

RADIO TEST REPORT

Test Report No. 15681446H-A-R1

Customer	SINFONIA TECHNOLOGY CO., LTD.
Description of EUT	Digital Photo Printer
Model Number of EUT	CS360
FCC ID	ZQU-D1151150
Test Regulation	FCC Part 15 Subpart C
Test Result	Complied
Issue Date	July 1, 2025
Remarks	-

Representative test engineer

Junki Nagatomi
Engineer

Approved by

Satofumi Matsuyama
Engineer

CERTIFICATE 5107.02

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REVISION HISTORY

Original Test Report No. 15681446H-A

This report is a revised version of 15681446H-A. 15681446H-A is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15681446H-A	April 8, 2025	-
1	15681446H-A-R1	July 1, 2025	Section 2.2 Product Description General Specification -Modified item name. Operating Temperature → Clock frequency (ies) in the system Section 3.3 Summary of Test Result -Modified worst margin for Electric Field Strength of Spurious Emission. 12.74 dB 269.920 MHz, Horizontal, QP → 3.92 dB 38.637 MHz, Vertical, QP SECTION 6: Radiated Emission (Fundamental, Spurious Emission and Spectrum Mask) -Modified size of table. 0.5 m by 1.0 m → 1.0 m by 1.5 m Appendix 2 Spurious Emission -Added data of vertical 38.637MHz.

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	Comité International Special des Perturbations Radioélectriques	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	SINFONIA TECHNOLOGY CO., LTD.
Address	100-Takegahana-cho, Ise-shi, Mie-ken 516-8550 Japan
Telephone Number	+81-596-36-1286
Contact Person	Tomoaki Ueda

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	Digital Photo Printer
Model Number	CS360
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	February 20, 2025
Test Date	March 12 to 16, 2025

2.2 Product Description

General Specification

Rating	AC 100 V to 240 V, 50 / 60 Hz
Clock frequency (ies) in the system	External: 24 MHz, CPU: Internal 300 MHz, SDRAM: 500 MHz, FPGA: 60 MHz / 50 MHz, USB: Maximum 480 MHz

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.

* Also the EUT complies with FCC Part 15 Subpart B.

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 C63.25.1-2018
RSS-Gen Issue 5/Amendment 1/Amendment 2 for ISED

3.3 Summary of Test Result

Item	Specification	Worst margin	Results	Remarks
Conducted Emission	<FCC> Section 15.207 <ISED> RSS-Gen 8.8	7.59 dB, 0.73414 MHz, QP, N	Complied	-
Electric Field Strength of Fundamental Emission	<FCC> Section 15.225(a) <ISED> RSS-210 B.6 (a)	89.30 dB, 13.56000 MHz, QP, 45 deg. (with Tag)	Complied	Radiated
Spectrum Mask	<FCC> Section 15.225(b)(c) <ISED> RSS-210 B.6 (a)	38.55 dB, 14.01000 MHz, QP, 45 deg.	Complied	Radiated
20 dB Bandwidth	<FCC> Section15.215(c) <ISED> -	See data	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	3.92 dB 38.637 MHz, Vertical , QP	Complied	Radiated
Frequency Tolerance	<FCC> Section 15.225(e) <ISED> RSS-210 B.6 (b)	See data	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 stable voltage was supplied by the end product which was required to have a power supply regulator.

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.

3.4 Addition to standard

Item	Specification	Worst margin	Results	Remarks
99% emission bandwidth	-	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.

3.5 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	5.0
		Vertical	5.0
	200 MHz to 1000 MHz	Horizontal	5.2
		Vertical	6.2
10 m	30 MHz to 200 MHz	Horizontal	5.5
		Vertical	5.4
	200 MHz to 1000 MHz	Horizontal	5.5
		Vertical	5.5
3 m	1 GHz to 6 GHz	dB	5.1
	6 GHz to 18 GHz	dB	5.4
1 m	10 GHz to 18 GHz	dB	5.4
	18 GHz to 26.5 GHz	dB	5.3
	26.5 GHz to 40 GHz	dB	4.8
0.5 m	26.5 GHz to 40 GHz	dB	5.0

-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	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	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	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)	The EUT Transmits and Receives at the same time and there is no receiving mode.

