RADIO TEST REPORT

Test Report No. 14039777M-C-R1

Customer	**YUYAMA MFG. CO., LTD.**
Description of EUT	**TABLET CASSETTE BASE**
Model Number of EUT	**TG-F321**
FCC ID	**WSLTG-F321**
Test Regulation	**FCC Part 15 Subpart C**
Test Result	**Complied**
Issue Date	**August 22, 2023**
Remarks	**-**

Representative test engineer	Approved by
Hiromitsu Tanabe Engineer	Kazuhiro Ando Engineer

CERTIFICATE 1266.01

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
☒ There is no testing item of "Non-accreditation".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 22.0

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- The information provided from the customer for this report is identified in SECTION 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No. 14039777M-C

This report is a revised version of 14039777M-C. 14039777M-C is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14039777M-C	July 11, 2023	-
1	14039777M-C-R1	August 22, 2023	P.19, P.20 - Correction of the antenna deg. for Result of the fundamental Emission at 3 m without Distance factor; From “180” to “135” P.22 - Replacement to the correct data

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	ICES	Interference-Causing Equipment Standard
AC	Alternating Current	IEC	International Electrotechnical Commission
AFH	Adaptive Frequency Hopping	IEEE	Institute of Electrical and Electronics Engineers
AM	Amplitude Modulation	IF	Intermediate Frequency
Amp, AMP	Amplifier	ILAC	International Laboratory Accreditation Conference
ANSI	American National Standards Institute	ISED	Innovation, Science and Economic Development Canada
Ant, ANT	Antenna	ISO	International Organization for Standardization
AP	Access Point	JAB	Japan Accreditation Board
ASK	Amplitude Shift Keying	LAN	Local Area Network
Atten., ATT	Attenuator	LIMS	Laboratory Information Management System
AV	Average	MCS	Modulation and Coding Scheme
BPSK	Binary Phase-Shift Keying	MRA	Mutual Recognition Arrangement
BR	Bluetooth Basic Rate	N/A	Not Applicable
BT	Bluetooth	NIST	National Institute of Standards and Technology
BT LE	Bluetooth Low Energy	NS	No signal detect.
BW	BandWidth	NSA	Normalized Site Attenuation
Cal Int	Calibration Interval	NVLAP	National Voluntary Laboratory Accreditation Program
CCK	Complementary Code Keying	OBW	Occupied Band Width
Ch., CH	Channel	OFDM	Orthogonal Frequency Division Multiplexing
CISPR	Comite International Special des Perturbations Radioelectriques	P/M	Power meter
CW	Continuous Wave	PCB	Printed Circuit Board
DBPSK	Differential BPSK	PER	Packet Error Rate
DC	Direct Current	PHY	Physical Layer
D-factor	Distance factor	PK	Peak
DFS	Dynamic Frequency Selection	PN	Pseudo random Noise
DQPSK	Differential QPSK	PRBS	Pseudo-Random Bit Sequence
DSSS	Direct Sequence Spread Spectrum	PSD	Power Spectral Density
EDR	Enhanced Data Rate	QAM	Quadrature Amplitude Modulation
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	QP	Quasi-Peak
EMC	ElectroMagnetic Compatibility	QPSK	Quadri-Phase Shift Keying
EMI	ElectroMagnetic Interference	RBW	Resolution Band Width
EN	European Norm	RDS	Radio Data System
ERP, e.r.p.	Effective Radiated Power	RE	Radio Equipment
EU	European Union	RF	Radio Frequency
EUT	Equipment Under Test	RMS	Root Mean Square
Fac.	Factor	RSS	Radio Standards Specifications
FCC	Federal Communications Commission	Rx	Receiving
FHSS	Frequency Hopping Spread Spectrum	SA, S/A	Spectrum Analyzer
FM	Frequency Modulation	SG	Signal Generator
Freq.	Frequency	SVSWR	Site-Voltage Standing Wave Ratio
FSK	Frequency Shift Keying	TR	Test Receiver
GFSK	Gaussian Frequency-Shift Keying	Tx	Transmitting
GNSS	Global Navigation Satellite System	VBW	Video BandWidth
GPS	Global Positioning System	Vert.	Vertical
Hori.	Horizontal	WLAN	Wireless LAN

CONTENTS PAGE

SECTION 1: Customer Information

Company Name	YUYAMA MFG. CO., LTD.
Address	1-2-12, Kouzushima, Toyonaka-shi, Osaka, 561-0843 Japan
Telephone Number	+81-6-6868-5030
Contact Person	Sho Oya

*Remarks:
YUYAMA MFG. CO., LTD. designates Yoshikawa RF Semicon Co., Ltd. as manufacturer of the product (TABLET CASSETTE BASE).

The information provided from the customer is as follows;
- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- SECTION 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	TABLET CASSETTE BASE
Model Number	TG-F321
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	May 13, 2022
Test Date	May 13 to 26, 2022

2.2 Product Description

General Specification

Rating	DC 5 V ±10 % (Radio Part) DC 12 V ±10 % (Motor Part)
Operating Temperature	-20 deg. C to +50 deg. C

Radio Specification

Equipment Type	Transceiver
Frequency of Operation	13.56 MHz
Type of Modulation	ASK

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart C The latest version on the first day of the testing period
Title	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.225 Operation within the band 13.110-14.010 MHz.

* The customer has declared that the EUT has complies with FCC Part 15 Subpart B as SDoC.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.207	7.2 dB, 29.49129 MHz, AV, L	Complied	-
	<ISED> RSS-Gen 8.8	<ISED> RSS-Gen 8.8			
Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.225(a)	76.6 dB, 13.56000 MHz, QP, 135 deg.	Complied	Radiated
	<ISED> RSS-Gen 6.4, 6.12	<ISED> RSS-210 B.6			
Spectrum Mask	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.225(b)(c)	44.6 dB, 13.11000 MHz, QP, 135 deg	Complied	Radiated
	<ISED> RSS-Gen 6.4, 6.13	<ISED> RSS-210 B.6			
20 dB Bandwidth	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section15.215(c)	See data	Complied	Radiated
	<ISED> -	<ISED> -			
Electric Field Strength of Spurious Emission	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.209, Section 15.225 (d)	4.9 dB 49.48 MHz, Vertical, QP	Complied	Radiated
	<ISED> RSS-Gen 6.4, 6.13	<ISED> RSS-210 B.6 RSS-Gen 8.9			
Frequency Tolerance	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.225(e)	See data	Complied	Radiated
	<ISED> RSS-Gen 6.11, 8.11	<ISED> RSS-210 B.6			
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.					

FCC Part 15.31 (e)

This EUT provides stable voltage constantly to RF Module regardless of input voltage.
Therefore, the EUT complies with the requirement.
However, the supply voltage was varied and tested at 85 % and 115 % of the nominal rated supply voltage during frequency tolerance test according to Section 15.225(e).

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT.
Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% emission bandwidth	<ISED>RSS-Gen 6.7	-	N/A	-	Radiated
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.					

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k = 2.

