Report on the RF Testing of:

YUYAMA MFG. CO., LTD
RFID Reader Writer B, Model: YG-1540002
FCC ID: WSLYG1540002

In accordance with FCC Part 15 Subpart C (15.225)

Prepared for: YUYAMA MFG. CO., LTD
1-2-12, Koudushima, Toyonaka, Osaka-fu, 561-0843, Japan
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Japan

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Document Number: JPD-TR-21246-0

SIGNATURE			
Hiroaki Suzuki			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	2022-02-11

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

EXECUTIVE SUMMARY – Result: Complied
A sample of this product was tested and the result above was confirmed in accordance with FCC Part 15 Subpart C (15.225).

ACCREDITED
Certificate #3686.03

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Japan

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1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-21246-0	First Issue	Refer to the cover page

1.2 Standards

CFR47 FCC Part 15 Subpart C (15.225)

1.3 Test methods

ANSI C63.10-2013

1.4 Deviation from standards

None

1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
2.1049	Occupied Bandwidth	Conducted	PASS	-
15.209 15.225 (a)(b)(c)(d)	Operation within the band 13.110-14.010MHz	Radiated	PASS	-
15.209 15.225 (d)	Transmitter Radiated Spurious Emissions	Radiated	PASS	-
15.225 (e)	Frequency Tolerance	Conducted	PASS	-
15.207	AC Power Line Conducted Emissions	Conducted	PASS	-

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

8-November-2021 - 15-November-2021

Japan

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	YUYAMA MFG. CO., LTD
	1-2-12, Koudushima, Toyonaka, Osaka-fu, 561-0843, Japan
	Phone: +81-6-6868-5030 Fax: +81-6-6868-5029
Equipment Under Test (EUT)	RFID Reader Writer B
Model number	YG-1540002
Serial number	N/A
Trade name	YUYAMA
Number of sample(s)	1
EUT condition	Pre-Production
Power rating	DC 5 V
Size	φ44 mm × 79 mm
Environment	Indoor and Outdoor use
Terminal limitation	0 ˚C to 50 ˚C
Hardware version	1.0.0
Software version	Not applicable
Firmware version	1.0.0
RF Specification	
Frequency range	13.56MHz
Modulation method	ASK
Antenna type	Loop antenna

2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

Modification State	Description of Modification	Modification fitted by	Date of Modification
Model: YG-1540002, Serial Number: N/A			
0	As supplied by the applicant	Not Applicable	Not Applicable

Japan

2.3 Variation of family model(s)

2.3.1 List of family model(s)

Not applicable

2.3.2 Reason for selection of EUT

Not applicable

2.4 Operating mode

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.
The worst emission was found in Y-axis and the worst case recorded.
Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

2.5 Operating flow

[Tx mode]
i) Bring the NFC tag close to the test sample.
ii) Start RF mode

Japan

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.3 System configuration” correspond to the list in “3.1 Equipment used” and “3.2 Cable(s) used”.
This test configuration is based on the manufacture’s instruction.
Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

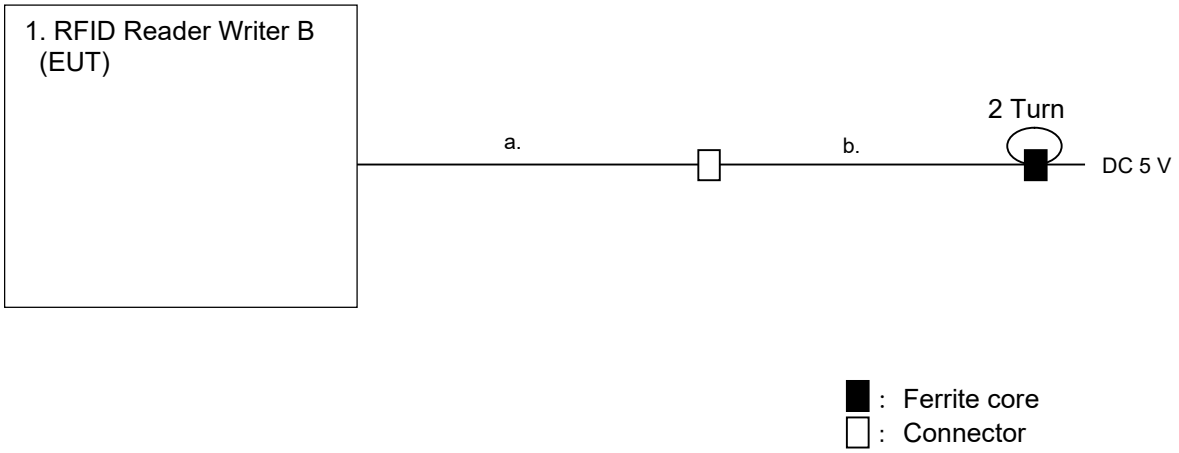
3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	RFID Reader Writer B	YUYAMA	YG-1540002	N/A	WSLYG1540002	EUT

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
a	DC cable	0.2	No	Plastic	
b	DC cable	0.25	No	Plastic	

3.3 System configuration



Japan

4 Test Result

4.1 Occupied Bandwidth

4.1.1 Measurement procedure

[FCC 2.1049]

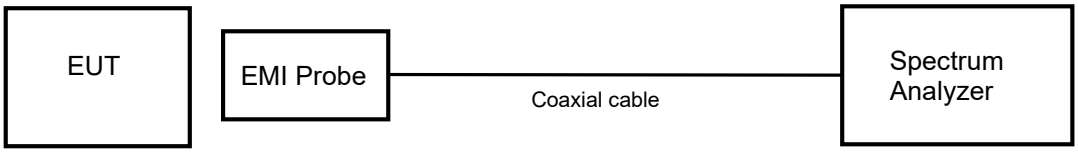
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to approach 1% of the selected span or less than 1%. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

The spectrum analyzer is set to;
- RBW=1kHz, VBW=3kHz, Span=100kHz, Sweep=auto, Detector=Peak, Trace mode = max hold.

