FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

BT SCANNER WITH 1D LINEAR IMAGER

MODEL NUMBER: LI4278

FCC ID: UZ7LI4278
IC: 109AN-LI4278

REPORT NUMBER: 11CA43439

ISSUE DATE: 2011-10-11

Prepared for
MOTOROLA SOLUTIONS INC
1 MOTOROLA PLAZA
HOLTSVILLE
NY, 11742, USA

Prepared by
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/11/11	Initial Issue	M. Antola

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MOTOROLA SOLUTIONS INC
1 MOTOROLA PLAZA
HOLTSVILLE, NY, 11742, USA

EUT DESCRIPTION: BT Scanner with 1D Linear Imager

MODEL: LI4278

SERIAL NUMBER: LI_EVAL_117 and LI_EVAL_121

DATE TESTED: 2011-09-21 to 2011-10-04

APPLICABLE STANDARDS{PRIVATE }	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

Underwriters Laboratories Inc. tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Inc. based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation, as described by the referenced documents. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL By:

Bob DeLisi
Senior Staff Engineer
UL

Tested By:

Mike Antola
Senior Project Engineer
UL

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/1002550.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an image scanner, Model: LI4278, which has a Bluetooth transceiver internally imbedded.

The radio module is manufactured by Motorola Solutions Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	GFSK	3.43	2.20
2402 - 2480	QPSK	3.06	2.02
2402 - 2480	8PSK	3.41	2.19

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an SMD antenna, with a maximum gain of 2.7 dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was STB2078 Regulatory Test App, rev. 1.10.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. This was found to be 8PSK, DH5 and GFSK, DH5.

The EUT can be operated in either a Passthru Cradle or Charging Cradle. The worse-case configuration was deemed to be with the Passthru Cradle. Therefore, all radiated testing was performed under this configuration.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Passthru Cradle	Motorola Solutions Inc.	STB4278	1119100503197	H9PLMX5452
Charge Cradle	Motorola Solutions Inc.	STB4208	1115400504980	UZ7CR0078
Power Supply	Motorola Solutions Inc.	PWRS-14000-148R	10196-C6-0821306-888C	N/A
Power Supply	Motorola Solutions Inc.	PWRS-14000-253R	F33351045000996	N/A

I/O CABLES

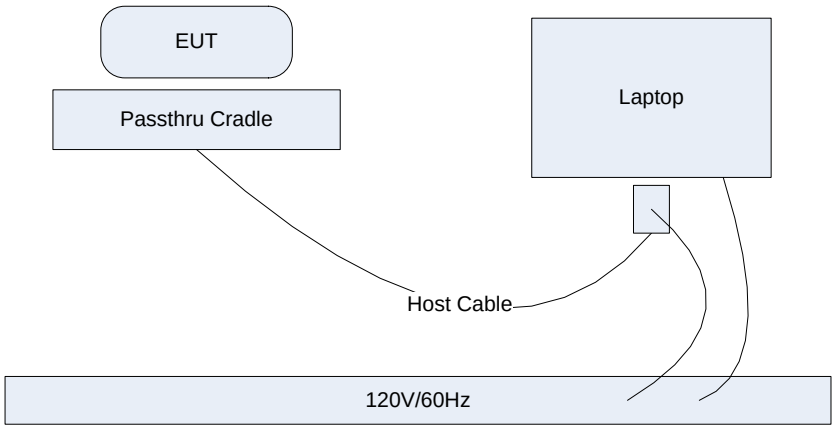
I/O CABLE LIST						
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks
1	RS232 Host Cable	1	RJ45/DB9	Ethernet	>3M	Connects Passthru Cradle to support PC

TEST SETUP

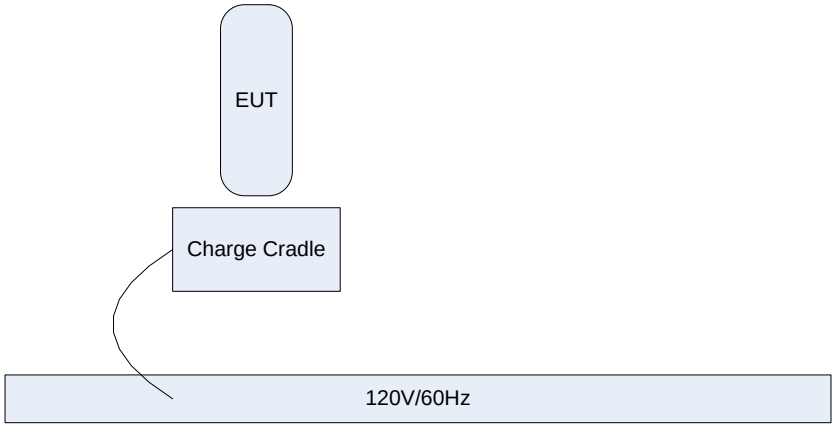
The EUT is synced with the Passthru Cradle during the tests. Test software exercised the radio.

SETUP DIAGRAM FOR TESTS

Passthru Cradle Configuration



Charging Cradle Configuration



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
Radiated Emissions					
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2011-03-01	2012-03-01
Bicon Antenna	Schaffner	VBA6106A	43441	2010-09-09	2011-09-30
Log-P Antenna	Schaffner	UPA6109	44068	2011-04-05	2012-04-05
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2011-02-01	2012-02-29
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2011-07-26	2012-07-26
Horn Antenna (1-2GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07	8933	2008-11-24	See * below
Horn Antenna (12-18 GHz)	ETS	3160-08	8932	2007-09-27	See * below
Horn Antenna (18-26.5 GHz)	ETS	3160-09	8947	2007-09-26	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2011-02-01	2012-02-29

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration. * Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.					

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2011-01-27	2012-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2011-02-04	2012-02-28
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.3	44736	N/A	N/A
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	43734	2010-03-08	2012-03-08
Multimeter	Fluke	43443	2011-02-01	2012-02-29	43443

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
Conducted RF Tests					
Spectrum Analyzer	Agilent	E4446A	72822	2011-07-02	2012-07-02
Power Meter	HP	437B	71769	2011-05-17	2012-05-17
Power Meter Sensor	HP	8481A	71770	2011-05-17	2012-05-17
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	43734	2010-03-08	2012-03-08

7. ANTENNA PORT TEST RESULTS

7.1. DH5 DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

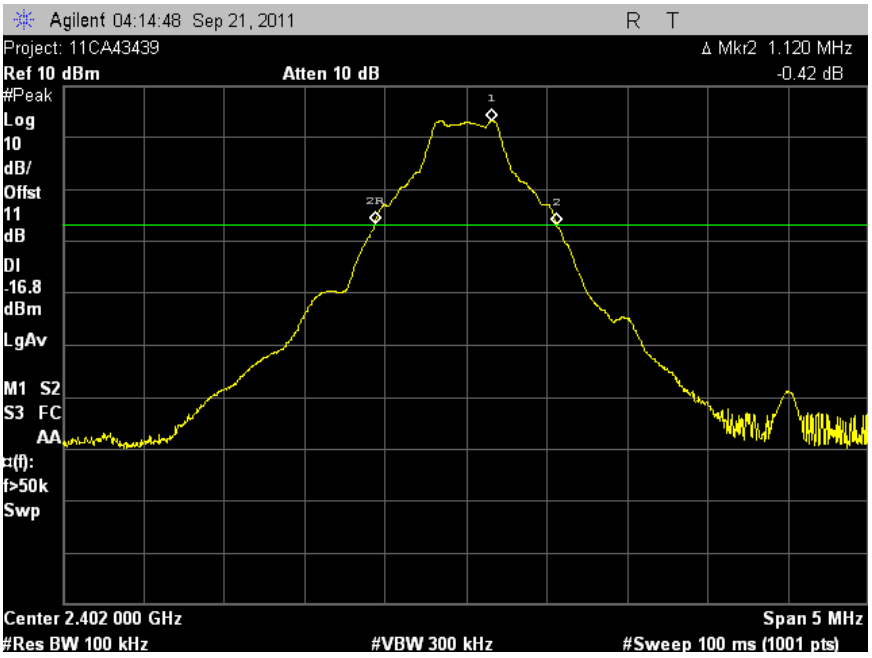
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

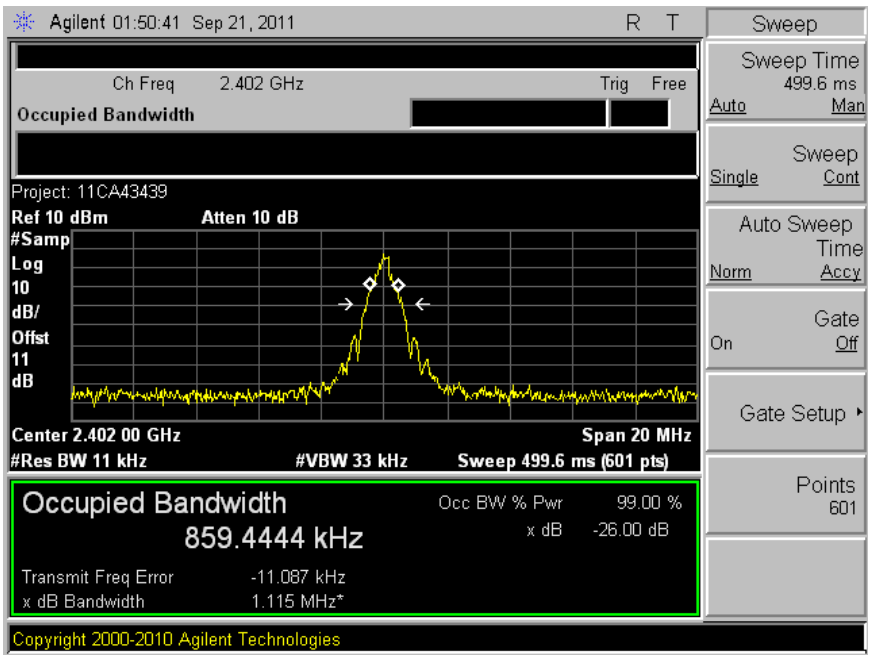
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	1120	859.4
Middle	2441	1125	903.4
High	2480	1120	874.1

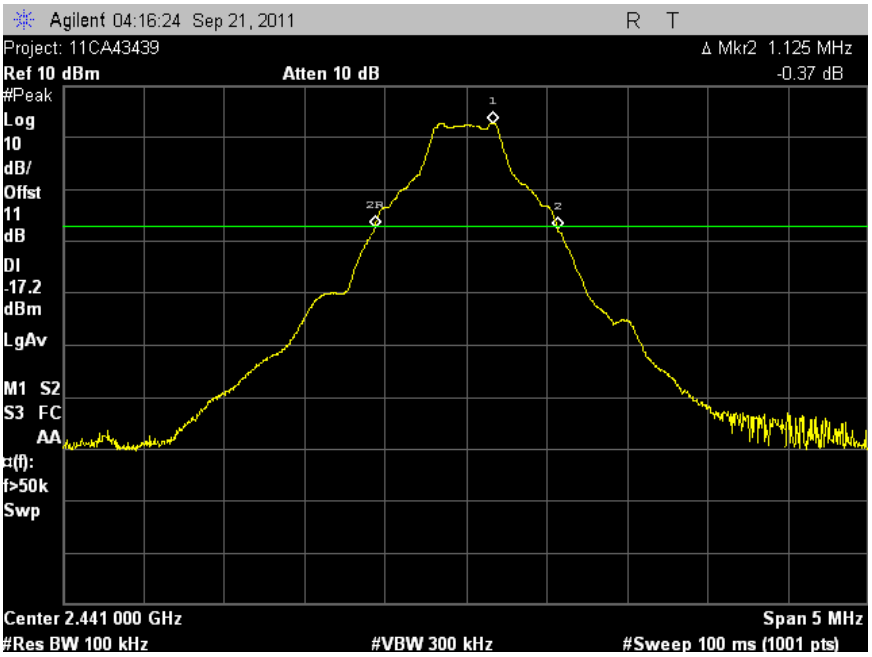
20 dB AND 99% BANDWIDTH

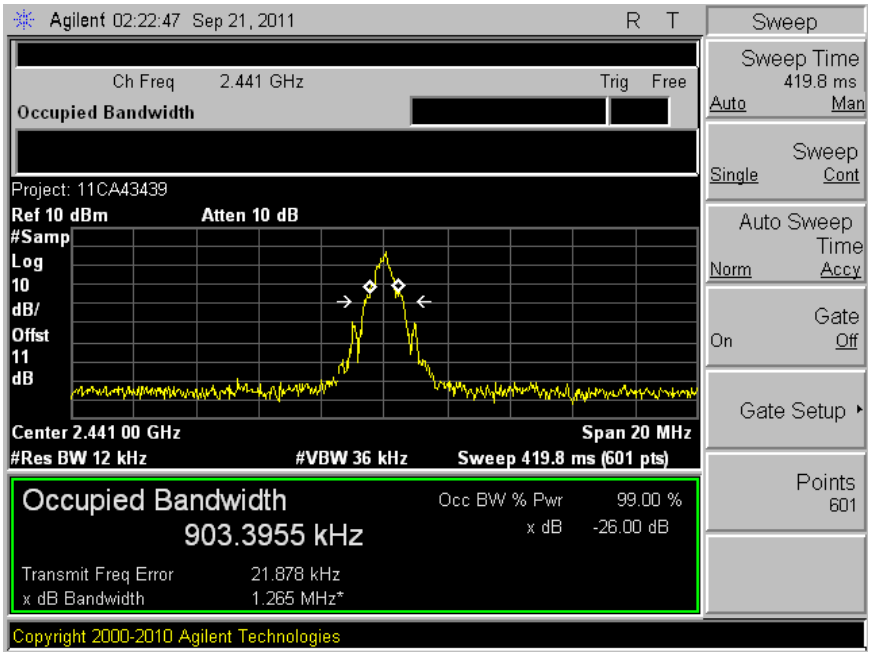
BANDWIDTH LOW CH



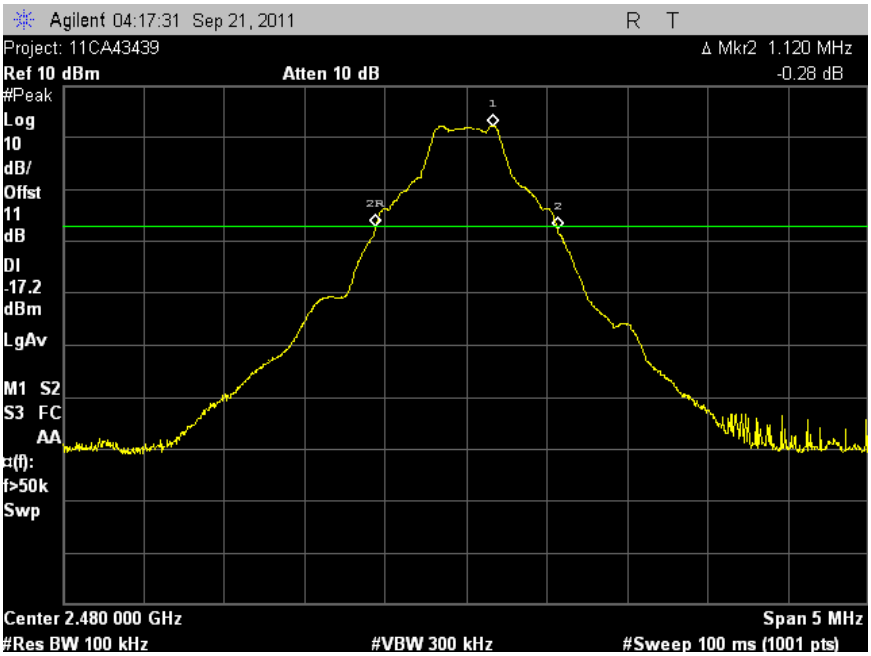


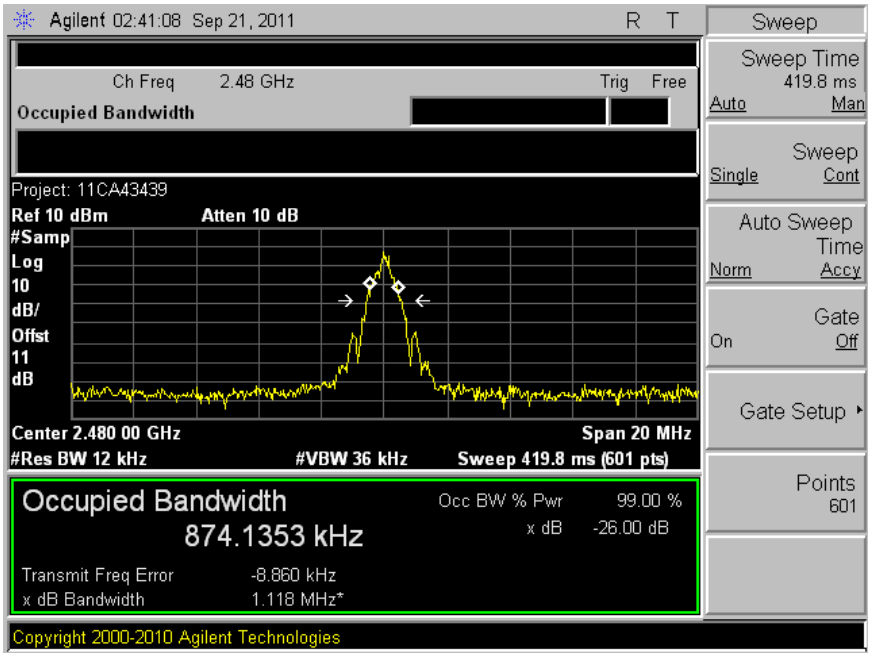
BANDWIDTH MID CH





BANDWIDTH HIGH CH





7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

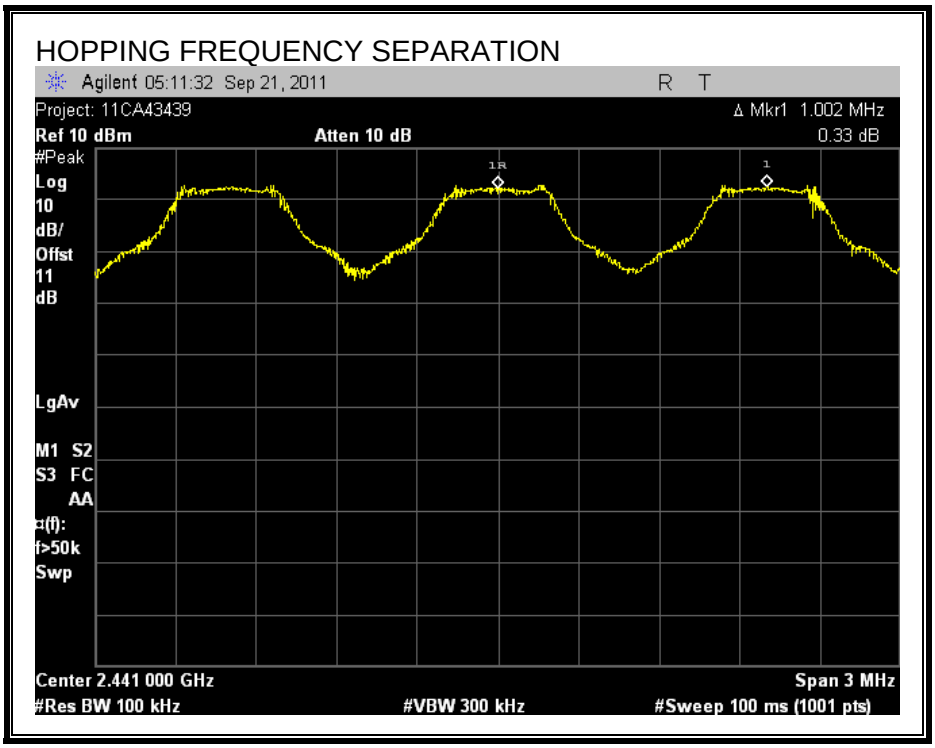
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

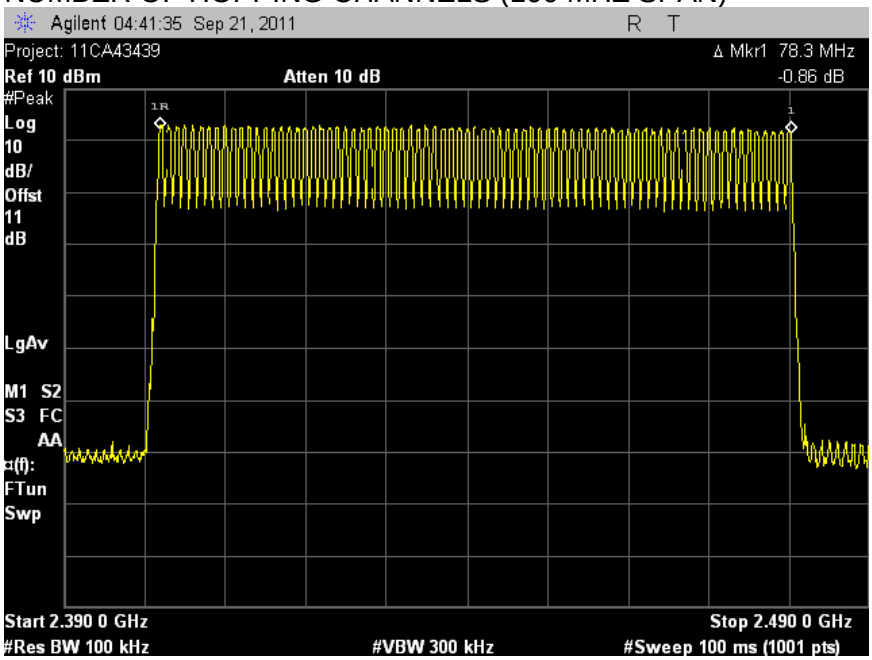
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

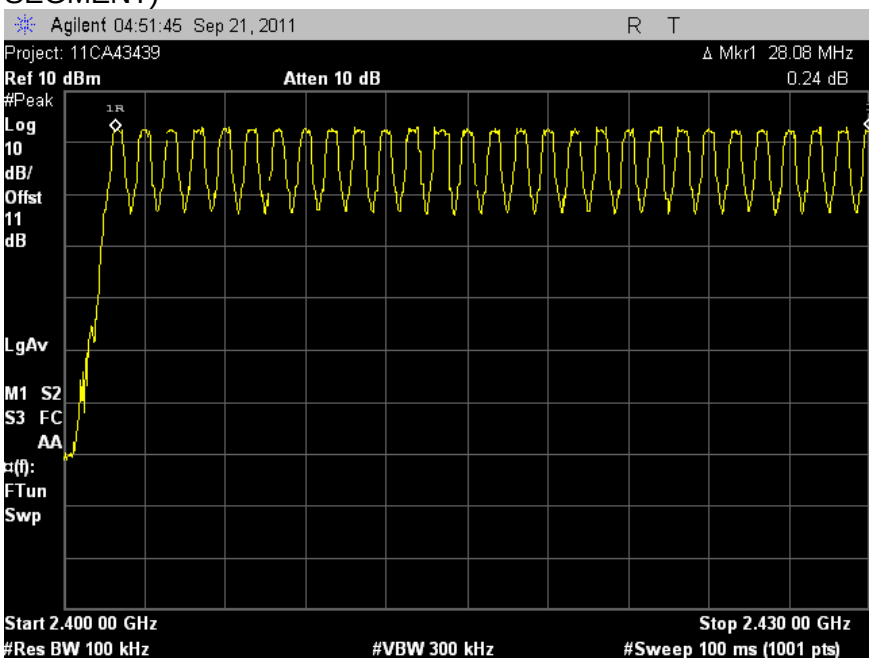
79 Channels observed.