Conducted emission

Frequency range	Calculate Uncertainty (+/-)
0.15 MHz to 30 MHz	3.2 dB

Radiated emission

Measurement distance	Frequency range	Calculate Uncertainty (+/-)
3 m	9 kHz to 30 MHz	2.9 dB
	30 MHz to 200 MHz	6.2 dB
	200 MHz to 1000 MHz	6.3 dB
	1 GHz to 6 GHz	5.0 dB
	6 GHz to 18 GHz	5.4 dB
	18 GHz to 40 GHz	5.5 dB
1 m	1 GHz to 18 GHz	5.4 dB
	18 GHz to 40 GHz	5.6 dB
0.5m	26.5 GHz to 40 GHz	5.9 dB

Antenna Terminal test

Test Item	Calculate Uncertainty (+/-)
Frequency Tolerance	7.9 x 10^-8
20 dB Bandwidth / 99 % Occupied Bandwidth	1.6 %

3.5 Test Location

UL Japan, Inc. Kashima EMC Lab.
1614 Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan
Telephone: +81-478-88-6500
A2LA Certificate Number: 1266.01 / FCC Test Firm Registration Number: 910230
ISED Lab Company Number: 4659A / CAB identifier: JP0006

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Open site	6.0 x 5.5 x 2.5	20 x 40	10 m
No.5 Open site	8.6 x 7.1 x 2.4	18 x 23	10 m
No.1 Shielded room	5.4 x 4.5 x 2.3	-	-
No.5 Shielded Room	4.2 x 3.1 x 2.5	-	-
No.9 Shielded Room	6.1 x 3.6 x 2.8	-	-
No.6 Semi-anechoic Chamber	8.5 x 5.5 x 5.2	-	3 m
No.10 Semi-anechoic Chamber	18.4 x 9.9 x 7.7	-	10 m
No.11 Semi-anechoic Chamber	9.0 x 6.5 x 5.2	-	3 m
No.1 Measurement room	5.0 x 3.7 x 2.6	-	-
No.2 Measurement room	4.3 x 4.4 x 2.7	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

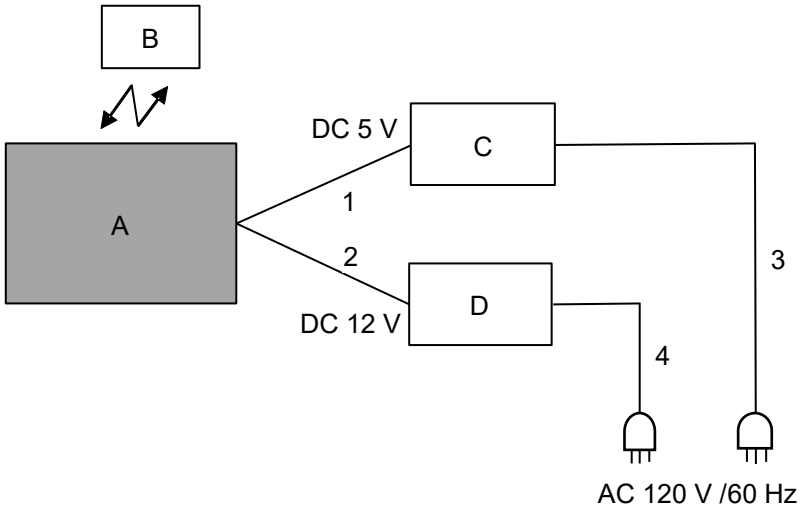
The mode is used:

Test mode	Remarks
1) Transmitting mode (Tx) - with Tag - without Tag	The EUT Transmits and Receives at the same time and there is no receiving mode.
The EUT was operated in a manner similar to typical use during the tests.	
*Power of the EUT was set by the software as follows; Power Setting: Fixed Software: YFWW210015 (Date: 2021.12.02, Storage location: embedded memory in Jig) *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	
Justification: The system was configured in typical fashion (as a user would normally use it) for testing.	

Test Item	Operating mode*
Conducted Emission	Tx Mod on, with Tag / without Tag
Electric Field Strength of Fundamental Emission	Tx Mod on, with Tag / without Tag
Spectrum Mask	Tx Mod on, with Tag / without Tag
20 dB Bandwidth and 99 % Occupied Bandwidth	Tx Mod on, with Tag / without Tag
Electric Field Strength of Spurious Emission	Tx Mod on, with Tag / without Tag
Frequency Tolerance	Tx Mod off

Frequency Tolerance:	
Temperature	-20 deg. C to +50 deg. C Step 10 deg. C
Voltage	Normal Voltage DC 5 V Maximum Voltage DC 5.75 V (DC 5 V +15 %) Minimum Voltage DC 4.25 V (DC 5 V -15 %)
* This EUT provides stable voltage constantly to RF Part regardless of input voltage.	

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remark
A	TABLET CASSETTE BASE	TG-F321	74	Yoshikawakogyo RF Semicon Co., Ltd.	EUT
B	Tag	YTW021-157	120	Yoshikawakogyo RF Semicon Co., Ltd.	-
C	DC Power Supply	PMX18-2A	AX000065	KIKUSUI ELECTRONICS CORP.	-
D	DC Power Supply	PMX35-3A	AV000508	KIKUSUI ELECTRONICS CORP.	-

List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	0.3	Unshielded	Unshielded	-
		0.3 + 1.2	Unshielded	Unshielded	*1)
2	DC Cable	0.3	Unshielded	Unshielded	-
		0.3 + 1.2	Unshielded	Unshielded	*1)
3	AC Cable	1.7	Unshielded	Unshielded	-
4	AC Cable	1.7	Unshielded	Unshielded	-

*1) Frequency Tolerance test only

SECTION 5: Conducted Emission

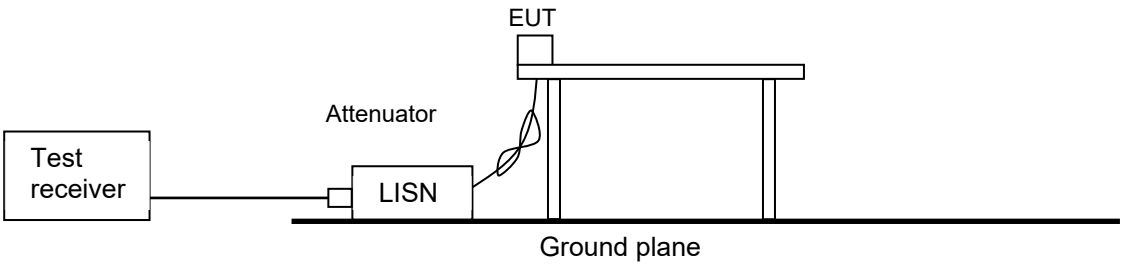
Test Procedure and conditions

EUT was placed on a wooden table of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN / (AMN) to the input power source. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Shielded room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

Figure 1: Test Setup



The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector : QP and CISPR AV
Measurement range : 0.15 MHz to 30 MHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Radiated Emission (Fundamental, Spurious Emission and Spectrum Mask)

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[Limit conversion]

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohmes. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to 45.5 - 51.5 = -6.0 dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

[Frequency: From 9 kHz to 30 MHz]

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for vertical polarization (antenna angle: 0 deg., 45 deg., 90 deg., and 135 deg.) and horizontal polarization.
*Refer to Figure 3 about Direction of the Loop Antenna.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

These tests were performed in semi anechoic chamber. Therefore the measured level of emissions may be higher than if measurements were made without a ground plane. However test results were confirmed to pass against standard limit.

[Frequency: From 30 MHz to 1 GHz]

The measuring antenna height varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.

