FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

CONTROLLER

MODEL NUMBER: M8936

FCC ID: AVHM8936
IC: 10329A-M8936

REPORT NUMBER: 10451636

ISSUE DATE: 2014-09-18

Prepared for
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NVLAP LAB CODE 100255-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	9/18/14	Initial Issue	M. Antola

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: PARTECH INC
8383 SENECA TPKE
NEW HARTFORD, CT, 13413, USA

EUT DESCRIPTION: MULTIFUNCTION TEMPERATURE PROBE

MODEL: M8936

SERIAL NUMBER: NON-SERIALIZED PRODUCTION UNIT

DATE TESTED: 9/17/14 – 9/18/14

APPLICABLE STANDARDS	
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

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested 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 herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, 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 a Controller that contains a Bluetooth transceiver operating in the 2402-2480MHz range.

The radio module is manufactured by Panasonic and the Model Number is PAN1326.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak EIRP radiated output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	-26.61	0.00218
2402 - 2480	DQPSK	-22.29	0.00590
2402 - 2480	Enhanced 8PSK	-21.24	0.00752

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integrated chip (SMD) antenna – Manufactured by Murata, Model Number LDA21K - with a maximum gain of 0.9 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was TIPROXY_v102_noBL_09162014.

The EUT driver software installed in the host support equipment during testing was TUSB3410, rev. 6.7.2.0.

The test utility software used during testing was CC256x Bluetooth Hardware Evaluation Tool, ver. 1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission was performed with the EUT set to transmit at the low, middle and high channel with highest output power as worst-case scenario.

Power line conducted emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Though preliminary testing, the worse-case modes were found to be GFSK and 8PSK (DH5 data rate), thus all testing was performed only in these configurations.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Compaq	CQ56-115DX	CNF1134NRP	PPD-AR5B95-H
Charge Cradle	Partech	K8935	SA 13C01356	NA

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	USB-Micro USB	Shielded	<3M	N/A

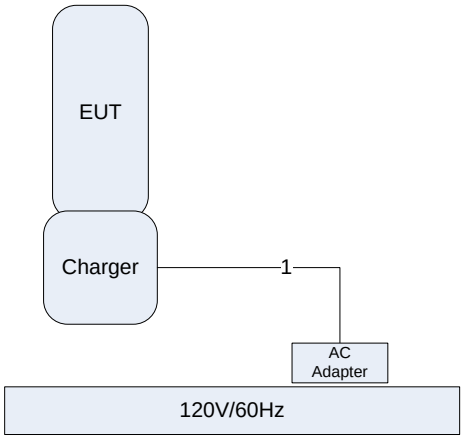
TEST SETUP

The EUT module is installed in a host device during the tests. Test software exercised the radio module.

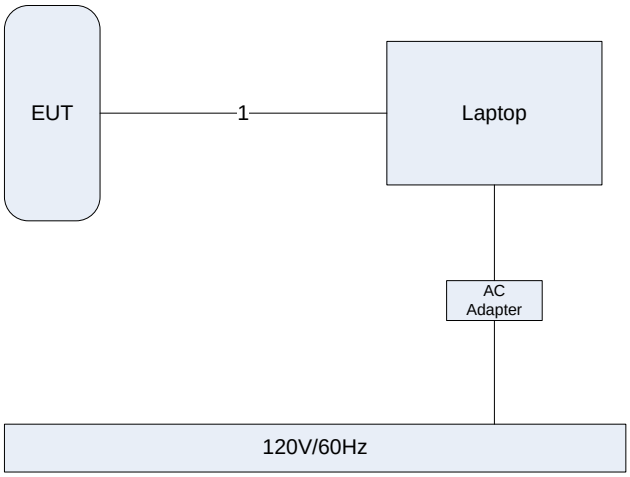
For power line conducted emissions, the EUT was tested in two modes – docked in the charge cradle, charge cradle powered from an AC adapter and with the EUT powered through the laptop.

SETUP DIAGRAM FOR TESTS

POWER LINE CONDUCTED



ALL TESTS



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
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESCI7	75141	2014-01-29	2015-01-31
Hybrid Antenna	Sunol	JB-1	84106	2014-02-19	2015-02-19
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 9.5	44740	N/A	N/A
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22
Multimeter	Fluke	87V	44547	2014-01-29	2015-01-31
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72822	2014-06-13	2015-06-13
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07 (26°)**	8933	2008-11-24	See * below
Horn Antenna (12-18 GHz)	ETS	3160-08 (26°)**	8932	2007-09-27	See * below
Horn Antenna (18-26.5 GHz)	ETS	3160-09 (27°)**	8947	2007-09-26	See * below
Horn Antenna	EMCO	3115	ME5A-766	2013-12-03	2014-12-03
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 9.5	44740	N/A	N/A
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22
Multimeter	Fluke	87V	44547	2014-01-29	2015-01-31

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
* - Note: As allowed by the calibration standard ANSI C63.10 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. ** - Number in parentheses denotes antenna beam width.					

CONDUCTED EMISSIONS					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2014-04-09	2015-04-09
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2014-01-28	2015-01-31
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2014-03-24	2016-04-24
Multimeter	Fluke	87V	64386	2014-01-28	2015-01-31
Solid Room					
EMI Receiver	Rohde & Schwarz	ESR	85496	2014-05-23	2015-05-23
LISN	Solar	9252-50-R-24-BNC	47367	2014-01-28	2015-01-31
Switch Driver	HP	11713A	44403	N/A	N/A
RF Switch Box	UL	2	44400	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2014-03-24	2016-04-24
Multimeter	Fluke	87V	64386	2014-01-28	2015-01-31

BENCH TESTS					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Spectrum Analyzer	Agilent	N9030A	85671	2014-06-27	2015-06-27

7. ANTENNA PORT TEST RESULTS

8. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

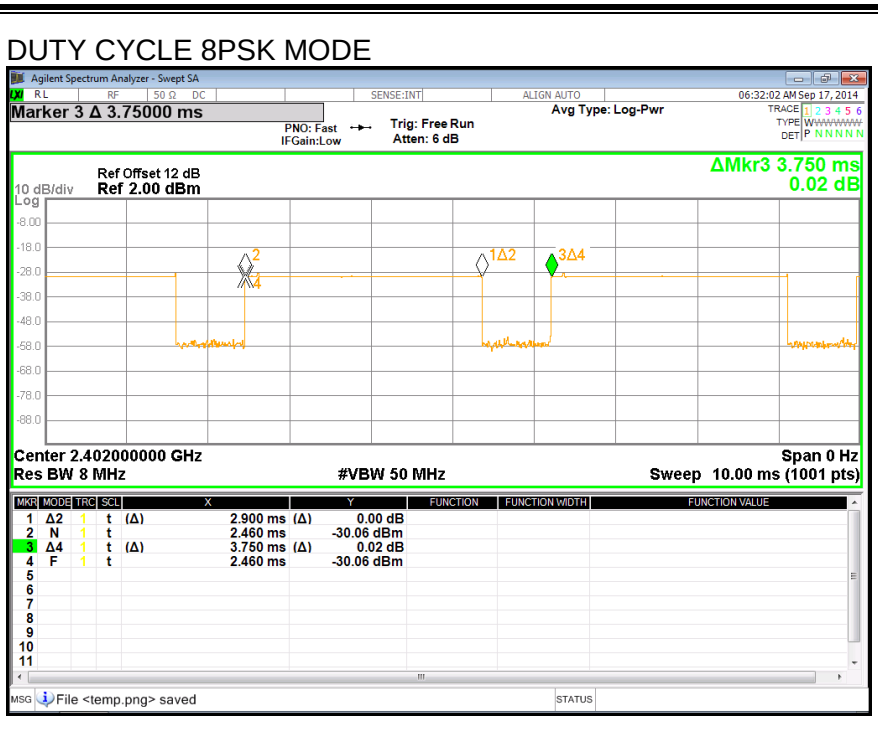
8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4 GHz band (Hopping OFF)						
Bluetooth GFSK	2.880	3.760	0.766	76.60%	1.16	0.347
Bluetooth 8PSK	2.900	3.750	0.773	77.33%	1.12	0.345

8.2. DUTY CYCLE PLOTS

DUTY CYCLE GFSK MODE

DUTY CYCLE 8PSK MODE



8.3. BASIC DATA RATE GFSK MODULATION

8.3.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

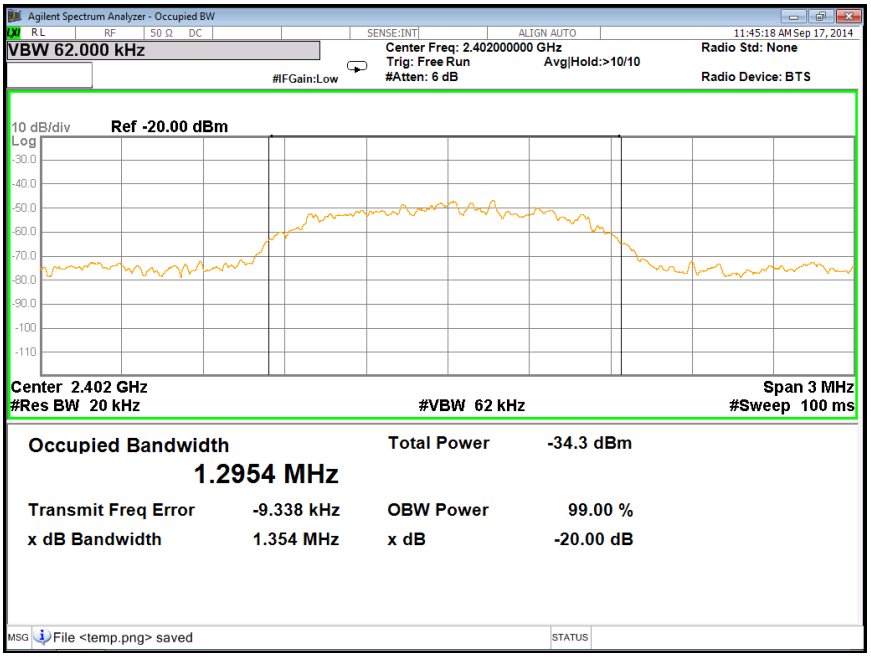
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

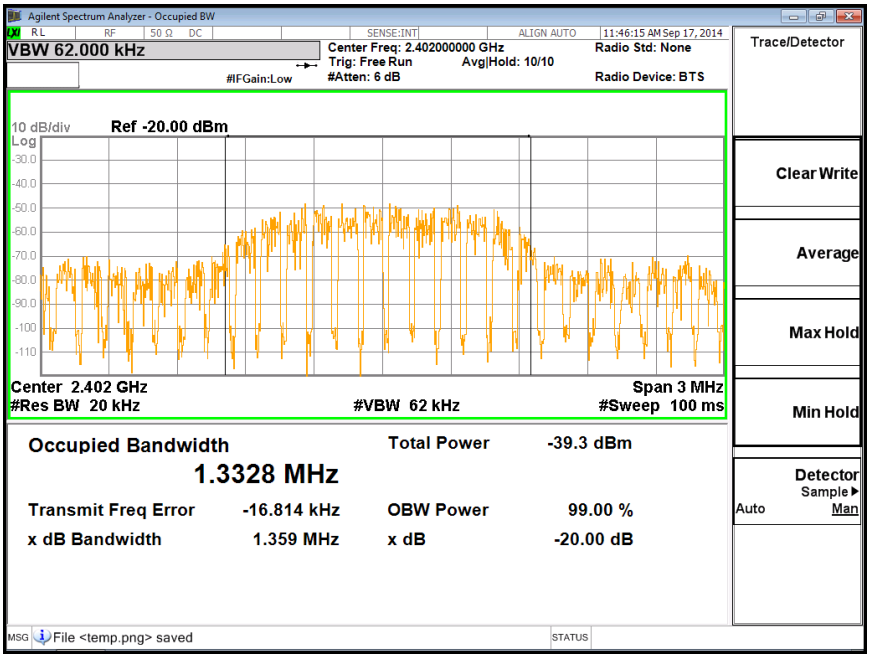
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	1354	1332.8
Middle	2441	1344	1279.1
High	2480	1342	1242.7

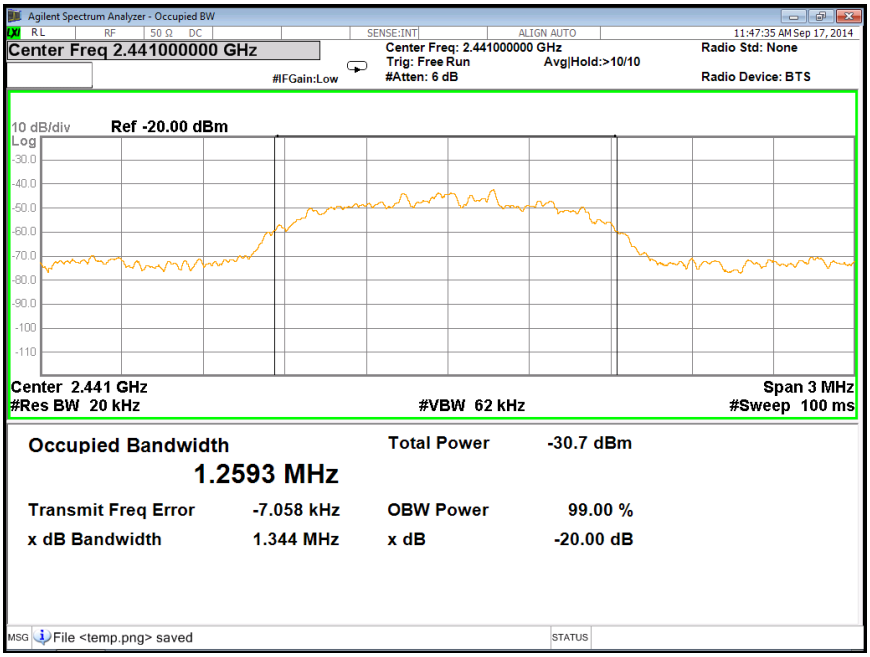
20 dB AND 99% BANDWIDTH

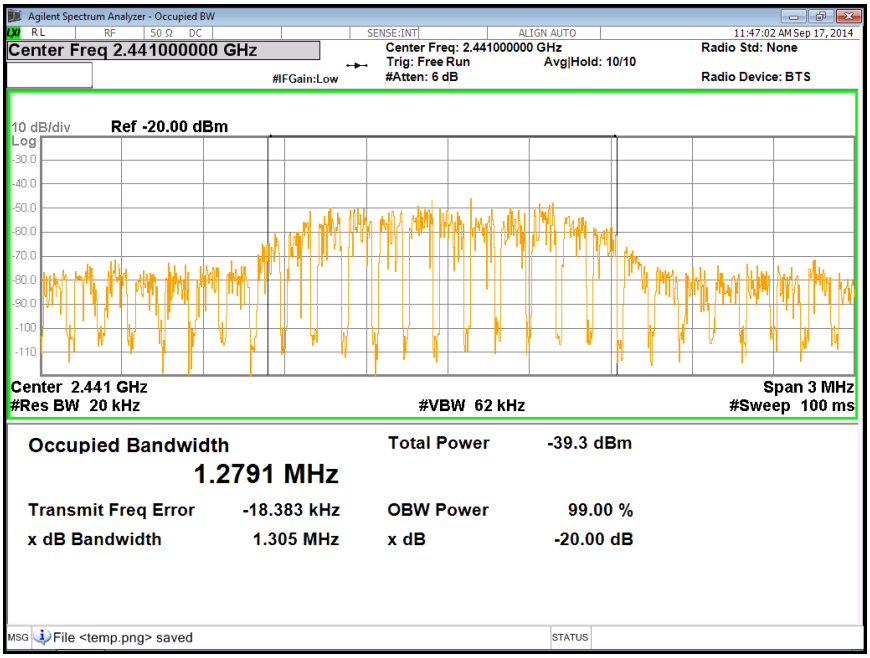
BANDWIDTH LOW CH



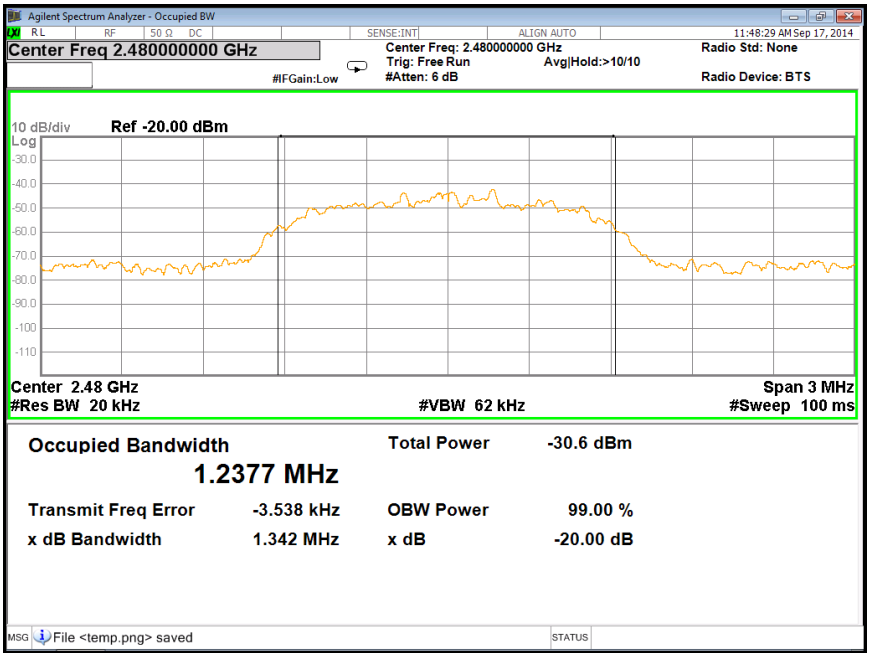


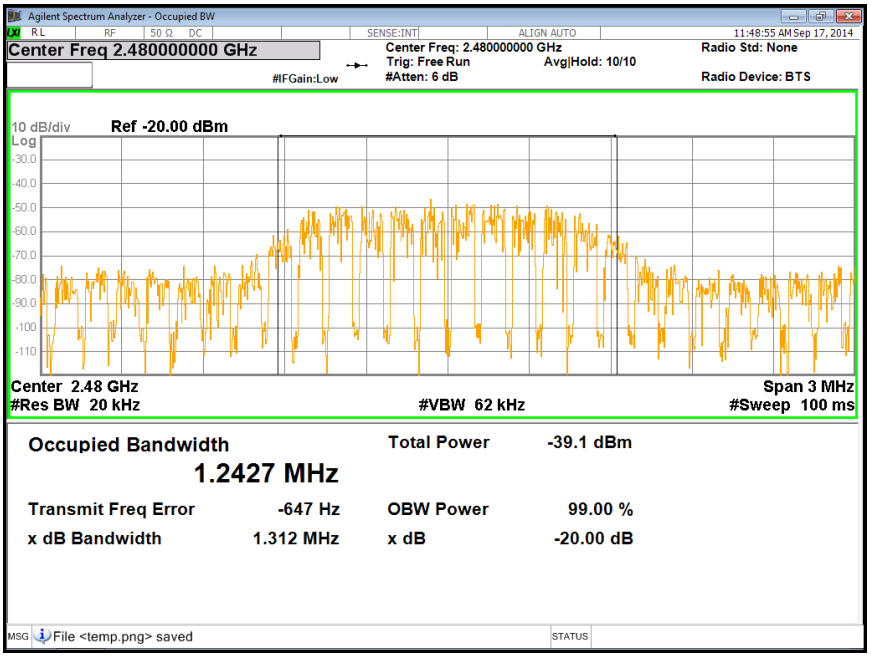
BANDWIDTH MID CH





BANDWIDTH HIGH CH





8.3.2. 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.

