Radio Test Report

FCC ID: H8GG11570HX

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

Issued Date	:	Jul. 16, 2012
Project No.	:	1204123A
Equipment	:	2.4G RF Mouse
Model Name	:	G11-570HX; G11-570HX-1; G11-570HX-2; G11-570HX-3; G11-570HX-4
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: Jun. 22, 2012
Date of Test: Jun. 22, 2012 ~ Jul. 09, 2012

Testing Engineer : (Josh Lin)

Technical Manager : (Jeff Yang)

Authorized Signatory : (Andy Chiu)

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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 Mouse
Brand Name : A4TECH
Model Name : G11-570HX; G11-570HX-1; G11-570HX-2; G11-570HX-3; G11-570HX-4
Applicant : A-FOUR TECH CO., LTD.
Date of Test : Jun. 22, 2012 ~ Jul. 09, 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-1-1204123A) 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 applicable in this Test Report

2.1 TEST FACILITY

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

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.)

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 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**%。

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

A. Conducted Measurement :

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

B. Radiated Measurement :

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
CB08	Radiated Emission at 3m	Horizontal Polarization	30 - 00MHz	3.35 dB	
			200 - 1000MHz	.11 dB	
			1 - 18GHz	3.97 dB	
			18 - 40GHz	4.01 dB	
		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

<table>
<tr><td>Equipment</td><td>2.4G RF Mouse</td></tr>
<tr><td>Brand Name</td><td>A4TECH</td></tr>
<tr><td>Model Name</td><td>G11-570HX; G11-570HX-1; G11-570HX-2; G11-570HX-3; G11-570HX-4</td></tr>
<tr><td>OEM Brand/Model Name</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>Models' differences between each other only the changes of model name which do not affect the EMI performance. Model G11-570HX was used for final testing and collecting test data included in this report.</td></tr>
<tr><td>Product Description</td><td>The EUT is a 2.4G RF Mouse.
<table>
<tr><td>Operation Frequency:</td><td>2407~2473 MHz</td></tr>
<tr><td>Modulation Type:</td><td>GFSK</td></tr>
<tr><td>Number Of Channel</td><td>14CH (Note 2)</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>-2.01dBm (Max.)</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Power Source</td><td>1. Battery supplied.
2. Supplied from PC USB port (Charge mode).</td></tr>
<tr><td>Power Rating</td><td>1. Battery: DC 3.7V 300mAh
2. I/P: DC 5V</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
<tr><td>Products Covered</td><td>1 * BATTERY: TENERG / TE-PL602030
1 * USB Cable</td></tr>
</table>

Note:

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

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2407	06	2430	11	2456
02	2411	07	2434	12	2460
03	2415	08	2437	13	2468
04	2422	09	2445	14	2473
05	2426	10	2451		

3. Table of Filed Antenna:

Antenna	Brand	Model Name	Type	Connector Type	Gain (dBi)
1	N/A	N/A	Ant. On PCB	N/A	-0.33

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.

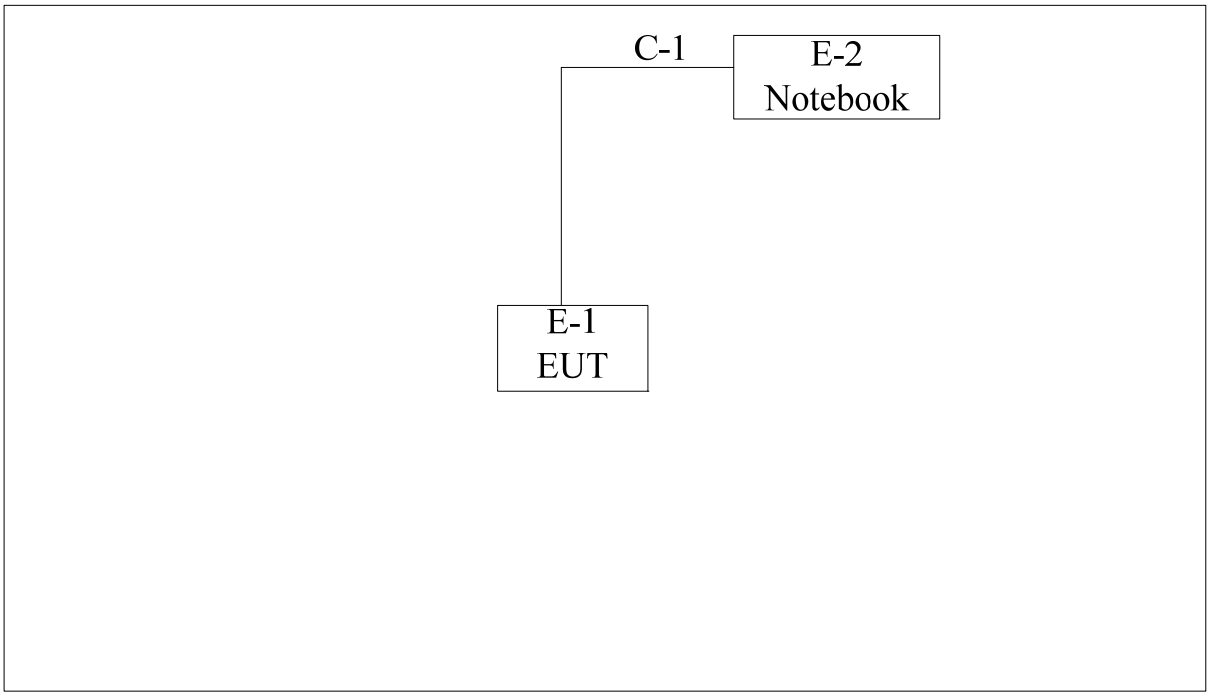
Pretest Test Mode	Description
Mode 1	2407 MHz
Mode 2	2437 MHz
Mode 3	2473 MHz

For Conducted Test	
Final Test Mode	Description
Mode 2	2437 MHz

Radiated Test (Bellow 1 GHz)	
Final Test Mode	Description
Mode 2	2437 MHz

Radiated Test (Above 1 GHz)	
Final Test Mode	Description
Mode 1	2407 MHz
Mode 2	2437 MHz
Mode 3	2473 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	2.4G RF Mouse	A4TECH	G11-570HX	H8GG11570HX	N/A	EUT
E-2	Notebook PC	DELL	PP18L	DOC	PF329 A01	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5M	-

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 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.

(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. 24, 2013
2	LISN	EMCO	3816/2	00066528	Mar. 26, 2013
3	Test Cable	TIMES	CFD300-NL	130	Jun. 15, 2013
4	EMI Test Receiver	R&S	ESCI	100080	Mar. 13, 2013
5	EMI Test Receiver	Agilent	N9038A	MY51210215	Jan. 26, 2013

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.

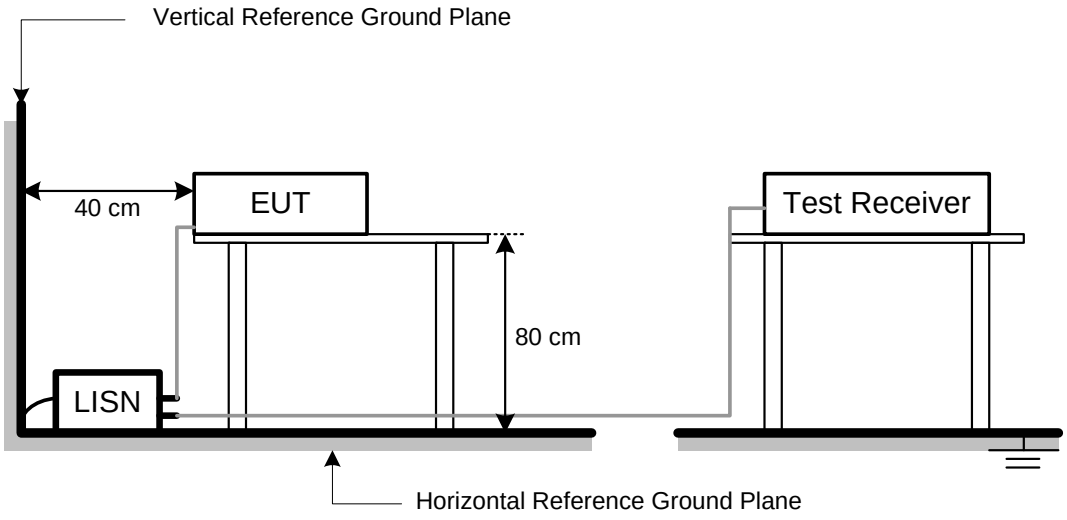
NOTE:

a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.2 sec./ MHz.
b. 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



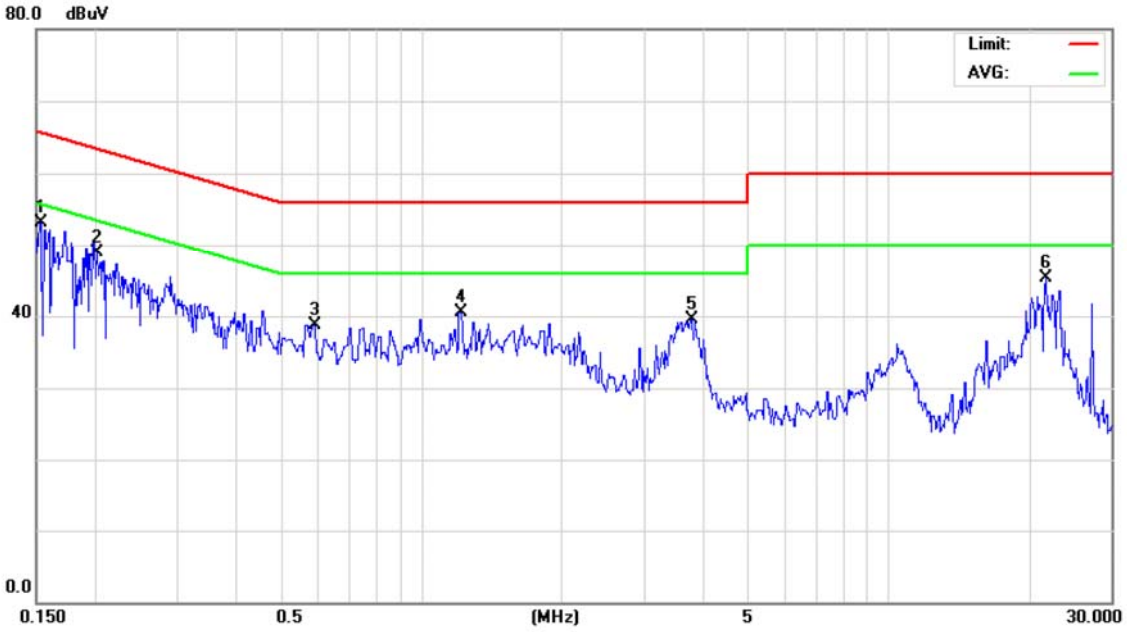
4.1.6 EUT OPERATING CONDITIONS

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

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	24°C	Relative Humidity：	48%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

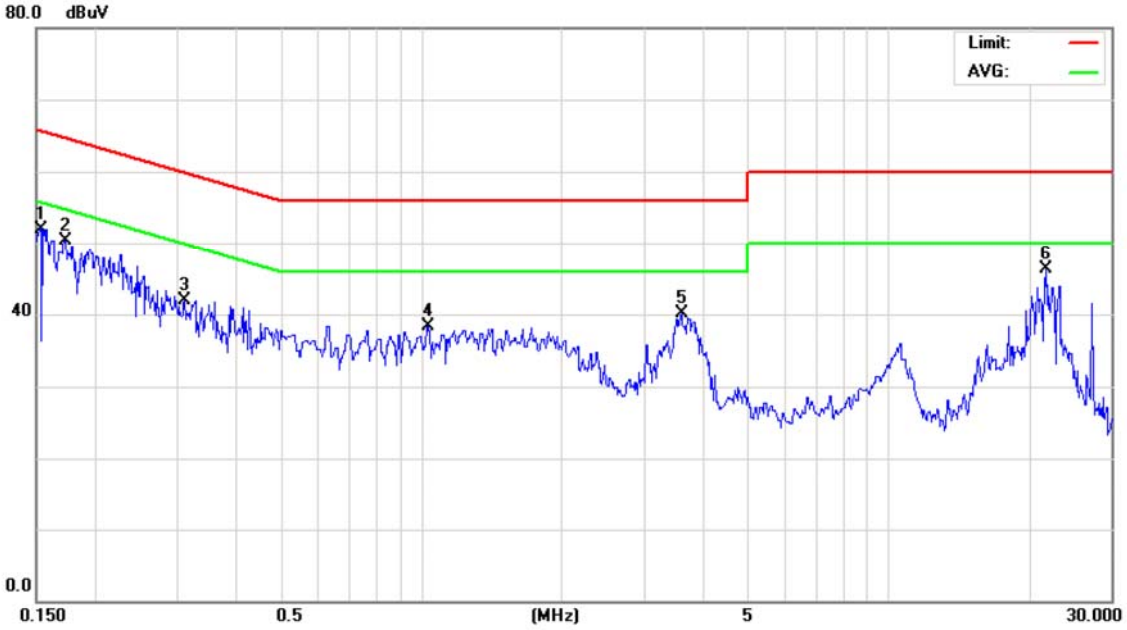
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1527	43.30	9.78	53.08	65.85	-12.77	peak	
2		0.2024	39.15	9.75	48.90	63.51	-14.61	peak	
3		0.5899	28.95	9.70	38.65	56.00	-17.35	peak	
4		1.2109	30.81	9.70	40.51	56.00	-15.49	peak	
5		3.7850	29.80	9.75	39.55	56.00	-16.45	peak	
6		21.6999	35.41	9.88	45.29	60.00	-14.71	peak	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	24°C	Relative Humidity：	48%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

