



Neutron Engineering Inc.

Radio Test Report

FCC ID: H8GRH200

This report concerns (check one) : ☒ Original Grant ☐ Class I Change

Issued Date : Oct. 11, 2012
Project No. : 1209009
Equipment : Wireless 2.4G HD Headset
Model Name : RH-200

Applicant : A-FOUR TECH CO., LTD.
Address : 6F., No. 108, Min-Chuan Rd., Xindian
Dist., New Taipei City, Taiwan R.O.C.

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Sep. 04, 2012
Date of Test: Sep. 04, 2012 ~ Sep. 21, 2012

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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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REPORT ISSUED HISTORY

Revised Version No.	Description	Issued Date
-	Initial Issue.	Oct. 11, 2012



1. CERTIFICATION

Equipment : Wireless 2.4G HD Headset
Brand Name : A4TECH
Model Name : RH-200
Applicant : A-FOUR TECH CO., LTD.
Date of Test : Sep. 04, 2012 ~ Sep. 21, 2012
Standards : FCC Part15, Subpart C: 2010(15.247) / ANCI C63.4: 2009

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-1-1209009) 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: 2010			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (c)	Antenna conducted Spurious Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	PASS	

NOTE:

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



2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

C02: (VCCI RN: C-3477; FCC RN: 614388; FCC DN: TW1054)

1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)

1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)

1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules and for reference only.

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95%**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

Test Site	Measurement Frequency Range	U , (dB)	NOTE
C02	150 kHz ~ 30 MHz	2.59	

B. Radiated emission test:

Test Site	Item	Measurement Frequency Range	Uncertainty	NOTE
CB08	Radiated emission at 3m	Horizontal Polarization	30 - 200MHz	3.35 dB
			200 - 1000MHz	3.11 dB
			1 - 18GHz	3.97 dB
			18 - 40GHz	4.01 dB
	Radiated emission at 3m	Vertical Polarization	30 - 200MHz	3.22 dB
			200 - 1000MHz	3.24 dB
			1 - 18GHz	4.05 dB
			18 - 40GHz	4.04 dB

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless 2.4G HD Headset	
Brand Name	A4TECH	
Model Name	RH-200	
OEM Brand/Model Name	N/A	
Model Difference	N/A	
Product Description	The EUT is a Wireless 2.4G HD Headset.	
	Operation Frequency:	2403~2478 MHz
	Modulation Type:	GFSK
	Bit Rate of Transmitter:	3 Mbps
	Number Of Channel	Please refer to Note 2.
	Antenna Designation:	Please refer to Note 3.
	Antenna Gain(Peak)	Please refer to Note 3.
	Output Power:	2.35 dBm (Max.)
	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	1. Battery supplied. 2. Supplied from PC USB port (Charge).	
Power Rating	1. I/P: DC 3.7V 300mAh 2. I/P: DC 5V 500mA	
Connecting I/O Port(s)	Please refer to the User's Manual	
Products Covered	1 * USB to DC Cable	

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

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Ant. On PCB	N/A	1.3400



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 Test Mode	Description
Mode 1	2403 MHz
Mode 2	2439 MHz
Mode 3	2478 MHz

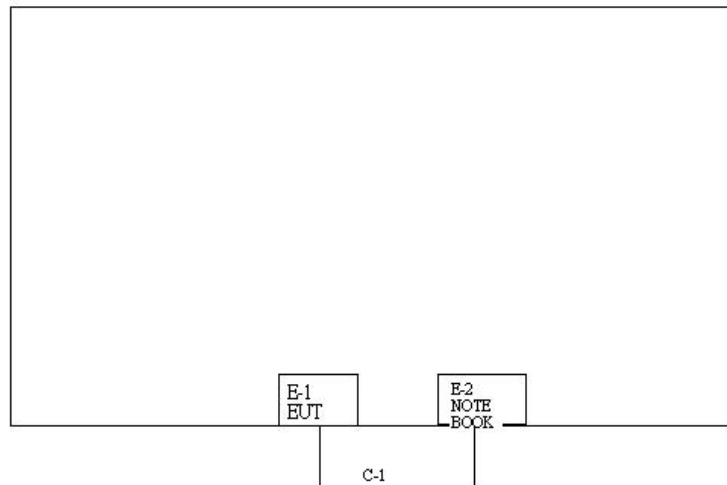
Conducted emission test	
Final Test Mode	Description
Mode 2	2439 MHz

Radiated Test (Below 1 GHz)	
Final Test Mode	Description
Mode 2	2439 MHz

Radiated Test (Above 1 GHz)	
Final Test Mode	Description
Mode 1	2403 MHz
Mode 2	2439 MHz
Mode 3	2478 MHz



3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



**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	Wireless 2.4G HD Headset	A4TECH	RH-200	H8GRH200	N/A	EUT
E-2	Notebook PC	DELL	D620	DOC	7T390 A03	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	0.55m	USB CABLE

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMITS (FREQUENCY RANGE 150 KHZ-30MHZ)

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

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.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value – Limit Value

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Apr. 06, 2013
2	LISN	EMCO	3816/2	00066528	Mar. 26, 2013
3	Test Cable	TIMES	CFD300-NL	130	Jun. 14, 2013
4	EMI Test Receiver	Agilent	N9038A	MY51210215	Jul. 26, 2013
5	50Ω BNC TYPE Terminator	N/A	N/A	05	Jun. 02, 2013

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

4.1.3 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

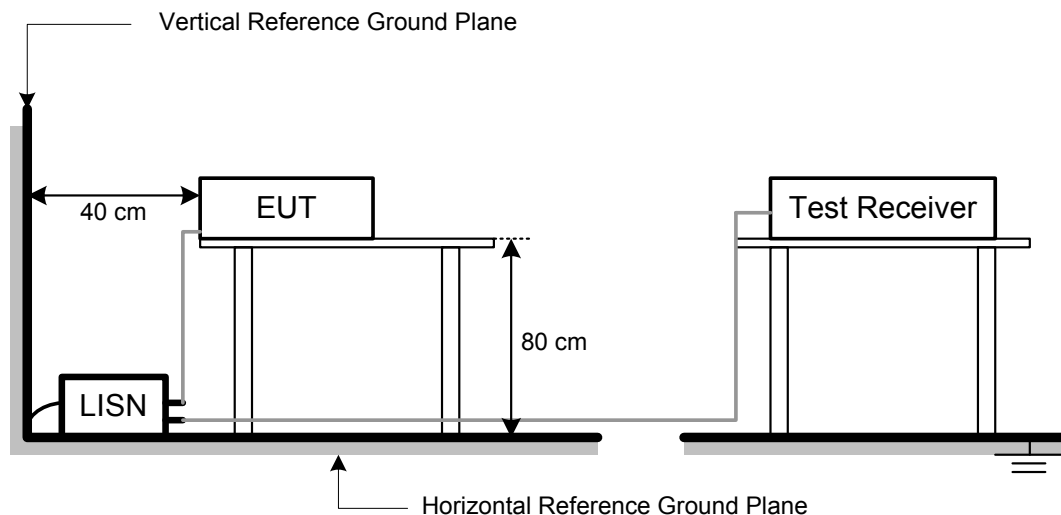
NOTE:

- Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn't perform.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP





4.1.6 EUT OPERATING CONDITIONS

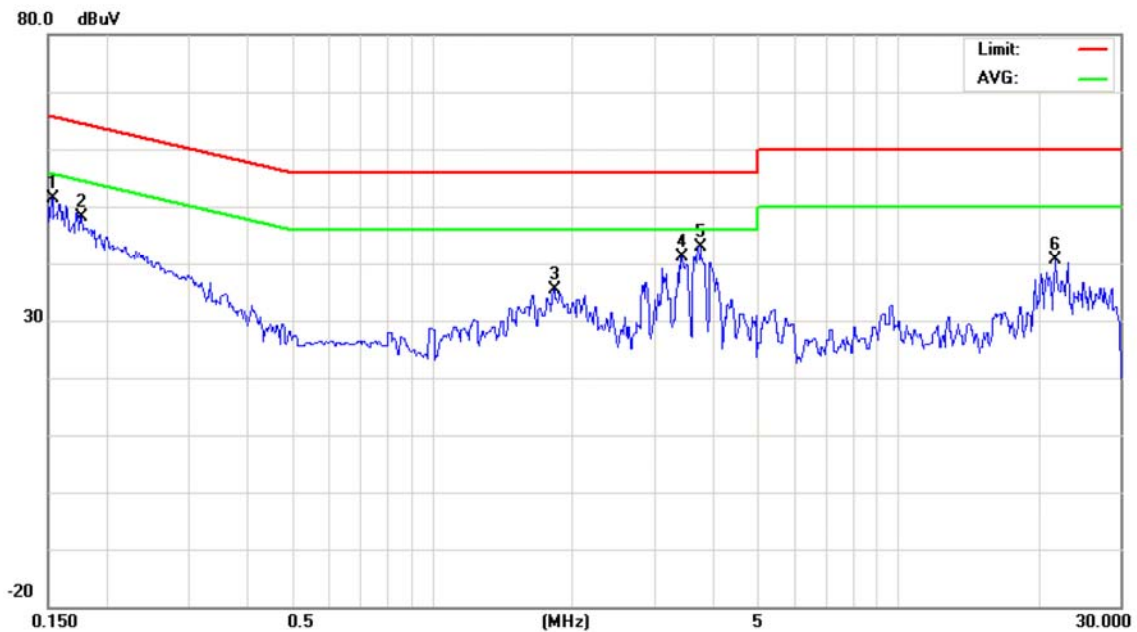
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



4.1.7 TEST RESULTS

E.U.T	Wireless 2.4G HD Headset	Model Name	RH-200
Temperature	24 °C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2439 MHz		

Phase: Line

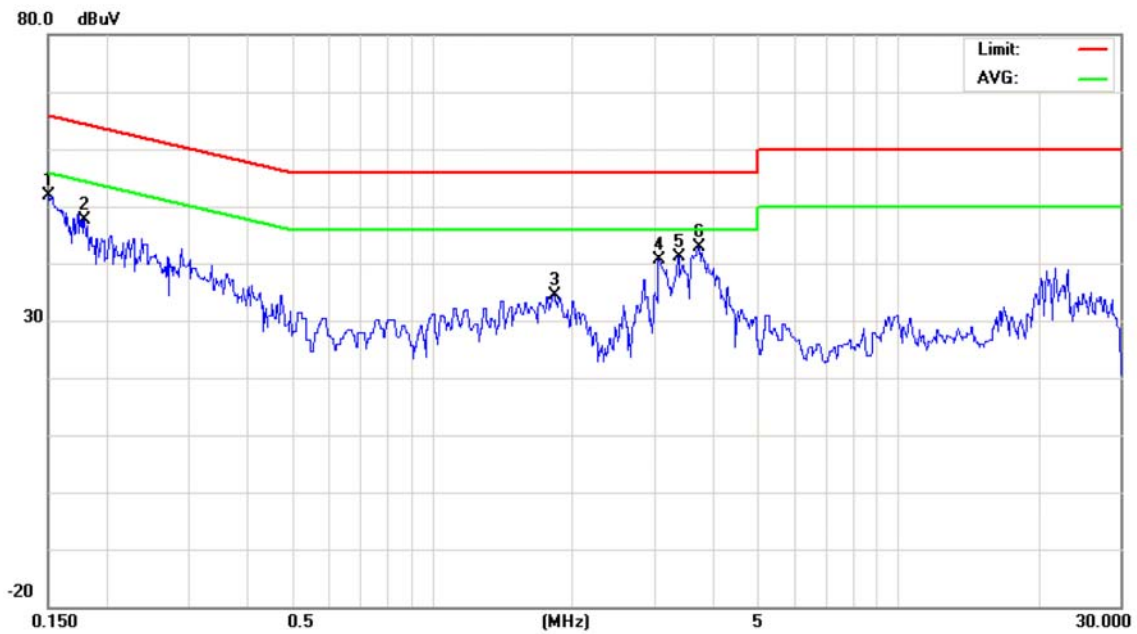


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1526	41.52	9.78	51.30	65.86	-14.56	peak	
2		0.1762	38.29	9.77	48.06	64.66	-16.60	peak	
3		1.8275	25.59	9.68	35.27	56.00	-20.73	peak	
4		3.4250	31.33	9.74	41.07	56.00	-14.93	peak	
5	*	3.7513	33.19	9.75	42.94	56.00	-13.06	peak	
6		21.6875	30.63	9.88	40.51	60.00	-19.49	peak	



E.U.T	Wireless 2.4G HD Headset	Model Name	RH-200
Temperature	24 °C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2439 MHz		

Phase: Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	42.02	9.78	51.80	66.00	-14.20	peak	
2		0.1789	37.88	9.76	47.64	64.54	-16.90	peak	
3		1.8275	24.78	9.67	34.45	56.00	-21.55	peak	
4		3.0650	30.98	9.71	40.69	56.00	-15.31	peak	
5		3.3688	31.53	9.72	41.25	56.00	-14.75	peak	
6	*	3.7288	33.17	9.73	42.90	56.00	-13.10	peak	



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 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 (micovolts/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)	Class B (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).
- (4) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
 Margin Level = Measurement Value – Limit Value



4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 16, 2013
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 17, 2013
4	Microflex Cable	N/A	N/A	1m	Apr. 14, 2013
5	Microflex Cable	AISI	S104-SMAP-1	10m	Apr. 14, 2013
6	Microflex Cable	N/A	N/A	3m	Apr. 14, 2013
7	Test Cable	N/A	LMR-400	966_12m	May. 15, 2013
8	Test Cable	N/A	LMR-400	966_3m	May. 15, 2013
9	Pre-Amplifier	EMC	EMC-330	980088	Jul. 07, 2013
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 12, 2013

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



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 or 10 meter open area test site. 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 radiated 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.
- g. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- h. EUT Orthogonal Axis :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- i. 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

NOTE: (30-1000MHz)

- a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz; SPA setting in RBW=120 kHz, VBW =120 kHz, Swp. Time = 0.3 sec./ MHz.
- b. 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.

