



FCC Radio Test Report

FCC ID: XW3DM9025RL

This report concerns (check one): Original Grant Class II Change

Issued Date : Jan. 17, 2013
Project No. : 1301C068
Equipment : 2.4GHz Wireless Mouse
Model Name : DM-9025RL
Applicant : Dongguan Siliten Electronics CO.,LTD
Address : Sijia Yewu Industrial estate, Shijie Town Dongguan
China

Tested by:
Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Jan. 08, 2013
Date of Test:
Jan. 08, 2013 ~ Jan. 16, 2013

Testing Engineer : David Mao
(David Mao)

Technical Manager : Leo Hung
(Leo Hung)

Authorized Signatory : Steven Lu
(Steven Lu)

Neutron Engineering Inc.

**No.3, Jinshagang 1st Road, ShiXia, Dalang
Town, Dong Guan, China.
TEL : (0769) 8318-3000 FAX : (0769) 8319-6000**



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.**

Neutron's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **Neutron** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **Neutron** issued reports.

Neutron's reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **Neutron-self**, extracts from the test report shall not be reproduced except in full with **Neutron's** authorized written approval.

Neutron's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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.



Table of Contents	Page
1 . CERTIFICATION	5
2 . SUMMARY OF TEST RESULTS	6
2.1 TEST FACILITY	7
2.2 MEASUREMENT UNCERTAINTY	7
3 . GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	10
3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	11
3.4 DESCRIPTION OF SUPPORT UNITS	12
4 . EMC EMISSION TEST	13
4.1 CONDUCTED EMISSION MEASUREMENT	13
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
4.1.2 MEASUREMENT INSTRUMENTS LIST	13
4.1.3 TEST PROCEDURE	14
4.1.4 DEVIATION FROM TEST STANDARD	14
4.1.5 TEST SETUP	14
4.1.6 EUT OPERATING CONDITIONS	14
4.1.7 TEST RESULTS	15
4.2 RADIATED EMISSION MEASUREMENT	16
4.2.1 RADIATED EMISSION LIMITS	16
4.2.2 MEASUREMENT INSTRUMENTS LIST	17
4.2.3 TEST PROCEDURE	19
4.2.4 DEVIATION FROM TEST STANDARD	19
4.2.5 TEST SETUP	20
4.2.6 EUT OPERATING CONDITIONS	21
4.2.7 TEST RESULTS (BELOW 30MHz)	22
4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)	23
4.2.9 TEST RESULTS (ABOVE 1000 MHz)	26
5 . BANDWIDTH TEST	38
5.1 MEASUREMENT INSTRUMENTS LIST	38
5.2 TEST PROCEDURE	38
5.3 DEVIATION FROM STANDARD	38
5.4 TEST SETUP	38
5.5 EUT OPERATION CONDITIONS	38
5.6 TEST RESULTS	39
6 . ANTENNA CONDUCTED SPURIOUS EMISSION	41
6.1 APPLIED PROCEDURES / LIMIT	41



Table of Contents	Page
6.1.1 MEASUREMENT INSTRUMENTS LIST	41
6.1.2 TEST PROCEDURE	41
6.1.3 DEVIATION FROM STANDARD	41
6.1.4 TEST SETUP	41
6.1.5 EUT OPERATION CONDITIONS	41
6.1.6 TEST RESULTS	42
7 . EUT TEST PHOTO	46



1. CERTIFICATION

Equipment : 2.4GHz Wireless Mouse
Brand Name : N/A
Model Name : DM-9025RL
Applicant : Dongguan Siliten Electronics CO.,LTD
Date of Test : Jan. 08, 2013 ~ Jan. 16, 2013
Test Sample : Engineering Sample
Standards : FCC Part15, Subpart C(15.249)/ ANSI 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-1-1301C068) 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 (15.249)			
StandardSection	Test Item	Judgment	Remark
FCC			
15.207	Conducted Emission	-	N/A
15.209	Radiated Emission	PASS	
15.249	Radiated Spurious Emission	PASS	

NOTE:

- (1)"N/A" denotes test is not applicable in this test report.
- (2)The EUT used new battery.



2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792
 Neutron's test firm number for FCC 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U,(dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)	NOTE
DG-CB03	CISPR	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz ~ 40GHz	V	4.04	
		18GHz ~ 40GHz	H	4.01	



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	2.4GHz Wireless Mouse	
Brand Name	N/A	
Model Name.	DM-9025RL	
Model Difference	N/A	
Product Description	The EUT is a 2.4GHz Wireless Mouse.	
	Product Type	Low Power Communication Device
	Operation Frequency	2405~2476 MHz
	Modulation Technology	GFSK
	Data rate	1Mbps
	Number of Channel	63CH .Please see note 2. (Page 11)
	Antenna Gain(Peak)	Please see note 3.(Page 9).
	Field Strength	67.56 dBuV/m (AV 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	DC voltage supplied from 1*AA battery.	
Power Rating	DC 1.5V	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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



2.

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

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Printed Antenna	N/A	2.12	-



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 Mode	Description
Mode 1	Low – 2405MHz
Mode 2	Middle – 2439MHz
Mode 3	High -2476MHz

For Conducted Test	
Final Test Mode	Description
-	"N/A" denotes test is not applicable in this test report.

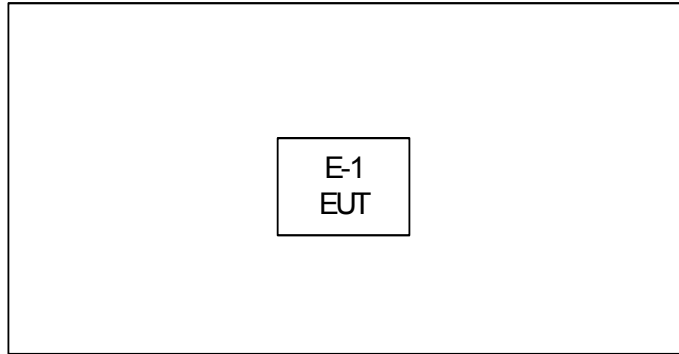
For Radiated Test	
Final Test Mode	Description
Mode 1	Low – 2405MHz
Mode 2	Middle – 2439MHz
Mode 3	High -2476MHz

Note:

- (1) The measurements are performed at the high, middle, low available channels.



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	2.4GHz Wireless Mouse	N/A	DM-9025RL	XW3DM9025RL	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
------	---------------	--------------	--------	------

Note:

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



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

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

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	00052765	May.04.2013
2	LISN	R&S	ENV216	100087	May.04.2013
3	Test Cable	N/A	C_17	N/A	Mar.28.2013
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.04.2013
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.04.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

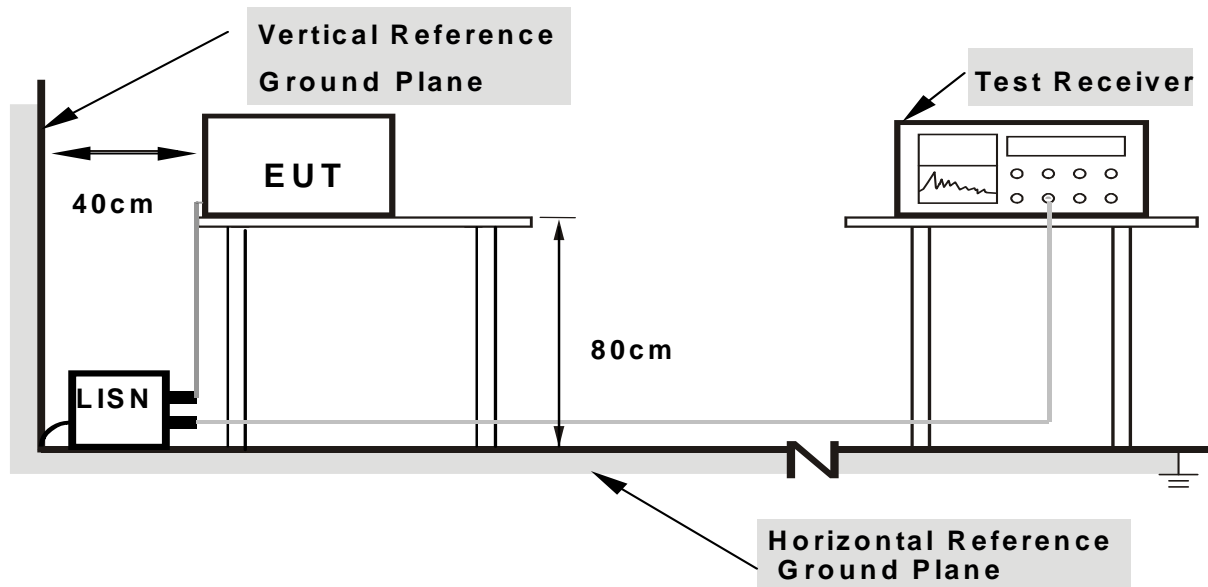
4.1.3 TEST PROCEDURE

- 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



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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.

The EUT was programmed to be in continuously transmitting mode.



4.1.7 TEST RESULTS

Remark

- (1) 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.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) "N/A" denotes test is not applicable in this Test Report.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

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
960~1000	500	3

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

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(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).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

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



4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	May.25.2013
2	Amplifier	HP	8447D	2944A09673	May.04.2013
3	Test Receiver	R&S	ESCI	100382	May.04.2013
4	Test Cable	N/A	C-01_CB03	N/A	Jun.30.2013
5	Antenna	ETS	3115	00075789	May.25.2013
6	Amplifier	Agilent	8449B	3008A02274	May.04.2013
7	Spectrum	Agilent	E4408B	US39240143	Nov. 16.2013
8	Test Cable	HUBER+SUHNER	C-45	N/A	May.02.2013
9	Controller	CT	SC100	N/A	N/A
10	Active Loop Antenna	R&S	HFH2-Z2	830749/020	May.04.2013
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct.23.2013
12	Horn Antenna	EMCO	3115	9605-4803	May.25.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of Equipment List is One Year.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1 MHz / 1 MHz for Peak, Average=PK-duty cycle

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector



Neutron Engineering Inc.

