



# **Current Status of Japan-US MOU and Progress of VCCI Module Level Validation Program**

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Director / VCCI council

# **1. VCCI Overview**

2. MOU between VCCI and FCC

3. Kit Module Program

# EMC-related Regulations in Japan and VCCI's role

Product Group	Emission	Immunity	
<b>ITE</b>	<b>VCCI</b> Computers, PDAs, Peripherals	Each Industrial Association's Standards	
<b>TTE</b>	Facsimiles Modems <b>Radio Law</b>  Radio Mobile Phones		
<b>Electrical Appliance</b>	Copiers, TV, VCR, Refrigerators Transformers, Electric Wires Fluorescent Lights, Others		<b>Microwave Ovens</b> <b>DEN-AN Law</b> (Product Safety)  
	<b>Medical Electrical Equipment</b>		MRI, CT, X-ray Generator, Others JIS T0601-1-2 (IEC 60601-1-2) Pharmaceutical Affairs Law

VCCI covers ITE and their kin equipment across category borders as far as they are not regulated with relevant laws. Immunity is interpreted as a quality issue that each manufacturer should pursue and achieve a proper level, except for medical electrical equipment.

## VCCI Council

¶ **VCCI** was **founded in Dec.1985** to voluntarily control EMI from ITE distributed in Japan by a coalition of industry association (JEIDA, JBMA, EIAJ and CIAJ) in corresponding to a strong guidance of Japanese government which released **Japanese version of CISPR 22** earlier that year.

### Purpose

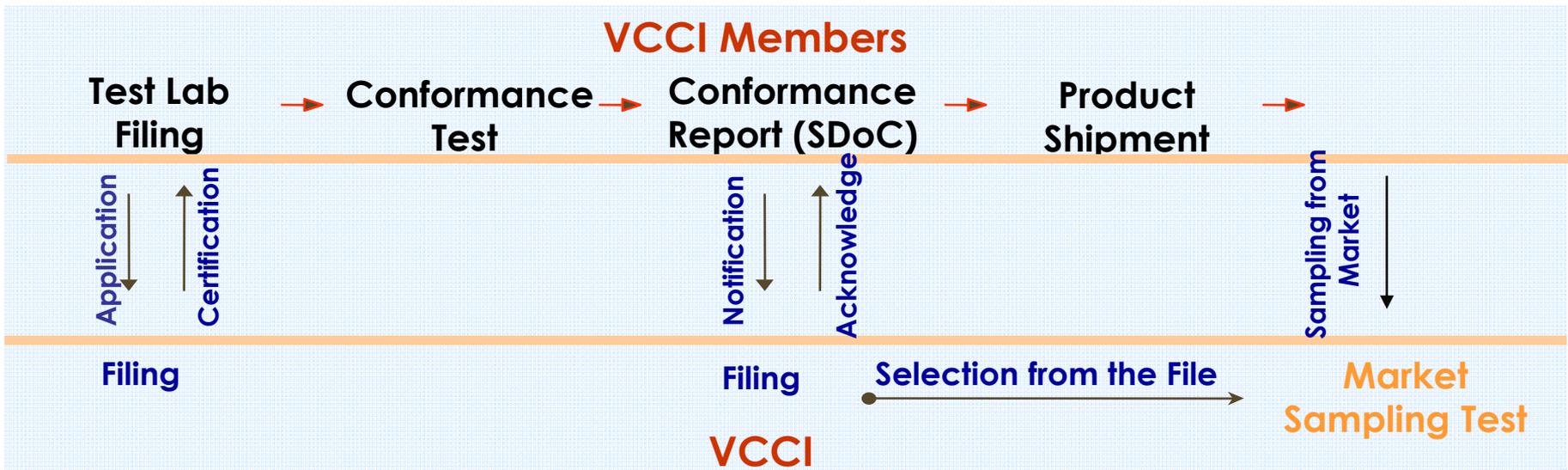
¶ The purpose of **VCCI Council** is to promote, in cooperation with relevant industry associations, the **voluntary control of radio disturbances** emitted from information technology equipment (ITE) on the one hand, and **improvement of robustness** of ITE against radio disturbances on the other hand, so that the interests of Japanese consumers are protected with respect to anxiety-free use of ITE.

# Feature of VCCI

- ¶ VCCI is a **privately-funded non-profit, membership organization**.
- ¶ VCCI publishes **administrative requirements and technical requirements** (VCCI rules) for VCCI members to follow.
- ¶ VCCI employs a system of **members' registration of measurement facilities** used for product conformity assessment.
- ¶ VCCI Members file **Declaration of Conformity** (DoC) to VCCI in the form of conformity verification report.
- ¶ VCCI conducts **market sampling tests** to check if the declared conformity is trustworthy

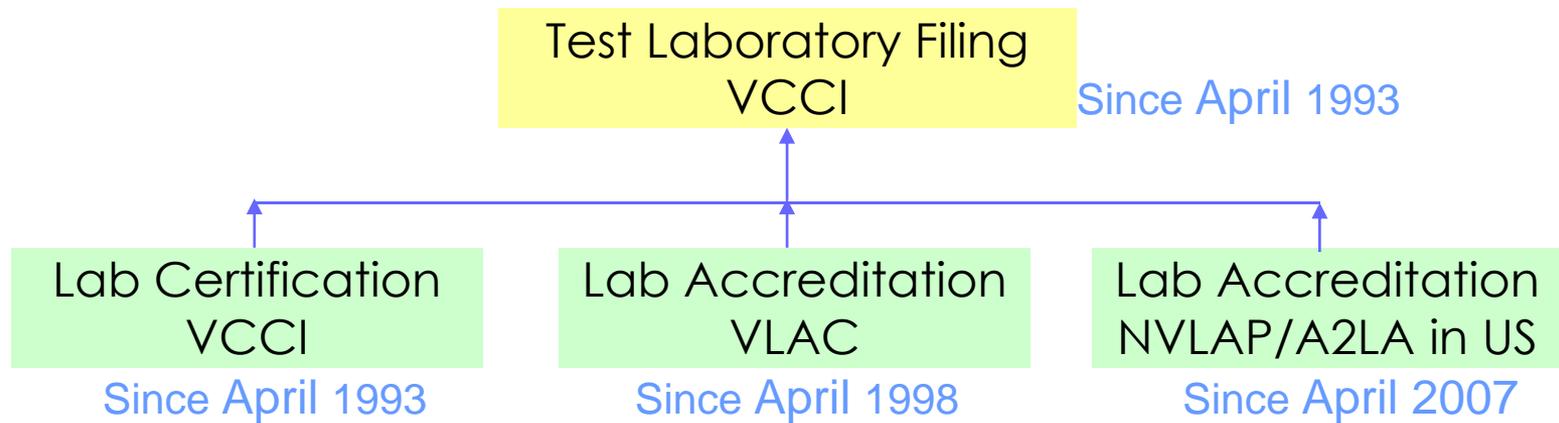
# VCCI Conformity procedure

- ¶ **Test a product** by VCCI registered measurement facility or measurement facility accredited by Laboratory Accreditation Body, and **confirm the conformity** with regard to clearance of the disturbance limits.
- ¶ Submit a **conformity verification report** to VCCI prior to placing the product in the market.
- ¶ Affix the **VCCI mark** on the product, and stipulate the **warning statement** in the instruction manuals.
- ¶ Cooperate with VCCI in **market sampling test** if the product is selected for the test



# Test Laboratory Filing

- ¶ Test lab to be used for VCCI conformity assessment shall be filed to the VCCI prior to starting the test
- ¶ Two routes are available for technical assessment of the laboratory to be filed – one is certification (paper review) by VCCI and the other is laboratory accreditation by VLAC using ISO 17025 + VCCI technical requirements
- ¶ In April 2007 additional route was opened - VCCI accepts labs accredited to VCCI requirements by NVLAP/A2LA without certification in the framework of MoU accessory to Japan-US telecom MRA. (VLAC can reciprocally provide EMI test lab accreditation for FCC.)



