TERMINATORS AS IBIS-AMI RECEIVERS

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May 13, 2018

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Need and Issues

For IBIS-AMI purposes, modeling receiver analog terminations as parallel RC circuits is attractive

- Most AMI analog buffers will be LTI “enough” to be modeled as simple RC circuits
- Generating and reading formal IBIS analog I-V tables for simple terminations is annoying
- Mistakes are easier to make when manually generating tables

Ideal scenario is to have SPICE-like RLC values, per corner, available as alternatives to I-V tables for IBIS analog models of receivers

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An Example

```
[Model]    fantasy_rx
Model_type Input
C_comp      2700f       2000f      3400f
|
Vinl = 0.25 | placeholder only
Vinh = 0.75 | placeholder only
|
[Temperature Range]  80  90    5
[Voltage Range]      1.0 0.8 1.2
|
[Algorithmic Model]
Executable Windows_VisualStudio14.0.24720.0_64 fantasy_rx_x64.dll fantasy_rx.ami
[End Algorithmic Model]
|
[GND Clamp]
-1.00 -0.0200000     -0.0222222     -0.0181818
0.000 0.0000000     0.0000000     0.0000000
1.000 0.0200000     0.0222222     0.0181818
```

```
|                  typ    min    max
[R GND Clamp]     50     45     55
```

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The Barrier and Potential Solutions

Model_type Terminator permits several RLC combinations as simple values

- [Rgnd], [Rpower], [Rac], [Cac]

Problem: Terminator is specifically prohibited for use with Algorithmic models

- This is apparently done to ensure logic thresholds are present on AMI analog receivers

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Terminator	This model type is an input-only model that can have analog loading effects on the circuit being simulated but has no digital logic thresholds. Examples of terminators are: capacitors, termination diodes, and pullup resistors.

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Usage Rules: The [Algorithmic Model] keyword must be positioned within a [Model] section and it may appear only once for each [Model] keyword in a .ibs file. It is not permitted under the [Submodel] keyword or in [Model]s which are of Model_type Terminator, Series or Series_switch.

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Three Options for a BIRD

1. Remove the prohibition on Model_type Terminator with IBIS-AMI
   - Logic thresholds will not be available in this case, but the change is easy to write

2. Permit [Rac], [Cac], [Rgnd], [Rpower] for non-Terminator input Model_types
   - Input, I/O, 3-state, I/O_open_*, Input_diff, I/O_diff, 3-state_diff, Input_ECL, I/O_ECL, 3-state_ECL
   - The [Rac], etc. keywords replace any other analog behavioral keywords aside from C_comp

3. Create new Model_type that uses only [Rac], etc. keywords plus thresholds under a new name
   - e.g., Model_type Linear_input, Model_type Linear_input_diff
   - Could address related issues for single-ended buffers

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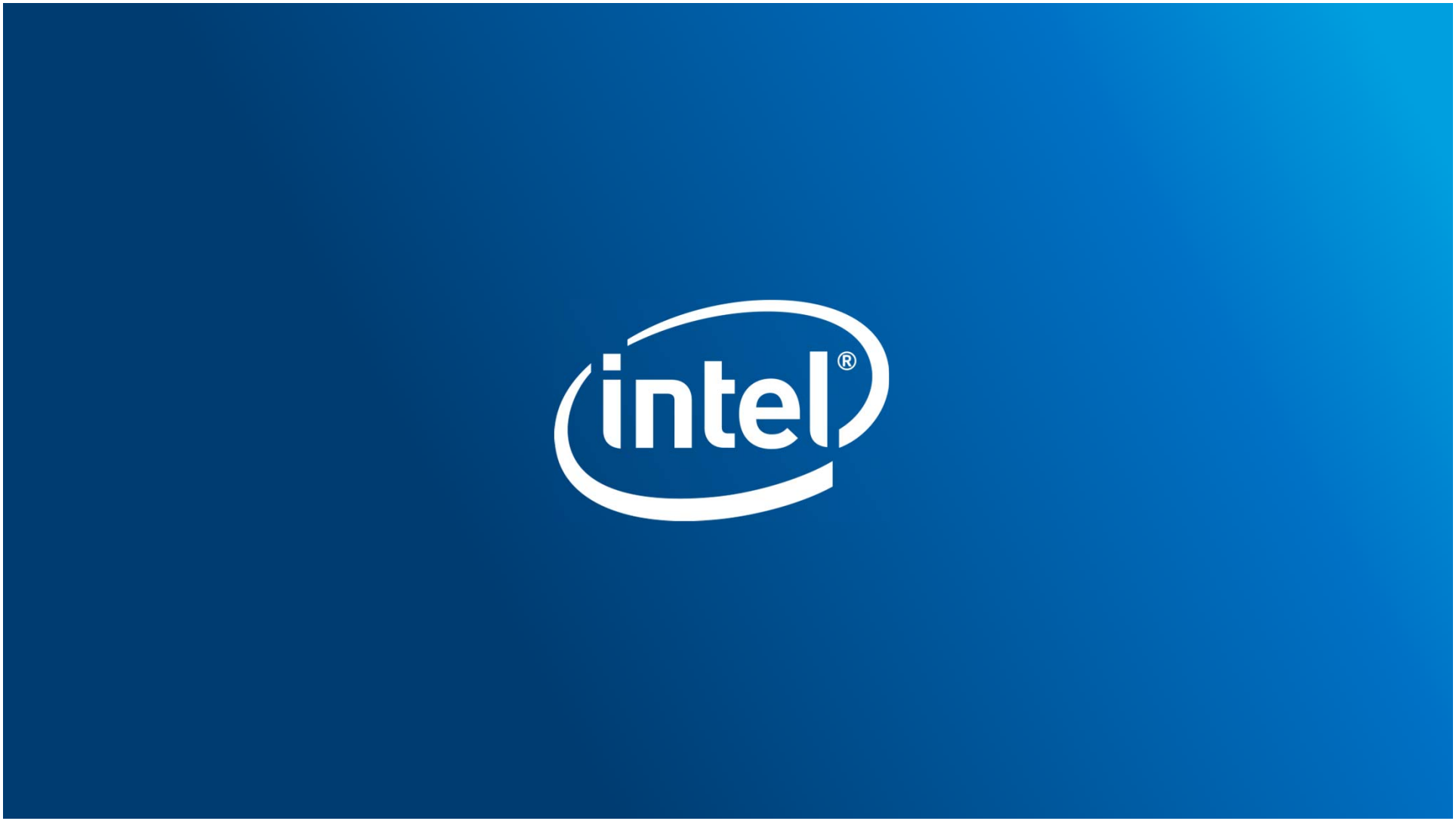
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