



Neutron Engineering Inc.

FCC Radio Test Report

FCC ID: H8GRN10A

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

Issued Date : May 03, 2010

Project No. : R1004014

Equipment : 2.4G RF Dongle

Model Name : RN-10A

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 Receipt: Apr. 21, 2010

Date of Test: Apr. 21, 2010 ~ Apr. 26, 2010

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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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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 Name : RN-10A
Applicant : A-FOUR TECH CO., LTD.
Date of Test : Apr. 21, 2010 ~ Apr. 26, 2010
Standards : FCC Part15, Subpart C / 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-R1004014) 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
FCC			
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 applicable in this Test Report



2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **CB08(FCC R.N.: 614388)** at the location of 1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

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 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	

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	2.4G RF Dongle												
Brand Name	A4TECH												
Model Name	RN-10A												
OEM Brand/Model Name	G-Cube / RN-10A												
Model Difference	Models' differences between each other only the changes of brand name which do not affect the EMI performance. Model RN-10A was used for final testing and collecting test data included in this report.												
Product Description	<p>The EUT is 2.4G RF Dongle.</p> <table border="1"> <tr> <td>Operation Frequency:</td><td>2406.5MHz ~ 2472.5MHz</td></tr> <tr> <td>Modulation Type:</td><td>GFSK</td></tr> <tr> <td>Number Of Channel</td><td>14</td></tr> <tr> <td>Antenna Designation:</td><td>Please refer to the Note 3.</td></tr> <tr> <td>Antenna Gain(Peak)</td><td>Please refer to the Note 3.</td></tr> <tr> <td>Output Power:</td><td>-2.59dBm (Max.)</td></tr> </table> <p>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.</p>	Operation Frequency:	2406.5MHz ~ 2472.5MHz	Modulation Type:	GFSK	Number Of Channel	14	Antenna Designation:	Please refer to the Note 3.	Antenna Gain(Peak)	Please refer to the Note 3.	Output Power:	-2.59dBm (Max.)
Operation Frequency:	2406.5MHz ~ 2472.5MHz												
Modulation Type:	GFSK												
Number Of Channel	14												
Antenna Designation:	Please refer to the Note 3.												
Antenna Gain(Peak)	Please refer to the Note 3.												
Output Power:	-2.59dBm (Max.)												
Power Source	Supplied from PC USB port.												
Power Rating	I/P: DC 5V												
Connecting I/O Port(s)	Please refer to the User's Manual												
Products Covered	N/A												

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	2406.5	06	2429.5	11	2455.5
02	2410.5	07	2433.5	12	2459.5
03	2414.5	08	2436.5	13	2467.5
04	2421.5	09	2444.5	14	2472.5
05	2425.5	10	2450.5		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Chip	N/A	3.0



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 possibly 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	TX	RX	Description
Mode 1	v		CH01, CH08, CH14

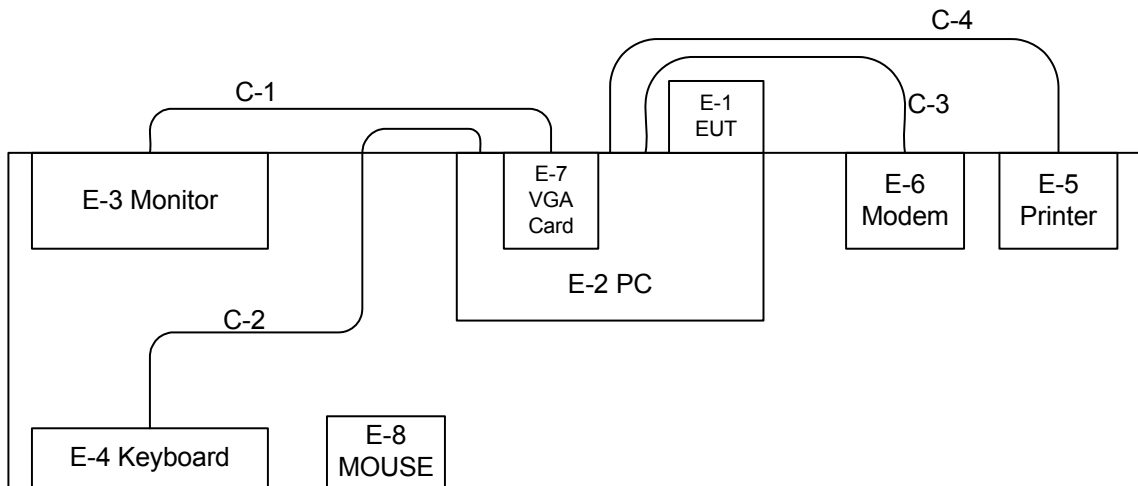
For Final Conducted Test			
Final Test Mode	TX	RX	Description
Mode 1	v		CH08

For Final Radiated Test < 1GHz			
Final Test Mode	TX	RX	Description
Mode 1	v		CH08

For Final Radiated Test > 1GHz			
Final Test Mode	TX	RX	Description
Mode 1	v		CH01, CH08, CH14

For Final Antenna Port Conducted Measurement			
Final Test Mode	TX	RX	Description
Mode 1	v		CH01, CH08, CH14

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED (CONDUCTED)



C-1 D-SUB Cable
C-2 PS/2 Cable
C-3 RS232 Cable
C-4 Parallel Cable



3.4 DESCRIPTION OF SUPPORT UNITS (CONDUCTED)

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-10A	H8GRN10A	N/A	EUT
E-2	PC	HP	HP Compaq dx7300 MT	DOC	SGH71505LH	
E-3	19" LCD Monitor	Samsung	SyncMaster 193P	DOC	DI19H4JXC05517A	
E-4	PS/2 K/B	Logitech	Y-SJ17(ACK260A)	DOC	SYU44664880	
E-5	Printer	SII	DPU-414	DOC	1045105A	
E-6	Modem	Intel	PCFM6501	EJMPCFM6501	306925-002	
E-7	VGA Card	ASUS	EAH4670/DI/512M/A	DOC	8BC0AI284/03	
E-8	MOUSE	GETMAX	G10-280	H8GG10280	N/A	

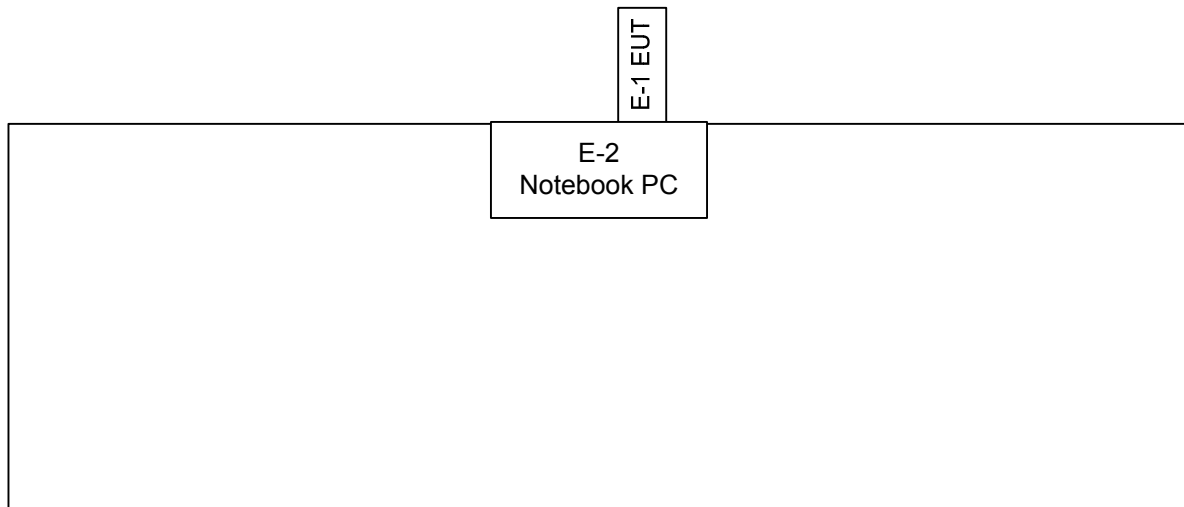
Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	1.8M	
C-2	YES	NO	1.5M	
C-3	YES	NO	1.7M	
C-4	YES	NO	1.7M	

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.



3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED (OTHER)



**3.4 DESCRIPTION OF SUPPORT UNITS (OTHER)**

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-10A	H8GRN10A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
N/A	-	-	-	

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	LISN	EMCO	3816/2	00042991	Feb. 7, 2011
2	Test Cable	N/A	SR03_C_01 &02	N/A	Aug. 19, 2010
3	Pulse Limiter	Electro-Metrics	EM-7600	112644	Dec. 27, 2010
4	EMI Test Receiver	R&S	ESCI	100082	Mar. 16, 2011
5	50Ω BNC TYPE Terminator	N/A	N/A	01	May 25, 2011
6	50Ω BNC TYPE Terminator	N/A	N/A	03	May 25, 2011
7	LISN	EMCO	4825/2	00028234	Jul. 13, 2010

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

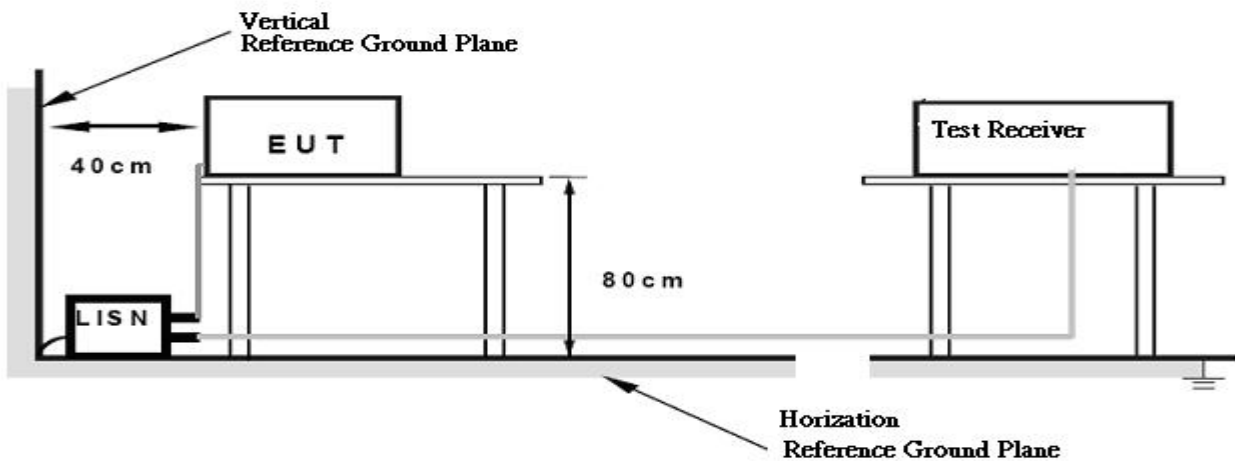
4.1.3 TEST PROCEDURE

- 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.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP





4.1.6 EUT OPERATING CONDITIONS

The EUT exercise program (EMC.exe) used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read (write) from (to) mass storage device (Disk).
2. Send "H" pattern to video port device (Monitor).
3. Send " H " pattern to parallel port device (Printer).
4. Send " H " pattern to serial port device (Modem).
5. The EUT TX/RX data to/from RF mouse.
6. Repeated from 2 to 5 continuously.

As the keyboard is strictly input device, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.