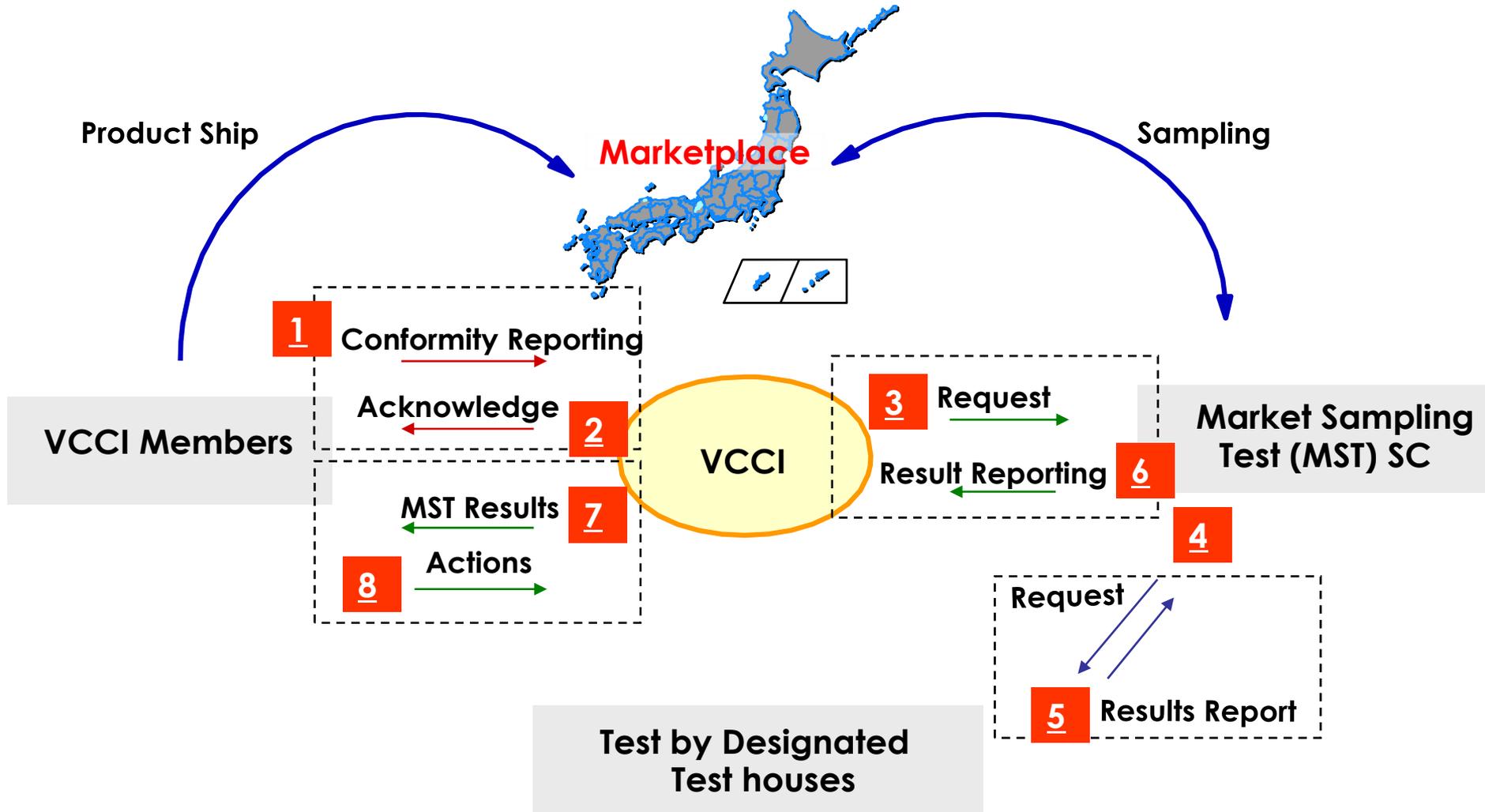
⇒ Certification or accreditation is member-option.

# EMC Regulation Scheme and VCCI

CATEGORY	#1	#2	#3	#4	#5
LEGAL rq't	NO	Legal	Legal	Legal	Legal
Technical STD's	IEC/CISPR	IEC/CISPR	IEC/CISPR	IEC/CISPR	Domestic STD or IEC/CISPR
TEST rq't	Self-Test	Self-Test	Self-Test	Self-Test	Authorized-Test
LAB rq't	Accreditation or Certification	Self Verification	Accreditation	Certification (Filing)	Designated Third Party
CONFORMITY	DOC	DOC	DOC	Verification	Certification
LABEL	Labeling	Labeling	Labeling	Labeling	Labeling
COUNTRIES categorized	VCCI	EU Hungary Czech Republic Slovakia Australia New Zealand	US FCC (PC etc.) Australia ( TTE, ISM) New Zealand ( TTE, ISM)	US FCC ( Consumer E&E )	Russia China CCIB Taiwan Korea Japan ( PSE, RL)*

