FCC Radio Test Report

FCC ID: PIBW3TX

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

Issued Date	:	Jan. 15, 2013
Project No.	:	1211C154
Equipment	:	Wireless Audio Sender
Model Name	:	W3 V03
Applicant	:	Audioengine, Ltd
Address	:	Rm 703, Kowloon Bldg, 555 Nathan Rd, Kowloon, Hong Kong
Manufacturer	:	ETHER ELECTRONICS CO.,LTD.
Address	:	4F, 5Building, DongFangMing Industrial Park, NO.83, DaBao Road, Bao an District, ShenZhen City, China

Tested by:
Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Nov. 27, 2012
Date of Test:
Nov. 27, 2012 ~ Jan. 15, 2013

Testing Engineer : David Mao
(David Mao)

Technical Manager : Leo Hung
(Leo Hung)

Authorized Signatory : Steven Lu
(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 **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Neutron's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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	:	Wireless Audio Sender
Brand Name	:	Audioengine
Model Name	:	W3 V03
Applicant	:	Audioengine, Ltd
Factory	:	ETHER ELECTRONICS CO.,LTD.
Address	:	4F, 5Building, DongFangMing Industrial Park, NO.83, DaBao Road, Bao an District, ShenZhen City, China
Date of Test	:	Nov. 27, 2012 ~ Jan. 15, 2013
Test Item	:	ENGINEERING SAMPLE
Standards	:	FCC Part15, Subpart C(15.247) / ANSI C63.4 : 2003 / FCC Public Notice DA 00-705, March 30, 2000.

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-1-1211C154) 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:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section 47 CFR Part 15	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247 (a)(1)	Hopping Channel Separation	PASS	
15.247 (b)(1)	Peak Output Power	PASS	
15.247(d) 15.209	Radiated Spurious Emission	PASS	
15.247 (a)(1)(iii)	Number of Hopping Frequency	PASS	
15.247 (a)(1)(iii)	Dwell Time	PASS	
15.205	Restricted Bands	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

(2) According to FCC Public Notice DA 00-705, March 30, 2000.

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

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	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Audio Sender
Brand Name	Audioengine
Model Name	W3 V03
Model Difference	N/A
Product Description	The EUT is a Wireless Audio Sender. Operation Frequency: 2406~2474 MHz Modulation Type: FHSS Bit Rate of Transmitter 5Mbps Number of Channel 18 CH Please see note 2.(Page 10) Antenna Designation: / Antenna Gain(Peak): Please see note 3. (Page 10) Output Power: 4.87 dBm 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.
Power Source	DC Voltage supplied from AC/DC adapter. Brand: GPE; Model: GPE053B-050100-Z
Power Rating	IP AC 100-240V~50-60Hz 0.2A OP DC 5V 1000mA 5W
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

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

2.

Channel List			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2406**	**10**	**2442**
02	2410	11	2446
03	2414	12	2450
04	2418	13	2454
05	2422	14	2458
06	2426	15	2462
07	2430	16	2466
08	2434	17	2470
09	2438	**18**	**2474**

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ACX	AT8010- T 2R9 HAA	Multilayer Chip Antenna	N/A	0.5

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base 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	Adapter Supply
Mode 2	PC MODE
Mode 3	TX Mode **NOTE (1)**

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For Conducted Emission	
Final Test Mode	Description
Mode 1	Adapter Supply
Mode 2	PC MODE

For Radiated Emission	
Final Test Mode	Description
Mode 3	TX Mode **NOTE (1)**

Note:

(1) The measurements are performed at the high, middle, low available channels.

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

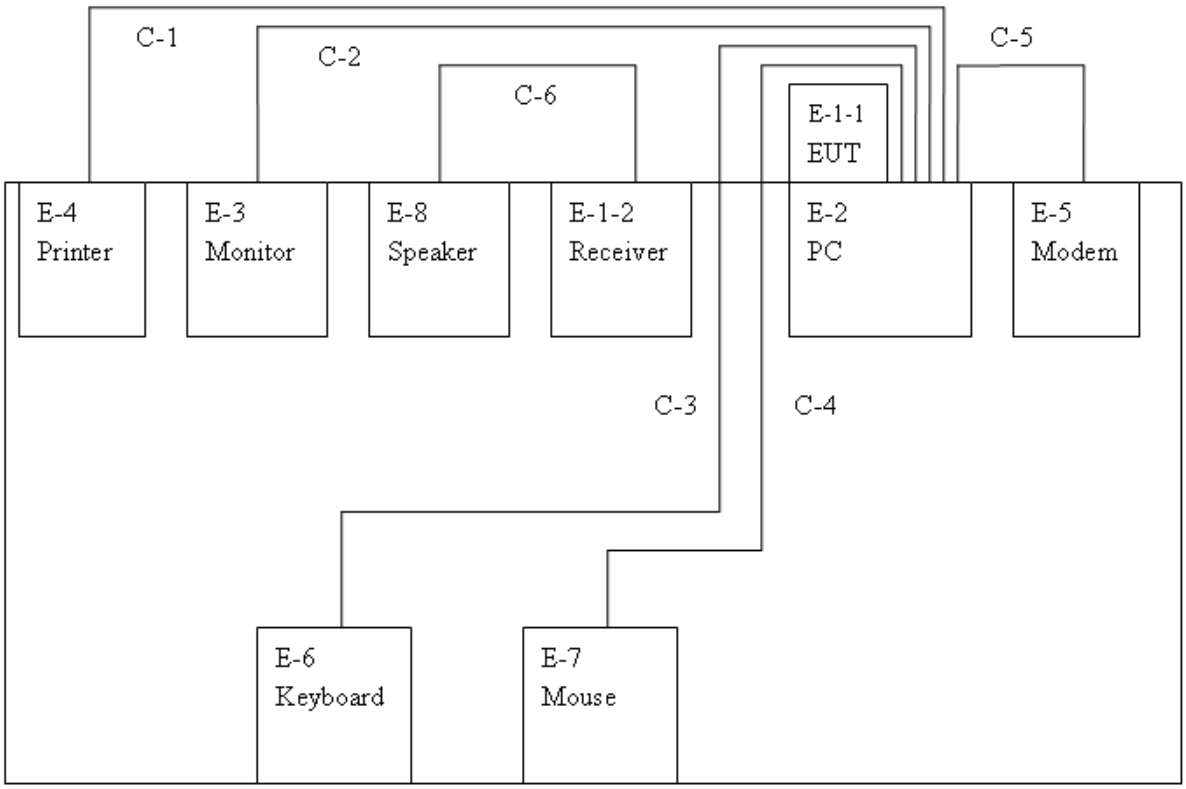
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software version	N/A		
Frequency	2406 MHz	2442 MHz	2474 MHz
Parameters-5Mbps	N/A	N//A	N/A

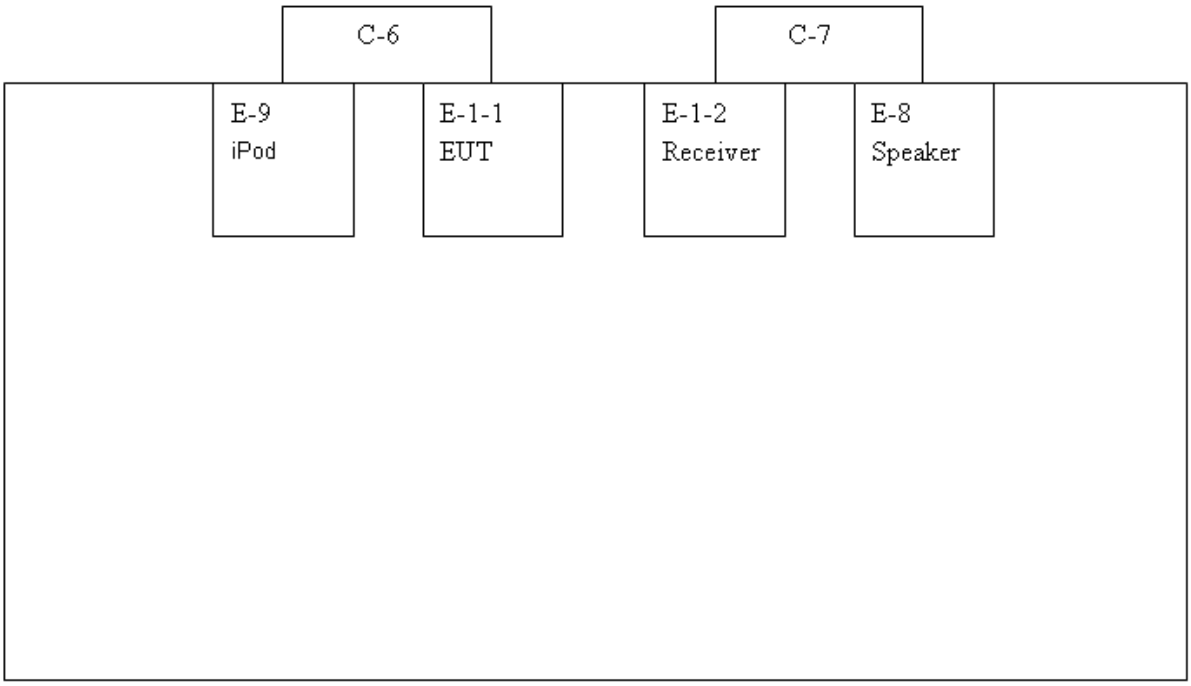
3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted:

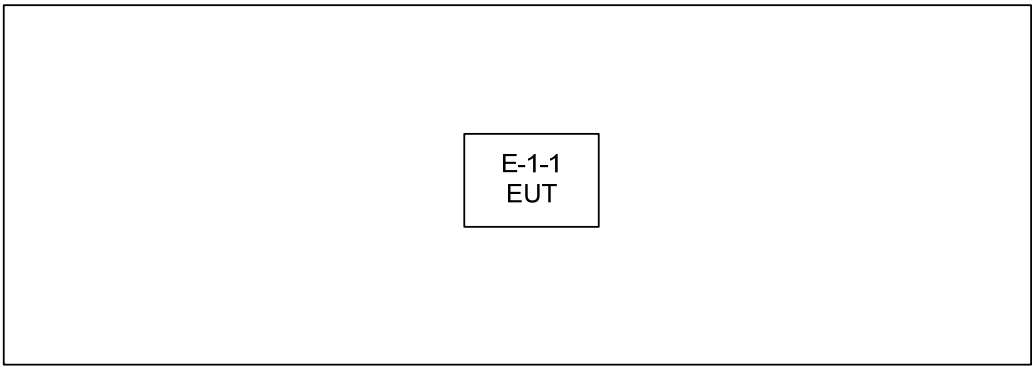
PC MODE



Adapter Supply



Radiated:



C-1 Parallel Cable
C-2 D-Sub Cable
C-3 USB Cable
C-4 USB Cable
C-5 RS232 Cable
C-6 Audio Cable
C-7 Audio Cable

3.5 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-1-1	Wireless Audio Sender	Audioengine	W3 V03	PIBW3TX	N/A	EUT
E-1-2	Wireless Audio Receiver	Audioengine	W3 V03	PIBW3RX	N/A	
E-2	PC	Dell 745	DCSM	DOC	G7K832X	
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	Speaker	iHome	iDM15	VER	N/A	
E-9	Ipod MP4	APPLE	A1136	DOC	8M637MYXV9M	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.8m	
C-2	YES	YES	1.8m	
C-3	YES	YES	1.5m	
C-4	YES	NO	1.5m	
C-5	NO	NO	1.8m	
C-6	NO	NO	0.5m	
C-7	NO	NO	0.5m	

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 AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	LISN	EMCO	3816/2	00052765	May.26.2012	May.04.2013
2	LISN	R&S	ENV216	100087	May.26.2012	May.04.2013
3	Test Cable	N/A	C_17	N/A	Mar.18.2012	Mar.28.2013
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.26.2012	May.04.2013
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.26.2012	May.04.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

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

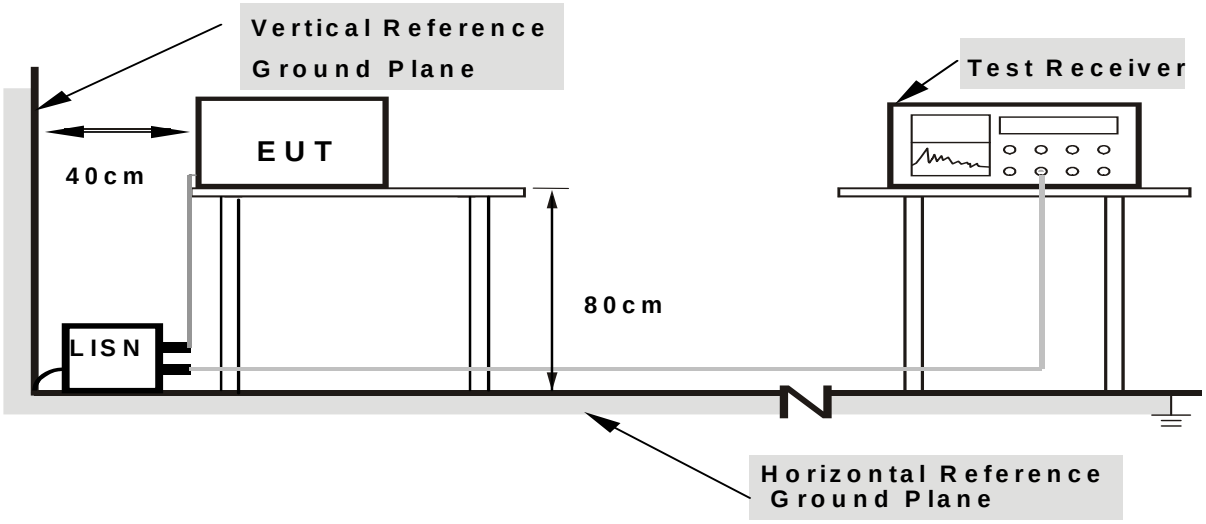
4.1.3 TEST PROCEDURE

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 is continue Transmitter/Receive data or Hopping on mode.

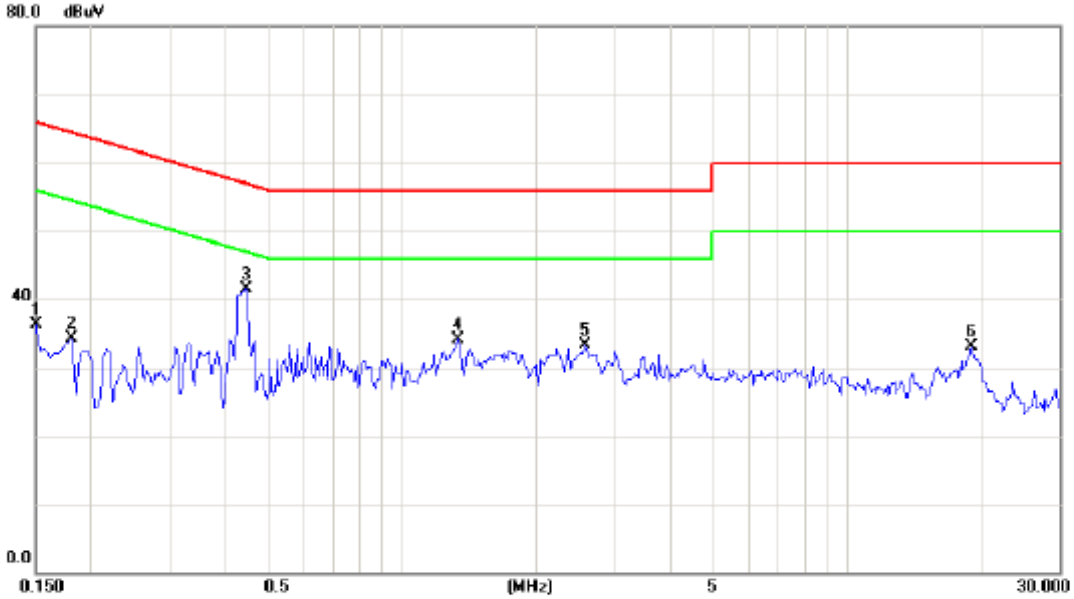
4.1.7 TEST RESULTS

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.

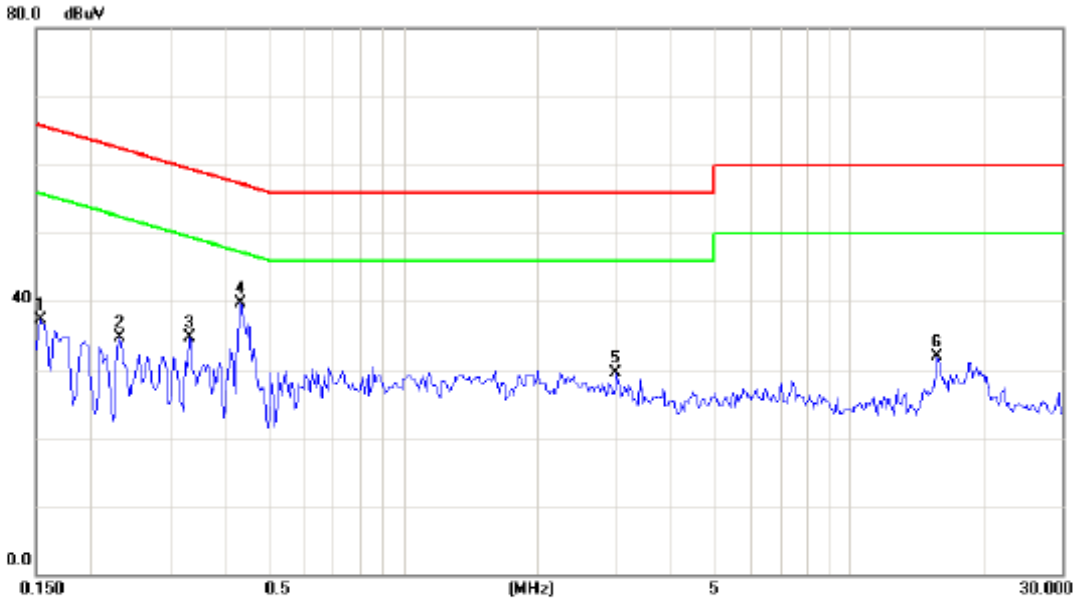
(2) Measuring frequency range from 150KHz to 30MHz.

