



Zacta

# TEST REPORT

Report number : Z071C-13467

Issue date : Dec. 27, 2013

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	: KYY22
FCC ID	: JOYKYY22

Date of test : December 18, 20 2013  
 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 : Chiaki Kanno  
 Chiaki Kanno

Taiki Watanabe  
 Taiki Watanabe

Authorized by : Hiroaki Suzuki  
 Hiroaki Suzuki  
 Manager of EMC Technical Department

**NVLAP**<sup>®</sup>  
 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 C63.4-2003

#### 1.2.2 Deviation from standards

None

### 1.3 List of applied test to the EUT

Test items Section	Test items	Condition	Result
15.247(d) 15.205 15.209	Spurious Emissions	Radiated	PASS
15.247(d) 15.205 15.209	Restricted Bands of Operation	Radiated	PASS

\*: Conducted test was to proceed at FCCID:JOYKYY21.

FCCID:JOYKYY22 was measured by applying only Radiated test.

#### 1.3.1 Test set up

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### 1.4 Modification to the EUT by laboratory

None



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## **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	:	KYY22
Serial number	:	N/A
EUT condition	:	Pre-Production
Max. frequency	:	1.5GHz
Power ratings	:	Battery: DC 3.8 V
Size	:	(W) 65.0 × (D) 11.0 × (H) 134.0 mm
Environment	:	Indoor and Outdoor use
Terminal limitation	:	-20°C to 60°C
RF Specification Protocol	:	Bluetooth 4.0 + EDR
Frequency range	:	2402MHz-2480MHz
Number of RF Channels	:	79 Channels
Modulation type/ Data rate	:	FHSS: GFSK (1Mbps), π/4-DQPSK (2Mbps), 8-DPSK (3Mbps)
Channel separation	:	1MHz
Antenna type	:	Internal antenna
Antenna gain	:	0dBi

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

Not applicable

### 2.4 Operating channels and frequencies

Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

## 2.5 Description of Test mode

The EUT had been tested under operating condition.  
There are three channels have been tested as following:

Tested Channel	Frequency [MHz]
Low	2402
Middle	2441
High	2480

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, Middle, High	FHSS	GFSK	DH5
Low, Middle, High	FHSS	8-DPSK	3-DH5

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.

## 2.6 Operating mode

[Tx mode]

- i) Bluetooth test program setup to the DM tool
- ii) Select a test mode
  - Operating frequency:
    - No hopping (Channel Low: 2402MHz, Channel Middle: 2441MHz, Channel High: 2480MHz)
    - Hopping
  - Packet type: DH5, 3-DH5
- iii) Start test mode

[Rx mode]

- i) Bluetooth test program setup to the DM tool
- ii) Select a test mode
  - Operating frequency: Channel Low: 2402MHz, Channel Middle: 2441MHz, Channel High: 2480MHz
- iii) Start test mode



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### ***3. Configuration of equipment***

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#### **3.1 Equipment(s) used**

<b>No.</b>	<b>Equipment</b>	<b>Company</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>FCC ID / DoC</b>	<b>Comment</b>
1	Mobile Phone	KYOCERA	KYY22	N/A	JOYKYY22	EUT

#### **3.2 System configuration**

1. Mobile Phone  
(EUT)

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

## 4. Spurious Emissions - Radiated -

### 4.1 Measurement procedure

[FCC 247(d), 15,205, 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.4
Frequency range	:	9kHz to 25GHz
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	:	Below 1GHz
- Detector	:	Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	:	200Hz, 120kHz
Spectrum analyzer setting	:	Above 1GHz
- Peak	:	RBW=1MHz, VBW=1MHz, Span=0Hz, Sweep=auto
- Average	:	RBW=1MHz, VBW=10Hz, Span=0Hz, Sweep=auto Display mode=Linear

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, Biconical antenna, Log periodic antenna and Double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop antenna is 1m above the ground plane.

