Radio Test Report

FCC ID: H8GRN10

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

Issued Date : Mar. 20, 2009
Project No. : R0902005
Equipment : 2.4G RF Dongle
Model Name : RN-10

Applicant : A-FOUR TECH CO., LTD.
Address : 6F, No.108, Min-Chuan Rd., Hsin-Tien, Taipei, Taiwan, R.O.C.

Tested by:
Neutron Engineering Inc. EMC Laboratory
Date of Test:
Feb. 26, 2009 ~ Mar. 11, 2009

Testing Engineer : Rush Kao
(Rush Kao)

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NVLAP Lab Code: 200145-0

ilac-MRA TAF Testing Laboratory 0659

Declaration

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

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Limitation

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

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1. CERTIFICATION

Equipment: 2.4G RF Dongle
Brand Name: A4Tech
Model No.: RN-10
Applicant: A-FOUR TECH CO., LTD.
Date of Test: Feb. 26, 2009 ~ Mar. 11, 2009
Test Item: ENGINEERING SAMPLE
Standards: FCC Part15, Subpart C(15.249) / RSS-210: 2004/ ANCI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-R0902005) 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			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.249	Radiated Spurious Emission	PASS	

NOTE:

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

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **C01/OS01(FCC R.N.: 95335)** at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.
Neutron's test firm number is 95335

2.2 MEASUREMENT UNCERTAINTY

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
C01	ANSI	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	V	2.86	
		30MHz ~ 200MHz	H	2.56	
		200MHz ~ 1,000MHz	V	2.88	
		200MHz ~ 1,000MHz	H	2.98	
OS-02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	2.4G RF Dongle
Brand Name	A4Tech
Model No.	RN-10
OEM Brand/Model No.	G-Cube/RN-10
Model Difference	N/A
Product Description	The EUT is a 2.4G RF Dongle. Operation Frequency: 2404.5~2473.5MHz Modulation Type: GFSK Number Of Channel 30CH Antenna Designation: Chip Antenna Antenna Gain(Peak) 2.5dBi Output Power: 99.49dBuV/m (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.
Channel List	Please refer to the Note 2.
Power Source	Supplied from PC USB port.
Power Rating	Supplied from PC USB port.
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	NA

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)	Channel	Frequency (MHz)
01	**2404.5**	09	2421.5	17	2440.5	25	2459.5
02	2406.5	10	2423.5	18	2442.5	26	2461.5
03	2408.5	11	2425.5	19	2444.5	27	2464.5
04	2410.5	12	2427.5	20	2446.5	28	2467.5
05	2412.5	13	2429.5	21	2450.5	29	2470.5
06	2414.5	14	2433.5	22	2453.5	**30**	**2473.5**
07	2416.5	**15**	**2436.5**	23	2455.5		
08	2419.5	16	2438.5	24	2457.5		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ACXA	AT8010-E2R9HAA	Chip Antenna	UFL	2.5

3.2 DESCRIPTION OF TEST MODES

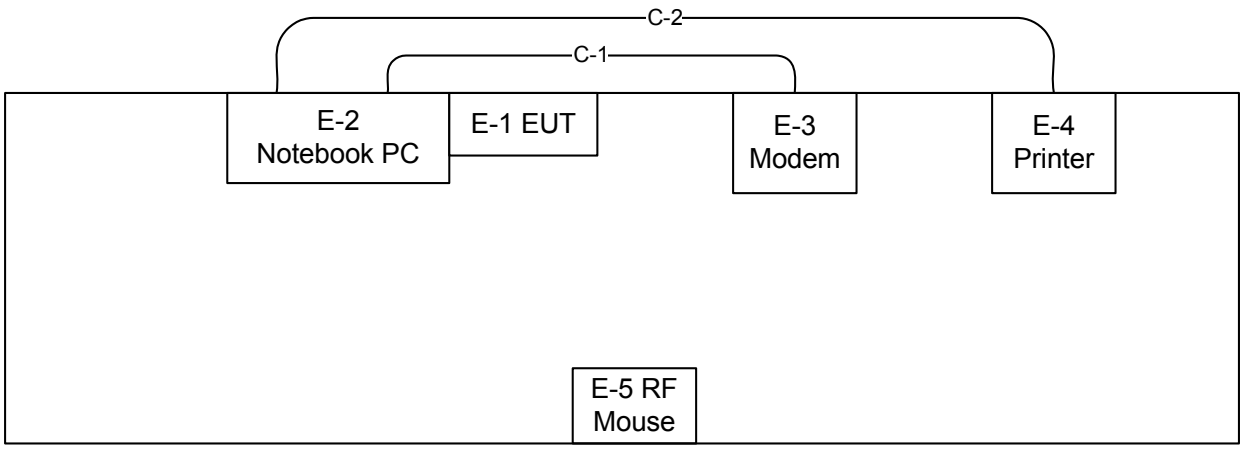
To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

Pretest Test Mode	Description
Mode 1	CH01
Mode 2	CH15
Mode 3	CH30

For Conducted Test	
Final Test Mode	Description
Mode 2	CH15

For Radiated Test	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH15
Mode 3	CH30

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 RS232 Cable
C-2 Parallel Cable

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	2.4G RF Dongle	A4Tech	RN-10	H8GRN10	N/A	EUT
E-2	Notebook PC	DELL	D600	DOC	7T390 A03	
E-3	Modem	ACEEX	DM-1414V	DOC	8041708	
E-4	Printer	SII	DPU-414	DOC	1045105A	
E-5	2.4G RF Mouse	A4Tech	G7630	H8GG7630	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.8M	
C-2	NO	NO	1.7M	

Note:

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

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (FREQUENCY RANGE 150KHZ-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.

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Test Cable	N/A	C01	N/A	Oct. 08, 2009
2	Test Cable	N/A	SR03_C_01 &02	N/A	Oct. 19, 2009
3	LISN	EMCO	3816/2	00042991	Jan. 21, 2010
4	Pulse Limiter	Electro-Metrics	EM-7600	112644	Dec. 28, 2009
5	50Ω Terminator	N/A	N/A	N/A	May 13, 2009
6	EMI Test Receiver	R&S	ESCI	100082	Mar. 23, 2009
7	LISN	EMCO	4825/2	00028234	Jul. 09, 2009

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

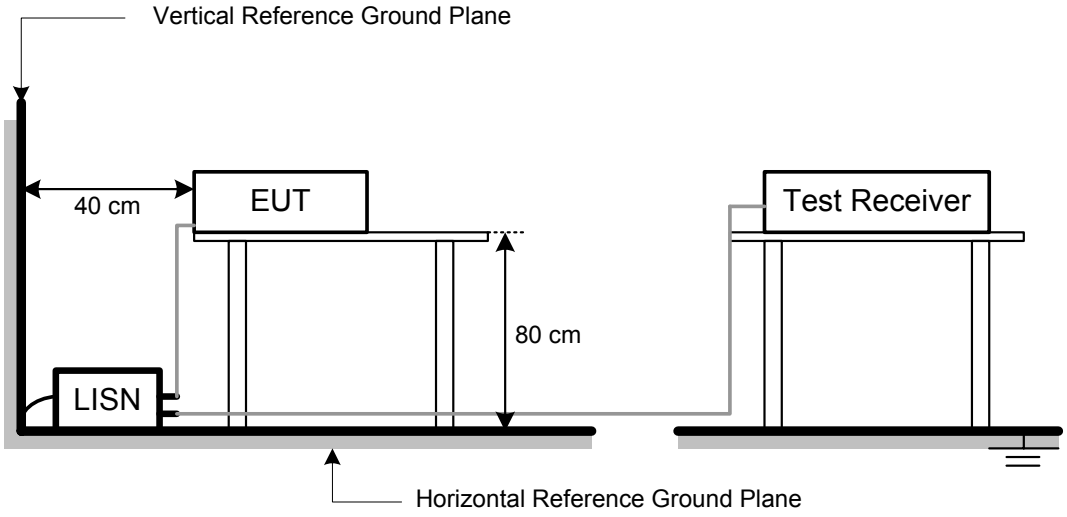
4.1.3 TEST PROCEDURE

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



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 :	2.4G RF Dongle	Model Name :	RN-10
Temperature :	24°C	Relative Humidity :	63%
Test Voltage :	AC 120V/60Hz		
Test Mode :	CH15		

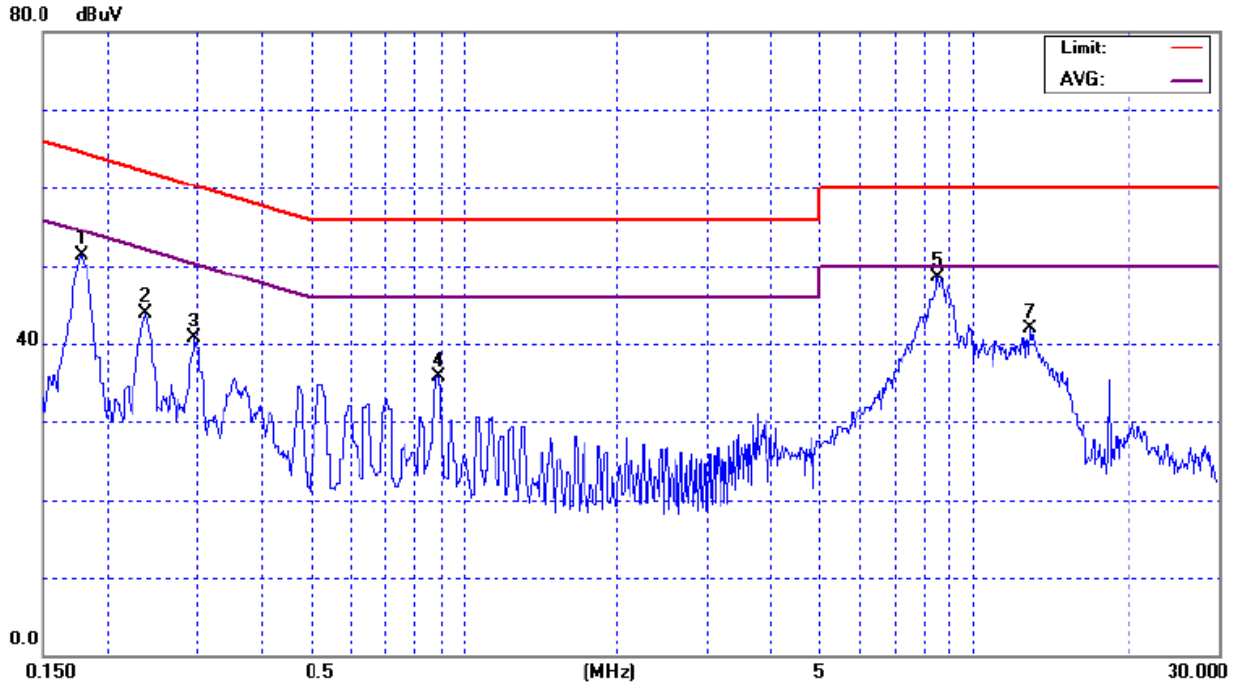
Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.18	Line	51.25	*	64.61	54.61	-13.36	(QP)
0.24	Line	43.83	*	62.18	52.18	-18.35	(QP)
0.30	Line	40.70	*	60.33	50.33	-19.63	(QP)
0.89	Line	35.64	*	56.00	46.00	-20.36	(QP)
8.50	Line	48.57	9.89	60.00	50.00	-11.43	(QP)
12.90	Line	41.96	*	60.00	50.00	-18.04	(QP)

