EMC Test Report

Project Number: 3044696

Report Number: 3044696EMC03 **Revision Level:** 0

Client: Intermec Technologies Corp.
6001 36th Avenue W
Everett, WA 988203
United States

Equipment Under Test: Mobile Computer

Marketing Name: Catalina

Model: CN51

Hardware Version: P2

Applicable Standards: FCC Part 15 Subpart C, § 15.247
RSS-210, Issue 8, December 2010
ANSI C63.10: 2009

Report issued on: 11 JUL 2013

Test Result: Compliant

Tested by: Brian Forster, EMC Engineer

Reviewed by: David Schramm, EMC Manager

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

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1 Summary of Test Results

Test Description	Test Specification (FCC)	Test Specification (Industry Canada)	Test Result
Occupied Bandwidth	15.247	RSS-210	Compliant
Peak Power Output	15.247(b)(1)	RSS-210 A8.4(4)	Compliant
Conducted Spurious Emissions	15.247(d)	RSS-210 A8.5	Compliant
Band Edge	15.247(d)	RSS-210 A8.5	Compliant
Radiated Spurious Emissions	15.247(d)	RSS-210 A8.5	Compliant
Spectral Density	15.247(e)	RSS-210 A8.2(b)	Compliant
AC Powerline Conducted Emission	15.207	RSS-GEN 7.2.4	Compliant

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name:	Intermec
Address:	6001 36th Avenue West
City, State, Zip, Country:	Everett, WA 98203 - 1264 6001 36th Avenue West

2.1 *Test Laboratory*

Name:	SGS North America, Inc.
Address:	620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country:	Suwanee, GA 30024, USA
Accrediting Body:	A2LA
Type of lab:	Testing Laboratory
Certificate Number:	3212.01

2.2 *General Information of EUT*

Marketing Name:	Catalina
Model:	1015CP01
Serial Number:	333X1200044(Conducted Measurements) 328X1200002(Radiated Measurements)
EUT Firmware Version:	1.0.0.0334
FCC ID:	EHA-1015CP01X1
Frequency Range:	2402 to 2480 MHz
Number of channels:	79
Modulation type:	GFSK, EDR 2, EDR 3
Channel spacing:	1 MHz
Antenna:	Integral
Rated Voltage:	3.8 VDC Internal Battery
Sample Received Date:	08 FEB 2013
Dates of testing:	08 FEB – 10 APR 2013

Operating Modes and Conditions

The EUT was configured in software to allow the user to the control the EUT to run continuously exercising all modes of operation.

During testing, the hopping sequence was stopped in accordance with Section 5.1 of ANSI C63.10-2009 so that the low, mid and high channels could be tested independently.

Modulations used: For fundamental and spurious measurements, the EUT was configured to operate continuously with Bluetooth modulation enabled.

As specified in Section 5.10.5 of ANSI C63.10:2009:

- Software was designed to allow the EUT to operate
  - at 100 % duty cycle
  - at the worst-case duty cycle to allow measurements in instances where an average correction factor needs to be determined to calculate the average field strength from the measured peak field strength
- The software allowed configuration and operation on all available unlicensed wireless device channels.
- The software allowed configuration and operation using all available modulations and data rates
- The software allowed configuration and operation on all available power out levels
- Since this is a frequency hopping system, the software allowed the hopping sequence to be turned off

2.3 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Intermec	EUT	1015CP01	333X1200044(Conducted Measurements) 328X1200002(Radiated Measurements)

3 Occupied Bandwidth

3.1 *Test Result*

Test Description	Test Method	Test Result
20 dB bandwidth	ANSI C63.10 (2009) clause 6.9	Pass

3.2 *Test Method*

The procedures from ANSI C63.10 (2009) clause 6.9 were used to determine the 20 dB bandwidth.

3.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.4 ℃
Relative Humidity: 47.8 %

3.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Receiver	ESU40	R&S	B079629	25 AUG 2012

Note: The calibration period equipment is 1 year.

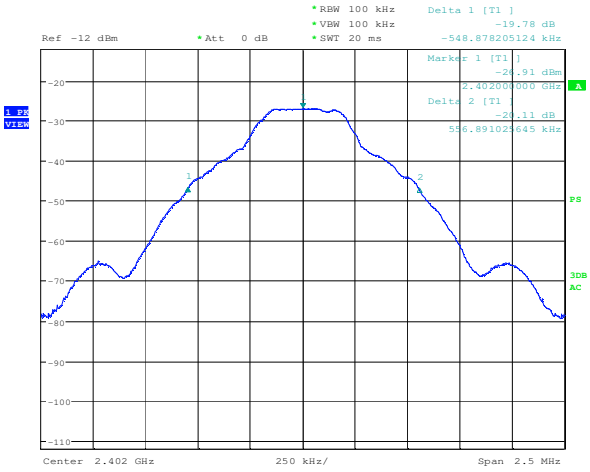
3.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

3.6 *Test Data*

Frequency	Channel No	Modulation	20 dB bandwidth kHz
2402	0	GFSK	1105.769
		EDR-2	1462.339
		EDR-3	1466.345
2441	39	GFSK	1101.762
		EDR-2	1462.339
		EDR-3	1462.339
2480	78	GFSK	1101.762
		EDR-2	1458.33
		EDR-3	1458.333

Occupied Bandwidth Plot, Low Channel
GFSK, EDR-2(2-DH3 GFSK), EDR-3(3-DH3 GFSK)



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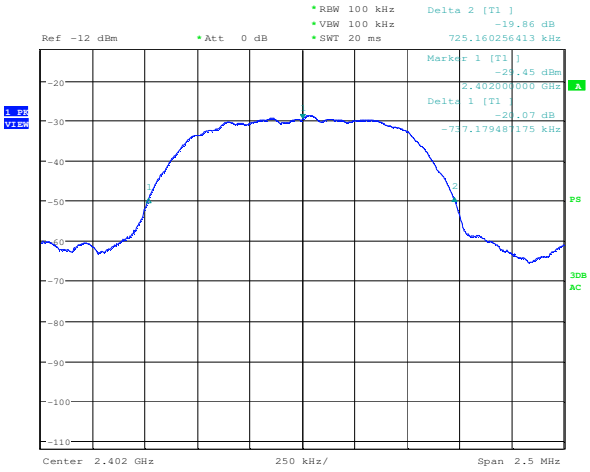

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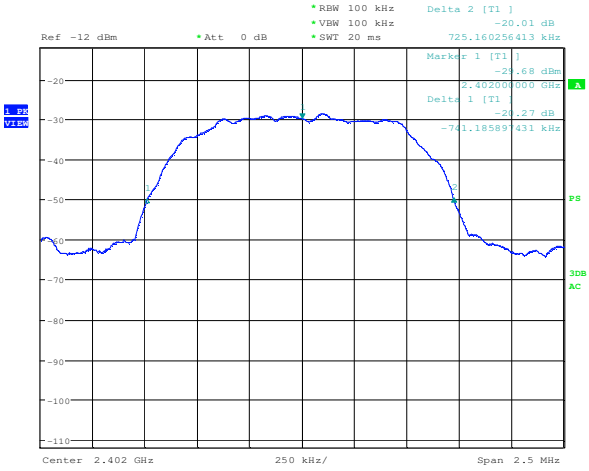

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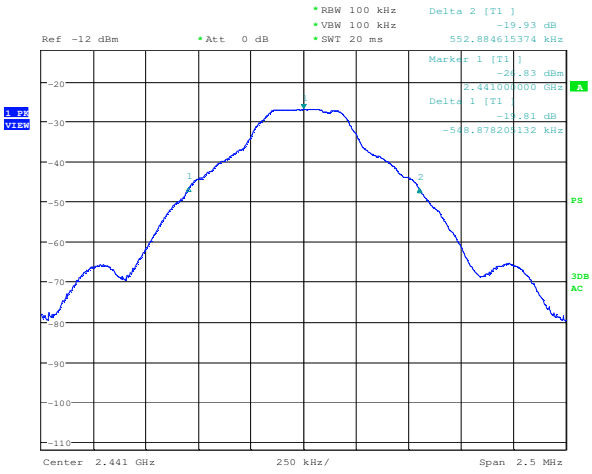
Occupied Bandwidth Plot, Mid Channel
GFSK, EDR-2(2-DH3 GFSK), EDR-3(3-DH3 GFSK)



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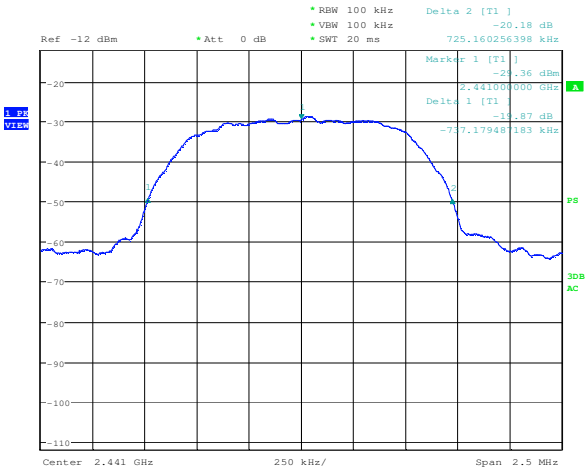

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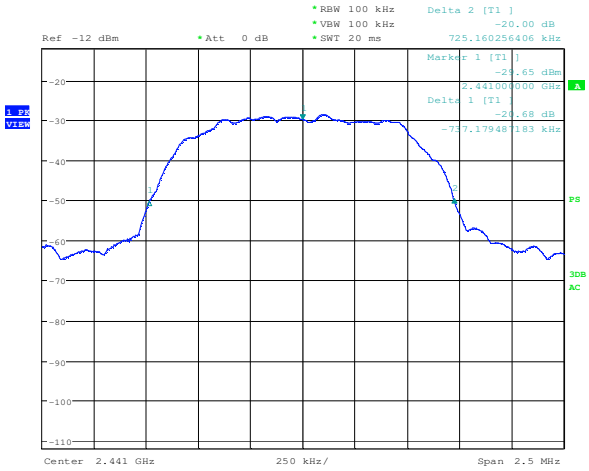

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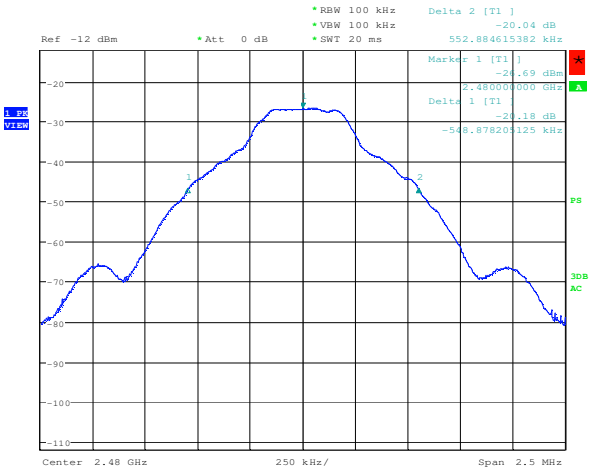
Occupied Bandwidth Plot, High Channel
GFSK, EDR-2(2-DH3 GFSK), EDR-3(3-DH3 GFSK)



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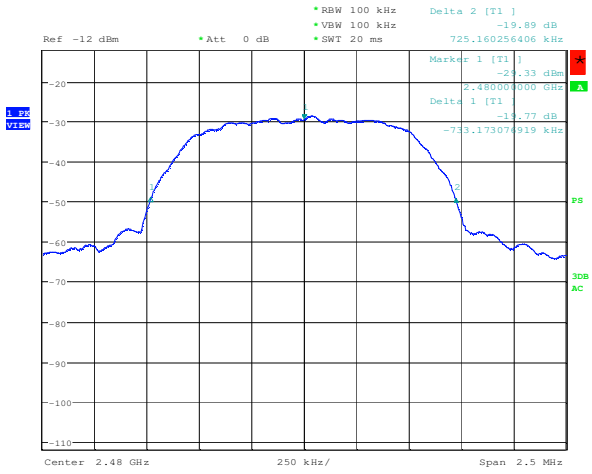

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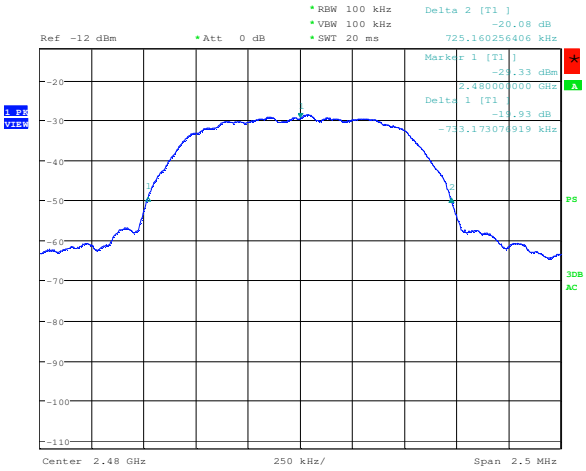


4 Peak Output Power

4.1 *Test Result*

Test Description	Test Specification	Test Result
Peak Output Power	15.247(a) (1) KDB 558074 D01 DTS Meas Guidance v03r01	Compliant

4.2 *Test Method*

The test data was measured using a spectrum analyzer with Peak detector and a resolution bandwidth of 3 MHz.

Limit
1 watt (30 dBm).

4.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.4 ℃
Relative Humidity: 47.8 %

4.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Receiver	ESU40	R&S	B079629	24 SEP 2013
Attenuator	BW-S30W2+	Mini-Circuits	NA	VBU
Network Analyzer	ZVL	R&S	B079799	1 JUL 2013

Note: The calibration period equipment is 1 year.

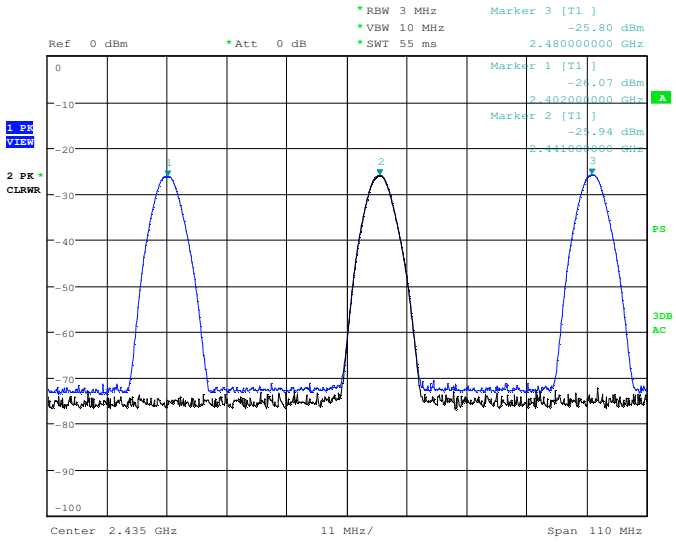
4.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

4.6 *Test Data*

Frequency	Channel	Modulation	Raw Measurement (dBm)	Attenuator + Cable (dB)	Peak Output Power (dBm)	Limit
2402	0	GFSK	-26.07	30.5	4.43	30
		EDR-2	-24.27	30.5	6.23	30
		EDR-3	-23.70	30.5	6.8	30
2441	39	GFSK	-23.94	30.5	6.56	30
		EDR-2	-24	30.5	6.5	30
		EDR-3	-23.31	30.5	7.19	30
2480	78	GFSK	-25.80	30.5	4.7	30
		EDR-2	-23.68	30.5	6.82	30
		EDR-3	-22.97	30.5	7.53	30

