**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER:** 228

**ISSUE TITLE:** Pin Name Field Extension

**REQUESTOR:**  Michael Mirmak, Intel Corporation

**DATE SUBMITTED:** December 5, 2023

**DATE REVISED:**

**DATE ACCEPTED:** January 26, 2024

**DEFINITION OF THE ISSUE:**

Due to the size and complexity of today’s component designs, the pin names used for these components may be long and contain information rather than just serving as a simple, unique identifier. However, the current IBIS syntax limits the [Pin] pin name field to five (5) characters. Similar limits exist for several related keywords.

This BIRD extends the pin name limit to 20 characters across ten keywords. In addition, some associated language is clarified for one keyword.

**SOLUTION REQUIREMENTS:**

The IBIS specification must meet these requirements:

Table 1: Solution Requirements

|  |  |
| --- | --- |
| Requirement | Notes |
| 1. Pin names as strings should be permitted to consume up to 20 characters
 |  |
| 1. Any keywords which rely on the pin name field should be modified appropriately
 |  |

**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 |
| [Pin] first column extended to 20 characters maximum | Modified |  |
| [Pin Mapping] first column extended to 20 characters maximum | Modified |  |
| [Diff Pin] first two columns extended to 20 characters maximum each | Modified |  |
| [Series Pin Mapping] first two columns extended to 20 characters maximum each | Modified |  |
| [Pin Numbers] first column extended to 20 characters maximum | Modified |  |
| [Pin List] first column extended to 20 characters maximum | Modified |  |
| [Repeater Pin] first two columns extended to 20 characters maximum each | Modified |  |
| [EMD Pin List] first column extended to 20 characters maximum | Modified |  |
| [Designator Pin List] first column extended to 20 characters maximum | Modified |  |
| [Pin EMI] first column extended to 20 characters maximum | Modified |  |

**PROPOSED CHANGES:**

All page and section numbers are with respect to IBIS 7.2.

In Section 5, under the [Pin] keyword Usage Rules, on p.34, change the following text:

Column length limits are:

 [Pin] 5 characters max

 model\_name 40 characters max

 signal\_name 40 characters max

 R\_pin 9 characters max

 L\_pin 9 characters max

 C\_pin 9 characters max

to:

Column length limits are:

 [Pin] 20 characters maximum

 model\_name 40 characters maximum

 signal\_name 40 characters maximum

 R\_pin 9 characters maximum

 L\_pin 9 characters maximum

 C\_pin 9 characters maximum

Also in Section 5, under the [Pin Mapping] keyword Usage Rules, on p.49, change the following text:

The column length limits are:

 [Pin Mapping] 5 characters max

 pulldown\_ref 15 characters max

 pullup\_ref 15 characters max

 gnd\_clamp\_ref 15 characters max

 power\_clamp\_ref 15 characters max

 ext\_ref 15 characters max

to:

The column length limits are:

 [Pin Mapping] 20 characters maximum

 pulldown\_ref 15 characters maximum

 pullup\_ref 15 characters maximum

 gnd\_clamp\_ref 15 characters maximum

 power\_clamp\_ref 15 characters maximum

 ext\_ref 15 characters maimum

Also in Section 5, under the [Diff Pin] keyword Usage Rules, on p.53, change the following text:

The column length limits are:

 [Diff Pin] 5 characters max

 inv\_pin 5 characters max

 vdiff 9 characters max

 tdelay\_typ 9 characters max

 tdelay\_min 9 characters max

 tdelay\_max 9 characters max

to:

The column length limits are:

 [Diff Pin] 20 characters maximum

 inv\_pin 20 characters maximum

 vdiff 9 characters maximum

 tdelay\_typ 9 characters maximum

 tdelay\_min 9 characters maximum

 tdelay\_max 9 characters maximum

Also in Section 5, under the [Series Pin Mapping] keyword Usage Rules, on p.56, change the following text:

The column length limits are:

 [Series Pin Mapping] 5 characters max

 pin\_2 5 characters max

 model\_name 40 characters max

 function\_table\_group 20 characters max

to:

The column length limits are:

 [Series Pin Mapping] 20 characters maximum

 pin\_2 20 characters maximum

 model\_name 40 characters maximum

 function\_table\_group 20 characters maximum

In Section 7.3, under the [Pin Numbers] keyword Usage Rules, on p. 181, change the following text:

 Pin names cannot exceed 5 characters in length.

to:

 Pin names shall not exceed twenty (20) characters in length.

In Section 8.2, under the [Pin List] keyword Usage Rules, on p. 195, change the following text:

There must be as many pin\_name/signal\_name rows as there are pins given by the preceding [Number Of Pins] keyword. Pin names must be the alphanumeric external pin names of the part. The pin names cannot exceed eight characters in length. Any pin associated with a signal name that begins with “GND” or “POWER” will be interpreted as connecting to the board’s ground or power plane. In addition, NC is a legal signal name and indicates that the Pin is a “no connect”.

to:

There shall be as many pin\_name/signal\_name rows as there are pins listed under the preceding [Number Of Pins] keyword. Pin names shall be the alphanumeric external pin names of the part. The pin names shall not exceed twenty (20) characters in length. Any pin associated with a signal name that begins with “GND” or “POWER” must be interpreted by simulation tools as connecting to the board’s ground or power plane. In addition, “NC” is a legal signal name and indicates that the pin is a “no connect”.

In Section 10.8, under the [Repeater Pin] keyword Other Notes, on p. 292, change the following text:

 The column length limits are:

 [Repeater Pin] 5 characters max

 tx\_non\_inv\_pin 5 characters max

to:

 The column length limits are:

 [Repeater Pin] 20 characters maximum

 tx\_non\_inv\_pin 20 characters maximum

In Section 12.3, under the [EMD Pin List] keyword Usage Rules, on p. 374, change the following text:

 The pin\_name entry shall not exceed eight characters in length.

to:

 The pin\_name entry shall not exceed twenty (20) characters in length.

Also in Section 12.3, under [Designator Pin List] keyword Usage Rules, on p. 378, change the following text:

The pin\_name entry (the portion after the reference designator and the “.”) shall not exceed eight characters in length.

to:

The pin\_name entry (the portion after the reference designator and the “.”) shall not exceed twenty (20) characters in length.

In Section 14, under the [Pin EMI] keyword Usage Rules on p.411, change the following text:

Column length limits are:

 pin\_name 5 characters max

 domain\_name 20 characters max

 clock\_div 5 characters max

to:

Column length limits are:

 pin\_name 20 characters maximum

 domain\_name 20 characters maximum

 clock\_div 5 characters maximum

**BACKGROUND INFORMATION/HISTORY:**

Note that the line length limit in IBIS 7.2 is 1024 characters. These changes will not cause violations of that limit for any keyword. Note that [Clock Pins] refers to pin names under [Pin] and [Diff Pin] but does not define colum size limits and so is not modified by this BIRD.

This BIRD was written in response to questions raised by Kyle Lake of Cadence in the October 6, 2023 IBIS Open Forum teleconference, as well as earlier, independent requests from other sources.