[Test instruments and test settings]

Frequency	Below 30 MHz	30 MHz to 1 GHz
Antenna Type	Loop	Hybrid

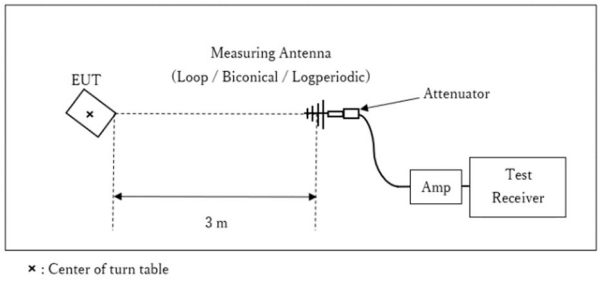
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Frequency	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz
Instrument used	Test Receiver				
Detector	PK / AV	QP	PK / AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	9 kHz	9 kHz	120 kHz
Test Distance	3 m *1)	3 m *1)	3 m *1)	3 m *2)	3 m

*1) Distance Factor: 40 x log (3 m / 300 m) = -80 dB
*2) Distance Factor: 40 x log (3 m / 30 m) = -40 dB

Figure 2: Test Setup

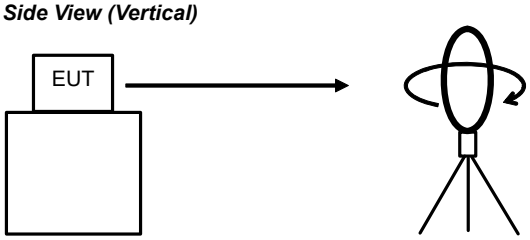
Below 1 GHz



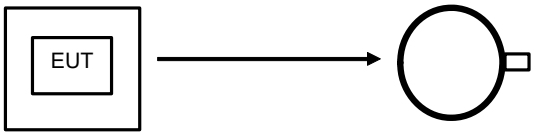
Test Distance: 3 m

Figure 3: Direction of the Loop Antenna

Side View (Vertical)

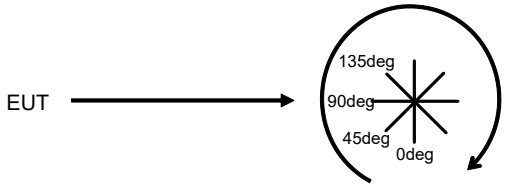


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

The test was made on EUT at the normal use position.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 9 kHz to 1 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Other test

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	300 kHz	3 kHz	10 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer
Frequency Tolerance *2)	-	-	-	-	-	-	Frequency counter
*1) The measurement was performed with Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement. *2) The temperature test was started after the temperature stabilization time of 30 minutes. The test was begun from 50 deg.C and the temperature was lowered each 10 deg.C.							

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

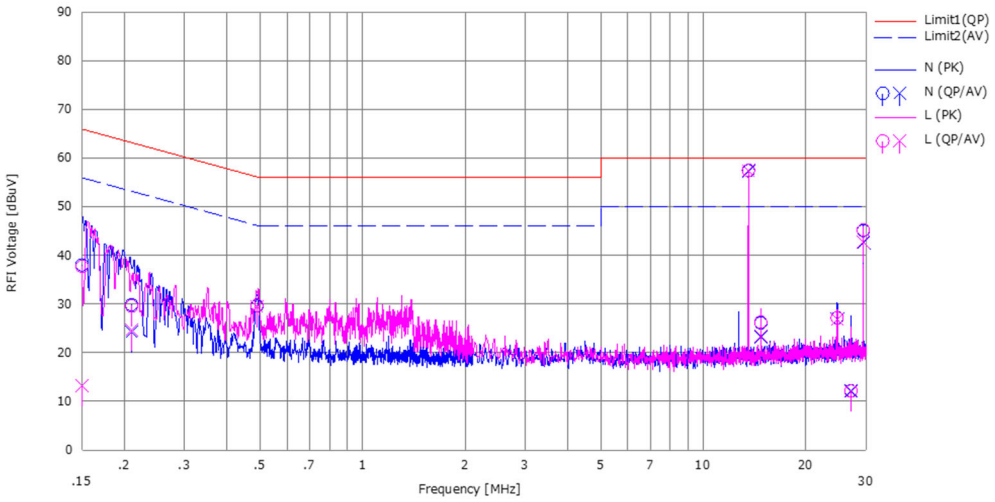
UL Japan, Inc. Kashima EMC Lab. No.1 Shielded Room
Date : 2022/05/13

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V (AC120V/60Hz)
Temp./Humi. : 20deg.C / 52%RH

Remarks : With tag

Limit : FCC_Part 15 Subpart C(15.207)

Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		(QP)	(AV)		(QP)	(AV)	(QP)	(AV)	(QP)	(AV)		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	27.90	3.00	10.15	38.05	13.15	66.00	56.00	27.9	42.8	N	
2	0.20967	19.70	14.10	10.17	29.87	24.27	63.22	53.22	33.3	28.9	N	
3	0.48914	19.40	19.30	10.20	29.60	29.50	56.18	46.18	26.5	16.6	N	
4	13.56000	46.30	46.20	11.11	57.41	57.31	60.00	50.00	2.5	-7.4	N	Carrier
5	14.74562	14.90	12.00	11.20	26.10	23.20	60.00	50.00	33.9	26.8	N	
6	24.72486	15.30	15.00	11.89	27.19	26.89	60.00	50.00	32.8	23.1	N	
7	27.12000	0.12	0.10	12.03	12.15	12.13	60.00	50.00	47.8	37.8	N	without tag
8	27.12000	0.12	0.10	12.03	12.15	12.13	60.00	50.00	47.8	37.8	N	
9	29.49130	33.00	30.50	12.10	45.10	42.60	60.00	50.00	14.9	7.4	N	
10	0.15000	27.50	3.00	10.21	37.71	13.21	66.00	56.00	28.2	42.7	L	
11	0.20960	19.40	14.50	10.20	29.60	24.70	63.22	53.22	33.6	28.5	L	
12	0.48921	19.50	19.30	10.21	29.71	29.51	56.18	46.18	26.4	16.6	L	
13	13.56000	46.40	46.30	11.11	57.51	57.41	60.00	50.00	2.4	-7.5	L	Carrier
14	14.74561	15.10	12.20	11.19	26.29	23.39	60.00	50.00	33.7	26.6	L	
15	24.72526	15.30	15.00	11.83	27.13	26.83	60.00	50.00	32.8	23.1	L	
16	27.12000	0.12	0.10	11.96	12.08	12.06	60.00	50.00	47.9	37.9	L	without tag
17	27.12000	0.12	0.10	11.96	12.08	12.06	60.00	50.00	47.9	37.9	L	
18	29.49129	33.20	30.70	12.04	45.24	42.74	60.00	50.00	14.7	7.2	L	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(AMN+Cable+ATT)[dB]
AMN:CLS-03

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

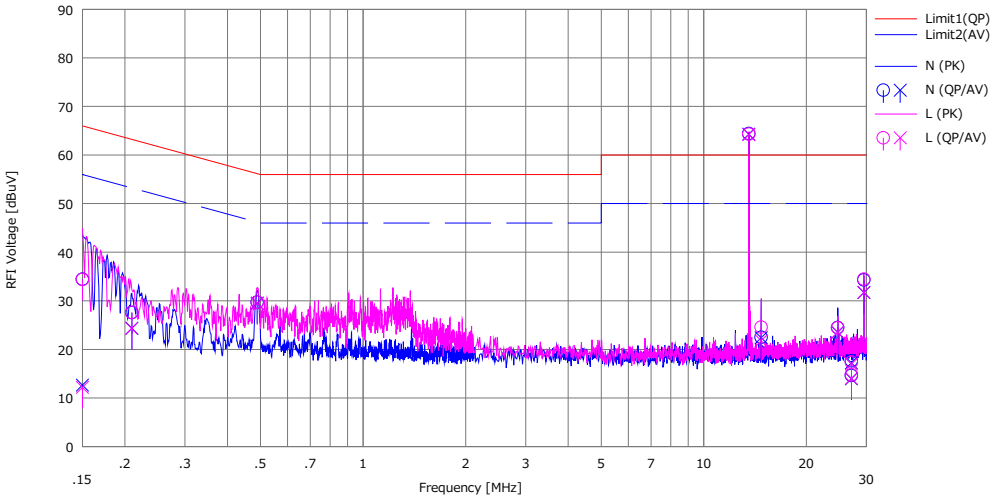
UL Japan, Inc. Kashima EMC Lab. No.1 Shielded Room
Date : 2022/05/13