The EUT was set to operate with following conditions.
- 13.56MHz

The test mode of EUT is as follows.
- Transmit mode

- Test configuration



4.1.2 Limit

None

4.1.3 Measurement result

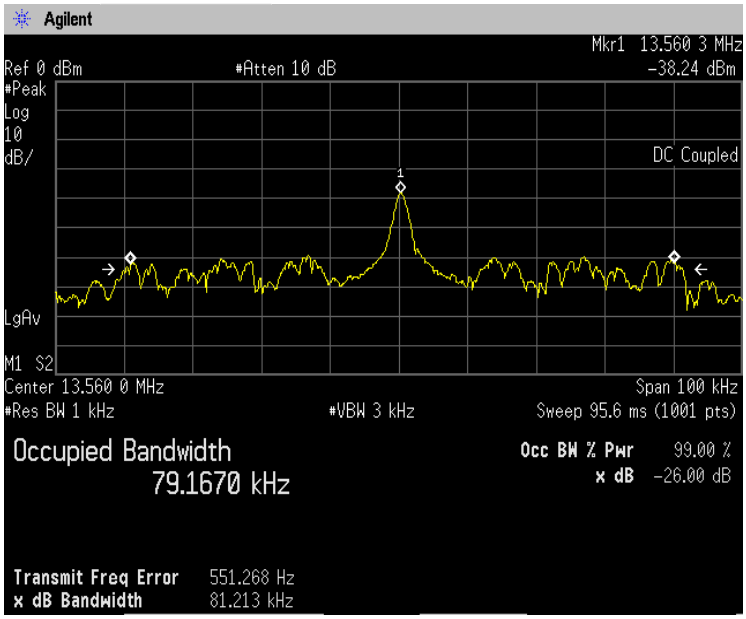
Date : 13-November-2021
Temperature : 20.8 [˚C]
Humidity : 37.4 [%]
Test place : Shielded room No.4

Test engineer : Taiki Watanabe

Frequency (MHz)	Occupied Bandwidth (kHz)
13.5603	79.1670

Japan

4.1.4 Trace data



Japan

4.2 Operation within the band 13.110-14.010MHz

4.2.1 Measurement procedure

[FCC 15.209, 15.225 (a)(b)(c)(d)]

Test was applied by following conditions.

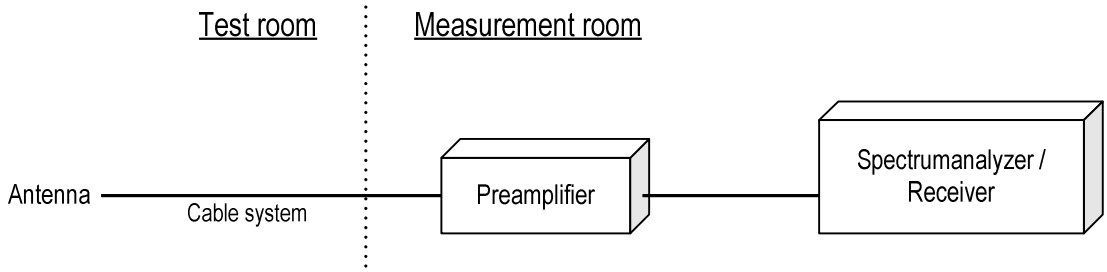
Test method	:	ANSI C63.10
Frequency range	:	13.110MHz to 14.010MHz
Test place	:	10m Semi-anechoic chamber No.1
EUT was placed on	:	FRP table / (W)2.0 m × (D)1.0 m × (H)0.8 m
Antenna distance	:	3m

Test receiver setting

- Detector	:	Quasi-peak
- Bandwidth	:	9kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements frequency range 13.110MHz to 14.010MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



4.2.2 Calculation method

Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)
Margin = Limit – Emission level

Japan

4.2.3 Limit

(a) The field strength of any emissions within the band 13.553-13.567MHz shall not exceed 15,848uV/m at 30m.
(b) Within the band 13.410-13.553MHz and 13.567-13.710MHz, the field strength of any emissions shall not exceed 334uV/m at 30m.
(c) Within the band 13.110-13.410MHz and 13.710-14.010MHz, the field strength of any emissions shall not exceed 106uV/m at 30m.
(d) The field strength of any emissions appearing outside of the 13.110-14.010MHz and shall not exceed the general radiated emission limits in FCC 15.209.

Note:
1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. Measurements were corrected to 30m using 40log (3/30) = -40.0dB

