**IBIS Open Forum Minutes**

Meeting Date: **May 12, 2023**

Meeting Location: **Teleconference**

**VOTING MEMBERS AND 2023 PARTICIPANTS**

|  |  |
| --- | --- |
| Altair | (JuneSang Lee) |
| AMD (Xilinx) | (Bassam Mansour) |
| Analog Devices (Maxim Integrated) | (Don Greer) |
| Ansys | Curtis Clark\*, Wei-hsing Huang |
| Applied Simulation Technology | (Fred Balistreri) |
| Aurora System | Dian Yang, Raj Raghuram |
| Broadcom | (Yunong Gan) |
| Cadence Design Systems | Kyle Lake\*, Jared James, John Philips,  Kristoffer Skytte |
| Celestica | (Sophia Feng) |
| Cisco Systems | (Stephen Scearce), Hong Wu |
| Dassault Systemes | Stefan Paret, BAI Longfei |
| GE Healthcare Technologies | (Balaji Sankarshanan) |
| Google | (Hanfeng Wang) |
| Honeywell | Bavish Vazhayil |
| Huawei Technologies | Danilo Di Febo, Marco De Stefano, (Hang (Paul) Yan) |
| Infineon Technologies AG | (Christian Sporrer) |
| Instituto de Telecomunicações | (Abdelgader Abdalla), Joana Catarina Mendes |
| Intel Corporation | Chi-te Chen, Kinger Cai, Michael Mirmak\*, Hsinho Wu\* |
| Keysight Technologies | Ming Yan, Douglas Burns, Fangyi Rao,  Pegah Alavi, Hee-Soo Lee, Heidi Barnes |
| Marvell | Steven Parker |
| MathWorks | Graham Kus\*, Walter Katz\*, Kerry Schotz |
| Micron Technology | [Randy Wolff], Justin Butterfield,  Akshay Shivaji Chaudhari, Dragos Dimitriu |
| MST EMC Lab | Chulsoon Hwang\*, Zhiping Yang\* |
| SerDesDesign.com | John Baprawski |
| Siemens EDA | Arpad Muranyi\*, Weston Beal\*, Matthew Leslie, Mikael Stahlberg, Todd Westerhoff, Scott Wedge, Randy Wolff\* |
| STMicroelectronics | Olivier Bayet, Rahul Kumar, Raushan Kumar, Manish-FTM Bansal, Sameer Vashishtha |
| Synopsys | Ted Mido\*, (Tushar Pandey), Wael Dghais |
| Teraspeed Labs | Bob Ross\* |
| Waymo | [Zhiping Yang], (Ji Zhang) |
| ZTE Corporation | (Shunlin Zhu) |
| Zuken | Michael Schäder, Markus Bücker, Ralf Brüning |
| Zuken USA | Lance Wang\* |

**OTHER PARTICIPANTS IN 2023**

|  |  |
| --- | --- |
| Alphawave Semi | Adrien Auge, Todd Bermensolo |
| Ciena | Hugues Tournier |
| Hitachi Ltd. | Yutaka Uematsu |
| Honeywell | Bavish Vazhayil |
| India Institute of Technology | Jai Narayan Tripathi, Vinod Verma |
| Nokia | Ramiro Guzman |
| OMNIVISION | Sirius Tsang |
| Signal Edge Solutions | Ben Dannan |
| SI Guys | Donald Telian |
| Socionext, Inc. | Raymond Yakura |
| University of Illinois Urbana-Champaign | Jose Schutt-Aine |
| University of Tunisia, Electronic Laboratory | Malek Souilem |
| Unaffiliated | Will Hobbs, Mike LaBonte, Jon Powell, Stephen Peters |
|  |  |

In the list above, attendees present at the meeting are indicated by “\*.” Those submitting an email ballot for their member organization for a scheduled vote 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:

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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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**INTRODUCTIONS AND MEETING QUORUM**

Randy Wolff reported that he was located at a ski resort in Idaho where snow is falling and would be moving to support an efficient meeting in order to ski as soon as the slopes opened. Those attending agreed to hold an efficient meeting.

Graham Kus declared that a quorum had been reached with 9 members attending, meeting the quorum minimum of 8.

**CALL FOR PATENTS**

Randy Wolff called for declaration of any patents or pending patents related to the IBIS, IBIS-ISS, ICM, or Touchstone 2.0 specifications. Patents were not declared.

**REVIEW OF MINUTES AND ARS**

Randy Wolff called for review of minutes of April 21, 2023. Graham Kus moved to approve. Curtis Clark seconded. There were no objections. The minutes were approved.

