EMC TEST REPORT

SIEMIC
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Report No.: 16070134-FCC-E

Supersede Report No.: N/A

Applicant	Shenzhen Qihu Intelligent Technology Company Limited
Product Name	Voyant 360 Dash Cam
Model No.	J501
Serial No.	N/A
Test Standard	FCC Part 15 Subpart B Class B:2015, ANSI C63.4: 2014
Test Date	March 25 to May 24, 2016
Issue Date	May 25, 2016
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Winnie Zhang	David Huang	
Winnie Zhang Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
16070134-FCC-E	NONE	Original	May 25, 2016

2. Customer information

Applicant Name	Shenzhen Qihu Intelligent Technology Company Limited
Applicant Add	Room201 Block A,No.1,Qianwan Rd.1,Qianhai Shenzhen HongKong Modern Service Industry Cooperation Zone Shenzhen
Manufacturer	Chicony Electronic(DongGuan) Co.,Ltd
Manufacturer Add	San Zhong Guan Li Qu, Qing Xi, Dong guan, Guangdong ZIP: 523651

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Voyant 360 Dash Cam
Main Model:	J501
Serial Model:	N/A
Date EUT received:	March 24, 2016
Test Date(s):	March 25 to May 24, 2016
Equipment Category :	JBP
Antenna Gain:	2dBi
Type of Modulation:	802.11b/g/n: DSSS, OFDM
RF Operating Frequency (ies):	WIFI:802.11b/g/n(20M): 2412-2472 MHz
Number of Channels:	WIFI :802.11b/g/n(20M): 13CH
Port:	USB Port
Input Power:	Battery: Model: 582535(1ICP6/26/36) Spec: 3.7V,470mAh,1.7Wh Charge limited voltage: 4.2V USB: 5.0V
Trade Name :	Voyant 360
FCC ID:	2AGGXJ501

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

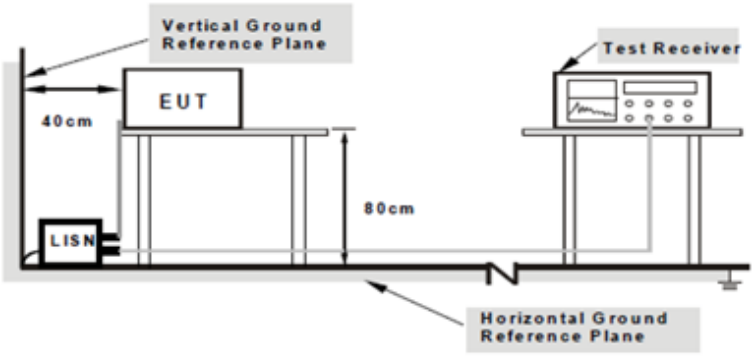
Emissions		
Test Item	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	24°C
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	May 23, 2016
Tested By :	Winnie Zhang

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107</td><td>a)</td><td>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.
<table>
<tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 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><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

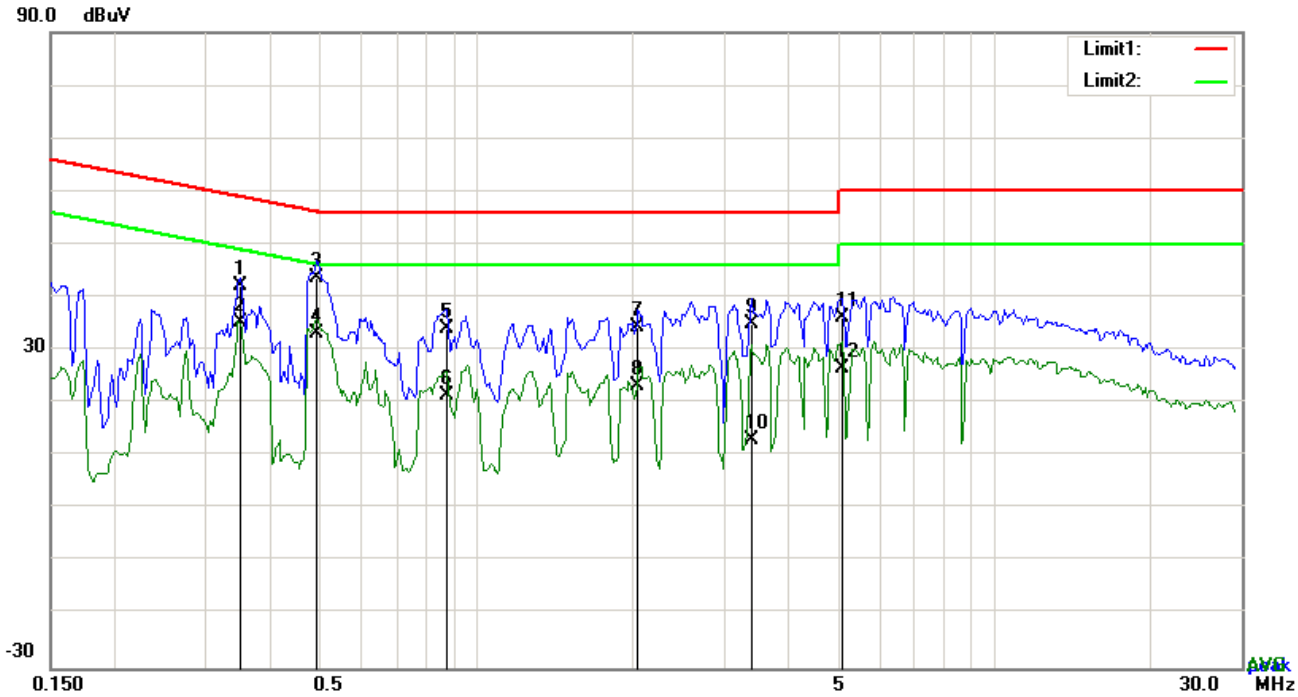
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.</td></tr>
</table>

