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		11-Oct-22	

IBIS Quality Report

Company:	STMicroelectronics
IBIS file name	m95p16_wl_1v8.ibs
IBIS Version:	4.0

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1. MODELING

IBIS (I/O, Buffer, Information, Specification) provide a standardized way, officially EIA standard 656-A-1999 and IEC 62014-1, to model behaviorally a digital component input, output and I/O buffers.

1.1 Component description

Component name	Technology	Component description
M95P16	CMOS	The M95P16 is a 16Mbit serial SPI page EEPROM with dual quad outputs.

1.2 Modeling conditions

Simulator used	AMS 2018.2 (Mentor Graphics)
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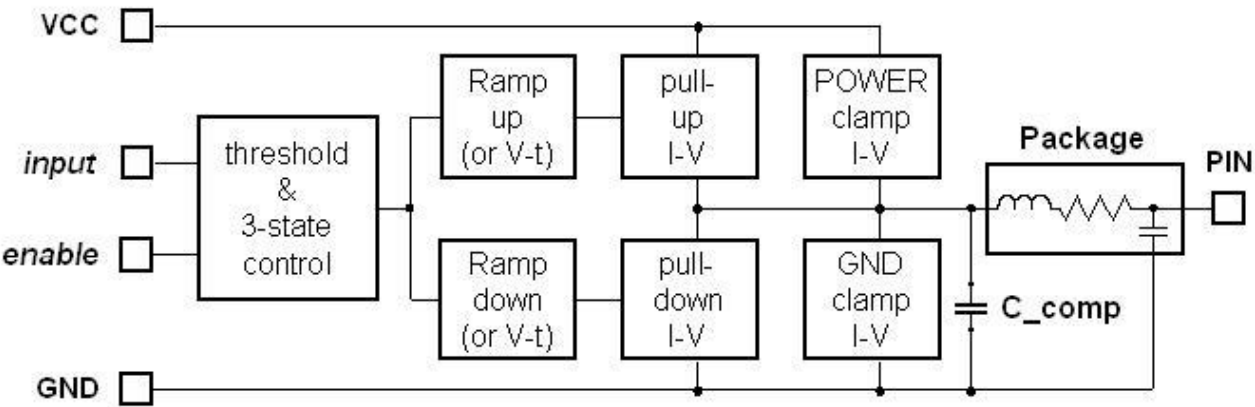


Figure 1: IBIS model generic structure

conditions	Typical	Minimum	Maximum
Temperature [C°]	25	-40	85
Voltage Supply [Volt]	1.80	1.60	2.00
Process setting	nom	weak	strong

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Model names (of Component)	Model Type	C_comp (typ, min, max)
mod_s	Input	1.535pF (typ), 1.466pF(min) , 1.607pF(max)
mod_c	Input	1.535pF (typ), 1.466pF(min) , 1.607pF(max)
mod_q_xy	Output	1.683pF (typ), 1.603pF (min) , 1.763pF(max)
mod_dwh_xy	I/O	1.683pF (typ), 1.603pF (min) , 1.763pF(max)

Model names (of Component)	Threshold and Vmeas	Timing parameters (if used)
mod_s	Vinl=0.540V , Vinh=1.260V (typ)	
mod_c	Vinl=0.540V , Vinh=1.260V (typ)	
mod_dwh_xy	Vinl=0.540V , Vinh=1.260V (typ)	
mod_dwh_xy	Vmeas=0.900V (typ)	Cref=50pF

Package	Description
WLCSP Package	8 balls WLCSP (1.809x1.363mm)

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1.3 Circuit for data extraction

The I-V data are extracted by simulations using the simulation setup shown in figure 2 below. This model is an I/O model, other model type derived from this structure. For more accurate modeling, certain combinations of V-T tables are recommended (with exception of Input-only model types) using the simulation setup shown in figure 3, with load conditions specified.