EUT：	Wireless Audio Sender	Model Name. ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Power ：	AC 120V/60Hz	Phase:	Line
Test Mode ：	Adapter Supply		



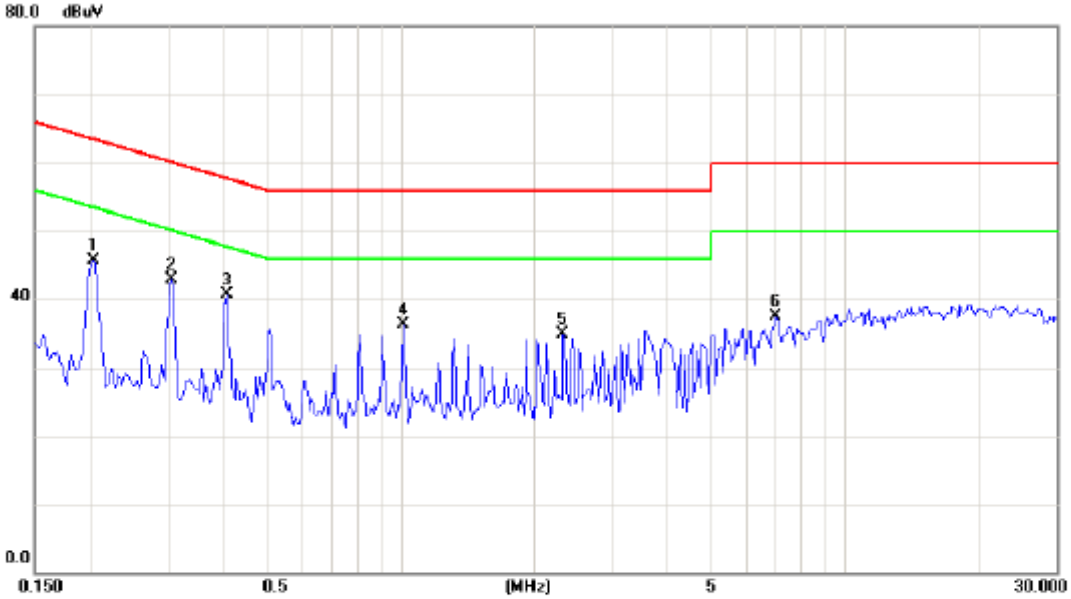
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	26.39	9.85	36.24	66.00	-29.76	peak	
2		0.1812	24.44	9.85	34.29	64.43	-30.14	peak	
3	*	0.4470	31.68	9.84	41.52	56.93	-15.41	peak	
4		1.3375	24.36	9.84	34.20	56.00	-21.80	peak	
5		2.5797	23.49	9.89	33.38	56.00	-22.62	peak	
6		19.0820	22.92	10.27	33.19	60.00	-26.81	peak	

EUT：	Wireless Audio Sender	Model Name. ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Power ：	AC 120V/60Hz	Phase:	Neutral
Test Mode ：	Adapter Supply		



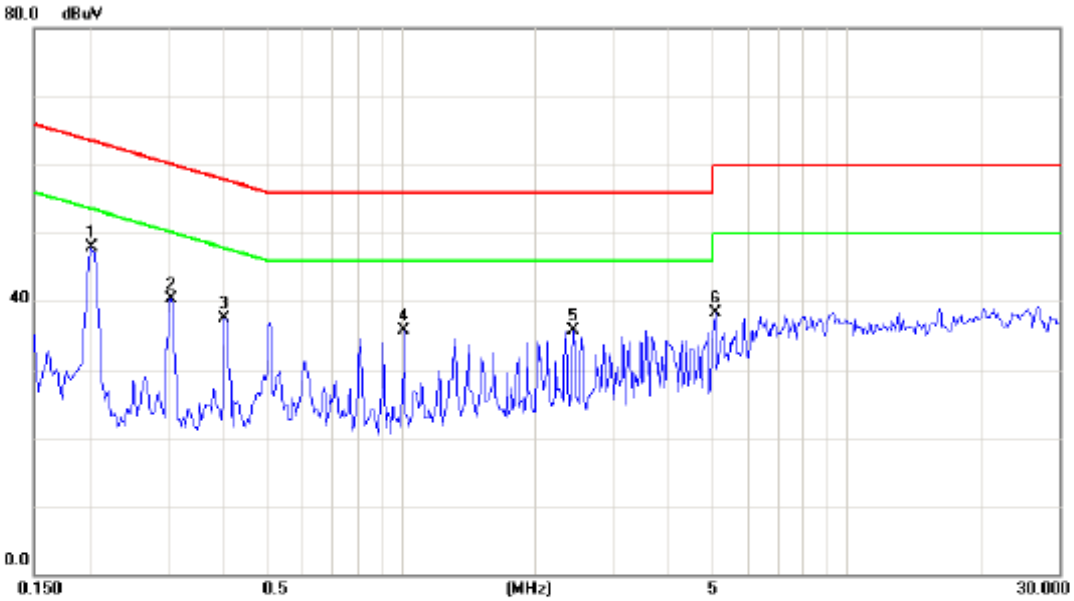
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	27.39	9.86	37.25	65.78	-28.53	peak	
2		0.2320	24.89	9.85	34.74	62.38	-27.64	peak	
3		0.3336	24.90	9.84	34.74	59.36	-24.62	peak	
4	*	0.4313	29.84	9.84	39.68	57.23	-17.55	peak	
5		2.9977	19.54	9.93	29.47	56.00	-26.53	peak	
6		15.7227	21.64	10.21	31.85	60.00	-28.15	peak	

EUT：	Wireless Audio Sender	Model Name. ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Power ：	AC 120V/60Hz	Phase:	Line
Test Mode ：	PC MODE		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2046	35.77	9.85	45.62	63.42	-17.80	peak	
2		0.3062	33.04	9.84	42.88	60.07	-17.19	peak	
3	*	0.4077	30.91	9.84	40.75	57.70	-16.95	peak	
4		1.0132	26.43	9.82	36.25	56.00	-19.75	peak	
5		2.3334	24.98	9.88	34.86	56.00	-21.14	peak	
6		7.0040	27.46	10.00	37.46	60.00	-22.54	peak	

EUT：	Wireless Audio Sender	Model Name. ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Power ：	AC 120V/60Hz	Phase:	Neutral
Test Mode ：	PC MODE		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.2028	38.02	9.85	47.87	63.50	-15.63	peak	
2		0.3062	30.40	9.84	40.24	60.07	-19.83	peak	
3		0.4040	27.71	9.84	37.55	57.77	-20.22	peak	
4		1.0170	25.76	9.87	35.63	56.00	-20.37	peak	
5		2.4350	25.86	9.93	35.79	56.00	-20.21	peak	
6		5.0781	28.34	9.97	38.31	60.00	-21.69	peak	

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc 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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

4.2.2 MEASUREMENT INSTRUMENTS LIST ANS SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Antenna	Schwarbeck	VULB9160	9160-3232	Jun .04.2012	May.25.2013
2	Amplifier	HP	8447D	2944A09673	May.26.2012	May.04.2013
3	Test Receiver	R&S	ESCI	100382	May.26.2012	May.04.2013
4	Test Cable	N/A	C-01_CB03	N/A	Jul.01.2012	Jul.01.2013
5	Antenna	ETS	3115	00075789	May.26.2012	May.25.2013
6	Amplifier	Agilent	8449B	3008A02274	May.26.2012	May.04.2013
7	Spectrum	Agilent	E4408B	US39240143	Nov.25.2012	Nov.16.2013
8	Test Cable	HUBER+SUHNER	C-45	N/A	May.04.2012	May.02.2013
9	Controller	CT	SC100	N/A	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	May.26.2012	May.25.2013
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Oct.13.2012	May.04.2013
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct.13.2012	Oct.12.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

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~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2.3 TEST PROCEDURE

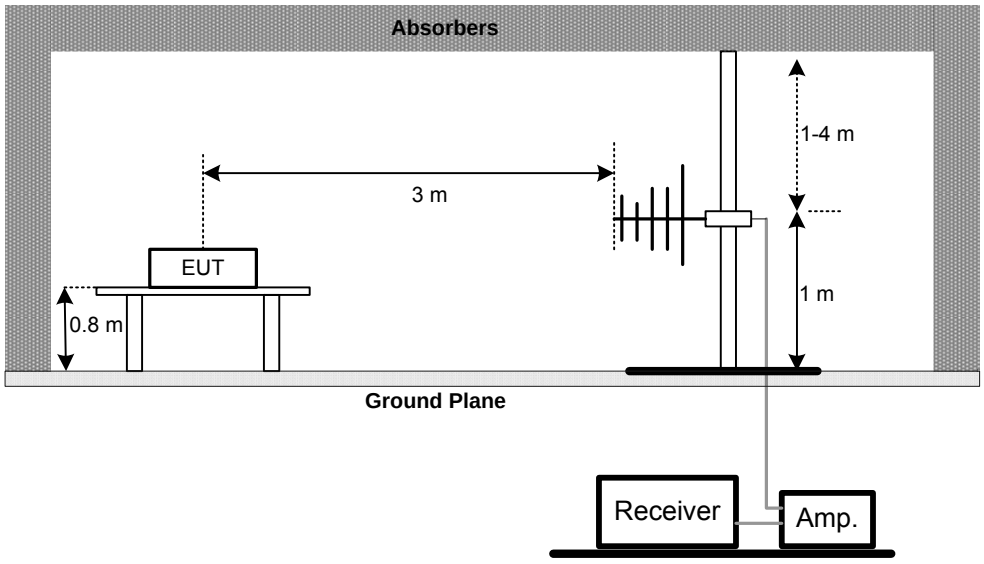
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 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

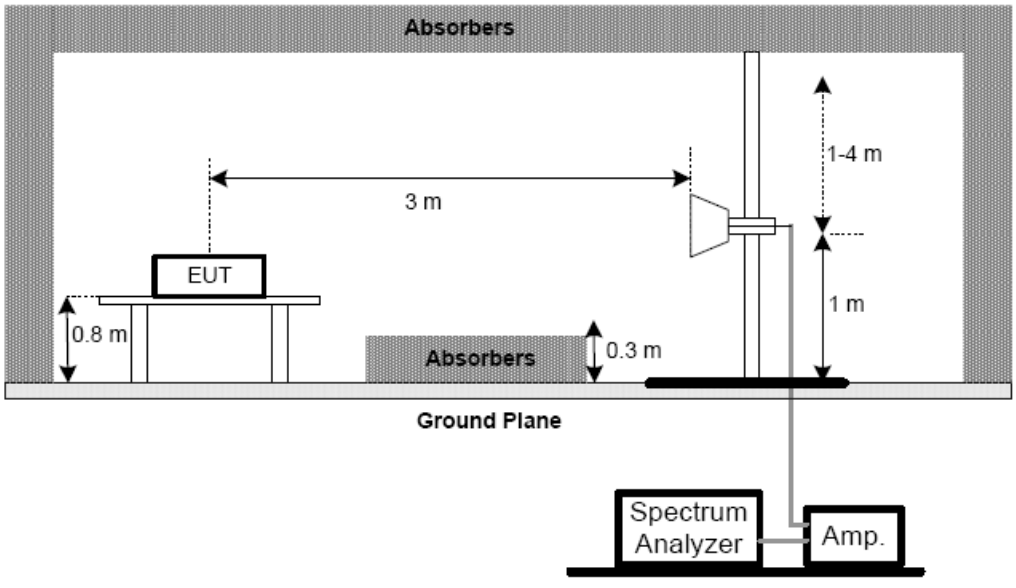
No deviation

4.2.5 TEST SETUP

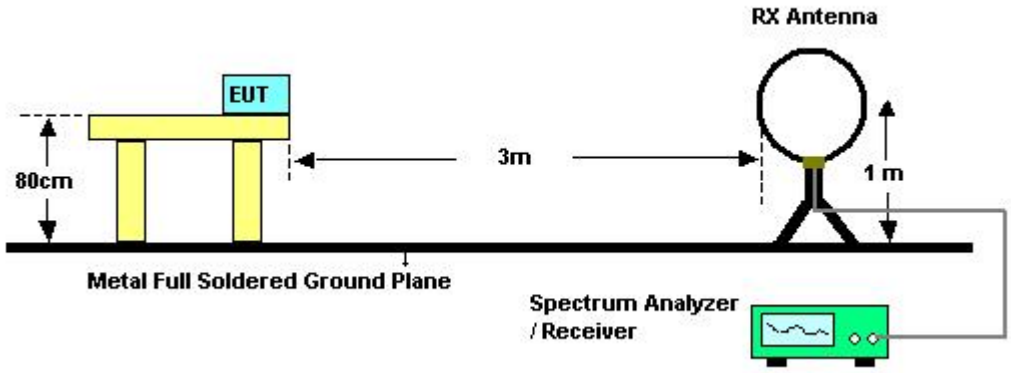
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For radiated emissions below 30MHz



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 (9K~ 30MHZ)

EUT：	300Mbps Wireless USB Adapter	Model Name ：	MT-WN813NM
Temperature：	26℃	Relative Humidity：	53 %
Pressure：	1010 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Mode		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0097	0°	25.78	24.30	50.08	127.87	-77.79	AVG
0.0097	0°	28.96	24.30	53.26	147.87	-94.61	PK
0.0244	0°	23.78	24.02	47.80	119.86	-72.06	AVG
0.0244	0°	26.42	24.02	50.44	139.86	-89.42	PK
0.0386	0°	20.04	23.12	43.16	115.87	-72.71	AVG
0.0386	0°	22.71	23.12	45.83	135.87	-90.04	PK
0.0617	0°	18.06	22.17	40.23	111.80	-71.57	AVG
0.0617	0°	23.69	22.17	45.86	131.80	-85.94	PK
0.2620	0°	21.89	20.37	42.26	99.24	-56.98	AVG
0.2620	0°	23.02	20.37	43.39	119.24	-75.85	PK
1.3750	0°	27.35	19.56	46.91	64.84	-17.93	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0098	90°	17.33	24.30	41.63	127.78	-86.15	AVG
0.0098	90°	20.68	24.30	44.98	147.78	-102.80	PK
0.0205	90°	16.25	24.27	40.52	121.37	-80.85	AVG
0.0205	90°	18.46	24.27	42.73	141.37	-98.64	PK
0.0465	90°	20.14	22.62	42.76	114.26	-71.50	AVG
0.0465	90°	22.87	22.62	45.49	134.26	-88.77	PK
0.0771	90°	21.44	21.86	43.30	109.86	-66.56	AVG
0.0771	90°	24.66	21.86	46.52	129.86	-83.34	PK
0.3602	90°	21.07	20.14	41.21	96.47	-55.27	AVG
0.3602	90°	24.96	20.14	45.10	116.47	-71.38	PK
1.5240	90°	23.15	19.55	42.70	63.94	-21.24	QP

Remark：

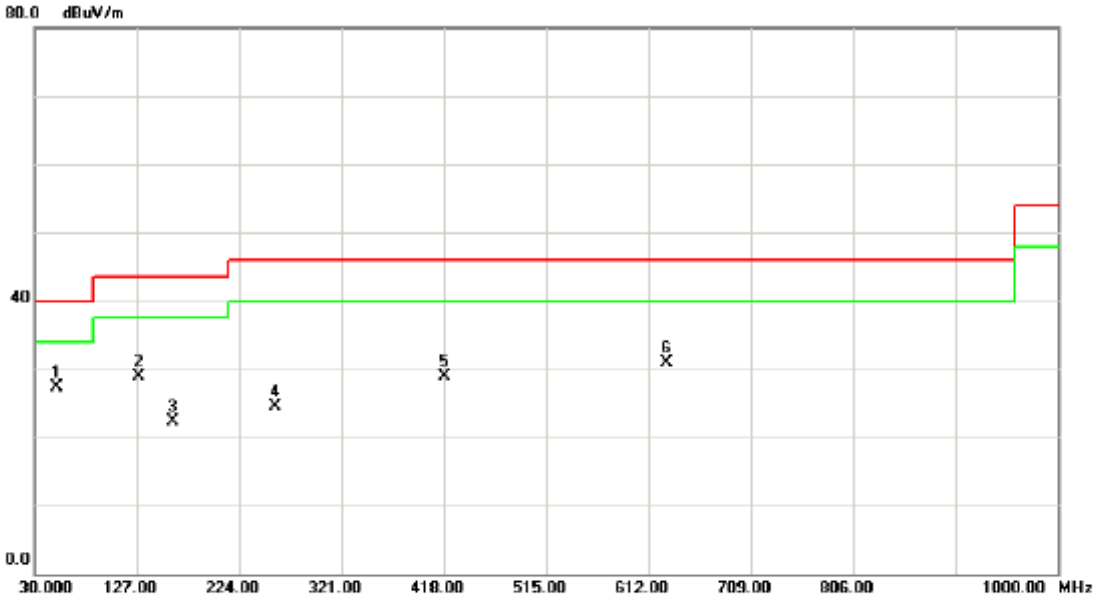
(1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
(2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);.
(3) Limit line = specific limits (dBuV) + distance extrapolation factor..

