



TESTING  
CERT #803.01, 803.02, 803.05, 803.06

**INNCOM INTERNATIONAL, INC.**  
**ADDENDUM TEST REPORT TO FC09-171A**

**FOR THE**

**20dB INNCOM ZIGBEE RADIO MODULE, 02-9894**

**FCC PART 15 SUBPART C SECTIONS 15.207 & 15.247 AND RSS-210 ISSUE 7**

TESTING  
**DRAFT**  
DATE OF ISSUE: JANUARY 15, 2010

**PREPARED FOR:**

INNCOM International, Inc.  
277 W. Main St.  
Niantic, CT 06357

**PREPARED BY:**

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CKC Laboratories, Inc.  
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P.O. No.: 00006341  
W.O. No.: 89056

Date of test: September 21 - October 5, 2009

**Report No.: FC09-171B**

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## ADMINISTRATIVE INFORMATION

**DATE OF TEST:** September 21 - October 5, 2009

**DATE OF RECEIPT:** September 21, 2009

**REPRESENTATIVE:** Ryan Gardner

**MANUFACTURER:**  
INNCOM International, Inc.  
277 W. Main St.  
Niantic, CT 06357

**TEST LOCATION:**  
CKC Laboratories, Inc.  
1120 Fulton Place  
Fremont, CA 94539

**TEST METHOD:** ANSI C63.4 (2003), RSS-210 Issue 7 and RSS GEN Issue 2

### PURPOSE OF TEST:

**Original:** To perform the testing of the 20dB INNCOM Zigbee Radio Module, 02-9894 with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.247 and RSS-210 devices.

**Addendum A:** To correct an error in the Power Output Table found on page 34. No additional testing was performed.

**Addendum B:** To correct an error in the addendum report number referenced on the front page from FC09-071 to FC09-171.

**DRAFT**

### APPROVALS

Steve Behm, Director of Engineering Services

### QUALITY ASSURANCE:



Steve Van Kirk, Senior EMC Engineer / Lab Manager

### TEST PERSONNEL:



Armando Del Angel, Test Engineer

## SUMMARY OF RESULTS

Test	Specification/Method	Results
Voltage Variations	FCC 15.31e	Pass
Conducted Emissions	FCC 15.207	Pass
6dB Bandwidth	FCC 15.247(a)(2)	Pass
RF Output Power	FCC 15.247(b)(3)	Pass
OATS Spurious Emissions	FCC 15.247(d)	Pass
Band Edge	FCC 15.247(d)	Pass
Peak Power Spectral Density	FCC 15.247(e)	Pass
99% Bandwidth	RSS-210 Issue 7 / RSS GEN Issue 2	Pass
Site File No.	FCC 318736 IC 3082C1	

### CONDITIONS DURING TESTING

No modifications to the EUT were necessary during testing.

### FCC 15.31(m) Number Of Channels

This device was tested on three channels.

### FCC 15.33(a) Frequency Ranges Tested

15.207 Conducted Emissions: 150 kHz – 30 MHz

15.247 Radiated Emissions: 30 MHz – 24.8 GHz

### FCC 15.203 Antenna Requirements

The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

### EUT Operating Frequency

The EUT was operating at 2.405 GHz – 2.4765 GHz.

## EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

## EQUIPMENT UNDER TEST

### **20dB INNCOM Zigbee Radio Module**

Manuf: INNCOM International, Inc.  
Model: 02-9894  
Serial: NA

## PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

### **Power Supply**

Manuf: NA  
Model: MW7EA08EL  
Serial: NA

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## MEASUREMENT UNCERTAINTIES

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ . Compliance is deemed to occur provided measurements are below the specified limits.

## REPORT OF EMISSIONS MEASUREMENTS

### TESTING PARAMETERS

#### TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within  $+15^{\circ}\text{C}$  and  $+35^{\circ}\text{C}$ .  
 The relative humidity was between 20% and 75%.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

### CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in  $\text{dB}\mu\text{V}/\text{m}$ , the spectrum analyzer reading in  $\text{dB}\mu\text{V}$  was corrected by using the following formula. This reading was then compared to the applicable specification limit.

<b>SAMPLE CALCULATIONS</b>	
Meter reading	(dB $\mu$ V)
+	Antenna Factor (dB)
+	Cable Loss (dB)
-	Distance Correction (dB)
-	Preamplifier Gain (dB)
=	Corrected Reading (dB $\mu$ V/m)

## TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. When conducted emissions testing was performed, a 10 dB external attenuator was used with internal offset correction in the analyzer.

## SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

### Peak

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

### Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

### Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.

## FCC 15.31(e) – VOLTAGE VARIATIONS

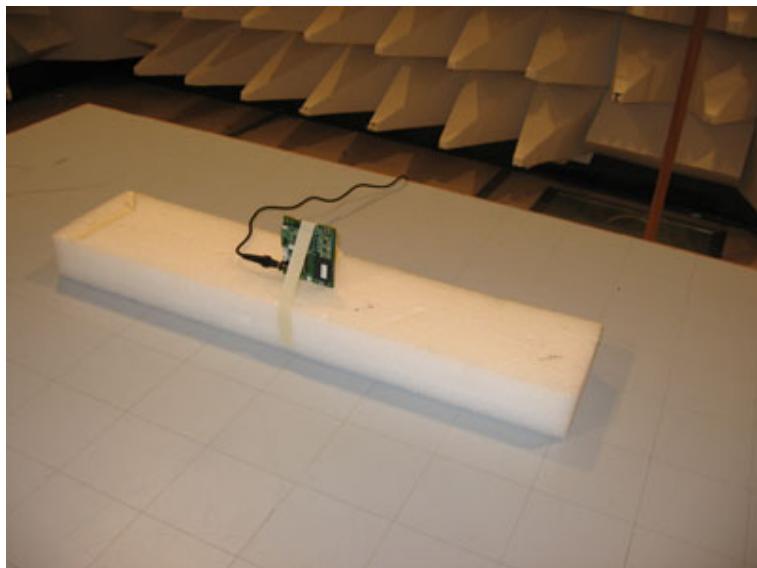
### Test Equipment

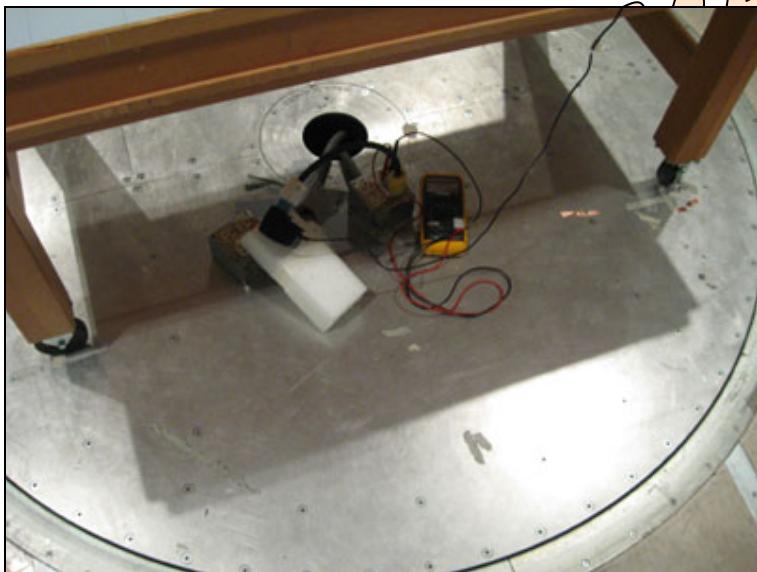
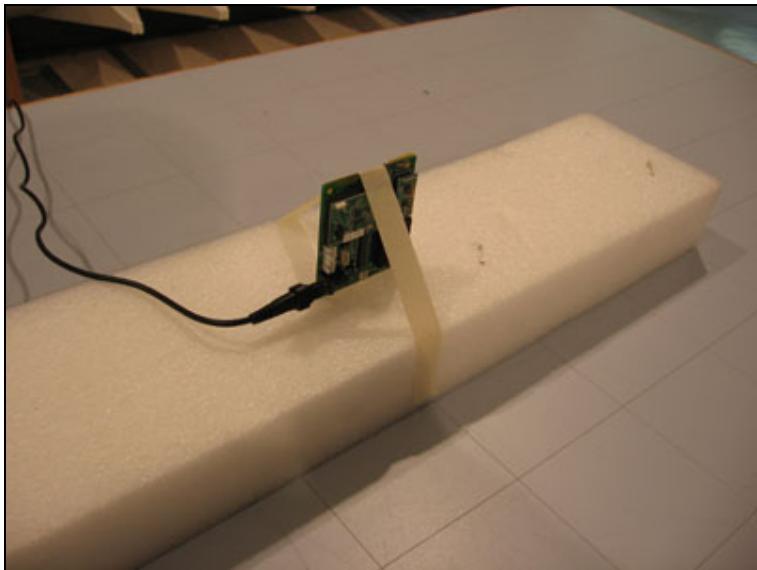
Asset #	Name	Manufacturer	Model	Serial	Cal Date	Cal Due
01314	AC Power Source	PPS	345AMXT-UPC3	9999-0190	6/4/2008	6/4/2010
3121	Cable	Astrolab	32026-2-29080-84		4/28/2009	4/28/2011
1412	Antenna, Horn	EMCO	3115	9606-4854	11/12/2007	11/12/2009
P05542	Cable, 23' blue	Andrews	Heliax		4/21/2009	4/21/2011
1271	Preamp	HP	83017A	3123A00464	9/17/2009	9/17/2011
2871	Spectrum Analyzer	Agilent	E4440A	MY46186333	4/29/2009	4/29/2011

### Test Conditions

The EUT is transmitting. Due to the lack of antenna connectors the test will be done through radiated measurements. EUT is located in the back edge of the test table over 10cm of Styrofoam. The Fundamental's emission will be maximized per ANSI C63.4 procedures. The input voltage to the EUT will be varied from 100% of the nominal voltage to 85% and 115% to analyze any change in the power output of the transmitter due to the voltage variations. EMI test will be used with the sole purpose of accurate Field Strength data gathering. Same calculation from the RF power output test will be done in order to convert the field strength to power.

### Test Setup Photos






**Test Data**

	Vertical	Horizontal	
	<b>85%</b>	<b>85%</b>	
<b>LOW</b>	12.54dBm	15.45dBm	30dBm
<b>MID</b>	11.50dBm	12.64dBm	30dBm
<b>HIGH</b>	6.37dBm	10.47dBm	30dBm
	<b>100%</b>	<b>100%</b>	
<b>LOW</b>	12.77dBm	16.07dBm	30dBm
<b>MID</b>	11.07dBm	12.40dBm	30dBm
<b>HIGH</b>	6.55dBm	10.42dBm	30dBm
	<b>115%</b>	<b>115%</b>	
<b>LOW</b>	13.06dBm	14.99dBm	30dBm
<b>MID</b>	11.30dBm	12.68dBm	30dBm
<b>HIGH</b>	6.60dBm	10.15dBm	30dBm

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**FCC 15.207 – CONDUCTED EMISSIONS**

**Test Equipment**

See data sheets for test equipment used.

**Test Setup Photos**



## Test Data Sheets

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **89056** Date: **10/5/2009**  
 Test Type: **Conducted Emissions** Time: **16:56:54**  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: **3**  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894 120V 60Hz  
 S/N:

### Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
Attenuator	9912	03/21/2008	03/21/2010	ANP05503
Filter	G7752	07/21/2008	07/21/2010	AN02611
EMCO LISN	9606-1049	06/02/2009	06/02/2011	AN01492

### Equipment Under Test (\* = EUT):

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

### Support Devices:

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

### Test Conditions / Notes:

Temperature 23°C  
 Relative Humidity 33%  
 Pressure 102.6kPa

Testing Conducted Emissions per FCC 15.207

The unit is a 20dB Zigbee Radio Module.  
 The Transmitter is located 10cm over the wooden table on styrofoam.  
 The transmitter will be transmitting in the LOW, MID and HIGH channels.  
 Vertical Ground plane is located 40cm from the back of the table.

