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19 August 2025

Minutes

Committee: TC-2; Electromagnetic Compatibility (EMC) Measurements
Place: Room 302A, Raleigh Convention Center,
500 S Salisbury St, Raleigh, NC 27601, United States.
Date: 19 August 2025 (Tuesday)
Time: 7:00 to 9:00 AM EDT
Webex login info: <https://ieee.webex.com/ieee> Meeting number = 2349 125 2300
Password = EMC2025

1.0 Call to Order/Introductions

The meeting had 16 attendees (14 in-person, 2 via Webex)

Quorum Check: TC-2 Meeting Quorum shall be 20% of the membership. Ballots for new officers shall have minimum voting participation of 50% and may include email ballots in the participation count. Candidates (those who have attended only a single meeting on or after 2021 prior to the start of this meeting) who are attending this meeting may be considered now considered members.

10 of 19 members, (53% of membership) attended.

1.1 Charter

The committee reviews the adequacy of measurement procedures and measurement instrumentation specifications for radiated and conducted emission and immunity tests. Also discussed is the rationale for product emission limits and immunity test levels including performance requirements. The committee also supports EMC standards and procedures that deal with measurements and their uncertainty and how they are interpreted and applied.

2.0 Minutes from 2024 IEEE EMC TC-2 meeting (6 Aug 2024) at the IEEE EMC+SIPI 2024 Phoenix, AZ, Symposium were unanimously approved.

3.0 TC-2 Election Status

TC-2 officer election was held in person during the August 1st 2023 TC-2 meeting and the members elected the following officers: Monrad Monsen (Chair), Ahalya Srikanth (Vice Chair) and John Kraemer (Secretary). Our next election will be held in summer of 2026 with the next officer transition occurring on 1 January 2027.

4.0 Privacy Statement

Personal data will be handled in accordance with the IEEE Privacy Policy which can be found at: <https://www.ieee.org/security-privacy.html> . The TC-2 minutes will have list attendee names unless you contact the TC-2 secretary to ask for your name to not be mentioned. The information you provide in the sign-in roster (including email and company) will be used by the chapter officers for TC-2 related notifications/communications.

Note: For any attendees that are participating remotely, please ensure that your full name appears on the Webex call. Also, please send the secretary an email (John.Kraemer@ieee.org) with your name, company and email address prior to the adjournment of today's meeting. (This will ensure that you are included in the attendance and will be on the distribution list for future TC-2 email news and meeting announcements).

5.0 Committee Membership Status was communicated by the Chair as follows:

5.1 Removal of non-active participants from membership roster.

Membership indicates that you have attended the TC-2 committee meeting at least two (2) or more times in the last four (4) years; candidates are shown as attending a single meeting on or after 2022 and no other. By committee rules, these candidates are not members of TC-2 unless they attend a second TC-2 meeting within a four-year period.

All attendees will initial the sign-in roster or add their name if it is not on the roster. After the August 2025 TC-2 meeting, those that have not attended a TC-2 meeting since 2022 will no longer be a TC-2 member but will remain on the list for one additional year (2026) to receive meeting announcements. Those that have not attended a TC-2 meeting since 2020 will be removed from the list. Any of those that are dropped from the membership list can rejoin TC-2 by attending the requisite number of meetings in the time frame noted above.

6.0 Current Symposium TC-2 Activity (IEEE EMC+SIPI 2025), August 2025

6.1 Symposium paper review status (top paper, top TC-2 paper, Round 2 reviewing, etc).

6.1.1 FULL PAPERS

- 1st round number submitted: 10
- Accepted: 10
- Rejected: 0

6.1.2 ABSTRACT REVIEW PAPERS

- 1st round number submitted: 14
- Accepted: 12
- Rejected: 2

6.2 Symposium Sessions sponsored by TC-2 are shown in the final program. TC-2 is to be congratulated for sponsoring or participating in the **five** sessions/tutorials and workshops listed below.

- 01:30 PM-5:00 PM, Monday (8/18/2025): “**Basic EMC Measurements**”, Tutorial, 5 presentations, Monrad Monsen (Chair), Location: Room 305A. 29 to 33 attendees.
- 1:30 PM-5:00 PM, Tuesday (8/19/2025): “**EMC Measurements: Medical & Probes**”, Technical, 6 presentations, Monrad Monsen (Chair), Ahalya Srikanth (Co-Chair), Location: Room 306A

