



RADIO TEST REPORT

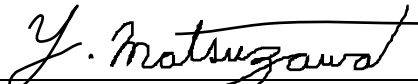
Test Report No. : 13628971S-C-R1

Applicant : Sony Corporation
Type of EUT : Contactless IC Card Reader/Writer
Model Number of EUT : RC-S660/U
FCC ID : AK8RCS660U
Test regulation : FCC Part 15 Subpart C: 2021
Test Result : Complied (Refer to SECTION 3.2)

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
6. This test report covers Radio technical requirements.
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13628971S-C. 13628971S-C is replaced with this report.

Date of test: January 8 to 21, 2021

Representative test engineer:


Yohsuke Matsuzawa
Engineer
Consumer Technology Division

Approved by:


Toyokazu Imamura
Leader
Consumer Technology Division



CERTIFICATE 1266.03

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

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REVISION HISTORY

Original Test Report No.: 13628971S-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13628971S-C	February 1, 2021	-	-
1	13628971S-C-R1	February 3, 2021	P.7	Modification of “FCC Part 15.31 (e)” from: The RF Module has its own regulator. The RF Module is constantly provided voltage through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement. to: The stable voltage was provided to the EUT during the tests. Therefore, this EUT complies with the requirement.
			P.11	Correction of Support equipment Model number of No. G “Laptop PC” from: PCG-XXXX to: VGN-G1
			P.13	Addition of 6.3 Test procedure. “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.”
			P.18	Deletion of Remarks “With Tag typeF (Felica)”

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Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer information

Company Name	:	Sony Global Manufacturing & Operations Corporation
Address	:	8-4, Shiomi Kisarazu-shi, Chiba, 292-0834 Japan.
Telephone Number	:	+81-438-37-4704
Contact Person	:	Youhei Hisano

The information provided from the customer is as follows;

- Applicant, Type 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
 - 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

Type	:	Contactless IC Card Reader/Writer
Model Number	:	RC-S660/U
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 3.3 V $\pm$ 5 %
Receipt Date	:	January 8, 2021
Country of Mass-production	:	Japan
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab.

2.2 Product Description

Model: RC-S660/U (referred to as the EUT in this report) is a Contactless IC Card Reader/Writer.

Clock frequency(ies) in the system (MAX): 27.12 MHz

The EUT has similar model: RC-S632

Radio specification

Equipment type	:	Transceiver
Frequency of operation	:	13.56 MHz
Type of modulation	:	ASK
Antenna type	:	Loop

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on January 12, 2021 and effective February 11, 2021

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.215 Additional provisions to the general radiated emission limitations.
Section 15.225 Operation within the band 13.110-14.010 MHz.

* The revision does not affect the test result conducted before its effective date.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods ----- ISED: RSS-Gen 8.8	FCC: Section 15.207 ----- ISED: RSS-Gen 8.8	3.5 dB, Freq: 0.15280 MHz, Detector: QP Phase: N Mode: Transmitting (13.56 MHz)	Complied a)	-
Electric Field Strength of Fundamental Emission	FCC: ANSI C63.10:2013 6 Standard test methods ----- ISED: RSS-Gen 6.4, 6.12	FCC: Section 15.225(a) ----- ISED: RSS-210 B.6	59.4 dB Polarization: Vertical	Complied b)	Radiated
Spectrum Mask	FCC: ANSI C63.10:2013 6 Standard test methods ----- ISED: RSS-Gen 6.4, 6.13	FCC: Section 15.225(b)(c) ----- ISED: RSS-210 B.6	39.8 dB, Freq: 13.553 MHz, Polarization: Vertical	Complied b)	Radiated
20 dB Bandwidth	FCC: ANSI C63.10:2013 6 Standard test methods ----- ISED: -	FCC: Section 15.215(c) ----- ISED: -	See data	Complied c)	Radiated
Electric Field Strength of Spurious Emission	FCC: ANSI C63.10:2013 6 Standard test methods ----- ISED: RSS-Gen 6.4, 6.13	FCC: Section 15.209, Section 15.225 (d) ----- ISED: RSS-210 B.6	4.0 dB Freq: 339.006 MHz, Polarization: Horizontal	Complied d)	Radiated
Frequency Tolerance	FCC: ANSI C63.10:2013 6 Standard test methods ----- ISED: RSS-Gen 6.11, 8.11	FCC: Section 15.225(e) ----- ISED: RSS-210 B.6	See data	Complied e)	Radiated *1)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

*1) The temperature variation for testing was set to -20 to + 60 deg.C, according to the customer's request.

- a) Refer to APPENDIX 1 (data of Conducted Emission)
- b) Refer to APPENDIX 1 (data of Electric Field Strength of Fundamental Emission)
- c) Refer to APPENDIX 1 (data of 20 dB bandwidth)
- d) Refer to APPENDIX 1 (data of Electric Field Strength of Spurious Emission)
- e) Refer to APPENDIX 1 (data of Frequency Tolerance)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

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FCC Part 15.31 (e)

The stable voltage was provided to the EUT during the tests.
Therefore, this EUT complies with the requirement.

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.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	ISED: RSS-Gen 6.7	ISED: -	N/A	- a)	Conducted

a) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

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

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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4,5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.56dB	2.9 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	2.7 dB	2.7 dB	-
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.0 dB	-
	1 GHz-6 GHz	4.8 dB	4.8 dB	4.8 dB	-
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB	-
	18 GHz-40 GHz	5.3 dB	5.3 dB	5.3 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	1.4 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.6 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.2 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	0.91 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.2 dB
Spurious emission (Conducted) below 1GHz	0.87 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.96 dB
Spurious emission (Conducted) 3 GHz-18 GHz	3.0 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.2 dB
Bandwidth Measurement	0.012 %
Duty cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.95 deg.C.
Humidity_SCH-01	0.83 %
Temperature_SCH-02	2.0 deg.C.
Humidity_SCH-02	6.6 %
Voltage	0.86 %

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3.5 Test Location

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A2LA Certificate Number: 1266.03

(FCC test firm registration number: 839876, ISED lab company number: 2973D / CAB identifier: JP0001)

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-

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 EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test item	Operating mode	Tested frequency
All items except for Frequency tolerance	NFC Communication	13.56 MHz
Frequency tolerance	NFC Communication (Unmodulated)	13.56 MHz

Software: NFCPortPoll_XP.exe Version 0.9.6.0
- Parameter file(Modulated): Type-F_212.bat
(Date: 2021.1.6, Storage location: Driven by connected PC)

Power setting: Fixed

*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.

The carrier level and noise levels were confirmed with and without Tag, and the test was made with the condition that has the maximum noise.

