

FCC TEST REPORT
for
Cobra Electronics Corporation

Car DVR
Model No.: CDR825E

Prepared for : Cobra Electronics Corporation
Address : 6500 West Cortland Street, Chicago, IL, 60707, United States

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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Report Number : R011407464E
Date of Test : Jul. 30~Aug. 19, 2014
Date of Report : Aug. 20, 2014

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Appendix I (4 Pages)

Appendix II (4 Pages)

TEST REPORT VERIFICATION

Applicant : Cobra Electronics Corporation
Manufacturer : Shenzhen Eeyelog Technology Co., Ltd.
EUT : Car DVR
Model No. : CDR825E
Rating : Input: DC 24V/12V, 0.5A
Output: DC 5V, 1A
Trade Mark : N.A.

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B 15.107, 15.109 & FCC / ANSI C63.4-2009

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Test : Jul. 30~Aug. 19, 2014

Prepared by : Barak Ban
(Engineer/ Barak Ban)

Reviewer : Amy Ding
(Project Manager/ Amy Ding)

Approved & Authorized Signer : Tom Chen
(Manager/ Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	: Car DVR
Model Number	: CDR825E
Test Power Supply	: DC 12/24V/ DC 5V via USB Port
Car Charger	: Input: DC 24V/12V Output: DC 5V/1A
Applicant	: Cobra Electronics Corporation
Address	: 6500 West Cortland Street, Chicago, IL, 60707, United States
Manufacturer	: Shenzhen Eeyelog Technology Co., Ltd.
Address	: A4, Building #2, Hengchangrong High-Tech park, Bao' an, Shenzhen, China.
Factory	: Shenzhen Eeyelog Technology Co., Ltd.
Address	: A4, Building #2, Hengchangrong High-Tech park, Bao' an, Shenzhen, China.
Date of receipt	: Jul. 30, 2014
Date of Test	: Jul. 30~Aug. 19, 2014

1.2. Auxiliary Equipment Used during Test

PC	: Manufacturer: DELL M/N: OPTIPLEX 380 S/N: 1J63X2X CE , FCC: DOC
MONITOR	: Manufacturer: DELL M/N: E170Sc S/N: CN-00V539-64180-055-0UPS CE , FCC: DOC
KEYBOARD	: Manufacturer: DELL M/N: SK-8115 S/N: CN-0DJ313-71616-06C-02XN CE , FCC: DOC Cable: 1m, unshielded
MOUSE	: Manufacturer: DELL M/N: M-UARDEL7 S/N: N/A CE , FCC: DOC Cable: 1m, unshielded
TV	: Manufacturer: SONY M/N: KDL-26EX550 S/N: 1012240 CE , FCC
Power Line	: Non-Shielded, 1.5m
VGA Cable	: Non-Shielded, 1.5m
Network Cable	: Non-Shielded, 1.5m

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, 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 our files. Registration 752021, July 10, 2013

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, February 22, 2013

Test Location

All Emissions tests were performed
 Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB
 Conduction Uncertainty : Uc = 3.4dB

1.5. Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions.

Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Power Line Conducted Emission Test (150KHz To 30MHz)	√
FCC Part 15 Subpart B	Radiated Emission Test (30MHz To 1000MHz)	√

- √ Indicates that the test is applicable
- x Indicates that the test is not applicable

2. POWER LINE CONDUCTED MEASUREMENT

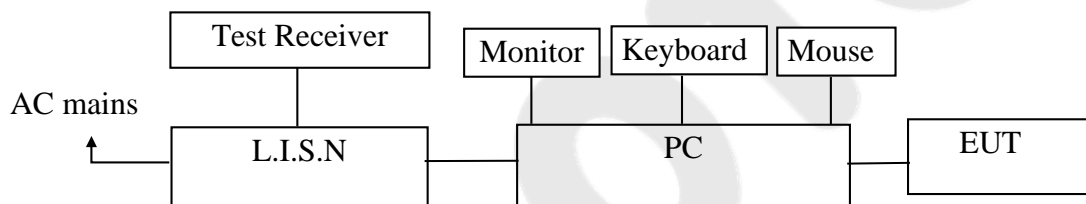
2.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 23, 2014	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2014	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 23, 2014	1 Year

2.2. Block Diagram of Test Setup

2.2.1. Block diagram of connection between the EUT and simulators



2.3. Power Line Conducted Emission Measurement Limits (FCC Part 15)

Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

2.4. Configuration of EUT on Measurement

The following equipments are installed on power line conducted emission measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown as Section 2.2.