	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode:	USB Mode

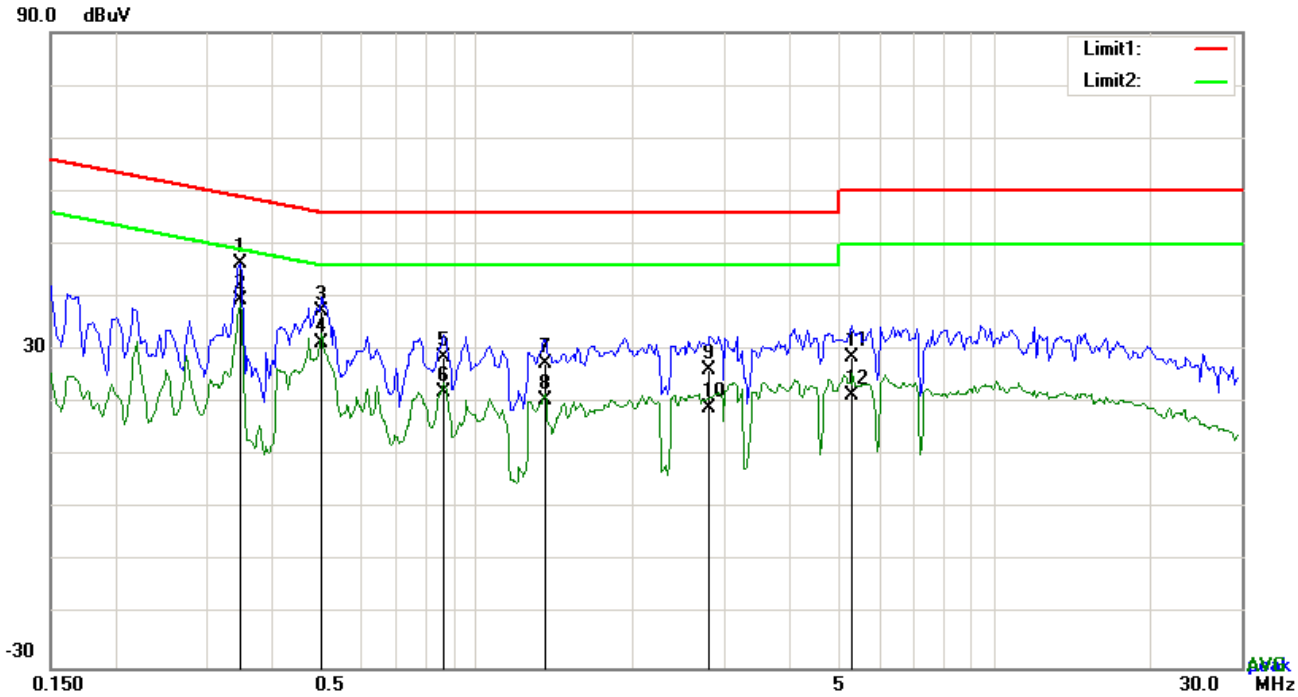


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.3489	32.25	QP	10.03	42.28	58.99	-16.71
2	L1	0.3489	25.22	AVG	10.03	35.25	48.99	-13.74
3	L1	0.4893	33.53	QP	10.03	43.56	56.18	-12.62
4	L1	0.4893	23.04	AVG	10.03	33.07	46.18	-13.11
5	L1	0.8754	23.88	QP	10.03	33.91	56.00	-22.09
6	L1	0.8754	11.48	AVG	10.03	21.51	46.00	-24.49
7	L1	2.0493	24.26	QP	10.04	34.30	56.00	-21.70
8	L1	2.0493	13.15	AVG	10.04	23.19	46.00	-22.81
9	L1	3.3861	24.99	QP	10.06	35.05	56.00	-20.95
10	L1	3.3861	3.01	AVG	10.06	13.07	46.00	-32.93
11	L1	5.0631	26.14	QP	10.08	36.22	60.00	-23.78
12	L1	5.0631	16.39	AVG	10.08	26.47	50.00	-23.53