* Randy Wolff to provide link to SAE ITC press release covering IBIS 7.2 release[AR]
  + Randy reports there has been no response. Will contact SAE ITC one more time.

**ANNOUNCEMENTS**, **CALL FOR ADDITIONAL AGENDA ITEMS**

Randy Wolff called for any agenda items. No new items were raised.

**MEMBERSHIP STATUS AND TREASURER'S REPORT**

Bob Ross reported, for 2023, we have 30 voting members and a quorum of 8. Bob noted that some affiliations have changed, with new email addresses are listed for Randy Wolff and Zhiping Yang.

Currently we have 25 renewals and 2 new members (for a total of 27) for 2023.

Bob is tracking two organizations for renewals.  It is likely that one organization will be dropped after June 1, 2023.

Bob stated we have paid 2,000 Euros (approximately $2,210) for a Silver sponsorship of SPI 2023 and the logistics for the European IBIS Summit.  We have paid $2,000 to the IBIS parser developer for ibischk720 development. Bob related some particulars regarding some of the renewals.

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**$14,575** Balance for 2023

**$19,625** Adjusted Balance for 2023 (Note, 2020 ZTE sponsorship moved forward to 2023)

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Bob

**WEBSITE ADMINISTRATION**

Randy Wolff reported on behalf of Steven Parker that a few updates, including AMD logo replacing Xilinx, and minutes links are up to date. Weston Beal mentioned that IEEE SPI next year would be in Lisbon, Spain. Randy polled for any requests on updates. Bob Ross suggested the past summits page include the recent IBIS Summit minutes and artifacts from Wednesday May 10, 2023. Bob remarked that the indices are updated, but the general AR for the website is to clean up the links and make sure they are valid including the most recent IBIS Summit [AR].

**MAILING LIST**

Curtis Clark reported everything is working with new affiliations updated.

**LIBRARY UPDATE**

Zhiping Yang reported no people have asked for library updates. However, there is a new request for datasheet type specification of IBIS. There was an agenda note how they can work better with IBIS. There are some ideas to convert to and from IBIS from Digital Datasheet. This is Kin CAD, which is an open-source organization that is trying to adopt IBIS. Bob Ross stated he is not sure the Data Sheet model would include VT or IV curve data. Zhiping shared some discussion on the specifics of the implementation by the organization, especially regarding IBIS Pin and Function, and they would ignore other metrics that would involve high speed simulation. Bob responded that one of the key metrics of a datasheet is the IO type (and listed them in IBIS terminology). They need to use IBIS terminology to be meaningful, as they are in fact based on datasheet verbiage, and there could be even more verbiage that IBIS does not cover. Zhiping shared a link (<https://github.com/edatasheets/edatasheets.github.io>)

**UNIVERSITY RELATIONS**

Chulsoon Hwang reported to be brainstorming outreach efforts, but no update. Randy Wolff asked if the IEEE EMC summit would include any student presentations. Chulsoon responded that at least one is expected to present, with multiple anticipated to attend.

**INTERNATIONAL/EXTERNAL ACTIVITIES**

Conferences:

Randy Wolff reported that the next conference is IEEE in Grand Rapids, Michigan in August (TBD)

Press Updates

Bob Ross volunteered that there is a new tool called PyBERT reported by David Banas that supports in general IBIS, and basically supports IBIS-AMI. Randy Wolff provided a link (<https://www.5gtechnologyworld.com/analyze-signal-integrity-in-serial-links-with-pybert/>)

Related Standards

Randy Wolff reported on behalf of Michael Mirmak that there DASC is interested in whether IBIS is interested in joining IEEE in some way if that can be arranged. Randy asked Zhiping Yang whether a meeting would make sense as to DASC as a path forward. Also, Randy stated DASC would like to set up a liaison, with IBIS, for example it could be Michael Mirmak. Next DASC meeting is June 1, 2023. Randy stated he could investigate discussion with DASC representatives.

IEEE IBIS Standardization

Randy Wolff stated there does not seem to be a path forward with SAE-ITC to work with IEEE, and perhaps another path would exist to become part of the IEEE umbrella of standards. This topic will be removed from future meetings for the time being.

