VCCI DAYORI

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Contents

Contribution

Memories of electromagnetic compatibility research

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Kunio Sawaya

In 1970, I was assigned to Professor Yasuto Mushiake's laboratory in the Department of Communications Engineering, School of Engineering at Tohoku University for my graduation work. Around this time, I became involved in the Technical Committee on Antennas and Propagation (established in 1954 and abbreviated as the AP Committee) of the Institute of Electronics, Information and Communication Engineers (IEICE). This committee is still the main research group that I belong to. Another technical committee of the IEICE, the Technical Committee on Electromagnetic Compatibility (EMCJ Committee), was established in 1977 through the efforts of Professor Risaburo Sato who graduated from the same university in the same year as Professor Mushiake. The AP Committee focuses on antenna engineering, radio wave propagation engineering, and electromagnetic field theories while the EMCJ Committee focuses on research into suppressing unwanted emissions of electronic devices, improving electronic device immunity to electromagnetic field emissions, and analyzing the impact of electromagnetic radiation on human body. The former conducts research into the transmission, propagation, and reception of radio waves over long distances, while the latter conducts research into the prevention of electromagnetic disturbances. While the goals of these two committees may appear to be contradictory, both involve the study of electromagnetic fields using identical theories and numerical analysis methods. When the EMCJ Committee was established, I was a novice research associate who was interested in researching numerical analysis methods for electromagnetic fields. Professor Sato's laboratory and Professor Mushiake's laboratory were next to each other. I performed characteristic analysis of antennas for mobile communications in Professor Mushiake's lab while harboring a closet interest in research into electromagnetic compatibility (which was being performed next door!).

In May 1994, the third International Symposium on Electromagnetic Compatibility (EMC '94/Sendai) was hosted by the IEICE, with Professor Tasuku Takagi of the Department of Communications Engineering as chair of the organizing and executive committee. I participated in the running of this symposium and became involved in research and activities regarding EMC. Around the same time, I worked as a secretary for the EMCJ Committee under the chairmanship of Shuichi Nitta, a professor at Tokyo University of Agriculture and Technology. Professor Nitta was actively involved in monthly seminars and the Yuzawa Workshop (held annually in Echigo-Yuzawa, in northern Japan) as well as exchanges with overseas researchers. In August 1996, the Korea-Japan

Joint Conference on Electromagnetic Theory and Compatibility (KJJC-EMTC '96) was held in Seoul (South Korea) as a joint effort of the EMCJ Committee, the Technical Committee on Electromagnetic Theory (EMT Committee) of the IEICE, the Korea Electromagnetic Engineering Society, and the Technical Society of Microwave, Antennas, and Propagation of the Korea Institute of Telematics and Electronics. In November of the same year, the Asia-Pacific Conference on Environmental Electromagnetics (CEEM '96) was held in Xian (China) as a joint effort of the EMCJ Committee, the China Institute of Communications, and Beijing University of Posts and Telecommunications. For these two conferences, Dr. Fujio Amemiya from NTT Advanced Technology and I served as secretaries. Dr. Amemiya was a secretary for the EMCJ Committee at the time, and he and I are alumni from the same university (we graduated from the same department in the same year). In May 1999, the fourth International Symposium on Electromagnetic Compatibility (EMC '99/Tokyo) was held, with Professor Nitta as chair of the organizing and steering committee. I was honored with holding vice chair for the committee. Through these international symposiums, I was able to communicate with researchers in the field of electromagnetic compatibility in Japan and overseas. KJJC was held every three years until 2015. CEEM was also held until 2015, although irregularly.

My ties with EMC continued. In 2001, the "Research and development project for 3D visualization technology for radio waves emitted from electronic devices" was conducted by the Sendai EMC Research Center. This research center was established by the Telecommunications Advancement Organization (National Institute of Information and Communications Technology from 2004). Professor Risaburo Sato led the project with myself as subleader. I engaged in research into visualization of radio waves. We measured electric field distributions on flat viewing planes to extrapolate the electromagnetic fields of specific points. To put it succinctly, it was an inverse problem. I remember having a hard time trying to solve the problem with young researchers, including Dr. Kazumasa Taira who was on temporary assignment from the Communications Research Laboratory. It was hard because an inverse problem can have multiple solutions. Part of the research result was presented at the fifth International Symposium on Electromagnetic Compatibility (EMC '04/Sendai) held in 2004, and the presentation received the Excellent Award.

Although my main field of research is antenna engineering, my involvement in research into electromagnetic compatibility has blessed me with many wonderful memories. There have been numerous highlights – notably, the international conferences. While international conferences of varying scope have become fairly commonplace, they were decidedly uncommon when we started joint international conferences in South Korea and China almost 25 years ago. They were valuable experiences for me. Another highlight was conducting research at the Sendai EMC Research Center, which proved to be an invaluable experience that broadened the scope of my research themes. Last but by no means least, I would like to express my gratitude to all my predecessors and colleagues for their cooperation and unwavering support during these times.

Kunio Sawaya

1976	Completed a doctoral degree program at the Graduate School of Engineering, Tohoku University, research associate at Tohoku University
1987	Associate professor, Tohoku University
1993	Professor, Tohoku University
1999	Vice chair, organizing and steering committee for the International Symposium on Electromagnetic Compatibility
2004	Chair, organizing and steering committee for the International Symposium on Antennas and Propagation
2009 - 2010	President of the Communications Society, IEICE
2013	Emeritus professor, Tohoku University
2015	Specially appointed professor, Tohoku University
2019	Research fellow, Tohoku University

Committee Activities

●Board

Date	November 11, 2021
Reported item	● Reported item 1 Report on the activities of the first half of FY 2021

●Steering Committee

Date	November 9 and December 15, 2021
Agenda items	● Agenda item 1 Report on the activities of the first half of FY 2021 (draft) ● Agenda item 2 Guidance on registration of product conformity (how to write model names) (draft) ● Agenda item 3 Activity plans (drafts) of the individual subcommittees for the next fiscal year ● Agenda item 4 Guidance for Emission Measurement Using FFT-based Measuring Instruments (draft)
Decisions and reported items	● Agenda item 1 Approved ● Agenda item 2 Approved ● Agenda item 3 Approved ● Agenda item 4 Soliciting comments from companies (for approval next time) ● Reported item 1 Report on APEMC 2021 (draft) ● Reported item 2 Translating guidance on registration of product conformity (how to write model names) into English ● Reported item 3 2022 Rules Briefing and Technical Symposium program (draft) ● Reported item 4 Activities of subcommittees (Technical, International Relations, Market Sampling Test, Public Relations, Education) in October and November ● Reported item 5 Secretariat work (member entry and withdrawal trends, number of compliance verification reports, income and expenditure records, etc.)

