

TEST REPORT

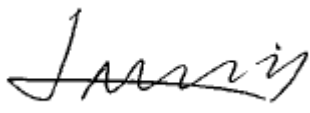
Applicant	SHUOYING DIGITAL SCIENCE&TECHNOLOGY(CHINA)Co.,LTD
Address	NO.187,5th Binhai Road,Wenzhou, zhejiang

Manufacturer or Supplier	SHUOYING DIGITAL SCIENCE&TECHNOLOGY(CHINA)Co.,LTD
Address	NO.187,5th Binhai Road,Wenzhou, zhejiang
Product	ACTION CAMERA
Brand Name	N/A
Model	DVH5015
Additional Model & Model Difference	N/A
Date of tests	Aug. 27, 2014 ~ Sep. 23, 2014

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

☒ **FCC Part 15, Subpart B, Class B**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Breeze Jiang Project Engineer / EMC Department	Approved by Madison Luo Supervisor / EMC Department
	 Date: Sep. 24, 2014

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

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Test Report No.: FV140826N028

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV140826N028	Original release	Sep. 24, 2014

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart B			
Standard Section	Test Item	Result	Remark
FCC Part 15, Subpart B, Class B	Conducted test	PASS	Meets limits minimum passing margin is – 18.58dB at 0.38851 MHz
	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets Class B Limit Minimum Passing Margin Is - 1.72 dB at 742.586MHz

1.1 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:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emission test	0.15MHz ~ 30MHz	+/- 2.66 dB
Radiated emissions test	30MHz ~ 1GHz	+ /- 4.06 dB

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	ACTION CAMERA
MODEL NO.	DVH5015
POWER SUPPLY	DC3.7V from Battery or DC5V from USB unit
CABLE SUPPLIED	USB Line:Unshielded detachable 0.8m,
THE HIGHEST OPERATING FREQUENCY	Below 108MHz

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was showed in test report.
3. Please refer to the EUT photo document (Reference No.: 140826N028) for detailed product photo.



2.2 DESCRIPTION OF TEST MODES

The EUT was tested under the following modes. And the final worst mode was marked in boldface and recorded in this report.

◆ FOR MAINS TERMINAL DISTURBANCE VOLTAGE TEST:

Test Mode	Test Voltage
Data Communication + Charging	DC 5V from PC input AC120V 60Hz

◆ FOR Radiated Emission Test:

Description of Test Mode	Test Voltage
Data Communication + Charging	DC 5V from PC input AC120V 60Hz
Recording+HDMI Out	DC 3.7V from Li-ion battery
Playback+HDMI Out	DC 3.7V from Li-ion battery

2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an dependent 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook PC	Lenovo	E430	MP-0DN27	N/A
2	Printer	Lenovo	LJ2200L	LP02857415 48001408	N/A
3	Mouse	DELL	MOC5UO	H0K00K92	N/A
4	Monitor	DELL	U2410f	23.058D0.017G	N/A

NO.	CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.0m, DC Line: Unshielded, Undetachable 2.0m.
2	AC Line: Unshielded, Detachable 1.5m, USB Line: Unshielded, Detachable 1.5m..
3	USB Line: Unshielded, Undetachable 1.5m.
4	AC Line: Unshielded, Detachable 1.5m, HDMI Line: Shielded detachable 1.0m, with two core.

3 EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTES:**
- (1) The lower limit shall apply at the transition frequencies.
 - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101418	Mar. 28,14	Mar. 27, 2015
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	May 13,14	May 12, 2015
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	May 13,14	May 12, 2015
Test software	ADT	ADT_Conc_ V7.3.7	N/A	N/A	N/A

- NOTE:**
1. The test was performed in shielded room 553.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

3.1.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2009 (section 7).