\* PSE: Product Safety Electrical appliance & materials  
RL: Radio Law

# VCCI Conformity procedure, Reporting to Sampling Test

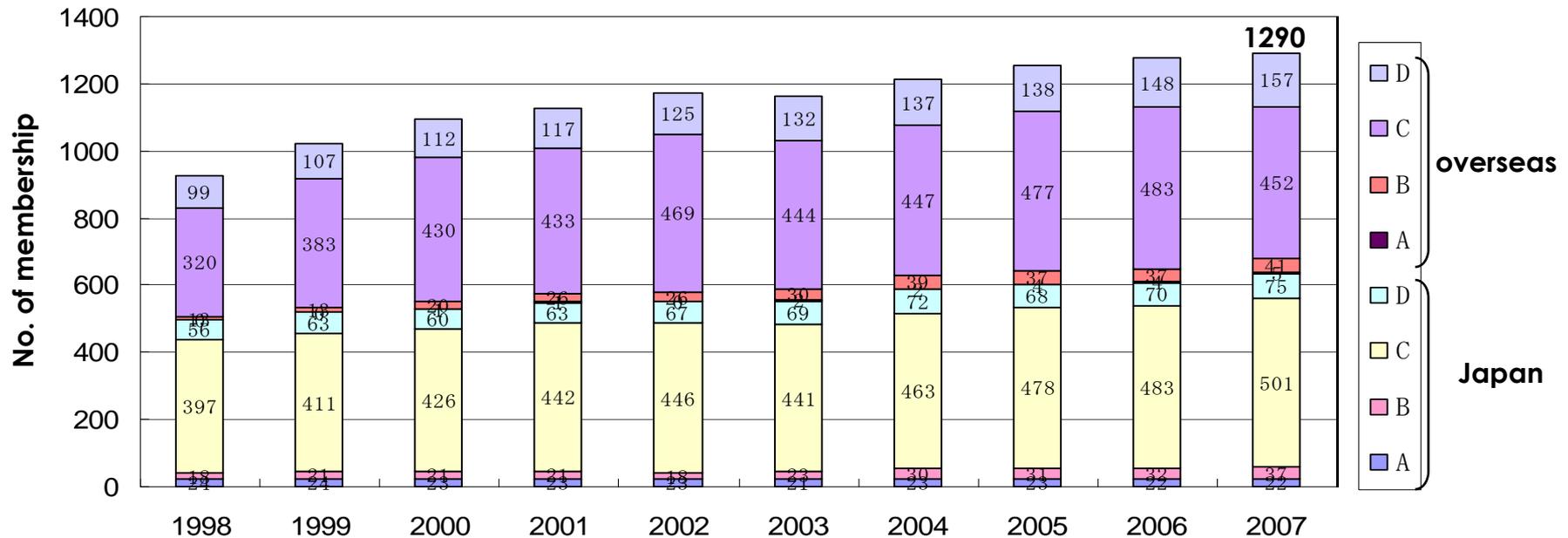


# VCCI Conformity Mark

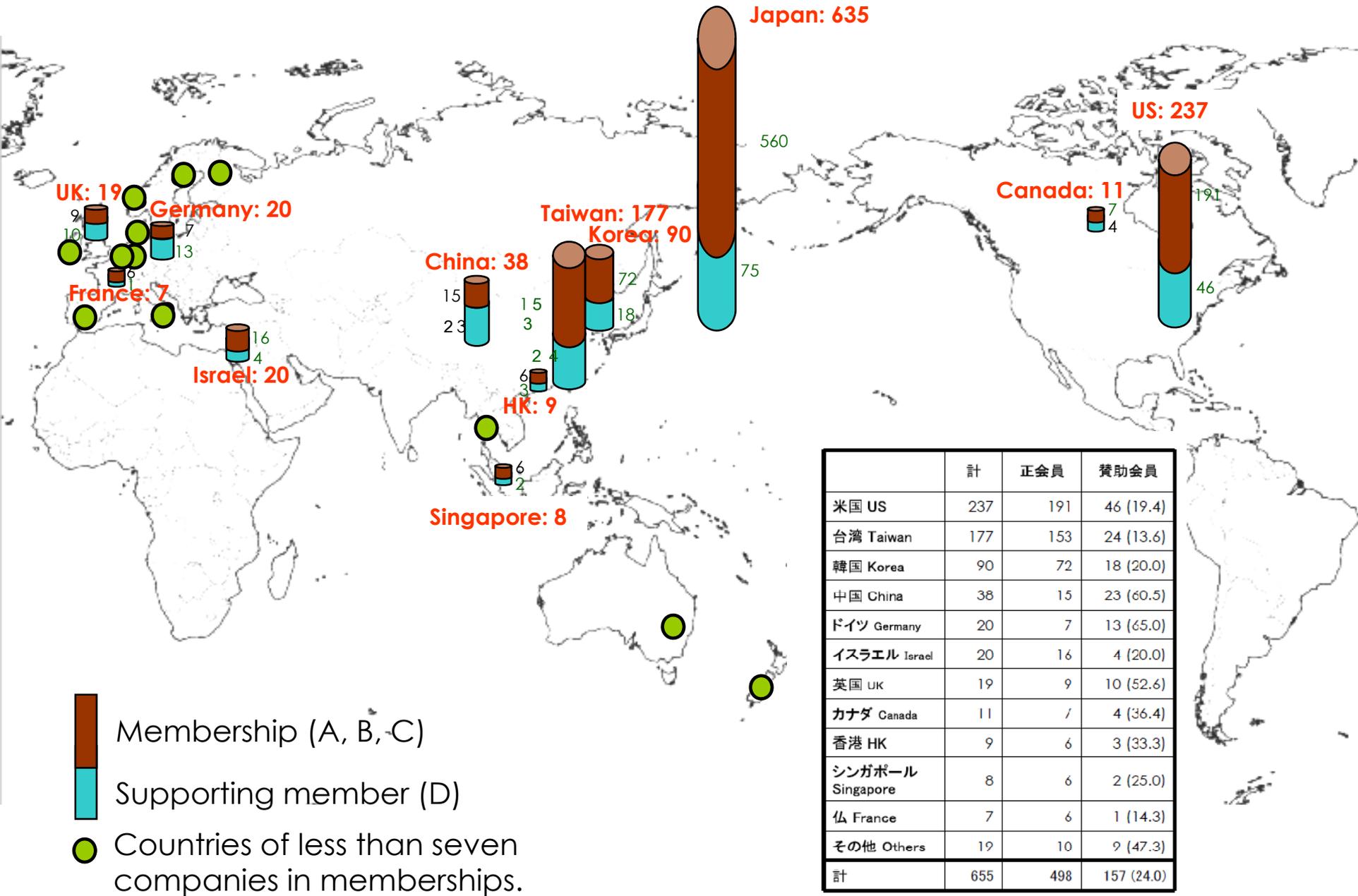
major world 3 conformity mark



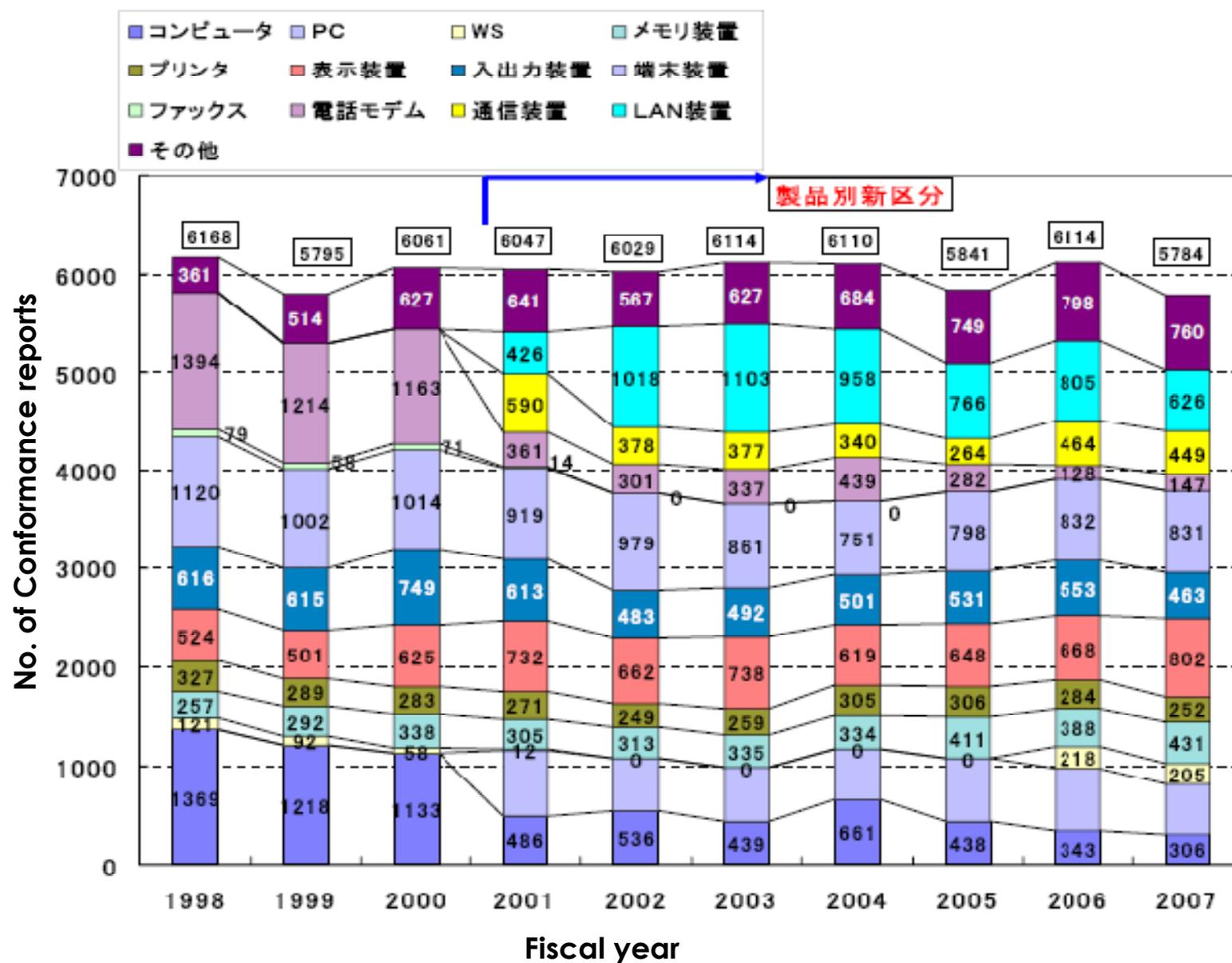
The membership amounts to about 1300 companies in the sum total



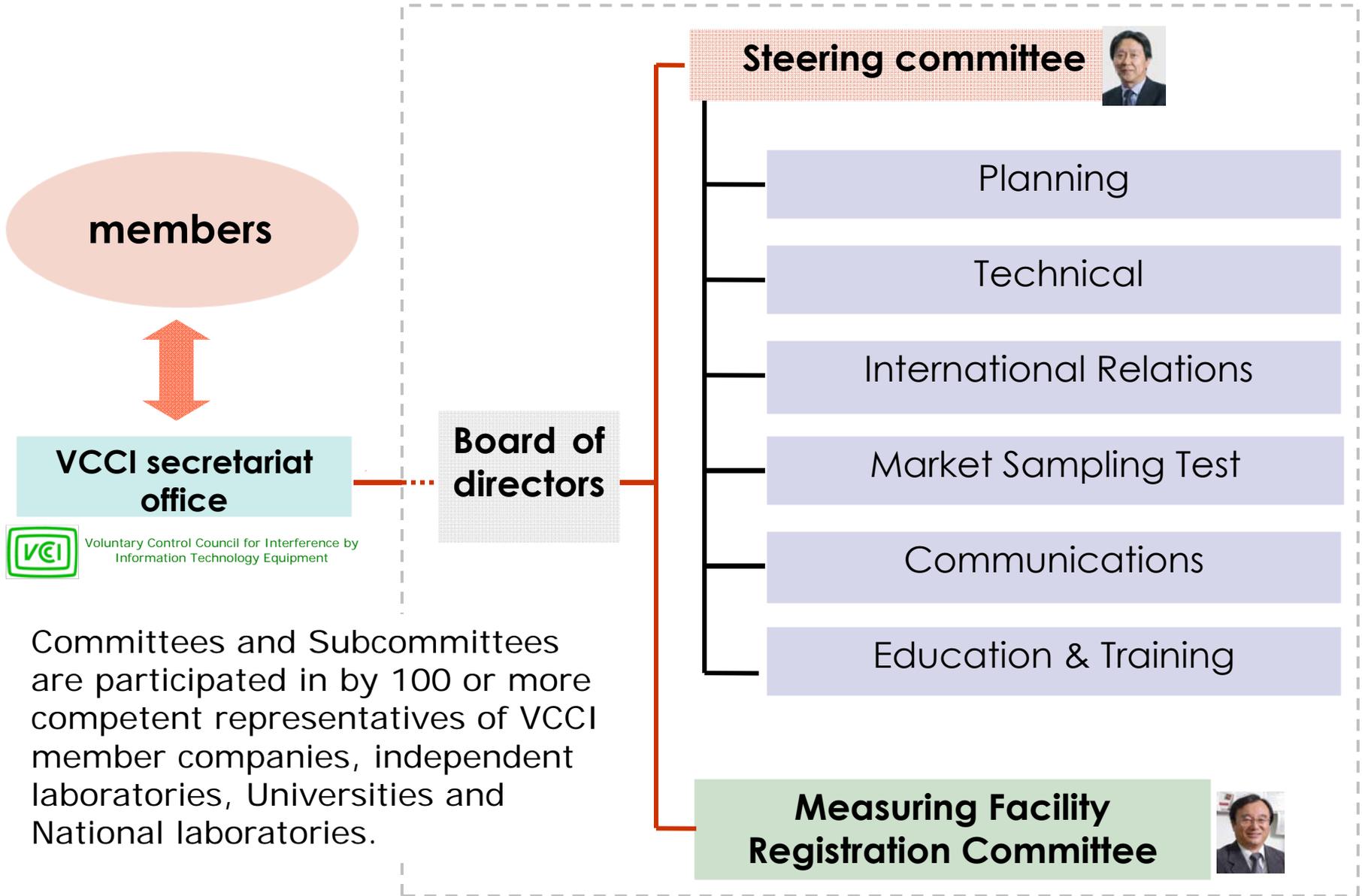
# VCCI membership Detail



# Chronological changes in the No. of conformity verification reports



# Organization



# History around VCCI

## VCCI Events

- (1985/12) VCCI established
- (1986/06) VCCI started operation (DoC)
- (1989) International Relation SC
- (1993/04) Test site registration system
- (1998/04) VLAC established  
Test lab accreditation system
- (2005/04) Kit-Module Program
- (2007/04) Test Lab Mutual Acceptance with FCC

Steering Comm.  
Marketing SC  
Technical SC  
Communication SC

Measurement Registration Comm.  
Education & Training SC

## WW EMC Events

- (1979) FCC enforced
- (1985) CISPR 22 released
- (1991) Korea
- (1996) EMC Directive (DoC)
- (1996) FCC (DoC)
- (1997) Australia (DoC)
- (1998) Taiwan

VCCI employs the DoC system right from the beginning, 10 years ahead of the DoC system in EU.

