

# CAO GADGETS, LLC

## WIRELESS TAG MANAGER

Model: ZGW04

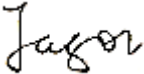

Sep 6<sup>th</sup> 2013

Report No.: SL13012801-CAO-001 FCC (15.231) Rev1.0  
(This report supersedes none SL13012801-CAO-001 FCC (15.231))



Modifications made to the product : None

This Test Report is Issued Under the Authority of:

	
Jason Zhang Compliance Engineer	David Zhang Engineering Reviewer

This test report may be reproduced in full only.  
Test result presented in this test report is applicable to the representative sample only.

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: [www.siemic.com](http://www.siemic.com); Follow us at:



# RF Test Report

To: 47 CFR 15.203, 15.207, 15.209, 15.231:2012

SIEMIC, INC.  
Accessing global markets



## Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

### Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless , Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

### Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF , Telecom
HongKong	OFTA (US002)	RF , Telecom

**CONTENTS**

**1 REPORT REVISION HISTORY .....3**

**2 EXECUTIVE SUMMARY .....4**

**3 CUSTOMER INFORMATION .....4**

**4 TEST SITE INFORMATION .....4**

**5 MODIFICATION .....4**

**6 EUT INFORMATION .....5**

6.1 EUT Description .....5

6.2 Radio Description .....5

6.3 EUT test modes/configuration Description.....6

6.4 EUT Photos - External .....7

6.5 EUT Photos - Internal .....8

6.6 EUT Test Setup Photos .....9

**7 SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION.....10**

7.1 Supporting Equipment .....10

7.2 Cabling Description .....10

7.3 Test Software Description .....10

**8 TEST SUMMARY.....11**

**9 MEASUREMENT UNCERTAINTY .....12**

**10 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS .....13**

10.1 Antenna Requirement.....13

10.2 Conducted Emission Test Result .....14

10.2 Radiated Measurement .....17

10.2.1 Radiated Fundamental and Spurious Emission .....18

10.2.2 Deactivation .....22

10.2.3 Occupied Bandwidth .....24

**ANNEX A. TEST INSTRUMENT .....27**

**ANNEX B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM .....28**

**ANNEX C. SIEMIC ACCREDITATION .....29**

## 1 Report Revision History

Report No.	Report Version	Description	Issue Date
SL13012801-CAO-001 FCC (15.231) Rev1.0	NONE	Original	5/30/2013
SL13012801-CAO-001 FCC (15.231) Rev1.0	Rev1.0	New test data for power down version EUT	9/6/2013

## 2 Executive Summary

The purpose of this test program was to demonstrate compliance of the CAO Gadgets, LLC, WIRELESS TAG MANAGER, and model: ZGW04 against the current Stipulated Standards. The ZGW04 has demonstrated compliance with the Stipulated Standard listed on 1<sup>st</sup> page.

## 3 Customer information

Applicant Name	:	CAO Gadgets, LLC
Applicant Address	:	WIRELESS TAG MANAGER
Manufacturer Name	:	CAO Gadgets, LLC
Manufacturer Address	:	2 Welbury, Aliso Viejo, CA 92656 USA

## 4 Test site information

Lab performing tests	:	SIEMIC Laboratories
Lab Address	:	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	:	881796
IC Test Site No.	:	4842D-2
VCCI Test Site No.	:	A0133

## 5 Modification

Index	Item	Description	Note

## 6 EUT Information

### 6.1 EUT Description

Product Name	:	WIRELESS TAG MANAGER
Model No.	:	ZGW04
Trade Name	:	CAO Gadgets, LLC
Serial No.	:	4105C104A300
Input Power	:	5 VDC
Date of EUT received	:	May 9th, 2013
Equipment Class/ Category	:	DSC
Clock Frequencies	:	25 MHz
Port/Connectors	:	USB, RJ45

### 6.2 Radio Description

#### Spec for Radio -

Radio Type	RFID
Operating Frequency	430MHz – 440MHz
Modulation	ASK
Antenna Type	ANT-433-PW-RA
Antenna Gain	1dBi

### 6.3 EUT test modes/configuration Description

Mode	Note
RF test	Continue ping tag
Note :None	

Test Item	Operating mode	Tested antenna port	Test frequencies
Antenna Requirement	N/A	-	435.04MHz
Conducted Emissions Voltage	Continues ping tag	-	
Manually and Automatically Deactivation (note 1)	Continues ping tag	-	
Fundamental & Radiated Spurious Emission Limits	Continues ping tag	-	
20 dB Bandwidth	Continues ping tag	-	

Note: EUT using an Antenna that attached to the PCB board. Only using radiated measurement during the test.



