TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

Product: Sports camera

Model No.: 9941, 9942

Trade mark: Cobra

Report No.: TCT170522E014

Issued Date: Jun. 01, 2017

Issued for:

Cobra Electronics Corporation

6500 West Cortland Street Chicago, IL 60707 USA

Issued By:

Shenzhen Tongce Testing Lab

1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

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Hotline: 400-6611-140 Tel: 86-755- 27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	Sports camera
Model No.:	9941, 9942
Applicant:	Cobra Electronics Corporation
Address:	6500 West Cortland Street Chicago, IL 60707 USA
Manufacturer:	Guangzhou Yaozhong Electronics Co., Ltd.
Address:	No.2, Shaxing Road, Shajiao, Lanhe, Nansha district, Guangzhou, China
Test Voltage:	DC 5 V(PC Input AC 120 V/ 60 Hz), DC 5 V(Adapter Input AC 120 V/ 60 Hz)
Date of Test:	May 24, 2017 ~ May 26, 2017
Applicable Standards:	47 CFR FCC Part 15 Subpart B: 2016 ANSI C63.4: 2014

The above equipment has been tested by Shenzhen Tongce Testing Lab and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	Jerry	***Date:***	***May 26, 2017***
	Jerry		
Check By:	Joe Zhou	***Date:***	***Jun. 01, 2017***
	Joe Zhou		
Approved By:	Tomsin	***Date:***	***Jun. 01, 2017***
	Tomsin		

2. Test Result Summary

Emission		
Test Method	**Item**	**Result**
FCC 47 CFR Part 15 Subpart B	Conducted Emission at Mains Terminals	Pass
	Radiated Emission	Pass

Note:

1. Pass: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.
5. The information of measurement uncertainty is available upon the customer's request.

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3. EUT Description

Product Name:	Sports camera
Model No.:	9941
Product Parameter:	Input: DC 5 V, 1 A
AC Mains:	☐Shielded ☐Unshielded, ☐Detachable ☐Un-detachable ☒Not applicable ☐Length:
DC Line:	☐Shielded ☐Unshielded, ☐Detachable ☐Un-detachable ☒Not applicable ☐Length:
Control Line:	☐Shielded ☐Unshielded, ☐Detachable ☐Un-detachable ☒Not applicable ☐Length:

Model(s) List

No.	Model Number	Tested With
1	9941	☒
Other models	9942	☐
Note: 9941 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of 9941 can represent the remaining models.		

4. Test Methodology

4.1. Decision of Final Test Mode

The EUT was tested together with the thereinafter additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.
The following test mode(s) were assessed:

Test Mode
Mode 1: Charging and Data Transmitting
Mode 2: Charging and Camera Shooting
Mode 3: Charging and SD Playing

The following test mode was found to produce the highest emission level.

The Worst Test Mode		
Emission	Conducted Emission	Mode 1: Charging and Data Transmitting
	Radiated Emission	Mode 1: Charging and Data Transmitting

4.2. EUT System Operation

1. Set up EUT with the support equipments.
2. Make sure the EUT work normally during the test.

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5. Setup of Equipment under Test

5.1. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Keyboard	PK1100U	04G104180039DP	/	ASUS
Mouse	MOBTUO	04G125610170DP	/	ASUS
PC	BM6620	D1PFCG0008HP	/	ASUS
Monitor	19PFL3120/T3	AU2A1241000762	/	PHILIPS
SD Card	SDSDU-016G	/	/	SanDisk

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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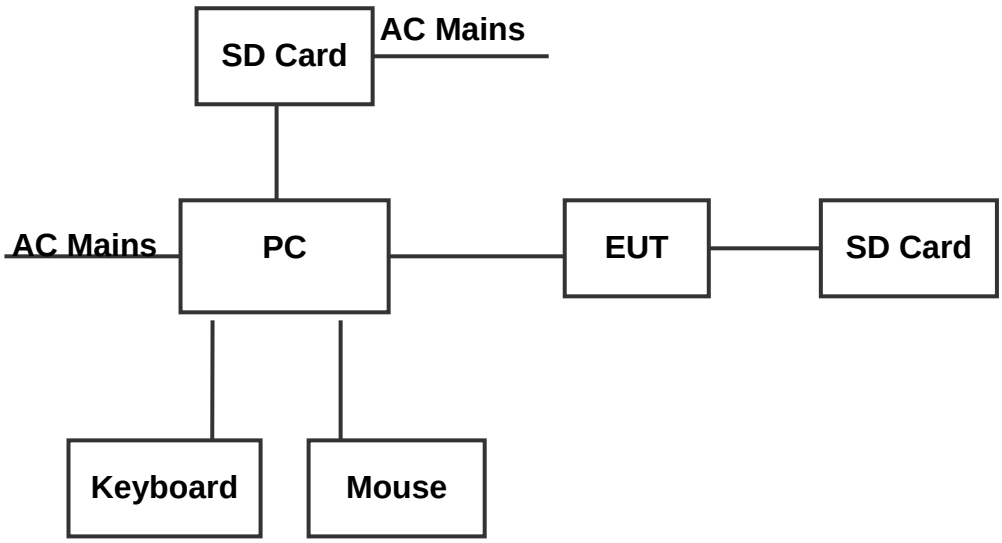
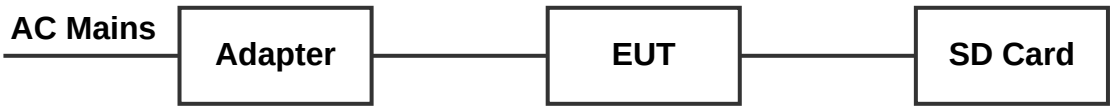
5.2. Configuration of System Under Test

