

**IBIS Open Forum Minutes**

Meeting Date: **November 13, 2020**

Meeting Location: **Online Virtual Summit**

**VOTING MEMBERS AND 2020 PARTICIPANTS**

ANSYS Curtis Clark, Wei-hsing Huang, Marko Marin

 Shai Sayfan-Altman, Zilwan Mahmod, Baolong Li

 Usman Saeed, Miyo Kawata\*

Applied Simulation Technology (Fred Balistreri)

Broadcom James Church, Jim Antonellis

Cadence Design Systems Zhen Mu, Ambrish Varma, Jared James

 Kumar Keshavan, Ken Willis, Suomin Cui

 Takuya Moriya\*, Tadaaki Yoshimura\*

Cisco Systems Stephen Scearce, Hong Wu, Han Gao

Dassault Systemes (CST) Stefan Paret

Ericsson [Anders Ekholm], Sungjoo Yu, Thomas Ahlstrom

Google Zhiping Yang, Shuai Jin, Zhenxue Xu, Hanfeng Wang

 Songping Wu, Yimajian Yan

Huawei Technologies (Hang (Paul) Yan)

IBM [Michael Cohen], Greg Edlund

Infineon Technologies AG (Christian Sporrer)

Instituto de Telecomunicações (Abdelgader Abdalla)

Intel Corporation Hsinho Wu, Michael Mirmak, Adrien Auge

 Fernando Mendoza, Taeyoung Kim, Wendem Beyene

 Oleg Mikulchenko, Nhan Phan, Ifiok Umoh

 Subas Bastola, Kinger Cai

Keysight Technologies Radek Biernacki, Hee-Soo Lee, Todd Bermensolo

 Graham Riley, Pegah Alavi, Fangyi Rao

 Stephen Slater, Toshinori Kageura\*, Hiroaki Sasaki\*

 Satoshi Nakamizo\*, Toshinobu Sanuki\*

Marvell Steve Parker, Johann Nittmann, Shaowu Huang

Maxim Integrated Joe Engert, Charles Ganal, Dzung Tran, Yan Liang

 Tushar Pandey

Mentor, A Siemens Business Arpad Muranyi, Raj Raghuram, Todd Westerhoff

 Weston Beal, Kunimoto Mashino\*, Kenji Kushima\*

Micron Technology Randy Wolff\*, Justin Butterfield, Larry Smith

 Vijay Kanagachalam

 Micron Memory Japan, G.K. Masayuki Honda\*, Mikio Sugawara\*

MST EMC Lab Chulsoon Hwang, Anfeng Huang, Bo Pu, Jiayi He

 Yin Sun

NXP John Burnett

SerDesDesign.com John Baprawski

SiSoft (MathWorks) Mike LaBonte\*, Walter Katz, Graham Kus

Synopsys Ted Mido\*, Andy Tai

Teraspeed Labs Bob Ross\*

Xilinx Ravindra Gali

ZTE Corporation (Shunlin Zhu)

