

RADIO TEST REPORT

Test Report No. 15937422H-R1

Customer	ART Finex Co.,Ltd.
Description of EUT	RFID reader/writer
Model Number of EUT	HXP200/3445-USB-S
FCC ID	2AM8PHXP2-3445US
Test Regulation	FCC Part 15 Subpart C
Test Result	Complied
Issue Date	October 27, 2025
Remarks	-

Representative test engineerTakumi Nishida
Engineer**Approved by**Satofumi Matsuyama
Engineer

CERTIFICATE 5107.02

- ☐ 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# 24.0

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REVISION HISTORY

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15937422H	September 19, 2025	-
1	15937422H-R1	October 27, 2025	Correction of erroneous description of Test Date in Clause 2.1. From "August 8 to September 9, 2025" To "August 18 to September 9, 2025"
1	15937422H-R1	October 27, 2025	Addition of the note * in Clause 4.1.

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

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SECTION 1: Customer Information

Company Name	ART Finex Co.,Ltd.
Address	6-1-33, Kamikobatacho, Sabae-shi, Fukui, 916-0037, Japan
Telephone Number	+81-778-54-8085
Contact Person	Toshikazu Kamei

The information provided by 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

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	RFID reader/writer
Model Number	HXP200/3445-USB-S
Serial Number	Refer to SECTION 4.2
Condition	Production model
Modification	No Modification by the test lab
Receipt Date	August 8 and 29, 2025
Test Date	August 18 to September 9, 2025

2.2 Product Description

General Specification

Rating	DC 5 V
Operating Temperature	-20 deg. C to 75 deg. C

Radio Specification

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

SECTION 3: Test Summary

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.

3.2 Reference Standards

ANSI/USEMCSC C63.2-2023
ANSI C63.4-2014+C63.4a-2017
ANSI C63.5-2017
ANSI C63.10-2020
ANSI/USEMCSC C63.10/Cor 1-2023
ANSI/USEMCSC C63.10a-2024 (incl. Errata) for ISED
ANSI C63.25.1-2018

3.3 Summary of Test Results

Item	Specification	Results	Remarks
Conducted Emission	<FCC> Section 15.207 ----- <ISED> RSS-Gen 8.8	Complied	-
Electric Field Strength of Fundamental Emission	<FCC> Section 15.225(a) ----- <ISED> RSS-210 B.6 (a)	Complied	Radiated
Spectrum Mask	<FCC> Section 15.225(b)(c) ----- <ISED> RSS-210 B.6 (a)	Complied	Radiated
20 dB Bandwidth	<FCC> Section15.215(c) ----- <ISED> -	Complied	Radiated
Electric Field Strength of Spurious Emission	<FCC> Section 15.209, Section 15.225 (d) ----- <ISED> RSS-210 B.6 (a) RSS-Gen 8.9	Complied	Radiated
Frequency Tolerance	<FCC> Section 15.225(e) ----- <ISED> RSS-210 B.6 (b)	Complied	Radiated

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.

FCC Part 15.31 (e)

The RF Module has its own regulator.

The RF Module is constantly provided with voltage through the regulator regardless of input voltage.

Therefore, this 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

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.4 Addition to standard

Item	Test Procedure	Results	Remarks
99% emission bandwidth	<ISED>RSS-Gen 6.7	-	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.

3.5 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

Item	Frequency range	Unit	Calculated Uncertainty (+/-)
AMN (LISN)	0.15 MHz to 30 MHz	dB	3.3

Radiated emission

Measurement distance	Frequency range		Unit	Calculated Uncertainty (+/-)
3 m	9 kHz to 30 MHz		dB	3.3
10 m			dB	3.1
3 m	30 MHz to 200 MHz	Horizontal	dB	5.0
		Vertical	dB	5.0
	200 MHz to 1000 MHz	Horizontal	dB	5.2
		Vertical	dB	6.2
10 m	30 MHz to 200 MHz	Horizontal	dB	5.5
		Vertical	dB	5.4
	200 MHz to 1000 MHz	Horizontal	dB	5.5
		Vertical	dB	5.5

-20 dB Bandwidth and 99% Occupied Bandwidth, Frequency Tolerance

Item	Unit	Calculated Uncertainty (+/-)
Bandwidth (OBW)	%	0.96
Frequency Readout (Frequency counter)	ppm	0.67
Frequency Readout (Spectrum analyzer frequency readout function)	ppm	2.13

3.6 Test Location

UL Japan, Inc. Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan

Telephone: +81-596-24-8999

*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber (SAC1)	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber (SAC2)	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber (SAC3)	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room (PR3)	3 m
No.3 shielded room (SR3)	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber (SAC4)	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room (PR4)	3 m
No.4 shielded room (SR4)	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber (SAC5)	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room (MR5)	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room (SR6)	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room (MR6)	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room (SR7)	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room (MR8)	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room (MR9)	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room (SR10)	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room (MR11)	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room (MR12)	2.6 x 3.4 x 2.5	N/A	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

* Size of vertical conducting plane (for Conducted Emission test): 2.0 x 2.0 m for No.1, No.2, No.3, No.4, and No.5 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.7 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)* - Type A - FeliCa - ISO/IEC15693 - ISO1800-3M3 - CW	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; Software: ASI Protocol RW Operation Program Version: 3.05.26 (Date: 2025.08 19, Storage location: Driven by connected PC) *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. *After the comparison of four tags in pre-check, the test was performed with the Type A as representative, which had the worst result.