*Mutual acceptance of  
accredited test labs  
between FCC and VCCI*

1. VCCI Overview

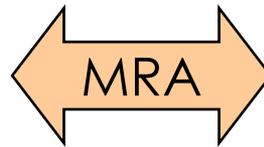
**2. MOU between VCCI and FCC**

3. Kit Module Program

# MRA Scheme between Japan and US

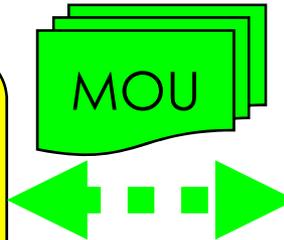


Radio Law  
and  
Telecommunication  
Business Law



47CFR Part 11,15,21,22  
47CFR Part 68

Voluntary Control  
for ITE

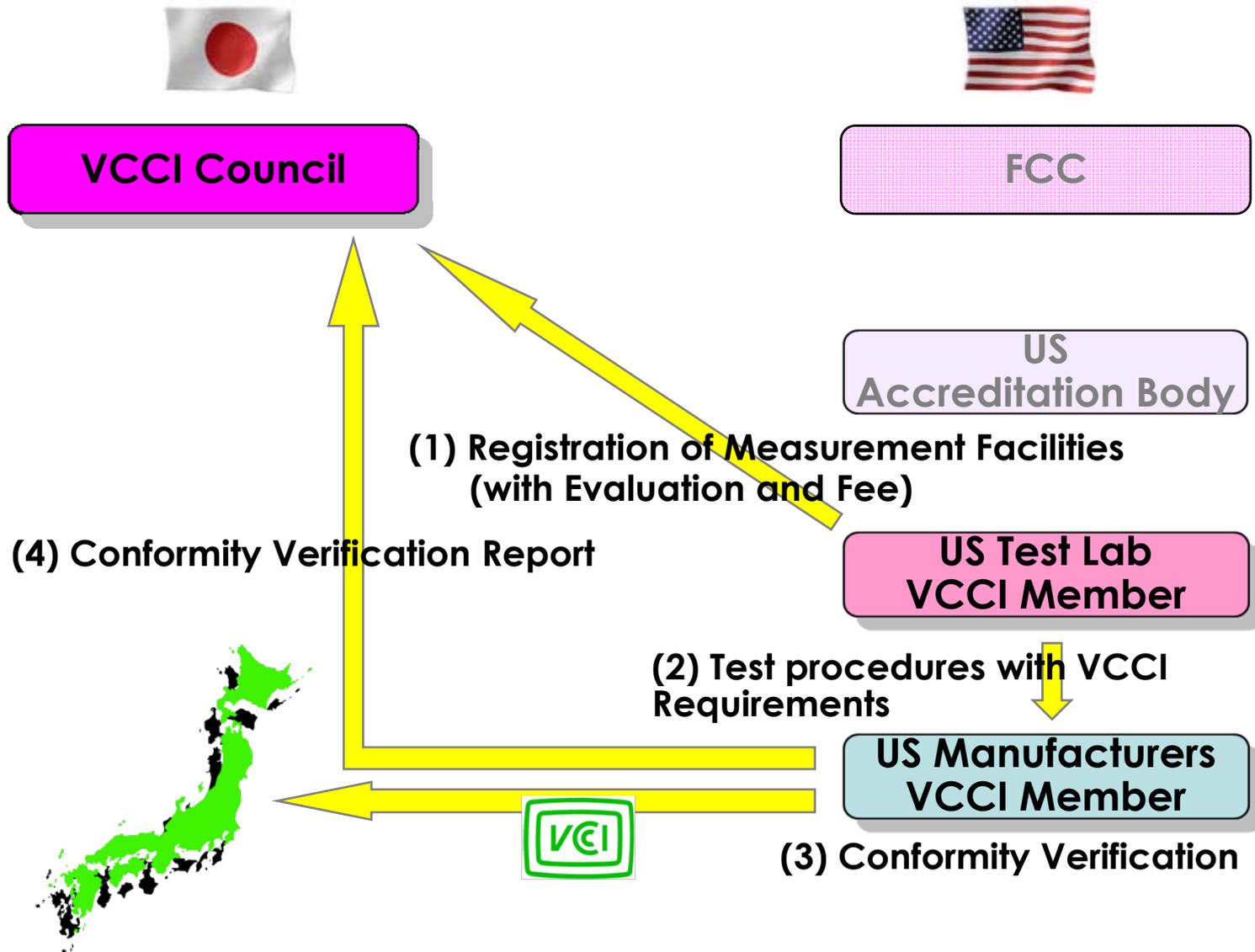


47CFR Part 15 Subpart B  
47CFR Part 18  
(the items base on DOC)

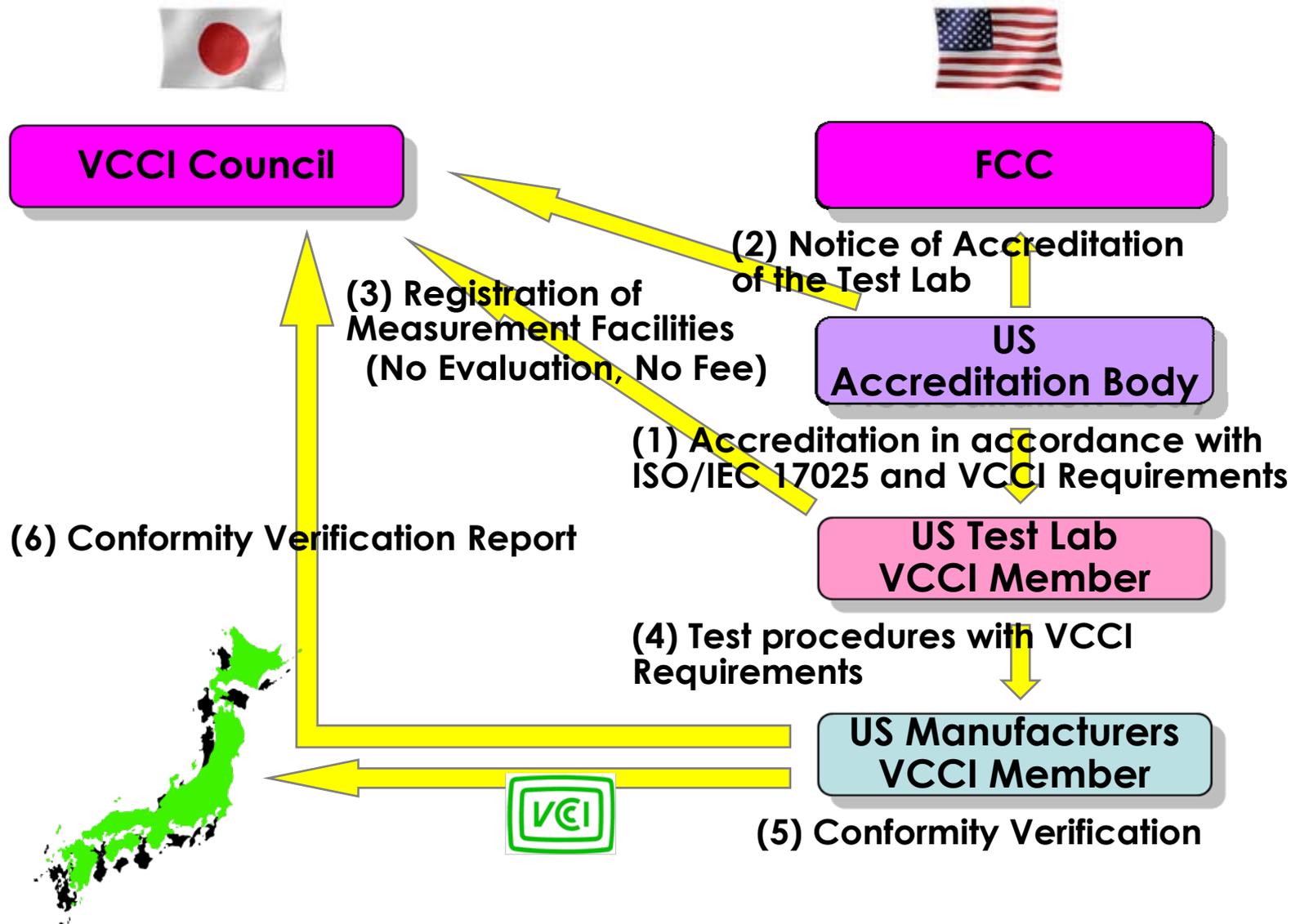
# Overview of MOU

- ¶ MOU between Japan and US was established by exchanging letters in **February, 2007**.
- ¶ ITE imported to Japan from US:  
**VCCI accepts test report** issued by testing laboratories in the US accredited by NVLAP and A2LA.
- ¶ ITE imported to US from Japan:  
**FCC accepts DOC** with test report issued by testing laboratories accredited by Japanese accreditation bodies.
- ¶ Testing laboratories need to be continually assessed by the accreditation bodies.