IBIS Summits:

IEEE SPI 2023 IBIS Summit (May 7-10, 2023, Aveiro, Portugal):

Randy Wolff summarized the summit was held at a large university campus, and mentioned attending the IEEE SPI conference in full, approximately 30 paper presentations with a keynote each day, excellent organization of the event and papers as well as tours. IBIS Summit was held as a hybrid event, which seemed to work well, with no significant issues with A/V. Presentations went well, with a couple of follow-ups requested such as BIRD220 to the authors of the paper from India, Bob Ross will send [AR]. And Jose Schutt-Aine of the University of Illinois Urbana-Champaign, shows a LIM simulator. Jose said he was looking for beta testers of that, and it does offer IBIS support (but not yet IBIS-AMI). Randy related that Jose was asking for feedback on how to display or report pole-residue information. Randy reported there was also some feedback on Touchstone, such as file size reduction and port naming schema. Randy polled for any other comments. Bob Ross volunteered that 28 people were initially registered, but some affiliations were not known. Randy responded he would help track that down. Weston Beal stated that he presented work on the power additions on Quality Specification, and polled for any suggestions or discussion, on the topic, to please contact him via email to arrange a discussion if desired, so that it could be finished up. Randy asked if Weston plans to present to the IBIS Open Forum, as an agenda item. Weston agreed and stated a hope that presentation to Open Forum would be the work nearly complete. Randy polled for any additional comments. There were none. Randy expressed thanks for everyone involved in participation and stated it went very well.

Randy stated IBIS is open to hosting additional presentations as well at this upcoming summit.

IEEE EMC+SIPI summit out in August-

Randy stated that IBIS participation must be officially approved. Randy stated that Chulsoon Hwang would be on-site and would appreciate if any other IBIS Board members could attend. Weston Beal stated he could also attend. Bob Ross motioned that we plan to hold the IBIS Summit Friday August 4th, 2023, as the EMC event is that whole week during August. Randy stated that we should first hold a more in depth discussion with IEEE before we hold an official motion. Bob stated last time we did not pay anything.

Link:

<https://spi2023.av.it.pt/submissions/>

**QUALITY TASK GROUP**

Bob Ross reported that we deferred on last release that now we must deal with several bugs. One is a solution to platform issue with AMI. Another that Graham Kus reported that deals with compiler warning messages, whether it is Windows or Linux or both (and whether it occurs in prior versions of source code). Also, whether bugs dealing with Randy Wolff’s reported NC that are not in compliance with the IBIS 7.2 specification- to document these perhaps as a BUG or separate BIRD. Bob stated there would probably be a 7.2.1 release to resolve these BUGs.

**Note:** The Quality task group checklist and other documentation can be found at:

[http://www.IBIS.org/quality\_wip/](http://www.ibis.org/quality_wip/)

**ADVANCED TECHNOLOGY MODELING TASK GROUP**

Arpad Muranyi that the activity is mostly about SPIM BIRD223, on BIRD web page. Recent discussion has been the question whether should be in IBIS specification or separately such as IBIS-ISS or Touchstone. He sent out an email yesterday, as it was decided to call a vote on people’s preferences. Next Tuesday there would be a strawman vote in the ATM and bring that to the Open Forum as a suggestion, and then hold an official vote at that time. Please spread the word as to whether it should be in IBIS or a separate specification or document.

Arpad reported another topic was question on continually adopting AMI models and their relation to BLOCK size. In case of AMI parameters that are returns to EDA tool. The discussion was triggered by DesignCon paper in February, IBIS modelling study in what a continually adapting model would return PAM-n thresholds to the tool, and Arpad wondered if that would interfere with size of AMI Out, such as the AMI could be returning data more frequently to the tool. Arpad stated the topic was tabled, so that it could be considered whether a real problem or could be ignored for the time being.

Arpad also mentioned that on the voting topic, that email vote would be possible in the event people were unable to attend. Bob Ross stated that if it is email vote, it is by organization. If it were strawman vote, it would be by opinions. But whether the resolution, it would have no bearing on actual approval of the BIRD. Arpad agreed, and that it would be whether the BIRD would be in IBIS specification or outside the specification. Randy Wolff encouraged everyone to attend the upcoming ATM meeting.

**Note:** Task group material can be found at:

[http://www.IBIS.org/macromodel\_wip/](http://www.ibis.org/macromodel_wip/)

**INTERCONNECT TASK GROUP**

**Note:** Task group material can be found at:

[http://www.IBIS.org/interconnect\_wip/](http://www.ibis.org/interconnect_wip/)

**EDITORIAL TASK GROUP**

Randy Wolff reported Randy Wolff reported on behalf of Michael Mirmak that working on essentially Touchstone 2.1 version which mostly relates to adding feature to Touchstone 1.0 syntax. The group is working on that. Then will move on to Touchstone 3.0, with some feedback gathered at the IBIS Summit with Michael Mirmak’s presentation on Touchstone related topics.

