VCCI DAYORI

No.147　2023.1

Contents

New Year's Greetings

President, VCCI Council
Keiichi Kawakami

I would like to extend my sincerest wishes for the coming year of 2023.

It is now going on three years since the start of the COVID-19 pandemic in 2020. As we settle into our post-pandemic lifestyles, in which work from home, web conferences, and cashless payments have become the norm, we expect to see further changes being made to address our urgent global environmental issues and geopolitical tensions.

As global competition continues to escalate, the IT and electronics industries, which are closely tied to the VCCI Council, are expected to leverage the technical capabilities they have cultivated thus far to actively respond to these changes. We also expect these industries to build platforms that facilitate solutions to the many problems faced by Japan, an "advanced" country in terms of social issues, and pave the way toward achieving our goal of Society 5.0.

In October last year, the comprehensive Society 5.0 exhibition CEATEC 2022 was held at Makuhari Messe for the first time in in three years, in tandem with an online exhibition. CEATEC featured all kinds of occupations and industries falling within the scope of Society 5.0. The exhibition also featured many case examples of "co-creation" to solve social issues, such as Partners Park, whose theme was the "Digital Garden City". Some of the most notable examples were products and solutions proposed to solve our global environmental issues and achieve the individual well-being we all aspire to in Society 5.0.

To implement these new products and solutions in society, we will need sensing technologies to collect the necessary data, and advanced computing power to process that data at high speeds, interconnected by the next-generation high-speed communication standard 5G. 5G, launched in April 2020, offers increased speeds and capacities, more connections among terminals, low latency, and ultra-high reliability. Needless to say, however, a clean electromagnetic environment will be essential to unleashing the potential of these features of 5G. With all this in mind, we must be extra vigilant in our work to address the growing roles and responsibilities of the VCCI Council.

Since its establishment 37 years ago, the VCCI Council (formerly, Voluntary Control Council for Interference by Information Technology Equipment (VCCI)) has strived to tackle the issue of electromagnetic interference from information technology equipment and address the concerns of

Japanese users of consumer electronic and electric devices. I would like to reiterate my deepest gratitude toward the related government offices and organizations and the VCCI Council members for their help in achieving the VCCI mark's wide recognition and ensuring that the VCCI technical standards conform to the international CISPR standards.

CISPR 32 Edition 2 (March 2015) is an international standard that addresses electromagnetic emission from multimedia devices. In December 2015, a recommendation was submitted to the Information and Communications Council of the Ministry of Internal Affairs and Communications, where it was decided that the standard would be applied in Japan. As a multimedia EMC standard, this standard integrates the formerly separate standards for information technology equipment and AV equipment. The VCCI Council's new Rules for Voluntary Control Measures based on international standards were issued and took effect in November 2016. The new and old rules operated in parallel until April 2019, after which only the new rules apply. Three years and nine months have passed since we began operating solely under the new rules. Our members fully understand the current rules, and are doing a good job complying with them. The new rules include new stipulations on FARs (fully anechoic rooms). In FY 2022, we received our first registration application from a measurement facility, which upon examination was accepted as the first measurement facility to be registered with VCCI. The number of new "Registration of Product Conformity" submissions have stayed strong, and we are grateful to have seen yet more new members from countries where we previously had none.

The voluntary regulation of the VCCI Council has depended since its establishment on three major activities: appropriate conformity validation by members, fair market sampling tests, and a measurement facility registration system. In addition, the VCCI Council has held hands-on education and training seminars to improve the skills of engineers working in EMI measurement. These past two years, most VCCI events have been held online through our website as a measure against the spread of COVID-19. However, from FY 2022, we resumed our hands-on education and training seminars in FY 2022, as well as our overseas business trips from the summer of last year. We were able to attend the international EMC symposiums 2022 IEEE EMC+SIPI and EMC EUROPE 2022, where we presented papers and held local poster sessions. In this way, we are proceeding with our activities while adapting to the post-pandemic "new normal".

Going forward, we will continue to work with all concerned parties to contribute to the formation of a clean electromagnetic environment by aptly addressing the social changes needed to achieve Society 5.0. We will continue to ensure that the VCCI Council's activities are meaningful to all of our members and, by extension, to consumers in Japan. In conclusion, I look forward to your continued understanding and support for the VCCI Council, and hope that 2023 will prove a bright and promising year for the future.

Contribution

VCCI and CISPR

International expert on CISPR/B and F
Masahiro Inoue

After graduating from university, I started working for an electric appliance manufacturer. My first assignment was in the electrical engineering department handling color televisions. Later, I also gained experience in quality control for VCRs, but I found that at both workplaces, I had to deal with unwanted radiation from equipment. In 1980, I was transferred to the head office, and subsequently accepted the position of chairman of the Noise Prevention Subcommittee, a sub-organization of the Home Electrical Appliances Committee in the Japan Electrical Manufacturers' Association (JEMA). This led to my first participation in the CISPR meeting held in Sydney in 1985. My role at that time was mainly collecting information on home appliances for subcommittee B, which dealt with microwave ovens, and subcommittee F, which dealt with household appliances in general. I also attended subcommittee B's meeting on the standardization of IT Equipment being discussed by WG2 (Work Group 2), and witnessed the discussion on the draft of CISPR 22 at the time the standard was established. This was my first encounter with CISPR.

The first edition of CISPR 22 was published in 1985. The Japanese version of this standard was reported by the Information and Communications Council as a domestic standard, and was followed by VCCI, which was founded around that time. The history of VCCI's domestic implementation of voluntary control of electromagnetic interference based on this standard is as described by the late Prof. Akira Sugiura (Professor Emeritus at Tohoku University, and former chairman of the CISPR committee under the Information and Communications Council). These writings can be found in "The Dawn of Japan's CISPR Activities" on the "CISPR's Archive of Activities" page of the EMCC (Electromagnetic Compatibility Conference) website. At the time, I was focused on my committee activities at JEMA, and was not directly involved with VCCI, so I am not particularly familiar with the activities during that period. However, I have been participating in the activities of VCCI's International Relations Subcommittee from 2009 to the present day.

Unusually for an employee of private company, I have worked as an EMC-standards specialist for over 20 years in the same office without being transferred. Even after retiring, I have been consistently engaged in EMC-related work as an employee of various foundations and associations. In particular, regarding CISPR, I served as a senior member of subcommittees B and F of the CISPR Committee under the Information and Communications Council. Regarding the Electrical Appliance and Material Safety Act, I was head of the Radio Noise Subcommittee of the Electrical Appliance and Material Research Committee, which drafts technical standards for radio noise, for about 15

years. In my memory involvement in VCCI during that time was comparatively small.

VCCI's purpose is to achieve the suppression of unwanted radio noise from information technology equipment through voluntary control by industry groups rather than through legal regulation. Such control is not legally enforceable akin to the FCC regulations in the US or the EMC Directive in the EU. Due to my close involvement with the Electrical Appliance and Material Safety Act I saw many noncompliant products passing through the market in the results of market surveillance tests, even regal requirement by the Act exists. I honestly doubted whether overseas manufacturers and manufacturers unaffiliated with industry associations could understand VCCI's voluntary control system and follow the rules. In fact, I even had the temerity to raise these doubts with Haruyoshi Nagasawa, Executive Director of VCCI at that time, at the reception in the city after the 2008 CISPR Osaka meeting. However presently, I greatly admire and respect all the people who worked tirelessly at VCCI before the voluntary control system became established in Japan, and before many manufacturers in Japan and overseas would become VCCI members as they have now.