Test Item	Operating mode
Conducted Emission	Tx Mod on, without Tag ^{*1)} Tx Mod on, 50 ohm terminated ^{*2)}
Electric Field Strength of Fundamental Emission	Tx Mod on, without Tag ^{*1)}
Spectrum Mask	Tx Mod on, without Tag ^{*1)}
20 dB Bandwidth and 99 % Occupied Bandwidth	Tx Mod on, with Tag / without Tag
Electric Field Strength of Spurious Emission	Tx Mod on, without Tag ^{*1)}
Frequency Tolerance	Tx CW without Tag ^{*1)}

*1) This EUT has two modes which Tag is attached to the EUT or not.

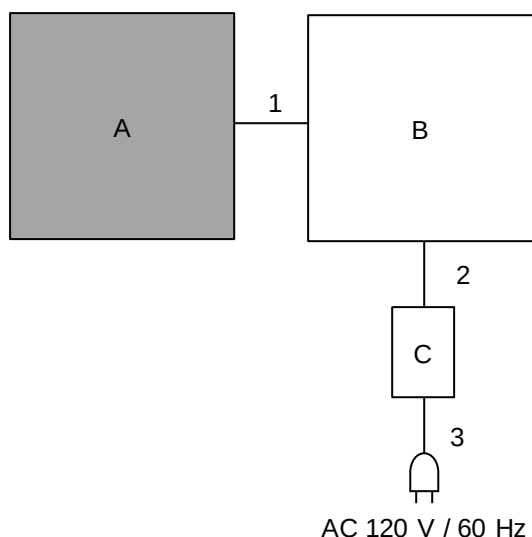
The worst case was confirmed with and without Tag. The test was performed with worst case.

*2) 50 ohm termination was installed instead of the antenna.

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

Conducted Emission



* 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	RFID reader/writer	HXP200/3445-USB-S	7E94SE1-1 *1) 7E94SE1-2 *2)	ART Finex Co.,Ltd.	EUT
B	Laptop PC	PR63PBAA337AD7X	6F053913H	TOSHIBA	-
C	AC Adapter	PA51770-1ACA	FX10800NSKACC	TOSHIBA	-

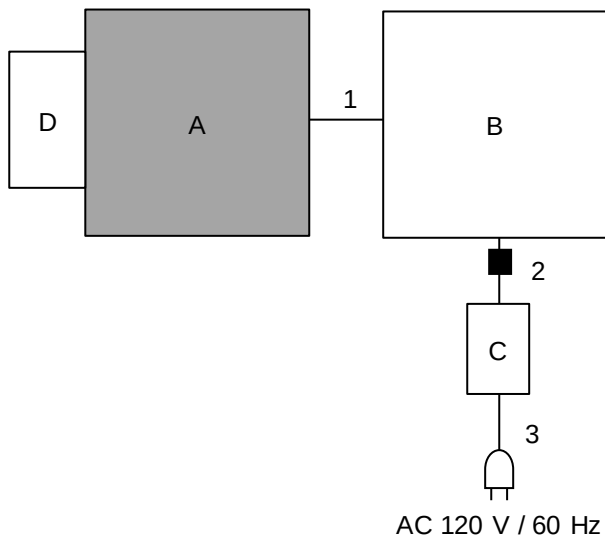
*1) Used for Normal EUT

*2) Used for 50 ohm terminated EUT

List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	DC Cable	1.7	Unshielded	Unshielded	-
3	AC Cable	0.8	Unshielded	Unshielded	-

Radiated Emission



■ : Standard Ferrite Core

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

Description of EUT and Support Equipment

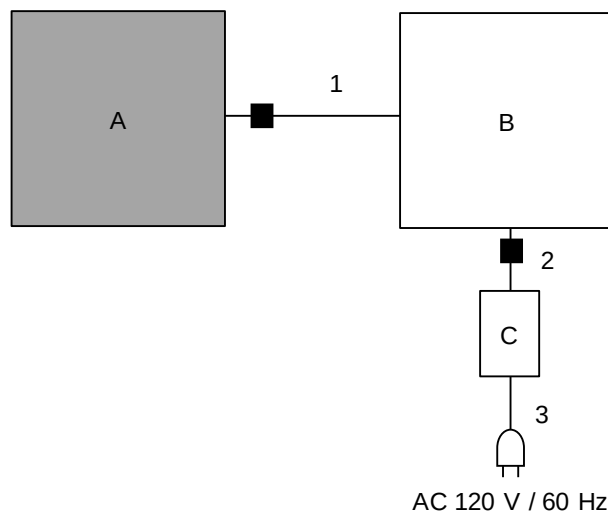
No.	Item	Model number	Serial Number	Manufacturer	Remark
A	RFID reader/writer	HXP200/3445-USB-S	7E94SE1	ART Finex Co.,Ltd.	EUT
B	Laptop PC	CF-MX4	5FKSA17992	Panasonic	-
C	AC Adapter	CF-AA62J2C	62J2CM2152251438SB	Panasonic	-
D	Tag	-	-	-	*1)