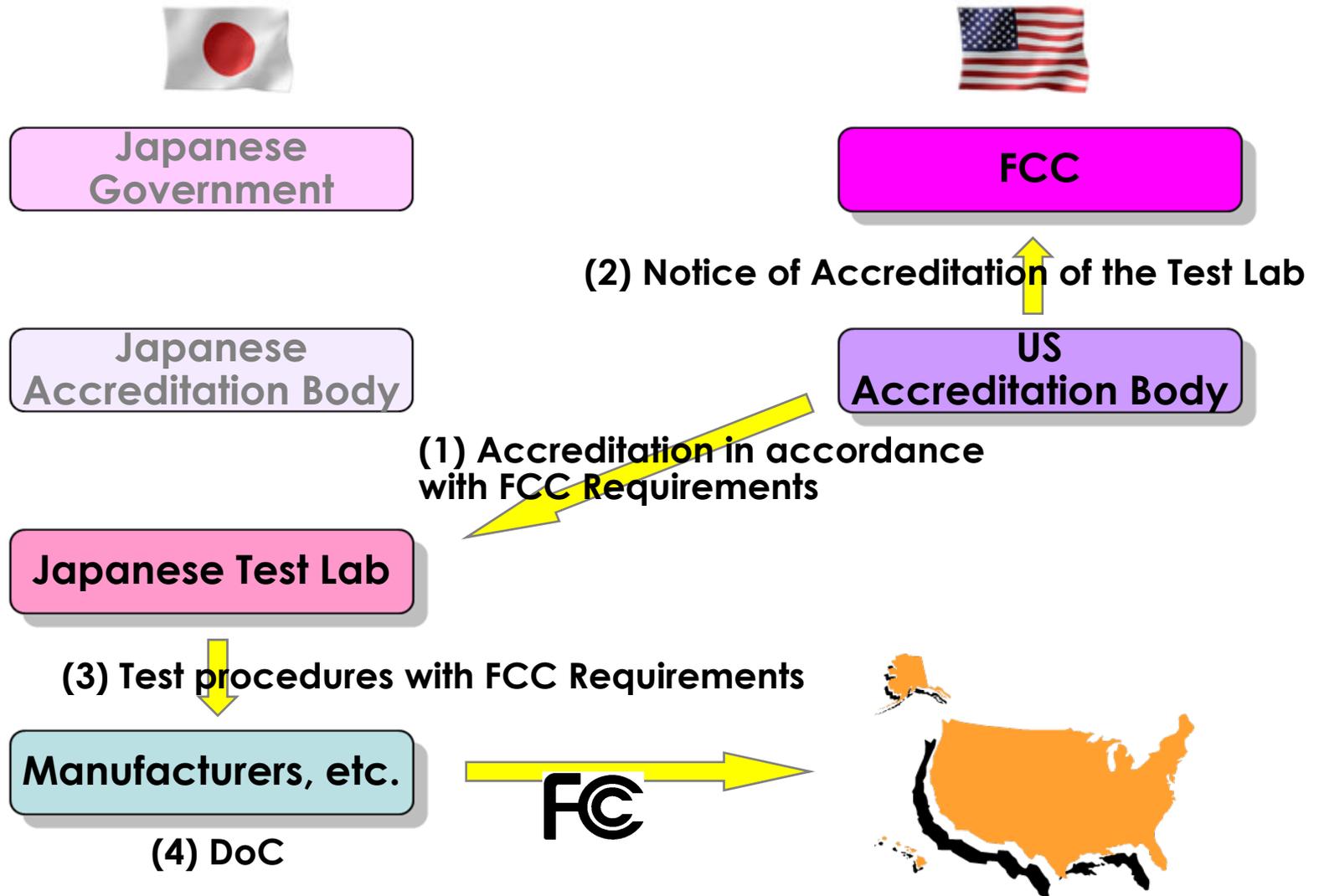
# Conformity Procedure to Japan before MOU



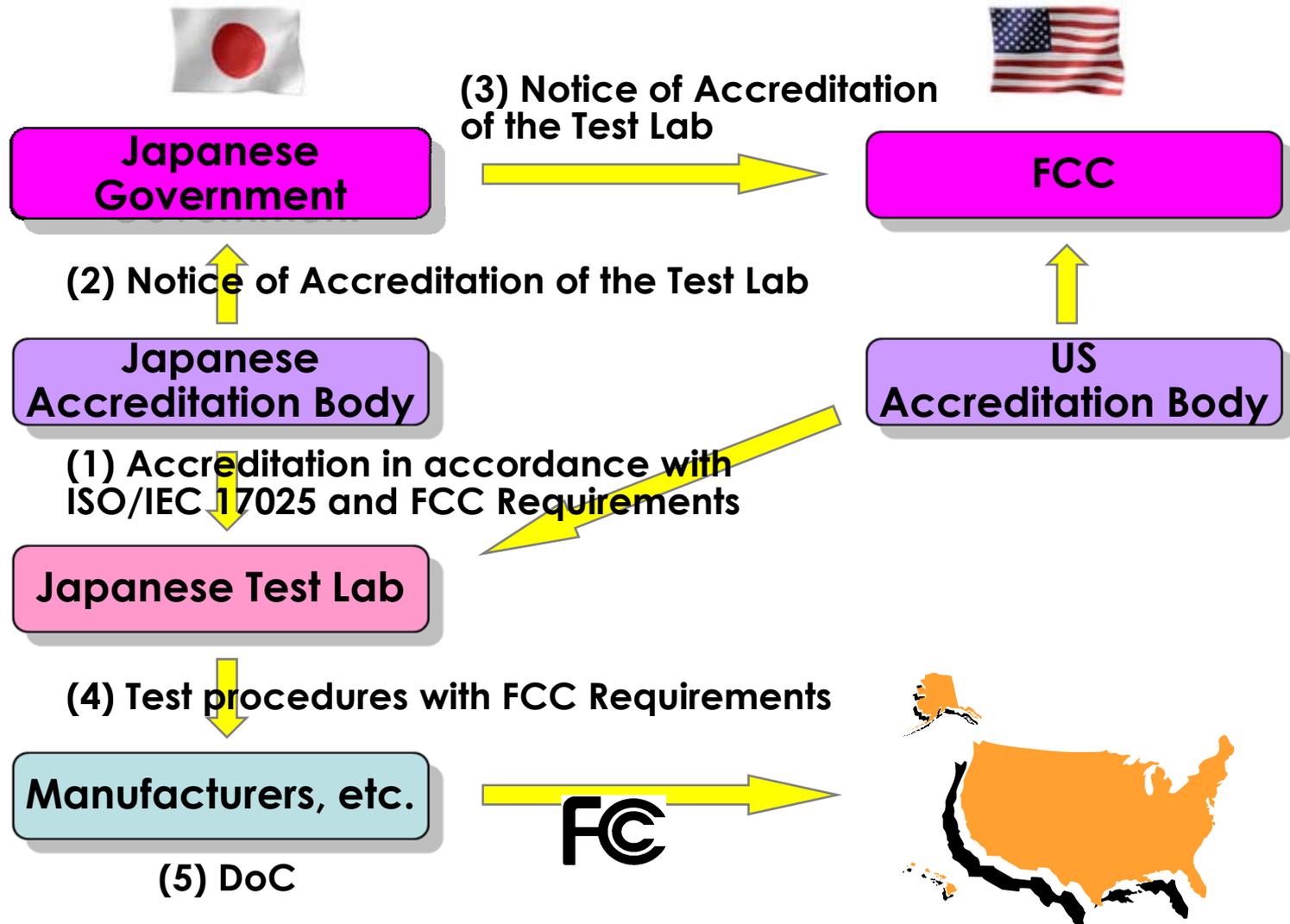
# Conformity Procedure to Japan after MOU



# Conformity Procedure to US before MOU



# Conformity Procedure to US after MOU



# Points of Concern

¶ Will **equal market access** be secured?

VCCI must accept test report from US just as US accepts DoC from Japan.

¶ Is the **level of laboratory accreditation** on a parity?

Because the accreditation bodies of the two countries are members of APLAC MRA, the equivalence is secured.

# Merits of MOU

## ¶ For test Laboratories

Accredited once in home country, accepted in the partner country

## ¶ For manufacturers

Earlier and less costlier market access to the partner country with a conformity test in home country.

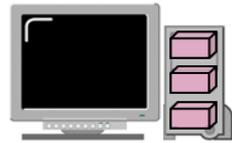
<Result>

	<b>No. of registered test labs accepted by the other party</b>
Japan	22 sites
US	39 sites

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# Kit-Module Program

It takes too much time to do EMC measurements.  
Is there any module whose noise is proven small?



**Problem of equipment manufacturers**

The noise evaluation  
method of the module

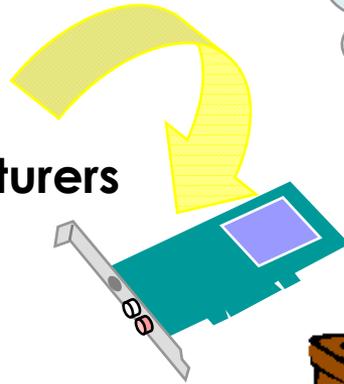


KA

## Kit-Module Program

Shorten development period of low noise products  
Simple evaluation of a modular noise level

I want my products to be  
known by a lot of people  
as with low noise.



**Problem of module manufacturers**

# Kit Module Program Overview

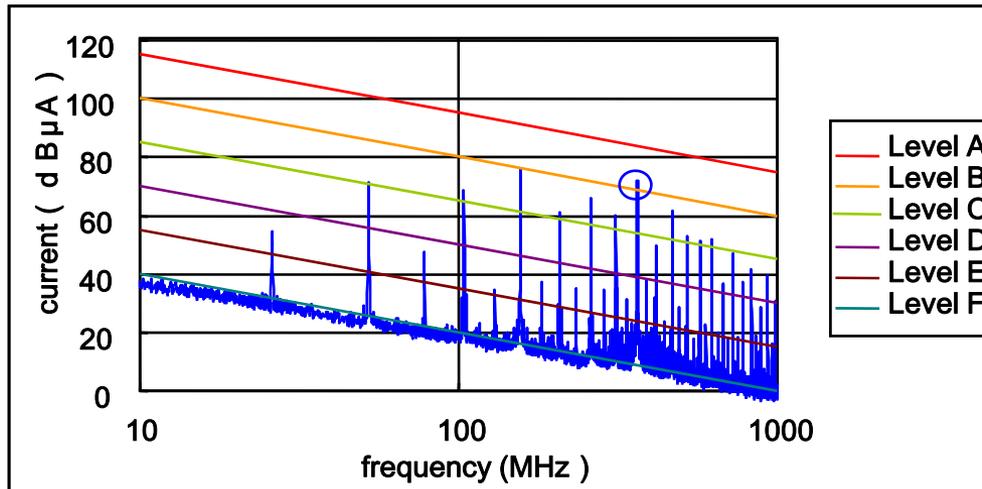
- An EMI quantification program, called Kit Module Program, for **IT module** (such as memories) started in April, 2005 as a VCCI Quality Program.
- 2-year task force in VCCI concluded that testing should be carried out based on **IEC 61967-6** (Integrated Circuit – Measurement of electromagnetic emissions, 150KHz to 1GHz -).
- Measurement of RF currents on power lines of modules on specified interposer with **miniature triplet-structured magnetic probe**.
- Marking with satisfied level (among levels A – F) on the product and filing with VCCI WEB database prior to shipment.
- VCCI member is **required to apply for the program** if he wants to put qualification mark on his products.
- Participation fee is required in addition to VCCI membership annual fee.

