EMC Test Report

Project Number: **3482330**

Report Number: **3482330EMC01** **Revision Level:** **0**

Client: **Arrayent Health LLC, d/b/a Ambio Health**

Equipment Under Test: **Ambio Scale**

Model Number: **1-050-01**

FCC ID: **Q4O-1-50**

Applicable Standards: **§ 15.249 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHZ, and 24.0–24.25 GHz.**

ANSI C63.10: 2009

Report issued on: **05 May 2014**

Test Result: **Compliant**

Tested by: _____
Jeremy O. Pickens, Senior EMC Engineer

Reviewed by: _____
David Schramm, EMC Manager

Remarks:
This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or Testing done by SGS International Electrical Approvals in connection with distribution or use of the product described in this report must be approved by SGS international Electrical Approvals in writing.

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1 Summary of Test Results

Test Description	Test Specification	Test Result
Field strength of fundamental	15.249(a)	Compliant
Field strength of spurious radiation	15.249 (a) and 15.209	Compliant
Fixed, point-to-point	15.249(b)	Not applicable
Occupied bandwidth	15.215(c)	Report data only
Duty Cycle	--	Report data only

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name: Arrayent Health LLC, d/b/a Ambio Health
Address: Soundview Plaza, Suite 700R
1266 E Main Street
City, State, Zip, Country: Stamford, CT 06902

2.2 *Test Laboratory*

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

2.3 *General Information of EUT*

Product Name: Ambio Scale
Model Number: 1-050-01
Serial Number: SCA00000050 (Low Channel), SCA00000049 (High Channel), Mid Channel Not Labeled
FCC ID: Q4O-1-50

Rated Voltage: 6Vdc
Test Voltage: 6Vdc (Four new AAA batteries)

Sample Received Date: 29 April 2014
Dates of testing: 01-02 May 2014

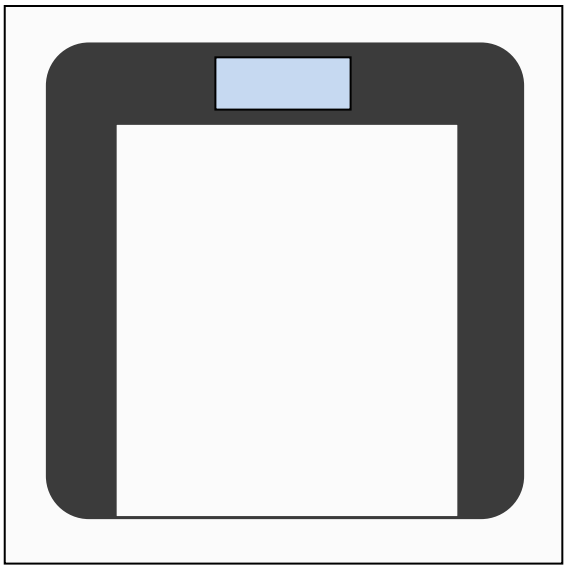
Ratings and declarations

Operation Frequency Range (OFR) TX Mode:	908.5 Mhz – 919.735
TX Channels:	908.5 Mhz + 1.1235*n Mhz (where 0<=n<=10)
Operation Frequency Range (OFR) RX Mode:	908.5 Mhz – 919.735
RX Channels:	908.5 Mhz + 1.1235*n Mhz (where 0<=n<=10)
Channel Bandwidth:	817.3kHz
Effective radiated power:	10dBm
Data rate:	100kbps
Modulation:	2-FSK, 240KHz frequency deviation
Antenna type:	Permanent, 8.2 cm, 26-gauge copper wire

2.4 *Operating Modes and Conditions*

Three scales were provided that were configured to transmit continuously: lowest, middle, and highest channels were evaluated.

2.5 *EUT Connection Block Diagram*



2.6 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Ambio Health	Wireless Scale (Low Channel)	1-50-01	SC00000050
B	Ambio Health	Wireless Scale (Mid Channel)	1-50-01	Not Labeled
C	Ambio Health	Wireless Scale (High Channel)	1-50-01	SC00000049

3 Field Strength of Fundamental

3.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of fundamental	15.249(a) RSS 210, A2.9 (1)	Compliant

3.2 *Test Method*

The test data was measured using a Peak detector. Average measurements were made by correcting the peak value with the duty cycle correction factor. The receiver's resolution bandwidth was set to 120 kHz for measurements taken in the 30MHz to 1GHz frequency range and 1MHz for measurements for 1GHZ and higher. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Fundamental Frequency	Average Limits			Peak Limits dBuV/m
	Millivolts/meter	Microvolts/m	dBuV/m	
902 - 928 MHz	50	50000	94	114
2400 - 2483.5 MHz	50	50000	94	114
5725 - 5875 MHz	50	50000	94	114
24 - 24.25 GHz	250	250000	108	128

3.3 *Test Site*

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 22.1 – 23.7°C
Relative Humidity: 39.3 – 55.3 %
Atmospheric Pressure: 98.2 kPa

3.4 *Test Equipment*

Test Date: 1-May-2014

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	21-Jun-2014
ANTENNA, BILOG	JB6	SUNOL	B079689	22-Aug-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079711	16-Sep-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	7-Aug-2014
RF CABLE	SF106	HUBER&SUHNER	B085892	16-Oct-2014
COAXIAL CABLE	1134	GORE	B094785	16-May-2014

Note: The calibration period equipment is 1 year.

3.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

3.6 *Test Data*

Test Data

Frequency MHz	Raw Pk (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Pk Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
908.631	73.5	V	81.7	164.7	23.1	2.3	0	0.0	98.9	114.0	-15.1
908.631	73.5	V	81.7	164.7	23.1	2.3	0	18.8	80.1	94.0	-13.9
913.947	75.3	V	120.5	164.5	23.2	2.3	0	0.0	100.8	114.0	-13.2
913.947	75.3	V	120.5	164.5	23.2	2.3	0	18.8	82.0	94.0	-12.0
919.561	76.4	V	122.9	166.5	23.2	2.4	0	0.0	102.0	114.0	-12.0
919.561	76.4	V	122.9	166.5	23.2	2.4	0	18.8	83.2	94.0	-10.8
908.631	85.7	H	27.6	100	23.1	2.3	0	0.0	111.1	114.0	-2.9
908.631	85.7	H	27.6	100	23.1	2.3	0	18.8	92.3	94.0	-1.7
913.947	85.1	H	171.5	100.0	23.2	2.3	0	0.0	110.6	114.0	-3.4
913.947	85.1	H	171.5	100.0	23.2	2.3	0	18.8	91.8	94.0	-2.2
919.561	86.1	H	169.5	100.0	23.2	2.4	0	0.0	111.7	114.0	-2.3
919.561	86.1	H	169.5	100.0	23.2	2.4	0	18.8	92.9	94.0	-1.1
QP Value = Level + AF + CL - Amp											
Margin = QP Value - Limit											