### Transducer Legend:

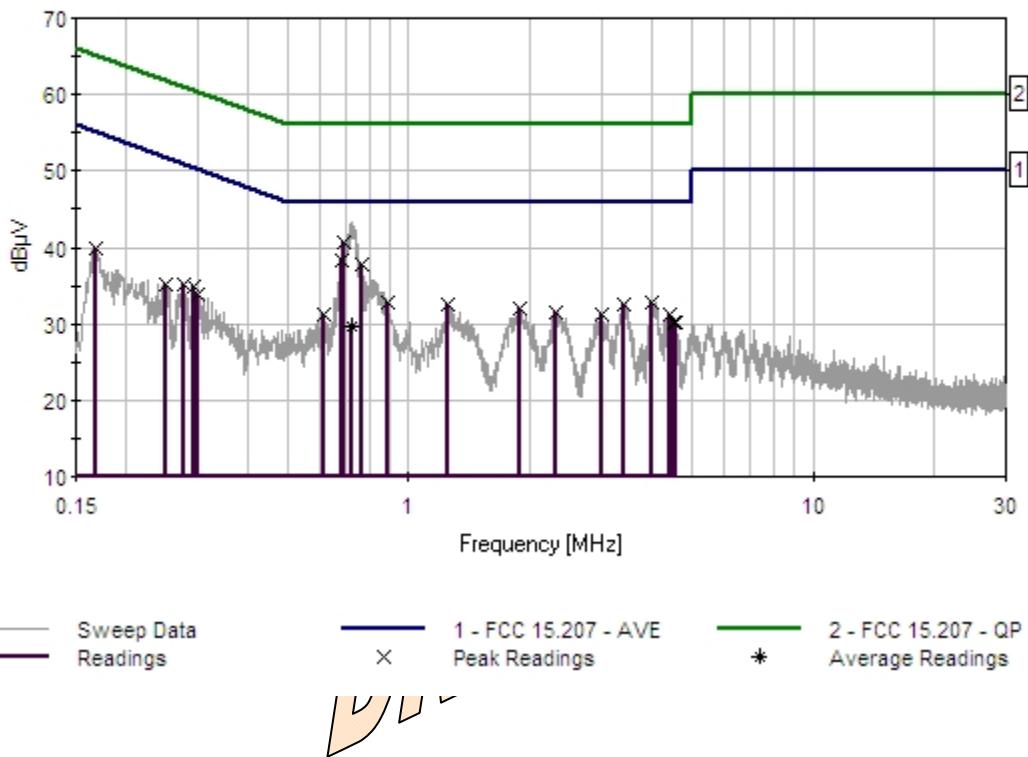
T1=CAB-ANP03121-042809	T2=CAB-ANP05360
T3=FIL-AN02611-072108	T4=ATT-ANP5503-032108
T5=CAB-ANP05542-042109	T6=CDN-AN01492-060209 - Line

### Measurement Data:

#	Freq	Reading listed by margin.					Test Lead: Line				
		Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
		MHz	dB $\mu$ V	dB	dB	dB	Table	dB $\mu$ V	dB $\mu$ V	dB	Ant
1	690.314k	30.0	+0.1	+0.1	+0.2	+10.1	+0.0	40.7	46.0	-5.3	Line
			+0.1	+0.1							

2	680.860k	27.5	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	38.2	46.0	-7.8	Line
3	760.853k	27.2	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	37.9	46.0	-8.1	Line
4	889.963k	22.2	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	32.9	46.0	-13.1	Line
5	3.986M	22.0	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	32.9	46.0	-13.1	Line
6	1.243M	21.9	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	32.6	46.0	-13.4	Line
7	3.386M	21.7	+0.1 +0.2	+0.1 +0.2	+0.2	+10.1	+0.0	32.6	46.0	-13.4	Line
8	1.889M	21.2	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	31.9	46.0	-14.1	Line
9	2.323M	20.8	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	31.5	46.0	-14.5	Line
10	2.995M	20.5	+0.1 +0.2	+0.1 +0.2	+0.1	+10.1	+0.0	31.3	46.0	-14.7	Line
11	618.321k	20.5	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	31.2	46.0	-14.8	Line
12	4.420M	20.3	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	31.2	46.0	-14.8	Line
13	168.907k	29.0	+0.1 +0.1	+0.0 +0.1	+0.4	+10.1	+0.0	39.8	55.0	-15.2	Line
14	294.714k	24.3	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.1	34.8	50.4	-15.6	Line
15	278.716k	24.7	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.0	35.2	50.9	-15.7	Line
16	4.530M	19.3	+0.1 +0.2	+0.2 +0.3	+0.1	+10.1	+0.0	30.3	46.0	-15.7	Line
17	4.560M	19.1	+0.1 +0.2	+0.2 +0.3	+0.1	+10.1	+0.0	30.1	46.0	-15.9	Line
18	723.038k Ave	18.9	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	29.6	46.0	-16.4	Line
^	723.038k	32.6	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	43.3	46.0	-2.7	Line
20	300.532k	23.3	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.0	33.8	50.2	-16.4	Line
21	251.082k	24.5	+0.1 +0.1	+0.0 +0.1	+0.2	+10.1	+0.0	35.1	51.7	-16.6	Line

CKC Laboratories Date: 10/5/2009 Time: [TESTTIME] INNCOM International WO#: 89056  
FCC 15.207 - AVE Test Lead: Line 120V 60Hz Sequence#: 3 Polarity: Line  
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **89056** Date: 10/5/2009  
 Test Type: **Conducted Emissions** Time: 16:59:57  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: 4  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894 120V 60Hz  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
Attenuator	9912	03/21/2008	03/21/2010	ANP05503
Filter	G7752	07/21/2008	07/21/2010	AN02611
EMCO LISN	9606-1049	06/02/2009	06/02/2011	AN01492

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

**Test Conditions / Notes:**

Temperature 23°C  
 Relative Humidity 33%  
 Pressure 102.6kPa

Testing Conducted Emissions per FCC 15.207

The unit is a 20dB Zigbee Radio Module.  
 The Transmitter is located 10cm over the wooden table on styrofoam.  
 The transmitter will be transmitting in the LOW, MID and HIGH channels.  
 Vertical Ground plane is located 40cm from the back of the table.

**Transducer Legend:**

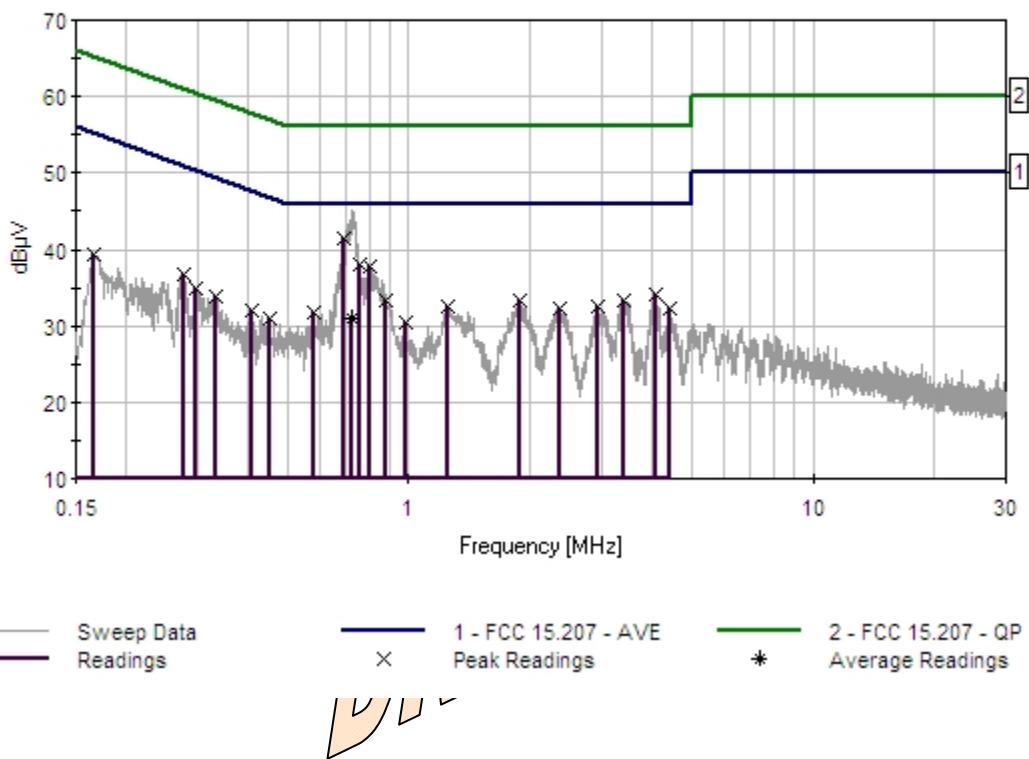
T1=CAB-ANP03121-042809	T2=CAB-ANP05360
T3=FIL-AN02611-072108	T4=ATT-ANP5503-032108
T5=CAB-ANP05542-042109	T6=CDN-AN01492-060209 - Neutral

**Measurement Data:**

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.			Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
			T1 dB	T2 dB	T3 dB					
1	693.223k	30.8	+0.1	+0.1	+0.2	+10.1	+0.0	41.4	46.0	-4.6
			+0.1	+0.0						Neutr
2	753.581k	27.5	+0.1	+0.1	+0.2	+10.1	+0.0	38.1	46.0	-7.9
			+0.1	+0.0						Neutr

3	796.486k	27.2	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	37.8	46.0	-8.2	Neutr
4	4.092M	23.4	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	34.2	46.0	-11.8	Neutr
5	3.391M	22.6	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	33.4	46.0	-12.6	Neutr
6	1.877M	22.6	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	33.3	46.0	-12.7	Neutr
7	877.205k	22.6	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	33.2	46.0	-12.8	Neutr
8	1.256M	22.0	+0.1 +0.1	+0.1 +0.0	+0.1	+10.1	+0.0	32.5	46.0	-13.5	Neutr
9	2.936M	21.8	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.5	46.0	-13.5	Neutr
10	2.366M	21.6	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.3	46.0	-13.7	Neutr
11	4.403M	21.5	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	32.3	46.0	-13.7	Neutr
12	278.716k	26.3	+0.1 +0.1	+0.0 +0.0	+0.1	+10.1	+0.0	36.7	50.9	-14.2	Neutr
13	580.506k	21.2	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	31.8	46.0	-14.2	Neutr
14	720.857k	20.3	+0.1 Ave	+0.1 +0.1	+0.2 +0.0	+10.1	+0.0	30.9	46.0	-15.1	Neutr
^	720.857k	34.4	+0.1 +0.1	+0.1 +0.0	+0.1	+10.1	+0.0	45.0	46.0	-1.0	Neutr
16	296.896k	24.4	+0.1 +0.1	+0.0 +0.0	+0.0	+10.1	+0.0	34.8	50.3	-15.5	Neutr
17	333.256k	23.4	+0.1 +0.1	+0.1 +0.0	+0.1	+10.1	+0.0	33.9	49.4	-15.5	Neutr
18	979.270k	19.8	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	30.4	46.0	-15.6	Neutr
19	411.067k	21.4	+0.1 +0.1	+0.1 +0.0	+0.1	+10.1	+0.0	31.9	47.6	-15.7	Neutr
20	165.271k	28.5	+0.1 +0.1	+0.0 +0.1	+0.5	+10.1	+0.0	39.4	55.2	-15.8	Neutr
21	452.518k	20.3	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	30.9	46.8	-15.9	Neutr

CKC Laboratories Date: 10/5/2009 Time: [TESTTIME] INNCOM International WO#: 89056  
FCC 15.207 - AVE Test Lead: Neutral 120V 60Hz Sequence#: 4 Polarity: Neutral  
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**

Specification: **FCC 15.207 - AVE**

Work Order #: **89056**

Date: 10/5/2009

Test Type: **Conducted Emissions**

Time: 16:53:44

Equipment: **20dB INNCOM Zigbee Radio Module**

Sequence#: 2

Manufacturer: INNCOM International, Inc.

Tested By: Armando Del Angel

Model: 02-9894

120V 60Hz

S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
Attenuator	9912	03/21/2008	03/21/2010	ANP05503
Filter	G7752	07/21/2008	07/21/2010	AN02611
EMCO LISN	9606-1049	06/02/2009	06/02/2011	AN01492

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

**Test Conditions / Notes:**

Temperature 23°C

Relative Humidity 33%

Pressure 102.6kPa

Testing Conducted Emissions per FCC 15.207

The unit is a 20dB Zigbee Radio Module.

The Transmitter is located 10cm over the wooden table on styrofoam.

The transmitter will be transmitting in the LOW, MID and HIGH channels.

Vertical Ground plane is located 40cm from the back of the table.