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.2 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz,VBW=10KHz, Swp. Time =0.2 sec./MHz。

(2) 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。

(3) Measuring frequency range from 150KHz to 30MHz。



E.U.T :	2.4G RF Dongle	Model Name :	RN-10
Temperature :	24°C	Relative Humidity :	63%
Test Voltage :	AC 120V/60Hz		
Test Mode :	CH15		

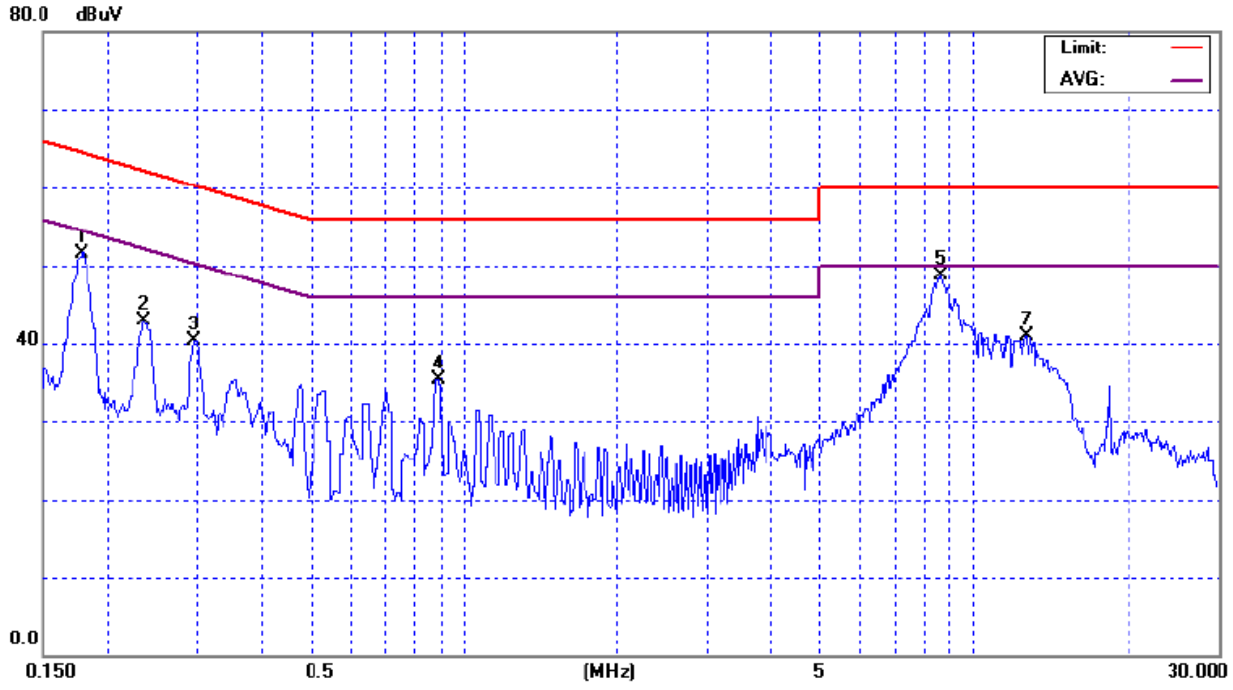
Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.18	Neutral	51.60	*	64.55	54.55	-12.95	(QP)
0.24	Neutral	42.95	*	62.23	52.23	-19.28	(QP)
0.30	Neutral	40.25	*	60.37	50.37	-20.12	(QP)
0.89	Neutral	35.33	*	56.00	46.00	-20.67	(QP)
8.60	Neutral	48.72	40.17	60.00	50.00	-9.83	(AV)
12.65	Neutral	40.99	*	60.00	50.00	-19.01	(QP)

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.2 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz,VBW=10KHz, Swp. Time =0.2 sec./MHz。

(2) 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。

(3) Measuring frequency range from 150KHz to 30MHz。



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

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

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

Note:

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

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

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

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

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

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

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

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

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3176	Jul. 24, 2009
2	Test Cable	N/A	10M_OS01	N/A	Oct. 20, 2009
3	Test Cable	N/A	OS01-1/-2	N/A	Oct. 08, 2009
4	Pre-Amplifier	Anritsu	MH648A(OS01)	M09961	Dec. 29, 2009
5	Spectrum Analyzer	HP	8591EM	3536A00681010	Mar. 13, 2009
6	EMI Measuring Receiver	SHCAFFNER	SCR 3501	408	Nov. 24.2009
7	Spectrum Analyzer	R&S	FSP-30	100854	Apr. 14, 2009
8	Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-546	May 27, 2009
9	Microwave Pre_amplifier	Agilent	8449B	3008A02331	Jan. 19, 2010
10	Microflex Cable	NA	NA	1m	Sep. 15, 2009
11	Microflex Cable	NA	NA	10M	Feb. 19, 2010

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

4.2.3 TEST PROCEDURE

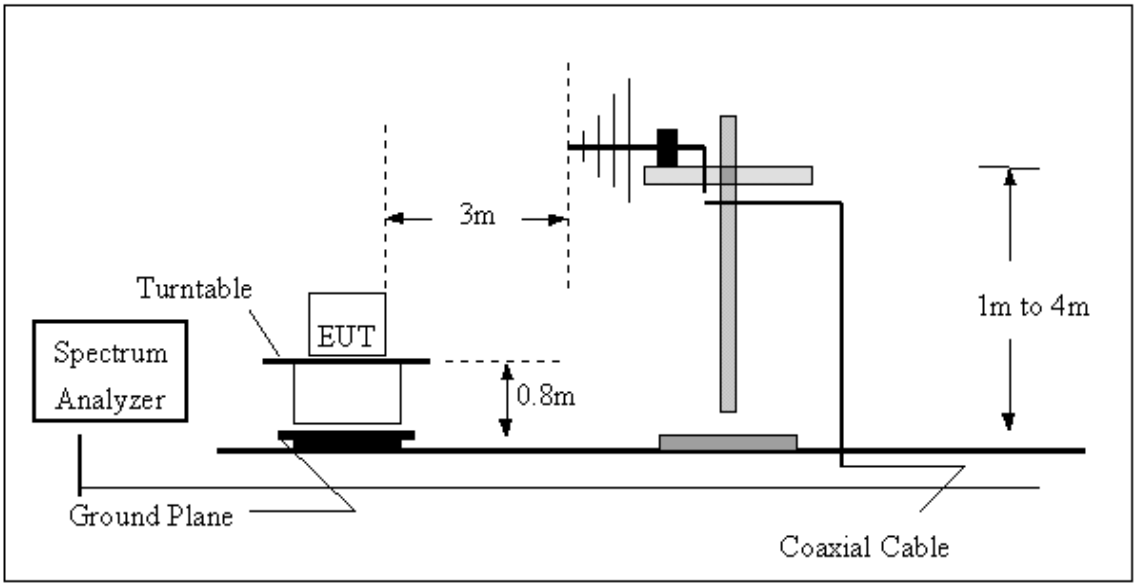
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated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

