



Zacta

TEST REPORT

Report number : Z101C-14070

Issue date : October 10, 2014

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	: KYV31
FCC ID	: JOYKYV31

Date of test : October 6, 7, 2014
Test place : TÜV SÜD Zacta Ltd. Yonezawa Testing Center
4149-7 Hachimanpara 5-chome
Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 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 client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by : Taiki Watanabe
Taiki Watanabe

Authorized by : Eiji Akiba
Eiji Akiba
Deputy General Manager of technical Department

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NVLAP LAB CODE 200306-0

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1. Summary of Test

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 C63.4-2003

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	N/A *
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	N/A *
15.207	AC Power Line Conducted Emissions	Conducted	N/A *

*: Since there is no change in Module from FCC ID: JOYKYY23, only the Radiated test items were performed.

1.3.1 Test set up

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1.4 Modification to the EUT by laboratory

None

2. Equipment Under Test

2.1 General Description of equipment

EUT is the Mobile Phone.

2.2 EUT information

Applicant : KYOCERA Corporation
Yokohama Office2-1-1 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 : KYV31

Serial number : N/A

EUT condition : Pre-production

Power ratings : Battery: DC 3.8V

Size : (W) 70.4 × (D) 9.9 × (H) 141.0 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 Y 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



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3. Configuration of equipment

3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Mobile Phone	KYOCERA	KYY23	N/A	JOYKYY23	EUT

3.2 System configuration

1. Mobile Phone
(EUT)

Note: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used”.

4. Operation within the band 13.110-14.010MHz

4.1 Measurement procedure

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

Test was applied by following conditions.

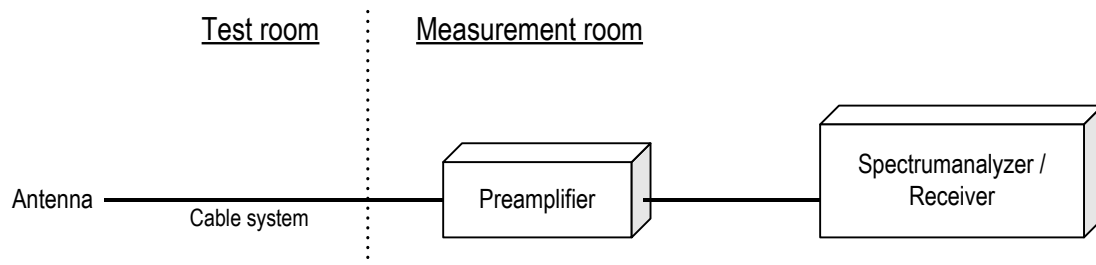
Test method	: ANSI C63.4
Frequency range	: 13.110MHz to 14.010MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

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



4.2 Calculation method

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

Margin = Limit – Emission level

4.3 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 $40\log(3/30) = -40.0\text{dB}$

4.4 Test data

Date : Oct. 7, 2014

Temperature : 20.3 [°C]

Humidity : 60.7 [%]