Phase: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1528	42.22	9.78	52.00	65.85	-13.85	peak	
2		0.1724	40.63	9.76	50.39	64.84	-14.45	peak	
3		0.3103	32.27	9.72	41.99	59.96	-17.97	peak	
4		1.0310	28.64	9.70	38.34	56.00	-17.66	peak	
5		3.5960	30.44	9.73	40.17	56.00	-15.83	peak	
6	*	21.7000	36.32	9.91	46.23	60.00	-13.77	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 on15.205(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 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	Oct. 06, 2012
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	May. 14, 2013
5	Microflex Cable	AISI	S104-SMAP-1	10m	May. 14, 2013
6	Microflex Cable	N/A	N/A	3m	May. 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	980001	May. 31, 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)

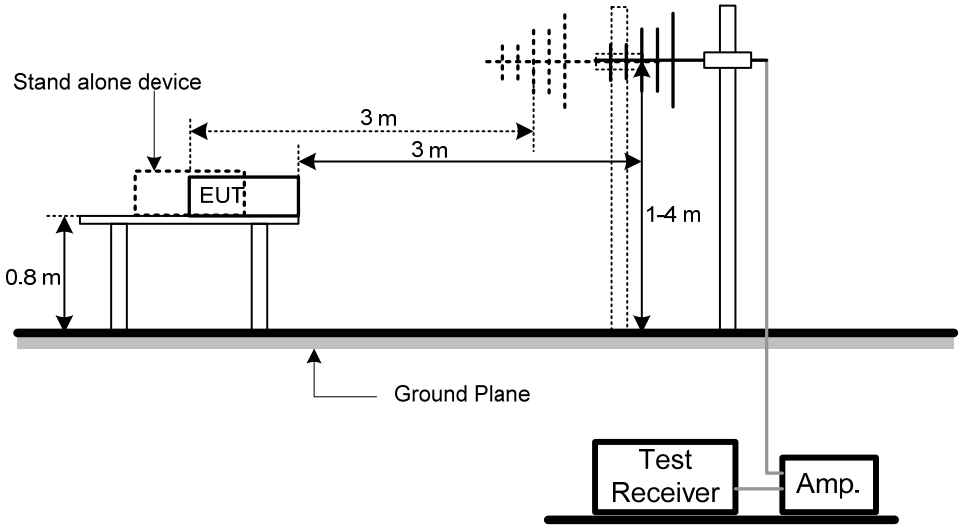
a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. All readings 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

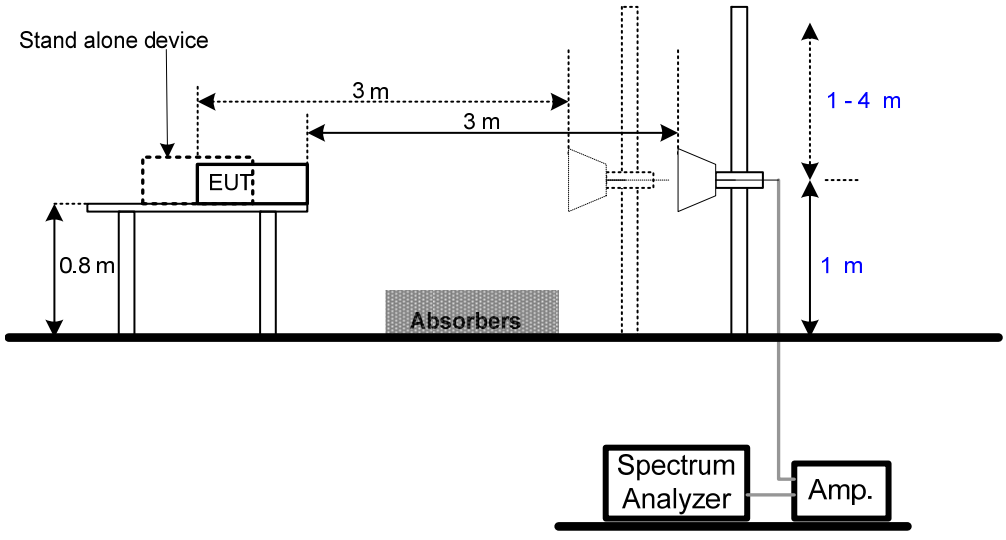
No deviation

4.2.5 TEST SETUP

Below 1 GHz



Above 1 GHz



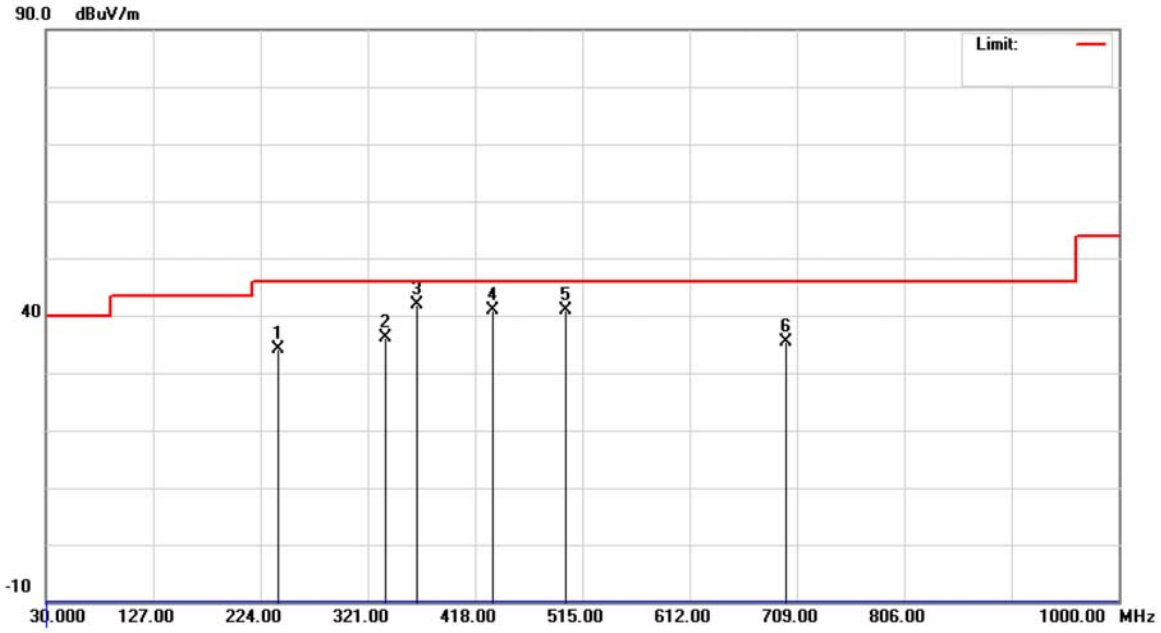
4.2.6 EUT OPERATING CONDITIONS

The EUT 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 operation condition was tested and used to collect the included data.

4.2.7 TEST RESULTS-BELLOW 1 GHZ

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

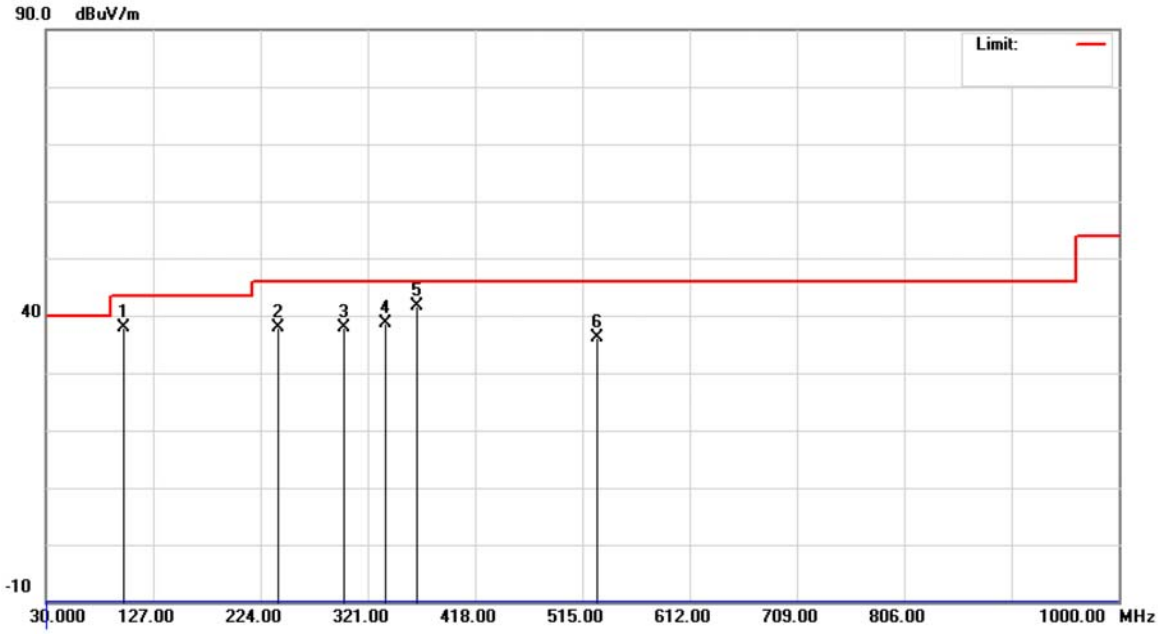
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		239.5200	55.17	-21.14	34.03	46.00	-11.97	peak	
2		336.5199	53.91	-17.73	36.18	46.00	-9.82	peak	
3	*	365.6199	58.98	-17.11	41.87	46.00	-4.13	peak	
4		433.5199	56.02	-15.12	40.90	46.00	-5.10	peak	
5		499.4800	54.87	-13.87	41.00	46.00	-5.00	peak	
6		699.2999	45.65	-10.15	35.50	46.00	-10.50	peak	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

