:** 2.3

## IBIS Quality Summary

1. ☒ Include the IBIS Quality Summary information in the Quality report. For details on IBIS Quality check the quality specification and quality checklist on IBIS quality webpage http://www.vhdl.org/pub/ibis/quality_wip/

   Include the Ibis quality levels for all components and models in the Ibis file.

   |IQ SUMMARY Overall Quality of component and models Level 2b
   |
   |IQ Level 0 - 0 errors 120 warnings
   |IQ Level 1 - All checks done for completeness and correctness

|IQ Level 2 - HSPICE Correlation

|IQ Buffer DQ_34_1066/DQ_34_ODT20_1066/DQ_34_ODT30_1066/DQ_34_ODT40_1066/
|DQ_34_ODT60_1066/DQ_34_ODT_120_1066: Quality level 2b
|IQ Buffer DQ_34_1333/DQ_34_ODT20_1333/DQ_34_ODT30_1333/DQ_34_ODT40_1333/
|DQ_34_ODT60_1333/DQ_34_ODT_120_1333: Quality level 2b
|IQ Buffer DQ_34_1600/DQ_34_ODT20_1600/DQ_34_ODT30_1600/DQ_34_ODT40_1600/
|DQ_34_ODT60_1600/DQ_34_ODT_120_1600: Quality level 2b

|IQ Buffer DQ_40_1066/DQ_40_ODT20_1066/DQ_40_ODT30_1066/DQ_40_ODT40_1066/
|DQ_40_ODT60_1066/DQ_40_ODT_120_1066: Quality level 2b
|IQ Buffer DQ_40_1333/DQ_40_ODT20_1333/DQ_40_ODT30_1333/DQ_40_ODT40_1333/
|DQ_40_ODT60_1333/DQ_40_ODT_120_1333: Quality level 2b
|IQ Buffer DQ_40_1600/DQ_40_ODT20_1600/DQ_40_ODT30_1600/DQ_40_ODT40_1600/
|DQ_40_ODT60_1600/DQ_40_ODT_120_1600: Quality level 2b

|IQ Buffer DQ_40_2133/DQ_40_ODT20_2133/DQ_40_ODT30_2133/DQ_40_ODT40_2133/
|DQ_40_ODT60_2133/DQ_40_ODT_120_2133: Quality level 2b

|IQ Buffer
DQS_34_1066/DQS_34_ODT20_1066/DQS_34_ODT30_1066/DQS_34_ODT40_1066/
|DQS_34_ODT60_1066/DQS_34_ODT_120_1066: Quality level 2b
|IQ Buffer
DQS_34_1333/DQS_34_ODT20_1333/DQS_34_ODT30_1333/DQS_34_ODT40_1333/
|DQS_34_ODT60_1333/DQS_34_ODT_120_1333: Quality level 2b
|IQ Buffer
DQS_34_1600/DQS_34_ODT20_1600/DQS_34_ODT30_1600/DQS_34_ODT40_1600/
|DQS_34_ODT60_1600/DQS_34_ODT_120_1600: Quality level 2b

|IQ Buffer
DQS_40_1066/DQS_40_ODT20_1066/DQS_40_ODT30_1066/DQS_40_ODT40_1066/
|DQS_40_ODT60_1066/DQS_40_ODT_120_1066: Quality level 2b
|IQ Buffer
DQS_40_1333/DQS_40_ODT20_1333/DQS_40_ODT30_1333/DQS_40_ODT40_1333/
|DQS_40_ODT60_1333/DQS_40_ODT_120_1333: Quality level 2b
|IQ Buffer
DQS_40_1600/DQS_40_ODT20_1600/DQS_40_ODT30_1600/DQS_40_ODT40_1600/
|DQS_40_ODT60_1600/DQS_40_ODT_120_1600: Quality level 2b

DQS_40_2133/DQS_40_ODT20_2133/DQS_40_ODT30_2133/DQS_40_ODT40_2133/
|DQS_40_ODT60_2133/DQS_40_ODT_120_2133: Quality level 2b

|IQ Buffer DM_INPUT_1066/DM_ODT20_1066/DM_ODT30_1066/DM_ODT40_1066/
|DM_ODT60_1066/DM_ODT_120_1066: Quality level 2b
|IQ Buffer DM_INPUT_1333/DM_ODT20_1333/DM_ODT30_1333/DM_ODT40_1333/
|DM_ODT60_1333/DM_ODT_120_1333: Quality level 2b
|IQ Buffer DM_INPUT_1600/DM_ODT20_1600/DM_ODT30_1600/DM_ODT40_1600/
|DM_ODT60_1600/DM_ODT_120_1600: Quality level 2b
|IQ Buffer DM_INPUT_2133/DM_ODT20_2133/DM_ODT30_2133/DM_ODT40_2133/
|DM_ODT60_2133/DM_ODT_120_2133: Quality level 2b

|IQ Buffer TDQS_ODT20_1066/TDQS_ODT30_1066/TDQS_ODT40_1066/
|TDQS_ODT60_1066/TDQS_ODT_120_1066: Quality level 2b
|IQ Buffer TDQS_ODT20_1333/TDQS_ODT30_1333/TDQS_ODT40_1333/
|TDQS_ODT60_1333/TDQS_ODT_120_1333: Quality level 2b
|IQ Buffer TDQS_ODT20_1600/TDQS_ODT30_1600/TDQS_ODT40_1600/
|TDQS_ODT60_1600/TDQS_ODT_120_1600: Quality level 2b

|IQ Buffer TDQS_ODT20_2133/TDQS_ODT30_2133/TDQS_ODT40_2133/
|TDQS_ODT60_2133/TDQS_ODT_120_2133: Quality level 2b

|IQ Buffer INPUT_1066/INPUT_1333/INPUT_1600/INPUT_2133: Quality level 2b
|IQ Buffer CLKIN_1066/CLKIN_1333/CLKIN_1600/CLKIN_2133: Quality level 2b

|IQ Buffer NF_INPUT: Quality level 2b
|
|IQ Level 1
| All Level 1 checks performed and are either OK or NA
|
|IQ Level 2
| Using VT IBIS Data compared to source hspice models
|
|IQ Level 2b
| C_comp laboratory and hspice correlation
|
|IQ BEGIN IBIS Quality Checklist

| | | |
|---|---|---|
|IQ FILE: v48c.ibs | IQ Level: | 1 |
|IQ COMPONENT: MT41J256M4HX | IQ Level: | 1 |
|IQ COMPONENT: MT41J128M8HX | IQ Level: | 1 |
|IQ MODEL: DQ_34_1066 | IQ Level: | 2b |
|IQ MODEL: DQ_34_ODT20_1066 | IQ Level: | 2b |
|IQ MODEL: DQ_34_ODT30_1066 | IQ Level: | 2b |
|IQ MODEL: DQ_34_ODT40_1066 | IQ Level: | 2b |
|IQ MODEL: DQ_34_ODT60_1066 | IQ Level: | 2b |
|IQ MODEL: DQ_34_ODT120_1066 | IQ Level: | 2b |

| | | |
|---|---|---|
| \|IQ MODEL: DQ_40_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT20_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT30_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT40_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT60_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT120_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_34_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_34_ODT20_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_34_ODT30_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_34_ODT40_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_34_ODT60_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_34_ODT120_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_40_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_40_ODT20_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_40_ODT30_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_40_ODT40_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_40_ODT60_1066 | IQ Level: | 2b |
| \|IQ MODEL: DQS_40_ODT120_1066 | IQ Level: | 2b |
| \|IQ MODEL: DM_INPUT_1066 | IQ Level: | 2b |
| \|IQ MODEL: DM_ODT20_1066 | IQ Level: | 2b |
| \|IQ MODEL: DM_ODT30_1066 | IQ Level: | 2b |
| \|IQ MODEL: DM_ODT40_1066 | IQ Level: | 2b |
| \|IQ MODEL: DM_ODT60_1066 | IQ Level: | 2b |
| \|IQ MODEL: DM_ODT120_1066 | IQ Level: | 2b |
| \|IQ MODEL: INPUT_1066 | IQ Level: | 2b |
| \|IQ MODEL:ODT_ INPUT_1066 | IQ Level: | 2b |
| | | |
| \|IQ MODEL: CLKIN_1066 | IQ Level: | 2b |
| \|IQ MODEL: TDQS_ODT20_1066 | IQ Level: | 2b |
| \|IQ MODEL: TDQS_ODT30_1066 | IQ Level: | 2b |
| \|IQ MODEL: TDQS_ODT40_1066 | IQ Level: | 2b |
| \|IQ MODEL: TDQS_ODT60_1066 | IQ Level: | 2b |
| \|IQ MODEL: TDQS_ODT120_1066 | IQ Level: | 2b |
| | | |
| \|IQ MODEL: DQ_34_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_34_ODT20_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_34_ODT30_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_34_ODT40_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_34_ODT60_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_34_ODT120_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT20_1333 | IQ Level: | 2b |
| \|IQ MODEL: DQ_40_ODT30_1333 | IQ Level: | 2b |

|IQ MODEL: DQ_40_ODT40_1333 IQ Level: 2b
|IQ MODEL: DQ_40_ODT60_1333 IQ Level: 2b
|IQ MODEL: DQ_40_ODT120_1333 IQ Level: 2b
|IQ MODEL: DQS_34_1333 IQ Level: 2b
|IQ MODEL: DQS_34_ODT20_1333 IQ Level: 2b
|IQ MODEL: DQS_34_ODT30_1333 IQ Level: 2b
|IQ MODEL: DQS_34_ODT40_1333 IQ Level: 2b
|IQ MODEL: DQS_34_ODT60_1333 IQ Level: 2b
|IQ MODEL: DQS_34_ODT120_1333 IQ Level: 2b
|IQ MODEL: DQS_40_1333 IQ Level: 2b
|IQ MODEL: DQS_40_ODT20_1333 IQ Level: 2b
|IQ MODEL: DQS_40_ODT30_1333 IQ Level: 2b
|IQ MODEL: DQS_40_ODT40_1333 IQ Level: 2b
|IQ MODEL: DQS_40_ODT60_1333 IQ Level: 2b
|IQ MODEL: DQS_40_ODT120_1333 IQ Level: 2b
|IQ MODEL: DM_INPUT_1333 IQ Level: 2b
|IQ MODEL: DM_ODT20_1333 IQ Level: 2b
|IQ MODEL: DM_ODT30_1333 IQ Level: 2b
|IQ MODEL: DM_ODT40_1333 IQ Level: 2b
|IQ MODEL: DM_ODT60_1333 IQ Level: 2b
|IQ MODEL: DM_ODT120_1333 IQ Level: 2b
|IQ MODEL: INPUT_1333 IQ Level: 2b
|IQ MODEL: ODT_INPUT_1333 IQ Level: 2b
|IQ MODEL: CLKIN_1333 IQ Level: 2b
|IQ MODEL: TDQS_ODT20_1333 IQ Level: 2b
|IQ MODEL: TDQS_ODT30_1333 IQ Level: 2b
|IQ MODEL: TDQS_ODT40_1333 IQ Level: 2b
|IQ MODEL: TDQS_ODT60_1333 IQ Level: 2b
|IQ MODEL: TDQS_ODT120_1333 IQ Level: 2b