4 Field Strength of Spurious Radiation

4.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.249 (a) and 15.209 RSS 210 2.6, A2.9 (1)(2)	Compliant

4.2 *Test Method*

Exploratory scans were performed over the frequency range as indicated in the tables below using the max hold function and incorporating a Peak detector and using TILE! software. The final test data was measured using a Quasi-Peak detector below 1GHz and a Peak detector above 1GHz. For harmonics of the fundamental, Average measurements were made by correcting the peak value with the duty cycle correction factor. For emissions other than harmonics of the fundamental, the Average measurements were made using the Average detector. The receivers resolution bandwidth was set to 120 kHz for measurements taken in the 30MHz to 1GHz frequency range and 1MHz for measurements for 1GHZ and higher. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Frequency	Limits		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 (1)	--
88 - 216 MHz	150	43.5 (1)	--
216 - 960 MHz	200	46 (1)	--
960 - 1000 MHz	500	54 (1)	--
1 - 40 GHz	500	54 (2)	74

(1) Quasi-peak limit
(2) Average limit

4.3 *Test Site*

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature:	21.3 – 23.8°C
Relative Humidity:	32.1 – 40.5 %
Atmospheric Pressure:	98.2 kPa

4.4 *Test Equipment*

Test Date: 2-May-2014

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	7-Oct-2014
ANTENNA, BILOG	JB6	SUNOL	B079689	22-Aug-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079711	16-Sep-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	7-Aug-2014
RF CABLE	SF106	HUBER&SUHNER	B085892	16-Oct-2014
COAXIAL CABLE	1134	GORE	B094785	16-May-2014
DESKTOP AMPLIFIER 30M-18 GHZ	NSP1800-25-HG	MITEQ	B085930	16-Oct-2014
RF CABLE - 7000MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079712	16-Sep-2014
DRG HORN (MEDIUM)	3117	ETS-LINDGREN	B079699	10-Jun-2014

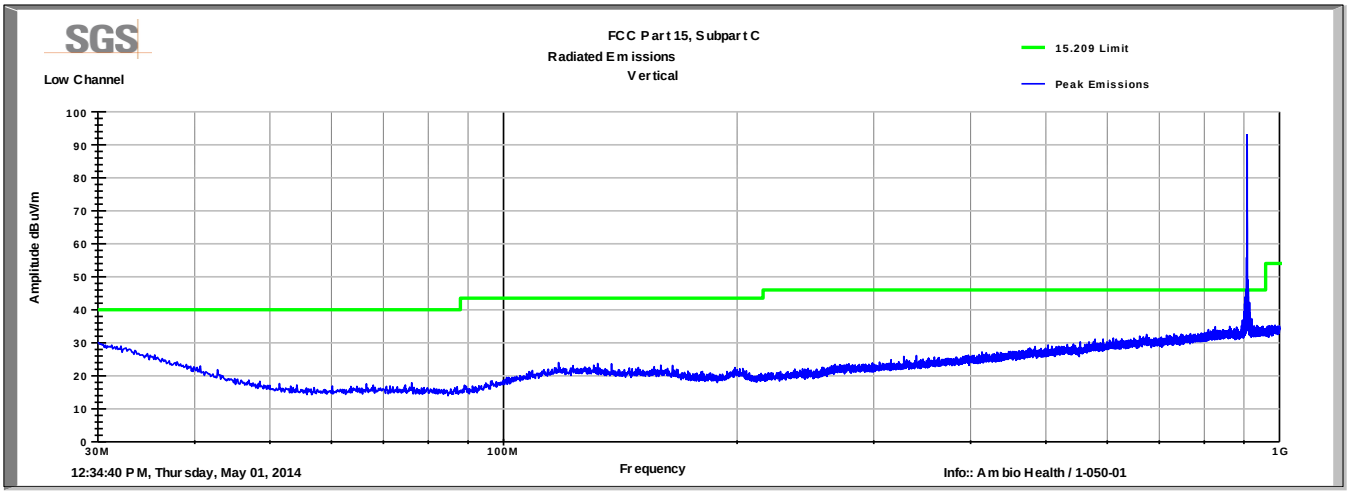
Note: The calibration period equipment is 1 year.

4.5 *Test Setup Photographs*

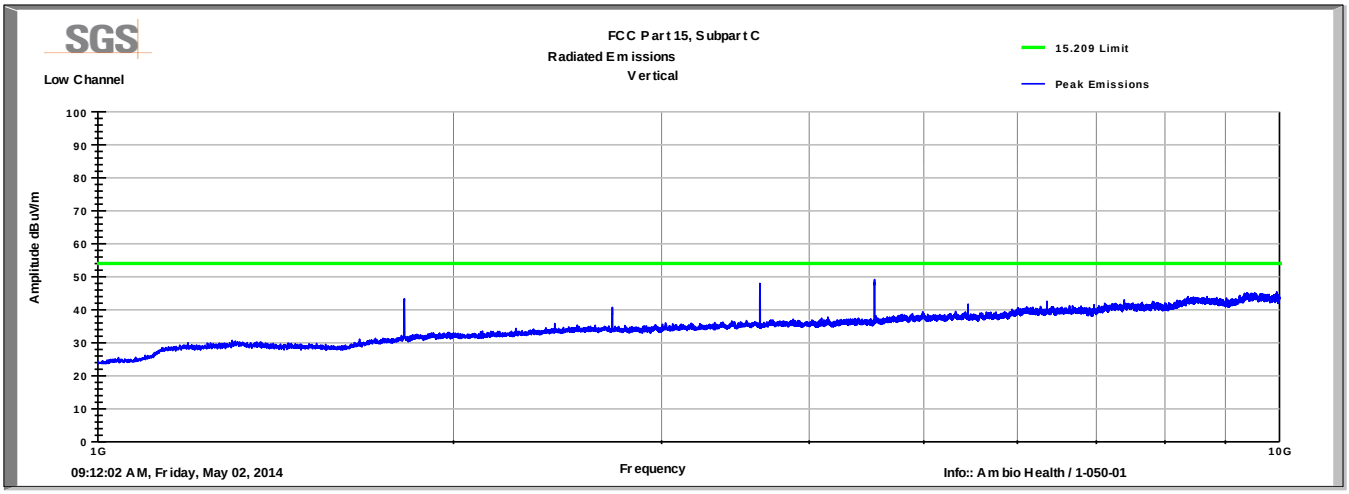
Test setup photographs are located in a separate exhibit.

