Excellence in Compliance Testing

Certification Test Report

FCC ID: U9O-SM200
IC: 7084A-SM200

FCC Rule Part: 15.249
IC Radio Standards Specification: RSS-210

ACS Report Number: 11-0216.W06.1A

Manufacturer: Synapse Wireless, Inc.
Model: SM200

Test Begin Date: June 14, 2011
Test End Date: June 15, 2011

Test Begin Date: May 22, 2012
Test End Date: May 23, 2012

Report Issue Date: June 13, 2012

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Reviewed by:
Kirby Munroe
Director, Wireless Certifications
ACS, Inc.

This report contains 17 pages

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specification RSS-210 for a single modular approval.

1.2 Product description

The Synapse Wireless SM200 Module is an IEEE 802.15.4 compliant RF module. The frequencies of RF transmission are in the ISM 2.4GHz band with 16 total channels of operation. These RF modules are intended to be used by OEM and Integrators with a host board in order to add RF wireless communication to their products.

There are four part numbers included under the model SM200. Differences in part numbers are described below.

SM200P81: Chip antenna; reflow solder mounting
RF200P81: Chip antenna; mounted on RF Engine carrier board, reflow solder or socket mounted
SM200PU1: U.FL connector for external antenna; reflow solder mounting
RF200PU1: U.FL connector for external antenna; mounted on RF Engine carrier board with PCB traces to U.FL connector, reflow solder or socket mounting

The differences between the 'SM' and 'RF' part numbers is the 'RF' module part numbers are placed on a RF Engine carrier board. This carrier board provides PCB trace to the U.FL connectors for the RF200PU1 part number variant.

Band of operation:	2405 – 2480 MHz
Number of hopping channels:	16
Channel spacing	5 MHz
Modulation format:	O-QPSK
Antenna:	Murata LDA312G4413H-280 Chip, -2.3dBi gain (Applicable to part numbers SM200P81 and RF200P81 only); Dipole, 3.2dBi gain (Applicable to part numbers SM200PU1 and RF200PU1 only)
RF connector:	U.FL (Applicable to part numbers SM200PU1 and RF200PU1 only)
Operating Voltage:	1.8 - 3.6VDC (9VDC to Evaluation Board)

Manufacturer Information:
Synapse Wireless, Inc.
500 Discovery Drive
Huntsville, AL 35806

Test Sample Serial Number(s): ACS#1 (Chip), ACS#2 (Dipole)

Test Sample Condition: The test samples were provided in good working order with no visible defects.

1.3 Test Methodology and Considerations

Only part numbers RF200P81 (chip antenna) and RF200PU1 (dipole antenna) were evaluated for showing compliance. These part numbers allowed use of an evaluation board for providing power and programming test modes during testing. See Section 5.0 – 6.0 for additional details.

For radiated emissions, including band edge, three orientations of the EUT were evaluated with data representing worst case provided.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions
5015 B.U. Bowman Drive
Buford, GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by the National Institute of Standards and Technology under their National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 200612-0. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

The Semi-Anechoic Chamber Test Site, Open Area Test Site (OATS) and Conducted Emissions Site have been fully described, submitted to, and accepted by the FCC, Industry Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

FCC Registration Number: 511277
Industry Canada Lab Code: 4175A-1
VCCI Member Number: 1831

- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 20' x 30' x 18' shielded enclosure. The chamber is lined with Toyo Ferrite Grid Absorber, model number FFG-1000. The ferrite tile grid is 101 x 101 x 19mm thick and weighs approximately 550 grams. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber.