NUMBER OF HOPPING CHANNELS

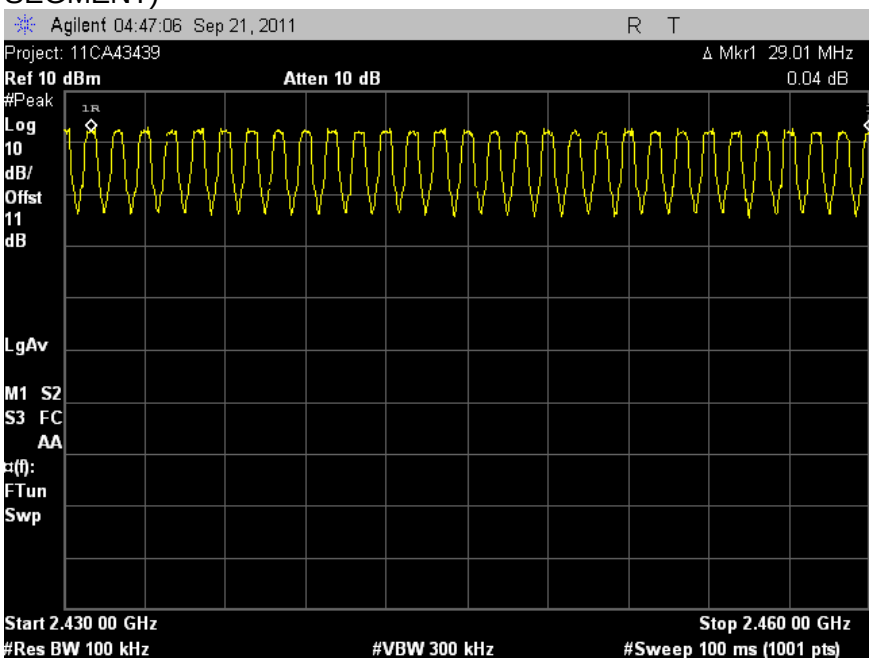
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



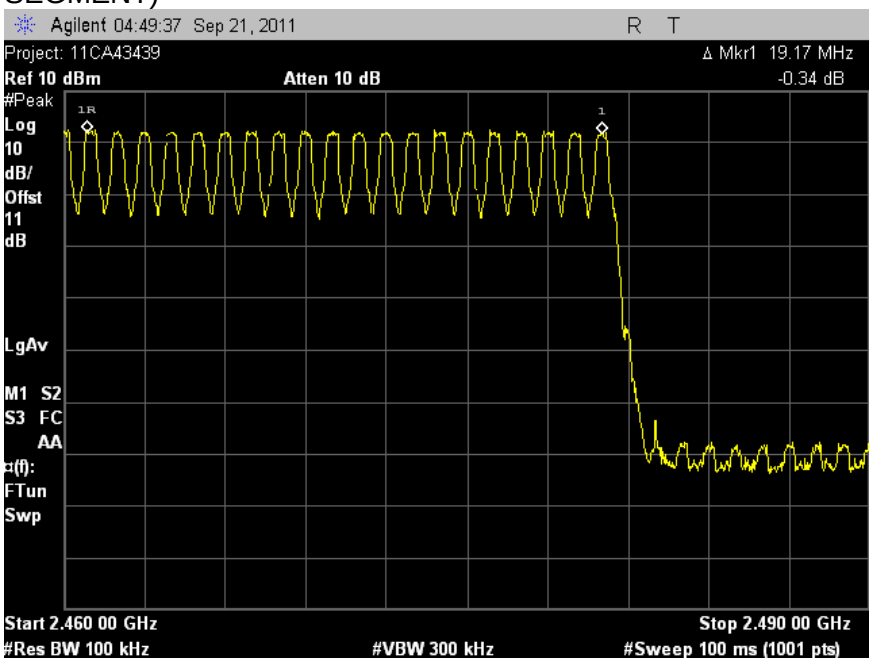
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

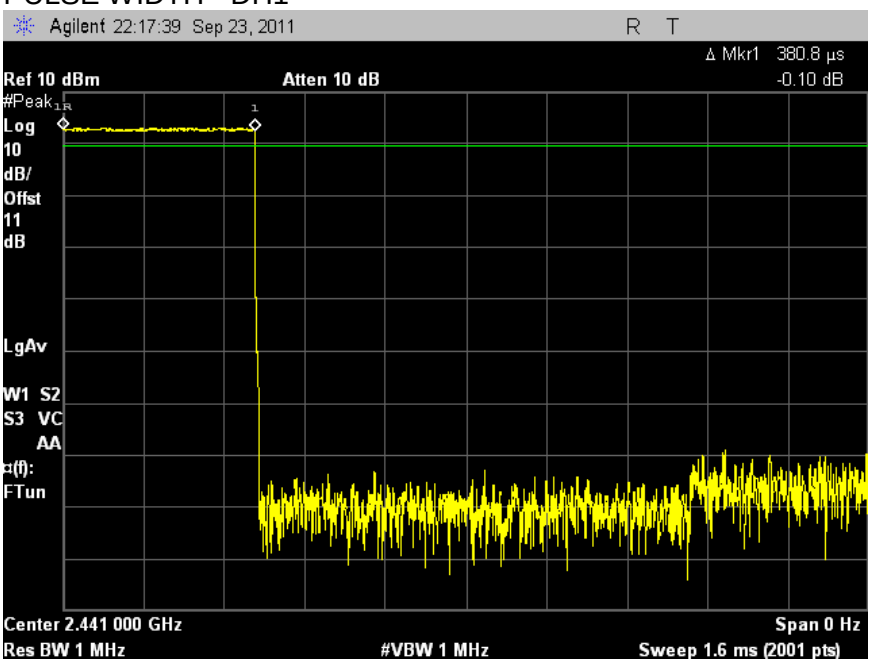
Time of Occupancy = 10 * xx pulses * yy msec = zz msec

GFSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.38	32	0.122	0.4	0.278
DH3	1.63	16	0.261	0.4	0.139
DH5	2.88	11	0.317	0.4	0.083

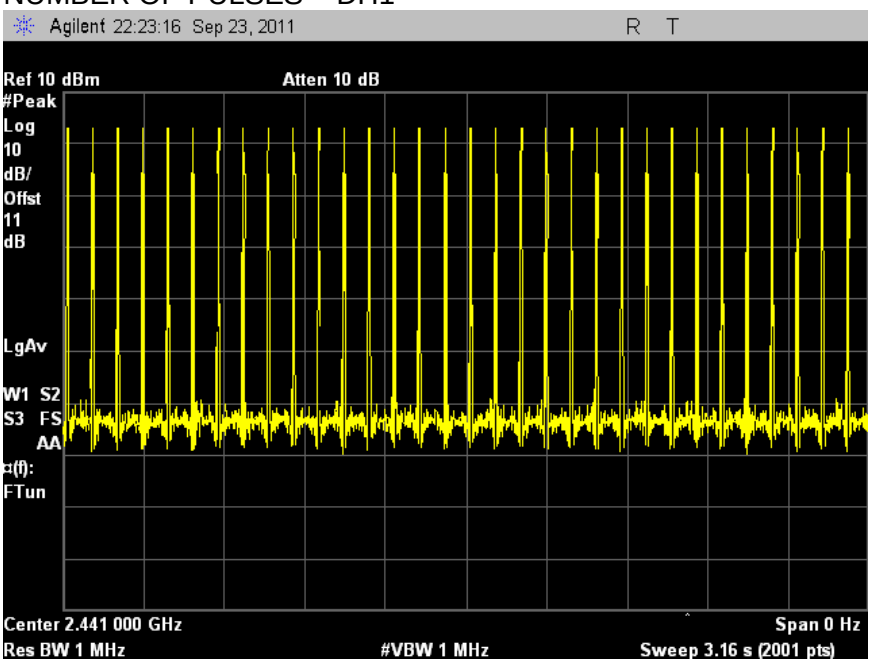
PULSE WIDTH

PULSE WIDTH - DH1



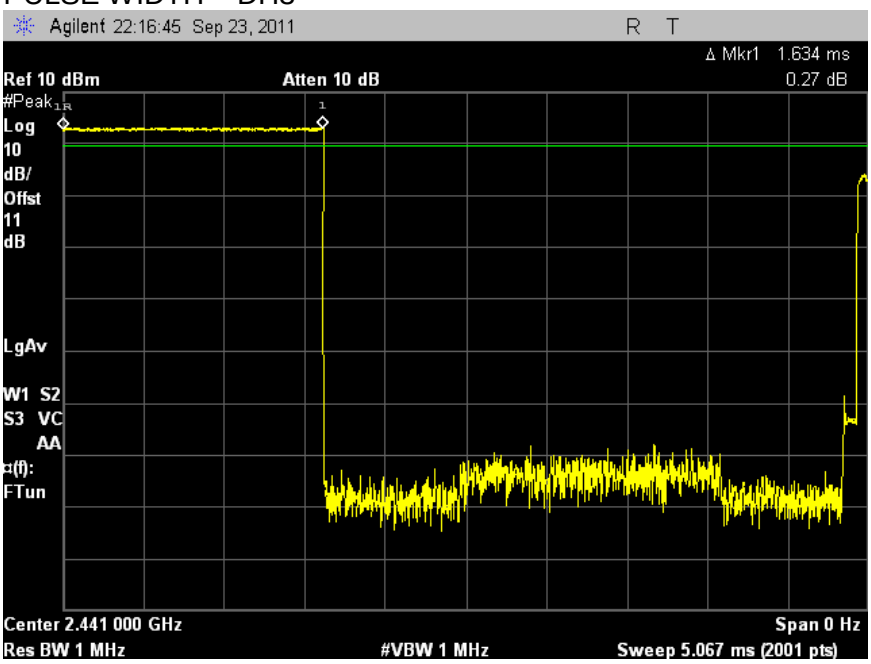
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

NUMBER OF PULSES – DH1



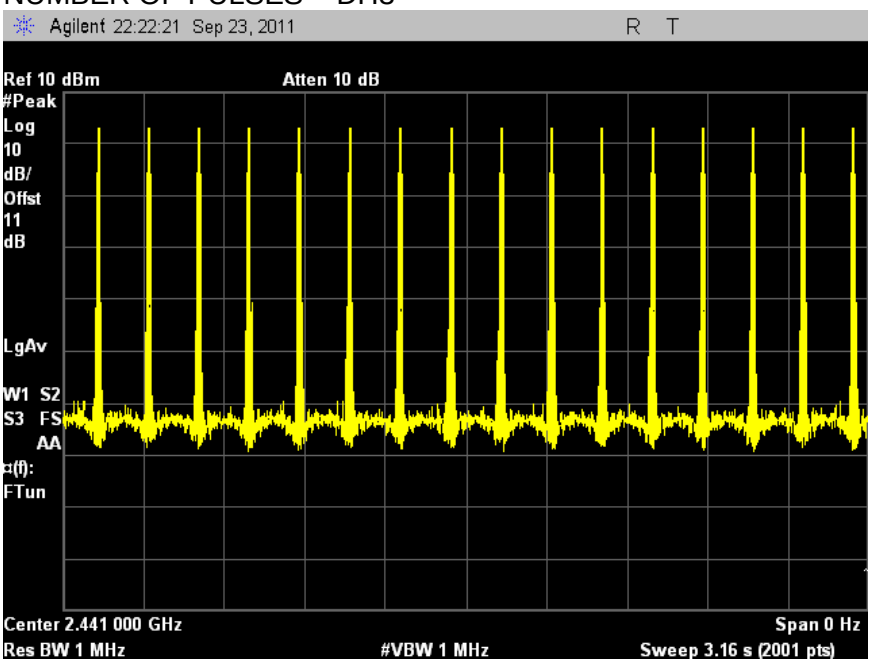
PULSE WIDTH

PULSE WIDTH – DH3



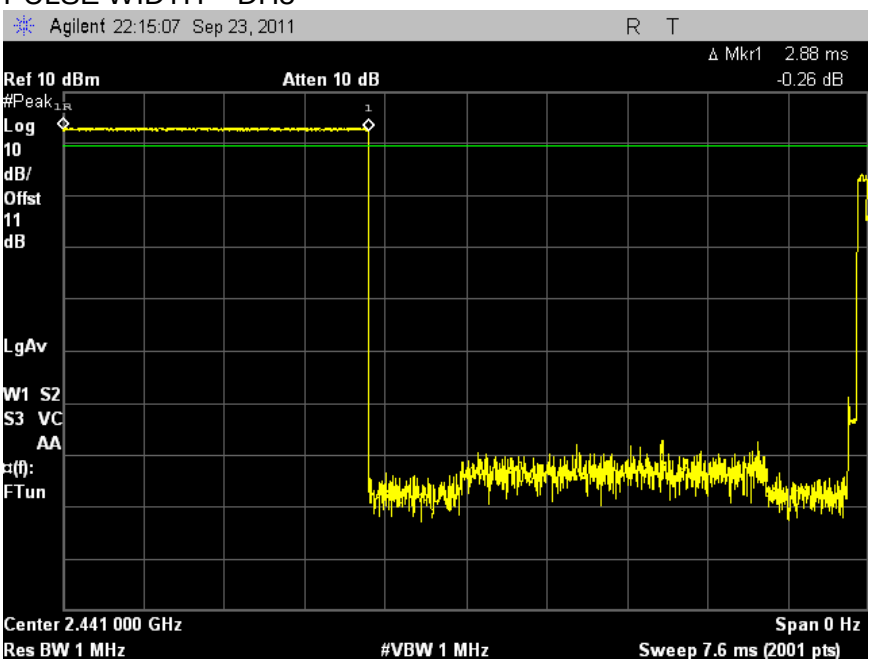
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

NUMBER OF PULSES – DH3



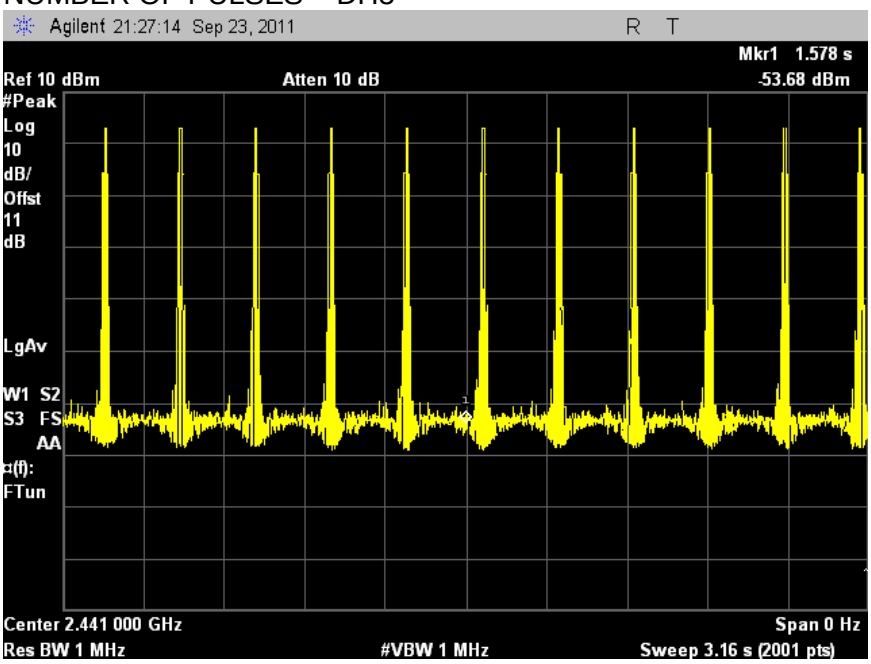
PULSE WIDTH

PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

NUMBER OF PULSES – DH5



7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 8 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

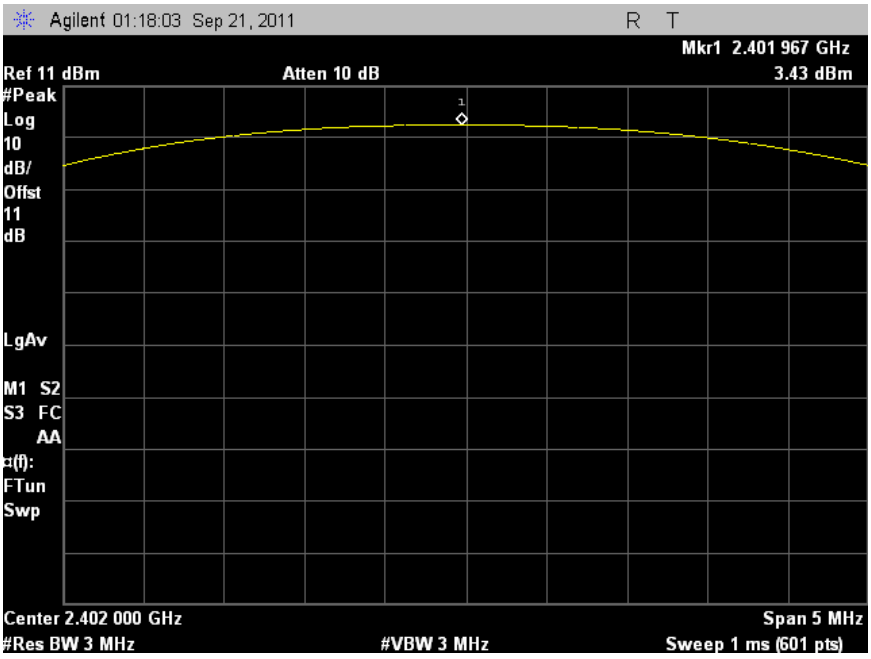
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

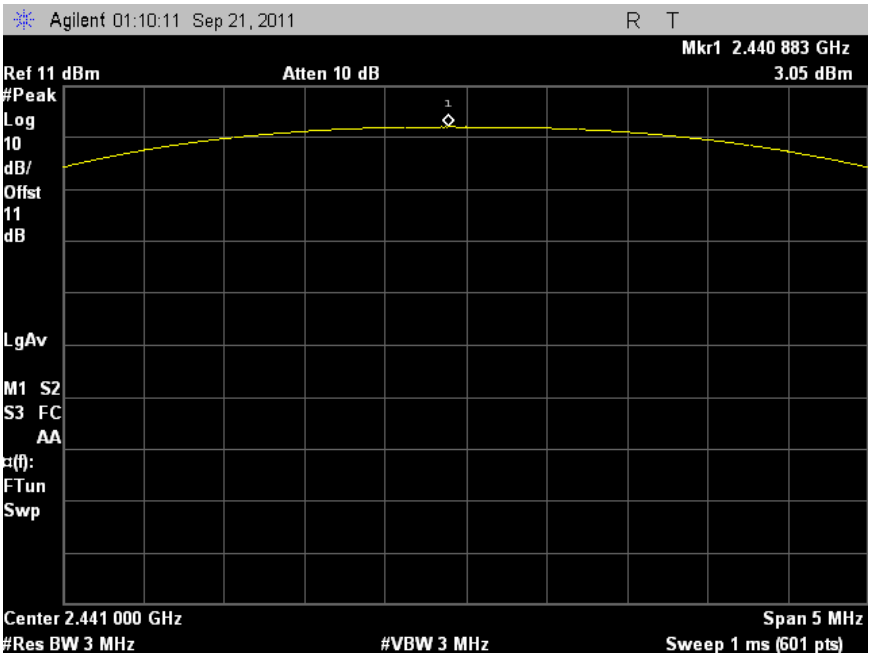
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	3.43	30	-26.57
Middle	2441	3.05	30	-26.95
High	2480	2.61	30	-27.39

OUTPUT POWER

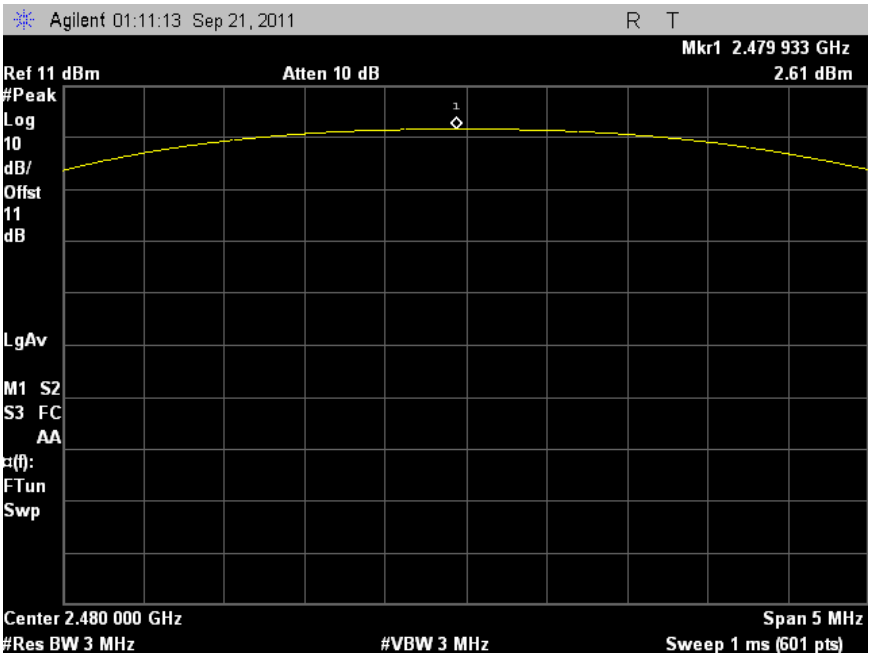
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



7.1.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.04
Middle	2441	1.65
High	2480	1.12

7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

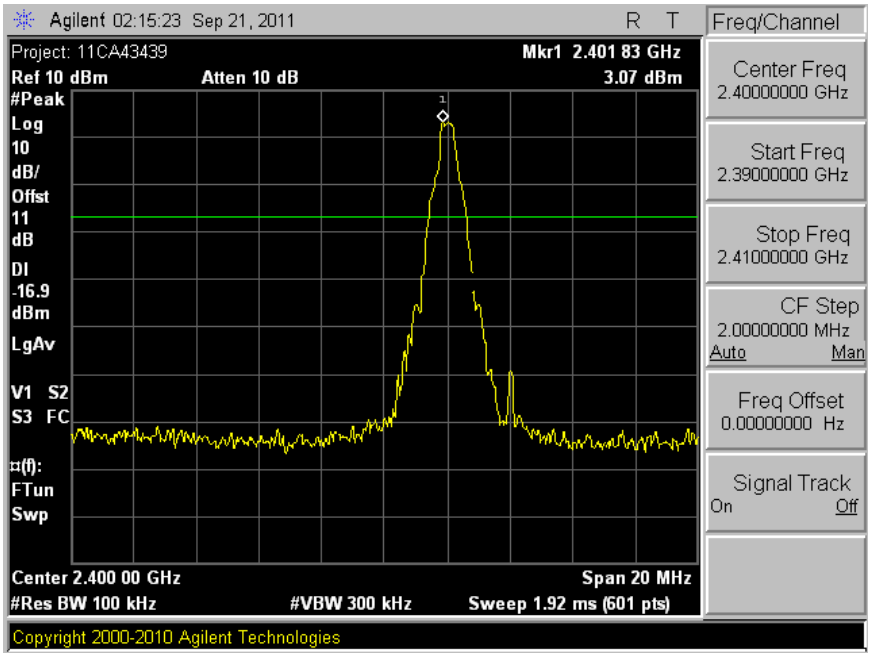
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

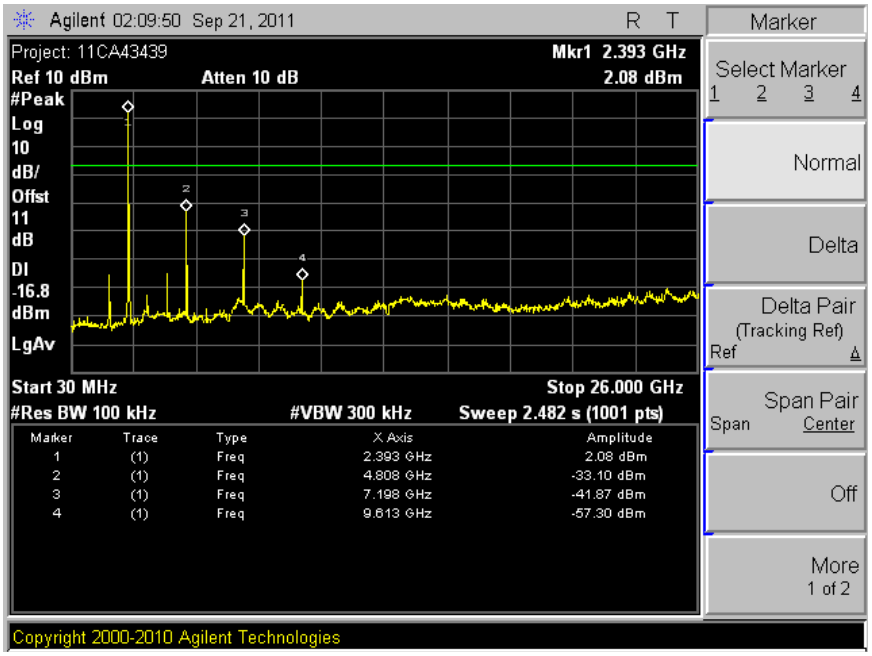
RESULTS

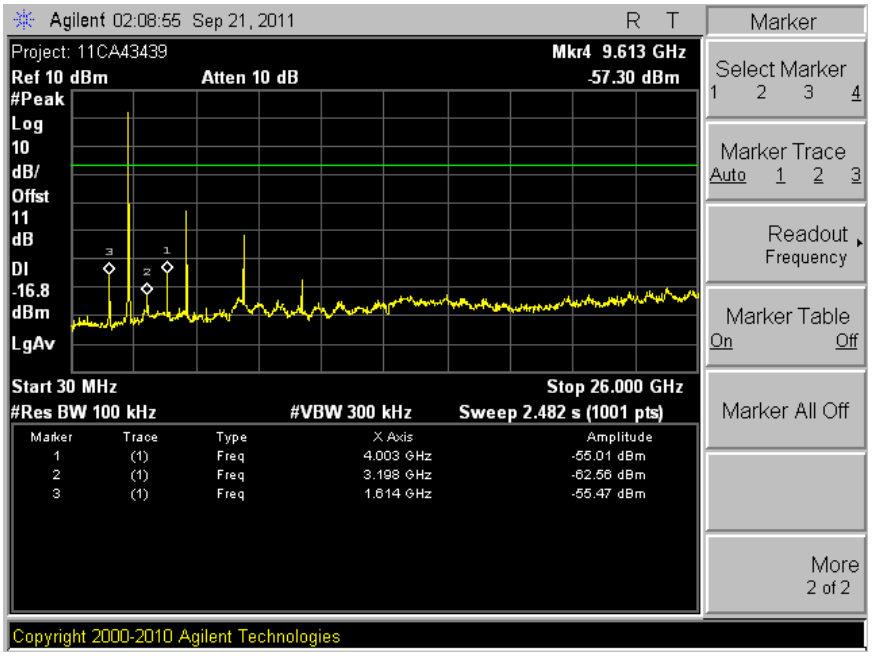
SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE



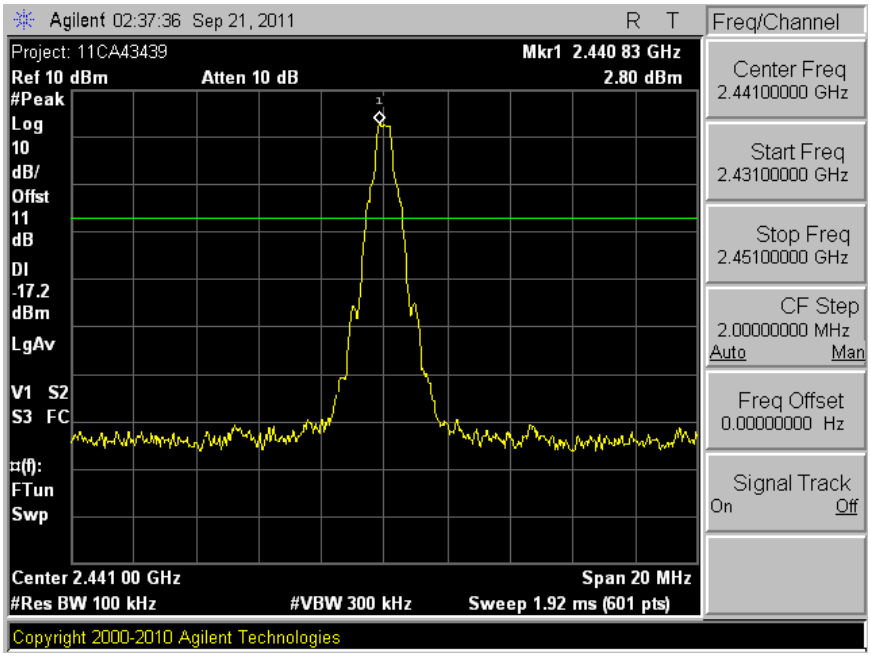
LOW CHANNEL SPURIOUS



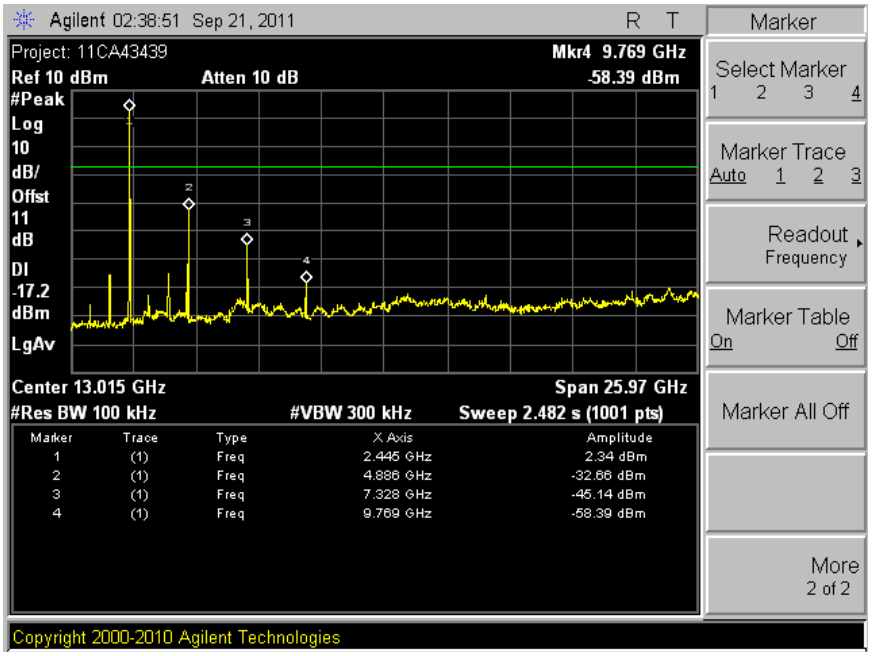


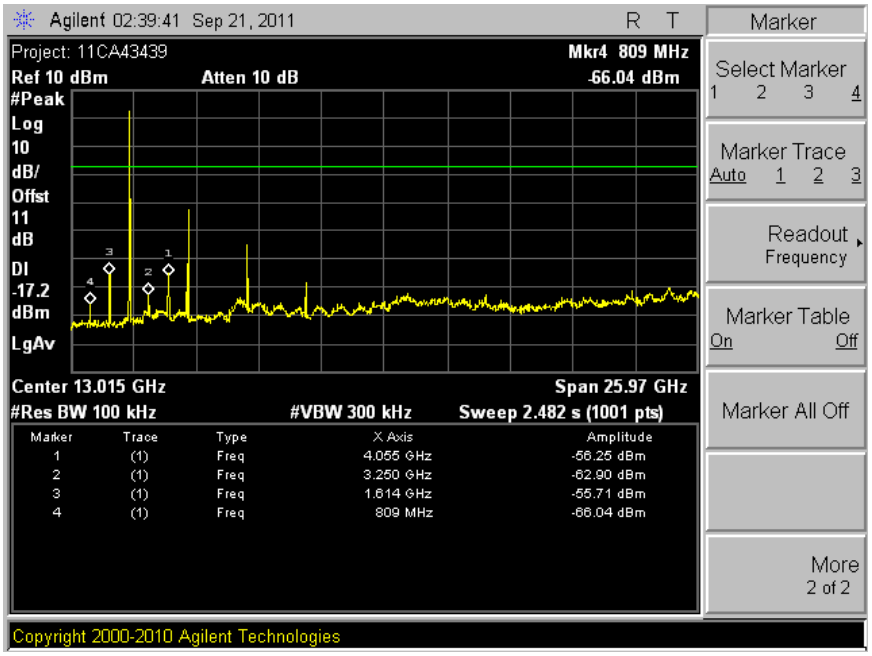
SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE



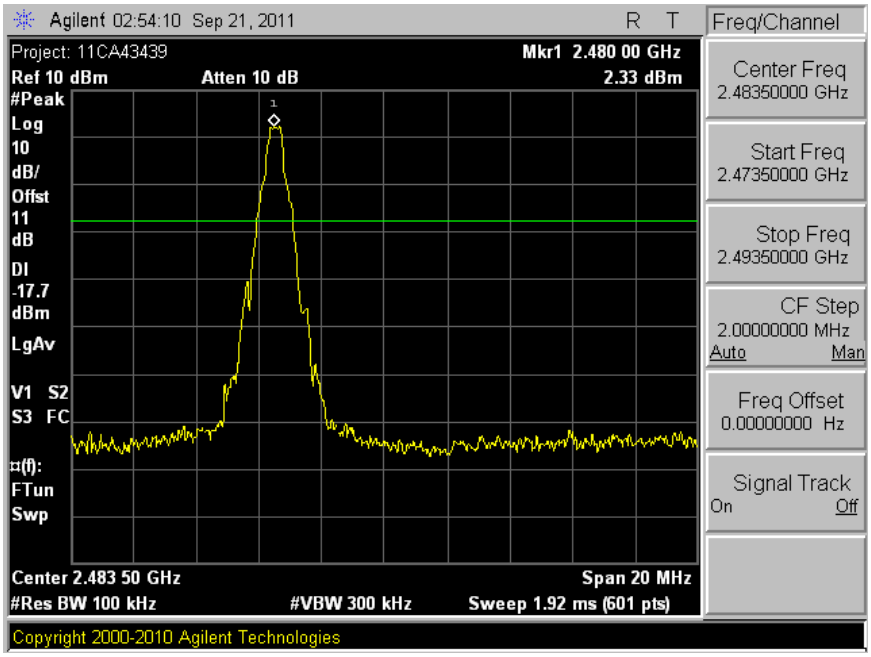
MID CHANNEL SPURIOUS



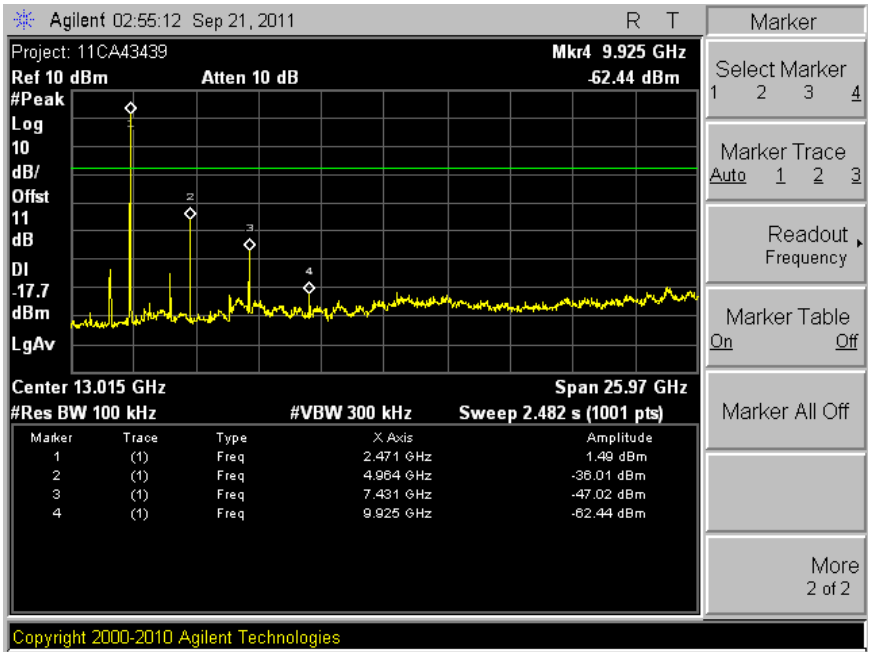


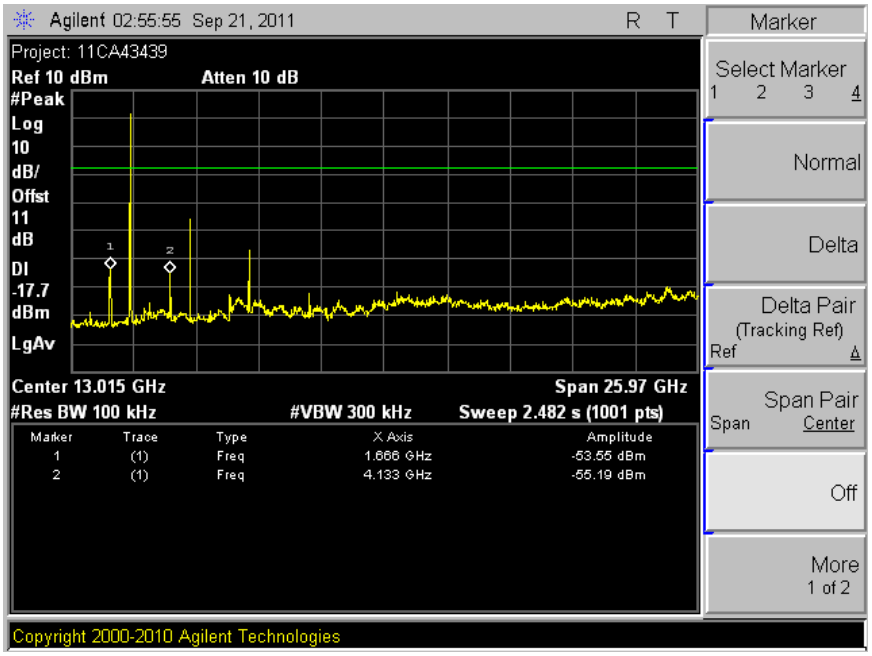
SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



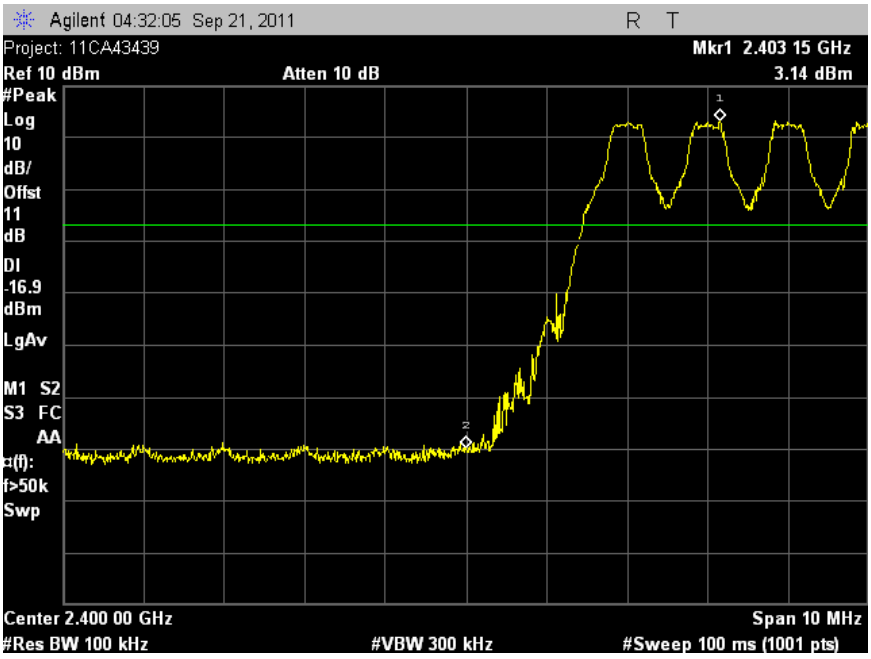
HIGH CHANNEL SPURIOUS





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON

7.2. DH5 DATA RATE 8PSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

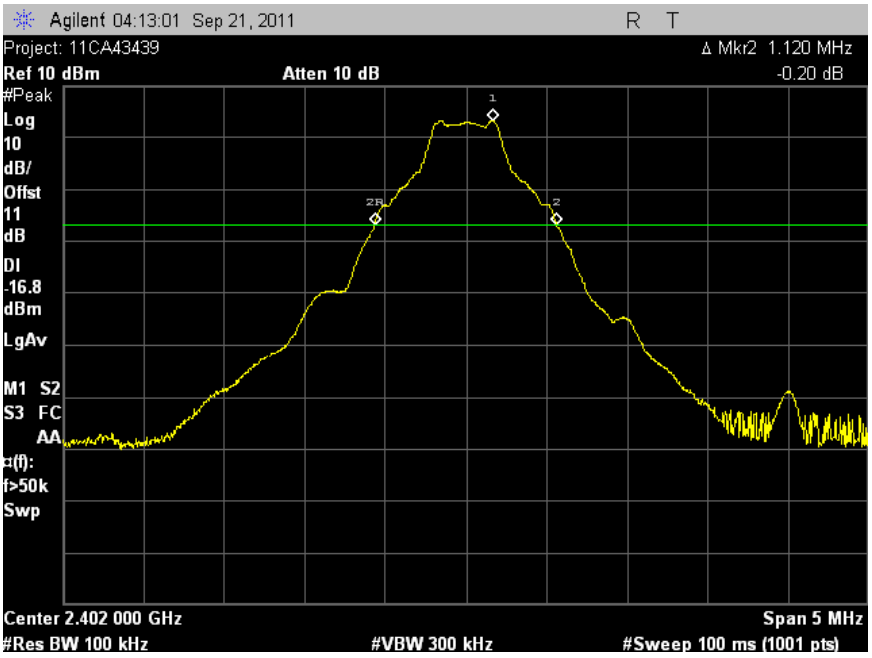
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

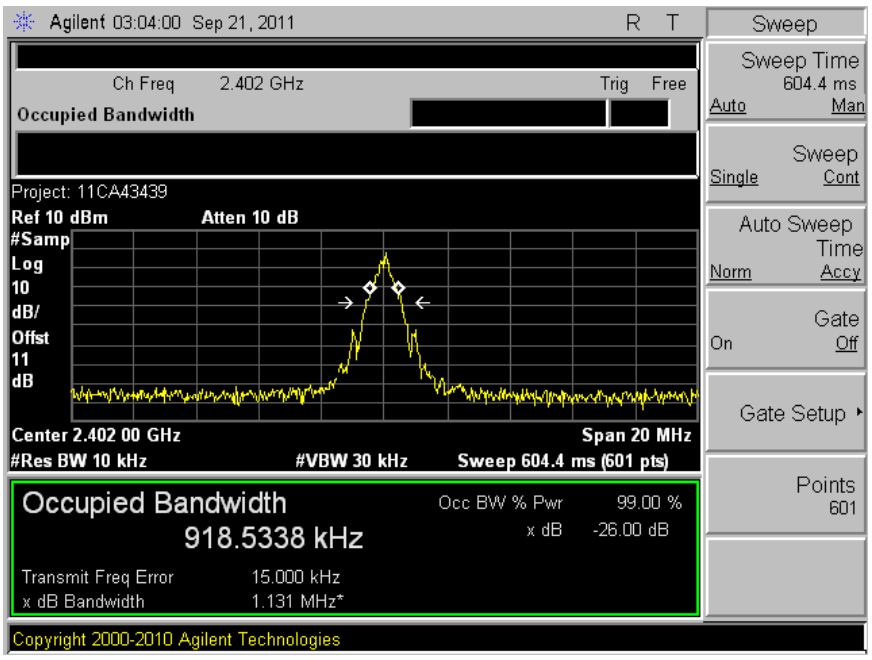
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	1120	918.5
Middle	2441	1125	870.7
High	2480	1125	893.5

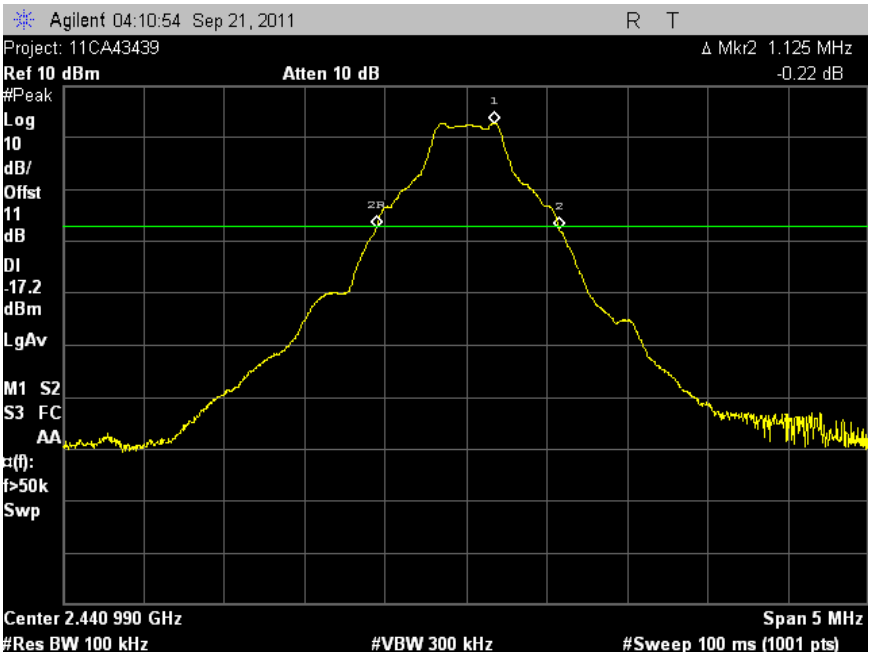
20 dB AND 99% BANDWIDTH

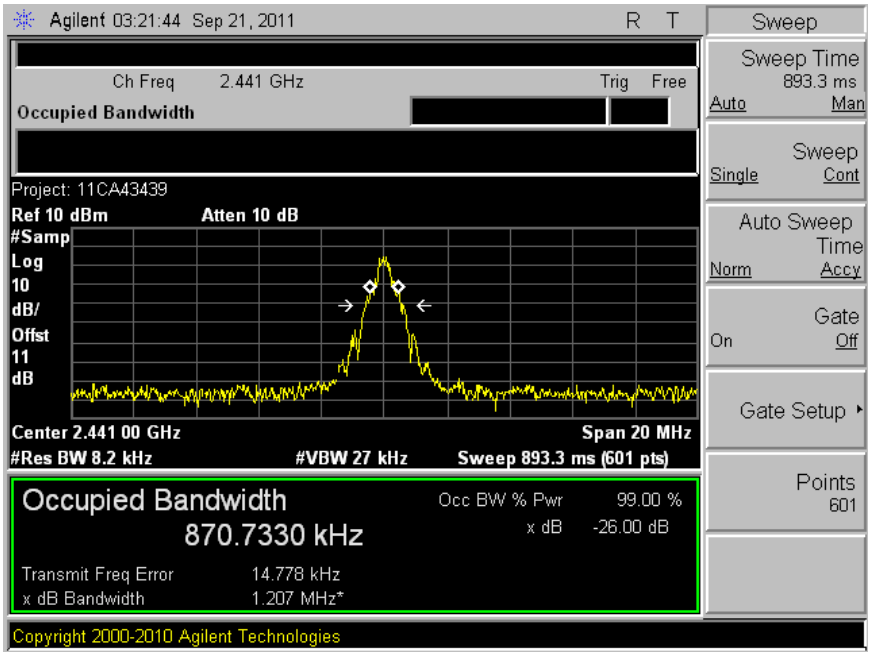
BANDWIDTH LOW CH



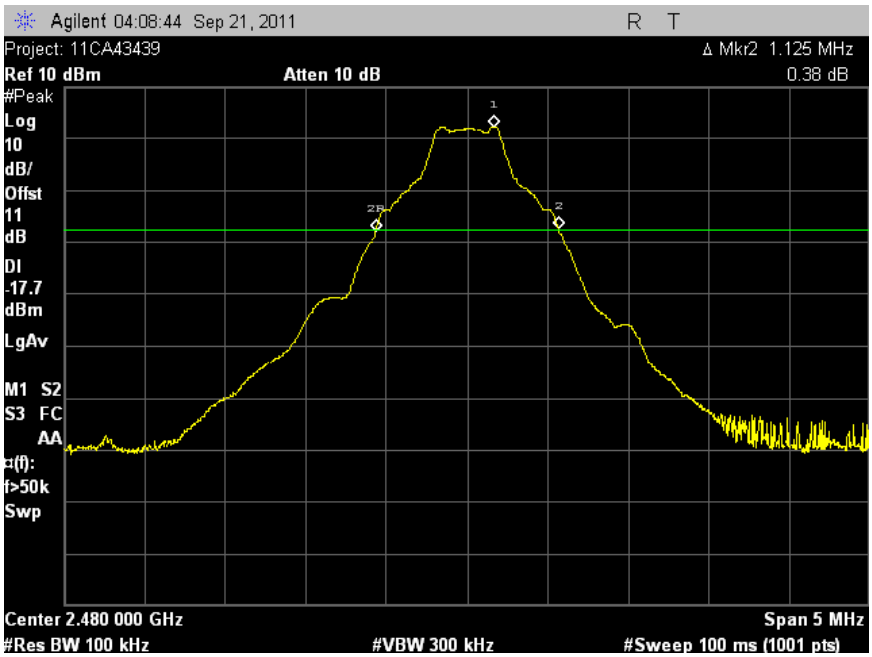


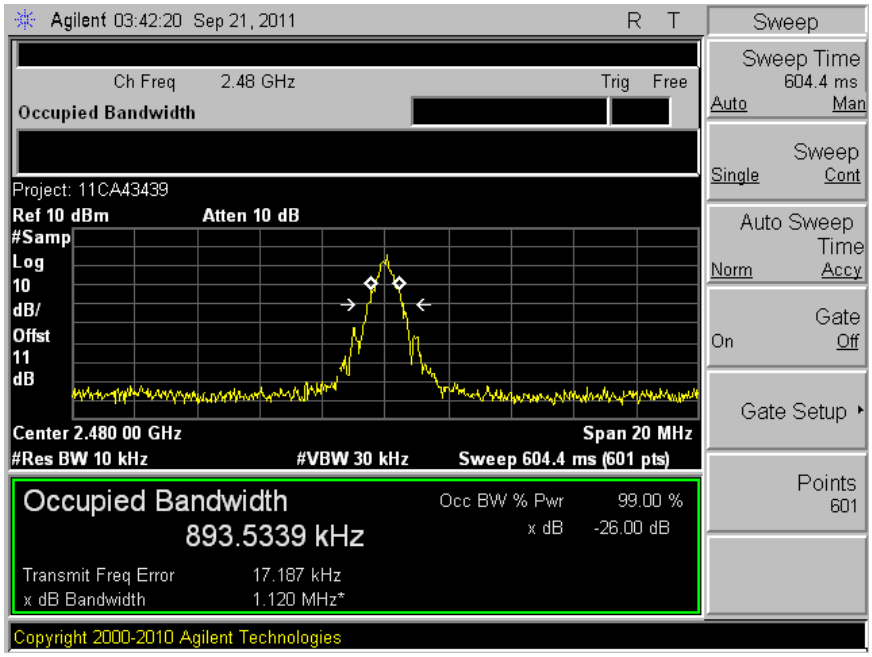
BANDWIDTH MID CH





BANDWIDTH HIGH CH





7.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

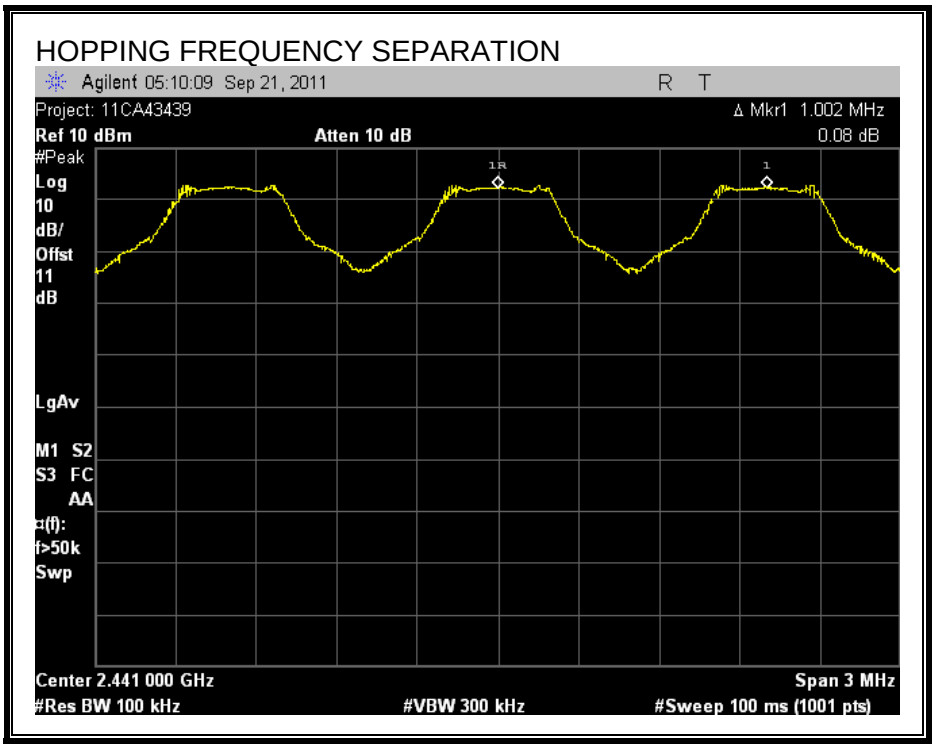
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