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

NOTE:

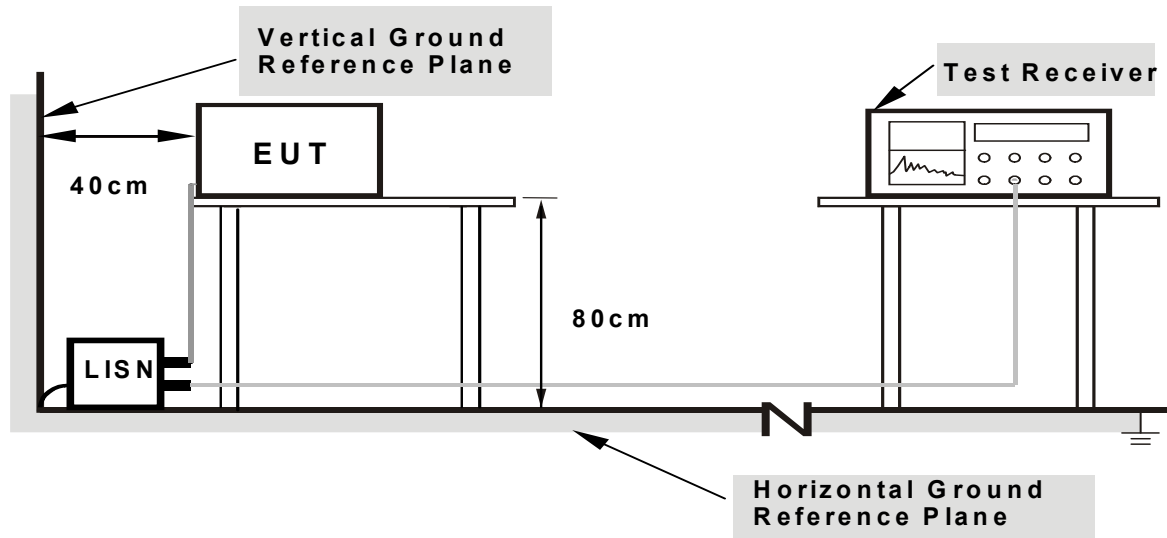
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

3.1.4 DEVIATION FROM TEST STANDARD

No deviation



3.1.5 TEST SETUP



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.

3.1.6 EUT OPERATING CONDITIONS

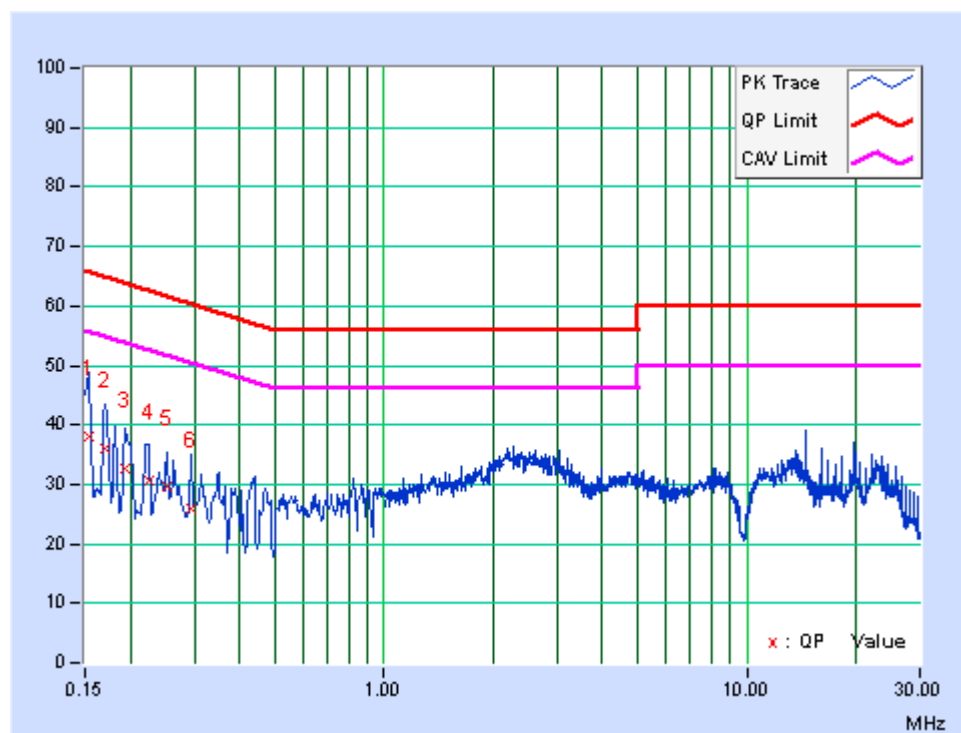
- a. Turned on the power of all equipment.
- b.. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

3.1.7 TEST RESULTS

TEST MODE	Data Communication + Charging	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from PC input AC120V 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	27deg. C, 55%RH	TESTED BY	Cheng Zhong