NOTE: (Above 1000MHz)

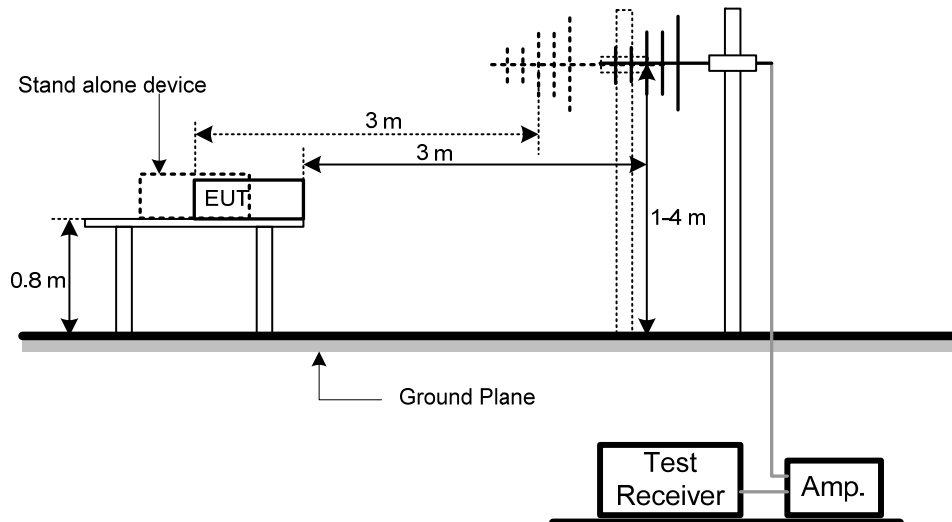
- a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
- b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

4.2.4 DEVIATION FROM TEST STANDARD

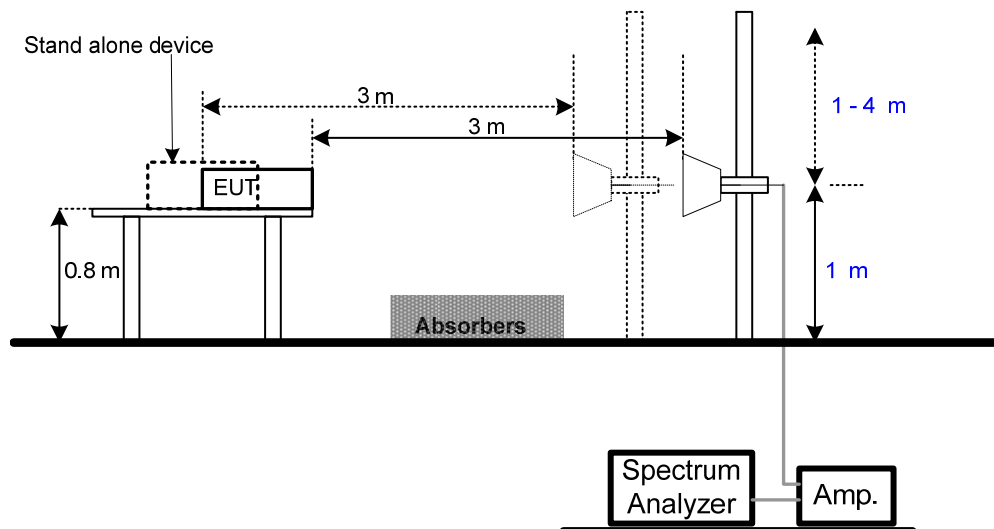
No deviation

4.2.5 TEST SETUP

Below 1 GHz



Above 1 GHz



4.2.6 EUT OPERATING CONDITIONS

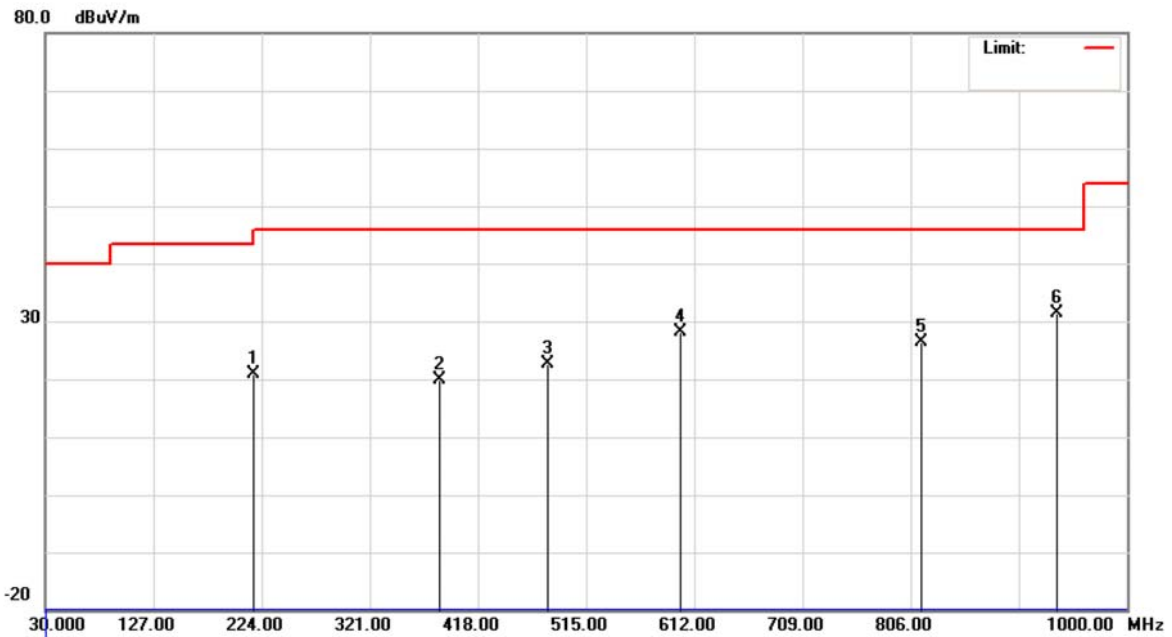
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



4.2.7 TEST RESULTS-BELLOW 1 GHZ

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2439 MHz		

Polarization: Vertical

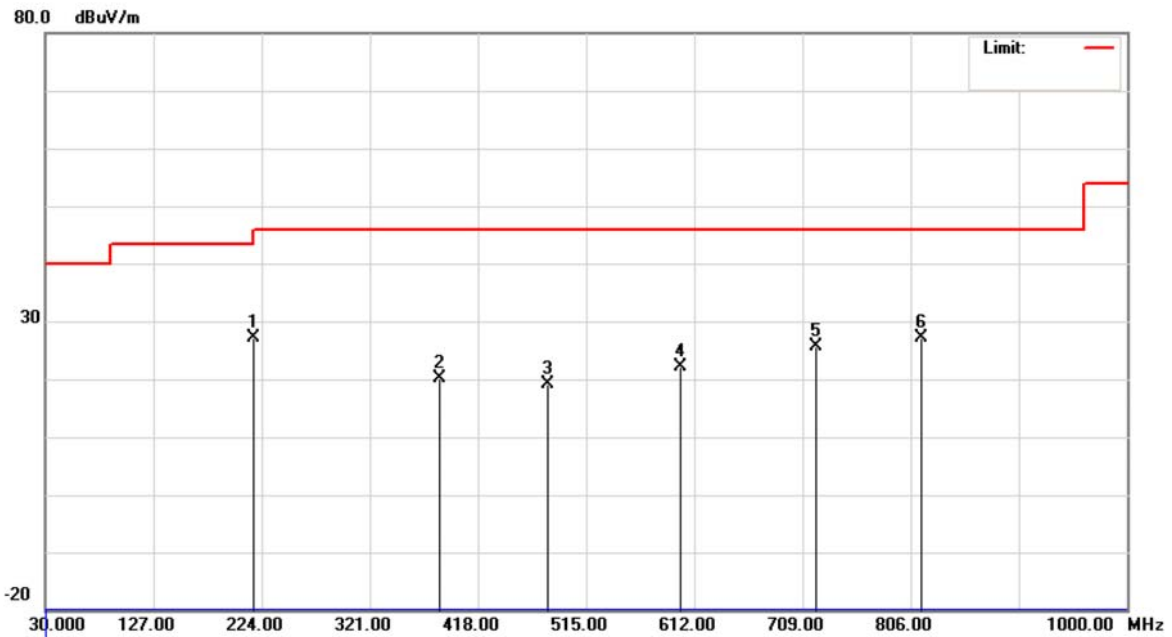


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		216.7250	42.18	-21.36	20.82	46.00	-25.18	peak	
2		384.0499	35.91	-15.99	19.92	46.00	-26.08	peak	
3		481.0499	36.35	-13.63	22.72	46.00	-23.28	peak	
4		599.8750	38.93	-10.87	28.06	46.00	-17.94	peak	
5		815.7000	34.26	-7.79	26.47	46.00	-19.53	peak	
6	*	936.9500	37.08	-5.75	31.33	46.00	-14.67	peak	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2439 MHz		

Polarization: Horizontal



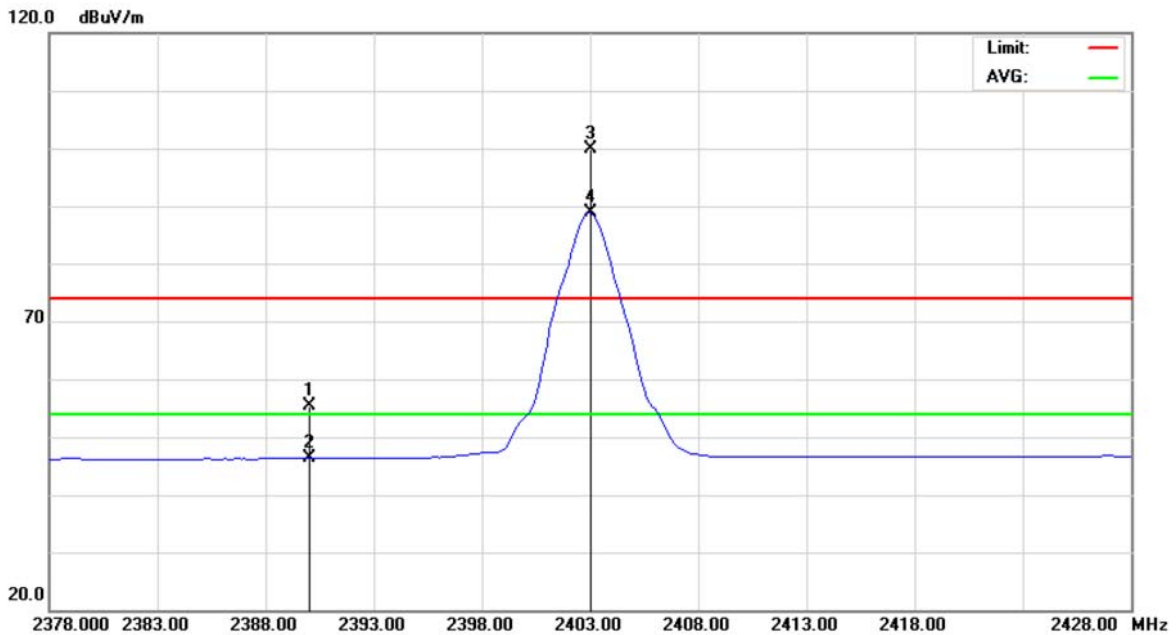
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	216.7250	48.59	-21.36	27.23	46.00	-18.77	peak	
2		384.0500	36.17	-15.99	20.18	46.00	-25.82	peak	
3		481.0500	32.80	-13.63	19.17	46.00	-26.83	peak	
4		599.8750	33.06	-10.87	22.19	46.00	-23.81	peak	
5		721.1250	34.74	-9.21	25.53	46.00	-20.47	peak	
6		815.7000	34.84	-7.79	27.05	46.00	-18.95	peak	