●Technical Subcommittee

Date	November 17 and December 7	
Agenda items	● Agenda item 1	Technical Subcommittee's planned activities and results for FY 2021
	● Agenda item 2	Technical Subcommittee's planned activities for FY 2022
	● Agenda item 3	2022 Rules Briefing and Technical Symposium
	● Agenda item 4	"Guidance for emission measurement using FFT based measuring instruments"
	● Agenda item 5	"Considerations on height scan and allowable values in radiated emission measurements above 1 GHz"
	● Agenda item 6	"Assessment of whether EUT impedance affects AANs with asymmetrical transformers" during measurement of conducted emissions
	● Agenda item 7	Methods of validation for test sites for radiated emission measurement up to 30 MHz
	● Agenda item 8	Activities for promoting standardization of mains cable termination devices
Continuing agenda items	● Agenda item 1, 2, 3, 4, 5, 6, 7, 8	
Decisions and reported items	● Reported item 1	Report on APEMC 2021 Hybrid Conference (September 27-30, 2021) (see page 15)
	● Reported item 2	Report on web conferences of the CISPR Plenary Assembly and SCs (November 8- 19, 2021)

●International Relations Subcommittee

Date	October 6, November 12, and December 7, 2021	
Agenda items	● Agenda item 1	Survey on trends in world EMC standards
	● Agenda item 2	International Forum for the current fiscal year
	● Agenda item 3	FY 2022 business plan
Continuing agenda items	● Agenda item 1	
	● Agenda item 2	Discussion about and preparation for the International Forum for the current fiscal year
Decisions and reported items	● Agenda item 1	The results of the survey on trends in world EMC standards were published on the VCCI website on October 6, November 12, and December 7.
	● Agenda item 2	Due to COVID-19 outbreak, the International Forum for the current fiscal year will be distributed on demand from March 14 through March 18. Lecturers will be invited from the EU, USA, China, and UK.

●Market Sampling Test Subcommittee

Date	October 11, November 11, and December 2, 2021
Agenda items	● Agenda item 1 Market sampling test report ● Agenda item 2 Document inspection report ● Agenda item 3 Planned activities for FY 2022
Decisions and reported items	● Agenda item 1 For FY 2021 sampling tests, 85 products were selected (purchased or acquired on loan) and tests are underway. Three items were tentatively determined as "failed" in the third quarter. For these three items and one item tentatively determined as "failed" in August, responsible members started investigation. One item was judged as "passed" based on the responsible member's investigation report. ● Agenda item 2 40 products were selected for document inspections for FY 2021, which are underway. ● Agenda item 3 Planned activities for FY 2022 were discussed and approved.

●Public Relations Subcommittee

Date	October 8, November 12, and December 3, 2021
Agenda items	● Agenda item 1 2022 desktop calendar and special calendar for overseas members ● Agenda item 2 CEATEC 2021 ONLINE ● Agenda item 3 Web content ● Agenda item 4 Creating Chinese, Taiwanese, and Korean versions of some pages of the VCCI website ● Agenda item 5 COMPUTEX TAIPEI 2022 ● Agenda item 6 Changing JR Osaka Station billboard advertisement designs ● Agenda item 7 Planned activities for FY 2022
Continuing agenda items	● Agenda item 4, 7
Decisions and reported items	● Agenda item 1 A report was made to announce completion of the 2022 desktop calendar and completion of shipping the copies of the wall calendar for existing overseas members. ● Agenda item 2 Participation in CEATEC 2021 ONLINE was reported (see page 22). ● Agenda item 3 Creation of web content was re-discussed. Some members mentioned that exhibition formats were fixed for Japanese online exhibitions and our original web content might not be effectively used for such exhibitions. When we checked the enrollment trend of new members, we realized that more new members came from overseas rather than from Japan, especially from China, Taiwan, and Korea. As a result of investigation and discussion, it was decided that, rather than create additional website content, we should translate some of the current website pages into Chinese, Taiwanese, and Korean for prospective members in China, Taiwan, and Korea (to familiarize them with the VCCI Council and prompt enrollment). ● Agenda item 5 In late October, 2021, the Japanese office of COMPUTEX TAIPEI informed us that the exhibition is currently scheduled to be held in 2022. The exhibition will be held from May 24 (Tue) through 27 (Fri), 2022 at the Taipei Nangang Exhibition Center. At the time of the meeting in November, we decided to participate. ● Agenda item 6 New design candidates for the JR Osaka Station billboard advertisement were discussed. After some additions and corrections, a new design was determined. The new billboard advertisement will be posted from January 2022.

●Education Subcommittee

Date	October 15, November 4, and December 10, 2021
Agenda items	● Agenda item 1 Refinement of textbooks for FY 2021 education and training sessions ● Agenda item 2 Holding status of education and training sessions for FY 2021 ● Agenda item 3 Planned education and training sessions for FY 2022
Continuing agenda items	● Agenda item 1, 3
Decisions and reported items	● Agenda item 1 Seven TFs were created to refine the textbooks mainly to cope with online distribution. Six TFs completed refinement. ● Agenda item 2 - In November, the subcommittee began accepting applications for four education and training sessions ("The basic of electromagnetic waves, EMI measurement technique below 1 GHz", "EMI measurement technique above 1 GHz", "The level up of the EMI measurement technique", and "EMI measurement instrumentation uncertainty (MIU)"). - The subcommittee is planning to hold classroom lectures online (live streaming) and provide hands-on training with all attendees in one place. Applications for the two education and training seminars containing hands-on training ("The basic of electromagnetic waves, EMI measurement technique below 1 GHz" and "EMI measurement technique above 1 GHz") reached the limit, and the subcommittee ended accepting applications. - Whether to hold lectures with face-to-face training will depend on the status of COVID-19. The subcommittee will place COVID-19 countermeasures at locations of hands-on training and determine whether it is viable to hold such lectures.

●Registration Committee for Measurement Facilities

Date	October 18, 2021
Agenda items	● The subcommittee reviewed the results of deliberations by the Measurement Facility Examination and Registration WG.
Decisions and reported items	Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 27 companies Radiated emission measurement facilities below 1 GHz 14 AC-mains-ports-conducted emission measurement facilities 13 Telecommunication-port-conducted emission measurement facilities 8 Radiated emission measurement facilities above 1 GHz 12 Applications returned with comments None Applications carried over to the next meeting None
Date	November 22, 2021
Agenda items	● The subcommittee reviewed the results of deliberations by the Measurement Facility Examination and Registration WG.
Decisions and reported items	Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 24 companies Radiated emission measurement facilities below 1 GHz 9 AC-mains-ports-conducted emission measurement facilities 14 Telecommunication-port-conducted emission measurement facilities 13 Radiated emission measurement facilities above 1 GHz 10 Applications returned with comments None Applications carried over to the next meeting None
Date	December 20, 2021
Agenda items	● The subcommittee reviewed the results of deliberations by the Measurement Facility Examination and Registration WG.
Decisions and reported items	Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 24 companies Radiated emission measurement facilities below 1 GHz 11 AC-mains-ports-conducted emission measurement facilities 14 Telecommunication-port-conducted emission measurement facilities 11 Radiated emission measurement facilities above 1 GHz 14 Applications returned with comments None Applications carried over to the next meeting None

●List of abbreviations used in VCCI Dayori

Abbreviation	Full Name
AAN	Asymmetric Artificial Network
AMN	Artificial Mains Network
APD	Amplitude Probability Distribution
AN	Artificial Network
CALTS	Calibration Test Site
CB	Competent Body
CD	Committee Draft
CDNE	Coupling Decoupling Network for Emission
CDV	Committee Draft for Vote
CMAD	Common Mode Absorbing Device
CP	Current Probe
CSA	Classical（Conventional）Site Attenuation
DAF	Dual Antenna Factor
DC	Document for Comment
DoC	Declaration of Conformity
DOW	Date of Withdrawal
EMF	Electromagnetic Field
EUT	Equipment Under Test
FAR	Fully Anechoic Room
FDIS	Final Draft International Standard
FSOATS	Free Space Open Area Test Site
IS	International Standard
ISM	Industrial Scientific and Medical
ITE	Information Technology Equipment
LCL	Longitudinal Conversion Loss
MME	Multimedia Equipment
MOU	Memorandum of Understanding
MRA	Mutual Recognition Agreement/Arrangement
NCB	National Certification Body
NP	New Work Item Proposal
NSA	Normalized Site Attenuation
OATS	Open Area Test Site
PAS	Publicly Available Specification
PLT	Power Line Telecommunication
RBW	Resolution Band Width
RRT	Round Robin Test
RSM	Reference Site Method
RVC	Reverberation Chamber
SAC	Semi Anechoic Chamber
SVSWR	Site voltage standing wave ratio
S/N	Signal to Noise ratio
TF	Task Force
UPS	Uninterruptible Power Supply System
VBW	Video Band Width
VHF-LISN	Very High Frequency-Line Impedance Stabilization Network
VSWR	Voltage Standing Wave Ratio
WG	Working Group
WP	Working Party