**6.4 EUT Photos - External**



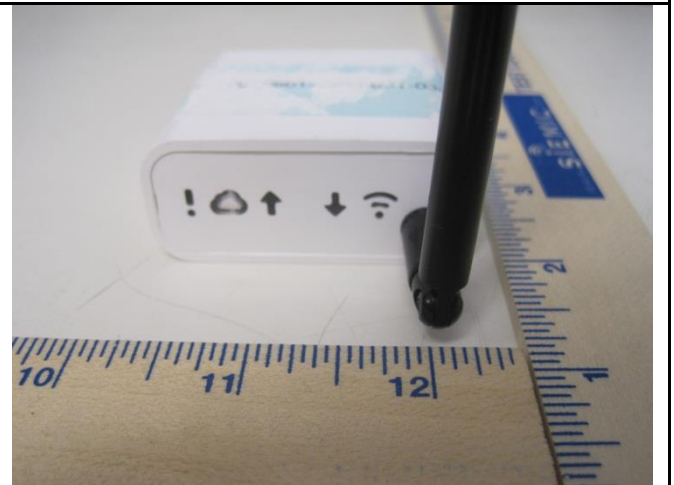
Top



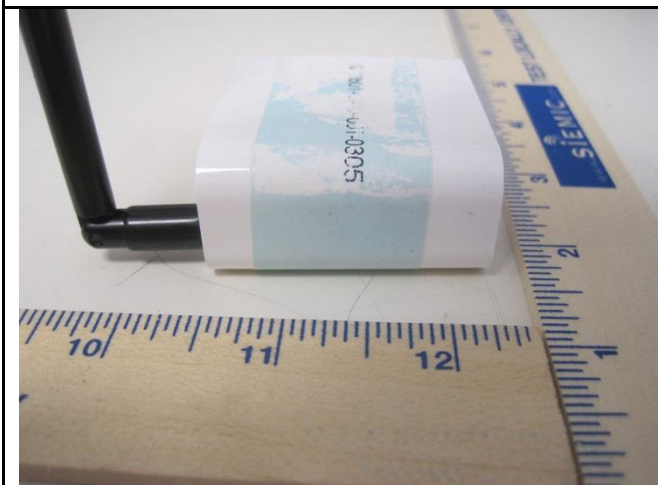
Bottom



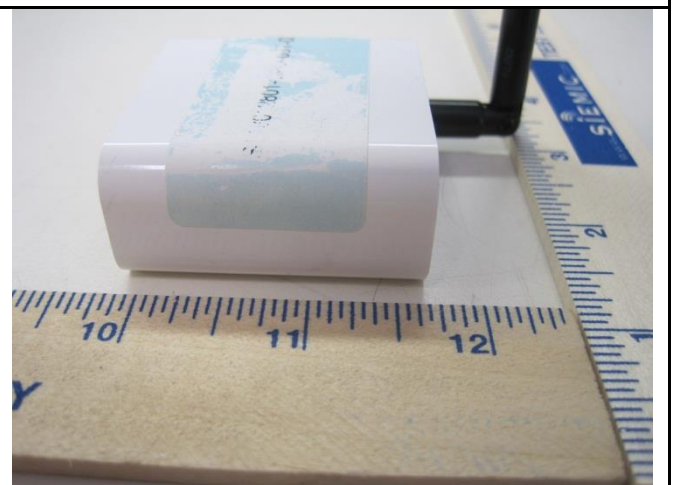
Front



Rear



Left Side



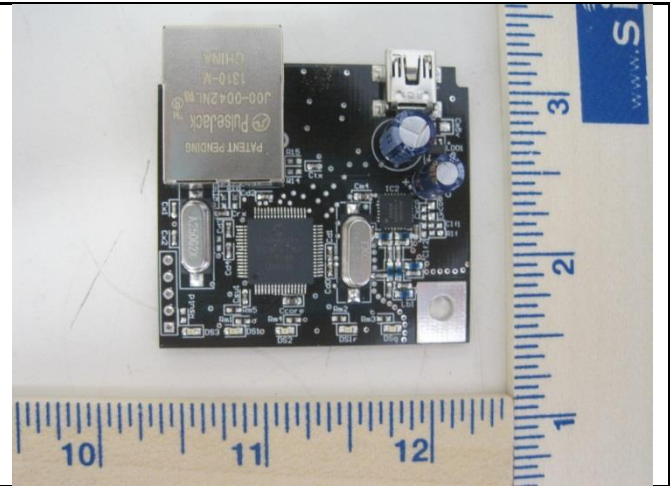
Right Side



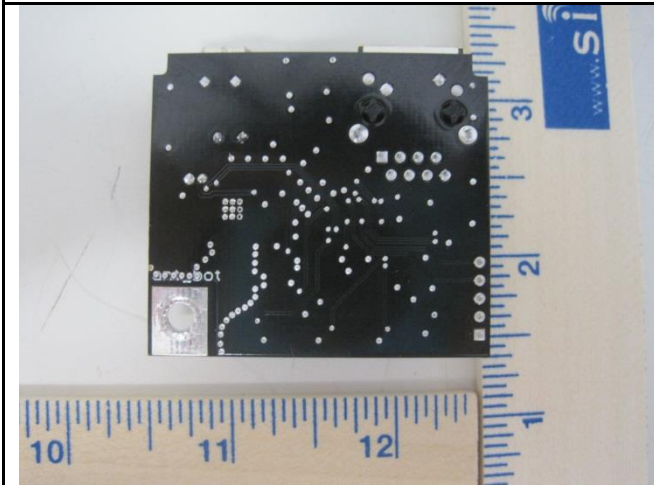
**6.5 EUT Photos - Internal**



**Antenna**



**Main Board Top**

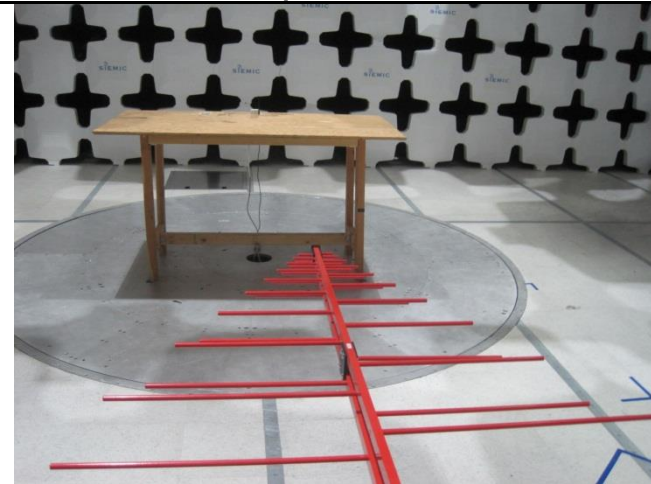


**Main Board Bottom**

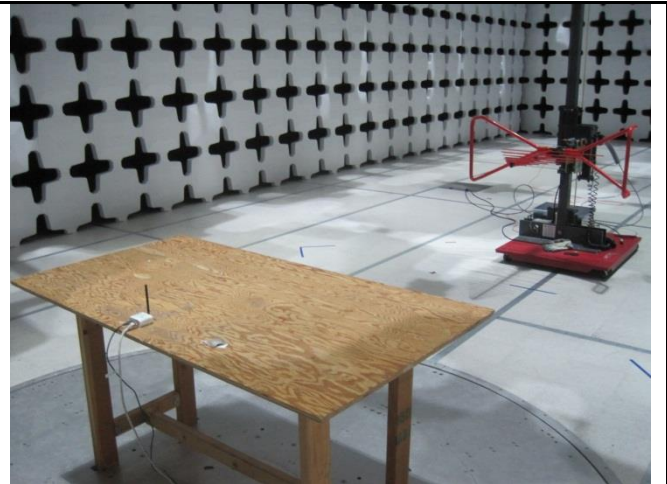


**Power Supply Unit**

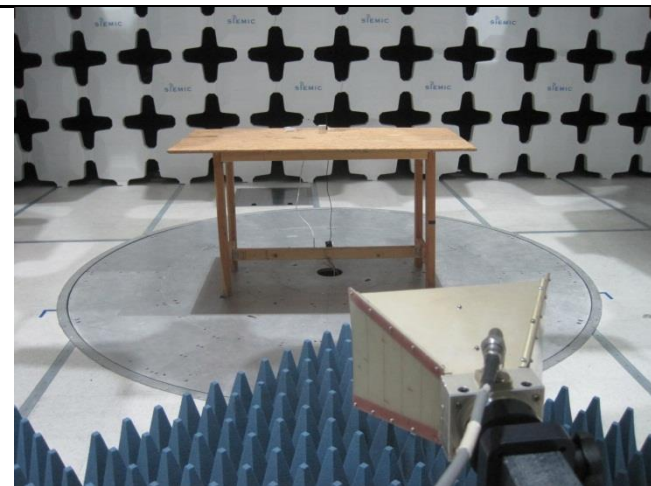
**6.6 EUT Test Setup Photos**



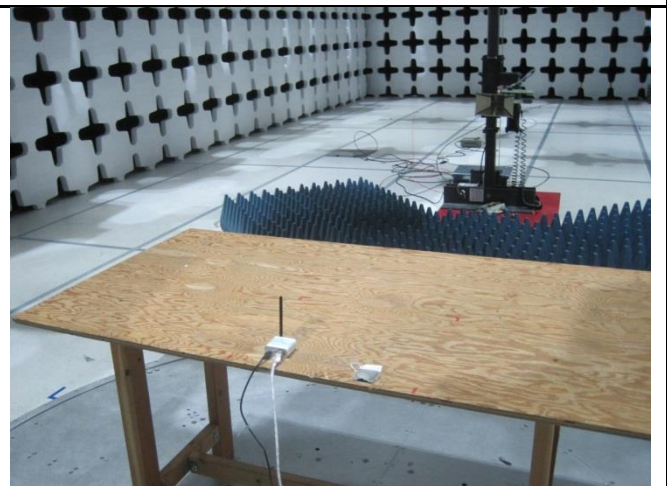
**Radiated Emission Test setup (<1GHz) - Front**



**Radiated Emission Test setup (<1GHz) - Rear**



**Radiated Emission Test setup (>1GHz) - Front**



**Radiated Emission Test setup (>1GHz) - Rear**



**Conducted Emission Test setup - Front**



**Conducted Emission Test setup - Rear**

## 7 Supporting Equipment/Software and cabling Description

### 7.1 Supporting Equipment

Index	Supporting Equipment Description	Model	Serial No.	Manu	Note
1	SWITCHING POWER SUPPLY	PSM03A-050Q-3	PD04500968	PHIHONG	PSU

### 7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
Cable	EUT	USB	PSU	USB	1.5	Unshielded	

### 7.3 Test Software Description

Test Item	Software	Description
Radiated Testing	Mytaglist webapp	Monitor Function

## 8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Antenna Requirement	FCC	15.203	FCC	-	<input checked="" type="checkbox"/> Pass
	IC		IC	-	<input type="checkbox"/> N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	ANSI C63.4 2009	<input checked="" type="checkbox"/> Pass
	IC	RSS Gen (7.2.2)	IC	-	<input type="checkbox"/> N/A

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Manually and Automatically Deactivation (note 1)	FCC	15.231 (a)(1) & (2)	FCC	ANSI C63.4 2009	<input checked="" type="checkbox"/> Pass
	IC	-	IC	-	<input type="checkbox"/> N/A