**Note:** Task group material can be found at:

[http://www.IBIS.org/editorial\_wip/](http://www.ibis.org/editorial_wip/)

**NEW ADMINISTRATIVE ISSUES**

Randy Wolff reported that someone volunteer be a returning officer, that would not be actively on the list of returning officers running for election. Arpad stated he would be willing to be nominated. Randy offered to review emails previous year for Arpad’s reference. The dates would be May 17 to 31st. Bob stated that anyone can vote but must be voting member company to be chair or vice chair, but that is the only restriction. Otherwise, anyone can be nominated or vote for officer positions. Just must be sure they are officially voting members. Arpad asked if people are willing to continue in current positions, can be considered part of nominations. Randy said all can be tallied as nomination lists.

Roll call: Graham Kus reported a mid-meeting count of 12 attendees.

**New and Revised \*IRDs**

BIRD224, by Liwei Zhao (Intel), reported that the reason we would like this change is to add ability to import Touchstone file (.ts4 file) for example the previous port order, are fixed. Both TX and RX side. While generating the model, we found the Touchstone file may have different port order. Would like to involve another type of order. So now we use the numbers to show the port order, side by side. Then we can decrease the effort of delivery and use of the IBIS model. Arpad Muranyi added that this proposal was discussed in IBIS ATM , and details have been already refined, and this BIRD represents those revisions. Randy Wolff noted this introduces two new reserved parameters for Tx and Rx, and also some new figures showing two types of port ordering. Both for the Tx and Rx sides. Randy stated that in ATM it was discussed to generalize this to allow any port order, but decided would be overly complicated, as we tend to see two types of port orders in majority, and that would be sufficient, as there are tools available to provide port-reordering to support one of the two majority formats. Arpad stated that people familiar with those terminology was IEEE ordering, and the other option is a new addition. The nomenclature is specific to the port numbering, and the noun references are not part of the specification. The two combinations would be supported. Liwei agreed.

Randy stated it would be scheduled for vote in an upcoming meeting.

BIRD 223: Randy mentioned there is an upcoming strawman poll in upcoming ATM meeting as to whether this is IBIS specification, or to be written as separate specification like Touchstone or IBIS-ISS with hooks into IBIS. Arpad once again restated the motivation for the strawman vote. Kyle Lake stated that Cadence is taking interest and would like to have an invite to be provided, a link to be shared within organizations.

**IRDs Scheduled for Vote**

None.

**IRDS Eligible for Vote**

BIRD223: Add support for SPIM in IBIS (Cai et al)

Link: <https://ibis.org/birds/bird223.docx>

Arpad Muranyi reported no update.

**Tabled IRDs: (No Discussion Without Motion to "untable")**

BIRD220: Pre-driver PSIJ Sensitivity Keyword (Ding et al)

Link:

[https://IBIS.org/birds/bird220.docx](https://ibis.org/birds/bird220.docx)

Bob Ross reported sharing the authors of the India paper to welcome their comments on BIRD220 and also the pending BIRD and invited to join the ATM if they wish.

Arpad stated there is a pending BIRD also by Kinger Cai, but is not yet a numbered BIRD, and would potentially follow the same path as the outcome of the current power-supply modelling BIRD follows. Same question may apply to both BIRDs. The BIRD220 on this screen is a completely different approach, basically an extension of what we already have, power-aware simulations, to extend to make more accurate. Time Domain simulation would include additional effects on output. All Time Domain related switching effects. The other BIRD is all frequency related. So they are different in those respects. But the outcome of the vote whether to adopt in IBIS specification or a separate document or specification would be the same path. Hopefully this avoids confusion.

Randy Wolff thanked Arpad for the clarification comments.

**IBISCHK AND TSCHK PARSER AND BUG STATUS**

IBISCHK Parser:

Bob Ross stated the new parser 7.2.0 had been released. Randy Wolff shared the link ([www.ibis.org/ibischk7](http://www.ibis.org/ibischk7)). Bob stated the executables are available thanks to Randy and others for providing checksums and executable packaging and anyway the parser is available. We will plan in the quality committee to work on several new bug reports on the IBISCHK parser, because we decided to release the parser with some known bugs without doing another revision of the parser. Arpad Muranyi once again mentioned that he discovered EMD related IBIS models, whether we will update the parser or the specification or both. Bob said he did not recall and stated we may need to clarify the IBIS specification, but update the IBISCHK parser as the intent was there. To make a warning or issue a warning report on something in EMD that is now stated as legal. Arpad stated we basically have an error message on the requirement that is not in the specification. Either reduce that error as a waring or make a statement in spec that those are required. Bob stated that it could be possible to do both- file a simple BIRD and then also adjust the parser. Arpad stated if the BIRD adds a statement to the specification, then we do not need to change the parser. If we don’t change the specification, then we need to change the parser. Bob stated the clarification BIRD would not change the specification, but would clarify what we intended in the specification, the rule of law is the IBISCHK parser is good. We do not deal with signal type and signal NC - NC is now an error. Randy Wolff suggested we discuss this further in the IBIS Quality meeting. Bob agreed we would defer this. Graham Kus reported warnings on that, and waiting for more information [AR].

