STMicroelectronics

TEST REPORT FOR

915 MHz Low Power RF Module, Model: SP1ML-915

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.207 & 15.247

Report No.: 95078-11

Date of issue: January 13, 2014

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

STMicroelectronics
Centro Direzionale Colleoni
Palazzo Andromeda 3
Agrate Brianza, 20041
Italy

REPRESENTATIVE: Giuseppe Scrocchi /
Lyle Bainbridge -Fusion Software, Inc.

REPORT PREPARED BY:

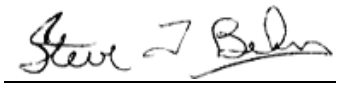
Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 95078

DATE OF EQUIPMENT RECEIPT: December 6, 2013
DATE(S) OF TESTING: December 6 - 16, 2013

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea D	US0060	SL2-IN-E-1146R	3082D-2	100638	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Description	Test Procedure/Method	Results
Voltage Variation	FCC Part 15 Subpart C Section 15.31(e) / 2.1055(d) / KDB 558074	Pass
Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / ANSI C63.4 (2003)	Pass
Radiated Emissions	FCC Part 15 Subpart C Section 15.209/ ANSI C63.4 (2003)	Pass
6dB Bandwidth	FCC Part 15 Subpart C Section 15.247(a)(2) / KDB 558074	Pass
RF Power Output	FCC Part 15 Subpart C Section 15.247(b)(3) / KDB 558074	Pass
Spurious Emissions	FCC Part 15 Subpart C 15.247(d)/ KDB 558074	Pass
Band Edge Compliance	FCC Part 15 Subpart C Section 15.247 / ITU-R 55/1 / KDB 558074	Pass
Power Spectral Density	FCC Part 15 Subpart C 15.247(e) / KDB 558074	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

915 MHz Low Power RF Module
Manuf: STMicroelectronics
Model: SP1ML-915
Serial: Unit #1

PERIPHERAL DEVICES

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

Module Dev Board
Manuf: STMicroelectronics
Model: SPIRIT1
Serial: 05

AC to USB Power Adapter
Manuf: Rhino
Model: PSNC-75M
Serial: 12-B013481

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

15.31(e) Voltage Variations

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.31(e)**
Work Order #: **95078** Date: 12/11/2013
Test Type: **Voltage Variation on Power**
Equipment: **915 MHz Low Power RF Module**
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
AN01438	DC Power Supply	6306D	1/11/2013	1/11/2015
AN01830	Multimeter	45	1/8/2013	1/8/2015
ANP05555	Cable	RG223/U	6/19/2012	6/19/2014

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power to the integral antenna. Frequency range of test 902 MHz to 928 MHz. Operating range of EUT 902 MHz to 928 MHz. RBW=620kHz, VBW=3MHz for 2FSK and GFSK. RBW=750kHz, VBW=3MHz for MSK. Site D. Temperature: 21°C, Humidity: 38%, Pressure: 100kPa. Manufacturer declared nominal voltage is 2.5Vdc. The supply voltage was varied between 85% and 115% of the nominal rated voltage. There was no variation in power for the supply voltage at 85% and 115% of the nominal rated voltage.

15.31(e)

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

15.31(e) 2FSK

Output Power 2FSK

903MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0022 W
915MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0017 W
927MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0009 W

15.31(e) GFSK

Output Power GFSK

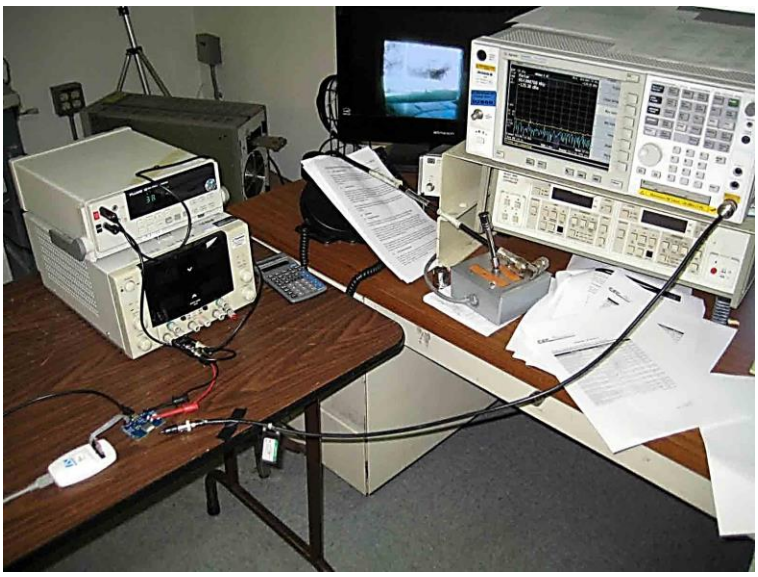
903MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0022 W
915MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0015 W
927MHz at 85% nominal voltage, and 115% of nominal voltage = 0.001 W

15.31(e) MSK

Output Power MSK

903MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0025 W
915MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0033 W
927MHz at 85% nominal voltage, and 115% of nominal voltage = 0.0015 W

Test Setup Photos



15.207 AC Conducted Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.207 AC Mains - Average**
Work Order #: **95078** Date: 12/6/2013
Test Type: **Conducted Emissions** Time: 4:32:50 PM
Equipment: **915 MHz Low Power RF Module** Sequence#: 10
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915 120V 60Hz
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T4	AN00848.1	50uH LISN-Line 1 (L1) (dB)	3816/2nm	3/14/2013	3/14/2015
	AN00848.1	50uH LISN-Line 2 (L2) (dB)	3816/2nm	3/14/2013	3/14/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with 2FSK at the highest power channel. Frequency range of data sheet is 150kHz to 30MHz. 150kHz-30MHz RBW=9kHz=VBW. Site D. Temperature: 21°C, Humidity: 43%, Pressure: 100kPa.

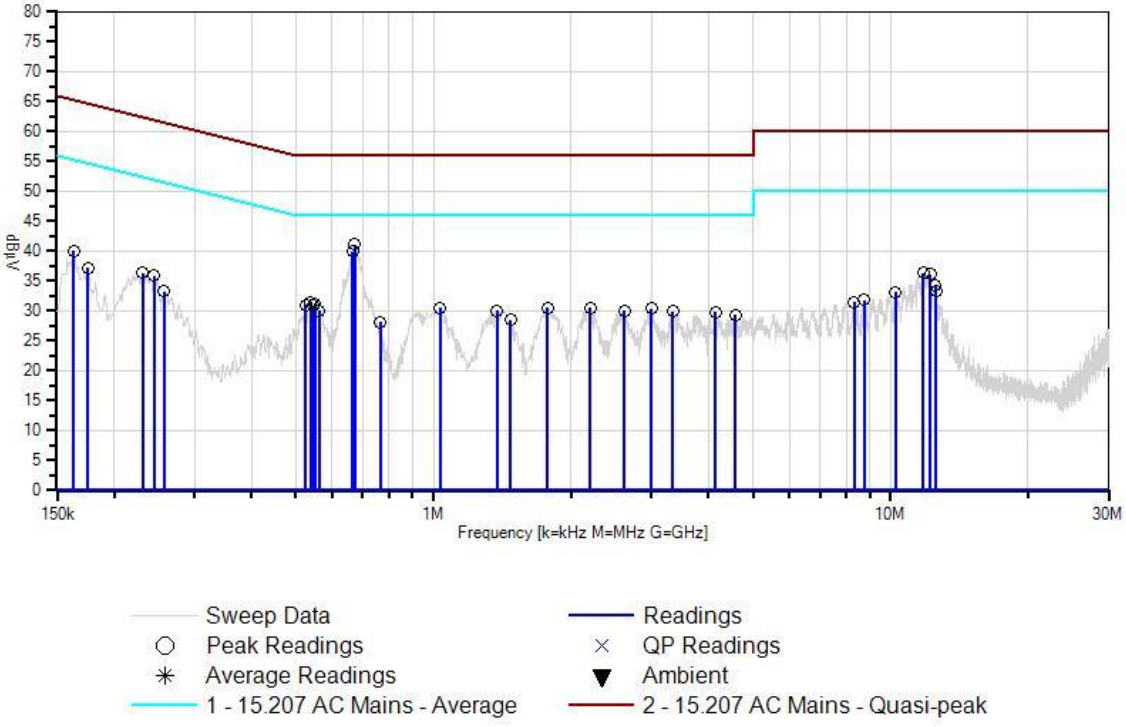
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L1(L)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	673.588k	35.0	+0.2	+0.1	+5.7	+0.1	+0.0	41.1	46.0	-4.9	L1(L)
2	665.589k	33.8	+0.2	+0.1	+5.7	+0.1	+0.0	39.9	46.0	-6.1	L1(L)
3	11.797M	29.8	+0.2	+0.3	+5.8	+0.3	+0.0	36.4	50.0	-13.6	L1(L)
4	12.202M	29.5	+0.2	+0.3	+5.8	+0.3	+0.0	36.1	50.0	-13.9	L1(L)
5	537.601k	25.5	+0.2	+0.1	+5.7	+0.0	+0.0	31.5	46.0	-14.5	L1(L)
6	549.963k	25.2	+0.2	+0.1	+5.7	+0.1	+0.0	31.3	46.0	-14.7	L1(L)
7	525.966k	25.0	+0.2	+0.1	+5.7	+0.0	+0.0	31.0	46.0	-15.0	L1(L)
8	544.873k	24.9	+0.2	+0.1	+5.7	+0.0	+0.0	30.9	46.0	-15.1	L1(L)
9	163.090k	33.9	+0.4	+0.1	+5.7	+0.0	+0.0	40.1	55.3	-15.2	L1(L)
10	1.035M	24.5	+0.1	+0.1	+5.7	+0.1	+0.0	30.5	46.0	-15.5	L1(L)
11	1.779M	24.4	+0.2	+0.1	+5.7	+0.1	+0.0	30.5	46.0	-15.5	L1(L)
12	2.204M	24.4	+0.2	+0.1	+5.7	+0.1	+0.0	30.5	46.0	-15.5	L1(L)
13	2.995M	24.2	+0.2	+0.2	+5.7	+0.1	+0.0	30.4	46.0	-15.6	L1(L)
14	12.526M	27.6	+0.2	+0.4	+5.8	+0.3	+0.0	34.3	50.0	-15.7	L1(L)
15	2.621M	23.9	+0.2	+0.2	+5.7	+0.1	+0.0	30.1	46.0	-15.9	L1(L)
16	561.599k	24.0	+0.2	+0.1	+5.7	+0.1	+0.0	30.1	46.0	-15.9	L1(L)
17	230.720k	30.4	+0.2	+0.1	+5.7	+0.0	+0.0	36.4	52.4	-16.0	L1(L)
18	244.537k	29.9	+0.2	+0.1	+5.7	+0.0	+0.0	35.9	51.9	-16.0	L1(L)
19	1.375M	24.0	+0.1	+0.1	+5.7	+0.1	+0.0	30.0	46.0	-16.0	L1(L)
20	3.335M	23.8	+0.1	+0.2	+5.7	+0.1	+0.0	29.9	46.0	-16.1	L1(L)
21	4.139M	23.7	+0.1	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	L1(L)
22	12.589M	26.7	+0.2	+0.4	+5.8	+0.3	+0.0	33.4	50.0	-16.6	L1(L)
23	4.577M	23.2	+0.1	+0.2	+5.7	+0.1	+0.0	29.3	46.0	-16.7	L1(L)
24	10.265M	26.5	+0.2	+0.3	+5.8	+0.3	+0.0	33.1	50.0	-16.9	L1(L)

25	175.452k	31.0	+0.4	+0.1	+5.7	+0.0	+0.0	37.2	54.7	-17.5	L1(L)
26	1.477M	22.4	+0.2	+0.1	+5.7	+0.1	+0.0	28.5	46.0	-17.5	L1(L)
27	765.216k	22.2	+0.1	+0.1	+5.7	+0.1	+0.0	28.2	46.0	-17.8	L1(L)
28	257.626k	27.3	+0.2	+0.1	+5.7	+0.0	+0.0	33.3	51.5	-18.2	L1(L)
29	8.770M	25.3	+0.2	+0.3	+5.8	+0.2	+0.0	31.8	50.0	-18.2	L1(L)
30	8.328M	25.0	+0.2	+0.3	+5.8	+0.2	+0.0	31.5	50.0	-18.5	L1(L)

CKC Laboratories, Inc. Date: 12/6/2013 Time: 4:32:50 PM STMicroelectronics WO#: 95078
15.207 AC Mains - Average Test Lead: L1(L) 120V 60Hz Sequence#: 10 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.207 AC Mains - Average**
Work Order #: **95078** Date: 12/6/2013
Test Type: **Conducted Emissions** Time: 4:41:02 PM
Equipment: **915 MHz Low Power RF Module** Sequence#: 11
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915 120V 60Hz
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
	AN00848.1	50uH LISN-Line 1 (L1) (dB)	3816/2nm	3/14/2013	3/14/2015
T4	AN00848.1	50uH LISN-Line 2 (L2) (dB)	3816/2nm	3/14/2013	3/14/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with 2FSK at the highest power channel. Frequency range of data sheet is 150kHz to 30MHz. 150kHz-30MHz RBW=9kHz=VBW. Site D. Temperature: 21°C, Humidity: 43%, Pressure: 100kPa.

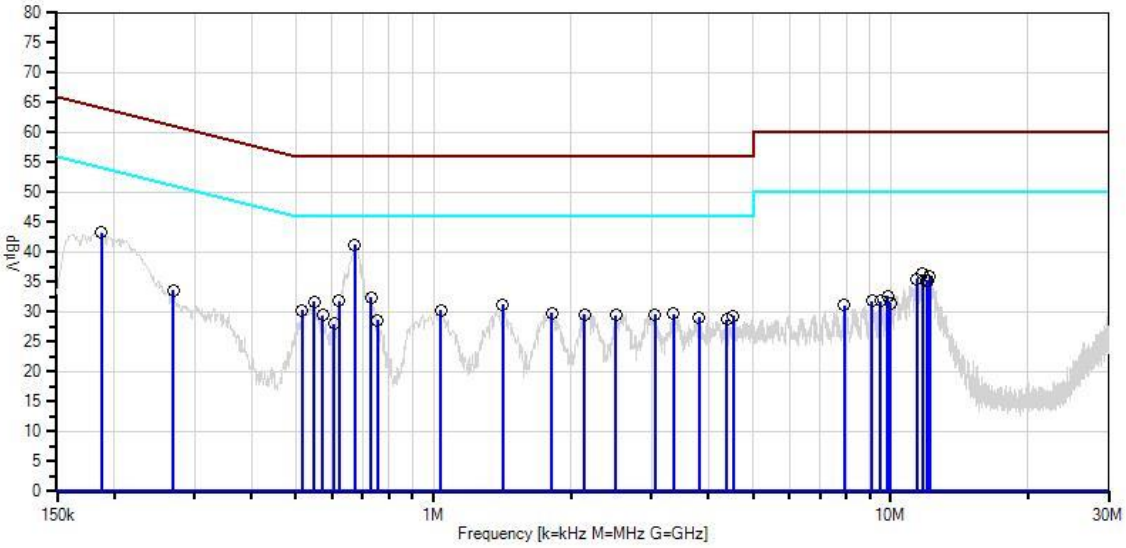
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: (N)L2

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	673.588k	35.3	+0.2	+0.1	+5.7	+0.0	+0.0	41.3	46.0	-4.7	(N)L2
2	187.815k	37.3	+0.2	+0.1	+5.7	+0.0	+0.0	43.3	54.1	-10.8	(N)L2
3	730.310k	26.5	+0.1	+0.1	+5.7	+0.0	+0.0	32.4	46.0	-13.6	(N)L2
4	11.761M	29.8	+0.2	+0.3	+5.8	+0.3	+0.0	36.4	50.0	-13.6	(N)L2
5	12.166M	29.4	+0.2	+0.3	+5.8	+0.3	+0.0	36.0	50.0	-14.0	(N)L2

6	620.502k	25.9	+0.2	+0.1	+5.7	+0.0	+0.0	31.9	46.0	-14.1	(N)L2
7	547.782k	25.6	+0.2	+0.1	+5.7	+0.1	+0.0	31.7	46.0	-14.3	(N)L2
8	11.418M	28.9	+0.2	+0.3	+5.8	+0.3	+0.0	35.5	50.0	-14.5	(N)L2
9	1.417M	25.2	+0.2	+0.1	+5.7	+0.1	+0.0	31.3	46.0	-14.7	(N)L2
10	11.986M	28.7	+0.2	+0.3	+5.8	+0.3	+0.0	35.3	50.0	-14.7	(N)L2
11	12.076M	28.7	+0.2	+0.3	+5.8	+0.3	+0.0	35.3	50.0	-14.7	(N)L2
12	515.057k	24.2	+0.2	+0.1	+5.7	+0.1	+0.0	30.3	46.0	-15.7	(N)L2
13	1.039M	24.3	+0.1	+0.1	+5.7	+0.1	+0.0	30.3	46.0	-15.7	(N)L2
14	1.813M	23.7	+0.2	+0.1	+5.7	+0.1	+0.0	29.8	46.0	-16.2	(N)L2
15	3.348M	23.6	+0.1	+0.2	+5.7	+0.1	+0.0	29.7	46.0	-16.3	(N)L2
16	2.140M	23.5	+0.2	+0.1	+5.7	+0.1	+0.0	29.6	46.0	-16.4	(N)L2
17	3.050M	23.4	+0.2	+0.2	+5.7	+0.1	+0.0	29.6	46.0	-16.4	(N)L2
18	572.507k	23.4	+0.2	+0.1	+5.7	+0.1	+0.0	29.5	46.0	-16.5	(N)L2
19	2.510M	23.3	+0.2	+0.2	+5.7	+0.1	+0.0	29.5	46.0	-16.5	(N)L2
20	4.522M	23.2	+0.1	+0.2	+5.7	+0.1	+0.0	29.3	46.0	-16.7	(N)L2
21	3.807M	23.0	+0.1	+0.2	+5.7	+0.1	+0.0	29.1	46.0	-16.9	(N)L2
22	4.390M	22.6	+0.1	+0.2	+5.7	+0.1	+0.0	28.7	46.0	-17.3	(N)L2
23	9.869M	26.1	+0.2	+0.3	+5.8	+0.3	+0.0	32.7	50.0	-17.3	(N)L2
24	752.854k	22.7	+0.1	+0.1	+5.7	+0.0	+0.0	28.6	46.0	-17.4	(N)L2
25	269.989k	27.6	+0.2	+0.1	+5.7	+0.0	+0.0	33.6	51.1	-17.5	(N)L2
26	606.685k	22.0	+0.2	+0.1	+5.7	+0.0	+0.0	28.0	46.0	-18.0	(N)L2
27	9.112M	25.2	+0.2	+0.3	+5.8	+0.3	+0.0	31.8	50.0	-18.2	(N)L2
28	9.508M	25.2	+0.2	+0.3	+5.8	+0.3	+0.0	31.8	50.0	-18.2	(N)L2
29	9.995M	24.9	+0.2	+0.3	+5.8	+0.3	+0.0	31.5	50.0	-18.5	(N)L2
30	7.923M	24.6	+0.2	+0.3	+5.8	+0.2	+0.0	31.1	50.0	-18.9	(N)L2

CKC Laboratories, Inc. Date: 12/6/2013 Time: 4:41:02 PM STMicroelectronics WO#: 95078
15.207 AC Mains - Average Test Lead: (N)L2 120V 60Hz Sequence#: 11 Ext ATTN: 0 dB



Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.207 AC Mains - Average**
Work Order #: **95078** Date: 12/10/2013
Test Type: **Conducted Emissions** Time: 4:15:59 PM
Equipment: **915 MHz Low Power RF Module** Sequence#: 12
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915 120V 60Hz
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T4	AN00848.1	50uH LISN-Line 1 (L1) (dB)	3816/2nm	3/14/2013	3/14/2015
	AN00848.1	50uH LISN-Line 2 (L2) (dB)	3816/2nm	3/14/2013	3/14/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with MSK at the highest power channel. Frequency range of data sheet is 150kHz to 30MHz. 150kHz-30MHz RBW=9kHz=VBW. Site D. Temperature: 22°C, Humidity: 31%, Pressure: 100kPa.

