

VCCI DAYORI

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How to Spend a Retirement

Shozo Satake

It's already been about seven and a half years since I retired from my position at VCCI. I would like to thank everyone who supported me during my tenure; I owe the successful completion of my duties to each and every one of you.

When the Secretariat asked me to contribute to the VCCI Dayori, I graciously accepted, hoping to take this opportunity to express my gratitude. However, the topic of this article is not the latest news on electromagnetic-noise technology, but something more personal. I'd like to share some of what I've been up to recently.

I still remember what my retired senior colleague said to me when he came to visit the company I worked at before VCCI. "Mr. Satake, you'd better have at least four or five hobbies before you retire. Mine is cameras, but I can't be going around carrying a camera every day. If you don't have a Monday hobby, a Tuesday hobby, a Wednesday hobby, and so on; if you don't fill your days with activities, you're going to be bored stiff." That was his advice to me.

I had already been swimming once a week and cooking dinner once a month, but his advice prompted me to start taking NHK's courses on cameras and senryu poetry. I thought cameras would provide all kinds of occasions to go out and take photos, and give me a reason to travel. I also attended several camera seminars. The most helpful advice I received during that period was this: while you can enjoy all kinds of photography techniques with an SLR (single-lens reflex) camera, for example by playing with shutter speed and aperture, it's just fine to use the automatic settings. As long as the composition is good, the photo will look good, too.

By studying composition in my photography, I managed to win several awards in the NHK courses. However, as a working adult, I had limited time to go out and take photos. After a while, I found myself stuck on the same kinds of subject matter all the time, and I sadly quit after five years of courses. Nowadays, I pretty much only take photos on vacation, or at my daughter's family gatherings. My main camera now is my handy smartphone.

As of today, my hobbies are swimming and golf once a week, walking 10,000 steps and composing senryu poems once a day, karaoke once a week, and cooking dinner three times a week. I'm enjoying having so many things to do every day.

Out of all these hobbies, my wife's favorite is my cooking. My wife buys the ingredients, and I follow whatever recipes I find online. I don't taste-test. I just follow the instructions like "1 Tbsp of sugar", and the dishes come out tasty enough.

The hobbies I absolutely need friends for are golf, senryu poetry, and karaoke.

The key to playing golf regularly is to have someone organize it. Even when you play golf with four or five close friends, people quit when they're past 70 and don't have the energy for it anymore. It becomes impossible to gather teams, and when you do, they tend to spontaneously fall apart. I'm now part of a group of about 30 people who've gotten around this problem. The organizer set up a system that lets us book three or four teams every Thursday just by declaring our attendance online. Even if people can't attend every week, we can all enjoy some casual fun playing with different team members each time. This has brought former teams back together again, and given us a large group of friends.

I play golf once a week on the green and once a week at the driving range. Unfortunately, I haven't gotten any better at it, but I still enjoy playing.

As for karaoke, in pre-COVID times, I used to go to a karaoke snack bar three to four days a week. When COVID hit, that was no longer an option. I started missing karaoke so much, I went to a karaoke box all by myself. When I asked the staff if I could sing alone, they told me, "Everyone sings alone these days." And so, my hobby of solo karaoke was born.

Because the karaoke box is potential source of infection clusters, you can feel safe knowing that they take strict ventilation and disinfection measures. After some time going to karaoke alone, I was in the city with the friends I made at the karaoke snack bar, and I brought up the karaoke box. Everyone was keen to go, so now, I'm going to karaoke with friends again. Karaoke's definitely more exciting with friends, isn't it?

In conclusion, my recommendation to you all is to find multiple hobbies, so that you too can enjoy a fun retirement!



Shozo Satake

- 1974: Completed his degree in electrical engineering, Graduate School of Engineering, Ehime University
- 1974 – 2009: Computer Division, Hitachi, Ltd.
- 2008 – 2015: VCCI Council

Committee Activities

●Board

Date	November 15, 2022
Reported item	<ul style="list-style-type: none"> ● Reported item 1 Report on the activities of the first half of FY 2022

●Steering Committee

Date	November 2, 2022, December 21	
Agenda items	<ul style="list-style-type: none"> ● Agenda item 1 Report on the activities of the first half of FY 2022 (draft) ● Agenda item 2 Guidance for Rules for Voluntary Control Measures (draft) ● Agenda item 3 Revised edition of the "Guidance for registration of product conformity - how to input the model number" (draft) ● Agenda item 4 Subcommittees' planned activities for FY 2023 (draft) 	
Decisions and reported items	<ul style="list-style-type: none"> ● Agenda item 1 Approved ● Agenda item 2 Approved ● Agenda item 3 Approved ● Agenda item 4 Approved ● Reported item 1 Report on the EMC Europe 2022 Symposium ● Reported item 2 Program for the 2023 Rules Briefing and Technical Symposium (draft) ● Reported item 3 Activities performed by the dedicated subcommittees (Technical, International Relations, Market Sampling Test, Public Relations, and Education) for the period from October to December ● Reported item 4 Secretariat work (such as member entry and withdrawal trends, the number of registration of product conformity, and income and expenditure records) 	

● Technical Subcommittee

Date	November 8, December 15, 2022	
Agenda items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 ● Agenda item 3 ● Agenda item 4 ● Agenda item 5 ● Agenda item 6 ● Agenda item 7 ● Agenda item 8 	<p>The Technical Subcommittee's activities for FY 2022</p> <p>Testing of radiated emission measurement up to 30 MHz</p> <p>Testing of EUT impedance's effects on AANs used with asymmetrical transformers during measurement of conducted emission</p> <p>Examination of whether uncertainties were improved by CMAD attachment using non-invasive measurement methods</p> <p>Examination of evaluation methods of measurement site validity for measurement facilities for radiated emission measurement up to 30 MHz</p> <p>Activities for promoting standardization of mains cable termination devices</p> <p>2023 Rules Briefing and Technical Symposium (draft)</p> <p>FY 2023 Technical Subcommittee's planned activities (draft)</p>
Continuing agenda items	● Agenda item	1, 2, 3, 4, 5, 6, 7, and 8
Decisions and reported items	<ul style="list-style-type: none"> ● Reported item 1 ● Reported item 2 	<p>Report on the CISPR San Francisco conference (October 28 to November 4)</p> <p>Presentation and auditing of papers submitted to the EMC EUROPE 2022 Symposium (Gothenburg, Sweden) at a poster session (see page 16)</p>

● International Relations Subcommittee

Date	October 12, November 9, December 8, 2022	
Agenda items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 ● Agenda item 3 	<p>Survey of Trends in World EMC Regulations</p> <p>Preparation for the FY 2022 International Forum</p> <p>The International Relations Subcommittee's planned activities for FY 2023</p>
Continuing agenda items	● Agenda item 1 and 2	
Decisions and reported items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 	<p>The online Survey of Trends in World EMC Regulations was updated on October 12 and December 9.</p> <p>The FY 2022 International Forum was scheduled for March 27 (Mon) to 31 (Fri), 2023.</p>

●Market Sampling Test Subcommittee

Date	October 11, November 11, and December 2, 2021
Agenda items	<ul style="list-style-type: none"> ● Agenda item 1 Market sampling test report ● Agenda item 2 Document inspection report ● Agenda item 3 Draft of planned activities for FY 2023
Decisions and reported items	<ul style="list-style-type: none"> ● Agenda item 1 The selection of up to 90 products to be purchased and borrowed for FY 2022 sampling tests has been finalized, and tests are being performed. Of two products being surveyed after being determined as failed in the first round and detected in the first half of the fiscal year, one product was acknowledged by its responsible VCCI member, who admitted to the failure. The remaining product was determined to have passed based on a VCCI member’s survey report. One product was detected in the third quarter, and is now being surveyed by a VCCI member. ● Agenda item 2 In the FY 2022 document inspections, 43 products were selected, of which 39 (excluding canceled products) were confirmed and are now being inspected. ● Agenda item 3 Approved