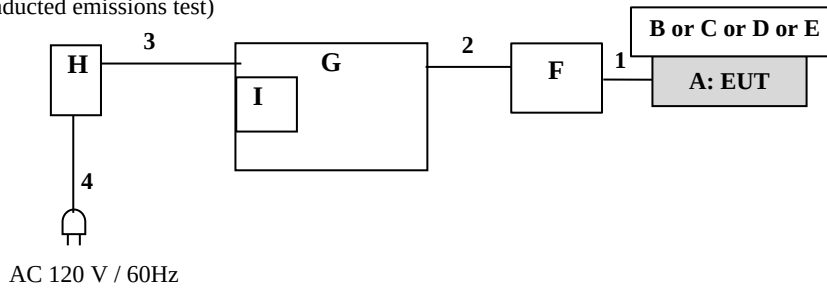
Combinations of the worst case:

Radiated emission (Carrier)	Radiated emission (Below 30MHz)	Radiated emission (Above 30MHz)
With Tag (Type F)	With Tag (Type F)	With Tag (Type F)

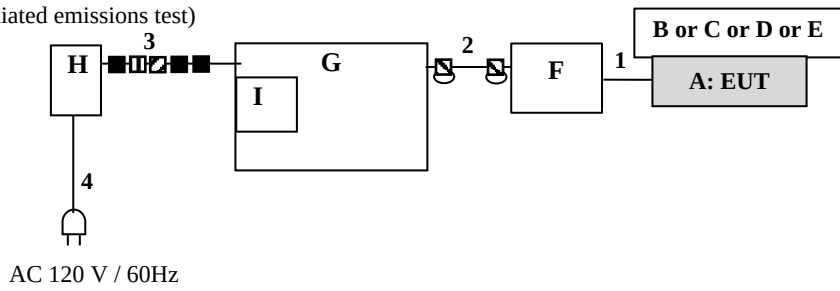
Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

4.2 Configuration and peripherals

(for Conducted emissions test)

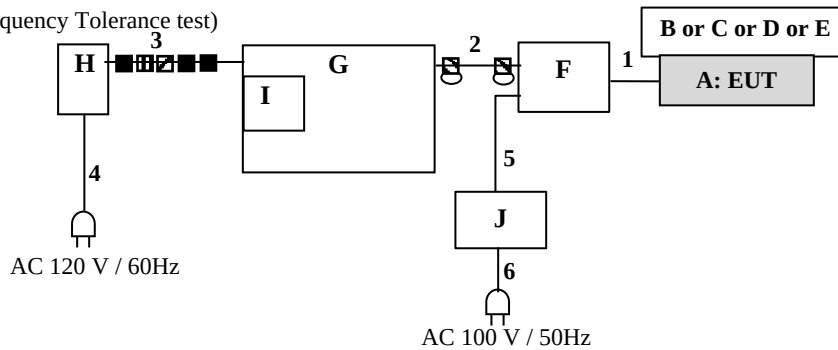


(for Radiated emissions test)



- ☐: Ferrite Core (2 turn)
(ZCAT2035-0930)
- ▤: Ferrite Core (1 turn)
(ZCAT2035-0930)
- ▥: Ferrite Core (1 turn)
(ZCAT1730-0730)
- : Ferrite Core (1 turn)
(ZCAT1325-0530)

(for Frequency Tolerance test)



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

* The ferrite core attached to DC cable is not used to reduce the noise from the EUT. Therefore, that does not affect the emission level of the EUT.

*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	Remarks
A	Contactless IC Card Reader/Writer	RC-S660/U	9999109 9999112 *1)	Sony	EUT
B	IC Card	-	-	-	type-F *2)
C	IC Card	-	-	-	type-A
D	IC Card	-	-	-	type-B
E	IC Card	-	-	-	type-V
F	Relay jig	-	-	Sony	-
G	Laptop PC	VGN-G1	J001YGP3	Sony	-
H	AC Adapter	PCGA-AC16V6	147774951 0795514	Sony	-
I	CF Card	GH-CF1GC	C201G145R1102 10163	GREEN HOUSE	-
J	DC power supply	PW16-5ADP	18026330	TWXIO	-

*1) Used for Conducted emissions test (Antenna terminated)

*2) *RC-S660/U is used with Type-F (FeliCa), Type-A, Type-B, Type V.
IC Card was determined type-F base on the pre-check.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Flexible flat cable	0.07	Unshielded	Unshielded	-
2	USB	0.3	Shielded	Shielded	-
3	DC	1.8	Unshielded	Unshielded	-
4	AC	0.8	Unshielded	Unshielded	-
5	DC	0.07 + 1.2	Unshielded	Unshielded	-
6	AC	0.8	Unshielded	Unshielded	-

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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.

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 via AC adapter in a Semi Anechoic Chamber.

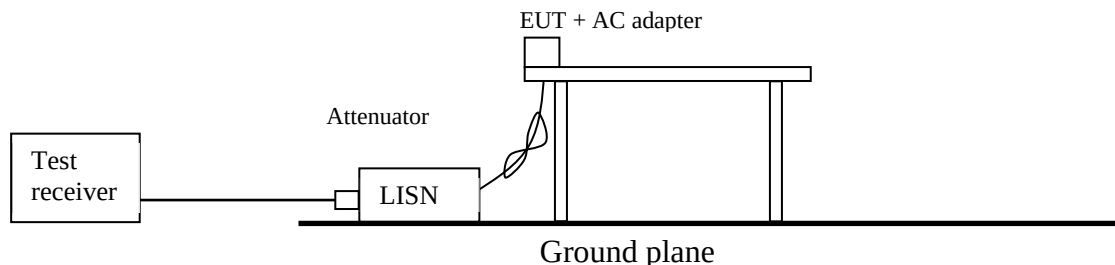
The EUT via AC adapter was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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 - 30 MHz
Test data	: APPENDIX
Test result	: Pass

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission

Test Procedure

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity. The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. Photographs of the set up are shown in APPENDIX 3.

6.3 Test procedure

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane at a distance of 3m. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area 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.

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3 m.

Frequency: From 9 kHz to 30 MHz at distance 3 m (Refer to Figure 2)

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. Drawing of the antenna direction is shown in Figure 1.

Frequency: From 30 MHz to 1 GHz at distance 3 m (Refer to Figure 2).

The measuring antenna height was 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.