TSCHK Parser:

No updated was reported.

**NEXT MEETING**

Randy Wolff stated the next meeting would be June 2, 2023 and June 23, 2023. Randy asked if there were any additional items. There were none raised. There was a motion to adjourn. The motion was seconded. There were no objections. The meeting was adjourned.

========================================================================

**NOTES**

IBIS CHAIR: Randy Wolff

[randy.wolff@ibis.org](mailto:randy.wolff@ibis.org)

VICE CHAIR: Lance Wang (978) 633-3388

lance.wang@ibis.org

Solutions Architect, Zuken USA

238 Littleton Road, Suite 100

Westford, MA 01886

SECRETARY: Graham Kus

graham.kus@ibis.org

Senior Engineer, The MathWorks, Inc.

3 Apple Hill Drive

Natick, MA 01760

TREASURER: Bob Ross (503) 246-8048

[bob@teraspeedlabs.com](mailto:bob@teraspeedlabs.com)

Engineer, Teraspeed Labs

10238 SW Lancaster Road

Portland, OR 97219

LIBRARIAN: Zhiping Yang

[zhiping.yang@ibis.org](mailto:zhiping.yang@ibis.org)

WEBMASTER: Steven Parker (845) 372-3294

[sparker@marvell.com](mailto:sparker@marvell.com)

Senior Staff Engineer, DSP, Marvell

2070 Route 52

Hopewell Junction, NY 12533-3507

POSTMASTER: Curtis Clark

[curtis.clark@ansys.com](mailto:curtis.clark@ansys.com)

Ansys, Inc.

400 Fifth Avenue

Suite 500

Waltham, MA 02451

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.
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  + <https://www.freelists.org/list/ibis-macro>
  + <https://www.freelists.org/list/ibis-interconn>
  + <https://www.freelists.org/list/ibis-editorial>
  + <https://www.freelists.org/list/ibis-quality>
* 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: ibischk7, 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 (attendee X; absent -)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Organization** | **Interest Category** | **Standards Ballot Voting Status** | **Mar. 31, 2023** | **Apr. 21, 2023** | **May 10, 2023** | **May 12, 2023** |
| Altair | User | Inactive | - | - | - | - |
| AMD (Xilinx) | Producer | Inactive | - | - | - | - |
| Analog Devices (Maxim Integrated) | Producer | Inactive | - | - | - | - |
| Ansys | User | Active | X | X | - | X |
| Applied Simulation Technology | User | Inactive | - | - | - | - |
| Aurora System | User | Inactive | - | - | - | - |
| Broadcom Ltd. | Producer | Inactive | - | - | - | - |
| Cadence Design Systems | User | Active | X | X | - | X |
| Celestica | User | Inactive | - | - | - | - |
| Cisco Systems | User | Inactive | - | - | - | - |
| Dassault Systemes | User | Inactive | - | - | X | - |
| GE Healthcare Technologies | User | Active | - | - | - | - |
| Google | User | Inactive | - | - | - | - |
| Honeywell | User | Active | - | X | - | - |
| Huawei Technologies | Producer | Inactive | - | - | X | - |
| Infineon Technologies AG | Producer | Inactive | - | - | - | - |
| Instituto de Telecomunicações | User | Inactive | - | - | X | - |
| Intel Corp. | Producer | Active | X | X | X | X |
| Keysight Technologies | User | Inactive | X | - | - | - |
| Marvell | Producer | Active | X | - | - | - |
| MathWorks | User | Active | X | X | X | X |
| Micron Technology | Producer | Active | X | - | - | - |
| MST EMC Lab | User | Inactive | - | X | - | X |
| SerDesDesign.com | User | Inactive | - | - | - | - |
| Siemens EDA | User | Active | X | X | X | X |
| STMicroelectronics | Producer | Inactive | - | - | X | - |
| Synopsys | User | Active | X | X | X | X |
| Teraspeed Labs | General Interest | Active | X | X | X | X |
| Waymo | User | Active | - | - | - | - |
| ZTE Corp. | User | Inactive | - | - | - | - |
| Zuken | User | Active | X | X | X | X |

= Temporarily not a voting member

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 (voting by email counts as attendance)

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.