*Power of the EUT was set by the software as follows;
Software: gui Version: 1.0.0.0
(Date: 2025.03.07, 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.

Test Item	Operating mode*
Conducted Emission	Tx Mod on, with Tag
Electric Field Strength of Fundamental Emission	Tx Mod on, with Tag
Spectrum Mask	Tx Mod on, with 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
Frequency Tolerance	Tx Mod on, without Tag

* After the comparison of the test data between with Tag and without Tag, the tests were performed with the worst case.

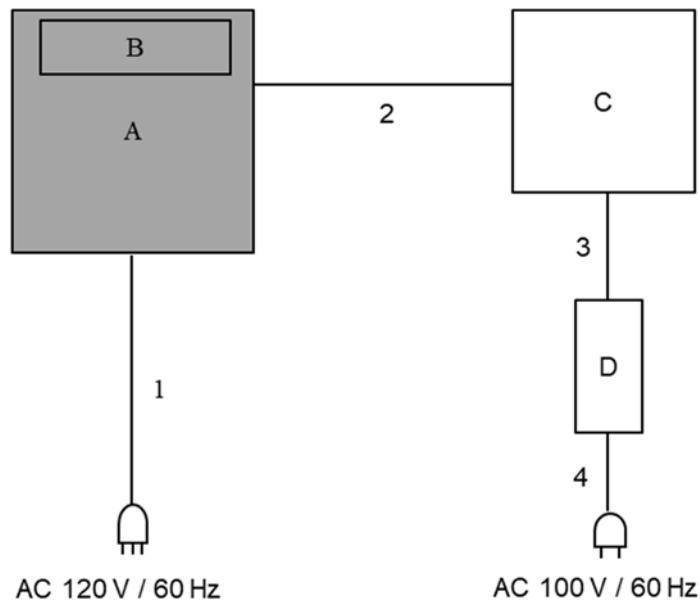
This EUT has two modes which Tag is attached or not. The worst case was confirmed with and without Tag attached, as a result, the test with Tag attached was the worst case. Therefore the test with Tag attached was performed only.

Frequency Tolerance:		
Temperature	+10 deg. C to +35 deg. C Step 10 deg. C *1)	
Voltage	Normal Voltage	AC 120 V
	Maximum Voltage	AC 138 V (AC 120 V +15 %)
	Minimum Voltage	AC 102 V (AC 120 V -15 %)

*This EUT provides stable voltage (DC 3.3 V) constantly to RF Part regardless of input voltage.

*1) Tests were performed within the operating range of the EUT as instructed by the customer.

4.2 Configuration and peripherals



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

*As a result of comparing AC 120 V and AC 240 V at pre-check, conducted emission test was performed with AC 120 V of the worst voltage as representative.

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remark
A	Digital Photo Printer	CS360	EM001	SINFONIA TECHNOLOGY CO., LTD.	EUT
B	Ribbon Tag	RI-I17-112A-03	001	Texas Instruments Incorporated	EUT
C	Laptop PC	PR63PBAA337AD7X	6F053913H	TOSHIBA	-
D	AC Adapter	PA51770-1ACA	FX10800NSKACC	TOSHIBA	-

List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	AC Cable	1.8	Unshielded	Unshielded	-
2	USB Cable	3.0	Shielded	Shielded	-
3	DC Cable	1.7	Unshielded	Unshielded	
4	AC Cable	0.8	Unshielded	Unshielded	

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform 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.

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

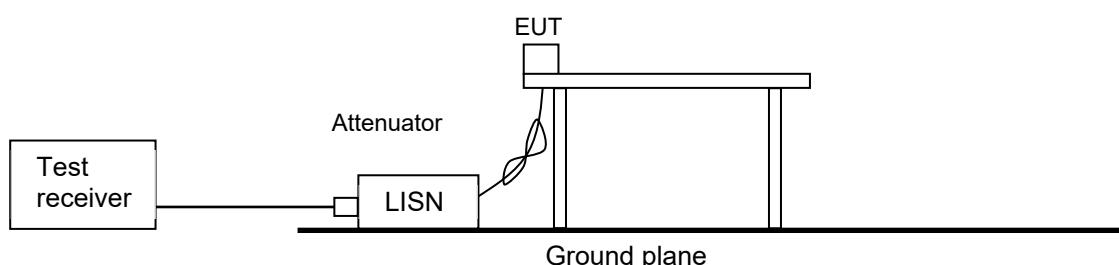
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected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