●Public Relations Subcommittee

Date	October 7, November 11, December 16, 2022	
Agenda items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 ● Agenda item 3 ● Agenda item 4 ● Agenda item 5 ● Agenda item 6 	<p>On the video "Examples of electromagnetic interference caused by electromagnetic disturbances"</p> <p>On CEATEC 2022</p> <p>On the video advertisement at Bic Camera TV sales floors</p> <p>Vision for regional cities</p> <p>On the candidates for additional website pages to be multilingualized</p> <p>Draft of planned activities for FY 2023</p>
Continuing agenda items	<ul style="list-style-type: none"> ● Agenda item 4, 5, and 6 	
Decisions and reported items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 ● Agenda item 3 	<p>It was decided that a final confirmation of the delivered videos would be performed, and if requested, a screening will be held for attendees at CEATEC. The following explanation will be given: "The purpose of these videos is to provide a clear visual introduction to electromagnetic interference caused by electromagnetic disturbances. These videos do not indicate the immunity of electronic devices to electromagnetic disturbances."</p> <p>Report on VCCI's participation in CEATEC 2022 held in October (see page 21)</p> <p>VCCI was informed that from August 2022, its video advertisements will no longer be broadcast on TV sales floors in six regional Bic Camera stores will (reducing the number of broadcasting stores from 20 stores across Japan to 14 stores in the Tokyo metropolitan area). This fiscal year's contracted volume will supposedly be adjusted so that the total number of advertisements will remain unchanged.</p> <p>This measure was implemented with the aim of advertising effectively in regional locations that cannot be covered by advertising on public transport. However, now that stores in regional cities will no longer play this role, we will look for other advertising media starting next fiscal year. We will discuss the other media in committee meetings, and promote the broadcasting of video advertisements according to our vision for regional cities. This is currently being discussed.</p>

● Education Subcommittee

Date	October 19, November 24, 2022	
Agenda items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 ● Agenda item 3 	<p>Discussing issues with FY 2022 education and training</p> <p>On the status of education and training conducted in FY 2022</p> <p>Education and training plans for FY 2023</p>
Continuing agenda items	<ul style="list-style-type: none"> ● Agenda item 1 and 3 	
Decisions and reported items	<ul style="list-style-type: none"> ● Agenda item 1 ● Agenda item 2 ● Agenda item 3 	<p>Three task forces (TFs) were established to promote revisions to lectures.</p> <p>TF 1: Discussing the incorporation of "EMI measurement technique above 1 GHz" lectures into "The basic of electromagnetic waves, EMI measurement technique below 1 GHz" lectures</p> <p>TF 2: Discussing the enhancement of calculation exercises and explanations of "EMI measurement instrumentation uncertainty"</p> <p>TF 3: Discussing the implementation of comprehension checks in education and training</p> <p>"The basic of electromagnetic waves, EMI measurement technique below 1 GHz" was held twice; the 58th session (classroom seminars: November 17, 18; practical courses: 24, 25) and the 59th session (classroom seminars: November 17, 18; practical courses: December 1, 2). At these sessions, measures were implemented to prevent the spread of COVID-19, and classroom seminars were livestreamed while practical courses were held in in-person groups. A total of 15 people attended, and received completion certificates.</p> <p>"EMI measurement technique above 1 GHz" was held twice; the 20th session (classroom seminars and practical courses: December 8, 9) and 21st session (classroom seminars and practical courses: December 15, 16). At these sessions, measures were implemented to prevent the spread of COVID-19, and practical courses were held in in-person groups. A total of 11 people attended, and received completion certificates.</p> <p>Two classroom-seminar-only education and training sessions (The level up of the EMI measurement technique, EMI measurement instrumentation uncertainty) have been planned for February 2023.</p> <p>Four lectures were established to be held in FY 2023. We are discussing holding classroom-seminar-only lectures as a</p>

	<p>combination of in-person-group and online formats (livestreams). We are also discussing holding lectures including practical courses in in-person groups. In particular, decisions about holding lectures including practical courses will be made while taking into account the circumstances around COVID-19. The following lectures have been planned:</p> <ul style="list-style-type: none">① The basic technique of EMI measurement [planned to be held in the first and second halves of the fiscal year]② The basic of electromagnetic waves, EMI measurement technique below 1 GHz (planned for revision) [planned to be held in the second half of the fiscal year]③ The level up of the EMI measurement technique [planned to be held in the second half of the fiscal year]④ EMI measurement instrumentation uncertainty (planned for revision) [planned to be held in the second half of the fiscal year]
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●Registration Committee for Measurement Facilities

Date	October 17, 2022
Agenda items	● Reviewed the results of deliberations by the Measurement Facility Examination WG.
Decisions	<p>Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 23 companies</p> <p>Radiated emission measurement facilities below 1 GHz: 17</p> <p>AC-mains-ports-conducted emission measurement facilities: 12</p> <p>Wired-telecommunication-port-conducted emission measurement facilities:16</p> <p>Radiated emission measurement facilities above 1 GHz: 11</p> <p>Applications returned with comments: None</p> <p>Applications carried over to the next meeting: None</p>
Date	November 21, 2022
Agenda items	● Reviewed the results of deliberations by the Measurement Facility Examination WG.
Decisions	<p>Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 19 companies</p> <p>Radiated emission measurement facilities below 1 GHz: 10</p> <p>AC-mains-ports-conducted emission measurement facilities: 10</p> <p>Wired-telecommunication-port-conducted emission measurement facilities: 14</p> <p>Radiated emission measurement facilities above 1 GHz: 10</p> <p>Applications returned with comments: None</p> <p>Applications carried over to the next meeting: None</p>
Date	December 19, 2022
Agenda items	● Reviewed the results of deliberations by the Measurement Facility Examination WG.
Decisions	<p>Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 19 companies</p> <p>Radiated emission measurement facilities below 1 GHz: 10</p> <p>AC-mains-ports-conducted emission measurement facilities: 12</p> <p>Wired-telecommunication-port-conducted emission measurement facilities:4</p> <p>Radiated emission measurement facilities above 1 GHz: 12</p> <p>Applications returned with comments: None</p> <p>Applications carried over to the next meeting: None</p>

EMC Standards for Semiconductor Devices

– EMC Standards for Integrated-Circuit Product Groups -

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. In TC47 (Semiconductor devices) and SC47A (Integrated circuits) of the IEC standards, EMC standards have been created for integrated circuits (ICs). However, this document explains the EMC standards for IEC-62228-series integrated-circuit product groups based on reference documents 1 and 2. For your reference, an overview of the EMC standards for semiconductor devices is provided in VCCI Dayori No. 139³⁾, emission-measurement methods in VCCI Dayori No. 146⁴⁾, and immunity-measurement methods in VCCI Dayori No. 147⁵⁾.

2. EMC standards for integrated-circuit product groups: "EMC Evaluation Method for Bus Transceivers: IEC 62228 Series"

In WG9 of IEC SC47A, which handle the standards for EMC measurement-evaluation methods for integrated circuits, evaluation of particular product groups had not yet been anticipated, and emission- and immunity-measurement methods were being discussed for general integrated circuits (ICs). The IEC-62228 series, however, could be called the first product-group standard relating to EMC in semiconductors.

Table 1 shows the current status of the IEC-62228 series of the EMC evaluation standards for vehicle-mounted network transceiver ICs. This series was initially proposed in Germany in 2004 to ensure the reliability of CANs (Controller Area Networks), which were commonly used as vehicle-mounted networks at the time, as an EMC characteristics-evaluation method for CAN transceiver ICs. The series was then standardized in the TS (Technical Specification). After this, EMC evaluation methods (IEC 62228-2) for LIN (Local Interconnect Network) transceiver ICs for low-speed buses were standardized in the IS (International Standard) in 2016. Around the same time, the IEC General Meeting in Frankfurt (SC47A/WG9) in the fall of 2016 decided on a policy to make the series of EMC evaluation-method standards for bus transceivers into the IEC 62228 series.

This was followed by the IEC 62228-3:2019 (for the high-speed-communication version of CAN, CAN-FD (Flexible Data-rate)) and IEC 62228-5:2021 (targeting consumer Ethernet (100BASE-TX) and vehicle-mounted

Ethernet (100BASE-T1, 1000BASE-T1) standards. In 2022, the Japanese-proposed CXPI-transceiver-IC test standard IEC 62228-7:2022 was issued.