4.2.8 TEST RESULTS-ABOVE 1 GHZ

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz		

Polarization: Vertical

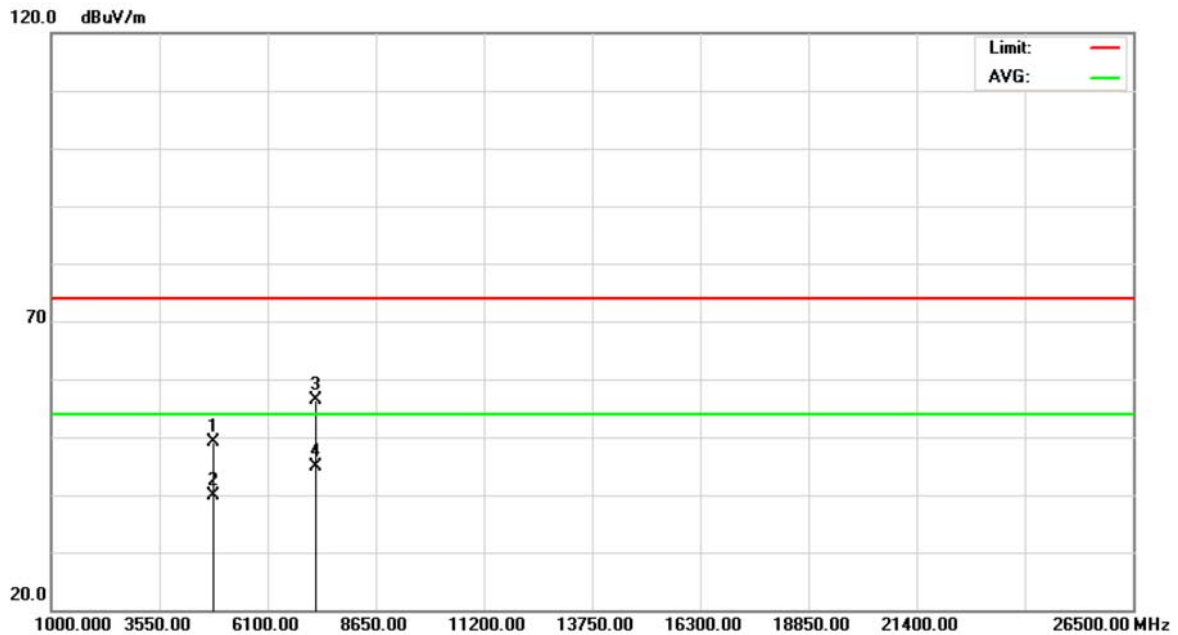


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2390.000	22.46	32.99	55.45	74.00	-18.55	peak	
2		2390.000	13.30	32.99	46.29	54.00	-7.71	AVG	
3	X	2403.000	66.78	33.06	99.84	74.00	25.84	peak	
4	*	2403.000	55.79	33.06	88.85	54.00	34.85	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz		

Polarization: Vertical

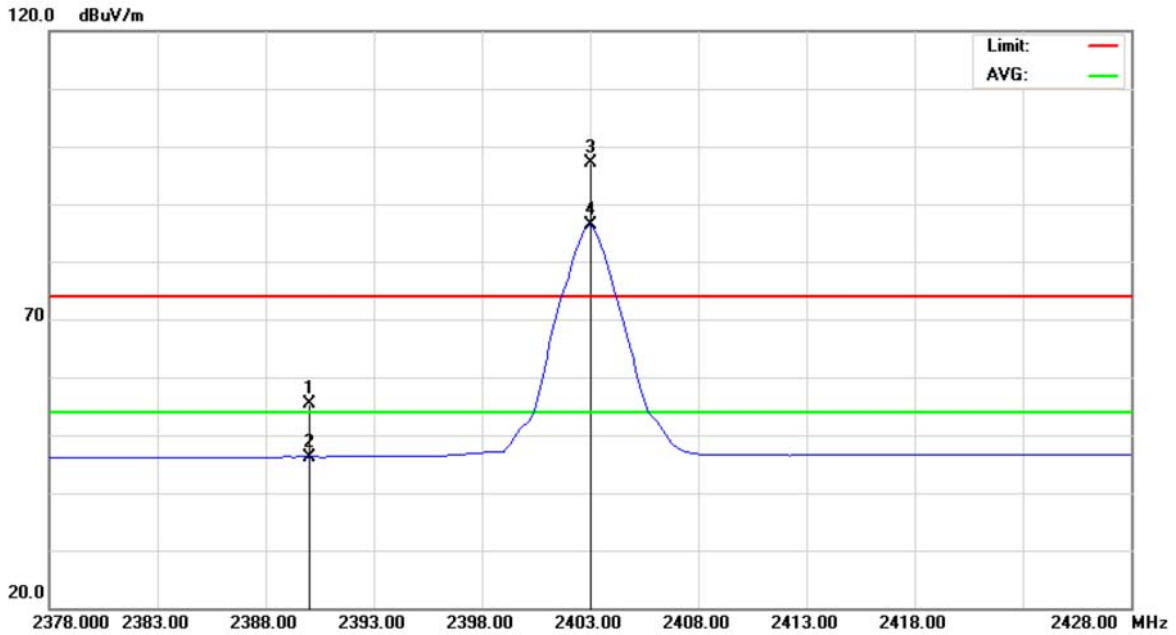


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4806.250	41.68	7.42	49.10	74.00	-24.90	peak	
2		4806.250	32.46	7.42	39.88	54.00	-14.12	AVG	
3		7209.000	41.47	14.80	56.27	74.00	-17.73	peak	
4	*	7209.000	30.11	14.80	44.91	54.00	-9.09	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz		

Polarization: Horizontal

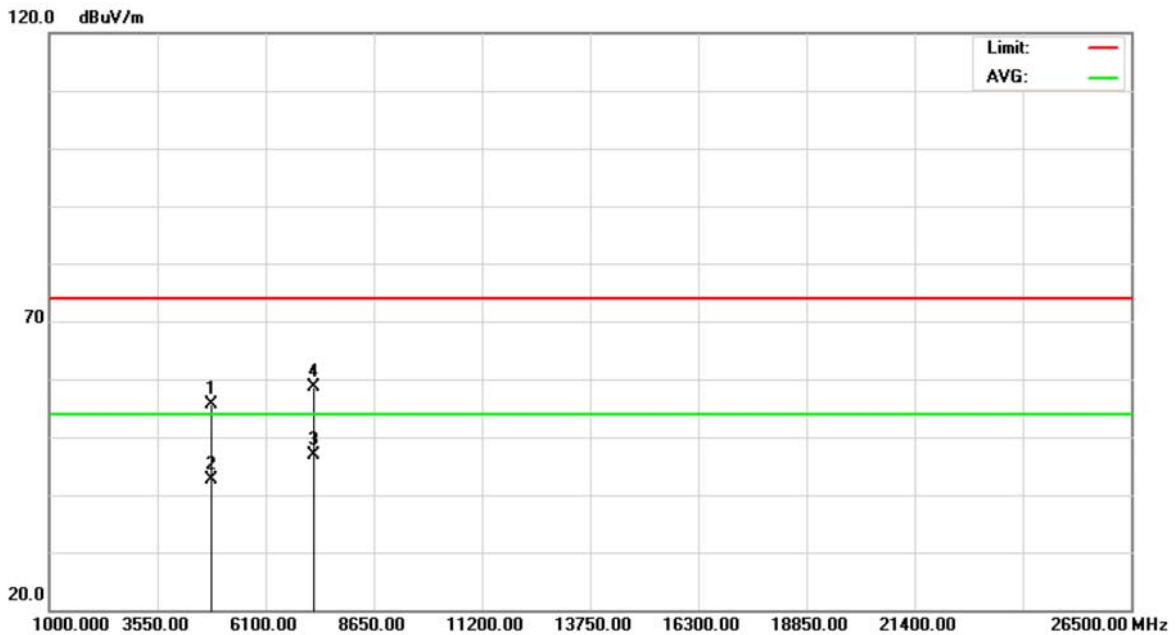


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2390.000	22.31	32.99	55.30	74.00	-18.70	peak	
2		2390.000	13.25	32.99	46.24	54.00	-7.76	AVG	
3	X	2403.000	64.13	33.06	97.19	74.00	23.19	peak	
4	*	2403.000	53.24	33.06	86.30	54.00	32.30	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz		

Polarization: Horizontal

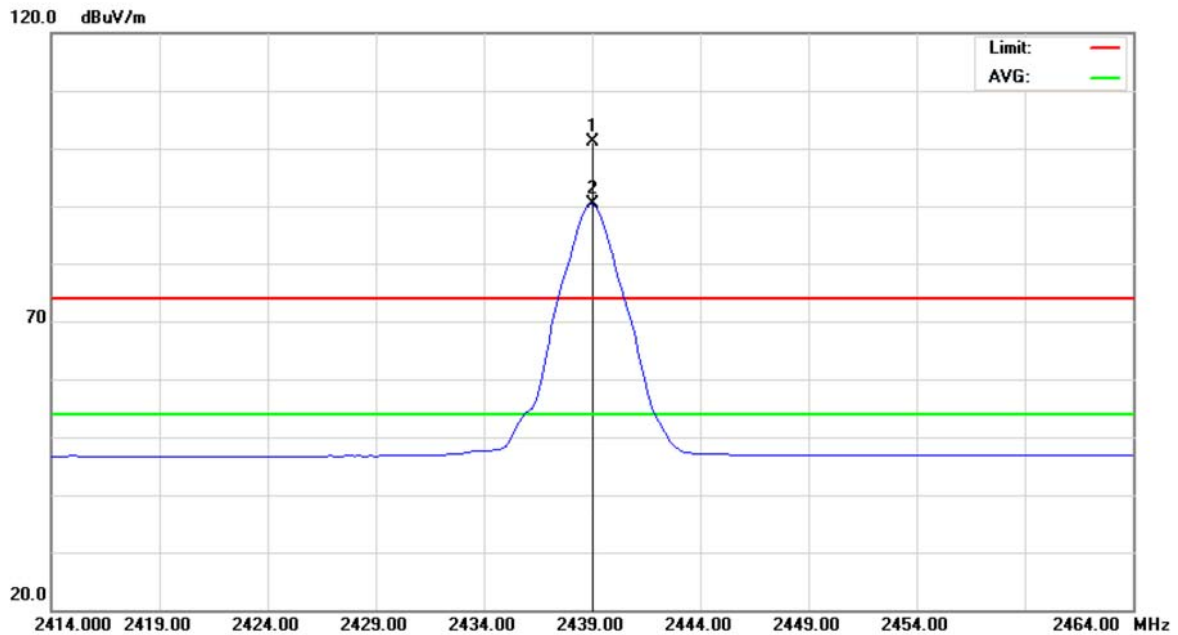


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4806.125	48.24	7.42	55.66	74.00	-18.34	peak	
2		4806.125	35.14	7.42	42.56	54.00	-11.44	AVG	
3	*	7209.000	32.08	14.80	46.88	54.00	-7.12	AVG	
4		7210.375	43.81	14.80	58.61	74.00	-15.39	peak	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2439 MHz		