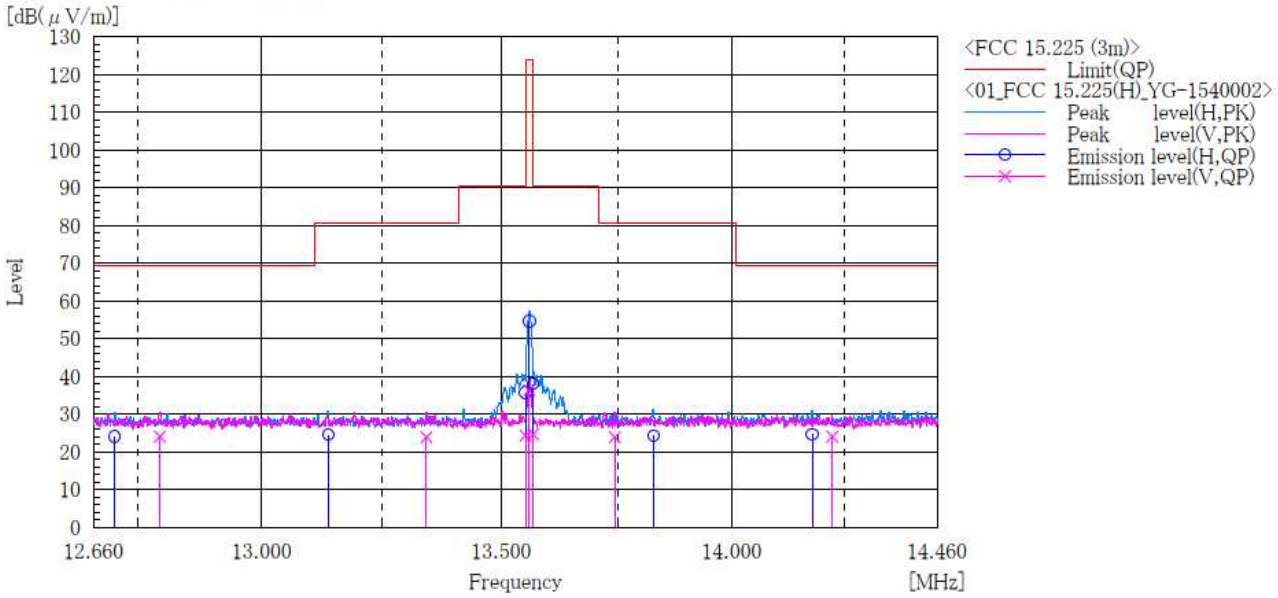
4.2.4 Test data

Date : 11-November-2021
Temperature : 22.9 [˚C]
Humidity : 32.4 [%] Test engineer : Taiki Watanabe
Test place : 10m Semi-anechoic chamber No.1

Frequency range (MHz)	Frequency (MHz)	Level		Limit (dBuV/m)	Margin (dB)	Result
		Measurered at 3m (dBuV/m)	Measurered at 30m (dBuV/m)			
13.553-13.567	13.560	68.8	28.8	84.0	55.2	PASS
13.41-13.553	13.552	49.6	9.6	50.5	40.9	PASS
13.567-13.71	13.568	51.9	11.9	50.5	38.6	PASS
13.11-13.41	13.401	34.7	-5.3	40.5	45.8	PASS
13.71-14.01	13.718	36.7	-3.3	40.5	43.8	PASS
12.66-13.11	12.978	25.5	-14.5	29.5	44.0	PASS
14.01-14.46	14.024	26.2	-13.8	29.5	43.3	PASS

4.2.5 Trace data

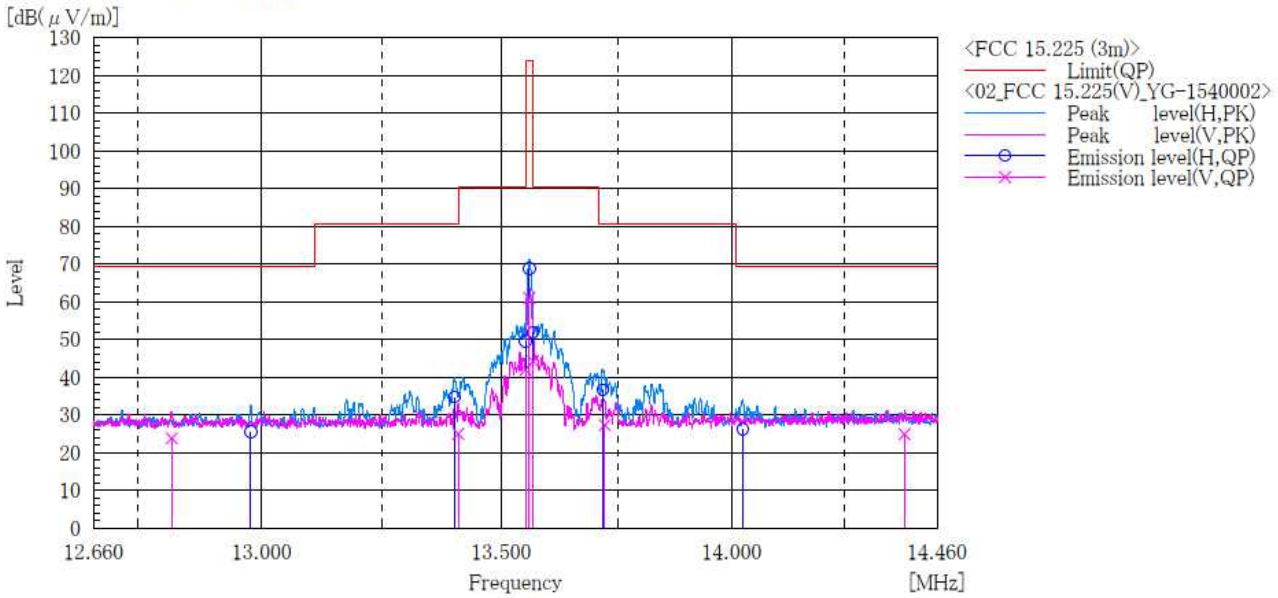
Company name	: YUYAMA MFG. CO., LTD	Standard	: FCC 15.225 (3m)
EUT	: RFID Reader Writer B	Operator	: T.Watanabe
Model No.	: YG-1540002	Tem,Hum	: 22.9[℃] 32.4[%]
Serial No.	: N/A	Note1	: Horizontal(X axis)
Test mode	: RF Radio mode	Note2	:



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]	Remark
1	13.560	V	43.0	-6.7	36.3	124.0	87.7	100.0	0.0	
2	13.552	V	31.0	-6.7	24.3	90.5	66.2	100.0	0.0	
3	13.568	V	31.3	-6.7	24.6	90.5	65.9	100.0	0.0	
4	13.342	V	30.6	-6.7	23.9	80.5	56.6	100.0	101.0	
5	13.744	V	30.6	-6.7	23.9	80.5	56.6	100.0	1.0	
6	12.793	V	30.7	-6.7	24.0	69.5	45.5	100.0	118.0	
7	14.223	V	30.7	-6.7	24.0	69.5	45.5	100.0	151.0	
8	13.560	H	61.4	-6.7	54.7	124.0	69.3	100.0	86.0	
9	13.552	H	42.4	-6.7	35.7	90.5	54.8	100.0	86.0	
10	13.568	H	44.7	-6.7	38.0	90.5	52.5	100.0	86.0	
11	13.137	H	31.2	-6.7	24.5	80.5	56.0	100.0	34.0	
12	13.828	H	31.0	-6.7	24.3	80.5	56.2	100.0	353.0	
13	12.702	H	30.7	-6.7	24.0	69.5	45.5	100.0	346.0	
14	14.178	H	31.3	-6.7	24.6	69.5	44.9	100.0	352.0	

