RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant / Manufacturer	:	Action Electronics Co.,Ltd.
Address	:	2480, TINGKAT PERUSAHAAN ENAM, PRAI FREE TRADE ZONE, 13600, PERAI, PENANG, Malaysia
Factory	:	Shenzhen SSP INDUSTRIES CO., LTD
Address	:	4 Floor, Block 1, NO.25 jinxing industrial Park, Jian'an Road, Fuyong Town,Bao'an District, Shenzhen,China
E.U.T.	:	10.1" Overhead Monitor with DVD Player
Brand Name	:	moviestoGO, Audiovox, ADVENT
Model No.	:	ODM71011, ADVEXL10HD, VODEXL10HD (For model difference refer to section 1.)
FCC ID	:	ATI9R3ODM71011
Measurement Standard	:	FCC PART 15.239: 2017
Date of Receiver	:	March 05, 2018
Date of Test	:	March 05, 2018 to April 18, 2018
Date of Report	:	April 19, 2018

This Test Report is Issued Under the Authority of :

Prepared by	Approved & Authorized Signer
Rose Hu / Engineer	Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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Address: Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan City, Guangdong, China

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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1802140FV00	Initial Issue	2018-04-19

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

Product name	:	10.1" Overhead Monitor with DVD Player
Main model number	:	ADVEXL10HD
Additional Model number	:	ODM71011, VODEXL10HD
Description of model difference	:	These models have the same circuit schematic, construction, PCB Layout and critical components. The difference is model number only due to trading purpose.
Power Supply	:	Input DC 12V
Test voltage	:	DC 12V
Hardware version	:	V1.0
Software version	:	V1.0
EUT Type	:	Class B
Note	:	N/A
Remark	:	N/A

Technical parameters

Frequency Range	:	88.1~107.9MHz
Modulation	:	FM
Channel space	:	100KHz
Number of Channel	:	199
Antenna Type	:	Integral Antenna
Antenna Gain	:	1.0 dBi

Test Frequency

FM	
Channel	**Frequency (MHz)**
Low	88.1
Mid	97.9
High	107.9

Note 1 : According to section 15.31(m), regards to the operating frequency range over 10MHz, the Lowest, middle, and the Highest frequency of channel were selected to perform the test. The selected frequency see below:

Note 2 : All the requirements have been tested by modulating the transmitter with a 2.5KHz tone at a level 16dB higher than that required to produce a frequency deviation of 75KHz.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **ATI9R3ODM71011** filing to comply with Section 15.239 of the FCC Part 15(2016), Subpart C Rule.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters. All other measurements were made in accordance with the procedures in 47 CFR part 2.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

FM Signal Generator	:	Manufacturer: LEADER M/N: 3214 S/N: 1100164

1.6 Test Facility and Location

Site Description

EMC Lab	:	Listed by CNAS, August 14, 2015 The certificate is valid until August 13, 2018 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 The Certificate Registration Number is L5795. Listed by A2LA, November 01, 2017 The certificate is valid until December 31, 2019 The Laboratory has been assessed and proved to be in compliance with ISO17025 The Certificate Registration Number is 4429.01 Listed by FCC, November 06, 2017 The Designation Number is CN1214 Test Firm Registration Number: 907417 Listed by Industry Canada, June 08, 2017 The Certificate Registration Number. Is 46405-9743
Name of Firm	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Site Location	:	Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan City, Guangdong Province, China

1.7 Summary of Test Results

FCC Rules	Description Of Test	Uncertainty	Result
§15.207 (a)	AC Power Conducted Emission	±1.06dB	N/A
§15.239(a)/ §2.1049	Occupied Bandwidth	±1.42 x10^{-4}%	Compliance
§15.239(b)	Field strength of the fundamental signal	±3.70dB	Compliance
§15.239(b)(c)/ §15.209/ §2.1053	Spurious emissions	±3.70dB	Compliance
§ 15.203	Antenna requirements	---	Compliance

Note: This product is powered by DC 12V battery and mounted in vehicle environment, thus the AC Power Conducted Emission test is not applicable.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

