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# **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.: R360, H350, R350, K350, G350, H360, K360, G360

FCC ID: 2ADDG-R360

Applicable standards: FCC CFR Title 47 Part 15 Subpart B:2014

Date of sample receipt: July 27, 2016

**Date of Test:** July 27, 2016 To August 22, 2016

**Date of report issue:** August 22, 2016

Test Result: PASS \*

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

Authorized Signature:

Kevin Yu Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the EBO product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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### 2 Version

Version No.	Date	Description
00	August 22, 2016	Original

Prepared By:	Jason	Date:	August 22, 2016
	Project Engineer		
Check By:	Congr	Date:	August 22, 2016
	Reviewer		



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### 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.

Test according to ANSI C63.4-2014

### 4.1 Measurement Uncertainty

Test Item	Frequency Range Measurement Uncer		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 uncer	rtainty is for coverage factor of k	=2 and a level of confidence of 9	95%.



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### 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.:	R360, H350, R350, K350, G350, H360, K360, G360
Test Model No.:	R360
Power supply:	DC 5V == 1A
	Or
	DC 3.7V, 1200mAh Li-ion Battery
	Adapter:
	Model:ZXT-051000E
	Input:100-240V~, 50/60Hz, 0.4A
	Output:5V==1A

### 5.3 Test mode

Test mode:				
REC mode	Keep the EUT in REC mode			
PC mode	Keep the EUT in data exchanging with PC mode			
HDMI mode	Keep the EUT in playback with HDMI output mode			
Test voltage:				
AC 120V/60Hz				



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### 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, July 20, 2010.

### Industry Canada (IC)

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, June 26, 2013.

#### 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China



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### 5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval
DELL	PC	EX745	N/A	DoC
Kingston	USB disk	4GB	N/A	DoC
DELL	Mouse	MOC5UO	N/A	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.



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### 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	Mar. 27 2016	Mar. 26 2017
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 14 2016	June 13 2017
4	Loop Antenna	ZHINAN	ZN30900A	GTS534	June 14 2016	June 13 2017
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 14 2016	June 13 2017
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 14 2016	June 13 2017
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 27 2016	Mar. 26 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	Mar. 27 2016	Mar. 26 2017
10	Coaxial Cable	GTS	N/A	GTS211	Mar. 27 2016	Mar. 26 2017
11	Coaxial cable	GTS	N/A	GTS210	Mar. 27 2016	Mar. 26 2017
12	Coaxial Cable	GTS	N/A	GTS212	Mar. 27 2016	Mar. 26 2017
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 14 2016	June 13 2017
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 14 2016	June 13 2017
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 14 2016	June 13 2017
16	Band filter	Amindeon	82346	GTS219	Mar. 27 2016	Mar. 26 2017
17	Constant temperature and humidity box	Oregon Scientific	BA-888	GTS248	June 14 2016	June 13 2017
18	D.C. Power Supply	Instek	PS-3030	GTS232	June 14 2016	June 13 2017



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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	7.0(L)x3.0(W)x3.0( H)	GTS264	June 14 2016	June 13 2017
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	June 14 2016	June 13 2017
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	June 14 2016	June 13 2017
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 14 2016	June 13 2017
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	June 14 2016	June 13 2017
6	Coaxial Cable	GTS	N/A	GTS227	June 14 2016	June 13 2017
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A



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### 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, Sv	weep time=auto		
Limit:	Fraguency range (MHz)	Limit (d	lBuV)	
	Frequency range (MHz)  Quasi-peak  Average			
	0.15-0.5	66 to 56*	56 to 46*	
	0.5-5	56	46	
	5-30	60	50	
Test setup:	* Decreases with the logarithm  Reference Plane	n or the frequency.		
Test presedure	LISN  40cm 80cm Filter AC power  Equipment  Test table/Insulation plane  Remark: EUT Equipment Under Test LISN Line Impedence Stabilization Network Test table height=0 8m			
Test procedure:	<ol> <li>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.</li> <li>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).</li> <li>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.</li> </ol>			
Test Instruments:	Refer to section 6 for details			
Test mode:	Refer to section 5.3 for details. All of the mode were tested and found the "PC mode" is the worst case. Only the data of worst case was reported.			
Test results:	Pass			