Fundamental & Radiated Spurious Emission Limits	FCC	15.231 (b) / 15.209	FCC	ANSI C63.4 2009	<input checked="" type="checkbox"/> Pass
	IC	-	IC	-	<input type="checkbox"/> N/A
20 dB Bandwidth	FCC	15.231 (c)	FCC	ANSI C63.4 2009	<input checked="" type="checkbox"/> Pass
	IC	-	IC	-	<input type="checkbox"/> N/A

Remark	<ol style="list-style-type: none"> <li>All measurement uncertainties are not taken into consideration for all presented test result.</li> <li>Refer to the operational description included with this application for detailed description timing diagrams for transmission duration.</li> <li>Test Method: ANSI C63.4: 2009</li> </ol>
--------	---



## 9 Measurement Uncertainty

Test Item	Frequency Range	Description	Uncertainty
AC Conducted Emissions Voltage	150KHz – 30MHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±3.5dB
Fundamental & Radiated Spurious Emission Limits	30MHz – 6GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB

## 10 Measurements, examination and derived results

### 10.1 Antenna Requirement

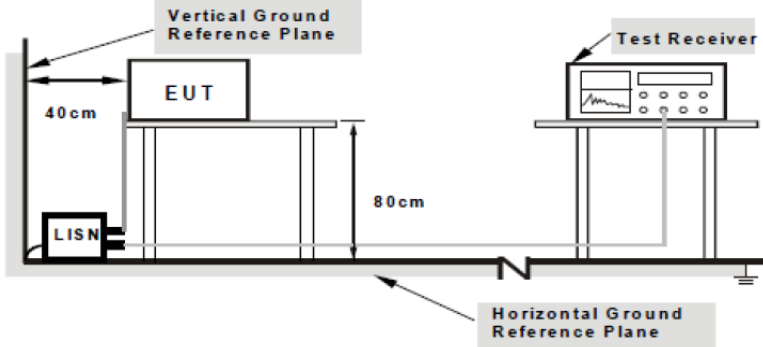
Spec	Item	Requirement	Applicable
§15.203		<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.</p> <p>Antenna requirement must meet at least one of the following:</p> <p>a) Antenna must be permanently attached to the device.  b) Antenna must use a unique type of connector to attach to the device.  c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.</p>	<input checked="" type="checkbox"/>
Remark	The Antenna permanently attached to the device by using screw-mount method which meets the requirement (See Internal Photographs submitted as another Exhibit).		
Result	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL		



## 10.2 Conducted Emission Test Result

### Conducted Emission Limit

Section	Frequency ranges (MHz)	Limit (dBuV)	
		QP	Average
Class B devices	0.15 ~ 0.5	66 - 56	56 - 46
	0.5 ~ 5	56	46
	5 ~ 30	60	50