Test Mode:	USB Mode

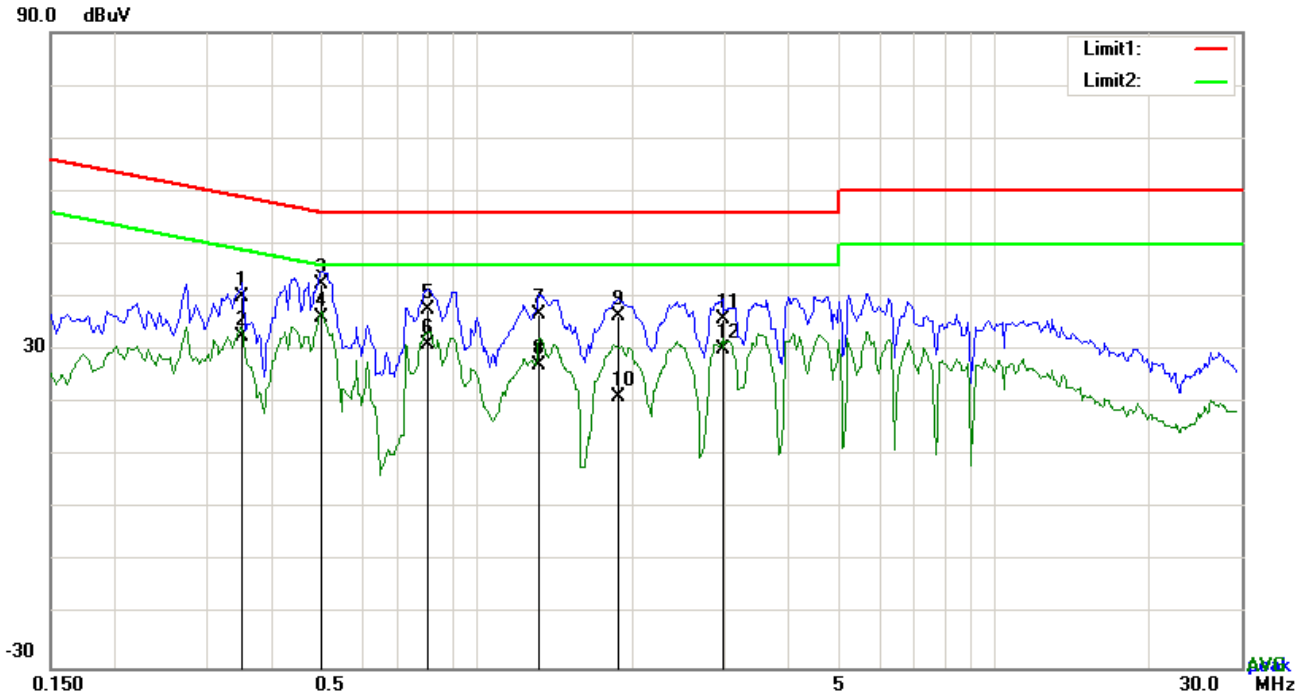


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.3489	36.32	QP	10.02	46.34	58.99	-12.65
2	N	0.3489	29.38	AVG	10.02	39.40	48.99	-9.59
3	N	0.5010	27.44	QP	10.02	37.46	56.00	-18.54
4	N	0.5010	21.37	AVG	10.02	31.39	46.00	-14.61
5	N	0.8637	18.72	QP	10.03	28.75	56.00	-27.25
6	N	0.8637	12.14	AVG	10.03	22.17	46.00	-23.83
7	N	1.3551	17.38	QP	10.03	27.41	56.00	-28.59
8	N	1.3551	10.38	AVG	10.03	20.41	46.00	-25.59
9	N	2.8137	16.26	QP	10.05	26.31	56.00	-29.69
10	N	2.8137	9.01	AVG	10.05	19.06	46.00	-26.94
11	N	5.2854	18.57	QP	10.07	28.64	60.00	-31.36
12	N	5.2854	11.30	AVG	10.07	21.37	50.00	-28.63

Test Mode:	USB Mode

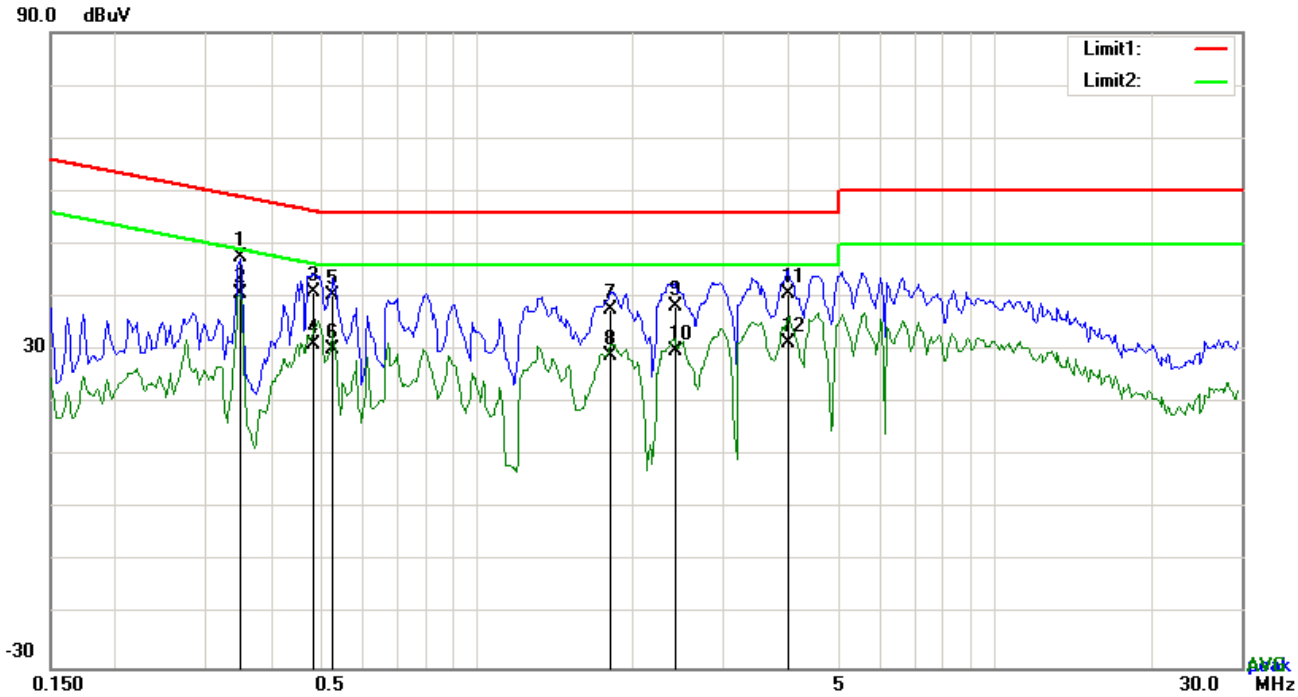


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.3528	29.97	QP	10.03	40.00	58.90	-18.90
2	L1	0.3528	22.44	AVG	10.03	32.47	48.90	-16.43
3	L1	0.5010	32.32	QP	10.03	42.35	56.00	-13.65
4	L1	0.5010	26.05	AVG	10.03	36.08	46.00	-9.92
5	L1	0.8013	27.71	QP	10.03	37.74	56.00	-18.26
6	L1	0.8013	20.99	AVG	10.03	31.02	46.00	-14.98
7	L1	1.3200	26.57	QP	10.03	36.60	56.00	-19.40
8	L1	1.3200	17.04	AVG	10.03	27.07	46.00	-18.93
9	L1	1.8738	26.30	QP	10.04	36.34	56.00	-19.66
10	L1	1.8738	11.18	AVG	10.04	21.22	46.00	-24.78
11	L1	2.9814	25.84	QP	10.05	35.89	56.00	-20.11
12	L1	2.9814	20.06	AVG	10.05	30.11	46.00	-15.89