Zuken Michael Schäder, Kazunari Koga, Kensuke Yoshijima\*

 Takayuki Shiratori\*

 Zuken USA Lance Wang\*

**OTHER PARTICIPANTS IN 2020**

A&D Print Engineering Co. Ryu Murota\*

Abeism Corp. Nobuyuki Kiyota\*

Accton Tariq Abou-Jeyab

Achronix Semiconductor Hansel Dsilva

AET Chihiro Ueda\*

Amazon Lab126 John Yan

AMD Japan Tadashi Arai\*

Apollo Giken Co. Satoshi Endo\*

Apple Jin Shi, Jun Xu

ARRL (IEEE EMC) Ed Hare

Astrodesign Yoshiaki Nishi\*

ATE Service Corp. Yutaka Honda\*

Aurora Innovation Jianming Li

Aurora System Hiroshi Ishikawa\*

Avnet K.K. Shinya Ishizuka\*

Canon Soh Hoshi\*, Satoru Ishikawa\*, Shinichi Ohno\*

Canon Components Takeshi Nagata\*

Casio Computer Co. Yasuhisa Hayashi\*

Christie Digital Systems Mingchang Wang

Ciena Kaisheng Hu\*

Clarion Co. Takatsugu Yasui\*

CMK Products Corp. Masaki Abe\*, Motoshi Nakamura\*

Cybernet Systems Co. Takayuki Tsuzura\*, Shiho Nagae\*, Akio Yanagi\*

D-CLUE Technologies Co. Kenzo Tan\*

De Montfort University (IEEE EMC) Alistair Duffy

Denso Corp. Hyounson Che\*, Koji Ichikawa\*

Design Methodology Lab Motoh Tanaka\*

Eizo Corp. Masaru Tamai\*

Exponential Failure Analysis

 Associates (IEEE EMC) Vignesh Rajamani

ETS-Lindgren Janet O’Neil

Facebook Xin Chang

Forum Engineering Minoru Nakahara\*

Fuji Xerox Manufacturing Co. Rumi Maeda\*

Fujitsu Kumiko Teramae\*, Ikuo Ohtsuka\*, Hirokazu Hidaka\*

 Takashi Kobayashi\*

Fujitsu Advanced Engineering Kazuhiro Kamegawa\*

Fujitsu Advanced Technologies Hideki Takauchi\*, Magumi Nagata\*, Yuji Sawa\*

Fujitsu Interconnect Technologies Toru Kuraishi\*, Masaki Kirinaka\*, Akiko Tsukada\*