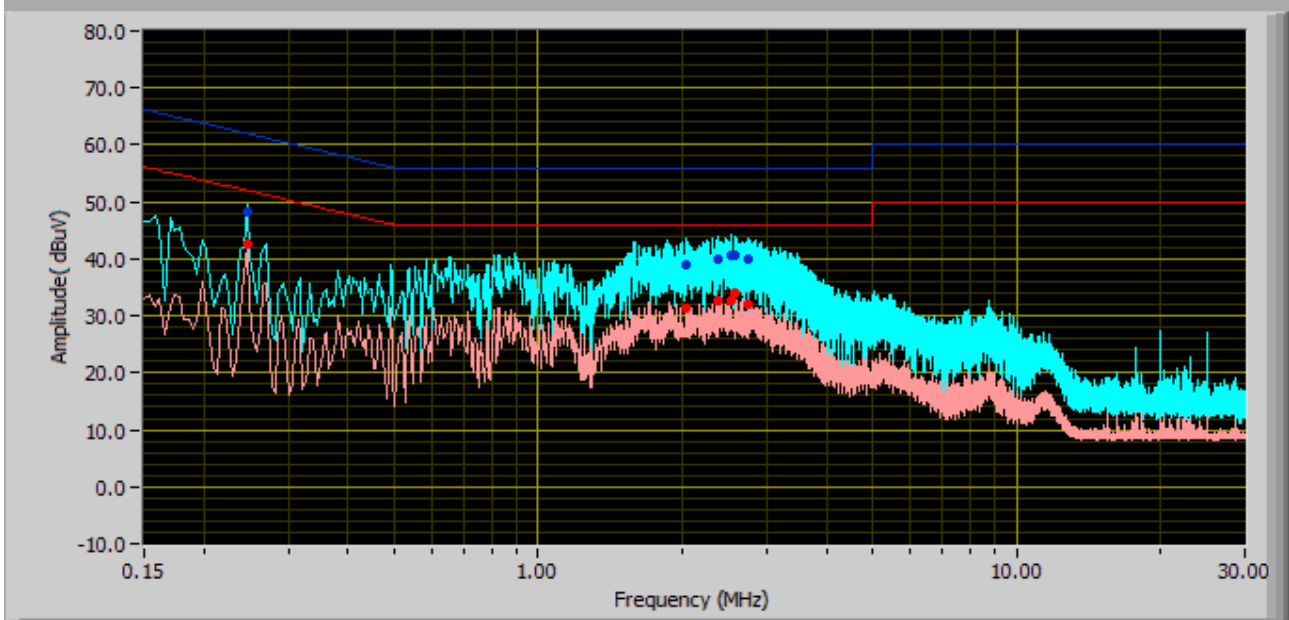
Spec	Item	Requirement	Applicable
§ 15.207, RSS210(A8.1)	a)	For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits set in § 15.207, as measured using a 50 $\mu$ H/50 ohms line impedance stabilization network (LISN).  AC Line conducted emission within the band 150KHz to 30MHz	<input checked="" type="checkbox"/>
Test Setup	 <p><b>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.</b></p>		
Procedure	<ul style="list-style-type: none"> <li>- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.</li> <li>- The power supply for the EUT was fed through a 50<math>\Omega</math>/50<math>\mu</math>H EUT LISN, connected to filtered mains.</li> <li>- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>- All other supporting equipments were powered separately from another main supply.</li> </ul>		
Test Date	05/24/2013	Environmental condition	Temperature 21oC Relative Humidity 46% Atmospheric Pressure 1019mbar
Remark			
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data     Yes                       N/A

Test Plot     Yes (See below)               N/A

### Test Result

**Final plot**



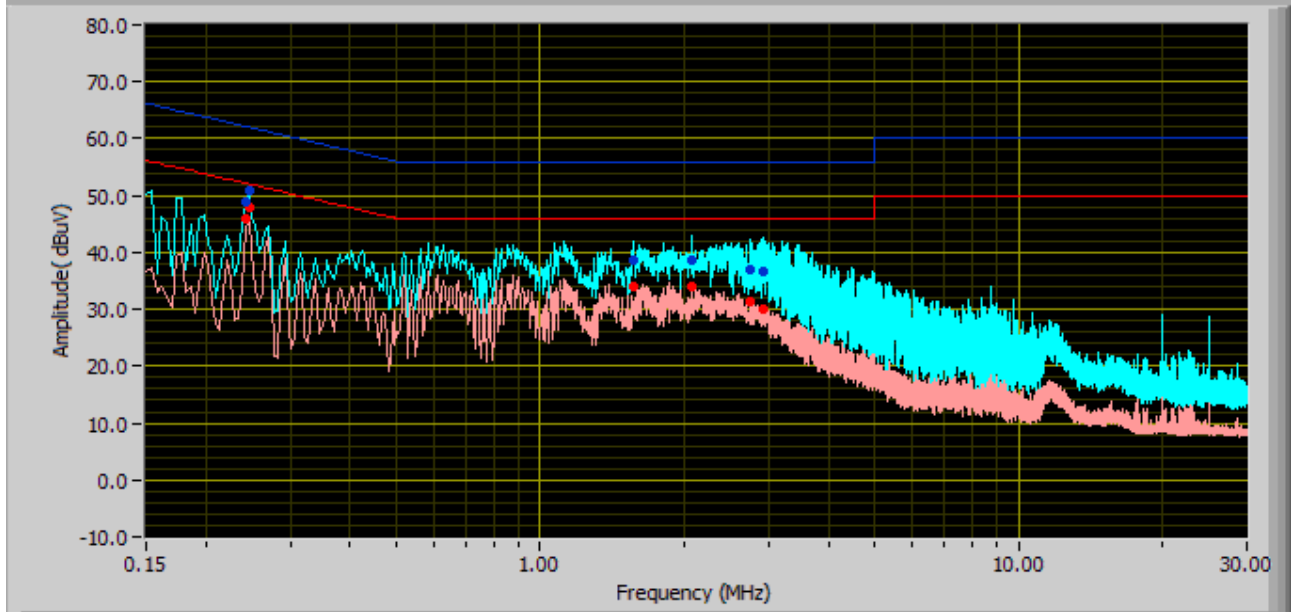
Quasi-Peak Limit

Average Limit

120V, 60Hz, Neutral Line

Frequency (MHz)	QP Value (dB $\mu$ V)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dB $\mu$ V)	Class B Limit (dB $\mu$ V)	Pass / Fail	Margin (dB)	Line
0.25	48.21	62.00	Pass	-13.79	42.74	52.00	Pass	-9.26	Neutral
2.04	38.95	56.00	Pass	-17.05	31.41	46.00	Pass	-14.59	Neutral
2.38	40.06	56.00	Pass	-15.94	32.76	46.00	Pass	-13.24	Neutral
2.53	40.52	56.00	Pass	-15.48	32.76	46.00	Pass	-13.24	Neutral
2.57	40.51	56.00	Pass	-15.50	33.96	46.00	Pass	-12.05	Neutral
2.76	39.87	56.00	Pass	-16.13	31.95	46.00	Pass	-14.05	Neutral