*1) Type A, FeliCa, ISO/IEC15693, ISO18000-3M3

List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	DC Cable	1.6	Unshielded	Unshielded	-
3	AC Cable	1.5	Unshielded	Unshielded	-

Frequency Tolerance



* 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	RFID reader/writer	HXP200/3445-USB-S	7E94SE1	ART Finex Co.,Ltd.	EUT
B	Laptop PC	CF-MX4	5FKSA17992	Panasonic	-
C	AC Adapter	CF-AA62J2C	62J2CM2152251438SB	Panasonic	-

List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	DC Cable	1.6	Unshielded	Unshielded	-
3	AC Cable	1.5	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on the platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of the platform was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of the platform. All other surfaces of the platform 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.

For the tests on EUT with other peripherals (as a whole system)

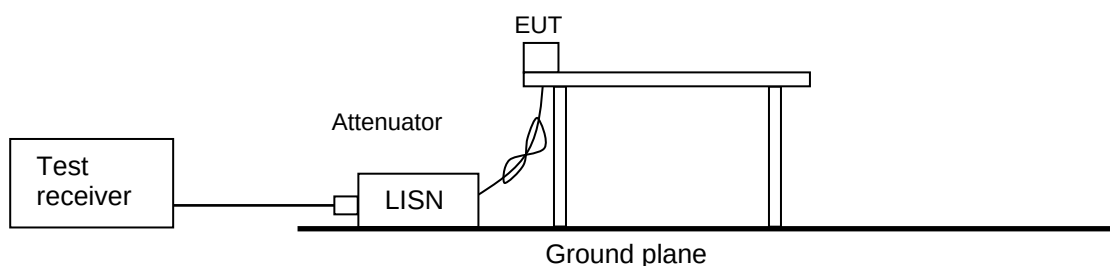
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

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 the platform of nominal size, 1.0 m by 1.5 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 Ohms. 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 200 MHz	200 MHz to 1 GHz
Antenna Type	Loop	Biconical	Logperiodic

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: $40 \times \log (3 \text{ m} / 300 \text{ m}) = -80 \text{ dB}$

*2) Distance Factor: $40 \times \log (3 \text{ m} / 30 \text{ m}) = -40 \text{ dB}$

Figure 2: Test Setup

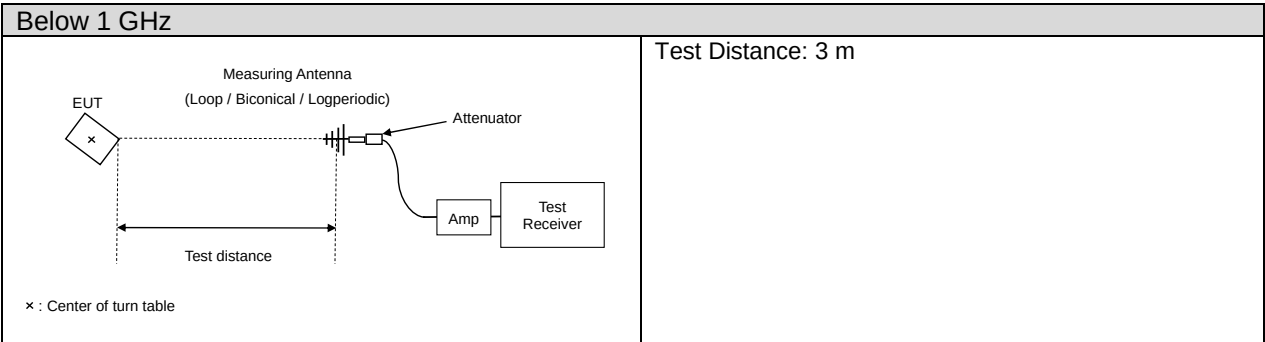
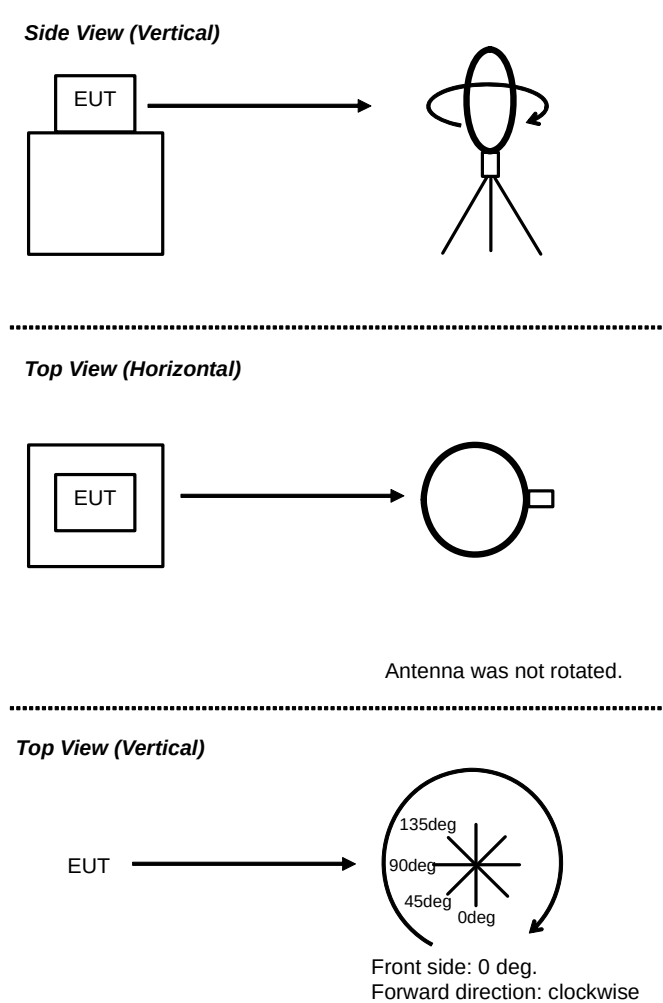


