RADIO TEST REPORT

Test Report No. : 12007721H-R4

Applicant	:	**CASIO COMPUTER CO., LTD.**
Type of Equipment	:	**Handheld Terminal**
Model No.	:	**IT-G500-C21E-US-B**
Test regulation	:	**FCC Part 15 Subpart C: 2018 (RFID part)**
FCC ID	:	**BBQITG500B**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
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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. This report is a revised version of 12007721H-R3. 12007721H-R3 is replaced with this report.

Date of test: October 31,2017 to March 2, 2018

Representative test engineer:

Takumi Shimada
Engineer
Consumer Technology Division

Approved by:

Takayuki Shimada
Engineer
Consumer Technology Division

NVLAP TESTING
NVLAP LAB CODE: 200572-0

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REVISION HISTORY

Original Test Report No.: 12007721H

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12007721H	December 1, 2017	-	-
1	12007721H-R1	February 15, 2018	P. 1, 6	Update to FCC version
1	12007721H-R1	February 15, 2018	P. 4	Correction of Power Supply (inner) in Clasue 2.2; From DC 3.3 V to DC 5.0 V
1	12007721H-R1	February 15, 2018	P. 6	Correction of stable voltage in FCC Part 15.31 (e) of Clasue 3.2; From DC 3.3 V to DC 5.0 V
2	12007721H-R2	February 23, 2018	P.6	Correction of Worst margin (AV) for Conducted emission in Clause 3.2; From 9.6 dB to 9.5 dB
2	12007721H-R2	February 23, 2018	P.10	Addition of following contents in Clause 4.1; - "(Cradle A, Cradle B)"description for Conducted emission - note *2)
2	12007721H-R2	February 23, 2018	P. 11, 12	Addition of Configuration and peripheral for Cradle B in Clause 4.2
2	12007721H-R2	February 23, 2018	P. 21 to 25	Addition of Conducted emission (Cradle Type B) data in APPENDIX 1.
2	12007721H-R2	February 23, 2018	P. 48	Addition of EMI test equipment in APPENDIX 2.
2	12007721H-R2	February 23, 2018	P. 50	Addition of Setup photo for Conducted emission (Cradle Type B) data in APPENDIX 3.
3	12007721H-R3	February 27, 2018	P. 11	Correction of Configuration and peripheral for Cradle B in Clause 4.2.
3	12007721H-R3	February 27, 2018	P. 12	Correction of Serial number of Cradle (M/N: HA-P62IO) in Clause 4.2.
4	12007721H-R4	March 5, 2018	P. 46, 47	Addition of test data for Frequency Tolerance in APPENDIX 1.
4	12007721H-R4	March 5, 2018	P. 49	Addition of test equipment in APPENDIX 2.

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SECTION 1: Customer information

Company Name	:	CASIO COMPUTER CO., LTD.
Address	:	2951-5, Ishikawa-Machi, Hachioji-shi Tokyo 192-8566, Japan
Telephone Number	:	+81-42-639-5188
Facsimile Number	:	+81-42-639-5046
Contact Person	:	TAKUYA SAITO

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Handheld Terminal
Model No.	:	IT-G500-C21E-US-B
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	Li-ion battery DC3.7V 1850mAh/6.9Wh, M/N:HA-D20BAT-A
Option Battery	:	Li-ion battery DC3.7V 3700mAh/14Wh, M/N:HA-D21LBAT-A
Receipt Date of Sample	:	October, 30, 2017
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: IT-G500-C21E-US-B (referred to as the EUT in this report) is a Handheld Terminal.

General Specification

Clock frequency(ies) in the system	CPU: 1.5 GHz
Power Supply (inner)	DC 5.0 V / DC 1.8 V

Radio Specification

WLAN (IEEE802.11b/g/a/n-20)

Equipment Type	Transceiver
Frequency of Operation	2412 MHz - 2462 MHz, 5180 MHz - 5825 MHz
Type of Modulation	DSSS, OFDM
Antenna type	Inverted F antenna (IEEE802.11b/g/n) Dipole antenna (IEEE802.11a/n)
Antenna Gain	0.79 dBi (2412 MHz -2462 MHz) 1.05 dBi (5180 MHz -5825 MHz)

BT

Equipment Type	Transceiver
Frequency of Operation	2402 MHz -2480 MHz
Type of Modulation	FHSS
Antenna type	Inverted F antenna
Antenna Gain	0.79 dBi

RFID

Equipment Type	Transceiver
Frequency of Operation	13.56 MHz
Type of Modulation	ASK
Antenna type	Loop antenna

* This test report applies to RFID.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on February 2, 2018 and effective March 5, 2018
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.225 Operation within the band 13.110-14.010 MHz.

* The revision on February 2, 2018, does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted emission	ANSI C63.10:2013 6 Standard test methods	Section 15.207	<QP> 2.3 dB 13.56000 MHz, N [Type A] (Cradle Type A) <AV> 9.5 dB 0.45523 MHz, L [ISO 15693] (Cradle Type B)	Complied	-
	<IC>RSS-Gen 8.8	<IC>RSS-Gen 8.8			
Electric Field Strength of Fundamental Emission	ANSI C63.10:2013 6 Standard test methods	Section 15.225(a)	53.6 dB, 13.56000 MHz, QP, 0 deg. [FeliCa 212 kbps]	Complied	Radiated
	<IC> RSS-Gen 6.4, 6.12	<IC>RSS-210 B.6			
Spectrum Mask	ANSI C63.10:2013 6 Standard test methods	Section 15.225(b)(c)	34.0 dB, 13.56700 MHz, QP, 0 deg. [FeliCa 212 kbps]	Complied	Radiated
	<IC>RSS-Gen 6.4, 6.13	<IC> RSS-210 B.6			
20dB Bandwidth	ANSI C63.10:2013 6 Standard test methods	Section15.215(c)	See data	Complied	Radiated
	<IC> -	<IC> -			
Electric Field Strength of Spurious Emission	ANSI C63.10:2013 6 Standard test methods	Section 15.209, Section 15.225 (d)	4.2 dB 149.154 MHz, Horizontal, QP	Complied	Radiated
	<IC>RSS-Gen 6.4, 6.13	<IC>RSS-210 B.6			
Frequency Tolerance	ANSI C63.10:2013 6 Standard test methods	Section 15.225(e)	See data	Complied	Radiated
	<IC>RSS-Gen 6.11, 8.11	<IC> RSS-210 B.6			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422					

FCC Part 15.31 (e)
This EUT provides stable voltage (DC 5.0 V / DC 1.8 V) constantly to RF Part 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
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99 % Occupied Band Width	RSS-Gen 6.6	-	Radiated	N/A	N/A	N/A

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

3.4 Uncertainty

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

Frequency range	Conducted emission using AMN(LISN) (+/-)
0.009 MHz to 0.15 MHz	3.1 dB
0.15 MHz to 30 MHz	2.5 dB

Test distance	Radiated emission (+/-)
	9 kHz to 30 MHz
3 m	3.8 dB
10 m	3.6 dB

*Measurement distance

Polarity	Radiated emission (Below 1 GHz)			
	(3 m*)(+/-)		(10 m*)(+/-)	
	30 MHz to 200 MHz	200 MHz to 1000 MHz	30 MHz to 200 MHz	200 MHz to 1000 MHz
Horizontal	5.0 dB	5.3 dB	5.0 dB	5.0 dB
Vertical	5.2 dB	6.3 dB	5.0 dB	5.0 dB

Radiated emission (Above 1 GHz)				
(3 m*)(+/-)		(1 m*)(+/-)		(10 m*)(+/-)
1 GHz to 6 GHz	6 GHz to 18 GHz	10 GHz to 26.5 GHz	26.5 GHz to 40 GHz	1 GHz to 18 GHz
5.2 dB	5.5 dB	5.5 dB	5.4 dB	5.5 dB

* Measurement distance

Antenna terminal test	Uncertainty (+/-)
Frequency error	
13.56 MHz	0.01541 ppm

Conducted emission test
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Radiated emission test (3 m)
[Electric Field Strength of Fundamental Emission and Spectrum Mask]
The data listed in this test report has enough margin, more than the site margin.

[Electric Field Strength of Spurious Emission]
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124
NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

Test site	IC Registration Number	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	2973C-1	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	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	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	2973C-4	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.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	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test set up, Test data, and Test instruments

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used :

Mode	Remarks
Transmitting mode (Tx 13.56 MHz) <Software: NFC Test024 V1.0> - TypeA - TypeB - FeliCa(212 kbps) - FeliCa(424 kbps) - ISO15693	With Tag Without Tag
The EUT was operated in a manner similar to typical use during the tests.	

Test Item	Operating mode	Type of tag
Conducted emission	Tx with Tag (Cradle A, Cradle B)	All type
	Tx without Tag (Cradle A, Cradle B)	All type
Electric Field Strength of Fundamental Emission	Tx with Tag *2) Tx without Tag *2)	All type
Spectrum Mask	Tx without Tag *1)	All type
20dB Bandwidth 99% Occupied Bandwidth	Tx with Tag Tx without Tag	All type
Electric Field Strength of Spurious Emission	Tx without Tag *1), *2)	All type
Frequency Tolerance	Tx Mod off	-

*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 each type of Tag.

*2) After the test results of the Cradle A, Cradle B, and without Cradle were compared at pre-check, the without Cradle was only tested as representative, as its result was the worst one.

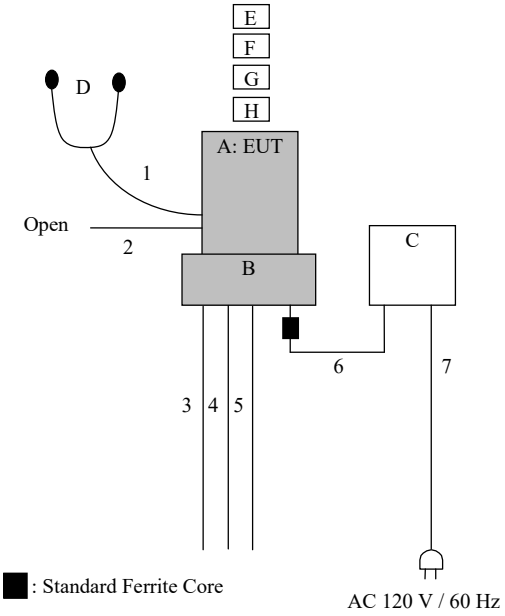
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

Frequency Tolerance:

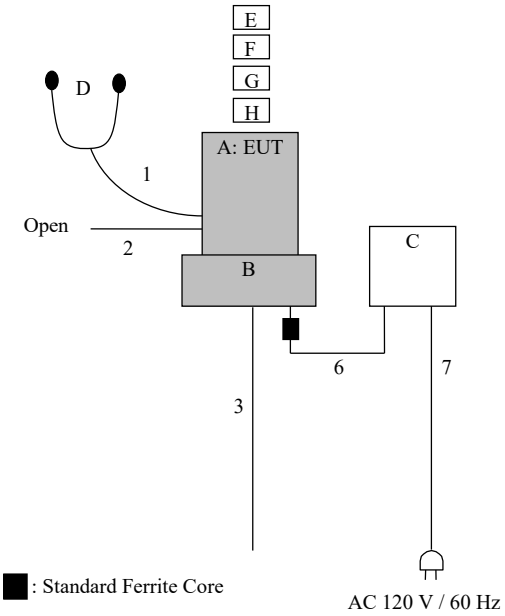
Temperature : -30 deg. C to +50 deg. C Step 10 deg. C (-30deg.C: Reference)
Voltage : Normal Voltage 3.7 V (Power Supply Battery Port)
Maximum Voltage DC 4.2 V*,
Minimum Voltage DC 3.7 V*
*Specifications of the manufacturer

4.2 Configuration and peripherals

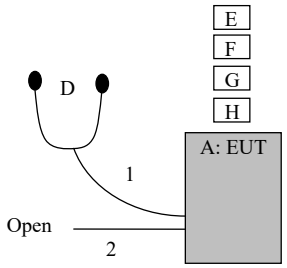
< For Conduction (Cradle A)>



< For Conduction (Cradle B)>



< For Radiation >



* 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	Remarks
A	Handheld Terminal	IT-G500-C21E-US-B	024HE JR7603482IAAF9	CASIO COMPUTER CO., LTD.	EUT
B	Cradle	HA-P62IO	001	CASIO COMPUTER CO., LTD.	EUT *1)
		HA-P60IO	241AAJW4B00501GA AA1		*2)
C	AC Adapter	AD-S42120C	0915C	CASIO COMPUTER CO., LTD.	*1)
		AD-S15050B	0711C		*2)
D	Ear phone	1DR-EX62VP	-	SONY	-
E	TypeA Card	SLE 66R01P	No.2	infineon	-
F	TypeB Card	-	No.1	-	-
G	Type FeliCa	-	No.2	-	-
H	ISO15693	-	33	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Ear phone Cable	1.2	Unshielded	Unshielded	-
2	USB Cable	1.5	Shielded	Shielded	-
3	USB Cable	1.0 *1) 3.0 *2)	Shielded	Shielded	-
4	USB Cable	1.5	Shielded	Shielded	-
5	LAN Cable	1.0	Unshielded	Unshielded	-
6	DC Cable	1.5	Unshielded	Unshielded	-
7	AC Cable	1.5	Unshielded	Unshielded	-

*1) Used for other tests except for Conducted emission test on Cradle B
*2) Used for Conducted emission test on Cradle B only

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.

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.

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

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

Test Procedure

[For below 1GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 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.

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 1 about Direction of the Loop Antenna.

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.

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.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz
Antenna Type	Loop	Biconical	Logperiodic

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

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

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.

- 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 - 1 GHz
Test data : APPENDIX 1
Test result : Pass

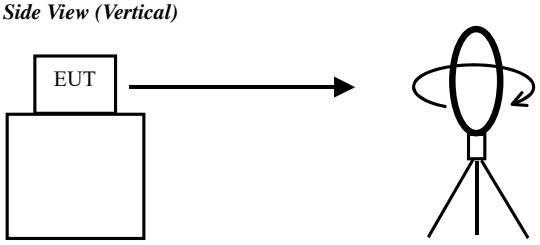
SECTION 7: Other test

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	50 kHz (for others except for ISO 15693)	1 kHz	3 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
	500 kHz (for ISO 15693 only)	3 kHz	9.1 kHz				
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	-	-	-	-	-	-	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.							