**Final plot**



Quasi-Peak Limit

Average Limit

120V, 60Hz, Phase Line

Frequency (MHz)	QP Value (dB $\mu$ V)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dB $\mu$ V)	Class B Limit (dB $\mu$ V)	Pass / Fail	Margin (dB)	Line
0.24	48.78	62.14	Pass	-13.36	45.82	52.14	Pass	-6.32	Phase
0.25	50.72	62.00	Pass	-11.28	48.06	52.00	Pass	-3.94	Phase
1.56	38.54	56.00	Pass	-17.46	33.95	46.00	Pass	-12.05	Phase
2.08	38.75	56.00	Pass	-17.25	33.96	46.00	Pass	-12.04	Phase
2.75	37.08	56.00	Pass	-18.92	31.31	46.00	Pass	-14.69	Phase
2.93	36.73	56.00	Pass	-19.27	30.13	46.00	Pass	-15.87	Phase

## 10.2 Radiated Measurement

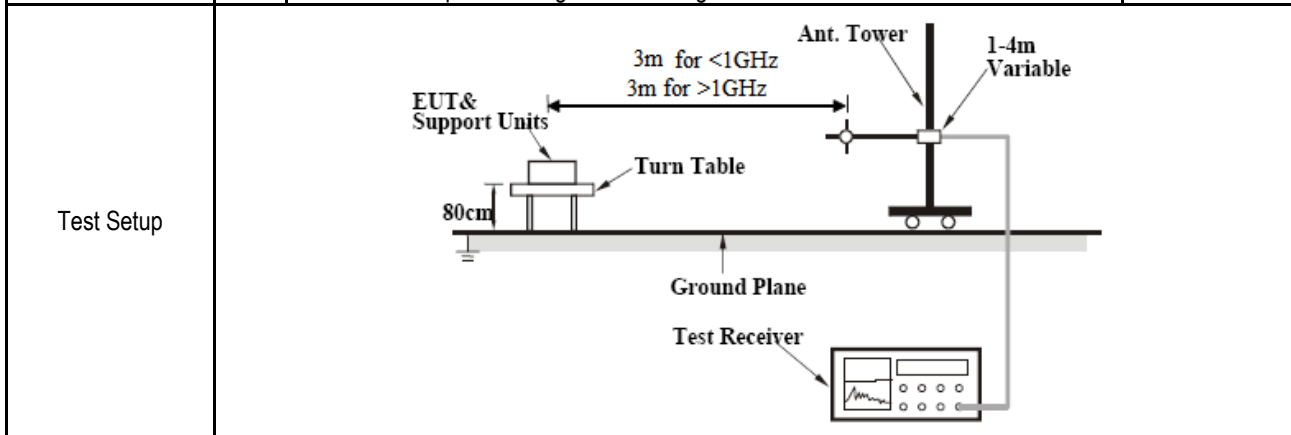
Receiver/Spectrum analyser setting

TEST	Detector	RBW	VBW	Test Distance		NOTES
Radiated Emission < 1GHz (30MHz – 1GHz)	PK/QP	100KHz	300KHz	3m	-	-
Radiated Emission < 30MHz	PK/QP	10KHz	30KHz	3m	-	-
Radiated Emission > 1GHz (1GHz – 18GHz)	PK/AV	1MHz	3MHz	3m	-	-
Radiated Emission > 1GHz (18GHz – 40GHz)	PK/AV	-	-	3m	-	-

### 10.2.1 Radiated Fundamental and Spurious Emission

Requirement(s):

Spec	Item	Requirement	Applicable																					
15.231 (b) / 15.209	(b)	<table border="1"> <thead> <tr> <th>Fundamental frequency (MHz)</th> <th>Field strength of fundamental (microvolts/meter)</th> <th>Field strength of spurious emissions (microvolts/meter)</th> </tr> </thead> <tbody> <tr> <td>40.66–40.70</td> <td>2,250</td> <td>225</td> </tr> <tr> <td>70–130</td> <td>1,250</td> <td>125</td> </tr> <tr> <td>130–174</td> <td>11,250 to 3,750</td> <td>1125 to 375</td> </tr> <tr> <td>174–260</td> <td>3,750</td> <td>375</td> </tr> <tr> <td>260–470</td> <td>13,750 to 12,500</td> <td>1375 to 1,250</td> </tr> <tr> <td>Above 470</td> <td>12,500</td> <td>1,250</td> </tr> </tbody> </table>	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	11,250 to 3,750	1125 to 375	174–260	3,750	375	260–470	13,750 to 12,500	1375 to 1,250	Above 470	12,500	1,250	<input checked="" type="checkbox"/>
		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	11,250 to 3,750	1125 to 375																				
		174–260	3,750	375																				
	260–470	13,750 to 12,500	1375 to 1,250																					
Above 470	12,500	1,250																						
(b)	Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.	<input type="checkbox"/>																						



Procedure	<ol style="list-style-type: none"> <li>1. The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> <li>a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</li> <li>b. The EUT was then rotated to the direction that gave the maximum emission.</li> <li>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</li> </ol> </li> <li>3. A Quasi-peak measurement was then made for that frequency point.</li> <li>4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</li> </ol>
-----------	---

Test Date	09/04/2013	Environmental condition	Temperature 21oC Relative Humidity 46% Atmospheric Pressure 1019mbar
-----------	------------	-------------------------	--