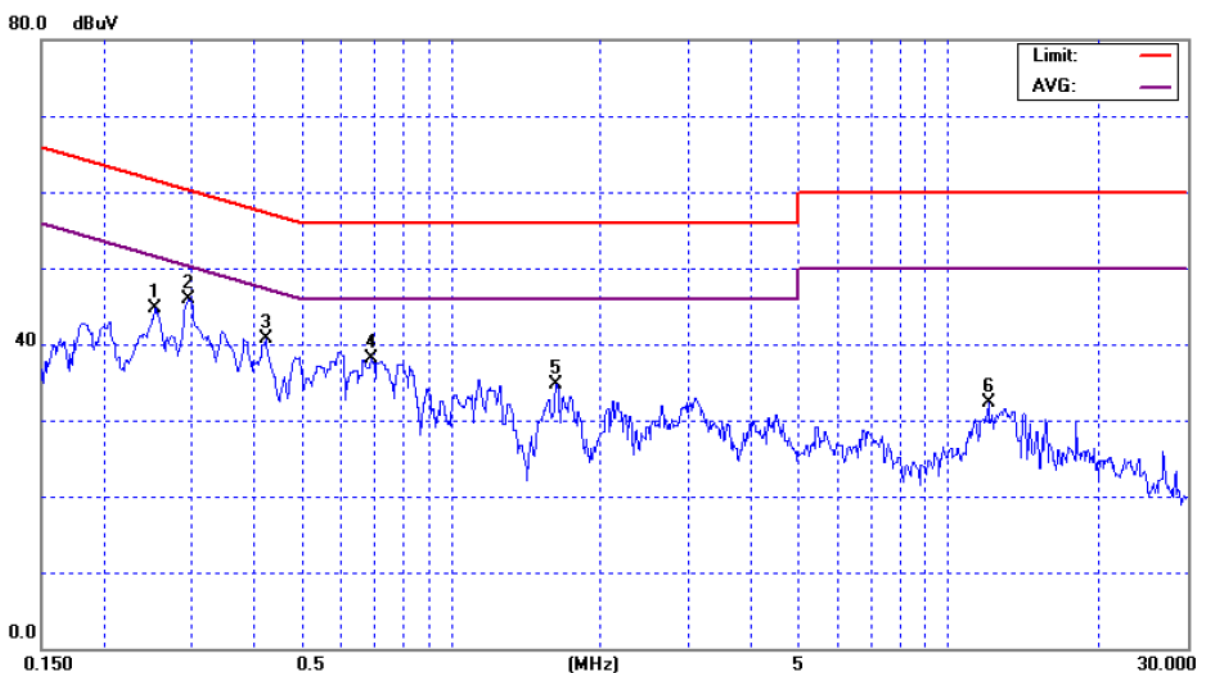
4.1.7 TEST RESULTS

E.U.T :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	24° C	Relative Humidity :	51%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	Normal Operation		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.25	Line	44.63	*	61.64	51.64	-17.01	(QP)
0.30	Line	45.86	*	60.32	50.32	-14.46	(QP)
0.42	Line	40.76	*	57.38	47.38	-16.62	(QP)
0.69	Line	38.03	*	56.00	46.00	-17.97	(QP)
1.63	Line	34.66	*	56.00	46.00	-21.34	(QP)
12.06	Line	32.31	*	60.00	50.00	-27.69	(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.



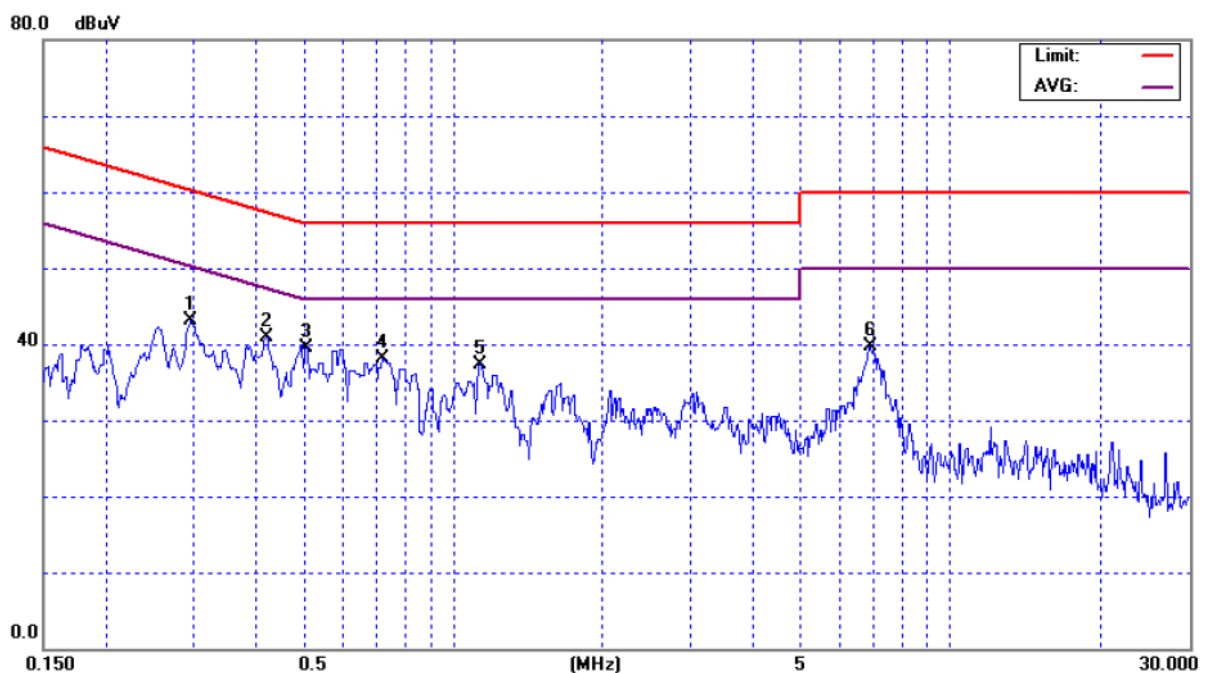


E.U.T :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	24 ° C	Relative Humidity :	51%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	Normal Operation		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.30	Neutral	43.01	*	60.32	50.32	-17.31	(QP)
0.42	Neutral	40.94	*	57.42	47.42	-16.48	(QP)
0.51	Neutral	39.53	*	56.00	46.00	-16.47	(QP)
0.72	Neutral	38.14	*	56.00	46.00	-17.86	(QP)
1.14	Neutral	37.32	*	56.00	46.00	-18.68	(QP)
6.91	Neutral	39.69	*	60.00	50.00	-20.31	(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 (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)	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).



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	Sep. 10, 2010
2	Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-546	Mar. 19, 2010
3	Microwave Pre-amplifier	Agilent	8449B	3008A01714	Apr. 19, 2011
4	Microflex Cable	N/A	N/A	1m	May. 20, 2010
5	Microflex Cable	AISI	S104-SMAP-1	10m	Aug. 23, 2010
6	Microflex Cable	N/A	N/A	3m	Aug. 23, 2010
7	Test Cable	N/A	LMR-400	966_12m	Jun. 18, 2010
8	Test Cable	N/A	LMR-400	966_3m	Jun. 18, 2010
9	Pre-Amplifier	EMC	EMC-330	980001	Jun. 03, 2010
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 17, 2010

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

4.2.3 TEST PROCEDURE

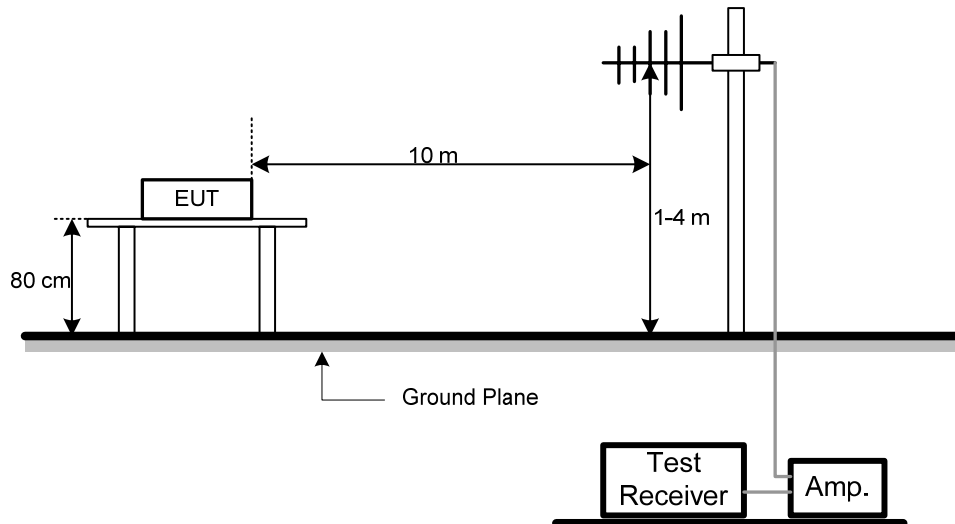
- The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- 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.
- 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

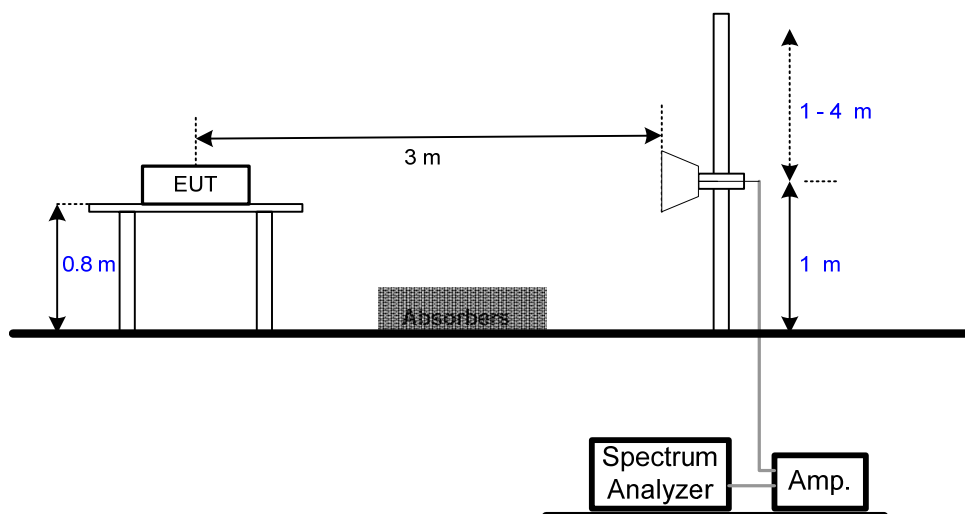
No deviation

4.2.5 TEST SETUP

Radiated Emission Test Set-Up Frequency 30 - 1000MHz



Radiated Emission Test Set-Up Frequency Above 1 GHz



4.2.6 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.



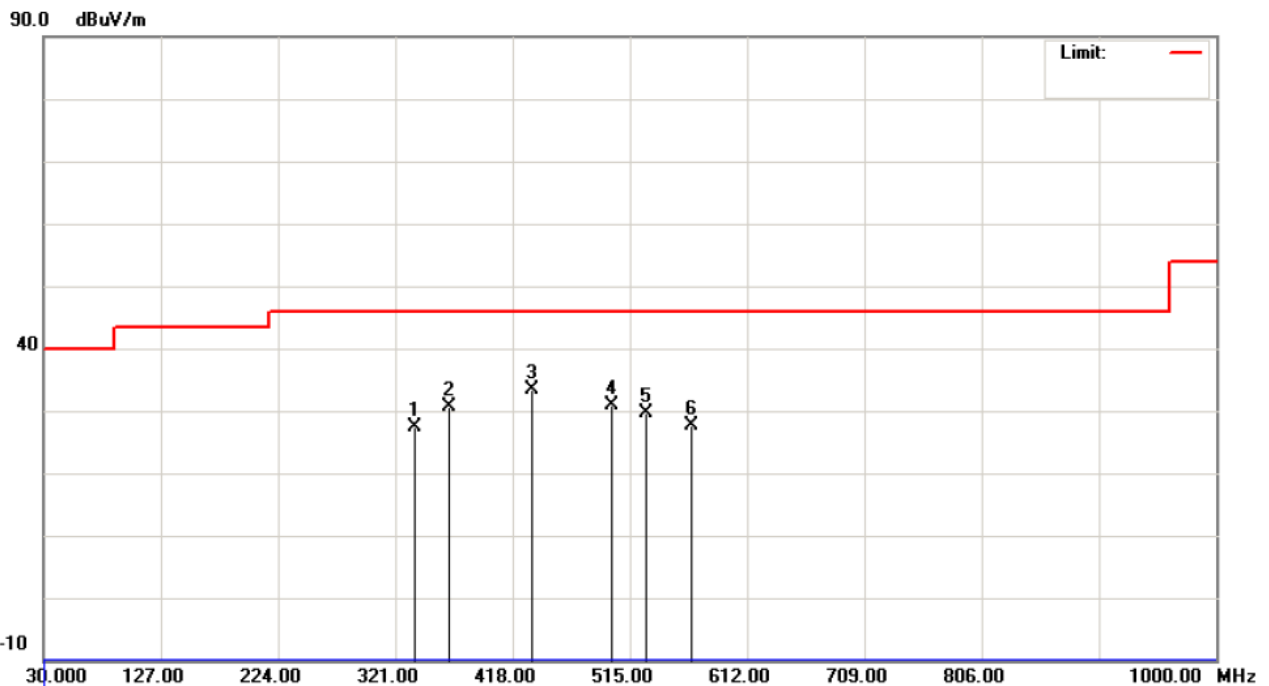
4.2.7 TEST RESULTS-BETWEEN 30MHZ - 1000MHZ

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH08		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
336.52	V	47.17	-19.71	27.46	46.00	- 18.54	
365.62	V	49.81	-19.09	30.72	46.00	- 15.28	
433.52	V	50.84	-17.37	33.47	46.00	- 12.53	
499.48	V	47.16	-16.30	30.86	46.00	- 15.14	
528.58	V	45.25	-15.70	29.55	46.00	- 16.45	
565.44	V	42.59	-14.93	27.66	46.00	- 18.34	

