

TEST REPORT

FCC ID:YHAJ177

Product: Optical Wireless Mouse

Model No.: J177

Additional Model: MS179,W6200,W6300,W150,W6100,W6500

Trade Mark: N/A

Report No.: TCT160712E030

Issued Date: Jul. 20, 2016

Issued for:

LITTLE WING TECHNOLOGIES CORP.

**3F-1, No. 36, Lane 118, Yi-An Road, Zhonghe District, New Taipei City,
Taiwan, R.O.C**

Issued By:

Shenzhen Tongce Testing Lab.

1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

TEL: +86-755-27673339

FAX: +86-755-27673332

Note: This report shall not be reproduced except in full, without the written approval of Shenzhen Tongce Testing Lab.

This document may be altered or revised by Shenzhen Tongce Testing Lab. personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

TABLE OF CONTENTS

1. Test Certification.....	3
2. Test Result Summary	4
3. EUT Description	5
4. Genera Information.....	7
4.1. Test Environment and Mode.....	7
4.2. Description of Support Units.....	7
5. Facilities and Accreditations	8
5.1. Facilities	8
5.2. Location	8
5.3. Measurement Uncertainty.....	8
6. Test Results and Measurement Data	9
6.1. Antenna Requirement	9
6.2. Conducted Emission.....	10
6.3. Radiated Emission Measurement	11
6.4. 20dB Occupied Bandwidth	19
Appendix A: Photographs of Test Setup	
Appendix B: Photographs of EUT	

1. Test Certification

Product:	Optical Wireless Mouse
Model No.:	J177
Additional Model:	MS179,W6200,W6300,W150,W6100,W6500
Applicant:	LITTLE WING TECHNOLOGIES CORP.
Address:	3F-1, No. 36, Lane 118, Yi-An Road, Zhonghe District, New Taipei City, Taiwan, R.O.C
Manufacturer:	GUANGZHOU BODA ELECTRONIC EQUIPMENT CO.,LTD
Address:	4 Xiajiyuanyi Road, Xindun Avenue, Xindun Village, Xintang District, GZ,PRC
Date of Test:	Jul. 12 – Jul. 20, 2016
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

SKY Luo

SKY Luo

Date:

Jul. 20, 2016

Reviewed By:

Joe Zhou

Joe Zhou

Date:

Jul. 20, 2016

Approved By:

Tomsin

Tomsin

Date:

Jul. 20, 2016

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	N/A
Field Strength of Fundamental	§15.249 (a)	PASS
Spurious Emissions	§2.1053 §15.249 (a) (d)/ §15.209	PASS
Band Edge	§2.1053 §15.249 (d)/ §15.205	PASS
20dB Occupied Bandwidth	§2.1049 §15.215 (c)	PASS

Note:

1. Pass: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product Name:	Optical Wireless Mouse
Model :	J177
Additional Model:	MS179,W6200,W6300,W150,W6100,W6500
Trade Mark:	N/A
Operation Frequency:	2402-2480MHz
Channel Separation:	2MHz
Number of Channel:	40
Modulation Technology:	GFSK
Antenna Type:	PCB print antenna
Antenna Gain:	1.76dBi
Power Supply:	DC 3V(AA Battery * 2)
Remark:	All models above are identical in interior structure, electrical circuits and components, and just model names are different for the marketing requirement.

Operation Frequency Each of Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402 MHz	13	2428 MHz	26	2454 MHz	39	2480 MHz
1	2404 MHz	14	2430 MHz	27	2456 MHz		
2	2406 MHz	15	2432 MHz	28	2458 MHz		
3	2408 MHz	16	2434 MHz	29	2460 MHz		
4	2410 MHz	17	2436 MHz	30	2462 MHz		
5	2412 MHz	18	2438 MHz	31	2464 MHz		
6	2414 MHz	19	2440 MHz	32	2466 MHz		
7	2416 MHz	20	2442 MHz	33	2468 MHz		
8	2418 MHz	21	2444 MHz	34	2470 MHz		
9	2420 MHz	22	2446 MHz	35	2472 MHz		
10	2422 MHz	23	2448 MHz	36	2474 MHz		
11	2424 MHz	24	2450 MHz	37	2476 MHz		
12	2426 MHz	25	2452 MHz	38	2478 MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2440MHz
The Highest channel	2480MHz

4. Genera Information

4.1. Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel
<p>The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.</p>	

4.2. 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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 572331

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- CNAS - Registration No.: CNAS L6165

Shenzhen TCT Testing Technology Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6165.