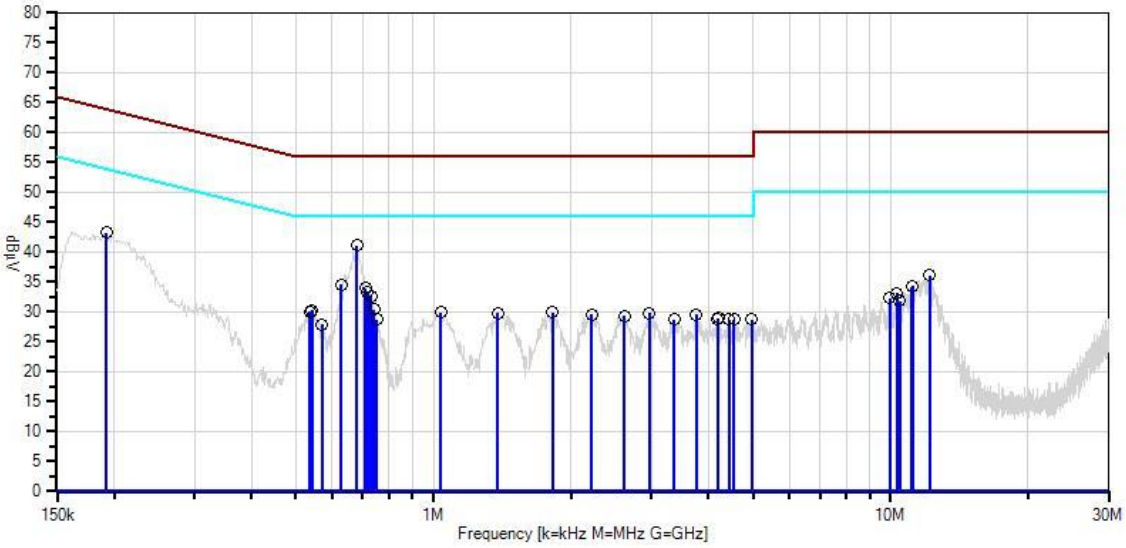
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L1(L)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	679.406k	35.0	+0.2	+0.1	+5.7	+0.1	+0.0	41.1	46.0	-4.9	L1(L)
2	192.178k	37.3	+0.2	+0.1	+5.7	+0.0	+0.0	43.3	53.9	-10.6	L1(L)
3	628.502k	28.5	+0.2	+0.1	+5.7	+0.1	+0.0	34.6	46.0	-11.4	L1(L)
4	708.494k	28.0	+0.1	+0.1	+5.7	+0.1	+0.0	34.0	46.0	-12.0	L1(L)
5	716.493k	27.4	+0.1	+0.1	+5.7	+0.1	+0.0	33.4	46.0	-12.6	L1(L)

6	731.038k	26.7	+0.1	+0.1	+5.7	+0.1	+0.0	32.7	46.0	-13.3	L1(L)
7	12.175M	29.5	+0.2	+0.3	+5.8	+0.3	+0.0	36.1	50.0	-13.9	L1(L)
8	741.218k	24.4	+0.1	+0.1	+5.7	+0.1	+0.0	30.4	46.0	-15.6	L1(L)
9	541.964k	24.3	+0.2	+0.1	+5.7	+0.0	+0.0	30.3	46.0	-15.7	L1(L)
10	11.166M	27.7	+0.2	+0.3	+5.8	+0.3	+0.0	34.3	50.0	-15.7	L1(L)
11	11.121M	27.6	+0.2	+0.3	+5.8	+0.3	+0.0	34.2	50.0	-15.8	L1(L)
12	536.146k	24.0	+0.2	+0.1	+5.7	+0.0	+0.0	30.0	46.0	-16.0	L1(L)
13	1.039M	23.9	+0.1	+0.1	+5.7	+0.1	+0.0	29.9	46.0	-16.1	L1(L)
14	1.821M	23.8	+0.2	+0.1	+5.7	+0.1	+0.0	29.9	46.0	-16.1	L1(L)
15	2.961M	23.6	+0.2	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	L1(L)
16	1.383M	23.8	+0.1	+0.1	+5.7	+0.1	+0.0	29.8	46.0	-16.2	L1(L)
17	2.217M	23.5	+0.2	+0.1	+5.7	+0.1	+0.0	29.6	46.0	-16.4	L1(L)
18	3.756M	23.5	+0.1	+0.2	+5.7	+0.1	+0.0	29.6	46.0	-16.4	L1(L)
19	2.617M	23.2	+0.2	+0.2	+5.7	+0.1	+0.0	29.4	46.0	-16.6	L1(L)
20	10.337M	26.5	+0.2	+0.3	+5.8	+0.3	+0.0	33.1	50.0	-16.9	L1(L)
21	4.199M	22.9	+0.1	+0.2	+5.7	+0.1	+0.0	29.0	46.0	-17.0	L1(L)
22	4.177M	22.8	+0.1	+0.2	+5.7	+0.1	+0.0	28.9	46.0	-17.1	L1(L)
23	4.547M	22.7	+0.1	+0.2	+5.7	+0.1	+0.0	28.8	46.0	-17.2	L1(L)
24	4.977M	22.7	+0.1	+0.2	+5.7	+0.1	+0.0	28.8	46.0	-17.2	L1(L)
25	750.672k	22.7	+0.1	+0.1	+5.7	+0.1	+0.0	28.7	46.0	-17.3	L1(L)
26	3.361M	22.6	+0.1	+0.2	+5.7	+0.1	+0.0	28.7	46.0	-17.3	L1(L)
27	4.428M	22.6	+0.1	+0.2	+5.7	+0.1	+0.0	28.7	46.0	-17.3	L1(L)
28	9.968M	25.7	+0.2	+0.3	+5.8	+0.3	+0.0	32.3	50.0	-17.7	L1(L)
29	570.325k	21.8	+0.2	+0.1	+5.7	+0.1	+0.0	27.9	46.0	-18.1	L1(L)
30	10.481M	25.3	+0.2	+0.3	+5.8	+0.3	+0.0	31.9	50.0	-18.1	L1(L)

CKC Laboratories, Inc. Date: 12/10/2013 Time: 4:15:59 PM STMicroelectronics WO#: 95078
15.207 AC Mains - Average Test Lead: L1(L) 120V 60Hz Sequence#: 12 Ext ATTN: 0 dB



Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.207 AC Mains - Average**
Work Order #: **95078** Date: 12/10/2013
Test Type: **Conducted Emissions** Time: 4:19:31 PM
Equipment: **915 MHz Low Power RF Module** Sequence#: 13
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915 120V 60Hz
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
	AN00848.1	50uH LISN-Line 1 (L1) (dB)	3816/2nm	3/14/2013	3/14/2015
T4	AN00848.1	50uH LISN-Line 2 (L2) (dB)	3816/2nm	3/14/2013	3/14/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to 5Vdc USB power adapter. The EUT is continuously transmitting at its rated maximum power with MSK at the highest power channel. Frequency range of data sheet is 150kHz to 30MHz. 150kHz-30MHz RBW=9kHz=VBW. Site D. Temperature: 22°C, Humidity: 31%, Pressure: 100kPa.

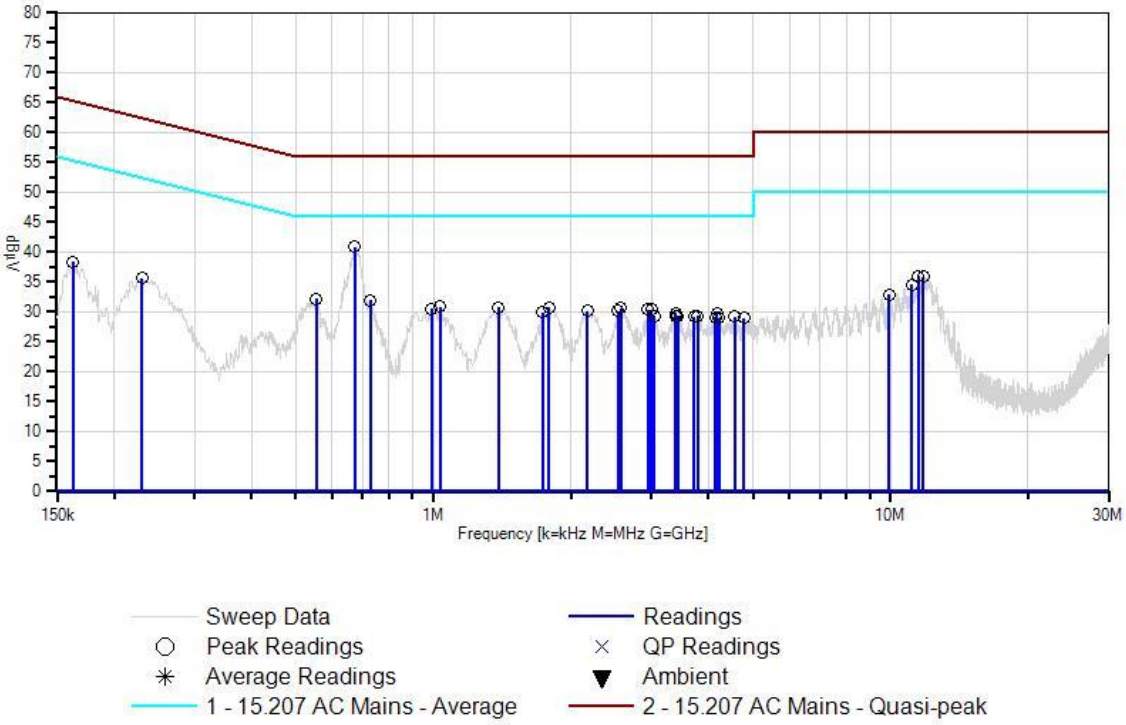
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: (N)L2

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	672.861k	34.9	+0.2	+0.1	+5.7	+0.0	+0.0	40.9	46.0	-5.1	(N)L2
2	553.599k	26.1	+0.2	+0.1	+5.7	+0.1	+0.0	32.2	46.0	-13.8	(N)L2
3	728.129k	26.1	+0.1	+0.1	+5.7	+0.0	+0.0	32.0	46.0	-14.0	(N)L2
4	11.508M	29.4	+0.2	+0.3	+5.8	+0.3	+0.0	36.0	50.0	-14.0	(N)L2
5	11.806M	29.3	+0.2	+0.3	+5.8	+0.3	+0.0	35.9	50.0	-14.1	(N)L2

6	1.035M	24.9	+0.1	+0.1	+5.7	+0.1	+0.0	30.9	46.0	-15.1	(N)L2
7	1.388M	24.8	+0.1	+0.1	+5.7	+0.1	+0.0	30.8	46.0	-15.2	(N)L2
8	1.792M	24.7	+0.2	+0.1	+5.7	+0.1	+0.0	30.8	46.0	-15.2	(N)L2
9	2.574M	24.5	+0.2	+0.2	+5.7	+0.1	+0.0	30.7	46.0	-15.3	(N)L2
10	11.130M	28.0	+0.2	+0.3	+5.8	+0.3	+0.0	34.6	50.0	-15.4	(N)L2
11	992.029k	24.5	+0.1	+0.1	+5.7	+0.1	+0.0	30.5	46.0	-15.5	(N)L2
12	2.948M	24.2	+0.2	+0.2	+5.7	+0.1	+0.0	30.4	46.0	-15.6	(N)L2
13	2.999M	24.2	+0.2	+0.2	+5.7	+0.1	+0.0	30.4	46.0	-15.6	(N)L2
14	2.174M	24.1	+0.2	+0.1	+5.7	+0.1	+0.0	30.2	46.0	-15.8	(N)L2
15	2.532M	24.0	+0.2	+0.2	+5.7	+0.1	+0.0	30.2	46.0	-15.8	(N)L2
16	1.732M	23.8	+0.2	+0.1	+5.7	+0.1	+0.0	29.9	46.0	-16.1	(N)L2
17	3.391M	23.7	+0.1	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	(N)L2
18	4.173M	23.7	+0.1	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	(N)L2
19	3.038M	23.2	+0.2	+0.2	+5.7	+0.1	+0.0	29.4	46.0	-16.6	(N)L2
20	3.782M	23.3	+0.1	+0.2	+5.7	+0.1	+0.0	29.4	46.0	-16.6	(N)L2
21	3.429M	23.2	+0.1	+0.2	+5.7	+0.1	+0.0	29.3	46.0	-16.7	(N)L2
22	3.399M	23.1	+0.1	+0.2	+5.7	+0.1	+0.0	29.2	46.0	-16.8	(N)L2
23	229.993k	29.6	+0.2	+0.1	+5.7	+0.0	+0.0	35.6	52.4	-16.8	(N)L2
24	4.564M	23.1	+0.1	+0.2	+5.7	+0.1	+0.0	29.2	46.0	-16.8	(N)L2
25	3.722M	23.1	+0.1	+0.2	+5.7	+0.1	+0.0	29.2	46.0	-16.8	(N)L2
26	162.363k	32.1	+0.5	+0.1	+5.7	+0.0	+0.0	38.4	55.3	-16.9	(N)L2
27	4.143M	23.0	+0.1	+0.2	+5.7	+0.1	+0.0	29.1	46.0	-16.9	(N)L2
28	4.207M	22.9	+0.1	+0.2	+5.7	+0.1	+0.0	29.0	46.0	-17.0	(N)L2
29	4.785M	22.9	+0.1	+0.2	+5.7	+0.1	+0.0	29.0	46.0	-17.0	(N)L2
30	9.914M	26.3	+0.2	+0.3	+5.8	+0.3	+0.0	32.9	50.0	-17.1	(N)L2

CKC Laboratories, Inc. Date: 12/10/2013 Time: 4:19:31 PM STMicroelectronics WO#: 95078
15.207 AC Mains - Average Test Lead: (N)L2 120V 60Hz Sequence#: 13 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.207 AC Mains - Average**
Work Order #: **95078** Date: 12/10/2013
Test Type: **Conducted Emissions** Time: 4:24:42 PM
Equipment: **915 MHz Low Power RF Module** Sequence#: 14
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915 120V 60Hz
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T4	AN00848.1	50uH LISN-Line 1 (L1) (dB)	3816/2nm	3/14/2013	3/14/2015
	AN00848.1	50uH LISN-Line 2 (L2) (dB)	3816/2nm	3/14/2013	3/14/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with GFSK at the highest power channel. Frequency range of data sheet is 150kHz to 30MHz. 150kHz-30MHz RBW=9kHz=VBW. Site D. Temperature: 22°C, Humidity: 31%, Pressure: 100kPa.