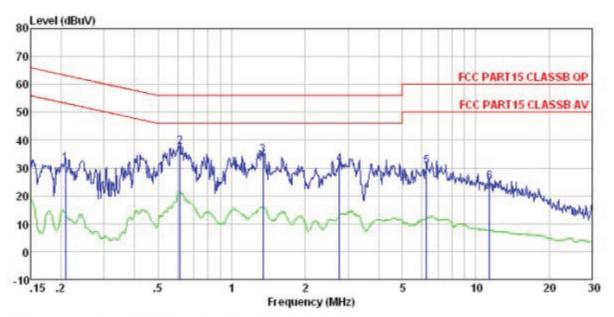


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#### **Measurement Data**

Test mode: PC mode LINE	
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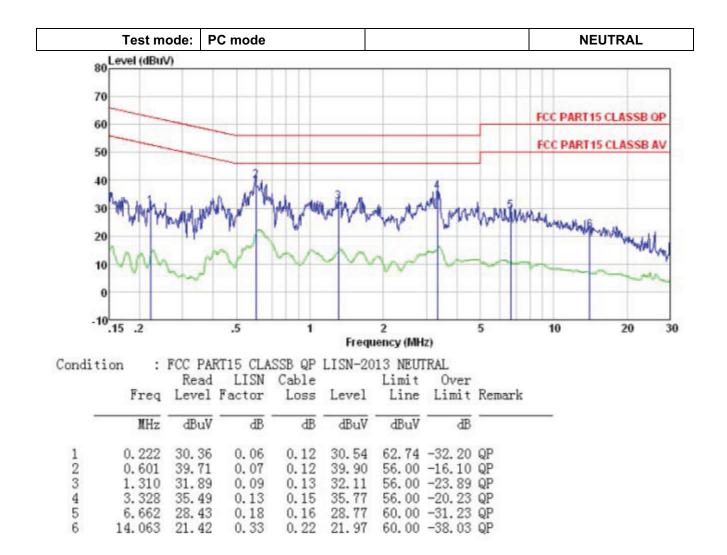


Conditio	n :	FCC PAI	RT15 CLA	SSB QP	LISN-20	13 LINE	5	
	Freq		LISN Factor			Limit Line	Over Limit	
	MHz	dBuV	dB	d₿	dBuV	dBuV	dB	
1	0.208	31.27	0.13	0.13	31.53	63.27	-31.74	QP
2	0.614	37.35	0.13	0.12	37.60	56.00	-18.40	QP
3	1.345	34.37	0.12	0.13	34.62	56.00	-21.38	QP
4	2.765	30.94	0.14	0.15	31.23	56.00	-24.77	QP
5	6.285	30.20	0.23	0.16	30.59	60.00	-29.41	QP
6	11.377					60.00		



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#### 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.



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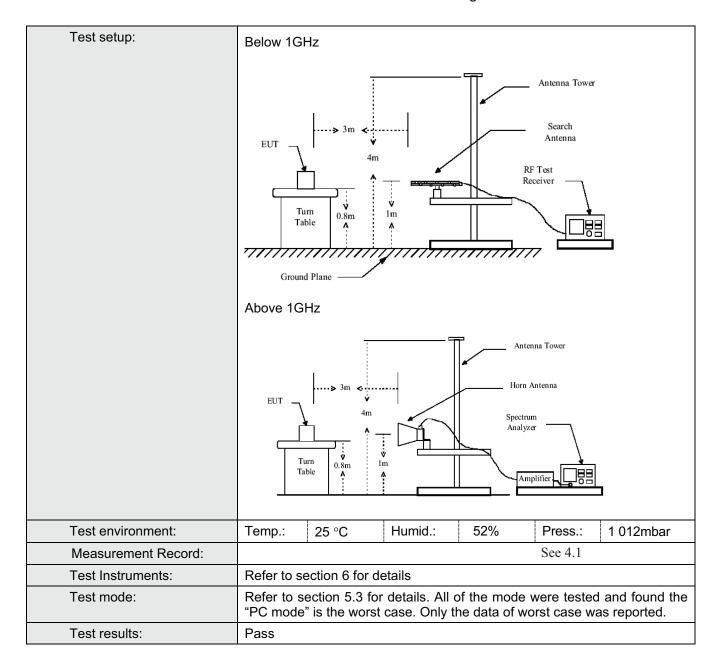
### 7.2 Radiated Emission