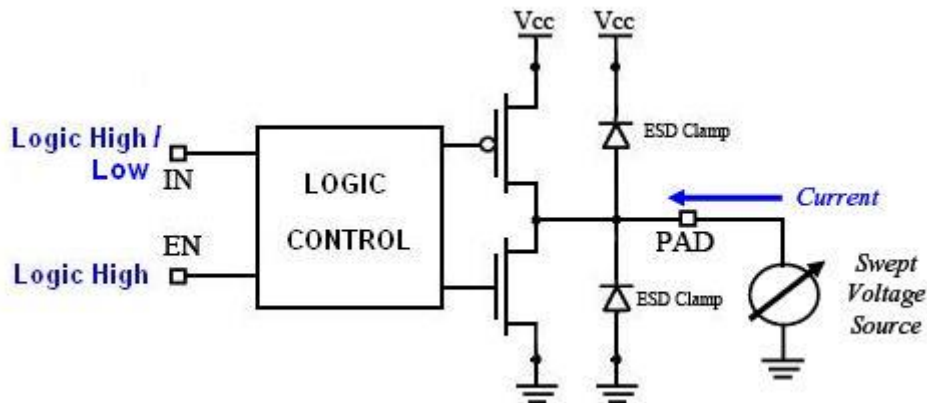


Figure 2: Simulation Setup to extract **I/V** data from I/O model type

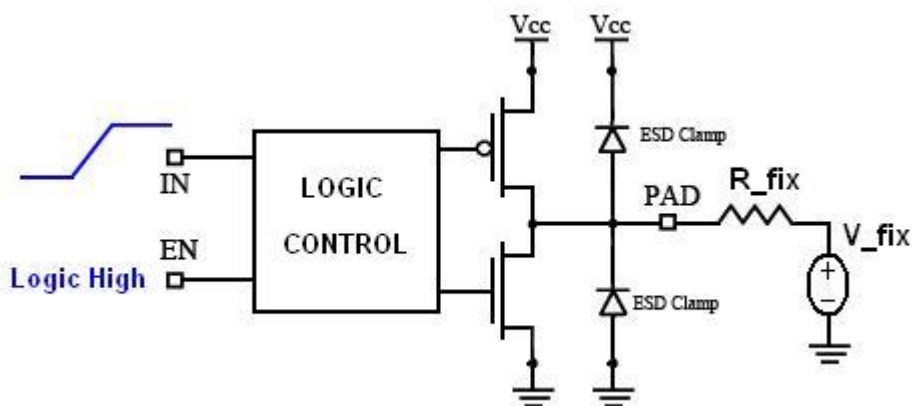


Figure 3: Simulation Setup to extract **V/T** data from I/O model type (see also Table 1)

V/T data condition extractions	Load conditions
Rising waveform	R_fix=50 Ohm, V_fix= 0.0 V
Rising waveform	R_fix=50 Ohm, V_fix= 1.8 V
Falling waveform	R_fix=50 Ohm, V_fix= 1.8 V
Falling waveform	R_fix=50 Ohm, V_fix= 0.0 V

Table 1: V/T curve extraction load conditions

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2. IBISCHK6 CHECK

The created IBIS model must be checked using IBISCHK6 parser to ensure that the syntax is correct. The result of the check is showed in the next section with some comments (optional).

2.1 Result Check by IBISCHK6

IBISCHK6 V6.0.1

Checking m95p16_wl_1v8.ibs for IBIS 4.2 Compatibility...