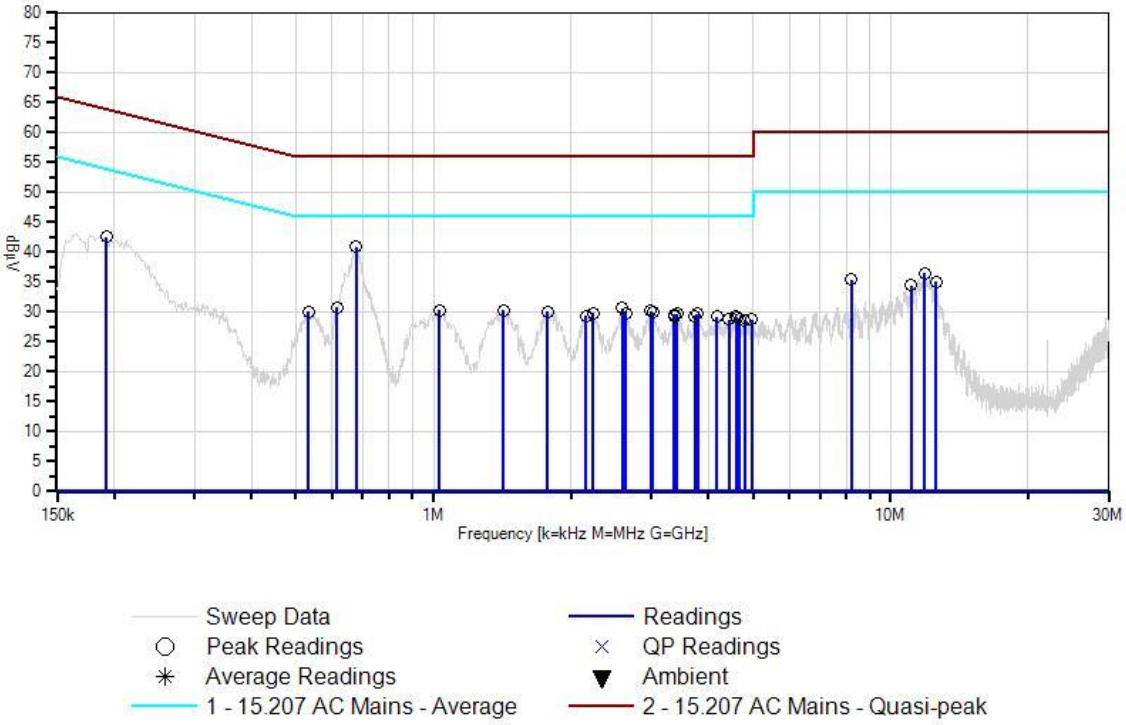
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L1(L)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	676.497k	34.8	+0.2	+0.1	+5.7	+0.1	+0.0	40.9	46.0	-5.1	L1(L)
2	192.178k	36.6	+0.2	+0.1	+5.7	+0.0	+0.0	42.6	53.9	-11.3	L1(L)
3	11.860M	29.9	+0.2	+0.3	+5.8	+0.3	+0.0	36.5	50.0	-13.5	L1(L)
4	8.202M	28.9	+0.2	+0.3	+5.8	+0.2	+0.0	35.4	50.0	-14.6	L1(L)
5	12.598M	28.4	+0.2	+0.4	+5.8	+0.3	+0.0	35.1	50.0	-14.9	L1(L)

6	613.957k	24.7	+0.2	+0.1	+5.7	+0.1	+0.0	30.8	46.0	-15.2	L1(L)
7	2.591M	24.5	+0.2	+0.2	+5.7	+0.1	+0.0	30.7	46.0	-15.3	L1(L)
8	11.103M	27.9	+0.2	+0.3	+5.8	+0.3	+0.0	34.5	50.0	-15.5	L1(L)
9	1.030M	24.3	+0.1	+0.1	+5.7	+0.1	+0.0	30.3	46.0	-15.7	L1(L)
10	1.422M	24.2	+0.2	+0.1	+5.7	+0.1	+0.0	30.3	46.0	-15.7	L1(L)
11	2.991M	24.0	+0.2	+0.2	+5.7	+0.1	+0.0	30.2	46.0	-15.8	L1(L)
12	1.779M	24.0	+0.2	+0.1	+5.7	+0.1	+0.0	30.1	46.0	-15.9	L1(L)
13	531.783k	24.0	+0.2	+0.1	+5.7	+0.0	+0.0	30.0	46.0	-16.0	L1(L)
14	3.016M	23.7	+0.2	+0.2	+5.7	+0.1	+0.0	29.9	46.0	-16.1	L1(L)
15	2.638M	23.6	+0.2	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	L1(L)
16	2.234M	23.7	+0.2	+0.1	+5.7	+0.1	+0.0	29.8	46.0	-16.2	L1(L)
17	3.412M	23.6	+0.1	+0.2	+5.7	+0.1	+0.0	29.7	46.0	-16.3	L1(L)
18	3.765M	23.6	+0.1	+0.2	+5.7	+0.1	+0.0	29.7	46.0	-16.3	L1(L)
19	3.790M	23.6	+0.1	+0.2	+5.7	+0.1	+0.0	29.7	46.0	-16.3	L1(L)
20	3.357M	23.5	+0.1	+0.2	+5.7	+0.1	+0.0	29.6	46.0	-16.4	L1(L)
21	2.153M	23.2	+0.2	+0.1	+5.7	+0.1	+0.0	29.3	46.0	-16.7	L1(L)
22	3.369M	23.2	+0.1	+0.2	+5.7	+0.1	+0.0	29.3	46.0	-16.7	L1(L)
23	3.727M	23.2	+0.1	+0.2	+5.7	+0.1	+0.0	29.3	46.0	-16.7	L1(L)
24	4.169M	23.1	+0.1	+0.2	+5.7	+0.1	+0.0	29.2	46.0	-16.8	L1(L)
25	4.594M	23.1	+0.1	+0.2	+5.7	+0.1	+0.0	29.2	46.0	-16.8	L1(L)
26	4.624M	22.9	+0.1	+0.2	+5.7	+0.1	+0.0	29.0	46.0	-17.0	L1(L)
27	4.675M	22.7	+0.1	+0.2	+5.7	+0.1	+0.0	28.8	46.0	-17.2	L1(L)
28	4.432M	22.6	+0.1	+0.2	+5.7	+0.1	+0.0	28.7	46.0	-17.3	L1(L)
29	4.973M	22.6	+0.1	+0.2	+5.7	+0.1	+0.0	28.7	46.0	-17.3	L1(L)
30	4.794M	22.5	+0.1	+0.2	+5.7	+0.1	+0.0	28.6	46.0	-17.4	L1(L)

CKC Laboratories, Inc. Date: 12/10/2013 Time: 4:24:42 PM STMicroelectronics WO#: 95078
15.207 AC Mains - Average Test Lead: L1(L) 120V 60Hz Sequence#: 14 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.207 AC Mains - Average**
Work Order #: **95078** Date: 12/10/2013
Test Type: **Conducted Emissions** Time: 4:32:15 PM
Equipment: **915 MHz Low Power RF Module** Sequence#: 15
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915 120V 60Hz
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
	AN00848.1	50uH LISN-Line 1 (L1) (dB)	3816/2nm	3/14/2013	3/14/2015
T4	AN00848.1	50uH LISN-Line 2 (L2) (dB)	3816/2nm	3/14/2013	3/14/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with GFSK at the highest power channel. Frequency range of data sheet is 150kHz to 30MHz. 150kHz-30MHz RBW=9kHz=VBW. Site D. Temperature: 22°C, Humidity: 31%, Pressure: 100kPa.

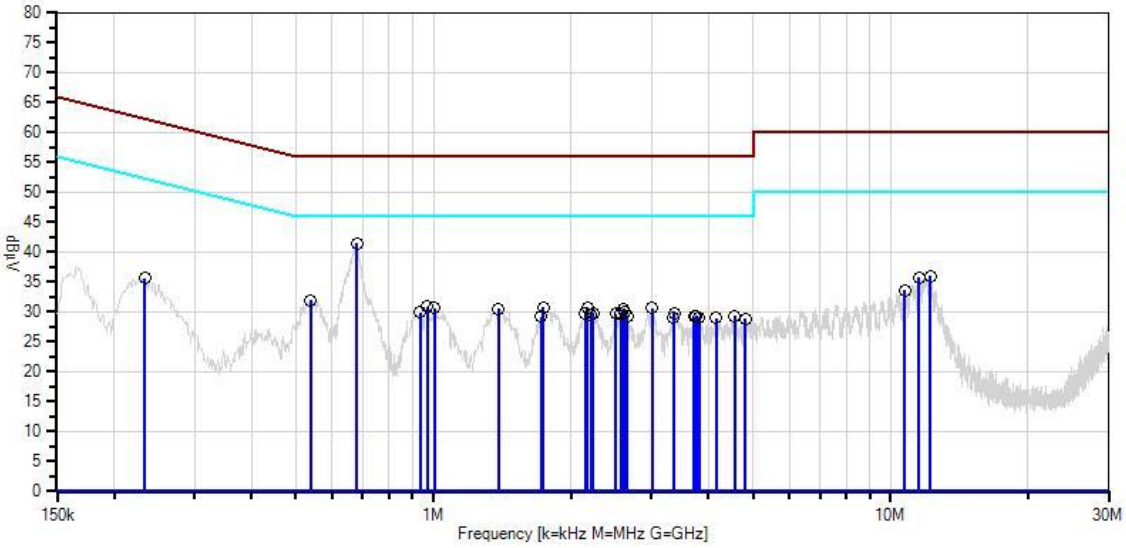
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: (N)L2

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	679.406k	35.5	+0.2	+0.1	+5.7	+0.0	+0.0	41.5	46.0	-4.5	(N)L2
2	537.601k	25.9	+0.2	+0.1	+5.7	+0.1	+0.0	32.0	46.0	-14.0	(N)L2
3	12.211M	29.4	+0.2	+0.3	+5.8	+0.3	+0.0	36.0	50.0	-14.0	(N)L2
4	11.544M	29.2	+0.2	+0.3	+5.8	+0.3	+0.0	35.8	50.0	-14.2	(N)L2
5	970.765k	24.9	+0.1	+0.1	+5.7	+0.1	+0.0	30.9	46.0	-15.1	(N)L2

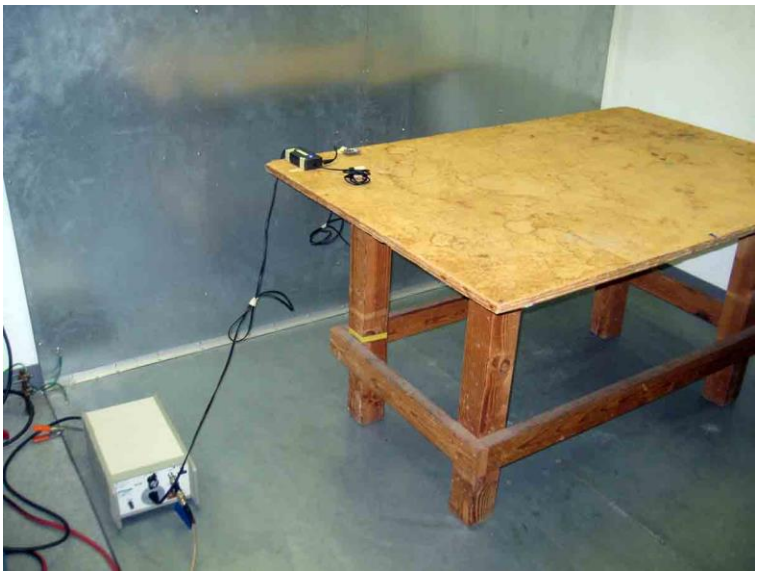
6	1.741M	24.7	+0.2	+0.1	+5.7	+0.1	+0.0	30.8	46.0	-15.2	(N)L2
7	2.174M	24.7	+0.2	+0.1	+5.7	+0.1	+0.0	30.8	46.0	-15.2	(N)L2
8	1.005M	24.6	+0.1	+0.1	+5.7	+0.1	+0.0	30.6	46.0	-15.4	(N)L2
9	3.012M	24.4	+0.2	+0.2	+5.7	+0.1	+0.0	30.6	46.0	-15.4	(N)L2
10	1.388M	24.5	+0.1	+0.1	+5.7	+0.1	+0.0	30.5	46.0	-15.5	(N)L2
11	2.595M	24.2	+0.2	+0.2	+5.7	+0.1	+0.0	30.4	46.0	-15.6	(N)L2
12	2.612M	23.9	+0.2	+0.2	+5.7	+0.1	+0.0	30.1	46.0	-15.9	(N)L2
13	936.743k	24.0	+0.1	+0.1	+5.7	+0.0	+0.0	29.9	46.0	-16.1	(N)L2
14	2.238M	23.6	+0.2	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	(N)L2
15	3.365M	23.7	+0.1	+0.2	+5.7	+0.1	+0.0	29.8	46.0	-16.2	(N)L2
16	2.145M	23.7	+0.2	+0.1	+5.7	+0.1	+0.0	29.8	46.0	-16.2	(N)L2
17	2.510M	23.5	+0.2	+0.2	+5.7	+0.1	+0.0	29.7	46.0	-16.3	(N)L2
18	2.566M	23.5	+0.2	+0.2	+5.7	+0.1	+0.0	29.7	46.0	-16.3	(N)L2
19	10.752M	27.0	+0.2	+0.3	+5.8	+0.3	+0.0	33.6	50.0	-16.4	(N)L2
20	2.213M	23.4	+0.2	+0.1	+5.7	+0.1	+0.0	29.5	46.0	-16.5	(N)L2
21	2.655M	23.2	+0.2	+0.2	+5.7	+0.1	+0.0	29.4	46.0	-16.6	(N)L2
22	4.564M	23.3	+0.1	+0.2	+5.7	+0.1	+0.0	29.4	46.0	-16.6	(N)L2
23	233.629k	29.6	+0.2	+0.1	+5.7	+0.0	+0.0	35.6	52.3	-16.7	(N)L2
24	3.761M	23.2	+0.1	+0.2	+5.7	+0.1	+0.0	29.3	46.0	-16.7	(N)L2
25	1.719M	23.1	+0.2	+0.1	+5.7	+0.1	+0.0	29.2	46.0	-16.8	(N)L2
26	3.722M	23.1	+0.1	+0.2	+5.7	+0.1	+0.0	29.2	46.0	-16.8	(N)L2
27	3.812M	23.0	+0.1	+0.2	+5.7	+0.1	+0.0	29.1	46.0	-16.9	(N)L2
28	3.352M	22.9	+0.1	+0.2	+5.7	+0.1	+0.0	29.0	46.0	-17.0	(N)L2
29	4.156M	22.9	+0.1	+0.2	+5.7	+0.1	+0.0	29.0	46.0	-17.0	(N)L2
30	4.811M	22.8	+0.1	+0.2	+5.7	+0.1	+0.0	28.9	46.0	-17.1	(N)L2

CKC Laboratories, Inc. Date: 12/10/2013 Time: 4:32:15 PM STMicroelectronics WO#: 95078
15.207 AC Mains - Average Test Lead: (N)L2 120V 60Hz Sequence#: 15 Ext ATTN: 0 dB

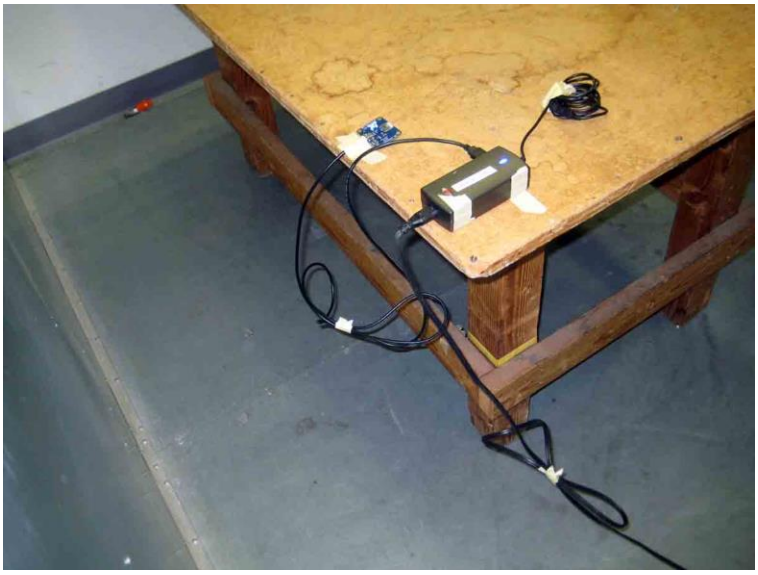


Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Setup Photos



Front View



Back View

15.247(a)(2) -6dBc Occupied Bandwidth

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.247(a)(2)**
Work Order #: **95078**
Test Type: **6dB Bandwidth**
Equipment: **915 MHz Low Power RF Module**
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

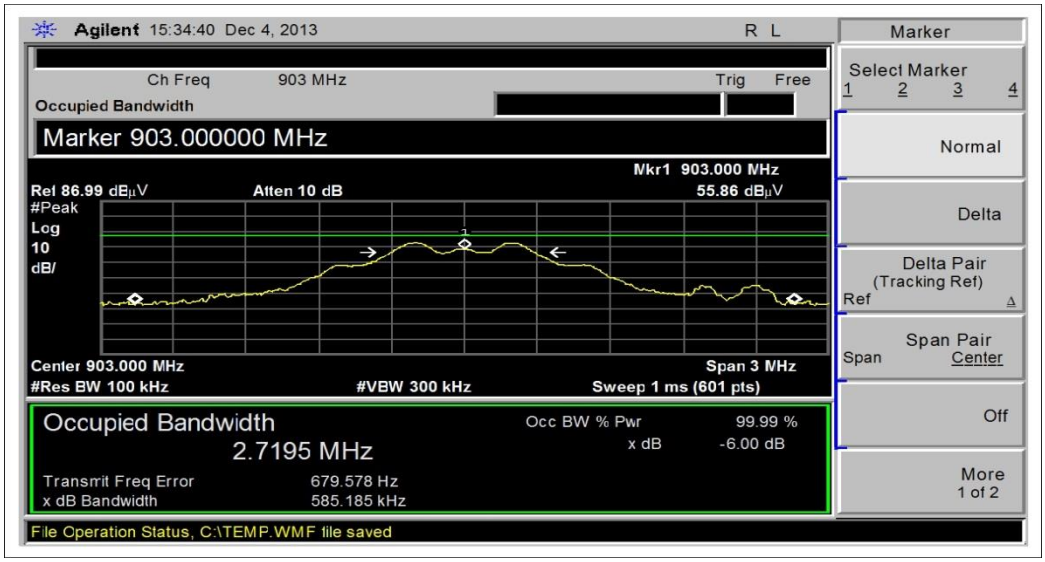
Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power to the integral antenna. Frequency range of test 902 MHz to 928 MHz. Operating range of EUT 902 MHz to 928 MHz. RBW=100kHz, VBW=300kHz. Site D. Temperature: 21°C, Humidity: 38%, Pressure: 100kPa.