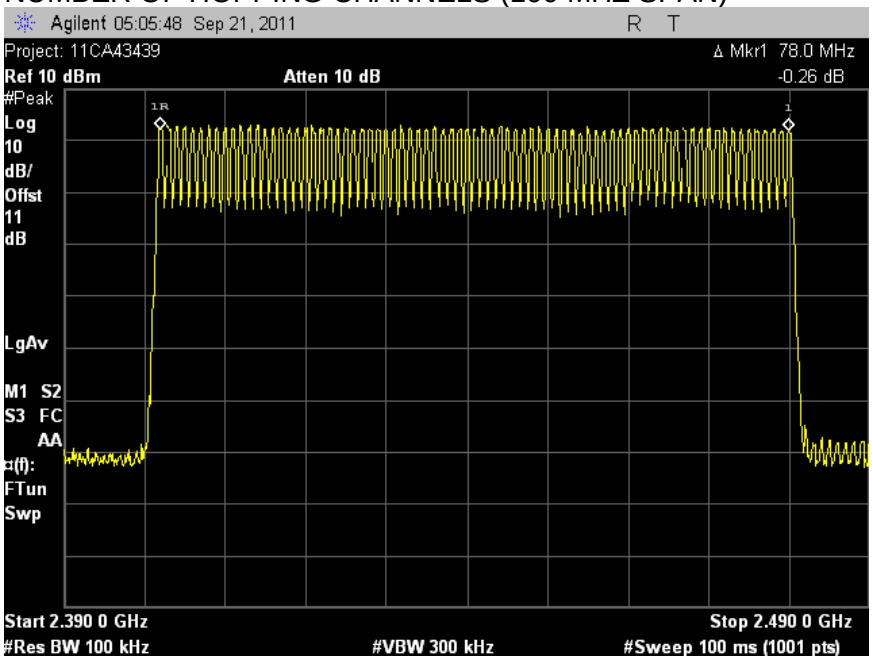
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

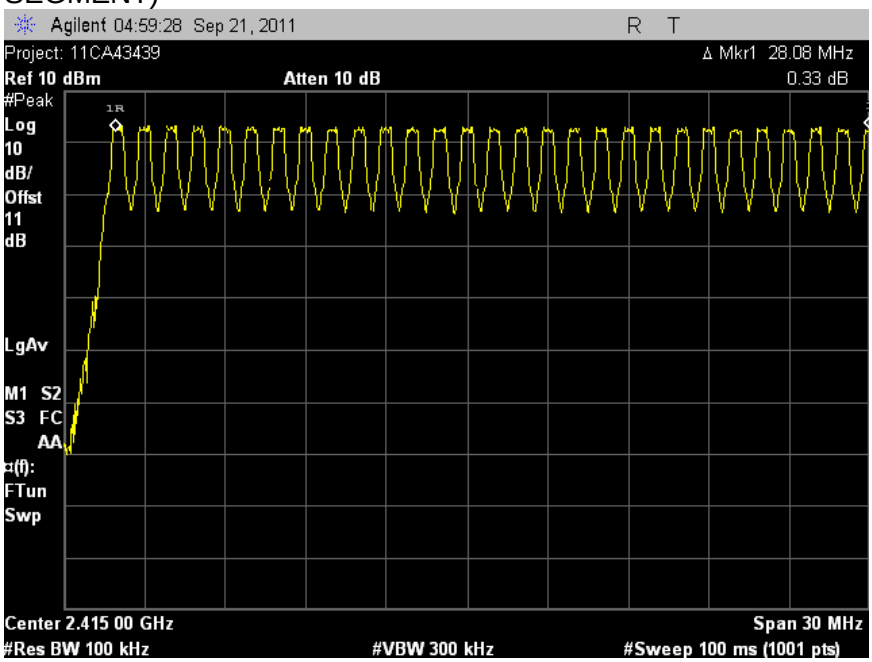
79 Channels observed.

NUMBER OF HOPPING CHANNELS

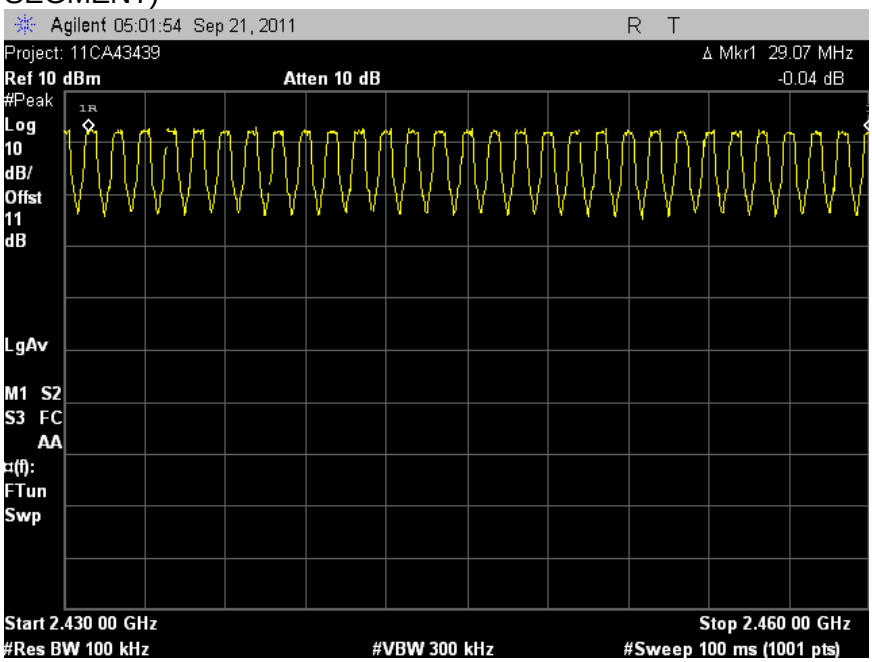
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



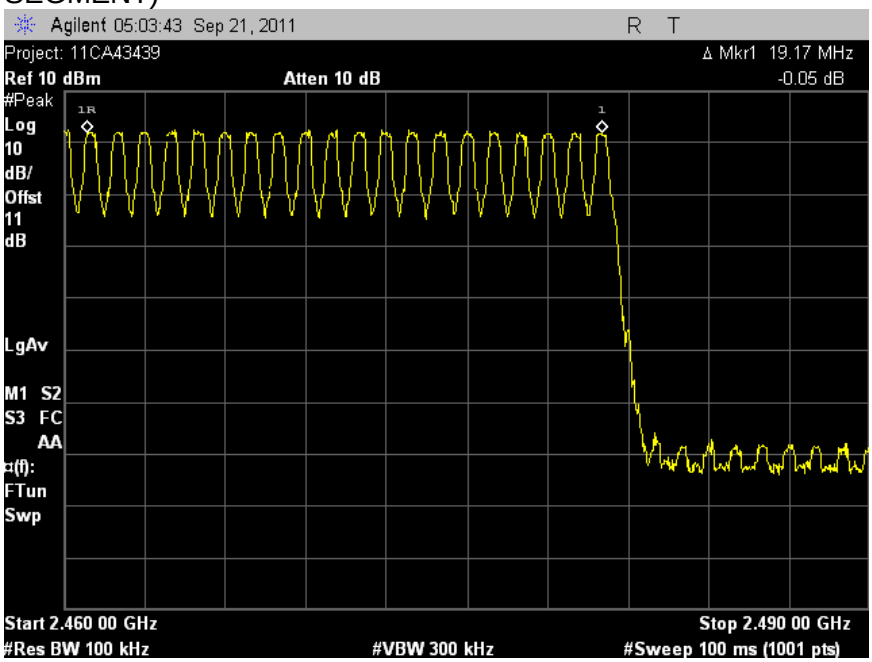
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

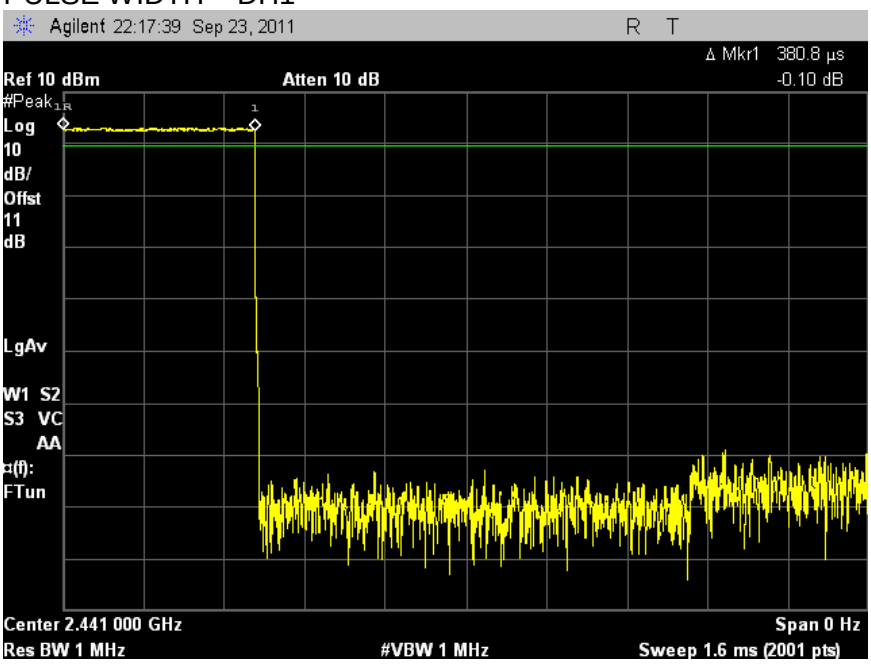
Time of Occupancy = 10 * xx pulses * yy msec = zz msec

8PSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.38	32	0.122	0.4	0.278
DH3	1.63	16	0.261	0.4	0.139
DH5	2.88	11	0.317	0.4	0.083

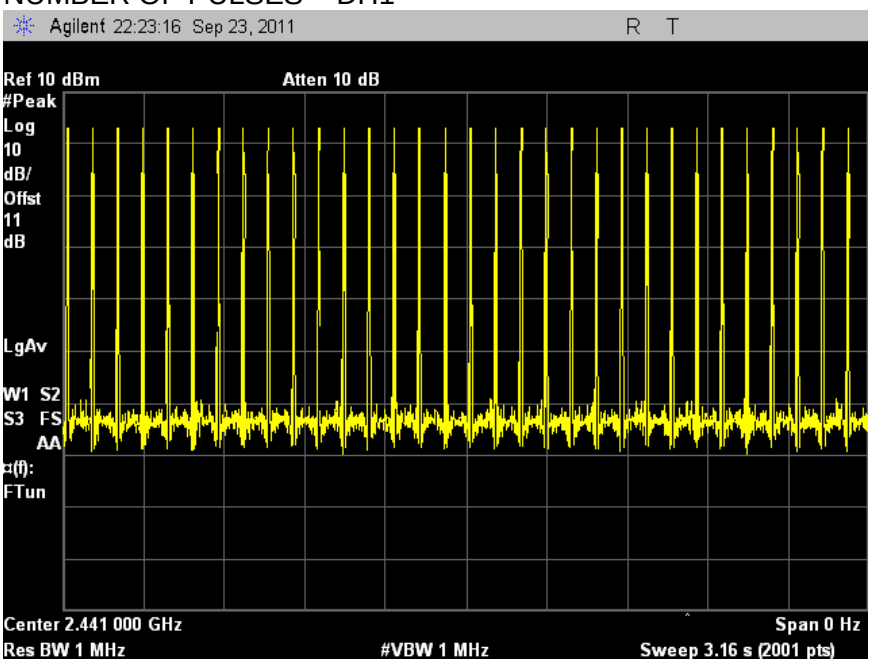
PULSE WIDTH

PULSE WIDTH – DH1



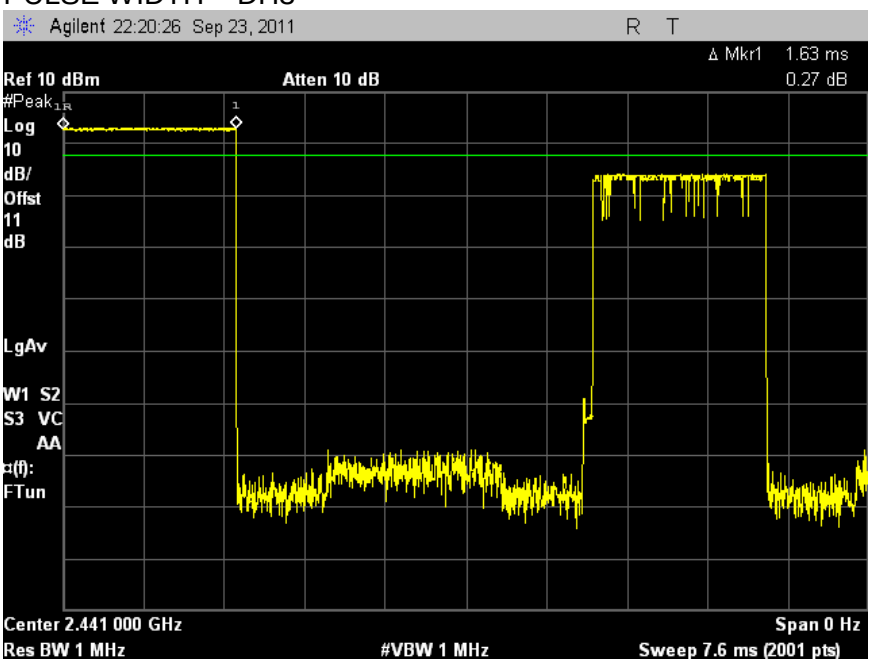
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

NUMBER OF PULSES – DH1



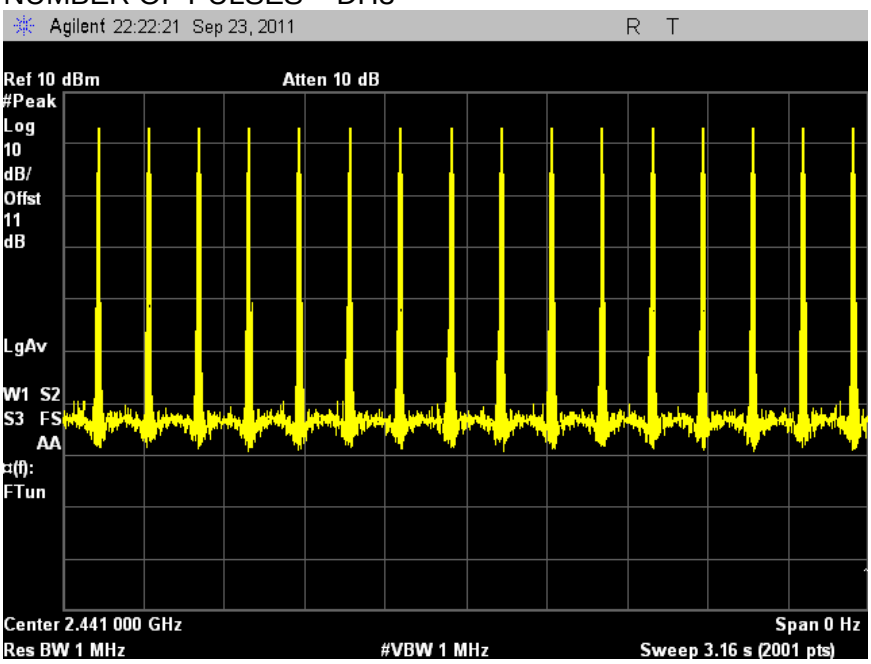
PULSE WIDTH

PULSE WIDTH – DH3



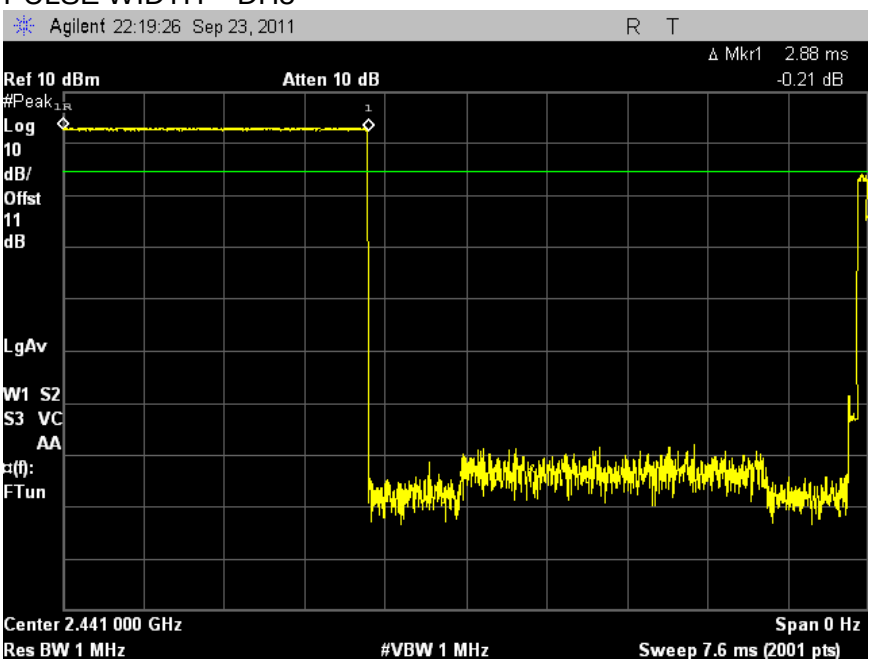
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

NUMBER OF PULSES – DH3



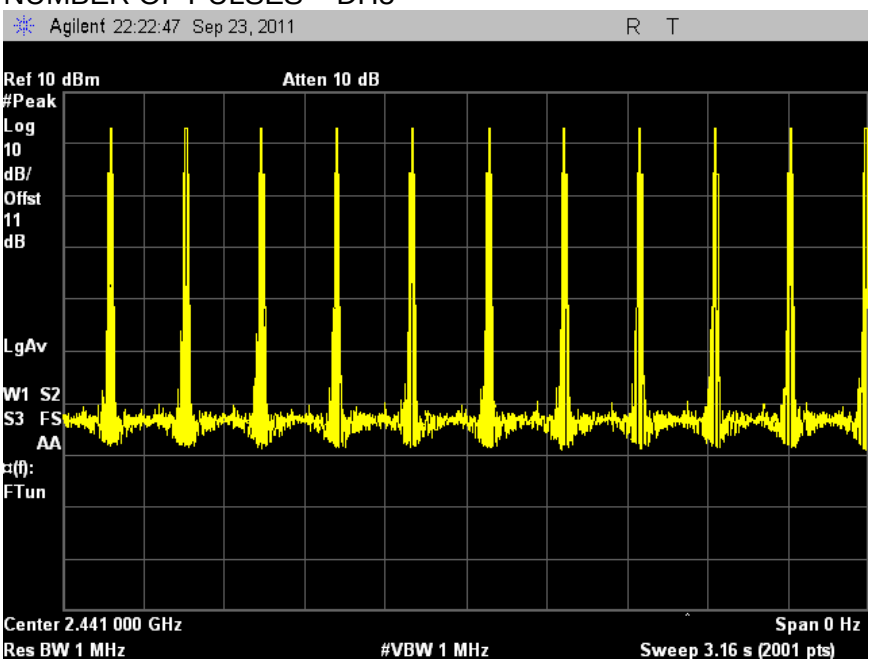
PULSE WIDTH

PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD

NUMBER OF PULSES – DH5



7.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 8 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

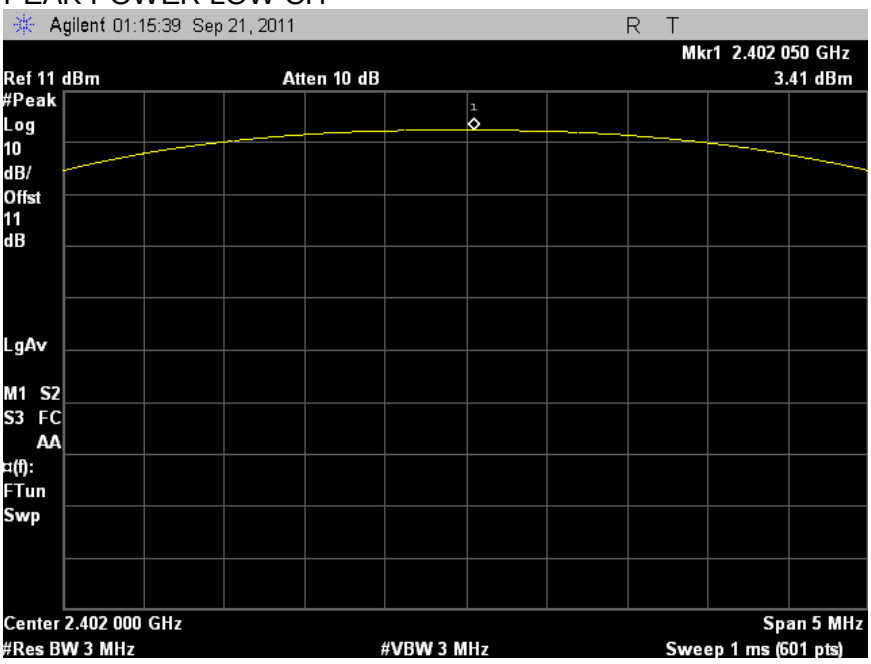
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