Now that manufacturers themselves are responsible for both product safety and EMC, we can recognize that VCCI's activities serve as an example of an organization that was ahead of its time, but still managed to succeed. The VCCI Council has backed up the international standardization activities led by Japanese experts in CISPR, and at the same time, enabled those standards to be quickly adopted in Japan, with the application of voluntary control. I would like to express my deep respect for this achievement, and I anticipate that VCCI will continue to play an important role in preventing electromagnetic interference in Japan.

Masahiro Inoue

1967	Graduated from the Electrical Engineering Department of Kyoto University
1967-2001	Matsushita Electric Industrial Co., Ltd. (currently Panasonic Holdings Corporation)
2002-2009	Japan Electrical Safety & Environment Technology Laboratories
2009-2017	KEC (Kansai Electronic Industry Development Center)
2017-2020	TOKIN EMC Engineering Co., Ltd.

Current positions

Contracted technical advisor to TOKIN EMC Engineering Co., Ltd.
Member of subcommittees B and F of the Radio Wave Utilization Environment Committee, Information and Communications Council of the Ministry of Internal Affairs and Communications

Committee Activities

●Steering Committee

Date	July 20, September 21, 2022	
Agenda items	● Agenda item 1	Selection of the committee chairperson
Decisions and reported items	● Agenda item 1	Approved
	● Reported item 1	Meetings of the Board of Directors and Council (June)
	● Reported item 2	Activities of subcommittees (Technical, International Relations, Market Sampling Test, Public Relations, and Education) in the period from June to August
	● Reported item 3	Secretariat work (such as member entry and withdrawal trends, the number of compliance verification reports, and income and expenditure records)
	● Reported item 4	On-demand distribution of VCCI Seminar 2022 at the Info-Communications Promotion Month held by the Ministry of Internal Affairs and Communications
	● Reported item 5	Distribution of the 2022 Rules Briefing and Technical Symposium Program
	● Reported item 6	Participation in TECHNO-FRONTIER 2022
	● Reported item 7	2022 IEEE EMC Symposium (mutual reporting with the US mutual recognition institute)
	● Reported item 8	VCCI Seminar 2022 (see page 28)

●Technical Subcommittee

Date	September 13, 2022
Agenda items	● Agenda item 1 Technical Subcommittee's planned activities for FY 2022 ● Agenda item 2 Testing of radiated emission measurement up to 30 MHz ● Agenda item 3 Testing of EUT impedance's effect on AANs with asymmetrical transformers during measurement of conducted emission ● Agenda item 4 Testing of whether measurement uncertainties were improved by CMAD attachment using non-invasive measurement methods ● Agenda item 5 Methods of validation for test sites for radiated emission measurement up to 30 MHz ● Agenda item 6 Activities for promoting standardization of mains cable termination devices
Continuing agenda items	● Agenda items 1, 2, 3, 4, 5, 6
Decisions and reported items	● Reported item 1 CISPR SC-H WG1 San Jose meeting report ● Reported item 2 Presentation and auditing of submitted papers at the 2022 IEEE EMC+SIPI International Symposium (Spokene, Washington) (see page 20)

●International Relations Subcommittee

Date	July 13 and September 14, 2022
Agenda items	● Agenda item 1 Survey of trends in world EMC standards ● Agenda item 2 Preparation for the FY 2022 International Forum
Continuing agenda items	● Agenda items 1, 2
Decisions and reported items	● Agenda item 1 FY 2022 edition of the world ITE/MME-related standards survey sheet (International Relations Subcommittee) updated on July 29 ● Agenda item 2 FY 2022 International Forum planned for March 2023

●Market Sampling Test Subcommittee

Date	July 14, September 12, 2022	
Agenda items	● Agenda item 1	Market sampling test report
	● Agenda item 2	Document inspection report
	● Agenda item 3	Results of further surveys regarding the FY 2021 market sampling test
	● Agenda item 4	Results of further surveys regarding the FY 2021 survey of the display of the VCCI mark
Decisions and reported items	● Agenda item 1	The products to be purchased and borrowed for FY 2022 sampling tests are being selected and tests are being performed. As a result, five products failed to meet the standards. Of these, additional tests and re-tests by members determined that three products passed. Two products are still being surveyed.
	● Agenda item 2	29 products were selected so far for FY 2022 document inspections, which are underway.
	● Agenda item 3	Of the products that failed the FY 2021 market sampling tests, further surveys involving additional tests and re-tests by members determined that three products passed.
	● Agenda item 4	Of the marked products with unknown reporting status in the FY 2021 market sampling tests, further surveys at 13 companies determined that some products were not reported. It was also determined that other products were reported, but there was difficulty matching the product label with the reported name. Corrective action has been taken for the former.

●Public Relations Subcommittee

Date	July 8, September 2, 2022
Agenda items	● Agenda item 1 Creating a video about disturbances by electromagnetic interference ● Agenda item 2 TECHNO-FRONTIER 2022 ● Agenda item 3 CEATEC 2022 ● Agenda item 4 Desktop and wall calendars ● Agenda item 5 Materials for business reports ● Agenda item 6 Video advertisement at Bic Camera TV sales floors
Continuing agenda items	● Agenda items 1, 3, 6
Decisions and reported items	● Agenda item 1 Video title specified as "Examples of electromagnetic interference caused by electromagnetic disturbances" Final confirmation and fine-tuning before recording the narration ● Reported item 2 Report on the real-life and online exhibits at TECHNO-FRONTIER 2022 (see page 18) ● Reported item 4 Report from the secretariat that desktop calendars were distributed at CEATEC and the like, while wall calendars created for overseas members will be sent out from October onward ● Reported item 5 Checking the FY 2021 materials for business reports at the Public Relations Subcommittee

●Education Subcommittee

Date	July 4 and August 26, 2022
Agenda items	● Agenda item 1 Discussing issues with FY 2022 education and training ● Agenda item 2 Status of preparations for FY 2022 education and training ● Agenda item 3 Results of FY 2022 education and training
Continuing agenda items	● Agenda item 1
Decisions and reported items	● Agenda item 1 - Discussing the setting up of three task forces (TFs) TF 1: Discussing integration of the EMI measurement technique above 1 GHz lecture with The basic of electromagnetic waves, EMI measurement technique below 1 GHz lecture TF 2: Discussing the creation and expansion of new questions enabling calculation of all EMI measurement instrumentation uncertainty (MIU) subject to the VCCI standards TF 3: Discussing the implementation of comprehension checks in education and training seminars ● Agenda item 2 - As a rule, classroom seminars for the second half of the fiscal year will be held online (livestreamed). However, when the COVID-19 situation settles down, hybrid classroom seminars will be held consisting of online and face-to-face. - Practical training in the second half of the fiscal year will continue to be held according to COVID-19 restrictions as in the first half. ● Agenda item 3 - On September 16, the 46th installment of The basic technique of EMI measurement was held online (livestreamed). All 8 attendees received attendance certificates.

