Expanding System-Level Power Simulation Modeling in IBIS

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https://www.ibis.org/
Outline

• Current power modeling in IBIS
• Collaboration with IEEE EMC Society
• Power Integrity modeling needs
• Future work
Current Power Modeling in IBIS

• Focused on I/O power supply
  – BIRD95.6 “Power Integrity using IBIS”
  – BIRD98.3 “Gate Modulation Effect”

• Improvements for PDN modeling
  – BIRD189.7 “Interconnect Modeling Using IBIS-ISS and Touchstone”, on-die and package PDN models
  – BIRD198.x “Keyword additions for On-Die PDN Modeling”, simplified core & I/O decoupling caps
Collaboration with IEEE EMC Society

• IBIS virtual participation in 2020 IEEE EMC + SIPI Symposium, August, 2020
  – https://www.emc2020virtual.emcss.org/
  – Introducing IBIS to a new audience

• Potential for power modeling standardization
  – IEEE EMC society power integrity and power consumption sandpit event
  – IBIS specification → IEEE standardization
  – Additions to existing IBIS spec or separate spec
High-quality and widely supported models for active power components are missing today!
System-Level Power Simulation

Use IBIS format models to do the following simulations:

- System level DC simulations, including IR drop, DCR (1st)
- System power consumption and efficiency (1st)
- AC simulations, i.e. PDN impedance (2nd)
- Transient load response, i.e. transient power noise (2nd)
- Power/thermal co-simulation (3rd)

(Ranking relative to standardization priority)
DC and Power Consumption Simulation

- No good models for charger, battery, DC/DC converters and Die
- BRD can be modeled well with existing EDA tools
- PKG can be modeled with existing PKG EDA tools, but it will be great if it can be included as a part of IC component models from the IC vendors.
Future Work

• IEEE EMC Society collaboration
• Home for PI Modeling
  – IBIS-centric
    • Existing ATM or new task group?
  – IEEE-centric
    • IBIS provides hooks to import final format and information (as an IBIS-ISS subcircuit)
[Thank You]

IBIS Open Forum:
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We welcome participation by all IBIS model makers, EDA tool vendors, IBIS model users, and interested parties.