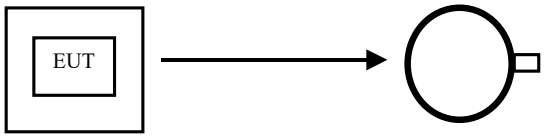
Test data : APPENDIX
Test result : Pass

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

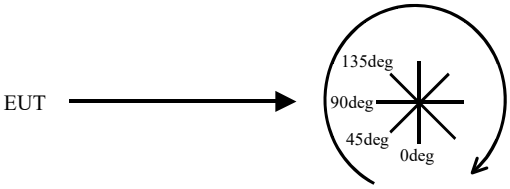


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)

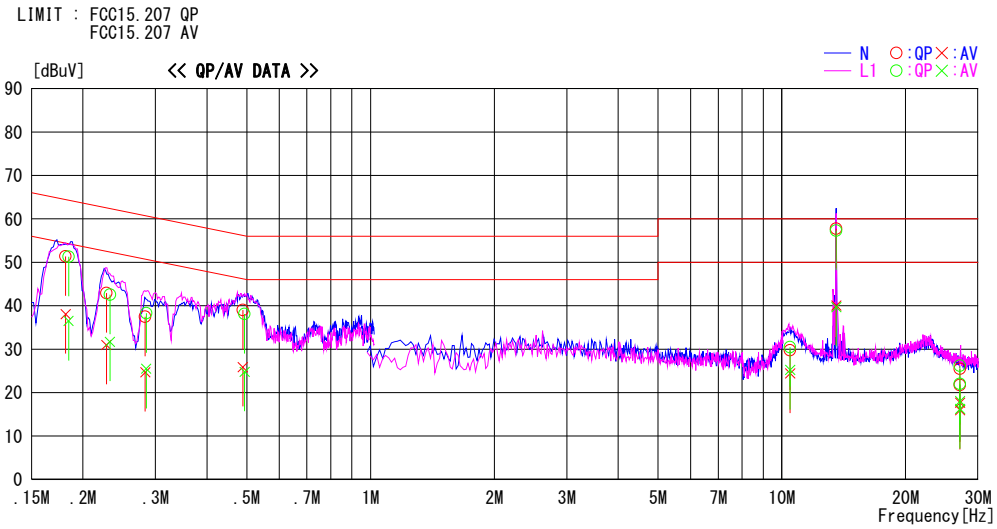


Front side: 0 deg.
Forward direction: clockwise

APPENDIX 1: Test data

Conducted emission
(Cradle Type A)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	November 10, 2017
Temperature / Humidity	23 deg. C / 44% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz Type A



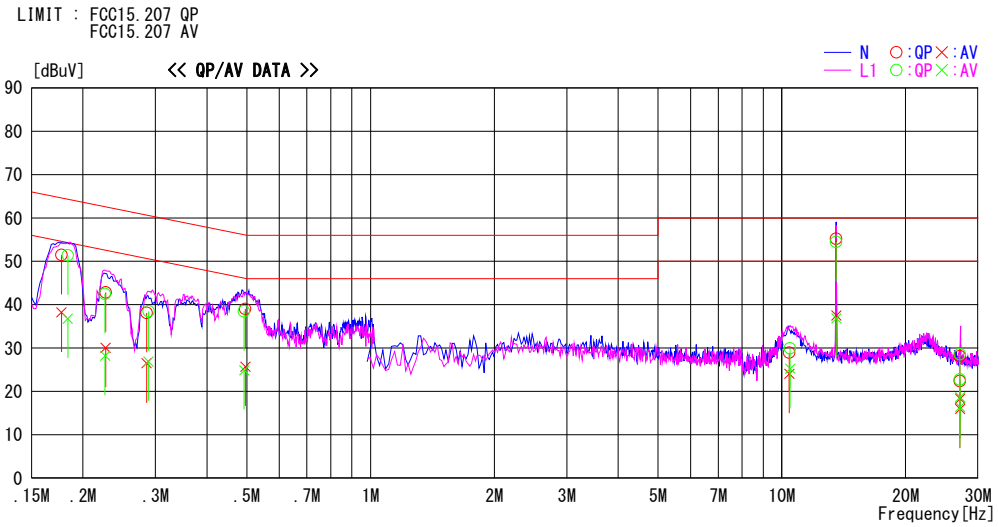
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.18138	38.3	25.0	13.1	51.4	38.1	64.4	54.4	13.0	16.3	N	
0.22803	29.8	17.9	13.1	42.9	31.0	62.5	52.5	19.6	21.5	N	
0.28325	24.3	11.5	13.2	37.5	24.7	60.7	50.7	23.2	26.0	N	
0.48928	25.7	12.6	13.3	39.0	25.9	56.2	46.2	17.2	20.3	N	
10.47094	15.4	10.1	14.3	29.7	24.4	60.0	50.0	30.3	25.6	N	
13.56000	43.2	25.6	14.5	57.7	40.1	60.0	50.0	2.3	9.9	N	
27.12000	10.3	2.5	15.2	25.5	17.7	60.0	50.0	34.5	32.3	N	
27.12000	6.5	0.8	15.2	21.7	16.0	60.0	50.0	38.3	34.0	N	without tag
0.18436	38.2	23.4	13.1	51.3	36.5	64.3	54.3	13.0	17.8	L1	
0.23263	29.5	18.6	13.1	42.6	31.7	62.4	52.4	19.8	20.7	L1	
0.28483	25.1	12.3	13.2	38.3	25.5	60.7	50.7	22.4	25.2	L1	
0.49403	24.8	11.5	13.3	38.1	24.8	56.1	46.1	18.0	21.3	L1	
10.47210	16.2	10.9	14.3	30.5	25.2	60.0	50.0	29.5	24.8	L1	
13.56000	42.8	25.2	14.5	57.3	39.7	60.0	50.0	2.7	10.3	L1	
27.12000	11.0	2.9	15.2	26.2	18.1	60.0	50.0	33.8	31.9	L1	
27.12000	6.8	1.0	15.2	22.0	16.2	60.0	50.0	38.0	33.8	L1	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type A)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	November 10, 2017
Temperature / Humidity	23 deg. C / 44% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz Type B



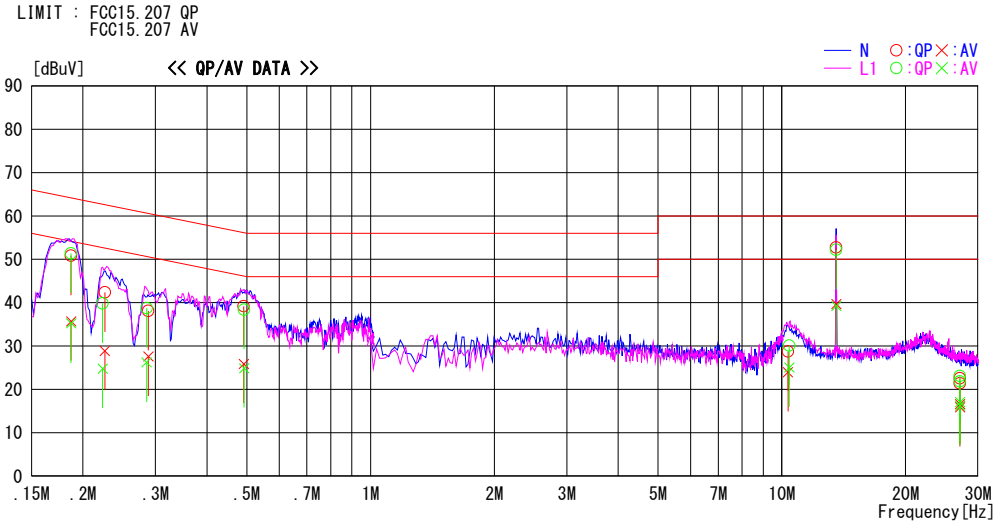
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.17732	38.4	25.1	13.1	51.5	38.2	64.6	54.6	13.1	16.4	N	
0.22693	29.7	17.0	13.1	42.8	30.1	62.6	52.6	19.8	22.5	N	
0.28557	24.9	13.3	13.2	38.1	26.5	60.7	50.7	22.6	24.2	N	
0.49645	25.7	12.4	13.3	39.0	25.7	56.1	46.1	17.1	20.4	N	
10.43116	14.6	9.8	14.3	28.9	24.1	60.0	50.0	31.1	25.9	N	
13.56000	40.7	23.0	14.5	55.2	37.5	60.0	50.0	4.8	12.5	N	
27.12000	12.9	3.1	15.2	28.1	18.3	60.0	50.0	31.9	31.7	N	
27.12000	7.2	0.8	15.2	22.4	16.0	60.0	50.0	37.6	34.0	N	without tag
0.18352	38.3	23.7	13.1	51.4	36.8	64.3	54.3	12.9	17.5	L1	
0.22607	29.4	15.1	13.1	42.5	28.2	62.6	52.6	20.1	24.4	L1	
0.28868	25.3	13.7	13.2	38.5	26.9	60.6	50.6	22.1	23.7	L1	
0.49282	25.2	11.6	13.3	38.5	24.9	56.1	46.1	17.6	21.2	L1	
10.47572	15.6	10.9	14.3	29.9	25.2	60.0	50.0	30.1	24.8	L1	
13.56000	40.0	22.4	14.5	54.5	36.9	60.0	50.0	5.5	13.1	L1	
27.12000	13.4	3.5	15.2	28.6	18.7	60.0	50.0	31.4	31.3	L1	
27.12000	7.5	1.2	15.2	22.7	16.4	60.0	50.0	37.3	33.6	L1	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type A)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	November 10, 2017
Temperature / Humidity	23 deg. C / 44% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz FeliCa 212kbps



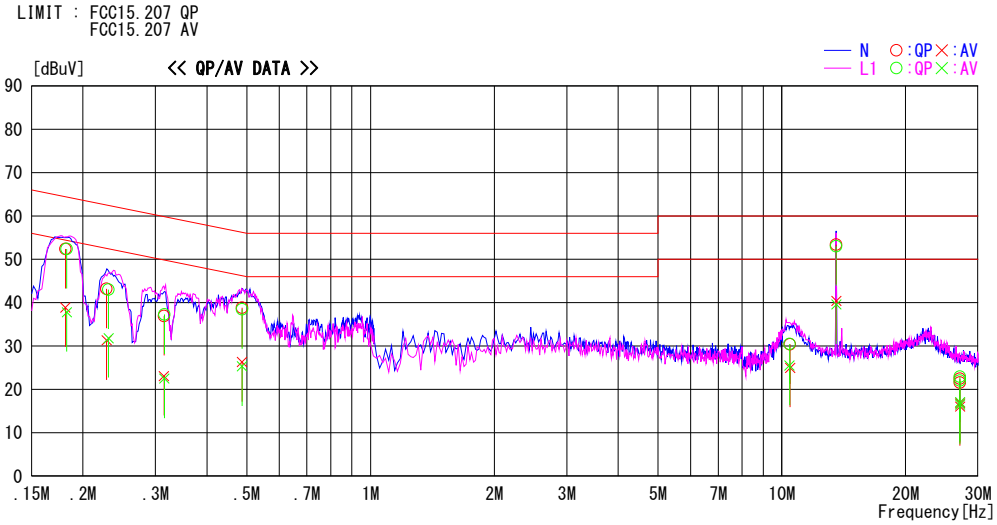
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.18701	37.7	22.6	13.1	50.8	35.7	64.2	54.2	13.4	18.5	N	
0.22603	29.3	15.8	13.1	42.4	28.9	62.6	52.6	20.2	23.7	N	
0.28846	24.9	14.4	13.2	38.1	27.6	60.6	50.6	22.5	23.0	N	
0.49174	25.9	12.6	13.3	39.2	25.9	56.1	46.1	16.9	20.2	N	
10.35158	14.4	9.7	14.3	28.7	24.0	60.0	50.0	31.3	26.0	N	
13.56000	38.2	25.2	14.5	52.7	39.7	60.0	50.0	7.3	10.3	N	
27.12000	7.4	1.4	15.2	22.6	16.6	60.0	50.0	37.4	33.4	N	
27.12000	6.2	0.7	15.2	21.4	15.9	60.0	50.0	38.6	34.1	N	without tag
0.18704	38.3	22.1	13.1	51.4	35.2	64.2	54.2	12.8	19.0	L1	
0.22325	26.7	11.7	13.1	39.8	24.8	62.7	52.7	22.9	27.9	L1	
0.28563	25.5	13.0	13.2	38.7	26.2	60.7	50.7	22.0	24.5	L1	
0.49288	25.1	11.6	13.3	38.4	24.9	56.1	46.1	17.7	21.2	L1	
10.43262	15.8	10.8	14.3	30.1	25.1	60.0	50.0	29.9	24.9	L1	
13.56000	37.7	24.7	14.5	52.2	39.2	60.0	50.0	7.8	10.8	L1	
27.12000	7.9	1.9	15.2	23.1	17.1	60.0	50.0	36.9	32.9	L1	
27.12000	6.6	1.0	15.2	21.8	16.2	60.0	50.0	38.2	33.8	L1	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type A)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	November 10, 2017
Temperature / Humidity	23 deg. C / 44% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz FeliCa 424kbps