●Registration Committee for Measurement Facilities

Date	July 19, 2022
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): 13 companies Radiated emission measurement facilities below 1 GHz 10 AC-mains-ports-conducted emission measurement facilities 6 Telecommunication-port-conducted emission measurement facilities 5 Radiated emission measurement facilities above 1 GHz 5 Applications returned with comments None Applications carried over to the next meeting None
Date	September 5, 2022
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 14 AC-mains-ports-conducted emission measurement facilities 12 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

●Report on Committee Activities: List of Acronyms

Abbreviation	Full Name
AAN	Asymmetric Artificial Network
AMN	Artificial Mains Network
ANSI	American National Standards Institute
APD	Amplitude Probability Distribution
APAC	Asia Pacific Accreditation Corporation
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China
BSMI	Bureau of Standards, Metrology and Inspection
CALTS	Calibration Test Site
CB	Certification Body
CB	Competent Body
CCC	China Compulsory Product Certification
CD	Committee Draft
CDN	Coupling Decoupling Network
CDNE	Coupling Decoupling Network for Emission
CDV	Committee Draft for Vote
CEMC	China Certification Center for Electromagnetic Compatibility
CEN	European Committee for Standardization
CENELEC	European Committee for Electro Technical Standardization
CISPR	International Special Committee on Radio Interference
CMAD	Common Mode Absorbing Device
CQC	China Quality Certification Center
CSA	Classical（Conventional）Site Attenuation
CSA	Canadian Standards Association
DAF	Dual Antenna Factor
DC	Document for Comment
DoC	Declaration of Conformity
DOW	Date of Withdrawal
DTI	Department of Trade and Industry
DUT	Device Under Test
Ecma	Ecma International
EICTA	European Information, Communications and Consumer Electronics Technology Industry Association
EMCC	Electro Magnetic Compatibility Conference
EMCAB	Electromagnetic Compatibility Advisory Bulletin
EMF	Electromagnetic Field
ETSI	European Telecommunication Standards Institute
EUANB	European Union Association of Notified Bodies
EUT	Equipment Under Test
FAR	Fully Anechoic Room
FDIS	Final Draft International Standard
GB	guo jia biao zhun（National Standard of China）
GSO	Gulf Cooperation Council Standardization Organization

Abbreviation	Full Name
ICES	Interference-Causing Equipment Standard
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IS	International Standard
ISM	Industrial Scientific and Medical
ITE	Information Technology Equipment
LCL	Longitudinal Conversion Loss
MIC	Ministry of Information and Communication
MME	Multimedia Equipment
MOU	Memorandum of Understanding
MP	Magnetic Probe
MRA	Mutual Recognition Agreement/Arrangement
NCB	National Certification Body
NICT	National Institute of Information and Communications Technology
NIST	National Institute of Standards and Technology
NP	New Work Item Proposal
NSA	Normalized Site Attenuation
OFDM	Orthogonal Frequency Division Multiplex
PAS	Publicly Available Specification
PLT	Power Line Telecommunication
R&TTE	Radio & Telecommunications Terminal Equipment
RBW	Resolution Band Width
REF	Reference
RRA	Radio Research Agency
RRT	Round Robin Test
RSM	Reference Site Method
RVC	Reverberation Chamber
SAC	Semi Anechoic Chamber
SDPPI	Semangat Disiplin Profesional Procuktif Integritas
S/N	Signal to Noise ratio
TF	Task Force
TG	Tracking Generator
UPS	Uninterruptible Power Supply
VBW	Video Band Width
VHF-LISN	Very High Frequency-Line Impedance Stabilization Network
VSWR	Voltage Standing Wave Ratio
WG	Working Group
WP	Working Party

31st instalment

EMC Standards for Semiconductor Devices – Methods for Measuring Immunity –

Masamitsu Tokuda

1. Foreword

As IoT, sensor networks, and automated driving become an increasing part of our daily life, it is important to ensure reliability of electrical and electronic systems hardware. With development of ADAS (advanced driver assistance systems), the techniques that are required for achieving EMC are shifting from conventional "techniques for minimizing noise" to techniques for securing functional safety and reliability of equipment, especially for onboard networks. At the same time, as immunity characteristics and ESD (electrostatic discharge) tolerance are expected to improve and wireless networks with lower electromagnetic emissions are high in demand, EMC evaluation and design of semiconductor devices (the building blocks of electrical and electronic systems) are also becoming increasingly more important. While TC47 (semiconductor devices)/SC47A (integrated circuits) of the IEC has developed EMC standards for integrated circuits (ICs), this article describes the standards for immunity measurement methods for ICs published as IEC 62132 series and IEC 62215 series, based on references 1 and 2. For an overview of EMC standards for semiconductor devices, refer to VCCI Dayori No. 139[3].

2. Methods of measuring integrated circuit (IC) immunity: IEC 62132 series

The measurement methods shown in Table 1 have been made a series. Like the methods of measuring emission (IEC 61967), these can be broadly categorized into "methods for measuring conductive immunity" and "methods for measuring radiated immunity". As mentioned in last month's issue4), several of these are paired methods for performing measurement using the same setup as emission measurements.

(1) IEC 62132-1: General conditions and definitions

Edition 1 (Ed.1.0) was published in 2006 for the measurement frequency range 150 kHz - 1 GHz. Later, a revised edition (Ed.2.0) was published in 2015 with the frequency range removed from the title due to the addition of new measurement methods and higher measurement frequencies. "Comparison Table for Test Methods" Annex A was revised to make it easier to select a measurement method from the IEC 62132 series.

(2) IEC 62132-2: TEM cell method: Radiated emission

This measurement method is paired with the emission measurement method IEC 61967-2. GTEM cells are included starting from Edition 1, published in 2010.

(3) IEC 62132-3: BCI method: Conducted emission

This is an IC immunity measurement method that uses current injection and current monitoring probes similar to those in the BCI method (bulk current injection method, ISO 11452-4), a standard-use immunity test method for vehicle-mounted equipment. Note that compared to the equipment-level BCI method's maximum measurement frequency of 400 MHz, the maximum frequency for IEC 62132-3 is 1 GHz. Practically speaking, however, such high frequencies are rarely used because the difficulty of designing a test board for probe placement makes it hard to obtain accurate measurements up to 1 GHz. For this reason, this standard was abolished in December 2020.

Table 1 Standards for methods of measuring integrated circuit immunity in semiconductors

(as of September 2022) [2)]

IEC 62132: Integrated circuits - Measurement of electromagnetic immunity

	Title
IEC 62132-1: 2015 Ed.1.0 (2006-01-19) Ed.2.0 (2015-10-28)	Integrated circuits - Measurement of electromagnetic immunity - Part 1: General conditions and definitions
IEC 62132-2: 2010 Ed.1.0 (2010-03-30)	Integrated circuits - Measurement of electromagnetic immunity - Part 2: Measurement of radiated immunity – TEM cell and wideband TEM cell method
IEC 62132-3: 2007 Ed.1.0 (2007-09-26) 47A/1094/Q(2020-03-06)	Integrated circuits - Measurement of electromagnetic immunity, 150 kHz to 1 GHz - Part 3: Bulk current injection (BCI) method [Withdrawn (2020-12-25)]
IEC 62132-4: 2006 Ed.1.0 (2006-02-21)	Integrated circuits - Measurement of electromagnetic immunity, 150 kHz to 1 GHz - Part 4: Direct RF power injection method (-> Extension of frequency range: Planned from 2015)
IEC 62132-5: 2005 Ed.1.0 (2005-10-10)	Integrated circuits - Measurement of electromagnetic immunity, 150 kHz to 1 GHz - Part 5: Workbench Faraday cage method
(IEC TS 62132-6 ED1) 47A/862/CD(2010-12-24)	(Integrated circuits - Measurement of electromagnetic immunity - Part 6: Local Injection Horn Antenna (LIHA) method)
IEC 62132-8: 2012 Ed.1.0 (2012-07-06)	Integrated circuits - Measurement of electromagnetic immunity - Part 8: Measurement of radiated immunity – IC stripline method
IEC TS 62132-9: 2014 Ed.1.0 (2014-08-21)	Integrated circuits - Measurement of electromagnetic immunity - Part 9: Measurement of radiated immunity – Surface scan method

