FCC Radio Test Report

FCC ID: Z6A02TEK

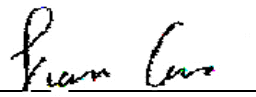
This report concerns (check one): ■ **Original Grant** □ **Class II Change**

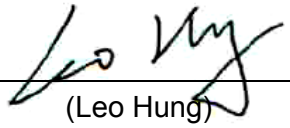
Issued Date	:	Nov. 07, 2011
Project No.	:	1110C132
Equipment	:	USB Dongle Transmitter
Model Name	:	airhead 1000;PC91
Applicant	:	Digital Interactive Systems Corp. DBA CompuExpert DBA TekNmotion
Address	:	26801 Vista Terrace, Lake Forest CA. 92630
Manufacturer Address		Guangdong Somic industrial CO.,Ltd Rm.3501，rengfeng bldg.No 490 Tianhe Rd, Guangzhou,china

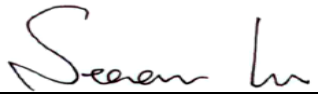
Tested by:
Neutron Engineering Inc. EMC Laboratory

Date of Receipt: Oct. 18, 2011

Date of Test:
Oct. 18, 2011 ~ Nov. 06, 2011

Testing Engineer : 
(Ivan Cao)

Technical Manager : 
(Leo Hung)

Authorized Signatory : 
(Steven Lu)

Neutron Engineering Inc.

No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.
TEL : (0769) 8318-3000 FAX : (0769) 8319-6000

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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1. CERTIFICATION

Equipment: USB Dongle Transmitter
Brand Name : TEKNMOTION; SOMIC
Model Name. : airhead 1000; PC91
Applicant: Digital Interactive Systems Corp. DBA CompuExpert DBA TekNmotion
Date of Test: Oct. 18, 2011 ~ Nov. 06, 2011
Test Item: ENGINEERING SAMPLE
Standards: FCC Part15, Subpart C(15.249)/ ANSI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1110C132) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249)			
StandardSection	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209	Radiated Emission	PASS	
15.249	Radiated Spurious Emission	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03**at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792
Neutron's test firm number for FCC 319330
Neutron's test firm number for IC 4428B-1

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
DG-CB03	CISPR	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>USB Dongle Transmitter</td></tr>
<tr><td>Brand Name</td><td>TEKNMOTION; SOMIC</td></tr>
<tr><td>Model Name.</td><td>airhead 1000; PC91</td></tr>
<tr><td>OEM Brand/Model Name</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>Brand and model name are different.</td></tr>
<tr><td>Product Description</td><td>The EUT is a USB Dongle Transmitter.
<table>
<tr><td>Product Type</td><td>Low Power Communication Device</td></tr>
<tr><td>Operation Frequency:</td><td>2403~2479 MHz</td></tr>
<tr><td>Modulation Type:</td><td>GFSK</td></tr>
<tr><td>Date rate:</td><td>2Mbps</td></tr>
<tr><td>Number of Channel</td><td>77CH .Please see Note 2.</td></tr>
<tr><td>Antenna Designation:</td><td>PCB antenna</td></tr>
<tr><td>Antenna Gain(Peak)</td><td>2.62 dBi</td></tr>
<tr><td>Output Power:</td><td>93.43 dBuV/m (AV Max.)</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification. Please refer to the User's Manual.</td></tr>
<tr><td>Channel List</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Power Source</td><td>DC Voltage supplied from PC USB Port.</td></tr>
<tr><td>Power Rating</td><td>I/P AC 120V/60Hz, O/P DC 5V</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2403MHz**	27	2429MHz	53	2455MHz
02	2404MHz	28	2430MHz	54	2456MHz
03	2405MHz	29	2431MHz	55	2457MHz
04	2406MHz	30	2432MHz	56	2458MHz
05	2407MHz	31	2433MHz	57	2459MHz
06	2408MHz	32	2434MHz	58	2460MHz
07	2409MHz	33	2435MHz	59	2461MHz
08	2410MHz	34	2436MHz	60	2462MHz
09	2411MHz	35	2437MHz	61	2463MHz
10	2412MHz	36	2438MHz	62	2464MHz
11	2413MHz	37	2439MHz	63	2465MHz
12	2414MHz	**38**	**2440MHz**	64	2466MHz
13	2415MHz	39	2441MHz	65	2467MHz
14	2416MHz	40	2442MHz	66	2468MHz
15	2417MHz	41	2443MHz	67	2469MHz
16	2418MHz	42	2444MHz	68	2470MHz
17	2419MHz	43	2445MHz	69	2471MHz
18	2420MHz	44	2446MHz	70	2472MHz
19	2421MHz	45	2447MHz	71	2473MHz
20	2422MHz	46	2448MHz	72	2474MHz
21	2423MHz	47	2449MHz	73	2475MHz
22	2424MHz	48	2450MHz	74	2476MHz
23	2425MHz	49	2451MHz	75	2477MHz
24	2426MHz	50	2452MHz	76	2478MHz
25	2427MHz	51	2453MHz	**77**	**2479MHz**
26	2428MHz	52	2454MHz		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB Antenna	N/A	2.62

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Wireless Mode
Mode 2	CH Lower – 2403MHz
Mode 3	CH Middle – 2440MHz
Mode 4	CH Highest -2479MHz

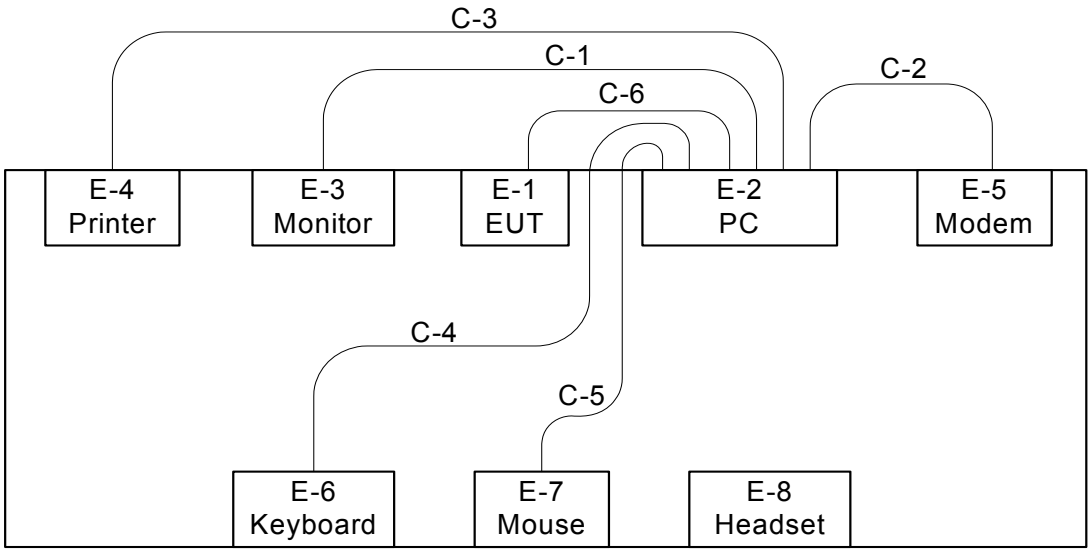
For Conducted Test	
Final Test Mode	Description
Mode 1	Wireless Mode

For Radiated Test	
Final Test Mode	Description
Mode 2	CH Lower – 2403MHz
Mode 3	CH Middle – 2440MHz
Mode 4	CH Highest -2479MHz

Note:
(1) The measurements are performed at the highest, middle, lowest available channels.

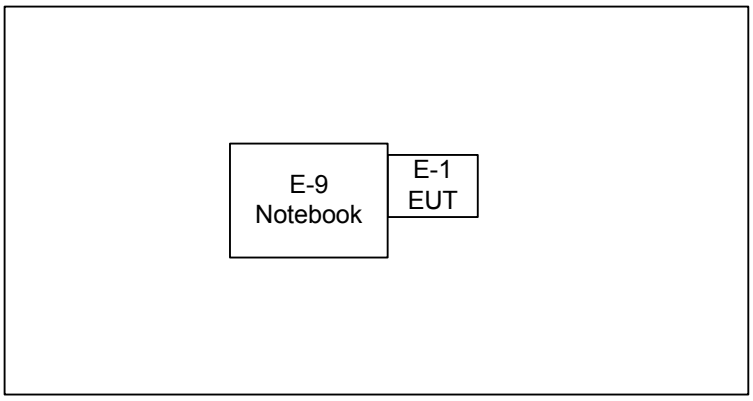
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted: Wireless Mode



C-1: D-Sub Cable
C-2: RS232 Cable
C-3: Parallel Cable
C-4: USB Cable
C-5: USB Cable
C-6: USB Cable

Radiated: TX/RX Mode



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	USB Dongle Transmitter	TEKNMOTION	airhead 1000	Z6A02TEK	N/A	EUT
E-2	PC	Lenovo	M4600V	DOC	SS0840636	
E-3	LCD monitor	Dell	E177FPc	DOC	CNOFJ179-64180-6AG-1WNS	
E-4	Printer	SII	DPU-414	DOC	3018507 B	
E-5	Modem	ACEEX	DM-1414V	IFAXDm1414	0603002131	
E-6	USB Keyboard	Dell	L100	DOC	CNORH6596589071T08NE	
E-7	USB Mouse	Dell	MO56UOA	DOC	FQJ000BS	
E-8	Airhead Headset	TEKNMOTION	airhead 1000	Z6A01TEK	N/A	
E-9	Notebook	DELL	INSPIRON1420	DOC	JX193A01SDC2	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	1.8M	
C-2	YES	NO	1.5M	
C-3	YES	NO	1.5M	
C-4	NO	NO	0.6M	
C-5	YES	YES	1.8M	
C-6	NO	NO	1.6M	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in m in『Length』column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	May.26.2012
2	LISN	R&S	ENV216	100087	May.26.2012
3	Test Cable	N/A	C_17	N/A	Mar.30.2012
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.26.2012
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

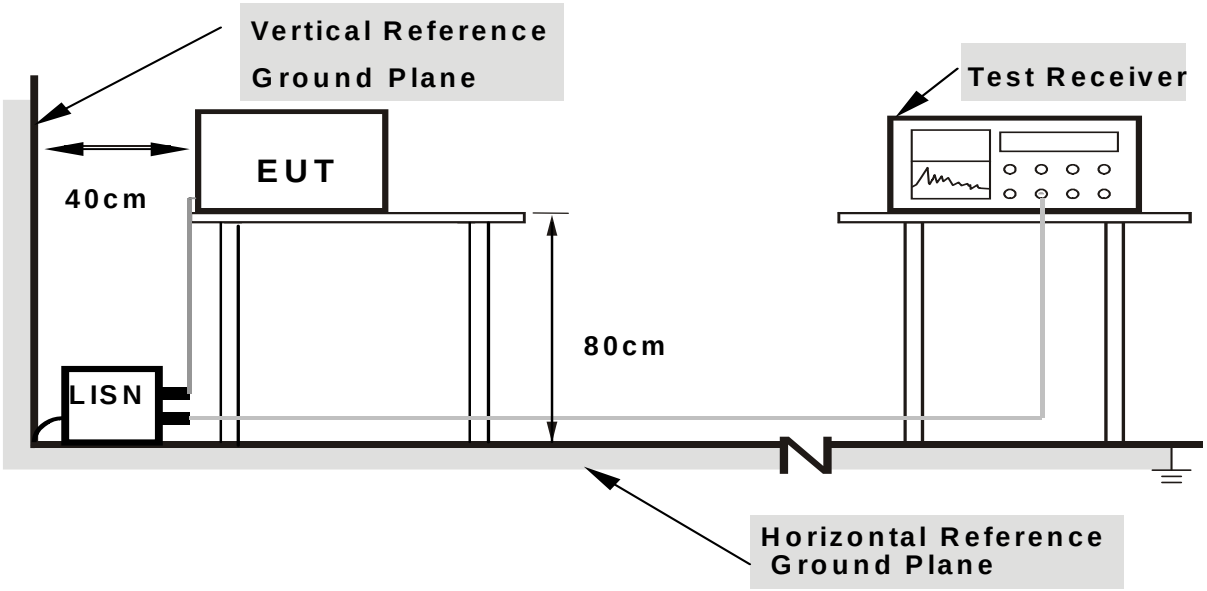
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting mode.