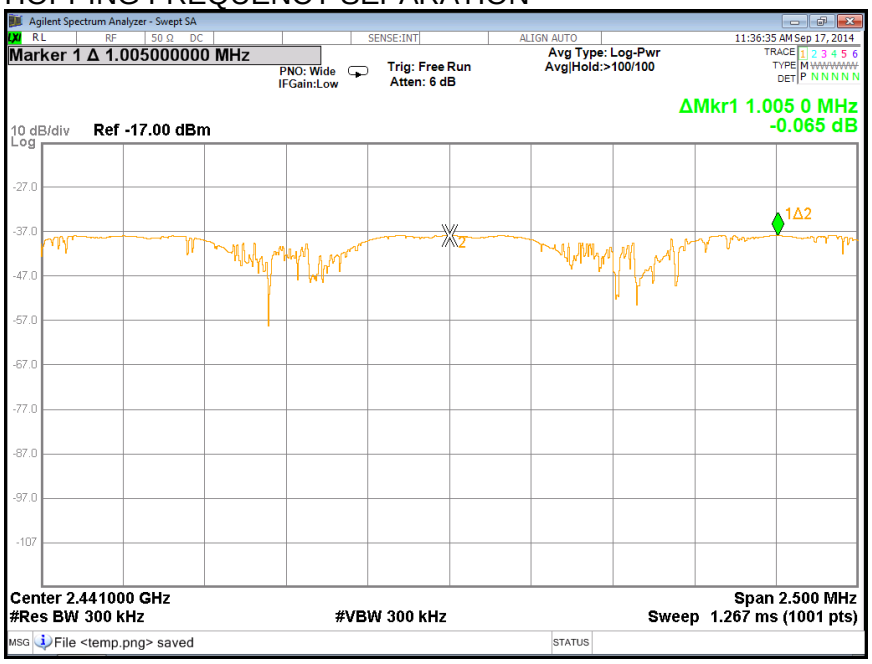
TEST PROCEDURE

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

RESULTS

HOPPING FREQUENCY SEPARATION

HOPPING FREQUENCY SEPARATION



8.3.3. 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

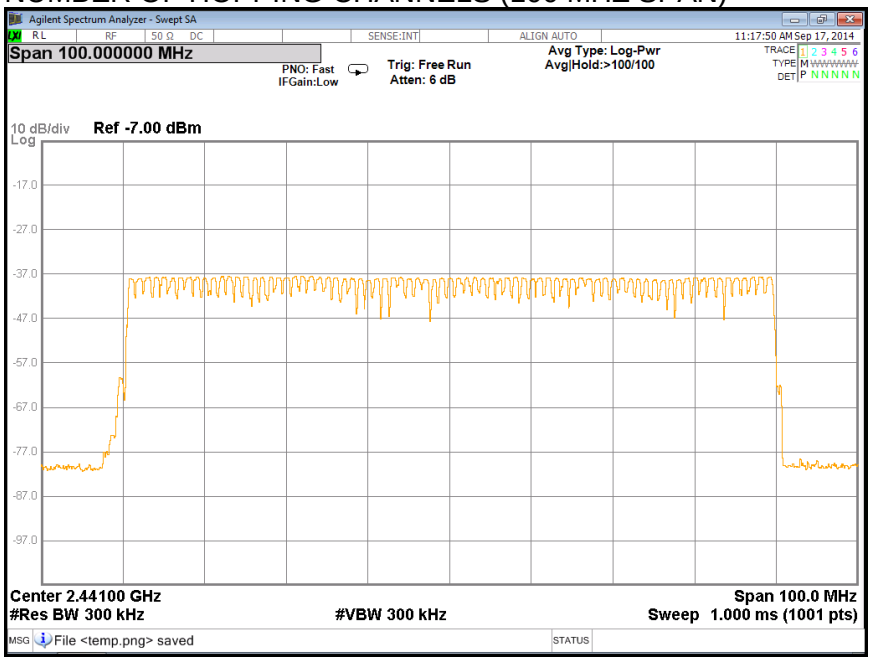
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

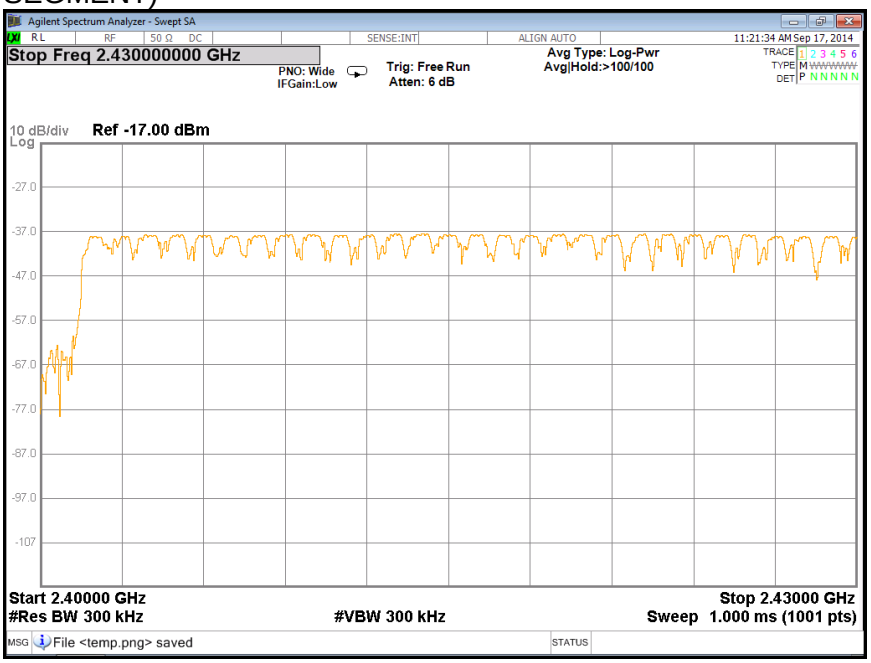
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS

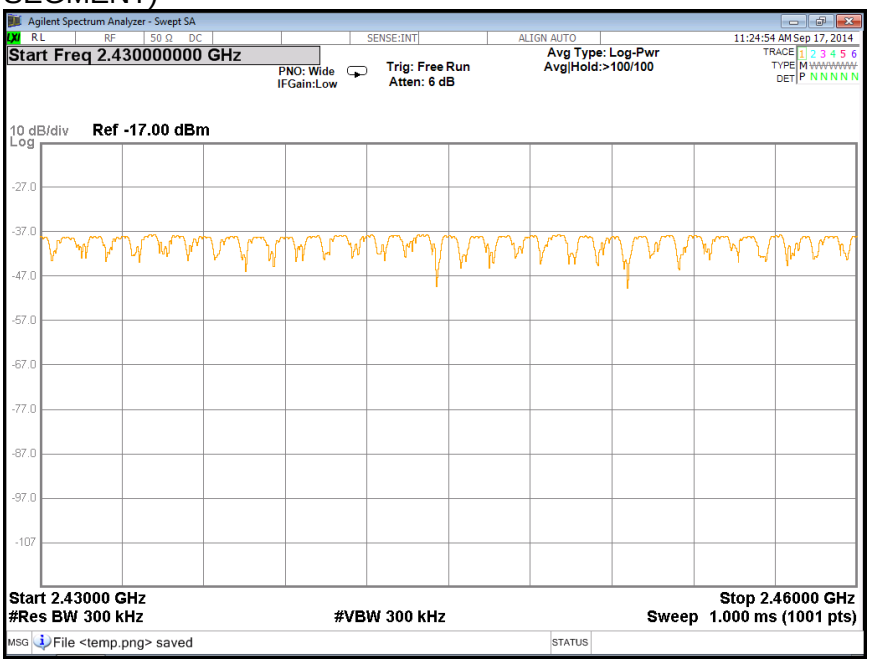
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



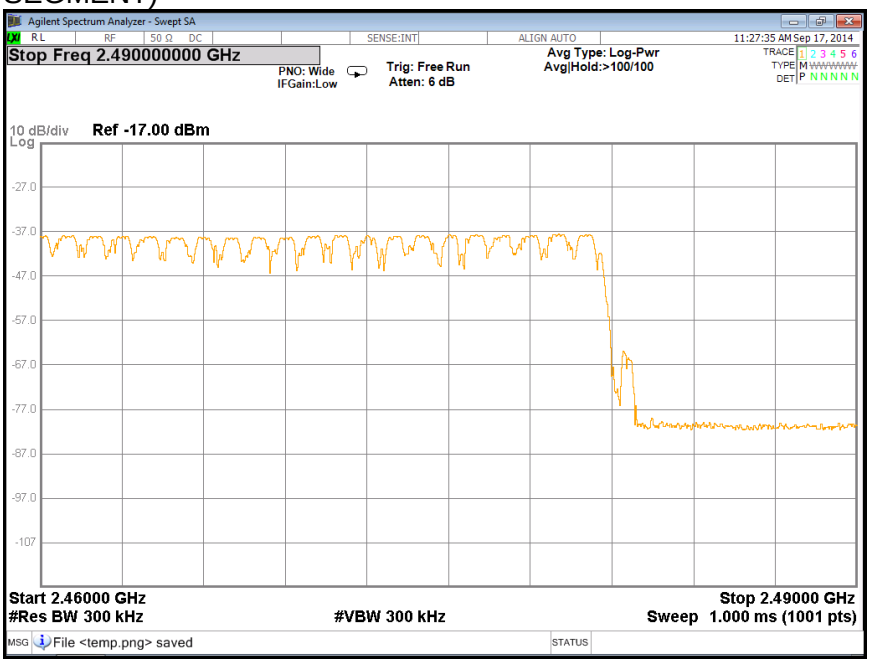
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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



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



8.3.4. 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.

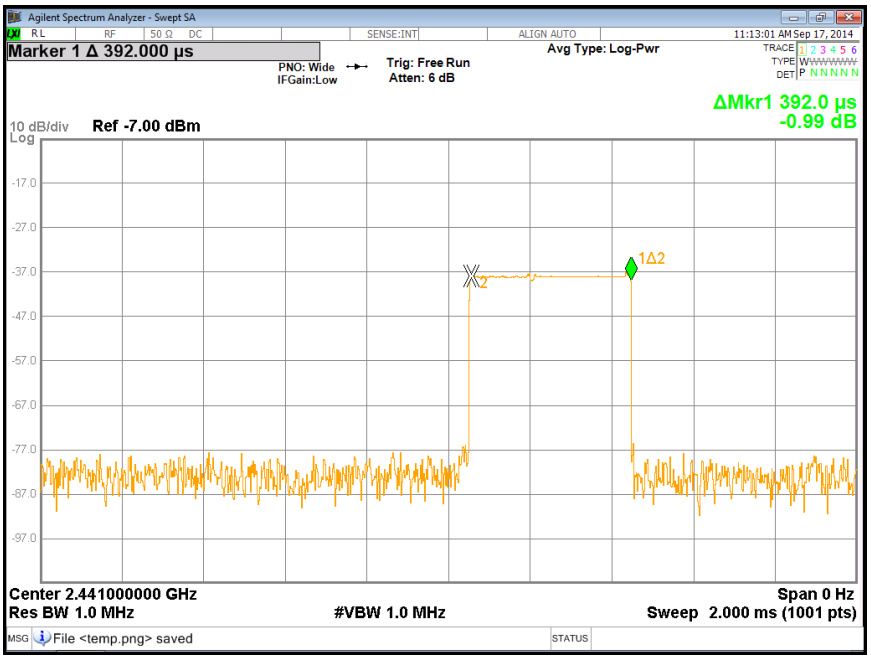
RESULTS

8PSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.392	32	0.125	0.4	-0.275
DH3	1.645	17	0.280	0.4	-0.120
DH5	2.89	10	0.289	0.4	-0.111

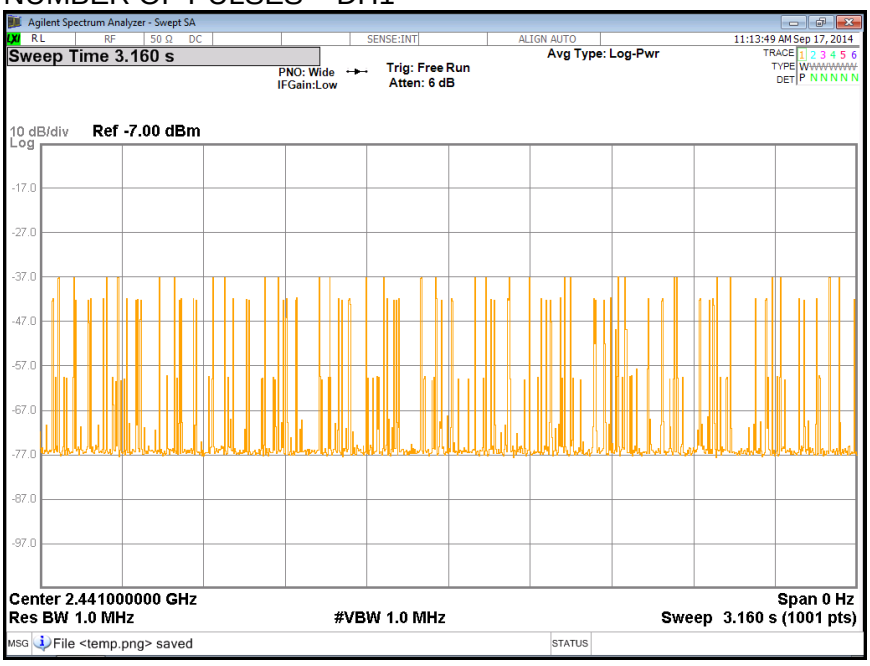
PULSE WIDTH - DH1

PULSE WIDTH – DH1

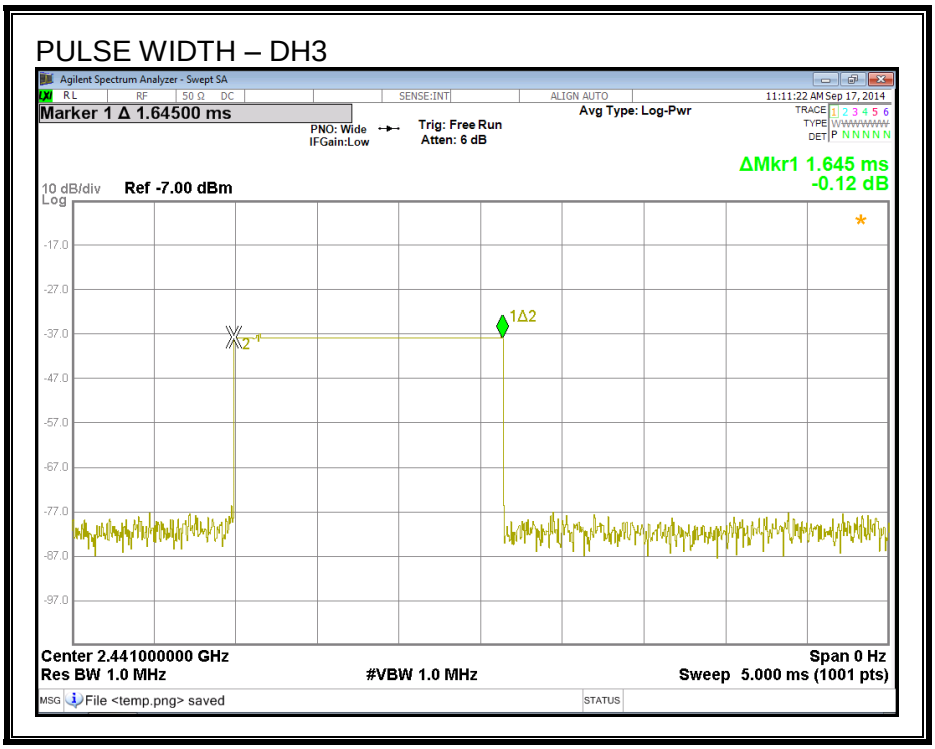


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1

NUMBER OF PULSES – DH1

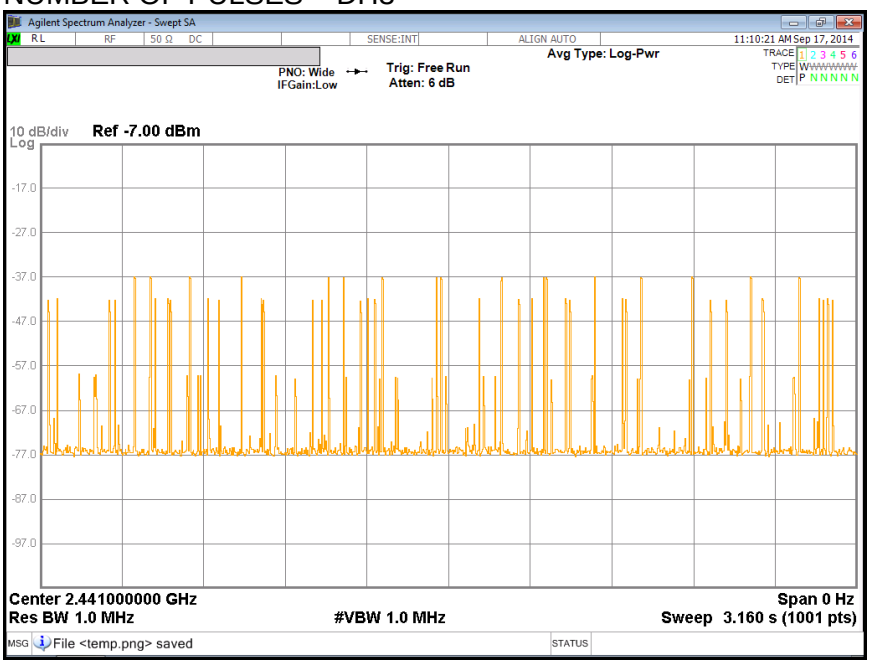


PULSE WIDTH – DH3

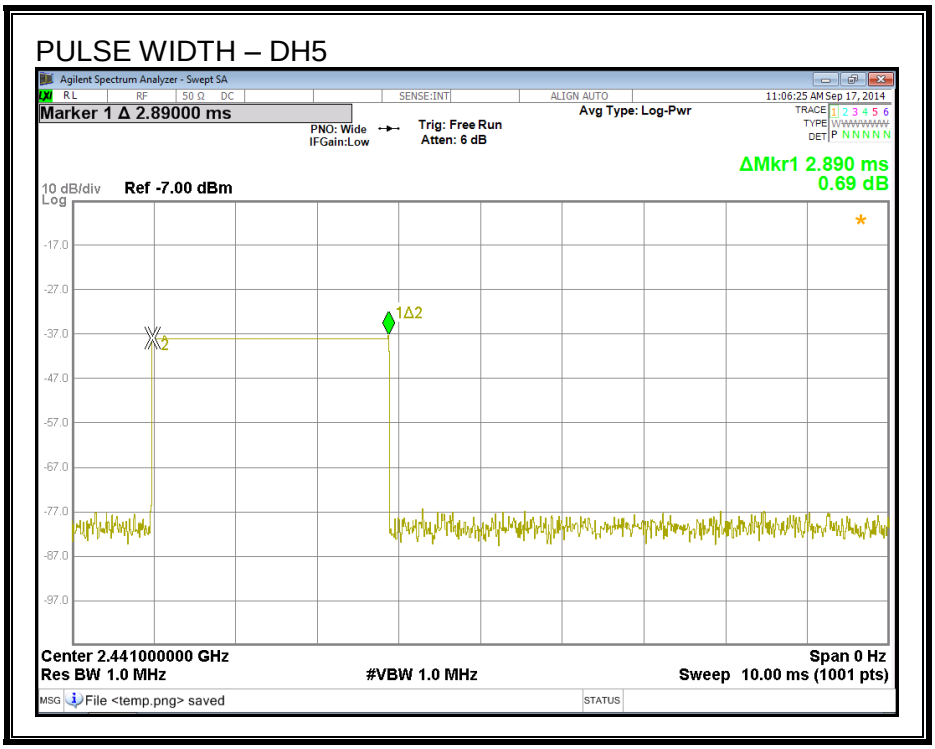


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3

NUMBER OF PULSES – DH3

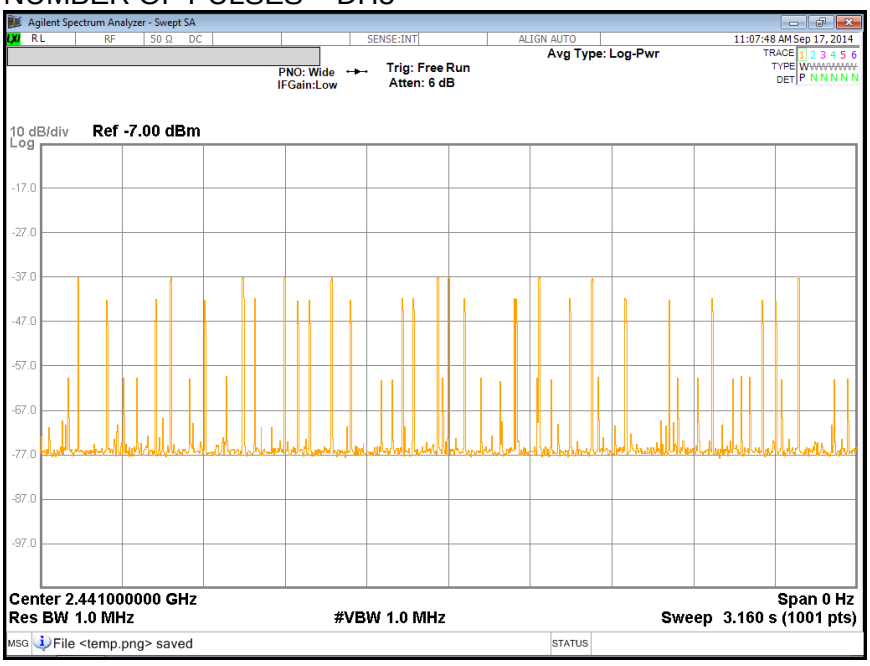


PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

NUMBER OF PULSES – DH5



8.3.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

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

TEST PROCEDURE

The transmitter output is measured via a radiated measurement (field strength). This value is then convered to an EIRP power measurement by means of the procedure outlined in the FCC document number DA 00-705, March 2000.

RESULTS

Channel	Frequency (MHz)	Output Power (dBuV/m)	EIRP Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	68.16	-26.61	30	-56.61
Middle	2441	67.76	-27.01	30	-57.01
High	2480	66.71	-28.06	30	-58.06

8.3.6. 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.