The EUT is Placed on a turntable, which is 0.8m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

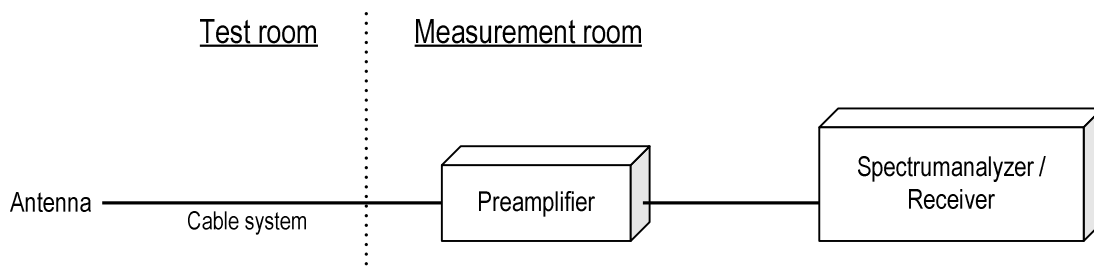
The EUT was set to operate with following conditions.

- No hopping [Channel Low: 2402MHz, Channel Middle: 2441MHz, Channel High: 2480MHz]

The test mode of EUT is as follows.

- Tx mode, Rx mode

- Test configuration





## 4.2 Calculation method

[9kHz to 150kHz]

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

Margin = Limit – Emission level

[150kHz to 25GHz]

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

Margin = Limit – Emission level

## 4.3 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	300	54.0	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition modulation.



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#### 4.4 Test data

Date : Dec. 20, 2013 Test personnel :  
 Temperature : 28.1 [°C]  
 Humidity : 24.1 [%] Tested by :  
 Test place : 3m Semi-anechoic chamber Taiki Watanabe

#### [DH5]

##### Channel Low

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4804.000	H	42.9	30.3	8.6	51.5	38.9	74.0	54.0	22.5	15.1	100.0	0.0
2	9608.000	H	44.5	33.7	16.8	61.3	50.5	74.0	54.0	12.7	3.5	100.0	6.0
3	9608.000	V	46.6	35.9	16.8	63.4	52.7	74.0	54.0	10.6	1.3	100.0	342.0

##### Channel Middle

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4882.000	H	43.5	30.3	9.0	52.5	39.3	74.0	54.0	21.5	14.7	100.0	0.0
2	9764.000	V	44.5	34.1	17.0	61.5	51.1	74.0	54.0	12.5	2.9	100.0	151.0
3	9764.000	H	44.7	31.8	17.0	61.7	48.8	74.0	54.0	12.3	5.2	100.0	151.0

##### Channel High

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4960.000	H	43.7	30.2	9.3	53.0	39.5	74.0	54.0	21.0	14.5	100.0	0.0
2	9920.000	V	43.5	32.3	17.5	61.0	49.8	74.0	54.0	13.0	4.2	103.0	148.0

#### [3-DH5]

##### Channel Low

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4804.000	H	42.9	30.2	8.6	51.5	38.8	74.0	54.0	22.5	15.2	100.0	0.0
2	9608.000	H	45.5	33.6	16.8	62.3	50.4	74.0	54.0	11.7	3.6	114.0	151.0
3	9608.000	V	46.4	35.6	16.8	63.2	52.4	74.0	54.0	10.8	1.6	100.0	343.0

##### Channel Middle

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4882.000	H	43.5	30.4	9.0	52.5	39.4	74.0	54.0	21.5	14.6	100.0	0.0
2	9764.000	H	43.5	32.0	17.0	60.5	49.0	74.0	54.0	13.5	5.0	100.0	148.0
3	9764.000	V	45.5	35.1	17.0	62.5	52.1	74.0	54.0	11.5	1.9	100.0	154.0

##### Channel High

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4960.000	H	44.2	30.1	9.3	53.5	39.4	74.0	54.0	20.5	14.6	100.0	0.0
2	9920.000	H	43.7	31.0	17.5	61.2	48.5	74.0	54.0	12.8	5.5	101.0	150.0
3	9920.000	V	43.9	32.6	17.5	61.4	50.1	74.0	54.0	12.6	3.9	103.0	150.0

#### Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.
3. No emission was detected in the receive mode.