|IQ MODEL: DQ_34_1600 IQ Level: 2b
|IQ MODEL: DQ_34_ODT20_1600 IQ Level: 2b
|IQ MODEL: DQ_34_ODT30_1600 IQ Level: 2b
|IQ MODEL: DQ_34_ODT40_1600 IQ Level: 2b
|IQ MODEL: DQ_34_ODT60_1600 IQ Level: 2b
|IQ MODEL: DQ_34_ODT120_1600 IQ Level: 2b
|IQ MODEL: DQ_40_1600 IQ Level: 2b
|IQ MODEL: DQ_40_ODT20_1600 IQ Level: 2b
|IQ MODEL: DQ_40_ODT30_1600 IQ Level: 2b
|IQ MODEL: DQ_40_ODT40_1600 IQ Level: 2b
|IQ MODEL: DQ_40_ODT60_1600 IQ Level: 2b
|IQ MODEL: DQ_40_ODT120_1600 IQ Level: 2b
|IQ MODEL: DQS_34_1600 IQ Level: 2b

|IQ MODEL: DQS_34_ODT20_1600 IQ Level: 2b
|IQ MODEL: DQS_34_ODT30_1600 IQ Level: 2b
|IQ MODEL: DQS_34_ODT40_1600 IQ Level: 2b
|IQ MODEL: DQS_34_ODT60_1600 IQ Level: 2b
|IQ MODEL: DQS_34_ODT120_1600 IQ Level: 2b
|IQ MODEL: DQS_40_1600 IQ Level: 2b
|IQ MODEL: DQS_40_ODT20_1600 IQ Level: 2b
|IQ MODEL: DQS_40_ODT30_1600 IQ Level: 2b
|IQ MODEL: DQS_40_ODT40_1600 IQ Level: 2b
|IQ MODEL: DQS_40_ODT60_1600 IQ Level: 2b
|IQ MODEL: DQS_40_ODT120_1600 IQ Level: 2b
|IQ MODEL: DM_INPUT_1600 IQ Level: 2b
|IQ MODEL: DM_ODT20_1600 IQ Level: 2b
|IQ MODEL: DM_ODT30_1600 IQ Level: 2b
|IQ MODEL: DM_ODT40_1600 IQ Level: 2b
|IQ MODEL: DM_ODT60_1600 IQ Level: 2b
|IQ MODEL: DM_ODT120_1600 IQ Level: 2b
|IQ MODEL: INPUT_1600 IQ Level: 2b
|IQ MODEL: ODT_INPUT_1600 IQ Level: 2b
|IQ MODEL: CLKIN_1600 IQ Level: 2b
|IQ MODEL: TDQS_ODT20_1600 IQ Level: 2b
|IQ MODEL: TDQS_ODT30_1600 IQ Level: 2b
|IQ MODEL: TDQS_ODT40_1600 IQ Level: 2b
|IQ MODEL: TDQS_ODT60_1600 IQ Level: 2b
|IQ MODEL: TDQS_ODT120_1600 IQ Level: 2b

|IQ MODEL: DQ_34_2133 IQ Level: 2b
|IQ MODEL: DQ_34_ODT20_2133 IQ Level: 2b
|IQ MODEL: DQ_34_ODT30_2133 IQ Level: 2b
|IQ MODEL: DQ_34_ODT40_2133 IQ Level: 2b
|IQ MODEL: DQ_34_ODT60_2133 IQ Level: 2b
|IQ MODEL: DQ_34_ODT120_2133 IQ Level: 2b
|IQ MODEL: DQ_40_2133 IQ Level: 2b
|IQ MODEL: DQ_40_ODT20_2133 IQ Level: 2b
|IQ MODEL: DQ_40_ODT30_2133 IQ Level: 2b
|IQ MODEL: DQ_40_ODT40_2133 IQ Level: 2b
|IQ MODEL: DQ_40_ODT60_2133 IQ Level: 2b
|IQ MODEL: DQ_40_ODT120_2133 IQ Level: 2b
|IQ MODEL: DQS_34_2133 IQ Level: 2b
|IQ MODEL: DQS_34_ODT20_2133 IQ Level: 2b
|IQ MODEL: DQS_34_ODT30_2133 IQ Level: 2b
|IQ MODEL: DQS_34_ODT40_2133 IQ Level: 2b
|IQ MODEL: DQS_34_ODT60_2133 IQ Level: 2b

|IQ MODEL: DQS_34_ODT120_2133 IQ Level: 2b
|IQ MODEL: DQS_40_2133 IQ Level: 2b
|IQ MODEL: DQS_40_ODT20_2133 IQ Level: 2b
|IQ MODEL: DQS_40_ODT30_2133 IQ Level: 2b
|IQ MODEL: DQS_40_ODT40_2133 IQ Level: 2b
|IQ MODEL: DQS_40_ODT60_2133 IQ Level: 2b
|IQ MODEL: DQS_40_ODT120_2133 IQ Level: 2b
|IQ MODEL: DM_INPUT_2133 IQ Level: 2b
|IQ MODEL: DM_ODT20_2133 IQ Level: 2b
|IQ MODEL: DM_ODT30_2133 IQ Level: 2b
|IQ MODEL: DM_ODT40_2133 IQ Level: 2b
|IQ MODEL: DM_ODT60_2133 IQ Level: 2b
|IQ MODEL: DM_ODT120_2133 IQ Level: 2b
|IQ MODEL: INPUT_2133 IQ Level: 2b
|IQ MODEL: ODT_INPUT_2133 IQ Level: 2b
|IQ MODEL: CLKIN_2133 IQ Level: 2b
|IQ MODEL: TDQS_ODT20_2133 IQ Level: 2b
|IQ MODEL: TDQS_ODT30_2133 IQ Level: 2b
|IQ MODEL: TDQS_ODT40_2133 IQ Level: 2b
|IQ MODEL: TDQS_ODT60_2133 IQ Level: 2b
|IQ MODEL: TDQS_ODT120_2133 IQ Level: 2b

