



NVLAP LAB CODE 200707-0



FCC PART 15.231

MEASUREMENT AND TEST REPORT

For

AURUM ELECTRONICS CORP.

No.160, Dayong Rd, Yongkang City, Tainan Hsien, 710 Taiwan

FCC ID: VQXAEC-9339B

Report Type: Original Report	Product Type: The Intelligent Motion Sensor Tracking Light (Transmitter)
Test Engineer:	<u>Phoenix Liu</u> <i>Phoenix Liu</i>
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Reviewed By:	<u>EMC Manager</u> <i>Green Xu</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008

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* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" Rev. 2

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The AURUM ELECTRONICS Corp.'s product, model: AEC-9339B /AEC-9336B or the "EUT" as referred to in this report is a *The Intelligent Motion Sensor Tracking Light (Transmitter)* , rated input voltage: 120V/60Hz.

Mechanical Description of EUT

The AURUM ELECTRONICS CORP.'s product, model number: AEC-9339B /AEC-9336B, AEC-9339B measures approximately 19.0 cm L x 18.0 cm W x 25.8 cm H, and AEC-9336B measures approximately 16.2 cm L x 18.0 cm W x 24.8 cm H.

Note: The two models AEC-9339B /AEC-9336B, which were explained in declaration. The models have the same RF module, circuit diagram and PCB. But they have different lamp size and power, so we selected only one radiated data and internal photos.

* All measurement and test data in this report was gathered from production sample serial number: 0807034(Assigned by BACL, Shenzhen). The EUT was received on 2008-07-11.

EUT Photograph



Model: AEC-9339B



Model: AEC-9336B

Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4-2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.231 rules.

Related Submittal(s)/Grant(s)

Part 15.249 submission with same FCC ID.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at
<http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

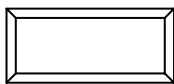
Special Accessories

N/A

Equipment Modifications

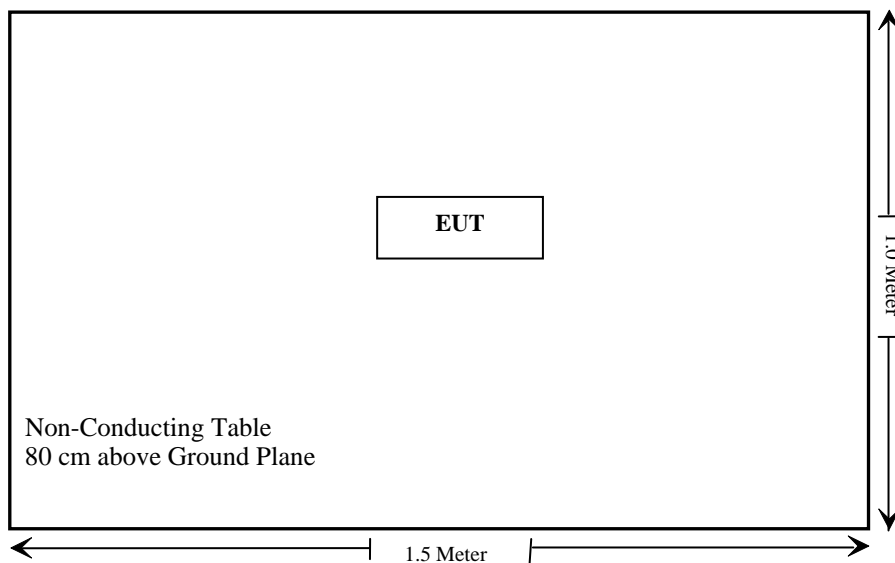
No modifications were made to the unit tested.

Configuration of Test Setup



EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.209	General Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant
§15.231 (b)	Radiated Emissions	Compliant*
§15.231 (c)	20dB Band Width Testing	Compliant
§15.231 (a)(1)	Deactivation Testing	Compliant
§15.231	Duty Cycle	Compliant

* Within measurement uncertainty.

CFR47 §15.203 - ANTENNA REQUIREMENT

Standard Applicable

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 shall be considered sufficient to comply with the provisions of this section.

The antenna of the EUT was solder antenna. The maximum gain is -1.0 dBi. The EUT use permanently attached antenna.

Result: Compliant.

Please refer to the EUT Internal photos.

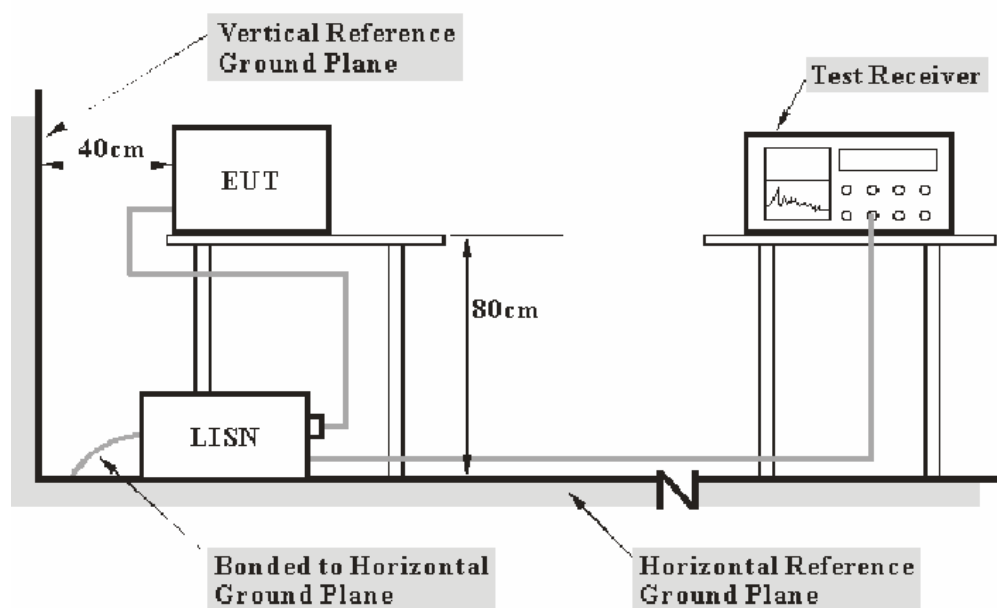
CFR47 §15.207 (a) - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp.(Shenzhen) is ± 2.4 dB.

