



**IEEE EMC Society
Technical Committee 4 – EMI Control**

<http://www.ewh.ieee.org/soc/emcs/committees/tc04/index.html>

Meeting Minutes

Place: Santa Clara Convention Center, Santa Clara, CA, USA

Date: 19 March 2015

1 Welcome & Introductions

The meeting called to order at 1200 by Mr. John Kraemer, TC 4 Vice-Chair. Attendees introduced themselves. The attendance sheet was passed around for signature.

2 Review of Draft Agenda

The draft agenda was reviewed and approved.

3 Announcements

None.

4 Last Meeting's Minutes

Minutes from the 2014 meeting in Raleigh, NC, USA were reviewed and accepted with two spelling corrections. Mr. Ross Carlton, TC 4 Secretary, will post the minutes on the TC web site.

5 Leadership

The TC elects officers every two (2) years. The current officers have served one (1) year of their two year term. The current officers are:

- Chairman: Phil Berger
- Vice-Chairman: John Kraemer
- Secretary: Ross Carlton

The next officer elections will be held in 2016 at the EMC Symposium in Ottawa, Canada.

6 Membership

Mr. Kraemer read the TC 4 Charter and described the purpose of the TC. He also reviewed the requirements for TC membership:

- Attend one (1) meeting of the TC every two (2) years.
- Review assigned papers in support of the yearly EMC Symposium(s).
- Provide a current resume and biography.

Attendees or other interested parties wishing to become members of TC 4 were requested to send a short biography and a resume to one of the officers.

Attendance at the past three meetings was as follows:

- 2012 – 21 attendees
- 2013 – 27 attendees
- 2014 – 19 attendees

7 Web Site

Mr. Ross Carlton, TC 4 Secretary, reviewed the status of the TC 4 web site. The web site has not been updated since prior to the 2013 Symposium. In consideration of TC 4 plans regarding the characterization of EMC gasket performance (see §10.1), the link for “SC2: Gaskets” under the Subcommittees link will be deleted.

ACTION: Mr. Carlton will update the TC 4 web site.

8 TAC Performance Guidelines for TCs

TC performance scores are not yet available. Scores should be provided at the EMC Symposium in August. For reference, the TC scored a total of 27 points (the minimum acceptable performance is 8 points) as reported at the 2014 EMC Symposium in Raleigh. The TC should continue to score well due to the number of technical papers reviewed and the acceptance of TC-sponsored workshops and tutorials for both Santa Clara and Dresden.

9 Program of Work Discussion

The discussion opened on the topic of the revision of IEEE Std 1302-2008 - IEEE Guide for the Electromagnetic Characterization of Conductive Gaskets in the Frequency Range of DC to 18 GHz being conducted as IEEE Project P1302. TC 4 has been interested in improvements to the characterization techniques and in extending the frequency range for some time. Mr. Gary Fenical updated the TC on the status of P1302. Work is in progress with a committee of about 20 members. Initial work will be in the area of evaluating proposed measurement methods. A meeting is planned during the Santa Clara Symposium but the formal meeting will be held in Dresden.

Mr. Christian Brull opened the next topic regarding the need for a near-field methodology for the characterization of the shielding effectiveness performance of board level shields. He expressed his desire to create a PAR for the development of such a standard. Mr. Brull proposed to develop an initial scope of such a standard to be presented at the next TC meeting. During discussion on such test methods, Mr. Fenical noted that the performance of the board level shield can be seriously impacted by the PCB, which forms the sixth side of the shielded enclosure. The methodology will need to account for such behavior.

Mr. David Brumbaugh noted that the SAE AE-4 committee currently has work in progress on similar gasket characterization standards:

- ARP1705C Coaxial Test Procedure to Measure the RF Shielding Characteristics of EMI Gasket Materials (Sponsored by Mr. George Kunkel)
 - SAE ARP-1705 needs to be revised to incorporate a change in the test fixture. The new test fixture improves accuracy between 1.0 and 10 GHz.
- ARP6248 Stripline Test Method to characterize the shielding effectiveness of conductive EMI gaskets up to 40 GHz (Sponsored by Mr. Christian Brull)
 - This new work proposal is intended to provide a test method to characterize the shielding effectiveness of conductive EMI gaskets up to 40 GHz.

