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IBIS Quality Report

Company:	STMicroelectronics
IBIS file name	m95p16_wl_2v5.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 output.

1.2 Modeling conditions

Simulator used	AMS 2018.2 (Mentor Graphics)
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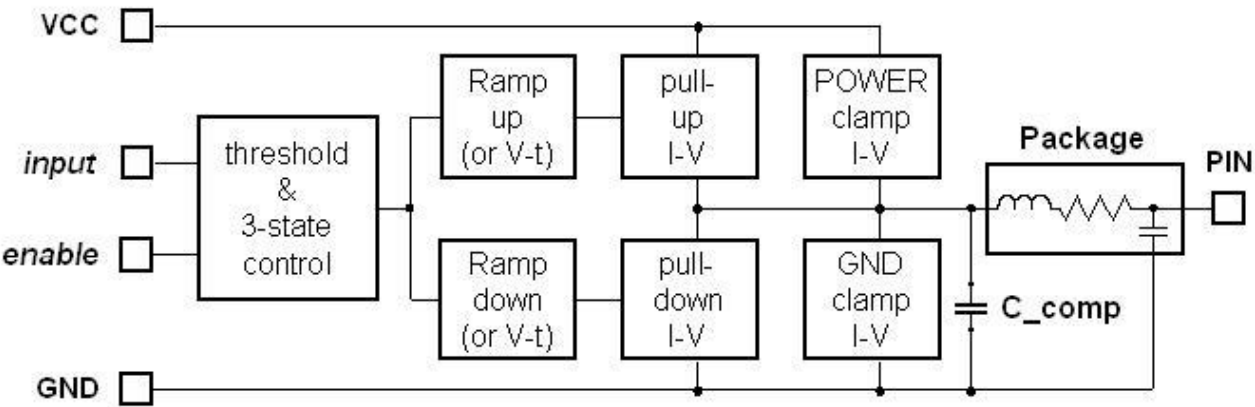


Figure 1: IBIS model generic structure

conditions	Typical	Minimum	Maximum
Temperature [C°]	25	-40	85
Voltage Supply [Volt]	2.50	2.30	2.70
Process setting	nom	weak	strong

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Model names (of Component)	Model Type	C_comp (typ, min, max)
mod_s	Input	1.014pF (typ), 0.968pF(min) , 1.062pF(max)
mod_c	Input	1.014pF (typ), 0.968pF(min) , 1.062pF(max)
mod_q_xy	Output	1.466pF (typ), 1.400pF(min) , 1.535pF(max)
mod_dwh_xy	I/O	1.466pF (typ), 1.400pF(min) , 1.535pF(max)

Model names (of Component)	Threshold and Vmeas	Timing parameters (if used)
mod_s	Vinl=0.750V , Vinh=1.750V (typ)	
mod_c	Vinl=0.750V , Vinh=1.750V (typ)	
mod_dwh_xy	Vinl=0.750V , Vinh=1.750V (typ)	
mod_dwh_xy	Vmeas=1.250V (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.