EUT Setup



- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The EUT was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>IF B/W</i>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2008-03-25	2009-03-25
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2008-03-25	2009-03-25

* Com-Power's LISN were used as the supporting equipment.

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp.(Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

7.00 dB at 17.920 MHz in the **Neutral** conductor mode for 9339B.
4.30 dB at 1.170 MHz in the **Neutral** conductor mode for 9336B.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Phoenix Liu on 2008-07-22.

Test Mode: Operating

Model: 9339B

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
17.920	43.00	AV	Neutral	50.00	7.00
17.900	42.90	AV	Line	50.00	7.10
0.180	45.30	AV	Neutral	54.00	8.70
0.230	53.10	QP	Line	62.40	9.30
0.360	37.90	AV	Neutral	49.00	11.10
0.575	44.70	QP	Line	56.00	11.30
27.920	37.80	AV	Neutral	50.00	12.20
0.180	51.10	QP	Neutral	64.00	12.90
0.350	43.80	QP	Neutral	59.00	15.20
27.600	34.70	AV	Line	50.00	15.30
17.920	43.80	QP	Neutral	60.00	16.20
17.900	43.60	QP	Line	60.00	16.40
12.900	32.40	AV	Neutral	50.00	17.60
0.730	37.90	QP	Neutral	56.00	18.10
27.200	41.70	QP	Line	60.00	18.30
27.210	41.60	QP	Neutral	60.00	18.40
12.750	28.90	AV	Line	50.00	21.10
0.730	24.30	AV	Neutral	46.00	21.70
0.230	30.40	AV	Line	52.40	22.00
0.575	23.10	AV	Line	46.00	22.90
12.900	33.20	QP	Neutral	60.00	26.80
12.750	31.70	QP	Line	60.00	28.30
4.620	27.20	QP	Line	56.00	28.80
4.620	4.60	AV	Line	46.00	41.40

Model: 9336B

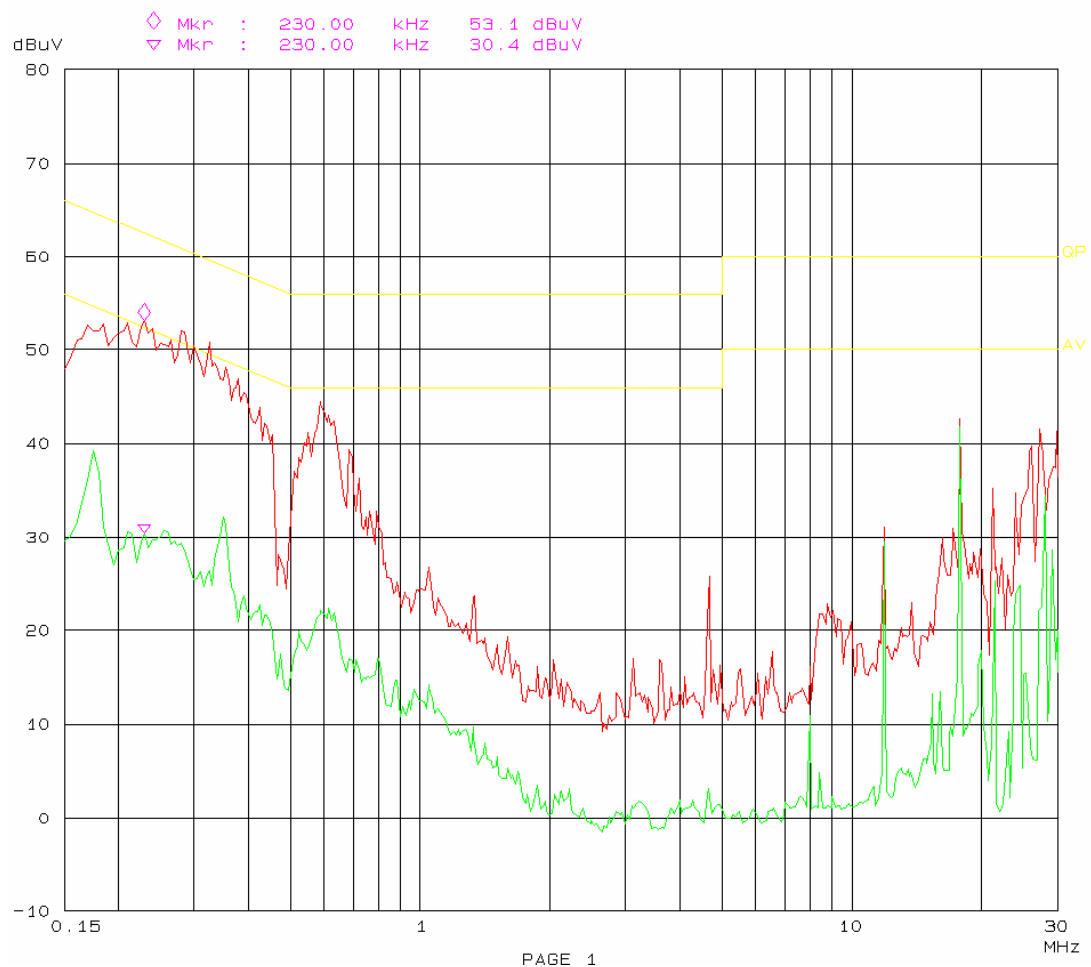
Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
1.170	51.70	QP	Neutral	56.00	4.30
0.370	53.90	QP	Neutral	58.50	4.60
1.260	50.40	QP	Neutral	56.00	5.60
17.810	42.10	AV	Line	50.00	7.90
27.820	41.60	AV	Neutral	50.00	8.40
27.830	40.30	AV	Line	50.00	9.70
17.950	38.70	AV	Neutral	50.00	11.30
0.215	40.90	AV	Line	53.00	12.10
27.830	45.20	QP	Line	60.00	14.80
17.810	43.90	QP	Line	60.00	16.10
0.215	46.80	QP	Line	63.00	16.20
27.820	42.20	QP	Neutral	60.00	17.80
17.950	41.70	QP	Neutral	60.00	18.30
0.370	28.50	AV	Neutral	48.50	20.00
12.630	29.40	AV	Line	50.00	20.60
0.375	37.10	QP	Line	58.40	21.30
0.375	26.40	AV	Line	48.40	22.00
1.170	22.50	AV	Neutral	46.00	23.50
12.610	25.40	AV	Neutral	50.00	24.60
1.260	20.80	AV	Neutral	46.00	25.20
12.630	30.40	QP	Line	60.00	29.60
12.610	28.00	QP	Neutral	60.00	32.00
5.210	26.20	QP	Line	60.00	33.80
5.210	4.70	AV	Line	50.00	45.30

