



Zacta

# TEST REPORT

Report number : JPD-TR-17060-0

Issue date : February 21, 2017

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

## FCC Part15 Subpart C

The test results are traceable to the international or national standards.

Applicant	: KYOCERA Corporation
Equipment under test (EUT)	: Mobile Phone
Model number	: DA28
FCC ID	: JOYDA28

Date of test : January 25, 28, 2017  
February 1, 21, 2017  
Test place : TÜV SÜD Zacta Ltd. Yonezawa Testing Center  
5-4149-7, Hachimanpara, Yonezawa-shi,  
Yamagata, 992-1128 Japan  
Phone: +81-238-28-2881 Fax: +81-238-28-2888  
Test results : Complied

The results in this report are applicable only to the equipment tested.  
This report shall not be re-produced except in full without the written approval of TÜV SÜD Zacta Ltd.  
This test report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by : Taiki Watanabe  
Taiki Watanabe

Approved by : Hiroaki Suzuki  
Hiroaki Suzuki  
Lab Manager of RF Lab



NVLAP LAB CODE 200306-0



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## 1. Summary of Test

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### 1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart C.

### 1.2 Standards

CFR47 FCC Part 15 Subpart C

#### 1.2.1 Test Methods

ANSI C63.10-2013

#### 1.2.2 Deviation from standards

None

### 1.3 List of applied test to the EUT

Test items Section	Classification of EUT	Condition	Result
RSS-Gen 4.6.1	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

#### 1.3.1 Test set up

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### 1.4 Modification to the EUT by laboratory

None



## **2. Equipment Under Test**

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### **2.1 General Description of equipment**

EUT is the Mobile Phone.

### **2.2 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 : Mobile Phone

Trade name : Kyocera

Model number : DA28

Serial number : N/A

EUT condition : Pre-production

Power ratings : Battery: DC 3.8V

Size : (W) 51.3 × (D) 113.8 × (H) 18.2 mm

Environment : Indoor and Outdoor USE

Terminal limitation : -20°C to 60°C

RF Specification  
Frequency range : 13.56MHz

Modulation method : ASK

Antenna type : Loop antenna

### **2.3 Variation of the family model(s)**

Not applicable



## 2.4 Description of Test 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.

## 2.5 Operating mode

[Transmit mode]

- i) NFC test program setup to the DM tool
- ii) Start test mode

### 3. Configuration of equipment

#### 3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Mobile Phone	KYOCERA	DA28	N/A	JOYDA28	EUT
2	AC Adapter	au	N/A	N/A	N/A	*

\*: AC power line Conducted Emission Test.

#### 3.2 Cable(s) used

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

\*: AC power line Conducted Emission Test.

#### 3.3 System configuration



# : Un-detachable cable

Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in "3.1 Equipment(s) used" and "3.2 Cable(s) used".

## 4. Occupied Bandwidth

### 4.1 Measurement procedure [IC RSS-Gen 4.6.1]

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99% bandwidth. 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=Sample

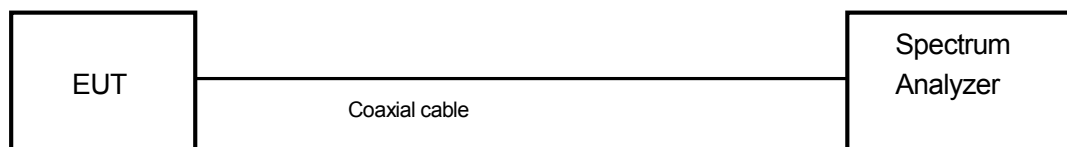
The EUT was set to operate with following conditions.

- 13.56MHz

The test mode of EUT is as follows.

- Transmit mode

- Test configuration



### 4.2 Limit

None

### 4.3 Measurement result

Date : February 21, 2017

Temperature : 22.9 [°C]

Humidity : 45.3 [%]

Test place : Shielded room No.4

Test engineer :

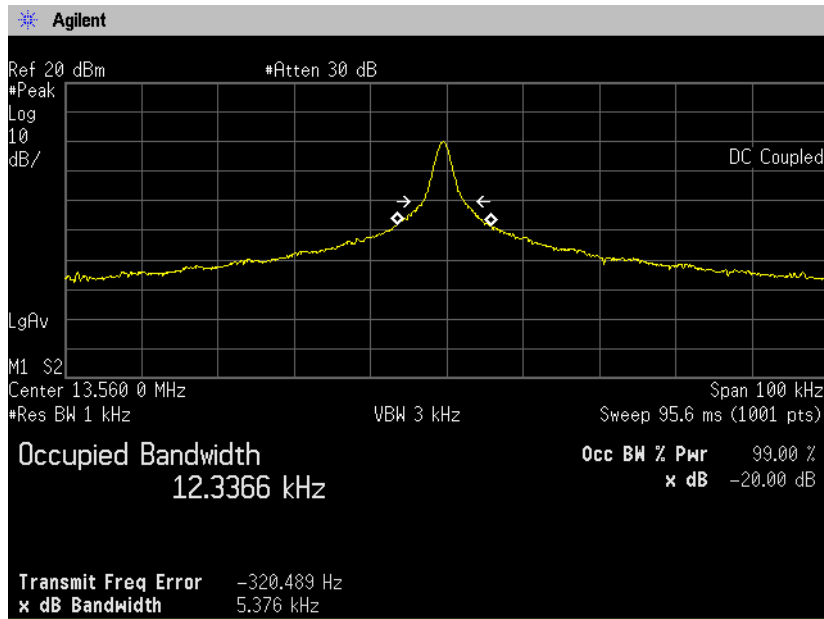
Taiki Watanabe

Frequency (MHz)	Occupied Bandwidth (kHz)
13.56	12.3366



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### 4.4 Trace data





## 5. Operation within the band 13.110-14.010MHz

### 5.1 Measurement procedure

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

Test was applied by following conditions.