**Transducer Legend:**

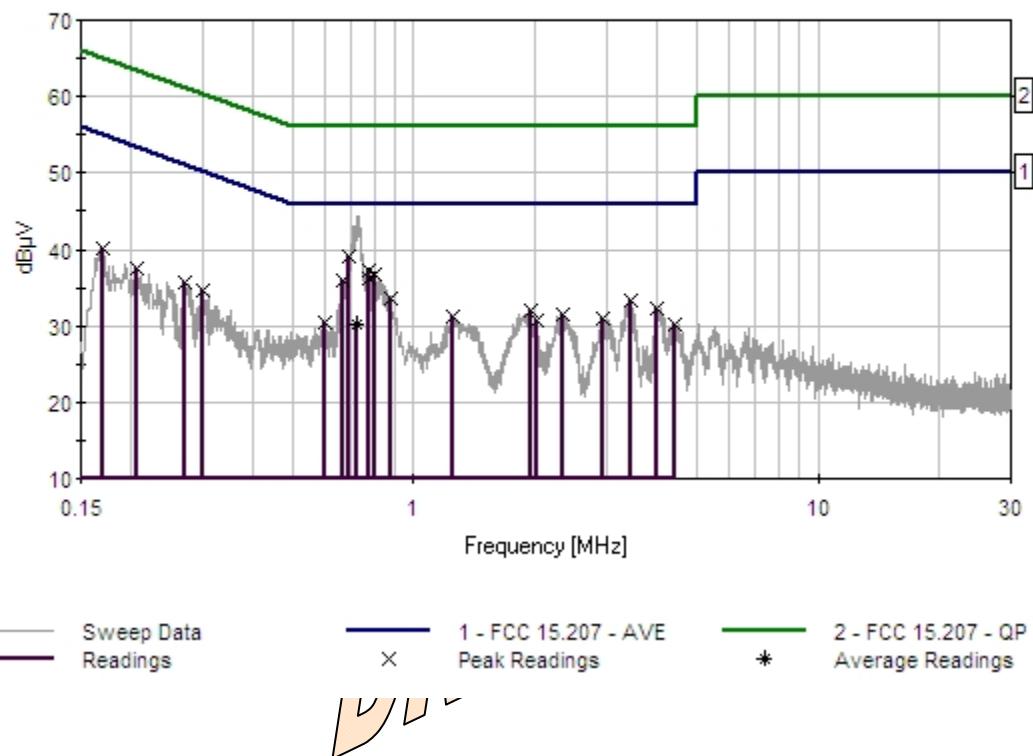
T1=CAB-ANP03121-042809	T2=CAB-ANP05360
T3=FIL-AN02611-072108	T4=ATT-ANP5503-032108
T5=CAB-ANP05542-042109	T6=CDN-AN01492-060209 - Line

**Measurement Data:** Reading listed by margin.

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V	dB $\mu$ V	dB	Ant
1	686.678k	28.3	+0.1	+0.1	+0.2	+10.1	+0.0	39.0	46.0	-7.0	Line
			+0.1	+0.1							
2	771.034k	26.6	+0.1	+0.1	+0.2	+10.1	+0.0	37.3	46.0	-8.7	Line
			+0.1	+0.1							

3	802.304k	26.1	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	36.8	46.0	-9.2	Line
4	775.397k	25.6	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	36.3	46.0	-9.7	Line
5	667.044k	25.2	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	35.9	46.0	-10.1	Line
6	877.205k	22.9	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	33.6	46.0	-12.4	Line
7	3.433M	22.3	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	33.2	46.0	-12.8	Line
8	3.999M	21.5	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	32.4	46.0	-13.6	Line
9	1.940M	21.2	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	31.9	46.0	-14.1	Line
10	2.349M	20.7	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	31.4	46.0	-14.6	Line
11	169.635k	29.4	+0.1 +0.1	+0.0 +0.1	+0.4	+10.1	+0.0	40.2	55.0	-14.8	Line
12	1.251M	20.5	+0.1 +0.1	+0.1 +0.1	+0.1	+10.1	+0.0	31.1	46.0	-14.9	Line
13	2.944M	20.1	+0.1 +0.2	+0.1 +0.2	+0.1	+10.1	+0.0	30.9	46.0	-15.1	Line
14	2.004M	20.0	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	30.7	46.0	-15.3	Line
15	270.716k	25.1	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.1	35.6	51.1	-15.5	Line
16	300.532k	24.1	+0.1 +0.1	+0.0 +0.1	+0.0	+10.1	+0.0	34.6	50.2	-15.6	Line
17	600.141k	19.7	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	30.4	46.0	-15.6	Line
18	4.437M	19.4	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	30.3	46.0	-15.7	Line
19	207.449k	26.9	+0.1 +0.1	+0.0 +0.1	+0.2	+10.1	+0.0	37.5	53.3	-15.8	Line
20	726.674k	19.4	+0.1 Ave	+0.1 +0.1	+0.2	+10.1	+0.0	30.1	46.0	-15.9	Line
^	726.674k	33.5	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	44.2	46.0	-1.8	Line

CKC Laboratories Date: 10/5/2009 Time: [TESTTIME] INNCOM International WO#: 89056  
FCC 15.207 - AVE Test Lead: Line 120V 60Hz Sequence#: 2 Polarity: Line  
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**

Specification: **FCC 15.207 - AVE**

Work Order #: **89056**

Date: 10/5/2009

Test Type: **Conducted Emissions**

Time: 17:02:30

Equipment: **20dB INNCOM Zigbee Radio Module**

Sequence#: 5

Manufacturer: INNCOM International, Inc.

Tested By: Armando Del Angel

Model: 02-9894

120V 60Hz

S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
Attenuator	9912	03/21/2008	03/21/2010	ANP05503
Filter	G7752	07/21/2008	07/21/2010	AN02611
EMCO LISN	9606-1049	06/02/2009	06/02/2011	AN01492

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

**Test Conditions / Notes:**

Temperature 23°C

Relative Humidity 33%

Pressure 102.6kPa

Testing Conducted Emissions per FCC 15.207

The unit is a 20dB Zigbee Radio Module.

The Transmitter is located 10cm over the wooden table on styrofoam.

The transmitter will be transmitting in the LOW, MID and HIGH channels.

Vertical Ground plane is located 40cm from the back of the table.

**Transducer Legend:**

T1=CAB-ANP03121-042809	T2=CAB-ANP05360
T3=FIL-AN02611-072108	T4=ATT-ANP5503-032108
T5=CAB-ANP05542-042109	T6=CDN-AN01492-060209 - Neutral

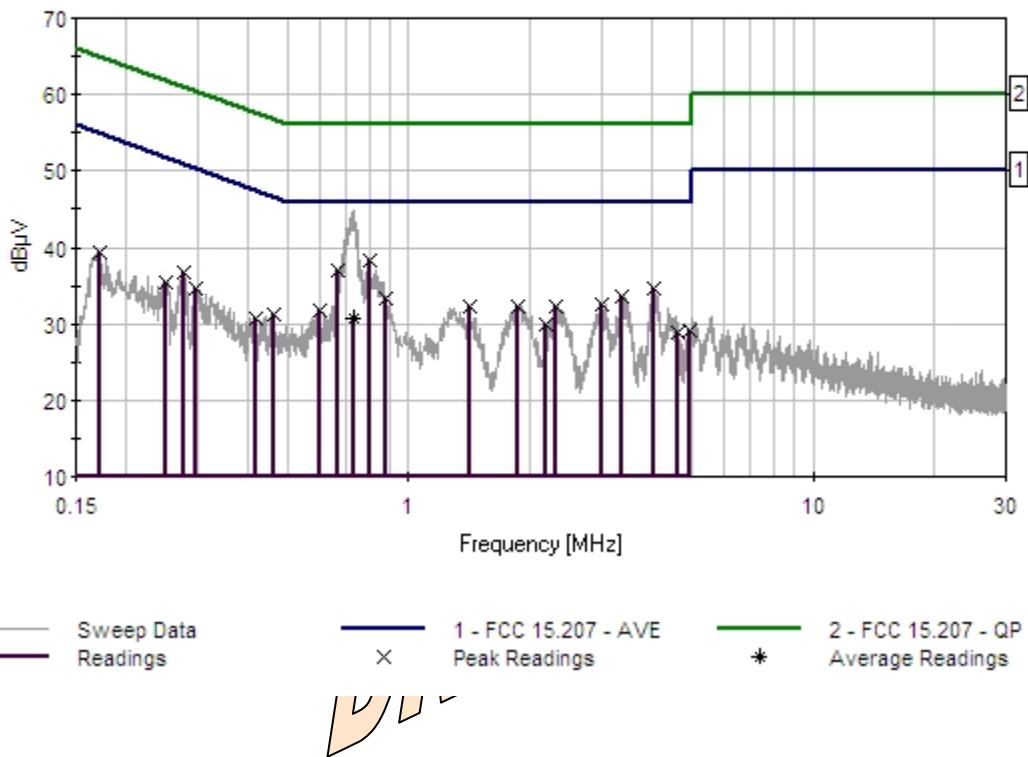
**Measurement Data:** Reading listed by margin.

Test Lead: Neutral

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6			Table				
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V	dB $\mu$ V	dB	Ant
1	803.757k	27.8	+0.1	+0.1	+0.2	+10.1	+0.0	38.4	46.0	-7.6	Neutr
			+0.1	+0.0							
2	668.497k	26.5	+0.1	+0.1	+0.2	+10.1	+0.0	37.1	46.0	-8.9	Neutr
			+0.1	+0.0							

3	4.033M	23.7	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	34.5	46.0	-11.5	Neutr
4	3.374M	22.8	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	33.6	46.0	-12.4	Neutr
5	877.205k	22.6	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	33.2	46.0	-12.8	Neutr
6	2.999M	21.8	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.5	46.0	-13.5	Neutr
7	1.864M	21.7	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.4	46.0	-13.6	Neutr
8	2.323M	21.7	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.4	46.0	-13.6	Neutr
9	1.413M	21.6	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	32.2	46.0	-13.8	Neutr
10	278.714k	26.2	+0.1 +0.1	+0.0 +0.0	+0.1	+10.1	+0.0	36.6	50.9	-14.3	Neutr
11	599.412k	21.1	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	31.7	46.0	-14.3	Neutr
12	733.945k Ave	20.1	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	30.7	46.0	-15.3	Neutr
^	733.945k	34.3	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	44.9	46.0	-1.1	Neutr
14	171.088k	28.5	+0.1 +0.1	+0.0 +0.1	+0.4	+10.1	+0.0	39.3	54.9	-15.6	Neutr
15	298.349k	24.3	+0.1 +0.1	+0.0 +0.0	+0.1	+10.1	+0.1	34.7	50.3	-15.6	Neutr
16	461.243k	20.5	+0.1 +0.1	+0.1 +0.0	+0.1	+10.1	+0.0	31.1	46.7	-15.6	Neutr
17	2.191M	19.1	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	29.8	46.0	-16.2	Neutr
18	251.081k	24.9	+0.1 +0.1	+0.0 +0.0	+0.2	+10.1	+0.0	35.4	51.7	-16.3	Neutr
19	418.338k	20.3	+0.1 +0.1	+0.1 +0.0	+0.1	+10.1	+0.0	30.8	47.5	-16.7	Neutr
20	4.981M	18.2	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	29.0	46.0	-17.0	Neutr
21	4.628M	18.1	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	28.9	46.0	-17.1	Neutr

CKC Laboratories Date: 10/5/2009 Time: [TESTTIME] INNCOM International WO#: 89056  
FCC 15.207 - AVE Test Lead: Neutral 120V 60Hz Sequence#: 5 Polarity: Neutral  
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **89056** Date: 10/5/2009  
 Test Type: **Conducted Emissions** Time: 16:49:21  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: 1  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894 120V 60Hz  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
Attenuator	9912	03/21/2008	03/21/2010	ANP05503
Filter	G7752	07/21/2008	07/21/2010	AN02611
EMCO LISN	9606-1049	06/02/2009	06/02/2011	AN01492

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

**Test Conditions / Notes:**

Temperature 23°C  
 Relative Humidity 33%  
 Pressure 102.6kPa

Testing Conducted Emissions per FCC 15.207

The unit is a 20dB Zigbee Radio Module.  
 The Transmitter is located 10cm over the wooden table on styrofoam.  
 The transmitter will be transmitting in the LOW, MID and HIGH channels.  
 Vertical Ground plane is located 40cm from the back of the table.

