



## Shenzhen EBO Testing Center

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Report No.: EBO1705017-E291  
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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  
**Manufacturer/Factory:** EKEN GROUP LIMITED  
**Address of** Room 2511-2512, Meilan Business Center, Qianjin Two Road,  
**Manufacturer/Factory:** XiXiang, Baoan District, ShenZhen, China  
**Equipment Under Test (EUT)**  
Product Name: ACTION CAMERA  
Model No.: Please refer to page 5  
**FCC ID:** 2ADDG-V8S  
**Applicable standards:** FCC CFR Title 47 Part 15 Subpart B:2016  
**Date of sample receipt:** May 05, 2017  
**Date of Test:** May 05, 2017 to May 19, 2017  
**Date of report issued:** May 19, 2017  
**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.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of EBO International Electrical Approvals or testing done by EBO International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by EBO International Electrical Approvals in writing.

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### 2 Version

Version No.	Date	Description
00	May 19, 2017	Original

Prepared by:

Project Engineer

Date:

May 19, 2017

Reviewed by:

Reviewer

Date:

May 19, 2017

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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 comply with the essential requirements in the standard.*

*Remark: Test according to ANSI C63.4:2014.*

#### Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	$\pm 4.34\text{dB}$	(1)
Radiated Emission	30MHz ~ 1000MHz	$\pm 4.24\text{dB}$	(1)
Radiated Emission	1GHz ~ 26.5GHz	$\pm 4.68\text{dB}$	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	$\pm 3.45\text{dB}$	(1)

Note (1): The measurement uncertainty is for coverage factor of  $k=2$  and a level of confidence of 95%.

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### 5 General Information

#### 5.1 General Description of EUT

Product Name:	ACTION CAMERA
Model No.:	V8s, A7, A8, A9, W7, W8, W9, W9R, W9se, W9Rse, H2, H2R, H2Rse, H3, H3R, N2, N9, H8, H8R, H8s, H8se, H8 Pro, H8 Plus, H9, H9s, H9R, H9Rse, H9 Pro, H9 Plus, G2, G3, K8, V1s, V2s, V3s, V4s, V5s, V6s, V7s, V9s, V8s Mack II Remark: All models are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the model name and appearance color for commercial purpose
Test Model No.:	V8s
Power supply:	Power Adapter Model:ZXT-051500E Input:AC 100-240V 50/60Hz, 0.4A Output:DC 5V,1A Or DC 3.7V,1050mAh,3.885Wh Rechargeable Li-ion battery pack

#### 5.2 Test mode and Test voltage

Test mode:	
PC mode	Keep the EUT in data exchange with PC.
REC mode	Keep the EUT in rec mode

#### 5.3 Description of Support Units

Note: All support units are DOC approval

Manufacturer	Description	Model	Serial Number
Apple	PC	A1278	C1MN99ERDTY3
DELL	KEYBOARD	SK-8115	N/A
DELL	MOUSE	MOC5UO	N/A
Kingston	TF card	SD-C01G	N/A

#### 5.4 Test Location

All tests were performed at: FCC —Registration No.: 600491
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

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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	9.0(L)*6.0(W)* 6.0(H)	250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	203	June.29 2016	June.28 2017
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	214	June.29 2016	June.28 2017
5	Double-ridged horn antenna	SCHWARZBECK	9120D	208	June.29 2016	June.28 2017
6	Horn Antenna	ETS-LINDGREN	3160-09	218	June.29 2016	June.28 2017
7	RF Amplifier	HP	8347A	204	June.29 2016	June.28 2017
8	Broadband Preamplifier	SCHWARZBECK	BBV9718	535	June.29 2016	June.28 2017
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	211	June.29 2016	June.28 2017
11	Coaxial Cable	GTS	N/A	210	June.29 2016	June.28 2017
12	Coaxial Cable	GTS	N/A	212	June.29 2016	June.28 2017
13	Thermo meter	N/A	N/A	256	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)	252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	552	June. 29 2016	June. 28 2017
3	Coaxial Switch	ANRITSU CORP	MP59B	225	June. 29 2016	June. 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	226	June. 29 2016	June. 28 2017
5	Coaxial Cable	GTS	N/A	227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	233	June. 29 2016	June. 28 2017