Charging and Data Transmitting



Charging and Camera Shooting/ SD Playing



(EUT: Sports camera)

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6. Facilities and Accreditations

6.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:
FCC - Registration No.: 572331
Shenzhen Tongce Testing Lab
The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 32. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	Item	MU
1.	Temperature	±0.1℃
2.	Humidity	±1.0 %
3.	Spurious Emissions, Conducted	±2.56 dB
4.	All Emissions, Radiated	±4.50 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

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7. Emission Test

7.1. Conducted Emission at Mains Terminals

7.1.1. Test Specification

Test Requirement:	FCC 47 CFR Part 15 Subpart B
Test Method:	ANSI C63.4: 2014
Frequency Range:	150 kHz to 30 MHz

7.1.2. Limits

Frequency (MHz)	Class A dB(uV)		Class B dB(uV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 – 56[a]	56 – 46[a]
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50
a. Decreases with the logarithm of the frequency				

7.1.3. Test Instruments

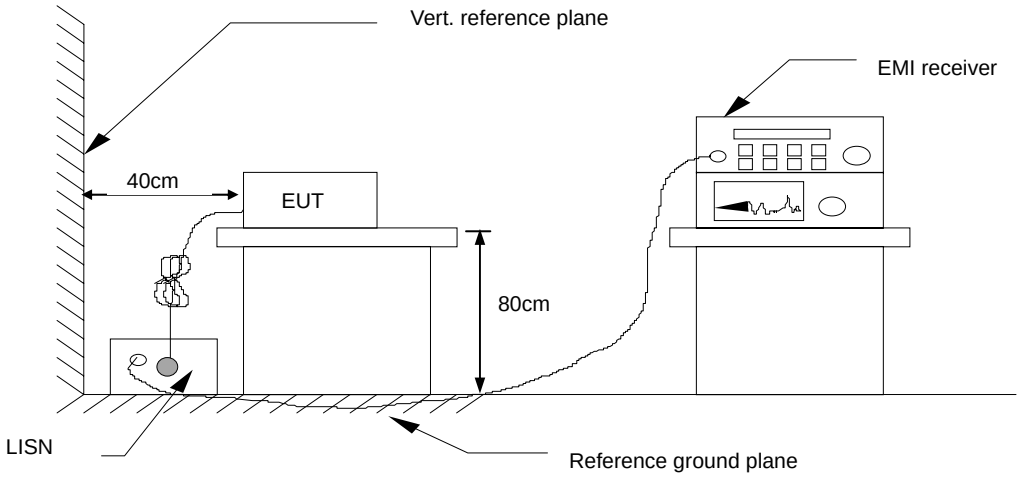
Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESCS30	100139	Aug. 11, 2017
LISN	Schwarzbeck	NSLK 8126	8126453	Aug. 16, 2017

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

7.1.4. Test Method

The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN

7.1.5. Block Diagram of Test Setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.6. Test Results

Test Environment:	Temp.:	26 ℃	Humid.:	60 %	Press.:	96 kPa			
Test Mode:	Mode 1, Mode 2, Mode 3								
Test Voltage:	DC 5 V(PC Input AC 120 V/ 60 Hz), DC 5 V(Adapter Input AC 120 V/ 60 Hz)								
Test Result:	Pass								

Note:

L1 = Live Line / N = Neutral Line

"---" denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

Freq. = Emission frequency in MHz

Reading level dB(μV) = Receiver reading

Corr. Factor (dB) = Attenuator factor + Cable loss

Level dB(μV) = Reading level dB(μV) + Corr. Factor (dB)

