

FCC Radio Test Report

FCC ID: O3L-PT-61L008

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

Issued Date : May 22, 2008
Project No. : R0803014
Equipment : 2.4G Wireless Laser Mouse (Lotus)
Model Name : PT-61L007; PT-61L008

Applicant : Paten Wireless Technology Inc.
Address : 8F, No. 407, Rueiguang Road, NeiHu,
Taipei 114, Taiwan, R.O.C.

Tested by:

Neutron Engineering Inc. EMC Laboratory

Date of Test:

May 11, 2008 ~ May 14, 2008

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Declaration

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

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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 Wireless Laser Mouse (Lotus)
Brand Name : Paten
Model No. : PT-61L007; PT-61L008
Applicant : Paten Wireless Technology Inc.
Date of Test : May 11, 2008 ~ May 14, 2008
Test Item : ENGINEERING SAMPLE
Standards : FCC Part15, Subpart C(15.249) / RSS-210: 2004/ ANCI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-R0803014) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209 15.249	Radiated Spurious Emission	PASS	

NOTE:

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

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **OS01** at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

Neutron's test firm number is 95335

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
OS-02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	2.4G Wireless Laser Mouse (Lotus)	
Brand Name	Paten	
Model No.	PT-61L007; PT-61L008	
OEM Brand/Model No.	N/A	
Model Difference	There are two models based on similar electrical circuit except the difference of list below:	
	Model Name	Chargeable
	PT-61L007	YES
	PT-61L008	NO
	All the above models were tested, and the model: PT-61L007 was found to be the worst case during the pr-scanning test. This model of the worst case was used for final testing and collecting test data included in this report.	
Product Description	The EUT is a 2.4G Wireless Laser Mouse (Lotus).	
	Operation Frequency:	2402~2470MHz
	Modulation Type:	GFSK
	Number Of Channel	16CH
	Antenna Designation:	Integral Antenna(Printed)
	Antenna Gain(Peak)	-0.98dBi
	Average Output Power:	79.00 dBuV/m (Max.)
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Power Source	Battery supplied	
Power Rating	DC I/P 3V (AAA Battery x 2)	
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.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	05	2405	09	2408	13	2411
02	2432	06	2435	10	2439	14	2441
03	2470	07	2468	11	2465	15	2462
04	2415	08	2444	12	2418	16	2459

3.2 DESCRIPTION OF TEST MODES

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

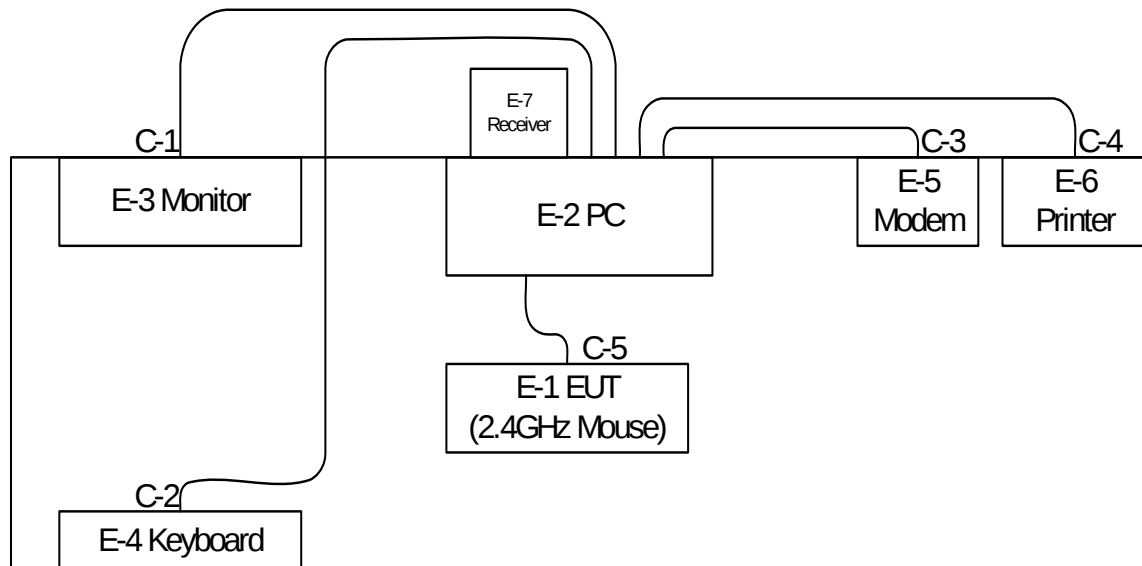
Pretest Test Mode	Description
Mode 1	CH01(PT-61L007; PT-61L008)
Mode 2	CH10(PT-61L007; PT-61L008)
Mode 3	CH03(PT-61L007; PT-61L008)

For Conducted Test	
Final Test Mode	Description
Mode 2	CH10(PT-61L007)

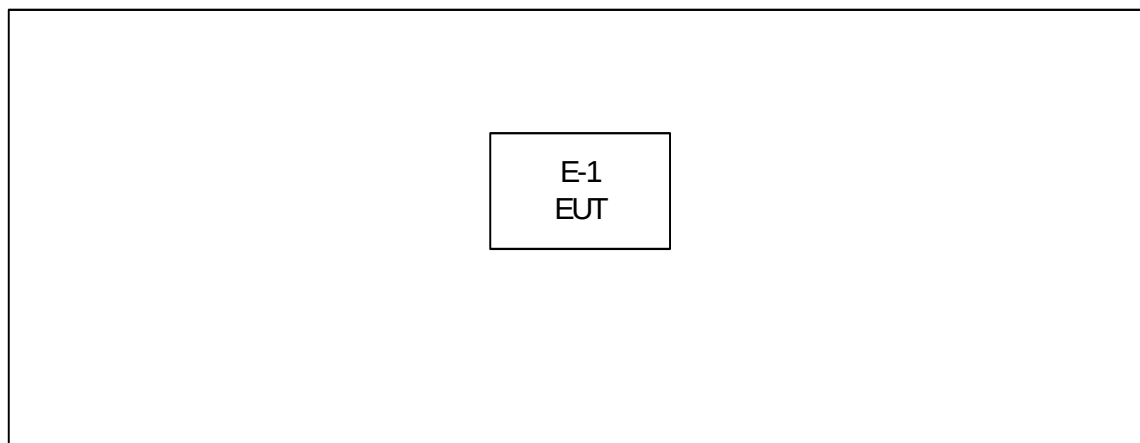
For Radiated Test	
Final Test Mode	Description
Mode 1	CH01(PT-61L007)
Mode 2	CH10(PT-61L007)
Mode 3	CH03(PT-61L007)

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

For PT-61L007



For PT-61L008



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 Wireless Laser Mouse (Lotus)	Paten	PT-61L007	O3L-PT-61L008	N/A	EUT
E-2	PC	HP	HP Compaq dx7300 MT	DOC	SGH71505LH	
E-3	19" LCD Monitor	Samsung	SyncMaster 193P	DOC	DI19H4JXC05517A	
E-4	PS/2 K/B	Logitech	Y-SJ17(ACK260A)	DOC	SYU44664880	
E-5	Modem	ACEEX	DM-1414V	DOC	8041708	
E-6	Printer	SII	DPU-414	DOC	1045105A	
E-7	2.4G USB RECEIVER	Paten	PT-91L001	DOC	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	1.8M	
C-2	YES	NO	1.5M	
C-3	YES	NO	1.7M	
C-4	YES	NO	1.8M	
C-5	NO	NO	0.2M	

Note:

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

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (FREQUENCY RANGE 150KHZ-30MHZ)

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

Note:

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

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Test Cable	N/A	C01	N/A	Oct. 10, 2008
2	LISN (SR03)	EMCO	3816/2	00042991	Jan. 29, 2009
3	Pulse Limiter	Electro-Metrics	EM-7600	112647	Oct. 10, 2008
4	50Ω Terminator	N/A	N/A	N/A	May 13, 2009
5	LISN	Rolf Heine	NNB-2/16Z	98053	Dec. 30, 2008
6	EMI Test Receiver	R&S	ESCI	100082	Feb. 23, 2009

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

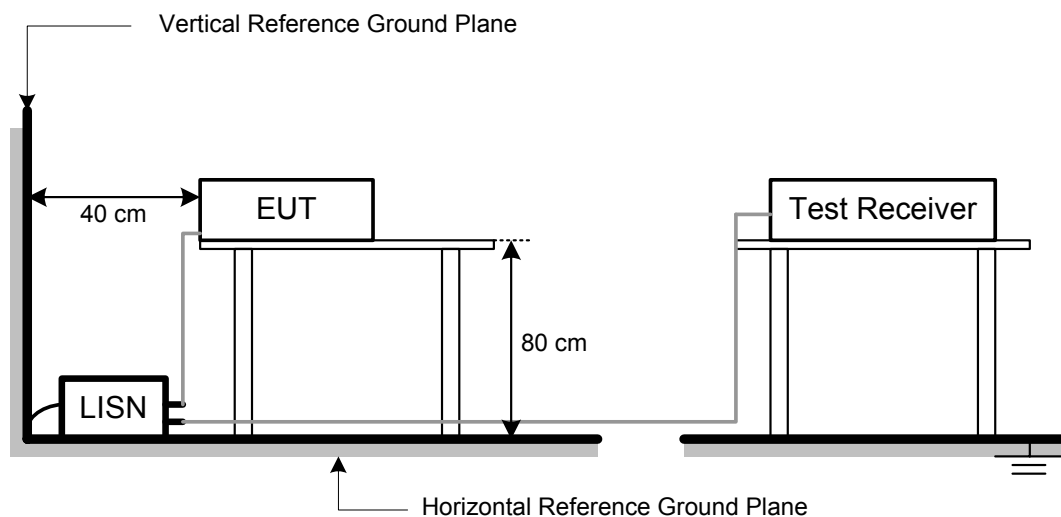
4.1.3 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