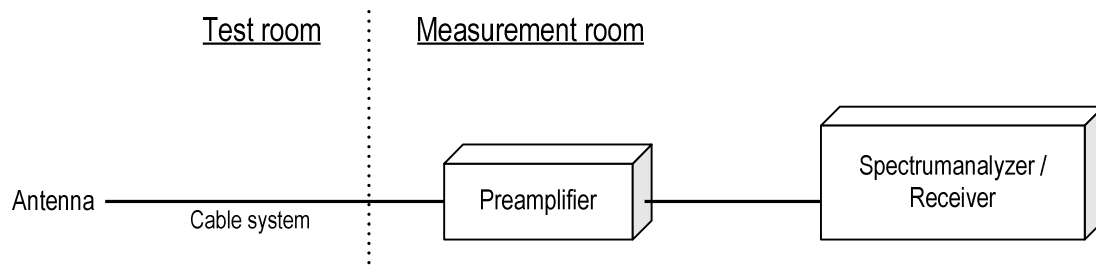
Test method	:	ANSI C63.10
Frequency range	:	13.110MHz to 14.010MHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	:	3m

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



### 5.2 Calculation method

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

Margin = Limit – Emission level

### 5.3 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  $40\log(3/30) = -40.0\text{dB}$

### 5.4 Test data

Date : January 25, 2017  
 Temperature : 17.1 [°C]  
 Humidity : 22.3 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Taiki Watanabe

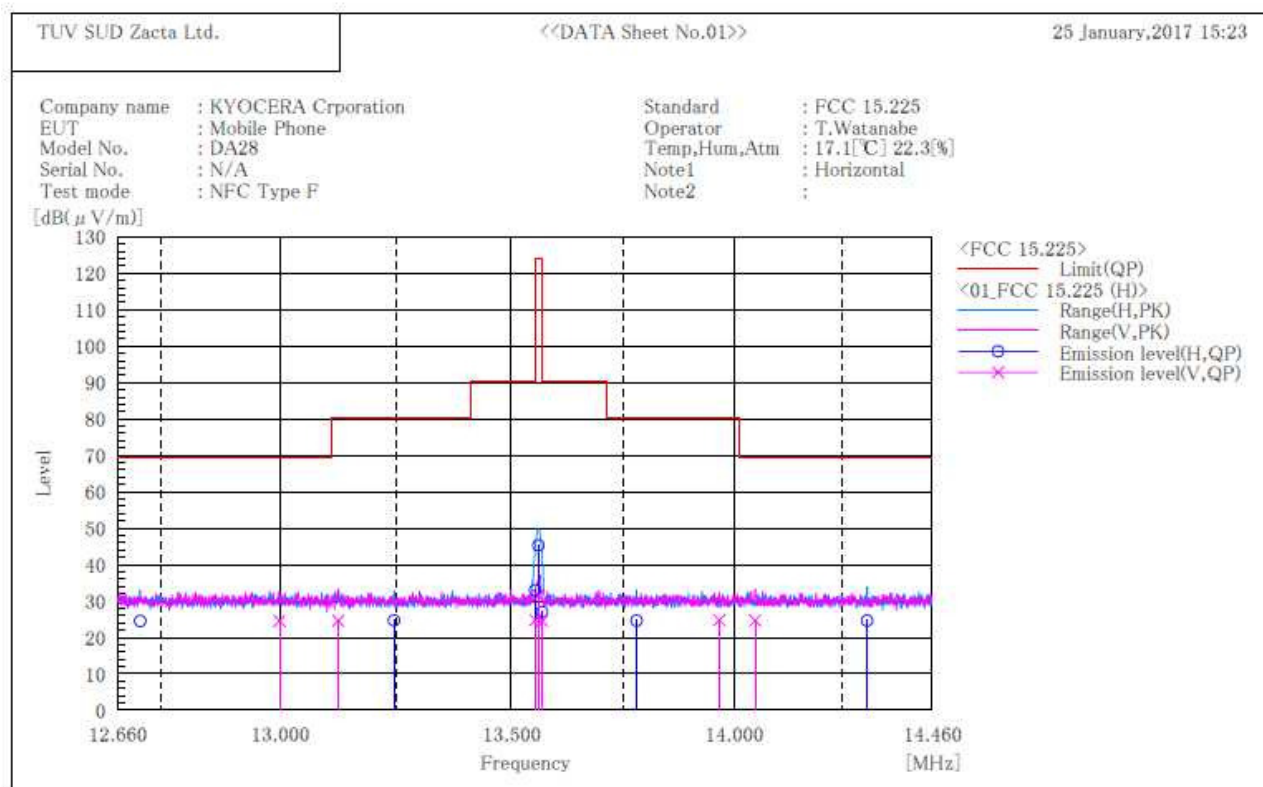
Frequency range (MHz)	Frequency (MHz)	Level		Limit (dBuV/m)	Margin (dB)	Result
		Measured at 3m (dBuV/m)	Measured at 30m (dBuV/m)			
13.553-13.567	13.560	57.2	17.2	84.0	66.8	PASS
13.41-13.553	13.553	44.6	4.6	50.5	45.9	PASS
13.567-13.71	13.568	37.1	-2.9	50.5	53.4	PASS
13.11-13.41	13.349	24.8	-15.2	40.5	55.7	PASS
13.71-14.01	13.996	24.8	-15.2	40.5	55.7	PASS
12.66-13.11	12.789	24.6	-15.4	29.5	44.9	PASS
14.01-14.46	14.279	25.0	-15.0	29.5	44.5	PASS