- **EMC Best Paper Finalist** presentation at 2:30pm “Obstacles and Mitigations for an Accurate Low Impedance, Low Frequency Measurement”, Faye Squires (Missouri University of Science & Technology, USA)
- **EMC Best Paper Finalist** at 3:30pm “RF-Induced Heating of Deep Brain Stimulation Devices During MRI: A Comparison Study of 1.5 T and 3 T Systems”, Sana Ullah (Northwestern University, USA)
- 8:30 AM-12:00 PM, Wednesday (8/20/2025): “**EMC Measurements: Emissions**”, Technical, 5 presentations, Dave Arnett (Chair), Monrad Monsen (Co-Chair), Location: Room 306A
- 8:30 AM- 12:00 PM, Thursday (8/21/2025): “**EMC Measurements: Design Related**”, Technical, 5 presentations, John Kraemer (Chair), Monrad Monsen (Co-Chair), Location 306A
 - **EMC Best Paper Finalist** at 8:30am “Measurements of Bonding and Faying Resistances for Stacked Bonds”, David Norte (BAE Systems, USA)
- 1:30 PM-4:30 PM, Thursday (8/21/2025): “**EMC Measurements: Immunity & Shielding**”, Technical, 5 presentations, Ahalya Srikanth (Chair), Monrad Monsen (Co-Chair), Location: Room 306A
 - **Exemplary Paper** at 1:30pm “An Overview of the IEEE P2715 Guide for the Characterization of the Shielding Effectiveness of Planar Materials”, Davy Pissort (ESAT-WaveCoRE Mechatronics Group, Belgium)

7.0 EMC Society Standards Status Update

The IEEE EMC Society sponsors many standards development, and that vast majority of the standards are devoted to EMC measurements related topics. We urge TC2 members and all within the EMC field to participate in the working groups to make these standards accurate, provide meaningful results and support the development of future technologies. You can participate in standards development, input standards improvements and even vote on future standards revisions by signing up in IEEE Standards Association myProject site (<https://development.standards.ieee.org/>). The table below shows the standards in the order they are listed on this myProject site.

Standard	Standard's Title	Group Chair
299.1	IEEE Standard Method for Measuring the Shielding Effectiveness of Enclosures and Boxes Having all Dimensions between 0.1 m and 2 m	Davy Pissort
299	IEEE Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures	Davy Pissort
	IEEE Standard Measurement Procedure for Field Disturbance Sensors 300 MHz to 40 GHz	TBA
	Topic: SE characterization for cables and connectors Title: TBA	TBA
1597.1	Standard for Validation of Computational Electromagnetics Computer Modeling and Simulations	Alistair Duffy
1597.2	IEEE Recommended Practice for Validation of Computational Electromagnetics Computer Modeling and Simulations	Alistair Duffy
2855	P2855 Recommended Practices for the Electromagnetic Characterization of Cable/Connector Assembly Shielding Effectiveness in Frequency Range of Direct Current to 40 GHz	Huadong Li
370	Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz.	Xiaoning Ye

2717	Passive Intermodulation Test Methods for Wireless Systems in Low Noise Environments	Lie Liu
1642	IEEE Recommended Practice for Protecting Publicly Accessible Computer Systems from Intentional Electromagnetic Interference (IEMI)	William Radasky
2838	Aircraft Component Lightning Strike Direct Effects Qualification	Frederick Heather
P187	IEEE Standard for Measurement Methods of Emissions from FM and Television Broadcast Receivers in the Frequency Range of 9kHz to 40GHz	David Traver
1848.1	Techniques and Measures to Manage Risks with Regard to Electromagnetic Disturbances - Machinery sector	Douglas Nix
2715	Guide for the Characterization of the Shielding Effectiveness of Planar Materials	Alpesh Bhoobe
	Topic: Power Line Noise Title: TBA	TBA
	Topic: Power Line Quality Title: TBA	TBA
1688	IEEE Standard Requirements for the Control of Electromagnetic Interference Characteristics of Replaceable Electronic Modules	Frederick Heather
	Techniques and Measures to Manager Risks with Regard To Electromagnetic Disturbances	Martin Armstrong
2710	Electromagnetic Shielding Performance of Enclosures for Portable Electronic Devices	Alistair Duffy
	Statistical Process Control for EMC Test Laboratories	Kimball Williams
2718	Guide for Near Field Characterization of Unintentional Stochastic Radiators	Valter Primiani
1560	Methods of Measurement of Radio Frequency Power Line Interference Filter in the Range of 100 Hz to 10 GHz	Daria Nemashkalo
1897	IEEE Recommended Practice for the Resolution of Power-Line Gap-Noise Reports	Michael Gruber
139	IEEE Recommended Practice for the Measurement of Radio Frequency Emission from Industrial, Scientific, and Medical (ISM) Equipment Installed on User's Premises	Ed Hare
187	Measurement Methods of Emissions	Ed Hare
299	Electromagnetic Shielding Enclosures	Maria Sarto
377	IEEE Recommended Practice for Measurement of Spurious Emission from Land-Mobile Communication Transmitters	Ed Hare
473	Recommended Practice for an Electromagnetic Site Survey (10 kHz to 40 GHz)	Chad Kiger
475	Field Disturbance Sensors	Ed Hare
1128	Recommended Practice for Radio-Frequency (RF) Absorber Evaluation in the Range of 30 MHz to 40 GHz	Zhong Chen
1140	IEEE Standard Procedures for the Measurement of Electric and Magnetic Fields from Video Display Terminals (VDTs) from 5 Hz to 400 kHz	Ed Hare
1302	Guide for the Electromagnetic Characterization of Conductive Gaskets in the Frequency Range of DC to 40 GHz	Johan Catrysse
1309	IEEE Standard for Calibration of Electromagnetic Field Sensors and Probes (Excluding Antennas) from 9 kHz to 40 GHz	Zhong Chen
1836	Power Line Quality	Larry Conrad
1837	Power Line Quality	S. Mark Halpin