**Transducer Legend:**

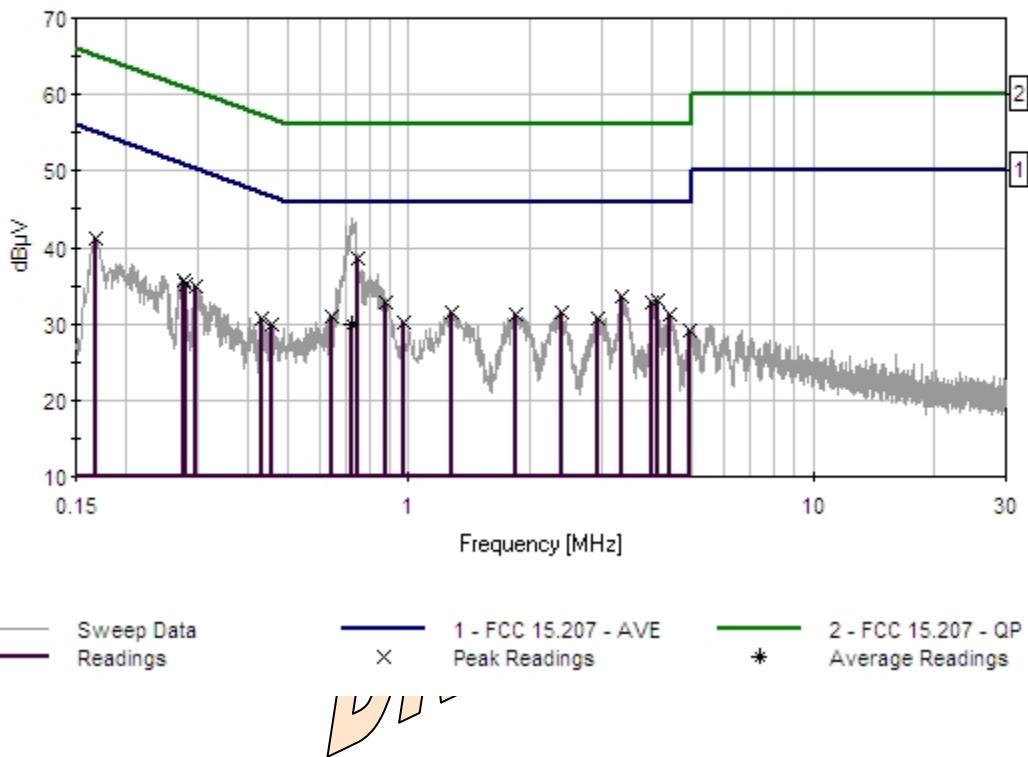
T1=CAB-ANP03121-042809	T2=CAB-ANP05360
T3=FIL-AN02611-072108	T4=ATT-ANP5503-032108
T5=CAB-ANP05542-042109	T6=CDN-AN01492-060209 - Line

**Measurement Data:** Reading listed by margin.

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6			Table				
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V	dB $\mu$ V	dB	Ant
1	749.218k	27.8	+0.1	+0.1	+0.2	+10.1	+0.0	38.5	46.0	-7.5	Line
			+0.1	+0.1							
2	3.382M	22.7	+0.1	+0.2	+0.1	+10.1	+0.0	33.6	46.0	-12.4	Line
			+0.2	+0.2							

3	4.131M	22.1	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	33.0	46.0	-13.0	Line	
4	881.458k	22.1	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	32.8	46.0	-13.2	Line	
5	3.990M	21.9	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	32.8	46.0	-13.2	Line	
6	168.180k	30.5	+0.1 +0.1	+0.0 +0.1	+0.4	+10.1	+0.0	41.3	55.0	-13.7	Line	
7	1.273M	21.0	+0.1 +0.1	+0.1 +0.1	+0.1	+10.1	+0.0	31.6	46.0	-14.4	Line	
8	2.383M	20.9	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	31.6	46.0	-14.4	Line	
9	1.843M	20.6	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	31.3	46.0	-14.7	Line	
10	4.432M	20.4	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	31.3	46.0	-14.7	Line	
11	646.682k	20.2	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	30.9	46.0	-15.1	Line	
12	277.261k	25.2	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.0	35.7	50.9	-15.2	Line	
13	2.936M	19.8	+0.1 +0.2	+0.1 +0.2	+0.1	+10.1	+0.0	30.6	46.0	-15.4	Line	
14	298.350k	24.3	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.1	34.8	50.3	-15.5	Line	
15	280.897k	24.6	+0.1 +0.1	+0.0 +0.1	+0.1	+10.1	+0.1	35.1	50.8	-15.7	Line	
16	966.512k	19.6	+0.1 +0.1	+0.1 +0.1	+0.1	+10.1	+0.0	30.3	46.0	-15.7	Line	
17	723.766k	19.1	+0.1 Ave	+0.1 +0.1	+0.1	+0.2	+10.1	+0.0	29.8	46.0	-16.2	Line
^	723.766k	33.0	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	43.7	46.0	-2.3	Line	
19	435.065k	20.0	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	30.7	47.2	-16.5	Line	
20	456.154k	19.3	+0.1 +0.1	+0.1 +0.1	+0.2	+10.1	+0.0	30.0	46.8	-16.8	Line	
21	4.960M	18.2	+0.1 +0.2	+0.2 +0.2	+0.1	+10.1	+0.0	29.2	46.0	-16.8	Line	

CKC Laboratories Date: 10/5/2009 Time: [TESTTIME] INNCOM International WO#: 89056  
FCC 15.207 - AVE Test Lead: Line 120V 60Hz Sequence#: 1 Polarity: Line  
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**

Specification: **FCC 15.207 - AVE**

Work Order #: **89056**

Date: 10/5/2009

Test Type: **Conducted Emissions**

Time: 17:05:05

Equipment: **20dB INNCOM Zigbee Radio Module**

Sequence#: 6

Manufacturer: INNCOM International, Inc.

Tested By: Armando Del Angel

Model: 02-9894

120V 60Hz

S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
Attenuator	9912	03/21/2008	03/21/2010	ANP05503
Filter	G7752	07/21/2008	07/21/2010	AN02611
EMCO LISN	9606-1049	06/02/2009	06/02/2011	AN01492

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

**Test Conditions / Notes:**

Temperature 23°C

Relative Humidity 33%

Pressure 102.6kPa

Testing Conducted Emissions per FCC 15.207

The unit is a 20dB Zigbee Radio Module.

The Transmitter is located 10cm over the wooden table on styrofoam.

The transmitter will be transmitting in the LOW, MID and HIGH channels.

Vertical Ground plane is located 40cm from the back of the table.

**Transducer Legend:**

T1=CAB-ANP03121-042809	T2=CAB-ANP05360
T3=FIL-AN02611-072108	T4=ATT-ANP5503-032108
T5=CAB-ANP05542-042109	T6=CDN-AN01492-060209 - Neutral

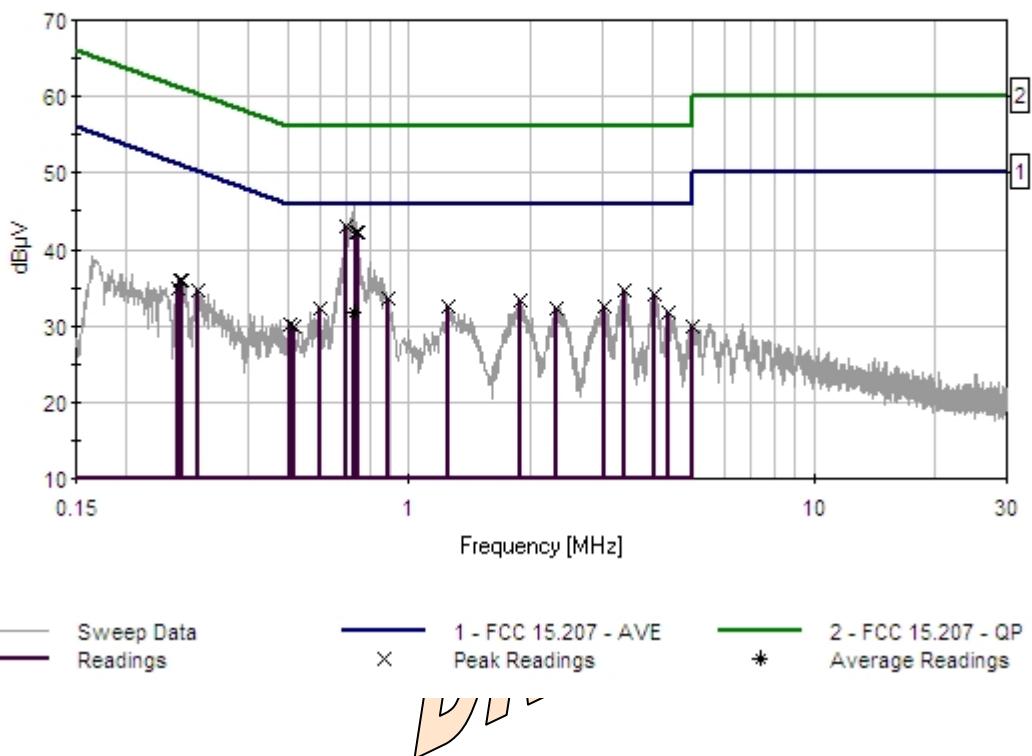
**Measurement Data:** Reading listed by margin.

Test Lead: Neutral

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6			Table				
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V	dB $\mu$ V	dB	Ant
1	695.404k	32.4	+0.1	+0.1	+0.2	+10.1	+0.0	43.0	46.0	-3.0	Neutr
			+0.1	+0.0							
2	741.218k	31.5	+0.1	+0.1	+0.2	+10.1	+0.0	42.1	46.0	-3.9	Neutr
			+0.1	+0.0							

3	745.581k	31.5	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	42.1	46.0	-3.9	Neutr
4	3.399M	23.8	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	34.6	46.0	-11.4	Neutr
5	4.045M	23.3	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	34.1	46.0	-11.9	Neutr
6	885.710k	23.0	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	33.6	46.0	-12.4	Neutr
7	1.889M	22.5	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	33.2	46.0	-12.8	Neutr
8	1.243M	21.9	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	32.5	46.0	-13.5	Neutr
9	3.038M	21.8	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.5	46.0	-13.5	Neutr
10	602.321k	21.8	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	32.4	46.0	-13.6	Neutr
11	2.319M	21.7	+0.1 +0.2	+0.1 +0.1	+0.1	+10.1	+0.0	32.4	46.0	-13.6	Neutr
12	728.855k Ave	21.2	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	31.8	46.0	-14.2	Neutr
^	728.855k	35.3	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	45.9	46.0	-0.1	Neutr
14	4.373M	21.0	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	31.8	46.0	-14.2	Neutr
15	275.806k	25.6	+0.1 +0.1	+0.0 +0.0	+0.1	+10.1	+0.1	36.0	50.9	-14.9	Neutr
16	270.715k	25.6	+0.1 +0.1	+0.0 +0.0	+0.1	+10.1	+0.0	36.0	51.1	-15.1	Neutr
17	301.258k	24.3	+0.1 +0.1	+0.0 +0.0	+0.1	+10.1	+0.0	34.7	50.2	-15.5	Neutr
18	505.603k	19.7	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	30.3	46.0	-15.7	Neutr
19	4.998M	19.2	+0.1 +0.2	+0.2 +0.1	+0.1	+10.1	+0.0	30.0	46.0	-16.0	Neutr
20	519.420k	19.3	+0.1 +0.1	+0.1 +0.0	+0.2	+10.1	+0.0	29.9	46.0	-16.1	Neutr
21	269.261k	24.4	+0.1 +0.1	+0.0 +0.0	+0.2	+10.1	+0.0	34.9	51.1	-16.2	Neutr

CKC Laboratories Date: 10/5/2009 Time: [TESTTIME] INNCOM International WO#: 89056  
FCC 15.207 - AVE Test Lead: Neutral 120V 60Hz Sequence#: 6 Polarity: Neutral  
Notes:



## FCC 15.247(a)(2) – 6dB BANDWIDTH

### Test Equipment

Asset #	Name	Manufacturer	Model	Serial	Cal date	Cal Due
3121	Cable	Astrolab	32026-2-29080-84		4/28/2009	4/28/2011
1412	Antenna, Horn	EMCO	3115	9606-4854	11/12/2007	11/12/2009
P05542	Cable, 23' blue	Andrews	Heliax		4/21/2009	4/21/2011
1271	Preamp	HP	83017A	3123A00464	9/17/2009	9/17/2011
2871	Spectrum Analyzer	Agilent	E4440A	MY46186333	4/29/2009	4/29/2011

### Test Conditions

EUT was transmitting. Due to the lack of antenna connectors the test was done through radiated measurements. EUT was located on the center of the test table over 10cm of Styrofoam. PSA was on max hold, marker-to-peak function is set on the peak of each channel, and then the marker was positioned 6dB below the peak on one side and then on the other side. The separation between those two points was the 6dB bandwidth. EUT was tested in the LOW (2.405GHz), MID (2.445GHz), and HIGH (2.475GHz). Test was done with a set of f new batteries.

