FCC REPORT

Applicant:	JOYO TECHNOLOGY CO., LTD
Address of Applicant:	2/F, Lushi Industry Building, 28th District, Baoan, Shenzhen, 518101 China.
Manufacturer/Factory:	JOYO TECHNOLOGY CO., LTD
Address of Manufacturer/Factory:	2/F, Lushi Industry Building, 28th District, Baoan, Shenzhen, 518101 China.

Equipment Under Test (EUT)

Product Name:	5.8G Digital Wireless Transmitter
Model No.:	JW-02
Trade Mark:	N/A
FCC ID:	2AIN7-JW-02
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249
Date of sample receipt:	April 03, 2018
Date of Test:	April 03, 2018 - May 10, 2018
Date of report issued:	May 10, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

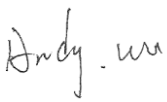
Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*May 10, 2018*	*Original*

Prepared By:  ***Date:*** *May 10, 2018*

Project Engineer

Check By:  ***Date:*** *May 10, 2018*

Reviewer

3 Contents

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

Remark: Test according to ANSI C63.10: 2013 and ANSI C63.4: 2014.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	5.8G Digital Wireless Transmitter
Model No.:	JW-02
Test Model No:	JW-02
Quantity of tested samples	1
Serial No.:	N/A
Test sample(s) ID:	N/A
Sample(s) Status	Engineer sample
Hardware:	N/A
Software:	N/A
Operation Frequency:	5731MHz-5819MHz
Channel numbers:	45
Channel separation:	2MHz
Modulation type:	GFSK
Antenna Type:	PCB antenna
Antenna gain:	0 dBi(declare by Applicant)
Power supply:	DC 3.7V From Battery, DC 5V From Adapter input AC 120V, 60Hz

Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
CH1	5731 MHz	CH21	5771 MHz	…	…
CH2	5733 MHz	CH22	5773 MHz	CH43	5815 MHz
CH3	5735 MHz	CH23	5775 MHz	CH44	5817 MHz
…	…	CH24	5777 MHz	CH45	5819 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:

Test channel	Frequency (MHz)
Lowest channel	5731 MHz
Middle channel	5775 MHz
Highest channel	5819 MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

Per-test mode .

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows: X axis is worse case and reported

Axis	X	Y	Z
Field Strength(dBuV/m)	101.56	98.35	99.98

5.3 Description of Support Units

None

5.4 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

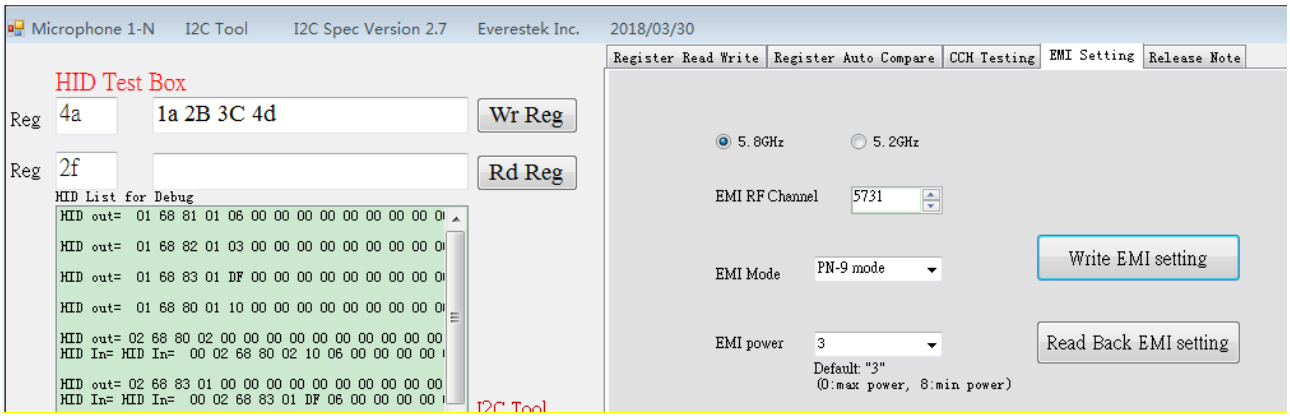
Fax: 0755-27798960

5.6 Additional instructions

Software (Used for test) from client

Mode	Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.		
Power level setup in software			
Test Software Name	I2C Tool		
Test Software Version	2.7		
Support Units (Software installation media)	Description	Manufacturer	Model
	LCD TV	PHILIPS	AU1A1212002906
Mode	Channel	Frequency (MHz)	Soft Set
GFSK	CH1	5731	TX level is built-in set parameters and cannot be changed and selected.
	CH23	5775	
	CH45	5819	

Run Software



6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 03 2015	July 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June 28 2017	June 27 2018
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2017	June 27 2018
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2017	June 27 2018
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2017	June 27 2018
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2017	June 27 2018
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 28 2017	June 27 2018
10	Coaxial Cable	GTS	N/A	GTS211	June 28 2017	June 27 2018
11	Coaxial cable	GTS	N/A	GTS210	June 28 2017	June 27 2018
12	Coaxial Cable	GTS	N/A	GTS212	June 28 2017	June 27 2018
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2017	June 27 2018
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2017	June 27 2018
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2017	June 27 2018
16	Band filter	Amindeon	82346	GTS219	June 28 2017	June 27 2018
17	Power Meter	Anritsu	ML2495A	GTS540	June 28 2017	June 27 2018
18	Power Sensor	Anritsu	MA2411B	GTS541	June 28 2017	June 27 2018

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June 28 2017	June 27 2018
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 28 2017	June 27 2018
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 28 2017	June 27 2018
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June 28 2017	June 27 2018