Measurements were performed with QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

	9 kHz to 90 kHz & 110 kHz to 150 kHz	90 kHz to 110 kHz	150 kHz to 490 kHz	490 kHz to 30 MHz	30 MHz to 1 GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	10 kHz	9 kHz	120 kHz
Distance factor *1)	-80 dB	-80 dB	-80 dB	-40 dB	-
Measuring antenna	Loop antenna				Biconical (30 MHz - 199.999 MHz) Logperiodic (200 MHz - 1 GHz)

*1) FCC 15.31 (f)(2) (9 kHz-30 MHz)

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

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

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 $45.5 - 51.5 = -6.0 \text{ dBuA/m}$, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

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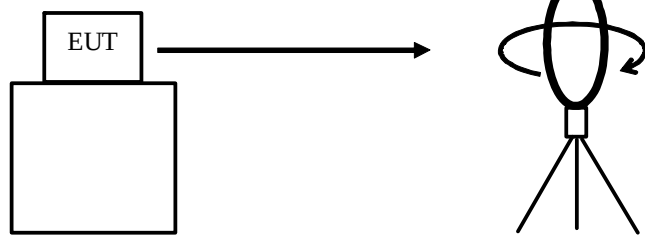
The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Combinations of the worst case

	Frequency	Below 30 MHz	Above 30 MHz
Module	Antenna polarization		
	Horizontal	Y	Y
Antenna	Vertical		Y
	Horizontal	Y	Y
	Vertical		Y

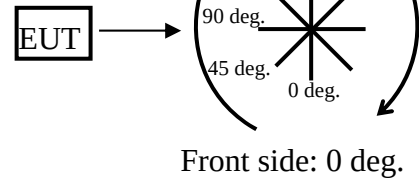
Figure 1: Direction of the Loop Antenna

Side View (Vertical)

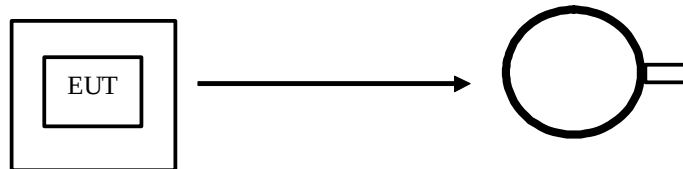


Front side: 0 deg.
Forward direction: clockwise

Top View (Vertical)



Top View (Horizontal)



Antenna was not rotated.

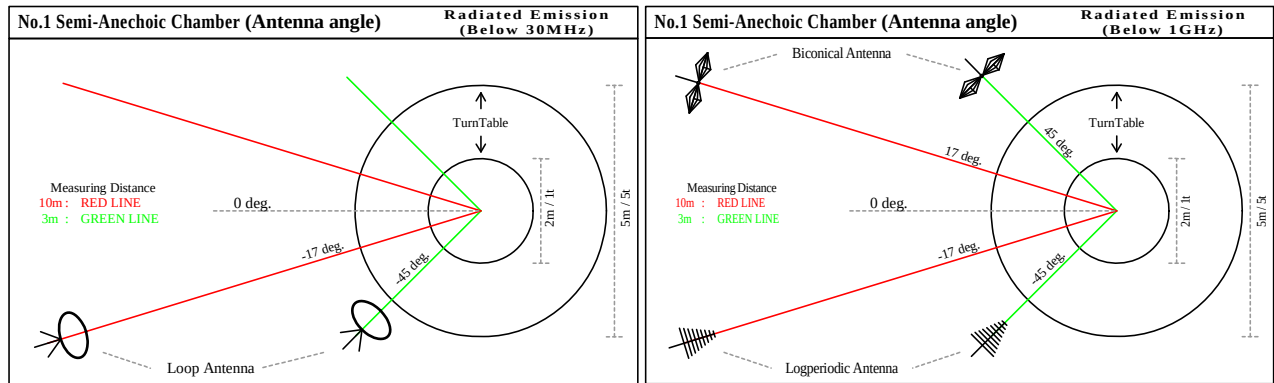
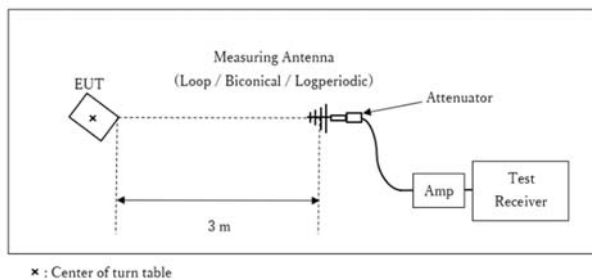


Figure 2. Antenna angle

[Test Setup]
Below 1 GHz



Test Distance: 3 m

6.4 Results

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

Measurement range : 9 kHz - 1 GHz

Test data : APPENDIX 1

Test result : Pass

SECTION 7: Frequency Tolerance

Test procedure

The frequency tolerance was measured with a frequency counter using a test fixture.

The temperature test was started after the temperature stabilization time of 30 minutes.

The test was begun from 60 deg.C and the temperature was lowered each 10 deg.C.

Summary of the test results: Pass

Refer to APPENDIX 1

SECTION 8: 20 dB bandwidth & 99 % Occupied bandwidth

Test procedure

The test was measured with a spectrum analyzer using a test fixture.

or The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	100 kHz	1 kHz	3 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth (OBW)	Enough width to display	1 to 5 % of OBW	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer

*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100%.

Summary of the test results: Pass

Refer to APPENDIX 1

DATA OF CONDUCTED EMISSION TEST

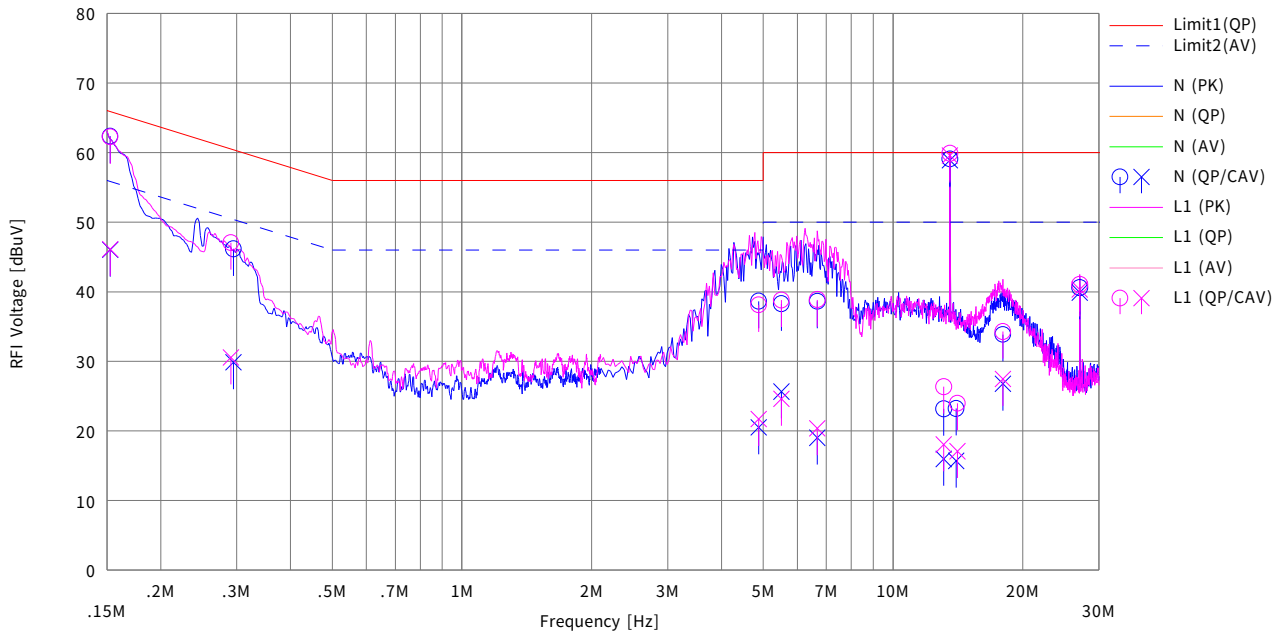
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2021/01/21