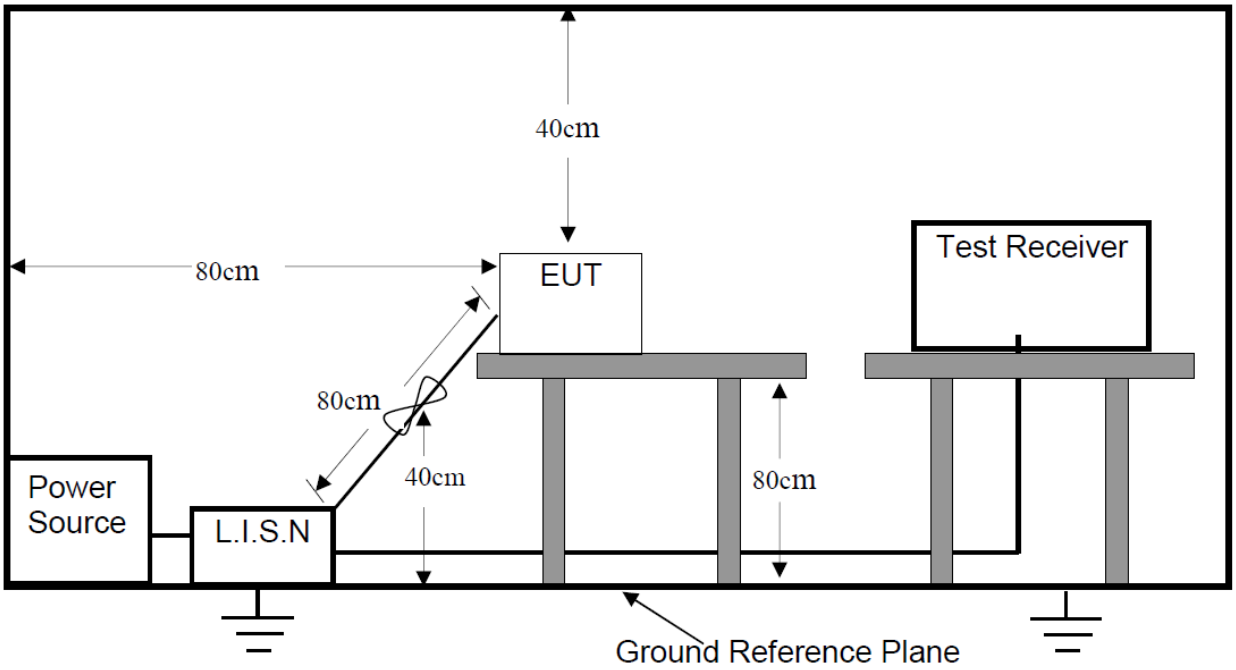
Not available for this EUT intended for grant.

2.3 Description of test modes

The EUT has been tested under operating condition. The Lowest, middle and highest channel were chosen for testing.