Test Mode :	USB Mode



Test Data

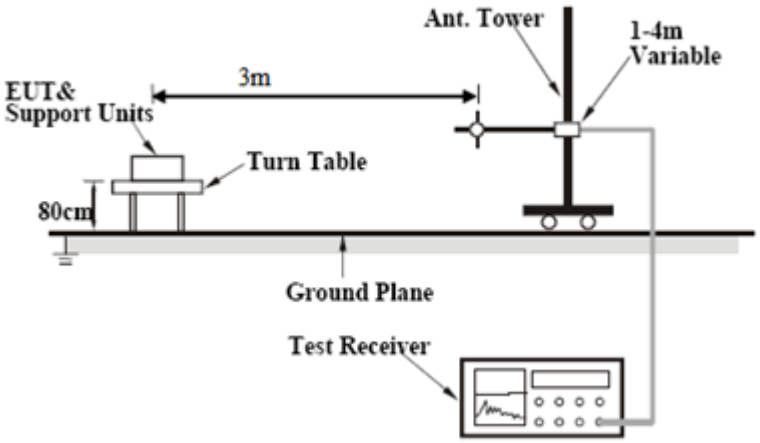
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.3489	37.54	QP	10.02	47.56	58.99	-11.43
2	N	0.3489	30.57	AVG	10.02	40.59	48.99	-8.40
3	N	0.4815	30.79	QP	10.02	40.81	56.31	-15.50
4	N	0.4815	21.18	AVG	10.02	31.20	46.31	-15.11
5	N	0.5283	30.48	QP	10.02	40.50	56.00	-15.50
6	N	0.5283	20.05	AVG	10.02	30.07	46.00	-15.93
7	N	1.8153	27.47	QP	10.04	37.51	56.00	-18.49
8	N	1.8153	18.90	AVG	10.04	28.94	46.00	-17.06
9	N	2.4120	28.34	QP	10.04	38.38	56.00	-17.62
10	N	2.4120	19.72	AVG	10.04	29.76	46.00	-16.24
11	N	3.9867	30.68	QP	10.06	40.74	56.00	-15.26
12	N	3.9867	21.33	AVG	10.06	31.39	46.00	-14.61

6.2 Radiated Emissions

Temperature	24°C
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	May 23, 2016
Tested By :	Winnie Zhang

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107(d)</td><td>a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
a. Vertical or horizontal polarization (whichever gave the higher emission level</td></tr>
</table>

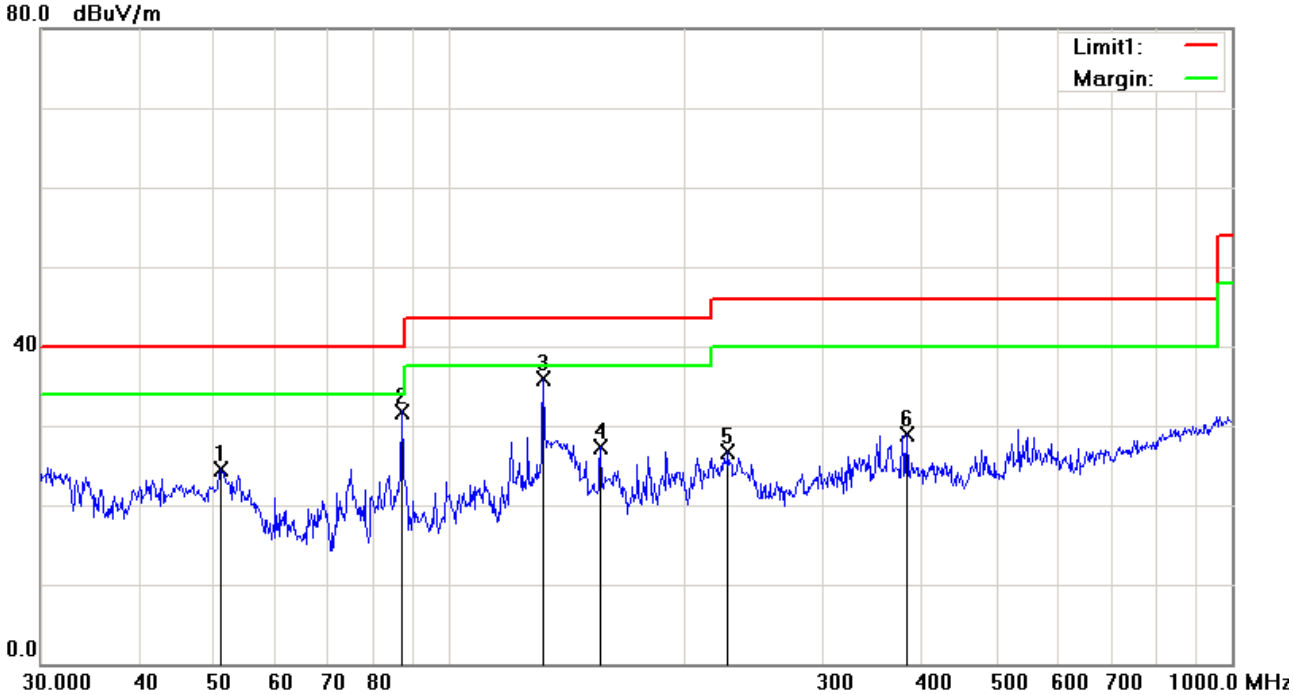
	over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. 4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz. ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode :	USB Mode