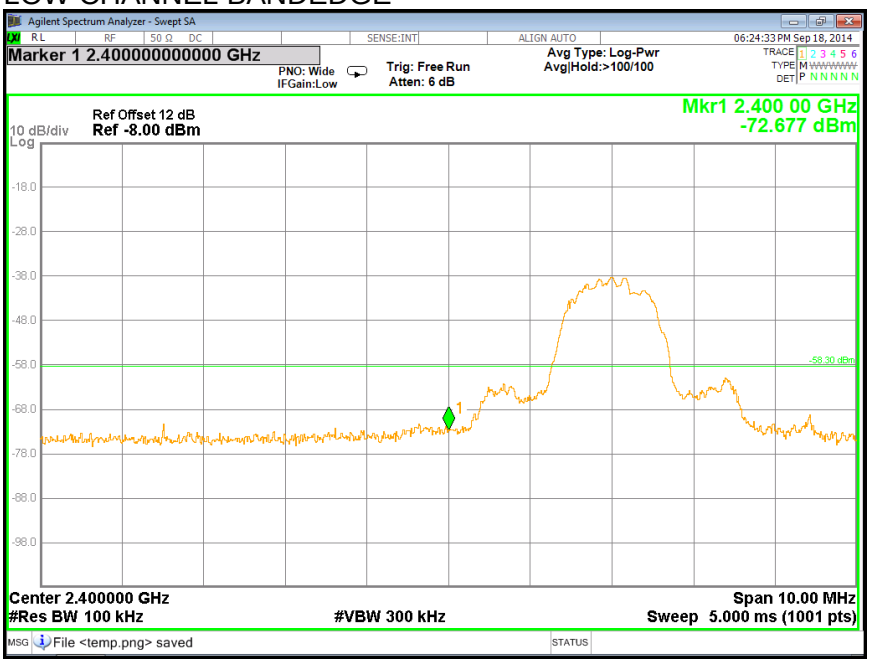
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

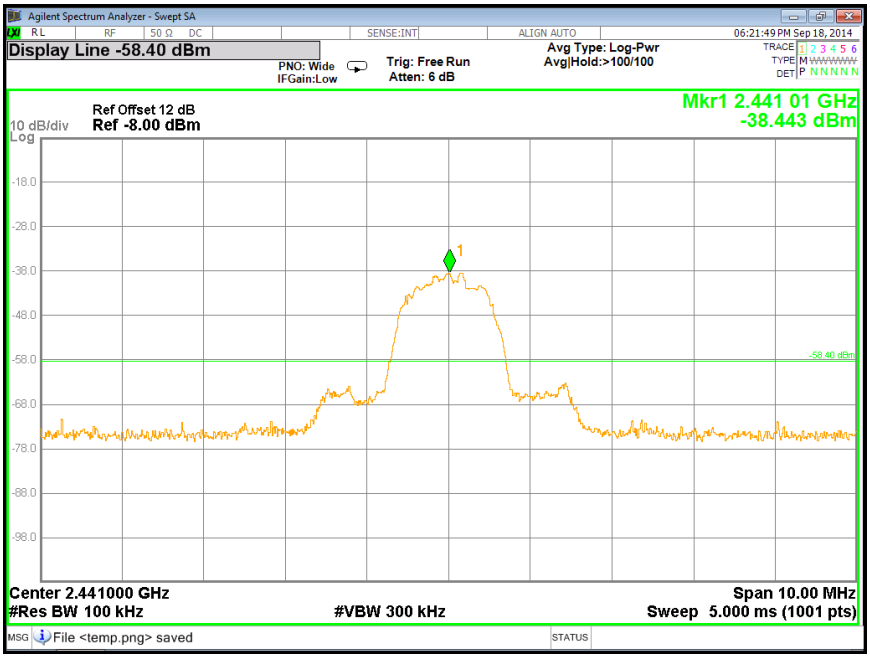
LOW CHANNEL BANDEDGE



LOW CHANNEL SPURIOUS

SPURIOUS EMISSIONS, MID CHANNEL

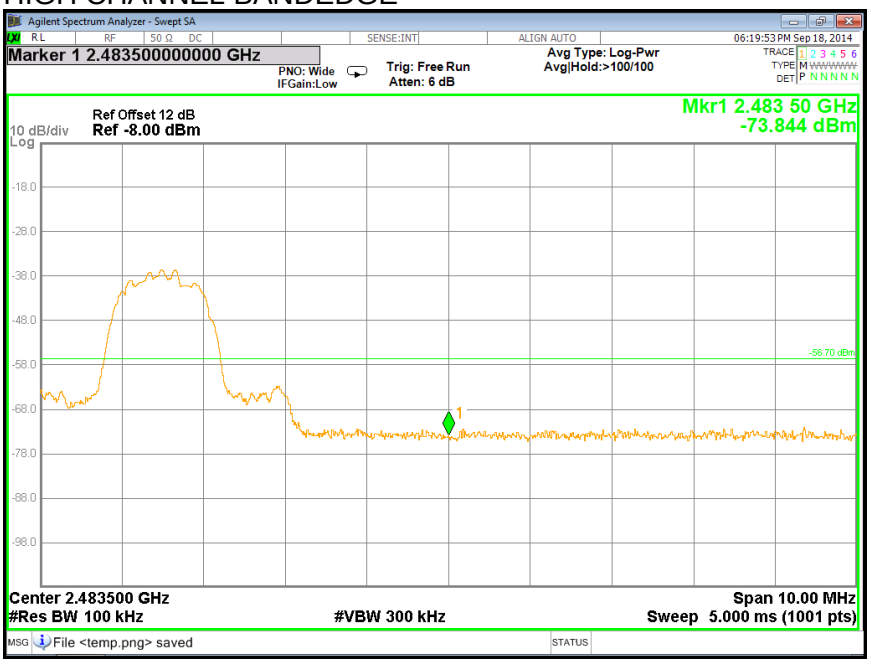
MID CHANNEL REFERENCE



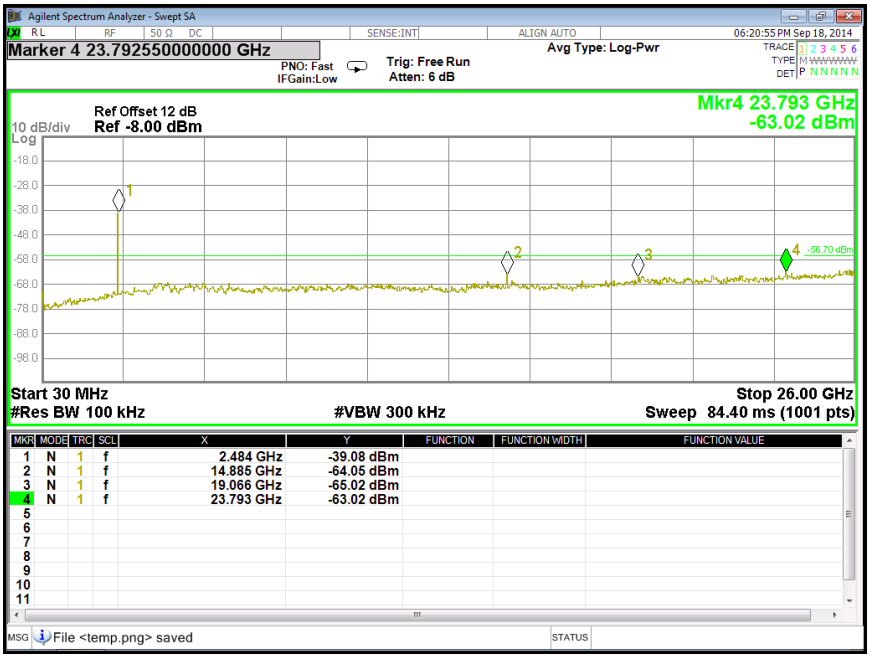
MID CHANNEL SPURIOUS

SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE

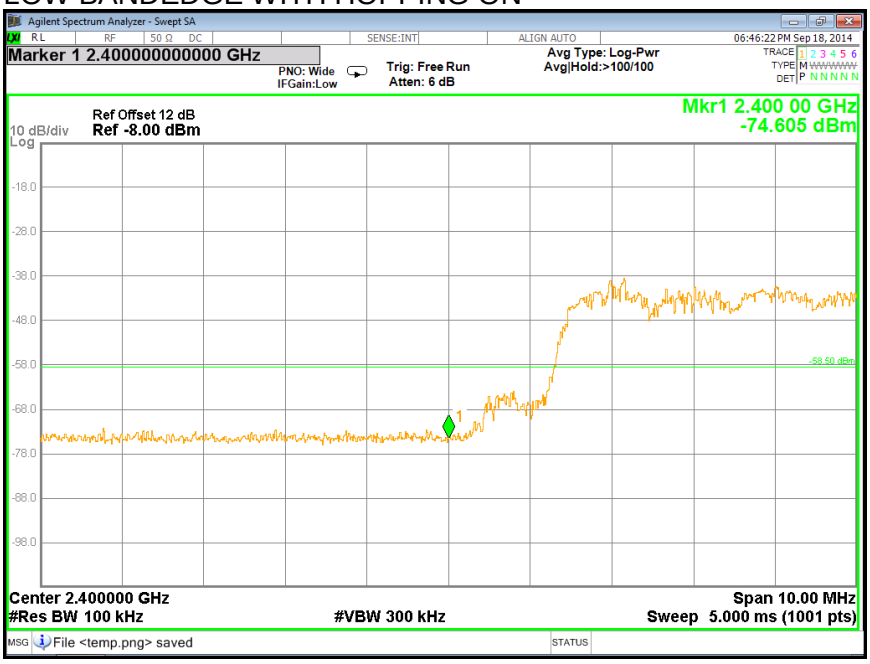


HIGH CHANNEL SPURIOUS

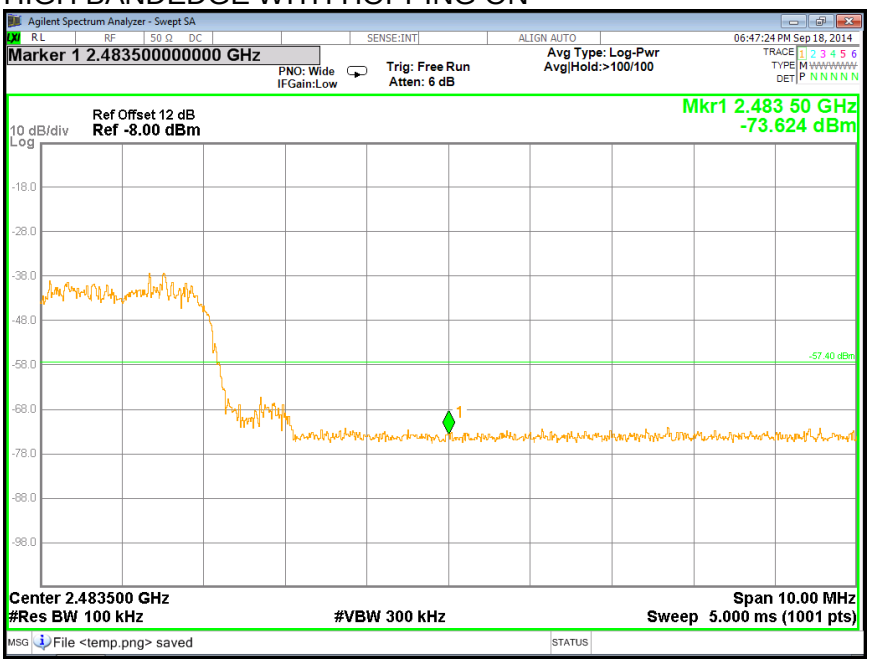


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



8.4. ENHANCED DATA RATE 8PSK MODULATION

8.4.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

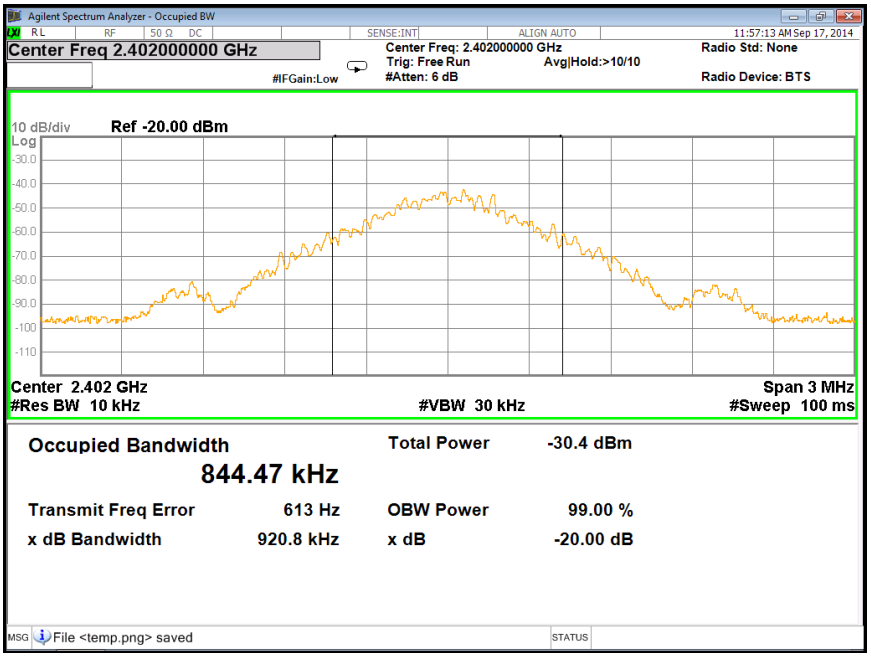
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

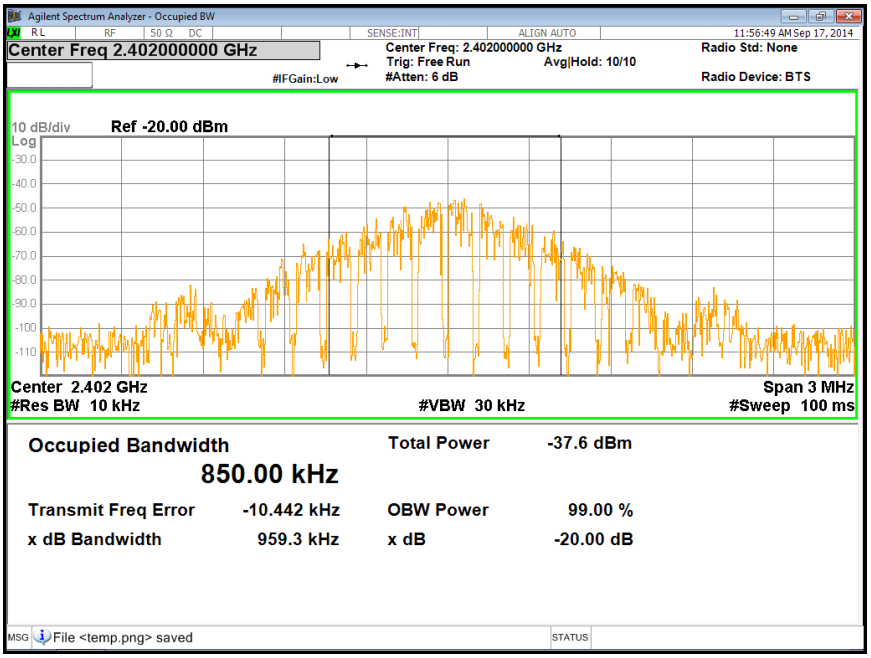
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	920.8	850
Middle	2441	919.1	844.12
High	2480	919.7	871.45

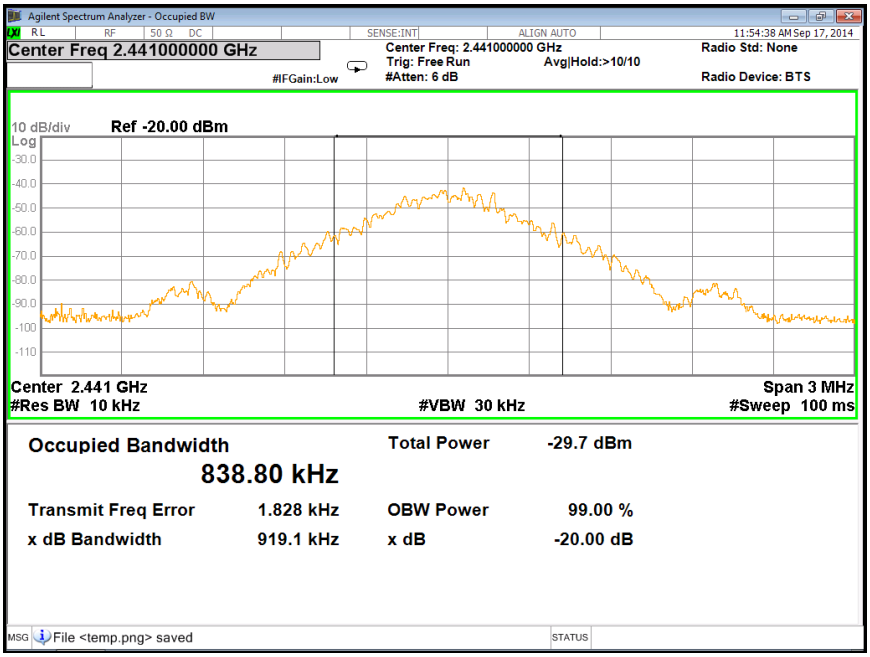
20 dB AND 99% BANDWIDTH

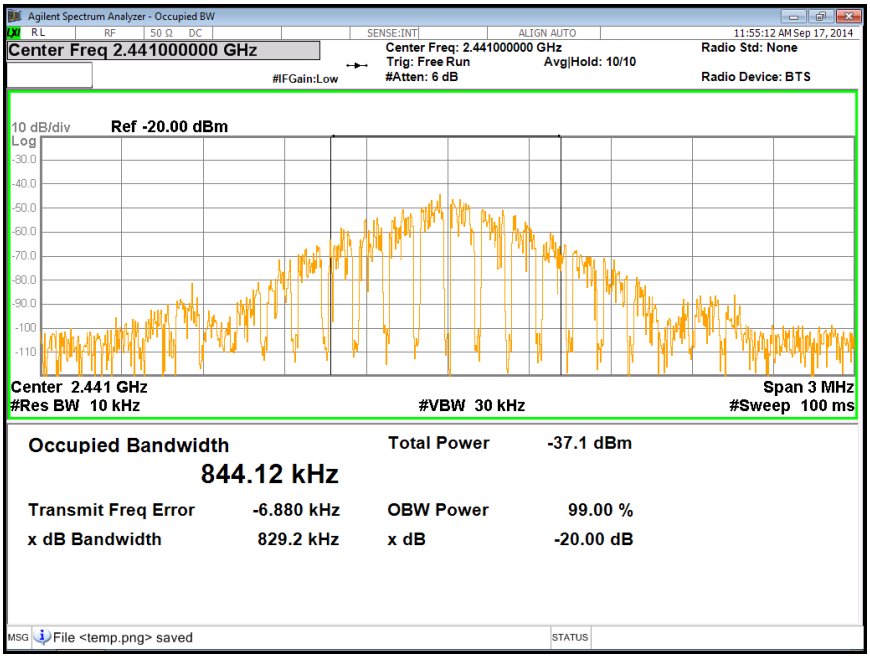
BANDWIDTH LOW CH



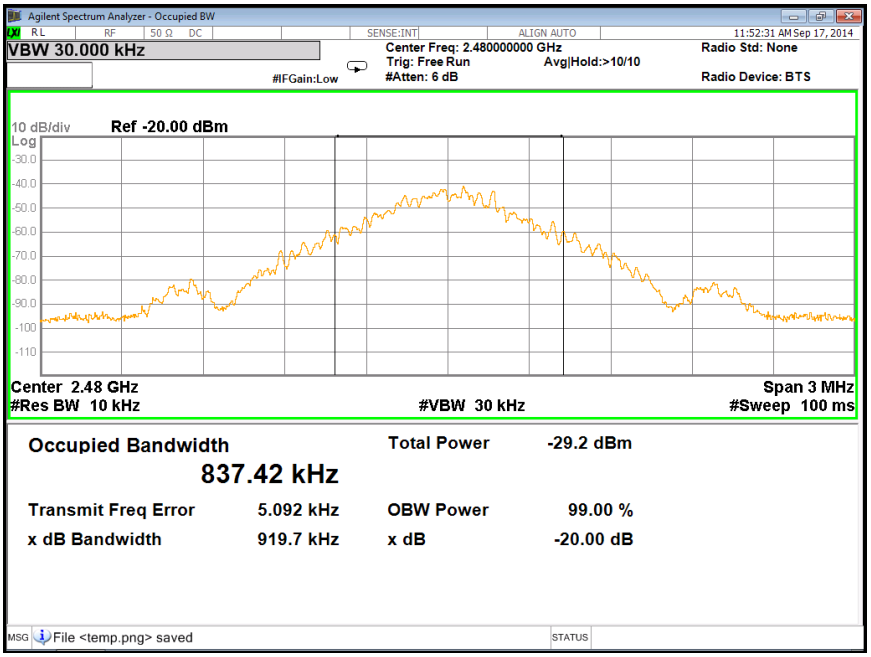


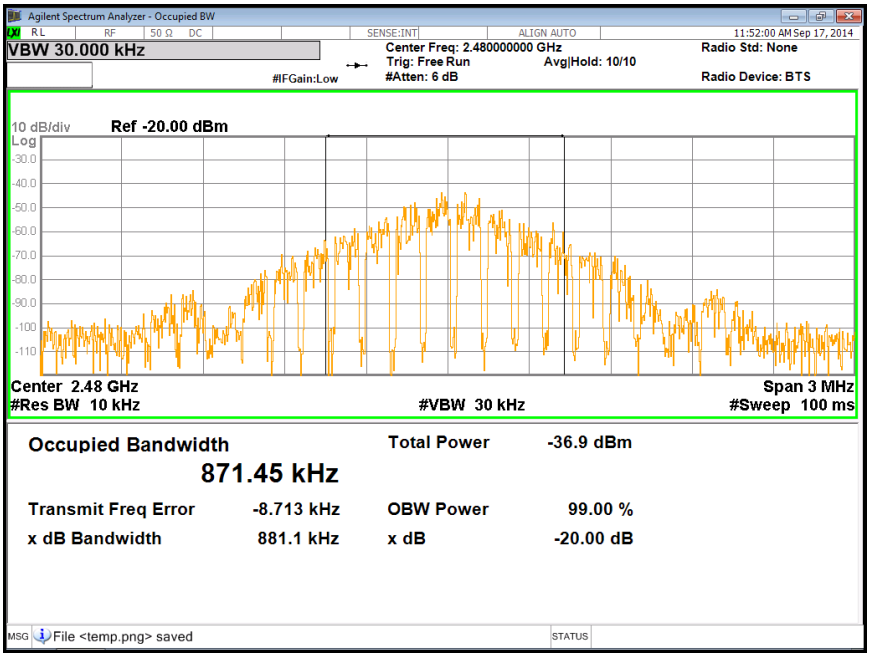
BANDWIDTH MID CH





BANDWIDTH HIGH CH





8.4.2. 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.