4.6 *Test Data*

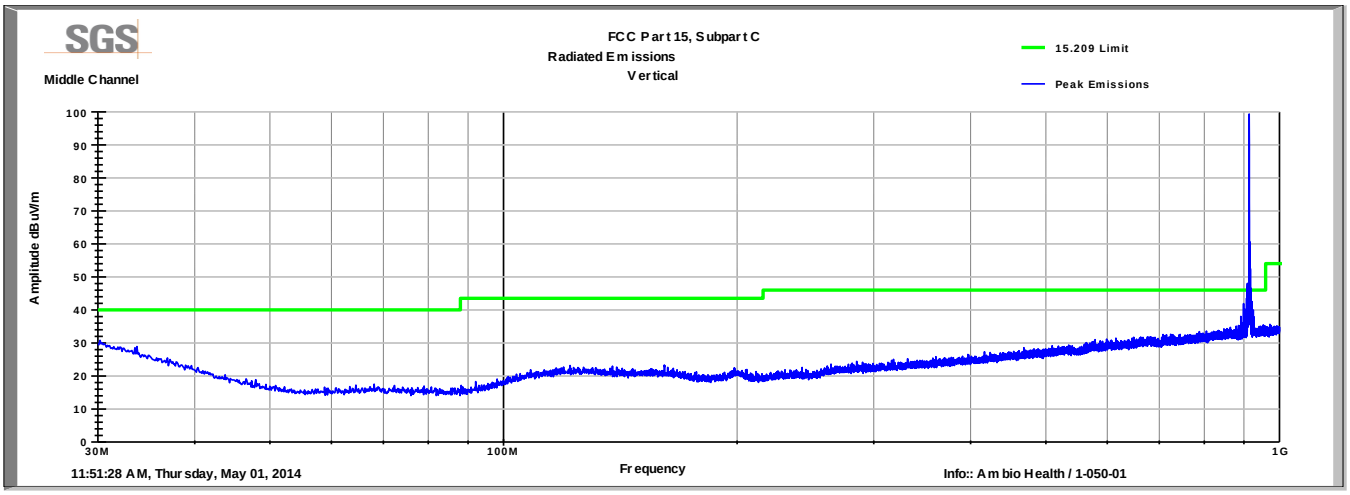
Vertical Peak Plot Low Channel – 30-1000MHz



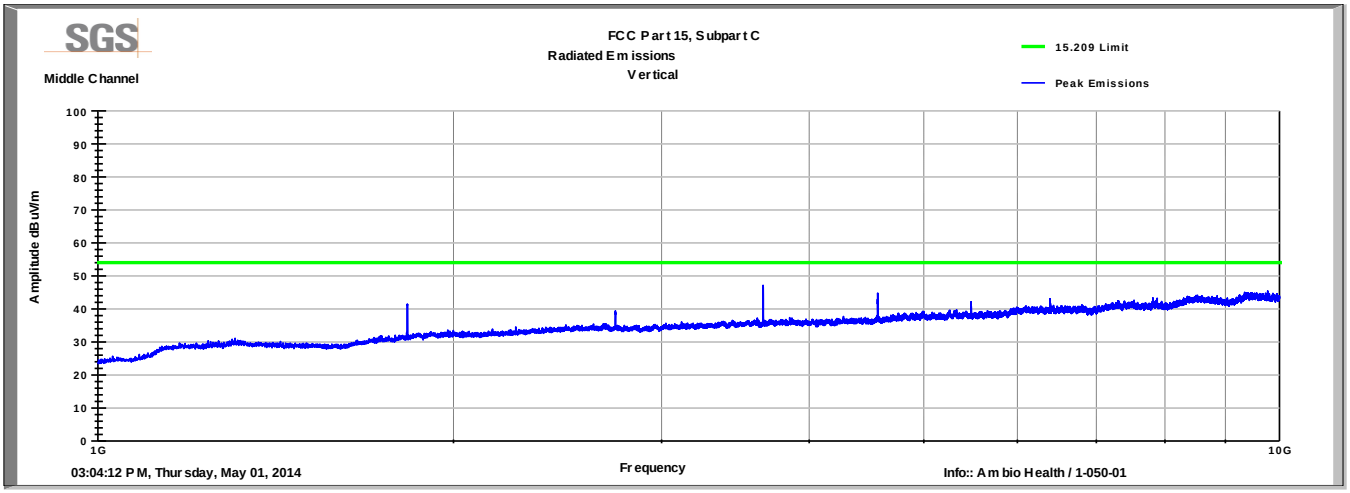
Vertical Peak Plot Low Channel – 1000-10000MHz



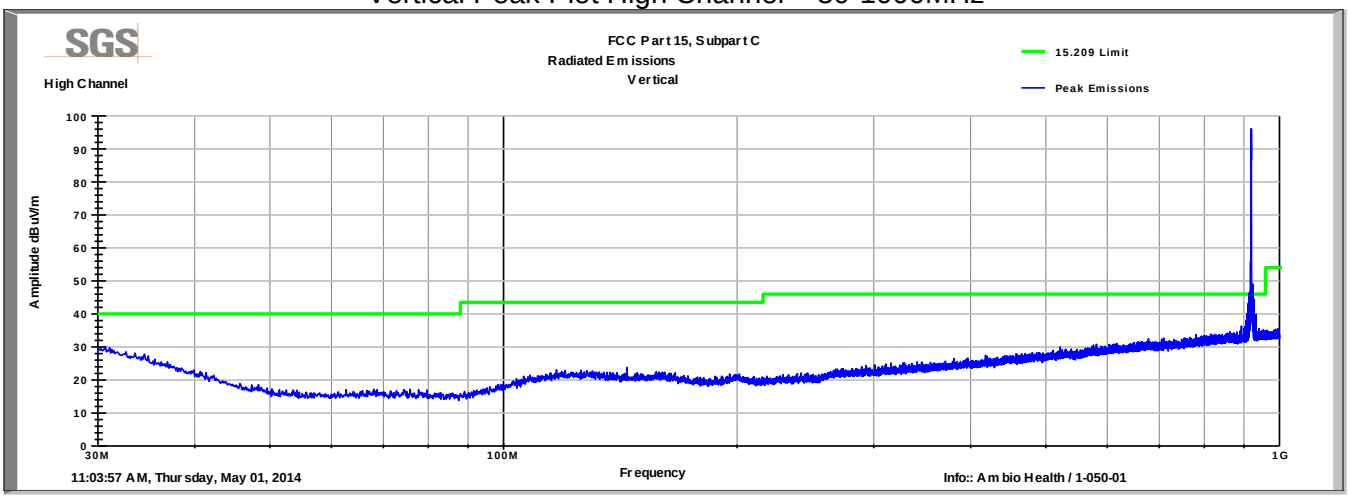
Vertical Peak Plot Middle Channel – 30-1000MHz