GFSK



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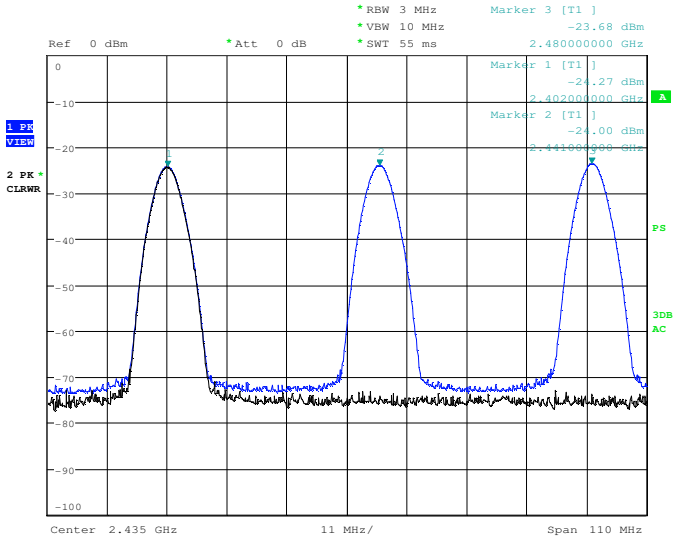
EDR2



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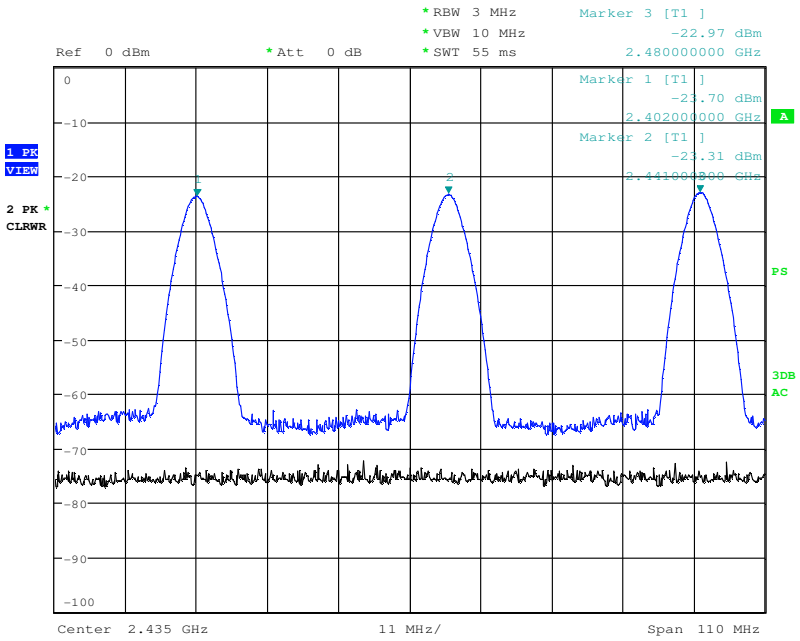
EDR3



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5 Conducted Spurious Emissions

5.1 *Test Result*

Test Description	Test Specification	Test Result
Conducted Spurious Emissions	15.247(d)	Compliant

5.2 *Test Method*

The test data was measured using a spectrum analyzer with

- Peak detector, max hold
- Resolution bandwidth of at least 100 kHz
- Video bandwidth at least 3x RBW
- Frequency range: 30 MHz to 25 GHz

The limit is 20 dB below the measured peak power.

5.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.4 ℃
Relative Humidity: 47.8 %

5.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	8565E	Agilent	B14984B	15OCT2013
Attenuator	BW-S30W2+	Mini-Circuits	B079794	VBU
40 GHz sig gen	HMC-T2240	Hittite	B079813	VBU

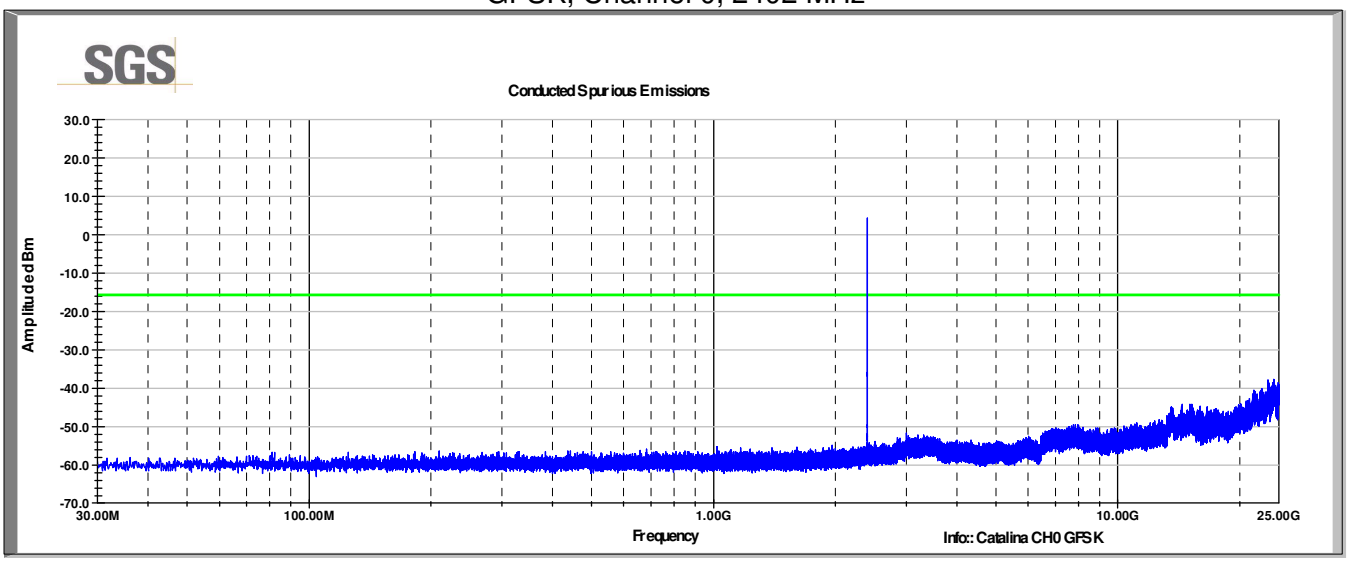
Note: The calibration period equipment is 1 year.

5.5 *Test Setup Photographs*

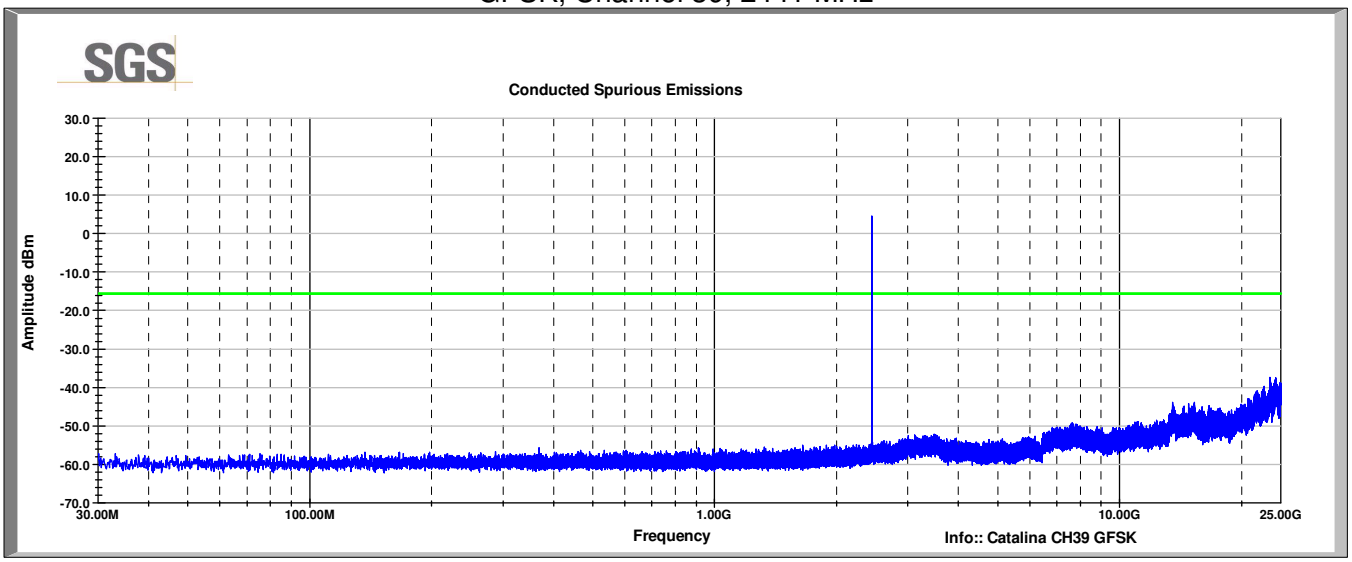
Test setup photographs are located in a separate exhibit.

