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4 August 2026

Minutes

Committee:	TC-2; Electromagnetic Compatibility (EMC) Measurements
Place:	Room Metropolitan (Tower Mezzanine Level), Hilton Anatole, 2201 North Stemmons Freeway, Dallas, TX 75207
Date:	4 August 2026 (Tuesday)
Time:	7:00 to 9:00 AM CDT
Webex login info:	https://ieee.webex.com/ieee (Direct Link) Meeting number = 2333 205 8227 Password = EMC2026

1.0 Call to Order/Introductions

Meeting started at 7:01am.

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 2022 prior to the start of this meeting) who are attending this meeting may be considered now considered members.

10 of 16 members, (62.5% of membership) attended. Total of 17 attended the meeting (7 first-time attendees).

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 Approval of Minutes from 2025 IEEE EMC TC-2 meeting (19 Aug 2025) at the IEEE EMC+SIPI 2025 Symposium (Raleigh, NC).

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 2027 with the next officer transition occurring on 1 October 2027.
John Kraemer has requested to step down from the Secretary role, so we are seeking a volunteer that will be willing to serve in that role.

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 (interim monrad_monsen@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 2023 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 2026 TC-2 meeting, those that have not attended a TC-2 meeting since 2023 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 2022 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 2026), August 2026

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: 18
- Accepted: 17
- Rejected: 1

6.1.2 ABSTRACT REVIEW PAPERS

- 1st round number submitted: 7
- Accepted: 5
- 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 **seven** sessions/tutorials and workshops listed below.

- 1:30 PM-5:00 PM, Monday (8/03/2026): "**Basic EMC Measurements**", Tutorial, 5 presentations, Monrad Monsen (Chair), Location: Cortez D.

- 10:30 AM-12:00 PM, Tuesday (8/04/2026): "**EMC MEASUREMENTS – REVERBERATION CHAMBERS AND MATERIAL CHARACTERIZATION**", Technical, 3 presentations, Monrad Monsen (Chair), Location: Coronado A.
    - ***BEST EMC PAPER FINALIST***, 10:30AM-11:00AM, "Statistics of Electromagnetic Fields within Complex Nested Cavities Coupled by Various Wires & Apertures", Marshall Sowell & Carl Hager
    - ***BEST EMC STUDENT PAPER FINALIST***, 11:00AM-11:30AM, "Refined Maximum Power-Based Approach for EMI Measurements in Reverberation Chambers", Fushi Zhang, Vignesh Rajamani, Neelakantam Venkatarayalu, Jens Medler, Shuwen Li and Danny Bennett
- 1:30 PM-3:00 PM, Tuesday (8/04/2026): "**EMC MEASUREMENTS - RADIATED EMISSIONS**", Technical, 3 presentations, Dave Arnett (Chair), Monrad Monsen (Co-Chair), Location: Coronado A.
- 3:30 PM-5:30 PM, Tuesday (8/04/2026): "**EMC MEASUREMENTS - SHIELDING**", Technical, 4 presentations, Ross Carlton (Chair), Monrad Monsen (Co-Chair), Location: Coronado A.
- 10:30 AM- 12:00 PM, Wednesday (8/05/2026): "**EMC MEASUREMENTS - HERO AND PIM**", Technical, 3 presentations, Dave Arnett (Chair), Monrad Monsen (Co-Chair), Location: Coronado A.
- 10:30 AM-12:00 PM, Thursday (8/06/2025): "**EMC MEASUREMENTS - PCB LEVEL ASSESSMENTS**", Technical, 3 presentations, Monrad Monsen (Chair), Location: Coronado A.
    - ***BEST EMC PAPER FINALIST***, 10:30AM-11:00AM, "High-Frequency PDN Characterization of a PCB using Optical Isolation up to 1 GHz Frequency", Aishwarya Gavi and Jan Hansen
- 2:00 PM-3:30 PM, Thursday (8/06/2025): "**EMC MEASUREMENTS - IMPEDANCE MEASUREMENTS AND PROBES**", Technical, 3 presentations, Monrad Monsen (Chair), Location: Coronado A.

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. The table below shows the current status on IEEE standards. My thanks to Ross Carlton (Secretary, Standards Development & Education Committee) for providing the below information.

Project / Standard Number	Standard Year	Title	Link	Expiration Date	State	PAR Approval Date	PAR Expiration Date	Status
139	1988	IEEE Recommended Practice for the Measurement of Radio Frequency Emission from Industrial, Scientific, and Medical (ISM) Equipment Installed on User's Premises	link	31-Dec-2022	Inactive-Reserved			
140	1990	IEEE Recommended Practice for Minimization of Interference from Radio-Frequency Heating Equipment	link	31-Dec-2001	Inactive-Withdrawn			