4.1.6 EUT OPERATING CONDITIONS

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

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

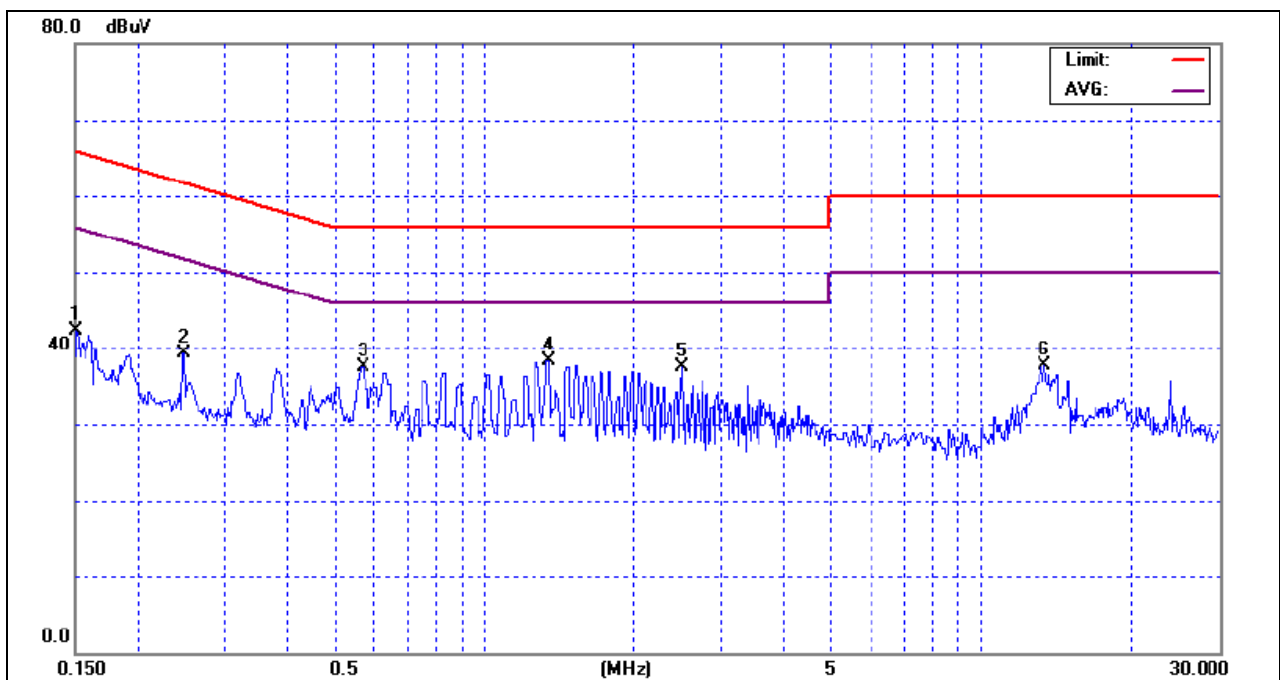
4.1.7 TEST RESULTS

E.U.T :	2.4G Wireless Laser Mouse (Lotus)	Model Name :	PT-61L007
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1008 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	CH10		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Line	42.33	*	65.96	55.96	-23.63	(QP)
0.25	Line	39.34	*	61.85	51.85	-22.51	(QP)
0.57	Line	37.52	*	56.00	46.00	-18.48	(QP)
1.35	Line	38.21	*	56.00	46.00	-17.79	(QP)
2.50	Line	37.41	*	56.00	46.00	-18.59	(QP)
13.45	Line	37.62	*	60.00	50.00	-22.38	(QP)

Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz ◦ Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10K Hz,VBW=10KHz, Swp. Time =0.3 sec./MHz ◦
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 'Note'. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform ◦ In this case, a " * " marked in AVG Mode column of Interference Voltage Measured ◦
- (3) Measuring frequency range from 150KHz to 30MHz ◦

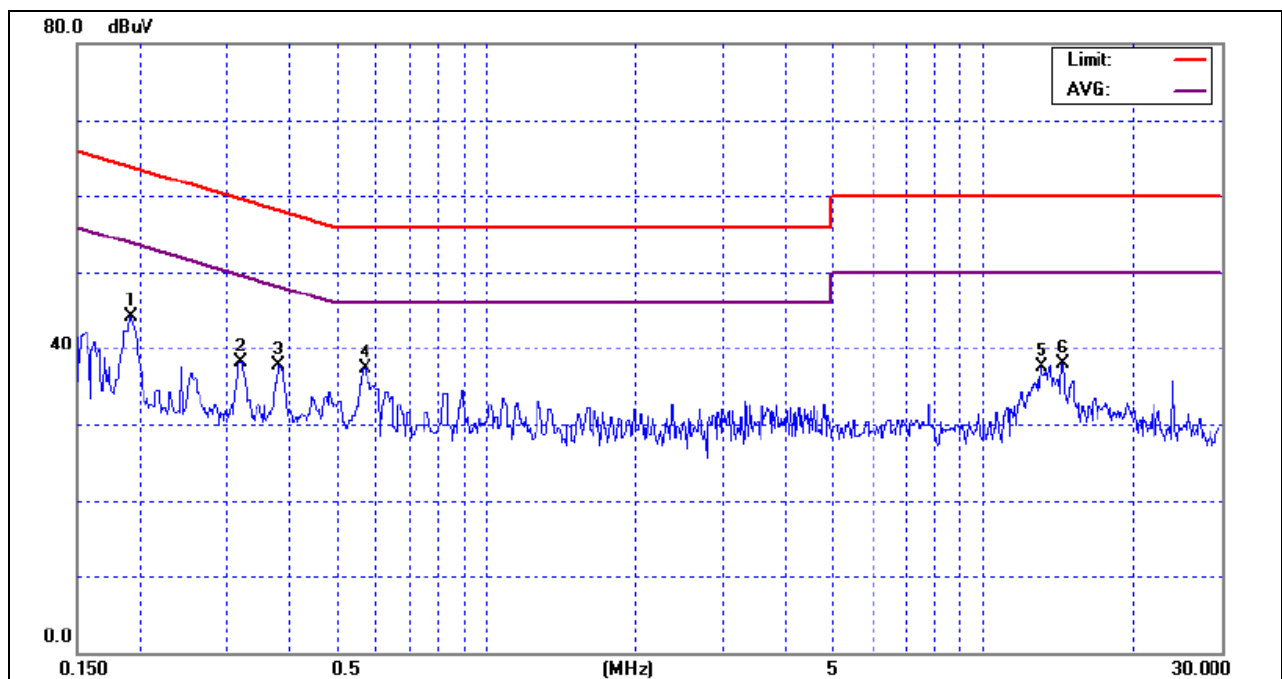


E.U.T :	2.4G Wireless Laser Mouse (Lotus)	Model Name :	PT-61L007
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1008 hPa	Test Voltage :	AC 230V/50Hz
Test Mode :	CH10		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.19	Neutral	44.10	*	63.95	53.95	-19.85	(QP)
0.32	Neutral	38.11	*	59.74	49.74	-21.63	(QP)
0.38	Neutral	37.77	*	58.26	48.26	-20.49	(QP)
0.57	Neutral	37.25	*	56.00	46.00	-18.75	(QP)
13.10	Neutral	37.50	*	60.00	50.00	-22.50	(QP)
14.45	Neutral	37.89	*	60.00	50.00	-22.11	(QP)

Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz ◦
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz,VBW=10KHz, Swp. Time =0.3 sec./MHz ◦
- (2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform ◦ In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured ◦
- (3) Measuring frequency range from 150KHz to 30MHz ◦



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

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

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

Note:

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

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

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

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15B.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

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

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3176	Apr. 11, 2009
2	Test Cable	N/A	10M_OS01	N/A	Oct. 10, 2008
3	Test Cable	N/A	OS01-1/-2	N/A	Oct. 10, 2008
4	Pre-Amplifier	Anritsu	MH648A(OS01)	M09961	Oct. 10, 2008
5	Test Receiver	MEB	SMV41	130	Jun. 21, 2008
6	Turn Table	Chance Most	CMTB-1.5	N/A	N/A
7	Spectrum Analyzer	ADVAN TEST	R3132	81700025	Mar. 21, 2009

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

4.2.3 TEST PROCEDURE

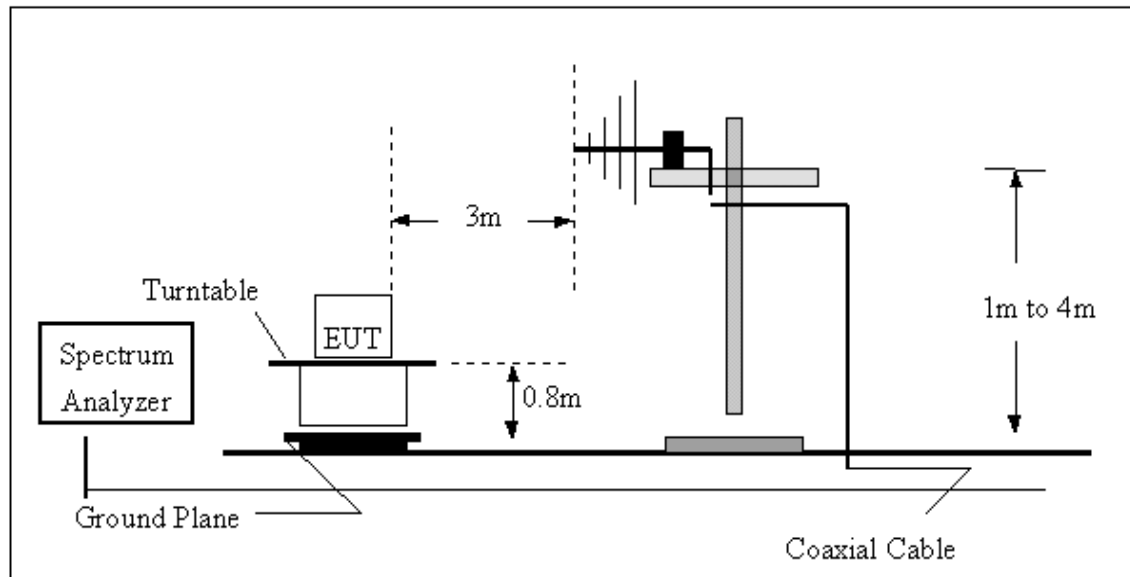
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated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

