Radio Test Report

FCC ID: H8GG9500H

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

Issued Date : Jul. 20, 2012
Project No. : 1201121B
Equipment : 2.4G RF Mouse
Model Name : G9-500H; G9-500F; 6100H; 9500H; 6100F; 8100F; G9-500H-1; G9-500H-2; G9-500H-3; G9-500H-4; G9-500H-5; G9-500H-6

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: Mar. 12, 2012
Date of Test: Mar. 12, 2012 ~ Mar. 16, 2012

Testing Engineer : Rush Kao
(Rush Kao)

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(Jeff Yang)

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Testing Laboratory
0659

C-2918 G-91 R-2669
R-2829 T-1666 T-1667

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 :	G9-500H; G9-500F; 6100H; 9500H; 6100F; 8100F; G9-500H-1; G9-500H-2; G9-500H-3; G9-500H-4; G9-500H-5; G9-500H-6
Applicant :	A-FOUR TECH CO., LTD.
Date of Test :	Mar. 12, 2012 ~ Mar. 16, 2012
Standards :	FCC Part15, Subpart C(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-1-1201121B) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
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:

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.

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
CB08	ANSI	30MHz ~ 200MHz	V	3.22	
		30MHz ~ 200MHz	H	3.35	
		200MHz ~ 1,000MHz	V	3.24	
		200MHz ~ 1,000MHz	H	3.11	
		1000MHz ~ 18000MHz	V	4.05	
		1000MHz ~ 18000MHz	H	3.97	
		18000MHz ~ 40000MHz	V	4.04	
		18000MHz ~ 40000MHz	H	4.01	

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 Mouse
Brand Name	A4TECH
Model Name	G9-500H; G9-500F; 6100H; 9500H; 6100F; 8100F; G9-500H-1; G9-500H-2; G9-500H-3; G9-500H-4; G9-500H-5; G9-500H-6
OEM Brand/Model Name	N/A
Model Difference	Please refer to Note 2.
Product Description	The EUT is a 2.4G RF Mouse. Operation Frequency: 2407~2473MHz Modulation Type: GFSK Number Of Channel 14CH (Note 3) Antenna Designation: Please refer to the Note 4. Antenna Gain(Peak) Please refer to the Note 4. Output Power: -4.30dBm (Max.) Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	Battery supplied
Power Rating	DC 1.5V
Connecting I/O Port(s	Please refer to the User's Manual
Products Covered	NA

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. All models are based on similar electrical circuit except the difference of list below:

Model Name	Brand Name	Lens Type
G9-500H; 6100H; 9500H; G9-500H-1; G9-500H-2; G9-500H-3; G9-500H-4; G9-500H-5; G9-500H-6	A4TECH	Holeless (Sealed lens, completely closed bottom, without any sensor opening)
G9-500F; 6100F; 8100F	A4TECH	V-Track (Vertical reinforced light, tiny lens hole)

All models have two optional sets of Boost IC+Schottky Diode:

No.	Boost IC+Schottky Diode
1	Schottky Diode is in the Boost IC (U3) and nothing on PCB location D2.
2	Schottky Diode is not in the Boost IC (U3) but on PCB location D2.

All the above models were tested, and the model:
G9-500H (No. 1) was found to be the worst case during the pre-scanning test. This model of the worst case was used for final testing and collecting test data included in this report.

3. 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		

4. Table of Filed Antenna:

Antenna	Brand	Model Name	Type	Connector Type	Gain (dBi)
1	N/A	N/A	Ant. On PCB	N/A	-1.17

3.2 DESCRIPTION OF TEST MODES

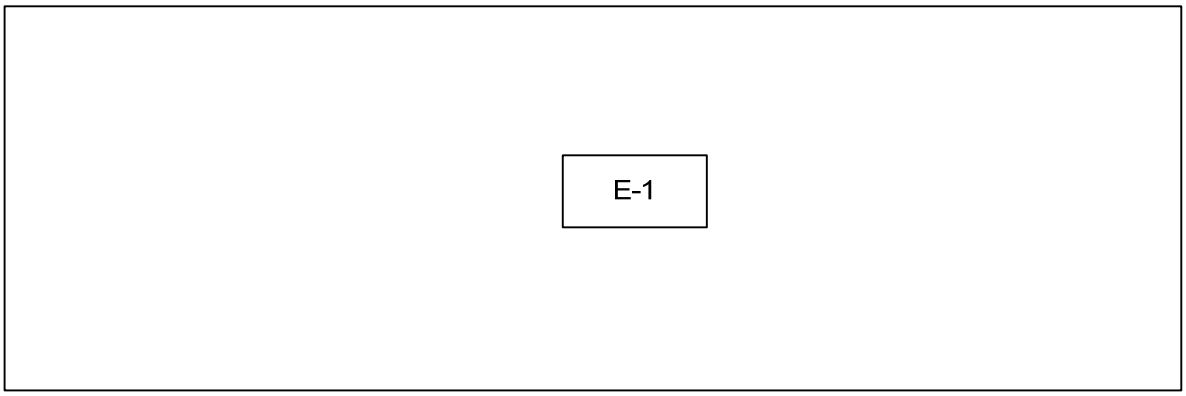
To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

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

For Radiated Test (30 -1000MHz)	
Final Test Mode	Description
Mode 2	2437MHz

For Radiated Test (Above 1000MHz)	
Final Test Mode	Description
Mode 1	2407MHz
Mode 2	2437MHz
Mode 3	2473MHz

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	G9-500H	H8GG9500H	N/A	EUT

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

Note:

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

4. EMC EMISSION TEST

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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 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

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 30, 2012
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Dec. 15, 2012
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 18, 2012
4	Microflex Cable	N/A	N/A	1m	May. 18, 2012
5	Microflex Cable	AISI	S104-SMAP-1	10m	Aug. 21, 2012
6	Microflex Cable	N/A	N/A	3m	Aug. 21, 2012
7	Test Cable	N/A	LMR-400	966_12m	Jun. 16, 2012
8	Test Cable	N/A	LMR-400	966_3m	Jun. 16, 2012
9	Pre-Amplifier	EMC	EMC-330	980001	Jun. 02, 2012
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 20, 2012

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

4.1.3 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)

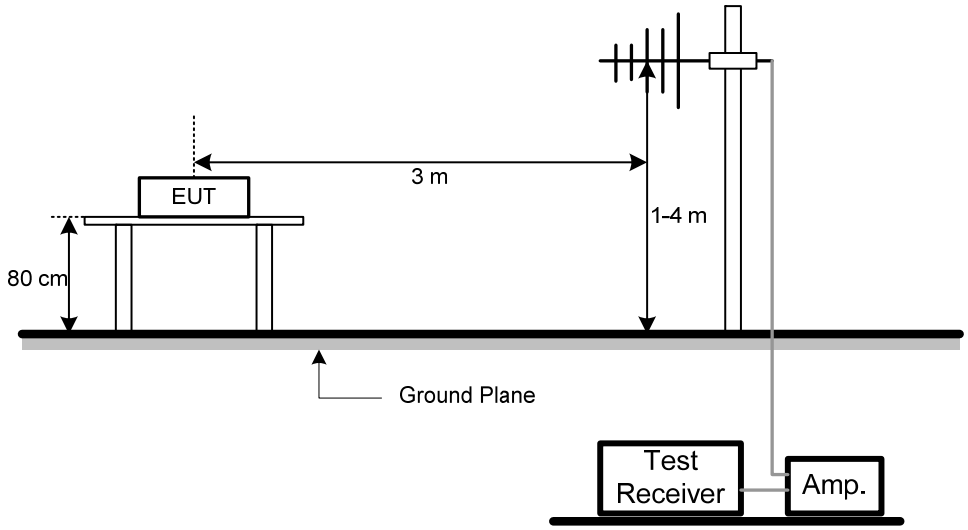
a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. All readings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