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Model: 9339BConduction Emission
FCC 15.207

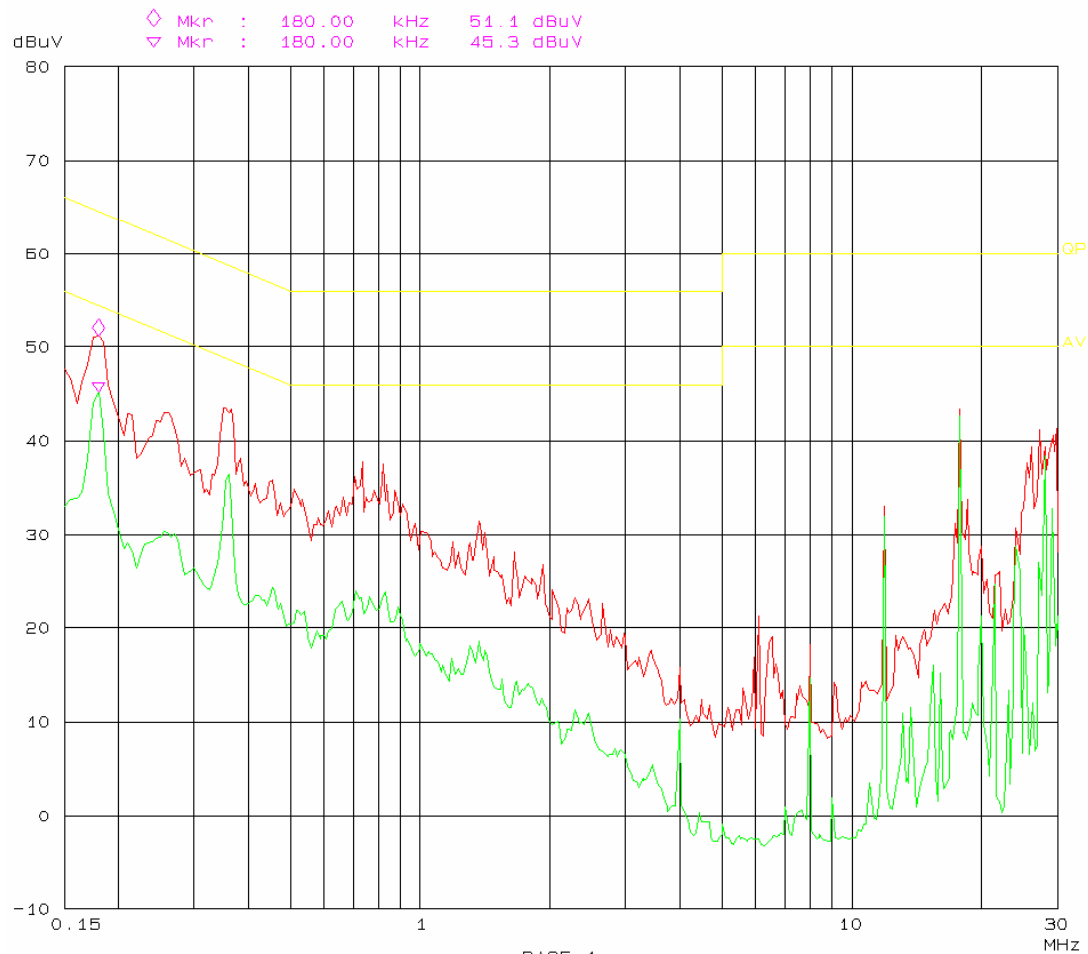
EUT: THE INTELLIGENT MOTION..LIGHT M/N: 9339B
Manuf: AURUM
Op Cond: OPERATING
Operator: PHOENIX
Test Spec: AC 120V/60Hz L
Comment: Temp: 25 Hum: 56%



Conduction Emission FCC 15.207

EUT: THE INTELLIGENT MOTION..LIGHT M/N: 9339B
Manuf: AURUM
Op Cond: OPERATING
Operator: PHOENIX
Test Spec: AC 120V/60Hz N
Comment: Temp: 25 Hum: 56%