4.2.4 DEVIATION FROM TEST STANDARD

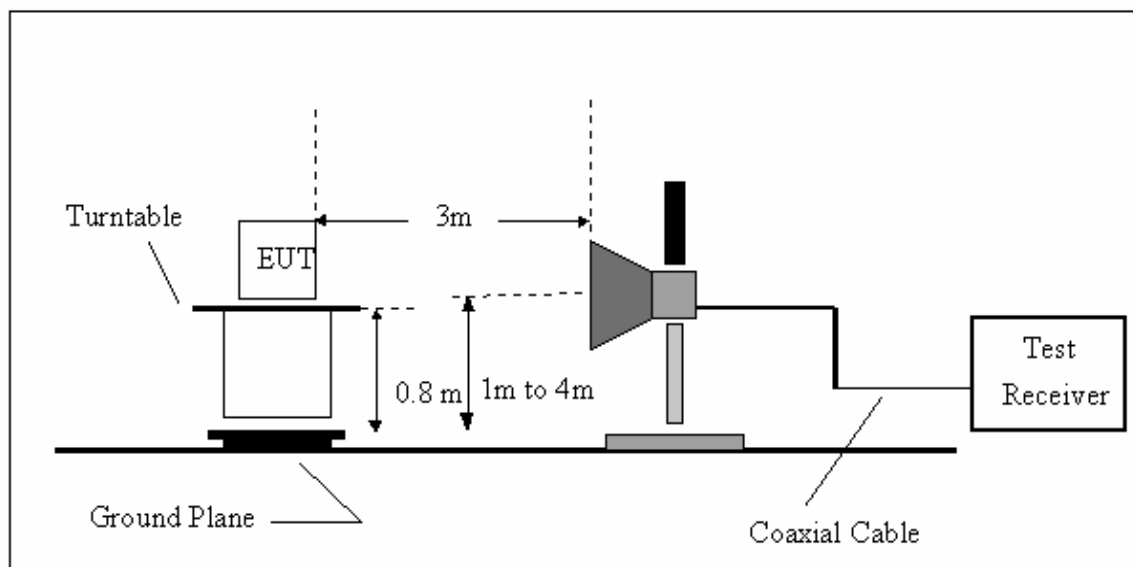
No deviation

4.2.5 TEST SETUP

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



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



4.2.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

4.2.7 TEST RESULTS (Between 30 – 1000 MHz)

EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24°C	Relative Humidity :	58%
Pressure :	1016hPa	Test Power :	DC 3V
Test Mode :	CH10		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
94.02	V	30.20	-12.31	17.89	43.50	- 25.61	
127.00	V	26.59	-9.42	17.17	43.50	- 26.33	
138.64	V	26.55	-8.38	18.17	43.50	- 25.33	
266.68	V	28.18	-8.79	19.39	46.00	- 26.61	
324.88	V	25.70	-6.99	18.71	46.00	- 27.29	
447.10	V	25.66	-3.92	21.74	46.00	- 24.26	

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.

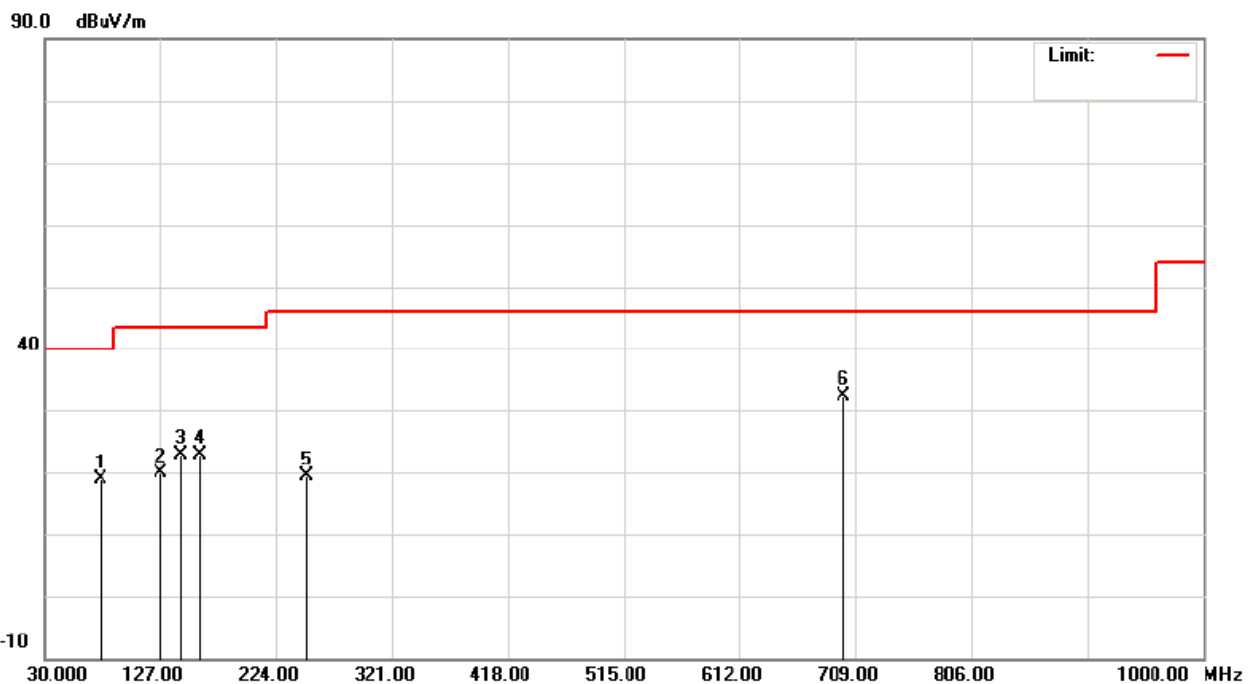


EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24°C	Relative Humidity :	58%
Pressure :	1016hPa	Test Power :	DC 3V
Test Mode :	CH10		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.56	H	31.53	-12.53	19.00	40.00	- 21.00	
127.00	H	29.40	-9.42	19.98	43.50	- 23.52	
144.46	H	30.82	-8.06	22.76	43.50	- 20.74	
159.98	H	30.71	-7.71	23.00	43.50	- 20.50	
249.22	H	28.71	-9.29	19.42	46.00	- 26.58	
699.30	H	31.22	1.19	32.41	46.00	- 13.59	

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.



4.2.8 TEST RESULTS (Above 1000 MHz)

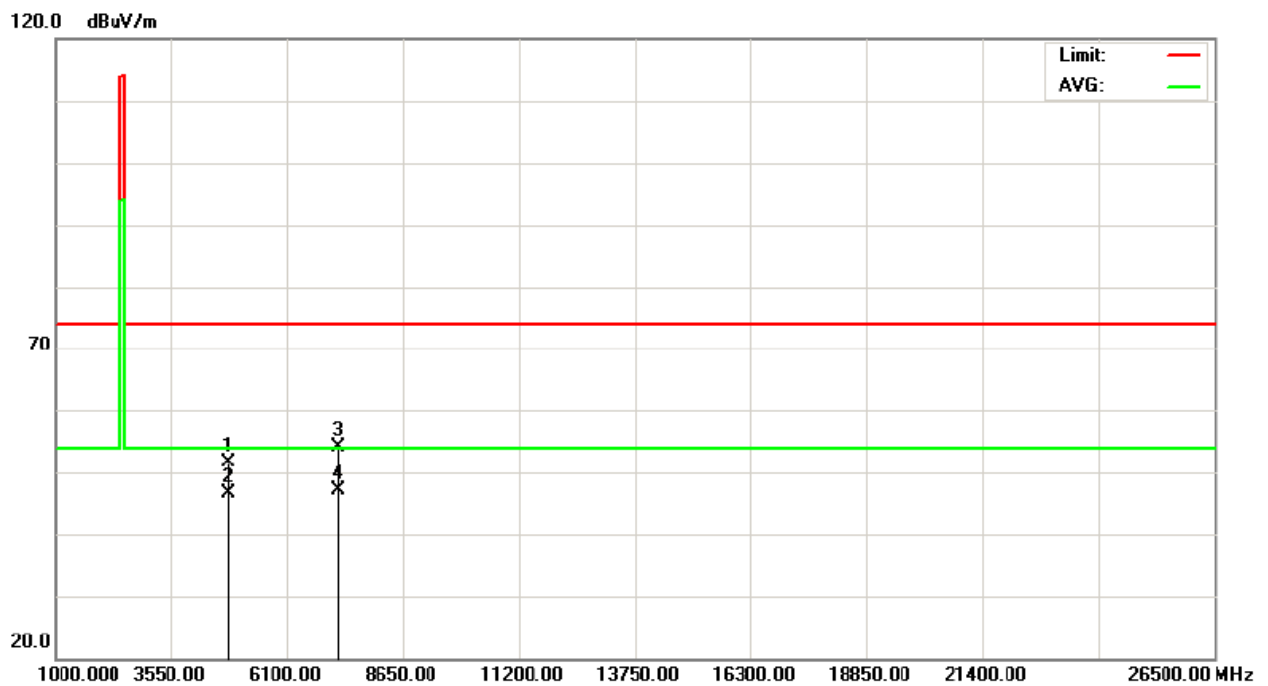
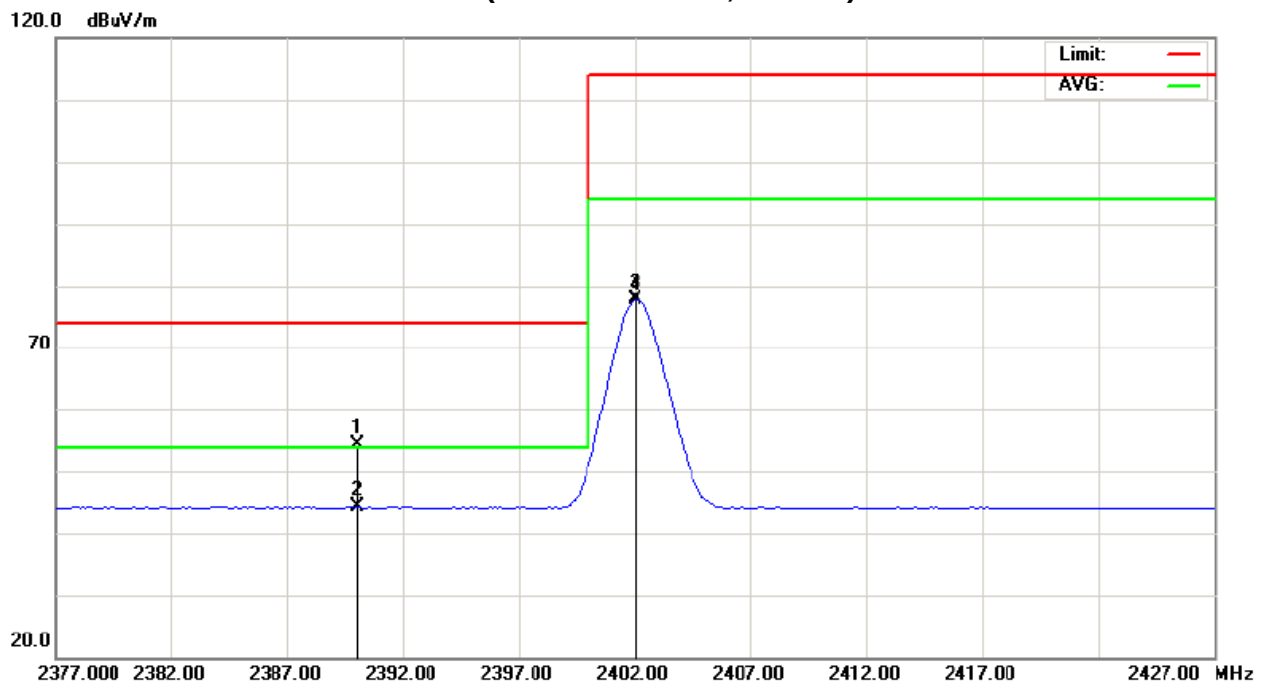
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	CH01		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	22.05	12.11	32.24	54.29	44.35	74.00	54.00	X/E
2402.10	V								X/F
4804.00	V	48.23	43.14	3.39	51.62	46.53	74.00	54.00	X/H
7205.92	V	45.14	38.25	8.92	54.06	47.17	74.00	54.00	X/H