Per Ross Carlton, more status detail is available at <https://www.emcs.org/wp-content/uploads/2025/08/EMC-Standards-Matrix.pdf>.

Additionally, the SDCOM webpage is at <https://www.emcs.org/standards/development-and-education/>.

Randy Jost briefly discussed the spacecraft EMI standard, which are similar to MIL-STD-461, and is up for the 5-year review. Randy offered to provide more information to those interested.

8.0 iNARTE Exam Question Review Activity

The Chair re-communicated the fact that IEEE terminated their relationship with iNARTE / Exemplar Global for EMC engineer and technician certification. The IEEE EMC Society has formed a standing committee chaired by Tom Braxton for updating EMC professional certification processes (formerly known as iNARTE) with a target of having exams available at the 2025 EMC Symposium, which was not met. Randy Jost said that the third party to administer the certification exams was being finalized, with the most likely outcome to be IEEE India since they have been successful with this sort of task for the IEEE Computer Society. Tom Fagan, who was in charge of collecting questions from TC-2 and TC-6 reported that we have enough questions, but they need to be vetted to ensure that they are not specification related. Tom and Randy reported that IEEE currently plans on re-writing the questions using AI to provide consistency. As far as TC-2 is concern, our effort in regard to providing exam questions is complete, however, if anyone has addition, non-specification related exam questions, they can send them to Tom.

9.0 Future Symposium Activity

9.1 Future topics and call for special sessions for the IEEE EMC+SIPI 2026 symposium in Dallas, Texas, USA on August 3 – 7, 2026.

9.2 Technical Program Responsibilities and session Chair reminders

We will not know how many sessions for 2026 that we will have until the paper reviews are completed.

9.3 2026 Paper Review Deadlines:

Proposed papers (full papers) due by 12 December 2025.

Acceptance or accept conditioned on changes will be issued by 27 February 2026.

Abstract review paper due 13 March 2026.

Revised full paper due 27 March 2026.

Final decision notification is 24 April 2026.

Final paper (adding author names, etc.) is 22 May 2026.

9.4 Paper reviewers

TC-2 members are welcome to be paper reviewers. If interested in reviewing papers, members should send Monrad Monsen (monrad_monsen@ieee.org) their resume along with your subject matter strengths/expertise so we can identify the best papers for you to review.

The TC-2 leadership team will send out the ScholarOne Abstracts link to the TC-2 distribution list to register for paper reviews.

9.5 New membership

TC-2 is always looking for more members that engage in the activities noted above.

9.6 New areas of interest / topics for 2026 Symposium for TC-2

9.6.1 Selection and care of cable workshop

- Support from P2855 working group

9.6.2 Setting up and EMC lab workshop

9.6.3 Presentation on how to write Test Procedures, or workshop on authoring EMC Test Documentation

- Include presentation on writing waivers
- Include presentation on how to define performance anomalies
- Process from Standards to Design to Measurement Process

9.6.4 Ask and Expert session on Test & Measurement

Randy Jost and Ross Carlton expressed interest in leading one or more of the above-mentioned workshops. Contact them or the chair if interested in participating as a presenter.

10.0 New Business Items

10.1 The chair talked about the LinkedIn TC-2 Group. 26 members as of today.

Members were encouraged to add posts to generate excitement for the Dallas EM Symposium and encourage EMC Measurement related presentations

11.0 Action Items

11.1 Investigate ideas for additional sessions and workshops – send ideas to chair.

12.0 Set meeting and agenda for next meeting(s)

12.1 Tentatively set for Tuesday August 4th, 2026, 7 am to 9 am, Dallas, Texas, USA.

13.0 Adjournment

John G. Kraemer

Secretary, IEEE EMC TC-2 (EMC Measurements)