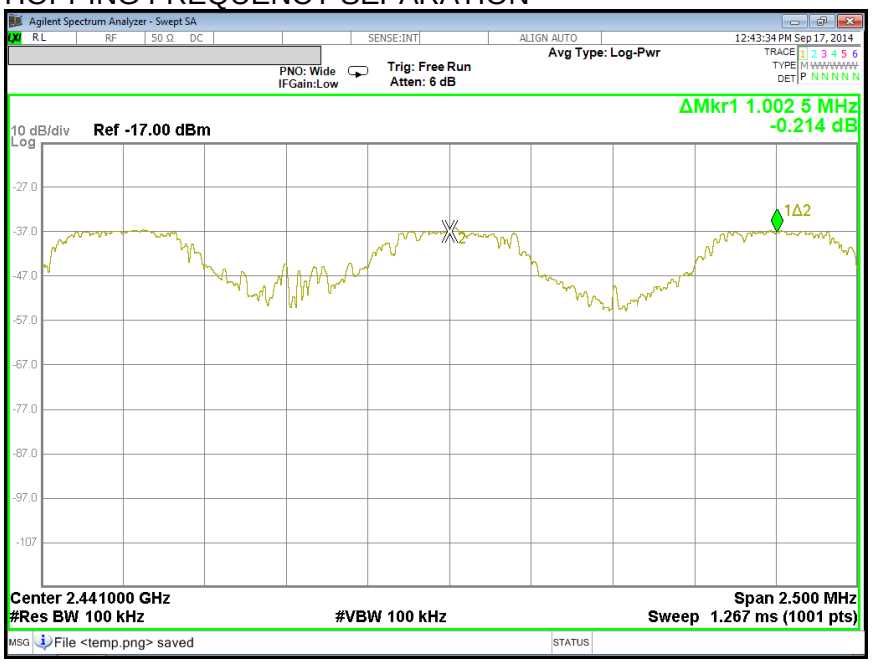
TEST PROCEDURE

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

RESULTS

HOPPING FREQUENCY SEPARATION

HOPPING FREQUENCY SEPARATION



8.4.3. 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

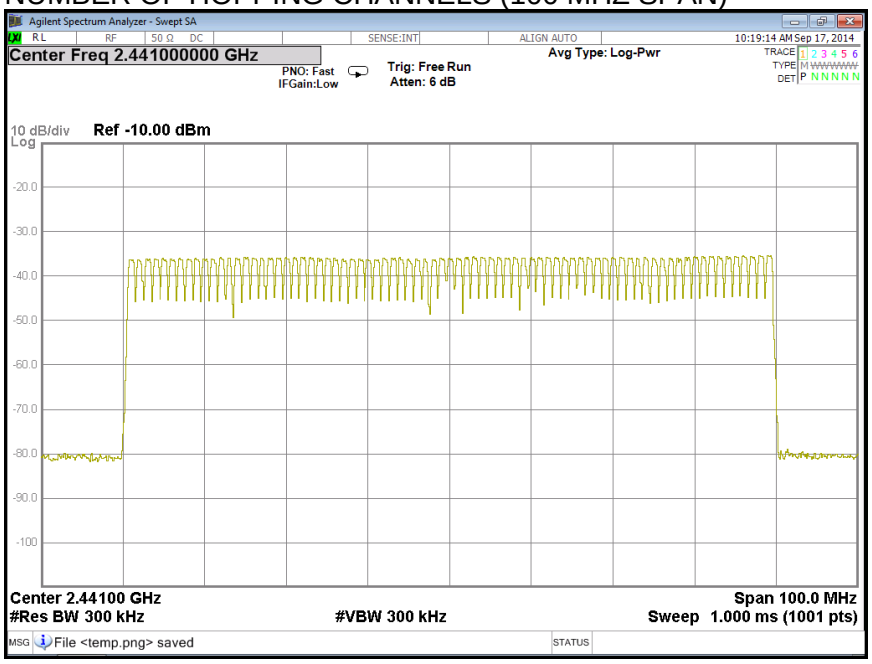
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

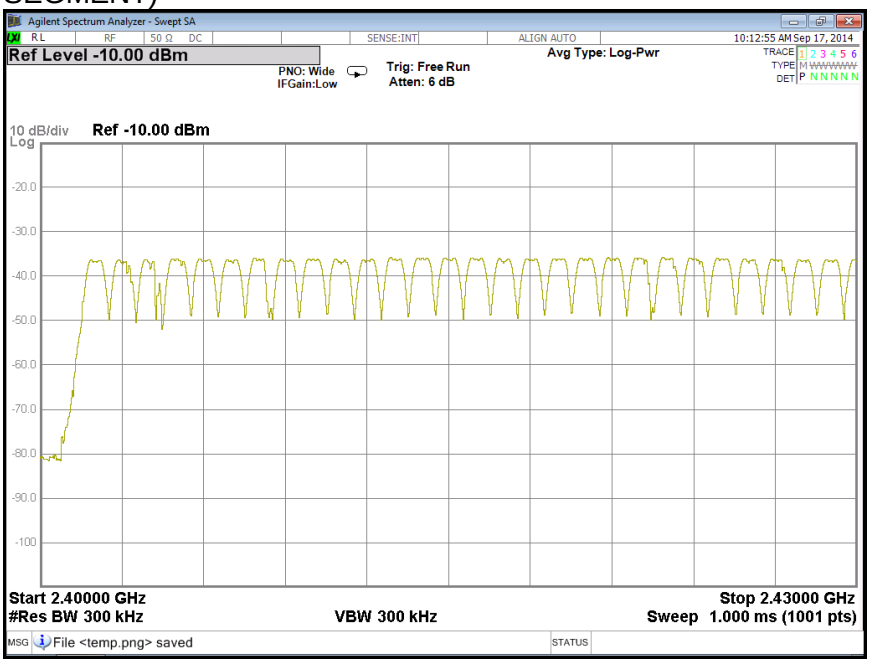
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS

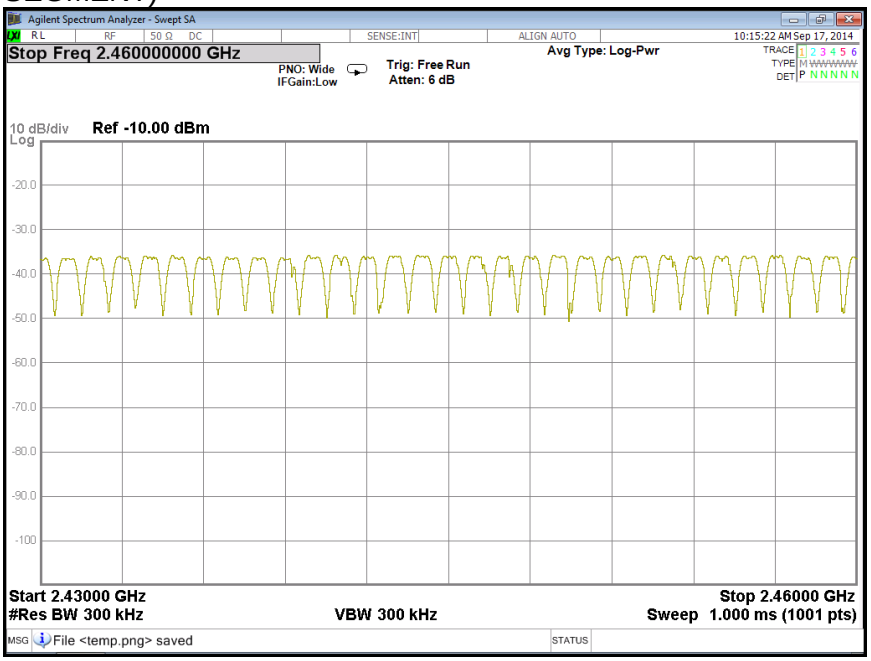
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



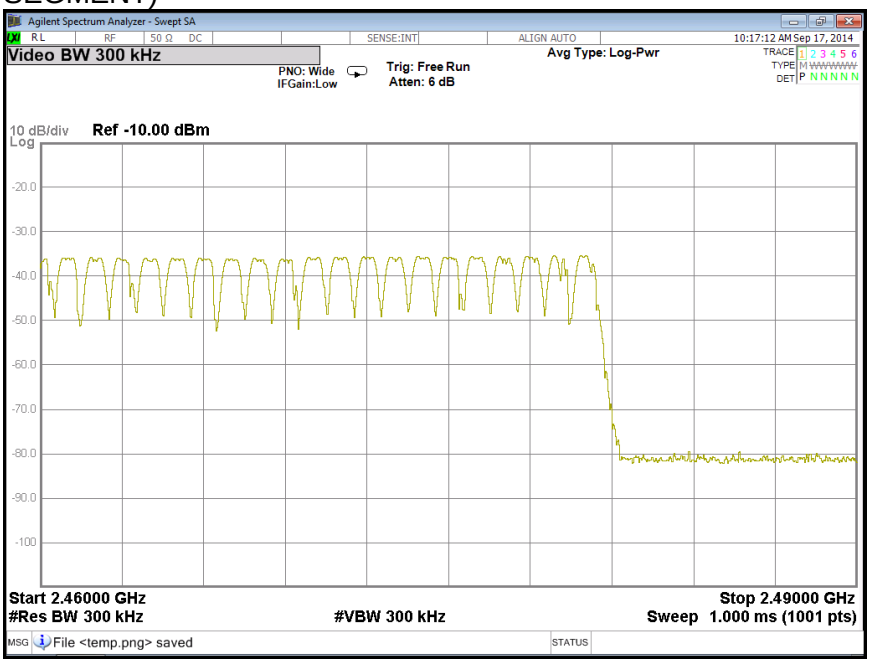
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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



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



8.4.4. 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

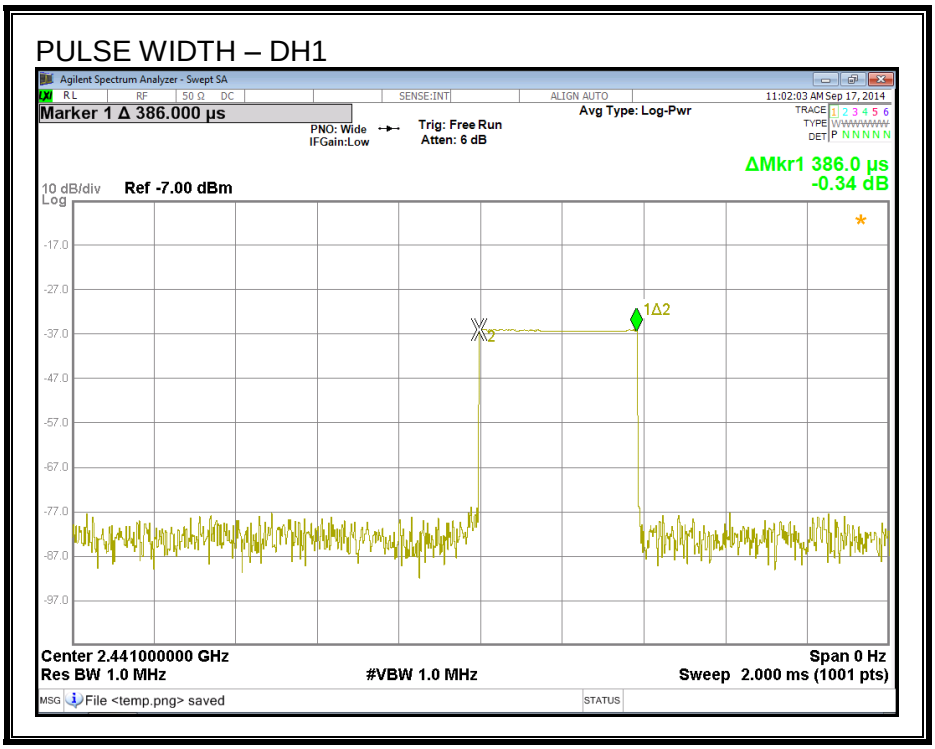
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

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

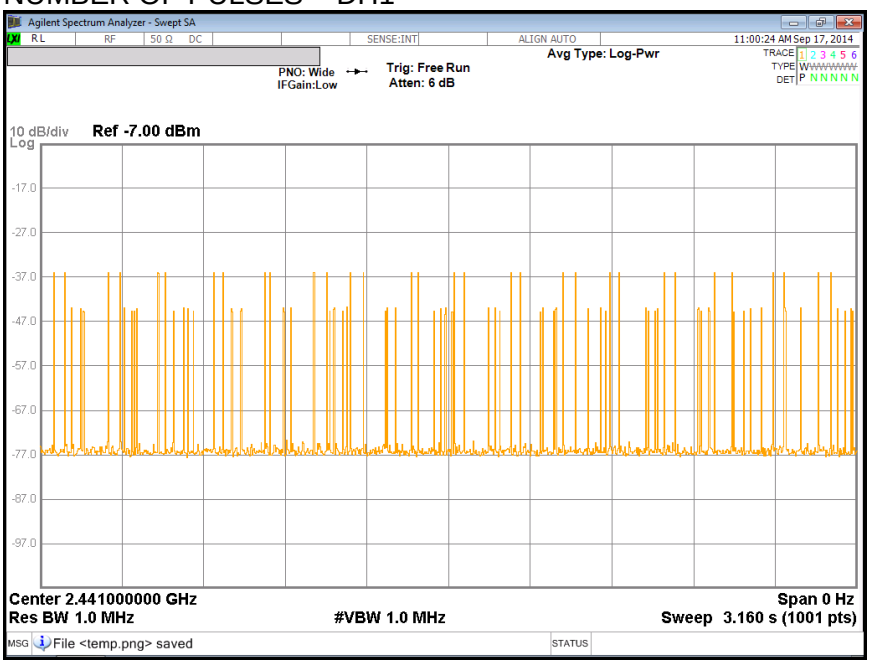
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.386	32	0.124	0.4	-0.276
DH3	1.642	17	0.279	0.4	-0.121
DH5	2.9	10	0.290	0.4	-0.110