Company name	: YUYAMA MFG. CO., LTD	Standard	: FCC 15.225 (3m)
EUT	: RFID Reader Writer B	Operator	: T.Watanabe
Model No.	: YG-1540002	Tem,Hum	: 22.9[℃] 32.4[%]
Serial No.	: N/A	Note1	: Vertical(Y axis)
Test mode	: RF Radio mode	Note2	:



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]	Remark
1	13.560	V	67.7	-6.7	61.0	124.0	63.0	100.0	64.0	
2	13.552	V	48.6	-6.7	41.9	90.5	48.6	100.0	64.0	
3	13.568	V	50.9	-6.7	44.2	90.5	46.3	100.0	64.0	
4	13.409	V	31.7	-6.7	25.0	80.5	55.5	100.0	79.0	
5	13.722	V	34.0	-6.7	27.3	80.5	53.2	100.0	254.0	
6	12.817	V	30.5	-6.7	23.8	69.5	45.7	100.0	158.0	
7	14.386	V	31.5	-6.6	24.9	69.5	44.6	100.0	79.0	
8	13.560	H	75.5	-6.7	68.8	124.0	55.2	100.0	0.0	
9	13.552	H	56.3	-6.7	49.6	90.5	40.9	100.0	0.0	
10	13.568	H	58.6	-6.7	51.9	90.5	38.6	100.0	0.0	
11	13.401	H	41.4	-6.7	34.7	80.5	45.8	100.0	195.0	
12	13.718	H	43.4	-6.7	36.7	80.5	43.8	100.0	358.0	
13	12.978	H	32.2	-6.7	25.5	69.5	44.0	100.0	0.0	
14	14.024	H	32.9	-6.7	26.2	69.5	43.3	100.0	14.0	

Japan

4.3 Radiated Emissions

4.3.1 Measurement procedure

[FCC 15.209, 15.225 (d)]

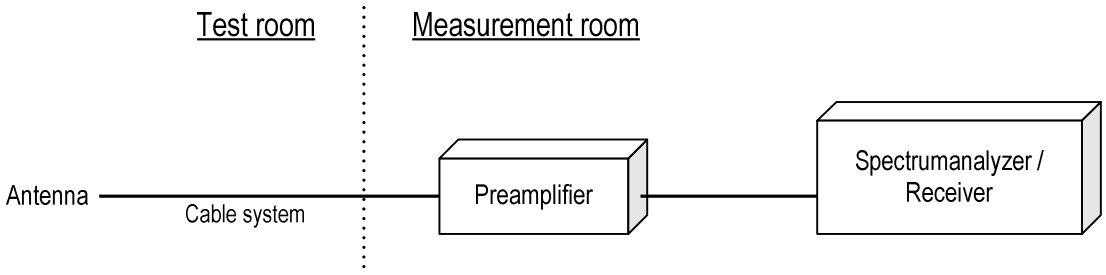
Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	9kHz to 30MHz
Test place	:	10m Semi-anechoic chamber No.1
EUT was placed on	:	FRP table / (W)2.0 m × (D)1.0 m × (H)0.8 m
Antenna distance	:	3m
Test receiver setting		
- Detector	:	Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	:	200Hz, 9kHz

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are 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 937606.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 30MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



Test was applied by following conditions.

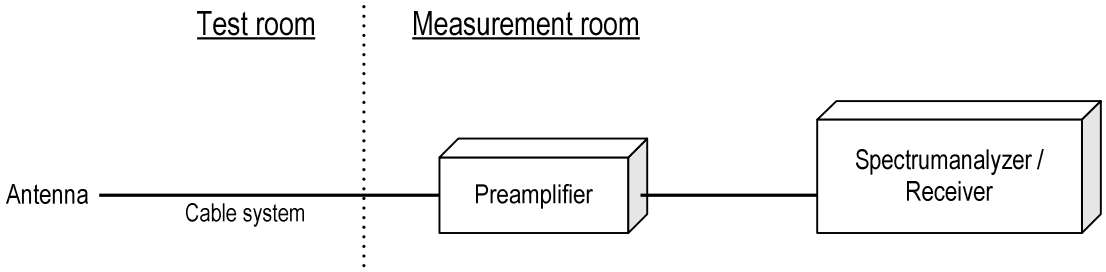
Test method	:	ANSI C63.10
Frequency range	:	30MHz to 1000MHz
Test place	:	10m Semi-anechoic chamber No.1
EUT was placed on	:	FRP table / (W)2.0 m × (D)1.0 m × (H)0.8 m
Antenna distance	:	3m

Test receiver setting

- Detector	:	Quasi-peak
- Bandwidth	:	120kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 1000MHz were performed with test receiver in above setting. In order to find the maximum emissions, antenna is adjusted between 1m and 4m in height and varied its polarization (horizontal and vertical), and EUT azimuth was also varied by rotating turntable 0 to 360 degrees. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



4.3.2 Calculation method

[9kHz to 150kHz]
Emission level = Reading + (Ant. factor + Cable system loss)
Margin = Limit – Emission level

[150kHz to 1000MHz]
Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)
Margin = Limit – Emission level

Japan

4.3.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490-1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:
1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. Measurements were corrected to 300m using 40log (3/300) = -80.0dB
   Measurements were corrected to 30m using 40log (3/30) = -40.0dB

4.3.4 Test data

Date : 8-November-2021
Temperature : 23.3 [˚C]
Humidity : 39.0 [%] Test engineer :
Test place : 10m Semi-anechoic chamber No.1 Taiki Watanabe