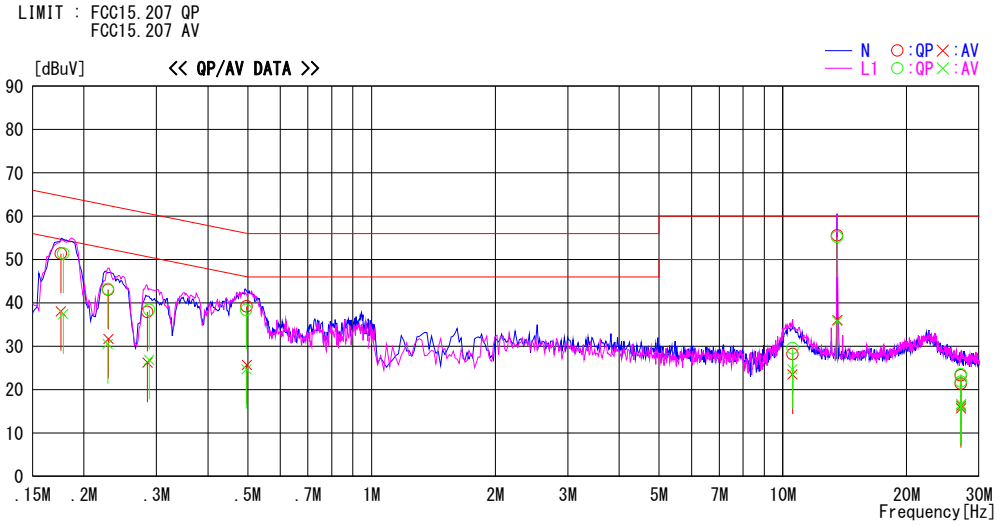
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.18114	39.3	25.8	13.1	52.4	38.9	64.4	54.4	12.0	15.5	N	
0.22812	30.1	18.2	13.1	43.2	31.3	62.5	52.5	19.3	21.2	N	
0.31467	23.6	9.8	13.3	36.9	23.1	59.8	49.8	22.9	26.7	N	
0.48709	25.5	13.0	13.3	38.8	26.3	56.2	46.2	17.4	19.9	N	
10.47080	16.1	10.7	14.3	30.4	25.0	60.0	50.0	29.6	25.0	N	
13.56000	38.9	25.9	14.5	53.4	40.4	60.0	50.0	6.6	9.6	N	
27.12000	7.3	1.6	15.2	22.5	16.8	60.0	50.0	37.5	33.2	N	
27.12000	6.4	0.9	15.2	21.6	16.1	60.0	50.0	38.4	33.9	N	without tag
0.18262	39.3	24.7	13.1	52.4	37.8	64.4	54.4	12.0	16.6	L1	
0.23070	29.9	18.7	13.1	43.0	31.8	62.4	52.4	19.4	20.6	L1	
0.31514	24.0	9.2	13.3	37.3	22.5	59.8	49.8	22.5	27.3	L1	
0.48691	25.2	12.0	13.3	38.5	25.3	56.2	46.2	17.7	20.9	L1	
10.43364	16.2	11.2	14.3	30.5	25.5	60.0	50.0	29.5	24.5	L1	
13.56000	38.5	25.1	14.5	53.0	39.6	60.0	50.0	7.0	10.4	L1	
27.12000	7.7	1.9	15.2	22.9	17.1	60.0	50.0	37.1	32.9	L1	
27.12000	6.8	1.3	15.2	22.0	16.5	60.0	50.0	38.0	33.5	L1	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type A)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	November 10, 2017
Temperature / Humidity	23 deg. C / 44% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz ISO 15693



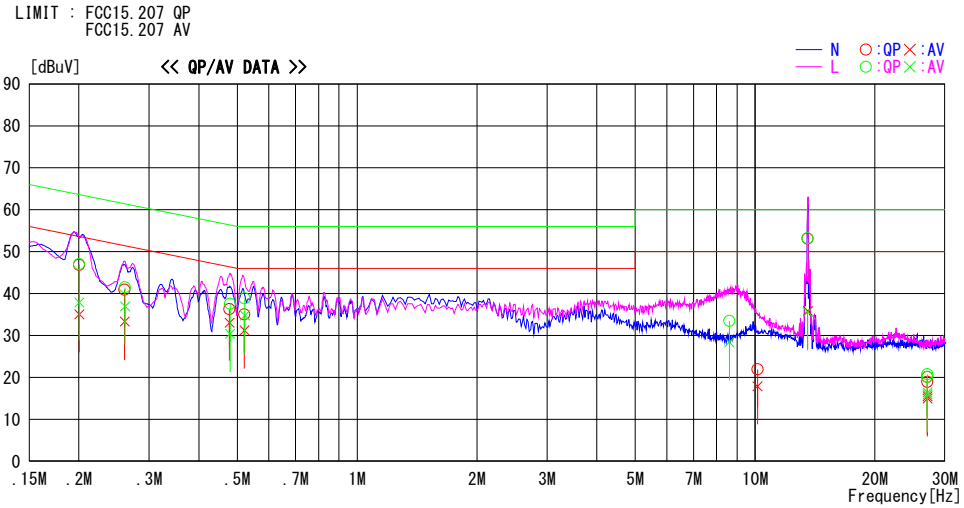
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.17577	38.3	25.0	13.1	51.4	38.1	64.7	54.7	13.3	16.6	N	
0.22932	29.9	18.6	13.1	43.0	31.7	62.5	52.5	19.5	20.8	N	
0.28509	24.7	13.0	13.2	37.9	26.2	60.7	50.7	22.8	24.5	N	
0.49731	25.9	12.4	13.3	39.2	25.7	56.0	46.0	16.8	20.3	N	
10.55102	13.9	9.2	14.3	28.2	23.5	60.0	50.0	31.8	26.5	N	
13.56000	41.1	21.6	14.5	55.6	36.1	60.0	50.0	4.4	13.9	N	
27.12000	8.1	1.1	15.2	23.3	16.3	60.0	50.0	36.7	33.7	N	
27.12000	6.2	0.5	15.2	21.4	15.7	60.0	50.0	38.6	34.3	N	without tag
0.17811	38.3	24.3	13.1	51.4	37.4	64.6	54.6	13.2	17.2	L1	
0.22838	30.1	17.4	13.1	43.2	30.5	62.5	52.5	19.3	22.0	L1	
0.28813	25.2	13.7	13.2	38.4	26.9	60.6	50.6	22.2	23.7	L1	
0.49605	25.1	11.4	13.3	38.4	24.7	56.1	46.1	17.7	21.4	L1	
10.55482	15.3	10.4	14.3	29.6	24.7	60.0	50.0	30.4	25.3	L1	
13.56000	40.7	21.3	14.5	55.2	35.8	60.0	50.0	4.8	14.2	L1	
27.12000	8.4	1.5	15.2	23.6	16.7	60.0	50.0	36.4	33.3	L1	
27.12000	6.6	0.9	15.2	21.8	16.1	60.0	50.0	38.2	33.9	L1	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type B)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	February 22, 2018
Temperature / Humidity	21 deg. C / 33% RH
Engineer	Masafumi Niwa
Mode	Tx 13.56 MHz Type A



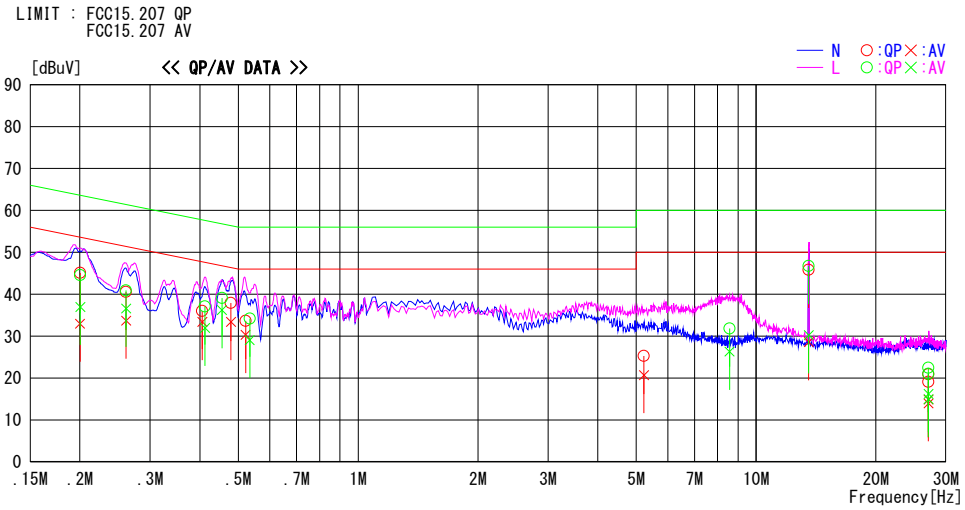
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.20032	33.5	21.8	13.3	46.8	35.1	63.6	53.6	16.8	18.5	N	
0.26050	27.6	20.0	13.3	40.9	33.3	61.4	51.4	20.5	18.1	N	
0.47802	23.0	19.8	13.3	36.3	33.1	56.4	46.4	20.1	13.3	N	
0.52084	21.6	17.8	13.4	35.0	31.2	56.0	46.0	21.0	14.8	N	
10.14007	7.8	3.8	14.1	21.9	17.9	60.0	50.0	38.1	32.1	N	
13.56000	38.9	21.7	14.2	53.1	35.9	60.0	50.0	6.9	14.1	N	
27.12000	5.4	0.8	14.7	20.1	15.5	60.0	50.0	39.9	34.5	N	
27.12000	4.2	0.3	14.7	18.9	15.0	60.0	50.0	41.1	35.0	N	without tag
0.20027	33.7	24.6	13.3	47.0	37.9	63.6	53.6	16.6	15.7	L	
0.26104	28.2	23.7	13.3	41.5	37.0	61.4	51.4	19.9	14.4	L	
0.47934	24.3	17.1	13.3	37.6	30.4	56.4	46.4	18.8	16.0	L	
0.52222	25.4	21.4	13.4	38.8	34.8	56.0	46.0	17.2	11.2	L	
8.61187	19.6	14.5	13.9	33.5	28.4	60.0	50.0	26.5	21.6	L	
13.56000	39.0	21.4	14.2	53.2	35.6	60.0	50.0	6.8	14.4	L	
27.12000	6.0	1.7	14.7	20.7	16.4	60.0	50.0	39.3	33.6	L	
27.12000	5.4	1.3	14.7	20.1	16.0	60.0	50.0	39.9	34.0	L	witout tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type B)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	February 22, 2018
Temperature / Humidity	21 deg. C / 33% RH
Engineer	Masafumi Niwa
Mode	Tx 13.56 MHz Type B



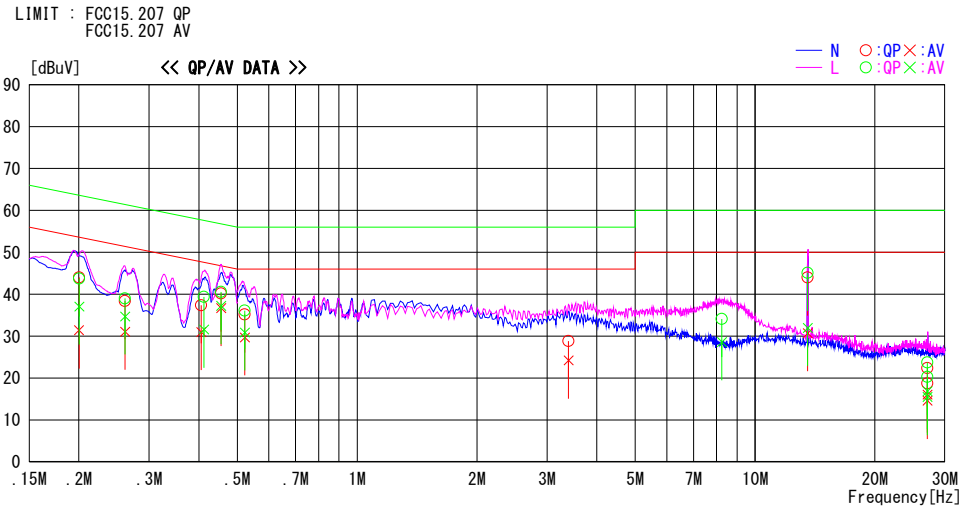
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.20010	31.8	19.7	13.3	45.1	33.0	63.6	53.6	18.5	20.6	N	
0.26099	27.3	20.4	13.3	40.6	33.7	61.4	51.4	20.8	17.7	N	
0.40613	22.7	20.1	13.3	36.0	33.4	57.7	47.7	21.7	14.3	N	
0.47908	24.6	20.1	13.3	37.9	33.4	56.4	46.4	18.5	13.0	N	
0.52158	20.3	16.9	13.4	33.7	30.3	56.0	46.0	22.4	15.7	N	
5.22750	11.5	6.9	13.8	25.3	20.7	60.0	50.0	34.7	29.3	N	
13.56000	31.6	14.4	14.2	45.8	28.6	60.0	50.0	14.2	21.4	N	
27.12000	6.2	0.2	14.7	20.9	14.9	60.0	50.0	39.1	35.1	N	
27.12000	4.4	-0.7	14.7	19.1	14.0	60.0	50.0	40.9	36.0	N	without tag
0.20028	31.3	23.7	13.3	44.6	37.0	63.6	53.6	19.0	16.6	L	
0.26093	27.6	23.3	13.3	40.9	36.6	61.4	51.4	20.5	14.8	L	
0.41224	23.8	18.7	13.3	37.1	32.0	57.6	47.6	20.5	15.6	L	
0.45469	25.8	22.9	13.3	39.1	36.2	56.8	46.8	17.7	10.6	L	
0.53403	20.8	15.7	13.4	34.2	29.1	56.0	46.0	21.8	16.9	L	
8.57884	17.9	12.4	13.9	31.8	26.3	60.0	50.0	28.2	23.7	L	
13.56000	32.5	16.0	14.2	46.7	30.2	60.0	50.0	13.3	19.8	L	
27.12000	7.8	1.5	14.7	22.5	16.2	60.0	50.0	37.5	33.8	L	
27.12000	6.3	0.3	14.7	21.0	15.0	60.0	50.0	39.0	35.0	L	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type B)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	February 22, 2018
Temperature / Humidity	21 deg. C / 33% RH
Engineer	Masafumi Niwa
Mode	Tx 13.56 MHz FeliCa 212kbps