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Barometer	ChangChun	DYM3	257	June. 29 2016	June. 28 2017

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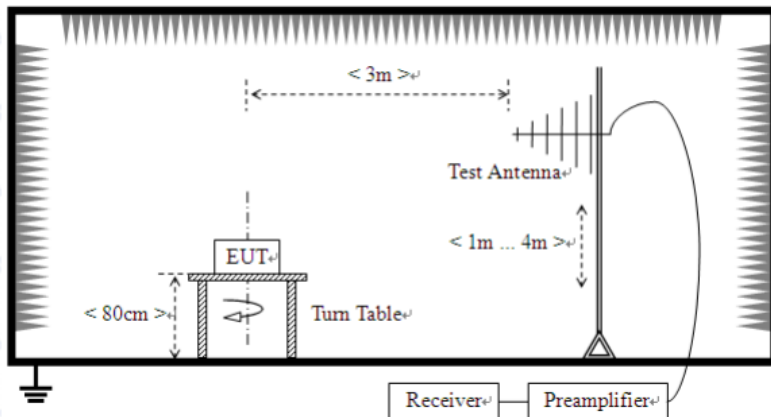
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## 7 Test Results and Measurement Data

### 7.1 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109				
Test Method:	ANSI C63.4:2014				
Test Frequency Range:	30MHz to 25000MHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-88MHz		40.00		Quasi-peak Value
	88MHz-216MHz		43.50		Quasi-peak Value
	216MHz-960MHz		46.00		Quasi-peak Value
	960MHz-1GHz		54.00		Quasi-peak Value
	Above 1GHz		54.00		Average Value
			74.00		Peak Value
Test setup:	Below 1GHz				
	<div></div>				
Test setup:	Above 1GHz				

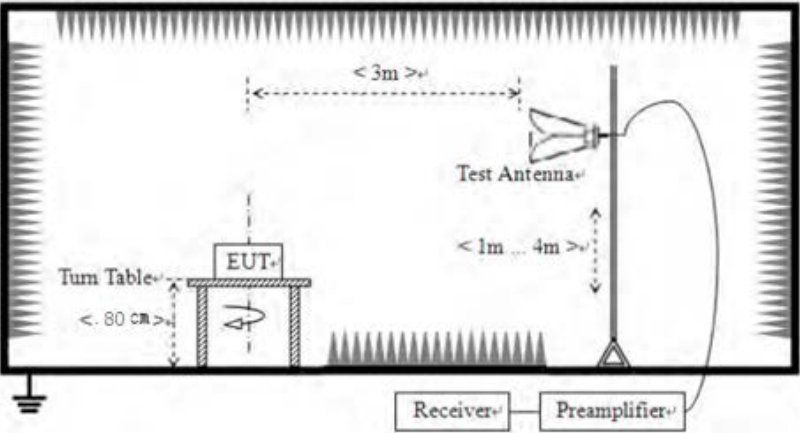
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Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	Uncertainty: $\pm 4.50\text{dB}$
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