PULSE WIDTH - DH1

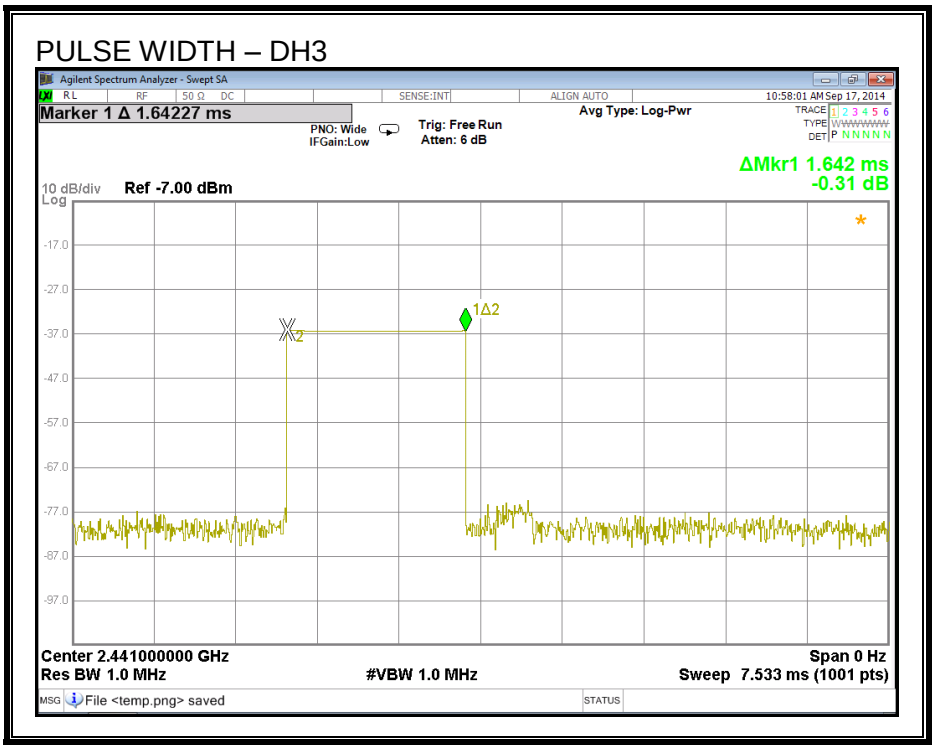


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1

NUMBER OF PULSES – DH1

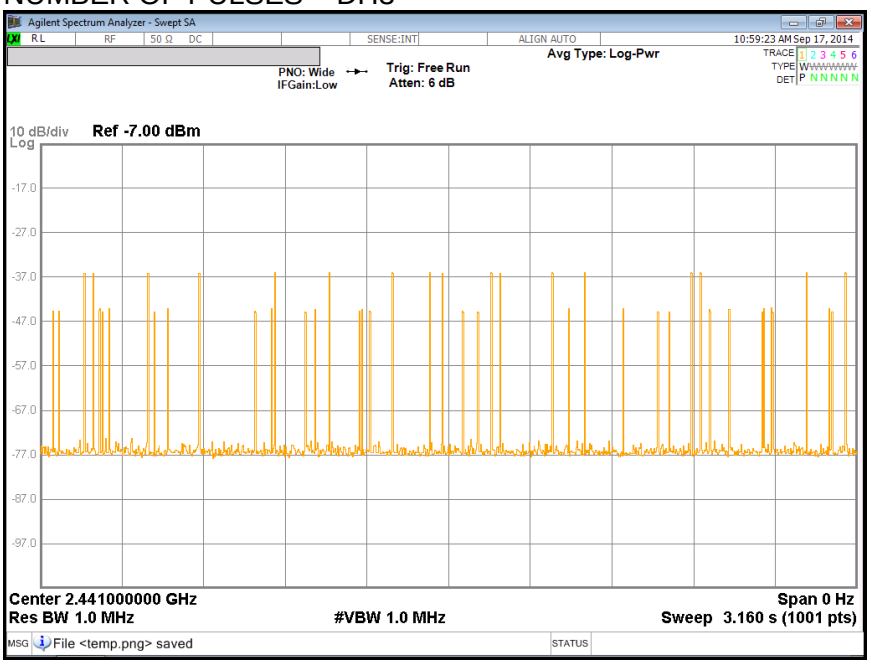


PULSE WIDTH – DH3

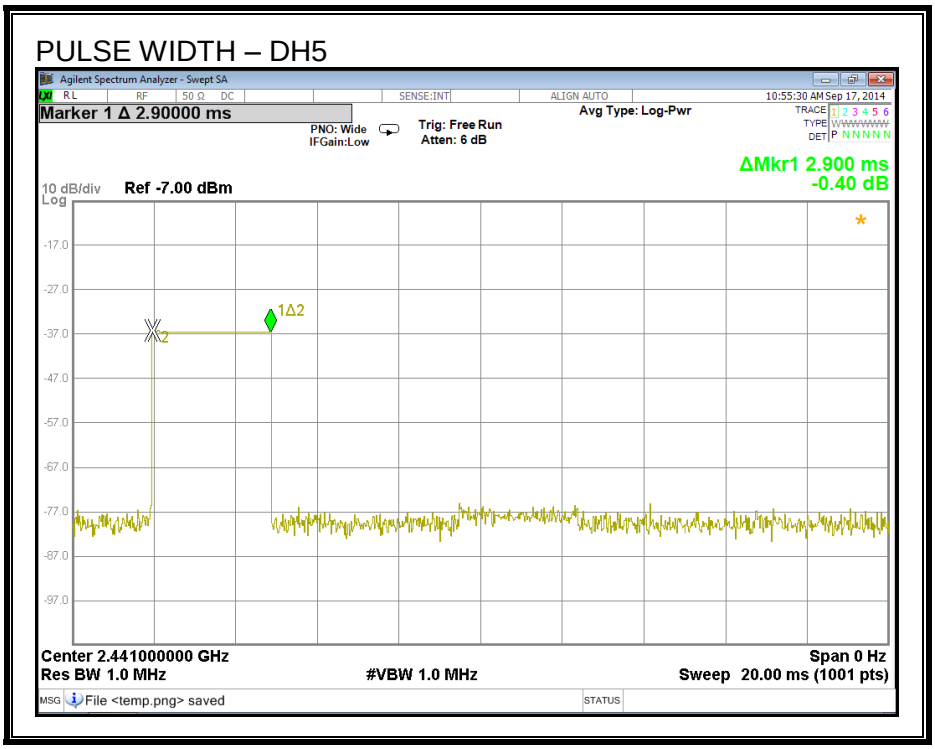


NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3

NUMBER OF PULSES – DH3

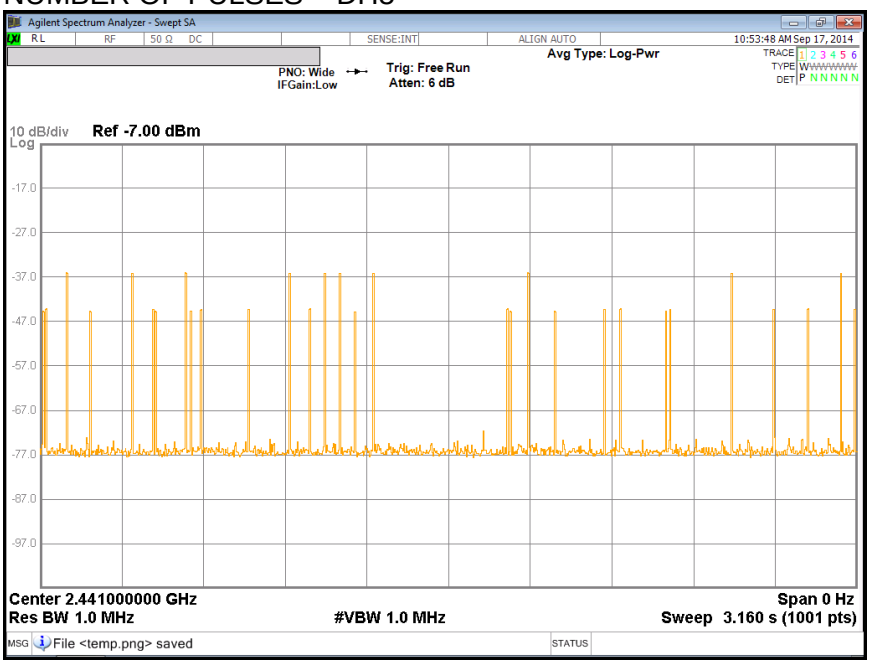


PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

NUMBER OF PULSES – DH5



8.4.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

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

TEST PROCEDURE

TEST PROCEDURE

The transmitter output is measured via a radiated measurement (field strength). This value is then convered to an EIRP power measurement by means of the procedure outlined in the FCC document number DA 00-705, March 2000.

RESULTS

Channel	Frequency (MHz)	Output Power (dBuV/m)	EIRP Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	73.26	-21.51	30	-51.51
Middle	2441	66.30	-28.47	30	-58.47
High	2480	73.53	-21.24	30	-51.24

8.4.6. 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.

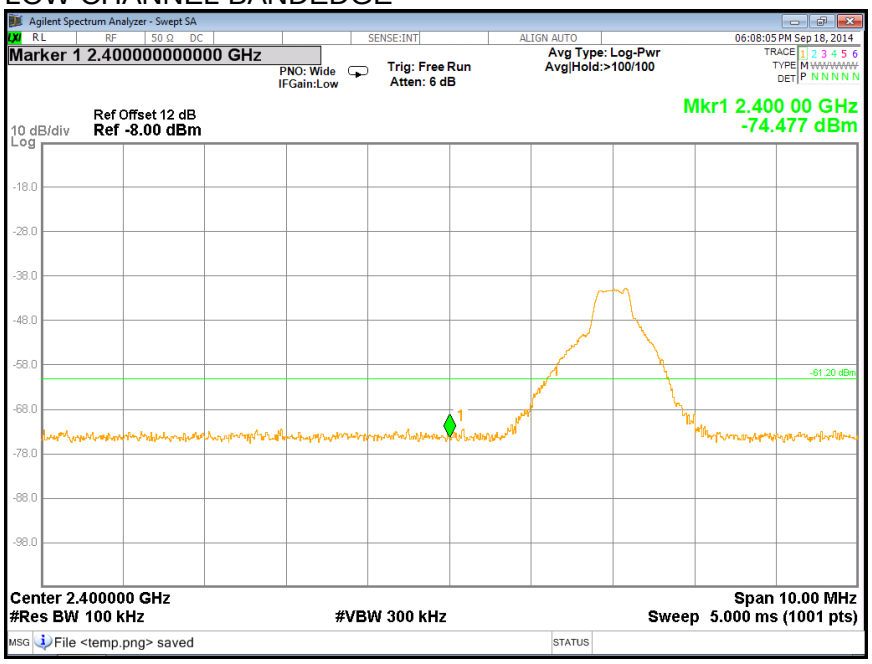
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

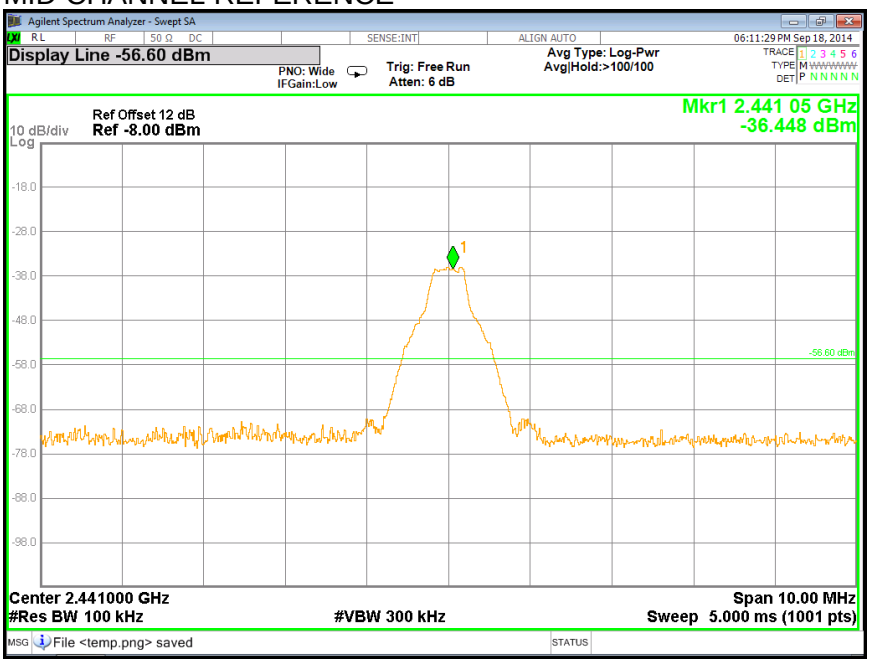
LOW CHANNEL BANDEDGE



LOW CHANNEL SPURIOUS

SPURIOUS EMISSIONS, MID CHANNEL

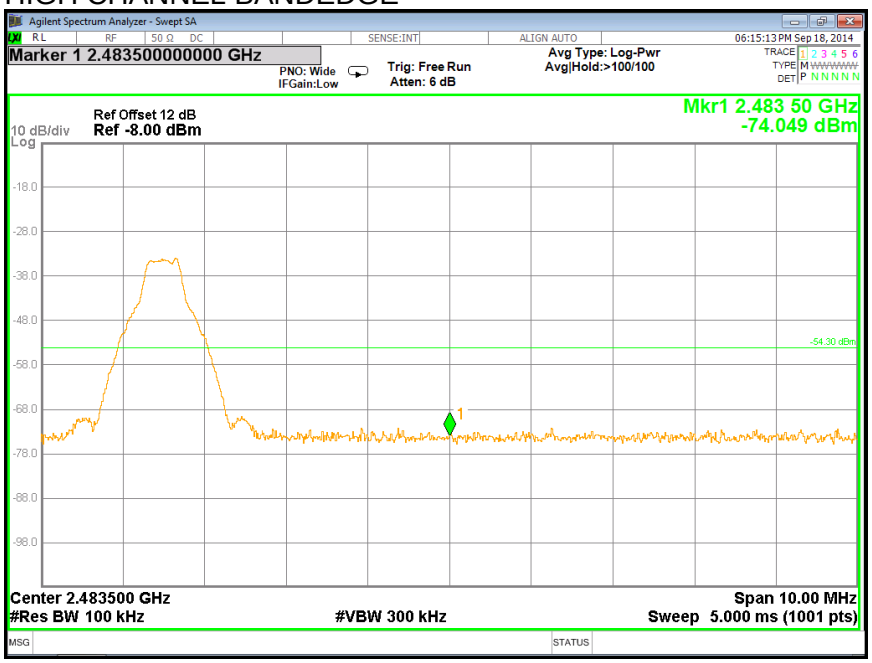
MID CHANNEL REFERENCE



MID CHANNEL SPURIOUS

SPURIOUS EMISSIONS, HIGH CHANNEL

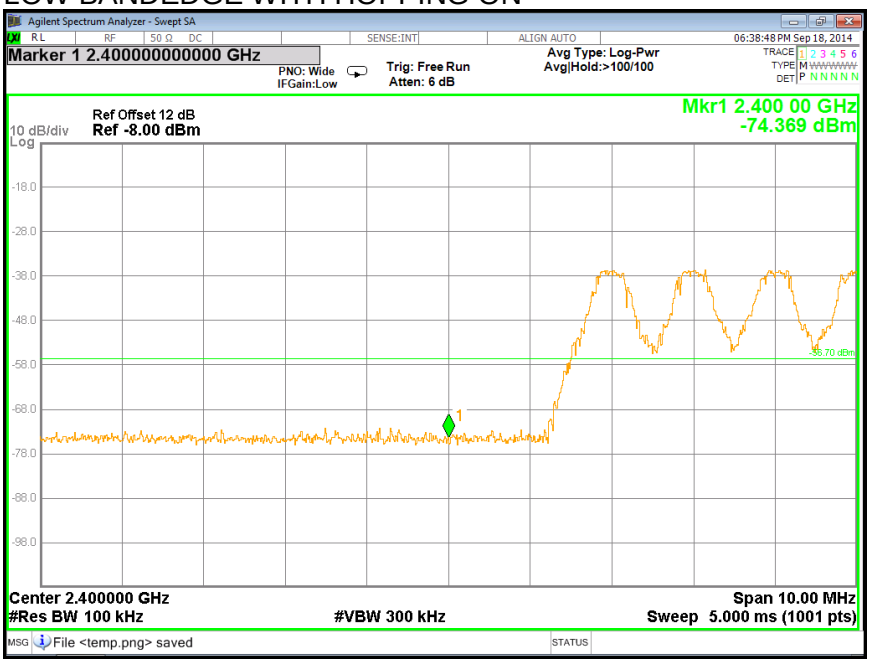
HIGH CHANNEL BANDEDGE



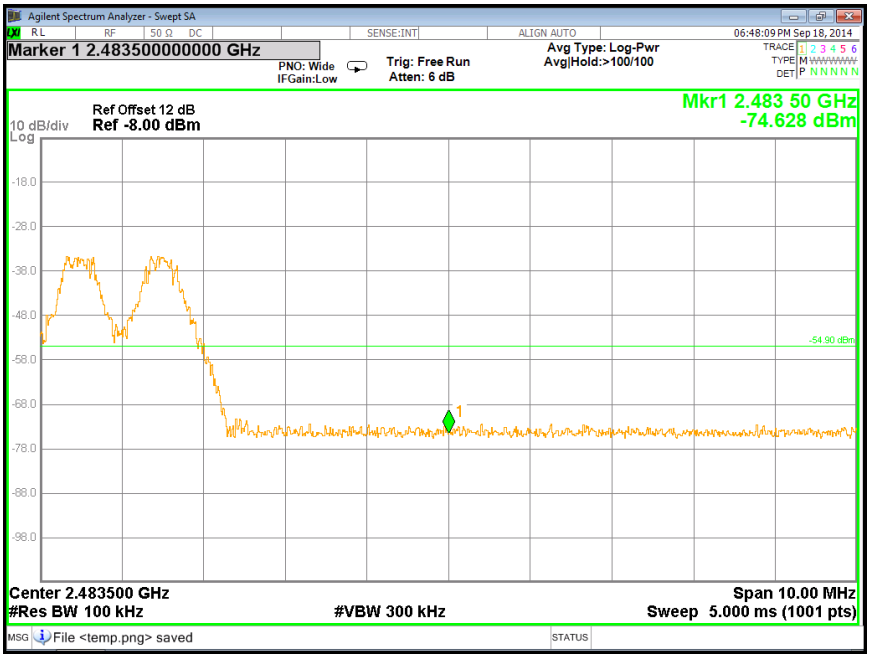
HIGH CHANNEL SPURIOUS

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

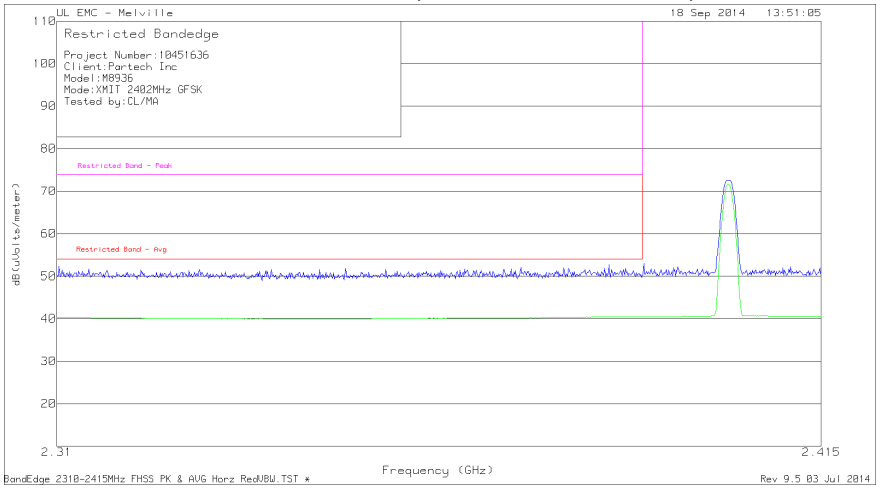
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

9.2. TRANSMITTER ABOVE 1 GHz

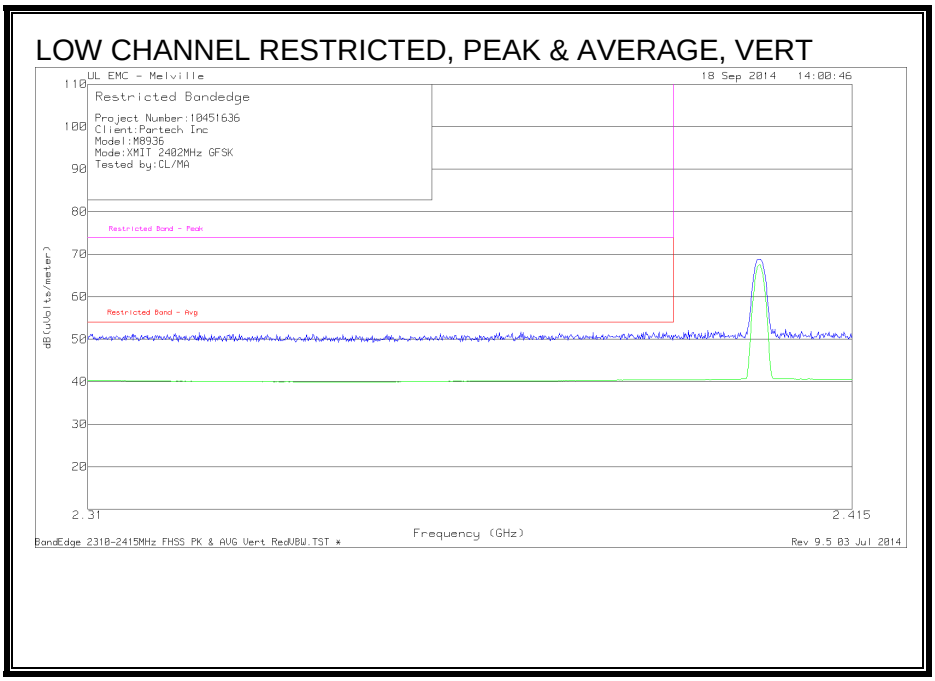
9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK & AVERAGE, HORIZ

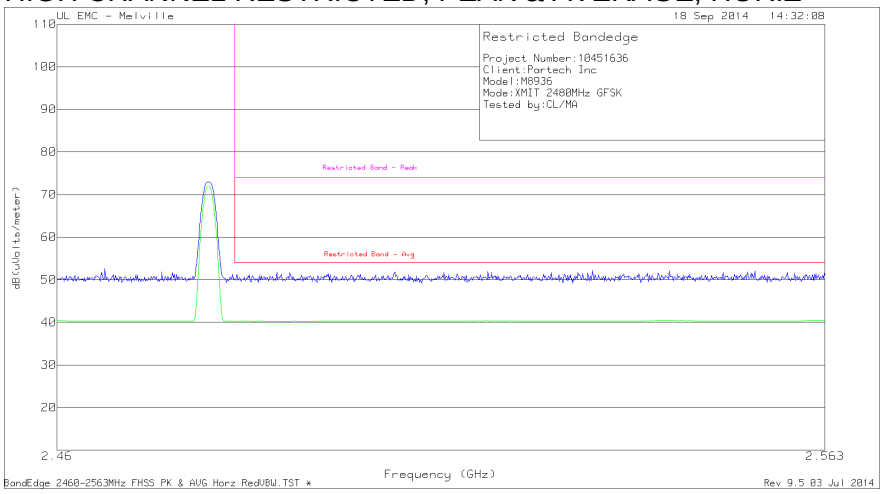


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



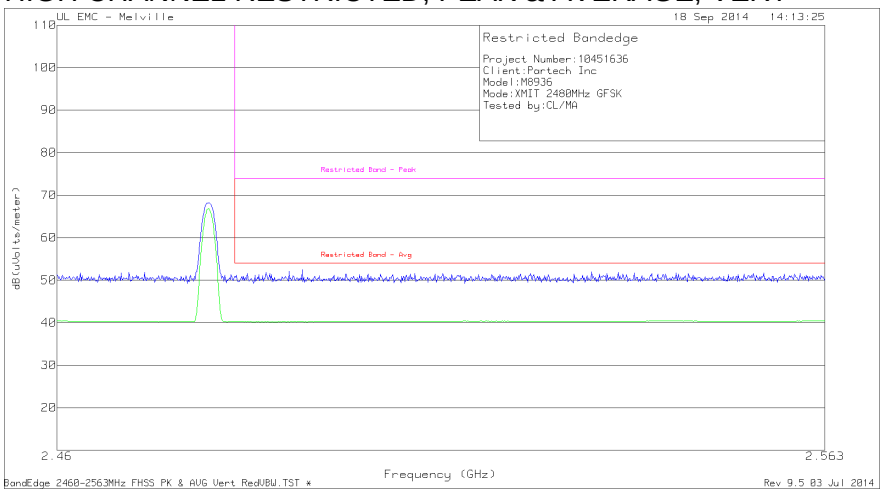
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL RESTRICTED, PEAK & AVERAGE, HORIZ

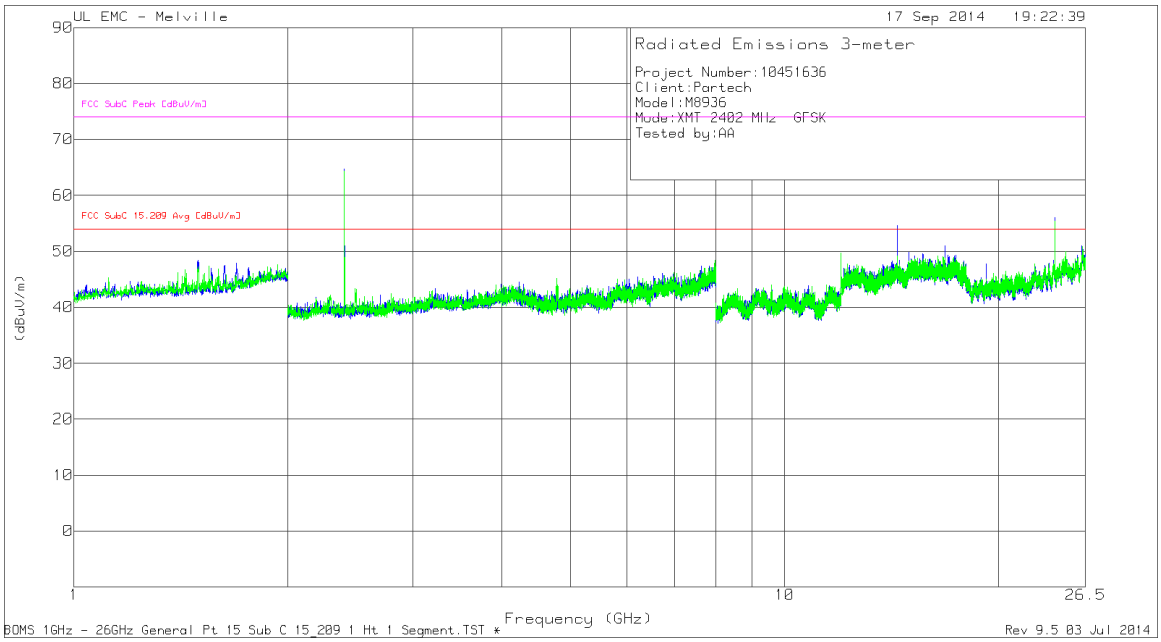


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL RESTRICTED, PEAK & AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS – LOW CHANNEL



Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.496	69.45	PK3	25.1	-44.34	50.21	-	-	74	-23.79	333	158	H
* 1.562	66.14	PK3	25.1	-44.44	46.8	-	-	74	-27.2	253	152	H
* 1.626	68.99	PK3	25.4	-44.31	50.08	-	-	74	-23.92	319	143	H
* 1.497	68.73	PK3	25.1	-44.33	49.5	-	-	74	-24.5	145	141	V
* 1.549	70	PK3	25.2	-44.32	50.88	-	-	74	-23.12	342	197	V
* 1.597	71.98	PK3	25.2	-44.25	52.93	-	-	74	-21.07	139	125	V
* 12.009	63.82	PK3	37.3	-47.2	53.92	-	-	74	-20.08	72	168	V
* 1.496	55.87	VB1T	25.1	-44.34	36.63	54	-17.37	-	-	333	158	H
* 1.562	52.57	VB1T	25.1	-44.45	33.22	54	-20.78	-	-	253	152	H
* 1.626	53.94	VB1T	25.4	-44.29	35.05	54	-18.95	-	-	319	143	H
* 1.497	55.12	VB1T	25.1	-44.33	35.89	54	-18.11	-	-	145	141	V
* 1.549	53.82	VB1T	25.2	-44.32	34.7	54	-19.3	-	-	342	197	V
* 1.597	54.73	VB1T	25.2	-44.25	35.68	54	-18.32	-	-	139	125	V
* 12.009	57.55	VB1T	37.3	-47.2	47.65	54	-6.35	-	-	72	168	V

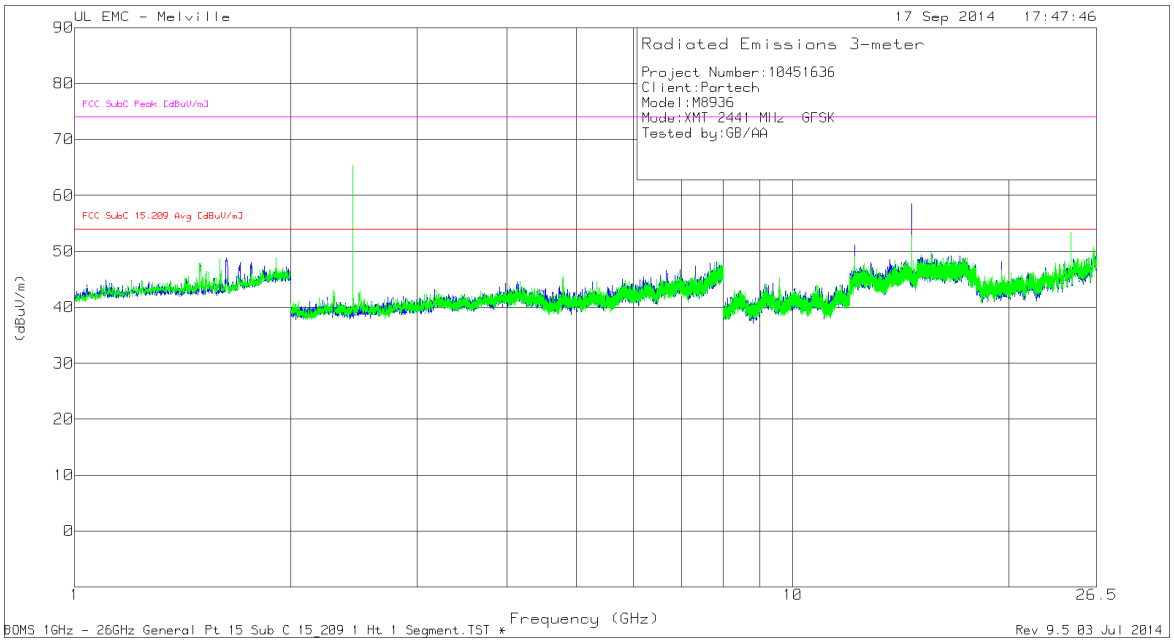
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

No additional frequencies above the system noise floor within the restricted band

HARMONICS AND SPURIOUS EMISSIONS – MID CHANNEL



Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.498	69.15	PK3	25.1	-44.32	49.93	-	-	74	-24.07	320	160	H
* 1.7	66.67	PK3	25.9	-44.08	48.49	-	-	74	-25.51	344	170	H
* 12.204	61.65	PK3	37.2	-46.13	52.72	-	-	74	-21.28	150	264	H
* 19.529	64.68	PK3	40.8	-52.04	53.44	-	-	74	-20.56	89	247	H
* 1.497	68.38	PK3	25.1	-44.33	49.15	-	-	74	-24.85	155	137	V
* 1.593	68.08	PK3	25.2	-44.29	48.99	-	-	74	-25.01	340	114	V
* 12.206	60.94	PK3	37.3	-46.15	52.09	-	-	74	-21.91	126	207	V
* 19.527	63.43	PK3	41.1	-52.09	52.44	-	-	74	-21.56	125	221	V
* 1.498	54.59	VB1T	25.1	-44.33	35.36	54	-18.64	-	-	320	160	H
* 1.7	52.43	VB1T	25.9	-44.09	34.24	54	-19.76	-	-	344	170	H
* 12.205	51.54	VB1T	37.2	-46.13	42.61	54	-11.39	-	-	150	264	H
* 19.529	52.67	VB1T	40.8	-52.04	41.43	54	-12.57	-	-	89	247	H
* 1.497	54.96	VB1T	25.1	-44.33	35.73	54	-18.27	-	-	155	137	V
* 1.593	51.93	VB1T	25.2	-44.29	32.84	54	-21.16	-	-	340	114	V
* 12.205	50.42	VB1T	37.3	-46.15	41.57	54	-12.43	-	-	126	207	V
* 19.527	51.2	VB1T	41.1	-52.08	40.22	54	-13.78	-	-	125	221	V

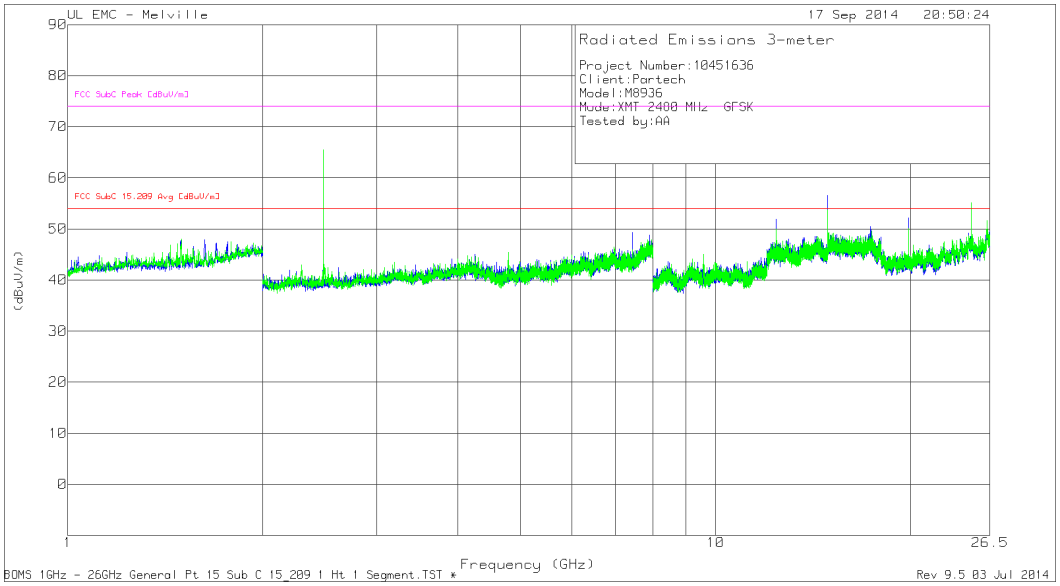
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

No additional frequencies above the system noise floor within the restricted band

HARMONICS AND SPURIOUS EMISSIONS – HIGH CHANNEL



Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.495	69.44	PK3	25.1	-44.35	50.19	-	-	74	-23.81	331	151	H
* 1.567	67.47	PK3	25.1	-44.41	48.16	-	-	74	-25.84	245	217	H
* 1.626	68.33	PK3	25.4	-44.29	49.44	-	-	74	-24.56	234	225	H
* 1.697	67.44	PK3	25.9	-44.14	49.2	-	-	74	-24.8	204	102	H
* 7.44	68.02	PK3	28.1	-42.61	53.51	-	-	74	-20.49	249	171	H
* 12.399	63.72	PK3	37.2	-47.8	53.12	-	-	74	-20.88	145	160	H
* 19.839	66.08	PK3	40.9	-51.63	55.35	-	-	74	-18.65	75	118	H
* 1.5	65.51	PK3	25.1	-44.25	46.36	-	-	74	-27.64	35	195	V
* 1.561	69.69	PK3	25.2	-44.41	50.48	-	-	74	-23.52	339	188	V
* 12.399	62.27	PK3	37.4	-47.8	51.87	-	-	74	-22.13	68	174	V
* 19.838	65.25	PK3	41.1	-51.63	54.72	-	-	74	-19.28	79	310	V
* 1.495	55.9	VB1T	25.1	-44.35	36.65	54	-17.35	-	-	331	151	H
* 1.567	52.66	VB1T	25.1	-44.41	33.35	54	-20.65	-	-	245	217	H
* 1.626	53.82	VB1T	25.4	-44.28	34.94	54	-19.06	-	-	234	225	H
* 1.697	53.14	VB1T	25.9	-44.13	34.91	54	-19.09	-	-	204	102	H
* 7.44	62.76	VB1T	28.1	-42.61	48.25	54	-5.75	-	-	249	171	H
* 12.399	58.29	VB1T	37.2	-47.8	47.69	54	-6.31	-	-	145	160	H
* 19.839	59.51	VB1T	40.9	-51.63	48.78	54	-5.22	-	-	75	118	H
* 1.5	52.36	VB1T	25.1	-44.26	33.2	54	-20.8	-	-	35	195	V
* 1.56	54.89	VB1T	25.2	-44.4	35.69	54	-18.31	-	-	339	188	V
* 12.399	56.35	VB1T	37.4	-47.8	45.95	54	-8.05	-	-	68	174	V
* 19.839	57.82	VB1T	41.1	-51.63	47.29	54	-6.71	-	-	79	310	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

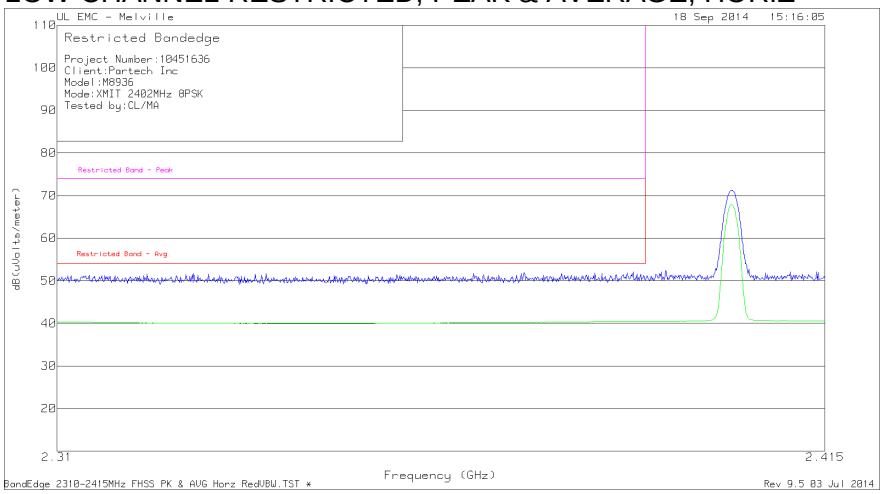
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

No additional frequencies above the system noise floor within the restricted band

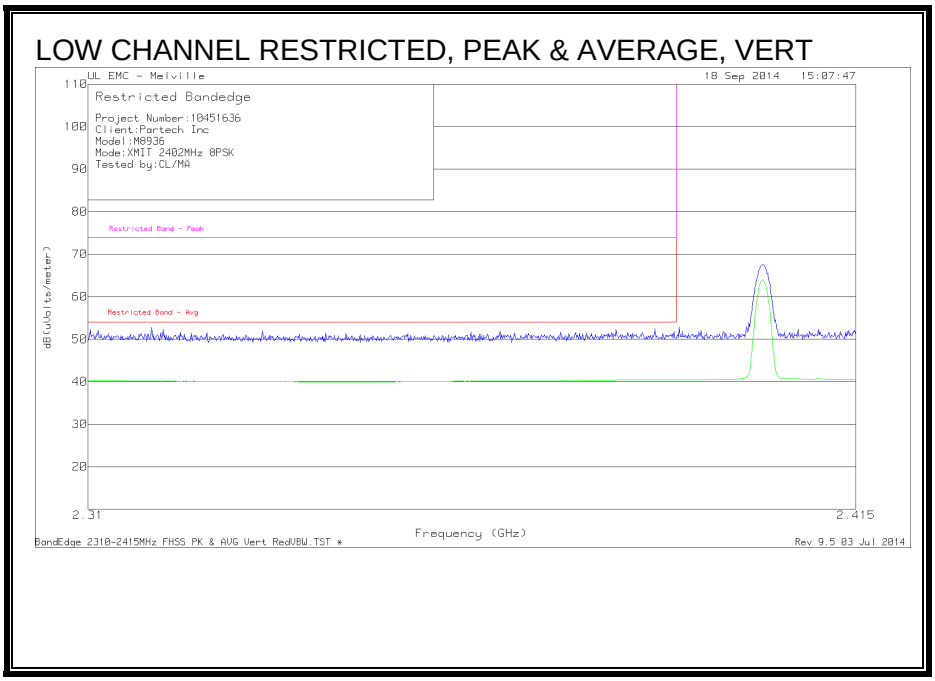
9.2.2. BASIC DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK & AVERAGE, HORIZ

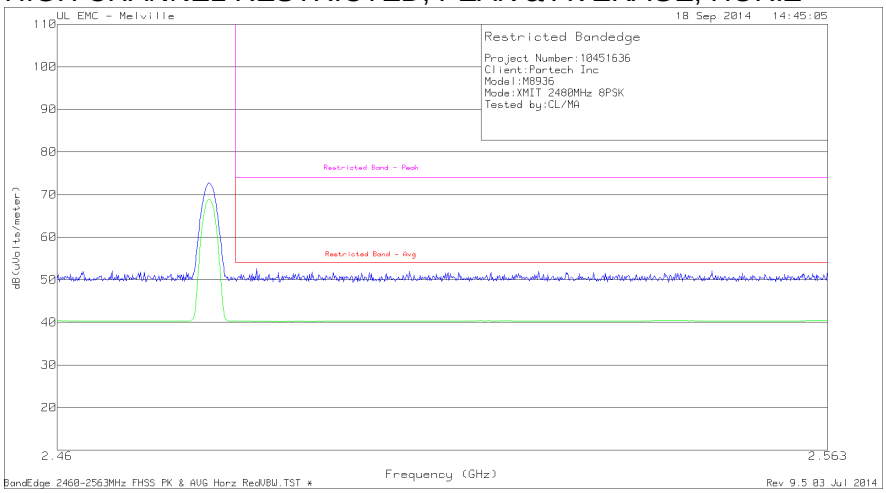


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



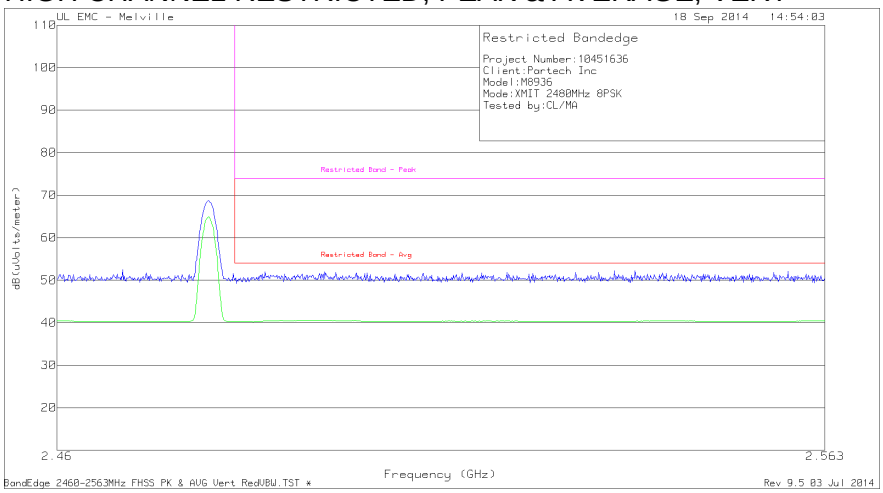
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL RESTRICTED, PEAK & AVERAGE, HORIZ

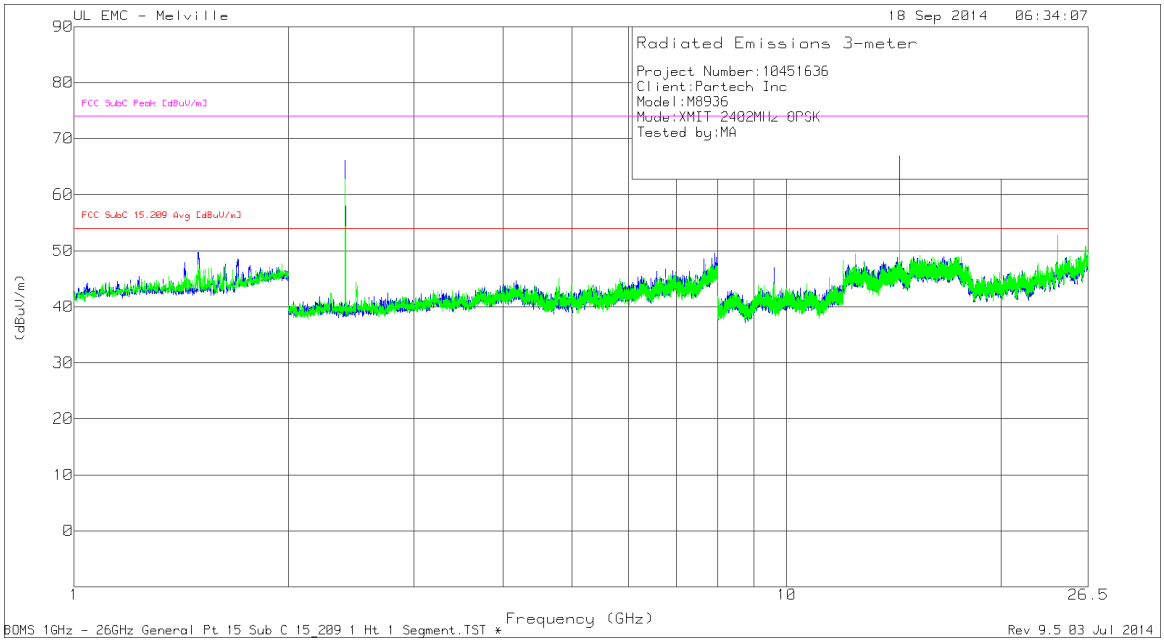


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL RESTRICTED, PEAK & AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS – LOW CHANNEL



Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.499	64.56	PK3	25.1	-44.3	45.36	-	-	74	-28.64	138	146	H
* 1.693	67.89	PK3	25.9	-44.17	49.62	-	-	74	-24.38	210	203	H
* 4.795	65.99	PK3	27.1	-45.46	47.63	-	-	74	-26.37	266	293	H
* 4.794	67.03	PK3	27.1	-45.47	48.66	-	-	74	-25.34	75	344	V
* 1.495	51.47	VB1T	25.1	-44.35	32.22	54	-21.78	-	-	138	146	H
* 1.693	54.03	VB1T	25.9	-44.17	35.76	54	-18.24	-	-	210	203	H
* 4.799	50.92	VB1T	27.1	-45.4	32.62	54	-21.38	-	-	266	293	H
* 4.794	51.15	VB1T	27.1	-45.47	32.78	54	-21.22	-	-	75	344	V

