Report on the RF Testing of:

KYOCERA Corporation
Mobile Phone, Model: DB05
FCC ID: JOYDB05

In accordance with FCC Part 15 Subpart C (15.225)

Japan

Add value.
Inspire trust.

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Document Number: JPD-TR-19158-0

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NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	01 OCT 2019

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

EXECUTIVE SUMMARY
A sample(s) of this product was tested and found to be compliant with FCC Part 15 Subpart C (15.225).

NVLAP TESTING
NVLAP LAB CODE 200306-0

ilac-MRA

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Japan

Contents

Japan

1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-19158-0	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 RSS-Gen 6.7	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

29-August-2019 - 13-September-2019

Japan

2 Equipment Under Test

2.1 EUT information

Applicant	KYOCERA Corporation
	Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan
	Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment Under Test (EUT)	Mobile Phone
Model number	DB05
Serial number	N/A
Trade name	Kyocera
Number of sample(s)	1
EUT condition	Pre-Production
Power rating	Battery: DC 3.85 V
Size	(W) 73.0 × (D) 153.0 × (H) 8.9 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 ˚C to 60 ˚C
Hardware version	DMT1
Software version	0.400BE
Firmware version	Not applicable
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: DB05, 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 Z-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) NFC test program setup to the Software
ii) Start test 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”.
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	Mobile Phone	KYOCERA	DB05	N/A	JOYDB05	EUT
2	AC Adapter	KDDI	0301PQA	N/A	N/A	*

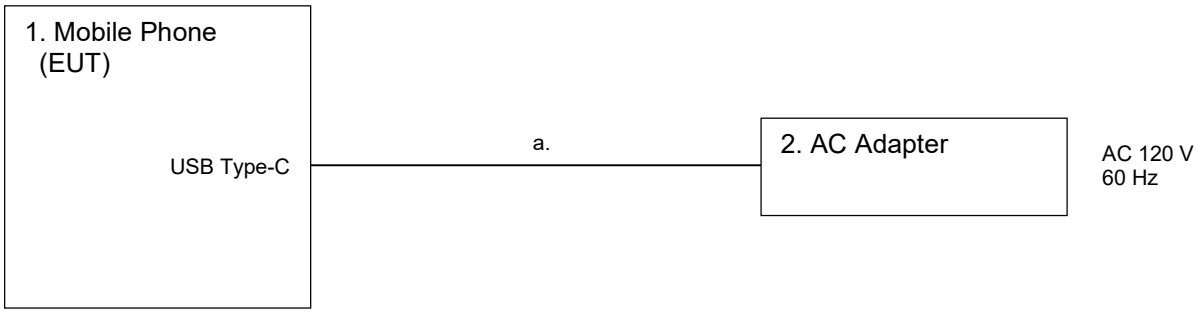
*:AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
a	USB cable (for AC Adapter)	1.0	Yes	Metal	*

*:AC power line Conducted Emission Test.

3.3 System configuration



Japan

4 Test Result

4.1 Occupied Bandwidth

4.1.1 Measurement procedure

[FCC 2.1049, RSS-Gen 6.7]

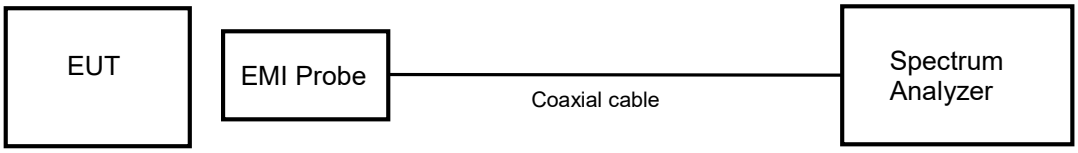
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to approach 1% of the selected span or less than 1%. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

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

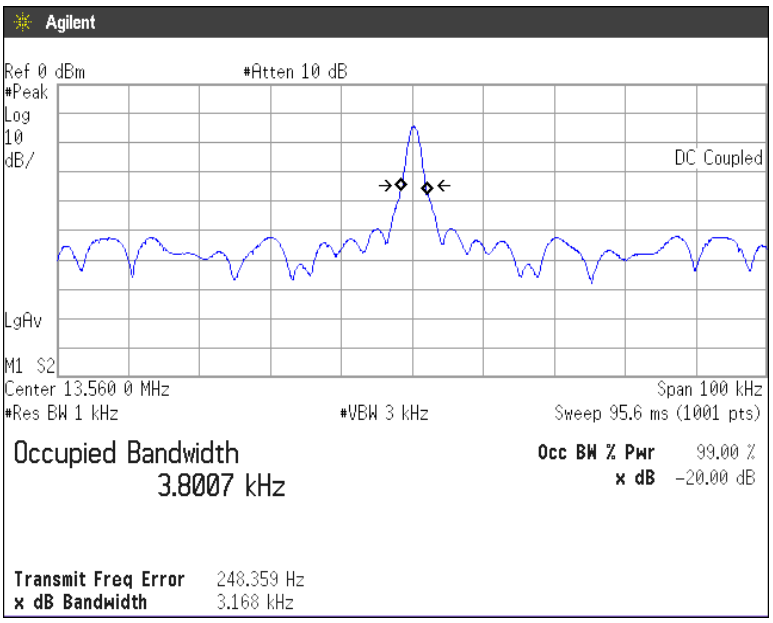
Date : 13-September-2019
Temperature : 23.3 [˚C]
Humidity : 51.9 [%]
Test place : Shielded room No.4

Test engineer : Kazunori Saito

Frequency (MHz)	Occupied Bandwidth (kHz)
13.56	3.8007

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.