Remark :

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

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



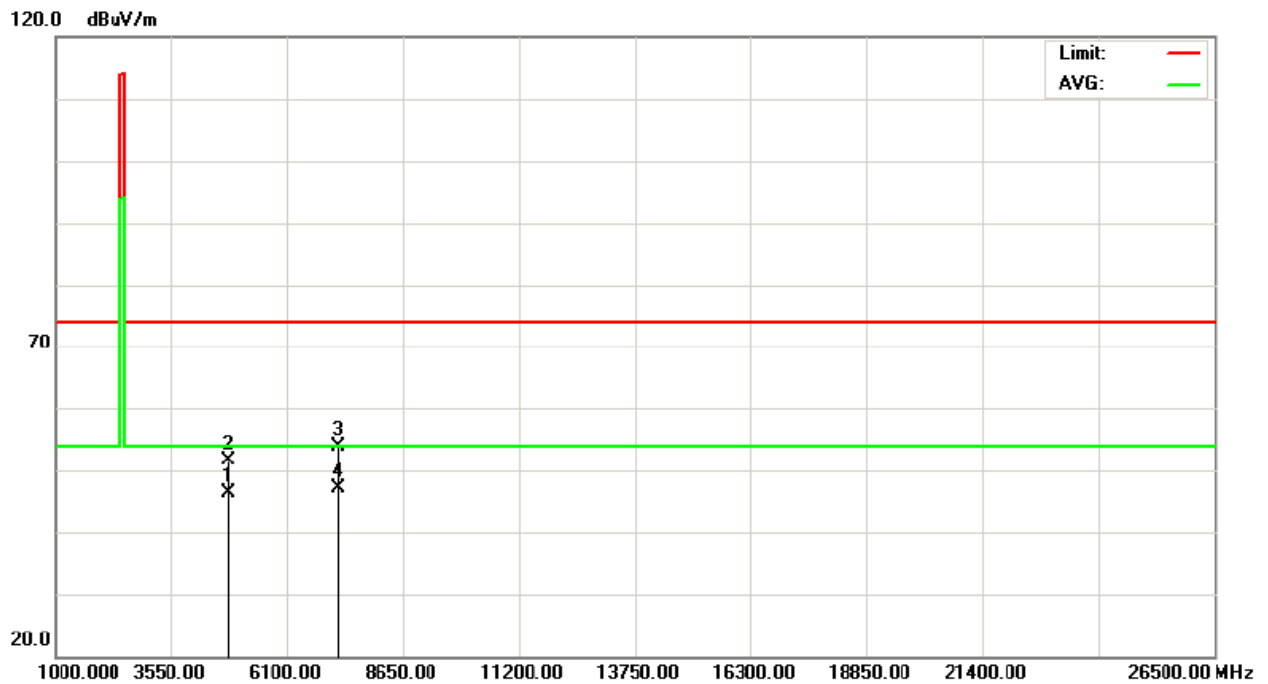
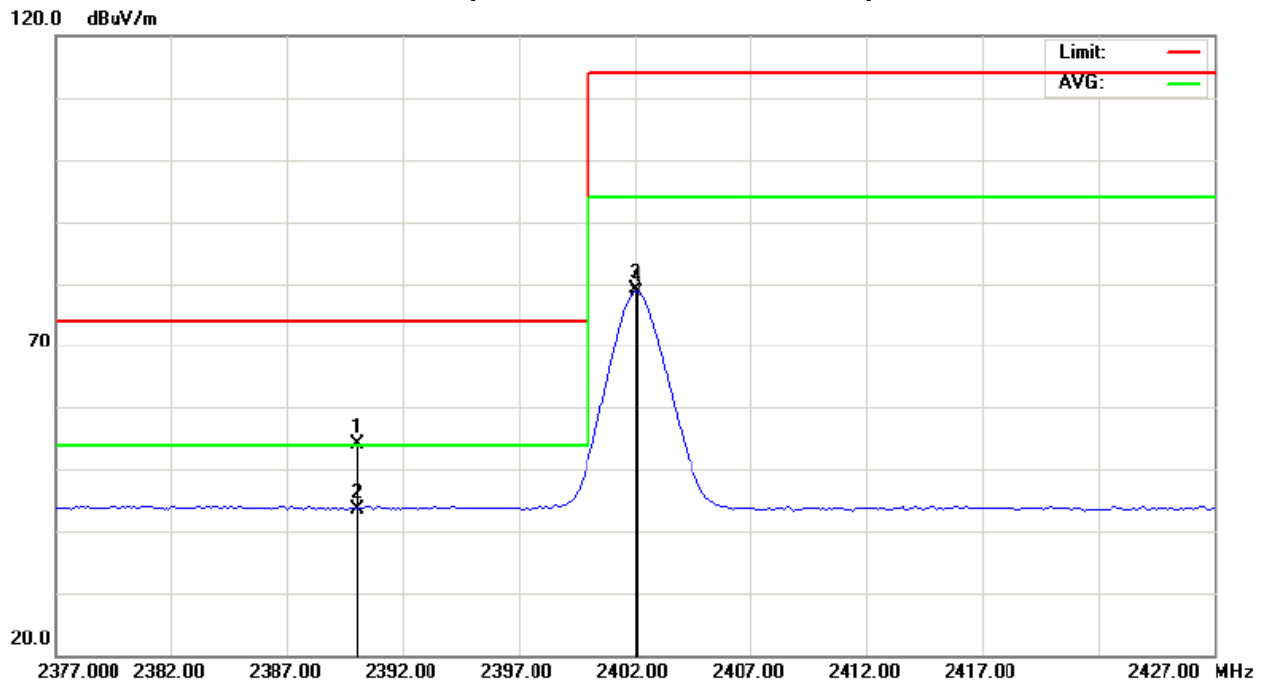
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	CH01		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	22.01	11.50	32.24	54.25	43.74	74.00	54.00	X/E
2402.00	H								X/F
4804.20	H	48.14	43.00	3.39	51.53	46.39	74.00	54.00	X/H
7206.04	H	44.97	38.22	8.92	53.89	47.14	74.00	54.00	X/H

Remark :