2.5.2. Turn on the power of all equipment.

2.5.3. Let the EUT work in test mode (Charging and Video, Communication) and measure it.

2.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of DC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2009 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test result are reported on Section 2.7.

2.7. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150KHz to 30 MHz is investigated.

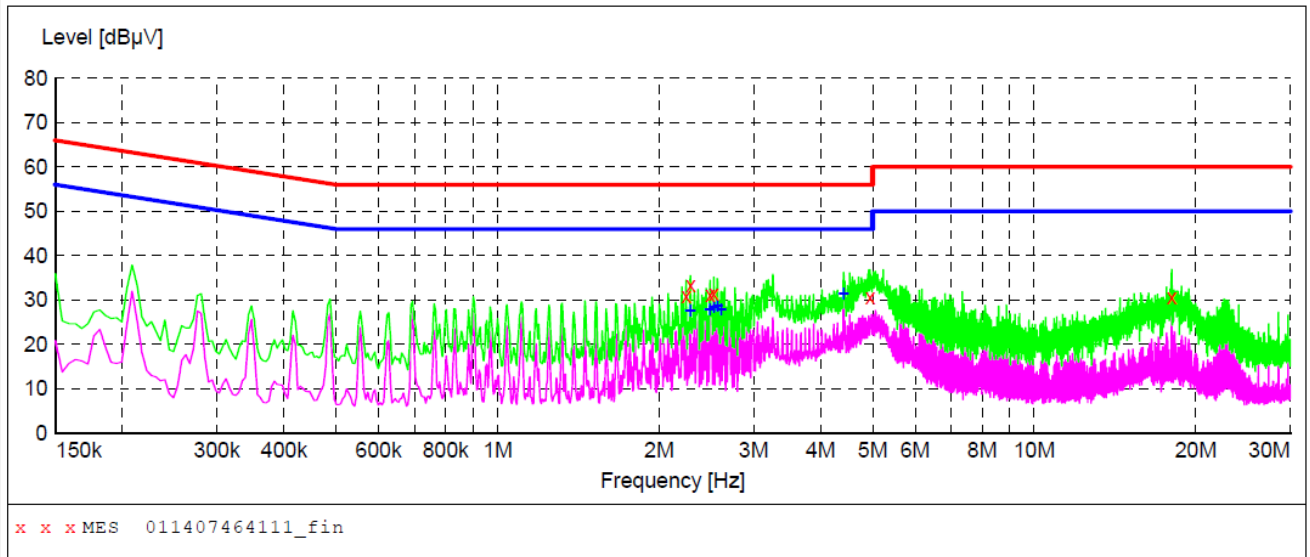
The EUT was tested on (Charging and Video, Communication) modes, only the worst data of (Communication) is attached in the following pages.

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: Communication
 Test Specification: DC 5V via USB Port
 Comment: L
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "011407464111_fin"

8/5/2014 7:51PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.246500	30.80	20.3	56	25.2	QP	L1	GND
2.287000	33.20	20.3	56	22.8	QP	L1	GND
2.489500	31.20	20.3	56	24.8	QP	L1	GND
2.530000	31.40	20.4	56	24.6	QP	L1	GND
4.946500	30.60	20.5	56	25.4	QP	L1	GND
18.032500	30.50	20.8	60	29.5	QP	L1	GND

MEASUREMENT RESULT: "011407464111_fin2"

