



**CFR47 PART 15 SUBPART C
CERTIFICATION TEST REPORT
FOR**

CDMA 1XRTT BC10/BC0/BC1 SLIDER MOBILE PHONE with BT 2.1

MODEL NUMBER: S3150

**FCC ID: V65S3150
REPORT NUMBER: 13U16201-1
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Prepared for
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NVLAP LAB CODE 200065-0

Revision History

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<u>---</u>	<u>10/07/13</u>	<u>Initial Issue</u>	<u>T. Chan</u>

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: KYOCERA CORP
EUT DESCRIPTION: CDMA 1xRTT BC10/BC0/BC1 Slider Mobile Phone with BT 2.1
MODEL: S3150
SERIAL NUMBER: 9211100168
DATE TESTED: OCTOBER 03 -04, 2013

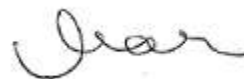
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL Verification Services Inc. 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 Verification Services 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 Verification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services 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 Verification Services Inc. By:

Tested By:



THU CHAN
WiSE Operations Manager
UL Verification Services Inc.

MONA HUA
WiSE Lab Technician
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
<input type="checkbox"/> Chamber A	<input checked="" type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ul.com>.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a CDMA 1xRTT BC10/BC0/BC1 slider mobile phone with Bluetooth 2.1.

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	Basic GFSK	-0.357	0.92
2402 - 2480	Enhanced QPSK	0.325	1.08
2402 - 2480	Enhanced 8PSK	-0.238	0.95

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PiFA antenna, with a maximum gain as below table.

Frequency (MHz)	Antenna Gain (dBi)
2402 -2480	-5.0

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0.500SP.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT is a portable device that has three orientations, Closed and Slide open; therefore, X (Lay down), Y (Landscape) and Z orientations (Standup) have been investigated with headset and AC/DC Charger with EUT closed and slide open and the worst case was found to be at X position, closed position with headset only.

The worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was including headset, AC charger and the mode and channel with the highest output power.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Kyocera	SCP-38ADT	5AAXAD040ULA	NA
Earphone	NA	NA	NA	NA

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.1m	To Spectrum Analyzer

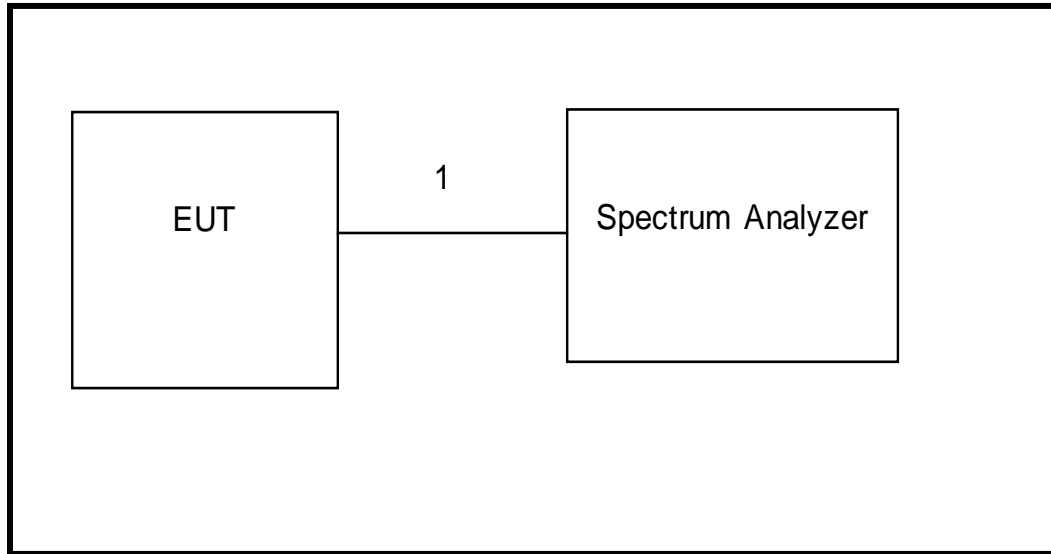
I/O CABLES (RADIATED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Audio	1	Jack	Un-Shielded	0.5m	NA

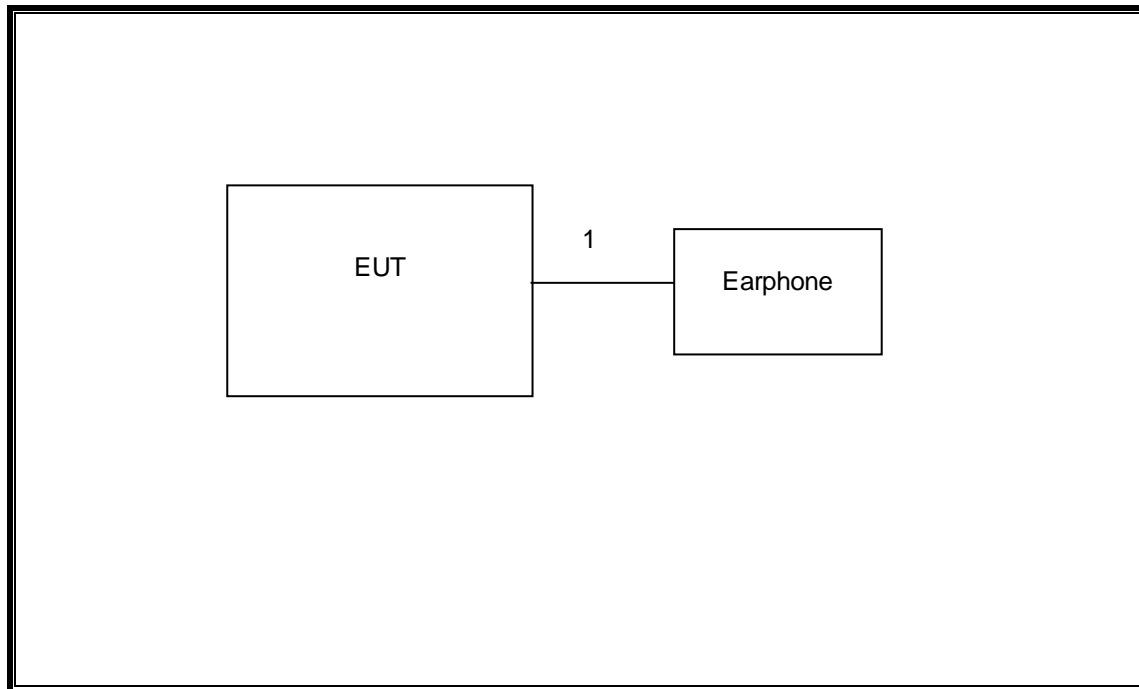
I/O CABLES (AC POWER CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115V	Un-Shielded	2m	NA
2	DC	1	USB	Un-Shielded	2m	NA
3	Audio	1	Jack	Un-Shielded	0.5m	NA

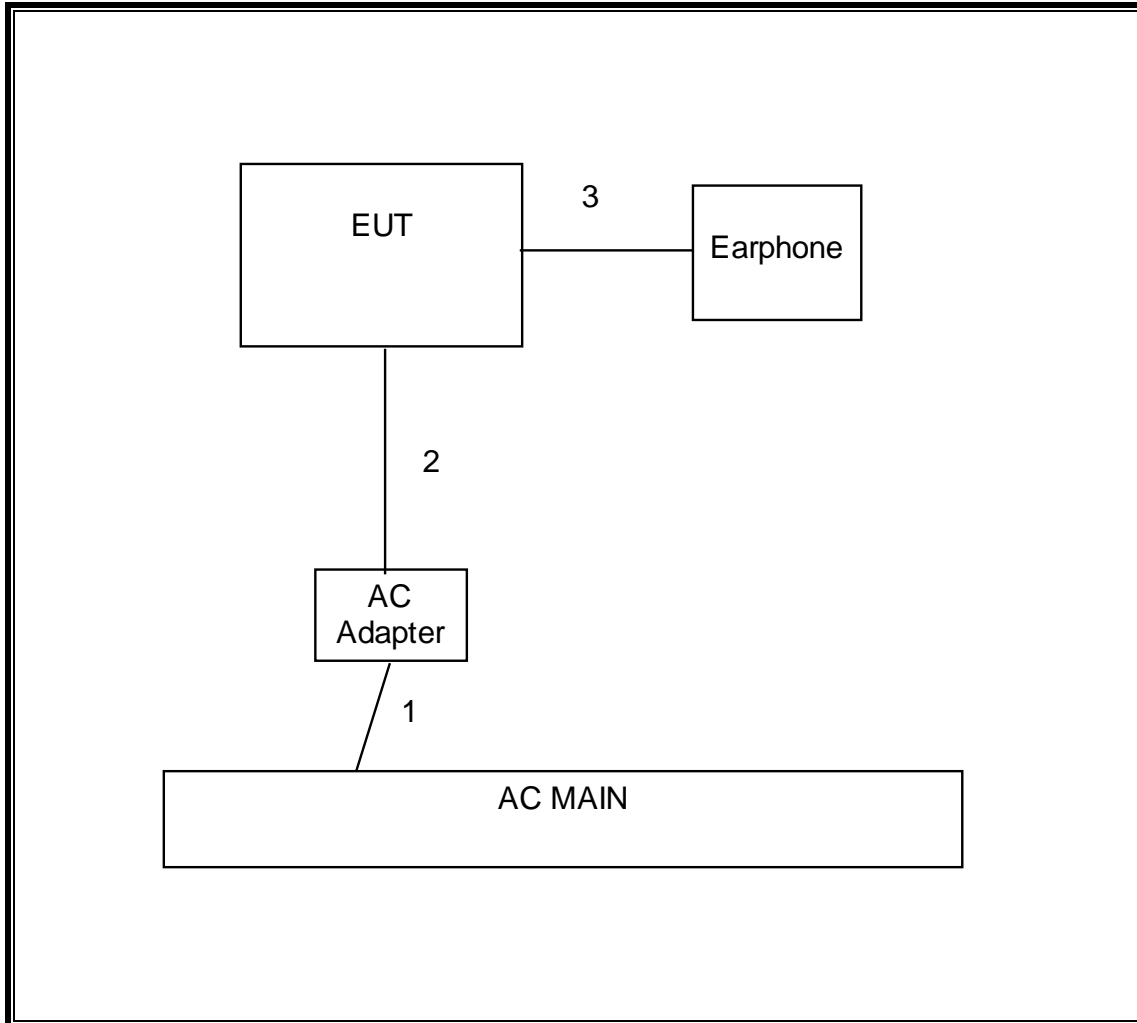
SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR BELOW 1GHZ & AC POWER CONDUCTED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	Asset	Cal Due
Horn Antenna 1-18GHz	ETS Lindgren	3117	F00132	02/19/14
Preamplifier, 1300 MHz	Sonoma	310	79146	11/06/13
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB3	F00027	03/07/14
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	01/14/14
Peak / Average Power Sensor	Agilent / HP	E9323A	F00026	04/03/14
P-Series single channel Power Meter	Agilent / HP	N1911A	F00153	04/05/14
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/20/14
Spectrum Analyzer, 40 GHz	Agilent / HP	8564E	C00951	07/29/14
Spectrum Analyzer, 44GHz	Agilent	N9030A	F00129	02/22/14
PreAmplifier, 1-26.5GHz	Agilent	8449B	F00167	03/23/14
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/09/14

7. ANTENNA PORT TEST RESULTS

7.1. 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 $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

GFSK

Channel	Frequency (MHz)	20 dB Bandwidth (KHz)	99% Bandwidth (KHz)
Low	2402	910.2	904.64
Middle	2441	868.0	857.29
High	2480	867.7	864.09

QPSK

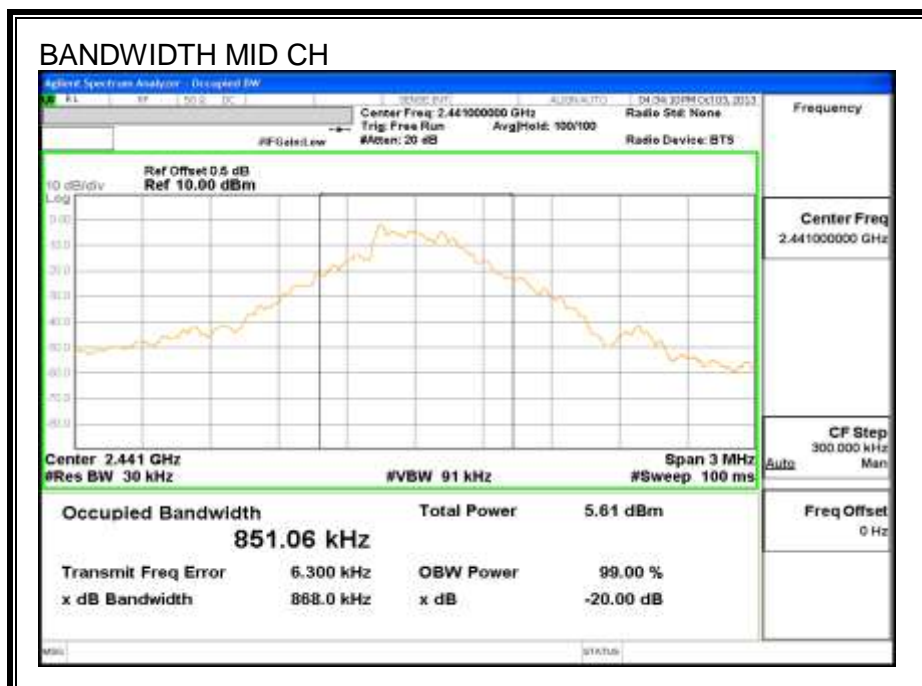
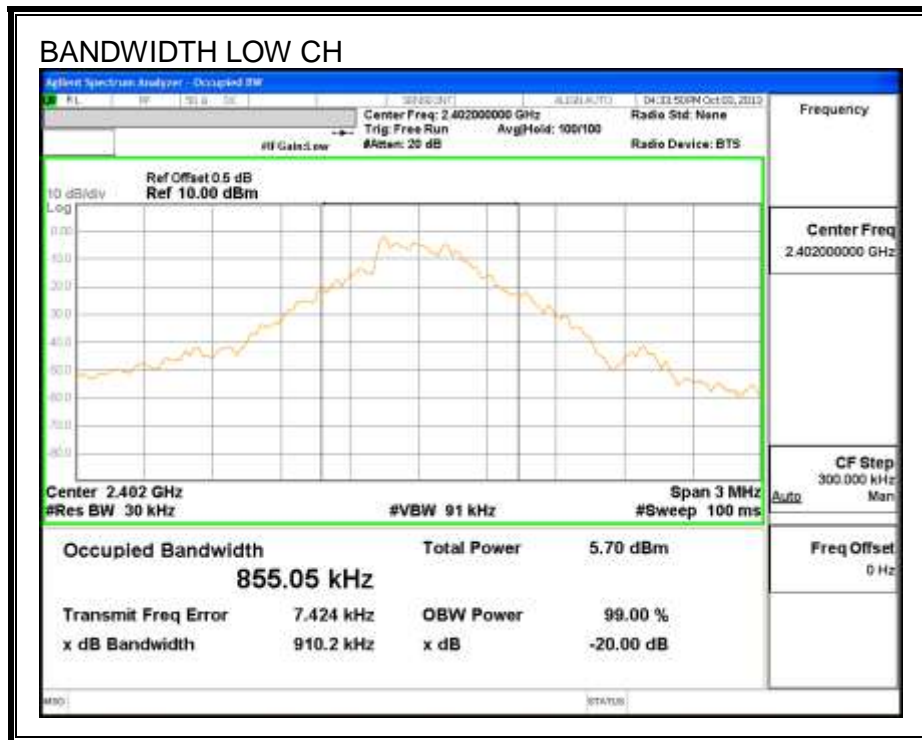
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.275	1.1426
Middle	2441	1.275	1.1580
High	2480	1.273	1.1769

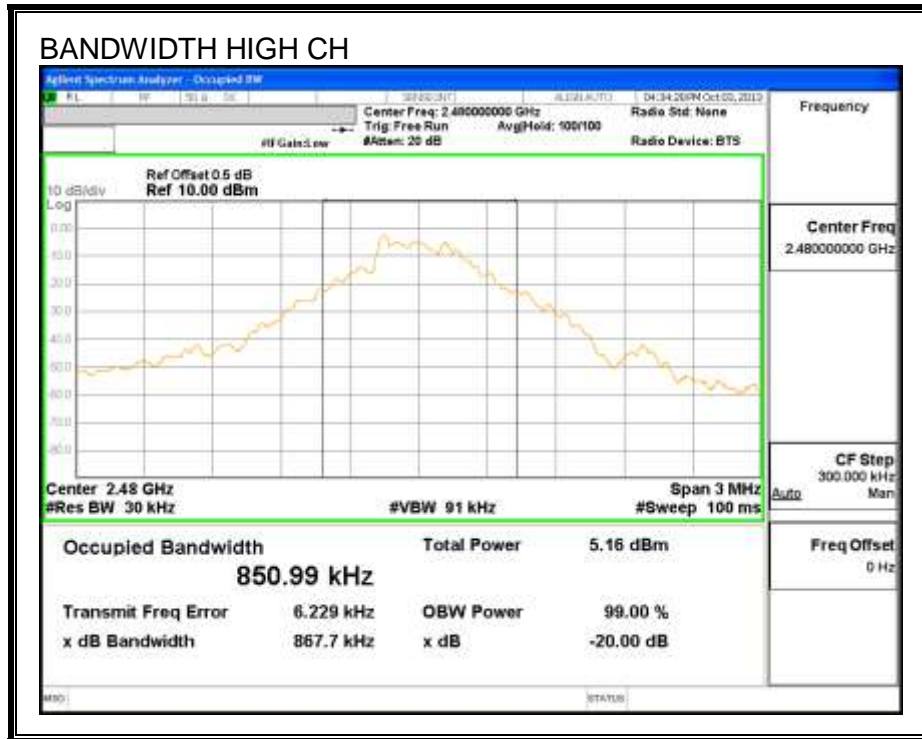
8PSK

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.265	1.1895
Middle	2441	1.267	1.1888
High	2480	1.266	1.2011

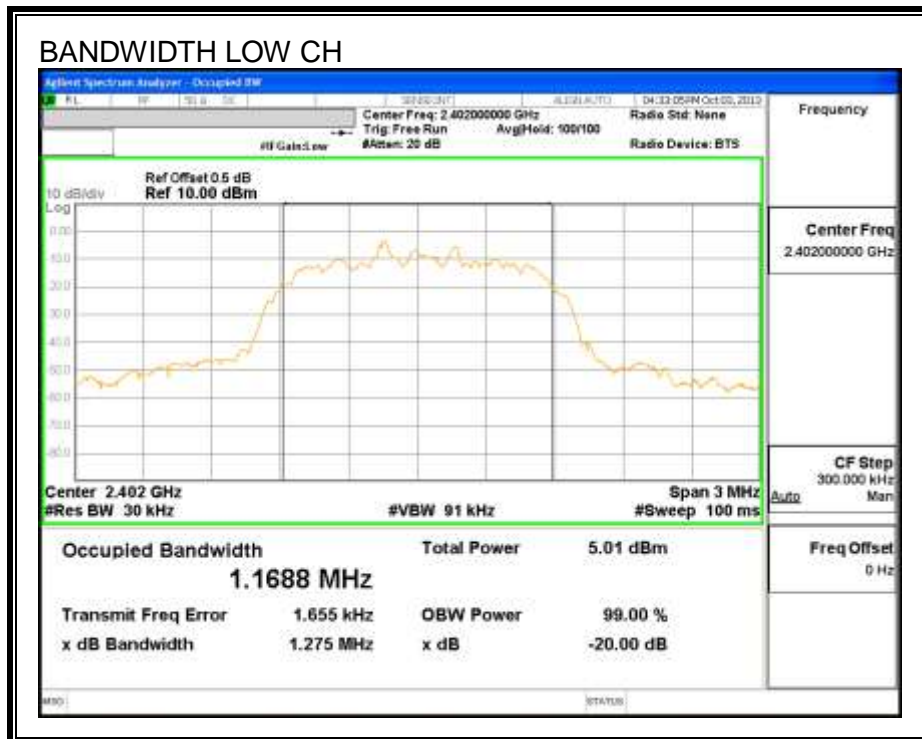
20 dB BANDWIDTH

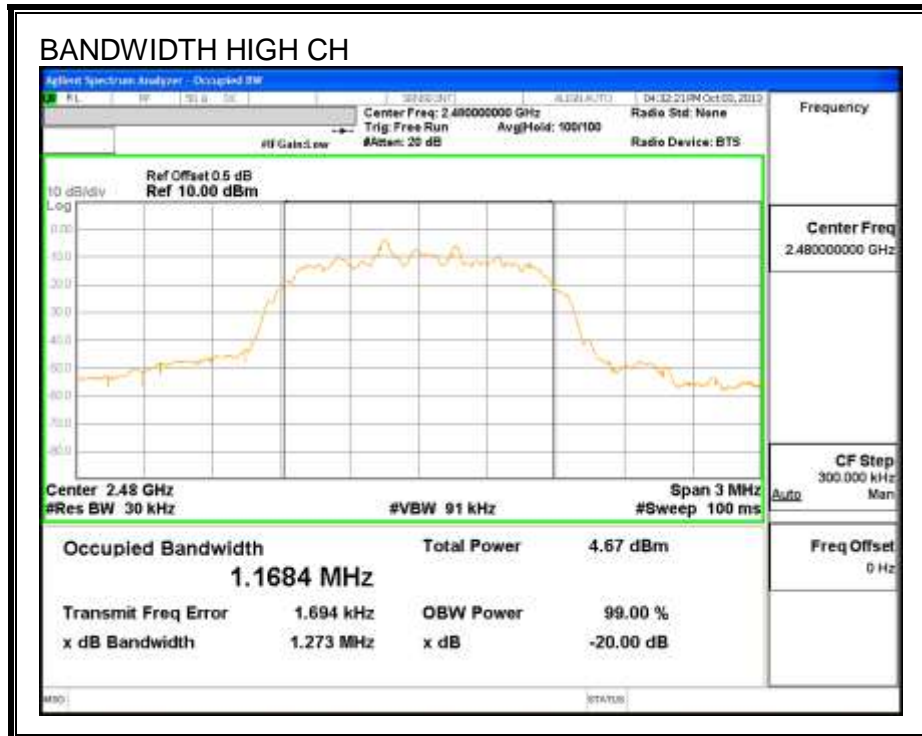
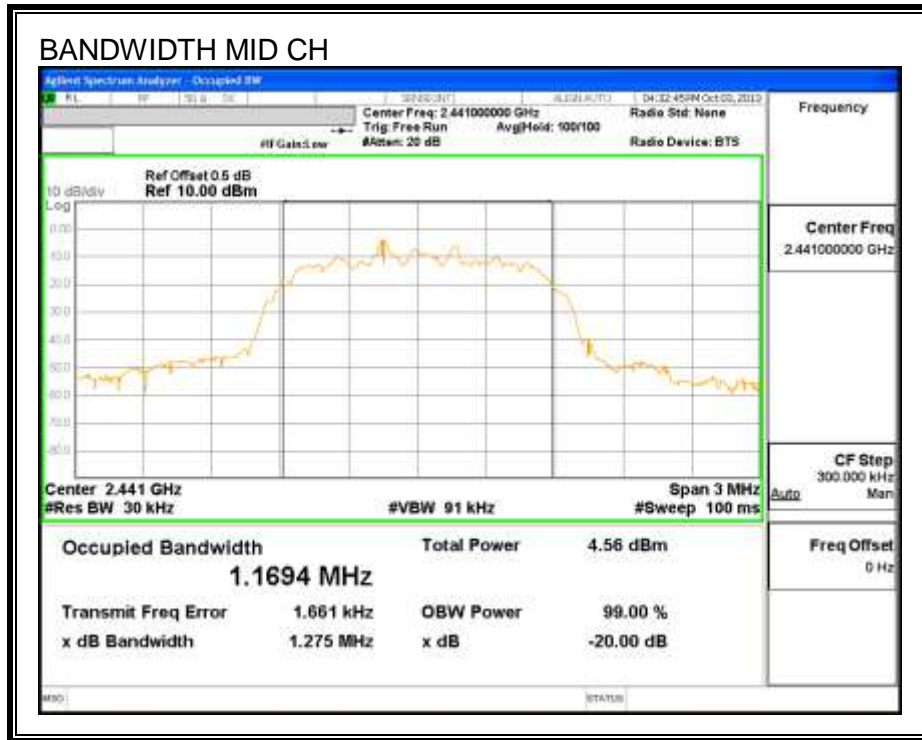
GFSK