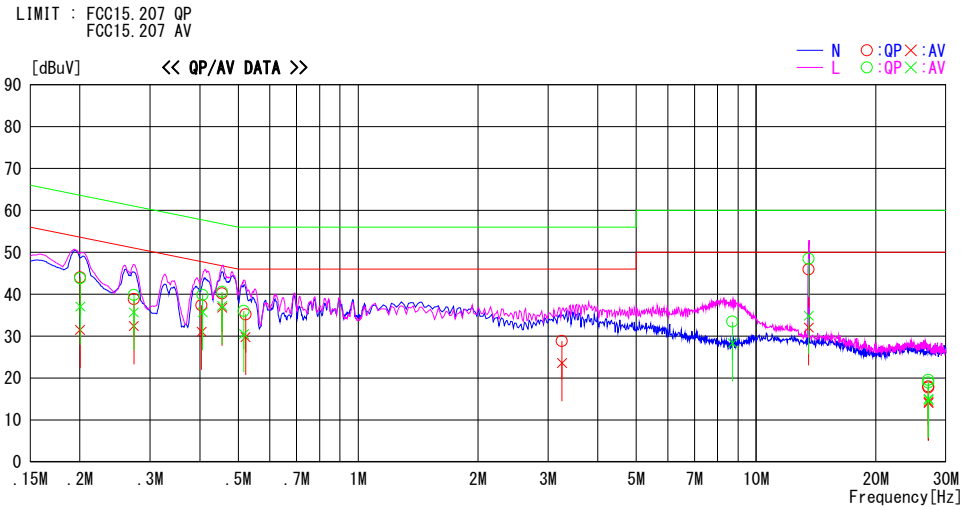
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.20014	30.7	18.1	13.3	44.0	31.4	63.6	53.6	19.6	22.2	N	
0.26097	25.1	17.8	13.3	38.4	31.1	61.4	51.4	23.0	20.3	N	
0.40609	24.1	17.7	13.3	37.4	31.0	57.7	47.7	20.3	16.7	N	
0.45539	26.9	23.4	13.3	40.2	36.7	56.8	46.8	16.6	10.1	N	
0.52175	21.8	16.3	13.4	35.2	29.7	56.0	46.0	20.8	16.3	N	
3.39919	15.2	10.6	13.6	28.8	24.2	56.0	46.0	27.2	21.8	N	
13.56000	29.8	16.5	14.2	44.0	30.7	60.0	50.0	16.0	19.3	N	
27.12000	7.7	1.4	14.7	22.4	16.1	60.0	50.0	37.6	33.9	N	
27.12000	4.0	-0.1	14.7	18.7	14.6	60.0	50.0	41.3	35.4	N	without tag
0.20032	30.4	23.8	13.3	43.7	37.1	63.6	53.6	19.9	16.5	L	
0.26094	25.7	21.4	13.3	39.0	34.7	61.4	51.4	22.4	16.7	L	
0.41213	26.1	18.3	13.3	39.4	31.6	57.6	47.6	18.2	16.0	L	
0.45517	27.3	23.9	13.3	40.6	37.2	56.8	46.8	16.2	9.6	L	
0.52189	22.7	17.5	13.4	36.1	30.9	56.0	46.0	19.9	15.1	L	
8.25521	20.2	14.7	13.9	34.1	28.6	60.0	50.0	25.9	21.4	L	
13.56000	30.9	17.8	14.2	45.1	32.0	60.0	50.0	14.9	18.0	L	
27.12000	9.0	2.2	14.7	23.7	16.9	60.0	50.0	36.3	33.1	L	
27.12000	5.6	0.8	14.7	20.3	15.5	60.0	50.0	39.7	34.5	L	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type B)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	February 22, 2018
Temperature / Humidity	21 deg. C / 33% RH
Engineer	Masafumi Niwa
Mode	Tx 13.56 MHz FeliCa 424kbps



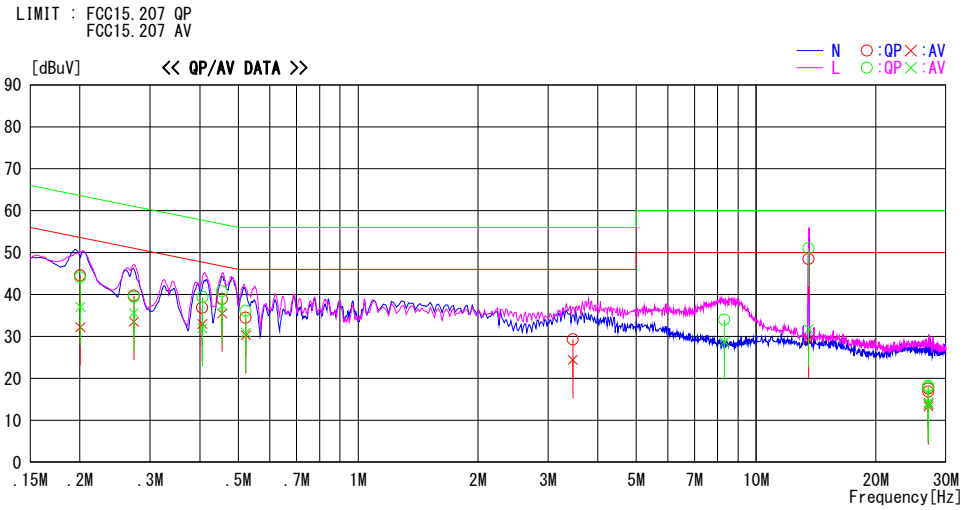
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.20012	30.7	18.2	13.3	44.0	31.5	63.6	53.6	19.6	22.1	N	
0.27310	25.5	19.1	13.3	38.8	32.4	61.0	51.0	22.2	18.6	N	
0.40425	24.1	17.8	13.3	37.4	31.1	57.8	47.8	20.4	16.7	N	
0.45517	26.9	23.5	13.3	40.2	36.8	56.8	46.8	16.6	10.0	N	
0.52171	21.8	16.4	13.4	35.2	29.8	56.0	46.0	20.8	16.2	N	
3.25384	15.2	10.0	13.6	28.8	23.6	56.0	46.0	27.2	22.4	N	
13.56000	31.7	17.9	14.2	45.9	32.1	60.0	50.0	14.1	17.9	N	
27.12000	3.3	-0.4	14.7	18.0	14.3	60.0	50.0	42.0	35.7	N	
27.12000	3.0	-0.6	14.7	17.7	14.1	60.0	50.0	42.3	35.9	N	without tag
0.20027	30.5	23.8	13.3	43.8	37.1	63.6	53.6	19.8	16.5	L	
0.27307	26.5	22.4	13.3	39.8	35.7	61.0	51.0	21.2	15.3	L	
0.40701	26.5	22.4	13.3	39.8	35.7	57.7	47.7	17.9	12.0	L	
0.45513	27.3	23.9	13.3	40.6	37.2	56.8	46.8	16.2	9.6	L	
0.51625	22.6	17.1	13.4	36.0	30.5	56.0	46.0	20.0	15.5	L	
8.71639	19.6	14.4	13.9	33.5	28.3	60.0	50.0	26.5	21.7	L	
13.56000	34.3	20.7	14.2	48.5	34.9	60.0	50.0	11.5	15.1	L	
27.12000	4.9	0.4	14.7	19.6	15.1	60.0	50.0	40.4	34.9	L	
27.12000	4.2	0.1	14.7	18.9	14.8	60.0	50.0	41.1	35.2	L	without tag

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

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted emission
(Cradle Type B)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	February 22, 2018
Temperature / Humidity	21 deg. C / 33% RH
Engineer	Masafumi Niwa
Mode	Tx 13.56 MHz ISO 15693



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.20024	31.3	18.9	13.3	44.6	32.2	63.6	53.6	19.0	21.4	N	
0.27309	26.4	20.2	13.3	39.7	33.5	61.0	51.0	21.3	17.5	N	
0.40613	23.5	19.7	13.3	36.8	33.0	57.7	47.7	20.9	14.7	N	
0.45531	25.6	22.2	13.3	38.9	35.5	56.8	46.8	17.9	11.3	N	
0.52197	21.1	16.9	13.4	34.5	30.3	56.0	46.0	21.5	15.7	N	
3.46182	15.7	10.8	13.6	29.3	24.4	56.0	46.0	26.7	21.6	N	
13.56000	34.3	15.0	14.2	48.5	29.2	60.0	50.0	11.5	20.8	N	
27.12000	2.9	-0.8	14.7	17.6	13.9	60.0	50.0	42.4	36.1	N	
27.12000	2.1	-1.4	14.7	16.8	13.3	60.0	50.0	43.2	36.7	N	without tag
0.20024	30.8	23.8	13.3	44.1	37.1	63.6	53.6	19.5	16.5	L	
0.27316	26.2	22.3	13.3	39.5	35.6	61.0	51.0	21.5	15.4	L	
0.40645	26.1	18.7	13.3	39.4	32.0	57.7	47.7	18.3	15.7	L	
0.45523	27.4	24.0	13.3	40.7	37.3	56.8	46.8	16.1	9.5	L	
0.52194	22.7	17.5	13.4	36.1	30.9	56.0	46.0	19.9	15.1	L	
8.32199	20.1	14.8	13.9	34.0	28.7	60.0	50.0	26.0	21.3	L	
13.56000	36.8	17.6	14.2	51.0	31.8	60.0	50.0	9.0	18.2	L	
27.12000	3.5	-0.5	14.7	18.2	14.2	60.0	50.0	41.8	35.8	L	
27.12000	3.1	-0.8	14.7	17.8	13.9	60.0	50.0	42.2	36.1	L	without tag

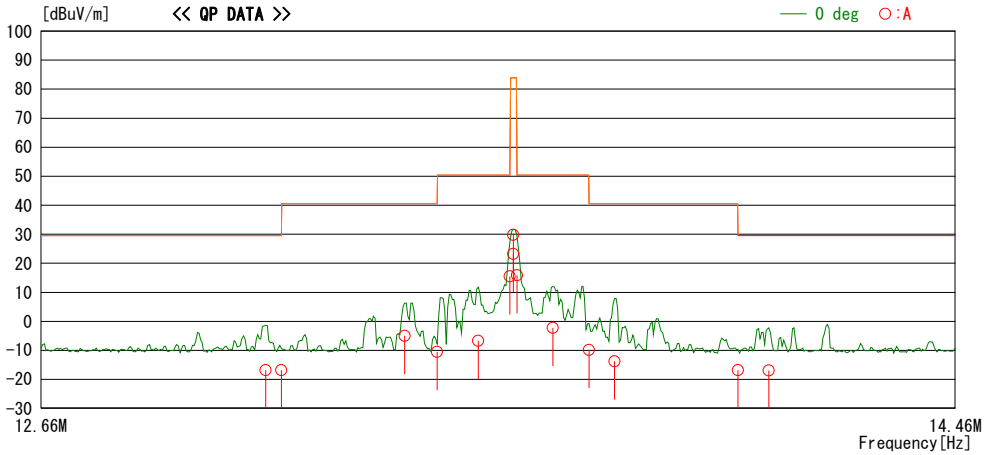
CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE + ATT)
Except for the above table: adequate margin data below the limits.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Fundamental emission and Spectrum Mask

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz Type A without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
13.08004	29.1	QP	19.6	-33.3	32.3	-16.9	29.5	46.4	0	A	100	
13.11000	29.2	QP	19.6	-33.3	32.3	-16.8	29.5	46.3	0	A	100	
13.34706	41.0	QP	19.6	-33.3	32.3	-5.0	40.5	45.5	0	A	100	
13.41000	35.4	QP	19.6	-33.3	32.3	-10.6	40.5	51.1	0	A	100	
13.49107	39.2	QP	19.6	-33.3	32.3	-6.8	50.4	57.2	0	A	100	
13.55300	61.4	QP	19.6	-33.3	32.3	15.4	50.4	35.0	0	A	100	
13.56000	75.7	QP	19.6	-33.3	32.3	29.7	83.9	54.2	0	A	100	
13.56000	69.2	QP	19.6	-33.3	32.3	23.2	83.9	60.7	0	A	100	with tag
13.56700	61.9	QP	19.6	-33.3	32.3	15.9	50.4	34.5	0	A	100	
13.63808	43.7	QP	19.6	-33.3	32.3	-2.3	50.4	52.7	0	A	100	
13.71000	36.1	QP	19.6	-33.3	32.3	-9.9	40.5	50.4	0	A	100	
13.76110	32.3	QP	19.5	-33.3	32.3	-13.8	40.5	54.3	0	A	100	
14.01000	29.2	QP	19.5	-33.3	32.3	-16.9	29.5	46.4	0	A	100	
14.07312	29.1	QP	19.5	-33.3	32.3	-17.0	29.5	46.5	0	A	100	

Result of the fundamental emission at 3 m without Distance factor

QP

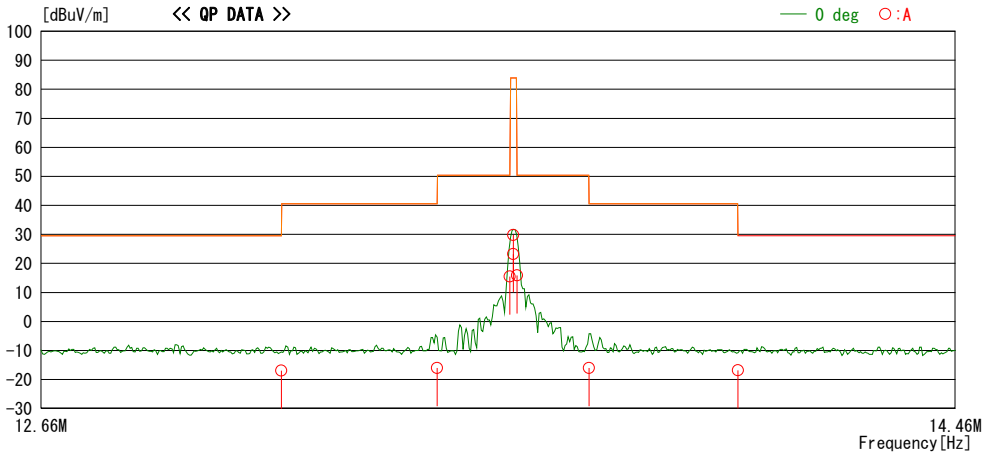
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0	13.56000	QP	75.7	19.6	6.7	32.3	-	69.7	-	-	Fundamental