Table 1 Standards and discussion plans for bus transceiver EMC evaluation methods (as of December 2022)
Integrated Circuits - EMC evaluation of bus transceivers

	Title and discussion plan
IEC/TS 62228:2007 Ed. 1.0 (02/16/2007)	Integrated circuits - EMC evaluation of CAN transceivers
IEC 62228-1: 2018 Ed. 1.0 (01/09/2018)	Integrated circuit - EMC evaluation of transceivers - Part 1: General conditions and definitions
IEC 62228-2: 2016 Ed. 1.0 (11/18/2016)	Integrated circuit - EMC evaluation of transceivers - Part 2: LIN transceivers
IEC 62228-3: 2019 Ed. 1.0 (03/11/2019)	Integrated circuit - EMC evaluation of transceivers - Part 3: CAN transceivers
IEC 62228-4	Part 4: Flex Ray -> (Time of proposal: undecided; country in charge: undecided)
IEC 62228-5: 2021 Ed. 1.0 (04/26/2021)	Integrated circuit - EMC evaluation of transceivers - Part 5: Ethernet transceivers
IEC 62228-5/AMD1 47A/1148/CDV (12/16/2022)	Amendment 1 - Integrated circuit - EMC evaluation of transceivers - Part 5: Ethernet transceivers (Optical Ethernet 1000BASE-RH)
IEC 62228-6: 2022 Ed. 1.0 (11/08/2022)	Integrated circuit - EMC evaluation of transceivers - Part 6: PSI5 transceivers
IEC 62228-7: 2022 Ed. 1.0 (02/22/2022)	Integrated circuit - EMC evaluation of transceivers - Part 7: CXPI transceivers ⇒ (Working Doc. proposed in 2017; 2017-12:NP, 2019-06:CD: Japan will be in charge.)
IEC 62228-8	Part 8: SENT/SPC -> (Time of proposal: undecided; country in charge: Germany)
IEC 62228-9	Part 9: LVDS -> (Time of proposal: undecided; country in charge: undecided)

(1) Structure of the IEC-62228 series

The following is a summary of the wiring configuration, topology, and communication speed for communication handled by the IEC-62228 series. However, discussions have begun regarding Part 5: Ethernet and the aforementioned vehicle-mounted optical Ethernet (1 Gbps and multigigabit) as targets of the standards for EMC characteristics-evaluation methods.

Part	Standard	Purpose (wiring configuration, topology, and communication speed)
Part 1	General	General purposes:
Part 2	LIN	general purposes: (1 wire • bus • 20 kbps)
Part 3	CAN	general purposes: (2 wires • bus • kbps to Mbps)
Part 4	FlexRay	general purposes: (2 wires • P2P, bus • 10 Mbps)
Part 5	Ethernet	general purposes: (2, 4, 8 wires • P2P • 10 Mbps to 1Gbps)
Part 6	PSI5	general purposes, sensors interface: (2 wires • P2P, bus • 125 kbps)
Part 7	CXPI	general purposes: (1 wire • bus • 20 kbps)
Part 8	SENT/SPC	general purposes, sensors interface: (1 wire • P2P • 20 kbps)
Part 9	LVDS	general purposes, high speed data: (2 wires • P2P • few Gbps)

Note that the following details are recorded in WG 9's minutes of the Frankfurt Meeting where the IEC-62228 series was decided on:

- The target fields and purposes for the IEC-62228 series will fall under "General purposes".
- As far as possible, the standards of the IEC-62228 series will be open to all industry fields.
- The standards of the IEC-62228 series will not be limited to automotive applications.
- When standards are expected to only be applied to a particular area, clearly state this under "Scope" of (each part of) the standards.

FlexRay (IEC 62228-4), which was already included as a standardization target in 2016, has no proposer and is not expected to be standardized. LVDS (low-voltage differential signaling) is a high-speed differential transmission system already being used even in vehicle-mounted systems, and is planned to become IEC 62228-9. However, at this stage, no draft of the standard has been proposed to the IEC. SerDes, which is for even faster differential signal systems including LVDS, is expected to become a standardization target in the partnership between OPEN Alliance and ASA (mentioned later in this document). Countries including Japan believe that advance measures are necessary.

(2) Standards referenced by the IEC-62228 series

The IEC-62228 series references the SC47A standard as an EMC evaluation-method standard. For example, if we show the standards referenced by IEC 62228-5:2021 (Ethernet transceiver ICs) in abbreviated form (see the following list), other ISO and IEC standards are also referenced. Among these, "[Normative references]" is a standard for a necessary measurement referenced in the text of the standard, but care must be taken with standards referenced as "[Bibliography (informative references)]" which are used in "Annex (Informative)" as

currently non-mandatory measurements, however might become mandatory requirements in the future. Currently, particular care must be taken with the radiated EMC test method "IC stripline method", where both emission and immunity fall under Informative References (IEC 61967-8, IEC 62132-8), in combination with the "TEM cell method".

[Normative references (referenced standards upon which the standards are based)]

Only excerpts relating to EMC measurement methods (abbreviated)

IEC 61967-1: General conditions and definitions

IEC 61967-4: 1 ohm/150 ohm direct coupling method

IEC 62132-1: General conditions and definitions

IEC 62132-4: Direct RF power injection (DPI) method

IEC 62215-3: Nonsynchronous transient injection method

IEC 62228-1: General conditions and definitions

ISO 10605, Road vehicles - Electrostatic discharge (ESD)

ISO 7637-2, Road vehicles - Electrical transient conduction along supply lines only

[Bibliography (informative references)]

CISPR 16-1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus

IEC 61000-4-2: Electrostatic discharge (ESD) immunity test

IEC 61000-4-4: Electrical fast transient/burst immunity test

IEC 61000-4-5: Surge immunity test

IEC 61967-2: TEM cell and wideband TEM cell method

IEC 61967-8: IC stripline method

IEC 62132-2: TEM cell and wideband TEM cell method

IEC 62132-8: IC stripline method

IEC 62615: Transmission line pulse (TLP)

(3) Overview of each part of the IEC-62228 series

IEC 62228-2 (LIN): Ed.1.0 (2016)

This is a single-wire low-speed bus. The original proposal was to perform testing in a configuration with three transceivers placed on the EMC test board. However, this was not an EMC test that included bus characteristics; the policy was to evaluate the emission and immunity characteristics and ESD tolerance of the IC alone. Therefore, the configuration was changed to use two transceivers.

IEC 62228-7 (CXPI): Ed.1.0 (2022)

The EMC evaluation standard for CXPI (Clock Extension Peripheral Interface) transceiver ICs, which was proposed by Japan as a single-wire low-speed bus similar to LIN, was issued in February 2022 as IEC 62228-7 Ed.1.0. CXPI was standardized in the Society of Automotive Engineers of Japan's JASO D015 and SAE J3076, and in 2020, the communication standard became an international standard in the form of ISO 20794. CXPI has equivalent communication speed to LIN, but is also expected to have advantages as a vehicle-mounted network and from an EMC perspective. Examples include ensuring responsiveness when the number of nodes increases or ease of adding and deleting nodes, and high reliability due to error detection (CRC support). JEITA semiconductor EMC-SC has also conducted verification experiments to propose the standard, using an EMC evaluation method standard

that had been proposed to the IEC in 2017. This evaluation standard includes embedded transceivers in addition to the original independent transceiver ICs.

Examples of limit lines and limit classes for emission and immunity characteristics have not been included as of Ed.1.0, but there is increasing demand for clarification of correspondence relations among EMC tests of vehicle-mounted equipment. For this reason, there is ongoing discussion at JEITA semiconductor EMC-SC to add this clarification to Ed.2.0.

IEC 62228-3 (CAN) : Ed.1.0 (2019)

The CAN transceiver standard (Part 3) is a revision of the existing IEC/TS 62228:2007 (targeting communication standards featuring High Speed CAN (up to 1 Mbps) and Low Speed CAN (up to 125 kbps)) that supports CAN FD (CAN with Flexible Data Rate, data rate 2 Mbps and 5 Mbps). The standard proposes, among other things, immunity evaluation via mask tests using CAN-FD frames. Also supported is the ISO-11898 standard, revised and added to in 2015, including support for the power-saving functionality CAN-PN (Partial Networking) (ISO 11898-6). The standard includes tests on the new wake-up mode that was added to the existing CAN. Tests including those for common mode chokes are also included. The configuration on the test board was a three-transceiver configuration in "IEC/TS 62228 : 2007 Ed.1.0", but in the new standard, this is changed to a two-transceiver configuration as shown in the LIN standard "IEC 62228-2 Ed.1.0". Test signals (and the like) are based on ISO 11898, Road vehicles - Controller area network (CAN).