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 12V (AC120V/60Hz)
Temp./Humi. : 20deg.C / 52%RH

Remarks : With tag

Limit : FCC_Part 15 Subpart C(15.207)

Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		〈QP〉	〈AV〉		〈QP〉	〈AV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	24.30	2.50	10.15	34.45	12.65	66.00	56.00	31.5	43.3	N	
2	0.20968	17.40	14.20	10.17	27.57	24.37	63.22	53.22	35.6	28.8	N	
3	0.48927	19.50	19.30	10.20	29.70	29.50	56.18	46.18	26.4	16.6	N	
4	13.56000	53.30	53.20	11.11	64.41	64.31	60.00	50.00	-4.5	-14.4	N	Carrier
5	14.73880	11.30	11.20	11.20	22.50	22.40	60.00	50.00	37.5	27.6	N	
6	24.72384	12.60	11.60	11.89	24.49	23.49	60.00	50.00	35.5	26.5	N	
7	27.12000	2.60	1.90	12.03	14.63	13.93	60.00	50.00	45.3	36.0	N	
8	27.12000	5.60	5.20	12.03	17.63	17.23	60.00	50.00	42.3	32.7	N	without tag
9	29.49127	22.20	19.60	12.10	34.30	31.70	60.00	50.00	25.7	18.3	N	
10	0.15000	24.20	2.00	10.21	34.41	12.21	66.00	56.00	31.5	43.7	L	
11	0.20936	17.40	14.10	10.20	27.60	24.30	63.23	53.23	35.6	28.9	L	
12	0.48932	19.50	19.30	10.21	29.71	29.51	56.18	46.18	26.4	16.6	L	
13	13.56000	53.20	53.10	11.11	64.31	64.21	60.00	50.00	-4.4	-14.3	L	Carrier
14	14.74565	13.40	10.60	11.19	24.59	21.79	60.00	50.00	35.4	28.2	L	
15	24.72350	12.60	11.70	11.83	24.43	23.53	60.00	50.00	35.5	26.4	L	
16	27.12000	2.80	2.10	11.96	14.76	14.06	60.00	50.00	45.2	35.9	L	
17	27.12000	5.40	5.00	11.96	17.36	16.96	60.00	50.00	42.6	33.0	L	without tag
18	29.49128	22.40	19.70	12.04	34.44	31.74	60.00	50.00	25.5	18.2	L	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(AMN+Cable+ATT)[dB]
AMN:CLS-03

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

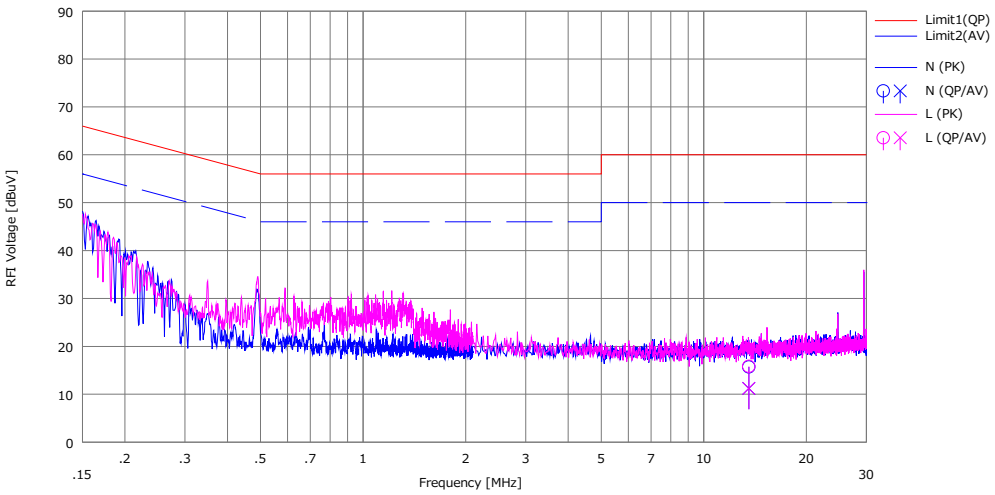
UL Japan, Inc. Kashima EMC Lab. No.1 Shielded Room
Date : 2022/05/13

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V (AC120V/60Hz)
Temp./Humi. : 20deg.C / 52%RH

Remarks : Antenna Terminated

Limit : FCC_Part 15 Subpart C(15.207)

Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		〈QP〉	〈AV〉		〈QP〉	〈AV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	13.56000	4.60	0.10	11.11	15.71	11.21	60.00	50.00	44.2	38.7	N	
2	13.56000	4.70	0.10	11.11	15.81	11.21	60.00	50.00	44.1	38.7	L	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(AMN+Cable+ATT)[dB]
AMN:CLS-03

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

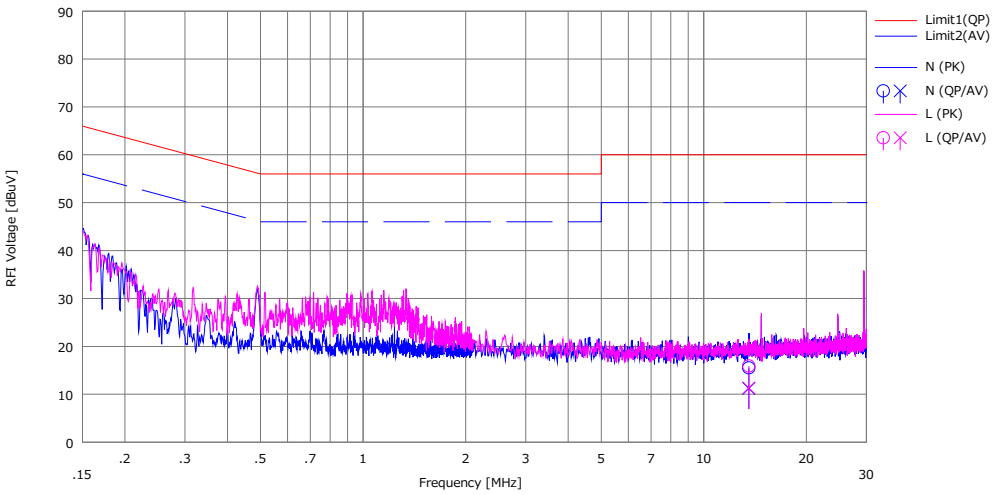
UL Japan, Inc. Kashima EMC Lab. No.1 Shielded Room
Date : 2022/05/13

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 12V (AC120V/60Hz)
Temp./Humi. : 20deg.C / 52%RH

Remarks : Antenna Terminated

Limit : FCC_Part 15 Subpart C(15.207)

