TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

IC: 22095-FREE3W
FCC ID: 2AG6O-FREE3W
Product: RollerMouse Free3 Wireless
Model No.: RM-FREE3-WL
Additional Model: N/A
Trade Mark: CONTOUR
Report No.: TCT161024E016
Issued Date: Nov. 04, 2016

Issued for:

CONTOUR (GUANGZHOU) DESIGN, INC.
Building B21-2F, Huachuang Animation Park, Panyu, Guangzhou, China

Issued By:

Shenzhen Tongce Testing Lab.
1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China
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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	RollerMouse Free3 Wireless
Model No.:	RM-FREE3-WL
Additional Model:	N/A
Applicant:	CONTOUR (GUANGZHOU) DESIGN, INC.
Address:	Building B21-2F, Huachuang Animation Park, Panyu, Guangzhou, China
Manufacturer:	CONTOUR (GUANGZHOU) DESIGN, INC.
Address:	Building B21-2F, Huachuang Animation Park, Panyu, Guangzhou, China
Date of Test:	Oct. 24 – Nov. 03, 2016
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249 RSS-210-i9 :2016, Paragraph Annex B.10 RSS-Gen Issue4: 2014

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: Jerry Xie ***Date:*** ***Nov. 03, 2016***

Jerry Xie

Reviewed By: ***Date:*** ***Nov. 04, 2016***

Joe Zhou

Approved By: Tomsin ***Date:*** ***Nov. 04, 2016***

Tomsin

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203 §RSS GEN sect. 8.3	PASS
AC Power Line Conducted Emission	§15.207 §RSS GEN sect. 8.8	PASS
Field Strength of Fundamental	§15.249 (a) §RSS 210 section B.10(a)	PASS
Spurious Emissions	§15.249 (a) (d)/ §15.209 §RSS Gen 8.9	PASS
Band Edge	§15.249 (d)/ §15.205 §RSS 210 section B.10(a)	PASS
20dB Occupied Bandwidth& 99% Occupied Bandwidth	§15.215 (c) §RSS Gen 6.6	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.

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3. EUT Description

Product Name:	RollerMouse Free3 Wireless
Model :	RM-FREE3-WL
Additional Model:	N/A
Trade Mark:	**CONTOUR**
Operation Frequency:	2402 - 2480MHz
Channel Separation:	1MHz
Modulation Technology:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	2dBi
Power Supply:	DC 3.7V

Operation Frequency Each of Channel

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2441MHz
The Highest channel	2480MHz

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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
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.	

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
Adapter	XC-0501000-06-B	/	/	TCT

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.

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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

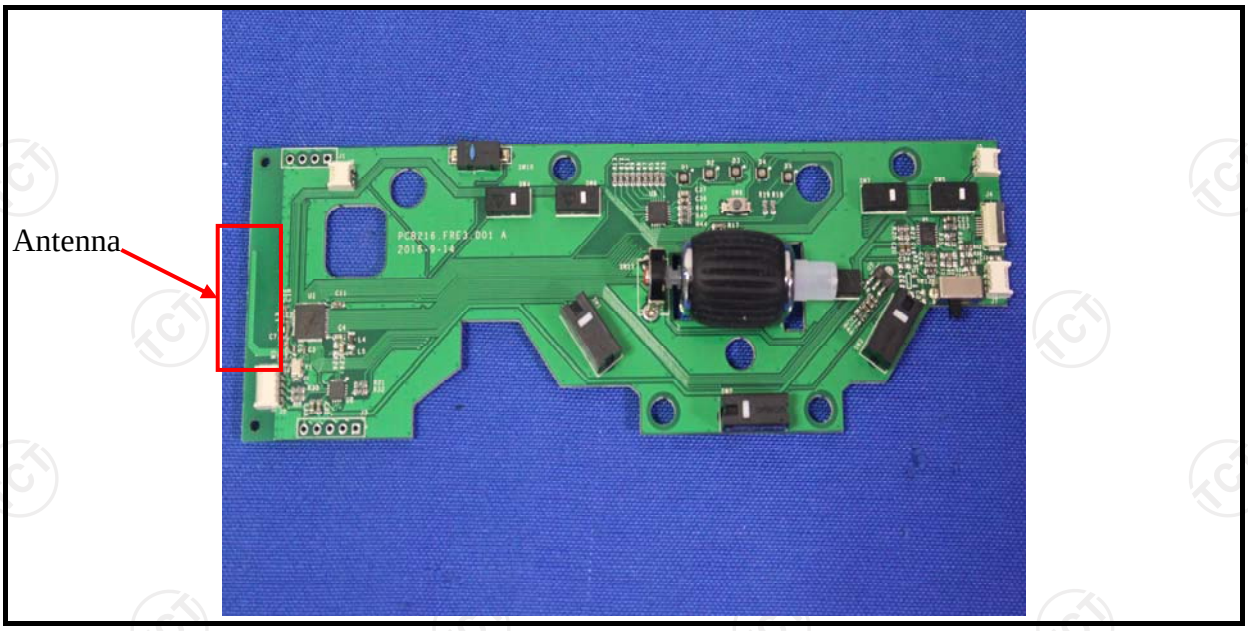
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1GHz)	±3.92dB
5	All emissions, radiated(>1GHz)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

6. Test Results and Measurement Data

6.1. Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c) RSS Gen section 8.3
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. 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. The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the licence-exempt apparatus. Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer. User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location: *This radio transmitter (identify the device by certification number or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.* Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).	
E.U.T Antenna:	
The Bluetooth antenna is an internal PCB antenna which permanently attached, and the best case gain of the antenna is 2dBi.	



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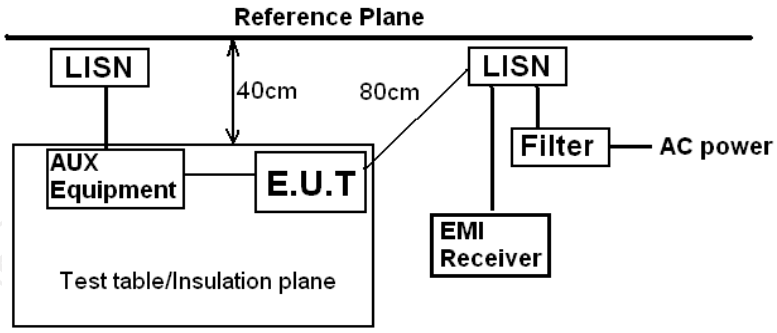
6.2. Conducted Emission

6.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207
RSS Gen</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></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>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T is 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 C63.10:2013 on conducted measurement.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

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6.2.2. Test Instruments

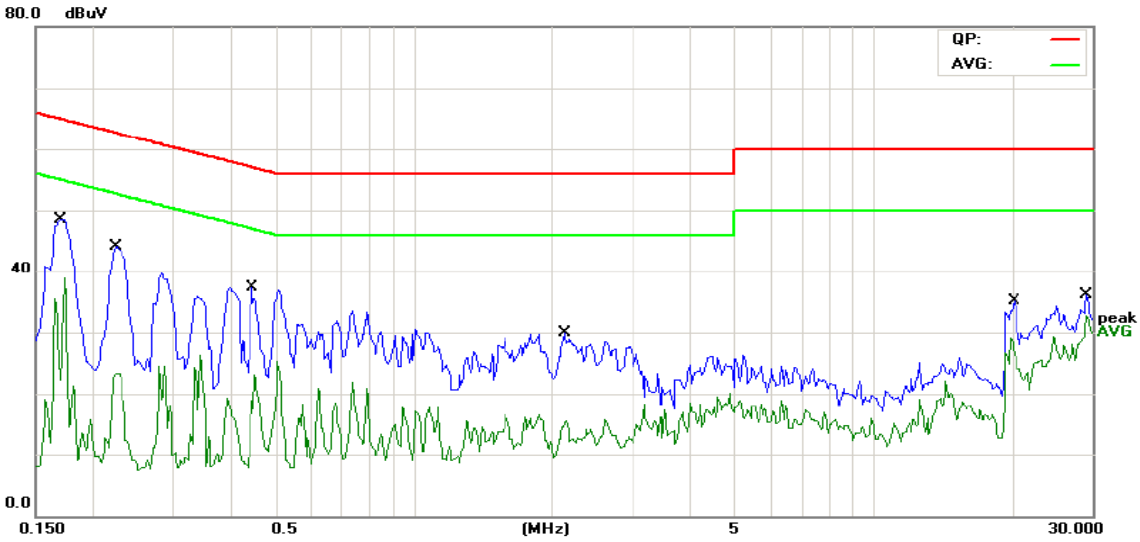
Conducted Emission Shielding Room Test Site (843)				
Equipment	**Equipment**	**Equipment**	**Equipment**	**Equipment**
EMI Test Receiver	R&S	ESCS30	100139	Aug. 11, 2017
LISN	Schwarzbeck	NSLK 8126	8126453	Aug. 16, 2017
Coax cable	TCT	CE-05	N/A	Aug. 11, 2017
EMI Test Software	Shurple Technology	EZ-EMC	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).*