Below 1GHz



Test Data

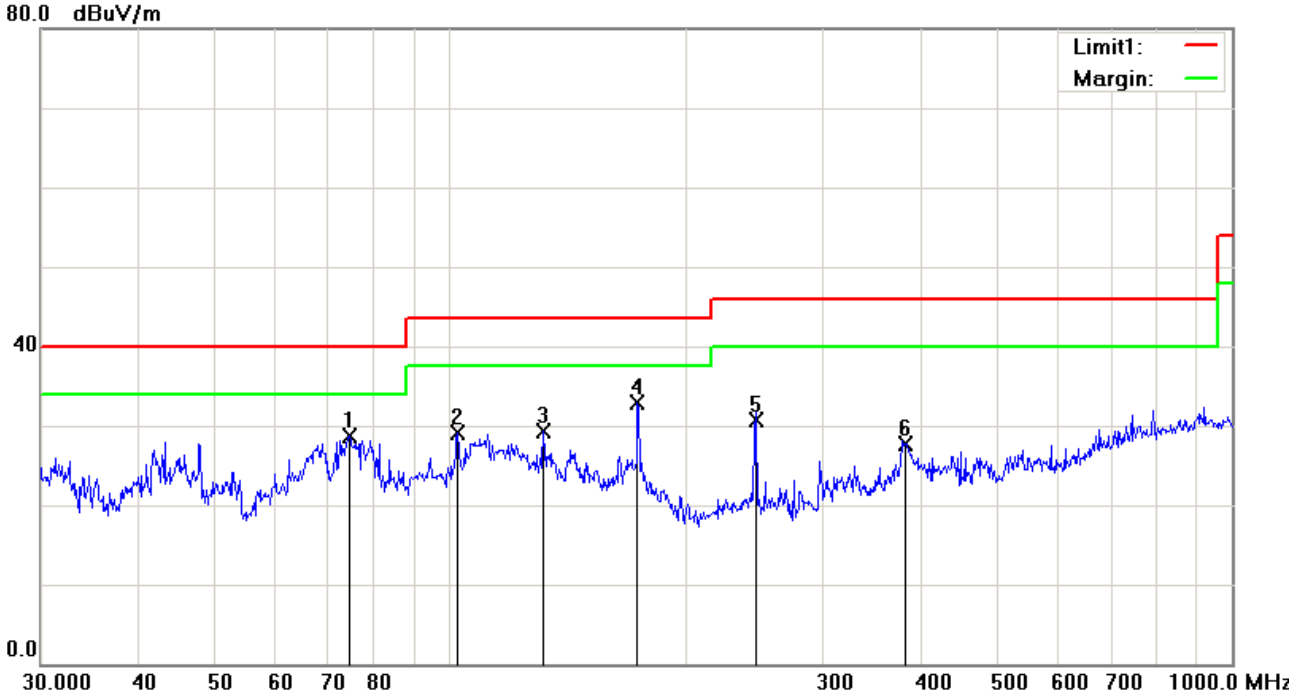
Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	50.9420	37.73	peak	-13.28	24.45	40.00	-15.55	100	331
2	H	86.8068	45.25	peak	-13.45	31.80	40.00	-8.20	100	318
3	H	131.7577	44.02	peak	-8.04	35.98	43.50	-7.52	100	150
4	H	155.9101	35.72	peak	-8.33	27.39	43.50	-16.11	100	208
5	H	226.8936	35.59	peak	-8.98	26.61	46.00	-19.39	100	176
6	H	383.9318	33.50	peak	-4.67	28.83	46.00	-17.17	100	219

Above 1GHz

Note: The frequency that above 1GHz is mainly from the environment noise.

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	74.3955	42.47	peak	-13.73	28.74	40.00	-11.26	100	27
2	V	102.3597	39.51	peak	-10.38	29.13	43.50	-14.37	100	149
3	V	131.7577	37.43	peak	-8.04	29.39	43.50	-14.11	100	360
4	V	173.8135	42.23	peak	-9.41	32.82	43.50	-10.68	100	153
5	V	246.8149	39.79	peak	-9.17	30.62	46.00	-15.38	100	208
6	V	382.5879	32.38	peak	-4.71	27.67	46.00	-18.33	100	251

Above 1GHz

Frequency (MHz)	Amplitude (dBμV/m)	Azimuth	Height (cm)	Polarity (H/V)	Factors (dB)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
1564.11	53.12	44	123	V	-22.23	74	-20.88	PK
2044.55	59.88	55	141	V	-21.02	74	-14.12	PK
1610.23	54.23	66	155	V	-23.22	74	-19.77	PK
2151.48	51.23	77	245	H	-21.44	74	-22.77	PK
2851.22	50.85	140	212	H	-21.55	74	-23.15	PK
1811.42	51.55	60	173	H	-20.65	74	-22.45	PK

*Note1: The highest frequency of the EUT is 2472 MHz, so the testing has been conformed to 5*2472MHz=12,360MHz.*

Note2: The frequency that above 3GHz is mainly from the environment noise.

Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

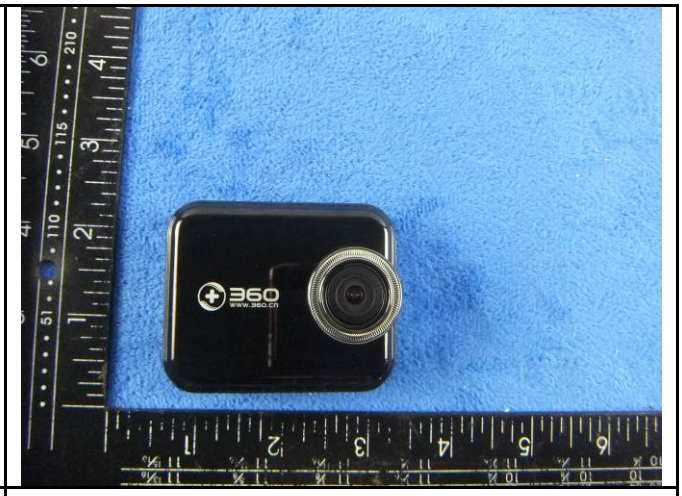
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	☑
Line Impedance Stabilization Network	LI-125A	191106	09/25/2015	09/24/2016	☑
Line Impedance Stabilization Network	LI-125A	191107	09/25/2015	09/24/2016	☑
LISN	ISN T800	34373	09/25/2015	09/24/2016	☑
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/24/2016	03/23/2017	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna	AH-118	71259	09/24/2015	09/23/2016	☑

Annex B. EUT And Test Setup Photographs

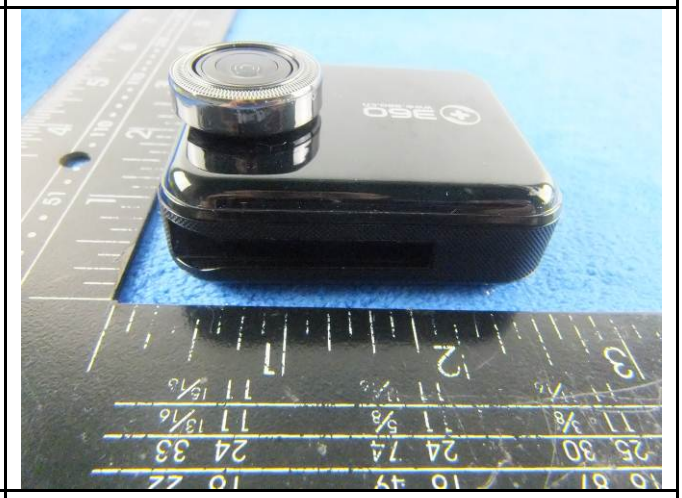
Annex B.i. Photograph: EUT External Photo