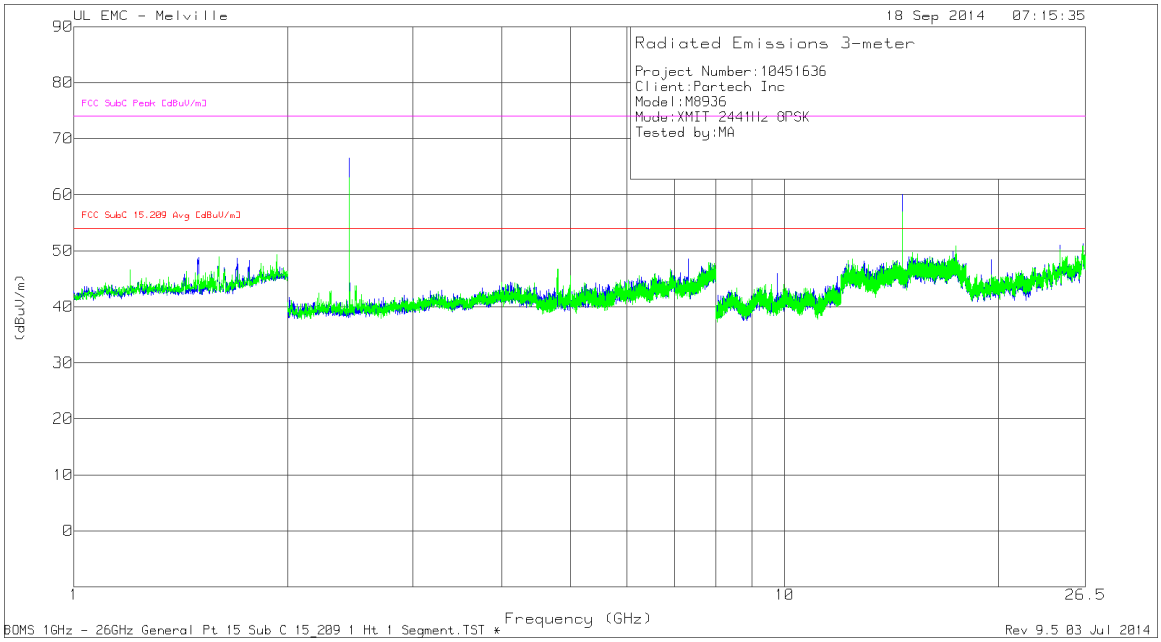
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

Note: No other emission s above the system noise floor within the restricted bands

HARMONICS AND SPURIOUS EMISSIONS – MID CHANNEL



Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.495	68.94	PK3	25.1	-44.35	49.69	-	-	74	-24.31	305	149	H
* 1.697	68.02	PK3	25.9	-44.13	49.79	-	-	74	-24.21	212	196	H
* 7.322	64.75	PK3	28	-42.19	50.56	-	-	74	-23.44	241	129	H
* 7.323	62.41	PK3	28	-42.19	48.22	-	-	74	-25.78	86	104	V
* 12.206	60.19	PK3	37.2	-46.15	51.24	-	-	74	-22.76	241	138	H
* 12.204	57.72	PK3	37.2	-46.13	48.79	-	-	74	-25.21	309	374	V
* 1.496	55.46	VB1T	25.1	-44.34	36.22	54	-17.78	-	-	305	149	H
* 1.695	54.36	VB1T	25.9	-44.17	36.09	54	-17.91	-	-	212	196	H
* 7.323	55.36	VB1T	28	-42.19	41.17	54	-12.83	-	-	241	129	H
* 7.323	51.25	VB1T	28	-42.19	37.06	54	-16.94	-	-	86	104	V
* 12.205	46.61	VB1T	37.2	-46.14	37.67	54	-16.33	-	-	241	138	H
* 12.205	45.9	VB1T	37.2	-46.14	36.96	54	-17.04	-	-	309	374	V

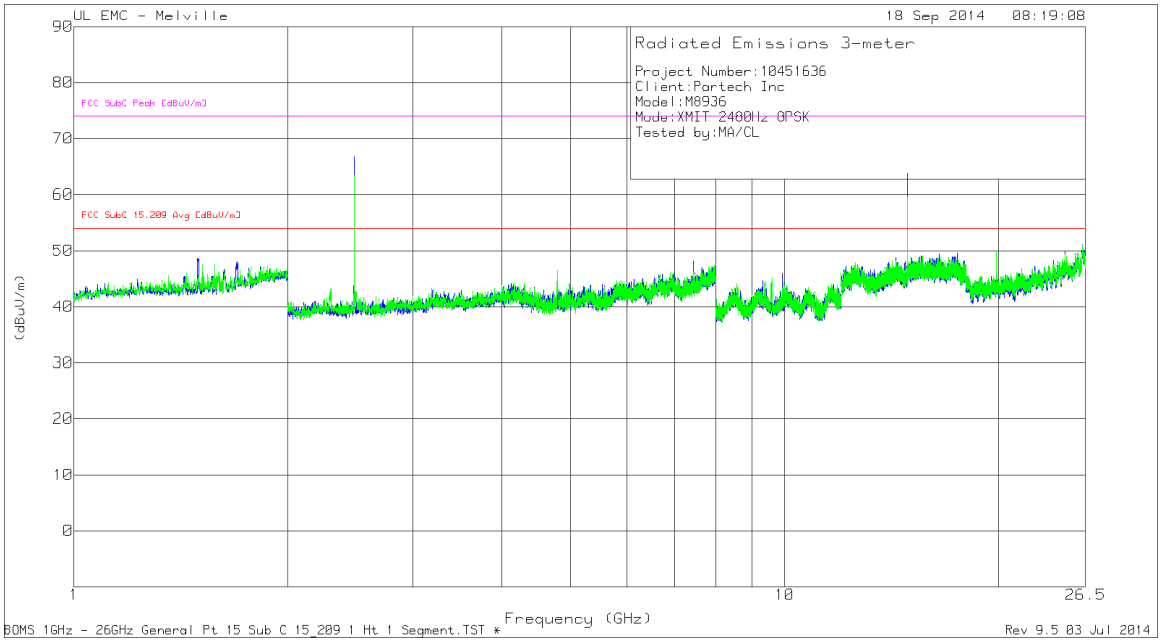
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

Note: No other emission s above the system noise floor within the restricted bands

HARMONICS AND SPURIOUS EMISSIONS – HIGH CHANNEL



Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	64.85	PK3	27.3	-45.14	47.01	-	-	74	-26.99	38	178	H
* 4.96	63.79	PK3	27.3	-45.14	45.95	-	-	74	-28.05	141	265	V
* 7.44	66.05	PK3	28.1	-42.6	51.55	-	-	74	-22.45	248	164	H
* 7.44	62.9	PK3	28.1	-42.6	48.4	-	-	74	-25.6	291	262	V
* 12.4	61.3	PK3	37.2	-47.81	50.69	-	-	74	-23.31	158	273	H
* 12.4	58.01	PK3	37.2	-47.81	47.4	-	-	74	-26.6	233	310	V
* 19.84	67.24	PK3	40.9	-51.63	56.51	-	-	74	-17.49	214	165	H
* 19.84	67.99	PK3	40.9	-51.63	57.26	-	-	74	-16.74	298	180	V
* 22.32	58.94	PK3	40.8	-47.36	52.38	-	-	74	-21.62	354	160	V
* 22.32	59.28	PK3	40.8	-47.36	52.72	-	-	74	-21.28	110	205	H
* 4.96	53.72	VB1T	27.3	-45.14	35.88	54	-18.12	-	-	38	178	H
* 4.96	51.71	VB1T	27.3	-45.14	33.87	54	-20.13	-	-	141	265	V
* 7.44	57.46	VB1T	28.1	-42.6	42.96	54	-11.04	-	-	248	164	H
* 7.44	50.96	VB1T	28.1	-42.6	36.46	54	-17.54	-	-	291	262	V
* 12.4	49.72	VB1T	37.2	-47.81	39.11	54	-14.89	-	-	158	273	H
* 12.4	45.32	VB1T	37.2	-47.81	34.71	54	-19.29	-	-	233	310	V
* 19.84	55.28	VB1T	40.9	-51.63	44.55	54	-9.45	-	-	214	165	H
* 19.84	56.78	VB1T	40.9	-51.63	46.05	54	-7.95	-	-	298	180	V
* 22.32	46.35	VB1T	40.8	-47.36	39.79	54	-14.21	-	-	354	160	V
* 22.32	46.31	VB1T	40.8	-47.36	39.75	54	-14.25	-	-	110	205	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

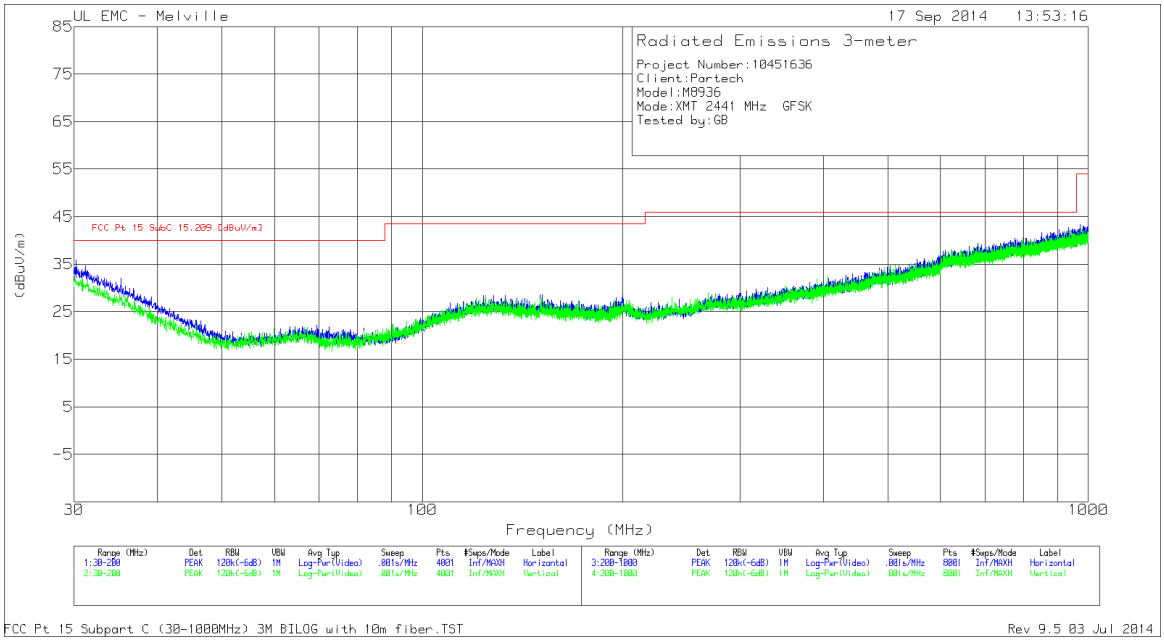
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

Note: No other emission s above the system noise floor within the restricted bands

9.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORSE-CASE GFSK MODE)

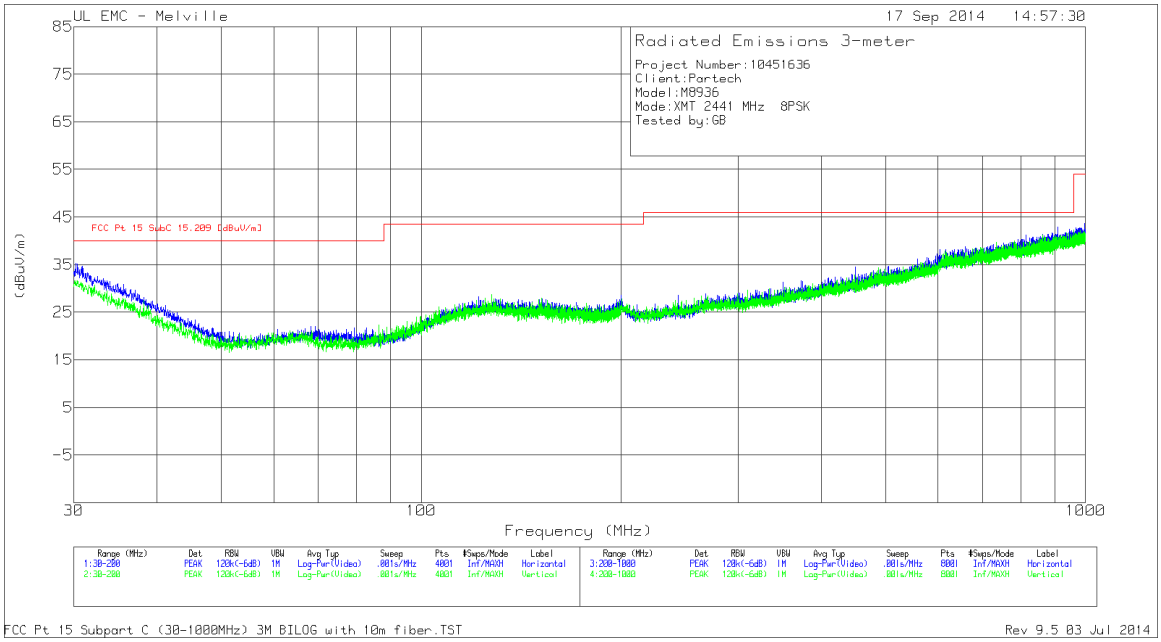
HORIZONTAL & VERICAL PLOT



NOTE: No emissions detected above the system noise floor

SPURIOUS EMISSIONS 30 TO 1000 MHz (OWRSE-CASE 8PSK MODE)

HORIZONTAL & VERTICAL PLOT



NOTE: No emissions detected above the system noise floor

10. 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.

Note: Since the fundamental of the RFID module was present on the initial scans, additional scans were performed with the output of the RFID module terminated.

RESULTS

WORST EMISSIONS – CONNECTED THROUGH LAPTOP

Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
.15276	20.58	CAV	10	30.58	65.85	-35.27	55.85	-25.27
.15959	20.58	CAV	10	30.58	65.49	-34.91	55.49	-24.91
.19292	36.17	CAV	10	46.17	63.91	-17.74	53.91	-7.74
.20509	35.29	CAV	10	45.29	63.4	-18.11	53.4	-8.11
.26585	34.46	CAV	10	44.46	61.25	-16.79	51.25	-6.79
.27897	25.29	CAV	10	35.29	60.85	-25.56	50.85	-15.56
.29113	17.96	CAV	10	27.96	60.49	-32.53	50.49	-22.53
.31411	21.2	CAV	10	31.2	59.86	-28.66	49.86	-18.66
.32264	21.97	CAV	10	31.97	59.64	-27.67	49.64	-17.67
.33843	22.15	CAV	10	32.15	59.24	-27.09	49.24	-17.09
.34874	14.17	CAV	10	24.17	58.99	-34.82	48.99	-24.82
.37177	12.82	CAV	10	22.82	58.46	-35.64	48.46	-25.64
.3889	17.36	CAV	10	27.36	58.09	-30.73	48.09	-20.73
.4011	17.84	CAV	10	27.84	57.83	-29.99	47.83	-19.99
.40653	17.6	CAV	10	27.6	57.72	-30.12	47.72	-20.12
.412	15.95	CAV	10	25.95	57.61	-31.66	47.61	-21.66
Frequency (MHz)	**Meter Reading (dBuV)**	**Det**	**Line 2 G/L (dB)**	**Corrected Reading (dBuV)**	**Class B QPK Limit (dBuV)**	**Margin (dB)**	**Class B Avg Limit (dBuV)**	**Margin (dB)**
.15842	21.04	CAV	10.1	31.14	65.55	-34.41	55.55	-24.41
.17145	20.84	CAV	10	30.84	64.89	-34.05	54.89	-24.05
.18073	21.52	CAV	10	31.52	64.45	-32.93	54.45	-22.93
.19731	35.92	CAV	10	45.92	63.72	-17.8	53.72	-7.8
.20481	34.66	CAV	10	44.66	63.41	-18.75	53.41	-8.75
.25356	26.77	CAV	10	36.77	61.64	-24.87	51.64	-14.87
.274	28.22	CAV	10	38.22	61	-22.78	51	-12.78
.28092	25.68	CAV	10	35.68	60.79	-25.11	50.79	-15.11
.30208	17.72	CAV	10	27.72	60.19	-32.47	50.19	-22.47
.31182	21.82	CAV	10	31.82	59.92	-28.1	49.92	-18.1
.31823	25.09	CAV	10	35.09	59.75	-24.66	49.75	-14.66
.32473	25.29	CAV	10	35.29	59.58	-24.29	49.58	-14.29
.3369	24.73	CAV	10	34.73	59.28	-24.55	49.28	-14.55
.36342	8.92	CAV	10	18.92	58.65	-39.73	48.65	-29.73
.38795	17.48	CAV	10	27.48	58.11	-30.63	48.11	-20.63
.39585	17.17	CAV	10.1	27.27	57.94	-30.67	47.94	-20.67

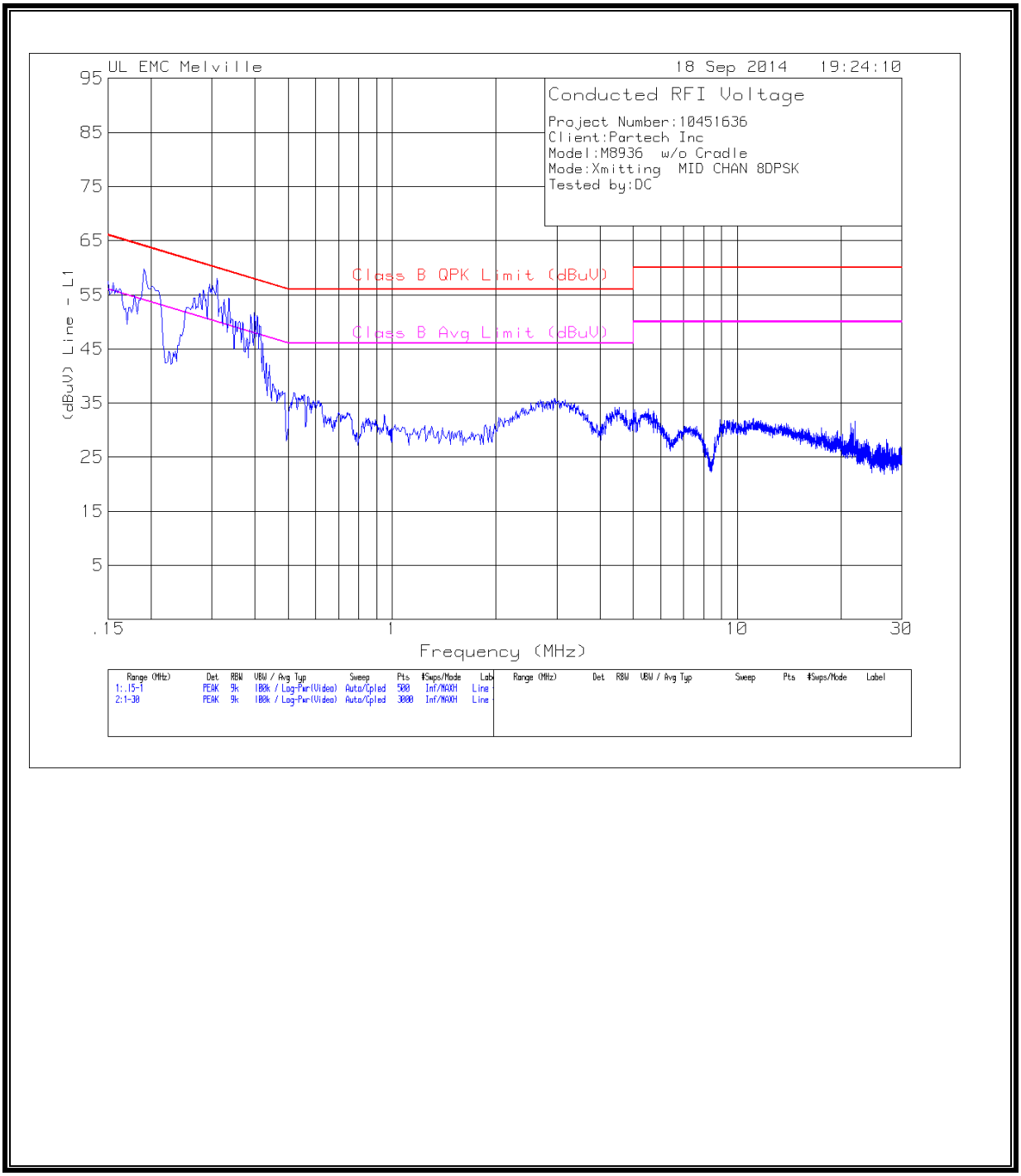
CAV - CISPR average detection

WORST EMISSIONS – CONNECTED THROUGH LAPTOP (CONT)