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 or the 10th harmonic of highest fundamental frequency ◦ “F” denotes fundamental frequency; “ H” denotes spurious frequency. “E” denotes band edge frequency.
- (4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission ◦
- (5) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



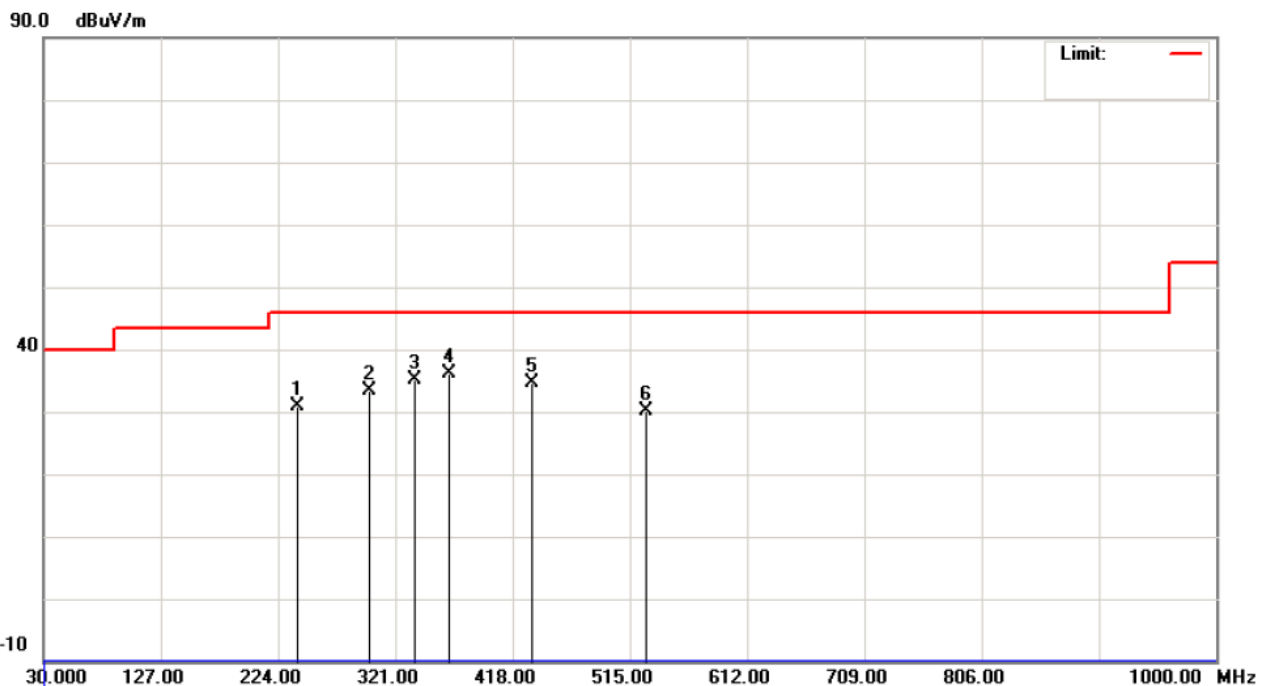


EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 °C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH08		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
239.52	H	53.10	-22.22	30.88	46.00	- 15.12	
299.66	H	53.95	-20.51	33.44	46.00	- 12.56	
336.52	H	54.82	-19.71	35.11	46.00	- 10.89	
365.62	H	55.31	-19.09	36.22	46.00	- 9.78	
433.52	H	51.89	-17.37	34.52	46.00	- 11.48	
528.58	H	45.83	-15.70	30.13	46.00	- 15.87	

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 or the 10th harmonic of highest fundamental frequency ◦ “F” denotes fundamental frequency; “ H” denotes spurious frequency. “E” denotes band edge frequency.
- (4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission ◦
- (5) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.





4.2.8 TEST RESULTS - ABOVE 1000MHZ

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 °C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01		

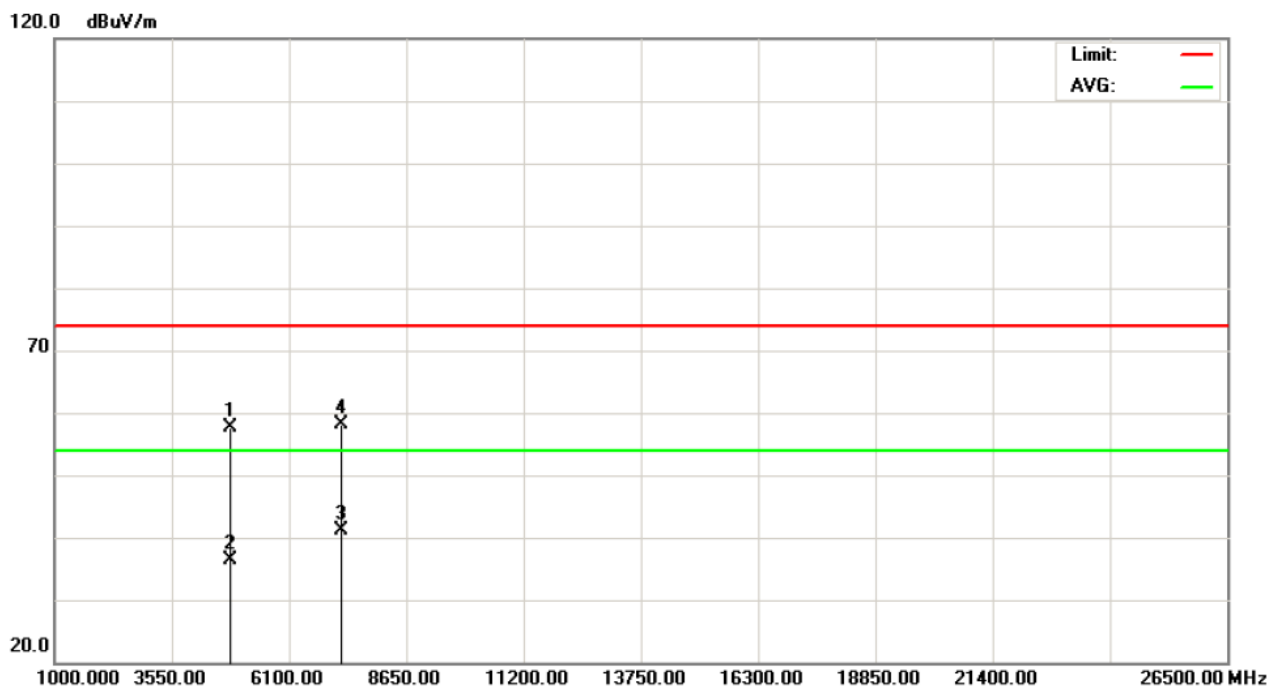
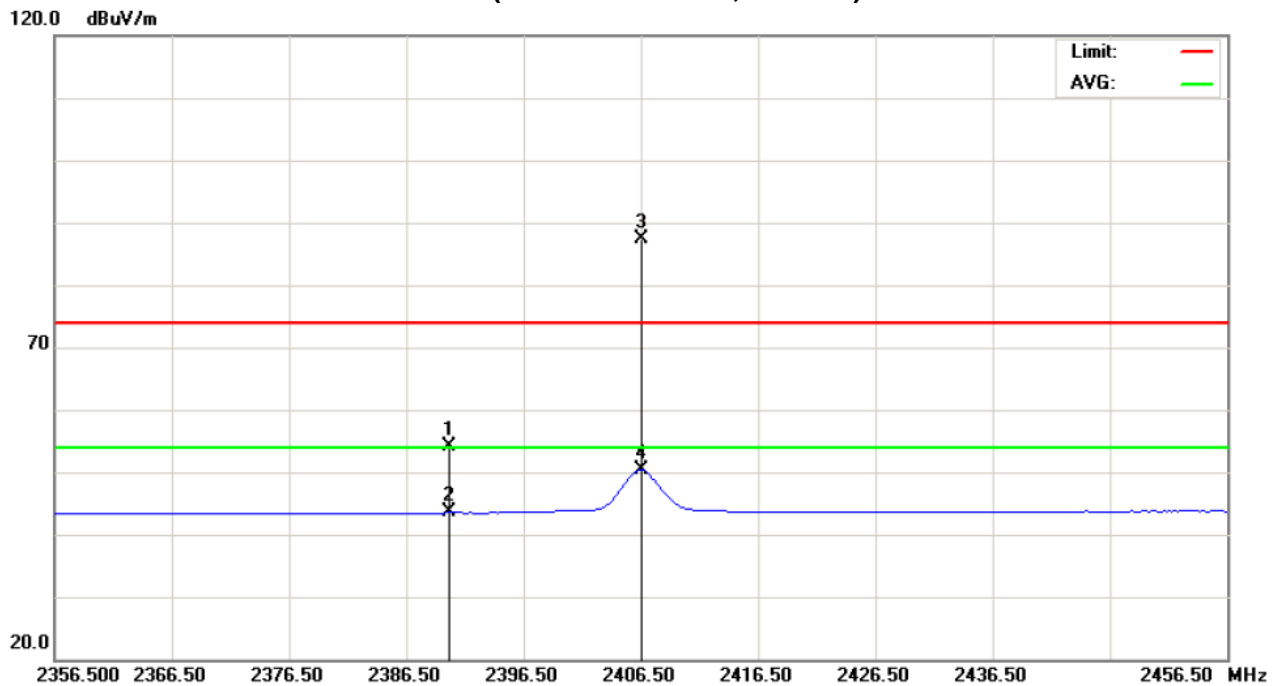
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	22.09	11.65	31.93	54.02	43.58	74.00	54.00	X/E
2406.50	V	55.28	18.35	32.00	87.28	50.35			X/F
4812.95	V	53.80	32.72	3.71	57.51	36.43	74.00	54.00	X/H
7219.98	V	49.12	32.06	9.00	58.12	41.06	74.00	54.00	X/H

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 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.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (5) 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.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



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





EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 ° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01		