Annex D (Informative) of IEC 62228-3 (CAN) specifies an "evaluation method for common mode chokes (CMCs)". Because this falls under an Informative References this is deemed a "recommendation". Effectively speaking, however, this is a requirement because it clearly states evaluation methods for the degree of equilibrium and for degradation of characteristics caused by CMC saturation when power is high. However, while CAN-transceiver I/O is a differential system, its degree of equilibrium is very poor, so this is essentially handled differently to high-equilibrium differential transmission systems such as Ethernet and LVDS. Further information on CMC evaluation standards can be found later in this document.

IEC 62228-5 (Ethernet): Ed.1.0 (2021)

The EMC standard for Ethernet transceiver ICs (Part 5) mainly targets vehicle-mounted Ethernet, and Ed.1.0 (2021) is a test method for vehicle-mounted 100 BASE-T1, 1000 BASE-T1, and consumer 100 BASE-TX. Because the targets of the IEC 62228 series are not limited to vehicle-mounted networks, in terms of the road map, this series handles "2-wire, 4-wire, and 8-wire" Ethernet transceivers. However, OPEN Alliance^{#1}, which effectively handles the standardization of the specifications for vehicle-mounted Ethernet standards, is also taking the lead in formulating EMC standards. "OPEN (One-Pair Ether-Net)" means "2-wire 1-pair Ethernet communication", and among the communication standards formulated by the IEEE, implementation conditions and test methods for vehicle-mounted Ethernet will be discussed as Specifications of each TC (Technical Committee) of the OPEN Alliance. After this, EMC-related specifications will be proposed as standards for IEC SC47A. The IEC's NP proposal for IEC 62228-5: Ed.1.0 was made in January 2018. However, in OPEN Alliance, the EMC specifications^{#2} of 100BASE-T1 transceiver IC were released in October 2017. The EMC specifications^{#3} for 1000BASE-T1 were released in December 2017 as Public Specifications. The details of these specifications are largely the same as

*1 OPEN Alliance (One-Pair Ether-Net) Inc. <https://www.opensig.org/home/>

*2 B. Körber, FTZ Zwickau, "100BASE-T1 EMC Measurement Specification for Transceivers", Ver.1.0, Final, Public, OPEN Alliance, October 4, 2017.

*3 B. Körber, FTZ Zwickau, "1000BASE-T1 EMC Measurement Specification for Transceivers", Ver.1.0, Final, Public, OPEN Alliance, December 13, 2017.

for the IEC's NP.

Currently, [TC9] and [TC15] of the OPEN Alliance are discussing electrical multi-gigabit Ethernet, and considerations are underway for the standardization of connector-evaluation methods and link-segment specifications. Linkage of OPEN and ASA TC E^{#4} also appears to be underway (see reference 2). Additionally, [TC15] appears to be in charge of "Transceiver EMC test spec for Multi GBASE-T1".

Electrical 10-Mbps vehicle-mounted 2-wire Ethernet (10PSE: 10BASE-T1S) is currently being discussed in partnership with [TC9] and [TC14] of the OPEN Alliance (see reference 2). These, too, will need to be supported due to the high likelihood that they will be additionally proposed to the IEC in the near future.

Common mode chokes and evaluation methods for ESD-protection elements in the IEC-62228 series

Evaluation methods for common mode chokes (CMCs) and evaluation methods for ESD-protection elements are included in IEC 62228-3 (CAN) and IEC 62228-5 (Ethernet) as Informative References. Ethernet requires a higher degree of equilibrium than CAN, especially CMCs and ESD-protection elements used by particularly high-speed Ethernet. In OPEN Alliance, requirements of Ethernet CMC and ESD-protection elements are issued as separate specification documents from EMC evaluation methods for transceiver ICs, divided according to communication speed (for 100BASE-T1 and 1000BASE-T1^{#5} respectively), and as previously mentioned, discussion has begun regarding specifications for 10BASE-T1S.

Unlike peer-to-peer (P2P) communication such as 100BASE-T1 and 1000BASE-T1, 10BASE-T1S uses multidrop communication, where the need to reduce reflections at drop nodes requires the maximum value of node capacity at the time of reception (RX) to be small. Considerations are also underway to make requirements on parasitic capacitance for CMCs stricter. However, even if parasitic capacitance for individual parts is small, parasitic capacitance increases in actual implementations on the board. For this reason, the validity of part requirements must be considered.

Also, some descriptions in the current standards are insufficient to secure measurement reproducibility for TLP measurement methods used in CMC saturation tests as described in the Annex of the current IEC 62228-5 (Ethernet). For this reason, Japan is planning to propose improvements to the standards for IEC SC47A/WG9 (see reference 2).

IEC 62228-5/AMD1 (optical Ethernet): (2022 proposal: currently being discussed)

In March 2022, Japan proposed an EMC evaluation method for transceiver ICs and FOTs (fiber-optic transceivers) that support 1-Gbps optical Ethernet (1000 BASE-RH, IEEE 802.3bv) using plastic optical fiber (POF), as an Annex of IEC 62228-5, sparking discussion. Current optical Ethernet ICs (made by KDPOF) do not have a battery-voltage system (V_BAT), and therefore do not require immunity tests. Accordingly, the current proposal is an EMC-evaluation standard (draft) for emission measurements only. However, disruptions to operations by the intrusion of disturbances from the local power-supply system cannot be eliminated completely, so we expect that in the future, some form of additional immunity evaluation will be needed for disturbances from local power-supply systems.

IEC 62228-6 (PSI5) : Ed.1.0 (2022)

PSI5 (Part 6) and SENT/SPC (Part 8) are used in sensor interfaces. PSI 5 (Peripheral Sensor Interface 5), used in airbag networks, has specifications formulated under PSI 5 organization, and uses two twisted-pair wires,

*4 Automotive Serdes Alliance (ASA), TC E(Channel & EMC Testing) <https://auto-serdes.org/>

*5 <https://www.opensig.org/about/specifications/>

claiming to offer high immunity. Similarly, DSI (Distributed System Interface) for airbag interfaces is not currently included in the road map for the IEC-62228 series. SENT/SPC stands for "**SENT** (*Single Edge Nibble Transmission*, SAE J2716) Protocol Interface including **SPC** (*Short PWM Code*) Support." and is used in vehicle-mounted sensor networks. Currently, only the PSI 5 evaluation standard IEC 62228-6 has been proposed to the IEC, with Ed.1.0 issued in November 2022.

[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
- 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
- 5) Masamitsu Tokuda: "EMC Standards for Semiconductor Devices: Methods for Measuring Immunity", VCCI Dayori No. 147, pp. 11-14, January 2023



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 the EMC Europe 2022 Symposium

Technical Subcommittee

The following is a report on VCCI's participation in EMC Europe 2022.

- Venue: The Swedish Exhibition & Congress Centre, Gothenburg, Sweden
- Trip duration (participation in the symposium): September 6 (Tue) to 8 (Thu), 2022
- Period of symposium: September 5 (Mon) to 8 (Thu), 2022
- Participants: Ms. Miyake of the Technical Subcommittee (NEC Corporation)
Mr. Muramatsu, Technical Manager (VCCI Council)
Ms. Inagaki, Program Manager (VCCI Council)

I. EMC Europe 2022 Symposium <Overview>

The Symposium was held in the real world for the first time in three years.

This time, the purpose was to present papers submitted by the VCCI Council at a poster session, participate in oral presentations and special sessions, and collect information.

There were 565 participants, with 3 keynote speeches, 18 oral presentations, 4 special sessions, 15 workshops, and 164 paper presentations (of which 24 were special sessions, 96 were oral presentations, and 44 were poster sessions) over the course of the Symposium. This number was slightly smaller than in past Symposiums. 30 countries presented papers: 26 from Germany, 20 from Sweden, 18 from France, 17 about The Netherlands, and 14 from Japan.