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

Fundamental emission and Spectrum Mask

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz Type B without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
13.11000	29.0	QP	19.6	-33.3	32.3	-17.0	29.5	46.5	0	A	105	
13.41000	29.9	QP	19.6	-33.3	32.3	-16.1	40.5	56.6	0	A	105	
13.55300	61.5	QP	19.6	-33.3	32.3	15.5	50.4	34.9	0	A	105	
13.56000	75.7	QP	19.6	-33.3	32.3	29.7	83.9	54.2	0	A	105	
13.56000	69.2	QP	19.6	-33.3	32.3	23.2	83.9	60.7	0	A	105	with tag
13.56700	61.9	QP	19.6	-33.3	32.3	15.9	50.4	34.5	0	A	105	
13.71000	30.0	QP	19.6	-33.3	32.3	-16.0	40.5	56.5	0	A	105	
14.01000	29.2	QP	19.5	-33.3	32.3	-16.9	29.5	46.4	0	A	105	

Result of the fundamental emission at 3 m without Distance factor

QP

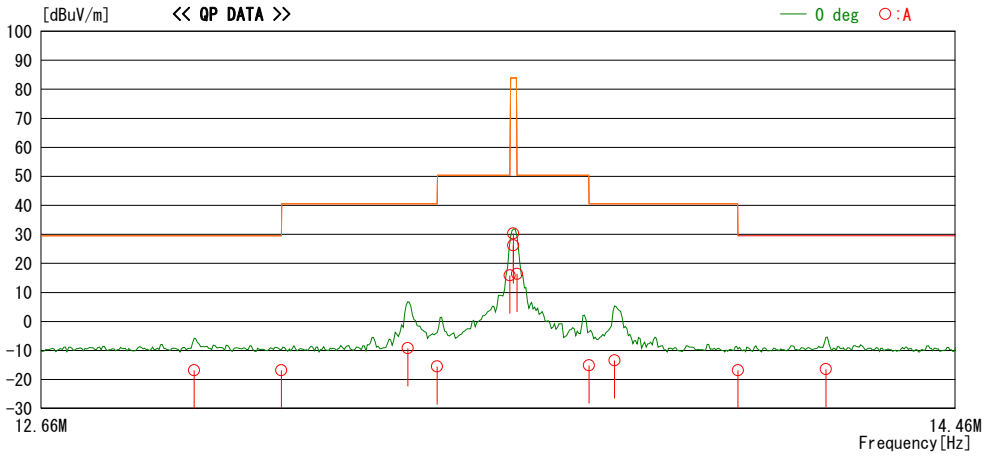
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0	13.56000	QP	75.7	19.6	6.7	32.3	-	69.7	-	-	Fundamental

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

Fundamental emission and Spectrum Mask

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz FeliCa 212 kbps without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
12.94502	29.1	QP	19.6	-33.3	32.3	-16.9	29.5	46.4	0	A	100	
13.11000	29.2	QP	19.6	-33.3	32.3	-16.8	29.5	46.3	0	A	100	
13.35306	36.8	QP	19.6	-33.3	32.3	-9.2	40.5	49.7	0	A	100	
13.41000	30.5	QP	19.6	-33.3	32.3	-15.5	40.5	56.0	0	A	100	
13.55300	61.8	QP	19.6	-33.3	32.3	15.8	50.4	34.6	0	A	100	
13.56000	76.3	QP	19.6	-33.3	32.3	30.3	83.9	53.6	0	A	100	
13.56000	72.2	QP	19.6	-33.3	32.3	26.2	83.9	57.7	0	A	100	with tag
13.56700	62.4	QP	19.6	-33.3	32.3	16.4	50.4	34.0	0	A	100	
13.71000	30.9	QP	19.6	-33.3	32.3	-15.1	40.5	55.6	0	A	100	
13.76110	32.7	QP	19.5	-33.3	32.3	-13.4	40.5	53.9	0	A	100	
14.01000	29.2	QP	19.5	-33.3	32.3	-16.9	29.5	46.4	0	A	100	
14.19013	29.6	QP	19.5	-33.3	32.3	-16.5	29.5	46.0	0	A	100	

Result of the fundamental emission at 3 m without Distance factor

QP

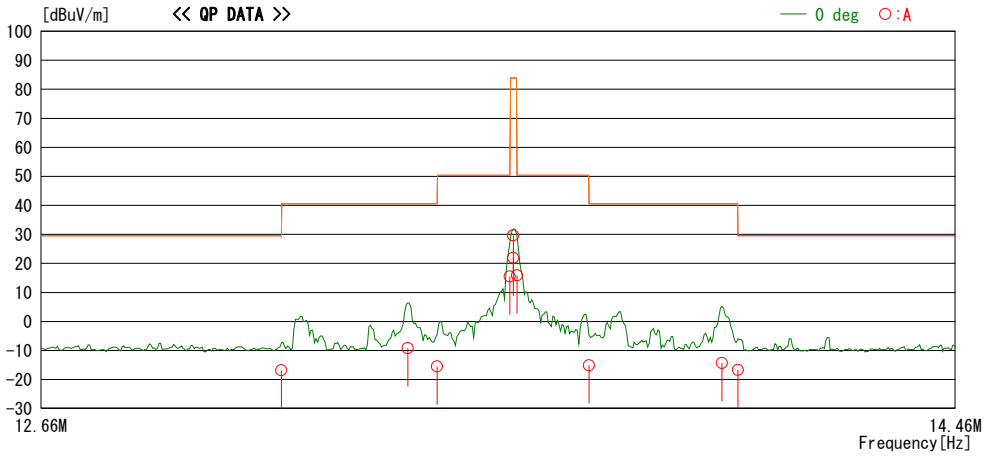
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0	13.56000	QP	76.3	19.6	6.7	32.3	-	70.3	-	-	Fundamental

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

Fundamental emission and Spectrum Mask

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz FeliCa 424 kbps without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
13.11000	29.2	QP	19.6	-33.3	32.3	-16.8	29.5	46.3	0	A	100	
13.35306	36.7	QP	19.6	-33.3	32.3	-9.3	40.5	49.8	0	A	100	
13.41000	30.5	QP	19.6	-33.3	32.3	-15.5	40.5	56.0	0	A	100	
13.55300	61.5	QP	19.6	-33.3	32.3	15.5	50.4	34.9	0	A	100	
13.56000	75.6	QP	19.6	-33.3	32.3	29.6	83.9	54.3	0	A	100	
13.56000	67.9	QP	19.6	-33.3	32.3	21.9	83.9	62.0	0	A	100	with tag
13.56700	61.9	QP	19.6	-33.3	32.3	15.9	50.4	34.5	0	A	100	
13.71000	30.9	QP	19.6	-33.3	32.3	-15.1	40.5	55.6	0	A	100	
13.97711	31.8	QP	19.5	-33.3	32.3	-14.3	40.5	54.8	0	A	100	
14.01000	29.4	QP	19.5	-33.3	32.3	-16.7	29.5	46.2	0	A	100	

Result of the fundamental emission at 3 m without Distance factor

QP

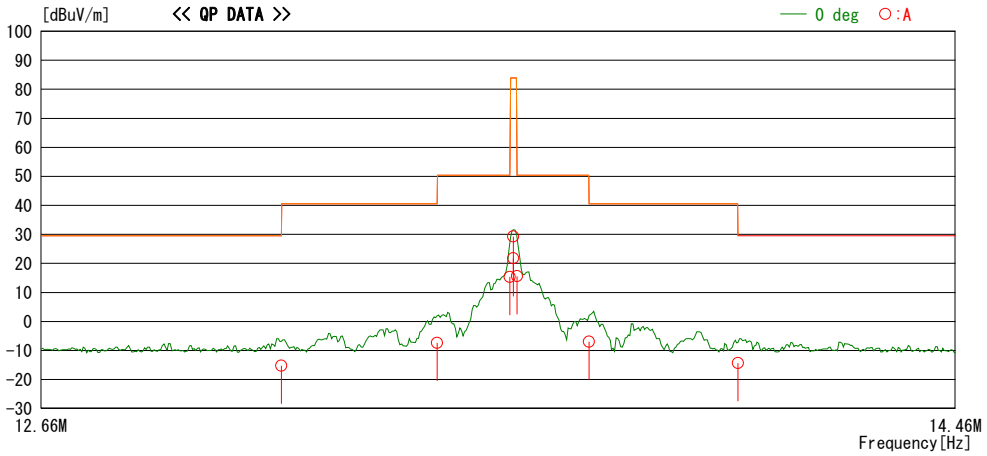
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0	13.56000	QP	75.6	19.6	6.7	32.3	-	69.6	-	-	Fundamental

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

Fundamental emission and Spectrum Mask

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56% RH
Engineer	Takumi Shimada
Mode	Tx 13.56 MHz ISO 15693 without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
13.11000	30.7	QP	19.6	-33.3	32.3	-15.3	29.5	44.8	0	A	105	
13.41000	38.6	QP	19.6	-33.3	32.3	-7.4	40.5	47.9	0	A	105	
13.55300	61.3	QP	19.6	-33.3	32.3	15.3	50.4	35.1	0	A	105	
13.56000	75.2	QP	19.6	-33.3	32.3	29.2	83.9	54.7	0	A	105	
13.56000	67.8	QP	19.6	-33.3	32.3	21.8	83.9	62.1	0	A	105	with tag
13.56700	61.6	QP	19.6	-33.3	32.3	15.6	50.4	34.8	0	A	105	
13.71000	39.0	QP	19.6	-33.3	32.3	-7.0	40.5	47.5	0	A	105	
14.01000	31.8	QP	19.5	-33.3	32.3	-14.3	29.5	43.8	0	A	105	

Result of the fundamental emission at 3 m without Distance factor

QP

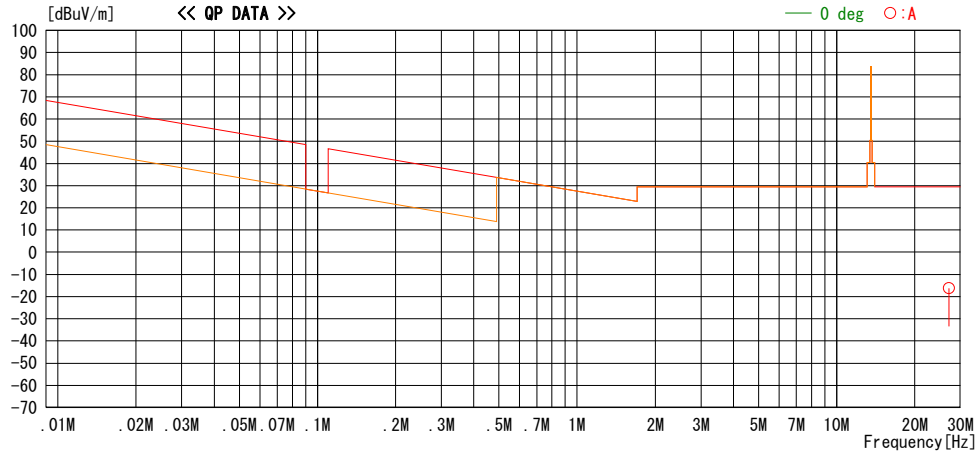
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0	13.56000	QP	75.2	19.6	6.7	32.3	-	69.2	-	-	Fundamental

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

Spurious emission (Below 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz Type A without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



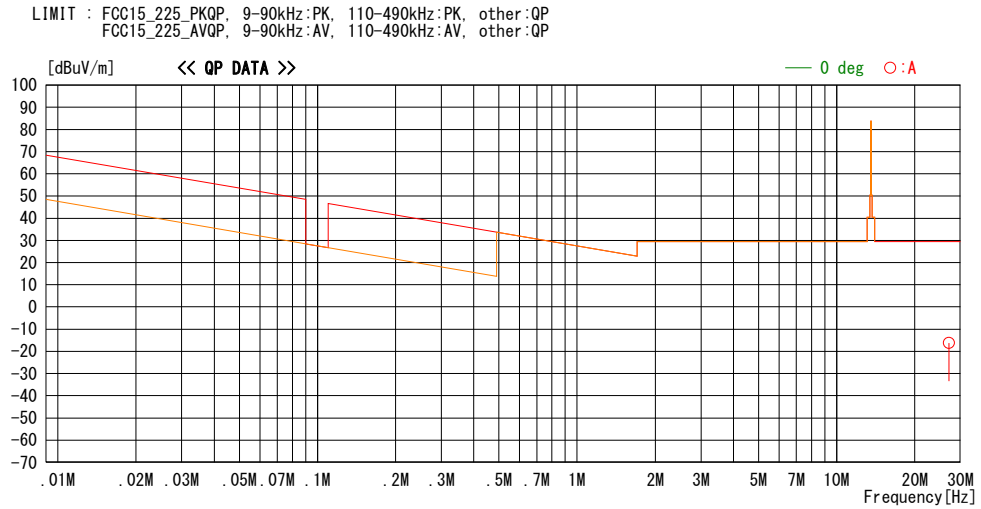
Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
27.12000	28.6	QP	20.4	-33.1	32.2	-16.3	29.5	45.8	0	A	0	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC,
1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Below 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz Type B without tag



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
27.12000	28.7	QP	20.4	-33.1	32.2	-16.2	29.5	45.7	0	A	105	

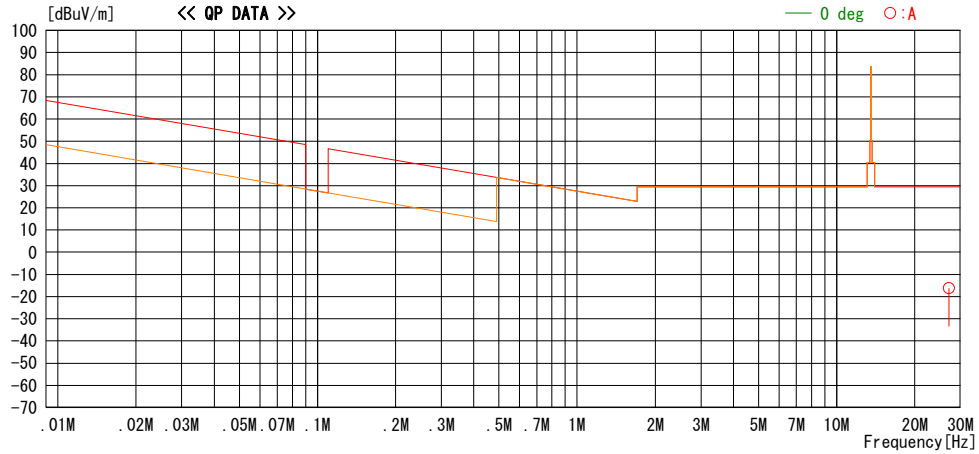
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC,
1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Below 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz FeliCa 212kbps without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
27.12000	28.7	QP	20.4	-33.1	32.2	-16.2	29.5	45.7	0	A	100	