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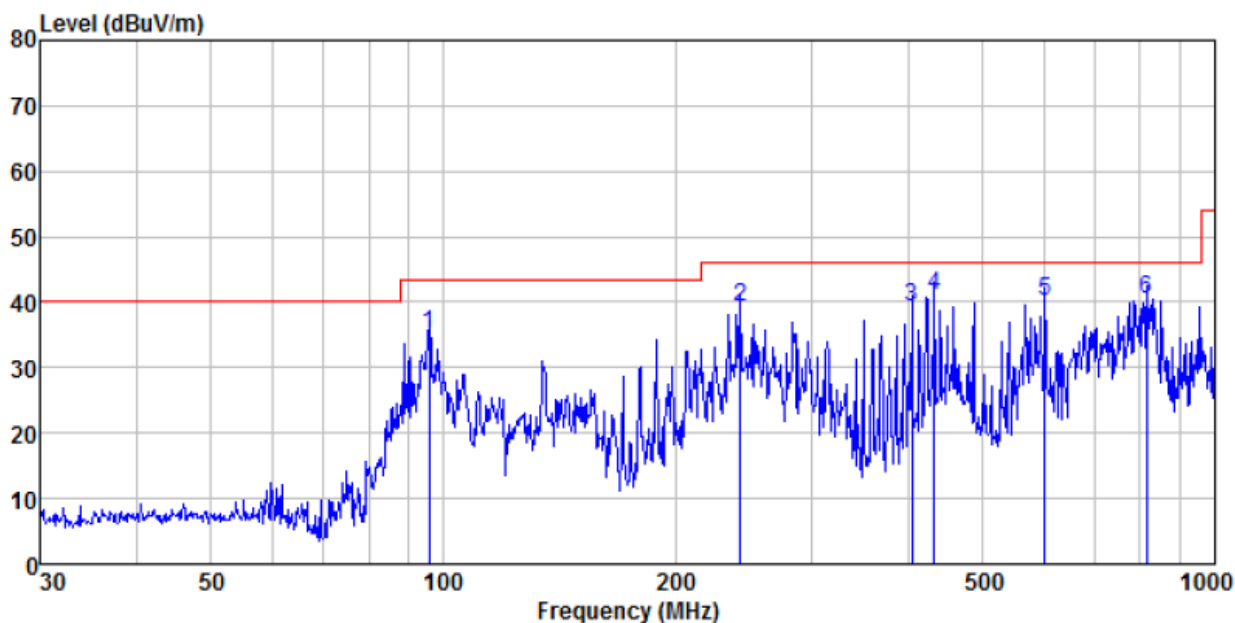
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### Measurement Data Below 1GHz

Test mode:	PC mode	Antenna Polarity:	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
95.762	52.40	11.35	1.16	29.82	35.09	43.50	-8.41	QP
242.525	55.16	11.66	2.08	29.74	39.16	46.00	-6.84	QP
404.667	50.32	15.56	2.88	29.59	39.17	46.00	-6.83	QP
432.546	51.49	16.17	3.01	29.57	41.10	46.00	-4.90	QP
601.427	46.65	19.30	3.73	29.39	40.29	46.00	-5.71	QP
815.968	43.60	21.46	4.52	29.14	40.44	46.00	-5.56	QP

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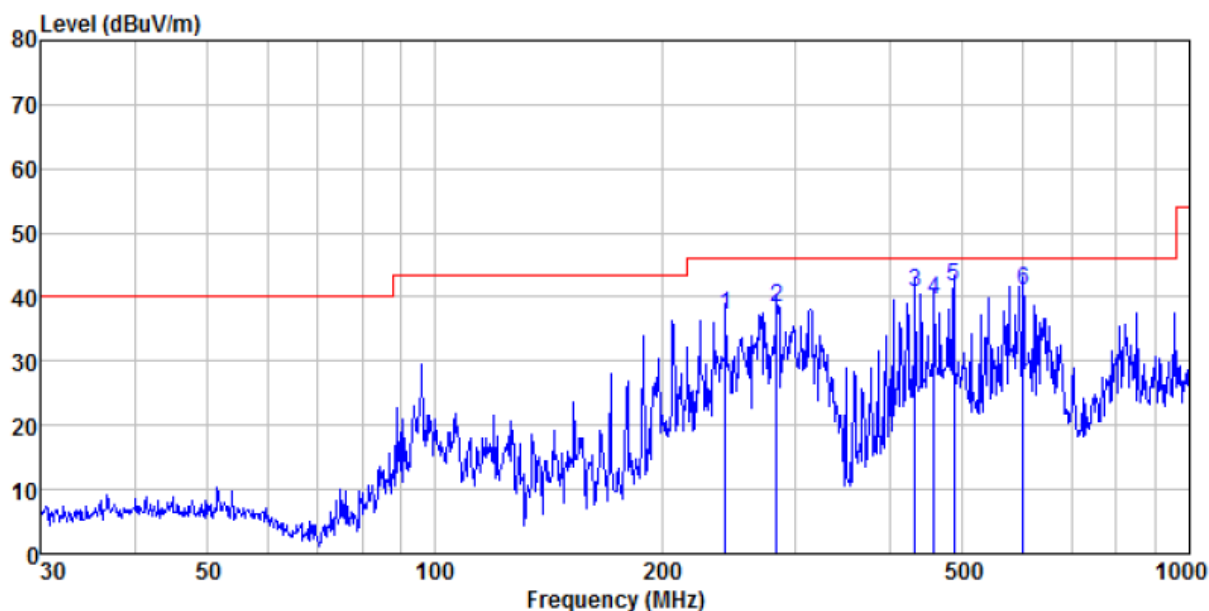