(4) IEC 62132-4: DPI (direct power injection) method: Conducted emission

This immunity test method injects high-frequency power directly into either the entire IC pin, or two differential pins through a 50-Ω line using a common-mode connection, to check for malfunctions while monitoring injected power and reflected power. This method has high reproducibility. This method has been adopted by the BISS standards, and is used frequently to test IC immunity. This is also the standard method used for extracting the macro-model ICIM-CI (integrated circuit immunity model - conducted immunity) to simulate IC immunity. At the 2017 Regensburg conference, it was agreed upon to implement the proposed extension of the frequency range up to at least 3 GHz starting in Germany

(DE-NC), but discussions are still ongoing. According to the EMC evaluation of Ethernet transceiver ICs in IEC-62228-5, the upper limit for DPI measurement bandwidth is 2 GHz, and there is an urgent need to extend the frequency range of this measurement method.

(5) IEC 62132-5: Workbench Faraday Cage method (WBFC method): Conducted emission

This measurement method is paired with the emission measurement method IEC 61967-5.

(6) IEC 62132-6: (Omitted) Measurement of electromagnetic immunity - Local Injection Horn Antenna (LIHA) method: Radiated emission

This is a method of testing immunity by placing a specially designed, miniature horn antenna directly on the test board's IC. This method was proposed as a TS, but was withdrawn after receiving many negative comments in the CD stage in 2012. However, in view of the recent trend of extending measurement frequencies to higher frequencies, this proposal could potentially be revived.

(7) IEC 62132-7: (Omitted) Mode Stirred Chamber method

As with IEC 61967-7, this has been announced, but there are no proposals.

(8) IEC 62132-8: IC stripline method: Radiated emission

This measurement method is paired with the emission measurement IEC 61967-8. Theoretically, this is similar to the TEM cell method, but is uses smaller sizes than the TEM and GTEM cells, has less injection power, and can emit higher electric fields. This method can be advantageous because it does not require a power amplifier with large output.

The method of EMC evaluation of Ethernet transceiver ICs in IEC 62228-5 includes the IC stripline method as an Informative Annex for both emission and immunity. The reason for this proposal is to reproduce high-frequency coupling via heat-dissipation conductors on the package.

(9) IEC TS 62132-9: Surface scan method: Radiated emission

This measurement method is paired with the emission measurement method IEC 61967-3 (surface scanning method). This method meets the standards for near-field scanning (NFS) data. This method is effective for injecting disturbances into ICs or LSIs via local electromagnetic coupling.

3. Methods of measuring integrated circuit (IC) impulse immunity: IEC 62215 series

Parts 2 and 3 have been published for the measurement methods shown in Table 2. Originally, Part 1 of the series standards, "General Terms and Definitions", was supposed to have been published as IEC 62215-1, but there have not yet been any proposals or deliberation regarding Part 1.

Table 2 Standards for integrated circuit impulse immunity in semiconductors (as of September 2022) [2)]

IEC 62215: Integrated circuits - Measurement of impulse immunity -

	Title
IEC TS 62215-2: 2007 Ed.1.0 (2007-09-10)	Integrated circuits - Measurement of impulse immunity - Part 2: Synchronous transient injection method
IEC 62215-3: 2013 Ed.1.0 (2013-07-17)	Integrated circuits - Measurement of impulse immunity - Part 3: Non-synchronous transient injection method

(1) IEC TS 62215-2: Synchronous transient injection method

This is a standard for detecting system errors by applying impulse disturbances synchronized with the clock signals of a digital device. During deliberation by WG9, this method was designated as a TS rather than an IS. This was because the method was more characteristic of a measurement method used by semiconductor manufacturers (and vendors) to acquire engineering data for use in the device development stage, than a standard used between manufacturers and users. However, this is expected to become more important in the future when acquiring the immunity characteristics of devices such as network devices.

(2) IEC 62215-3: Non-synchronous transient injection method

While the aforementioned IEC 62132-4 (DPI method) is an immunity measurement method for frequency-domain disturbances, this measurement method uses a test board extremely similar (almost identical) to that of the DPI method. This method measures immunity by injecting disturbance pulses from a transient generator (compatible with IEC 61000-4-4, IEC 61000-4-5, or ISO 7637-2). This method is expected to become more important in the future due to the recent rise in the performance and frequencies of power electronics equipment and devices. In Europe in particular, ESD / EFT issues in semiconductor devices are being closely watched. Japan is also facing the need to proactively address these issues. Note that IEC 62215-3 is also cited as a standard measurement method in "EMC Evaluation Method for Bus Transceivers: IEC 62228 Series", described later in this document.

[References]

1) Osami Wada: "VI. EMC Standards for Semiconductor Devices, World EMC standards and stipulations" (FY 2020 version), Japan Management Association, pp. 42-52, July 2020
https://event.jma.or.jp/TF_EMC2020
2) Osami Wada: "VII. EMC Standards for Semiconductor Devices, World EMC standards and stipulations" (FY 2022 version), Japan Management Association, pp. 59-67, July 2022
3) Masamitsu Tokuda: "EMC Standards for Semiconductor Devices: Overview", VCCI Dayori No. 139, pp. 11-13, January 2021
4) Masamitsu Tokuda: "EMC Standards for Semiconductor Devices: Emission Measurement Methods", VCCI Dayori No. 146, pp. 9-13, October 2021

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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 Participation in TECHNO-FRONTIER 2022

Public Relations Subcommittee

This is a report on the participation in TECHNO-FRONTIER 2022.

Exhibition name: TECHNO-FRONTIER 2022
https://www.jma.or.jp/tf/

Real exhibition period : July 20, 2022 (Wed) through 22 (Fri)
Number of exhibitor companies : 278
Number of visitors : 16,643
Venue : Tokyo Big Site

Online exhibition period : July 25, 2022 (Mon) through 29 (Fri)
Number of exhibitor companies : 57 (Online exhibition: 22, hybrid exhibition: 35)
Number of visitors : 4,564 (unique)

[TECHNO-FRONTIER]

TECHNO-FRONTIER is a mechatronics/electronics exhibition sponsored by the Japan Management Association for manufacturing engineers to promote development and create markets.

The show and conference event showcases element technologies (motors, power supplies, sensors, etc.) and a wide range of products and technologies for product design. The exhibition also holds symposiums presenting trends in cutting-edge technologies.

TECHNO-FRONTIER 2022 consisted of both real and online exhibitions (via booth).

[Real exhibition]

Presenters' attendance times were limited in consideration of COVID-19. Documents such as VCCI enrollment were prepared and a VCCI Council introductory video was presented using two types of monitor panel.

➢ Documents
- Introduction of VCCI Council (pamphlet)
- VCCI enrollment
- Annual Report 2020
- Education/training guide of VCCI Council
- Scope of international standard CISPR 32

VCCI Council Booth

- Introductory videos (Japanese)
  Three themes "Do you know this mark?", "Acquiring the VCCI mark", and "Scope of VCCI" (approx. 7 minutes)

- Questionnaire for visitors
  41 booth visitors responded to the questionnaire (for which they received a novelty ballpoint pen)

[Online exhibition]

In accordance with the sponsor's online exhibition conditions, we published an overview of VCCI Council, various introductory videos, and downloadable materials (English and Japanese) on the VCCI Council website.