## 5. Restricted Band of Operation

### 5.1 Measurement procedure [FCC 247(d), 15.205, 15.209]

Test was applied by following conditions.

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

Spectrum analyzer setting  
 - Peak : RBW=1MHz, VBW=1MHz, Span=Arbitrary setting, Sweep=auto  
 - Average : RBW=1MHz, VBW=10Hz, Span=Arbitrary setting, Sweep=auto  
 Display mode=Linear

Radiated emission measurements are performed at 3m distance with the broadband antenna (Double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission.

The EUT is Placed on a turntable, which is 0.8m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

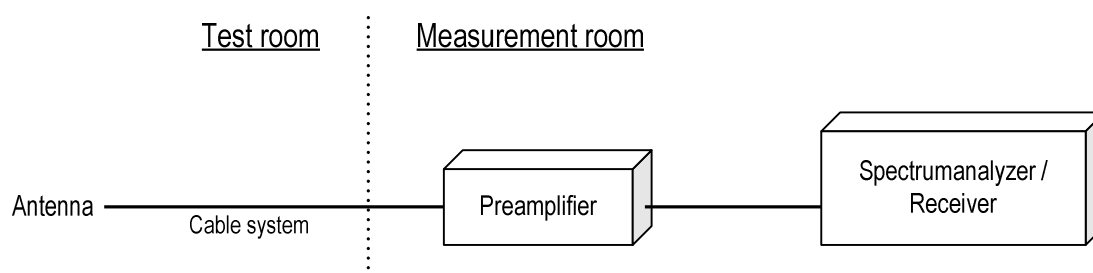
The EUT was set to operate with following conditions.

- No hopping [Channel Low: 2402MHz, Channel High: 2480MHz]

The test mode of EUT is as follows.

- Tx mode

- Test configuration



### 5.2 Limit

Emission at the boundary of the restricted band provided by 15.205 shall be lower than 15.209 limit.

### 5.3 Measurement Result

Channel	Frequency [MHz]	Results Chart	Result
Low	2402	See the Trace Data	Pass
High	2480	See the Trace Data	Pass



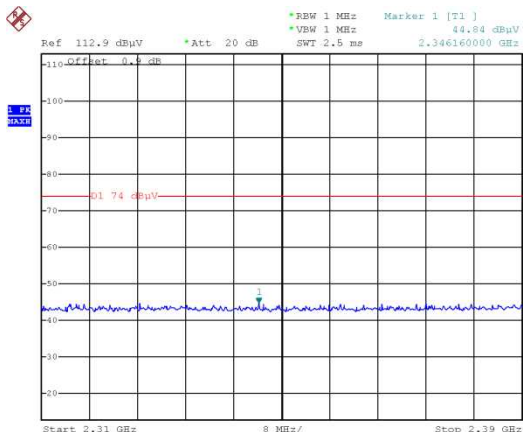
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### 5.4 Test data

Date : Dec. 18, 2013  
 Temperature : 22.7 [°C]  
 Humidity : 38.5 [%]  
 Test place : 3m Semi-anechoic chamber

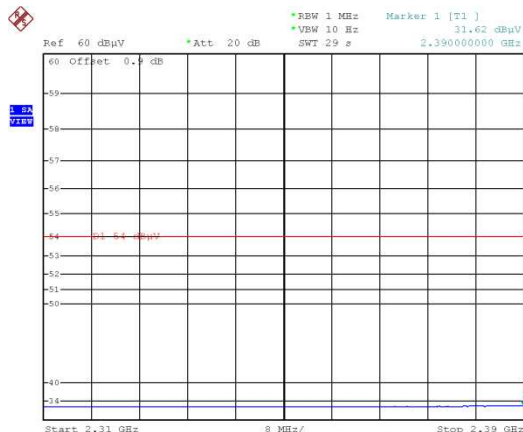
Test personnel :  
 Tested by : Chiaki Kanno