Company : Sony Global Manufacturing & Operations Corporation
Kind of EUT : Contactless IC Card Reader/Writer
Model No. : RC-S660/U
Serial No. : 9999109
Remarks : With Tag typeF (Felica)

Mode : Transmitting (13.56 MHz)
Order No. : 13628971S
Power : DC 3.3 V (AC Adapter: 120 V / 60 Hz)
Temp./Humi. : 22 deg.C / 39 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Toshinori Yamada



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15280	49.90	33.60	12.44	62.34	46.04	65.85	55.85	3.5	9.8	N	Reference, Carrier
2	0.29503	33.70	17.40	12.46	46.16	29.86	60.38	50.38	14.2	20.5	N	
3	4.88094	25.90	7.80	12.72	38.62	20.52	56.00	46.00	17.3	25.4	N	
4	5.51171	25.50	12.90	12.75	38.25	25.65	60.00	50.00	21.7	24.3	N	
5	6.67356	25.80	6.20	12.80	38.60	19.00	60.00	50.00	21.4	31.0	N	
6	13.11000	10.10	2.90	13.07	23.17	15.97	60.00	50.00	36.8	34.0	N	
7	13.56000	46.00	45.80	13.08	59.08	58.88	60.00	50.00	0.9	-8.9	N	
8	14.01000	10.10	2.60	13.10	23.20	15.70	60.00	50.00	36.8	34.3	N	
9	17.96983	20.60	13.50	13.26	33.86	26.76	60.00	50.00	26.1	23.2	N	
10	27.12000	27.00	26.30	13.59	40.59	39.89	60.00	50.00	19.4	10.1	N	
11	0.15280	49.80	33.70	12.44	62.24	46.14	65.85	55.85	3.6	9.7	L1	Reference, Carrier
12	0.29083	34.60	18.10	12.44	47.04	30.54	60.50	50.50	13.4	19.9	L1	
13	4.88094	25.40	9.00	12.70	38.10	21.70	56.00	46.00	17.9	24.3	L1	
14	5.51171	26.10	11.90	12.71	38.81	24.61	60.00	50.00	21.1	25.3	L1	
15	6.67356	26.10	7.60	12.76	38.86	20.36	60.00	50.00	21.1	29.6	L1	
16	13.11000	13.40	5.10	12.95	26.35	18.05	60.00	50.00	33.6	31.9	L1	
17	13.56000	46.90	46.60	12.96	59.86	59.56	60.00	50.00	0.1	-9.6	L1	
18	14.10000	11.00	4.10	12.97	23.97	17.07	60.00	50.00	36.0	32.9	L1	
19	17.96983	21.20	14.40	13.07	34.27	27.47	60.00	50.00	25.7	22.5	L1	
20	27.12000	27.80	27.10	13.23	41.03	40.33	60.00	50.00	18.9	9.6	L1	

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2021/01/21

Company : Sony Global Manufacturing & Operations Corporation

Kind of EUT : Contactless IC Card Reader/Writer

Model No. : RC-S660/U

Serial No. : 9999112

Remarks : **Termination**

Mode : Communication

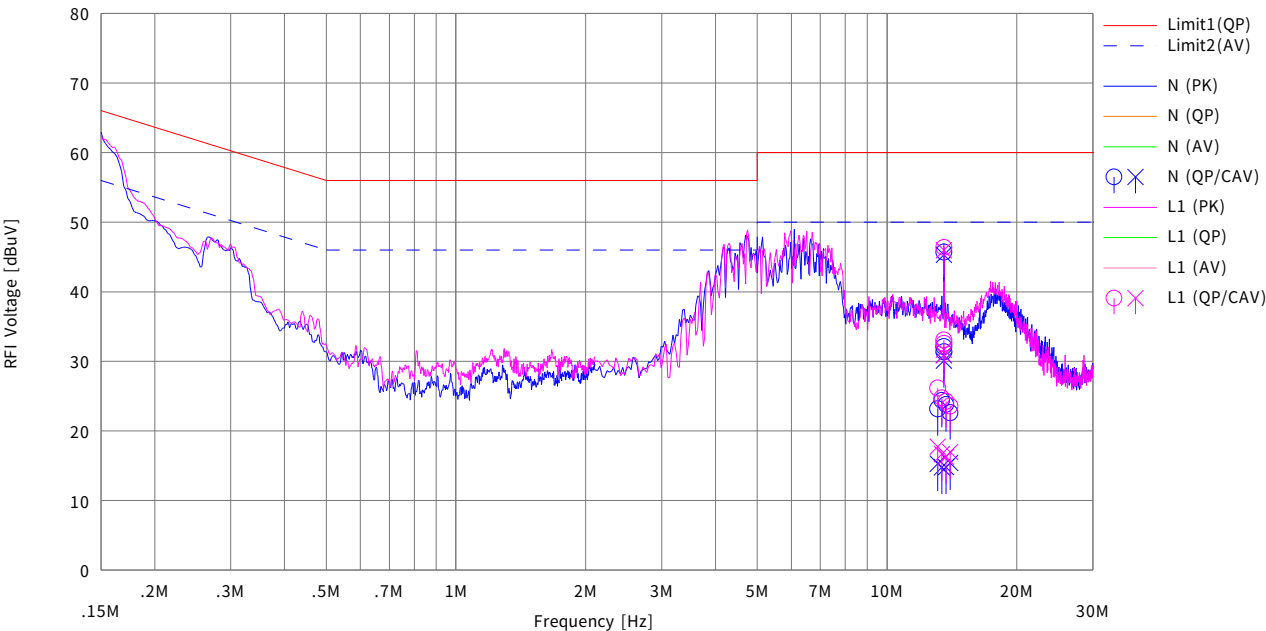
Order No. : 13628971S

Power : DC 3.3 V (AC Adapter: 120 V / 60 Hz)