Figure 3: Direction of the Loop Antenna



- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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 tests

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth	Between 1.5 times and 5.0 times of the OBW	1 to 5 % of OBW	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer
Frequency Tolerance	-	-	-	-	-	-	Frequency counter
*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement.							

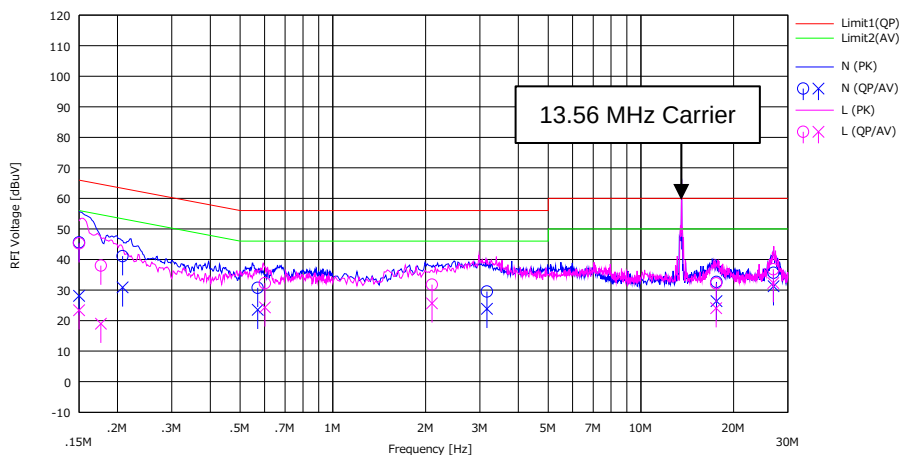
Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

Mode	Mode 1 Type A without Tag			
Date	Test site	Temperature	Humidity	Engineer
September 4, 2025	SAC3	23 deg. C	70 % RH	Nachi Konegawa

Limit : FCC_Part 15 Subpart C(15.207)



No.	Freq. [MHz]	Reading		USN	LOSS	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]			<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	32.50	15.00	0.05	13.04	45.59	28.09	66.00	56.00	20.41	27.91	N	
2	0.20770	28.00	17.80	0.05	13.05	41.10	30.90	63.30	53.30	22.20	22.40	N	
3	0.57020	17.60	10.40	0.05	13.09	30.74	23.54	56.00	46.00	25.26	22.46	N	
4	3.16312	16.20	10.50	0.09	13.26	29.55	23.85	56.00	46.00	26.45	22.15	N	
5	17.58600	18.60	12.30	0.36	13.69	32.65	26.35	60.00	50.00	27.35	23.65	N	
6	26.95500	21.20	16.80	0.56	13.88	35.64	31.24	60.00	50.00	24.36	18.76	N	
7	0.15000	32.20	10.30	0.05	13.04	45.29	23.39	66.00	56.00	20.71	32.61	L	
8	0.17670	24.90	5.90	0.05	13.05	38.00	19.00	64.64	54.64	26.64	35.64	L	
9	0.60180	19.10	11.20	0.05	13.09	32.24	24.34	56.00	46.00	23.76	21.66	L	
10	2.09810	18.50	12.40	0.07	13.20	31.77	25.67	56.00	46.00	24.23	20.33	L	
11	17.55400	18.10	10.00	0.39	13.69	32.18	24.08	60.00	50.00	27.82	25.92	L	
12	26.91630	22.30	17.80	0.61	13.88	36.79	32.29	60.00	50.00	23.21	17.71	L	