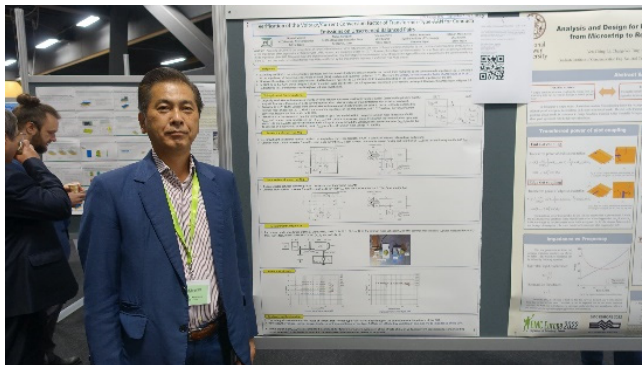
The papers submitted by the VCCI Council were presented in the "Poster Session 2" in the afternoon of September 7 (Wed).

1. Paper presentations

Session: Poster Session 2

- Title: Verification of the Voltage/Current Conversion Factor of Transformer type-AAN for Conducted Emissions on Unscreened Balanced Pairs
- Authors: Nozomi Miyake (VCCI Council/NEC Corporation)
Naoya Haraguchi (FUJIFILM Business Innovation Corp.)
Fujio Amemiya (VCCI Council)
Nobuo Kuwabara (Kyushu Institute of Technology)
Hidenori Muramatsu (VCCI Council)
- Presenter: Nozomi Miyake (VCCI Council/NEC Corporation)

- Overview: The voltage-to-current conversion ratio of AANs used in conducted emission measurements for wired network ports based on CISPR 32 is 44 dB. However, the voltage-to-current conversion ratio of AANs actually fluctuates depending on the common-mode impedance of EUTs. This paper shows how the transformer-type AANs' voltage-to-current conversion ratio fluctuates in response to common-mode impedance of EUTs. Also shown are the test results for both the current transformer-type AAN displayed in the current CISPR 32 Figure G.3, and the newly discussed improved transformer-type AAN. According to the test results, the voltage-to-current conversion ratio of the current transformer-type AAN fluctuates depending on the common-mode impedance of EUTs. Meanwhile, for the improved transformer-type AAN, voltage-to-current conversion ratio is not influenced by common-mode impedance of EUTs, and is largely a constant value.
- Impressions: Japan participated in the poster session remotely, replying to questions from participants at the venue online. We saw a high level of interest among participants based on the two questions that were asked remotely, and the scenes of participants engaged in activities such as debating in front of a poster at the poster-session venue.
- Q&A: The following questions were asked at the presentation:
 - Q1: Can you tell us about the impedance Z_{cat} of transformer-type AANs?
 - A1: The purpose of the impedance Z_{cat} is to provide the imbalance needed to adjust the LCL of AANs.
 - Q2: What is the purpose of this verification?
 - A2: The purpose is to make sure the voltage-to-current conversion ratio of transformer-type AANs is largely a constant value, and to improve the uncertainty of measurements.



Poster-session venue



Online Q&A

2. Keynote overview

Session: Keynote 2

- Title: Radiofrequency Fields from Mobile Phone Technologies and Health
- Presenter: Prof. Maria Feychting
- Country: Sweden
- Affiliation: Swedish Defence Research Agency (FOI)

- Overview: This lecture discussed how the introduction of handheld mobile phones in the late 1980s increased the public's exposure to radio-frequency (RF) fields, but with every passing generation of mobile-phone technology, RF exposure levels from handsets decreased. However, it was reported that there is little research data on the latest-generation wireless technology in higher-frequency ranges such as 26 GHz, and that exposure levels must be continuously monitored.

3. Technical Session overview

(1) Session: Poster Session 1

- Title: Impact of Electromagnetic Radiation of 4G/5G Base Stations on Medical Short-Range Devices in Urban Area
- Presenter: Mr. Aliaksandr Svistunou
- Country: Belarus
- Affiliation: EMC R&D Laboratory Belarusian State University
- Overview: The impact of electromagnetic emissions from 4G/5G base stations on short-range medical equipment in urban areas was simulated using a multipath radio propagation model, taking into account propagation from outdoor to indoor environments. To execute the simulation, a 3D model was created based on a section of an urban area containing buildings 6 to 60 m tall. This lecture explained that the result of testing that 3D model showed that such emissions could interfere with medical devices. This lecture also provided recommendations for reducing these electromagnetic interference levels.
- Impressions: This research focused on the electromagnetic interference levels of electromagnetic waves from outside impacting equipment inside buildings. However, if simulations can also be used to test levels of electromagnetic propagation from equipment to the outside, we expect to be able to test the impacts of electromagnetic disturbances at the actual installation site in advance.

(2) Wireless Technologies 1

- Title: EMC challenges with 6G
- Presenter: Mr. Kia Wiklundh
- Country: Sweden
- Impressions: Swedish Defence Research Agency (FOI)
- Overview: This lecture showed an example of the interference issues that need to be addressed when using 6G. This lecture explained that for 6G, there are 100 units of device density every 1m^3 , and explained the impacts on interference among devices at high density. Here, high-density devices were analyzed at 60 GHz, and the impact on interference of using directional antennas was analyzed, revealing that there was a risk of interference problems occurring with directional antennas in the future.
- Impressions: Currently, CISPR is considering extending the upper limit of the frequency range for radiated

emission measurement to 40 GHz. This paper analyzed the impacts on interference of the use of directional antennas at 60 MHz, for example highlighting the risks of using directional antennas at high frequency ranges. This served as a useful reference for radiated emission measurements.

(3) Stochastic Methods in EMC

- Title: Investigation of the Impact of Height Scans in Fully Anechoic Rooms on Detection of Maximal Radiated Field Strength Using Monte Carlo Simulation
- Presenter: Mr. Jorg Petzold
- Country: Germany
- Impressions: Otto-von-Guericke University
- Overview: CISPR 16-2-3 specifies a fixed height for receive antennas for radiated emission measurements above 1 GHz using absorbent floor materials. Additionally, CISPR 32 is debating the impacts of relaxing the limits for radiated emission and vertical movement of measuring antennas. This paper described a Monte Carlo simulation performed for a measurement process using a statistical radiator model to generate radiation patterns. This paper then described a new measurement procedure for radiated emissions whose maximum level difference is 3 dB, where radiated emissions are measured by using a 3D scan.
- Impressions: For frequencies over 1 GHz, the use of FAR as the measuring facility has been proposed in order to use measurement methods using a 3D scan. However, this requires antennas to be raised and lowered while maintaining an equal distance between the antenna and EUT. We would like to focus on test results using actual measurements in our research going forward.

(4) Measurements 1

- Title: In-situ Measurements of Conducted and Radiated Emissions from Photovoltaic Installations
- Presenter: Mrs. Sara Linder
- Country: Sweden
- Impressions: Swedish Defence Research Agency (FOI)
- Overview: Regarding emissions from solar power generation systems, a report was given on the results of measuring conducted and radiated emissions at solar-panel installation sites. The measurement frequency range was 10 kHz to 200 MHz for conducted emissions, and 10 kHz to 1 GHz for radiated emissions. For the measurement method, a current clamp was used for conducted emissions, and for radiated emissions, an antenna was placed 20 m away from the solar panel. For the operating conditions, inverters in solar power generation systems were measured both the on and off states. The measurement result showed that both conducted and radiated emissions could be measured at the installation site, and inverter noise could be observed, but was difficult to separate from environmental noise such as radio waves.
- Impressions: In the revised CISPR 32, in-situ measurement methods for large devices were considered,

serving as a useful reference for actual measurement methods. When revising the standards, it will be necessary to focus on points such as measurement conditions at the actual installation site and separation of emissions and environmental noise from the measurement results.

4. Exhibition overview

While the focus was on trends in companies that were already regular participants in exhibitions, 33 companies participated in the exhibition booths, which appeared to be roughly the same number and the same companies as three years ago.