Mr. Brumbaugh suggested that TC 4 members may be interested in participating in the SAE effort. It was noted that there are already several TC 4 members involved, including the sponsors of the standards, but that any information or invitation to participate would be forwarded to the TC 4 membership.

10 Subcommittee Update

10.1 SC1: Grounding and Bonding

The Chair of this Subcommittee, Mr. William Bush, was unable to attend the meeting. As a result, the status of this SC is unknown.

ACTION: Mr. Kraemer will contact the Chair of SC1 for status.

10.2 SC2: Gaskets

The Chair of this Subcommittee, Mr. Fenical, recommended closing the SC in favor of TC 4 members participating in the revision of IEEE Std 1302 being undertaken by P1302 under the scope of TC 2.

10.3 SC3: Materials

The Chair of this Subcommittee, Mr. Mark Montrose, reported that interest in the topic of materials science as applied to EMC is slowly growing. He explained the scope of SC3 being developed to help expand interest and membership. While the workshop proposed by SC3 was not accepted, the workshop was reformatted as a Plenary Session resulting in the first real focus on the topic at an EMC Symposium.

11 Symposium Activities for Santa Clara (March 2015)

Mr. Kraemer reviewed the TC's activities in support of the 2015 IEEE EMC Symposium in Santa Clara. The TC supported the Symposium in the following ways:

- Held annual meeting.
- Reviewed 9 technical papers with 6 accepted.
- Chaired one Technical Session.

- Sponsored one half-day Workshop on “EMI Debugging Techniques” chaired by Mr. Carlton.
- Sponsored one Plenary Session on “Optimizing Interference Control using Material Science” chaired by Mr. Montrose.

12 Symposium Activities for Dresden (August 2015)

Mr. Kraemer reviewed the TC’s activities in support of the 2015 IEEE EMC Symposium in Dresden. The TC plans to support the Symposium in the following ways:

- Reviewed 81 technical papers with 43 accepted as of this meeting.
- Hold annual meeting.
- Chair Technical Sessions.
- Sponsor one half-day Workshop on “EMI Debugging Techniques” focusing on radiated RF emissions chaired by Mr. Carlton.

13 Symposium Activities for Ottawa (July 2016)

Mr. Kraemer reviewed the TC’s activities in support of the 2016 IEEE EMC Symposium in Ottawa. The TC plans to support the Symposium in the following ways:

- Review papers.
- Hold annual meeting.
- Chair Technical Sessions.
- Sponsor at least one Session, Workshop or Tutorial. Suggested activities were as follows:
 - A panel discussion organized by Mr. Montrose on the topic of “properties of materials.”
 - A panel discussion organized by Mr. Fenical on the topic of “the application of board level shields.”
 - A workshop organized by Mr. Bruce Archambeault on the topic of “using automated tools to enhance first-pass success.”
 - A workshop organized by Mr. Carlton continuing the exploration of “EMI debugging techniques.”

14 Old Business

None

15 Action Items

None

16 Closing

The meeting was adjourned at 1307.

Minutes submitted by: Ross Carlton, Secretary, TC4 (ross.carlton@ieee.org)