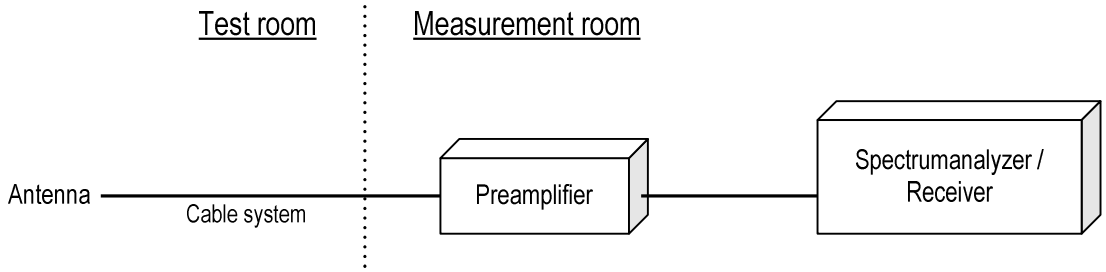
Test method	:	ANSI C63.10
Frequency range	:	13.110MHz to 14.010MHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m
Antenna distance	:	3m

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

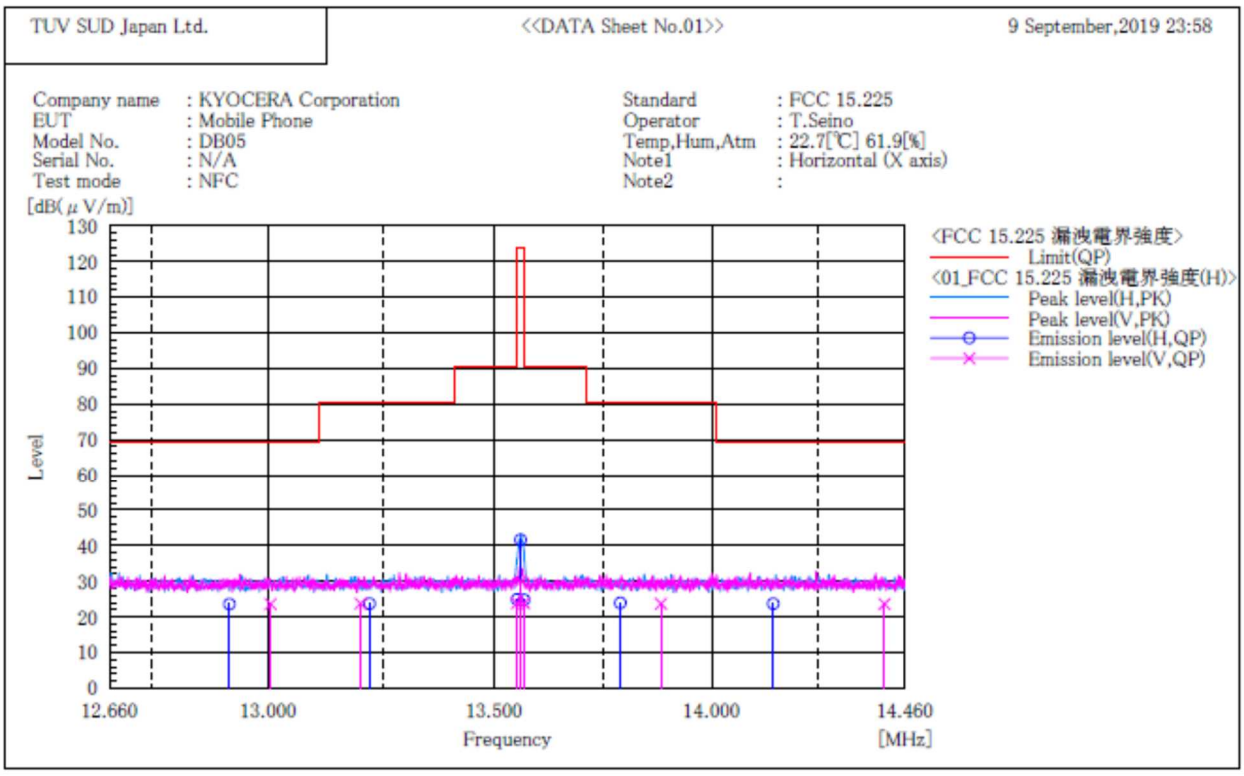
Date : 9-September-2019
Temperature : 22.7 [˚C]
Humidity : 61.9 [%]
Test place : Shielded room No.4
Test engineer : Tadahiro Seino