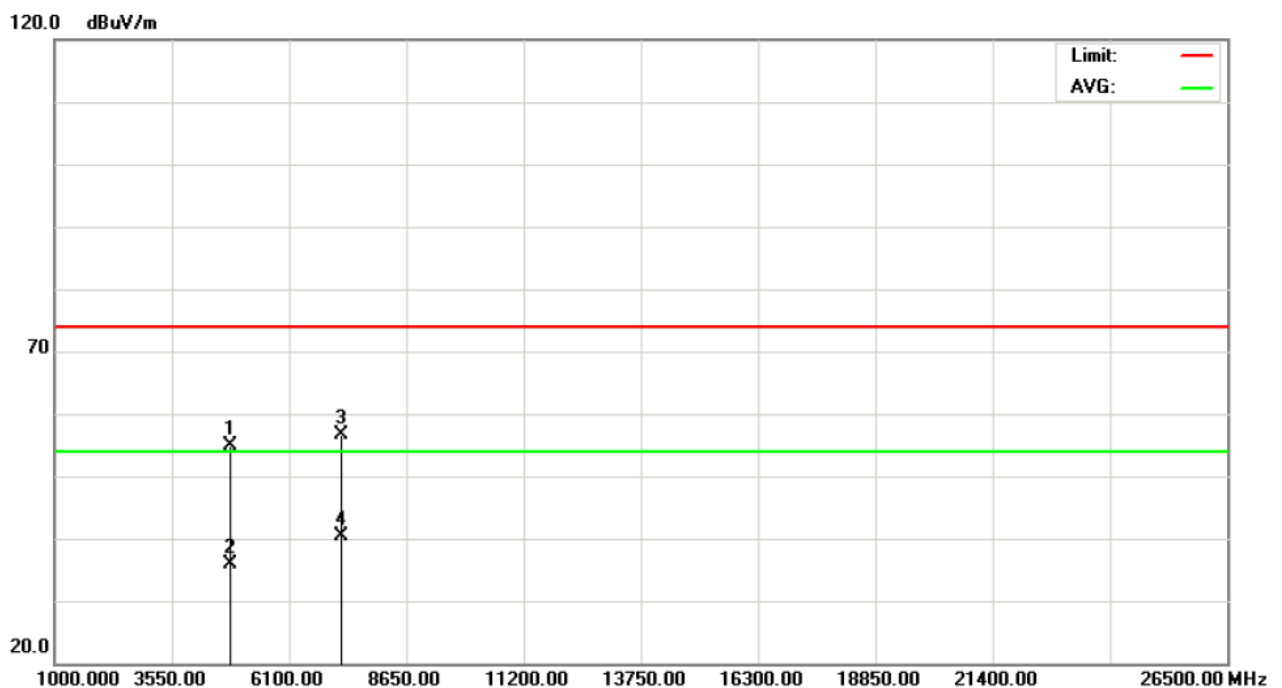
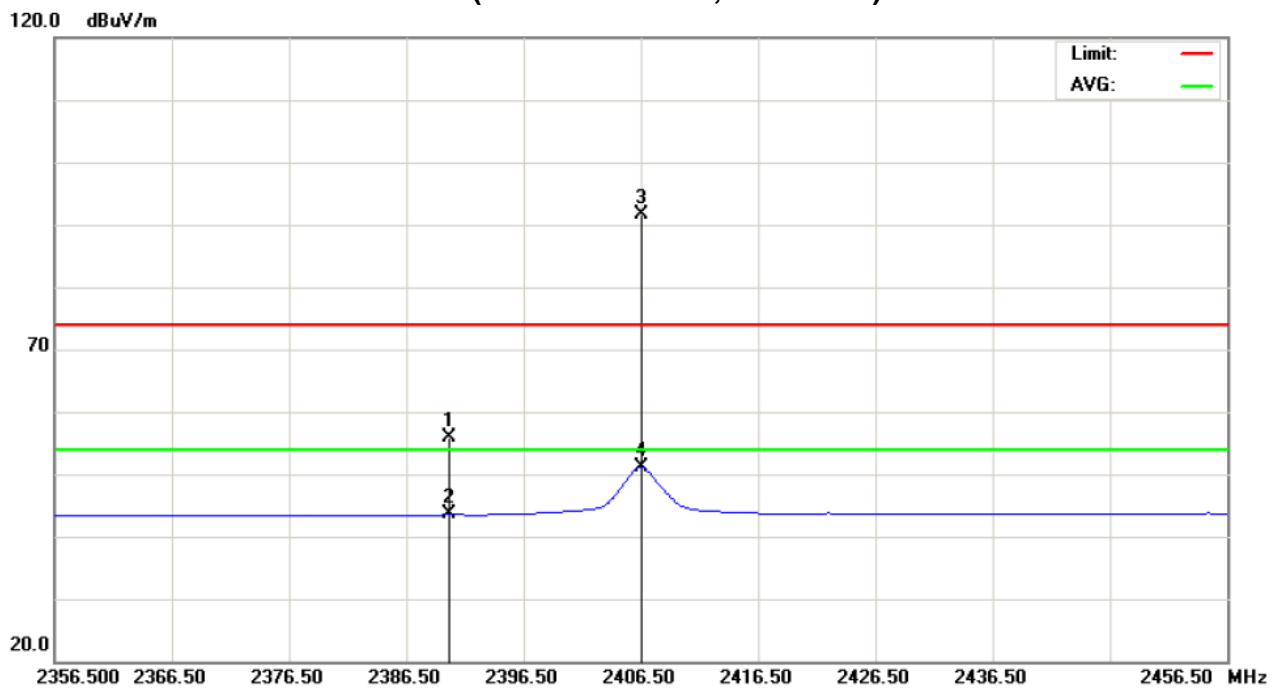
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	23.95	11.64	31.93	55.88	43.57	74.00	54.00	X/E
2406.50	H	59.71	19.13	31.99	91.70	51.12			X/F
4813.03	H	51.20	32.10	3.71	54.91	35.81	74.00	54.00	X/H
7219.37	H	47.60	31.42	9.00	56.60	40.42	74.00	54.00	X/H

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 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.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (5) 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.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



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





EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 ° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH08		

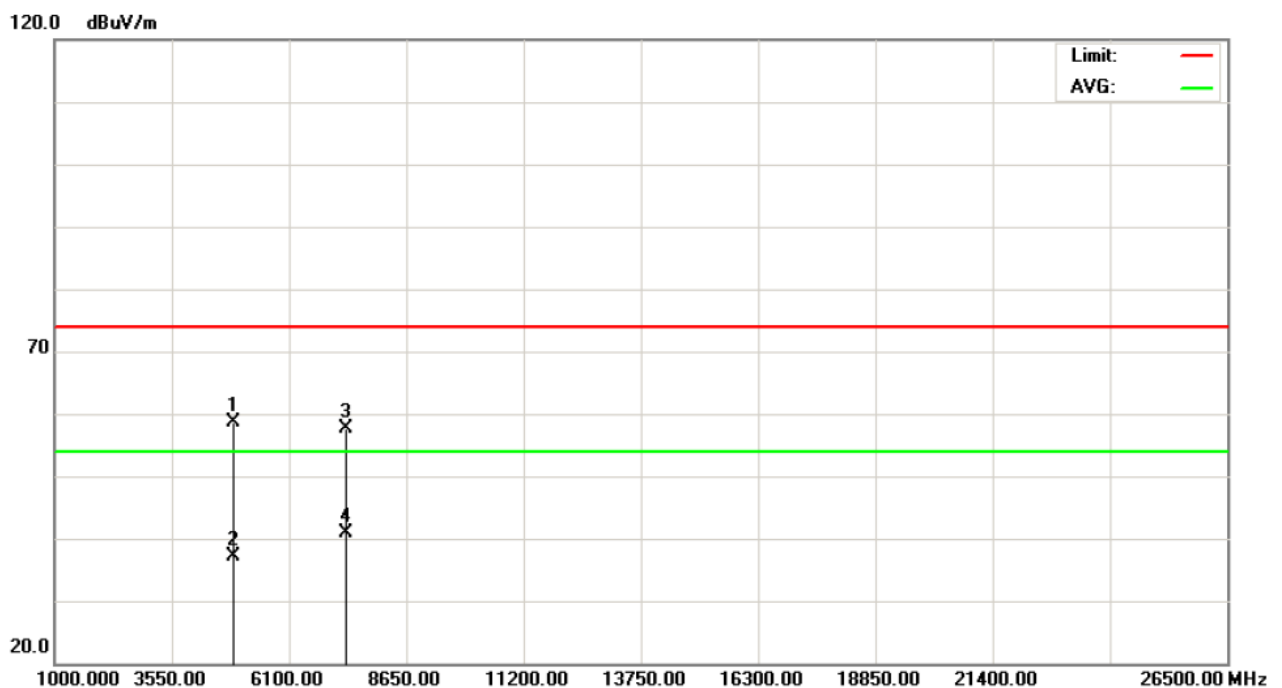
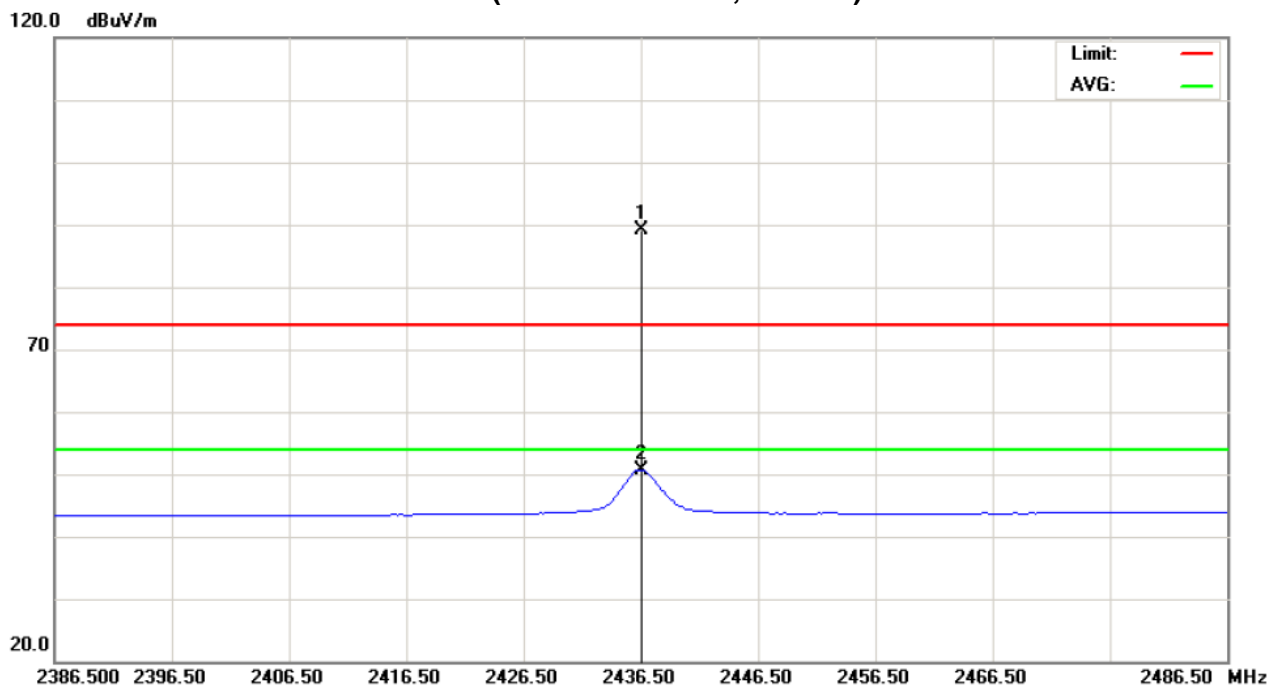
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2436.50	V	57.04	18.60	32.11	89.15	50.71			X/F
4872.87	V	54.80	33.32	3.90	58.70	37.22	74.00	54.00	X/H
7309.31	V	48.59	31.83	9.14	57.73	40.97	74.00	54.00	X/H

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 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.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (5) 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.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis : X
CH08 (Above 1000 MHz, Vertical)





EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 ° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH08		

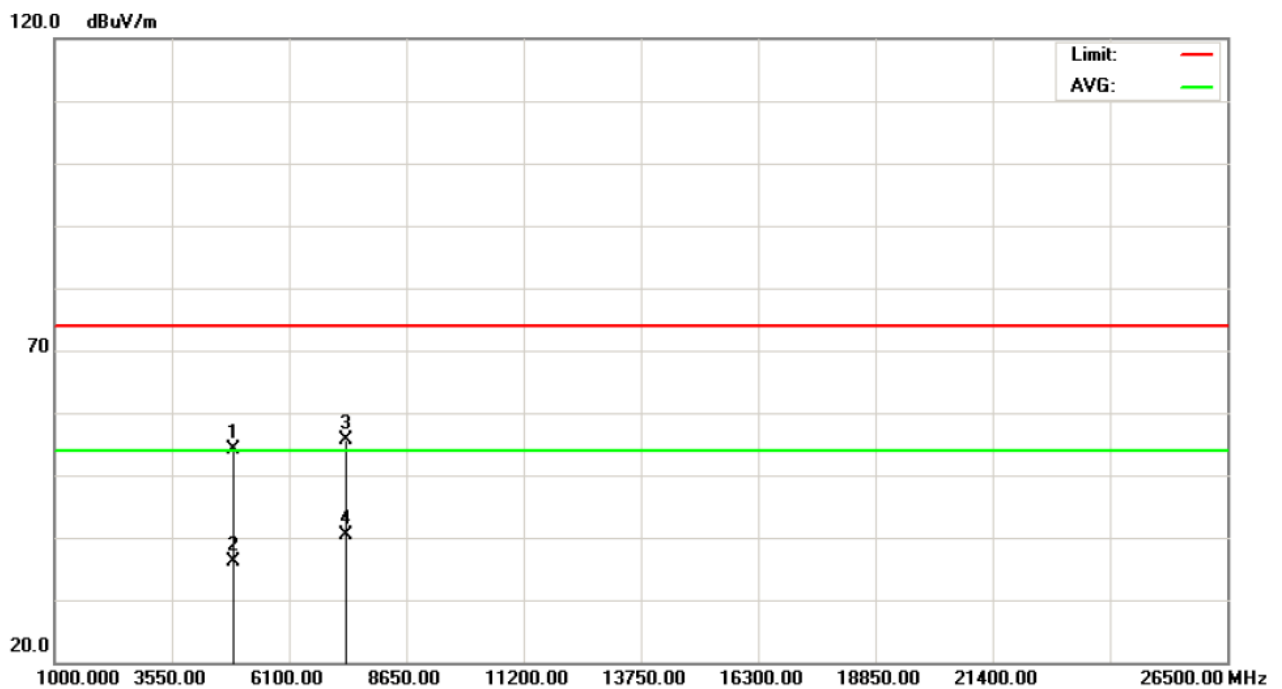
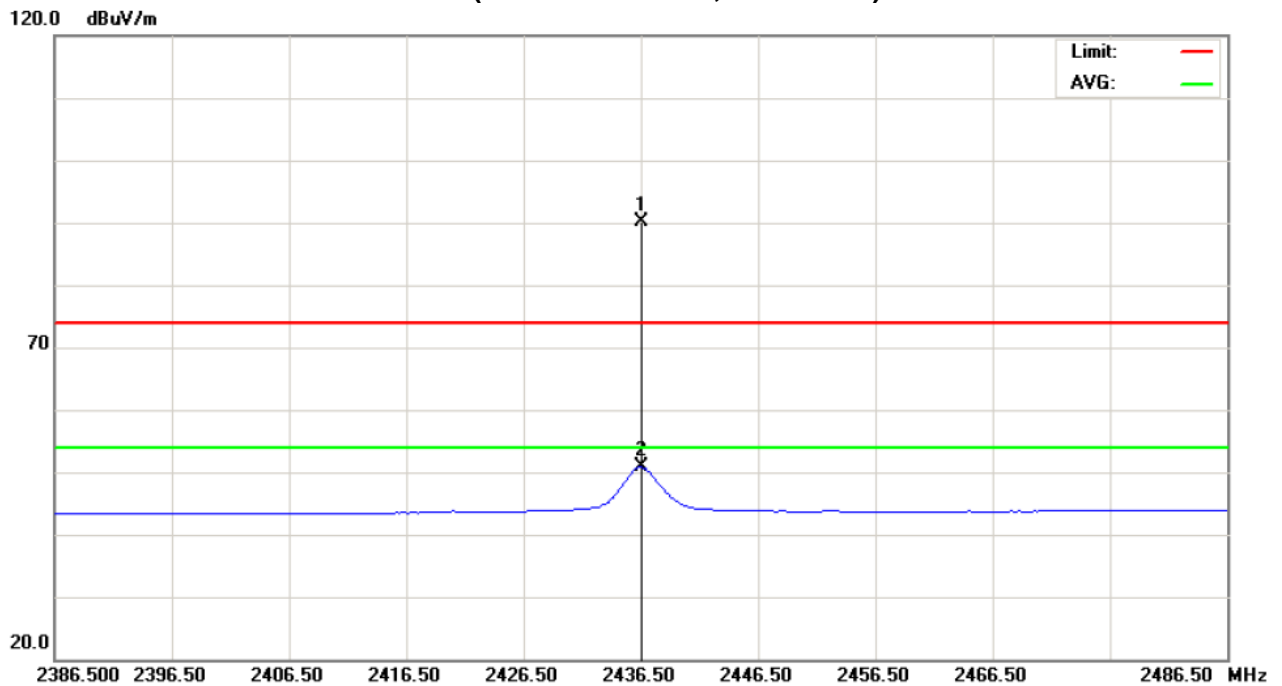
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2436.50	H	57.90	18.65	32.11	90.01	50.76			X/F
4872.87	H	50.17	32.26	3.90	54.07	36.16	74.00	54.00	X/H
7309.35	H	46.37	31.18	9.14	55.51	40.32	74.00	54.00	X/H