4.2.8 TEST RESULTS (BETWEEN30 – 1000 MHZ)

Remark：

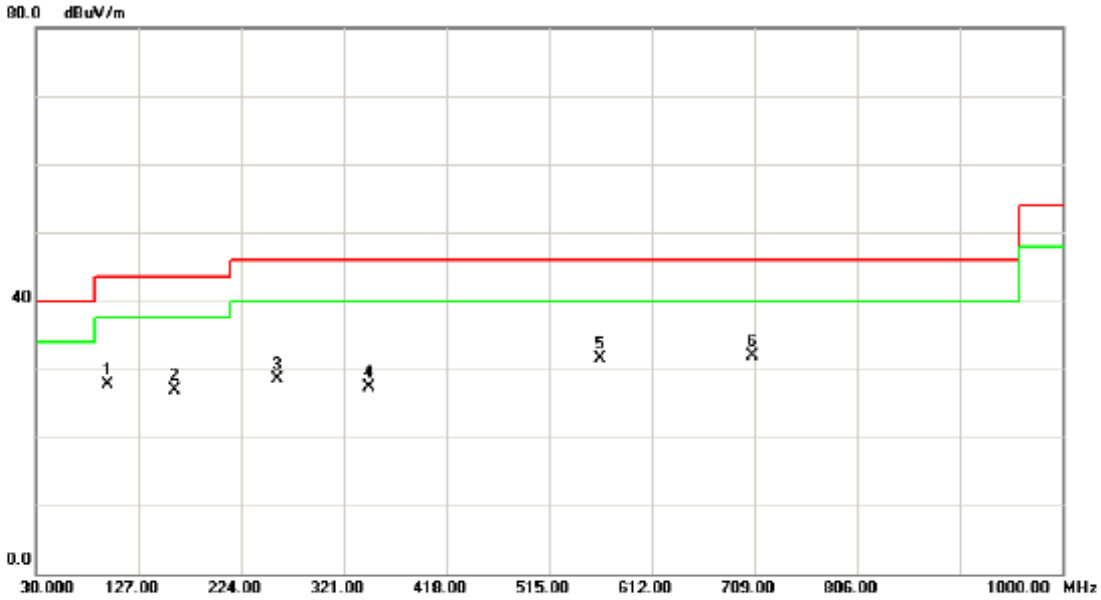
(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
(3) Measuring frequency range from 30MHz to 1000MHz.
(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Voltage ：	AC 120V/60Hz	Phase:	Vertical
Test Mode ：	TX 2406MHz –CH01		



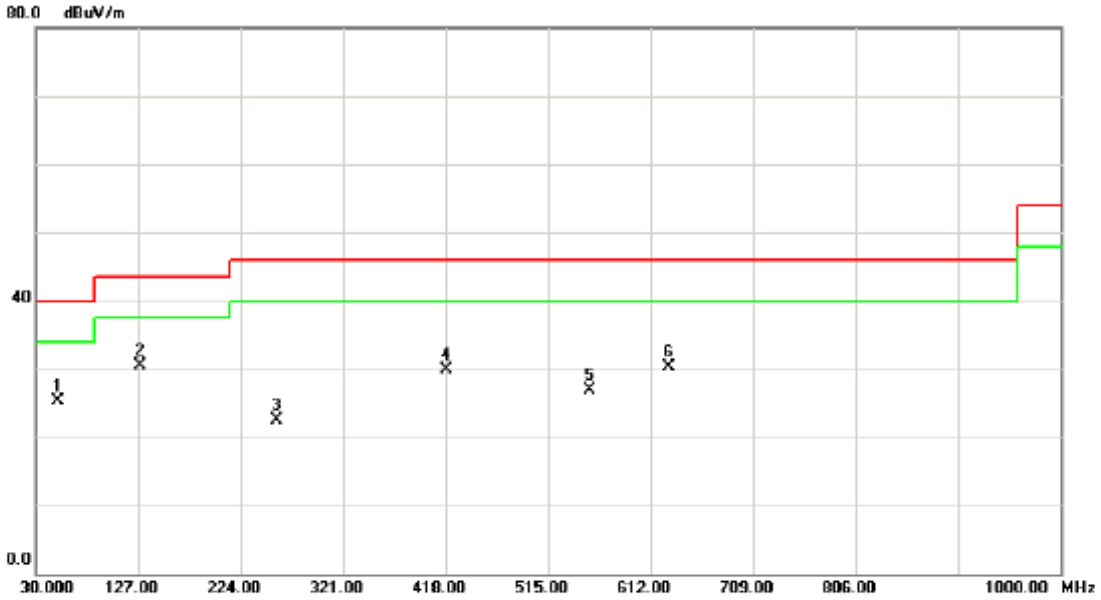
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	51.8250	44.89	-17.63	27.26	40.00	-12.74	peak	
2		129.4250	47.30	-18.37	28.93	43.50	-14.57	peak	
3		160.9500	40.27	-17.94	22.33	43.50	-21.17	peak	
4		257.9500	38.98	-14.51	24.47	46.00	-21.53	peak	
5		418.0000	38.34	-9.52	28.82	46.00	-17.18	peak	
6		628.9750	35.82	-5.01	30.81	46.00	-15.19	peak	

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Voltage ：	AC 120V/60Hz	Phase:	Horizontal
Test Mode ：	TX 2406MHz –CH01		



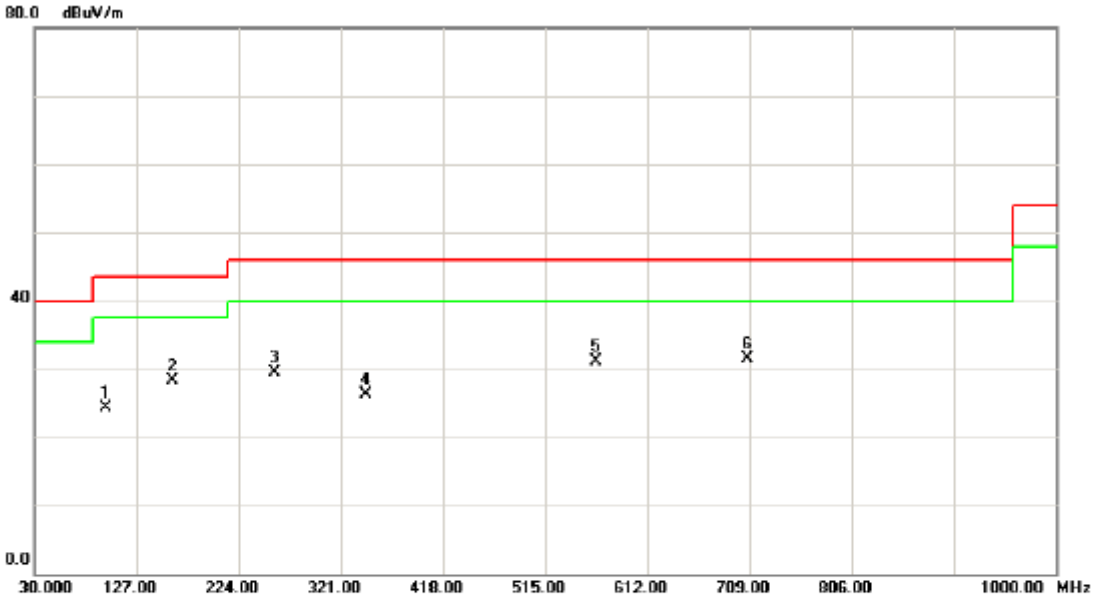
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		97.9000	46.43	-18.68	27.75	43.50	-15.75	peak	
2		160.9500	44.83	-17.94	26.89	43.50	-16.61	peak	
3		257.9500	43.11	-14.51	28.60	46.00	-17.40	peak	
4		345.2500	39.03	-11.64	27.39	46.00	-18.61	peak	
5		563.5000	37.87	-6.30	31.57	46.00	-14.43	peak	
6	*	706.5750	36.51	-4.60	31.91	46.00	-14.09	peak	

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Voltage ：	AC 120V/60Hz	Phase:	Vertical
Test Mode ：	TX 2442MHz –CH10		



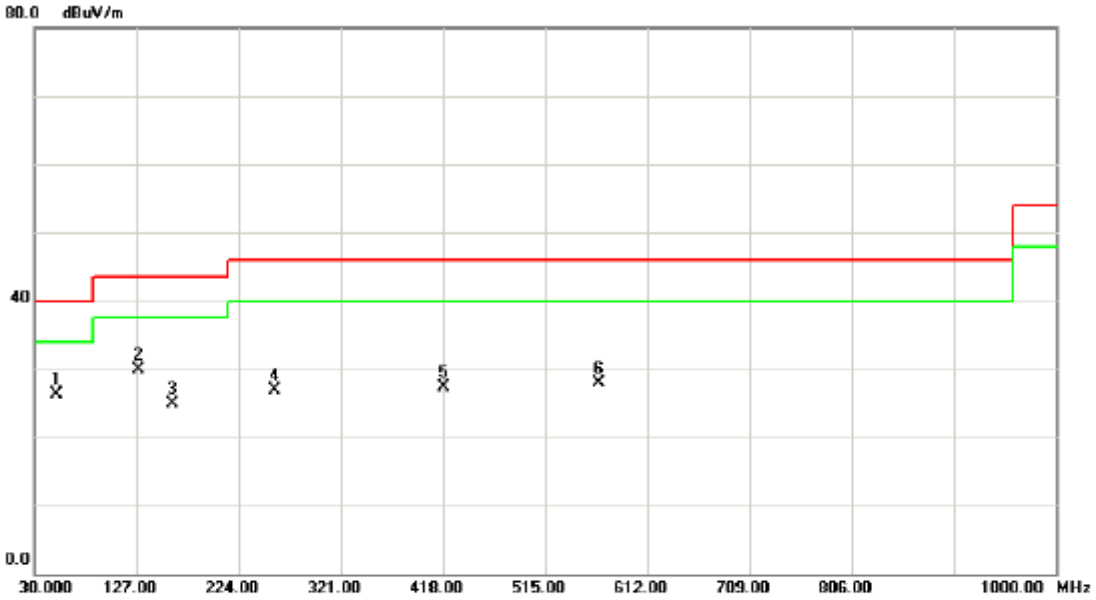
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		51.8250	42.89	-17.63	25.26	40.00	-14.74	peak	
2	*	129.4250	48.80	-18.37	30.43	43.50	-13.07	peak	
3		257.9500	36.98	-14.51	22.47	46.00	-23.53	peak	
4		418.0000	39.34	-9.52	29.82	46.00	-16.18	peak	
5		553.8000	33.36	-6.50	26.86	46.00	-19.14	peak	
6		628.9750	35.32	-5.01	30.31	46.00	-15.69	peak	

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Voltage ：	AC 120V/60Hz	Phase:	Horizontal
Test Mode ：	TX 2442MHz –CH10		



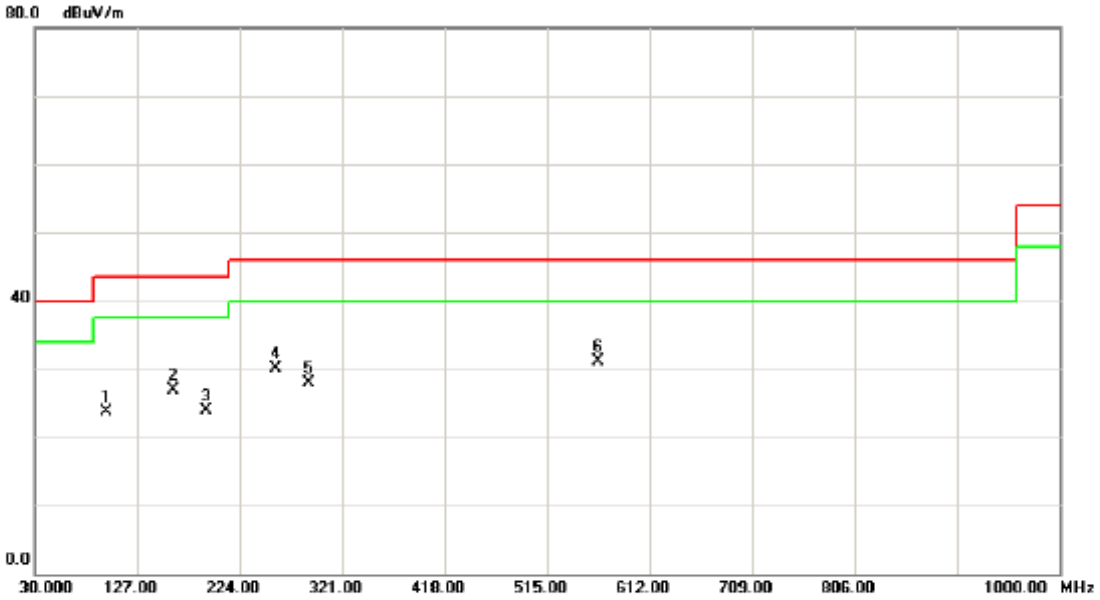
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		97.9000	42.93	-18.68	24.25	43.50	-19.25	peak	
2		160.9500	46.33	-17.94	28.39	43.50	-15.11	peak	
3		257.9500	44.11	-14.51	29.60	46.00	-16.40	peak	
4		345.2500	38.03	-11.64	26.39	46.00	-19.61	peak	
5		563.5000	37.37	-6.30	31.07	46.00	-14.93	peak	
6	*	706.5750	36.01	-4.60	31.41	46.00	-14.59	peak	

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Voltage ：	AC 120V/60Hz	Phase:	Vertical
Test Mode ：	TX 2474MHz –CH18		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		51.8250	43.89	-17.63	26.26	40.00	-13.74	peak	
2	*	129.4250	48.30	-18.37	29.93	43.50	-13.57	peak	
3		160.9500	42.77	-17.94	24.83	43.50	-18.67	peak	
4		257.9500	41.48	-14.51	26.97	46.00	-19.03	peak	
5		418.0000	36.84	-9.52	27.32	46.00	-18.68	peak	
6		565.9250	34.14	-6.25	27.89	46.00	-18.11	peak	

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Test Voltage ：	AC 120V/60Hz	Phase:	Horizontal
Test Mode ：	TX 2474MHz –CH18		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		97.9000	42.43	-18.68	23.75	43.50	-19.75	peak	
2		160.9500	44.83	-17.94	26.89	43.50	-16.61	peak	
3		192.4750	40.99	-17.06	23.93	43.50	-19.57	peak	
4		257.9500	44.61	-14.51	30.10	46.00	-15.90	peak	
5		289.4750	40.59	-12.63	27.96	46.00	-18.04	peak	
6	*	563.5000	37.37	-6.30	31.07	46.00	-14.93	peak	

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX 2406MHz – CH01		

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	22.11	11.00	32.28	54.39	43.28	74.00	54.00	X/E
2406.83	**V**	**67.11**	**63.36**	**32.26**	**99.37**	**95.62**			**X/F**
4812.13	V	50.36	37.42	6.14	56.50	43.56	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 .

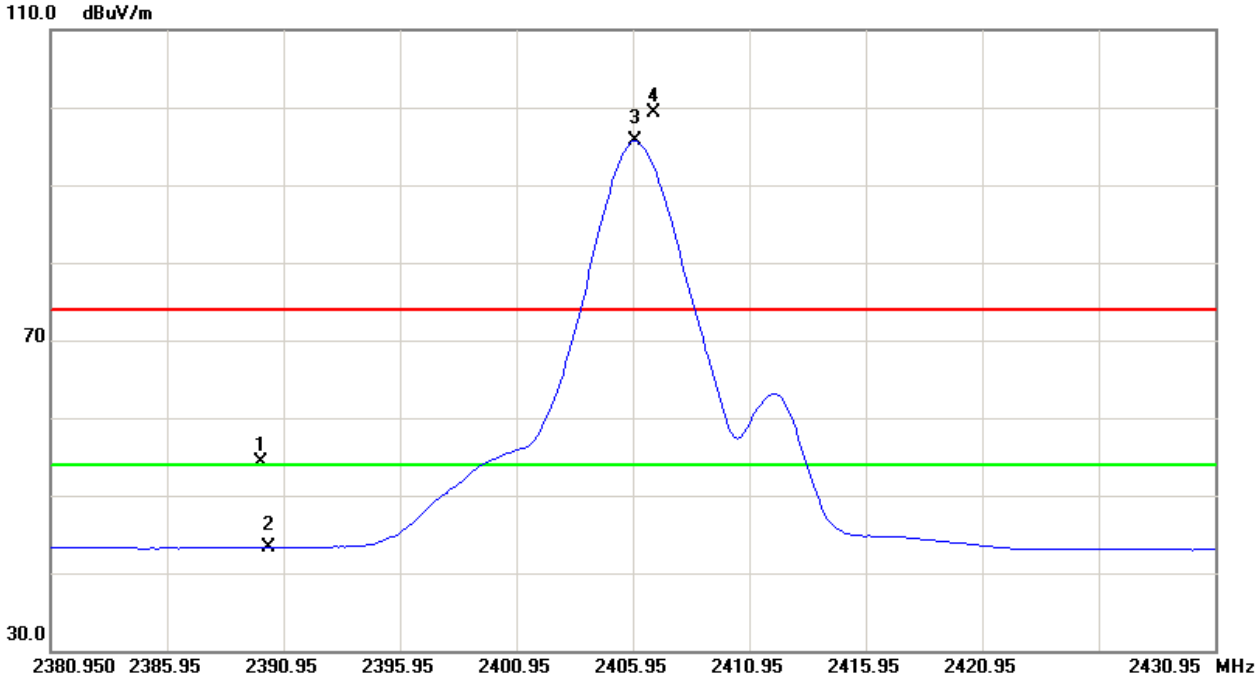
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

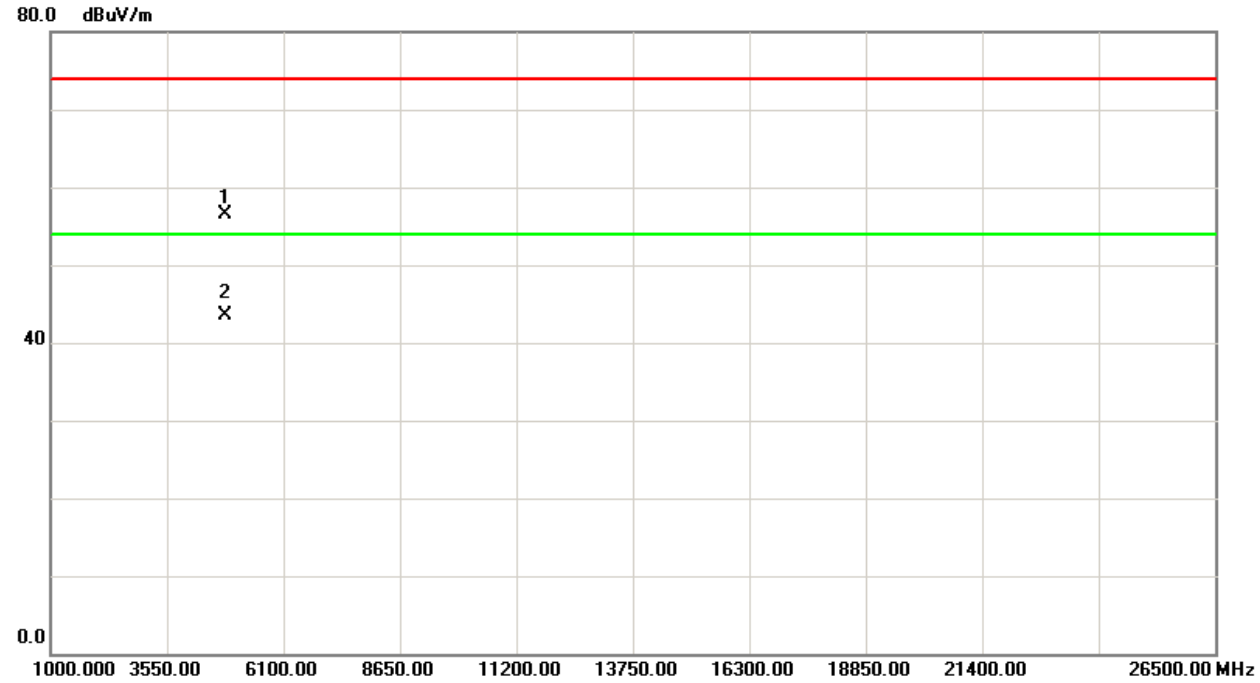
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(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

TX CH01(Above 1000 MHz, Vertical)





EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1010hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX 2406MHz – CH01		

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	23.50	11.13	32.28	55.78	43.41	74.00	54.00	X/E
2406.95	**H**	**68.24**	**64.50**	**32.26**	**100.50**	**96.76**			**X/F**
4812.05	H	52.23	40.15	6.14	58.37	46.29	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 .