5.6 *Test Data*

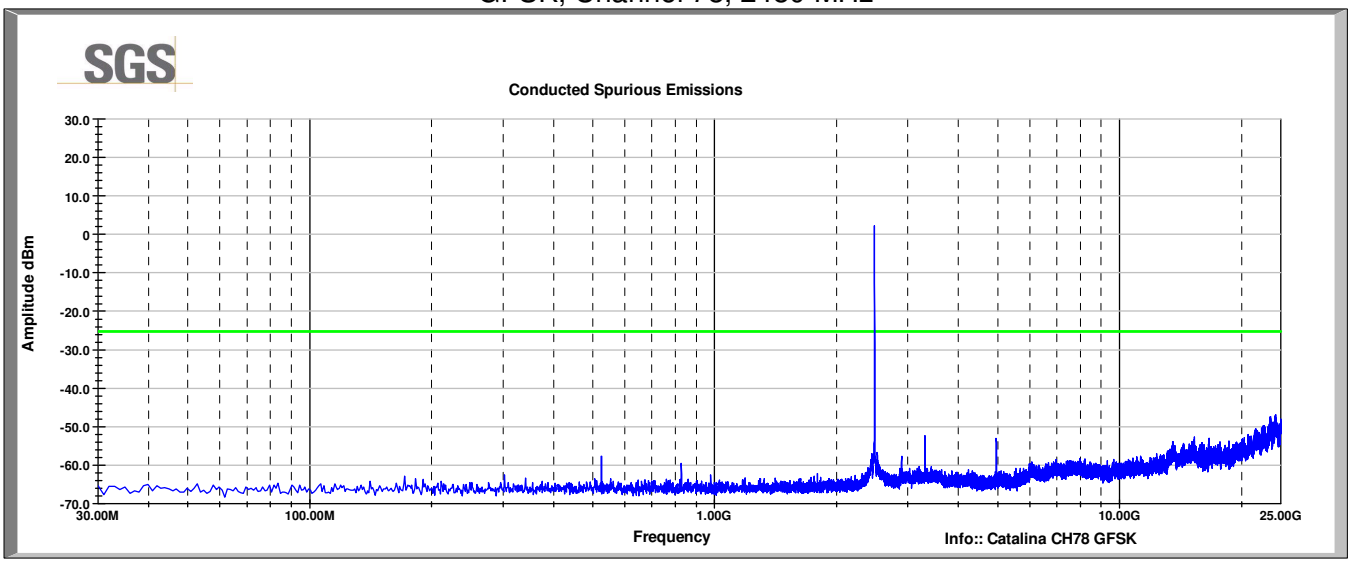
GFSK, Channel 0, 2402 MHz



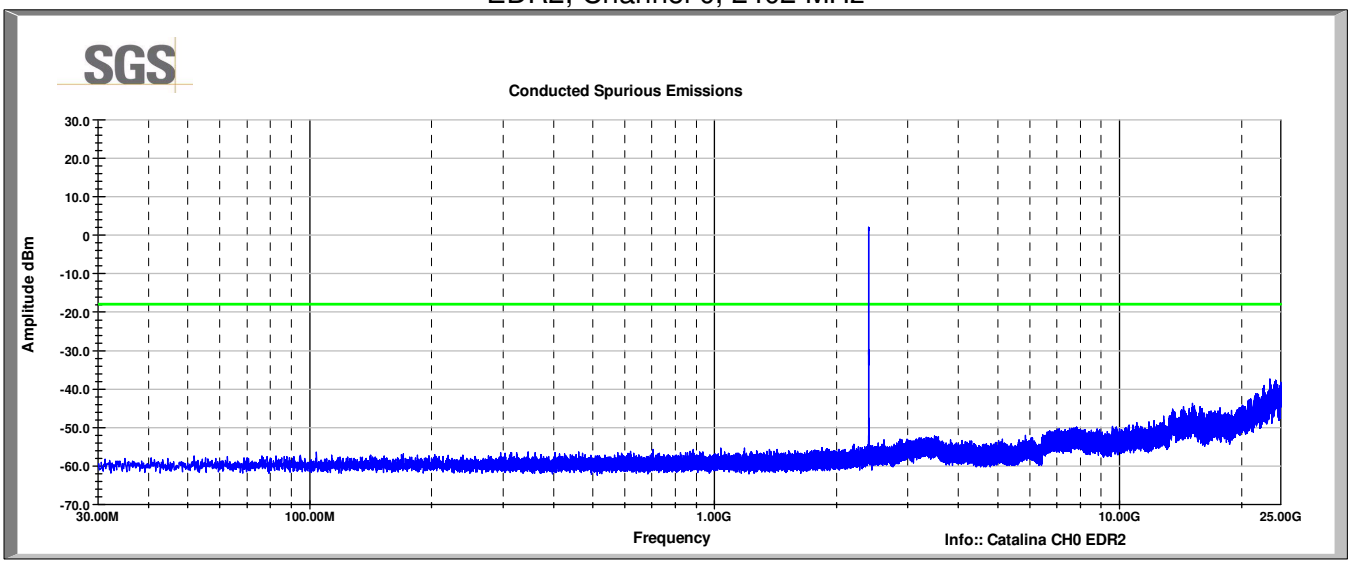
GFSK, Channel 39, 2441 MHz



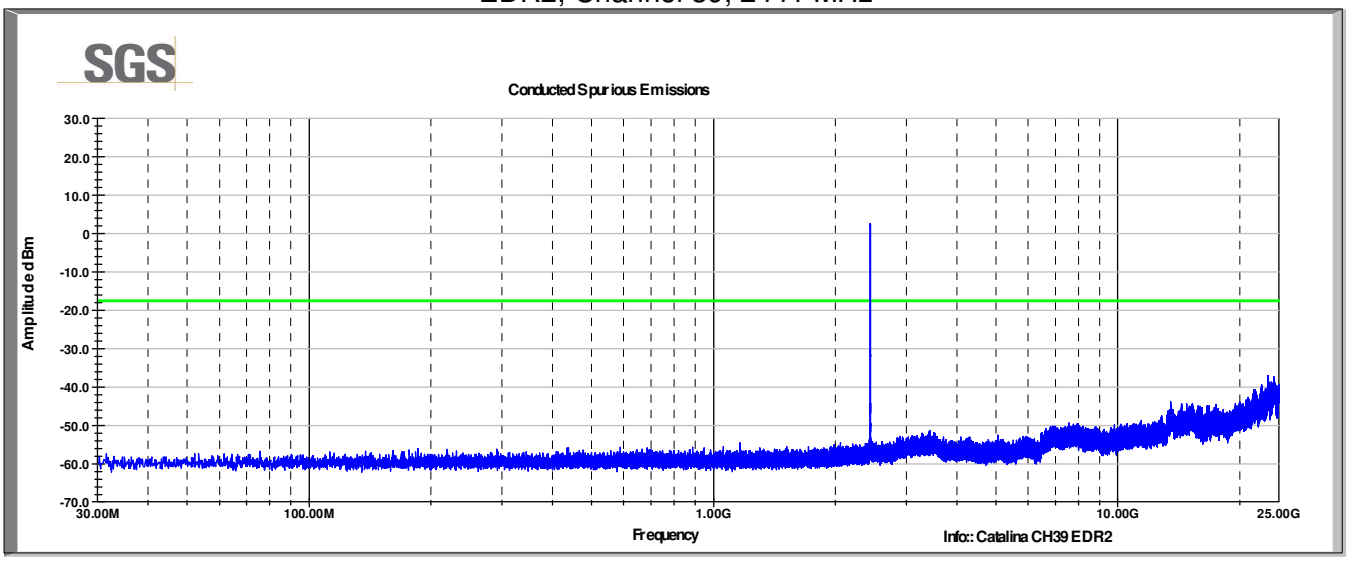
GFSK, Channel 78, 2480 MHz



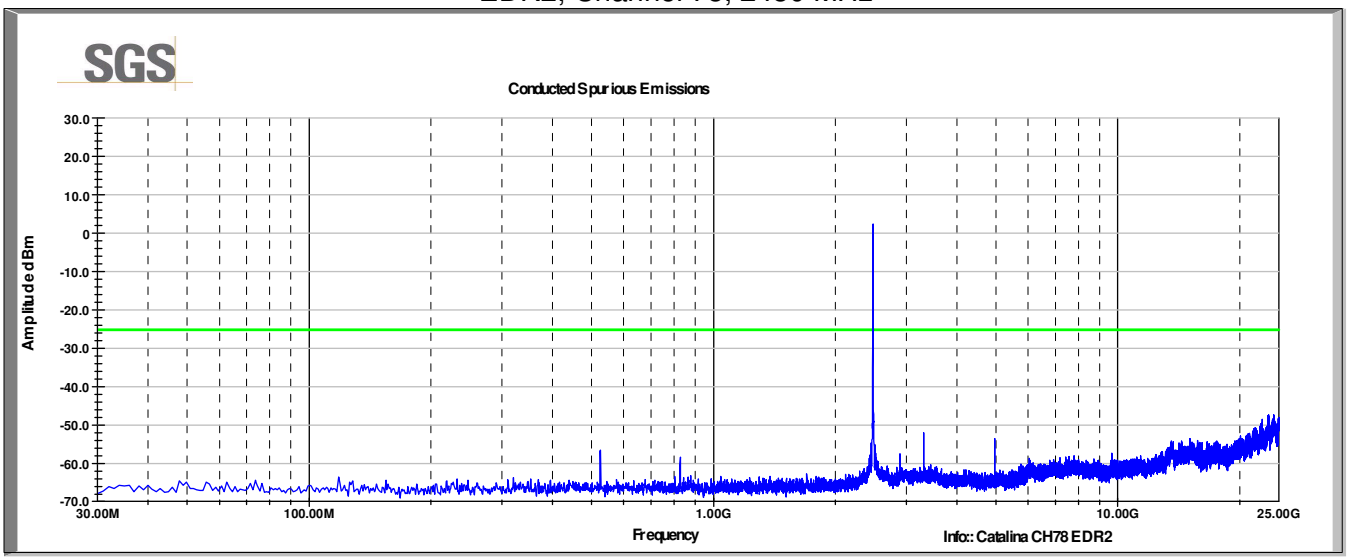
EDR2, Channel 0, 2402 MHz



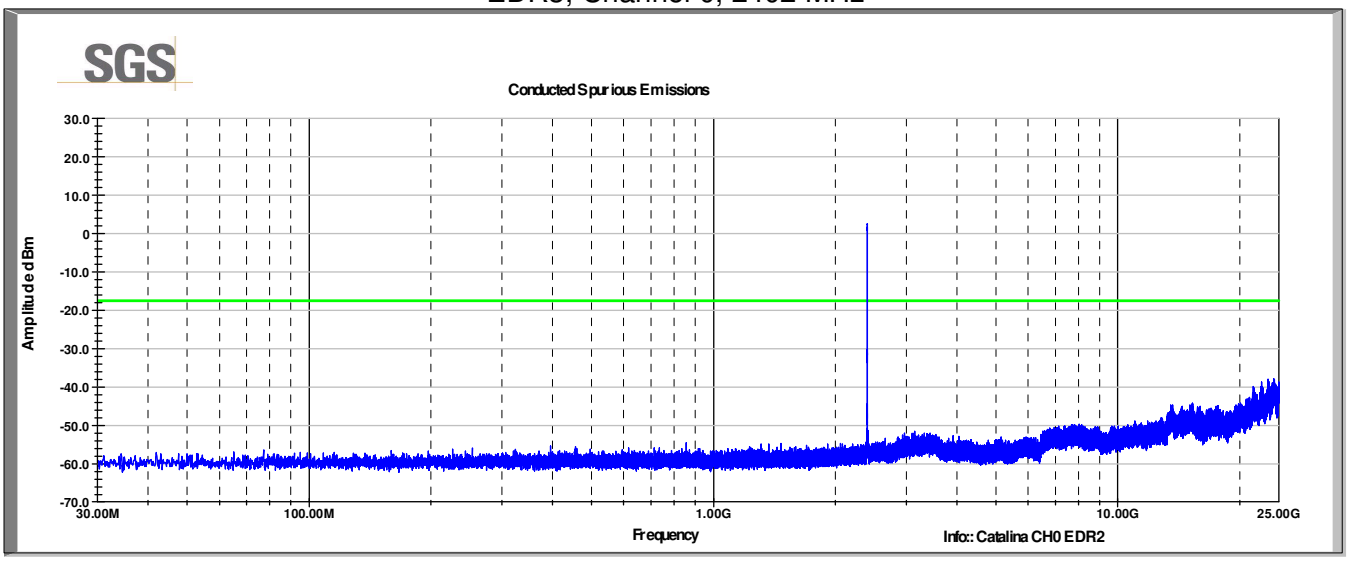
EDR2, Channel 39, 2441 MHz



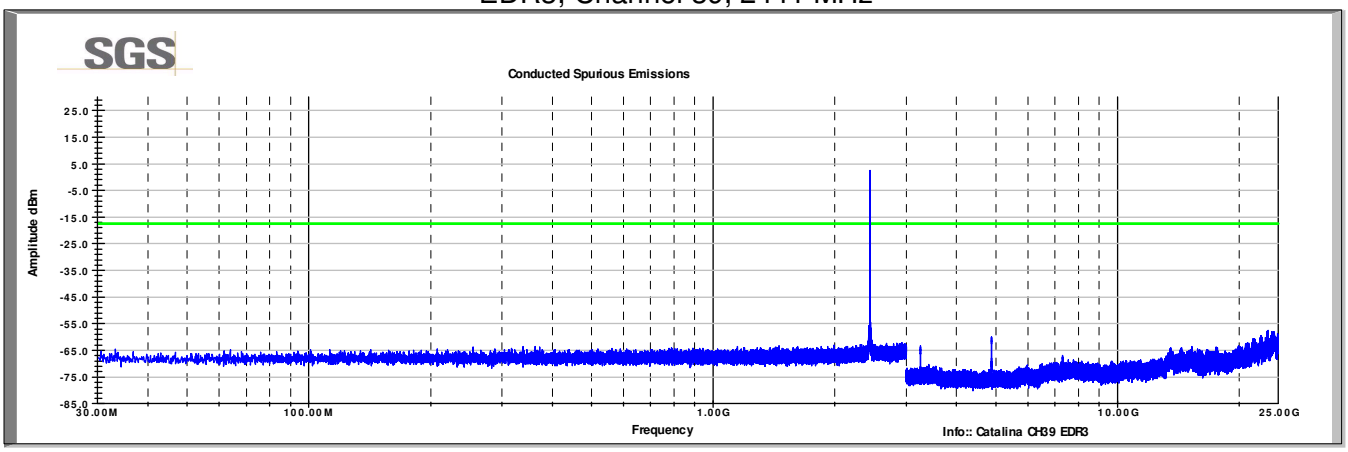
EDR2, Channel 78, 2480 MHz



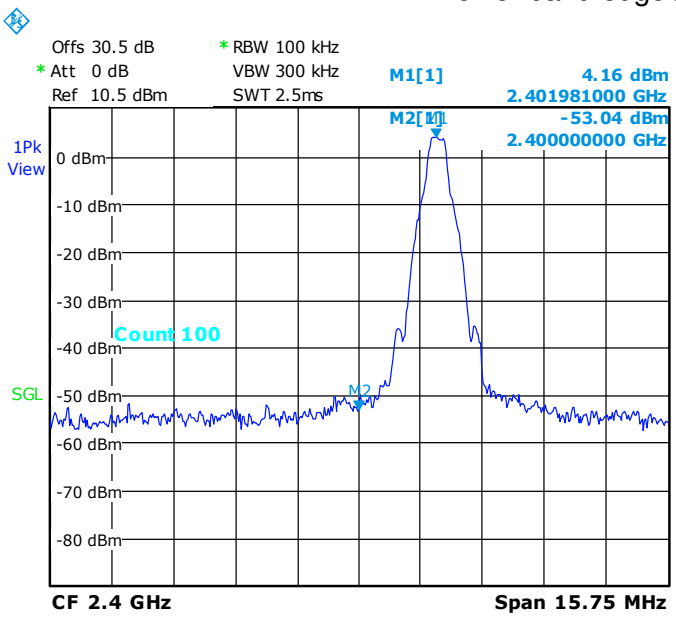
EDR3, Channel 0, 2402 MHz



EDR3, Channel 39, 2441 MHz



GFSK
Lower band edge / Upper band edge



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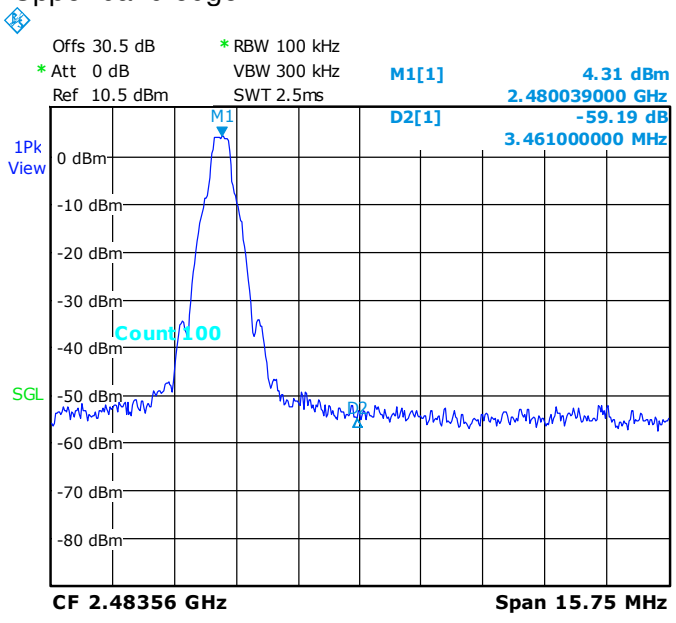

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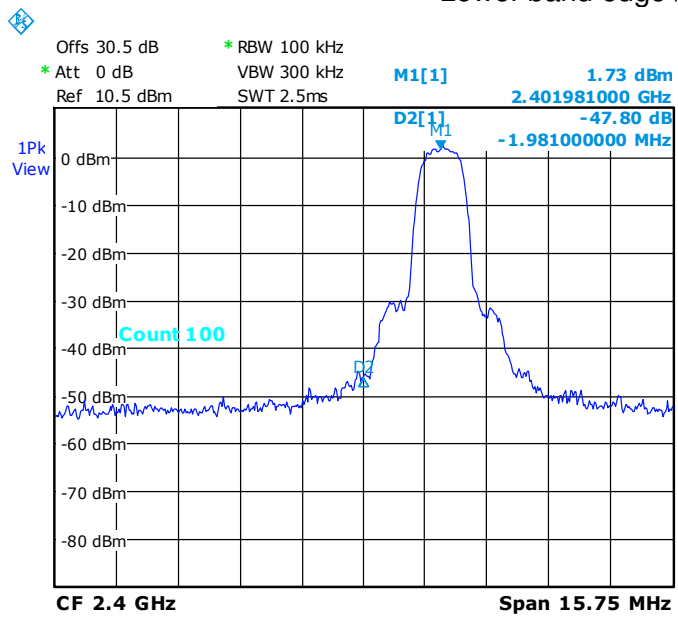
EDR 2
Lower band edge / Upper band edge



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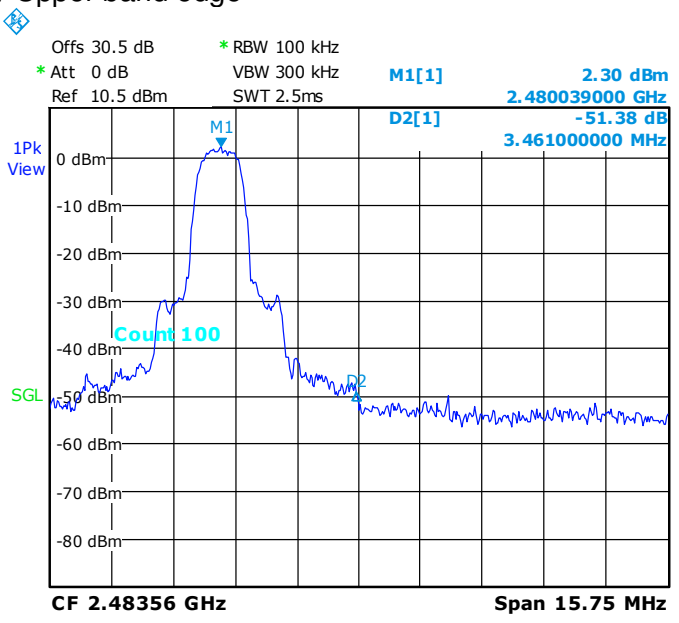

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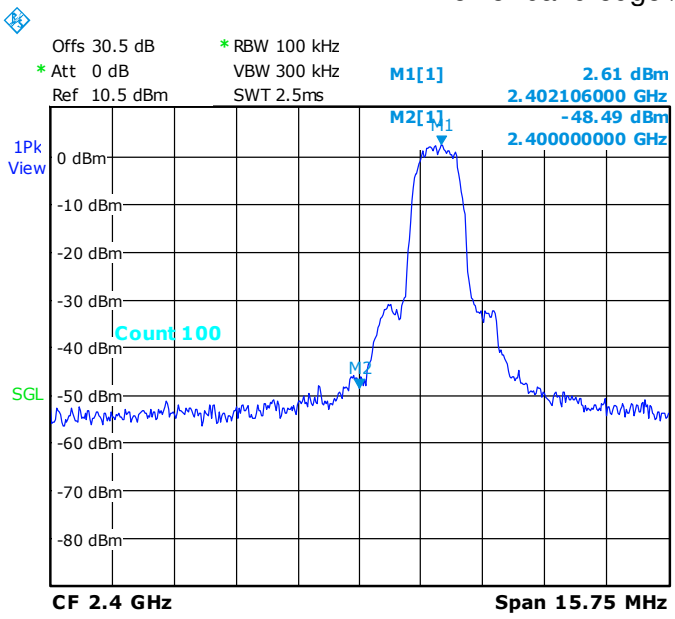
EDR 3
Lower band edge / Upper band edge



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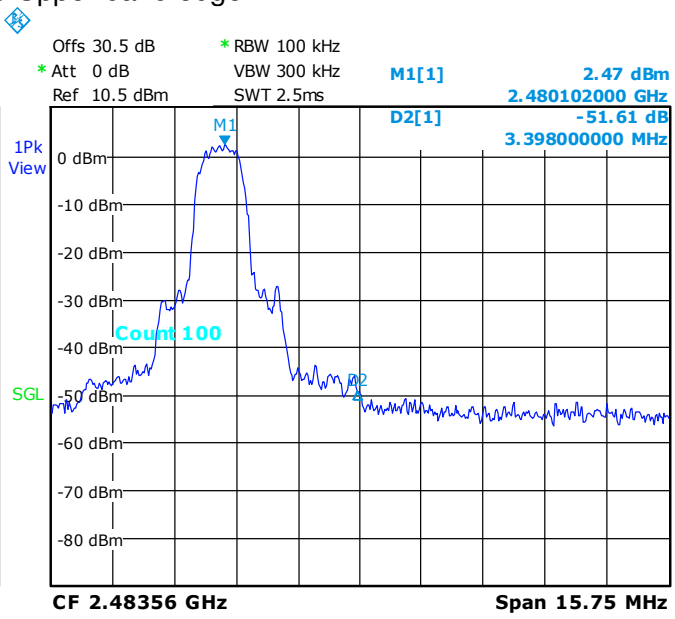


Date: 27.FEB.2013 13:24:40

6 Field Strength of Spurious Radiation

6.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.247 (d) and 15.209 RSS 210 2.6, A2.9 (1)(2)	Compliant

6.2 *Test Method*

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

Test distance:

30 MHz to 1 GHz - The EUT to measurement antenna distance is 3 meters
1 to 18 GHz - The EUT to measurement antenna distance is 3 meters
18 to 40 GHz - The EUT to measurement antenna distance is 3 meters

Frequency	Limits(1)		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 (2)	--
88 - 216 MHz	150	43.5 (2)	--
216 - 960 MHz	200	46 (2)	--
960 - 1000 MHz	500	54 (2)	--
1 - 40 GHz	500	54 (3)	74

(1) These limits are applicable to emissions that fall within the restricted band.
(2) Quasi-peak limit
(3) Average limit

For other frequencies that do not fall within the restricted band, the limits of 15.247(d) apply (i.e. 20 dBc / 100kHz).