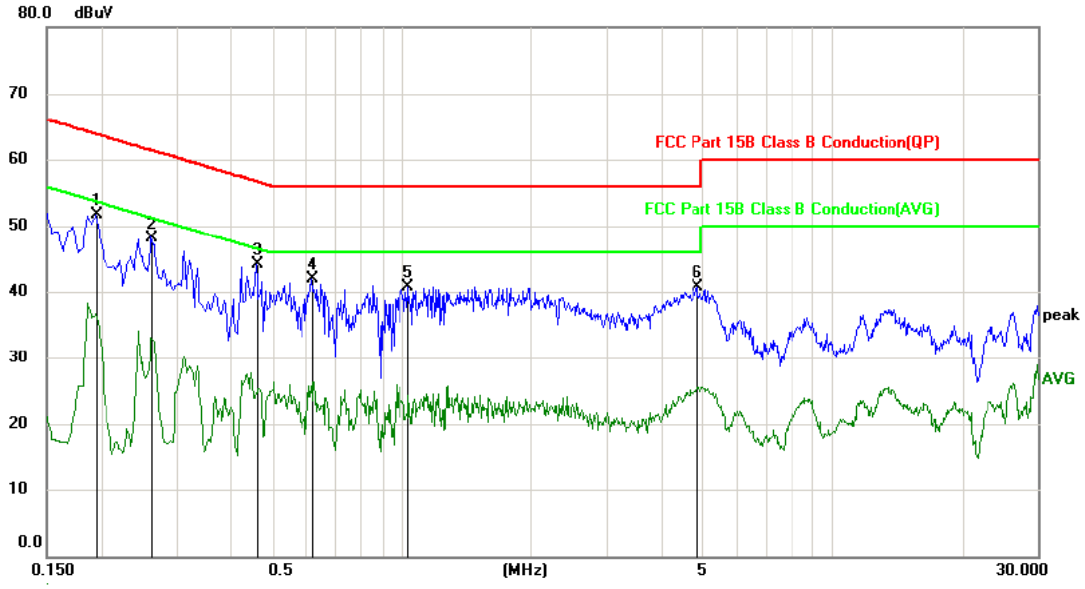
Limit dB(μV) = Limit stated in standard

Margin (dB) = Level dB(μV) – Limits dB(μV)

Q.P. =Quasi-Peak

AVG=Average

Please refer to following diagram for individual



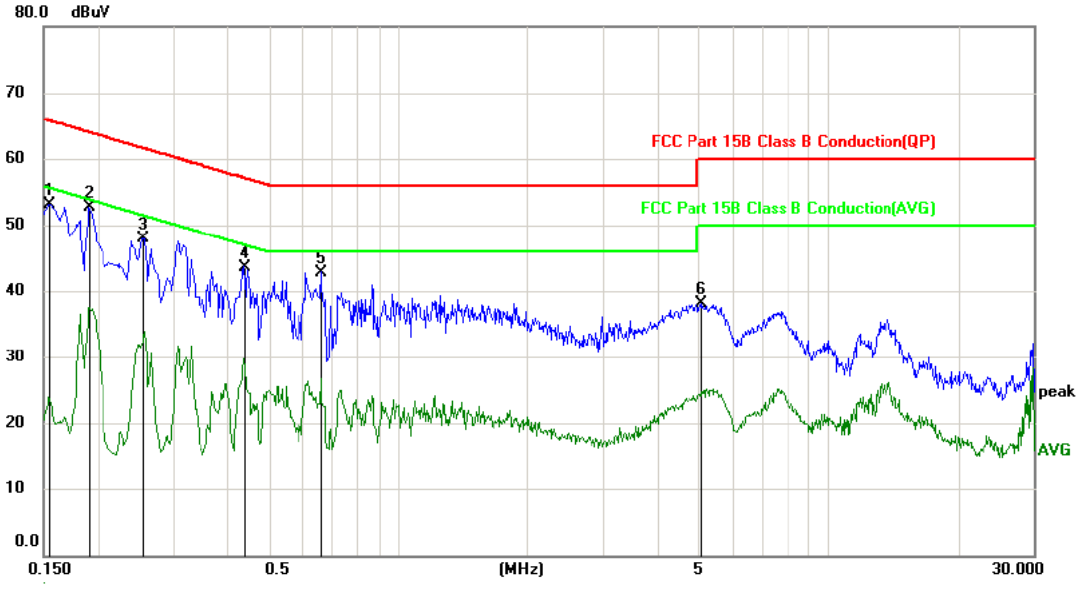
Site | Phase: *L1* | Temperature: 26

Limit: FCC Part 15B Class B Conduction(QP) | Power: | Humidity: 60 %

Mode: Charging and Data Transmitting

Note: DC 5V(PC Input AC 120V/60Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1949	40.34	11.45	51.79	63.83	-12.04	peak	
2		0.2625	36.78	11.42	48.20	61.35	-13.15	peak	
3		0.4605	32.70	11.32	44.02	56.68	-12.66	peak	
4		0.6180	30.70	11.26	41.96	56.00	-14.04	peak	
5		1.0365	29.41	11.21	40.62	56.00	-15.38	peak	
6		4.8525	30.08	10.66	40.74	56.00	-15.26	peak	



Site | Phase: N | Temperature: 26

Limit: FCC Part 15B Class B Conduction(QP) | Power: | Humidity: 60 %

Mode: Charging and Data Transmitting

Note: DC 5V(PC Input AC 120V/60Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1545	41.60	11.47	53.07	65.75	-12.68	peak	
2	*	0.1905	41.24	11.45	52.69	64.01	-11.32	peak	
3		0.2535	36.57	11.42	47.99	61.64	-13.65	peak	
4		0.4380	32.27	11.33	43.60	57.10	-13.50	peak	
5		0.6630	31.56	11.24	42.80	56.00	-13.20	peak	
6		5.0820	27.56	10.62	38.18	60.00	-21.82	peak	

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7.2. Radiated Emission

7.2.1. Test Specification

Test Requirement:	FCC 47 CFR Part 15 Subpart B
Test Method:	ANSI C63.4: 2014
Frequency Range:	30 MHz to 6000 MHz
Measurement Distance:	3 m
Antenna Polarization:	Horizontal & Vertical

7.2.2. Limits

Frequency (MHz)	Class A (at 3m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	49.0	40.0
88 ~ 216	53.5	43.5
216 ~ 960	56.4	46.0
960 ~ 1000	59.5	54.0

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level dB(μV/m) = 20 log Emission level (μV/m).