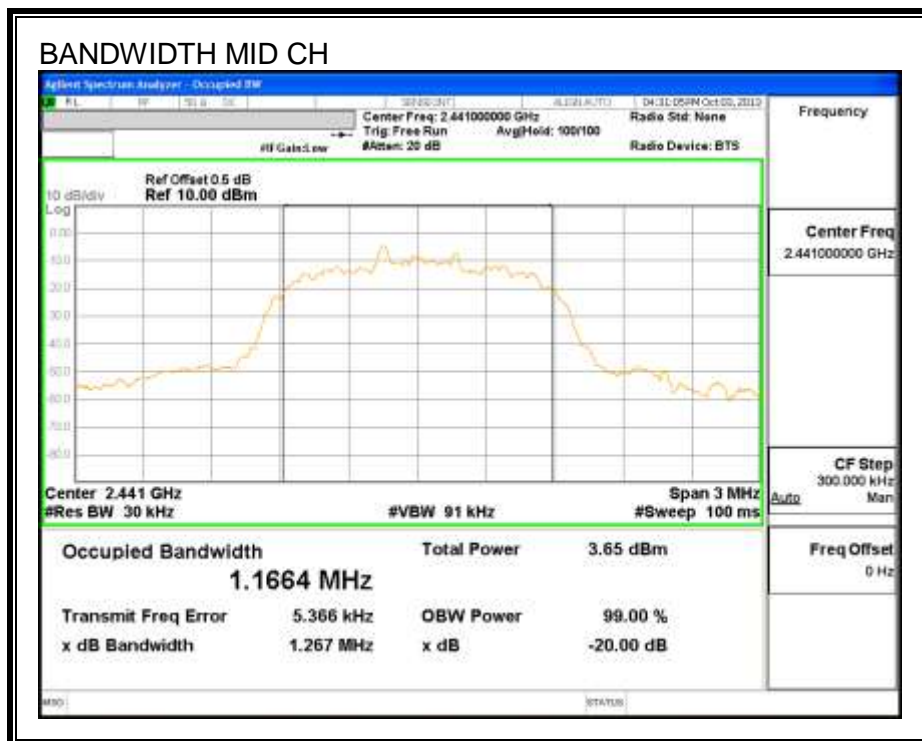
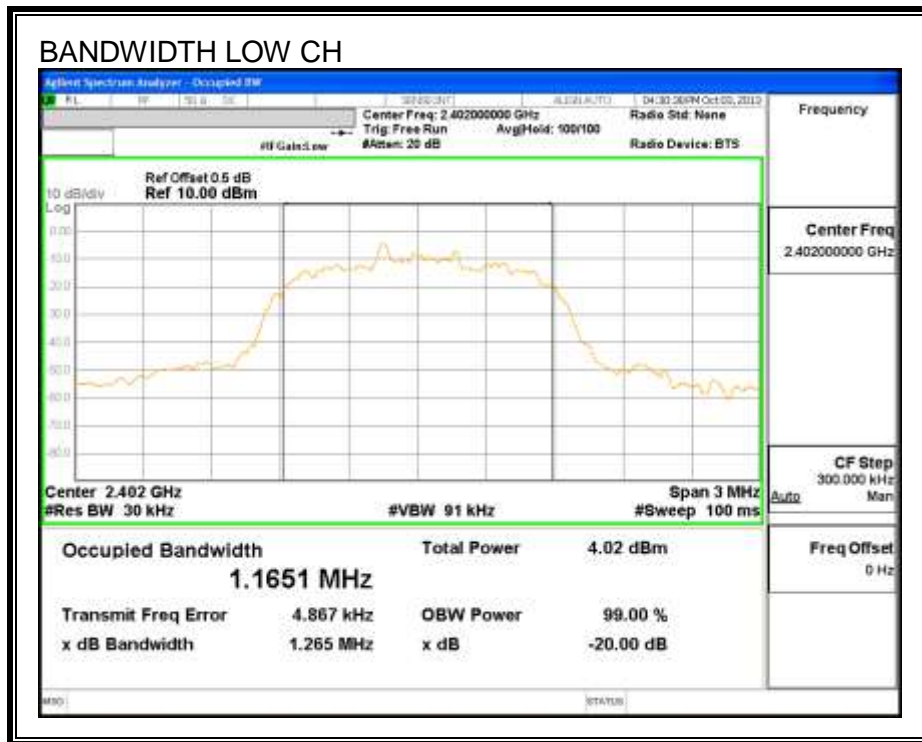


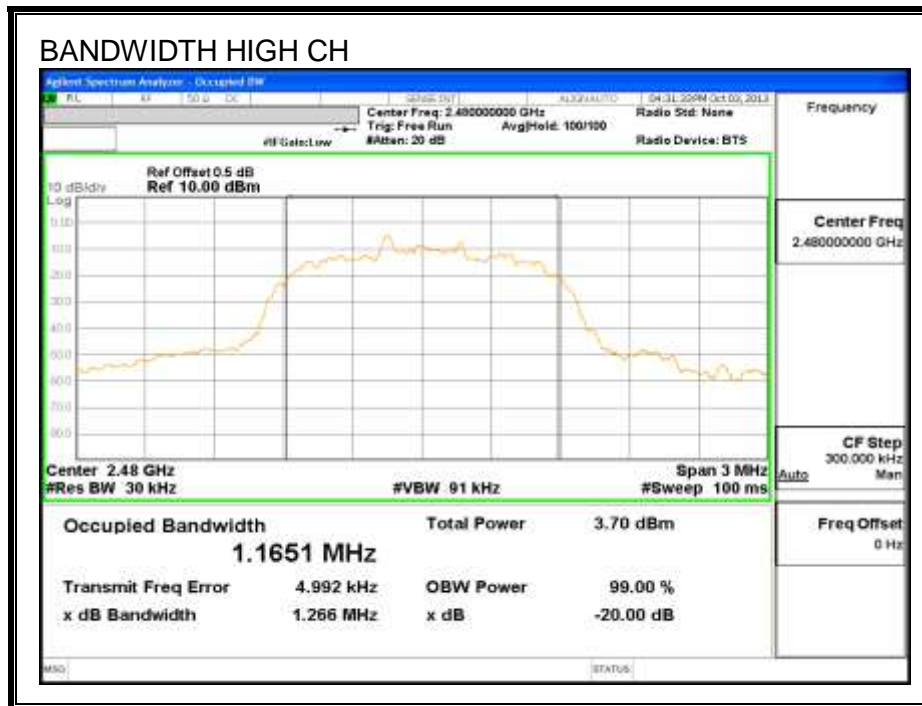
QPSK





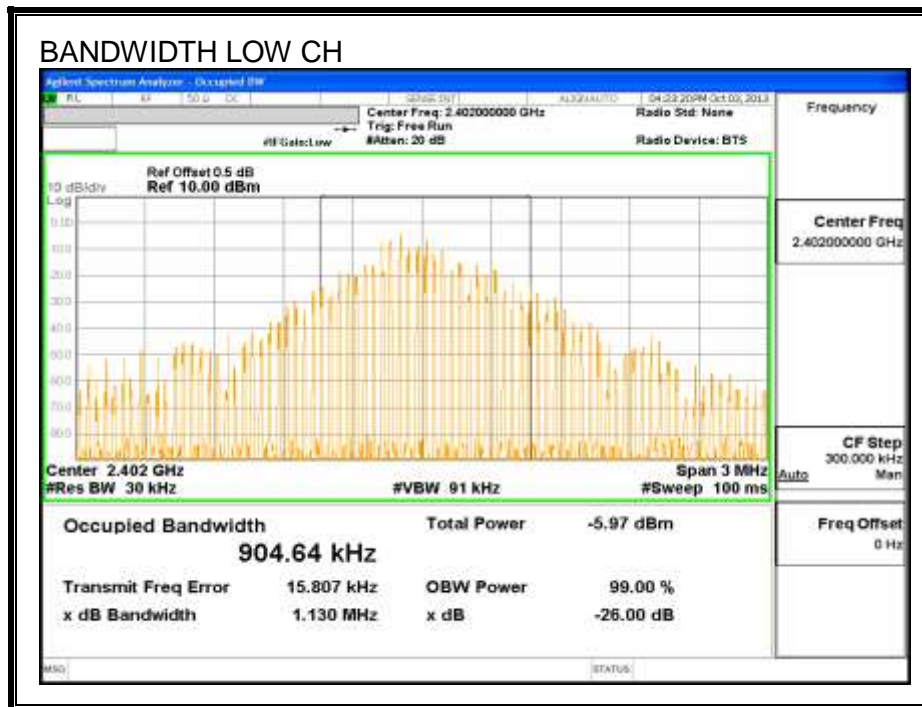
8PSK

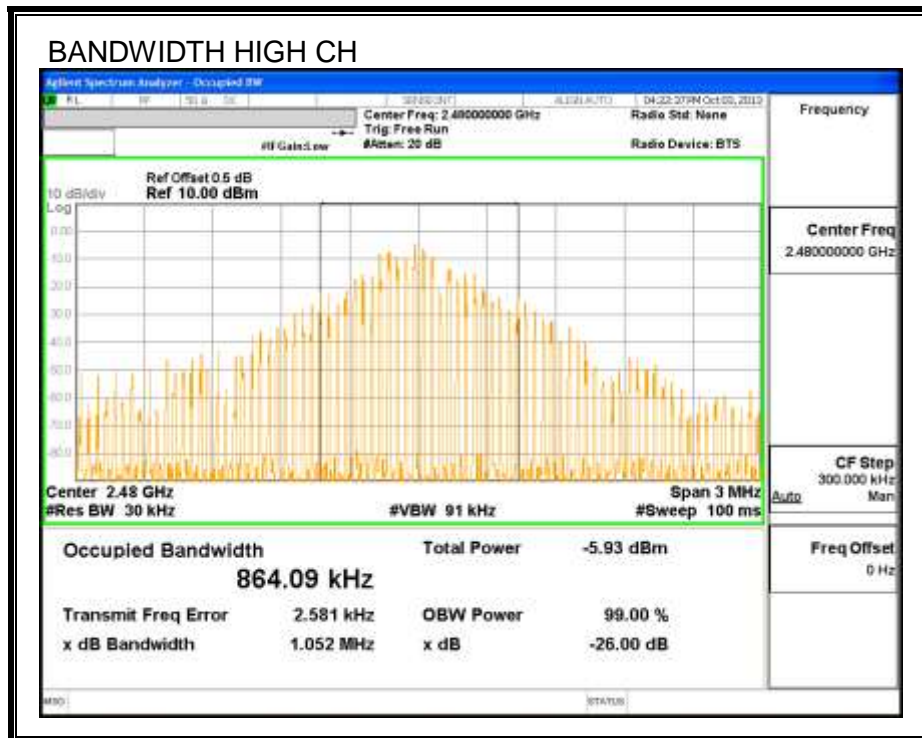
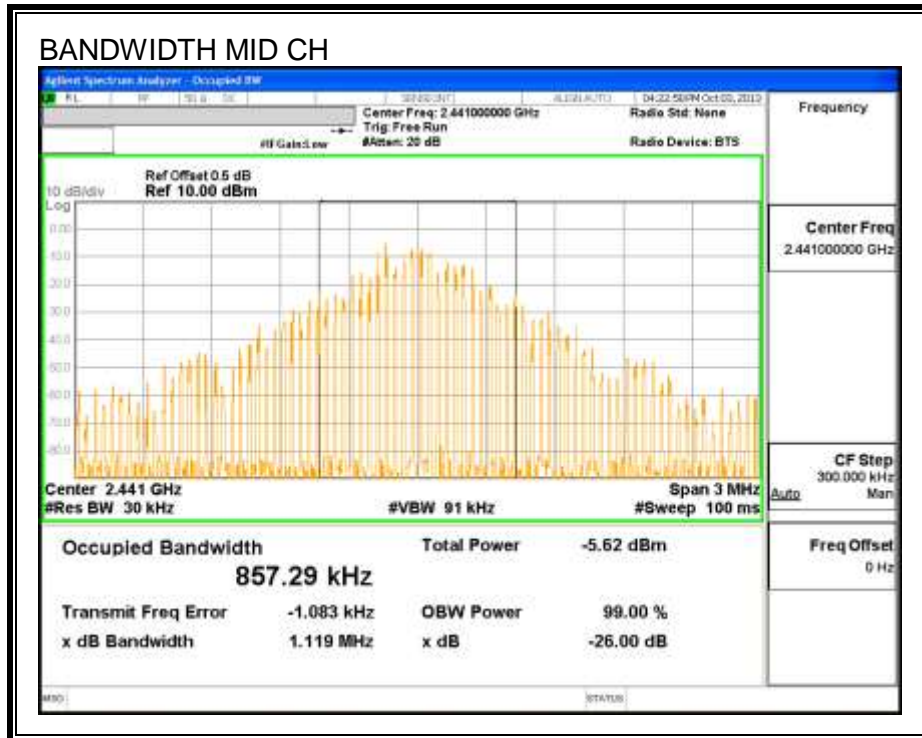




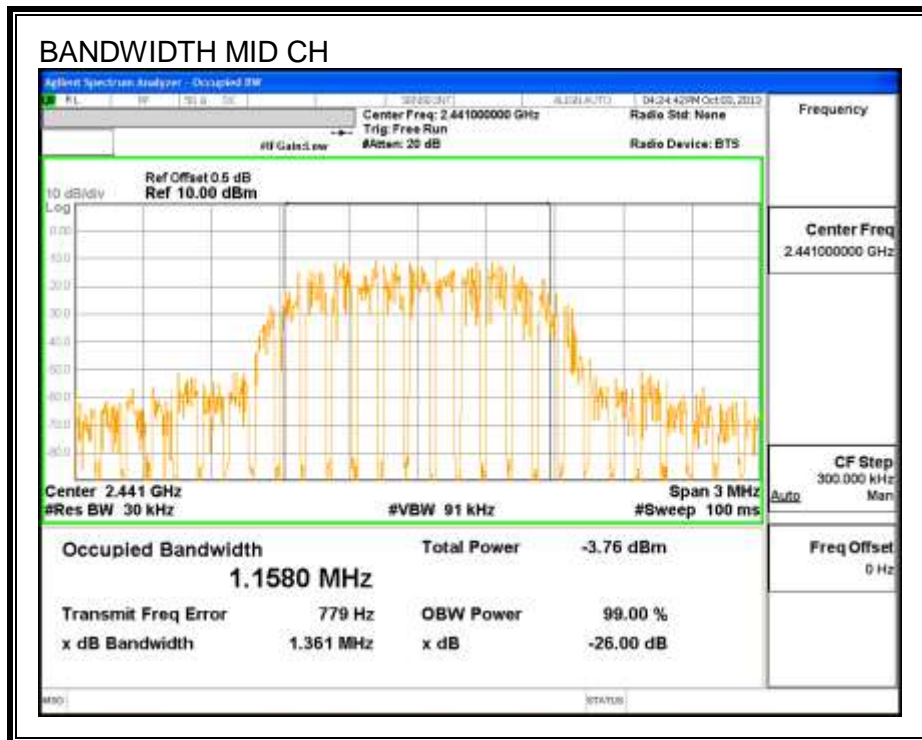
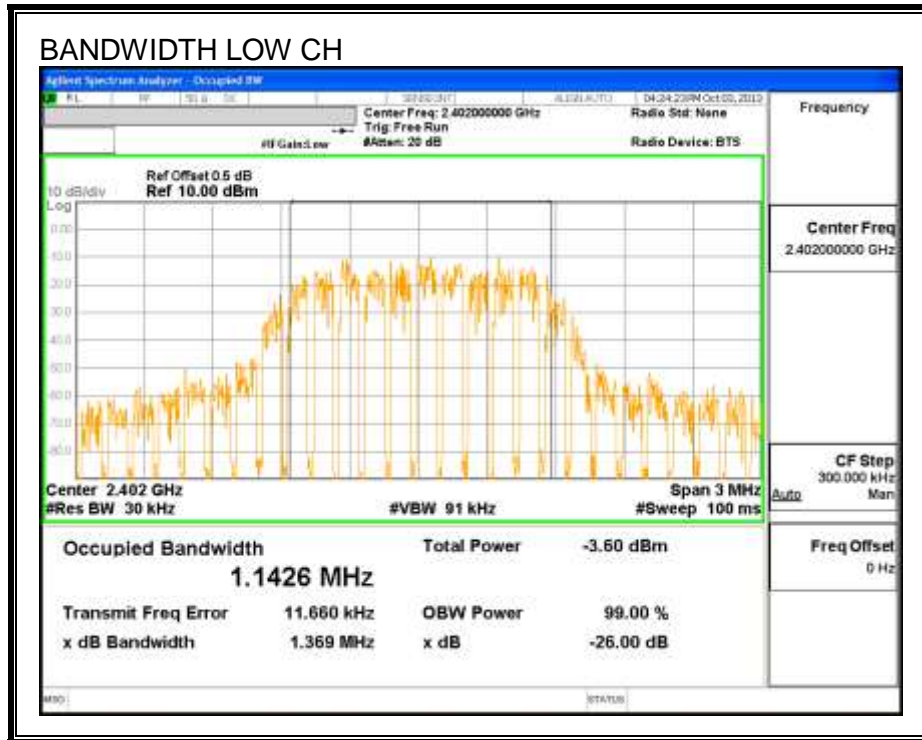
99% BANDWIDTH

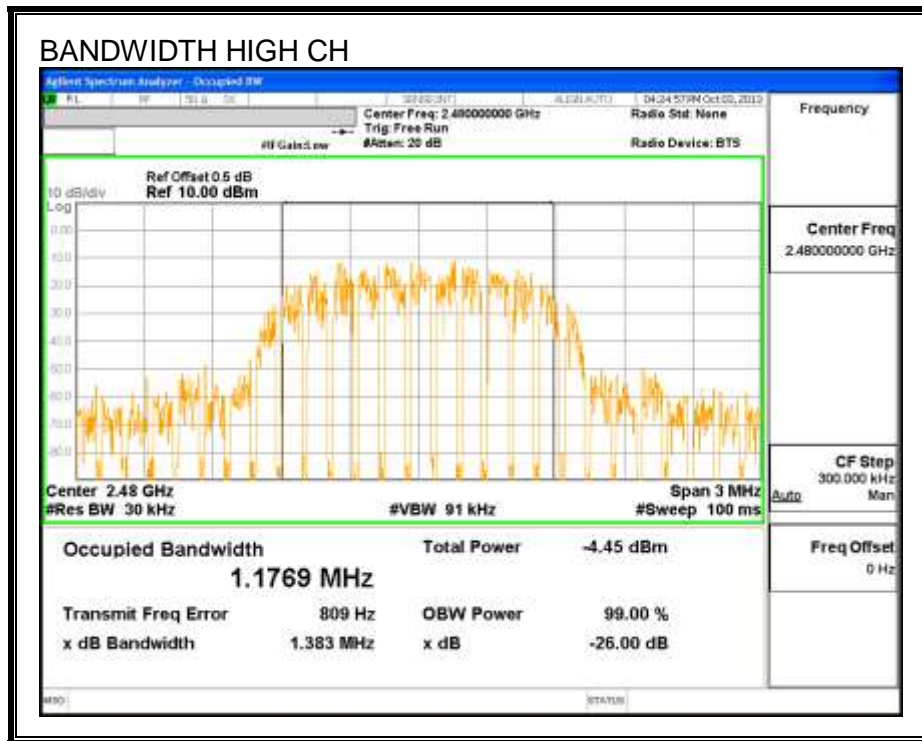
GFSK



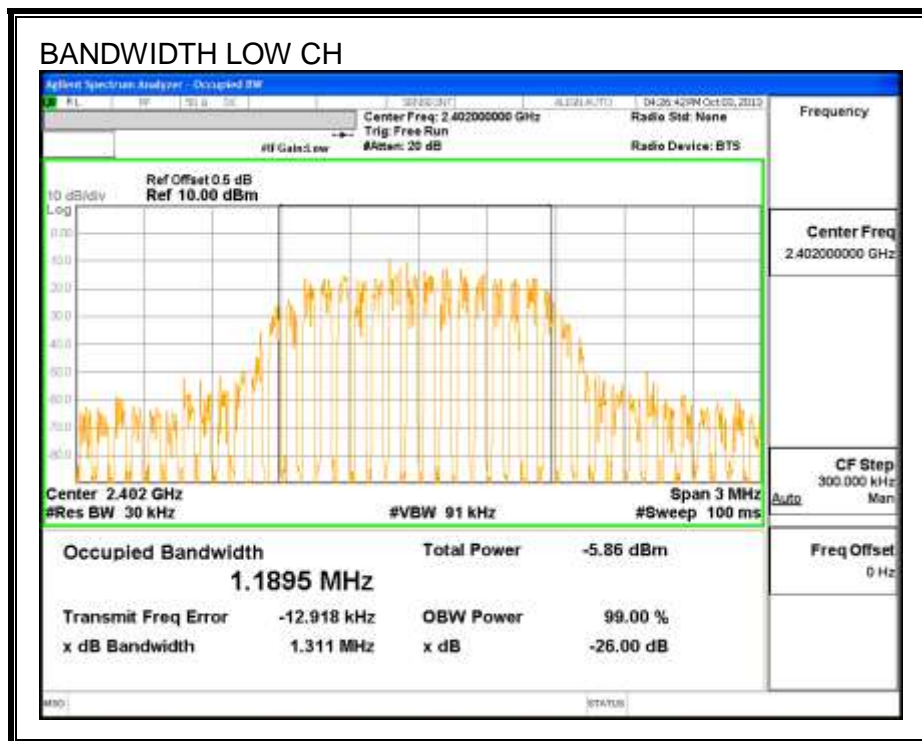


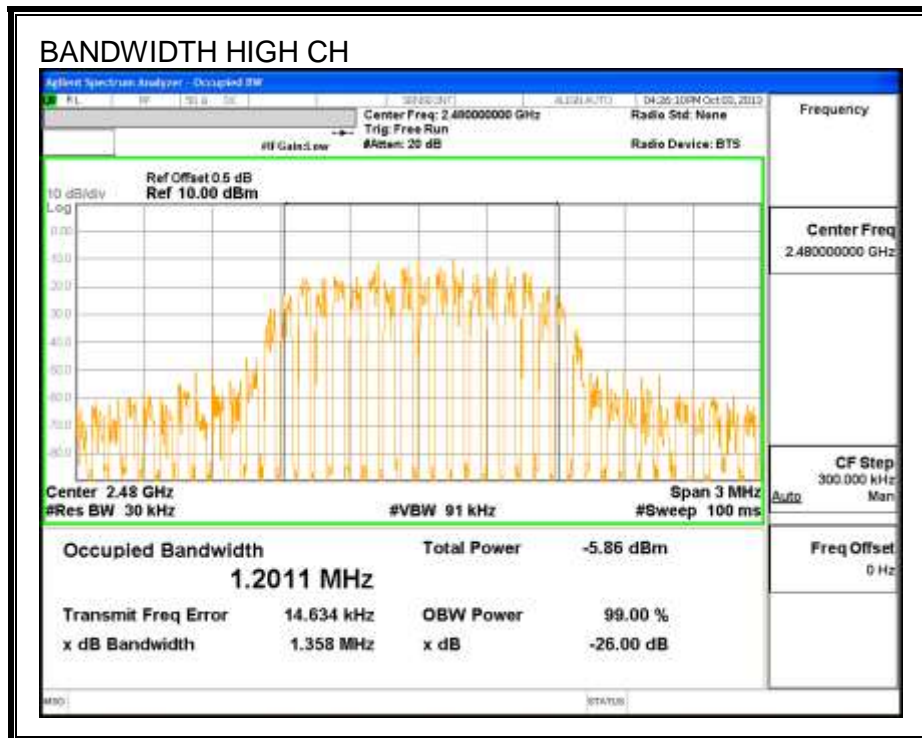
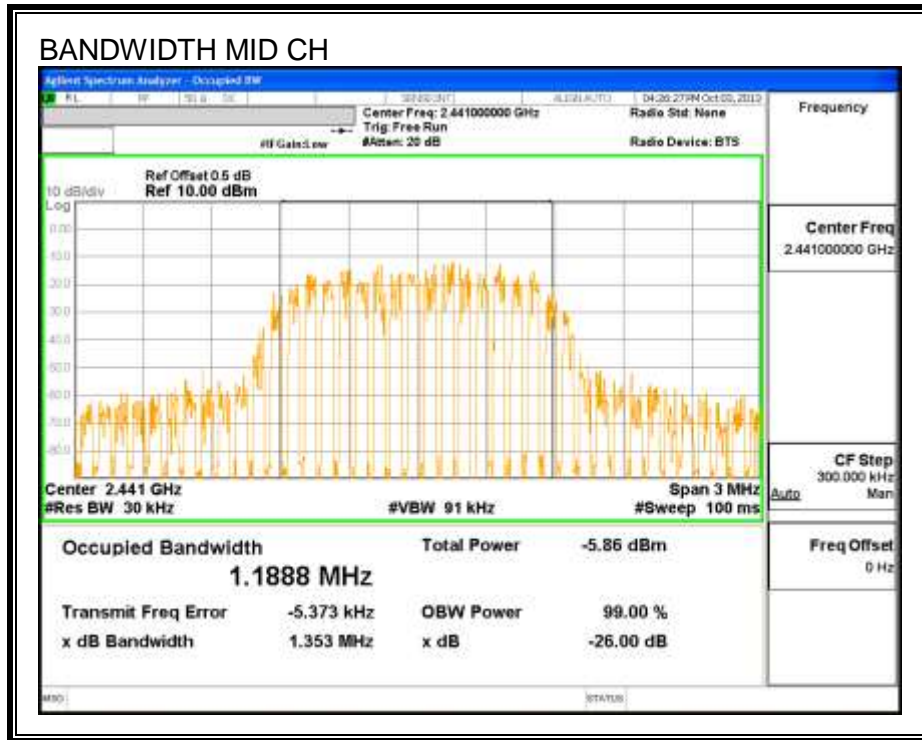
QPSK