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.83	27.35	11.26	38.18	22.09	65.79	55.79	-27.61	-33.70
2	0.16955	10.77	25.39	8.47	36.16	19.24	64.98	54.98	-28.83	-35.75
3	0.19305	10.68	21.87	9.90	32.55	20.58	63.90	53.90	-31.36	-33.33
4	0.22429	10.64	20.14	13.67	30.78	24.31	62.66	52.66	-31.88	-28.35
5	0.25166	10.62	19.11	12.49	29.73	23.11	61.70	51.70	-31.97	-28.59
6	0.29467	10.64	15.31	9.95	25.95	20.59	60.39	50.39	-34.45	-29.81

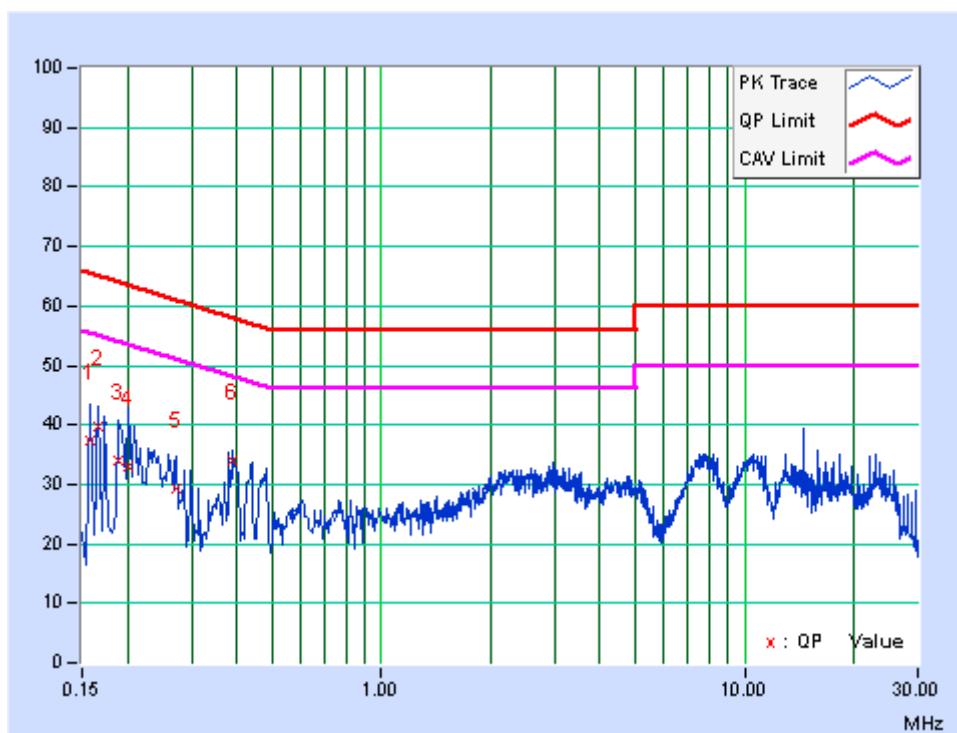
REMARKS: The emission levels of other frequencies were very low against the limit.



TEST MODE	Data Communication + Charging	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from PC input AC120V 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	27deg. C, 55%RH	TESTED BY	Cheng Zhong

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	10.63	26.69	4.43	37.32	15.06	65.58	55.58	-28.26	-40.52
2	0.16564	10.61	29.17	3.72	39.78	14.33	65.18	55.18	-25.39	-40.84
3	0.18903	10.57	23.57	9.81	34.14	20.38	64.08	54.08	-29.94	-33.70
4	0.20031	10.55	22.30	11.11	32.85	21.66	63.60	53.60	-30.75	-31.94
5	0.27120	10.55	18.61	11.00	29.16	21.55	61.08	51.08	-31.92	-29.53
6	0.38851	10.59	23.51	18.93	34.10	29.52	58.10	48.10	-24.00	-18.58

REMARKS: The emission levels of other frequencies were very low against the limit.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Test Standard: FCC Part 15B Subpart B (Section: 15.109)

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBµV/m)				
Frequencies (MHz)	ICES-003, Class A	ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960				
960-1000	49.5	43.5	47	37
1000-3000	Avg: 49.5	Avg: 43.5	Not defined	Not defined
Above 3000	Peak: 69.5	Peak: 63.5	Not defined	Not defined