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### 5.5 Trace data

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



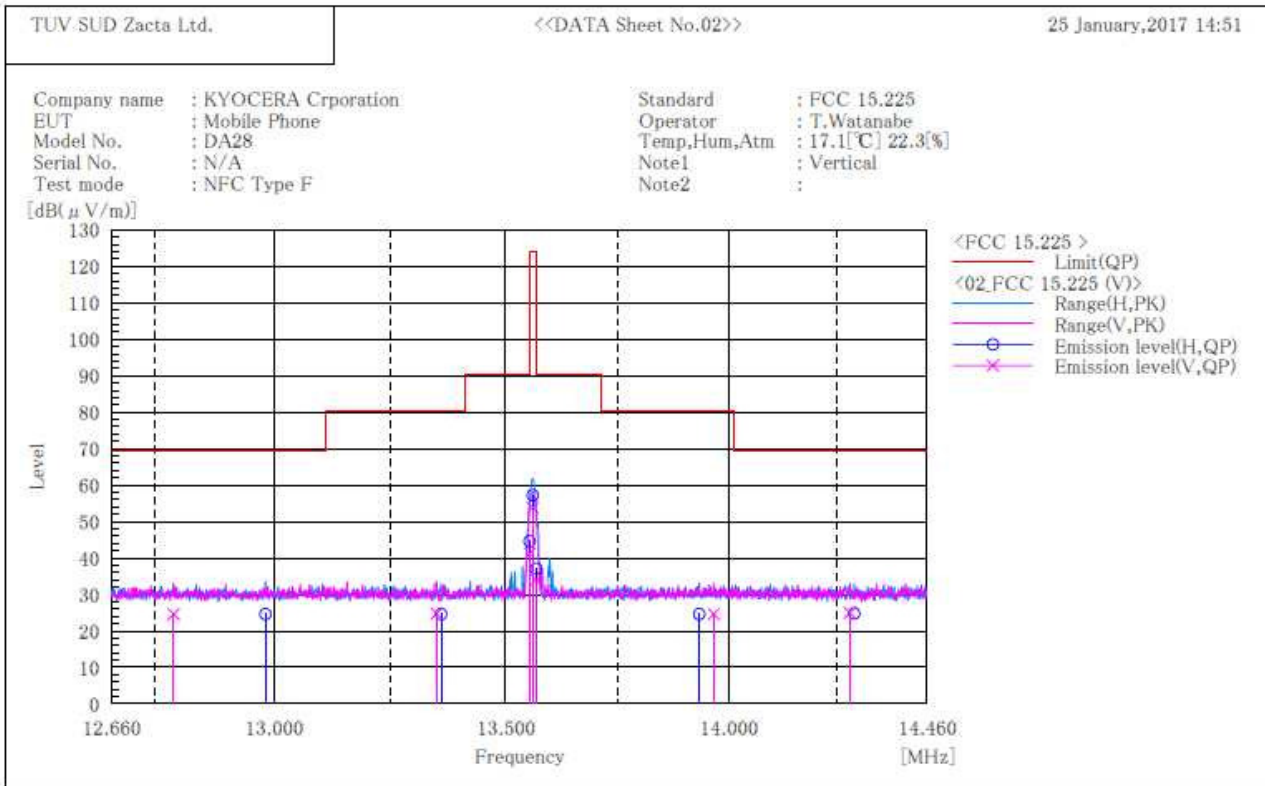
#### Final Result

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 [°]	Remark
1	13.560	V	35.1	-3.6	31.5	124.0	92.5	100.0	130.0	
2	13.553	V	28.4	-3.6	24.8	90.5	65.7	100.0	130.0	
3	13.568	V	28.2	-3.6	24.6	90.5	65.9	100.0	130.0	
4	13.124	V	28.3	-3.7	24.6	80.5	55.9	100.0	12.0	
5	13.966	V	28.4	-3.6	24.8	80.5	55.7	100.0	77.0	
6	12.999	V	28.2	-3.7	24.5	69.5	45.0	100.0	204.0	
7	14.048	V	28.3	-3.6	24.7	69.5	44.8	100.0	0.0	
8	13.560	H	48.9	-3.6	45.3	124.0	78.7	100.0	325.0	
9	13.553	H	36.6	-3.6	33.0	90.5	57.5	100.0	325.0	
10	13.568	H	30.6	-3.6	27.0	90.5	63.5	100.0	325.0	
11	13.244	H	28.4	-3.7	24.7	80.5	55.8	100.0	258.0	
12	13.779	H	28.2	-3.6	24.6	80.5	55.9	100.0	322.0	
13	12.707	H	28.2	-3.7	24.5	69.5	45.0	100.0	155.0	
14	14.307	H	28.2	-3.6	24.6	69.5	44.9	100.0	155.0	