4.1.4 DEVIATION FROM TEST STANDARD

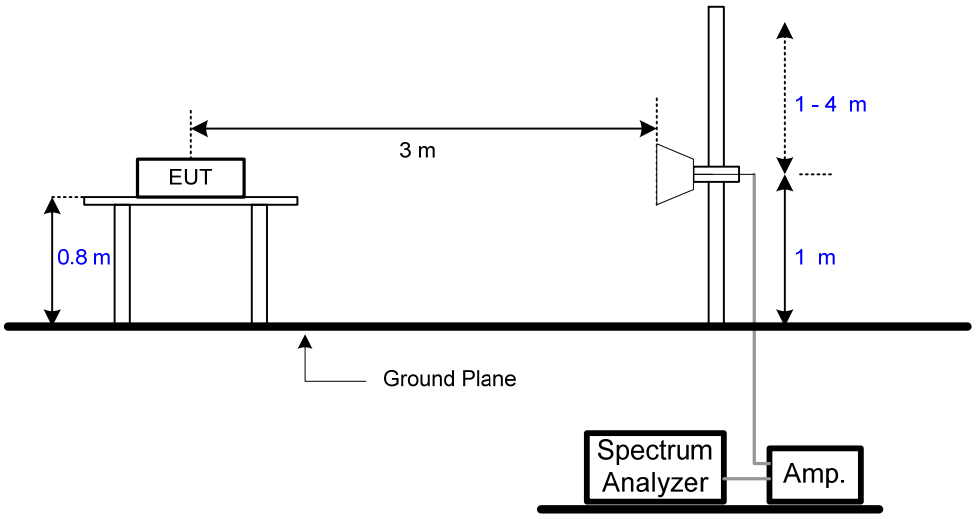
No deviation

4.1.5 TEST SETUP

Radiated Emission Test Set-Up Frequency 30 - 1000MHz



Radiated Emission Test Set-Up Frequency Above 1 GHz



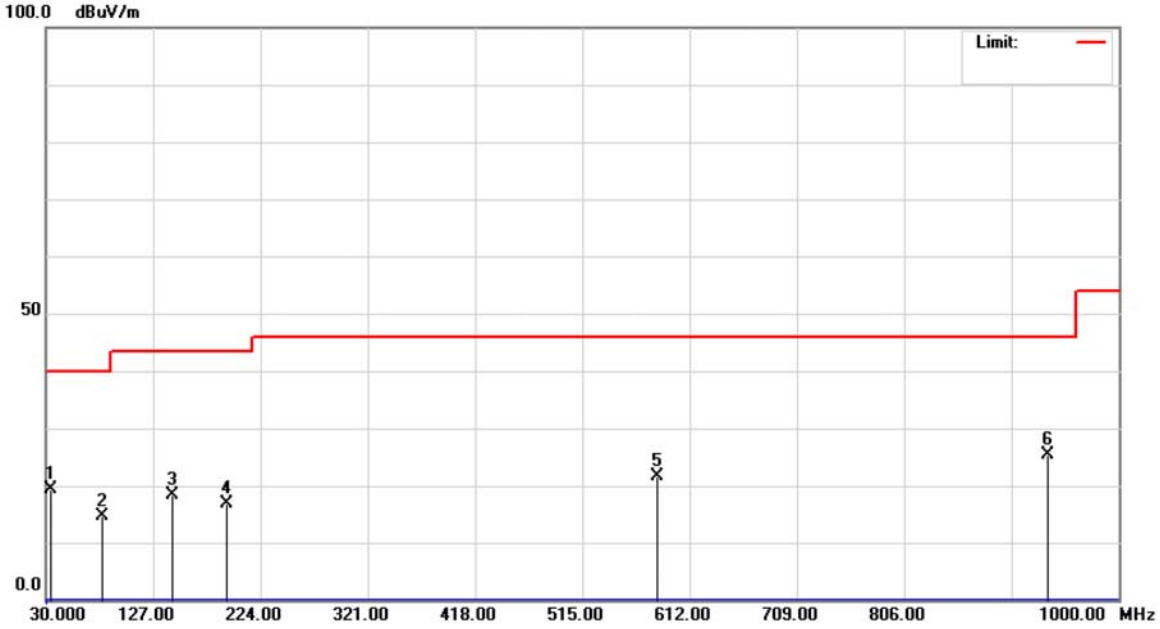
4.1.6 EUT OPERATING CONDITIONS

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

4.1.7 TEST RESULTS-BETWEEN 30MHz – 1000MHz

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2437MHz		

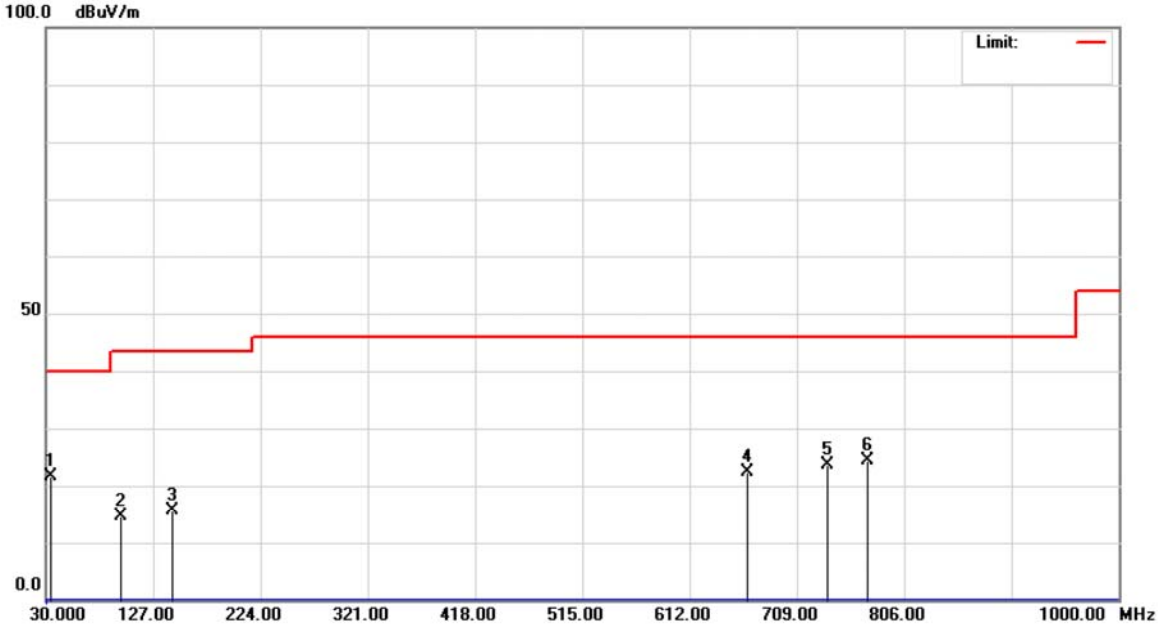
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.8800	32.40	-13.01	19.39	40.00	-20.61	peak	
2		80.4400	31.40	-16.89	14.51	40.00	-25.49	peak	
3		144.4600	31.60	-13.22	18.38	43.50	-25.12	peak	
4		192.9600	32.97	-16.16	16.81	43.50	-26.69	peak	
5		582.9000	27.99	-6.46	21.53	46.00	-24.47	peak	
6		935.9800	27.39	-2.10	25.29	46.00	-20.71	peak	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2437MHz		

Polarization: Horizontal

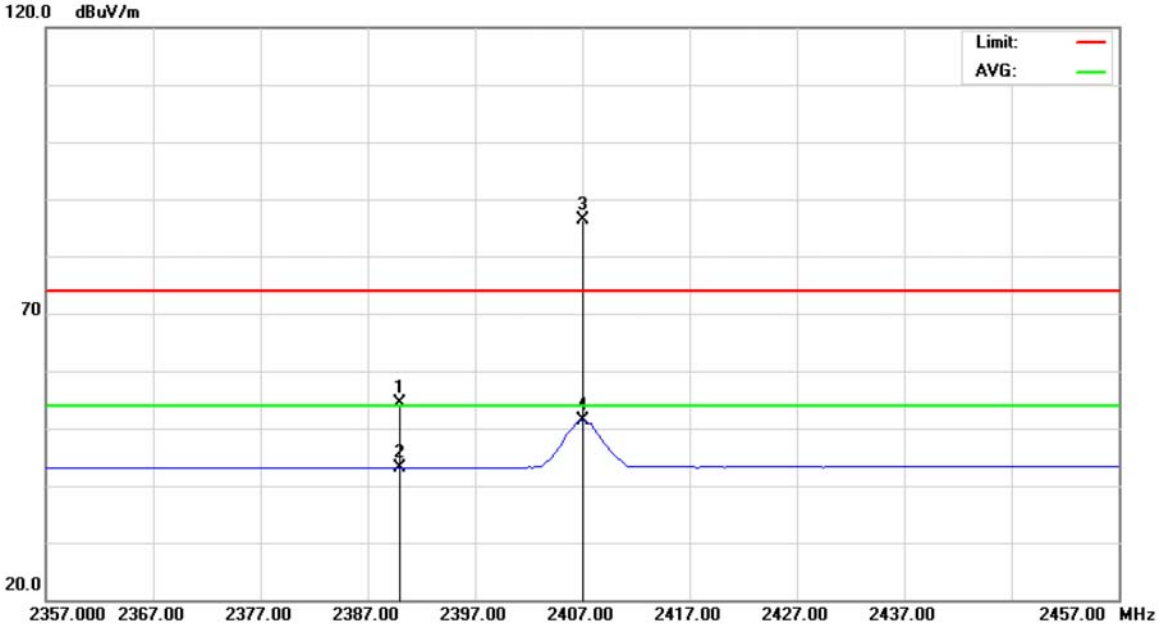


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.8800	34.76	-13.01	21.75	40.00	-18.25	peak	
2		97.9000	32.83	-18.20	14.63	43.50	-28.87	peak	
3		144.4600	28.79	-13.22	15.57	43.50	-27.93	peak	
4		664.3800	27.25	-4.95	22.30	46.00	-23.70	peak	
5		736.1599	27.27	-3.75	23.52	46.00	-22.48	peak	
6		773.0200	27.51	-3.16	24.35	46.00	-21.65	peak	

4.1.8 TEST RESULTS-ABOVE 1000MHz

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2407MHz		

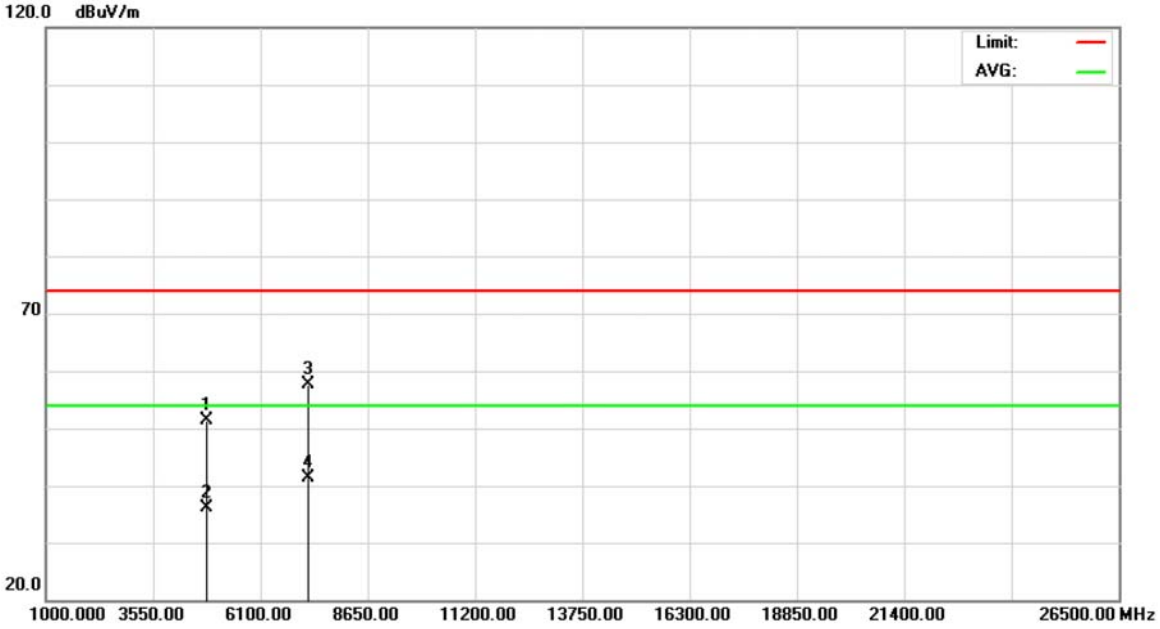
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.05	32.32	54.37	74.00	-19.63	peak	
2		2390.000	10.77	32.32	43.09	54.00	-10.91	AVG	
3	*	2407.000	54.05	32.41	86.46	74.00	12.46	peak	
4		2407.000	19.00	32.41	51.41	54.00	-2.59	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2407MHz		

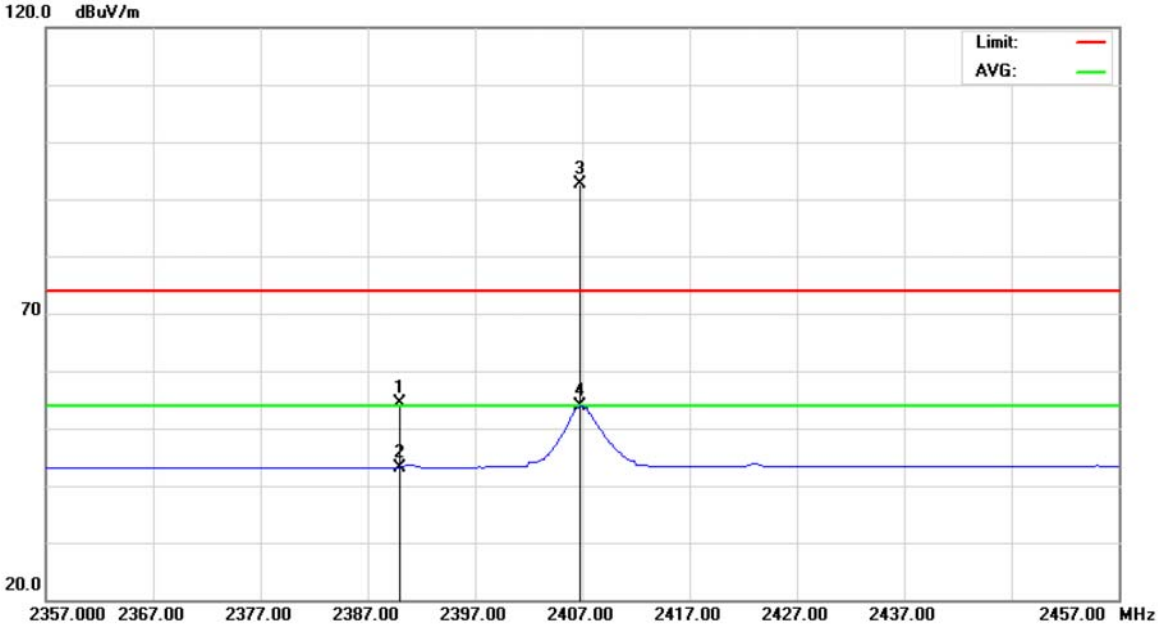
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4814.000	48.33	3.16	51.49	74.00	-22.51	peak	
2		4814.000	33.05	3.16	36.21	54.00	-17.79	AVG	
3		7221.200	47.33	10.41	57.74	74.00	-16.26	peak	
4	*	7221.200	30.85	10.41	41.26	54.00	-12.74	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2407MHz		

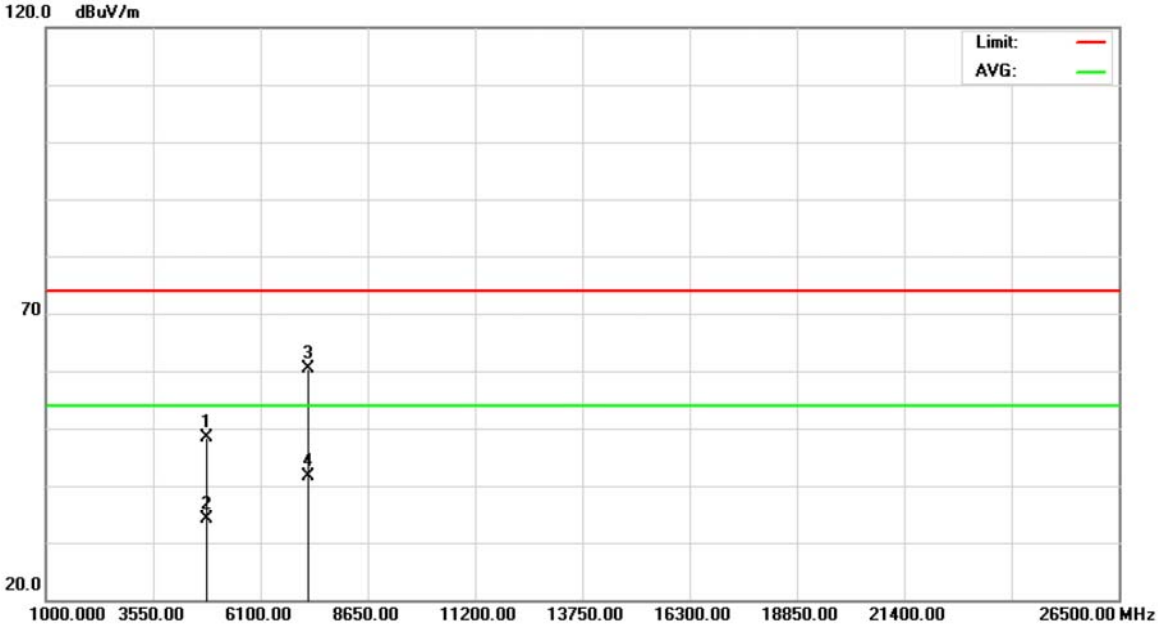
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.05	32.32	54.37	74.00	-19.63	peak	
2		2390.000	10.84	32.32	43.16	54.00	-10.84	AVG	
3	*	2406.800	60.21	32.41	92.62	74.00	18.62	peak	
4		2406.800	21.46	32.41	53.87	54.00	-0.13	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2407MHz		

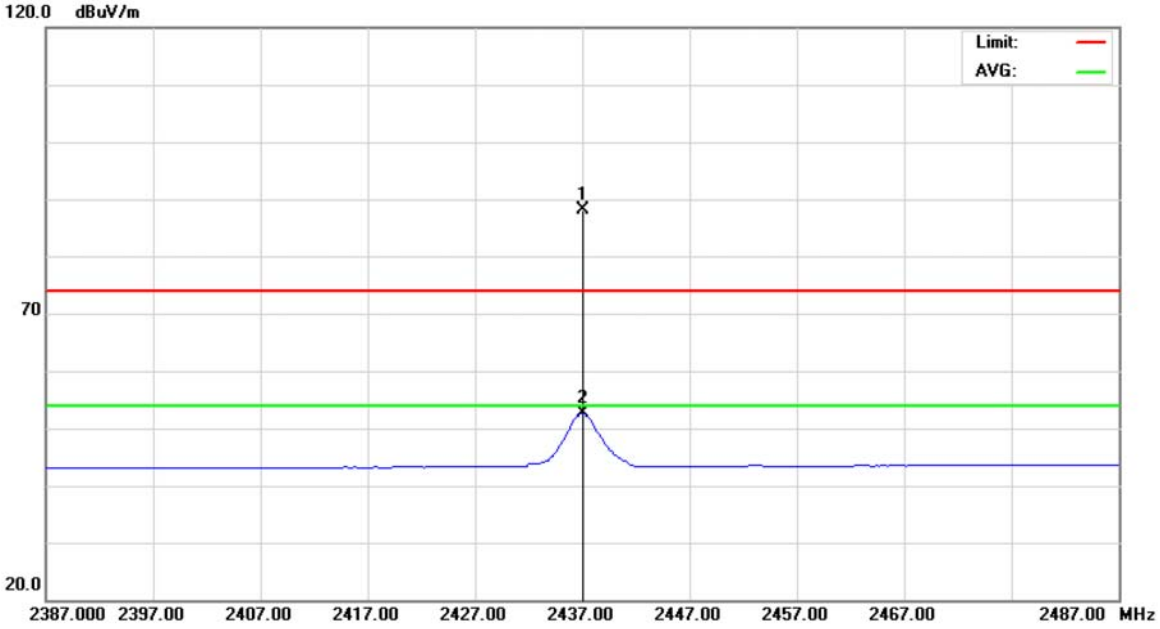
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4814.000	45.30	3.16	48.46	74.00	-25.54	peak	
2		4814.000	31.06	3.16	34.22	54.00	-19.78	AVG	
3		7220.840	50.02	10.41	60.43	74.00	-13.57	peak	
4	*	7220.840	31.11	10.41	41.52	54.00	-12.48	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2437MHz		

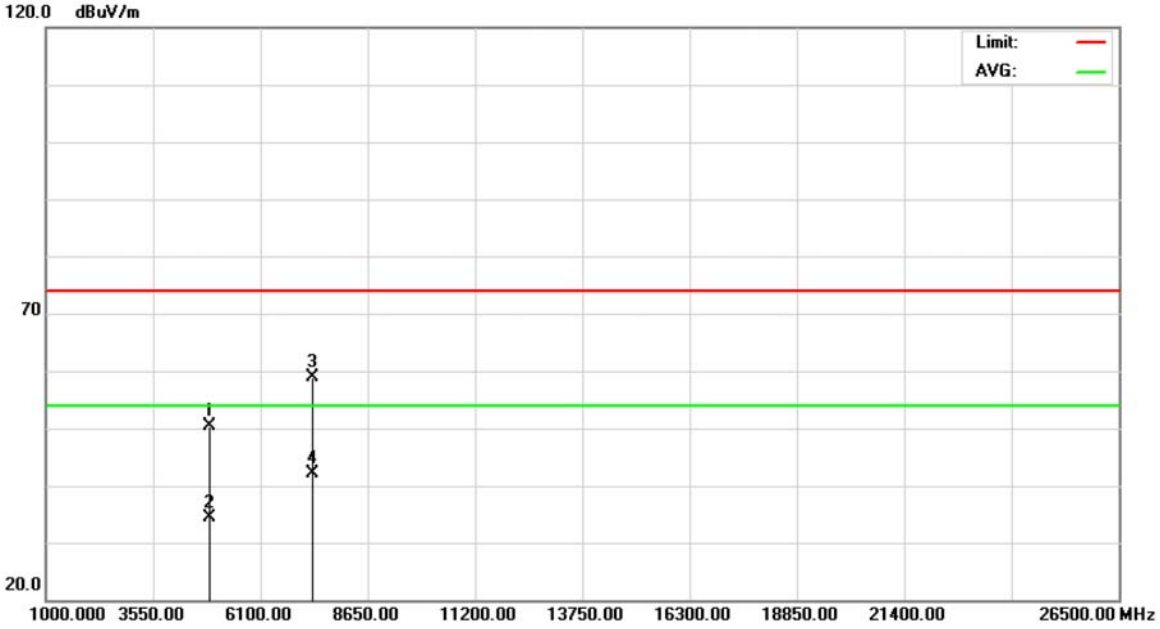
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2437.000	55.53	32.56	88.09	74.00	14.09	peak	
2		2437.000	20.05	32.56	52.61	54.00	-1.39	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2437MHz		

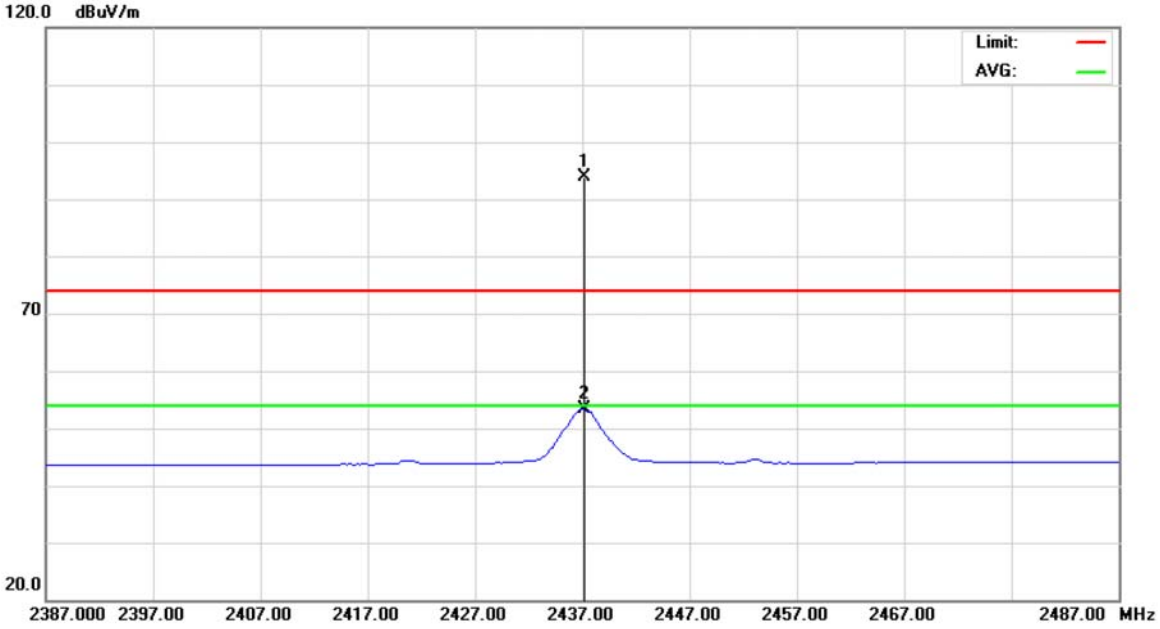
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4874.000	47.03	3.29	50.32	74.00	-23.68	peak	
2		4874.000	31.14	3.29	34.43	54.00	-19.57	AVG	
3		7311.200	48.37	10.56	58.93	74.00	-15.07	peak	
4	*	7311.200	31.55	10.56	42.11	54.00	-11.89	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2437MHz		

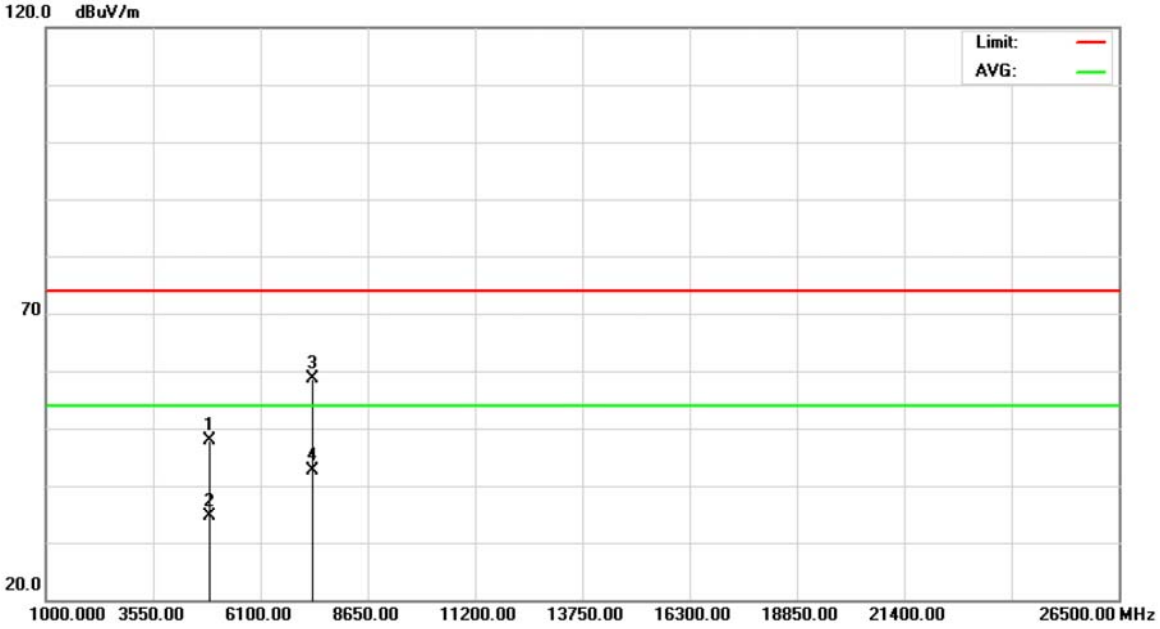
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2437.200	61.33	32.56	93.89	74.00	19.89	peak	
2		2437.200	20.75	32.56	53.31	54.00	-0.69	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage :	DC 1.5V		
Test Mode ：	2437MHz		

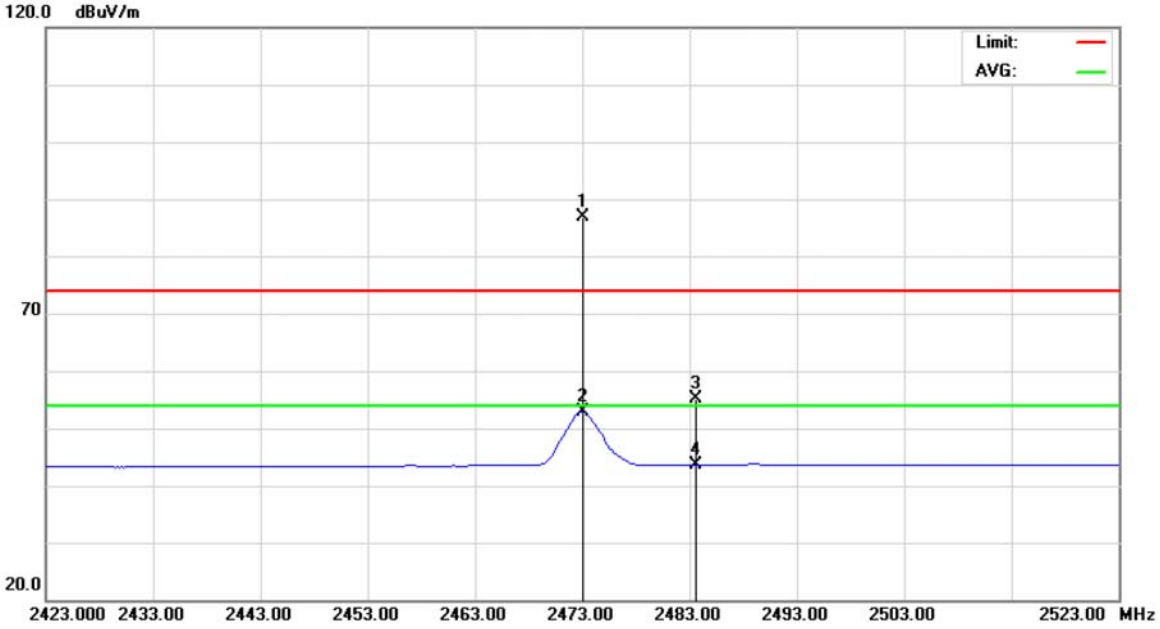
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4874.200	44.56	3.29	47.85	74.00	-26.15	peak	
2		4874.200	31.34	3.29	34.63	54.00	-19.37	AVG	
3		7311.000	48.03	10.55	58.58	74.00	-15.42	peak	
4	*	7311.000	32.00	10.55	42.55	54.00	-11.45	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2473MHz		

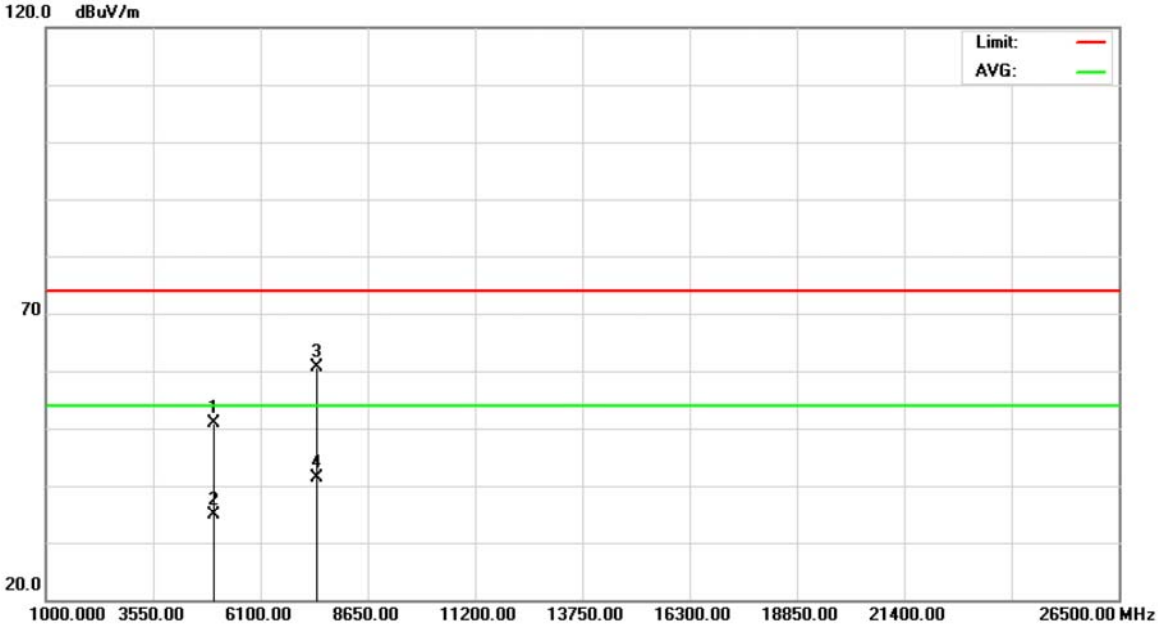
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2473.000	54.23	32.74	86.97	74.00	12.97	peak	
2		2473.000	20.13	32.74	52.87	54.00	-1.13	AVG	
3		2483.500	22.25	32.79	55.04	74.00	-18.96	peak	
4		2483.600	10.84	32.79	43.63	54.00	-10.37	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	2473MHz		

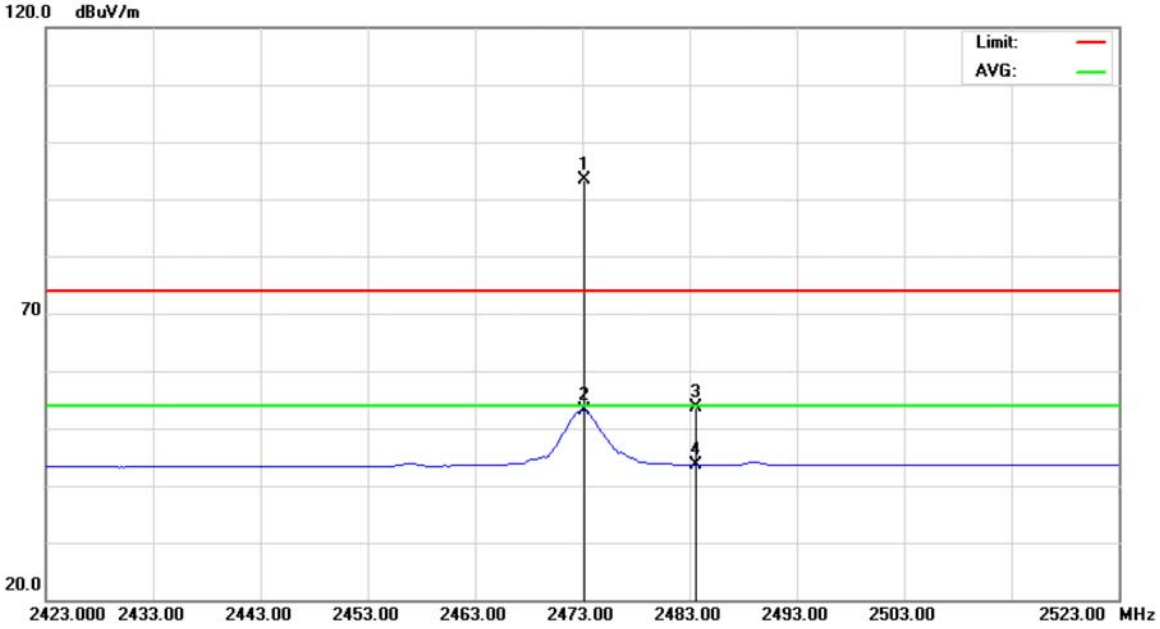
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4946.200	47.39	3.44	50.83	74.00	-23.17	peak	
2		4946.200	31.34	3.44	34.78	54.00	-19.22	AVG	
3		7419.000	49.99	10.72	60.71	74.00	-13.29	peak	
4	*	7419.000	30.54	10.72	41.26	54.00	-12.74	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage :	DC 1.5V		
Test Mode ：	2473MHz		

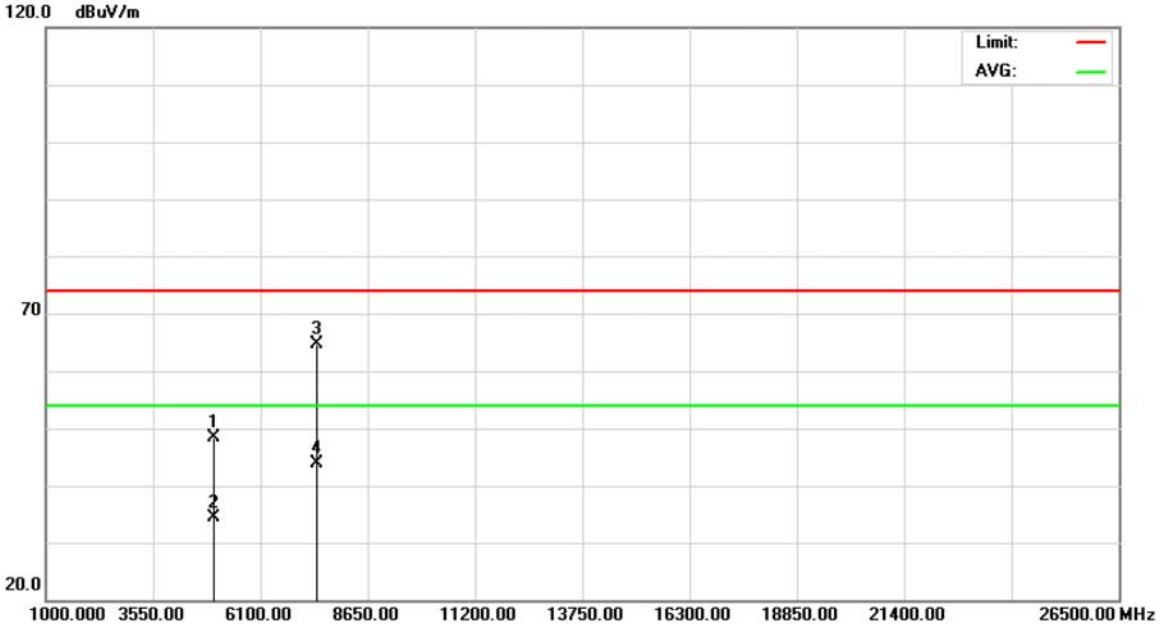
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2473.200	60.54	32.74	93.28	74.00	19.28	peak	
2		2473.200	20.47	32.74	53.21	54.00	-0.79	AVG	
3		2483.500	20.87	32.79	53.66	74.00	-20.34	peak	
4		2483.600	10.88	32.79	43.67	54.00	-10.33	AVG	

EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage :	DC 1.5V		
Test Mode ：	2473MHz		

Polarization: Horizontal

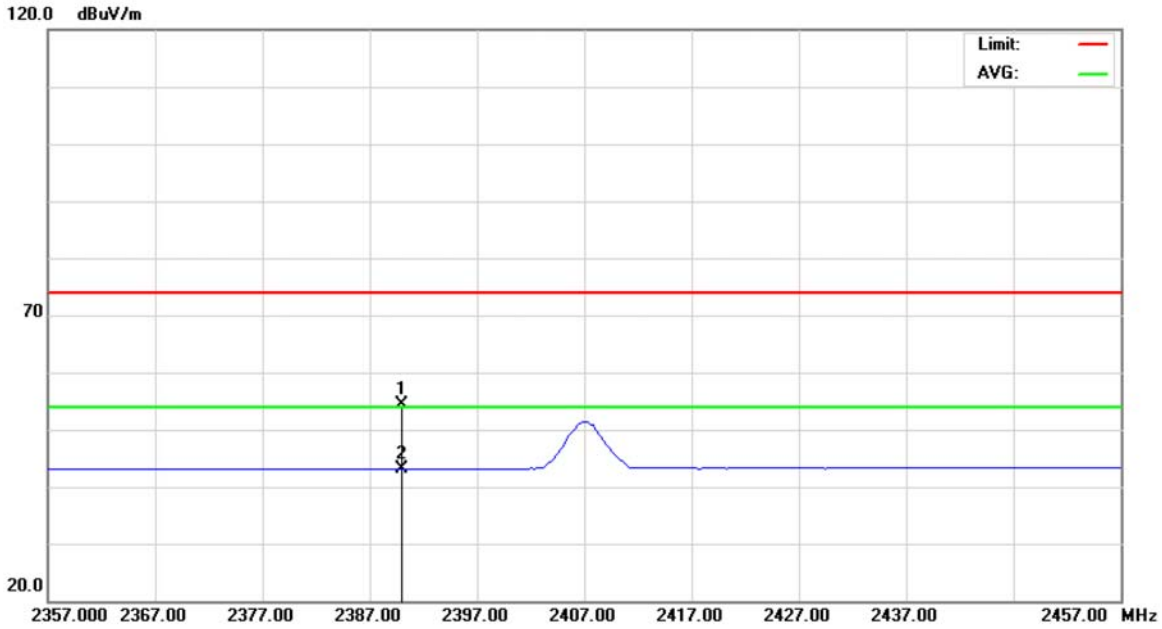


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4946.000	44.88	3.44	48.32	74.00	-25.68	peak	
2		4946.000	30.89	3.44	34.33	54.00	-19.67	AVG	
3	*	7418.830	54.00	10.72	64.72	74.00	-9.28	peak	
4		7418.830	33.24	10.72	43.96	54.00	-10.04	AVG	

4.1.9 TEST RESULTS-RESTRICTED BANDS REQUIREMENTS

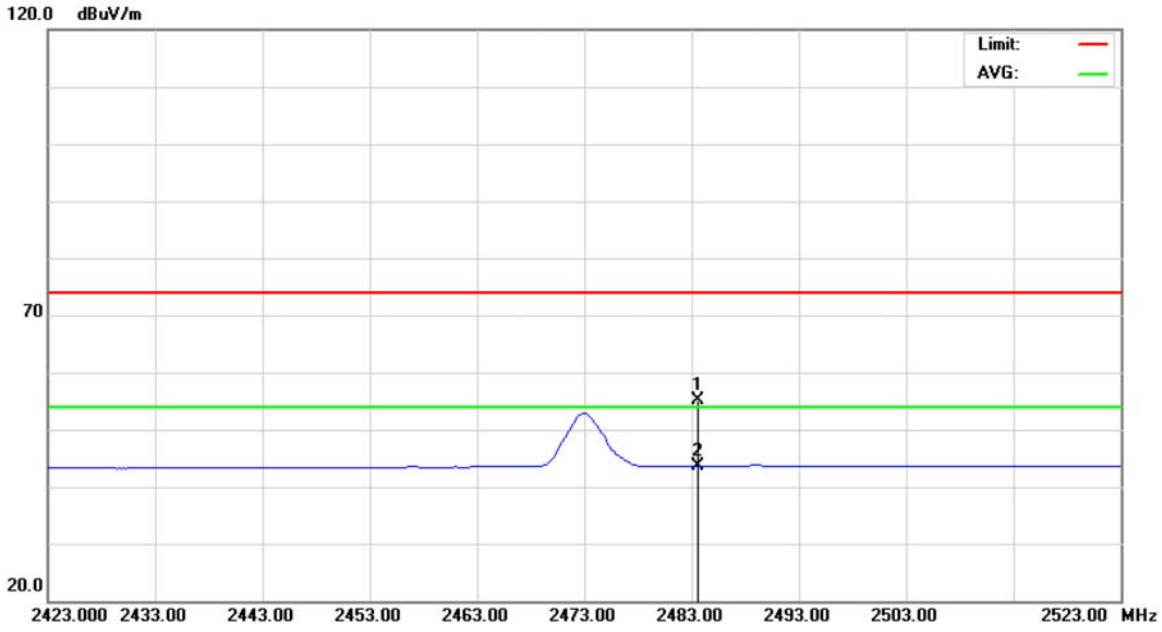
EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	DC 1.5V		
Test Mode ：	TX CH 2407MHz/2473MHz(Vertical)		
Note：	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2407MHz). 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 (2473MHz). Then the field strength was measured at 2483.5-2500 MHz.		

2407MHz/ 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	22.05	32.32	54.37	74.00	-19.63	peak	
2	*	2390.000	10.77	32.32	43.09	54.00	-10.91	AVG	

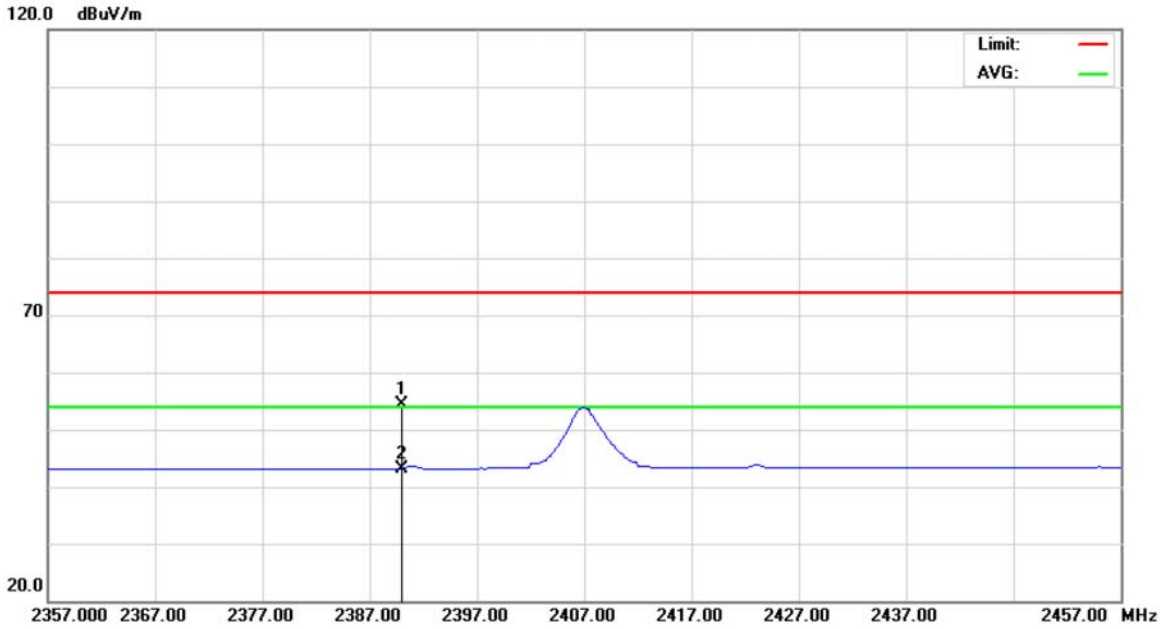
2473MHz/ Orthogonal Axes: X Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	22.25	32.79	55.04	74.00	-18.96	peak	
2	*	2483.600	10.84	32.79	43.63	54.00	-10.37	AVG	

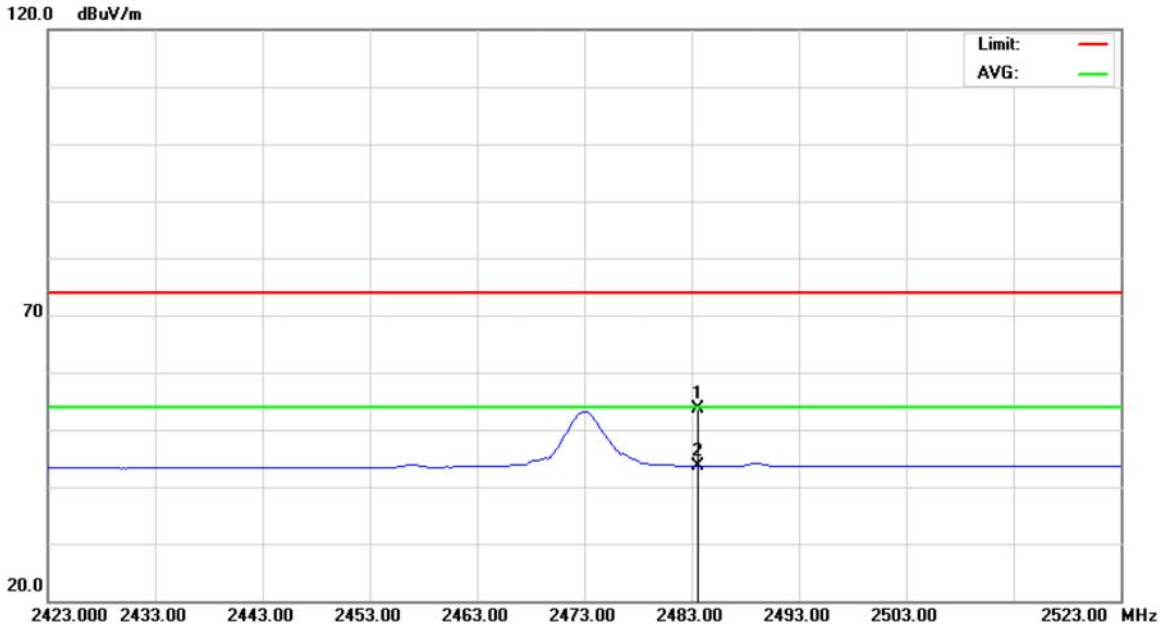
EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity：	60%
Test Voltage :	DC 1.5V		
Test Mode ：	TX CH 2407MHz/2473MHz (Horizontal)		
Note：	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2407MHz). 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 (2473MHz). Then the field strength was measured at 2483.5-2500 MHz.		

2407MHz/ 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	22.05	32.32	54.37	74.00	-19.63	peak	
2	*	2390.000	10.84	32.32	43.16	54.00	-10.84	AVG	

2473MHz/ 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	20.87	32.79	53.66	74.00	-20.34	peak	
2	*	2483.600	10.88	32.79	43.67	54.00	-10.33	AVG	

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C			
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 , Serial No. or No Calibration specified.

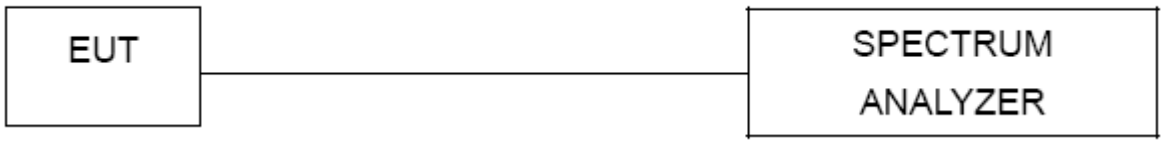
5.1.2 TEST PROCEDURE

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

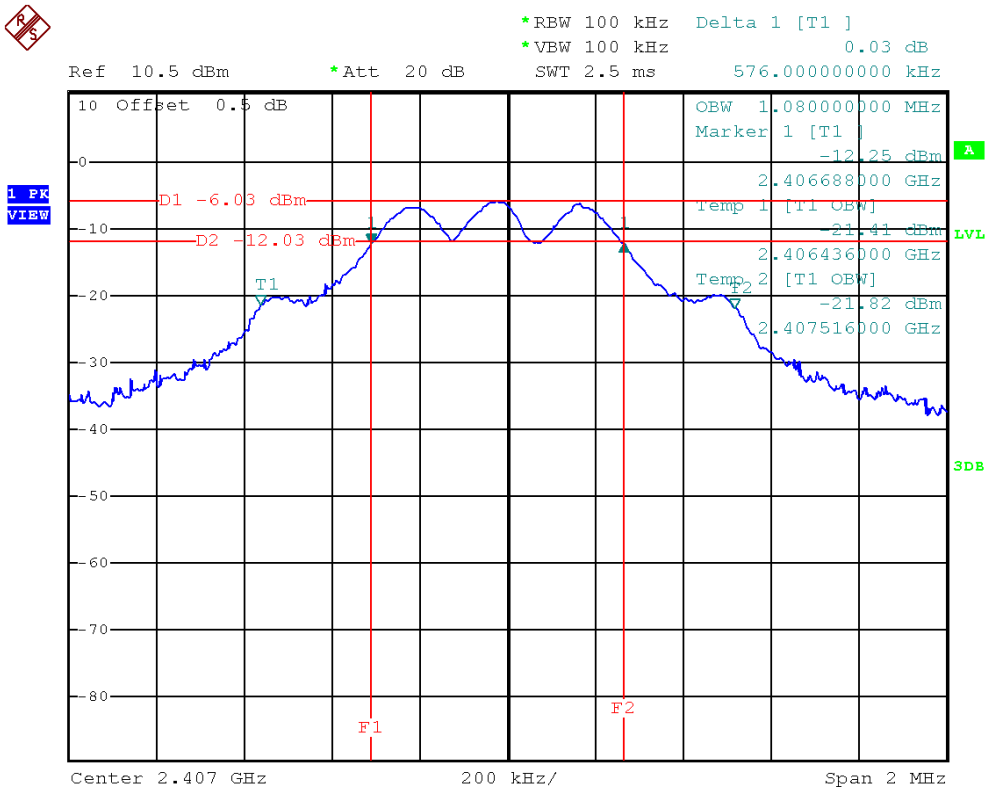
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.6 TEST RESULTS

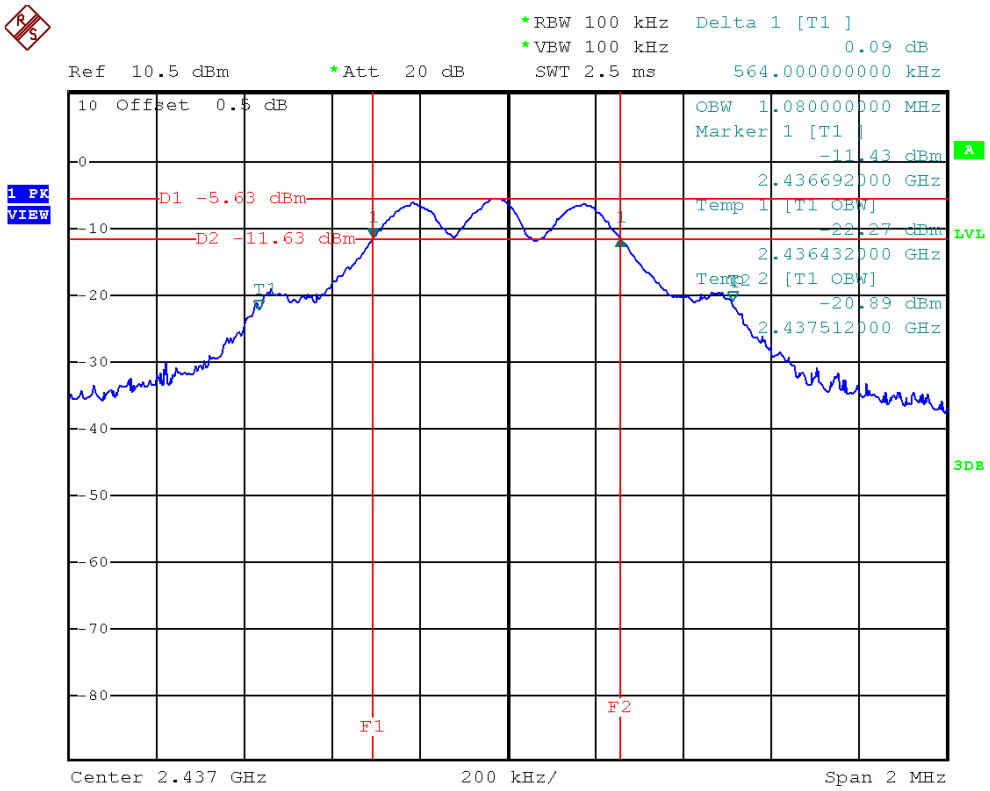
EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	26°C	Relative Humidity :	60%
Test Voltage :	DC 1.5V		
Test Mode ：	2407MHz/2437MHz/2473MHz		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	99% Occupied BW (MHz)	LIMIT (MHz)
01	2407	0.58	1.08	>=500KHz
08	2437	0.56	1.08	>=500KHz
14	2473	0.57	1.08	>=500KHz

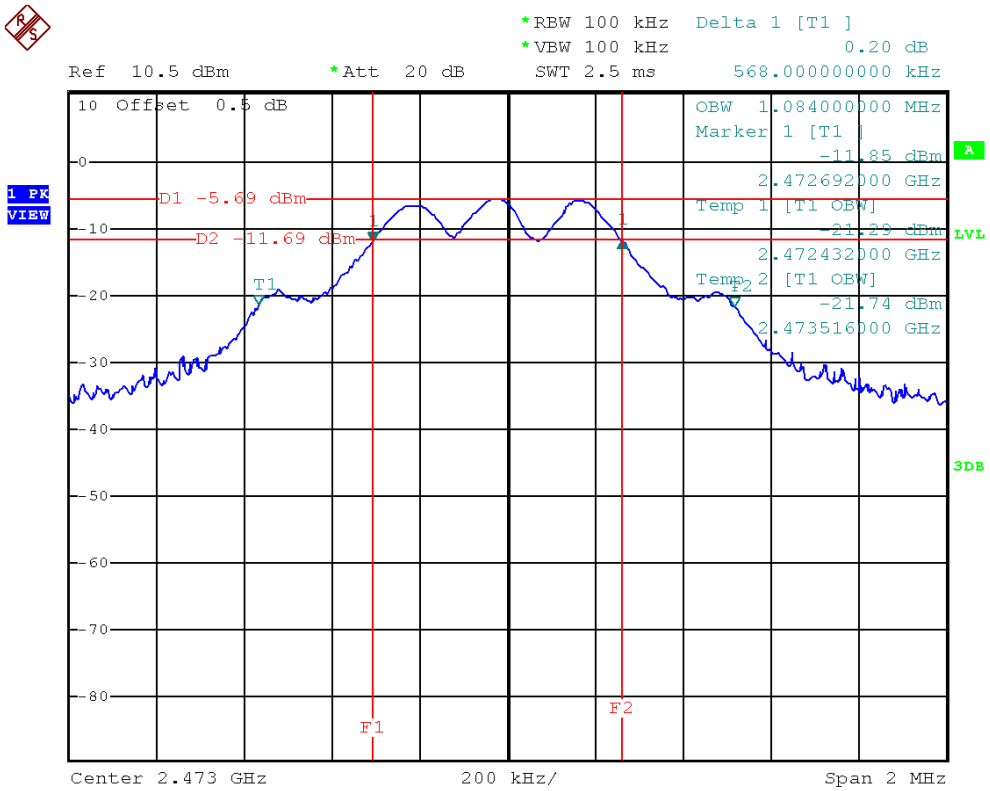
2407MHz



2437MHz



2473MHz



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	ML2495A	1128008	Jul. 13, 2012
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Jul. 18, 2012

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

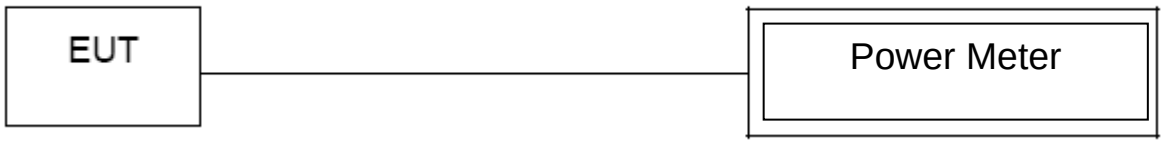
6.1.2 TEST PROCEDURE

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 ：	G9-500H
Temperature：	26°C	Relative Humidity :	60%
Test Voltage :	DC 1.5V		
Test Mode ：	2407MHz/2437MHz/2473MHz		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
01	2407	-4.76	30	1
08	2437	-4.66	30	1
14	2473	-4.30	30	1

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	Oct. 06, 2012

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

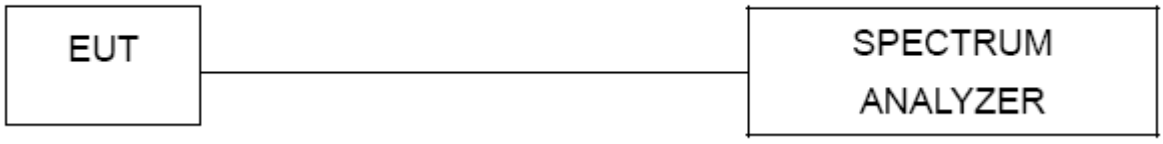
7.1.2 TEST PROCEDURE

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

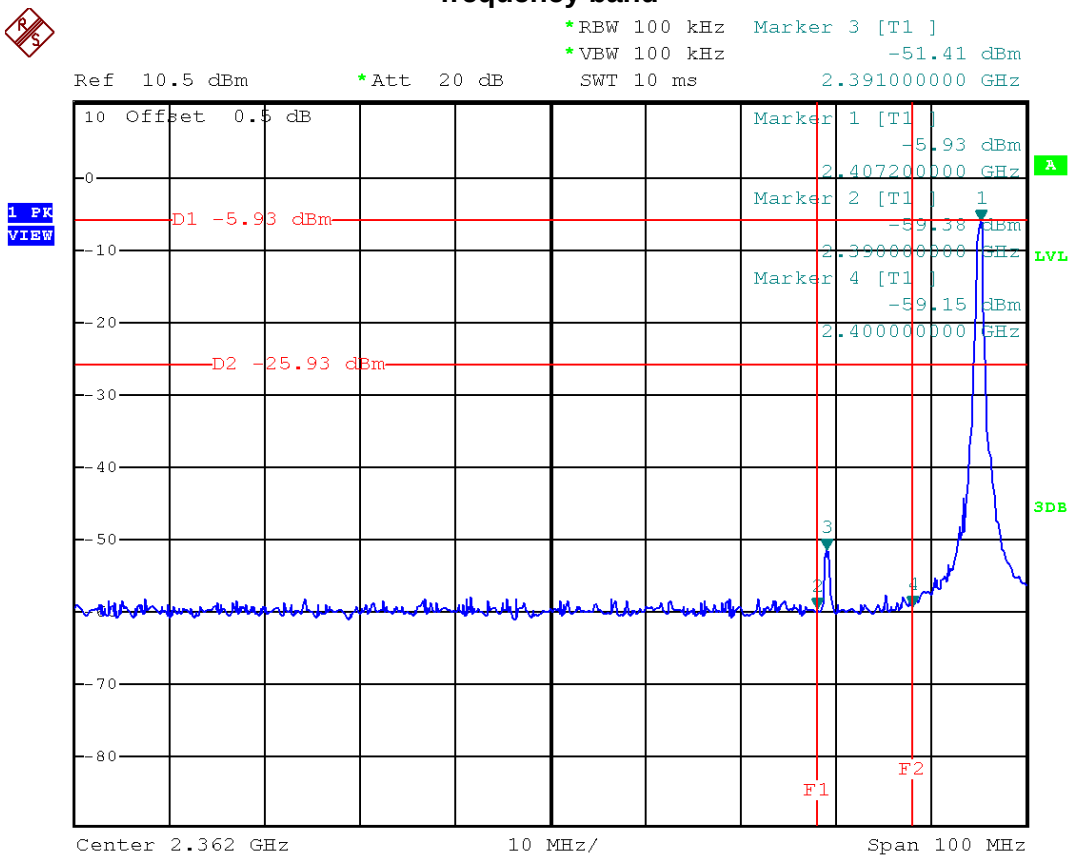
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.6 TEST RESULTS

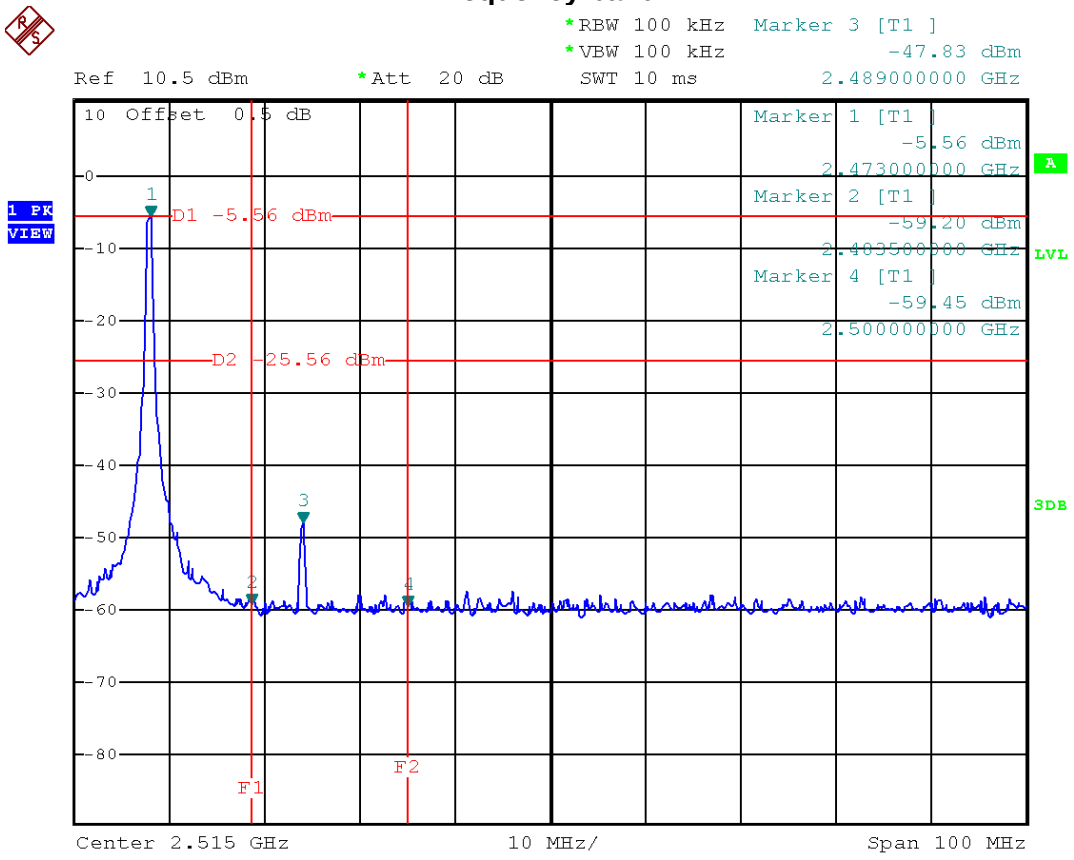
EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	24°C	Relative Humidity :	54%
Test Voltage :	DC 1.5V		
Test Mode ：	2407MHz/2473MHz		

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)
2391.00	-51.41	2489.00	-47.83
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.			

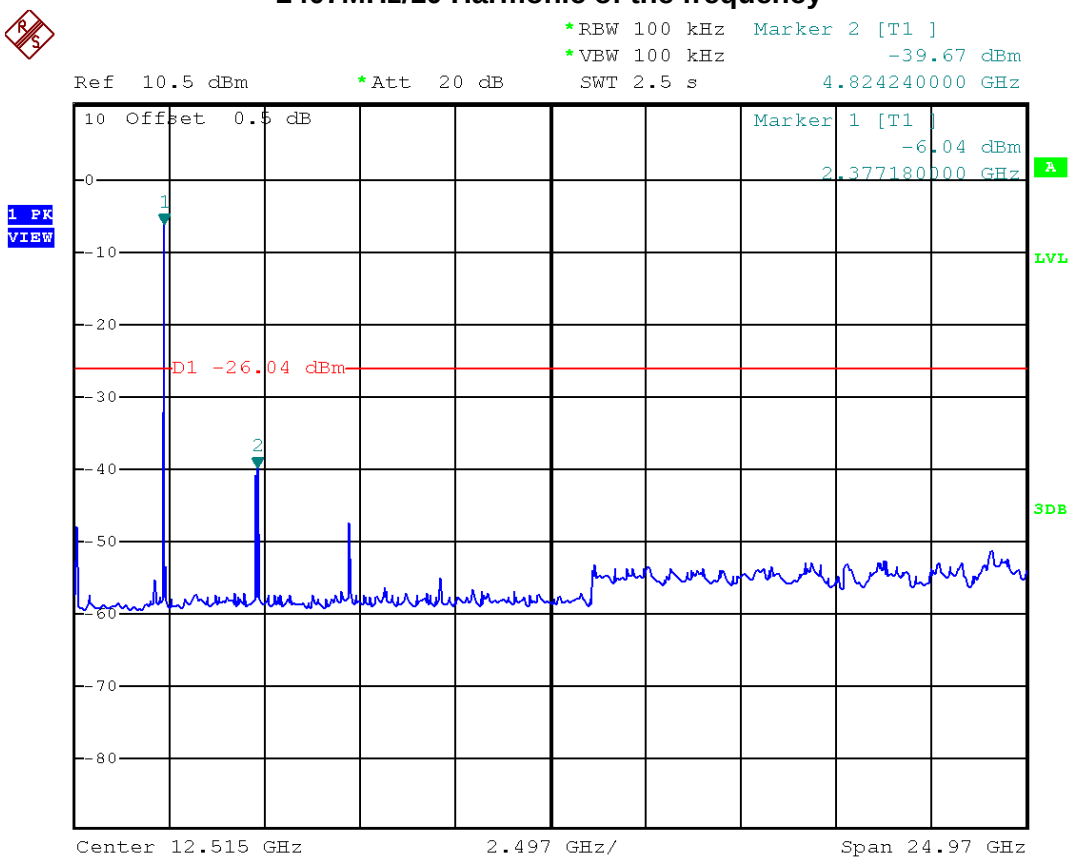
2407MHz/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



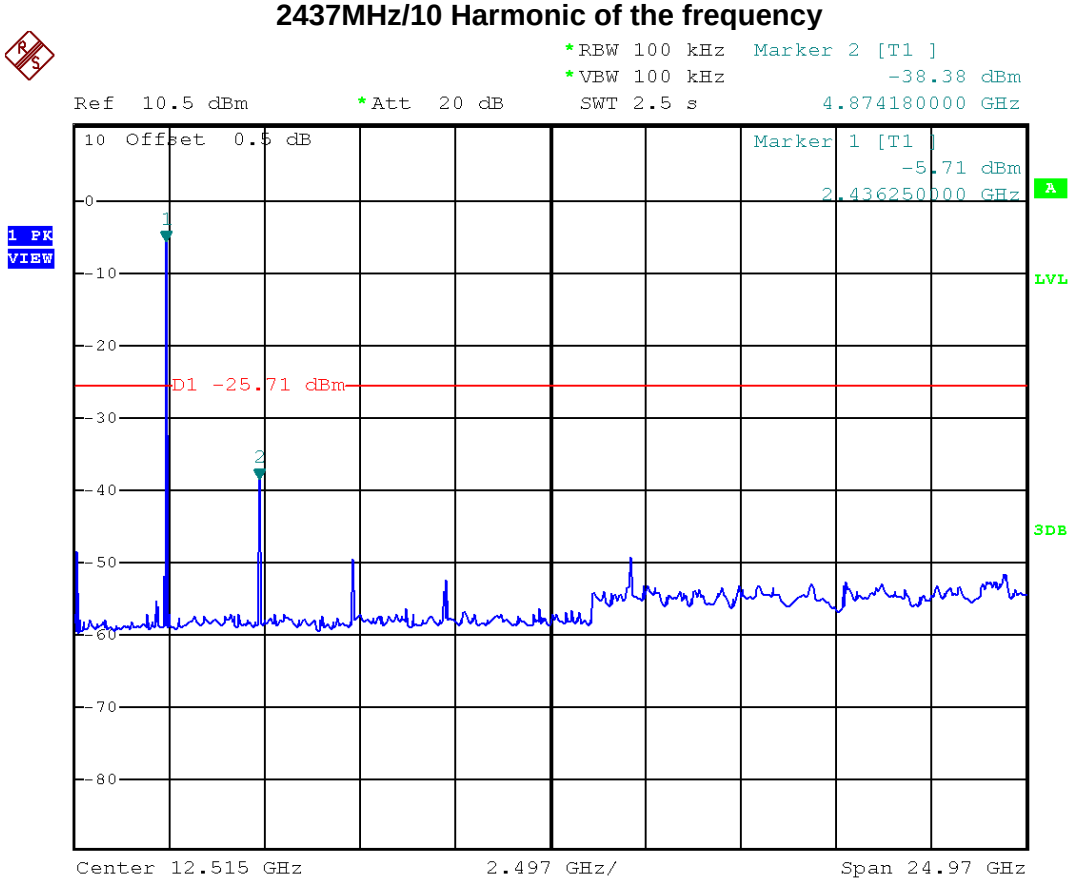
2473MHz/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



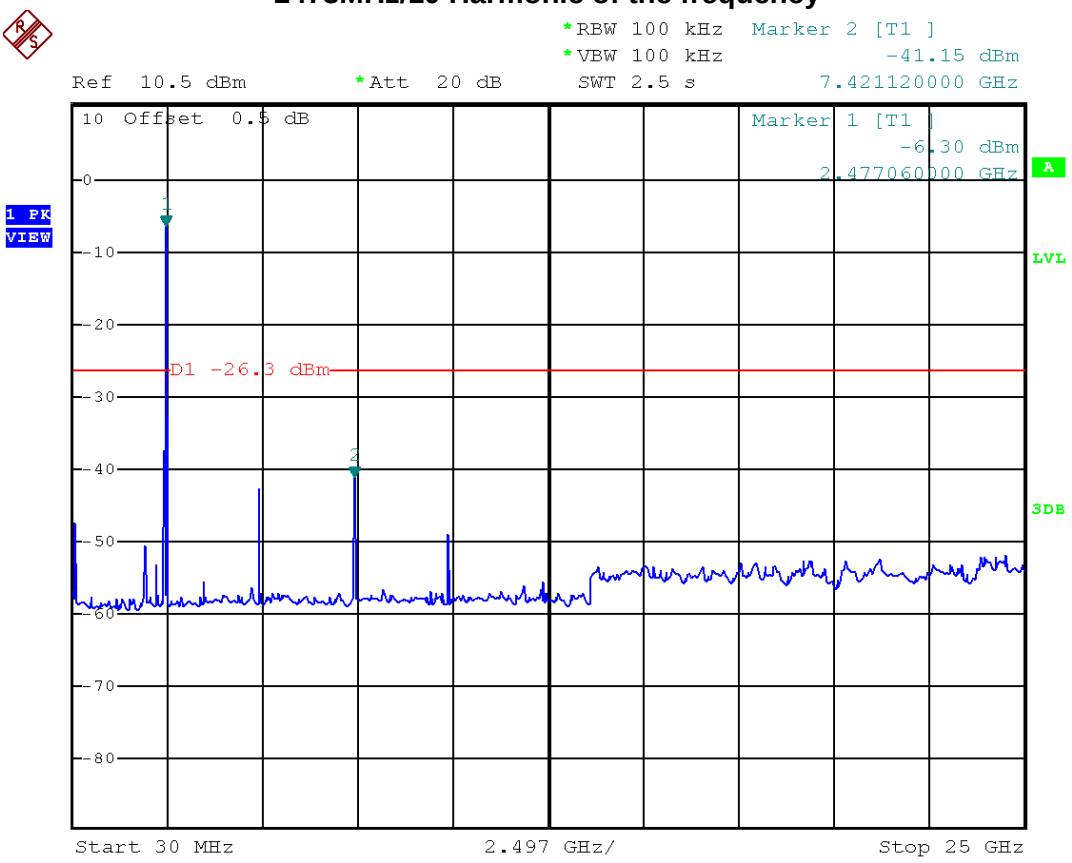
2407MHz/10 Harmonic of the frequency



2437MHz/10 Harmonic of the frequency



2473MHz/10 Harmonic of the frequency



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	Oct. 06, 2012

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

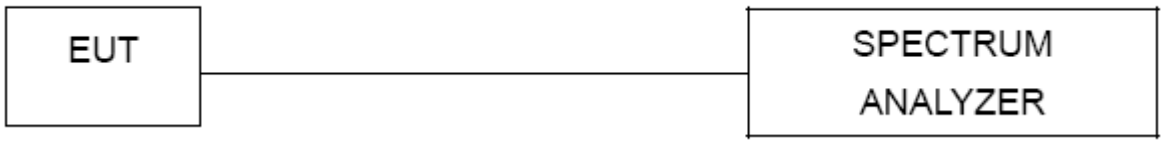
8.1.2 TEST PROCEDURE

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

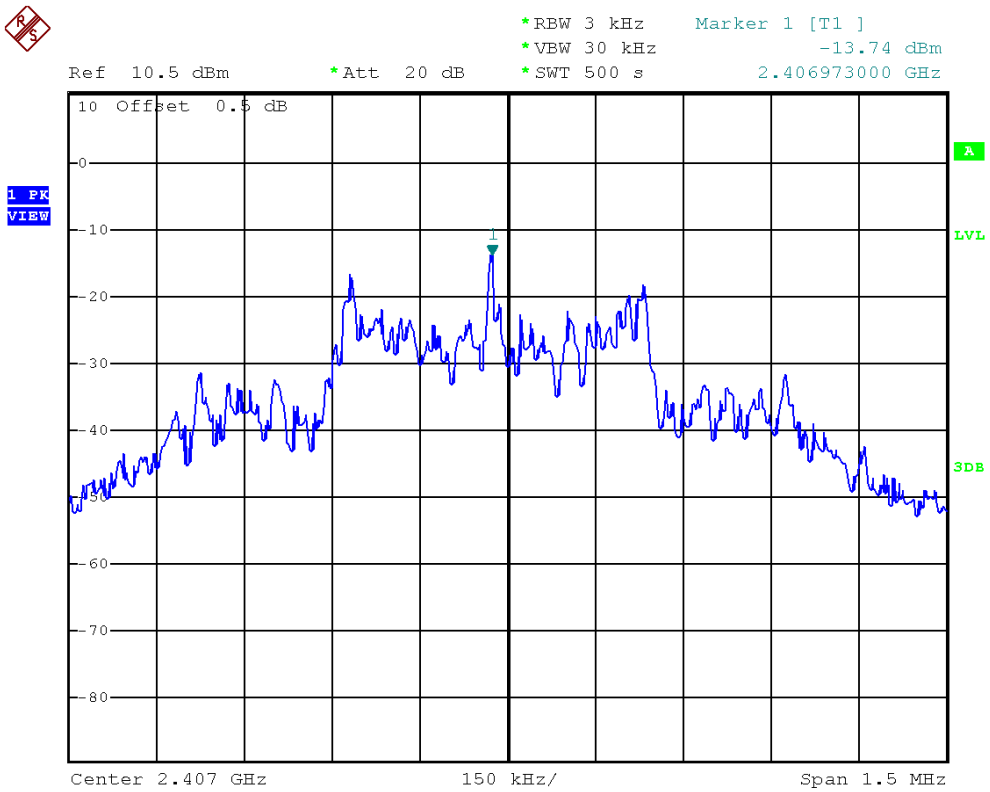
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.6 TEST RESULTS

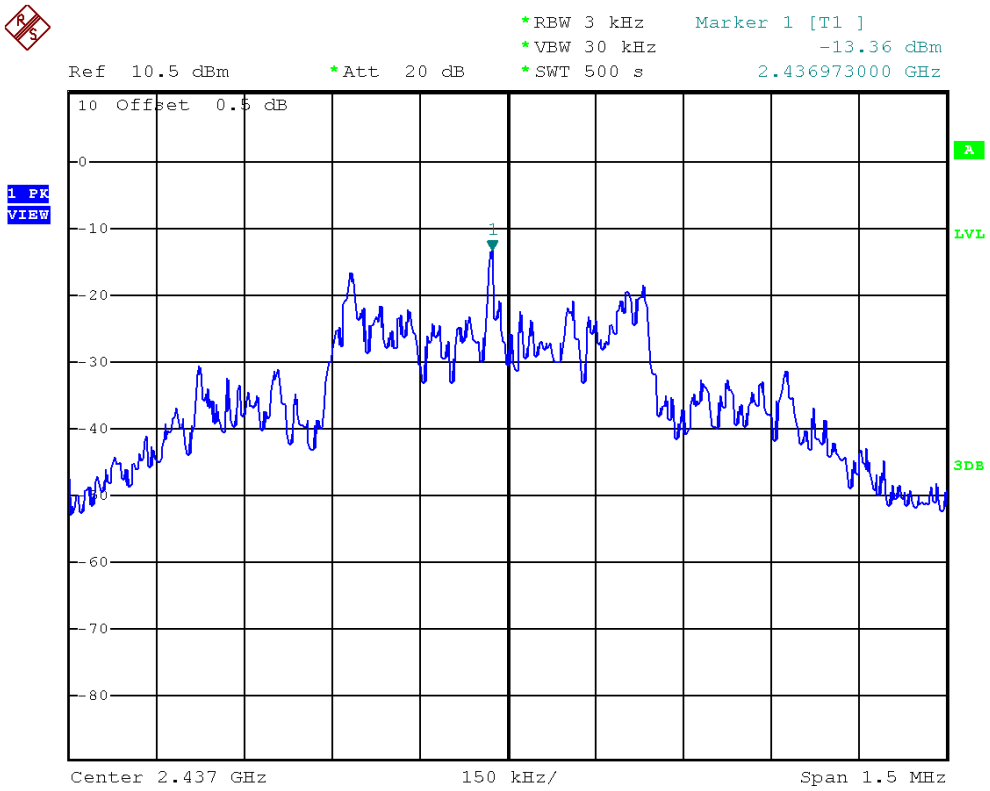
EUT：	2.4G RF Mouse	Model Name ：	G9-500H
Temperature：	24˚C	Relative Humidity :	54%
Test Voltage :	DC 1.5V		
Test Mode ：	2407MHz/2437MHz/2473MHz		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
01	2407	-13.74	8
08	2437	-13.36	8
14	2473	-13.34	8

2407MHz



2437MHz



2473MHz