# Disturbance level in Kit-Module Program

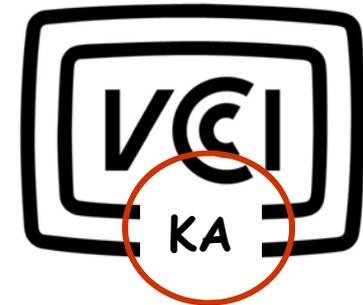
Disturbance level	Disturbance limits (dB $\mu$ A)		
	10MHz	100MHz	1000MHz
Disturbance level A	115	95	75
Disturbance level B	100	80	60
Disturbance level C	85	65	45
Disturbance level D	70	50	30
Disturbance level E	55	35	15
Disturbance level F	40	20	0

Note 1. The disturbance limits from 10 to 1000 MHz shall be linearly varied when the frequency is presented in logarithm, and current values are presented in dB  $\mu$  A.

Six quantifying levels are preset. All levels decrease in proportion to frequency. Amplitude of the level A was determined through a comprehensive field testing as a level with which most modules may meet.

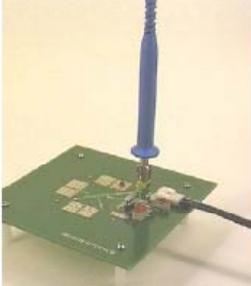
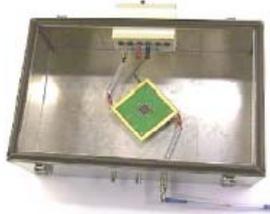
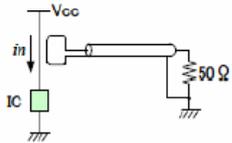
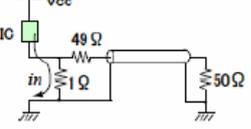
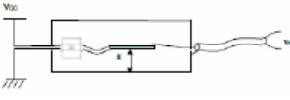
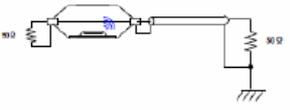


An instance of meeting Level A



# Appropriate test methods for “kit module”

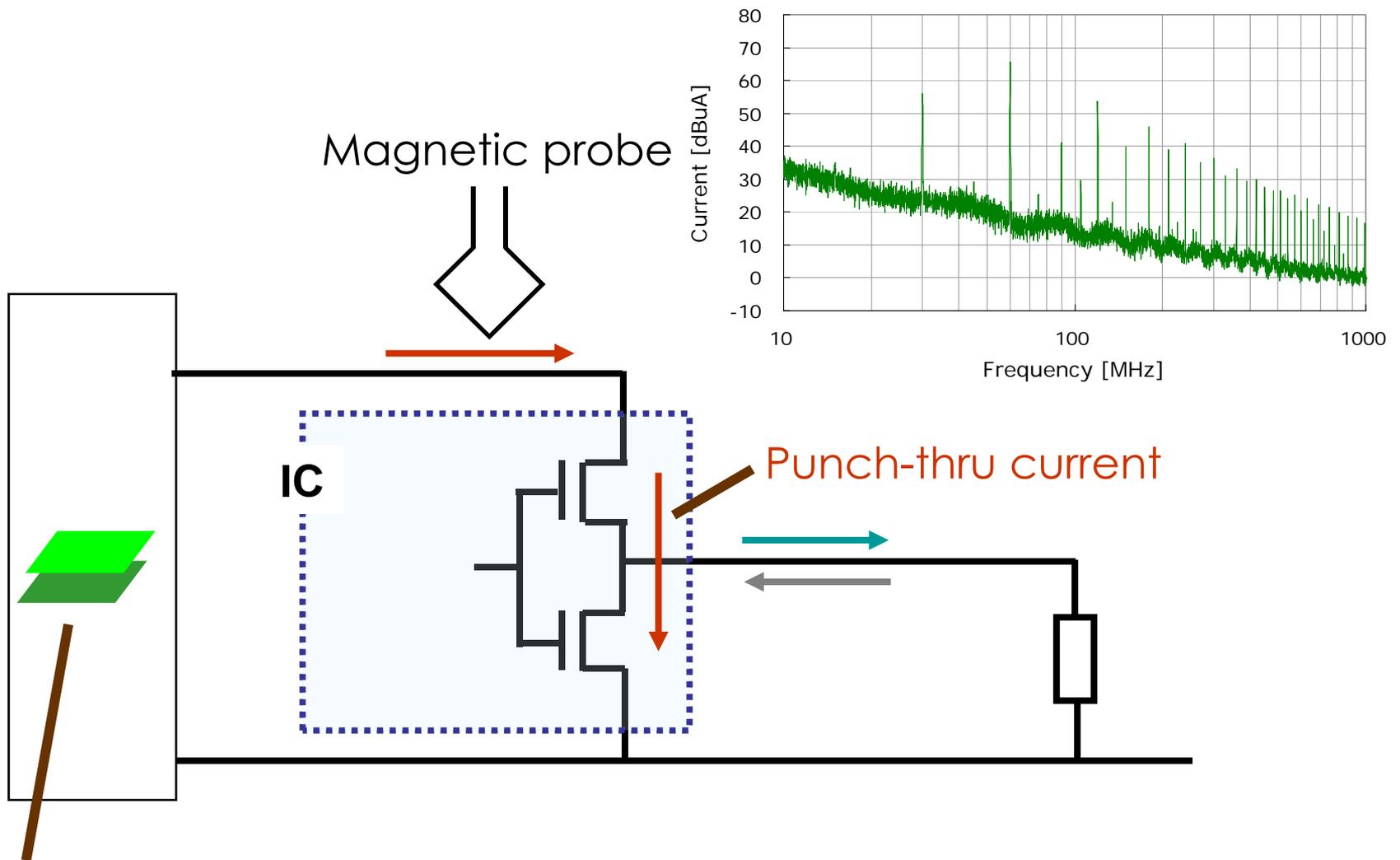
Semiconductor industry has developed several novel test methods to evaluate IC's and standardized as IEC 61967, Integrated circuits – Measurement of electromagnetic emissions, 150 kHz to 1 GHz.

Part 6 MP Method	Part 4 VDE Method	Part 5 47A/615/CDV WBFC Method	Part 2 47A/619/NP TEM -Cell Method
			
			
<ul style="list-style-type: none"> <li>• P.S current</li> <li>• M.P probe (non contact)</li> </ul>	<ul style="list-style-type: none"> <li>• Ground Current</li> <li>• 1 Ω Resistance probe (contact)</li> </ul>	<ul style="list-style-type: none"> <li>• Common mode Current</li> <li>• 150 Ω line WBFC</li> </ul>	<ul style="list-style-type: none"> <li>• radiated electric field strength</li> <li>• TEM Cell</li> </ul>

VCCI reviewed four candidates; Magnetic Probe Method, VDE method, Workbench Faraday Cage Method and TEM Cell Method.

Magnetic Probe Method has been employed in terms of its simplicity, facility cost and high measurement repeatability.