Polarization: Horizontal

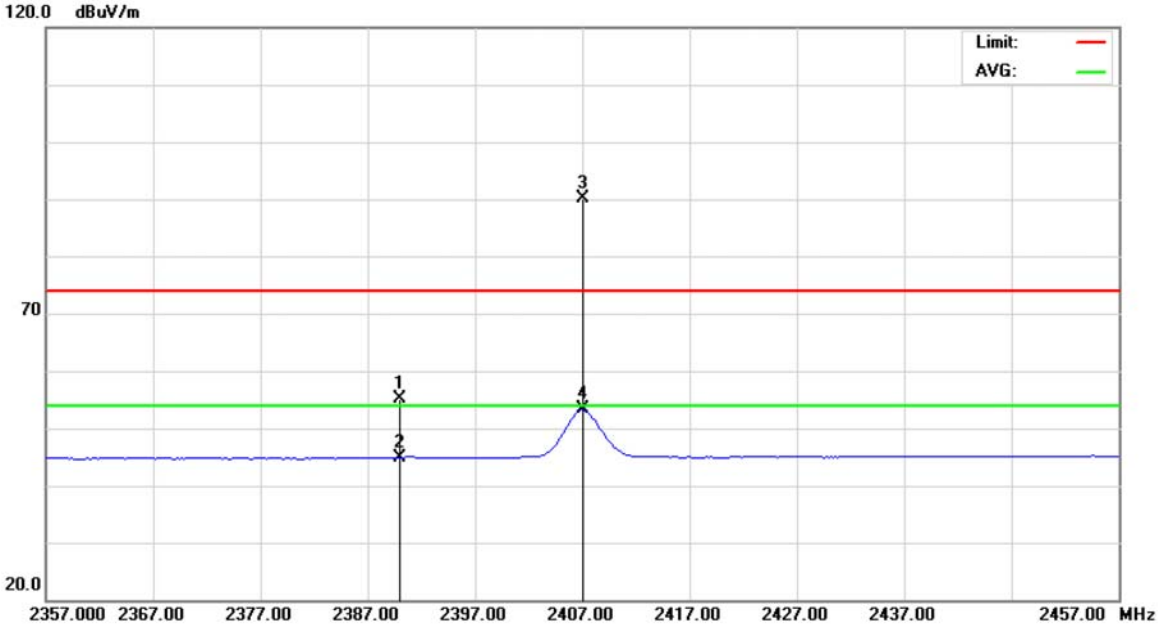


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		99.8399	62.21	-24.29	37.92	43.50	-5.58	peak	
2		239.5200	58.92	-21.14	37.78	46.00	-8.22	peak	
3		299.6600	56.65	-18.83	37.82	46.00	-8.18	peak	
4		336.5199	56.29	-17.73	38.56	46.00	-7.44	peak	
5	*	365.6199	58.81	-17.11	41.70	46.00	-4.30	peak	
6		528.5800	49.54	-13.43	36.11	46.00	-9.89	peak	

4.2.8 TEST RESULTS-ABOVE 1 GHZ

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz		

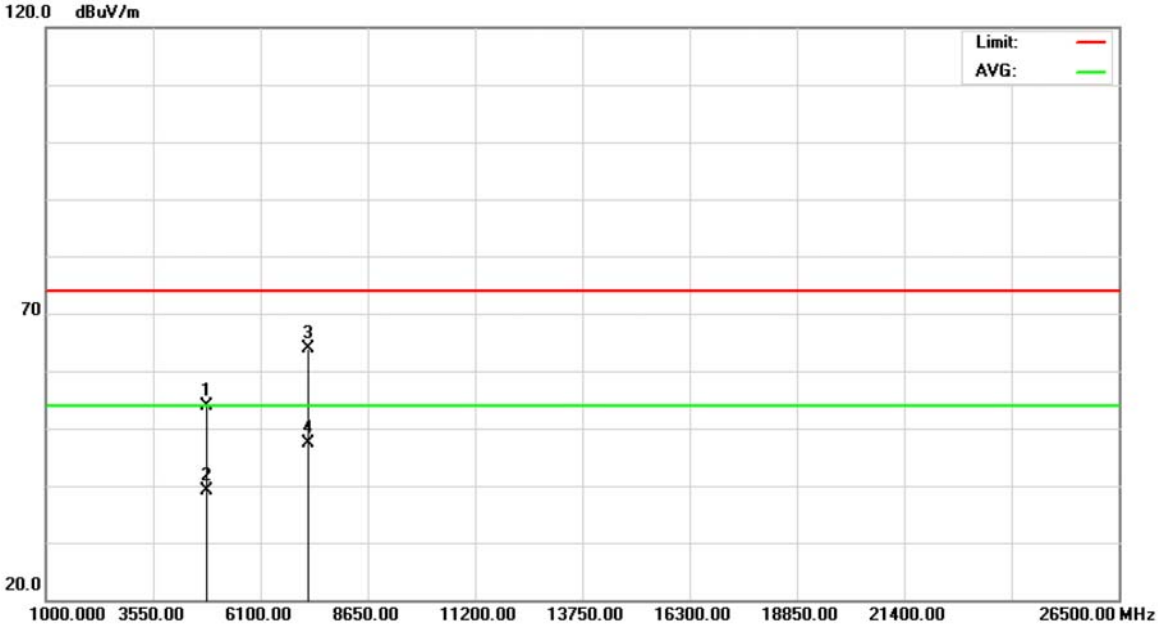
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	21.70	33.42	55.12	74.00	-18.88	peak	
2		2390.000	11.40	33.42	44.82	54.00	-9.18	AVG	
3	*	2407.000	56.59	33.51	90.10	74.00	16.10	peak	
4		2407.000	19.78	33.51	53.29	54.00	-0.71	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz		

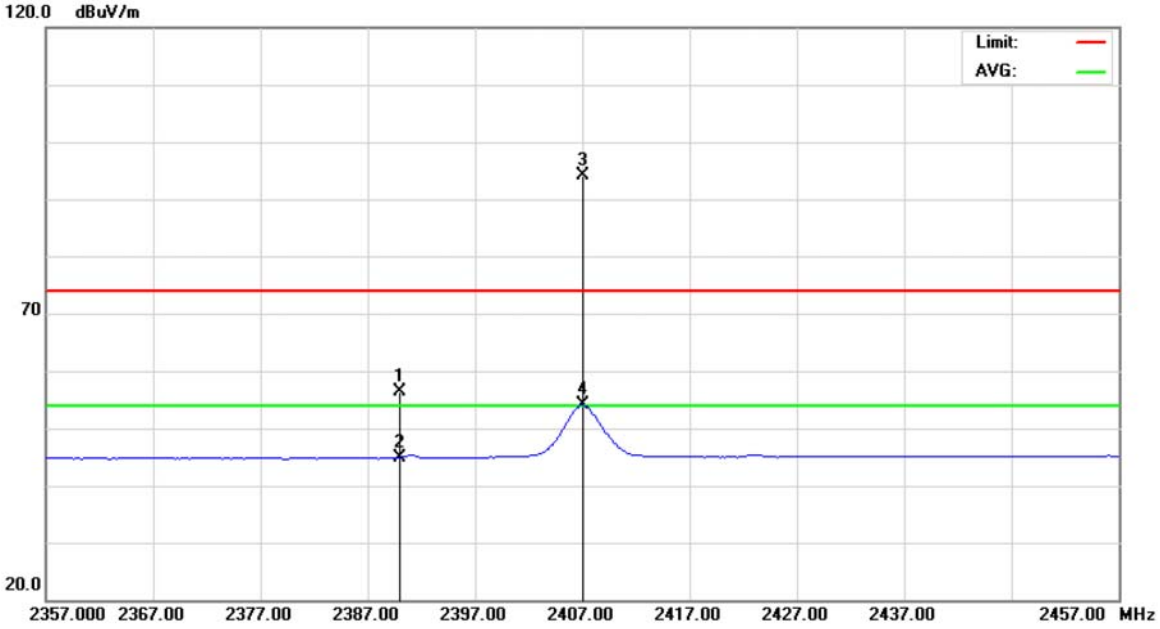
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4814.232	46.35	7.45	53.80	74.00	-20.20	peak	
2		4814.232	31.67	7.45	39.12	54.00	-14.88	AVG	
3		7221.010	49.17	14.83	64.00	74.00	-10.00	peak	
4	*	7221.010	32.64	14.83	47.47	54.00	-6.53	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz		

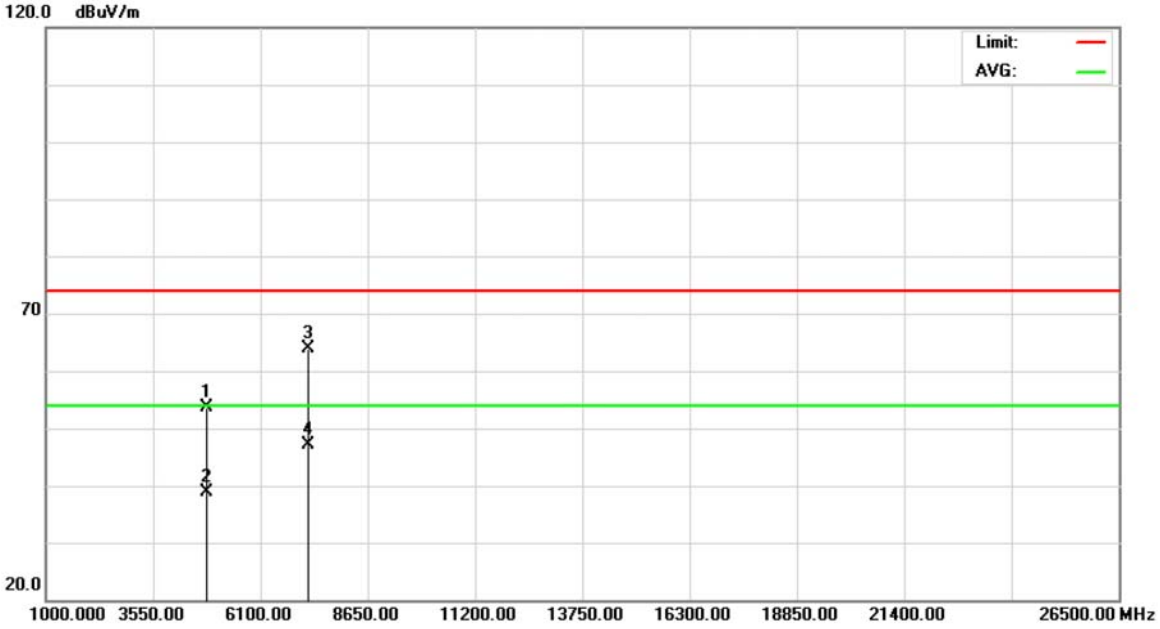
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.87	33.42	56.29	74.00	-17.71	peak	
2		2390.000	11.47	33.42	44.89	54.00	-9.11	AVG	
3	*	2407.000	60.51	33.51	94.02	74.00	20.02	peak	
4	X	2407.000	20.56	33.51	54.07	54.00	0.07	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz		

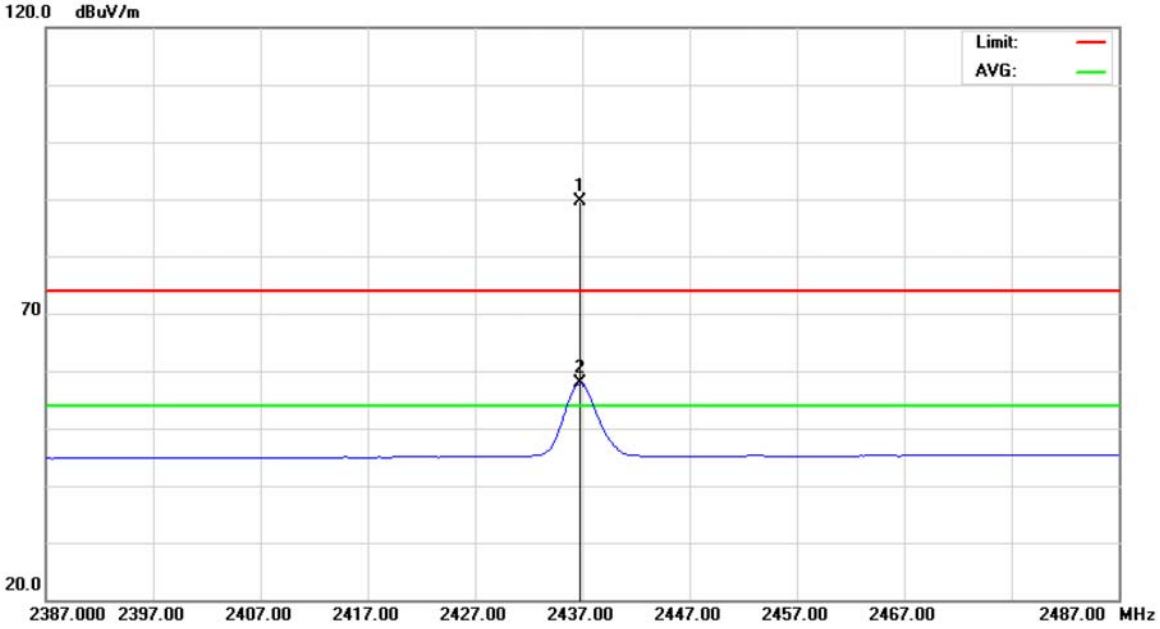
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4814.170	46.24	7.45	53.69	74.00	-20.31	peak	
2		4814.170	31.45	7.45	38.90	54.00	-15.10	AVG	
3		7221.070	49.17	14.83	64.00	74.00	-10.00	peak	
4	*	7221.070	32.36	14.83	47.19	54.00	-6.81	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