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	ICES-003, Class A	ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960				
960-1000	60	54	57.5	47.5
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74	Avg: 56 Peak: 76	Avg: 50 Peak: 70
Above 3000			Avg: 60 Peak: 80	Avg: 54 Peak: 74

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



3.2.2 TEST INSTRUMENTS

FOR FREQUENCY Below1GHz (10m Chamber)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 06,14	Mar. 05, 2015
EMI Test Receiver	Rohde&Schwarz	ESU 26	100005	May 13,14	May 12, 2015
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 03, 13	Dec. 02, 2014
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Dec. 03, 13	Dec. 02, 2014
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25,14	Jun. 24, 2015
Signal Amplifier	Agilent	8447D	2944A11174	Jun. 25,14	Jun. 24, 2015
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	May 15, 14	May 14, 2015
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A

FOR FREQUENCY ABOVE 1GHz(10m Chamber)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 06,14	Mar. 05, 2015
EMI Test Receiver	Rohde&Schwarz	ESU 26	100005	May 13,14	May 12, 2015
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 9, 14	Apr. 8, 2015
Pre-Amplifier (100MHz-26.5GHz)	EMCI	EMC 012645	980077	Jun. 16,14	Jun. 15, 2015
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,13	Nov. 03, 2014
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A

- NOTE:** 1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 3. The FCC Site Registration No. is 502831.

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	ETS-Lindgren	3117	00085519	Feb. 02,13	Feb. 01, 2015

- NOTE:** 1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 24 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 3. The FCC Site Registration No. is 502831.

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Feb. 13,14	Feb. 12, 2017

- NOTE:** 1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 36 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 3. The FCC Site Registration No. is 502831.

3.2.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2009 (section 12).

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters (below 1GHz) and 3 meters (above 1GHz) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna 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. The bore sight should be used during the test above 1GHz.
- d. 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.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test receiver/spectrum was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

NOTE:

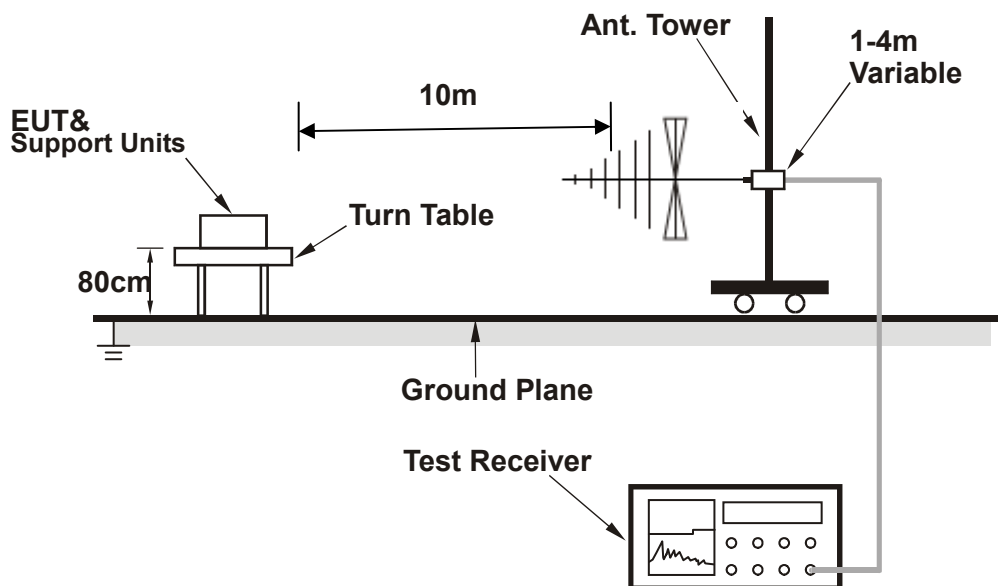
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
3. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
4. $\text{Emission level(dBuV/m)} = \text{Raw Value(dBuV)} + \text{Correction Factor(dB/m)}$
5. $\text{Correction Factor(dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)}$ (if the raw value not contains the amplifier);
6. $\text{Correction Factor(dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)} - \text{Amplifier Gain(dB)}$ (if the raw value contains the amplifier)
7. $\text{Margin value} = \text{Emission level} - \text{Limit value}$.