Duty cycle: TX 2405MHz

$$\text{Duty cycle} = T_{\text{ON}} / (T_{\text{ON}} + T_{\text{OFF}})$$

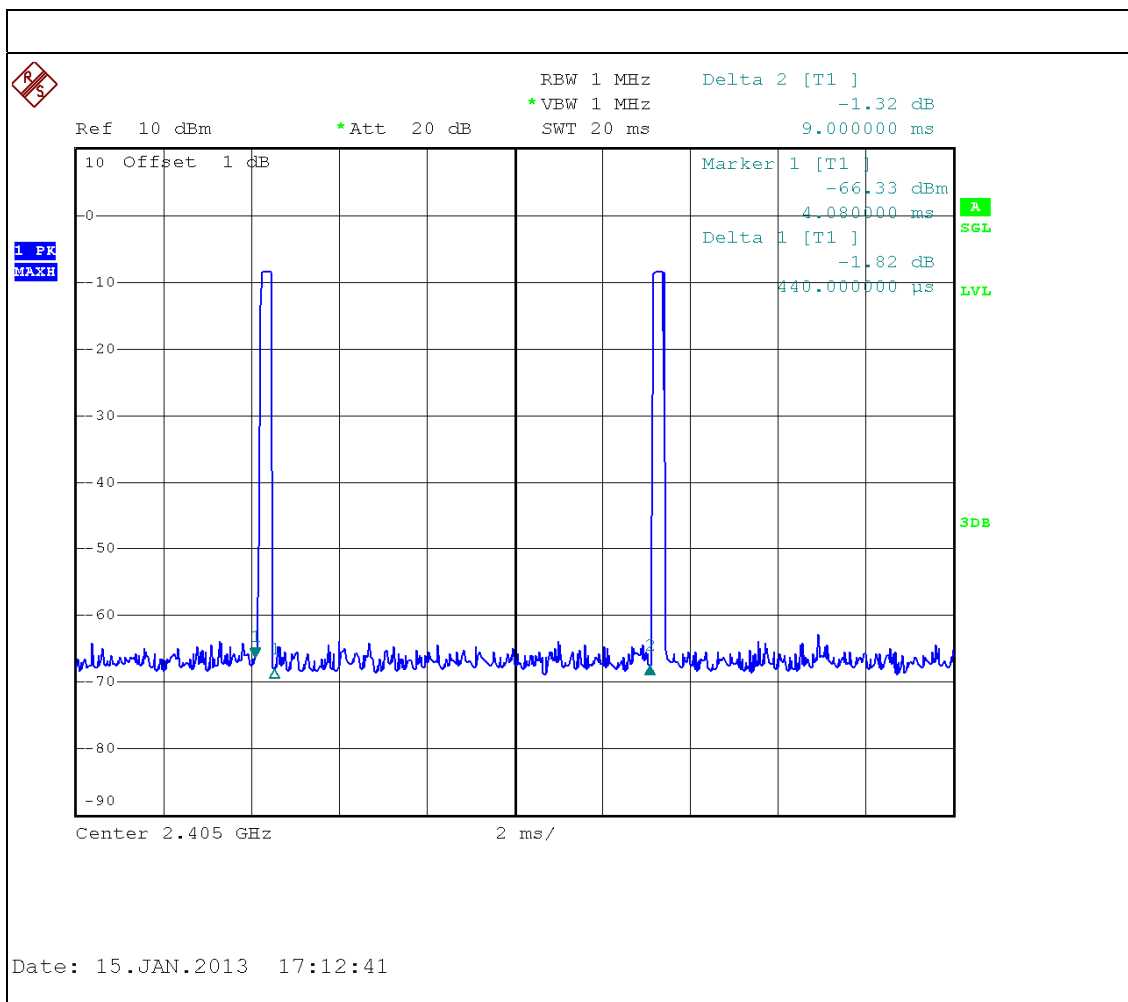
T_{ON} : 0.44msec

$T_{\text{ON}} + T_{\text{OFF}}$: (total time):9 msec

Duty cycle: 4.89%

$$\text{AV} = \text{PK} + 20 \log(\text{Duty cycle})$$

$$\text{AV} = \text{PK} - 26.22$$





4.2.3 TEST PROCEDURE

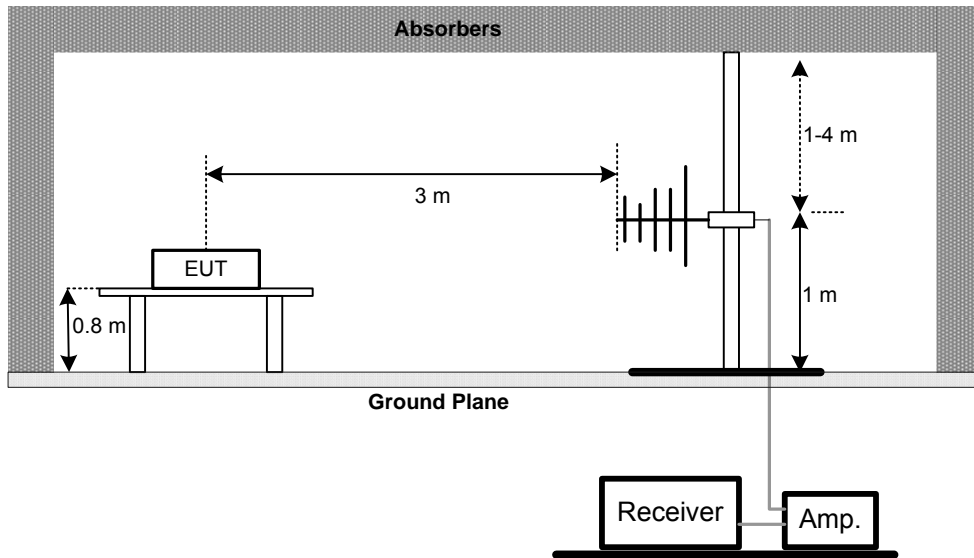
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then AV detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

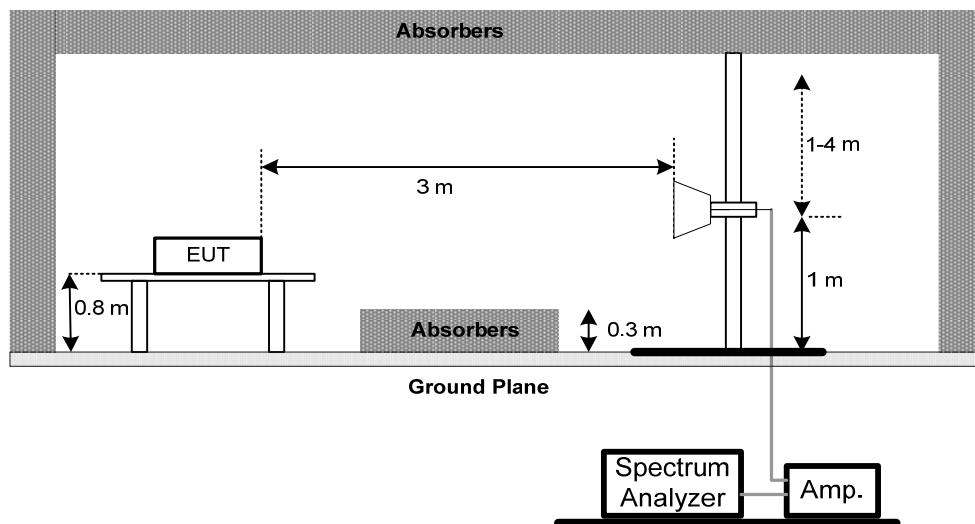
No deviation

4.2.5 TEST SETUP

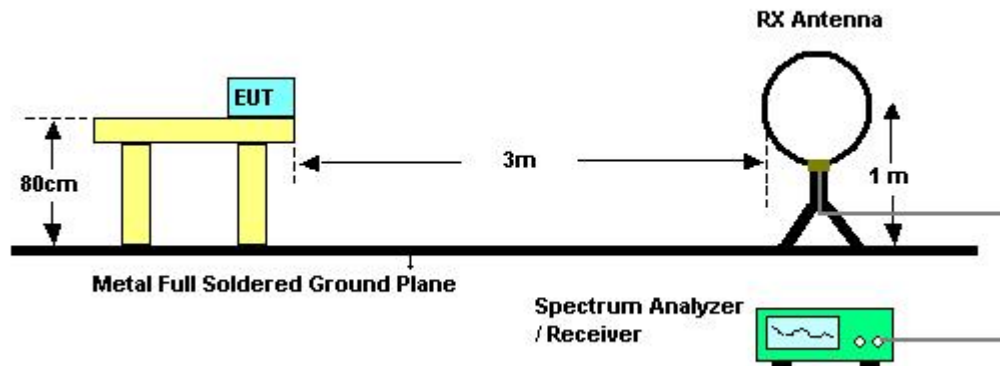
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For radiated emissions below 30MHz



4.2.6 EUT OPERATING CONDITIONS

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



4.2.7 TEST RESULTS (BELOW 30MHz)

EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	26°C	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX Mode 2405MHz		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.046	0°	20.02	22.69	42.71	114.44	-71.74	AVG
0.046	0°	36.25	23.76	60.01	134.44	-74.43	PK
0.286	0°	17.59	20.31	37.90	98.47	-60.57	AVG
0.286	0°	34.27	21.90	56.17	118.47	-62.31	PK
0.486	0°	21.63	19.83	41.46	93.88	-52.41	AVG
0.486	0°	37.11	20.14	57.25	113.88	-56.62	PK
2.29	0°	28.71	19.33	48.04	69.54	-21.50	QP
5.75	0°	26.78	18.14	44.92	69.54	-24.62	QP
8.38	0°	29.75	17.93	47.68	69.54	-21.86	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.085	90°	18.89	21.69	40.58	108.98	-68.39	AVG
0.085	90°	27.55	22.25	49.80	128.98	-79.18	PK
0.382	90°	20.27	20.08	40.35	95.97	-55.61	AVG
0.382	90°	32.65	21.19	53.84	115.97	-62.13	PK
3.184	90°	25.79	18.92	44.71	69.54	-24.83	QP
5.527	90°	28.46	18.16	46.62	69.54	-22.92	QP
8.02	90°	26.87	17.96	44.83	69.54	-24.71	QP
11.13	90°	27.93	17.87	45.80	69.54	-23.74	QP

Remark :

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);.
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor..



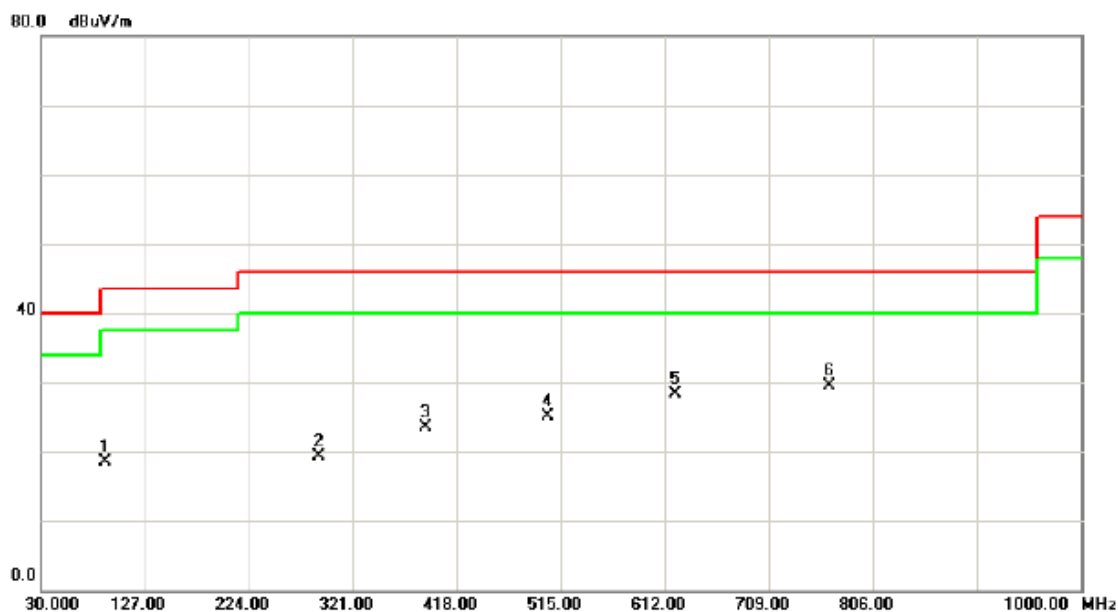
4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) 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 .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



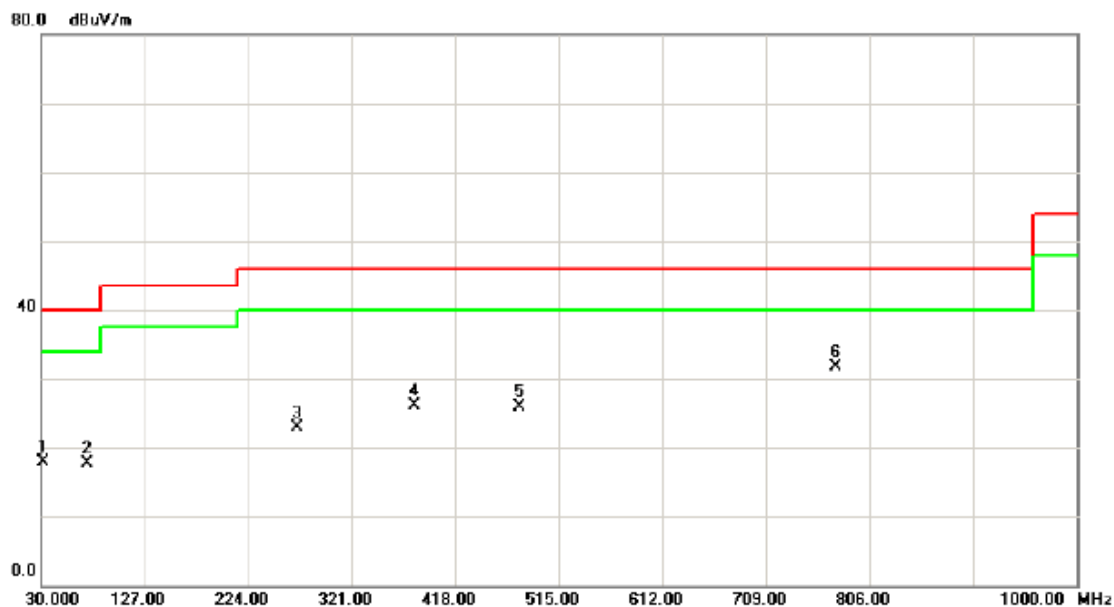
EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25 °C	Relative Humidity	58 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode :	TX Mode 2405MHz	Polarization:	Vertical