4.1.7 TEST RESULTS

EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	Wireless Mode		

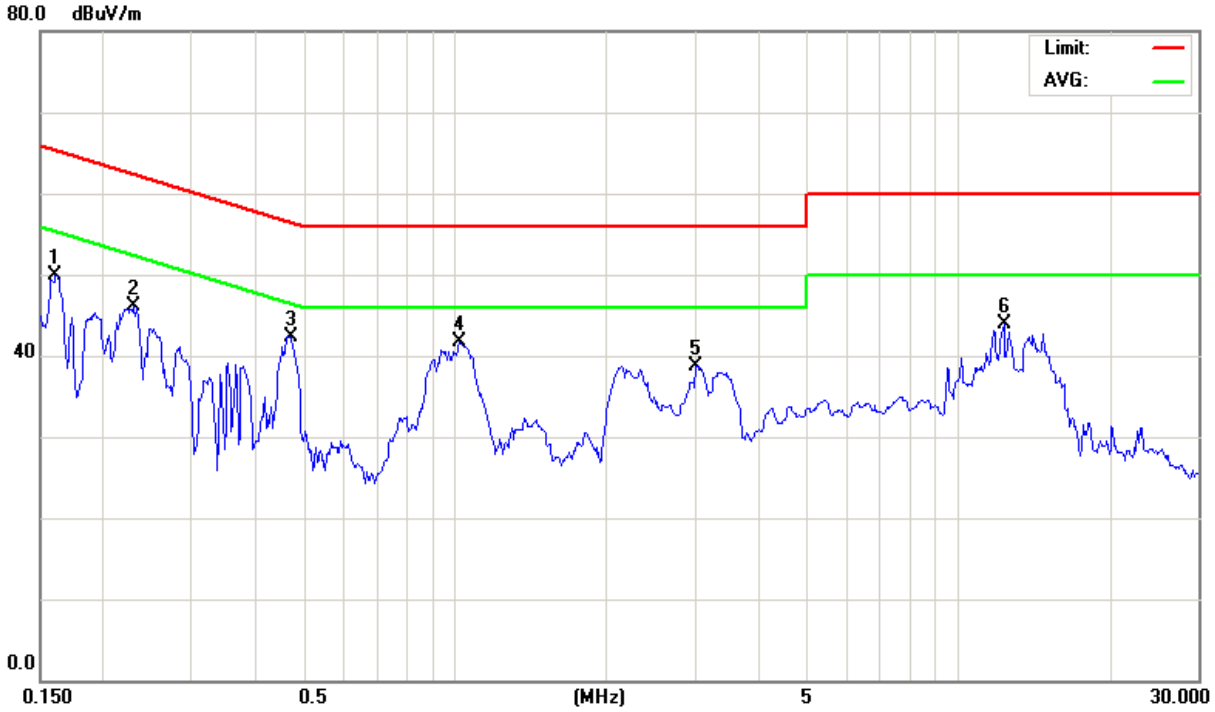
Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	Line	49.96	*	65.43	55.43	-15.47	(QP)
0.23	Line	46.06	*	62.49	52.49	-16.43	(QP)
0.47	Line	42.30	*	56.45	46.45	-14.15	(QP)
1.02	Line	41.71	*	56.00	46.00	-14.29	(QP)
3.01	Line	38.71	*	56.00	46.00	-17.29	(QP)
12.32	Line	43.86	*	60.00	50.00	-16.14	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz.

(3) " N/A" denotes test is not applicable in this Test Report.



EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	Wireless Mode		

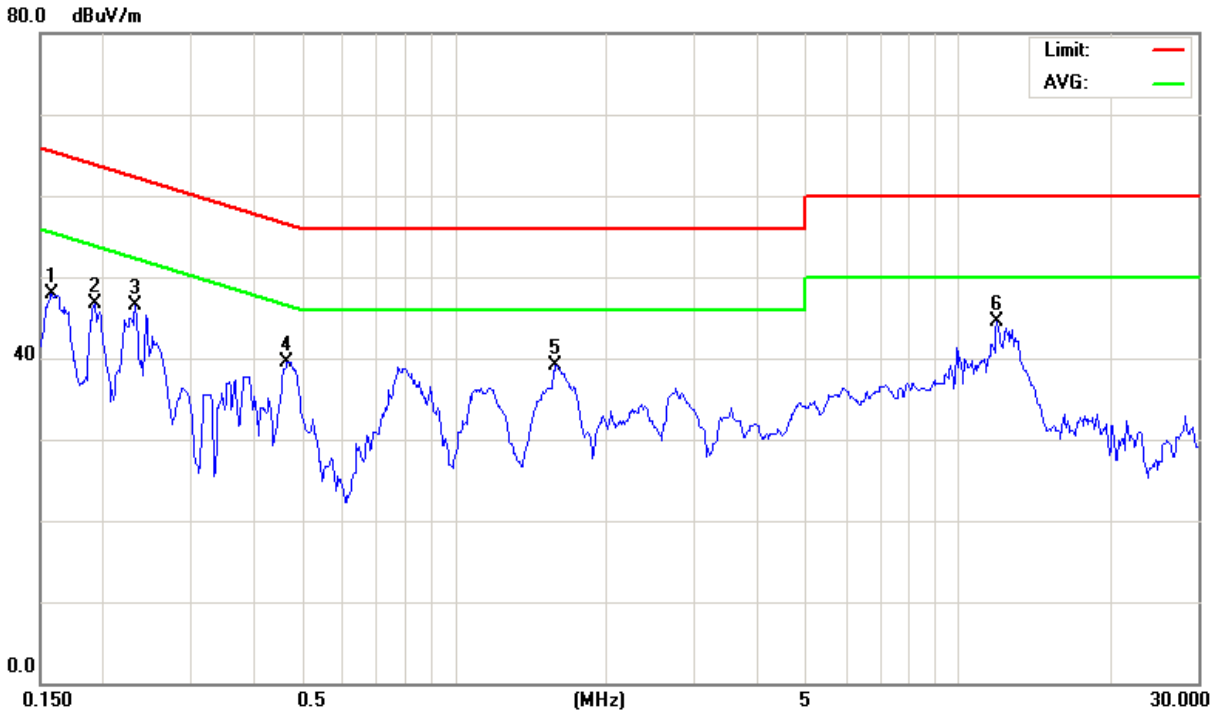
Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	Neutral	47.90	*	65.56	55.56	-17.66	(QP)
0.19	Neutral	46.63	*	63.94	53.94	-17.31	(QP)
0.23	Neutral	46.48	*	62.39	52.39	-15.91	(QP)
0.46	Neutral	39.47	*	56.63	46.63	-17.16	(QP)
1.59	Neutral	39.07	*	56.00	46.00	-16.93	(QP)
11.93	Neutral	44.41	*	60.00	50.00	-15.59	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform ◦ In this case, a " * " marked in AVG Mode column of Interference Voltage Measured ◦

(2) Measuring frequency range from 150KHz to 30MHz.

(3) " N/A" denotes test is not applicable in this Test Report.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 μV/m (54 dBμV/m) @ 3 m	Above 2483.5

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Horn Antenna	ETS	3115	00075789	May.11.2012
2	Amplifier	Agilent	8449B	3008A02274	May.25.2012
3	Spectrum	Agilent	E4408B	US39240143	Nov.15.2011
4	Test Cable	HUBER+SUHNER	CB03 High Fre	N/A	May.02.2012
5	Bi-log Antenna	Schwarbeck	VULB9160	9160-3232	May.25.2012
6	Amplifier	HP	8447D	2944A09673	May.25.2012
7	Test Receiver	R&S	ESCI	100895	May.25.2012
8	Test Cable	N/A	C-01_CB03	N/A	Jul.04.2012
9	Controller	CT	SC100	N/A	N/A
10	Triple Loop Antenna	R&S	HFH2-Z2	830749/020	May.26.2012
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	May.11.2012

Remark: ” N/A” denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2.3 TEST PROCEDURE

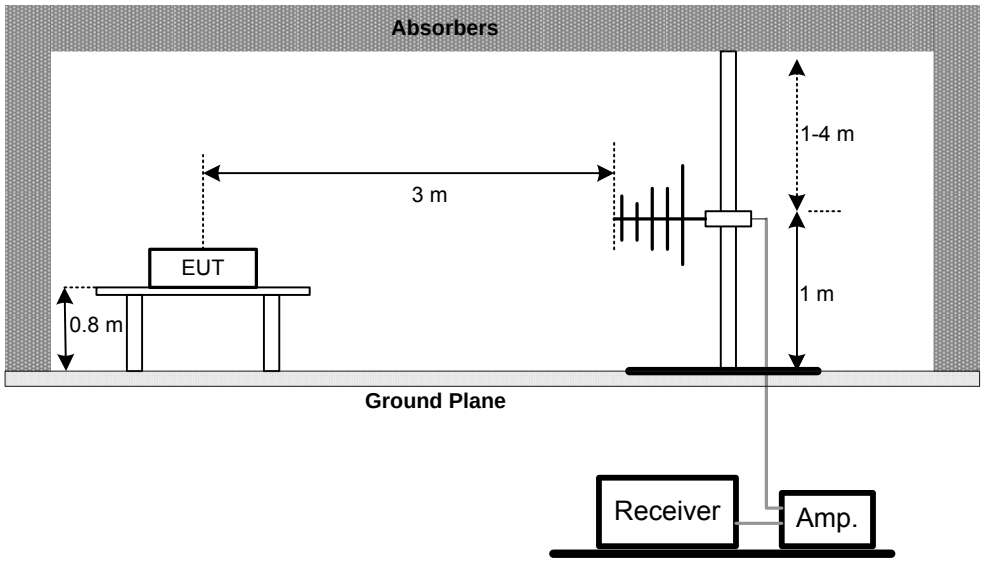
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

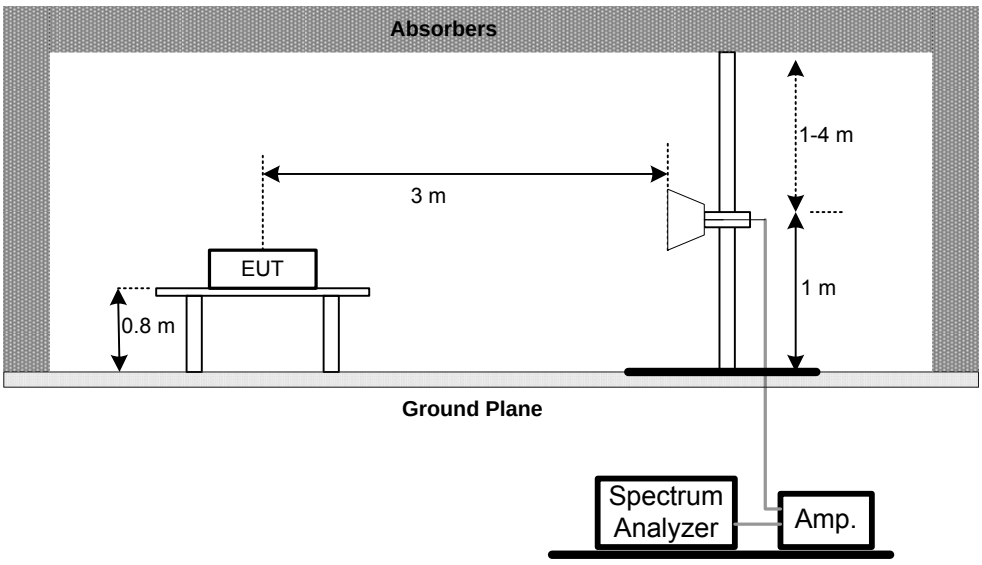
No deviation

4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.7 TEST RESULTS (BETWEEN 30 – 1000 MHz)

EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX Mode 2403MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
39.70	V	46.60	-16.83	29.77	40.00	- 10.23	
95.48	V	46.84	-18.48	28.36	43.50	- 15.14	
180.35	V	42.58	-16.88	25.70	43.50	- 17.80	
432.55	V	39.95	-8.43	31.52	46.00	- 14.48	
498.03	V	39.37	-7.39	31.98	46.00	- 14.02	
534.40	V	39.43	-6.07	33.36	46.00	- 12.64	