|IQ END IBIS Quality Checklist

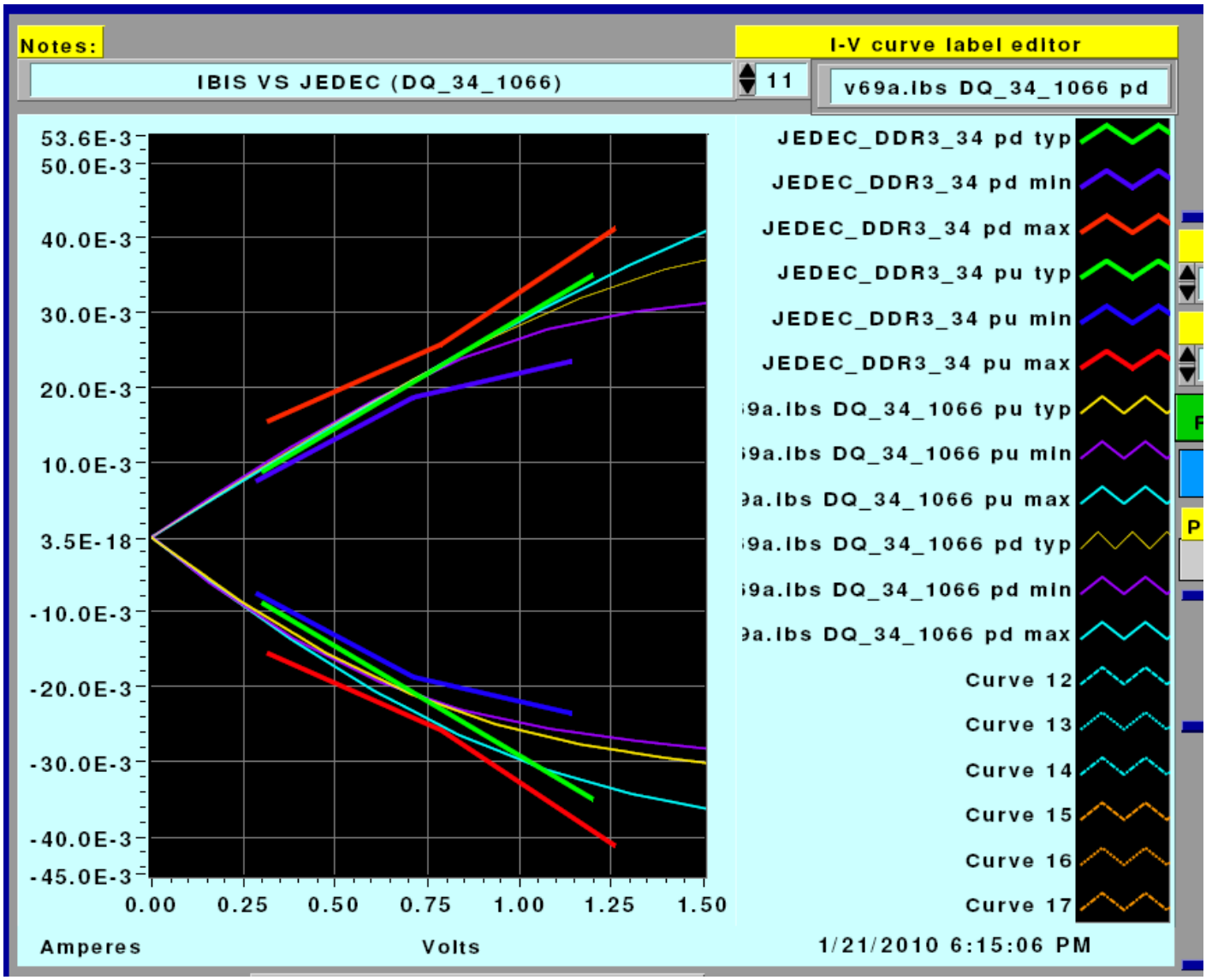
 

# IBIS MODEL Correlation

## Datasheet Correlation

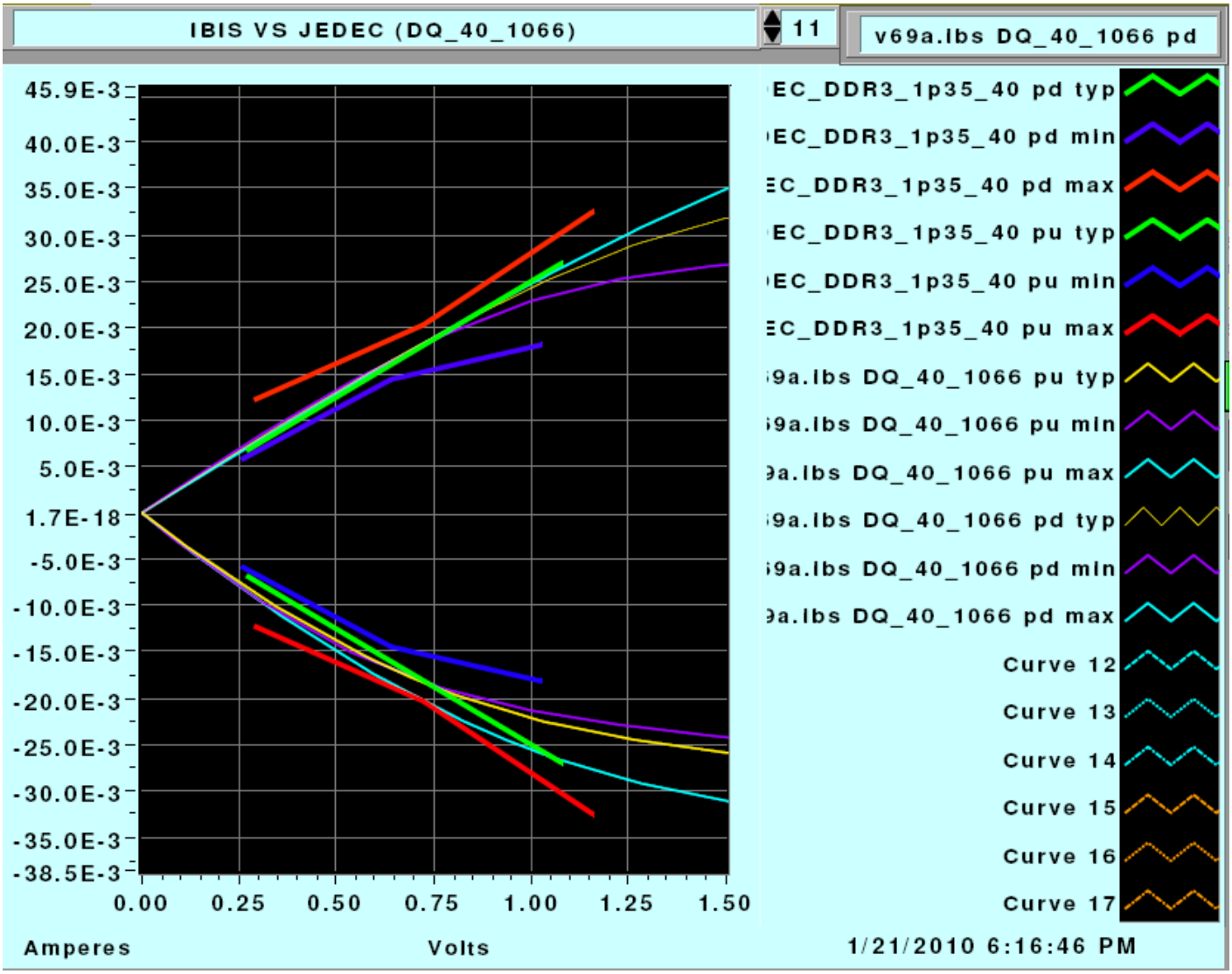
1. ☒ For Output model or I/O model compare datasheet IOH/IOL data with IBIS pullup/pulldown data.

### 34-Ohm Drive



## 40-Ohm Drive



2. ☒ Compare C_comp with datasheet Input C. Provide C_comp comparison table for all models and for all package combinations (i.e. x4, x8 and x16)
   Insert component name here **MT41J128M16HA**

| | | IBIS | | Datasheet | |
|---|---|---|---|---|---|
| | | Min | max | min | max |
| **DQ_34_1066 DQ_40_1066** | C_comp | 1.12pF | 1.41pF | | |
| | C package | 0.31pF | 0.52pF | | |
| | C_total | 1.43pF | 1.93pF | 1.5pF | 3.0pF |
| **INPUT_1066** | C_comp | 0.55pF | 0.75pF | | |
| | C package | 0.29pF | 0.6pF | | |
| | C_total | 0.84pF | 1.35pF | 0.75pF | 1.35pF |
| **ODT_INPUT_1066** | C_comp | 0.5pF | 0.7pF | | |
| | C package | 0.52pF | 0.52pF | | |
| | C_total | 1.02pF | 1.22pF | 0.75pF | 1.35pF |
| **CLKIN_1066** | C_comp | 0.6pF | 0.71pF | | |
| | C package | 0.33pF | 0.34pF | | |
| | C_total | 0.93pF | 1.05pF | 0.8pF | 1.6pF |
| **DQ_34_1333 DQ_40_1333** | C_comp | 1.11pF | 1.39pF | | |
| | C package | 0.31pF | 0.52pF | | |
| | C_total | 1.42pF | 1.91pF | 1.5pF | 2.5pF |
| **INPUT_1333** | C_comp | 0.54pF | 0.74pF | | |
| | C package | 0.29pF | 0.6pF | | |
| | C_total | 0.83pF | 1.34pF | 0.75pF | 1.3pF |
| **ODT_INPUT_1333** | C_comp | 0.49pF | 0.69pF | | |
| | C package | 0.52pF | 0.52pF | | |
| | C_total | 1.01pF | 1.21pF | 0.75pF | 1.35pF |
| **CLKIN_1333** | C_comp | 0.59pF | 0.69pF | | |
| | C package | 0.33pF | 0.34pF | | |
| | C_total | 0.92pF | 1.03pF | 0.8pF | 1.40pF |
| **DQ_34_1600 DQ_40_1600** | C_comp | 1.09pF | 1.39pF | | |
| | C package | 0.31pF | 0.52pF | | |
| | C_total | 1.4pF | 1.91pF | 1.5pF | 2.3pF |
| **INPUT_1600** | C_comp | 0.53pF | 0.73pF | | |

| | | | | | |
|---|---|---|---|---|---|
| | C package | 0.29pF | 0.6pF | | |
| | C_total | 0.82pF | 1.33pF | 0.75pF | 1.30pF |
| **ODT_INPUT_1066** | C_comp | 0.48pF | 0.68pF | | |
| | C package | 0.52pF | 0.52pF | | |
| | C_total | 1pF | 1.2pF | 0.75pF | 1.35pF |
| **CLKIN_1600** | C_comp | 0.58pF | 0.68pF | | |
| | C package | 0.33pF | 0.34pF | | |
| | C_total | 0.91pF | 1.02pF | 0.8pF | 1.40pF |

3. ☐ If slew rate specifications (Rise slew and Fall slew) are available from the datasheet, complete HSPICE simulation to generate slew rate data and provide a comparison table.

4. ☒ Compare ODT data with datasheet
ODT calculated using the formula RTT=$(V_{IH(ac)} - V_{IL(ac)})/|(I(V_{IH(ac)}) - I(V_{IL(ac)})|$

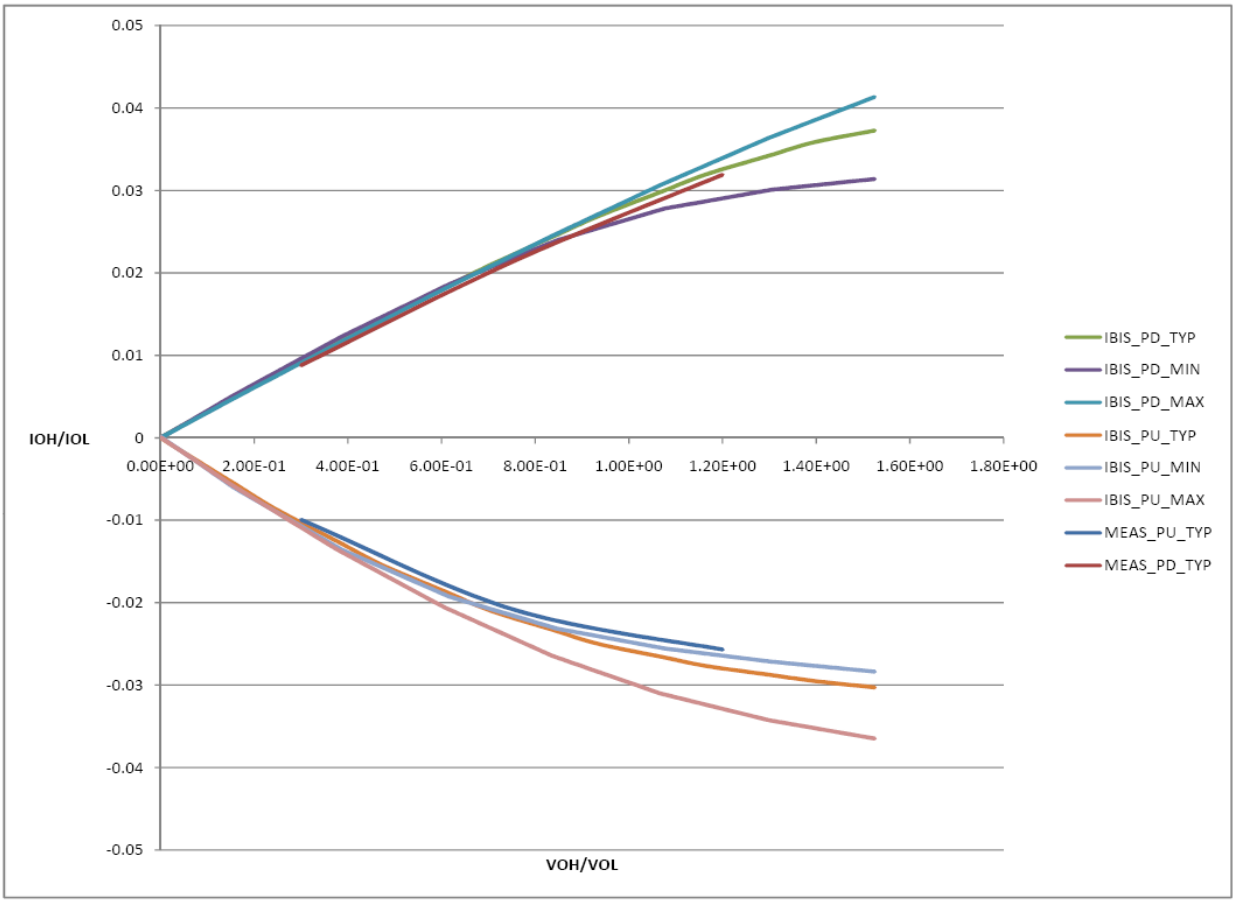
| | TYP | MIN | MAX |
|---|---|---|---|
| **Vinl** | 0.575 | 0.5375 | 0.6125 |
| **Vinh** | 0.925 | 0.8875 | 0.9625 |
| | | | |
| **I(Vinl)** | -6.35E-03 | -6.06E-03 | -9.21E-03 |
| **I(Vinh)** | 7.41E-03 | 6.24E-03 | 6.26E-03 |
| | | | |
| **Rtt(model-DQ_34_1066)** | 25.44 | 28.46 | 22.62 |
| **Rtt(datasheet)-in units Rzq/12** | 1 | 1.6 | 0.9 |
| **Rtt(datasheet)-in ohms** | 20 | 32 | 18 |