The turntable is 150cm in diameter and is located 160cm from the back wall of the chamber. The chamber is grounded via 1 - 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Behind the turntable is a 3' x 6' x 4' deep shielded pit used for support equipment if necessary. The pit is equipped with 1 - 4" PVC chases from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:

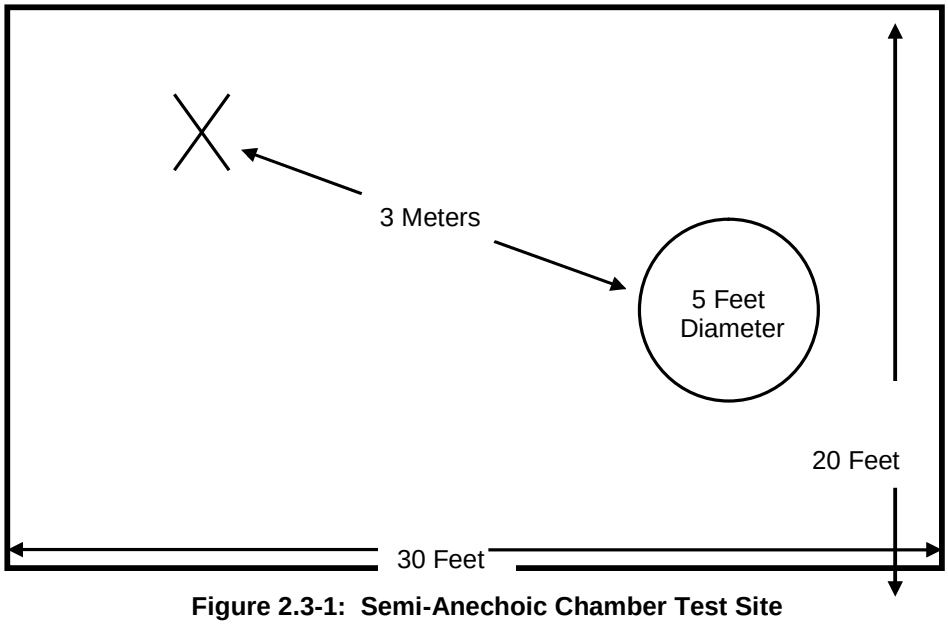


Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.3.2 Open Area Tests Site (OATS)

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 - 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 - 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 2.3-2 below:

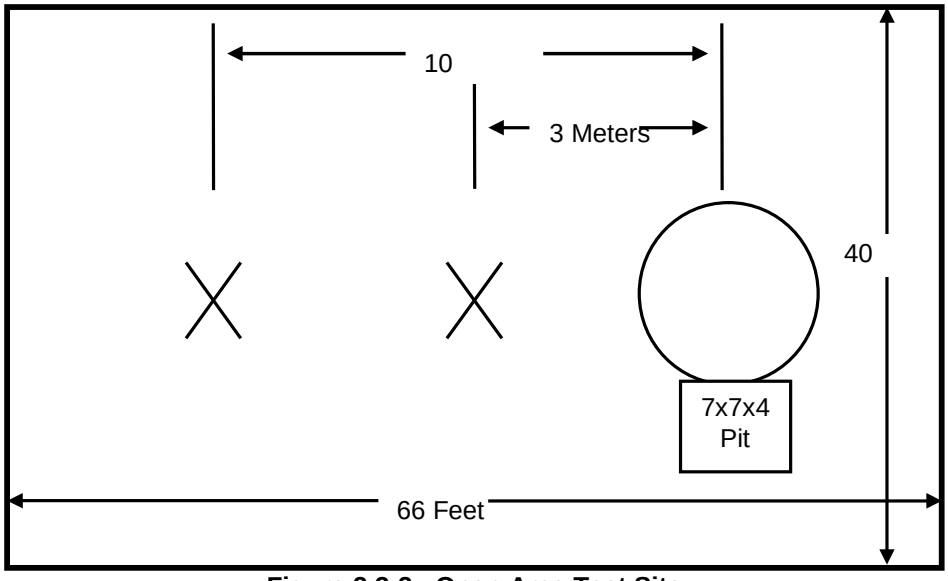


Figure 2.3-2: Open Area Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 8' solid aluminum horizontal ground reference plane (GRP) bonded every 3" to an 8' X 8' vertical ground plane.