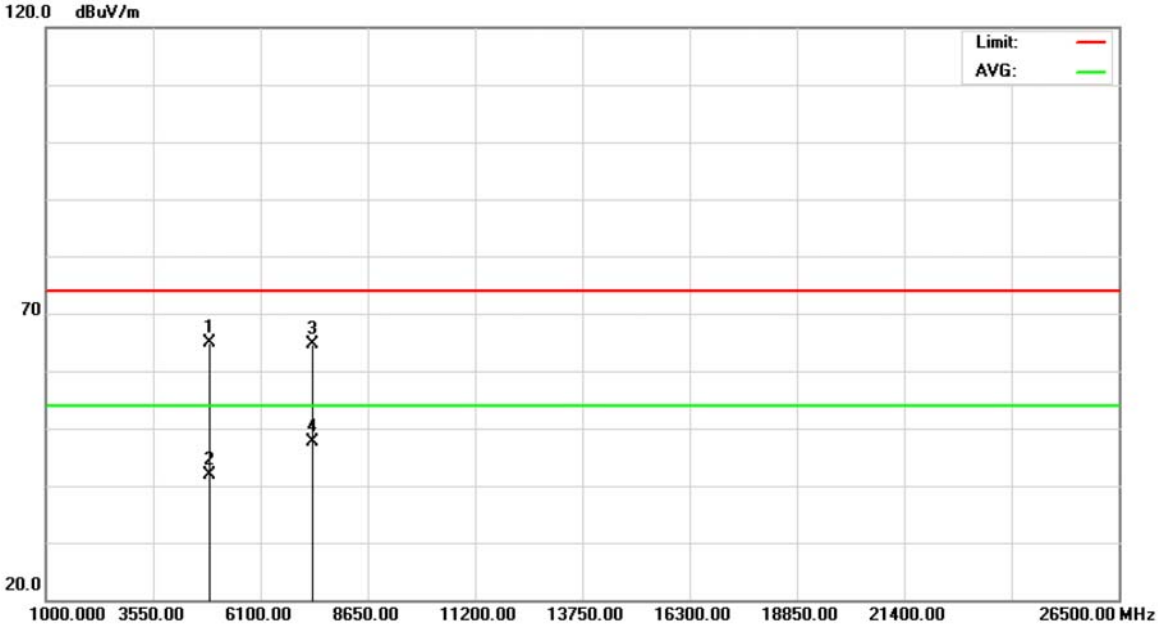
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2436.800	55.89	33.67	89.56	74.00	15.56	peak	
2	X	2436.800	24.09	33.67	57.76	54.00	3.76	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

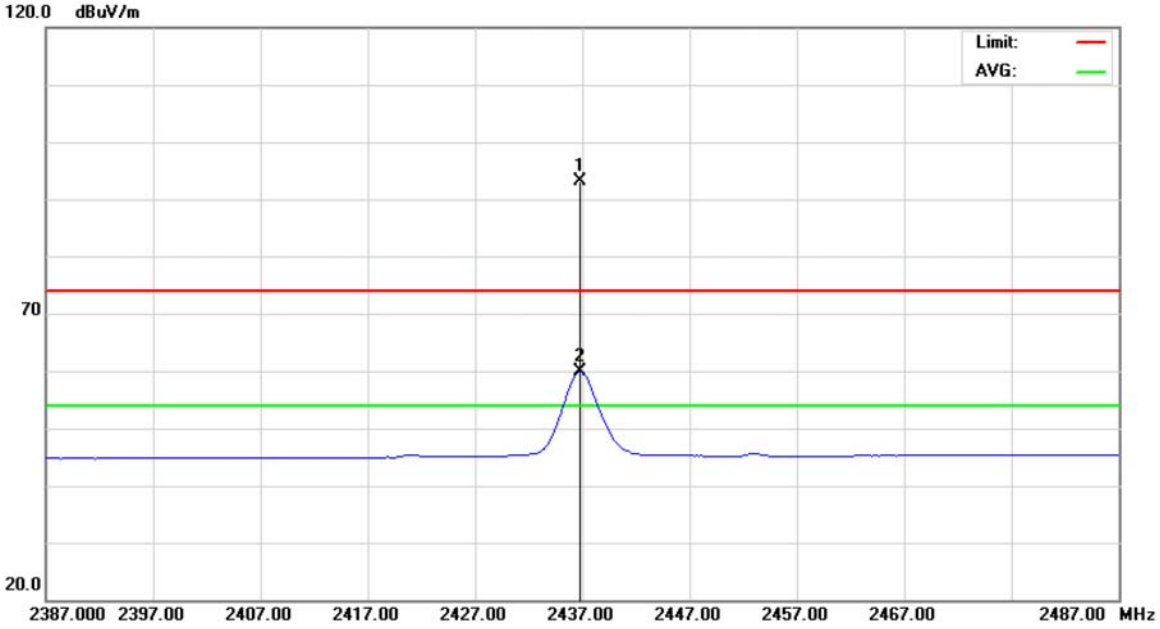
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4873.210	57.32	7.66	64.98	74.00	-9.02	peak	
2		4873.210	34.18	7.66	41.84	54.00	-12.16	AVG	
3		7309.580	49.62	15.06	64.68	74.00	-9.32	peak	
4	*	7309.580	32.55	15.06	47.61	54.00	-6.39	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

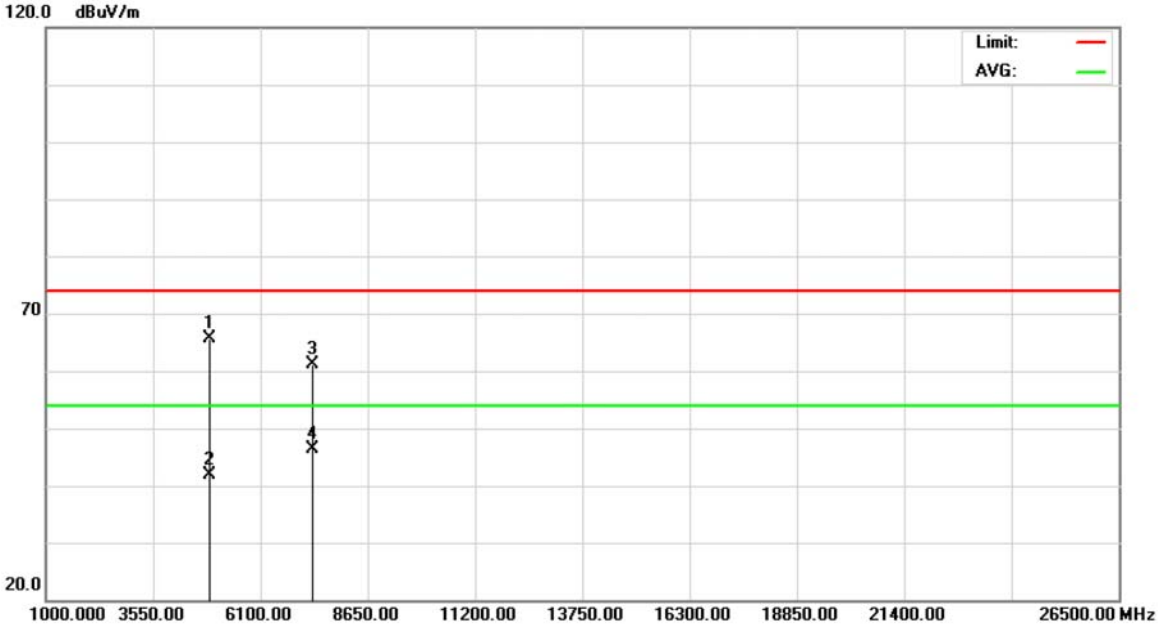
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2436.800	59.57	33.67	93.24	74.00	19.24	peak	
2	X	2436.800	26.12	33.67	59.79	54.00	5.79	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage :	AC 120V/60Hz (System)		
Test Mode ：	2437 MHz		

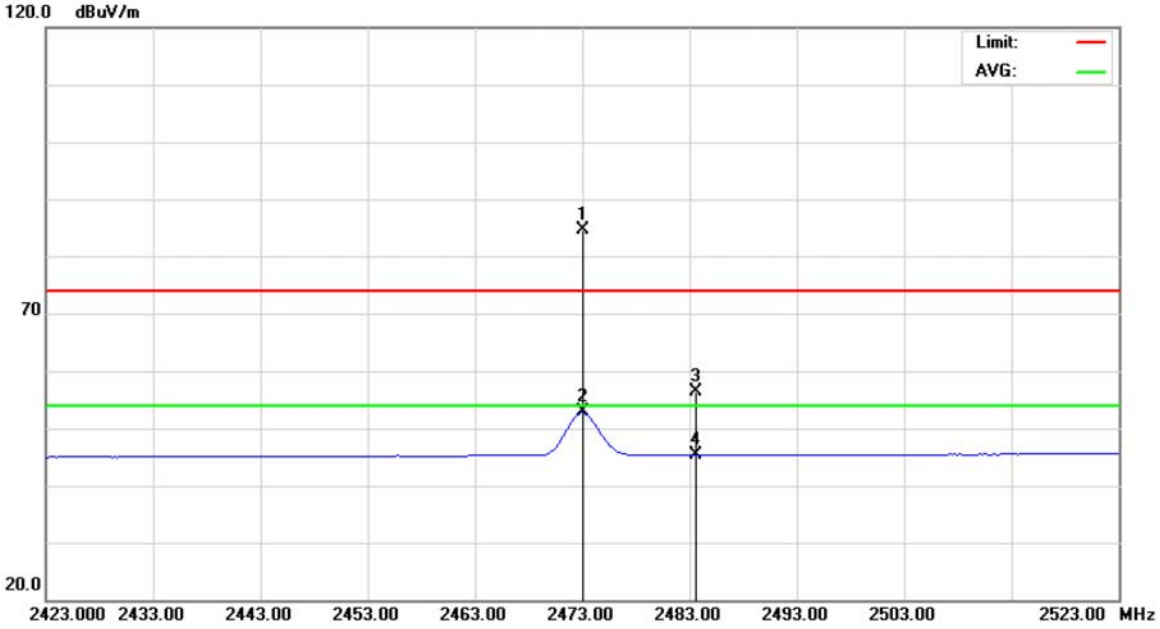
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4873.130	57.98	7.66	65.64	74.00	-8.36	peak	
2		4873.130	34.19	7.66	41.85	54.00	-12.15	AVG	
3		7309.580	46.18	15.06	61.24	74.00	-12.76	peak	
4	*	7309.580	31.30	15.06	46.36	54.00	-7.64	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2473 MHz		

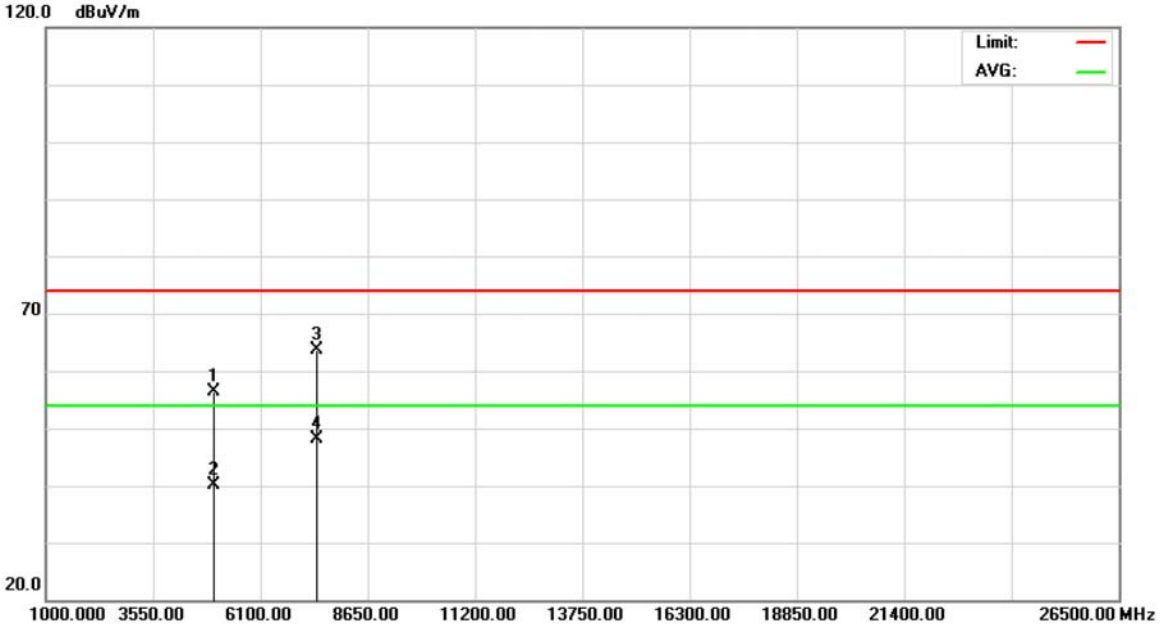
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2473.000	50.82	33.87	84.69	74.00	10.69	peak	
2		2473.000	18.93	33.87	52.80	54.00	-1.20	AVG	
3		2483.500	22.35	33.92	56.27	74.00	-17.73	peak	
4		2483.500	11.44	33.92	45.36	54.00	-8.64	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2473 MHz		