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	June 28 2017	June 27 2018

7 Test results and Measurement Data

7.1 Antenna requirement

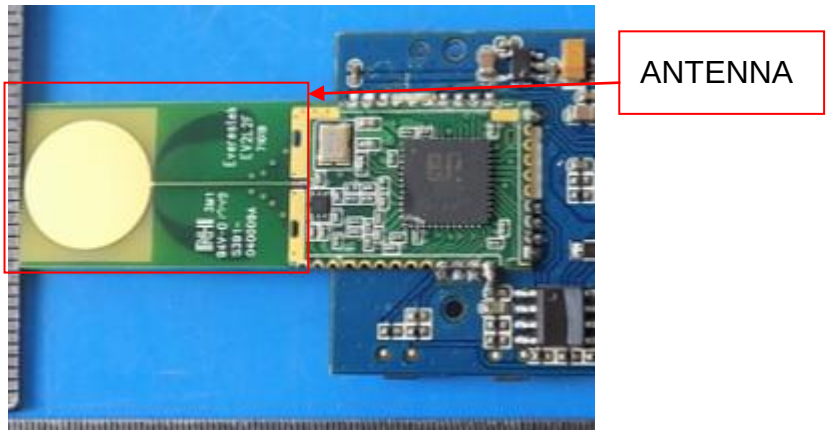
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

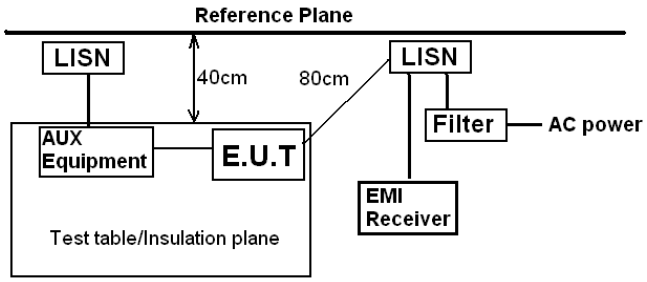
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is PCB antenna, the best case gain of the antenna is 0dBi



7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	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 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The EUT 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 C63.10: 2013 on conducted measurement.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

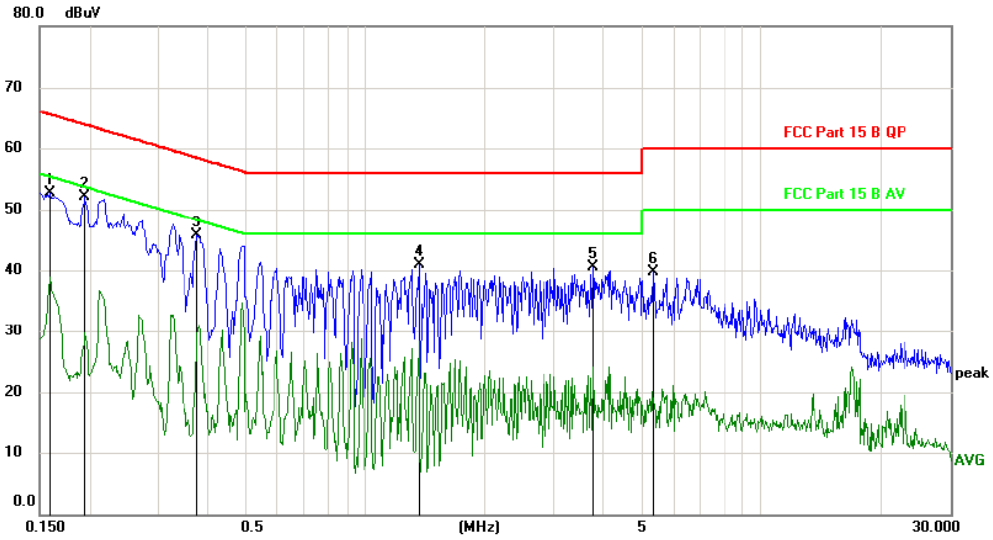
Site LAB
Limit: FCC Part 15 B QP
EUT: Digital Wireless Transmitter&Receiver
M/N: JW-02
Mode: Charging
Note:

Phase: L1
Power: AC 120V/60Hz

Temperature: 23.6
Humidity: 54 %

Conducted Emission Measurement

File :JW-02 CE Data :#3 Date: 2018-4-9 Time: 9:55:02



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1590	43.01	9.73	52.74	65.52	-12.78	peak	
2	*	0.1949	42.33	9.74	52.07	63.83	-11.76	peak	
3		0.3750	35.94	9.77	45.71	58.39	-12.68	peak	
4		1.3604	31.00	9.86	40.86	56.00	-15.14	peak	
5		3.7500	30.32	10.10	40.42	56.00	-15.58	peak	
6		5.3340	29.43	10.20	39.63	60.00	-20.37	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

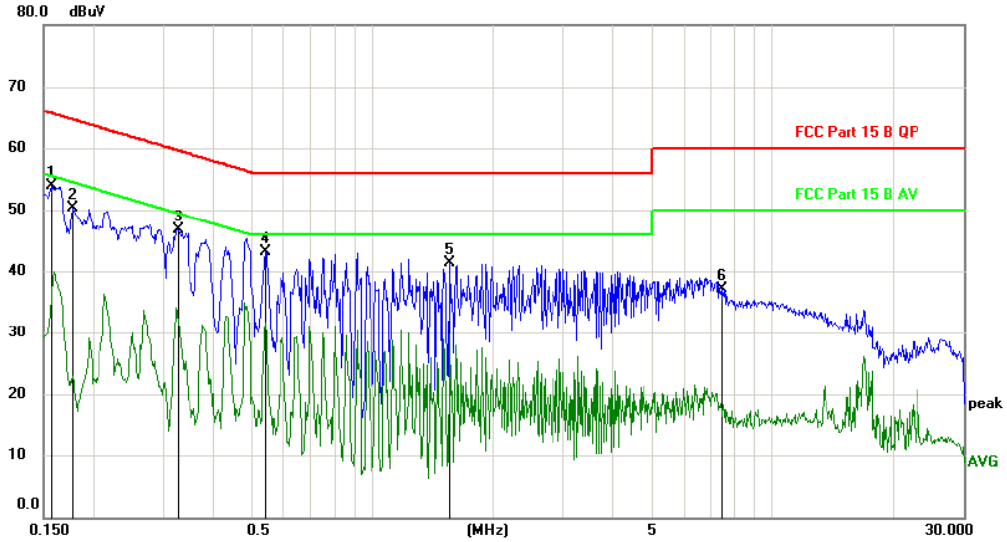
Site LAB
Limit: FCC Part 15 B QP
EUT: Digital Wireless Transmitter&Receiver
M/N: JW-02
Mode: Charging
Note:

Phase: N
Power: AC 120V/60Hz

Temperature: 23.6
Humidity: 54 %

Conducted Emission Measurement

File :JW-02 CE Data :#4 Date: 2018-4-9 Time: 10:06:24



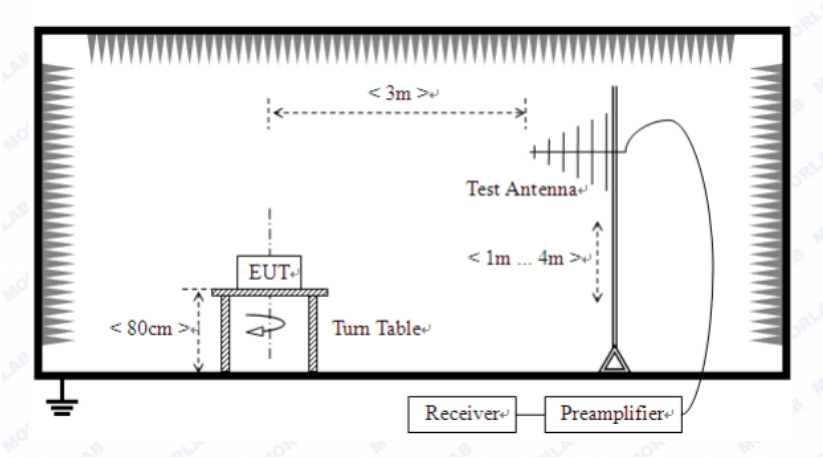
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1565	44.14	9.73	53.87	65.65	-11.78	peak	
2		0.1770	40.49	9.73	50.22	64.63	-14.41	peak	
3		0.3255	36.90	9.77	46.67	59.57	-12.90	peak	
4		0.5369	33.35	9.79	43.14	56.00	-12.86	peak	
5		1.5539	31.41	9.88	41.29	56.00	-14.71	peak	
6		7.4310	26.76	10.28	37.04	60.00	-22.96	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

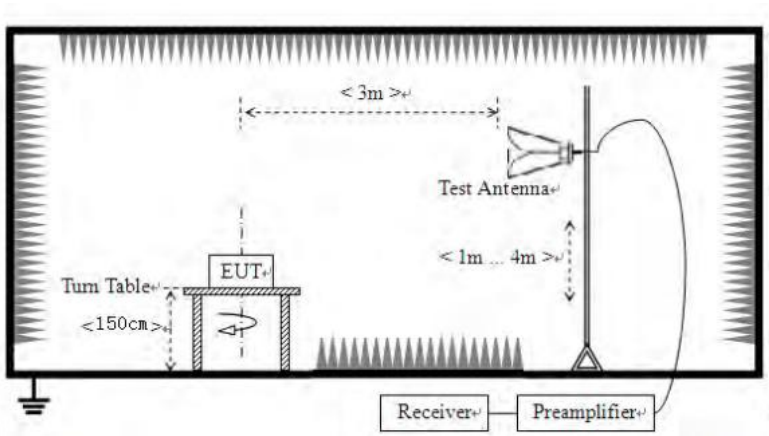
Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

7.3 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></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><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>Carrier frequency</td><td>94.00</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Spurious Emissions)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</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 setup:</td><td>Below 1GHz
 

Above 1GHz</td></tr>
</table>

	
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. 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 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 rota 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 Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5731.00	78.89	31.54	13.22	30.25	93.40	114.00	-20.60	Vertical
5775.00	78.35	31.65	13.64	30.29	93.35	114.00	-20.65	Vertical
5819.00	79.34	31.72	13.96	30.34	94.68	114.00	-19.32	Vertical
5731.00	86.22	31.54	13.22	30.25	100.73	114.00	-13.27	Horizontal
5775.00	86.75	31.65	13.64	30.29	101.75	114.00	-12.25	Horizontal
5819.00	86.75	31.72	13.96	30.34	102.09	114.00	-11.91	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5731.00	69.55	31.54	13.22	30.25	84.06	94.00	-9.94	Vertical
5775.00	69.59	31.65	13.64	30.29	84.59	94.00	-9.41	Vertical
5819.00	70.02	31.72	13.96	30.34	85.36	94.00	-8.64	Vertical
5731.00	77.09	31.54	13.22	30.25	91.60	94.00	-2.40	Horizontal
5775.00	76.69	31.65	13.64	30.29	91.69	94.00	-2.31	Horizontal
5819.00	76.66	31.72	13.96	30.34	92.00	94.00	-2.00	Horizontal

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*

NOTE: RBW 5MHz VBW 5MHz Peak detector is for PK value， RMS detector is for AV value

7.3.2 Spurious emissions

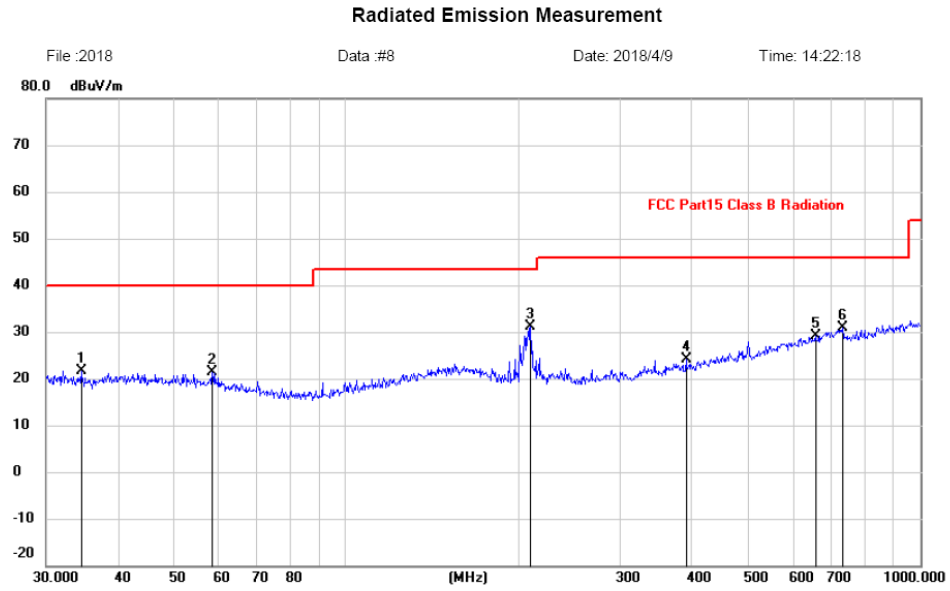
■ Below 1GHz

Horizontal:

Site LAB
Limit: FCC Part15 Class B Radiation
EUT: 5.8G Digital Wireless Transmitter
M/N: JW-02
Mode: Charging
Note:
Engineer Signature:

Polarization: *Horizontal*
Power: AC 120V/60Hz
Distance: 3m

Temperature: 23.9
Humidity: 46 %



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		34.5173	8.20	13.49	21.69	40.00	-18.31	peak			
2		58.4074	8.20	13.11	21.31	40.00	-18.69	peak			
3	*	209.3129	20.37	10.67	31.04	43.50	-12.46	peak			
4		392.0951	8.74	15.40	24.14	46.00	-21.86	peak			
5		658.8362	8.94	20.23	29.17	46.00	-16.83	peak			
6		731.9203	9.44	21.38	30.82	46.00	-15.18	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Vertical:

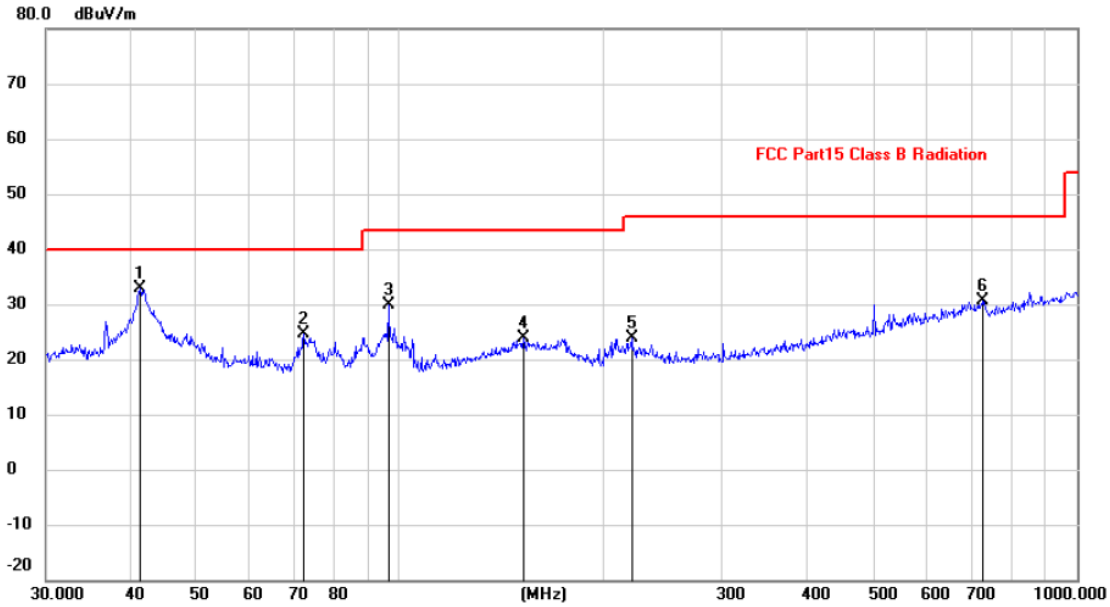
Site LAB
Limit: FCC Part15 Class B Radiation
EUT: 5.8G Digital Wireless Transmitter
M/N: JW-02
Mode: Charging
Note:
Engineer Signature:

Polarization: *Vertical*
Power: AC 120V/60Hz
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :2018 Data :#7 Date: 2018/4/9 Time: 14:20:29



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	41.2765	18.68	14.11	32.79	40.00	-7.21	peak			
2		72.0843	13.91	10.67	24.58	40.00	-15.42	peak			
3		96.4362	19.51	10.31	29.82	43.50	-13.68	peak			
4		152.1297	9.22	14.56	23.78	43.50	-19.72	peak			
5		219.8449	12.59	11.30	23.89	46.00	-22.11	peak			
6		726.8052	9.28	21.33	30.61	46.00	-15.39	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

■ Above 1GHz

Test channel:	Channel 1

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11462.00	39.09	34.27	14.78	31.78	56.36	74.00	-17.64	Vertical
17193.00	35.53	36.32	15.65	32.03	55.47	74.00	-18.53	Vertical
22924.00	35.89	38.51	16.14	32.12	58.42	74.00	-15.58	Vertical
28665.00	*					74.00		Vertical
40000.00	*					74.00		Vertical
11462.00	43.79	34.27	14.78	31.78	61.06	74.00	-12.94	Horizontal
17193.00	38.87	36.32	15.65	32.03	58.81	74.00	-15.19	Horizontal
22924.00	37.57	38.51	16.14	32.12	60.10	74.00	-13.90	Horizontal
28665.00	*					74.00		Horizontal
40000.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11462.00	26.73	34.27	14.78	31.78	44.00	54.00	-10.00	Vertical
17193.00	23.74	36.32	15.65	32.03	43.68	54.00	-10.32	Vertical
22924.00	20.95	38.51	16.14	32.12	43.48	54.00	-10.52	Vertical
28665.00	*					54.00		Vertical
40000.00	*					54.00		Vertical
11462.00	30.89	34.27	14.78	31.78	48.16	54.00	-5.84	Horizontal
17193.00	26.51	36.32	15.65	32.03	46.45	54.00	-7.55	Horizontal
22924.00	23.49	38.51	16.14	32.12	46.02	54.00	-7.98	Horizontal
28665.00	*					54.00		Horizontal
40000.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test channel:	Channel 23

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.00	39.84	34.29	14.79	31.79	57.13	74.00	-16.87	Vertical
17325.00	35.88	36.34	15.66	32.04	55.84	74.00	-18.16	Vertical
23100.00	35.33	38.53	16.15	32.13	57.88	74.00	-16.12	Vertical
28875.00	*					74.00		Vertical
40000.00	*					74.00		Vertical
11550.00	43.56	34.29	14.79	31.79	60.85	74.00	-13.15	Horizontal
17325.00	39.21	36.34	15.66	32.04	59.17	74.00	-14.83	Horizontal
23100.00	37.95	38.53	16.15	32.13	60.50	74.00	-13.50	Horizontal
28875.00	*					74.00		Horizontal
40000.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.00	26.68	34.29	14.79	31.79	43.97	54.00	-10.03	Vertical
17325.00	23.63	36.34	15.66	32.04	43.59	54.00	-10.41	Vertical
23100.00	21.91	38.53	16.15	32.13	44.46	54.00	-9.54	Vertical
28875.00	*					54.00		Vertical
40000.00	*					54.00		Vertical
11550.00	31.00	34.29	14.79	31.79	48.29	54.00	-5.71	Horizontal
17325.00	27.19	36.34	15.66	32.04	47.15	54.00	-6.85	Horizontal
23100.00	23.53	38.53	16.15	32.13	46.08	54.00	-7.92	Horizontal
28875.00	*					54.00		Horizontal
40000.00	*					54.00		Horizontal

Remark:

4. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
5. *"*", means this data is the too weak instrument of signal is unable to test.*
6. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test channel:	Channel 45

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11638.00	39.51	34.31	14.80	31.80	56.82	74.00	-17.18	Vertical
17457.00	35.89	36.36	15.67	32.05	55.87	74.00	-18.13	Vertical
23276.00	35.13	38.55	16.16	32.14	57.70	74.00	-16.30	Vertical
29095.00	*					74.00		Vertical
40000.00	*					74.00		Vertical
11638.00	43.61	34.31	14.80	31.80	60.92	74.00	-13.08	Horizontal
17457.00	39.20	36.36	15.67	32.05	59.18	74.00	-14.82	Horizontal
23276.00	37.80	38.55	16.16	32.14	60.37	74.00	-13.63	Horizontal
29095.00	*					74.00		Horizontal
40000.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11638.00	27.06	34.31	14.80	31.80	44.37	54.00	-9.63	Vertical
17457.00	24.24	36.36	15.67	32.05	44.22	54.00	-9.78	Vertical
23276.00	21.04	38.55	16.16	32.14	43.61	54.00	-10.39	Vertical
29095.00	*					54.00		Vertical
40000.00	*					54.00		Vertical
11638.00	31.28	34.31	14.80	31.80	48.59	54.00	-5.41	Horizontal
17457.00	26.30	36.36	15.67	32.05	46.28	54.00	-7.72	Horizontal
23276.00	23.38	38.55	16.16	32.14	45.95	54.00	-8.05	Horizontal
29095.00	*					54.00		Horizontal
40000.00	*					54.00		Horizontal

Remark:

7. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
8. *"*", means this data is the too weak instrument of signal is unable to test.*
9. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

7.3.3 Bandedge emissions

Test channel:	channel 1

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5725.00	39.38	31.54	13.22	30.25	53.89	74.00	-20.11	Vertical
5875.00	35.74	31.65	13.64	30.29	50.74	74.00	-23.26	Vertical
5725.00	40.04	31.54	13.22	30.25	54.55	74.00	-19.45	Horizontal
5875.00	38.73	31.65	13.64	30.29	53.73	74.00	-20.27	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5725.00	23.58	31.54	13.22	30.25	38.09	54.00	-15.91	Vertical
5875.00	23.55	31.65	13.64	30.29	38.55	54.00	-15.45	Vertical
5725.00	23.93	31.54	13.22	30.25	38.44	54.00	-15.56	Horizontal
5875.00	23.68	31.65	13.64	30.29	38.68	54.00	-15.32	Horizontal

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*

Test channel:	channel 45

Peak value:

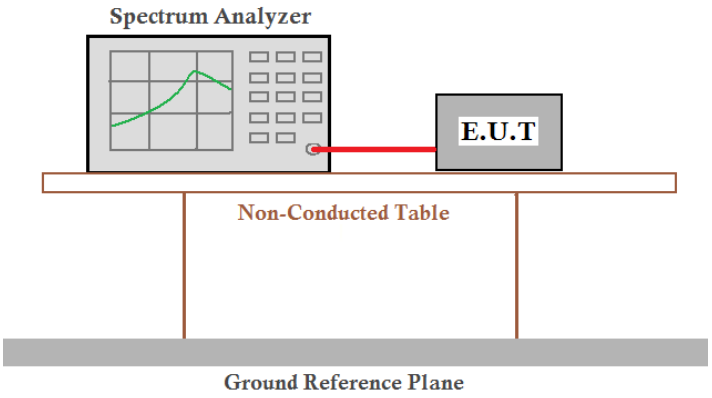
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5725.00	39.98	31.54	13.22	30.25	54.49	74.00	-19.51	Vertical
5875.00	35.82	31.65	13.64	30.29	50.82	74.00	-23.18	Vertical
5725.00	40.04	31.54	13.22	30.25	54.55	74.00	-19.45	Horizontal
5875.00	38.57	31.65	13.64	30.29	53.57	74.00	-20.43	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5725.00	23.69	31.54	13.22	30.25	38.20	54.00	-15.80	Vertical
5875.00	23.82	31.65	13.64	30.29	38.82	54.00	-15.18	Vertical
5725.00	24.60	31.54	13.22	30.25	39.11	54.00	-14.89	Horizontal
5875.00	23.86	31.65	13.64	30.29	38.86	54.00	-15.14	Horizontal

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*

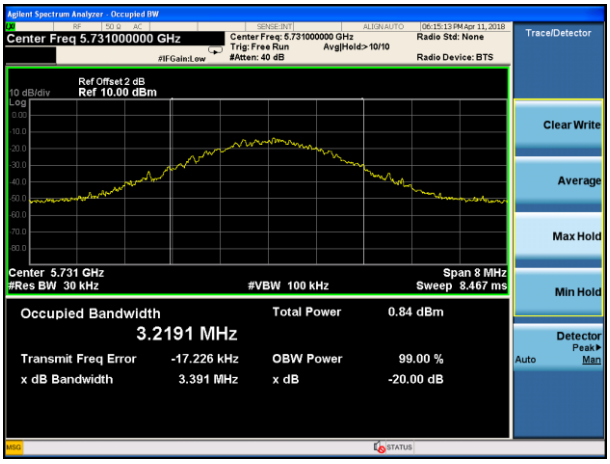
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 5725-5875 MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

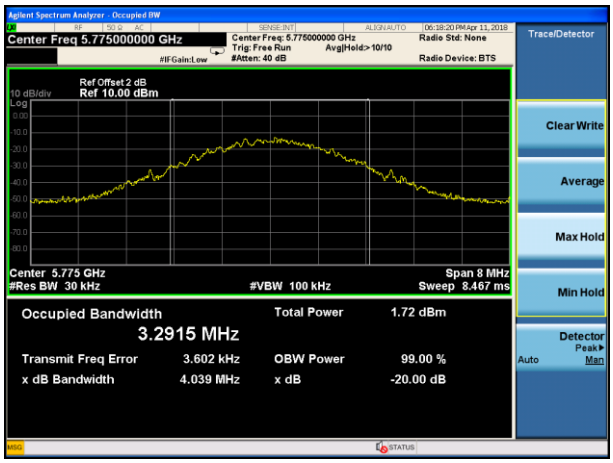
Measurement Data

Test channel	20dB bandwidth(MHz)	Result
1	3.391	Pass
23	4.039	Pass
45	3.365	Pass

Test plot as follows:



CH1



CH23

CH45

8 Test Setup Photo

Radiated Emission

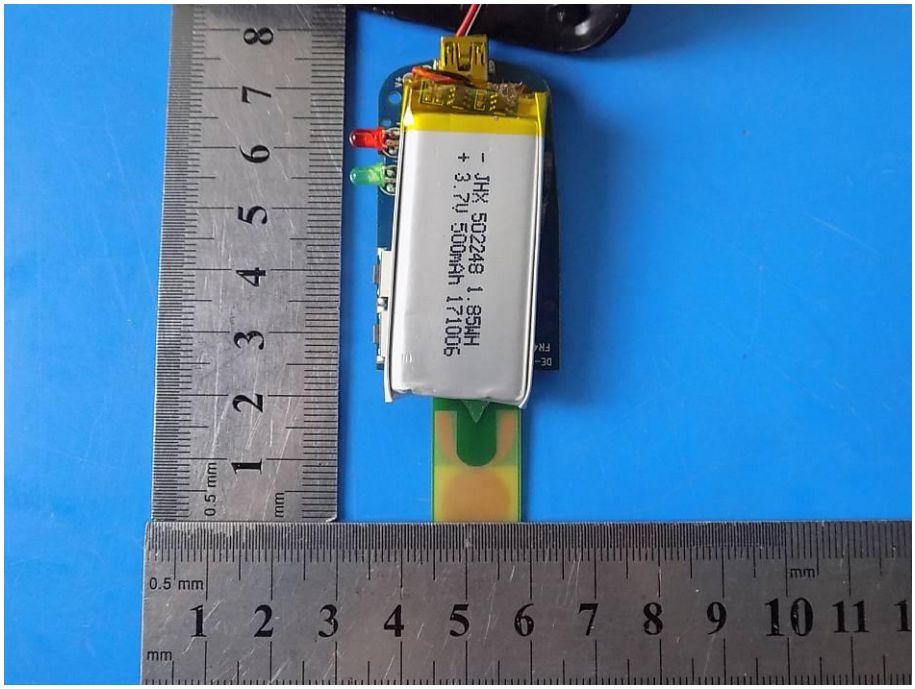
Conducted Emission

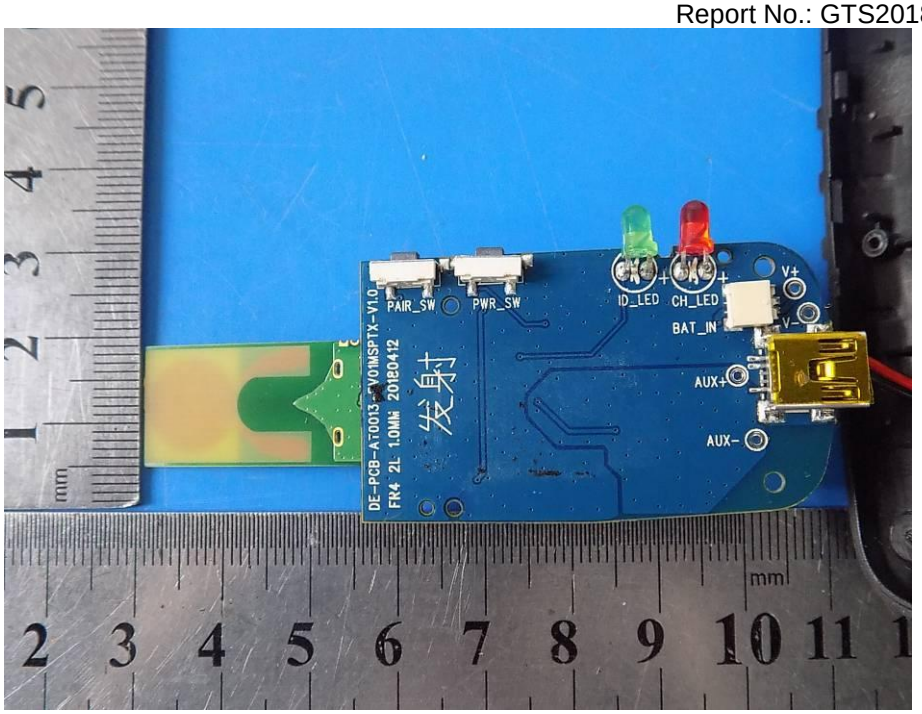
9 EUT Constructional Details


JW-02 TRANSMITTER
JOYO


JW-02 TRANSMITTER
JOYO


- JHX 502248 1.85WH
+ 3.7V 500mAh 171006


- JHX 502248 1.85WH
+ 3.7V 500mAh 171006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PWR_SW
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CH_LED
V+
V-
BAT_IN
AUX+
AUX-
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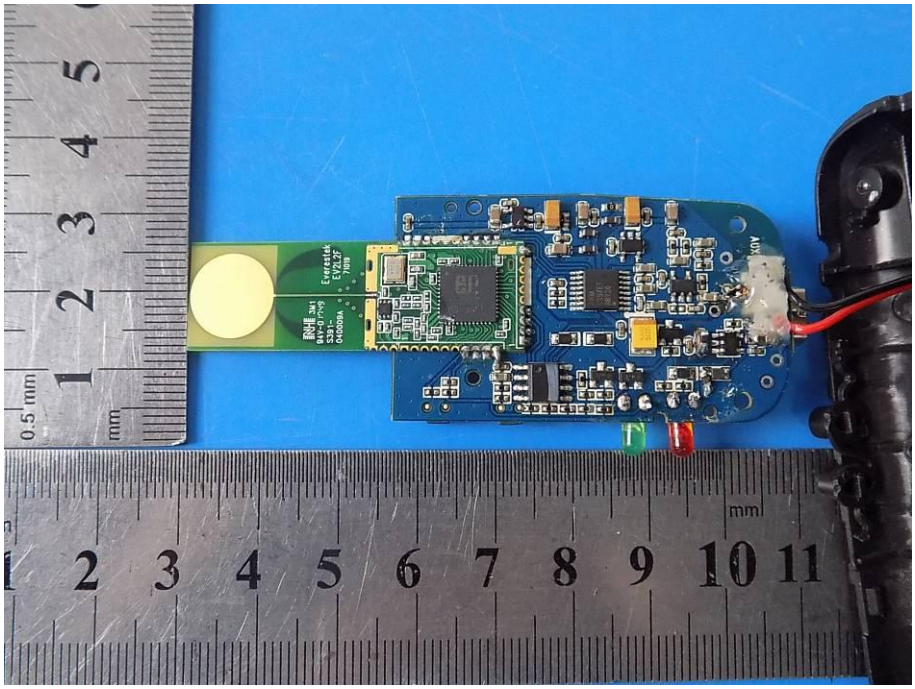
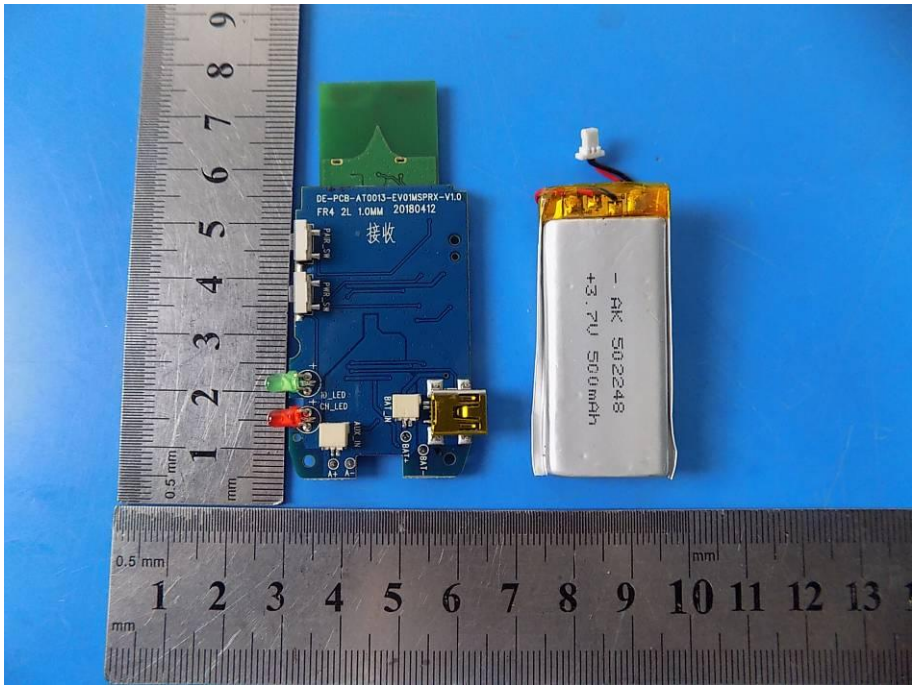
FR4 2L 1.0MM 201E0412
发射
mm


0.5 mm
mm


JOYO
JW-02 RECEIVER


JOYO
JW-02 RECEIVER


- AK 502248
+3.7V 500mAh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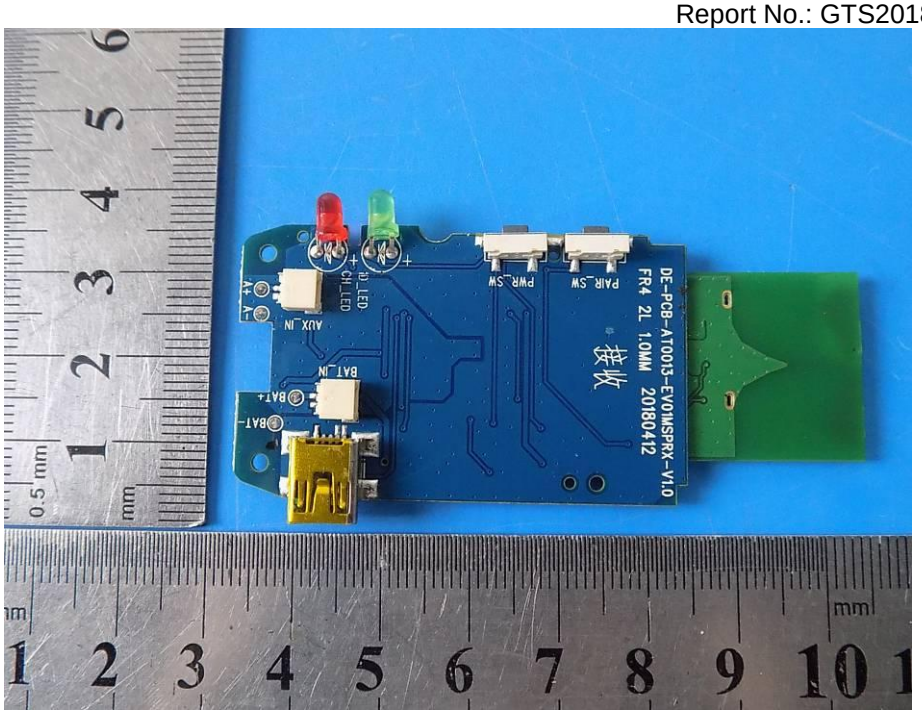
接收
- AK 502248
+3.7V 500mAh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BL_LED
CH_LED
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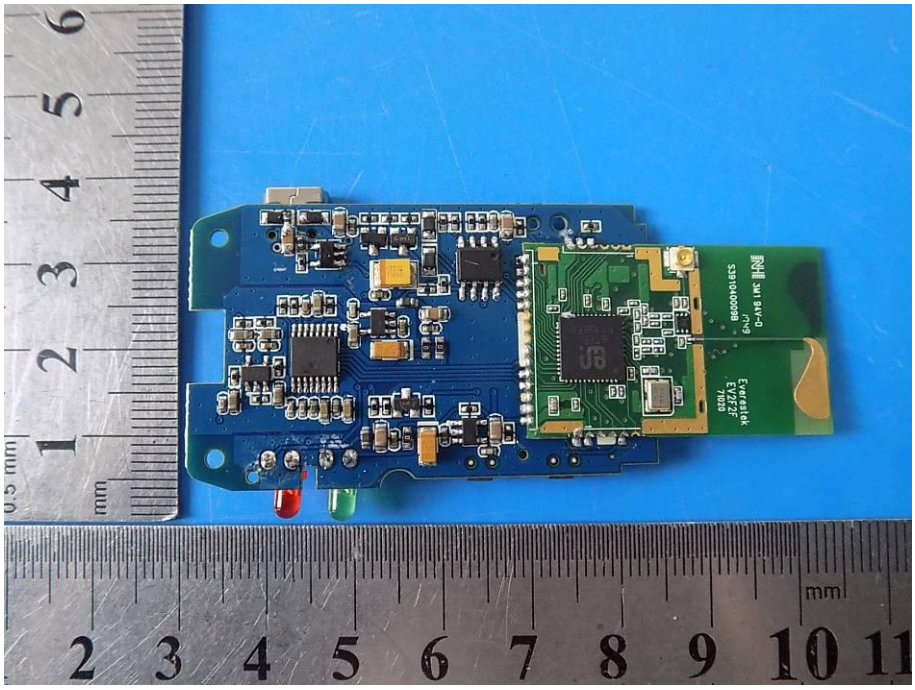
BAT_IN
BAT+
BAT-



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