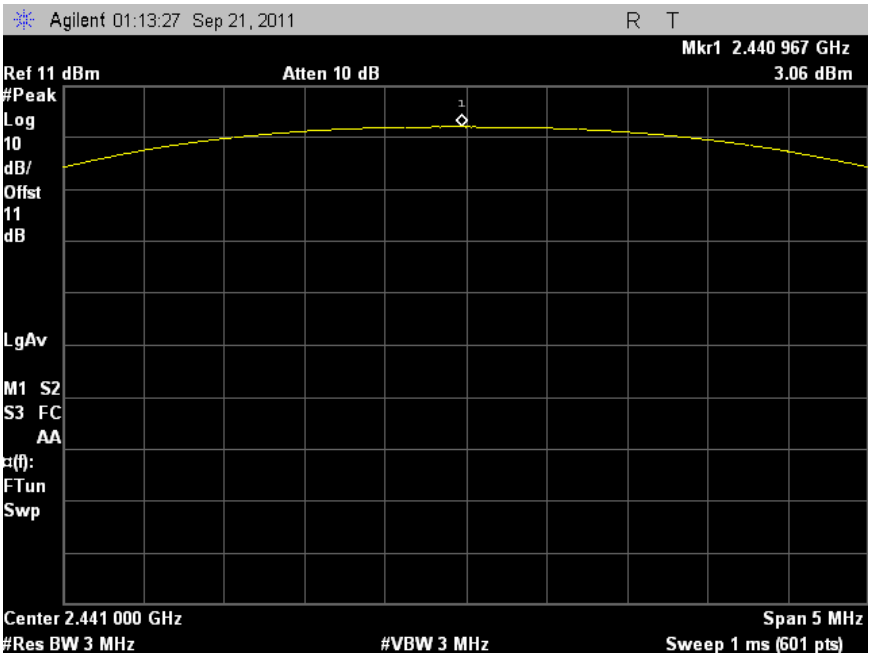
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	3.41	30	-26.59
Middle	2441	3.06	30	-26.94
High	2480	2.62	30	-27.38

OUTPUT POWER

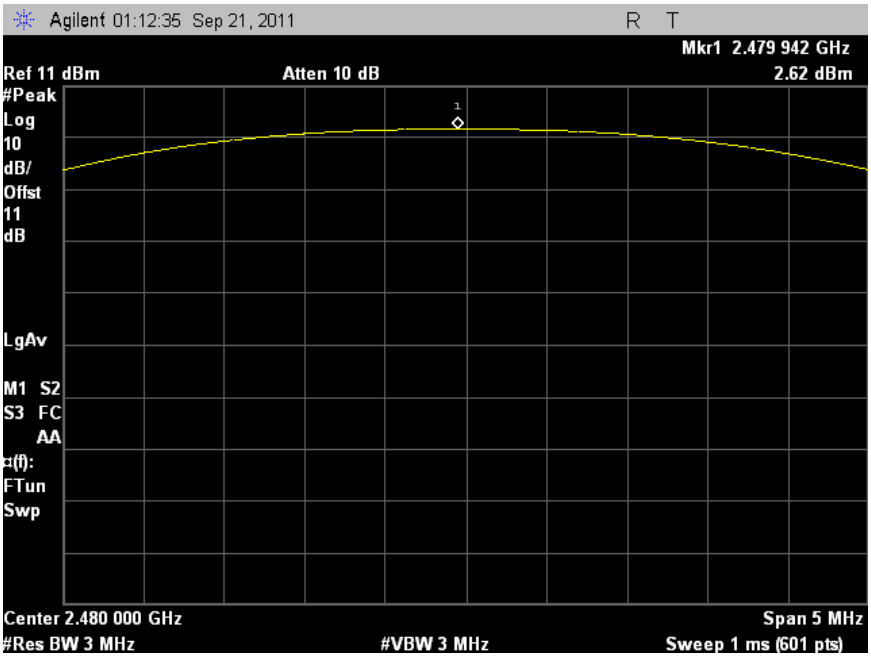
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



7.2.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.03
Middle	2441	1.65
High	2480	1.12

7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

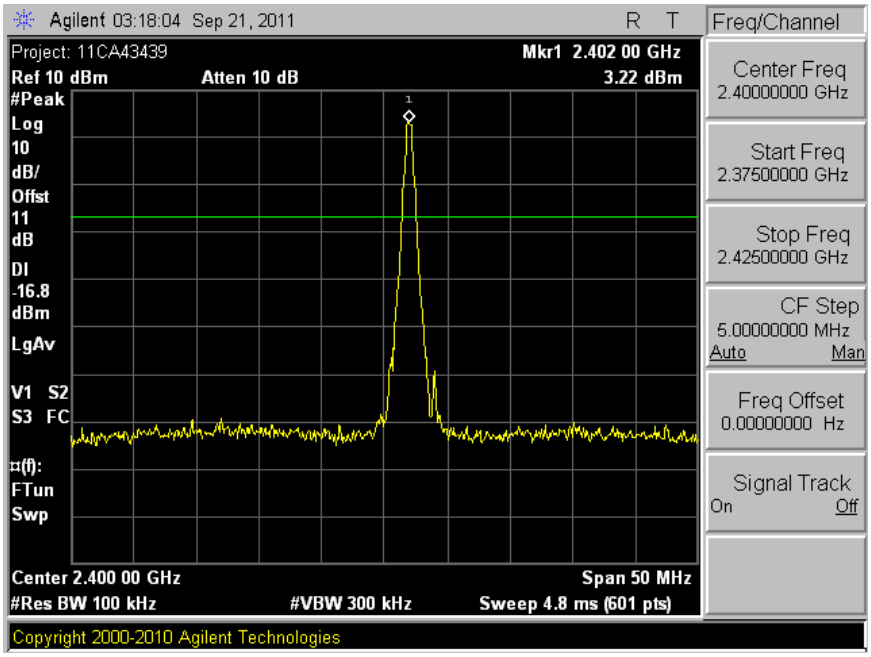
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

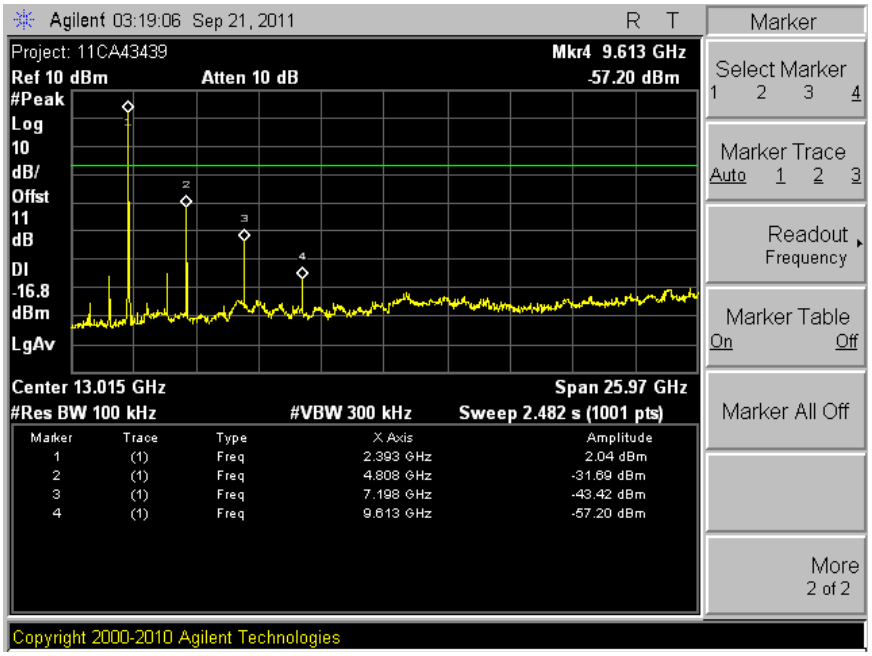
RESULTS

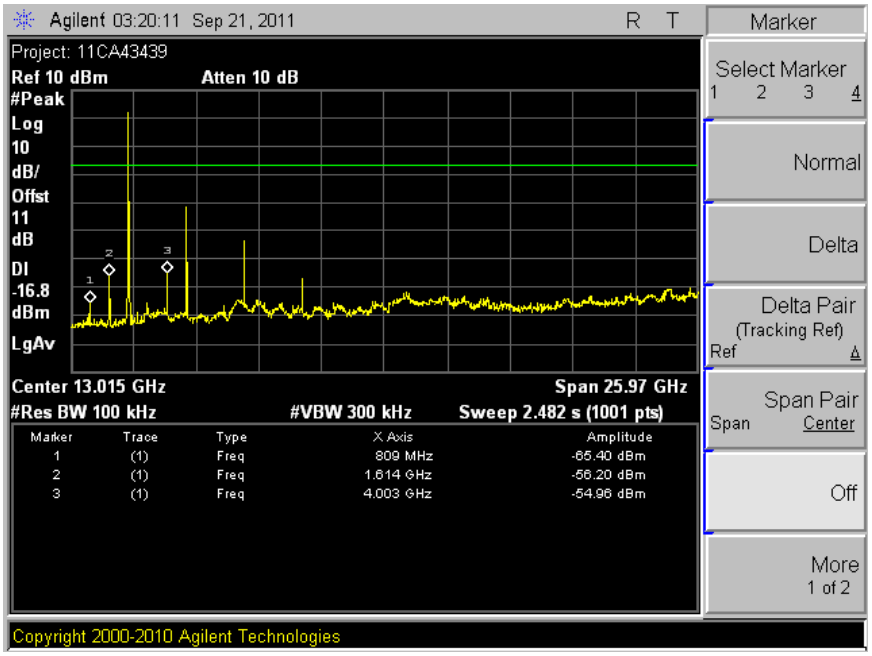
SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE



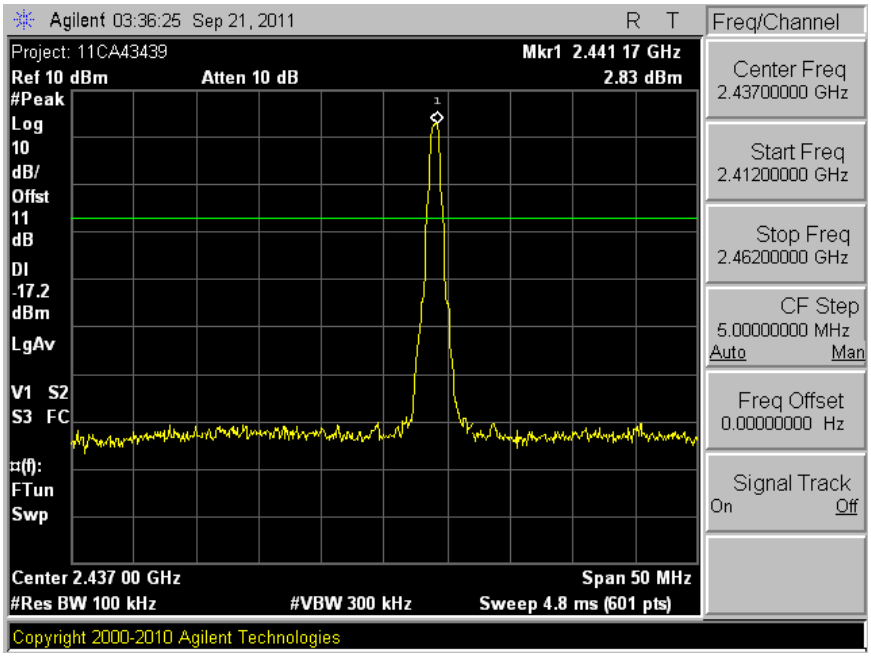
LOW CHANNEL SPURIOUS



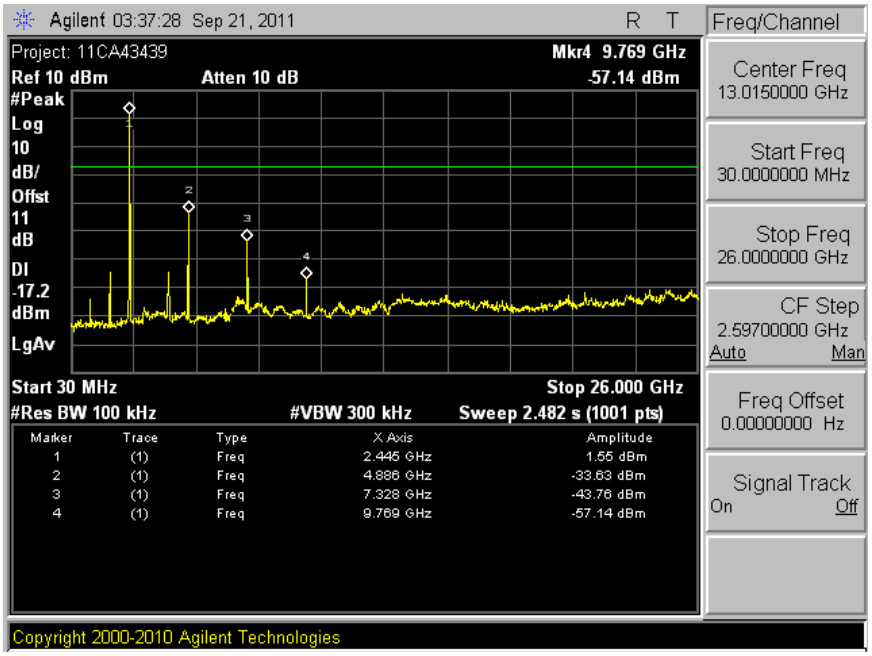


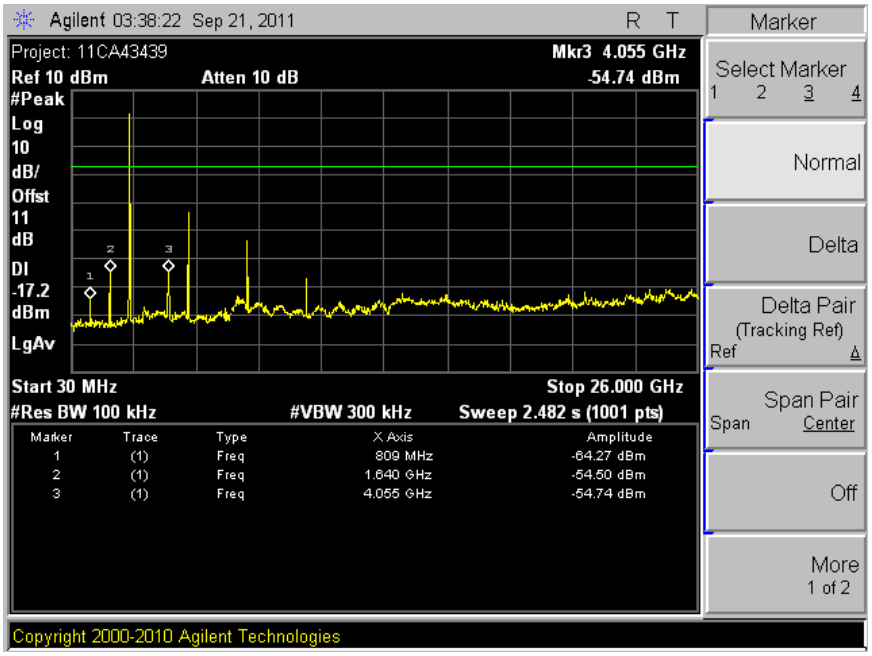
SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE



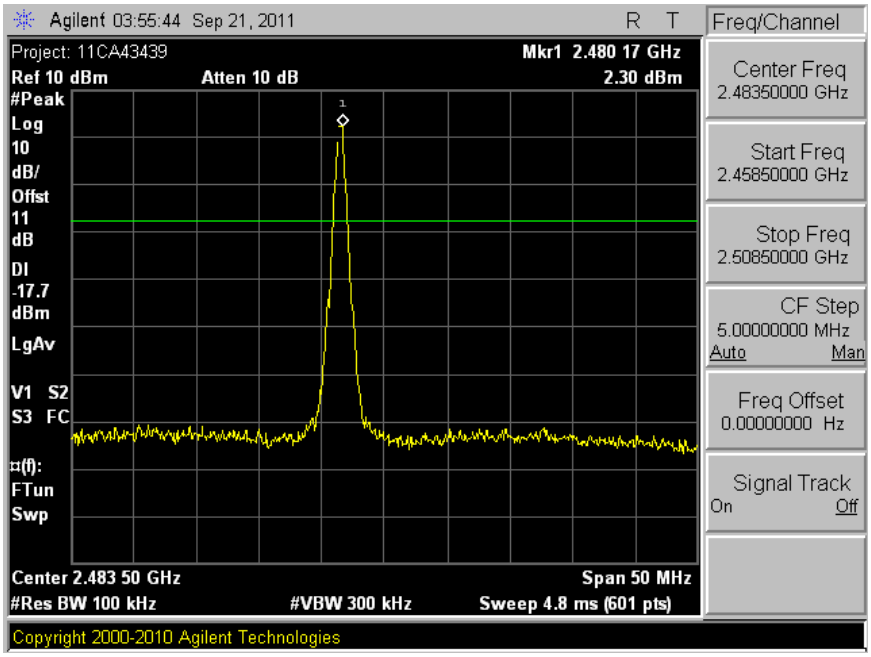
MID CHANNEL SPURIOUS



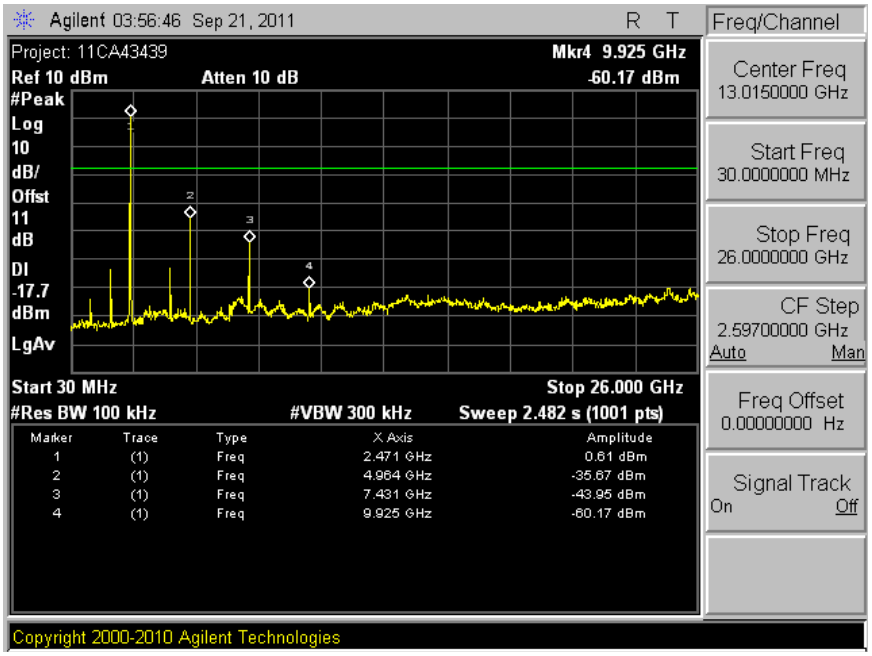


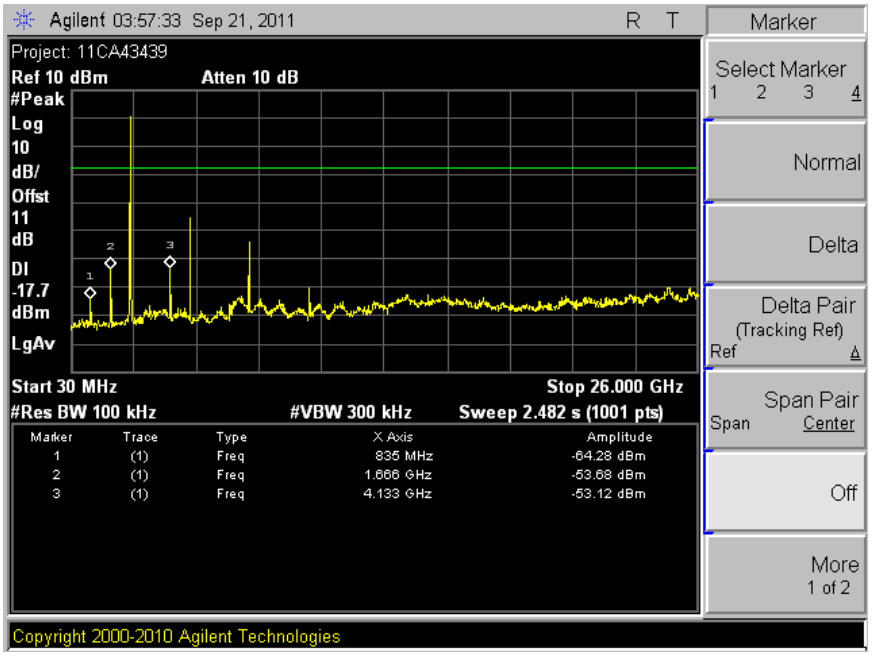
SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



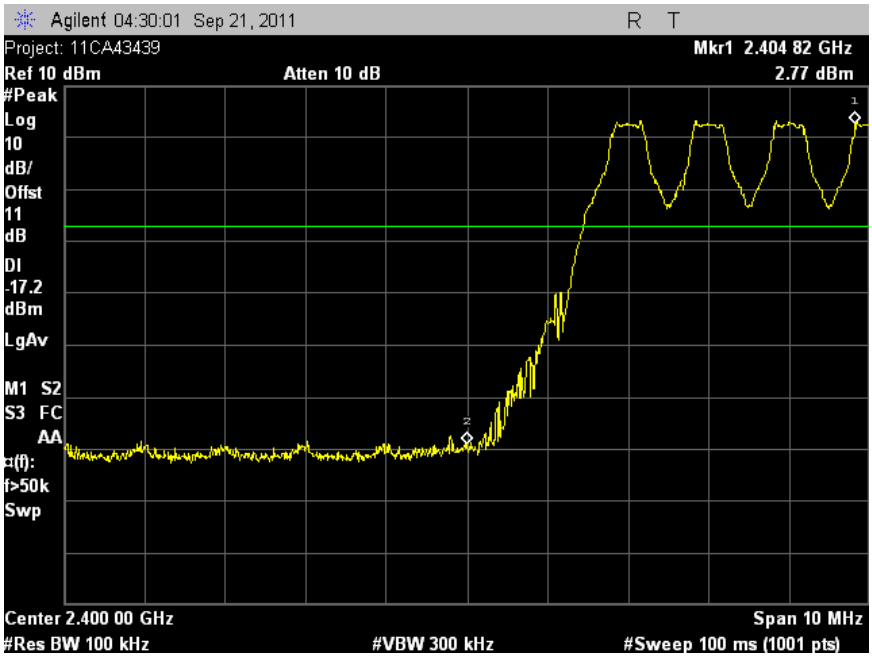
HIGH CHANNEL SPURIOUS





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

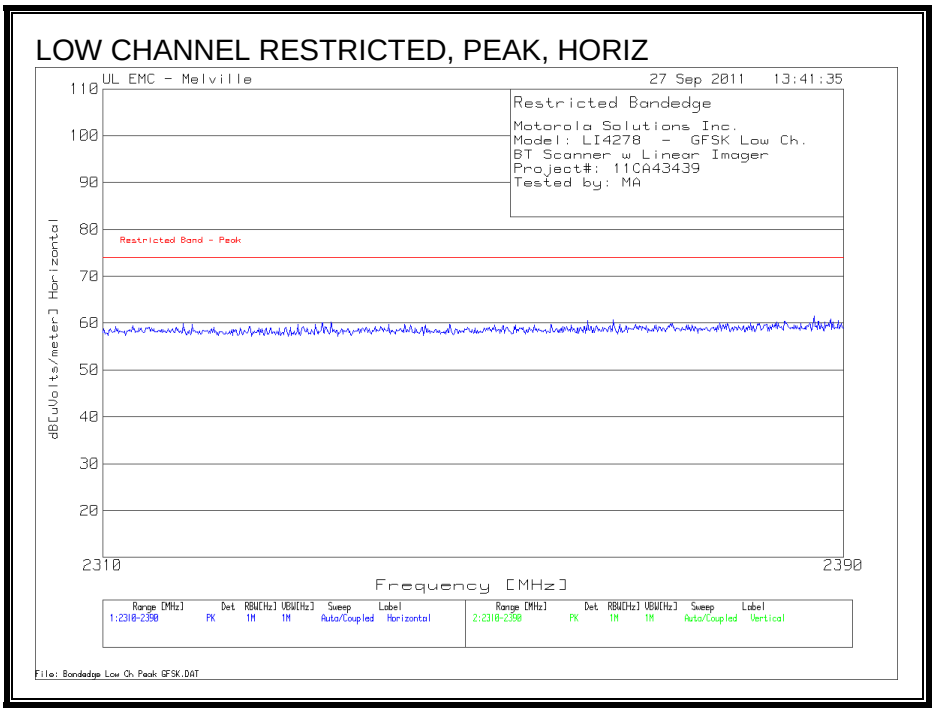
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