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	90.6250	37.59	-19.18	18.41	43.50	-25.09	peak	
2	289.4750	31.85	-12.63	19.22	46.00	-26.78	peak	
3	388.9000	33.71	-10.19	23.52	46.00	-22.48	peak	
4	502.8750	33.34	-8.28	25.06	46.00	-20.94	peak	
5	621.7000	33.48	-5.13	28.35	46.00	-17.65	peak	
6 *	764.7750	33.52	-4.05	29.47	46.00	-16.53	peak	



EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25 °C	Relative Humidity	58 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode :	TX Mode 2405MHz	Polarization:	Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		32.4250	34.48	-16.55	17.93	40.00	-22.07	peak	
2		73.6500	36.45	-18.84	17.61	40.00	-22.39	peak	
3		270.0750	36.80	-13.82	22.98	46.00	-23.02	peak	
4		379.2000	36.62	-10.53	26.09	46.00	-19.91	peak	
5		478.6250	34.50	-8.65	25.85	46.00	-20.15	peak	
6	*	774.4750	35.67	-3.94	31.73	46.00	-14.27	peak	



4.2.9 TEST RESULTS (ABOVE 1000 MHz)

EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	60 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX 2405MHz		

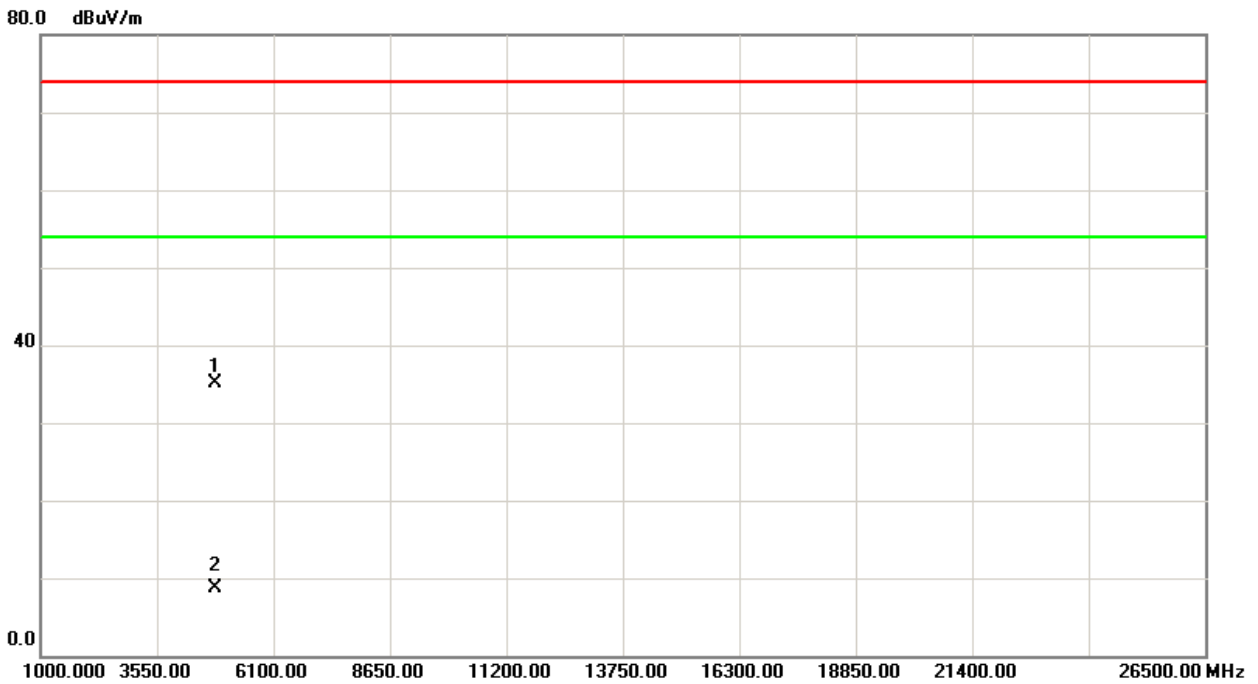
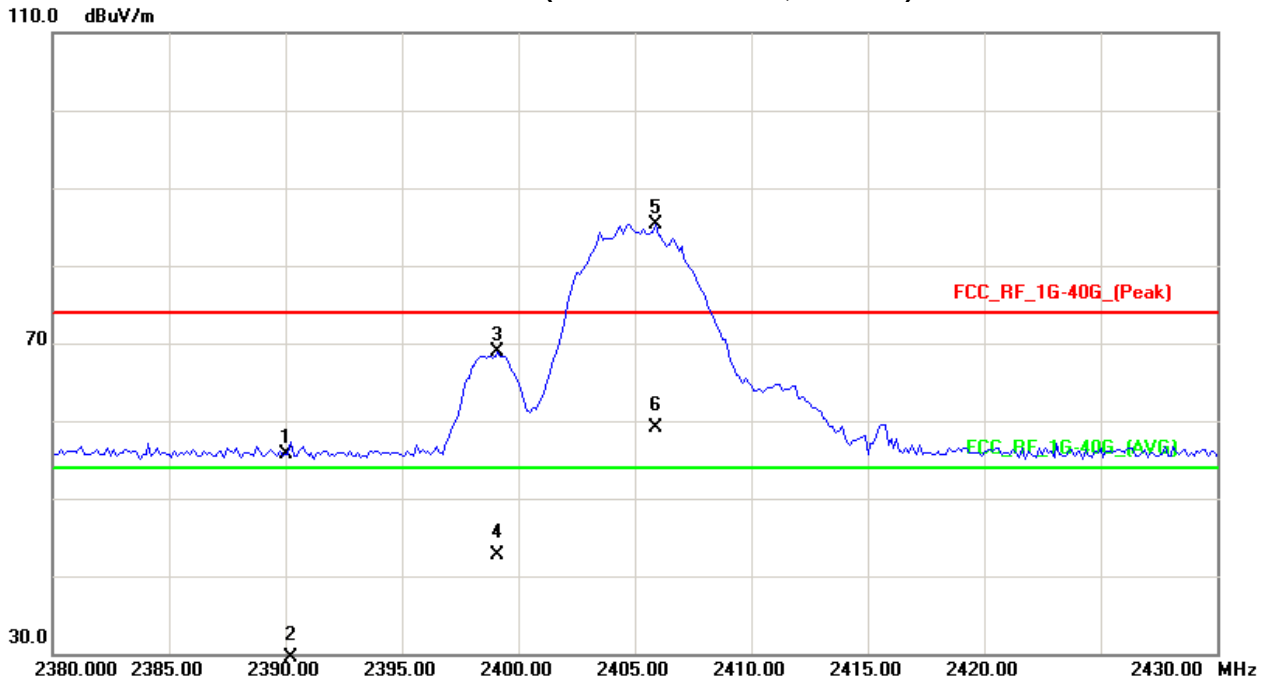
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	23.43	-2.79	32.28	55.71	29.49	74.00	54.00	X/E
2399.13	V	36.68	10.46	32.27	68.95	42.73	74.00	54.00	X/E
2405.88	V	53.05	26.83	32.26	85.31	59.09	114.00	94.00	X/F
4809.97	V	28.89	2.67	6.13	35.02	8.80	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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
- (8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) ,Final AV=PK-26.22



Orthogonal Axis : X
TX 2405MHz (Above 1000 MHz, Vertical)





EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	60 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX 2405MHz		

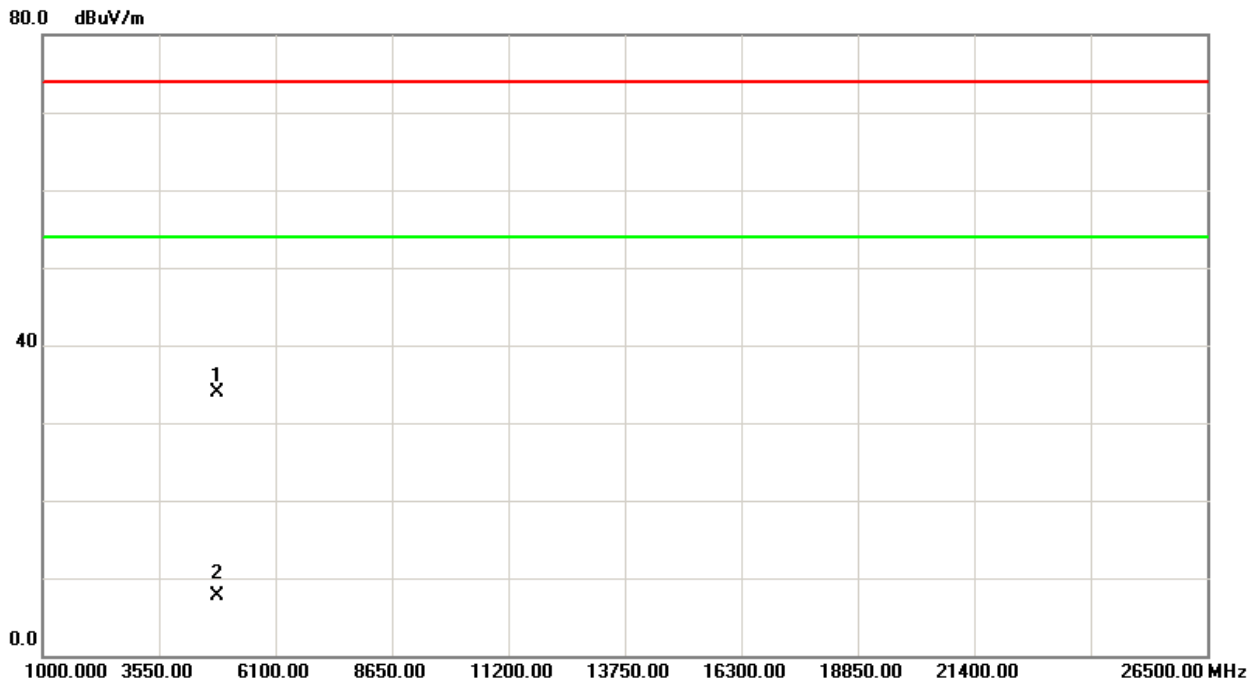
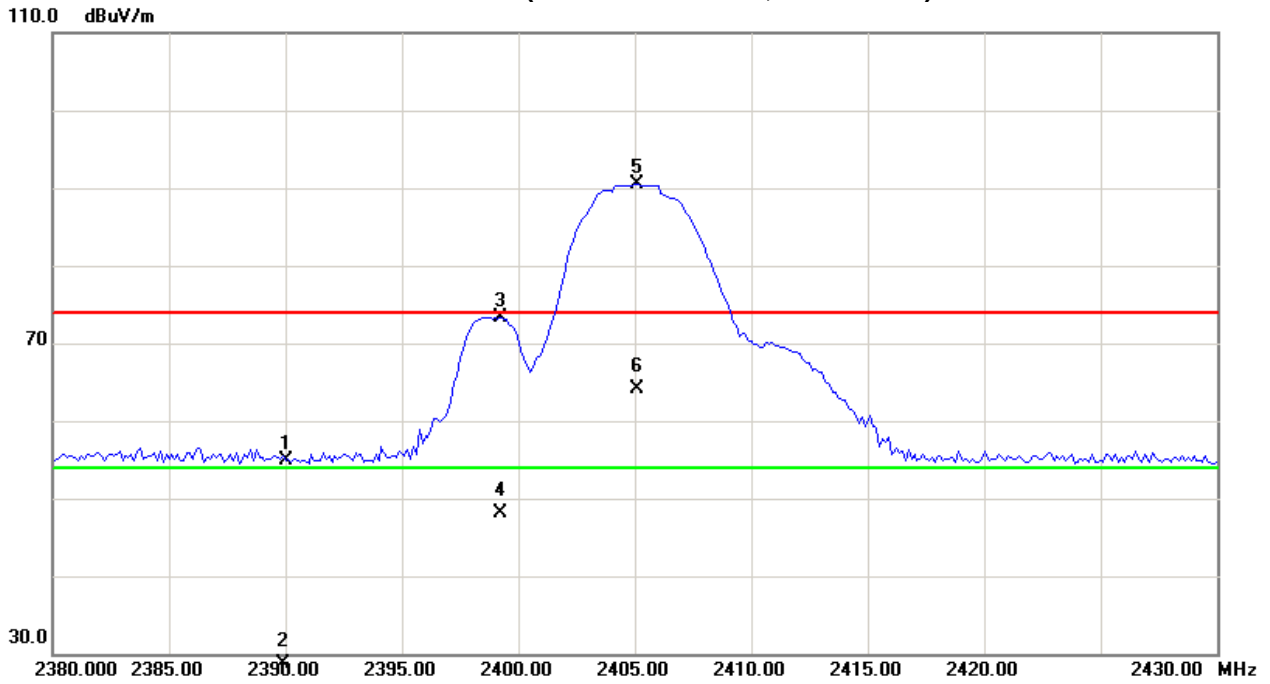
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	22.55	-3.67	32.28	54.83	28.61	74.00	54.00	X/E
2399.25	H	41.12	15.90	32.27	73.39	48.17	74.00	54.00	X/E
2405.13	H	58.15	31.93	32.26	90.41	64.19	114.00	94.00	X/F
4810.04	H	27.76	1.54	6.13	33.89	7.67	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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
- (8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) , Final AV=PK-26.22