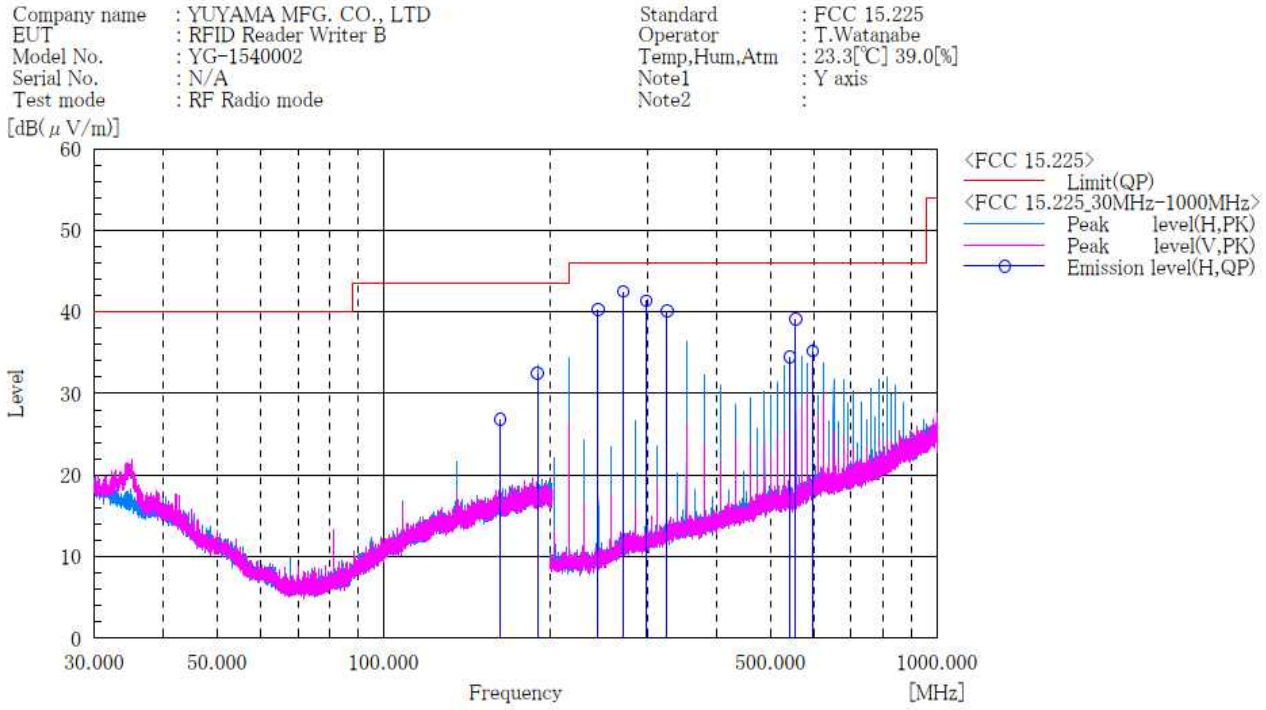
Date : 11-November-2021
Temperature : 22.9 [˚C]
Humidity : 32.4 [%] Test engineer :
Test place : 10m Semi-anechoic chamber No.1 Taiki Watanabe

Japan

[9kHz to 30MHz]

H/V	Frequency (MHz) At 3m	Reading (dBuV) At 3m	c.f (dB(1/m))	Result (dBuV/m) At 3m	Result (dBuV/m) At 30m	Limit (dBuV/m) At 30m	Margin	Result
H	27.12	29.5	-5.4	24.1	-15.9	29.5	45.4	PASS
V	27.12	29.4	-5.4	24.0	-16.0	29.5	45.5	PASS

[30MHz to 1000MHz]



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	162.720	H	36.2	-9.4	26.8	43.5	16.7	174.0	93.0
2	189.840	H	40.9	-8.4	32.5	43.5	11.0	164.0	285.0
3	244.100	H	56.1	-15.8	40.3	46.0	5.7	107.0	109.0
4	271.203	H	56.6	-14.1	42.5	46.0	3.5	108.0	236.0
5	298.323	H	54.9	-13.5	41.4	46.0	4.6	100.0	227.0
6	325.445	H	52.6	-12.5	40.1	46.0	5.9	100.0	233.0
7	542.411	H	42.7	-8.2	34.5	46.0	11.5	164.0	322.0
8	555.969	H	47.1	-8.0	39.1	46.0	6.9	167.0	322.0
9	596.650	H	41.6	-6.4	35.2	46.0	10.8	304.0	318.0

Japan

4.4 Frequency Tolerance

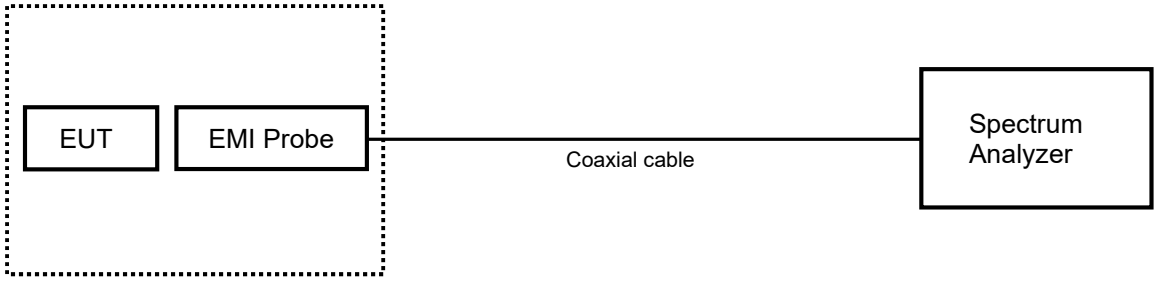
4.4.1 Measurement procedure

[FCC 15.205 (e)]

The EUT was placed of an inside of a constant temperature chamber as the temperature in the chamber was varied between -30˚C and +50˚C. The temperature was incremented by 10˚C intervals and the unit was allowed to stabilize at each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channels center frequency was recorded.