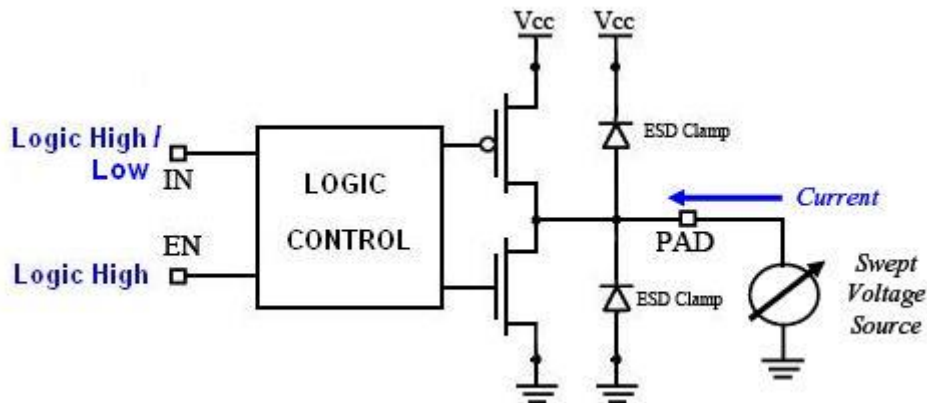


Figure 2: Simulation Setup to extract **I/V** data from I/O model type

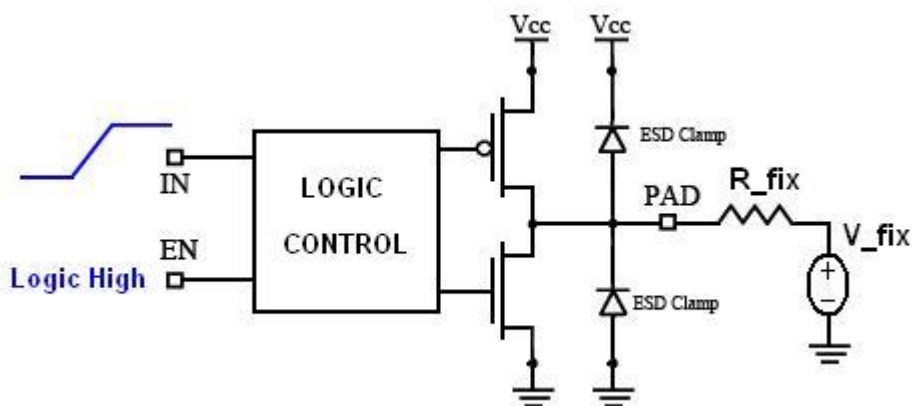


Figure 3: Simulation Setup to extract **V/T** data from I/O model type (see also Table 1)

V/T data condition extractions	Load conditions
Rising waveform	$R_{fix}=50\text{ Ohm}$, $V_{fix}= 0.0\text{ V}$
Rising waveform	$R_{fix}=50\text{ Ohm}$, $V_{fix}= 2.5\text{ V}$
Falling waveform	$R_{fix}=50\text{ Ohm}$, $V_{fix}= 2.5\text{ V}$
Falling waveform	$R_{fix}=50\text{ Ohm}$, $V_{fix}= 0.0\text{ V}$

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_2d5.ibs for IBIS 4.2 Compatibility...

NOTE (line 326) - Pulldown Maximum data is non-monotonic
NOTE (line 293) - Pulldown Maximum data is non-monotonic
NOTE (line 294) - Pulldown Typical data is non-monotonic
NOTE (line 295) - Pulldown Minimum data is non-monotonic
NOTE (line 392) - Pullup Maximum data is non-monotonic
NOTE (line 394) - Pullup Typical data is non-monotonic
NOTE (line 394) - Pullup Minimum data is non-monotonic
NOTE (line 1200) - Pulldown Maximum data is non-monotonic
NOTE (line 1201) - Pulldown Typical data is non-monotonic
NOTE (line 1202) - Pulldown Minimum data is non-monotonic
NOTE (line 1298) - Pullup Maximum data is non-monotonic
NOTE (line 1299) - Pullup Typical data is non-monotonic
NOTE (line 1300) - Pullup Minimum data is non-monotonic
NOTE (line 2110) - Pulldown Maximum data is non-monotonic
NOTE (line 2111) - Pulldown Typical data is non-monotonic
NOTE (line 2112) - Pulldown Minimum data is non-monotonic
NOTE (line 2208) - Pullup Typical data is non-monotonic
NOTE (line 2208) - Pullup Maximum data is non-monotonic
NOTE (line 2209) - Pullup Minimum data is non-monotonic
NOTE (line 3009) - Pulldown Maximum data is non-monotonic
NOTE (line 3010) - Pulldown Typical data is non-monotonic
NOTE (line 3011) - Pulldown Minimum data is non-monotonic
NOTE (line 3108) - Pullup Typical data is non-monotonic
NOTE (line 3108) - Pullup Maximum data is non-monotonic
NOTE (line 3109) - Pullup Minimum data is non-monotonic
NOTE (line 4098) - Pulldown Maximum data is non-monotonic
NOTE (line 4099) - Pulldown Typical data is non-monotonic
NOTE (line 4100) - Pulldown Minimum data is non-monotonic
NOTE (line 4196) - Pullup Typical data is non-monotonic
NOTE (line 4196) - Pullup Maximum data is non-monotonic
NOTE (line 4197) - Pullup Minimum data is non-monotonic
NOTE (line 4970) - Pulldown Maximum data is non-monotonic
NOTE (line 4971) - Pulldown Typical data is non-monotonic
NOTE (line 4972) - Pulldown Minimum data is non-monotonic
NOTE (line 5068) - Pullup Typical data is non-monotonic