Remark	Note1: All 3 axes have been investigated. Only worst case is presented in test report. Note2: The peak reading of EUT emission was verified by using both spectrum analyser and oscilloscope. The reading was found to be stable and there's no PDCF(Pulse Desensitization Correction Factor ) required. Note3: Duty cycle Factor = 20 log ( T pulse / T period)
--------	--

Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
--------	--

Test Data     Yes (See below)       N/A

Test Plot     Yes (See below)       N/A

**Fundamental Measurement @ 431.04MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (MHz)	Reading (dBuV)	Azimuth	Polarity	Height (m)	Factors (dB)	Corrected Data (dBuV/m)	FCC 15.231(a) Limit (dBuV)	Margin (dB)	Detector
431.04	78.67	296	V	1	19.02	97.69	101.94	-4.25	Peak
431.04	61.64	296	V	1	19.02	80.66	81.94	-1.28	Ave
431.04	79.21	118	H	1	19.02	98.23	101.94	-3.71	Peak
431.04	62.18	118	H	1	19.02	81.20	81.94	-0.74	Ave

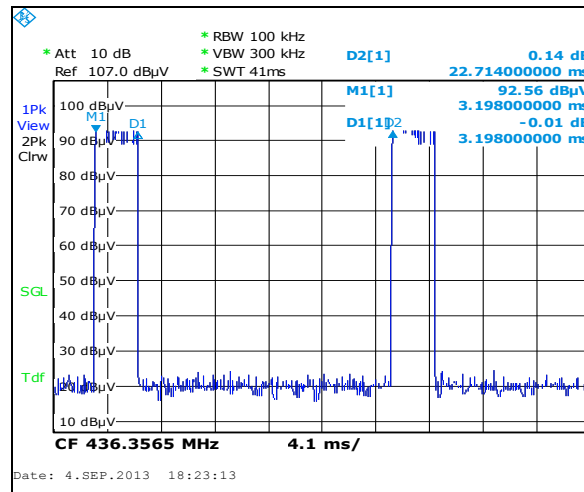
**Fundamental Measurement @ 435.20MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (MHz)	Reading (dBuV)	Azimuth	Polarity	Height (m)	Factors (dB)	Corrected Data (dBuV/m)	FCC 15.231(a) Limit (dBuV)	Margin (dB)	Detector
435.20	79.16	296	V	1	19.02	98.18	101.94	-3.76	Peak
435.20	62.13	296	V	1	19.02	81.15	81.94	-0.79	Ave
435.20	79.19	118	H	1	19.02	98.21	101.94	-3.73	Peak
435.20	62.16	118	H	1	19.02	81.18	81.94	-0.76	Ave

**Fundamental Measurement @ 439.36MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (MHz)	Reading (dBuV)	Azimuth	Polarity	Height (m)	Factors (dB)	Corrected Data (dBuV/m)	FCC 15.231(a) Limit (dBuV)	Margin (dB)	Detector
439.36	78.49	296	V	1	19.02	97.51	101.94	-4.43	Peak
439.36	61.46	296	V	1	19.02	80.48	81.94	-1.46	Ave
439.36	78.53	118	H	1	19.02	97.55	101.94	-4.39	Peak
439.36	61.50	118	H	1	19.02	80.52	81.94	-1.42	Ave

Duty cycle Factor =  $20 \log (T \text{ pulse} / T \text{ period}) = 20 \log (3.198 / 22.714) = -17.03\text{dB}$





**Spurious Emissions (<1GHz) Measurement @ 435.20MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity	Height	Factors	Limit (dBuV)	Margin (dB)	Detector
200.04	37.26	317.00	V	100.00	14.69	51.48	-14.22	QP
399.94	37.53	195.00	V	144.00	17.93	61.94	-24.41	QP
426.94	24.92	81.00	V	175.00	18.77	61.94	-37.02	QP
437.45	25.37	118.00	H	215.00	19.27	61.94	-36.57	QP
869.91	61.20	7.00	V	189.00	25.32	61.94	-0.74	QP

**Spurious Emissions (>1GHz) Measurement @ 431.04MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (GHz)	Reading (dBuV)	Direction (degree)	Height (cm)	Polar (V/H)	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Detector
1.293	56.78	-	-	V	25.35	2.03	31.98	52.18	61.94	-9.76	Peak
1.293	57.42	-	-	H	26.56	2.32	32.01	54.29	61.94	-7.65	Peak
1.724	55.06	-	-	H	27.96	2.58	32.05	53.55	61.94	-8.39	Peak
1.724	54.09	-	-	V	27.96	2.58	32.05	52.58	61.94	-9.36	Peak
2.155	51.25	-	-	V	29.13	2.77	32.14	51.01	61.94	-10.93	Peak
2.155	53.61	-	-	H	29.13	2.77	32.14	53.37	61.94	-8.57	Peak

Emission was scanned up to 6GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit. If the emission PK level is within Average limit, then the maximization and average measurement are not performed.

**Spurious Emissions (>1GHz) Measurement @ 435.2MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (GHz)	Reading (dBuV)	Direction (degree)	Height (cm)	Polar (V/H)	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Detector
1.306	56.49	-	-	V	25.35	2.03	31.98	51.89	61.94	-10.05	Peak
1.304	57.11	-	-	H	26.56	2.32	32.01	53.98	61.94	-7.96	Peak
1.741	54.75	-	-	H	27.96	2.58	32.05	53.24	61.94	-8.70	Peak
1.741	53.79	-	-	V	27.96	2.58	32.05	52.28	61.94	-9.66	Peak
2.176	50.97	-	-	V	29.13	2.77	32.14	50.73	61.94	-11.21	Peak
2.176	53.31	-	-	H	29.13	2.77	32.14	53.07	61.94	-8.87	Peak

Emission was scanned up to 6GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit. If the emission PK level is within Average limit, then the maximization and average measurement are not performed.