8PSK





7.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

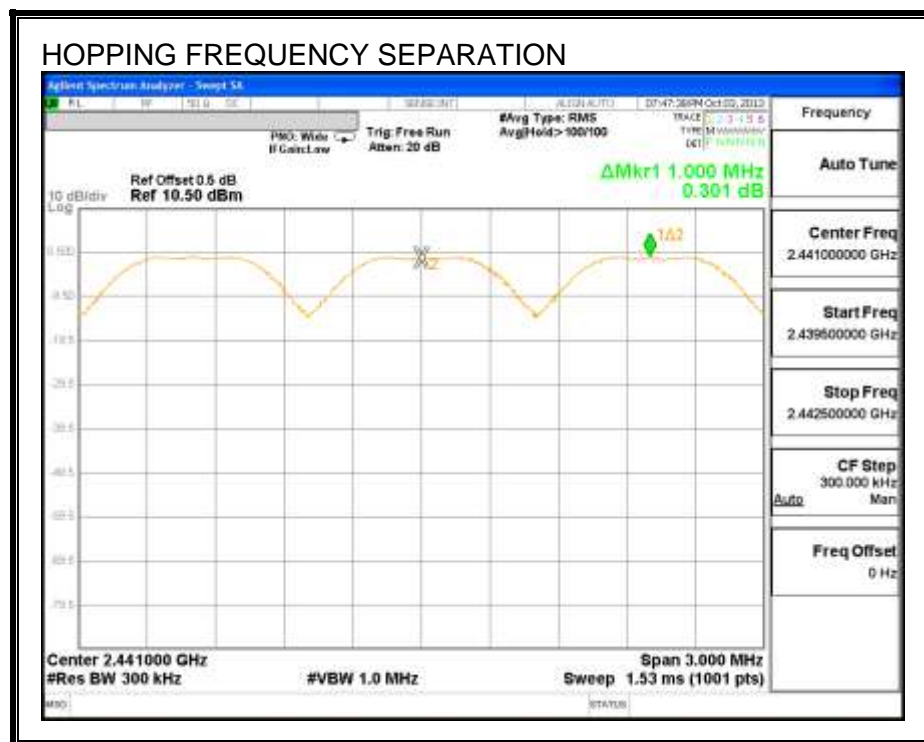
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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.

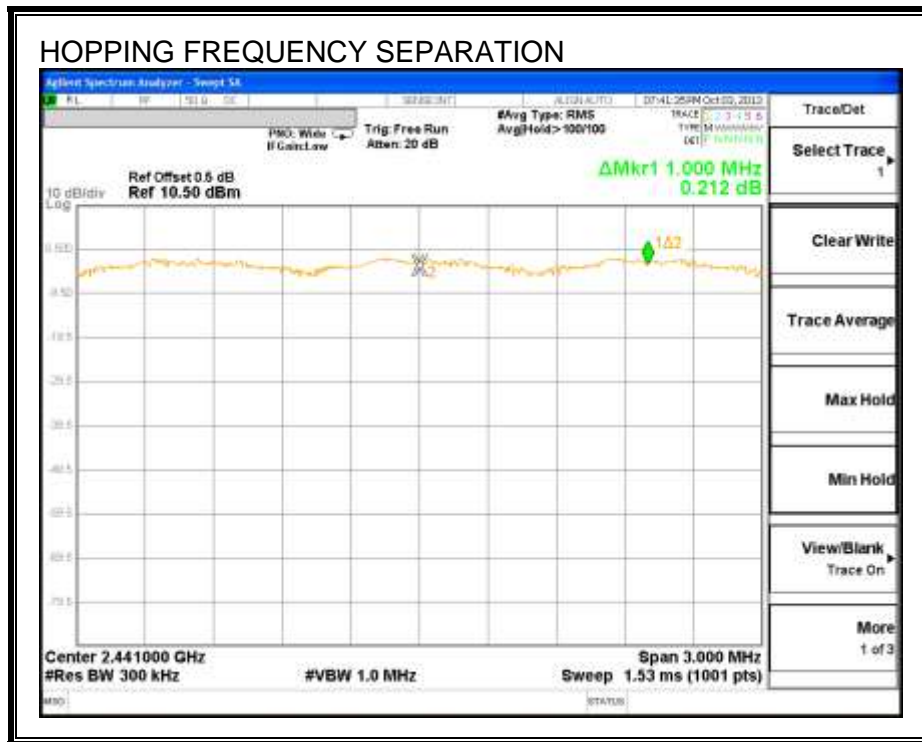
TEST PROCEDURE

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.

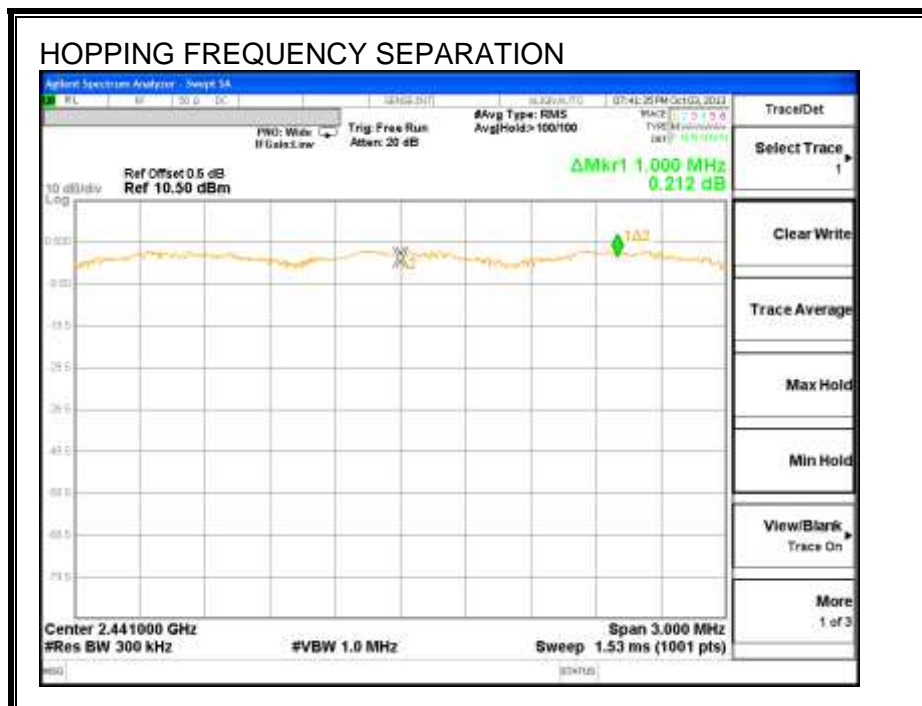
GFSK



QPSK



8PSK



7.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

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

TEST PROCEDURE

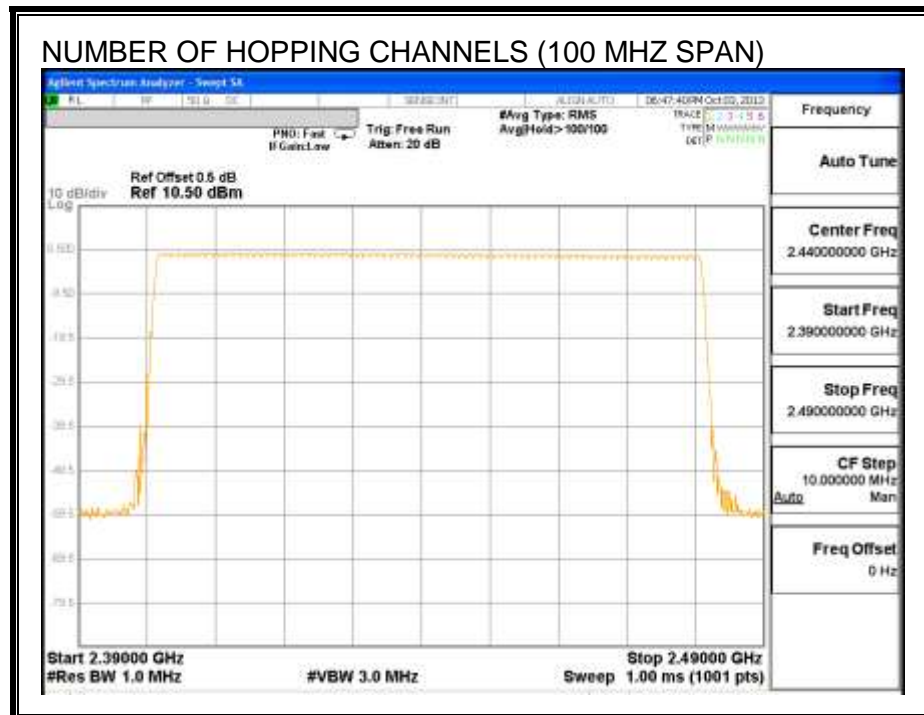
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

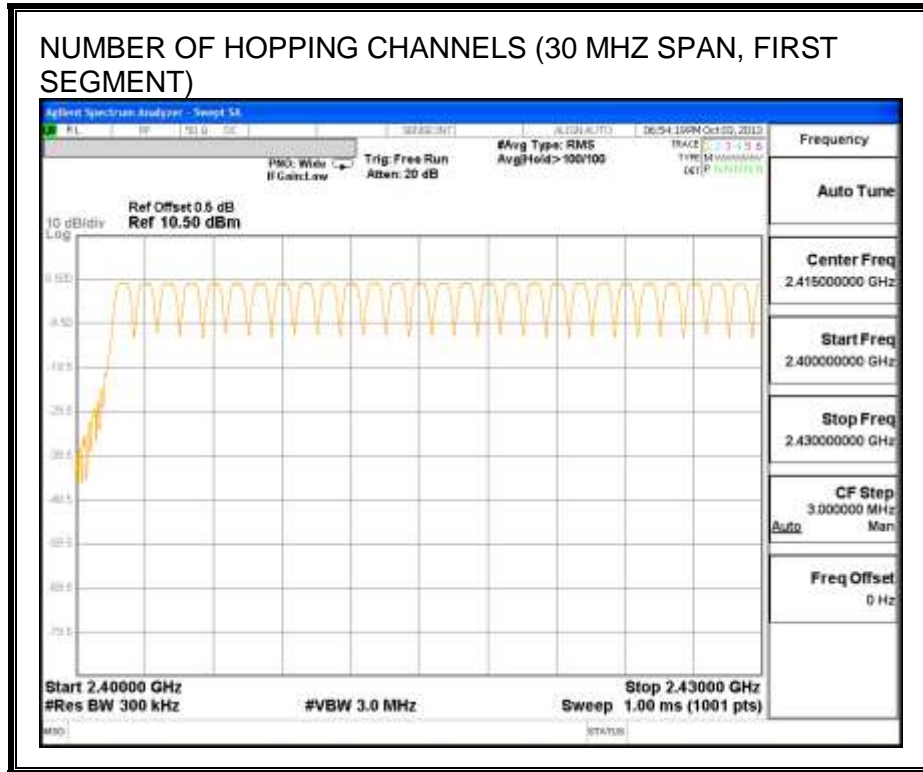
79 Channels observed.

NUMBER OF HOPPING CHANNELS

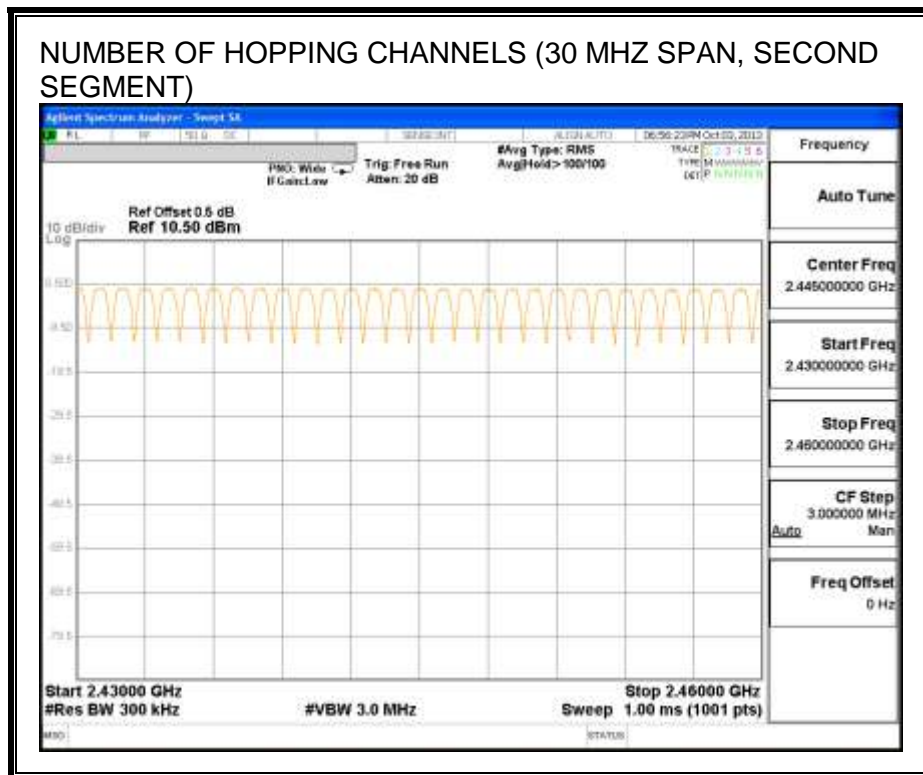
GFSK

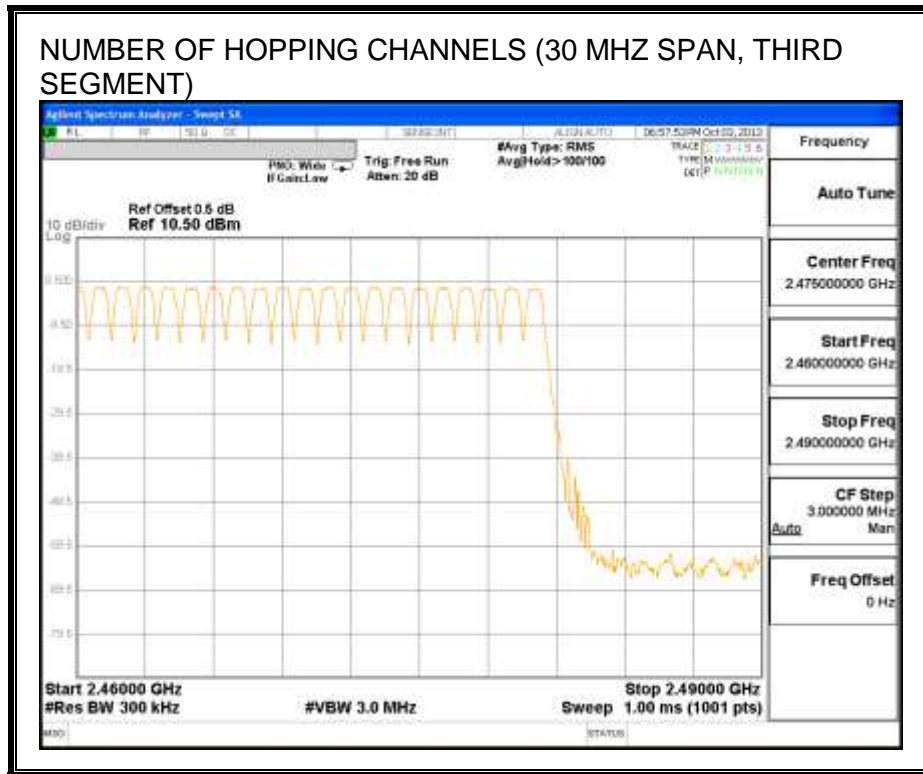


NUMBER OF HOPPING CHANNELS (30 MHz SPAN, FIRST SEGMENT)

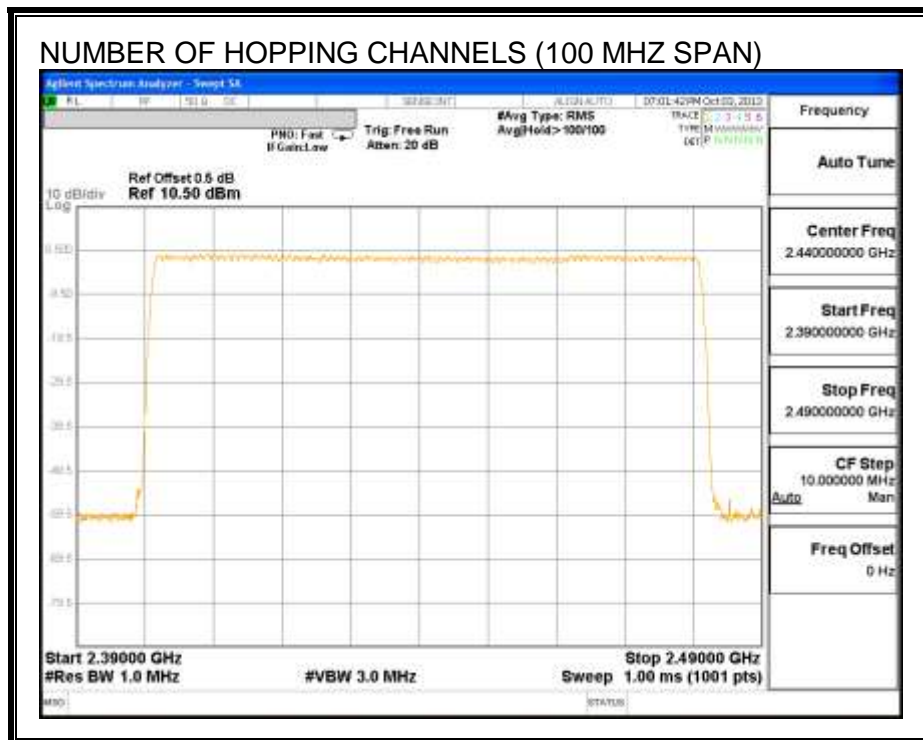


NUMBER OF HOPPING CHANNELS (30 MHz SPAN, SECOND SEGMENT)