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	57.5	17.5	84.0	66.5	PASS
13.41-13.553	13.552	37.8	-2.2	50.5	52.7	PASS
13.567-13.71	13.568	40.0	0	50.5	50.5	PASS
13.11-13.41	13.345	30.4	-9.6	40.5	50.1	PASS
13.71-14.01	13.788	30.4	-9.6	40.5	50.1	PASS
12.66-13.11	12.845	30.3	-9.7	29.5	39.2	PASS
14.01-14.46	14.296	30.3	-9.7	29.5	39.2	PASS

Japan

4.2.5 Trace data

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]



Final Result

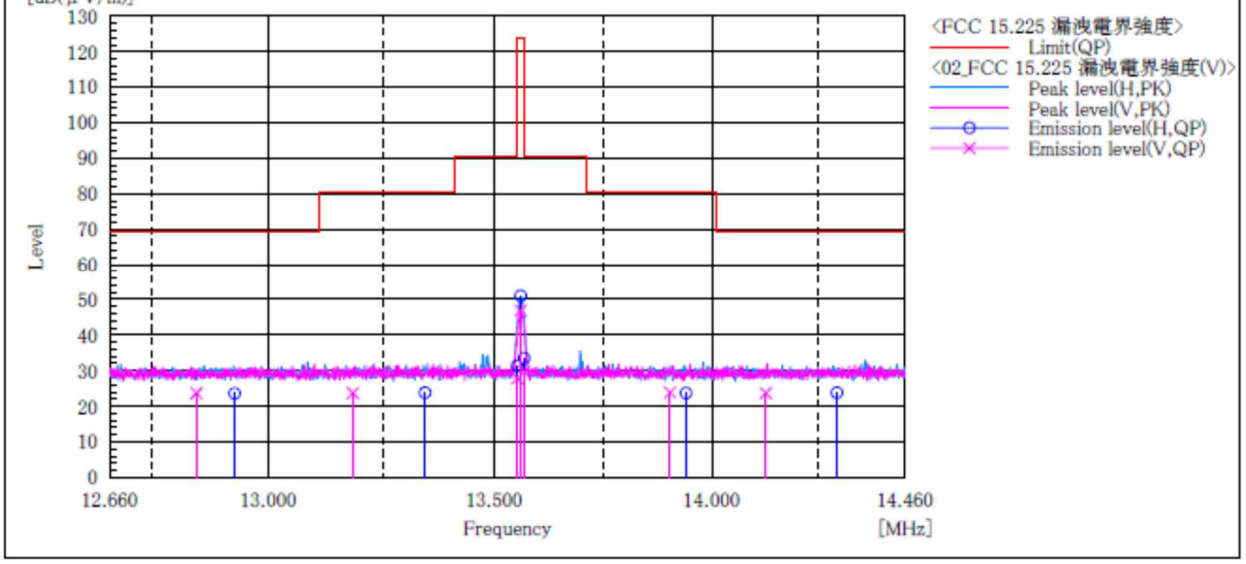
No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	13.560	V	36.5	-6.5	30.0	124.0	94.0	100.0	276.0
2	13.552	V	30.3	-6.5	23.8	90.5	66.7	100.0	276.0
3	13.568	V	30.3	-6.5	23.8	90.5	66.7	100.0	276.0
4	13.202	V	30.3	-6.6	23.7	80.5	56.8	100.0	293.0
5	13.882	V	30.2	-6.5	23.7	80.5	56.8	100.0	224.0
6	13.005	V	30.2	-6.6	23.6	69.5	45.9	100.0	134.0
7	14.410	V	30.1	-6.5	23.6	69.5	45.9	100.0	41.0
8	13.560	H	48.1	-6.5	41.6	124.0	82.4	100.0	22.0
9	13.552	H	31.4	-6.5	24.9	90.5	65.6	100.0	22.0
10	13.568	H	31.3	-6.5	24.8	90.5	65.7	100.0	22.0
11	13.222	H	30.3	-6.6	23.7	80.5	56.8	100.0	0.0
12	13.788	H	30.4	-6.5	23.9	80.5	56.6	100.0	59.0
13	12.916	H	30.2	-6.6	23.6	69.5	45.9	100.0	290.0
14	14.145	H	30.2	-6.5	23.7	69.5	45.8	100.0	33.0

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Japan Ltd. <<DATA Sheet No.02>> 9 September,2019 23:30

Company name : KYOCERA Corporation
EUT : Mobile Phone
Model No. : DB05
Serial No. : N/A
Test mode : NFC