6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2 Phase: *L1* Temperature: 23 (C)

Limit: FCC Part 15B Class B Conduction(QP) Power: Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1695	34.87	11.47	46.34	64.98	-18.64	QP	
2		0.1695	19.75	11.47	31.22	54.98	-23.76	AVG	
3		0.2242	29.42	11.44	40.86	62.66	-21.80	QP	
4		0.2242	14.18	11.44	25.62	52.66	-27.04	AVG	
5		0.4429	17.92	11.33	29.25	57.01	-27.76	QP	
6		0.4429	4.67	11.33	16.00	47.01	-31.01	AVG	
7		2.1265	7.75	11.64	19.39	56.00	-36.61	QP	
8		2.1265	-0.19	11.64	11.45	46.00	-34.55	AVG	
9		20.2968	21.17	10.57	31.74	60.00	-28.26	QP	
10		20.2968	8.25	10.57	18.82	50.00	-31.18	AVG	
11		29.1601	23.12	10.63	33.75	60.00	-26.25	QP	
12		29.1601	17.79	10.63	28.42	50.00	-21.58	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

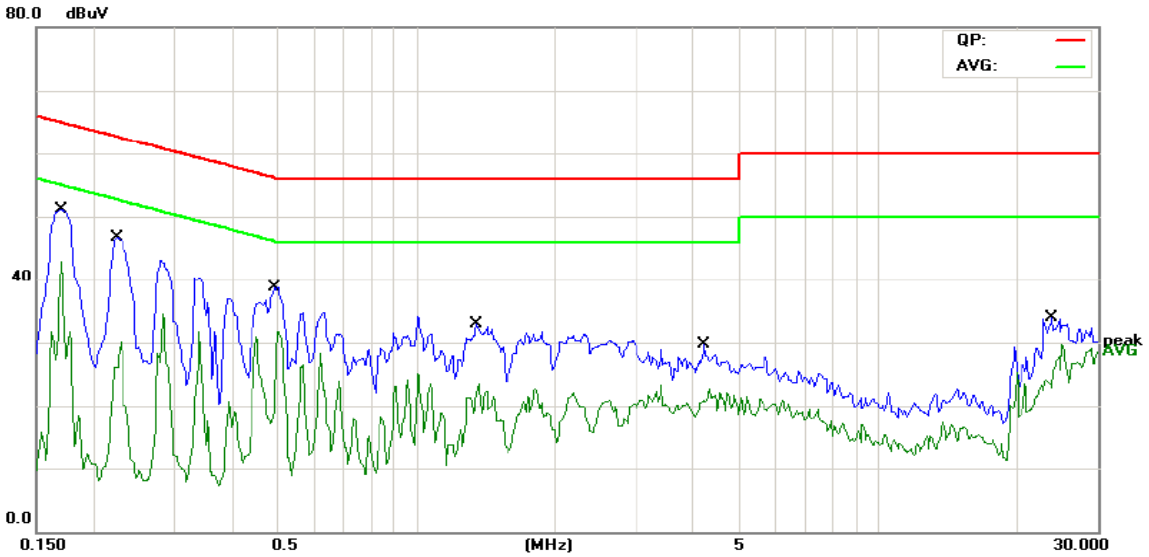
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2 Phase: *N* Temperature: 23 (C)

Limit: FCC Part 15B Class B Conduction(QP) Power: Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1695	36.60	11.47	48.07	64.98	-16.91	QP	
2		0.1695	23.51	11.47	34.98	54.98	-20.00	AVG	
3		0.2242	31.65	11.44	43.09	62.66	-19.57	QP	
4		0.2242	18.85	11.44	30.29	52.66	-22.37	AVG	
5		0.4938	21.38	11.30	32.68	56.10	-23.42	QP	
6		0.4938	9.22	11.30	20.52	46.10	-25.58	AVG	
7		1.3453	16.34	11.37	27.71	56.00	-28.29	QP	
8		1.3453	8.78	11.37	20.15	46.00	-25.85	AVG	
9		4.2108	12.71	10.89	23.60	56.00	-32.40	QP	
10		4.2108	6.40	10.89	17.29	46.00	-28.71	AVG	
11		23.9414	18.70	10.73	29.43	60.00	-30.57	QP	
12		23.9414	11.58	10.73	22.31	50.00	-27.69	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBµV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBµV) = Reading level (dBµV) + Corr. Factor (dB)

Limit (dBµV) = Limit stated in standard

Margin (dB) = Measurement (dBµV) – Limits (dBµV)

Q.P. =Quasi-Peak

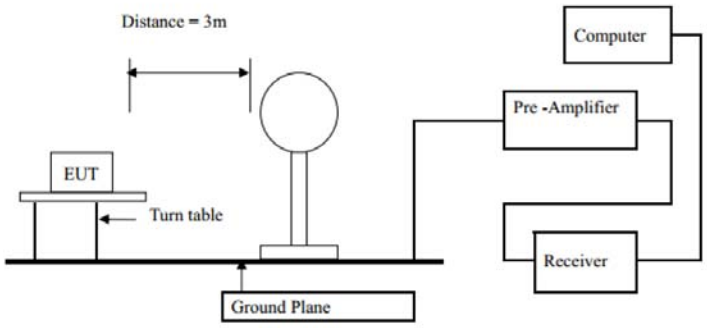
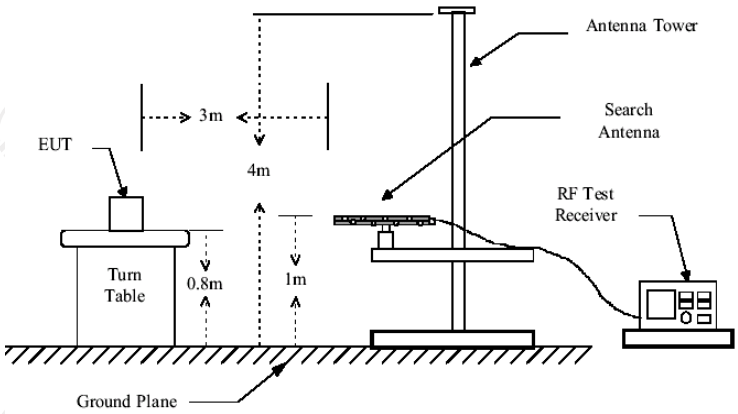
AVG =average

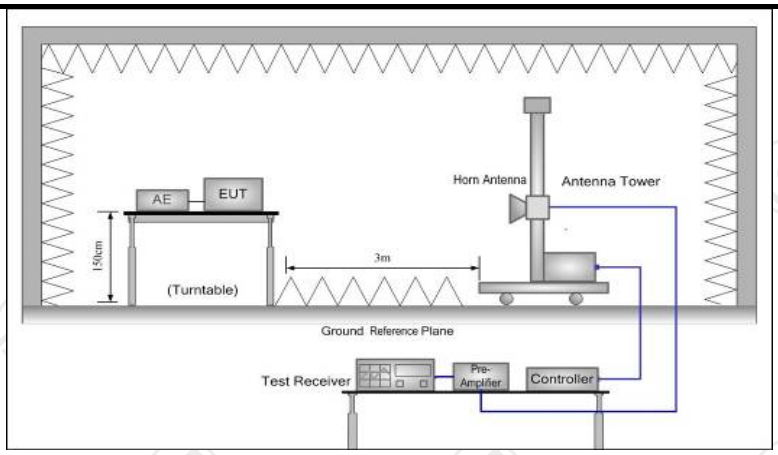
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