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 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.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (5) 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.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis : X
CH08 (Above 1000 MHz, Horizontal)





EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 ° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH14		

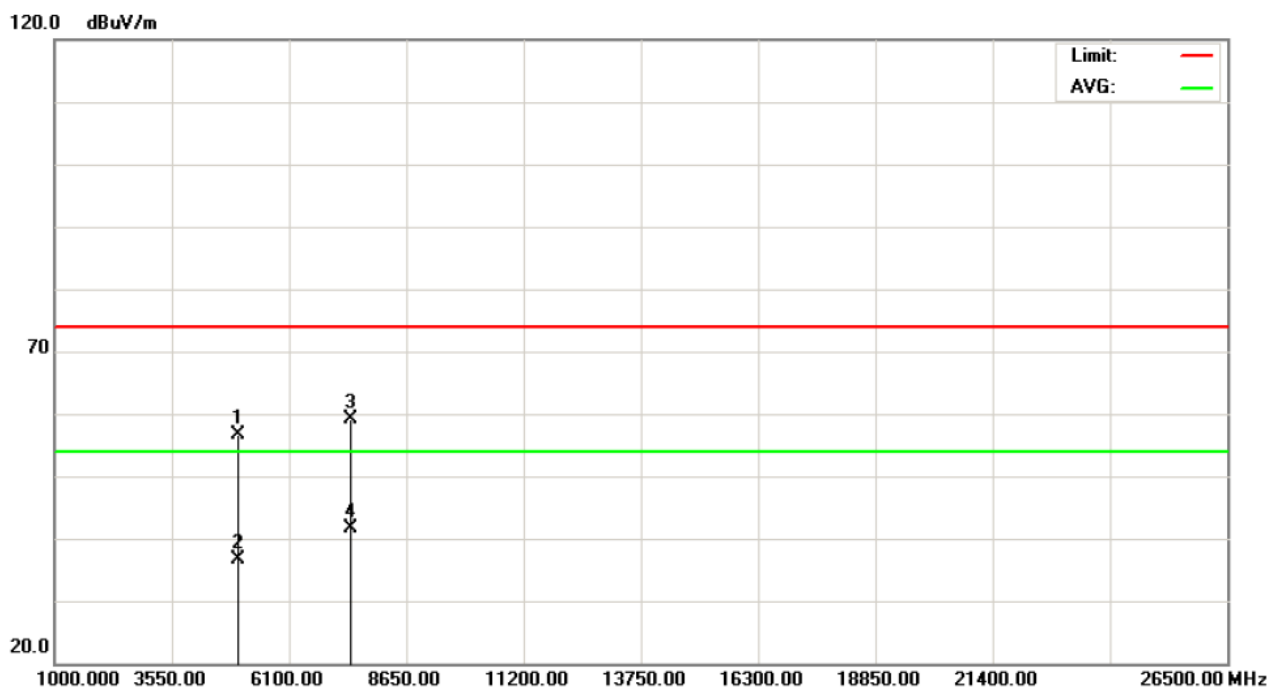
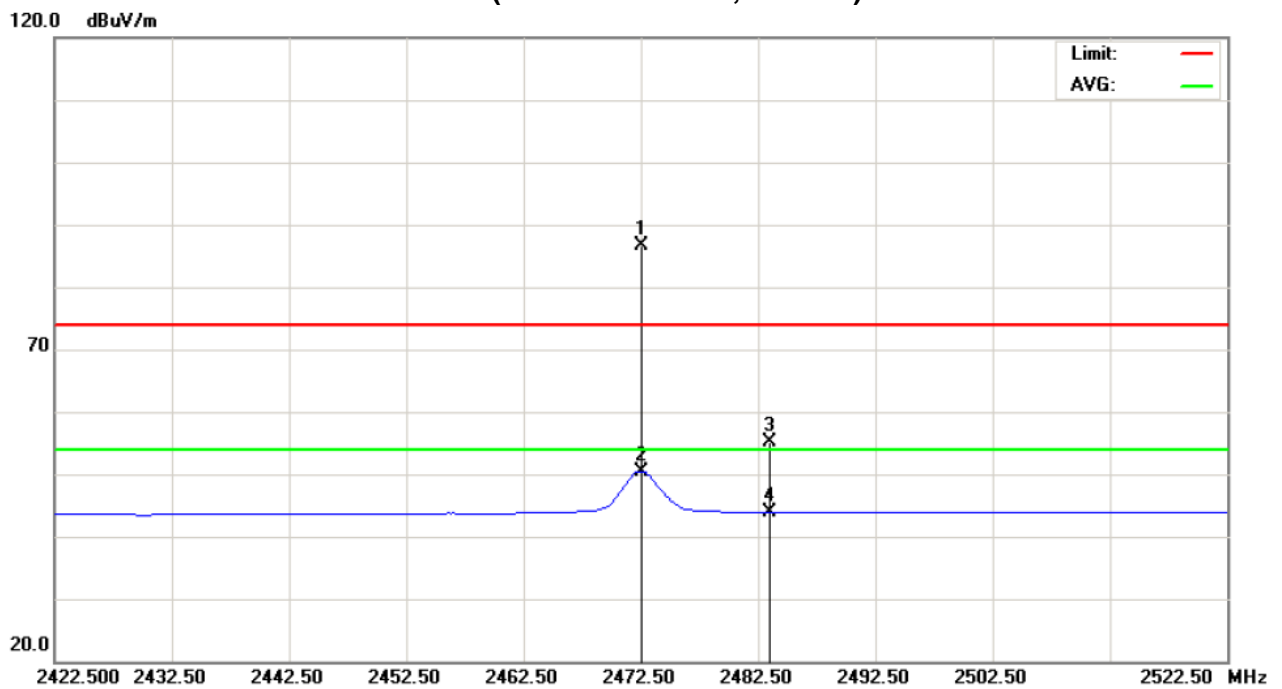
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2472.50	V	54.40	6.00	32.24	86.64	38.24			X/F
2483.50	V	22.78	11.54	32.29	55.07	43.83	74.00	54.00	X/E
4944.95	V	52.43	32.53	4.13	56.56	36.66	74.00	54.00	X/H
7417.41	V	49.89	32.43	9.32	59.21	41.75	74.00	54.00	X/H

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 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.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (5) 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.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis : X
CH14 (Above 1000 MHz, Vertical)





EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 ° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH14		

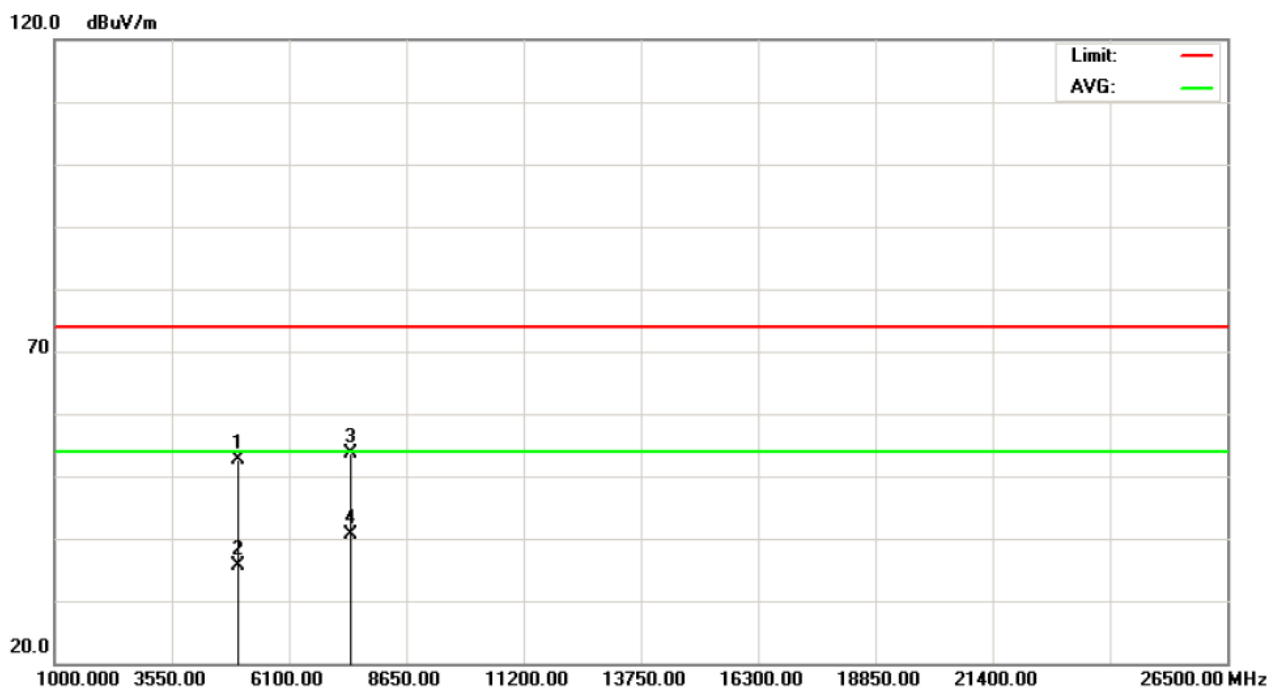
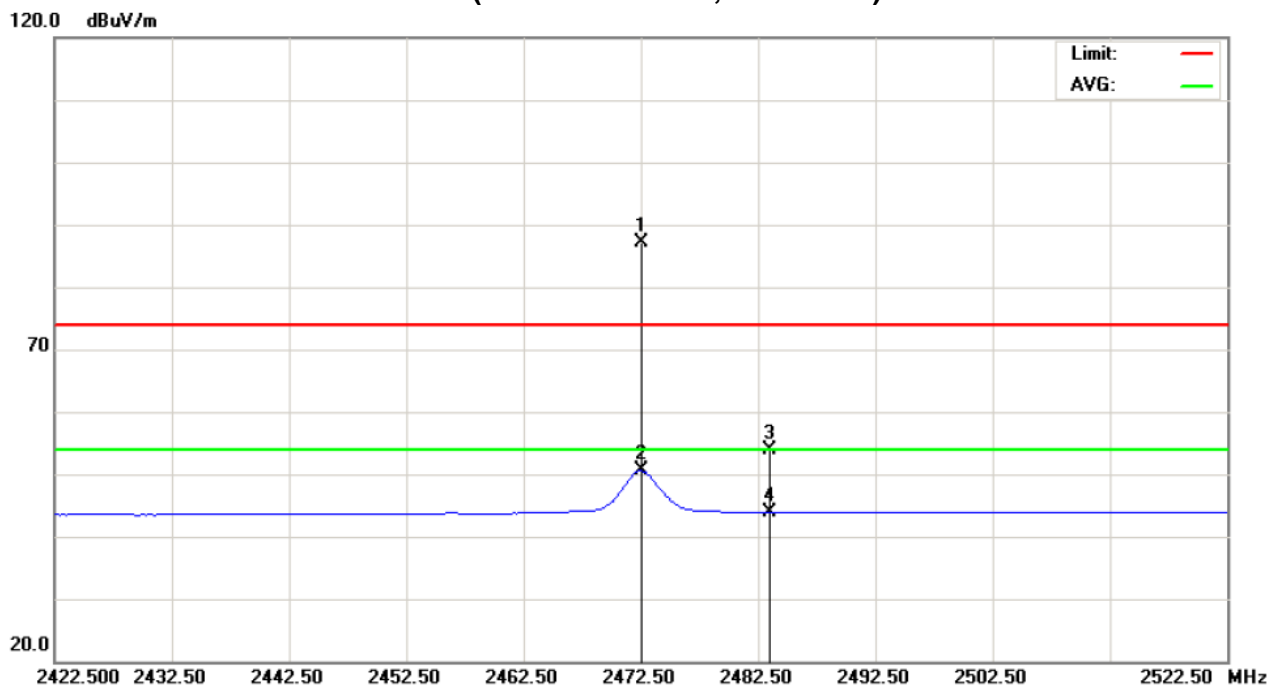
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2472.50	H	54.91	18.32	32.24	87.15	50.56			X/F
2483.50	H	21.67	11.30	32.29	53.96	43.59	74.00	54.00	X/E
4944.95	H	48.43	31.51	4.13	52.56	35.64	74.00	54.00	X/H
7417.29	H	44.30	31.32	9.32	53.62	40.64	74.00	54.00	X/H