Standard : FCC 15.225
Operator : T.Seino
Temp,Hum,Atm : 22.7[℃] 61.9[%]
Note1 : Vertical (Z axis)
Note2 :



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dBμV]	c.f [dB(1/m)]	Result QP [dBμV/m]	Limit QP [dBμV/m]	Margin QP [dB]	Height [cm]	Angle [°]
1	13.560	V	53.4	-6.5	46.9	124.0	77.1	100.0	101.0
2	13.552	V	34.3	-6.5	27.8	90.5	62.7	100.0	101.0
3	13.568	V	36.3	-6.5	29.8	90.5	60.7	100.0	101.0
4	13.185	V	30.3	-6.6	23.7	80.5	56.8	100.0	63.0
5	13.903	V	30.3	-6.5	23.8	80.5	56.7	100.0	95.0
6	12.845	V	30.3	-6.6	23.7	69.5	45.8	100.0	28.0
7	14.127	V	30.2	-6.5	23.7	69.5	45.8	100.0	89.0
8	13.560	H	57.5	-6.5	51.0	124.0	73.0	100.0	180.0
9	13.552	H	37.8	-6.5	31.3	90.5	59.2	100.0	180.0
10	13.568	H	40.0	-6.5	33.5	90.5	57.0	100.0	180.0
11	13.345	H	30.4	-6.6	23.8	80.5	56.7	100.0	349.0
12	13.940	H	30.2	-6.5	23.7	80.5	56.8	100.0	0.0
13	12.927	H	30.2	-6.6	23.6	69.5	45.9	100.0	121.0
14	14.296	H	30.3	-6.5	23.8	69.5	45.7	100.0	328.0

Japan

4.3 Radiated Emissions

4.3.1 Measurement procedure

[FCC 15.209, 15.225 (d)]

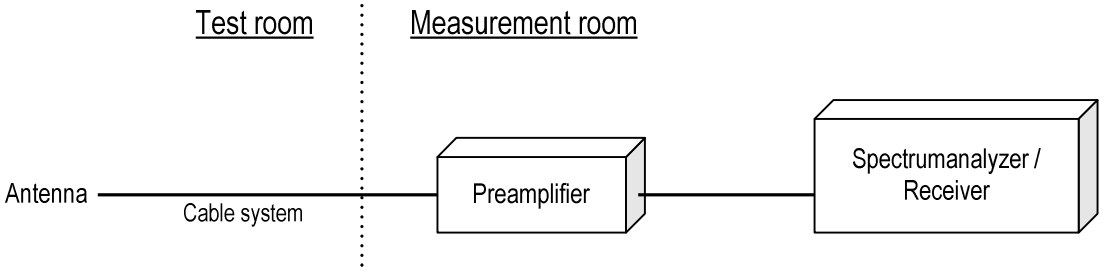
Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	9kHz to 30MHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m
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.

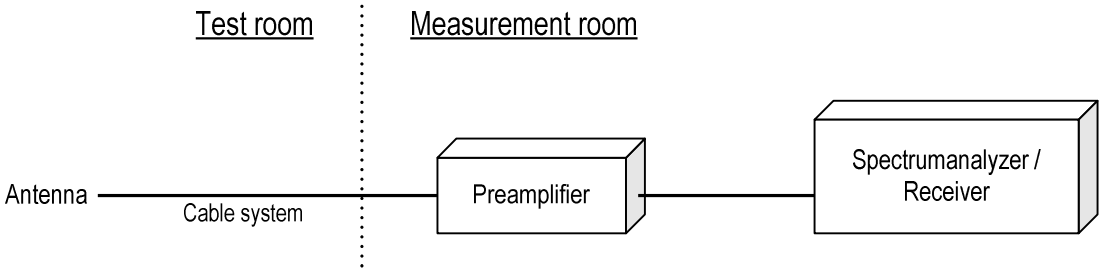
Test method	:	ANSI C63.10
Frequency range	:	30MHz to 1000MHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m
Antenna distance	:	3m