### [DH5] Channel Low Horizontal Peak



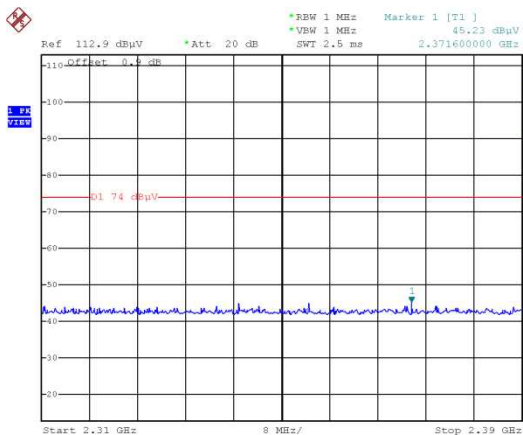
Date: 18.DECEMBER.2013 18:05:04

### Average



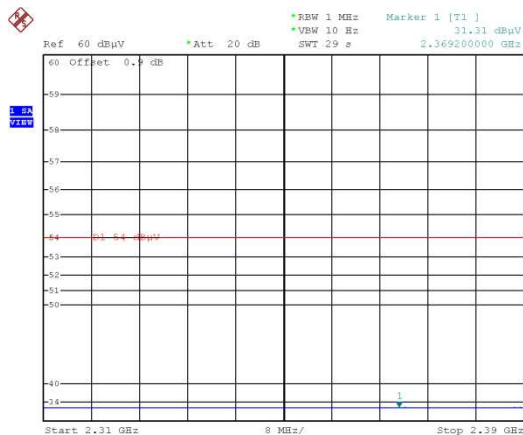
Date: 18.DECEMBER.2013 18:06:35

### Vertical Peak



Date: 18.DECEMBER.2013 18:10:06

### Average

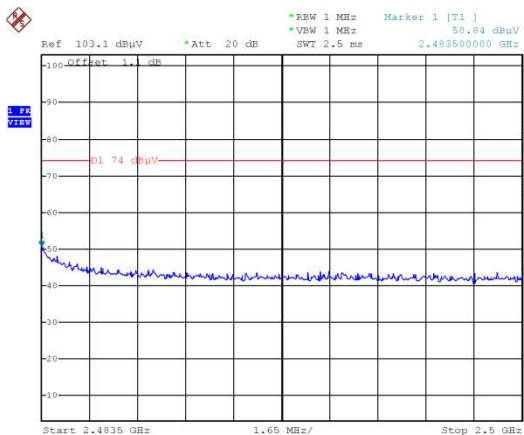


Date: 18.DECEMBER.2013 18:08:55



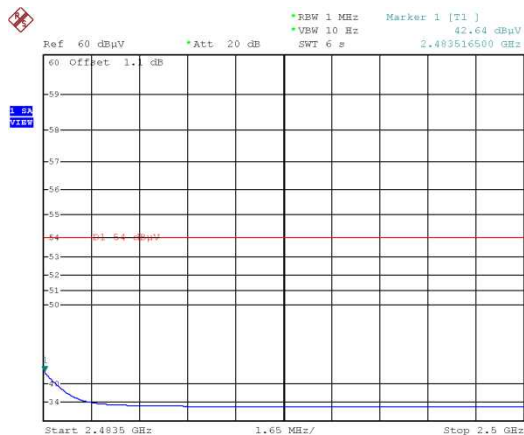
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### Channel High Horizontal Peak