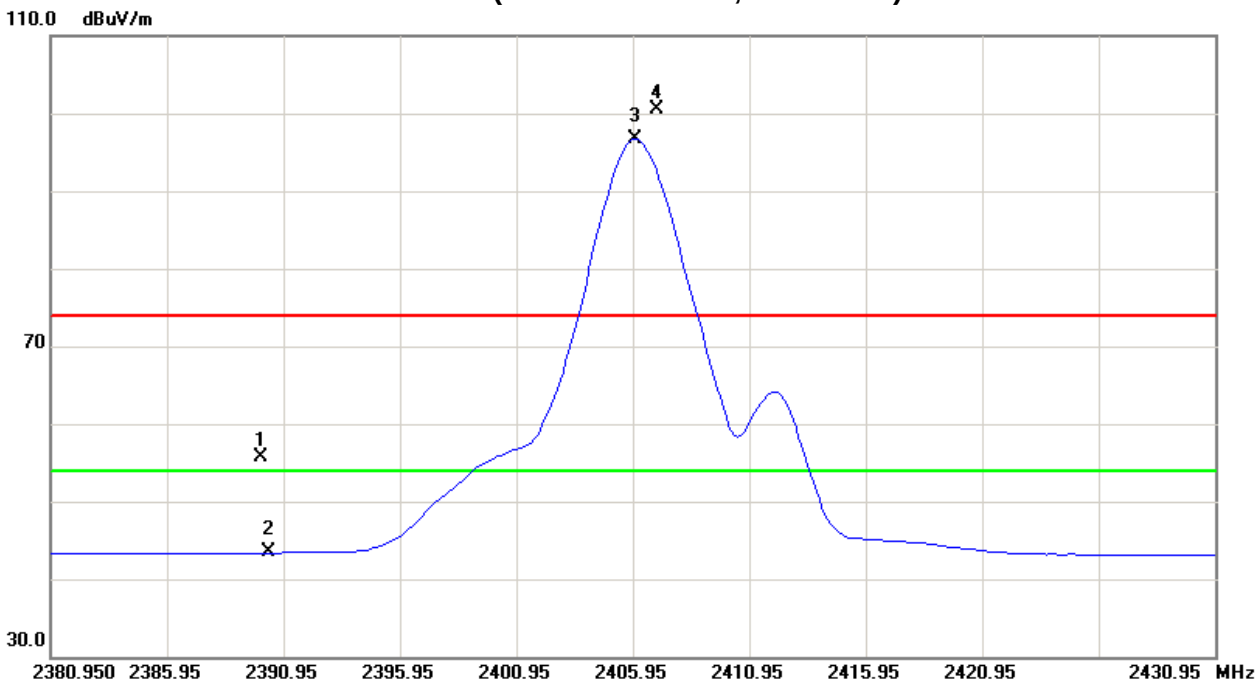
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

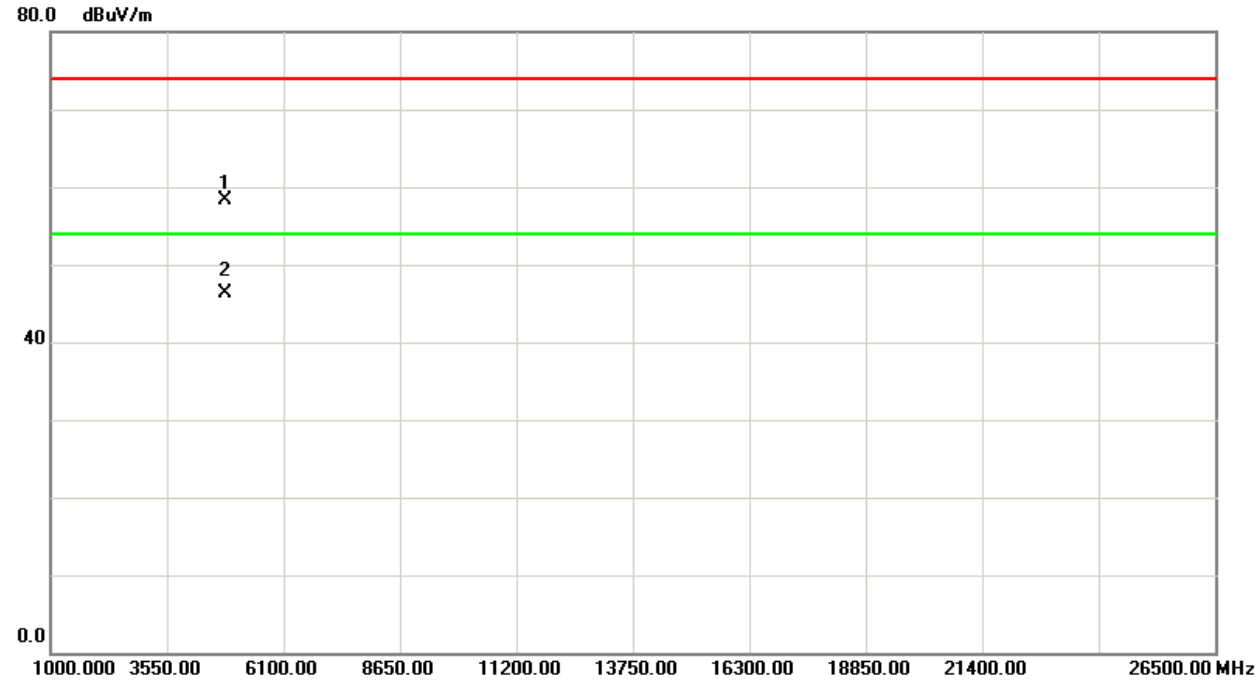
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(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

TX CH01(Above 1000 MHz, Horizontal)





EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX 2442MHz –CH10		

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)	
2440.88	**V**	**65.55**	**60.51**	**32.23**	**97.78**	**92.74**			**X/F**
4884.12	V	49.22	36.59	6.43	55.65	43.02	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 .

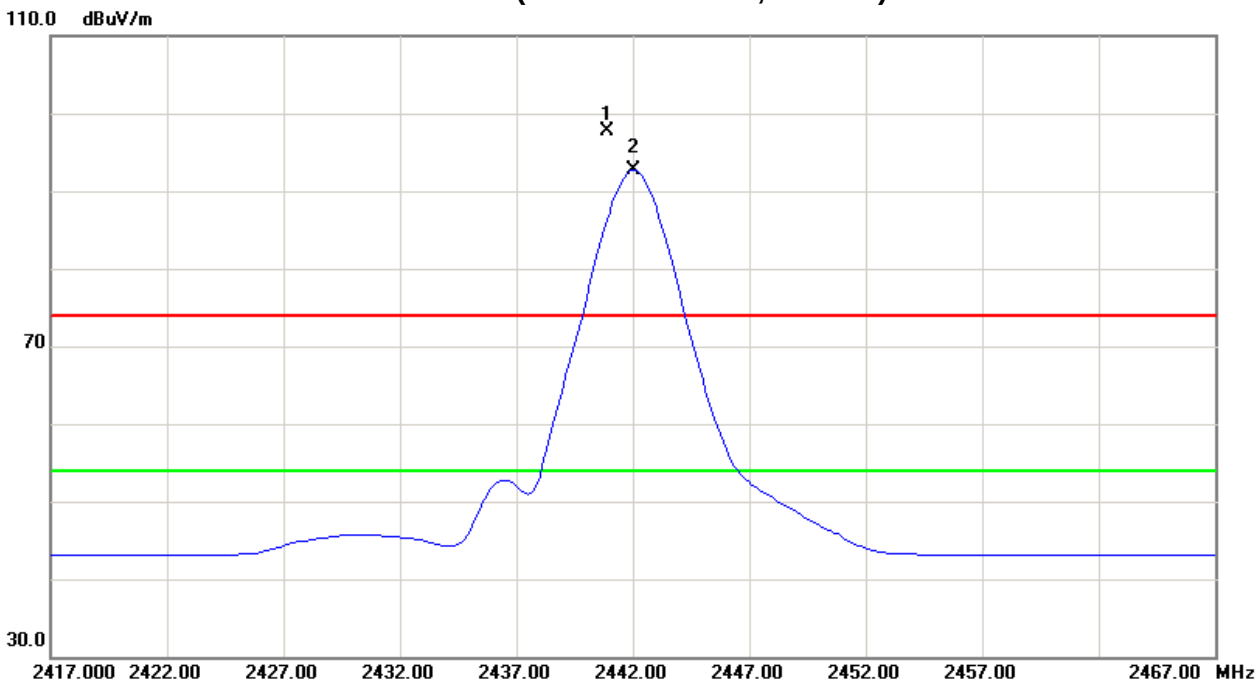
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

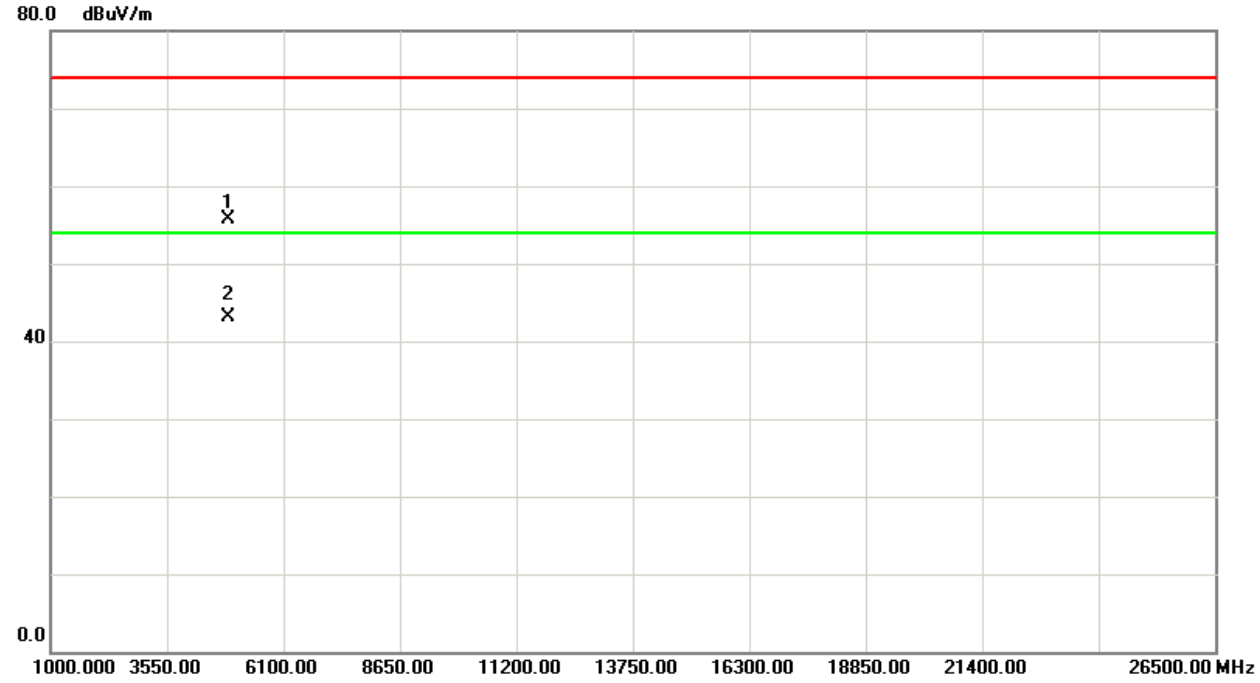
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(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

TX CH10 (Above 1000 MHz, Vertical)





EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX 2442MHz –CH10		

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)	
2441.00	**H**	**67.89**	**64.09**	**32.23**	**100.12**	**96.32**			**X/F**
4884.04	H	51.69	39.48	6.43	58.12	45.91	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.

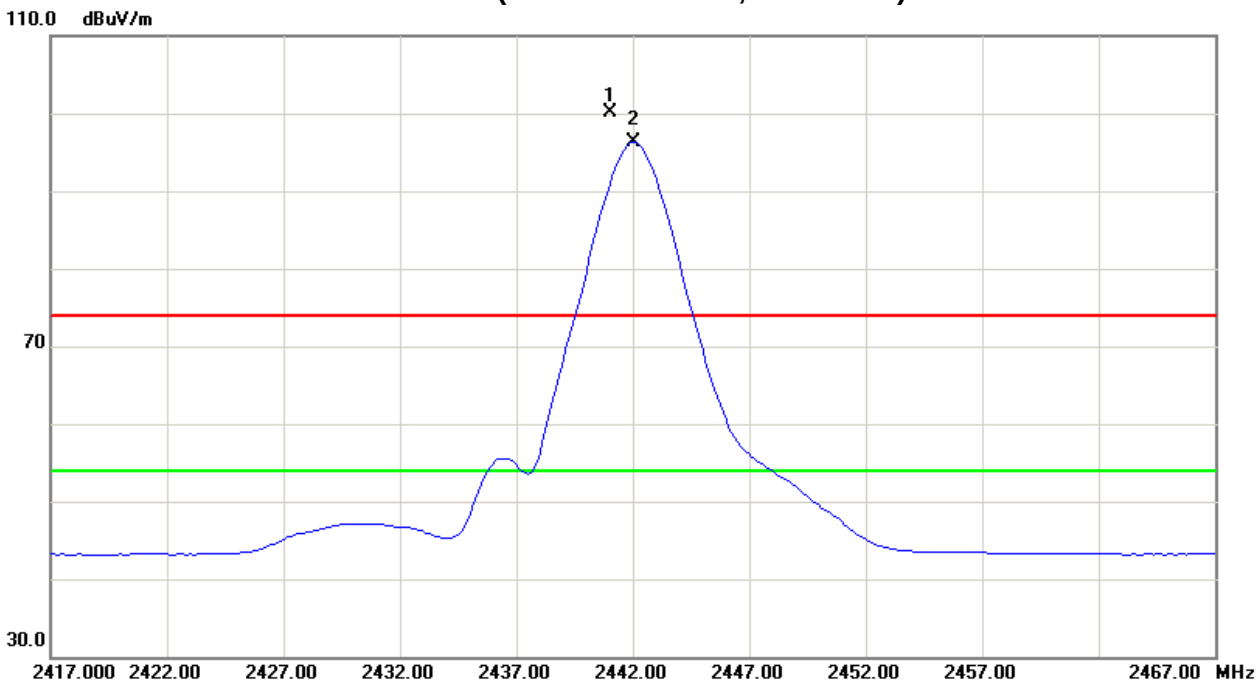
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

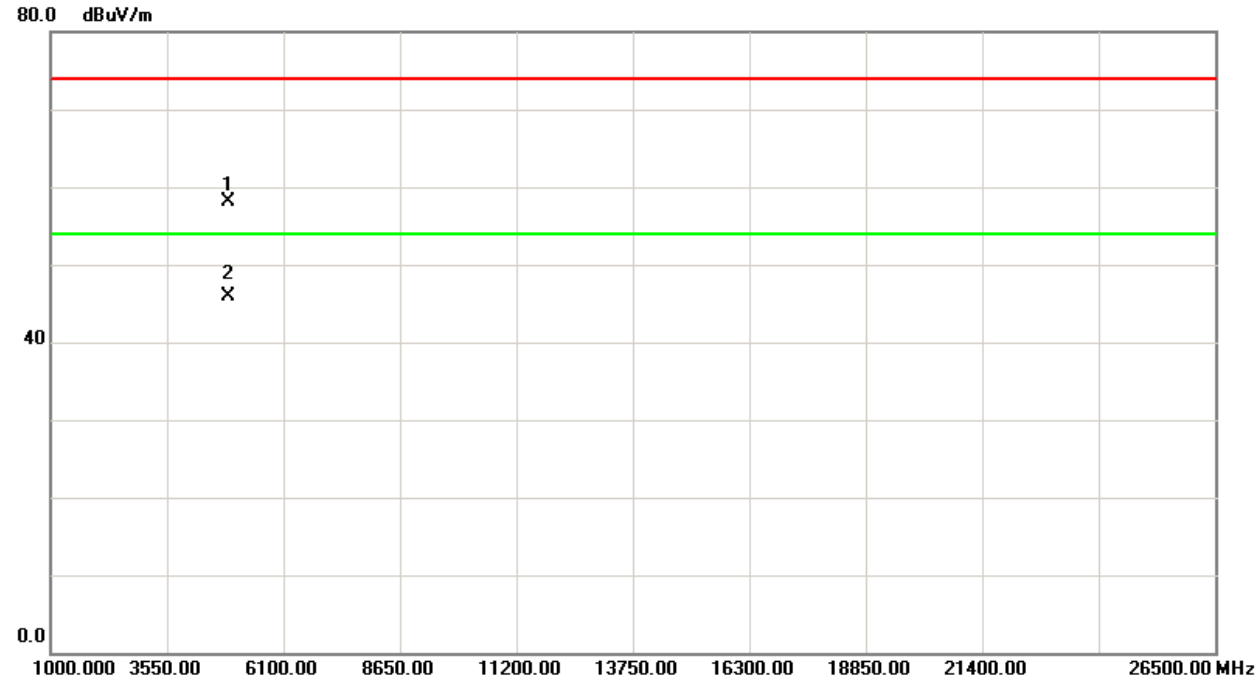
(6) EUT Orthogonal Axis：

"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

TX CH10 (Above 1000 MHz, Horizontal)





EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1010hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX 2474MHz –CH18		

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)	
2473.00	**V**	**64.66**	**59.86**	**32.19**	**96.85**	**92.05**			**X/F**
2483.50	V	23.69	11.65	32.17	55.86	43.82	74.00	54.00	X/E
4948.05	V	49.52	37.14	6.70	56.22	43.84	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 .