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

Japan

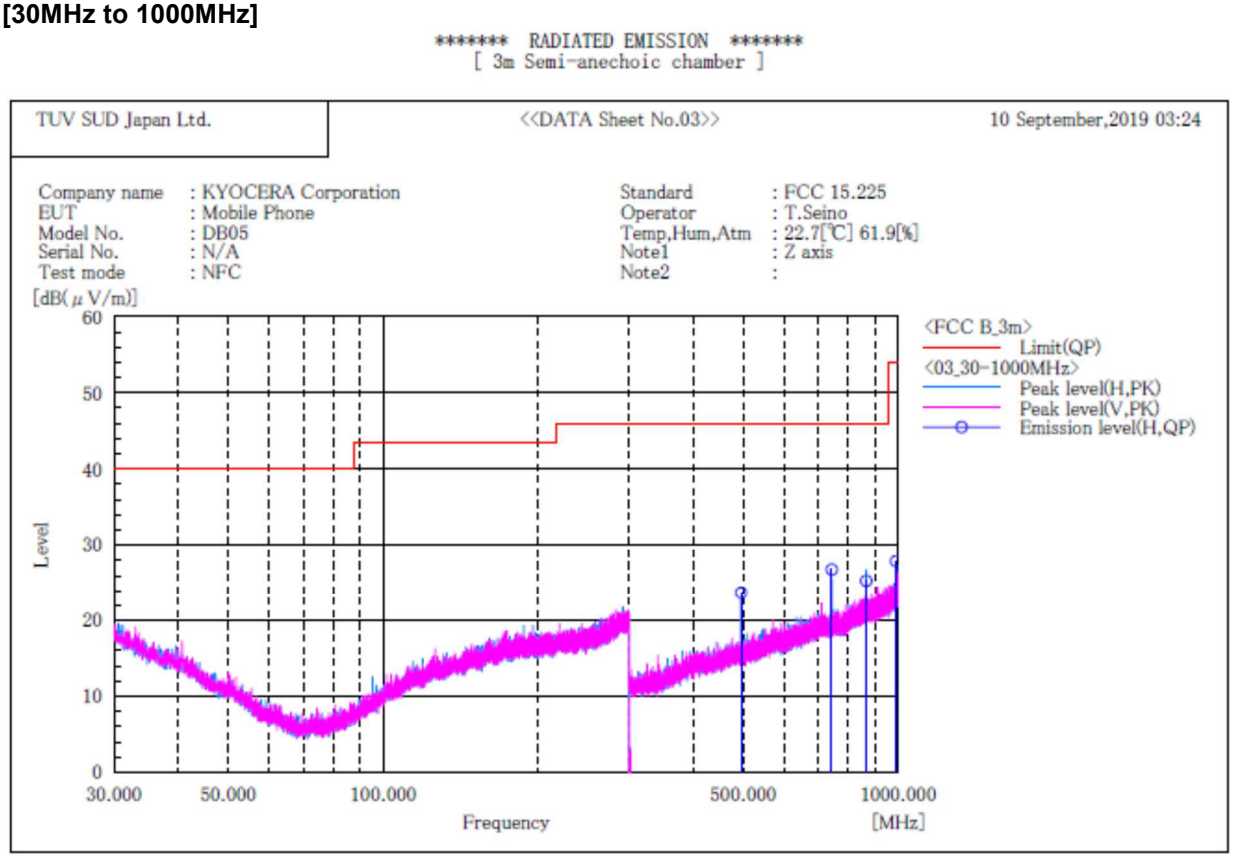
4.3.4 Test data

Date : 10-September-2019
Temperature : 22.7 [°C]
Humidity : 61.9 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Tadahiro Seino

[9kHz to 30MHz]

Frequency (MHz)	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 (dB)	Result
27.12	28.9	-5.2	23.7	-16.3	29.5	45.8	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	495.000	H	33.2	-9.5	23.7	46.0	22.3	195.0	0.0
2	742.500	H	32.6	-5.8	26.8	46.0	19.2	121.0	0.0
3	866.250	H	28.9	-3.6	25.3	46.0	20.7	176.0	10.0
4	990.002	H	29.3	-1.4	27.9	54.0	26.1	214.0	0.0

Japan

4.4 Frequency Tolerance

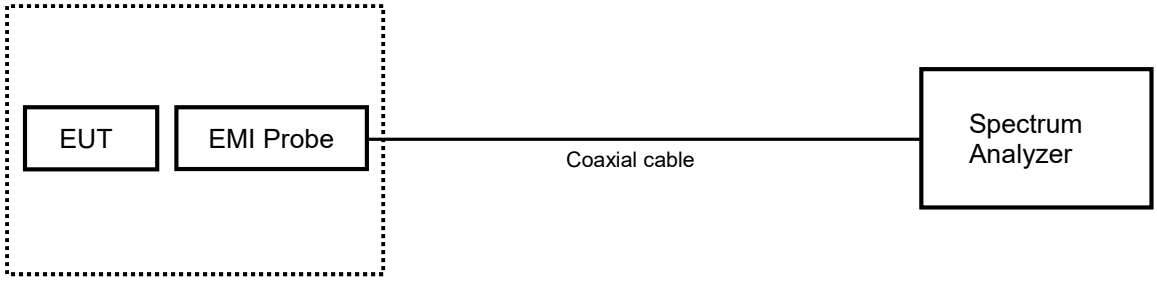
4.4.1 Measurement procedure

[FCC 15.205 (e)]

The EUT was placed of an inside of an 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-September-2019
Temperature : 23.3 [˚C]
Humidity : 51.9 [%]
Test place : Shielded room No.4