8/5/2014 7:51PM

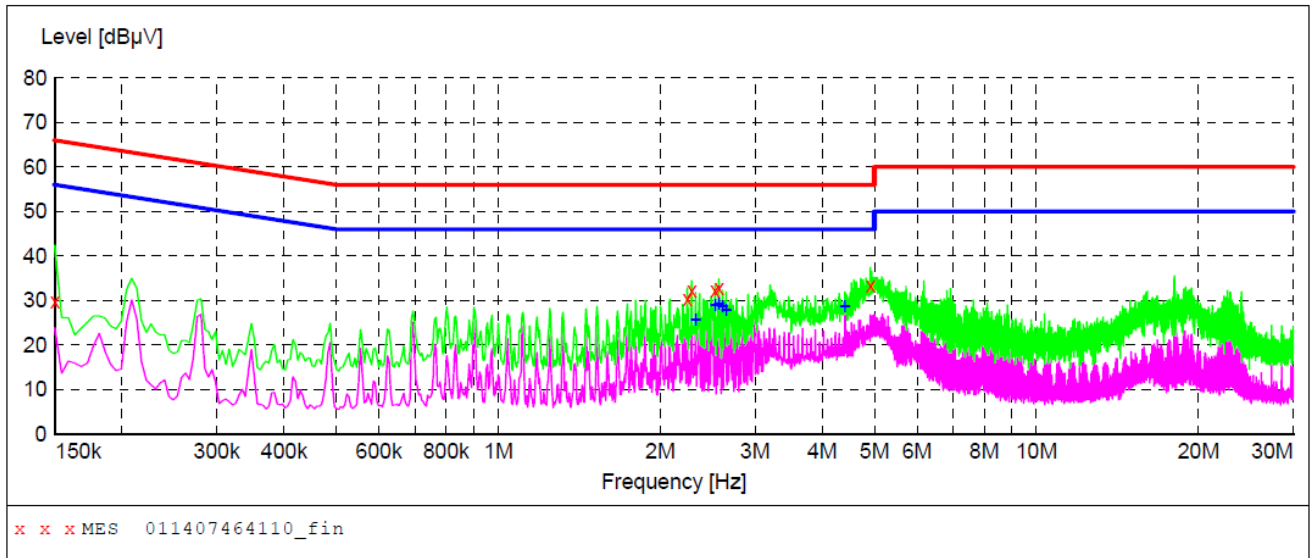
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.287000	27.70	20.3	46	18.3	AV	L1	GND
2.489500	27.80	20.3	46	18.2	AV	L1	GND
2.530000	28.30	20.4	46	17.7	AV	L1	GND
2.570500	28.60	20.4	46	17.4	AV	L1	GND
2.611000	27.90	20.4	46	18.1	AV	L1	GND
4.415500	31.50	20.5	46	14.5	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: Communication
 Test Specification: DC 5V via USB Port
 Comment: N
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "011407464110_fin"

8/5/2014 7:47PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	29.80	20.1	66	36.2	QP	N	GND
2.246500	30.20	20.3	56	25.8	QP	N	GND
2.287000	32.10	20.3	56	23.9	QP	N	GND
2.530000	32.30	20.4	56	23.7	QP	N	GND
2.570500	32.80	20.4	56	23.2	QP	N	GND
4.915000	33.30	20.5	56	22.7	QP	N	GND

MEASUREMENT RESULT: "011407464110_fin2"

8/5/2014 7:47PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.327500	25.80	20.3	46	20.2	AV	N	GND
2.530000	29.00	20.4	46	17.0	AV	N	GND
2.570500	29.30	20.4	46	16.7	AV	N	GND
2.611000	28.70	20.4	46	17.3	AV	N	GND
2.651500	27.80	20.4	46	18.2	AV	N	GND
4.411000	28.70	20.5	46	17.3	AV	N	GND

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

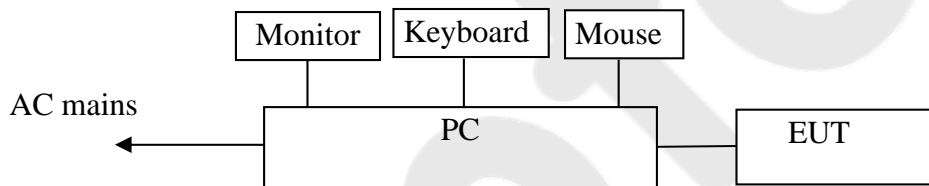
The following test equipments are used during the radiated emission measurement:

3.1.1. For Anechoic Chamber

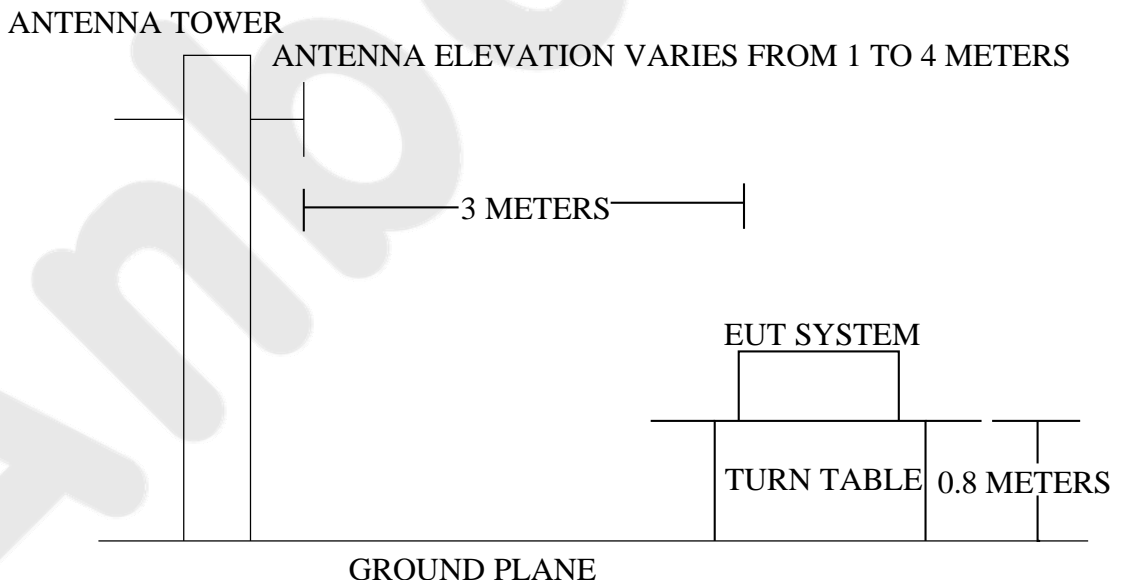
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 23, 2014	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 14, 2013	3 Year
3.	Pre-amplifier	SONOMA	310N	186860	Aug. 09, 2014	1 Year

3.2. Block Diagram of Test Setup

3.2.1. Block diagram of connection between the EUT and simulators



3.2.2. Anechoic Chamber Test Setup Diagram



3.3. Radiated Emission Limit (Subpart B Class B)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30~88	3	100	40.0
88~216	3	150	43.5

216~960	3	200	46.0
960~1000	3	500	54.0

- Remark :
- (1) Emission level (dB) μ V = 20 log Emission level μ V/m
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.4. EUT Configuration on Measurement

The following equipments are installed on radiated emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT as shown in Section 3.2.

3.5.2. Let the EUT work in test mode (Charging and Video, Communication, HDMI Out) and measure it.

3.6. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (Trilog Broadband Antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2009 on radiated emission measurement.

The bandwidth of the EMI test receiver (ESCI) is set at 120kHz.

The frequency range from 30MHz to 1000MHz is checked.