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Test mode:	PC mode	Antenna Polarity:	Vertical
------------	---------	-------------------	----------



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
242.525	53.06	11.66	2.08	29.74	37.06	46.00	-8.94	QP
283.979	53.05	13.01	2.29	30.08	38.27	46.00	-7.73	QP
432.546	51.27	16.17	3.01	29.57	40.88	46.00	-5.12	QP
459.114	49.17	16.65	3.13	29.54	39.41	46.00	-6.59	QP
487.315	50.51	17.26	3.25	29.51	41.51	46.00	-4.49	QP
601.427	47.53	19.30	3.73	29.39	41.17	46.00	-4.83	QP

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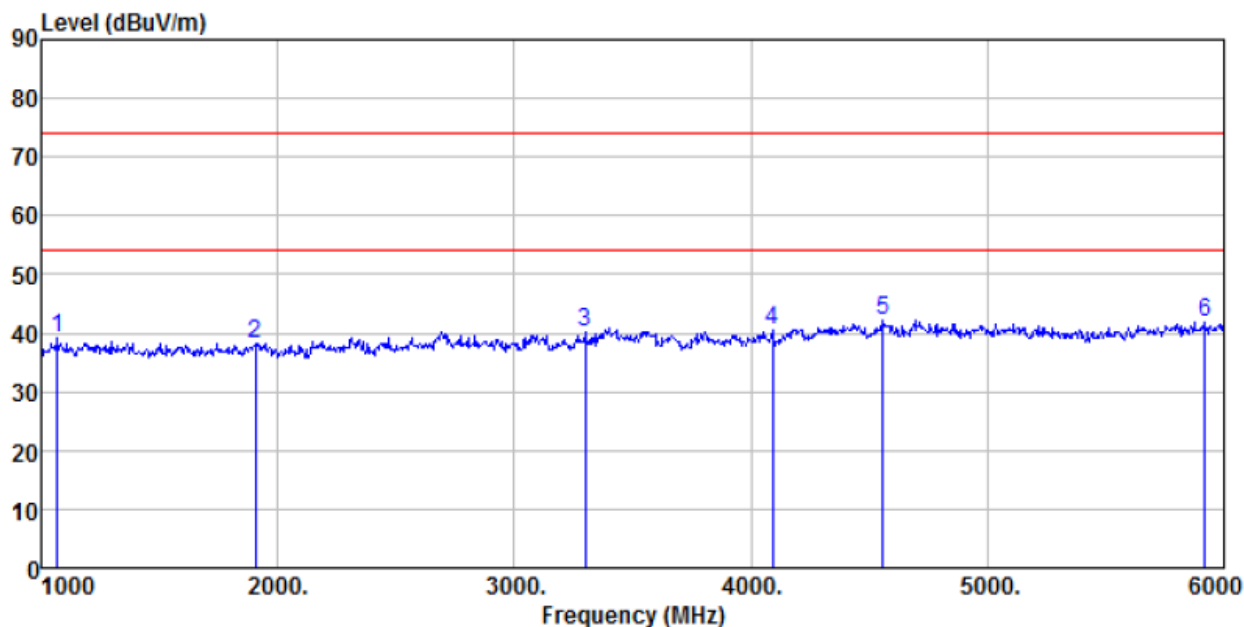
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### Above 1GHz

Test mode:	PC mode	Antenna Polarity:	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
1070.000	42.89	24.67	4.35	32.87	39.04	74.00	-34.96	Peak
1905.000	41.79	25.77	4.91	34.29	38.18	74.00	-35.82	Peak
3300.000	38.21	28.35	6.56	32.99	40.13	74.00	-33.87	Peak
4090.000	34.82	29.89	7.95	32.07	40.59	74.00	-33.41	Peak
4560.000	34.33	31.44	8.39	31.96	42.20	74.00	-31.80	Peak
5920.000	31.24	32.78	10.09	32.18	41.93	74.00	-32.07	Peak