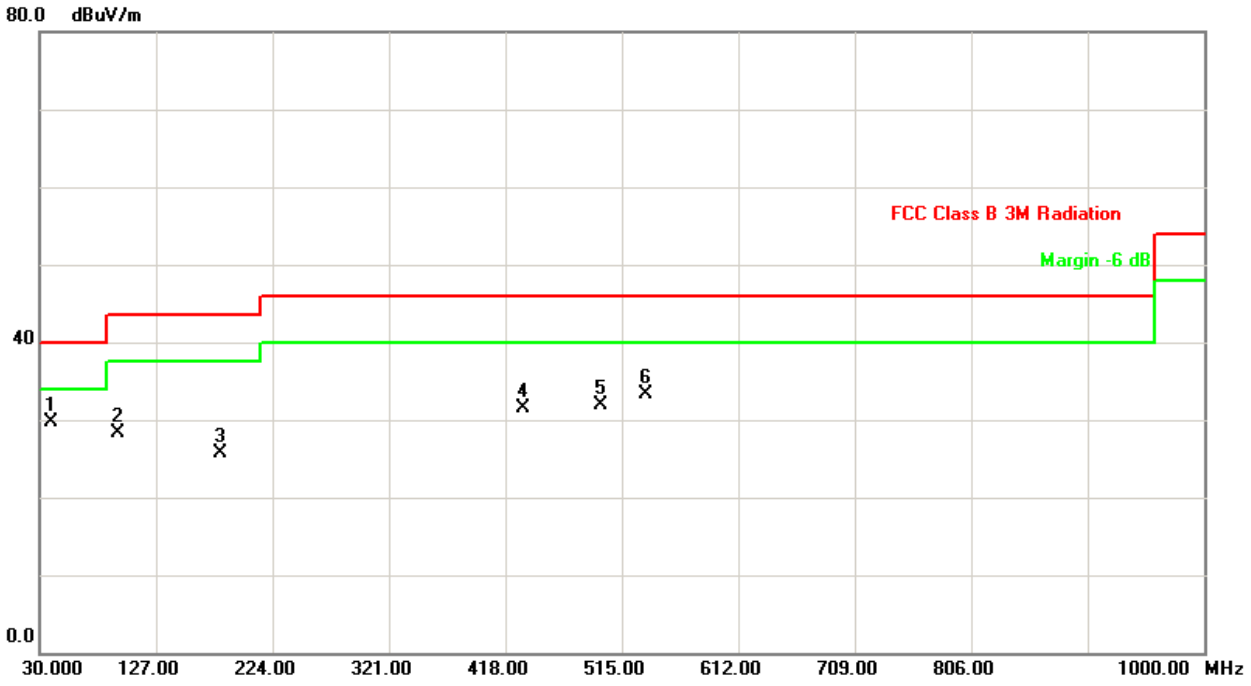
Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX Mode 2403MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
95.48	H	47.80	-18.48	29.32	43.50	- 14.18	
192.48	H	48.15	-16.69	31.46	43.50	- 12.04	
287.05	H	41.54	-12.23	29.31	46.00	- 16.69	
367.08	H	43.60	-10.21	33.39	46.00	- 12.61	
432.55	H	39.79	-8.43	31.36	46.00	- 14.64	
498.03	H	41.60	-7.39	34.21	46.00	- 11.79	

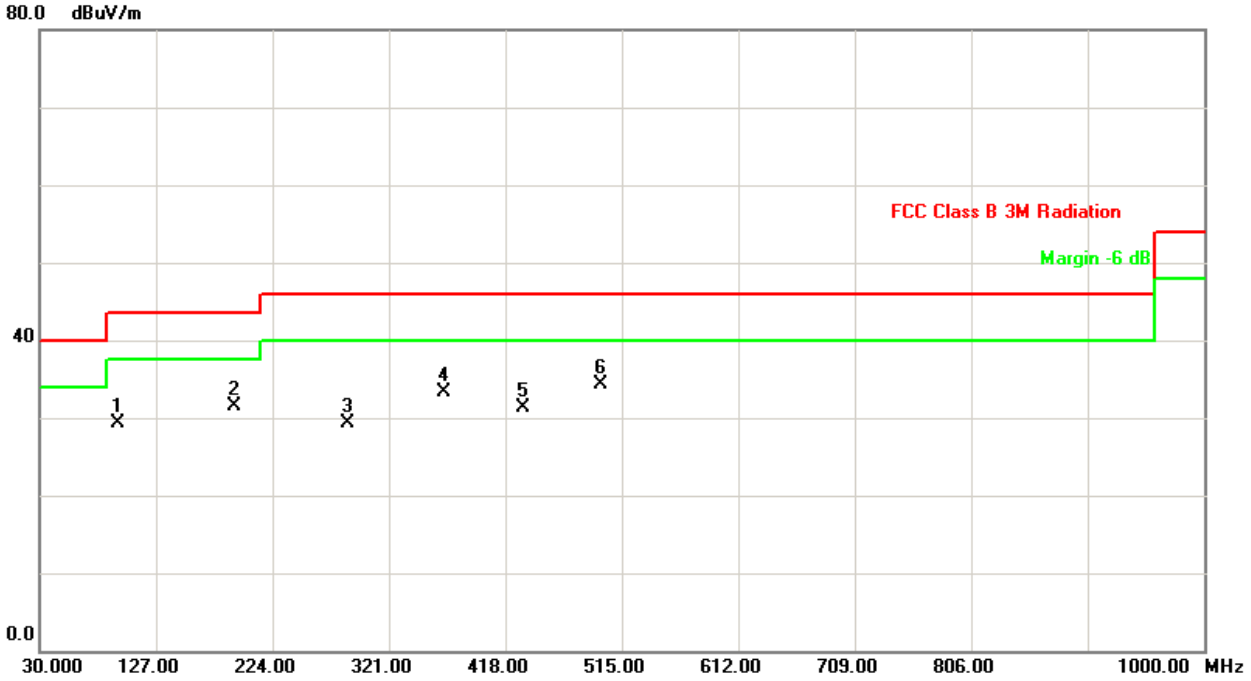
Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



4.2.8 TEST RESULTS (ABOVE 1000 MHz)

EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2403MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	21.57	10.13	31.91	53.48	42.04	74.00	54.00	X/E
2403.00	**V**	**61.18**	**59.60**	**31.89**	**93.07**	**91.49**	**114.00**	**94.00**	**X/F**
4806.14	V	52.24	45.82	5.22	57.46	51.04	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

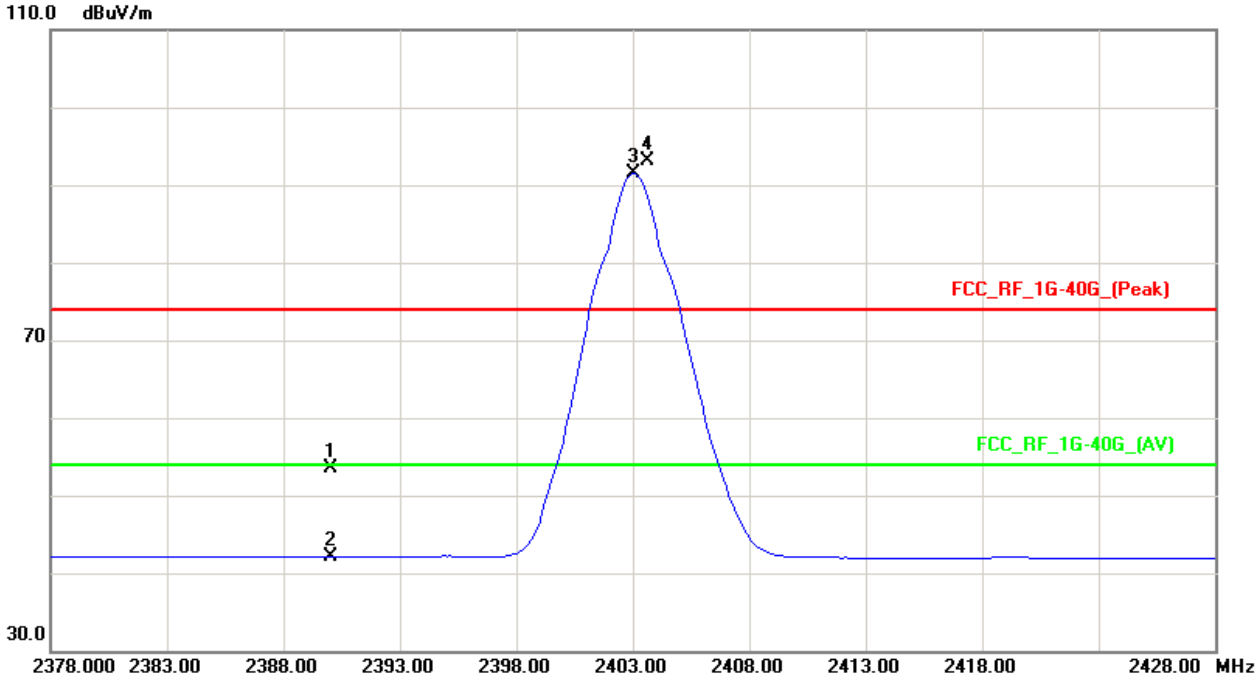
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

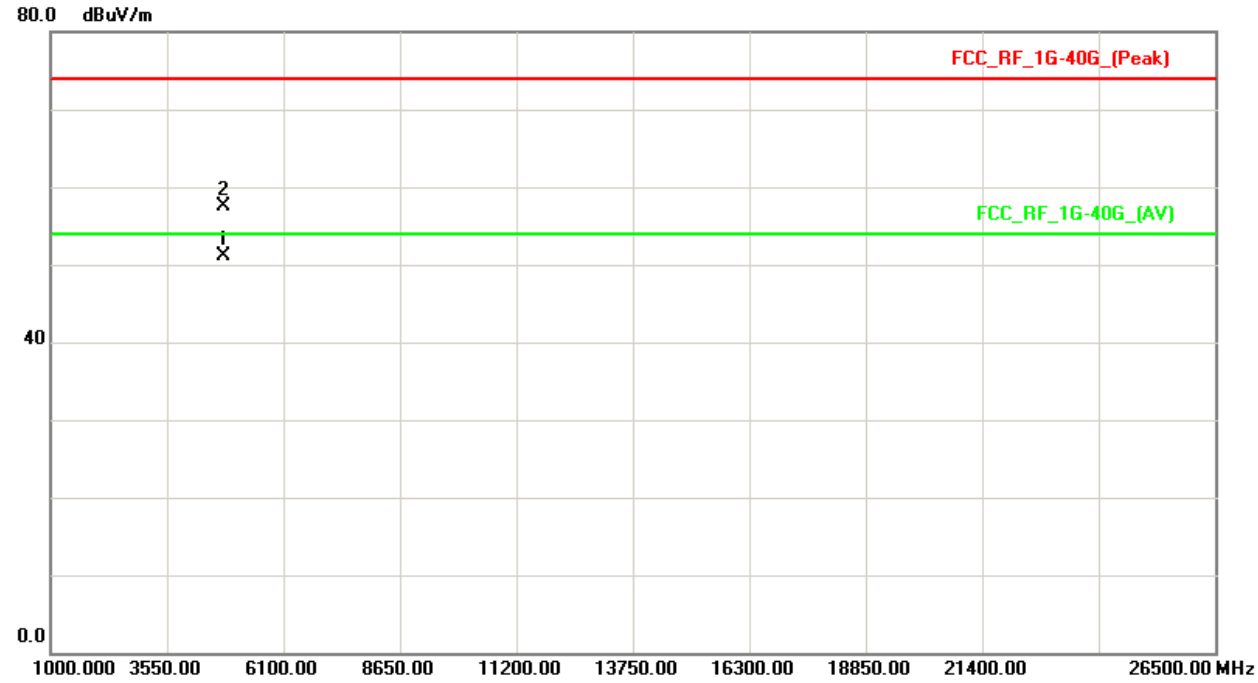
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2403MHz (Above 1000 MHz, Vertical)





EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2403MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	27.03	9.63	31.91	58.94	41.54	74.00	54.00	X/E
2403.00	**H**	**62.14**	**61.18**	**31.89**	**94.03**	**93.07**	**114.00**	**94.00**	**X/F**
4806.01	H	54.60	47.04	5.22	59.82	52.26	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

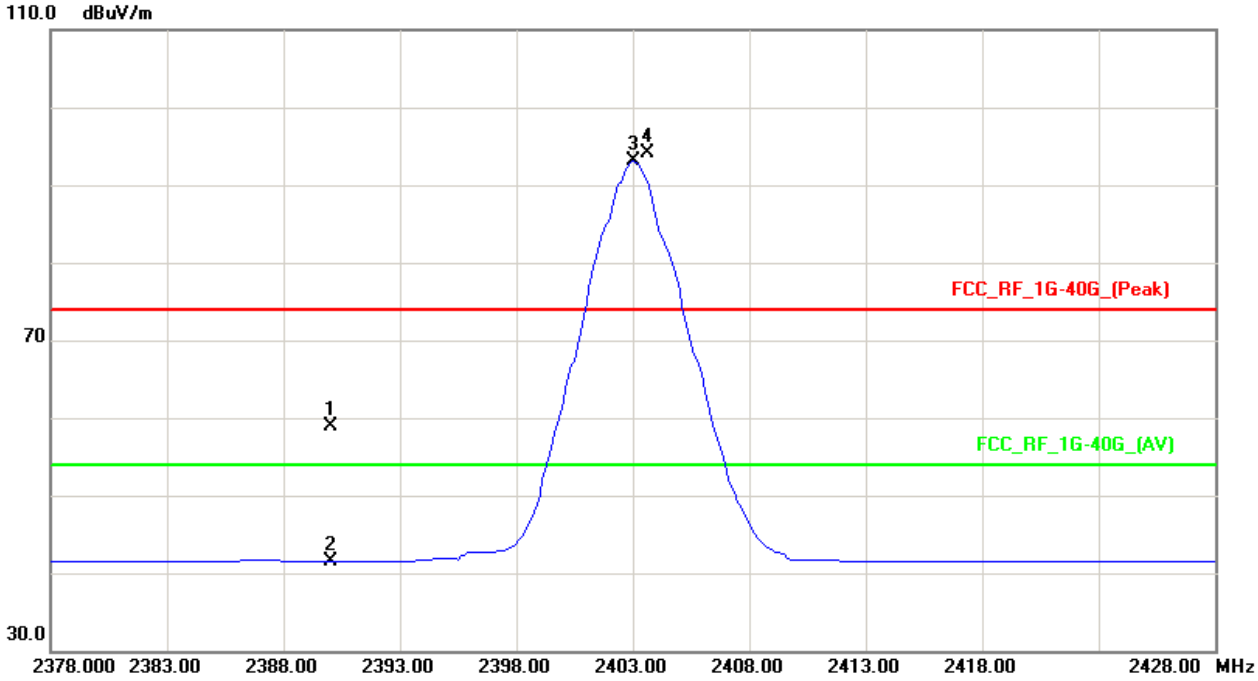
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

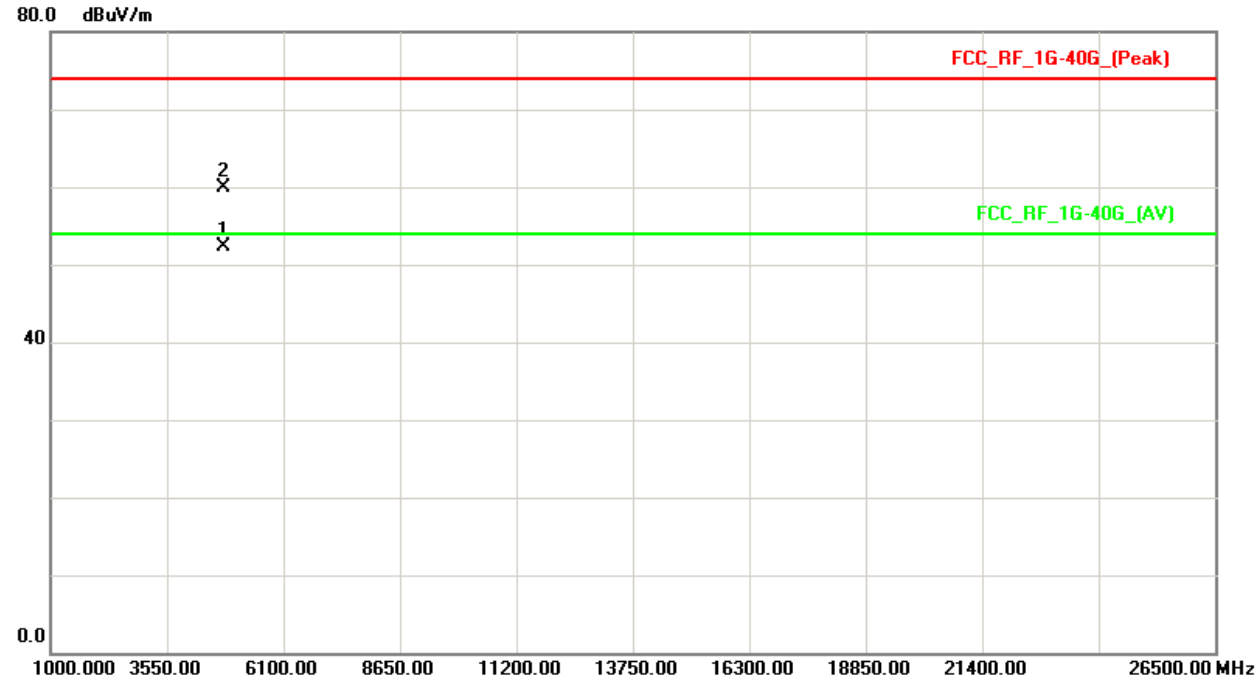
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2403MHz (Above 1000 MHz, Horizontal)





EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2440MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2440.00	**V**	**61.85**	**60.20**	**31.85**	**93.70**	**92.05**	**114.00**	**94.00**	**X/F**
4879.96	V	52.36	44.95	5.49	57.85	50.44	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

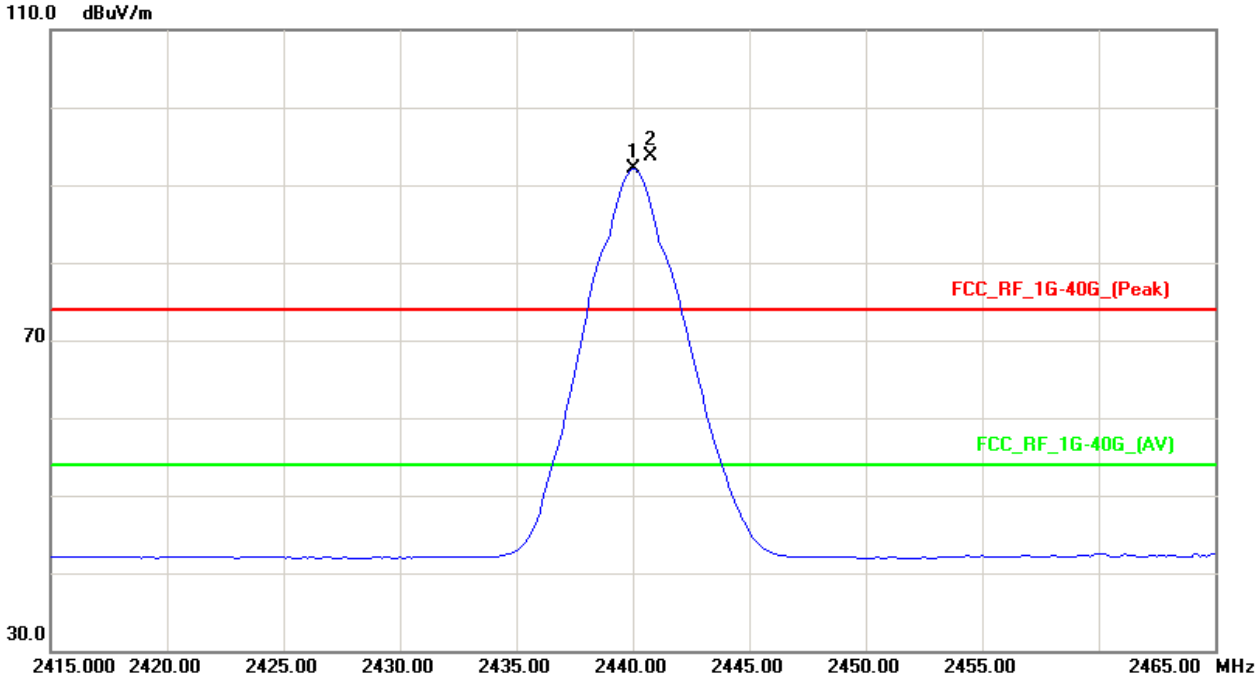
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

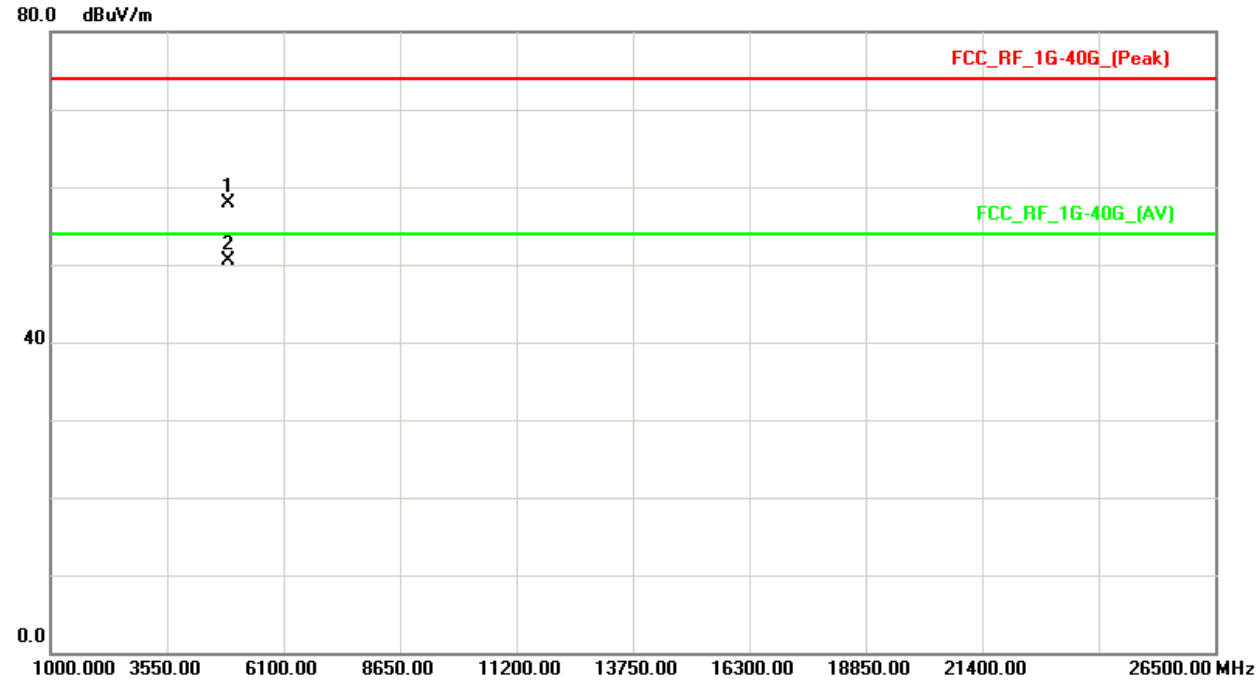
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2440 MHz (Above 1000 MHz, Vertical)





EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2440MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2440.13	**H**	**64.12**	**61.58**	**31.85**	**95.97**	**93.43**	**114.00**	**94.00**	**X/F**
4879.99	H	52.82	46.59	5.49	58.31	52.08	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