Below 1 GHz

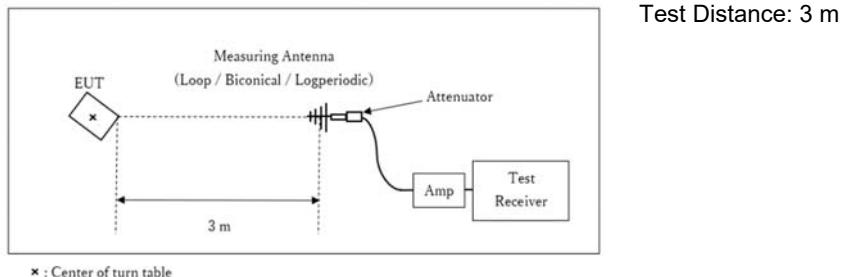
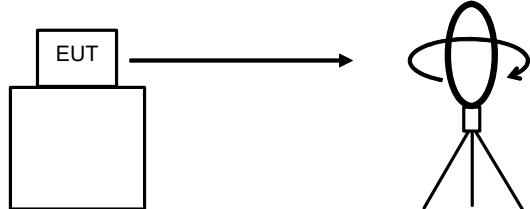


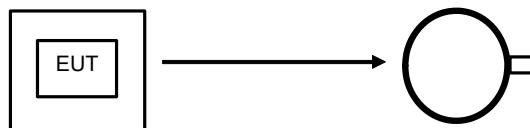
Figure 3: Direction of the Loop Antenna

Side View (Vertical)



.....

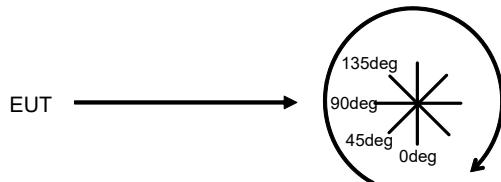
Top View (Horizontal)



.....

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 tests

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	5 MHz	30 kHz	91 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	-	-	-	-	-	-	Spectrum Analyzer *2)

*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.
*2) The measurement was performed with Marker Frequency Counter Function.

Test data : APPENDIX

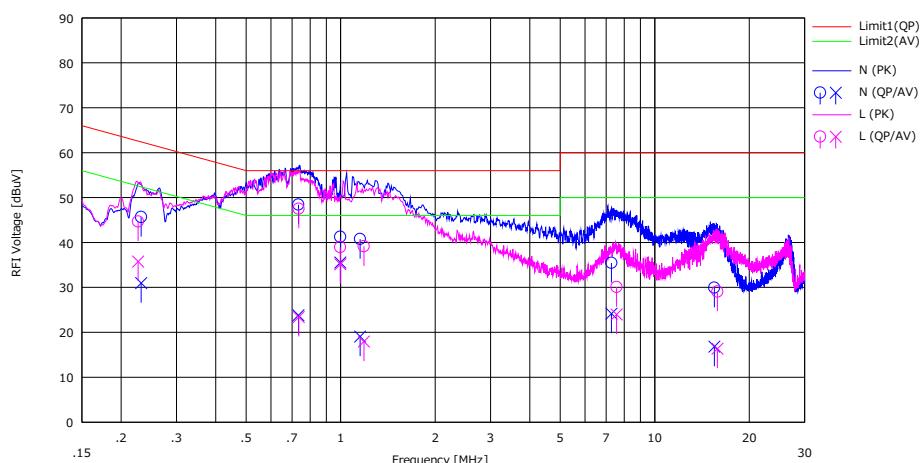
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

Test place Ise EMC Lab.
 Semi Anechoic Chamber No.4
 Date March 16, 2025
 Temperature / Humidity 20 deg. C / 46 % RH
 Engineer Shousei Hamaguchi
 Mode Mode 1

Limit : FCC_Part 15 Subpart C(15.207)



