

FCC TEST REPORT  
for  
Aeon Labs LLC.

Micro Smart Energy Switch G2  
Model No.: DSC18103-ZWUS, DSC26103-ZWUS

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Report Number : 201111778F  
Date of Test : Nov. 30~Dec. 12, 2011  
Date of Report : Dec. 15, 2011

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APPENDIX I (Photos of EUT) (2 Pages)

## TEST REPORT

Applicant : Aeon Labs LLC.  
 Manufacturer : Aeon Labs LLC.  
 EUT : Micro Smart Energy Switch G2  
 Model No. : DSC18103-ZWUS, DSC26103-ZWUS  
 Serial No. : N/A  
 Rating : AC 120V, 60Hz, 10A, 1200W  
 Trade Mark : N/A

## Measurement Procedure Used:

FCC Part15 Subpart C, Paragraph 15.207, 15.209&15.249

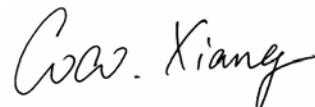
The device described above is tested by Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

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

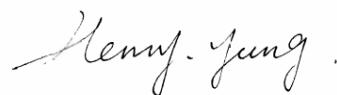
Date of Test : Nov. 30~Dec. 12, 2011



Prepared by : (Tested Engineer / Andy Chen)



Reviewer : (Project Manager / Coco Xiang)



Approved & Authorized Signer : (Manager / Henry Yang)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : Micro Smart Energy Switch G2

Model Number : DSC18103-ZWUS, DSC26103-ZWUS  
(Note: All Models are the same except the model number & Low-voltage circuit of appliances, so we prepare "DSC18103-ZWUS" for EMC test only.)

Test Power Supply : AC 120V, 60Hz

Frequency : 908.42MHz / 908.40MHz

Antenna : Gain is 3dBi  
(The antenna used in this product is Monopole antenna)

Applicant : Aeon Labs LLC.  
Address : 121 Buckingham drive, unit36 santa claras CA95051 USA

Manufacturer : Aeon Labs LLC.  
Address : 121 Buckingham drive, unit36 santa claras CA95051 USA

Date of receiver : Nov. 29, 2011

Date of Test : Nov. 30~Dec. 12, 2011

## 1.2. Description of Test Facility

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

### **CNAS - LAB Code: L3503**

Anbotech 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**

Anbotech 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, August 20, 2010.

### **IC-Registration No.: 8058A-1**

Anbotech 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, August 30, 2010.

### **Test Location**

All Emissions tests were performed at

Anbotech Compliance Laboratory Limited. at 1/F, 1 /Building, SEC Industrial Park, No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

## 1.3. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

## 2. MEASURING DEVICE AND TEST EQUIPMENT

The following test equipments were used during test:

Equipment	Manufacturer	Model #	Serial #	Data of Cal.	Due Data
EMI Test Receiver	Rohde & Schwarz	ESCI	100119	Mar.03, 2011	Mar.02, 2012
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	Sep.22, 2011	Sep.21, 2012
EMI Test Software	SHURPLE	ESK1	N/A	N/A	N/A
Spectrum Analyzer	Agilent	E7405A	MY45114970	Jun.21, 2011	Jun.20, 2012
Signal Generator	Rohde & Schwarz	SMR27	100124	Jul.06, 2010	Jul.05, 2012
Signal Generator	Rohde & Schwarz	SML03	102319	Aug.01, 2010	Aug.01, 2012
AC Power Source	Sepcial power system	YF650	N/A	N/A	N/A
Absorbing Clamp	Rohde & Schwarz	MDS21	100218	Apr.30, 2010	Apr.29, 2012
Power Meter	Rohde & Schwarz	NRVD	101287	Jul.19, 2011	Jul.18, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Universal radio Communication tester	Rohde & Schwarz	CMU200	101724	Sep.08, 2011	Sep.07, 2012
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
BiConilog Antenna	ETS-LINDGREN	3142C	00042670	Mar.03, 2011	Mar.02, 2012
BiConilog Antenna	ETS-LINDGREN	3142C	00042673	Mar.03, 2011	Mar.02, 2012
Loop Antenna	ETS-LINGREN	6502	00071730	Mar.03, 2011	Mar.02, 2012
Double-ridged Waveguide horn	ETS-LINDGREN	3117	00035926	Dec.30, 2009	Dec.29, 2011
Double-ridged Waveguide horn	ETS-LINDGREN	3117	00041545	Dec.30, 2009	Dec.29, 2011
Pre-amplifier	CD	PAM0203	804203	Jun.21, 2011	Jun.20, 2012
RF Switch	CD	RSU-M3	706543	Jun.21, 2011	Jun.20, 2012
Thermo-/Hygrometer	N/A	TH01	N/A	May.03, 2011	May.02, 2012
Shielding Room	Zhong Yu Electronic	N/A	N/A	N/A	N/A
3m Anechoic Chamber	Zhong Yu Electronic	N/A	N/A	Apr.28, 2010	Apr.27, 2012