3. Conducted Emissions Test

3.1 Test SET-UP (Block Diagram of Configuration)



3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

Operation Mode: FM Mode

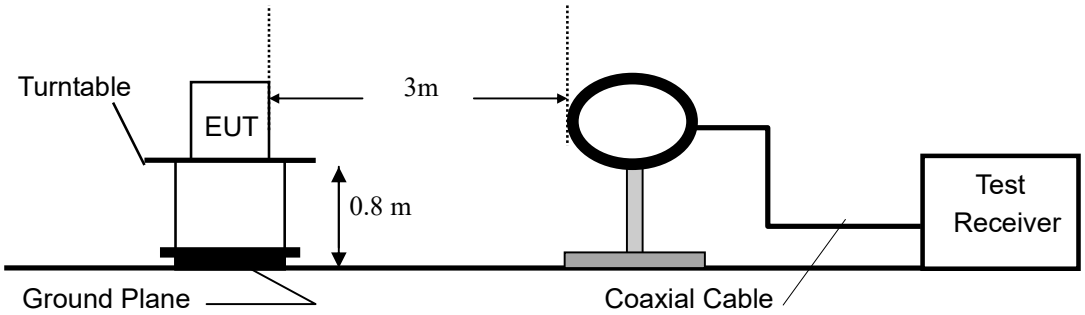
3.3 Measurement Results

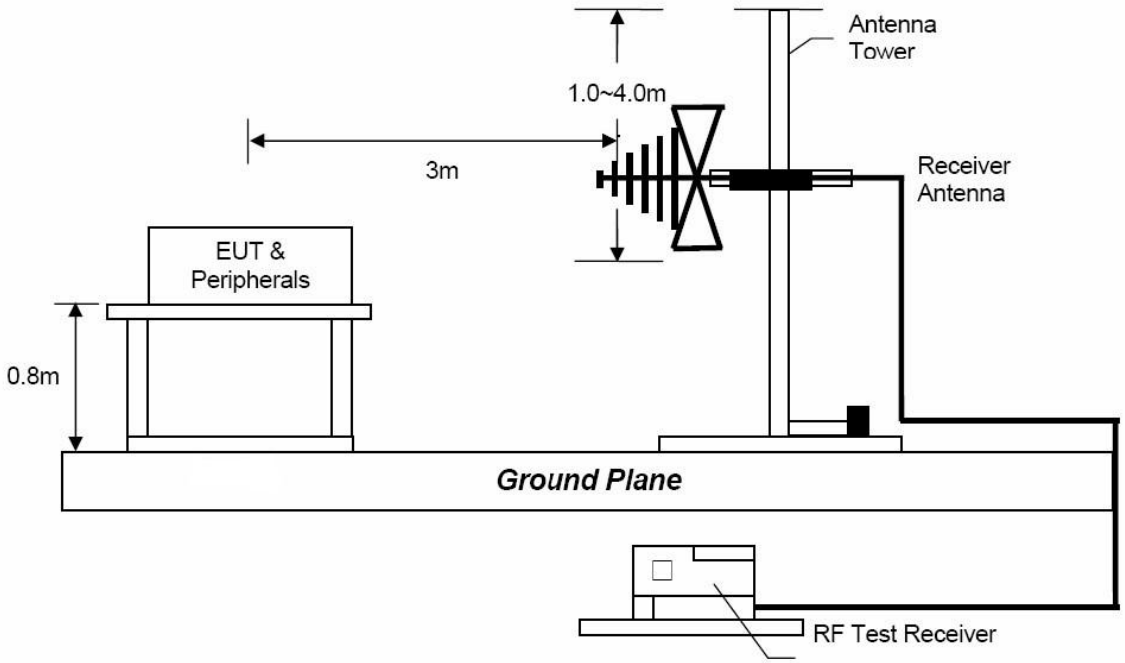
Not applicable.

4. Radiated Spurious Emissions and Restricted Bands

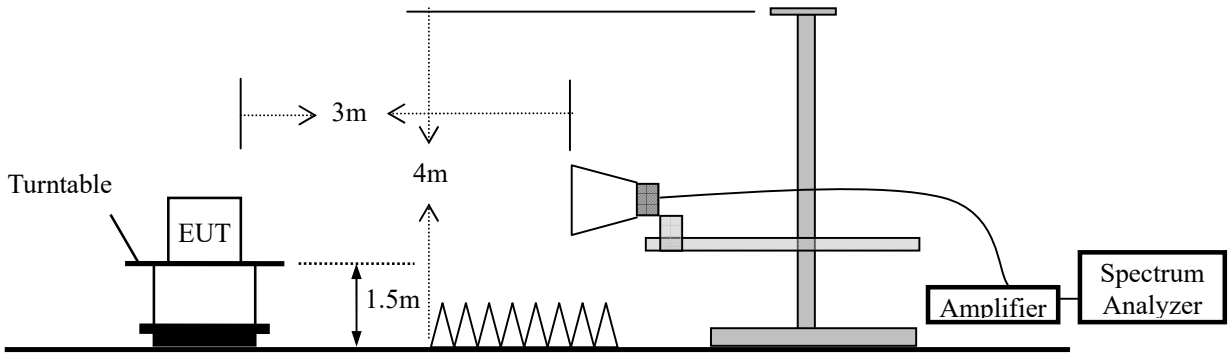
4.1 Test SET-UP (Block Diagram of Configuration)

4.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz





4.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



4.2 Measurement Procedure

a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
b. For the radiated emission test above 1GHz:
   The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. 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.
e. 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. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

4.3 Limit

(1) Limit for Field strength of the fundamental signal

Frequency	Limit	
	Average Value (dBuv/m @3m)	Peak Value (dBuv/m @3m)
88-108MHz	47.96	67.96

Note: FCC part 15.239(b) the field strength of any emissions with the permitted 200KHz band shall not exceed 250microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provision in section 15.35 for limiting peak emissions apply.

(2) Limit for Spurious emission

Frequency MHz	Limit
	Quasi-peak Value (dBuv/m @3m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

4.4 Measurement Results

Pass.

Please refer to following plots for items Spurious Emissions and Field Strength of Fundamental.