Test engineer : Kazunori Saito

Reference Frequency: EUT Channel 13.56MHz at 20ºC

Limit: ±0.01% = ±100ppm = ±0.00135603MHz

Power Supply [V]	Temperature [ºC]	Measurements Frequency (startup) [MHz]	Frequency Tolerance (startup) [ppm]	Measurements Frequency (2mins) [MHz]	Frequency Tolerance (2mins) [ppm]	Measurements Frequency (5mins) [MHz]	Frequency Tolerance (5mins) [ppm]	Measurements Frequency (10mins) [MHz]	Frequency Tolerance (10mins) [ppm]	Limit [ppm]	Result
3.80	50	13.560230	16.962	13.560230	16.962	13.560260	19.174	13.560240	17.699	±100	PASS
	40	13.560235	17.330	13.560255	18.805	13.560240	17.699	13.560235	17.330		
	30	13.560240	17.699	13.560245	18.068	13.560235	17.330	13.560250	18.437		
	20	13.560000	-	13.560250	18.437	13.560255	18.805	13.560260	19.174		
	10	13.560270	19.912	13.560265	19.543	13.560260	19.174	13.560255	18.805		
	0	13.560265	19.543	13.560280	20.649	13.560255	18.805	13.560275	20.280		
	-10	13.560260	19.174	13.560260	19.174	13.560285	21.018	13.560290	21.386		
	-20	13.560225	16.593	13.560230	16.962	13.560230	16.962	13.560245	18.068		
	-30	13.560210	15.487	13.560230	16.962	13.560235	17.330	13.560215	15.855		
3.42	20	13.560255	18.805	13.560246	18.142	13.560240	17.699	13.560245	18.068		
4.18	20	13.560260	19.174	13.560250	18.437	13.560255	18.805	13.560255	18.805		

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 90% to 110%

Japan

4.5 AC Power Line Conducted Emissions

4.5.1 Measurement procedure

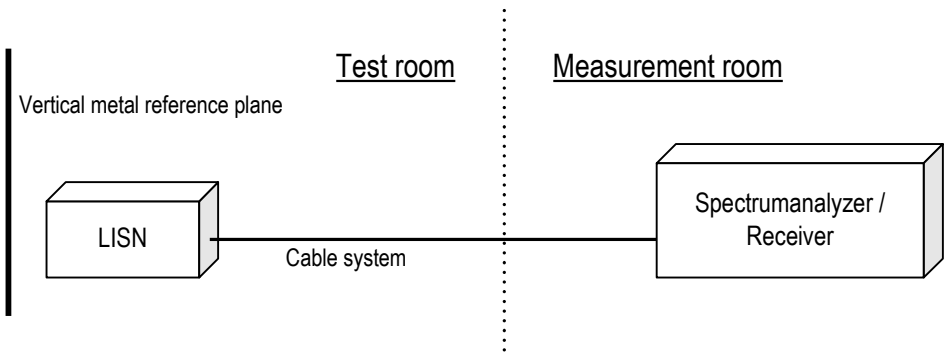
[FCC 15.207]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	0.15 MHz to 30 MHz
Test place	:	3 m Semi-anechoic chamber
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



Japan

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

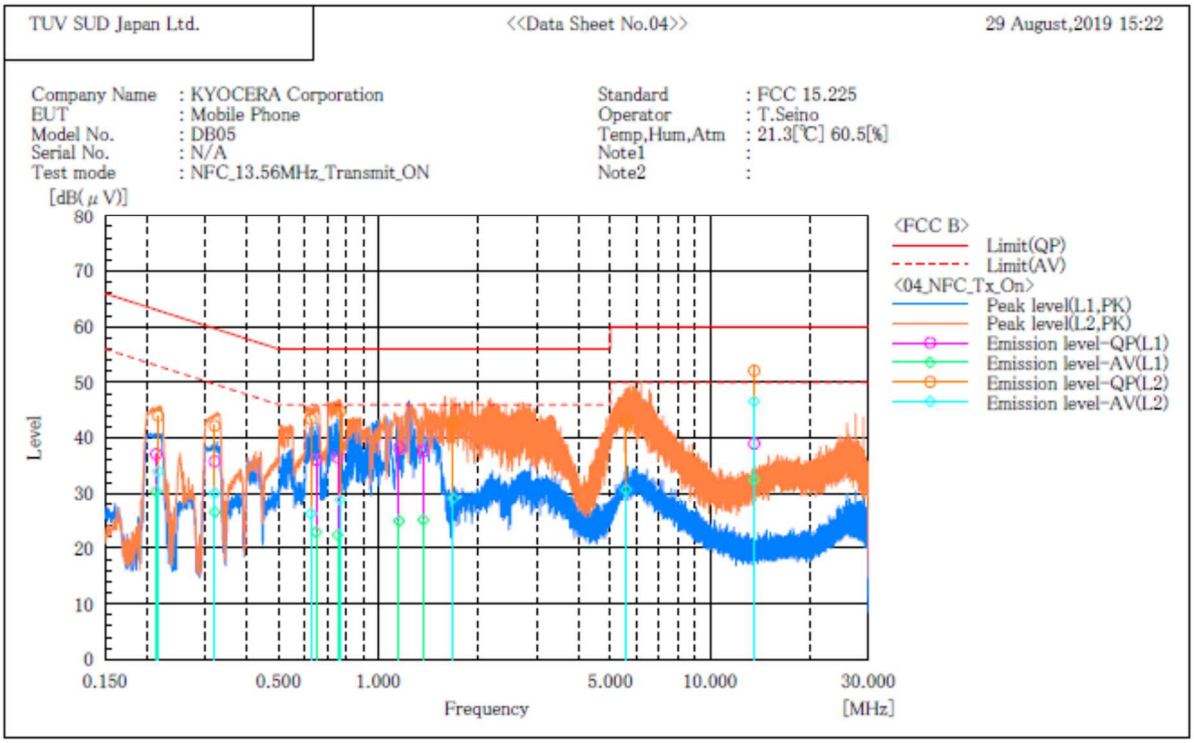
*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