6.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions
Temperature: 23.8 ℃
Relative Humidity: 46.6 %

6.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Bilog Antenna	JB6	Sunol	B079689	04 SEP 2013
DRWG antenna	3117	ETS-Lindgren	B079699	21 MAR 2013
DRWG antenna	3116B	ETS-Lindgren	B079697	01 FEB 2014
Receiver	ESU40	R & S	B079629	24 SEP 2013
Spectrum Analyzer	N9030A	Agilent	US51160210	01 JUL 2013
Pre-Amplifier	NSP1800-25-HG	Miteq	B085930	30 OCT 2013
Pre-Amplifier	NSP1840-HG	Miteq	B087572	22 OCT 2013
RF Filter	BRM50702	Microtronics	NA	VBU
Coaxial Cable	Sucoflex 106	Huber+Suhner	B079715	22 SEP 2013
Coaxial Cable	Sucoflex 106	Huber+Suhner	B079660	13 AUG 2013
Coaxial Cable	Sucoflex 106	Huber+Suhner	B085888	22 OCT 2013
Coaxial Cable	Sucoflex 102	Huber+Suhner	B079824	12 DEC 2013
Coaxial Cable	Sucoflex 102	Huber+Suhner	B079822	12 DEC 2013

Note: The calibration period equipment is 1 year.

6.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

6.6 *Test Data*

Radiated Data – 30-1000MHz

Modulation	Frequency MHz	Raw QP dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
GFSK	45.68	47.5	V	353.0	100.0	9.8	0.4	31.6	26.1	40.5	-14.4
GFSK	112.40	50.4	V	63.0	100.0	12.9	0.7	31.5	32.4	40.5	-8.1
GFSK	126.30	41.8	V	152.0	100.0	13.5	0.7	31.5	24.5	40.5	-16.0
GFSK	168.97	45.8	V	107.0	100.0	12.0	0.9	31.4	27.2	40.5	-13.3
GFSK	245.58	56.1	V	237.0	100.0	11.6	1.1	31.4	37.4	47.5	-10.1
GFSK	453.11	39.3	V	191.0	100.0	17.1	1.5	31.2	26.6	47.5	-20.9
EDR-2	45.54	15.9	V	361.0	100.0	9.9	0.4	0.0	26.2	40.5	-14.3
EDR-2	113.19	16.9	V	238.0	100.0	13.0	0.7	0.0	30.6	40.5	-9.9
EDR-2	127.59	13.8	V	347.0	100.0	13.5	0.7	0.0	28.1	40.5	-12.4
EDR-2	135.20	14.3	V	347.0	100.0	13.1	0.8	0.0	28.1	40.5	-12.4
EDR-2	168.72	18.5	V	361.0	100.0	12.0	0.9	0.0	31.4	40.5	-9.1
EDR-2	245.84	25.8	V	253.0	100.0	11.6	1.1	0.0	38.5	47.5	-9.0
EDR-3	40.60	44.8	V	183.0	100.0	13.0	0.4	31.7	26.5	40.5	-14.0
EDR-3	45.83	46.4	V	9.0	100.0	9.8	0.4	31.6	25.0	40.5	-15.5
EDR-3	62.19	46.3	V	202.0	100.0	7.4	0.5	31.6	22.6	40.5	-17.9
EDR-3	112.65	48.8	V	103.0	100.0	12.9	0.7	31.5	30.9	40.5	-9.6
EDR-3	177.64	48.0	V	18.0	100.0	11.2	0.9	31.4	28.7	40.5	-11.8
EDR-3	455.89	43.6	V	225.0	100.0	17.1	1.5	31.2	31.0	47.5	-16.5
GFSK	112.92	32.8	H	109.0	100.0	13.0	0.7	31.5	15.0	40.5	-25.5
GFSK	167.30	40.9	H	173.0	100.0	12.1	0.9	31.4	22.4	40.5	-18.1
GFSK	239.97	49.8	H	45.0	100.0	11.7	1.1	31.3	31.2	47.5	-16.3
GFSK	243.40	51.2	H	265.0	100.0	11.6	1.1	31.4	32.6	47.5	-14.9
GFSK	299.29	35.9	H	107.0	100.0	13.8	1.2	31.3	19.6	47.5	-27.9
GFSK	299.63	35.1	H	132.0	100.0	13.8	1.2	31.3	18.7	47.5	-28.8
EDR-2	45.24	3.8	H	129.0	400.0	10.0	0.4	0.0	14.2	40.5	-26.3
EDR-2	112.93	13.1	H	129.0	376.0	13.0	0.7	0.0	26.7	40.5	-13.8
EDR-2	167.95	11.0	H	121.0	236.0	12.1	0.9	0.0	23.9	40.5	-16.6
EDR-2	243.47	22.5	H	361.0	206.0	11.6	1.1	0.0	35.2	47.5	-12.3
EDR-2	299.61	7.6	H	361.0	235.0	13.8	1.2	0.0	22.6	47.5	-24.9
EDR-2	719.72	7.6	H	315.0	151.0	20.7	1.9	0.0	30.2	47.5	-17.3
EDR-3	62.03	32.9	H	328.0	100.0	7.4	0.5	31.6	9.2	40.5	-31.3
EDR-3	112.13	40.0	H	16.0	100.0	12.8	0.7	31.5	22.0	40.5	-18.5
EDR-3	240.08	44.6	H	281.0	100.0	11.7	1.1	31.3	26.0	47.5	-21.5
EDR-3	243.52	46.5	H	264.0	100.0	11.6	1.1	31.4	27.8	47.5	-19.7
EDR-3	298.55	33.9	H	99.0	100.0	13.8	1.2	31.3	17.5	47.5	-30.0
EDR-3	299.63	34.4	H	101.0	100.0	13.8	1.2	31.3	18.1	47.5	-29.4

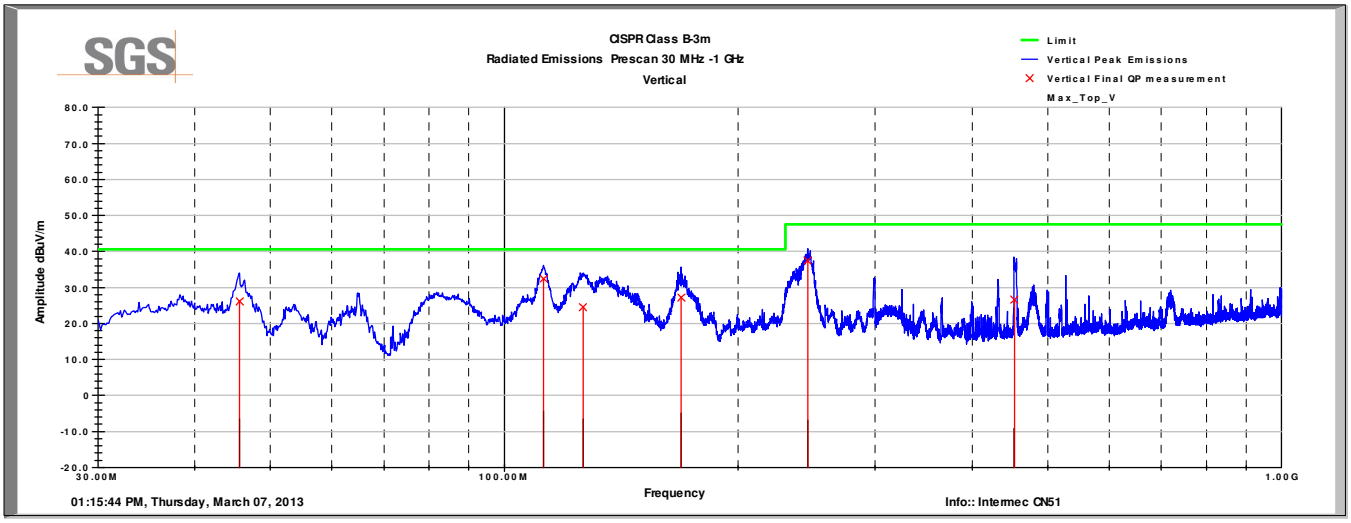
Radiated Data – 1-25GHz

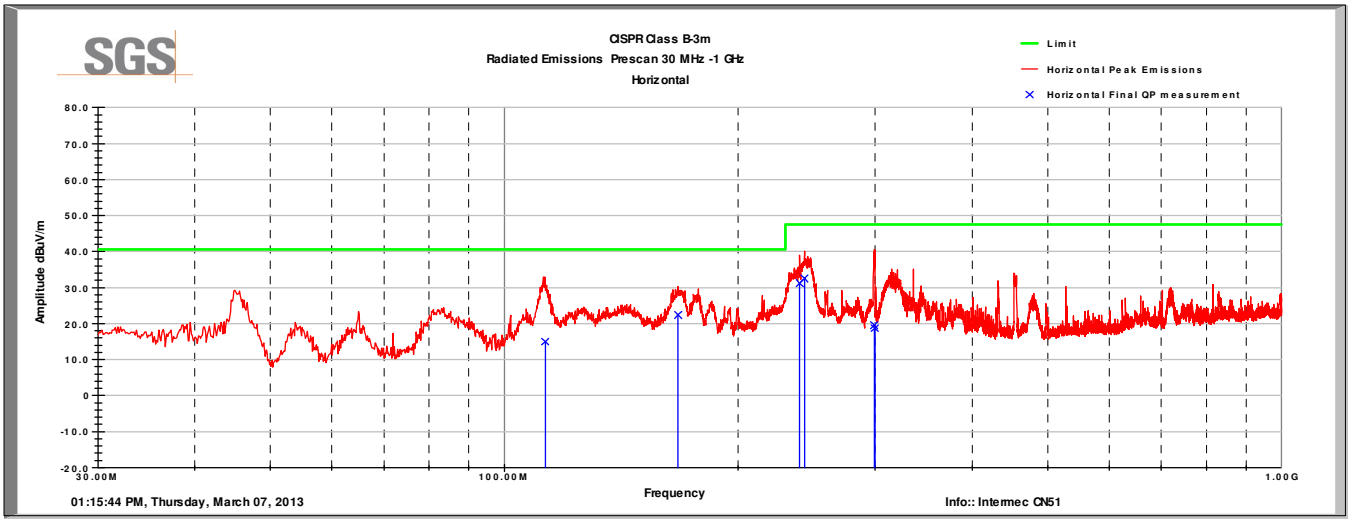
Orientation U/B/S	Tx Frequency MHz	Modulation	Frequency MHz	Detector	Raw Reading dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Corr'd Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Upright	2402.00	GFSK	4804.00	Average	36.4	V	44.6	201.3	34.8	6.4	33.6	44.0	54.0	-10.0
Upright	2402.00	GFSK	4804.00	Peak	43.0	V	44.6	201.3	34.8	6.4	33.6	50.6	74.0	-23.4
Upright	2402.00	EDR-2	4804.00	Average	34.0	V	44.6	201.3	34.8	6.4	33.6	41.6	54.0	-12.4
Upright	2402.00	EDR-2	4804.00	Peak	43.8	V	44.6	201.3	34.8	6.4	33.6	51.4	74.0	-22.6
Upright	2402.00	EDR-3	4804.00	Average	34.2	V	44.6	201.3	34.8	6.4	33.6	41.8	54.0	-12.2
Upright	2402.00	EDR-3	4804.00	Peak	43.7	V	44.6	201.3	34.8	6.4	33.6	51.3	74.0	-22.7
Upright	2402.00	GFSK	4804.00	Average	37.8	H	25.5	160.0	34.8	6.4	33.6	45.4	54.0	-8.6
Upright	2402.00	GFSK	4804.00	Peak	44.7	H	25.5	160.0	34.8	6.4	33.6	52.3	74.0	-21.7
Side	2402.00	EDR-2	4804.00	Average	34.7	H	0.0	134.0	34.8	6.4	33.6	42.3	54.0	-11.7
Side	2402.00	EDR-2	4804.00	Peak	43.8	H	0.0	134.0	34.8	6.4	33.6	51.4	74.0	-22.6
Side	2402.00	EDR-3	4804.00	Average	34.6	H	0.0	134.0	34.8	6.4	33.6	42.2	54.0	-11.8
Side	2402.00	EDR-3	4804.00	Peak	42.9	H	0.0	134.0	34.8	6.4	33.6	50.5	74.0	-23.5
Side	2402.00	GFSK	7206.00	Average	34.6	V	100.0	26.4	36.2	8.1	33.6	45.3	54.0	-8.7
Side	2402.00	GFSK	7206.00	Peak	43.5	V	100.0	26.4	36.2	8.1	33.6	54.2	74.0	-19.8
Side	2402.00	EDR-2	7206.00	Average	33.7	V	100.0	26.4	36.2	8.1	33.6	44.4	54.0	-9.6
Side	2402.00	EDR-2	7206.00	Peak	42.1	V	100.0	26.4	36.2	8.1	33.6	52.8	74.0	-21.2
Side	2402.00	EDR-3	7206.00	Average	33.4	V	100.0	26.4	36.2	8.1	33.6	44.1	54.0	-9.9
Side	2402.00	EDR-3	7206.00	Peak	42.1	V	100.0	26.4	36.2	8.1	33.6	52.8	74.0	-21.2
Upright	2402.00	GFSK	7206.00	Average	33.5	H	320.8	170.0	36.2	8.1	33.6	44.2	54.0	-9.8
Upright	2402.00	GFSK	7206.00	Peak	42.5	H	320.8	170.0	36.2	8.1	33.6	53.2	74.0	-20.8
Upright	2402.00	EDR-3	7206.00	Average	33.3	H	320.8	170.0	36.2	8.1	33.6	44.0	54.0	-10.0
Upright	2402.00	EDR-3	7206.00	Peak	43.0	H	320.8	170.0	36.2	8.1	33.6	53.7	74.0	-20.3
Side	2439.00	GFSK	4878.00	Average	35.2	V	344.7	100.0	34.8	6.5	33.6	42.9	54.0	-11.1
Side	2439.00	GFSK	4878.00	Peak	43.6	V	344.7	100.0	34.8	6.5	33.6	51.3	74.0	-22.7
Side	2439.00	EDR-2	4878.00	Average	33.7	V	344.7	100.0	34.8	6.5	33.6	41.4	54.0	-12.6
Side	2439.00	EDR-2	4878.00	Peak	41.5	V	344.7	100.0	34.8	6.5	33.6	49.2	74.0	-24.8
Side	2439.00	EDR-3	4878.00	Average	34.0	V	344.7	100.0	34.8	6.5	33.6	41.7	54.0	-12.3
Side	2439.00	EDR-3	4878.00	Peak	42.4	V	344.7	100.0	34.8	6.5	33.6	50.1	74.0	-23.9
Upright	2439.00	GFSK	4878.00	Average	36.0	H	16.9	170.6	34.8	6.5	33.6	43.7	54.0	-10.3
Upright	2439.00	GFSK	4878.00	Peak	44.6	H	16.9	170.6	34.8	6.5	33.6	52.3	74.0	-21.7
Upright	2439.00	EDR-2	4878.00	Average	34.2	H	16.9	170.6	34.8	6.5	33.6	41.9	54.0	-12.1
Upright	2439.00	EDR-2	4878.00	Peak	43.0	H	16.9	170.6	34.8	6.5	33.6	50.7	74.0	-23.3
Upright	2439.00	EDR-3	4878.00	Average	34.5	H	16.9	170.6	34.8	6.5	33.6	42.2	54.0	-11.8
Upright	2439.00	EDR-3	4878.00	Peak	43.3	H	16.9	170.6	34.8	6.5	33.6	51.0	74.0	-23.0
Side	2439.00	GFSK	7317.00	Average	34.8	V	23.2	144.3	36.2	8.1	33.6	45.5	54.0	-8.5
Side	2439.00	GFSK	7317.00	Peak	44.0	V	23.2	144.3	36.2	8.1	33.6	54.7	74.0	-19.3
Side	2439.00	EDR-2	7317.00	Average	33.9	V	23.2	144.3	36.2	8.1	33.6	44.6	54.0	-9.4
Side	2439.00	EDR-2	7317.00	Peak	41.5	V	23.2	144.3	36.2	8.1	33.6	52.2	74.0	-21.8
Side	2439.00	EDR-3	7317.00	Average	34.1	V	23.2	144.3	36.2	8.1	33.6	44.8	54.0	-9.2
Side	2439.00	EDR-3	7317.00	Peak	43.2	V	23.2	144.3	36.2	8.1	33.6	53.9	74.0	-20.1
Upright	2439.00	GFSK	7317.00	Average	33.3	H	11.1	100.0	36.2	8.1	33.6	44.0	54.0	-10.0
Upright	2439.00	GFSK	7317.00	Peak	41.8	H	11.1	100.0	36.2	8.1	33.6	52.5	74.0	-21.5
Side	2439.00	EDR-2	7317.00	Average	33.5	H	15.9	115.0	36.2	8.1	33.6	44.2	54.0	-9.8
Side	2439.00	EDR-2	7317.00	Peak	42.3	H	15.9	115.0	36.2	8.1	33.6	53.0	74.0	-21.0
Upright	2439.00	EDR-3	7317.00	Average	33.5	H	11.1	100.0	36.2	8.1	33.6	44.2	54.0	-9.8
Upright	2439.00	EDR-3	7317.00	Peak	41.8	H	11.1	100.0	36.2	8.1	33.6	52.5	74.0	-21.5
Upright	2480.00	GFSK	4960.00	Average	38.3	H	21.3	169.7	34.9	6.5	33.6	46.2	54.0	-7.8
Upright	2480.00	GFSK	4960.00	Peak	44.6	H	21.3	169.7	34.9	6.5	33.6	52.5	74.0	-21.5
Upright	2480.00	EDR-2	4960.00	Average	36.7	H	21.3	169.7	34.9	6.5	33.6	44.6	54.0	-9.4
Upright	2480.00	EDR-2	4960.00	Peak	44.5	H	21.3	169.7	34.9	6.5	33.6	52.4	74.0	-21.6
Back	2480.00	EDR-3	4960.00	Average	33.3	H	95.5	128.0	34.9	6.5	33.6	41.2	54.0	-12.8
Back	2480.00	EDR-3	4960.00	Peak	42.1	H	95.5	128.0	34.9	6.5	33.6	50.0	74.0	-24.0
Side	2480.00	GFSK	4960.00	Average	36.7	V	16.5	106.2	34.9	6.5	33.6	44.6	54.0	-9.4
Side	2480.00	GFSK	4960.00	Peak	44.1	V	16.5	106.2	34.9	6.5	33.6	52.0	74.0	-22.0
Side	2480.00	EDR-2	4960.00	Average	34.8	V	16.5	106.2	34.9	6.5	33.6	42.7	54.0	-11.3
Side	2480.00	EDR-2	4960.00	Peak	44.5	V	16.5	106.2	34.9	6.5	33.6	52.4	74.0	-21.6
Side	2480.00	EDR-3	4960.00	Average	36.4	V	315.9	261.1	34.9	6.5	33.6	44.3	54.0	-9.7
Side	2480.00	EDR-3	4960.00	Peak	44.9	V	315.9	261.1	34.9	6.5	33.6	52.8	74.0	-21.2
Upright	2480.00	GFSK	7440.00	Average	35.3	H	311.3	99.0	36.1	8.2	33.6	46.0	54.0	-8.0
Upright	2480.00	GFSK	7440.00	Peak	44.1	H	311.3	99.0	36.1	8.2	33.6	54.8	74.0	-19.2
Upright	2480.00	EDR-2	7440.00	Average	33.7	H	311.3	99.0	36.1	8.2	33.6	44.4	54.0	-9.6
Upright	2480.00	EDR-2	7440.00	Peak	43.2	H	311.3	99.0	36.1	8.2	33.6	53.9	74.0	-20.1
Upright	2480.00	EDR-3	7440.00	Average	34.2	H	311.3	99.0	36.1	8.2	33.6	44.9	54.0	-9.1
Upright	2480.00	EDR-3	7440.00	Peak	42.1	H	311.3	99.0	36.1	8.2	33.6	52.8	74.0	-21.2
Side	2480.00	GFSK	7440.00	Average	35.4	V	29.9	128.0	36.1	8.2	33.6	46.1	54.0	-7.9
Side	2480.00	GFSK	7440.00	Peak	44.2	V	29.9	128.0	36.1	8.2	33.6	54.9	74.0	-19.1
Side	2480.00	EDR-2	7440.00	Average	33.8	V	29.9	128.0	36.1	8.2	33.6	44.5	54.0	-9.5
Side	2480.00	EDR-2	7440.00	Peak	43.1	V	29.9	128.0	36.1	8.2	33.6	53.8	74.0	-20.2
Side	2480.00	EDR-3	7440.00	Average	33.4	V	45.6	199.6	36.1	8.2	33.6	44.1	54.0	-9.9
Side	2480.00	EDR-3	7440.00	Peak	41.6	V	45.6	199.6	36.1	8.2	33.6	52.3	74.0	-21.7
Upright	2480.00	GFSK	2483.50	Average	29.4	V	360.0	341.8	32.6	4.3	33.4	32.8	54.0	-21.2
Upright	2480.00	GFSK	2483.50	Peak	38.8	V	360.0	341.8	32.6	4.3	33.4	42.2	74.0	-31.8
Upright	2480.00	GFSK	2483.50	Average	30.5	H	360.0	100.0	32.6	4.3	33.4	33.9	54.0	-20.1
Upright	2480.00	GFSK	2483.50	Peak	40.7	H	360.0	100.0	32.6	4.3	33.4	44.1	74.0	-29.9