## Measurement Correlation

1. ☒ For Output model or I/O model compare measured IOH/IOL data with IBIS pullup pulldown data. If the measurement condition is different than IBIS condition, run hspice simulation using the same measurement condition, for example Vcc, temp and process. Include measurement conditions in the pullup/pulldown images.

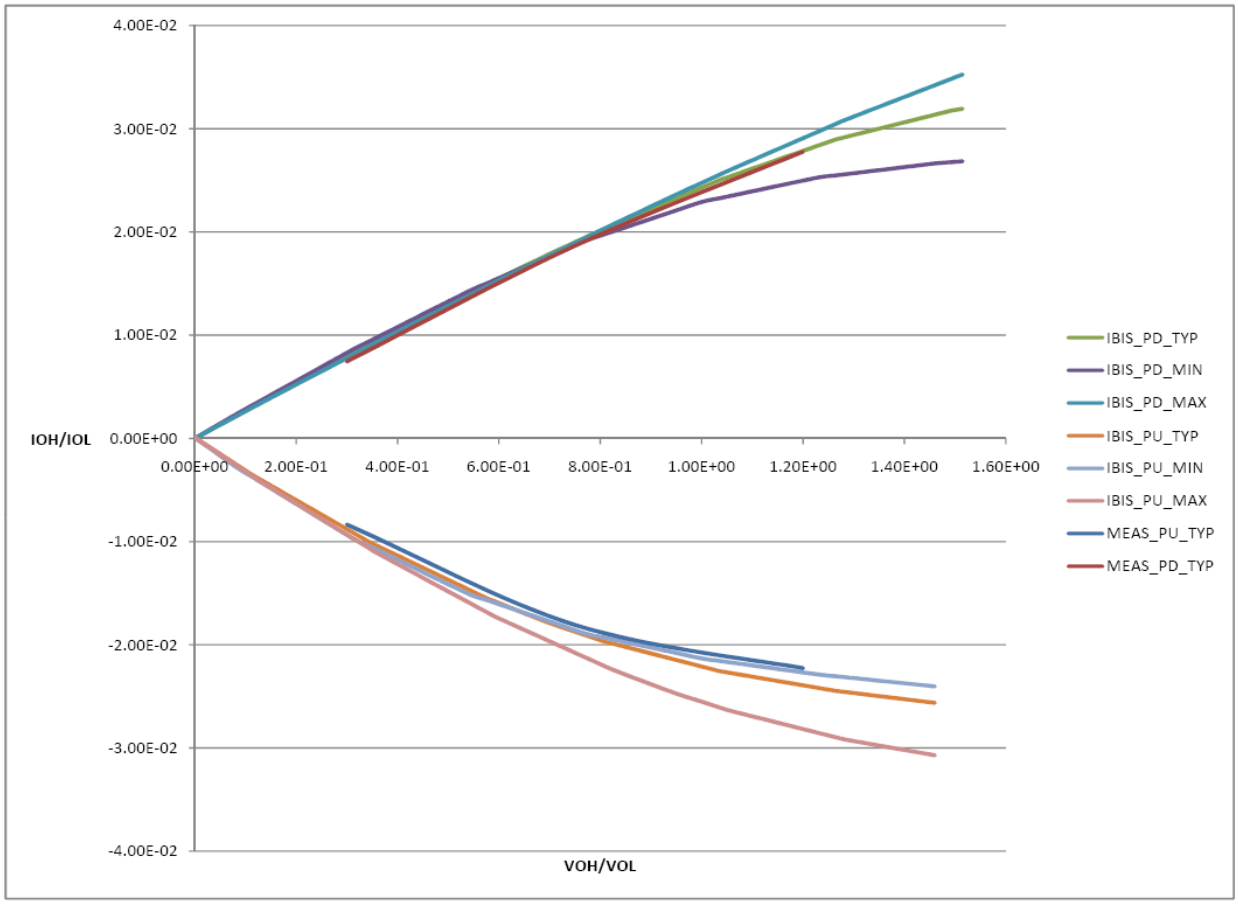
 

## DQ_34_1066



## DQ_40_1066



2. ☒ Compare C_comp with measured C_comp. Provide C_comp comparison table for all models and for all package combinations (i.e x4, x8 and x16)

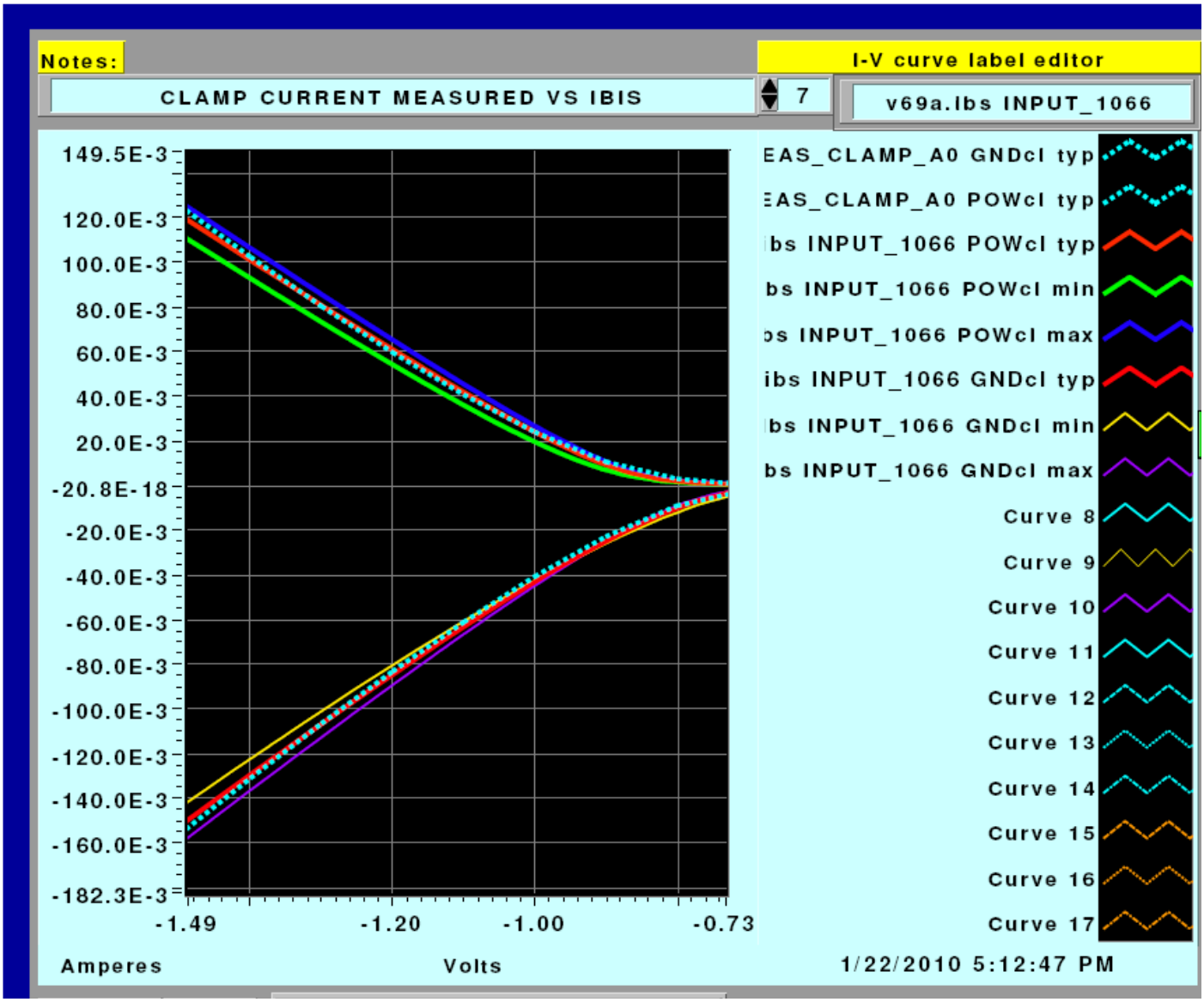
## MT41J256M8HX

| | | IBIS | | | Measured | | |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | max | min | typ | max |
| **DQ** | C_comp | 1.12pF | 1.26pF | 1.41pF | NA | NA | NA |
| | C package | 0.32pF | 0.40pF | 0.50pF | NA | NA | NA |
| | C_total | 1.44pF | 1.66pF | 1.91pF | 1.55pF | 1.63pF | 1.72pF |
| **INPUT** | C_comp | 0.55pF | 0.65pF | 0.76pF | NA | NA | NA |
| | C package | 0.26pF | 0.34pF | 0.5pF | NA | NA | NA |
| | C_total | 0.81pF | 0.99pF | 1.26pF | 0.91F | 0.99pF | 1.07pF |
| **ODT_INPUT** | C_comp | 0.5pF | 0.6pF | 0.7pF | | | |
| | C package | 0.52pF | 0.52pF | 0.52pF | | | |
| | C_total | 1.02pF | 1.12pF | 1.22pF | 1.09pF | 1.095pF | 1.10pF |
| **CLK** | C_comp | 0.6pF | 0.66pF | 0.71pF | NA | NA | NA |
| | C package | 0.32pF | 0.34pF | 0.36pF | NA | NA | NA |
| | C_total | 0.92pF | 1pF | 1.07pF | 0.93pF | 1.01pF | 1.04pF |

3. ☒ If measured clamp current data is available provide an IBIS and Silicon clamp comparison for all models

## INPUT_1066



4. ☐ If slew rate specifications (Rise slew and Fall slew) are available from measurements, complete HSPICE simulation to generate slew rate data and provide a comparison table.