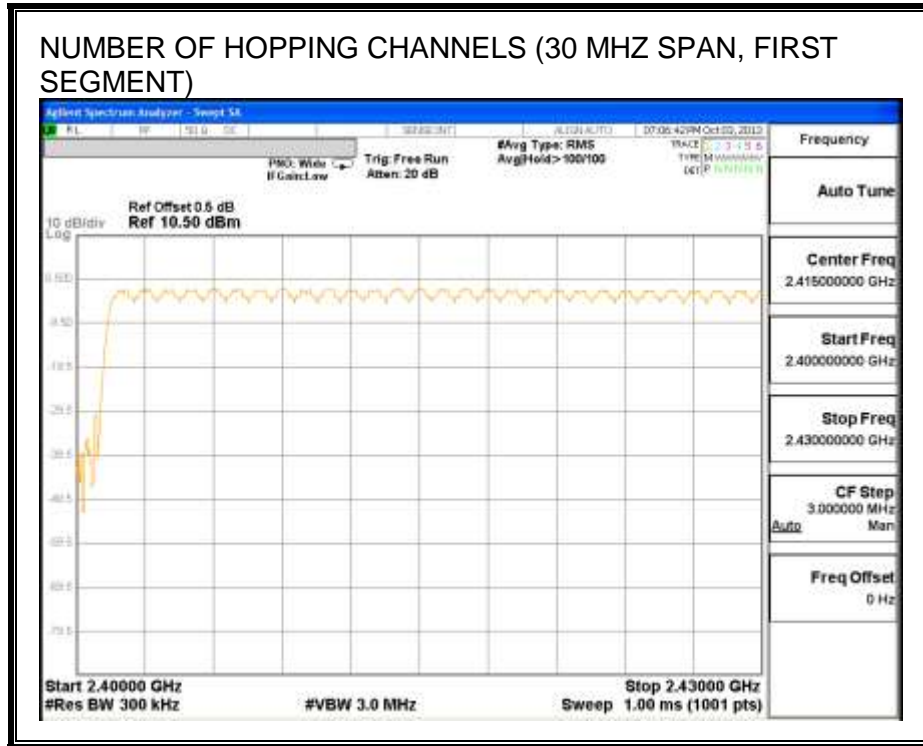




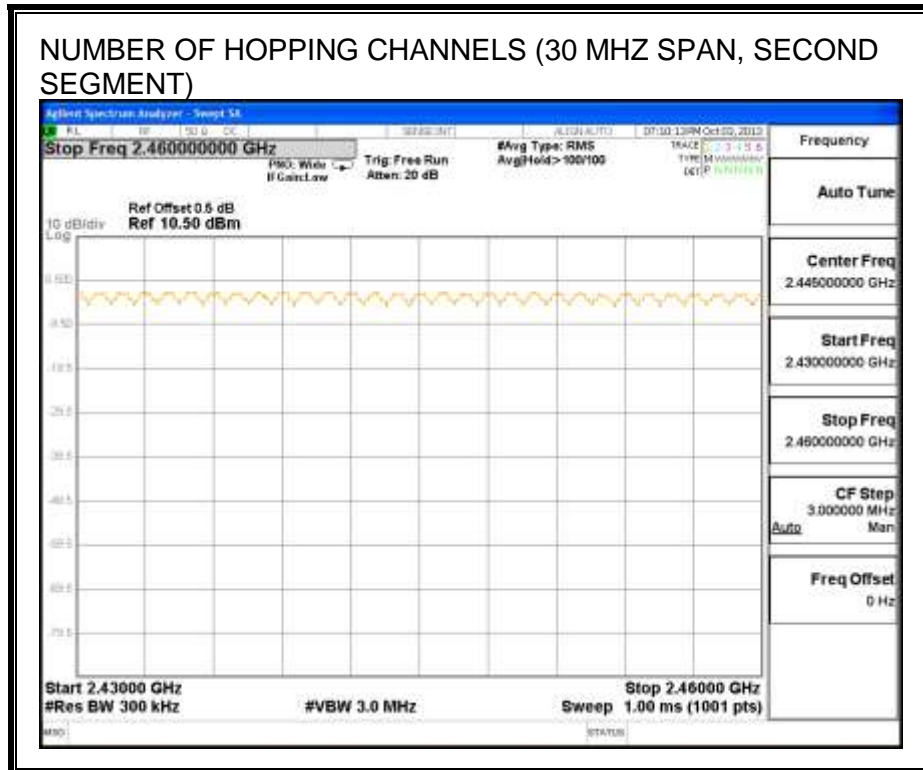
QPSK

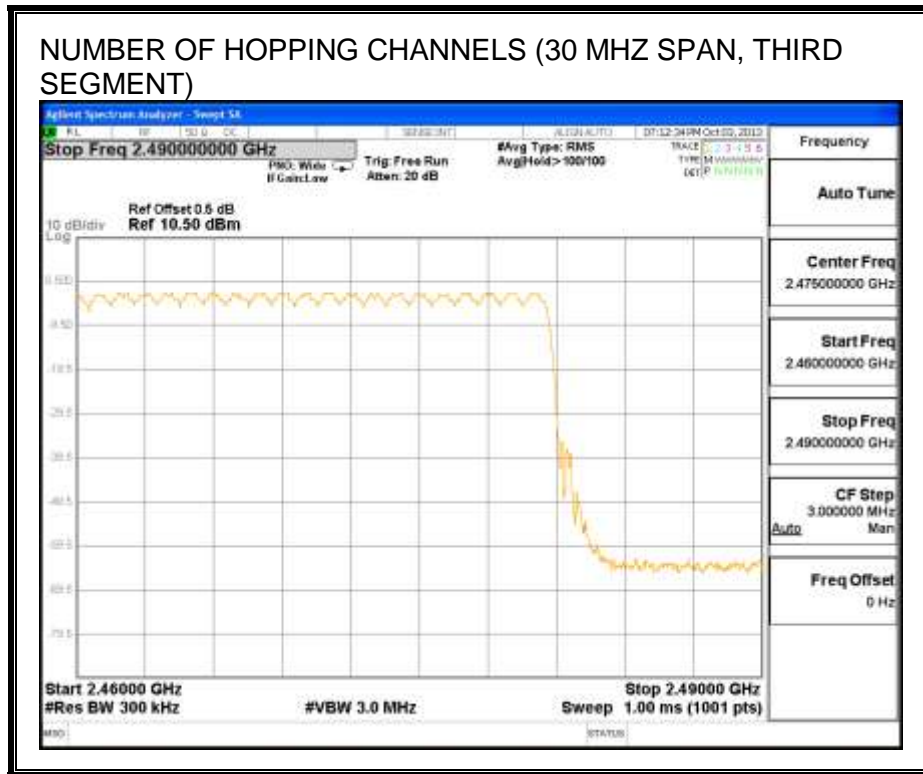


NUMBER OF HOPPING CHANNELS (30 MHz SPAN, FIRST SEGMENT)

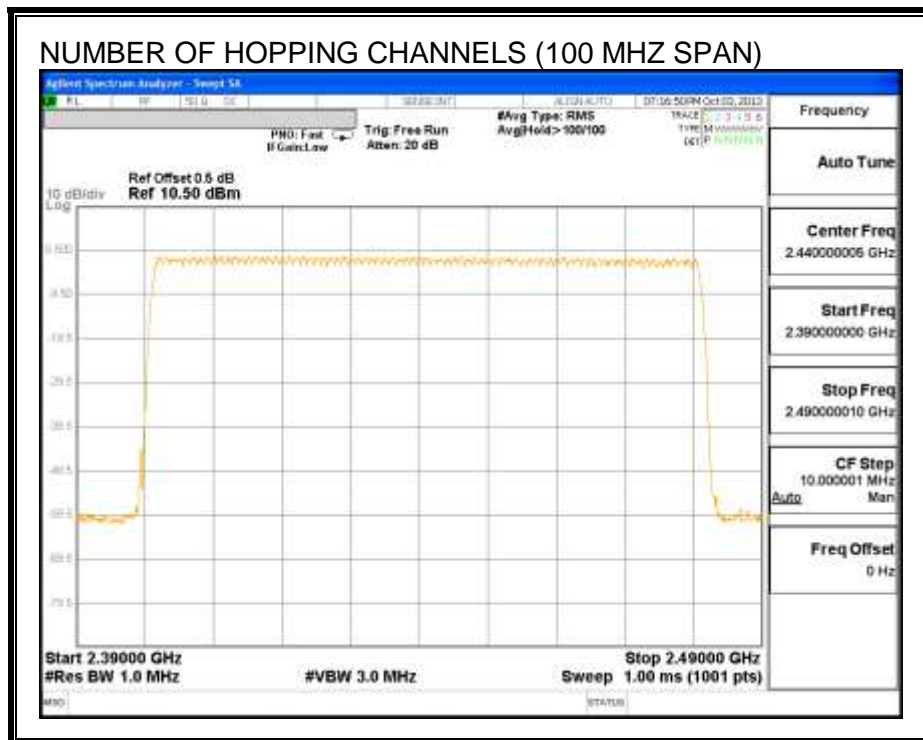


NUMBER OF HOPPING CHANNELS (30 MHz SPAN, SECOND SEGMENT)

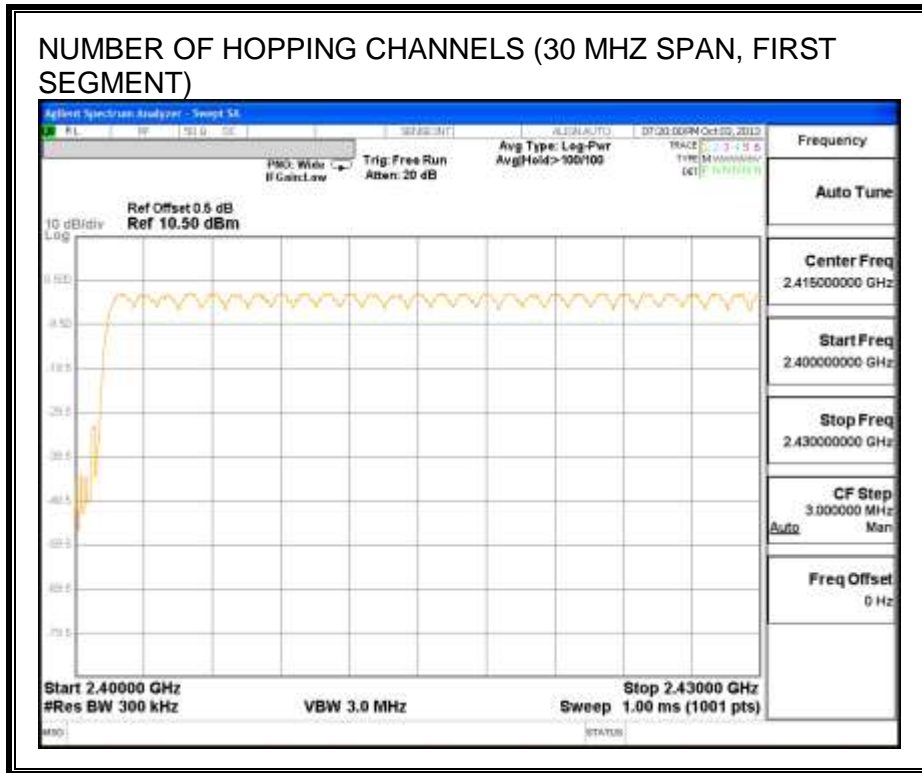




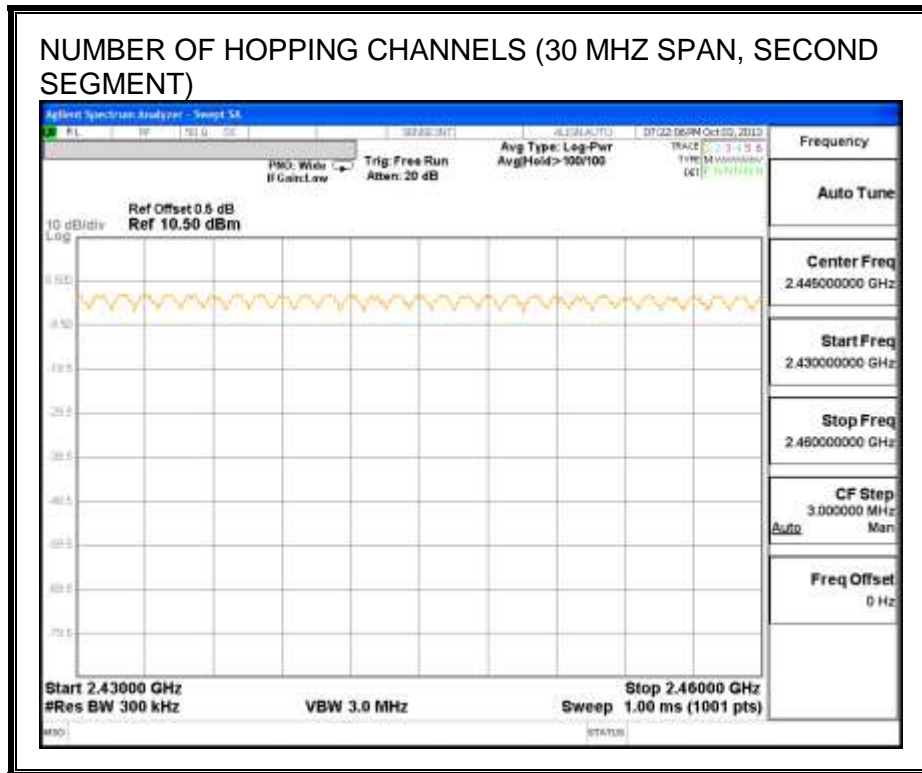
8PSK

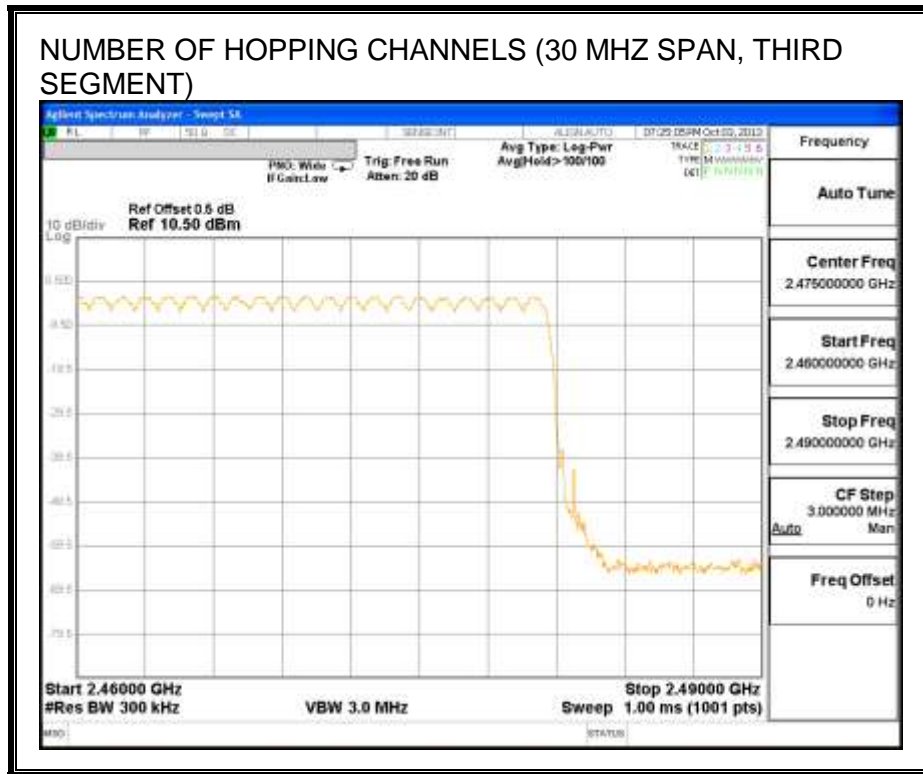


NUMBER OF HOPPING CHANNELS (30 MHz SPAN, FIRST SEGMENT)



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





7.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

RESULT

GFSK

GFSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.398	32	0.127	0.4	-0.273
DH3	1.642	17	0.279	0.4	-0.121
DH5	2.893	13	0.376	0.4	-0.024

QPSK

QPSK Mode

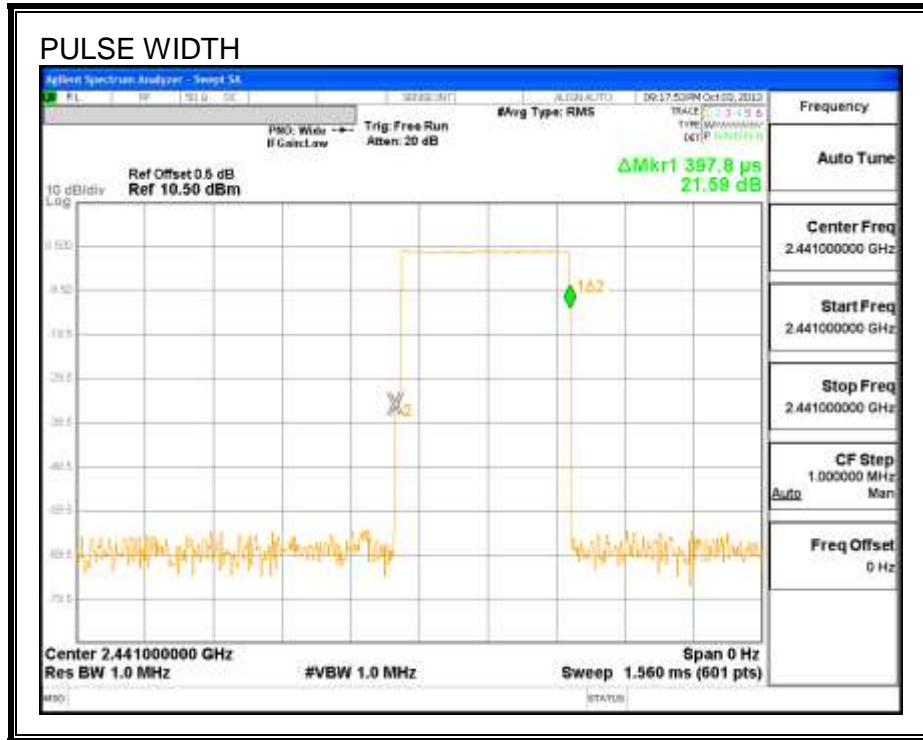
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.375	32	0.120	0.4	-0.280
DH3	1.645	13	0.214	0.4	-0.186
DH5	2.910	11	0.320	0.4	-0.080

8PSK

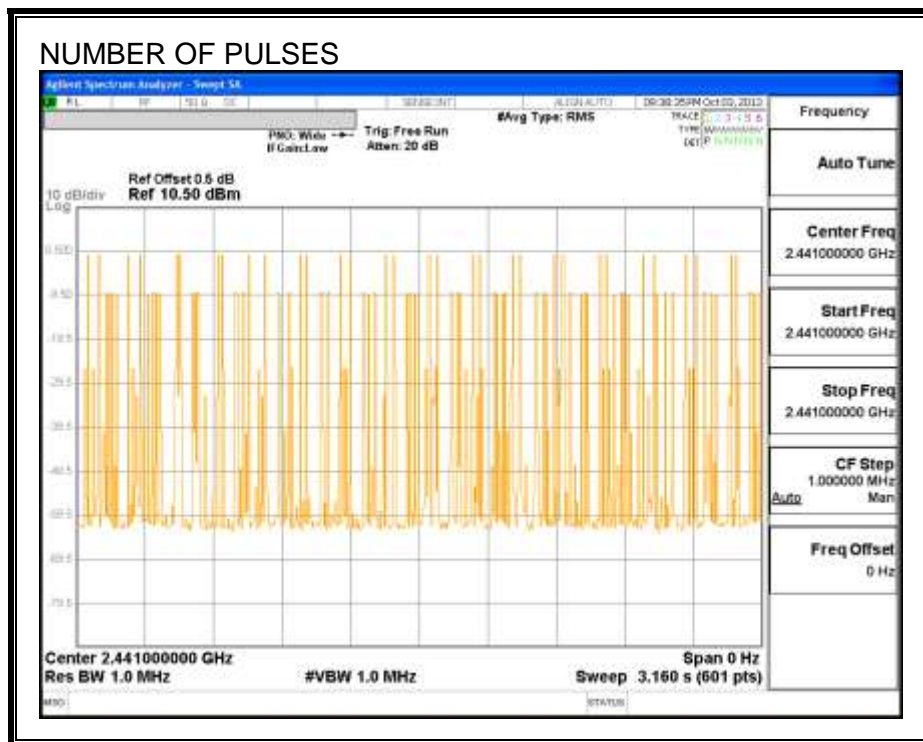
8PSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.3930	32	0.126	0.4	-0.274
DH3	1.6400	18	0.295	0.4	-0.105
DH5	2.8950	13	0.376	0.4	-0.024

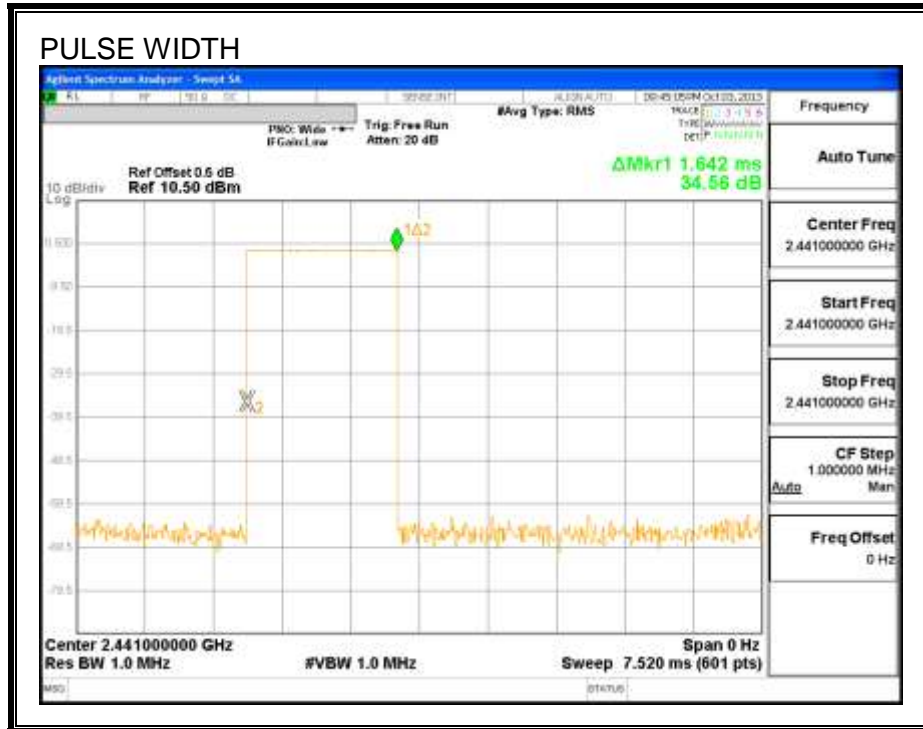
GFSK, DH1



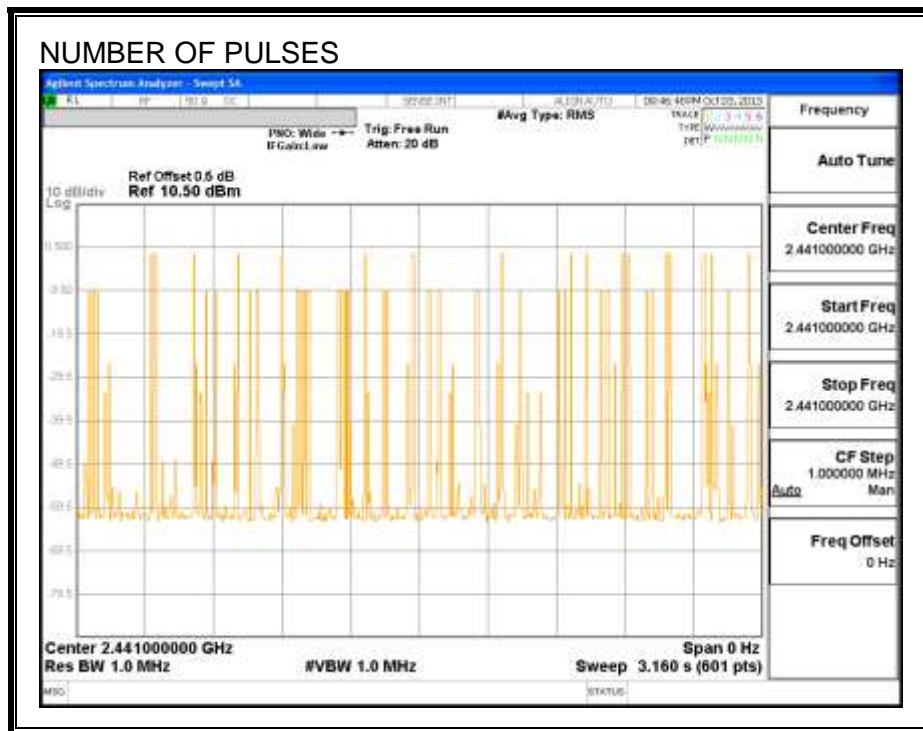
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