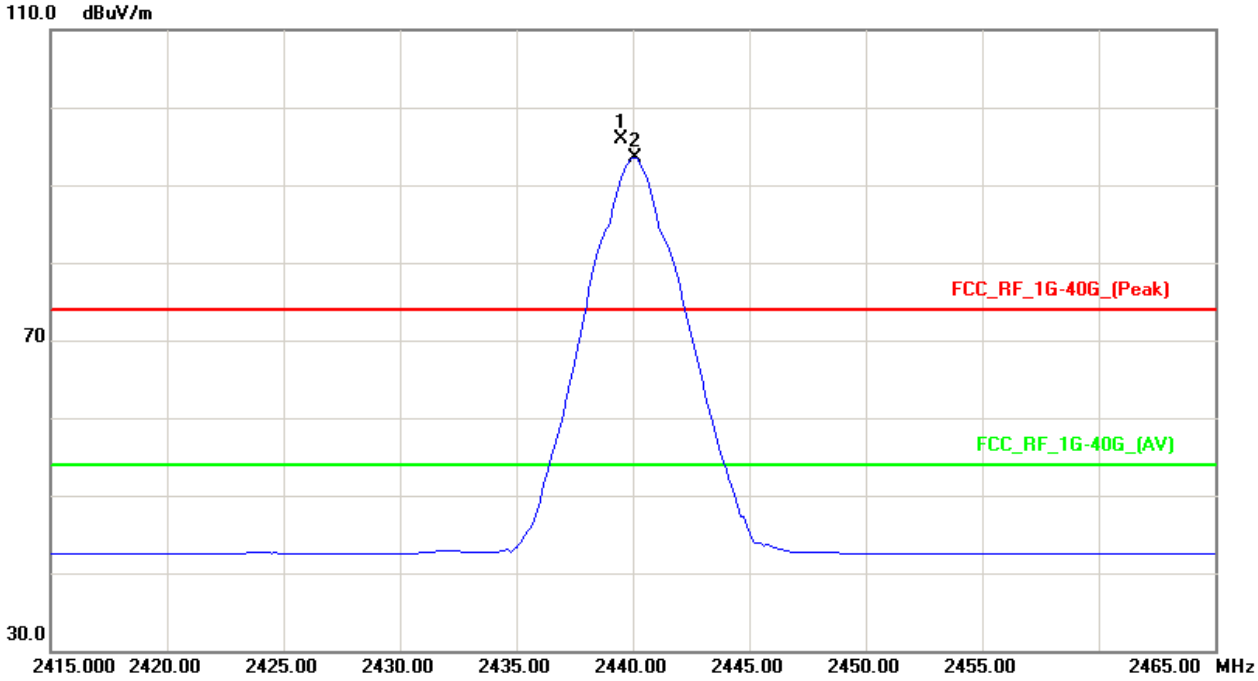
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

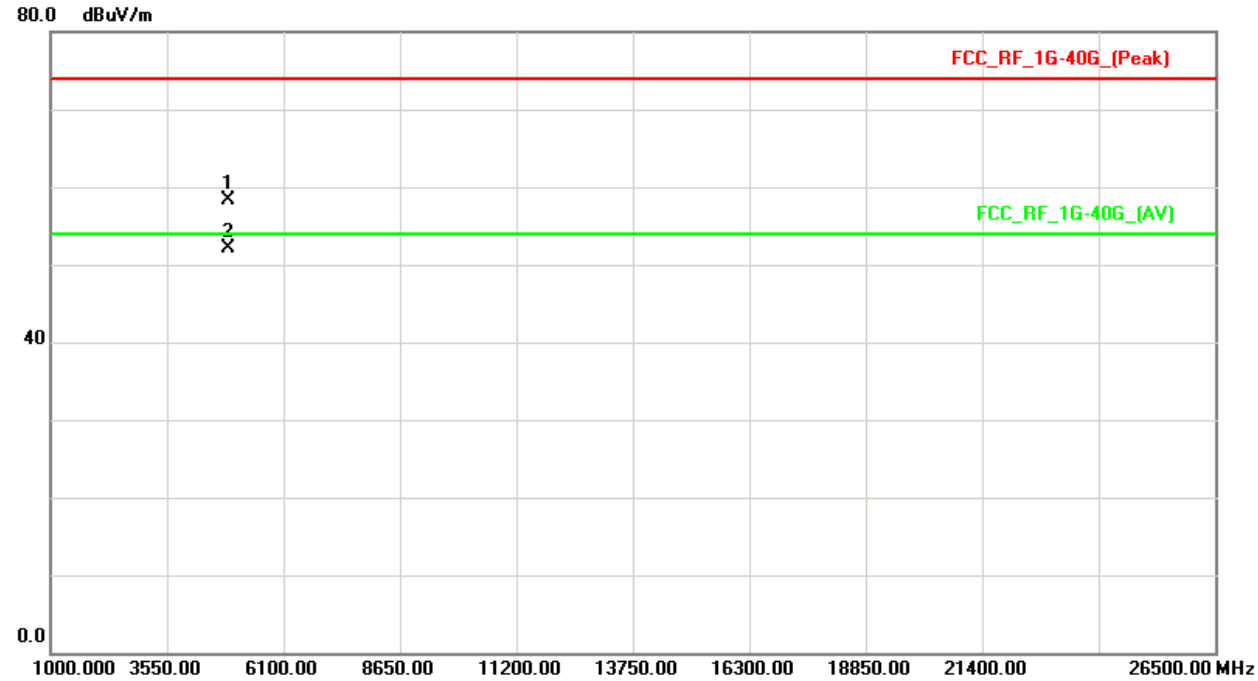
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2440MHz (Above 1000 MHz, Horizontal)





EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2479MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2479.13	**V**	**61.91**	**60.01**	**31.80**	**93.71**	**91.81**	**114.00**	**94.00**	**X/F**
2483.50	V	35.60	16.36	31.80	67.40	48.16	74.00	54.00	X/E
4958.00	V	52.51	46.09	5.78	58.29	51.87	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

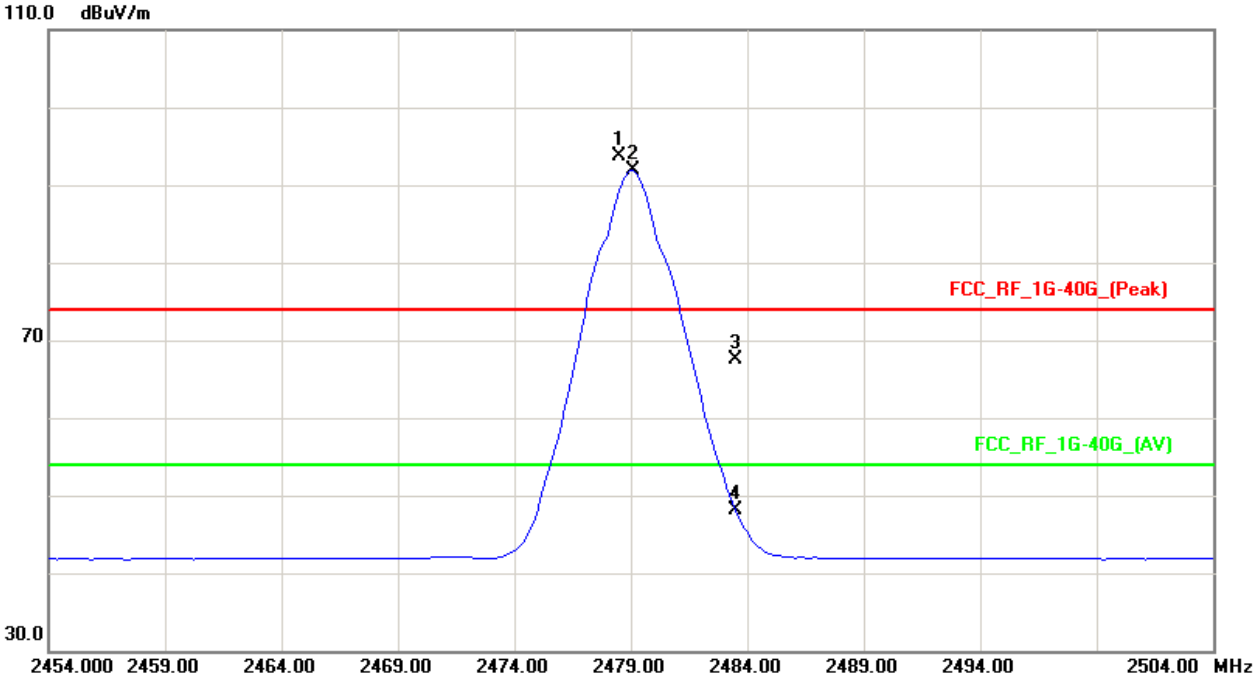
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

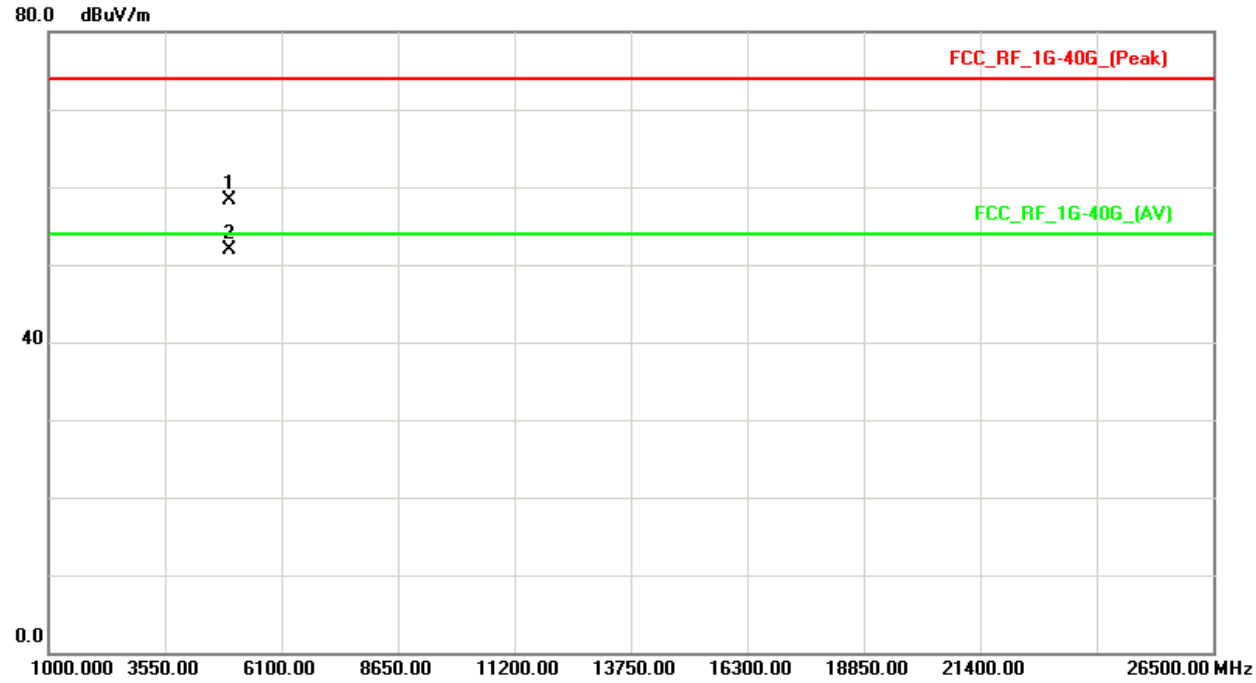
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2479MHz (Above 1000 MHz, Vertical)





EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2479MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2479.13	**H**	**63.23**	**61.32**	**31.80**	**95.03**	**93.12**	**114.00**	**94.00**	**X/F**
2483.50	H	38.15	18.28	31.80	69.95	50.08	74.00	54.00	X/E
4958.00	H	54.55	47.40	5.78	60.33	53.18	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