The EUT was set to operate with following conditions.
- 13.56MHz
The test mode of EUT is as follows.
- Transmit mode

- Test configuration



Constant Temperature Chamber

4.4.2 Limit

The Frequency tolerance of the carrier signal shall be maintained within +/- 0.01% over a temperature variation of -30 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

Japan

4.4.3 Test data

Date : 13-November-2021
Temperature : 20.8 [˚C]
Humidity : 37.4 [%] Test engineer :
Test place : Shielded room No.4 Taiki Watanabe

Date : 15-November-2021
Temperature : 25.3 [˚C]
Humidity : 36.3 [%] Test engineer :
Test place : Shielded room No.4 Taiki Watanabe

Reference Frequency: EUT Channel 13.56MHz at 20ºC
Limit: ±0.01% = ±100ppm = ±0.135603MHz

Power Supply	Temperature	Measurements Frequency (startup)	Frequency Tolerance (startup)	Measurements Frequency (2mins)	Frequency Tolerance (2mins)	Measurements Frequency (5mins)	Frequency Tolerance (5mins)	Measurements Frequency (10mins)	Frequency Tolerance (10mins)	Limit	Result
[V]	[ºC]	[MHz]	[ppm]	[MHz]	[ppm]	[MHz]	[ppm]	[MHz]	[ppm]	[ppm]	
5.00	50	13.560250	18.437	13.560260	19.174	13.560260	19.174	13.560260	19.174	±100	PASS
	40	13.560275	20.280	13.560280	20.649	13.560280	20.649	13.560285	21.018		
	30	13.560270	19.912	13.560260	19.174	13.560275	20.280	13.560295	21.755		
	20	13.560000	-	13.560330	24.336	13.560340	25.074	13.560340	25.074		
	10	13.560330	24.336	13.560310	22.861	13.560415	30.605	13.560380	28.024		
	0	13.560405	29.867	13.560415	30.605	13.560400	29.499	13.560395	29.130		
	-10	13.560405	29.867	13.560405	29.867	13.560390	28.761	13.560415	30.605		
	-20	13.560375	27.655	13.560380	28.024	13.560385	28.392	13.560395	29.130		
	-30	13.560325	23.968	13.560320	23.599	13.560325	23.968	13.560310	22.861		
4.25	20	13.560340	25.074	13.560340	25.074	13.560335	24.705	13.560350	25.811		
5.75	20	13.560340	25.074	13.560340	25.074	13.560340	25.074	13.560335	24.705		

Note. Frequency Tolerance (ppm) = (Measurements Frequency (MHz) – Reference Frequency (MHz)) / Reference Frequency (MHz) x 1000000

The primary power supply voltage rating of this EUT is 85% to 115%

Japan

4.5 AC Power Line Conducted Emissions

4.5.1 Measurement procedure

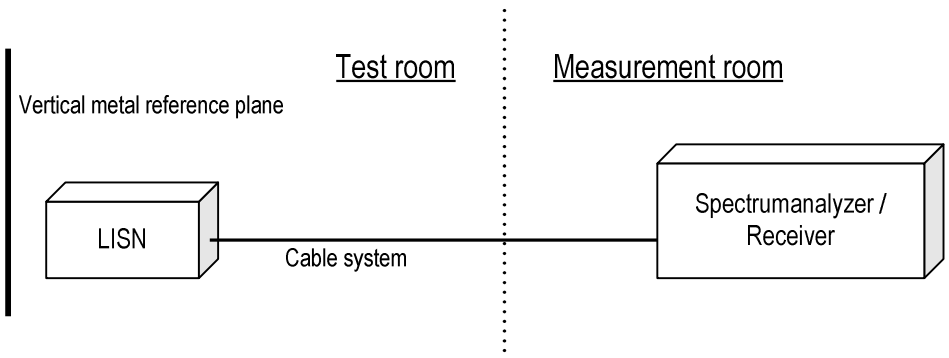
[FCC 15.207]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	0.15 MHz to 30 MHz
Test place	:	10m Semi-anechoic chamber No.1
EUT was placed on	:	FRP table / (W)2.0 m × (D)1.0 m × (H)0.8 m
Vertical Metal Reference Plane	:	(W)2.0 m × (H)2.0 m 0.4 m away from EUT
Test receiver setting		
- Detector	:	Quasi-peak, Average
- Bandwidth	:	9 kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.
LISN for peripheral is terminated in 50Ω.
EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



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4.5.2 Calculation method

Emission level = Reading + (LISN. Factor + Cable system loss)
Margin = Limit – Emission level

Example:
Limit @ 6.770 MHz: 60.0 dBµV(Quasi-peak)
: 50.0 dBµV(Average)
(Quasi peak) Reading = 41.2 dBµV c.f = 10.3 dB
Emission level = 41.2 + 10.3 = 51.5 dBµV
Margin = 60.0 – 51.5 = 8.5 dB
(Average) Reading = 35.0 dBµV c.f = 10.3 dB
Emission level = 35.0 + 10.3 = 45.3 dBµV
Margin = 50.0 – 45.3 = 4.7 dB

4.5.3 Limit

Frequency [MHz]	Limit	
	QP [dBuV]	AV [dBuV]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

4.5.4 Measurement result

Date : 11-November-2021
Temperature : 22.9 [˚C]
Humidity : 32.4 [%] Test engineer : Taiki Watanabe
Test place : 10m Semi-anechoic chamber No.1

