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## IBIS Quality Report

Company:	STMicroelectronics
IBIS file name	pe_11_m95p32_1d8.ibs
IBIS Version:	4.0



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## 1. MODELING

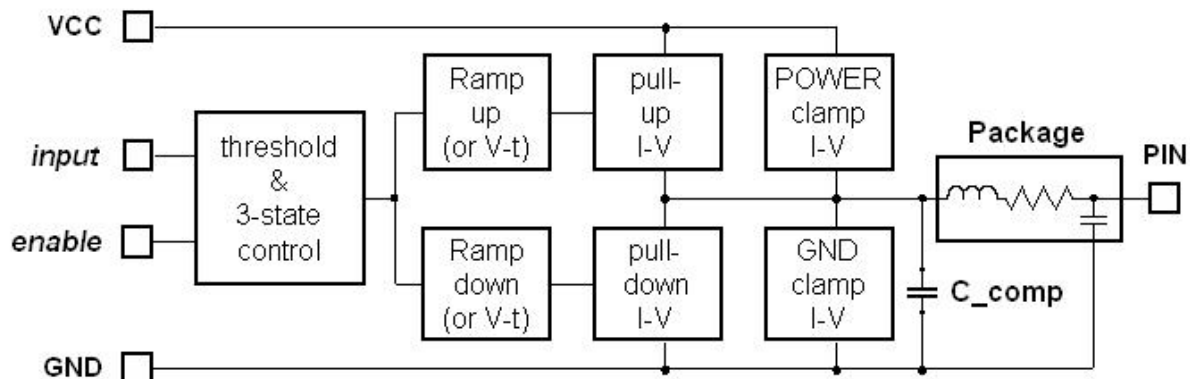
IBIS (I/O, Buffer, Information, Specification) provide a standardized way, officially EIA standard 656-A-1999 and IEC 62014-1, to model behaviorally a digital component input, output and I/O buffers.

### 1.1 Component description

Component name	Technology	Component description
M95P32	CMOS	The M95P32-E is a 32Mbit 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	105
Voltage Supply [Volt]	1.80	1.60	2.00
Process setting	nom	weak	strong

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<b>Model names</b> (of Component)	<b>Model Type</b>	<b>C_comp (typ, min, max)</b>
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	1.630pF (typ), 1.607pF (min) , 1.683pF(max)
mod_dwh_xy	I/O	1.630pF (typ), 1.607pF (min) , 1.683pF(max)

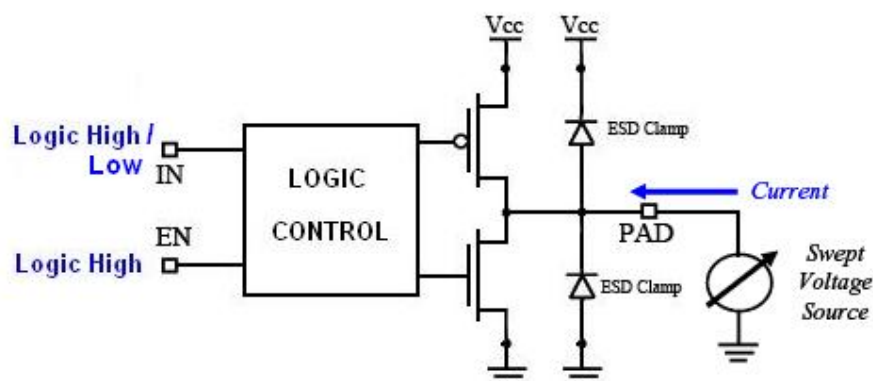
<b>Model names</b> (of Component)	<b>Threshold and Vmeas</b>	<b>Timing parameters (if used)</b>
mod_s	Vinl=0.540V , Vinh=1.260V (typ)	
mod_c	Vinl=0.540V , Vinh=1.260V (typ)	
mod_dwh_xy	Vinl=0.540V , Vinh=1.260V (typ)	
mod_q_xy	Vmeas=0.900V (typ)	Cref=30pF

<b>Package</b>	<b>Description</b>
SO8N Package	8 leads SO8N 150 mil package

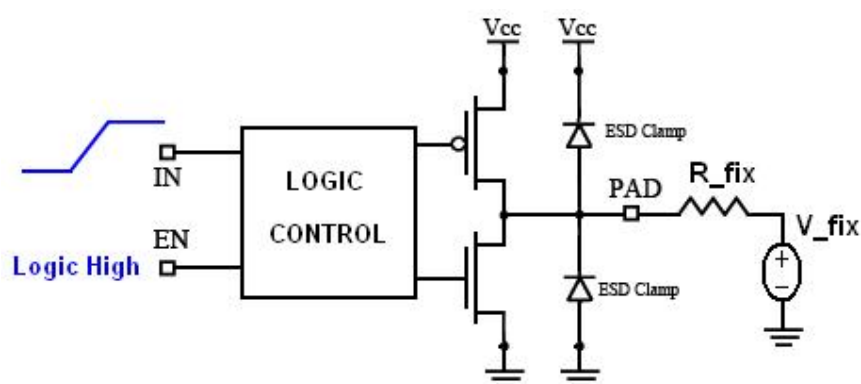
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### 1.3 Circuit for data extraction