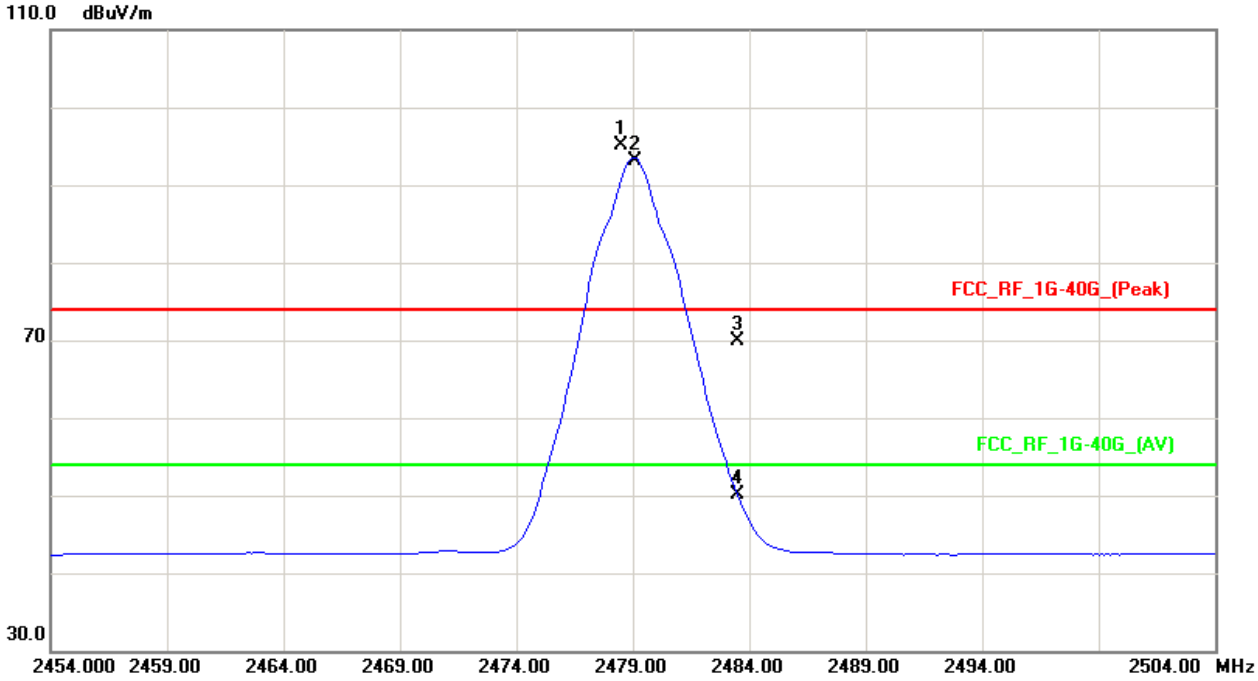
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

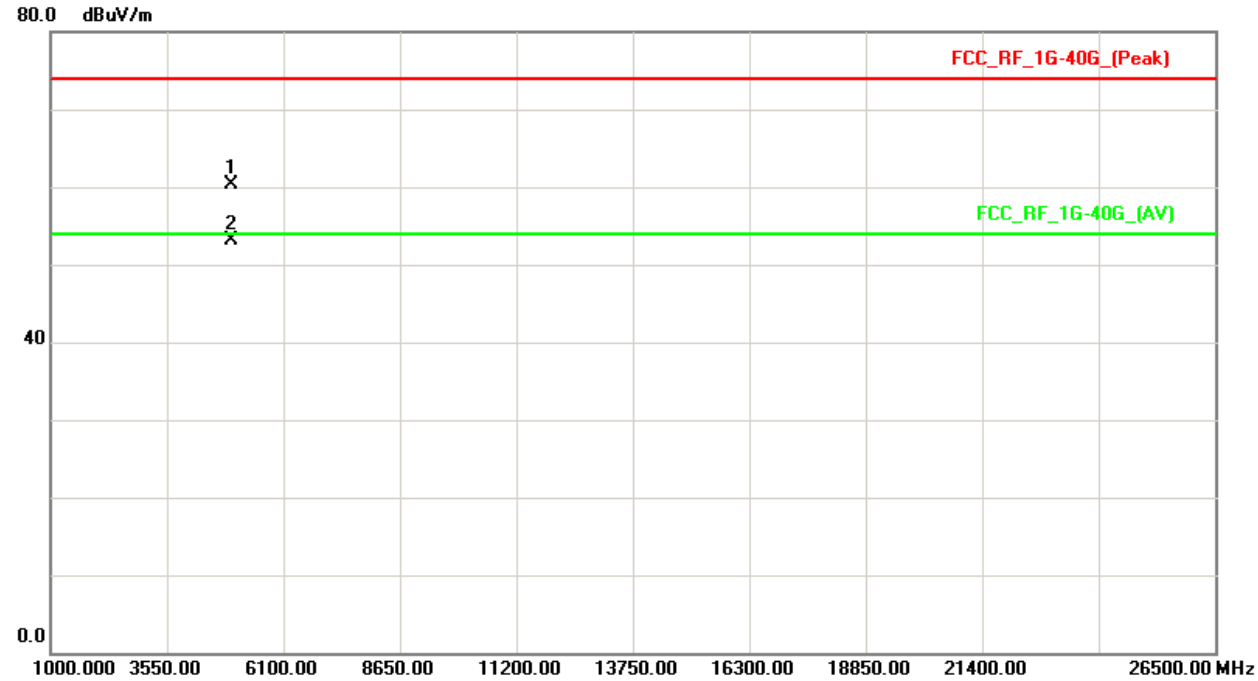
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2479MHz (Above 1000 MHz, Horizontal)





4.2.9 TEST RESULTS (2400 – 2483.5 MHz)

EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH 2403MHz/2440MHz/2479MHz		

		Peak	AV		Peak	AV	Peak	AV	
Freq.	Ant.Pol.	Reading		Ant./CL/	Actual FS		Limit3m		
(MHz)	(H/V)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	NOTE
2403.00	V	61.18	59.60	31.89	93.07	91.49	114.00	94.00	CH01
2403.00	H	62.14	61.18	31.89	94.03	93.07	114.00	94.00	CH01
2440.00	V	61.85	60.20	31.85	93.70	92.05	114.00	94.00	CH38
2440.13	H	64.12	61.58	31.85	95.97	93.43	114.00	94.00	CH38
2479.13	V	61.91	60.01	31.80	93.71	91.81	114.00	94.00	CH77
2479.13	H	63.23	61.32	31.80	95.03	93.12	114.00	94.00	CH77

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

(3) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(4) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

5. BANDWIDTH TEST

5.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

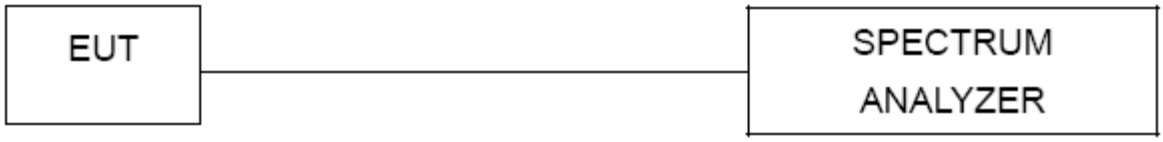
5.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 10 ms.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

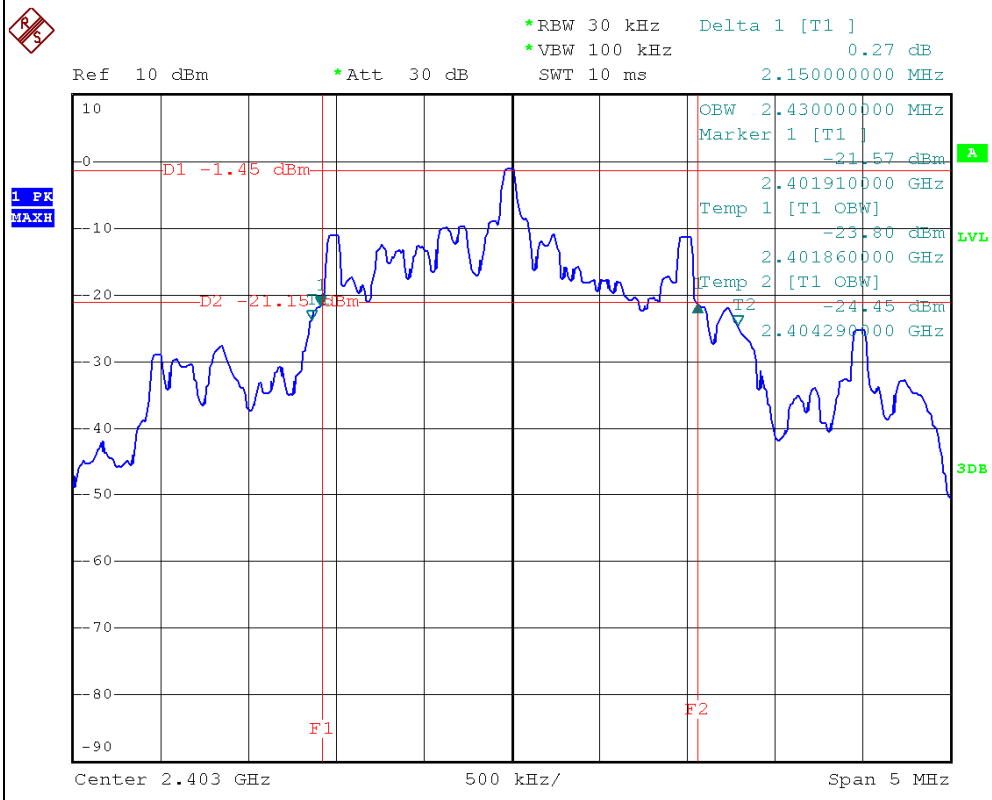
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	22℃	Relative Humidity：	55 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH01/ CH38/ CH77		

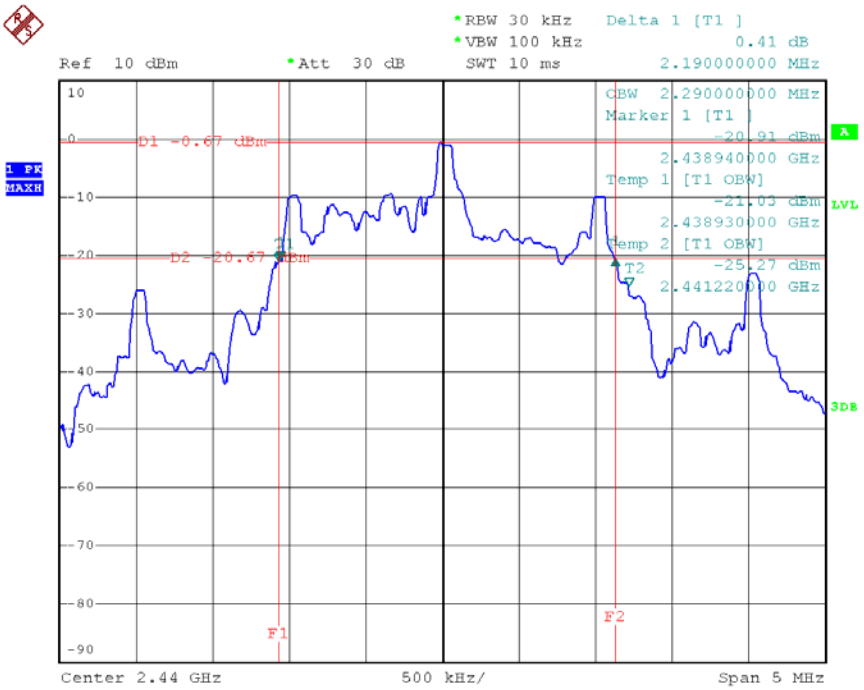
Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% occupied Bandwidth(MHz)
CH01	2404	2.15	2.43
CH38	2440	2.19	2.29
CH77	2476	2.18	2.27

TX CH01



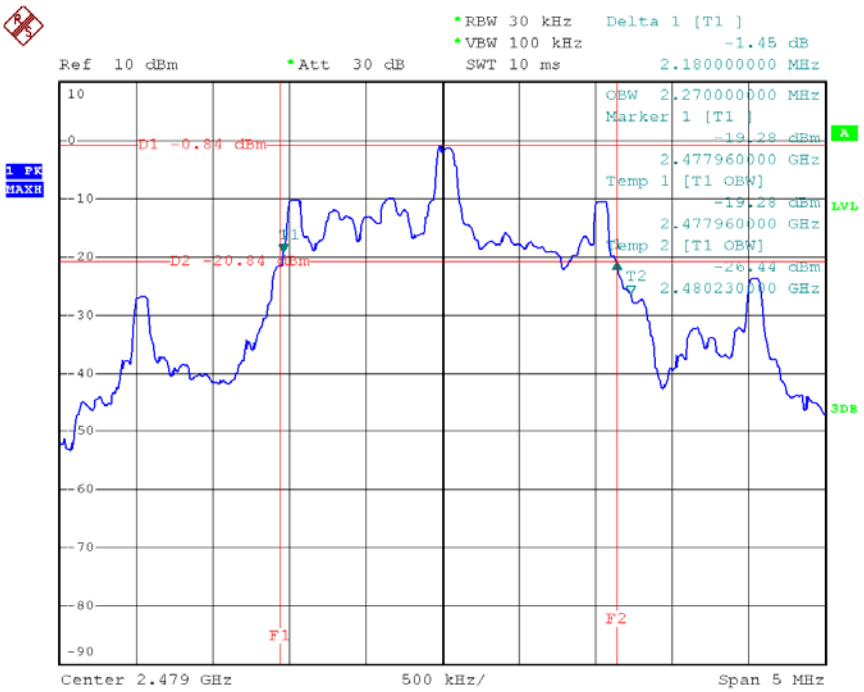
Date: 28.OCT.2011 17:31:35

TX CH38



Date: 28.OCT.2011 17:28:48

TX CH77



Date: 28.OCT.2011 17:30:43

6. ANTENNA CONDUCTED SPURIOUS EMISSION

6.1 APPLIED PROCEDURES / LIMIT

50dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

6.1.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz.