7.2.3. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	R&S	FSEM	848597-001	Aug. 11, 2017
Amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Amplifier	EM	EM30265	07032613	Aug. 11, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

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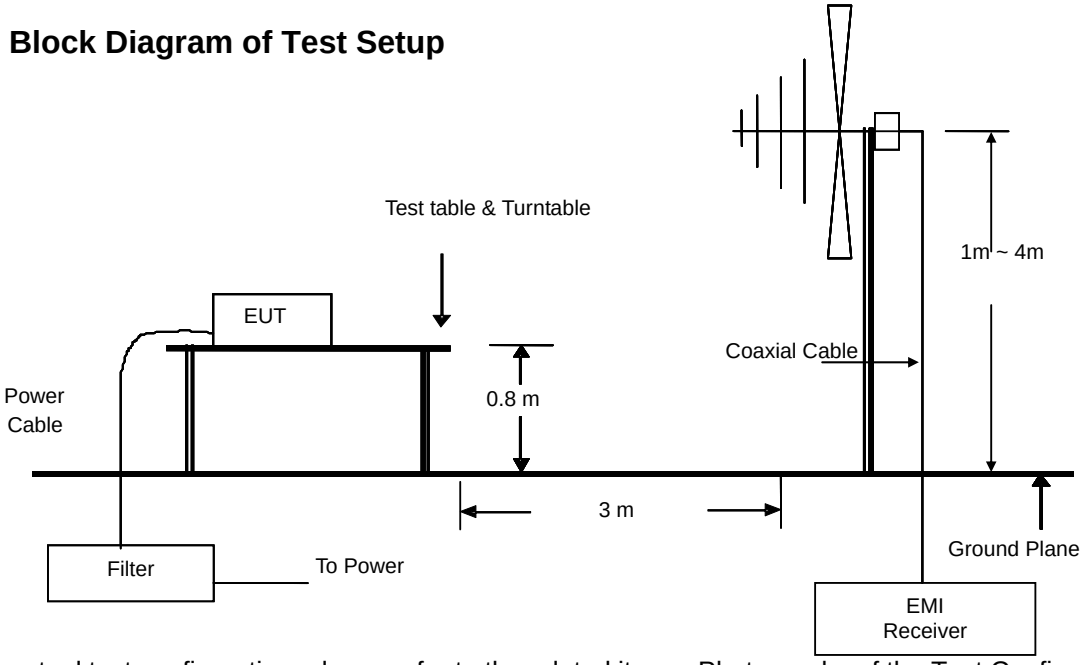
7.2.4. Test Method

Measurements were made in a 3-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. Block Diagram of Test Setup.

7.2.5. Block Diagram of Test Setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

7.2.6. Test Results

Test Environment:	Temp.:	25 ℃	Humid.:	55 %	Press.:	96 kPa	
Test Mode:	Mode 1, Mode 2, Mode 3						
Test Voltage:	DC 5 V(PC Input AC 120 V/ 60 Hz), DC 5 V(Adapter Input AC 120 V/ 60 Hz)						
Test Result:	Pass						

Note:

Freq. = Emission frequency in MHz

Reading level dB(μV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

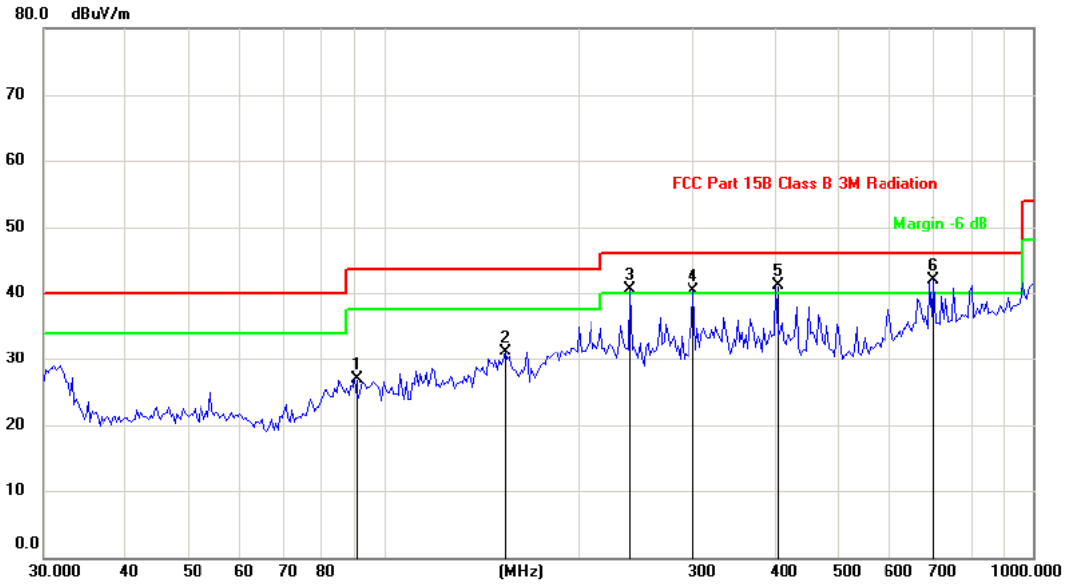
Measurement dB(μV/m) = Reading level dB(μV) + Corr. Factor (dB)