Yellow indicates ISM band edges

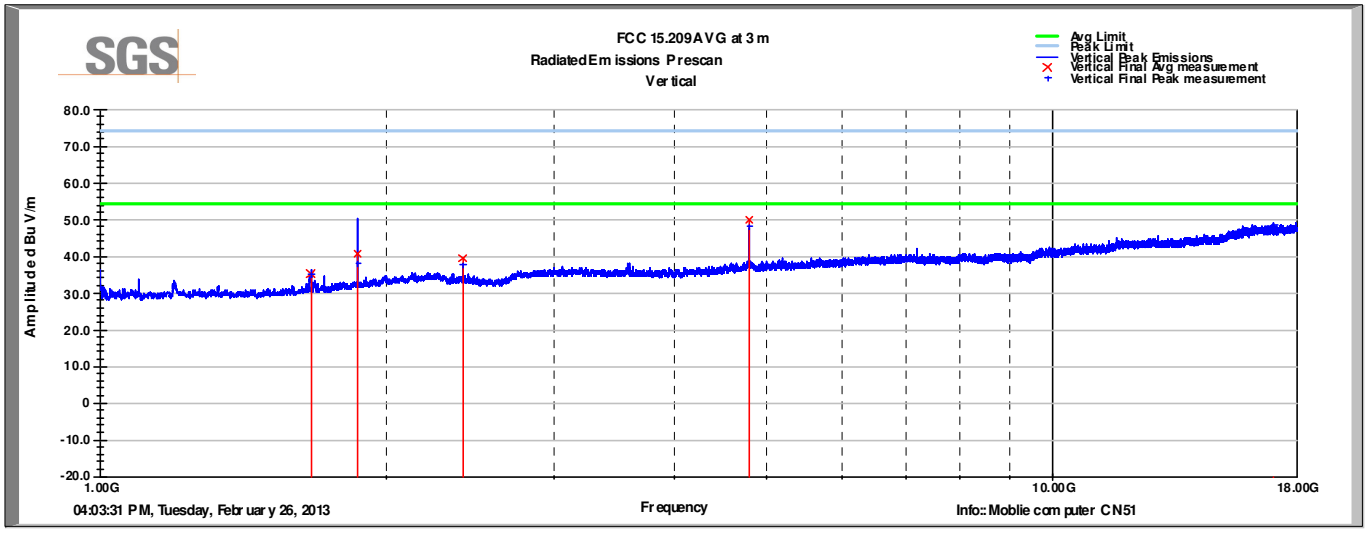
Note: For all scans performed 18 – 25 GHz, no signals were found above the equipment noise floor.