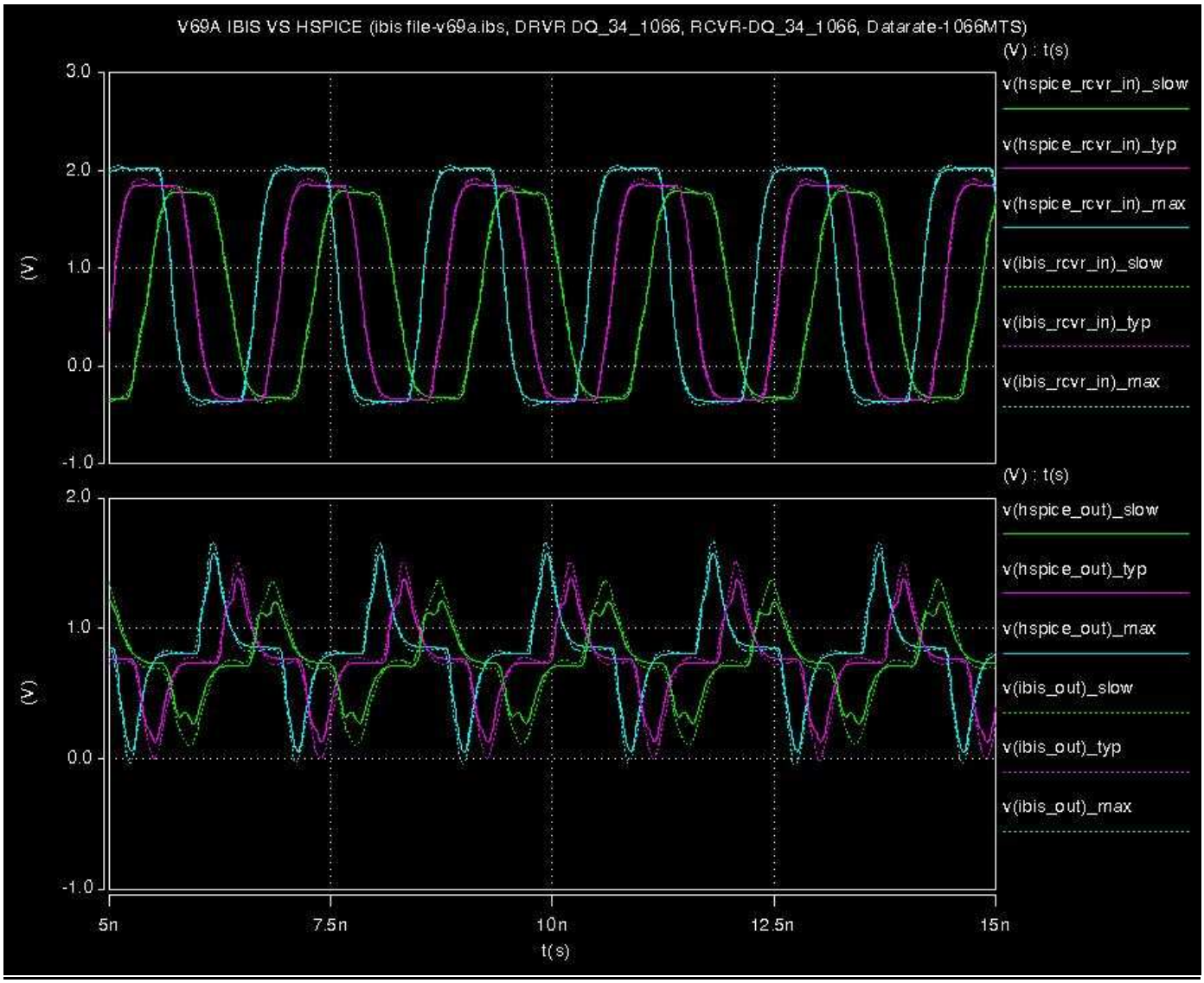
   **NOT AVAILABLE**

**IBIS vs HSPICE Correlation**

1. ☒ For all output model or I/O model run hspice transient simulation using encrypted netlist and using IBIS model (b-element).
   a. ☒ Use the below setup and node naming conventions for the IBIS and HSPICE deck file (.sp file). Indicate and update the setup diagram if it is different. Indicate version of HSPICE simulator used for simulation:
   b. ☒ Run simulation for all corners cases and at maximum allowable speed grade

