

**IBIS Open Forum Minutes**

Meeting Date: **November 13, 2020**

Meeting Location: **Online Virtual Summit**

**VOTING MEMBERS AND 2020 PARTICIPANTS**

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Teraspeed Labs Bob Ross\*

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Mitsuba Corp. Dai Yanagisawa\*, Yuko Kakubari\*

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Yumiko Sugaya\*, Osamu Ninomiya

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TFF Tektronix Co. Katsuhiko Suzuki\*

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Unaffiliated Colin Brench

University of Florida Shuo Wang

Unknown Affiliation Y Ao\*

XTUS Sejin Pak\*

Yamaha Corporation Tetsuya Kakimoto\*

Yazaki Parts Co. Kenichi Fujisawa\*

In the list above, attendees at the meeting are indicated by \*. Principal members or other active members who have not attended are in parentheses. Participants who no longer are in the organization are in square brackets.

**UPCOMING MEETINGS**

The connection information for future IBIS teleconferences is as follows:

<https://tinyurl.com/IBISOFfridayTeams>

[Join Microsoft Teams Meeting](https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZmIyZGI5NTQtZDM4MS00NmU5LTgyNmYtNzU4ZTllMWI5NGM4%40thread.v2/0?context=%7b%22Tid%22%3a%22fcbfc6fa-e20b-4a1d-b629-1b8e17697dbc%22%2c%22Oid%22%3a%227735c7ad-2577-4290-9e27-bce52c296030%22%7d)

Conference ID: 803 509 041#

[Local numbers](https://dialin.teams.microsoft.com/d1ae197a-e3fc-4c53-90b6-39fdeba65bc1?id=803509041) | [Learn more about Teams](https://support.microsoft.com/en-us/office/join-a-meeting-in-teams-1613bb53-f3fa-431e-85a9-d6a91e3468c9?ui=en-us&rs=en-us&ad=us) | [Meeting options](https://teams.microsoft.com/meetingOptions/?organizerId=7735c7ad-2577-4290-9e27-bce52c296030&tenantId=fcbfc6fa-e20b-4a1d-b629-1b8e17697dbc&threadId=19_meeting_ZmIyZGI5NTQtZDM4MS00NmU5LTgyNmYtNzU4ZTllMWI5NGM4@thread.v2&messageId=0&language=en-US)

Join with a video conferencing device

[106010980@teams.bjn.vc](mailto:106010980@teams.bjn.vc) VTC Conference ID: 1143484747

[Alternate VTC dialing instructions](https://support.bluejeans.com/s/article/VTC-Dial-In-Options-for-Teams-Meetings)

All teleconference meetings are 8:00 a.m. to 9:55 a.m. US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting.

NOTE: "AR" = Action Required.

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**OFFICIAL OPENING**

The Asian IBIS Summit – Japan took place on Friday, November 13, 2020 as an online virtual meeting. About 163 people representing 95 organizations attended.

The notes below capture some of the content and discussions. The meeting presentation slides, individual presentation video recordings, and full meeting video recording are available at:

<https://ibis.org/summits/nov20a/>

Start and stop times listed in these minutes refer to the meeting recording linked at:

<https://ibis.org/summits/nov20a/summit_recording.mp4>

Takayuki Shiratori chaired the meeting and managed the online meeting platform. He opened the meeting by introducing attendees to the meeting platform and gave instructions on how to ask questions. (Start time: 4:45, End time: 11:45)

Randy Wolff opened the summit by welcoming everyone and thanking them for joining. He thanked the sponsors and JEITA for help organizing the meeting. (Start time: 12:00, End time: 13:30)

**2020 ASIAN IBIS SUMMIT (TOKYO) MEETING WELCOMES**

Satoshi Nakamizo (Keysight Technologies Japan K.K., Japan) (Chair, JEITA EDA Model Specialty Committee)

Satoshi Nakamizo provided a meeting welcome to the attendees on behalf of JEITA.

(Start time: 16:15, End time: 19:00)

**IBIS CHAIR’S REPORT**

Randy Wolff (Micron Technology, USA)

Randy Wolff provided a report on ongoing activities of the IBIS Open Forum.