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NOTE (line 5068) - Pullup Maximum data is non-monotonic
 NOTE (line 5069) - Pullup Minimum data is non-monotonic
 NOTE (line 5889) - Pulldown Maximum data is non-monotonic
 NOTE (line 5890) - Pulldown Typical data is non-monotonic
 NOTE (line 5891) - Pulldown Minimum data is non-monotonic
 NOTE (line 5989) - Pullup Typical data is non-monotonic
 NOTE (line 5989) - Pullup Minimum data is non-monotonic
 NOTE (line 5989) - Pullup Maximum data is non-monotonic
 NOTE (line 6763) - Pulldown Maximum data is non-monotonic
 NOTE (line 6764) - Pulldown Typical data is non-monotonic
 NOTE (line 6765) - Pulldown Minimum data is non-monotonic
 NOTE (line 6863) - Pullup Typical data is non-monotonic
 NOTE (line 6863) - Pullup Maximum data is non-monotonic
 NOTE (line 6864) - 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.

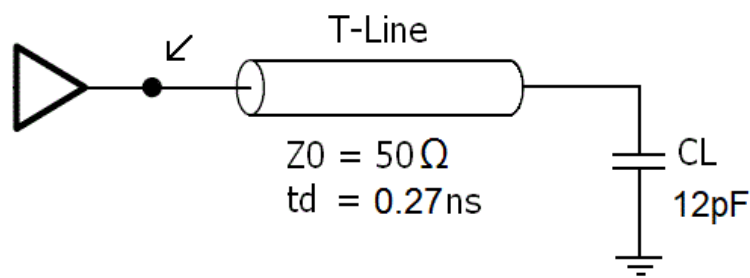


Figure 4: Circuit used for functional check

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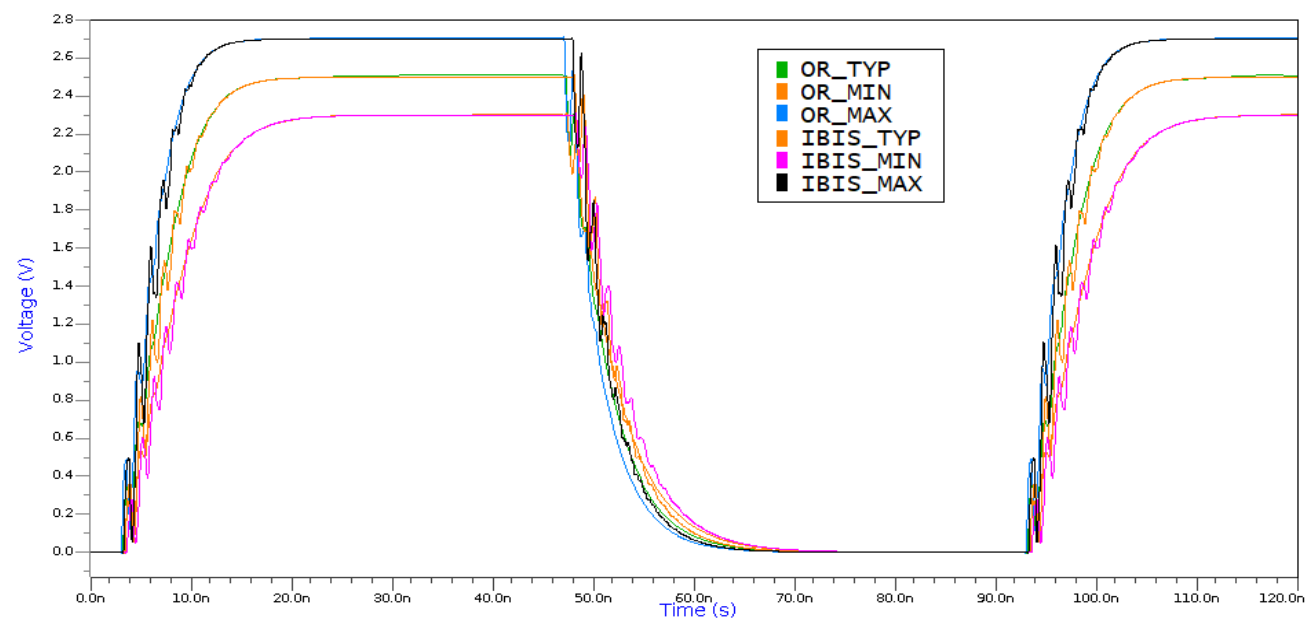