187	2018	IEEE Standard for Measurement of Emissions from FM and Television Broadcast Receivers in the Frequency Range of 9 kHz to 40 GHz	link	31-Dec-2028	Active			
299	2006	Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures	link	31-Dec-2022	Inactive-Reserved	13-Feb-2025	31-Dec-2029	Chair = Pavi Radhakrishnan Revision in progress. Developing draft. Meeting 8:00am, Wed, 8/5/2026, room Monet
299.1	2013	Standard Method for Measuring the Shielding Effectiveness of Enclosures and Boxes Having all Dimensions between 0.1 m and 2 m	link	31-Dec-2023	Inactive-Reserved	13-Feb-2025	31-Dec-2029	Chair = Davy Pissoort Revision in progress. Developing draft. Meeting 8:00am, Wed, 8/5/2026, room Monet
370	2020	IEEE Standard for Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz	link	31-Dec-2030	Active			
377	1980	IEEE Recommended Practice for Measurement of Spurious Emission from Land-Mobile Communication Transmitters	link	31-Dec-2018	Inactive-Reserved			
473	2025	Recommended Practice for an Electromagnetic Site Survey (10 kHz to 40 GHz)	link	31-Dec-2035	Active			
475	2000	IEEE Standard Measurement Procedure for Field Disturbance Sensors 300 MHz to 40 GHz	link	31-Dec-2022	Inactive-Reserved			
1128	1998	Recommended Practice for Radio-Frequency (RF) Absorber Evaluation in the Range of 30 MHz to 40 GHz	link	31-Dec-2022	Active PAR	6-Dec-2017	31-Dec-2025	Chair = Zhong Chen. Revision in progress. Developing draft.
1140	1994	IEEE Standard Procedures for the Measurement of Electric and Magnetic Fields from Video Display Terminals (VDTs) from 5 Hz to 400 kHz	link	31-Dec-2018	Inactive-Reserved			
1302	2019	IEEE Guide for the Electromagnetic Characterization of Conductive Gaskets in the Frequency Range of DC to 40 GHz	link	31-Dec-2029	Active			
1309	2013	Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 kHz to 40 GHz	link	31-Dec-2023	Inactive-Reserved			Meeting 10:00am, Wed, 8/5/2026, room Ming
1560	2013	Standard for Methods of Measurement of Radio Frequency Power Line Interference Filter in the Range of 100 Hz to 10 GHz	link	31-Dec-2023	Active PAR	26-Sep-2024	31-Dec-2028	Chair = Dario Nemashkalo Revision in progress. Developing draft.
1597.1	2022	IEEE Standard for Validation of Computational Electromagnetics Computer Modeling and Simulations	link	31-Dec-2032	Active			
1597.2	2010	Recommended Practice for Validation of Computational Electromagnetics Computer Modeling and Simulations	link	31-Dec-2020	Inactive-Reserved			

1642	2015	IEEE Recommended Practice for Protecting Publicly Accessible Computer Systems from Intentional Electromagnetic Interference (IEMI)	link	31-Dec-2025	Active			
1688	2015	IEEE Standard Requirements for the Control of Electromagnetic Interference Characteristics of Replaceable Electronic Modules	link	31-Dec-2025	Active			
1848	2020	IEEE Standard for Techniques and Measures to Manage Functional Safety and Other Risks with Regard to Electromagnetic Disturbances	link	31-Dec-2030	Active			Meeting 8:00am, Wed, 8/5/2026, room Milan
P1848.1		Standard for Techniques & Measures to Manage Functional Safety and Other Risks With Regard to Electromagnetic Disturbances – Machinery Sector	link		Active PAR	21-Sep-2023	31-Dec-2027	Chair = Doug Nix Revision in progress. Developing draft.
1897	2024	IEEE Approved Draft Recommended Practice for Location of Power-Line Gap Interference Sources	link	31-Dec-2034	Active			
2665	2022	IEEE Recommended Practice for Statistical Process Control for EMC Test Laboratories	link	31-Dec-2032	Active			
P2710		Recommended Practice for Techniques to Evaluate the Performance of Enclosures and Other Methods for Electromagnetically Shielding Portable Electronic Devices	link		Active PAR	21-Sep-2023	31-Dec-2026	Chair = Alistair Duffy Revision in progress. Developing draft.
2715	2023	IEEE Guide for the Characterization of the Shielding Effectiveness of Planar Materials	link	31-Dec-2033	Active			
2716	2022	IEEE Guide for the Characterization of the Effectiveness of Printed Circuit Board Level Shielding	link	31-Dec-2032	Active			
2717	2024	IEEE Approved Draft Recommended Practice for Passive Intermodulation Test Methods for Wireless Systems in Low Noise Environments	link	31-Dec-2034	Active			
2718	2023	IEEE Guide for Near Field Characterization of Unintentional Stochastic Radiators	link	31-Dec-2033	Active			
P2838		Standard for Aircraft Component Lightning Strike Direct Effects Qualification	link		Active PAR	7-Nov-2019	31-Dec-2025	Chair = Fred Heather Revision in progress. Close to ballot. Meeting 10:00am, Thu, 8/6/2026, room Ming
P2855		Recommended Practice for the Electromagnetic Characterization of Cable/Connector Assembly Shielding Effectiveness in Frequency Range of Direct Current to 40 GHz	link		Active PAR	5-Mar-2020	31-Dec-2026	Chair = Huadong Li Revision in progress. Close to ballot.
P4119		Standard for Integration of Modeling and Simulation Methods in Electromagnetic Compatibility Engineering	link		Active PAR	14-May-2026	31-Dec-2030	Chair = Scott Piper Revision in progress. Developing draft.