Tested by : Hiromitsu Tanabe



No.	Freq.	Reading ⟨QP⟩	Reading ⟨AV⟩	C.Fac	Results ⟨QP⟩	Results ⟨AV⟩	Limit ⟨QP⟩	Limit ⟨AV⟩	Margin ⟨QP⟩	Margin ⟨AV⟩	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	13.56000	4.40	0.10	11.11	15.51	11.21	60.00	50.00	44.4	38.7	N	
2	13.56000	4.80	0.20	11.11	15.91	11.31	60.00	50.00	44.0	38.6	L	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(AMN+Cable+ATT)[dB]
AMN:CLS-03

Fundamental Emission and Spectrum Mask

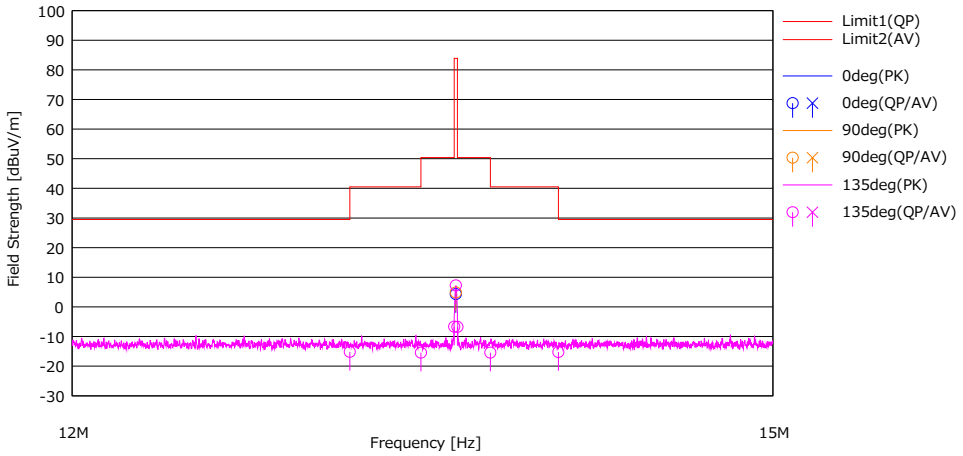
DATA OF RADIATED EMISSION(below 30MHz) TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2022/05/26

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V, DC 12V
Temp./Humi. : 20 deg.C / 50 %RH

Remarks : Without Tag

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Antenna	Table	Comment
		〈QP〉	〈AV〉				〈QP〉	〈AV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉			
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]		[deg]	
1	13.56000	42.20	---	19.39	-33.03	24.25	4.31	---	83.90	---	79.5	---	0deg	80	
2	13.56000	42.75	---	19.39	-33.03	24.25	4.86	---	83.90	---	79.0	---	90deg	160	
3	13.11000	22.72	---	19.39	-33.05	24.23	-15.17	---	29.50	---	44.6	---	135deg	100	
4	13.41000	22.43	---	19.39	-33.03	24.24	-15.45	---	40.50	---	55.9	---	135deg	100	
5	13.55300	31.21	---	19.39	-33.03	24.25	-6.68	---	50.40	---	57.0	---	135deg	100	
6	13.56000	45.13	---	19.39	-33.03	24.25	7.24	---	83.90	---	76.6	---	135deg	100	
7	13.56700	31.13	---	19.39	-33.03	24.25	-6.76	---	50.40	---	57.1	---	135deg	100	
8	13.71000	22.45	---	19.40	-33.02	24.25	-15.42	---	40.50	---	55.9	---	135deg	100	
9	14.01000	22.64	---	19.40	-33.01	24.27	-15.24	---	29.50	---	44.7	---	135deg	100	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+D.Fac)[dB]-Gain(AMP)[dB]
Ant.Type=LOOP:Loop antenna

Result of the fundamental Emission at 3 m without Distance factor

QP

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
135	13.56000	QP	45.13	19.39	6.97	24.25	-	47.24	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

Fundamental Emission and Spectrum Mask

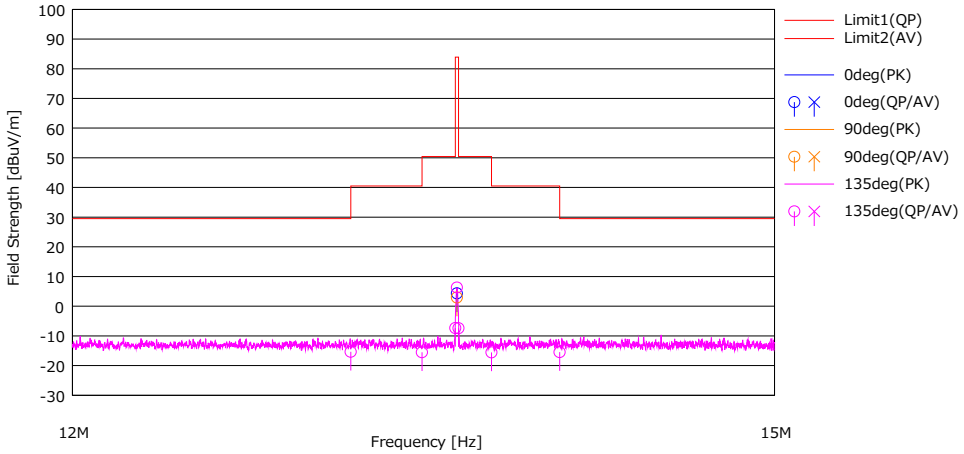
DATA OF RADIATED EMISSION(below 30MHz) TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2022/05/26

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V, DC 12V
Temp./Humi. : 20 deg.C / 50 %RH

Remarks : With Tag

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Antenna	Table	Comment
		〈QP〉	〈AV〉				〈QP〉	〈AV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉			
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]		[deg]	
1	13.56000	42.20	---	19.39	-33.03	24.25	4.31	---	83.90	---	79.5	---	0deg	96	
2	13.56000	40.83	---	19.39	-33.03	24.25	2.94	---	83.90	---	80.9	---	90deg	173	
3	13.11000	22.53	---	19.39	-33.05	24.23	-15.36	---	29.50	---	44.8	---	135deg	115	
4	13.41000	22.37	---	19.39	-33.03	24.24	-15.51	---	40.50	---	56.0	---	135deg	115	
5	13.55300	30.54	---	19.39	-33.03	24.25	-7.35	---	50.40	---	57.7	---	135deg	115	
6	13.56000	44.20	---	19.39	-33.03	24.25	6.31	---	83.90	---	77.5	---	135deg	115	
7	13.56700	30.48	---	19.39	-33.03	24.25	-7.41	---	50.40	---	57.8	---	135deg	115	
8	13.71000	22.33	---	19.40	-33.02	24.25	-15.54	---	40.50	---	56.0	---	135deg	115	
9	14.01000	22.43	---	19.40	-33.01	24.27	-15.45	---	29.50	---	44.9	---	135deg	115	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+D.Fac)[dB]-Gain(AMP)[dB]
Ant.Type=LOOP:Loop antenna

Result of the fundamental Emission at 3 m without Distance factor

QP

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
135	13.56000	QP	44.20	19.39	6.97	24.25	-	46.31	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