NOTE (line 326) - Pulldown Maximum data is non-monotonic
NOTE (line 328) - Pulldown Typical data is non-monotonic
NOTE (line 329) - Pulldown Minimum data is non-monotonic
NOTE (line 423) - Pullup Maximum data is non-monotonic
NOTE (line 424) - Pullup Typical data is non-monotonic
NOTE (line 426) - Pullup Minimum data is non-monotonic
NOTE (line 1240) - Pulldown Maximum data is non-monotonic
NOTE (line 1242) - Pulldown Typical data is non-monotonic
NOTE (line 1243) - Pulldown Minimum data is non-monotonic
NOTE (line 1336) - Pullup Maximum data is non-monotonic
NOTE (line 1338) - Pullup Typical data is non-monotonic
NOTE (line 1339) - Pullup Minimum data is non-monotonic
NOTE (line 2158) - Pulldown Maximum data is non-monotonic
NOTE (line 2160) - Pulldown Typical data is non-monotonic
NOTE (line 2161) - Pulldown Minimum data is non-monotonic
NOTE (line 2255) - Pullup Maximum data is non-monotonic
NOTE (line 2256) - Pullup Typical data is non-monotonic
NOTE (line 2257) - Pullup Minimum data is non-monotonic
NOTE (line 3070) - Pulldown Maximum data is non-monotonic
NOTE (line 3072) - Pulldown Typical data is non-monotonic
NOTE (line 3073) - Pulldown Minimum data is non-monotonic
NOTE (line 3167) - Pullup Maximum data is non-monotonic
NOTE (line 3168) - Pullup Typical data is non-monotonic
NOTE (line 3169) - Pullup Minimum data is non-monotonic
NOTE (line 4216) - Pulldown Maximum data is non-monotonic
NOTE (line 4218) - Pulldown Typical data is non-monotonic
NOTE (line 4219) - Pulldown Minimum data is non-monotonic
NOTE (line 4314) - Pullup Maximum data is non-monotonic
NOTE (line 4315) - Pullup Typical data is non-monotonic
NOTE (line 4316) - Pullup Minimum data is non-monotonic
NOTE (line 5099) - Pulldown Maximum data is non-monotonic
NOTE (line 5101) - Pulldown Typical data is non-monotonic
NOTE (line 5102) - Pulldown Minimum data is non-monotonic
NOTE (line 5195) - Pullup Maximum data is non-monotonic
NOTE (line 5197) - Pullup Typical data is non-monotonic

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NOTE (line 5198) - Pullup Minimum data is non-monotonic
NOTE (line 6013) - Pulldown Maximum data is non-monotonic
NOTE (line 6015) - Pulldown Typical data is non-monotonic
NOTE (line 6016) - Pulldown Minimum data is non-monotonic
NOTE (line 6111) - Pullup Maximum data is non-monotonic
NOTE (line 6112) - Pullup Typical data is non-monotonic
NOTE (line 6113) - Pullup Minimum data is non-monotonic
NOTE (line 6937) - Pulldown Maximum data is non-monotonic
NOTE (line 6939) - Pulldown Typical data is non-monotonic
NOTE (line 6940) - Pulldown Minimum data is non-monotonic
NOTE (line 7034) - Pullup Maximum data is non-monotonic
NOTE (line 7035) - Pullup Typical data is non-monotonic
NOTE (line 7037) - Pullup Minimum data is non-monotonic
 Errors : 0

File Passed

Adding comments about the Warning or Note:
<p>The output check contains some Notes about non-monotonic data of I-V curves, but they are not indicative of problems inside the model.</p>

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3. FUNCTIONAL CHECK

The created IBIS model must be compared with the Original Buffer circuit. The signal outputs, in the same load conditions (Figure 4), must match. These output comparisons are presented in TYP, MIN and MAX condition. This section cannot be defined for Input and Terminator model type, because they are input-only model types.

How well results are matched?	Put “X” into the right filed
Curves shape match correctly, but there is a little time translation.	
Curves shape match correctly, but there is a mismatch into the Overshoot and/or Undershoot regions.	
Curves match well.	X

3.1 Functional verification

Circuit used for output comparison results is illustrated in figure 4.