The site is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 4.1.3-1:

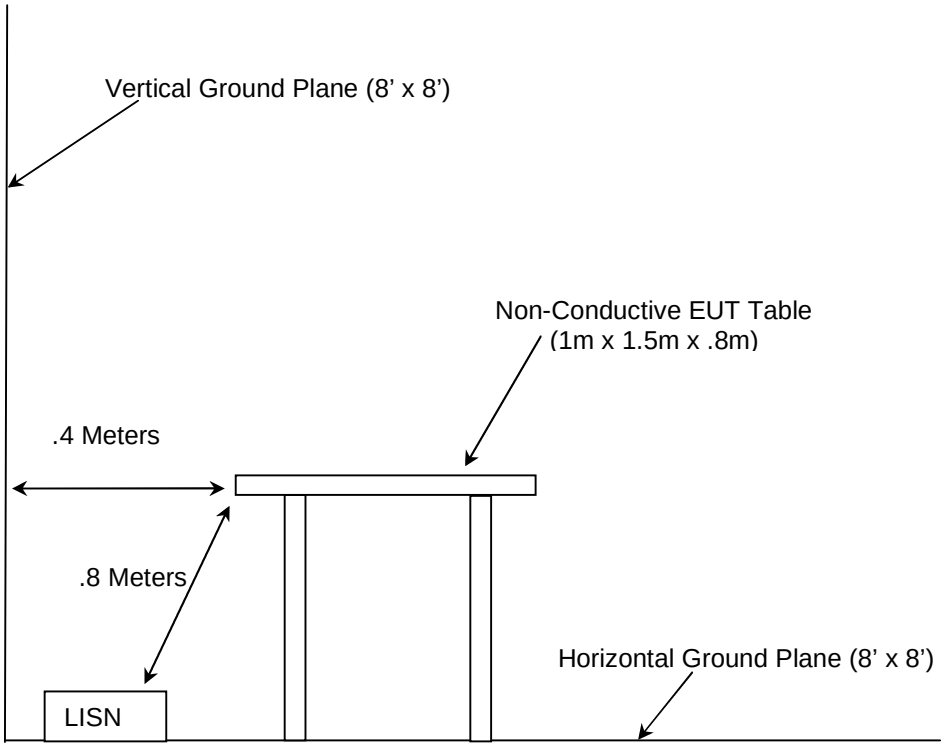


Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2009: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2012
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2012
- Industry Canada Radio Standards Specification: RSS-210 - Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8, December 2010
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 3, December 2010.