Figure 6: IBIS vs Eldo comparison results of “mod_q_00” Model

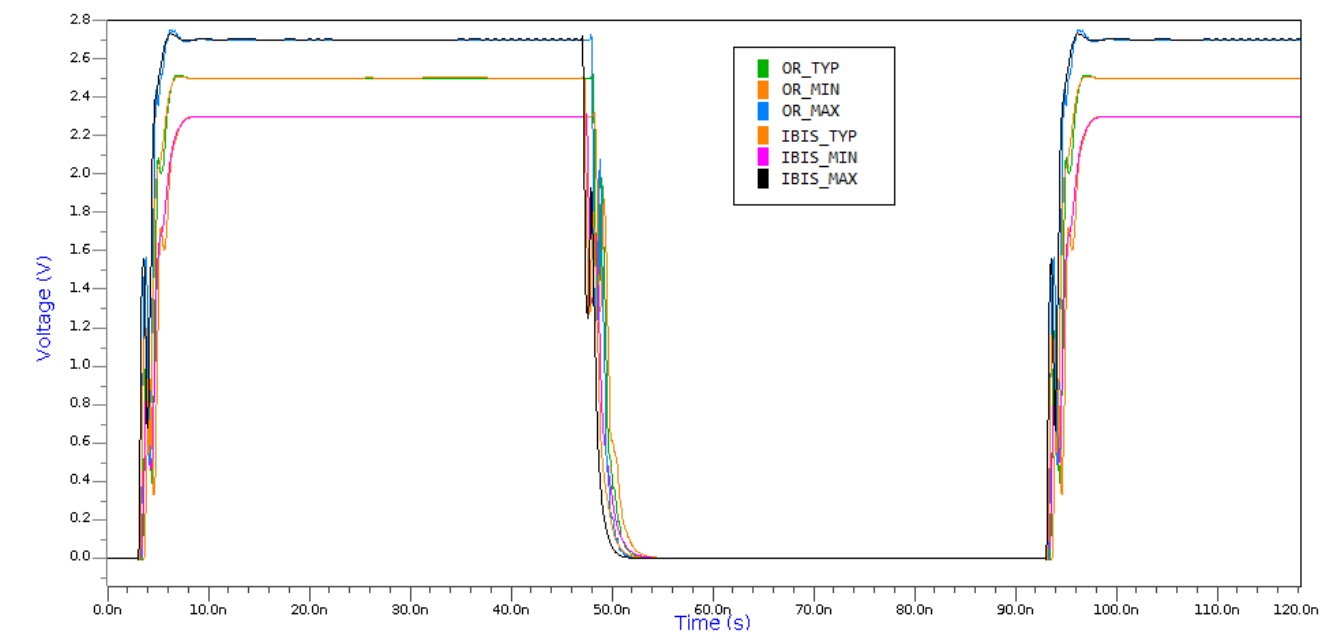


Figure 7: IBIS vs Eldo (original) comparison results of “mod_dwh_10” Model

Output Comparisons:

Adding comments about the comparison:

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4. EXTRA INFORMATION

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

Other specifications	description