Orthogonal Axis : X
TX 2405MHz (Above 1000 MHz, Horizontal)





EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	60 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX 2439MHz		

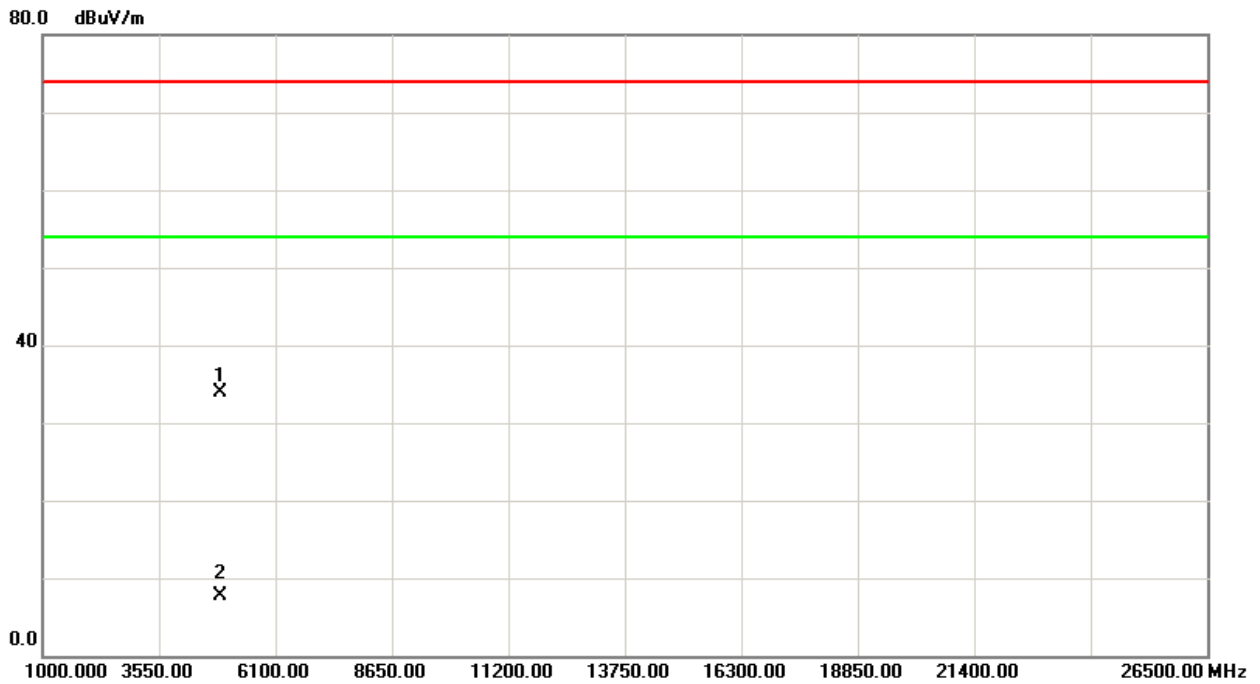
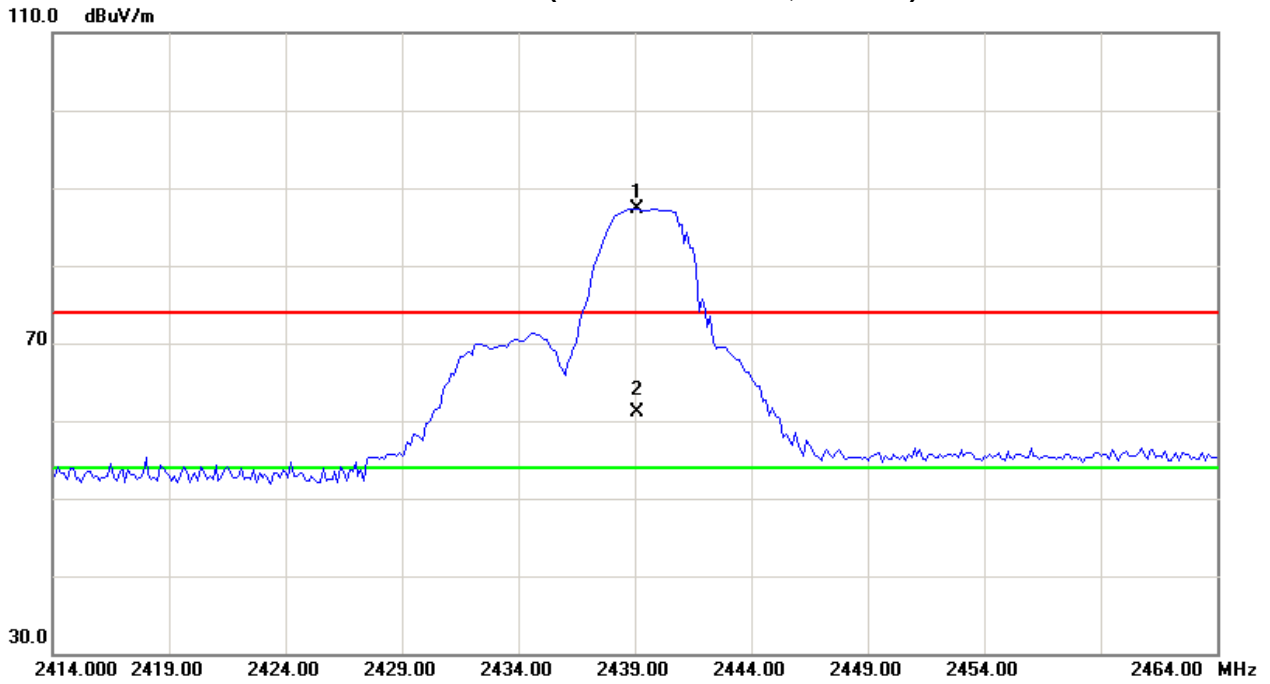
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2439.13	V	55.07	28.85	32.22	87.29	61.07	114.00	94.00	X/F
4878.03	V	27.57	1.35	6.41	33.98	7.76	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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
- (8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) ,Final AV=PK-26.22



Orthogonal Axis : X
TX 2448 MHz (Above 1000 MHz, Vertical)





EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	60 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX 2439MHz		

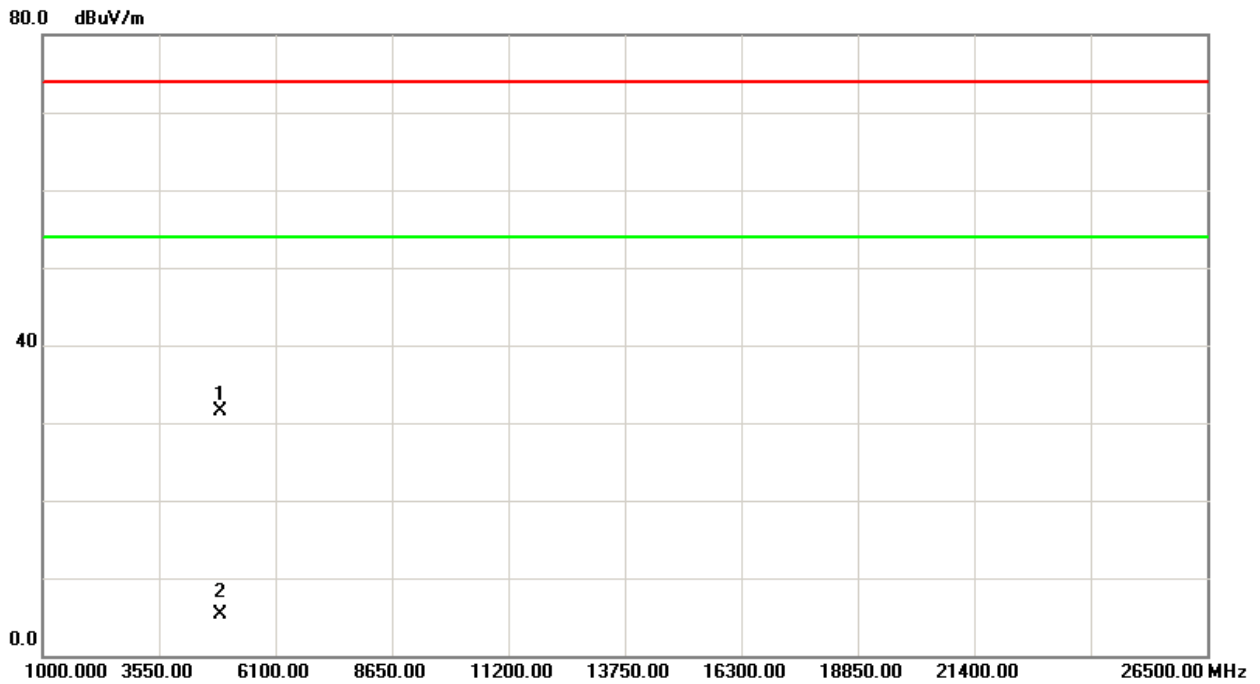
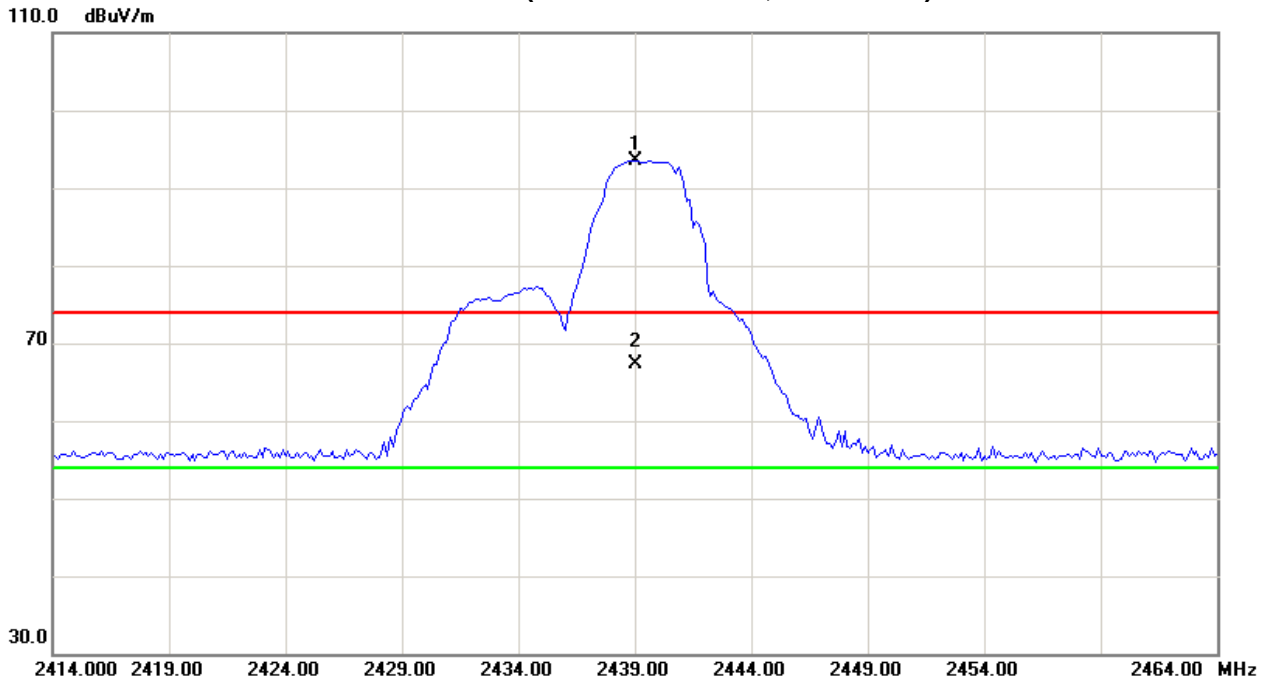
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2439.00	H	61.28	35.06	32.22	93.50	67.28	114.00	94.00	X/F
4878.12	H	25.16	-1.06	6.41	31.57	5.35	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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
- (8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) , Final AV=PK-26.22