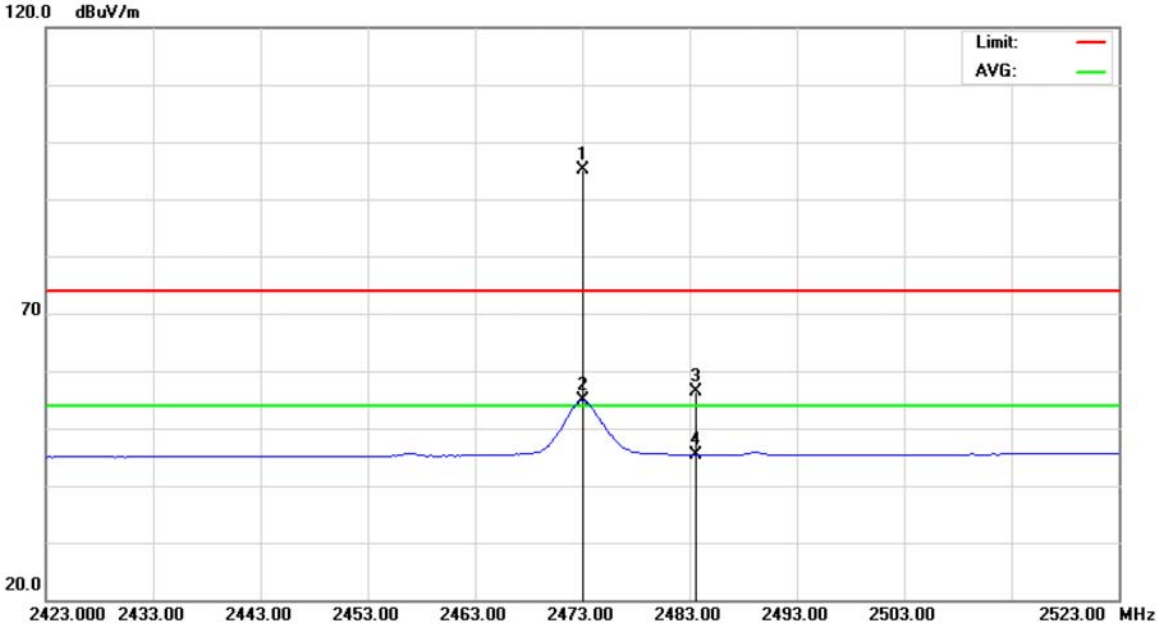
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4946.030	48.33	7.93	56.26	74.00	-17.74	peak	
2		4946.030	32.22	7.93	40.15	54.00	-13.85	AVG	
3		7419.050	48.16	15.35	63.51	74.00	-10.49	peak	
4	*	7419.050	32.67	15.35	48.02	54.00	-5.98	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2473 MHz		

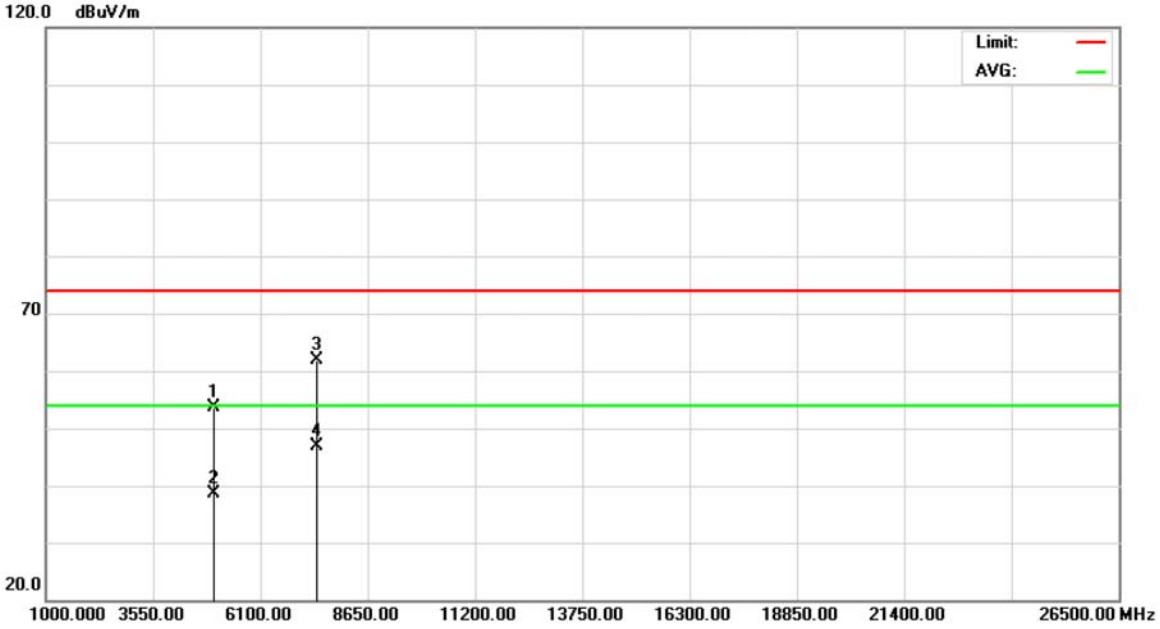
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2473.000	61.31	33.87	95.18	74.00	21.18	peak	
2	X	2473.000	21.04	33.87	54.91	54.00	0.91	AVG	
3		2483.500	22.54	33.92	56.46	74.00	-17.54	peak	
4		2483.500	11.50	33.92	45.42	54.00	-8.58	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	2473 MHz		

Polarization: Horizontal

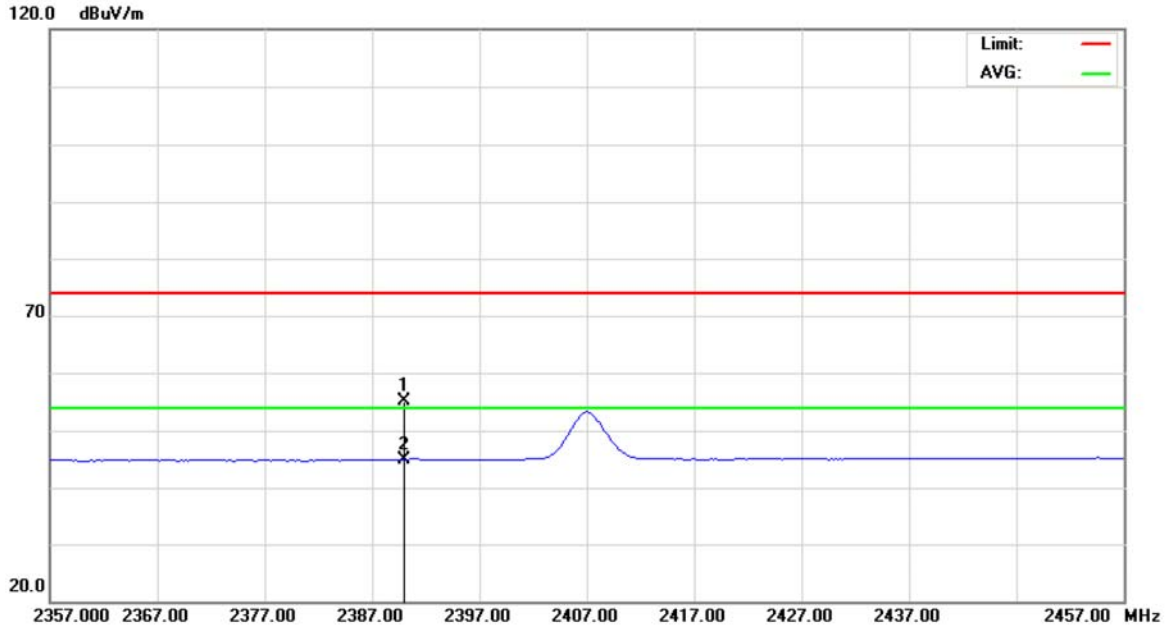


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4946.110	45.62	7.93	53.55	74.00	-20.45	peak	
2		4946.110	30.69	7.93	38.62	54.00	-15.38	AVG	
3		7418.950	46.43	15.35	61.78	74.00	-12.22	peak	
4	*	7418.950	31.53	15.35	46.88	54.00	-7.12	AVG	

4.2.9 TEST RESULTS-RESTRICTED BANDS REQUIREMENTS

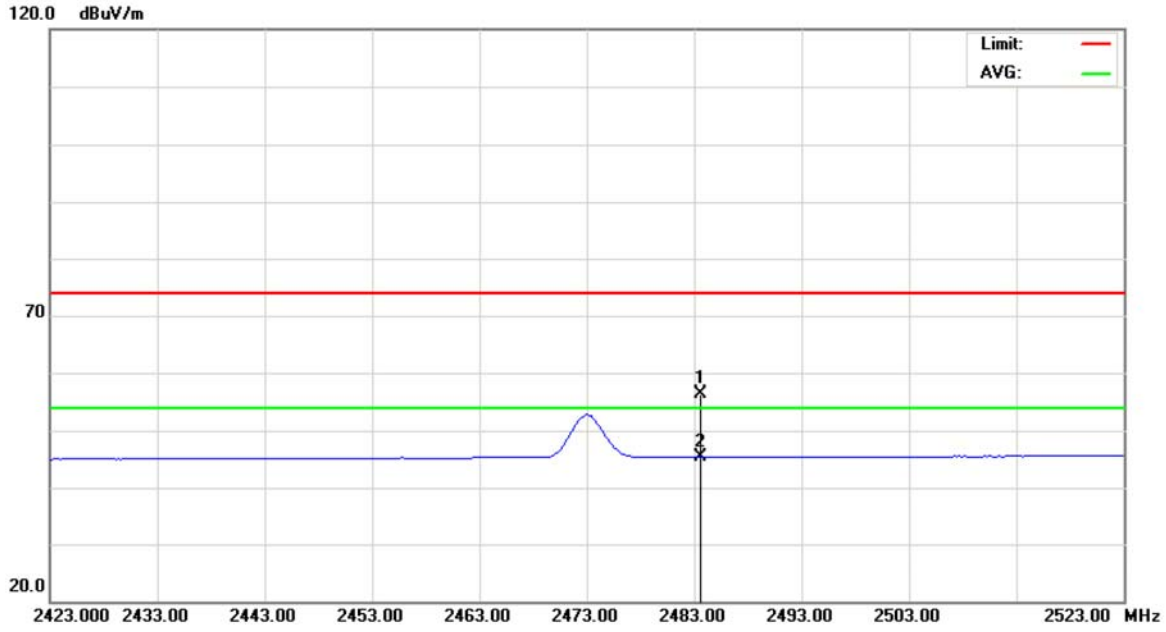
EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz (System)		
Test Mode ：	TX CH 2407 MHz/2473 MHz(Vertical)		
Note：	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2407 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 (2473 MHz). Then the field strength was measured at 2483.5-2500 MHz.		