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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 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.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (5) 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.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis : X
CH14 (Above 1000 MHz, Horizontal)





4.2.9 TEST RESULTS-RESTRICTED BANDS REQUIREMENTS

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 ° C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH14 (Vertical)		
Note :	<p>The emission of the carrier radiated field strength is measured for CH01, CH14 (Peak and AV) as following:</p> <ol style="list-style-type: none"> 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 (CH14). Then the field strength was measured at 2483.5-2500 MHz. 		

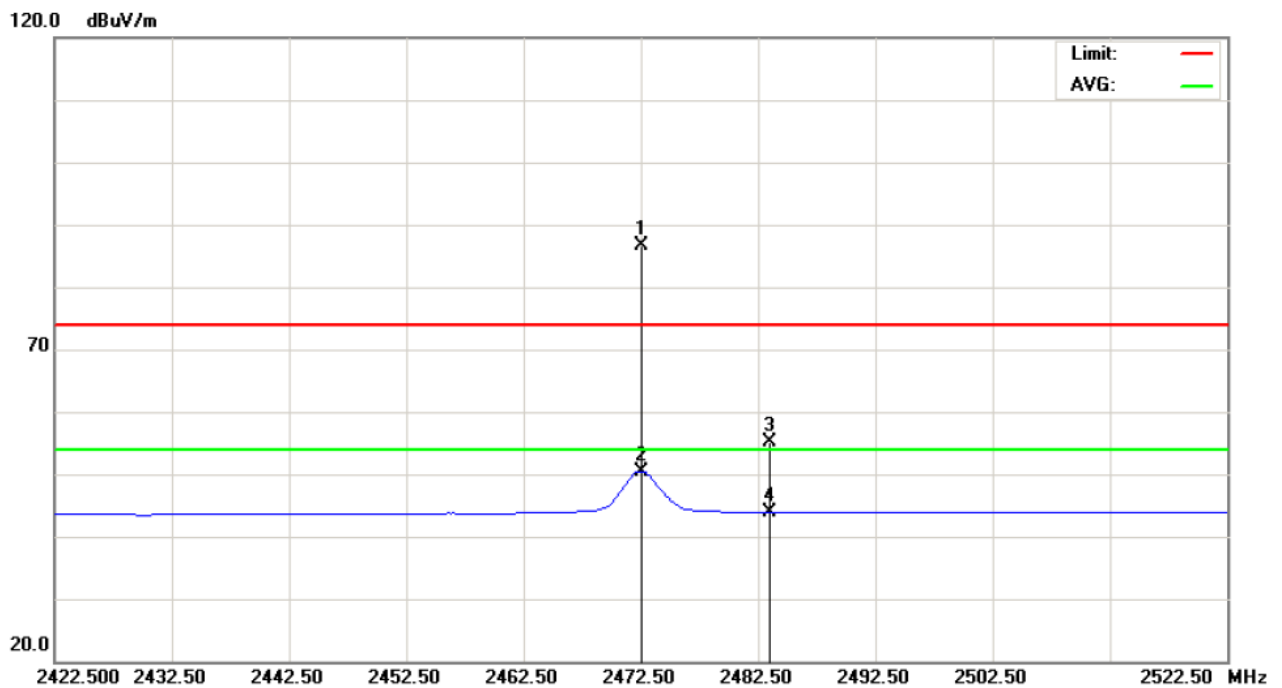
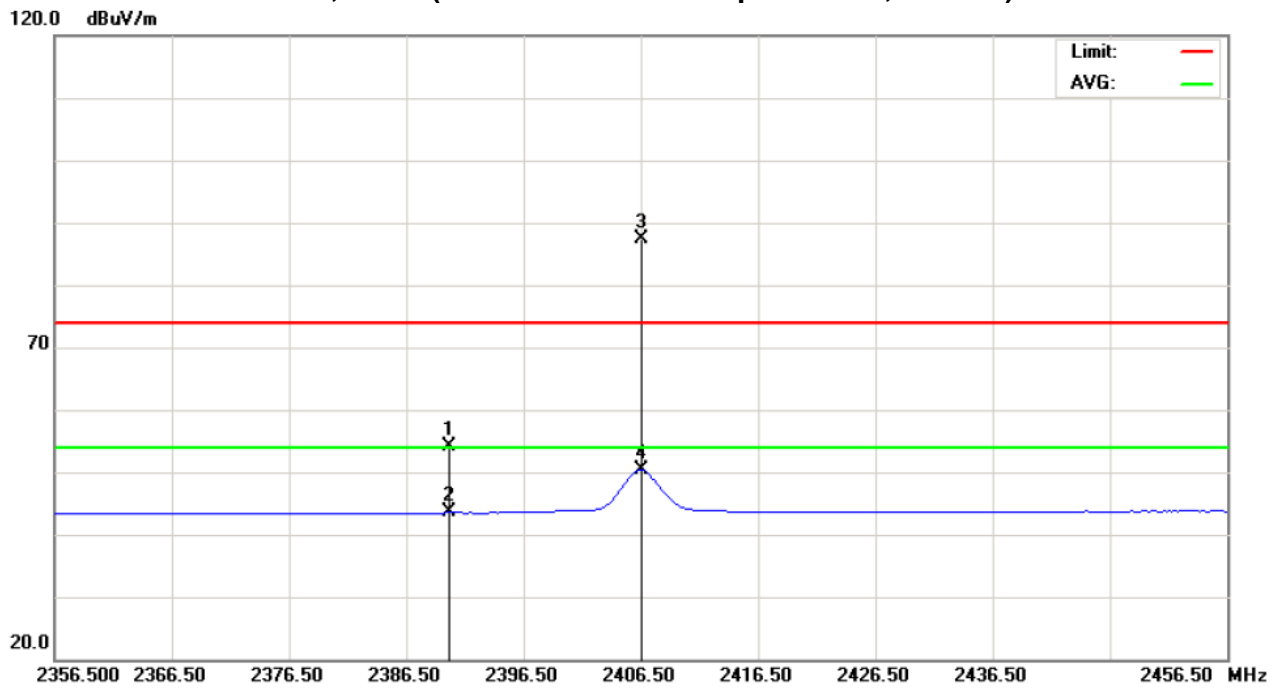
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	22.09	11.65	31.93	54.02	43.58	74.00	54.00	X
2483.50	V	22.78	11.54	32.29	55.07	43.83	74.00	54.00	X

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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) EUT Orthogonal Axes :
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



CH01, CH14 (Restricted Bands Requirements, Vertical)





EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	23 °C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH14 (Horizontal)		
Note :	<p>The emission of the carrier radiated field strength is measured for CH01, CH14 (Peak and AV) as following:</p> <ol style="list-style-type: none"> 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 (CH14). Then the field strength was measured at 2483.5-2500 MHz. 		

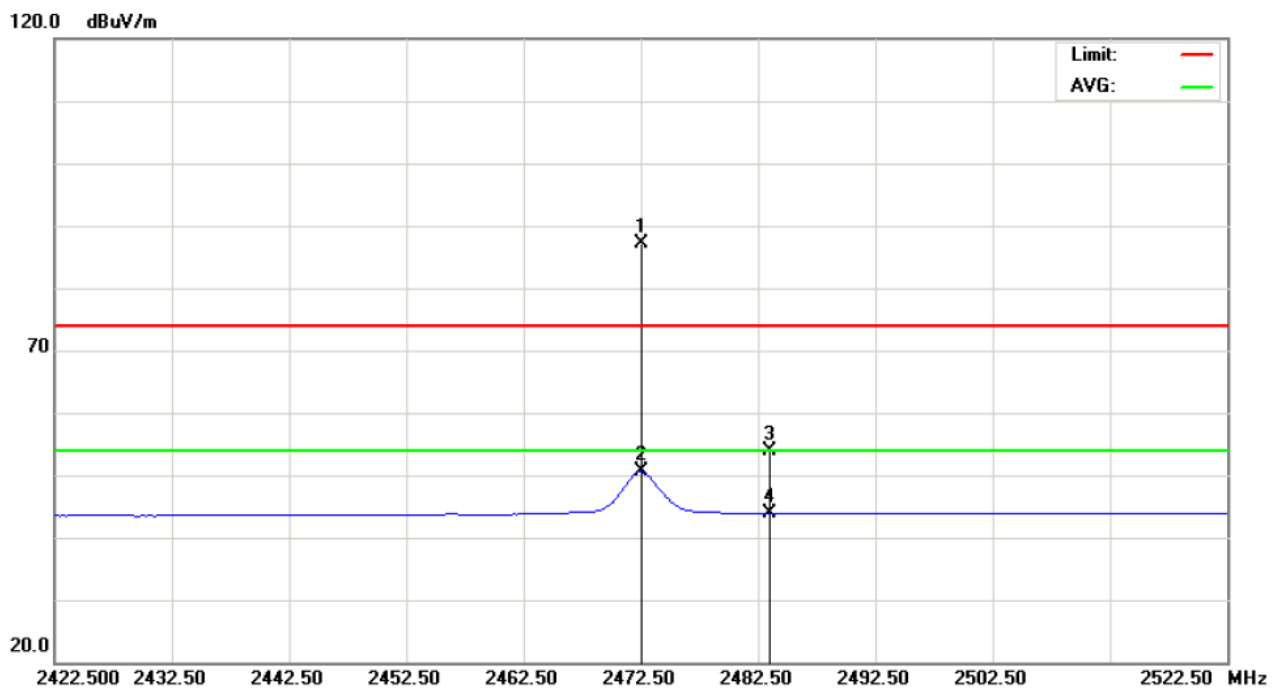
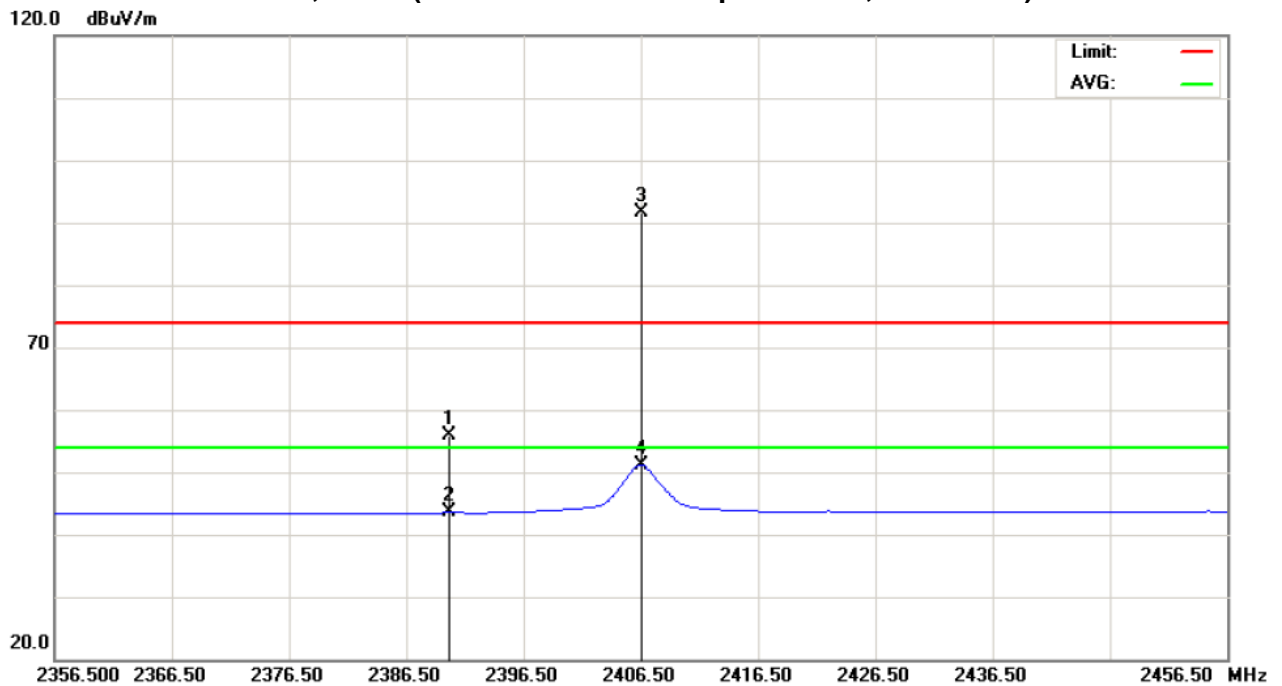
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	23.95	11.64	31.93	55.88	43.57	74.00	54.00	X
2483.50	H	21.67	11.30	32.29	53.96	43.59	74.00	54.00	X

Remark :

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 25GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (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) EUT Orthogonal Axes :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand



CH01, CH14 (Restricted Bands Requirements, Horizontal)





5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

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

5.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Sep. 10, 2010

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

5.1.2 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.