28th instalment

International EMC Product Standards without JIS Counterparts and Responsible TCs (Part 2)

Masamitsu Tokuda

1. Foreword

The IEC (International Electrotechnical Commission) have TCs (technical committees) for various products. Such TCs define EMC requirements for particular products in product standards. The EMC zone news page of the IEC website provides access to a list of EMC product standards[1]. There are two methods to define EMC requirements in product standards. One method is to define EMC requirements in clauses in the main body of product standards. The other method is to create stand-alone EMC publications, separate from the main body of product standards. This article covers only the latter type – stand-alone EMC product standards defining EMC requirements[2-4]. Table 1 lists the EMC product standards that were created by IEC TCs for particular products, without JIS (Japanese Industrial Standards) counterparts[5]. Note that the EMC product standards for automobiles are not included in this article because they were already explained in previous articles in VCCI Dayori[5-8]. The EMC product standards for semiconductor devices are also not included here because they are planned to be explained in future articles in VCCI Dayori.

This article introduces the EMC product standards created by TC 46 (cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories).

2. TC 46 (cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories)[5]

TC 46 (cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories) created many EMC product standards for test methods for metallic communication cables and test methods for metallic cables and other passive components (parts 4-0 to 4-16). Part 4-0 specifies the relationship between surface transfer impedance and screening attenuation as well as recommended limits. Part 4-1 provides an introduction to electromagnetic screening measurements. Parts 4-2 to 4-15 specify how to determine surface transfer impedance, screening attenuation, and coupling attenuation using various test methods including the triaxial method and absorbing clamp method.

For the triaxial method for testing metallic communication cables, IEC 62153-4-3 specifies how to measure surface transfer impedance, IEC 62153-4-4 specifies how to measure screening attenuation of cables up to and above 3 GHz, and IEC 62153-4-9 specifies how to measure coupling attenuation of screened balanced cables.

For the absorbing clamp method for testing metallic communication cables, IEC 62153-4-5 specifies how to determine screening or coupling attenuation of cables, IEC 62153-4-11 specifies how to

determine coupling attenuation or screening attenuation of patch cords, coaxial cable assemblies and pre-connectorized cables, IEC 62153-4-12 specifies how to determine coupling attenuation or screening attenuation of connecting hardware, IEC 62153-4-13 specifies how to determine coupling attenuation of links and channels (laboratory conditions), and IEC 62153-4-14 specifies how to determine coupling attenuation of cable assemblies (field conditions).

For other methods for testing metallic communication cables, IEC 62153-4-2 specifies how to determine screening and coupling attenuation using the injection clamp method, IEC 62153-4-6 specifies how to determine surface transfer impedance using the line injection method, and IEC 62153-4-10 specifies how to determine transfer impedance and screening attenuation of feed-throughs and electromagnetic gaskets using the double coaxial test method.

Table 1 International EMC Product Standards Created by TCs without JIS Counterparts (Part 2)

(as of December 2021)[5)]

Standard number [latest edition: month and year of issue]	Standard name
TC 46 (cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories)	
IEC 62153-4-0 [Ed.1.0: 11/2007]	Metallic communication cable test methods - Part 4-0: Electromagnetic compatibility (EMC)- Relationship between surface transfer impedance and screening attenuation, recommended limits
IEC 62153-4-1 [Ed.1.1: 05/2020]	Metallic communication cable test methods - Part 4-1: Electromagnetic compatibility (EMC)- Introduction to electromagnetic screening measurements
IEC 62153-4-2 [Ed.1.0: 10/2003]	Metallic communication cable test methods - Part 4-2: Electromagnetic compatibility (EMC)- Screening and coupling attenuation- Injection clamp method
IEC 62153-4-3 [Ed.2.0: 10/2013]	Metallic communication cable test methods - Part 4-3: Electromagnetic compatibility (EMC)- Surface transfer impedance-Triaxial method
IEC 62153-4-4 [Ed.2.0: 04/2015]	Metallic communication cable test methods - Part 4-4: Electromagnetic compatibility (EMC)- Test method for measuring of the screening attenuation as up to and above 3 GHz, triaxial method
IEC 62153-4-5 [Ed.2.0: 08/2021]	Metallic communication cable test methods - Part 4-5: Electromagnetic compatibility (EMC)- Screening or coupling attenuation- Absorbing clamp method
IEC 62153-4-6 [Ed.2.0: 08/2017]	Metallic communication cable test methods - Part 4-6: Electromagnetic compatibility (EMC)- Surface transfer impedance- line injection method

IEC 62153-4-7 [Ed.3.0: 07/2021]	Metallic cables and other passive components test methods - Part 4-7: Electromagnetic compatibility (EMC)- Test method for measuring of transfer impedance Z_T and screening attenuation a_S or coupling attenuation a_C of connectors and assemblies- Triaxial tube in tube method
IEC 62153-4-8 [Ed.2.0: 06/2018]	Metallic cables and other passive components-Test methods - Part 4-8: Electromagnetic compatibility (EMC)- Capacitive coupling admittance
IEC 62153-4-9 [Ed.2.1: 07/2020]	Metallic communication cable test methods - Part 4-9: Electromagnetic compatibility (EMC)- Coupling attenuation of screened balanced cables, triaxial method
IEC 62153-4-10 [Ed.2.1: 07/2020]	Metallic communication cable test methods - Part 4-10: Electromagnetic compatibility (EMC)- Transfer impedance and screening attenuation of feed-throughs and electromagnetic gaskets- Double coaxial test method
IEC 62153-4-11 [Ed.1.0: 08/2009]	Metallic communication cable test methods - Part 4-11: Electromagnetic compatibility (EMC)- Coupling attenuation or screening attenuation of patch cords, coaxial cable assemblies, pre-connectorized cables – Absorbing clamp method
IEC 62153-4-12 [Ed.1.0: 08/2009]	Metallic communication cable test methods - Part 4-12: Electromagnetic compatibility (EMC)- Coupling attenuation or screening attenuation of connecting hardware- Absorbing clamp method
IEC 62153-4-13 [Ed.1.0: 08/2009]	Metallic communication cable test methods - Part 4-13: Electromagnetic compatibility (EMC)- Coupling attenuation of links and channels (laboratory conditions)- Absorbing clamp method
IEC 62153-4-14 [Ed.1.0: 05/2012]	Metallic communication cable test methods - Part 4-14: Electromagnetic compatibility (EMC)- Coupling attenuation of cable assemblies (Field conditions) absorbing clamp method
IEC 62153-4-15 [Ed.2.0: 08/2021]	Metallic cables and other passive components test methods - Part 4-15: Electromagnetic compatibility (EMC)- Test method for measuring transfer impedance and screening attenuation- or coupling attenuation with triaxial cell
IEC 62153-4-16 [Ed.2.0: 08/2021]	Metallic cables and other passive components test methods - Part 4-16: Electromagnetic compatibility (EMC)- Extension of the frequency range to higher frequencies for transfer impedance and to lower frequencies for screening attenuation measurements using the triaxial setup
IEC 62153-4-17 [Ed.1.0: 08/2018]	Metallic cables and other passive components-Test methods - Part 4-17: Electromagnetic compatibility (EMC)- Reduction Factor
TC 46 (cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories) SC 46A (coaxial cables)	
IEC 61726 [Ed.3.0: 09/2015]	Cable assemblies, cables, connectors and passive microwave components- Screening attenuation measurement by the reverberation chamber method