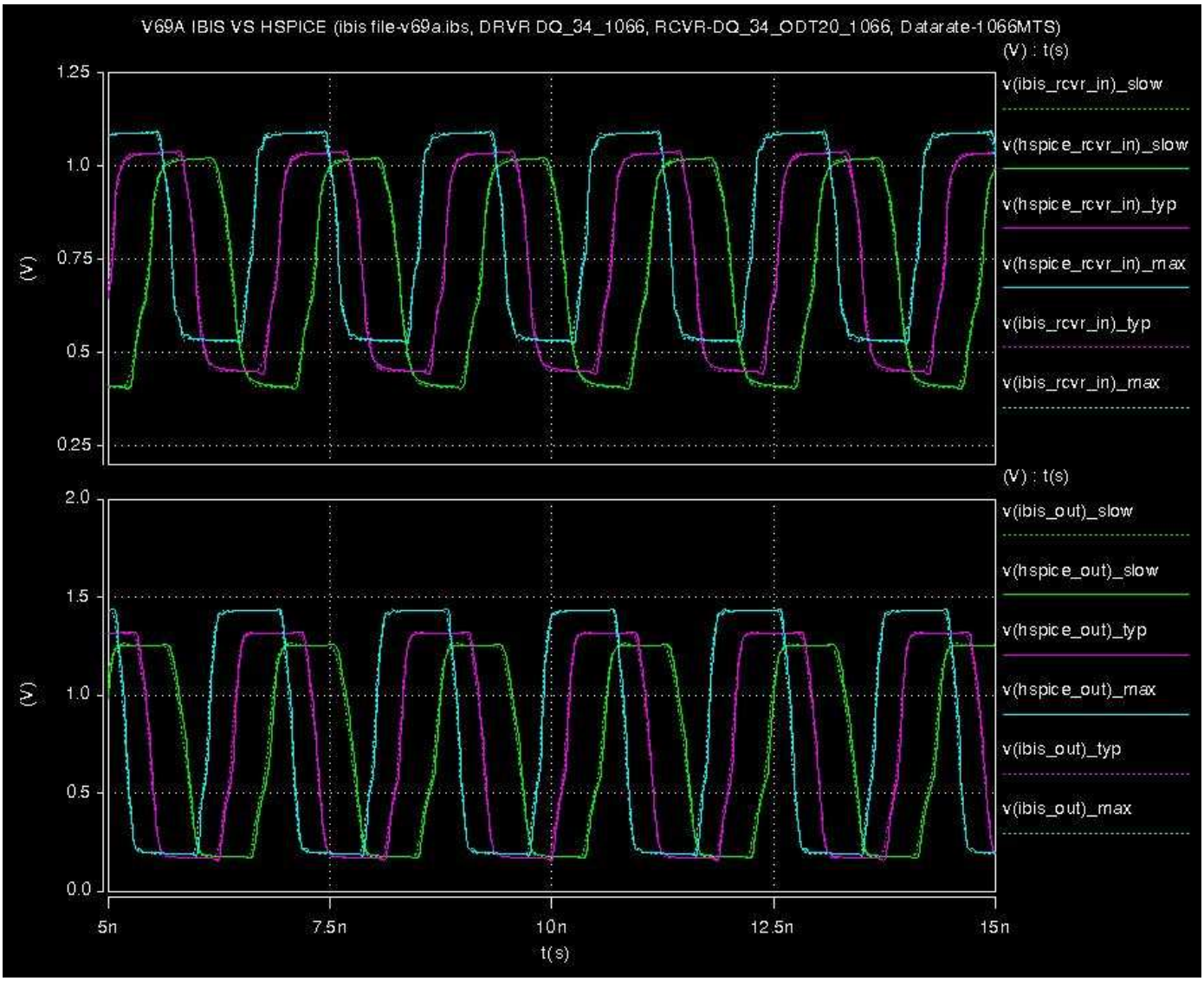
 

### i. DQ_34_1066 driving DQ_34_1066



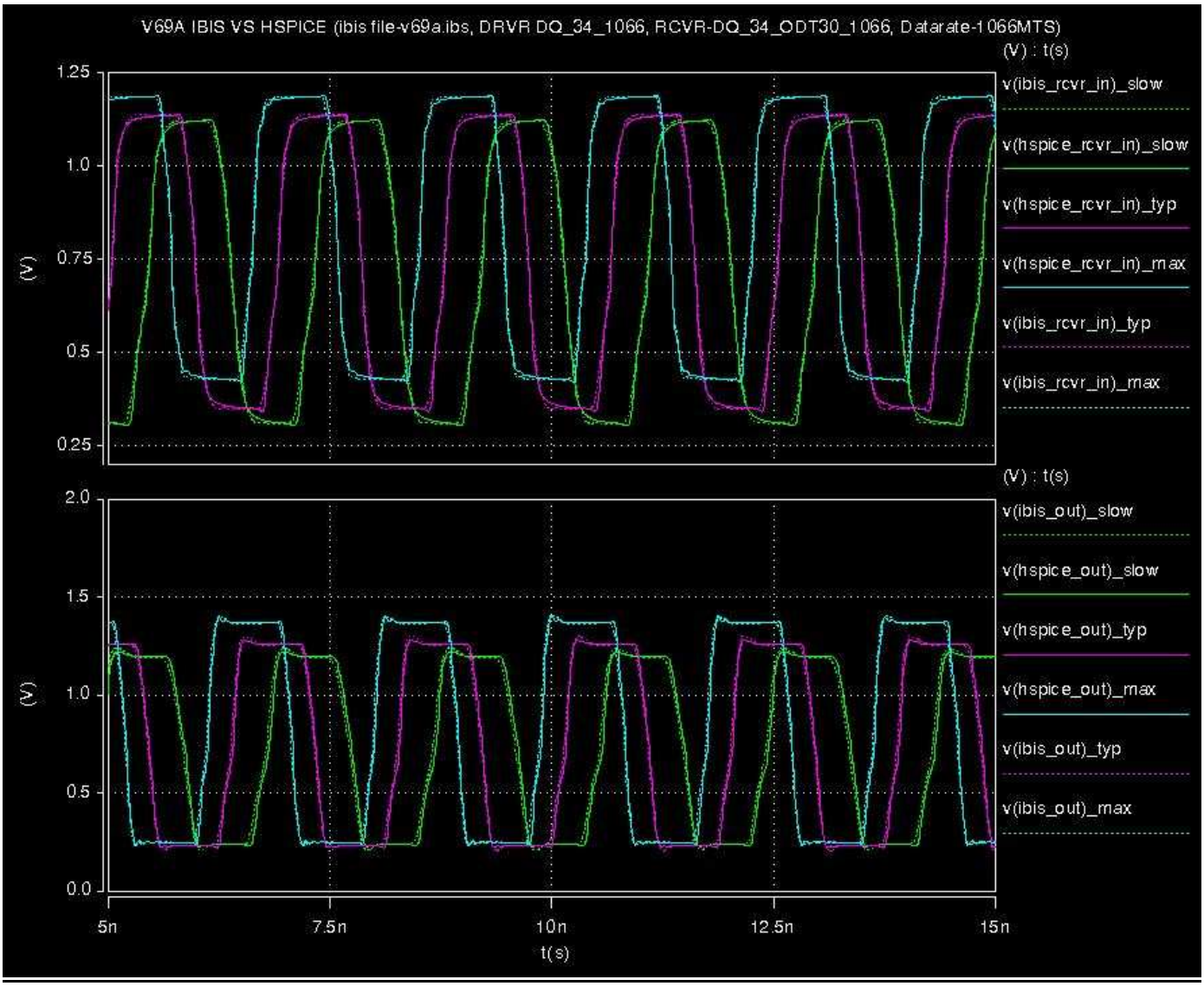

 

### ii. DQ_34_1066 driving DQ_34_ODT20_1066



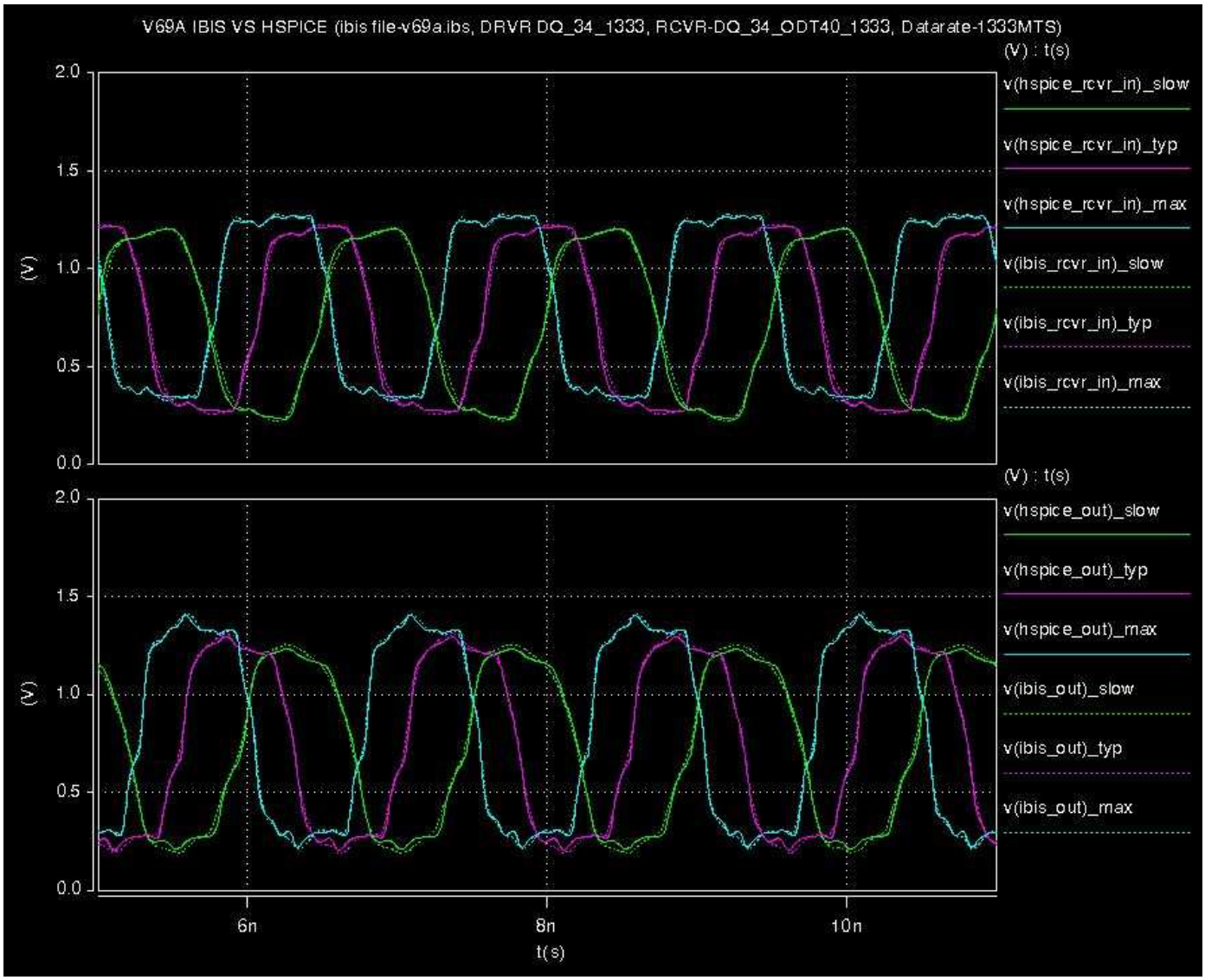

 

### iii. DQ_34_1066 driving DQ_34_ODT30_1066



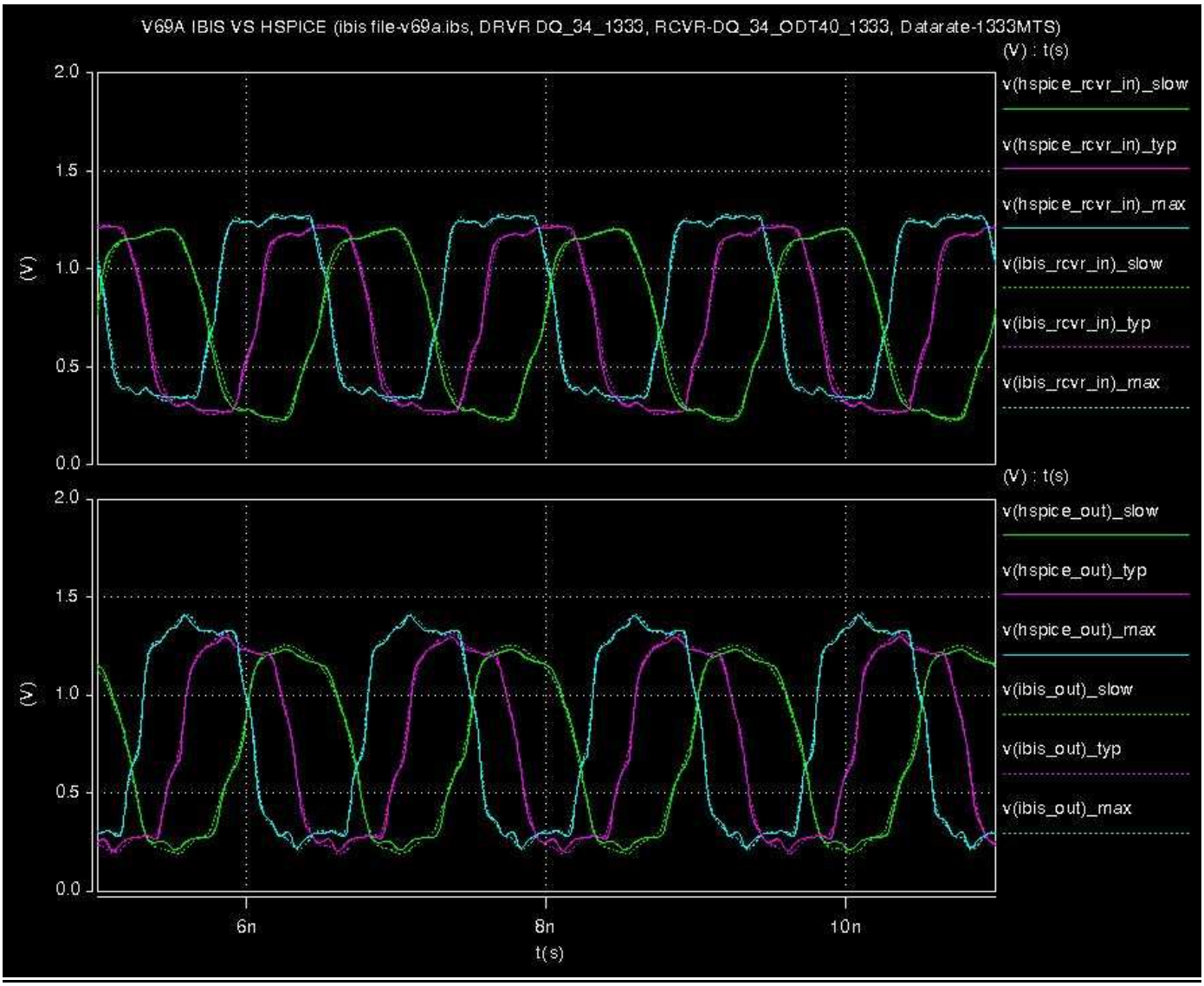

 