(Start time: 19:00, End time: 30:30)

**BRIEF REVIEW OF PDN IN IBIS**

Bob Ross (Teraspeed Labs, USA)

Bob Ross discussed power delivery network modeling in IBIS provided by various keywords.

Ted Mido asked what the advantages of the new model are proposed by the university compared to the previous models. Bob replied that the biggest difference is that it can handle pre-driver switching. For more information, please refer to the paper published by Missouri University of Science and Technology.

Masaki Kunii asked how we handle Touchstone data for power supply pins and power supply patterns in a PDN. Bob responded that IBIS-ISS can handle SPICE and S-parameters. How to handle them in simulation depends on EDA tools. Randy Wolff commented that we can represent any network with IBIS-ISS in IBIS, but what we haven't been able to include is the current of on-die power delivery. We would like to discuss how to express this in the future.

(Start time: 30:30, End time: 1:00:00)

**THE ON DIE DECAP MODELING PROPOSAL (BIRD198.3)**

Megumi Ono\*, Atsushi Tomishima\*\* (\*Socionext, \*\*Toshiba Electronic Devices & Storage Corp.; Japan)

[Presented by Megumi Ono (Socionext, Japan)]

Megumi Ono reviewed BIRD198.3 and its capabilities for modeling on-die decoupling capacitance.

Randy Wolff asked Ono-san if she had any comments about her experience writing the BIRD and if there is anything IBIS can do to improve the BIRD process. Ono-san responded that although there is a time difference, we were able to have a lot of discussions via email and they were good for hearing what we missed, especially the comments and opinions from the EDA vendor’s perspective.

Ted Mido asked if there are any difficulties or improvements in writing this BIRD. Ono-san responded she was glad to receive various comments and questions discussed in the IBIS ATM task group. Face-to-face discussions may have been difficult.

Bob Ross commented that on slide page 18, there is a little glitch on the AC analysis impedance curve. What is this glitch? Kazuyuki Sakata responded this glitch is a resonance due to the small capacitors and inductors on the package and chip. The model proposed today is an on die decap model, so there is no need to model and include these capacitors and inductors.

Tadashi Arai commented that he understands there are requests for chip vendors to create and provide models. However, modeling is difficult due to the large number of even simple I/O buffers. In addition, power aware IBIS modeling is more difficult. Initially, he thought chip vendors were refusing to provide models to protect their IP. However, this is incorrect, and the chip designer does not understand the modeling method correctly, so the model cannot be provided. Is there any good way to get a good understanding of the modeling procedure? Randy responded that we haven't updated the cookbook for a long time. There is some information in the IBIS specification, for example, how to create ISSO\_PU and ISSO\_PD data. There are also some software tools to help to extract power aware data when you create an IBIS model. There are a few commercial software options. We need to create some better training materials for that.

(Start time: 1:00:00, End time: 1:38:00)

**BOARD DESIGN FOR LOW LOSS**

Shinichi Maeda (KEI Systems, Japan)

Shinichi Maeda presented a methodology for designing a low loss interconnect.

Shinichi Tanimoto said it was explained that the loss differs depending on the thickness of the copper foil. Does the loss change if the thickness is greater than the skin depth? Maeda-san responded that the skin depth should be considered not only above and below, but also laterally. The surface area of ​​the four sides changes depending on the thickness, and if it becomes thinner, the current from the side will decrease.

Taiji Hosaka said although not directly related to today's talk, please comment on the causality of the PCB due to dielectrics. Maeda-san responded that he thinks causality refers to the characteristics of S-parameters. Causality indicates the "roughness" of measuring or analyzing S-parameters. Looking at the phase of the S-parameters, if there are few measurement points, it may appear that the phase is reversed even though the amount of phase rotation is originally large. This is a causality problem. If the phase rotates smoothly, the causality problem will not occur.

Takayuki Mizogami asked what kind of design should be made in case of changes in line width or layer composition due to variations in PCB manufacturing when considering future signal speedups. Maeda-san responded that even if there is a slight deviation in the characteristic impedance, the loss and reflection are not so large. However, the accumulation of small deviations can have a significant impact. In the case of differential signals, skew occurs between pairs due to the difference in relative permittivity due to the glass cloth. If the wiring is long, skew will accumulate, which is a problem.