Polarization: Vertical

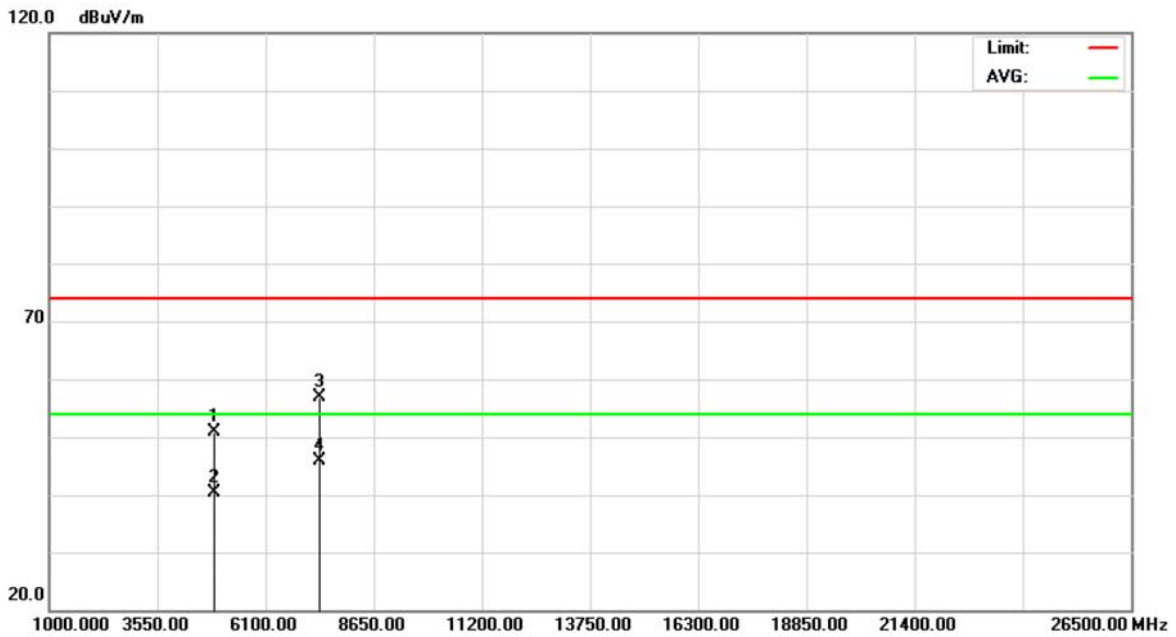


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2439.000	67.90	33.26	101.16	74.00	27.16	peak	
2	*	2439.000	57.10	33.26	90.36	54.00	36.36	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2439 MHz		

Polarization: Vertical

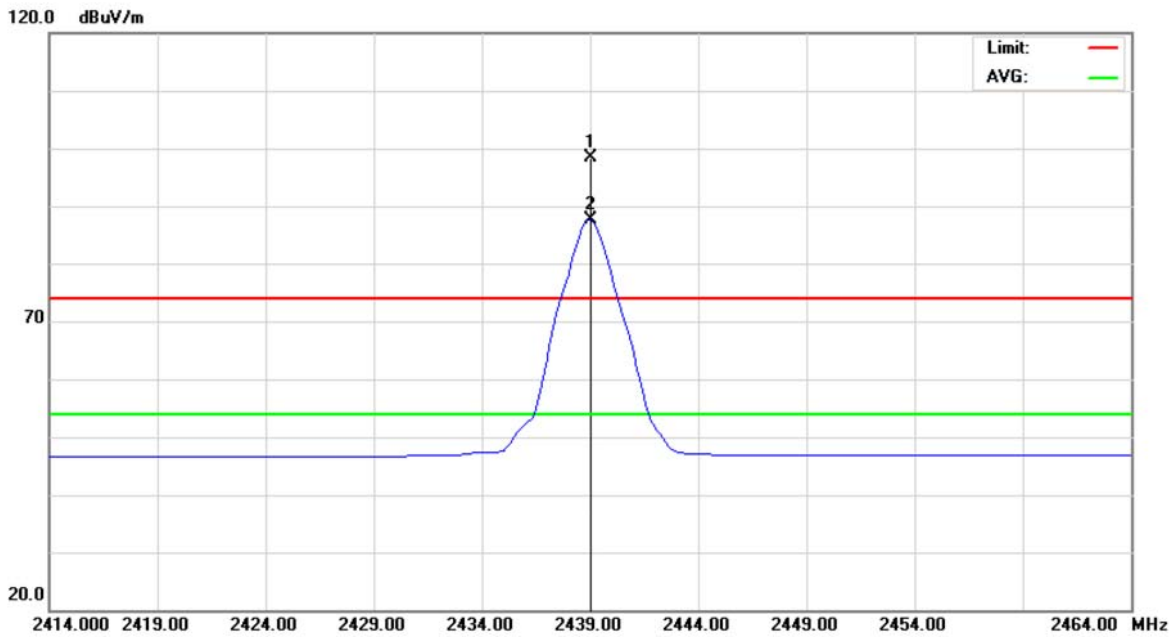


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4878.000	43.19	7.68	50.87	74.00	-23.13	peak	
2		4878.000	32.65	7.68	40.33	54.00	-13.67	AVG	
3		7316.950	41.74	15.08	56.82	74.00	-17.18	peak	
4	*	7316.950	30.78	15.08	45.86	54.00	-8.14	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26° C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2439 MHz		

Polarization: Horizontal

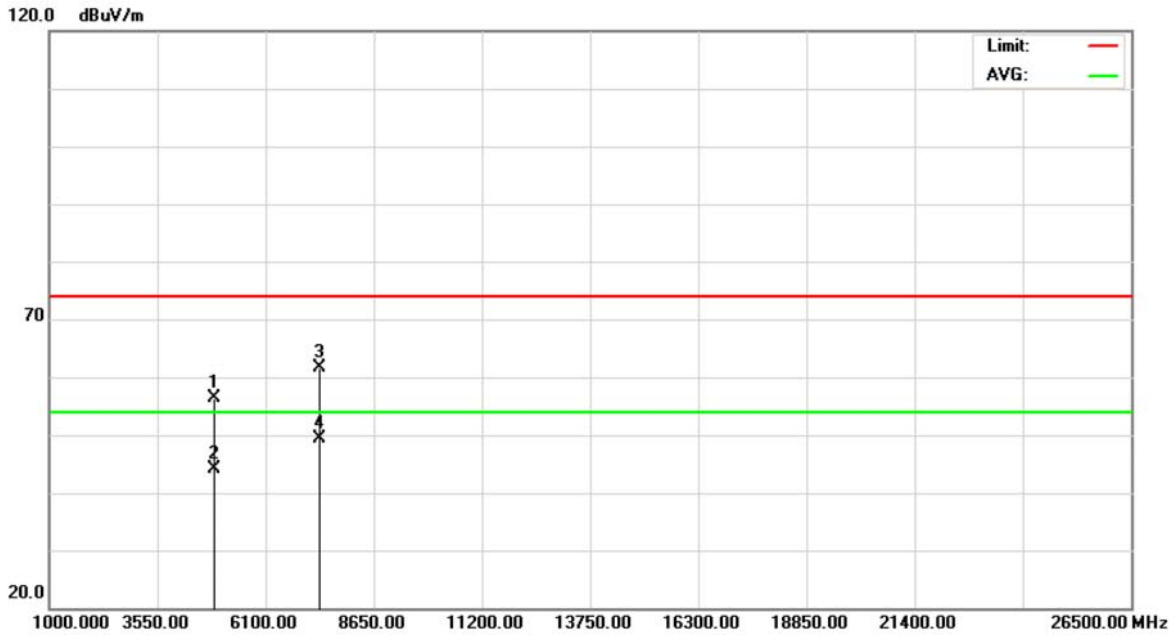


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2439.000	65.15	33.26	98.41	74.00	24.41	peak	
2	*	2439.000	54.37	33.26	87.63	54.00	33.63	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2439 MHz		

Polarization: Horizontal

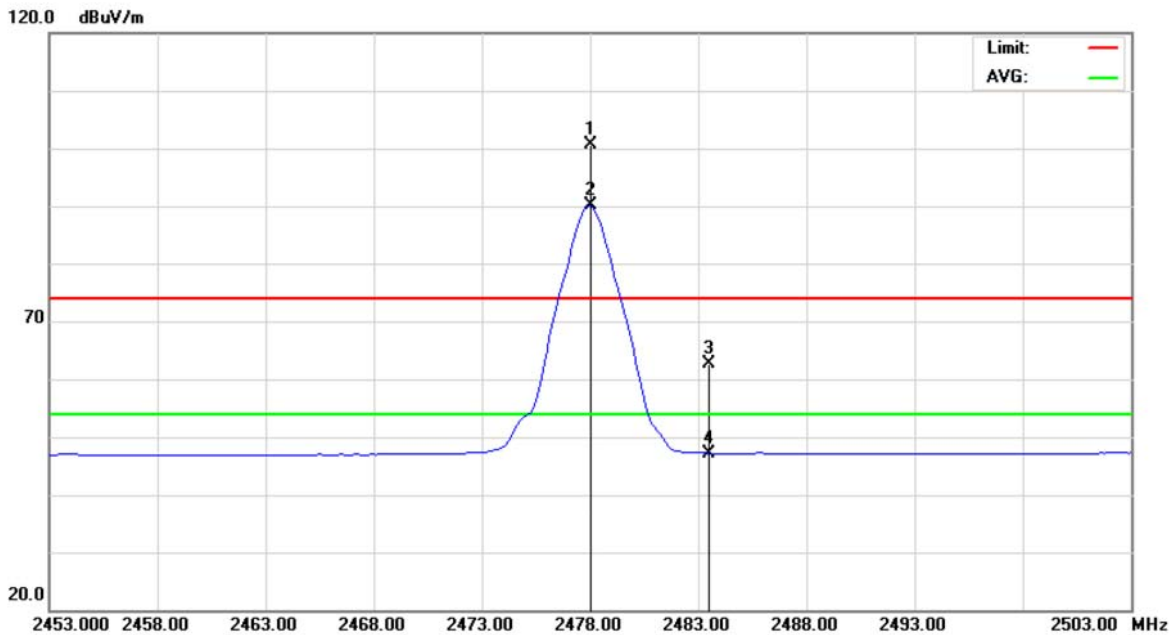


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4878.150	48.73	7.68	56.41	74.00	-17.59	peak	
2		4878.150	36.36	7.68	44.04	54.00	-9.96	AVG	
3		7315.450	46.65	15.08	61.73	74.00	-12.27	peak	
4	*	7315.450	34.20	15.08	49.28	54.00	-4.72	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2478 MHz		

Polarization: Vertical

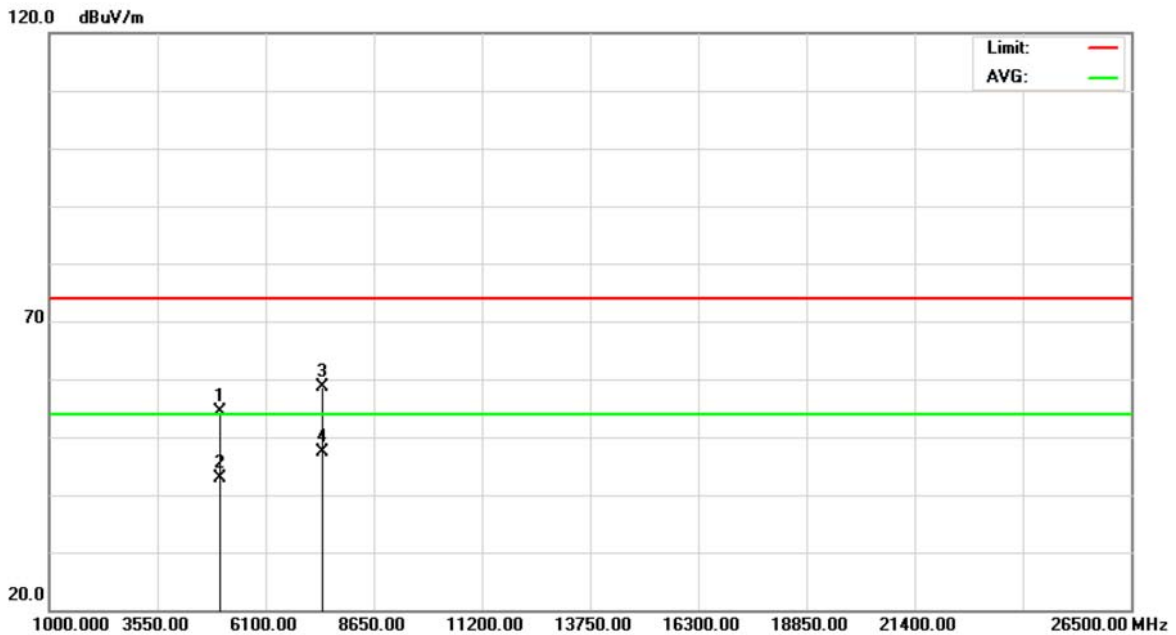


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2478.000	67.20	33.47	100.67	74.00	26.67	peak	
2	*	2478.000	56.57	33.47	90.04	54.00	36.04	AVG	
3		2483.500	29.25	33.50	62.75	74.00	-11.25	peak	
4		2483.500	13.72	33.50	47.22	54.00	-6.78	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2478 MHz		

Polarization: Vertical

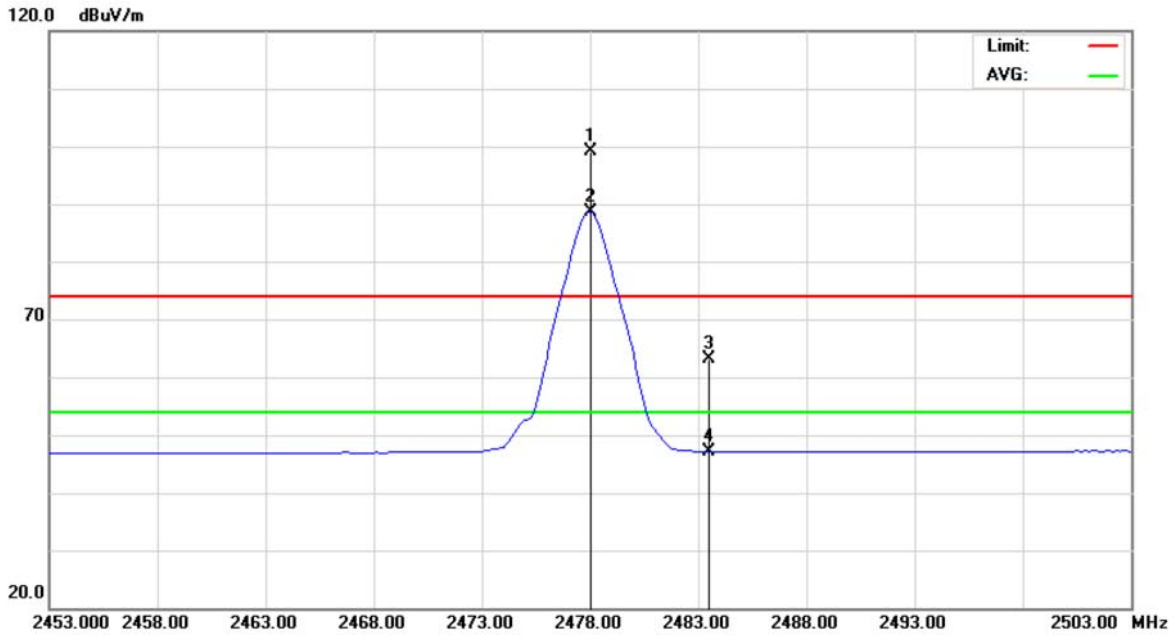


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4956.000	46.47	7.96	54.43	74.00	-19.57	peak	
2		4956.000	34.92	7.96	42.88	54.00	-11.12	AVG	
3		7432.500	43.24	15.38	58.62	74.00	-15.38	peak	
4	*	7432.500	31.91	15.38	47.29	54.00	-6.71	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2478 MHz		

Polarization: Horizontal

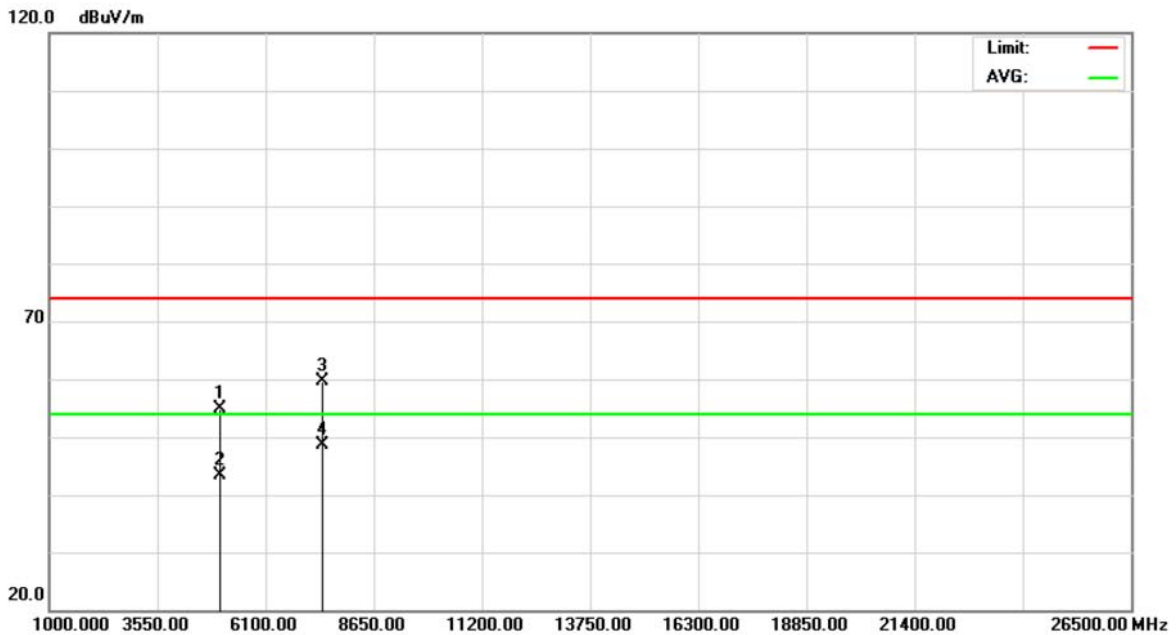


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2478.000	65.78	33.47	99.25	74.00	25.25	peak	
2	*	2478.000	55.21	33.47	88.68	54.00	34.68	AVG	
3		2483.500	29.52	33.50	63.02	74.00	-10.98	peak	
4		2483.500	13.68	33.50	47.18	54.00	-6.82	AVG	



EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2478 MHz		

Polarization: Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4956.000	47.01	7.96	54.97	74.00	-19.03	peak	
2		4956.000	35.46	7.96	43.42	54.00	-10.58	AVG	
3		7432.500	44.36	15.38	59.74	74.00	-14.26	peak	
4	*	7432.500	33.16	15.38	48.54	54.00	-5.46	AVG	



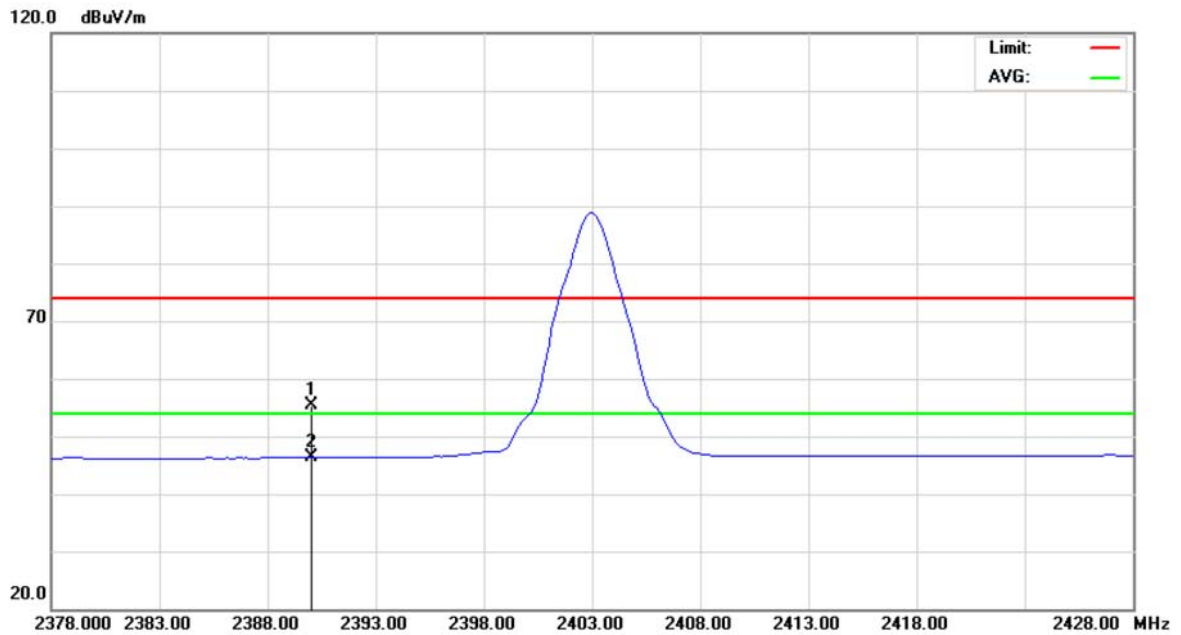
4.2.9 TEST RESULTS-RESTRICTED BANDS REQUIREMENTS

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	TX CH 2403 MHz/2478 MHz(Vertical)		
Note :	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2403 MHz). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was configured with the worst case antenna and setup to transmit at the highest channel (2478 MHz). Then the field strength was measured at 2483.5-2500 MHz.		



2403 MHz/ Orthogonal Axes: X

Polarization: Vertical

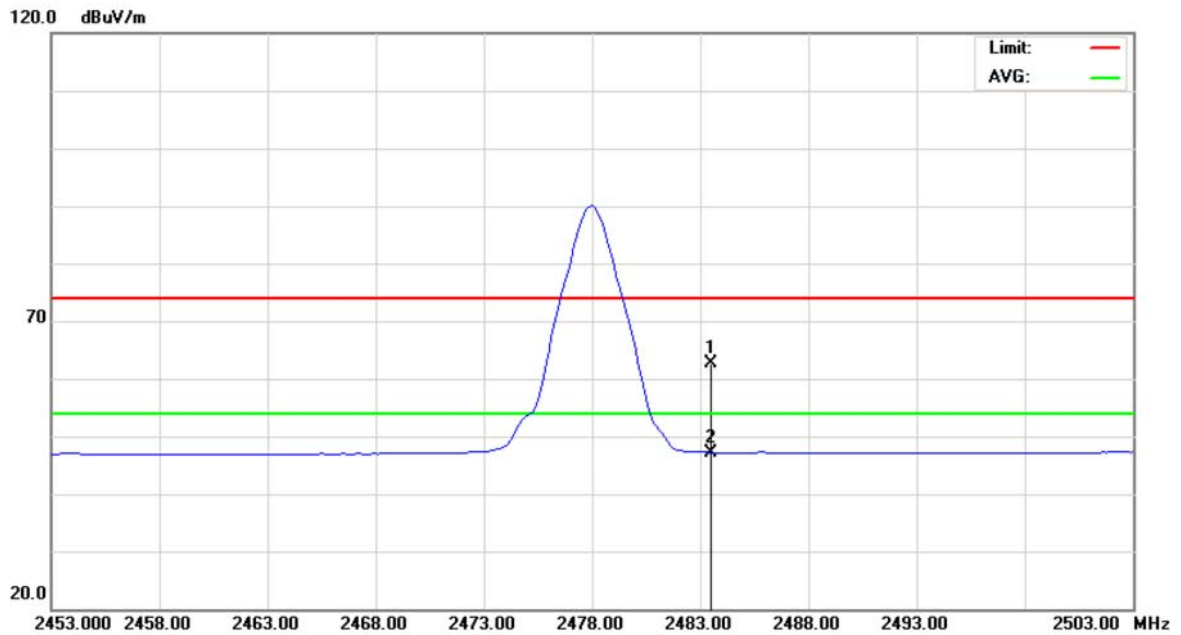


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2390.000	22.46	32.99	55.45	74.00	-18.55	peak	
2	*	2390.000	13.30	32.99	46.29	54.00	-7.71	AVG	



2478 MHz/ Orthogonal Axes: X

Polarization: Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2483.500	29.25	33.50	62.75	74.00	-11.25	peak	
2	*	2483.500	13.72	33.50	47.22	54.00	-6.78	AVG	

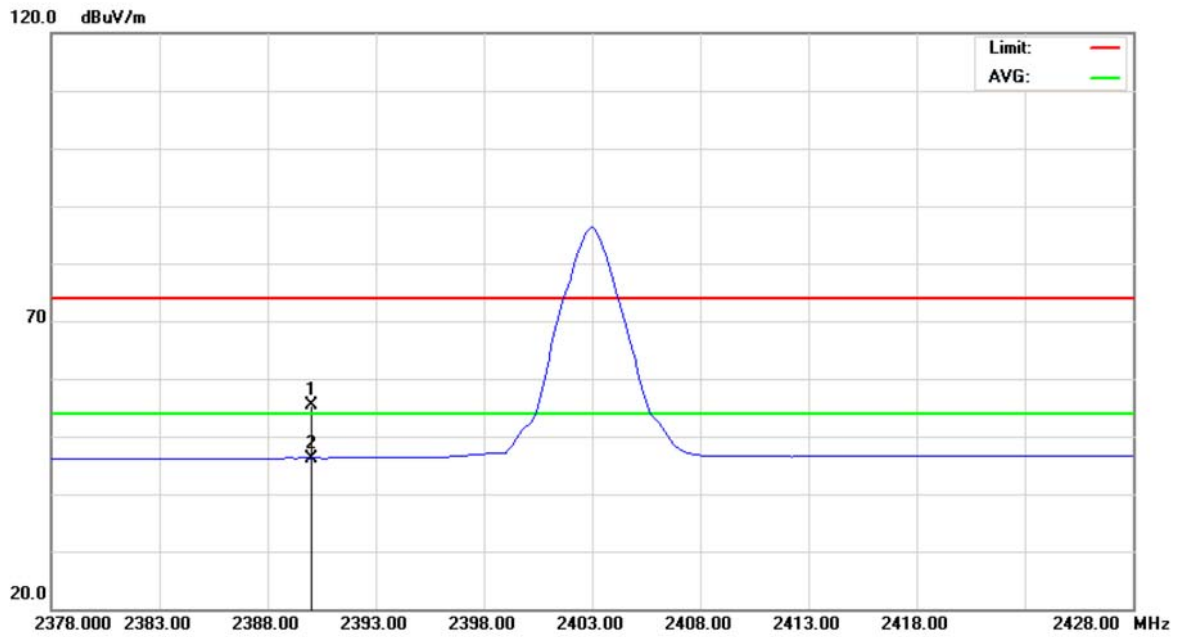


EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 ° C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	TX CH 2403 MHz/2478 MHz (Horizontal)		
Note :	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2403 MHz). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was configured with the worst case antenna and setup to transmit at the highest channel (2478 MHz). Then the field strength was measured at 2483.5-2500 MHz.		



2403 MHz/ Orthogonal Axes: X

Polarization: Horizontal

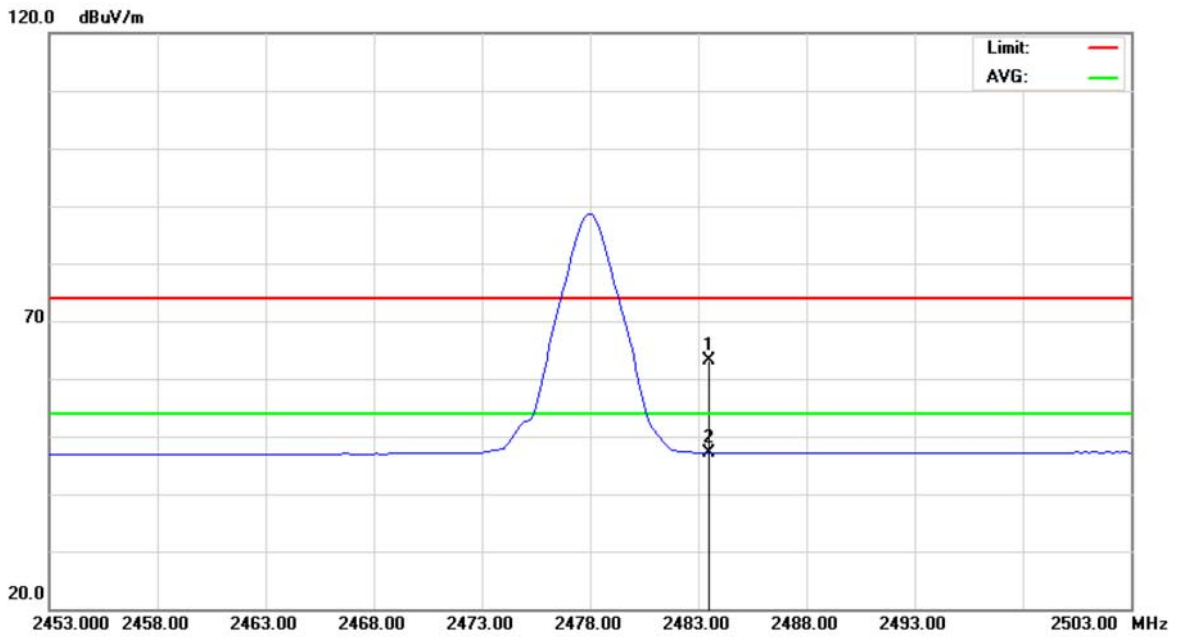


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2390.000	22.31	32.99	55.30	74.00	-18.70	peak	
2	*	2390.000	13.25	32.99	46.24	54.00	-7.76	AVG	



2478 MHz/ Orthogonal Axes: X

Polarization: Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2483.500	29.52	33.50	63.02	74.00	-10.98	peak	
2	*	2483.500	13.68	33.50	47.18	54.00	-6.82	AVG	



5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013

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

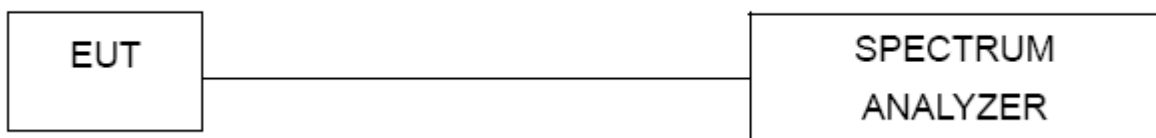
5.3 TEST PROCEDURE

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

5.4 DEVIATION FROM STANDARD

No deviation.

5.5 TEST SETUP



5.6 EUT OPERATION CONDITIONS

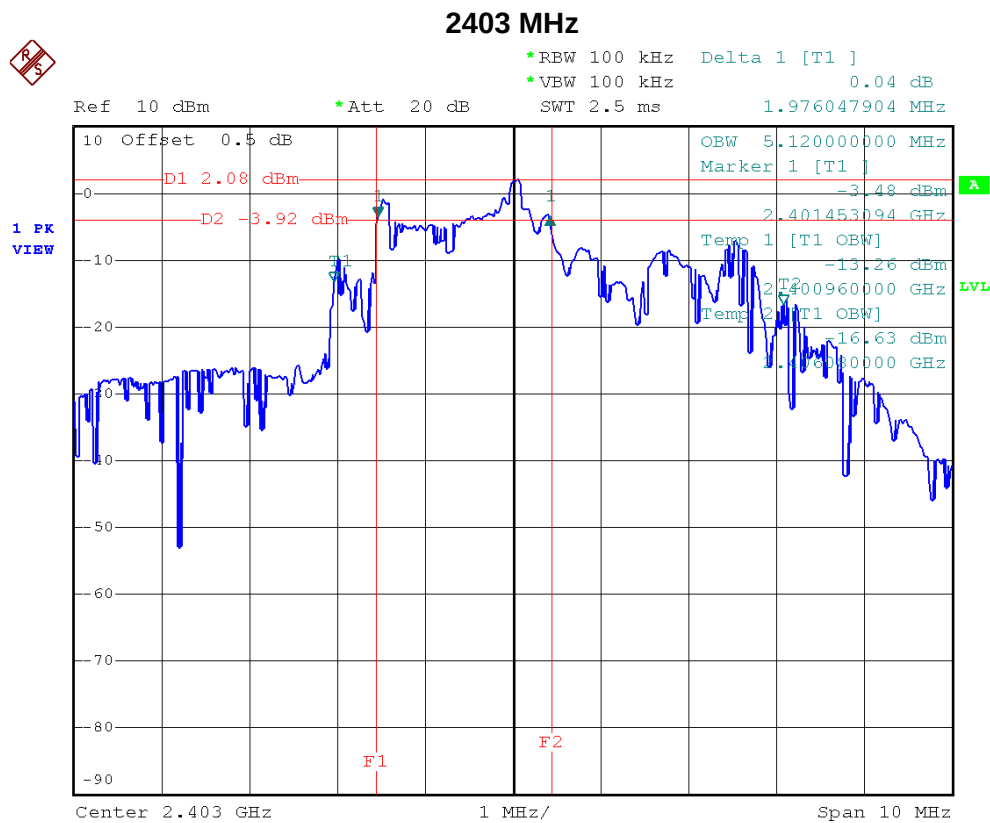
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



5.7 TEST RESULTS

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz/2439 MHz/2478 MHz		

Frequency	Bandwidth (MHz)	99% Occupied BW (MHz)	LIMIT (MHz)
2403 MHz	1.98	5.12	>=500KHz
2439 MHz	1.14	3.40	>=500KHz
2478 MHz	0.84	2.64	>=500KHz

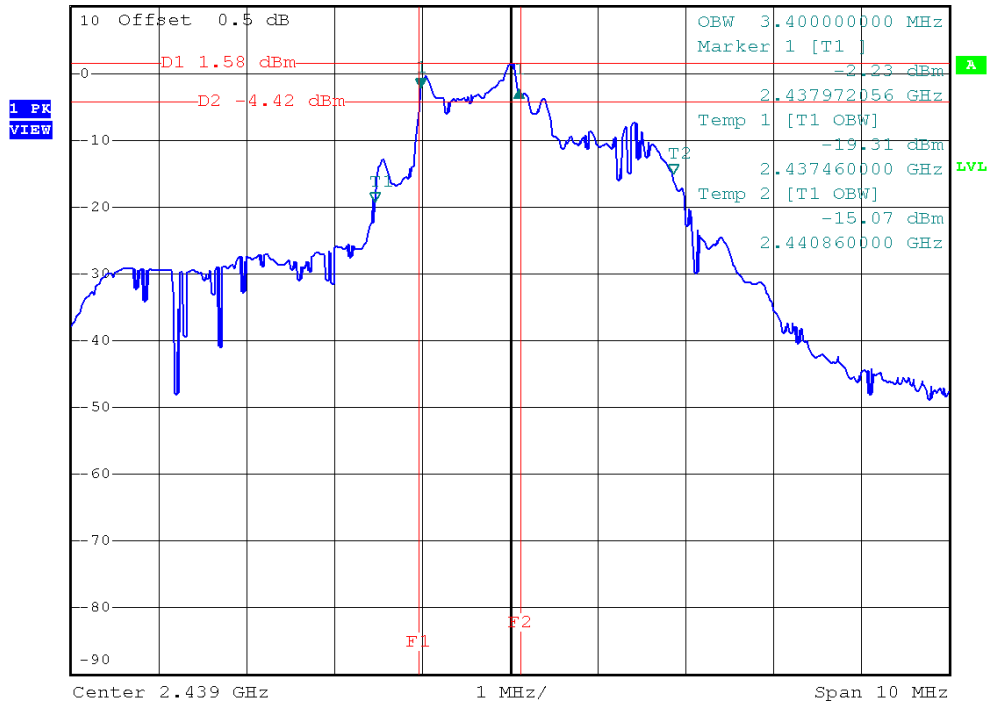




2439 MHz



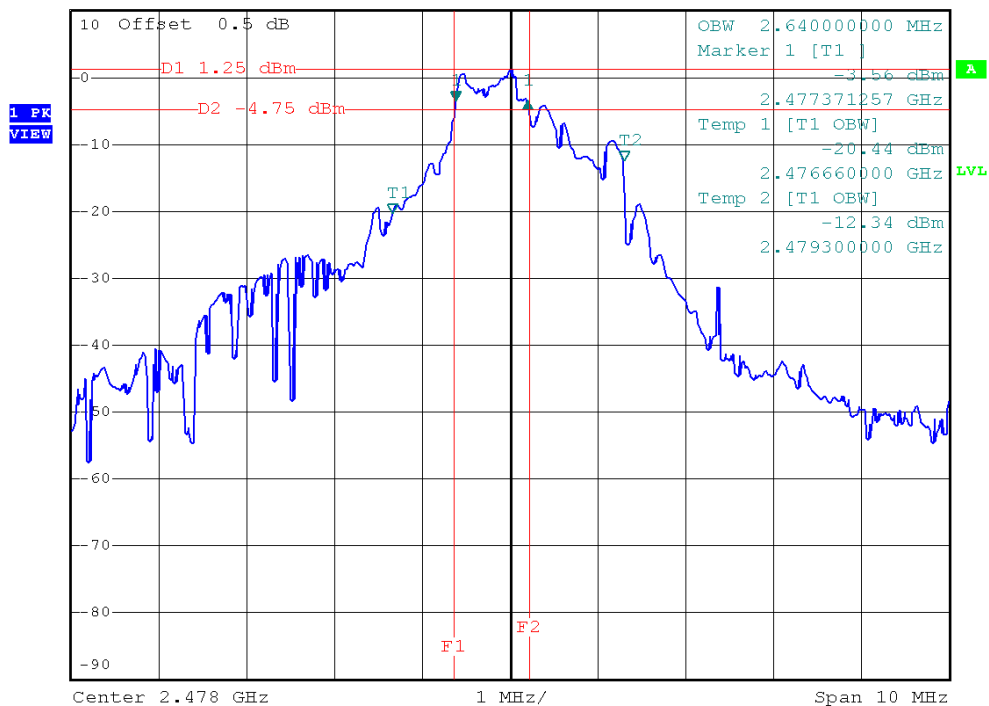
*RBW 100 kHz Delta 1 [T1]
*VBW 100 kHz -0.28 dB
Ref 10 dBm *Att 20 dB SWT 2.5 ms 1.137724551 MHz



2478 MHz



*RBW 100 kHz Delta 1 [T1]
*VBW 100 kHz -0.04 dB
Ref 10 dBm *Att 20 dB SWT 2.5 ms 838.323353360 kHz





6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Feb,20,2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Feb,20,2013

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

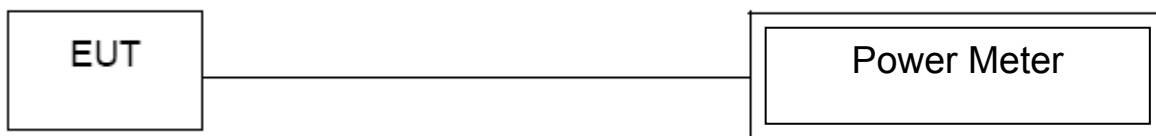
6.3 TEST PROCEDURE

The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,

6.4 DEVIATION FROM STANDARD

No deviation.

6.5 TEST SETUP



6.6 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.



6.7 TEST RESULTS

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	26 °C	Relative Humidity :	60%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz/2439 MHz/2478 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
2403 MHz	2.35	30	1
2439 MHz	2.03	30	1
2478 MHz	1.21	30	1



7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Antenna conducted Spurious Emission	20dB less than the peak value of fundamental frequency	30-25000	PASS

7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013

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

7.3 TEST PROCEDURE

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

7.4 DEVIATION FROM STANDARD

No deviation.

7.5 TEST SETUP



7.6 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.



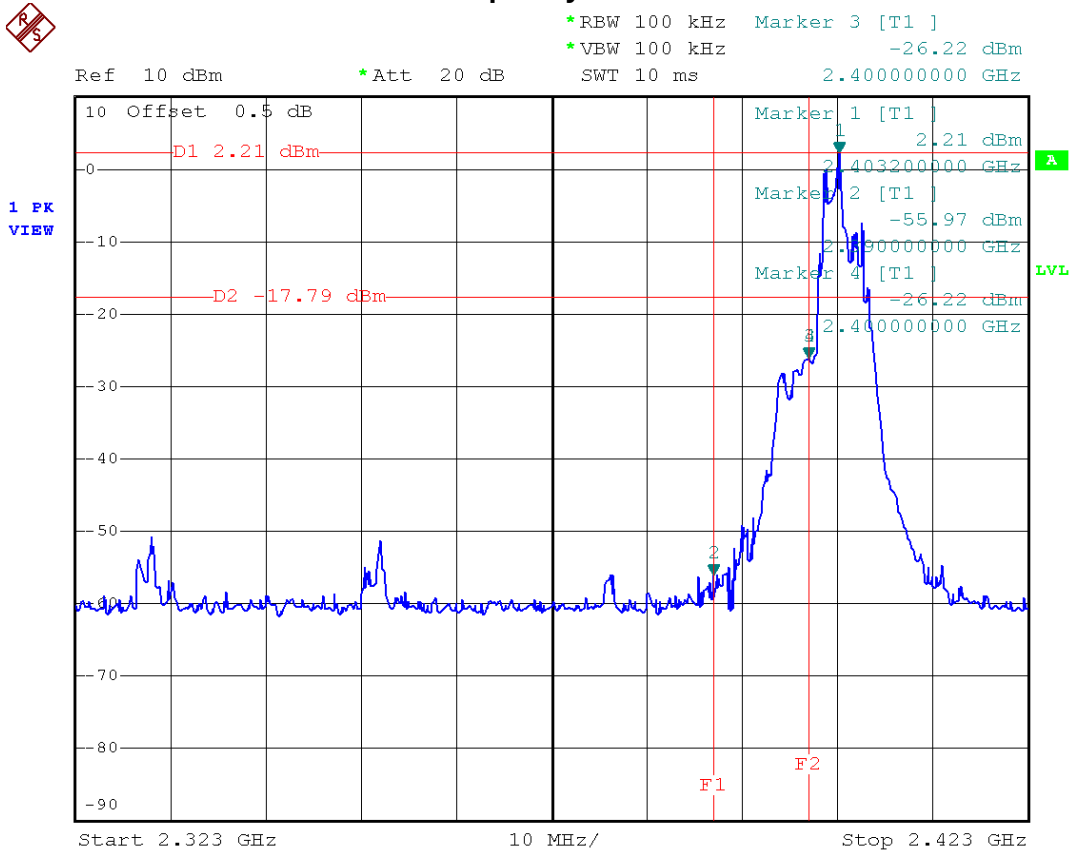
7.7 TEST RESULTS

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	24 ° C	Relative Humidity :	54%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz/2439 MHz/2478 MHz		

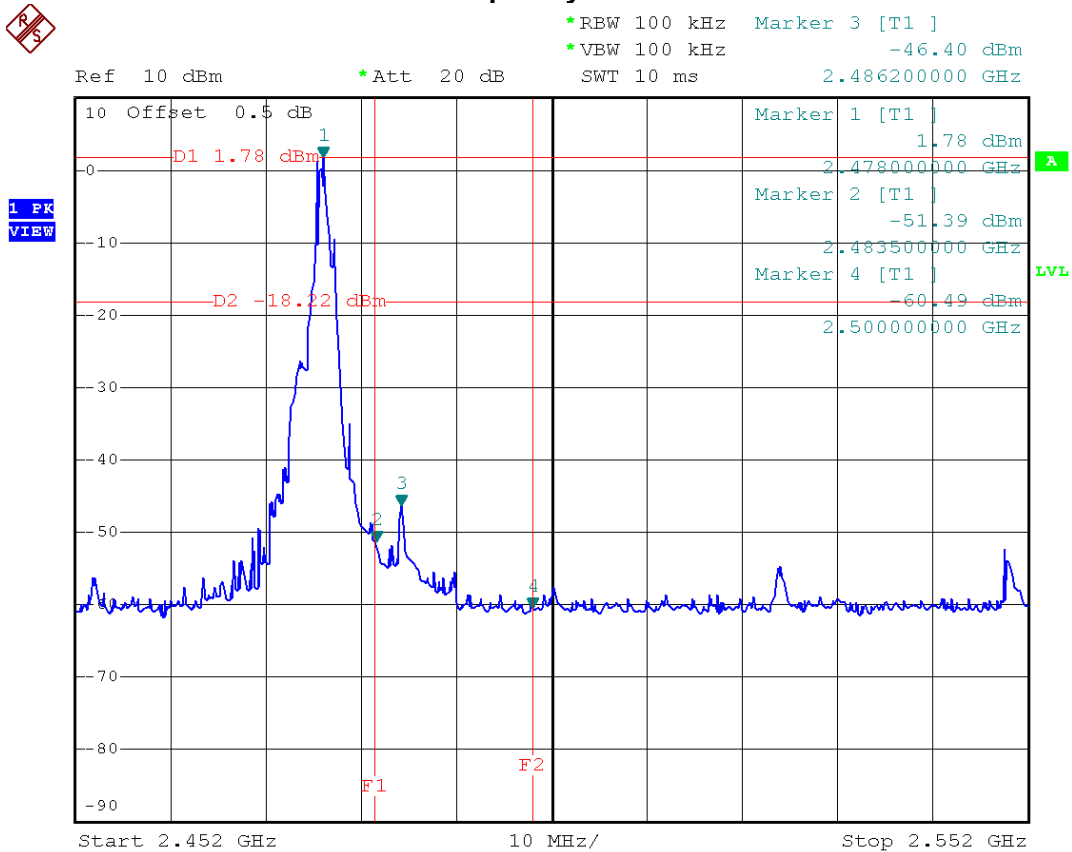
Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-26.22	2486.20	-46.40
Result			
In any 100kHz bandwidth 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 level of the desired power.			



2403 MHz/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



2478 MHz/The max. radio frequency power in any 100 kHz bandwidth within the frequency band

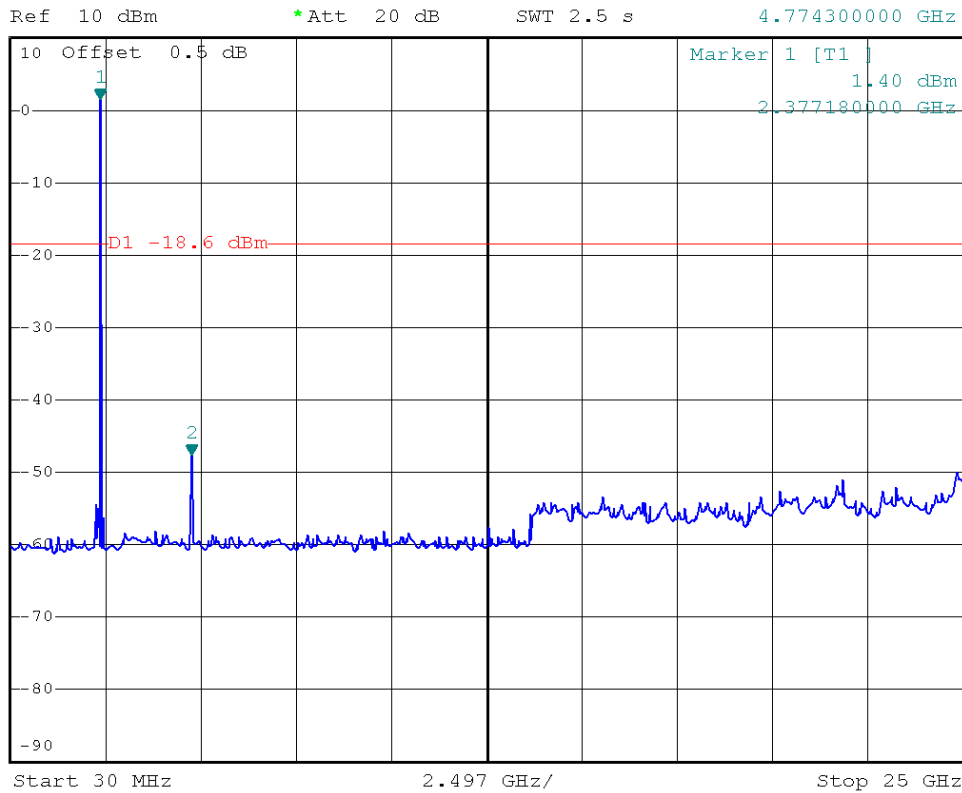




2403 MHz/10 Harmonic of the frequency



*RBW 100 kHz Marker 2 [T1]
*VBW 100 kHz -47.55 dBm
SWT 2.5 s 4.774300000 GHz

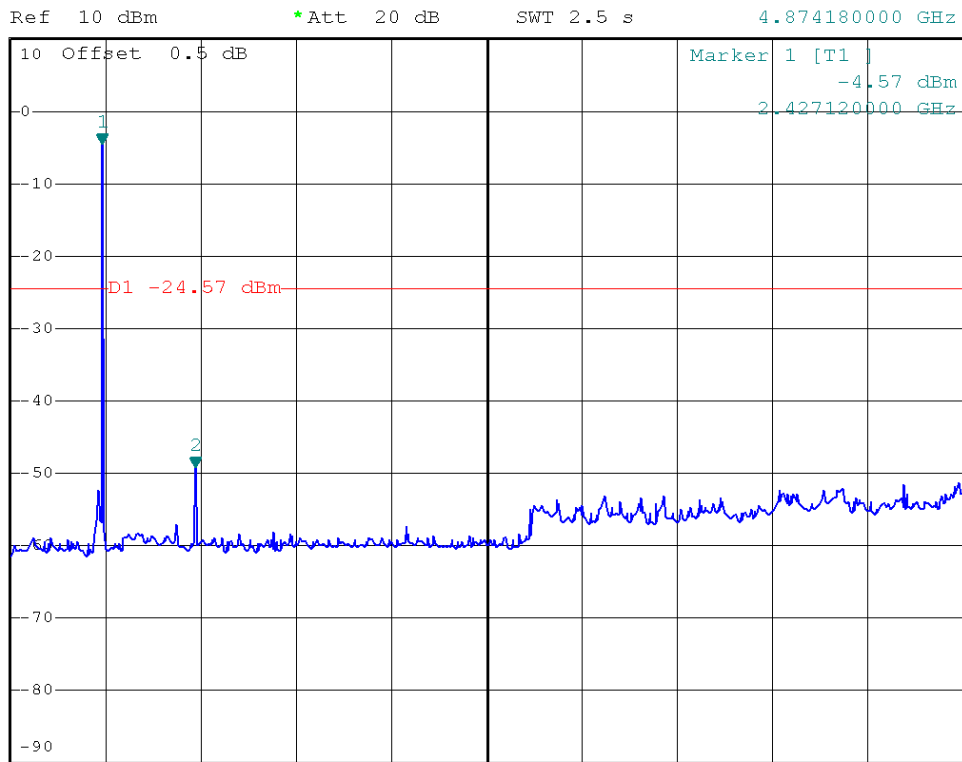


Start 30 MHz 2.497 GHz/ Stop 25 GHz

2439 MHz/10 Harmonic of the frequency



*RBW 100 kHz Marker 2 [T1]
*VBW 100 kHz -49.25 dBm
SWT 2.5 s 4.874180000 GHz



Center 12.515 GHz 2.497 GHz/ Span 24.97 GHz



2478 MHz/10 Harmonic of the frequency



*RBW 100 kHz Marker 2 [T1]
*VBW 100 kHz -43.46 dBm
SWT 2.5 s 4.924120000 GHz

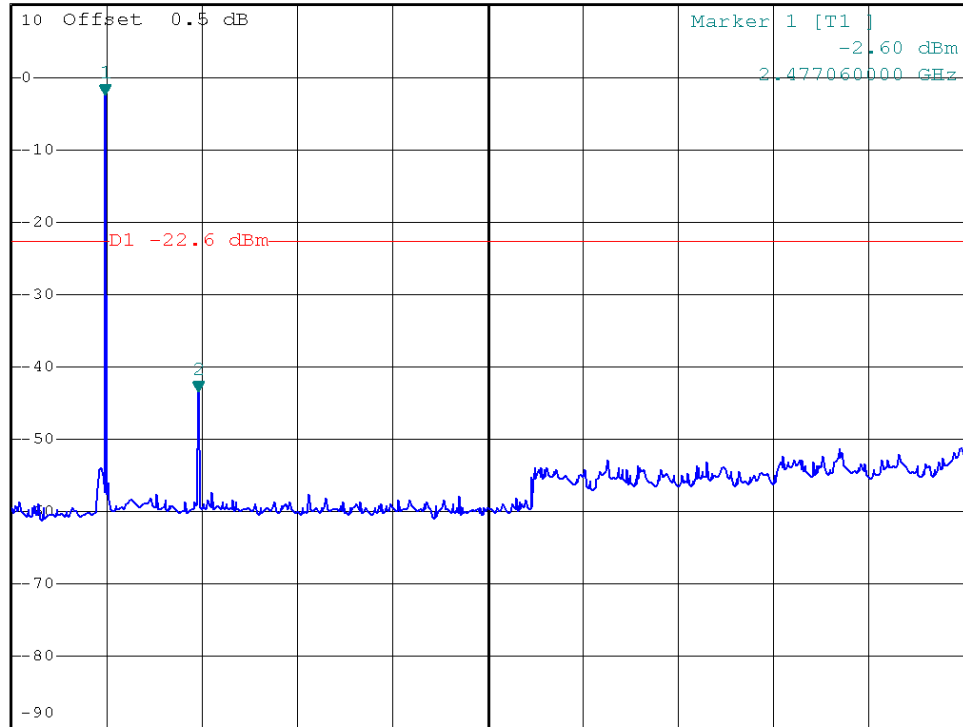
Ref 10 dBm

*Att 20 dB

SWT 2.5 s

4.924120000 GHz

1 PK
VIEW



Start 30 MHz

2.497 GHz/

Stop 25 GHz



8. POWER SPECTRAL DENSITY TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013

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

8.3 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW=3KHz, VBW=30KHz, Sweep time = 500s.

8.4 DEVIATION FROM STANDARD

No deviation.

8.5 TEST SETUP



8.6 EUT OPERATION CONDITIONS

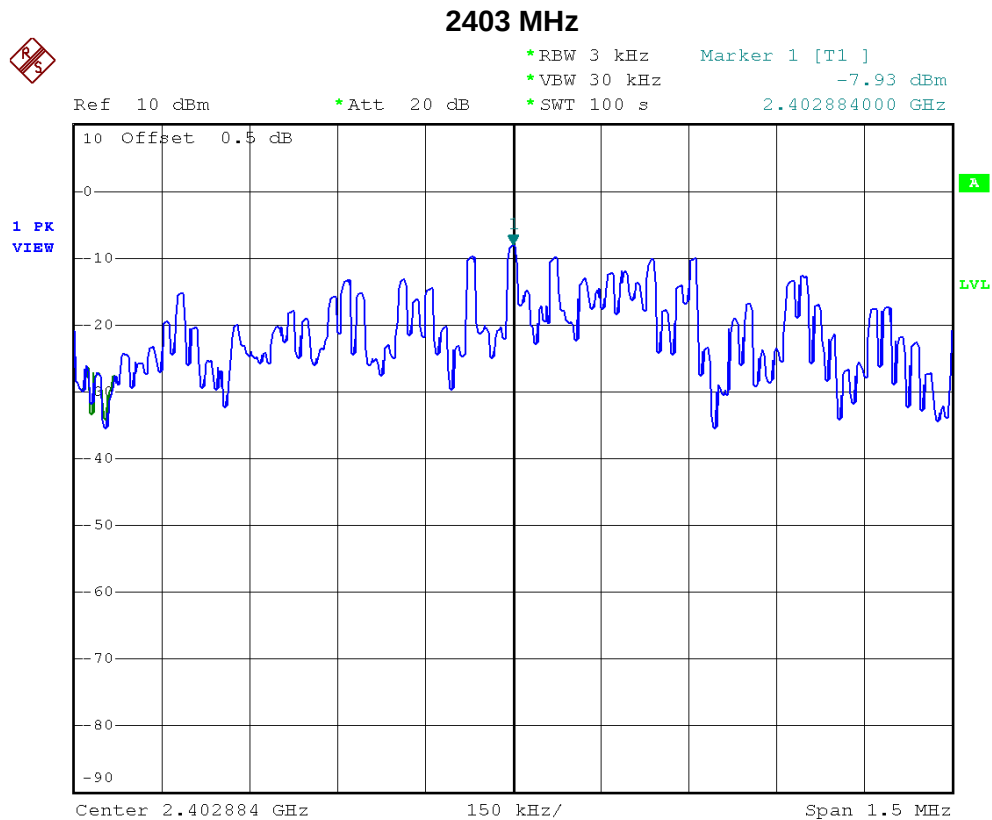
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



8.7 TEST RESULTS

EUT :	Wireless 2.4G HD Headset	Model Name :	RH-200
Temperature :	24 °C	Relative Humidity :	54%
Test Voltage :	DC 3.7V		
Test Mode :	2403 MHz/2439 MHz/2478 MHz		

Frequency	Power Density (dBm)	LIMIT (dBm)
2403 MHz	-7.93	8
2439 MHz	-8.72	8
2478 MHz	-9.02	8





2439 MHz

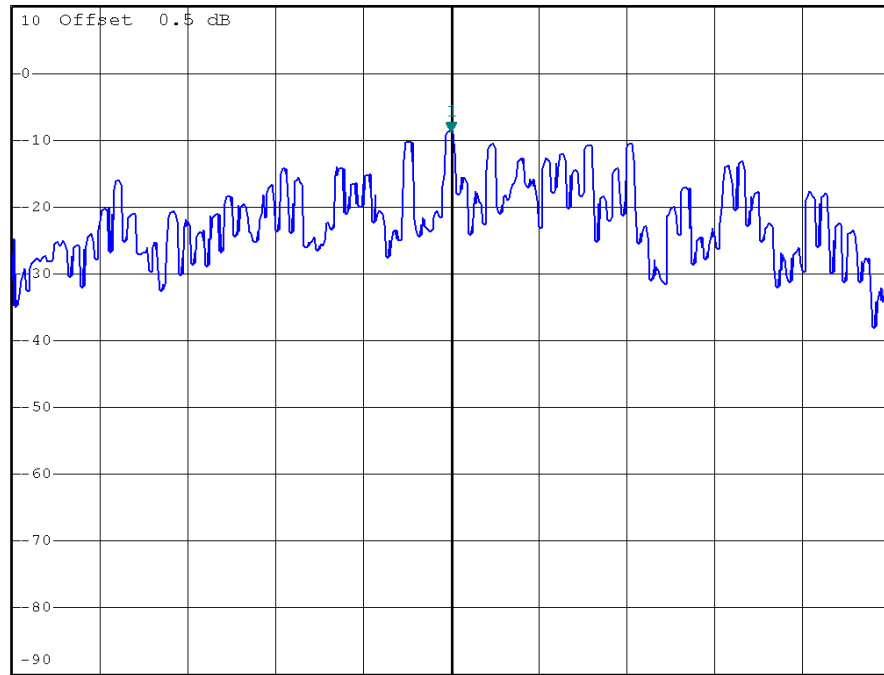


*RBW 3 kHz Marker 1 [T1]
*VBW 30 kHz -8.72 dBm
*SWT 100 s 2.438888000 GHz

Ref 10 dBm

*Att 20 dB

1 PK
VIEW



Center 2.438888 GHz

150 kHz/

Span 1.5 MHz

2478 MHz

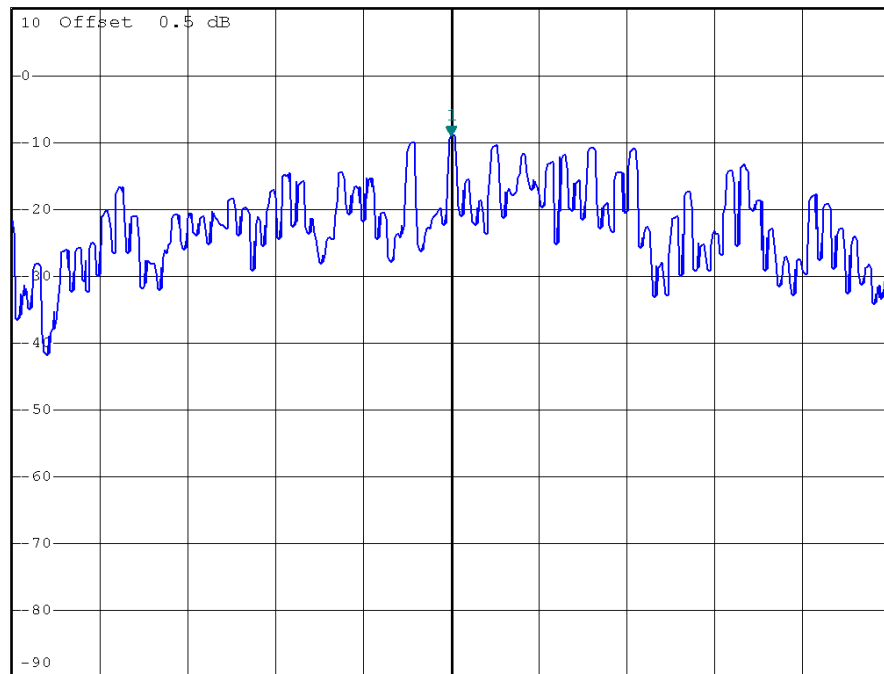


*RBW 3 kHz Marker 1 [T1]
*VBW 30 kHz -9.02 dBm
*SWT 100 s 2.477884000 GHz

Ref 10 dBm

*Att 20 dB

1 PK
VIEW



Center 2.477884 GHz

150 kHz/

Span 1.5 MHz



9. RF EXPOSURE TEST

9.1 APPLIED PROCEDURES / LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Feb,20,2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Feb,20,2013

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

9.3 MPE CALCULATION METHOD & TEST RESULTS

The power is too low, so no RF calculations are needed.