Japan

4.5.4 Test data

[Transmit ON]

***** CONDUCTED EMISSION at MAINS PORT *****
[3m Semi-anechoic chamber]



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.214	26.7	20.0	10.4	37.1	30.4	63.0	53.0	25.9	22.6
2	0.321	25.4	16.1	10.4	35.8	26.5	59.7	49.7	23.9	23.2
3	0.650	25.7	12.5	10.4	36.1	22.9	56.0	46.0	19.9	23.1
4	0.754	26.1	12.0	10.4	36.5	22.4	56.0	46.0	19.5	23.6
5	1.154	27.9	14.5	10.4	38.3	24.9	56.0	46.0	17.7	21.1
6	1.366	27.2	14.7	10.4	37.6	25.1	56.0	46.0	18.4	20.9
7	13.560	27.6	21.1	11.4	39.0	32.5	60.0	50.0	21.0	17.5

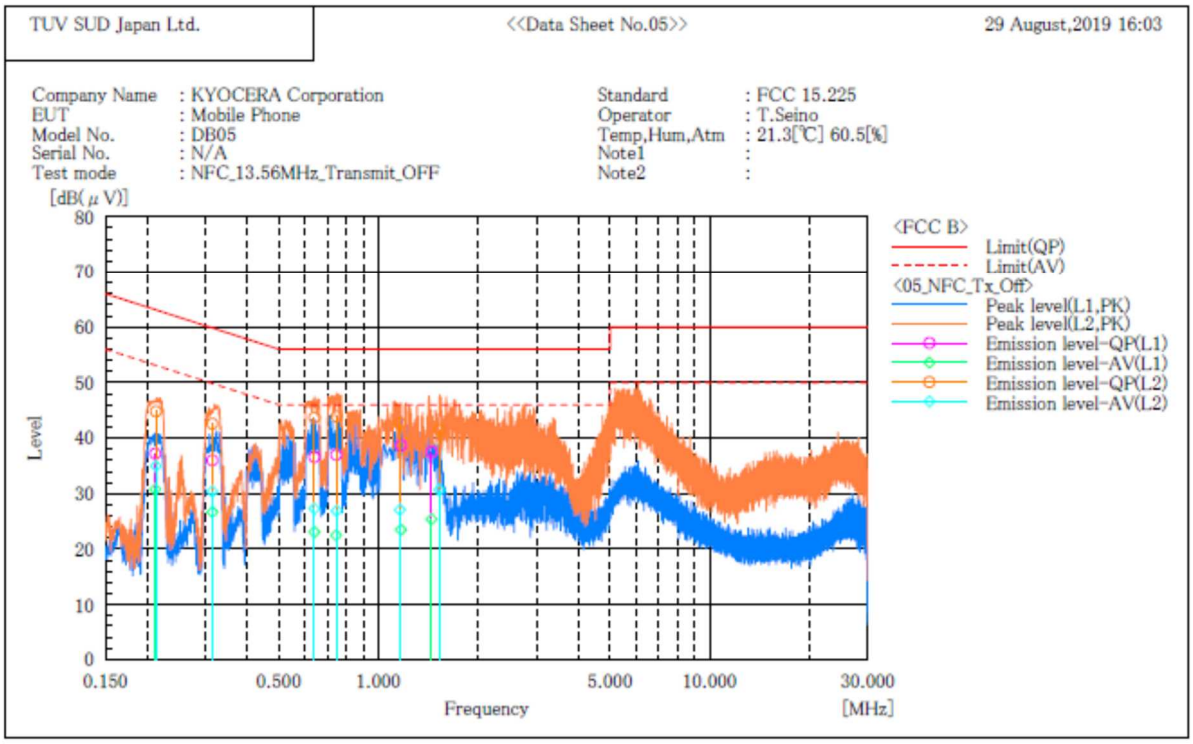
--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.217	33.6	23.6	10.4	44.0	34.0	62.9	52.9	18.9	18.9
2	0.321	31.8	19.7	10.4	42.2	30.1	59.7	49.7	17.5	19.6
3	0.626	33.0	15.8	10.4	43.4	26.2	56.0	46.0	12.6	19.8
4	0.767	34.4	18.4	10.4	44.8	28.8	56.0	46.0	11.2	17.2
5	1.681	32.3	18.7	10.4	42.7	29.1	56.0	46.0	13.3	16.9
6	5.584	32.2	20.0	10.7	42.9	30.7	60.0	50.0	17.1	19.3
7	13.567	40.6	35.1	11.5	52.1	46.6	60.0	50.0	7.9	3.4