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

Tel: 86-755-36638142

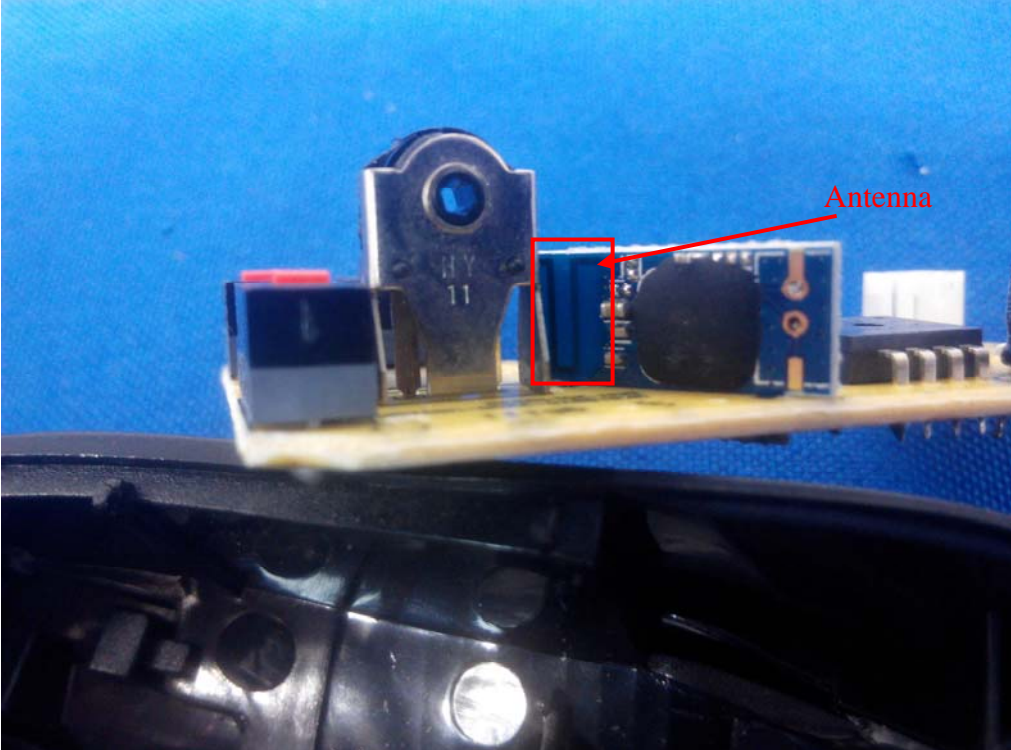
5.3. Measurement Uncertainty

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 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1GHz)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1GHz)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^{\circ}\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<p>15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p> <p>15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</p>	
E.U.T Antenna:	
<p>The EUT antenna is an internal PCB antenna which permanently attached, and the best case gain of the antenna is 1.76dBi.</p>	
	

6.2. Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<div><p>Reference Plane</p><p>40cm 80cm</p><p>LISN</p><p>AUX Equipment</p><p>E.U.T</p><p>Test table/Insulation plane</p><p>LISN</p><p>Filter</p><p>AC power</p><p>EMI Receiver</p><p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>														
Test Mode:	Transmitting mode with modulation														
Test Procedure:	<ol style="list-style-type: none">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement.														
Test Result:	The EUT is powered by DC 3V from 2*AA battery, so this test item is not applicable.														