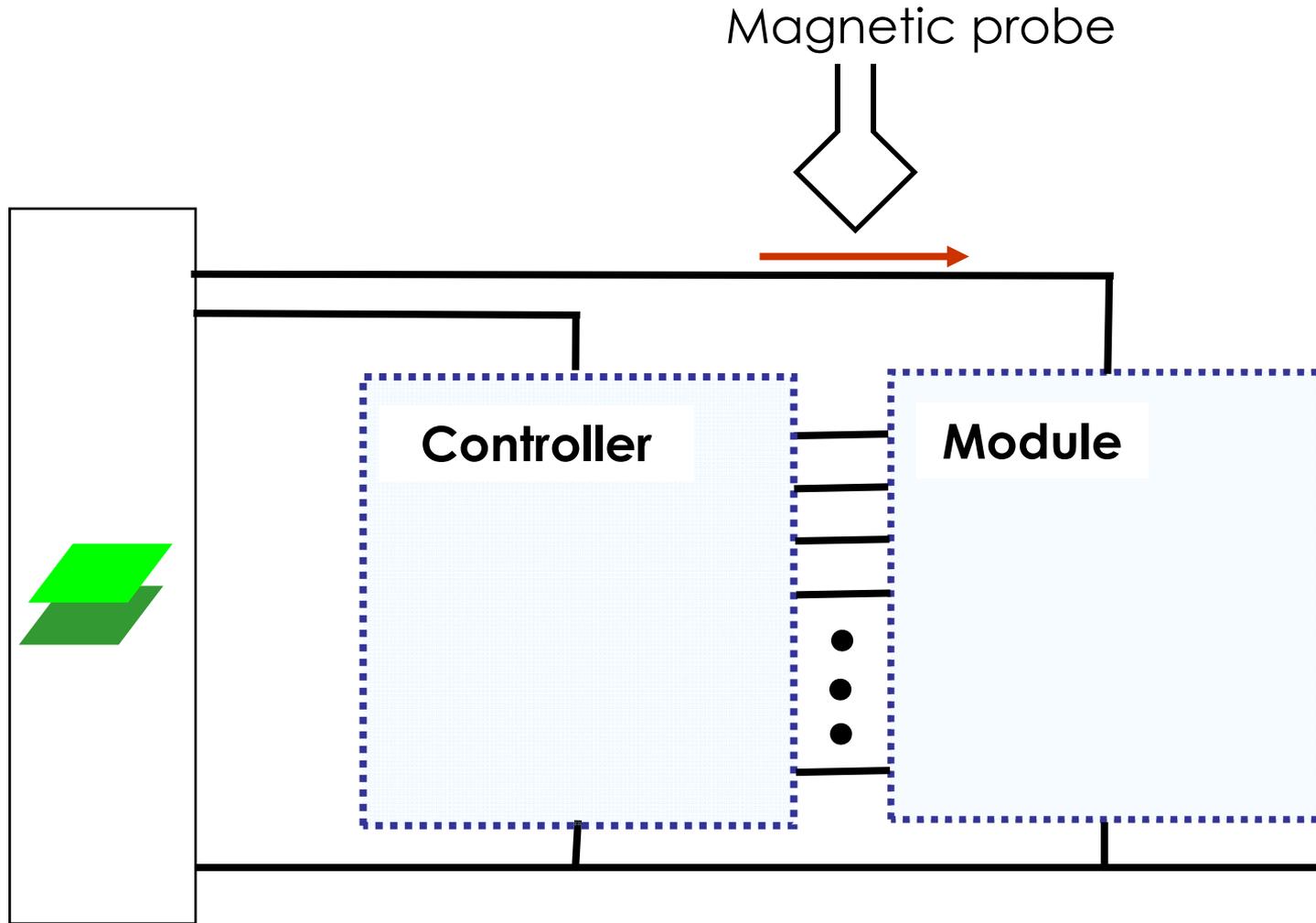
# Current on Power line and EM Emission



Resonance on Voltage Planes and contribute to large EM emissions



# Magnetic Probe Method for Module





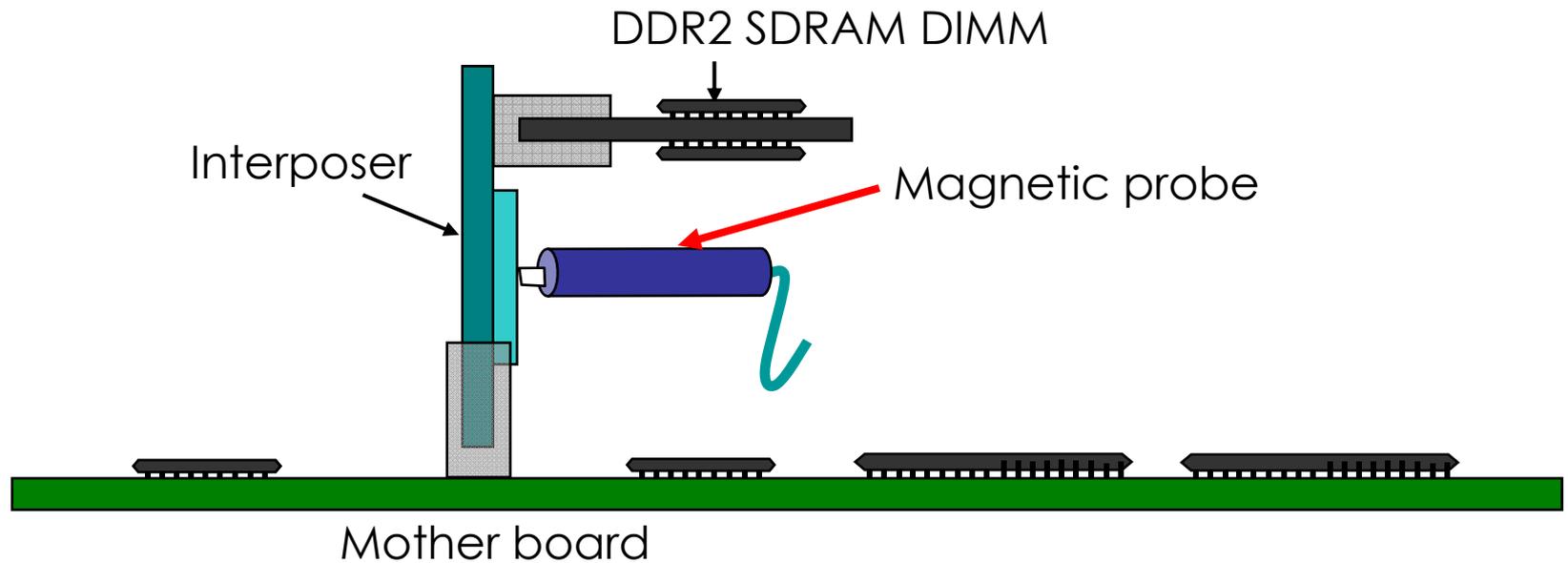
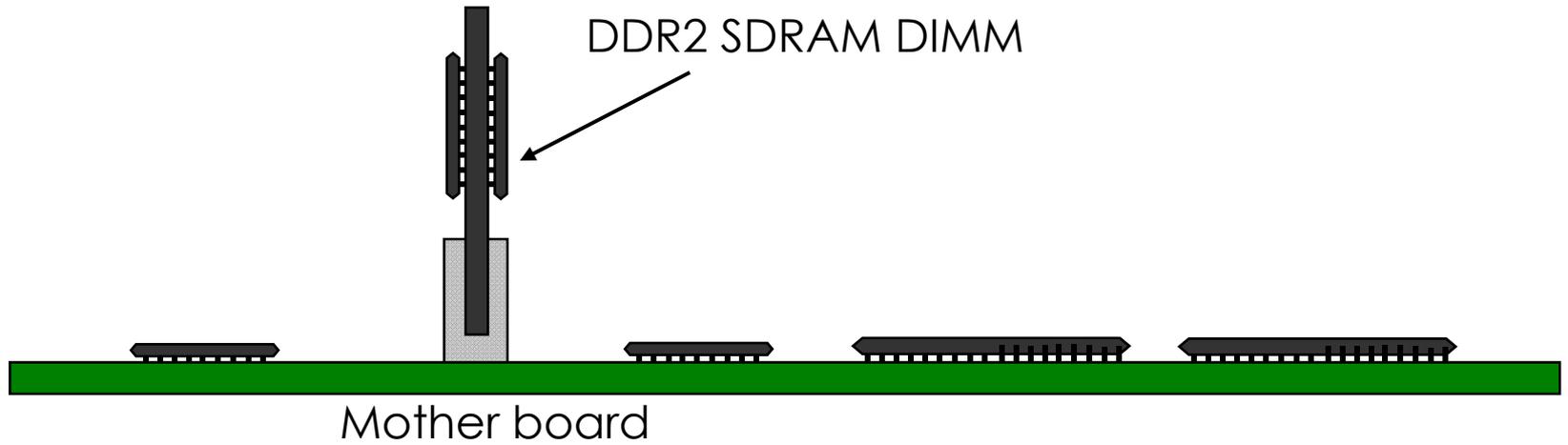
# Module Measurement Method for DIMM

Development of special controller for each module is not practical and the simpler way to evaluate memory modules ( DDR2 SDRAM DIMM ) with MP method is desirable....



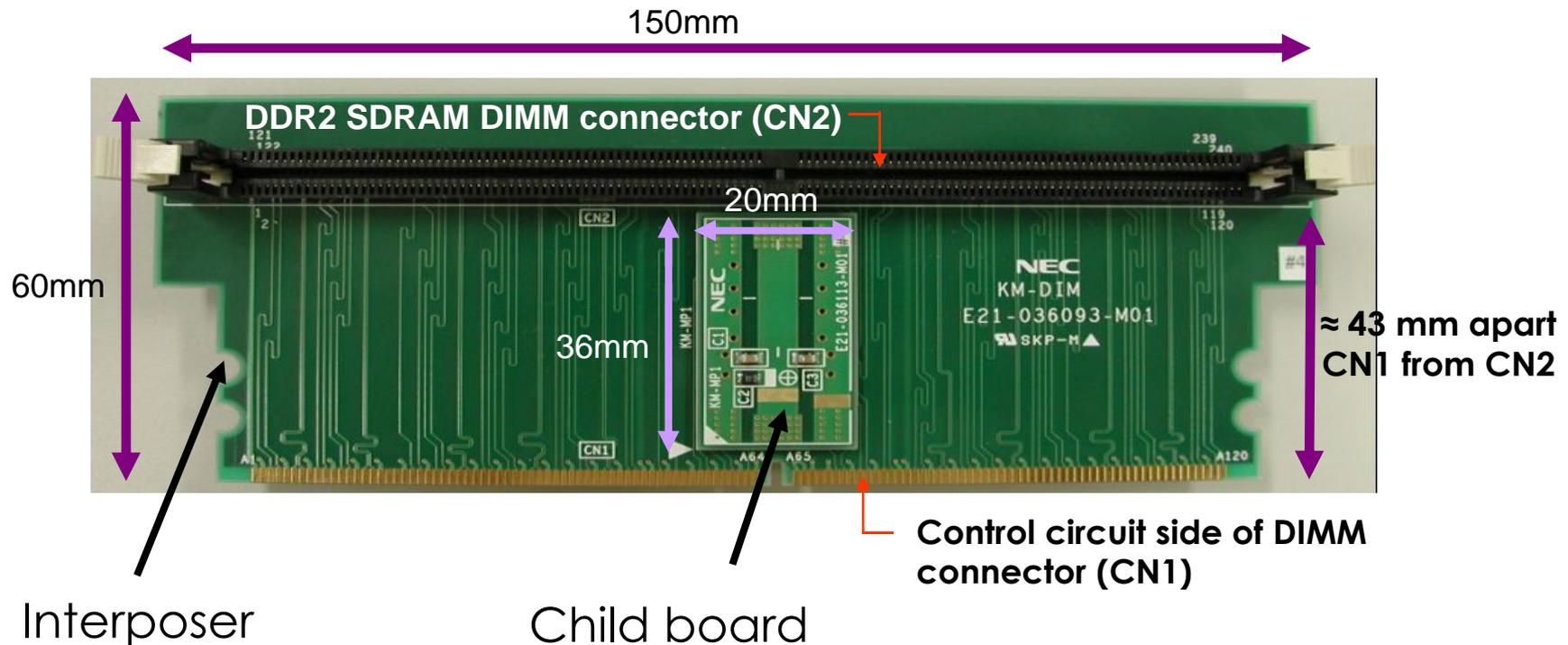
Condition	Implementation with
No special controller	Typical Motherboards available in the market
Observing real operational frequencies	
Coping with large currents	Special interposer with specified MP method measurement pattern