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

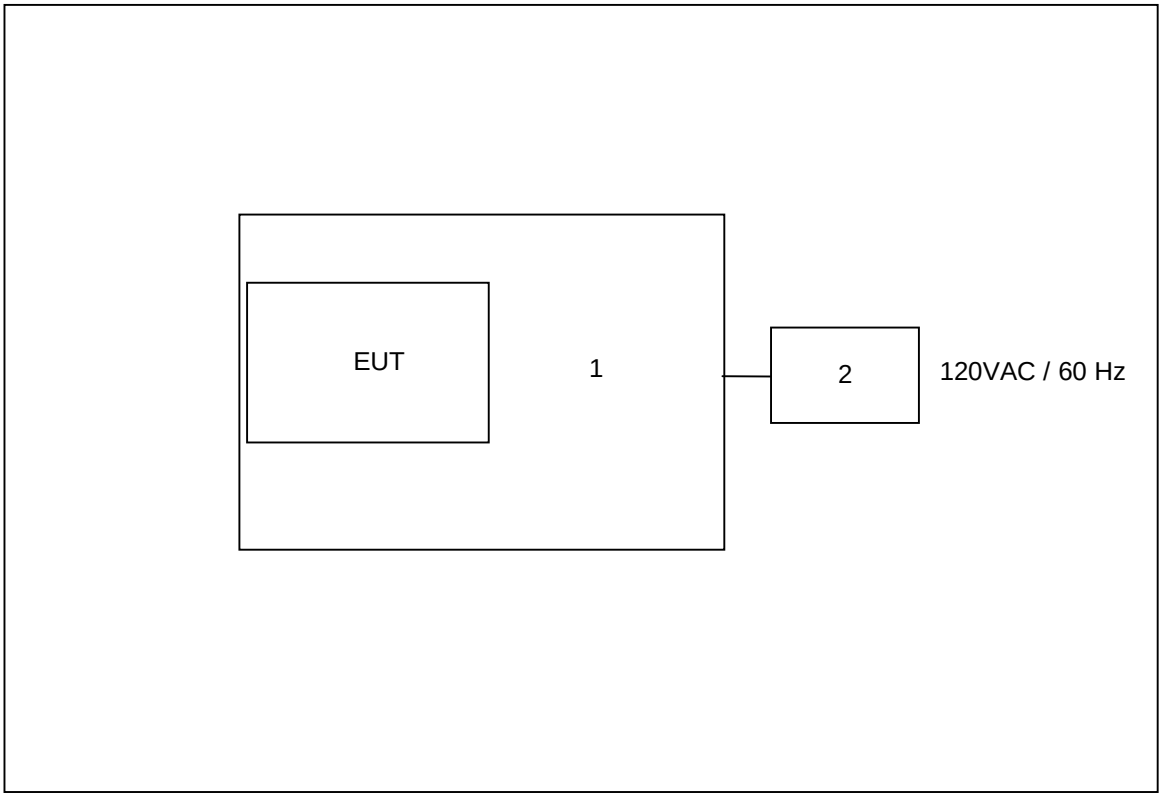
AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
1	Rohde & Schwarz	ESMI - Display	Spectrum Analyzers	833771/007	9/23/2010	9/23/2012
2	Rohde & Schwarz	ESMI-Receiver	Spectrum Analyzers	839587/003	9/23/2010	9/23/2012
3	Rohde & Schwarz	ESMI - Display	Spectrum Analyzers	839379/011	5/26/2011	5/26/2013
4	Rohde & Schwarz	ESMI - Receiver	Spectrum Analyzers	833827/003	5/26/2011	5/26/2013
25	Chase	CBL6111	Antennas	1043	9/13/2010	9/13/2012
30	Spectrum Technologies	DRH-0118	Antennas	970102	4/27/2011	4/27/2013
73	Agilent	8447D	Amplifiers	2727A05624	3/21/2011	3/21/2012
73	Agilent	8447D	Amplifiers	2727A05624	9/30/2011	9/30/2012
153	EMCO	3825/2	LISN	9411-2268	1/13/2011	1/13/2013
167	ACS	Chamber EMI Cable Set	Cable Set	167	1/26/2011	1/26/2012
167	ACS	Chamber EMI Cable Set	Cable Set	167	12/21/2011	12/21/2012
168	Hewlett Packard	11947A	Attenuators	44829	2/4/2011	2/4/2012
168	Hewlett Packard	11947A	Attenuators	44829	2/1/2012	2/1/2013
283	Rohde & Schwarz	FSP40	Spectrum Analyzers	1000033	8/31/2010	8/31/2011
283	Rohde & Schwarz	FSP40	Spectrum Analyzers	1000033	8/26/2011	8/26/2012
291	Florida RF Cables	SMRE-200W-12.0-SMRE	Cables	None	12/7/2010	12/7/2011
291	Florida RF Cables	SMR-200W-12.0-SMRE	Cables	None	12/2/2011	12/2/2012
292	Florida RF Cables	SMR-290AW-480.0-SMR	Cables	None	4/11/2011	4/11/2012
292	Florida RF Cables	SMR-290AW-480.0-SMR	Cables	None	4/2/2012	4/2/2013
324	ACS	Belden	Cables	8214	7/9/2010	7/9/2011
324	ACS	Belden	Cables	8214	7/6/2011	7/6/2012
334	Rohde&Schwarz	3160-10	Antennas	45576	11/4/2010	NCR
335	Suhner	SF-102A	Cables	882/2A	8/29/2011	8/29/2012
338	Hewlett Packard	8449B	Amplifiers	3008A01111	3/24/2011	3/24/2012
338	Hewlett Packard	8449B	Amplifiers	3008A01111	3/1/2012	8/31/2012
345	Suhner Sucoflex	102A	Cables	1077/2A	8/29/2011	8/29/2012
422	Florida RF Cables	SMS-200AW-72.0-SMR	Cables	805	12/29/2010	12/29/2011
422	Florida RF Cables	SMS-200AW-72.0-SMR	Cables	805	12/2/2011	12/2/2012
432	Microwave Circuits	H3G020G4	Filters	264066	7/16/2010	7/16/2011
432	Microwave Circuits	H3G020G4	Filters	264066	7/11/2011	7/11/2012

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	Test Evaluation Board	Synapse Wireless, Inc	500202.01A	NA
2	9V DC Power Supply	Tamuracorp	318AS09035	0711

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM



7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement – FCC: Section 15.203

The SM200 utilizes an integrated chip antenna as well as a U.FL connector external antenna for external antenna use.