 Radiated Ellission								
Test Requirement:	FCC Part15 B Section 15.109							
Test Method:	ANSI C63.4:2014							
Test Frequency Range:	30MHz to 25GHz							
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)							
Receiver setup:								
	Frequency	Detector	RBW	VBW	Remark			
	30MHz- 1GHz	Quasi-peal	k 120kHz	300kHz	Quasi-peak Value			
	Above 1GHz	Peak	1MHz	3MHz	Peak Value			
	Above Toriz	Peak	1MHz	10Hz	Average Value			
Limit:								
	Freque	ency	Limit (dBuV	/m @3m)	Remark			
	30MHz-8	8MHz	40.0	00	Quasi-peak Value			
	88MHz-2	16MHz	43.5	50	Quasi-peak Value			
	216MHz-9	60MHz	46.0	00	Quasi-peak Value			
	960MHz-	·1GHz	00	Quasi-peak Value				
	Above 1	IGH <del>z</del>	54.0	00	Average Value			
	7,5000	OTIZ	74.0	00	Peak Value			
Test Procedure:	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.							
	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.							



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#### 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



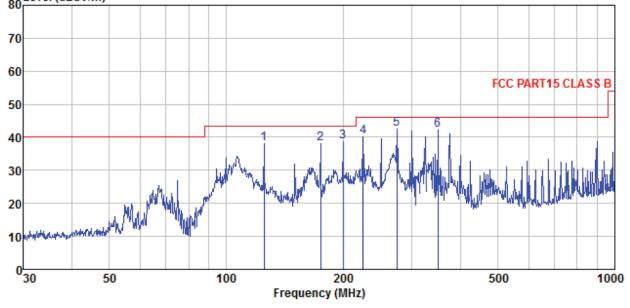
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#### **Measurement Data**

Below 1GHz



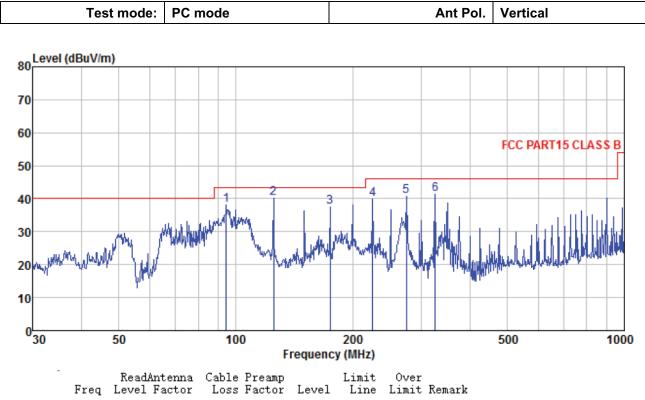


	Freq			Cable Preamp Loss Factor Leve:				Over Limit	
	MHz	dBu₹	dB/m	dB	<u>dB</u>	dBuV/m	dBuV/m	<u>dB</u>	
1 2 3 4 5 6	199.986 225.308	54.27 53.48 54.11 55.41	12.57 13.41 14.55	1.84 1.99 2.25	29.30 29.20 29.44 29.83	37.98 38.69 40.07 42.38	43.50 43.50 43.50 46.00 46.00	-5.52 -4.81 -5.93 -3.62	QP QP QP QP



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	Freq			Cable Preamp Loss Factor					Remark
	MHz	dBu∀	dB/π	dB	<u>dB</u>	$\overline{dBuV/m}$	$\overline{dBuV/m}$	dB	
1 2 3 4 5 6	94. 428 125. 007 175. 037 225. 308 275. 157 325. 596	53.65 53.97 53.68	14.75 11.70 11.29 13.41 14.55 15.59		29.30 29.44 29.83	39.93	43.50 43.50 46.00 46.00	-6.07	QP QP QP QP