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

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



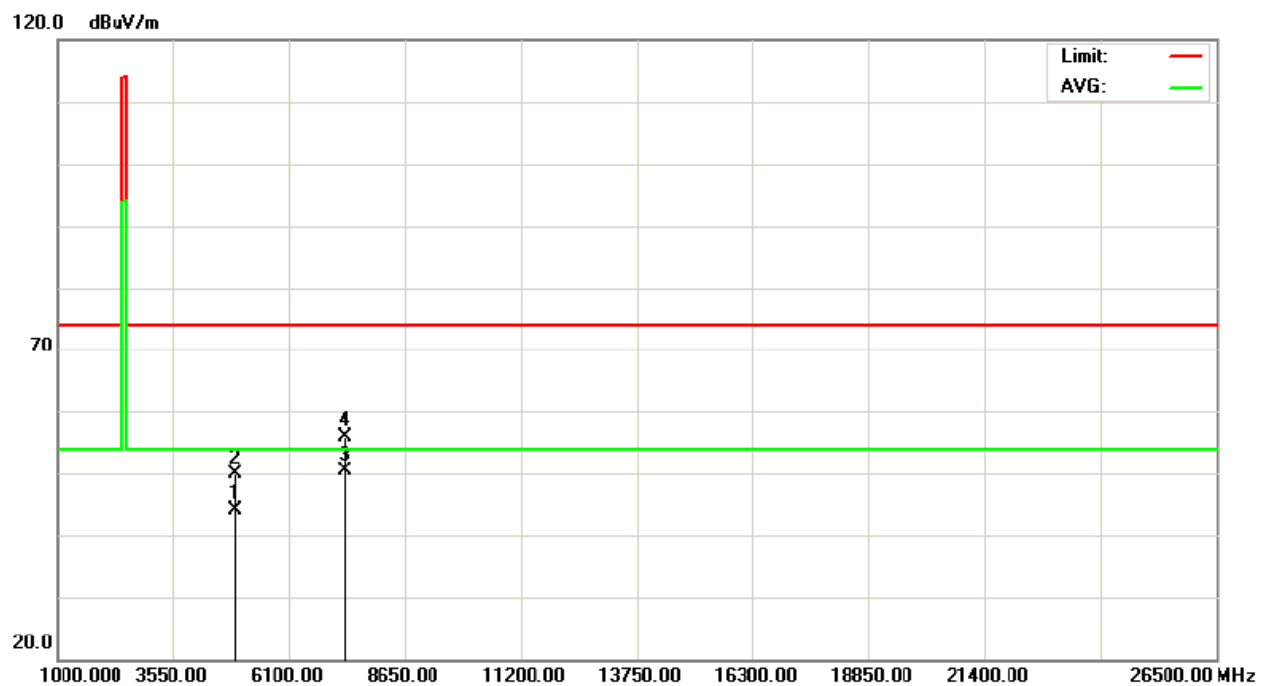
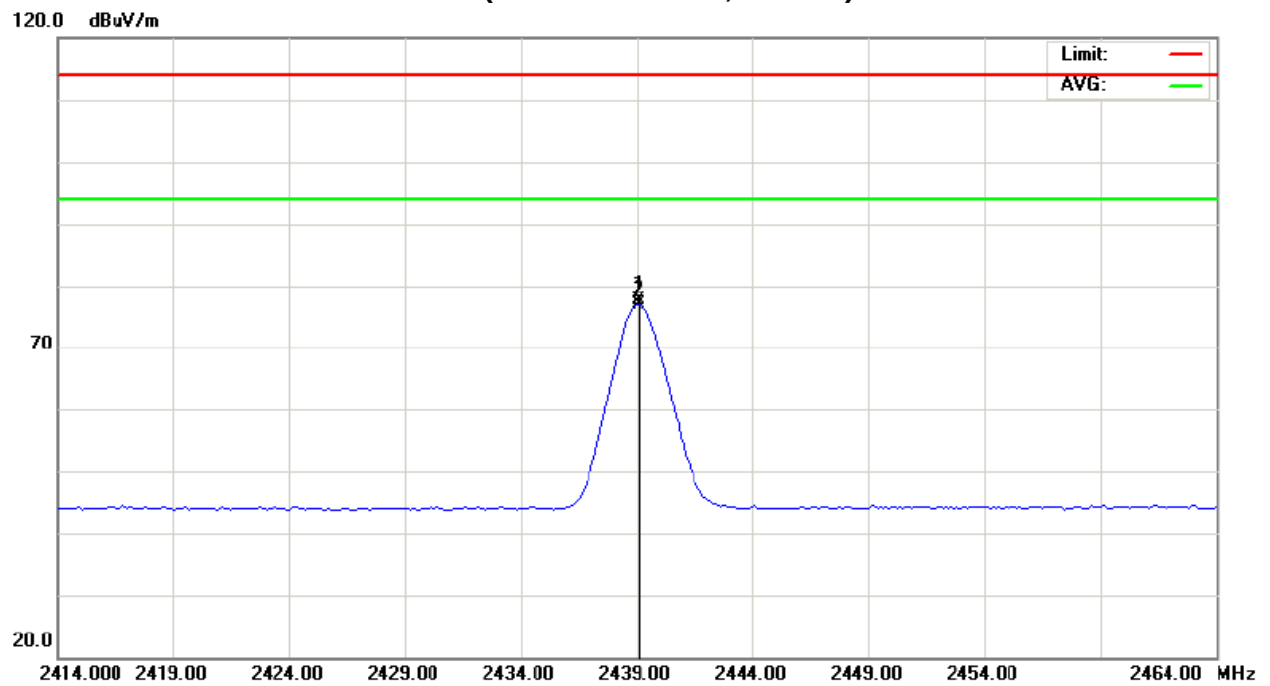
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	CH10		

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)	
2439.10	V								X/F
4878.64	V	46.23	40.56	3.68	49.91	44.24	74.00	54.00	X/H
7317.28	V	46.63	41.13	9.18	55.81	50.31	74.00	54.00	X/H

Remark :

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

Orthogonal Axes : X
CH10(Above 1000 MHz, Vertical)



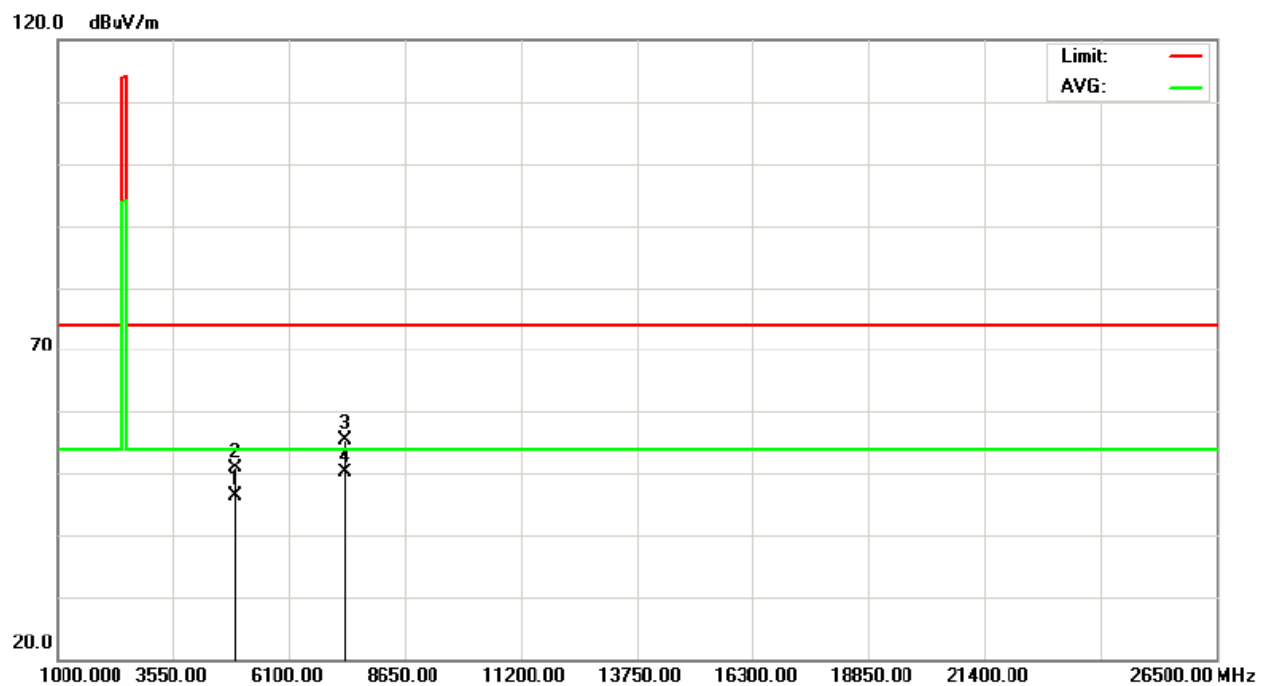
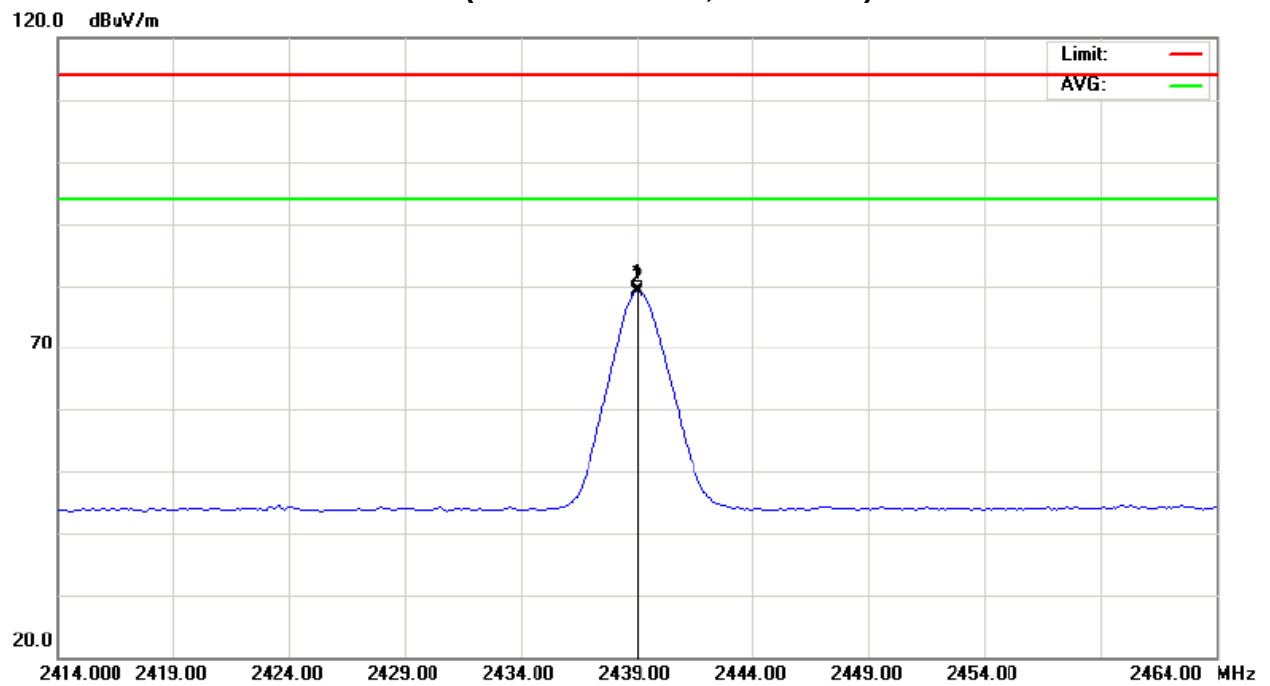
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	CH10		

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)	
2439.10	H								X/F
4878.14	H	47.28	42.67	3.68	50.96	46.35	74.00	54.00	X/H
7317.04	H	46.24	41.06	9.18	55.42	50.24	74.00	54.00	X/H

Remark :

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

Orthogonal Axes : X
CH10(Above 1000 MHz, Horizontal)