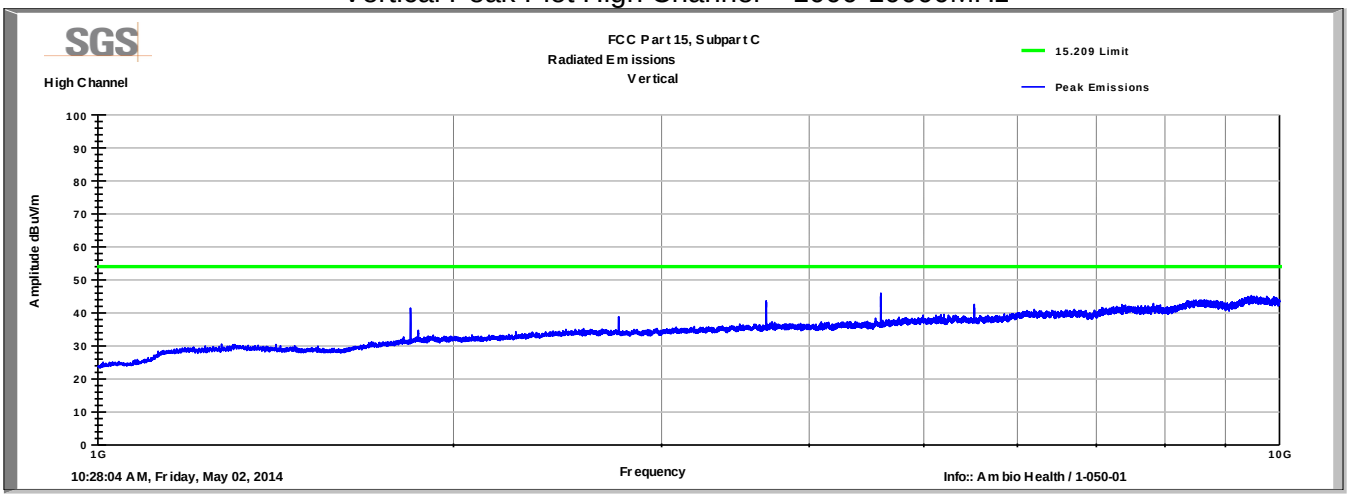
Vertical Peak Plot Middle Channel – 1000-10000MHz



Vertical Peak Plot High Channel – 30-1000MHz



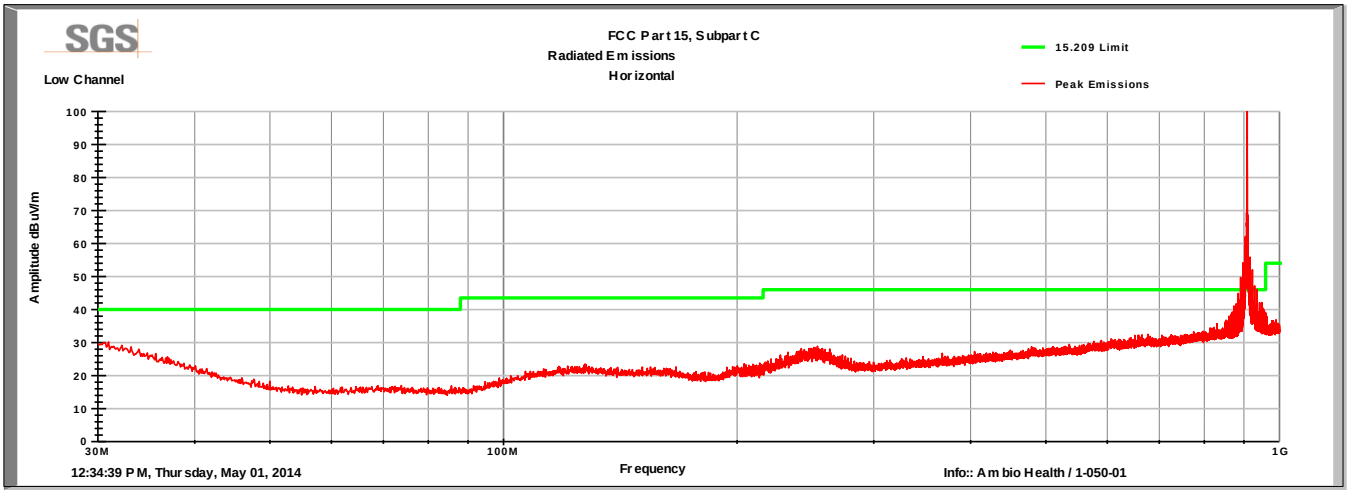
Vertical Peak Plot High Channel – 1000-10000MHz