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\*\*\*\*\* 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 [°]	Remark
1	13.560	V	57.4	-3.6	53.8	124.0	70.2	100.0	270.0	
2	13.553	V	44.9	-3.6	41.3	90.5	49.2	100.0	270.0	
3	13.568	V	37.6	-3.6	34.0	90.5	56.5	100.0	270.0	
4	13.349	V	28.5	-3.7	24.8	80.5	55.7	100.0	125.0	
5	13.966	V	28.2	-3.6	24.6	80.5	55.9	100.0	260.0	
6	12.789	V	28.3	-3.7	24.6	69.5	44.9	100.0	211.0	
7	14.279	V	28.6	-3.6	25.0	69.5	44.5	100.0	284.0	
8	13.560	H	60.8	-3.6	57.2	124.0	66.8	100.0	358.0	
9	13.553	H	48.2	-3.6	44.6	90.5	45.9	100.0	358.0	
10	13.568	H	40.7	-3.6	37.1	90.5	53.4	100.0	358.0	
11	13.359	H	28.3	-3.7	24.6	80.5	55.9	100.0	45.0	
12	13.933	H	28.2	-3.6	24.6	80.5	55.9	100.0	12.0	
13	12.982	H	28.3	-3.7	24.6	69.5	44.9	100.0	348.0	
14	14.289	H	28.4	-3.6	24.8	69.5	44.7	100.0	161.0	

## 6. Radiated Emissions

### 6.1 Measurement procedure [FCC 15.209, 15.225 (d)]

Test was applied by following conditions.

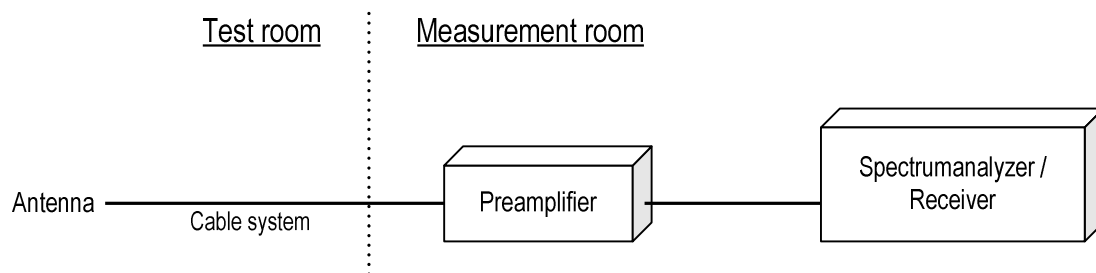
Test method	: ANSI C63.10
Frequency range	: 9kHz to 30MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

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 area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 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



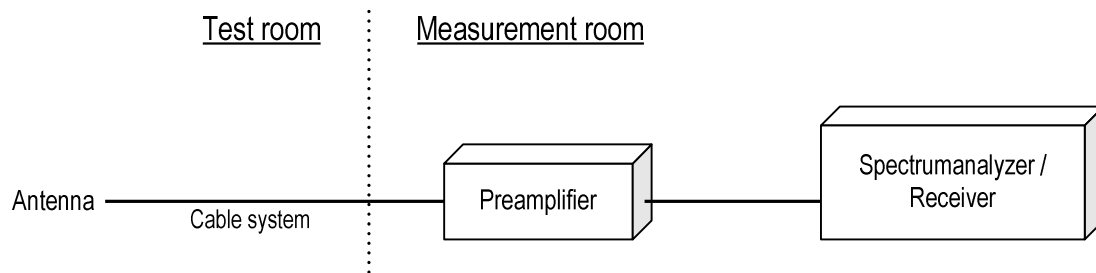
Test was applied by following conditions.

Test method : ANSI C63.10  
 Frequency range : 30MHz to 1000MHz  
 Test place : 10m Semi-anechoic chamber No.2  
 EUT was placed on : FRP table / (W)2.0m × (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



## 6.2 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

### 6.3 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 30m using  $40\log(3/30) = -40.0\text{dB}$



**6.4 Test data**

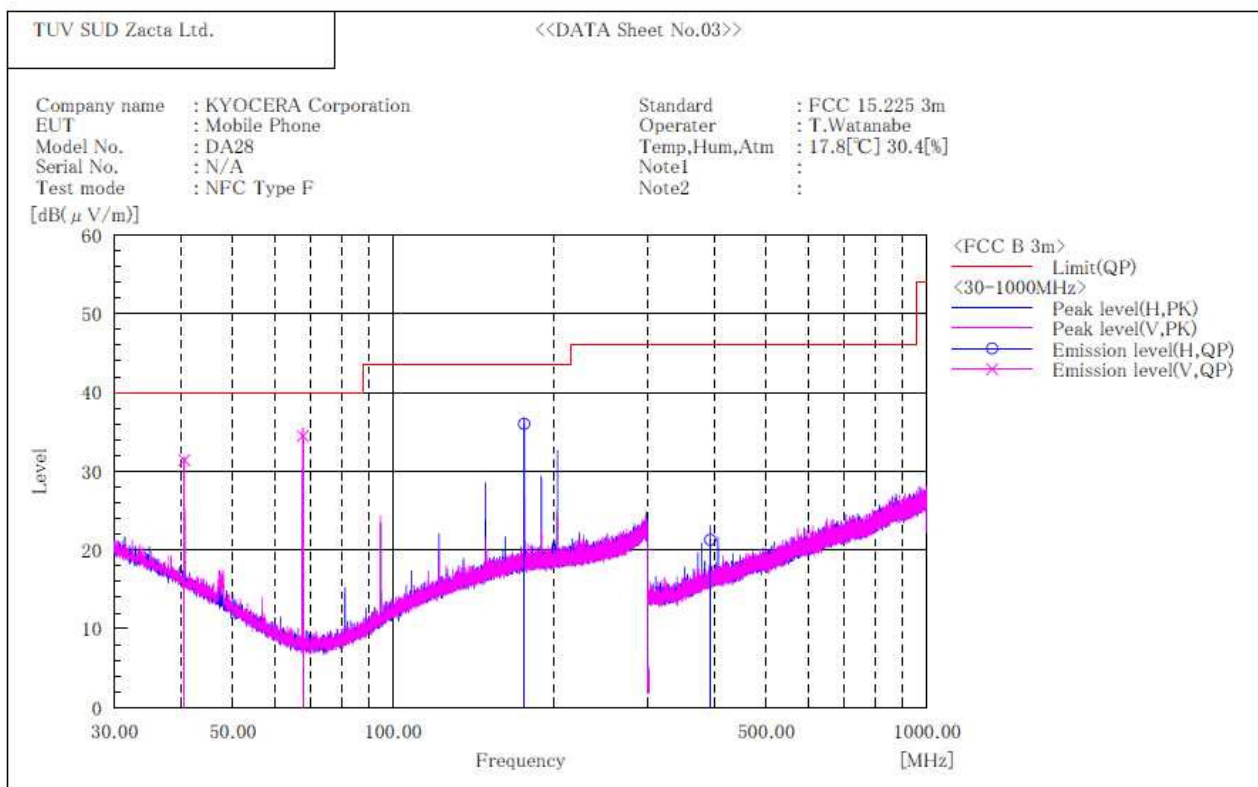
Date : January 28, 2017  
 Temperature : 17.8 [°C]  
 Humidity : 30.4 [%]  
 Test place : 10m Semi-anechoic chamber No.2  
 Test engineer : Taiki Watanabe