7.2 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 7.2.4

7.2.1 Measurement Procedure

ANSI C63.4 sections 6 and 7 were the guiding documents for this evaluation. Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Applicable Limit - Corrected Reading

7.2.2 Measurement Results

Results of the test are shown below in and Table 7.2.2-1 to 7.2.2-2.

Table 7.2.2-1: Line 1 Conducted EMI Results

Frequency (MHz)	Detector	Level (dBuV)	Correction Factor (dB)	Limit (dBuV)	Margin (dB)
0.186000	QP	29.30	10.0	64	34.9
0.324000	QP	25.30	10.0	60	34.3
0.426000	QP	22.80	10.0	57	34.5
0.528000	QP	16.90	10.0	56	39.1
0.534000	QP	17.20	10.0	56	38.8
0.702000	QP	18.20	10.1	56	37.8
0.744000	QP	17.80	10.1	56	38.2
0.876000	QP	13.40	10.0	56	42.6
1.482000	QP	10.00	10.0	56	46.0
3.420000	QP	9.20	9.9	56	46.8
0.192000	AV	17.90	9.9	54	36.0
0.318000	AV	8.80	10.0	50	40.9
0.426000	AV	8.40	10.0	47	38.9
0.510000	AV	7.70	10.0	46	38.3
0.576000	AV	7.90	10.0	46	38.1
0.690000	AV	7.80	10.1	46	38.2
0.774000	AV	7.70	10.1	46	38.3
0.936000	AV	7.20	10.0	46	38.8
1.434000	AV	7.00	10.0	46	39.0
3.438000	AV	6.60	9.9	46	39.4

Table 7.2.2-2: Line 2 Conducted EMI Results

Frequency (MHz)	Detector	Level (dBuV)	Correction Factor (dB)	Limit (dBuV)	Margin (dB)
0.192000	QP	28.50	9.9	64	35.4
0.330000	QP	23.00	10.0	60	36.4
0.396000	QP	20.10	10.1	58	37.9
0.462000	QP	13.80	10.0	57	42.8
0.588000	QP	16.30	10.0	56	39.7
0.840000	QP	13.40	10.0	56	42.6
1.026000	QP	14.10	10.0	56	41.9
1.056000	QP	13.90	10.0	56	42.1
1.248000	QP	12.30	10.0	56	43.7
1.446000	QP	11.20	10.0	56	44.8
0.264000	AV	8.90	10.0	51	42.4
0.330000	AV	8.40	10.0	50	41.1
0.396000	AV	8.10	10.1	48	39.9
0.462000	AV	7.60	10.0	47	39.1
0.546000	AV	7.80	10.0	46	38.2
0.858000	AV	7.40	10.0	46	38.6
0.948000	AV	7.40	10.0	46	38.7
1.056000	AV	7.40	10.0	46	38.6
1.206000	AV	7.30	10.0	46	38.7
1.482000	AV	7.20	10.0	46	38.8

7.3 20dB / 99% Bandwidth – FCC: Section 15.215, IC: RSS-Gen 4.6.1

7.3.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set between two times and five times the occupied bandwidth (OBW) of the emission. The RBW of the spectrum analyzer was set to approximately 1 % to 5 % of the OBW. The trace was set to max hold with a peak detector active. The Delta function of the analyzer was utilized to determine the 20 dB bandwidth of the emission.

The occupied bandwidth measurement function of the analyzer was used for the 99% bandwidth. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. A sampling detector was used.