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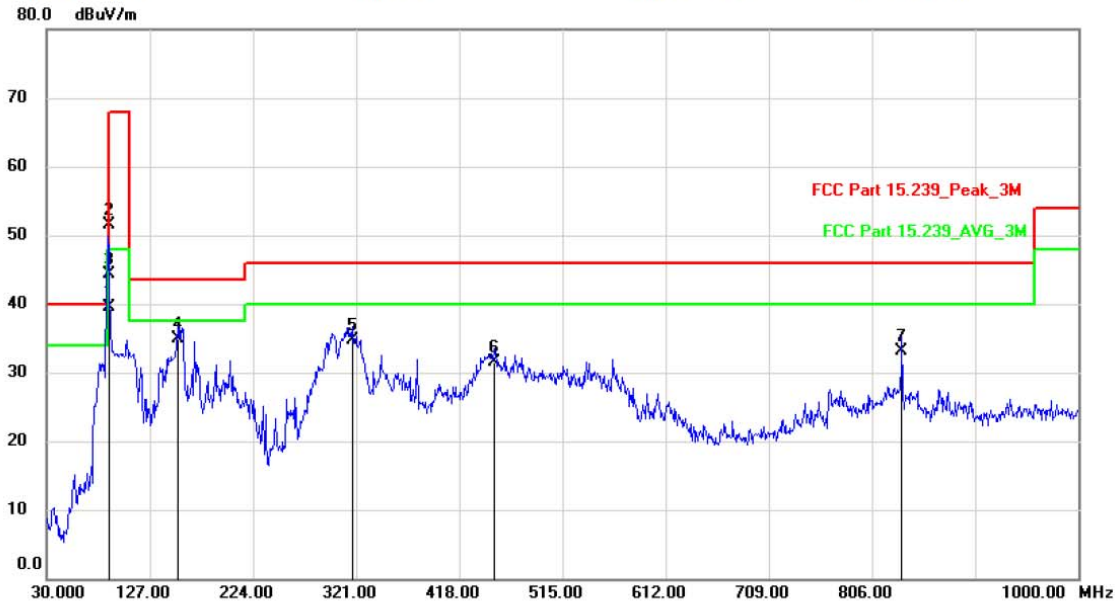
Radiated Emission Measurement

File :ODM71011 Data :#54 Date: 2018-3-21 Time: 9:24:24



Site
Limit: FCC Part 15.239_Peak_3M
EUT:
M/N: ADVEXL10HD
Mode: TX(88.1)
Note: 10.1" Overhead Monitor with DVD Player

Polarization: ***Horizontal***
Power: DC12V
Distance: 3m

Temperature: 26
Humidity: 47 %

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		88.0000	53.93	-14.43	39.50	43.50	-4.00	QP			
2		88.1000	65.91	-14.40	51.51	67.96	-16.45	peak			
3	*	88.1000	58.79	-14.40	44.39	47.96	-3.57	AVG			
4		153.1898	50.40	-15.40	35.00	43.50	-8.50	QP			
5		317.1200	44.81	-10.01	34.80	46.00	-11.20	QP			
6		450.9800	39.43	-7.93	31.50	46.00	-14.50	QP			
7		834.1299	34.58	-1.38	33.20	46.00	-12.80	QP			

Note: Below 30MHz & Above 1GHz, the emissions are lower than 20dB below the allowable limit.

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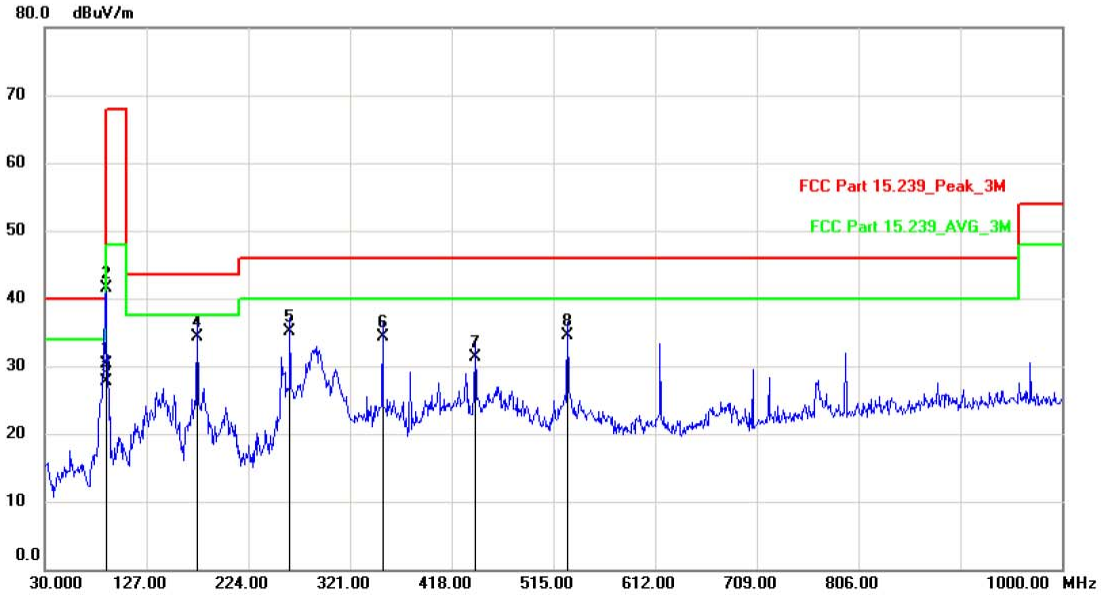
Radiated Emission Measurement

File :ODM71011 Data :#55 Date: 2018-3-30 Time: 8:36:43



Site
Limit: FCC Part 15.239_Peak_3M
EUT:
M/N: ADVEXL10HD
Mode: TX(88.1)
Note: 10.1" Overhead Monitor with DVD Player