 Manabu Fukuzawa\*, Hiromi Kurokawa\*

 Syunsuke Fujisawa\*

Fujitsu Optical Components Masaki Kunii\*

Furuno Electric Co. Naoaki Sasao\*

Global Unichip Japan Masafumi Mitsuicshi\*, Shingo Sakai\*

Hamamatsu Photonics K.K. Hidetoshi Nakamura\*, Ryouji Yamamoto\*

Hitachi Kenichi Ishino\*

Hitachi Solutions Technology Sadahiro Nonoyama\*

Hoei Co. Tatsuya Chiba\*

Holor Technology Kimihiro Ogawa\*

Hoya Corp. Masayuki Hagiwara\*

IB Electronics Makoo Matsumuro\*

Innotech Corp. Shinobu Seki\*

Japan Radio Co. Hiroto Katakura\*, Takashi Sato\*

Jujube Taiji Hosaka\*

JVC Kenwood Corporation Yasutoshi Ojima\*

Kandou Bus Sherman Chen

KEI Systems Shinichi Maeda\*

Keyence Corporation Takashi Moro\*

Kioxia Corporation Yasuo Otsuka, Minori Yoshitomi\*, Takayuki Mizogami\*

 Masato Kanie\*

Kioxia Systems Co. Tomomichi Takahashi\*, Yukio Tanoue\*, Jyunya Shibasaki\*

 Eiji Kozuka\*

Konika Minolta Takayuki Suzuki\*

Lemonade Social Media Rachel Norrod

Megachips Corporation Tomochika Kitamura\*, Takahito Fukushima\*

Meiko Electronics Co. Kiyoshi Baba\*

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

Mitsubishi Electric Corp. Yusuke Suzuki\*

Mitsubishi Electric Engineering Co. Yasuhiro Segawa\*, Minehiko Horii\*

Modech Tadashi Aoki\*

Murata Manufacturing Co. Shigeaki Hashimoto\*

NEC Platforms Yusuke Onodera\*

Nikon Corporation Manabu Matsumoto\*

Nissan Motor Corp. Hidenari Nakashima\*

Oki Electric Industry Co. Atsushi Kitai\*, Kenichi Saito\*

OmniVision Sirius Tsang

Panasonic Corporation Kenkichi Hirano\*, Shinichi Tanimoto\*, Minori Harada\*

Pioneer Corp. Yuichi Tamura\*

Privatech Kazuo Ogasawara\*

PWB Corp. Toru Ohhisa\*

Qualcomm Kevin Roselle, Sunil Gupta, Yi Cao

Renesas Electronics Corp. Genichi Tanaka\*, Kazunori Yamada\*, Masato Suzuki\*

 Kazuyuki Sakata\*

Ricoh Co. Yasumasa Yamataki\*, Miyoko Goto\*, Toshihiko Makino\*

 Kurose Koji\*

Rion Co. Katsuya Nakao\*

RITA Electronics Takahide Nozaki

Rockwell Automation Meilin Wu

Rohm Co. Noboru Takizawa\*, Nobuya Sumiyoshi\*

Ryosan Co. Takahiro Sato\*

SAE ITC Jose Godoy

Samsung Wonsuk Choi

San Jose State University Vincent Tam

SAXA Takayuki Ito\*, Takayuki Sato\*

Seagate Preetesh Rathod, Alex Tain, Karthik Chandrasekar

 Emmanuel Atta

Seiko Epson Corp. Shinichiro Kawano\*, Toshiyuki Nishiyama\*, Ryuichi Okada\*

 Kenichiro Yajima\*

Shimadzu Corp. Kazuo Nakajima\*

Shinko Electric Industries Co. Takumi Ikeda\*, Manabu Nakamura\*

Signal Metrics Ron Olisar

Silvaco Japan Co. Yoshiharu Furui, Yoshihiko Yamamoto\*

 Atsushi Hasegawa\*, Yoshinori Kanno\*

SK Hynix Memory Solutions Jongchul Shin, Alex Lee, James Yu

Socionext Matsumura Motoaki, Shinichiro Ikeda

 Takafumi Shimada, Hajime Ohmi\*, Jyunko Nakamoto\*

 Shizue Katoh\*, Makoto Kumazawa\*, Masatomo Ichioka\*

 Fumiyo Kawatsuji\*, Megumi Ohno\*, Yukiko Tanaka\*

 Yumiko Sugaya\*, Osamu Ninomiya

Sohwa & Sophia Technologies Tomoki Yamada\*

Sony Global Manufacturing & Takashi Mizoroki\*

 Operations Corporation

Sony LSI Design Toru Fujii\*, Kazuki Murata\*

SPISim [Wei-hsing Huang]

Technopro Design Co. Mai Fukuoka\*

Tektronix Co. Takafumi Watanabe\*

Teradyne Dongmei Han, Edward Pulscher, Sheri Zhuang

 Tomoo Tashiro, Paul Carlin, Tao Wang

TFF Tektronix Co. Katsuhiko Suzuki\*

Tokairika Co. Furuna Yamamoto\*

Tokyo Drawing Naoya Iisaka\*, Masahiko Nakamura\*

Toshiba Yasuki Torigoshi\*

 Toshiba Development & Nobuyuki Kasai\*

 Engineering Corp.

 Toshiba Electronic Device Youichi Sato\*

 Solutions Corp.

 Toshiba Electronic Devices & Yoshinori Fukuba\*, Toshihiro Tsujimura\*

 Storage Corp. Atsushi Tomishima\*, Takahiro Aoki\*

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 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**

IBIS CHAIR: Randy Wolff (208) 363-1764

rrwolff@micron.com

Principal Engineer, Silicon SI Group, Micron Technology, Inc.

8000 S. Federal Way

P.O. Box 6, Mail Stop: 01-720

Boise, ID 83707-0006

VICE CHAIR: Lance Wang (978) 633-3388

lance.wang@ibis.org

Solutions Architect, Zuken USA

238 Littleton Road, Suite 100

Westford, MA 01886

SECRETARY: Curtis Clark

curtis.clark@ansys.com

 ANSYS, Inc.

 150 Baker Ave Ext

 Concord, MA 01742

TREASURER: Bob Ross (503) 246-8048

bob@teraspeedlabs.com

Engineer, Teraspeed Labs

10238 SW Lancaster Road

Portland, OR 97219

LIBRARIAN: Zhiping Yang (650) 214-0868

zhipingyang@google.com

Sr. Hardware Manager, Google LLC

1600 Amphitheatre Parkway

Mountain View, CA 94043

WEBMASTER: Steven Parker (845) 372-3294

sparker@marvell.com

Senior Staff Engineer, DSP, Marvell

2070 Route 52

Hopewell Junction, NY 12533-3507

POSTMASTER: Mike LaBonte

mlabonte@sisoft.com

 IBIS-AMI Modeling Specialist, SiSoft

 1 Lakeside Campus Drive

 Natick, MA 01760

This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to 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 and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org).
* To subscribe to one of the task group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, or 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/>
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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.