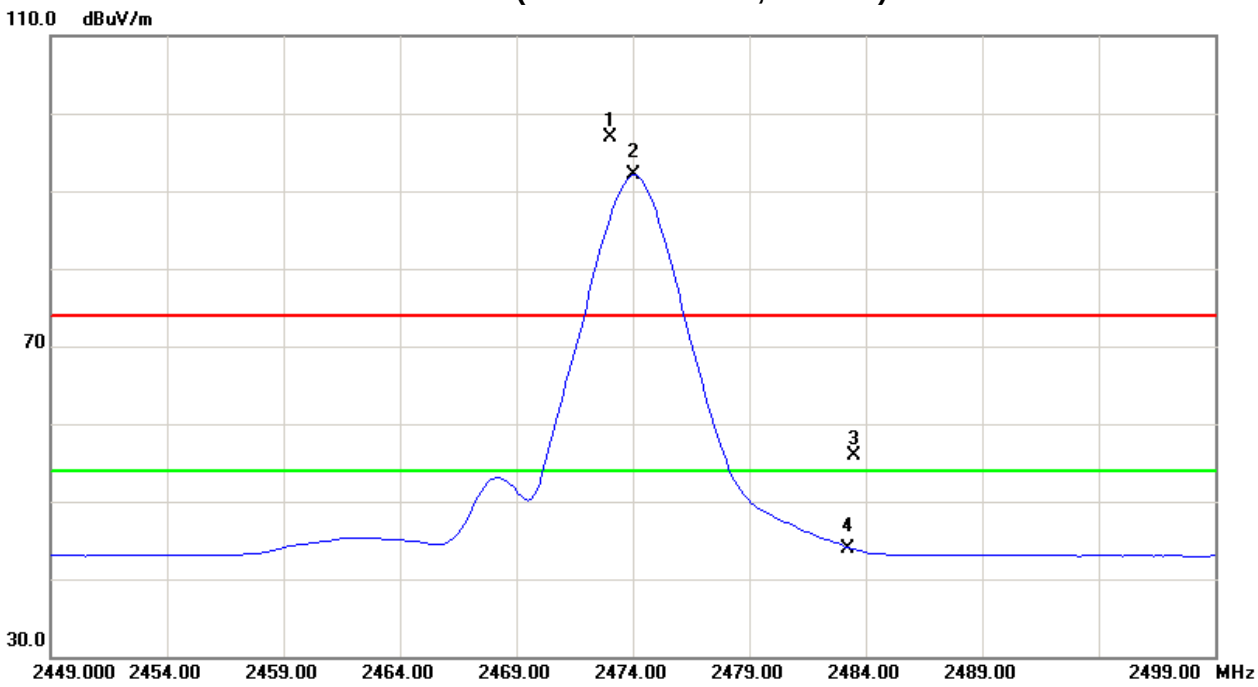
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

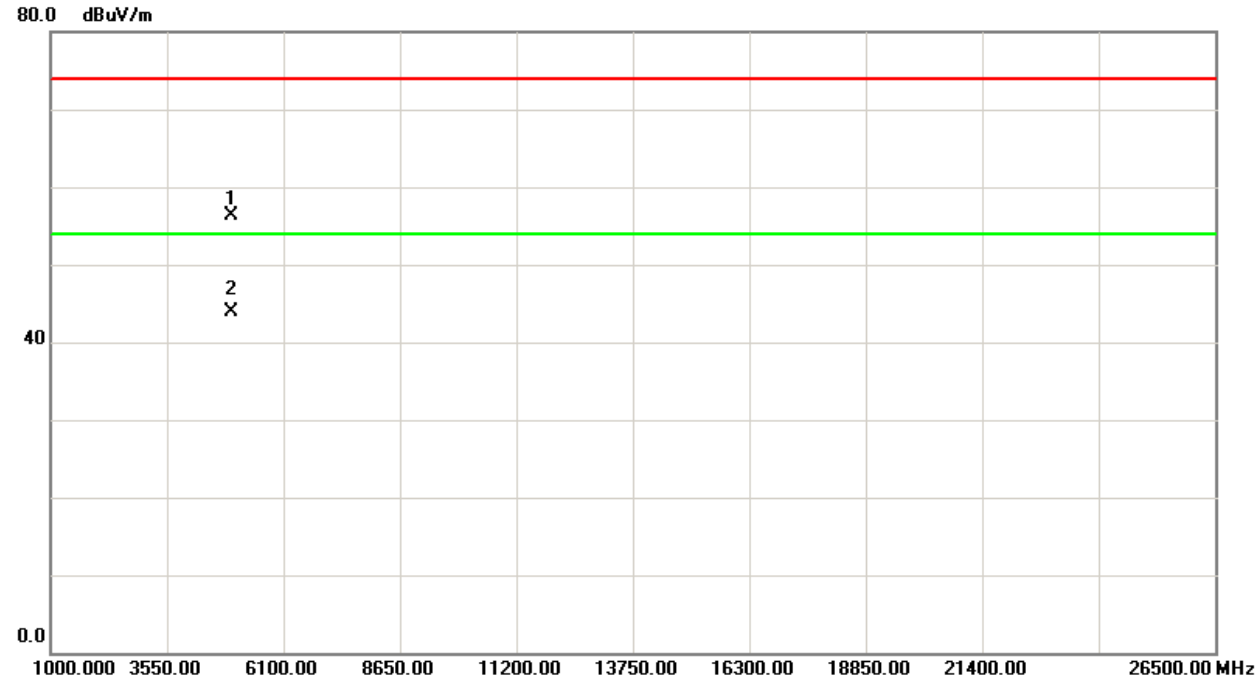
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(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

TX CH18 (Above 1000 MHz, Vertical)





EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX 2474MHz –CH18		

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)	
2472.88	**H**	**67.04**	**63.12**	**32.19**	**99.23**	**95.31**			**X/F**
2483.50	H	24.77	12.56	32.17	56.94	44.73	74.00	54.00	X/E
4948.12	H	52.06	38.94	6.70	58.76	45.64	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 .

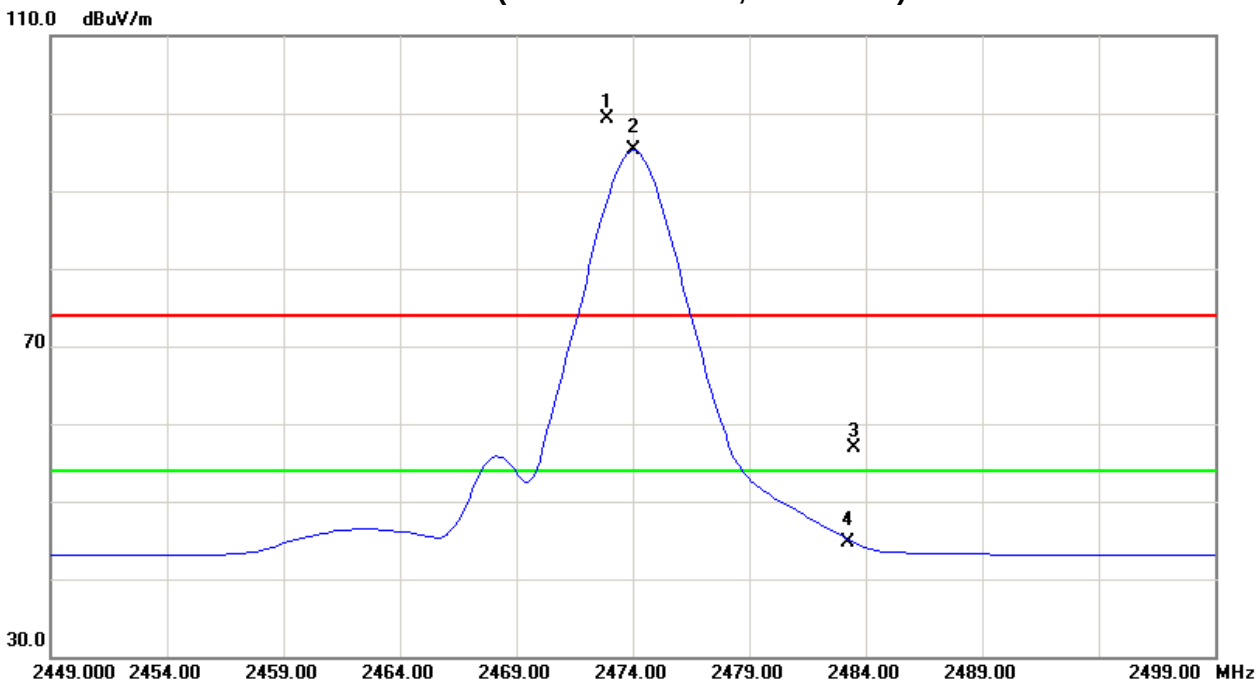
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

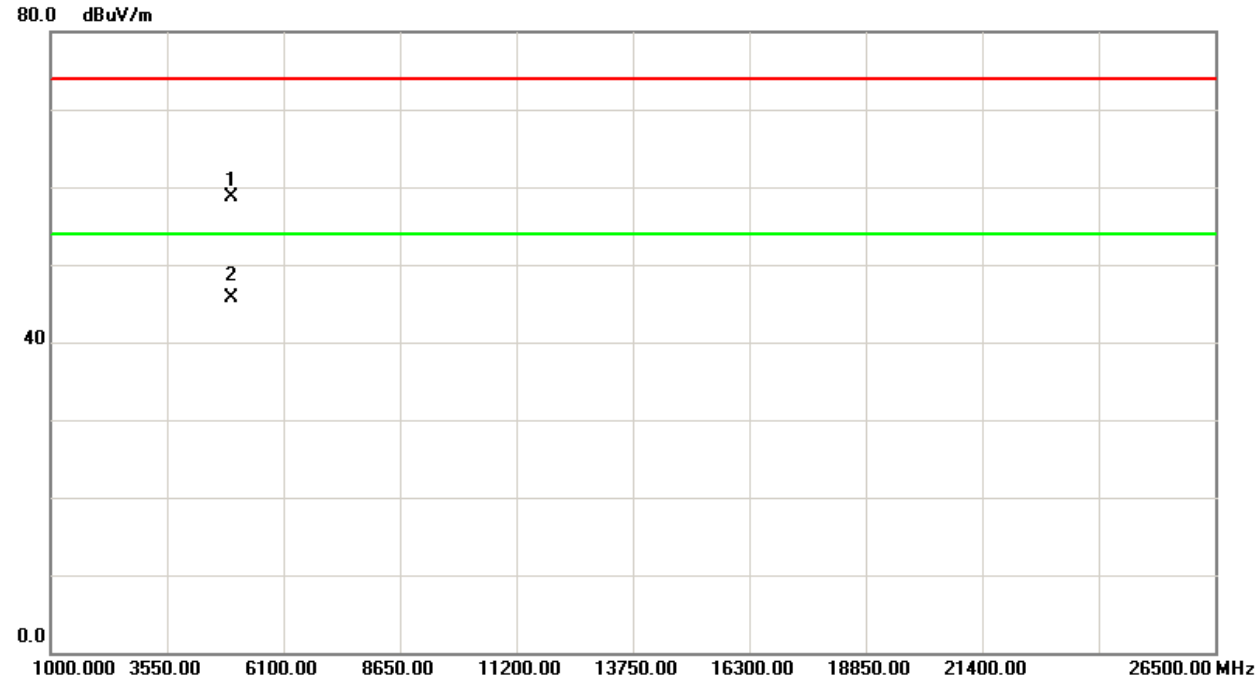
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(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

TX CH18 (Above 1000 MHz, Horizontal)





5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

5.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.16.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

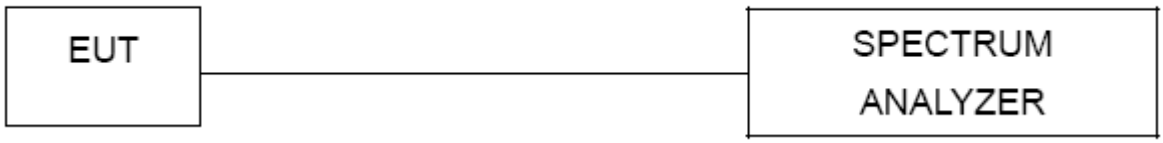
5.1.2 TEST PROCEDURE

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, Sweep time = Auto.

5.1.3 DEVIATION FROM STANDARD

No deviation.

5.1.4 TEST SETUP



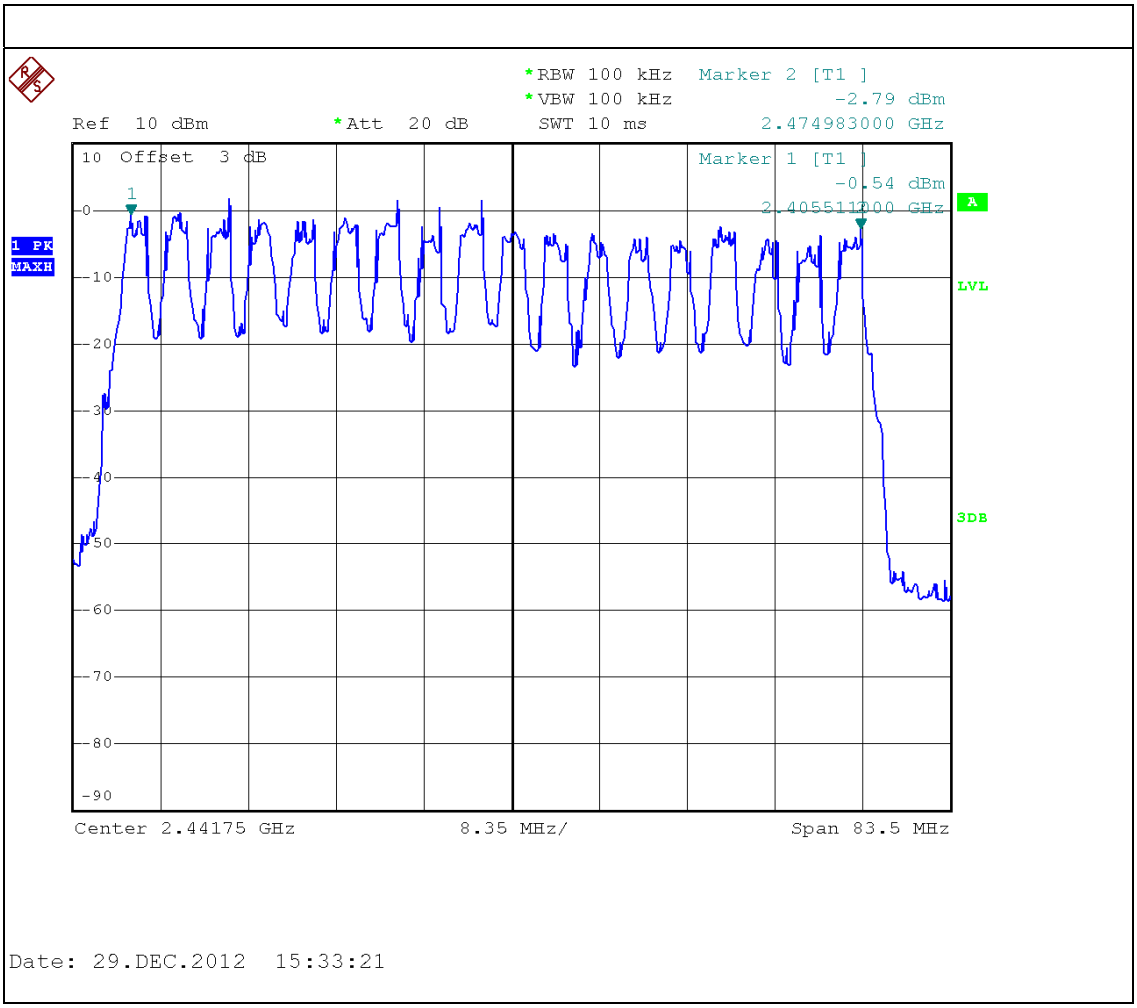
5.1.5 EUT OPERATION CONDITIONS

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.

5.1.6 TEST RESULTS

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Hopping Mode		

Number of Hopping Channel	18



6. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.16.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

6.1.2 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.

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

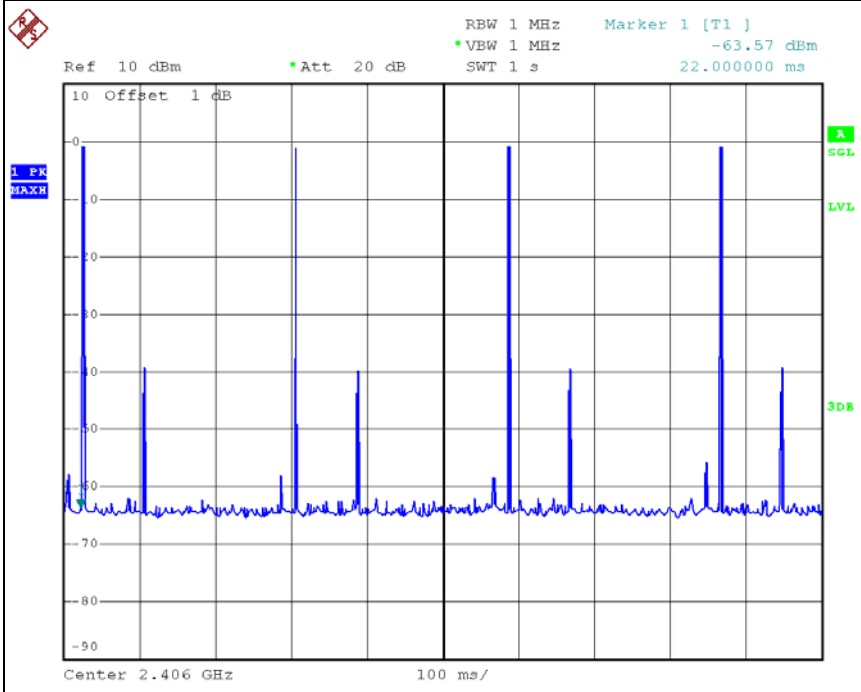
EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Hopping Mode		

Mode	Number of transmission in a 7.2(18Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
2406 MHz	(4/1) *7.2=28.8 times **Note1**	0.17	4.896	400

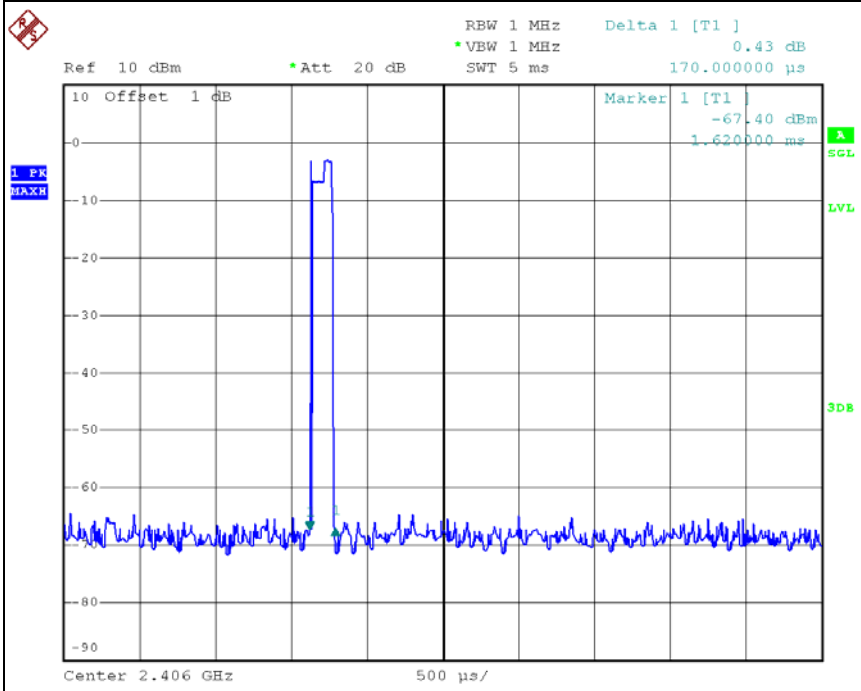
Note1: 4 times of occupied channels per 1 second

	Results
Measured cycle (sec)	18 CH*0.4=7.2
The total number of frequency-hopping per second	((4/1)*18)=72
The number of occupied channels per second	72/18=4(number/sec)
occupied time for each channel(1)	0.17ms
The total number of channels occupied within one cycle (2)	(4/1) *7.2=28.8 times
The average time of occupancy within one cycle(1)*(2)	4.896msec
LIMIT (msec)	400msec

Hopping Mode : 4(times/1sec)



Date: 29.DEC.2012 09:05:38



Date: 29.DEC.2012 09:10:51

7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

7.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.16.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

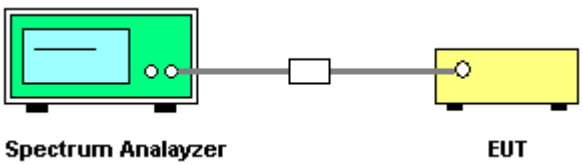
7.1.2 TEST PROCEDURE

a. The EUT must have its hopping function enabled
b. Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
Video (or Average) Bandwidth (VBW) ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

7.1.3 DEVIATION FROM STANDARD

No deviation.