3.2.4 DEVIATION FROM TEST STANDARD

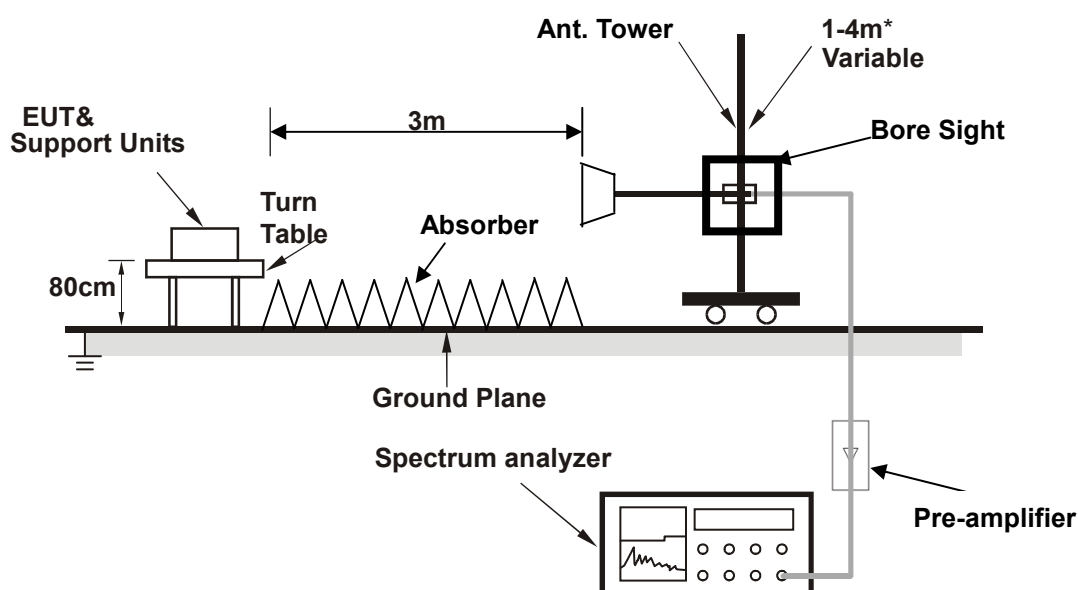
No deviation

3.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



* : depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

3.2.6 EUT OPERATING CONDITIONS

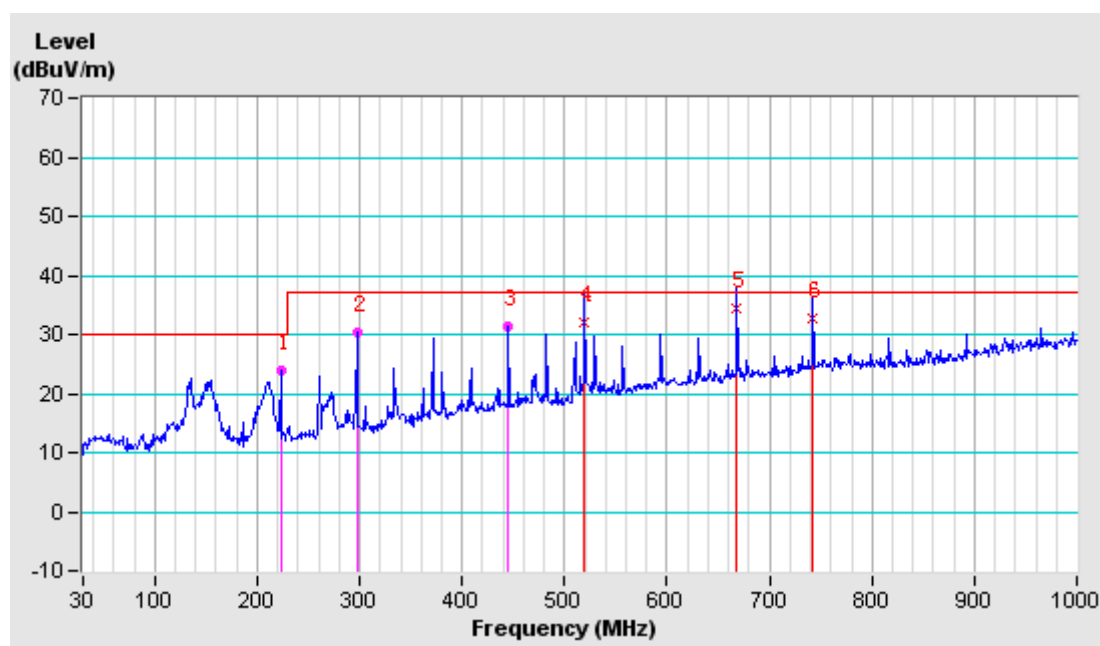
- Turn on the power supply of the EUT.
- EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