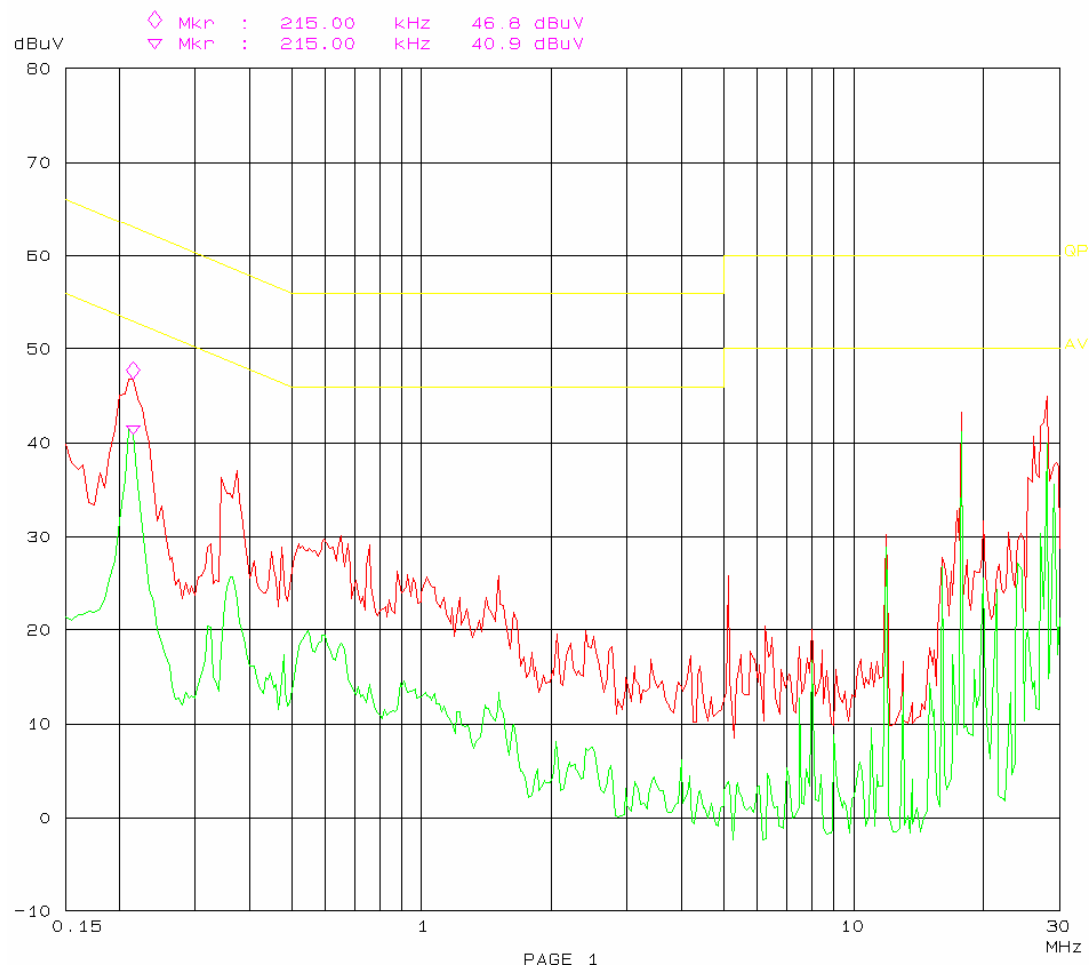
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Model: 9336BConduction Emission
FCC 15.207

EUT: THE INTELLIGENT MOTION..LIGHT M/N: 9336B
Manuf: AURUM
Op Cond: OPERATING
Operator: PHOENIX
Test Spec: AC 120V/60Hz L
Comment: Temp: 25 Hum: 56%

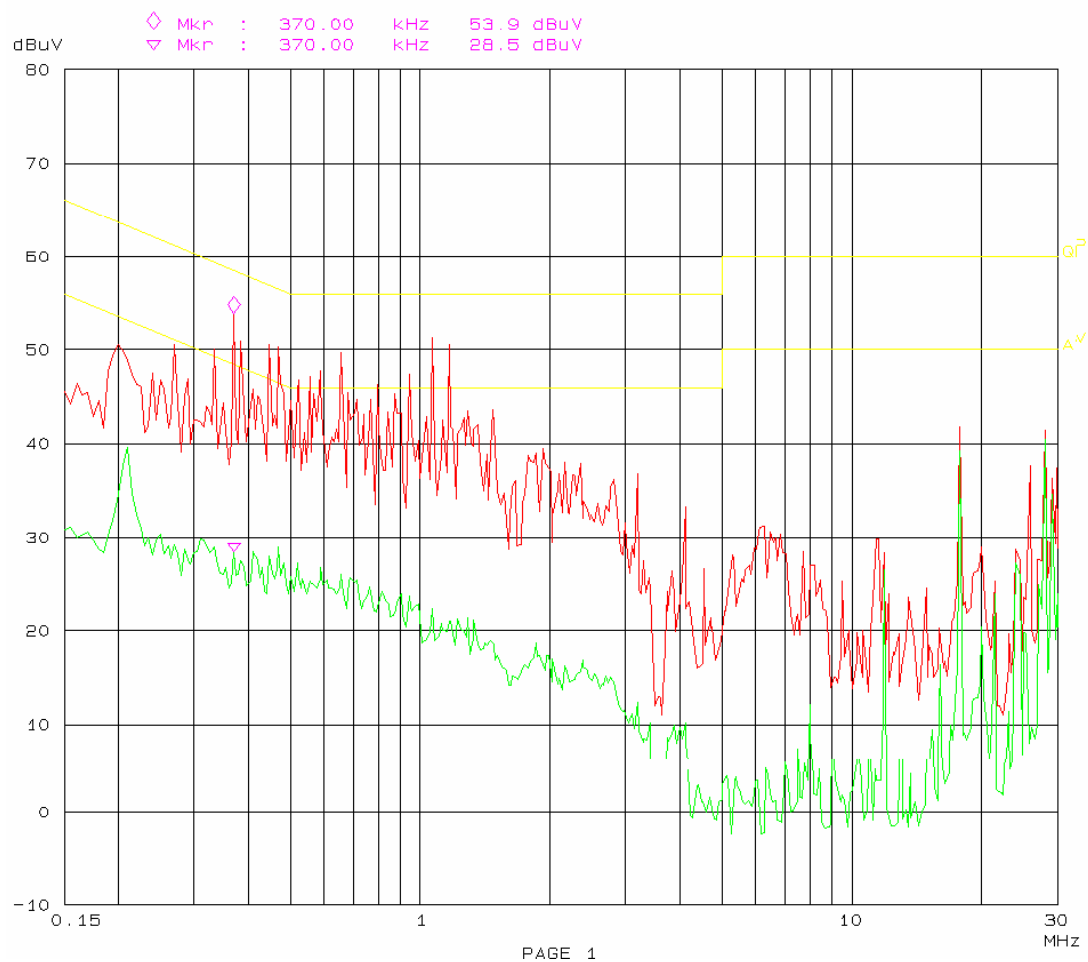
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Conduction Emission FCC 15.207

EUT: THE INTELLIGENT MOTION..LIGHT M/N: 9336B
Manuf: AURUM
Op Cond: OPERATING
Operator: PHOENIX
Test Spec: AC 120V/60Hz N
Comment: Temp: 25 Hum: 56%

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CFR47 §15.205, §15.209, §15.231 (b) - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 4.0 dB.

Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,370 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12,500*	375 to 1,250*
Above 470	12,500	1,250

Linear interpolations for frequency ranges 130 - 174 MHz and 260 - 470 MHz.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

Test Procedure

For the radiated emissions test, the EUT was connected to AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Peak and Average detection mode.

Corrected Amplitude & Margin Calculation

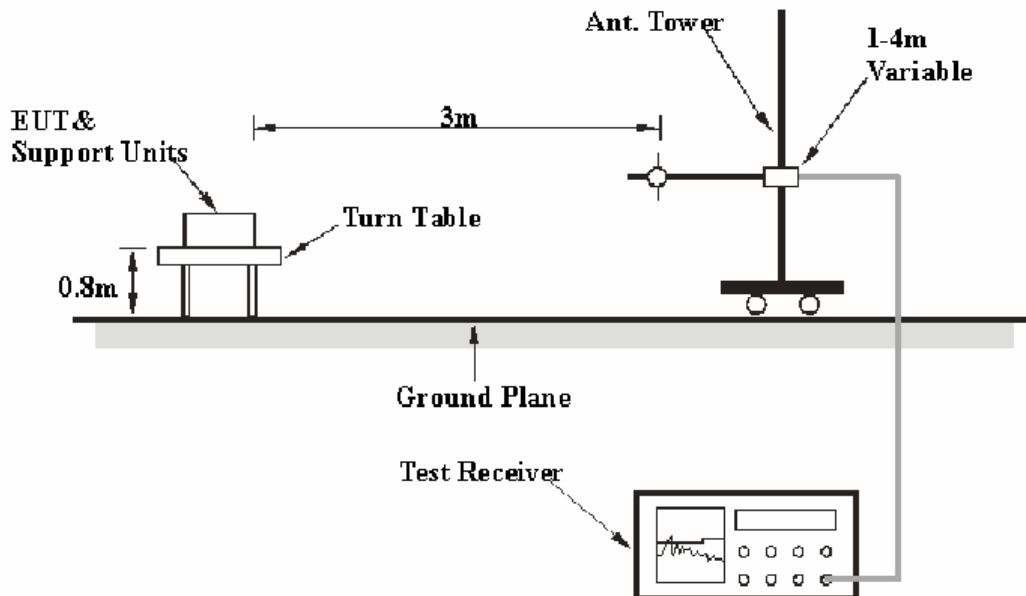
The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 5.8dB means the emission is 5.8dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15 § 15.209 and 15.231.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5 GHz.

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

<i>Frequency Range</i>	<i>RBW</i>	<i>VBW</i>
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz – 5 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-08-14	2009-08-14
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.231, with the worst margin reading of:

Below 1GHz: 0.44 dB at 867.84 MHz in the Horizontal polarization.
Above 1GHz: 10.48 dB at 1301.76 MHz in the Horizontal polarization.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Phoenix Liu on 2008-11-18.

Test Mode: Transmitting

Below 1GHz:

Frequency (MHz)	Corrected Amp. (dBμV/m)	Detector (PK/QP/AV)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position Degree	Limit (dBμV/m)	Margin (dB)
867.84	60.36	**	140.0	H	180.0	60.8	0.44*
867.84	58.71	**	194.0	V	162.0	60.8	2.09*
433.92	77.99	**	179.0	H	174.0	80.8	2.81*
867.84	69.99	PK	140.0	H	180.0	80.8	10.81
867.84	68.34	PK	194.0	V	162.0	80.8	12.46
433.92	87.62	PK	179.0	H	174.0	100.8	13.18
433.92	50.30	**	104.0	V	334.0	80.8	30.5
433.92	59.93	PK	104.0	V	334.0	100.8	40.87

Above 1GHz:

Freq. (MHz)	Meter Reading (dBμV)	Detector (PK/AV)	Table Direction Degree	Antenna			Cable Loss (dB)	Pre Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.231/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
1301.76	43.52	**	0	1.4	H	/	/	/	43.52	54	10.48	Harmonic
1301.76	38.42	**	0	1.4	V	/	/	/	38.42	54	15.58	Harmonic
1301.76	58.04	PK	0	1.4	H	24.80	5.11	34.80	53.15	74	20.85	Harmonic
1301.76	52.94	PK	0	1.4	V	24.80	5.11	34.80	48.05	74	25.95	Harmonic

Note:* Within measurement uncertainty.

** Calculate Average value based on Duty Cycle correction factor.

CFR47 §15.231(c) - 20dB BANDWIDTH TESTING

Requirement

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
HP	Amplifier	8447E	1937A01046	2008-11-15	2009-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2008-08-14	2009-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

With the EUT's antenna attached, the waveform was received by the test antenna which was connected to the spectrum analyzer, plot the 20 dB bandwidth.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Phoenix Liu on 2008-11-18.