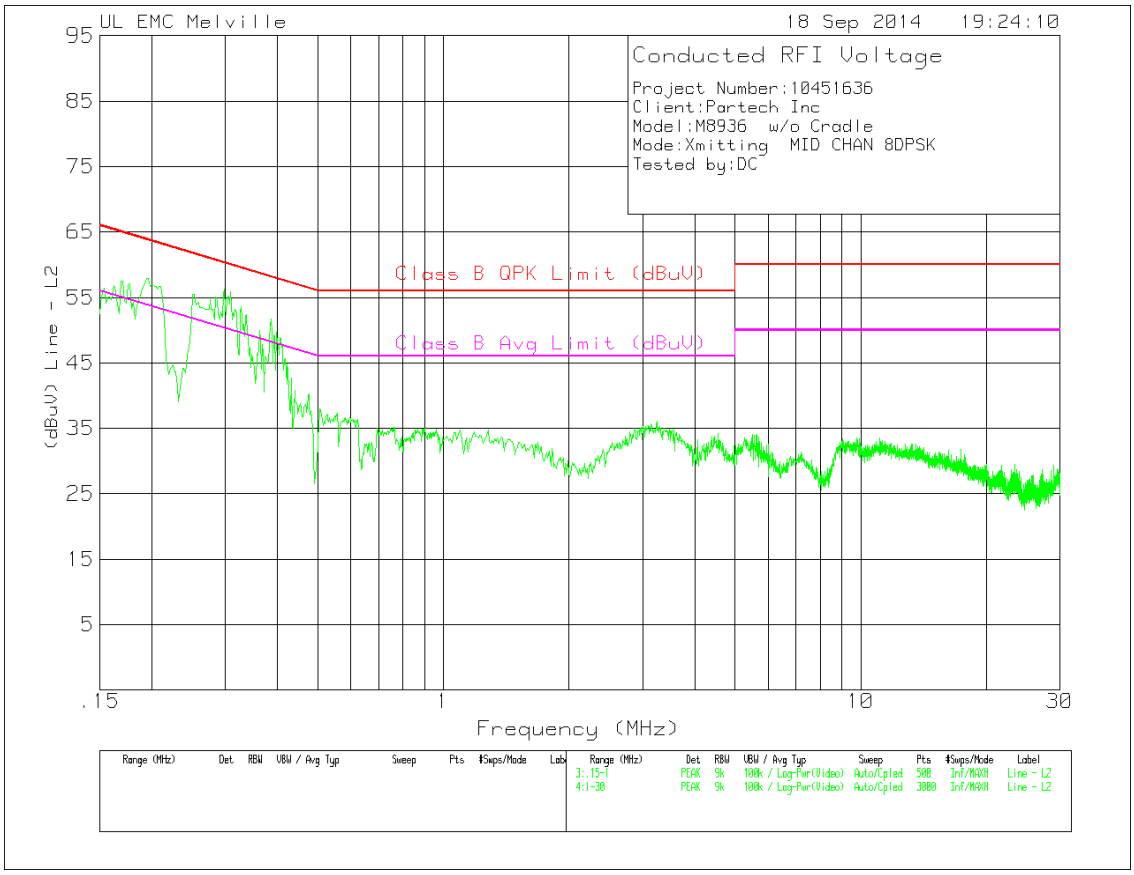
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
.192895	42.55	QP	10	52.55	63.91	-11.36	53.91	-1.36
.279427	36.45	QP	10	46.45	60.83	-14.38	50.83	-4.38
.293925	38.67	QP	10	48.67	60.41	-11.74	50.41	-1.74
.313568	36.54	QP	10	46.54	59.88	-13.34	49.88	-3.34
.323313	36.26	QP	10	46.26	59.62	-13.36	49.62	-3.36
.335525	36.45	QP	10	46.45	59.31	-12.86	49.31	-2.86
.399908	30.75	QP	10	40.75	57.86	-17.11	47.86	-7.11
Frequency (MHz)	**Meter Reading (dBuV)**	**Det**	**Line 2 G/L (dB)**	**Corrected Reading (dBuV)**	**Class B QPK Limit (dBuV)**	**Margin (dB)**	**Class B Avg Limit (dBuV)**	**Margin (dB)**
.192798	41.97	QP	10	51.97	63.92	-11.95	53.92	-1.95
.280598	35.78	QP	10	45.78	60.8	-15.02	50.8	-5.02
.302118	37.5	QP	10	47.5	60.18	-12.68	50.18	-2.68
.312243	37.26	QP	10	47.26	59.91	-12.65	49.91	-2.65
.32458	36.9	QP	10	46.9	59.59	-12.69	49.59	-2.69

QP - Quasi-Peak detector

LINE 1 RESULTS – CONNECTED THROUGH LAPTOP



LINE 2 RESULTS – CONNECTED THROUGH LAPTOP



WORST EMISSIONS – WITH ANTENNA CONNECTED

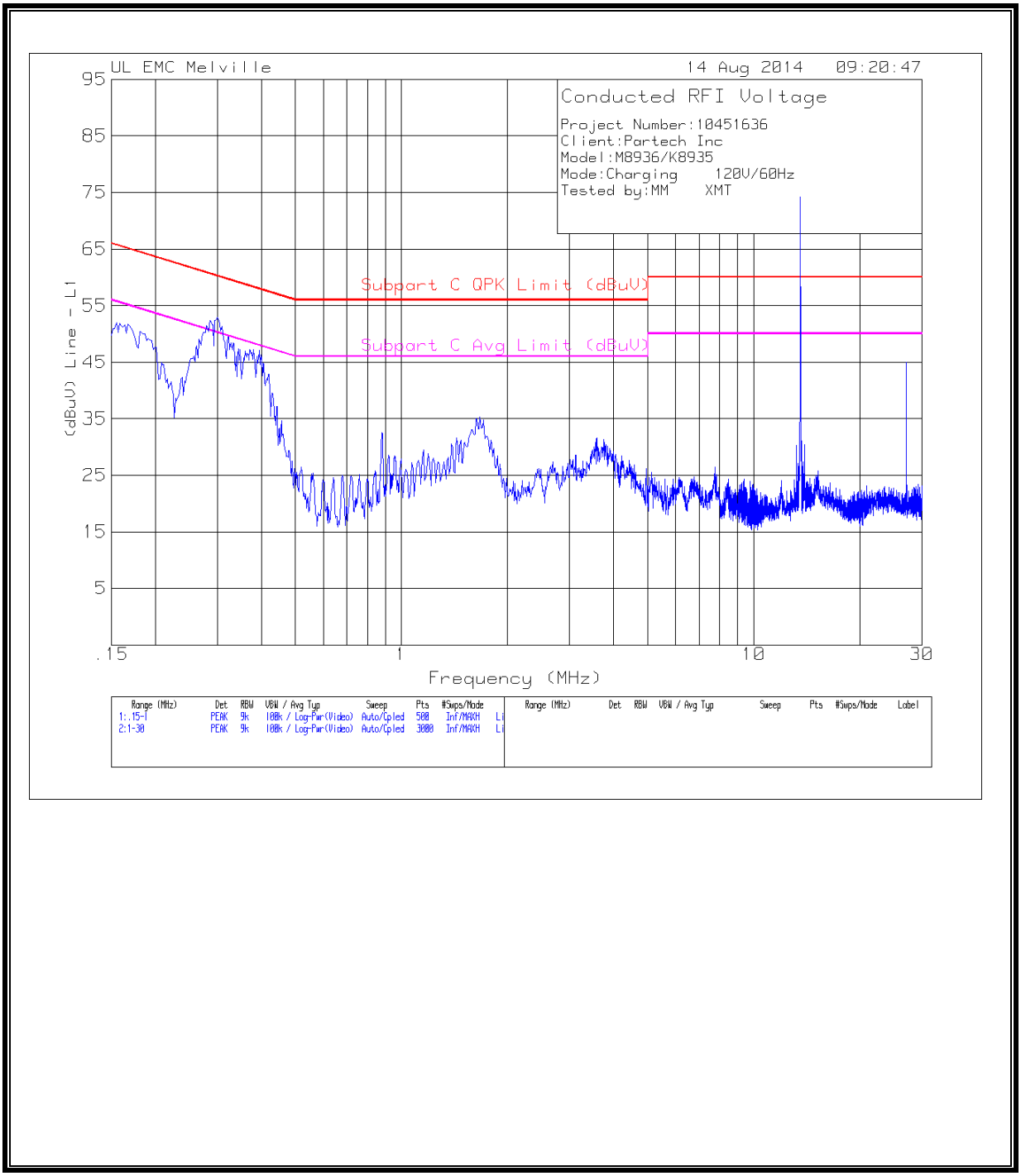
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.163753	16.16	CAV	10	26.16	-	-	55.27	-29.11
.27783	16.09	CAV	10	26.09	-	-	50.88	-24.79
.28716	14.61	CAV	10	24.61	-	-	50.61	-26
.317873	14.35	CAV	10	24.35	-	-	49.76	-25.41
.343743	8.41	CAV	10	18.41	-	-	49.11	-30.7
.378083	7.3	CAV	10	17.3	-	-	48.32	-31.02
13.5597	58.88	CAV	10.8	69.68	-	-	**50**	**19.68**
27.119125	20.19	CAV	11.8	31.99	-	-	50	-18.01
Frequency (MHz)	**Meter Reading (dBuV)**	**Det**	**Line 2 G/L (dB)**	**Corrected Reading (dBuV)**	**Subpart C QPK Limit (dBuV)**	**Margin (dB)**	**Subpart C Avg Limit (dBuV)**	**Margin (dB)**
.175323	14.43	CAV	10	24.43	-	-	54.7	-30.27
.269303	11.08	CAV	10	21.08	-	-	51.14	-30.06
.290325	13.71	CAV	10	23.71	-	-	50.52	-26.81
.337788	8.41	CAV	10	18.41	-	-	49.26	-30.85
.379048	7.1	CAV	10	17.1	-	-	48.3	-31.2
13.559725	55.58	CAV	10.9	66.48	-	-	**50**	**16.48**
27.11955	15.8	CAV	11.9	27.7	-	-	50	-22.3

CAV - CISPR average detection

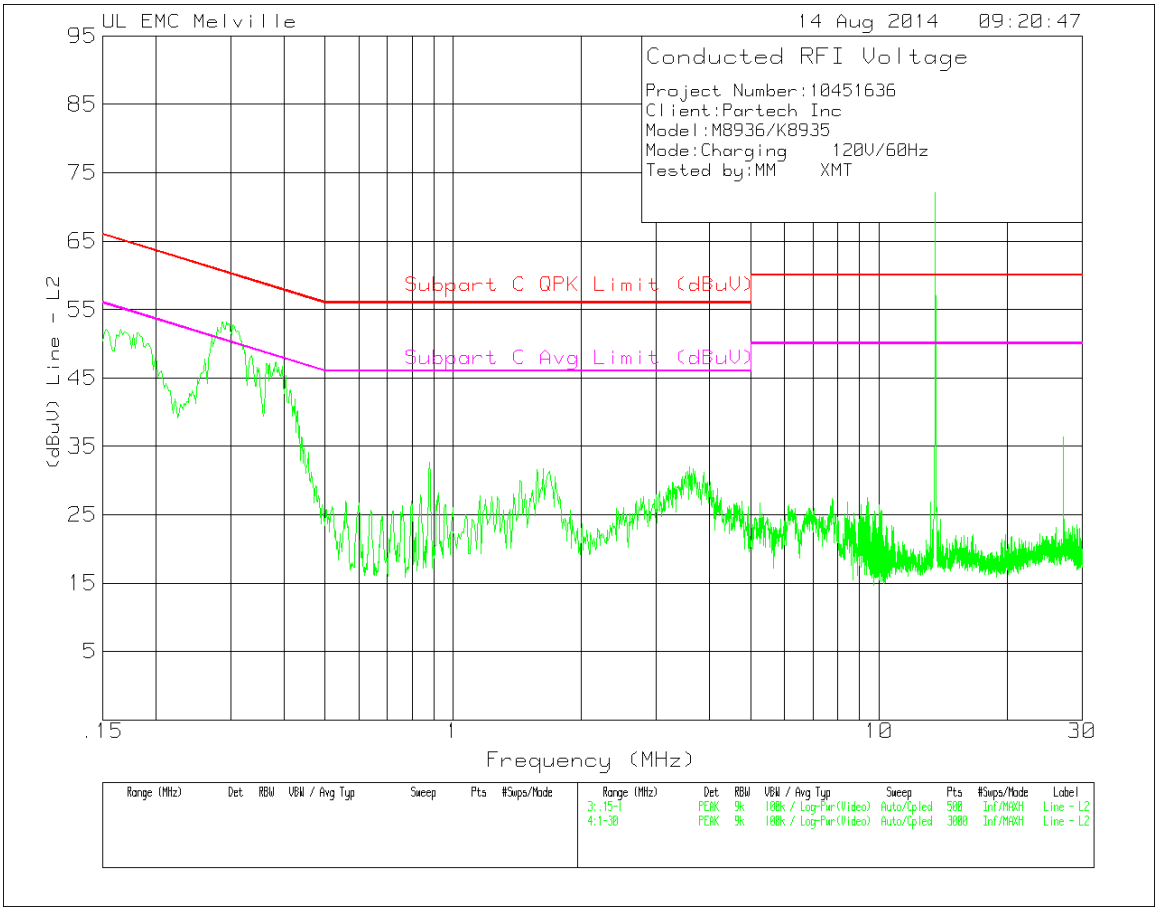
Frequency (MHz)	Meter Reading (dBuV)	Det	Line 1 G/L (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.163753	33.67	QP	10	43.67	65.27	-21.6	-	-
.27783	33.13	QP	10	43.13	60.88	-17.75	-	-
.28716	34.83	QP	10	44.83	60.61	-15.78	-	-
.317873	31.37	QP	10	41.37	59.76	-18.39	-	-
.343743	27.65	QP	10	37.65	59.11	-21.46	-	-
.378083	27.69	QP	10	37.69	58.32	-20.63	-	-
13.5597	63.2	QP	10.8	74	**60**	**14**	-	-
27.119125	31.03	QP	11.8	42.83	60	-17.17	-	-
Frequency (MHz)	**Meter Reading (dBuV)**	**Det**	**Line 2 G/L (dB)**	**Corrected Reading (dBuV)**	**Subpart C QPK Limit (dBuV)**	**Margin (dB)**	**Subpart C Avg Limit (dBuV)**	**Margin (dB)**
.175323	34.05	QP	10	44.05	64.7	-20.65	-	-
.269303	31.34	QP	10	41.34	61.14	-19.8	-	-
.290325	35.27	QP	10	45.27	60.52	-15.25	-	-
.337788	28.29	QP	10	38.29	59.26	-20.97	-	-
.379048	27.58	QP	10	37.58	58.3	-20.72	-	-
13.559725	59.68	QP	10.9	70.58	**60**	**10.58**	-	-
27.11955	23.92	QP	11.9	35.82	60	-24.18	-	-

QP - Quasi-Peak detector

LINE 1 RESULTS – WITH ANTENNA CONNECTED



LINE 2 RESULTS – WITH ANTENNA CONNECTED

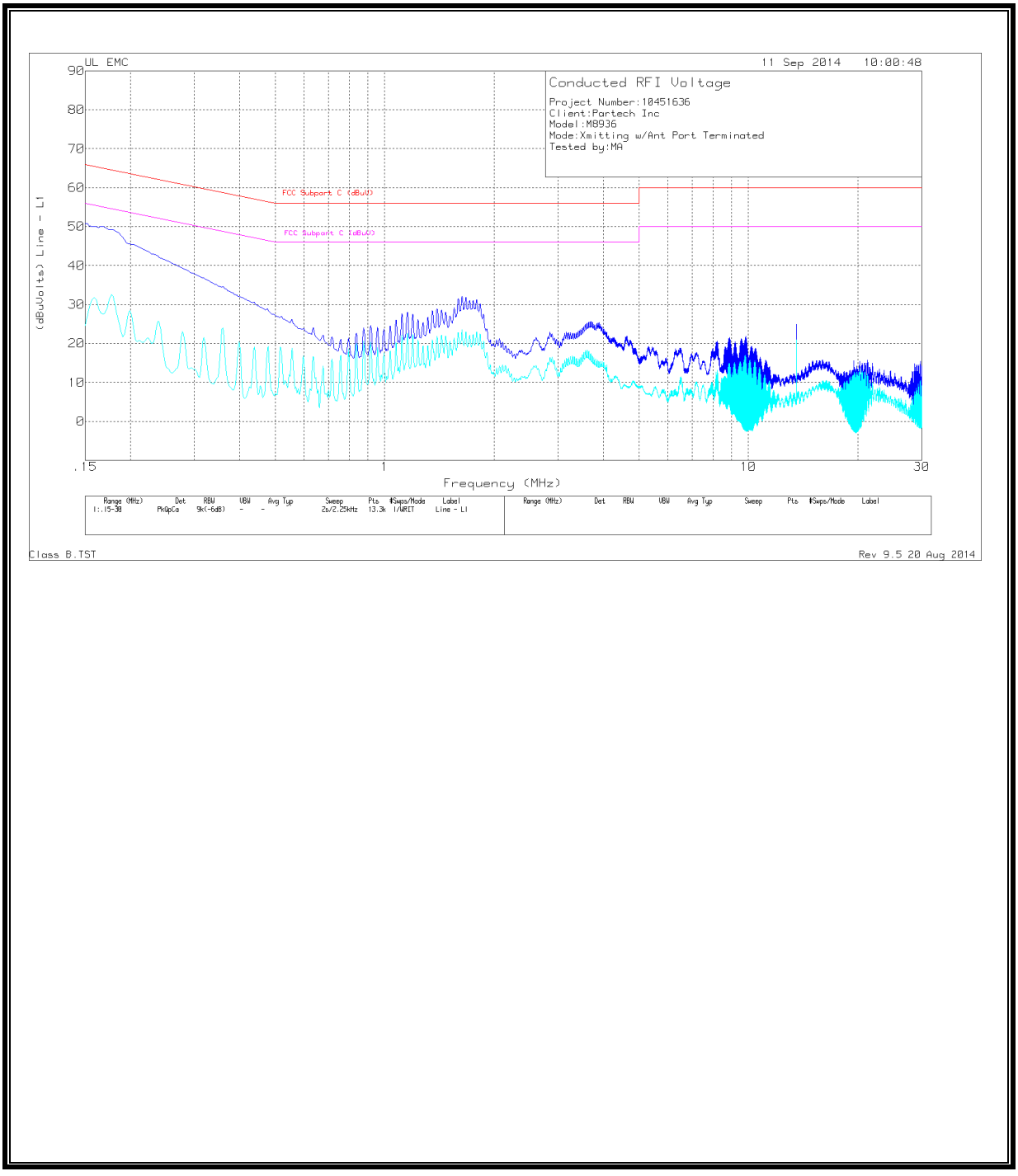


WORST EMISSIONS – WITH ANTENNA PORT TERMINATED

Frequency (MHz)	Meter Reading (dBuV)	Det	K1SWTL (dB)	Corrected Reading (dBuVolts)	FCC Subpart C QPk (dBuV)	QP Margin (dB)	FCC Subpart C Avg (dBuV)	Av(CISPR)Margin (dB)
.15225	17.29	Ca	10	27.29	-	-	55.88	-28.59
.18825	13.13	Ca	10	23.13	-	-	54.11	-30.98
.28275	9.46	Ca	10	19.46	-	-	50.73	-31.27
1.671	12.78	Ca	10.1	22.88	-	-	46	-23.12
13.56	10.62	Ca	10.3	20.92	-	-	50	-29.08
27.1185	-5.06	Ca	10.5	5.44	-	-	50	-44.56
.15225	40.78	Qp	10	50.78	65.88	-15.1	-	-
.18825	37.78	Qp	10	47.78	64.11	-16.33	-	-
.28275	28.94	Qp	10	38.94	60.73	-21.79	-	-
1.671	21.7	Qp	10.1	31.8	56	-24.2	-	-
13.56	14.65	Qp	10.3	24.95	60	-35.05	-	-
27.1185	-.02	Qp	10.5	10.48	60	-49.52	-	-
Frequency (MHz)	**Meter Reading (dBuV)**	**Det**	**K2SWTL (dB)**	**Corrected Reading (dBuVolts)**	**FCC Subpart C QPk (dBuV)**	**QP Margin (dB)**	**FCC Subpart C Avg (dBuV)**	**Av(CISPR)Margin (dB)**
.16125	18.23	Ca	10	28.23	-	-	55.4	-27.17
.27375	6.47	Ca	10	16.47	-	-	51	-34.53
1.6305	9.66	Ca	10.1	19.76	-	-	46	-26.24
3.75	3.56	Ca	10.1	13.66	-	-	46	-32.34
13.56	7.96	Ca	10.3	18.26	-	-	50	-31.74
26.36925	-6.61	Ca	10.5	3.89	-	-	50	-46.11
.16125	42.01	Qp	10	52.01	65.4	-13.39	-	-
.27375	32.6	Qp	10	42.6	61	-18.4	-	-
1.6305	18.17	Qp	10.1	28.27	56	-27.73	-	-
3.75	14.41	Qp	10.1	24.51	56	-31.49	-	-
13.56	10.93	Qp	10.3	21.23	60	-38.77	-	-
26.36925	-1.77	Qp	10.5	8.73	60	-51.27	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 1 RESULTS – WITH ANTENNA PORT TERMINATED



LINE 2 RESULTS – WITH ANTENNA PORT TERMINATED