5. Impressions

For this year's poster-session presentation, PCs were placed next to the poster exhibit, and the main author of the exhibit participated remotely, answering questions asked online. Questions asked at the venue were answered by the co-author, who was participating in person. Online questions were answered in a Q&A session using the chat or microphone. Although some aspects of the questions were difficult to convey, the Q&A session was lively, and fulfilled its objective.

An overview of this year's Symposium was given before the keynote speech. Although it was reported that slightly fewer papers were submitted due to the COVID-19 pandemic, we want to continue making an effort to submit as many papers as possible going forward. This year's Symposium was quite different from last year's Symposium, which was held online. As expected, this year's real-life Q&A session turned out to be a lively event.

Report on Participation in CEATEC 2022

Public Relations Subcommittee

The following is a report on VCCI's participation in CEATEC 2022.

Exhibition name: CEATEC2022

<https://www.ceatec.com/2022/en/>

Makuhari Messe venue exhibition period: October 18 (Tue) to 21 (Fri), 2022

- Number of exhibitor companies: 562 companies and groups (number for 2019: 787 companies and groups)
- Number of exhibitor companies from overseas: 146 companies and groups from 27 countries and regions (number for 2019: 250 companies and groups from 24 countries and regions)
- Number of exhibitor startups and academic research institutions: 81 companies and groups (number for 2019 : 170 companies and groups)
- Number of new exhibitor companies: 266 companies and groups (number for 2019: 304 companies and groups)
- Actual number of visitors: 81,612



Online exhibition period: October 1 (Sat) 2022 to 31 (Mon)

Number of exhibitor companies: 347

Number of registered visitors: 30,307

1. Introduction to CEATEC

Held by the Communications and Information Network Association of Japan (CIAJ), the Japan Electronics and Information Technology Industries Association (JEITA), and the Computer Software Association of Japan (CSAJ), CEATEC is Asia's largest international exhibition for IT technology and electronics.

CEATEC 2020 and 2021 were online-only events, while this year's CEATEC was the first in three years to be held at a real-life venue.

This year's exhibition was held both at Makuhari Messe and online, and the VCCI Council participated through both real-life and online booths.

2. Makuhari Messe

The booth showcased materials such as membership information, three types of panels, and introductory videos about VCCI, while taking due care to prevent the spread of COVID-19.



The VCCI Council booth

● Materials

- Introduction to the VCCI Council (triple-folded pamphlet)
- Information on VCCI enrollment
- Annual Report 2021
- Guide to the VCCI Council's education and training
- Scope of the international standard CISPR 32
- Introduction to the VCCI Council's guidance

● Introductory videos (Japanese)

- Videos on the three topics "Do you know VCCI mark?", "Acquiring the VCCI mark", and "Scope of VCCI" (approx. 7 minutes)
- Just in case someone asked, "What is electromagnetic interference?", we prepared a new video called "Examples of electromagnetic interference caused by electromagnetic disturbances" that would provide a clear understanding of the topic. This year, no one asked the question.

Going forward, we will continue to explain to viewers that "The purpose of these videos is to provide a clear visual introduction to electromagnetic interference caused by electromagnetic disturbances. These videos do not indicate the immunity of electronic devices to electromagnetic disturbances."

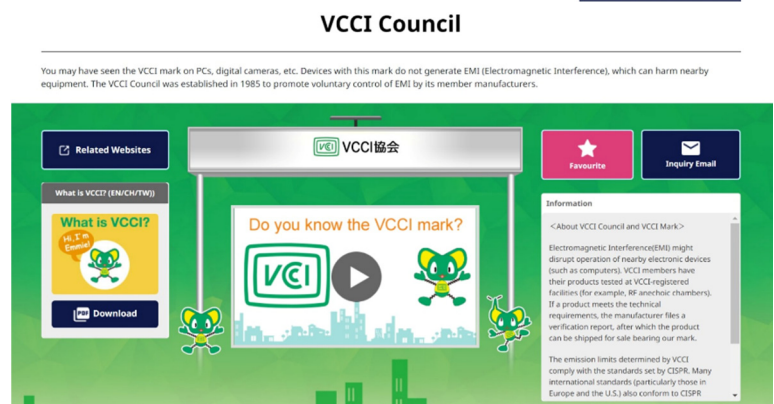
● Booth visitors

The booth received 122 visitors during the exhibition period. Of these, 105 completed the questionnaire. Desk calendars for 2023 and ball-point pens were handed out to the visitors as novelties.

Booth Number K101

3. Online exhibition

In compliance with the sponsors' conditions for holding an online booth, an overview of VCCI, introductory videos, and downloadable materials were posted online in both Japanese and English.



Example of an online booth

● Introductory videos (Japanese and English)

- The three topics "Do you know VCCI mark?",

"Acquiring the VCCI mark", and "Scope of VCCI" (approx. 7 minutes)

●Materials (Japanese and English, and Chinese (with parts in simplified and traditional characters))

- Introduction to the VCCI mark
- Introduction to the VCCI Council
- Annual Report 2021
- Japanese electromagnetic regulations
- Scope of the international standard CISPR 32
- Guide to the VCCI Council's education and training
- Introduction to advertisements of the VCCI Council

●Number of booth visitors

The booth received 357 visitors during the exhibition period. Of these, 16 completed the questionnaire. Novelties were sent to those who completed the questionnaire.

4. Impressions

At the venue, many people did not know about the VCCI Council in detail, so the event felt like a good opportunity to get people interested in the VCCI Council's activities and the VCCI mark. Going forward, we will consider creating documents such as pamphlets on the VCCI Council's activities.

A considerable number of people also visited the online exhibition.

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

Status on FY2022 Market Sampling Tests

Market Sampling Test Subcommittee

As of December 27, 2022

Planned number of market sampling tests	Loan-based	35	100
	Purchase-based	65	

Sampling test	Selected	Cancelled (Not shipped, etc.)	Testable samples	Test completed (Included number)	Judgment			
					Passed	Failed - tentative		
						Finally passed	Finally failed	Pending
Grand total	98	4	90	57	51	4	1	1

Loan-based testing total		39	4	34	24	22	0	1	1
Term (Included number)	1 st Quarter	9	3	6	5	5	–	–	–
	2 nd Quarter	12	–	12	12	11	–	1	–
	3 rd Quarter	10	–	10	7	6	–	–	1
	4 th Quarter	8	1	6	–	–	–	–	–

Purchase-based testing total		59	0	56	33	29	4	0	0
Term (Included number)	1 st Quarter	18	0	18	18	14	4	–	–
	2 nd Quarter	10	–	10	6	6	–	–	–
	3 rd Quarter	13	–	13	9	9	–	–	–
	4 th Quarter	18	–	15	–	–	–	–	–

Passed	Failed	Pending
55	1	1

Document inspection	Selected	Cancelled (withdrawal, etc.)	Inspectable samples	Pre-check completed	Judgment completed	Judgment	
						Cleared	Problems identified
	43	3	39	39	33	31	2

Details of failure in FY 2022

As of December 2022

Company	PLUS Corporation
Device : model	LIVE Whiteboard : LWB-0507SST
Test result	Radiated emission measurement: Horizontal: 7.9 dB excess; Vertical: 9.5 dB excess at 959 MHz
Cause / improvement	<p>Cause:</p> <p>This system is a product consisting of a whiteboard and USB camera. The USB hub is installed between the USB camera (which films the whiteboard surface) and the PC, and the camera and hub are connected via pre-connectorized cables.</p> <p>When a connection failure occurs in the connectors of the camera and hub, the camera does not work properly. The conformity confirmation test found a connection failure in this very location. This was considered the reason why the maximum radiated emission could not be measured. Measures were subsequently taken to address locations prone to connection failures, thus lowering the risk of connection failures in shipped products.</p> <p>Countermeasures:</p> <p>Shipping of model number LWB-0507SST has been stopped.</p> <p>Because the product in question is within the limits for Technical Requirements VCCI-CISPR 32:2016 Class A, new model number LWB-0507SST-1 will be registered as Class A equipment.</p> <p>Measures to take on stocked and shipped products:</p> <p>The product in question is intended to be used in office meeting rooms rather than residential environments.</p> <p>Customers who have already received shipped products will be identified and sent an explanation that the product is Class A equipment, as well as an instruction manual for handling Class A equipment. An announcement will also be posted on our official website just in case customers are overlooked. In the unlikely case that we receive an electromagnetic-interference report, we will respond by confirming the facts and recalling the product.</p> <p>Stocked products will have their model number changed to LWB-0507SST-1.</p> <p>Prevention:</p> <p>We will revise our internal EMC test guidelines, and correct or add the following details:</p> <ol style="list-style-type: none"> ① We will confirm the product's operating conditions before, during, and after every test and measurement. ② Items to be checked during measurement will be listed on a check sheet and recorded during measurement. ③ If the product design is changed, we will thoroughly confirm that the change does not impact the EMC test. ④ We will make sure that the relevant department checks the validity of measurement results during the review.