Polarization: ***Vertical***
Power: DC12V
Distance: 3m

Temperature: 26
Humidity: 47 %

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		88.0000	47.73	-17.43	30.30	43.50	-13.20	QP			
2		88.1000	59.00	-17.40	41.60	67.96	-26.36	peak			
3		88.1000	45.19	-17.40	27.79	47.96	-20.17	AVG			
4	*	175.5000	51.77	-17.47	34.30	43.50	-9.20	QP			
5		263.7699	48.54	-13.34	35.20	46.00	-10.80	QP			
6		352.0400	45.53	-11.13	34.40	46.00	-11.60	QP			
7		440.3100	42.59	-11.19	31.40	46.00	-14.60	QP			
8		528.5800	43.20	-8.70	34.50	46.00	-11.50	QP			

Note: Below 30MHz & Above 1GHz, the emissions are lower than 20dB below the allowable limit.

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Radiated Emission Measurement

File :ODM71011 Data :#57 Date: 2018-4-3 Time: 18:44:09

Site
Limit: FCC Part 15.239_Peak_3M
EUT:
M/N: ADVEXL10HD
Mode: TX(97.9)
Note: 10.1" Overhead Monitor with DVD Player

Polarization: ***Horizontal***
Power: DC12V
Distance: 3m

Temperature: 26
Humidity: 47 %

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		97.9000	62.77	-12.40	50.37	67.96	-17.59	peak			
2		97.9000	49.32	-12.40	36.92	47.96	-11.04	AVG			
3		98.0000	58.88	-12.38	46.50	67.96	-21.46	QP			
4	*	132.8200	50.08	-15.28	34.80	43.50	-8.70	QP			
5		154.1600	44.68	-15.38	29.30	43.50	-14.20	QP			
6		299.6600	43.97	-10.47	33.50	46.00	-12.50	QP			
7		405.3900	44.69	-8.99	35.70	46.00	-10.30	QP			
8		431.5800	39.89	-8.39	31.50	46.00	-14.50	QP			

Note: Below 30MHz & Above 1GHz, the emissions are lower than 20dB below the allowable limit.

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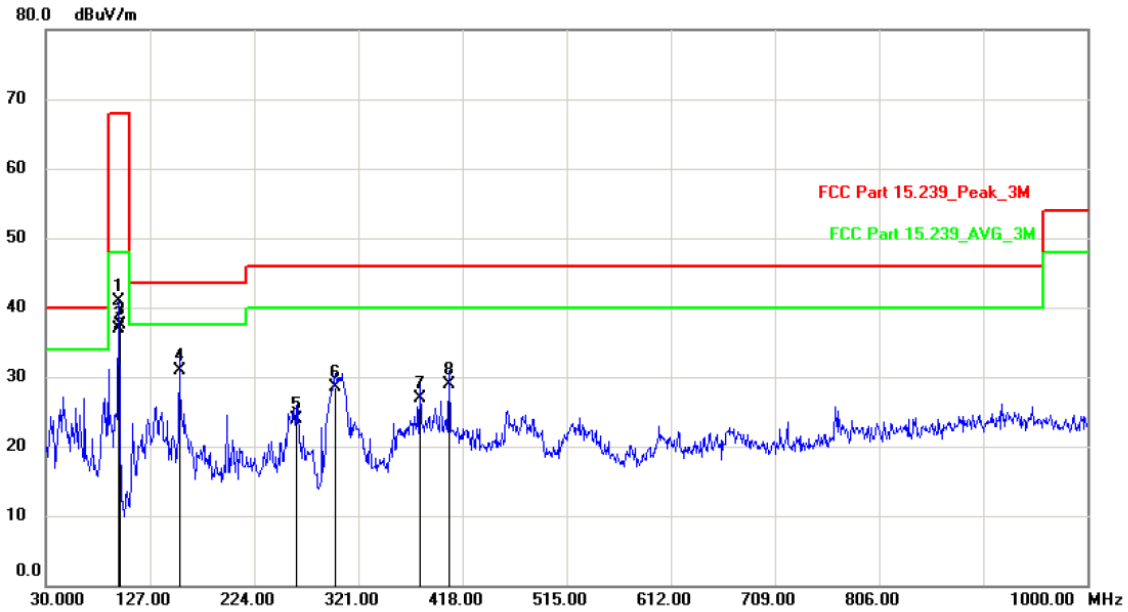
Radiated Emission Measurement

File :ODM71011 Data :#56 Date: 2018-4-3 Time: 18:42:07



Site
Limit: FCC Part 15.239_Peak_3M
EUT:
M/N: ADVEXL10HD
Mode: TX(97.9)
Note: 10.1" Overhead Monitor with DVD Player