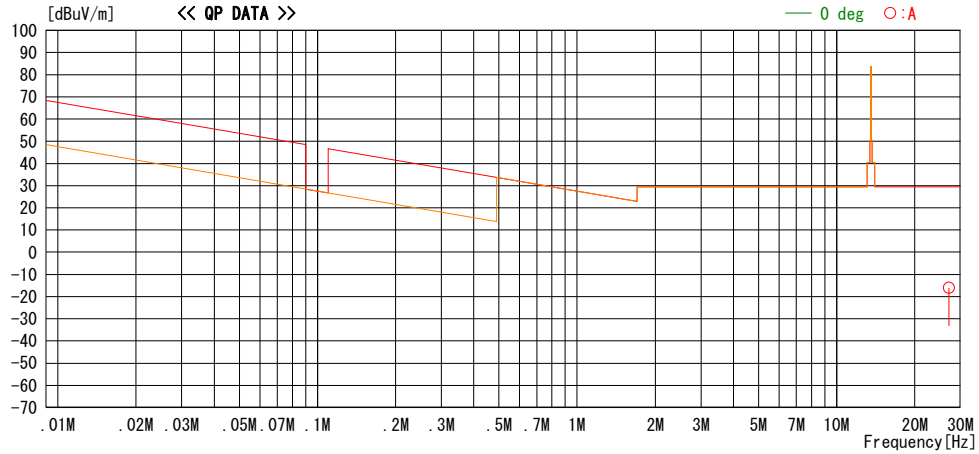
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC,
1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Below 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz FeliCa 424kbps without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
27.12000	28.8	QP	20.4	-33.1	32.2	-16.1	29.5	45.6	0	A	100	

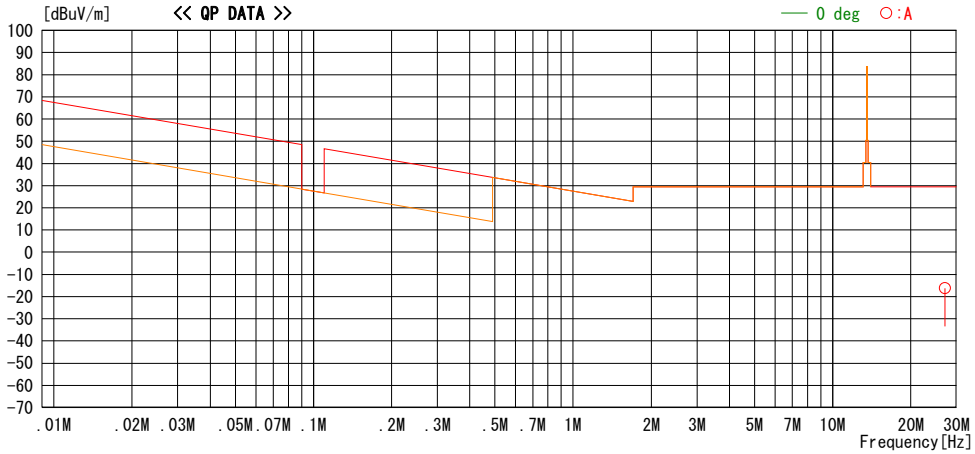
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC,
1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Below 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz ISO 15693 without tag

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



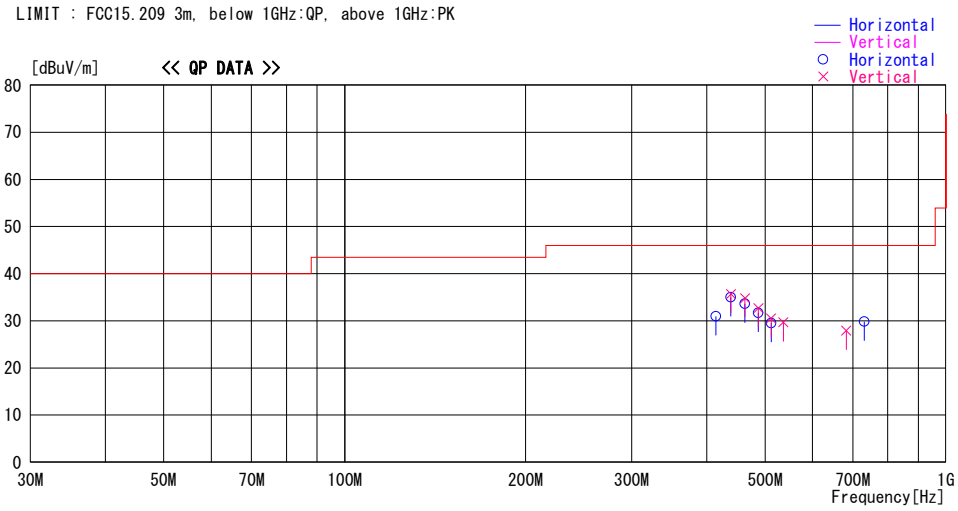
Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna [deg]		Table [deg]	Comment
27.12000	28.7	QP	20.4	-33.1	32.2	-16.2	29.5	45.7	0	A	105	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Above 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 9, 2017
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Yuta Moriya
	(Below 1 GHz)
Mode	Tx 13.56 MHz Type A



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
414.478	36.2	QP	16.0	-21.2	31.0	265	100	Hori.	46.0	15.0	
438.859	39.5	QP	16.5	-21.0	35.0	265	100	Hori.	46.0	11.0	
438.859	40.2	QP	16.5	-21.0	35.7	332	123	Vert.	46.0	10.3	
463.235	38.7	QP	17.0	-20.9	34.8	353	107	Vert.	46.0	11.2	
463.241	37.5	QP	17.0	-20.9	33.6	263	208	Hori.	46.0	12.4	
487.615	35.0	QP	17.4	-20.7	31.7	269	191	Hori.	46.0	14.3	
487.613	36.0	QP	17.4	-20.7	32.7	350	108	Vert.	46.0	13.3	
511.997	33.3	QP	17.8	-20.6	30.5	0	100	Vert.	46.0	15.5	
536.390	31.9	QP	18.2	-20.4	29.7	351	100	Vert.	46.0	16.3	
682.650	28.0	QP	19.6	-19.7	27.9	15	160	Vert.	46.0	18.1	
731.435	29.1	QP	20.0	-19.3	29.8	101	114	Hori.	46.0	16.2	
511.997	32.3	QP	17.8	-20.6	29.5	269	176	Hori.	46.0	16.5	

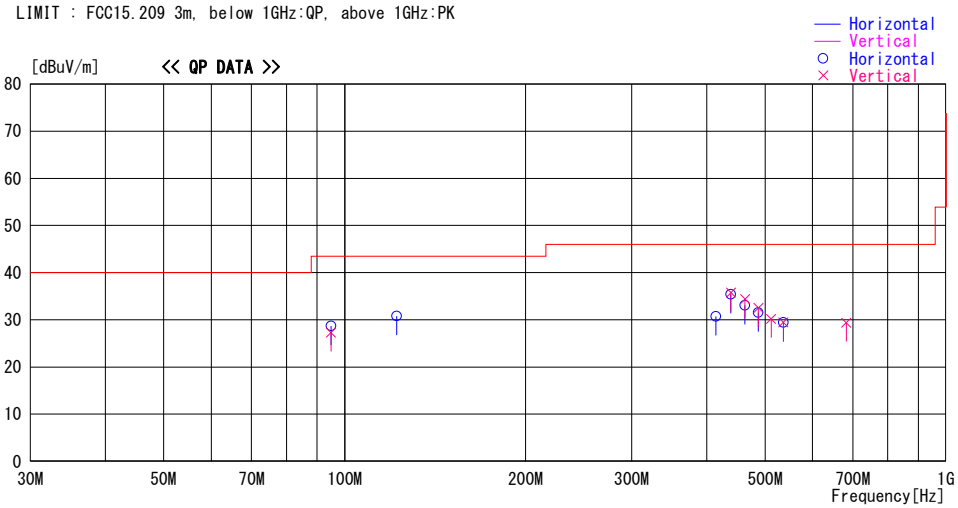
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Above 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 9, 2017
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Yuta Moriya
	(Below 1 GHz)
Mode	Tx 13.56 MHz Type B



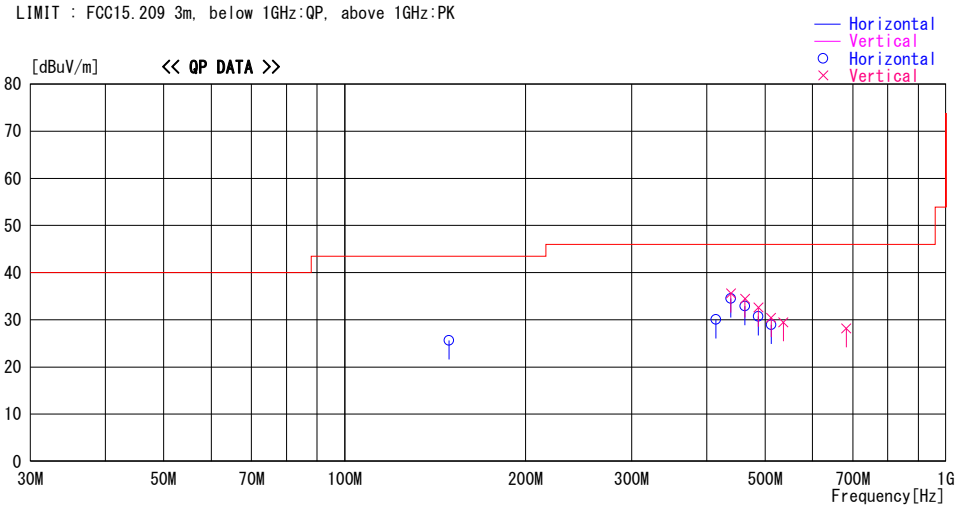
Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
94.919	42.3	QP	9.1	-24.1	27.3	254	100	Vert.	43.5	16.2	
94.919	43.7	QP	9.1	-24.1	28.7	167	181	Hori.	43.5	14.8	
122.052	41.5	QP	13.1	-23.8	30.8	150	138	Hori.	43.5	12.7	
414.470	35.9	QP	16.0	-21.2	30.7	272	100	Hori.	46.0	15.3	
438.855	39.9	QP	16.5	-21.0	35.4	267	100	Hori.	46.0	10.6	
438.861	40.3	QP	16.5	-21.0	35.8	353	122	Vert.	46.0	10.2	
463.244	38.3	QP	17.0	-20.9	34.4	351	113	Vert.	46.0	11.6	
463.249	37.0	QP	17.0	-20.9	33.1	261	209	Hori.	46.0	12.9	
487.608	34.8	QP	17.4	-20.7	31.5	273	191	Hori.	46.0	14.5	
487.612	35.8	QP	17.4	-20.7	32.5	336	110	Vert.	46.0	13.5	
512.006	33.0	QP	17.8	-20.6	30.2	347	100	Vert.	46.0	15.8	
536.372	31.6	QP	18.2	-20.4	29.4	271	163	Hori.	46.0	16.6	
536.378	31.7	QP	18.2	-20.4	29.5	348	100	Vert.	46.0	16.5	
682.667	29.5	QP	19.6	-19.7	29.4	314	151	Vert.	46.0	16.6	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Above 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 9, 2017
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Yuta Moriya
	(Below 1 GHz)
Mode	Tx 13.56 MHz FeliCa 212 kbps



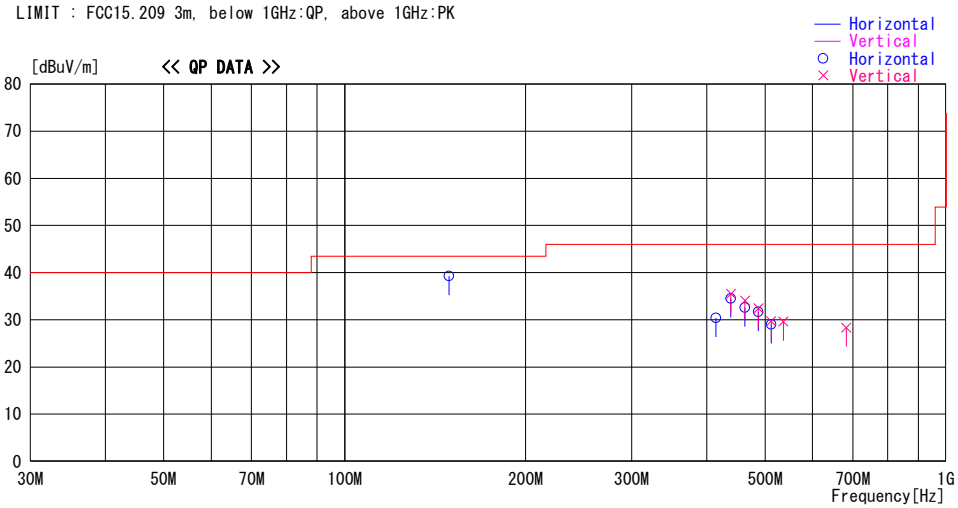
Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
149.155	34.2	QP	14.8	-23.4	25.6	247	129	Hori.	43.5	17.9	
414.492	35.3	QP	16.0	-21.2	30.1	267	100	Hori.	46.0	15.9	
438.849	40.1	QP	16.5	-21.0	35.6	304	124	Vert.	46.0	10.4	
438.875	39.0	QP	16.5	-21.0	34.5	282	100	Hori.	46.0	11.5	
463.235	38.4	QP	17.0	-20.9	34.5	354	115	Vert.	46.0	11.5	
463.248	36.8	QP	17.0	-20.9	32.9	260	205	Hori.	46.0	13.1	
487.596	34.0	QP	17.4	-20.7	30.7	270	190	Hori.	46.0	15.3	
487.628	35.9	QP	17.4	-20.7	32.6	340	102	Vert.	46.0	13.4	
511.997	33.2	QP	17.8	-20.6	30.4	327	100	Vert.	46.0	15.6	
512.006	31.7	QP	17.8	-20.6	28.9	254	178	Hori.	46.0	17.1	
536.369	31.7	QP	18.2	-20.4	29.5	351	100	Vert.	46.0	16.5	
682.661	28.3	QP	19.6	-19.7	28.2	300	161	Vert.	46.0	17.8	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Above 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 9, 2017
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Yuta Moriya
	(Below 1 GHz)
Mode	Tx 13.56 MHz FeliCa 424 kbps