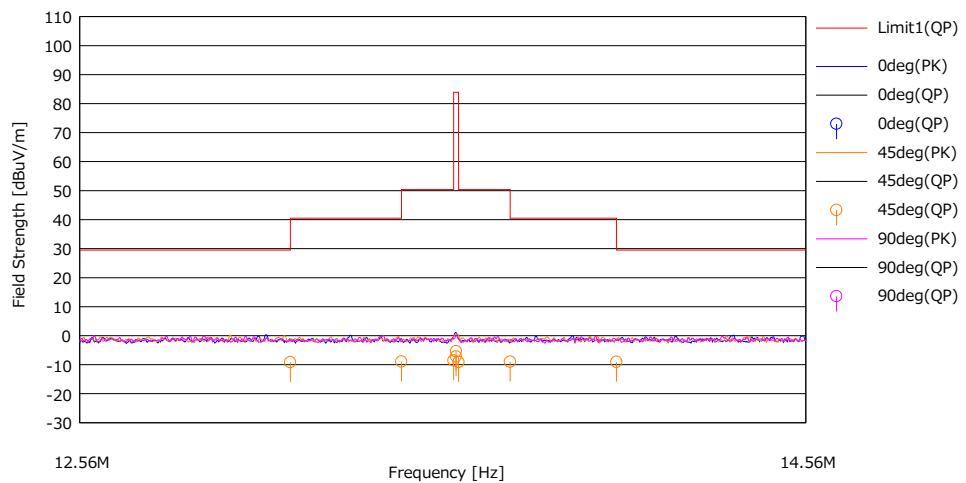
No.	Freq. [MHz]	Reading		LISN [dB]	LOSS [dB]	Results		Limit		Margin		Phase	Comment
		$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]			$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]	$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]	$\langle QP \rangle$ [dB]	$\langle AV \rangle$ [dB]		
1	0.23162	32.40	17.70	0.04	13.22	45.66	30.96	62.39	52.39	16.73	21.43	N	
2	0.73414	35.10	10.50	0.04	13.27	48.41	23.81	56.00	46.00	7.59	22.19	N	
3	0.99762	27.90	22.20	0.04	13.30	41.24	35.54	56.00	46.00	14.76	10.46	N	
4	1.15314	27.40	5.70	0.04	13.31	40.75	19.05	56.00	46.00	15.25	26.95	N	
5	7.28214	21.70	10.40	0.13	13.61	35.44	24.14	60.00	50.00	24.56	25.86	N	
6	15.48335	15.80	2.70	0.28	13.84	29.92	16.82	60.00	50.00	30.08	33.18	N	
7	0.22664	31.40	22.50	0.03	13.22	44.65	35.75	62.57	52.57	17.92	16.82	L	
8	0.73532	34.20	10.10	0.03	13.27	47.50	23.40	56.00	46.00	8.50	22.60	L	
9	0.99725	25.60	21.80	0.04	13.30	38.94	35.14	56.00	46.00	17.06	10.86	L	
10	1.18615	25.80	4.60	0.04	13.31	39.15	17.95	56.00	46.00	16.85	28.05	L	
11	7.56212	16.30	10.20	0.15	13.62	30.07	23.97	60.00	50.00	29.93	26.03	L	
12	15.83909	14.90	2.20	0.30	13.85	29.05	16.35	60.00	50.00	30.95	33.65	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

Test place Ise EMC Lab.
 Semi Anechoic Chamber No.4
 Date March 13, 2025
 Temperature / Humidity 20 deg. C / 40 % RH
 Engineer Takeshi Hiyaji
 Mode Mode 1

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



No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin [dB]	Antenna [deg]	Table [deg]	Comment
1	13.11000	36.10	20.27	-33.39	32.13	-9.15	29.50	38.65	45deg	63	
2	13.41000	36.30	20.30	-33.38	32.13	-8.91	40.50	49.41	45deg	63	
3	13.553300	36.60	20.31	-33.38	32.13	-8.60	50.40	59.00	45deg	63	
4	13.560000	38.00	20.31	-33.38	32.13	-7.20	83.90	91.10	45deg	140	without Tag
5	13.560000	39.80	20.31	-33.38	32.13	-5.40	83.90	89.30	45deg	63	with Tag *
6	13.567000	36.10	20.31	-33.38	32.13	-9.10	50.40	59.50	45deg	63	
7	13.710000	36.20	20.32	-33.37	32.13	-8.98	40.50	49.48	45deg	63	
8	14.010000	36.10	20.35	-33.37	32.13	-9.05	29.50	38.55	45deg	63	