6.3. Radiated Emission Measurement

6.3.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209
RSS 210 section B.10</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit(Field strength of the fundamental signal):</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">2400MHz-2483.5MHz</td><td>94.00</td><td>Average Value</td></tr>
<tr><td>114.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit(Spurious Emissions):</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>Quasi-peak Value</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>Quasi-peak Value</td></tr>
<tr><td>1.705-30</td><td>30</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit (band edge) :</td><td>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.</td></tr>
<tr><td>Test Procedure:</td><td>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.
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.
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</td></tr>
</table>

	the measurement. 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&SCHWARZ	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	Aug. 11, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Aug. 11, 2017
Pre-amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Aug. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9170	373	Aug. 13, 2017
Coax cable (9kHz-40GHz)	TCT	RE-low-01	N/A	Aug. 11, 2017
Coax cable (9kHz-40GHz)	TCT	RE-high-02	N/A	Aug. 11, 2017
Coax cable (9kHz-40GHz)	TCT	RE-low-03	N/A	Aug. 11, 2017
Coax cable (9kHz-40GHz)	TCT	RE-high-04	N/A	Aug. 11, 2017
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	78.65(PK)	H	114/94	-35.35
2402	75.60(AV)	H	114/94	-18.40
2441	77.10(PK)	H	114/94	-36.90
2441	74.61(AV)	H	114/94	-19.39
2480	75.81(PK)	H	114/94	-38.19
2480	71.98(AV)	H	114/94	-22.02
2402	79.19(PK)	V	114/94	-34.81
2402	76.70(AV)	V	114/94	-17.30
2441	79.11(PK)	V	114/94	-34.89
2441	76.50(AV)	V	114/94	-17.50
2480	78.78(PK)	V	114/94	-35.22
2480	75.09(AV)	V	114/94	-18.91

Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/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

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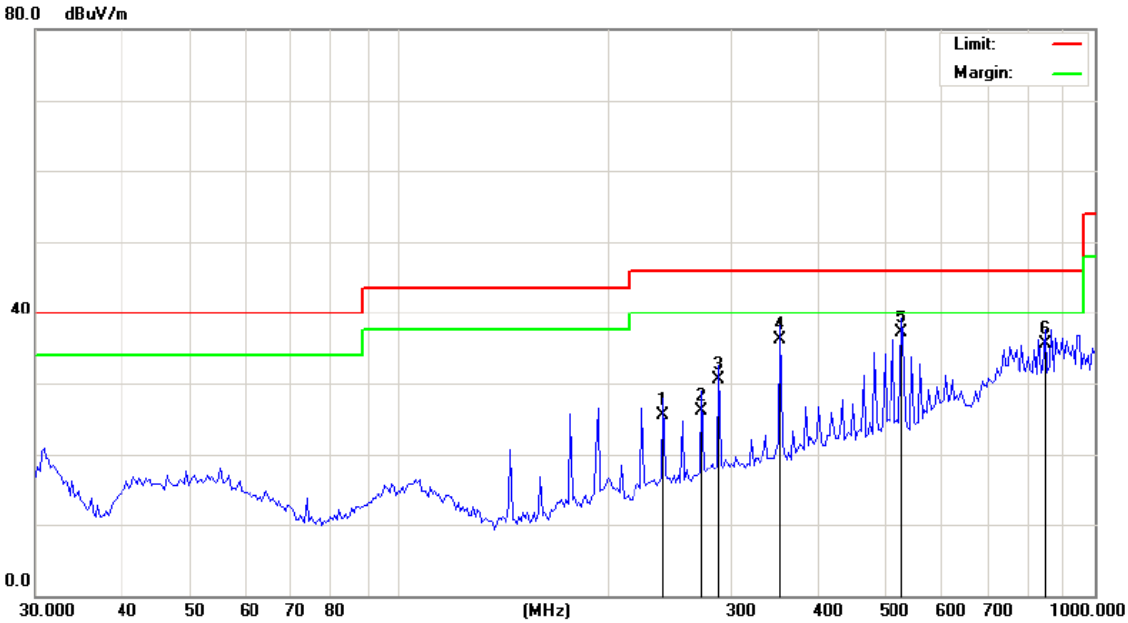
Frequency Range (30MHz-1GHz)

Horizontal:



Site

Limit: FCC Part 15B Class B RE_3 m

Polarization: *Horizontal*

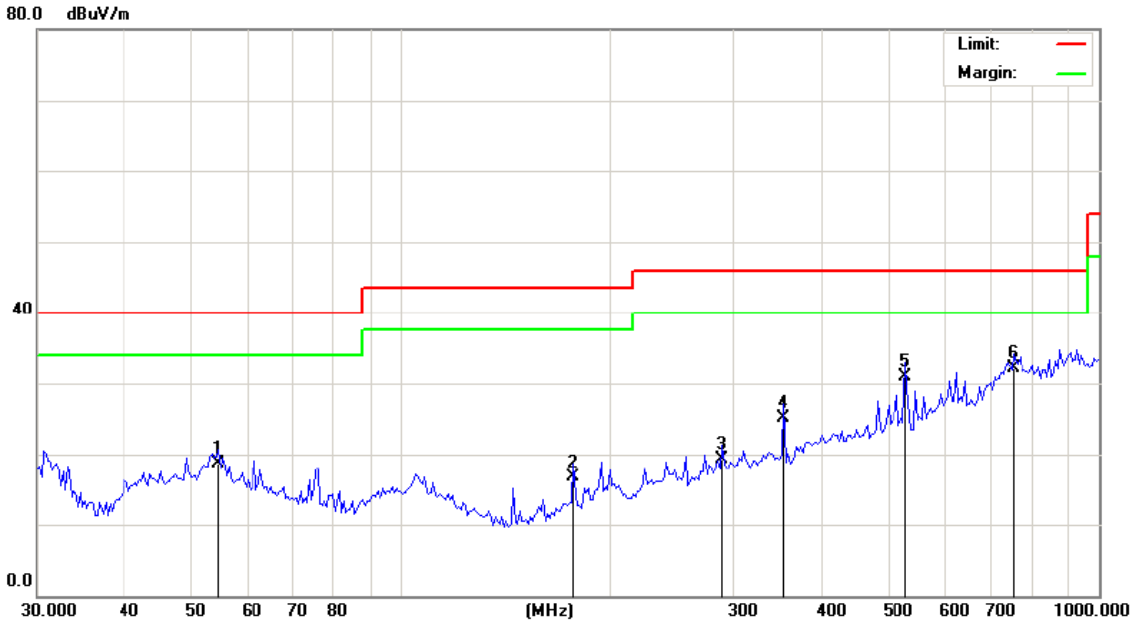
Power: AC 120V/60Hz

Temperature: 23

Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		240.1442	33.83	-8.31	25.52	46.00	-20.48	QP		0	
2		272.5246	34.17	-8.04	26.13	46.00	-19.87	QP		0	
3		288.2840	37.52	-7.08	30.44	46.00	-15.56	QP		0	
4		353.4471	41.96	-5.94	36.02	46.00	-9.98	QP		0	
5	*	527.5706	39.47	-2.37	37.10	46.00	-8.90	QP		0	
6		850.7603	30.55	5.03	35.58	46.00	-10.42	QP		0	

Vertical:



Site	Polarization: ***Vertical***	Temperature: 23
Limit: FCC Part 15B Class B RE_3 m	Power: AC 120V/60Hz	Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		54.5167	27.93	-9.29	18.64	40.00	-21.36	QP		0	
2		176.2744	29.63	-12.93	16.70	43.50	-26.80	QP		0	
3		288.2840	26.40	-7.08	19.32	46.00	-26.68	QP		0	
4		353.4471	31.06	-5.94	25.12	46.00	-20.88	QP		0	
5		527.5706	33.37	-2.37	31.00	46.00	-15.00	QP		0	
6	*	754.9628	25.78	6.27	32.05	46.00	-13.95	QP		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 (dBuV)	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	51.27	---	-4.20	47.07	---	74.00	---	-26.93
2387.50	H	---	50.16	-4.20	---	45.96	74.00	54.00	-8.04
4804.00	H	48.73	---	-3.94	44.79	---	74.00	54.00	-9.21
7206.00	H	47.92	---	0.52	48.44	---	74.00	54.00	-5.56
---	---	---	---	---	---	---	---	---	---
2387.50	V	54.61	---	-4.20	50.41	---	74.00	---	-19.59
2387.50	V	---	46.98	-4.20	---	42.78	74.00	54.00	-11.22
4804.00	V	49.53	---	-3.94	45.59	---	74.00	54.00	-8.41
7206.00	V	45.58	---	0.52	46.10	---	74.00	54.00	-7.90
---	---	---	---	---	---	---	---	---	---