For the triaxial method for testing metallic cables and other passive components, IEC 62153-4-7 specifies how to measure transfer impedance, screening attenuation and coupling attenuation of connectors and assemblies using triaxial tubes, IEC 62153-4-15 specifies how to measure transfer impedance and screening attenuation or coupling attenuation using a triaxial cell, and IEC 62153-4-16 specifies extension of the frequency range to higher frequencies for transfer impedance measurements and to lower frequencies for screening attenuation measurements using the triaxial set-up. In addition to EMC product standards that describe the triaxial method, IEC 62153-4-8 specifies how to determine capacitive coupling admittance and IEC 62153-4-17 specifies the reduction factor.

SC 46A (coaxial cables) of TC 46 created IEC 61726, which is an EMC product standard specifying how to measure screening attenuation using the reverberation chamber method for cable assemblies, cables, connectors, and passive microwave components.

[References]

1) EMC zone news page, IEC website: list of EMC product standards, September 2021
   EMC Product Standards | IEC
2) Electromagnetic compatibility - Wikipedia
   https://en.wikipedia.org/wiki/Electromagnetic_compatibility
3) EMC-related JIS (Japanese Industrial Standards) in Japan – EMC, safety standards - FC2
   http://firstspring.blog.fc2.com/blog-entry-131.html
4) EMC Test (OKI Engineering)
   https://www.oeg.co.jp/emc/emc.html
5) Masamitsu Tokuda: "Handbook on EMC Designs and Measurement Tests", Kagakujyoho Shuppan Co., Ltd., pp. 133-138, July 2021
6) Masamitsu Tokuda: "Automotive EMC Standards Developed by CISPR and IEC/TC69", VCCI Dayori, No. 136, pp.11-13, April 2020
7) Masamitsu Tokuda: "Automotive Immunity Standards Developed by ISO/TC22", VCCI Dayori, No. 137, pp.10-15, July 2020
8) Masamitsu Tokuda: "R10: International Regulation on EMC of Automobiles", VCCI Dayori, No. 138, pp.10-12, October 2020

Masamitsu Tokuda

1967 Graduated from Electronics Engineering Department of Hokkaido University
1969 Completed Electronics Engineering, Faculty of Engineering, Graduate School of Hokkaido University
Joined NTT, assigned to the Electrical Communications Laboratories
1987 Leader of EMC Study Group, NTT Telecommunication Networks Laboratories
1996 Professor of Electric Engineering Department, Kyushu Institute of Technology
2001 Professor of Electronic Communication Department, Musashi Engineering University
2010 Professor emeritus of Tokyo City University
Visiting co-researcher of the Graduate School of Frontier Sciences, The University of Tokyo

Major prizes received
1986 Merit award – IEICE
(on the design theory and evaluation method for optical fiber cables)
1997 Information communication merit award by MPT
(on EMC technology development)
2003 Industrial standard merit award by the minister of METI
2004 IEICE fellow
2007 Promoted to IEEE fellow

Report on APEMC 2021 HYBRID CONFERENCE

Technical Subcommittee

The following is a report on the APEMC 2021 Hybrid Conference.

- Venue: Bali, Indonesia (VCCI Council participated online)
- Academic conference period: September 27 (Mon) through 30 (Thu), 2021

[Overview]

As a result of COVID-19 restrictions, the symposium was held online and face-to-face.

Our participation in the conference included presentation of a paper submitted from the VCCI Council, oral sessions, and workshop/tutorial sessions to collect information.

During the course of the conference, there were 20 oral sessions (comprising 7 special sessions and 13 technical sessions), presentations of 151 papers (26 from Japan including one from VCCI Council), and 20 workshop/tutorial sessions.

Papers were presented from 23 countries and two regions: 27 from China, 26 from Japan, 19 from the Netherlands, 15 from Taiwan, and 12 from Indonesia.

The paper of the VCCI Council was presented in the oral session "EMC Measurements and EM Environment".

1. Presentation of Papers

Session: Technical Papers (TC-02) EMC Measurements and EM Environment

- Title: Verification of Using 150-Ohm Δ-AN Specified in Clause 4.7 of CISPR 16-1-2 for Measuring Conducted Emissions on AC Mains Power Ports
- Authors: Nozomi Miyake (NEC Corporation/VCCI Council), Motoki Yoshida (Panasonic Corporation/VCCI Council), and Hidenori Muramatsu (VCCI Council)
- Presenter: Nozomi Miyake (NEC Corporation/VCCI Council)
- Overview: This paper describes the results of examination into whether alternative measurement using the newly defined (added) Δ-AN is possible for AC mains port conducted emission measurements (using AMN) defined by CISPR 16-1-2. A comb generator and a desktop PC were used as EUT. The maximum Δ-AN measurement values of the comb generator and the desktop PC were high by 14.3 dB and 16.9 dB respectively, based on the measured values of AC mains cable conducted emissions using an AMN and Δ-AN. Based on the result obtained through this examination, this paper suggests that tolerances of AC mains port conducted emission must be specified for measurements using Δ-AN because measurement using

Δ-AN is overvaluation.

- Impressions: With respect to conducted emissions defined in CISPR 16-1-2, this paper clarified differences in conducted emission measurement results using AMN and Δ-AN. The presentation also discussed points to be considered in selecting an AMN and Δ-AN for actually measuring EUTs.
- Q&A: There was a basic question about the measurement location and target of EUT using Δ-AN.

2. Overview of Keynote, Workshop, and Tutorial Sessions

Session: Workshop 3 Conducted EMI problems with modern static electrical energy meters (Malfunction of smart meters due to conducted EMI)

- Overview: Three persons gave a presentation on the problems with conducted EMI with modern smart meters, latent smart meter problems, and the results of examination of disturbance current by experiment.

  Many consumers have encountered billing issues after replacement of electromechanical watt-hour meters with electronic watt-hour meters (smart meters). It has been acknowledged that photo/electric converters are related to this issue. A troubleshooting experiment was conducted in the laboratory to identify the cause. The experiment revealed that the problem is due to dim light from a light source (LED or miniature fluorescent light) and variable-speed water pumps. The maximum misdiagnosis rate in the experiment was 2675 %. It was reported that electronic watt-hour meters with a Rogowski coil had the highest misdiagnosis rate, while electronic watt-hour meters using a shunt resistor or a hall element had a lower misdiagnosis rate.

3. Overview of Oral Sessions

(1) Session: Session: SS-07 The Emerging Near-field/Far-field EMC Measurement and Modeling Technologies for Complex Electromagnetic Problems

- Title: Research on Calibration Method of Horizontal Loop Magnetic Near-field Probe
- Presenter: Pengcheng Huang, *et al*
- Country: China
- Affiliation: China Electronic Product Reliability and Environmental Testing Research Institute, Guangzhou
- Overview: The near-field probe is an important tool for troubleshooting EMC-related issues in integrated circuits (ICs). The IEC 61967 standard defines only the vertical-loop (horizontal magnetic field) calibration method for magnetic near-field probes. Based on IEC 61967 (related to the probe calibration method), this report proposed a calibration method for near-field magnetic field probes using TEM fields near the poles of a microstrip line. To validate this method, a prototype horizontal loop near-field magnetic field probe was constructed using

low temperature co-fired ceramic (LTCC) and a 50-Ohm microstrip line on a PCB. The calibration method using the vertical component of the magnetic field generated in the vicinity of the microstrip line (perpendicular to the PCB) was observed through simulation and experiment, and it was deemed that the horizontal-loop near-field magnetic field probe could be calibrated.