**Spurious Emissions (>1GHz) Measurement @ 439.36MHz @ 3 Meter [FCC 15.231(a)]**

Frequency (GHz)	Reading (dBuV)	Direction (degree)	Height (cm)	Polar (V/H)	Antenna Loss (dB)	Cable loss (dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Detector
1.318	56.20	-	-	V	25.35	2.03	31.98	51.60	61.94	-10.34	Peak
1.318	56.80	-	-	H	26.56	2.32	32.01	53.67	61.94	-8.27	Peak
1.757	54.45	-	-	H	27.96	2.58	32.05	52.94	61.94	-9.00	Peak
1.757	53.50	-	-	V	27.96	2.58	32.05	51.99	61.94	-9.95	Peak
2.197	50.69	-	-	V	29.13	2.77	32.14	50.45	61.94	-11.49	Peak
2.197	53.01	-	-	H	29.13	2.77	32.14	52.77	61.94	-9.17	Peak

Emission was scanned up to 6GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit. If the emission PK level is within Average limit, then the maximization and average measurement are not performed.

**10.2.2 Deactivation**

**Requirement(s):**

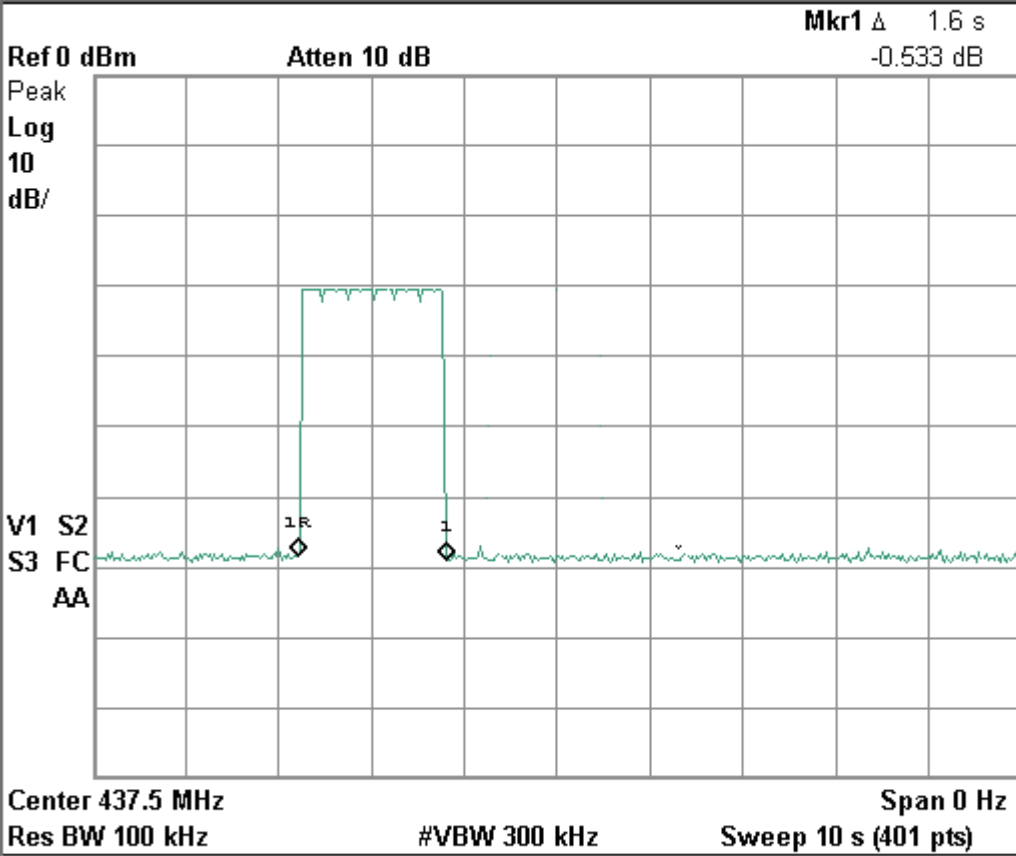
Spec	Item	Requirement	Applicable
47 CFR §15.231	(a)	(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation	<input checked="" type="checkbox"/>
Test Setup			
Procedure	<ul style="list-style-type: none"> <li>- Allow the trace to stabilize.</li> <li>- Use the spectrum analyzer measurement function to determine delta time.</li> <li>- Capture the plot.</li> </ul>		
Test Date	07/30/2012	Environmental condition	Temperature 21oC Relative Humidity 46% Atmospheric Pressure 1019mbar
Remark	NONE		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

**Test Data**     Yes (See below)       N/A

**Test Plot**     Yes (See below)       N/A

Agilent 17:07:35 Jul 30, 2012

R T



Marker

Select Marker  
 1 2 3 4

Normal

Delta

Delta Pair  
 (Tracking Ref)  
 Ref Delta

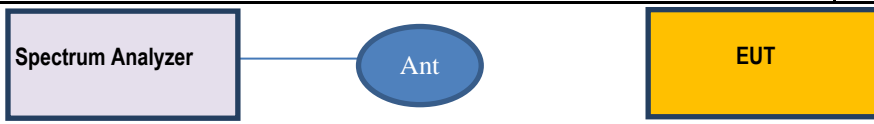
Span Pair  
 Span Center

Off

More  
 1 of 2

### 10.2.3 Occupied Bandwidth

#### Requirement(s):

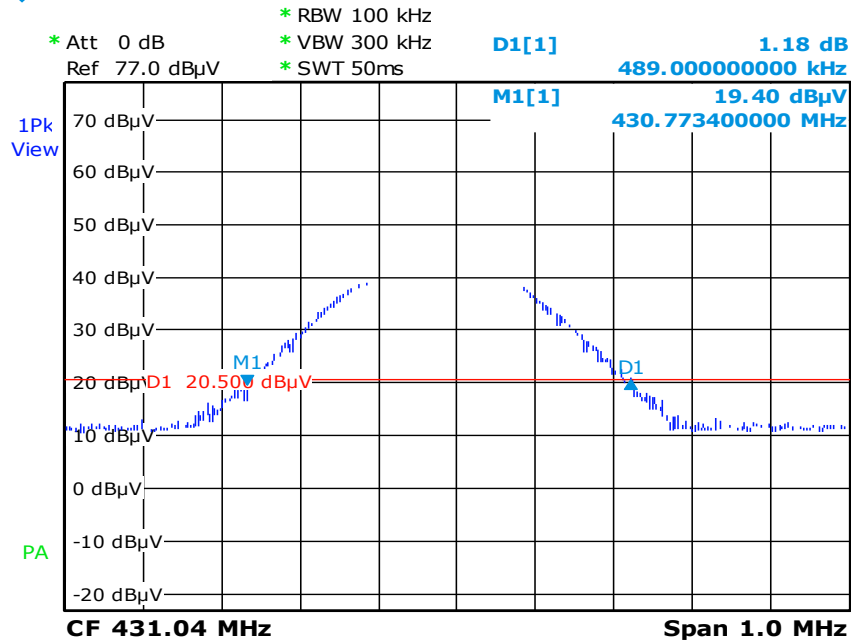
Spec	Item	Requirement	Applicable
47 CFR §15.231	(c)	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier	<input checked="" type="checkbox"/>
Test Setup			
Procedure	<ul style="list-style-type: none"> <li>- Allow the trace to stabilize.</li> <li>- Use the spectrum analyzer built-in measurement function to determine the 20dB.</li> <li>- Capture the plot.</li> </ul>		
Test Date	09/04/2012	Environmental condition	Temperature 21oC Relative Humidity 46% Atmospheric Pressure 1019mbar
Remark	NONE		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data     Yes (See below)       N/A