### iv. DQ_34_1333 driving DQ_34_ODT40_1333



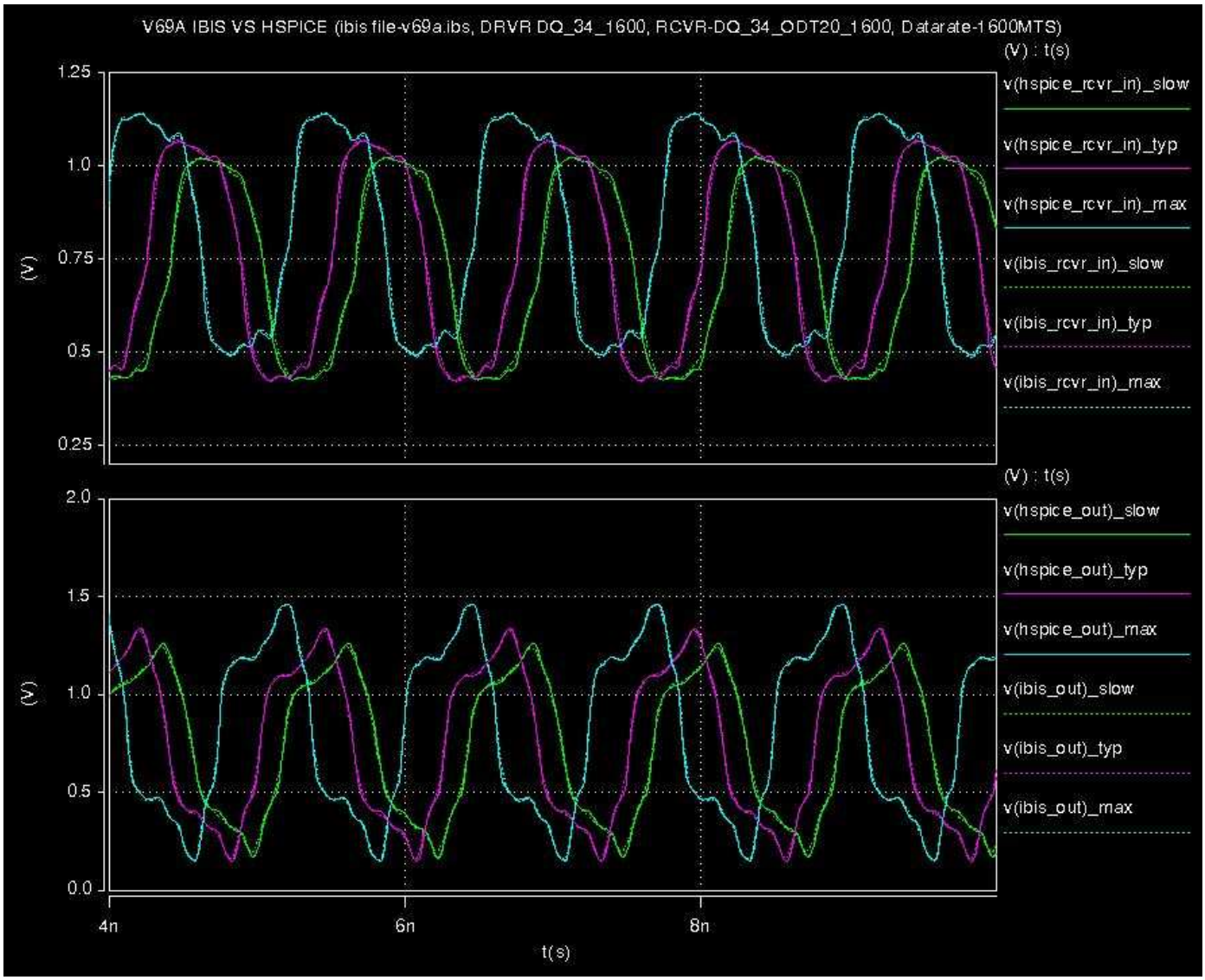

### v. DQ_34_1333 driving DQ_34_ODT60_1333



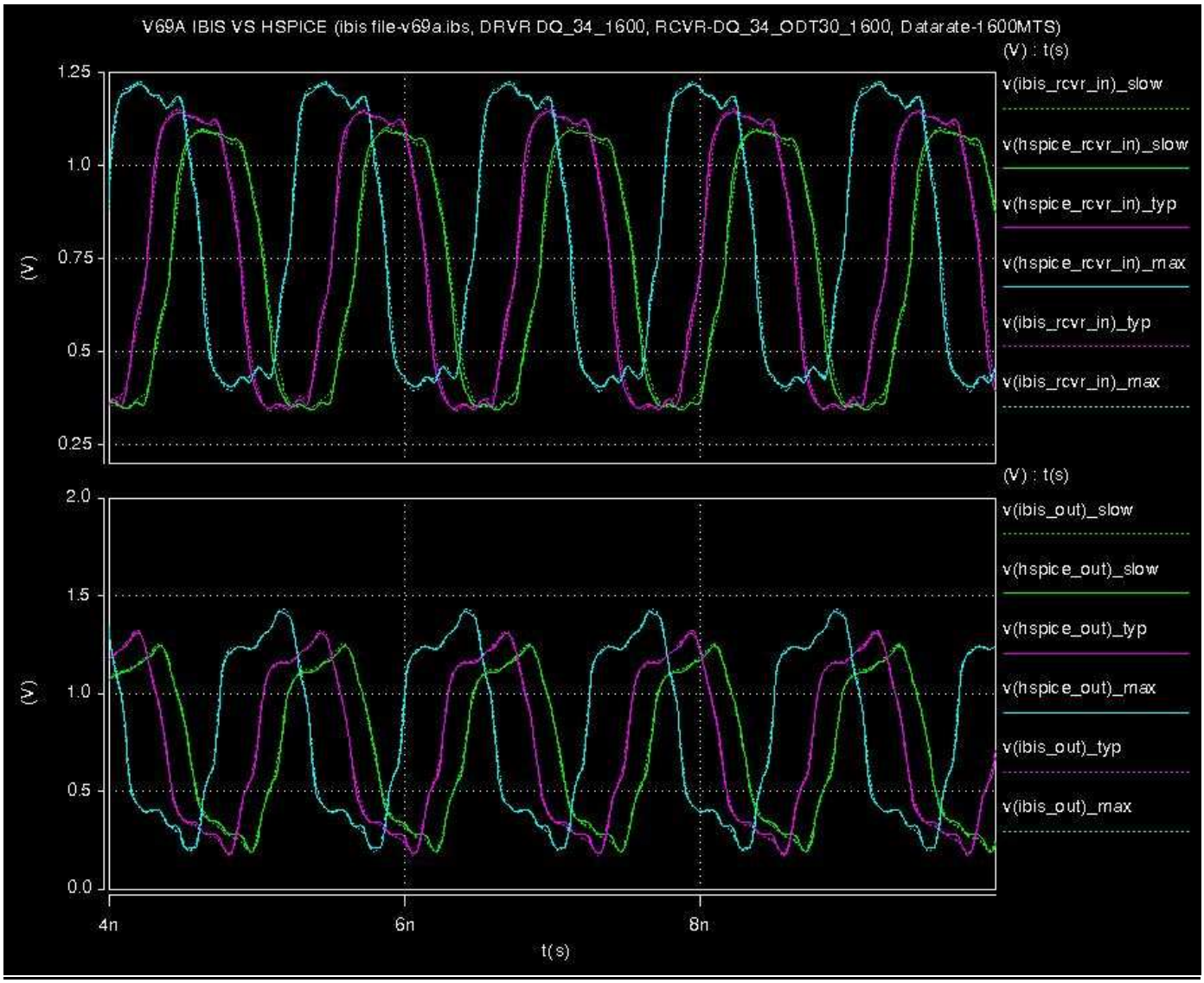

 

### vi. DQ_34_1600 driving DQ_34_ODT20_1600



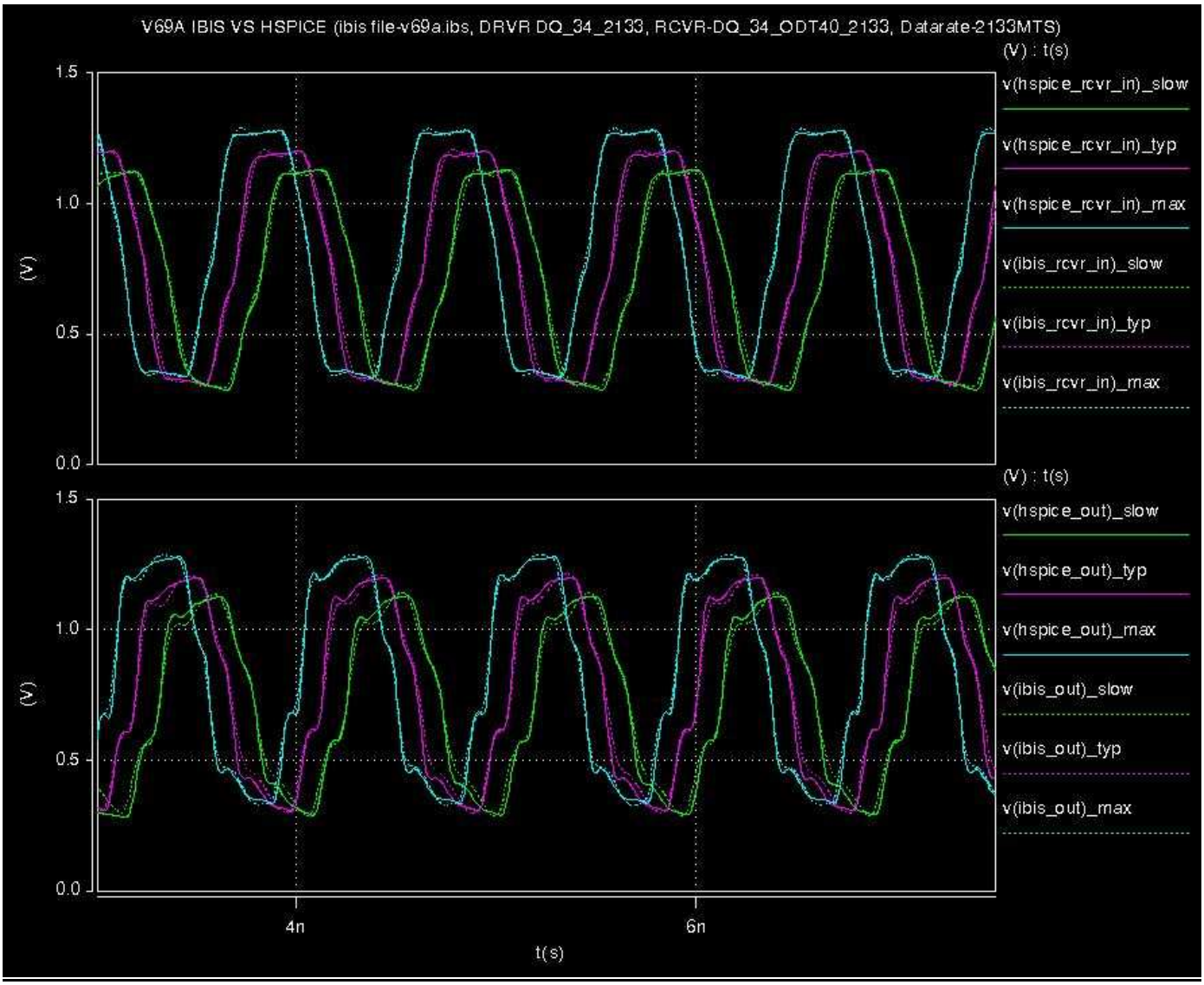

 