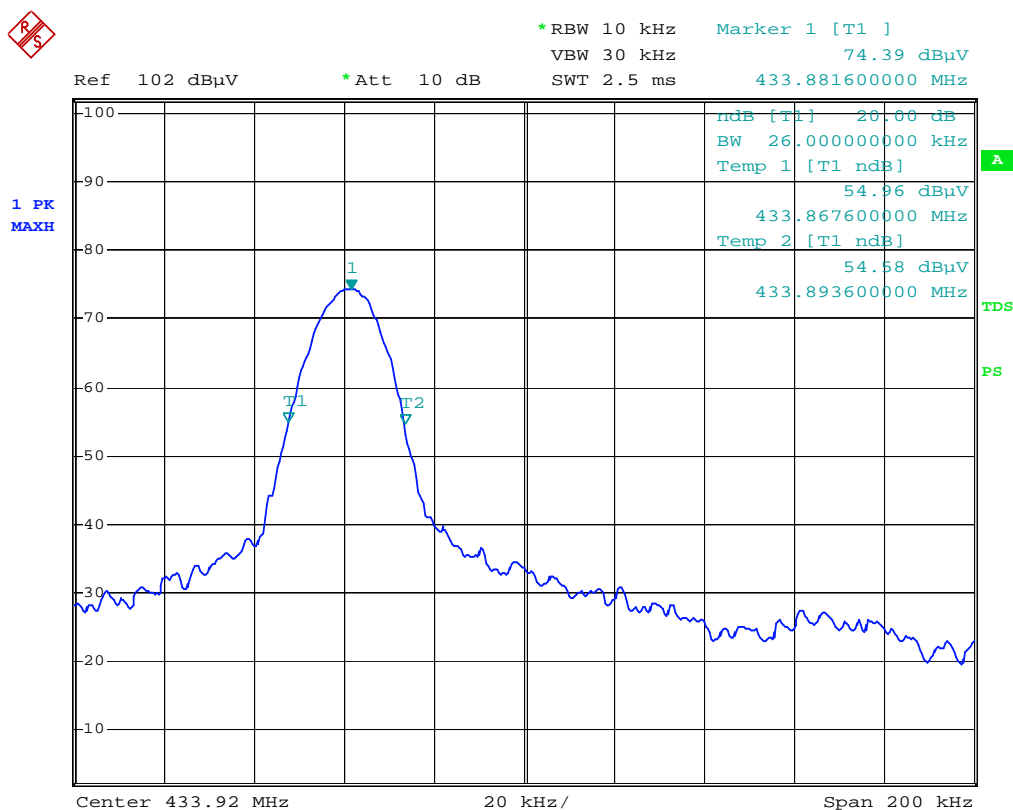
Test Mode: Transmitting

Please refer to following table and plot.

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
433.92	26	1084.8	Pass

Note: 20 dB Bandwidth Limit = 0.25% * center frequency = 0.25% * 433.92MHz = 1.0848 MHz

20 dB Bandwidth



20dB bandwidth

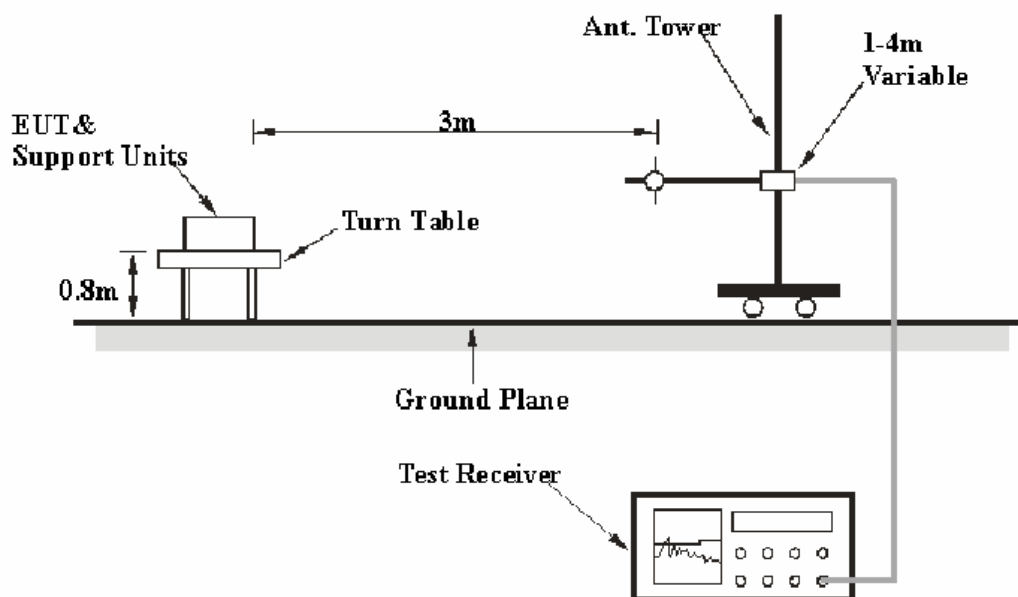
Date: 18.NOV.2008 11:31:26

CFR47 §15.231(a) - DEACTIVATION TESTING

Requirement

Per 15.231(a) (1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

EUT Setup



The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15.231(a) limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
HP	Amplifier	8447E	1937A01046	2008-11-15	2009-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2008-08-14	2009-08-14

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

CFR47 §15.231- DUTY CYCLE

Limit

Nil (No dedicated limit specified in the Rules).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-10-16	2009-10-16

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer=operating frequency.
4. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz, Span=0Hz.
5. Repeat above procedures until all frequency measured was complete.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.2 kPa

The testing was performed by Phoenix Liu on 2008-11-18.