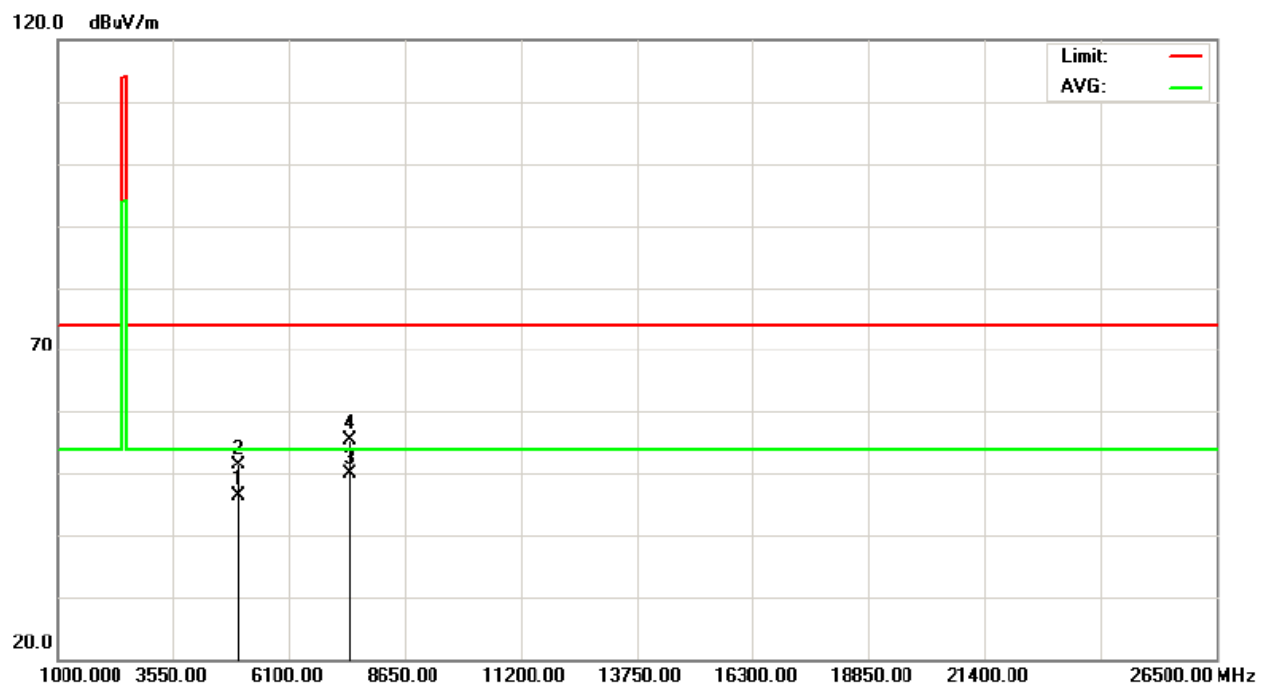
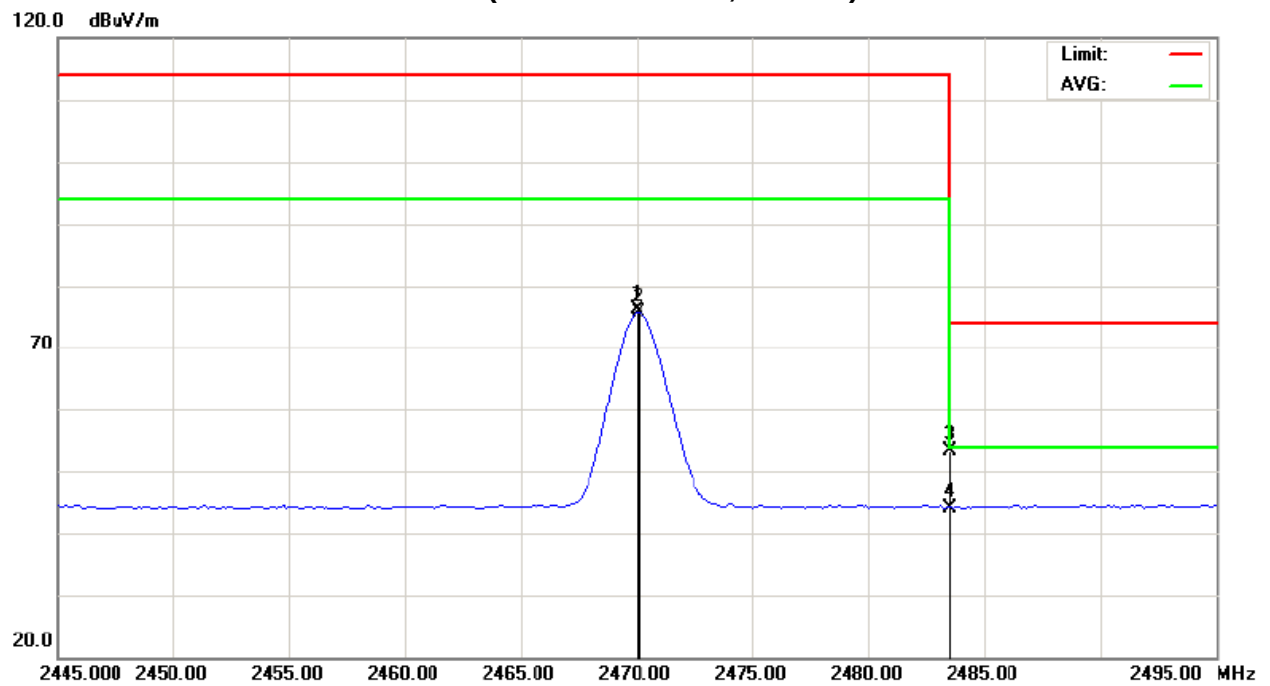
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	CH03		

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)	
2470.00	V								X/F
2483.50	V	20.88	11.66	32.59	53.47	44.25	74.00	54.00	X/E
4940.14	V	47.43	42.53	3.93	51.36	46.46	74.00	54.00	X/H
7410.12	V	45.98	40.46	3.39	49.37	43.85	74.00	54.00	X/H

Remark :

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

Orthogonal Axes : X
CH03 (Above 1000 MHz, Vertical)



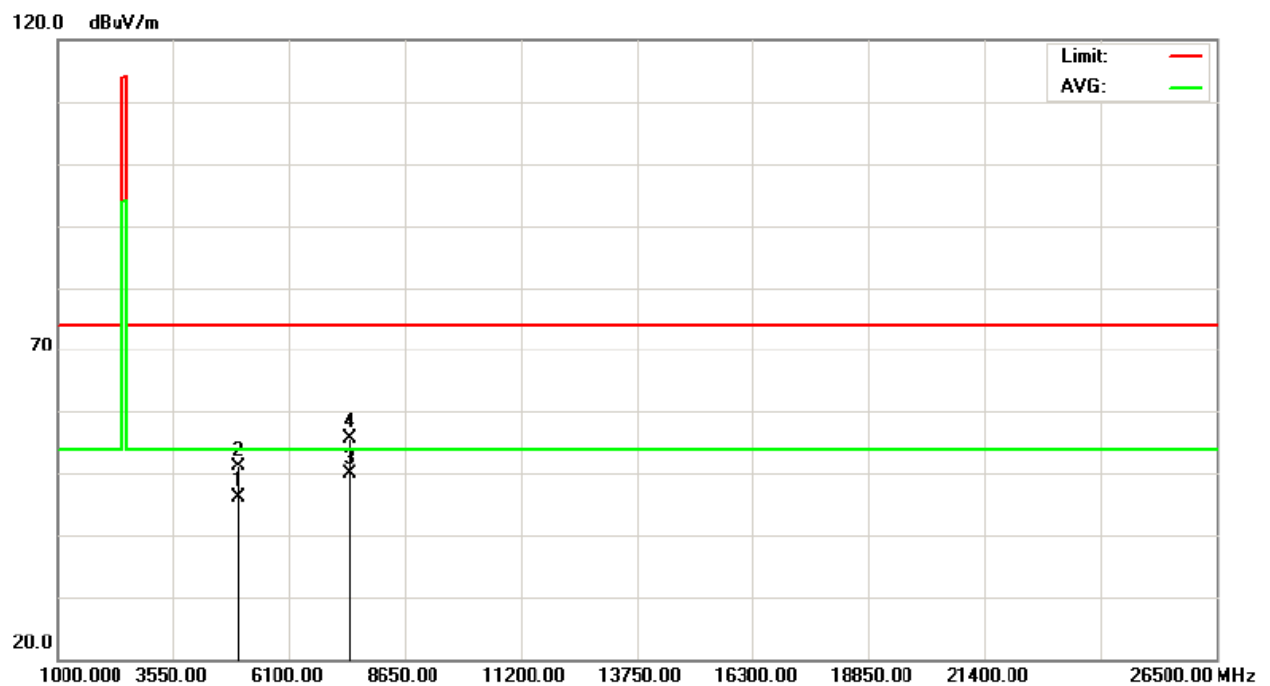
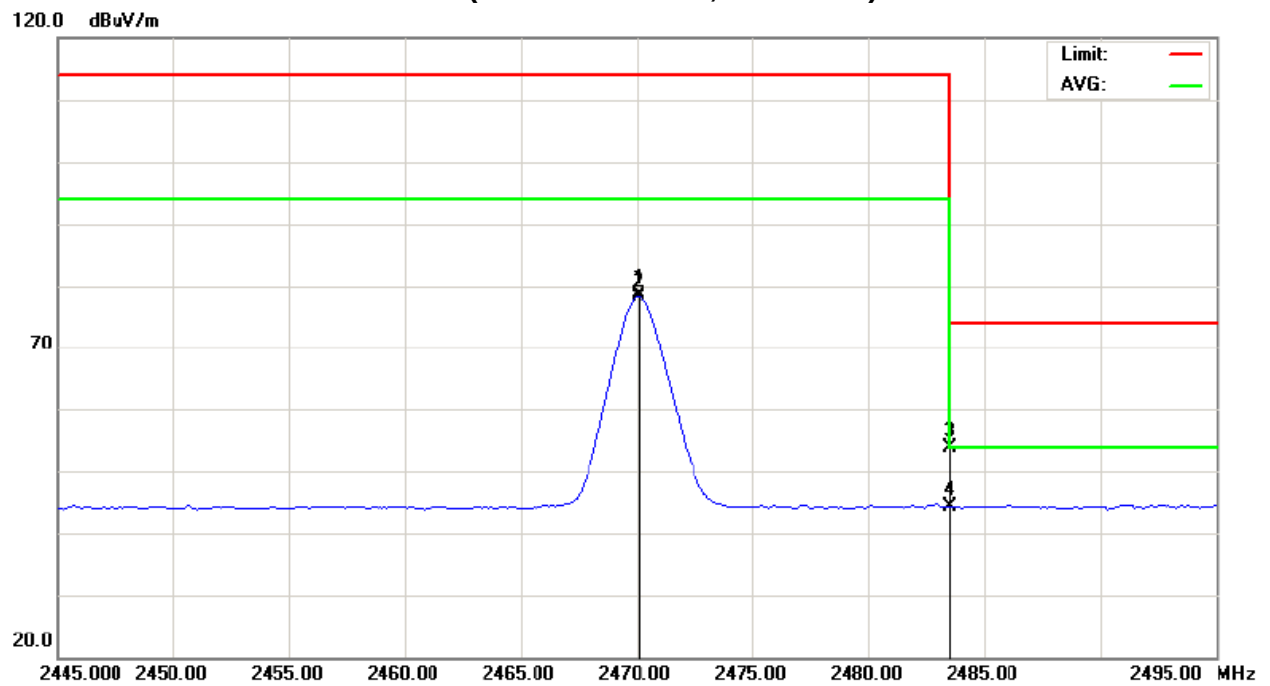
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	CH03		