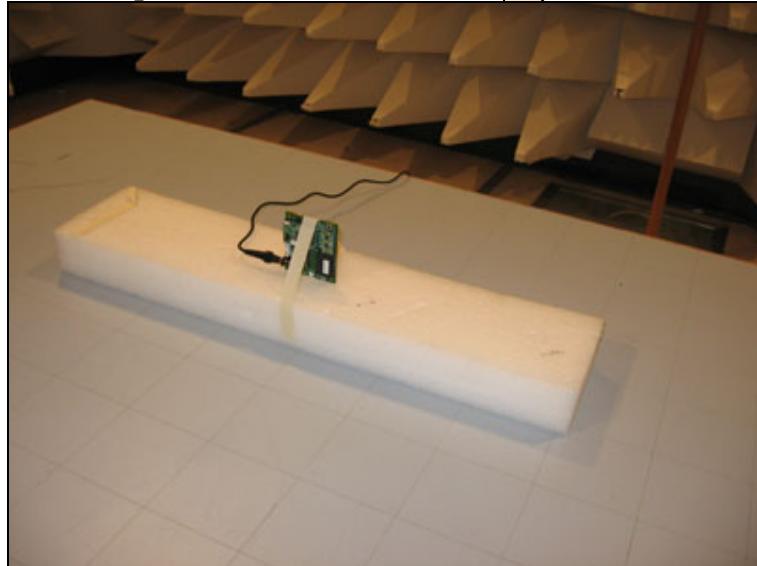
RBW = 100 kHz

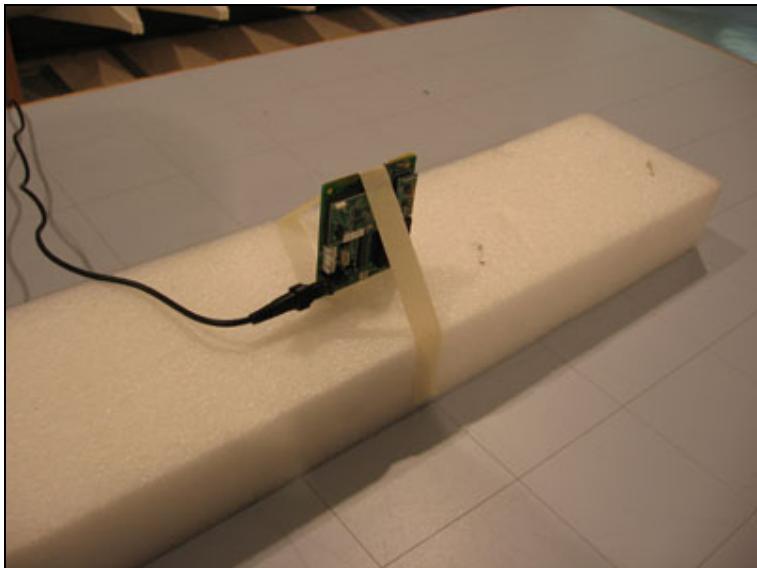
VBW = 1 MHz

Span = 10MHz

**DRAFT**

### Test Setup Photos





### Test Data

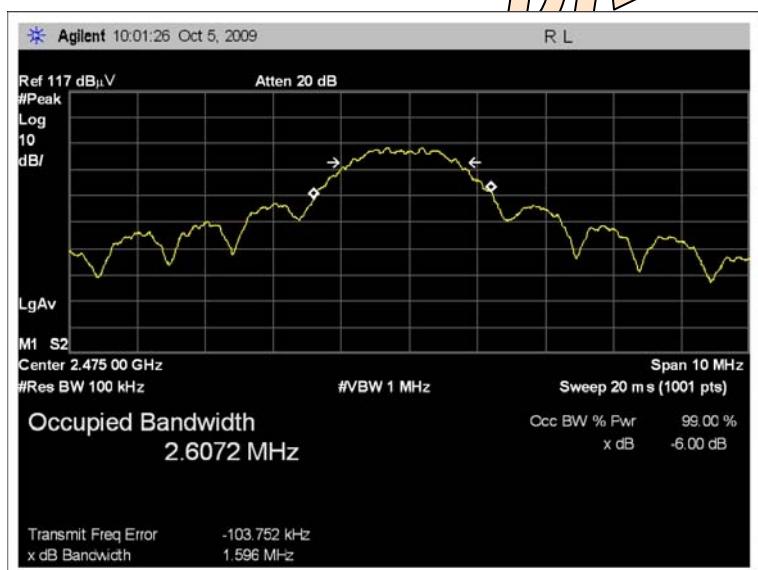
Channel	6dB Bandwidth	Limit
LOW	1.58MHz	500kHz
MID	1.58MHz	500kHz
HIGH	1.59MHz	500kHz

### FCC 15.247(a)(2) OCCUPIED BANDWIDTH



**FCC 15.247(a)(2) OCCUPIED BANDWIDTH**


DRAFT

**FCC 15.247(a)(2) OCCUPIED BANDWIDTH**


## FCC 15.247(b)(3) – RF POWER OUTPUT

### Test Equipment

Asset #	Name	Manufacturer	Model	Serial	Cal date	Cal Due
3121	Cable	Astrolab	32026-2-29080-84		4/28/2009	4/28/2011
1412	Antenna, Horn	EMCO	3115	9606-4854	11/12/2007	11/12/2009
P05542	Cable, 23' blue	Andrews	Heliax		4/21/2009	4/21/2011
1271	Preamp	HP	83017A	3123A00464	9/17/2009	9/17/2011
2871	Spectrum Analyzer	Agilent	E4440A	MY46186333	4/29/2009	4/29/2011

### Test Conditions

EUT was transmitting. Due to the lack of antenna connectors the test was done through radiated measurements. EUT was located on the center of the test table over 10cm of Styrofoam. The Fundamental's emission was maximized per ANSI C63.4 procedures. EMI test was used with the sole purpose of accurate Field Strength data gathering. EUT was tested in the LOW (2.405GHz), MID (2.445GHz), and HIGH (2.475GHz). The gain (G) of the EUT's antenna was 1dBi.

The following calculation was used per FCC procedures in order to obtain the transmitter peak power:

$$P = (E \cdot d)^2 / (30 \cdot G)$$

E: Is the field strength in V/m

G: Is the numeric gain of the transmitting antenna over an isotropic radiator.

d: Is the distance at which the measurement is being executed.

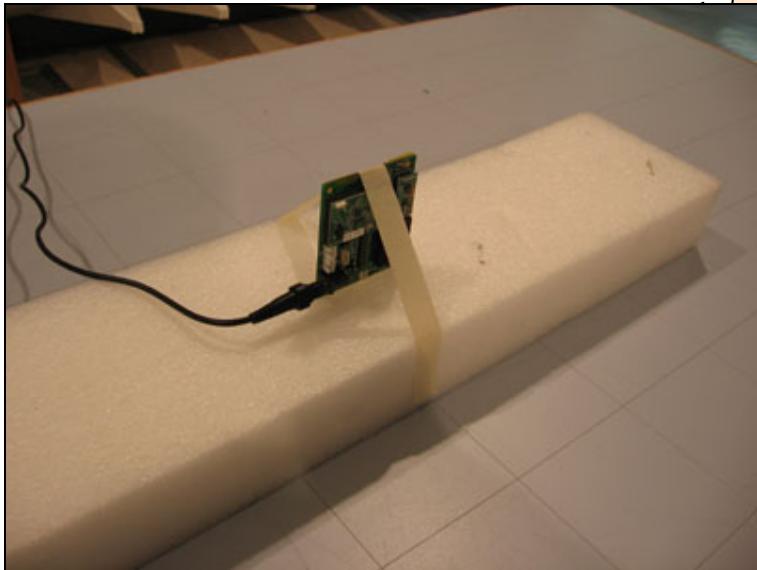
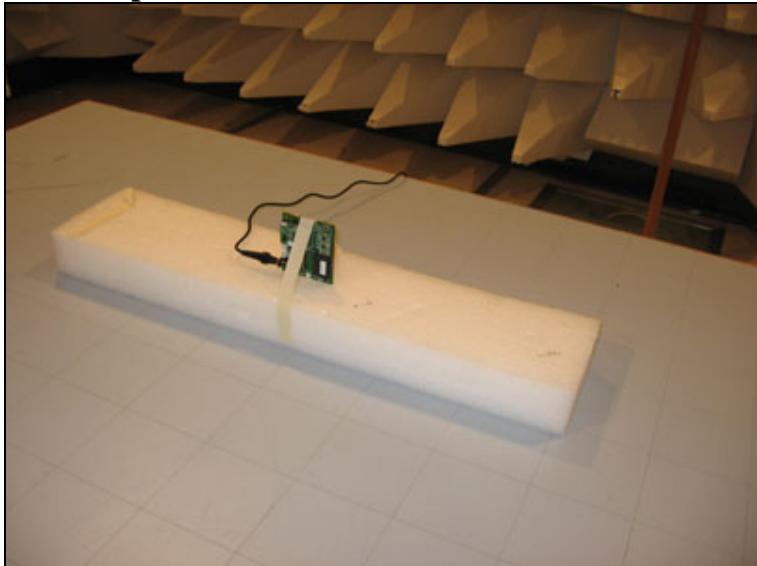
Since the measurements were taken with a RBW of 1MHz, and the 20dB BW of the signal is 2.5MHz; a correction factor of 3.97dB (10 log (2.5/1)) was added to the measurements taken.

RBW = 1 MHz

VBW = 1 MHz

Span = 5MHz

### Test Setup Photos



### Test Data

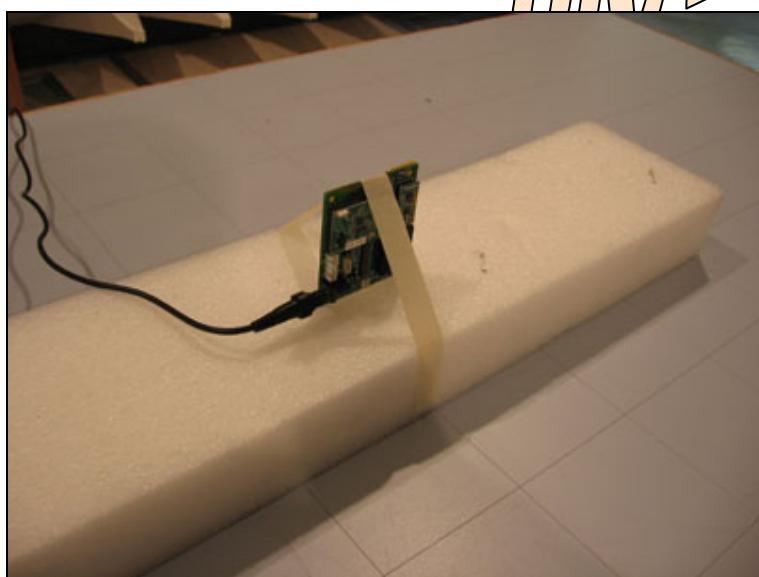
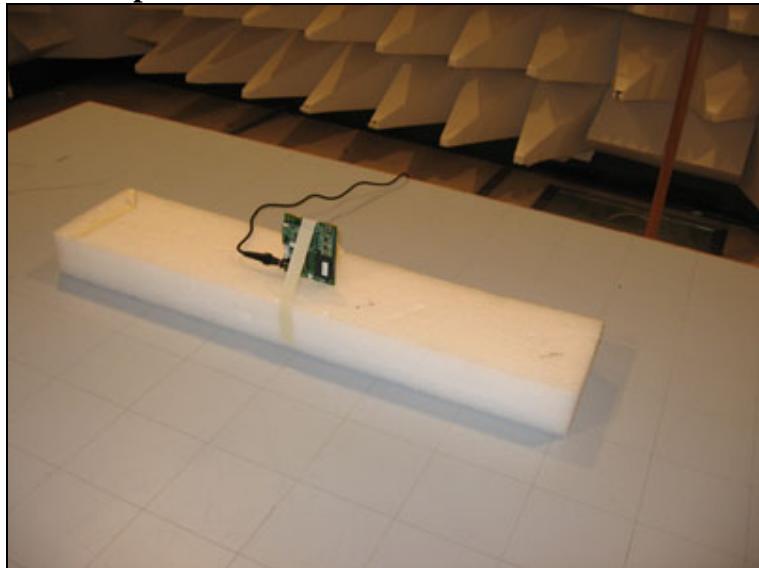
	<b>Power</b>	<b>LIMIIT</b>
<b>LOW</b>	17.068dBm	30dBm
<b>MID</b>	12.398dBm	30dBm
<b>HIGH</b>	10.738dBm	30dBm

**FCC 15.247(d) – OATS RADIATED SPURIOUS EMISSIONS**

**Test Equipment**

See the data sheets for test equipment used.

**Test Setup Photos**



## Test Data Sheets

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Fluke Corporation**  
 Specification: **FCC 15.247/15.209**  
 Work Order #: **89608** Date: 10/5/2009  
 Test Type: **Radiated Scan** Time: 15:57:13  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: 1  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894  
 S/N:

### Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8447D Preamp	2944A08601	07/08/2008	07/08/2010	AN01517
Agilent E4440A	MY46186330	01/31/2008	01/31/2010	AN02872
Cable 6'	51	12/30/2008	12/30/2010	ANP05361
Antenna	2453	12/22/2008	12/22/2010	AN01994
Cable 20'	16	11/10/2008	11/10/2010	ANP05360
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
EMCO 3115 Horn	9606-4854	11/12/2007	11/12/2009	AN01412
"Horn Antenna, Active 18-26GHz"	1114018	11/12/2008	11/12/2010	2742
Preamp	3123A00464	09/17/2009	09/17/2011	1271
Filter	311SH10- 3000/T10000-0/0	12/02/2008	12/02/2010	3116
cable		12/02/2008	12/02/2010	3123

### Equipment Under Test (\* = EUT):

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee	INNCOM International,	02-9894	
Radio Module*	Inc.		