- Impressions: Japan led an initiative to standardize calibration of near-field probes for EMI evaluation of semiconductors. The intensity of the horizontal component of the magnetic field near a microstrip line is highest on the microstrip line. For this reason, detailed rules may be required for calibration based on the reference vertical magnetic field, while a vertical loop can be easily configured.

(2) Session: TC-02 EMC Measurements and EM Environment

- Title: Experimental Observations of the Minimum Dwell Time for Radiated Immunity Tests in a Vibrating Intrinsic Reverberation Chamber
- Presenter: Danilo IZZO, *et al.*
- Country: The Netherlands
- Affiliation: University of Twente
- Overview: A reverberation chamber allows testing of electronic devices in a statistically even isotropic electromagnetic field. A vibrating intrinsic reverberation chamber (VIRC) whose walls flexibly vibrate using a shielded tent can generate independent electromagnetic field strength consecutively. This presentation discussed the test time required to generate statistically independent fields within a 1.5 m x 1.2 m x 1.0 m chamber. The presentation focused on the results of examination at frequencies near the lowest usable frequency (LUF). Comparing the simulation results with empirical results, the authors suggested that predictions of minimum dwell times based solely on theoretical approaches would be highly error-prone if there is a less-than-ideal stirring process.
- Impressions: VIRC is also described in IEC 61000-4-21. The possibility of continuous mode generation, especially near LUFs, is expected to be of useful reference, although further study is required before its practical application.

(3) Session: TC-02 EMC Measurements and EM Environment

- Title: Title: Analysis of Metamaterial Walls Reverberation Chamber by Using Modal Expansion
- Presenter: Jeudy KEAN, *et al.*
- Country: France
- Affiliation: LAPLACE laboratory, Toulouse INP-ENSEEIHT
- Overview: Reducing the LUF can be expected by adding a material with anisotropic reflection characteristics, such as metamaterial. This presentation discussed metamaterial conditions

required for reducing the LUF. Examination revealed that the LUF can be reduced by using a capacitive metamaterial. As a result of calculation, it was proposed that the LUF would be reduced to approximately one-third of that measured in a conventional reverberation chamber.

- Impressions: The notion of controlling LUF (as determined by chamber size) using metamaterials that can equivalently control the phase of reflected waves on the wall surface is unique. Although a model was used in this examination, measurement in a reverberation chamber was considered helpful as a verification item of VCCI Council. Although a model was used in this examination, measurement in a reverberation chamber was considered helpful as a verification item of VCCI Council.

(4) Session: TC-02 EMC Measurements and EM Environment

- Title: Proposal of radiated disturbance measurements above 30 MHz for large-scale electric equipment
- Presenter: Tatsuru Itsukaichi, *et al.*
- Country: Japan
- Affiliation: Tohoku Gakuin University
- Overview: This session proposes the radiated emission testing method for large EUT in a frequency band above 30 MHz. Conventionally, radiated emission tests for large EUT are conducted to measure the radiated emission level in four orthogonal directions (0°, 90°, 180°, and 270°) from the maximum outer diameter with EUT placed on a turntable using an antenna at a distance of 10 m. In this presentation, multiple antennas are installed at intervals of 1.5 m at a distance of 3 m from large equipment to measure respective disturbance levels (based on CISPR 16-2-3 for testing small devices). As a result of measurement, the difference between measured disturbance levels was approximately 10 dB (approximately 8 dB at 72 MHz, and approximately 13 dB at 85 MHz), which is the value in consideration of the distance (10 m/3 m) attenuation. This session proposed the validity of the measurement method.
- Impressions: An anechoic chamber equipped with a large turntable was required for evaluating large equipment using the conventional testing method. However, such anechoic chambers are not common, and considerable cost is required for transporting and installing EUTs. Authorizing the effectiveness of this method brings significant time and economic advantages. This session was considered helpful as a verification item of VCCI Council.

(5) Session: TC-02 EMC Measurements and EM Environment

- Title: Design and Evaluation of Long Hexagonal Folded Antenna
- Presenter: Toshiya Ishizaki
- Country: Japan
- Affiliation: Tohoku Gakuin University

- Overview: A hexagonal folded antenna was designed and constructed for use as a wideband antenna for measuring EMI and RF immunity, and then its characteristics were evaluated. The three-antenna method was used to measure antenna gain using nine different-sized antennas (three for each size). The results showed that the use of a foldable rectangular hexagonal antenna (with a rectangular antenna element) resulted in increased antenna gain in the frequency band 2 GHz to 20 GHz.
- Impressions: It is reported that a single foldable rectangular hexagonal antenna, as proposed in this session, can cover 2 GHz to 20GHz. If it is verified that this type of antenna can cover higher frequencies, it will be used for 5G and Beyond 5, and proposals to CISPR and TC77 will be closely monitored.

(6) Session: TC-02 EMC Measurements and EM Environment

- Title: Correlation Between Measured Wideband Radio-Frequency Electromagnetic Radiation and the Area of Buildings
- Presenter: Xinwei Song *et al.*
- Country: China
- Affiliation: Beijing University
- Overview: This session discussed the effect of buildings and other architectural structures surrounding electromagnetic waves on broadband electromagnetic waves in order to infer the radiation status of electromagnetic waves based on topographic and urban maps. Wideband electromagnetic emissions in the frequency range 100 kHz to 6.5 GHz were measured at 60 points on a road within 600 m from a building area in Beijing, and then the influence of buildings was determined as a function of distance from buildings. The results showed that the level of electromagnetic radiation directly correlated with the area surrounded by buildings, with the most direct correlation being at distances between 400 m and 600 m from the measurement point. Furthermore, by calculating and examining the boundary at which the correlation between electromagnetic radiation level and building area decreases, electromagnetic radiation levels can be estimated up to 500 m from the building area. The influence of buildings at a distance of 400 m to 500 m is most dominant.
- Impressions: This session presented an example of examination on electromagnetic wave propagation status when a base station of mobile radio or Wi-Fi is set up in an urban area. A non-building area, an area including several buildings, and a congested building area were selected around a concentric circle area with the measurement location at center, and wideband electromagnetic emissions were measured on a road in Beijing. We were interested in finding out whether the results also applied in the case where electromagnetic emissions are measured in a city where building height, inter-building distance, and road width are significantly different from those in Beijing.

(7) Session: TC-10 Signal Integrity and Power Integrity

- Title: Analysis of Grand Void Patterns for Differential Microstrip Impedance Matching on Surface Mount Pads
- Presenter: Kuan-Ting Wu *et al.*
- Area: Taiwan
- Affiliation: ASUSTEK Computer Inc.
- Overview: Various problems occur as a result of interference between pads for surface-mount devices (SMDs) and the underlying ground layer on a printed circuit board (PCB). The method of removing the ground under the pads reduces influence on signal transmission. This session presented the ground removing method (square or circle only beneath four pads, rectangular including two pads, or square or circle including four pads) through simulation of comparative evaluation for the surface current flowing on the PCB. Consequently, the best result was obtained by removing the ground in a circle including four pads.
- Impressions: This method is deemed useful for designing ultra high frequency circuits towards 5G and 6G. In the next step regarding surface current simulation, we are considering adding evaluation of radiated electromagnetic fields (at a distance of 30 cm, for example).