7.3.2 Measurement Results

Results are shown below in table 7.3.2-1 and figure 7.3.2-1 to 7.3.2-6:

Table 7.3.2-1: 20dB / 99% Bandwidth

Frequency [MHz]	20dB Bandwidth [MHz]	99% Bandwidth [MHz]
2405	2.450	2.338
2440	2.478	2.366
2480	2.464	2.380

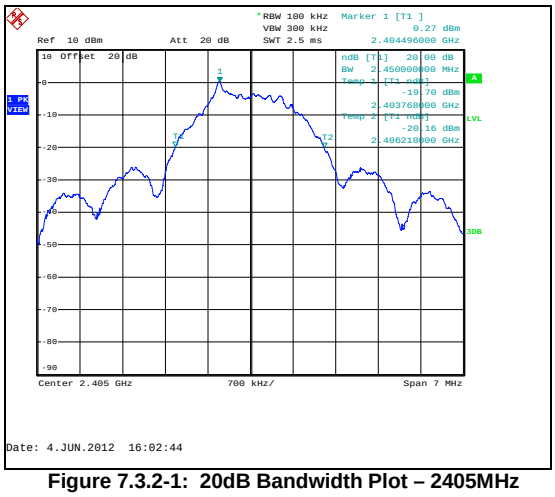


Figure 7.3.2-1: 20dB Bandwidth Plot – 2405MHz

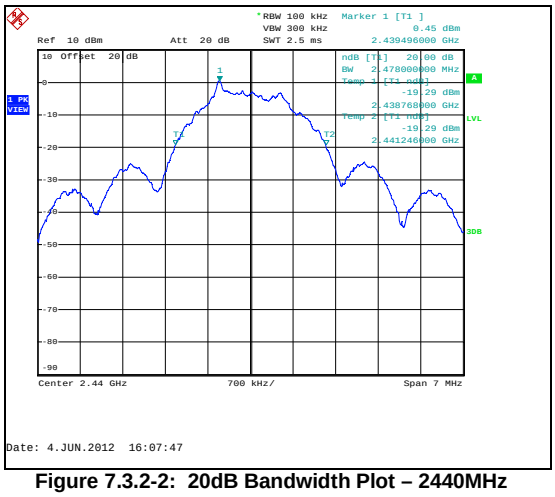


Figure 7.3.2-2: 20dB Bandwidth Plot – 2440MHz

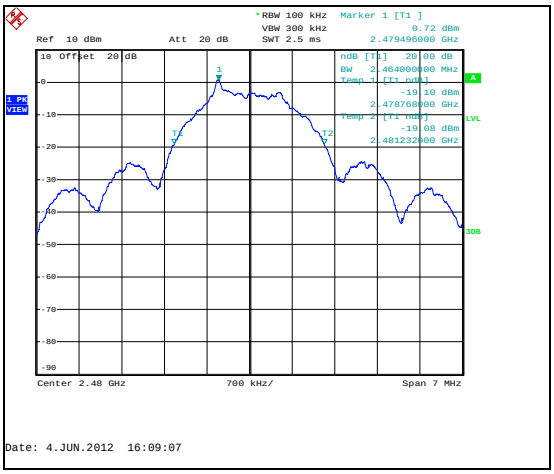


Figure 7.3.2-3: 20dB Bandwidth Plot – 2480MHz

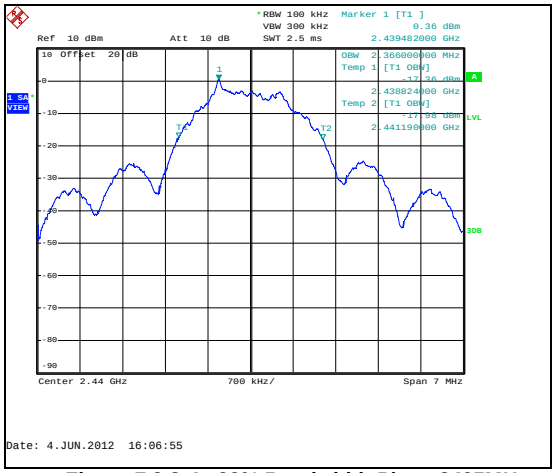


Figure 7.3.2-4: 99% Bandwidth Plot – 2405MHz

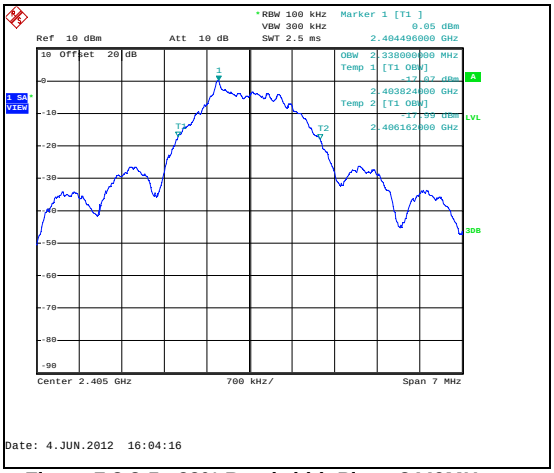


Figure 7.3.2-5: 99% Bandwidth Plot – 2440MHz

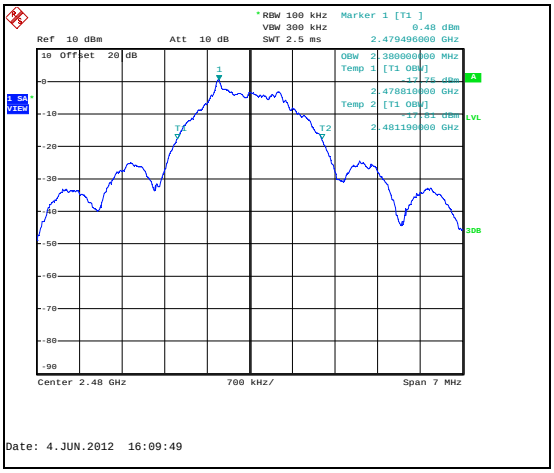


Figure 7.3.2-6: 99% Bandwidth Plot – 2480MHz

7.4 Fundamental Field Strength – FCC: Section 15.249(a) IC: RSS-210 A2.9(a)

7.4.1 Measurement Procedure

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For fundamentals below 1GHz, quasi-peak measurements were made using a resolution bandwidth (RBW) of 120 kHz and a video bandwidth (VBW) of 300 kHz. For fundamentals above 1GHz, peak and average measurements were made using a resolution bandwidth (RBW) of 1 MHz and a video bandwidth (VBW) of 3 MHz.

Where applicable, the measured average emissions where further corrected for the duty cycle. See section 7.5 for the duty cycle justification.

7.4.2 Measurement Results

Results are shown below in Tables 7.4.2-1 and 7.4.2-2.