Whole Package View



EUT - Front View

EUT - Rear View



EUT - Top View

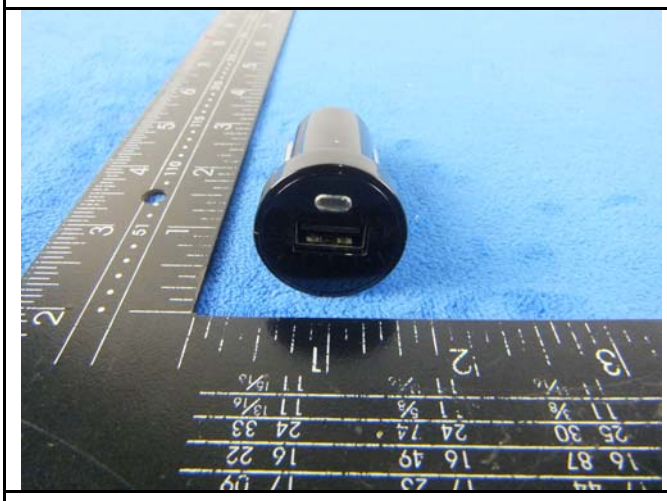
EUT - Bottom View

EUT - Left View

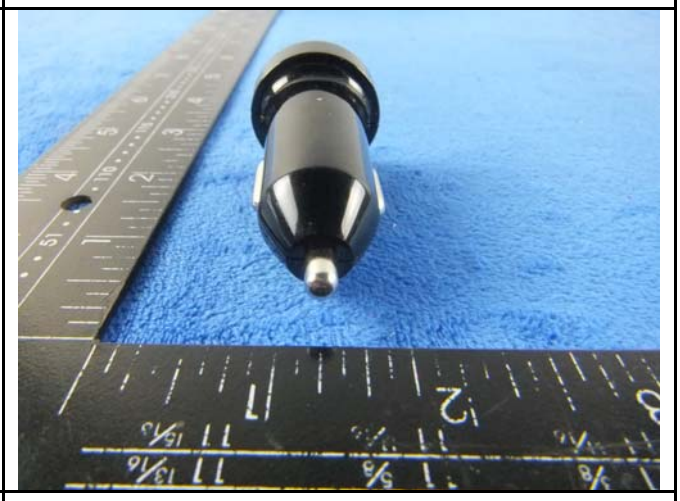
EUT - Right View

Car charge - Front View

Car charge – Rear View



Car charge - Left View

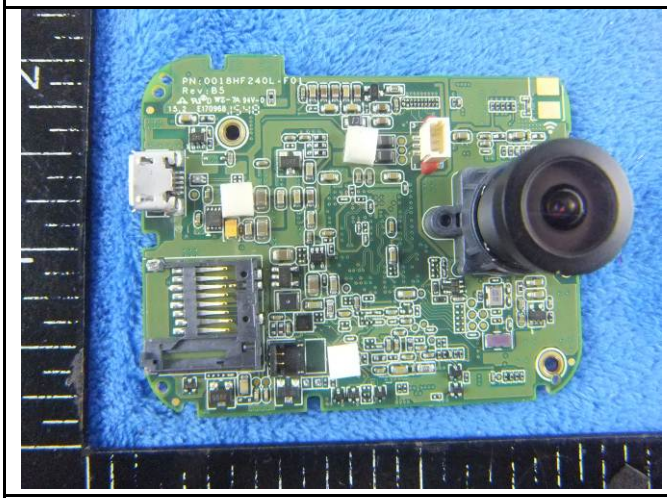


Car charge – Right View

Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1

Cover Off - Top View 2

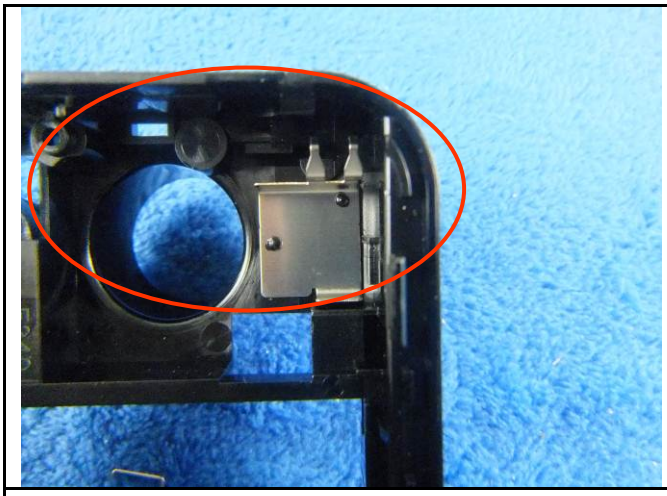


Mainboard - Front View

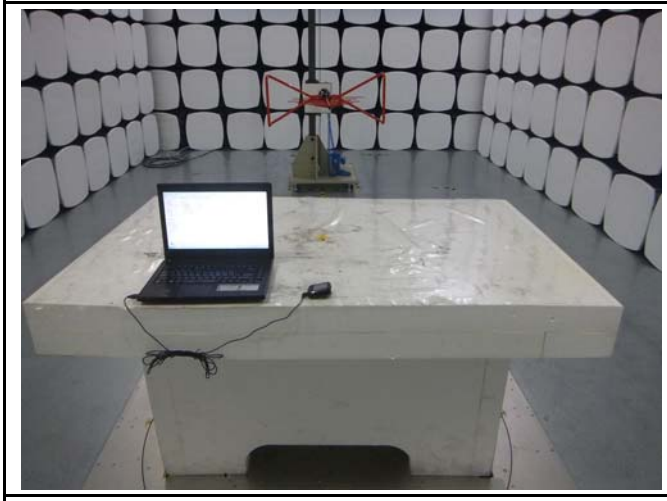
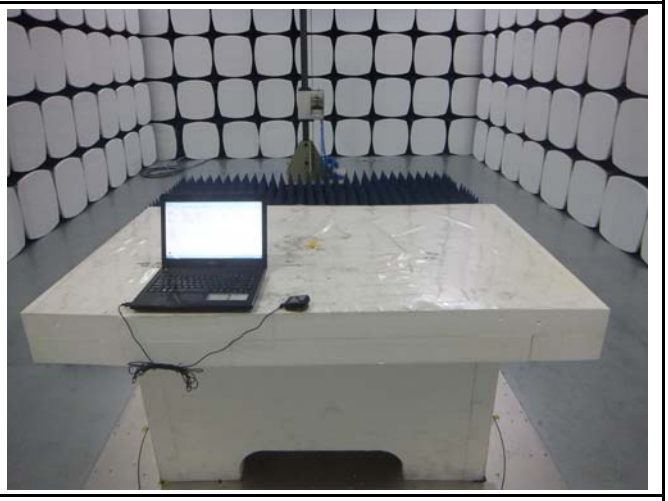
Mainboard – Rear View

Battery - Front View

Battery - Rear View

	
WIFI Antenna View	

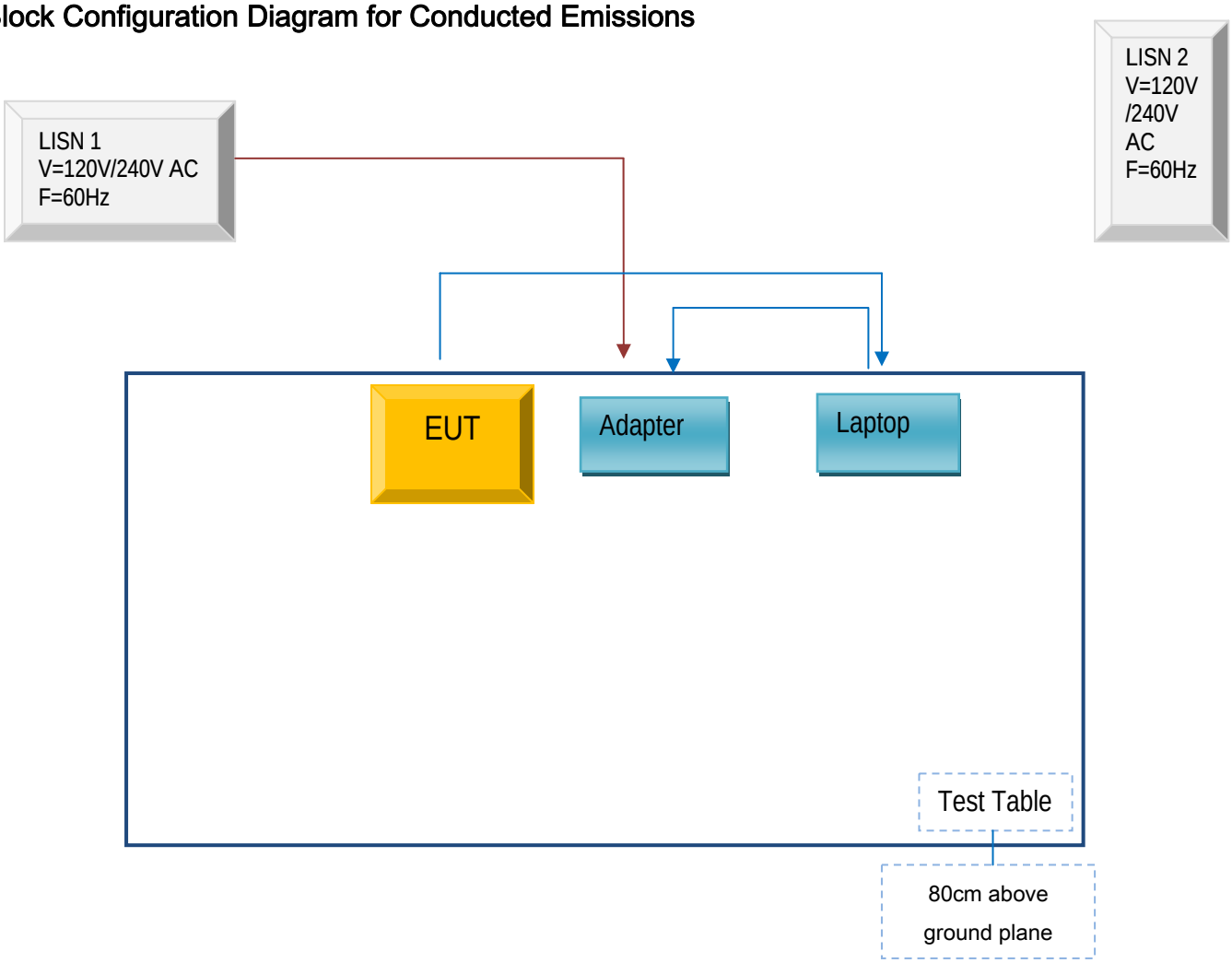
Annex B.iii. Photograph: Test Setup Photo