### vii. DQ_34_1600 driving DQ_34_ODT30_1600



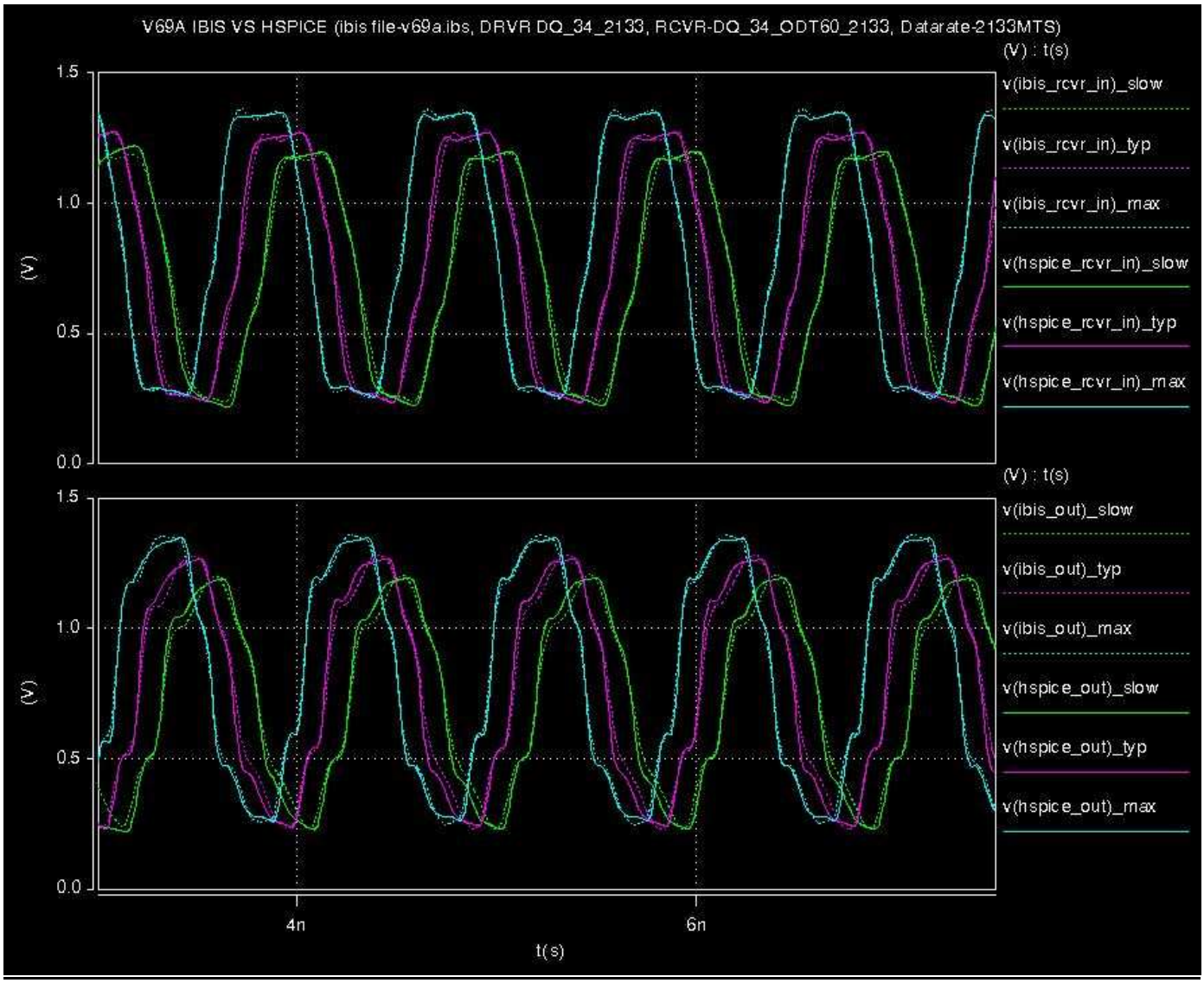

 

### viii. DQ_34_2133 driving DQ_34_ODT40_2133



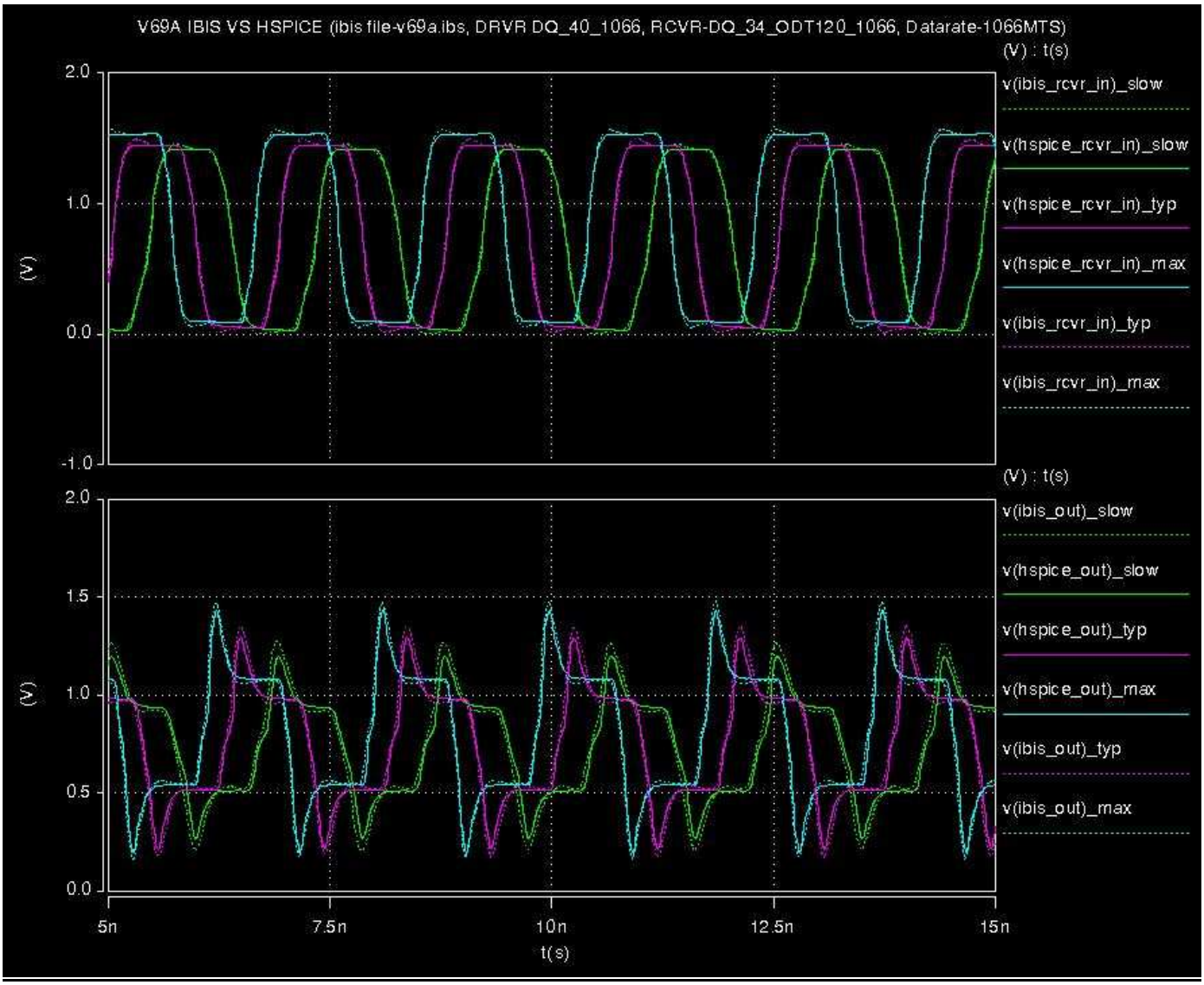

 

### ix. DQ_34_2133 driving DQ_34_ODT60_2133



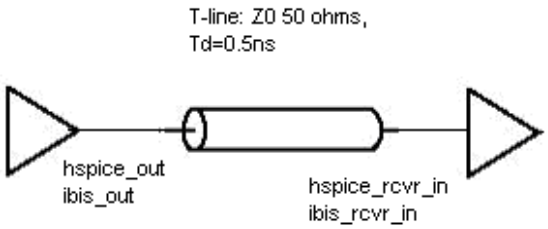
### x. DQ_40_1066 driving DQ_34_ODT120_1066



**Setup**

Simulator synopsys Hspice 2008.09




**Comments:**

i. In Hspice vs IBIS simulation IBIS model waveform time shifted to align with Hspice simulation
ii. ODT calculated from Hspice simulation

Document Revision History

Rev **1.0** – **01/15/2008**

- IBIS revision **1.0**
- HSPICE revision **1.0**

Rev **2.0** – **01/25/2010**

- IBIS revision **2.0**
- HSPICE revision **2.0**

Rev **2.1** – **05/11/2010**

- IBIS revision **2.1**
- HSPICE revision **2.3**