PAR = Project Authorization Request. It is the means by which standards projects are started within the IEEE SA. PARs define the scope, purpose, and stakeholders for the new project.

Anyone interested in participating in one or more of the working groups can get more information by:

- Attending the working group itself if meeting this week.
    - **P1309** "Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 kHz to 40 GHz" Renewal Working Group meeting, 8:00-9:30am, Wednesday (Aug 5th), room Ming, Webex number 2346 286 6286.
    - **1848** "IEEE Standard for Techniques and Measures to Manage Functional Safety and Other Risks with Regard to Electromagnetic Disturbances" Renewal Working Group meeting, 8:00-9:30am, Wednesday (Aug 5th), room Milan, Webex number 2342 218 5584.
    - **Shielding Standards** continuity working group meeting, 8:00-10:00am, Wednesday (Aug 5th), room Monet, Webex number 2344 236 7061. This working group supports 299 "Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures" and 299.1 "Standard Method for Measuring the Shielding Effectiveness of Enclosures and Boxes Having all Dimensions between 0.1 m and 2 m".
    - **P2838** "Standard for Aircraft Component Lightning Strike Direct Effects Qualification" Working Group meeting, 10:00am-Noon, Thursday (Aug 6th), room Ming, Webex number 2340 181 7043.
    - ***New Proposal*** "Recommended Practices for the Electrical Characterization of Metal Contacts from DC to Radio Frequency", Noon-1:30pm, Wednesday (Aug 5th), room Miro, Webex 2331 269 8295. Both PAR and standard number yet to be issued.
- Attending the Standards Development & Education Committee **(SDECom) meeting**, 2:00-4:00pm, Thursday (Aug 6th), room Ming, Webex number 2341 985 9710.
- Attending the **Standards Happy Hour**, 4:00-6:00pm, Thursday (Aug 6th), room Monet.

Additionally, the SDECom webpage is at https://www.emcs.org/standards/development-and-education/ which provides the officers and latest EMC standards status information.

8.0 Professional EMC Engineer Exam Question Review Activity

IEEE terminated their relationship with iNARTE / Exemplar Global for EMC engineer and technician certification. The IEEE EMC Society formed a standing committee for updating EMC certification processes (formerly known as iNARTE). This committee was first chaired by Tom Braxton, then Mark Steffka, and now Matt Juszczyk. The committee plans to use IEEE India to administer the tests, monitor the continuing education of the certified EMC engineers and collect testing and later renewal fees.

Tom Fagan reported that the professional EMC engineer committee will meet Thursday. They have 1600 questions, but 800 of these will need to be removed because the test will focus on the EMC discipline and not on standards that may be unique to different industries and product categories.

9.0 Future Symposium Activity

9.1 Future topics and call for special sessions for the IEEE EMC+SIPI 2026 symposium in Portland, Oregon, USA on July 12-16, 2027.

Jacob Dixon (IBM) proposes a workshop/tutorial half-day session on EMC topics for large Data Centers. He noted that the high power draw and cooling challenges of the new densely packed Artificial Intelligence (AI) data centers raise EMC issues. After a few presentations on specific topics inherent in these data center designs, Monrad Monsen suggested that the session could end with a diverse industry panel discussing various issues raised and solutions tried plus to take on attendee questions. Jacob and Monrad will further discuss this proposal after the TC2 meeting. Please contact Jacob and Monrad if you have additional ideas for this session or would be interested in being one of the presenters.

9.2 Technical Program Responsibilities and Session Chair Reminders

If you would like to be on the paper review committee, please let Monrad Monsen know. Send him your EMC related credentials (education & experience) and the topics you feel comfortable reviewing so he can allocate appropriate papers to you for review. We attempt to have a minimum of three people review each paper.

9.3 2027 Paper Review Deadlines:

Special Session Proposals due 20 November 2026.
Traditional (full papers) and Special Session papers due by 25 December 2026.
Workshop, Tutorial, Experiments & Demonstration Proposals due 15 January 2027.
Paper acceptance or accept conditioned on changes will be issued by 5 February 2027.
Abstract review papers due 19 February 2027.
Revised full paper due 5 March 2027.
Final decision notification is 8 April 2027.
Final paper (adding author names, etc.) is 7 May 2027.

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.

NOTE: Later during the week, the symposium technical leadership announced that for EMC+SIPI 2027 Symposium we will be going away from ScholarOne and will instead use EDAS. TC2 will provide more details on this transition in future emails.

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 2027 Symposium for TC-2

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 the chair.

12.0 Set meeting and agenda for next meeting(s)

12.1 Tentatively set for Tuesday July 13th, 2027, 7 am to 9 am, Portland, Oregon, USA.

13.0 Adjournment

The meeting was adjourned at 7:51am.

Monrad Monsen
Chair, IEEE EMC TC-2 (EMC Measurements)