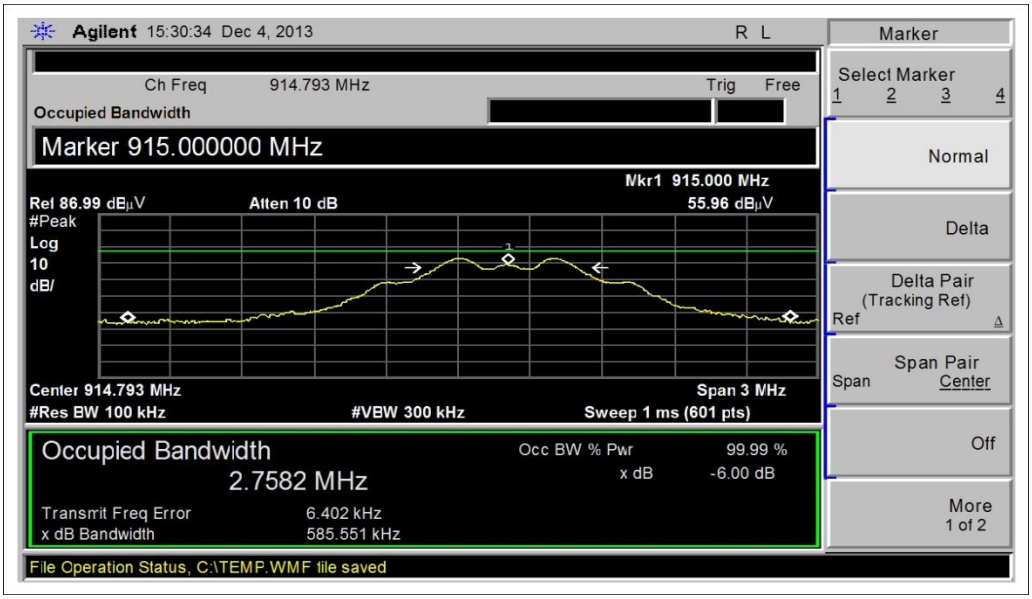
15.247(a)(2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

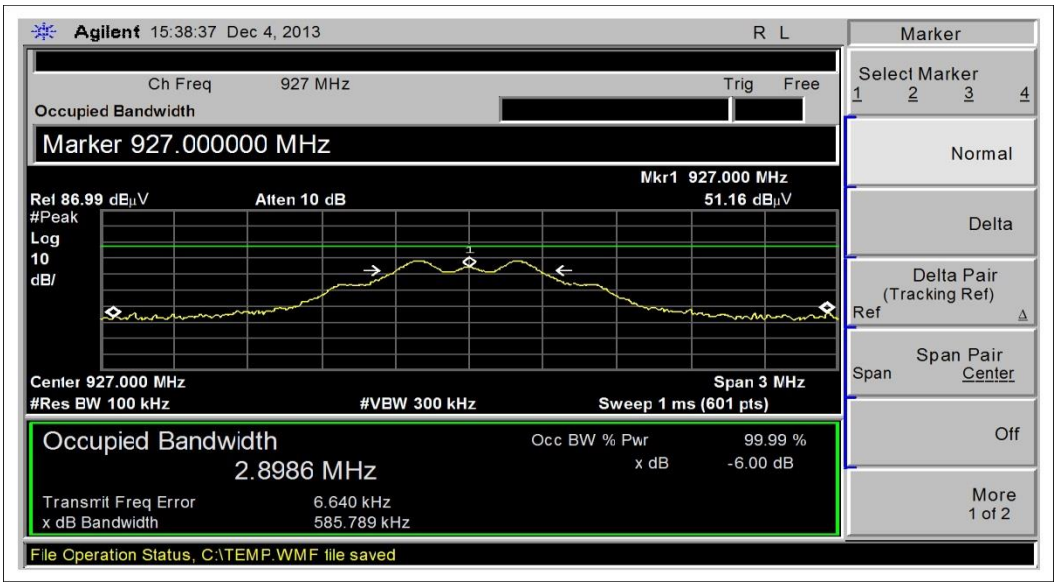
Test Data



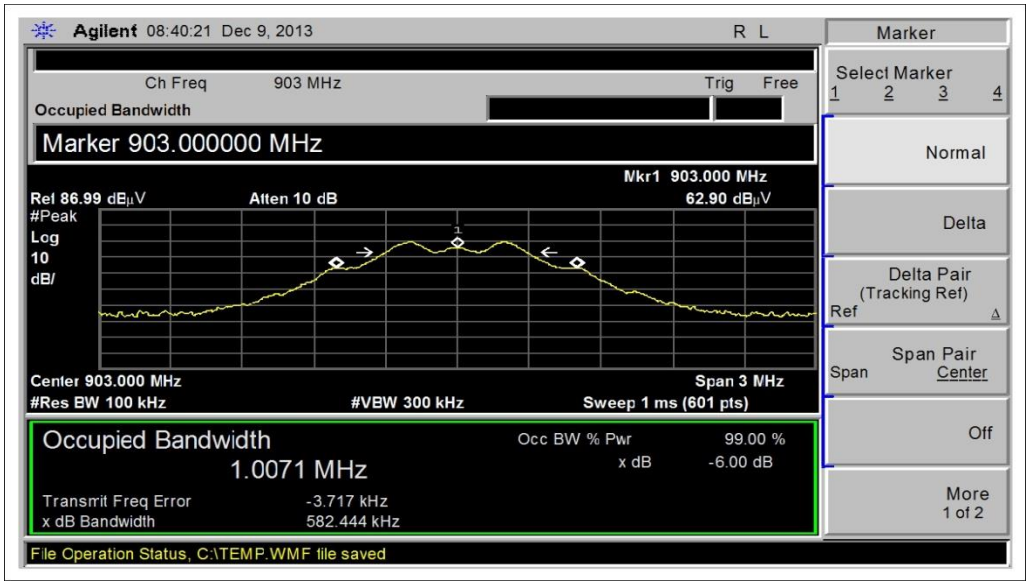
Low channel 2FSK



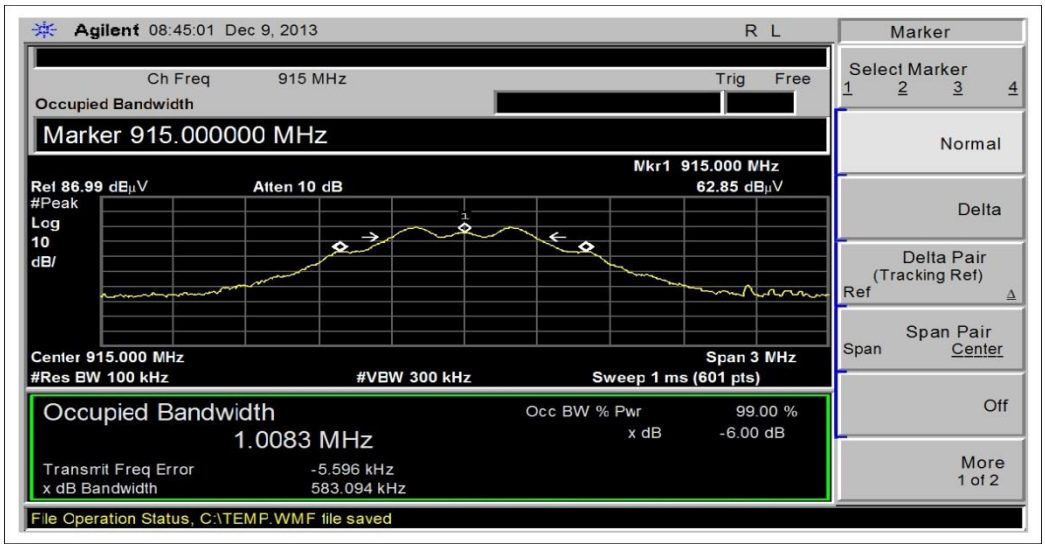
Middle channel 2FSK



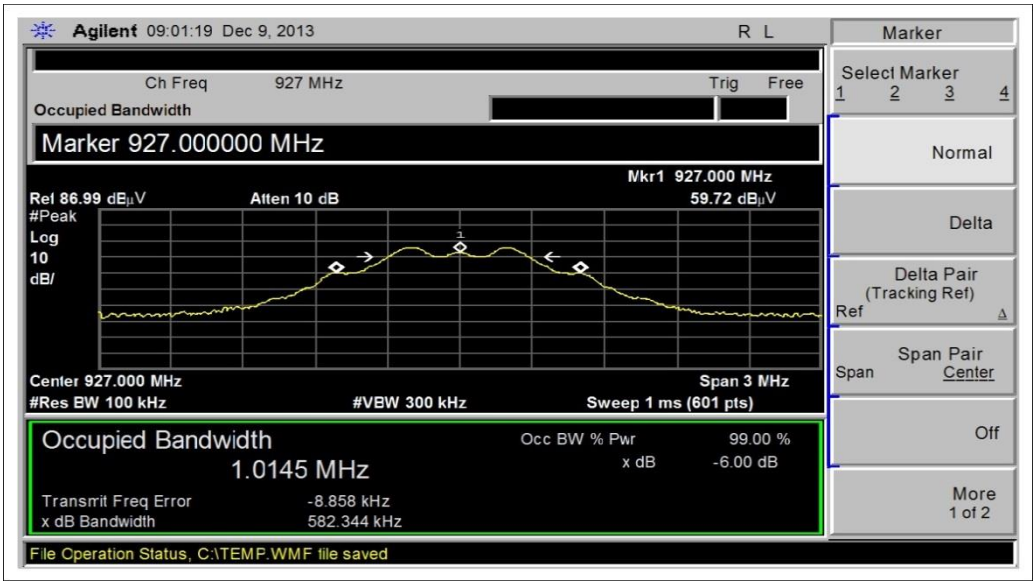
High channel 2FSK



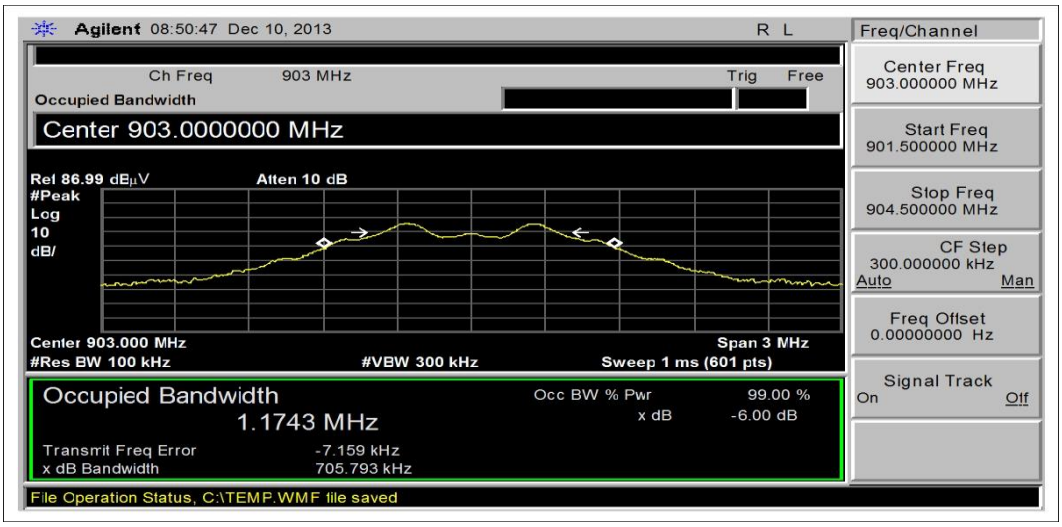
Low channel GFSK



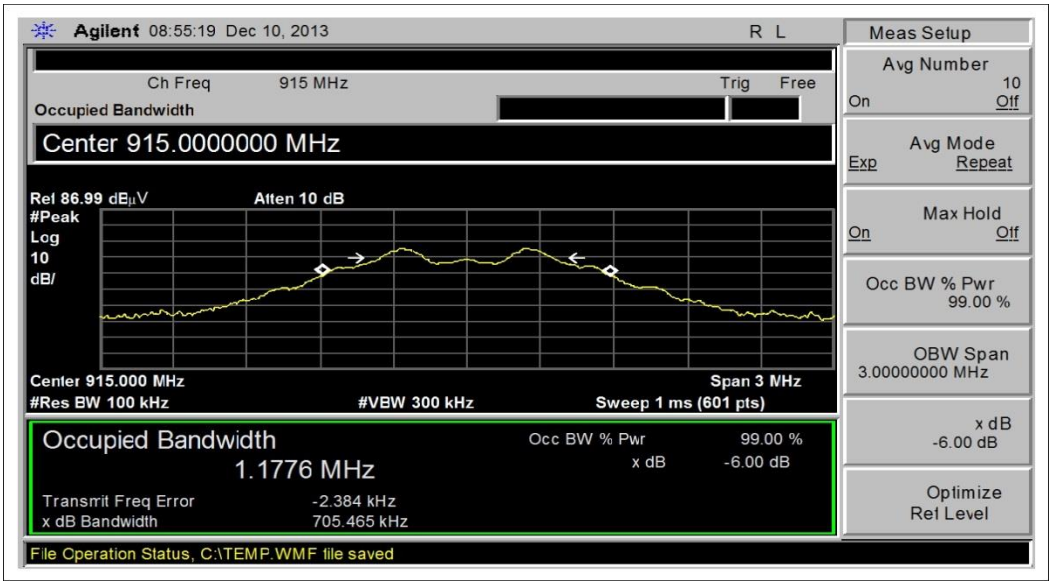
Middle channel GFSK



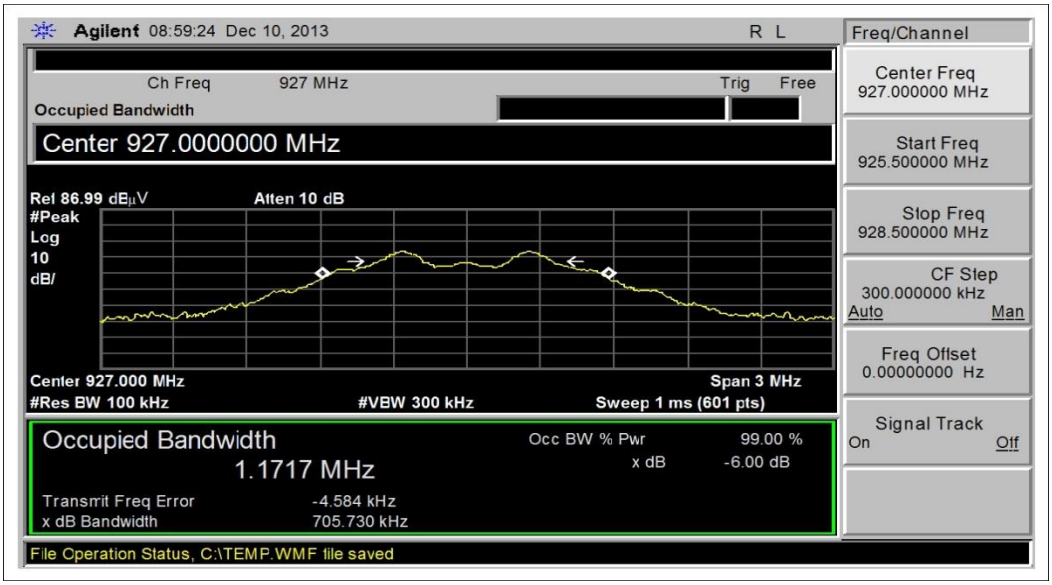
High channel GFSK



Low channel MSK



Middle channel MSK



High channel MSK

Test Setup Photos

Test Setup

15.247(b)(3) RF Power Output

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.247(b)(3)**
Work Order #: **95078** Date: 12/5,9,10/2013
Test Type: **RF Output Power**
Equipment: **915 MHz Low Power RF Module**
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power to the **integral antenna**. Data taken at a low, middle, and high channel. Frequency range of test 902 MHz to 928 MHz. Operating range of EUT 902 MHz to 928 MHz. RBW=620kHz, VBW=3MHz for 2FSK and GFSK. RBW=750kHz, VBW=3MHz for MSK. Site D. Temperature: 21°C, Humidity: 38%, Pressure: 100kPa. Data taken with EUT positioned in each axis system and a total of six orientations. Maximum levels reported.

15.247(b)(3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

558074 D01 DTS Meas Guidance v03r01 April 2013

If a radiated test configuration is used, then the measured power or field strength levels shall be converted to equivalent conducted power levels for comparison to the applicable output power limit. This may be accomplished by first measuring the radiated field strength or power levels using a methodology for maximum peak conducted power or maximum conducted (average) power as applicable and peak or average power spectral density as applicable. The radiated field strength or power level can then be converted to EIRP (see ANSI C63.10 for guidance).

ANSI C63.10 2013

G.2 Field strength approach (linear terms)

$$\text{EIRP} = p_t \times g_t = (E \times d)^2 / 30$$

where

p_t is the transmitter output power in watts
g_t is the numeric gain of the transmitting antenna (dimensionless)
E is the electric field strength in V/m
d is the measurement distance in meters (m)

$$\text{ERP} = \text{EIRP}/1.64 = (E \times d)^2 / (30 \times 1.64) = (E \times d)^2 / 49.2$$

where all terms are as previously defined.

15.247(b)(3) 2FSK

903MHz, E=100.3dBuV/m=0.104V/m
915MHz, E=99.2dBuV/m=0.0912V/m
927MHz, E=96.5dBuV/m=0.0668V/m
d=3 meters
EIRP
903MHz, EIRP=$(0.104x3)^2/30$=0.00324W=+5.1dBm
915MHz, EIRP=$(0.0912x3)^2/30$=0.00250W=+4.0dBm
927MHz, EIRP=$(0.0668x3)^2/30$=0.00134W=+1.3dBm

Conducted Output Power 2FSK

903MHz, +5.1dBm – 1.6dBi = +3.5 dBm = 0.0022 W
915MHz, +4.0dBm – 1.6dBi = +2.4 dBm = 0.0017 W
927MHz, +1.3dBm – 1.6dBi = -0.3 dBm = 0.0009 W

15.247(b)(3) GFSK

903MHz, E=100.2dBuV/m=0.102V/m
915MHz, E=99.5dBuV/m=0.0944V/m
927MHz, E=97.0dBuV/m=0.0708V/m
d=3 meters
EIRP
903MHz, EIRP=$(0.102x3)^2/30$=0.00314W=+5.0dBm
915MHz, EIRP=$(0.0944x3)^2/30$=0.00267W=+4.3dBm
927MHz, EIRP=$(0.0708x3)^2/30$=0.00150W=+1.8dBm

Conducted Output Power GFSK

903MHz, +5.0dBm – 1.6dBi = +3.4 dBm = 0.0022 W
915MHz, +4.3dBm – 1.6dBi = +2.7 dBm = 0.0015 W
927MHz, +1.8dBm – 1.6dBi = +0.2 dBm = 0.001 W

15.247(b)(3) MSK

903MHz, E=100.8dBuV/m=0.110V/m
915MHz, E=102.1dBuV/m=0.127V/m
927MHz, E=98.6dBuV/m=0.085V/m
d=3 meters
EIRP
903MHz, EIRP=$(0.110x3)^2/30$=0.00363W=+5.6dBm
915MHz, EIRP=$(0.127x3)^2/30$=0.00484W=+6.8dBm
927MHz, EIRP=$(0.085x3)^2/30$=0.00217W=+3.4dBm

Conducted Output Power MSK

903MHz, +5.6dBm – 1.6dBi = +4.0 dBm = 0.0025 W
915MHz, +6.8dBm – 1.6dBi = +5.2 dBm = 0.0033 W
927MHz, +3.4dBm – 1.6dBi = +1.8 dBm = 0.0015 W