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 pe\_11\_m95p32\_1d8.ibs for IBIS 4.2 Compatibility...*

NOTE (line 328) - Pulldown Maximum data is non-monotonic  
NOTE (line 330) - Pulldown Typical data is non-monotonic  
NOTE (line 332) - Pulldown Minimum data is non-monotonic  
NOTE (line 426) - Pullup Maximum data is non-monotonic  
NOTE (line 427) - Pullup Typical data is non-monotonic  
NOTE (line 428) - Pullup Minimum data is non-monotonic  
NOTE (line 1359) - Pulldown Maximum data is non-monotonic  
NOTE (line 1361) - Pulldown Typical data is non-monotonic  
NOTE (line 1363) - Pulldown Minimum data is non-monotonic  
NOTE (line 1457) - Pullup Maximum data is non-monotonic  
NOTE (line 1458) - Pullup Typical data is non-monotonic  
NOTE (line 1459) - Pullup Minimum data is non-monotonic  
NOTE (line 2389) - Pulldown Maximum data is non-monotonic  
NOTE (line 2391) - Pulldown Typical data is non-monotonic  
NOTE (line 2393) - Pulldown Minimum data is non-monotonic  
NOTE (line 2485) - Pullup Maximum data is non-monotonic  
NOTE (line 2487) - Pullup Typical data is non-monotonic  
NOTE (line 2488) - Pullup Minimum data is non-monotonic  
NOTE (line 3423) - Pulldown Maximum data is non-monotonic  
NOTE (line 3425) - Pulldown Typical data is non-monotonic  
NOTE (line 3427) - Pulldown Minimum data is non-monotonic  
NOTE (line 3520) - Pullup Maximum data is non-monotonic  
NOTE (line 3521) - Pullup Typical data is non-monotonic  
NOTE (line 3523) - Pullup Minimum data is non-monotonic  
NOTE (line 4662) - Pulldown Maximum data is non-monotonic  
NOTE (line 4664) - Pulldown Typical data is non-monotonic  
NOTE (line 4666) - Pulldown Minimum data is non-monotonic  
NOTE (line 4760) - Pullup Maximum data is non-monotonic  
NOTE (line 4761) - Pullup Typical data is non-monotonic  
NOTE (line 4762) - Pullup Minimum data is non-monotonic  
NOTE (line 5698) - Pulldown Maximum data is non-monotonic  
NOTE (line 5700) - Pulldown Typical data is non-monotonic  
NOTE (line 5702) - Pulldown Minimum data is non-monotonic  
NOTE (line 5796) - Pullup Maximum data is non-monotonic  
NOTE (line 5797) - Pullup Typical data is non-monotonic  
NOTE (line 5798) - Pullup Minimum data is non-monotonic  
NOTE (line 6732) - Pulldown Maximum data is non-monotonic  
NOTE (line 6734) - Pulldown Typical data is non-monotonic

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*NOTE (line 6736) - Pulldown Minimum data is non-monotonic*  
*NOTE (line 6828) - Pullup Maximum data is non-monotonic*  
*NOTE (line 6830) - Pullup Typical data is non-monotonic*  
*NOTE (line 6831) - Pullup Minimum data is non-monotonic*  
*NOTE (line 7770) - Pulldown Maximum data is non-monotonic*  
*NOTE (line 7772) - Pulldown Typical data is non-monotonic*  
*NOTE (line 7774) - Pulldown Minimum data is non-monotonic*  
*NOTE (line 7867) - Pullup Maximum data is non-monotonic*  
*NOTE (line 7868) - Pullup Typical data is non-monotonic*  
*NOTE (line 7870) - Pullup Minimum data is non-monotonic*  
 Errors : 0

*File Passed*

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

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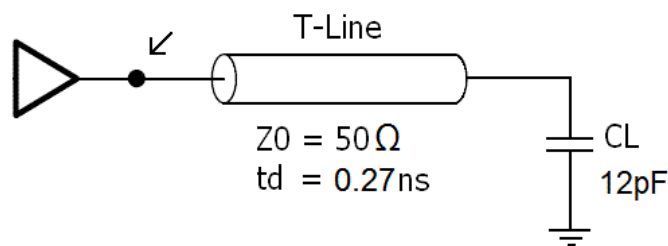
### 3. FUNCTIONAL CHECK