Limit dB(μV/m) = Limit stated in standard

Margin (dB) = Measurement dB(μV/m) – Limits dB(μV/m)

Q.P. =Quasi-Peak

Please refer to following diagram for individual



Site

Limit: FCC Part 15B Class B 3M Radiation

Note: DC 5V(PC Input AC 120V/60Hz)

Polarization: *Horizontal*

Power:

Temperature: 25

Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		90.4198	34.63	-7.80	26.83	43.50	-16.67	peak			
2		154.2428	41.27	-10.23	31.04	43.50	-12.46	peak			
3	!	240.1442	49.55	-9.07	40.48	46.00	-5.52	peak			
4	!	300.6988	45.52	-5.21	40.31	46.00	-5.69	peak			
5	!	401.1050	42.66	-1.48	41.18	46.00	-4.82	peak			
6	*	703.7314	38.17	3.82	41.99	46.00	-4.01	peak			

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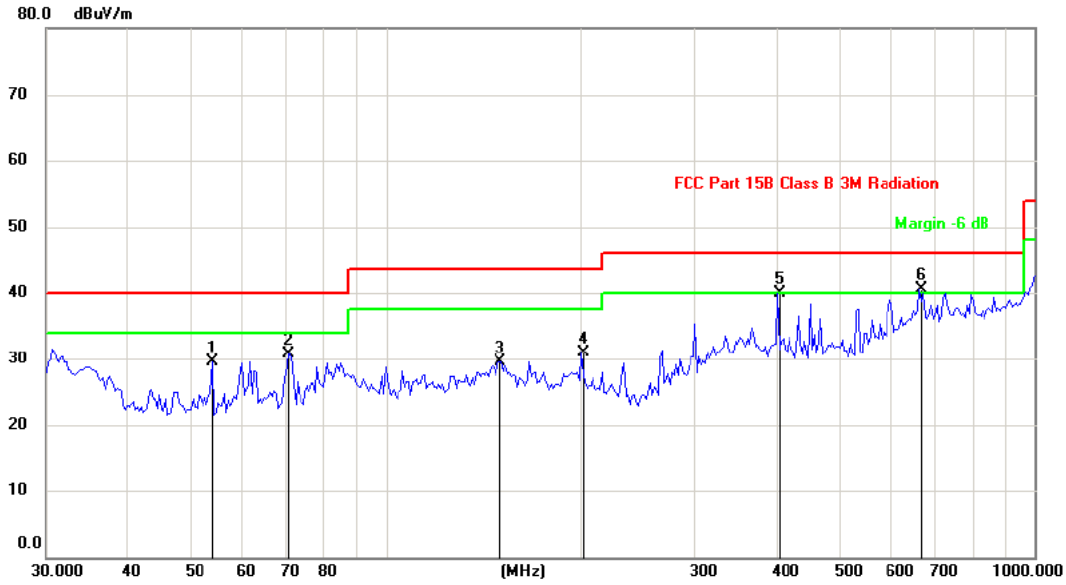


Site

Limit: FCC Part 15B Class B 3M Radiation

Mode: Charging and Data Transmitting

Note: DC 5V(PC Input AC 120V/60Hz)

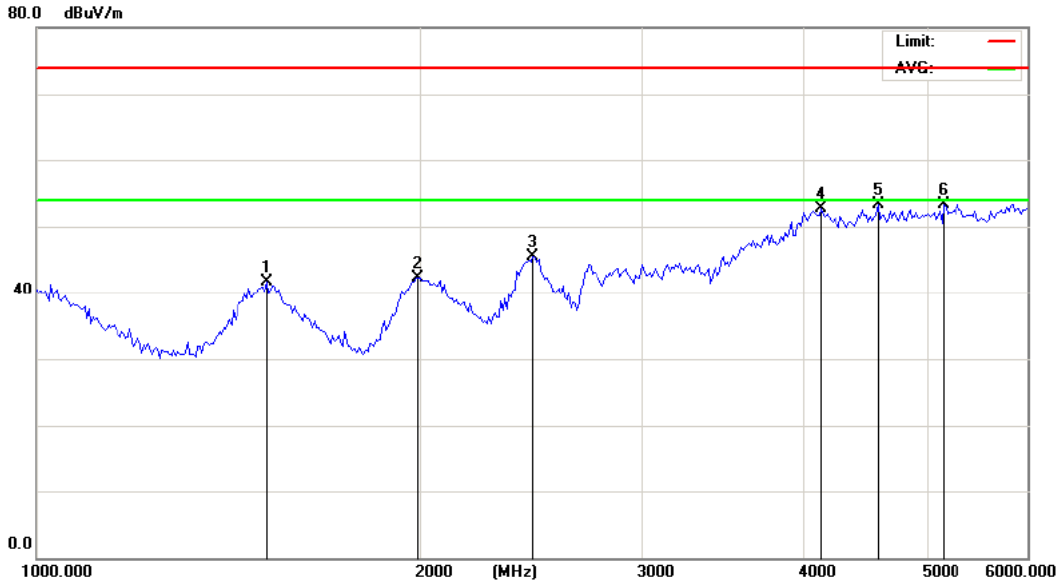
Polarization: *Vertical*

Power:

Temperature: 25

Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		54.1349	36.54	-7.04	29.50	40.00	-10.50	peak			
2		70.7047	41.87	-11.10	30.77	40.00	-9.23	peak			
3		149.9676	39.94	-10.35	29.59	43.50	-13.91	peak			
4		200.0432	39.93	-9.07	30.86	43.50	-12.64	peak			
5		401.1050	41.38	-1.48	39.90	46.00	-6.10	peak			
6	*	665.2610	37.25	3.18	40.43	46.00	-5.57	peak			



Site

Limit: FCC Part 15B Class B Above 1GHz RE(PK)

Mode: Charging and Data Transmitting

Note: DC 5V((PC Input AC 120V/60Hz)

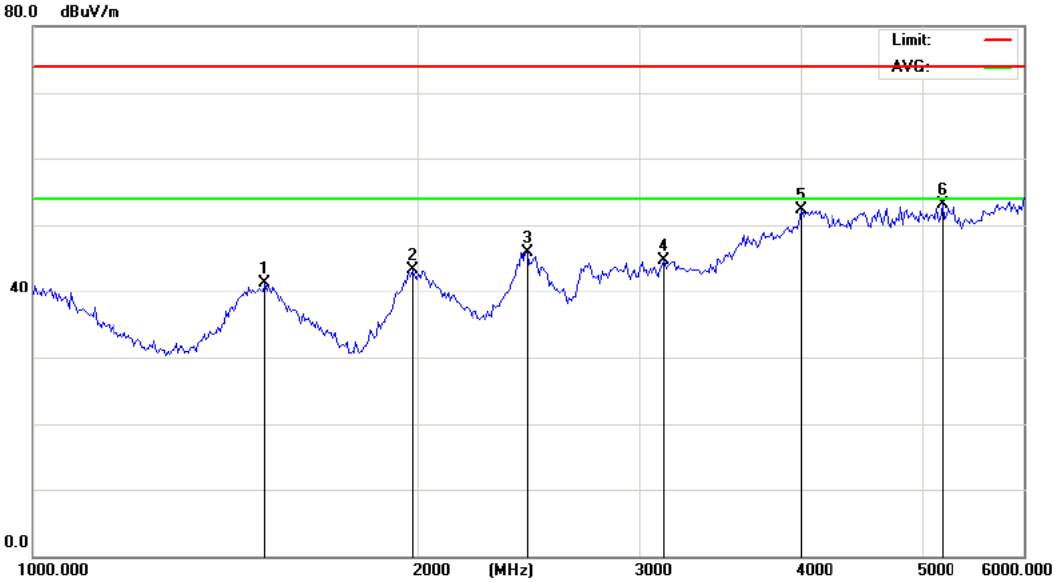
Polarization: ***Horizontal***

Power:

Temperature: 25

Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1516.676	53.41	-11.77	41.64	74.00	-32.36	peak		0	
2		1992.549	52.08	-9.71	42.37	74.00	-31.63	peak		0	
3		2453.891	52.57	-7.13	45.44	74.00	-28.56	peak		0	
4		4130.203	50.24	2.54	52.78	74.00	-21.22	peak		0	
5		4583.473	49.84	3.47	53.31	74.00	-20.69	peak		0	
6	*	5160.069	47.48	5.85	53.33	74.00	-20.67	peak		0	