Test Setup Photos

Test Setup

15.247(d) Radiated Spurious Emissions

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **95078** Date: 12/6/2013
Test Type: **Maximized Emissions** Time: 15:42:56
Equipment: **915 MHz Low Power RF Module** Sequence#: 4
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T6	AN00010	Preamp	8447D	3/29/2012	3/29/2014
	AN00314	Loop Antenna	6502	6/29/2012	6/29/2014
T7	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T8	AN01646	Horn Antenna	3115	4/13/2012	4/13/2014
T9	ANP06360	Cable	L1-PNMNM-48	8/29/2012	8/29/2014
T10	AN02946	Cable	32022-2-2909K-36TC	7/31/2013	7/31/2015
T11	AN03169	High Pass Filter	HM1155-11SS	7/30/2013	7/30/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with 2FSK. Frequency range of data sheet is 9kHz to 10GHz. 9kHz-150kHz RBW=200Hz=VBW. 150kHz-30MHz RBW=9kHz=VBW. 30MHz-1000MHz RBW=120kHz=VBW. 1000MHz-10000MHz RBW=1MHz=VBW. Site D. Temperature: 16°C, Humidity: 41%, Pressure: 100kPa. Data taken with EUT set to a low, middle, and high channel. Data taken with EUT positioned in each axis system and a total of six orientations.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	896.940M	37.8	+0.0	+3.6	+0.5	+3.5	+0.0	39.9	46.0	-6.1	Vert
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
2	896.537M	37.8	+0.0	+3.6	+0.5	+3.5	+0.0	39.9	46.0	-6.1	Horiz
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
3	896.523M	37.3	+0.0	+3.6	+0.5	+3.5	+0.0	39.4	46.0	-6.6	Vert
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
4	896.539M	37.2	+0.0	+3.6	+0.5	+3.5	+0.0	39.3	46.0	-6.7	Horiz
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
5	896.963M	37.0	+0.0	+3.6	+0.5	+3.5	+0.0	39.1	46.0	-6.9	Horiz
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
6	896.542M	37.0	+0.0	+3.6	+0.5	+3.5	+0.0	39.1	46.0	-6.9	Vert
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
7	7222.260M	33.3	+0.0	+10.9	+0.0	+0.0	+0.0	47.1	54.0	-6.9	Vert
			+0.0	+0.0	-39.2	+34.8					
			+6.1	+1.2	+0.0						
8	7225.672M	33.3	+0.0	+10.9	+0.0	+0.0	+0.0	47.1	54.0	-6.9	Vert
			+0.0	+0.0	-39.2	+34.8					
			+6.1	+1.2	+0.0						
9	896.537M	36.9	+0.0	+3.6	+0.5	+3.5	+0.0	39.0	46.0	-7.0	Vert
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
10	896.967M	36.5	+0.0	+3.6	+0.5	+3.5	+0.0	38.6	46.0	-7.4	Vert
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
11	7321.663M	32.3	+0.0	+11.1	+0.0	+0.0	+0.0	46.5	54.0	-7.5	Horiz
			+0.0	+0.0	-39.2	+34.9					
			+6.1	+1.2	+0.1						
12	8128.972M	30.4	+0.0	+11.7	+0.0	+0.0	+0.0	46.3	54.0	-7.7	Horiz
			+0.0	+0.0	-39.2	+35.6					
			+6.5	+1.2	+0.1						
13	1806.556M	49.8	+0.0	+5.1	+0.0	+0.0	+0.0	46.2	54.0	-7.8	Horiz
			+0.0	+0.0	-39.7	+27.3					
			+2.8	+0.6	+0.3						
14	7225.810M	32.3	+0.0	+10.9	+0.0	+0.0	+0.0	46.1	54.0	-7.9	Horiz
			+0.0	+0.0	-39.2	+34.8					
			+6.1	+1.2	+0.0						
15	2744.347M	47.6	+0.0	+5.9	+0.0	+0.0	+0.0	46.0	54.0	-8.0	Horiz
			+0.0	+0.0	-39.7	+27.8					
			+3.4	+0.8	+0.2						

16	1806.397M	49.5	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	45.9	54.0	-8.1	Horiz
17	7225.631M	32.1	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	45.9	54.0	-8.1	Vert
18	7417.630M	31.4	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	45.8	54.0	-8.2	Vert
19	7414.292M	31.4	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	45.8	54.0	-8.2	Horiz
20	1853.503M	49.1	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	45.7	54.0	-8.3	Horiz
21	6490.342M	33.0	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	45.7	54.0	-8.3	Horiz
22	7414.439M	31.3	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	45.7	54.0	-8.3	Vert
23	896.952M	35.5	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	37.6	46.0	-8.4	Horiz
24	6487.548M	32.9	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	45.6	54.0	-8.4	Horiz
25	1829.683M	49.1	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	45.6	54.0	-8.4	Horiz
26	8236.897M	29.2	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	45.5	54.0	-8.5	Vert
27	7222.450M	31.7	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	45.5	54.0	-8.5	Vert
28	2744.363M	47.0	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	45.4	54.0	-8.6	Horiz
29	1830.367M	48.9	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	45.4	54.0	-8.6	Horiz
30	896.549M	35.2	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	37.3	46.0	-8.7	Horiz
31	2709.689M	47.2	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	45.3	54.0	-8.7	Horiz
32	7417.539M	30.7	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	45.1	54.0	-8.9	Horiz

33	1829.580M	48.6	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	45.0	54.0	-9.0	Horiz
34	1854.578M	48.1	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	44.7	54.0	-9.3	Horiz
35	896.945M	34.6	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	36.7	46.0	-9.3	Vert
36	7222.231M	30.8	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	44.6	54.0	-9.4	Horiz
37	1805.317M	48.2	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	44.6	54.0	-9.4	Horiz
38	5491.400M	34.5	+0.0 +0.0 +5.2	+9.1 +0.0 +1.2	+0.0 -39.4 +0.2	+0.0 +33.8	+0.0	44.6	54.0	-9.4	Vert
39	6490.512M	31.9	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	44.6	54.0	-9.4	Vert
40	1853.574M	48.0	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	44.6	54.0	-9.4	Horiz
41	8233.147M	28.1	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	44.4	54.0	-9.6	Horiz
42	1854.378M	47.8	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	44.4	54.0	-9.6	Horiz
43	6487.464M	31.6	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	44.3	54.0	-9.7	Vert
44	2780.336M	45.4	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	44.2	54.0	-9.8	Horiz
45	6406.413M	32.1	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	44.2	54.0	-9.8	Vert
46	1829.508M	47.8	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	44.2	54.0	-9.8	Vert
47	896.942M	34.1	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	36.2	46.0	-9.8	Horiz
48	7321.860M	29.8	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	44.0	54.0	-10.0	Horiz
49	2780.344M	45.2	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	44.0	54.0	-10.0	Horiz

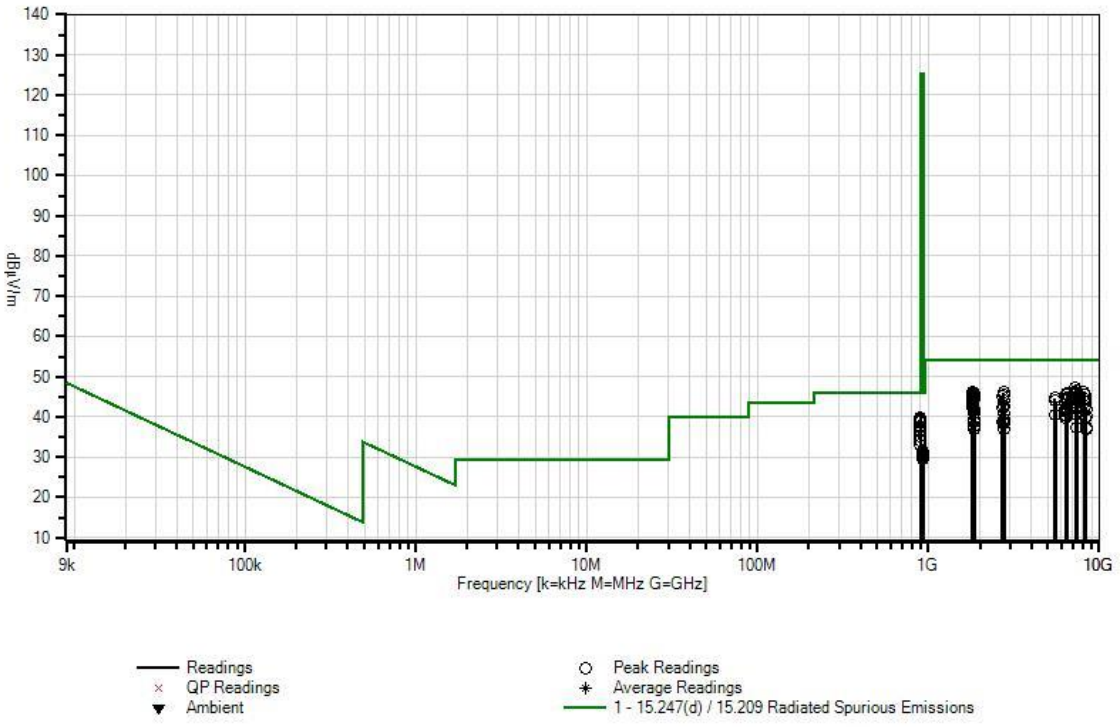
50	8129.000M	28.0	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	43.9	54.0	-10.1	Vert
51	5560.250M	33.8	+0.0 +0.0 +5.2	+9.1 +0.0 +1.2	+0.0 -39.3 +0.2	+0.0 +33.7	+0.0	43.9	54.0	-10.1	Vert
52	8233.013M	27.5	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	43.8	54.0	-10.2	Vert
53	7225.747M	29.8	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	43.6	54.0	-10.4	Vert
54	7321.983M	29.2	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	43.4	54.0	-10.6	Vert
55	896.942M	33.2	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	35.3	46.0	-10.7	Vert
56	1806.361M	46.8	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	43.2	54.0	-10.8	Vert
57	896.525M	33.0	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	35.1	46.0	-10.9	Vert
58	8232.950M	26.5	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	42.8	54.0	-11.2	Vert
59	2781.790M	43.8	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	42.6	54.0	-11.4	Horiz
60	7226.031M	28.6	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	42.4	54.0	-11.6	Horiz
61	7414.434M	28.0	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	42.4	54.0	-11.6	Vert
62	2709.772M	44.2	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	42.3	54.0	-11.7	Horiz
63	896.938M	32.2	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	34.3	46.0	-11.7	Vert
64	1805.606M	45.9	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	42.3	54.0	-11.7	Vert
65	896.542M	32.0	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	34.1	46.0	-11.9	Horiz
66	7322.063M	27.9	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	42.1	54.0	-11.9	Horiz

67	8341.020M	25.4	+0.0	+12.0	+0.0	+0.0	+0.0	42.0	54.0	-12.0	Horiz
			+0.0	+0.0	-39.3	+36.0					
			+6.5	+1.3	+0.1						
68	6322.460M	30.0	+0.0	+9.9	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Vert
			+0.0	+0.0	-38.9	+33.9					
			+5.6	+1.2	+0.1						
69	6406.425M	29.7	+0.0	+9.9	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Horiz
			+0.0	+0.0	-38.8	+34.1					
			+5.6	+1.2	+0.1						
70	1853.478M	45.2	+0.0	+5.3	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Vert
			+0.0	+0.0	-39.7	+27.4					
			+2.9	+0.4	+0.3						
71	6406.650M	29.5	+0.0	+9.9	+0.0	+0.0	+0.0	41.6	54.0	-12.4	Vert
			+0.0	+0.0	-38.8	+34.1					
			+5.6	+1.2	+0.1						
72	896.952M	31.1	+0.0	+3.6	+0.5	+3.5	+0.0	33.2	46.0	-12.8	Horiz
			+21.9	-27.4	+0.0	+0.0					
			+0.0	+0.0	+0.0						
73	8125.072M	25.3	+0.0	+11.7	+0.0	+0.0	+0.0	41.2	54.0	-12.8	Vert
	Ave		+0.0	+0.0	-39.2	+35.6					
			+6.5	+1.2	+0.1						
^	8125.072M	35.7	+0.0	+11.7	+0.0	+0.0	+0.0	51.6	54.0	-2.4	Vert
			+0.0	+0.0	-39.2	+35.6					
			+6.5	+1.2	+0.1						
^	8125.047M	26.6	+0.0	+11.7	+0.0	+0.0	+0.0	42.5	54.0	-11.5	Vert
			+0.0	+0.0	-39.2	+35.6					
			+6.5	+1.2	+0.1						
76	6490.409M	28.4	+0.0	+10.0	+0.0	+0.0	+0.0	41.1	54.0	-12.9	Vert
			+0.0	+0.0	-38.7	+34.3					
			+5.7	+1.3	+0.1						
77	1854.503M	44.4	+0.0	+5.3	+0.0	+0.0	+0.0	41.0	54.0	-13.0	Vert
			+0.0	+0.0	-39.7	+27.4					
			+2.9	+0.4	+0.3						
78	2780.473M	42.1	+0.0	+6.0	+0.0	+0.0	+0.0	40.9	54.0	-13.1	Horiz
			+0.0	+0.0	-39.7	+28.0					
			+3.5	+0.8	+0.2						
79	2781.525M	42.0	+0.0	+6.0	+0.0	+0.0	+0.0	40.8	54.0	-13.2	Vert
			+0.0	+0.0	-39.7	+28.0					
			+3.5	+0.8	+0.2						
80	5563.248M	30.4	+0.0	+9.2	+0.0	+0.0	+0.0	40.6	54.0	-13.4	Horiz
			+0.0	+0.0	-39.3	+33.7					
			+5.2	+1.2	+0.2						
81	7417.577M	26.1	+0.0	+11.3	+0.0	+0.0	+0.0	40.5	54.0	-13.5	Vert
			+0.0	+0.0	-39.3	+34.9					
			+6.2	+1.2	+0.1						
82	6319.764M	28.6	+0.0	+9.9	+0.0	+0.0	+0.0	40.4	54.0	-13.6	Horiz
			+0.0	+0.0	-38.9	+33.9					
			+5.6	+1.2	+0.1						
83	6487.510M	27.6	+0.0	+10.0	+0.0	+0.0	+0.0	40.3	54.0	-13.7	Vert
			+0.0	+0.0	-38.7	+34.3					
			+5.7	+1.3	+0.1						

84	8345.092M	23.5	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	40.1	54.0	-13.9	Horiz
85	6322.400M	27.9	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	39.7	54.0	-14.3	Vert
86	8232.960M	23.4	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	39.7	54.0	-14.3	Horiz
87	2780.270M	40.8	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	39.6	54.0	-14.4	Vert
88	1853.590M	42.7	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	39.3	54.0	-14.7	Horiz
89	933.044M	28.2	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	31.2	46.0	-14.8	Vert
90	933.478M	27.9	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.9	46.0	-15.1	Horiz
91	933.451M	27.9	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.9	46.0	-15.1	Vert
92	1854.407M	42.1	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	38.7	54.0	-15.3	Horiz
93	2709.756M	40.5	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	38.6	54.0	-15.4	Vert
94	933.024M	27.6	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.6	46.0	-15.4	Vert
95	933.044M	27.4	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.4	46.0	-15.6	Horiz
96	2780.433M	39.5	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	38.3	54.0	-15.7	Vert
97	933.434M	27.1	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.1	46.0	-15.9	Horiz
98	933.048M	26.9	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	29.9	46.0	-16.1	Horiz
99	933.454M	26.9	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	29.9	46.0	-16.1	Vert
100	1853.537M	41.2	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	37.8	54.0	-16.2	Vert

101	932.984M	26.6	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	29.6	46.0	-16.4	Horiz
102	7318.240M	23.3	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	37.5	54.0	-16.5	Horiz
103	8341.250M	20.8	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	37.4	54.0	-16.6	Vert
104	933.458M	26.4	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	29.4	46.0	-16.6	Horiz
105	8344.860M	20.5	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	37.1	54.0	-16.9	Vert
106	1854.377M	40.5	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	37.1	54.0	-16.9	Vert
107	2781.820M	38.3	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	37.1	54.0	-16.9	Vert

CKC Laboratories, Inc. Date: 12/6/2013 Time: 15:42:56 STMicroelectronics WO#: 95078
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 4 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **95078** Date: 12/9/2013
Test Type: **Maximized Emissions** Time: 17:24:27
Equipment: **915 MHz Low Power RF Module** Sequence#: 4
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T6	AN00010	Preamp	8447D	3/29/2012	3/29/2014
	AN00314	Loop Antenna	6502	6/29/2012	6/29/2014
T7	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T8	AN01646	Horn Antenna	3115	4/13/2012	4/13/2014
T9	ANP06360	Cable	L1-PNMNM-48	8/29/2012	8/29/2014
T10	AN02946	Cable	32022-2-2909K-36TC	7/31/2013	7/31/2015
T11	AN03169	High Pass Filter	HM1155-11SS	7/30/2013	7/30/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with GFSK. Frequency range of data sheet is 9kHz to 10GHz. 9kHz-150kHz RBW=200Hz=VBW. 150kHz-30MHz RBW=9kHz=VBW. 30MHz-1000MHz RBW=120kHz=VBW. 1000MHz-10000MHz RBW=1MHz=VBW. Site D. Temperature: 16°C, Humidity: 41%, Pressure: 100kPa. Data taken with EUT set to a low, middle, and high channel. Data taken with EUT positioned in each axis system and a total of six orientations.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	896.970M	38.2	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	40.3	46.0	-5.7	Vert
2	896.543M	37.8	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	39.9	46.0	-6.1	Vert
3	896.560M	37.6	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	39.7	46.0	-6.3	Vert
4	7222.370M	33.8	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	47.6	54.0	-6.4	Horiz
5	896.963M	37.5	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	39.6	46.0	-6.4	Horiz
6	8124.620M	31.7	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	47.6	54.0	-6.4	Horiz
7	6490.380M	34.8	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	47.5	54.0	-6.5	Horiz
8	896.935M	37.4	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	39.5	46.0	-6.5	Vert
9	8236.900M	31.1	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	47.4	54.0	-6.6	Vert
10	1806.537M	51.0	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	47.4	54.0	-6.6	Horiz
11	1806.160M	50.7	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	47.1	54.0	-6.9	Horiz
12	896.534M	36.9	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	39.0	46.0	-7.0	Horiz
13	8129.270M	31.0	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	46.9	54.0	-7.1	Horiz
14	1806.378M	50.5	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.9	54.0	-7.1	Horiz
15	896.937M	36.7	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	38.8	46.0	-7.2	Vert