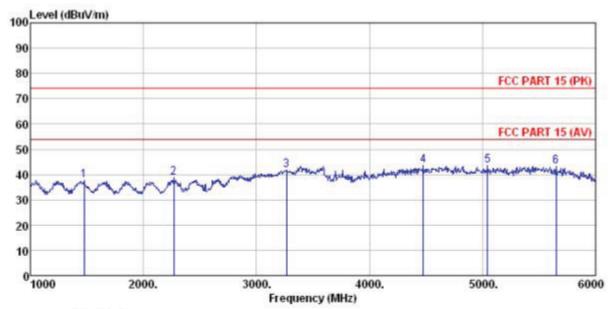


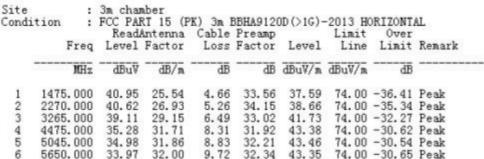
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Above 1GHz

Test mode: PC mode	Ant Pol. Horizontal
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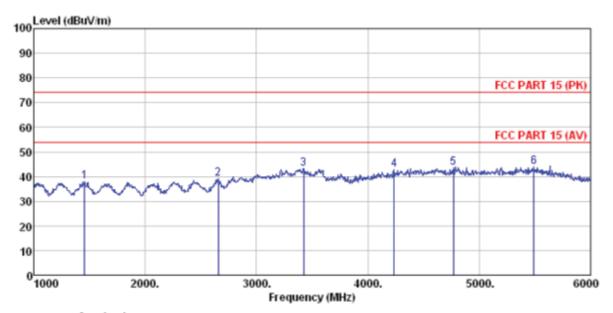
Note: From 6GHz to 25GHz, no emission found, only worse case 1GHz to 6GHz is reported



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Site		3m char							
Condi	ition :		RT 15 (F						
	Freq		intenna Factor						Remark
	MHz	dBu∀	dB/m	₫B	₫B	dBuV/m	dBuV/m	₫B	
1	1455.000	41.31	25.48	4.65	33.53	37.91	74.00	-36.09	Peak
2	2655.000	39.20	28.08	5.63	33.72	39.19	74.00	-34.81	Peak
3	3425.000	40.03	29.11	6.82	32.83	43.13	74.00	-30.87	Peak
4	4235.000	36.40	30.35	8.09	31.92	42.92	74.00	-31.08	Peak
5	4770.000	35.28	31.79	8.58	32.07	43.58	74.00	-30.42	Peak
6	5490.000	33.56	33.25	9.49	32.42	43.88	74.00	-30.12	Peak

Note: From 6GHz to 25GHz, no emission found, only worse case 1GHz to 6GHz is reported



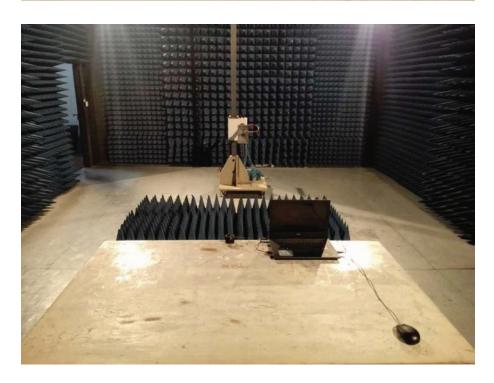
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# 8 Test Setup Photo

Radiated Emission







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#### Conducted Emission



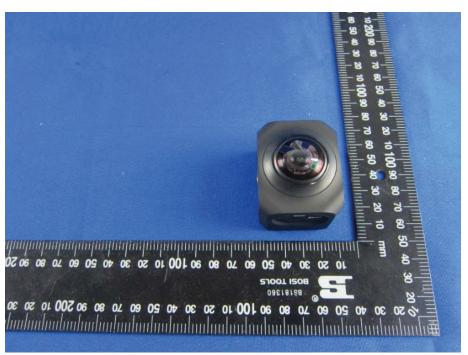


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### 9 EUT Constructional Details