7.1.4 TEST SETUP



7.1.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in hopping mode.

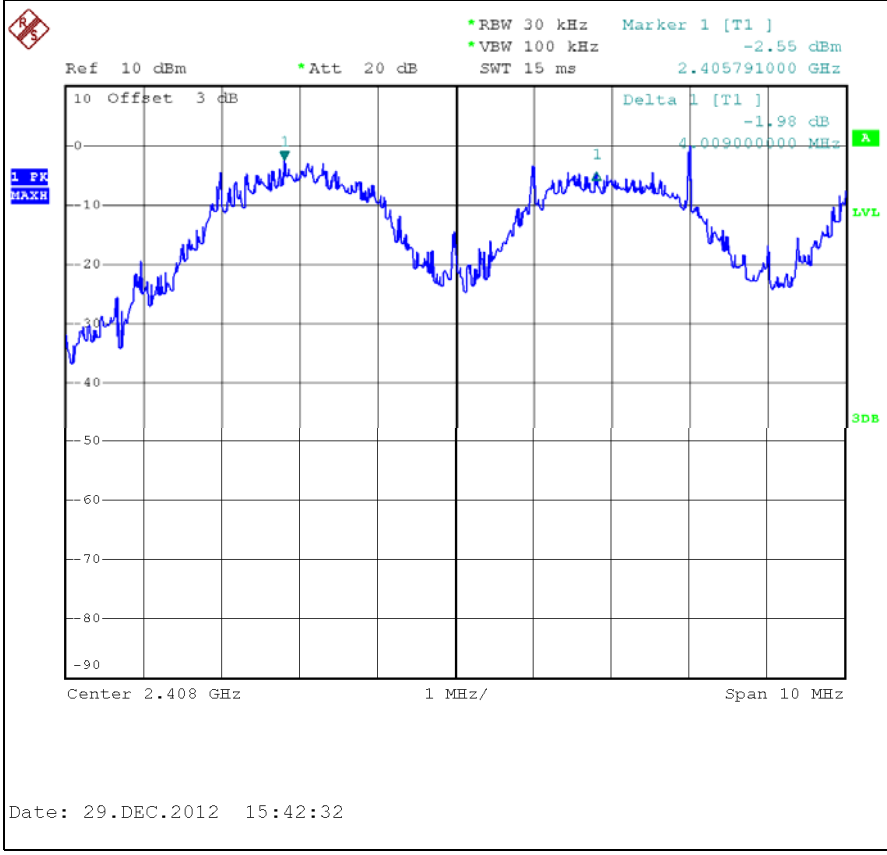
7.1.6 TEST RESULTS

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	CH01 / CH10 / CH18		

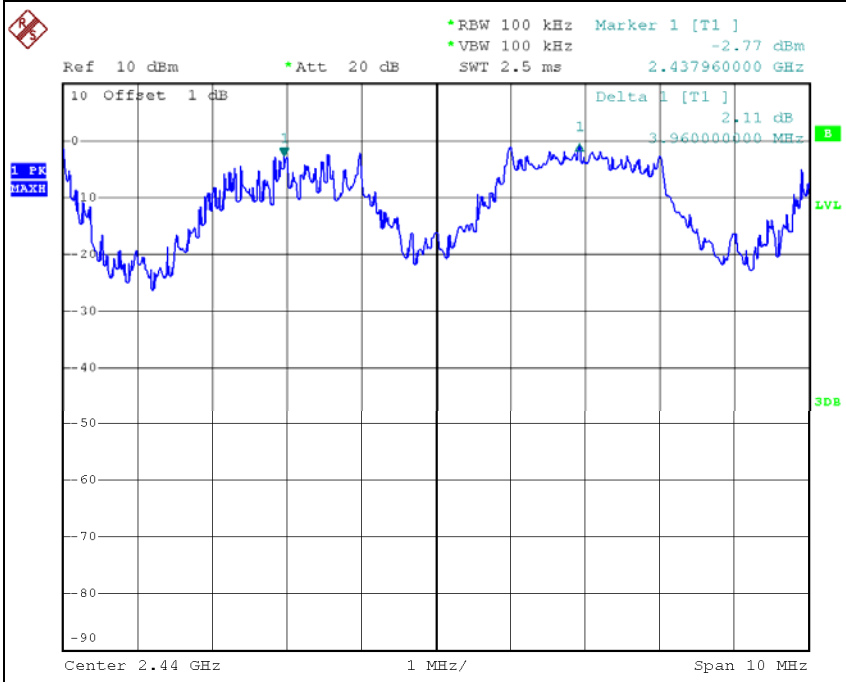
Frequency	Ch. Separation (MHz)	20dB Bandwidth (MHz)	Result
2406 MHz	4.009	4.460	**Complies**
2442 MHz	3.960	3.920	**Complies**
2474 MHz	3.940	4.020	**Complies**

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth

CH01

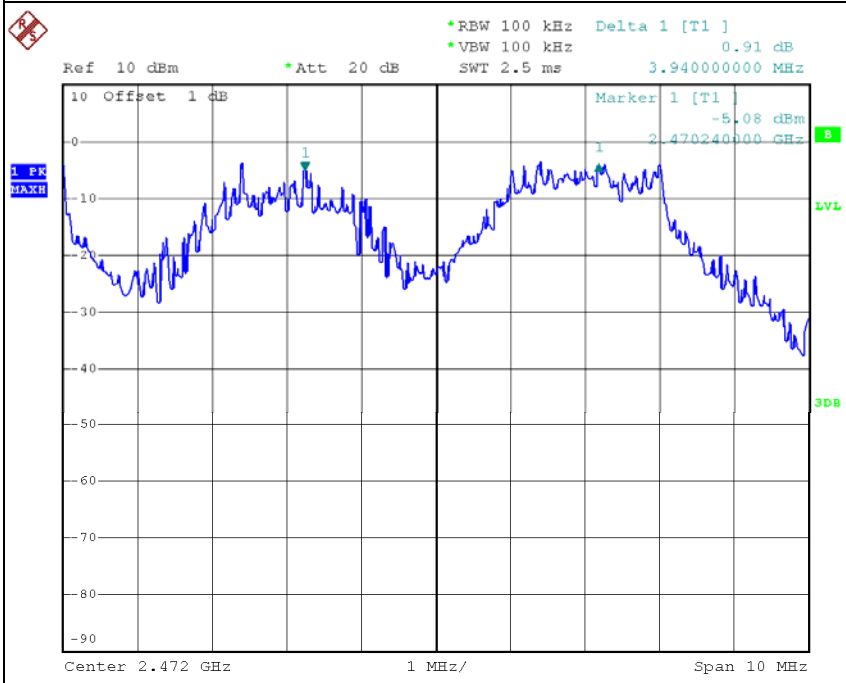


CH10



Date: 29.DEC.2012 15:44:55

CH18



Date: 29.DEC.2012 15:50:04

8. BANDWIDTH TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Frequency Range (MHz)
15.247 (a)(2)	Bandwidth	2400-2483.5

8.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.16.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

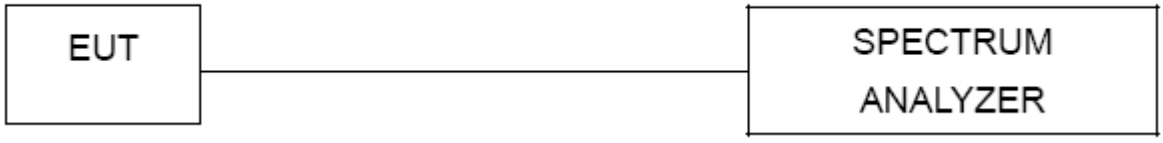
8.1.2 TEST PROCEDURE

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= 30KHz, VBW=100KHz, Sweep time = Auto.

8.1.3 DEVIATION FROM STANDARD

No deviation.

8.1.4 TEST SETUP



8.1.5 EUT OPERATION CONDITIONS

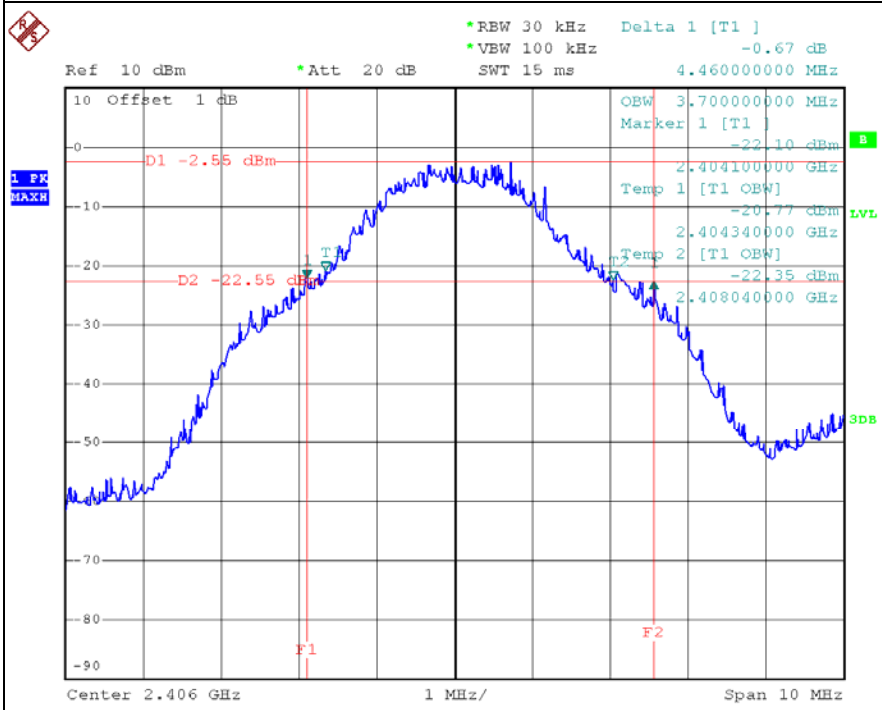
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.6 TEST RESULTS

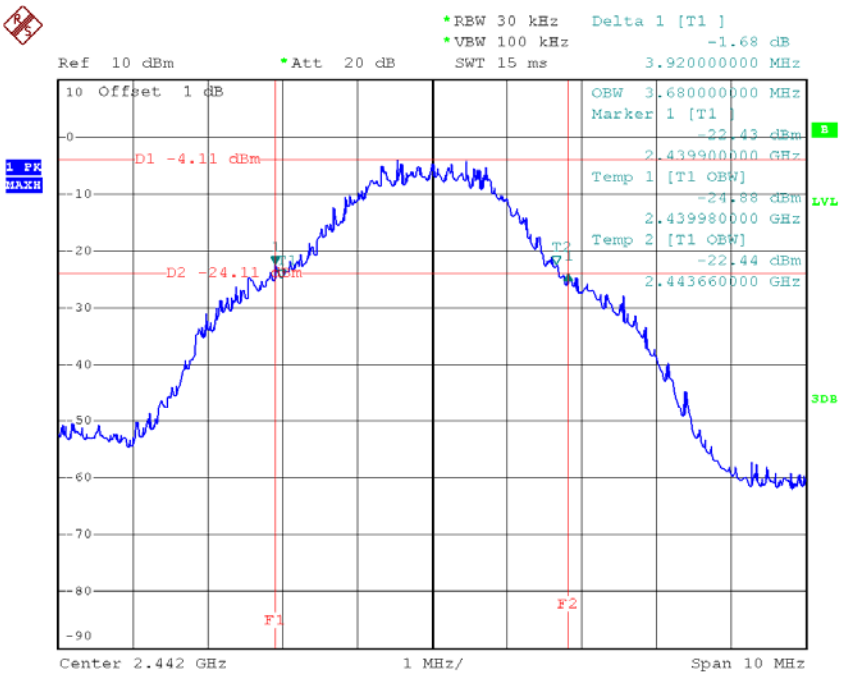
EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	CH01 / CH10 / CH18		

Frequency	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Result
2406 MHz	4.46	3.70	**PASS**
2442 MHz	3.92	3.68	**PASS**
2474 MHz	4.02	3.70	**PASS**

CH01

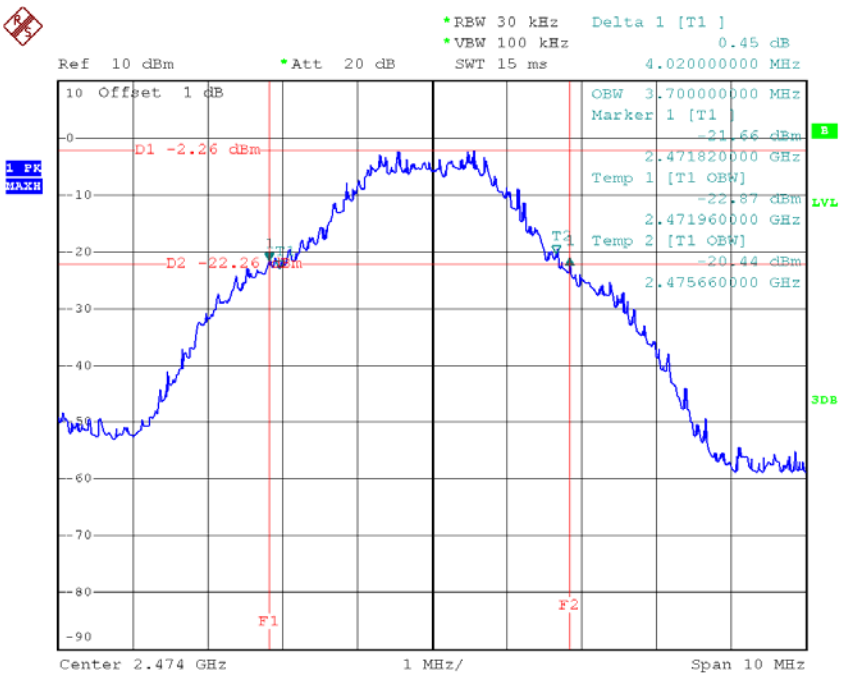


CH10



Date: 29.DEC.2012 14:55:21

CH18



Date: 29.DEC.2012 15:03:38

9. PEAK OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS

9.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.16.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

9.1.2 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= 10MHz, VBW= 10MHz, Sweep time = Auto.

9.1.3 DEVIATION FROM STANDARD

No deviation.