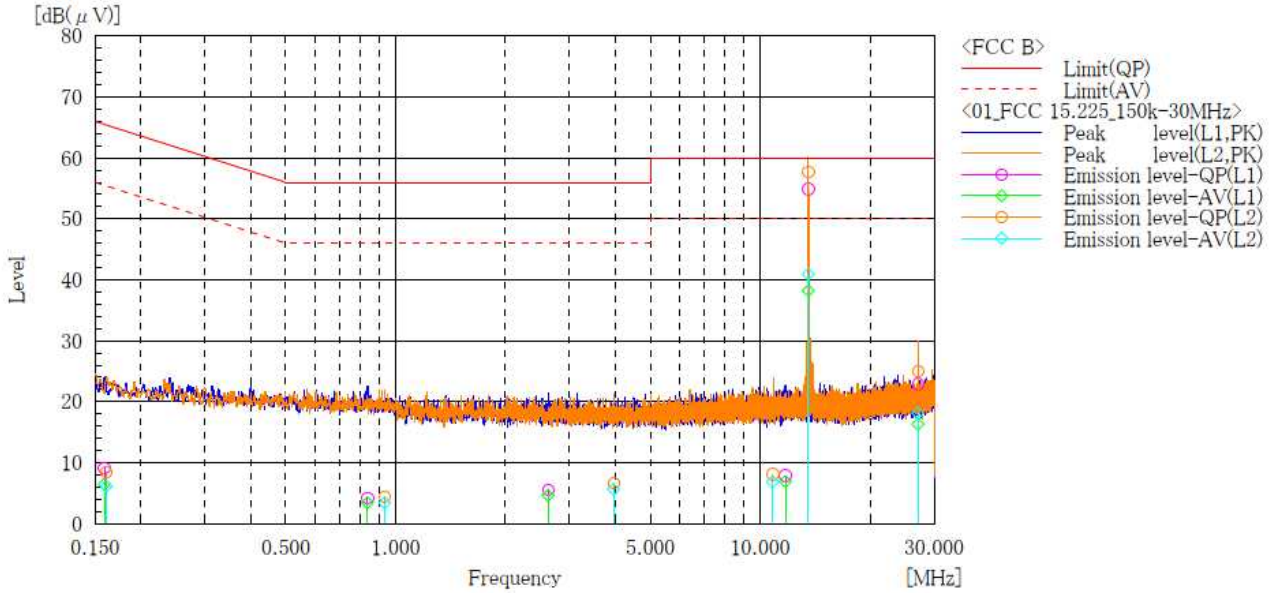
Japan

4.5.5 Test data

[Transmit ON]

Company name : YUYAMA MFG. CO., LTD
EUT : RFID Reader Writer B
Model No. : YG-1540002
Serial No. : N/A
Test mode : RF Radio mode

Standard : FCC 15.225
Operator : T.Watanabe
Temp,Hum,Atm : 22.9[℃] 32.4[%]
Note1 :
Note2 :



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.159	-1.3	-4.0	10.4	9.1	6.4	65.5	55.5	56.4	49.1
2	0.838	-6.1	-6.9	10.3	4.2	3.4	56.0	46.0	51.8	42.6
3	2.621	-4.9	-5.8	10.4	5.5	4.6	56.0	46.0	50.5	41.4
4	11.717	-3.0	-4.0	10.9	7.9	6.9	60.0	50.0	52.1	43.1
5	13.560	44.0	27.3	10.9	54.9	38.2	60.0	50.0	5.1	11.8
6	27.120	11.7	5.1	11.2	22.9	16.3	60.0	50.0	37.1	33.7

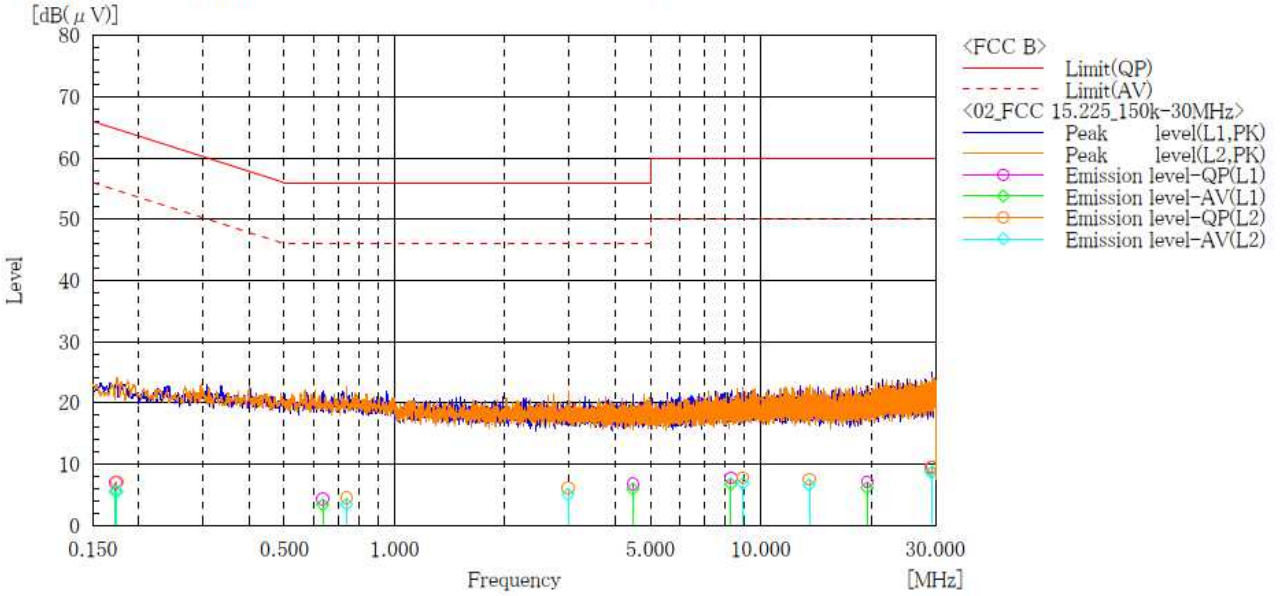
--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.161	-2.0	-4.3	10.4	8.4	6.1	65.4	55.4	57.0	49.3
2	0.934	-5.9	-6.9	10.3	4.4	3.4	56.0	46.0	51.6	42.6
3	3.969	-3.9	-4.9	10.5	6.6	5.6	56.0	46.0	49.4	40.4
4	10.840	-2.8	-4.1	10.9	8.1	6.8	60.0	50.0	51.9	43.2
5	13.560	46.7	29.9	11.0	57.7	40.9	60.0	50.0	2.3	9.1
6	27.120	13.7	6.8	11.3	25.0	18.1	60.0	50.0	35.0	31.9