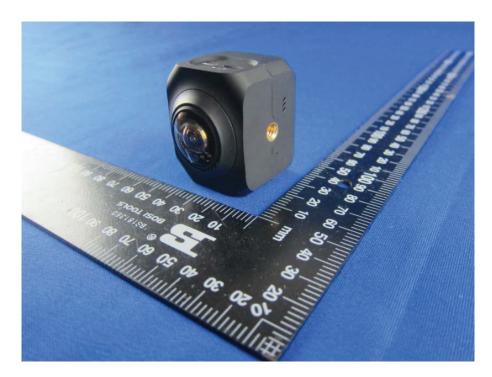


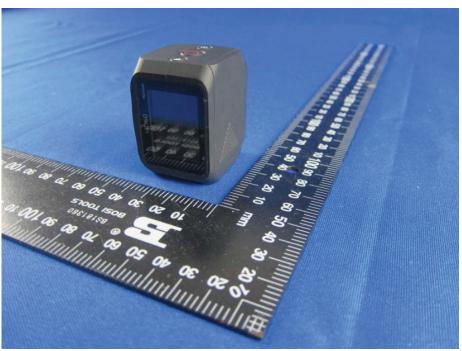




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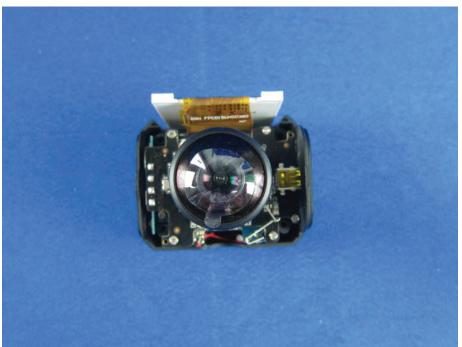




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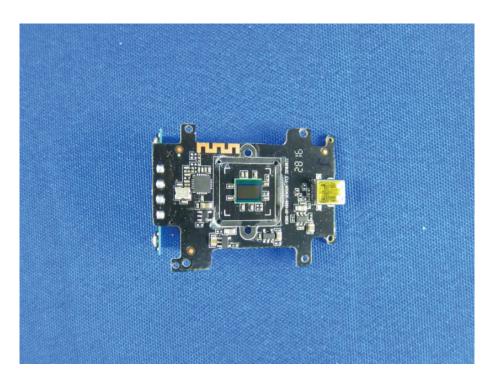


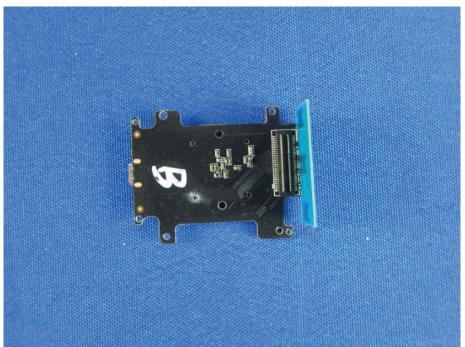




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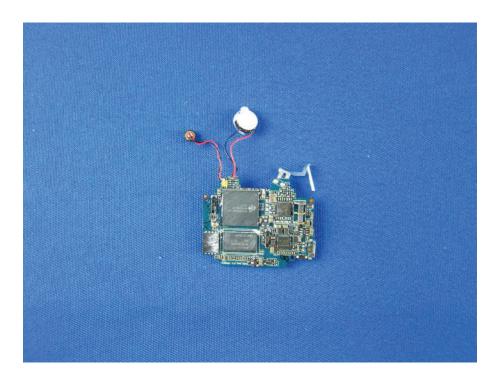


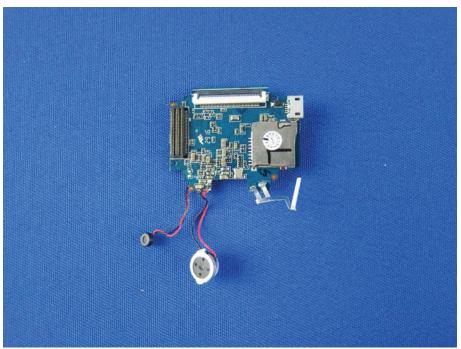




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