6.3. Radiated Emission Measurement

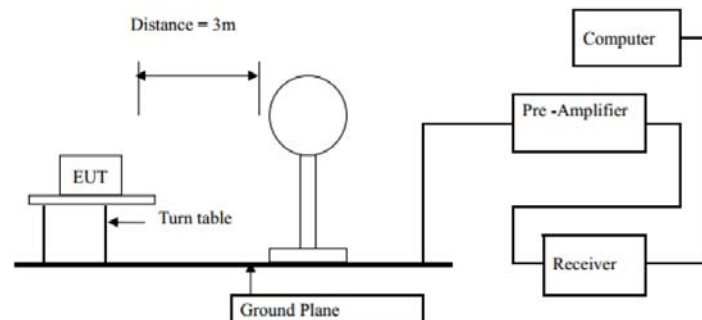
6.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209/ Part 2 J Section 2.1053				
Test Method:	ANSI C63.4: 2014 and ANSI C63.10:2013				
Frequency Range:	9 kHz to 25 GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit(Field strength of the fundamental signal):	Frequency		Limit (dBuV/m @3m)		Remark
	2400MHz-2483.5MHz		94.00		Average Value
			114.00		Peak Value
Limit(Spurious Emissions):	Frequency		Limit (dBuV/m @3m)		Remark
	0.009-0.490		2400/F(KHz)		Quasi-peak Value
	0.490-1.705		24000/F(KHz)		Quasi-peak Value
	1.705-30		30		Quasi-peak Value
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
	Above 1GHz		54.0		Average Value
74.0			Peak Value		
Limit (band edge) :	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 to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
Test Procedure:	<div>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber in below 1GHz, 1.5m above the ground in above 1GHz. The table was rotated 360 degrees to determine the position of the highest radiation.</div> <div>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</div> <div>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</div>				

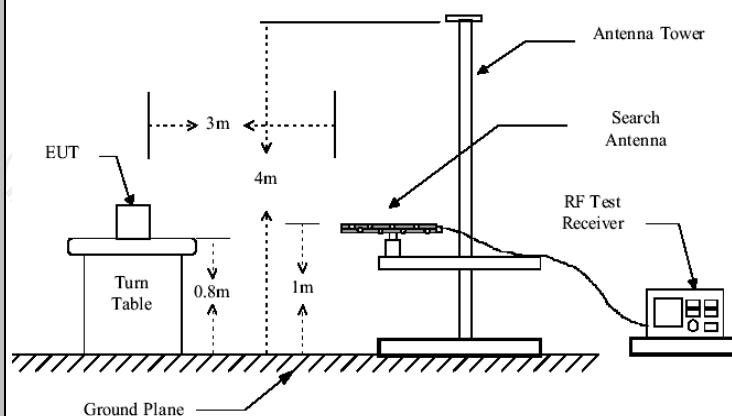
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test setup:

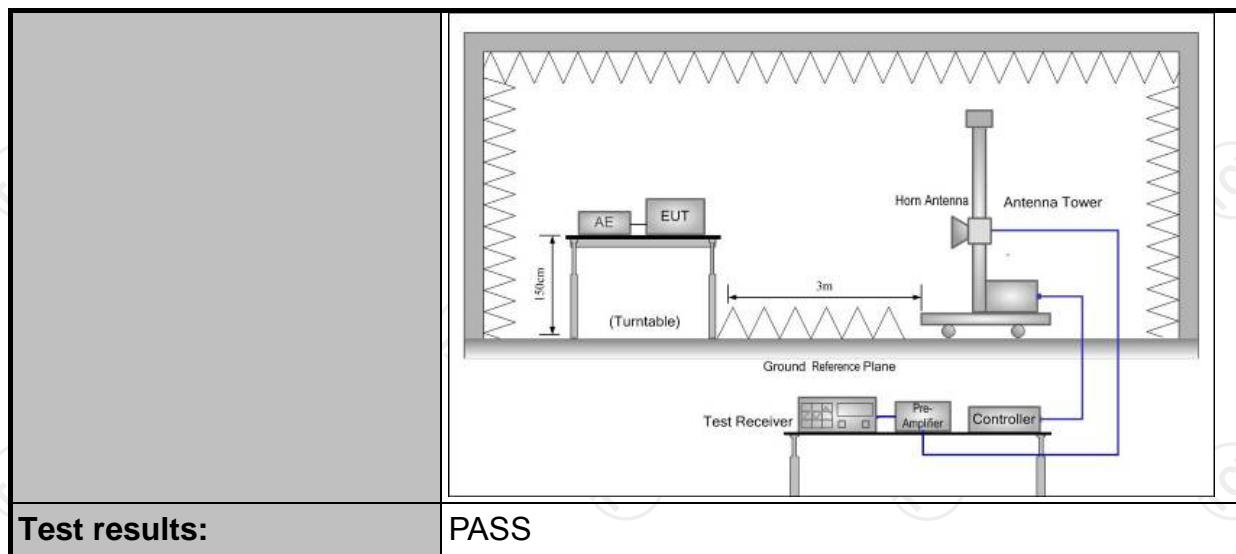
For radiated emissions below 30MHz



30MHz to 1GHz



Above 1GHz



Test results:

PASS

6.3.2. Test Instruments

ESPI Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Sep. 11, 2016
Spectrum Analyzer	ROHDE&SCHW ARZ	FSEM	848597/001	Sep. 11, 2016
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 12, 2016
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 11, 2016
Pre-amplifier	HP	8447D	2727A05017	Sep. 11, 2016
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 13, 2016
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 13, 2016
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 13, 2016
Horn Antenna	Schwarzbeck	BBHA 9170	373	Sep. 13, 2016
Coax cable	TCT	RE-low-01	N/A	Sep. 11, 2016
Coax cable	TCT	RE-high-02	N/A	Sep. 11, 2016
Coax cable	TCT	RE-low-03	N/A	Sep. 11, 2016
Coax cable	TCT	RE-high-04	N/A	Sep. 11, 2016
Antenna Mast	CCS	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.3.3. Test Data

Field Strength of Fundamental

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horizontal /Vertical	Limits PK/AV (dBuV/m)	Margin (dB)
2402	86.66(PK)	H	114/94	-27.34
2402	82.34(AV)	H	114/94	-11.66
2440	85.76(PK)	H	114/94	-28.24
2440	81.49(AV)	H	114/94	-12.51
2480	84.91(PK)	H	114/94	-29.09
2480	80.95(AV)	H	114/94	-13.05
2402	85.95(PK)	V	114/94	-28.05
2402	81.76(AV)	V	114/94	-12.24
2440	85.35(PK)	V	114/94	-28.65
2440	81.26(AV)	V	114/94	-12.74
2480	85.03(PK)	V	114/94	-28.97
2480	81.15(AV)	V	114/94	-12.85

Spurious Emissions

Frequency Range (9 kHz-30MHz)

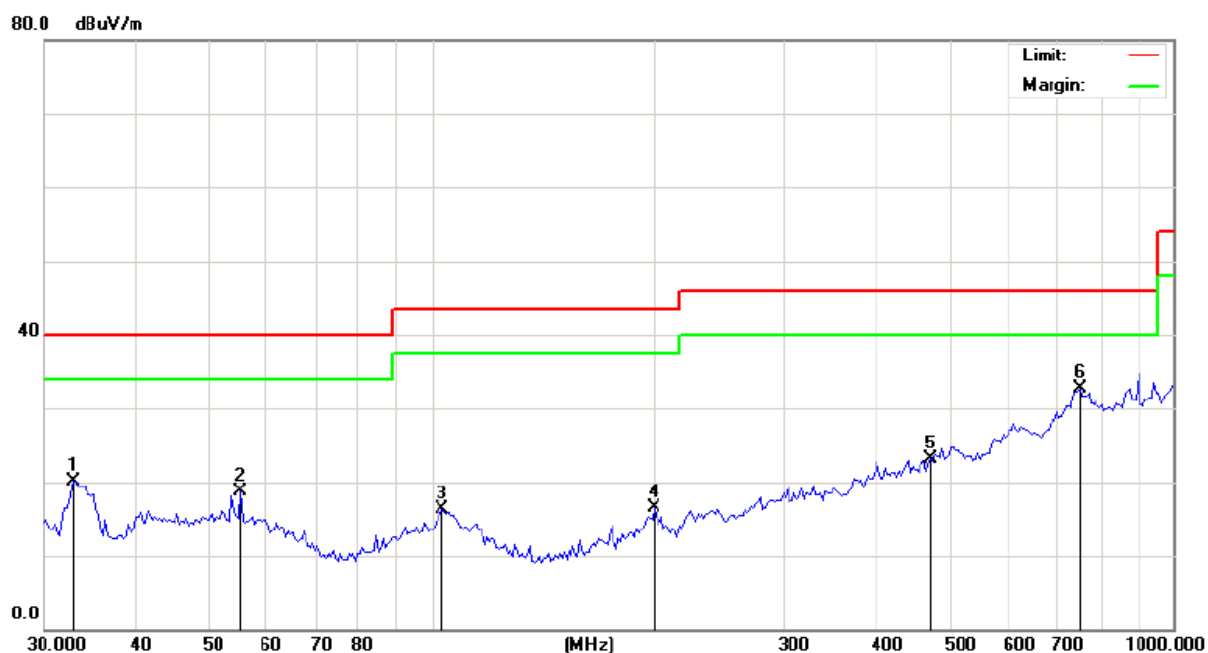
Frequency (MHz)	Level@3m (dBuV/m)	Limit@3m (dBuV/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