Online Booth

- Introductory videos (English and Japanese)
  - Three themes "Do you know this mark?", "Acquiring the VCCI mark", and "Scope of VCCI" (approx. 7 minutes)

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

- Number of booth visitors: 217 (number of repeat visitors: 565)

[Impressions]

The real exhibition was clearly an ideal opportunity for visitors unfamiliar with VCCI Council to learn about VCCI Council and its activities.

A considerable number of people visited the online exhibition.

We intend to continue exhibitions (both online and real) as useful opportunities to present VCCI Council activities and VCCI mark PR activities.

Report on 2022 IEEE EMC + SIPI International Symposium

Steering Committee /Technical Subcommittee

This is a report on the 2022 IEEE International Symposium on Electromagnetic Compatibility, Signal and Power Integrity.

- Venue: Spokane Convention Center, Washington, USA
- Trip duration (participation in the symposium): August 1, 2022 (Mon) through 4 (Thu)
- Academic conference period: August 1, 2022 (Mon) through 5 (Fri)
- Participants: Kunihiro Osabe, Technical Adviser, Technical Subcommittee
  Akira Oda, Executive Director, VCCI Council
  Yoko Inagaki, Program Manager, VCCI Council

I. Overview of 2022 IEEE EMC + SIPI Symposium

A real symposium was held for the first time in three years.

We took part in this symposium to present the paper submitted from the VCCI Council and participate in technical sessions, special sessions, and workshop/tutorial sessions to collect information.

There were 34 technical and special sessions and 176 papers (comprising 32 special sessions, 44 abstract reviews, 88 regular sessions, and 12 poster sessions) were presented. The number of posted papers was approximately 20% fewer than those for conventional symposiums. Two persons were infected by COVID-19 and 10 persons were unable to obtain a visa, so those people presented video papers instead. The number of papers submitted from Japan consisted of just several papers. In addition, 29 workshop/tutorial sessions, 14 experimental demonstration sessions, and 5 Q&A sessions by experts were held.

The paper submitted from the VCCI Council was presented in "EMC Measurements - I & II" in the technical session held on August 4 (Thu) p.m.

1. Presentation of papers

Session: Technical Papers (TP-TH-PM1-TC-2) EMC Measurements - I & II

- Title: Justification of Balanced VHF-LISN Termination
- Authors: Kunihiro Osabe (VCCI Council), Nobuo Kuwabara (Kyushu Institute of Technology), Hidenori Muramatsu (VCCI Council)
- Presenter: Kunihiro Osabe (VCCI Council)
- Overview: Termination of the AC mains cable of measurement target equipment in radiated emissions testing is currently under discussion in CISPR / A & I Joint Ad-hoc Group-6 (JAHG-6),

where balanced type and unbalanced type of VHF-LISN are proposed as termination devices. This paper demonstrated that termination by a balanced VHF-LISN is valid for radiated emissions testing for the cabinet port of equipment under test (EUT) based on measurement results using a comb generator and actual devices in round-robin testing (RRT). Where radiated emissions from an unbalanced power network need to be considered, unbalanced VHF-LISN is useful.

- Impressions: VCCI Council has presented papers on VHF-LISN for five consecutive years (since 2018) at IEEE EMC symposiums in Long Beach, USA. It was difficult to find time for Q&A in the virtual symposiums in 2020 and 2021. However, in this real symposium (held for the first time in three years), approximately 40 visitors participated with keen interest. Q&A raised questions that will be useful for future discussions at CISPR / A & I JAHG6.
- Q&A: The following is a sample of the Q&A in the presentation.

  Q1: The difference from the measurement result (without a termination device) using actual devices is shown in the normal distribution chart. What does the X axis mean?

  A1: The X-axis direction represents the degree of variation at the same level in the amplitude probability distribution, showing that the degree of variation varies depending on equipment.

  Q2: Are there any differences in emission characteristics between the actual environment and an environment where EUT is terminated by a termination device at the test site?

  A2: Your question is relevant given that balanced 25-ohm common-mode termination can reproduce a resonance state for obtaining characteristics as close as possible to those in the actual use environment. While the resonant frequency varies with differences in terminating conditions, the maximum emission value remains almost constant. Using an unbalanced VHF-LISN that loses resonant characteristics results in a significant difference in emission level.

2. Overview of Keynote, Workshop & Tutorial

(1) Session: Keynote Presentation

- Title: Return-to-Flight Electromagnetic Measurements: The NASA Shuttle Ascent Debris Radar System
- Presenter: Dr. Brian M. Kent
- Country: U.S.A.
- Affiliation: Aerospace Consultant, IEEE Fellow
- Overview: This lecture started with the re-examination of the accident investigation of Space Shuttle Columbia. This was followed by an explanation about the NASA debris radar (NDR) system developed to evaluate how debris is generated in the ascending step until the Space Shuttle enters orbit, EMI measurement in the development process, and the NDR safety verification result. Currently, the NDR system can visualize, in near real-time, debris at the time of launch, and analyze the ballistic value of detected ascending debris. Furthermore, this system can

evaluate the type and size of material, place of generation, and threat to the orbiter based on scattering of debris on the radar and ballistic characteristics. The NDR system was used for all Shuttle missions subsequent to Columbia.

- Impressions: This lecture, beginning with the accident investigation of Columbia, clearly showed a commitment to safety, including consideration of the possibility of radar-induced electromagnetic interference affecting the Shuttle navigation system.

(2) Workshop WS-MO-AM-4

Low Frequency and Modelling of Conducted Interference in Systems with Multiple Converters

- Title: Assessment of the Aggregation and Propagation of Conducted Emissions in Power System
- Presenter: David Thomas
- Country: United Kingdom
- Affiliation: University of Nottingham, United Kingdom
- Overview: Considerations were added to multiplexed emissions generated by the power converter at the solar panel park. The conducted interference measurement result using the current clamp method showed that there were differences in conducted interference depending on frequency, and that conducted interference may increase 5 to 10 times at a certain frequency. This workshop concluded that superimposition of interference should be examined as a problem of probability.
- Title: Pearson's Random Walk Approach to Evaluating Interference Generated by a Group of Converters
- Presenter: Robert Smolenski
- Country: Poland
- Affiliation: Uniwersytet Zielonogórski, Poland
- Overview: This paper considers interference of the 1 MW PV system. As a result of the comparison between emissions from a single power converter and emissions from multiple power converters, though there is a measurement uncertainty of approximately 20 dB, emissions are clearly on the increase. When the results of comparison between emissions from a single power converter and emissions from multiple power converters in the measurement site are provided, and the random walk theory of humans (a model to obtain a probability of existence of a person in a certain area from the starting point after the person starts from a point and moves a straight arbitrary distance in a random direction and repeats such a random motion) as a numerical model is referenced, an increase in emissions of multiple converters is clarified.
- Impressions: This workshop deals with conducted interference in the low frequency area of the multi-power converter system and modeling, and this paper considers superimposition of interference generated by power converters. Generalizing the prediction method may be difficult due to random elements. However, we felt that this method can be implemented for predicting increased interference caused by multiple lighting devices.