### 3. Test Procedure

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of Anbotek Compliance Laboratory Limited. The EUT was transmitting a test signal during the testing.

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.4-2009 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

**Example:**

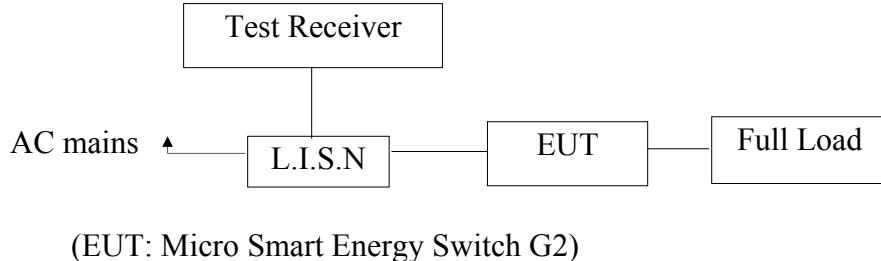
Freq (MHz) METER READING + ACF = FS  
20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

**ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES:** The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

## 4. Conducted Limits

### 4.1. Block Diagram of Test Setup

#### 4.1.1. Block diagram of connection between the EUT and simulators



### 4.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB( $\mu$ V)	
	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.

### 4.3. 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.

EUT : Micro Smart Energy Switch G2

Model Number : DSC18103-ZWUS

Applicant : Aeon Labs LLC.

### 4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in test mode (Full Load) and measure it.

#### 4.5. 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 AC 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 C63.4-2003 on Conducted Emission Measurement.

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

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

The test results are reported on Section 4.6.

#### 4.6. Power Line Conducted Emission Measurement Results

**PASS.**

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

The test curves Please refer the following pages.