Middle channel: 2441 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)			
4880.00	H	49.36	---	-3.98	44.25	---	74	54	-8.62
7320.00	H	48.54	---	0.57	48.43	---	74	54	-4.89
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---
4880.00	V	49.03	---	-3.98	46.27	---	74	54	-8.95
7320.00	V	47.57	---	0.57	46.92	---	74	54	-5.86
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	----	---	---	---

High channel: 2480 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)			
2486.58	H	51.29	---	-2.38	48.91	---	74	---	-25.09
2486.58	H	---	44.82	-2.38	---	42.44	74	54	-11.56
4948.00	H	51.32	---	-3.98	47.34	---	74	54	-6.66
7422.00	H	50.69	---	0.57	51.26	---	74	54	-2.74
---	---	---	---	---	---	---	---	---	---
2483.51	V	67.53	---	-2.38	65.93	---	74.00	---	-8.07
2483.51	V	---	48.18	-2.38	---	45.80	74.00	54.00	-6.93
4948.00	V	50.57	---	-3.98	46.59	---	74.00	54.00	-7.41
7422.00	V	49.14	---	0.57	49.71	---	74.00	54.00	-4.29
---	---	---	---	---	---	---	---	---	---

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 (dBuV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
2400	H	49.13	---	-4.2	44.93	---	74.00	---	-29.07
2400	H	---	42.56	-4.2	---	38.36	---	54.00	-15.64
---	---	---	---	---	---	---	---	---	---
2400	V	48.61	---	-4.2	44.41	---	74.00	---	-29.59
2400	V	---	39.78	-4.2	---	35.58	---	54.00	-18.42
---	---	---	---	---	---	---	---	---	---

Low channel: 2480 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
2483.5	H	50.84	---	-4.2	46.64	---	74.00	---	-27.36
2483.5	H	---	41.63	-4.2	---	37.43	---	54.00	-16.57
---	---	---	---	---	---	---	---	---	

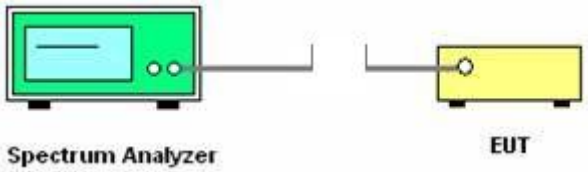
2483.5	V	49.39	---	-4.2	45.19	---	74.00	---	-28.81
2483.5	V	---	40.82	-4.2	---	36.62	---	54.00	-17.38
---	---	---	---	---	---	---	---	---	---

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.*

6.4. 20dB Occupied Bandwidth & 99%Occupied Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c) RSS Gen
Test Method:	ANSI C63.10: 2013 RSS Gen section 6.6
Limit:	N/A
	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≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	
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	Aug. 12, 2017

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)	99% Occupy Bandwidth (kHz)	Limit	Conclusion
Lowest	1650.64	1706.73	---	PASS
Middle	1594.55	1682.69	---	PASS
Highest	1722.76	1650.64	---	PASS

Test plots as follows:

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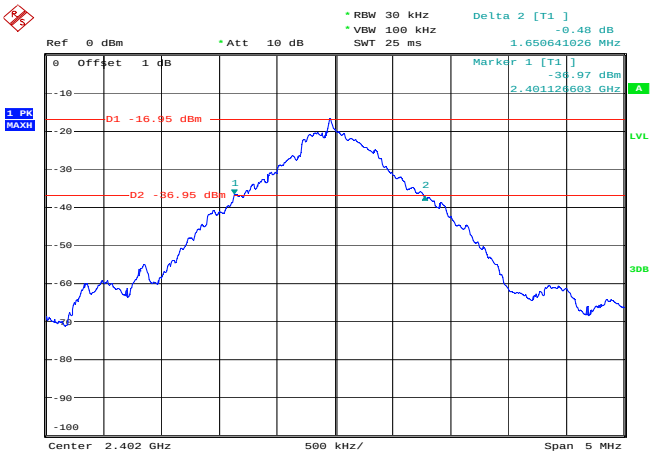
20dB Occupy Bandwidth:

Lowest channel



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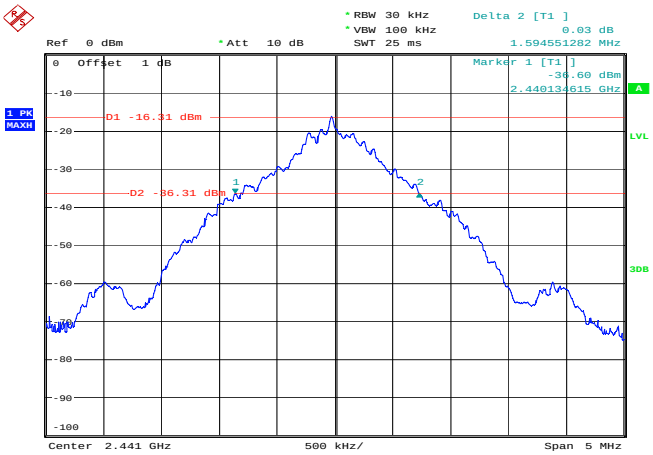
Middle channel



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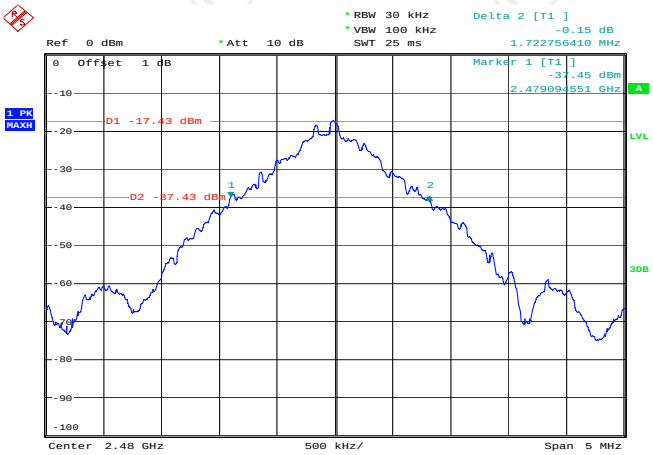
Highest channel



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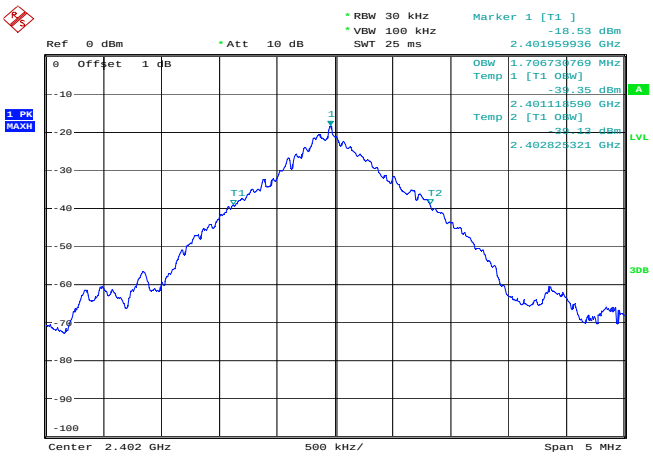
99% Occupy Bandwidth

Lowest channel



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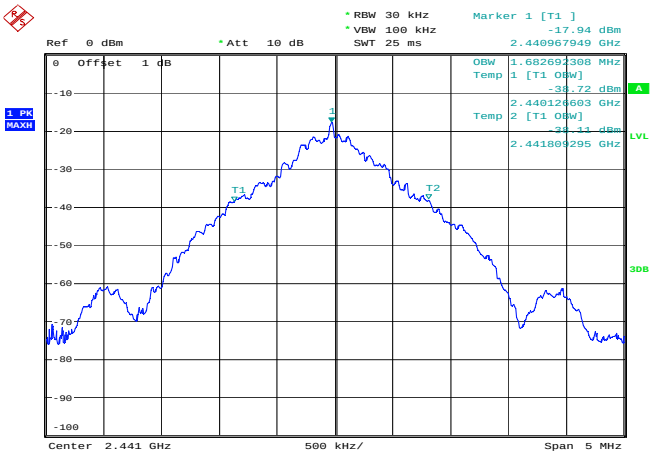
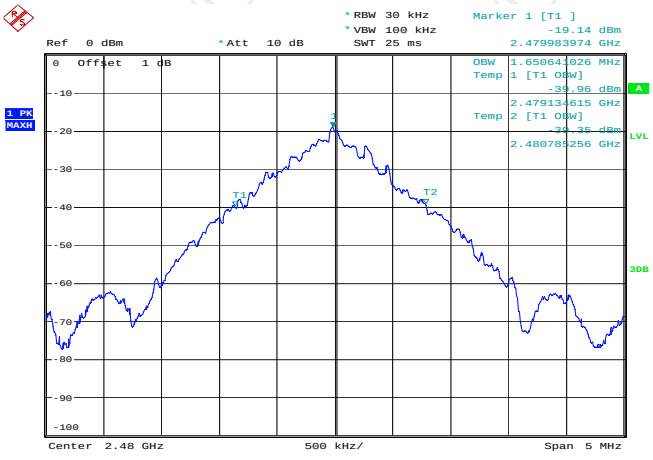
Middle channel