Orthogonal Axis : X
TX 2439MHz (Above 1000 MHz, Horizontal)





EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	60 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX 2476MHz		

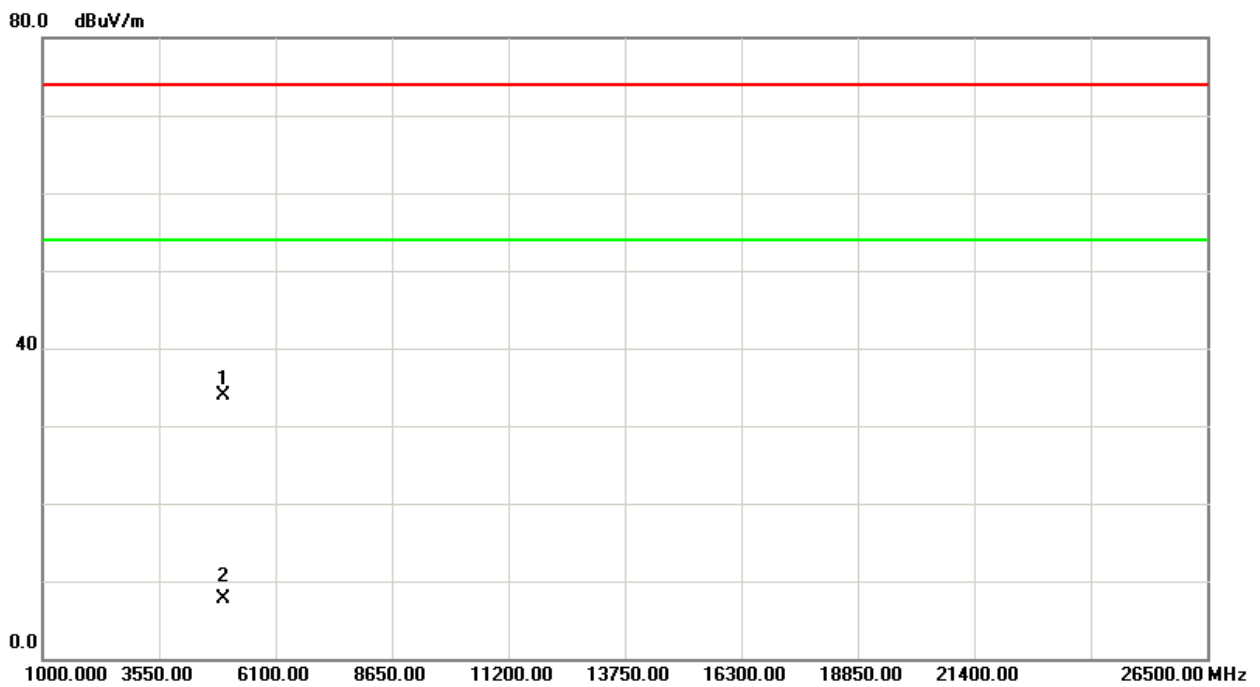
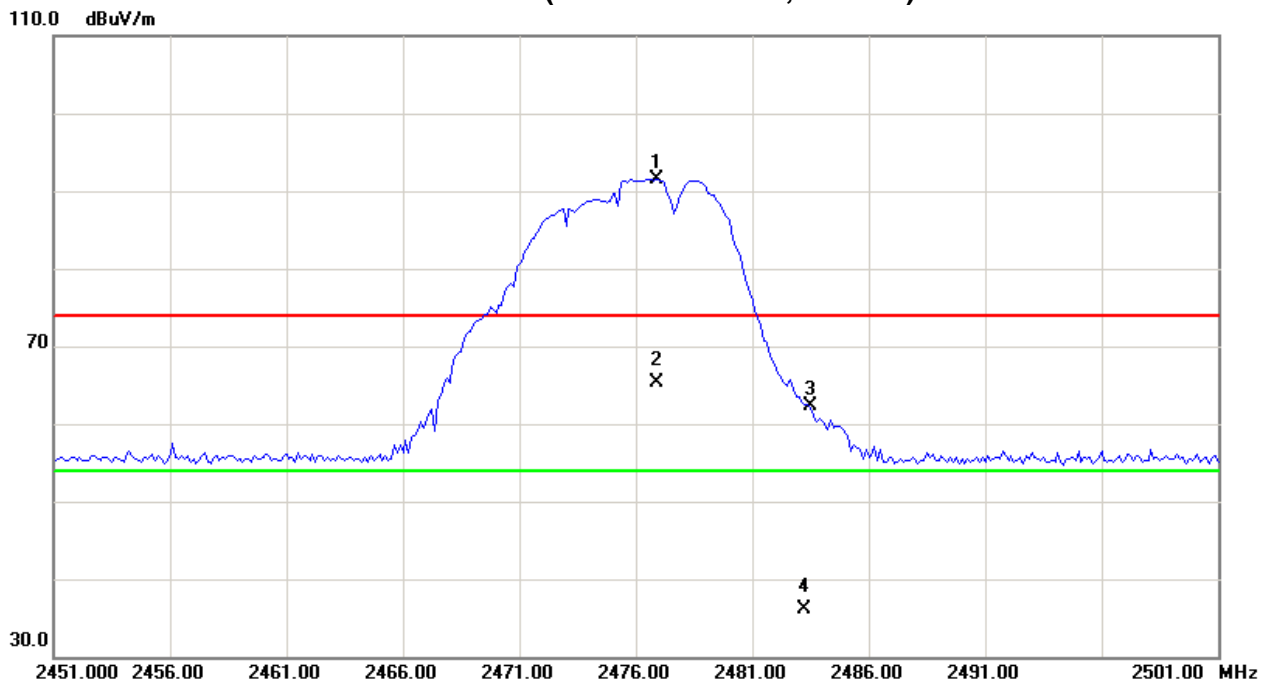
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2476.88	V	59.32	33.10	32.19	91.51	65.29	114.00	94.00	X/F
2483.50	V	30.16	3.94	32.17	62.33	36.11	74.00	54.00	X/E
4951.97	V	27.28	1.06	6.70	33.98	7.76	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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
- (8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) ,Final AV=PK-26.22



Orthogonal Axis : X
TX 2476MHz (Above 1000 MHz, Vertical)





EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	60 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX 2476MHz		

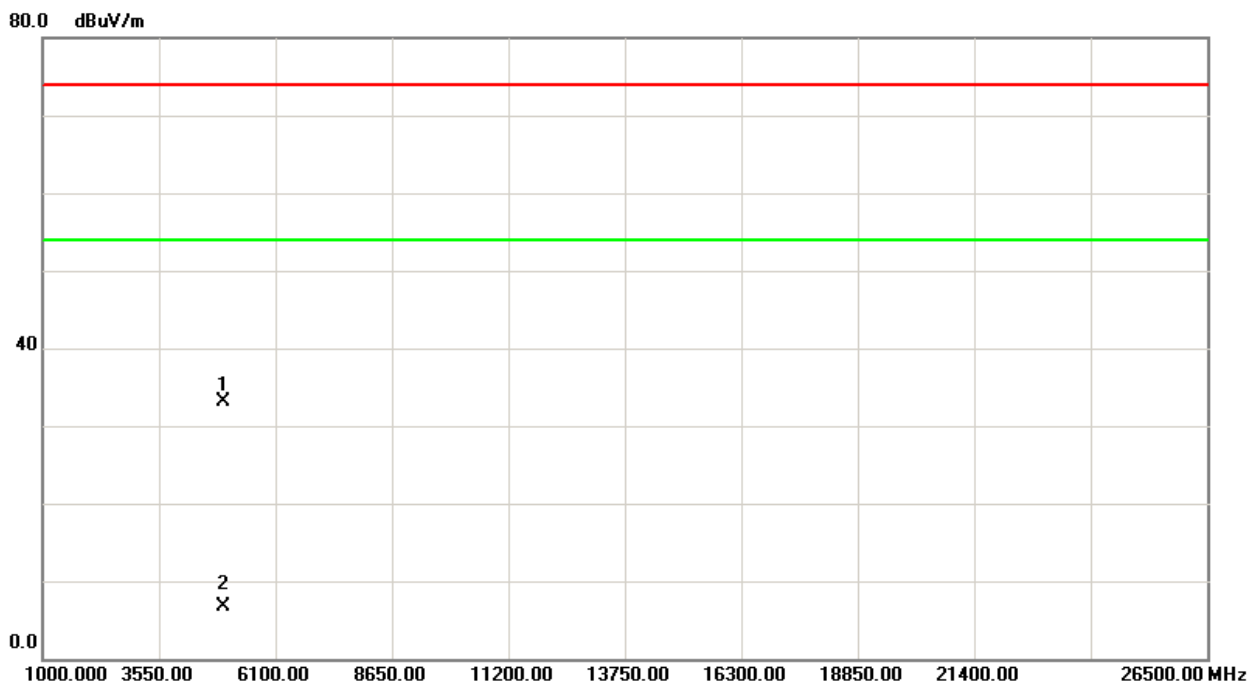
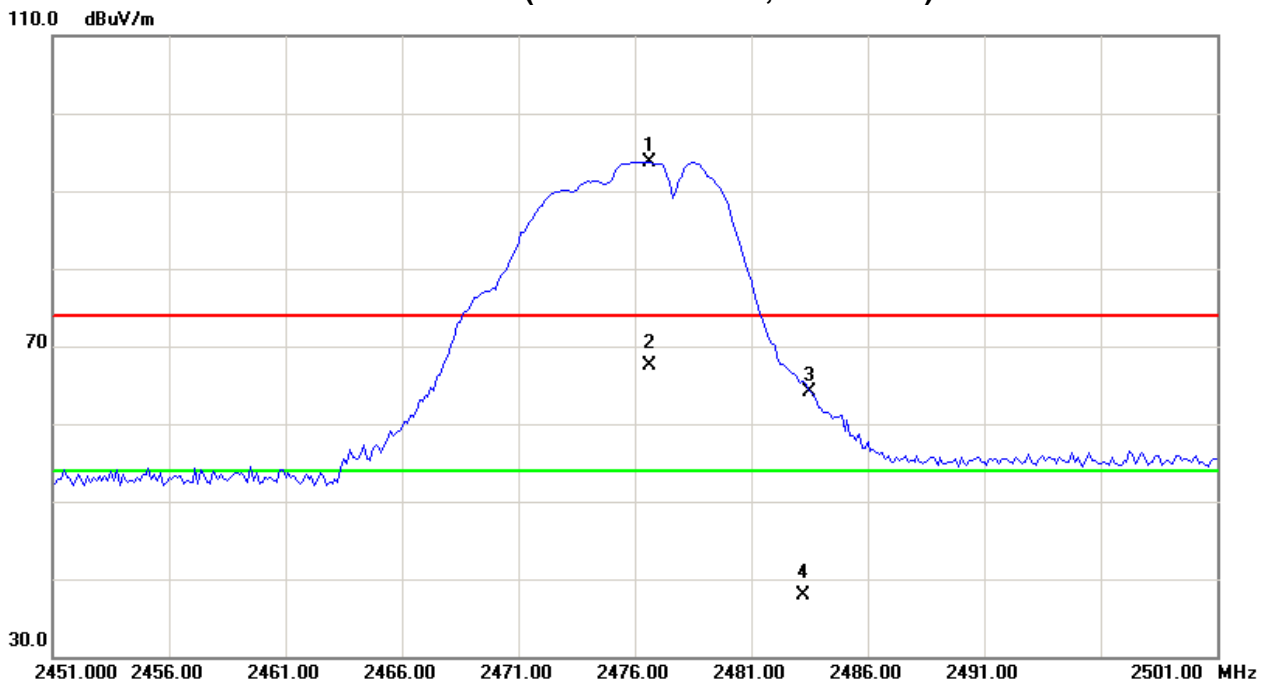
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2476.63	H	61.59	35.37	32.19	93.78	67.56	114.00	94.00	X/F
2483.50	H	31.91	5.69	32.17	64.08	37.86	74.00	54.00	X/E
4952.01	H	26.31	0.09	6.70	33.01	6.79	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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
- (8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) , Final AV=PK-26.22