Report from the Secretariat

● List of Members (October 2022 - December 2022)

New members

Membership	Member No.	Company Name	Country
Regular	4288	KS Corporation	JAPAN
Regular	4262	Rakuten Symphony Singapore	SINGAPORE
Regular	4273	NZXT Inc.	CHINESE TAIPEI
Regular	4275	Suzhou Pseakin Electronics Technology	CHINA
Regular	4279	Linxee(Beijing) Technology Co., Ltd	CHINA
Regular	4280	Cherry Americas, LLC	USA
Regular	4281	QANBA USA, LLC	USA
Regular	4282	Wuxi Taclink Optoelectronics Technology Co., Ltd.	CHINA
Regular	4283	DIGILIFE TECHNOLOGIES CO., LTD.	CHINESE TAIPEI
Regular	4285	H2VR HOLDCO INC	USA
Regular	4287	COCOAENT Co., LTD.	KOREA
Supporting	4284	Shenzhen LCS Compliance Testing Laboratory Ltd.	CHINA

Company name change

Membership	Member No.	Company Name	Country	Old company name
Regular	3296	Meiko Embedded Products, Ltd.	JAPAN	NEC Embedded Products, Ltd.
Regular	3880	SolarEdge Technologies Japan Co., Ltd.	JAPAN	SolarEdge Technologies Ltd.
Regular	4159	AUO Corporation	CHINESE TAIPEI	AU Optronics Corporation
Supporting	555	Parker Chomerics Test Services	USA	Chomerics Test Services

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

● VCCI Schedule for FY 2023

April	May	June Release VCCI Dayori No.149
July TECHNO-FRONTIER 2022	August Release Annual Report	September Release VCCI Dayori No.150
October CEATEC 2023	November	December Release VCCI Dayori No.151
January	February	March Release VCCI Dayori No.152

● Status of Compliance Test Notifications (VCCI 32-1)

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 2022			November 2022			December 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.	A2	a2	17	4	21	43	1	44	34	1	35
		Stationary	Workstation, Desktop PC, etc.	B2	b2	3	15	18	3	24	27	2	13	15
		Portable	Laptop PC, Tablet PC, etc.	C2	c2	0	33	33	1	33	34	0	87	87
		Other computers	Wearable computers, Wearable device, Smart watch, Smart glass, etc.	E2	e2	1	5	6	1	2	3	2	1	3
	Peripheral / Terminal	Memory device	HDD, SSD, USB Memory, Media drive, Disk device, NAS, DAS, SAN, etc.	G2	g2	6	15	21	6	19	25	5	15	20
		Printer device	Printer including multifunction machine, etc. (portable)	H2	h2	5	11	16	6	4	10	3	12	15
		Display device	CRT display, Monitor, Projector, etc.	J2	j2	16	69	85	9	73	82	7	39	46
		Other I/O devices	Image scanner, OCR, Pen tablet, Stylus pen, etc.	M2	m2	0	6	6	0	7	7	2	12	14
		General purpose terminal	Display controller terminal, etc.	N2	n2	0	0	0	5	0	5	1	0	1
		Special purpose terminal	POS, Terminal for finance, insmance, etc.	Q2	q2	4	0	4	8	4	12	0	2	2
		Other peripheral	PCI Card, Graphics Card, Mouse, Keyboard, Cradle, etc.	R2	r2	5	58	63	3	43	46	10	28	38
		Copying machine / Multifunction copying machine	Copying machine, Multifunction copying machine, etc. (Stationary)	S2	s2	2	3	5	0	1	1	0	1	1
	Communications equipment	Terminal equipment	Mobile phone, Smart phone, PHS phone, etc.	T2	t2	0	6	6	0	2	2	0	0	0
			Telephone device such as PBX, FAX, Key telephone systems, Cordless phone, etc.	U2	u2	0	1	1	0	4	4	0	0	0
		Network-related equipment	Communication line connecting device including Modem, Digital transmission unit, DSU, TA, Media converter, etc.	V2	v2	0	1	1	1	0	1	4	0	4
			LAN-related device, including Router, HUB, etc. Local switch, etc.	W2	w2	34	16	50	45	23	68	77	18	95
	Other communication equipment	Other communication equipment	X2	x2	18	7	25	6	6	12	14	7	21	
	Broadcast receiver equipment		TV, Radio, Tuner, Video recorder, Set-top box, etc.	/	k2	/	1	1	/	0	0	/	0	0
Audio equipment		Speaker, Amplifier, IC recorder, Digital audio player, Headset, DTM, AI speaker, etc.	L2	l2	0	5	5	0	11	11	1	3	4	
Video equipment	Video equipment	Digital video camera, Web camera, Network camera, Video player, Photo frame, Digital camera, Drive recorder, etc.	I2	i2	2	18	20	6	18	24	11	7	18	
	Other video equipment	VR goggles, Scan converter, etc.	P2	p2	1	2	3	0	0	0	6	0	6	
Entertainment lighting control equipment		Entertainment lighting control equipment, etc.	Z2	z2	0	0	0	0	0	0	0	0	0	
Other MME	Entertainment / Education	Electronic stationery	Electronic dictionary, e-book reader, Translator, Calculator, etc.	D2	d2	0	2	2	0	0	0	0	0	
		Electronic toy	Game console, Game pad, toy drone, etc.	Y2	y2	0	3	3	0	1	1	0	0	
		Other Entertainment / Education equipment	Navigator, AI robot, etc.	F2	f2	0	1	1	0	0	0	0	0	
	Other MME	MME other than the above	O2	o2	11	2	13	10	5	15	3	7	10	
Total					125	284	409	153	281	434	182	253	435	

● 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 2022 – December 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:
BWS TECH INC.	Shield Room 1	-	-	-	-	-	C-20129	2025/10/16	23, Gokhyeon-ro 480beon-gil, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-31-333-7430
BWS TECH INC.	Shield Room 1	-	-	-	-	-	T-20130	2025/10/16	23, Gokhyeon-ro 480beon-gil, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-31-333-7430
BWS TECH INC.	10 m SAC	-	-	-	-	-	G-20165	2025/10/16	23, Gokhyeon-ro 480beon-gil, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-31-333-7430
BWS TECH INC.	10 m SAC	-	-	-	-	○	R-20172	2025/10/16	23, Gokhyeon-ro 480beon-gil, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-31-333-7430
Eurofins E&E Wireless Taiwan Co., Ltd.	966 Semi-Anechoic Chamber (96601-WG)	-	-	-	-	-	G-20164	2025/10/16	No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)	+886-3-271-0188
Eurofins E&E Wireless Taiwan Co., Ltd.	Conduction01-WG	-	-	-	-	-	C-20128	2025/10/16	No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)	+886-3-271-0188
Eurofins E&E Wireless Taiwan Co., Ltd.	Conduction01-WG	-	-	-	-	-	T-20129	2025/10/16	No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)	+886-3-271-0188
Eurofins E&E Wireless Taiwan Co., Ltd.	966 Semi-Anechoic Chamber (96601-WG)	-	-	-	○	-	R-20171	2025/10/16	No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)	+886-3-271-0188
Kunshan Balun Communications Technology Co., Ltd.	Kunshan Balun Communications Technology Co., Ltd.	-	-	-	-	-	G-20163	2025/10/16	Room 101, Building 5, No. 1689, Zizhu Road, Yushan, Kunshan, Jiangsu, China	+86-755-5787-3002
Kunshan Balun Communications Technology Co., Ltd.	Kunshan Balun Communications Technology Co., Ltd.	-	-	-	○	-	R-20170	2025/10/16	Room 101, Building 5, No. 1689, Zizhu Road, Yushan, Kunshan, Jiangsu, China	+86-755-5787-3002
Kunshan Balun Communications Technology Co., Ltd.	Kunshan Balun Communications Technology Co., Ltd.	-	-	-	-	-	T-20128	2025/10/16	Room 101, Building 5, No. 1689, Zizhu Road, Yushan, Kunshan, Jiangsu, China	+86-755-5787-3002