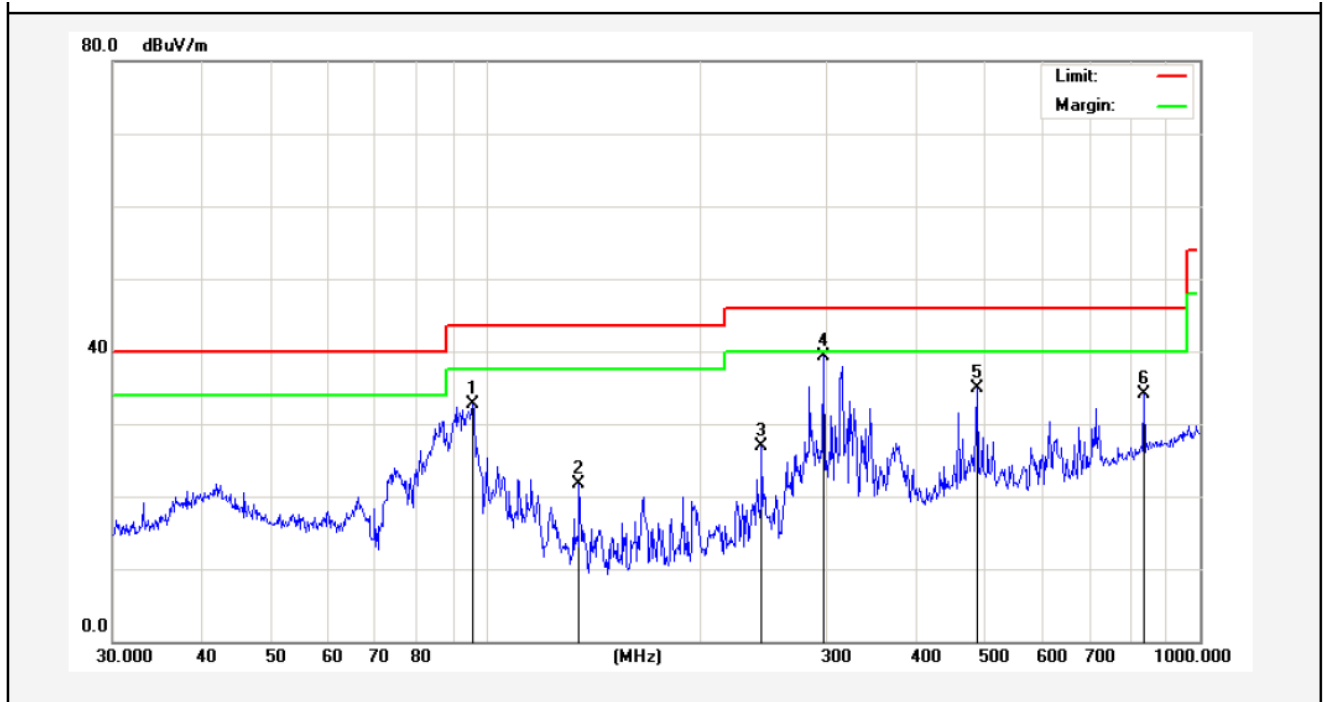
The test mode is tested in chamber and all the test results are listed in Section 3.7.

3.7. Radiated Emission Measurement Results

PASS.