6.1.3 DEVIATION FROM STANDARD

No deviation.

6.1.4 TEST SETUP

6.1.5 EUT OPERATION CONDITIONS

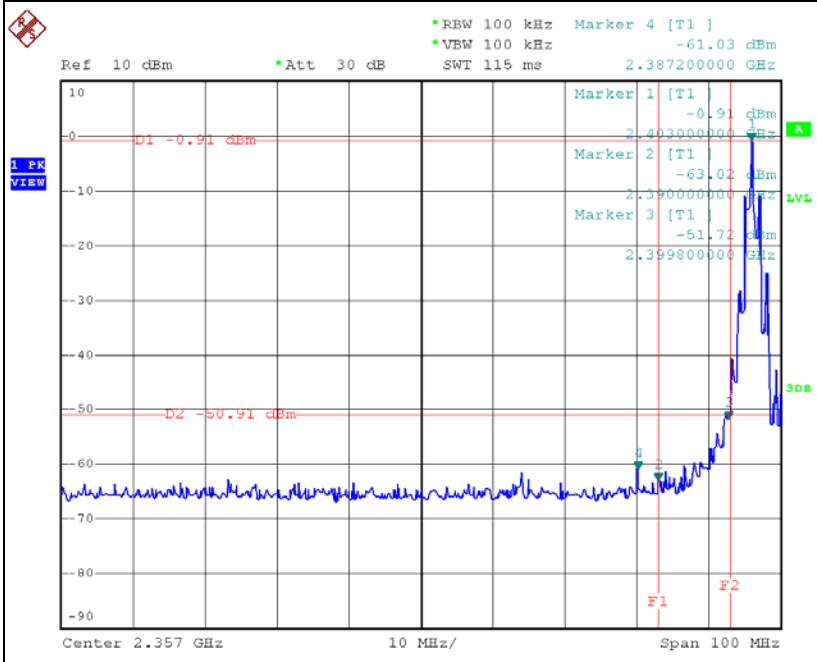
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.6 TEST RESULTS

EUT：	USB Dongle Transmitter	Model Name. ：	airhead 1000
Temperature：	20℃	Relative Humidity：	55 %
Pressure：	1009 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH01, CH38, CH77		

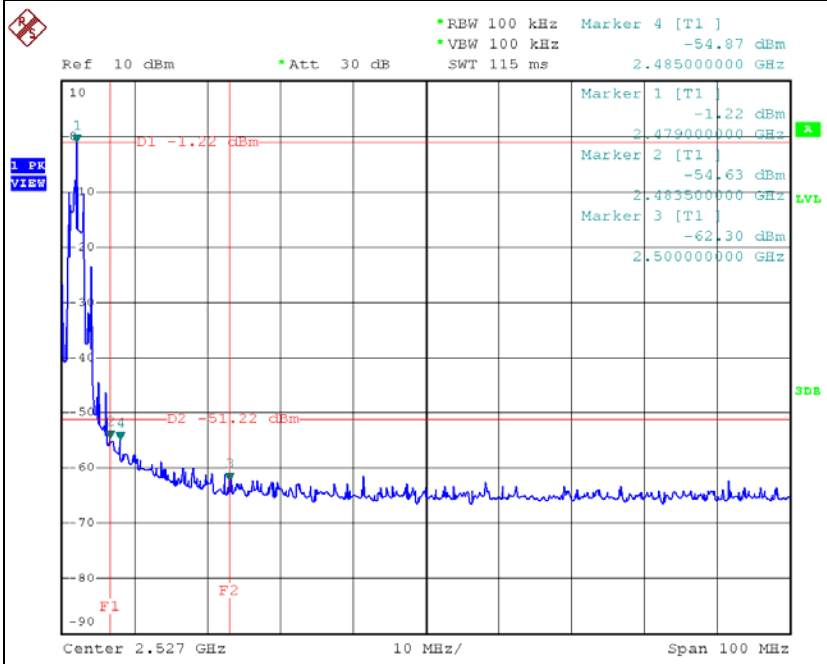
Channel of Worst Data: CH01			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2399.80	-51.72	2483.50	-54.63
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 50dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

TX CH 01



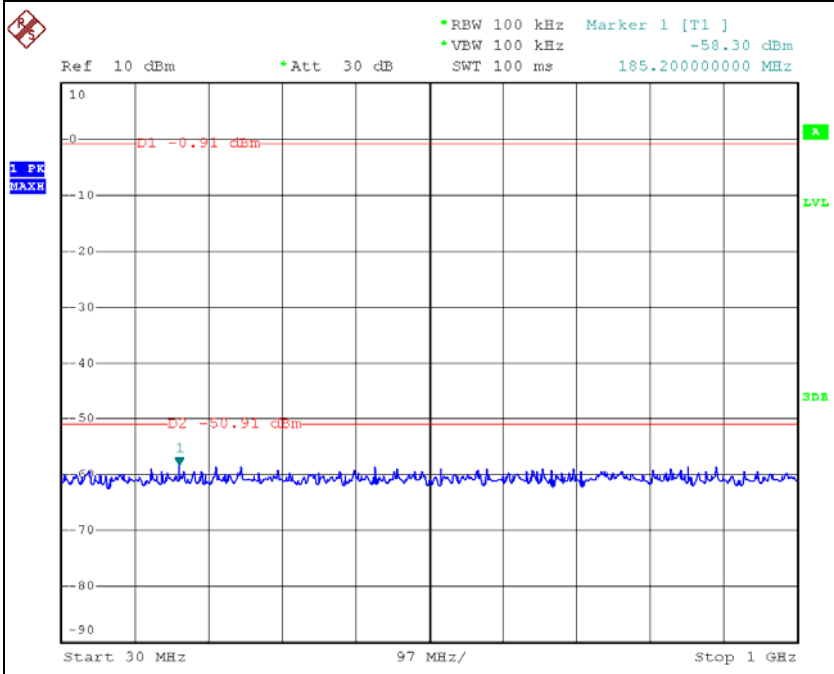
Date: 28.OCT.2011 17:34:44

TX CH77



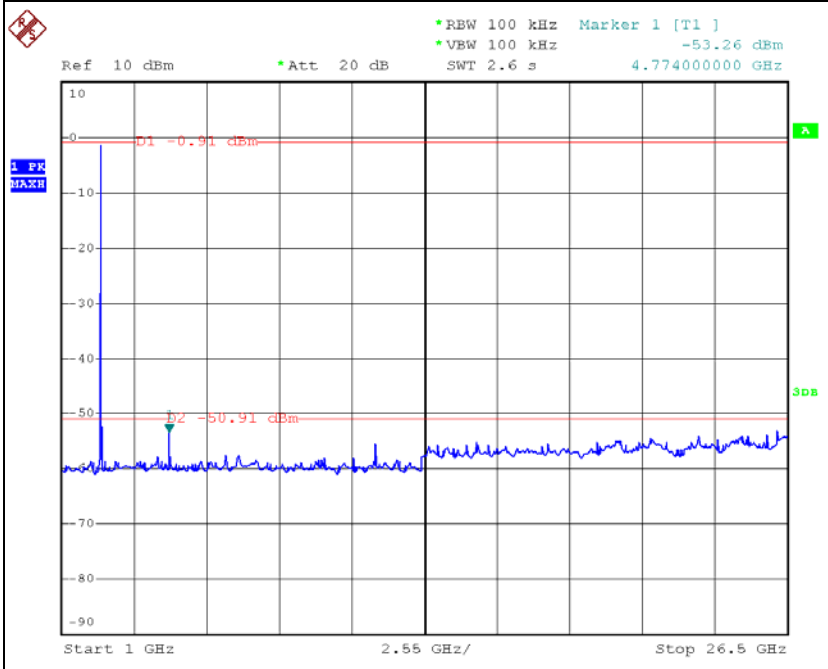
Date: 28.OCT.2011 17:39:26

TX CH 01 (30MHz~1GHz)



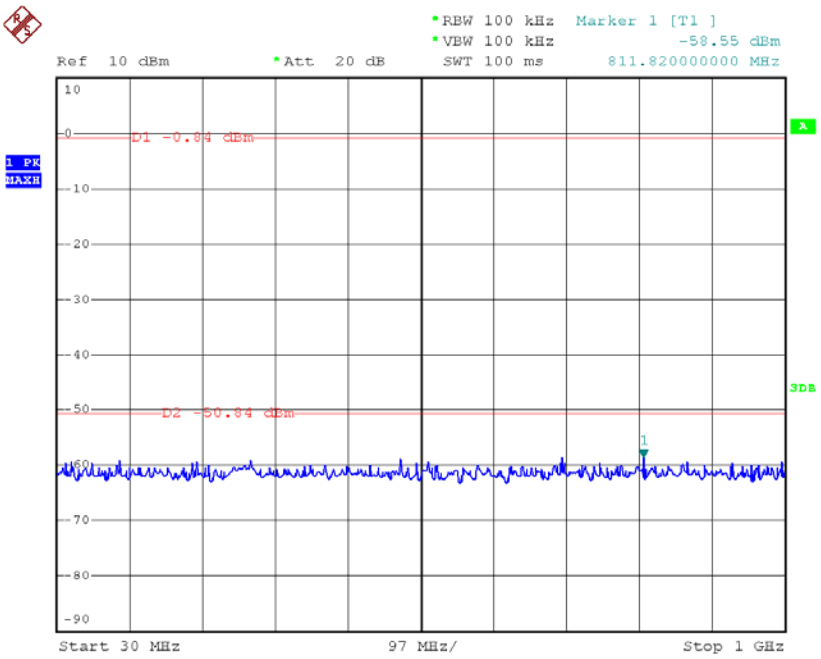
Date: 28.OCT.2011 17:35:18

TX CH 01(1GHz～10th Harmonic)