### Support Devices:

Function	Manufacturer	Model #	S/N
power supply	?	MW7EA08EL	

### Test Conditions / Notes:

Temperature 24°C

Humidity: 38%

Pressure: 102.1kPa

Testing Radiated Spurious Emissions per FCC 15.247(d)

The EUT is 20dB Zigbee Radio Module

The EUT is located in the center of the test table raised 10cm with styrofoam.

The EUT will be transmitting in the LOW, MID, and HIGH channels.

Because of the lack of antenna connectors the test will have to be done through radiated scans.

30 - 1000MHz	RBW=100kHz	VBW=1MHz
1.0 - 24.8GHz	RBW=1MHz	VBW=3MHz

**Transducer Legend:**

T1=CAB-ANP03121-042809	T2=ANT-AN01412-111207
T3=CAB-ANP05542-042109	T4=AMP-AN01271-091709
T5=CAB-ANP03123-120208	T6=FIL-AN03116-120208
T7=ANT AN01994 25-1000MHz	T8=AMP-AN01517-070808
T9=CAB-ANP05360	T10=CAB-ANP05361

#	Freq	Rdng	Reading listed by margin.				Test Distance: 3 Meters			
			T1	T2	T3	T4	Dist	Corr	Spec	Margin
			T5	T6	T7	T8	Table	dB $\mu$ V/m	dB $\mu$ V/m	Polar
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	Ant
1	34.050M	44.9	+0.2	+0.0	+0.0	+0.0	+0.0	35.6	40.0	-4.4
	QP		+0.0	+0.0	+19.2	-29.1				Horiz
			+0.3	+0.1						175
^	34.050M	47.7	+0.2	+0.0	+0.0	+0.0	+0.0	38.4	40.0	-1.6
			+0.0	+0.0	+19.2	-29.1				Horiz
			+0.3	+0.1						175
3	12375.000M	33.8	+3.0	+38.9	+6.7	-35.0	+0.0	49.2	54.0	-4.8
			+1.6	+0.2	+0.0	+0.0				Horiz
			+0.0	+0.0			199			240
4	7426.250M	38.5	+2.1	+36.5	+5.2	-34.6	+0.0	49.1	54.0	-4.9
			+1.1	+0.3	+0.0	+0.0				Verti
			+0.0	+0.0				49.1		99
5	4810.871M	42.1	+1.9	+33.2	+4.2	-38.8	+0.0	49.1	54.0	-4.9
	Ave		+0.8	+0.7	+0.0	+0.0				Verti
			+0.0	+0.0				49.1		100
^	4810.871M	49.4	+1.9	+33.2	+4.2	-33.8	+0.0	56.4	54.0	+2.4
			+0.8	+0.7	+0.0	+0.0				Verti
			+0.0	+0.0				56.4		100
7	4890.780M	41.4	+1.9	+33.4	+4.2	-33.7	+0.0	48.6	54.0	-5.4
	Ave		+0.8	+0.6	+0.0	+0.0				Verti
			+0.0	+0.0				48.6		100
^	4890.780M	48.7	+1.9	+33.4	+4.2	-33.7	+0.0	55.9	54.0	+1.9
			+0.8	+0.6	+0.0	+0.0				Verti
			+0.0	+0.0				55.9		100
9	7336.305M	38.1	+2.1	+36.4	+5.2	-34.6	+0.0	48.6	54.0	-5.4
			+1.1	+0.3	+0.0	+0.0	360			Horiz
			+0.0	+0.0				48.6		179
10	9781.645M	33.3	+2.5	+38.6	+6.0	-33.9	+0.0	48.0	54.0	-6.0
			+1.2	+0.3	+0.0	+0.0	360			Horiz
			+0.0	+0.0				48.0		100
11	4950.915M	39.8	+2.0	+33.6	+4.2	-33.7	+0.0	47.4	54.0	-6.6
			+0.9	+0.6	+0.0	+0.0	360			Verti
			+0.0	+0.0				47.4		99
12	14850.050M	28.4	+3.0	+40.7	+7.2	-34.8	+0.0	46.2	54.0	-7.8
			+1.3	+0.4	+0.0	+0.0				Horiz
			+0.0	+0.0				46.2		148
13	14429.050M	26.3	+3.0	+41.3	+7.0	-34.8	+0.0	46.0	54.0	-8.0
			+1.4	+1.8	+0.0	+0.0				Verti
			+0.0	+0.0			360			99
14	45.120M	47.3	+0.2	+0.0	+0.0	+0.0	+0.0	30.9	40.0	-9.1
			+0.0	+0.0	+12.0	-29.1	360			Verti
			+0.4	+0.1				30.9		150

15	17116.420	25.4	+3.5	+40.6	+8.1	-34.8	+0.0	44.3	54.0	-9.7	Horiz
	M		+1.1	+0.4	+0.0	+0.0		360	Noise floor		100
			+0.0	+0.0							
16	50.520M	49.9	+0.2	+0.0	+0.0	+0.0	+0.0	30.3	40.0	-9.7	Verti
			+0.0	+0.0	+8.8	-29.1	360		HIGH channel		100
			+0.4	+0.1							
17	9619.181M	28.8	+2.5	+38.7	+5.9	-34.0	+0.0	43.8	54.0	-10.2	Verti
			+1.5	+0.4	+0.0	+0.0			Noise floor readings		99
			+0.0	+0.0							
18	12225.000	28.0	+3.0	+39.1	+6.5	-35.0	+0.0	43.5	54.0	-10.5	Verti
	M		+1.6	+0.3	+0.0	+0.0		360	MID Channel		100
			+0.0	+0.0							
19	44.310M	45.0	+0.2	+0.0	+0.0	+0.0	+0.0	29.1	40.0	-10.9	Horiz
			+0.0	+0.0	+12.5	-29.1	360		HIGH channel		175
			+0.4	+0.1							
20	4890.920M	35.4	+1.9	+33.4	+4.2	-33.7	+0.0	42.6	54.0	-11.4	Horiz
	Ave		+0.8	+0.6	+0.0	+0.0	11		MID Channel		99
			+0.0	+0.0							
^	4890.920M	44.0	+1.9	+33.4	+4.2	-33.7	+0.0	51.2	54.0	-2.8	Horiz
			+0.8	+0.6	+0.0	+0.0	11		MID Channel		99
			+0.0	+0.0							
22	4810.829M	35.3	+1.9	+33.2	+4.2	-33.8	+0.0	42.3	54.0	-11.7	Horiz
	Ave		+0.8	+0.7	+0.0	+0.0	30		LOW Channel		99
			+0.0	+0.0							
^	4810.829M	43.4	+1.9	+33.2	+4.2	-33.8	+0.0	50.4	54.0	-3.6	Horiz
			+0.8	+0.7	+0.0	+0.0	30		LOW Channel		99
			+0.0	+0.0							
24	69.420M	50.2	+0.3	+0.0	+0.0	+0.0	+0.0	28.2	40.0	-11.8	Verti
			+0.0	+0.0	+0.0	-29.2	360		HIGH channel		100
			+0.5	+0.1							
25	7216.236M	31.5	+2.2	+36.3	+5.1	-34.6	+0.0	42.0	54.0	-12.0	Horiz
	Ave		+1.1	+0.4	+0.0	+0.0	322		LOW Channel		123
			+0.0	+0.0							
^	7216.236M	40.9	+2.2	+36.3	+5.1	-34.6	+0.0	51.4	54.0	-2.6	Horiz
			+1.1	+0.4	+0.0	+0.0	322		LOW Channel		123
			+0.0	+0.0							
27	7216.179M	31.3	+2.2	+36.3	+5.1	-34.6	+0.0	41.8	54.0	-12.2	Verti
	Ave		+1.1	+0.4	+0.0	+0.0	329		LOW Channel		99
			+0.0	+0.0							
^	7216.179M	41.1	+2.2	+36.3	+5.1	-34.6	+0.0	51.6	54.0	-2.4	Verti
			+1.1	+0.4	+0.0	+0.0	329		LOW Channel		99
			+0.0	+0.0							
29	7336.360M	30.5	+2.1	+36.4	+5.2	-34.6	+0.0	41.0	54.0	-13.0	Verti
	Ave		+1.1	+0.3	+0.0	+0.0	360		MID Channel		100
			+0.0	+0.0							
^	7336.360M	39.8	+2.1	+36.4	+5.2	-34.6	+0.0	50.3	54.0	-3.7	Verti
			+1.1	+0.3	+0.0	+0.0	360		MID Channel		100
			+0.0	+0.0							
31	9897.788M	26.2	+2.4	+38.6	+6.0	-34.0	+0.0	40.5	54.0	-13.5	Horiz
	Ave		+1.1	+0.2	+0.0	+0.0	11		LOW Channel		100
			+0.0	+0.0							
^	9897.788M	38.6	+2.4	+38.6	+6.0	-34.0	+0.0	52.9	54.0	-1.1	Horiz
			+1.1	+0.2	+0.0	+0.0	11		LOW Channel		100
			+0.0	+0.0							

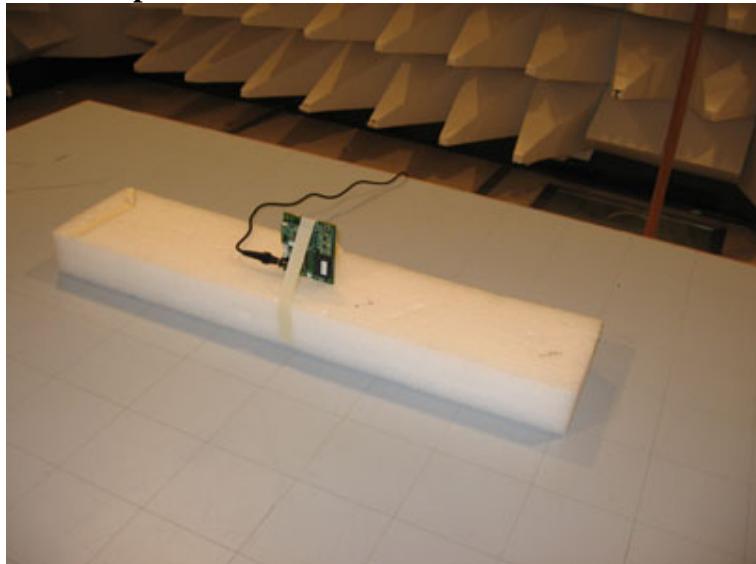
33	51.330M	46.3	+0.2	+0.0	+0.0	+0.0	+0.0	26.3	40.0	-13.7	Verti
			+0.0	+0.0	+8.4	-29.1	360		MID Channel		150
			+0.4	+0.1							
34	12022.290	23.7	+2.8	+39.4	+6.6	-35.0	+0.0	39.9	54.0	-14.1	Horiz
	M		+1.9	+0.5	+0.0	+0.0					
	Ave		+0.0	+0.0			336		LOW Channel		124
^	12022.290	34.8	+2.8	+39.4	+6.6	-35.0	+0.0	51.0	54.0	-3.0	Horiz
	M		+1.9	+0.5	+0.0	+0.0					
			+0.0	+0.0			336		LOW Channel		124
36	7426.201M	28.4	+2.1	+36.5	+5.2	-34.6	+0.0	39.0	54.0	-15.0	Horiz
	Ave		+1.1	+0.3	+0.0	+0.0	10		LOW Channel		100
			+0.0	+0.0							
^	7426.201M	39.8	+2.1	+36.5	+5.2	-34.6	+0.0	50.4	54.0	-3.6	Horiz
			+1.1	+0.3	+0.0	+0.0	10		LOW Channel		100
			+0.0	+0.0							
38	9621.729M	23.3	+2.5	+38.7	+5.9	-34.0	+0.0	38.3	54.0	-15.7	Horiz
	Ave		+1.5	+0.4	+0.0	+0.0			LOW Channel		152
			+0.0	+0.0							
^	9621.729M	33.9	+2.5	+38.7	+5.9	-34.0	+0.0	48.9	54.0	-5.1	Horiz
			+1.5	+0.4	+0.0	+0.0			LOW Channel		152
			+0.0	+0.0							
40	65.100M	44.2	+0.3	+0.0	+0.0	+0.0	+0.0	21.4	40.0	-18.6	Horiz
			+0.0	+0.0	+5.6	-29.2	360		HIGH channel		175
			+0.4	+0.1							
41	169.590M	42.0	+0.4	+0.0	+0.0	+0.0	+0.0	24.4	43.5	-19.1	Verti
			+0.0	+0.0	+9.8	-28.8	360		HIGH channel		100
			+0.8	+0.2							
42	80.490M	38.4	+0.3	+0.0	+0.0	+0.0	+0.0	17.8	40.0	-22.2	Verti
			+0.0	+0.0	+7.6	-29.1	360		MID Channel		150
			+0.5	+0.1							
43	375.600M	29.9	+0.6	+0.0	+0.0	+0.0	+0.0	18.8	46.0	-27.2	Verti
			+0.0	+0.0	+15.6	-28.8			HIGH channel		150
			+1.2	+0.3							