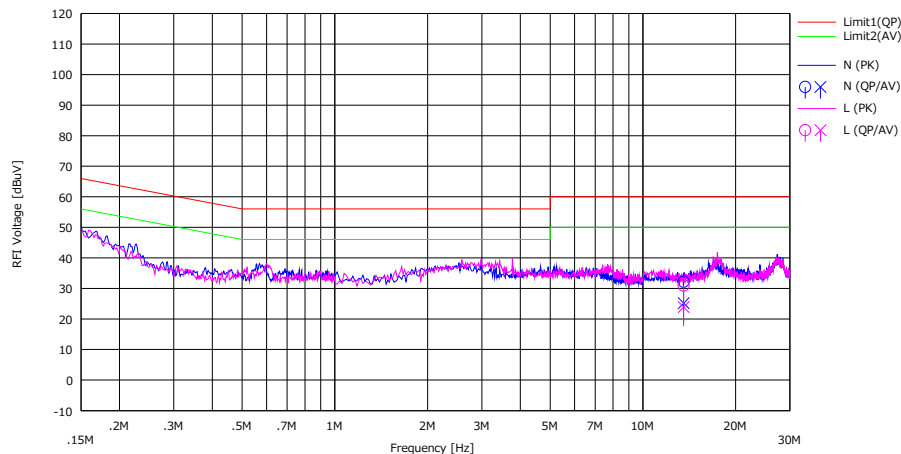
CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

Conducted Emission

Mode	Mode 1 Type A without Tag (50 ohm terminated)			
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Date	Test site	Temperature	Humidity	Engineer
September 4, 2025	SAC3	23 deg. C	70 % RH	Nachi Konegawa

Limit : FCC_Part 15 Subpart C(15.207)



No.	Freq. [MHz]	Reading		LISN [dB]	LOSS [dB]	Results		Limit		Margin		Phase	Comment
		[dBuV]	[dBuV]			[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	13.56000	18.30	11.30	0.32	13.59	32.21	25.21	60.00	50.00	27.79	24.79	N	
2	13.56000	17.00	10.00	0.33	13.59	30.92	23.92	60.00	50.00	29.08	26.08	L	

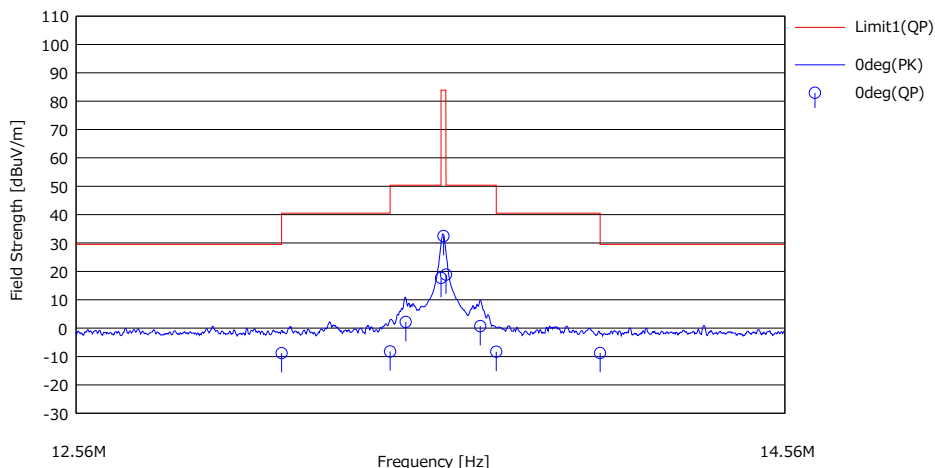
CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

Fundamental Emission and Spectrum Mask

Mode	Mode 1 Type A without Tag
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Date	Test site	Temperature	Humidity	Engineer
August 18, 2025	SAC2	22 deg. C	57 % RH	Takumi Nishida

Limit : FCC15.225(a), 9-90kHz:PK, 110-490kHz:PK, other:QP



No.	Freq. [MHz]	Reading [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]	Table	Comment
1	13.11000	35.90	20.27	-32.85	32.13	-8.81	29.50	38.31	Odeg	0	
2	13.41000	36.40	20.30	-32.83	32.13	-8.26	40.50	48.76	Odeg	0	
3	13.45378	46.80	20.30	-32.83	32.13	2.14	50.40	48.26	Odeg	0	
4	13.55300	62.30	20.31	-32.83	32.13	17.65	50.40	32.75	Odeg	0	
5	13.56000	77.10	20.31	-32.83	32.13	32.45	83.90	51.45	Odeg	0	
6	13.56700	63.50	20.31	-32.83	32.13	18.85	50.40	31.55	Odeg	0	
7	13.66440	45.32	20.32	-32.82	32.13	0.69	50.40	49.71	Odeg	0	
8	13.71000	36.30	20.32	-32.82	32.13	-8.33	40.50	48.83	Odeg	0	
9	14.01000	35.80	20.35	-32.80	32.13	-8.78	29.50	38.28	Odeg	0	