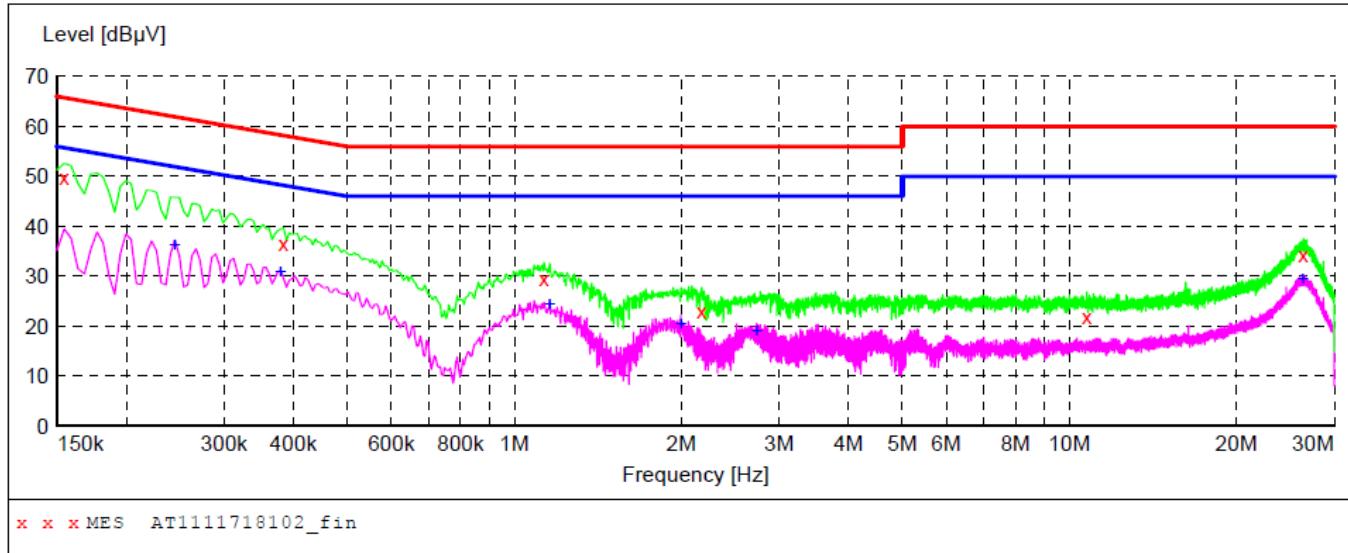
FCC ID: XBADSC18103

**CONDUCTED EMISSION TEST DATA**

EUT: Micro Smart Energy Switch G2 M/N: DSC18103-ZWUS  
 Operating Condition: Full Load  
 Test Site: 1# Shielded Room  
 Operator: Well.Wang  
 Test Specification: AC 120V/60Hz  
 Comment: Live Line  
 Tem:25°C Hum:50%

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

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "AT1111718102\_fin"**

11/30/2011 1:41PM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.154500	49.80	10.1	66	16.0	QP	L1	GND
0.384000	36.40	10.1	58	21.8	QP	L1	GND
1.130500	29.40	10.2	56	26.6	QP	L1	GND
2.174500	23.10	10.3	56	32.9	QP	L1	GND
10.747000	22.00	10.6	60	38.0	QP	L1	GND
26.420500	34.40	10.9	60	25.6	QP	L1	GND

**MEASUREMENT RESULT: "AT1111718102\_fin2"**

11/30/2011 1:41PM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.244500	36.30	10.1	52	15.6	AV	L1	GND
0.379500	30.90	10.1	48	17.4	AV	L1	GND
1.157500	24.30	10.2	46	21.7	AV	L1	GND
1.994500	20.40	10.3	46	25.6	AV	L1	GND
2.732500	18.90	10.4	46	27.1	AV	L1	GND
26.321500	29.50	10.9	50	20.5	AV	L1	GND