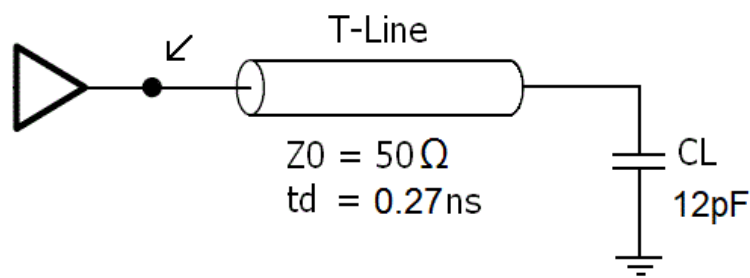


Figure 4: Circuit used for functional check

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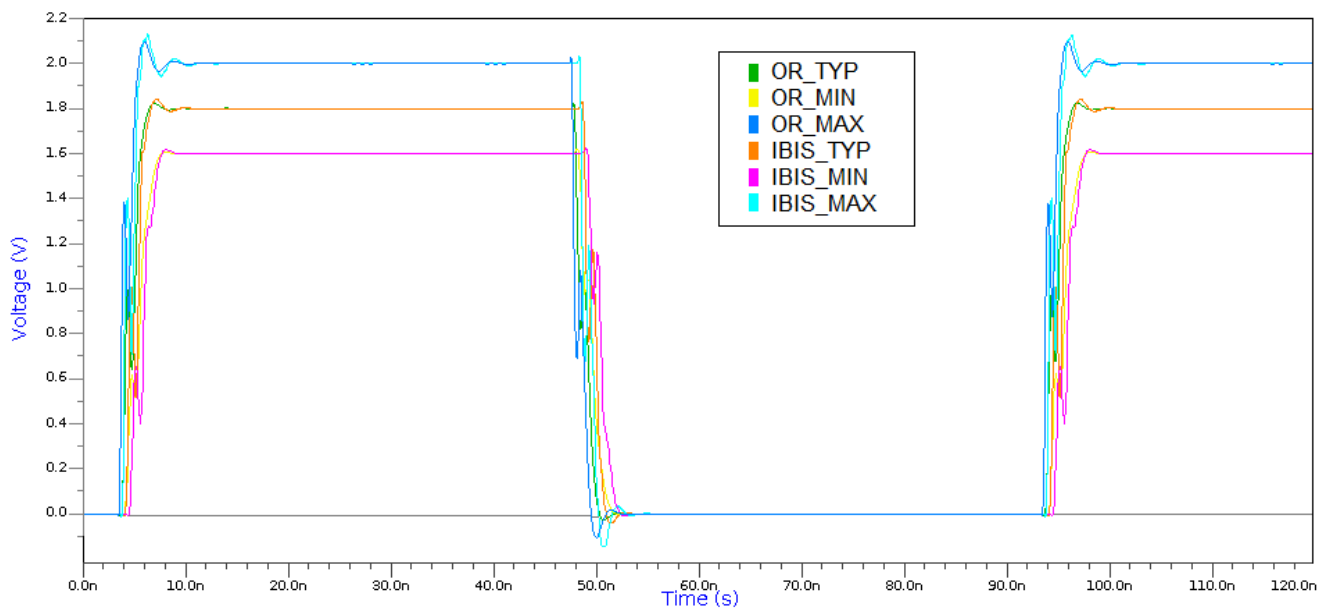