Japan

[Transmit OFF]

Company name	: YUYAMA MFG. CO., LTD	Standard	: FCC 15.225
EUT	: RFID Reader Writer B	Operator	: T.Watanabe
Model No.	: YG-1540002	Temp,Hum,Atm	: 22.9[℃] 32.4[%]
Serial No.	: N/A	Note1	:
Test mode	: Transmit OFF	Note2	:



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.173	-3.4	-4.9	10.4	7.0	5.5	64.8	54.8	57.8	49.3
2	0.637	-6.0	-7.0	10.3	4.3	3.3	56.0	46.0	51.7	42.7
3	4.476	-3.9	-4.7	10.6	6.7	5.9	56.0	46.0	49.3	40.1
4	8.300	-3.0	-4.0	10.7	7.7	6.7	60.0	50.0	52.3	43.3
5	19.520	-4.0	-5.0	11.1	7.1	6.1	60.0	50.0	52.9	43.9
6	29.363	-1.8	-2.6	11.3	9.5	8.7	60.0	50.0	50.5	41.3

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.175	-3.3	-4.9	10.4	7.1	5.5	64.7	54.7	57.6	49.2
2	0.740	-5.8	-6.9	10.3	4.5	3.4	56.0	46.0	51.5	42.6
3	2.980	-4.4	-5.5	10.5	6.1	5.0	56.0	46.0	49.9	41.0
4	8.953	-3.0	-4.0	10.8	7.8	6.8	60.0	50.0	52.2	43.2
5	13.565	-3.5	-4.4	11.0	7.5	6.6	60.0	50.0	52.5	43.4
6	29.254	-2.0	-2.8	11.4	9.4	8.6	60.0	50.0	50.6	41.4

Japan

5 Antenna requirement

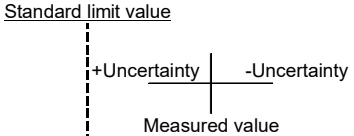
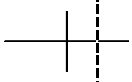
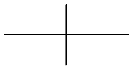
According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.
The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

Japan

6 Measurement Uncertainty

Expanded uncertainties stated are calculated with a coverage Factor k=2.
Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission, AMN (9 kHz – 150 kHz)	±3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.2 dB
Radiated emission (30 MHz – 1000 MHz)	±5.3 dB
Radiated emission (1 GHz – 6 GHz)	±4.8 dB
Radiated emission (6 GHz – 18 GHz)	±4.5 dB
Radiated emission (18 GHz – 40 GHz)	±6.4 dB
Radio Frequency	±1.4 * 10^{-8}
RF power, conducted	±0.8 dB
Adjacent channel power	±2.4 dB
Temperature	±0.6 °C
Humidity	±1.2 %
Voltage (DC)	±0.4 %
Voltage (AC, <10kHz)	±0.2 %

Judge	Measured value and standard limit value
PASS	**Case1**  Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2  Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	**Case3**  Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4  Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

Japan

7 Laboratory Information

Testing was performed and the report was issued at:

TÜV SÜD Japan Ltd. Yonezawa Testing Center

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881

Accreditation and Registration
A2LA
Certificate #3686.03

VLAC
Accreditation No.: VLAC-013

BSMI
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada
ISED#: 4224A

VCCI Council
Registration number: A-0166

Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	30-Sep-2022	20-Sep-2021
Microwave cable	SUHNER	SUCOFLEX102/2m	31648	31-Mar-2022	10-Mar-2021
EMI Probe	ANRITSU	MA2601C	N/A(1753)	31-Oct-2022	31-Oct-2021
Temperature and humidity chamber	ESPEC	PL1KP	14007261	30-Sep-2022	03-Sep-2021

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI receiver	ROHDE&SCHWARZ	ESR7	101742	31-Jan-2022	19-Jan-2021
Preamplifier	TSJ	MLA-0118-J02	14882	31-Oct-2022	27-Oct-2021
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	30-Apr-2022	27-Apr-2021
Attenuator	TDC	TAT-43B-06	N/A(S209)	31-Jul-2022	20-Jul-2021
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	VHA91032851	31-May-2022	31-May-2021
Log-periodic antenna	Schwarzbeck	VUSLP9111B	343	31-Aug-2022	20-Aug-2021
Attenuator	TDC	TAT-43B-06	N/A(S209)	31-Jul-2022	20-Jul-2021
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S504)	31-Jul-2022	20-Jul-2021
Microwave cable	SUHNER	SUCOFLEX104/9m	MY23758/4	31-Oct-2022	28-Oct-2021
		SUCOFLEX104/1m	MY24628/4	31-Oct-2022	28-Oct-2021
		SUCOFLEX104/2m	SN MY28398/4	31-Oct-2022	28-Oct-2021
		SUCOFLEX106/12m	41624/6	31-Oct-2022	28-Oct-2021
		SUCOFLEX106/13m	MY1159/6	31-Oct-2022	28-Oct-2021
PC	HP	dc7800small	JPA7450FPJ	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
10m Semi-anechoic Chamber	TOKIN	N/A	N/A(9001-NSA3m)	31-May-2022	22-May-2021
10m Semi-anechoic Chamber	TOKIN	N/A	N/A(9001-NSA10m)	31-May-2022	22-May-2021

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI receiver	ROHDE&SCHWARZ	ESR7	101742	31-Jan-2022	19-Jan-2021
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Dec-2021	15-Dec-2020
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	TNW-407F2	12-17-110-2	30-Jun-2022	17-Jun-2021
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Dec-2021	15-Dec-2020
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Dec-2021	15-Dec-2020
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Dec-2021	15-Dec-2020
PC	HP	dc7800small	JPA7450FPJ	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.