Temp./Humi. : 22 deg.C / 39 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Toshinori Yamada



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	13.11000	10.10	2.20	13.07	23.17	15.27	60.00	50.00	36.8	34.7	N	
2	13.41000	11.30	1.70	13.08	24.38	14.78	60.00	50.00	35.6	35.2	N	
3	13.55300	19.00	17.80	13.08	32.08	30.88	60.00	50.00	27.9	19.1	N	
4	13.56000	32.60	32.20	13.08	45.68	45.28	60.00	50.00	14.3	4.7	N	
5	13.56700	18.30	17.00	13.08	31.38	30.08	60.00	50.00	28.6	19.9	N	
6	13.71000	10.70	1.70	13.09	23.79	14.79	60.00	50.00	36.2	35.2	N	
7	14.01000	9.50	2.30	13.10	22.60	15.40	60.00	50.00	37.4	34.6	N	
8	13.11000	13.20	4.80	12.95	26.15	17.75	60.00	50.00	33.8	32.2	L1	
9	13.41000	11.80	3.70	12.96	24.76	16.66	60.00	50.00	35.2	33.3	L1	
10	13.55300	20.10	18.70	12.96	33.06	31.66	60.00	50.00	26.9	18.3	L1	
11	13.56000	33.40	33.00	12.96	46.36	45.96	60.00	50.00	13.6	4.0	L1	
12	13.56700	19.60	17.90	12.96	32.56	30.86	60.00	50.00	27.4	19.1	L1	
13	13.71000	11.30	3.30	12.97	24.27	16.27	60.00	50.00	35.7	33.7	L1	
14	14.01000	10.60	4.00	12.97	23.57	16.97	60.00	50.00	36.4	33.0	L1	

Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.1 Semi Anechoic Chamber

Company: Sony Global Manufacturing & Operations Corporation Equipment: Contactless IC Card Reader/Writer Model: RC-S660/U Sample No.: 9999109 Power: DC 3.3 V Mode: Transmitting 13.56 MHz with Tag Remarks: NFC type F (Felica) (Axis: H: Y / Ver: Y) , Vertical polarization (antenna angle) of the worst case: 0 deg.	Regulation: FCC Part15 Subpart C 15.225 Test Distance: 3 m Date: January 8, 2021 Temperature: 22 deg.C Humidity: 30 %RH ENGINEER: Takahiro Kawakami
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Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN		Angle [deg.]
		Hor [dBuV]	Ver [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]	
1	13.560	61.1	70.2	19.5	6.6	31.9	-40.0	15.4	24.5	83.9	68.5	59.4	140

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

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

Limits (30 m)

• 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.110	29.9	29.9	19.5	6.6	31.9	-40.0	-15.8	-15.8	29.5	45.3	45.3
2	13.349	33.9	42.5	19.5	6.6	31.9	-40.0	-11.8	-3.3	40.5	52.3	43.8
2	13.410	30.2	33.0	19.5	6.6	31.9	-40.0	-15.5	-12.7	40.5	56.0	53.2
3	13.553	47.2	56.3	19.5	6.6	31.9	-40.0	1.5	10.6	50.4	48.9	39.8
4	13.567	46.6	55.6	19.5	6.6	31.9	-40.0	0.9	9.9	50.4	49.5	40.5
5	13.710	30.1	32.4	19.5	6.6	31.9	-40.0	-15.6	-13.3	40.5	56.1	53.8
5	13.772	32.8	40.7	19.5	6.6	31.9	-40.0	-12.9	-5.01	40.5	53.4	45.5
6	14.010	30.0	29.9	19.6	6.6	31.9	-40.0	-15.7	-15.8	29.5	45.2	45.3

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

• $F_c \pm 7 \text{ kHz}$: 13.553 MHz to 13.567 MHz

• $F_c \pm 150 \text{ kHz}$: 13.410 MHz to 13.710 MHz

• $F_c \pm 450 \text{ kHz}$: 13.110 MHz to 14.010 MHz

$F_c = 13.56 \text{ MHz}$

Limits (30 m)

• 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))

• 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))

• Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Emission

UL Japan, Inc.
Shonan EMC Lab. No.1 Semi Anechoic Chamber

Company:	Sony Global Manufacturing & Operations Corporation	Regulation:	FCC Part15 Subpart C 15.225
Equipment:	Contactless IC Card Reader/Writer	Test Distance:	3 m
Model:	RC-S660/U	Date:	January 8, 2021
Sample No.:	9999109	Temperature:	22 deg.C
Power:	DC 3.3 V	Humidity:	30 %RH
Mode:	Transmitting 13.56 MHz	ENGINEER:	Takahiro Kawakami Yohsuke Matsuzawa
EUT axis:	Below 30MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type F (Felica), with Tag, Vertical polarization (antenna angle) of the worst case: 90 deg. Above 30MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type F (Felica), with Tag		

Remarks:

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	27.12	QP	31.1	20.1	6.9	31.8	-40.0	-13.7	29.5	43.2	-	312	* Limit: 30m
Hori.	40.683	QP	34.5	14.6	7.3	31.8	0.0	24.6	43.5	18.9	265	223	
Hori.	67.806	QP	49.3	6.8	7.4	31.8	0.0	31.7	43.5	11.8	167	228	
Hori.	122.041	QP	37.3	13.3	8.2	31.8	0.0	27.0	46.0	19.0	140	235	
Hori.	257.645	QP	53.7	12.1	6.3	31.8	0.0	40.3	46.0	5.7	100	281	
Hori.	311.884	QP	50.0	13.9	6.6	31.8	0.0	38.7	46.0	7.3	100	283	
Hori.	339.006	QP	52.2	14.8	6.8	31.8	0.0	42.0	46.0	4.0	100	287	
Hori.	366.122	QP	47.8	15.1	7.0	31.8	0.0	38.0	46.0	8.0	100	270	
Vert.	27.12	QP	40.5	20.1	6.9	31.8	-40.0	-4.3	29.5	33.8	-	78	* Limit: 30m
Vert.	40.679	QP	39.0	14.6	7.3	31.8	0.0	29.1	40.0	10.9	100	156	
Vert.	67.806	QP	43.3	6.8	7.4	31.8	0.0	25.7	40.0	14.3	207	150	
Vert.	646.111	QP	38.7	19.2	8.5	32.2	0.0	34.2	46.0	11.8	100	357	

Result = Reading + Ant Factor + Loss (Cable+ATT+ΔAF(above 30 MHz)) - Gain(Ampriifier) + Distance factor(below 30 MHz)

* Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

* Carrier level (Result at 3 m): Hor= 55.4 dBuV/m, Ver= 64.5 dBuV/m

UL Japan, Inc.
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa, Japan 259-1220