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

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

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
	45	13.56000	QP	39.80	20.31	6.62	32.13	-	34.60	-	-	- Fundamental

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

Spurious Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date March 13, 2025
Temperature / Humidity 20 deg. C / 40 % RH
Engineer Takeshi Hiyaji
Mode Mode 1

PK or QP

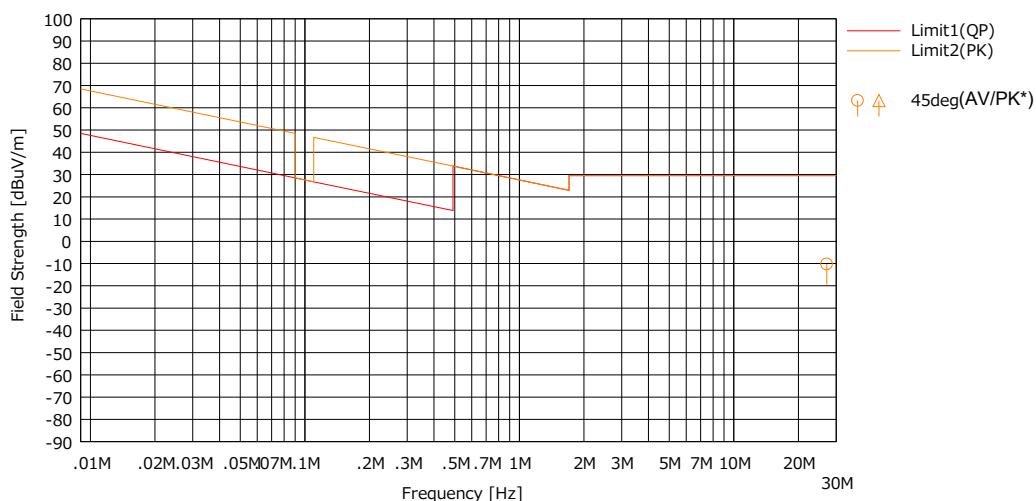
Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
45deg	27.120	QP	34.00	20.96	-33.08	32.12	-	-10.24	29.5	39.74	
Hori.	38.637	QP	29.30	15.24	6.95	32.11	-	19.38	40.0	20.62	
Hori.	64.923	QP	33.10	6.74	7.30	32.09	-	15.05	40.0	24.95	
Hori.	71.418	QP	25.90	6.40	7.38	32.09	-	7.59	40.0	32.41	
Hori.	269.920	QP	43.20	12.93	9.17	32.02	-	33.28	46.0	12.74	
Hori.	374.988	QP	37.10	15.35	9.83	32.08	-	30.20	46.0	15.82	
Hori.	488.983	QP	24.00	17.72	10.44	32.18	-	19.98	46.0	26.04	
Vert.	38.637	QP	46.00	15.24	6.95	32.11	-	36.08	40.0	3.92	
Vert.	64.923	QP	41.40	6.74	7.30	32.09	-	23.35	40.0	16.65	
Vert.	71.418	QP	35.10	6.40	7.38	32.09	-	16.79	40.0	23.21	
Vert.	269.920	QP	36.60	12.93	9.17	32.02	-	26.68	46.0	19.34	
Vert.	374.988	QP	28.40	15.35	9.83	32.08	-	21.50	46.0	24.52	
Vert.	488.983	QP	26.60	17.72	10.44	32.18	-	22.58	46.0	23.44	