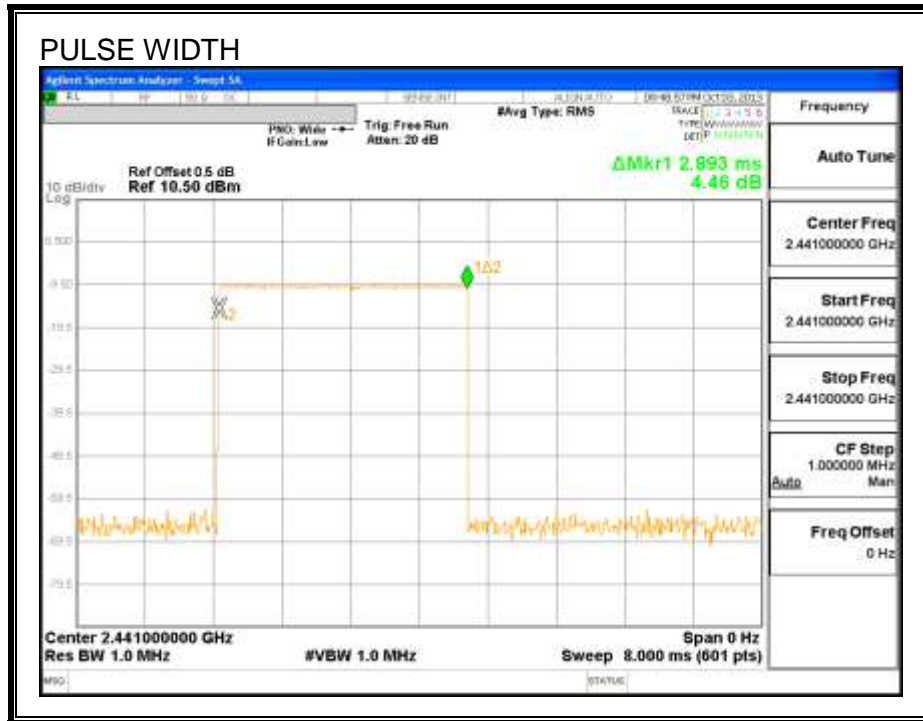
PULSE WIDTH GFSK DH3



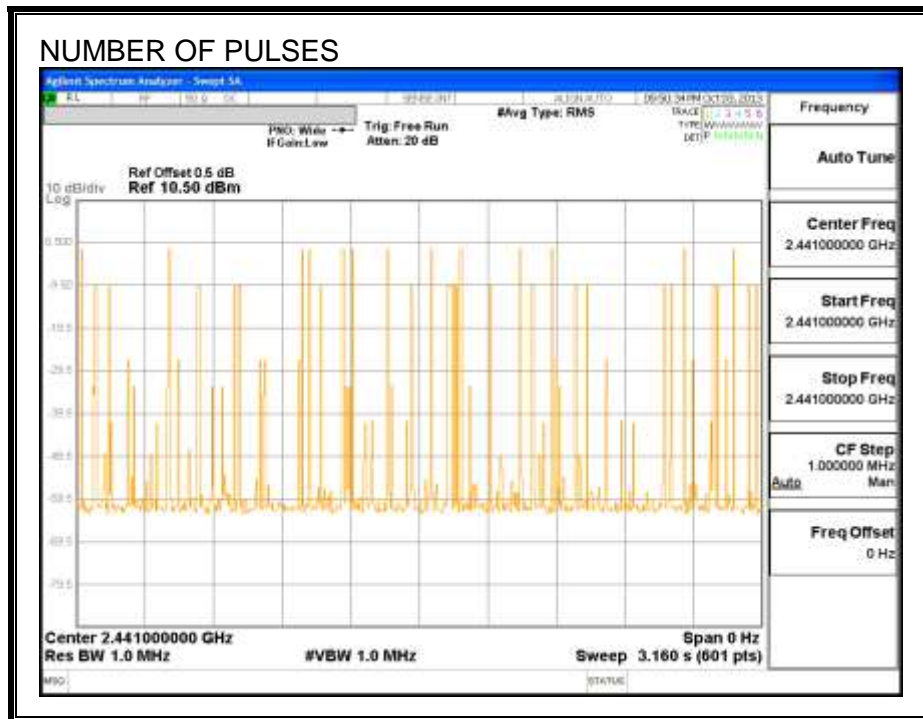
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



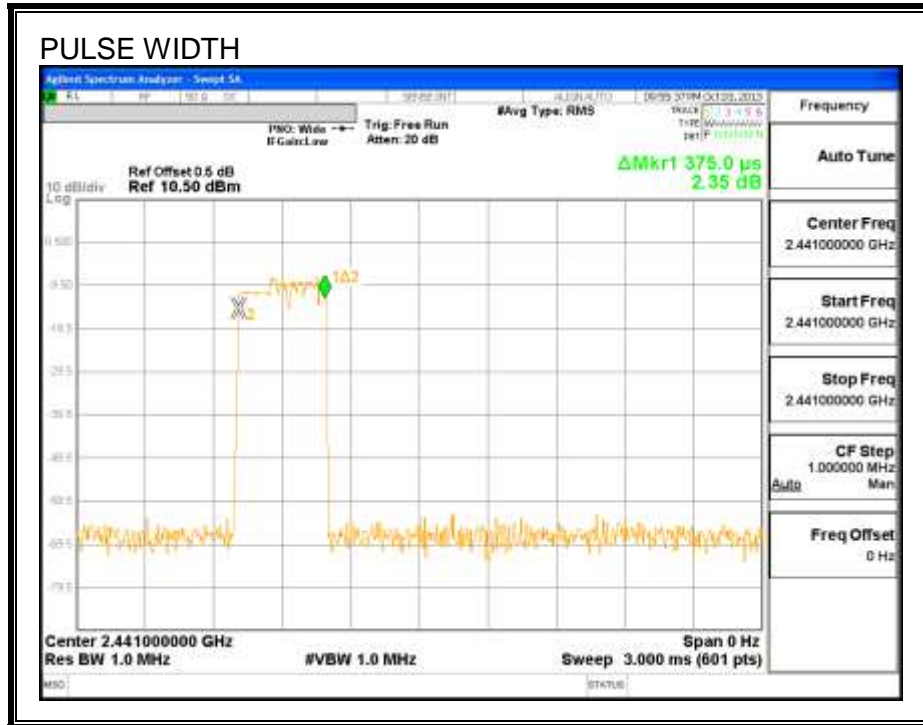
PULSE WIDTH GFSK DH5



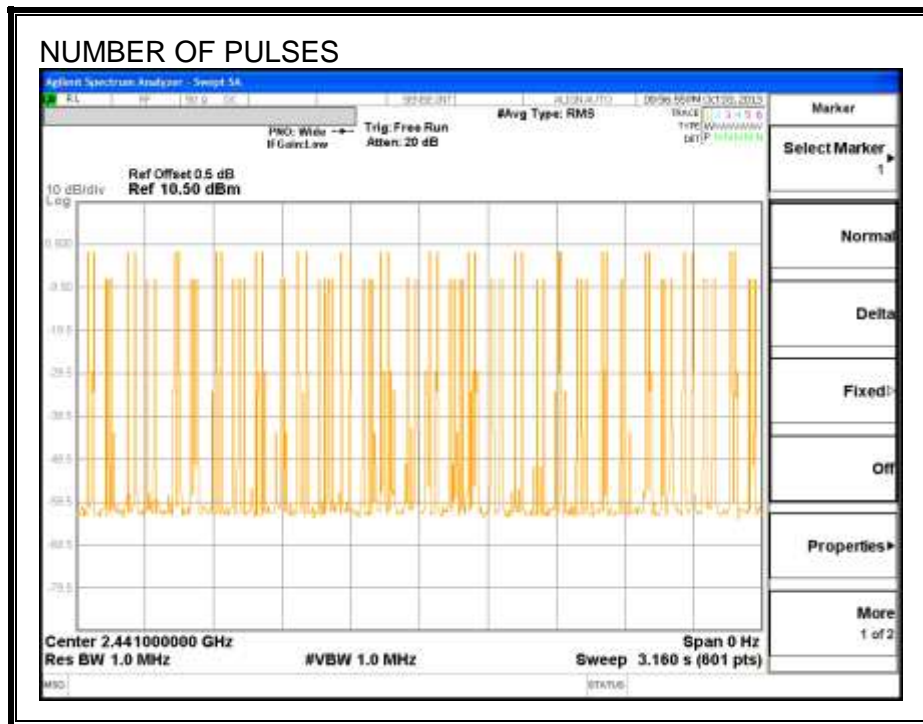
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



QPSK, 2DH1



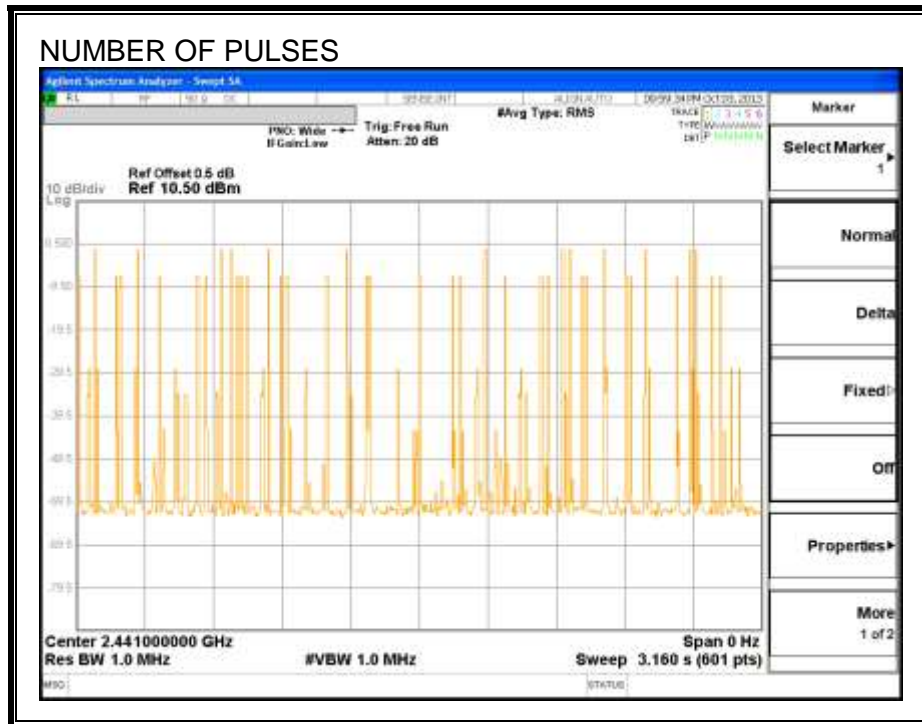
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



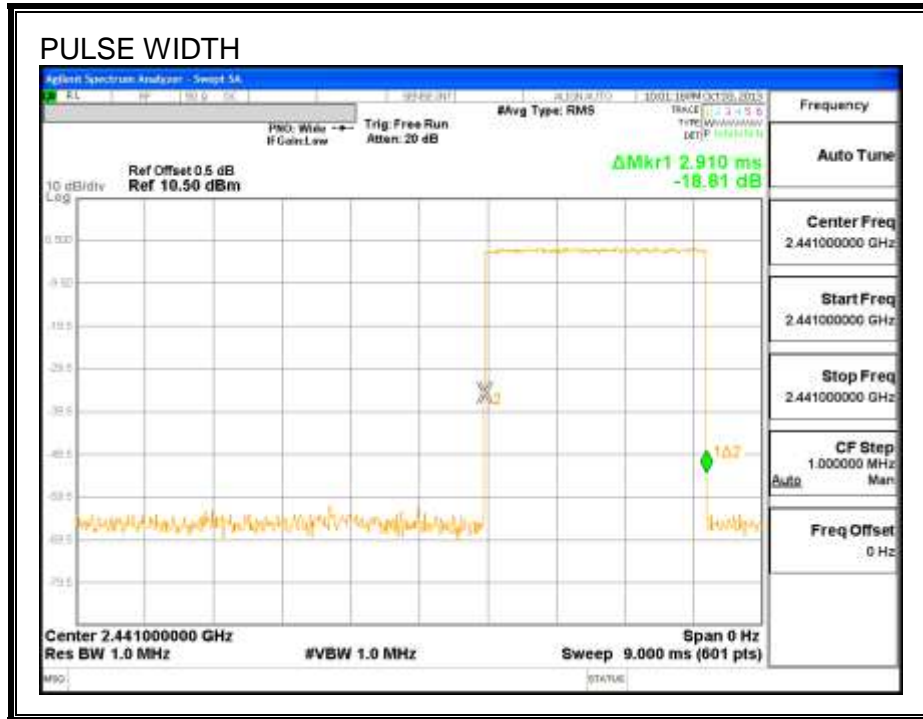
PULSE WIDTH QPSK 2DH3



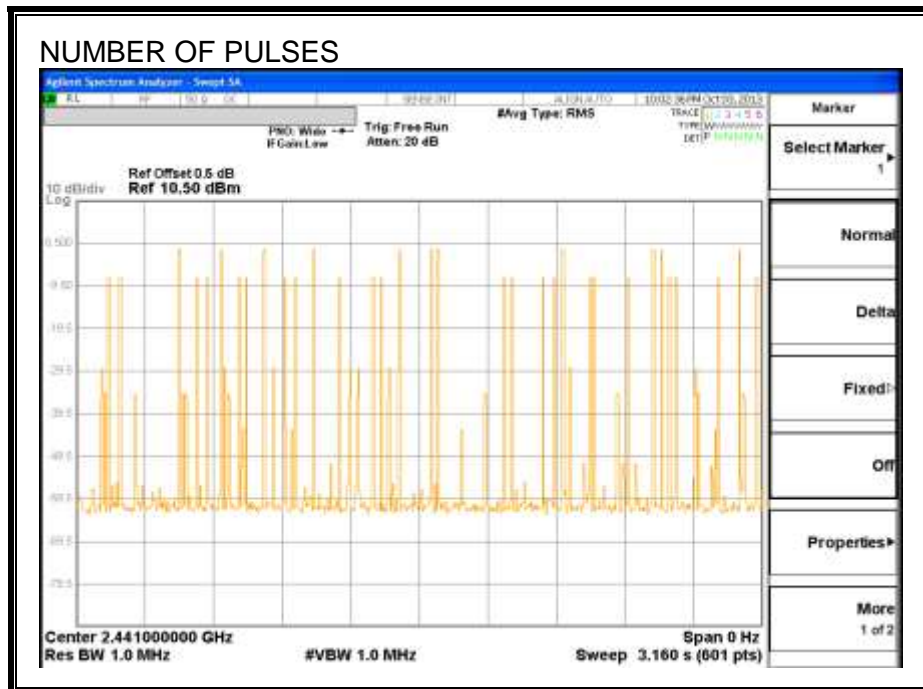
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



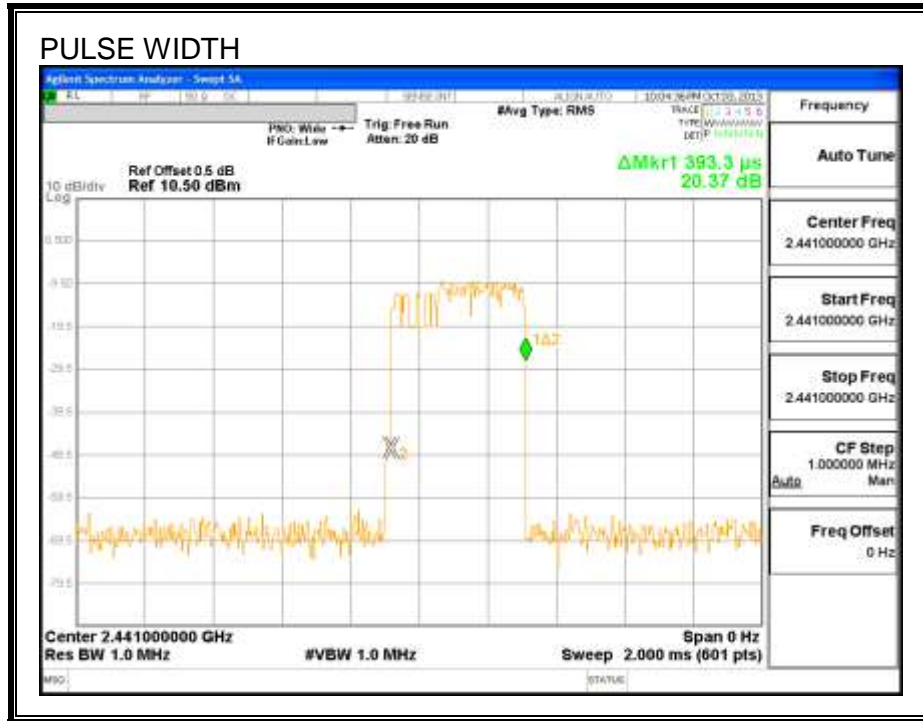
PULSE WIDTH QPSK 2DH5



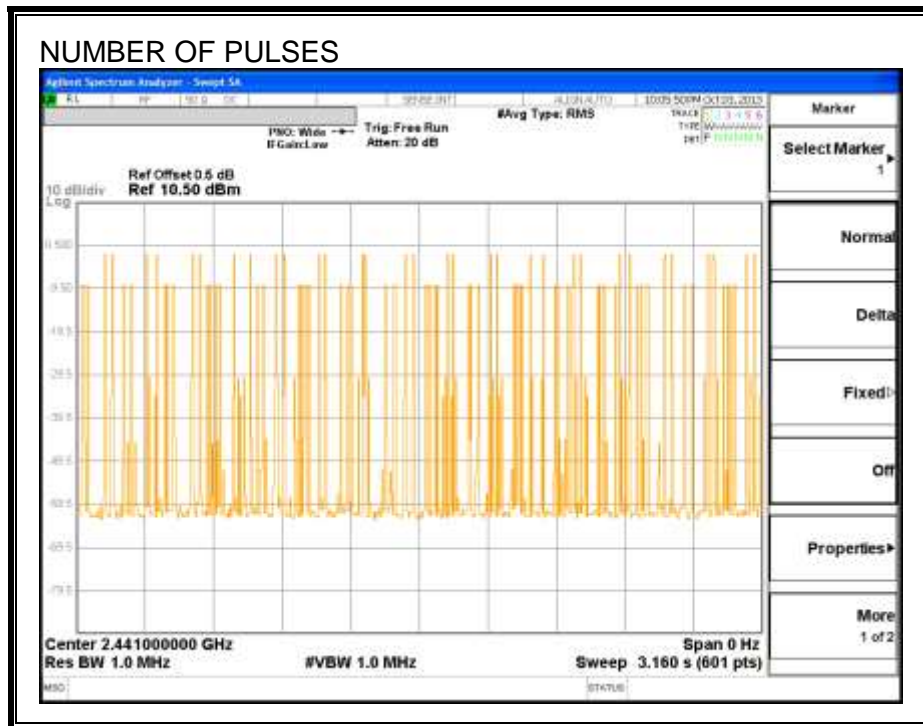
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



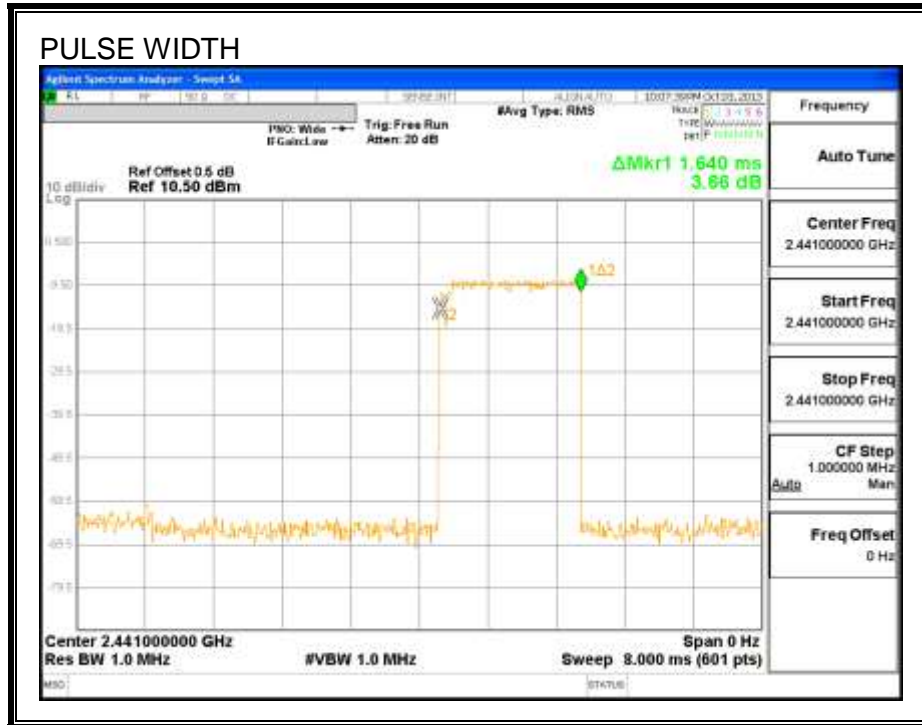
8PSK, 3DH1



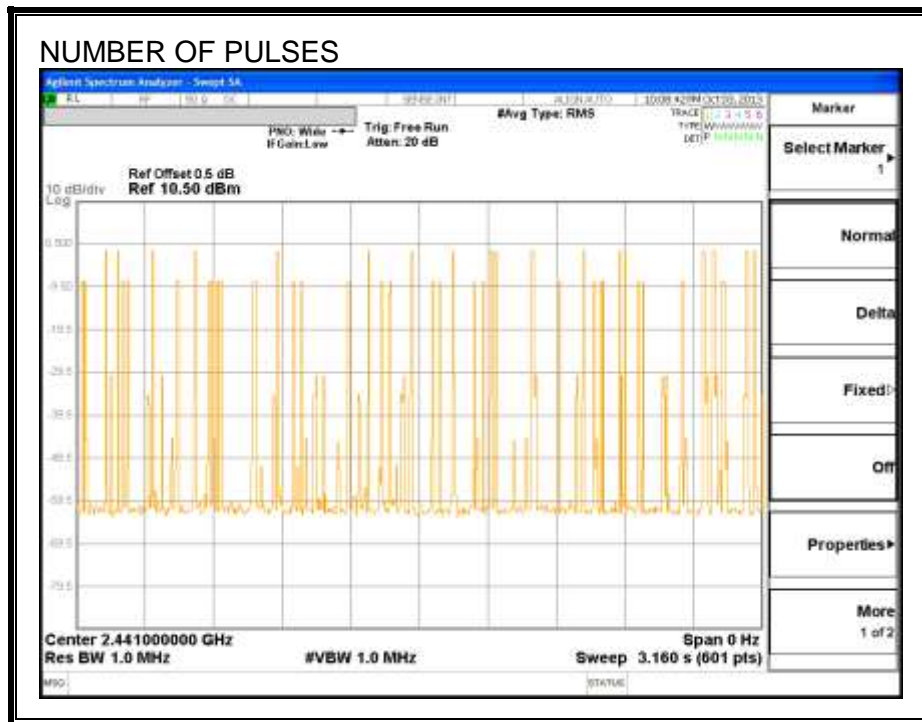
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



PULSE WIDTH 8PSK 3DH3



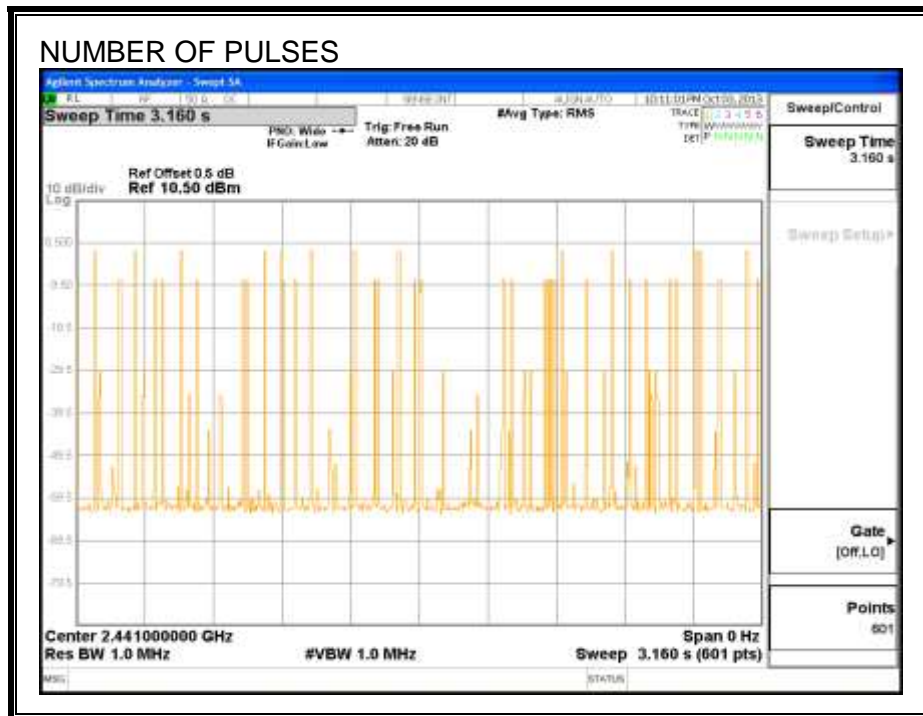
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



PULSE WIDTH 8PSK 3DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

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 analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

GFSK

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.357	30	-30.36
Middle	2441	-0.430	30	-30.43
High	2480	-0.917	30	-30.92