Test place : 3m Semi-anechoic chamber

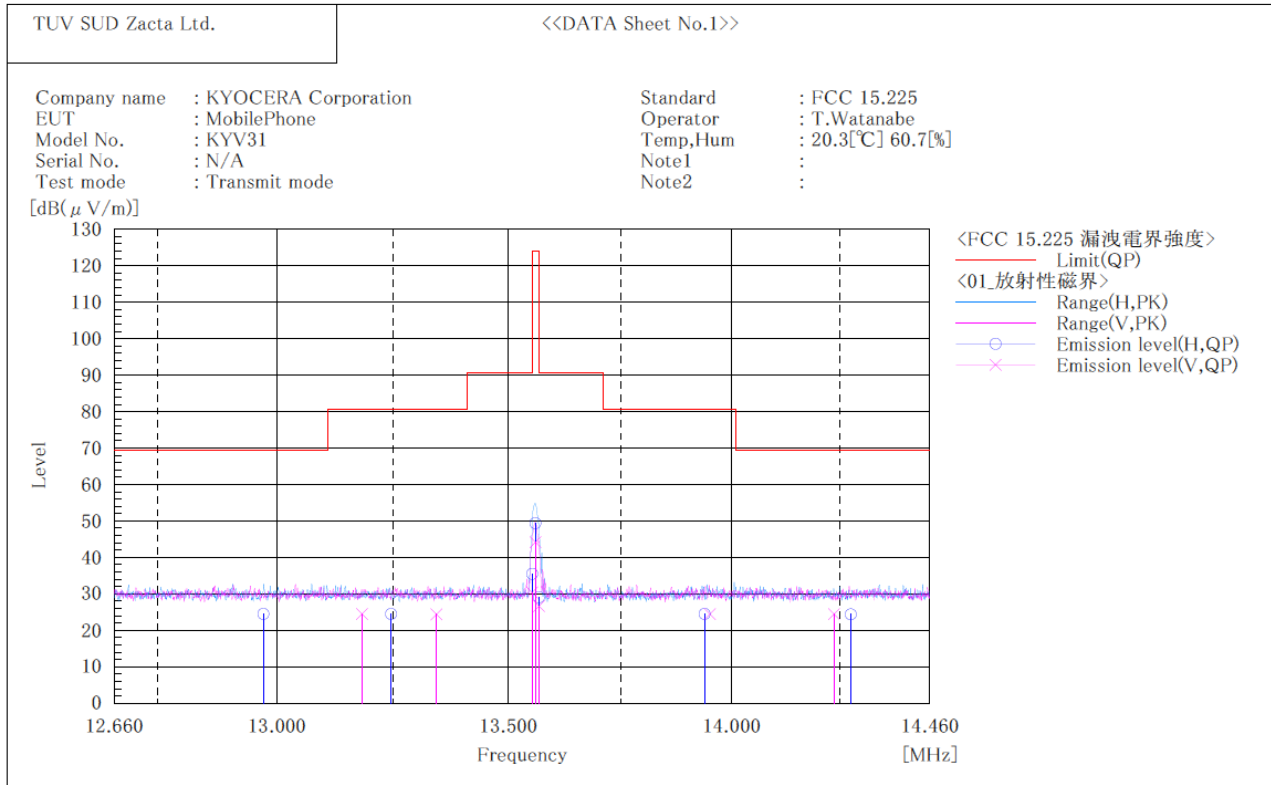
Test engineer :

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	49.4	9.4	84.0	74.6	PASS
13.41-13.553	13.553	35.5	-4.5	50.5	55.0	PASS
13.567-13.71	13.568	29.1	-10.9	50.5	61.4	PASS
13.11-13.41	13.245	24.5	-15.5	40.5	56.0	PASS
13.71-14.01	13.939	24.5	-15.5	40.5	56.0	PASS
12.66-13.11	12.972	24.5	-15.5	29.5	45.0	PASS
14.01-14.46	14.236	24.5	-15.5	29.5	45.0	PASS

4.5 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	H	53.1	-3.7	49.4	124.0	74.6	100.0	4.0	
2	13.553	H	39.2	-3.7	35.5	90.5	55.0	100.0	4.0	
3	13.568	H	32.8	-3.7	29.1	90.5	61.4	100.0	4.0	
4	13.245	H	28.2	-3.7	24.5	80.5	56.0	100.0	220.0	
5	13.939	H	28.1	-3.6	24.5	80.5	56.0	100.0	262.0	
6	12.972	H	28.2	-3.7	24.5	69.5	45.0	100.0	143.0	
7	14.275	H	28.0	-3.6	24.4	69.5	45.1	100.0	166.0	
8	13.560	V	47.9	-3.7	44.2	124.0	79.8	100.0	312.0	
9	13.553	V	34.1	-3.7	30.4	90.5	60.1	100.0	312.0	
10	13.568	V	30.4	-3.7	26.7	90.5	63.8	100.0	312.0	
11	13.343	V	28.1	-3.7	24.4	80.5	56.1	100.0	302.0	
12	13.951	V	28.1	-3.6	24.5	80.5	56.0	100.0	212.0	
13	13.182	V	28.2	-3.7	24.5	80.5	56.0	100.0	294.0	
14	14.236	V	28.1	-3.6	24.5	69.5	45.0	100.0	64.0	