3. Overview of Technical Session

(1) Conducted EMI Research

- Title: Preliminary Study on Conducted Emission of a Dynamic Wireless Power Transfer System for Automotive
- Presenter: Tommaso Campi *et.al.*
- Country: Italy
- Affiliation: University of L'Aquila, Italy
- Overview: This paper considers conducted interference generated by the dynamic WPT (DWPT) system during vehicle travel. The main difference from conducted interference generated by the static WPT system is the transient noise generated by the transmission coil turning on and off during vehicle motion. The possibility of serious interference being caused by such transient noise while vehicles travel on an electrified load, in particular, was investigated. The result obtained in the electrified load section (85 kHz, 10 kW) showed a significant conducted interference level in both ground and on-board circuits.
- Impressions: The dynamic WPT (DWPT) system is widely considered to be the next generation of electric vehicle charging system. Though impacts on the ordinary power supply network cannot be accurately predicted, this system may give rise to new issues of electromagnetic interference in the future, and we will continue to monitor its development.

(2) EMC Measurements - I & II

- Title: Comparison of EMC Chamber Debugging Techniques
- Presenter: Yibo Wang, Zhong Chen
- Country: U.S.A.
- Affiliation: ETS-Lindgren, Inc.
- Overview: The SVSWR method of evaluating radiated interference (above 1 GHz) measurement sites is prescribed in CISPR16-1-4. This method is suitable for measuring scalar series, but is not suitable for debugging chamber problems. The time-domain SVSWR method (prescribed in the ANSI C63.25.1 standard as an alternate site validation method) provides results equivalent to the SVSWR method of CISPR, and can also provide chamber debug information using the inverse Fourier transform for vector response measurement in the frequency domain. However, the time-domain SVSWR method cannot extract information in regard to direction of unnecessary reflected signals. The chamber imaging method proposed in this paper allows chamber debugging by viewing 2D images of chamber reflections, and is described for chamber debugging in a 3-meter EMC anechoic chamber.
- Impressions: This paper proposes debugging of radiated interference (above 1 GHz) measurement sites. We felt that this method is useful for evaluating the necessity of antenna height scan of the Absorber Lined Test Site.

(3) Poster session:

- Title: Impact of Antenna Tilt on Measurements below 1 GHz in Anechoic Chamber
- Presenter: Krzysztof Sieczkarek *et.al.*
- Country: Poland
- Affiliation: Poznań Institute of Technology, Poland
- Overview: In the current radiated interference measurement (30 MHz to 1 GHz), the maximum level is measured by moving the antenna up and down with the antenna kept horizontal. A difference of a few dB value is measured in the maximum level by tilting the antenna in this frequency range. Therefore, a measurement method using an antenna lift with a tilting mechanism is recommended.
- Impressions: In discussion with the presenter, it was stated that while the point in terms of maximizing the level of interference was valid, in terms of standardization, it would be difficult to standardize because of the huge amount of measurement time that would be expected.

4. Overview of exhibition

The trends of exhibition participant companies have been focused on. This year, 64 companies participated in the exhibition booth (almost as many as those three years ago). The exhibition had a more low-key atmosphere than on previous occasions due to the fewer number of symposium participants.

5. Impressions

We fulfilled our objective of presenting the paper – something that could not be achieved at the previous virtual symposium. Attendance of participants was keenly felt and a lively Q&A session was conducted.

Prior to the keynote speech, the overview of this symposium was explained and it was reported that the number of submitted papers was approximately 20% fewer due to COVID-19, as in APEMC and EMC Euro. We will continue to submit papers whenever possible. Our impression was that this symposium differed considerably from the real symposium in 2019; namely, welcoming a female IEEE EMC Society chairperson along with more female participants in the session and Q&A. We felt an interesting and most welcome sign of the times.


IEEE
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2022
2022 IEEE INTERNATIONAL SYMPOSIUM ON
ELECTROMAGNETIC COMPATIBILITY,
SIGNAL & POWER INTEGRITY
Justification of Balanced VHF-LISN Termination

Ⅱ. Report on Meeting with A2LA

Date/time: August 2, 2022 (Tue) 15:00 to 15:45

Venue: Academic conference room

Participants: A2LA: Mr. Kim Paddison ; Director of Business Development
Ms. Megan McConnell ; Accreditation Manager
VCCI: Akira Oda, Executive Director
Yoko Inagaki, Program Manager

Objective: A2LA has signed an MOU with VCCI Council. A2LA and VCCI Council exchange the current situation and opinions in a face-to-face meeting at IEEE EMC.

Agendas

1. Report on the current situation from VCCI Council
   - Document: VCCI Update (Aug. 2022)

   Mr. Akira Oda (Executive Director of VCCI Council) gave an overview of VCCI Council activities and the current situation.

2. Report on the current situation from A2LA

   Among testing laboratories accredited by A2LA, 54 testing laboratories are registered in VCCI Council.

3. Main opinion exchange

   A2LA is interested in the international forum program of VCCI Council. We confirmed our intention to continue the MOU (due for renewal in May 2023).

   This meeting was a good opportunity for newly-appointed Mr. Kim Paddison to get an overview of VCCI Council.

Ⅲ. Report on NVLAP Meeting

Date/time: August 2, 2022 (Tue) 16:00 to 16:45

Venue: Academic conference room

Participants: NVLAP: Ms. Janneth I. Marcelo ; Program Manager
Ms. Amanda McDonald ; Program Manager
VCCI: Akira Oda, Executive Director
Yoko Inagaki, Program Manager

Objective: NVLAP has signed an MOU with VCCI Council. NVLAP and VCCI Council exchange the current situation and opinions in a face-to-face meeting at IEEE EMC.

Agendas

1. Report on the current situation from VCCI Council
   - Document: VCCI Update （Aug. 2022）

   Mr. Akira Oda (Executive Director of VCCI Council) gave an overview of VCCI Council activities and the current situation.

2. Report on the current situation from NVLAP

   NVLAP is an organization within NIST (National Institute of Standard and Technology) under the umbrella of U.S. Department of Commerce. A full-support program started in 1976. NVLAP is a member of ILAC, APLAC, and IAAC. NVLAP has accredited a total of approximately 700 testing laboratories, including 115 testing laboratories related to EMC and telecommunication. Among testing laboratories accredited by NVLAP, 14 testing laboratories are registered in VCCI Council. NVLAP was certified by the Accreditation Scheme for Conformity Assessment (ASCA) in 2020.

3. Main opinion exchange

   We confirmed that the VCCI Council's recently-published guidance is not included in the requirements for accreditation. We also confirmed our intention to continue the MOU (due for renewal in May 2023).

Report on Holding VCCI Seminar 2022

Steering Committee

Under the protracted COVID-19 pandemic, we hosted VCCI Seminar 2022 (as in 2021) to introduce our activities and offer latest news to our overseas members.

The Seminar (Info-Communications Promotion Month event hosted by the Ministry of Internal Affairs and Communications) was held on demand through our website from June 6 through June 10, 2022. The English aspect of the Seminar included posting of the following four introductory videos from September 5 (Mon) through September 16 (Fri). People wishing to participate applied through our website and watched a total of 75 minutes of video materials (including an introductory overview). We sincerely thank all those who took the time to view the materials.