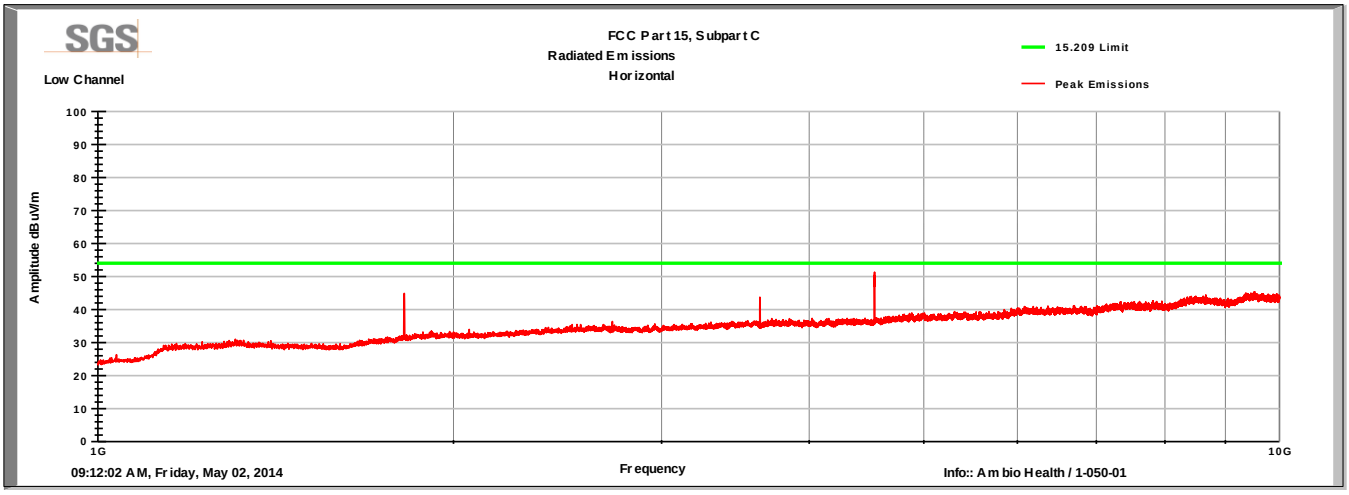
Test Data - Vertical

Frequency MHz	Raw Pk (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Pk Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Low Channel											
1817.23	59.7	V	59.8	348.8	30.4	3.4	42.9	0.0	50.6	74.0	-23.4
1817.23	59.7	V	59.8	348.8	30.4	3.4	42.9	18.8	32.6	54.0	-21.4
3633.43	59.3	V	159.1	371.1	33.2	5	44.4	0.0	53.1	74.0	-20.9
3633.43	59.3	V	159.1	371.1	33.2	5	44.4	18.8	35.1	54.0	-18.9
4543.30	56.6	V	155.5	242.5	34.0	5.7	44.1	0.0	52.2	74.0	-21.8
4543.30	56.6	V	155.5	242.5	34.0	5.7	44.1	18.8	34.2	54.0	-19.8
Middle Channel											
1827.99	58.2	V	59.8	348.8	30.5	3.4	42.9	0.0	49.2	74.0	-24.8
1827.99	58.2	V	59.8	348.8	30.5	3.4	42.9	18.8	31.2	54.0	-22.8
3655.72	57.3	V	59.7	115.6	33.2	5.0	44.4	0.0	51.1	74.0	-22.9
3655.72	57.3	V	59.7	115.6	33.2	5.0	44.4	18.8	33.1	54.0	-20.9
4571.39	57.7	V	283.9	309.2	34	5.7	44.1	0.0	53.3	74.0	-20.7
4571.39	57.7	V	283.9	309.2	34	5.7	44.1	18.8	35.3	54.0	-18.7
High Channel											
1839.17	55.7	V	111.3	320.0	30.6	3.4	42.9	0.0	46.8	74.0	-27.2
1839.17	55.7	V	111.3	320.0	30.6	3.4	42.9	18.8	28.8	54.0	-25.2
3678.4	57.0	V	35.6	333.6	33.2	5	44.4	0.0	50.8	74.0	-23.2
3678.4	57.0	V	35.6	333.6	33.2	5	44.4	18.8	32.8	54.0	-21.2
4599.55	56.6	V	272.1	206.4	34.1	5.7	44.0	0.0	52.4	74.0	-21.6
4599.55	56.6	V	272.1	206.4	34.1	5.7	44.0	18.8	34.4	54.0	-19.6
QP Value = Level + AF + CL - Amp											
Margin = QP Value - Limit											

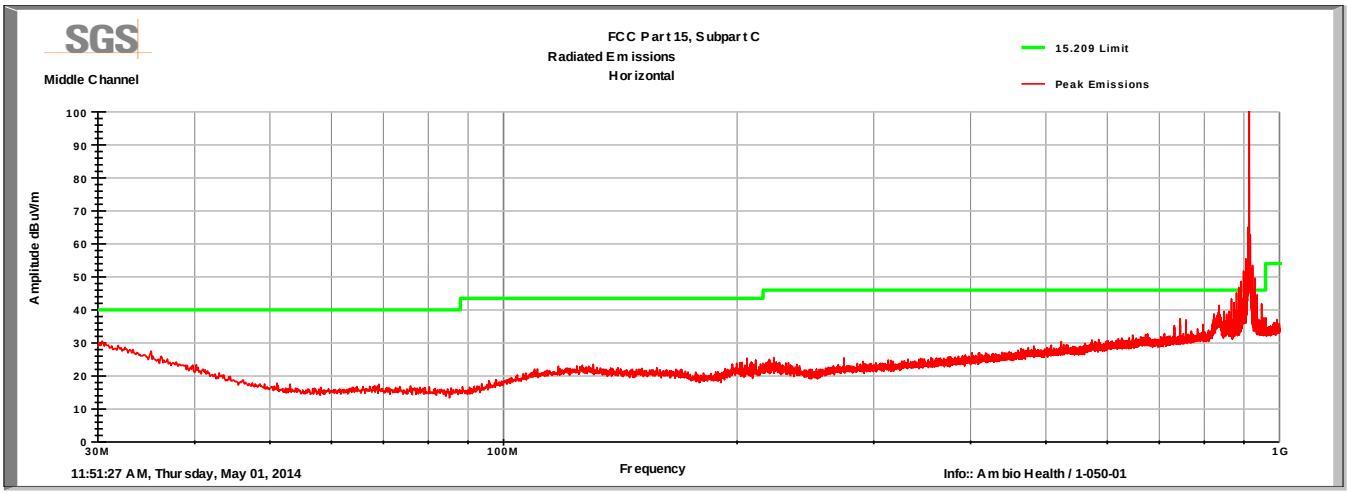
Horizontal Peak Plot Low Channel – 30-1000MHz