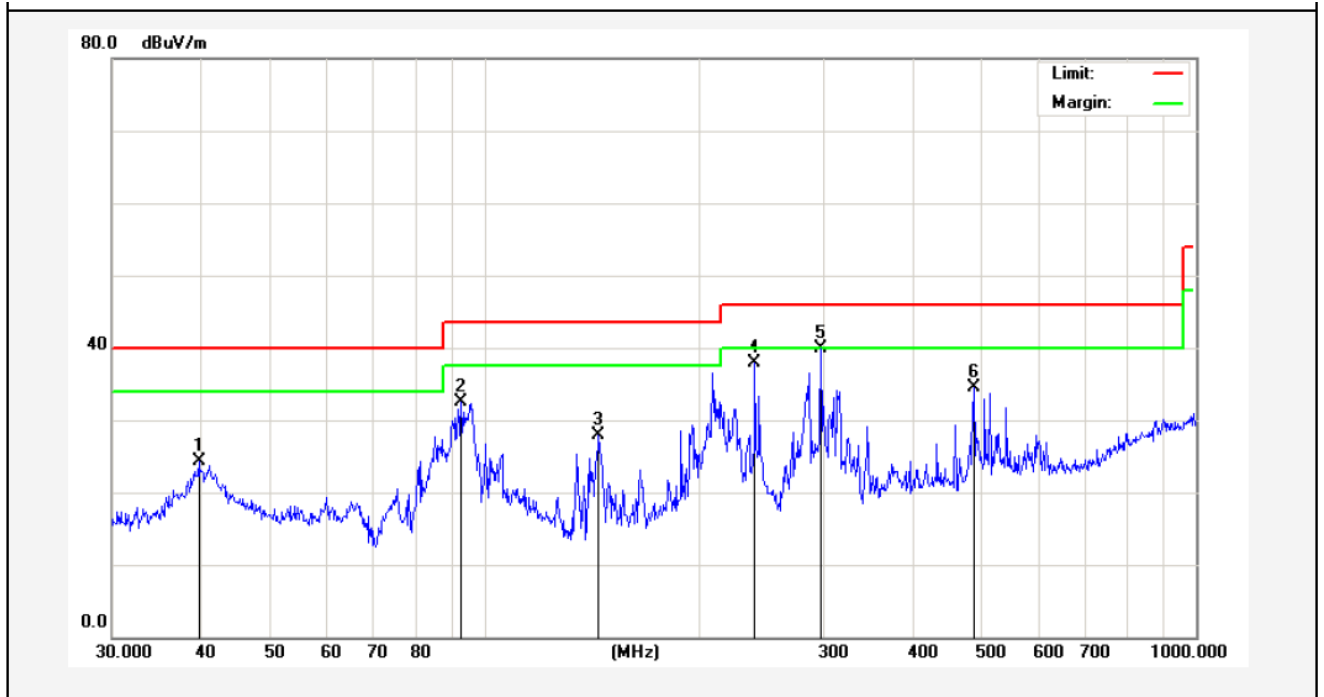
The EUT was tested on (Charging and Video, Communication, HDMI Out) modes, only the worst data of (Communication) is attached in the following pages.

Job No.:	011407464E	Polarization:	Horizontal
Standard:	(RE)FCC PART15 B _3m	Power Source:	DC 5V via USB Port
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Mode:	Communication	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	95.7622	53.76	-20.98	32.78	43.50	-10.72	peak			
2	135.0319	44.78	-23.15	21.63	43.50	-21.87	peak			
3	243.3772	45.15	-18.24	26.91	46.00	-19.09	peak			
4	297.2241	57.07	-17.76	39.31	46.00	-6.69	peak			
5	487.3151	46.29	-11.32	34.97	46.00	-11.03	peak			
6	836.2443	40.06	-5.89	34.17	46.00	-11.83	peak			

Job No.:	011407464E	Polarization:	Vertical
Standard:	(RE)FCC PART15 B_3m	Power Source:	DC 5V via USB Port
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Mode:	Communication	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	39.7146	34.94	-10.59	24.35	40.00	-15.65	peak			
2	92.7871	49.32	-16.84	32.48	43.50	-11.02	peak			
3	144.8418	46.28	-18.42	27.86	43.50	-15.64	peak			
4	239.9874	52.05	-14.09	37.96	46.00	-8.04	peak			
5	297.2241	54.75	-14.76	39.99	46.00	-6.01	peak			
6	487.3151	45.79	-11.32	34.47	46.00	-11.53	peak			

4. PHOTOGRAPH

4.1. Photo of Power Line Conducted Emission Test



4.2. Photo of Radiated Emission Test



APPENDIX I
(Photos of EUT)

Anbotek

APPENDIX I (EXTERNAL PHOTOS)

Figure 1
The EUT- Overall View



Figure 2
The EUT- Front View



Figure 3
The EUT- Back View



Figure 4
The EUT- Top View



Figure 5
The EUT- Bottom View



Figure 6
The EUT- Right Side View



Figure 7
The EUT- Left Side View



APPENDIX II (INTERNAL PHOTOS)