(38 participants: 13 from China, 11 from Taiwan, 4 each from USA and Korea, 2 from Slovenia, 1 each from UK, Canada, Hong Kong, and Czechia)

	Theme	Lecturer
1	VCCI Council Activities	Mr. Akira Oda Executive Director, VCCI Council
2	Market Survey -1	Mr. Minoru Hirata Secretariat, Market Sampling Test Subcommittee, VCCI Council
	Market Survey -2	Mr. Minoru Hirahara Secretariat, Market Sampling Test Subcommittee, VCCI Council
3	Overview of VCCI Facility Registration - Notes on application and examples of issues and checking -	Mr. Seijun Fukaya Secretariat, Registration Committee for Measurement Facilities, VCCI Council
4	Frequently Asked Questions Sent to VCCI Council - Scope, registration of product conformity, etc. -	Mr. Masahiro Hoshino Secretary General, VCCI Council

Status on FY2022 Market Sampling Tests

Market Sampling Test Subcommittee

As of September 30, 2022

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		59	2	52	32	23	3	0	2
Loan-based testing total		31	2	26	14	9	0	0	1
Term (Included number)	1st Quarter	9	2	6	3	2	—	—	—
	2nd Quarter	12	—	12	11	7	—	—	1
	3rd Quarter	10	—	8	—	—	—	—	—
	4th Quarter	—	—	—	—	—	—	—	—
Purchase-based testing total		28	0	26	18	14	3	0	1
Term (Included number)	1st Quarter	18	0	18	18	14	3	—	1
	2nd Quarter	10	—	8	—	—	—	—	—
	3rd Quarter	—	—	—	—	—	—	—	—
	4th Quarter	—	—	—	—	—	—	—	—

Final Result

Passed	Failed	Pending
26	0	2

Document inspection	Selected	Cancelled (withdrawal, etc.)	Inspectable samples	Pre-check completed	Judgment completed	Judgment	
						Cleared	Problems identified
	29	2	24	24	15	15	—

Report from the Secretariat

● List of Members (July 2022 - September 2022)

New members

Membership	Member No.	Company Name	Country
Regular	4263	Kyokuto Trading Inc.	JAPAN
Regular	4267	IBIS Inc.	JAPAN
Regular	4270	Japan Display Inc.	JAPAN
Regular	4271	NITTO KOGYO CORPORATION	JAPAN
Regular	4276	Mitsubishi Electric Building Solutions Corporation	JAPAN
Regular	4251	Asian Power Devices Inc.	CHINA
Regular	4259	IPVideo Corporation	USA
Regular	4261	Shenzhen Samoon Technology Co., Ltd	CHINA
Regular	4266	LEDGER SAS	FRANCE
Regular	4269	RuggON Corporation	CHINESE TAIPEI
Regular	4272	People & Technology	KOREA
Regular	4274	Beijing Orion Star Technology Co., Ltd.	CHINA
Supporting	4257	ICR Co., Ltd.	KOREA
Supporting	4265	Megalab Group Inc.	CANADA
Supporting	4268	Waltek Testing Group Co., Ltd.	CHINA
Supporting	4277	World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.	CHINA

Company name change

Membership	Member No.	Company Name	Country	Old company name
Regular	3439	Virtual Instruments Corporation, DBA Virtana Corp	USA	Virtual Instruments Corporation
Regular	3631	ALDEBARAN	FRANCE	SoftBank Robotics Europe
Regular	4018	Protempis LLC.	USA	Trimble INC.
Supporting	3034	Eurofins E&E Wireless Taiwan Co., Ltd.	CHINESE TAIPEI	A Test Lab Techno Corp.

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

● VCCI Schedule for FY 2022 (as of September 30, 2022)

April ・The basic technique of EMI measurement	**May** ・The basic of electromagnetic waves, EMI measurement technique below 1 GHz	**June** ・Release VCCI Dayori No.145 ・EMI measurement technique above 1 GHz ・EMI measurement instrumentation uncertainty (MIU)
July ・TECHNO-FRONTIER 2022	**August** ・Release Annual Report	**September** ・Release VCCI Dayori No.146 ・The basic technique of EMI measurement
October ・CEATEC 2022	**November** ・The basic of electromagnetic waves, EMI measurement technique below 1 GHz	**December** ・Release VCCI Dayori No.147 ・The basic of electromagnetic waves, EMI measurement technique below 1 GHz ・EMI measurement technique above 1 GHz
January	**February** ・The level up of the EMI measurement technique ・EMI measurement instrumentation uncertainty (MIU)	**March** ・Release VCCI Dayori No.148

● Status of Compliance Test Notifications

July 2022—September 2022 (Product names are examples and are not limiting)

Classification of MME (Product types are not limited to only the following examples.)				Classification code		July 2022			August 2022			September 2022		
				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	28	0	28	15	1	16	20	3	23
		Stationary	Workstation, Desktop PC, etc.	B 2	b 2	4	12	16	1	17	18	0	11	11
		Portable	Laptop PC, Tablet PC, etc.	C 2	c 2	0	23	23	0	42	42	0	20	20
		Other computers	Wearable computers, Wearable device, Smart watch, Smart glass, etc.	E 2	e 2	0	1	1	0	0	0	4	9	13
	Peripheral / Terminal	Memory device	HDD, SSD, USB Memory, Media drive, Disk device, NAS, DAS, SAN, etc.	G 2	g 2	18	28	46	15	26	41	8	17	25
		Printer device	Printer including multifunction machine, etc. (portable)	H 2	h 2	0	6	6	11	4	15	7	19	26
		Display device	CRT display, Monitor, Projector, etc.	J 2	j 2	6	59	65	12	68	80	8	69	77
		Other I/0 devices	Image scanner, OCR, Pen tablet, Stylus pen, etc.	M 2	m 2	0	3	3	2	7	9	3	5	8
		General purpose terminal	Display controller terminal, etc.	N 2	n 2	0	0	0	1	0	1	0	1	1
		Special purpose terminal	POS, Terminal for finance, insmance, etc.	Q 2	q 2	2	2	4	4	0	4	0	1	1
		Other peripheral	PCI Card, Graphics Card, Mouse, Keyboard, Cradle, etc.	R 2	r 2	6	31	37	2	51	53	6	39	45
		Copying machine / Multifunction copying machine	Copying machine, Multifunction copying machine, etc. (Stationary)	S 2	s 2	0	3	3	0	1	1	0	1	1
	Communications equipment	Terminal equipment	Mobile phone, Smart phone, PHS phone, etc.	T 2	t 2	0	0	0	0	5	5	1	7	8
			Telephone device such as PBX, FAX, Key telephone systems, Cordless phone, etc.	U 2	u 2	0	0	0	0	0	0	1	3	4
		Network-related equipment	Communication line connecting device including Modem, Digital transmission unit, DSU, TA, Media converter, etc.	V 2	v 2	1	2	3	4	5	9	3	4	7
			LAN-related device, including Router, HUB, etc. Local switch, etc.	W 2	w 2	43	15	58	30	18	48	50	10	60
		Other communication equipment	Other communication equipment	X 2	x 2	8	8	16	16	10	26	25	13	38
Broadcast receiver equipment			TV, Radio, Tuner, Video recorder, Set-top box, etc.		k 2		3	3		0	0		0	0
Audio equipment			Speaker, Amplifier, IC recorder, Digital audio player, Headset, DTM, AI speaker, etc.	L 2	l 2	0	9	9	0	1	1	1	13	14
Video equipment		Video equipment	Digital video camera, Web camera, Network camera, Video player, Photo frame, Digital camera, Drive recorder, etc.	I 2	i 2	5	19	24	0	7	7	9	9	18
		Other video equipment	VR goggles, Scan converter, etc.	P 2	p 2	2	0	2	0	1	1	1	0	1
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	1	1	0	0	0	0	4	4
		Electronic toy	Game console, Game pad, toy drone, etc.	Y 2	y 2	0	1	1	0	0	0	0	2	2
		Other Entertainment / Education equipment	Navigator, AI robot, etc.	F 2	f 2	0	0	0	0	0	0	1	0	1
	Other MME		MME other than the above	O 2	o 2	3	5	8	10	0	10	11	5	16
Total						126	231	357	123	264	387	159	265	424