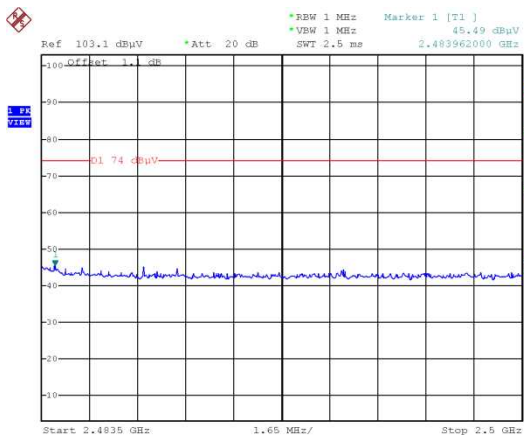
Date: 18.DEC.2013 18:57:03

### Average



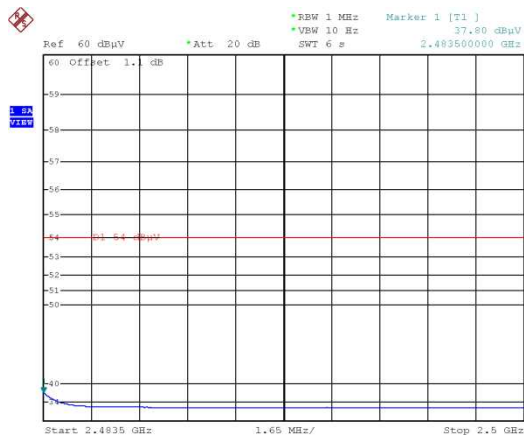
Date: 18.DEC.2013 18:57:59

### Vertical Peak



Date: 18.DEC.2013 19:08:40

### Average

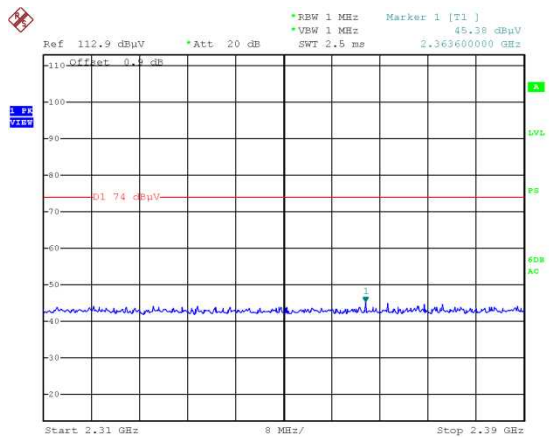


Date: 18.DEC.2013 18:59:34



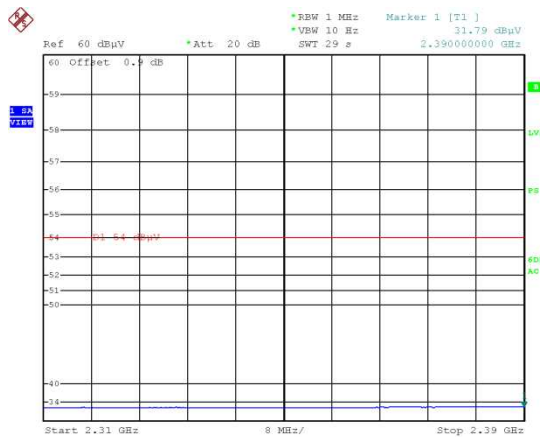
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### [3-DH5] Channel Low Horizontal Peak



