Shenzhen EBO Technology Co., Ltd.

A112~114, Qinye Business Center, Xin'an Sixth Road, 82th District,
Bao'an, Shenzhen, China.
Telephone: +86-755-29451282,
Fax: +86-755-22639141

TEST REPORT

Applicant:	EKEN GROUP LIMITED
Address of Applicant:	Room 2511-2512, Meilan Business Center, Qianjin Two Road, XiXiang, Baoan District, ShenZhen, China

Equipment Under Test (EUT)

Product Name:	ACTION CAMERA
Model No.:	Pano360 Pro, Pano360, Pano360 se
FCC ID:	2ADDG-PANO360
Applicable standards:	FCC CFR Title 47 Part 15 Subpart B:2015
Date of sample receipt:	February 16, 2017
Date of Test:	February 16, 2017 To March 09.2017
Date of report issue:	March 09.2017
Test Result :	PASS *

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

Authorized Signature:

Kevin Yu
Laboratory Manager

2 Version

Version No.	Date	Description
00	*March 09.2017*	*Original*

Prepared By:  ***Date:*** *March 09.2017*

Project Engineer

Check By:  ***Date:*** *March 09.2017*

Reviewer

3 Contents

4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part15.107	PASS
Radiated Emissions	Part15.109	PASS

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

Remark： Test according to 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 Client Information

Applicant:	EKEN GROUP LIMITED
Address of Applicant:	Room 2511-2512, Meilan Business Center, Qianjin Two Road, XiXiang, Baoan District, ShenZhen, China
Manufacturer:	EKEN GROUP LIMITED
Address of Manufacturer:	Room 2511-2512, Meilan Business Center, Qianjin Two Road, XiXiang, Baoan District, ShenZhen, China

5.2 General Description of EUT

Product Name:	ACTION CAMERA
Model No.:	Pano360 Pro, Pano360, Pano360 se
Test Model:	Pano360 Pro
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The only difference is the model name and battery capacity for commercial purpose.	
Power Supply:	DC 3.7V 2*650mAh battery or DC 5V/1.5A POWER ADAPTER MODEL: ZXT-051500E INPUT: AC 100-240V,50/60Hz,0.4A OUTPUT: DC 5V/1.5A

5.3 Test mode

Test mode:	
REC mode	Keep the EUT in video record mode.
PC mode	Keep the EUT in data exchange with pc

5.4 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully
described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter
from the FCC is maintained in files. Registration 600491, June 22, 2016.

● **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.

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

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
Apple	PC	A1278	C1MN99ERDTY3	Doc
Kingston	TF card	SD-C01G	N/A	Doc
DELL	KEYBOARD	SK-8115	GTS237-2	Doc
DELL	MOUSE	MOC5UO	GTS237-3	Doc

5.7 Deviation from Standards

Biconical, log.per. antenna and horn antenna were used instead of dipole antenna.
Semi-anechoic Chamber was used as alternation of open air test sites, and all test suites were performed with radiated method in it.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

6 Test Instruments list

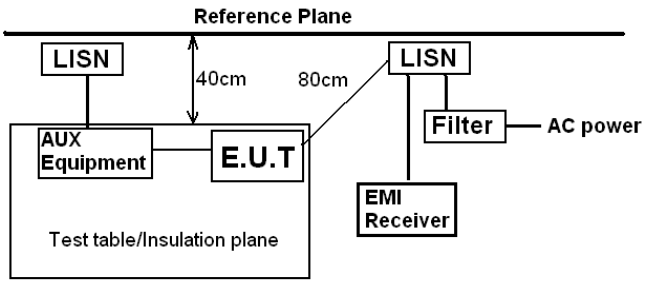
Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	June. 29 2016	June. 28 2017
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June. 29 2016	June. 28 2017
5	Double-ridged horn antenna	SCHWARZBECK	9120D	GTS208	June. 29 2016	June. 28 2017
6	RF Amplifier	HP	8347A	GTS204	June. 29 2016	June. 28 2017
7	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	June. 29 2016	June. 28 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	June. 29 2016	June. 28 2017
10	Coaxial Cable	GTS	N/A	GTS211	June. 29 2016	June. 28 2017
11	Thermo meter	N/A	N/A	GTS256	June. 29 2016	June. 28 2017

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. 29 2016	June. 28 2017
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June. 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June. 28 2017
5	Coaxial Cable	GTS	N/A	GTS227	June. 29 2016	June. 28 2017
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 29 2016	June. 28 2017

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	Jun. 29 2016	Jun. 28 2017

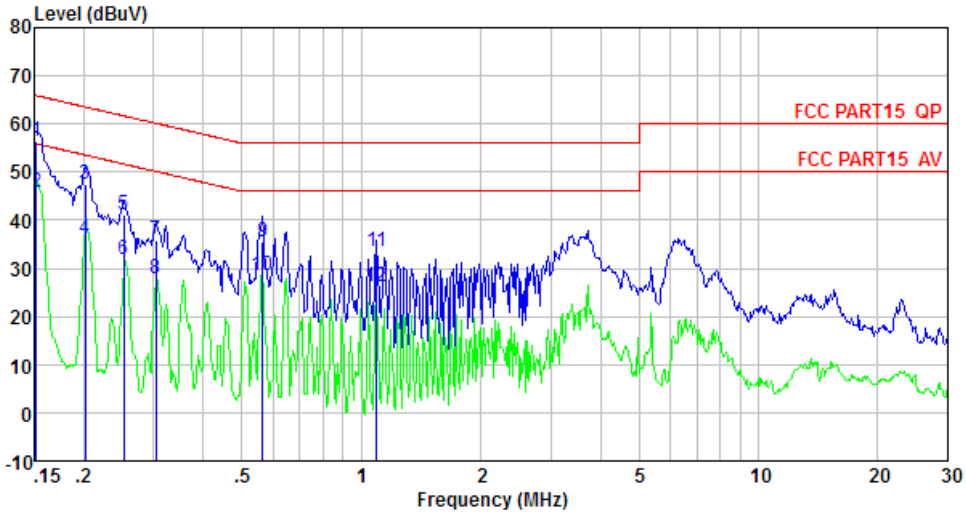
7 Test Results and Measurement Data

7.1 Conducted Emissions

Test Requirement:	FCC Part15 B Section 15.107
Test Method:	ANSI C63.4:2014
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 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: 2014 on conducted measurement.
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

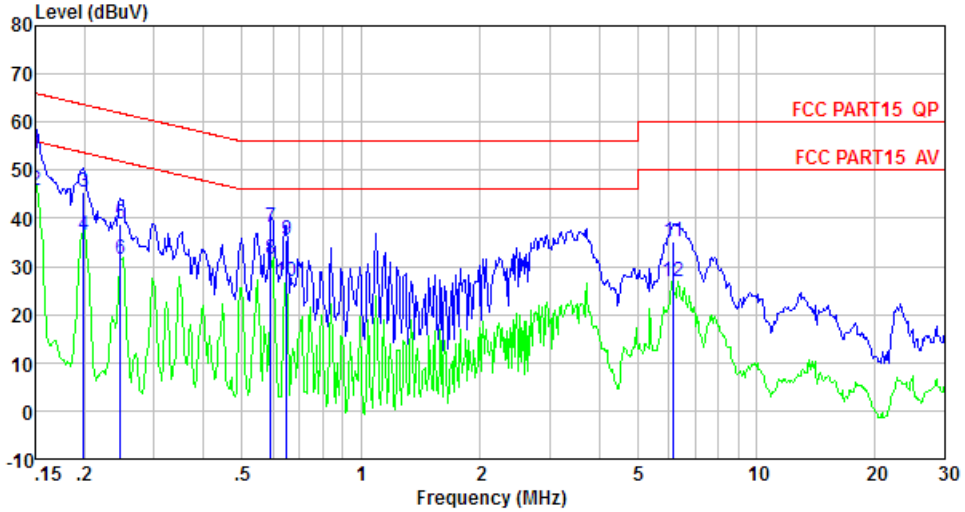
Measurement Data

Test mode	PC mode	Polarization	Line



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.152	55.73	0.42	0.12	56.27	65.91	-9.64	QP
0.152	45.35	0.42	0.12	45.89	55.91	-10.02	Average
0.202	46.84	0.43	0.13	47.40	63.54	-16.14	QP
0.202	35.66	0.43	0.13	36.22	53.54	-17.32	Average
0.252	40.43	0.44	0.11	40.98	61.69	-20.71	QP
0.252	31.24	0.44	0.11	31.79	51.69	-19.90	Average
0.303	35.21	0.44	0.10	35.75	60.15	-24.40	QP
0.303	27.19	0.44	0.10	27.73	50.15	-22.42	Average
0.564	35.08	0.33	0.12	35.53	56.00	-20.47	QP
0.564	27.95	0.33	0.12	28.40	46.00	-17.60	Average
1.094	33.15	0.25	0.13	33.53	56.00	-22.47	QP
1.094	25.78	0.25	0.13	26.16	46.00	-19.84	Average

Test mode	PC mode	Polarization	Neutral



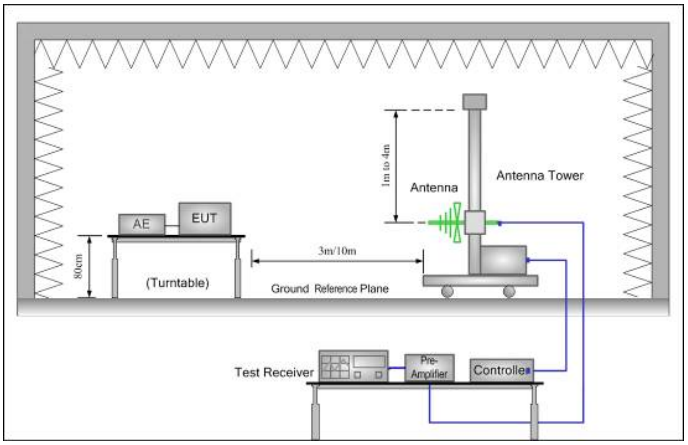
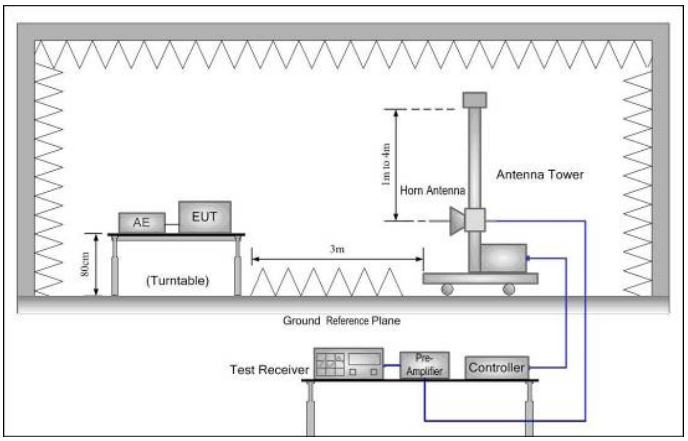
Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.150	53.05	0.41	0.12	53.58	66.00	-12.42	QP
0.150	45.27	0.41	0.12	45.80	56.00	-10.20	Average
0.199	44.86	0.41	0.13	45.40	63.67	-18.27	QP
0.199	35.82	0.41	0.13	36.36	53.67	-17.31	Average
0.247	38.29	0.42	0.11	38.82	61.86	-23.04	QP
0.247	30.88	0.42	0.11	31.41	51.86	-20.45	Average
0.592	37.71	0.28	0.12	38.11	56.00	-17.89	QP
0.592	31.25	0.28	0.12	31.65	46.00	-14.35	Average
0.647	35.26	0.26	0.13	35.65	56.00	-20.35	QP
0.647	26.45	0.26	0.13	26.84	46.00	-19.16	Average
6.186	34.70	0.21	0.16	35.07	60.00	-24.93	QP
6.186	26.65	0.21	0.16	27.02	50.00	-22.98	Average

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.

7.2 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 B Section 15.109</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2014</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</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:</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>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 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.
</td></tr>
</table>

Test setup:	Below 1GHz  Above 1GHz  					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Measurement Record:	Uncertainty: ± 4.5dB					
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

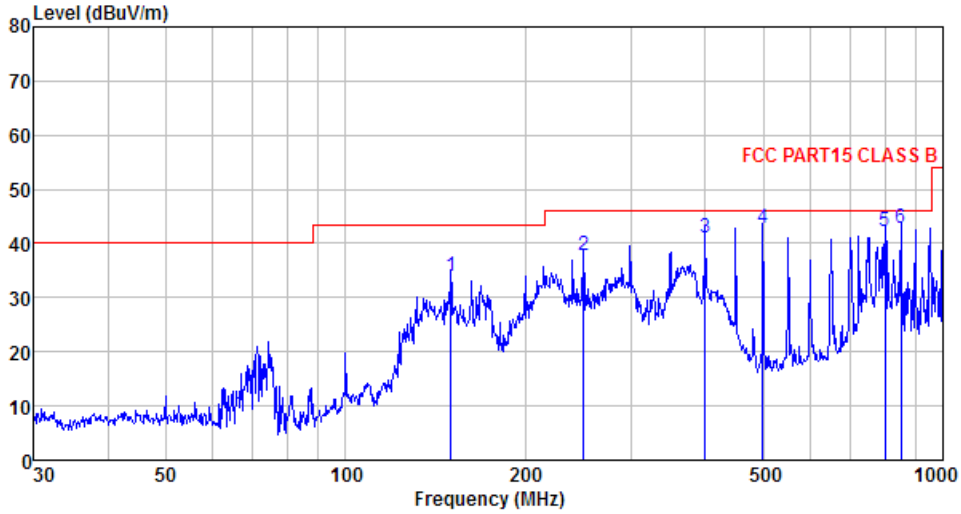
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

For above 1GHz test ,1GHz to 25GHz all have been tested, only worse case 1GHz to 6GHz is reported, from 6GHz to 25GHz, no emission is found.

Measurement Data

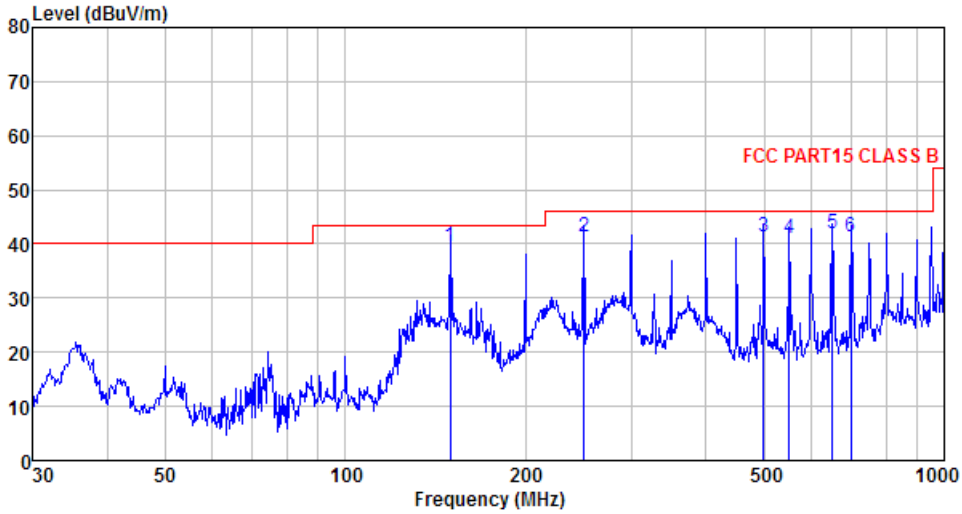
Below 1GHz

Test mode	PC mode	Polarization	Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
150.011	54.52	7.50	1.57	29.60	33.99	43.50	-9.51	QP
250.301	53.52	11.85	2.12	29.79	37.70	46.00	-8.30	QP
400.432	52.23	15.50	2.85	29.60	40.98	46.00	-5.02	QP
499.425	51.37	17.50	3.30	29.50	42.67	46.00	-3.33	QP
798.980	45.65	21.30	4.45	29.10	42.30	46.00	-3.70	QP
851.035	45.72	21.75	4.66	29.20	42.93	46.00	-3.07	QP

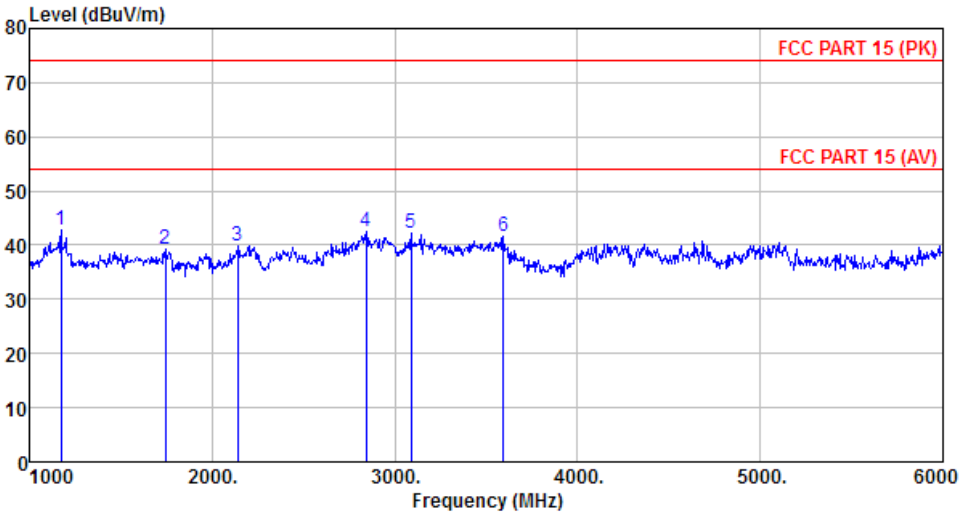
Test mode	PC mode	Polarization	Vertical



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
149.486	60.06	7.50	1.56	29.60	39.52	43.50	-3.98	QP
250.301	57.14	11.85	2.12	29.79	41.32	46.00	-4.68	QP
499.425	50.04	17.50	3.30	29.50	41.34	46.00	-4.66	QP
550.948	48.64	18.40	3.53	29.45	41.12	46.00	-4.88	QP
649.660	47.66	19.55	3.91	29.30	41.82	46.00	-4.18	QP
699.305	46.60	19.79	4.08	29.20	41.27	46.00	-4.73	QP

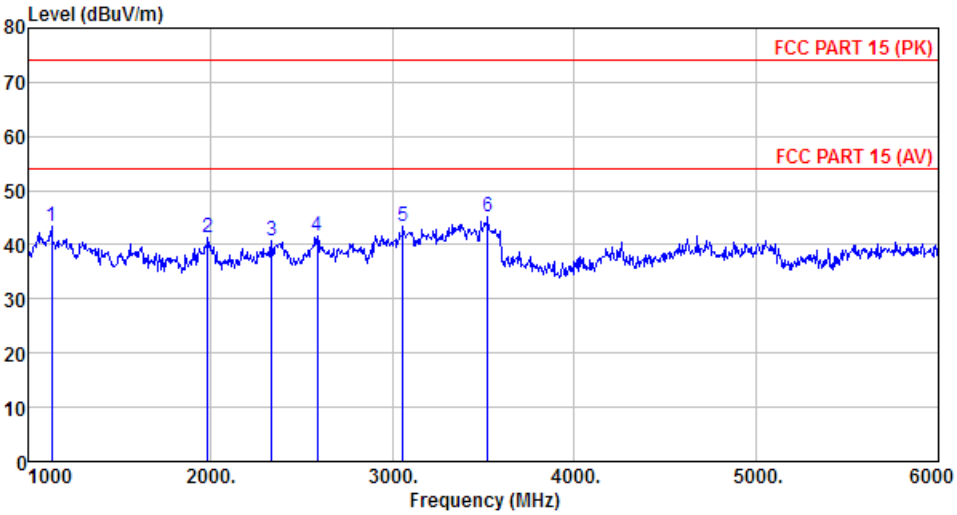
Above 1GHz

Test mode	PC mode	Polarization	Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
1175.000	46.09	25.20	4.45	33.04	42.70	74.00	-31.30	Peak
1745.000	43.27	25.06	4.83	34.03	39.13	74.00	-34.87	Peak
2140.000	41.66	27.46	5.12	34.30	39.94	74.00	-34.06	Peak
2845.000	41.92	28.39	5.80	33.49	42.62	74.00	-31.38	Peak
3090.000	40.67	28.69	6.12	33.22	42.26	74.00	-31.74	Peak
3595.000	37.89	29.13	7.15	32.64	41.53	74.00	-32.47	Peak

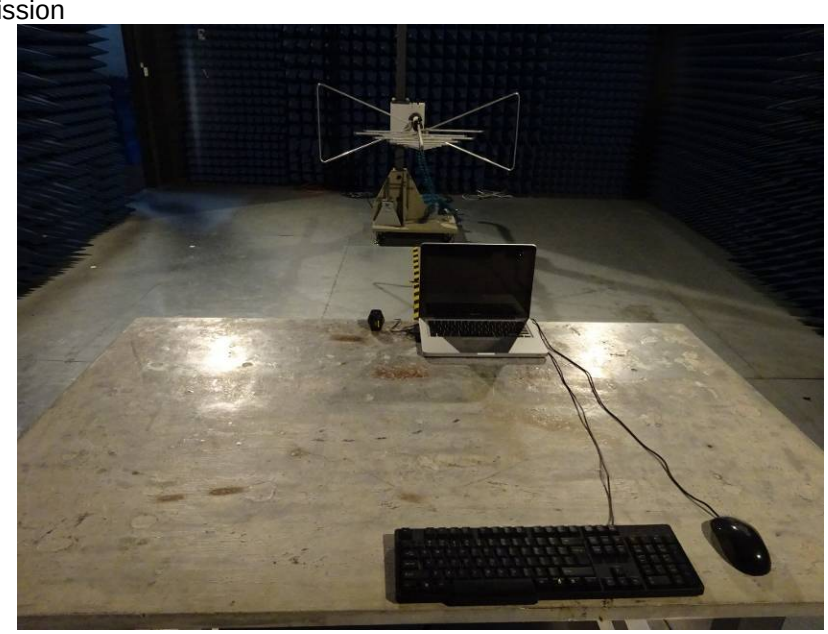
Test mode	PC mode	Polarization	Vertical



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1130.000	46.98	24.89	4.41	32.98	43.30	74.00	-30.70	Peak
1985.000	44.65	26.06	4.95	34.43	41.23	74.00	-32.77	Peak
2340.000	41.82	27.77	5.33	34.07	40.85	74.00	-33.15	Peak
2590.000	42.08	27.77	5.57	33.78	41.64	74.00	-32.36	Peak
3060.000	42.07	28.66	6.06	33.26	43.53	74.00	-30.47	Peak
3525.000	41.82	29.04	7.01	32.71	45.16	74.00	-28.84	Peak

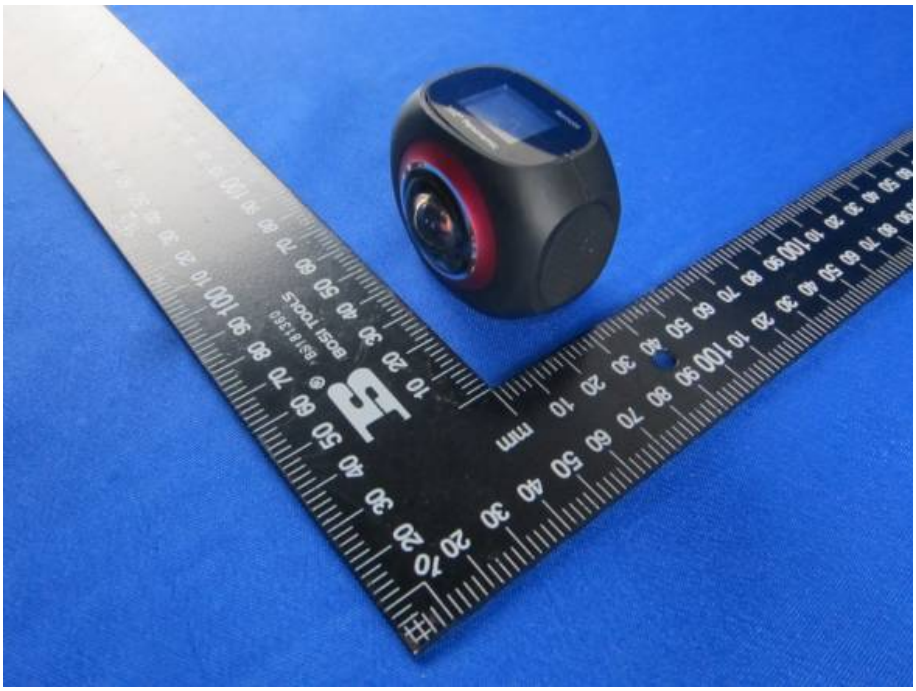
8 Test Setup Photo

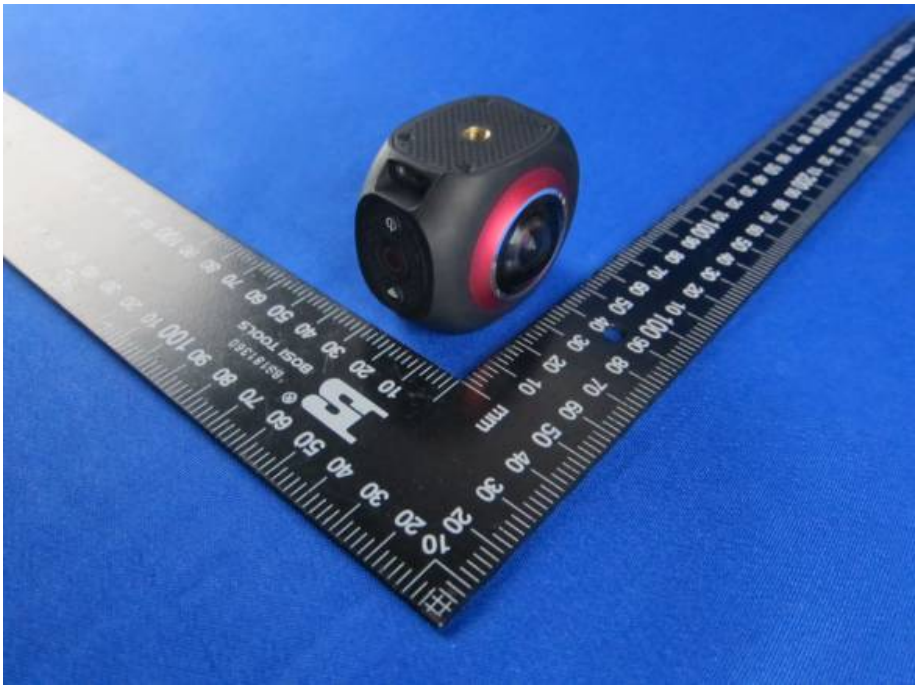
Radiated Emission

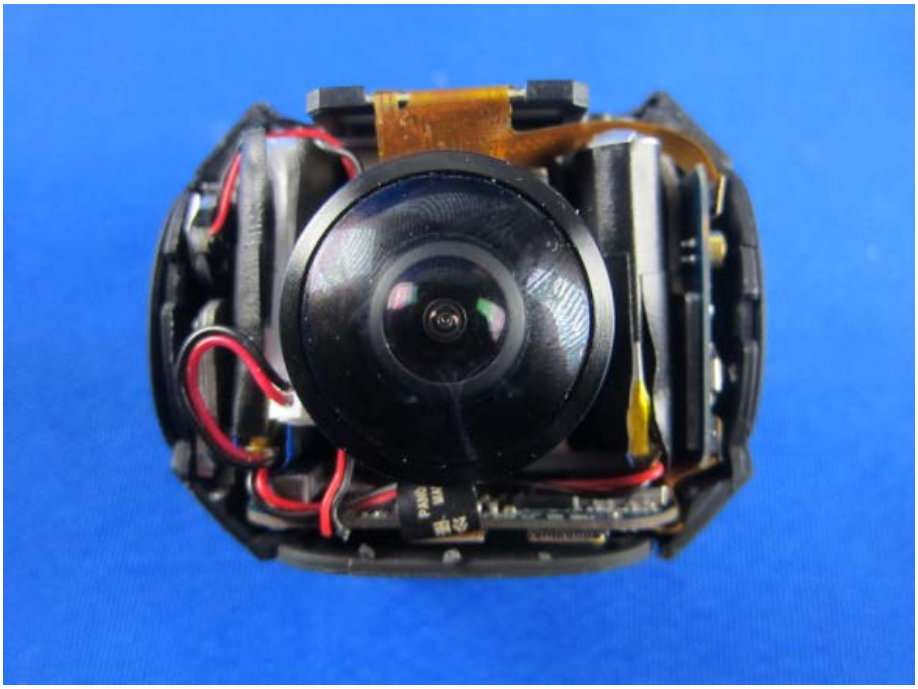


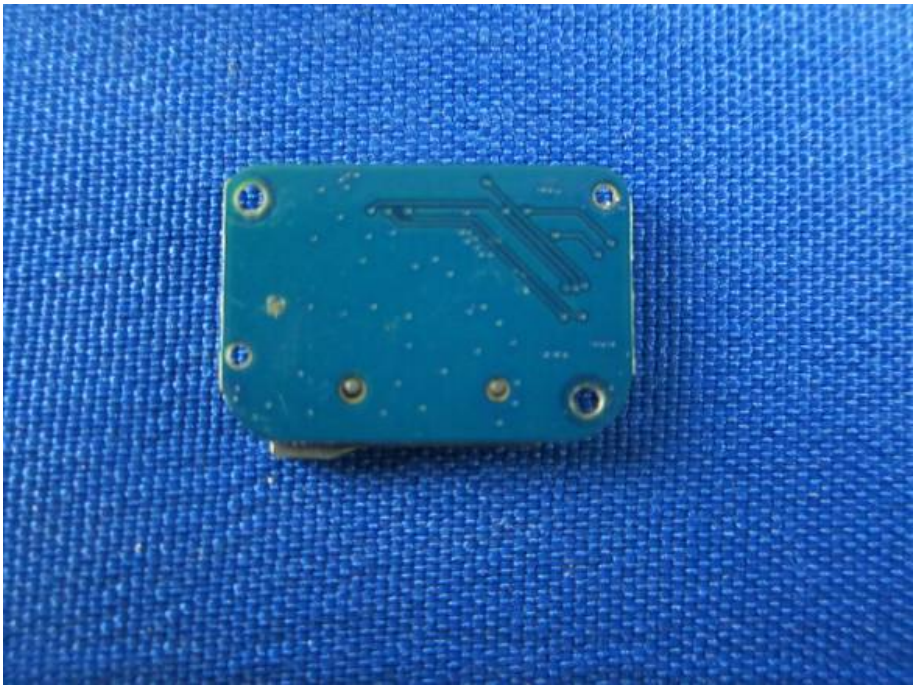
Conducted Emission

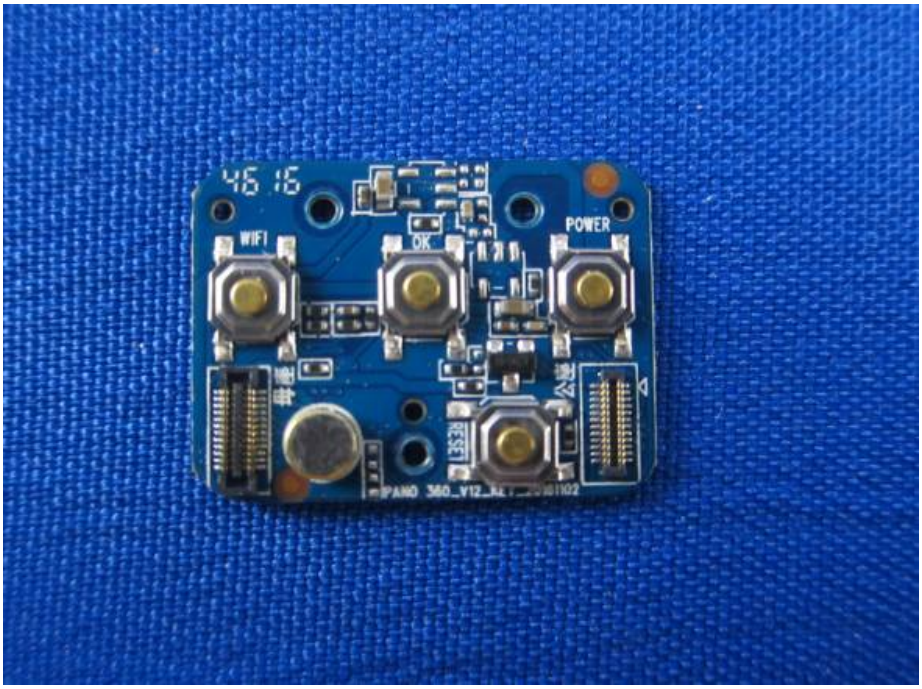
9 EUT Constructional Details

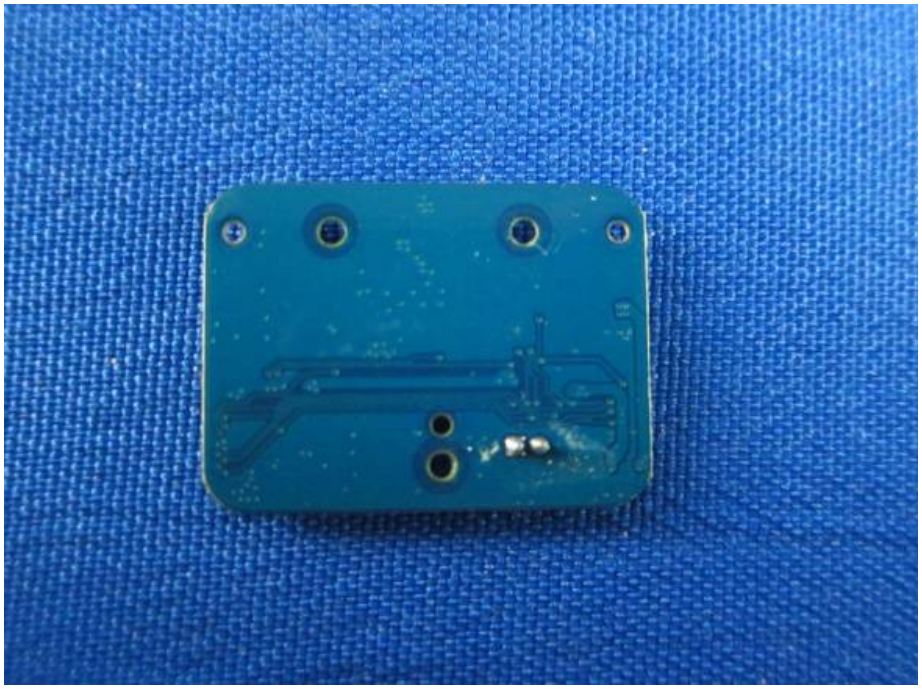


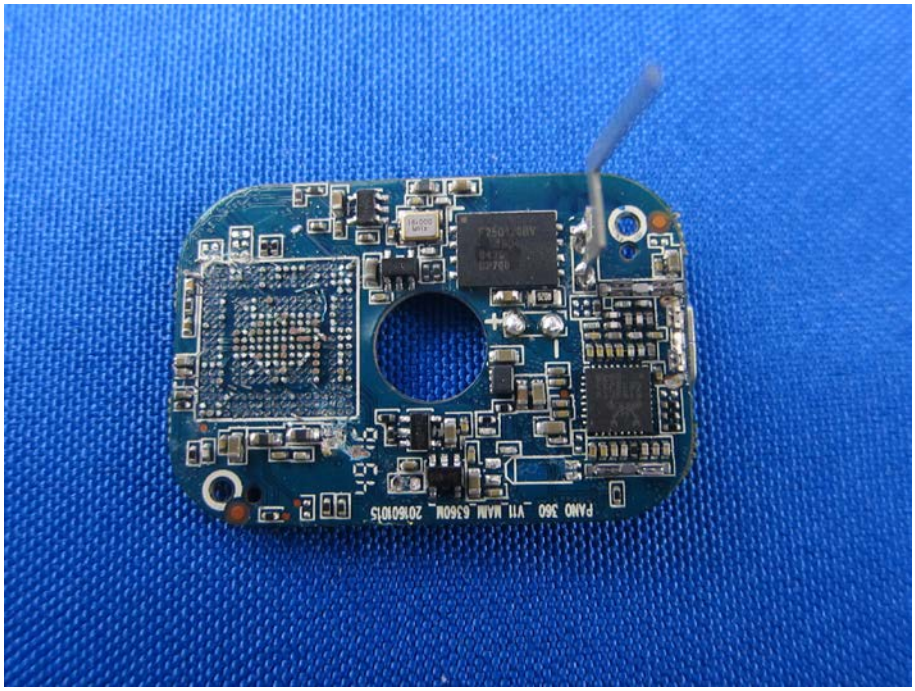












------ End------