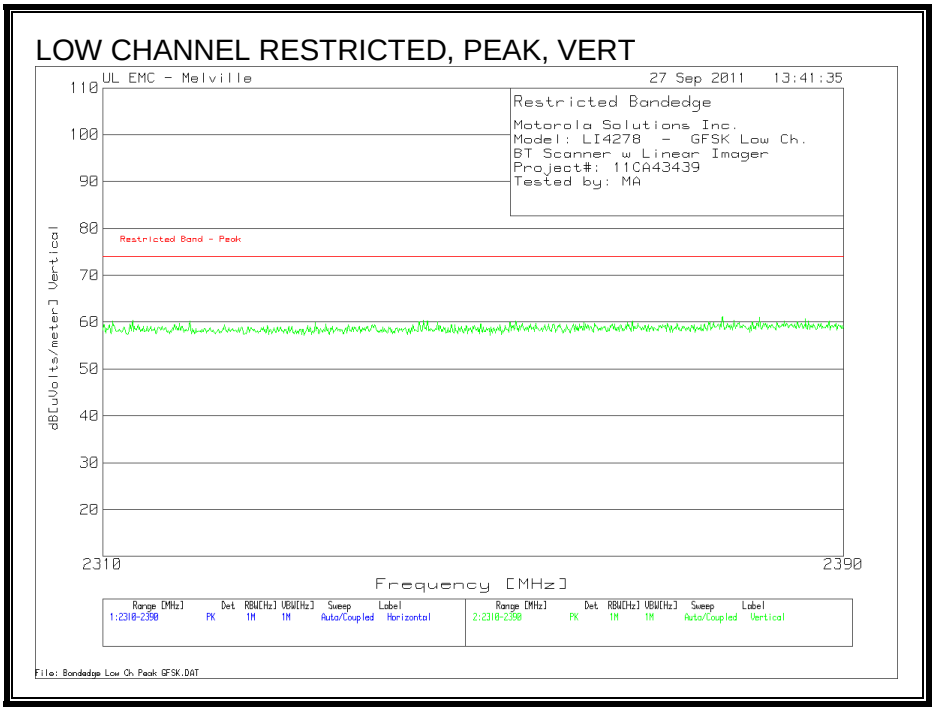
8.2.1. DH5 DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



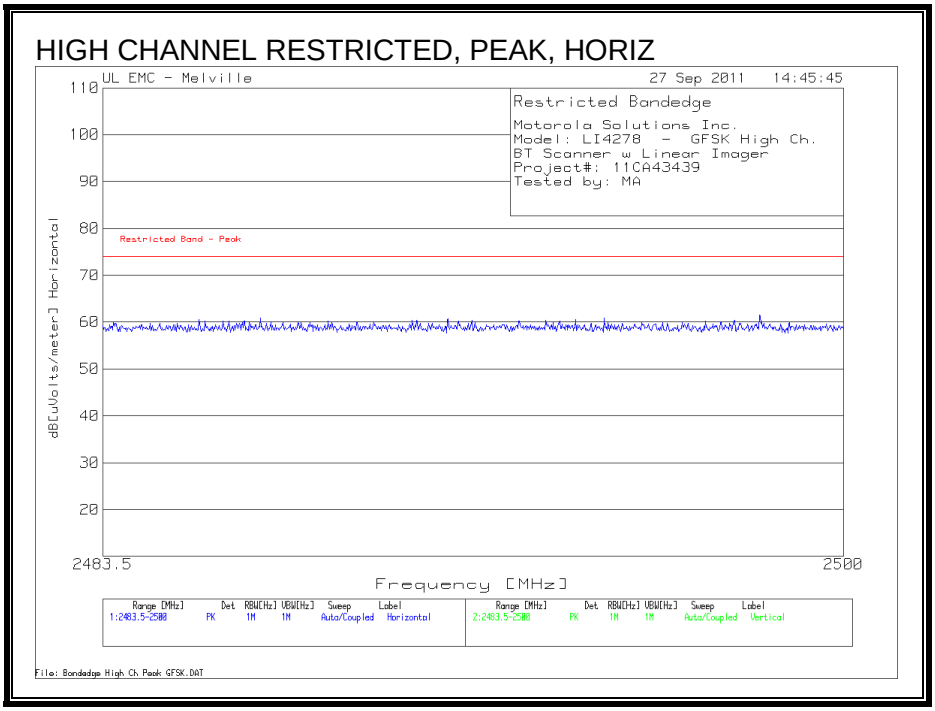
LOW CHANNEL RESTRICTED, AVG, HORIZ

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

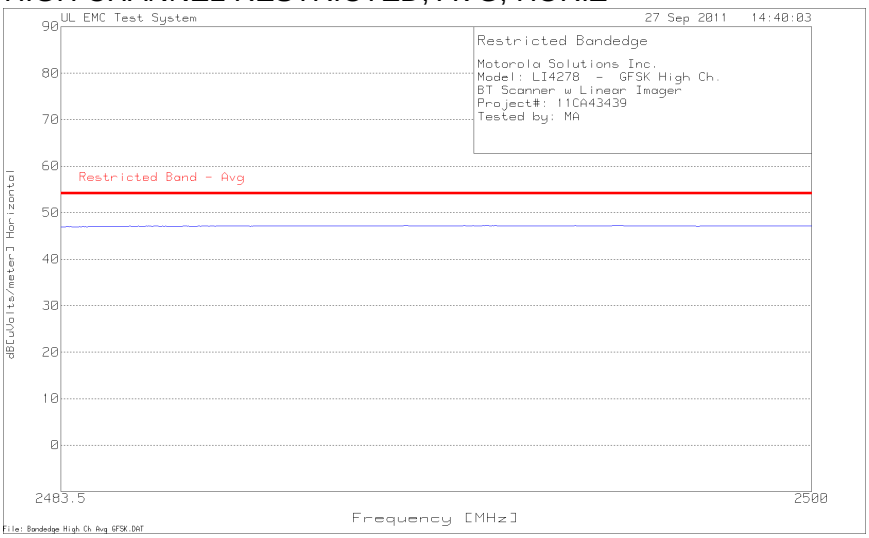


LOW CHANNEL RESTRICTED, AVG, VERT

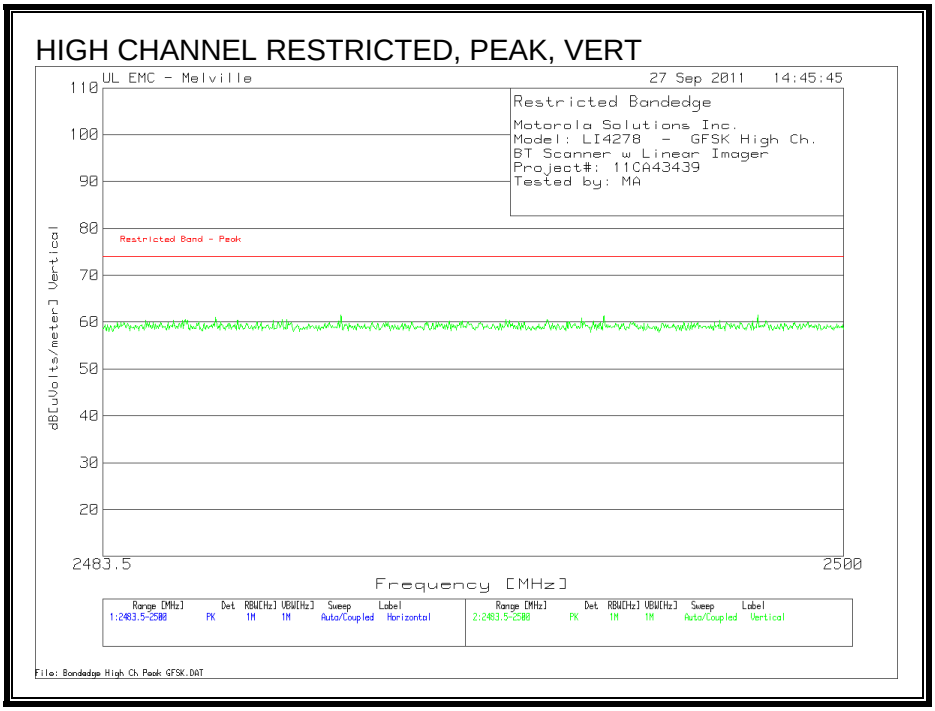
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



HIGH CHANNEL RESTRICTED, AVG, HORIZ



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CHANNEL RESTRICTED, AVG, VERT

RESTRICTED BANDEDGE (LOW CHANNEL, PK & AVG, HORIZ & VERT)

Motorola Solutions Inc.									
Model: LI4278 - GFSK Low Ch.									
BT Scanner w Linear Imager									
Project#: 11CA43439									
Tested by: MA									
PEAK MEASUREMENT									
Horizontal 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2389.44	35.22	PK	21.1	4.3	60.62	74	-13.38	100	Horz
Vertical 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2389.2	34.18	PK	21.3	4.31	59.79	74	-14.21	100	Vert
AVERAGE MEASUREMENT									
Horizontal 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2389.44	21.81	Av	21.1	4.3	47.21	54	-6.79	100	Horz
Vertical 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2389.44	21.82	Av	21.3	4.3	47.42	54	-6.58	100	Vert
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

RESTRICTED BANDEDGE (HIGH CHANNEL, PK & AVG, HORIZ & VERT)

Motorola Solutions Inc.									
Model: LI4278 - GFSK High Ch.									
BT Scanner w Linear Imager									
Project#: 11CA43439									
Tested by: MA									
PEAK MEASUREMENT									
Horizontal 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2483.649	33.74	PK	21.4	4.27	59.41	74	-14.59	100	Horz
Vertical 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2483.599	33.59	PK	21.6	4.26	59.45	74	-14.55	100	Vert
AVERAGE MEASUREMENT									
Horizontal 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2483.649	21.33	Av	21.4	4.27	47	54	-7	100	Horz
Vertical 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2483.632	21.39	Av	21.6	4.26	47.25	54	-6.75	100	Vert
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

HARMONICS AND SPURIOUS EMISSIONS

Low Channel

Motorola Solutions Inc.
Model: LI4278
BT Scanner w Linear Imager
Project#: 11CA43439
Tested by: MA

Horizontal 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1614.28	61.12	PK	21.1	-44.29	37.93	54	-16.07	74	-36.07	134	337	Horz

Horizontal 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4003.382	63.37	PK	28	-52.14	39.23	54	-14.77	74	-34.77	340	345	Horz
4804.291	75.56	PK	27.1	-52.54	50.12	54	-3.88	74	-23.88	296	345	Horz

Vertical 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1614.419	62.5	PK	21.1	-44.29	39.31	54	-14.69	74	-34.69	287	332	Vert

Vertical 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4003.386	63.73	PK	28	-52.14	39.59	54	-14.41	74	-34.41	317	387	Vert
4804.006	74.14	PK	27.3	-52.53	48.91	54	-5.09	74	-25.09	214	396	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

Mid Channel

Motorola Solutions Inc.
Model: LI4278
BT Scanner w Linear Imager
Project#: 11CA43439
Tested by: MA

Horizontal 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1613.3	64.28	PK	21.1	-44.26	41.12	54	-12.88	74	-32.88	48	343	Horz

Horizontal 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4055.364	61.07	PK	28.1	-51.81	37.36	54	-16.64	74	-36.64	217	318	Horz
4882.375	74.27	PK	27.2	-52.53	48.94	54	-5.06	74	-25.06	176	200	Horz
7322.851	68.05	PK	28	-51.86	44.19	54	-9.81	74	-29.81	290	257	Horz

Vertical 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1614.1287	52.49	PK	21.1	-44.29	29.3	54	-24.7	74	-44.7	352	256	Vert

Vertical 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4056.96	51.24	PK	27.9	-51.79	27.35	54	-26.65	74	-46.65	204	328	Vert
4882.318	72.53	PK	27.5	-52.53	47.5	54	-6.5	74	-26.5	346	372	Vert
7322.762	67.66	PK	27.9	-51.86	43.7	54	-10.3	74	-30.3	295	223	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

High Channel

Motorola Solutions Inc.
Model: LI4278
BT Scanner w Linear Imager
Project#: 11CA43439
Tested by: MA

Horizontal 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1665.4	62.9	PK	20.9	-44.23	39.57	54	-14.43	74	-34.43	307	186	Horz

Horizontal 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4133.412	64.18	PK	28	-51.85	40.33	54	-13.67	74	-33.67	196	390	Horz
4960.39	76.43	PK	27.3	-52.5	51.23	54	-2.77	74	-22.77	264	387	Horz
7439.784	66.96	PK	28.1	-51.39	43.67	54	-10.33	74	-30.33	203	343	Horz

Vertical 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1665.446	65.81	PK	20.9	-44.23	42.48	54	-11.52	74	-31.52	95	213	Vert

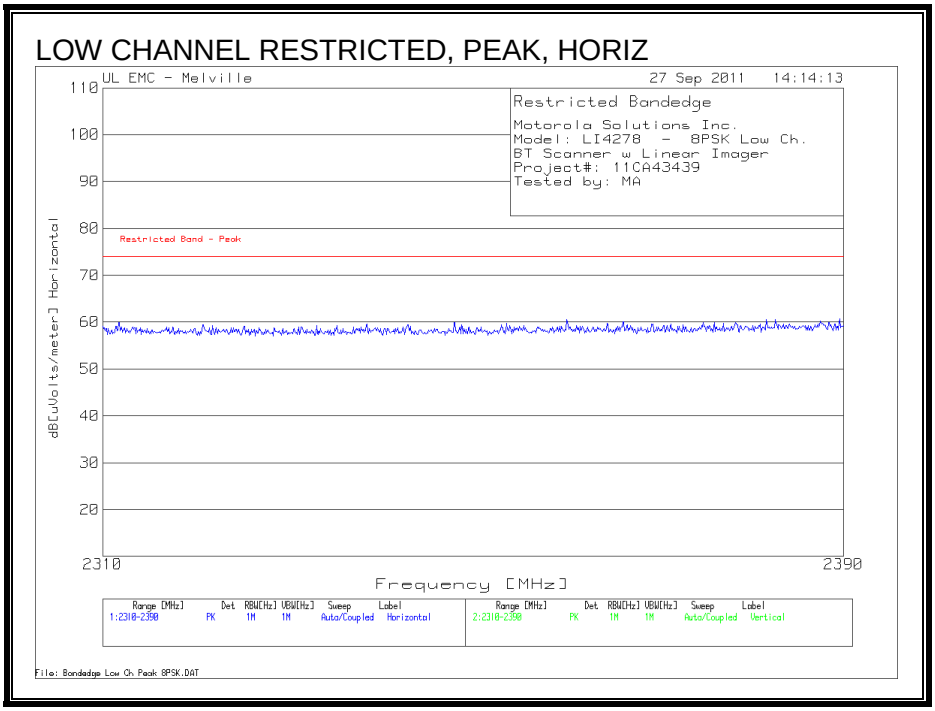
Vertical 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4133.3236	62.25	PK	27.9	-51.85	38.3	54	-15.7	74	-35.7	180	370	Vert
4959.694	76.16	PK	27.4	-52.51	51.05	54	-2.95	74	-22.95	195	330	Vert
7439.735	65	PK	28	-51.39	41.61	54	-12.39	74	-32.39	302	385	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

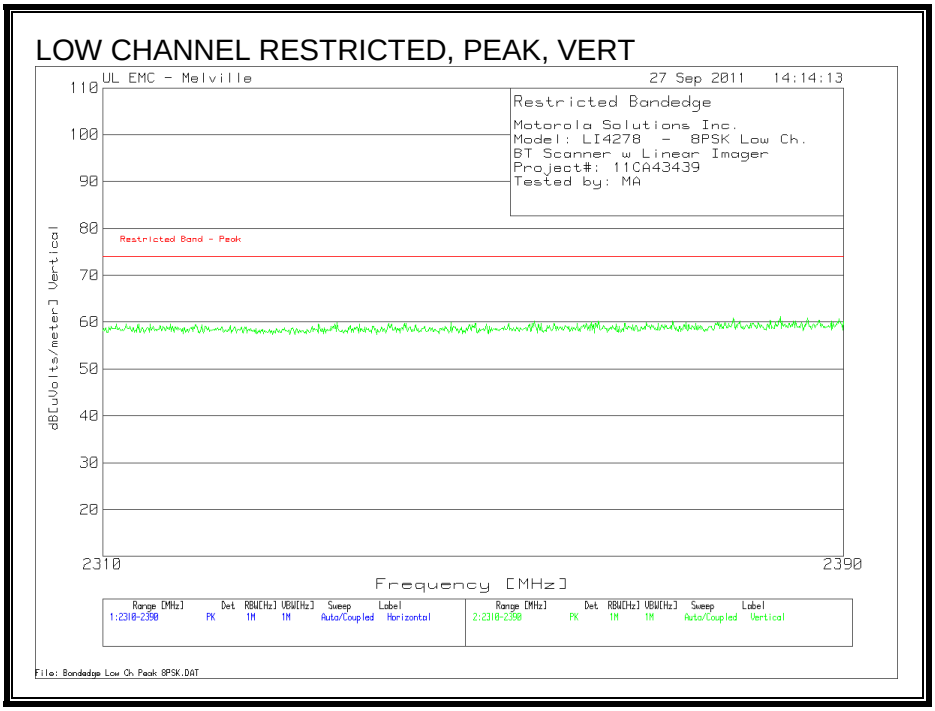
8.2.2. DH5 DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



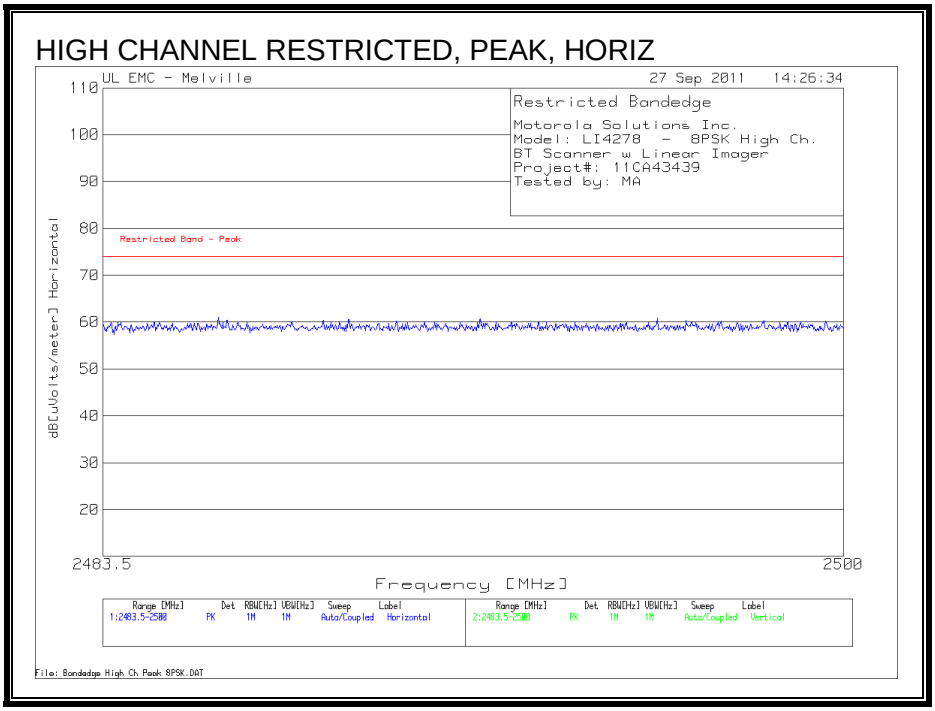
LOW CHANNEL RESTRICTED, AVG, HORIZ

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

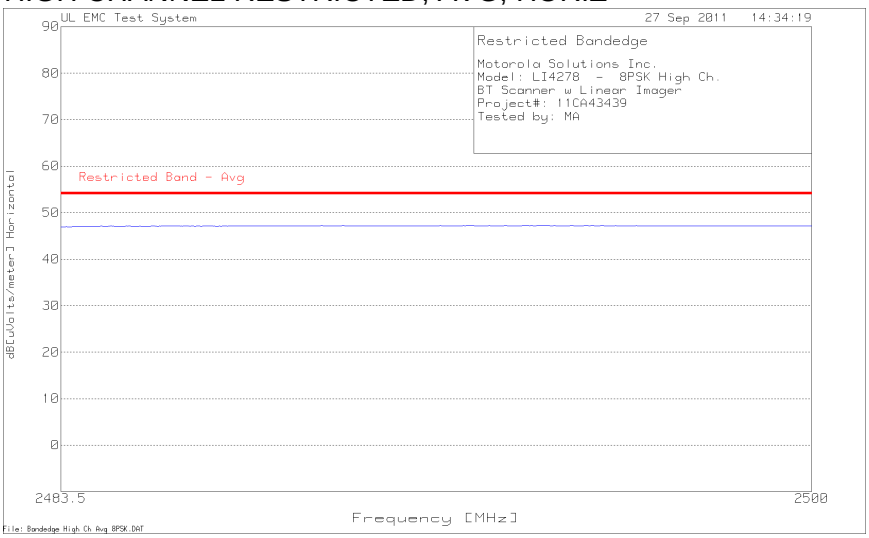


LOW CHANNEL RESTRICTED, AVG, VERT

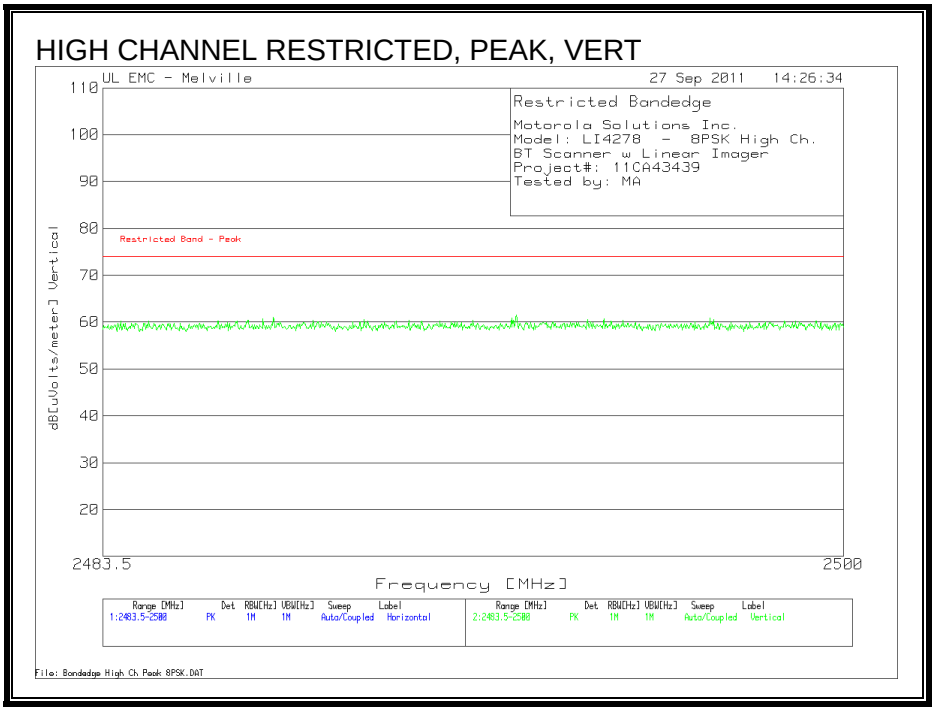
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



HIGH CHANNEL RESTRICTED, AVG, HORIZ



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CHANNEL RESTRICTED, AVG, VERT

RESTRICTED BANDEDGE (LOW CHANNEL, PK & AVG, HORIZ & VERT)

Motorola Solutions Inc.									
Model: LI4278 - 8PSK Low Ch.									
BT Scanner w Linear Imager									
Project#: 11CA43439									
Tested by: MA									
PEAK MEASUREMENT									
Horizontal 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2389.6	35.33	PK	21.1	4.29	60.72	74	-13.28	100	Horz
Vertical 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2389.52	35.13	PK	21.3	4.29	60.72	74	-13.28	100	Vert
AVERAGE MEASUREMENT									
Horizontal 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2389.2	21.81	Av	21.1	4.31	47.22	54	-6.78	100	Horz
Vertical 2310 - 2390MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2389.52	21.82	Av	21.3	4.29	47.41	54	-6.59	100	Vert
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