2407 MHz/ Orthogonal Axes: X Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	21.70	33.42	55.12	74.00	-18.88	peak	
2	*	2390.000	11.40	33.42	44.82	54.00	-9.18	AVG	

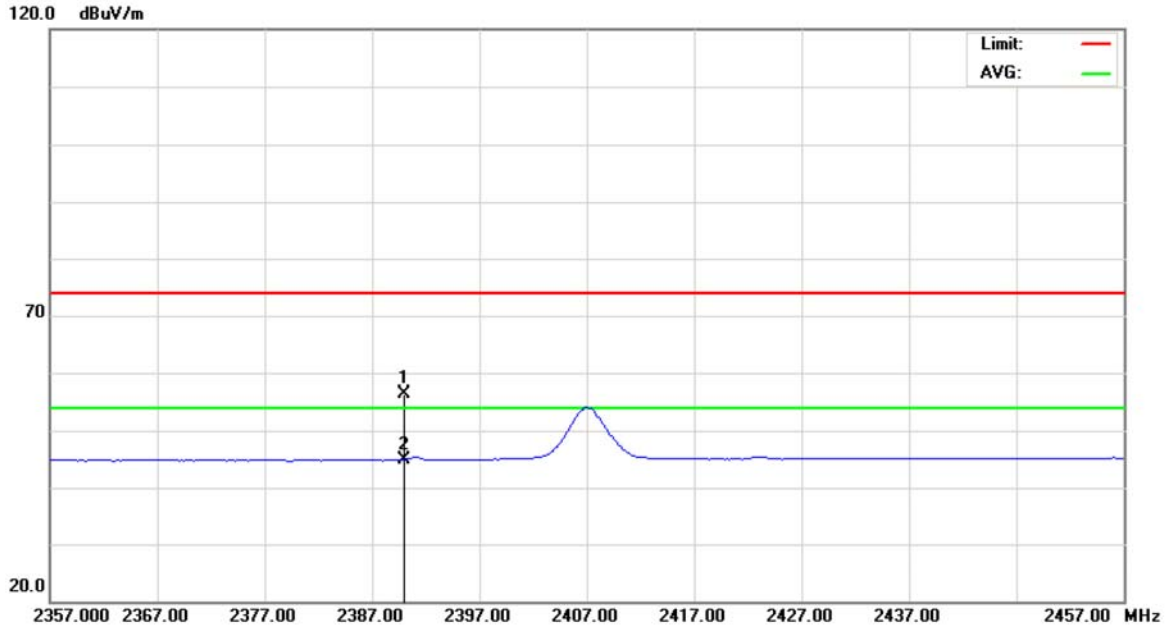
2473 MHz/ Orthogonal Axes: X Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	22.35	33.92	56.27	74.00	-17.73	peak	
2	*	2483.500	11.44	33.92	45.36	54.00	-8.64	AVG	

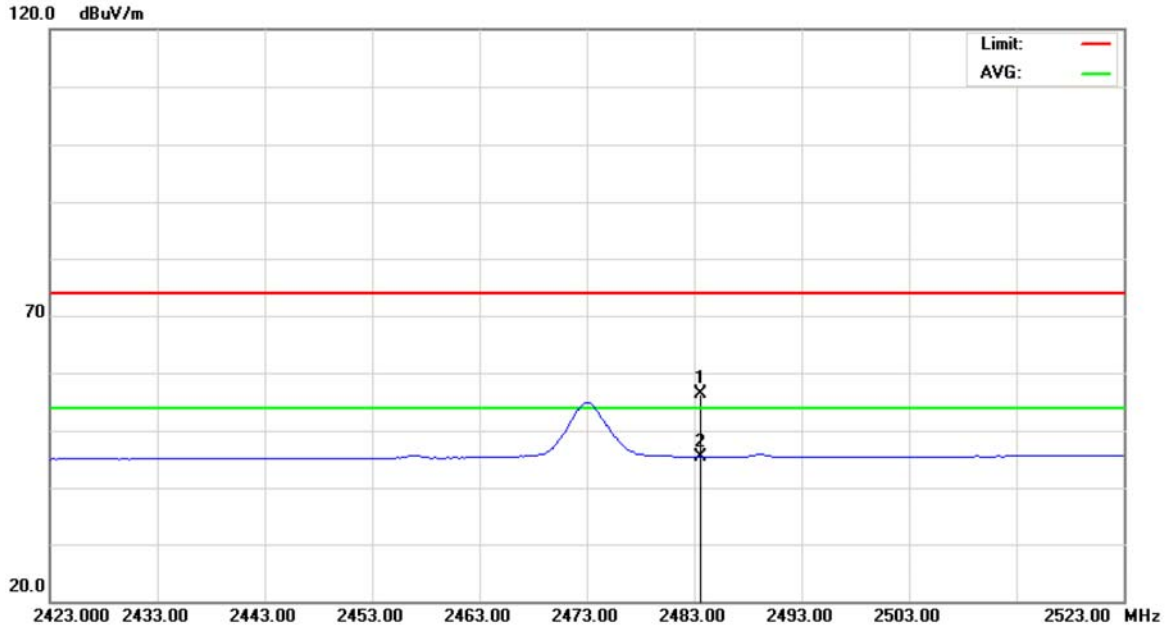
EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity：	60%
Test Voltage :	AC 120V/60Hz (System)		
Test Mode ：	TX CH 2407 MHz/2473 MHz (Horizontal)		
Note：	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2407 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 (2473 MHz). Then the field strength was measured at 2483.5-2500 MHz.		

2407 MHz/ Orthogonal Axes: X Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.87	33.42	56.29	74.00	-17.71	peak	
2	*	2390.000	11.47	33.42	44.89	54.00	-9.11	AVG	

2473 MHz/ Orthogonal Axes: X Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	22.54	33.92	56.46	74.00	-17.54	peak	
2	*	2483.500	11.50	33.92	45.42	54.00	-8.58	AVG	

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Bandwidth	>= 500KHz (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	Oct. 06, 2012

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

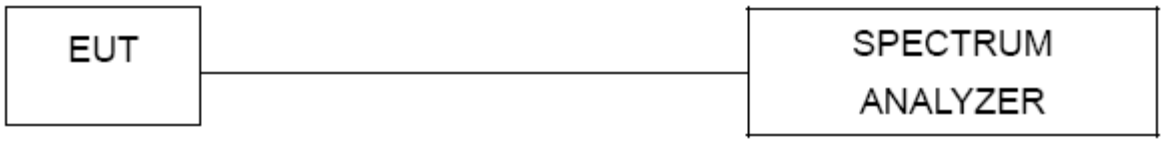
5.1.2 TEST PROCEDURE

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

5.1.3 DEVIATION FROM STANDARD

No deviation.

5.1.4 TEST SETUP



5.1.5 EUT OPERATION CONDITIONS

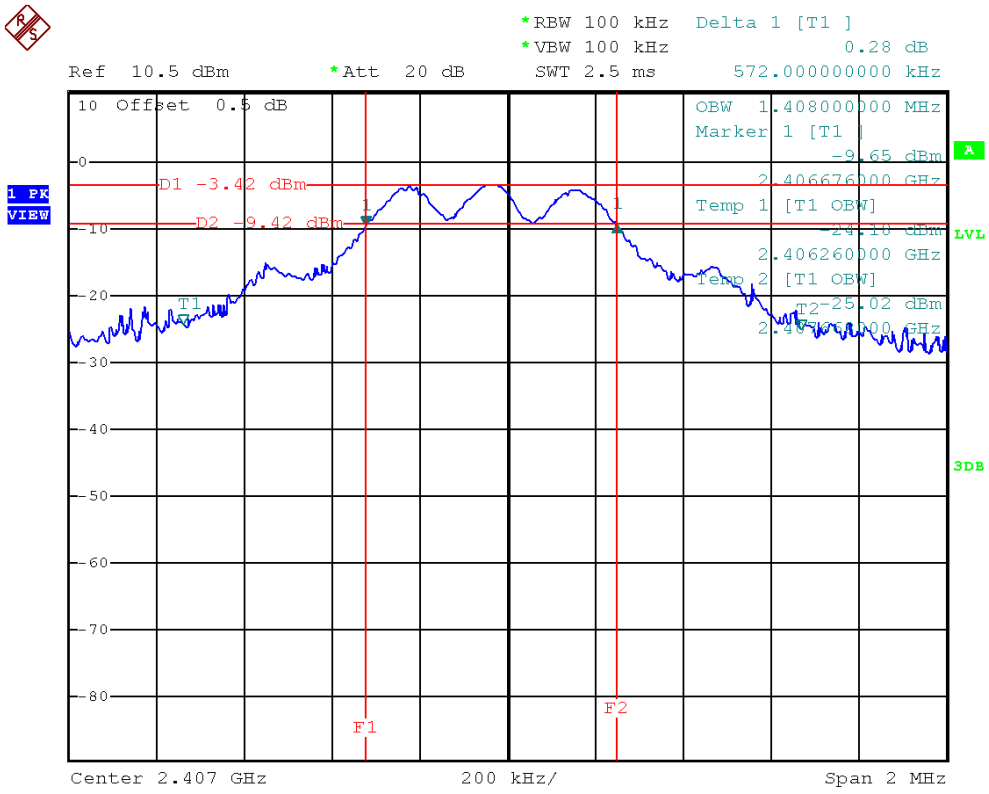
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.6 TEST RESULTS

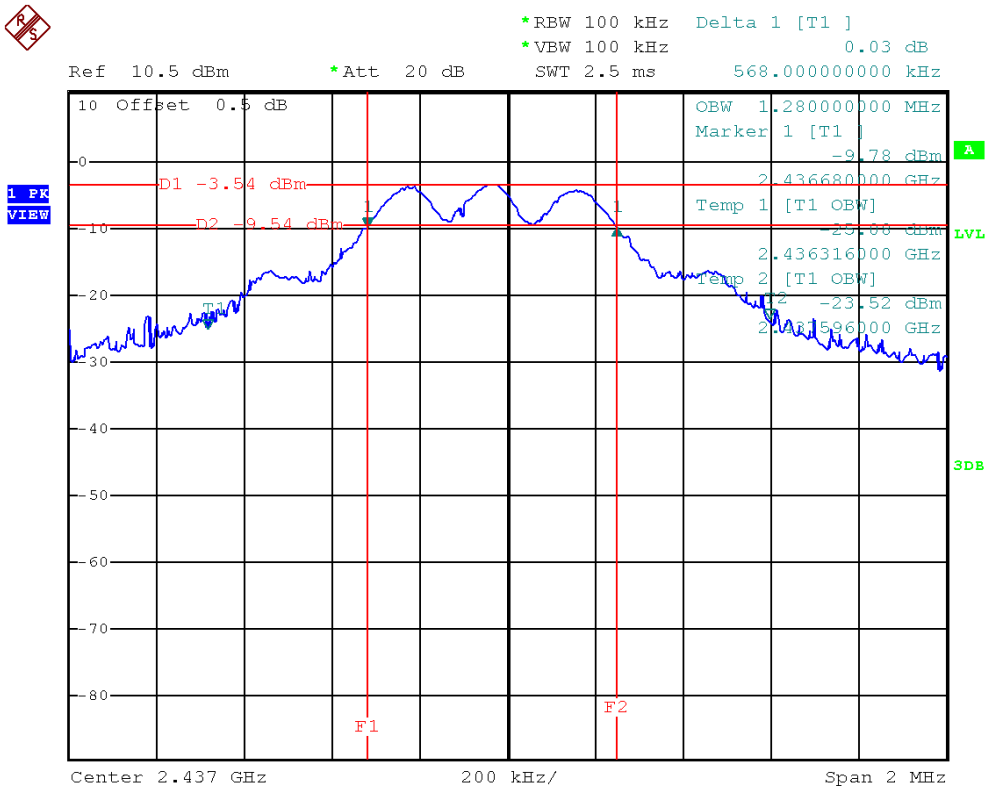
EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity :	60%
Test Voltage :	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz/2437 MHz/2473 MHz		

Frequency	Bandwidth (MHz)	99% Occupied BW (MHz)	LIMIT (MHz)
2407 MHz	0.57	1.41	>=500KHz
2437 MHz	0.57	1.28	>=500KHz
2473 MHz	0.57	1.18	>=500KHz