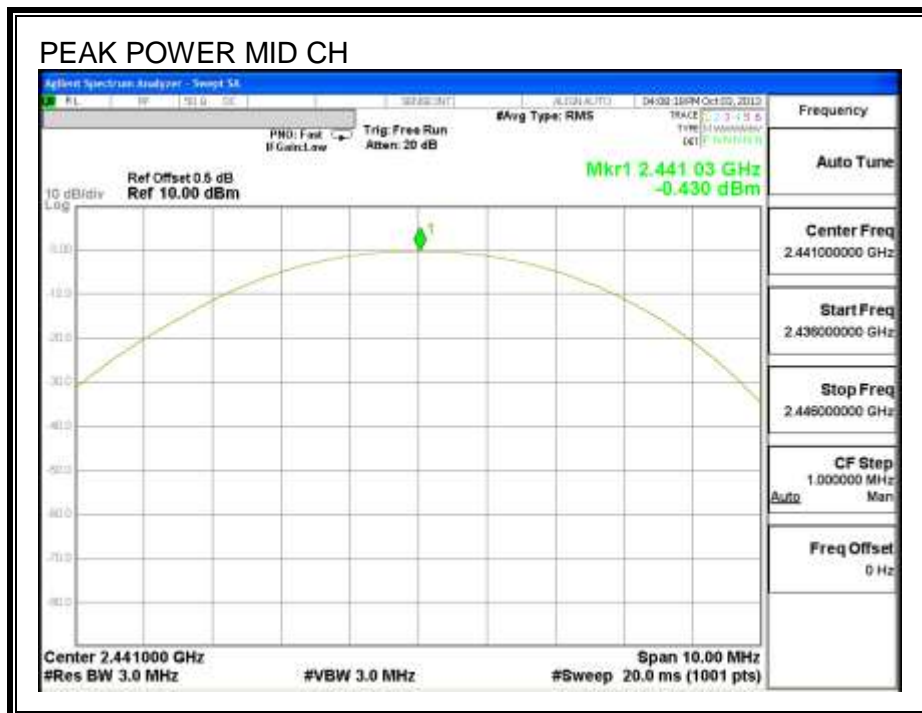
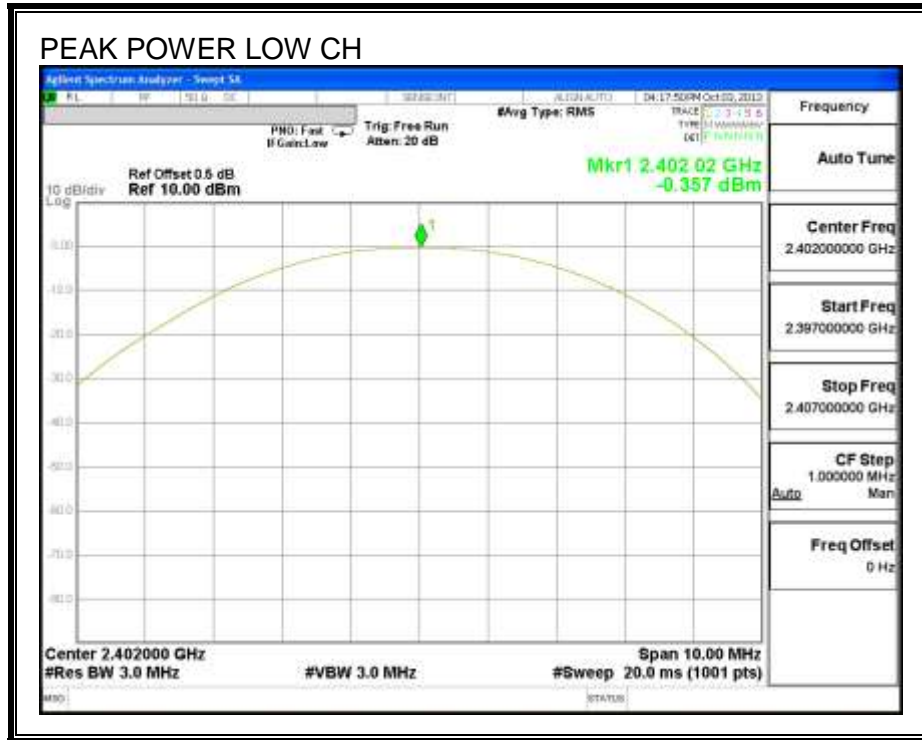
QPSK

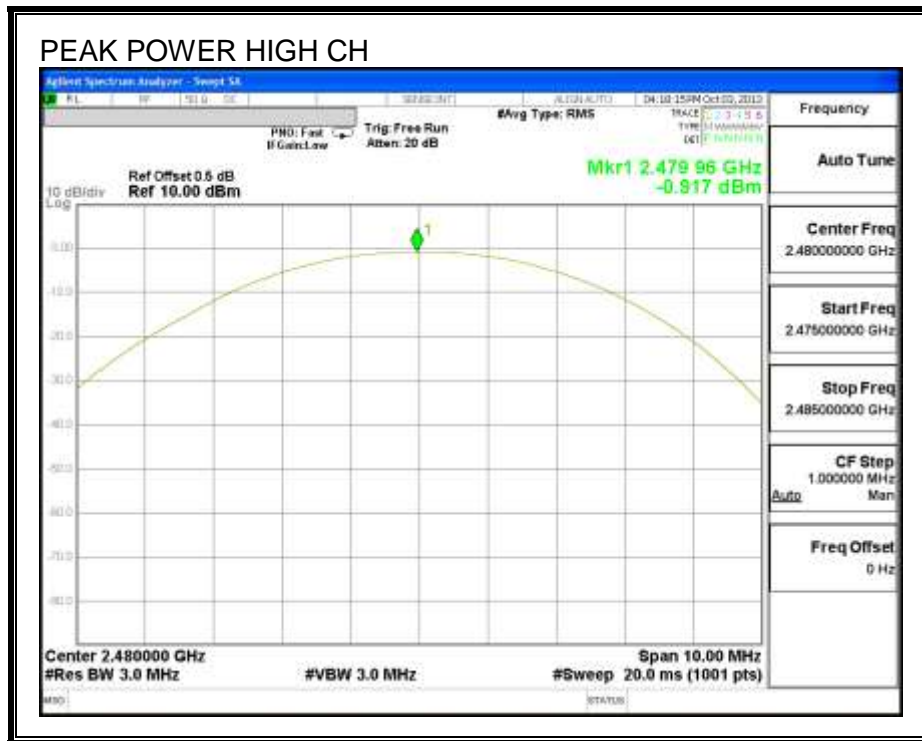
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	0.325	20.97	-20.65
Middle	2441	-0.262	20.97	-21.23
High	2480	-0.243	20.97	-21.21

8PSK

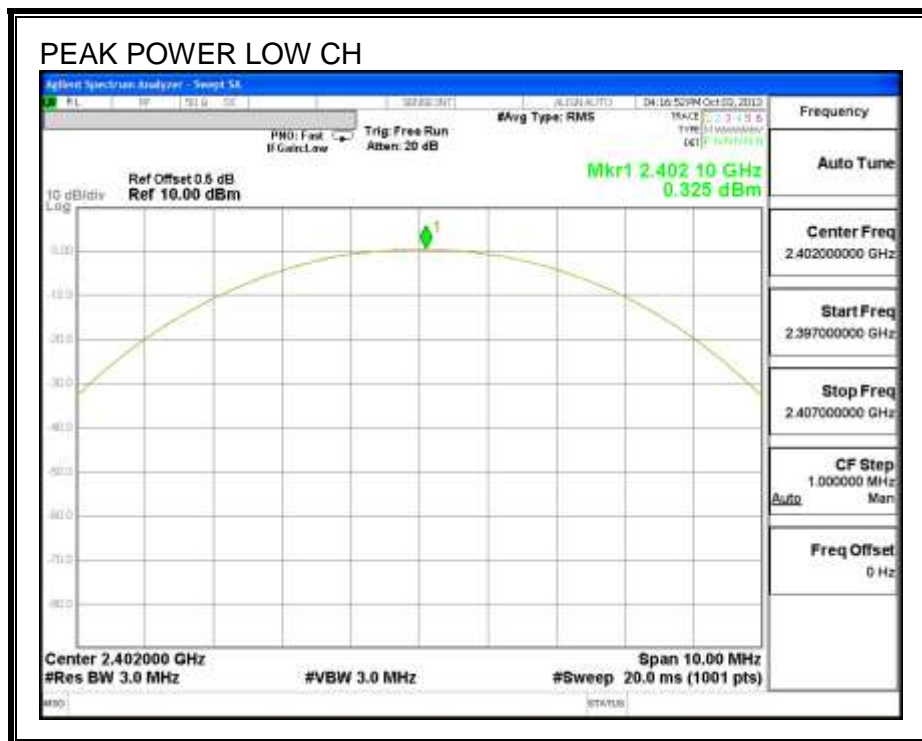
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.238	20.97	-21.21
Middle	2441	-0.350	20.97	-21.32
High	2480	-0.823	20.97	-21.79

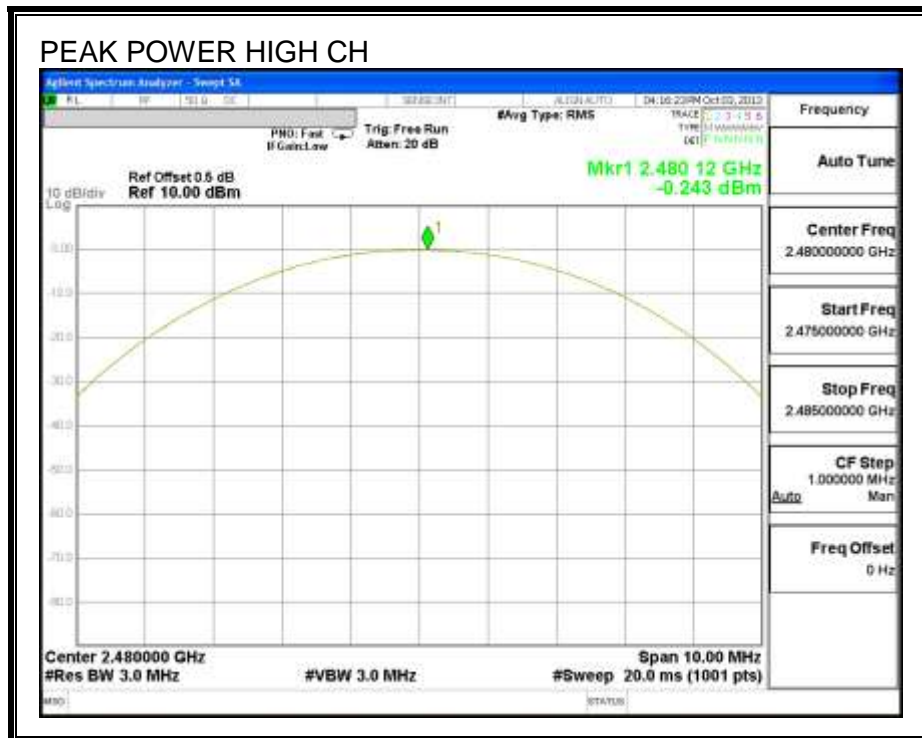
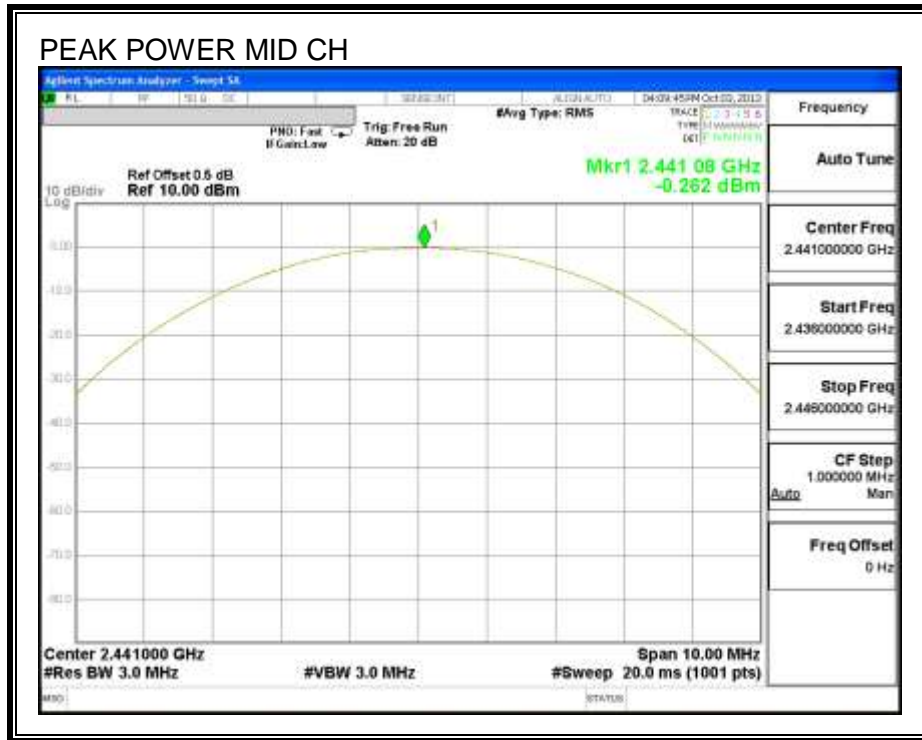
GFSK



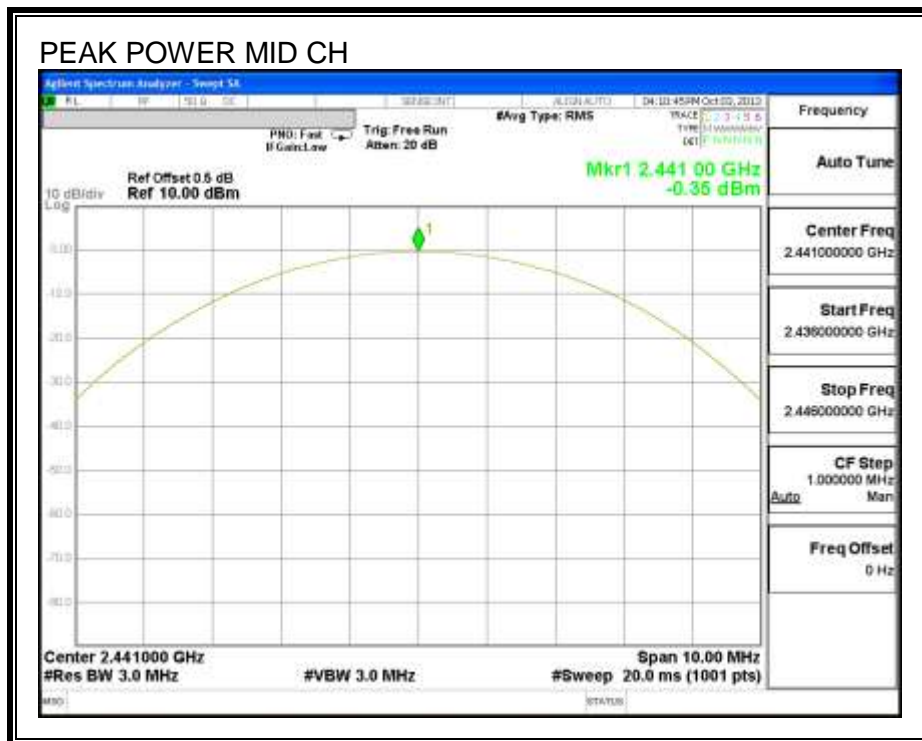
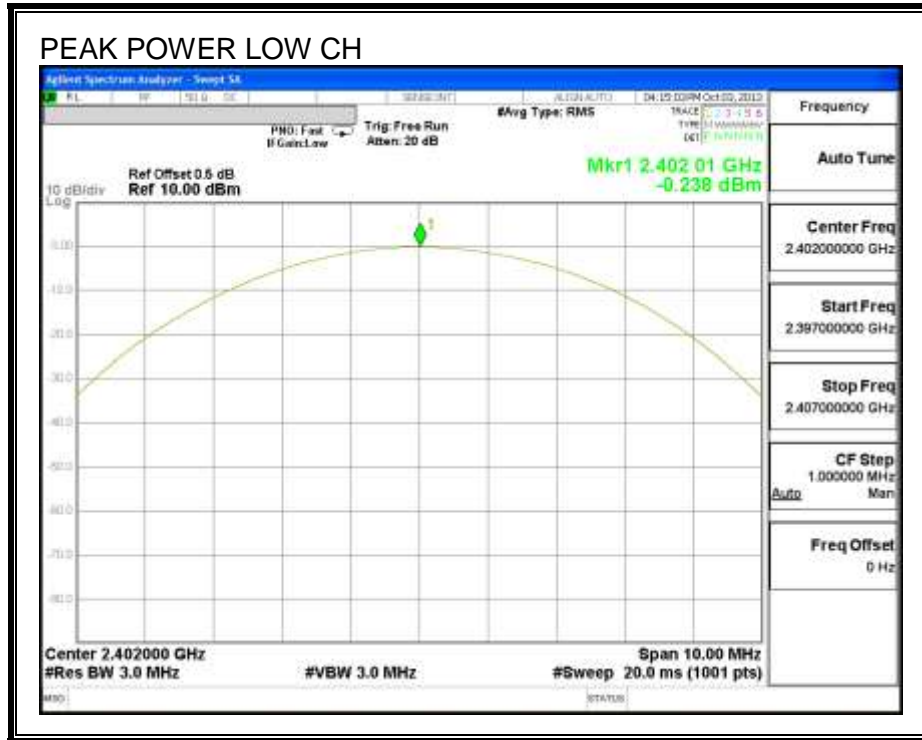


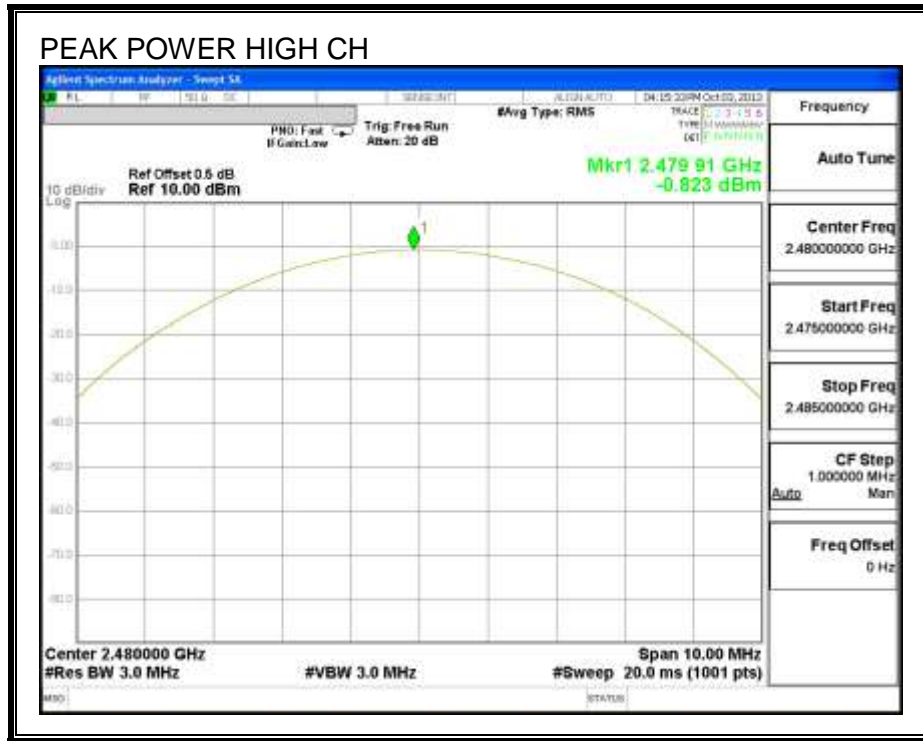
QPSK





8PSK





7.6. 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 10.9 dB (including 10 dB pad and 0.9 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

GFSK

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-0.64
Middle	2441	-0.71
High	2480	-0.99

QPSK

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-2.23
Middle	2441	-2.26
High	2480	-2.90

8PSK

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-3.27
Middle	2441	-3.87
High	2480	-3.04

7.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

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.

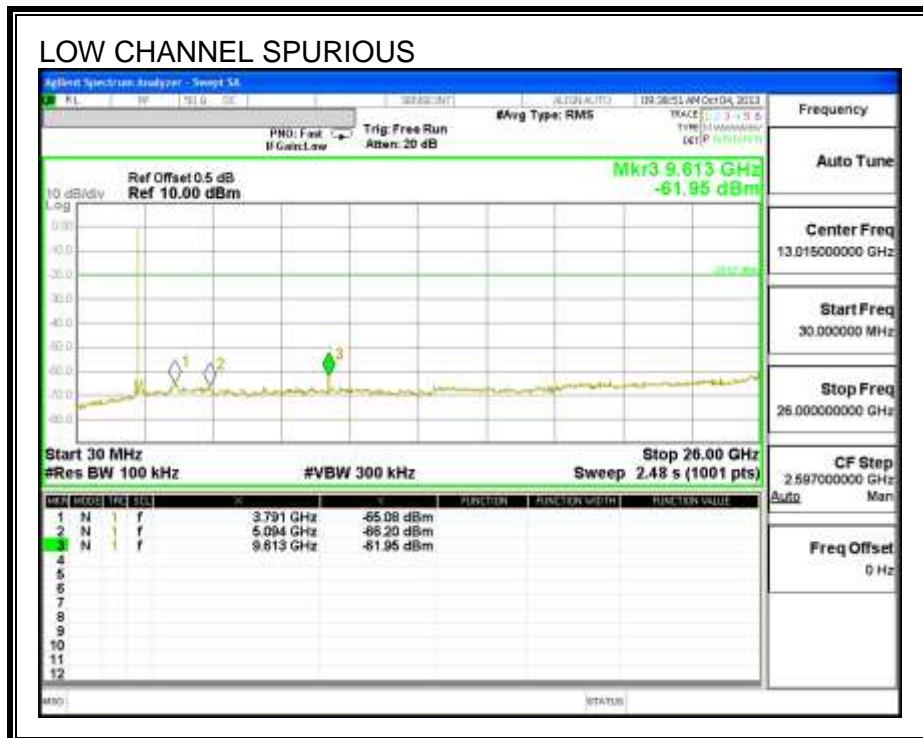
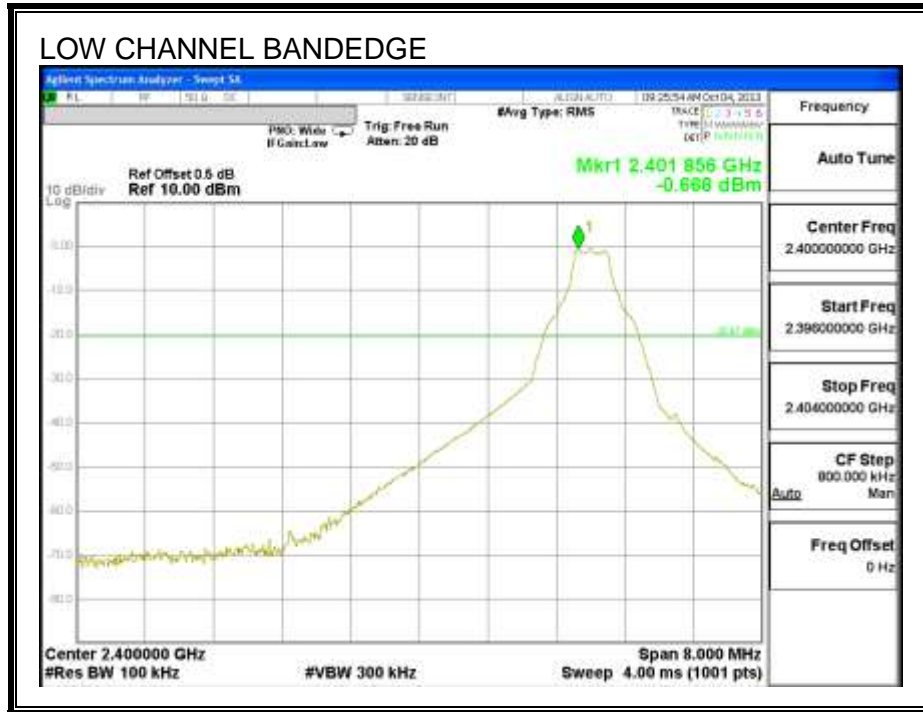
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