RESTRICTED BANDEDGE (HIGH CHANNEL, PK & AVG, HORIZ & VERT)

Motorola Solutions Inc.									
Model: LI4278 - 8PSK High Ch.									
BT Scanner w Linear Imager									
Project#: 11CA43439									
Tested by: MA									
PEAK MEASUREMENT									
Horizontal 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2483.682	34.28	PK	21.4	4.27	59.95	74	-14.05	100	Horz
Vertical 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Peak	Margin	Height [cm]	Polarity
2483.616	33.61	PK	21.6	4.26	59.47	74	-14.53	100	Vert
AVERAGE MEASUREMENT									
Horizontal 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2483.616	21.32	Av	21.4	4.26	46.98	54	-7.02	100	Horz
Vertical 2483.5 - 2500MHz									
Test Frequency	Meter Reading	Detector	AF-48107 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	Restricted Band - Avg	Margin	Height [cm]	Polarity
2483.665	21.41	Av	21.6	4.27	47.28	54	-6.72	100	Vert
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

HARMONICS AND SPURIOUS EMISSIONS

Low Channel

Motorola Solutions Inc.
Model: LI4278
BT Scanner w Linear Imager
Project#: 11CA43439
Tested by: MA

Horizontal 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1599.96	67.99	PK	21.2	-44.15	45.04	54	-8.96	74	-28.96	149	307	Horz
1613.114	63.41	PK	21.1	-44.26	40.25	54	-13.75	74	-33.75	217	346	Horz

Horizontal 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4056.15	59.49	PK	28.1	-51.8	35.79	54	-18.21	74	-38.21	172	358	Horz
4882.19	75.87	PK	27.2	-52.53	50.54	54	-3.46	74	-23.46	290	383	Horz
7322.606	67.06	PK	28	-51.87	43.19	54	-10.81	74	-30.81	329	383	Horz
4003.495	63.1	PK	28	-52.14	38.96	54	-15.04	74	-35.04	357	166	Horz
4803.8436	74.88	PK	27.1	-52.53	49.45	54	-4.55	74	-24.55	360	396	Horz

Vertical 1000 - 2000MHz

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1602.16	74.9	PK	21.2	-44.21	51.89	54	-2.11	74	-22.11	80	340	Vert
1609.62	68.78	PK	21.2	-44.24	45.74	54	-8.26	74	-28.26	90	345	Vert

Vertical 4000 - 8000MHz

Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4055.03	60.96	PK	27.9	-51.82	37.04	54	-16.96	74	-36.96	43	400	Vert
4881.902	75.61	PK	27.5	-52.52	50.59	54	-3.41	74	-23.41	288	389	Vert
7323.086	63.76	PK	27.9	-51.86	39.8	54	-14.2	74	-34.2	93	339	Vert
4003.317	64.54	PK	28	-52.14	40.4	54	-13.6	74	-33.6	305	382	Vert
4804.09	73.62	PK	27.3	-52.53	48.39	54	-5.61	74	-25.61	38	390	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

Mid Channel

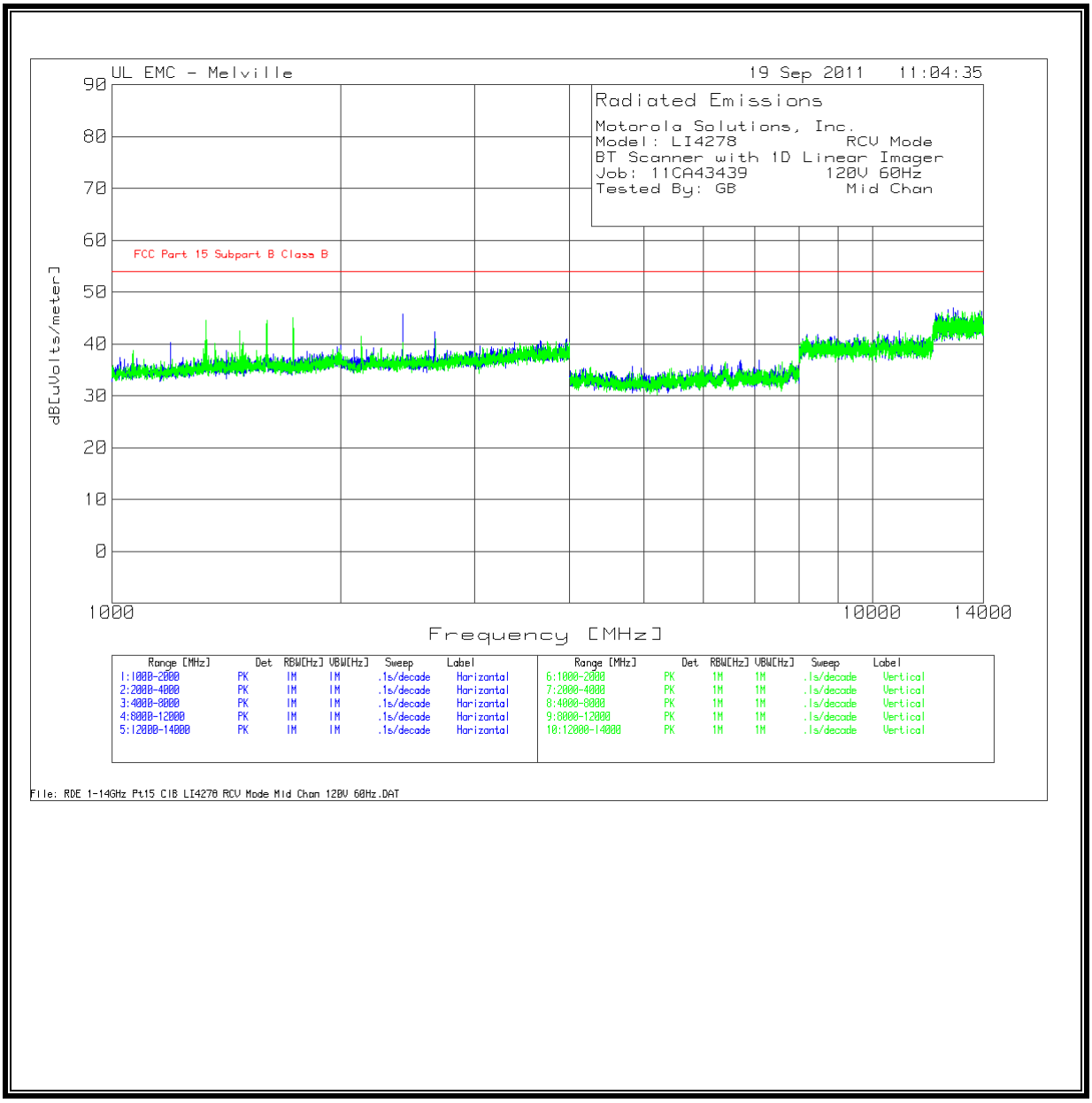
Motorola Solutions Inc.												
Model: LI4278												
BT Scanner w Linear Imager												
Project#: 11CA43439												
Tested by: MA												
Horizontal 1000 - 2000MHz												
Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1599.96	67.99	PK	21.2	-44.15	45.04	54	-8.96	74	-28.96	149	307	Horz
Horizontal 4000 - 8000MHz												
Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4056.15	59.49	PK	28.1	-51.8	35.79	54	-18.21	74	-38.21	172	358	Horz
4882.19	75.87	PK	27.2	-52.53	50.54	54	-3.46	74	-23.46	290	383	Horz
7322.606	67.06	PK	28	-51.87	43.19	54	-10.81	74	-30.81	329	383	Horz
Vertical 1000 - 2000MHz												
Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1602.16	74.9	PK	21.2	-44.21	51.89	54	-2.11	74	-22.11	80	340	Vert
Vertical 4000 - 8000MHz												
Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4055.03	60.96	PK	27.9	-51.82	37.04	54	-16.96	74	-36.96	43	400	Vert
4881.902	75.61	PK	27.5	-52.52	50.59	54	-3.41	74	-23.41	288	389	Vert
7323.086	63.76	PK	27.9	-51.86	39.8	54	-14.2	74	-34.2	93	339	Vert
PK - Peak detector (Maximized)												
QP - Quasi-Peak detector												
LnAv - Linear Average detector												
LgAv - Log Average detector												
Av - Average detector												
CAV - CISPR Average detector												
RMS - RMS detection												
CRMS - CISPR RMS detection												

High Channel

Motorola Solutions Inc.												
Model: LI4278												
BT Scanner w Linear Imager												
Project#: 11CA43439												
Tested by: MA												
Horizontal 1000 - 2000MHz												
Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1667.641	61.93	PK	20.9	-44.26	38.57	54	-15.43	74	-35.43	291	385	Horz
Horizontal 4000 - 8000MHz												
Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4133.304	64.41	PK	28	-51.85	40.56	54	-13.44	74	-33.44	84	394	Horz
4959.785	73.34	PK	27.3	-52.51	48.13	54	-5.87	74	-25.87	257	395	Horz
7439.71	69.02	PK	28.1	-51.39	45.73	54	-8.27	74	-28.27	172	239	Horz
Vertical 1000 - 2000MHz												
Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
1665.955	52.26	PK	20.9	-44.23	28.93	54	-25.07	74	-45.07	235	356	Vert
Vertical 4000 - 8000MHz												
Test Frequency	Meter Reading	Detector	AF-48106 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
4133.392	63.26	PK	27.9	-51.85	39.31	54	-14.69	74	-34.69	66	360	Vert
4960.298	77.83	PK	27.4	-52.5	52.73	54	-1.27	74	-21.27	215	370	Vert
7439.98	64.66	PK	28	-51.38	41.28	54	-12.72	74	-32.72	86	370	Vert
PK - Peak detector (Maximized)												
QP - Quasi-Peak detector												
LnAv - Linear Average detector												
LgAv - Log Average detector												
Av - Average detector												
CAV - CISPR Average detector												
RMS - RMS detection												
CRMS - CISPR RMS detection												

8.3. RECEIVER ABOVE 1 GHz

8.3.1. RECEIVER ABOVE 1 GHz

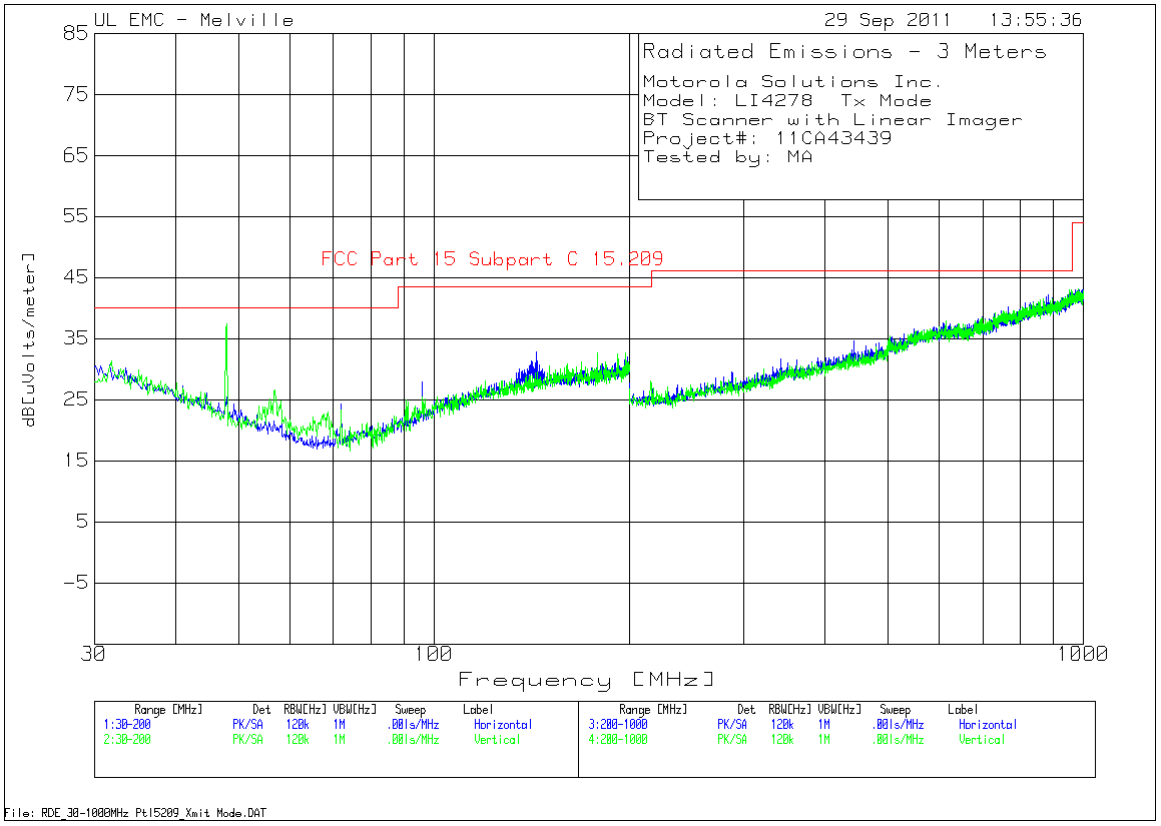


Motorola Solutions, Inc.										
Model: LI4278 RCV Mode										
BT Scanner with 1D Linear Imager										
Job: 11CA43439 120V 60Hz										
Tested By: GB Mid Chan										
Horizontal 2000 - 4000MHz										
Test Frequency	Meter Reading	Detector	3161-02_Horz_27Sept08 [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart B Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
2413.793	67.44	PK	21.1	-42.74	45.8	54	-8.2	288	215	Horz
2653.673	63.41	PK	21.5	-42.52	42.39	54	-11.61	105	215	Horz
Vertical 1000 - 2000MHz										
Test Frequency	Meter Reading	Detector	51442 1-2GHz [dB]	BOMS Factor [dB]	dB[uVolts/meter]	FCC Part 15 Subpart B Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
1330.335	68.34	PK	20.6	-44.43	44.51	54	-9.49	77	99	Vert
1470.765	66	PK	20.8	-44.22	42.58	54	-11.42	281	99	Vert
1598.201	67.52	PK	21.2	-44.16	44.56	54	-9.44	229	215	Vert
1730.635	68.44	PK	20.8	-44.14	45.1	54	-8.9	256	215	Vert
PK - Peak detector										
QP - Quasi-Peak detector										
LnAv - Linear Average detector										
LgAv - Log Average detector										
Av - Average detector										
CAV - CISPR Average detector										
RMS - RMS detection										
CRMS - CISPR RMS detection										

8.4. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, TX MODE)

PLOT

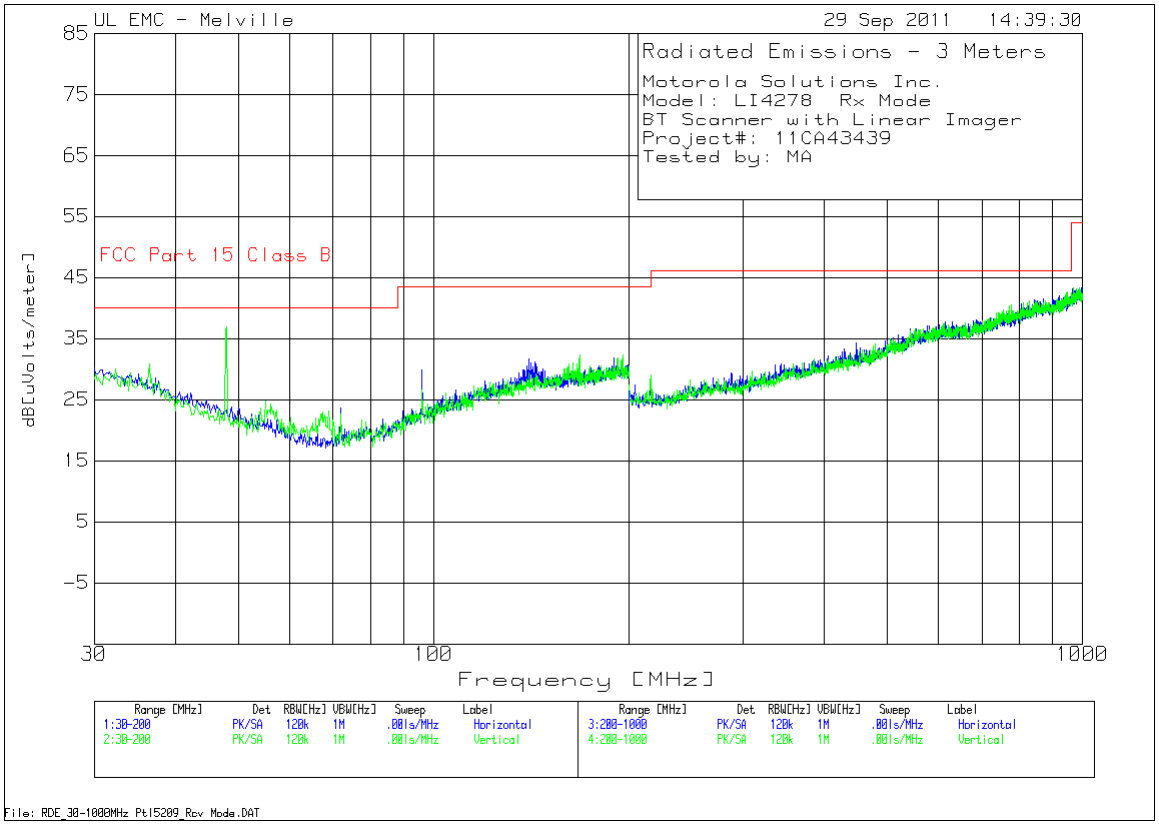


DATA

Motorola Solutions Inc.									
Model: LI4278 Tx Mode									
BT Scanner with Linear Imager									
Project#: 11CA43439									
Tested by: MA									
Horizontal 30 - 200MHz									
Test Frequency	Meter Reading	Detector	3M Bicon 54 Horz 05Apr12 [dB]	3MLoc 30-1000MHz 02Feb12 [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
144.014	17.29	PK	14.3	1.2	32.79	43.5	-10.71	238	200	Horz
96.026	16.92	PK	9.9	1	27.82	43.5	-15.68	118	300	Horz
Vertical 30 - 200MHz									
Test Frequency	Meter Reading	Detector	3M Bicon 54 Vert 05Apr12 [dB]	3MLoc 30-1000MHz 02Feb12 [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
48.038	26.39	PK	10.3	0.7	37.39	40	-2.61	358	100	Vert
56.8869	18.53	PK	7.4	0.7	26.63	40	-13.37	3	100	Vert
178.7287	15.3	PK	15.9	1.4	32.6	43.5	-10.9	273	100	Vert
Vertical 200 - 1000MHz									
Test Frequency	Meter Reading	Detector	LogP 3M Vert 44067 02May12 [dB]	3MLoc 30-1000MHz 02Feb12 [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
983.5918	14.55	PK	24.8	3.7	43.05	54	-10.95	324	300	Vert
Vertical 30 - 200MHz									
Test Frequency	Meter Reading	Detector	3M Bicon 54 Vert 05Apr12 [dB]	3MLoc 30-1000MHz 02Feb12 [dB]	dB[uVolts/meter]	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]	Height [cm]	Polarity
48.0008	25.23	QP	10.3	0.7	36.23	40	-3.77	40	126	Vert
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, RX MODE)

PLOT



DATA

Motorola Solutions Inc.										
Model: LI4278 Rx Mode										
BT Scanner with Linear Imager										
Project#: 11CA43439										
Tested by: MA										
Horizontal 30 - 200MHz										
Test Frequency	Meter Reading	Detector	AF-54 [dB]	GL-3M [dB]	dB[uVolts/meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
96.026	19.02	PK	9.9	1	29.92	43.5	-13.58	269	300	Horz
141.1211	15.57	PK	14.2	1.2	30.97	43.5	-12.53	238	199	Horz
Vertical 30 - 200MHz										
Test Frequency	Meter Reading	Detector	AF-54 [dB]	GL-3M [dB]	dB[uVolts/meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
48.038	25.96	PK	10.3	0.7	36.96	40	-3.04	349	100	Vert
168.008	15.21	PK	15.8	1.3	32.31	43.5	-11.19	66	100	Vert
195.5756	14.43	PK	16.3	1.5	32.23	43.5	-11.27	266	100	Vert
Horizontal 200 - 1000MHz										
Test Frequency	Meter Reading	Detector	AF-44067 [dB]	GL-3M [dB]	dB[uVolts/meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
985.993	14.6	PK	24.6	3.7	42.9	54	-11.1	54	400	Horz
Vertical 30 - 200MHz										
Test Frequency	Meter Reading	Detector	AF-54 [dB]	GL-3M [dB]	dB[uVolts/meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
48.0047	24.15	QP	10.3	0.7	35.15	40	-4.85	116	112	Vert
PK - Peak detector										
QP - Quasi-Peak detector										
LnAv - Linear Average detector										
LgAv - Log Average detector										
Av - Average detector										
CAV - CISPR Average detector										
RMS - RMS detection										
CRMS - CISPR RMS detection										

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

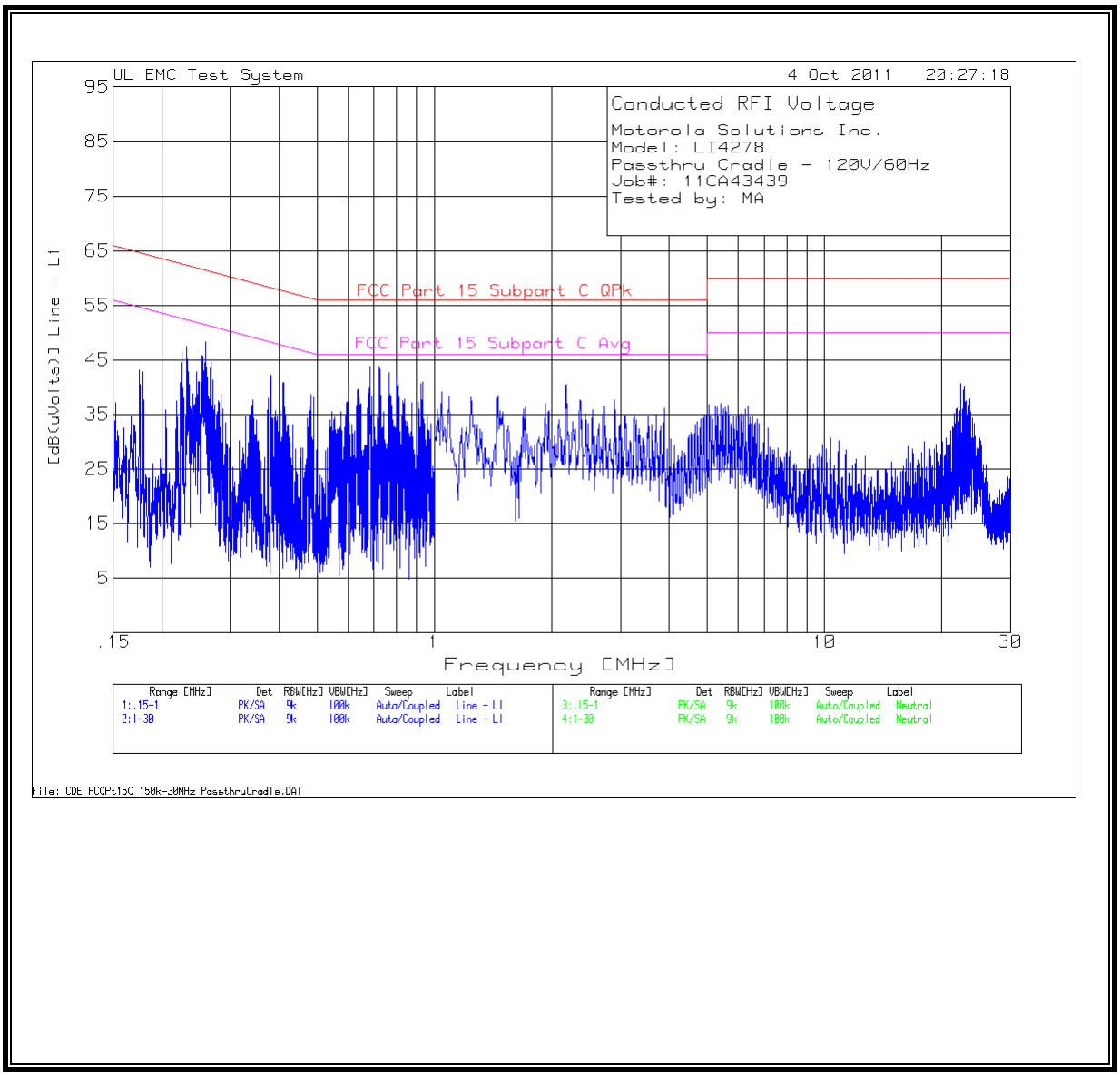
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