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

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

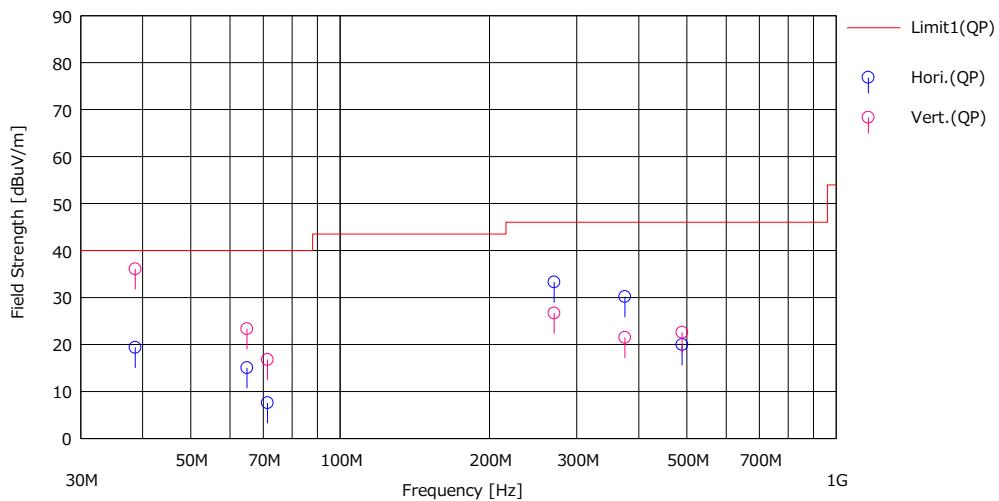
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date March 13, 2025
Temperature / Humidity 20 deg. C / 40 % RH
Engineer Takeshi Hiyaji
Mode Mode 1

(below 30MHz)



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

(above 30MHz)

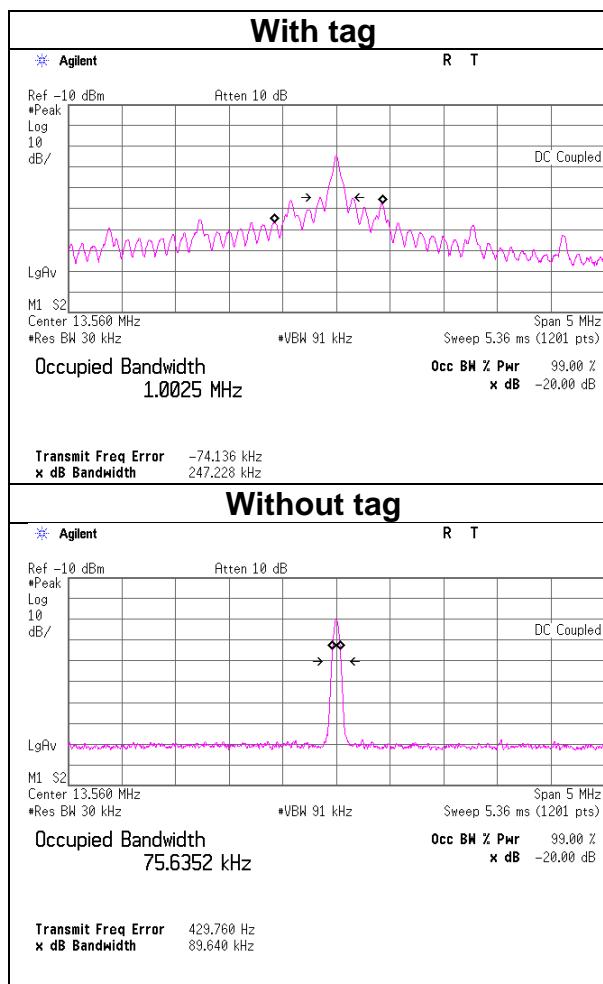


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

20 dB Bandwidth and 99% Occupied Bandwidth

Test place Ise EMC Lab.
No.11 Measuremt Room
Date March 14, 2025
Temperature / Humidity 23 deg. C / 40 % RH
Engineer Junki Nagatomi
Mode Mode 1

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	With Tag	247.228	1002.5
	Without Tag	89.640	75.6352



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 Ise EMC Lab.
Semi Anechoic Chamber No.6
Date March 12, 2025
Temperature / Humidity 24 deg. C / 45 % RH
Engineer Junki Nagatomi
Mode Mode 1