Spurious Emission

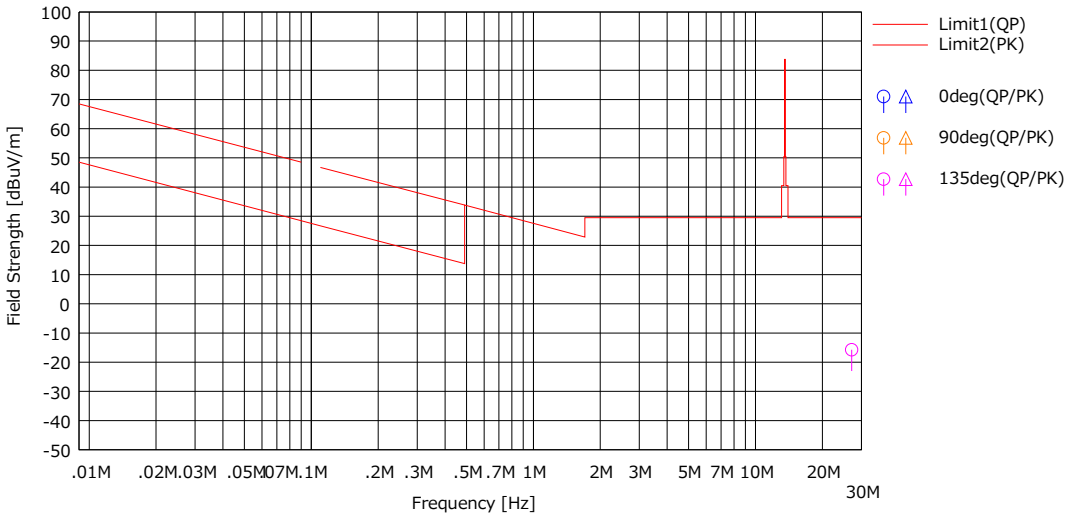
DATA OF RADIATED EMISSION(below 30MHz) TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2022/05/26

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V, DC 12V
Temp./Humi. : 20 deg.C / 50 %RH

Remarks : Without Tag

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Antenna	Table	Comment
		〈QP〉	〈PK〉				〈QP〉	〈PK〉	〈QP〉	〈PK〉	〈QP〉	〈PK〉			
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]		[deg]	
1	27.12000	21.40	---	19.88	-32.58	24.45	-15.75	---	29.50	---	45.2	---	135deg	0	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+D.Fac)[dB]-Gain(AMP)[dB]
Ant.Type=LOOP:Loop antenna

Spurious Emission

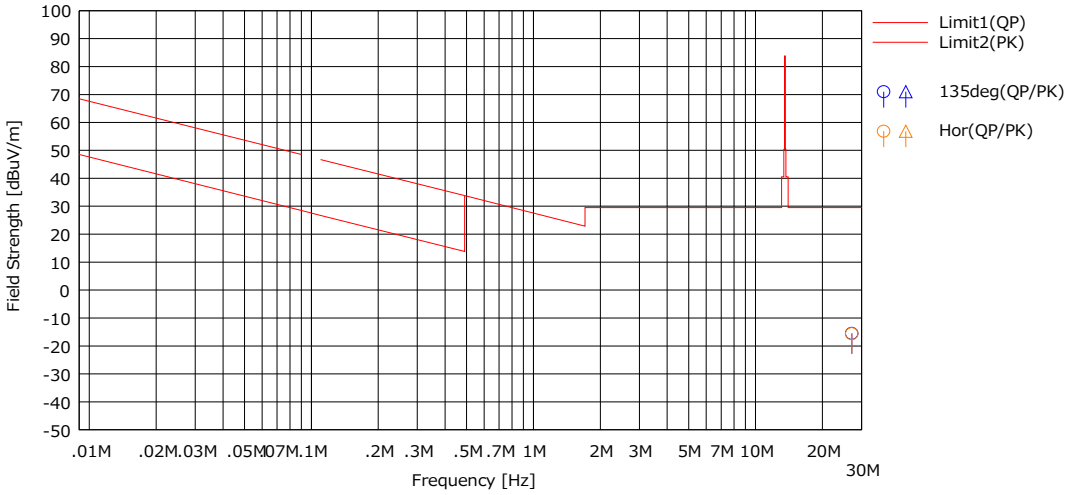
DATA OF RADIATED EMISSION(below 30MHz) TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2022/05/26

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V, DC 12V
Temp./Humi. : 20 deg.C / 50 %RH

Remarks : With Tag

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Hiromitsu Tanabe



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Antenna	Table	Comment
		〈QP〉	〈PK〉				〈QP〉	〈PK〉	〈QP〉	〈PK〉	〈QP〉	〈PK〉			
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]		[deg]	
1	27.12000	21.63	---	19.88	-32.58	24.45	-15.52	---	29.50	---	45.0	---	135deg	310	
2	27.12000	21.53	---	19.88	-32.58	24.45	-15.62	---	29.50	---	45.1	---	Hor	35	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+D.Fac)[dB]-Gain(AMP)[dB]
Ant.Type=LOOP:Loop antenna

Spurious Emission

DATA OF RADIATED EMISSION TEST

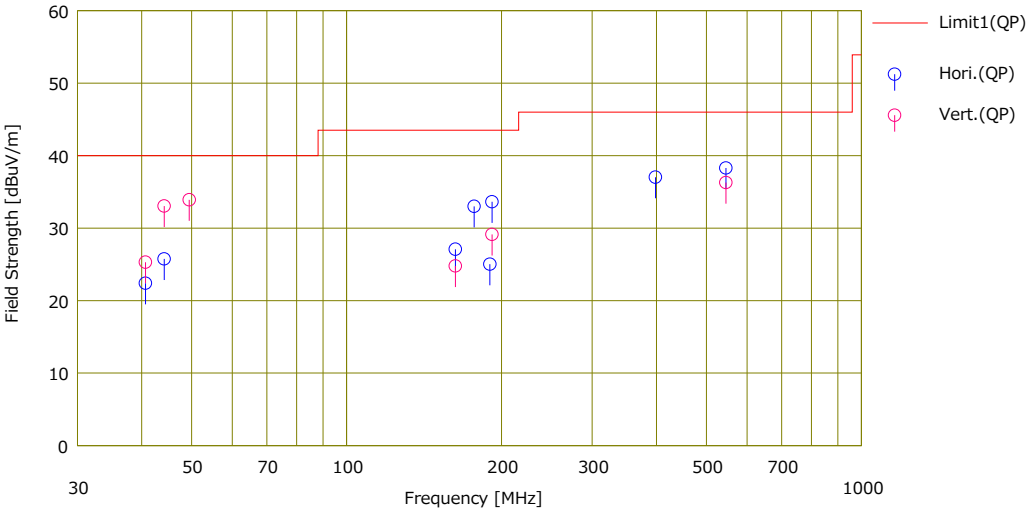
UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2022/05/25

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V, DC 12V
Temp./Humi. : 20 deg.C / 50 %RH

Remarks : Without Tag

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

Tested by : Hiromitsu Tanabe



No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	40.680	34.60	13.34	6.06	31.60	22.40	40.00	17.6	Hori.	210	91	HB	
2	44.238	37.60	13.63	6.12	31.60	25.75	40.00	14.2	Hori.	223	140	HB	
3	162.720	37.60	13.38	7.50	31.40	27.08	43.50	16.4	Hori.	190	237	HB	
4	176.950	44.40	12.35	7.64	31.39	33.00	43.50	10.5	Hori.	174	256	HB	
5	189.840	38.00	10.61	7.76	31.35	25.02	43.50	18.4	Hori.	144	114	HB	
6	191.700	46.80	10.41	7.77	31.35	33.63	43.50	9.8	Hori.	185	118	HB	
7	398.136	43.20	15.49	9.55	31.22	37.02	46.00	8.9	Hori.	100	281	HB	
8	545.565	40.60	18.40	10.41	31.13	38.28	46.00	7.7	Hori.	206	127	HB	
9	40.680	37.50	13.34	6.06	31.60	25.30	40.00	14.7	Vert.	100	285	HB	
10	44.238	44.90	13.63	6.12	31.60	33.05	40.00	6.9	Vert.	100	135	HB	
11	49.483	45.50	13.80	6.20	31.60	33.90	40.00	6.1	Vert.	100	150	HB	
12	162.720	35.30	13.38	7.50	31.40	24.78	43.50	18.7	Vert.	100	0	HB	
13	191.700	42.30	10.41	7.77	31.35	29.13	43.50	14.3	Vert.	100	256	HB	
14	545.592	38.60	18.40	10.41	31.13	36.28	46.00	9.7	Vert.	115	121	HB	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]
Ant.Type=HB:Hybrid Antenna