Date: 31.OCT.2016 17:08:39

Highest channel



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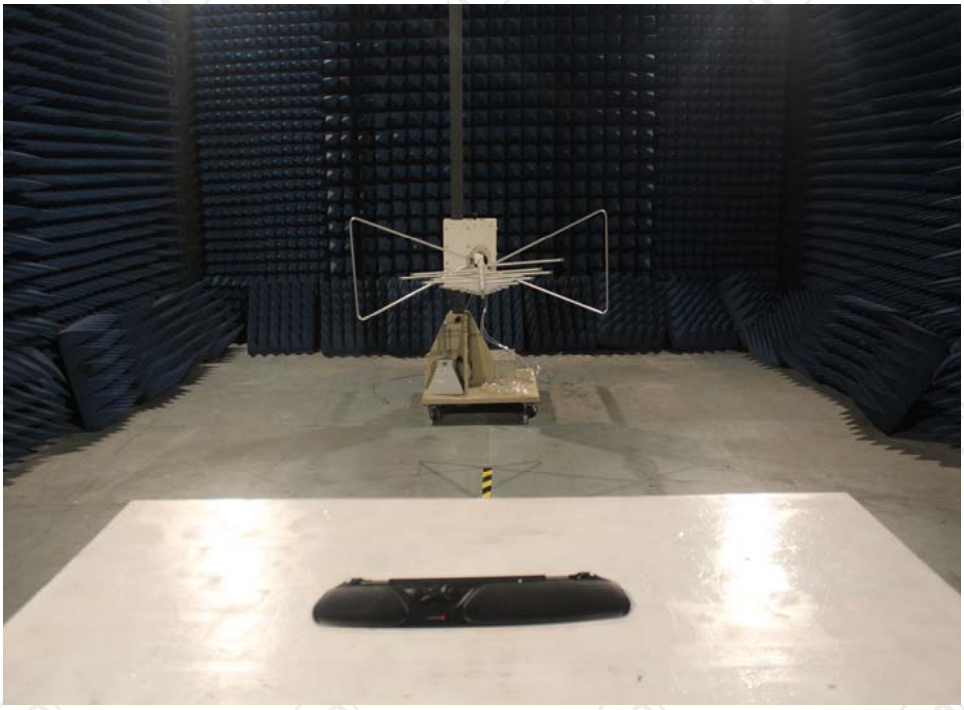
Appendix A: Photographs of Test Setup

Product: RollerMouse Free3 Wireless
Model: RM-FREE3-WL
Radiated Emission



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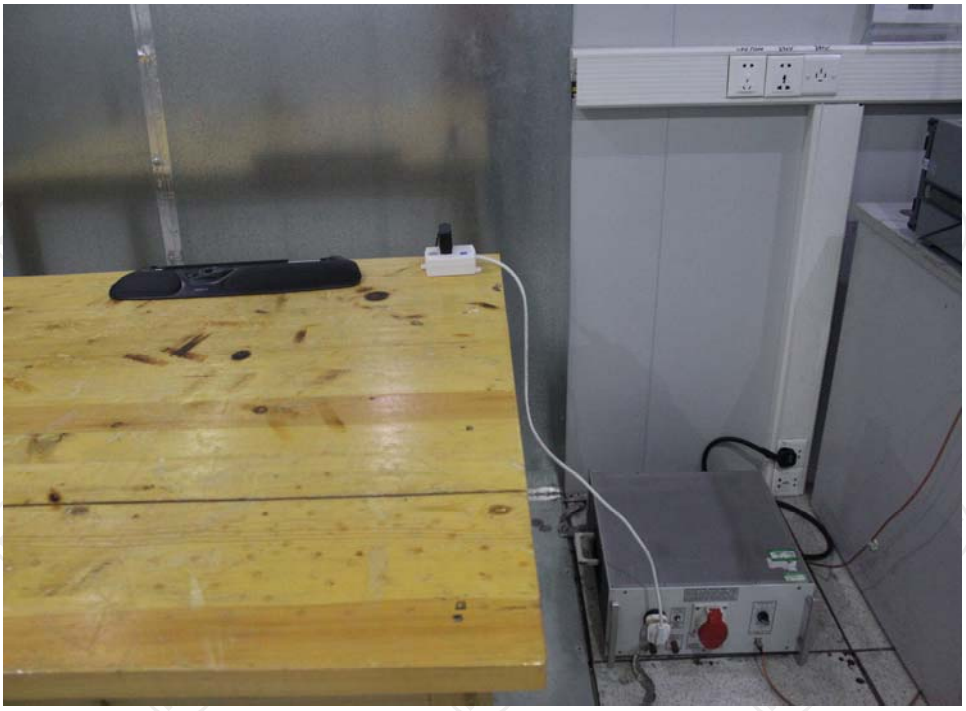
Conducted Emission



Appendix B: Photographs of EUT
Product: RollerMouse Free3 Wireless
Model: RM-FREE3-WL
External Photos