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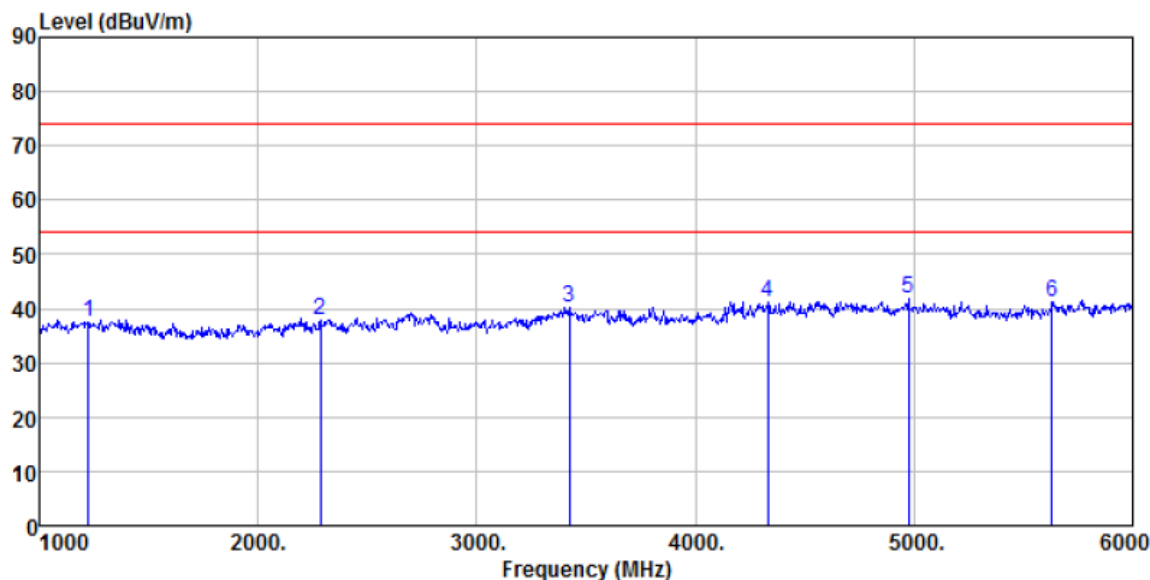


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Test mode:	PC mode	Antenna Polarity:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
1225.000	40.82	25.45	4.49	33.13	37.63	74.00	-36.37	Peak
2285.000	38.85	27.99	5.28	34.13	37.99	74.00	-36.01	Peak
3425.000	37.46	28.72	6.82	32.83	40.17	74.00	-33.83	Peak
4330.000	34.19	30.83	8.18	31.86	41.34	74.00	-32.66	Peak
4975.000	33.31	31.94	8.74	32.17	41.82	74.00	-32.18	Peak
5630.000	31.69	32.32	9.70	32.36	41.35	74.00	-32.65	Peak

### 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**

No emission found for above 6GHz , so only worse case 30MHz to 6GHz is reported

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### 7.2 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														
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>0.5-30</td><td>60</td><td>50</td></tr></table>	Frequency range (MHz)	Limit (dBμV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	0.5-30	60	50
Frequency range (MHz)	Limit (dBμV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
0.5-30	60	50													
Test setup:	<div><p style="text-align: center;"><b>Reference Plane</b></p><p style="text-align: center;">Test table/Insulation plane</p><p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>														
Test procedure	<div><div>1.</div><div>The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.</div></div> <div><div>2.</div><div>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs).</div></div> <div><div>3.</div><div>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.</div></div>														
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar														
Test Instruments:	Refer to section 6 for details														
Test mode:	Refer to section 5.2 for details														
Test results:	Pass														