● 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 (July 2022 – September 2022)

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:
岩崎通信機株式会社	本社第2本館 電波暗室	-	-	-	-	-	G-20158	2025/7/18	東京都杉並区久我山1-7-41	03-5370-5156
岩崎通信機株式会社	本社第2本館 電波暗室	-	-	-	-	-	C-20123	2025/7/18	東京都杉並区久我山1-7-41	03-5370-5156
岩崎通信機株式会社	本社第2本館 電波暗室	-	-	-	-	-	T-20123	2025/7/18	東京都杉並区久我山1-7-41	03-5370-5156
NECプラットフォームズ株式会社	掛川3 m法電波暗室	-	-	-	-	-	C-20126	2025/9/4	静岡県掛川市下俣800番地	0537-22-8457
NECプラットフォームズ株式会社	掛川3 m法電波暗室	-	-	-	-	-	G-20162	2025/9/4	静岡県掛川市下俣800番地	0537-22-8457
NECプラットフォームズ株式会社	掛川3 m法電波暗室	-	-	-	○	-	R-20169	2025/9/4	静岡県掛川市下俣800番地	0537-22-8457
NECプラットフォームズ株式会社	掛川3 m法電波暗室	-	-	-	-	-	T-20126	2025/9/4	静岡県掛川市下俣800番地	0537-22-8457
CTK Co., Ltd.	CTK Unhak 1 Shielded Room	-	-	-	-	-	C-20124	2025/9/4	142, Dongbu-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea	+82-31-219-9972
CTK Co., Ltd.	CTK Unhak 1 Shielded Room	-	-	-	-	-	T-20124	2025/9/4	142, Dongbu-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea	+82-31-219-9972
CTK Co., Ltd.	CTK Unhak 1 SAC	-	-	-	-	○	R-20167	2025/9/4	142, Dongbu-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea	+82-31-219-9972
CTK Co., Ltd.	CTK Unhak 1 SAC	-	-	-	-	-	G-20159	2025/9/4	142, Dongbu-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea	+82-31-219-9972
SGS Taiwan Ltd.	SGS Wuku Conduction Site SR I	-	-	-	-	-	C-20125	2025/9/4	No.12, Ln. 116, Wu Kung 3rd Rd, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan	+886-2-2299-3279

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
SGS Taiwan Ltd.	SGS Wuku Conduction Site SR I	-	-	-	-	-	T-20125	2025/9/4	No.12, Ln. 116, Wu Kung 3rd Rd, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan	+886-2-2299-3279
SGS Taiwan Ltd.	SGS 966 Chamber SAC I	-	-	-	○	-	R-20168	2025/9/4	No.12, Ln. 116, Wu Kung 3rd Rd, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan	+886-2-2299-3279
SGS Taiwan Ltd.	SGS 966 Chamber SAC I	-	-	-	-	-	G-20125	2025/9/4	No.12, Ln. 116, Wu Kung 3rd Rd, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan	+886-2-2299-3279
Kiwa Netherlands B.V.	Kiwa Netherlands B.V.	-	-	-	○	-	R-20163	2025/9/4	Wilmersdorf 50, 7327 AC Apeldoorn, The Netherlands	+31-88-998-3600
CSA Group Bayern GmbH	SR2	-	-	-	-	-	T-20127	2025/9/4	Straubinger Strasse 100, D-94447 Plattling, Germany	+49-9424-9481-310
Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch	966 Chamber	-	-	-	-	-	G-20160	2025/9/4	No.96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong, China	+86-769-8998-2098
Kunshan Balun Communications Technology Co., Ltd.	Kunshan Balun Communications Technology Co., Ltd.	-	-	-	-	-	C-20127	2025/9/4	Room 101, Building 5, No. 1689 Zizhu Road, Yushan, Kunshan, Jiangsu, China	+86-755-5787-3002

Closing words

In the fall of 2022, I visited Kamikochi in Nagano Prefecture for the first time in about 30 years.

Kamikochi is a scenic spot in the mountains at an altitude of about 1,500 m. Many of you are probably familiar with the famous view from Kappa Bridge, which appears in the novel "Kappa" by Ryunosuke Akutagawa and is often covered in the media.

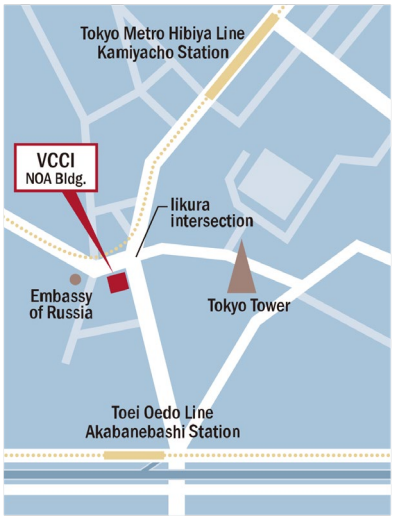
The previous night, I'd heard reports that the roads to Kamikochi might have been closed due to the record-breaking heavy rains brought by Typhoon no. 15 (Typhoon Talas) centering on the Tokai region. Luckily, though, the next morning's weather was surprisingly clear.

We took an early-morning bus from Matsumoto Station and got off at "Taisho Pond". Taisho Pond was created by the eruption of Mt. Yakedake, and the reflection of the surrounding mountains on the pond's surface is simply magical. I was so entranced by the scenery, when it was time to move on, I had trouble pulling myself away. The first thing we did was hike 4 km to Kappa Bridge. It was so pleasant walking amongst the trees under the soft light filtering in through the canopy, I felt spiritually refreshed. After walking for some time, I noticed the beautiful scenery of the Azusa River unfolding before my eyes. It took my breath away. The river was a crystal-clear emerald green. At Kappa Bridge, the sight of the majestic Hotaka mountain range put a radiant smile on everyone's faces. The contrast with the blue sky was so wonderful, it was truly a spectacular view! (All my exhaustion from the day fell away in an instant.)

Located further in was Myojin Pond. It was about a 6-km walk there, including the return trip. While enjoying the scenery of the Hotaka mountain range, invigorated by the bright red color of the rowanberries, the birdsong, and the greetings from other hikers passing to and fro, we eventually arrived at Myojin Pond. At the edge of the pond stood the Okumiya branch of the Hotaka Shrine, enveloped by coniferous forest. The atmosphere was solemn. There were two ponds, Ichino-ike and Nino-ike; one big and one small. At Nino-ike, there were mossy rocks with trees sprouting from them. We relaxed there for about half an hour, enjoying the Japanese-garden-like view. I felt strangely at home in that place.

Kamikochi was as wondrous and full of nature's beauty as it had been all those years ago. Not only that, I was impressed by the lack of litter, and by the beauty of the convenient, well-maintained forest and lakeside trails. The staff at the local store told us that they were all picking up litter regularly, and working to preserve the environment.

My heart goes out once again to all of those people engaged in these kinds of activities to preserve the beauty of nature. (M.M.)



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