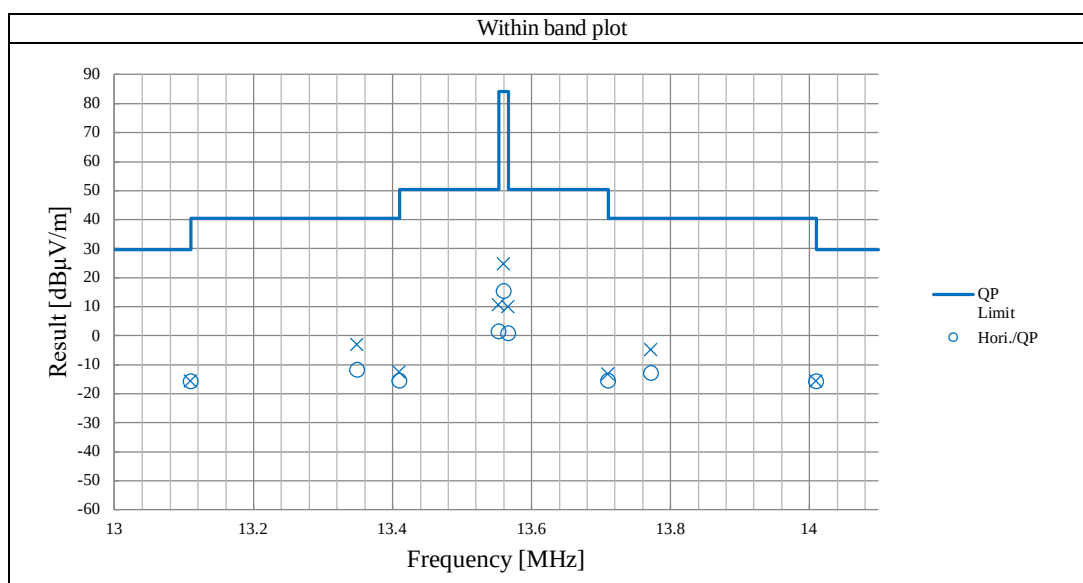
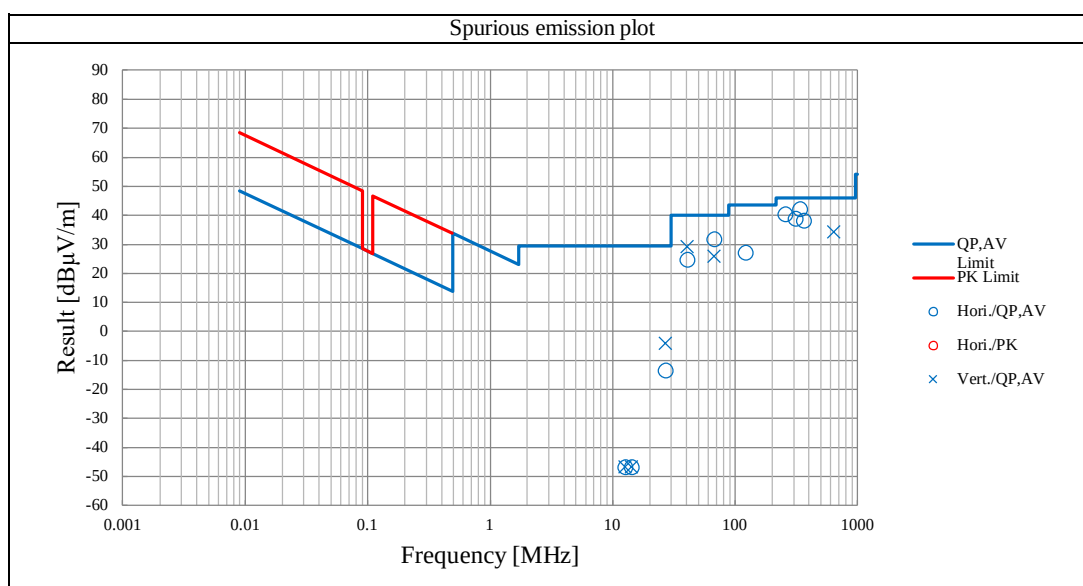
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Radiated Emission (Worst mode plot)

UL Japan, Inc.
Shonan EMC Lab. No.1 Semi Anechoic Chamber

Company:	Sony Global Manufacturing & Operations Corporation	Regulation:	FCC Part15 Subpart C 15.225
Equipment:	Contactless IC Card Reader/Writer	Test Distance:	3 m
Model:	RC-S660/U	Date:	January 8, 2021
Sample No.:	9999109	Temperature:	22 deg.C
Power:	DC 3.3 V	Humidity:	30 %RH
Mode:	Transmitting 13.56 MHz	ENGINEER:	Takahiro Kawakami Yohsuke Matsuzawa
EUT axis:	Below 30MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type F (Felica), with Tag, Vertical polarization (antenna angle) of the worst case: 90 deg. Above 30MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type F (Felica), with Tag		
Remarks:	These plots data contains sufficient number to show the trend of characteristic features for EUT.		



Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company	Sony Global Manufacturing & Operations Corporation	Regulation	FCC Part15 Subpart C 15.225 (e)
Equipment	Contactless IC Card Reader/Writer	Date	January 8, 2021
Model	RC-S660/U	Temperature	25 deg.C
Serial No.	9999109	Humidity	41 %RH
Power	DC 3.3V	ENGINEER	Yohsuke Matsuzawa
Mode	Transmitting 13.56 MHz (None modulation)		

Temperature Variation: -20 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560020	0.000020	0.00015	0.010
after 2 minutes	13.56	13.560023	0.000023	0.00017	0.010
after 5 minutes	13.56	13.560025	0.000025	0.00018	0.010
after 10 minutes	13.56	13.560025	0.000025	0.00018	0.010

Temperature Variation: -10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560062	0.000062	0.00046	0.010
after 2 minutes	13.56	13.560064	0.000064	0.00047	0.010
after 5 minutes	13.56	13.560064	0.000064	0.00047	0.010
after 10 minutes	13.56	13.560063	0.000063	0.00046	0.010

Temperature Variation: 0 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560075	0.000075	0.00055	0.010
after 2 minutes	13.56	13.560075	0.000075	0.00055	0.010
after 5 minutes	13.56	13.560075	0.000075	0.00055	0.010
after 10 minutes	13.56	13.560075	0.000075	0.00055	0.010

Temperature Variation: 10 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560064	0.000064	0.00047	0.010
after 2 minutes	13.56	13.560063	0.000063	0.00046	0.010
after 5 minutes	13.56	13.560062	0.000062	0.00046	0.010
after 10 minutes	13.56	13.560062	0.000062	0.00046	0.010