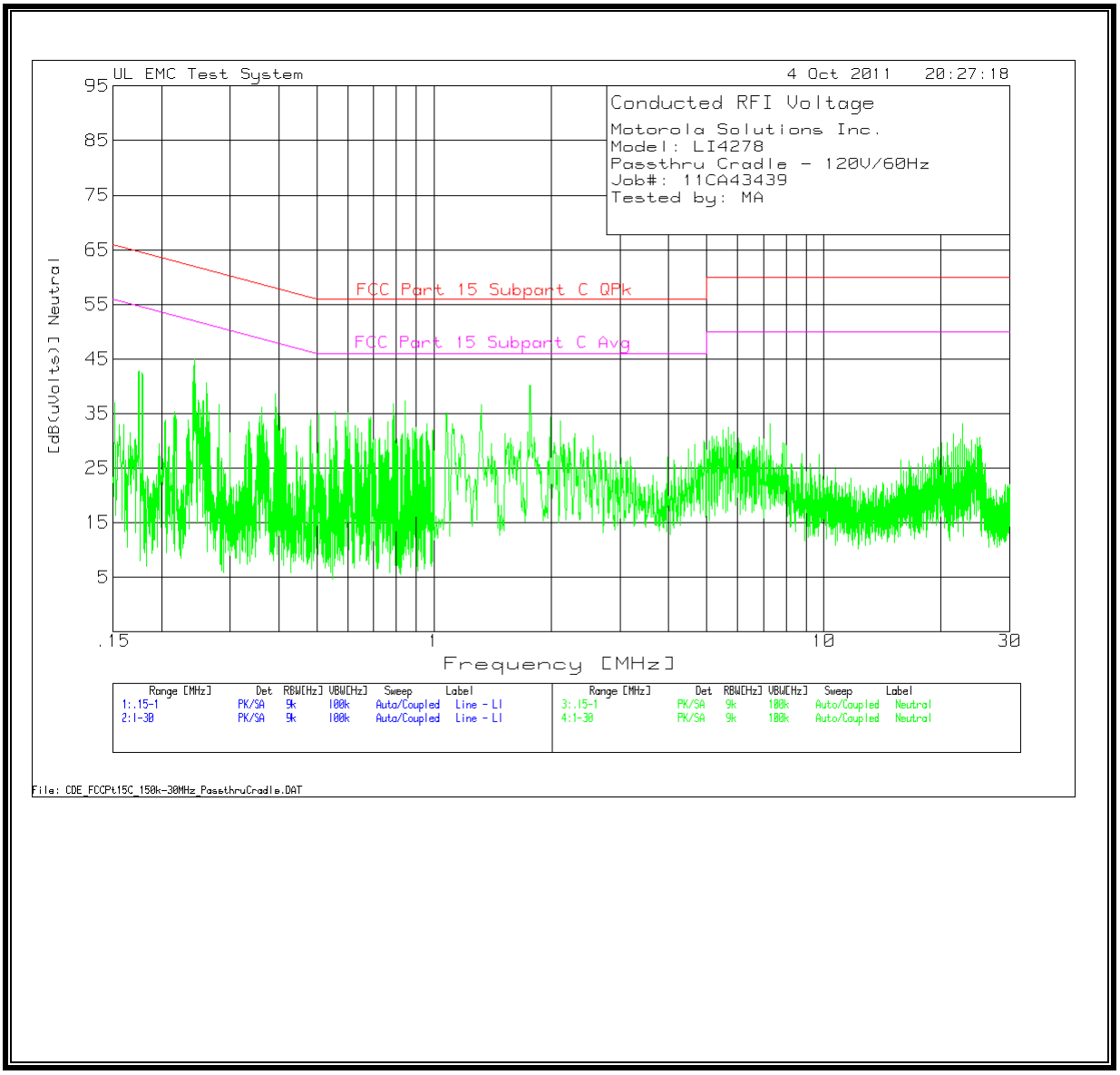
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

LINE 1 RESULTS – PASSTHRU CRADLE CONFIGURATION



LINE 2 RESULTS – PASSTHRU CRADLE CONFIGURATION



NUMERICAL DATA – PASSTHRU CRADLE CONFIGURATION

Motorola Solutions Inc.
Model: LI4278
Passthru Cradle - 120V/60Hz
Job#: 11CA43439
Tested by: MA

Line - L1 .15 - 1MHz

Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.23162	36.56	PK	10.9	47.46	62.4	-14.94	52.4	-4.94
0.25882	37.48	PK	10.8	48.28	61.5	-13.22	51.5	-3.22
0.37989	31.81	PK	10.6	42.41	58.3	-15.89	48.3	-5.89
0.68425	33.33	PK	10.4	43.73	56	-12.27	46	-2.27
0.72216	33.37	PK	10.4	43.77	56	-12.23	46	-2.23
0.76348	32.2	PK	10.4	42.6	56	-13.4	46	-3.4
0.93131	30.51	PK	10.4	40.91	56	-15.09	46	-5.09

Line - L1 1 - 30MHz

Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
2.17183	30.12	PK	10.4	40.52	56	-15.48	46	-5.48
22.30766	29.85	PK	10.8	40.65	60	-19.35	50	-9.35

Neutral .15 - 1MHz

Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.24301	34.09	PK	10.9	44.99	62	-17.01	52	-7.01
0.3906	28	PK	10.6	38.6	58.1	-19.5	48.1	-9.5
0.7861	26.41	PK	10.4	36.81	56	-19.19	46	-9.19

Neutral 1 - 30MHz

Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
1.76575	29.79	PK	10.4	40.19	56	-15.81	46	-5.81
7.29426	22.67	PK	10.5	33.17	60	-26.83	50	-16.83
1.31906	26.19	PK	10.4	36.59	56	-19.41	46	-9.41

Line - L1 .15 - 1MHz

Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.23201	23.19	Av	10.9	34.09	62.38	-28.29	52.38	-18.29
0.25942	22.62	Av	10.8	33.42	61.45	-28.03	51.45	-18.03
0.38008	17.02	Av	10.6	27.62	58.28	-30.66	48.28	-20.66
0.68417	17.64	Av	10.4	28.04	56	-27.96	46	-17.96
0.72196	17.54	Av	10.4	27.94	56	-28.06	46	-18.06
0.76343	16.58	Av	10.4	26.98	56	-29.02	46	-19.02
0.9313	16.33	Av	10.4	26.73	56	-29.27	46	-19.27

Line - L1 1 - 30MHz

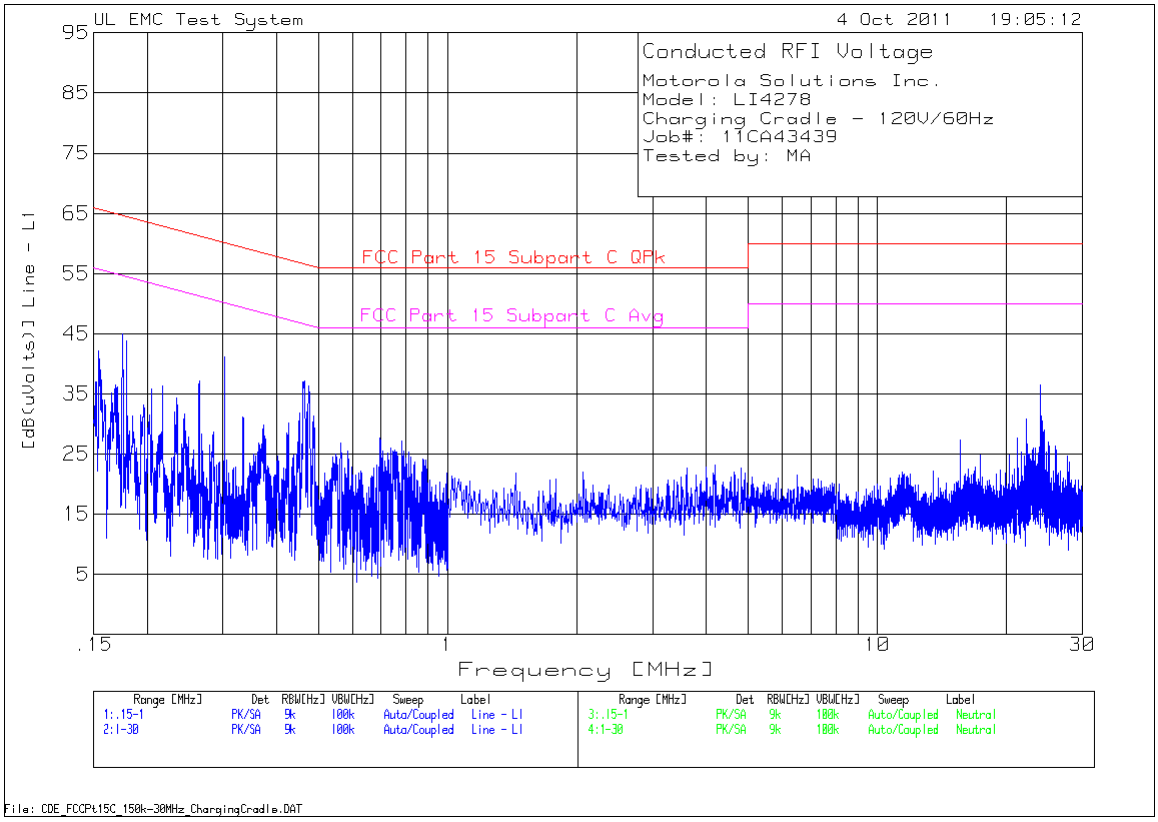
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
2.17165	13.4	Av	10.4	23.8	56	-32.2	46	-22.2

Neutral 1 - 30MHz

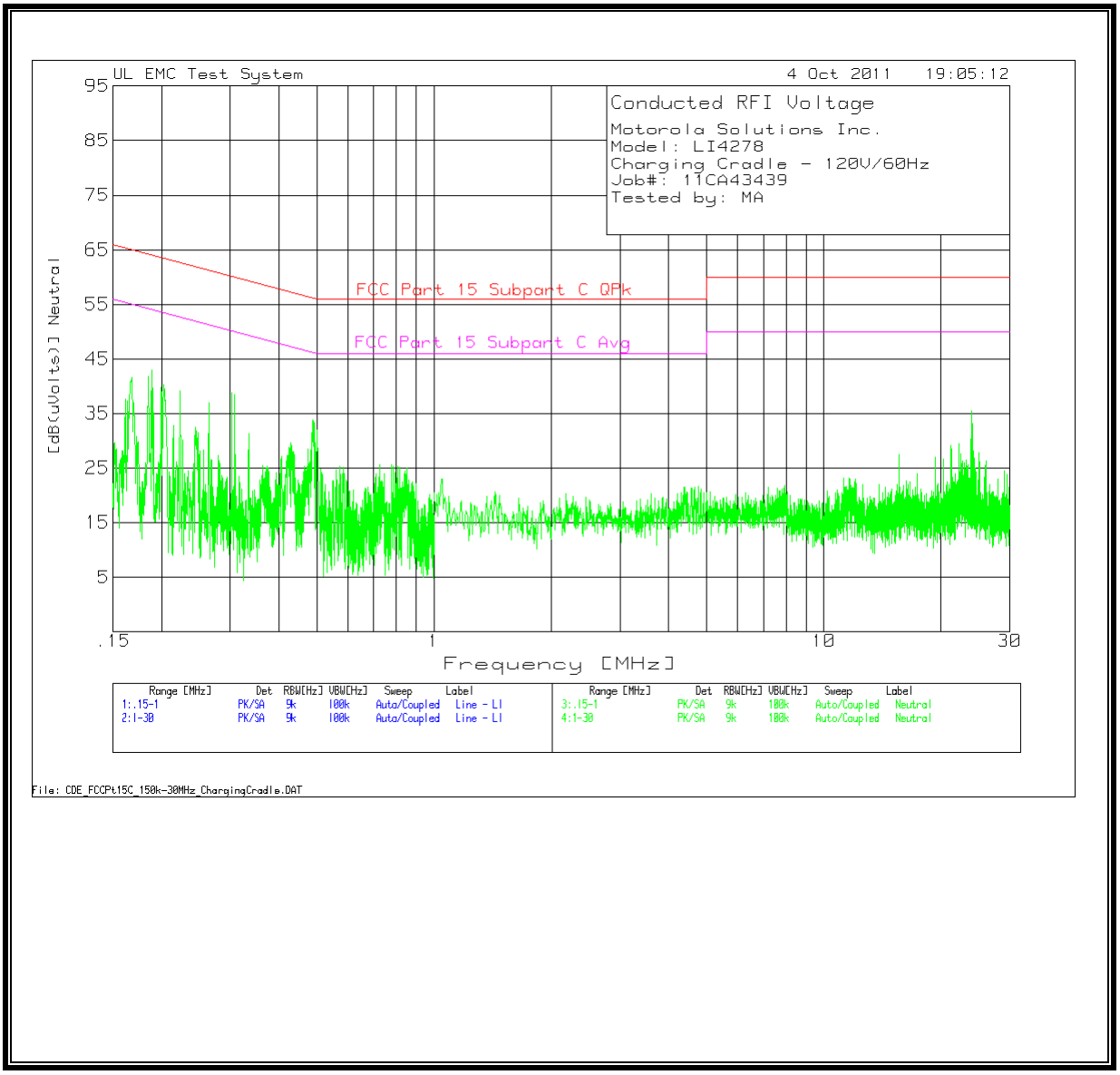
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
1.76616	8.57	Av	10.4	18.97	56	-37.03	46	-27.03

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

LINE 1 RESULTS – CHARGING CRADLE CONFIGURATION



LINE 2 RESULTS – CHARGING CRADLE CONFIGURATION



NUMERICAL DATA – CHARGING CRADLE CONFIGURATION

Motorola Solutions Inc.								
Model: LI4278								
Charging Cradle - 120V/60Hz								
Job#: 11CA43439								
Tested by: MA								
Line - L1 .15 - 1MHz								
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.175	33.7	PK	11.3	45	64.7	-19.7	54.7	-9.7
0.30218	30.39	PK	10.7	41.09	60.2	-19.11	50.2	-9.11
0.46354	26.68	PK	10.5	37.18	56.6	-19.42	46.6	-9.42
0.69564	17.23	PK	10.4	27.63	56	-28.37	46	-18.37
0.78304	16.79	PK	10.4	27.19	56	-28.81	46	-18.81
Line - L1 1 - 30MHz								
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
23.96679	25.7	PK	10.8	36.5	60	-23.5	50	-13.5
Neutral .15 - 1MHz								
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.18843	31.74	PK	11.2	42.94	64.1	-21.16	54.1	-11.16
0.22243	28.08	PK	11	39.08	62.7	-23.62	52.7	-13.62
0.16751	30.17	PK	11.4	41.57	65.1	-23.53	55.1	-13.53
0.30252	28.15	PK	10.7	38.85	60.2	-21.35	50.2	-11.35
0.48803	23.26	PK	10.5	33.76	56.2	-22.44	46.2	-12.44
Neutral 1 - 30MHz								
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
23.96679	24.42	PK	11	35.42	60	-24.58	50	-14.58
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								

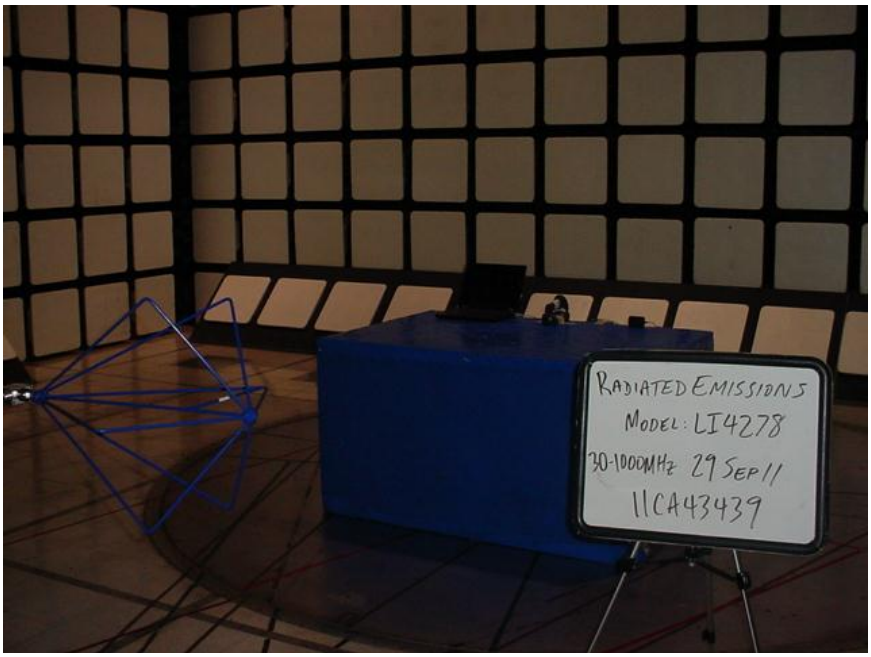
10. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

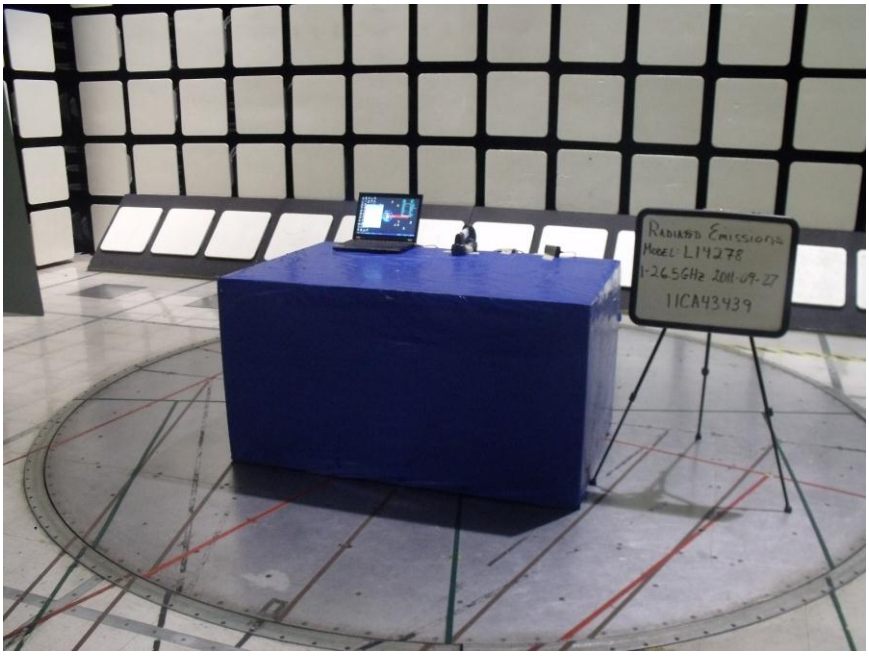
ANTENNA PORT CONDUCTED PHOTO

RADIATED RF MEASUREMENT SETUP

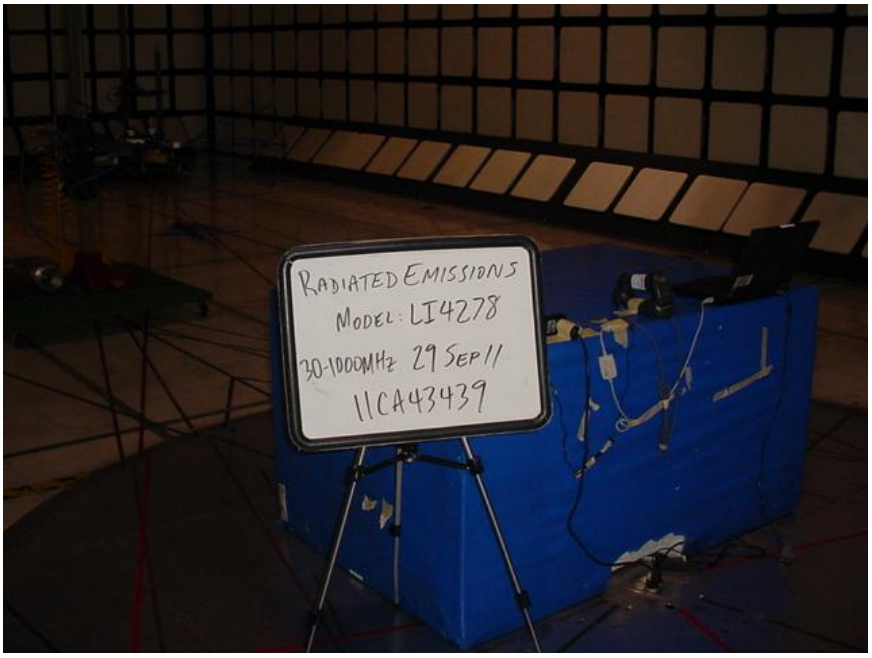
RADIATED FRONT PHOTO
BELOW 1 GHz



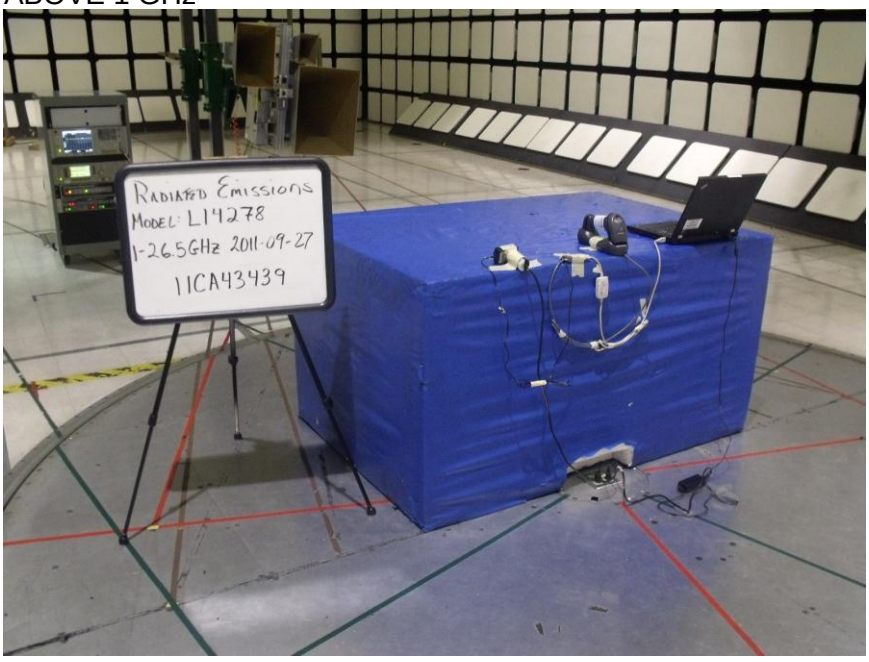
ABOVE 1 GHz



RADIATED BACK PHOTO
BELOW 1 GHz

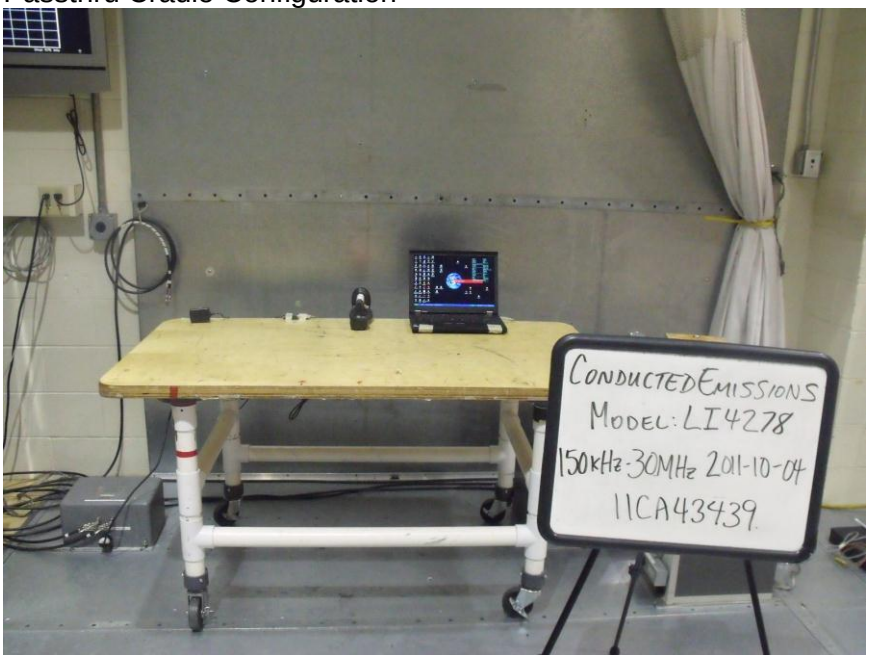


ABOVE 1 GHz



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO
Passthru Cradle Configuration



Charging Cradle Configuration

LINE CONDUCTED BACK PHOTO
Passthru Cradle Configuration

Charging Cradle Configuration

END OF REPORT