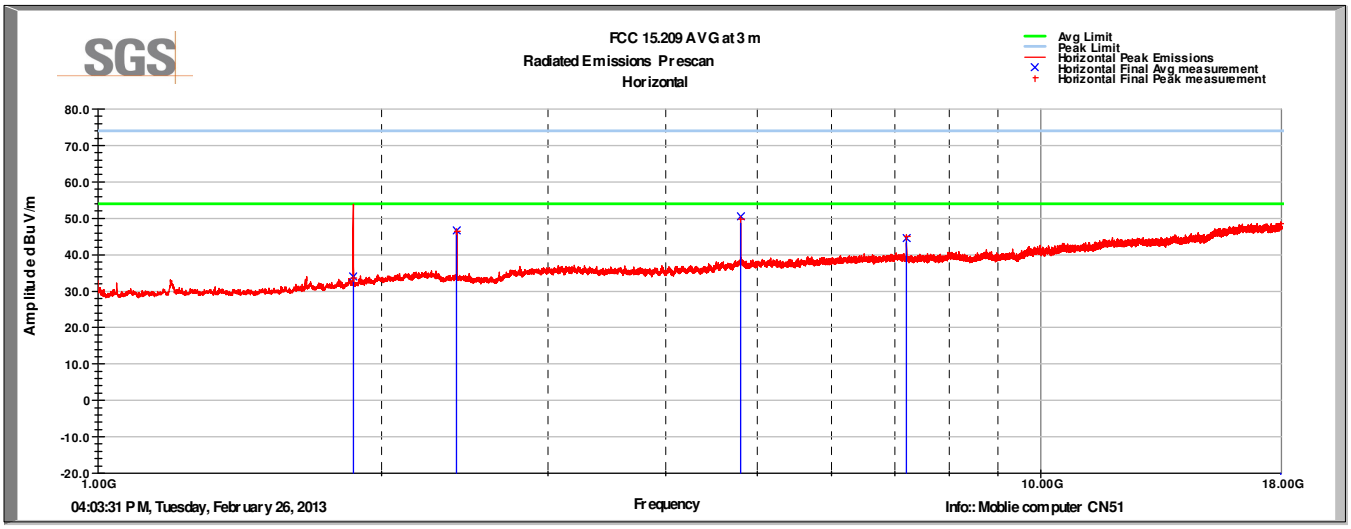
Low Channel
GFSK



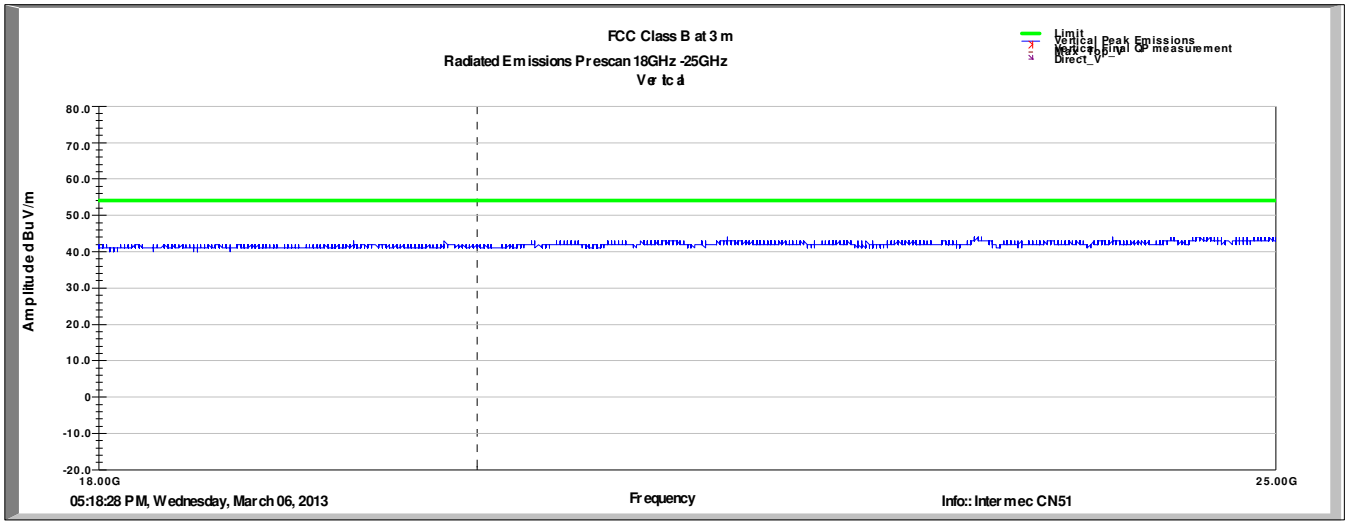


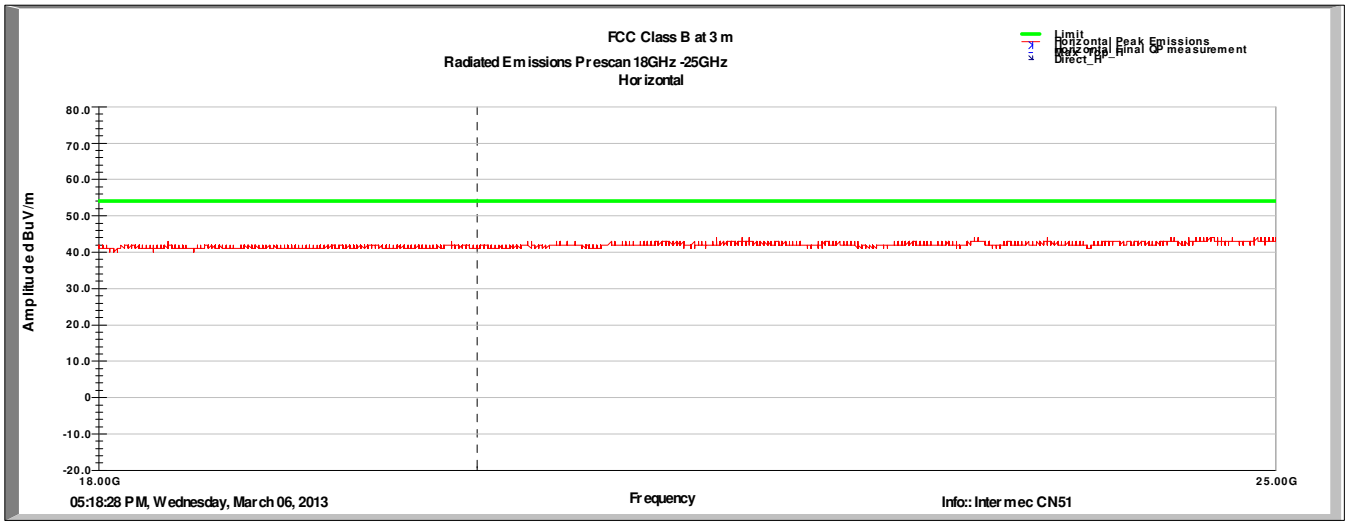
Low Channel
GFSK



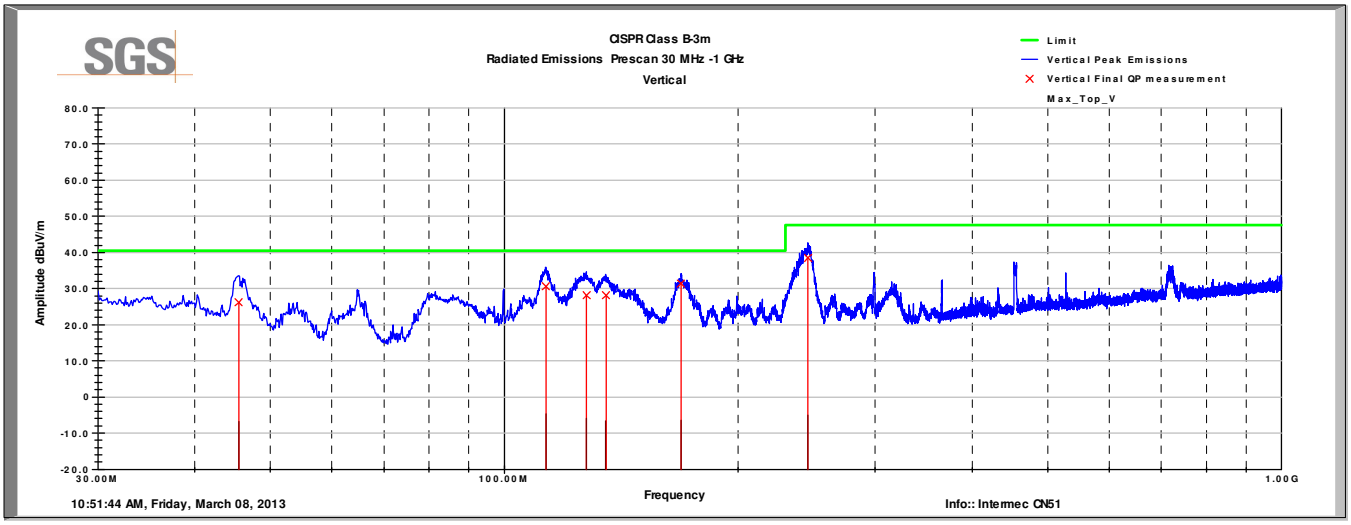


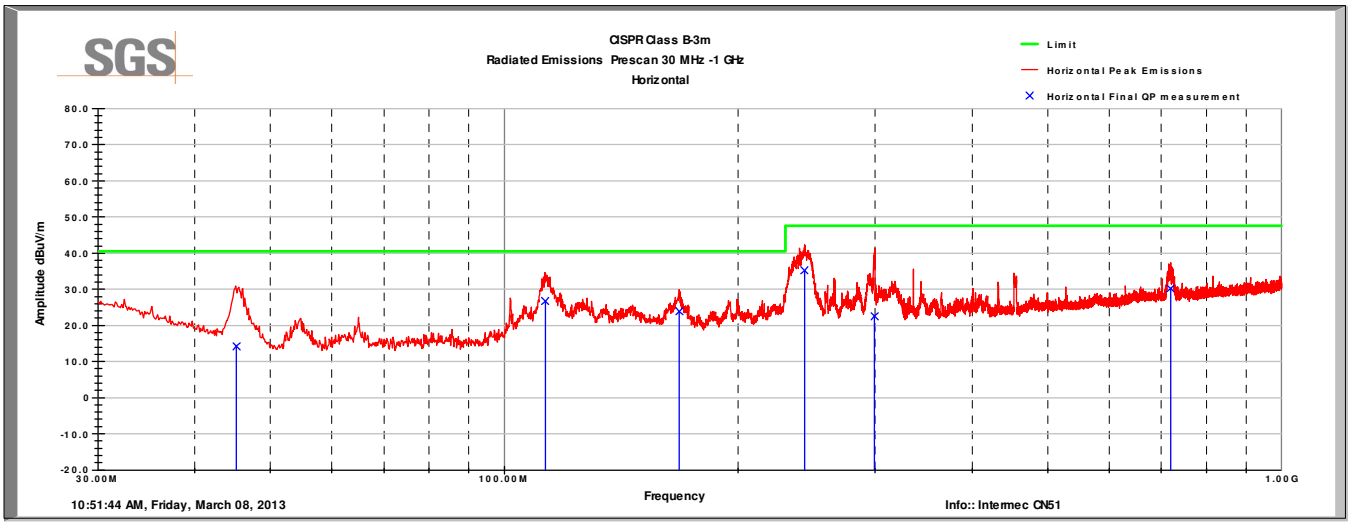
Low Channel
GFSK



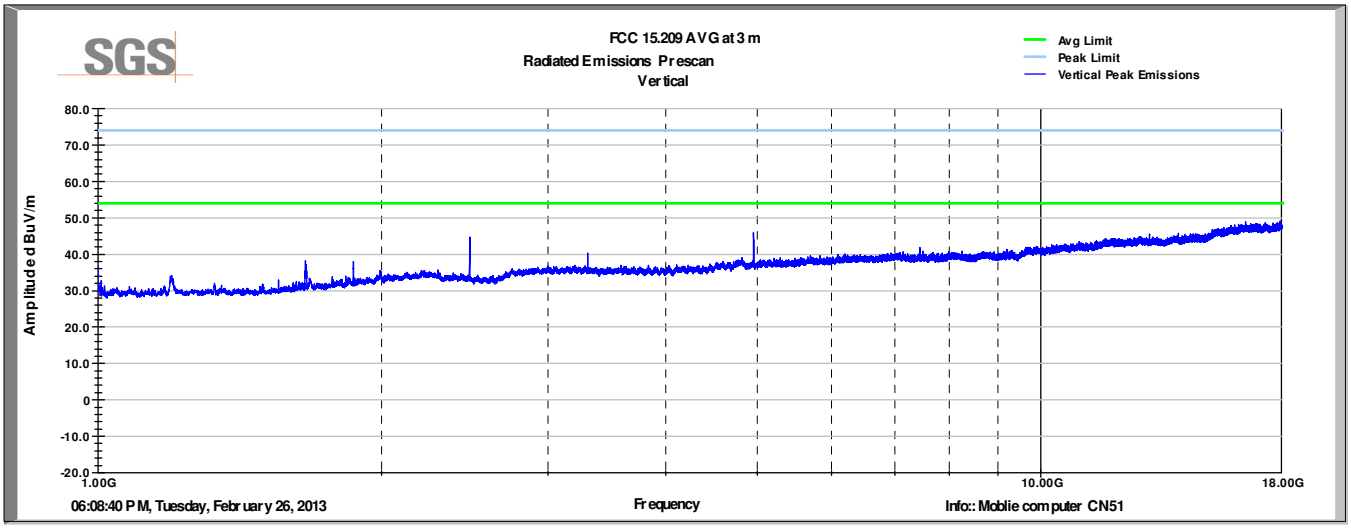


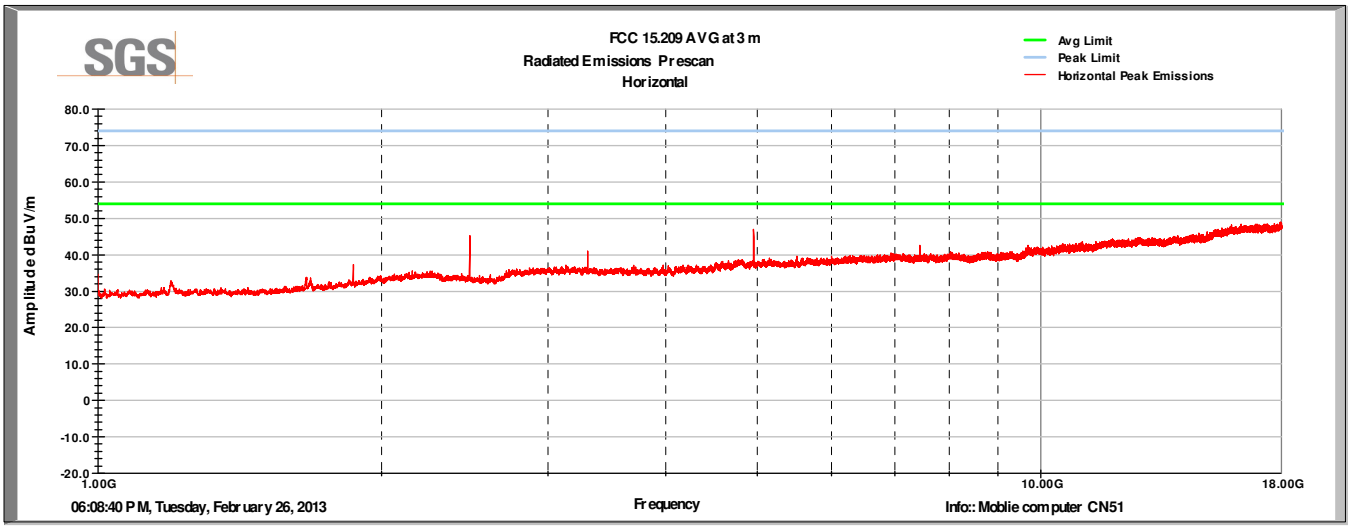
EDR2


SGS
CISPR Class B-3m
Radiated Emissions Prescan 30 MHz -1 GHz
Vertical
Limit
Vertical Peak Emissions
Vertical Final QP measurement
Max_Top_V
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
30.00M
100.00M
1.00G
Frequency
10:51:44 AM, Friday, March 08, 2013
Info:: Intermec CN51

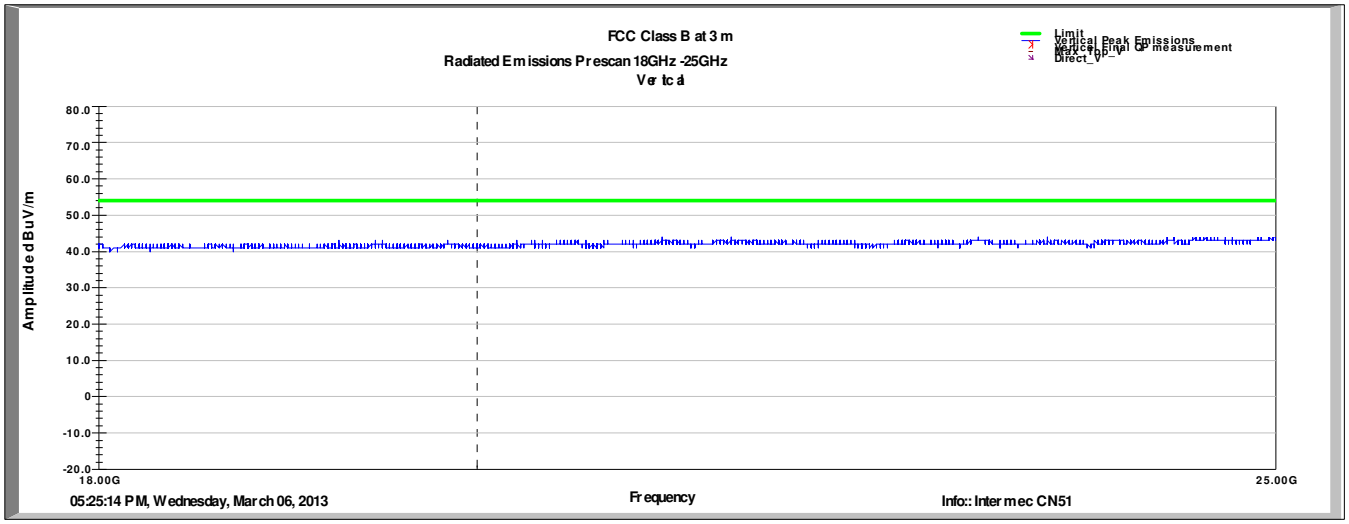

SGS
CISPR Class B-3m
Radiated Emissions Prescan 30 MHz -1 GHz
Horizontal
Limit
Horizontal Peak Emissions
Horizontal Final QP measurement
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
30.00M
100.00M
1.00G
Frequency
10:51:44 AM, Friday, March 08, 2013
Info:: Intermec CN51

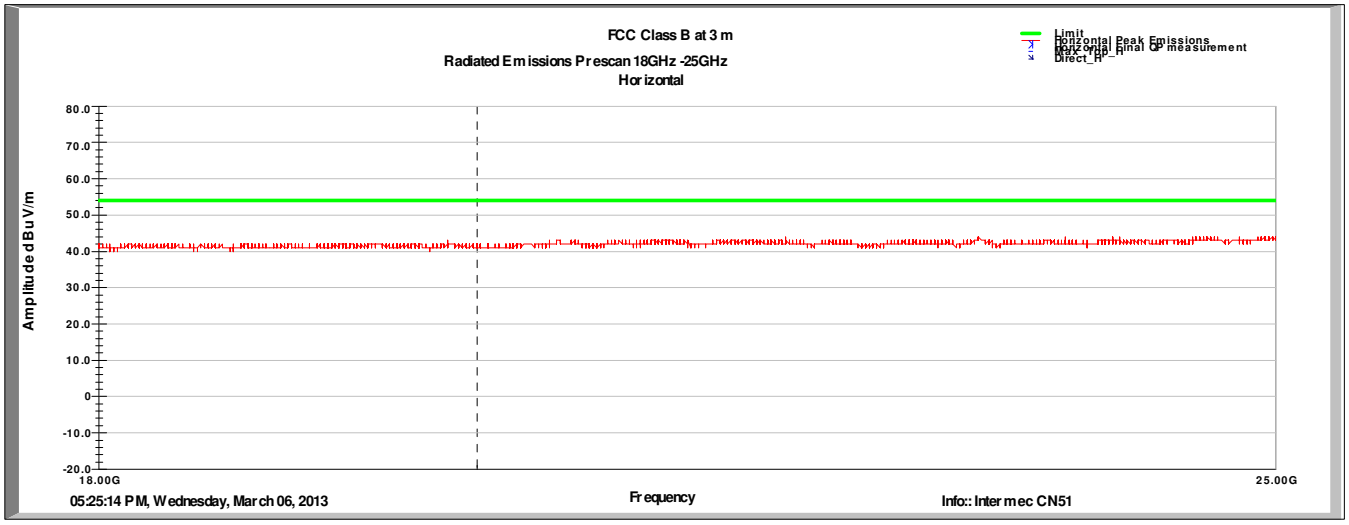
EDR2


FCC 15.209 AVG at 3 m
Radiated Emissions Prescan
Vertical
Avg Limit
Peak Limit
Vertical Peak Emissions
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
1.00G
10.00G
18.00G
06:08:40 PM, Tuesday, February 26, 2013
Frequency
Info:: Moblie computer CN51

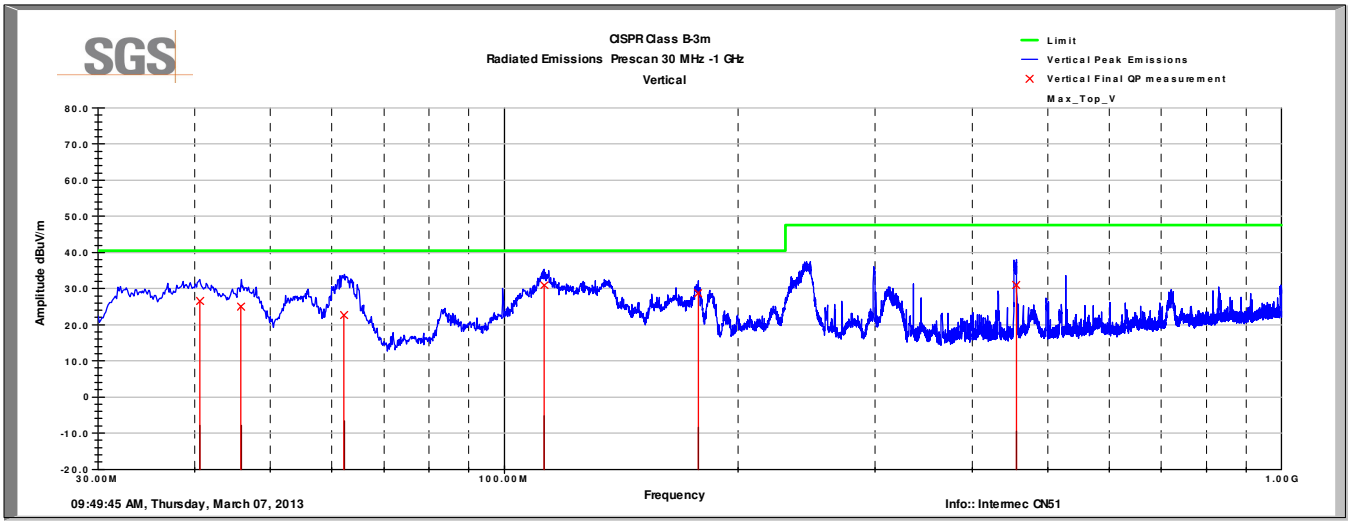

FCC 15.209 AVG at 3 m
Radiated Emissions Prescan
Horizontal
Avg Limit
Peak Limit
Horizontal Peak Emissions
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
1.00G
10.00G
18.00G
06:08:40 PM, Tuesday, February 26, 2013
Frequency
Info:: Moblie computer CN51