Polarization: ***Vertical***
Power: DC12V
Distance: 3m

Temperature: 26
Humidity: 47 %

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		97.9000	56.84	-15.98	40.86	67.96	-27.10	peak			
2	*	97.9000	52.90	-15.98	36.92	47.96	-11.04	AVG			
3		98.0000	53.48	-15.98	37.50	67.96	-30.46	QP			
4		154.1600	49.38	-18.38	31.00	43.50	-12.50	QP			
5		263.7700	37.34	-13.34	24.00	46.00	-22.00	QP			
6		299.6600	41.07	-12.47	28.60	46.00	-17.40	QP			
7		378.2300	38.09	-11.19	26.90	46.00	-19.10	QP			
8		405.3900	40.15	-11.25	28.90	46.00	-17.10	QP			

Note: Below 30MHz & Above 1GHz, the emissions are lower than 20dB below the allowable limit.

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Radiated Emission Measurement

File :ODM71011 Data :#58 Date: 2017-11-16 Time: 22:16:42

Site
Limit: FCC Part 15.239_Peak_3M
EUT:
M/N: ADVEXL10HD
Mode: TX(107.9)
Note: 10.1" Overhead Monitor with DVD Player

Polarization: ***Horizontal***
Power: DC 12V
Distance: 3m

Temperature: 24
Humidity: 47 %

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		107.9000	65.17	-16.08	49.09	67.96	-18.87	peak			
2		107.9000	60.68	-16.08	44.60	47.96	-3.36	AVG			
3	*	108.0000	56.28	-16.08	40.20	43.50	-3.30	QP			
4		184.2298	51.78	-16.88	34.90	43.50	-8.60	QP			
5		215.2700	50.41	-16.11	34.30	43.50	-9.20	QP			
6		372.4100	45.38	-11.18	34.20	46.00	-11.80	QP			
7		455.8299	45.94	-10.04	35.90	46.00	-10.10	QP			
8		792.4198	39.35	-2.05	37.30	46.00	-8.70	QP			

Note: Below 30MHz & Above 1GHz, the emissions are lower than 20dB below the allowable limit.

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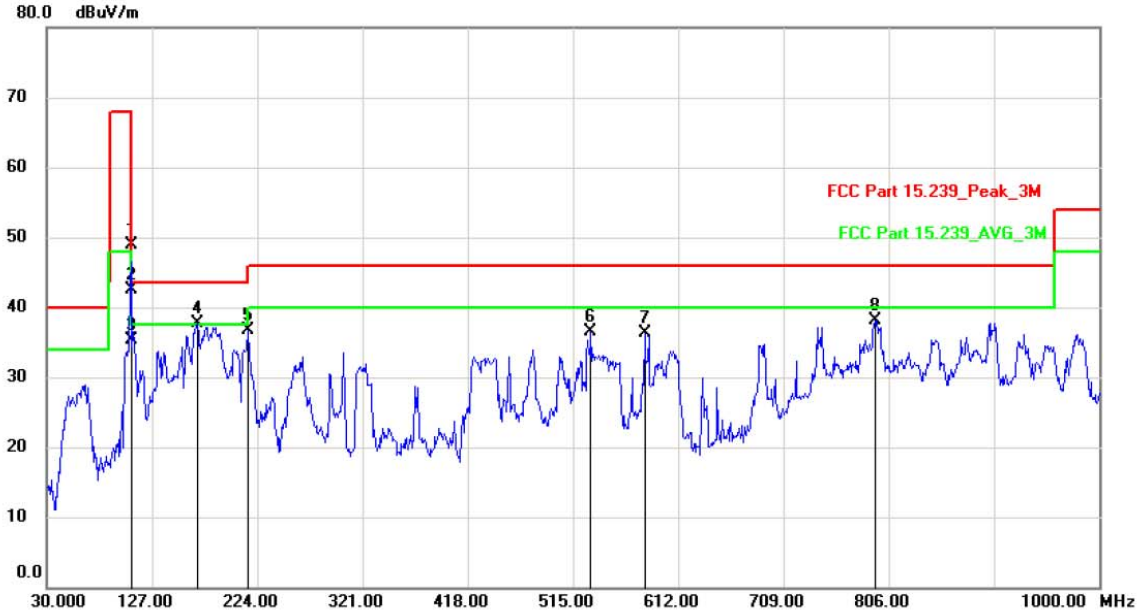
Radiated Emission Measurement

File :ODM71011 Data :#59 Date: 2017-11-16 Time: 22:21:10



Site
Limit: FCC Part 15.239_Peak_3M
EUT:
M/N: ADVEXL10HD
Mode: TX(107.9)
Note: 10.1" Overhead Monitor with DVD Player