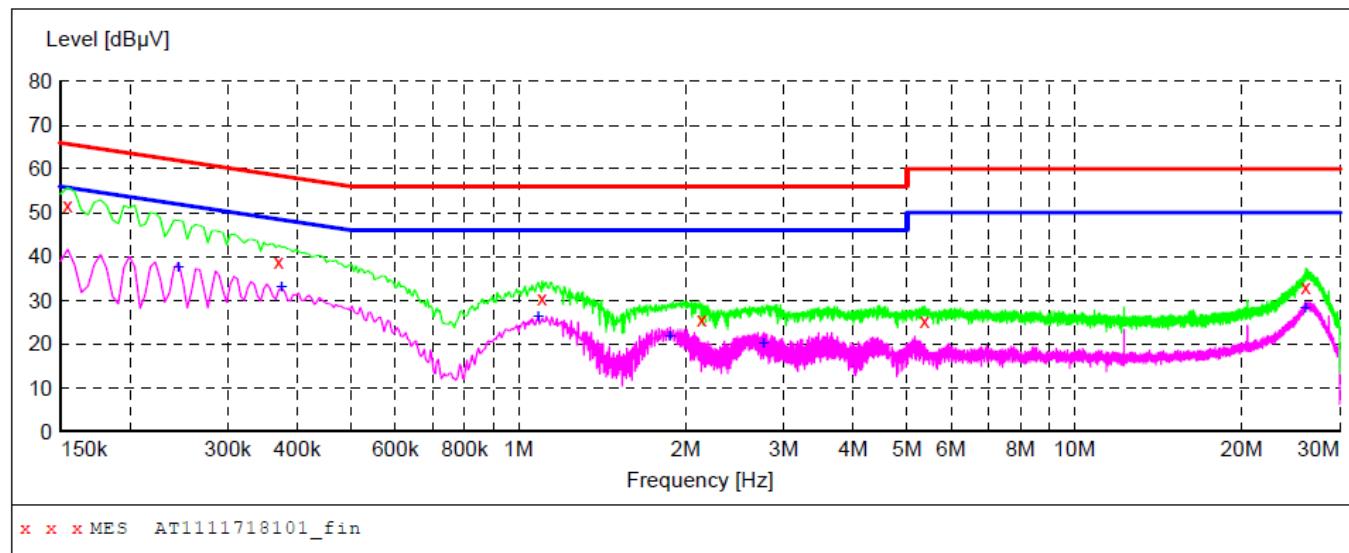
FCC ID: XBADSC18103

**CONDUCTED EMISSION TEST DATA**

EUT: Micro Smart Energy Switch G2 M/N: DSC18103-ZWUS  
 Operating Condition: Full Load  
 Test Site: 1# Shielded Room  
 Operator: Well.Wang  
 Test Specification: AC 120V/60Hz  
 Comment: Neutral Line  
 Tem:25°C Hum:50%

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

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "AT1111718101\_fin"**

11/30/2011 1:37PM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.154500	51.70	10.1	66	14.1	QP	N	GND
0.370500	39.00	10.1	59	19.5	QP	N	GND
1.103500	30.60	10.2	56	25.4	QP	N	GND
2.138500	25.70	10.3	56	30.3	QP	N	GND
5.378500	25.30	10.5	60	34.7	QP	N	GND
26.078500	33.10	10.9	60	26.9	QP	N	GND

**MEASUREMENT RESULT: "AT1111718101\_fin2"**

11/30/2011 1:37PM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.244500	37.70	10.1	52	14.2	AV	N	GND
0.375000	32.90	10.1	48	15.5	AV	N	GND
1.085500	26.20	10.2	46	19.8	AV	N	GND
1.873000	21.80	10.3	46	24.2	AV	N	GND
2.759500	20.00	10.4	46	26.0	AV	N	GND
26.015500	28.20	10.9	50	21.8	AV	N	GND

## 5. Radiation Interference

### 5.1. Requirements (15.249, 15.209):

FIELD STRENGTH of Fundamental: 902-928 MHZ 2.4-2.4835 GHz 94 dB $\mu$ V/m @3m	FIELD STRENGTH of Harmonics 54 dB $\mu$ V/m @3m	S15.209 30 - 88 MHz 88 - 216 MHz 216 - 960 MHz ABOVE 960 MHz	40 dB $\mu$ V/m @3M 43.5 46 54dB $\mu$ V/m
---	---	--	---

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

### 5.2 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz. The EUT is tested in 9\*6\*6 Chamber.

The test results are listed in Section 5.3.

### 5.3 Test Results

PASS.

The test curves Please refer the following pages.

**Data: (Frequency=908.40MHz)****Horizontal**

Frequen cy MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dB $\mu$ V	Level dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Remark
85.89	0.65	8.45	38.81	59.26	29.55	40.00	-10.45	QP
171.99	0.74	10.33	39.42	59.63	31.28	43.50	-12.22	QP
908.40	1.51	29.00	38.52	98.07	90.06	94.0	-3.94	Peak
1,816.80	1.82	28.02	39.21	55.20	45.83	54.0	-8.17	Peak
2,725.20	2.28	33.16	35.16	43.52	43.80	54.0	-10.20	Peak
3,633.60	2.50	33.31	35.02	39.01	39.80	54.0	-14.20	Peak
4,542.00	2.65	34.40	34.77	33.74	36.02	54.0	-17.98	Peak
5,450.40	---	---	---	---	---	---	---	---
6,358.80	---	---	---	---	---	---	---	---
7,267.20	---	---	---	---	---	---	---	---
8,175.60	---	---	---	---	---	---	---	---
9,084.00	---	---	---	---	---	---	---	---

