**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER:** 191.1\_draft1

**ISSUE TITLE:** Clarifying Locations for Si\_location and Timing\_location

**REQUESTOR:**  Bob Ross, Teraspeed Labs

**DATE SUBMITTED:** June 28, 2017

**DATE REVISED:** TBD

**DATE ACCEPTED:**

**DEFINITION OF THE ISSUE:**

The Interconnect Modeling BIRD189 defines three separate interfaces as Buffer and Pad (for die pad) and Pin. The [Component] subparameters for Si\_location and Timing\_location only provide Die and Pin options. Originally BIRD191 introduced a new “Buffer” option. However, BIRD191.1 is changed to just clarify that when there is a choice between a buffer location and a die location due to how an Interconnect Model Set may be configured, the location “Die” always means the buffer location. This makes the “Die” location consistent with the existing package model options and when an [Interconnect Model Set[ is used. Some arguments for this interpretation are given at the end.

**SOLUTION REQUIREMENTS:**

The IBIS specification must meet these requirements:

Table 1: Solution Requirements

|  |  |
| --- | --- |
| Requirement | Notes |
| 1. Clarify what the “Die” selection for Si\_location and Timing\_location means when Buffer and Pad (die pad) locations are both available | The Interconnect Modeling BIRD189.x divides the existing “Die” location (which can mean buffer) into Buffer and Pad (which can mean die pad) |

**SUMMARY OF PROPOSED CHANGES:**

For review purposes, the proposed changes are summarized as follows:

Table 2: IBIS Keywords, Subparameters, AMI Reserved\_Parameters, and AMI functions Affected

|  |  |  |
| --- | --- | --- |
| Specification Item | New/Modified/Other | Notes |
| Under [Component], Si\_location and Timing\_location add clarification ofr the “Die” selection | Text |  |

**PROPOSED CHANGES:**

*On page 20 under the [Component] keyword, replace:*

*Keyword:* [Component]

*Required:*        Yes

*Description:* Marks the beginning of the IBIS description of the integrated circuit named after the keyword.

*Sub-Params:*   Si\_location, Timing\_location

*Usage Rules:*   If the .ibs file contains data for more than one component, each section must begin with a new [Component] keyword.  The length of the component name must not exceed 40 characters, and blank characters are allowed.

NOTE: Blank characters are not recommended due to usability issues.

Si\_location and Timing\_location are optional and specify where the Signal Integrity and Timing measurements are made for the component.  Allowed values for either subparameter are “Die” or “Pin”.  The default location is at the “Pin”.

*Example:*

[Component]     7403398 MC452

|

Si\_location     Pin    | Optional subparameters to give measurement

Timing\_location Die    | location positions

With (proposed change in red):

*Keyword:* [Component]

*Required:*        Yes

*Description:* Marks the beginning of the IBIS description of the integrated circuit named after the keyword.

*Sub-Params:*   Si\_location, Timing\_location

*Usage Rules:*   If the .ibs file contains data for more than one component, each section must begin with a new [Component] keyword.  The length of the component name must not exceed 40 characters, and blank characters are allowed.

NOTE: Blank characters are not recommended due to usability issues.

Si\_location and Timing\_location are optional and specify where the Signal Integrity and Timing measurements are made for the component.  Allowed values for either subparameter are “Die” or “Pin”. For pins that connect to a buffer through an [Interconnect Model Set], keyword described below, the “Die” selection shall be at the buffer terminal location. The default location is at the “Pin”.

*Example:*

[Component]     7403398 MC452

|

Si\_location     Pin    | Optional subparameters to give measurement

Timing\_location Die    | location positions

**BACKGROUND INFORMATION/HISTORY:**

BIRD191 is needed to overcome a technical omission in BIRD189.x. BIRD191 should appear in the same release as BIRD189.x. This could be regarded as a quick, but necessary fix.

Working on BIRD161.x is suggested as an option. However, it contains much material that would not be quickly vetted for approval and adoption in the next release. Moreover, some content has been handled in other BIRDs and other content presupposes some structures that are still in discussion and debate.

Because they are closely connected, this BIRD’s technical change could have been included in BIRD189.x.

BIRD191.1 changes the title and adopts a different rule. “Die” will be the buffer location in all cases for consistency and simplicity:.

1. “Die” is the same location as standard IBIS with just package models so that there is no difference with or without an available [Interconnect Model Set]
2. “Die” is always the same location with [Interconnect Model Set] keywords that documents buffer-to-pad-to-pin,paths or direct buffer-to-pin paths (where pad is not defined)
3. There is no need for different calculations for the same [Model] at different pins because of possible differences in the on-die interconnect structure
4. There is no need for dealing with on-die coupling effects for multiple Buffer\_I/O’s