Conducted Emissions Test Setup – TF Card Front View	Conducted Emissions Test Setup – TF Card Side View
	
Radiated Emissions Test Setup Below 1GHz - TF Card Front View	Radiated Emissions Test Setup Above 1GHz - TF Card Side View

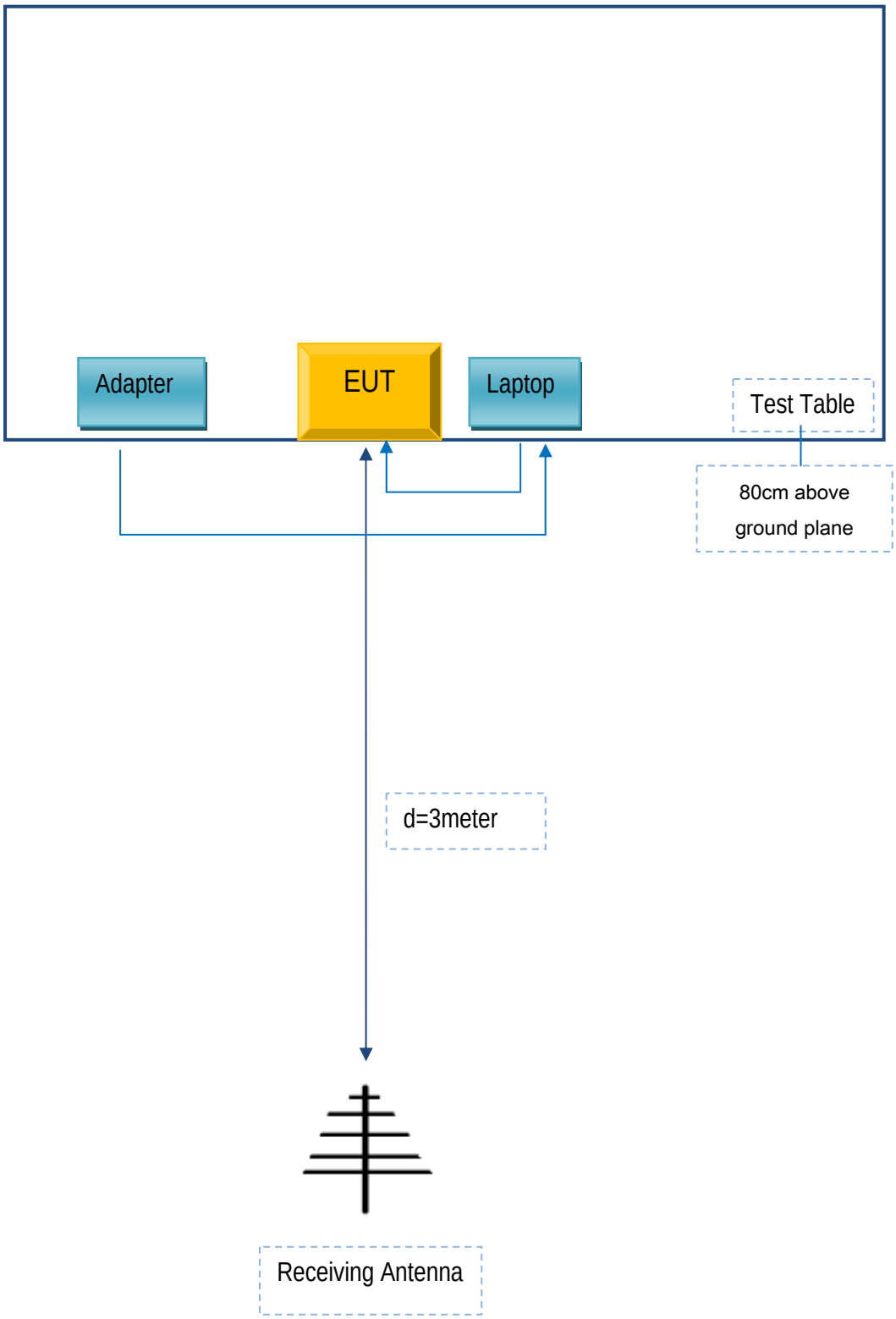
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Lenovo Laptop	E40	LR-1EHRX

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	1m	C201303
Power Cable	Un-shielding	No	1m	Y1120331

Annex D. User Manual / Block Diagram / Schematics / Partlist

See attachment

Annex E. DECLARATION OF SIMILARITY

N/A