5.1.3 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 4.2.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Chip antenna measurement result.

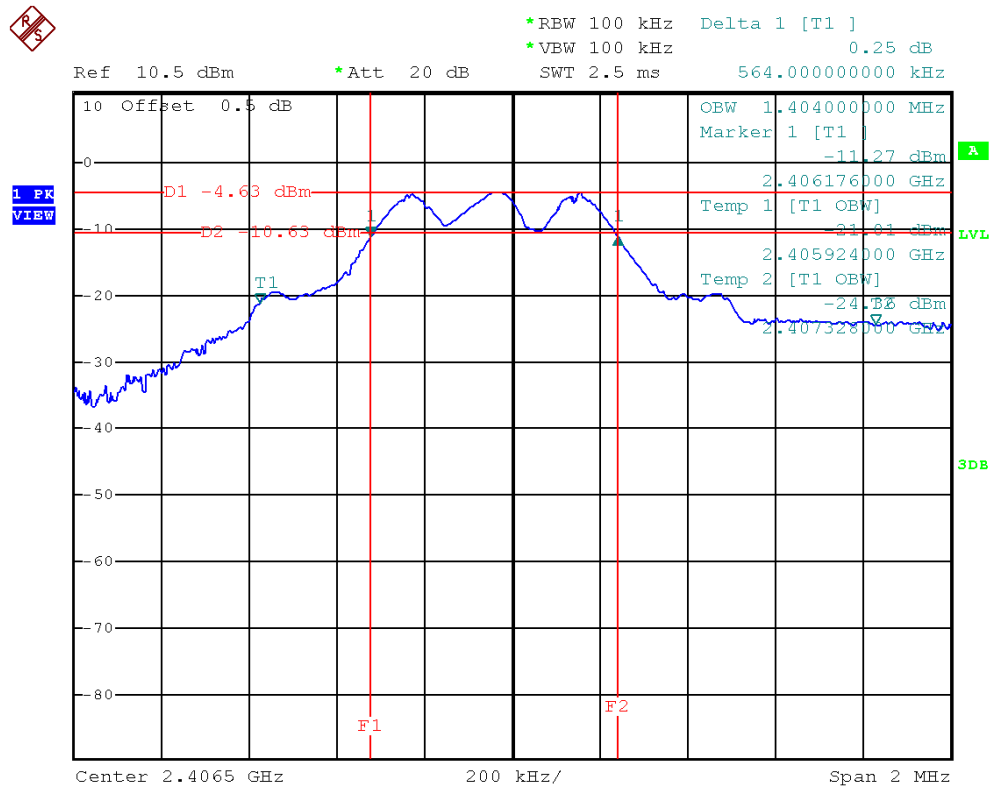


5.1.6 TEST RESULTS

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	17 °C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH08, CH14		

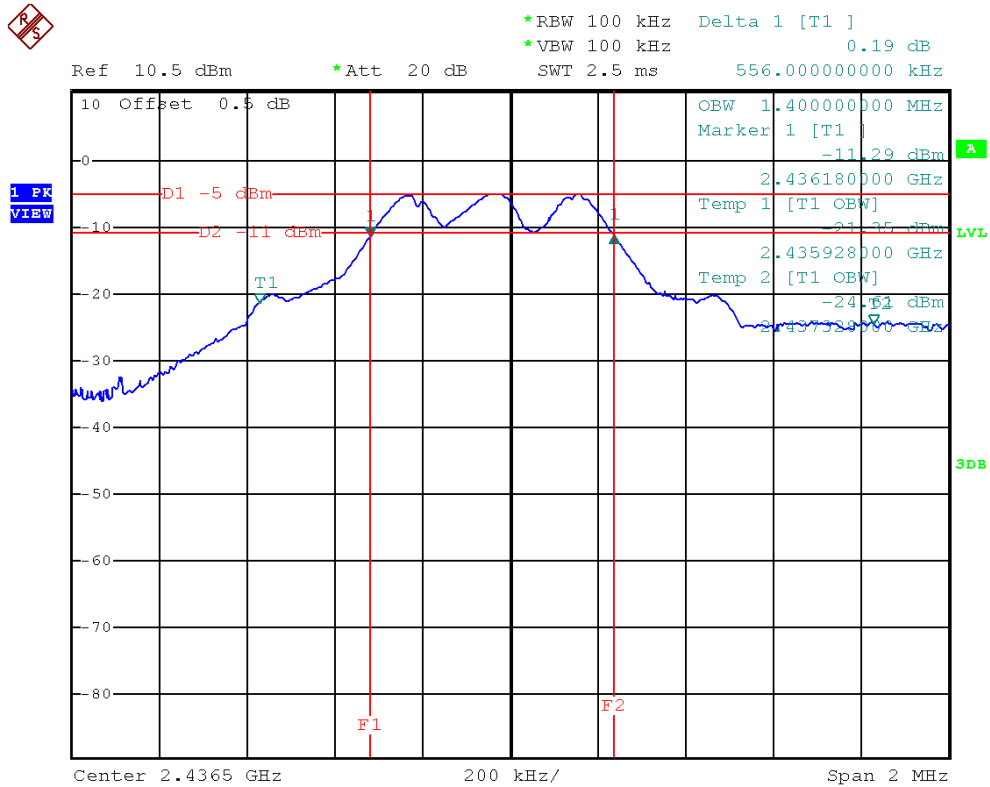
Test Channel	Frequency (MHz)	Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	LIMIT (MHz)
CH01	2406.5	0.56	1.40	>=500KHz
CH08	2436.5	0.56	1.40	>=500KHz
CH14	2472.5	0.56	1.39	>=500KHz

CH01

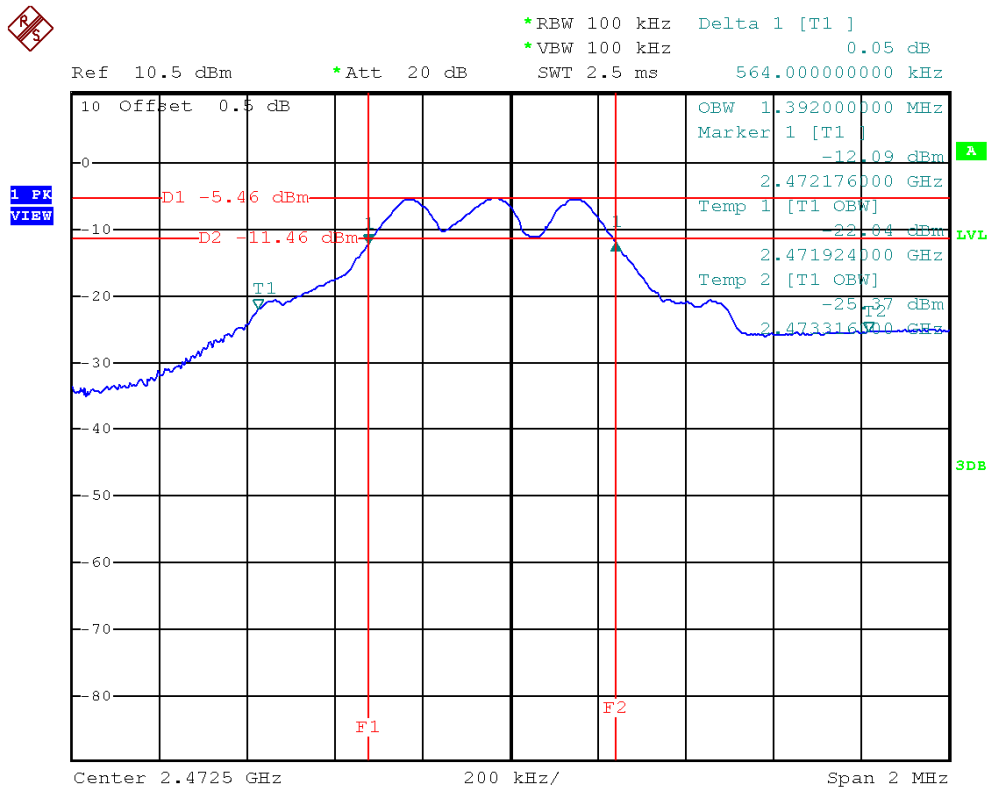




CH08



CH14





6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

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

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2487A	6K00004714	Feb. 10, 2011
2	Power Meter Sensor	Anritsu	MA2491A	34138	Feb. 10, 2011

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

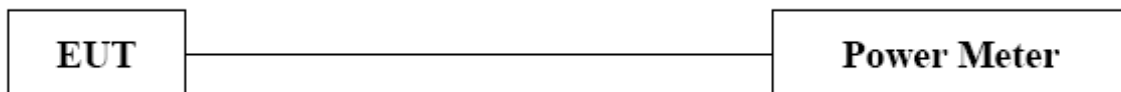
6.1.2 TEST PROCEDURE

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

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 4.2.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Chip antenna measurement result.

**6.1.6 TEST RESULTS**

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	17 ° C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH08, CH14		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2406.5	-2.59	30	1
CH08	2436.5	-2.94	30	1
CH14	2472.5	-3.49	30	1

Remark :

- (1) The test requirement, RF conducted output power shall measure each transmitter chain by using channel power method.
- (2) Antenna Gain=-1.35 dBi.



7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 APPLIED PROCEDURES / LIMIT

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

7.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Sep. 10, 2010

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

7.1.2 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.

7.1.3 DEVIATION FROM STANDARD

No deviation.

7.1.4 TEST SETUP



7.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.2.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Chip antenna measurement result.



7.1.6 TEST RESULTS

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	17 ° C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH14		

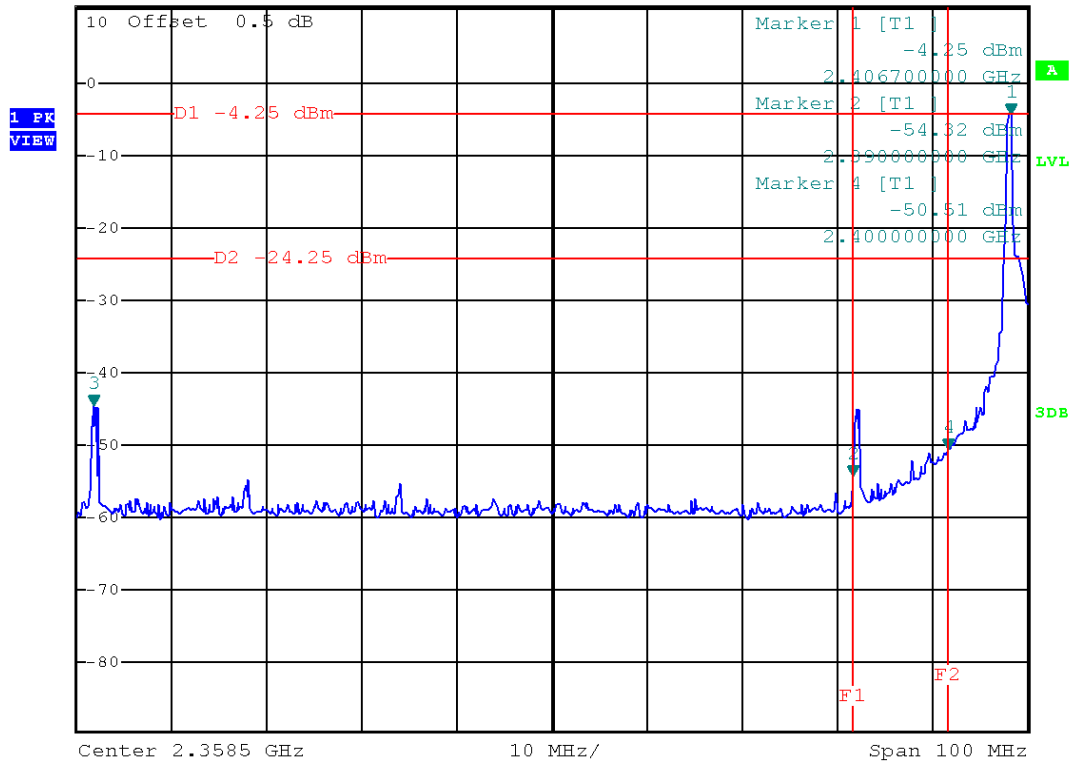
Channel of Worst Data: CH01,CH11			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2310.3	-44.51	2488.5	-45.18
Result			
In any 100kHz 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.			