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
Megalab Group Inc.	Megalab Group Inc.	-	-	-	○	-	R-20173	2025/10/16	150 Addison Hall Circle, Aurora, Ontario, Canada	+1-905-752-1925
Megalab Group Inc.	Megalab Group Inc.	-	-	-	-	-	C-20132	2025/11/20	150 Addison Hall Circle, Aurora, Ontario, Canada	+1-905-752-1925
Megalab Group Inc.	Megalab Group Inc.	-	-	-	-	-	T-20133	2025/11/20	150 Addison Hall Circle, Aurora, Ontario, Canada	+1-905-752-1925
Nemko Korea Co., Ltd.	Yurim-ro AC mains power ports	-	-	-	-	-	C-20135	2025/11/20	165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-10-4065-9422
Nemko Korea Co., Ltd.	Yurim-ro Telecommunication (Wired) ports	-	-	-	-	-	T-20135	2025/11/20	165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-10-4065-9422
Nemko Korea Co., Ltd.	Yurim-ro 10 m Chamber below 1 GHz	-	-	-	○	○	R-20178	2025/11/20	165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-10-4065-9422
Sporton International Inc.	Hwa Ya Conducted Test Site CO04-HY	-	-	-	-	-	T-20132	2025/11/20	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	+886-3-327-3456
Sporton International Inc.	Hwa Ya 3 m Semi-anechoic Chamber 03CH01-HY	-	-	-	○	-	R-20175	2025/11/20	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	+886-3-327-3456
Sporton International Inc.	Hwa Ya 3 m Semi-anechoic Chamber 03CH01-HY	-	-	-	-	-	G-20168	2025/11/20	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	+886-3-327-3456
Sporton International Inc.	Hwa Ya Conducted Test Site CO04-HY	-	-	-	-	-	C-20131	2025/11/20	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	+886-3-327-3456
TÜV Rheinland Sweden AB	TÜV Rheinland Sweden AB	-	-	-	-	-	T-20134	2025/11/20	Mobilvagen 10, Lund, Sweden	+46-46-272-5746
TÜV Rheinland Sweden AB	TÜV Rheinland Sweden AB	-	-	-	-	-	C-20134	2025/11/20	Mobilvagen 10, Lund, Sweden	+46-46-272-5746
TÜV Rheinland Sweden AB	TÜV Rheinland Sweden AB	-	-	-	-	-	G-20171	2025/11/20	Mobilvagen 10, Lund, Sweden	+46-46-272-5746
TÜV Rheinland Sweden AB	TÜV Rheinland Sweden AB	-	-	-	○	-	R-20177	2025/11/20	Mobilvagen 10, Lund, Sweden	+46-46-272-5746
JNDL Laboratory CO., LTD.	Radiated emissions at Above 1 GHz	-	-	-	-	-	G-20170	2025/11/20	199-1, Gwibaek-ri, Heungcheon-myeon, Yeosu-si, Gyeonggi-do, Republic of Korea	+82-31-3822277
JNDL Laboratory CO., LTD.	Radiated emissions at Below 1 GHz	-	-	-	○	○	R-20176	2025/11/20	199-1, Gwibaek-ri, Heungcheon-myeon, Yeosu-si, Gyeonggi-do, Republic of Korea	+82-31-3822277

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
Waltek Testing Group Co., Ltd.	Conducted emissions at AC Mains Power Ports	-	-	-	-	-	C-20130	2025/11/20	No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China	+86-769-2267-6998
Waltek Testing Group Co., Ltd.	Conducted emissions at Telecommunication (Wired) ports	-	-	-	-	-	T-20131	2025/11/20	No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China	+86-769-2267-6998
Waltek Testing Group Co., Ltd.	Radiated emissions above 1 GHz	-	-	-	-	-	G-20166	2025/11/20	No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China	+86-769-22676998
Waltek Testing Group Co., Ltd.	Radiated emissions below 1 GHz (10 m site)	-	-	-	-	○	R-20174	2025/11/20	No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China	+86-769-2267-6998
QualiTech, EMC Lab.	QualiTech, EMC Lab.	-	-	-	-	-	G-20167	2025/11/20	30 Hasivim street, Petah-Tikva, Israel	+972-4-8286461
CSA Group Bayern GmbH	SAC2 SER3	-	-	-	-	-	G-20169	2025/11/20	Straubinger Strasse 100, Plattling, Germany	+49-9424-9481-310
CSA Group Bayern GmbH	SAC1 SER3	-	-	-	-	-	G-20173	2025/12/18	Straubinger Strasse 100, Plattling, Germany	+49-9424-9481-310
CSA Group Bayern GmbH	SAC1 A5	-	-	-	-	○	R-20179	2025/12/18	Straubinger Strasse 100, Plattling, Germany	+49-9424-9481-310
JNDL Laboratory CO., LTD.	Conducted emissions	-	-	-	-	-	C-20133	2025/12/18	#317 Kumgang-Penterium IT B tower, 282 Hagui-ro, Dongangu, Anyang-si, Gyeonggi-do, Republic of Korea	+82-10-4581-2370
JNDL Laboratory CO., LTD.	Conducted emissions Telecommunication	-	-	-	-	-	T-20136	2025/12/18	#317 Kumgang-Penterium IT B tower, 282 Hagui-ro, Dongangu, Anyang-si, Gyeonggi-do, Republic of Korea	+82-10-4581-2370
KES Co., Ltd.	KES Co., Ltd. (D-Dong, Yeosu Site)	-	-	-	-	-	C-20136	2025/12/18	473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, Republic of Korea.	+82-31-425-6200
Megalab Group Inc.	Megalab Group Inc.	-	-	-	-	-	G-20174	2025/12/18	150 Addison Hall Circle, Aurora, Ontario, Canada	+1-905-752-1925
Nemko Korea Co., Ltd.	Yurim-ro 10 m Chamber above 1 GHz	-	-	-	-	-	G-20172	2025/12/18	165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-10-4065-9422
World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.	Site 843	-	-	-	-	-	C-20137	2025/12/18	Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China	+86-132-6581-6812

Closing words

The last time I was in charge of writing an editor's note was about two years ago. Looking back, it seems I was rambling on about how I felt one year into both the COVID-19 pandemic and my own job transfer, which took me away from my family. Back then, I would never have expected that both of those things would continue for two more years. How have your lifestyles changed during that time? Have you experienced any of the following?

■ Changes at work

- More remote rather than in-person meetings
- Fewer opportunities to meet coworkers in person (completing work mostly through email exchanges, much like with work associates from other companies)

■ Changes outside work (in your time off)

- Fewer opportunities to go out for leisure
- More online shopping rather than window shopping

Here are my personal thoughts on the pros and cons of the aforementioned changes:

■ Pros

- No need to commute, saving time and money
- No temptation to stop by somewhere on the way home


■ Cons

- Harder to take breaks for a change of pace
- Less walking to get around
- Less socializing

These points are only an "insect's-eye view" (i.e., my personal, short-term perspective), with my own subjective bias toward the status quo or the "good old times". Meanwhile, if we take a bird's-eye view (a big-picture perspective over the long term, from past to future), we can see these kinds of changes as occurring not only on the individual or corporate level, but equally across all things. We can see that since ages past, the entire world has been continuously adapting to change. Still, for some reason - human nature, perhaps - our hearts are drawn to the unchanging, and we grieve when reality is not so. Are we ordinary people to blame for our lack of enlightenment? One solution to this dilemma is to accept reality while indulging in our individual dream worlds. In the near future, we could potentially be indulging in virtual dream worlds of our own making.

If we get trapped in these virtual dream worlds, we could become unable or unwilling to come back to reality. Which fate lies in store for us? These days, I can't help but wonder with a little fear and fascination. (K.K.)

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