**[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	26.9	-2.3	24.6	-15.4	29.5	44.9	PASS

**[30MHz to 1000MHz]**

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #2 ]



**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	40.678	V	39.8	-8.4	31.4	40.0	8.6	100.0	92.0	
2	67.796	V	50.8	-16.3	34.5	40.0	5.5	100.0	91.0	
3	176.280	H	41.7	-5.7	36.0	43.5	7.5	152.0	165.0	
4	393.226	H	29.1	-7.8	21.3	46.0	24.7	100.0	341.0	



## 7. Frequency Tolerance

---

### 7.1 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  $-30^{\circ}\text{C}$  and  $+50^{\circ}\text{C}$ . The temperature was incremented by  $10^{\circ}\text{C}$  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.

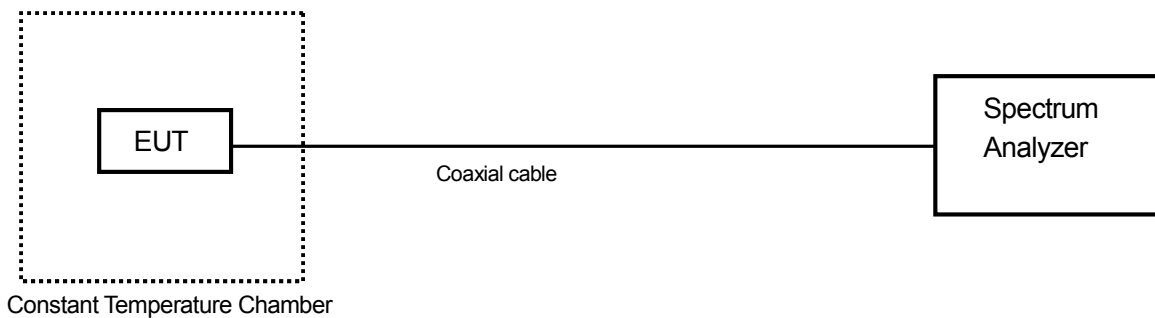
The EUT was set to operate with following conditions.

- 13.56MHz

The test mode of EUT is as follows.

- Transmit mode

- Test configuration



### 7.2 Limit

The Frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  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.



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### 7.3 Test data

Date : February 21, 2017  
 Temperature : 22.9 [°C]  
 Humidity : 45.3 [%]  
 Test place : Shielded room No.4

Test engineer : Taiki Watanabe

Reference Frequency: EUT Channel 13.56MHz at 20°C											
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]	[°C]	[MHz]	[ppm]	[MHz]	[ppm]	[MHz]	[ppm]	[MHz]	[ppm]	[ppm]	
3.80	50	13.559521	-3.98242570	13.559533	-3.09744221	13.559544	-2.28620735	13.559711	10.02981288	± 100	PASS
	40	13.559555	-1.47497248	13.559782	15.26596519	13.559547	-2.06496148	13.559615	2.94994497		
	30	13.559571	-0.29499450	13.559453	-8.99733214	13.559634	4.35116882	13.559646	5.23615231		
	20	13.559575	-	13.559347	-16.81468630	13.559434	-10.39855600	13.559631	4.12992295		
	10	13.559661	6.34238167	13.559614	2.87619634	13.559632	4.20367158	13.559545	-2.21245872		
	0	13.559671	7.07986792	13.559645	5.16240369	13.559665	6.63737617	13.559456	-8.77608627		
	-10	13.559640	4.79366057	13.559651	5.60489543	13.559681	7.81735416	13.559561	-1.03248074		
	-20	13.559625	3.68743121	13.559342	-17.18342942	13.559604	2.13871010	13.559528	-3.46618533		
	-30	13.559595	1.47497248	13.559762	13.79099271	13.559435	-10.32480738	13.559621	3.39243671		
3.23	20	13.559679	7.66985691	13.559669	6.93237067	13.559499	-5.60489543	13.559731	11.50478536		
4.37	20	13.559634	4.35116882	13.559486	-6.56362755	13.559751	12.97975785	13.559451	-9.14482939		

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

## 8. AC Power Line Conducted Emissions

### 8.1 Measurement procedure [FCC 15.207]

Test was applied by following conditions.