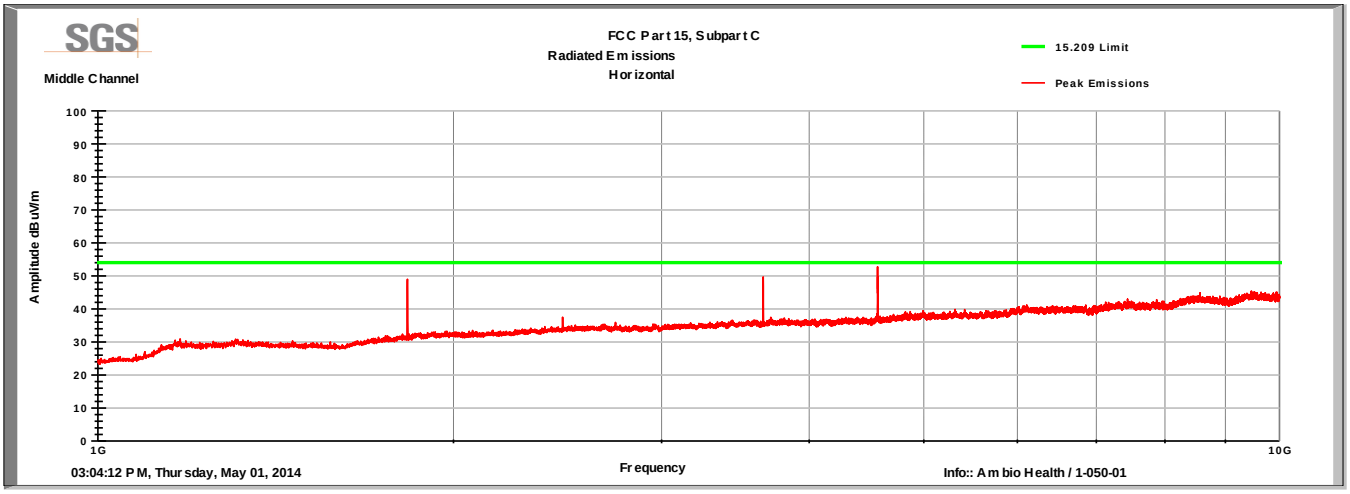
Horizontal Peak Plot Low Channel – 1000-10000MHz



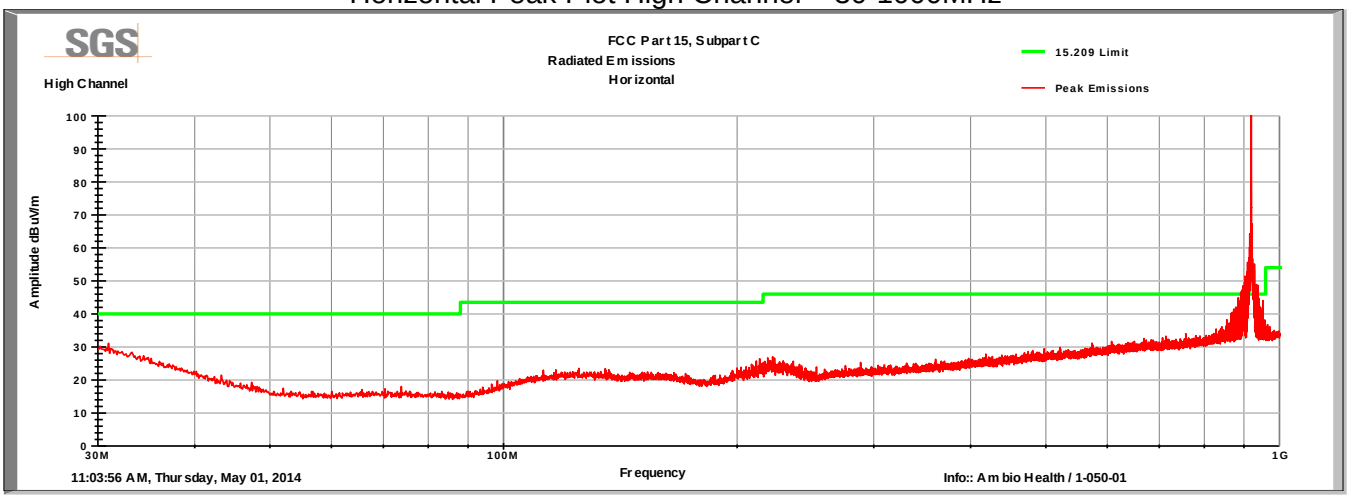
Horizontal Peak Plot Middle Channel – 30-1000MHz



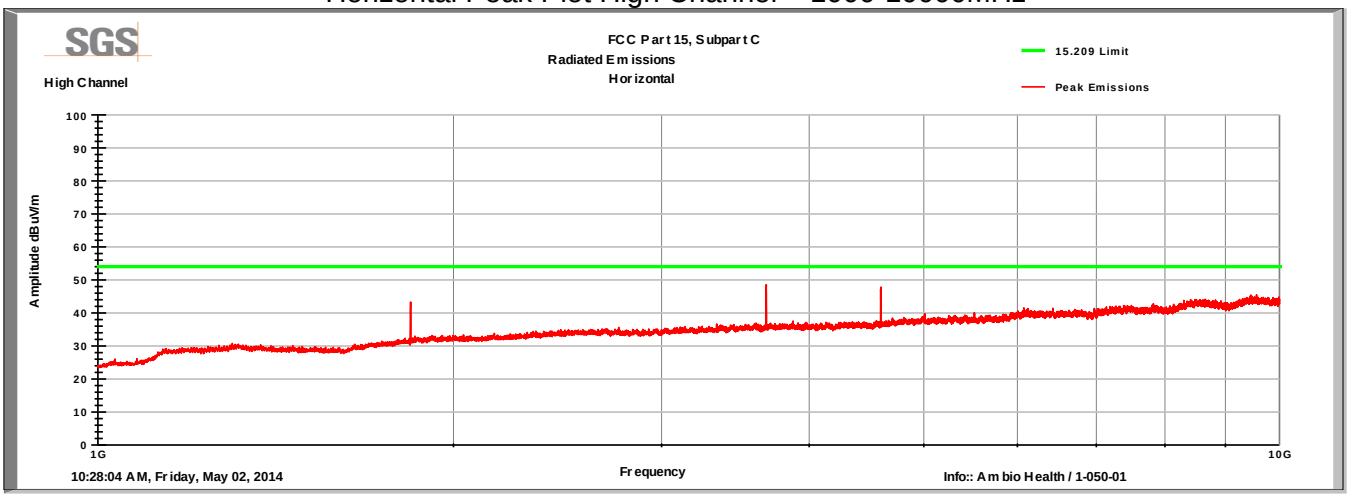
Horizontal Peak Plot Middle Channel – 1000-10000MHz