5. Radiated Emissions

5.1 Measurement procedure [FCC 15.209, 15.225 (d)]

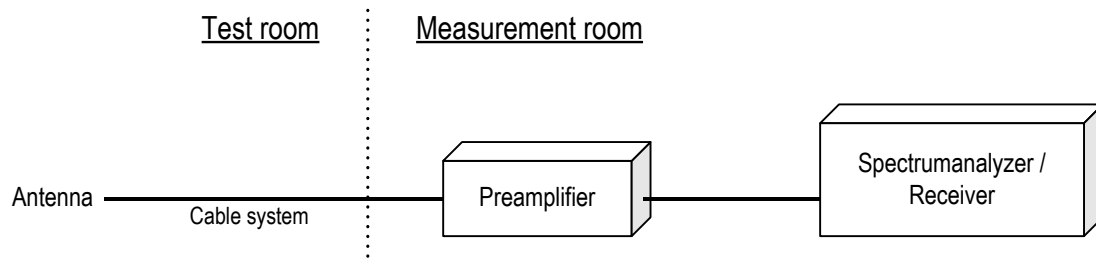
Test was applied by following conditions.

Test method	: ANSI C63.4
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

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



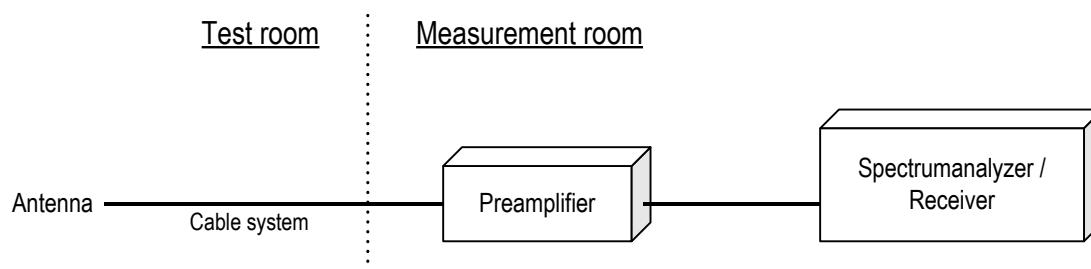
Test was applied by following conditions.

Test method	: ANSI C63.4
Frequency range	: 30MHz to 1000MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m x (D)1.0m x (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



5.2 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

5.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	$2400 / F$ [kHz]	$20\log E$ [uV/m]	300
0.490-1.705	$24000 / F$ [kHz]	$20\log E$ [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] = $20\log$ Emission [uV/m]
3. Measurements were corrected to 30m using $40\log (3/30) = -40.0\text{dB}$

5.4 Test data

Date : Oct. 7, 2014
 Temperature : 20.3 [°C]
 Humidity : 60.7 [%]
 Test place : 3m Semi-anechoic chamber

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	25.7	-1.5	24.2	-15.8	29.5	45.3	PASS

Date : Oct.6, 2014
 Temperature : 18.6 [°C]
 Humidity : 59.6 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Taiki Watanabe

[30MHz to 1000MHz]

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	40.665	H	31.2	-8.0	23.2	40.0	16.8	300.0	180.0
2	40.680	V	35.9	-8.0	27.9	40.0	12.1	100.0	78.0
3	67.803	H	44.6	-15.4	29.2	40.0	10.8	299.0	149.0
4	67.801	V	42.9	-15.4	27.5	40.0	12.5	100.0	97.0
5	94.917	H	41.9	-12.9	29.0	43.5	14.5	200.0	141.0
6	94.917	V	33.1	-12.9	20.2	43.5	23.3	100.0	0.0
7	149.160	H	40.1	-6.9	33.2	43.5	10.3	189.0	152.0
8	149.160	V	32.4	-6.9	25.5	43.5	18.0	199.0	242.0

Note: Expect for above emissions, no emissions were observed during Radiated testing.