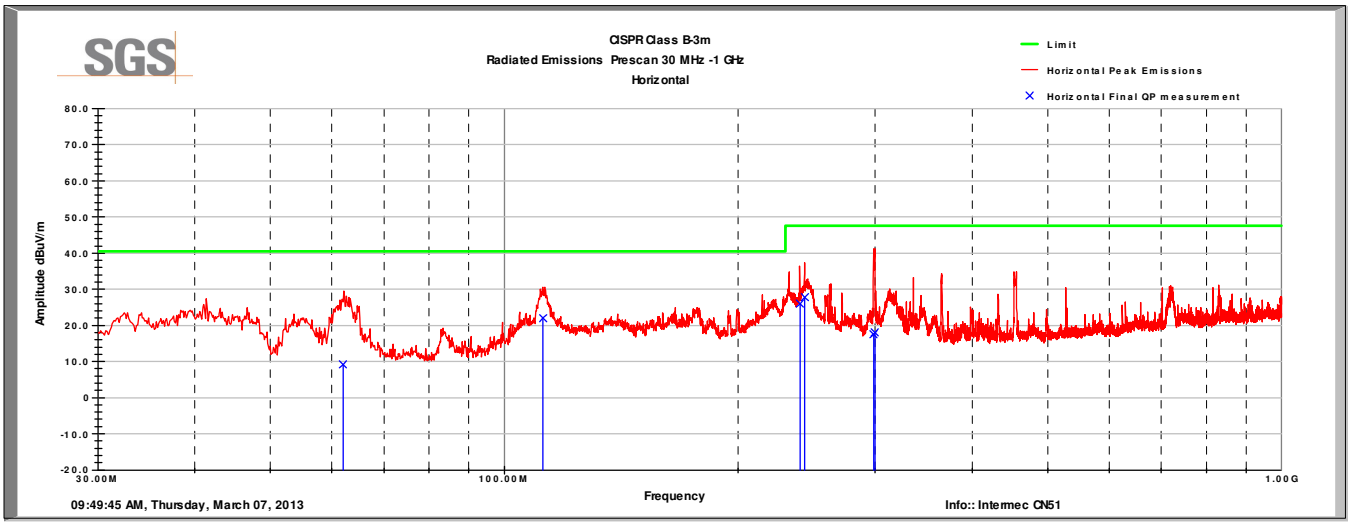
EDR2


FCC Class B at 3 m
Radiated Emissions Prescan 18GHz -25GHz
Vertical
Limit
Vertical Peak Emissions
Vertical Final QP measurement
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
18.00G
25.00G
05:25:14 PM, Wednesday, March 06, 2013
Frequency
Info:: Intermec CN51


FCC Class B at 3 m
Radiated Emissions Prescan 18GHz -25GHz
Horizontal
Limit
Horizontal Peak Emissions
Horizontal Final QP measurement
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
18.00G
25.00G
05:25:14 PM, Wednesday, March 06, 2013
Frequency
Info:: Intermec CN51

EDR3


CISPR Class B-3m
Radiated Emissions Prescan 30 MHz -1 GHz
Vertical
Limit
Vertical Peak Emissions
Vertical Final QP measurement
Max_Top_V
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
30.00M
100.00M
1.00G
Frequency
09:49:45 AM, Thursday, March 07, 2013
Info:: Intermec CN51


CISPR Class B-3m
Radiated Emissions Prescan 30 MHz -1 GHz
Horizontal
Limit
Horizontal Peak Emissions
Horizontal Final QP measurement
Amplitude dBuV/m
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30.0
20.0
10.0
0
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-20.0
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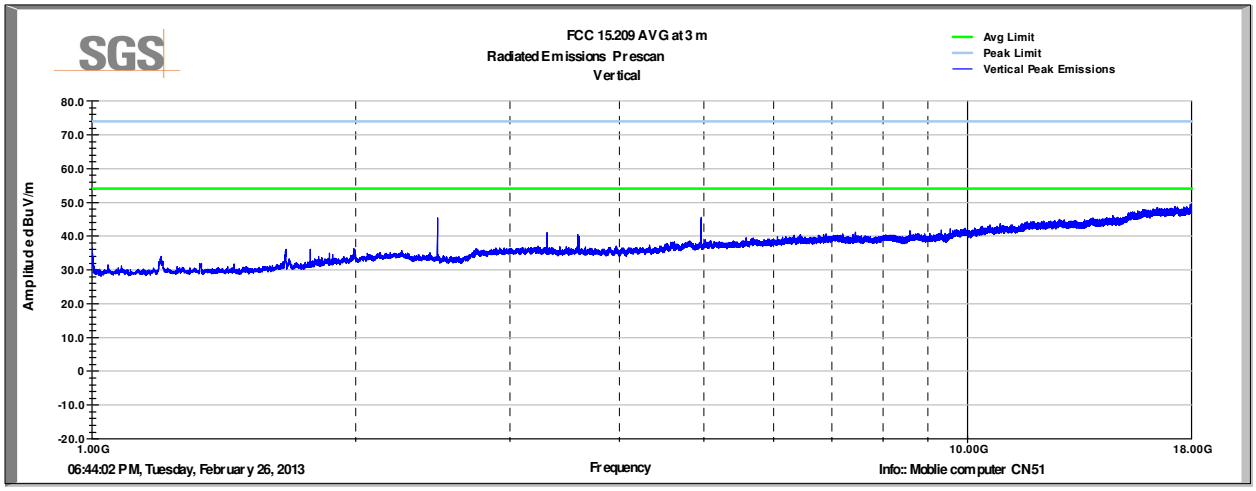
100.00M
1.00G
Frequency
09:49:45 AM, Thursday, March 07, 2013
Info:: Intermec CN51

EDR3


FCC 15.209 AVG at 3 m
Radiated Emissions Prescan
Vertical
Avg Limit
Peak Limit
Vertical Peak Emissions
Amplitude dBuV/m
80.0
70.0
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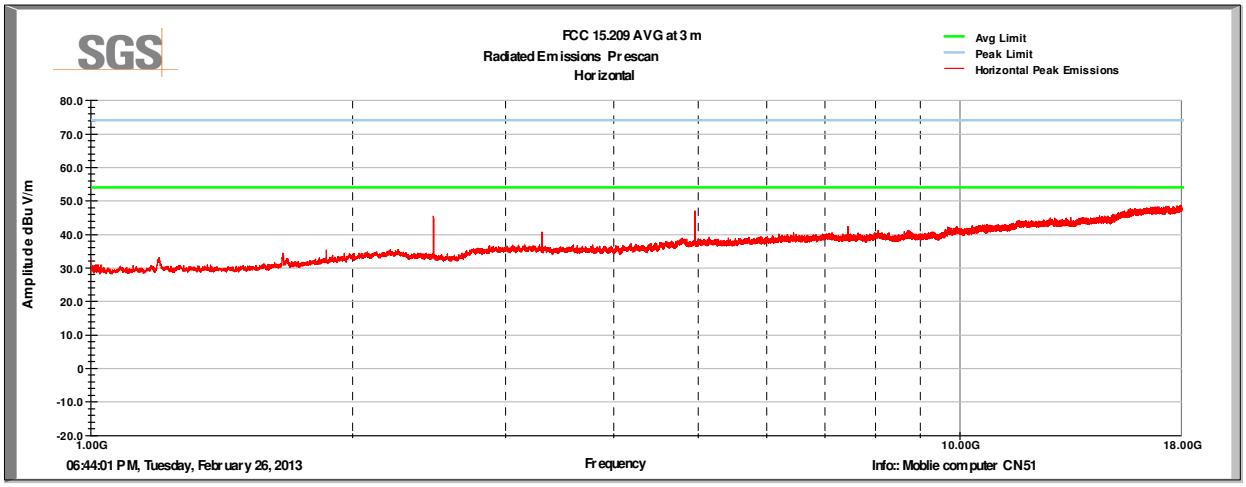
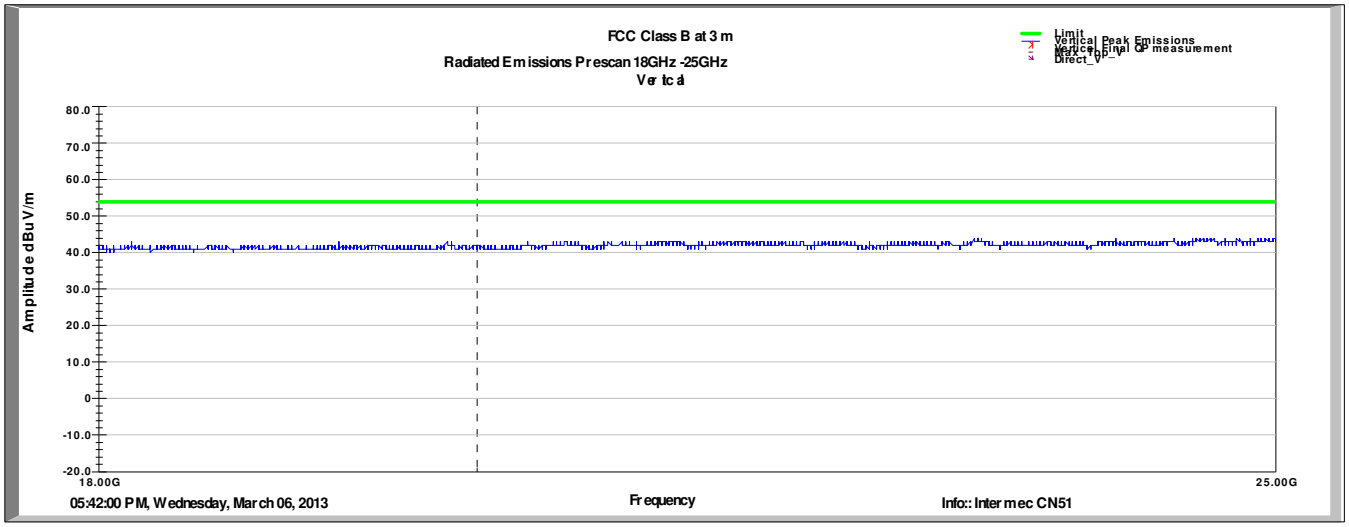
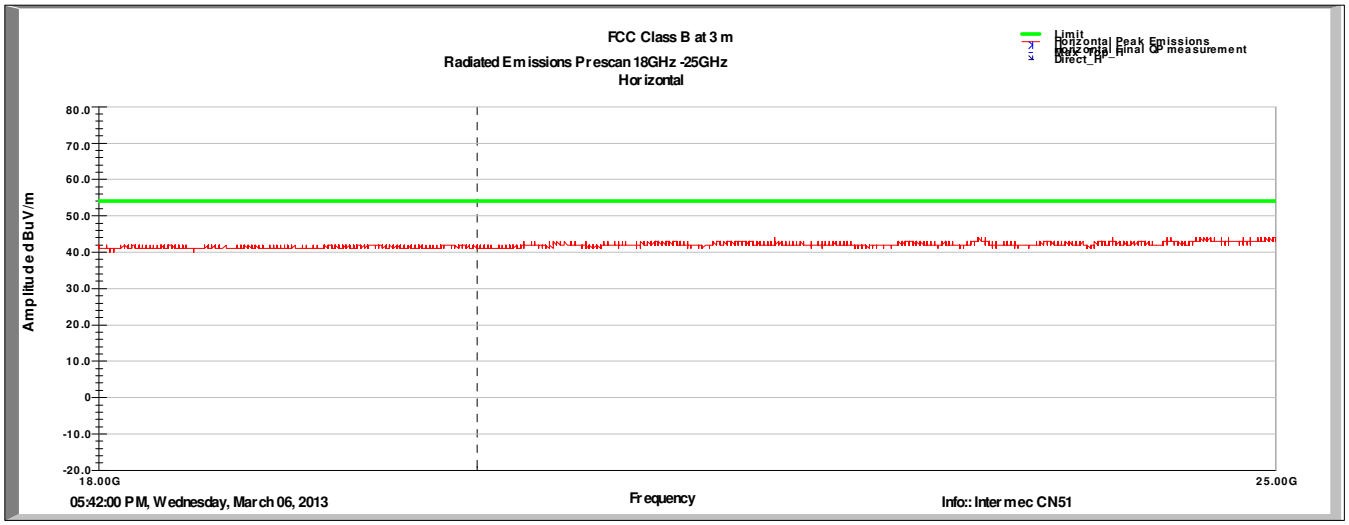
40.0
30.0
20.0
10.0
0
-10.0
-20.0
1.00G
10.00G
18.00G
06:44:02 PM, Tuesday, February 26, 2013
Frequency
Info:: Moblie computer CN51


FCC 15.209 AVG at 3 m
Radiated Emissions Prescan
Horizontal
Avg Limit
Peak Limit
Horizontal Peak Emissions
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
1.00G
10.00G
18.00G
06:44:01 PM, Tuesday, February 26, 2013
Frequency
Info:: Moblie computer CN51

EDR3


FCC Class B at 3 m
Radiated Emissions Prescan 18GHz -25GHz
Vertical
Limit
Vertical Peak Emissions
Vertical Final QP measurement
Max_Top_V
Direct_V
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
18.00G
25.00G
05:42:00 PM, Wednesday, March 06, 2013
Frequency
Info:: Intermec CN51


FCC Class B at 3 m
Radiated Emissions Prescan 18GHz -25GHz
Horizontal
Limit
Horizontal Peak Emissions
Horizontal Final QP measurement
Max_Top_H
Direct_H
Amplitude dBuV/m
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
-10.0
-20.0
18.00G
25.00G
05:42:00 PM, Wednesday, March 06, 2013
Frequency
Info:: Intermec CN51

7 Power Spectral Density

7.1 *Test Result*

Test Description	Basic Standards	Test Result
Power Spectral Density	15.247(f), 15.247(e) ANSI C63.4:2009	Compliant

7.2 *Test Method*

The EUT was set at each channel and data rate to transmit continuously, the peak emission was located and set as the center frequency. It was connected via customer supplied cable to the spectrum analyzer. The span was reduced to 300 kHz, swept 100 times with a 3 kHz RBW, peak detector and trace averaged. The peak signal was then measured and reported. The limit is 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 22.7 ℃
Relative Humidity: 34.2 %

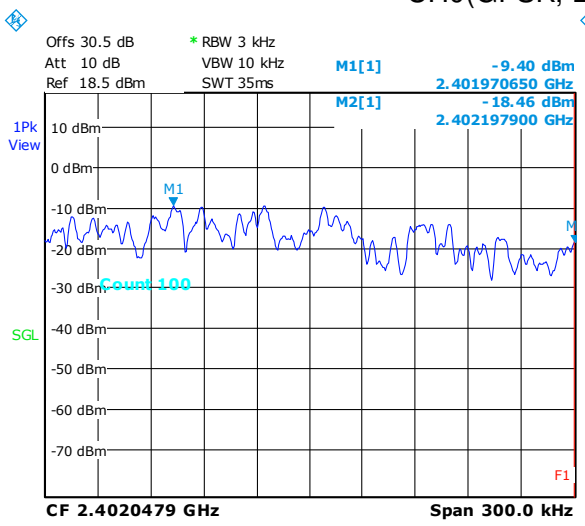
7.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSL	R&S	1257361J	08JAN2014
Attenuator	BW-S30W2+	Mini-Circuits		VBU
Network Analyzer	ZVL	R&S	B079799	1 JUL 2013

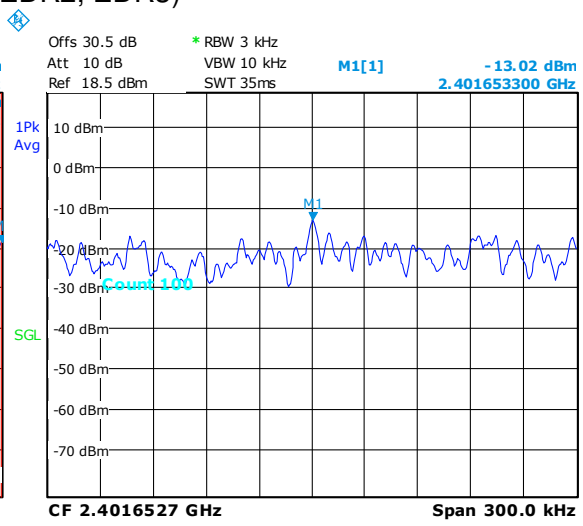
Note: The calibration period equipment is 1 year.