Test Plot     Yes (See below)       N/A

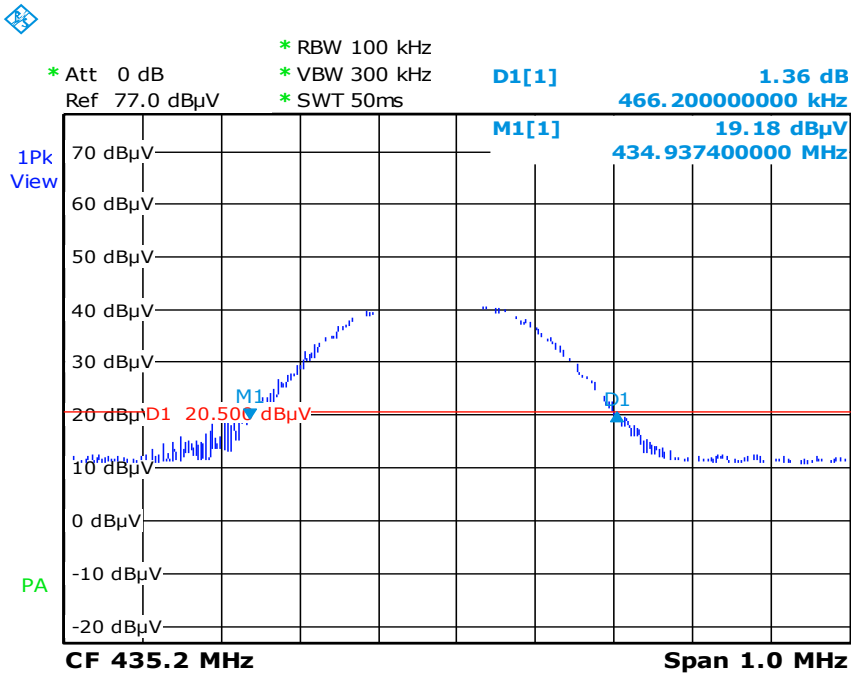
#### Test Result

Fundamental Frequency (MHz)	Measured 20 dB Bandwidth (KHz)	FCC 15.231 Limit (KHz)	Result
431.04	489.0	1077.6	Pass
435.20	466.2	1088.0	Pass
439.36	485.0	1098.4	Pass



Date: 5.SEP.2013 01:21:05

20 dB Bandwidth – Low CH



Date: 5.SEP.2013 01:19:25

20 dB Bandwidth – Mid CH





## Annex A. TEST INSTRUMENT

















Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
<b>Conducted Emissions</b>						
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	<input checked="" type="checkbox"/>
R&S LISN	ESH2-Z5	861741/013	05/18/2013	1 Year	05/18/2014	<input checked="" type="checkbox"/>
CHASE LISN	MN2050B	1018	07/24/2013	1 Year	07/24/2014	<input type="checkbox"/>
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>						
Agilent	E4407B	US88441016	05/31/2013	1 Year	05/31/2014	<input checked="" type="checkbox"/>
R & S Receiver	ESL6	100178	03/01/2013	1 Year	03/01/2014	<input checked="" type="checkbox"/>
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	<input type="checkbox"/>
Passive Loop Antenna (10k-30MHz)	6512	49120	5/22/2013	1 Year	5/22/2014	<input type="checkbox"/>
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	02/09/2013	1 Year	02/09/2014	<input checked="" type="checkbox"/>
Horn Antenna (1-26.5GHz)	3115	10SL0059	04/26/2013	1 Year	04/26/2014	<input checked="" type="checkbox"/>
Pre-Amplifier(1 ~ 26GHz)	8449	3008A00715	5/17/2013	1 Year	05/17/2014	<input checked="" type="checkbox"/>
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2013	1 Year	05/30/2014	<input type="checkbox"/>
3 Meters SAC	3M	N/A	10/13/2012	1 Year	10/13/2013	<input type="checkbox"/>
10 Meters SAC	10M	N/A	06/05/2013	1 Year	06/05/2014	<input checked="" type="checkbox"/>
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	<input checked="" type="checkbox"/>

Test report No.	SL13012801-CAO-001 FCC (15.231) Rev1.0
Page	28 of 32
FCC ID	ZGW04

## **Annex B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM**

Please see attachment

## Annex C. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		<a href="#">A1, A2, A3, A4, B1, B2, B3, B4, C</a>
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		<b>Radio &amp; Telecommunications Terminal Equipment:</b> EN45001 – EN ISO/IEC 17025
		<b>Electromagnetic Compatibility:</b> EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)	 	<a href="#">Phase I, Phase II</a>
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
HongKong OFCA		<b>(Phase II)</b> OFCA Foreign Certification Body for Radio and Telecom
		<b>(Phase I)</b> Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		<b>Radio:</b> Scope A – All Radio Standard Specification in Category I
		<b>Telecom:</b> CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		<b>Radio</b> : A1. Terminal equipment for purpose of calling <b>Telecom</b> : B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		<b>EMI</b> : KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI <b>EMS</b> : KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS <b>Radio</b> : RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 <b>Telecom</b> : President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		<b>EMC</b> : AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 <b>Radiocommunications</b> : AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 <b>Telecommunications</b> : AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2

Test report No.	SL13012801-CAO-001 FCC (15.231) Rev1.0
Page	31 of 32
FCC ID	ZGW04

This page has been left blank intentionally.