Test Mode: Transmitting

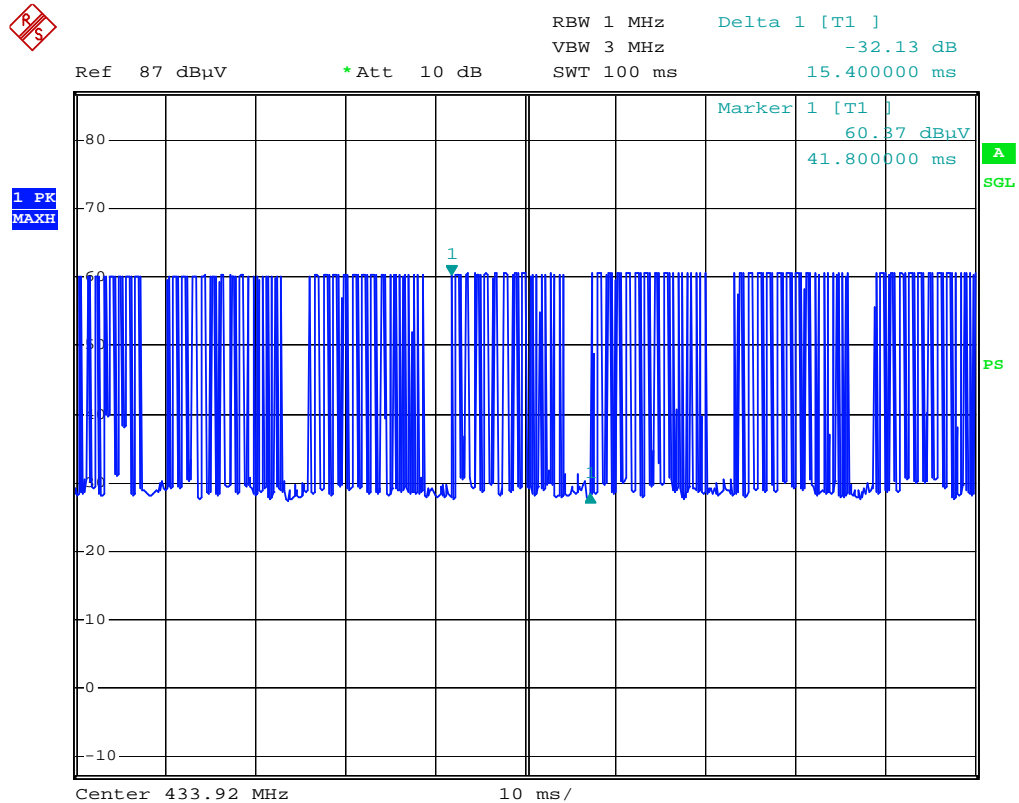
Test Result: Compliant.

Please refer to following plot

$$T_p = 15.6 \text{ ms}$$

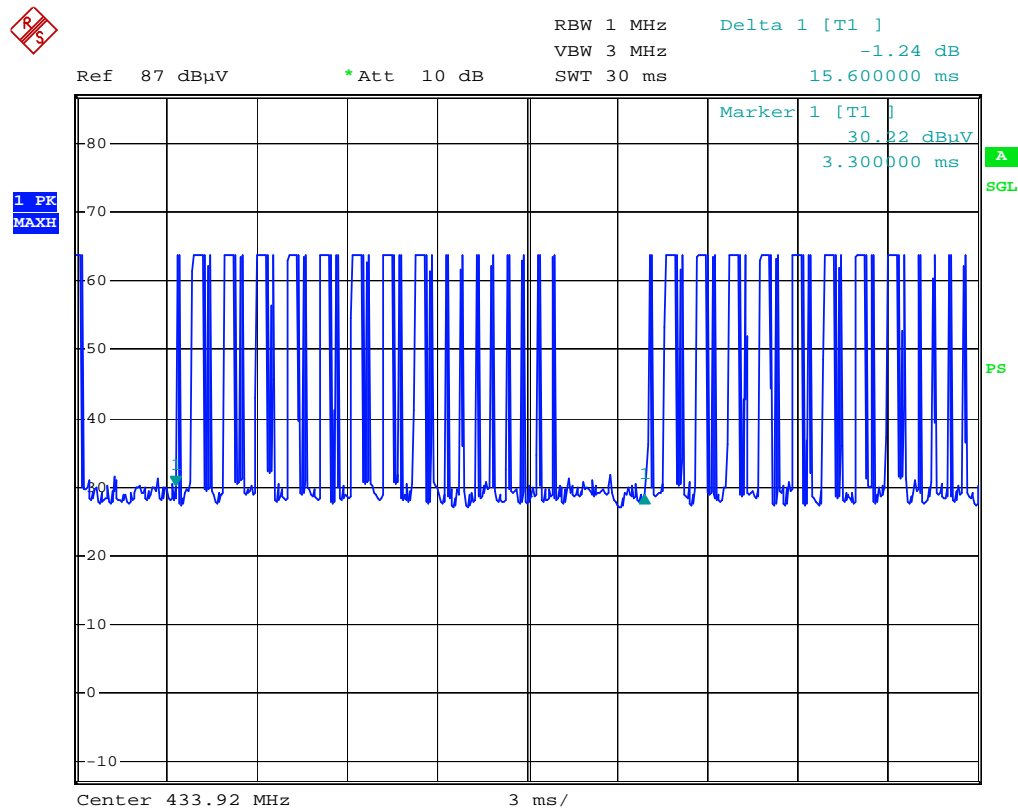
$$T_{on} = 0.410 \times 8 + 0.110 \times 17 = 5.15 \text{ ms}$$

$$\text{Factor} = 20 * \log (T_{on} / T_p) = 20 * \log (5.15 / 15.6) = -9.63 \text{ dB}$$

T_p :