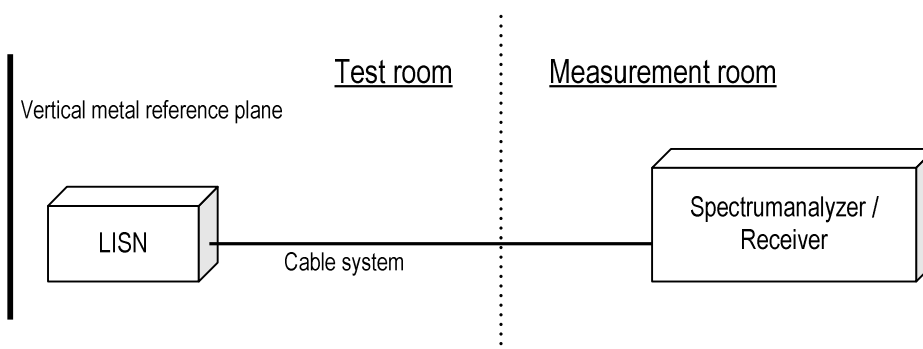
Test method	: ANSI C63.10
Frequency range	: 0.15MHz to 30MHz
Test place	: 10m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Vertical Metal Reference Plane	: (W)2.0m × (H)2.0m 0.4m away from EUT
Test receiver setting	
- Detector	: Quasi-peak, Average
- Bandwidth	: 9kHz

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



### 8.2 Calculation method

Emission level = Reading + (LISN. factor + Cable system loss)

Margin = Limit – Emission level

### 8.3 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

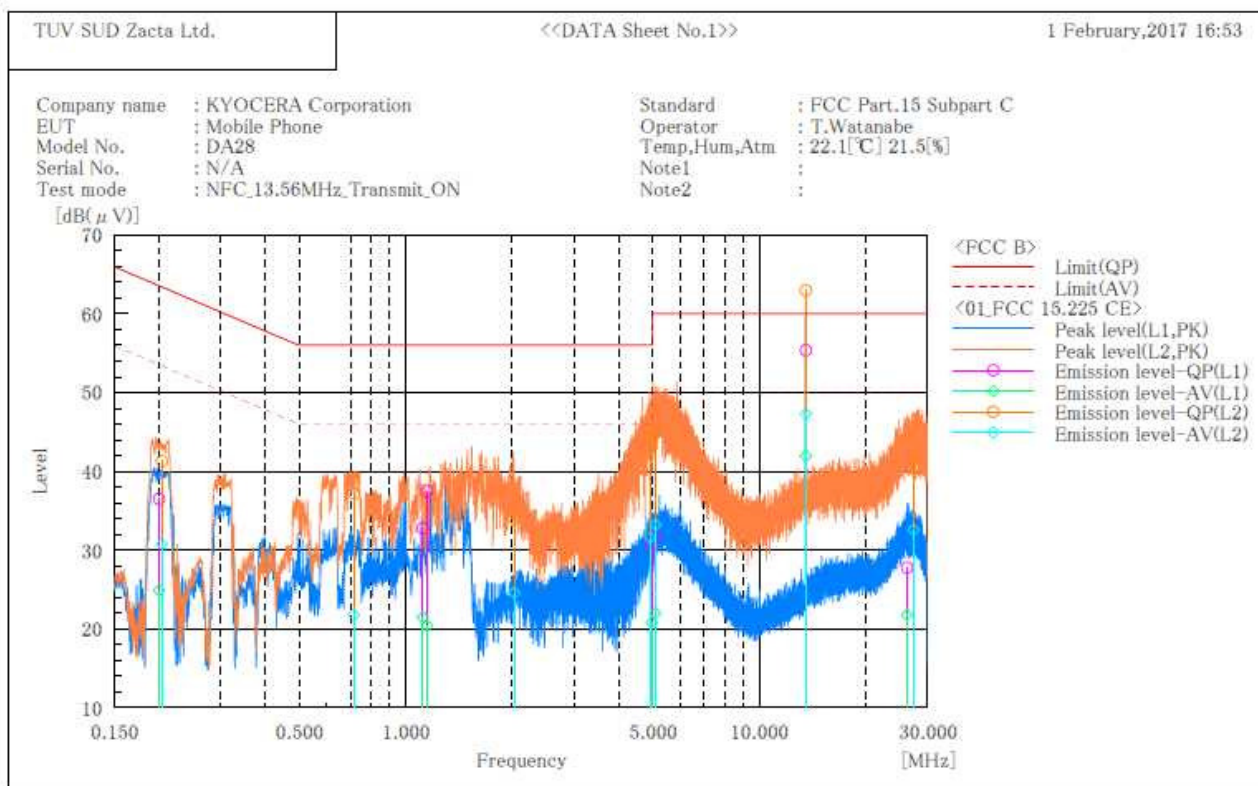
\*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.