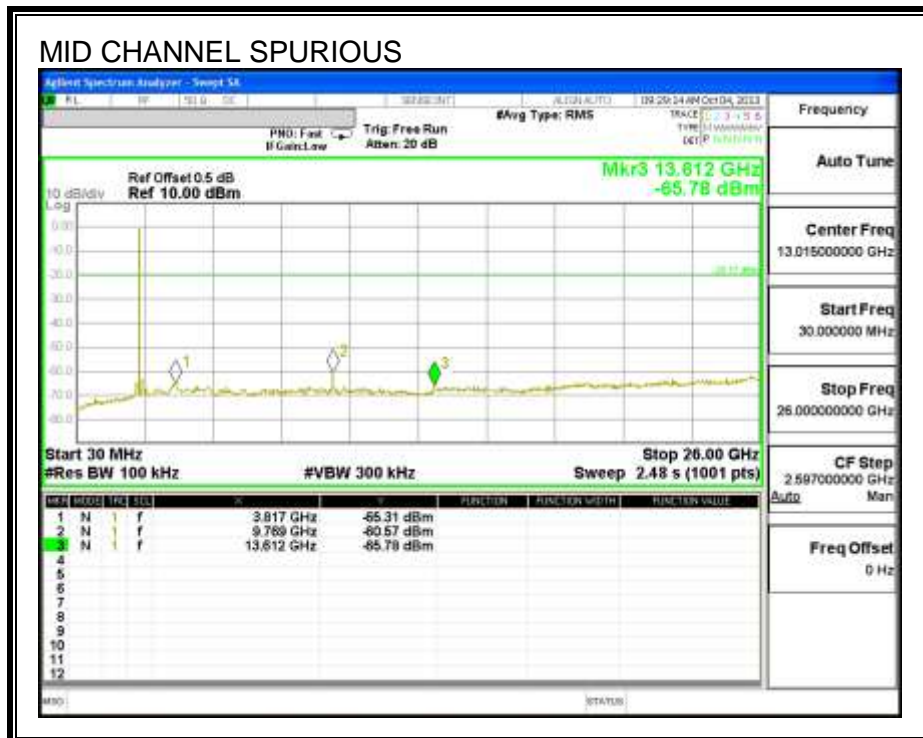
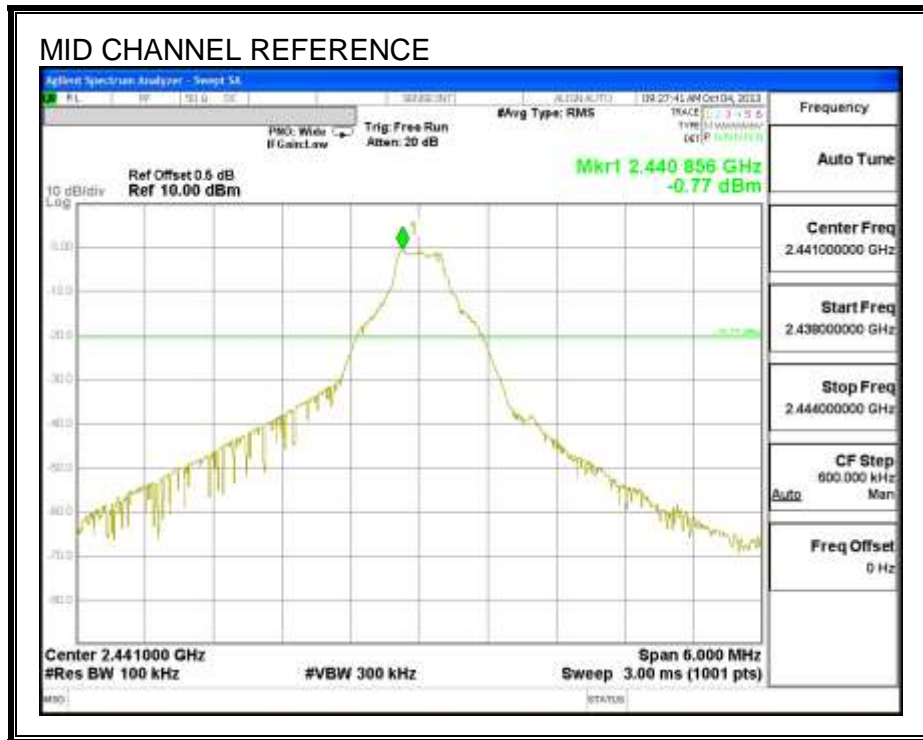
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

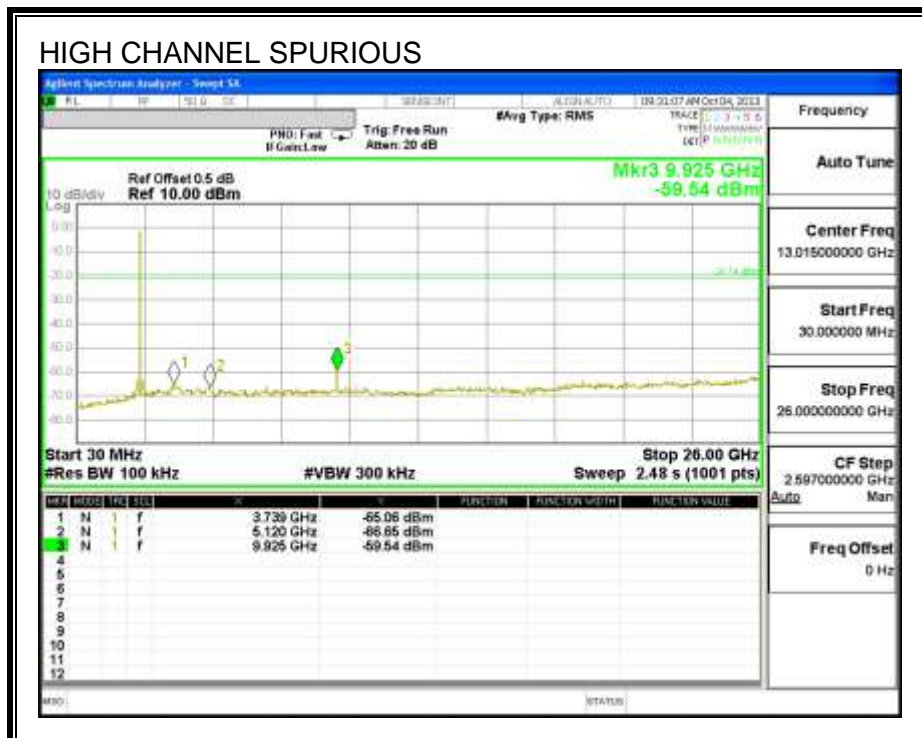
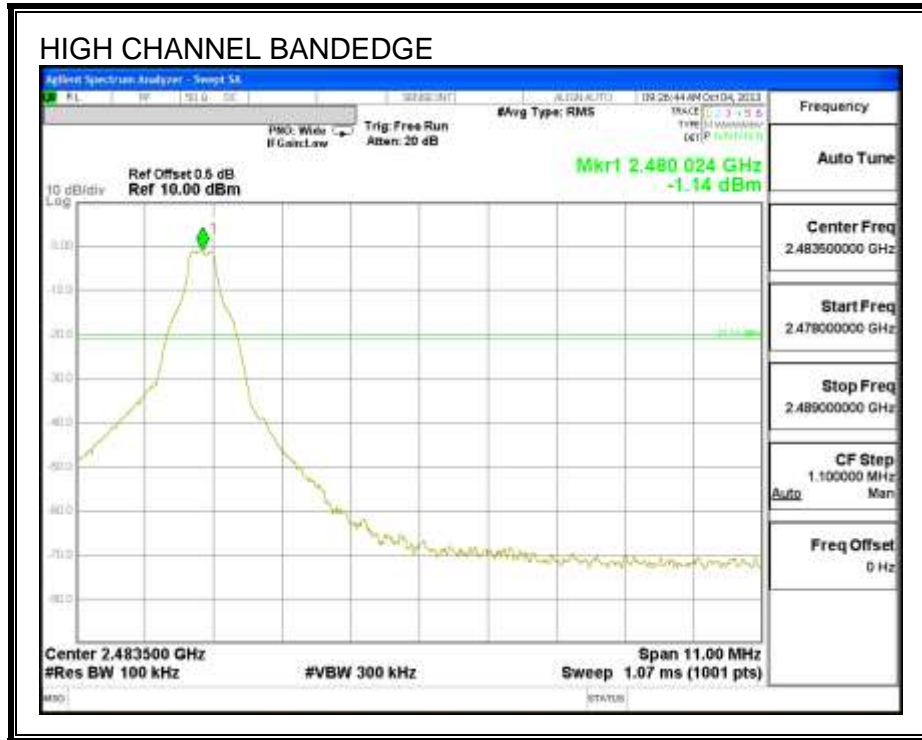
RESULTS

SPURIOUS EMISSIONS

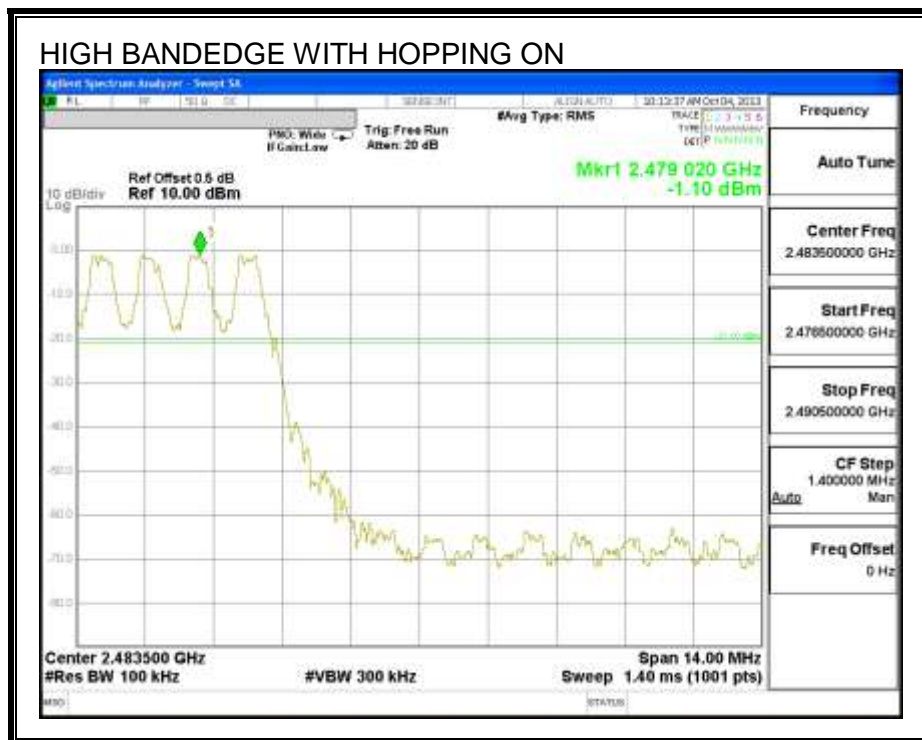
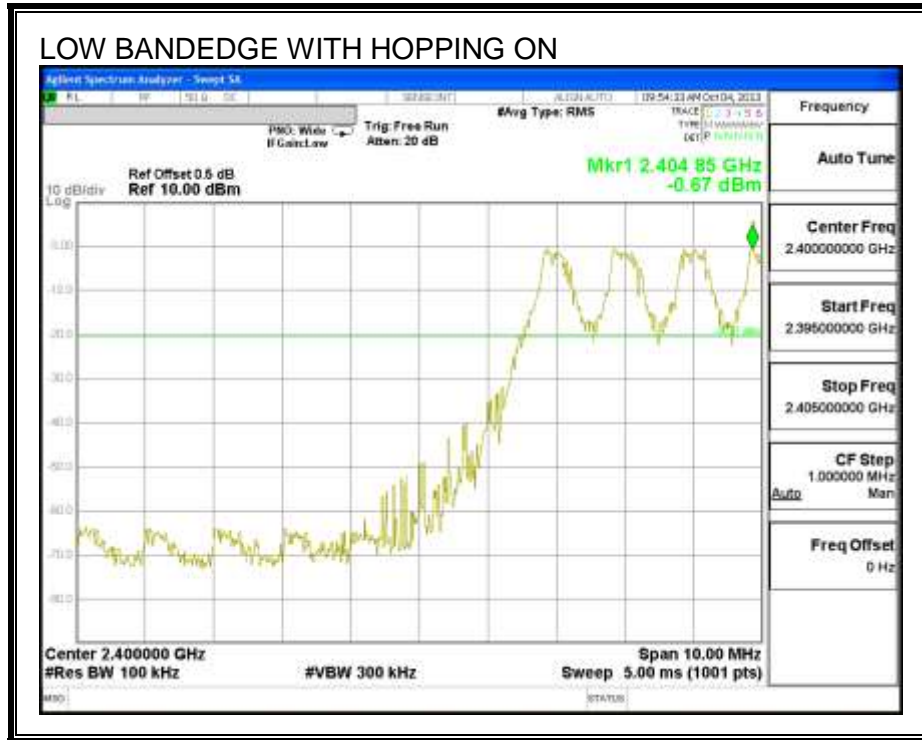
GFSK



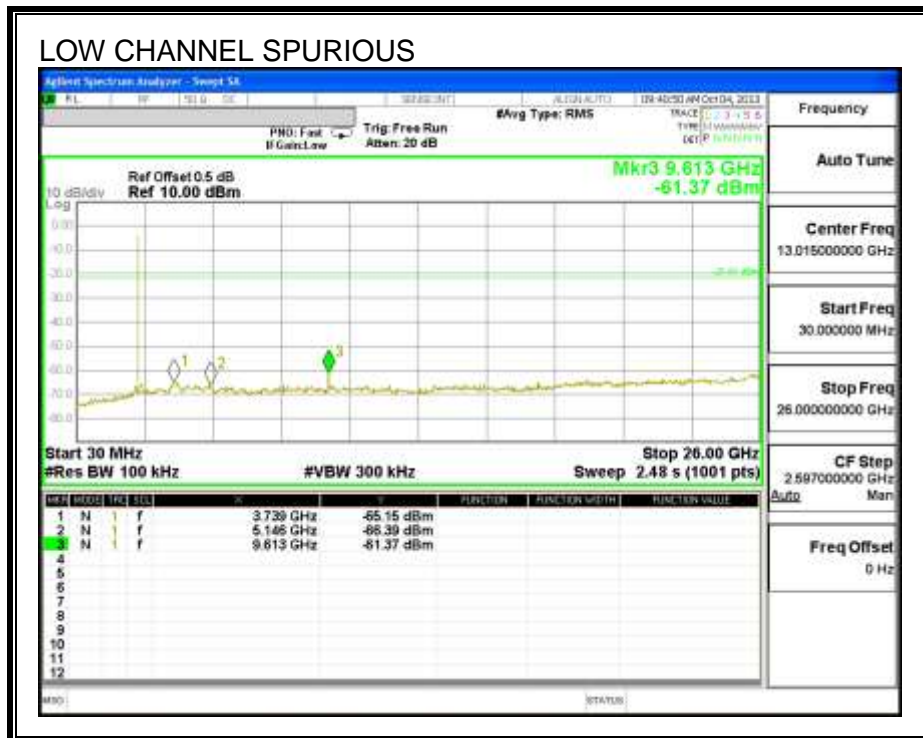
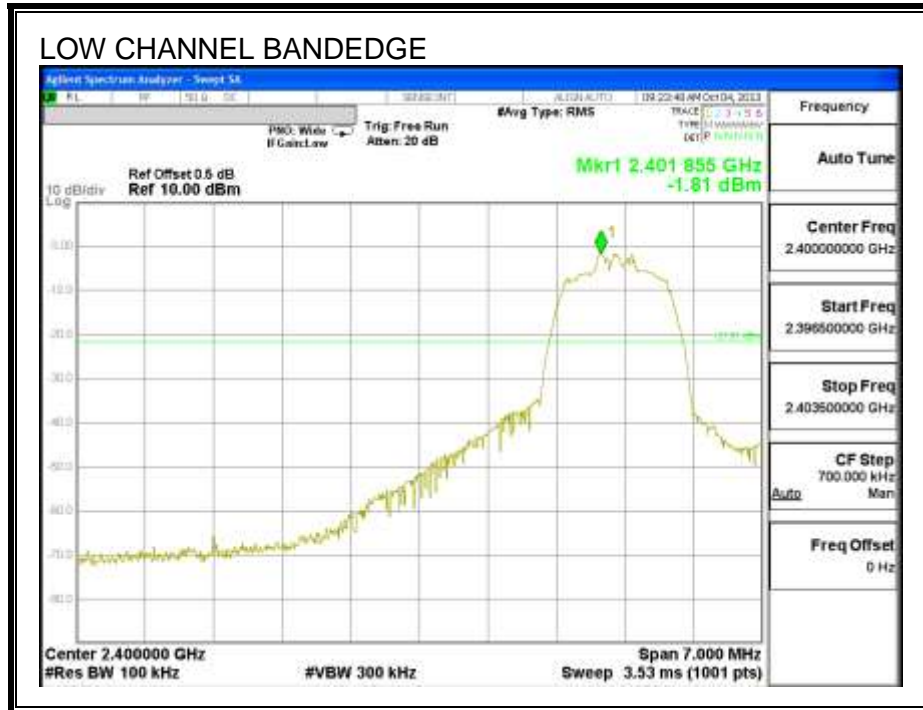


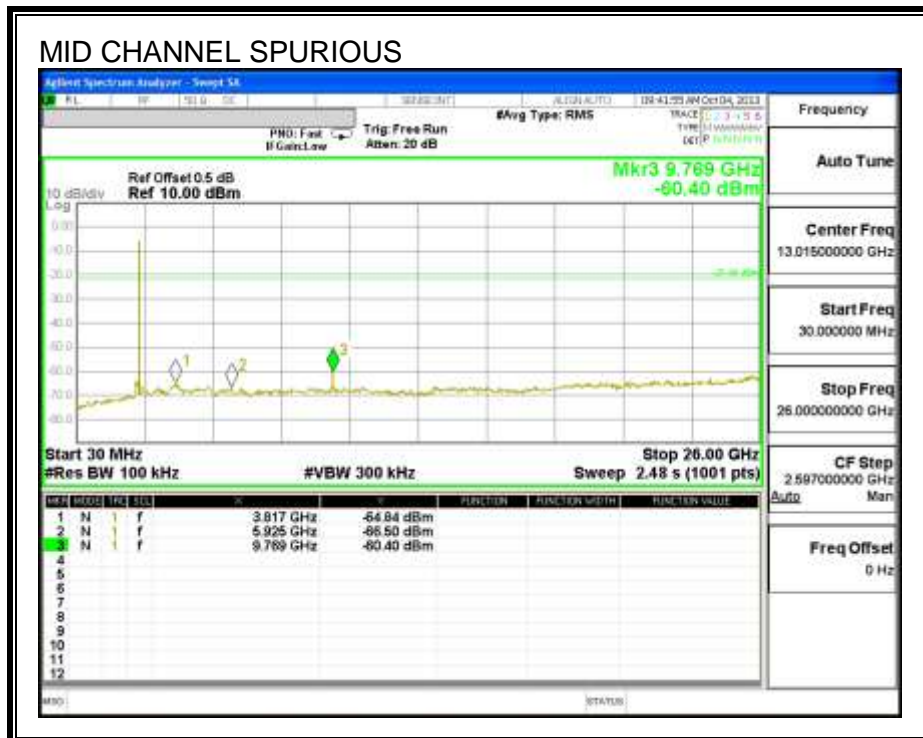
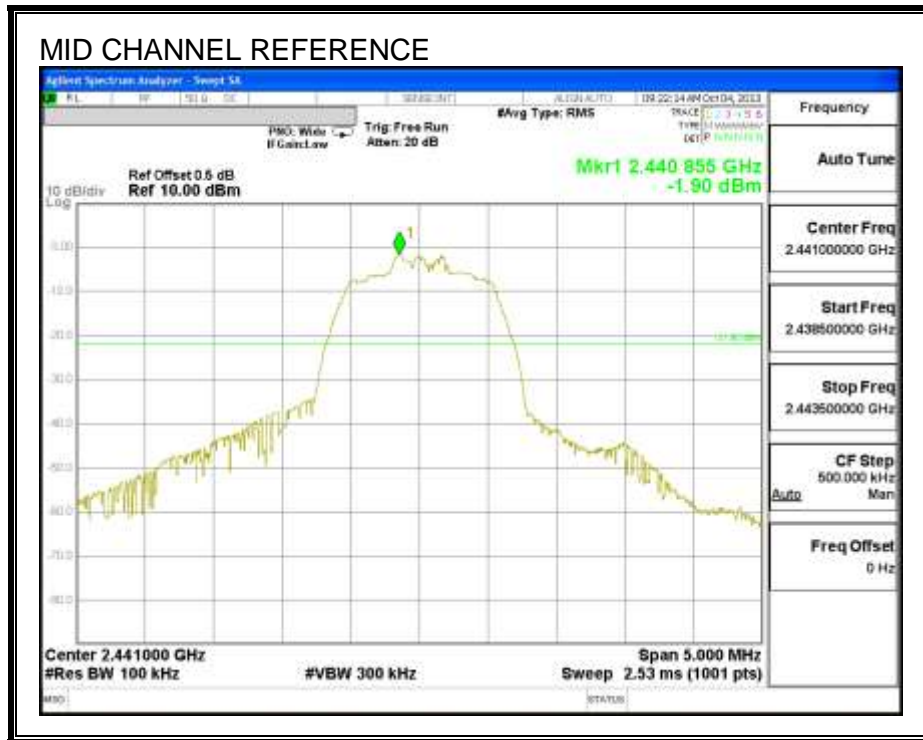