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)	
2470.10	H								X/F
2483.50	H	21.36	11.90	32.59	53.95	44.49	74.00	54.00	X/E
4940.22	H	47.20	42.31	3.93	51.13	46.24	74.00	54.00	X/H
7410.16	H	46.15	40.46	9.39	55.54	49.85	74.00	54.00	X/H

Remark :

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

Orthogonal Axes : X
CH03 (Above 1000 MHz, Horizontal)



4.2.9 TEST RESULTS (2400 – 2483.5 MHz)

EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	TX CH01/CH10/CH03		

Freq. (MHz)	Ant.Pol. (H/V)	Reading		Ant./CF CF(dB)	Actual FS		Limit3m		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2402.00	V	45.67	45.43	32.28	77.95	77.71	114.00	94.00	CH01
2402.00	H	46.83	46.28	32.28	79.11	78.56	114.00	94.00	CH01
2439.10	V	45.16	44.46	32.42	77.58	76.88	114.00	94.00	CH10
2439.00	H	47.08	46.58	32.42	79.50	79.00	114.00	94.00	CH10
2470.00	V	46.31	43.03	32.54	78.85	75.57	114.00	94.00	CH03
2470.10	H	46.05	45.51	32.54	78.59	78.05	114.00	94.00	CH03

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (3) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) EUT Orthogonal Axes :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand

4.2.10 TEST RESULTS (Restricted Bands Requirements)

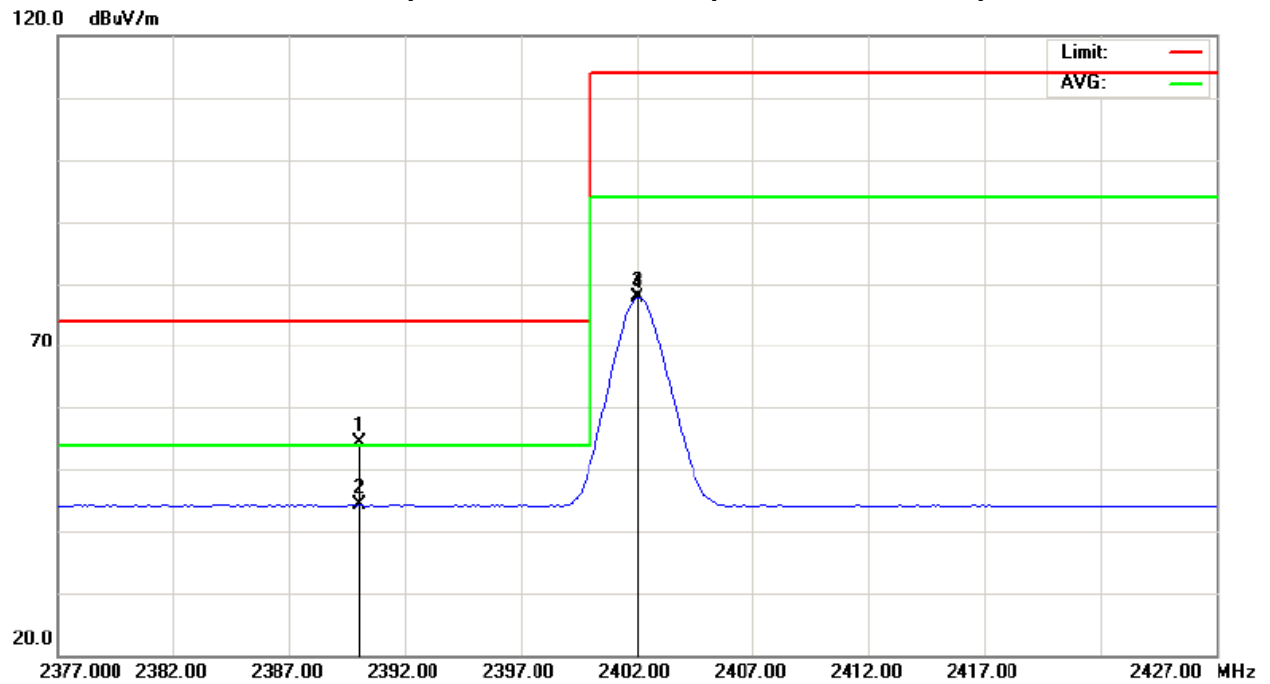
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	TX CH01/CH03(Vertical)		
Note :	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (CH01). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was configured with the worst case antenna and setup to transmit at the highest channel (CH03). Then the field strength was measured at 2483.5-2500 MHz. 3. The band edge emission plot on the following page 34 shows 41.66dB delta between carrier maximum power and local maximum emission in 2400MHz. The emission of carrier strength list in the test result of channel 1 at the item 4.1. is 83.31dBuV/m(Peak) and 82.21dBuV/m(AV), so the maximum field strength in 2400MHz is 83.31-41.66=41.65dBuV/m which is under 74 dBuV/m limit, and 82.21-41.66=40.55dBuV/m which is under 54 dBuV/m limit		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	22.05	12.11	32.24	54.29	44.35	74.00	54.00	CH01
2483.50	V	20.88	11.66	32.59	53.47	44.25	74.00	54.00	CH03

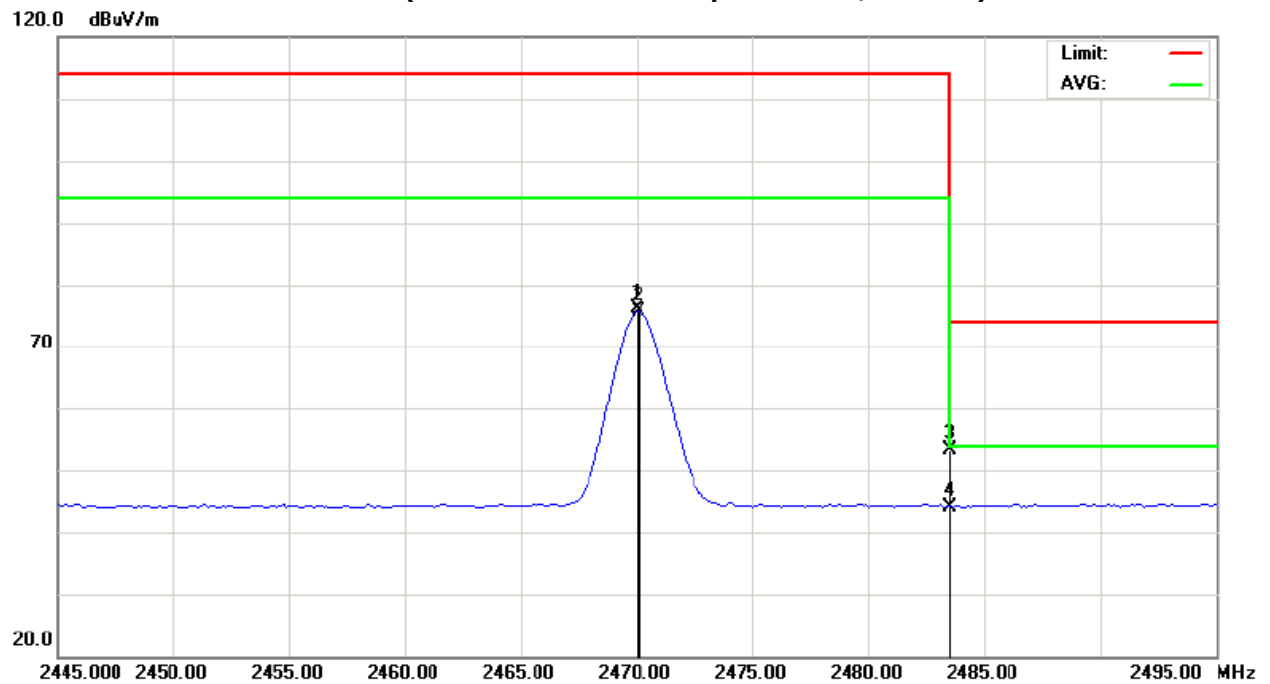
Remark :

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission °
- (2) EUT Orthogonal Axes :
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

TX CH01 (Restricted Bands Requirements, Vertical)



TX CH03 (Restricted Bands Requirements, Vertical)