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**8.4 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 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	0.201	26.1	14.5	10.4	36.5	24.9	63.6	53.6	27.1	28.7
2	1.119	22.5	11.2	10.3	32.8	21.5	56.0	46.0	23.2	24.5
3	1.151	27.2	10.1	10.3	37.5	20.4	56.0	46.0	18.5	25.6
4	4.973	20.0	10.3	10.5	30.5	20.8	56.0	46.0	25.5	25.2
5	5.091	21.2	11.5	10.5	31.7	22.0	60.0	50.0	28.3	28.0
6	13.560	44.6	31.2	10.8	55.4	42.0	60.0	50.0	4.6	8.0
7	26.219	16.6	10.6	11.2	27.8	21.8	60.0	50.0	32.2	28.2

--- L2 Phase ---

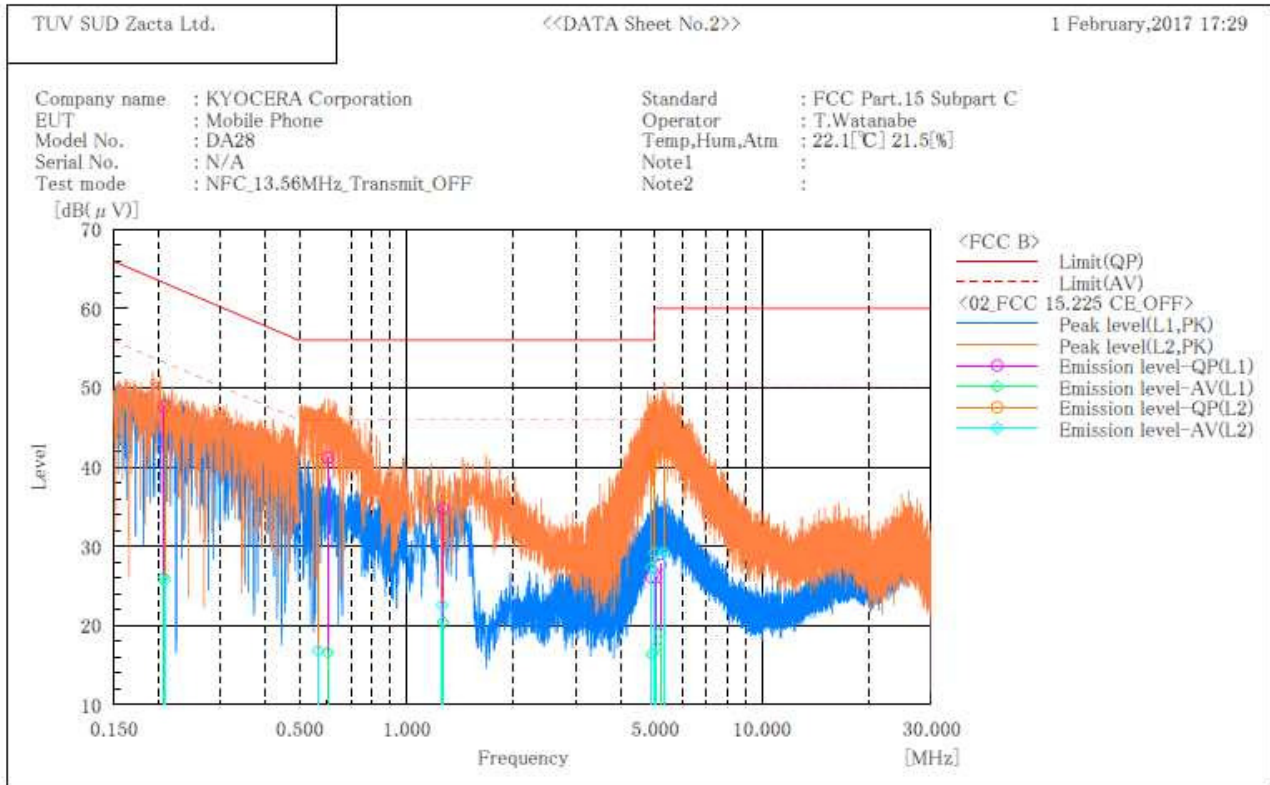
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.205	30.9	20.4	10.4	41.3	30.8	63.4	53.4	22.1	22.6
2	0.715	26.9	11.5	10.3	37.2	21.8	56.0	46.0	18.8	24.2
3	2.032	23.6	14.2	10.4	34.0	24.6	56.0	46.0	22.0	21.4
4	4.910	33.6	21.1	10.5	44.1	31.6	56.0	46.0	11.9	14.4
5	5.097	34.6	22.7	10.5	45.1	33.2	60.0	50.0	14.9	16.8
6	13.560	52.1	36.4	10.9	63.0	47.3	60.0	50.0	-3.0	2.7
7	27.345	30.0	21.0	11.6	41.6	32.6	60.0	50.0	18.4	17.4



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[Transmit OFF]

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



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	0.208	37.3	15.7	10.4	47.7	26.1	63.3	53.3	15.6	27.2
2	0.601	30.9	6.3	10.3	41.2	16.6	56.0	46.0	14.8	29.4
3	1.271	24.5	10.1	10.3	34.8	20.4	56.0	46.0	21.2	25.6
4	4.906	15.6	5.9	10.5	26.1	16.4	56.0	46.0	29.9	29.6
5	5.042	15.6	6.8	10.5	26.1	17.3	60.0	50.0	33.9	32.7
6	5.193	17.2	8.6	10.5	27.7	19.1	60.0	50.0	32.3	30.9

--- 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	0.209	37.5	15.3	10.4	47.9	25.7	63.2	53.2	15.3	27.5
2	0.566	30.6	6.5	10.3	40.9	16.8	56.0	46.0	15.1	29.2
3	1.262	26.2	12.3	10.3	36.5	22.6	56.0	46.0	19.5	23.4
4	4.894	30.3	16.8	10.5	40.8	27.3	56.0	46.0	15.2	18.7
5	4.999	31.4	18.7	10.5	41.9	29.2	56.0	46.0	14.1	16.8
6	5.324	31.3	18.7	10.5	41.8	29.2	60.0	50.0	18.2	20.8



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## 9. Uncertainty of measurement

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Expanded uncertainties stated are calculated with a coverage Factor  $k=2$ .