Frequency Range (30MHz-1GHz)

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 25

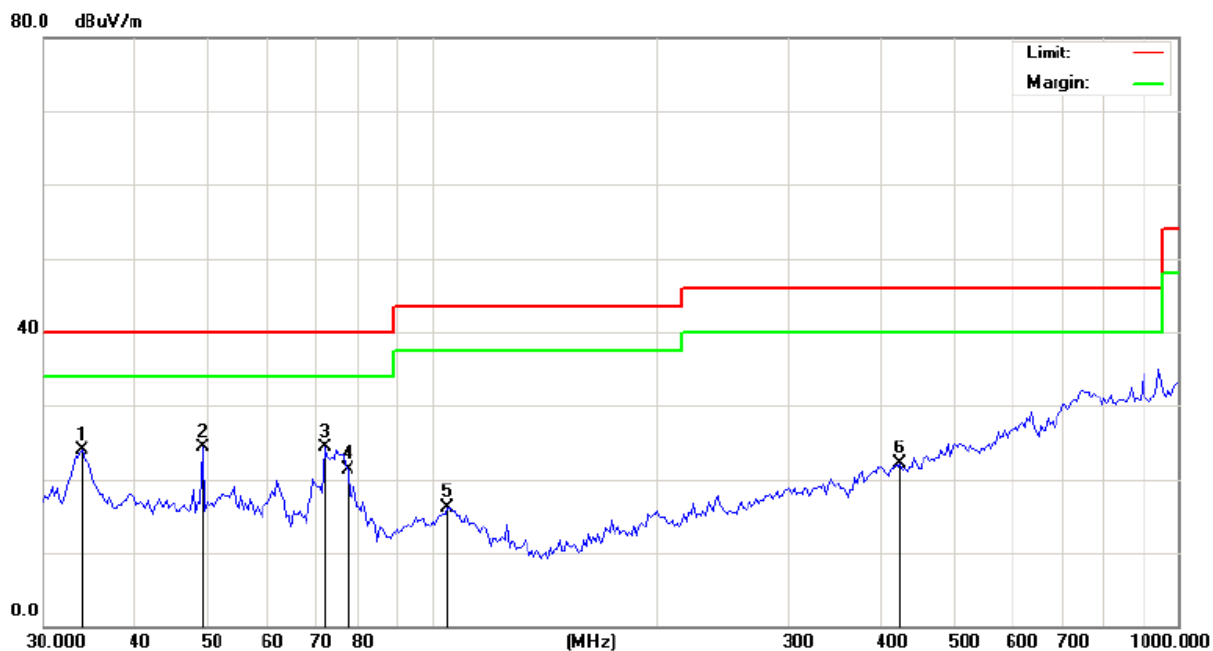
Limit: FCC Part 15B Class B RE_3 m

Power: DC 3V

Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		32.8697	33.88	-13.77	20.11	40.00	-19.89	peak		0	
2		55.2882	29.36	-10.65	18.71	40.00	-21.29	peak		0	
3		103.3353	27.10	-10.80	16.30	43.50	-27.20	peak		0	
4		200.0432	27.23	-10.82	16.41	43.50	-27.09	peak		0	
5		471.4664	27.57	-4.51	23.06	46.00	-22.94	peak		0	
6	*	749.6761	27.85	4.78	32.63	46.00	-13.37	peak		0	

Vertical:



Site

Polarization: **Vertical**

Temperature: 25

Limit: FCC Part 15B Class B RE_3 m

Power: DC 3V

Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		33.8067	37.81	-13.95	23.86	40.00	-16.14	peak	0	
2		49.0627	34.95	-10.71	24.24	40.00	-15.76	peak	0	
3	*	71.7054	39.66	-15.36	24.30	40.00	-15.70	peak	0	
4		76.9256	37.63	-16.32	21.31	40.00	-18.69	peak	0	
5		104.7980	26.36	-10.18	16.18	43.50	-27.32	peak	0	
6		424.3000	26.76	-4.75	22.01	46.00	-23.99	peak	0	

Note: Measurements were conducted in all channels (high, middle, low), and the worst case (low channel) was submitted only.

Above 1GHz

Low channel: 2402 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
2387.50	H	51.35	---	-4.20	47.15	---	74.00	54.00	-6.85
2387.50	H	---	49.68	-4.20	---	45.48	74.00	54.00	-8.52
4804.00	H	47.62	---	-3.94	43.68	---	74.00	54.00	-10.32
7206.00	H	46.83	---	0.52	47.35	---	74.00	54.00	-6.65
---	---	---	---	---	---	---	---	---	---
2387.50	V	55.72	---	-4.20	51.52	---	74.00	54.00	-2.48
2387.50	V	---	45.87	-4.20	---	41.67	74.00	54.00	-12.33
4804.00	V	48.59	---	-3.94	44.65	---	74.00	54.00	-9.35
7206.00	V	43.46	---	0.52	43.98	---	74.00	54.00	-10.02
---	---	---	---	---	---	---	---	---	---

Middle channel: 2440MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
4880.00	H	48.23	---	-3.98	44.25	---	74.00	54.00	-9.75
7320.00	H	47.86	---	0.57	48.43	---	74.00	54.00	-5.57
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---
4880.00	V	50.25	---	-3.98	46.27	---	74.00	54.00	-7.73
7320.00	V	46.35	---	0.57	46.92	---	74.00	54.00	-7.08
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---

High channel: 2480MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
2486.58	H	52.06	---	-2.38	49.68	---	74.00	54.00	-4.32
2486.58	H	---	42.34	-2.38	---	39.96	74.00	54.00	-14.04
4960.00	H	53.62	---	-3.98	49.64	---	74.00	54.00	-4.36
7440.00	H	49.57	---	0.57	50.14	---	74.00	54.00	-3.86
---	---	---	---	---	---	---	---	---	---
2483.51	V	50.61	---	-2.38	48.23	---	74.00	54.00	-5.77
2483.51	V	---	43.25	-2.38	---	40.87	74.00	54.00	-13.13
4960.00	V	52.83	---	-3.98	48.85	---	74.00	54.00	-5.15
7440.00	V	49.24	---	0.57	49.81	---	74.00	54.00	-4.19
---	---	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

Band Edge Requirement

Low channel: 2402 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
2400	H	48.78	---	-4.2	Peak	AV	74.00	---	-29.42
2400	H	---	40.35	-4.2	---	---	---	54.00	-17.85
---	---	---	---	---	---	---	---	---	---
2400	V	49.82	---	-4.2	Peak	AV	74.00	---	-28.38
2400	V	---	37.67	-4.2	---	---	---	54.00	-20.53
---	---	---	---	---	---	---	---	---	---


Low channel: 2480MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
2483.5	H	48.73	---	-4.2	Peak	AV	74.00	---	-29.47
2483.5	H	---	40.52	-4.2	---	---	---	54.00	-17.68
---	---	---	---	---	---	---	---	---	---
2483.5	V	51.27	---	-4.2	Peak	AV	74.00	---	-26.93
2483.5	V	---	39.52	-4.2	---	---	---	54.00	-18.68
---	---	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak/Average)(dBμV/m)-(Peak/Average) limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown "---" in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

6.4.20dB Occupied Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)/ Part 2 J Section 2.1049
Test Method:	ANSI C63.10: 2013
Limit:	N/A
	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW\geq1% of the 20 dB bandwidth; VBW\geqRBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	 <p>The diagram illustrates the test setup. On the left is a green Spectrum Analyzer with a screen and two knobs. A cable connects it to a yellow rectangular box on the right labeled 'EUT'.</p>
Test Mode:	Transmitting mode with modulation
Test results:	PASS

6.4.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 12, 2016

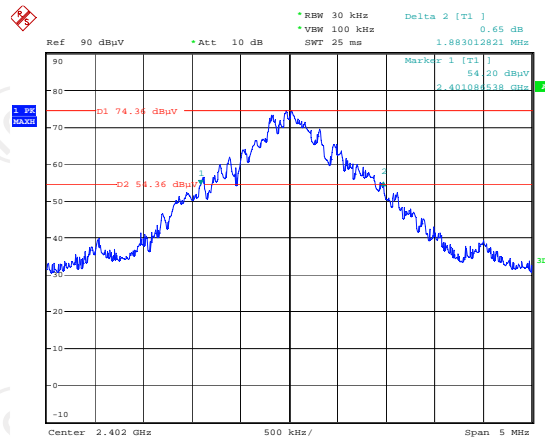
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.4.3. Test data

Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
Lowest	1883	---	PASS
Middle	1891	---	PASS
Highest	1899	---	PASS

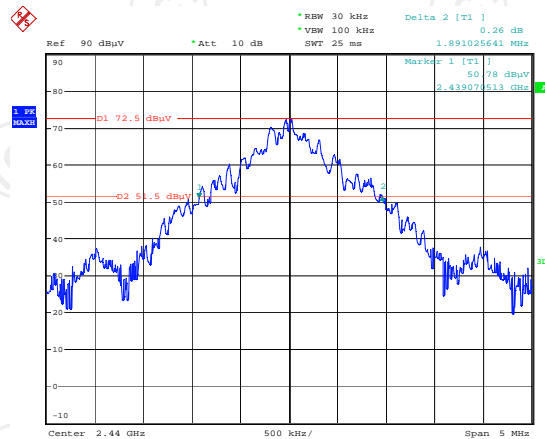
Test plots as follows:

Lowest channel



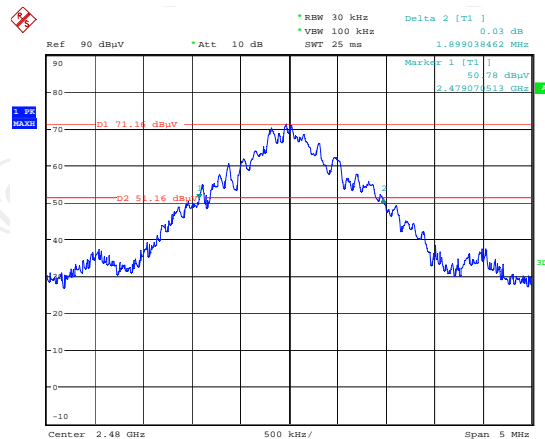
Date: 19.JUL.2016 14:39:17

Middle channel



Date: 19.JUL.2016 14:41:30

Highest channel



Date: 19.JUL.2016 14:42:32

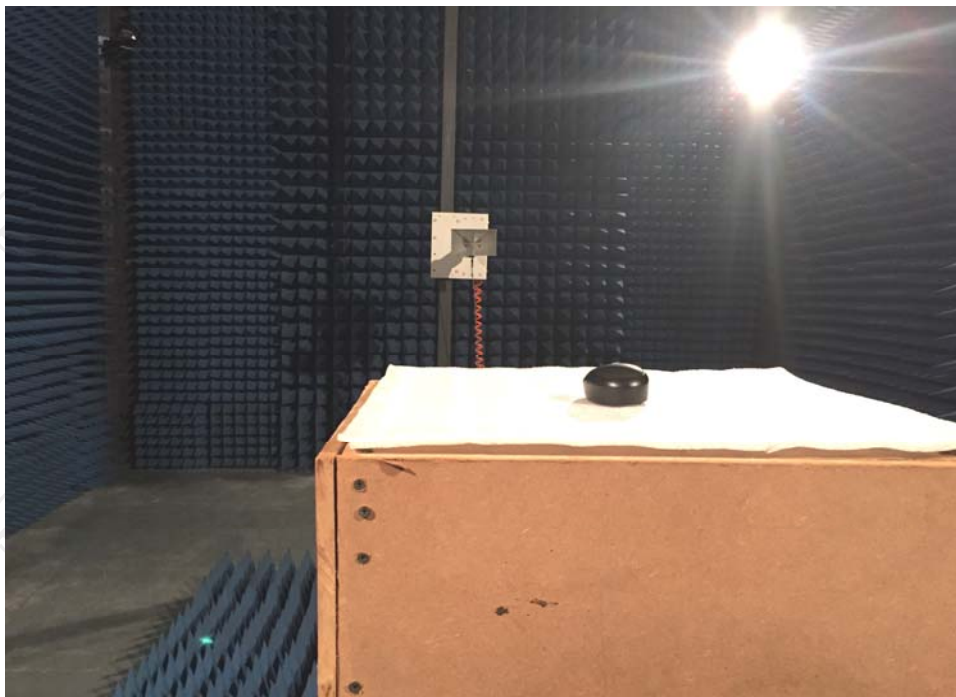
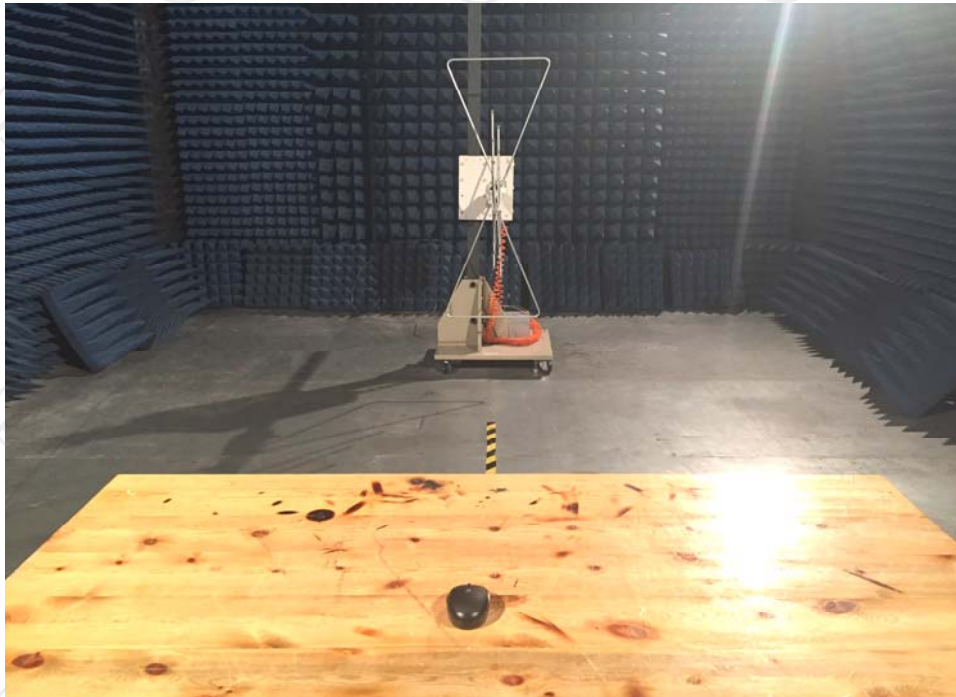
*****END OF REPORT*****

Appendix A: Photographs of Test Setup

Product: Optical Wireless Mouse

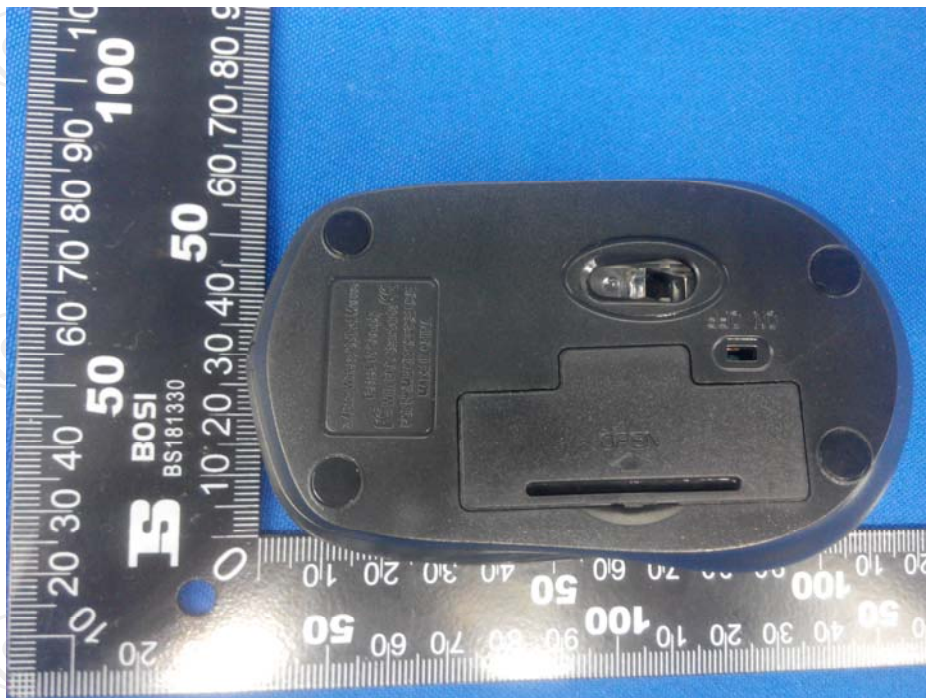
Model: J177

Radiated Emission



**Appendix B: Photographs of EUT
Product: Optical Wireless Mouse
Model: J177
External Photos**





Product: Optical Wireless Mouse
Model: J177
Internal Photos