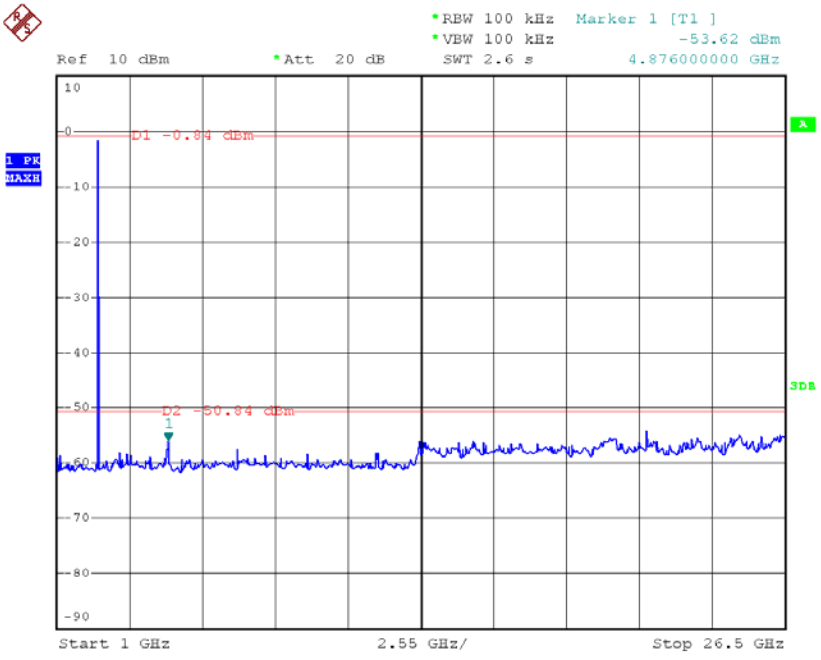
Date: 28.OCT.2011 17:36:13

TX CH38 (30MHz~1GHz)



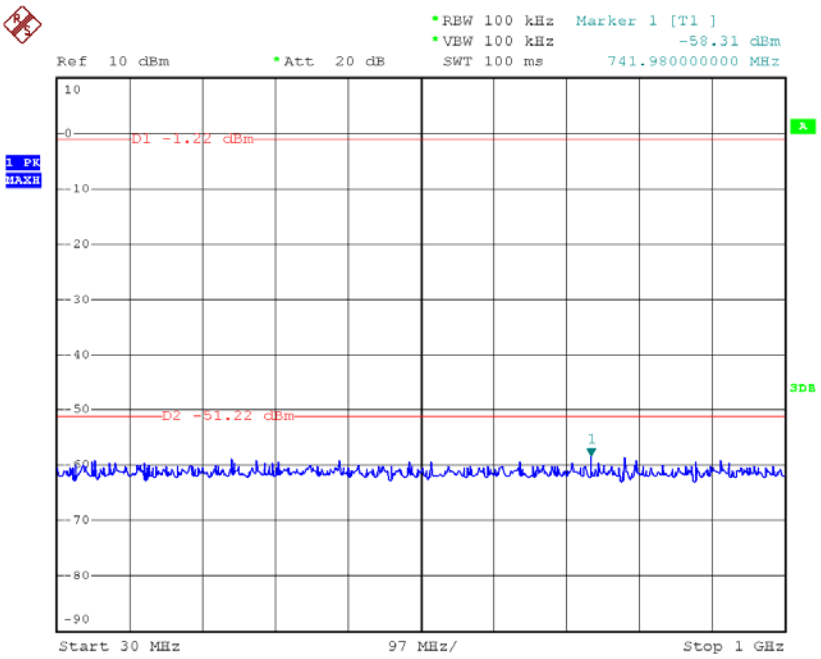
Date: 28.OCT.2011 17:37:16

TX CH38(1GHz～10th Harmonic)



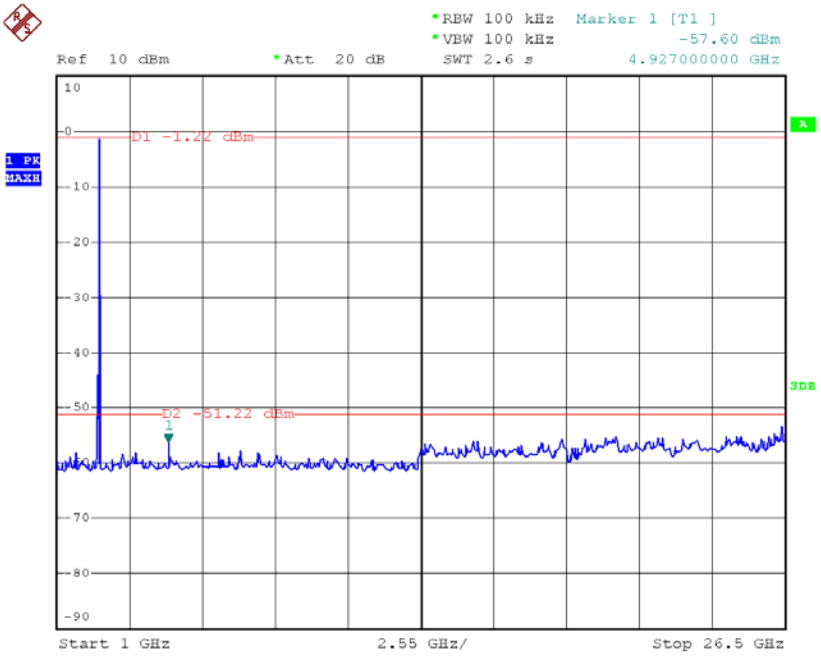
Date: 28.OCT.2011 17:37:06

TX CH77(30MHz~1GHz)



Date: 28.OCT.2011 17:40:46

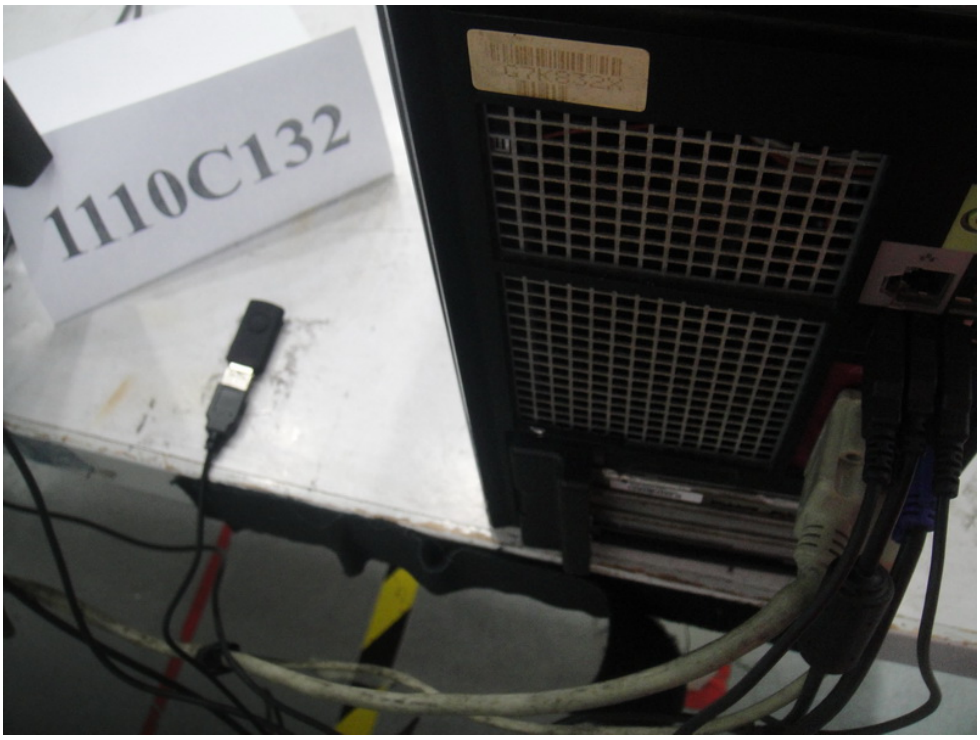
TX CH77(1GHz～10th Harmonic)



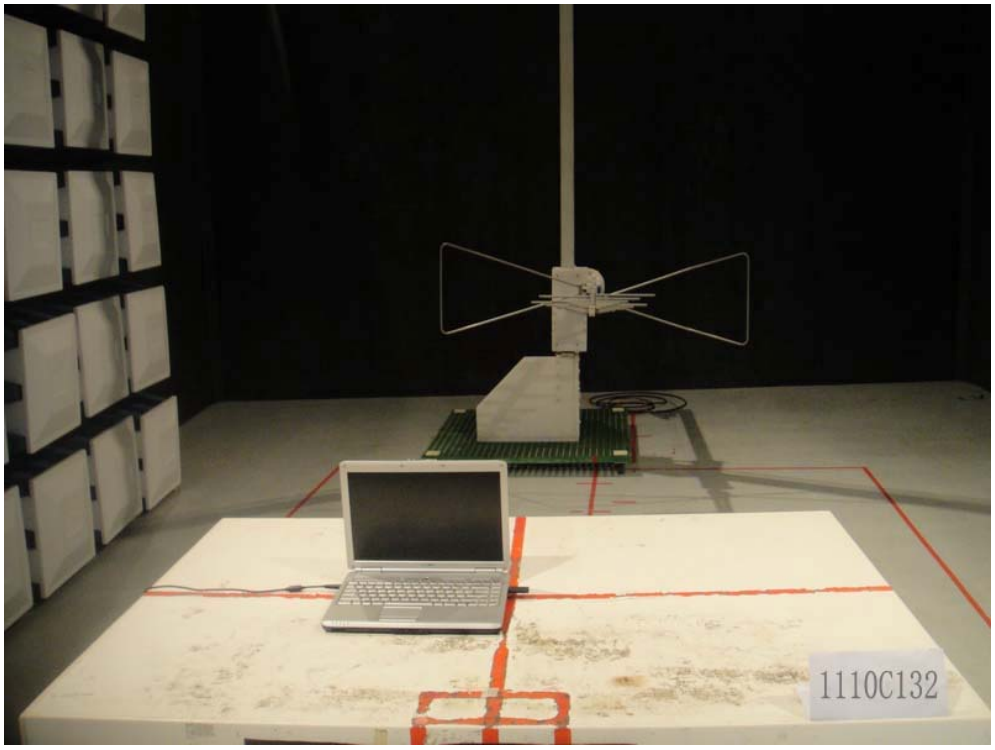
Date: 28.OCT.2011 17:41:04

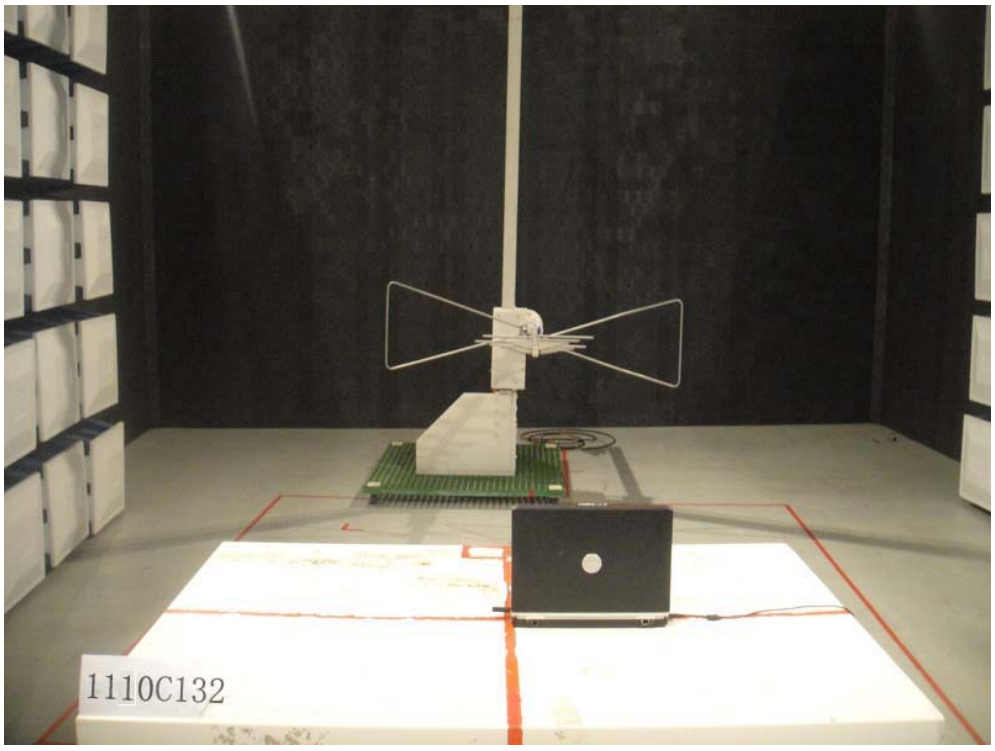
7. EUT TEST PHOTO

Conducted Measurement Photos
Wireless Mode



Radiated Measurement Photos
30M~1000MHz





Radiated Measurement Photos
Above 1000MHz