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.	<b>X</b>

#### 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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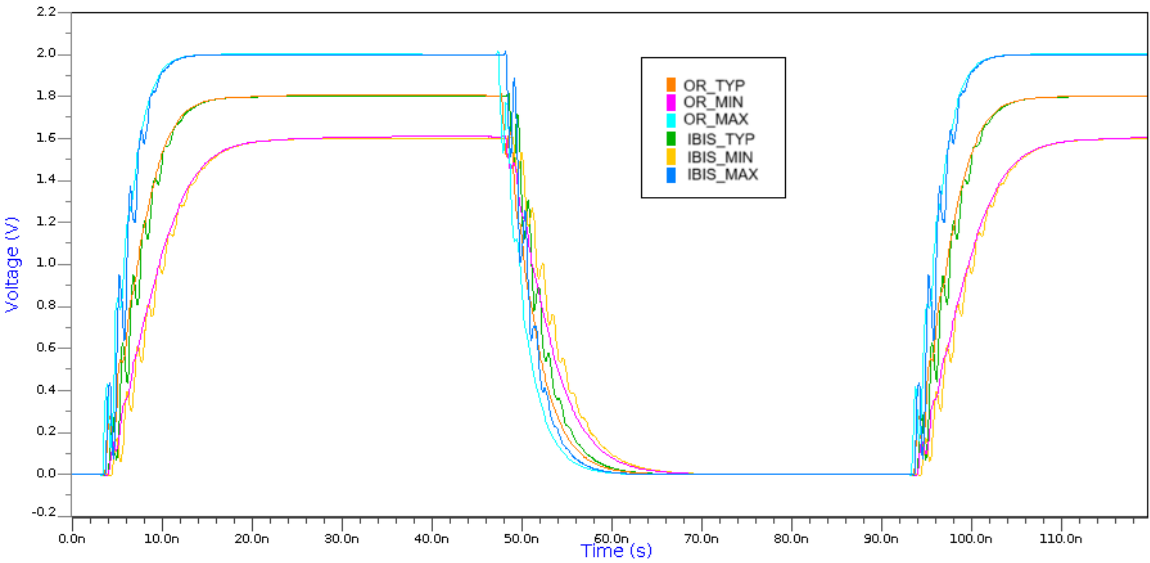


Figure 5: IBIS vs original comparison results of “mod\_q\_01” Model

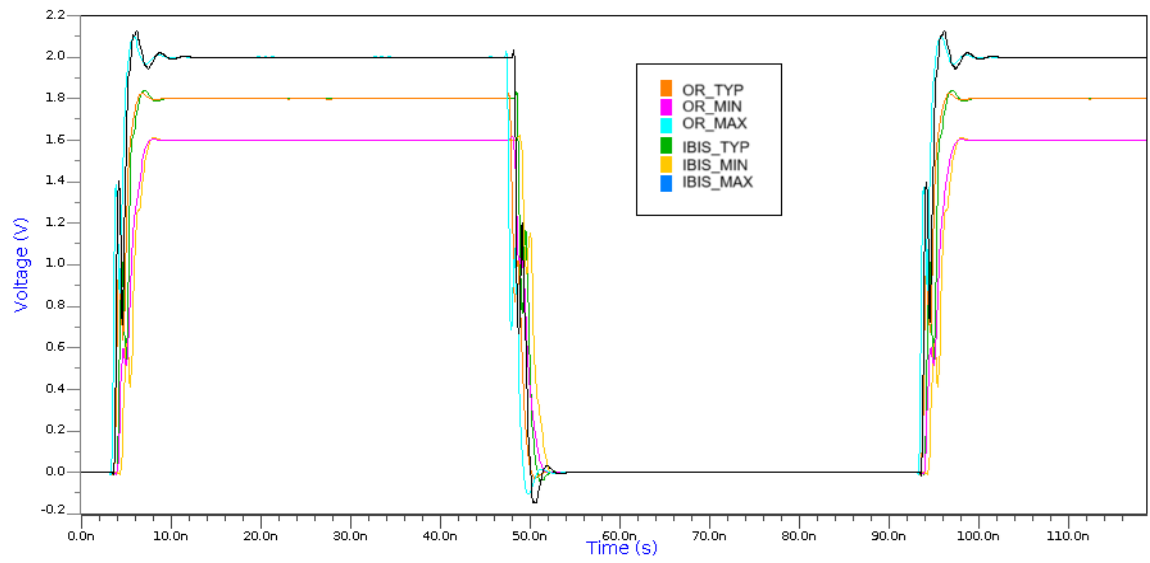


Figure 6: IBIS vs original comparison results of “mod\_dwh\_11” Model

Output Comparisons:

<b>Adding comments about the comparison:</b>

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#### 4. EXTRA INFORMATION

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

<b>Other specifications</b>	<b>description</b>