Figure 5: IBIS vs Eldo (original) comparison results of "mod_q_11" Model

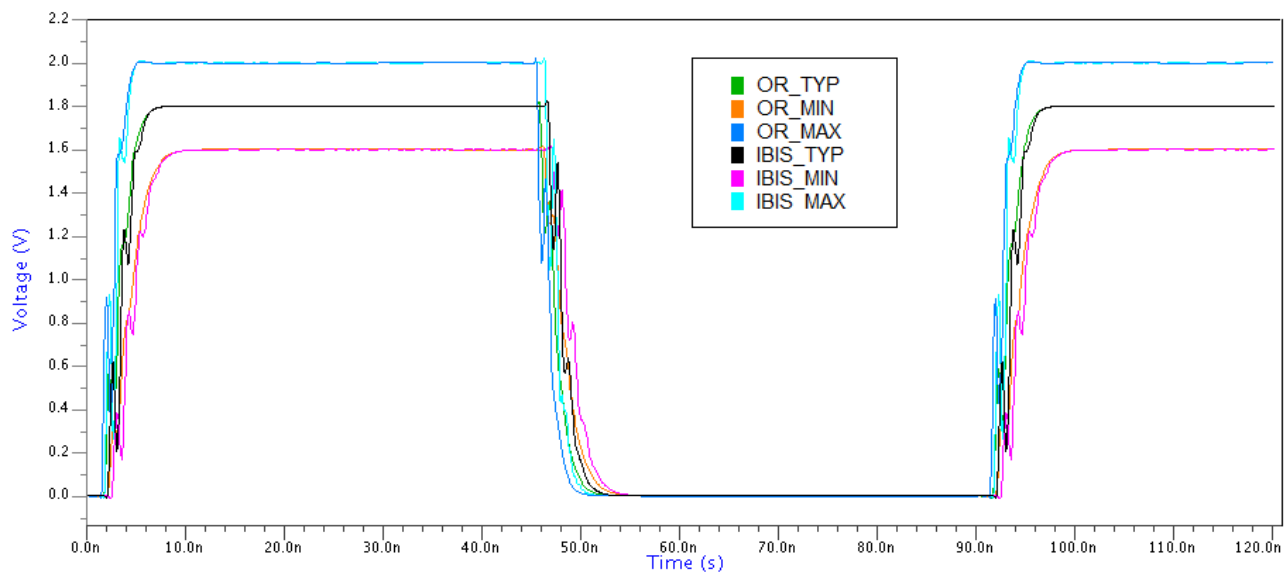


Figure 6: IBIS vs Eldo comparison results of "mod_q_10" Model

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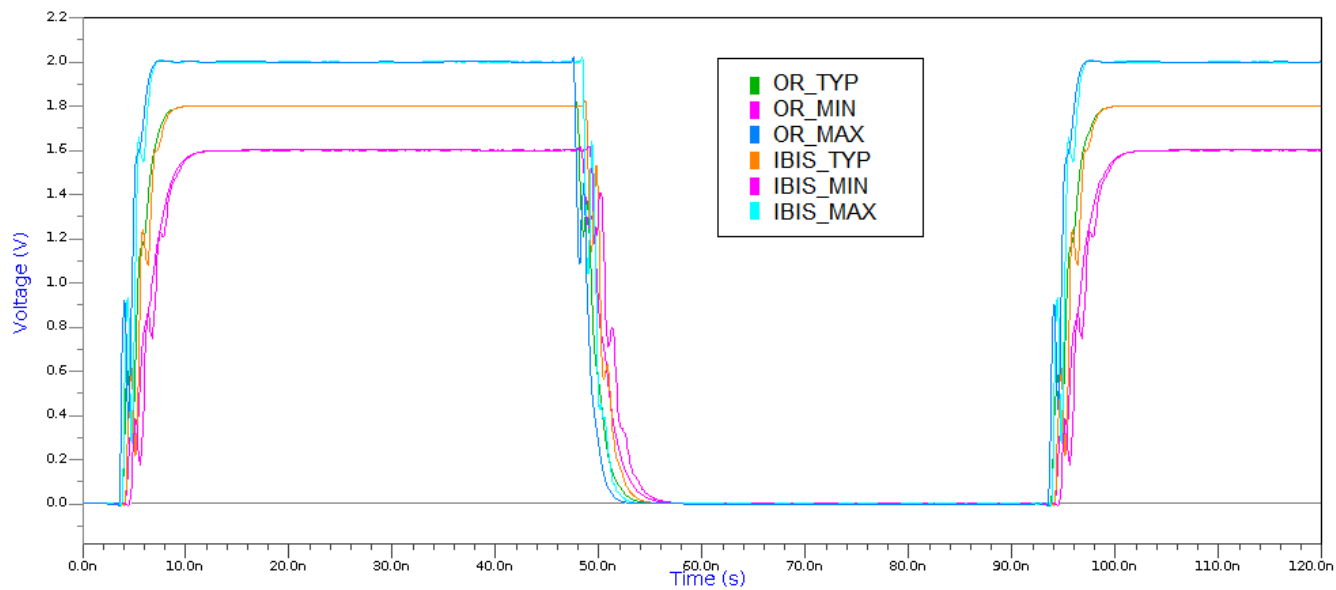


Figure 7: IBIS vs Eldo (original) comparison results of “mod_dwh_10” Model

Output Comparisons:

Adding comments about the comparison:

4. EXTRA INFORMATION

This section can contain other extra information, to explain some other features of peculiar IBIS model

Other specifications	description