3.2.7 TEST RESULTS

TEST MODE	Playback+HDMI Out	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 3.7V from Li-ion battery	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 66% RH	TESTED BY:	Kery He

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	222.787	-15.04	39.07	24.03	30.00	-5.97	400	205
2	296.993	-11.77	42.27	30.50	37.00	-6.50	400	322
3	445.524	-8.49	39.99	31.50	37.00	-5.50	200	336
4	519.700	-7.44	39.54	32.10	37.00	-4.90	400	257
5	668.300	-3.78	38.28	34.50	37.00	-2.50	400	21
6	742.600	-2.09	34.83	32.74	37.00	-4.26	400	211

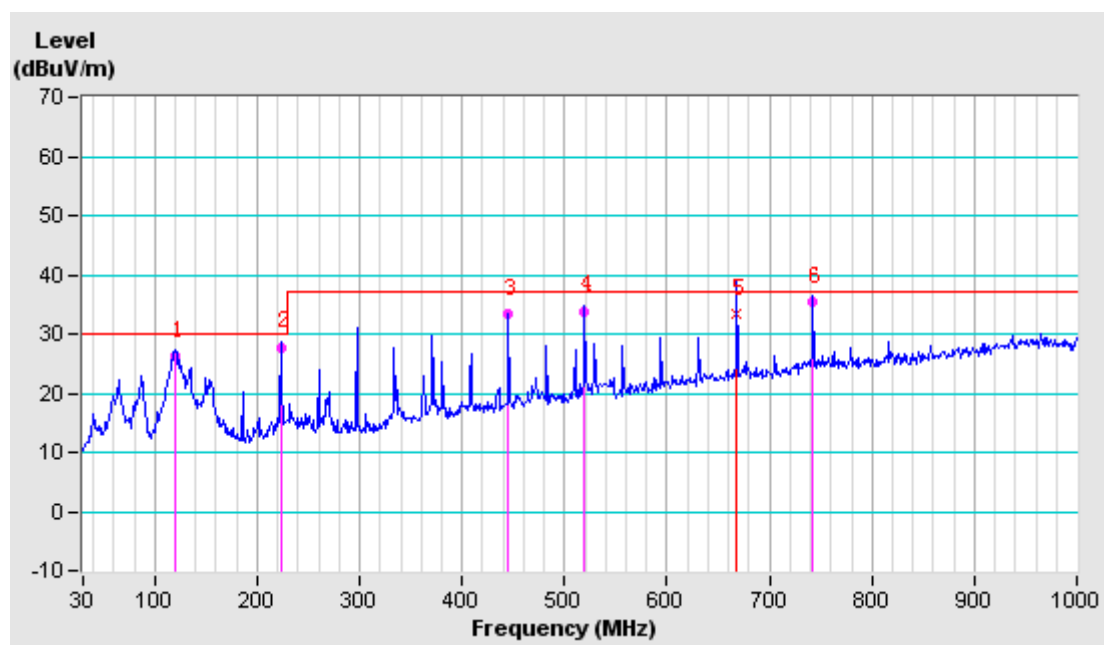
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported



TEST MODE	Playback+HDMI Out	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 3.7V from Li-ion battery	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 66% RH	TESTED BY: Kery He	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	119.119	-15.05	41.18	26.13	30.00	-3.87	300	79
2	222.787	-14.61	42.31	27.70	30.00	-2.30	100	108
3	445.524	-7.99	41.24	33.25	37.00	-3.75	100	144
4	519.850	-6.79	40.49	33.70	37.00	-3.30	300	114
5	668.310	-3.17	36.47	33.30	37.00	-3.70	100	77
6	742.586	-1.32	36.60	35.28	37.00	-1.72	300	123

- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported



4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the EUT test photo document (Reference No.: 140826N028) for detailed product test photo.

5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---