Horizontal Peak Plot High Channel – 30-1000MHz



Horizontal Peak Plot High Channel – 1000-10000MHz



Test Data - Horizontal

Frequency MHz	Raw Pk (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Pk Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Low Channel											
1817.23	61.3	H	336.7	161.1	30.4	3.4	42.9	0.0	52.2	74.0	-21.8
1817.23	61.3	H	336.7	161.1	30.4	3.4	42.9	18.8	33.4	54.0	-20.6
3633.43	54.4	H	355.9	393.6	33.2	5.0	44.4	0.0	48.2	74.0	-25.8
3633.43	54.4	H	355.9	393.6	33.2	5.0	44.4	18.8	29.4	54.0	-24.6
4543.30	55.7	H	226.0	242.8	34.0	5.7	44.1	0.0	51.3	74.0	-22.7
4543.30	55.7	H	226.0	242.8	34.0	5.7	44.1	18.8	32.5	54.0	-21.5
Middle Channel											
1827.99	62.3	H	349.2	165.7	30.5	3.4	42.9	0.0	53.3	74.0	-20.7
1827.99	62.3	H	349.2	165.7	30.5	3.4	42.9	18.8	34.5	54.0	-19.5
3655.72	58.9	H	328.1	284.4	33.2	5.0	44.4	0.0	52.7	74.0	-21.3
3655.72	58.9	H	328.1	284.4	33.2	5.0	44.4	18.8	33.9	54.0	-20.1
4571.39	56.5	H	83.2	264.7	34.0	5.7	44.1	0.0	52.1	74.0	-21.9
4571.39	56.5	H	83.2	264.7	34.0	5.7	44.1	18.8	33.3	54.0	-20.7
High Channel											
1839.17	61.7	H	342.9	161.6	30.6	3.4	42.9	0.0	52.8	74.0	-21.2
1839.17	61.7	H	342.9	161.6	30.6	3.4	42.9	18.8	34.0	54.0	-20.0
3678.40	57.7	H	317.2	325.6	33.2	5.0	44.4	0.0	51.5	74.0	-22.5
3678.40	57.7	H	317.2	325.6	33.2	5.0	44.4	18.8	32.7	54.0	-21.3
4599.55	53.9	H	99.0	305.9	34.1	5.7	44.0	0.0	49.7	74.0	-24.3
4599.55	53.9	H	99.0	305.9	34.1	5.7	44.0	18.8	30.9	54.0	-23.1
QP Value = Level + AF + CL - Amp											
Margin = QP Value - Limit											

5 Occupied Bandwidth

5.1 *Test Result*

Test Description	Basic Standards	Test Result
Occupied bandwidth	15.215(c)	Report data only

5.2 *Test Method*

Bandwidth measurements were recorded using the 99% bandwidth function of the measurement receiver.

5.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.1 – 23.7°C
Relative Humidity: 39.3 – 55.3 %
Atmospheric Pressure: 98.2 kPa

5.4 *Test Equipment*

Test Date: 1-May-2014

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	21-Jun-2014
ANTENNA, BILOG	JB6	SUNOL	B079689	22-Aug-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079711	16-Sep-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	7-Aug-2014
RF CABLE	SF106	HUBER&SUHNER	B085892	16-Oct-2014
COAXIAL CABLE	1134	GORE	B094785	16-May-2014

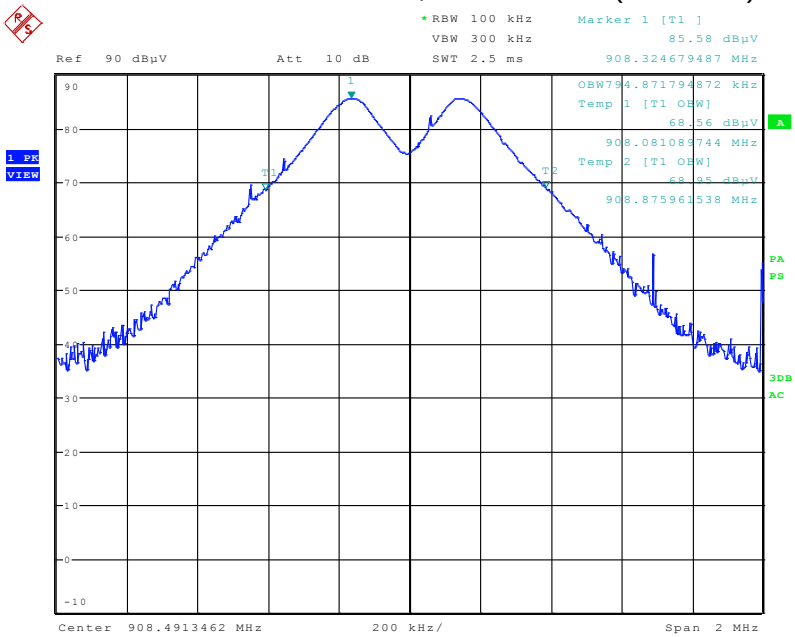
Note: The calibration period equipment is 1 year.

5.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

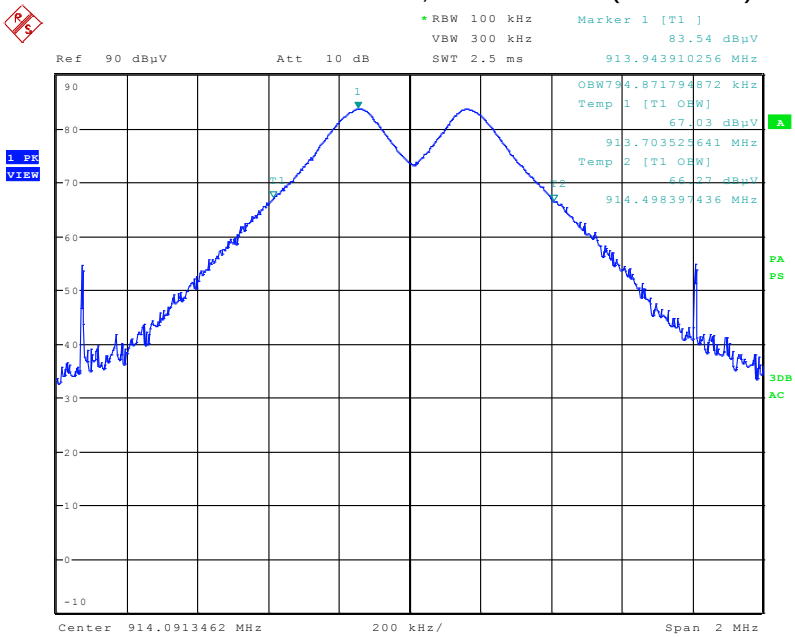
5.6 *Test Data*

99% Bandwidth Plot, Low Channel (794.9kHz)