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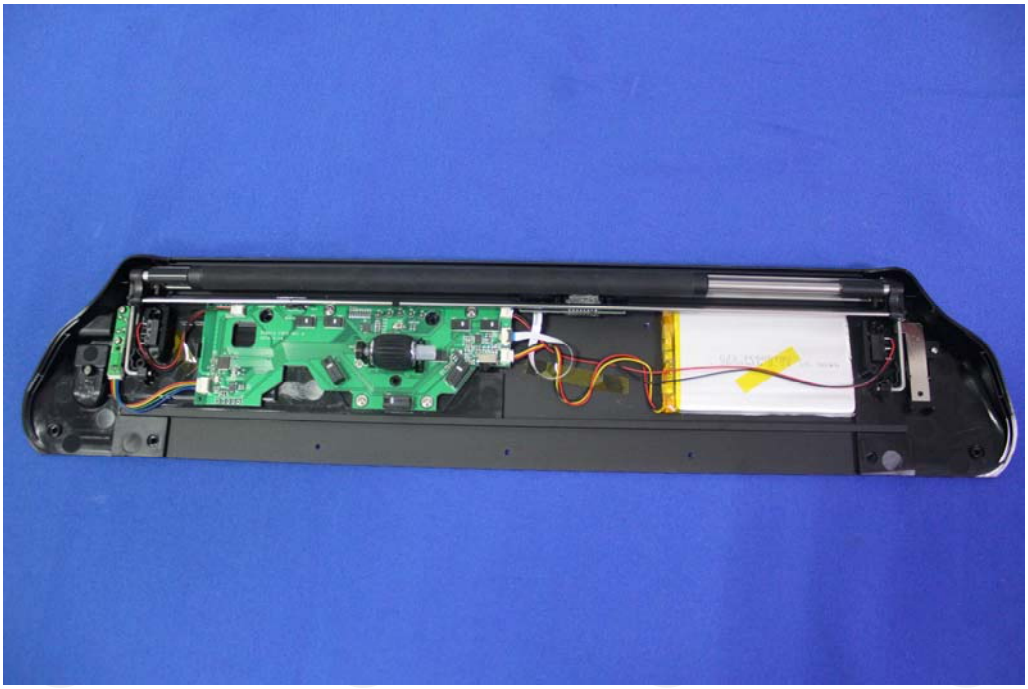
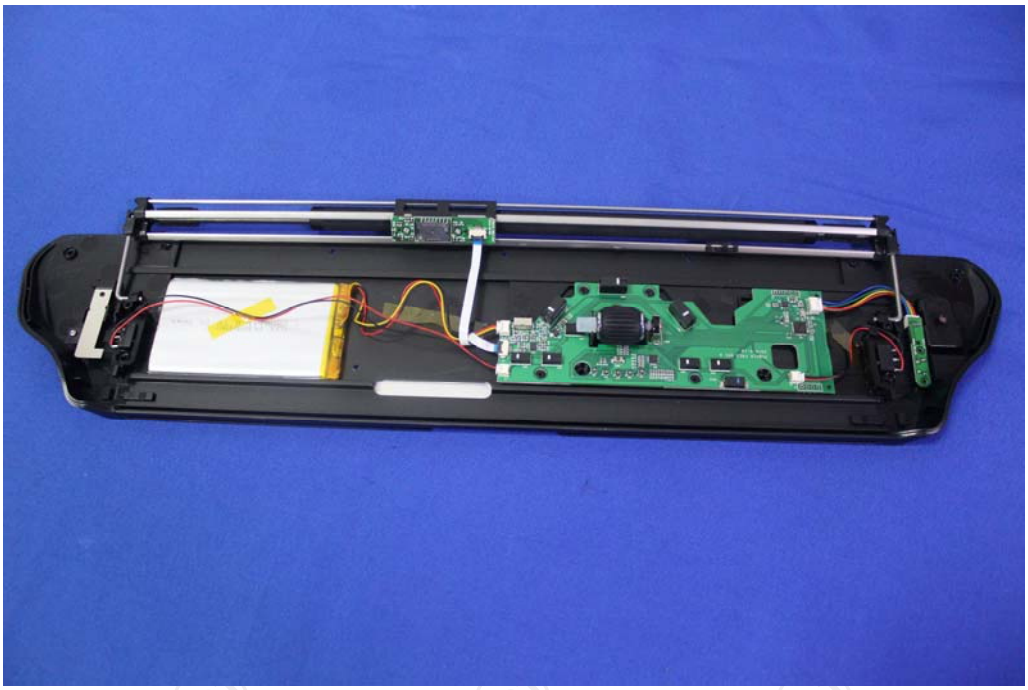
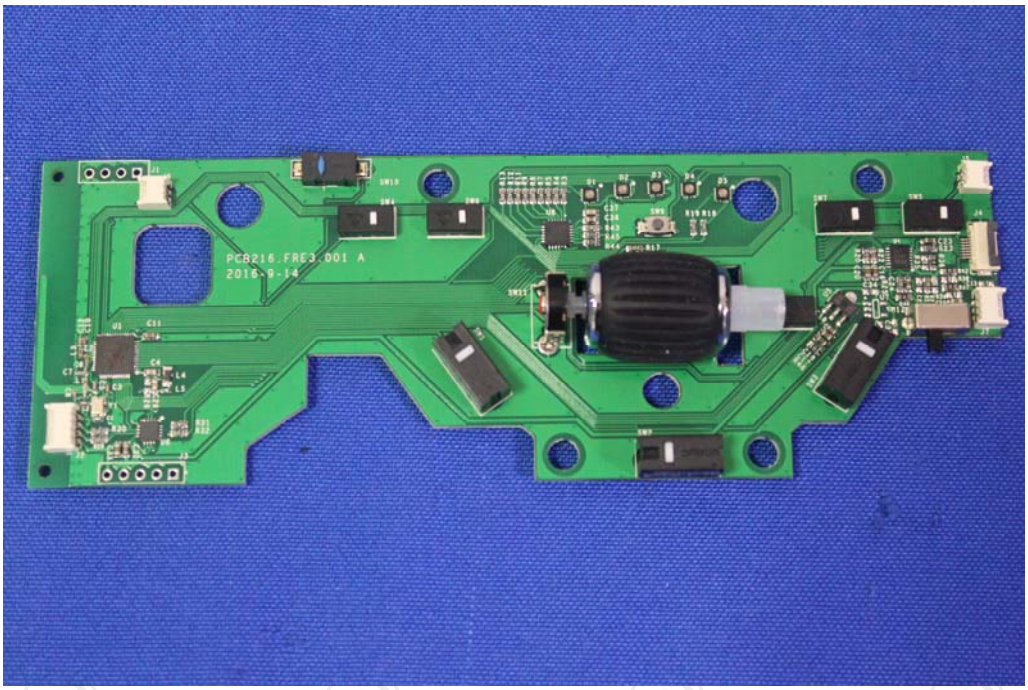
Product: RollerMouse Free3 Wireless
Model: RM-FREE3-WL
Internal Photos



Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

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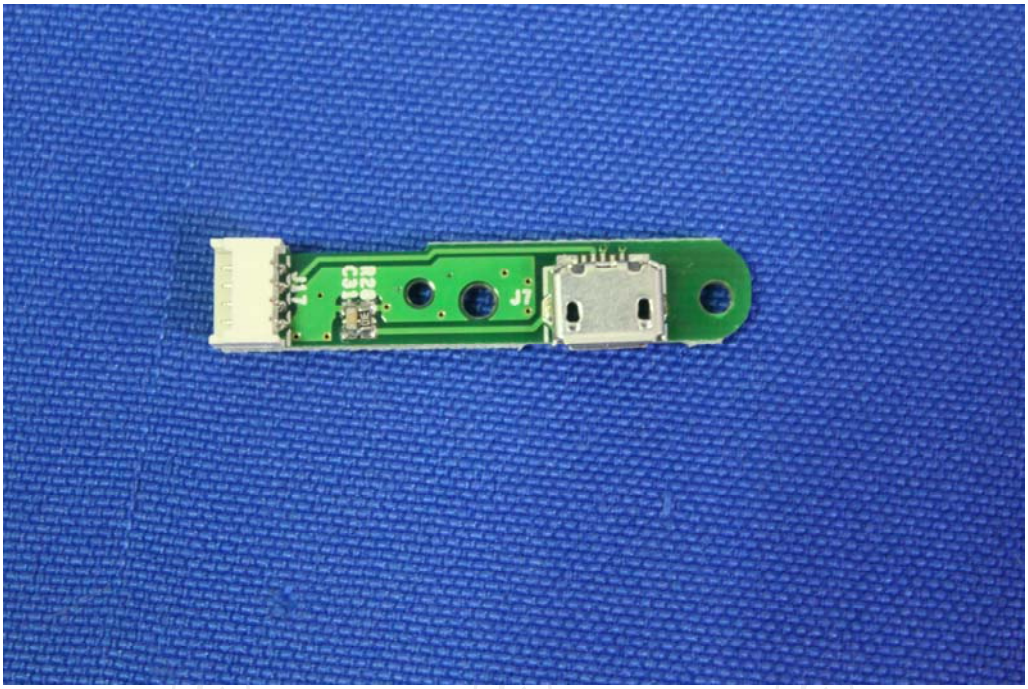
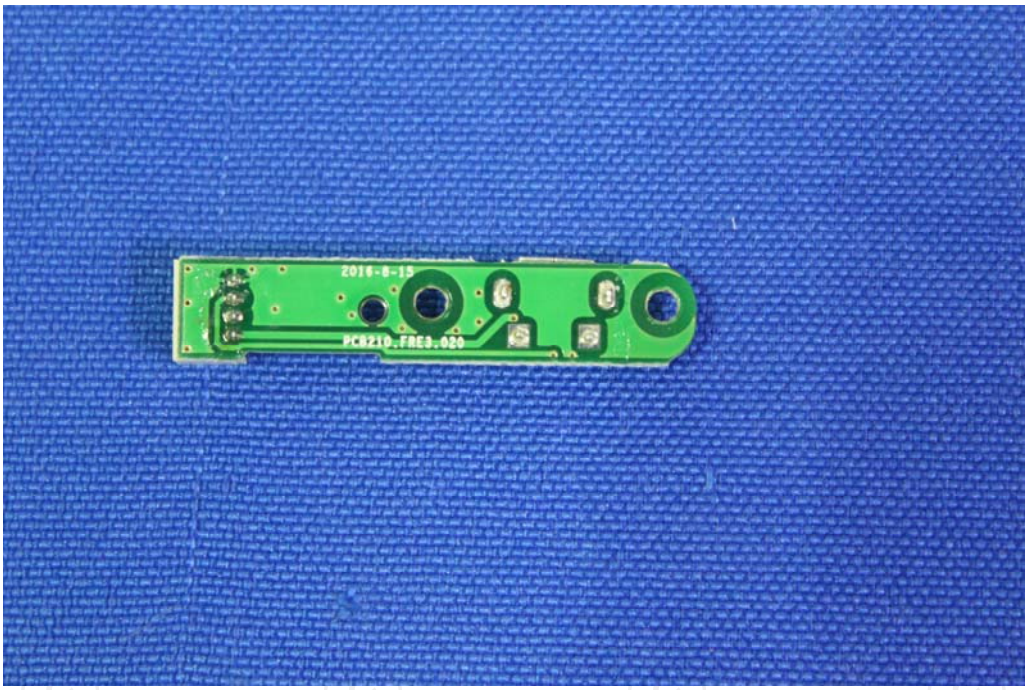
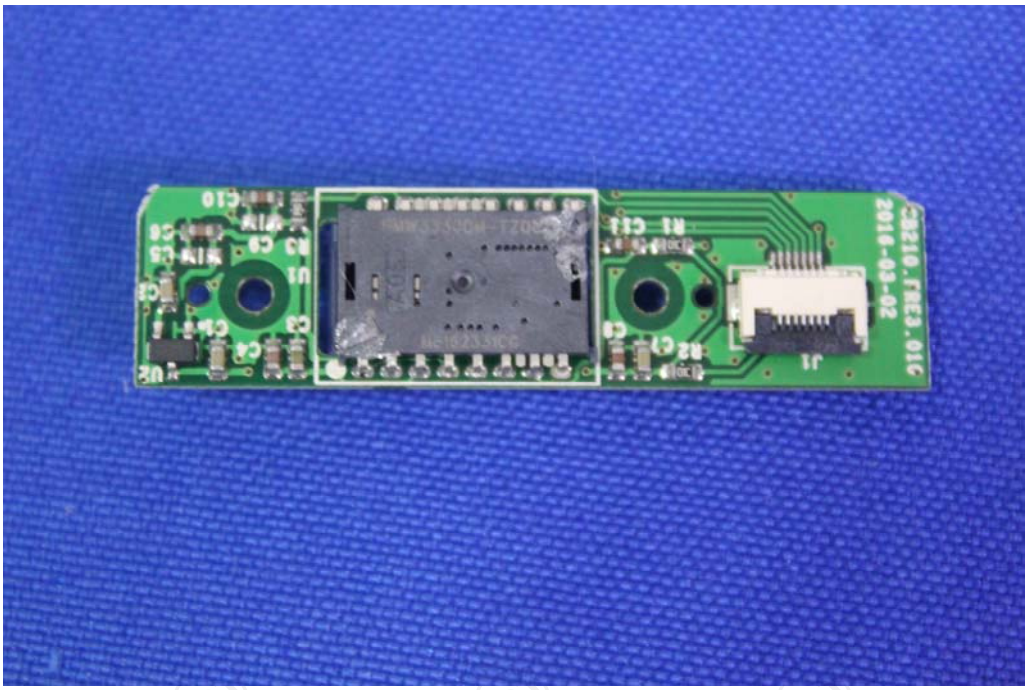
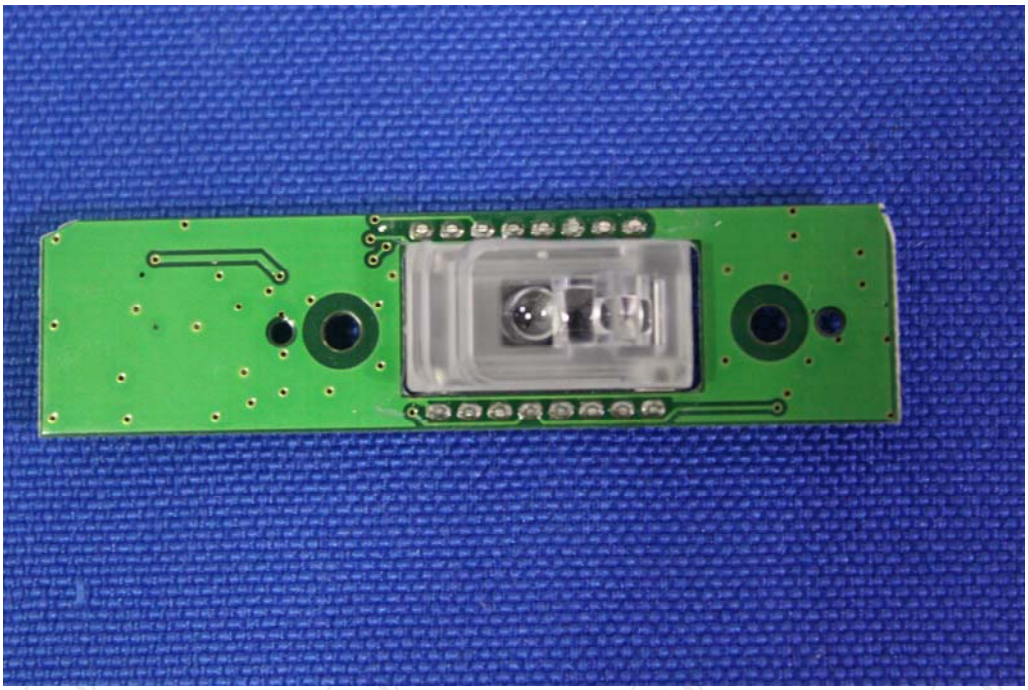
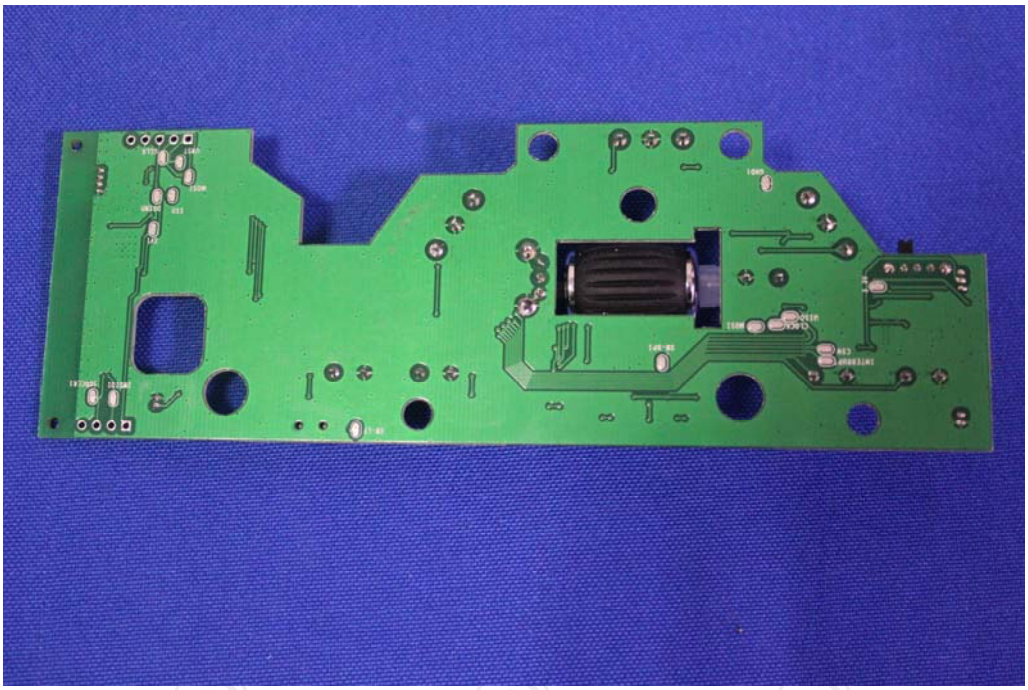
2016-9-14

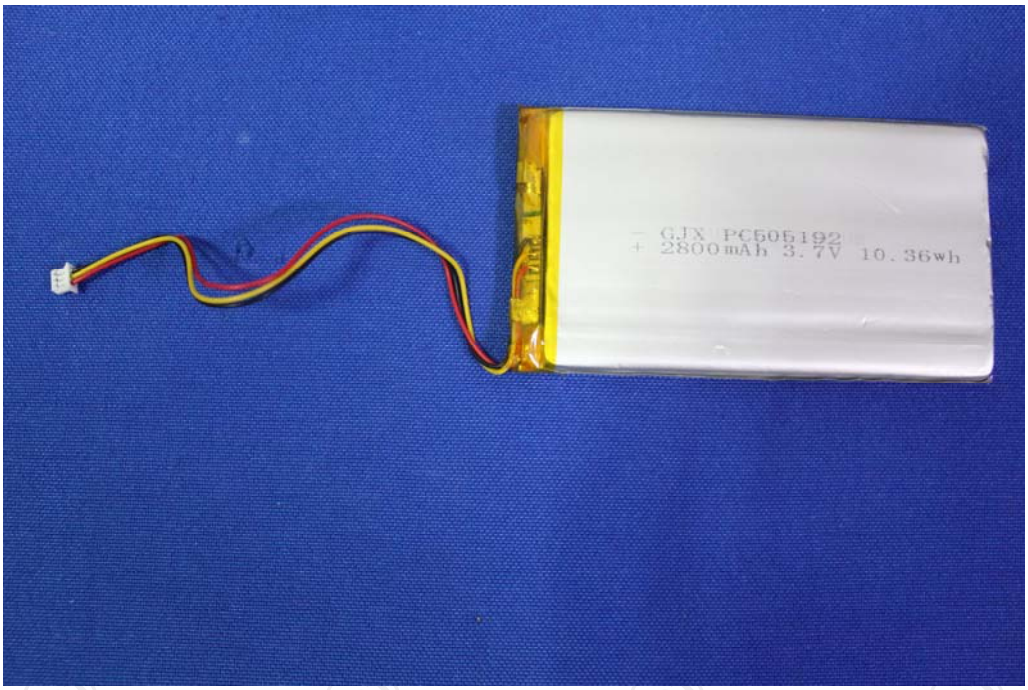












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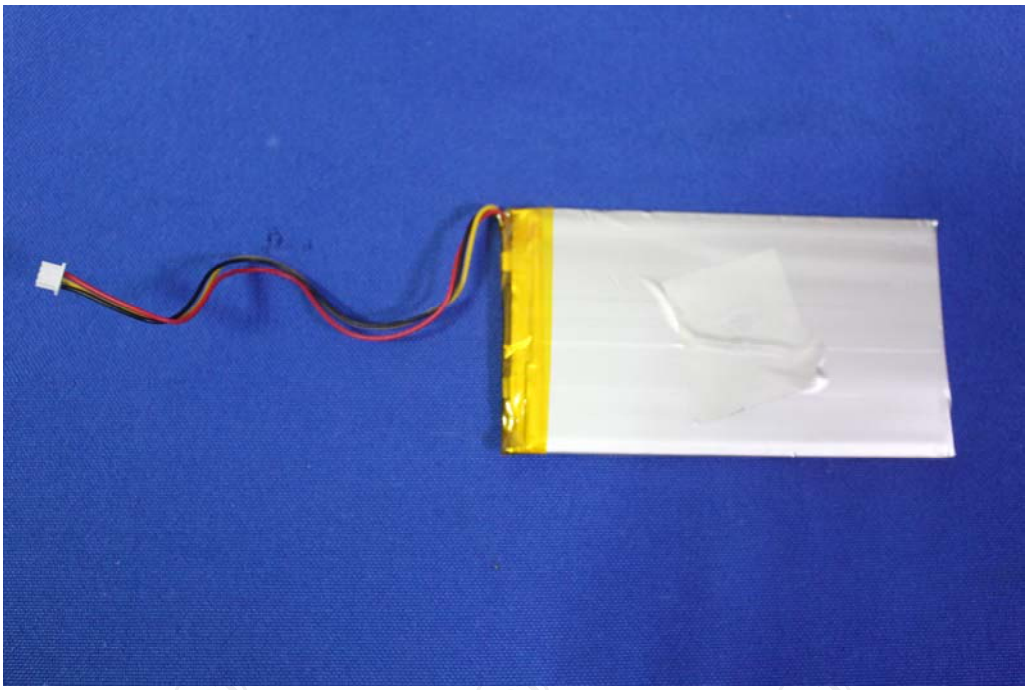

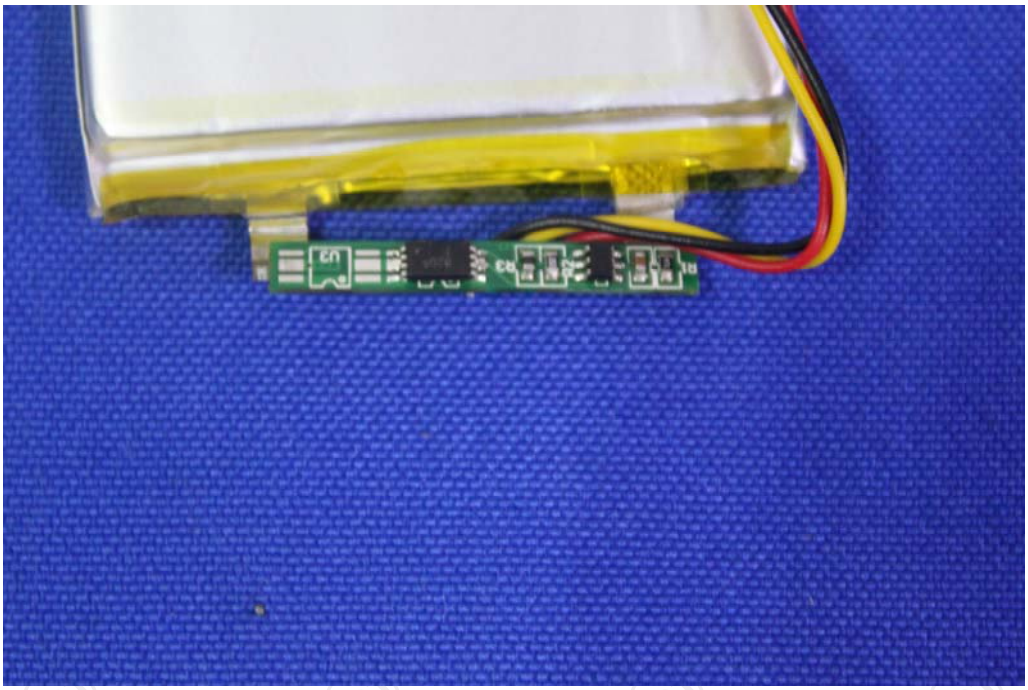

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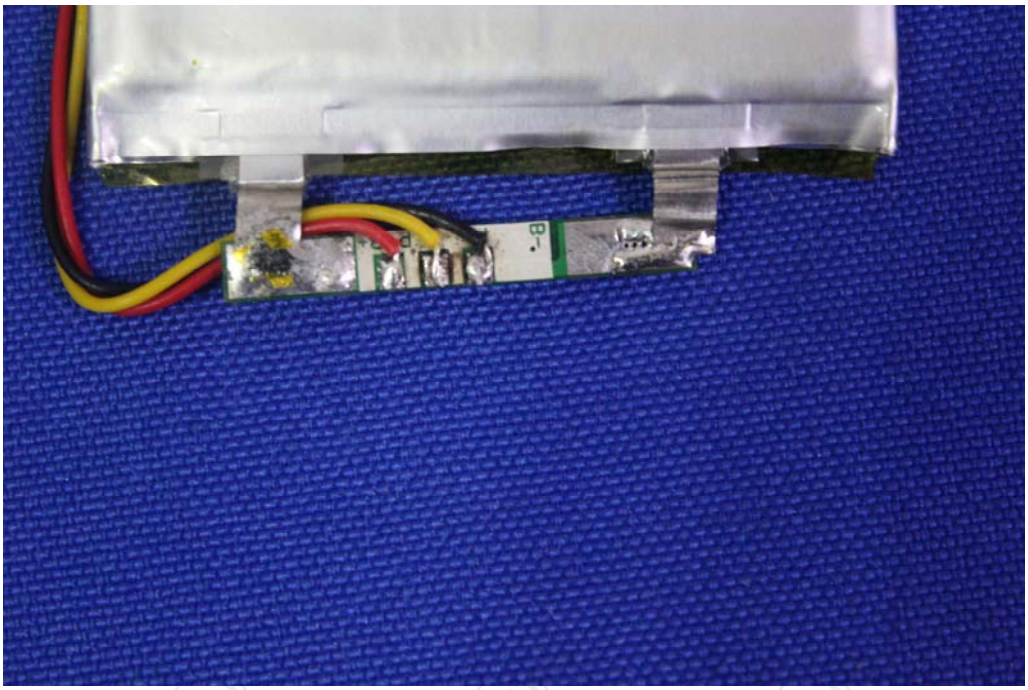

*****END OF REPORT*****

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