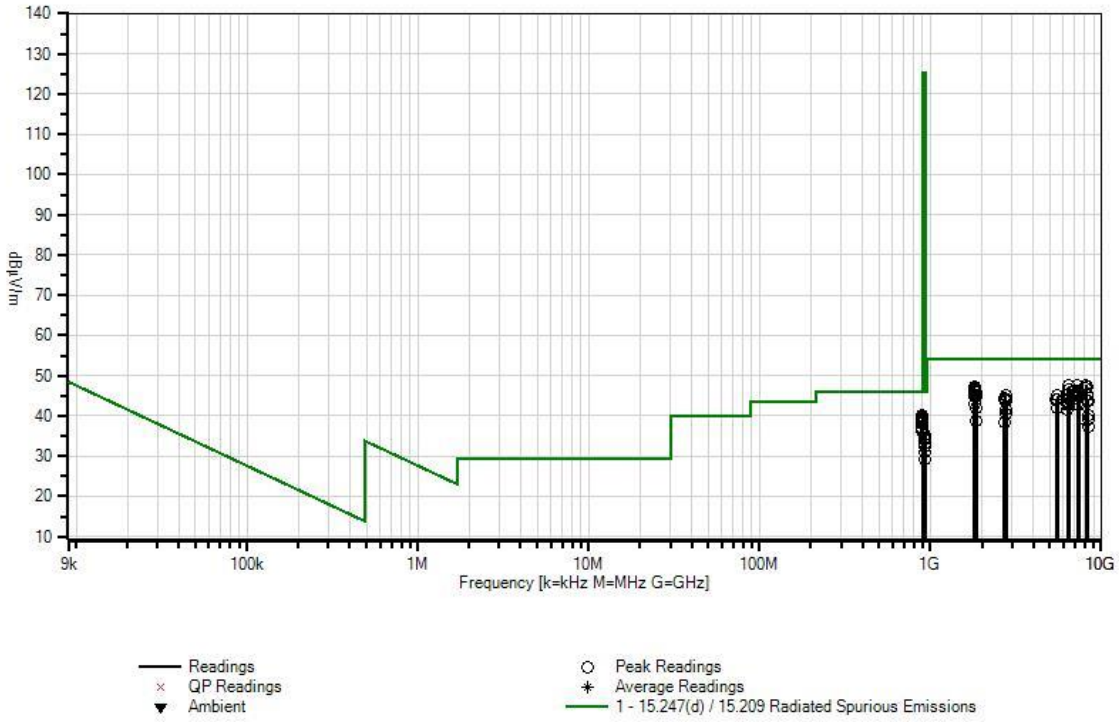
16	6406.420M	34.5	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	46.6	54.0	-7.4	Vert
17	1830.475M	50.1	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	46.6	54.0	-7.4	Horiz
18	1829.658M	50.0	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	46.5	54.0	-7.5	Horiz
19	896.963M	36.3	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	38.4	46.0	-7.6	Horiz
20	7417.580M	31.8	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	46.2	54.0	-7.8	Horiz
21	7321.850M	32.0	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	46.2	54.0	-7.8	Horiz
22	7414.330M	31.7	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	46.1	54.0	-7.9	Horiz
23	7225.830M	32.3	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	46.1	54.0	-7.9	Horiz
24	1806.393M	49.7	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.1	54.0	-7.9	Vert
25	1805.528M	49.7	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.1	54.0	-7.9	Vert
26	7321.770M	31.7	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	45.9	54.0	-8.1	Vert
27	896.567M	35.8	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	37.9	46.0	-8.1	Horiz
28	1853.542M	49.3	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	45.9	54.0	-8.1	Horiz
29	7414.350M	31.3	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	45.7	54.0	-8.3	Vert
30	8233.230M	29.1	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	45.4	54.0	-8.6	Horiz
31	6490.280M	32.6	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	45.3	54.0	-8.7	Horiz
32	7417.820M	30.8	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	45.2	54.0	-8.8	Vert

33	1853.558M	48.6	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	45.2	54.0	-8.8	Horiz
34	8232.980M	28.9	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	45.2	54.0	-8.8	Vert
35	6322.392M	33.4	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	45.2	54.0	-8.8	Horiz
36	2745.492M	46.8	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	45.2	54.0	-8.8	Horiz
37	1805.503M	48.7	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	45.1	54.0	-8.9	Vert
38	7225.770M	31.3	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	45.1	54.0	-8.9	Horiz
39	896.935M	35.0	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	37.1	46.0	-8.9	Horiz
40	5563.250M	34.8	+0.0 +0.0 +5.2	+9.2 +0.0 +1.2	+0.0 -39.3 +0.2	+0.0 +33.7	+0.0	45.0	54.0	-9.0	Vert
41	1854.458M	48.2	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	44.8	54.0	-9.2	Horiz
42	7321.800M	30.4	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	44.6	54.0	-9.4	Horiz
43	1829.675M	48.1	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	44.6	54.0	-9.4	Vert
44	7225.730M	30.7	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	44.5	54.0	-9.5	Vert
45	6490.580M	31.8	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	44.5	54.0	-9.5	Horiz
46	896.541M	34.3	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	36.4	46.0	-9.6	Vert
47	7225.930M	30.6	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	44.4	54.0	-9.6	Vert
48	2709.687M	46.2	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	44.3	54.0	-9.7	Vert
49	5491.800M	34.0	+0.0 +0.0 +5.2	+9.1 +0.0 +1.2	+0.0 -39.4 +0.2	+0.0 +33.8	+0.0	44.1	54.0	-9.9	Vert

50	2709.220M	46.0	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	44.1	54.0	-9.9	Horiz
51	5418.220M	34.1	+0.0 +0.0 +5.2	+9.0 +0.0 +1.2	+0.0 -39.4 +0.1	+0.0 +33.8	+0.0	44.0	54.0	-10.0	Vert
52	2744.592M	45.5	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	43.9	54.0	-10.1	Horiz
53	8341.030M	27.2	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	43.8	54.0	-10.2	Horiz
54	2781.525M	45.0	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	43.8	54.0	-10.2	Horiz
55	6322.860M	31.8	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	43.6	54.0	-10.4	Vert
56	8232.820M	27.3	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	43.6	54.0	-10.4	Vert
57	2780.800M	44.8	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	43.6	54.0	-10.4	Horiz
58	933.018M	32.1	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	35.1	46.0	-10.9	Horiz
59	6406.800M	31.0	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	43.1	54.0	-10.9	Vert
60	7222.170M	29.2	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	43.0	54.0	-11.0	Vert
61	1830.383M	46.4	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	42.9	54.0	-11.1	Vert
62	7318.350M	28.5	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	42.7	54.0	-11.3	Vert
63	6406.750M	30.6	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	42.7	54.0	-11.3	Horiz
64	933.463M	31.5	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	34.5	46.0	-11.5	Horiz
65	933.037M	31.4	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	34.4	46.0	-11.6	Vert
66	933.037M	31.1	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	34.1	46.0	-11.9	Horiz

67	5563.350M	31.9	+0.0 +0.0 +5.2	+9.2 +0.0 +1.2	+0.0 -39.3 +0.2	+0.0 +33.7	+0.0	42.1	54.0	-11.9	Horiz
68	1854.367M	45.4	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	42.0	54.0	-12.0	Vert
69	2745.692M	43.1	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	41.5	54.0	-12.5	Vert
70	6319.830M	29.7	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	41.5	54.0	-12.5	Vert
71	933.422M	30.2	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	33.2	46.0	-12.8	Vert
72	2780.467M	41.8	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	40.6	54.0	-13.4	Vert
73	933.030M	29.2	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	32.2	46.0	-13.8	Horiz
74	8345.150M	23.4	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	40.0	54.0	-14.0	Horiz
75	8345.220M	22.6	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	39.2	54.0	-14.8	Vert
76	933.058M	28.0	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	31.0	46.0	-15.0	Vert
77	1853.592M	42.2	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	38.8	54.0	-15.2	Vert
78	2709.687M	40.4	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	38.5	54.0	-15.5	Vert
79	8128.750M Ave	22.1	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	38.0	54.0	-16.0	Vert
^	8128.750M	35.7	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	51.6	54.0	-2.4	Vert
81	8341.070M	20.9	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	37.5	54.0	-16.5	Vert
82	933.424M	26.2	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	29.2	46.0	-16.8	Horiz
83	933.041M	26.1	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	29.1	46.0	-16.9	Vert

CKC Laboratories, Inc. Date: 12/9/2013 Time: 17:24:27 STMicroelectronics WO#: 95078
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 4 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **95078** Date: 12/16/2013
Test Type: **Maximized Emissions** Time: 12:56:58
Equipment: **915 MHz Low Power RF Module** Sequence#: 4
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T6	AN00010	Preamp	8447D	3/29/2012	3/29/2014
	AN00314	Loop Antenna	6502	6/29/2012	6/29/2014
T7	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T8	AN01646	Horn Antenna	3115	4/13/2012	4/13/2014
T9	ANP06360	Cable	L1-PNMNM-48	8/29/2012	8/29/2014
T10	AN02946	Cable	32022-2-2909K-36TC	7/31/2013	7/31/2015
T11	AN03169	High Pass Filter	HM1155-11SS	7/30/2013	7/30/2015

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power with MSK. Frequency range of data sheet is 9kHz to 10GHz. 9kHz-150kHz RBW=200Hz=VBW. 150kHz-30MHz RBW=9kHz=VBW. 30MHz-1000MHz RBW=120kHz=VBW. 1000MHz-10000MHz RBW=1MHz=VBW. Site D. Temperature: 16°C, Humidity: 41%, Pressure: 100kPa. Data taken with EUT set to a low, middle, and high channel. Data taken with EUT positioned in each axis system and a total of six orientations.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	6486.980M	36.0	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	48.7	54.0	-5.3	Horiz
2	8232.780M	32.3	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	48.6	54.0	-5.4	Vert
3	7221.770M	34.7	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	48.5	54.0	-5.5	Horiz
4	1805.550M	52.0	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	48.4	54.0	-5.6	Horiz
5	7226.220M	34.4	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	48.2	54.0	-5.8	Vert
6	7413.980M	33.8	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	48.2	54.0	-5.8	Horiz
7	1806.692M	51.7	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	48.1	54.0	-5.9	Horiz
8	7226.420M	34.3	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	48.1	54.0	-5.9	Horiz
9	8237.400M	31.8	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	48.1	54.0	-5.9	Vert
10	7221.670M	34.3	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	48.1	54.0	-5.9	Vert
11	7321.620M	33.8	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	48.0	54.0	-6.0	Horiz
12	8124.580M	31.9	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	47.8	54.0	-6.2	Horiz
13	7418.300M	33.4	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	47.8	54.0	-6.2	Horiz
14	7418.100M	33.4	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	47.8	54.0	-6.2	Vert
15	1829.275M	51.3	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	47.7	54.0	-6.3	Horiz

16	6491.130M	35.0	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	47.7	54.0	-6.3	Horiz
17	1853.460M	51.1	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	47.7	54.0	-6.3	Horiz
18	1853.580M	51.0	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	47.6	54.0	-6.4	Horiz
19	7221.580M	33.8	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	47.6	54.0	-6.4	Vert
20	1854.377M	50.9	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	47.5	54.0	-6.5	Horiz
21	1830.658M	51.0	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	47.5	54.0	-6.5	Horiz
22	7413.750M	33.0	+0.0 +0.0 +6.2	+11.3 +0.0 +1.2	+0.0 -39.3 +0.1	+0.0 +34.9	+0.0	47.4	54.0	-6.6	Vert
23	6491.280M	34.7	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	47.4	54.0	-6.6	Vert
24	896.516M	37.2	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	39.3	46.0	-6.7	Horiz
25	8124.430M	31.3	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	47.2	54.0	-6.8	Vert
26	8237.330M	30.9	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	47.2	54.0	-6.8	Horiz
27	6406.950M	35.0	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	47.1	54.0	-6.9	Vert
28	896.971M	36.8	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	38.9	46.0	-7.1	Vert
29	1830.333M	50.4	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	46.9	54.0	-7.1	Vert
30	1854.633M	50.2	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	46.8	54.0	-7.2	Horiz
31	1806.558M	50.3	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.7	54.0	-7.3	Horiz
32	1805.367M	50.2	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.6	54.0	-7.4	Horiz

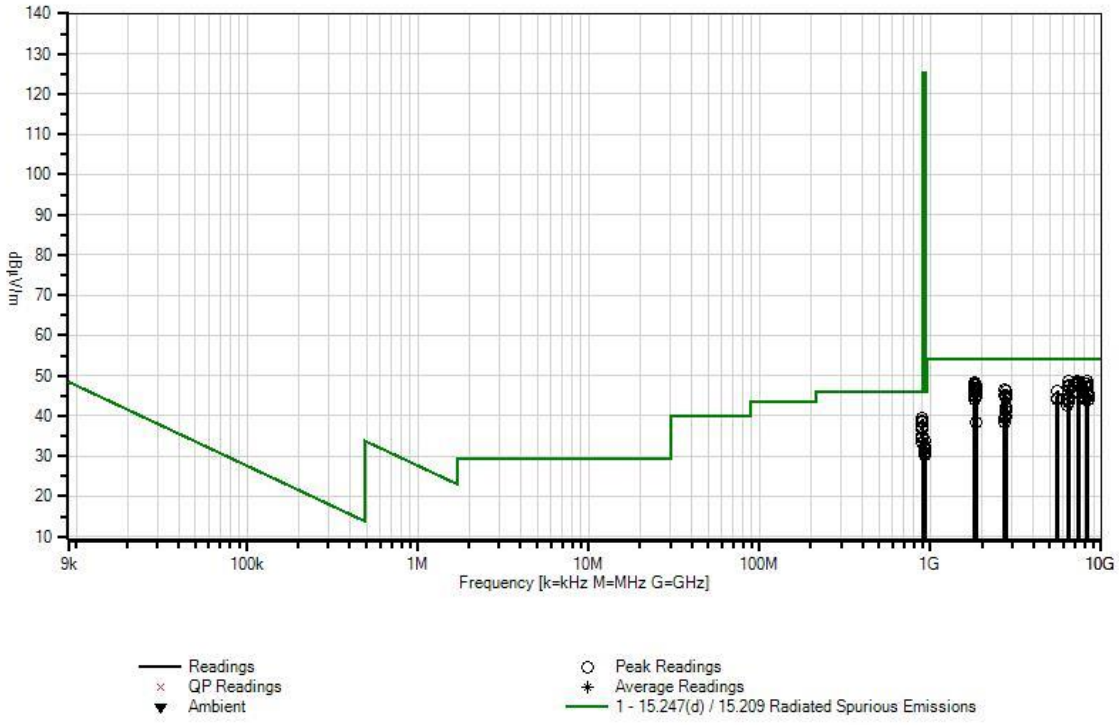
33	1829.400M	50.2	+0.0 +0.0 +2.8	+5.2 +0.0 +0.5	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.6	54.0	-7.4	Vert
34	2710.233M	48.4	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.7	+0.0	46.6	54.0	-7.4	Horiz
35	1806.425M	50.1	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	46.5	54.0	-7.5	Vert
36	897.012M	36.3	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	38.4	46.0	-7.6	Horiz
37	5560.100M	36.2	+0.0 +0.0 +5.2	+9.1 +0.0 +1.2	+0.0 -39.3 +0.2	+0.0 +33.7	+0.0	46.3	54.0	-7.7	Vert
38	2745.767M	47.9	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	46.3	54.0	-7.7	Vert
39	2745.725M	47.8	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	46.2	54.0	-7.8	Horiz
40	6487.070M	33.4	+0.0 +0.0 +5.7	+10.0 +0.0 +1.3	+0.0 -38.7 +0.1	+0.0 +34.3	+0.0	46.1	54.0	-7.9	Vert
41	7226.280M	32.3	+0.0 +0.0 +6.1	+10.9 +0.0 +1.2	+0.0 -39.2 +0.0	+0.0 +34.8	+0.0	46.1	54.0	-7.9	Vert
42	8129.080M	30.1	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	46.0	54.0	-8.0	Horiz
43	2744.125M	47.6	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	46.0	54.0	-8.0	Vert
44	1853.433M	49.3	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	45.9	54.0	-8.1	Vert
45	1805.342M	49.3	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	45.7	54.0	-8.3	Vert
46	8340.970M	29.0	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	45.6	54.0	-8.4	Vert
47	7317.950M	31.3	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	45.5	54.0	-8.5	Vert
48	7322.220M	31.3	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	45.5	54.0	-8.5	Vert
49	7318.020M	31.3	+0.0 +0.0 +6.1	+11.1 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +34.9	+0.0	45.5	54.0	-8.5	Horiz

50	8232.780M	29.1	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.0	+0.0 +35.8	+0.0	45.4	54.0	-8.6	Horiz
51	8345.500M	28.7	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	45.3	54.0	-8.7	Vert
52	2708.192M	47.1	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	45.2	54.0	-8.8	Horiz
53	896.995M	35.1	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	37.2	46.0	-8.8	Vert
54	2744.142M	46.7	+0.0 +0.0 +3.4	+5.9 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.8	+0.0	45.1	54.0	-8.9	Horiz
55	896.492M	34.9	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	37.0	46.0	-9.0	Vert
56	8345.500M	28.3	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	44.9	54.0	-9.1	Horiz
57	1854.593M	48.2	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	44.8	54.0	-9.2	Vert
58	896.465M	34.7	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	36.8	46.0	-9.2	Horiz
59	1806.575M	48.4	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	44.8	54.0	-9.2	Vert
60	896.995M	34.5	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	36.6	46.0	-9.4	Vert
61	2782.025M	45.8	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	44.6	54.0	-9.4	Horiz
62	5489.330M	34.4	+0.0 +0.0 +5.2	+9.1 +0.0 +1.2	+0.0 -39.4 +0.2	+0.0 +33.8	+0.0	44.5	54.0	-9.5	Vert
63	5494.470M	34.4	+0.0 +0.0 +5.2	+9.1 +0.0 +1.2	+0.0 -39.4 +0.2	+0.0 +33.8	+0.0	44.5	54.0	-9.5	Horiz
64	2780.267M	45.6	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	44.4	54.0	-9.6	Horiz
65	8129.370M	28.4	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	44.3	54.0	-9.7	Vert
66	6323.120M	32.5	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	44.3	54.0	-9.7	Vert