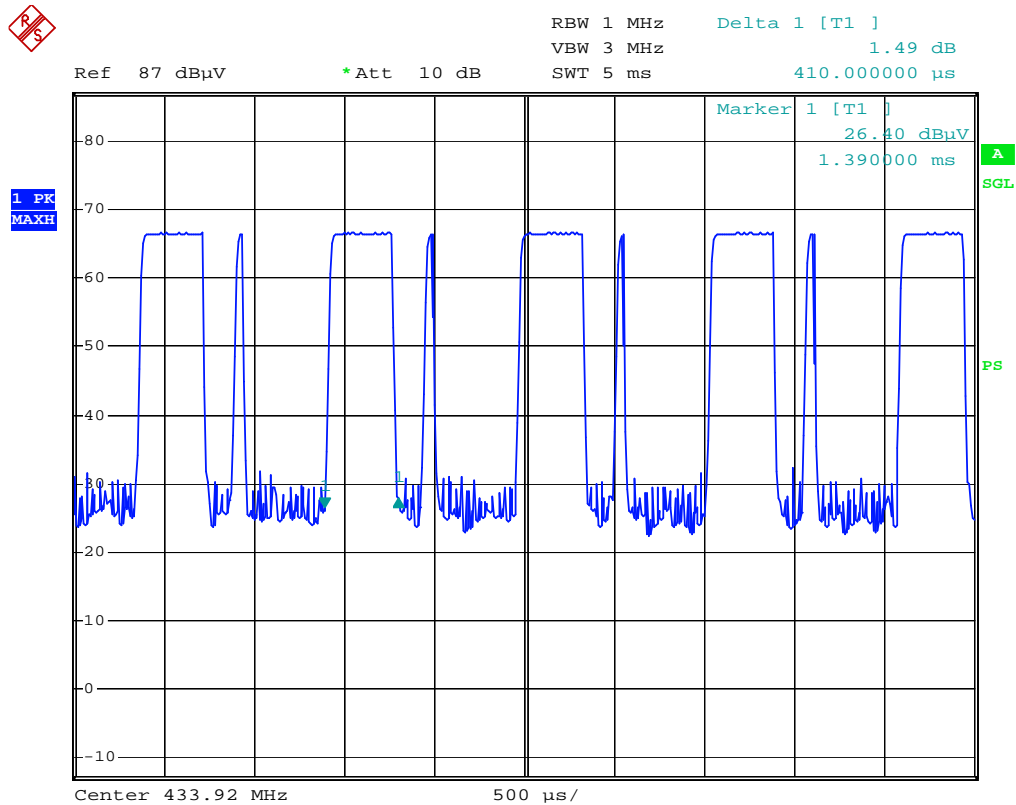
duty cycle 1

Date: 18.NOV.2008 15:18:27

T_{on}-1:

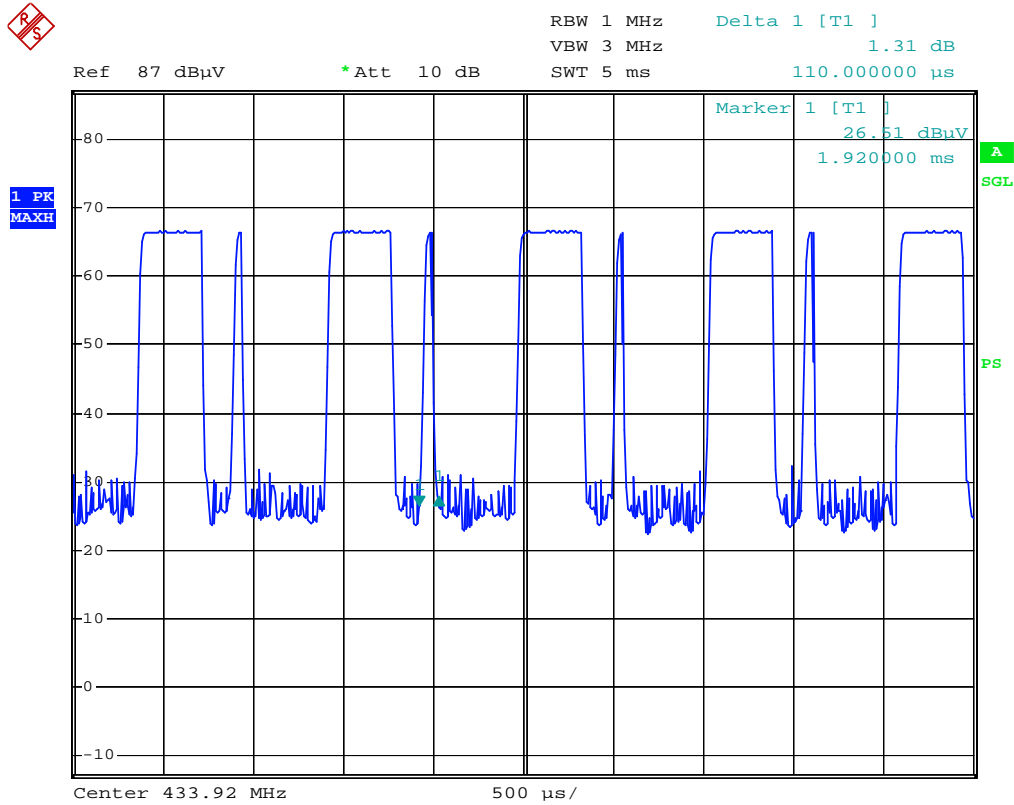
duty cycle 2

Date: 18.NOV.2008 15:20:37

T_{on}-2:

duty cycle 3

Date: 18.NOV.2008 15:26:48

T_{on}-3:

duty cycle 4

Date: 18.NOV.2008 15:27:19

PRODUCT SIMILAR DECLARATION LETTER



AURUM ELECTRONICS CORP

No.160.Dayong Rd, Yongkang City, Tainan Hsien, 710 Taiwan

Tel:00886-6-2720116 Fax:00886-6-2711890

E-mail:aurum@aurum.com.tw Website: www.aurum.com.tw

To:Bay Area Compliance Laboratories Corp.

Declaration of Similarity

To:whom it may concern,

We, AURUM ELECTRONICS CORP;

Address: No.160, Dayong Rd, Yongkang City ,Tainan Hsien ,710 Taiwan

Hereby declare that

Product name: THE INTELLIGENT MOTION SENSOR TRACKING LIGHT

Model No:AEC-9339B(AEC-9336B)

For our business issue and market requirement,we would like to list two photos on certificates and reports.We declare that there is no electrical change has made to the equipment that alters the compliance charaterristic,except that the power consumption!

While the power consumption for testing product AEC-9339B is 300W,For AEC-9336B IS 150W

Please kindly handle on the project.

Sincerely Yours,

Signature:

A handwritten signature in black ink, appearing to read "Eugene Huang". Below the signature, the date "Sep 18, 2008" is written.

Typed or Printed Name: Eugene Huang

Title: Vice General Manager

Company Name: AURUM ELECTRONICS CORP.

*******END OF REPORT*******