9.1.4 TEST SETUP

9.1.5 EUT OPERATION CONDITIONS

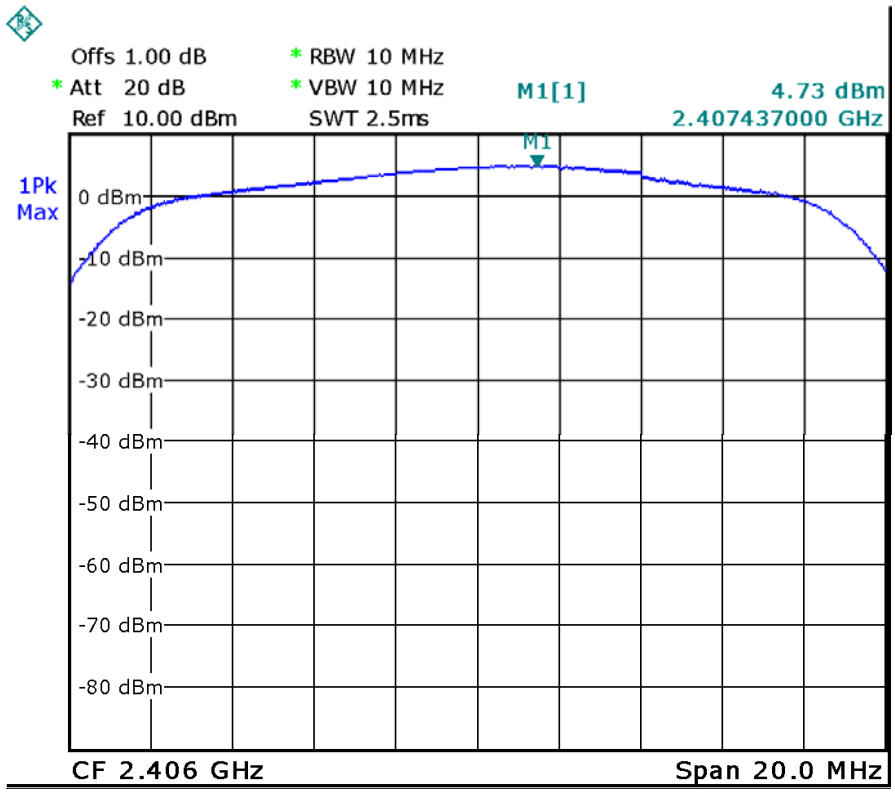
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

9.1.6 TEST RESULTS

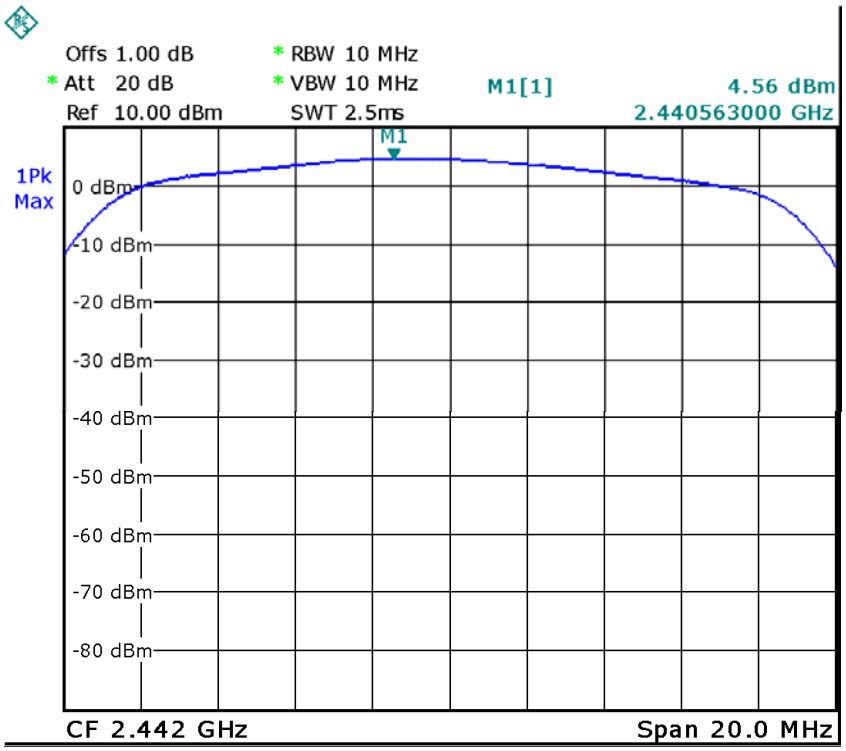
EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	CH01 / CH10 / CH18		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2406	4.73	21	0.125
CH10	2442	4.56	21	0.125
CH18	2474	4.87	21	0.125

CH01

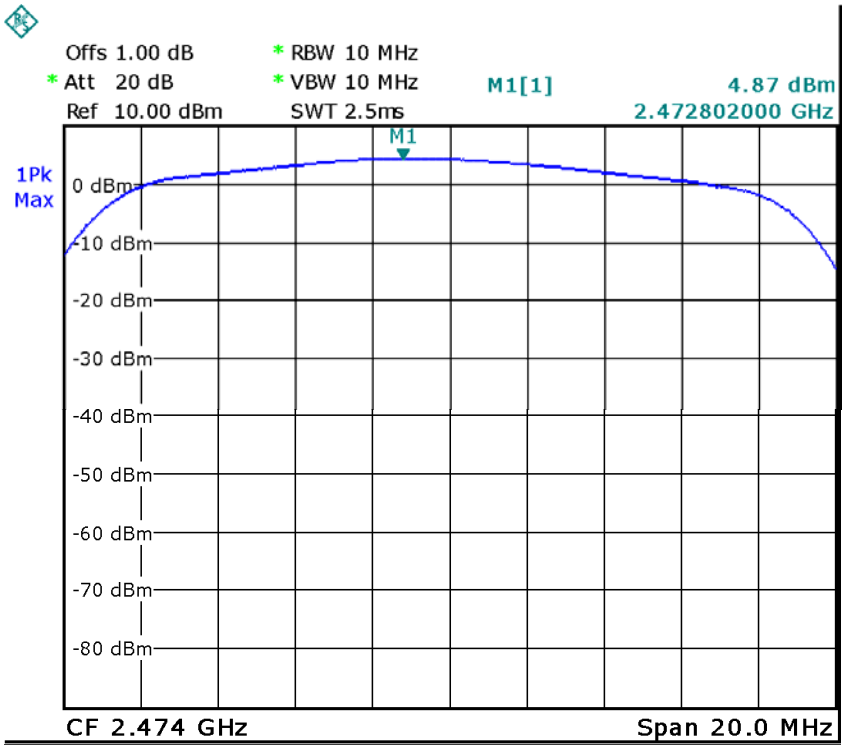


CH10



Date: 15.JAN.2013 08:36:14

CH18



Date: 15.JAN.2013 08:36:46

10. ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 APPLIED PROCEDURES / LIMIT

20dBc 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

10.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.16.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

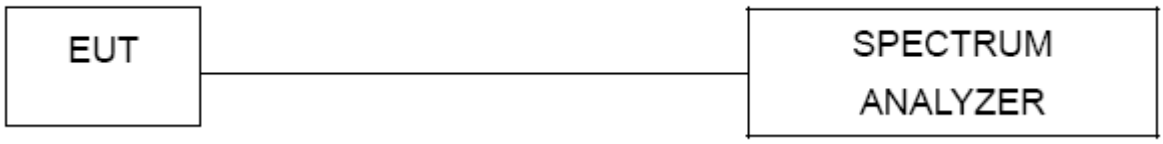
10.1.2 TEST PROCEDURE

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, Sweep time = Auto.

10.1.3 DEVIATION FROM STANDARD

No deviation.

10.1.4 TEST SETUP



10.1.5 EUT OPERATION CONDITIONS

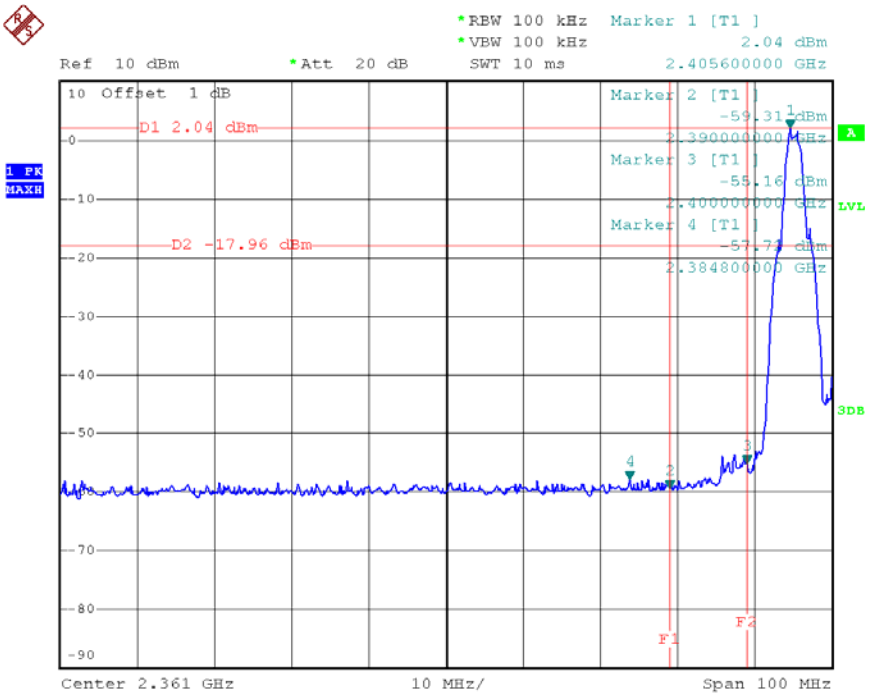
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

10.1.6 TEST RESULTS

EUT：	Wireless Audio Sender	Model Name ：	W3 V03
Temperature：	25 ℃	Relative Humidity：	58 %
Pressure：	1009 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	CH01 / CH10/ CH18-5Mbps & Hopping on mode (5Mbps)		

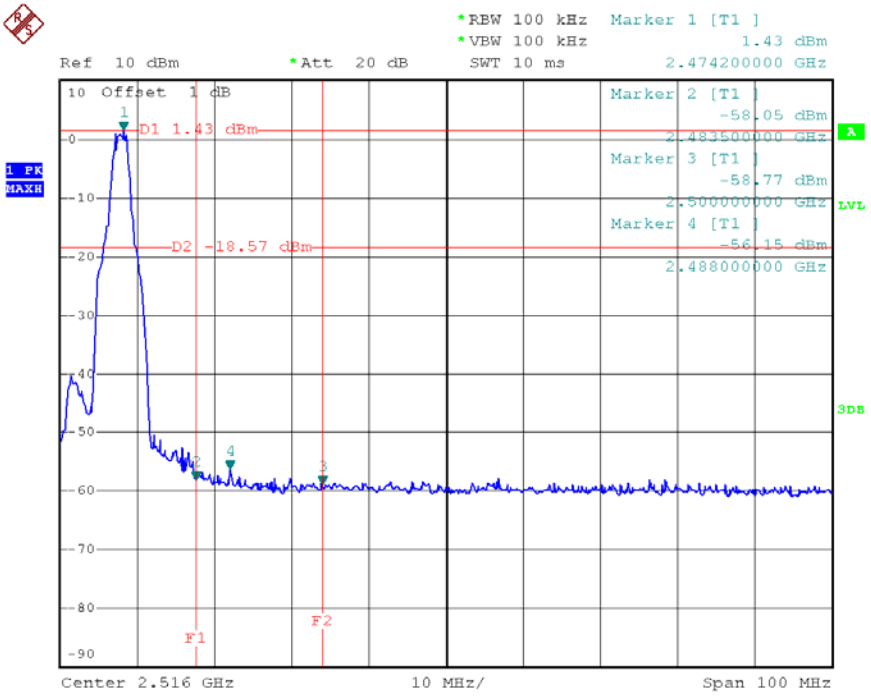
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-55.16	2488.00	-56.15
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

CH01 (Lower)



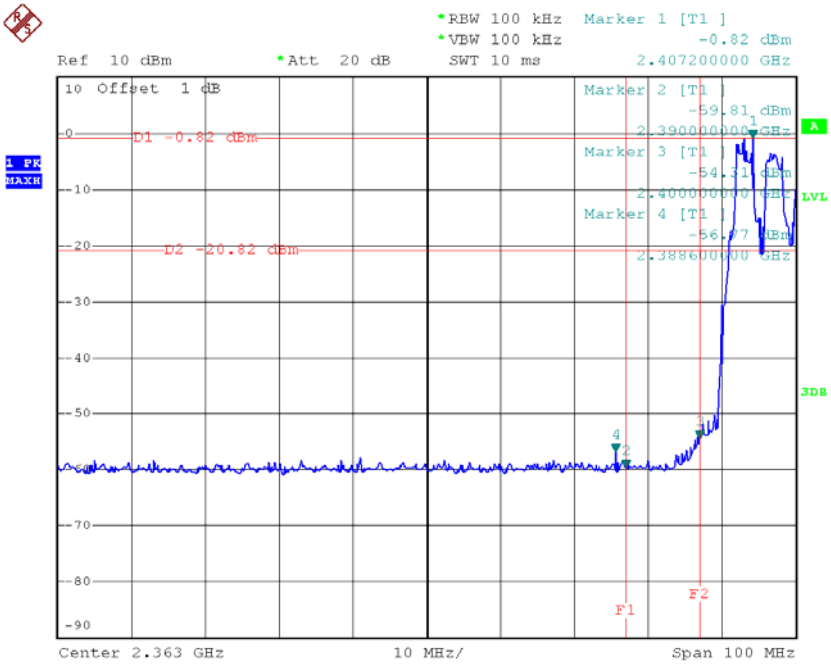
Date: 29.DEC.2012 14:52:36

CH18 (upper)



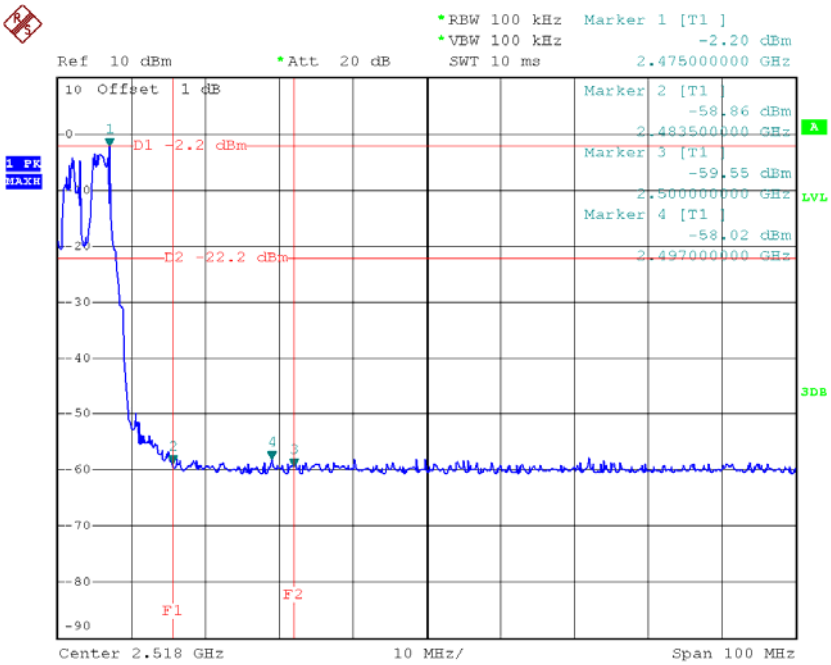
Date: 29.DEC.2012 15:00:31

Hopping on mode (Lower)



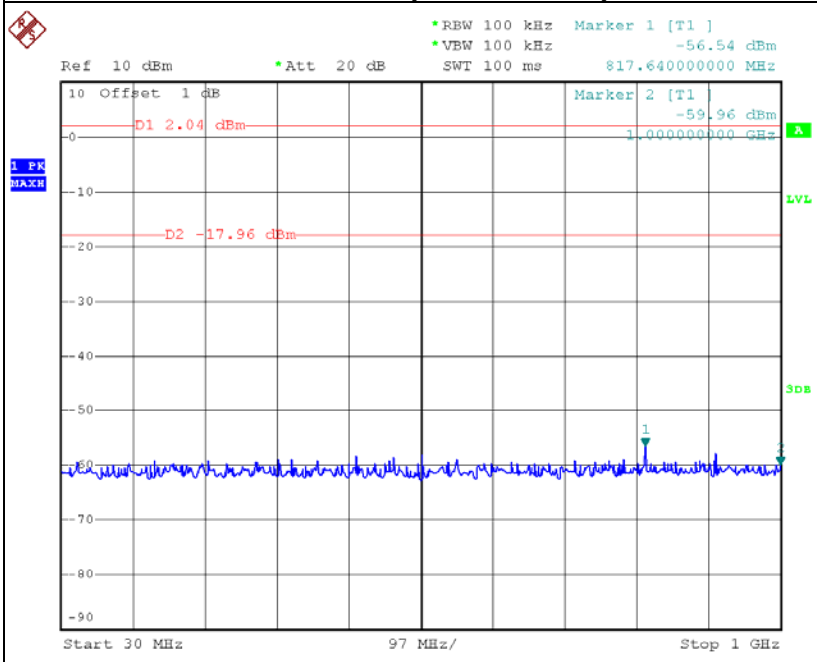
Date: 29.DEC.2012 16:15:58

Hopping on mode (upper)



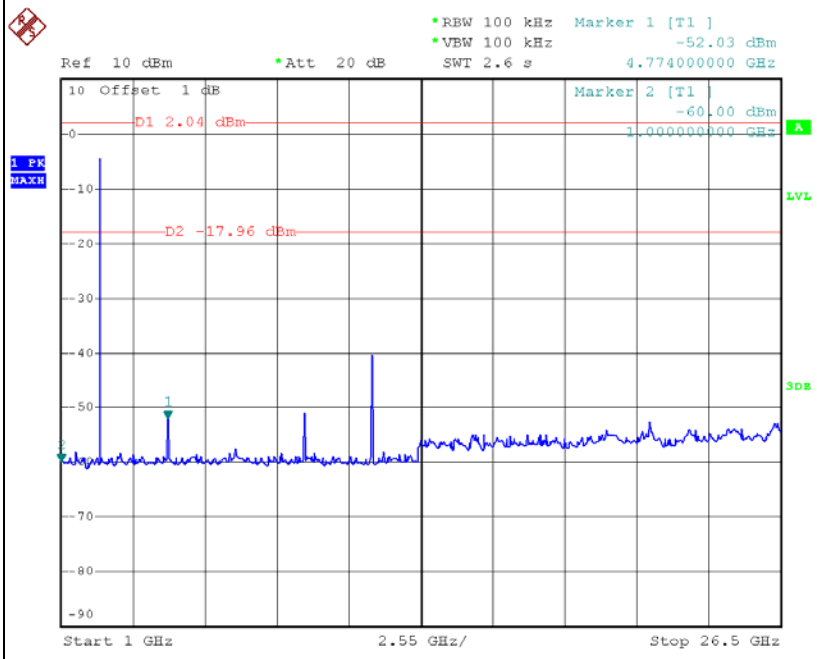
Date: 29.DEC.2012 16:12:34

CH01 (30MHz~1GHz)



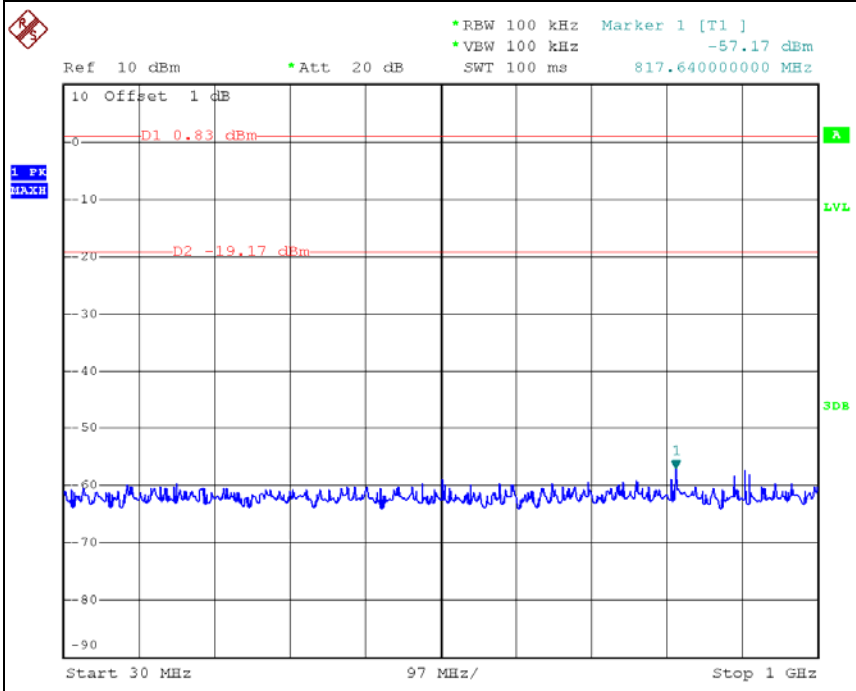
Date: 29.DEC.2012 14:52:51

CH01(1GHz～10th Harmonic)