RESULT = READING + ANT FACTOR + LOSS (CABLE + Attenuator + Distance Factor*) - GAIN(AMP)

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

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
0	13.56000	QP	77.10	20.31	7.17	32.13	-	72.45	-	-	Fundamental

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

Spurious Emission

Mode	Mode 1 Type A without Tag
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Date	Test site	Temperature	Humidity	Engineer	Measurement Range
August 18, 2025	SAC2	22 deg. C	57 % RH	Takumi Nishida	Below 30 MHz
September 4, 2025	SAC3	23 deg. C	70 % RH	Nachi Konegawa	Above 30 MHz

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	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
0deg	27.120	QP	34.10	20.96	-32.33	32.11	-	-9.38	29.5	38.88	
Hori.	52.220	QP	32.20	9.66	7.30	32.19	-	16.97	40.0	23.03	
Hori.	71.920	QP	37.40	8.97	7.58	32.16	-	21.79	40.0	18.21	
Hori.	132.040	QP	30.20	11.36	8.26	32.11	-	17.71	43.5	25.81	
Hori.	216.960	QP	23.40	11.19	9.03	32.04	-	11.58	46.0	34.44	
Hori.	244.034	QP	34.40	11.88	9.25	32.02	-	23.51	46.0	22.51	
Hori.	515.472	QP	28.70	17.79	11.05	32.03	-	25.51	46.0	20.51	
Hori.	542.400	QP	30.10	17.85	11.20	32.03	-	27.12	46.0	18.90	
Vert.	52.220	QP	50.70	9.66	7.30	32.19	-	35.47	40.0	4.53	
Vert.	71.920	QP	42.80	8.97	7.58	32.16	-	27.19	40.0	12.81	
Vert.	132.040	QP	43.50	11.36	8.26	32.11	-	31.01	43.5	12.51	
Vert.	216.960	QP	37.70	11.19	9.03	32.04	-	25.88	46.0	20.14	
Vert.	244.034	QP	41.80	11.88	9.25	32.02	-	30.91	46.0	15.11	
Vert.	515.472	QP	29.70	17.79	11.05	32.03	-	26.5	46.0	19.5	
Vert.	542.400	QP	34.00	17.85	11.20	32.03	-	31.0	46.0	15.0	

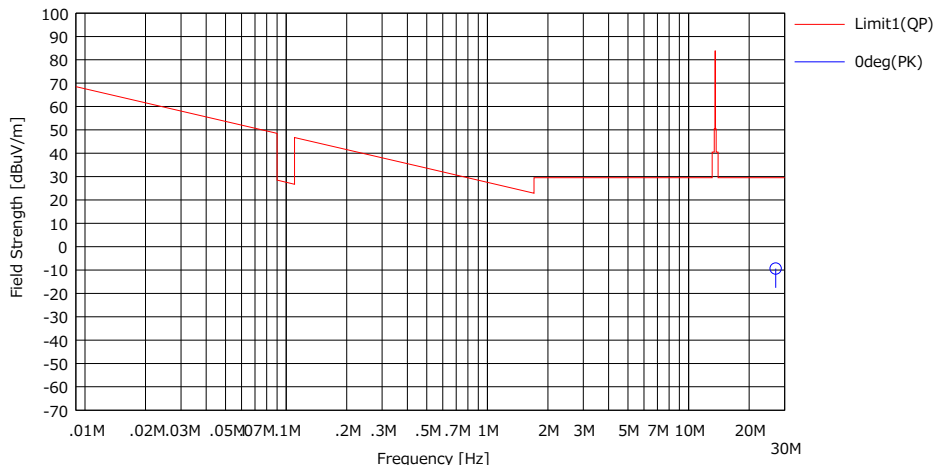
Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amplifier)

Radiated Spurious Emission (Plot data, Worst case for Spurious Emission)

Mode	Mode 1 Type A without Tag				
Date	Test site	Temperature	Humidity	Engineer	Measurement Range
August 18, 2025	SAC2	22 deg. C	57 % RH	Takumi Nishida	Below 30 MHz
September 4, 2025	SAC3	23 deg. C	70 % RH	Nachi Konegawa	Above 30 MHz