Site | Polarization: *Vertical* | Temperature: 25

Limit: FCC Part 15B Class B Above 1GHz RE(PK) | Power: | Humidity: 55 %

Mode: Charging and Data Transmitting

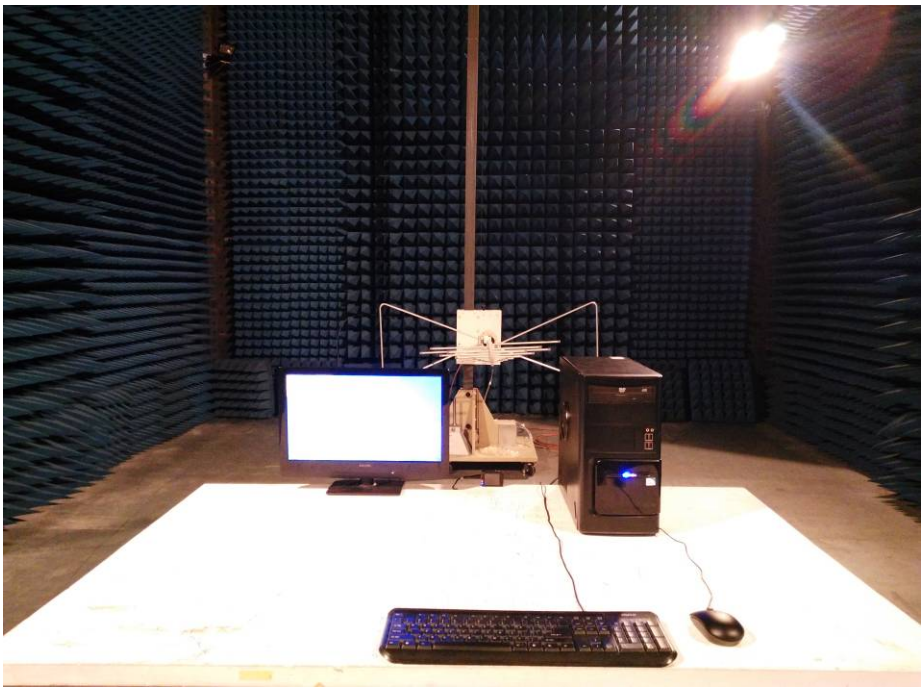
Note: DC 5V(PC Input AC 120V/60Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1522.132	53.06	-11.78	41.28	74.00	-32.72	peak		0	
2		1985.407	53.02	-9.80	43.22	74.00	-30.78	peak		0	
3		2445.096	53.16	-7.17	45.99	74.00	-28.01	peak		0	
4		3132.535	50.28	-5.53	44.75	74.00	-29.25	peak		0	
5		4013.249	50.03	2.36	52.39	74.00	-21.61	peak		0	
6	*	5178.631	47.27	5.92	53.19	74.00	-20.81	peak		0	

8. Photographs of Test Configuration

Conducted Emission Test View

Radiated Emission Test View



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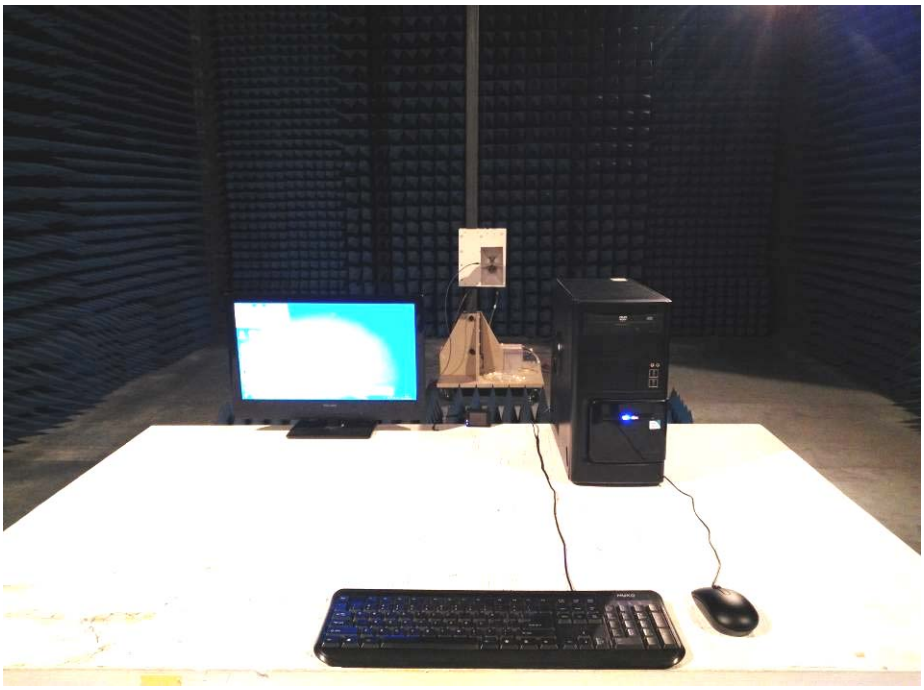