Figure 8
The EUT- Inside View



Figure 9
PCB Of The EUT- Front View



Figure 10
PCB Of The EUT- Front View

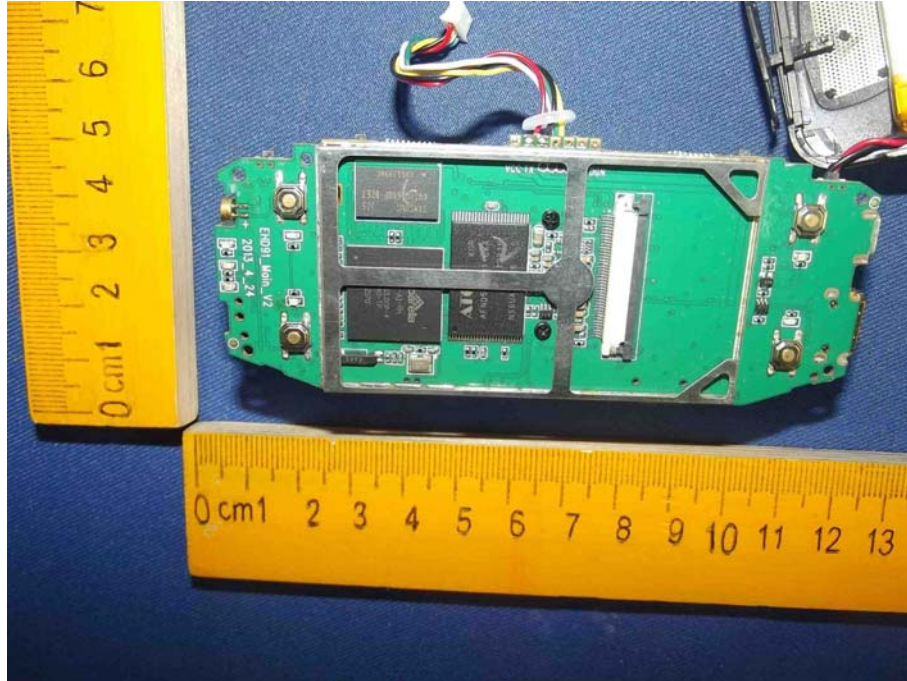


Figure 11
PCB Of The EUT- Back View

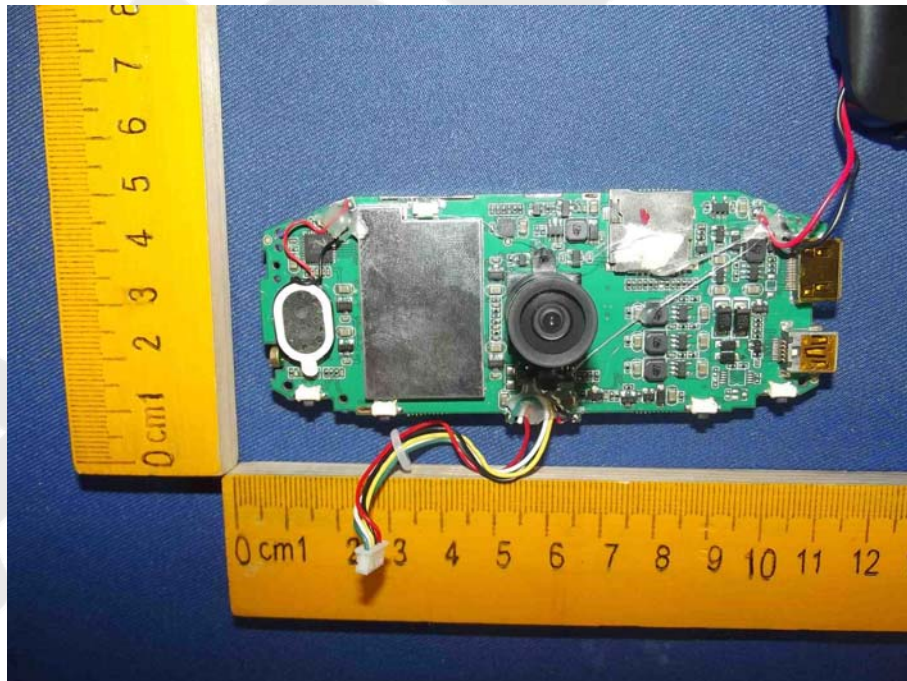