**Vertical**

Frequen cy MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dB $\mu$ V	Level dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Remark
135.98	0.70	9.21	39.02	57.92	28.81	43.50	-14.69	QP
416.18	0.76	11.97	40.11	55.66	28.28	46.00	-17.72	QP
908.40	1.51	29.00	38.52	97.06	89.05	94.0	-4.95	Peak
1,816.80	1.82	28.02	39.21	55.30	45.93	54.0	-8.87	Peak
2,725.20	2.28	33.16	35.16	42.60	42.88	54.0	-11.12	Peak
3,633.60	2.50	33.31	35.02	38.06	38.85	54.0	-15.15	Peak
4,542.00	2.65	34.40	34.77	32.54	34.82	54.0	-19.18	Peak
5,450.40	---	---	---	---	---	---	---	---
6,358.80	---	---	---	---	---	---	---	---
7,267.20	---	---	---	---	---	---	---	---
8,175.60	---	---	---	---	---	---	---	---
9,084.00	---	---	---	---	---	---	---	---

**NOTE: “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.**

**Data: (Frequency=908.42MHz)****Horizontal**

Frequen cy MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dB $\mu$ V	Level dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Remark
95.29	0.64	8.46	38.51	58.16	29.11	40.00	-10.19	QP
181.49	0.77	10.43	39.02	57.87	30.05	43.50	-13.45	QP
908.42	1.51	29.00	38.52	98.23	90.22	94.0	-3.78	Peak
1,816.84	1.82	28.02	39.21	54.30	44.93	54.0	-9.07	Peak
2,725.26	2.28	33.16	35.16	41.50	41.78	54.0	-12.22	Peak
3,633.68	2.50	33.31	35.02	38.70	38.86	54.0	-15.14	Peak
4,542.10	2.65	34.40	34.77	33.90	36.18	54.0	-17.82	Peak
5,450.52	---	---	---	---	---	---	---	---
6,358.94	---	---	---	---	---	---	---	---
7,267.36	---	---	---	---	---	---	---	---
8,175.78	---	---	---	---	---	---	---	---
9,084.20	---	---	---	---	---	---	---	---

**Vertical**

Frequen cy MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dB $\mu$ V	Level dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Remark
137.98	0.76	9.41	39.03	57.92	29.06	43.50	-14.44	QP
422.43	0.72	11.82	40.81	55.66	27.39	46.00	-18.61	QP
908.42	1.51	29.00	38.52	96.07	88.07	94.0	-5.93	Peak
1,816.84	1.82	28.02	39.21	55.20	45.83	54.0	-8.17	Peak
2,725.26	2.28	33.16	35.16	41.01	41.29	54.0	-12.71	Peak
3,633.68	2.50	33.31	35.02	38.40	39.19	54.0	-14.81	Peak
4,542.10	2.65	34.40	34.77	32.14	34.42	54.0	-19.58	Peak
5,450.52	---	---	---	---	---	---	---	---
6,358.94	---	---	---	---	---	---	---	---
7,267.36	---	---	---	---	---	---	---	---
8,175.78	---	---	---	---	---	---	---	---
9,084.20	---	---	---	---	---	---	---	---