Temperature Variation: 20 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560033	0.000033	0.00024	0.010
after 2 minutes	13.56	13.560035	0.000035	0.00026	0.010
after 5 minutes	13.56	13.560034	0.000034	0.00025	0.010
after 10 minutes	13.56	13.560033	0.000033	0.00024	0.010

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Data of Frequency Tolerance

Temperature Variation: 30 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560001	0.000001	0.00001	0.010
after 2 minutes	13.56	13.560000	0.000000	0.00000	0.010
after 5 minutes	13.56	13.559998	-0.000002	-0.00001	0.010
after 10 minutes	13.56	13.559999	-0.000001	-0.00001	0.010

Temperature Variation: 40 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559970	-0.000030	-0.00022	0.010
after 2 minutes	13.56	13.559970	-0.000030	-0.00022	0.010
after 5 minutes	13.56	13.559970	-0.000030	-0.00022	0.010
after 10 minutes	13.56	13.559970	-0.000030	-0.00022	0.010

Temperature Variation: 50 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559960	-0.000040	-0.00029	0.010
after 2 minutes	13.56	13.559959	-0.000041	-0.00030	0.010
after 5 minutes	13.56	13.559959	-0.000041	-0.00030	0.010
after 10 minutes	13.56	13.559959	-0.000041	-0.00030	0.010

Temperature Variation: 60 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559972	-0.000028	-0.00021	0.010
after 2 minutes	13.56	13.559973	-0.000027	-0.00020	0.010
after 5 minutes	13.56	13.559972	-0.000028	-0.00021	0.010
after 10 minutes	13.56	13.559974	-0.000026	-0.00019	0.010

Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company	Sony Global Manufacturing & Operations Corporation	Regulation	FCC Part15 Subpart C 15.225 (e)
Equipment	Contactless IC Card Reader/Writer	Date	January 12, 2021
Model	RC-S660/U	Temperature	26 deg.C
Serial No.	9999109	Humidity	24 %RH
Power	DC 3.3V	ENGINEER	Kenichi Adachi
Mode	Transmitting 13.56 MHz (None modulation)		

Voltage Variation: DC 3.3 V

Temperature Variation: 20 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560010	0.000010	0.00007	0.010
after 2 minutes	13.56	13.559987	-0.000013	-0.00010	0.010
after 5 minutes	13.56	13.559984	-0.000016	-0.00012	0.010
after 10 minutes	13.56	13.559979	-0.000021	-0.00015	0.010

Voltage Variation: DC 3.135 V

Temperature Variation: 20 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559984	-0.000016	-0.00012	0.010
after 2 minutes	13.56	13.559979	-0.000021	-0.00015	0.010
after 5 minutes	13.56	13.559977	-0.000023	-0.00017	0.010
after 10 minutes	13.56	13.559975	-0.000025	-0.00018	0.010

Voltage Variation: DC 3.465 V

Temperature Variation: 20 deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559981	-0.000019	-0.00014	0.010
after 2 minutes	13.56	13.559971	-0.000029	-0.00021	0.010
after 5 minutes	13.56	13.559970	-0.000030	-0.00022	0.010
after 10 minutes	13.56	13.559970	-0.000030	-0.00022	0.010

UL Japan, Inc.

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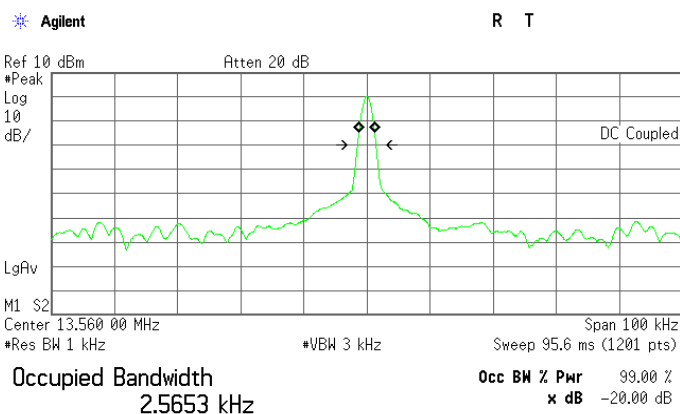
Facsimile : +81 463 50 6401

20 dB bandwidth & 99 % Occupied bandwidth: FCC 15.215 / RSS-Gen

UL Japan, Inc.
Shonan EMC Lab. No.5 Shielded Room

Company:	Sony Global Manufacturing & Operations Corporation	Regulation:	FCC Part15 Subpart C 15.215
Equipment:	Contactless IC Card Reader/Writer		
Model:	RC-S660/U	Date:	January 8, 2021
Sample No.:	9999109	Temperature:	25 deg.C
Power:	DC 3.3 V	Humidity:	41 %RH
Mode:	Transmitting 13.56 MHz	ENGINEER:	Yohsuke Matsuzawa
	NFC type F		

20 dB Bandwidth: 3.001 kHz
99 % Occupied Bandwidth: 2.5653 kHz



Transmit Freq Error -8.724 Hz
x dB Bandwidth 3.001 kHz

*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.

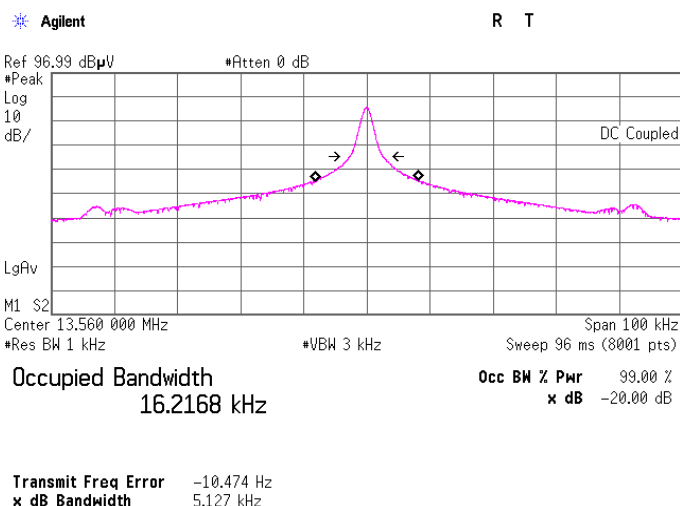
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20 dB bandwidth & 99 % Occupied bandwidth: FCC 15.215 / RSS-Gen

UL Japan, Inc.
Shonan EMC Lab. No.5 Shielded Room

Company:	Sony Global Manufacturing & Operations Corporation	Regulation:	FCC Part15 Subpart C 15.215
Equipment:	Contactless IC Card Reader/Writer		
Model:	RC-S660/U	Date:	January 12, 2021
Sample No.:	9999109	Temperature:	26 deg.C
Power:	DC 3.3 V	Humidity:	24 %RH
Mode:	Transmitting 13.56 MHz	ENGINEER:	Kenichi Adachi
	NFC type A		

20 dB Bandwidth: 5.127 kHz
99 % Occupied Bandwidth: 16.2168 kHz



*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.