Table 7.4.2-1: Fundamental Field Strength – Chip Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
2405	91.49	84.38	H	-5.39	86.10	61.98	114.0	94.0	27.9	32.0
2405	96.09	88.42	V	-5.39	90.70	66.02	114.0	94.0	23.3	28.0
2440	96.60	89.38	H	-5.23	91.37	67.13	114.0	94.0	22.6	26.8
2440	97.87	91.01	V	-5.23	92.64	68.76	114.0	94.0	21.4	25.2
2480	97.95	90.74	H	-5.06	92.89	68.67	114.0	94.0	21.1	25.3
2480	101.19	93.95	V	-5.06	96.13	71.88	114.0	94.0	17.9	22.1

Table 7.4.2-2: Fundamental Field Strength – Dipole Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
2405	99.39	93.88	H	-5.40	93.99	71.46	114.0	94.0	20.0	22.5
2405	108.68	102.48	V	-5.40	103.28	80.06	114.0	94.0	10.7	13.9
2440	98.98	93.32	H	-5.25	93.73	71.05	114.0	94.0	20.3	22.9
2440	109.14	103.35	V	-5.25	103.89	81.08	114.0	94.0	10.1	12.9
2480	98.78	92.94	H	-5.08	93.70	70.84	114.0	94.0	20.3	23.1
2480	107.90	102.19	V	-5.08	102.82	80.09	114.0	94.0	11.2	13.9

7.5 Radiated Spurious Emissions - FCC: Section 15.249(a)(d)(e); IC:RSS-210 A2.9(a)(b)

7.5.1 Measurement Procedure

Radiated emissions tests were made over the frequency range of 30MHz to 25 GHz, 10 times the highest fundamental frequency.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000MHz, peak and average measurements were made with RBW and VBW of 1 MHz and 3 MHz respectively. The average emissions were further corrected by applying the duty cycle correction of the EUT for comparison to the average limit.