Orthogonal Axis : X
TX 2476MHz (Above 1000 MHz, Horizontal)





5. BANDWIDTH TEST

5.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.16.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

5.2 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.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

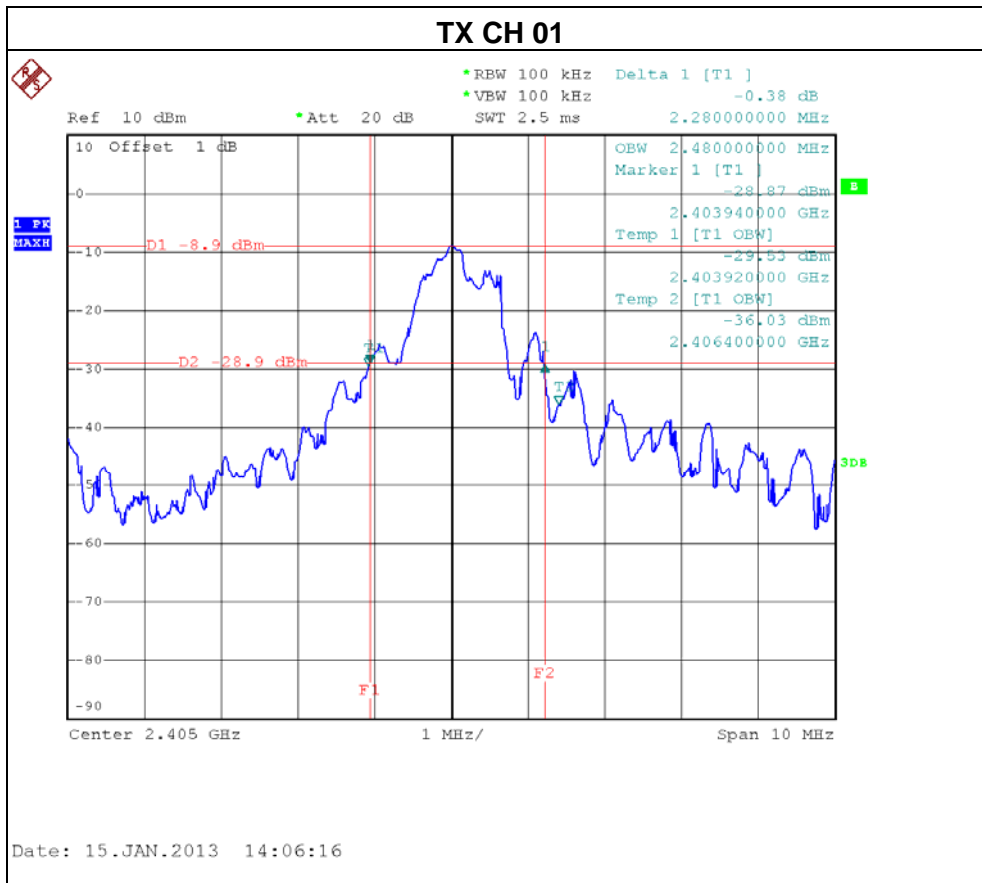
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

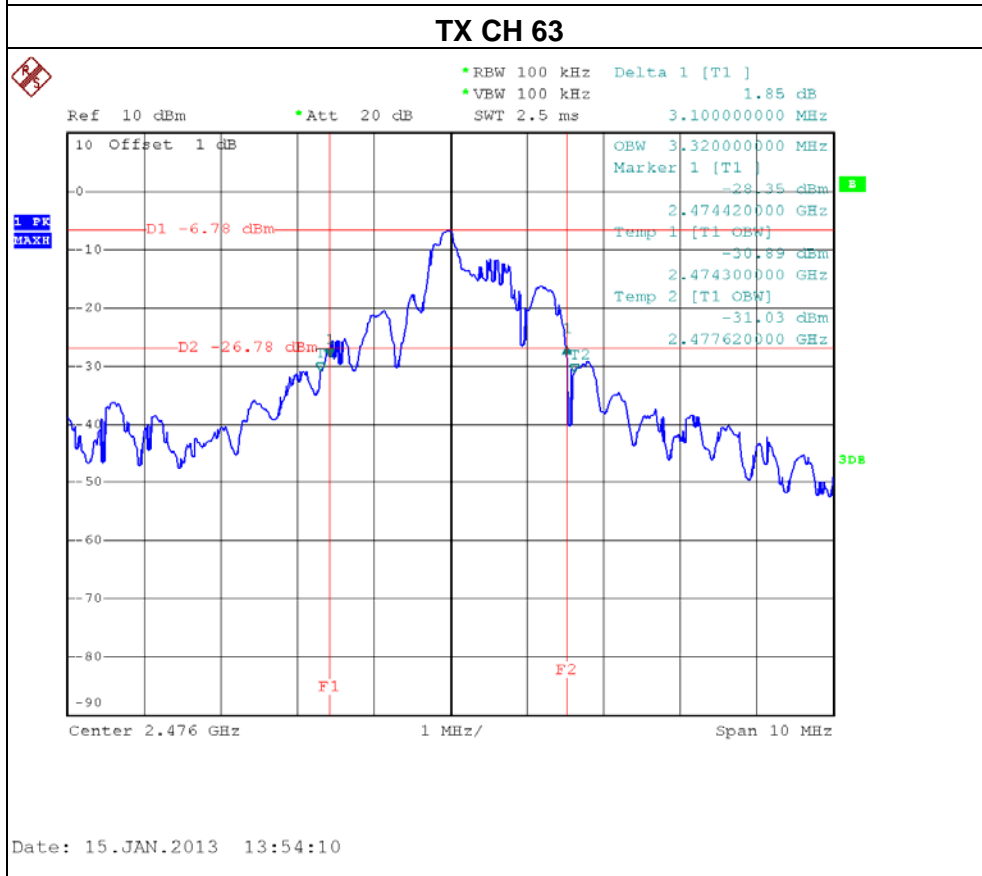
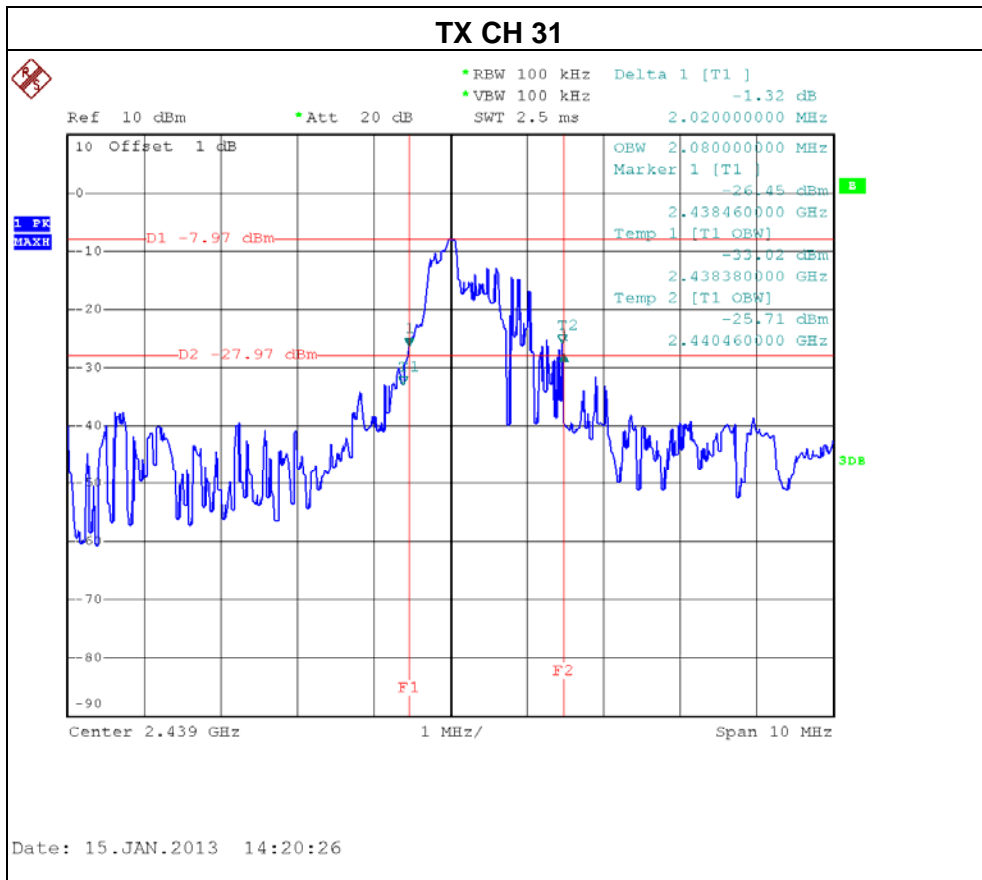


5.6 TEST RESULTS

EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX CH 01/31/63		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)
CH 01	2402	2.28
CH 31	2439	2.02
CH 63	2476	3.10







6. ANTENNA CONDUCTED SPURIOUS EMISSION

6.1 APPLIED PROCEDURES / LIMIT

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 (micровolts/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
960~1000	500	3

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.16.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

6.1.2 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 = 10 ms.

6.1.3 DEVIATION FROM STANDARD

No deviation.

6.1.4 TEST SETUP



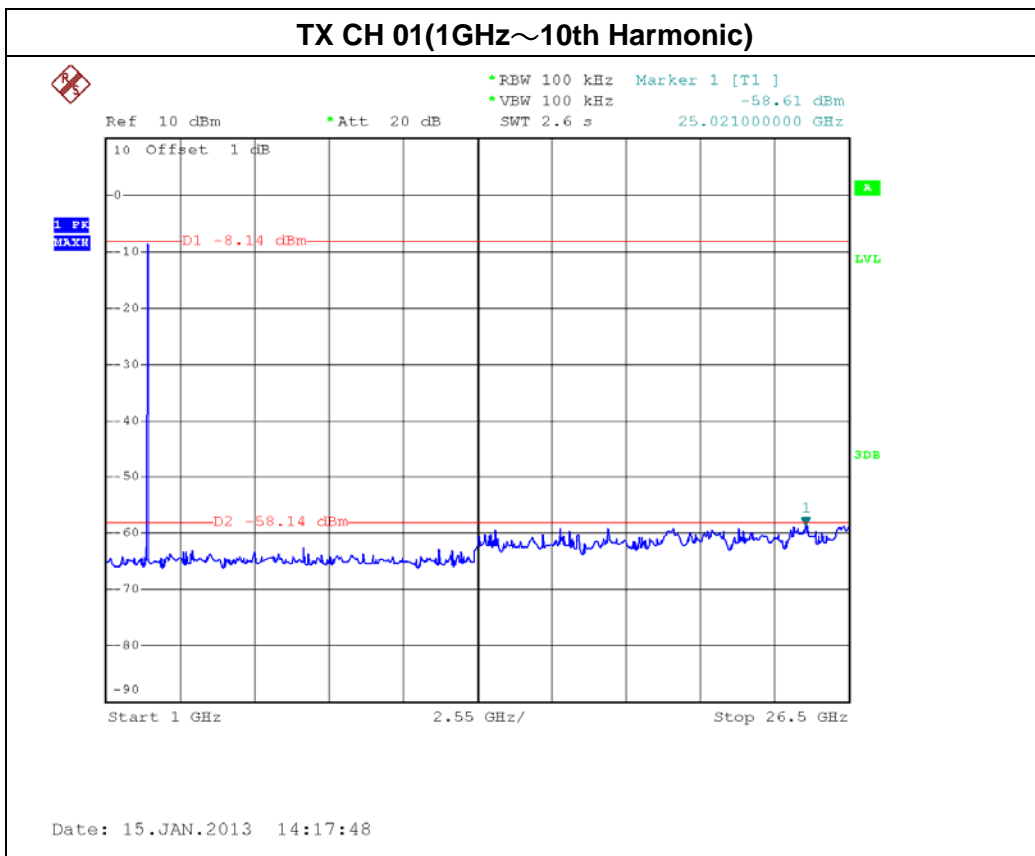
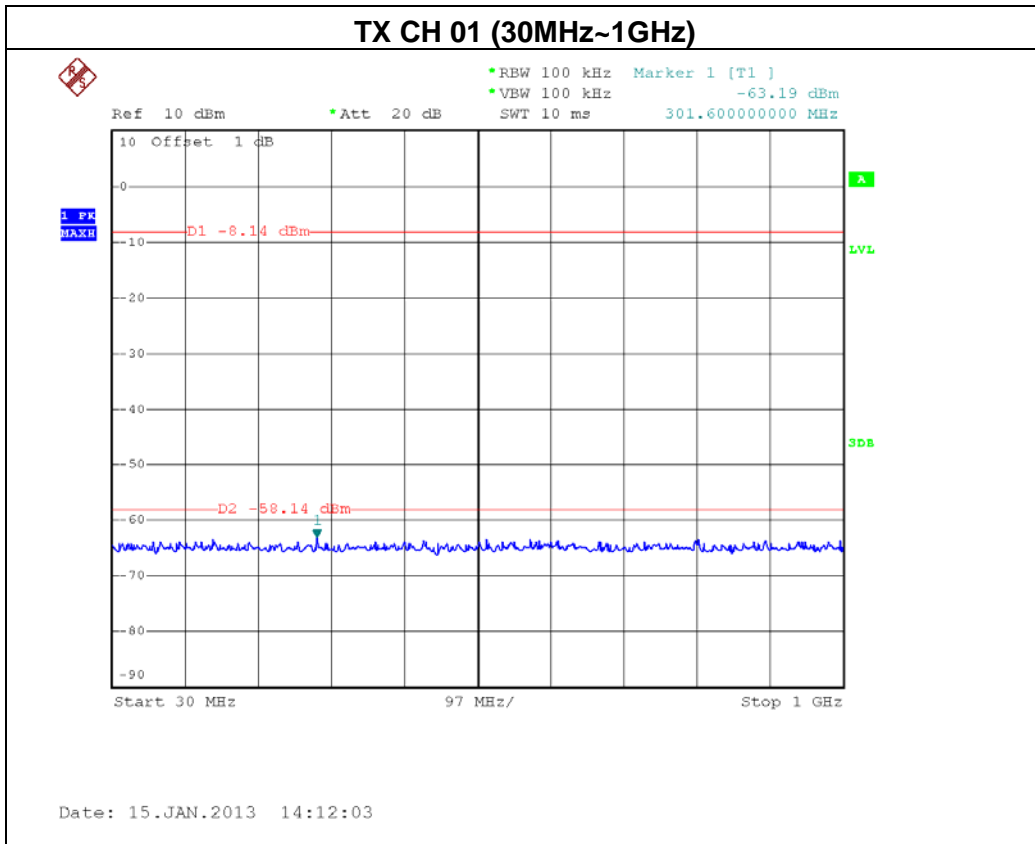
6.1.5 EUT OPERATION CONDITIONS

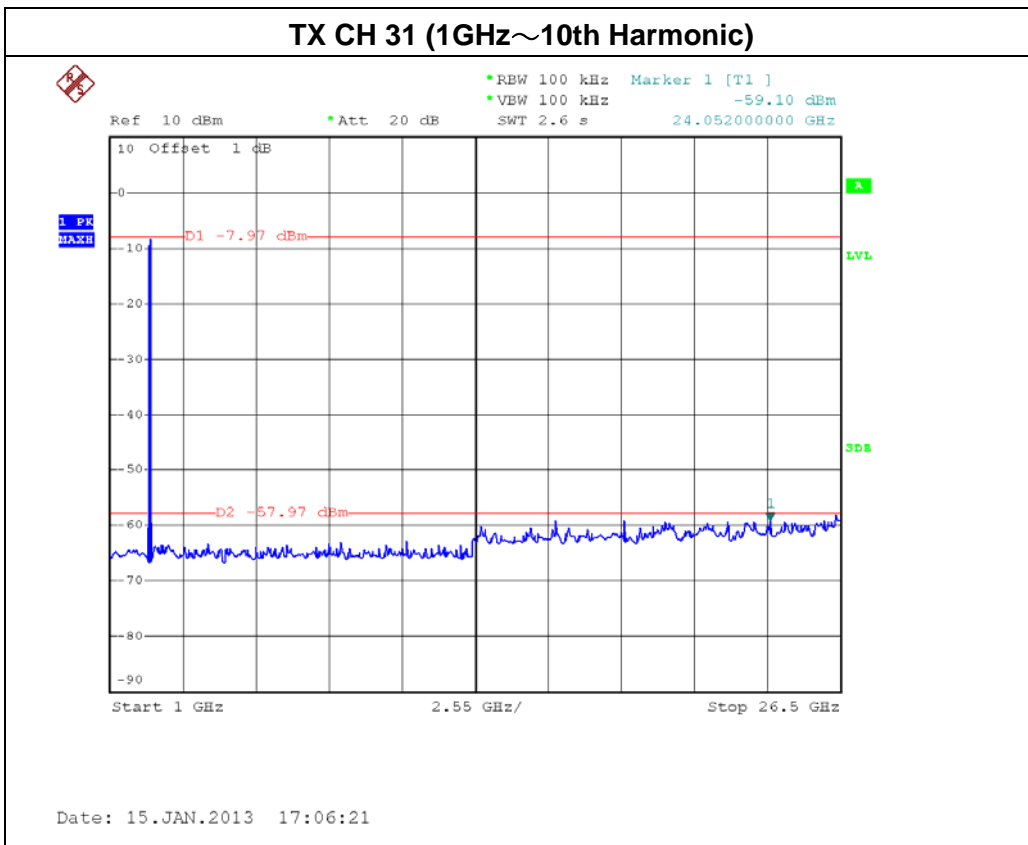
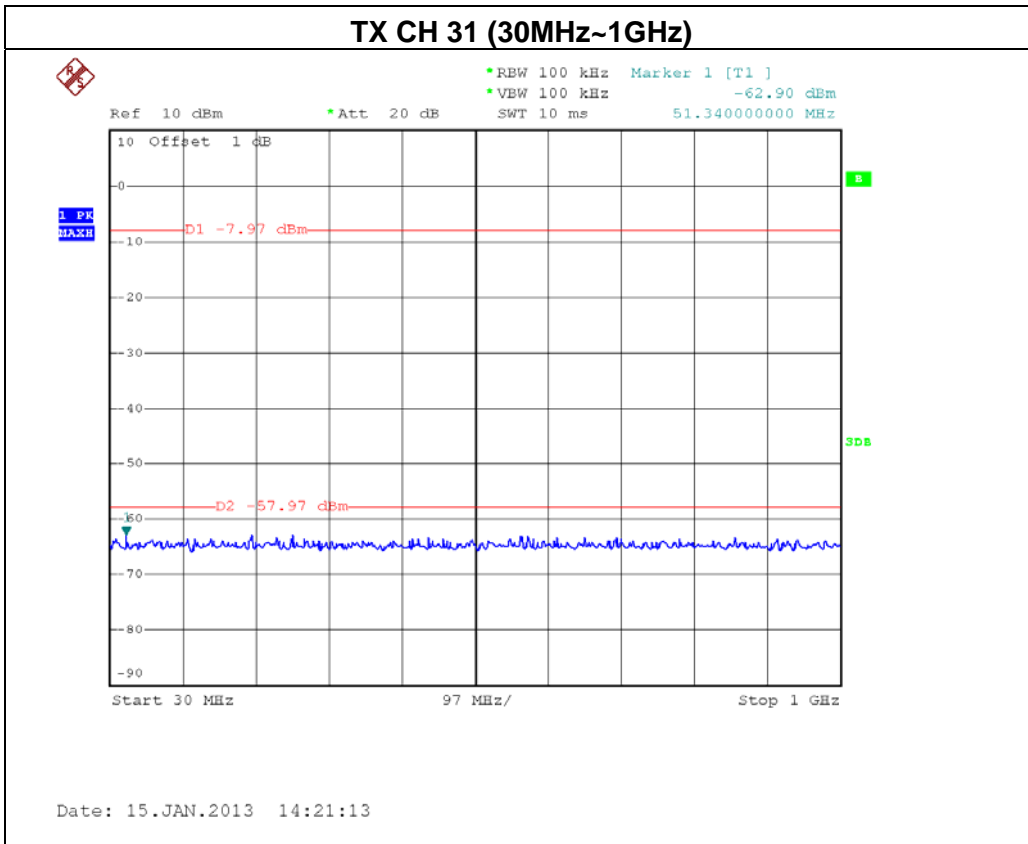
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

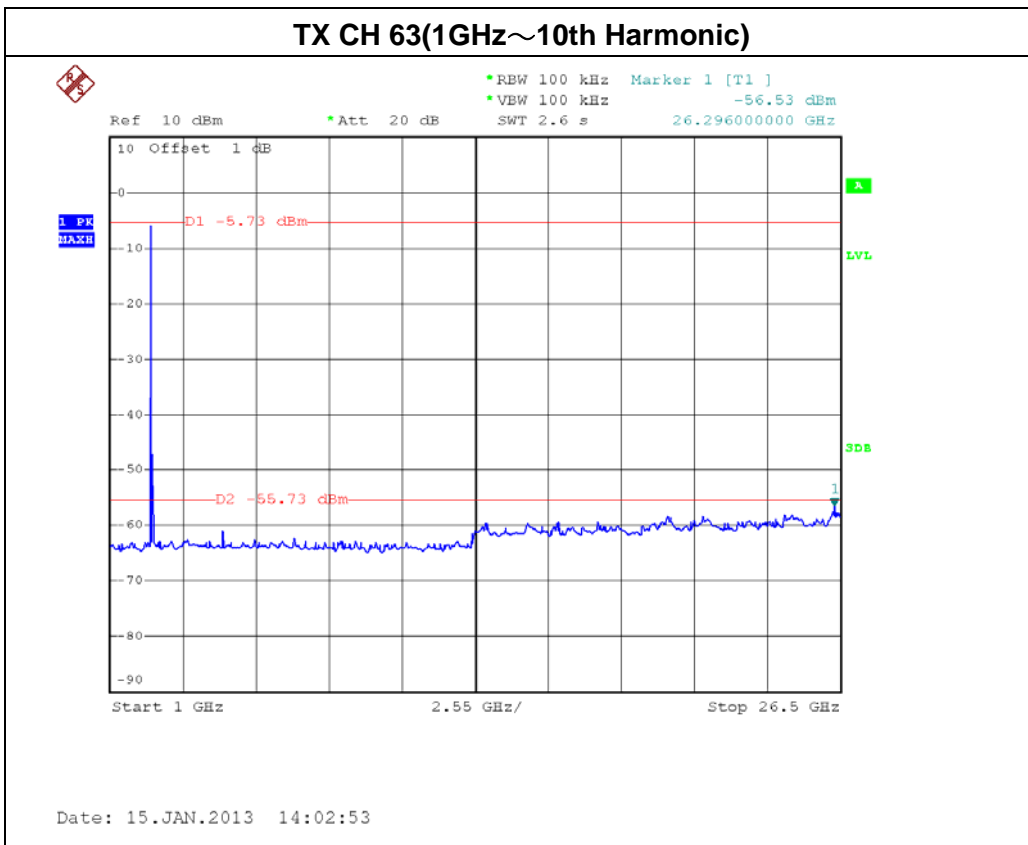
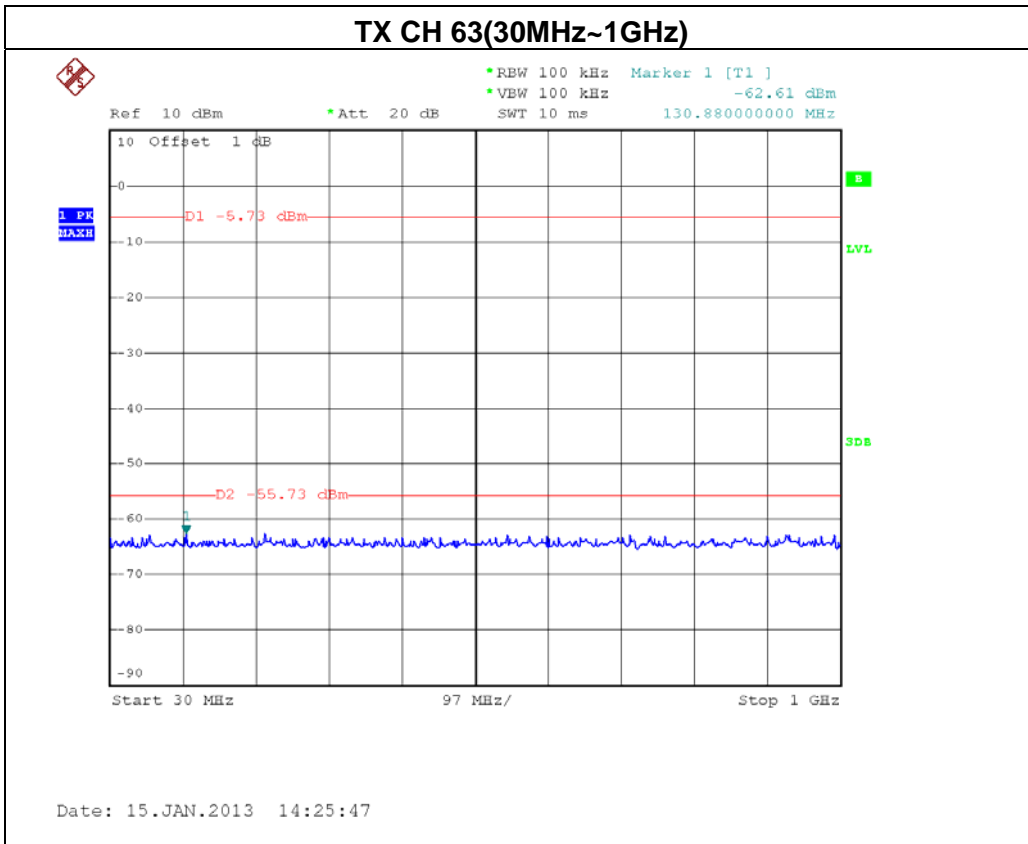


6.1.6 TEST RESULTS

EUT	2.4GHz Wireless Mouse	Model Name	DM-9025RL
Temperature	25°C	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 1.5V
Test Mode	TX CH01, CH 31, CH 63		



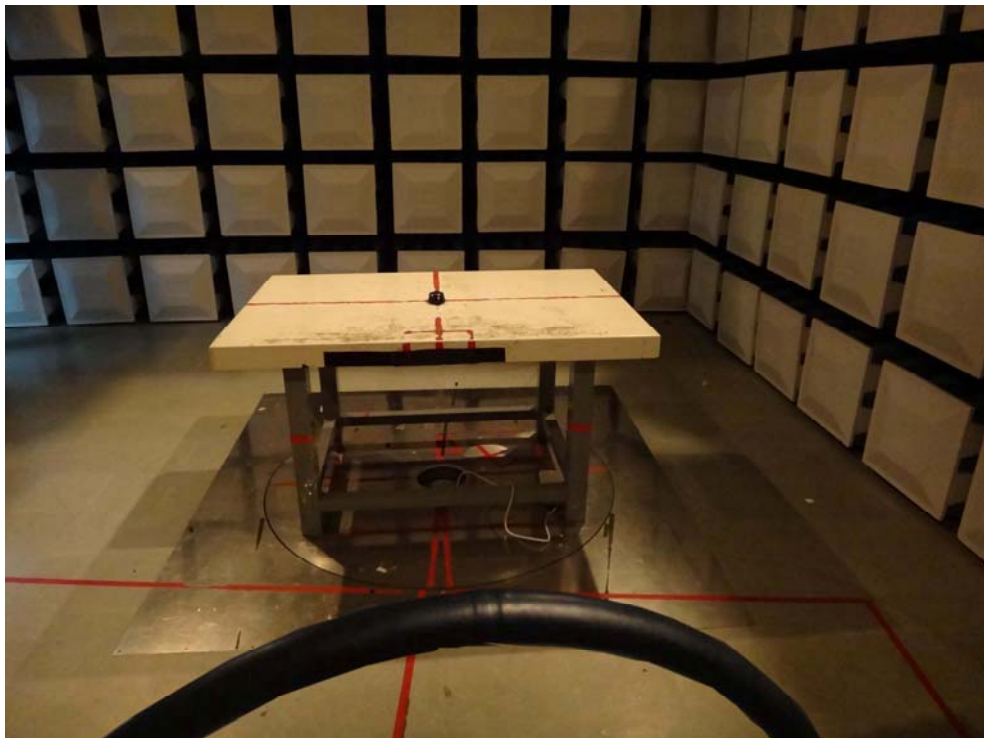






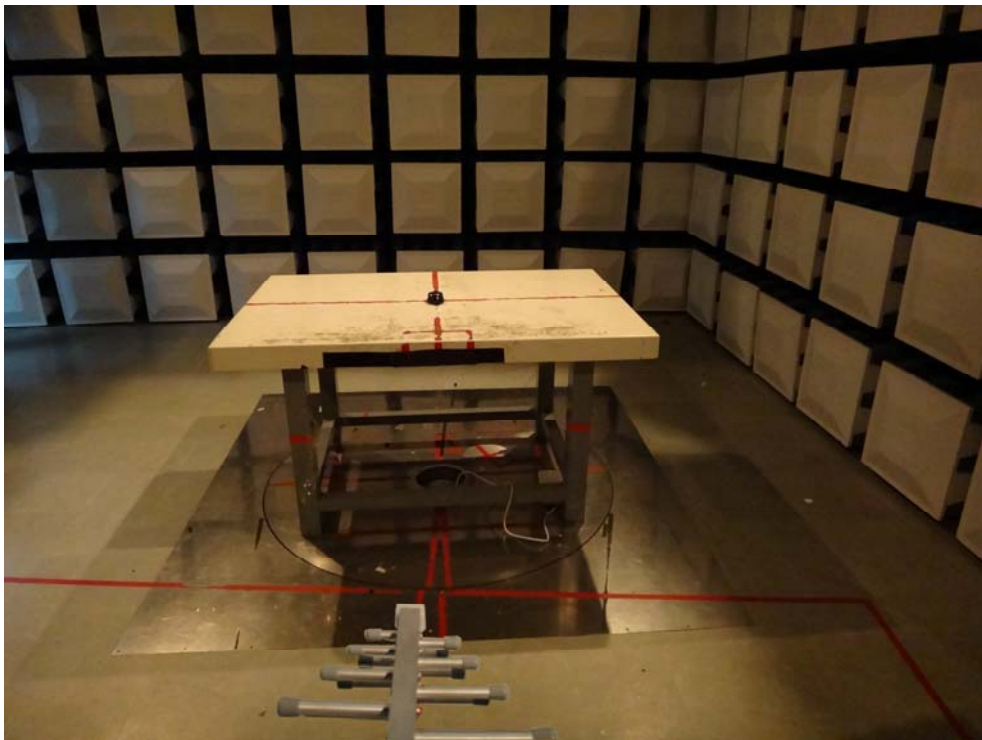
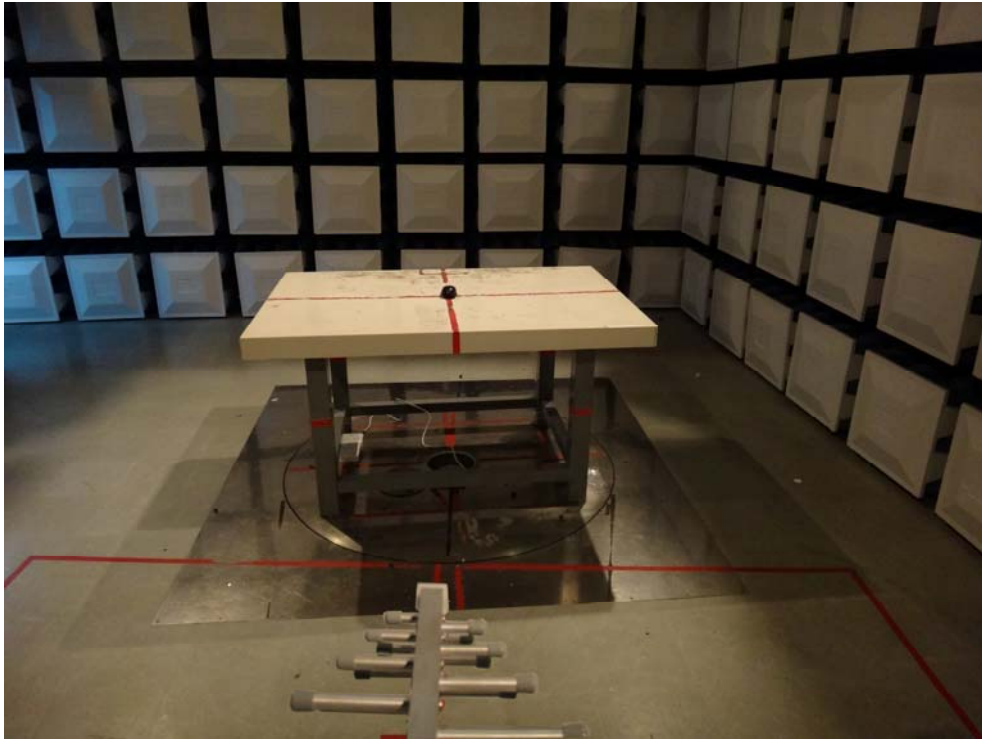
7. EUT TEST PHOTO

**Radiated Measurement Photos
9K-30MHz**





**Radiated Measurement Photos
30M~1000MHz**





**Radiated Measurement Photos
Above 1000MHz**