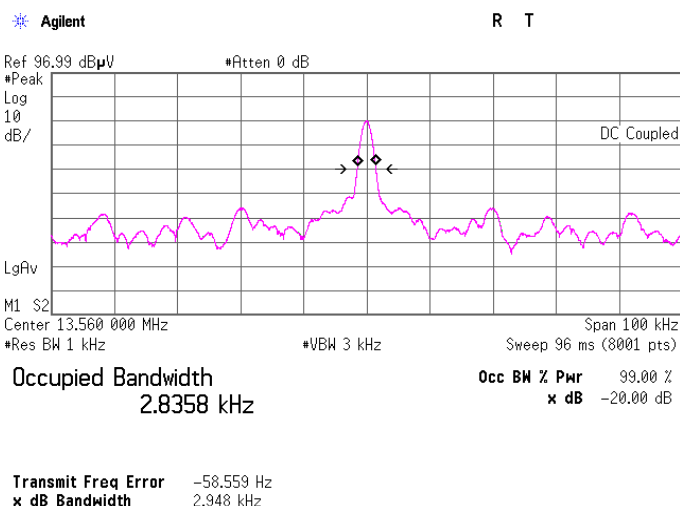
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20 dB bandwidth & 99 % Occupied bandwidth: FCC 15.215 / RSS-Gen

UL Japan, Inc.
Shonan EMC Lab. No.5 Shielded Room

Company:	Sony Global Manufacturing & Operations Corporation	Regulation:	FCC Part15 Subpart C 15.215
Equipment:	Contactless IC Card Reader/Writer		
Model:	RC-S660/U	Date:	January 12, 2021
Sample No.:	9999109	Temperature:	26 deg.C
Power:	DC 3.3 V	Humidity:	24 %RH
Mode:	Transmitting 13.56 MHz	ENGINEER:	Kenichi Adachi
	NFC type B		

20 dB Bandwidth: 2.948 kHz
99 % Occupied Bandwidth: 2.8358 kHz



*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.

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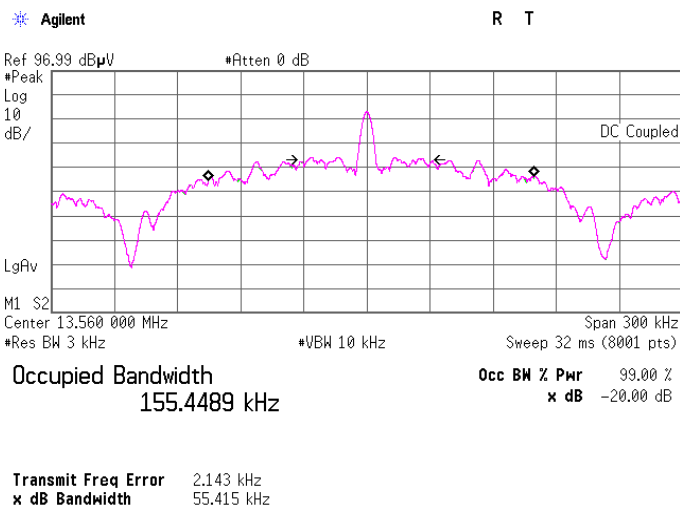
Facsimile : +81 463 50 6401

20 dB bandwidth & 99 % Occupied bandwidth: FCC 15.215 / RSS-Gen

UL Japan, Inc.
Shonan EMC Lab. No.5 Shielded Room

Company:	Sony Global Manufacturing & Operations Corporation	Regulation:	FCC Part15 Subpart C 15.215
Equipment:	Contactless IC Card Reader/Writer		
Model:	RC-S660/U	Date:	January 12, 2021
Sample No.:	9999109	Temperature:	26 deg.C
Power:	DC 3.3 V	Humidity:	24 %RH
Mode:	Transmitting 13.56 MHz	ENGINEER:	Kenichi Adachi
	NFC type V		

20 dB Bandwidth: 55.415 kHz
99 % Occupied Bandwidth: 155.4489 kHz



*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.

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APPENDIX 2

Test Instruments

EMI test equipment

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
CE	KJM-02	146432	Measure	TAJIMA	GL19-55	-	-	-
CE	SAT3-10	144960	Attenuator	JFW	50HF-003N	-	2020/08/18	12
CE	SCC-C9/C10/SRSE-03	145036	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	2020/04/12	12
CE	SLS-05	145542	LISN	Rohde & Schwarz	ENV216	100516	2020/02/18	12
CE	SOS-26	191844	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/30	12
CE	STR-08	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2020/12/02	12
CE	STS-03	146210	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997823	2020/10/19	12
CE,RE	COTS-SEMI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
RE	KAT6-04	144899	Attenuator	Inmet	18N-6dB	-	2020/12/10	12
RE	KJM-09	145929	Measure	KOMELON	KMC-36	-	-	-
RE	SAEC-01(NSA)	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2020/04/08	12
RE	SAF-01	145003	Pre Amplifier	SONOMA	310N	290211	2020/02/19	12
RE	SAT3-09	144959	Attenuator	JFW	50HF-003N	-	2020/08/18	12
RE	SAT6-15	167096	Attenuator	JFW	50HF-006N	-	2020/02/21	12
RE	SBA-01	145161	Biconical Antenna	Schwarzbeck Mess - Elektronik	BBA9106	91032664	2020/04/04	12
RE	SCC-A1/A3/A5/A7/A8/A13/SRSE-01	144967	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	2020/04/12	12
RE	SCC-A2/A4/A6/A7/A8/A13/SRSE-01	144968	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	2020/04/12	12
RE	SCC-M1	194601	Coaxial Cable	Fjikura	5D-2W	-	2020/12/10	12
RE	SLA-05	145527	Logperiodic Antenna	Schwarzbeck Mess - Elektronik	VUSLP9111B	193	2020/04/04	12
RE	SLP-02	145536	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	2020/04/15	12
RE	SOS-20	191837	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/28	12
RE	STR-01	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2020/04/24	12
RE	STS-01	145792	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997812	2020/10/19	12
TF	SCH-01	145200	Temperature and Humidity Chamber	Espec	PL-1KT	14020837	2020/04/02	12
TF	SFC-03	183119	Microwave Counter	Keysight Technologies Inc	53151A	US40511493	2020/11/16	12
TF	SOS-19	175823	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/10/01	12
TF	SRENT-15	160899	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46185516	2020/01/15	12
TF	SSCA-01	146178	Search coil	Langer	RF-R 400-1	02-0634	-	-
TF	STS-05	146212	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997828	2020/10/19	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,

TF: Test Fixture

End of Report