Spurious Emission

DATA OF RADIATED EMISSION TEST

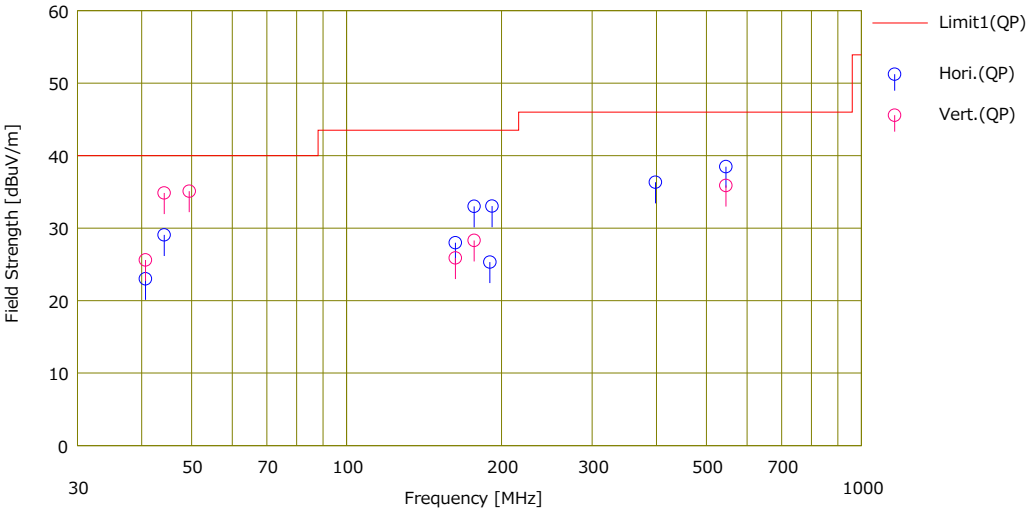
UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2022/05/25

Mode : Transmitting and Receiving
Order No. : 14039777
Power : DC 5V, DC 12V
Temp./Humi. : 20 deg.C / 50 %RH

Remarks : With Tag

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

Tested by : Hiromitsu Tanabe



No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	40.680	35.20	13.34	6.06	31.60	23.00	40.00	17.0	Hori.	213	84	HB	
2	44.238	40.90	13.63	6.12	31.60	29.05	40.00	10.9	Hori.	286	152	HB	
3	162.720	38.50	13.38	7.50	31.40	27.98	43.50	15.5	Hori.	205	249	HB	
4	176.950	44.40	12.35	7.64	31.39	33.00	43.50	10.5	Hori.	181	247	HB	
5	189.840	38.30	10.61	7.76	31.35	25.32	43.50	18.1	Hori.	176	112	HB	
6	191.700	46.20	10.41	7.77	31.35	33.03	43.50	10.4	Hori.	167	116	HB	
7	398.136	42.50	15.49	9.55	31.22	36.32	46.00	9.6	Hori.	100	280	HB	
8	545.565	40.80	18.40	10.41	31.13	38.48	46.00	7.5	Hori.	205	127	HB	
9	40.680	37.80	13.34	6.06	31.60	25.60	40.00	14.4	Vert.	100	310	HB	
10	44.238	46.70	13.63	6.12	31.60	34.85	40.00	5.1	Vert.	100	190	HB	
11	49.480	46.70	13.80	6.20	31.60	35.10	40.00	4.9	Vert.	100	128	HB	
12	162.720	36.40	13.38	7.50	31.40	25.88	43.50	17.6	Vert.	100	0	HB	
13	176.947	39.70	12.35	7.64	31.39	28.30	43.50	15.2	Vert.	100	0	HB	
14	545.592	38.20	18.40	10.41	31.13	35.88	46.00	10.1	Vert.	116	117	HB	

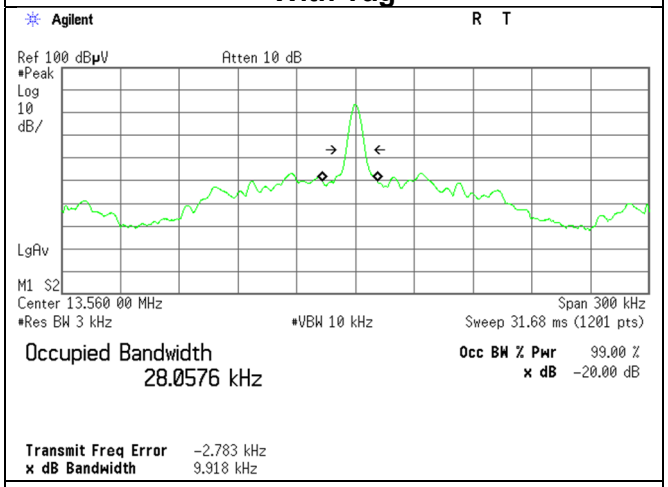
Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]
Ant.Type=HB:Hybrid Antenna

20 dB Bandwidth and 99% Occupied Bandwidth

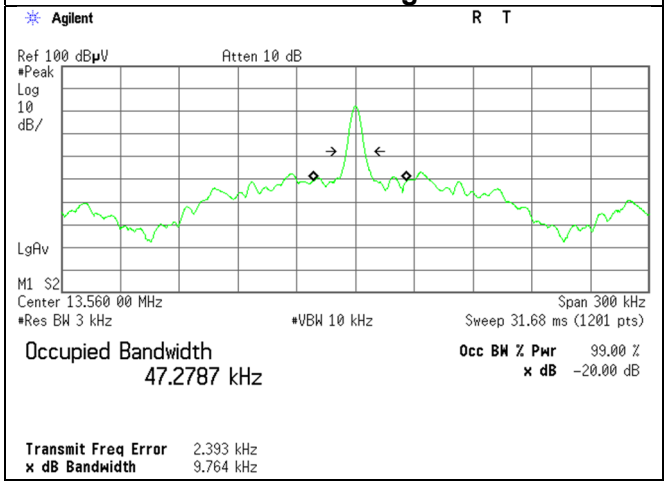
Test place	Kashima EMC Lab. No.2 Measurement room
Date	May 26, 2022
Temperature / Humidity	20 deg. C / 49 % RH
Engineer	Hiromitsu Tanabe
Mode	Tx Mod on

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	With Tag	9.92	28.06
	Without Tag	9.76	47.28

With Tag



Without Tag



* Since the transmitter signal is CW-like it is impractical to use a RBW setting of 1 - 5% of the emission bandwidth since the emission bandwidth will be proportional to the RBW.