**FCC 15.247(d) - BAND EDGE**

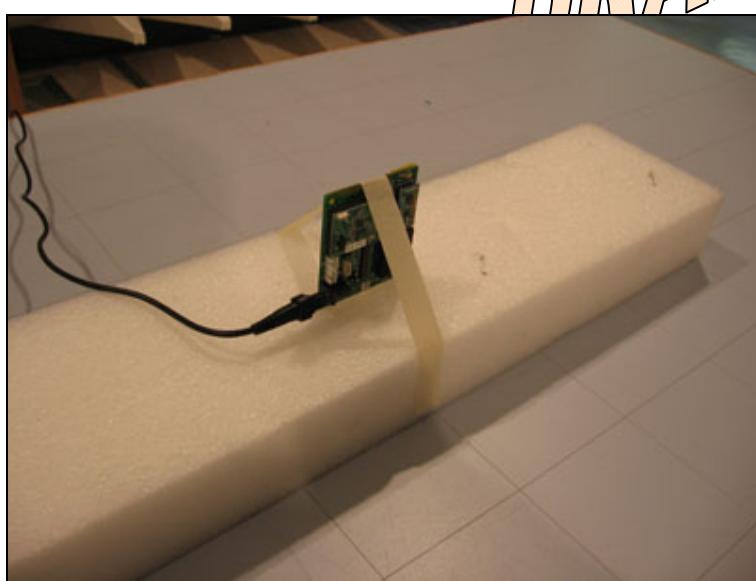
**Test Equipment**

See the data sheets for test equipment used.

**Test Setup Photos**



OKAII ET



## Test Plots

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.247(d) Bandedge Compliance**  
 Work Order #: **89056** Date: **10/5/2009**  
 Test Type: **Radiated Scan** Time: **12:32:36**  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: **3**  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894  
 S/N:

### *Test Equipment:*

Function	S/N	Calibration Date	Cal Due Date	Asset #
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
EMCO 3115 Horn	9606-4854	11/12/2007	11/12/2009	AN01412 EMCO 3115 Horn
HP 83017A	3123A00464	09/17/2009	09/17/2011	AN01271
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
High freq. Cable	N/A	12/02/2008	12/02/2010	AN03123

### *Equipment Under Test (\* = EUT):*

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

### *Support Devices:*

Function	Manufacturer	Model #	S/N

### *Test Conditions / Notes:*

Temperature 21°C

Humidity: 33%

Pressure: 102.7kPa

Testing Bandedge Compliance per FCC15.247(d)

The EUT is 20dB Zigbee Radio Module

The EUT is located in the center of the test table raised 10cm with styrofoam.

The EUT will be transmitting in the LOW and HIGH channels.

Because of the lack of antenna connectors the test will have to be done through radiated scans.

Plot shows peak values only with 1MHz RBW, tabular data shows both peak and average values.

Limit line includes the 54dBuV/m at the restricted bands and 20dBc with respect to the fundamental on the rest of the frequencies.

RBW = 1MHz

VBW = 1MHz

**Transducer Legend:**

T1=CAB-ANP03121-042809  
T3=AMP-AN01271-091709  
T5=CAB-ANP03123-120208

T2=CAB-ANP05542-042109  
T4=ANT-AN01412-111207

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.				Test Distance: 3 Meters			
			T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB
1	2405.356M	109.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	107.9	107.9	+0.0 Horiz 181
2	2389.502M Ave	43.6	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	42.3	54.0	-11.7 Horiz 181
^	2389.502M	56.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.9	54.0	+0.9 Horiz 181
4	2389.372M Ave	43.5	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	42.2	54.0	-11.8 Horiz 181
^	2389.372M	55.8	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.5	54.0	+0.5 Horiz 181
6	2388.117M Ave	42.6	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	41.3	54.0	-12.7 Horiz 181
^	2388.117M	56.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.9	54.0	+0.9 Horiz 181
8	2387.953M Ave	42.4	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	41.1	54.0	-12.9 Horiz 181
^	2387.953M	55.1	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	53.8	54.0	-0.2 Horiz 181
10	2386.347M Ave	41.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	40.6	54.0	-13.4 Horiz 181
^	2386.347M	55.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.6	54.0	+0.6 Horiz 181
^	2386.347M	52.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	51.0	54.0	-3.0 Horiz 181
13	2386.347M Ave	41.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	40.6	54.0	-13.4 Horiz 181
14	2386.347M Ave	41.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	40.6	54.0	-13.4 Horiz 181
15	2385.509M Ave	41.8	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	40.5	54.0	-13.5 Horiz 181
^	2385.509M	54.8	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	53.5	54.0	-0.5 Horiz 181
17	2384.007M Ave	41.7	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	40.4	54.0	-13.6 Horiz 181
^	2384.007M	55.1	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	53.8	54.0	-0.2 Horiz 181
19	2399.990M	70.4	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	69.1	87.9	-18.8 Horiz 181
20	2399.668M	68.0	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	66.7	87.9	-21.2 Horiz 181
21	2397.641M	60.4	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	59.1	87.9	-28.8 Horiz 181
22	2397.276M	57.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	56.0	87.9	-31.9 Horiz 181

23	2395.551M	56.6	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	55.3	87.9	-32.6	Horiz 181
24	2395.829M	56.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	55.0	87.9	-32.9	Horiz 181
25	2390.594M	56.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.9	87.9	-33.0	Horiz 181
26	2395.092M	56.1	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.8	87.9	-33.1	Horiz 181
27	2395.057M	56.0	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.7	87.9	-33.2	Horiz 181
28	2394.849M	55.8	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.5	87.9	-33.4	Horiz 181
29	2394.009M	55.7	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.4	87.9	-33.5	Horiz 181
30	2393.749M	55.6	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	54.3	87.9	-33.6	Horiz 181
31	2390.005M Ave	42.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	41.6	87.9	-46.3	Horiz 181
^	2390.005M	56.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 53	55.0	87.9	-32.9	Horiz 181

*DRAFT*

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.247(d) Bandedge Compliance**  
 Work Order #: **89056** Date: 10/5/2009  
 Test Type: **Radiated Scan** Time: 12:55:39 PM  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: 5  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
EMCO 3115 Horn	9606-4854	11/12/2007	11/12/2009	AN01412 EMCO 3115 Horn
HP 83017A	3123A00464	09/17/2009	09/17/2011	AN01271
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
High freq. Cable	N/A	12/02/2008	12/02/2010	AN03123

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

Temperature 21°C
Humidity: 33%
Pressure: 102.7kPa
Testing Bandedge Compliance per FCC15.247(d)
The EUT is 20dB Zigbee Radio Module
The EUT is located in the center of the test table raised 10cm with styrofoam.
The EUT will be transmitting in the LOW and HIGH channels.
Because of the lack of antenna connectors the test will have to be done through radiated scans.
Plot shows peak values only with 1MHz RBW, tabular data shows both peak and average values.
Limit line includes the 54dBuV/m at the restricted bands and 20dBc with respect to the fundamental on the rest of the frequencies.
RBW = 1MHz
VBW = 1MHz

**Transducer Legend:**

T1=CAB-ANP03121-042809  
T3=AMP-AN01271-091709  
T5=CAB-ANP03123-120208

T2=CAB-ANP05542-042109  
T4=ANT-AN01412-111207

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.				Test Distance: 3 Meters			
			T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB
1	2405.348M	102.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	101.0	101.0	+0.0 Verti 128
2	2387.634M	49.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	48.6	54.0	-5.4 Verti 128
3	2389.441M	49.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	48.6	54.0	-5.4 Verti 128
4	2387.703M	49.6	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	48.3	54.0	-5.7 Verti 128
5	2388.255M	49.6	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	48.3	54.0	-5.7 Verti 128
6	2381.295M	49.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	48.0	54.0	-6.0 Verti 128
7	2383.869M	49.3	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	48.0	54.0	-6.0 Verti 128
8	2385.458M	49.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.9	54.0	-6.1 Verti 128
9	2385.725M	49.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.9	54.0	-6.1 Verti 128
10	2385.829M	49.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.9	54.0	-6.1 Verti 128
11	2387.452M	49.2	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.9	54.0	-6.1 Verti 128
12	2382.478M	49.1	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.8	54.0	-6.2 Verti 128
13	2384.438M	49.1	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.8	54.0	-6.2 Verti 128
14	2385.354M	49.1	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.8	54.0	-6.2 Verti 128
15	2386.235M	49.0	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.7	54.0	-6.3 Verti 128
16	2386.313M	49.0	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.7	54.0	-6.3 Verti 128
17	2386.882M	49.0	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.7	54.0	-6.3 Verti 128
18	2386.969M	49.0	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.7	54.0	-6.3 Verti 128
19	2383.420M	48.9	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.6	54.0	-6.4 Verti 128
20	2383.644M	48.8	+1.2 +0.5	+2.7	-34.5	+28.8	+0.0 222	47.5	54.0	-6.5 Verti 128

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.247(d) Bandedge Compliance**  
 Work Order #: **89056** Date: 10/5/2009  
 Test Type: **Radiated Scan** Time: 11:51:42  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: 2  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
EMCO 3115 Horn	9606-4854	11/12/2007	11/12/2009	AN01412 EMCO 3115 Horn
HP 83017A	3123A00464	09/17/2009	09/17/2011	AN01271
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
High freq. Cable	N/A	12/02/2008	12/02/2010	AN03123

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

Temperature 21°C
Humidity: 33%
Pressure: 102.7kPa
Testing Bandedge Compliance per FCC15.247(d)
The EUT is 20dB Zigbee Radio Module
The EUT is located in the center of the test table raised 10cm with styrofoam.
The EUT will be transmitting in the LOW and HIGH channels.
Because of the lack of antenna connectors the test will have to be done through radiated scans.
Plot shows peak values only with 1MHz RBW, tabular data shows both peak and average values.
Limit line includes the 54dBuV/m at the restricted bands and 20dBc with respect to the fundamental on the rest of the frequencies.
RBW = 1MHz
VBW = 1MHz

**Transducer Legend:**

T1=CAB-ANP03121-042809  
T3=AMP-AN01271-091709  
T5=CAB-ANP03123-120208

T2=CAB-ANP05542-042109  
T4=ANT-AN01412-111207

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.				Test Distance: 3 Meters			
			T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB
1	2474.399M	107.6	+1.2 +0.5	+2.8	-34.4	+29.0	+0.0 37	106.7	106.7	+0.0 Horiz 180
2	2485.359M	54.1	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	53.3	54.0	-0.7 Horiz 180
3	2494.485M	53.5	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	52.7	54.0	-1.3 Horiz 180
4	2497.063M	52.8	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	52.0	54.0	-2.0 Horiz 180
5	2492.968M	52.7	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	51.9	54.0	-2.1 Horiz 180
6	2493.437M	52.6	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	51.8	54.0	-2.2 Horiz 180
7	2490.218M Ave	41.5	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	40.7	54.0	-13.3 Horiz 180
^	2490.218M	53.9	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	53.1	54.0	-0.9 Horiz 180
9	2483.530M Ave	41.3	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	40.5	54.0	-13.5 Horiz 180
^	2483.530M	55.4	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	54.6	54.0	+0.6 Horiz 180
11	2484.413M Ave	41.1	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	40.3	54.0	-13.7 Horiz 180
^	2484.413M	54.2	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	53.4	54.0	-0.6 Horiz 180
13	2493.967M Ave	39.8	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	39.0	54.0	-15.0 Horiz 180
^	2493.967M	52.8	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	52.0	54.0	-2.0 Horiz 180
15	2497.618M Ave	39.4	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	38.6	54.0	-15.4 Horiz 180
^	2497.618M	52.4	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 37	51.6	54.0	-2.4 Horiz 180
17	2501.844M	50.9	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	50.2	86.7	-36.5 Horiz 180
18	2502.910M	50.8	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	50.1	86.7	-36.6 Horiz 180
19	2502.427M	50.7	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	50.0	86.7	-36.7 Horiz 180
20	2504.336M	50.4	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	49.7	86.7	-37.0 Horiz 180
21	2501.683M	50.3	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	49.6	86.7	-37.1 Horiz 180
22	2502.117M	50.3	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	49.6	86.7	-37.1 Horiz 180

23	2502.204M	50.1	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	49.4	86.7	-37.3	Horiz 180
24	2504.571M	49.4	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	48.7	86.7	-38.0	Horiz 180
25	2504.038M	49.1	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 37	48.4	86.7	-38.3	Horiz 180