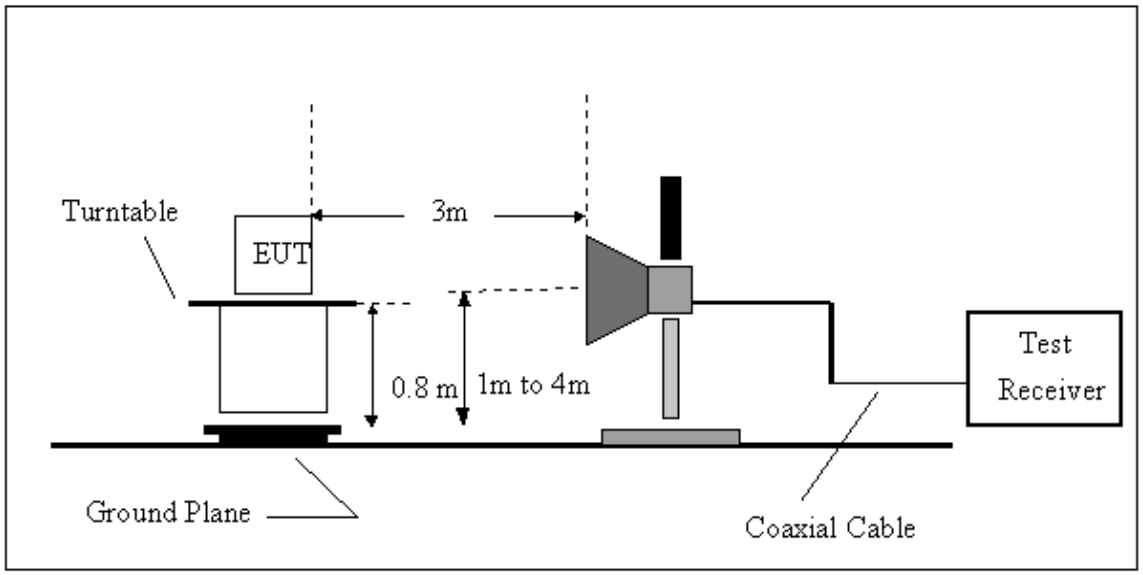
No deviation

4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



4.2.6 EUT OPERATING CONDITIONS

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

4.2.7 TEST RESULTS-BETWEEN 30MHz – 1000MHz

EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	CH15		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
217.60	V	42.31	-14.63	27.68	46.00	- 18.32	
335.90	V	43.89	-10.15	33.74	46.00	- 12.26	
366.24	V	46.07	-9.00	37.07	46.00	- 8.93	
432.88	V	44.99	-7.12	37.87	46.00	- 8.13	
699.30	V	38.89	-1.40	37.49	46.00	- 8.51	
898.80	V	36.64	2.50	39.14	46.00	- 6.86	

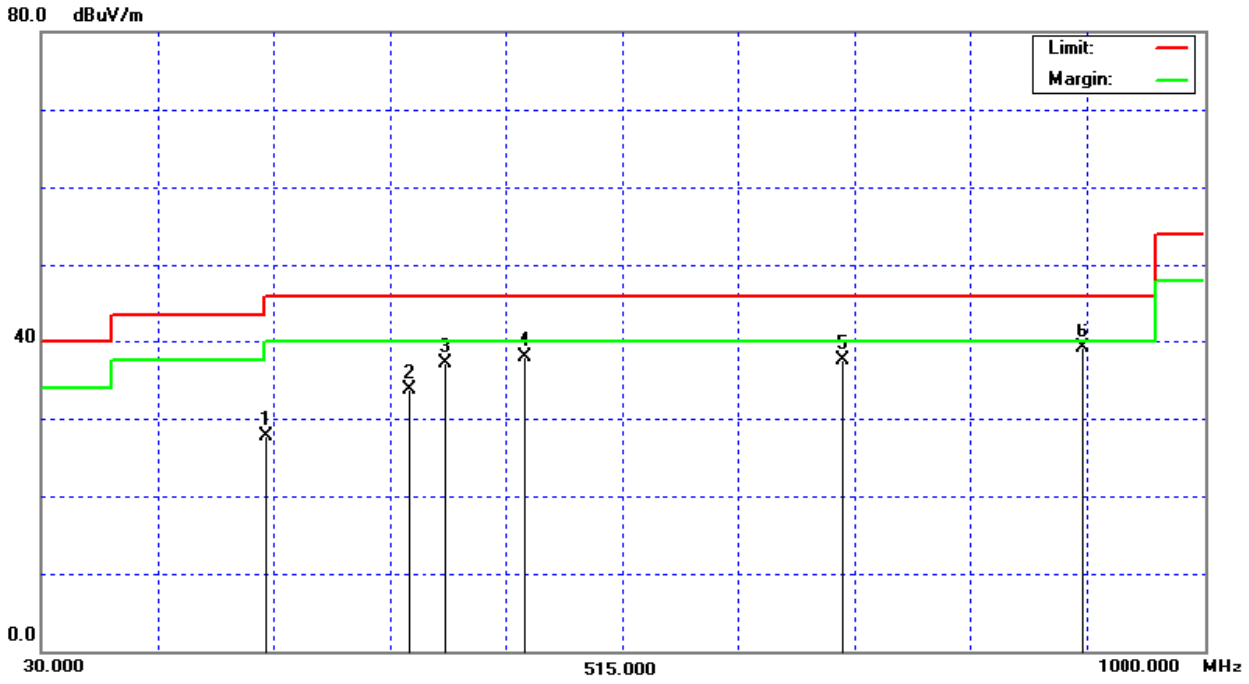
Remark：

(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 measure-ment didn't perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value is under the limit for more than 20dB, the signal will not show in table。



EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14 °C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	CH15		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
336.00	H	39.55	-10.14	29.41	46.00	- 16.59	
366.68	H	44.31	-8.99	35.32	46.00	- 10.68	
433.32	H	43.99	-7.11	36.88	46.00	- 9.12	
499.97	H	43.49	-5.32	38.17	46.00	- 7.83	
527.82	H	39.27	-4.70	34.57	46.00	- 11.43	
898.71	H	31.19	2.50	33.69	46.00	- 12.31	

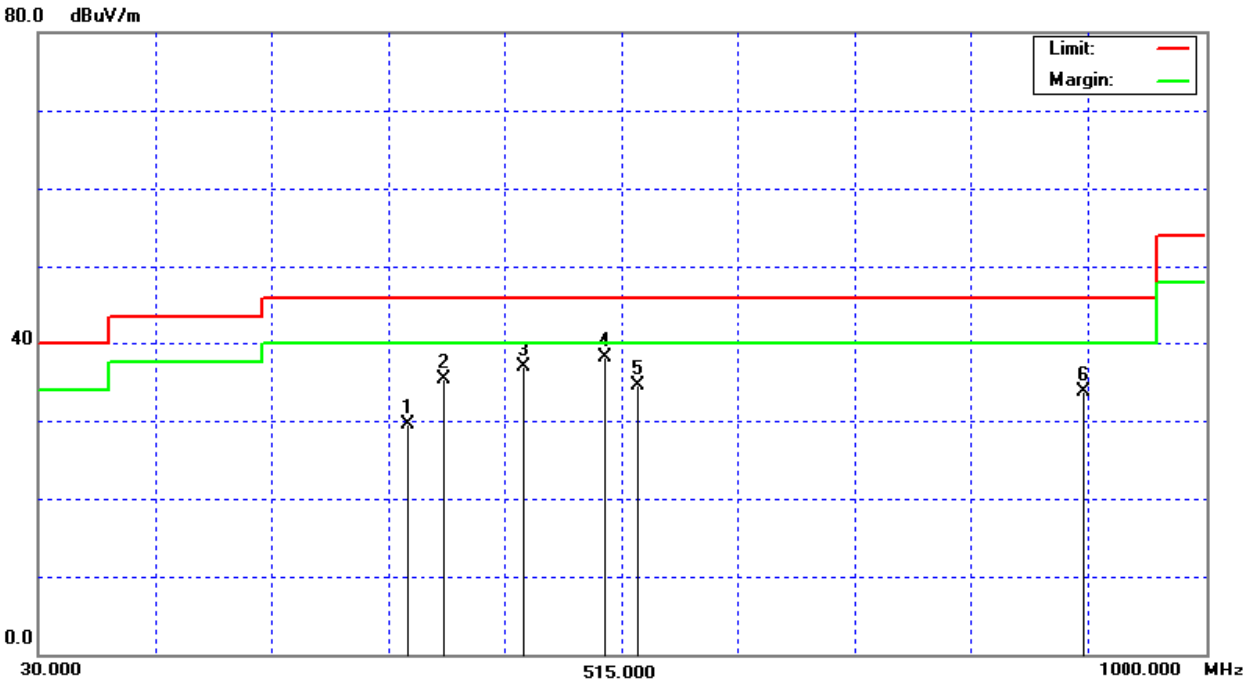
Remark：

(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 measure-ment didn't perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value is under the limit for more than 20dB, the signal will not show in table。



4.2.8 TEST RESULTS-ABOVE 1000MHz

EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	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	23.09	7.70	32.57	55.66	40.27	74.00	54.00	X/E
2400.00	V	29.55	14.16	32.63	62.18	46.79	74.00	54.00	X/E
2404.50	**V**								**X/F**
4808.74	V	46.41	31.02	4.52	50.93	35.54	74.00	54.00	X/H
7213.24	V	48.52	33.13	11.05	59.57	44.18	74.00	54.00	X/H

Remark：

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

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

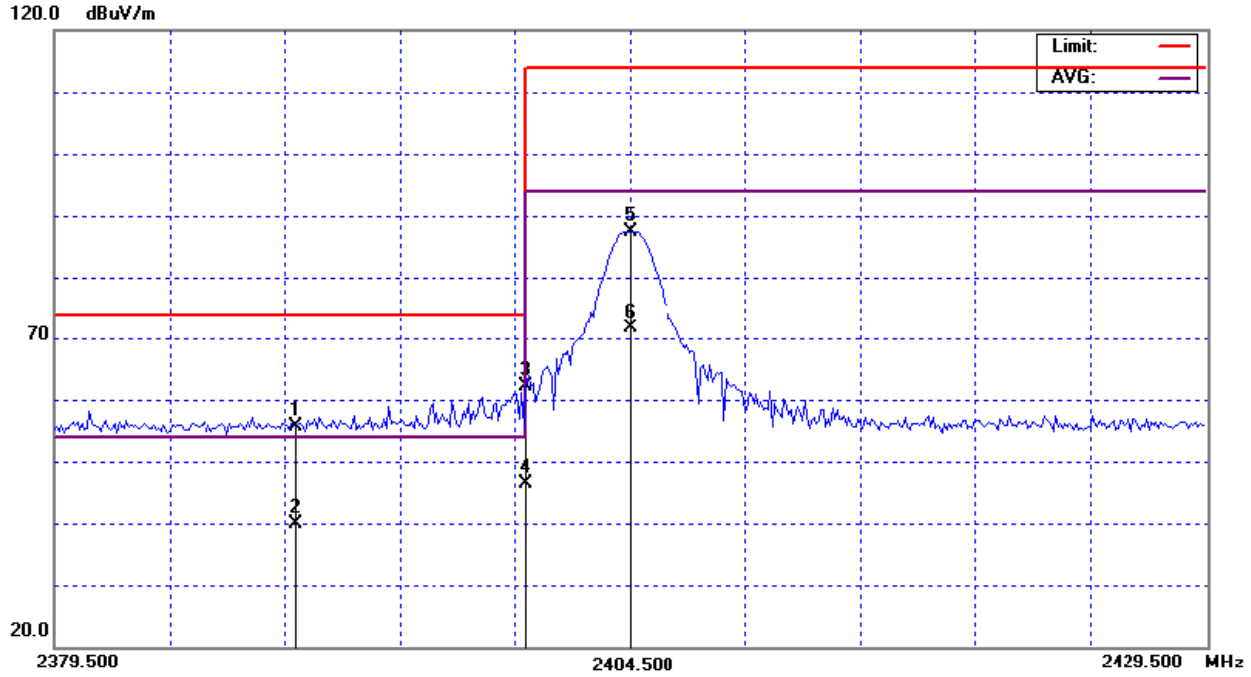
(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

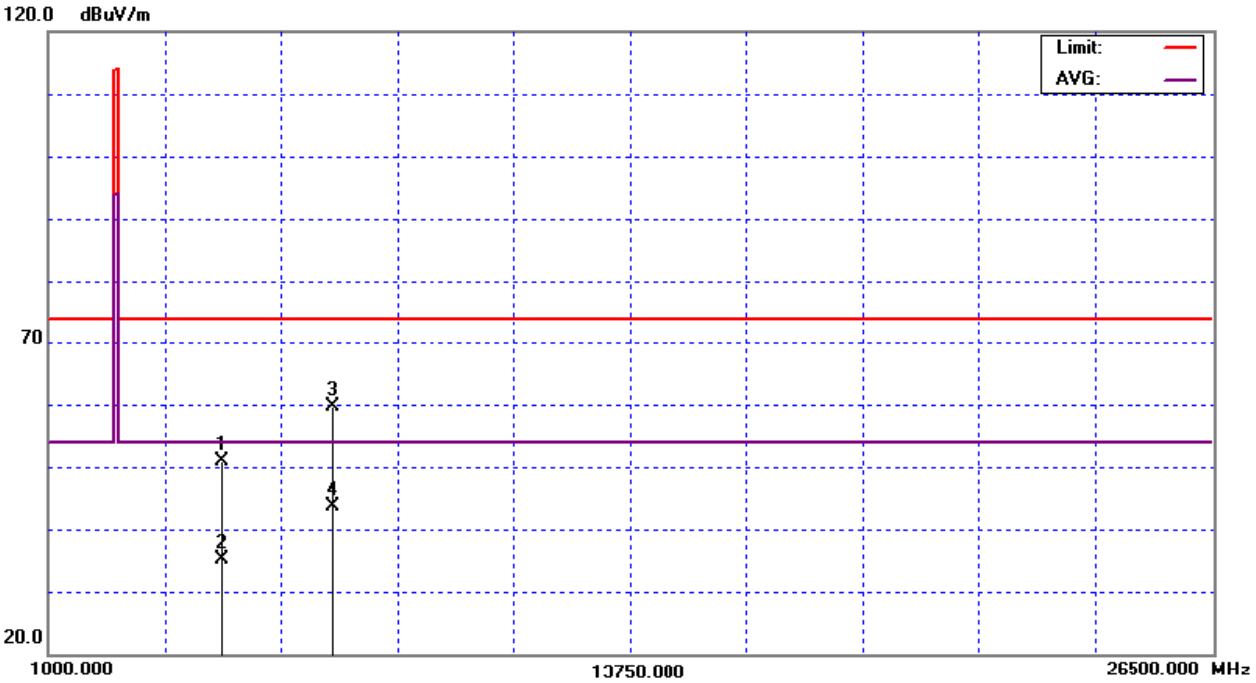
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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

Orthogonal Axes：X
CH01 (Above 1000 MHz, Vertical)





EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	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	23.03	7.64	32.57	55.60	40.21	74.00	54.00	X/E
2400.00	H	36.46	21.06	32.63	69.09	53.69	74.00	54.00	X/E
2404.30	**H**								**X/F**
4808.80	H	43.74	28.35	4.52	48.26	32.87	74.00	54.00	X/H
7213.40	H	45.99	31.60	11.05	57.04	42.65	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.)

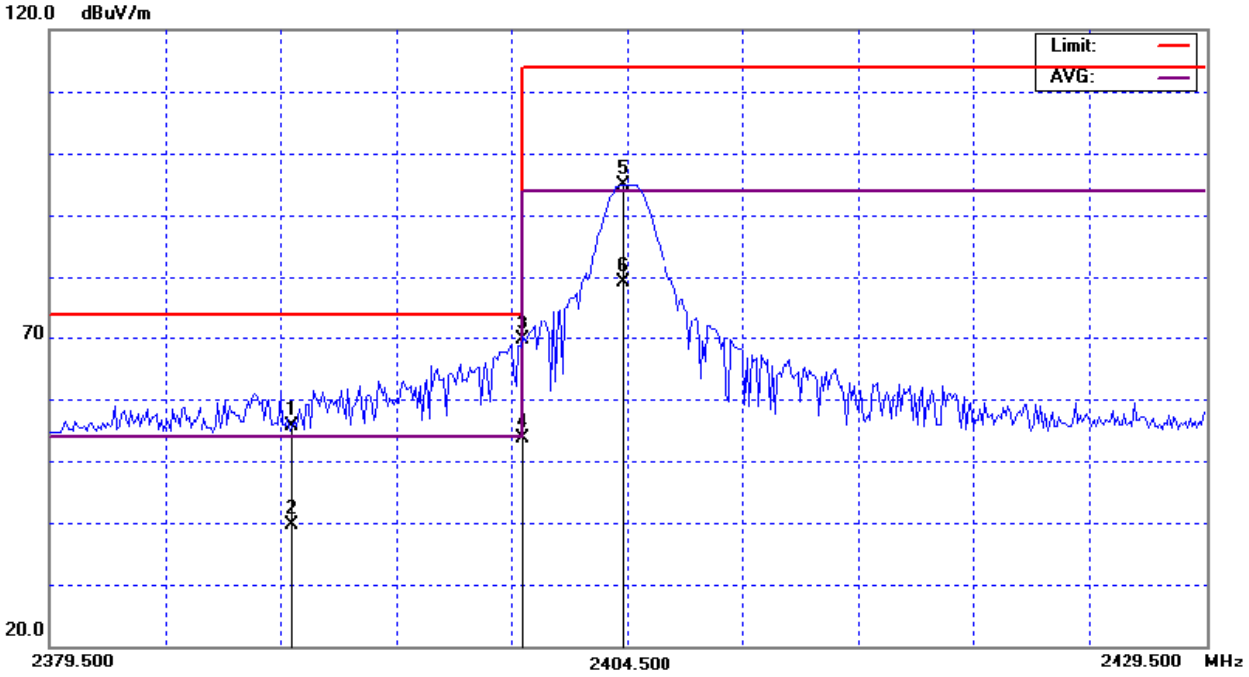
(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

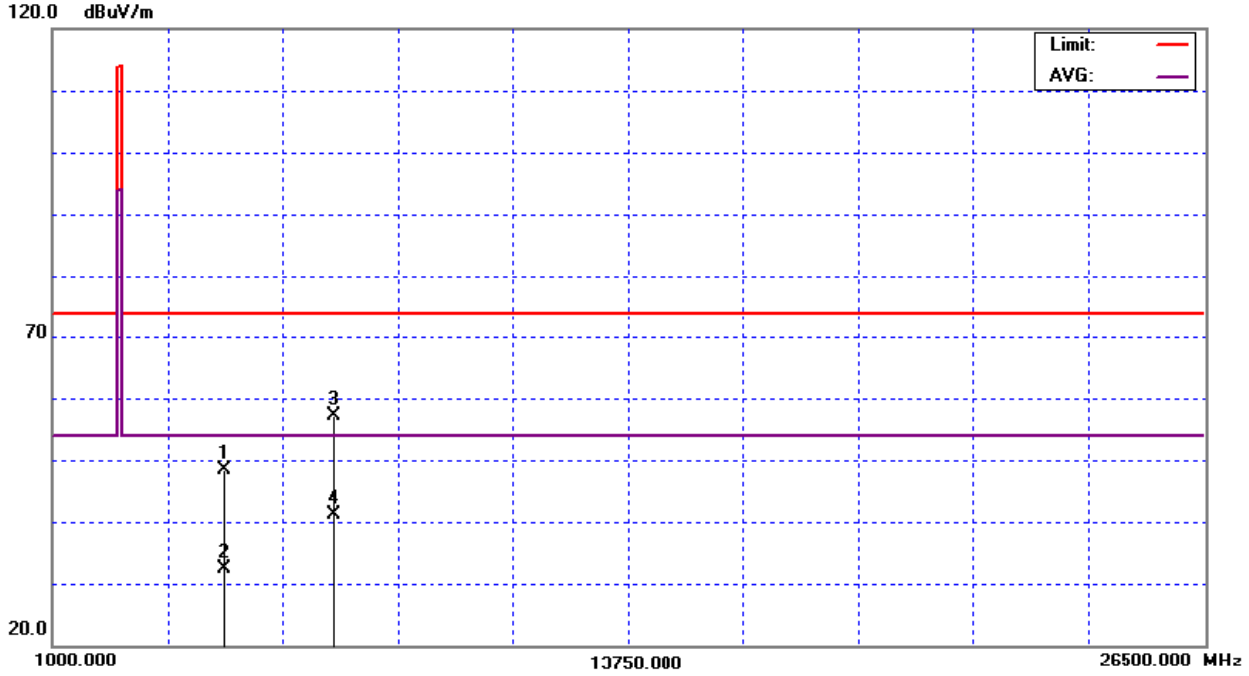
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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

Orthogonal Axes：X
CH01 (Above 1000 MHz, Horizontal)





EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	CH15		

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)	
2436.50	**V**								**X/F**
4873.10	V	46.46	31.07	4.73	51.19	35.80	74.00	54.00	X/H
7309.64	V	46.67	31.28	11.35	58.02	42.63	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.)

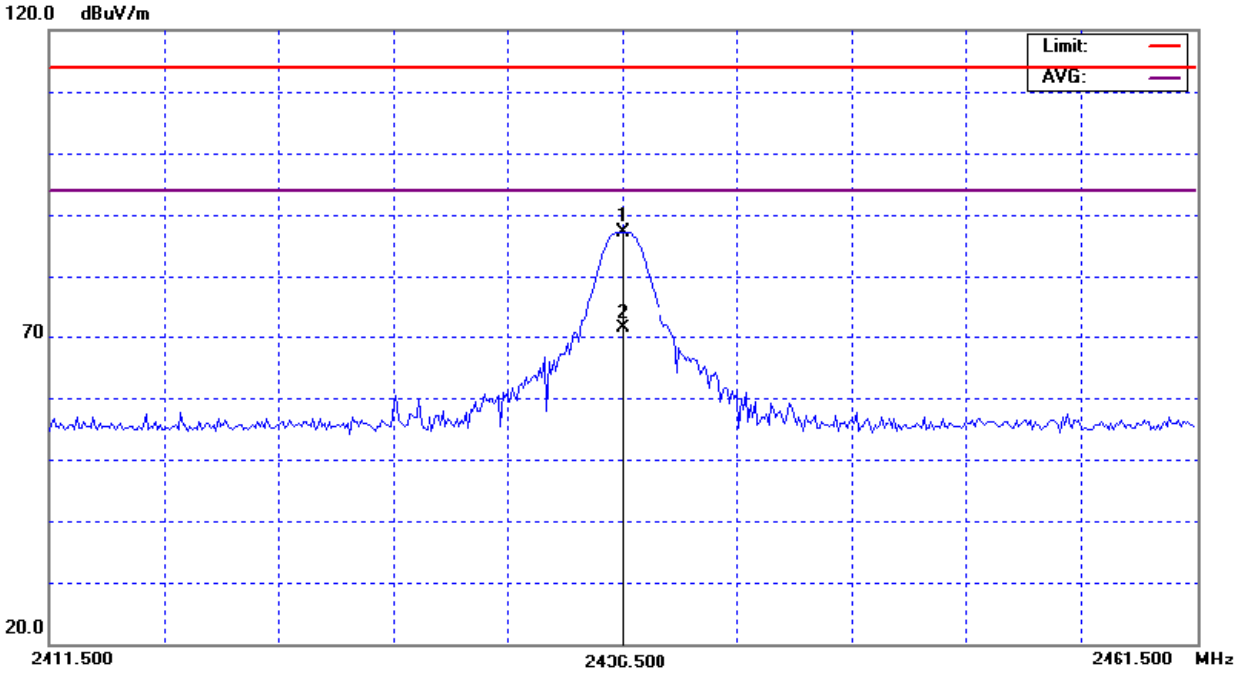
(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

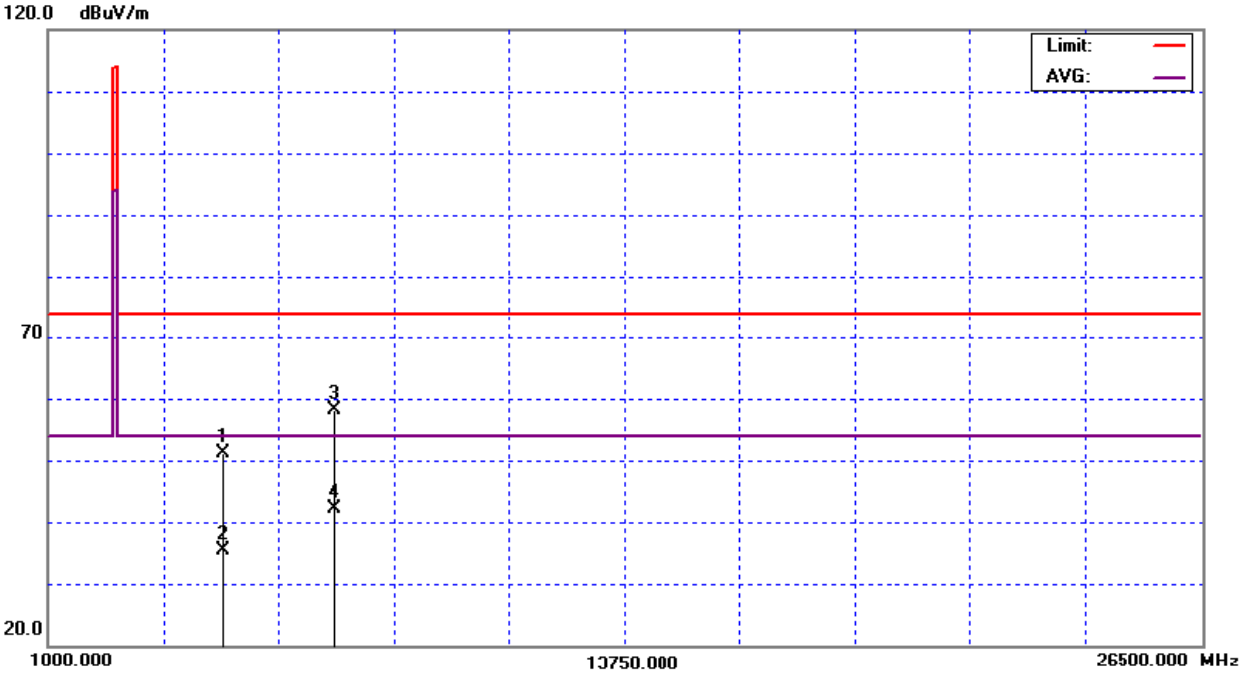
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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

Orthogonal Axes：X
CH15(Above 1000 MHz, Vertical)





EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	CH15		

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)	
2436.70	**H**								**X/F**
4873.04	H	44.37	28.98	4.73	49.10	33.71	74.00	54.00	X/H
7309.64	H	43.56	28.17	11.35	54.91	39.52	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 。

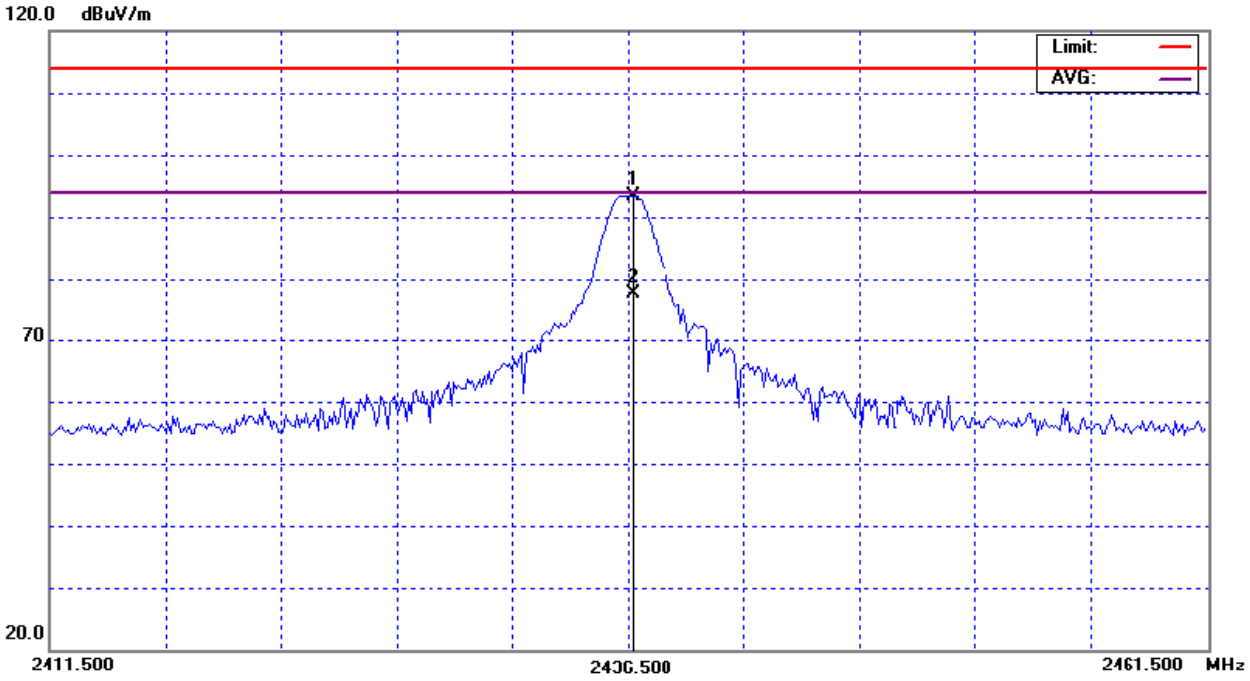
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

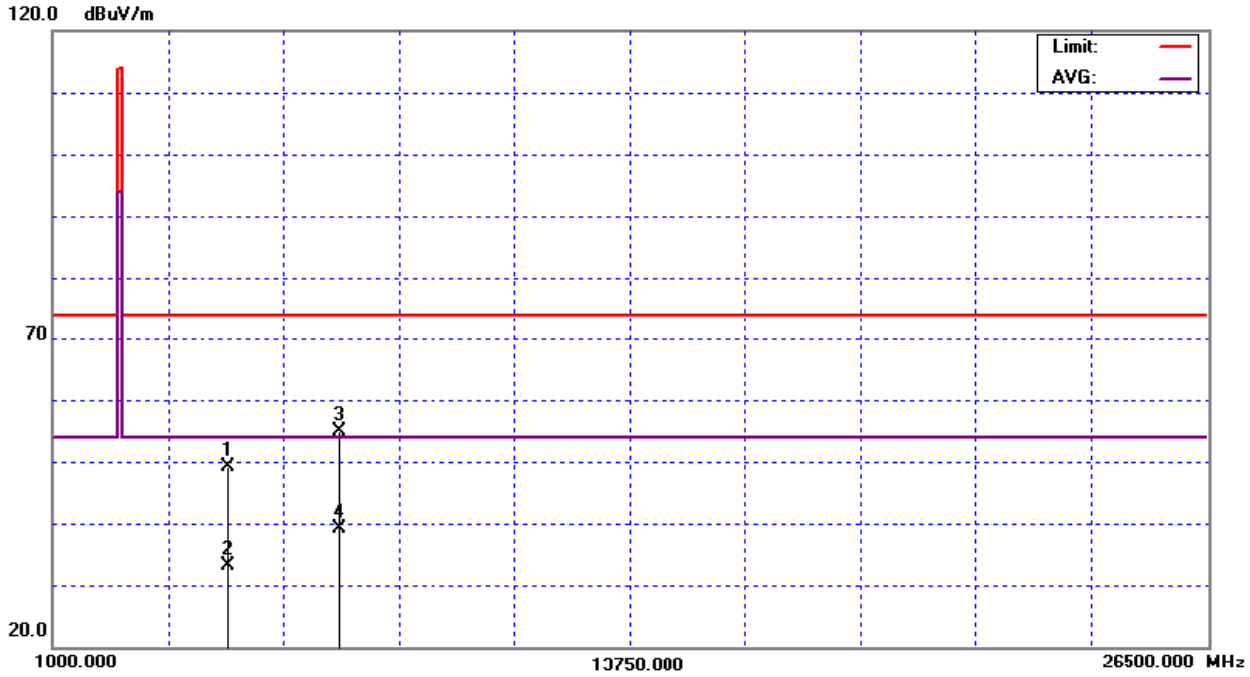
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

Orthogonal Axes：X
CH15(Above 1000 MHz, Horizontal)





EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	CH30		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
(MHz)	H/V	Peak (dBuV)	AV (dBuV)	CF(dB)	Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2473.50	**V**								**X/F**
2483.50	V	22.77	7.38	33.10	55.87	40.48	74.00	54.00	X/E
4946.46	V	48.39	33.00	4.96	53.35	37.96	74.00	54.00	X/H
7420.70	V	44.47	29.08	11.70	56.17	40.78	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.)

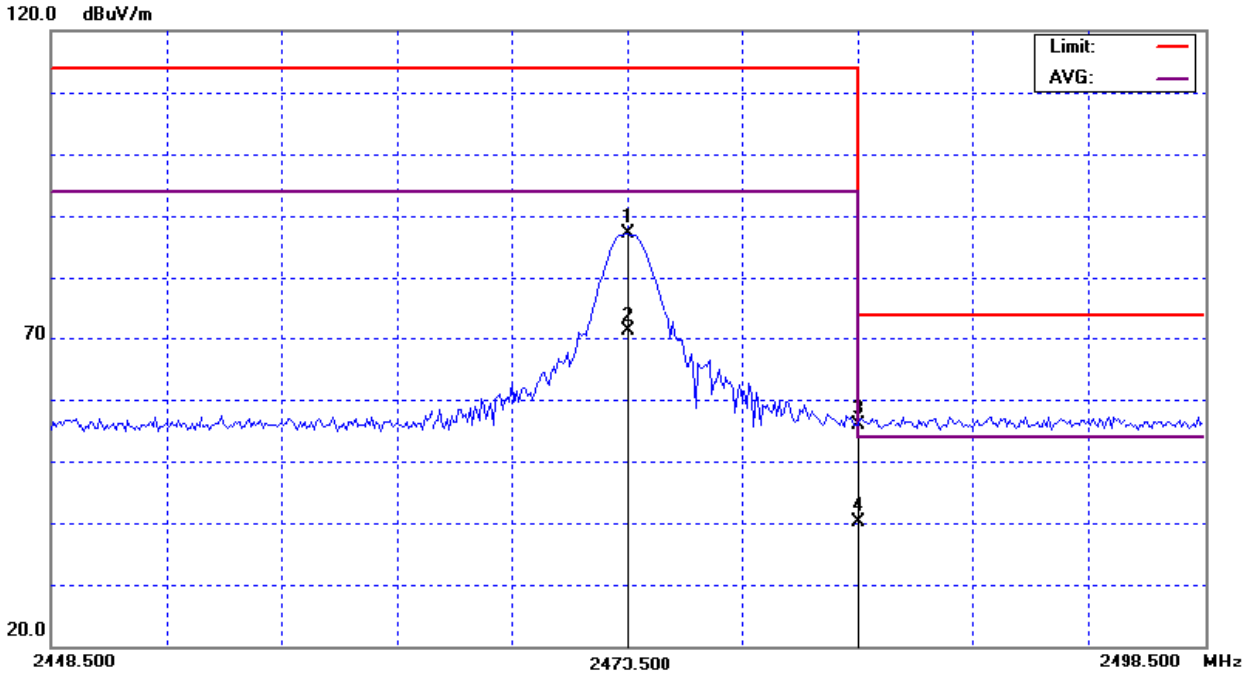
(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

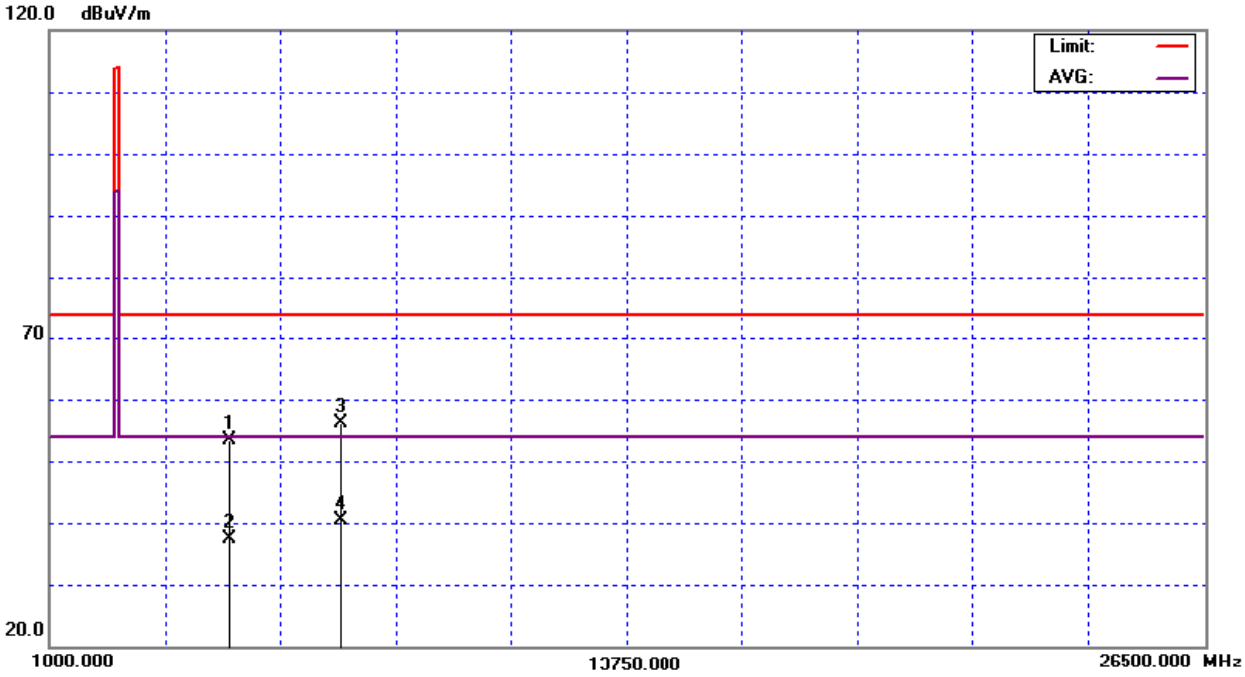
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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

Orthogonal Axes：X
CH30 (Above 1000 MHz, Vertical)





EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	CH30		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
(MHz)	H/V	Peak (dBuV)	AV (dBuV)	CF(dB)	Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2473.30	**H**								**X/F**
2483.50	H	27.60	12.21	33.10	60.70	45.31	74.00	54.00	X/E
4947.14	H	43.17	27.78	4.97	48.14	32.75	74.00	54.00	X/H
7420.58	H	43.81	28.42	11.70	55.51	40.12	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.)

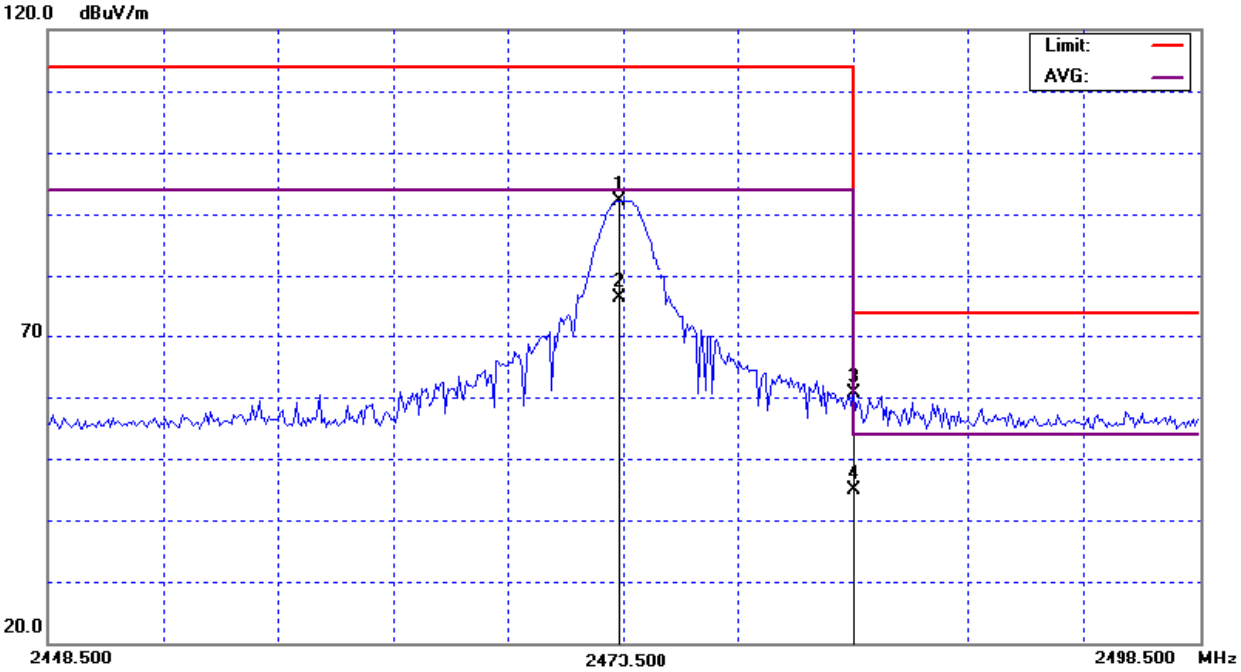
(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

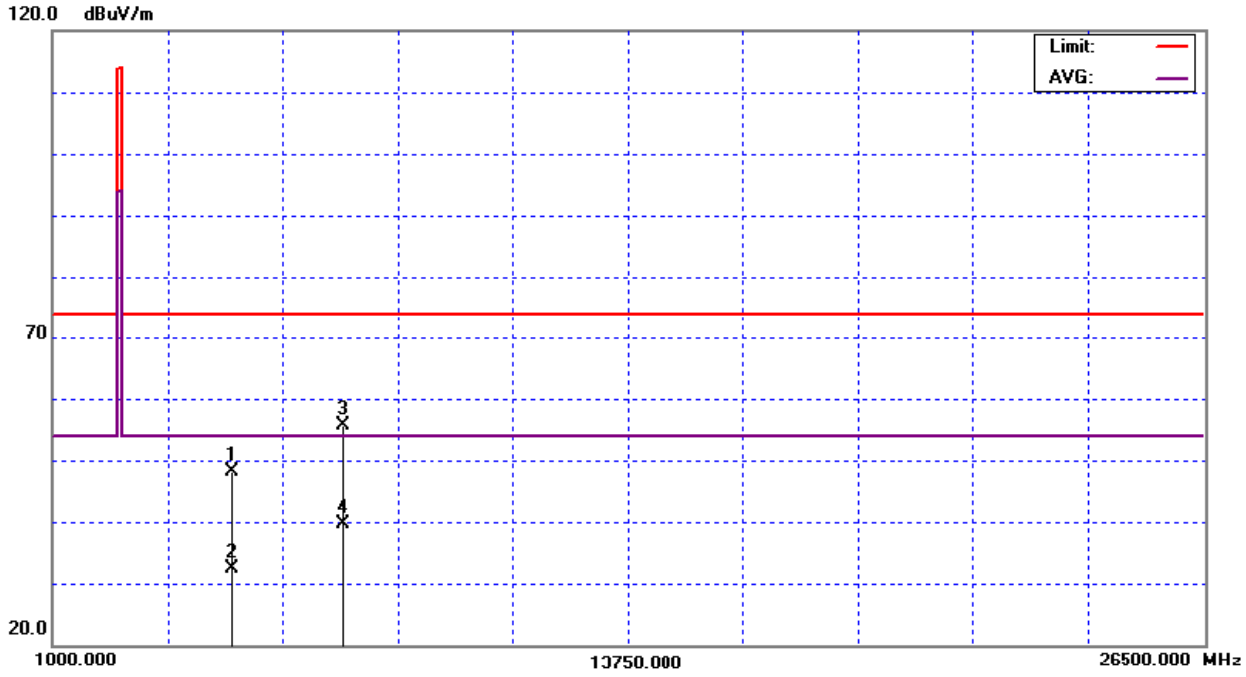
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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

Orthogonal Axes：X
CH30 (Above 1000 MHz, Horizontal)





4.2.9 TEST RESULTS-2404.5MHz – 2473.5MHz

EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	TX CH 2404.5MHz/2436.5MHz/2473.5MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Actual FS		Limit3m		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	(H/V)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2404.50	V	54.79	39.40	32.66	87.45	72.06	114.00	94.00	CH01
2404.50	H	62.34	46.95	32.65	94.99	79.60	114.00	94.00	CH01
2436.50	V	54.40	39.01	32.83	87.23	71.84	114.00	94.00	CH15
2436.50	H	60.60	45.21	32.84	93.44	78.05	114.00	94.00	CH15
2473.50	V	53.98	38.59	33.04	87.02	71.63	114.00	94.00	CH30
2473.50	H	59.11	43.72	33.04	92.15	76.76	114.00	94.00	CH30

Remark：

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

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

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

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

4.2.10 TEST RESULTS-RESTRICTED BANDS REQUIREMENTS

EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	TX CH 2404.5MHz/2473.5MHz(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 (CH01). 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 (CH30). Then the field strength was measured at 2483.5-2500 MHz.		

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	23.09	7.70	32.57	55.66	40.27	74.00	54.00	CH01
2483.50	V	22.77	7.38	33.10	55.87	40.48	74.00	54.00	CH30

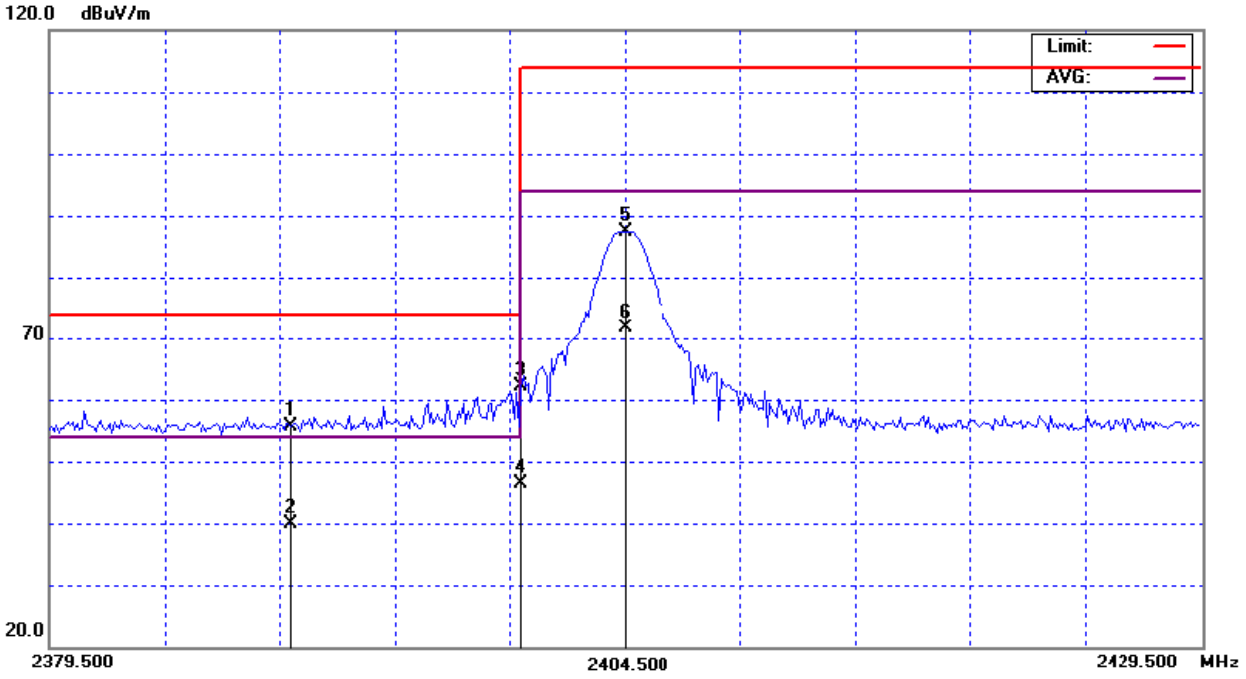
Remark：

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

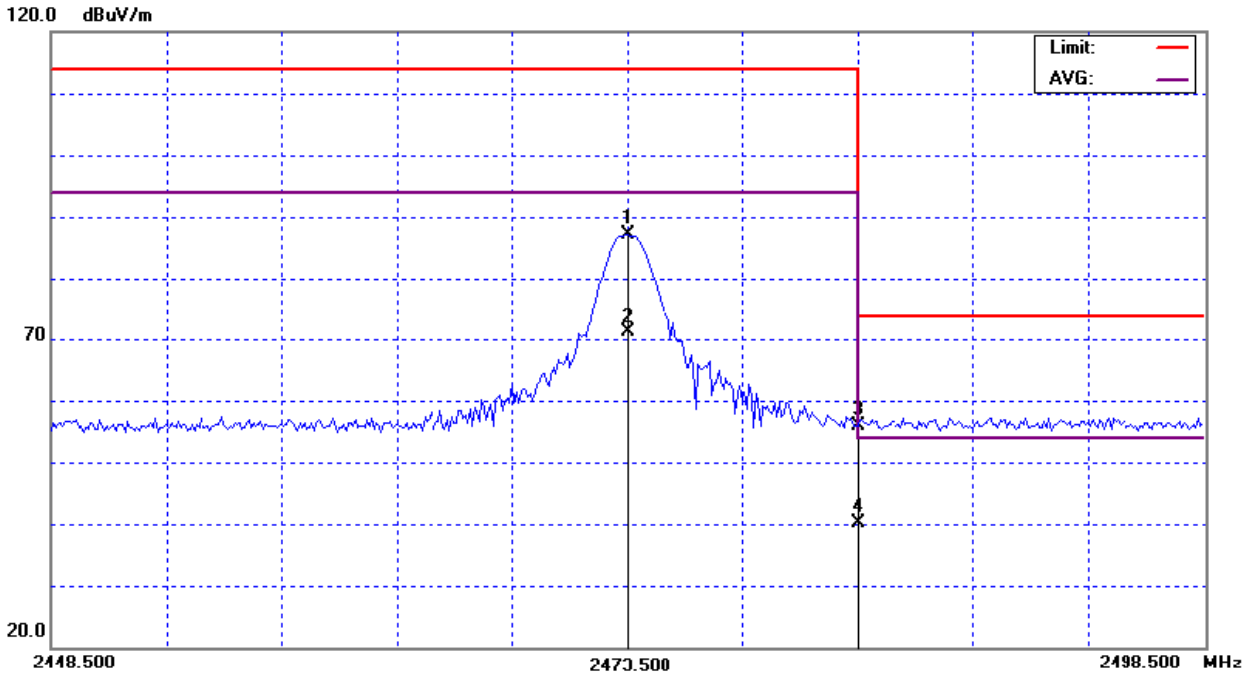
(2) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