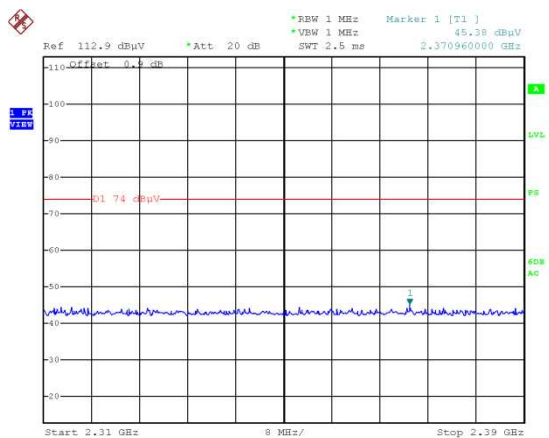
Date: 18.DEC.2013 18:27:49

### Average



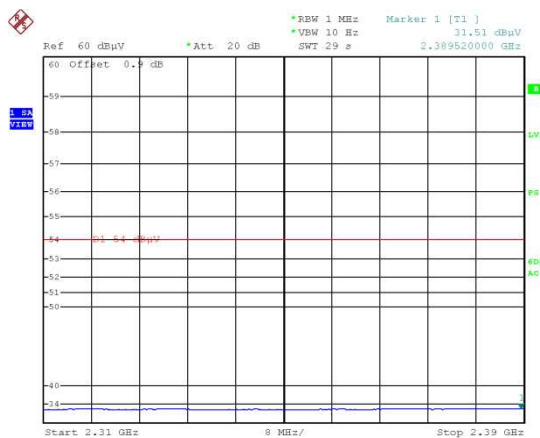
Date: 18.DEC.2013 18:29:45

### Vertical Peak



Date: 18.DEC.2013 18:31:56

### Average

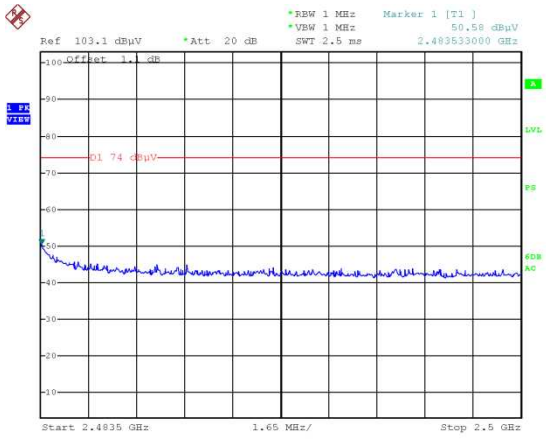


Date: 18.DEC.2013 18:33:13



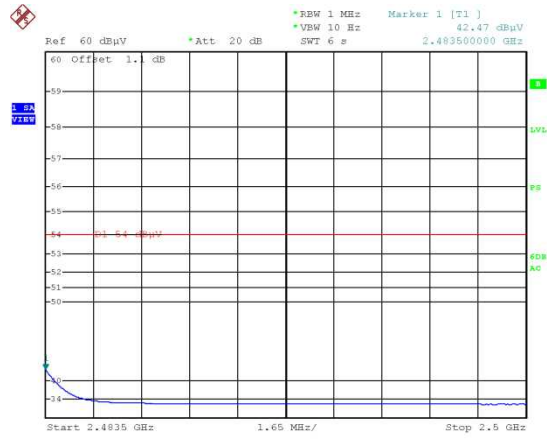
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### Channel High Horizontal Peak