TC4 Member List

NAME	AFFILITATION	EMAIL	ATTEND
Arafiles, Virgilio	DoD	vparafiles@ieee.org	12
Archambeault, Bruce	IBM	barch@us.ibm.com	12, 15.1
Beetner, Daryl	Missouri University of Science & Technology	daryl@mst.edu	13
Berger, Phil	Missouri University of Science & Technology	bergerphi@mst.edu	12, 13, 14
Bodette, Ed	IBM	bodette@us.ibm.com	13
Brull, Christian	Schlegel	christian.brull@schlegelemi.com	13, 14, 15.1
Brunbaugh, David	Boeing	david.brumbaugh@boeing.com	15.1
Burnham, Karen	NASA/JSC	karen.burnham@nasa.gov	13
Bush, William	Consultant	wbush@ieee.org	13
Carlstad, Vidar	Norwegian Aremend Forces	vcarlstad@mil.no	13
Carlton, Ross	National Instruments	ross.carlton@ieee.org	12,13, 14, 15.1
Conway, Patrick	Ball Aerospace	pconway@ball.com	13
Courtenay, Robert	Pacific Aerospace	rcourtenay@pacaero.com	12
Crowder, Michael	IBM	michaelc@us.ibm.com	13, 14
Davis, Bob	Lockhhed Martin	robert.h.davis@lmco.com	12, 15.1
Dixon, Paul	Laird	paul.dixon@lairdtech.com	13
Drewniak, Dr. James	Missouri University of Science & Technology	drewniak@umr.edu	12
Faraji, Parisa	Graftech Int'l	parisa.faraji@graftech.com	12, 13, 14
Fenical, Gary	Laird Technologies	gary.fenical@lairdtech.com	12, 13, 14, 15.1
Green, David	ARC Technologies	dgreen@arc-tech.com	14
Hannemann, Todd	Retlif	thannemann@retlif.com	13
Hofmann, Bob	Hofmann EMC Engineering	hrhofmann@att.net	13
Todd Hubing	Clemson University	hubing@clemson.edu	14, 15.1
Inman, David	Chomerics	dinman@parker.com	13, 14, 15.1
Jordan, Howard	Beechcraft	howard_jordan@beechcraft.com	13
Juszczyk, Matt	Rockwell Collins	matthew.juszczyk@rockwellcollins.com	-
Kerns, Donald	Dayton T. Brown	drkerns@ieee.org	12, 14
Khorrani, Mohammad	Laird Technologies	mohammad.khorrani@lairdtech.com	15.1
Kiger, Chad	AMS	ckiger@ams-corp.com	12
Kimmel, William	Kimmel-Gerke Assoc.	bkimmel@emiguru.com	14
Kraemer, John	Rockwell Collins	jgkraeme@rockwellcollins.com	12, 13, 14, 15.1
Kunkel, George	Spira	george@spira-emi.com	12, 13, 15.1
LaCourse, Adam	Curtis Instruments	lacoursea@curtisinstruments.com	15.1

NAME	AFFILITATION	EMAIL	ATTEND
Landers, Dean	Retlif	dlanders@retlif	13
McCallum, Ian	Graftech Int'l	ian.mccallum@graftech.com	14
McDonald, Tim	Electromagnetic Applications Inc	tim@ema3d.com	13
McInerney, Mike	Mac & Ernie	mkmcinerney@ieee.org	15.1
Mohr, Richard	R.J. Mohr Associates	r.j.mohr@ieee.org	12
Monsen, Monrad	Oracle	Monrad.monsen@oracle.com	15.1
Montrose, Mark	Montrose Compliance	m.montrose@ieee.org	12, 13, 14, 15.1
O'Connor, Finn	Alion	foconnor@alionscience.com	12, 13
Oliver, Mike	MAJR Products	emi@majr.com	13
Phipps, Kermit	AMS	khipps@ams-corp.com	12
Pissoort, Davy	KU Leuven	davy.pissoort@kulueven.be	13, 14
Prawica, Jack	DLS	jprawica@dlsemc.com	-
Sadonis, Ryan	LeaderTech	rsadonis@leadertechinc.com	12
Shafii, Jamal	UTC Aerospace	Jamal.shafii@utas.itc.com	13
Shea, Amy		ashea_home@yahoo.com	12
She, Brian	Laird Technologies	brian.she@lairdtech.com	12, 13, 14
Spaulding, Deirdre	Nuclear Regulatory Commission	deirdre.spaulding@nrc.gov	12
Steffka, Mark	General Motors	msteffka@ieee.org	15.1
Tazi, Aziz	Transport Canada	Aziz.tazi@tc.gc.ca	14
Wan, Fayu	Missouri University of Science & Technology	fayu.wan@gmail.com	-
Wantz, William	Spira	william@spira-emi.com	15.1
Wegrzyniak, Pawel	Laird Technologies	Pawel.wegrzyniak@lairdtech.com	14
Williams, Kimball	IEEE	k.williams@ieee.org	14
Zeng, Hua	Hitachi Automotive	hua.zeng@hitachi-automotive.us	12