Polarization: ***Vertical***
Power: DC 12V
Distance: 3m

Temperature: 24
Humidity: 47 %

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		107.9000	64.98	-16.08	48.90	67.96	-19.06	peak			
2	*	107.9000	58.67	-16.08	42.59	47.96	-5.37	AVG			
3		108.0000	51.38	-16.08	35.30	43.50	-8.20	QP			
4		168.7100	55.46	-17.85	37.61	43.50	-5.89	peak			
5		215.2700	52.82	-16.11	36.71	43.50	-6.79	peak			
6		531.4900	45.16	-8.68	36.48	46.00	-9.52	peak			
7		580.9600	43.78	-7.55	36.23	46.00	-9.77	peak			
8		793.3899	40.20	-2.04	38.16	46.00	-7.84	peak			

Note: Below 30MHz & Above 1GHz, the emissions are lower than 20dB below the allowable limit.

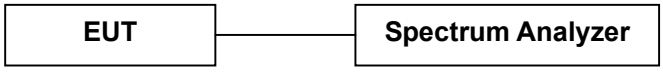
5. Occupied Bandwidth

5.1 Measurement Procedure

FCC Part 15C section 15.239(a) & §2.1049

1. Set the parameters of SPA as below:
   Centre frequency = Operation frequency
   RBW=3KHz
   VBW=10KHz
   Span: 300KHz
   Sweep time: Auto
2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
3. Record the plots and reported.

5.2 Test SET-UP (Block Diagram of Configuration)

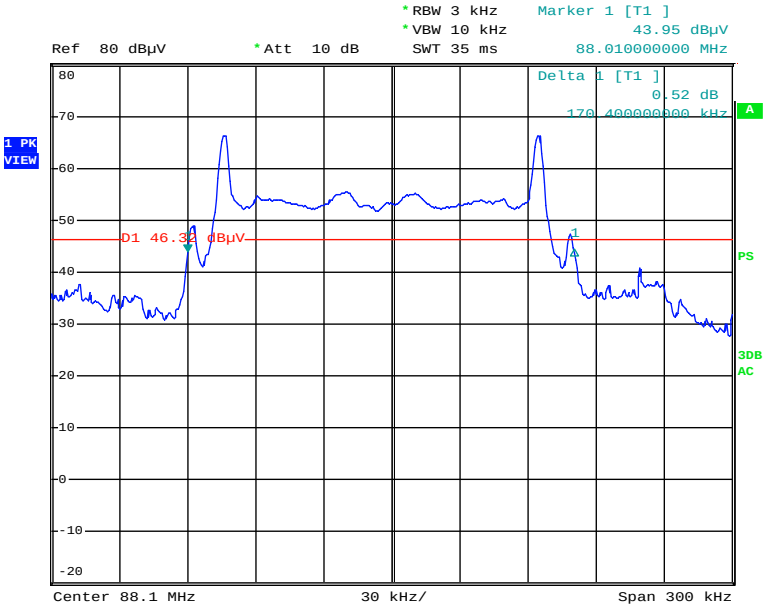


5.3 Measurement Results

Refer to attached data chart.

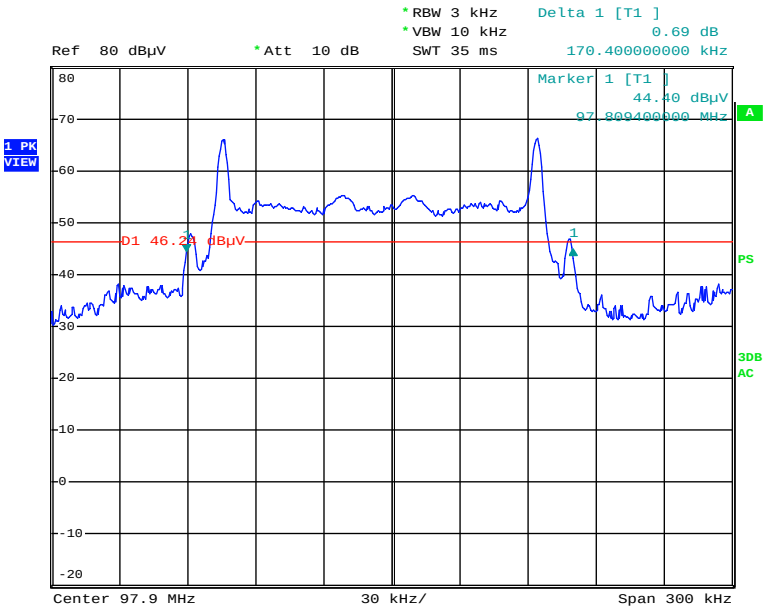
Channel Frequency(MHz)	20dB Bandwidth(kHz)	Limit (kHz)	Result
88.1	170.4	200	PASS
97.9	170.4	200	PASS
107.9	170.4	200	PASS