All out of band emissions, including emissions at the band-edge, were evaluated.

7.5.2 Duty Cycle Correction

For average radiated measurements, using a 14.1 duty cycle, the measured level was reduced by a factor 17.02dB. The duty cycle correction factor is determined using the formula: 20log (14.1/100) = -17.02dB.

A detailed analysis of the duty cycle timing is provided in the Theory of Operation accompanying this report.

7.5.3 Measurement Results

Radiated spurious emissions found in the band of 30MHz to 25GHz are reported in tables 7.5.3-1 and 7.5.3-2 below.

Table 7.5.3-1: Radiated Spurious Emissions Tabulated Data – Chip Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2400	56.85	47.24	H	-5.41	51.44	24.81	74.0	54.0	22.6	29.2
2400	59.02	50.59	V	-5.41	53.61	28.16	74.0	54.0	20.4	25.8
4810	49.20	39.98	H	1.93	51.13	24.89	74.0	54.0	22.9	29.1
4810	50.14	40.51	V	1.93	52.07	25.42	74.0	54.0	21.9	28.6
Middle Channel										
4880	48.26	39.11	H	2.09	50.35	24.19	74.0	54.0	23.6	29.8
4880	49.82	40.28	V	2.09	51.91	25.36	74.0	54.0	22.1	28.6
High Channel										
2483.5	67.35	56.95	H	-5.04	62.31	34.89	74.0	54.0	11.7	19.1
2483.5	70.91	60.17	V	-5.04	65.87	38.11	74.0	54.0	8.1	15.9
4960	49.45	40.00	H	2.28	51.73	25.26	74.0	54.0	22.3	28.7
4960	50.37	40.56	V	2.28	52.65	25.82	74.0	54.0	21.4	28.2

Table 7.5.3-2: Radiated Spurious Emissions Tabulated Data – Dipole Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2400	61.89	54.05	H	-5.42	56.47	31.61	74.0	54.0	17.5	22.4
2400	70.37	62.98	V	-5.42	64.95	40.54	74.0	54.0	9.1	13.5
4810	52.73	43.97	H	2.11	54.84	29.06	74.0	54.0	19.2	24.9
4810	53.26	44.65	V	2.11	55.37	29.74	74.0	54.0	18.6	24.3
Middle Channel										
4880	51.26	42.75	H	2.28	53.54	28.01	74.0	54.0	20.5	26.0
4880	52.56	43.08	V	2.28	54.84	28.34	74.0	54.0	19.2	25.7
High Channel										
2483.5	68.42	58.46	H	-5.07	63.35	36.38	74.0	54.0	10.6	17.6
2483.5	77.33	67.47	V	-5.07	72.26	45.39	74.0	54.0	1.7	8.6
4960	51.32	41.17	H	2.47	53.79	26.63	74.0	54.0	20.2	27.4
4960	52.79	43.23	V	2.47	55.26	28.69	74.0	54.0	18.7	25.3

7.5.4 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T	=	Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
R_U	=	Uncorrected Reading
R_C	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
AG	=	Amplifier Gain
DC	=	Duty Cycle Correction Factor

Example Calculation: Peak

Corrected Level: 56.85 - 5.41 = 51.44dBuV/m
Margin: 74dBuV/m – 51.44dBuV/m = 22.6dB

Example Calculation: Average

Corrected Level: 47.24 - 5.41 - 17.02 = 24.81dBuV
Margin: 54dBuV – 24.81dBuV = 29.2dB

8 CONCLUSION

In the opinion of ACS, Inc. the SM200, manufactured by Synapse Wireless, Inc. meet the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT