



IBIS Summary Documents

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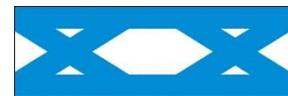
(presented by Anders Ekholm, Ericsson)



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Document Samples

- Keyword Hierarchy tree in IBIS Version 6.0, Section 3.1
- Expanded Keyword Hierarchy tree
- Evolution document
- IBIS-AMI parameter tables in IBIS Version 6.0, Section 10.7
- These documents summarize the IBIS elements



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Official Keyword Hierarchy (Section 3.1) from Specification



Keywords

IBIS Version 6.0

3.1 KEYWORD HIERARCHY

.ibs FILE

File Header Section

- [IBIS Ver]
- [Comment Char]
- [File Name]
- [File Rev]
- [Date]
- [Source]
- [Notes]
- [Disclaimer]
- [Copyright]

[Component]

- [Manufacturer]
- [Package]
- [Pin]

[Package Model]

[Alternate Package Models]

[End Alternate Package Models]

[Pin Mapping]

[Diff Pin]

[Repeater Pin]

[Series Pin Mapping]

[Series Switch Groups]

[Node Declarations]

[End Node Declarations]

[Circuit Call]

[End Circuit Call]

[Begin EMI Component]

- [Pin EMI]
- [Pin Domain EMI]
- [End EMI Component]

Si_location, Timing_location

R_pkg, L_pkg, C_pkg
signal_name, model_name, R_pin,
L_pin, C_pin

pulldown_ref, pullup_ref,
gnd_clamp_ref, power_clamp_ref,
ext_ref
inv_pin, vdiff, tdelay_typ,
tdelay_min, tdelay_max
tx_non_inv_pin
pin_2, model_name,
function_table_group
On, Off

Signal_pin, Diff_signal_pins,
Series_pins, Port_map

Domain, Cpd, C_Heatsink_gnd,
C_Heatsink_float
domain_name, clock_div
percentage

Subparameters

IBIS Version 6.0

[Model Selector]

[Model]

Model_type, Polarity, Enable,
Vinl, Vinh, C_comp, C_comp_pullup,
C_comp_pulldown,
C_comp_power_clamp,
C_comp_gnd_clamp
Vmeas, Cref, Rref, Vref
Rref_diff, Cref_diff

[Model Spec]

Vinh, Vinl, Vinh+, Vinh-, Vinl+,
Vinl-, S_overshoot_high,
S_overshoot_low, D_overshoot_high,
D_overshoot_low, D_overshoot_time,
D_overshoot_area_h,
D_overshoot_area_l,
D_overshoot_ampl_h,
D_overshoot_ampl_l,
Pulse_high, Pulse_low, Pulse_time,
Vmeas, Cref, Rref, Vref, Cref_rising,
Cref_falling, Rref_rising,
Rref_falling, Vref_rising,
Vref_falling, Vmeas_rising,
Vmeas_falling,
Rref_diff, Cref_diff,
Weak_R, Weak_I, Weak_V
Vth, Vth_min, Vth_max, Vinh_ac,
Vinh_dc, Vinl_ac, Vinl_dc,
Threshold_sensitivity,
Reference_supply, Vcross_low,
Vcross_high, Vdiff_ac, Vdiff_dc,
Tslaw_ac, Tdiffslew_ac

[Receiver Thresholds]

[Add Submodel]

[Driver Schedule]

[Temperature Range]

[Voltage Range]

[Pullup Reference]

[Pulldown Reference]

[POWER Clamp Reference]

[GND Clamp Reference]

[External Reference]

[C Comp Corner]

C_comp, C_comp_pullup,
C_comp_pulldown,
C_comp_power_clamp,
C_comp_gnd_clamp

[TTgnd]

Unofficial Keyword Hierarchy

Updated from September, 2007

- Keyword Hierarchy tree
 - 165 distinct keyword usages
 - Some keywords are re-used in different contexts (e.g., [IBIS Ver], [End], [Rising Waveform], etc. and in .ibs, .pkg and .ebd files)
- Hierarchy documents updated with Version 5.1 and Version 6.0 information



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Unofficial Keyword Hierarchy Tree with Extra Information

```
ross_6_0_tree.txt - Notepad
File Edit Format View Help
-- [Component] (m)                (3.2)  Si_location *, Timing_location *
-----
-- [Manufacturer]
-- [Package]                      R_pkg, L_pkg, C_pkg
-- [Pin]                          signal_name, model_name, R_pin,
                                L_pin, C_pin
-- [Package Model]                (2.1)
  |-- [Alternate Package Models] (m)    (4.2)
  |-- [End Alternate Package Models]
-- [Pin Mapping]                  (2.1)  pulldown_ref, pullup_ref,
                                (4.2)  gnd_clamp_ref, power_clamp_ref,
                                ext_ref
-- [Diff Pin]                    (2.1)  inv_pin, vdiff, tdelay_typ,
                                tdelay_min, tdelay_max
-- [Repeater Pin]                (6.0)  tx_non_inv_pin
-- [Series Pin Mapping]          (3.2)  pin_2, model_name,
                                function_table_group
-- [Series Switch Groups]        (3.2)  on (m), off (m)
-- [Node Declarations]            (4.2)
  |-- [End Node Declarations]
-- [Circuit call]                (4.2)  signal_pin, diff_signal_pins,
                                (6.0)  series_pins, port_map (m)
                                converter_parameters (m)
  |-- [End Circuit call]
-- [Begin EMI Component]          (5.1)  domain *, cpd, c_heatsink_gnd,
                                c_heatsink_float
  |-- [Pin EMI]                   domain_name, clock_div
  |-- [Pin Domain EMI]            percentage
  |-- [End EMI Component]
-- [Model selector] (m)          (3.2)
-- [Model] (m)                   Model_type *, Polarity *, Enable *,
                                Vinl, Vinh, C_comp,
                                (2.1)  Vmeas, Cref, Rref, Vref
                                (4.2)  C_comp_pullup, C_comp_pulldown,
                                C_comp_power_clamp, C_comp_gnd_clamp,
                                Rref_diff, Cref_diff
-----
-- [Model spec]                  (3.2)  Vinh, Vinl, Vinh+, Vinh-, Vinl+,
                                Vinl-, S_overshoot_high,
                                S_overshoot_low, D_overshoot_high,
                                D_overshoot_low, D_overshoot_time,
                                Pulse_high, Pulse_low, Pulse_time,
                                Vmeas,
                                (4.2)  Cref, Rref, Vref, Cref_rising,
                                Cref_falling, Rref_rising,
                                Rref_falling, Vref_rising,
                                Vref_falling, Vmeas_rising,
                                Vmeas_falling,
                                Rref_diff, Cref_diff,
                                (5.1)  Weak_R, Weak_I, Weak_V,
                                D_overshoot_area_h, D_overshoot_area_l,
                                D_overshoot_amp_l_h, D_overshoot_amp_l_l
```

**(ml): multiple locations for
[Comment Char]**

(m): multiple times

**(x.y): when added at major
version [1.1 (blank), 2.1, 3.2,
4.2, 5.1, 6.0]**

***: choices or selections given
at end**

Enumerated Choices at End

ross_6_0_tree.txt - Notepad

File Edit Format View Help

Test_load_type (4.2, 5.1)
Single_ended
Differential

Language (4.2)
SPICE
VHDL-AMS
Verilog-AMS
VHDL-A(MS)
Verilog-A(MS)
IBIS-ISS (6.0)

Corner, A_to_D corner_name (4.2)
Typ
Min
Max

Corner, D_to_A corner_name (4.2)
Typ
Min
Max

D_to_A polarity (6.0)
Non_Inverting
Inverting

Reserved Digital Port Names (4.2)
D_receive
D_drive
D_enable
D_switch

Reserved Analog Port Names (4.2)
A_signal
A_pos
A_neg
A_signal_pos
A_signal_neg

Reserved Analog Reference Names (4.2)
A_pufref
A_pdref
A_pcref
A_gcref
A_extref
A_gnd

Domain (5.1)
Digital
Analog
Digital_analog

Model_EMI_type (5.1)
Ferrite
Not_a_ferrite

Model_Domain (5.1)
Digital
Analog

Executable (5.1)
Platform_Compiler_Bits File_Name Parameter_File

For example, IBIS-ISS added as a Language choice in Version 6.0

polarity added to D_to_A with Non_Inverting and Inverting selections in Version 6.0

Start [Taskbar icons] 9:45 AM

Unofficial Evolution Document

- Evolution document features:
 - Updated columns show major version evolution
 - Rules and changes evolution
 - Significant subparameter selections such as the *_type subparameter choices
- Hierarchy and Evolution documents contain overlapping information, but expanded Hierarchy document has more detail
- Sample page shown next



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Evolution Document (*_type, EMI Information and Repeater Pin)

ross_6_0_evo_draft2a.doc [Compatibility Mode] - Microsoft Word

<u>Test_data_type</u> and <u>Test_load_type</u> SELECTIONS					
Version 1.1	Version 2.1	Version 3.2	Version 4.2	Version 5.1	Version 6.0
			<u>Single_ended</u>		
			<u>Differential</u>		
[Begin EMI Component] KEYWORDS					
Version 1.1	Version 2.1	Version 3.2	Version 4.2	Version 5.1	Version 6.0
				<u>[Pin EMI]</u>	
				<u>[Pin Domain EMI]</u>	
<u>Model_emi_type</u> SELECTIONS					
Version 1.1	Version 2.1	Version 3.2	Version 4.2	Version 5.1	Version 6.0
				<u>Ferrite</u>	
				<u>Not_a_Ferrite</u>	
(SUBPARAMETERS) FOR OTHER KEYWORDS					
Version 1.1	Version 2.1	Version 3.2	Version 4.2	Version 5.1	Version 6.0
<u>[Component]</u>		<u>[Component]</u> <u>(Si_location,</u> <u>Timing_location)</u>		<u>[Begin EMI Component]</u> <u>(Domain, Cpd,</u> <u>C_Heatsink_gnd,</u> <u>C_Heatsink_float)</u>	<u>[Repeater Pin]</u> <u>(tx_non_inv_pin)</u>
<u>[Package]</u> <u>(R_pkg, L_pkg,</u> <u>C_pkg)</u>				<u>[Pin EMI]</u> <u>(domain_name,</u> <u>clock_div)</u>	
<u>[Pin]</u> <u>(signal_name,</u> <u>model_name, R_pin,</u>				<u>[Pin Domain EMI]</u> <u>(percentage)</u>	

IBIS-AMI .ami File

Parameter Syntax (Section 10.3)

(`<parameter_name>`
(**Usage** `<usage>`) | required
(**Type** `<data_type>`) | required
(**{Format}** `<data_format>` `<data>`) | required *

(**List_Tip**) | optional with (**{Format}** **List**)
(**Default** `<value>`) | optional or illegal *
(**Description** `<string>`) | optional
)

* **Value** or **Default**, but not both, and other rules



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New - Four Summary Tables in Section 10.7 of the Specification

- **Usages for Reserved Parameters**
- **Types for Reserved Parameters**
- **Formats for Reserved Parameters**
- **Types for Format values**
- **28 Reserved Parameters, 18 new since Version 5.1**
- **Part of one table shown next**



IBIS-AMI Reserved Parameters and Allowable Data Types

ver6_0-wip4.docx [Compatibility Mode] - Microsoft Word

Table 31 – Allowable Data Types for Reserved Parameters

Reserved Parameter	Data Type				
	Float	UI	Integer	String	Boolean
AMI_Version ¹				X	
DLL_ID ³				X	
DLL_Path ³				X	
GetWave_Exists					X
Ignore_Bits ²			X		
Init_Returns_Impulse					X
Max_Init_Aggressors			X		
Repeater_Type ³				X	
Rx_Clock_PDF	X	X			
Rx_Clock_Recovery_DCD ³	X	X			
Rx_Clock_Recovery_Dj ³	X	X			
Rx_Clock_Recovery_Mean ³	X	X			
Rx_Clock_Recovery_Rj ³	X	X			
Rx_Clock_Recovery_Sj ³	X	X			
Rx_DCD ³	X	X			
Rx_Dj ³	X	X			
Rx_Noise ³	X				

Conclusion

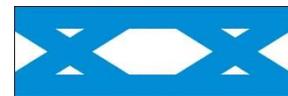
- Summary information provides quick references for IBIS and IBIS-AMI syntax
- Document references

<http://www.eda.org/ibis/ver6.0/>

ver6_0.docx, .pdf (official specification)

tree_6_0.txt (unofficial)

evol_6_0.docx, .pdf (unofficial)



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