Figure 12
PCB Of The EUT- Back View

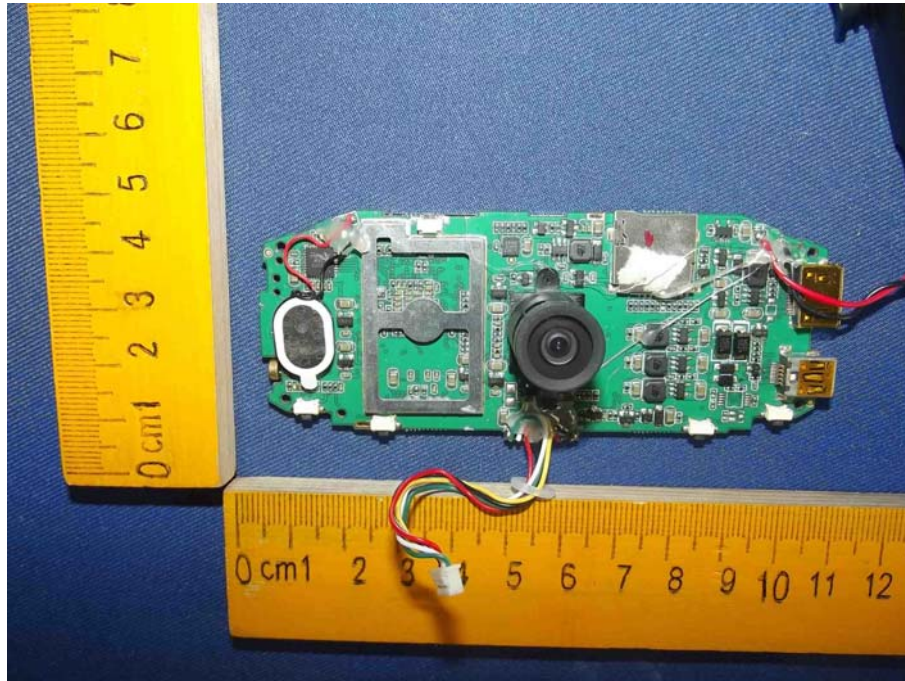


Figure 13
PCB Of The EUT- Front View

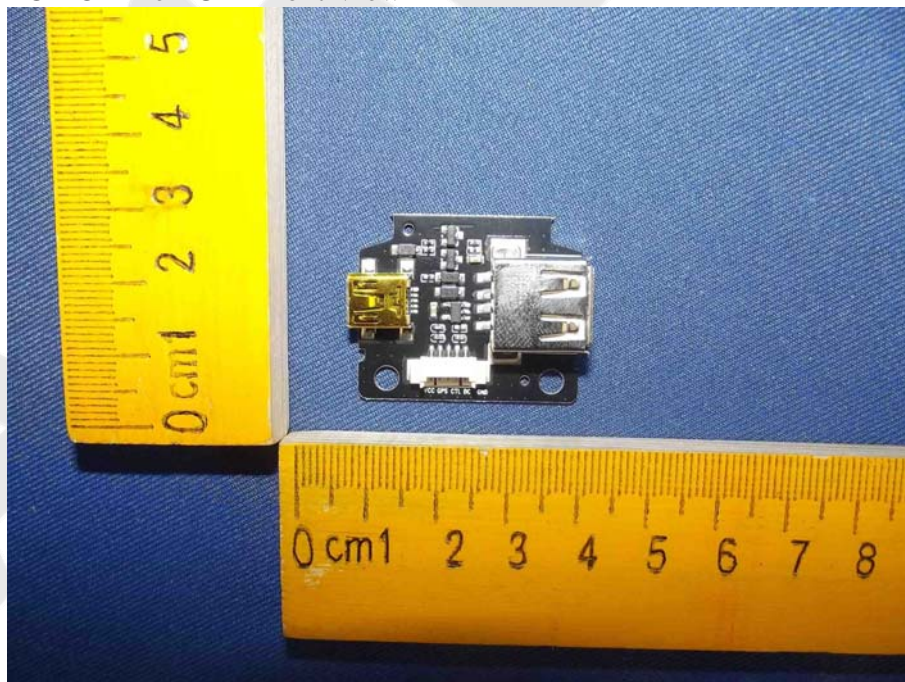


Figure 14
PCB Of The EUT- Back View