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission at mains port	$\pm 3.0\text{dB}$
Radiated emission (9kHz – 30MHz)	$\pm 4.4\text{dB}$
Radiated emission (30MHz – 1000MHz)	$\pm 4.5\text{dB}$
Radiated emission (1000MHz – 26GHz)	$\pm 3.9\text{dB}$



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## 10. Laboratory description

### 1. Location

Name: Yonezawa Testing Center  
 Address: 5-4149-7, Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan  
 Phone: +81-238-28-2881  
 Fax: +81-238-28-2888

### 2. Accreditation and Registration

#### 1) NVLAP

LAB CODE: 200306-0

#### 2) VLAC

Accreditation No.: VLAC-013

#### 3) BSMI

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

#### 4) FCC

Registration number	Expiration date
540072	2017-2-20

#### 5) Industry Canada

Site number	Facility	Expiration date
4224A-4	3m Semi-anechoic chamber	2017-12-03
4224A-5	10m Semi-anechoic chamber No.1	2017-12-03
4224A-6	10m Semi-anechoic chamber No.2	2019-12-14

#### 6) VCCI Council

Registration number	Expiration date
A-0166	2017-07-03

## Appendix A. Test equipment

### Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	Jul. 31, 2017	Jul. 15, 2016
Microwave cable	SUHNER	SUCOFLEX104/1.5m	322087/4	Jul. 31, 2017	Jul. 20, 2016
EMI Probe	ANRITSU	MA2601C	N/A(1753)	Oct. 31, 2017	Oct. 30, 2016
EMI Receiver	ROHDE&SCHWARZ	ESCI	100764	Aug. 31, 2017	Aug. 19, 2016
Preamplifier	ANRITSU	MH648A	M96057	May 31, 2017	May 10, 2016
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	892246/010	May 31, 2017	May 9, 2016
Attenuator	TDC	TAT-43B-06	N/A(S209)	May 31, 2017	May 10, 2016
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2155	Jun. 30, 2017	Jun. 2, 2016
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	Jun. 30, 2017	Jun. 2, 2016
Attenuator	TME	CFA-01NPJ-6	N/A(S275)	May 31, 2017	May 10, 2016
Attenuator	TME	CFA-01NPJ-3	N/A(S272)	May 31, 2017	May 10, 2016
Microwave cable	SUHNER	SUCOFLEX104/9m	MY30037/4	May 31, 2017	May 10, 2016
		SUCOFLEX104/1m	my24610/4	May 31, 2017	May 10, 2016
		SUCOFLEX104/1.5m	317226/4	May 31, 2017	May 10, 2016
		SUCOFLEX106/7m	41625/6	May 31, 2017	May 10, 2016
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.3.61	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	May 31, 2017	May 11, 2016
EMI Receiver	ROHDE&SCHWARZ	ESR7	101187	Sep. 30, 2017	Sep. 9, 2016
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2550	Sep. 30, 2017	Sep. 6, 2016
Log periodic antenna	Schwarzbeck	UHALP9108A	0561	Sep. 30, 2017	Sep. 6, 2016
Attenuator	TDC	TAT-43B-03	N/A(S205)	Jun. 30, 2017	Jun. 21, 2016
Attenuator	TME	CFA-01NPJ-6	N/A(S274)	Jun. 30, 2017	Jun. 21, 2016
Microwave Cable	HUBER+SUHNER	SUCOFLEX104/1m	SN MY20467/6	Jan. 31, 2018	Jan. 6, 2017
Microwave Cable	HUBER+SUHNER	SUCOFLEX104/9m	MY23759/4	Jan. 31, 2018	Jan. 6, 2017
Microwave Cable	HUBER+SUHNER	SUCOFLEX106/10m	501944/6	Jan. 31, 2018	Jan. 6, 2017
Microwave Cable	HUBER+SUHNER	SUCOFLEX104/2m	MY15464/4	Jan. 31, 2018	Jan. 6, 2017
Microwave Cable	HUBER+SUHNER	SUCOFLEX104/2m	MY15570/4	Jan. 31, 2018	Jan. 6, 2017
Preamplifier	ANRITSU	MH648A	M96257	Jun. 30, 2017	Jun. 20, 2016
PC	DELL	OPTIPLEX9010	00186-228-073-851	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
10m Semi-Anechoic Chamber	TOKIN	10m Semi an-echoic Chamber No.2	N/A(NSA10mΦ3m)	Jan. 31, 2018	Jan. 6, 2017
Low temperature and humidity chamber	Espec	PL1KP	14007261	Jan. 31, 2017	Jan. 22, 2016
Low temperature and humidity chamber	Espec	PL1KP	14007261	Jan. 31, 2018	Jan. 20, 2017





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**Conducted emission at mains port**

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100764	Aug. 31, 2017	Aug. 19, 2016
Attenuator	HUBER+SUHNER	6810.01.A	N/A(S411)	Feb. 28, 2017	Feb. 23, 2016
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	Mar. 31, 2017	Mar. 28, 2016
Coaxial cable	FUJIKURA	5D-2W/4m	N/A(S350)	Feb. 28, 2017	Feb. 23, 2016
Coaxial cable	FUJIKURA	5D-2W/1m	N/A(S193)	Feb. 28, 2017	Feb. 23, 2016
Coaxial cable	SUHNER	RG214/U/10m	N/A(S194)	Feb. 28, 2017	Feb. 23, 2016
PC	DELL	DIMENSION E521	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.