Frequency	Channel No	Modulation	Spectral Density Value (dBm/3kHz)
2402	0	GFSK	-9.4
		EDR-2	-13.02
		EDR-3	-14.52
2441	39	GFSK	-9.61
		EDR-2	-13.31
		EDR-3	-14.74
2480	78	GFSK	-9.69
		EDR-2	-13.44
		EDR-3	-14.56

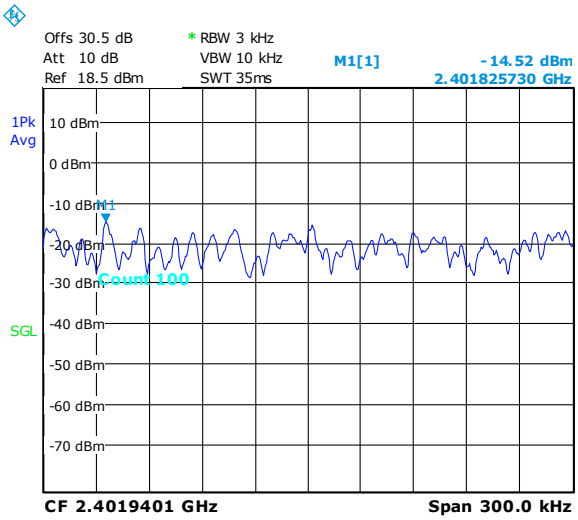
CH0(GFSK, EDR2, EDR3)



Date: 27.FEB.2013 09:58:53

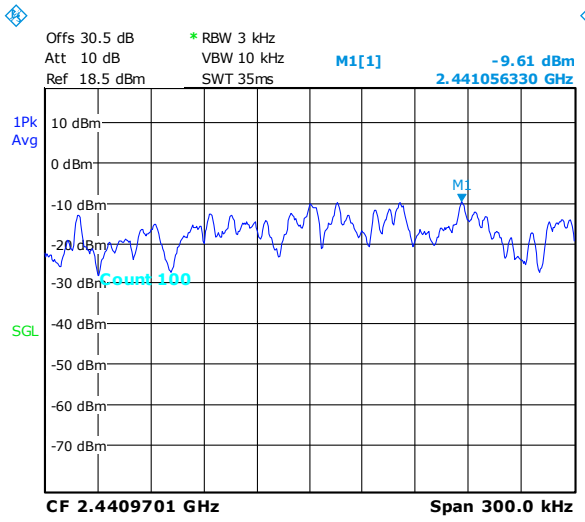


Date: 27.FEB.2013 10:00:34



Date: 27.FEB.2013 10:01:59

CH39(GFSK, EDR2, EDR3)



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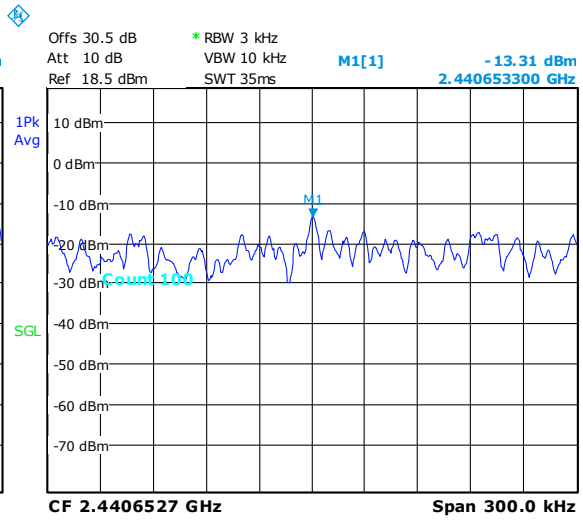
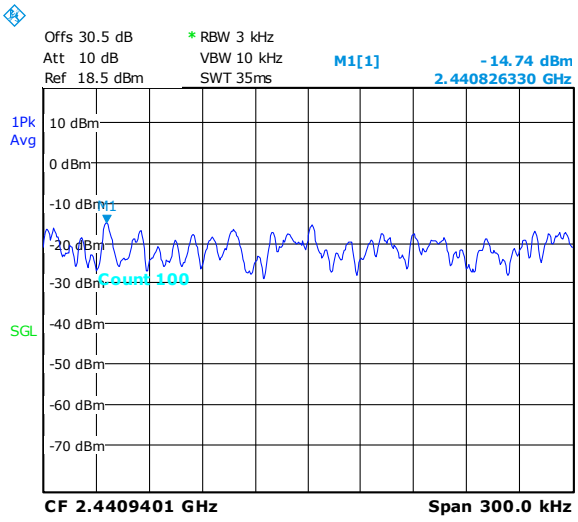
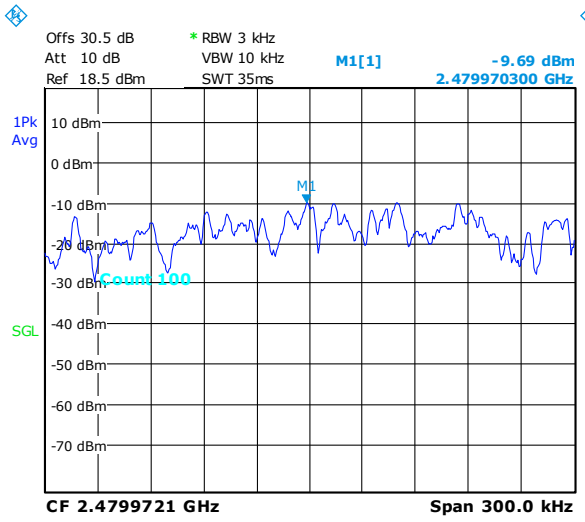


Date: 27.FEB.2013 10:17:11



Date: 27.FEB.2013 10:18:12

CH78(GFSK, EDR2, EDR3)



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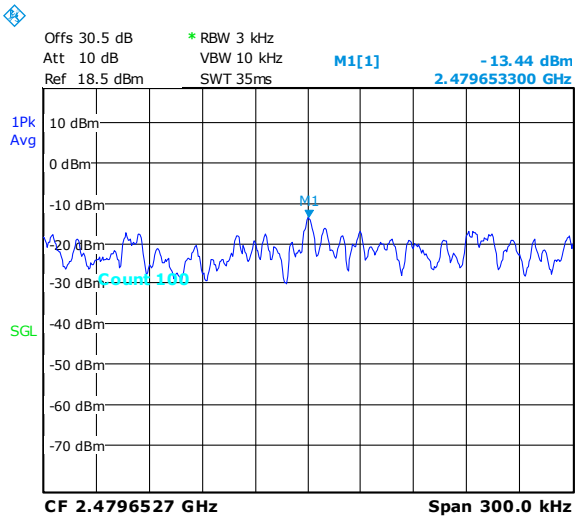
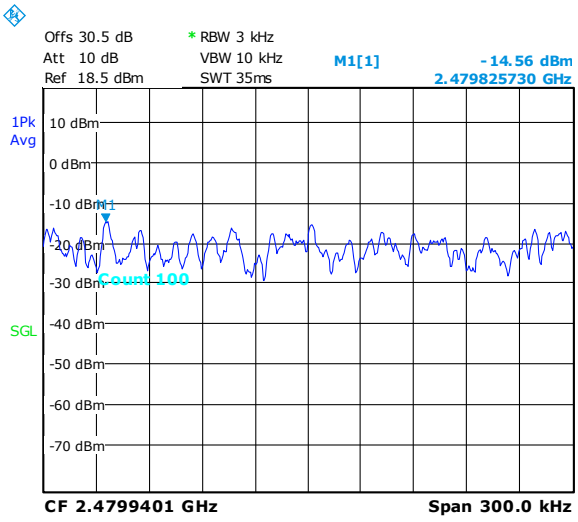


Date: 27.FEB.2013 10:15:51



Date: 27.FEB.2013 10:19:05

8 Conducted Emissions

8.1 *Test Result*

Test Description	Basic Standards	Test Result
Conducted Emissions	15.107, Class B ANSI C63.4:2009	Compliant

8.2 *Test Method*

With the receivers resolution bandwidth was set to 9 kHz the initial preliminary exploratory scans were performed over the measuring frequency range (0.15MHz to 30MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

Frequency Range	Class A Limits (dBuV)		Class B Limits (dBuV)	
	FCC	CISPR	FCC	CISPR
0.15 to 0.5 MHz	Avg 66 QP 79		Avg 56 to 46 QP 66 to 56	
0.5 to 5 MHz	Avg 60 QP 73		Avg 46 Pk 56	
5 to 30 MHz	Avg 60 QP 73		Avg 50 Pk 60	

8.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.4 ℃
Relative Humidity: 47.8 %

8.4 *Test Equipment*

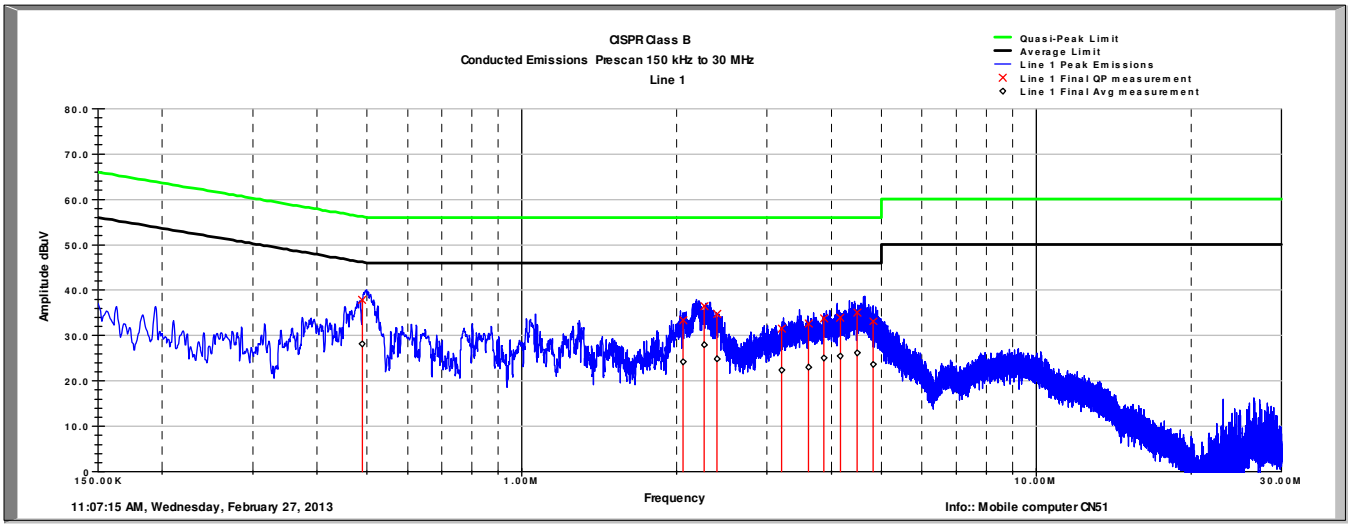
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
LISN	NNB51	TESEQ	B085882	9 OCT 2013
Receiver	ESU8	R & S	B085759	12 JUN 2013

Note: The calibration period equipment is 1 year.

Software:
“Conducted Emissions” TILE! profile dated 10 Nov 2011

8.5 *Test Data*

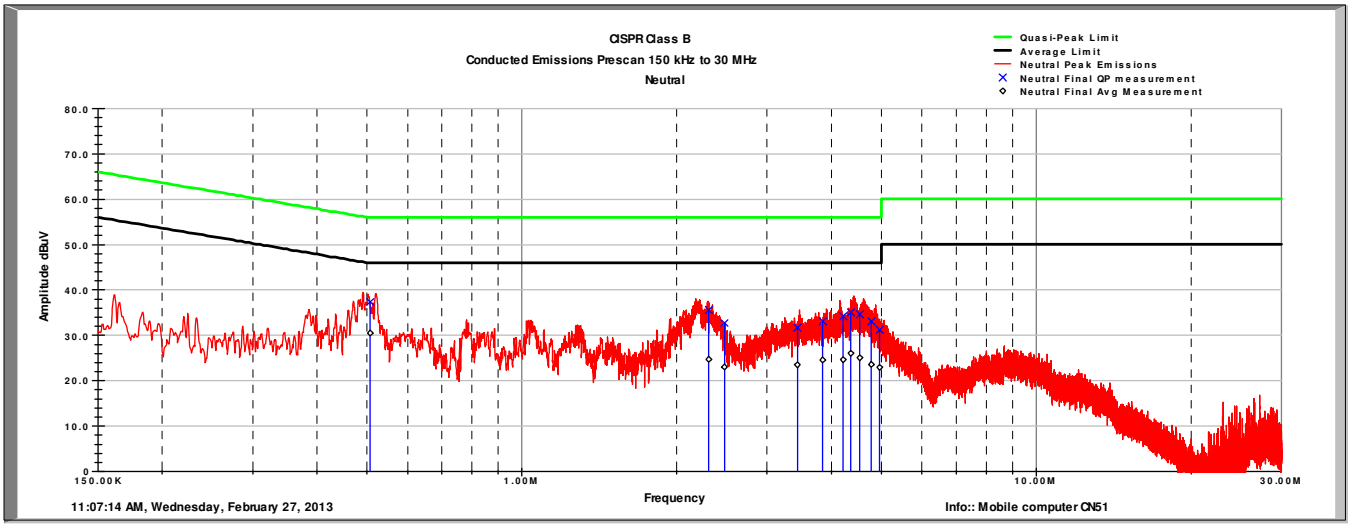
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.490	37.9	56.2	-18.3	28.2	46.2	-18.0
2.061	33.4	56.0	-22.6	24.2	46.0	-21.8
2.265	36.5	56.0	-19.5	28.0	46.0	-18.0
2.400	34.7	56.0	-21.3	24.9	46.0	-21.1
3.201	31.5	56.0	-24.5	22.4	46.0	-23.6
3.611	32.6	56.0	-23.4	23.0	46.0	-23.0
3.869	33.8	56.0	-22.2	25.1	46.0	-20.9
4.161	33.9	56.0	-22.1	25.5	46.0	-20.5
4.491	35.1	56.0	-20.9	26.2	46.0	-19.8
4.825	33.1	56.0	-22.9	23.7	46.0	-22.3

Neutral Conducted Emissions Plot



Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.507	37.4	56.0	-18.6	30.5	46.0	-15.5
2.311	35.6	56.0	-20.4	24.7	46.0	-21.3
2.478	32.7	56.0	-23.3	23.0	46.0	-23.0
3.436	31.7	56.0	-24.3	23.5	46.0	-22.5
3.850	33.1	56.0	-22.9	24.6	46.0	-21.4
4.218	34.2	56.0	-21.8	24.6	46.0	-21.4
4.364	35.1	56.0	-20.9	26.1	46.0	-19.9
4.543	34.6	56.0	-21.4	25.1	46.0	-20.9
4.780	33.1	56.0	-22.9	23.6	46.0	-22.4
4.963	31.2	56.0	-24.8	23.0	46.0	-23.0

9 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	11 JUL 2013