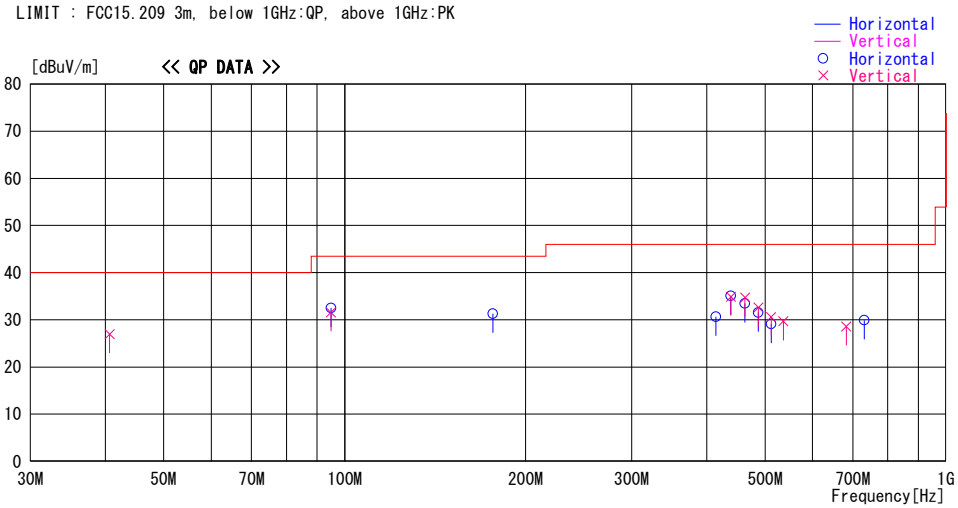
Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
149.154	47.9	QP	14.8	-23.4	39.3	285	218	Hori.	43.5	4.2	
414.476	35.6	QP	16.0	-21.2	30.4	249	100	Hori.	46.0	15.6	
438.856	40.0	QP	16.5	-21.0	35.5	311	125	Vert.	46.0	10.5	
438.855	39.0	QP	16.5	-21.0	34.5	270	100	Hori.	46.0	11.5	
463.222	38.0	QP	17.0	-20.9	34.1	355	107	Vert.	46.0	11.9	
463.231	36.5	QP	17.0	-20.9	32.6	275	100	Hori.	46.0	13.4	
487.616	35.0	QP	17.4	-20.7	31.7	255	189	Hori.	46.0	14.3	
487.609	35.8	QP	17.4	-20.7	32.5	335	104	Vert.	46.0	13.5	
512.014	32.5	QP	17.8	-20.6	29.7	302	100	Vert.	46.0	16.3	
511.991	31.8	QP	17.8	-20.6	29.0	274	178	Hori.	46.0	17.0	
536.381	31.8	QP	18.2	-20.4	29.6	329	100	Vert.	46.0	16.4	
682.660	28.4	QP	19.6	-19.7	28.3	300	164	Vert.	46.0	17.7	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Spurious emission (Above 30MHz)

Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 9, 2017
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Yuta Moriya
	(Below 1 GHz)
Mode	Tx 13.56 MHz ISO 15693



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
414.475	35.8	QP	16.0	-21.2	30.6	265	100	Hori.	46.0	15.4	
438.857	39.6	QP	16.5	-21.0	35.1	96	100	Hori.	46.0	10.9	
438.859	39.4	QP	16.5	-21.0	34.9	201	122	Vert.	46.0	11.1	
463.237	38.6	QP	17.0	-20.9	34.7	353	111	Vert.	46.0	11.3	
463.240	37.4	QP	17.0	-20.9	33.5	259	209	Hori.	46.0	12.5	
487.613	34.8	QP	17.4	-20.7	31.5	253	188	Hori.	46.0	14.5	
487.627	35.9	QP	17.4	-20.7	32.6	352	104	Vert.	46.0	13.4	
511.997	33.4	QP	17.8	-20.6	30.6	344	100	Vert.	46.0	15.4	
536.381	31.9	QP	18.2	-20.4	29.7	348	100	Vert.	46.0	16.3	
682.667	28.7	QP	19.6	-19.7	28.6	314	151	Vert.	46.0	17.4	
731.438	29.2	QP	20.0	-19.3	29.9	86	116	Hori.	46.0	16.1	
512.007	31.9	QP	17.8	-20.6	29.1	274	182	Hori.	46.0	16.9	
40.669	37.8	QP	14.1	-24.9	27.0	82	100	Vert.	40.0	13.0	
94.920	46.6	QP	9.1	-24.1	31.6	255	100	Vert.	43.5	11.9	
94.912	47.5	QP	9.1	-24.1	32.5	89	181	Hori.	43.5	11.0	
176.288	38.2	QP	16.2	-23.1	31.3	271	189	Hori.	43.5	12.2	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

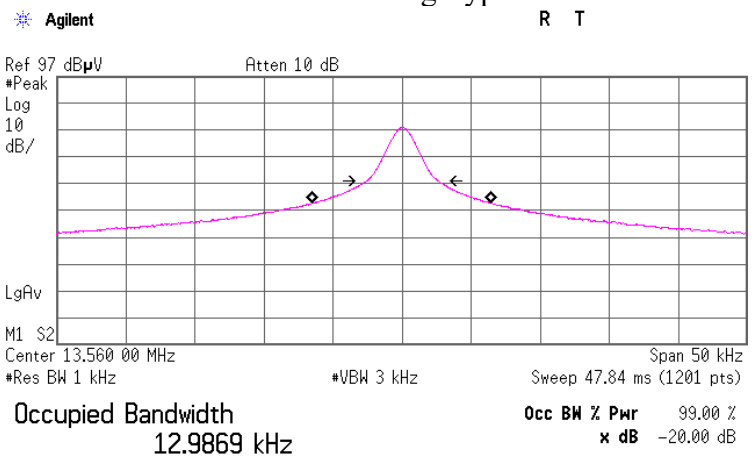
*The test result is rounded off to one or two decimal places, so some differences might be observed.

20dB Bandwidth and 99% Occupied Bandwidth

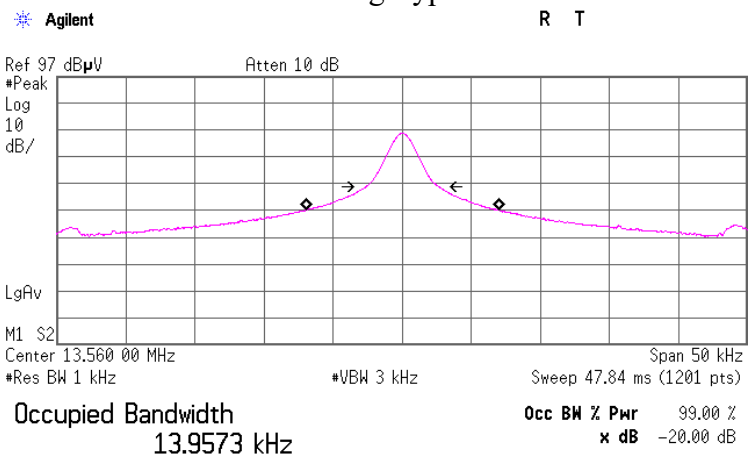
Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz Type A

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	5.27	12.99
	With Tag	5.31	13.96

Without Tag Type A



With Tag Type A

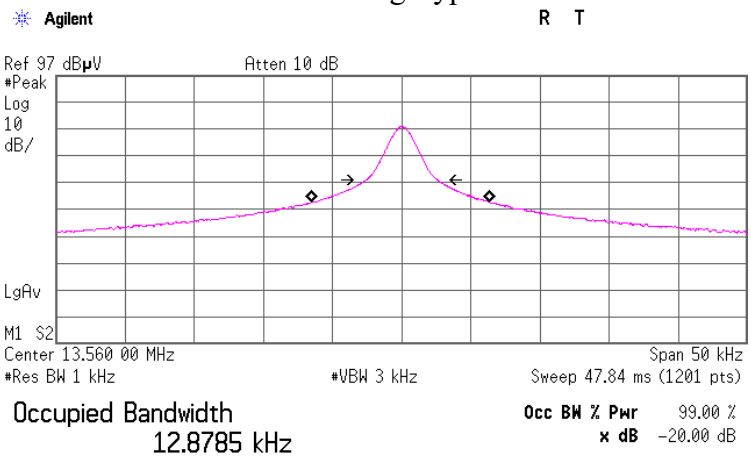


20dB Bandwidth and 99% Occupied Bandwidth

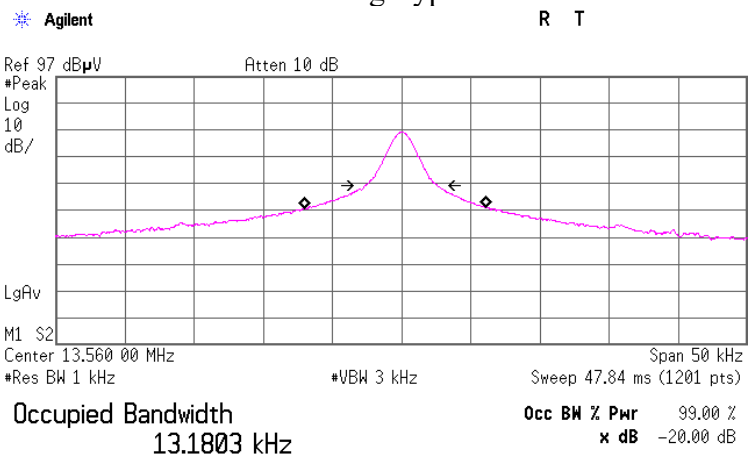
Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz Type B

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	5.27	12.88
	With Tag	5.24	13.18

Without Tag Type B



With Tag Type B

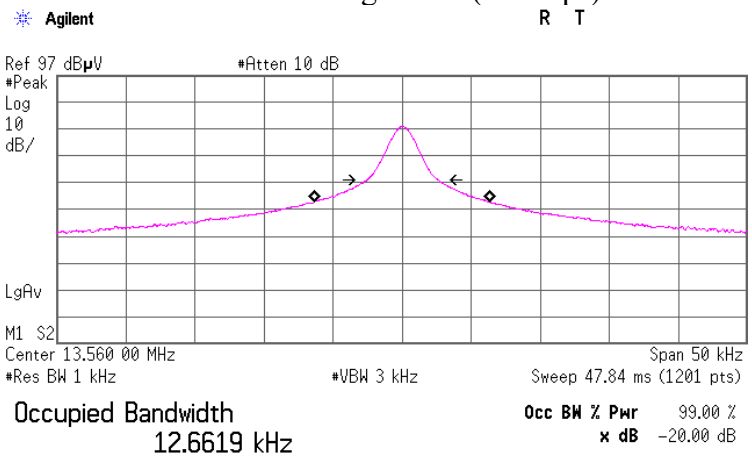


20dB Bandwidth and 99% Occupied Bandwidth

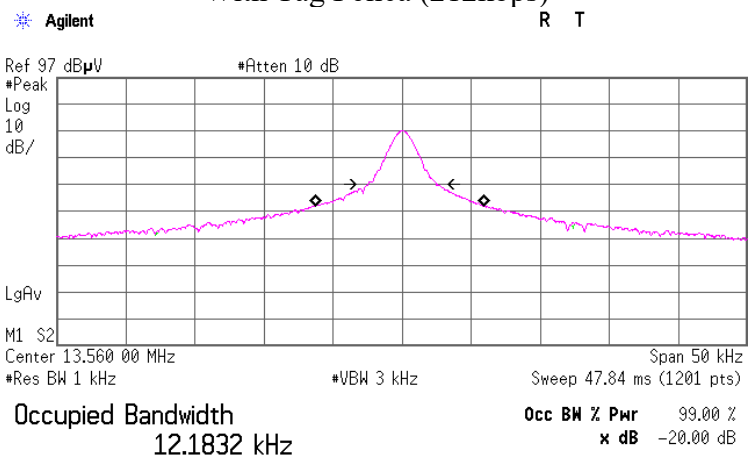
Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada (Below 30 MHz)
Mode	Tx 13.56 MHz FeliCa 212 kbps

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	5.23	12.66
	With Tag	4.95	12.18

Without Tag Felica (212kbps)



With Tag Felica (212kbps)

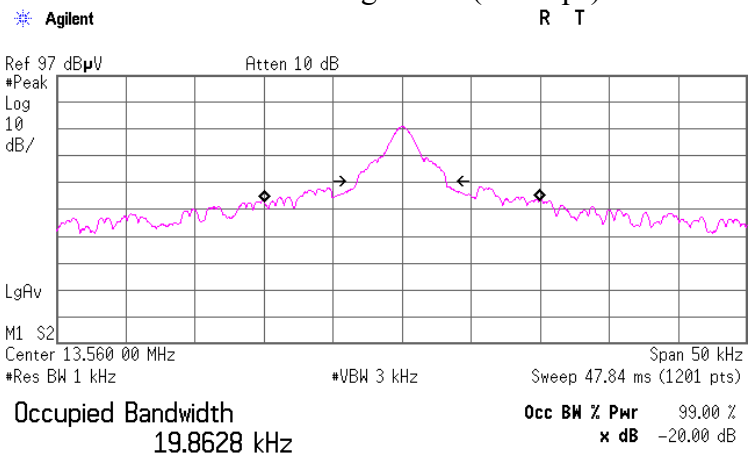


20dB Bandwidth and 99% Occupied Bandwidth

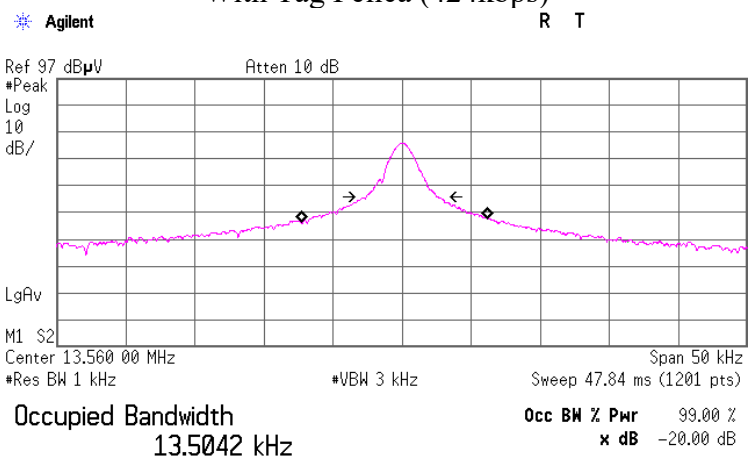
Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada
	(Below 30 MHz)
Mode	Tx 13.56 MHz FeliCa 424 kbps