67	6319.430M	32.4	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	44.2	54.0	-9.8	Vert
68	6404.230M	32.0	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	44.1	54.0	-9.9	Vert
69	1805.317M	47.7	+0.0 +0.0 +2.8	+5.1 +0.0 +0.6	+0.0 -39.7 +0.3	+0.0 +27.3	+0.0	44.1	54.0	-9.9	Vert
70	8129.080M	28.1	+0.0 +0.0 +6.5	+11.7 +0.0 +1.2	+0.0 -39.2 +0.1	+0.0 +35.6	+0.0	44.0	54.0	-10.0	Vert
71	8340.750M	27.3	+0.0 +0.0 +6.5	+12.0 +0.0 +1.3	+0.0 -39.3 +0.1	+0.0 +36.0	+0.0	43.9	54.0	-10.1	Horiz
72	5563.520M	33.7	+0.0 +0.0 +5.2	+9.2 +0.0 +1.2	+0.0 -39.3 +0.2	+0.0 +33.7	+0.0	43.9	54.0	-10.1	Horiz
73	897.005M	33.2	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	35.3	46.0	-10.7	Horiz
74	6403.270M	31.1	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.8 +0.1	+0.0 +34.1	+0.0	43.2	54.0	-10.8	Horiz
75	6323.230M	30.8	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	42.6	54.0	-11.4	Horiz
76	896.995M	32.5	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	34.6	46.0	-11.4	Vert
77	6319.230M	30.7	+0.0 +0.0 +5.6	+9.9 +0.0 +1.2	+0.0 -38.9 +0.1	+0.0 +33.9	+0.0	42.5	54.0	-11.5	Horiz
78	896.482M	32.3	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	34.4	46.0	-11.6	Horiz
79	2781.867M	43.6	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	42.4	54.0	-11.6	Horiz
80	2780.108M	43.0	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	41.8	54.0	-12.2	Horiz
81	932.977M	30.7	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	33.7	46.0	-12.3	Horiz
82	896.468M	31.4	+0.0 +21.9 +0.0	+3.6 -27.4 +0.0	+0.5 +0.0 +0.0	+3.5 +0.0	+0.0	33.5	46.0	-12.5	Horiz
83	2780.192M	42.4	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	41.2	54.0	-12.8	Vert

84	932.977M	29.3	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	32.3	46.0	-13.7	Vert
85	933.541M	29.0	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	32.0	46.0	-14.0	Horiz
86	933.507M	28.9	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	31.9	46.0	-14.1	Vert
87	2781.667M	41.0	+0.0 +0.0 +3.5	+6.0 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +28.0	+0.0	39.8	54.0	-14.2	Vert
88	933.520M	28.6	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	31.6	46.0	-14.4	Horiz
89	2709.942M	41.2	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	39.3	54.0	-14.7	Vert
90	933.527M	28.1	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	31.1	46.0	-14.9	Vert
91	933.007M	27.6	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.6	46.0	-15.4	Vert
92	1853.460M	41.9	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	38.5	54.0	-15.5	Horiz
93	1854.510M	41.8	+0.0 +0.0 +2.9	+5.3 +0.0 +0.4	+0.0 -39.7 +0.3	+0.0 +27.4	+0.0	38.4	54.0	-15.6	Horiz
94	2708.150M	40.3	+0.0 +0.0 +3.4	+5.8 +0.0 +0.8	+0.0 -39.7 +0.2	+0.0 +27.6	+0.0	38.4	54.0	-15.6	Vert
95	932.984M	27.3	+0.0 +22.5 +0.0	+3.6 -27.3 +0.0	+0.6 +0.0 +0.0	+3.6 +0.0	+0.0	30.3	46.0	-15.7	Horiz

CKC Laboratories, Inc. Date: 12/16/2013 Time: 12:56:58 STMicroelectronics WO#: 95078
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 4 Ext ATTN: 0 dB



Band Edge Compliance

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**

Work Order #: **95078** Date: 12/6,9,10/2013
Test Type: **Band Edge Compliance**
Equipment: **915 MHz Low Power RF Module**
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

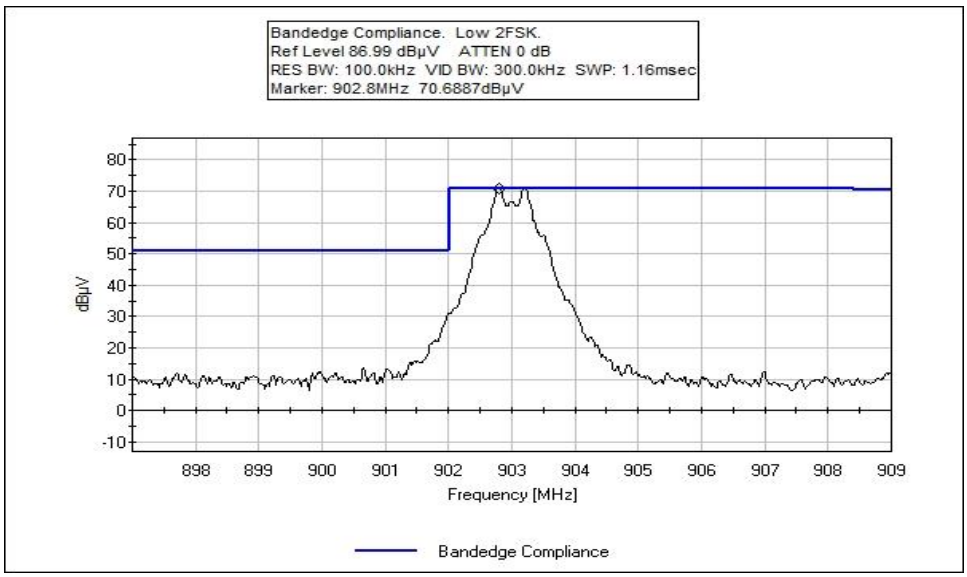
Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

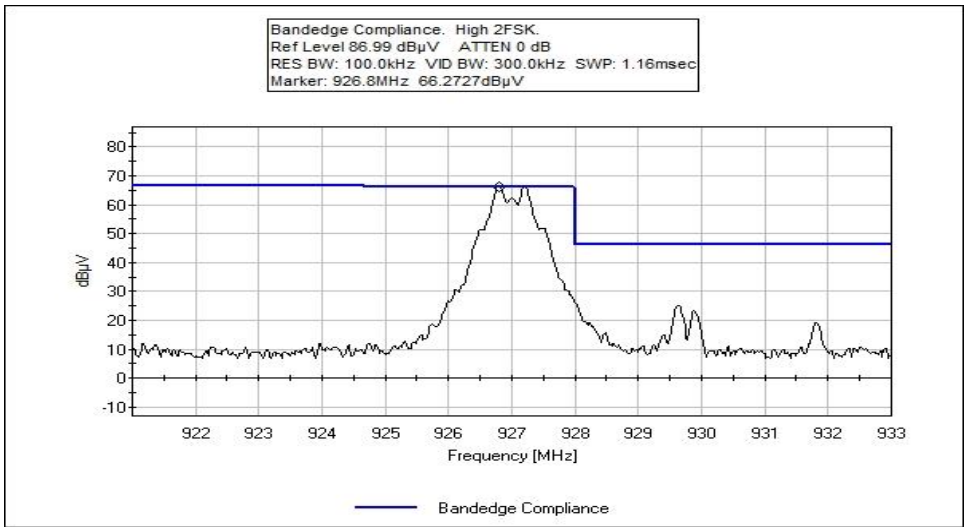
Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power to the integral antenna with 2FSK, GFSK, or MSK. Frequency range of test 902 MHz to 928 MHz. Operating range of EUT 902 MHz to 928 MHz. RBW=100kHz, VBW=300kHz. Site D. Temperature: 21°C, Humidity: 38%, Pressure: 100kPa.

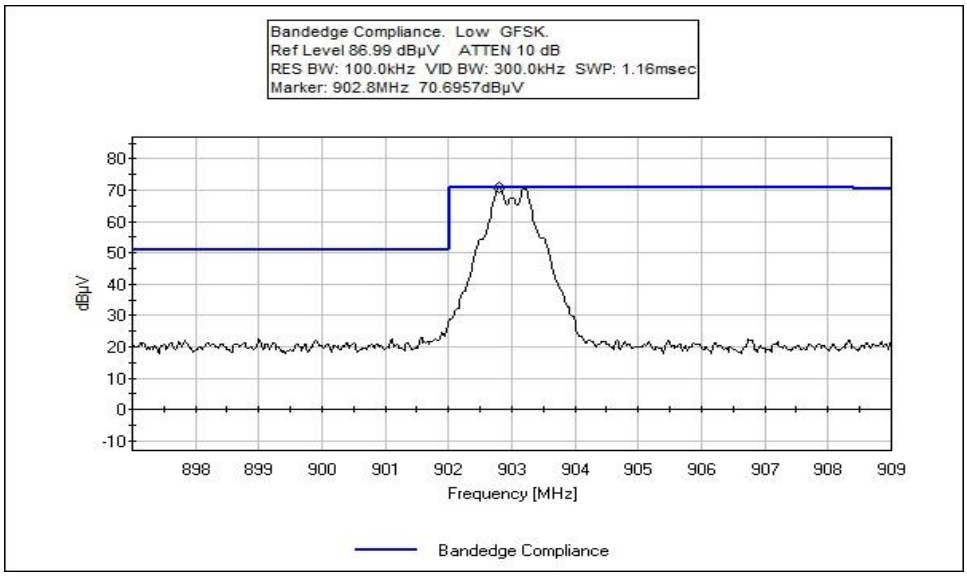
Test Data



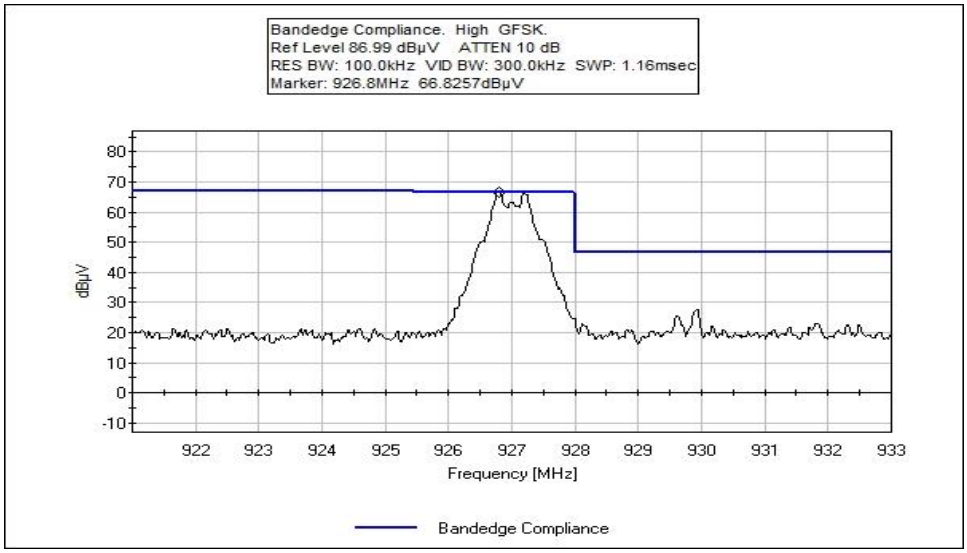
Low channel 2FSK



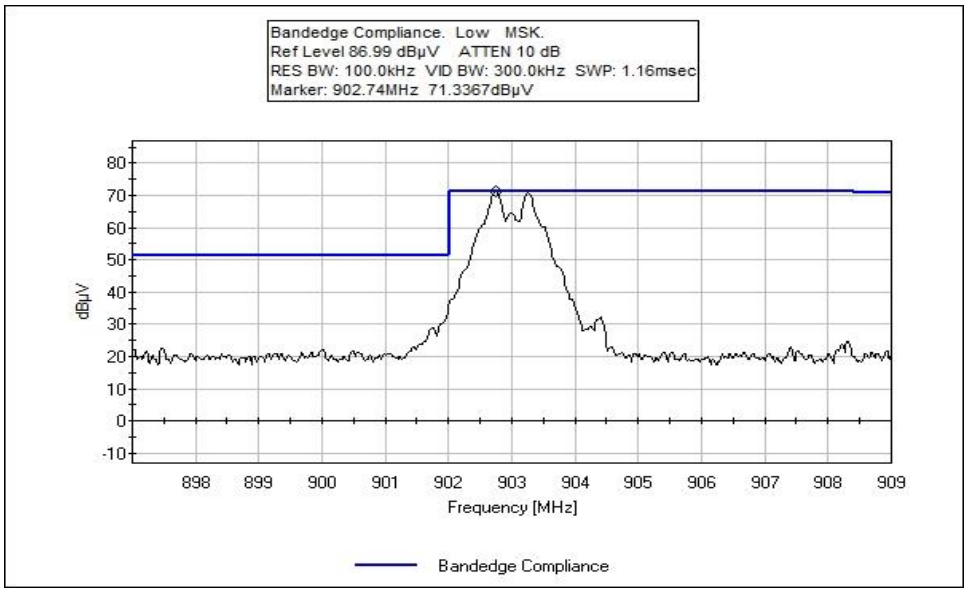
High channel 2FSK



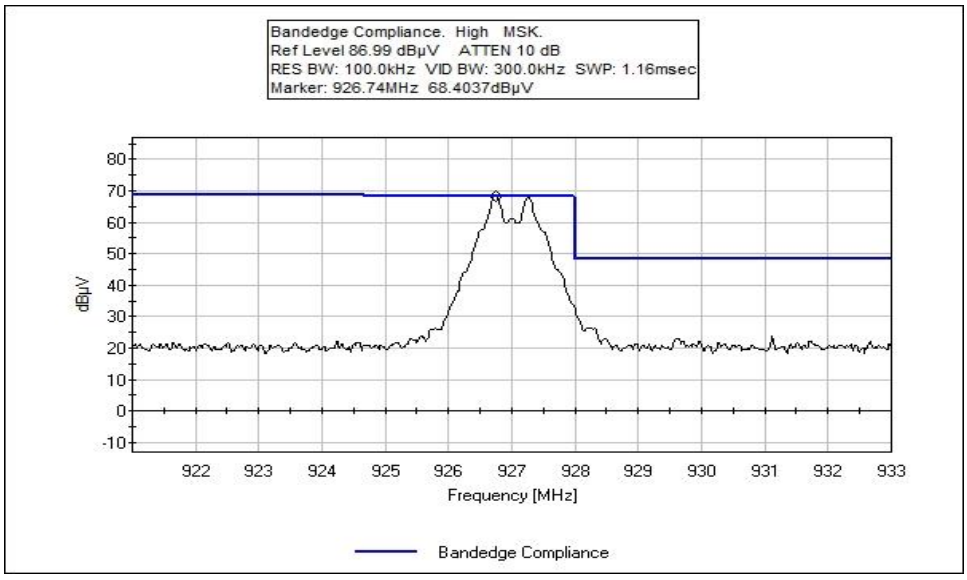
Low channel GFSK



High channel GFSK

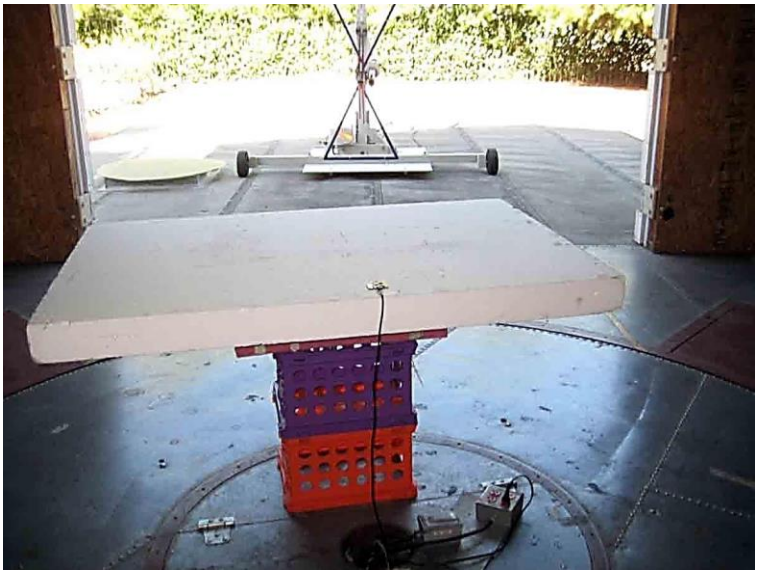


Low channel MSK



High channel MSK

Test Setup Photos



Test Setup

15.247(e) Power Spectral Density

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **STMicroelectronics**
Specification: **15.247(e)**
Work Order #: **95078**
Test Type: **Power Spectral Density**
Equipment: **915 MHz Low Power RF Module**
Manufacturer: STMicroelectronics Tested By: S. Yamamoto
Model: SP1ML-915
S/N: Unit #1

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014

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

Function	Manufacturer	Model #	S/N
915 MHz Low Power RF Module*	STMicroelectronics	SP1ML-915	Unit #1

Support Devices:

Function	Manufacturer	Model #	S/N
Module Dev Board	STMicroelectronics	SPIRIT1	05
AC to USB Power Adapter	Rhino	PSNC-75M	12-B013481

Test Conditions / Notes:

The equipment under test (EUT) is installed on the module dev board. The module dev board and EUT are powered from the USB cable port on the module dev board. The USB cable is connected to an AC to USB power adapter. The EUT is continuously transmitting at its rated maximum power to the integral antenna. Frequency range of test 902 MHz to 928 MHz. Operating range of EUT 902 MHz to 928 MHz. RBW=620kHz, VBW=3MHz for 2FSK and GFSK. RBW=750kHz, VBW=3MHz for MSK. Power spectral density RBW=3kHz, VBW=10kHz. Site D. Data taken with EUT set to a low, middle and high channel. Temperature: 21°C, Humidity: 38%, Pressure: 100kPa.