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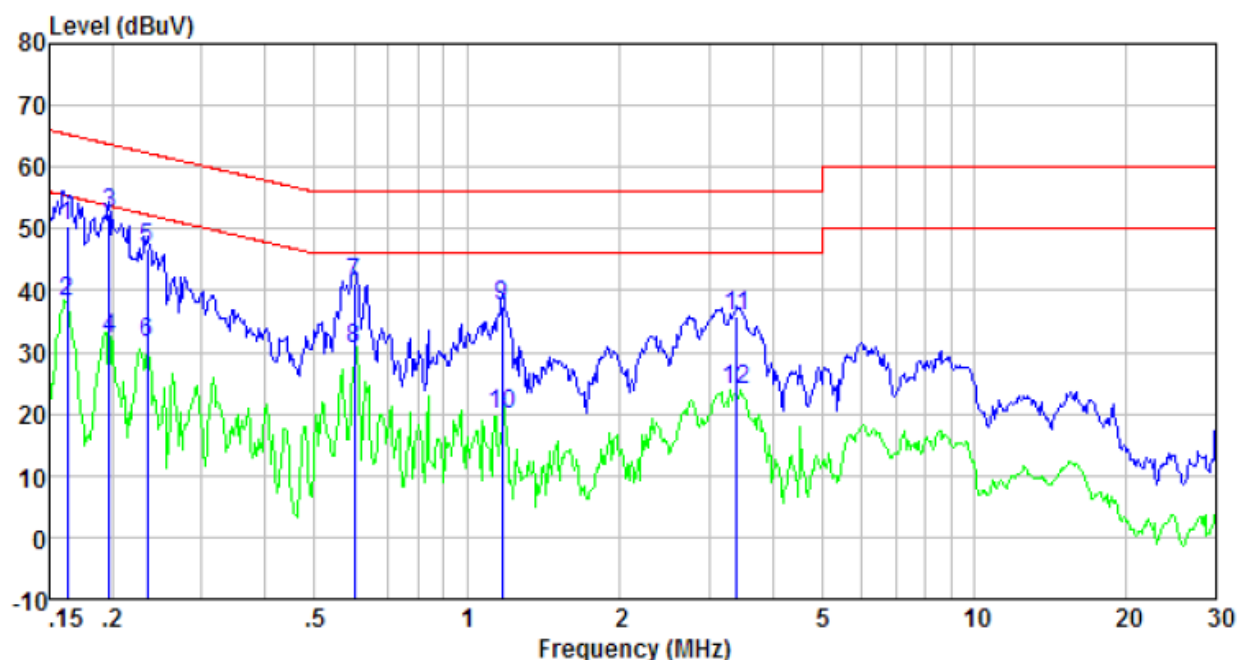
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### Measurement Data

Test mode:	PC mode	Phase Polarity:	Line
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Freq MHz	Reading level dBuV	LIISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.162	50.06	0.41	0.12	50.59	65.34	-14.75	QP
0.162	37.53	0.41	0.12	38.06	55.34	-17.28	Average
0.197	52.02	0.41	0.13	52.56	63.76	-11.20	QP
0.197	31.56	0.41	0.13	32.10	53.76	-21.66	Average
0.234	46.37	0.42	0.12	46.91	62.30	-15.39	QP
0.234	30.91	0.42	0.12	31.45	52.30	-20.85	Average
0.598	40.88	0.28	0.12	41.28	56.00	-14.72	QP
0.598	30.28	0.28	0.12	30.68	46.00	-15.32	Average
1.172	37.25	0.21	0.13	37.59	56.00	-18.41	QP
1.172	19.59	0.21	0.13	19.93	46.00	-26.07	Average
3.399	35.37	0.21	0.15	35.73	56.00	-20.27	QP
3.399	23.37	0.21	0.15	23.73	46.00	-22.27	Average