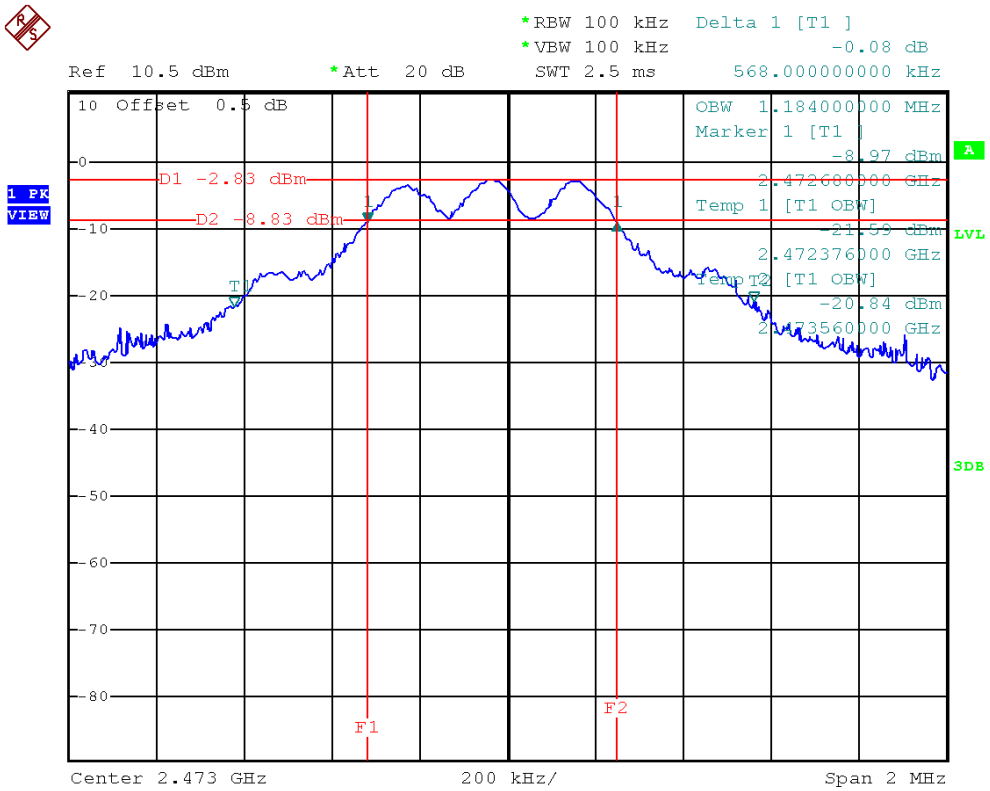
2407 MHz



2437 MHz



2473 MHz



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

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Jul. 13, 2012
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Jul. 18, 2012
3	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06, 2012

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

6.1.2 TEST PROCEDURE

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

6.1.6 TEST RESULTS

EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	26°C	Relative Humidity :	60%
Test Voltage :	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz/2437 MHz/2473 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
2407 MHz	-2.11	30	1
2437 MHz	-2.01	30	1
2473 MHz	-2.23	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

7.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06, 2012

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

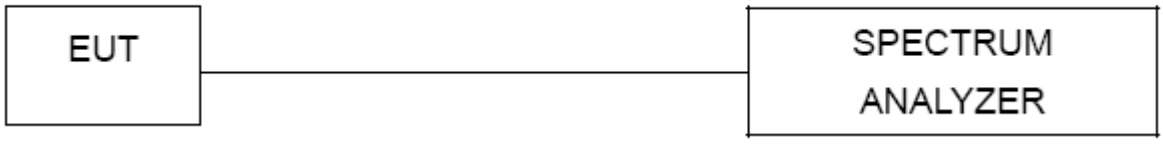
7.1.2 TEST PROCEDURE

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

7.1.3 DEVIATION FROM STANDARD

No deviation.

7.1.4 TEST SETUP



7.1.5 EUT OPERATION CONDITIONS

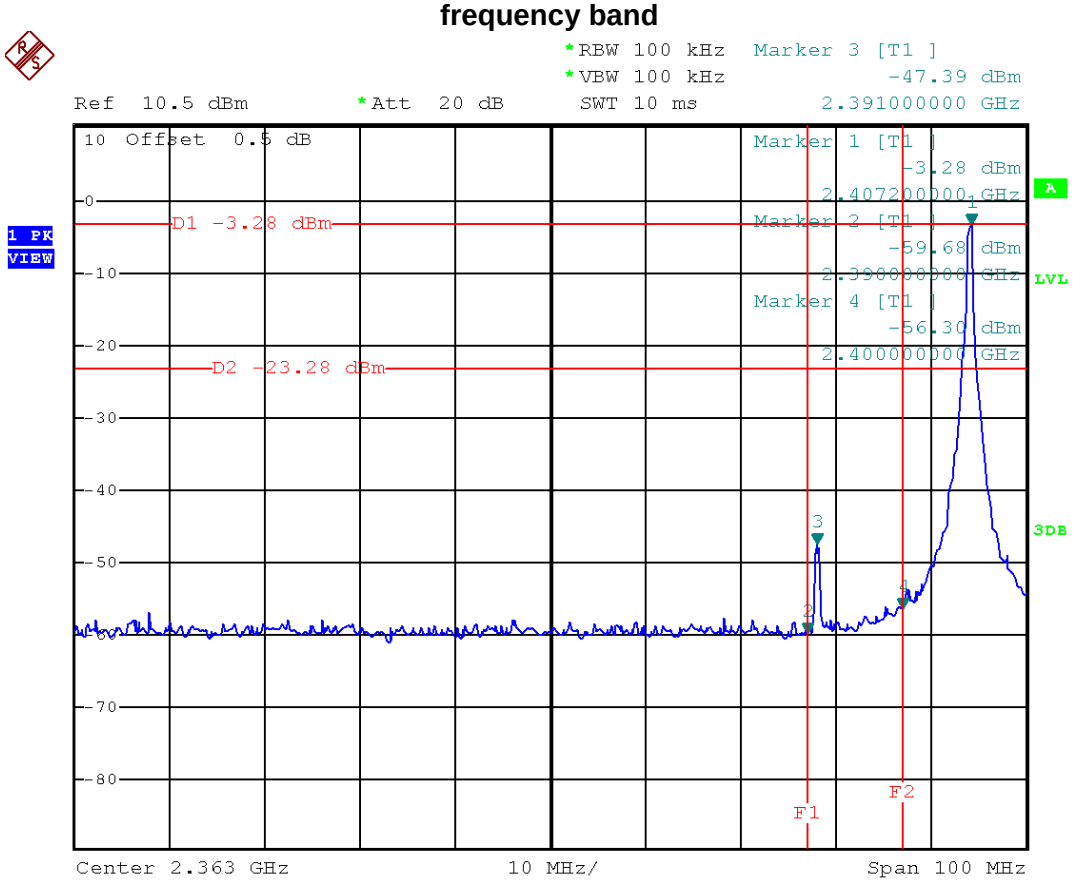
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.6 TEST RESULTS

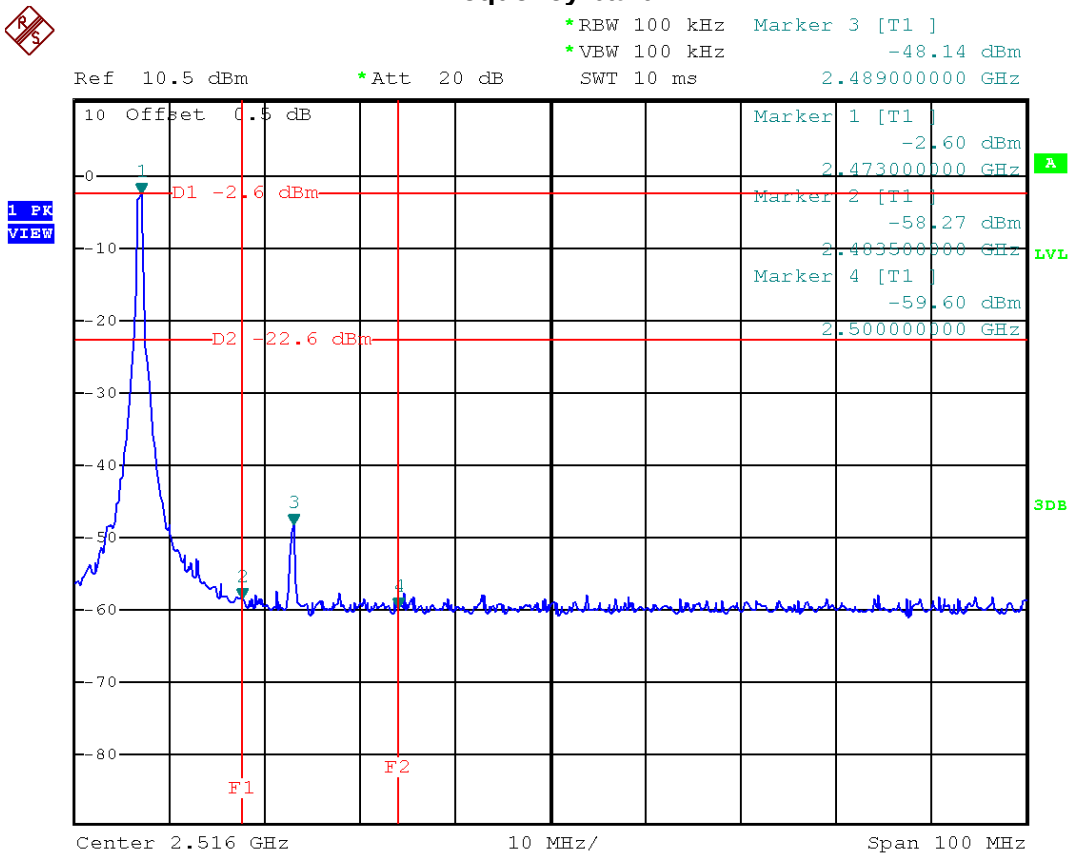
EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	24°C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz/2473 MHz		

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)
2391.0	-47.39	2489.0	-48.14
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

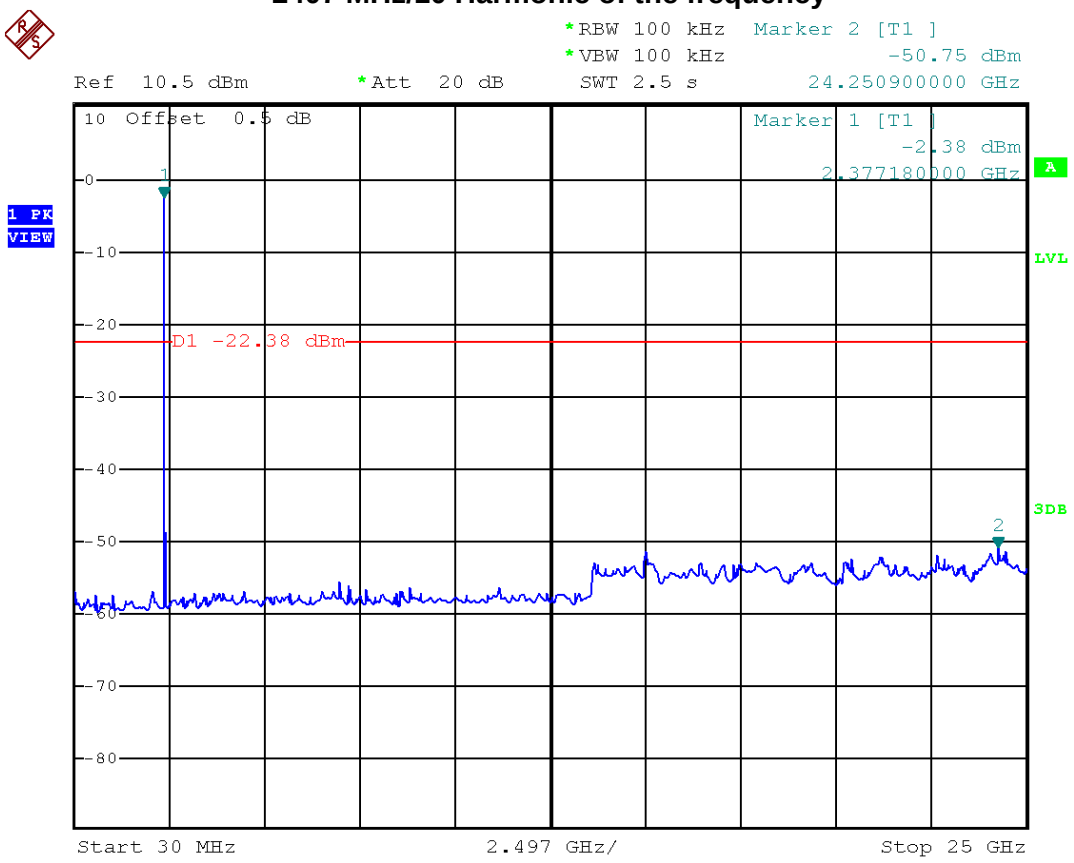
2407 MHz/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