Temp. [deg. C]	Voltage [V]	Tested timing	Measured frequency [MHz]	Frequency error [MHz]	Result		Limit [+/- %]
					[%]	[ppm]	
35	120	Power on	13.559533	-0.000467	-0.00345	-34.5	0.01
		+ 2 min.	13.559527	-0.000473	-0.00349	-34.9	0.01
		+ 5 min.	13.559523	-0.000477	-0.00352	-35.2	0.01
		+ 10 min.	13.559523	-0.000477	-0.00352	-35.2	0.01
30	120	Power on	13.559542	-0.000458	-0.00338	-33.8	0.01
		+ 2 min.	13.559535	-0.000465	-0.00343	-34.3	0.01
		+ 5 min.	13.559531	-0.000469	-0.00346	-34.6	0.01
		+ 10 min.	13.559528	-0.000472	-0.00348	-34.8	0.01
20	120	Power on	13.559536	-0.000464	-0.00343	-34.3	0.01
		+ 2 min.	13.559535	-0.000465	-0.00343	-34.3	0.01
		+ 5 min.	13.559535	-0.000465	-0.00343	-34.3	0.01
		+ 10 min.	13.559535	-0.000465	-0.00343	-34.3	0.01
20	102 (120V -15%)	Power on	13.559536	-0.000464	-0.00342	-34.2	0.01
		+ 2 min.	13.559536	-0.000464	-0.00342	-34.2	0.01
		+ 5 min.	13.559537	-0.000463	-0.00342	-34.2	0.01
		+ 10 min.	13.559536	-0.000464	-0.00342	-34.2	0.01
20	138 (120V +15%)	Power on	13.559536	-0.000464	-0.00342	-34.2	0.01
		+ 2 min.	13.559536	-0.000464	-0.00342	-34.2	0.01
		+ 5 min.	13.559536	-0.000464	-0.00342	-34.2	0.01
		+ 10 min.	13.559536	-0.000464	-0.00342	-34.2	0.01
10	120	Power on	13.559545	-0.000455	-0.00335	-33.5	0.01
		+ 2 min.	13.559549	-0.000451	-0.00333	-33.3	0.01
		+ 5 min.	13.559549	-0.000451	-0.00333	-33.3	0.01
		+ 10 min.	13.559549	-0.000451	-0.00333	-33.3	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 started at 35 deg. C.

The temperature was reduced in 10°C increments starting from 30°C.

*Tests were performed within the operating range of the EUT as instructed by the customer.

APPENDIX 2: Test instruments

Test Equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	141217	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W/SFM141/421-010/sucoform141-PE/RFM-E121(SW)	-/04178	06/14/2024	12
CE	141248	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	12/03/2024	12
CE	141358	LISN(AMN)	Schwarzbeck Mess-Elektronik OHG	NSLK8127	8127-730	07/09/2024	12
CE	141538	LISN(AMN)	Schwarzbeck Mess-Elektronik OHG	NSLK8127	8127-732	07/14/2024	12
CE	141545	DIGITAL HiTESTER	HIOKI E. E. CORPORATION	3805	51201148	02/25/2025	12
CE	141934	Terminator	TME	CT-01BP	-	04/01/2024	12
CE	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	05/17/2024	12
CE	142230	Measure, Tape, Steel	KOMELON	KMC-36	-	-	-
CE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
CE	244710	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202104	01/19/2025	12
FT	141429	Temperature and Humidity Chamber	Espec	PL-2KP	14015723	08/23/2024	12
FT	141558	Digital Tester (TRUE RMS MULTIMETER)	Fluke Corporation	115	17930030	05/17/2024	12
FT	141900	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46185823	11/13/2024	12
FT	142645	Loop Antenna	UL-ISE	-	-	-	-
FT	244712	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202106	01/19/2025	12
RE	141198	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	2513	07/10/2024	12
RE	141217	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W/SFM141/421-010/sucoform141-PE/RFM-E121(SW)	-/04178	06/14/2024	12
RE	141267	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-192	09/18/2024	12
RE	141397	Coaxial Cable	UL-ISE EMC	-	-	11/29/2024	12
RE	141545	DIGITAL HiTESTER	HIOKI E. E. CORPORATION	3805	51201148	02/25/2025	12
RE	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	04/04/2024	12
RE	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	05/17/2024	12
RE	142011	AC4_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	12/13/2023	24
RE	142230	Measure, Tape, Steel	KOMELON	KMC-36	-	-	-
RE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	220646	Attenuator	Huber+Suhner	6806 N-50-1	-	03/06/2025	12
RE	244710	Thermo-Hygrometer	HIOKI E. E. CORPORATION	LR5001	231202104	01/19/2025	12
RE	252514	Active Loop Antenna	Schwarzbeck Mess-Elektronik OHG	FMZB 1519-60 D	1519-60 D-067	09/26/2024	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

FT: Frequency Tolerance

RE: Radiated Emission