Japan

[Transmit OFF]

***** CONDUCTED EMISSION at MAINS PORT *****
[3m Semi-anechoic chamber]



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.212	26.8	20.4	10.4	37.2	30.8	63.1	53.1	25.9	22.3
2	0.315	25.6	16.3	10.4	36.0	26.7	59.8	49.8	23.8	23.1
3	0.640	26.2	12.7	10.4	36.6	23.1	56.0	46.0	19.4	22.9
4	0.745	26.6	12.1	10.4	37.0	22.5	56.0	46.0	19.0	23.5
5	1.168	28.3	13.1	10.4	38.7	23.5	56.0	46.0	17.3	22.5
6	1.445	27.1	15.0	10.4	37.5	25.4	56.0	46.0	18.5	20.6

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.213	34.4	24.6	10.4	44.8	35.0	63.1	53.1	18.3	18.1
2	0.315	32.2	20.0	10.4	42.6	30.4	59.8	49.8	17.2	19.4
3	0.640	33.3	16.9	10.4	43.7	27.3	56.0	46.0	12.3	18.7
4	0.748	33.5	16.5	10.4	43.9	26.9	56.0	46.0	12.1	19.1
5	1.160	32.3	16.7	10.4	42.7	27.1	56.0	46.0	13.3	18.9
6	1.528	31.1	20.3	10.4	41.5	30.7	56.0	46.0	14.5	15.3

5 Antenna requirement

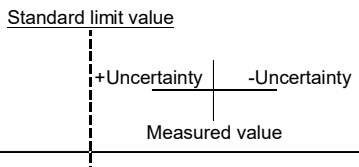
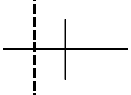
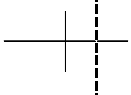
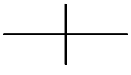
According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.
The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC 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)	±3.8 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.1 dB
Radiated emission (30 MHz – 1000 MHz)	±4.9 dB
Radiated emission (1 GHz – 6 GHz)	±4.8 dB
Radiated emission (6 GHz – 18 GHz)	±5.1 dB
Radiated emission (18 GHz – 40 GHz)	±5.8 dB
Radio Frequency	$\pm 1.4 * 10^{-8}$
RF power, conducted	±0.6 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
Fax: +81-238-28-2888

Accreditation and Registration
NVLAP
LAB CODE: 200306-0

VLAC
Accreditation No.: VLAC-013

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

Innovation, Science and Economic Development Canada

Site number	Facility	Expiration date
4224A-4	3 m Semi-anechoic chamber	27-November-2020
4224A-5	10 m Semi-anechoic chamber No. 1	27-November-2020
4224A-6	10 m Semi-anechoic chamber No. 2	14-December-2019

VCCI Council

Registration number	Expiration date
A-0166	03-July-2021

Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Aug-2020	05-Aug-2019
Microwave cable	SUHNER	SUCOFLEX102/2m	31648	31-Mar-2020	08-Mar-2019
EMI Probe	ANRITSU	MA2601C	N/A(1753)	31-Oct-2019	18-Oct-2018
Temperature and humidity chamber	ESPEC	PL1KP	14007261	31-Dec-2019	07-Dec-2018

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2019	20-Sep-2018
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Oct-2019	12-Oct-2018
Preamplifier	SONOMA	310	372170	30-Sep-2019	20-Sep-2018
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	31-Mar-2020	07-Mar-2019
Attenuator	TOYO Connector	NA-PJ-6	N/A(S507)	31-Dec-2019	17-Dec-2018
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	VHA91031308	31-May-2020	16-May-2019
Log periodic antenna	Schwarzbeck	UHALP9108A	0728	31-May-2020	16-May-2019
Attenuator	TAMAGAWA.ELEC	CFA-01/6dB	N/A(S465)	31-May-2020	17-May-2019
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2019	11-Jul-2018
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/1m	my24610/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/1.5m	MY19309/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/7m	41625/6	31-Jan-2020	16-Jan-2019
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2020	14-May-2019

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2019	20-Sep-2018
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Jan-2020	17-Jan-2019
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	31-May-2020	16-May-2019
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Jan-2020	16-Jan-2019
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Jan-2020	16-Jan-2019
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Jan-2020	16-Jan-2019
PC	DELL	DIMENSION	75465BX	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.