# Conceptual Sketch of Test



# Interposer

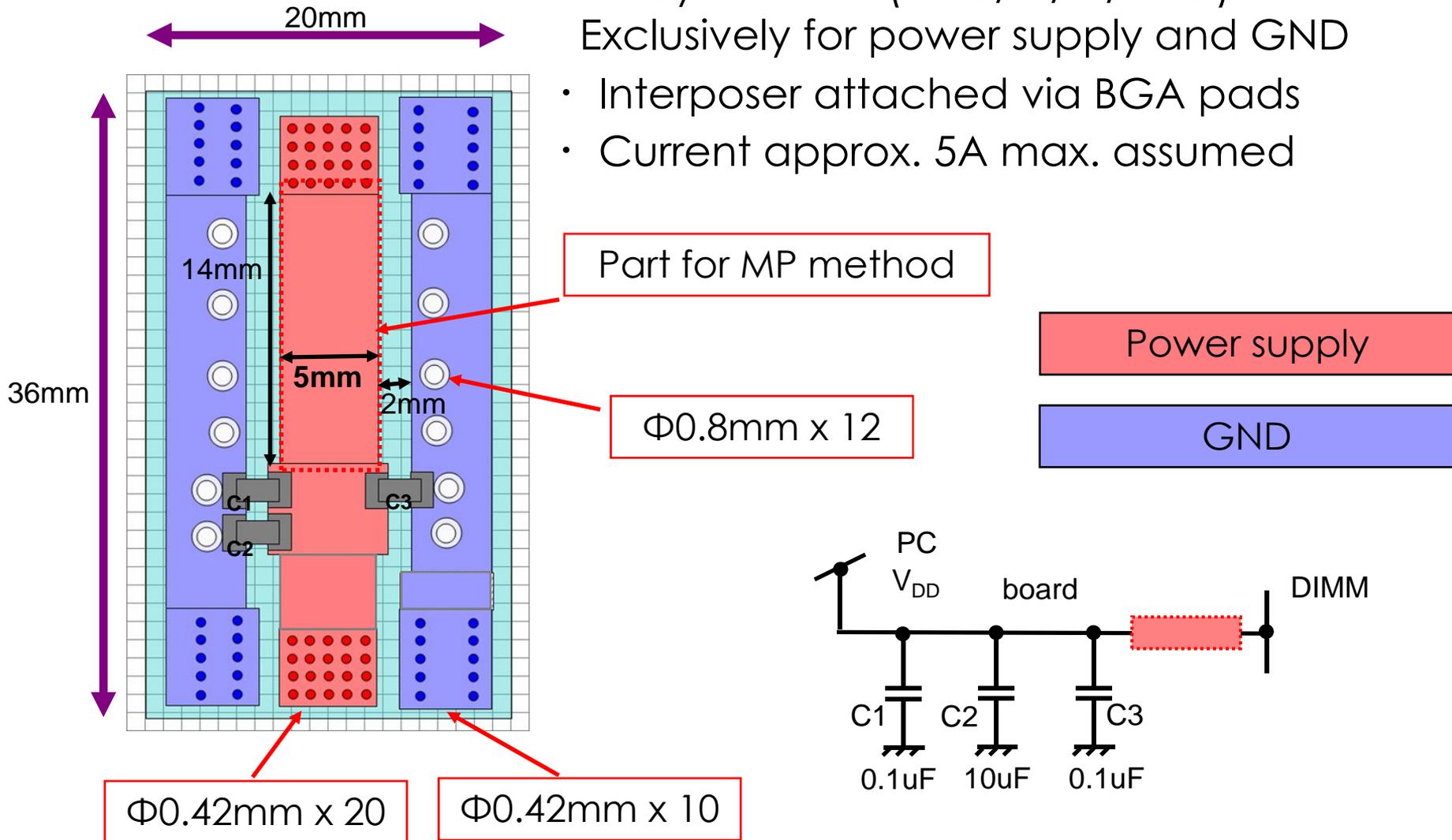
- 6-layer board ( S,G+V,G,V,G+V,S )
- child board connected with interposer via BGA pads
- Signal patterns from CN1 to CN2 in the shortest and equal length (layers 1 and 6)
- Power supply pattern connected to child board via BGA pads through the inner layer



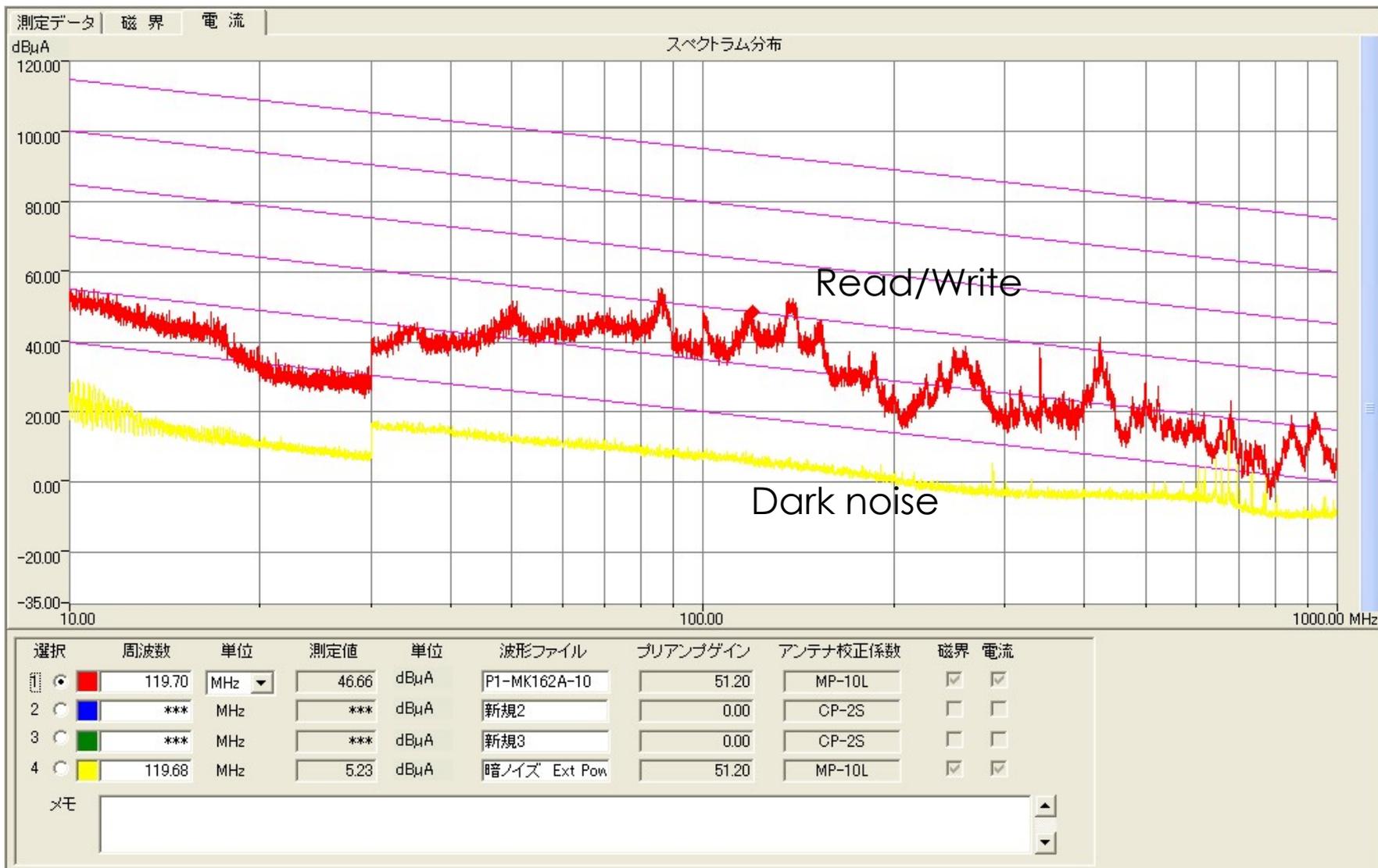


# Child Board

- 4-layer board (V+G/G/G/V+G)  
Exclusively for power supply and GND
- Interposer attached via BGA pads
- Current approx. 5A max. assumed



# Measurement Results





# Conclusion

¶ **VCCI Council**, a privately-funded non-profit membership organization, has been promoting **voluntary control of radio disturbances** emitted from ITE since 1985.

¶ **MOU between Japan and US** was established by exchanging letters in February, 2007.

	No. of registered test labs accepted by the other party
Japan	22 sites
US	39 sites

¶ **Kit Module Program** for IT module started in April, 2005 as a VCCI Quality Program. **Magnetic Probe Method**, IEC 61967-6, is used as the measurement method.