Mizogami-san asked if that means that the relative permittivity changes depending on the orientation of the glass cloth? Do you have information on what kind of wiring should be used? Maeda-san responded as you know, there is a method of chamfering at an angle to make the glass cloth uniform, but the manufacturing cost of the PCB will increase.

Hyounson Che commented that when performing SI simulations of PCB, the material properties (the relative permittivity and the dielectric loss tangent of the dielectric) use the values ​​provided by the substrate manufacturer. However, these values ​​make a difference between the actual measurement and the simulation result. Please tell me how to collect the relative permittivity and the dielectric loss tangent value of the dielectric when executing the SI simulation. Maeda-san responded that various data such as the surface roughness of copper foil, the shape of glass cloth and physical property values ​​are required for accurate simulation, but it is difficult to obtain all the information. Also, because the design value and the manufacturing value are different, the simulation result and the actual measurement result may be different. In order to deal with these problems, it is common practice to create an evaluation board and obtain simulation input values ​​to match actual measurements.

(Start time: 1:48:00, End time: 2:24:00)

**TO OBTAIN HIGH ACCURACY OF IBIS-AMI CHANNEL SIMULATION**

Masaki Kirinaka, Akiko Tsukada (Fujitsu Interconnect Technologies, Japan)

[Presented by Masaki Kirinaka (Fujitsu Interconnect Technologies, Japan)]

Masaki Kirinaka presented a study on the sensitivity of samples per bit (SPB) in IBIS-AMI to simulation accuracy.

Ted Mido commented that a large SPB value can represent jitter more accurately. However, each model has its own recommended value, so it is better to check it before using it.

Randy Wolff noted that it takes a long time to simulate using a large SPB value such as 1024. Are there any requirements for tools and algorithms from the perspective of the IBIS specifications?

Kirinaka-san said he has rarely considered chip jitter when running simulations. However, it became necessary to apply random jitter when running the simulation. Using the characteristic of Gaussian distribution when random jitter is applied correctly, we have now examined the effect of SPB values ​​on simulation results. Normally, SPB values ​​such as 32 and 64 are often used, but according to the results of this verification, it was necessary to use a large value such as 512. Increasing the SPB value will increase the time required for the simulation. He would like to hear your opinion on this.

Ted Mido commented that in this presentation, he understands that the reason why you had to use a large SPB value was because the period of random jitter applied was short. The chip vendor may have specified a random jitter value to apply when running the simulation. But whether random jitter is important in actual hardware design is another matter. Since the SPB value is used when calculating the equalization in the IBIS-AMI model, increasing the value to improve the accuracy will increase the simulation time. EDA vendors and IC vendors need to continue to work together to address short-period jitter.

(Start time: 2:24:15, End time: 2:58:30)

**CLOSING REMARKS**

Bob Ross shared a picture of IBIS officers at a breakfast with JEITA officers before the DesignCon 2019 IBIS Summit meeting. He noted DesignCon is moved to April 2021. He hopes we can all get together sometime soon in the future.

Randy Wolff thanked the members of JEITA for help in organizing the meeting. He noted it is our first virtual summit experience, and it went well. Randy thanked Ted Mido for help with translations. He thanked the presenters and the participants. He hoped to meet everyone again in person in 2021.

(Start time: 3:02:45, End time: 3:07:15)

**NEXT MEETING**

The Virtual IBIS Summit – China will be held on November 20, 2020.

The next IBIS Open Forum teleconference meeting will be held on December 4, 2020. The following teleconference meeting is tentatively scheduled for January 8, 2021.