**NOTE: “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.**

## 6. Occupied Bandwidth

### 6.1. Requirements (15.249):

The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

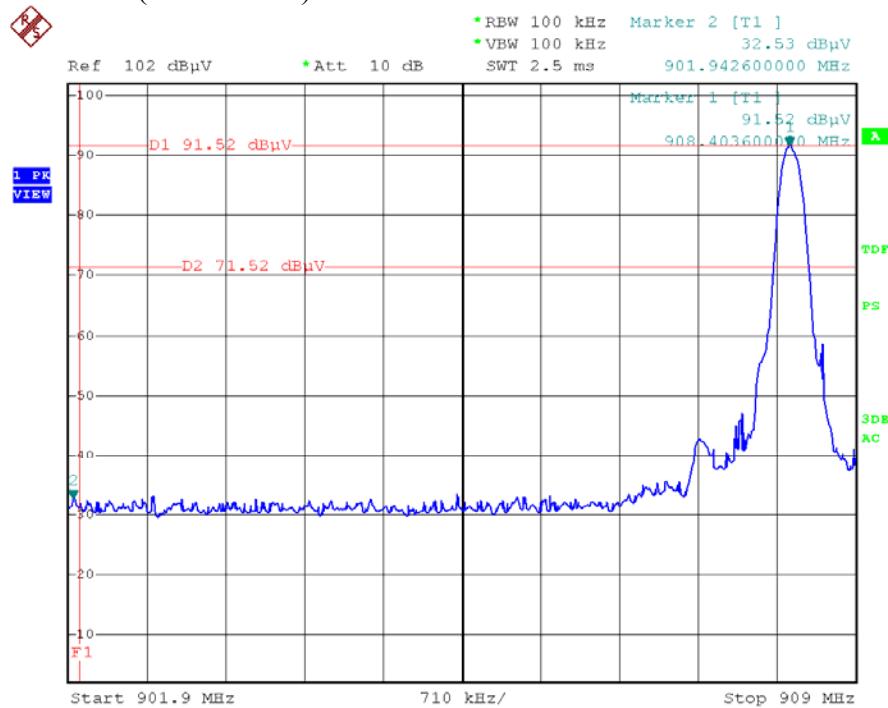
### 6.2 Test Results

Pass.

Please refer the following plot.

FCC ID: XBADSC18103

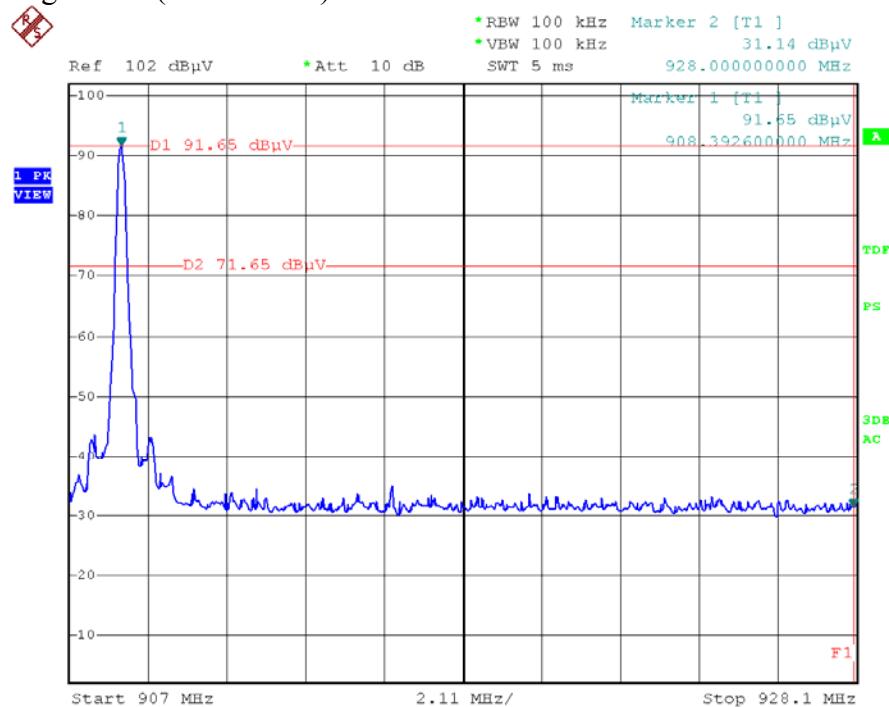
## Left Side (908.40MHz)