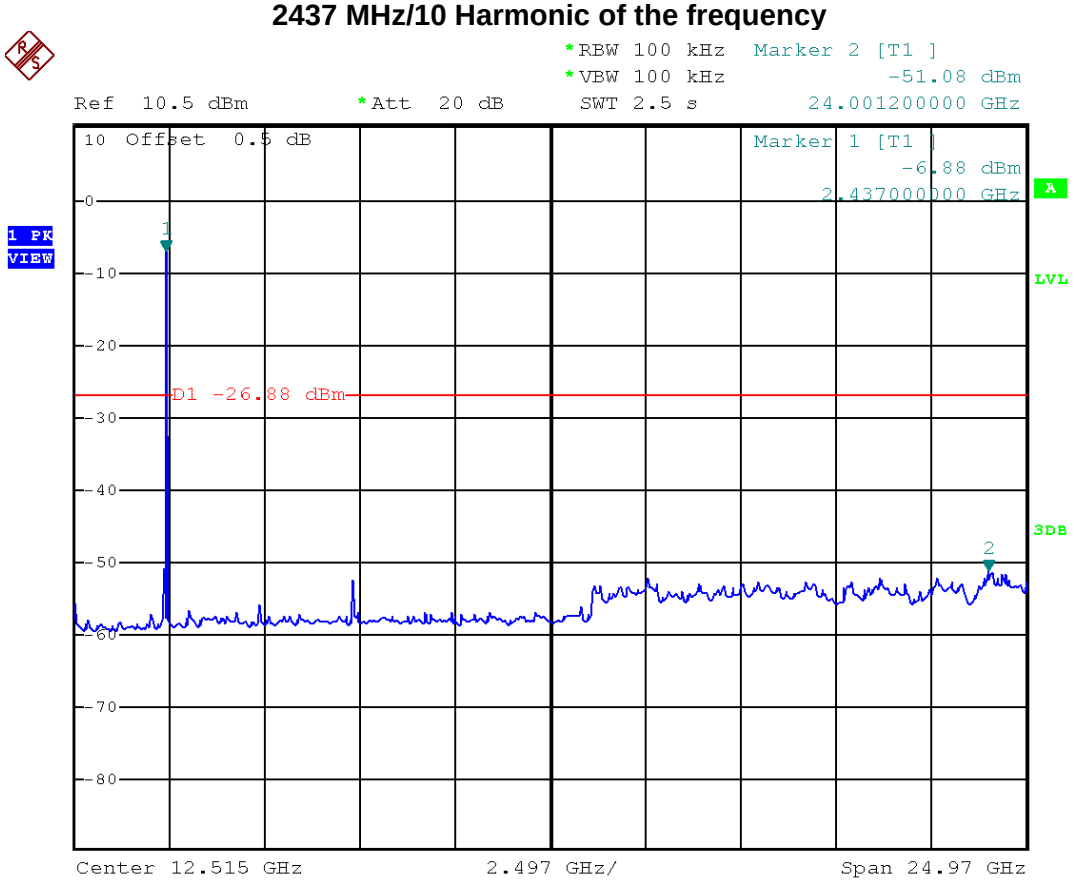
2473 MHz/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



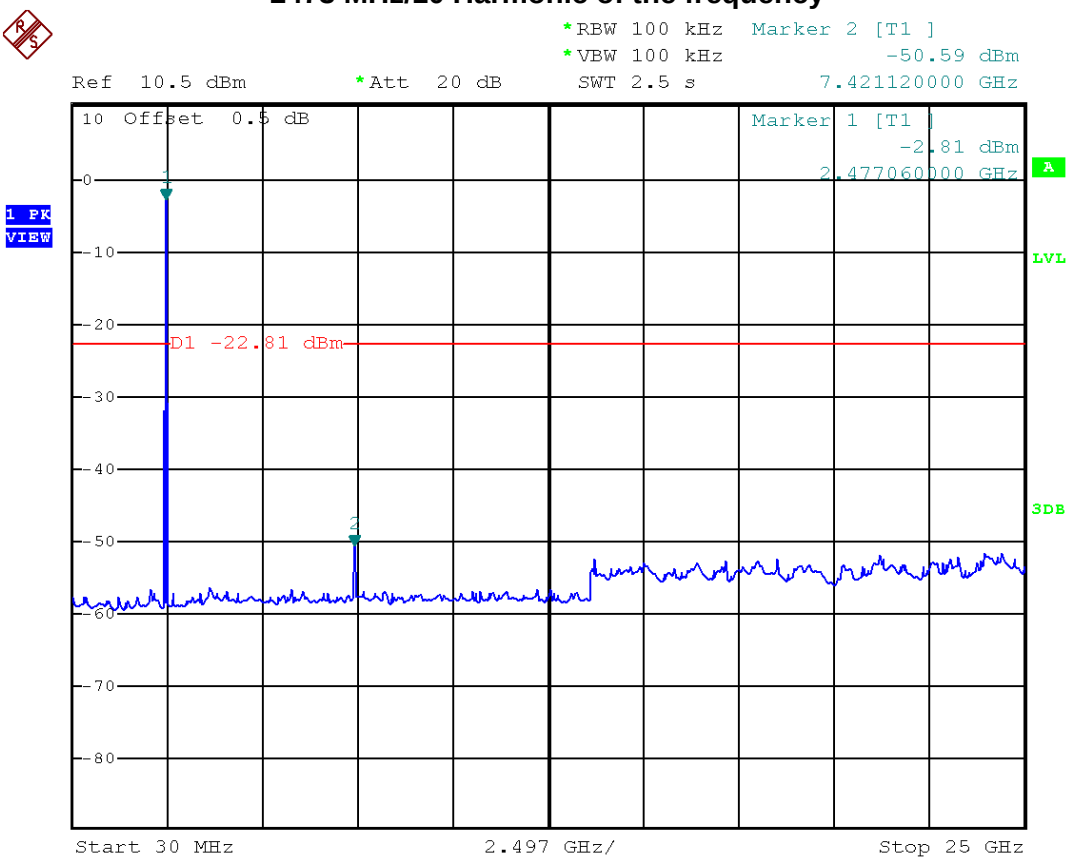
2407 MHz/10 Harmonic of the frequency



2437 MHz/10 Harmonic of the frequency



2473 MHz/10 Harmonic of the frequency



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

8.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06, 2012

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

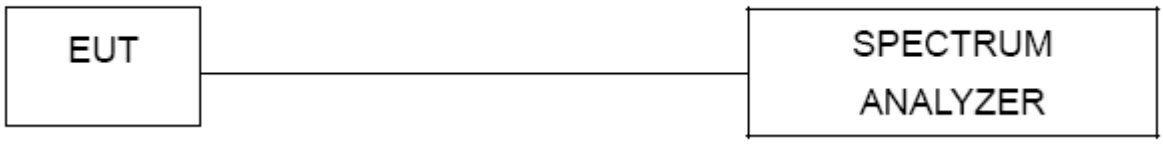
8.1.2 TEST PROCEDURE

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

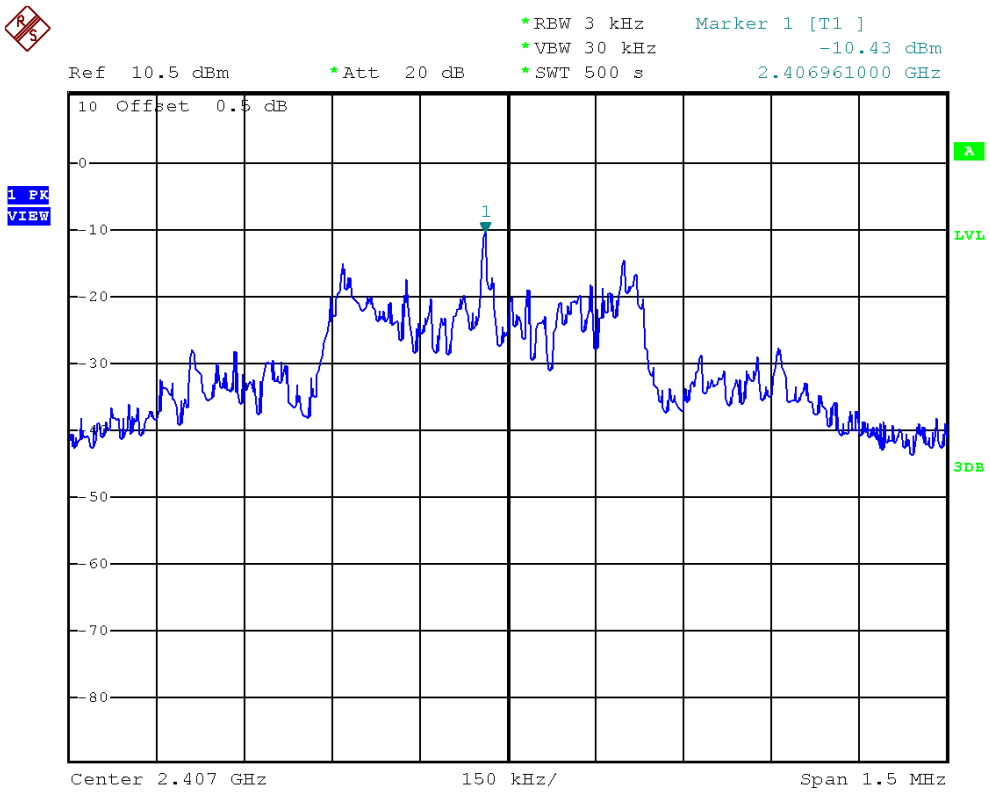
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.6 TEST RESULTS

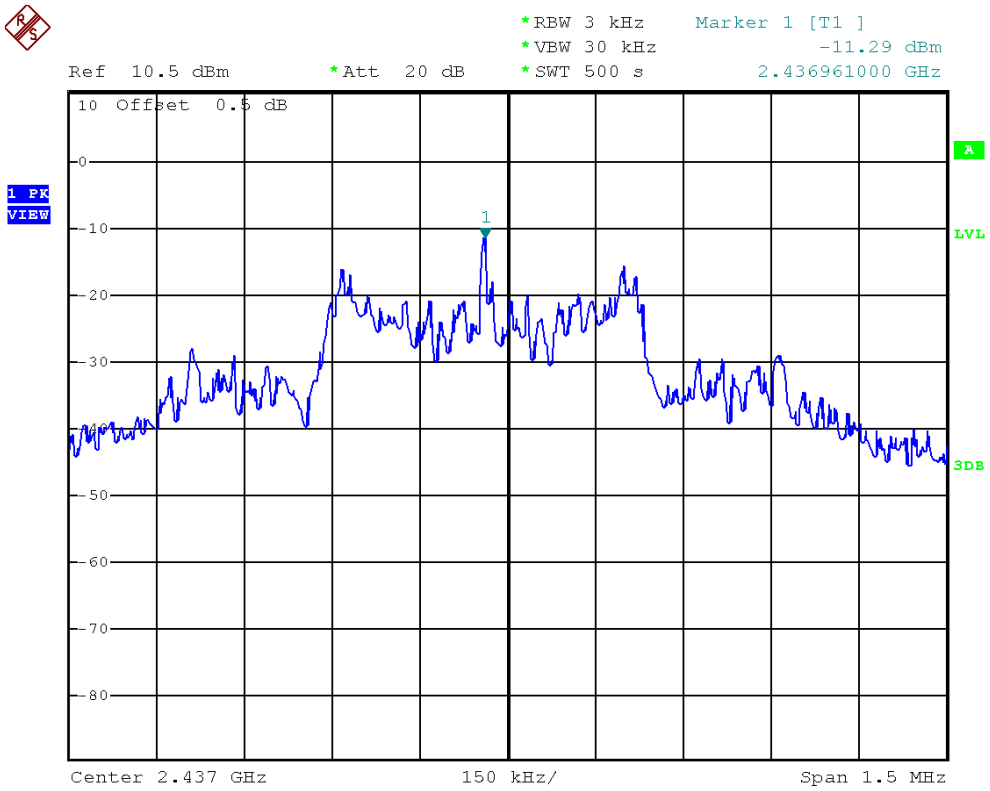
EUT：	2.4G RF Mouse	Model Name ：	G11-570HX
Temperature：	24˚C	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz (System)		
Test Mode ：	2407 MHz/2437 MHz/2473 MHz		

Frequency	Power Density (dBm)	LIMIT (dBm)
2407 MHz	-10.43	8
2437 MHz	-11.29	8
2473 MHz	-10.56	8

2407 MHz



2437 MHz



2473 MHz