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**NOTES**

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This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to [info@ibis.org](mailto:info@ibis.org). Examples of inquiries are:

* To obtain general information about IBIS.
* To ask specific questions for individual response.
* To subscribe to the official [ibis@freelists.org](mailto:ibis@freelists.org) and/or [ibis-users@freelists.org](mailto:ibis-users@freelists.org) email lists (formerly [ibis@eda.org](mailto:ibis@eda.org) and [ibis-users@eda.org](mailto:ibis-users@eda.org)).
* To subscribe to one of the task group email lists: [ibis-macro@freelists.org](mailto:ibis-macro@freelists.org), [ibis-interconn@freelists.org](mailto:ibis-interconn@freelists.org), or [ibis-quality@freelists.org](mailto:ibis-quality@freelists.org).
* To inquire about joining the IBIS Open Forum as a voting Member.
* To purchase a license for the IBIS parser source code.
* To report bugs or request enhancements to the free software tools: ibischk6, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

The BUG Report Form for ibischk resides along with reported BUGs at:

<http://www.ibis.org/bugs/ibischk/>   
[http://www.ibis.org/ bugs/ibischk/bugform.txt](http://www.ibis.org/%20bugs/ibischk/bugform.txt)

The BUG Report Form for tschk2 resides along with reported BUGs at:

<http://www.ibis.org/bugs/tschk/>   
<http://www.ibis.org/bugs/tschk/bugform.txt>

The BUG Report Form for icmchk resides along with reported BUGs at:

<http://www.ibis.org/bugs/icmchk/>   
<http://www.ibis.org/bugs/icmchk/icm_bugform.txt>

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

<http://www.ibis.org/bugs/s2ibis/bugs2i.txt>   
<http://www.ibis.org/bugs/s2ibis2/bugs2i2.txt>   
<http://www.ibis.org/bugs/s2iplt/bugsplt.txt>

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

<http://www.ibis.org/>

Check the IBIS file directory on ibis.org for more information on previous discussions and results:

<http://www.ibis.org/directory.html>

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**SAE STANDARDS BALLOT VOTING STATUS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Organization** | **Interest Category** | **Standards Ballot Voting Status** | **September 18, 2020** | **October 09, 2020** | **October 30, 2020** | **November 13, 2020** |
| ANSYS | User | Active | X | X | X | X |
| Applied Simulation Technology | User | Inactive | - | - | - | - |
| Broadcom Ltd. | Producer | Inactive | - | - | - | - |
| Cadence Design Systems | User | Active | X | X | X | X |
| Cisco Systems | User | Inactive | - | - | - | - |
| Dassault Systemes | User | Inactive | - | - | - | - |
| Ericsson | Producer | Inactive | - | - | - | - |
| Google | User | Active | X | X | X | - |
| Huawei Technologies | Producer | Inactive | - | - | - | - |
| Infineon Technologies AG | Producer | Inactive | - | - | - | - |
| Instituto de Telecomunicações | User | Inactive | - | - | - | - |
| IBM | Producer | Inactive | - | - | - | - |
| Intel Corp. | Producer | Active | X | X | X | - |
| Keysight Technologies | User | Active | X | X | X | X |
| Marvell | Producer | Active | X | - | X | - |
| Maxim Integrated | Producer | Inactive | - | - | X | - |
| Mentor, A Siemens Business | User | Active | X | X | X | X |
| Micron Technology | Producer | Active | X | X | X | X |
| MST EMC Lab | User | Inactive | - | - | - | - |
| NXP | Producer | Inactive | - | - | - | - |
| SerDesDesign.com | User | Inactive | - | - | - | - |
| SiSoft | User | Active | X | X | X | X |
| Synopsys | User | Active | X | X | X | X |
| Teraspeed Labs | General Interest | Active | X | X | X | X |
| Xilinx | Producer | Inactive | - | - | - | - |
| ZTE Corp. | User | Inactive | - | - | - | - |
| Zuken | User | Active | X | X | X | X |

Criteria for SAE member in good standing:

* Must attend two consecutive meetings to establish voting membership
* Membership dues current
* Must not miss two consecutive meetings

Interest categories associated with SAE standards ballot voting are:

* Users - members that utilize electronic equipment to provide services to an end user.
* Producers - members that supply electronic equipment.
* General Interest - members are neither producers nor users. This category includes, but is not limited to, government, regulatory agencies (state and federal), researchers, other organizations and associations, and/or consumers.