SES-908.40-Bandedge-L

Date: 12.DEC.2011 11:43:04

## Right Side (908.40MHz)

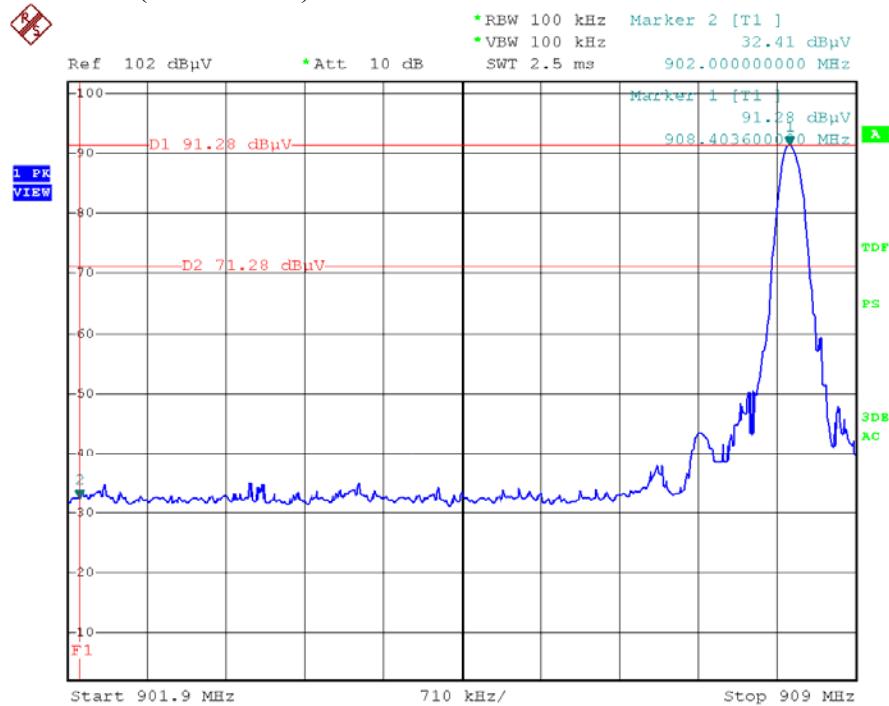


SES-908.40-Bandedge-H

Date: 12.DEC.2011 11:41:20

FCC ID: XBADSC18103

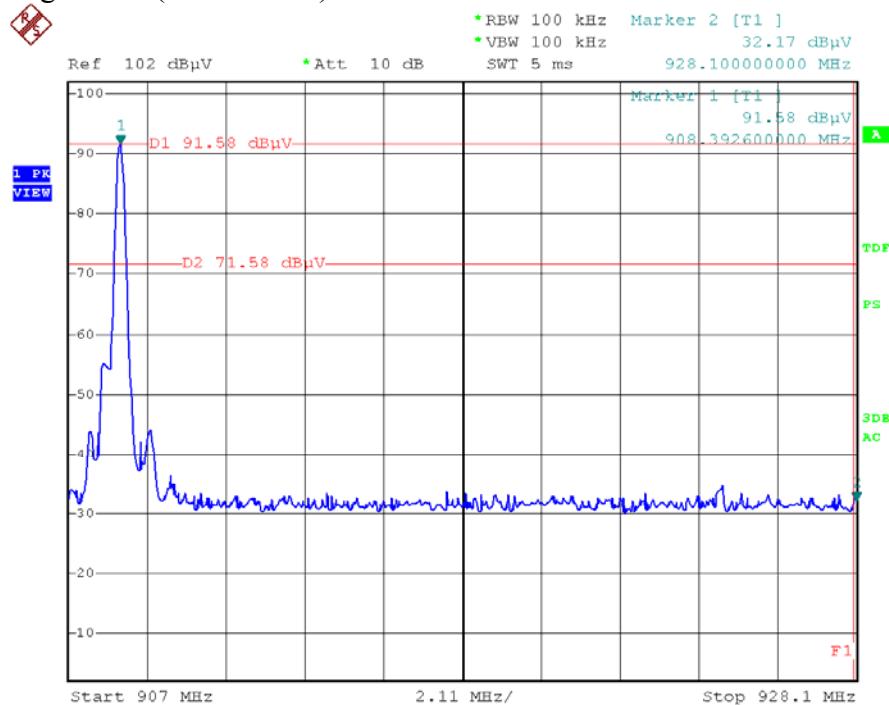
## Left Side (908.42MHz)



SES-908.42-Bandedge-L

Date: 12.DEC.2011 11:14:24

## Right Side (908.42MHz)



SES-908.42-Bandedge-H

Date: 12.DEC.2011 11:16:18