*DRAFT*

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **INNCOM International**  
 Specification: **FCC 15.247(d) Bandedge Compliance**  
 Work Order #: **89056** Date: 10/5/2009  
 Test Type: **Radiated Scan** Time: 11:26:13 AM  
 Equipment: **20dB INNCOM Zigbee Radio Module** Sequence#: 1  
 Manufacturer: INNCOM International, Inc. Tested By: Armando Del Angel  
 Model: 02-9894  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
High freq. Cable	N/A	04/28/2009	04/28/2011	AN03121
Agilent E4440A	MY46186333	04/29/2009	04/29/2011	AN02871
Cable, 23' blue Heliax	N/A	04/21/2009	04/21/2011	P05542
9606-4854	11/12/2007	11/12/2009		AN01412 EMCO 3115 Horn
HP 83017A	3123A00464	09/17/2009	09/17/2011	AN01271
High freq. Cable	N/A	12/02/2008	12/02/2010	AN03123

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
20dB INNCOM Zigbee Radio Module*	INNCOM International, Inc.	02-9894	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

Temperature 21°C
Humidity: 33%
Pressure: 102.7kPa
Testing Bandedge Compliance per FCC15.247(d)
The EUT is 20dB Zigbee Radio Module
The EUT is located in the center of the test table raised 10cm with styrofoam.
The EUT will be transmitting in the LOW and HIGH channels.
Because of the lack of antenna connectors the test will have to be done through radiated scans.
Plot shows peak values only with 1MHz RBW, tabular data shows both peak and average values.
Limit line includes the 54dBuV/m at the restricted bands and 20dBc with respect to the fundamental on the rest of the frequencies.
RBW = 1MHz
VBW = 1MHz

**Transducer Legend:**

T1=CAB-ANP03121-042809  
T3=AMP-AN01271-091709  
T5=CAB-ANP03123-120208

T2=CAB-ANP05542-042109  
T4=ANT-AN01412-111207

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.				Test Distance: 3 Meters			
			T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB
1	2474.399M	101.4	+1.2 +0.5	+2.8	-34.4	+29.0	+0.0 219	100.5	100.5	+0.0 Verti 146
2	2483.566M	48.4	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	47.6	54.0	-6.4 Verti 146
3	2485.113M	48.3	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	47.5	54.0	-6.5 Verti 146
4	2483.652M	48.2	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	47.4	54.0	-6.6 Verti 146
5	2485.938M	48.2	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	47.4	54.0	-6.6 Verti 146
6	2486.271M	48.2	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	47.4	54.0	-6.6 Verti 146
7	2494.436M	47.2	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	46.4	54.0	-7.6 Verti 146
8	2494.966M	47.1	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	46.3	54.0	-7.7 Verti 146
9	2496.755M	47.1	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	46.3	54.0	-7.7 Verti 146
10	2492.648M	46.9	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	46.1	54.0	-7.9 Verti 146
11	2494.658M	46.9	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	46.1	54.0	-7.9 Verti 146
12	2492.746M	46.8	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	46.0	54.0	-8.0 Verti 146
13	2492.216M	46.7	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	45.9	54.0	-8.1 Verti 146
14	2497.754M	46.7	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	45.9	54.0	-8.1 Verti 146
15	2497.717M	46.6	+1.2 +0.5	+2.8	-34.4	+29.1	+0.0 219	45.8	54.0	-8.2 Verti 146
16	2501.349M	44.9	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 219	44.2	80.5	-36.3 Verti 146
17	2501.894M	44.9	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 219	44.2	80.5	-36.3 Verti 146
18	2503.109M	44.9	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 219	44.2	80.5	-36.3 Verti 146
19	2502.439M	44.8	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 219	44.1	80.5	-36.4 Verti 146
20	2506.257M	43.8	+1.3 +0.5	+2.8	-34.4	+29.1	+0.0 219	43.1	80.5	-37.4 Verti 146

## FCC 15.247(e) - PEAK POWER SPECTRAL DENSITY

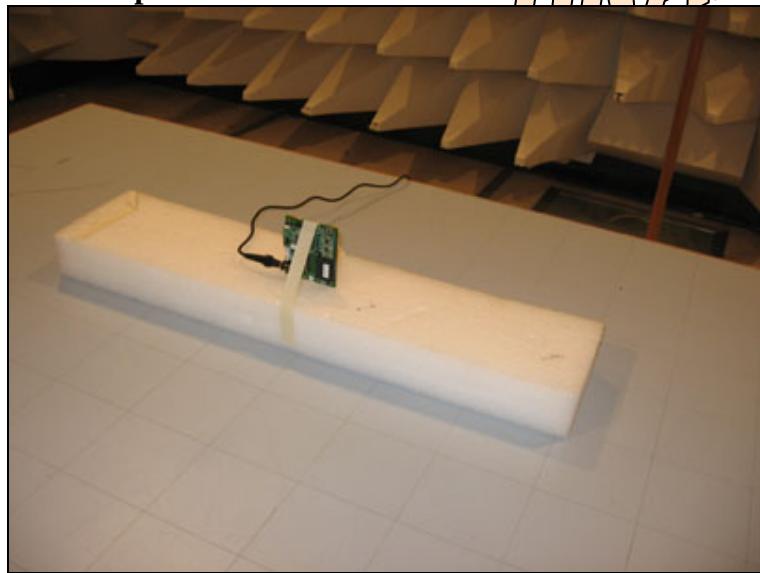
### Test Equipment

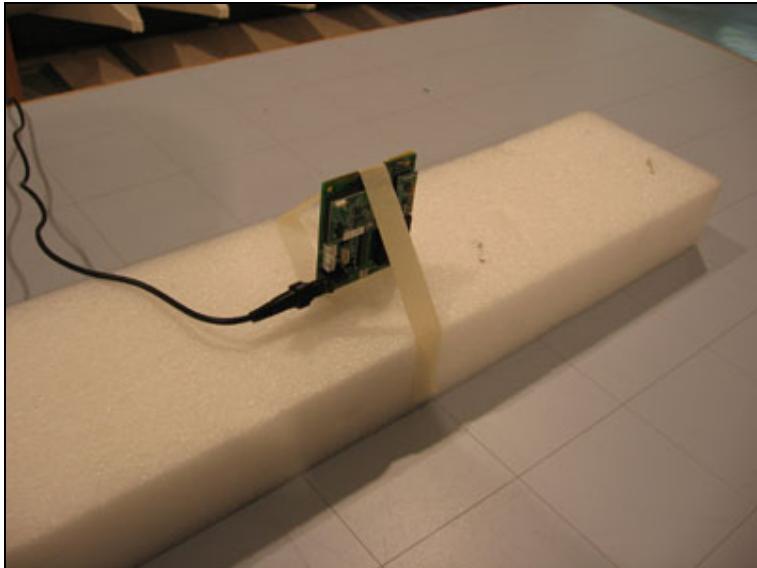
Asset #	Name	Manufacturer	Model	Serial	Cal date	Cal Due
3121	Cable	Astrolab	32026-2-29080-84		4/28/2009	4/28/2011
1412	Antenna, Horn	EMCO	3115	9606-4854	11/12/2007	11/12/2009
P05542	Cable, 23' blue	Andrews	Heliax		4/21/2009	4/21/2011
1271	Preamp	HP	83017A	3123A00464	9/17/2009	9/17/2011
2871	Spectrum Analyzer	Agilent	E4440A	MY46186333	4/29/2009	4/29/2011

### Test Conditions

The EUT was transmitting. Due to the lack of antenna connectors the test was done through radiated measurements. EUT was located on the center of the test table over 10cm of Styrofoam. The Fundamental's emission was maximized per ANSI C63.4 procedures. PSA was on max hold centered at the desired channel. EMI test was used with the solely purpose of accurate Field Strength data gathering. Same calculation from the RF power output test was used in order to convert the field strength to power. EUT was tested in the LOW (2.405GHz), MID (2.445GHz), and HIGH (2.475GHz).

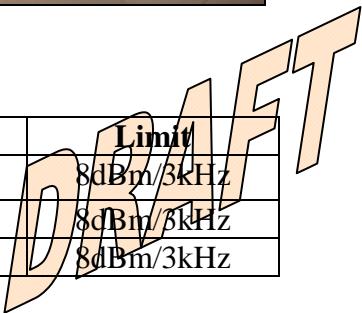
### Test Setup Photos





### Test Data

	Power	Limit
<b>LOW</b>	-4.832dBm/3kHz	8dBm/3kHz
<b>MID</b>	-7.762dBm/3kHz	8dBm/3kHz
<b>HIGH</b>	-7.232dBm/3kHz	8dBm/3kHz



## RSS-210 - 99% BANDWIDTH

### Test Equipment

Asset #	Name	Manufacturer	Model	Serial	Cal date	Cal Due
3121	Cable	Astrolab	32026-2-29080-84		4/28/2009	4/28/2011
1412	Antenna, Horn	EMCO	3115	9606-4854	11/12/2007	11/12/2009
P05542	Cable, 23' blue	Andrews	Heliax		4/21/2009	4/21/2011
1271	Preamp	HP	83017A	3123A00464	9/17/2009	9/17/2011
2871	Spectrum Analyzer	Agilent	E4440A	MY46186333	4/29/2009	4/29/2011

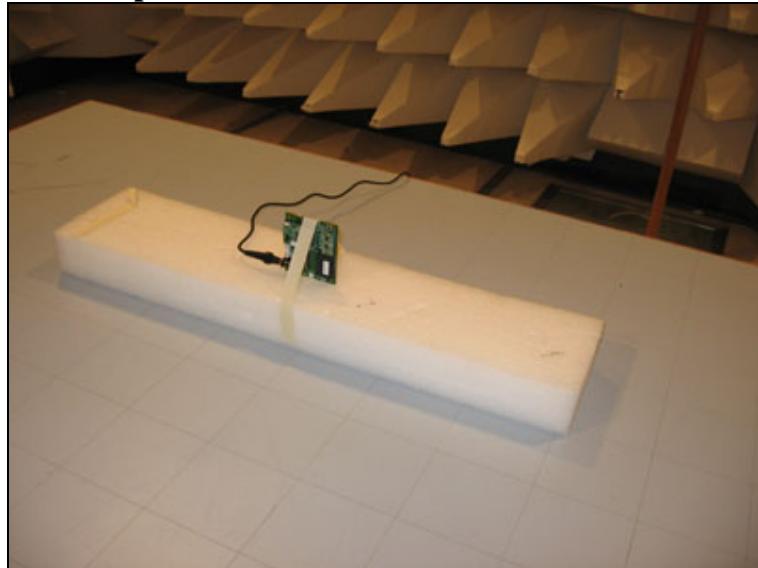
### Test Conditions

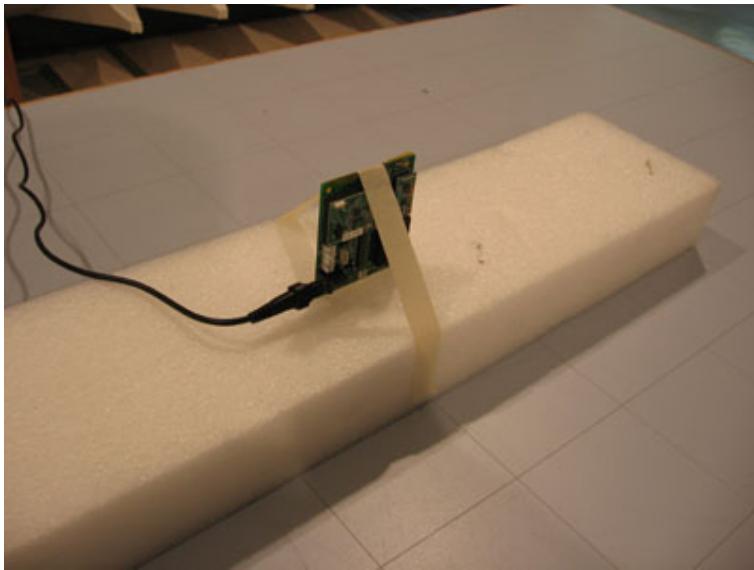
EUT was transmitting. Due to the lack of antenna connectors the test was done through radiated measurements. EUT was located on the center of the test table over 10cm of Styrofoam. PSA was on max hold. Agilent procedure used for each channel. EUT was tested in the LOW (2.405GHz), MID (2.445GHz), and HIGH (2.475GHz).

RBW = 100 kHz  
VBW = 1 MHz  
Span = 10 MHz

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### Test Setup Photos





## Test Plots

Channel	99% Bandwidth
LOW	2.53MHz
MID	2.53MHz
HIGH	2.60MHz

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## RSS-210 99% BANDWIDTH



## RSS-210 99% BANDWIDTH



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## RSS-210 99% BANDWIDTH