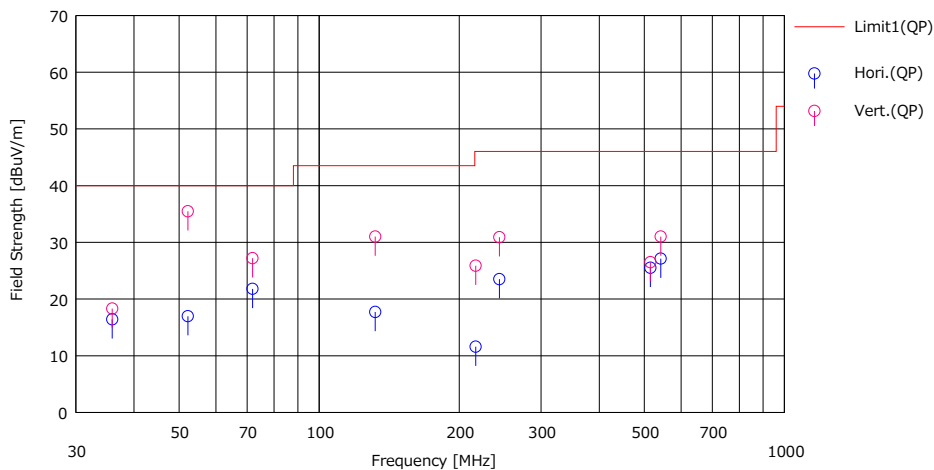
(below 30 MHz)

Limit : FCC15.209(a), 9-90kHz:PK, 110-490kHz:PK, other:QP



* Data above 490 kHz were measured using a QP detector.

(above 30 MHz)

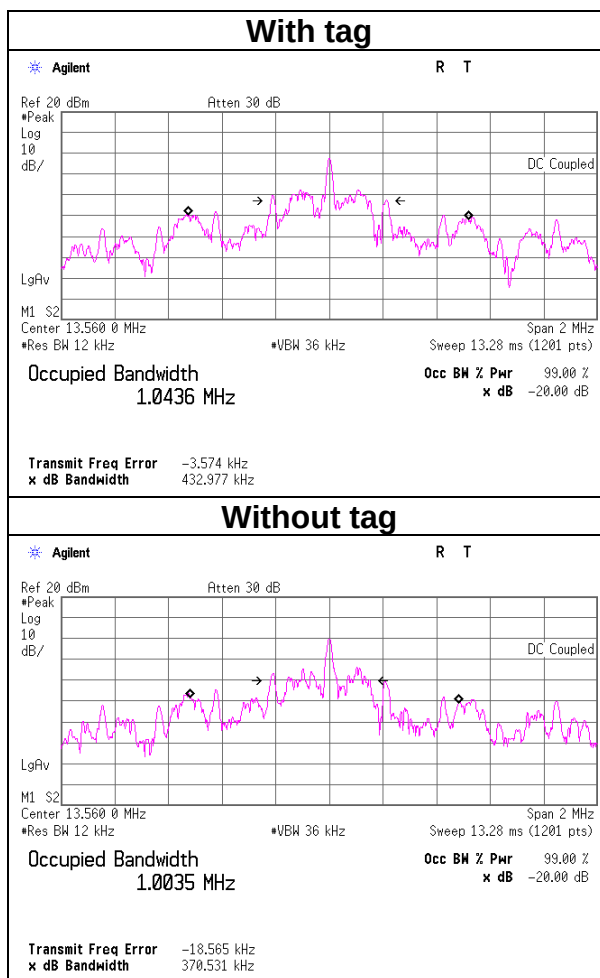


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

20 dB Bandwidth and 99% Occupied Bandwidth

Mode	Mode 1 Type A			
Date	Test site	Temperature	Humidity	Engineer
September 9, 2025	MR6	24 deg. C	53 % RH	Tetsuro Yoshida

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	With Tag	432.977	1043.6000
	Without Tag	370.531	1003.5000



Frequency Tolerance

Mode	Mode1 CW			
Date	Test site	Temperature	Humidity	Engineer
September 9, 2025	MR6	24 deg. C	53 % RH	Tetsuro Yoshida