(8) Session: TC-07 Aerospace EMC

- Title: Measurements of Electromagnetic Emission Nearby a Compact Drone
- Presenter: Makoto Nagata
- Country: Japan
- Affiliation: Kobe University
- Overview: This session presented the results of examination of electromagnetic interference between a drone's control function and radio module. When a drone flies above a densely populated region, it requires control via a cellular radio channel. Due to the densely-populated circuits in a compact drone, prevention of EMI is of critical importance This presentation reported the measurement results of electromagnetic disturbances (500 MHz to 6 GHz) irradiated from a drone placed in a radio anechoic chamber at a distance of 200 mm. The measurement results showed that the drone emitted electromagnetic waves of -151 dBm/Hz in the 800 MHz frequency band. Furthermore, when a cellular communication receiver was mounted on the same drone, reception sensitivity decreased by as much as 15 dB.
- Impressions: Drone-related EMC problems are treated as typical issues of flying robots in CISPR at present. CISPR has commenced research into ways of conducting emission measurements and immunity tests. However, methods of conducting these same measurements and tests during normal drone operation (that is, remaining airborne, omnidirectional movement, and motion speed) is still under consideration by the CISPR Product Committee. The decrease in reception sensitivity reported in this presentation indicates a need for future examination of

electromagnetic interference between a drone's control function and the radio module. We look forward to future examination results. We look forward to future examination results. This session was helpful in considering emission measurement methods for drones and immunity test methods.

4. Overview of Exhibition

Three organizations participated in the exhibition.

5. Impressions

Presentation of papers achieved the intended purpose.

It felt that participants could take part in more sessions due to the online/face-to-face nature of the symposium.

As showcased in the contents of this symposium, the effectiveness of measurements of large equipment at a distance shorter than the standard, measurement methods using a reverberation chamber, and drone measurement methods under actual operating conditions were examined. VCCI Council will make use of trends of standards and information obtained from the presentations for future investigation and verification methods. We shall endeavor to continue submitting papers to APEMC and other symposiums.

Report on Participation in CEATEC 2021 ONLINE

Public Relations Subcommittee

This is a report on CEATEC 2021 ONLINE.

Exhibition name: CEATEC 2021 ONLINE
https: //www.ceatec.com/ja/
Period: October 19 (Tue) through 22 (Fri), 2021
Archive period: October 22 (Fri) through November 30 (Tue), 2021
Number of exhibitor companies: 314
Registered number of visitors (unique) : 41,262

1. CEATEC

CEATEC is Asia's largest international exhibition for information technology and electronics, and is held annually in October at Makuhari Messe.

Under the banner "CEATEC 2021 ONLINE - Toward connecting society, co-creating the future, and the new-normal society", the exhibition disseminated information on both current and future technologies and services necessary for the new-normal society. The CEATEC 2021 exhibition was held online (as it was in 2020).

2. VCCI Council Booth

In accordance with the sponsor's online exhibition conditions, we published an overview of VCCI Council, introductory motion videos, and downloadable materials in both English and Japanese. Our online booth was designed to guide visitors to a questionnaire page. Questionnaire respondents could later receive a novelty.

Online booth

- Motion videos (English/Japanese)
  - "Do you know this mark?" (approx. 30 seconds)
  - Three themes "What is the VCCI Mark?", "How does a product for VCCI making?" and "Application range of VCCI" (approx. 7 minutes)

- Documents (English, Chinese (simplified and traditional characters), Japanese)
  - Introduction of VCCI mark
  - Introduction of VCCI Council
  - Annual Report 2020
  - Japanese electromagnetic regulations
  - Scope of international standard CISPR 32
  - Advertisement introduction of VCCI Council

- Number of booth visitors (until end of archive period)
  683 (including 46 questionnaire respondents)

3. Impressions

We participated in CEATEC 2021 ONLINE as we did in 2020.

We received a lot of valuable feedback in regard to the question of how our online exhibition could be improved. All feedback will be taken into consideration for future online and actual exhibitions.

We believe the online exhibition served as a great opportunity for people who generally do not attend conventional venue exhibitions to learn about VCCI Council.

We received a comment in the questionnaire that steady public relations activities through exhibitions are effective in spreading the word about VCCI Council activities. We will continue to promote public relations activities, including VCCI Council activities and the VCCI mark through participation in online exhibitions and real exhibitions.

Status on FY2021 Market Sampling Tests

Market Sampling Test Subcommittee

As of December 28, 2021

Planned number of market sampling tests	Loan-based	45	100
	Purchase-based	55	

Sampling test		Selected	Cancelled (Not shipped, etc.)	Testable samples	Test completed (Included number)	Judgment			
						Passed	Failed- tentative		
							Finally passed	Finally failed	Pending
Grand total		99	1	87	73	58	1	1	2
(Previous month grand total)		72	1	58	31	30	0	0	1
Loan-based testing total		46	1	44	34	23	1	1	1
Term (Included number)	1st Quarter	12	1	11	11	11	—	—	—
	2nd Quarter	20	—	20	19	12	1	1	1
	3rd Quarter	8	—	8	4	—	—	—	—
	4th Quarter	6	—	5	—	—	—	—	—
Purchase-based testing total		53	0	43	39	35	0	0	1
Term (Included number)	1st Quarter	20	0	20	20	19	—	—	1
	2nd Quarter	20	—	20	19	16	—	—	—
	3rd Quarter	13	—	3	—	—	—	—	—
	4th Quarter	—	—	—	—	—	—	—	—

Final Result

Passed	Failed	Pending
59	1	2

Document inspection	Selected	Cancelled (withdrawal, etc.)	Inspectable samples	Pre-check completed	Judgment completed	Judgment	
						Cleared	Problems identified
	41	2	39	36	23	19	4

Report from the Secretariat

● List of Members (October 2021 - December 2021)

New members

Membership	Member No.	Company Name	Country
Regular	4206	OHASHI SANGYO & CO., LTD.	JAPAN
Regular	4209	GS Yuasa Infrastructure Systems Co., Ltd.	JAPAN
Regular	4210	NTT PC Communications Incorporated	JAPAN
Regular	4212	FG-Lab Inc.	JAPAN
Regular	4213	Rhino Products Co., Ltd.	JAPAN
Regular	4187	Vecima Networks Inc.	CANADA
Regular	4195	HKC OVERSEAS LIMITED	CHINA
Regular	4203	Technologies Humanware	CANADA
Regular	4204	Airspan Networks Inc.	USA
Regular	4205	LEWITT GmbH	AUSTRIA
Regular	4207	BT5 Technologies	USA
Regular	4211	ASROCK Incorporation	CHINESE TAIPEI
Regular	4214	WHA YU INDUSTRIAL Co., Ltd.	CHINESE TAIPEI
Regular	4216	Ubiquoss Inc.	KOREA
Supporting	4201	Guangzhou GRG Metrology & Test Co., Ltd.	CHINA
Supporting	4202	SIQ Ljubljana	SLOVENIA

Company name change

Membership	Member No.	Company Name	Country	Old company name
Regular	2791	Handreamnet, CO., LTD	KOREA	SubGate CO., Ltd.
Regular	636	Cherry Europe GmbH	GERMANY	Cherry GmbH
Regular	3437	rf IDEAS, Inc.	USA	RF IDeas, Inc.
Regular	3630	Canon Korea Inc.	KOREA	Canon Korea Business Solutions Inc.
Supporting	2186	LGAI Technological Center, S.A. (Applus+ Laboratories)	SPAIN	APPLUS+ LGAI
Supporting	2257	Shenzhen FuLian FuGui Precision Industry Co., Ltd.	CHINA	Shenzhen FuGui Precision Industry Co., Ltd.
Supporting	3207	DSTech Co., Ltd.	KOREA	DSTech Co.
Supporting	3220	Nemko Scandinavia AS	NORWAY	Nemko AS
Supporting	4201	Guangzhou GRG Metrology & Test Co., Ltd.	CHINA	GUANGZHOU GRG METROLOGY & TEST CO., LTD.