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	6.40	19.86
	With Tag	5.21	13.50

Without Tag Felica (424kbps)



With Tag Felica (424kbps)

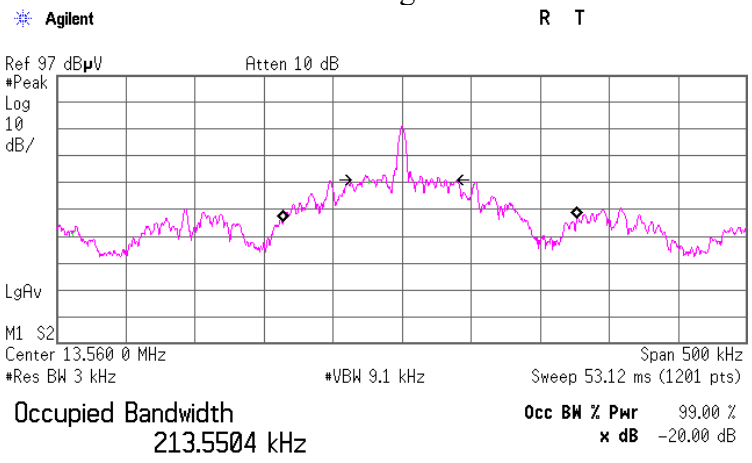


20dB Bandwidth and 99% Occupied Bandwidth

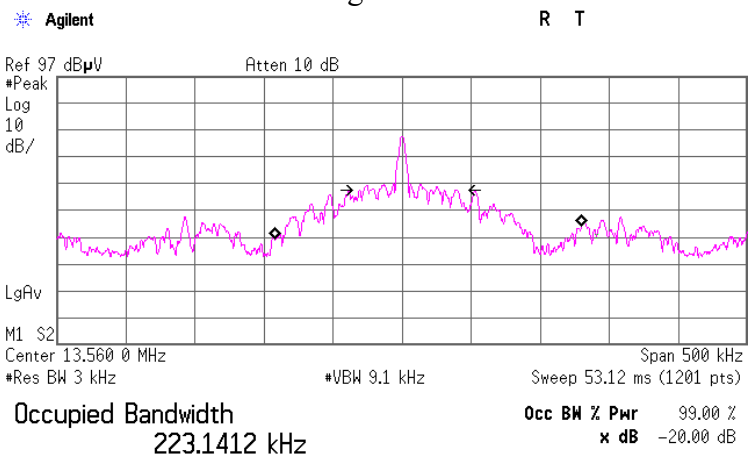
Report No.	12007721H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	November 8, 2017
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Takumi Shimada (Below 30 MHz)
Mode	Tx 13.56 MHz ISO 15693

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	60.48	213.55
	With Tag	67.63	223.14

Without Tag ISO 15693



With Tag ISO 15693



Frequency Tolerance

Test place	Ise EMC Lab. No.11 measurement room	
Report No.	12007721H	
Date	October 31, 2017	March 2, 2018
Temperature/ Humidity	24 deg. C / 26 % RH	22 deg. C / 31 % RH
Engineer	Yuta Moriya	Shuichi Ohyama
Mode	Tx Mod off	

Battery Input (3.7 V)

Test condition		Tested	Measured	Frequency	Result		Limit
Temp.	Voltage	timing	frequency	error			
[deg. C]	[V]		[MHz]	[MHz]	[%]	[ppm]	[+/- %]
50	3.7	Power on	13.560014	0.000014	0.00010	1.0	0.01
		+ 2 min.	13.560014	0.000014	0.00010	1.0	0.01
		+ 5 min.	13.560014	0.000014	0.00011	1.1	0.01
		+ 10 min.	13.560015	0.000014	0.00011	1.1	0.01
40	3.7	Power on	13.560012	0.000011	0.00008	0.8	0.01
		+ 2 min.	13.560012	0.000012	0.00009	0.9	0.01
		+ 5 min.	13.560012	0.000012	0.00009	0.9	0.01
		+ 10 min.	13.560012	0.000012	0.00009	0.9	0.01
30	3.7	Power on	13.560025	0.000025	0.00019	1.9	0.01
		+ 2 min.	13.560025	0.000025	0.00019	1.9	0.01
		+ 5 min.	13.560026	0.000026	0.00019	1.9	0.01
		+ 10 min.	13.560026	0.000026	0.00019	1.9	0.01
20	3.7	Power on	13.560052	0.000052	0.00038	3.8	0.01
		+ 2 min.	13.560053	0.000053	0.00039	3.9	0.01
		+ 5 min.	13.560053	0.000053	0.00039	3.9	0.01
		+ 10 min.	13.560054	0.000053	0.00039	3.9	0.01
20	3.145	Power on	13.560123	0.000123	0.00091	9.1	0.01
	(3.7V -15%)	+ 2 min.	13.560109	0.000109	0.00080	8.0	0.01
		+ 5 min.	13.560088	0.000088	0.00065	6.5	0.01
		+ 10 min.	13.560079	0.000079	0.00058	5.8	0.01
20	4.255	Power on	13.560085	0.000085	0.00063	6.3	0.01
	(3.7V +15%)	+ 2 min.	13.560084	0.000084	0.00062	6.2	0.01
		+ 5 min.	13.560073	0.000073	0.00054	5.4	0.01
		+ 10 min.	13.560073	0.000073	0.00054	5.4	0.01
10	3.7	Power on	13.560089	0.000089	0.00065	6.5	0.01
		+ 2 min.	13.560089	0.000089	0.00065	6.5	0.01
		+ 5 min.	13.560089	0.000089	0.00065	6.5	0.01
		+ 10 min.	13.560089	0.000089	0.00066	6.6	0.01
0	3.7	Power on	13.560120	0.000120	0.00088	8.8	0.01
		+ 2 min.	13.560120	0.000120	0.00088	8.8	0.01
		+ 5 min.	13.560120	0.000120	0.00088	8.8	0.01
		+ 10 min.	13.560120	0.000120	0.00088	8.8	0.01
-10	3.7	Power on	13.560148	0.000148	0.00109	10.9	0.01
		+ 2 min.	13.560148	0.000148	0.00109	10.9	0.01
		+ 5 min.	13.560148	0.000148	0.00109	10.9	0.01
		+ 10 min.	13.560148	0.000148	0.00109	10.9	0.01
-20	3.7	Power on	13.560152	0.000151	0.00112	11.2	0.01
		+ 2 min.	13.560151	0.000151	0.00111	11.1	0.01
		+ 5 min.	13.560151	0.000151	0.00112	11.2	0.01
		+ 10 min.	13.560151	0.000151	0.00112	11.2	0.01
-30	3.7	Power on	13.560135	0.000135	0.00100	10.0	0.01
		+ 2 min.	13.560135	0.000135	0.00100	10.0	0.01
		+ 5 min.	13.560135	0.000134	0.00099	9.9	0.01
		+ 10 min.	13.560134	0.000133	0.00098	9.8	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.

Frequency Tolerance

Test place	Ise EMC Lab. No.11 measurement room
Report No.	12007721H
Date	March 2, 2018
Temperature/ Humidity	22 deg. C / 31 % RH
Engineer	Shuichi Ohyama
Mode	Tx Mod off

USB Input (5.0 V)

Test condition		Tested	Measured	Frequency	Result		Limit
Temp.	Voltage	timing	frequency	error			
[deg. C]	[V]		[MHz]	[MHz]	[%]	[ppm]	[+/- %]
50	5.0	Power on	13.560014	0.000014	0.00010	1.0	0.01
		+ 2 min.	13.560012	0.000012	0.00009	0.9	0.01
		+ 5 min.	13.560012	0.000012	0.00009	0.9	0.01
		+ 10 min.	13.560013	0.000013	0.00010	1.0	0.01
40	5.0	Power on	13.560029	0.000029	0.00021	2.1	0.01
		+ 2 min.	13.560018	0.000018	0.00013	1.3	0.01
		+ 5 min.	13.560015	0.000015	0.00011	1.1	0.01
		+ 10 min.	13.560014	0.000014	0.00010	1.0	0.01
30	5.0	Power on	13.560063	0.000063	0.00046	4.6	0.01
		+ 2 min.	13.560039	0.000039	0.00029	2.9	0.01
		+ 5 min.	13.560032	0.000032	0.00024	2.4	0.01
		+ 10 min.	13.560026	0.000026	0.00019	1.9	0.01
20	5.0	Power on	13.560095	0.000095	0.00070	7.0	0.01
		+ 2 min.	13.560074	0.000074	0.00055	5.5	0.01
		+ 5 min.	13.560063	0.000063	0.00046	4.6	0.01
		+ 10 min.	13.560052	0.000052	0.00038	3.8	0.01
20	4.25	Power on	13.560082	0.000082	0.00060	6.0	0.01
	(5V -15%)	+ 2 min.	13.560063	0.000063	0.00046	4.6	0.01
		+ 5 min.	13.560056	0.000056	0.00041	4.1	0.01
		+ 10 min.	13.560053	0.000053	0.00039	3.9	0.01
20	5.75	Power on	13.560076	0.000076	0.00056	5.6	0.01
	(5V +15%)	+ 2 min.	13.560058	0.000058	0.00043	4.3	0.01
		+ 5 min.	13.560053	0.000053	0.00039	3.9	0.01
		+ 10 min.	13.560051	0.000051	0.00038	3.8	0.01
10	5.0	Power on	13.560127	0.000127	0.00094	9.4	0.01
		+ 2 min.	13.560104	0.000104	0.00077	7.7	0.01
		+ 5 min.	13.560093	0.000093	0.00069	6.9	0.01
		+ 10 min.	13.560085	0.000085	0.00063	6.3	0.01
0	5.0	Power on	13.560151	0.000151	0.00111	11.1	0.01
		+ 2 min.	13.560141	0.000141	0.00104	10.4	0.01
		+ 5 min.	13.560134	0.000134	0.00099	9.9	0.01
		+ 10 min.	13.560126	0.000126	0.00093	9.3	0.01
-10	5.0	Power on	13.560152	0.000152	0.00112	11.2	0.01
		+ 2 min.	13.560151	0.000151	0.00111	11.1	0.01
		+ 5 min.	13.560150	0.000150	0.00111	11.1	0.01
		+ 10 min.	13.560148	0.000148	0.00109	10.9	0.01
-20	5.0	Power on	13.560118	0.000118	0.00087	8.7	0.01
		+ 2 min.	13.560144	0.000144	0.00106	10.6	0.01
		+ 5 min.	13.560149	0.000149	0.00110	11.0	0.01
		+ 10 min.	13.560151	0.000151	0.00111	11.1	0.01
-30	5.0	Power on	13.560121	0.000121	0.00089	8.9	0.01
		+ 2 min.	13.560132	0.000132	0.00097	9.7	0.01
		+ 5 min.	13.560135	0.000135	0.00100	10.0	0.01
		+ 10 min.	13.560138	0.000138	0.00102	10.2	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

EMI test equipment (Tested on October 31 to November 10, 2017)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	CE	2017/09/30 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	CE	2017/01/20 * 12
MJM-25	Measure	KOMELON	KMC-36	-	CE	-
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	CE	2017/06/27 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(EUT)	2017/07/24 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/ RG400u(1.5m)/ RFM-E421(Switcher)	-/01068 (Switcher)	CE	2017/06/26 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/12/21 * 12
MMM-03	Digital Tester	Fluke	FLUKE 26-3	78030621	CE	2017/08/07 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2017/10/31 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2017/01/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2017/08/22 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2017/08/22 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2017/10/02 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2017/01/26 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2017/07/12 * 12
MAT-98	Attenuator	KEYSIGHT	8491A	MY52462349	RE	2016/12/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2017/03/27 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2017/01/19 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2017/10/11 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(3m)/ ucoform141-PE(1m)/ 421-010(1.5m)/ RFM-E321(Switcher)	-/00640	RE	2017/07/12 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2017/06/12 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2017/08/31 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2016/12/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2016/11/10 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2017/08/21 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/ 5D-2W(5m)/ 5D-2W(0.8m)/ 5D-2W(1m)	-	RE	2017/02/24 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2017/09/27 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2016/11/28 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	RE	2017/08/07 * 12
MFC-01	Microwave Counter	Advantest	R5373	120100309	FT	2017/06/21 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	FT	2017/04/10 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	FT	2016/12/13 * 12
MBM-12	Barometer	Sunoh	SBR121	873	FT	2015/02/04 * 36

EMI test equipment (Tested on February 22, 2018)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2017/10/30 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	CE	2018/01/24 * 12
MJM-26	Measure	KOMELON	KMC-36	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE	-
MTR-10	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	CE	2018/01/30 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE	2017/07/24 * 12
MAT-67	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2017/12/19 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ sucoform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2017/07/26 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	CE	2018/01/09 * 12

EMI test equipment (Tested on March 2, 2018)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MFC-01	Microwave Counter	Advantest	R5373	120100309	FT	2017/06/21 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	FT	2017/04/10 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	FT	2017/12/31 * 12
MBM-12	Barometer	Sunoh	SBR121	873	FT	2018/02/08 * 36

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: CE: Conducted Emission, RE: Radiated Emission, FT: Frequency Tolerance