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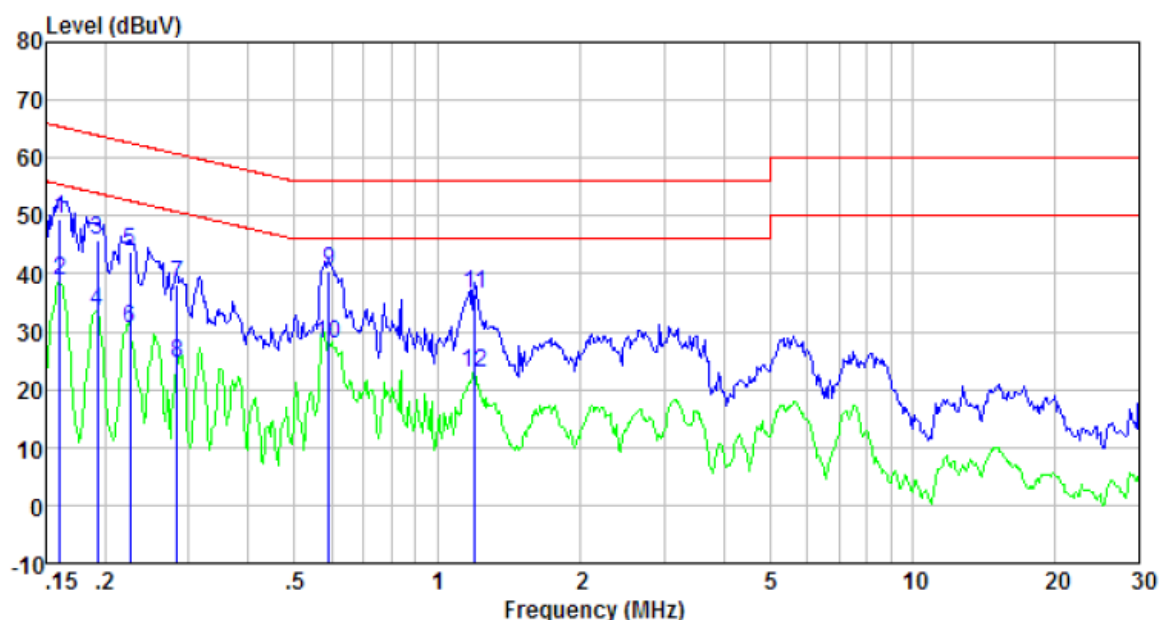


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Test mode:	PC mode	Phase Polarity:	Neutral
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Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.161	48.77	0.42	0.12	49.31	65.43	-16.12	QP
0.161	38.23	0.42	0.12	38.77	55.43	-16.66	Average
0.192	45.24	0.43	0.13	45.80	63.93	-18.13	QP
0.192	32.79	0.43	0.13	33.35	53.93	-20.58	Average
0.226	43.27	0.43	0.12	43.82	62.61	-18.79	QP
0.226	29.83	0.43	0.12	30.38	52.61	-22.23	Average
0.283	37.60	0.44	0.10	38.14	60.72	-22.58	QP
0.283	24.14	0.44	0.10	24.68	50.72	-26.04	Average
0.592	39.91	0.31	0.12	40.34	56.00	-15.66	QP
0.592	27.34	0.31	0.12	27.77	46.00	-18.23	Average
1.197	36.06	0.24	0.13	36.43	56.00	-19.57	QP
1.197	22.43	0.24	0.13	22.80	46.00	-23.20	Average

### Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

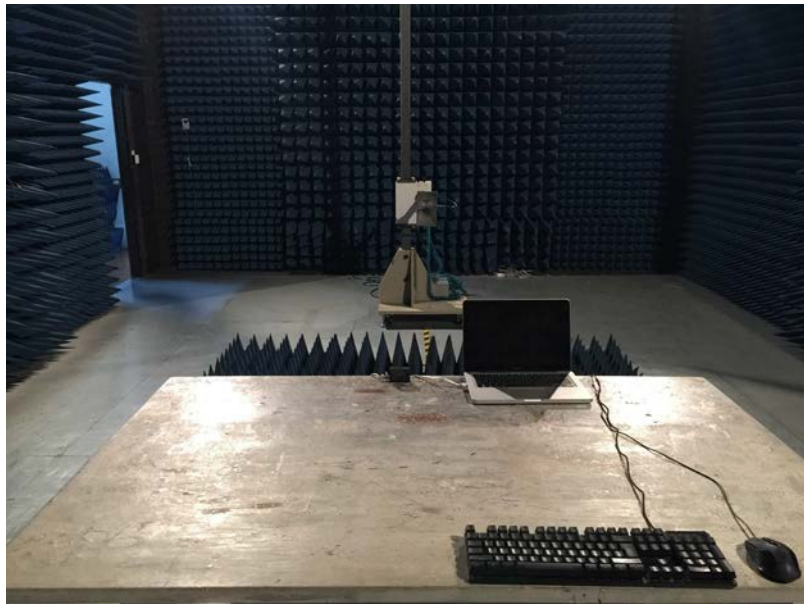
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## 8 Test Setup Photo

Radiated Emission:



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### Conducted Emission



## 9 EUT Constructional Details

Reference to the test report No. EBO1705017-E290

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