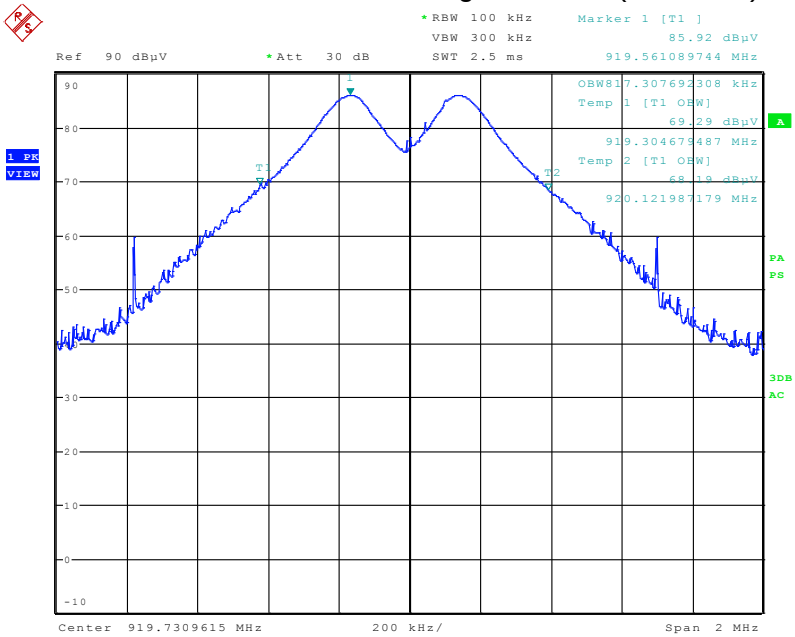
Date: 1.MAY.2014 09:46:16

99% Bandwidth Plot, Mid Channel (794.9kHz)



Date: 1.MAY.2014 09:51:27

99% Bandwidth Plot, High Channel (817.3kHz)



Date: 1.MAY.2014 10:34:21

6 Duty Cycle

6.1 *Test Result*

Test Description	Basic Standards	Test Result
Duty Cycle	--	Reported

6.2 *Test Method*

Clause 7.5 of ANSI C63.10 (2009) was used.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.1 – 23.7°C
Relative Humidity: 39.3 – 55.3 %
Atmospheric Pressure: 98.2 kPa

6.4 *Test Equipment*

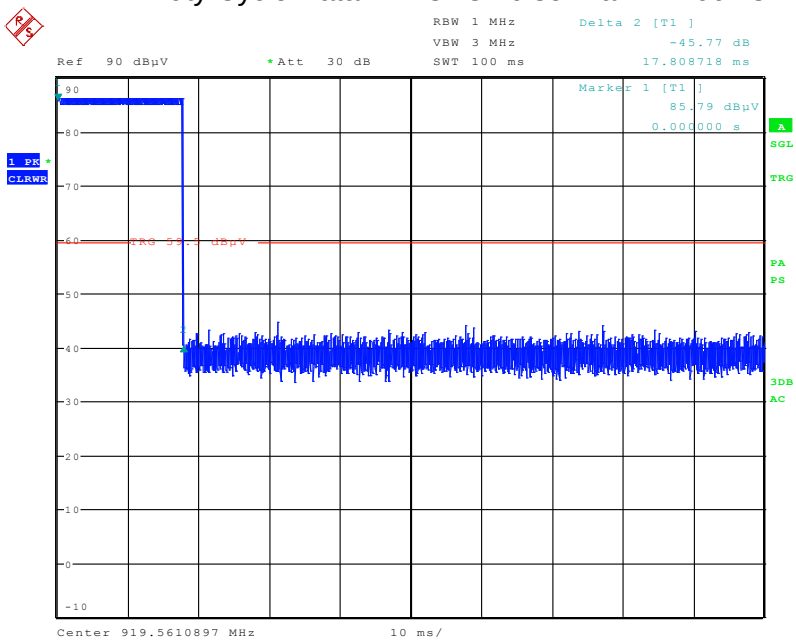
Test Date: 1-May-2014

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	21-Jun-2014
ANTENNA, BILOG	JB6	SUNOL	B079689	22-Aug-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079711	16-Sep-2014
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	7-Aug-2014
RF CABLE	SF106	HUBER&SUHNER	B085892	16-Oct-2014
COAXIAL CABLE	1134	GORE	B094785	16-May-2014
DESKTOP AMPLIFIER 30M-18 GHZ	NSP1800-25-HG	MITEQ	B085930	16-Oct-2014
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	28-Aug-2014

Note: The calibration period equipment is 1 year.

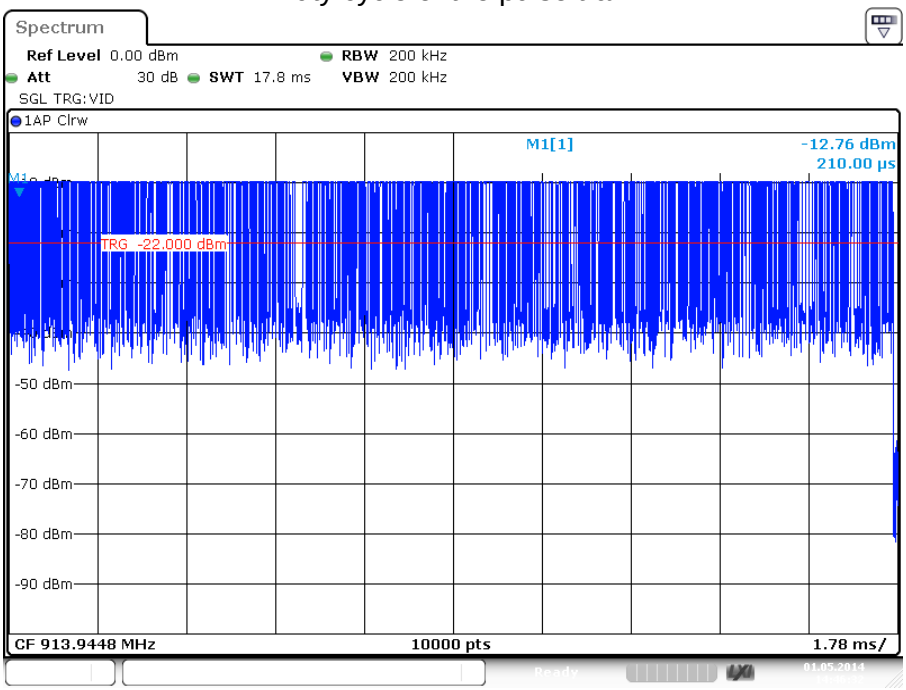
6.5 *Test Data*

Duty Cycle Data - 17.8ms Pulse Train in 100ms



Date: 1.MAY.2014 10:39:28

Duty cycle of the pulse train



Date: 1.MAY.2014 14:46:33

Trace data analyzed by Excel = 64.66% over the pulse train
64.66% * 17.8ms = 11.51% duty cycle over 100ms
20*LOG(1/DC) = 18.8dB correction

7 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	05 May 2014