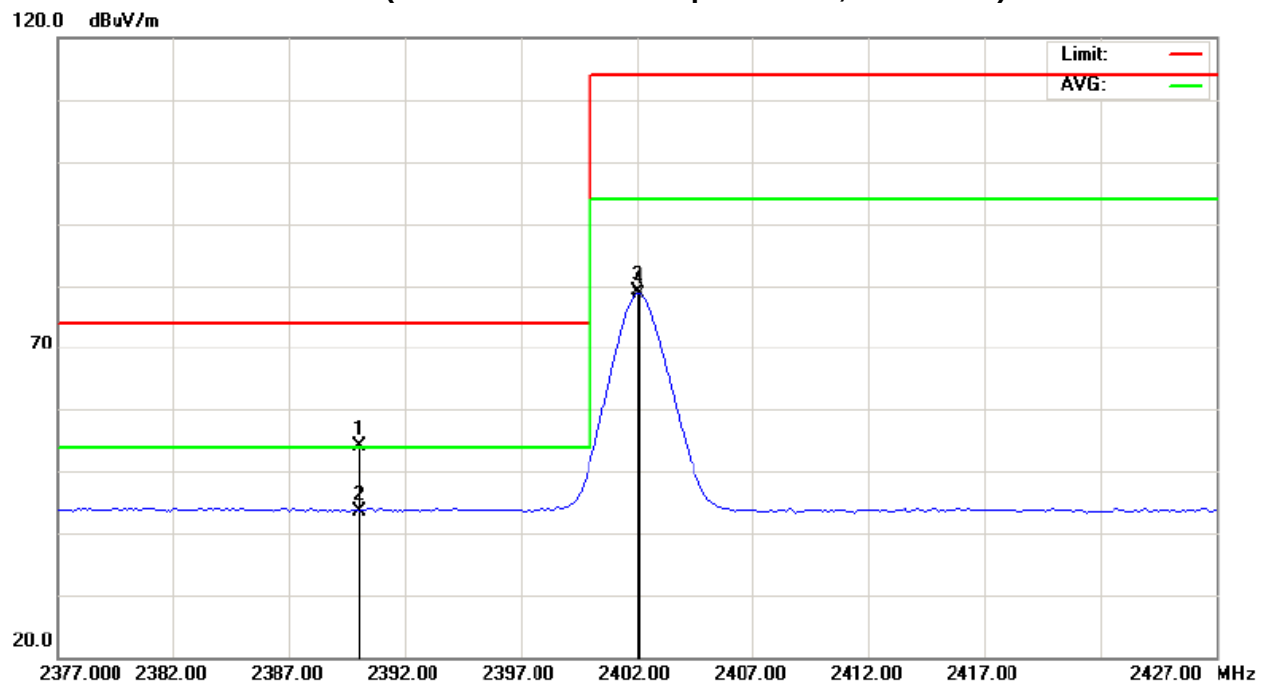
EUT :	2.4G Wireless Laser Mouse (Lotus)	Model No. :	PT-61L007
Temperature :	24 °C	Relative Humidity :	58 %
Pressure :	1016 hPa	Test Power :	DC 3V
Test Mode :	TX CH01/CH03 (Horizontal)		
Note :	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (CH01). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was configured with the worst case antenna and setup to transmit at the highest channel (CH03). Then the field strength was measured at 2483.5-2500 MHz. 3. The band edge emission plot on the following page 34 shows 42.11dB delta between carrier maximum power and local maximum emission in 2400MHz. The emission of carrier strength list in the test result of channel 1 at the item 4.1. is 87.54dBuV/m(Peak) and 86.43dBuV/m(AV), so the maximum field strength in 2400MHz is 87.54-42.11=45.43dBuV/m which is under 74 dBuV/m limit, and 86.53-42.11=44.42dBuV/m which is under 54 dBuV/m limit		

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	22.01	11.50	32.24	54.25	43.74	74.00	54.00	CH01
2483.50	H	21.36	11.90	32.59	53.95	44.49	74.00	54.00	CH03

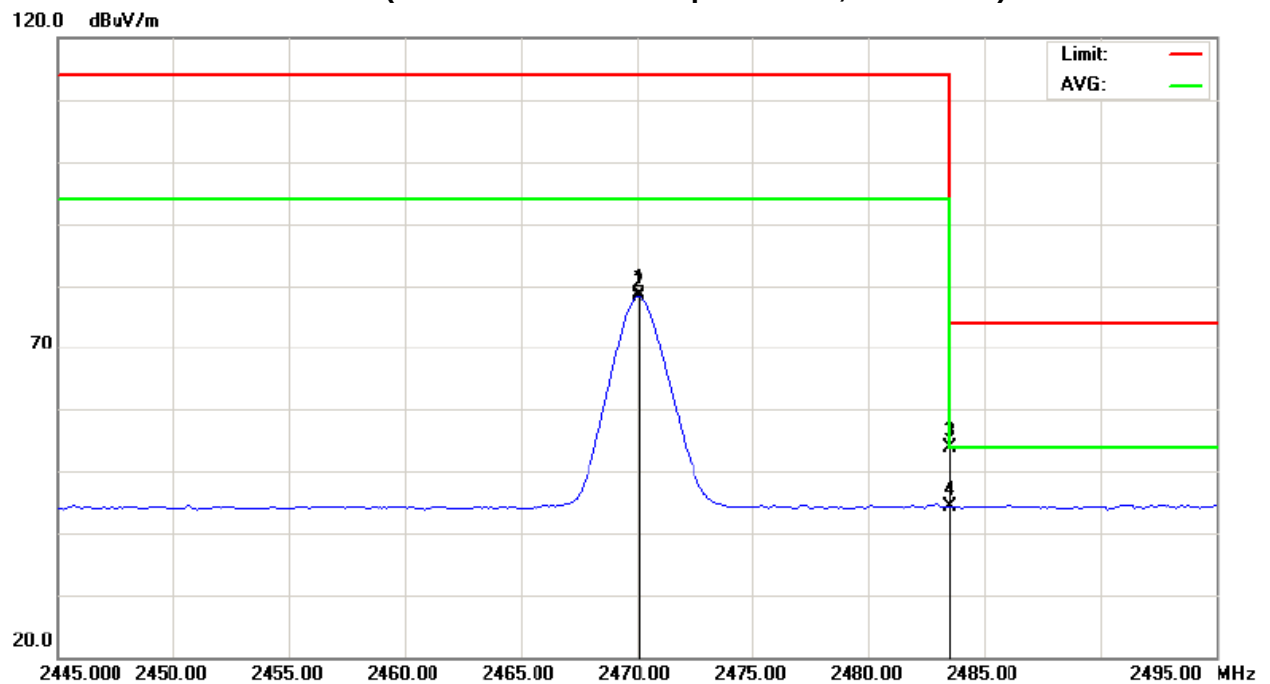
Remark :

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (2) EUT Orthogonal Axes :
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

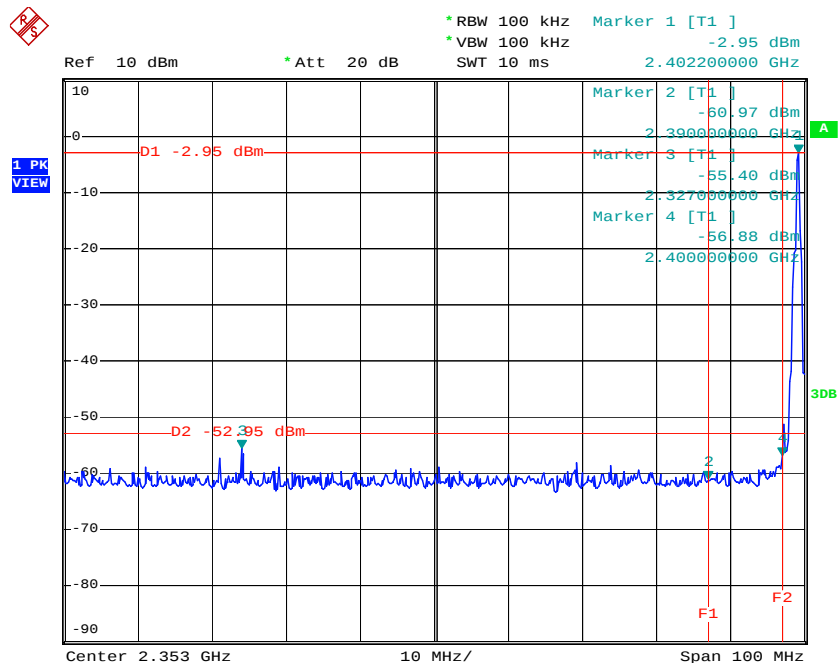
TX CH01 (Restricted Bands Requirements, Horizontal)



TX CH03 (Restricted Bands Requirements, Horizontal)

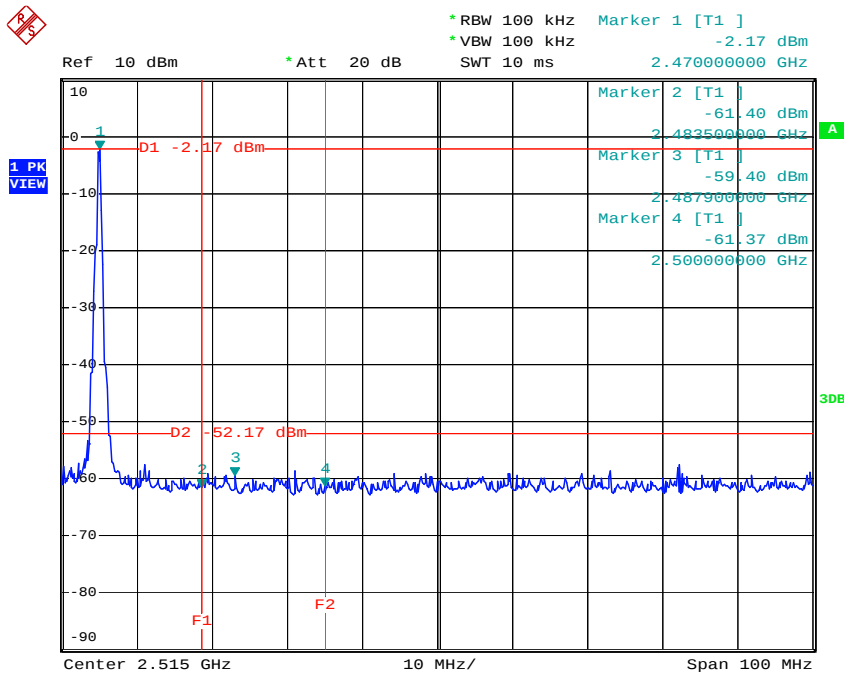


TX CH01 –Average-Lower



Date: 11.MAY.2008 11:54:38

TX CH03 –Average-Highest



Date: 11.MAY.2008 12:00:08

5. EUT TEST PHOTO

Conducted Measurement Photos



Radiated Measurement Photos