9. Photographs of EUT

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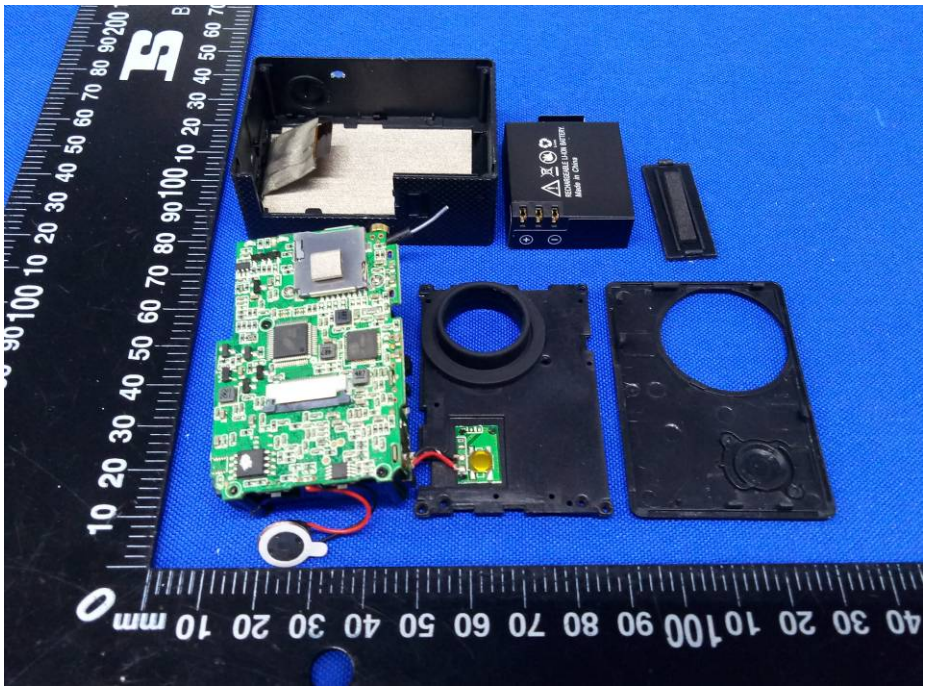
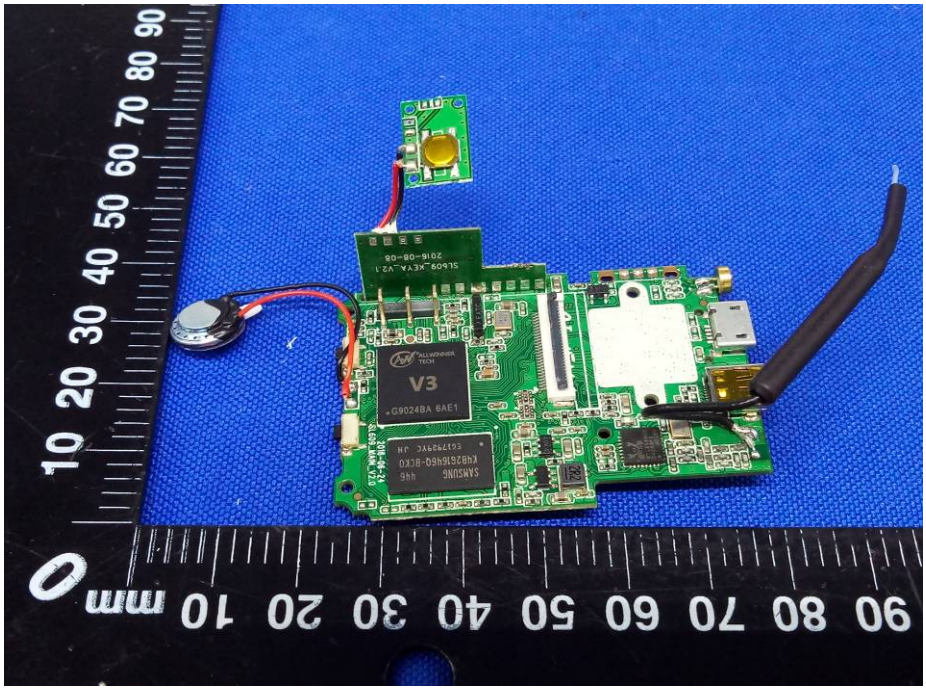
RoX
mm


RoX
mode
mm

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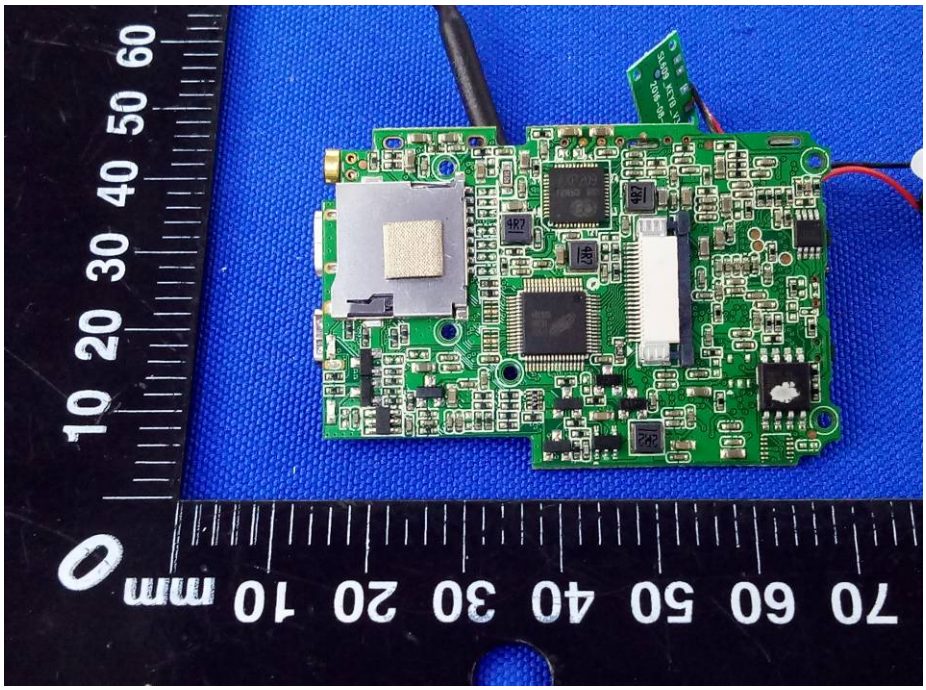

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