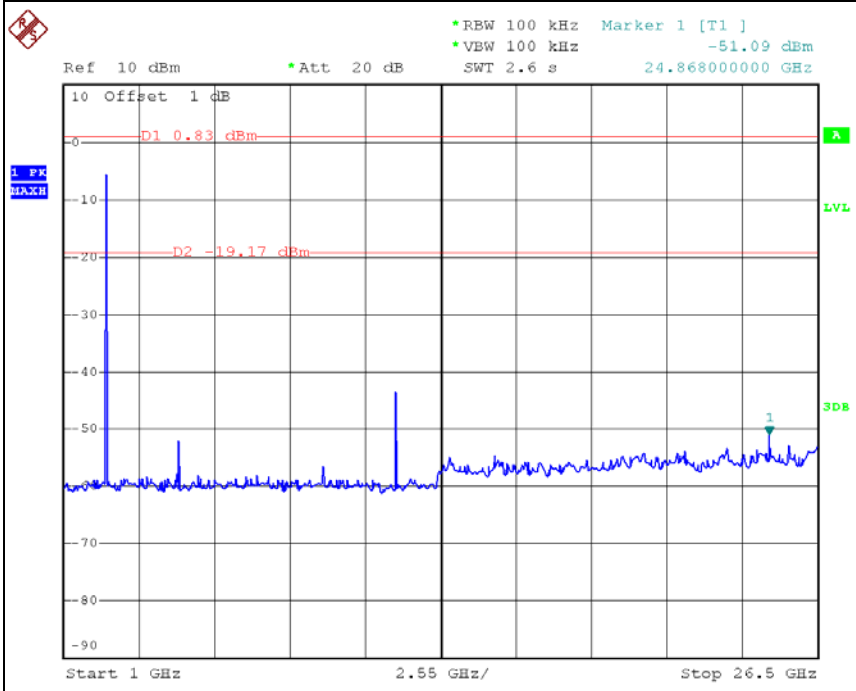
Date: 29.DEC.2012 14:53:33

CH10 (30MHz~1GHz)



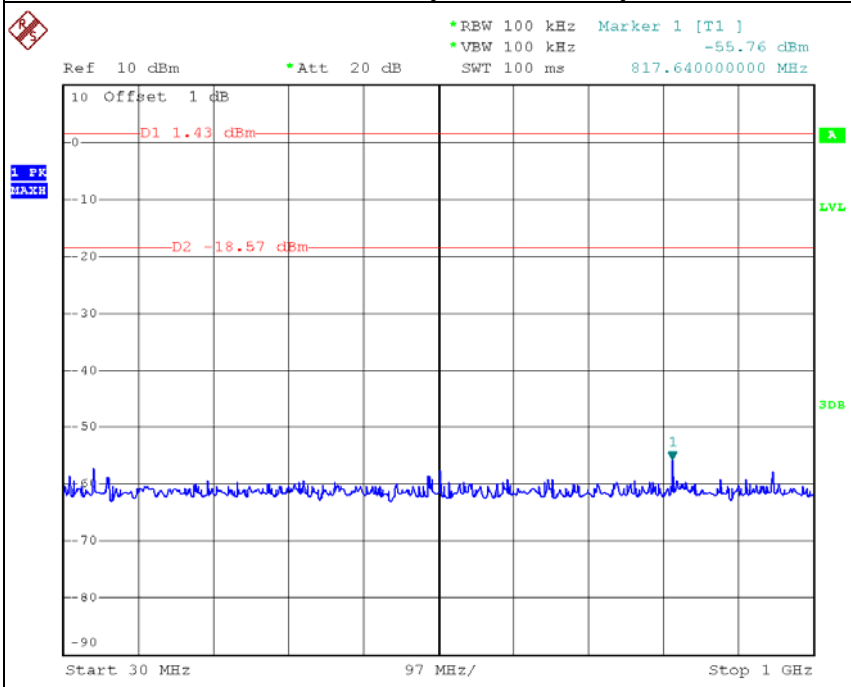
Date: 29.DEC.2012 14:56:48

CH10(1GHz～10th Harmonic)



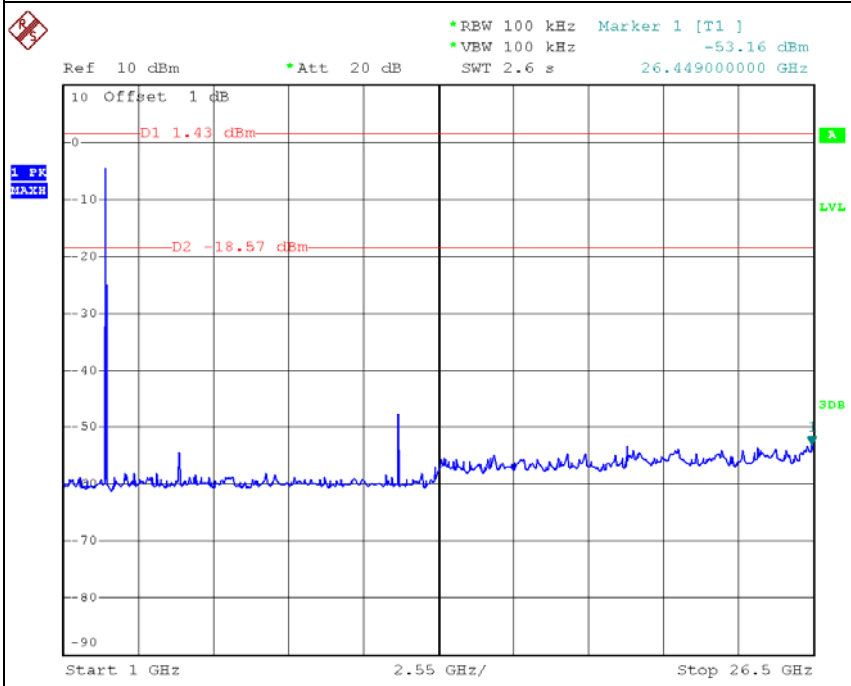
Date: 29.DEC.2012 14:59:08

CH18 (30MHz~1GHz)



Date: 29.DEC.2012 15:00:50

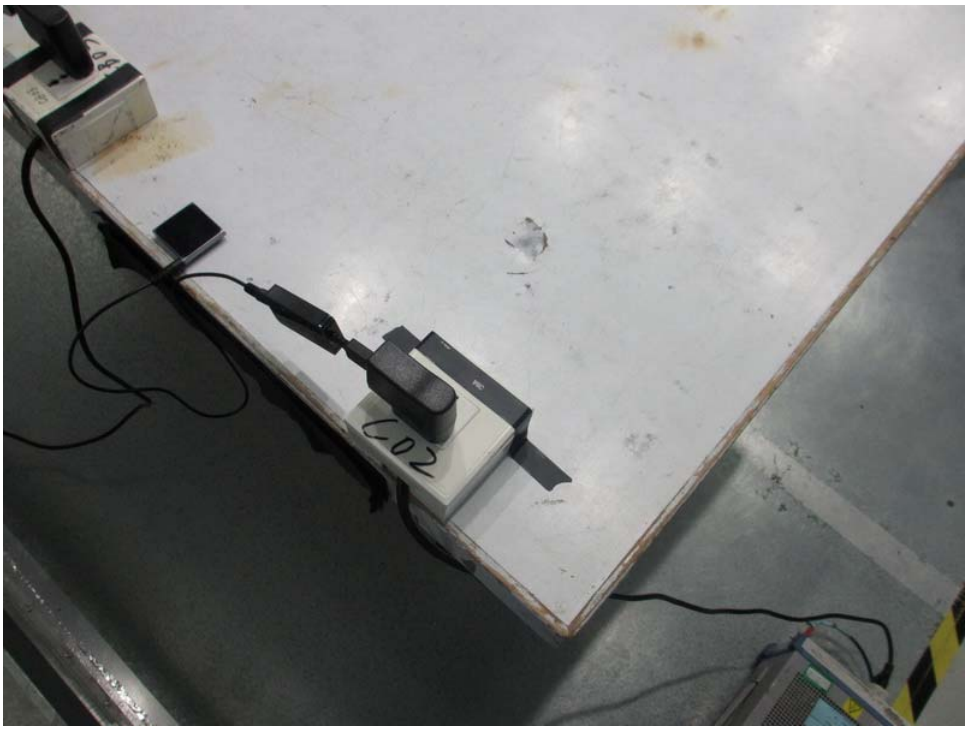
CH18(1GHz～10th Harmonic)



Date: 29.DEC.2012 15:01:14

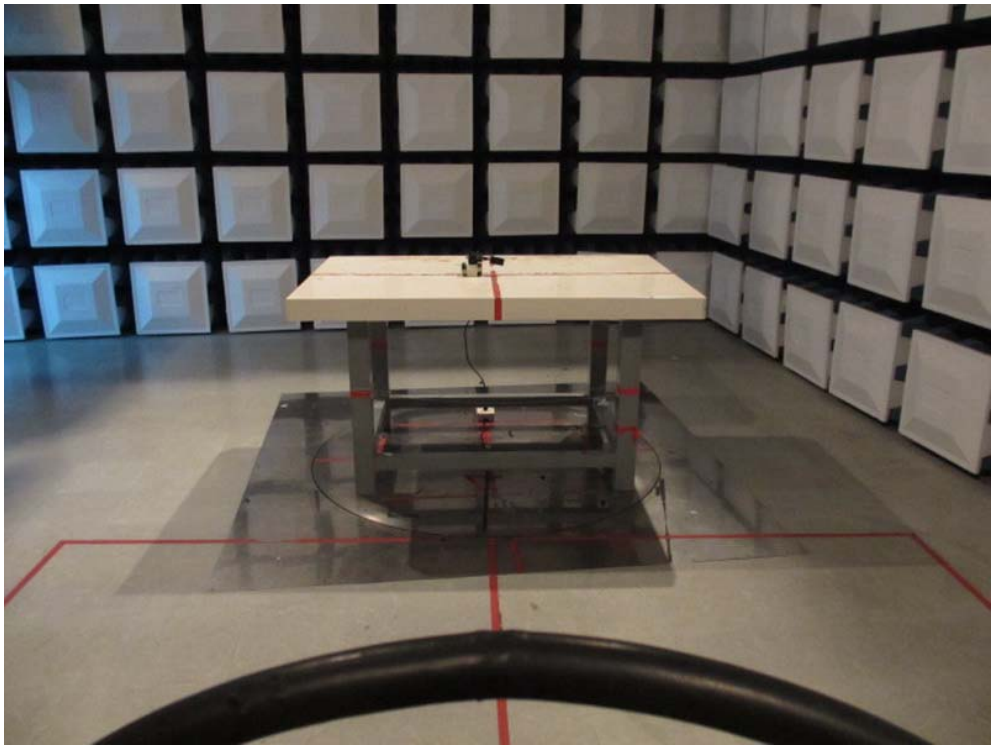
11. EUT TEST PHOTO

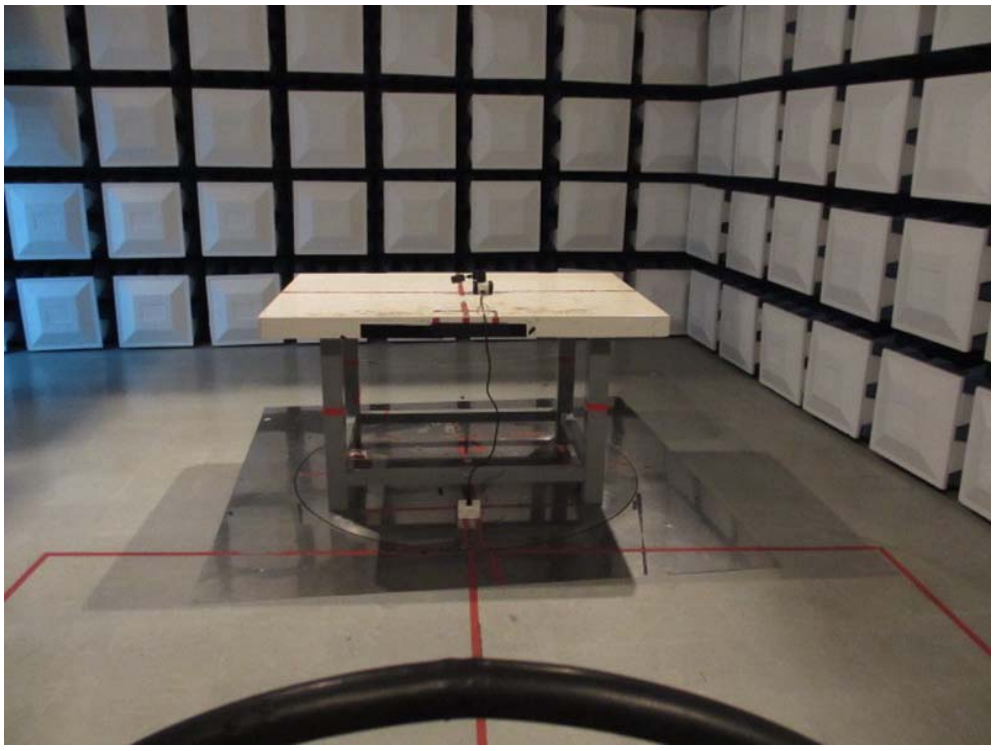
Conducted Measurement Photos
Adapter Supply



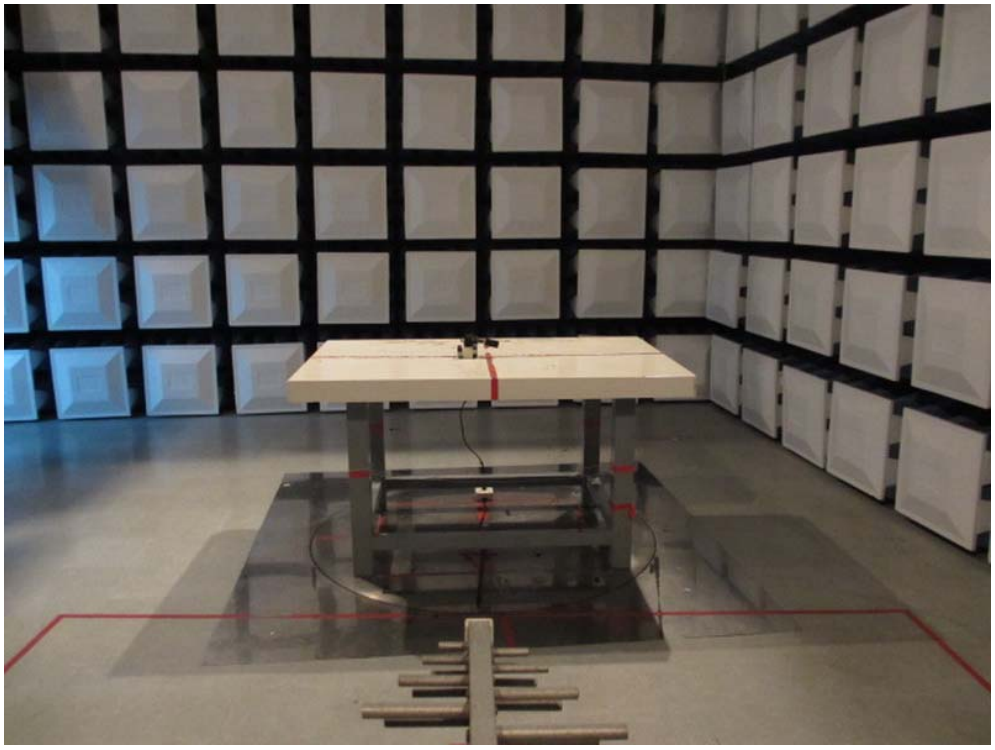
Conducted Measurement Photos
PC MODE

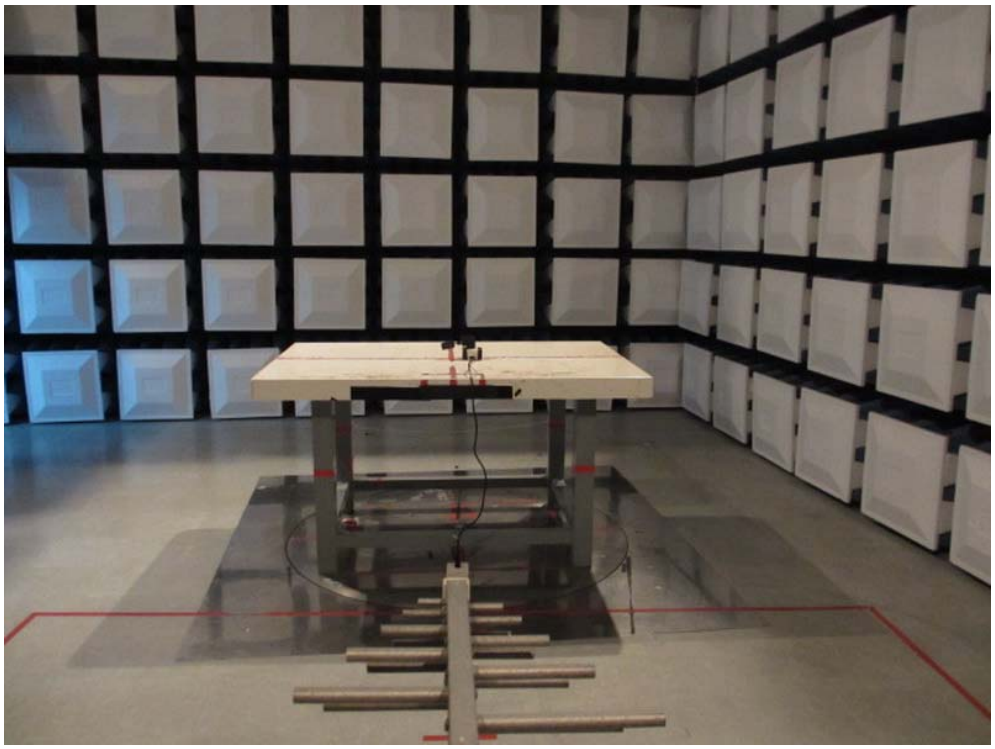
Radiated Measurement Photos
9K~30MHz





Radiated Measurement Photos
30~1000MHz





Radiated Measurement Photos
Above 1000MHz