Lowest Channel



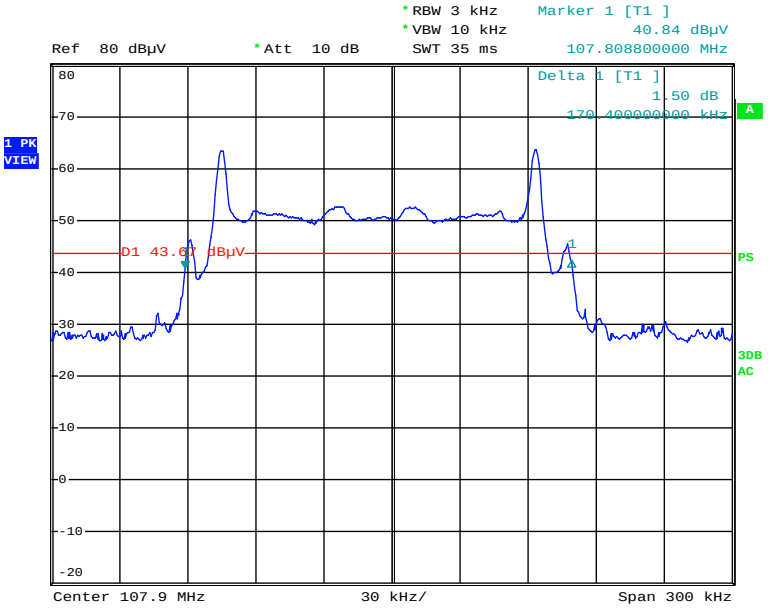
Date: 7.MAR.2018 14:30:13

Middle Channel



Date: 7.MAR.2018 14:34:08

Highest Channel



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6. Antenna Application

6.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

6.2 Measurement Results

The antenna is integral antenna that no antenna other than that furnished by the responsible party shall be used with the device, and the best case gain of the antenna is 1.0dBi. So, the antenna is consider meet the requirement.

7. Test Equipment List

Description	Manufacturer	Model Number	Serial Number	Characteristics	Calibration Date	Calibration Due Date
Test Receiver	Rohde & Schwarz	ESCI7	100837	9KHz~7GHz	Mar. 13, 2018	Mar. 12, 2019
Antenna	Schwarzbeck	VULB9162	9162-010	30MHz~7GHz	Mar. 14, 2018	Mar. 13, 2019
Cable	Huber+Suhner	CBL2-NN-1M	22390001	9KHz~7GHz	Mar. 13, 2018	Mar. 12, 2019
Cable	Huber+Suhner	CIL02	N/A	9KHz~7GHz	Mar. 13, 2018	Mar. 12, 2019
RF Cable	Huber+Suhner	SF-104	MY16559/4	9KHz~25GHz	Apr. 25, 2017	Apr. 25, 2018
Power Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Mar. 13, 2018	Mar. 12, 2019
Horn Antenna	Schwarzbeck	BBHA9170	9170-242	15GHz~40GHz	Mar. 13, 2018	Mar. 12, 2019
Horn Antenna	Com-Power	AH-118	071078	1GHz~18GHz	Mar. 14, 2018	Mar. 13, 2019
RF Cable	Huber+Suhner	SF-104	N/A	9KHz~40GHz	Apr. 25, 2017	Apr. 24, 2018
Loop antenna	Daze	ZA30900A	0708	9KHz~30MHz	Apr. 25, 2017	Apr. 24, 2018
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	20Hz~26.5GHz	Apr. 25, 2017	Apr. 24, 2018
Spectrum Analyzer	Rohde & Schwarz	FSV40	101003	10Hz~40GHz	Apr. 06, 2017	Apr. 05, 2018
Pre-Amplifier	EMCI	EMC 184045	980102	18GHz~40GHz	Nov. 03, 2017	Nov. 02, 2018
Pre-Amplifier	Agilent	8449B	3008A02964	1GHz~26.5GHz	Apr. 25, 2017	Apr. 24, 2018
L.I.S.N.	Rohde & Schwarz	ENV 216	101317	9KHz~30MHz	Mar. 13, 2018	Mar. 12, 2019
Temporary antenna connector	TESCOM	SS402	N/A	9KHz-25GHz	N/A	N/A
Power Meter	Anritsu	ML2495A	1139001	100k-65GHz	Nov. 03, 2017	Nov. 02, 2018
Power Sensor	Anritsu	MA2411B	100345	300M-40GHz	Nov. 03, 2017	Nov. 02, 2018

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

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