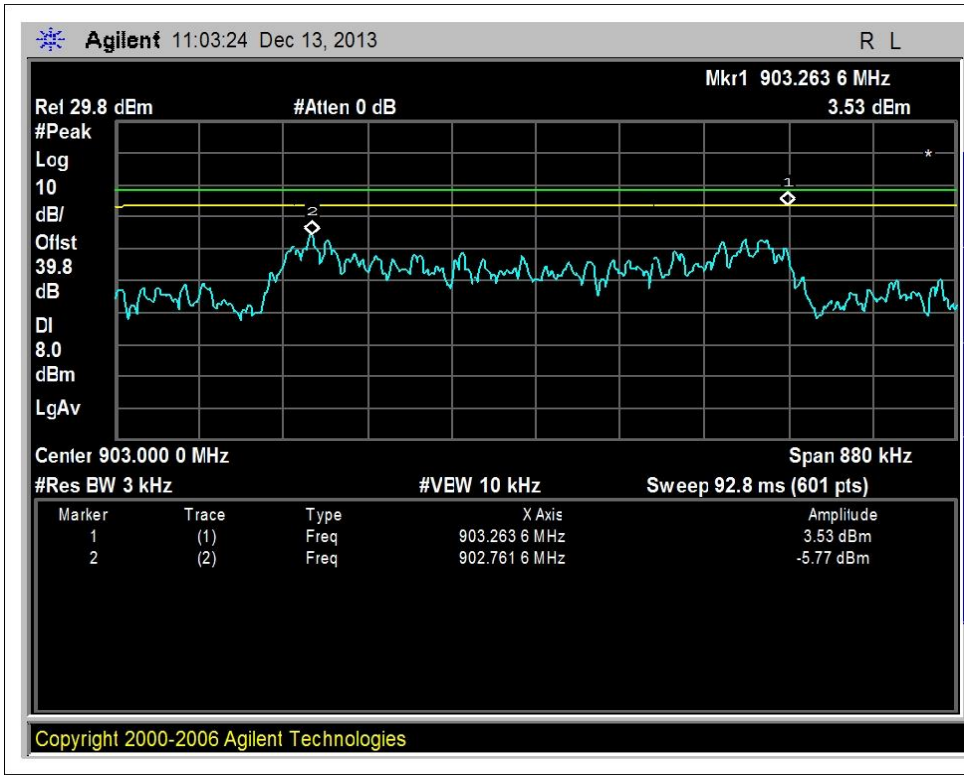
15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

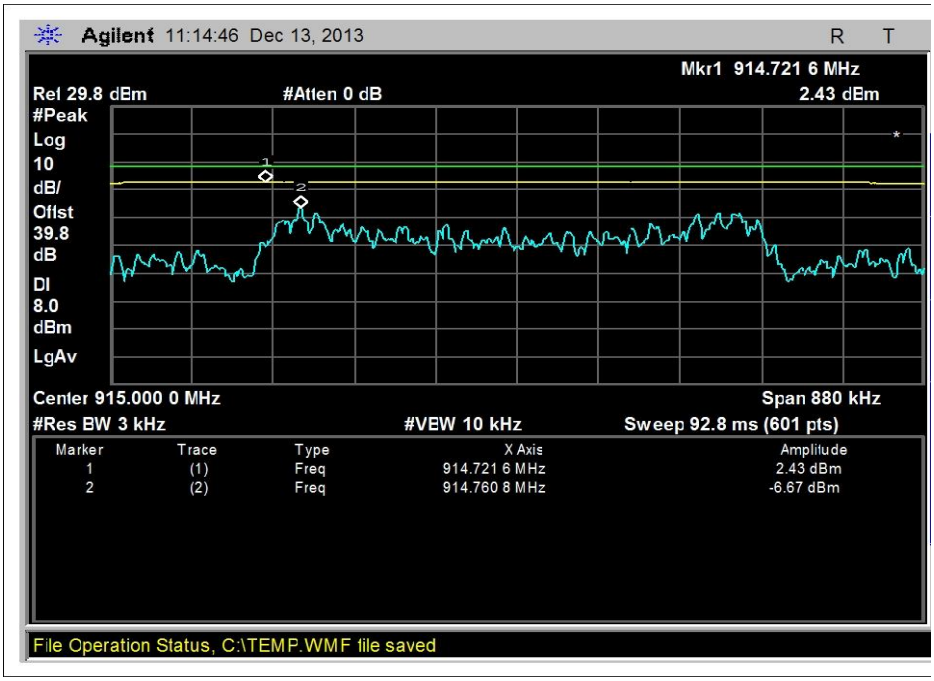
Data plots

The peak output power was measured using a peak radiated emissions measurement due to EUT uses an integral antenna. The radiated measurement was used to calculate an equivalent maximum peak conducted output power in accordance with ANSI C63.10. The spectrum analyzer offset was adjusted so that the yellow trace read the calculated value for maximum peak conducted output power. The blue trace indicates the power spectral density taken with a 3kHz bandwidth. The peak amplitude of the blue trace is compared with the 8dBm limit (green display line on plot).

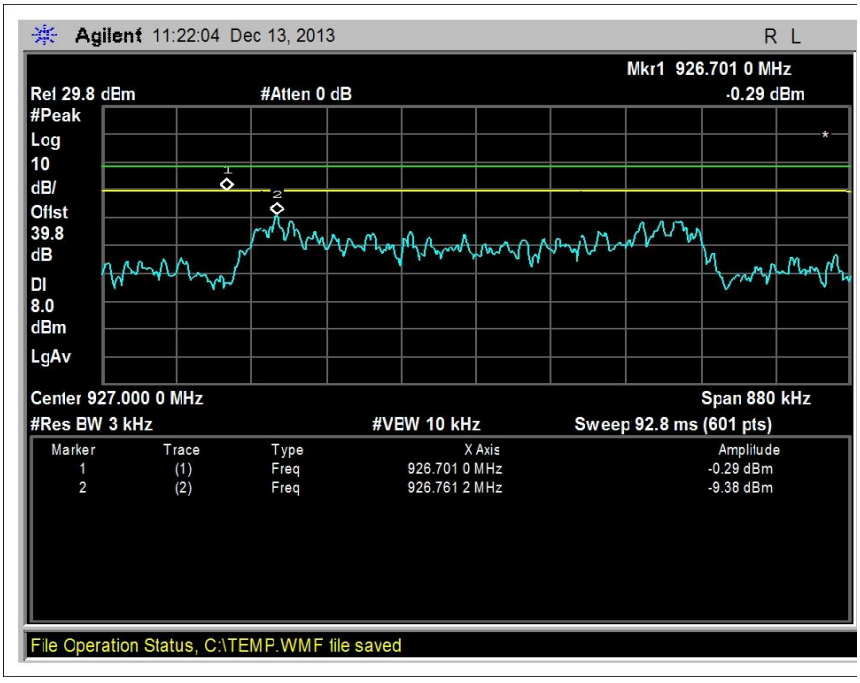
Test Data



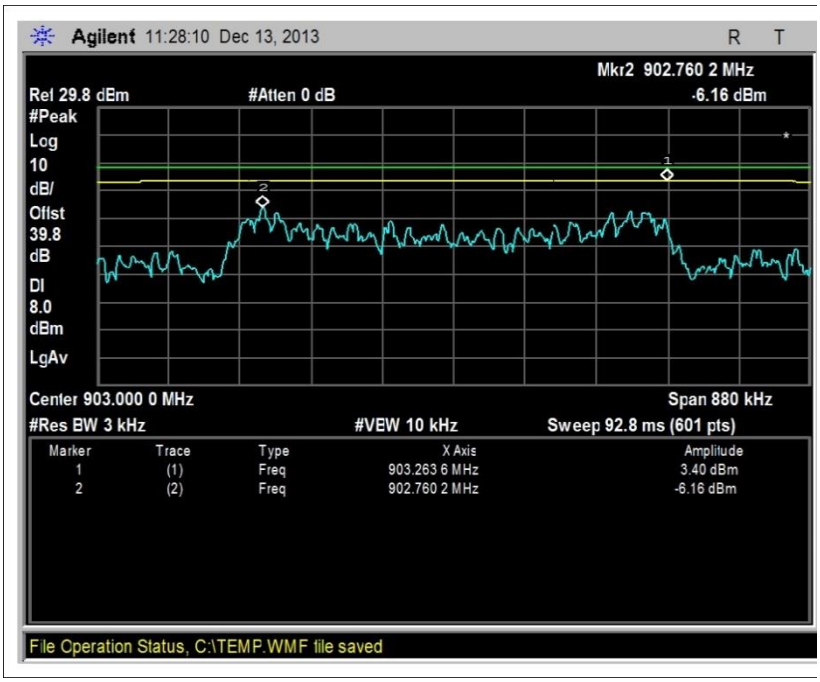
Low channel 2FSK



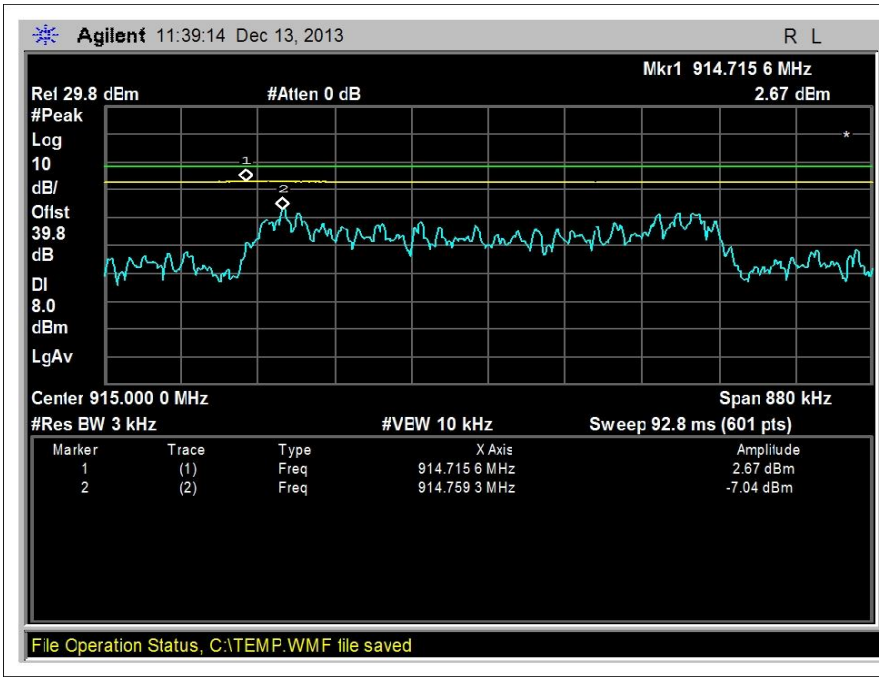
Middle channel 2FSK



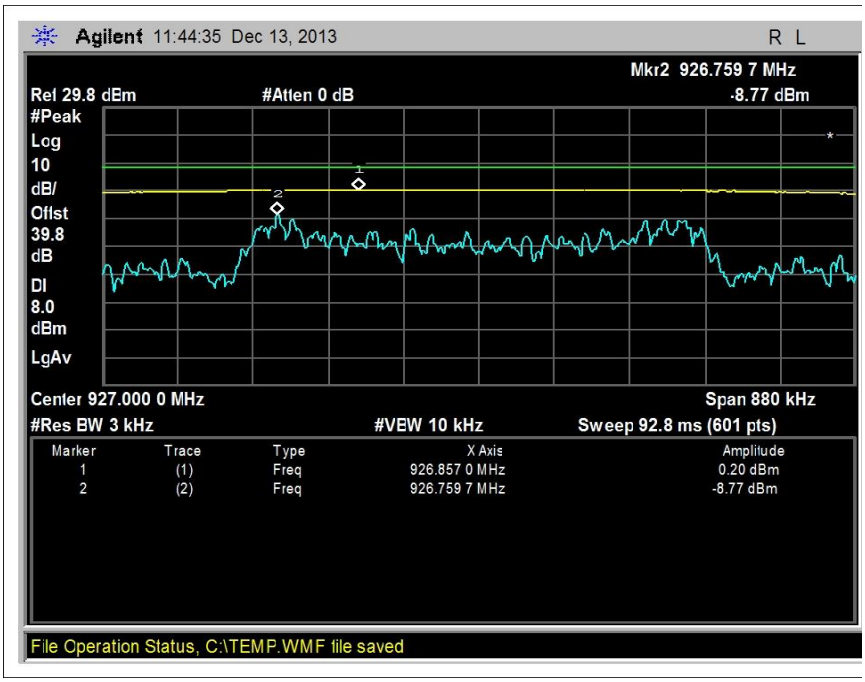
High channel 2FSK



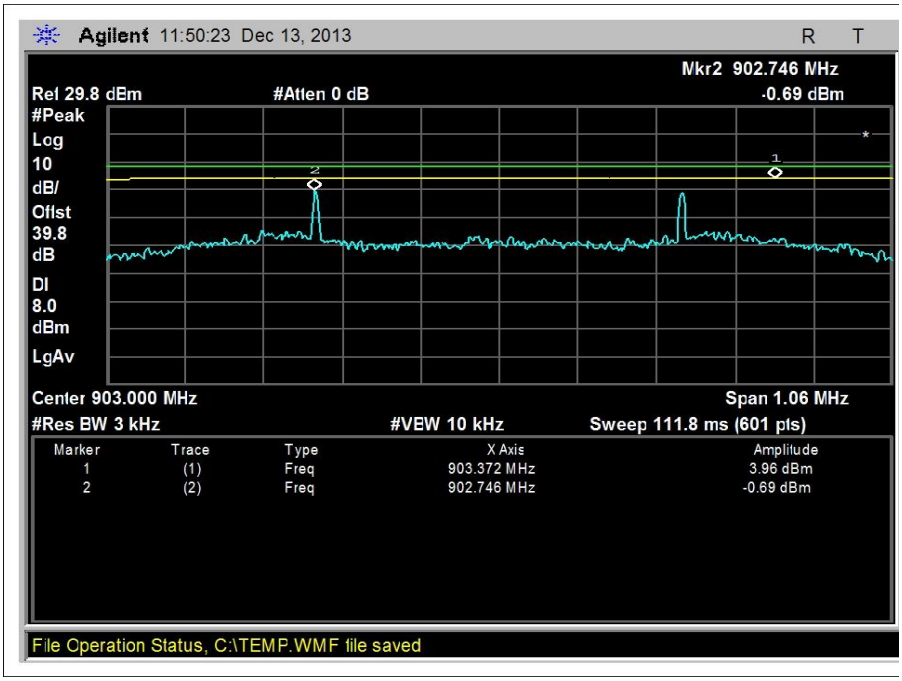
Low channel GFSK



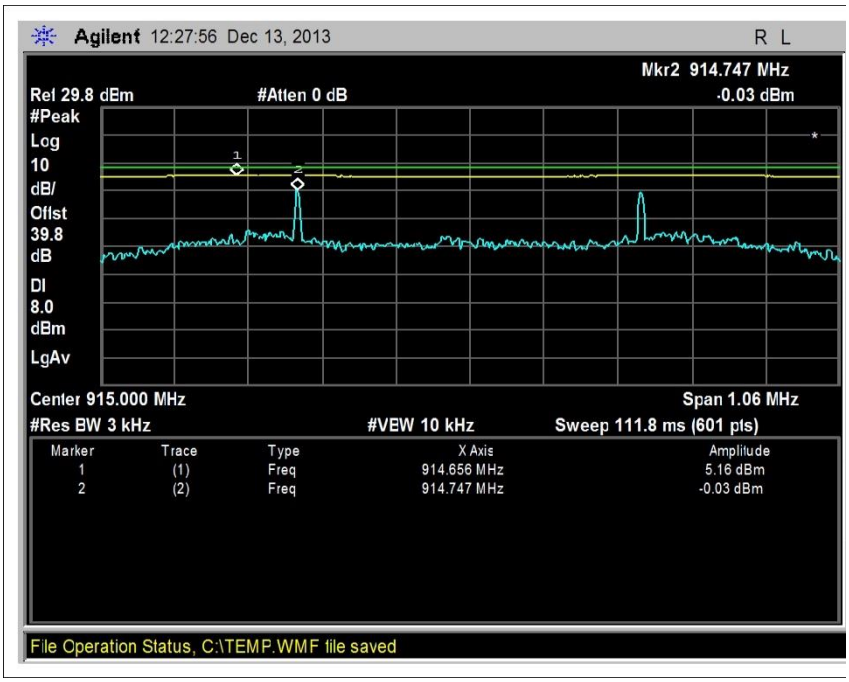
Middle channel GFSK



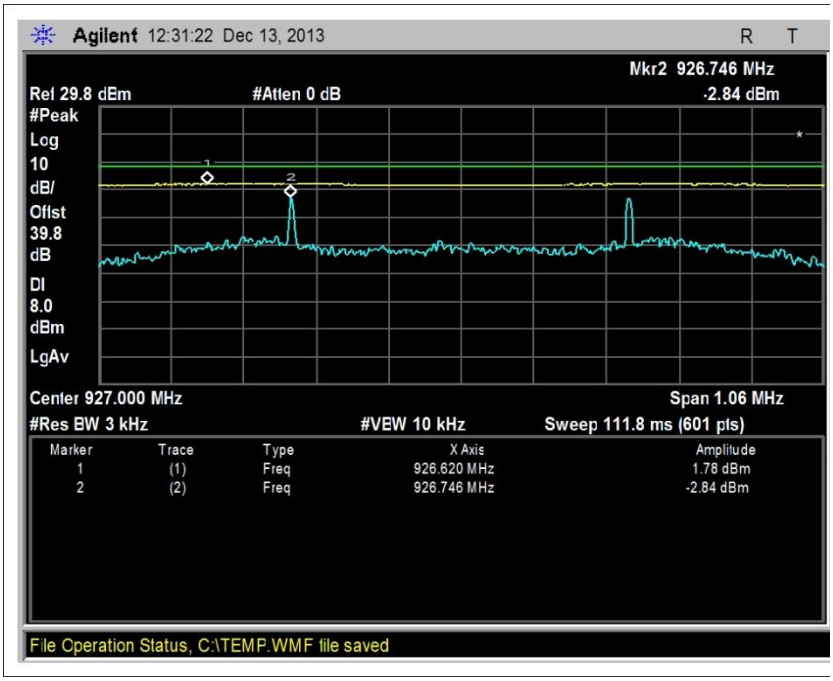
High channel GFSK



Low channel MSK

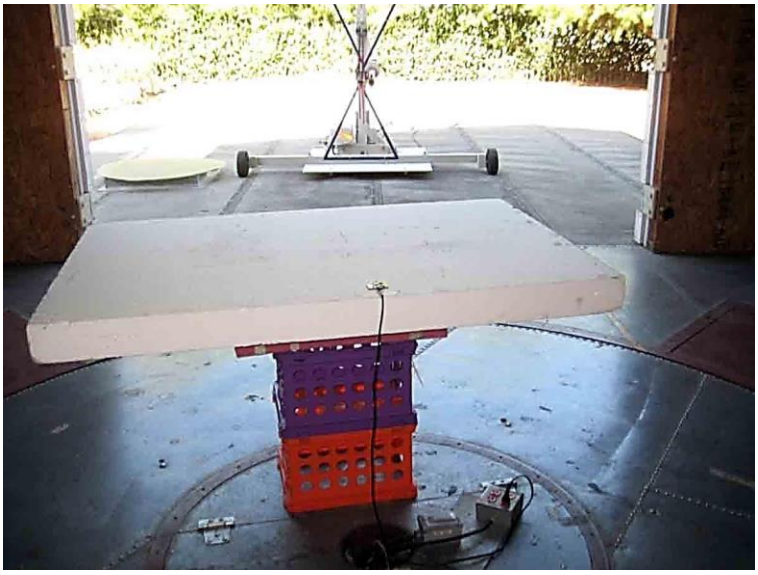


Middle channel MSK



High channel MSK

Test Setup Photos



Test Setup

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: 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 dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/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. Unless otherwise specified, 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.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

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 "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. 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 or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent 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

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. 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.