TX CH01 (Restricted Bands Requirements, Vertical)



TX CH30 (Restricted Bands Requirements, Vertical)



EUT：	2.4G RF Dongle	Model No. ：	RN-10
Temperature：	14°C	Relative Humidity：	81%
Test Power ：	AC 120V/60Hz		
Test Mode ：	TX CH 2404.5MHz/2473.5MHz (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 (CH01). 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 (CH30). Then the field strength was measured at 2483.5-2500 MHz.		

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	23.03	7.64	32.57	55.60	40.21	74.00	54.00	CH01
2483.50	H	27.60	12.21	33.10	60.70	45.31	74.00	54.00	CH30

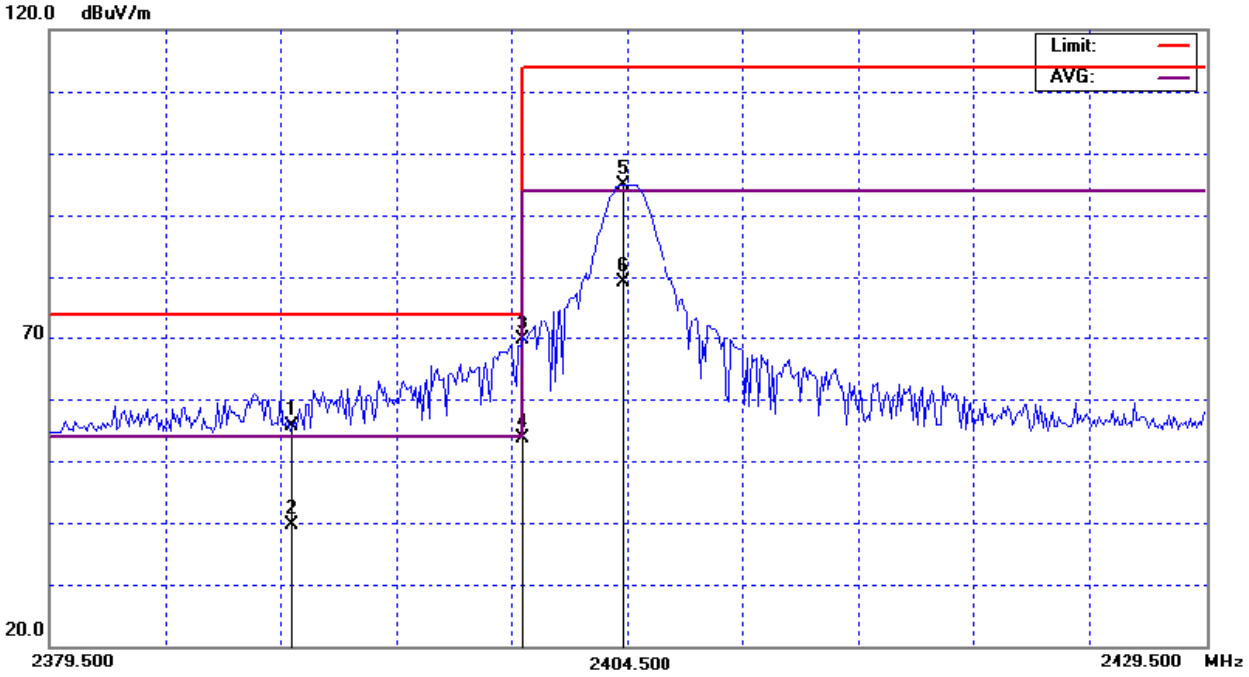
Remark：

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

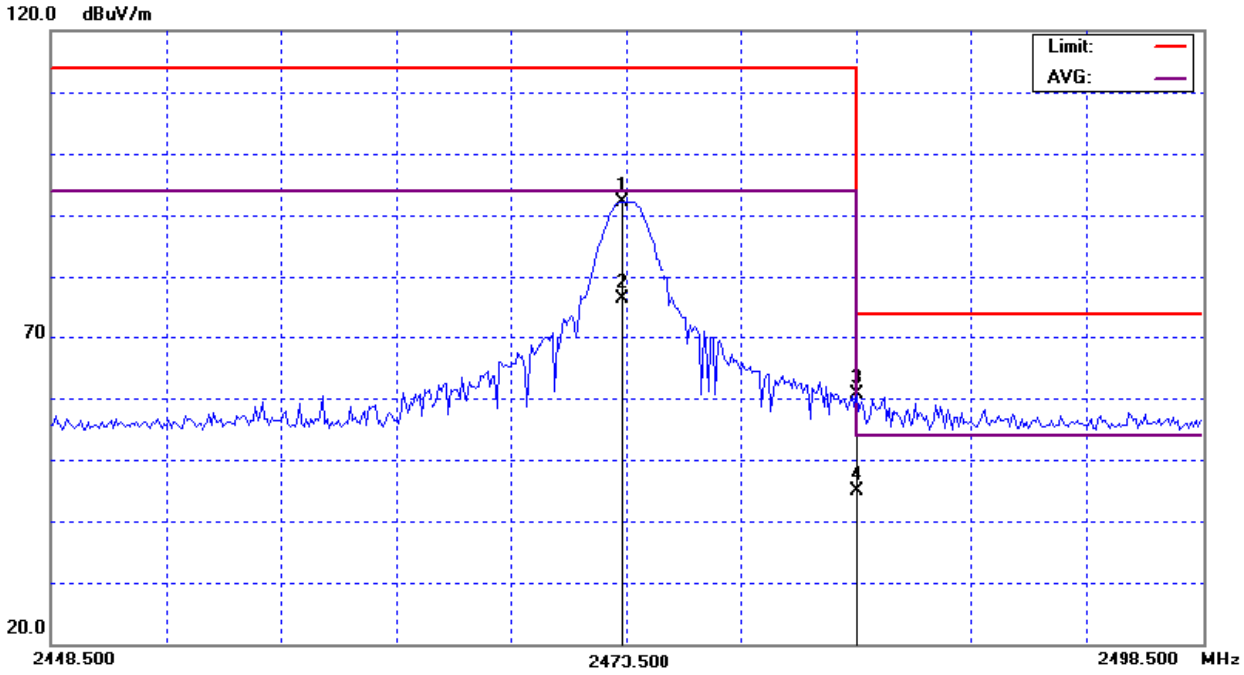
(2) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

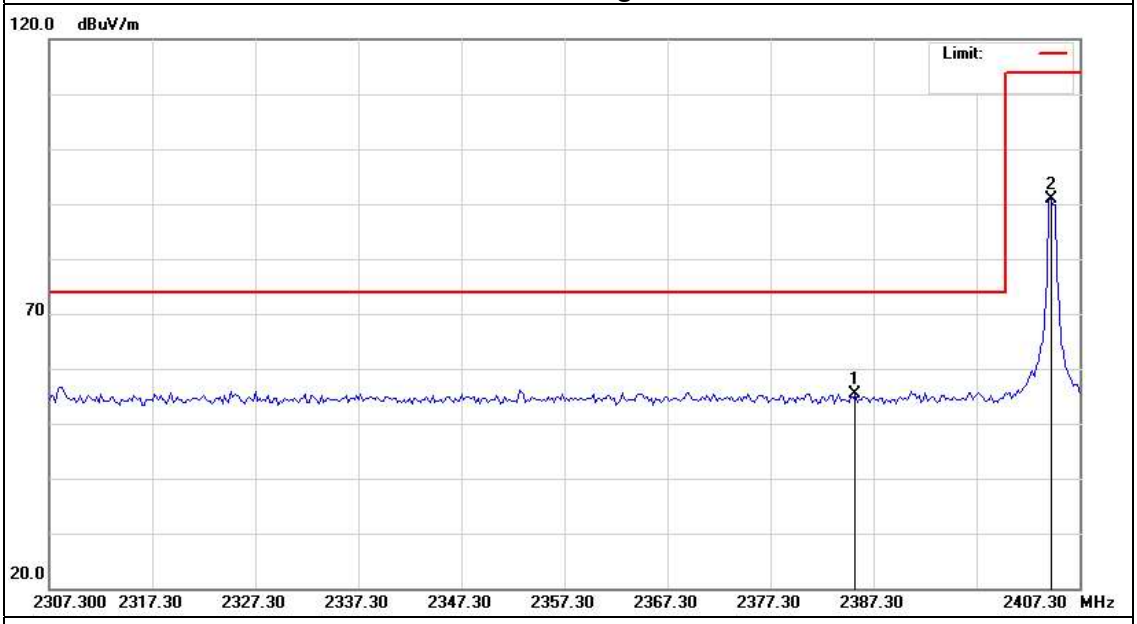
TX CH01 (Restricted Bands Requirements, Horizontal)



TX CH30 (Restricted Bands Requirements, Horizontal)



TX CH01 –Average-Lower



TX CH30 –Average-Highest