Frequency Tolerance

Test place	Kashima EMC Lab. No.2 Measurement room
Date	May 26, 2022
Temperature / Humidity	20 deg. C / 49 % RH
Engineer	Hiromitsu Tanabe
Mode	Tx Mod off

Test condition		Tested timing	Measured frequency	Frequency error	Result		Limit
Temp. [deg. C]	Voltage [V]		[MHz]	[MHz]	[%]	[ppm]	[+/- %]
50	5	Power on	13.559921	-0.000079	-0.00058	-5.8	0.01
		+ 2 min.	13.559917	-0.000083	-0.00061	-6.1	0.01
		+ 5 min.	13.559917	-0.000083	-0.00061	-6.1	0.01
		+ 10 min.	13.559916	-0.000084	-0.00062	-6.2	0.01
40	5	Power on	13.559950	-0.000050	-0.00037	-3.7	0.01
		+ 2 min.	13.559947	-0.000053	-0.00039	-3.9	0.01
		+ 5 min.	13.559946	-0.000054	-0.00040	-4.0	0.01
		+ 10 min.	13.559945	-0.000055	-0.00041	-4.1	0.01
30	5	Power on	13.559987	-0.000013	-0.00010	-1.0	0.01
		+ 2 min.	13.559983	-0.000017	-0.00013	-1.3	0.01
		+ 5 min.	13.559983	-0.000017	-0.00013	-1.3	0.01
		+ 10 min.	13.559981	-0.000019	-0.00014	-1.4	0.01
20	5	Power on	13.560019	0.000019	0.00014	1.4	0.01
		+ 2 min.	13.560016	0.000016	0.00012	1.2	0.01
		+ 5 min.	13.560015	0.000015	0.00011	1.1	0.01
		+ 10 min.	13.560014	0.000014	0.00010	1.0	0.01
20	4.25 (5V -15%)	Power on	13.560019	0.000019	0.00014	1.4	0.01
		+ 2 min.	13.560016	0.000016	0.00012	1.2	0.01
		+ 5 min.	13.560015	0.000015	0.00011	1.1	0.01
		+ 10 min.	13.560014	0.000014	0.00010	1.0	0.01
20	5.75 (5V +15%)	Power on	13.560019	0.000019	0.00014	1.4	0.01
		+ 2 min.	13.560016	0.000016	0.00012	1.2	0.01
		+ 5 min.	13.560015	0.000015	0.00011	1.1	0.01
		+ 10 min.	13.560014	0.000014	0.00010	1.0	0.01
10	5	Power on	13.560046	0.000046	0.00034	3.4	0.01
		+ 2 min.	13.560044	0.000044	0.00032	3.2	0.01
		+ 5 min.	13.560044	0.000044	0.00032	3.2	0.01
		+ 10 min.	13.560043	0.000043	0.00032	3.2	0.01
0	5	Power on	13.560055	0.000055	0.00041	4.1	0.01
		+ 2 min.	13.560055	0.000055	0.00041	4.1	0.01
		+ 5 min.	13.560055	0.000055	0.00041	4.1	0.01
		+ 10 min.	13.560054	0.000054	0.00040	4.0	0.01
-10	5	Power on	13.560038	0.000038	0.00028	2.8	0.01
		+ 2 min.	13.560042	0.000042	0.00031	3.1	0.01
		+ 5 min.	13.560043	0.000043	0.00032	3.2	0.01
		+ 10 min.	13.560043	0.000043	0.00032	3.2	0.01
-20	5	Power on	13.559989	-0.000011	-0.00008	-0.8	0.01
		+ 2 min.	13.559997	-0.000003	-0.00002	-0.2	0.01
		+ 5 min.	13.559999	-0.000001	-0.00001	-0.1	0.01
		+ 10 min.	13.559999	-0.000001	-0.00001	-0.1	0.01

Calculation formula: Frequency error = Measured frequency - Tested frequency
Result [%] = Frequency error / Tested frequency * 100

Tested frequency: 13.56 MHz
Limit (+/-): 0.01 % (+/- 100ppm)

APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	CLS-24	143525	A.M.N.	Rohde & Schwarz	ENV216	101027	2021/08/20	12
CE	CLS-03	143499	A.M.N.	Rohde & Schwarz	ESH3-Z5	829567/010	2021/07/08	21
CE	CTM-26	143703	Terminator	Suhner	65_BNC-50-0-2/133_NE	none	2021/11/17	12
CE	CCC-S1-C(SR)	143155	1 Site CE System	N/A	none(No.1 CE SR)	-	2021/07/09	12
CE	CTR-05	144196	Test Receiver	Rohde & Schwarz	ESCI	100608	2021/10/22	12
CE	CSCL-12	143653	Ruler	TAJIMA	L19-55	none	-	-
CE	COS-27	200034	Temperature & Humidity Logger	HIOKI E.E. CORPORATION	LR5001/LR9504	200636456/200699552	2021/07/20	12
CE	CTS-05	144207	Digital Multimeter	Fluke Corporation	112	89790157	2021/10/11	12
CE, RE	COTS-CEMI-03	178804	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3 (RE,CE,ME,PE)	Ver 3.1.0484	-	-
RE	CBL-08	143121	LOGBICON	Schwarzbeck Mess-Elektronik OHG	VULB 9168	343	2022/04/18	12
RE	CAT5-03	178806	5dB Fixed Atten.	Pasternack Enterprises	PE7047-5	none	2022/04/01	12
RE	CCC-S10-R3	143165	10 Site RE 3m System	UL Japan	none	none	2021/08/10	12
RE	CAF-28	183880	Pre-Amplifier	UL Japan	ZKL-2	001	2022/04/06	12
RE	CTR-09	144199	Test Receiver	Keysight Technologies Inc	N9038A	MY53290016	2021/07/16	12
RE	KLP-01	143833	Loop Antenna	Rohde & Schwarz	HFH2-Z2	827779/008	2021/10/06	12
RE	CCC-M01	143161	Coaxial Cable	Fujikura,HP,Mini-Circits,Fujikura	3D2W	none	2021/05/17	12
RE	CAT6-17	144245	6dB Fixed Atten.	Suhner	6906.01.A	none	2021/07/16	12
RE	CAF-24	171927	Pre Amplifier	UL Japan	GALI-84+	001	2021/07/16	12
RE	CCC-S10-C	143157	10 Site CE System	UL Japan	none	none	2021/08/10	12
RE	CSCL-19	178881	Ruler	Stanley	1-30-696	none	-	-
RE	COS-10	143542	Temperature & Humidity Indicator	HIOKI E.E. CORPORATION	3641/9680-50	090999895/090905406	2021/06/24	12
RE	CTS-14	144216	Digital Multimeter	Fluke Corporation	115	994460954	2021/10/20	12
FT	CCH-04	143181	Temperature and Humidity Chamber	Espec	PL-1J	15004059	2021/10/14	12
FT	CFC-02	143423	Frequency Counter	Keysight Technologies Inc	53151A	US40511823	2022/04/13	12
FT, BW	CMS-07	143942	Near Field Probe	Langer	LF-R400	02-0815	-	-
FT, BW	CTS-08	144210	Digital Multimeter	Fluke Corporation	112	89790193	2021/10/11	12
FT, BW	COS-27	200034	Temperature & Humidity Logger	HIOKI E.E. CORPORATION	LR5001/LR9504	200636456/200699552	2021/07/20	12
BW	CSA-07	143643	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY52490024	2021/06/08	12

***Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item:

CE: Conducted Emission
RE: Radiated Emission
FT: Frequency Tolerance
BW: Bandwidth