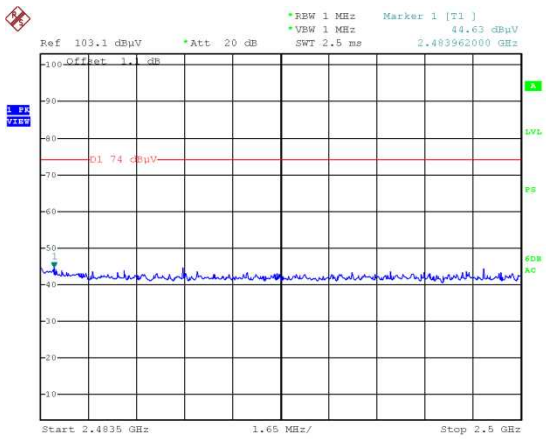
Date: 18.DEC.2013 18:44:55

### Average



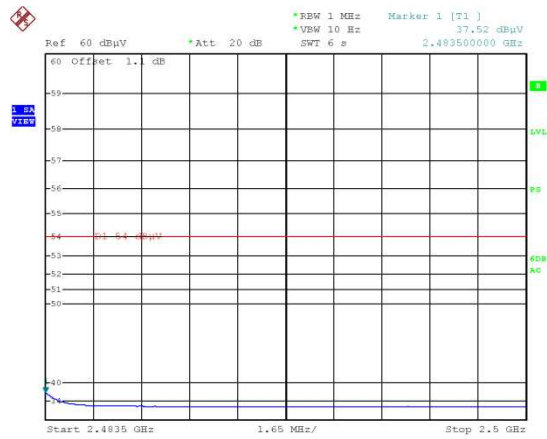
Date: 18.DEC.2013 18:45:36

### Vertical Peak



Date: 18.DEC.2013 18:48:11

### Average



Date: 18.DEC.2013 18:47:13



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## ***6. Antenna requirement***

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According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that 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.



## 7. 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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## 8. 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	-	-	-	-	Jul. 3, 2015
10m Semi-anechoic chamber				VLAC-013	
Shielded room No.1				VLAC-013	

3) FCC filing:

Site name	Registration Number	Expiry Date
Site 2	91065	Oct.31, 2014
Site 3		
3m Semi-anechoic chamber	540072	Jan. 9, 2016
10m Semi-anechoic chamber		
Shielded room No.1		

4) Industry Canada Oats site filing:

Site name	Sites on file: Oats 3m/10m	Expiry Date
Site 2	4224A-2	Jan. 23, 2015
Site 3	4224A-3	
3m Semi-anechoic chamber	4224A-4	
10m Semi-anechoic chamber	4224A-5	

5) VCCI site filing:

Site name	Radiated emission	Conducted emission for mains port	Conducted emission for telecom port	Expiry Date
Site 2	R-137	C-133	T-1221	Nov. 16, 2014 Nov. 28, 2014* (*:Telecom port)
Site 3	R-138	C-134	T-1222	
3m Semi-anechoic chamber	-	A-0166	A-0166	Jul. 3, 2015
10m Semi-anechoic chamber				
Shielded room No.1				

6) TÜV SÜD PS authorization:

Authorized as an EMC test laboratory

7) TÜV Rheinland authorization:

Authorized as an EMC test laboratory



Zacta

## Appendix A. Test equipment

### Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ECSI	100451	Nov. 2014	Nov. 16, 2013
Preamplifier	ANRITSU	MH648A	M96057	Jun. 2014	Jun. 12, 2013
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	892246/010	Sep. 2014	Sep. 14, 2012
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2155	May 2014	May 1, 2013
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	May 2014	May 1, 2013
Attenuator	TME	CFA-01NPJ-6	N/A (S275)	Jun. 2014	Jun. 6, 2013
Attenuator	TME	CFA-01NPJ-3	N/A (S272)	Jun. 2014	Jun. 6, 2013
Spectrum analyzer	Agilent Technologies	E4440A	US4432655	May 2014	May 14, 2013
Preamplifier	Agilent Technologies	8449B	3008A1008	Dec. 2014	Dec. 9, 2013
Double ridged guide antenna	EMCO	3115	4328	Jan. 2014	Jan. 21, 2013
Attenuator	AEROFLEX	40A-03	081217-20	Feb. 2014	Feb. 23, 2013
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170189	May 2015	May 2, 2013
Preamplifier	TSJ	MLA-1840-B03-35	1240332	May 2015	May 2, 2013
Notch filter	Micro-Tronics	BRM50702	045	Nov. 2014	Nov. 12, 2013
Microwave cable	SUHNER	SUCOFLEX104/9m	322083/4	May 2014	May 14, 2013
		SUCOFLEX104/9m	346316/4	Oct. 2014	Oct. 6, 2013
		SUCOFLEX104/1m	322084/4	Oct. 2014	Oct. 6, 2013
		SUCOFLEX104/1.5m	317226/4	Oct. 2014	Oct. 6, 2013
		SUCOFLEX104/7m	41625/6	Oct. 2014	Oct. 6, 2013
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 2014	May 6, 2013
3m Semi-anechoic chamber	TOKIN	N/A	N/A (9002-SVSWR)	May 2014	May 6, 2013