Note: Please fill out and submit "Form 9 Change Notification" on the website when a company name has been changed.

Withdrawn members (who submitted a withdrawal notice)

Membership	Member No.	Company Name	Country
Regular	1833	FUJITSU KANSAI-CHUBU NET-TECH LIMITED	JAPAN
Regular	3386	FUJITSU COMPUTER TECHNOLOGIES LIMITED	JAPAN
Regular	4058	Deraoya-Project LLC	JAPAN
Supporting	1145	Eurofins E&E Hursley Ltd	U.K.

● VCCI Schedule for FY 2022

April	May	June ・Release VCCI Dayori No.145
July TECHNO-FRONTIER 2022	August ・Release Annual Report	September ・Release VCCI Dayori No.146
October ・CEATEC 2022	November	December ・Release VCCI Dayori No.147
January	February	March ・Release VCCI Dayori No.148

● Status of Compliance Test Notifications

October 2021—December 2021 (Product names are examples and are not limiting)

Classification of MME (Product types are not limited to only the following examples.)				Classification code		October 2021			November 2021			December 2021		
				Class A	Class B	Class A	Class B	Total	Class A	Class B	Total	Class A	Class B	Total
ITE	Computer	Large	Super computer, Server, etc.	A 2	a 2	34	1	35	23	0	23	21	2	23
		Stationary	Workstation, Desktop PC, etc.	B 2	b 2	3	27	30	2	27	29	6	23	29
		Portable	Laptop PC, Tablet PC, etc.	C 2	c 2	1	43	44	1	32	33	0	55	55
		Other computers	Wearable computers, Wearable device, Smart watch, Smart glass, etc.	E 2	e 2	0	0	0	4	1	5	4	2	6
	Peripheral / Terminal	Memory device	HDD, SSD, USB Memory, Media drive, Disk device, NAS, DAS, SAN, etc.	G 2	g 2	7	23	30	17	32	49	8	30	38
		Printer device	Printer including multifunction machine, etc. (portable)	H 2	h 2	3	10	13	13	2	15	3	0	3
		Display device	CRT display, Monitor, Projector, etc.	J 2	j 2	26	52	78	15	39	54	6	44	50
		Other I/0 devices	Image scanner, OCR, Pen tablet, Stylus pen, etc.	M 2	m 2	3	7	10	0	3	3	0	8	8
		General purpose terminal	Display controller terminal, etc.	N 2	n 2	0	7	7	0	1	1	2	0	2
		Special purpose terminal	POS, Terminal for finance, insmance, etc.	Q 2	q 2	8	4	12	7	2	9	3	0	3
		Other peripheral	PCI Card, Graphics Card, Mouse, Keyboard, Cradle, etc.	R 2	r 2	0	56	56	11	59	70	8	37	45
		Copying machine / Multifunction copying machine	Copying machine, Multifunction copying machine, etc. (Stationary)	S 2	s 2	0	0	0	2	1	3	1	0	1
	Communications equipment	Terminal equipment	Mobile phone, Smart phone, PHS phone, etc.	T 2	t 2	0	4	4	0	6	6	0	2	2
			Telephone device such as PBX, FAX, Key telephone systems, Cordless phone, etc.	U 2	u 2	0	0	0	0	0	0	2	0	2
		Network-related equipment	Communication line connecting device including Modem, Digital transmission unit, DSU, TA, Media converter, etc.	V 2	v 2	2	2	4	3	2	5	2	1	3
			LAN-related device, including Router, HUB, etc. Local switch, etc.	W 2	w 2	51	35	86	31	29	60	23	32	55
		Other communication equipment	Other communication equipment	X 2	x 2	7	11	18	18	10	28	11	12	23
Broadcast receiver equipment			TV, Radio, Tuner, Video recorder, Set-top box, etc.		k 2		4	4		0	0		0	0
Audio equipment			Speaker, Amplifier, IC recorder, Digital audio player, Headset, DTM, AI speaker, etc.	L 2	l 2	1	8	9	0	9	9	0	10	10
Video equipment		Video equipment	Digital video camera, Web camera, Network camera, Video player, Photo frame, Digital camera, Drive recorder, etc.	I 2	i 2	7	9	16	10	2	12	10	6	16
		Other video equipment	VR goggles, Scan converter, etc.	P 2	p 2	0	0	0	0	1	1	0	2	2
Entertainment lighting control equipment			Entertairunent lighting control equipment, etc.	Z 2	z 2	0	0	0	0	0	0	0	0	0
Other MME	Entertainment / Education	Electronic stationery	Electronic dictionary, e-book reader, Translator, Calculator, etc.	D 2	d 2	0	0	0	0	3	3	0	0	0
		Electronic toy	Game console, Game pad, toy drone, etc.	Y 2	y 2	1	5	6	1	2	3	0	0	0
		Other Entertainment / Education equipment	Navigator, AI robot, etc.	F 2	f 2	0	1	1	0	0	0	0	0	0
	Other MME		MME other than the above	O 2	o 2	12	7	19	7	4	11	7	8	15
Total						166	316	482	165	267	432	117	274	391

● Registration Status of Measurement and Other Facilities

The following table indicates the status on registration of measuring facilities in the most recent three months.

Facilities listed here are only those made open by registering members in principle. Members with those facilities whose valid period expired are kindly advised to contact VCCI to inform of the status they are in. Status to choose from are, renewal application being filed, new application being filed, waiting for the next issue to carry, or terminating the registration (all facilities are posted in the Web site).

Facilities in Japan are listed in Japanese.

List of newly registered or renewed facilities (October 2021 – December 2021)

R: Radiated EMI measurement facilities below 1GHz　C: AC-mains-ports-conducted EMI measurement facilities

T: Telecommunication-port-conducted EMI measurement facilities　G: Radiated EMI measurement facilities above 1GHz