Test condition Temp. [deg. C]	Voltage [V]	Tested timing	Measured frequency [MHz]	Frequency error [MHz]	Result		Limit [+/- %]
					[%]	[ppm]	
50	5	Power on	13.560146	0.000146	0.00108	10.8	0.01
		+ 2 min.	13.560153	0.000153	0.00113	11.3	0.01
		+ 5 min.	13.560157	0.000157	0.00116	11.6	0.01
		+ 10 min.	13.560160	0.000160	0.00118	11.8	0.01
40	5	Power on	13.560148	0.000148	0.00109	10.9	0.01
		+ 2 min.	13.560145	0.000145	0.00107	10.7	0.01
		+ 5 min.	13.560145	0.000145	0.00107	10.7	0.01
		+ 10 min.	13.560146	0.000146	0.00108	10.8	0.01
30	5	Power on	13.560130	0.000130	0.00096	9.6	0.01
		+ 2 min.	13.560158	0.000158	0.00117	11.7	0.01
		+ 5 min.	13.560157	0.000157	0.00116	11.6	0.01
		+ 10 min.	13.560159	0.000159	0.00117	11.7	0.01
20	5	Power on	13.560180	0.000180	0.00133	13.3	0.01
		+ 2 min.	13.560167	0.000167	0.00123	12.3	0.01
		+ 5 min.	13.560163	0.000163	0.00120	12.0	0.01
		+ 10 min.	13.560163	0.000163	0.00120	12.0	0.01
20	4.25 (5V -15%)	Power on	13.560165	0.000165	0.00122	12.2	0.01
		+ 2 min.	13.560167	0.000167	0.00123	12.3	0.01
		+ 5 min.	13.560168	0.000168	0.00124	12.4	0.01
		+ 10 min.	13.560169	0.000169	0.00125	12.5	0.01
20	5.75 (5V +15%)	Power on	13.560181	0.000181	0.00133	13.3	0.01
		+ 2 min.	13.560164	0.000164	0.00121	12.1	0.01
		+ 5 min.	13.560160	0.000160	0.00118	11.8	0.01
		+ 10 min.	13.560159	0.000159	0.00117	11.7	0.01
10	5	Power on	13.560194	0.000194	0.00143	14.3	0.01
		+ 2 min.	13.560180	0.000180	0.00133	13.3	0.01
		+ 5 min.	13.560178	0.000178	0.00131	13.1	0.01
		+ 10 min.	13.560177	0.000177	0.00131	13.1	0.01
0	5	Power on	13.560202	0.000202	0.00149	14.9	0.01
		+ 2 min.	13.560192	0.000192	0.00142	14.2	0.01
		+ 5 min.	13.560195	0.000195	0.00144	14.4	0.01
		+ 10 min.	13.560194	0.000194	0.00143	14.3	0.01
-10	5	Power on	13.560186	0.000186	0.00137	13.7	0.01
		+ 2 min.	13.560200	0.000200	0.00147	14.7	0.01
		+ 5 min.	13.560201	0.000201	0.00148	14.8	0.01
		+ 10 min.	13.560199	0.000199	0.00147	14.7	0.01
-20	5	Power on	13.560139	0.000139	0.00103	10.3	0.01
		+ 2 min.	13.560192	0.000192	0.00142	14.2	0.01
		+ 5 min.	13.560196	0.000196	0.00145	14.5	0.01
		+ 10 min.	13.560198	0.000198	0.00146	14.6	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)

*The test was begun from 50 deg. C and the temperature was lowered each 10 deg. C.

APPENDIX 2: Test instruments

Test Equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	141216	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W/SFM14/ suciform141-PE/ 421-010/ RFM-E321(SW)	-/00640	07/04/2025	12
CE	141290	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	12/10/2024	12
CE	141532	DIGITAL HiTESTER	HIOKI E. E. CORPORATION	3805	051201197	01/16/2025	12
CE	141537	LISN(AMN)	Schwarzbeck Mess- Elektronik OHG	NSLK8127	8127-731	07/04/2025	12
CE	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	06/30/2025	12
CE	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	07/09/2025	24
CE	142183	Measure	KOMELON	KMC-36	-	10/21/2024	12
CE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
CE	244709	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202103	01/19/2025	12
RE	141267	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess- Elektronik OHG	VUSLP9111B	9111B-192	09/18/2024	12
RE	141323	Coaxial cable	UL-ISE	-	-	09/08/2025	12
RE	141532	DIGITAL HiTESTER	HIOKI E. E. CORPORATION	3805	051201197	01/16/2025	12
RE	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/14/2025	12
RE	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	06/30/2025	12
RE	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	07/09/2025	24
RE	142183	Measure	KOMELON	KMC-36	-	10/21/2024	12
RE	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	06/24/2025	12
RE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	197990	Biconical Antenna	Schwarzbeck Mess- Elektronik OHG	VHBB 9124 + BBA 9106	01365	11/18/2024	12
RE	244709	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202103	01/19/2025	12
FT	141429	Temperature and Humidity Chamber	Espec	PL-2KP	14015723	08/28/2025	12
FT	141498	Microwave Counter	ADVANTEST	R5373	120100309	07/22/2025	12
FT	141558	Digital Tester(TRUE RMS MULTIMETER)	Fluke Corporation	115	17930030	05/13/2025	12
FT	141903	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186390	01/30/2025	12
FT	202512	Loop Antenna	UL-ISE	-	-	-	-
FT	244712	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202106	01/19/2025	12
AT	141558	Digital Tester(TRUE RMS MULTIMETER)	Fluke Corporation	115	17930030	05/13/2025	12
AT	141903	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186390	01/30/2025	12
AT	202512	Loop Antenna	UL-ISE	-	-	-	-
AT	244712	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202106	01/19/2025	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 test,
AT: Antenna Terminal Conducted test,

RE: Radiated Emission test
FT: Frequency Tolerance test