6. Uncertainty of measurement

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)	$\pm 3.9\text{dB}$

7. Laboratory description

1. Location:

TÜV SÜD Zacta Ltd. Yonezawa Testing Center
4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 Fax: +81-238-28-2888

2. Facility filing information:

1) NVLAP accreditation: NVLAP Lab. code: 200306-0

2) VLAC accreditation: Lab. code: VLAC-013

Site name	Radiated emission	Conducted emission for mains port	Conducted emission for telecom port	Radiated emission (CMAD)	Expiry Date
3m Semi-anechoic chamber	VLAC-013	VLAC-013	VLAC-013	-	Jul. 3, 2015
10m Semi-anechoic chamber No.1				VLAC-013	
10m Semi-anechoic chamber No.2				VLAC-013	
Shielded room No.1	-	VLAC-013	-	-	

3) FCC filing:

Site name	Registration Number	Expiry Date
Site 3	91065	Oct.31, 2014
3m Semi-anechoic chamber	540072	Feb. 20, 2017
10m Semi-anechoic chamber No.1		
10m Semi-anechoic chamber No.2		
Shielded room No.1		

4) Industry Canada Oats site filing:

Site name	Sites on file: Oats 3m/10m	Expiry Date
Site 3	4224A-3	Jan. 23, 2015
3m Semi-anechoic chamber	4224A-4	
10m Semi-anechoic chamber No.1	4224A-5	
10m Semi-anechoic chamber No.2	4224A-6	Jan. 15, 2017

5) VCCI site filing:

Site name	Radiated emission	Conducted emission for mains port	Conducted emission for telecom port	Expiry Date
Site 3	R-138	C-134	T-1222	Nov. 16, 2014 Nov. 28, 2014* (*:Telecom port)
3m Semi-anechoic chamber	A-0166	A-0166	A-0166	Jul. 3, 2015
10m Semi-anechoic chamber No.1				
10m Semi-anechoic chamber No.2				
Shielded room No.1	-	A-0166		

6) TÜV SÜD PS authorization:

Authorized as an EMC test laboratory

7) TÜV Rheinland authorization:

Authorized as an EMC test laboratory



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Appendix A. Test equipment

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ECSI	100451	Nov. 30, 2014	Nov. 16, 2013
Preamplifier	ANRITSU	MH648A	M96057	Jun. 30, 2015	Jun. 12, 2014
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	892246/010	Oct. 31, 2014	Oct. 5, 2013
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2125	May 31, 2015	May 7, 2014
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	May 31, 2015	May 7, 2014
Attenuator	TME	CFA-01NPJ-6	N/A (S275)	Jun. 30, 2015	Jun. 9, 2014
Attenuator	TME	CFA-01NPJ-3	N/A (S272)	Jun. 30, 2015	Jun. 9, 2014
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	May 31, 2015	May 30, 2014
Microwave cable	SUHNER	SUCOFLEX104/9m	346316/4	Oct. 31, 2015	Oct. 31, 2014
		SUCOFLEX104/1m	322084/4	Oct. 31, 2015	Oct. 31, 2014
		SUCOFLEX104/1.5m	317226/4	Oct. 31, 2015	Oct. 31, 2014
		SUCOFLEX104/7m	41625/6	Oct. 31, 2015	Oct. 31, 2014
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-anechoic chamber	TOKIN	N/A	N/A (9002-NSA)	May 31, 2015	May 6, 2014

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