EMI Parameters for IBIS

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Proposed EMI parameters

- **Cpd**
  - Power Dissipation Capacitance.
  - This is the internal parasitic capacitance + the equivalent capacitance associated with the *through currents* when both transistors are momentarily conducting.
  - Parameter is given in the datasheets.
  - Used to calculate the noise voltage on the power bus (\( I(t) = C_{eff} \frac{dv}{dt} \) where \( C_{eff} \) is the total decoupling capacitance).

- **DIE HEIGHT**
  - Represented by package thickness.
  - Used for loop area calculation.
Proposed EMI parameters

- **HEATSINK**
  Heatsink dimensions (Length, Width, Thickness).
  Dimensions used to calculate capacitance.
  Also need to indicate which components have a heatsink.
  Heatsinks can act as antennas and are driven by potential differences on the power plane.

- **CON_PIN**
  Assigns a model name to a pin of a connector.

- **CON_SPEC**
  Assigns parameters to CON_PIN. Parameters indicate whether the pin is unshielded, shielded, connected to the shield, has a ferrite filter, and has an explicit filter capacitor.
  Used to calculate an antenna impedance for the pin.
Proposed EMI parameters - examples

- Example 1
  [Component] comp_1
  CPD  6.4  # pF
  ICCD 61.5  # mA/MHz

- Example 2
  [Component] comp_2
  DIE_HEIGHT 78.74  # mils
  HEATSINK L: 590.55  W: 590.55  T: 472.44  # mils
Proposed EMI parameters - examples

- Example 3

  [Component] connector_1
  CON_PIN 1 sig_out
  CON_PIN 2 sig_shield
  CON_PIN 3 sig_out
  CON_PIN G1 grounded

  [Model] sig_out
  CON_SPEC unshielded C: 6.0 # unshielded pin, C in pF

  [Model] sig_shield
  CON_SPEC is_to_shield C: 9.0 # pin connected to the shielded, C in pF

  [Model] grounded
  CON_SPEC is_shielded C: 7.0 # individually shielded pin, C in pF
What’s next?

- Use proper SI units
  E.g. e-12F instead of pF, Metric units, etc.

- Prepare a more detailed specification
  - Need to add more details as to why these parameters are important.
  - How to measure the parameters.

- Submit a Bird