CH01



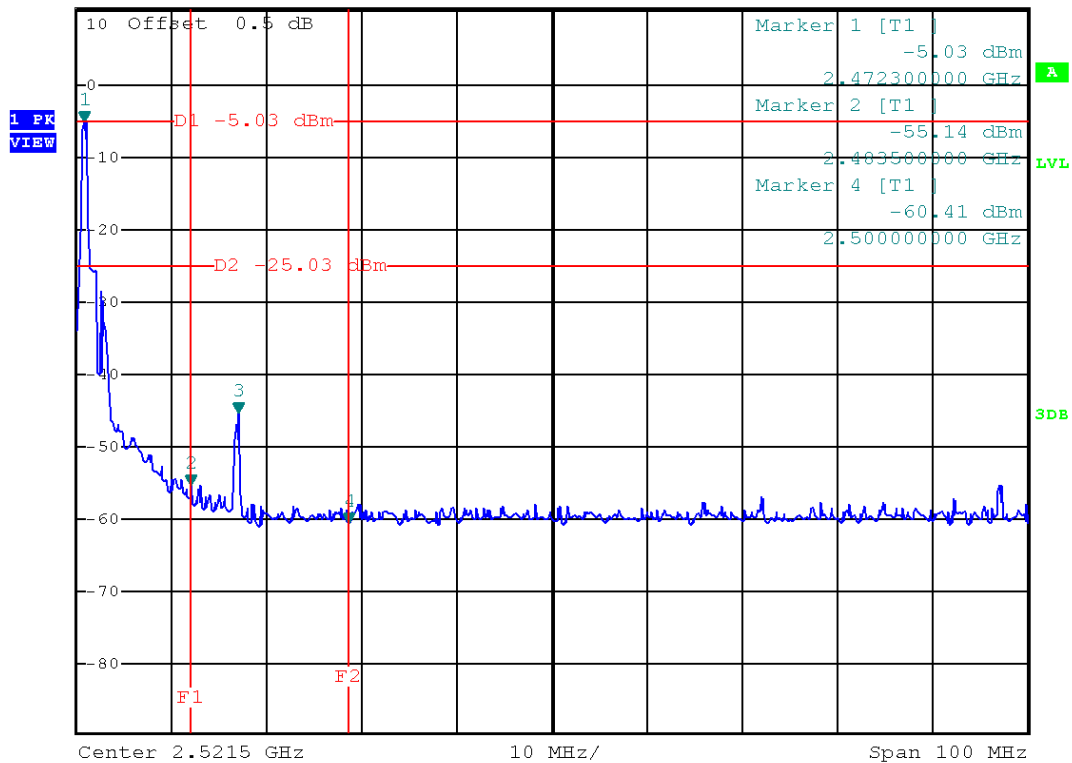
*RBW 100 kHz Marker 3 [T1]
*VBW 100 kHz -44.51 dBm
Ref 10.5 dBm *Att 20 dB SWT 10 ms 2.310300000 GHz



CH14



*RBW 100 kHz Marker 3 [T1]
*VBW 100 kHz -45.18 dBm
Ref 10.5 dBm *Att 20 dB SWT 10 ms 2.488500000 GHz





8. POWER SPECTRAL DENSITY TEST

8.1 APPLIED PROCEDURES / LIMIT

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

8.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Sep. 10, 2010

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

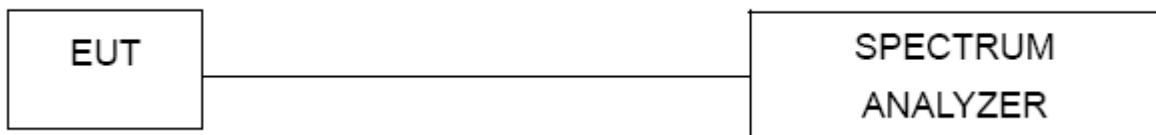
8.1.2 TEST PROCEDURE

- 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.

8.1.3 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 4.2.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Chip antenna measurement result.

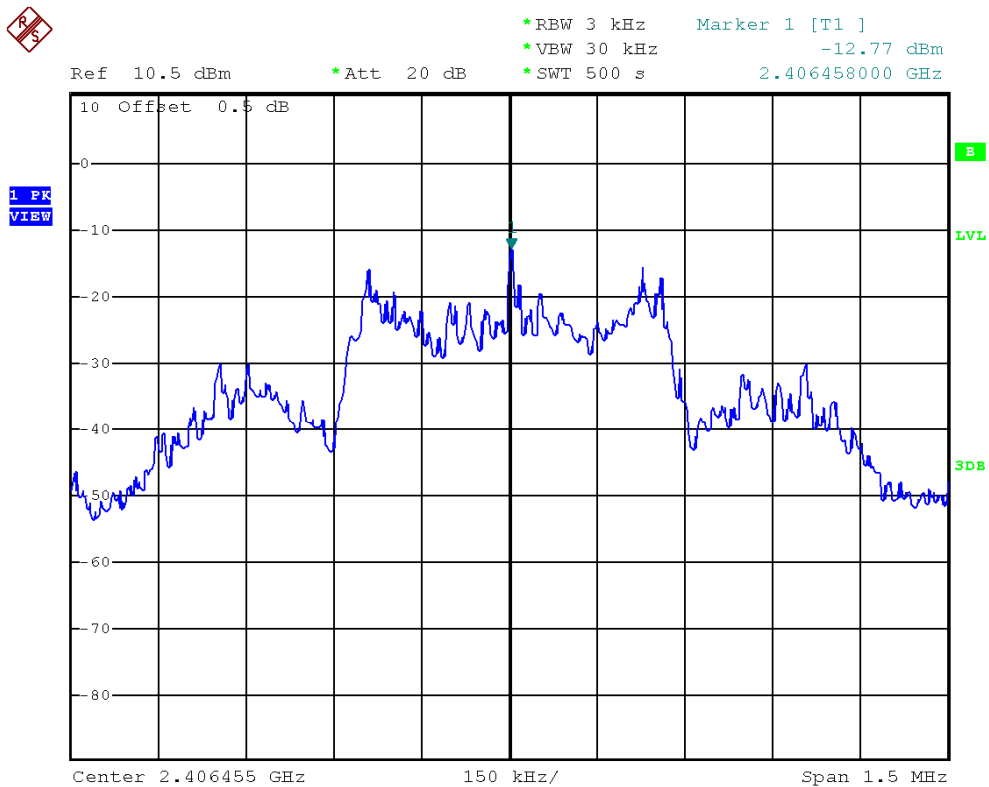


8.1.6 TEST RESULTS

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	17 °C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH08, CH14		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2406.5	-12.77	8
CH08	2436.5	-13.10	8
CH14	2472.5	-13.68	8

CH01





CH08

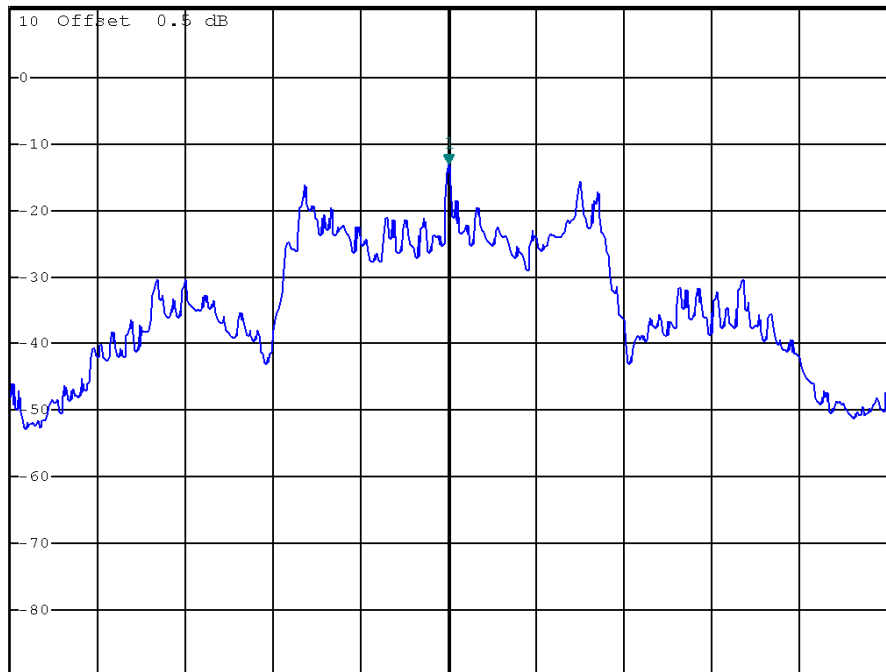


*RBW 3 kHz Marker 1 [T1]
*VBW 30 kHz -13.10 dBm
*SWT 500 s 2.436458000 GHz

Ref 10.5 dBm

*Att 20 dB

1 PK
VIEW



Center 2.436458 GHz

150 kHz/

Span 1.5 MHz

CH14

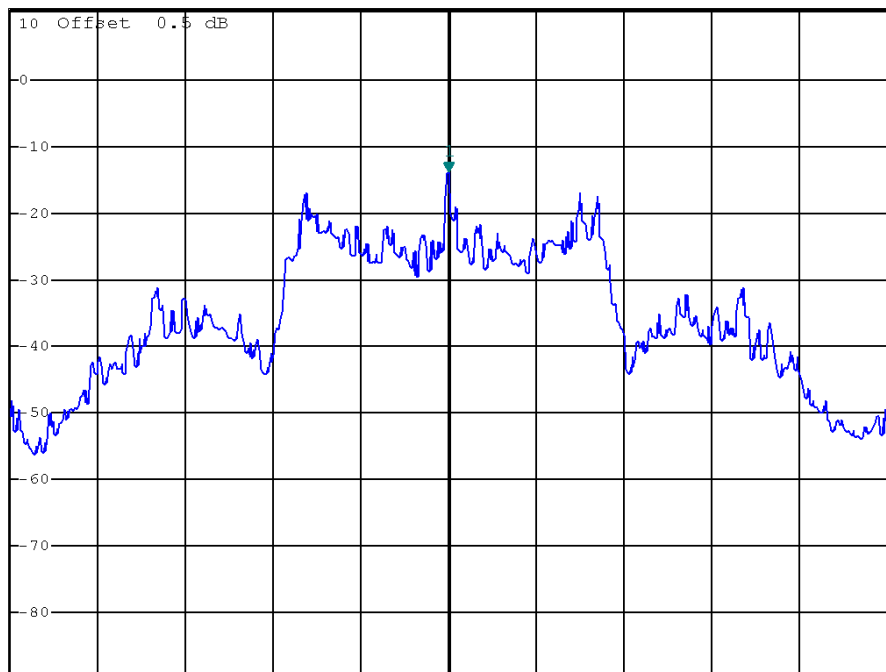


*RBW 3 kHz Marker 1 [T1]
*VBW 30 kHz -13.68 dBm
*SWT 500 s 2.472458000 GHz

Ref 10.5 dBm

*Att 20 dB

1 PK
VIEW



Center 2.472458 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. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(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

9.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2487A	6K00004714	Feb. 10, 2011
2	Power Meter Sensor	Anritsu	MA2491A	34138	Feb. 10, 2011

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

9.1.2 MPE CALCULATION METHOD

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



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 4.2.6 Unless otherwise a special operating condition is specified in the follows during the testing.



9.1.6 TEST RESULTS

EUT :	2.4G RF Dongle	Model Name :	RN-10A
Temperature :	17 ° C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz (SYSTEM)		
Test Mode :	CH01, CH08, CH14		

The power is so low so there is no need for RF calculations.