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
EKTOS Testing & Reliability Services A/S	TRS-TLC-C	-	-	-	-	-	C-20108	2024/10/17	Hammerholmen 45A, 2650 Hvidovre, Denmark	+45-28831701
EKTOS Testing & Reliability Services A/S	TRS-TLC-T	-	-	-	-	-	T-20110	2024/10/17	Hammerholmen 45A, 2650 Hvidovre, Denmark	+45-28831701
EKTOS Testing & Reliability Services A/S	TRS-TLC-G	-	-	-	-	-	G-20142	2024/10/17	Hammerholmen 45A, 2650 Hvidovre, Denmark	+45-28831701
EKTOS Testing & Reliability Services A/S	TRS-TLC-R	-	-	-	○	-	R-20148	2024/10/17	Hammerholmen 45A, 2650 Hvidovre, Denmark	+45-28831701
EMTEK (Shenzhen) Co., Ltd.	3 m 1# Semi-anechoic Chamber	-	-	-	-	-	G-20141	2024/10/17	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China	+86-755-26954280
東芝キヤリアエンジニアリング＆ライフサポート株式会社	＃502電波暗室	-	-	-	-	-	T-20108	2024/10/17	静岡県富士市蓼原336番地	0545-62-5739
Cerpass Technology Corporation	Cerpass Technology (Dong Guan) Co.,Ltd.	-	-	-	-	○	R-20147	2024/10/17	Room 102, No.5 Xing' an Road, Chang' an Town, Dongguan city, Guangdong, 523847, China	+86-769-85471212-2820
DEKRA Testing and Certification Co., Ltd.	TR26	-	-	-	-	-	C-20109	2024/11/21	Room 108, Building A, Lenovo Sci-tech Port, No.5899 xiyou Road, Economic and Technological Development Zone, Hefei, 230601 P.R. China	+86-512-62515088-5160
DEKRA Testing and Certification Co., Ltd.	TR26	-	-	-	-	-	T-20111	2024/11/21	Room 108, Building A, Lenovo Sci-tech Port, No.5899 xiyou Road, Economic and Technological Development Zone, Hefei, 230601 P.R. China	+86-512-62515088-5160

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
DEKRA Testing and Certification Co., Ltd.	AC16	-	-	-	-	○	R-20149	2024/11/21	Room 108, Building A, Lenovo Sci-tech Port, No.5899 xiyou Road, Economic and Technological Development Zone, Hefei, 230601 P.R. China	+86-512-62515088-5160
DEKRA Testing and Certification Co., Ltd.	AC16	-	-	-	-	-	G-20143	2024/11/21	Room 108, Building A, Lenovo Sci-tech Port, No.5899 xiyou Road, Economic and Technological Development Zone, Hefei, 230601 P.R. China	+86-512-62515088-5160
Guangzhou GRG Metrology & Test Co., Ltd.	Semi-anechoic chamber #SZEMC2021-Z001 (Radiation 3 meter site)	-	-	-	-	-	G-20144	2024/11/21	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China	+86-755-61180008
Guangzhou GRG Metrology & Test Co., Ltd.	Semi-anechoic chamber #SA210603-01 (Radiation 3 meter site)	-	-	-	-	-	G-20145	2024/11/21	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China	+86-755-61180008
Guangzhou GRG Metrology & Test Co., Ltd.	10m Semi-anechoic chamber #SZEMC2019-G059	-	-	-	-	○	R-20150	2024/11/21	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China	+86-755-61180008
Guangzhou GRG Metrology & Test Co., Ltd.	Conducted disturbance shielded room (AC Mains Ports)	-	-	-	-	-	C-20111	2024/11/21	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China	+86-755-61180008
Guangzhou GRG Metrology & Test Co., Ltd.	Conducted disturbance shielded room (Wired network Ports)	-	-	-	-	-	T-20112	2024/11/21	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China	+86-755-61180008
Shenzhen Huaxia Testing Technology Co., Ltd.	Shenzhen Huaxia Testing Technology Co., Ltd.	-	-	-	-	-	C-20110	2024/11/21	1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China	+86-755-26648642

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	SAC-3	-	-	-	-	-	G-20140	2024/11/21	Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong, China	+86-755-33323481
TÜV SÜD PSB Pte. Ltd.	3 m RF Chamber (Lab 7)	-	-	-	○	-	R-20151	2024/11/21	15 International Business Park Singapore 6099387	+65-6973-6268
パナソニック株式会社	京橋電波暗室	-	-	-	-	-	G-20146	2024/12/19	大阪府大阪市中央区城見2丁目2番33号 ytv京橋ビル	080-9938-3873
パナソニック株式会社	京橋電波暗室	-	-	-	○	-	R-20152	2024/12/19	大阪府大阪市中央区城見2丁目2番33号 ytv京橋ビル	080-9938-3873
パナソニック株式会社	門真EMCサイト 3 m法電波暗室	-	-	-	○	-	R-20153	2024/12/19	大阪府門真市大字門真1048	06-6908-5950
EMITECH Angers	Emitech Juigne	-	-	-	-	-	C-20112	2024/12/19	Parc d'activite de Lanserre, 21 rue de la Fuye, Juigne sur Loire, France	+33 2 41 57 57 40
EMITECH Angers	Emitech Juigne	-	-	-	-	-	T-20113	2024/12/19	Parc d'activite de Lanserre, 21 rue de la Fuye, Juigne sur Loire, France	+33 2 41 57 57 40
EMITECH Angers	EMITECH Juigne- Semi Anechoic Chamber- 8592	-	-	-	-	-	G-20147	2024/12/19	Parc d'activite de Lanserre, 21 rue de la Fuye, Juigne sur Loire, France	+33 2 41 57 57 40

Closing words

My ultimate favorite dish is Tonkatsu (Japanese pork cutlet) so I visit a Tonkatsu restaurant almost every week.

For this essay, I would like to introduce the owner of a Tonkatsu restaurant that I frequently visit. It is discreetly located in a quiet residential area.

The owner says he decided to go to culinary school and become a cook because his father told him to get "marketable skills". After acquiring a chef's license, he chose to start his own Tonkatsu restaurant when he was only 22, thinking Tonkatsu was a simple dish and all he needed was one fryer to be successful.

When he first opened the restaurant, he could not attract many customers but persevered through trial and error, and introduced dishes other than Tonkatsu to the menu. 19 years later, the restaurant fell into financial trouble, and he seriously considered closing things down.

One day, he went to a different supplier on a whim and bought a premium branded pork he'd never tried before. When he cooked the meat, he was shocked at the difference from the pork that he usually bought. No juices leaked out from the crust. There was no unpleasant taste. The meat was not gamy. And the fat melted like ice cream. From that moment on, his attitude toward pork changed. He decided to check every detail about how pigs were raised, regularly visit pig farms and slaughterhouses, and check the food pigs ate.

When he started to serve premium pork that he carefully selected and was confident about, business turned better.

It was his turning point.

Now, he insists that he can tell whether pork came from a male pig or a female pig from the smell of meat.

Once a month, he temporarily closes his restaurant to visit pig farms all over Japan, from Hokkaido to Okinawa (Ishigaki Island).

Since he began to study the biology and farming process of pigs, he became increasingly conscious not to waste the life nurtured by farmers. Now he wants to cook meat carefully and serve it in the premium condition. As a result, he now cuts meat and slowly deep-fries it at low temperatures after an order is placed, not before.

Last time I visited the restaurant, it was so crowded that I had to wait for an hour before I could eat Tonkatsu.

The next premium pork the owner is planning to serve is from pigs that are fed on wine. He found this rare brand of pork at the end of the last year in a pig farm in the Yamanashi prefecture (which is famous for wine making). I am looking forward to tasting wine-fed pork.

I sincerely hope that the owner will keep serving his delicious Tonkatsu. (J.I.)

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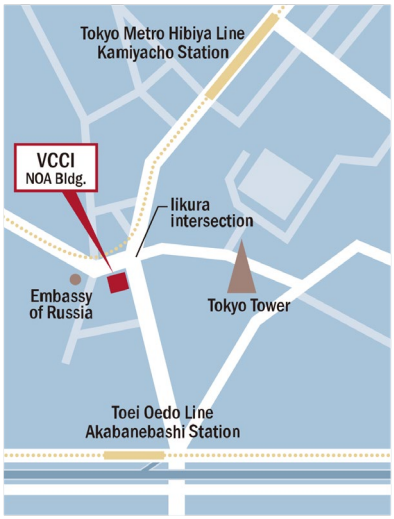

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