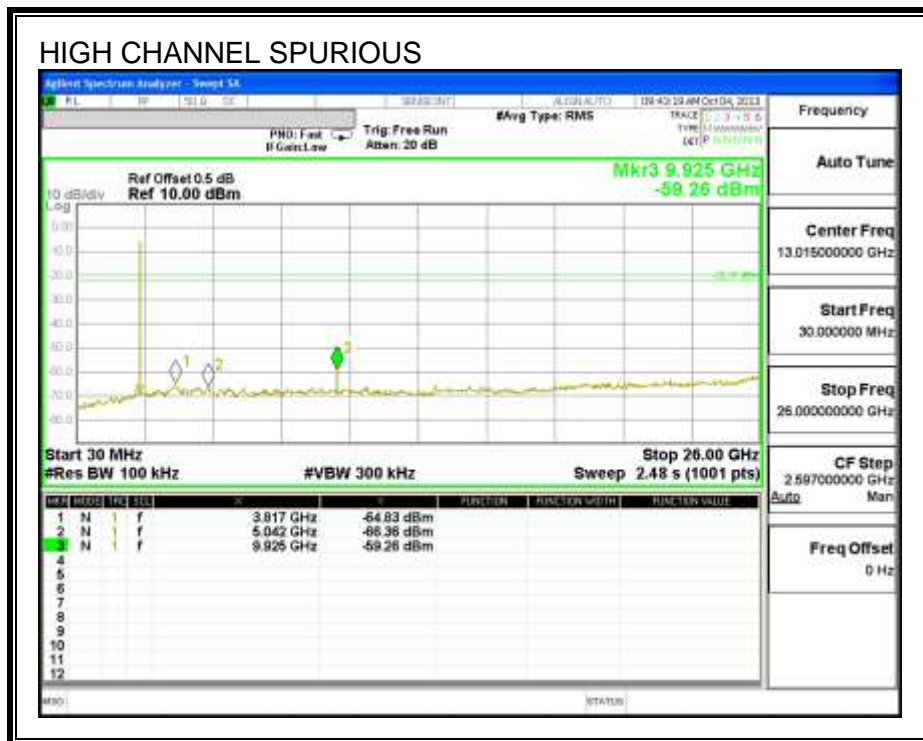
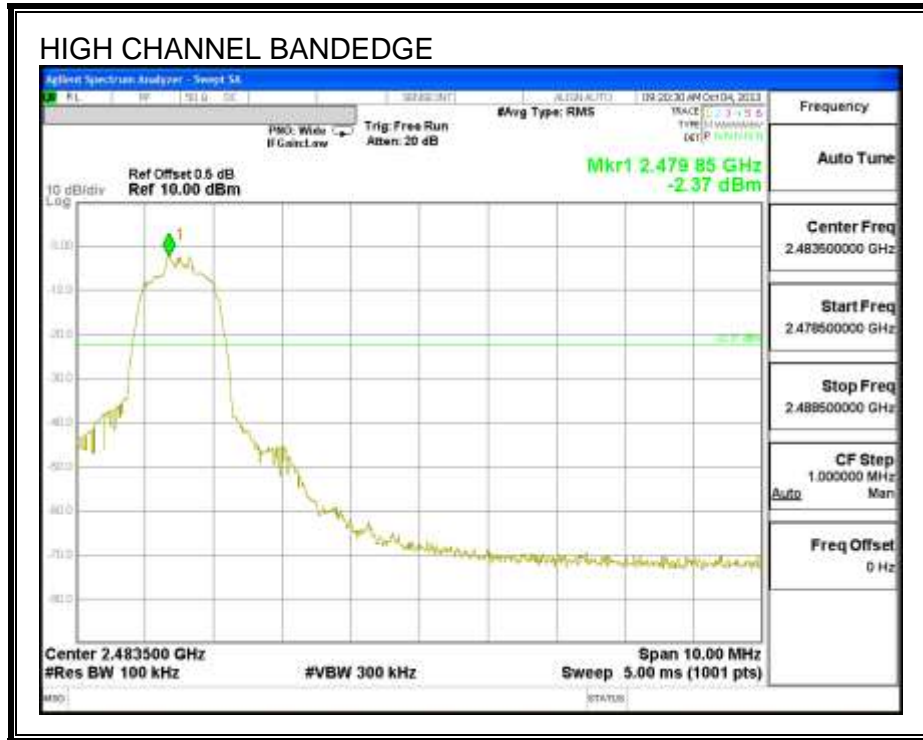
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



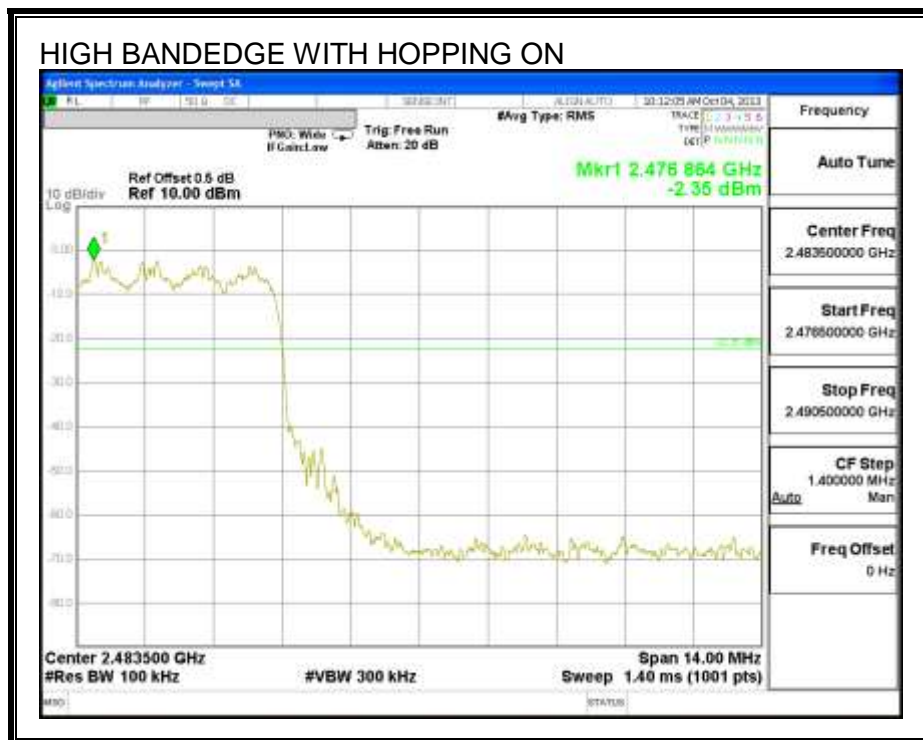
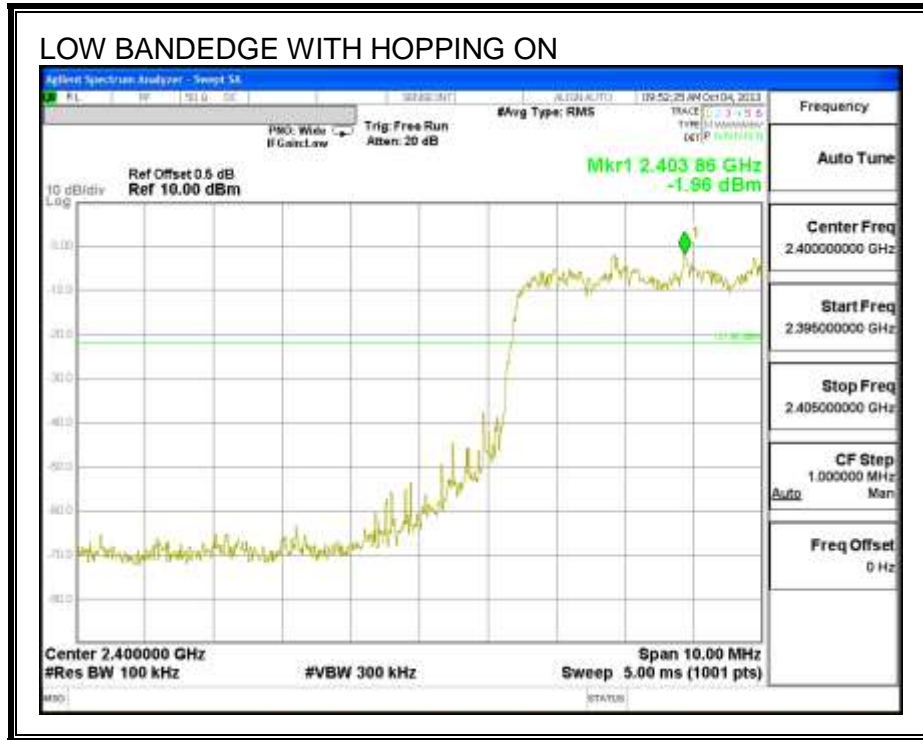
QPSK



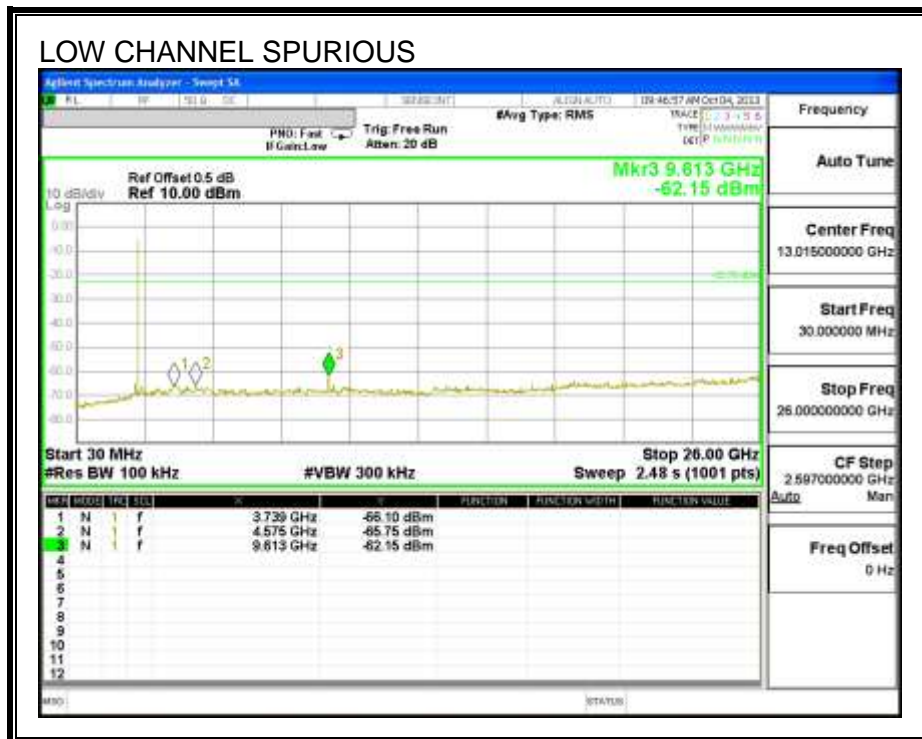
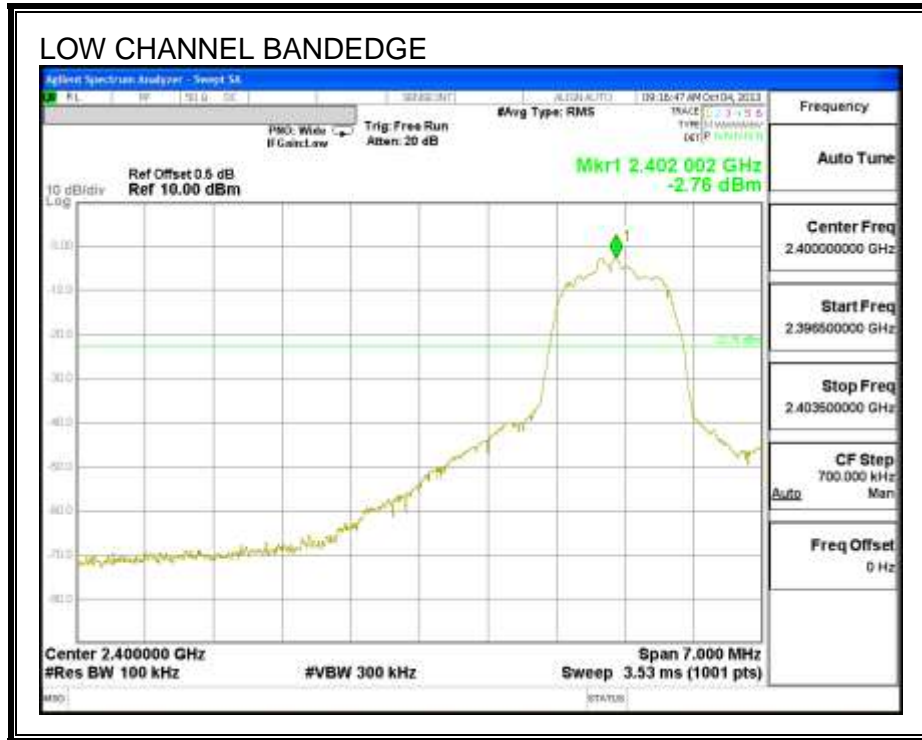


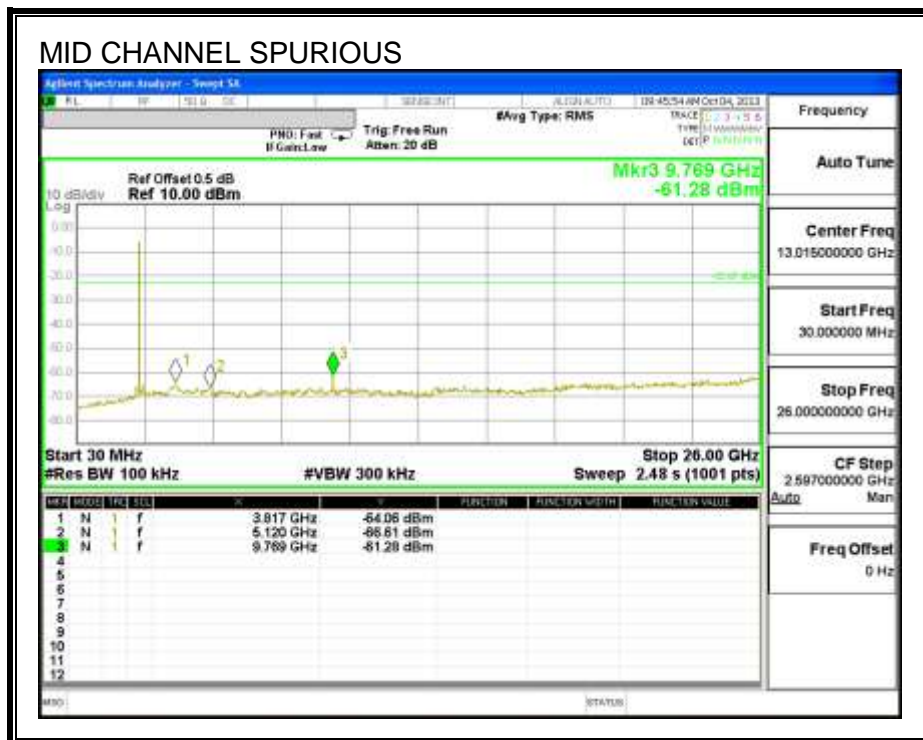
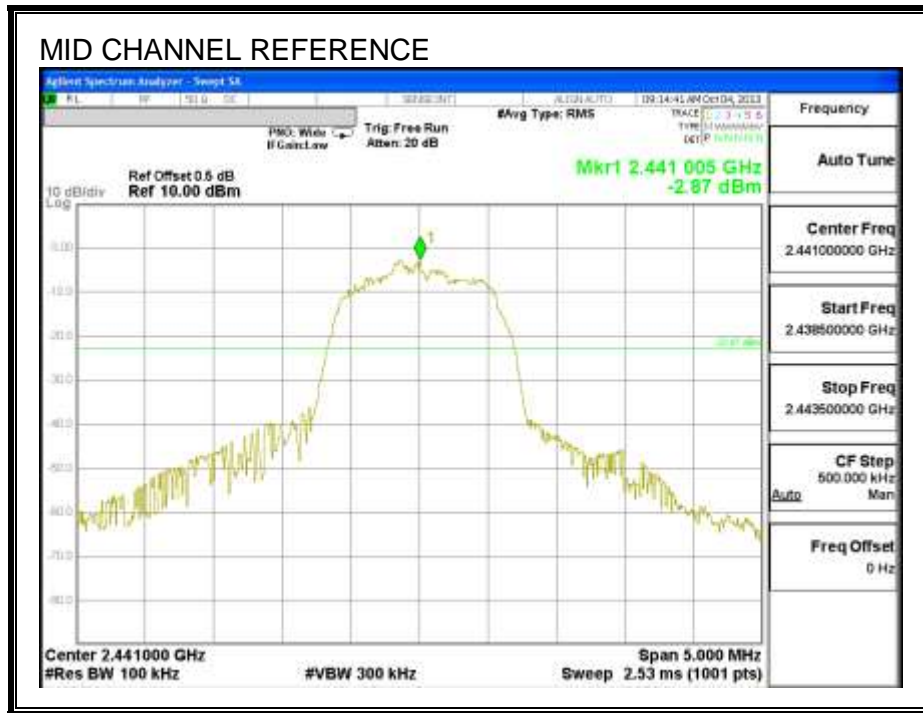


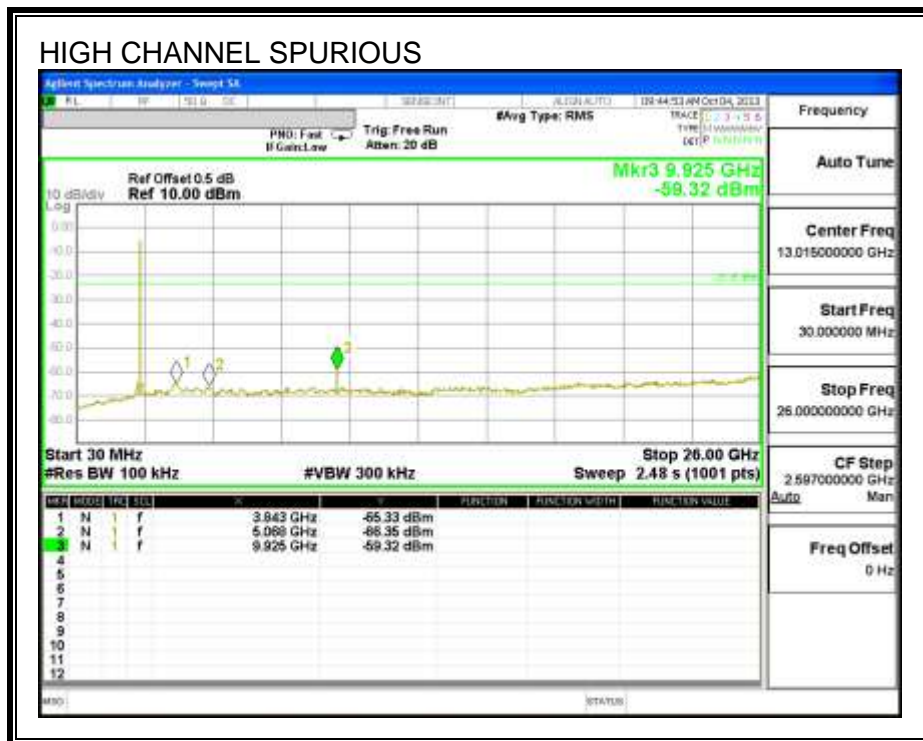
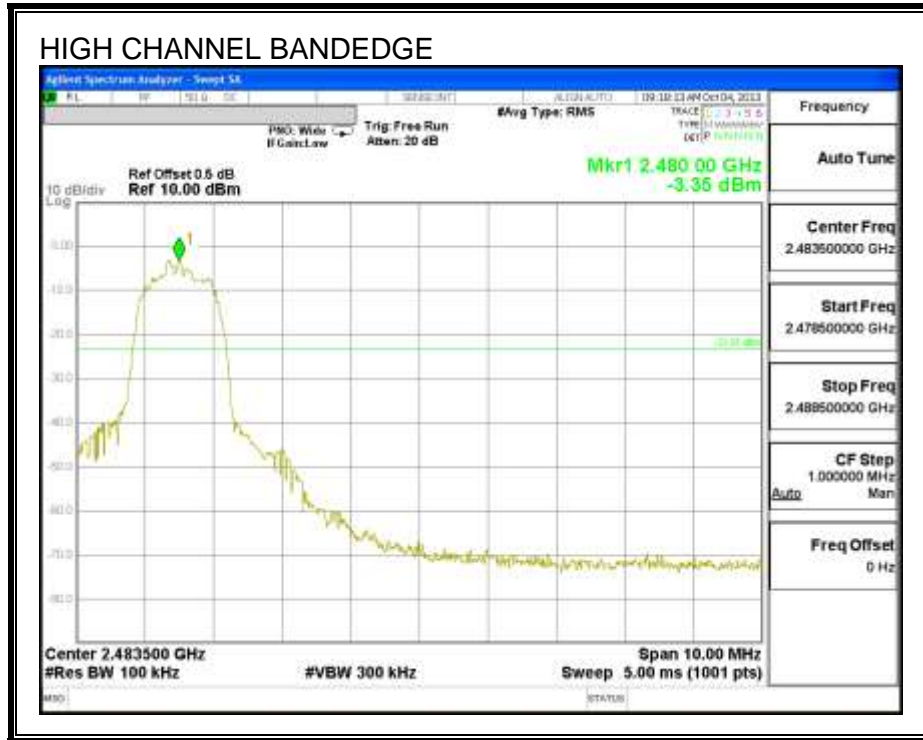
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



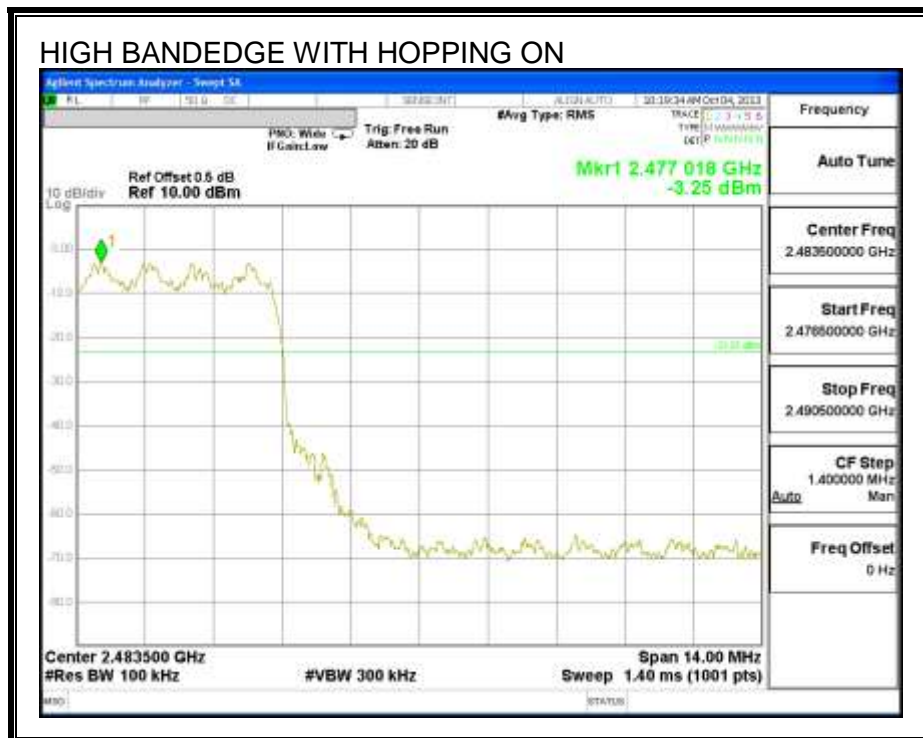
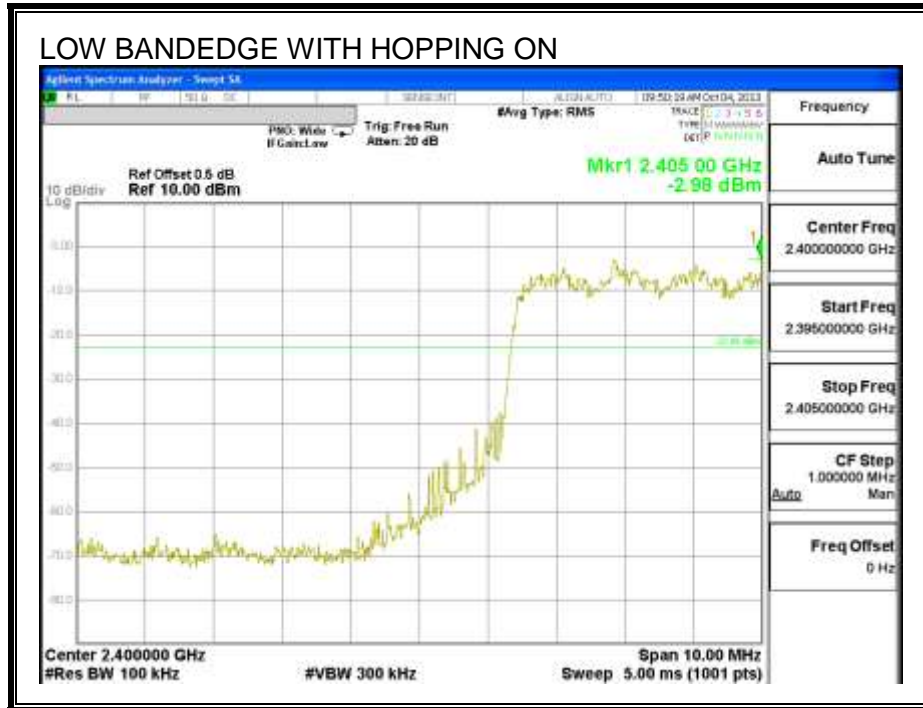
8PSK







SPURIOUS BANDEGE EMISSIONS WITH HOPPING ON



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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.

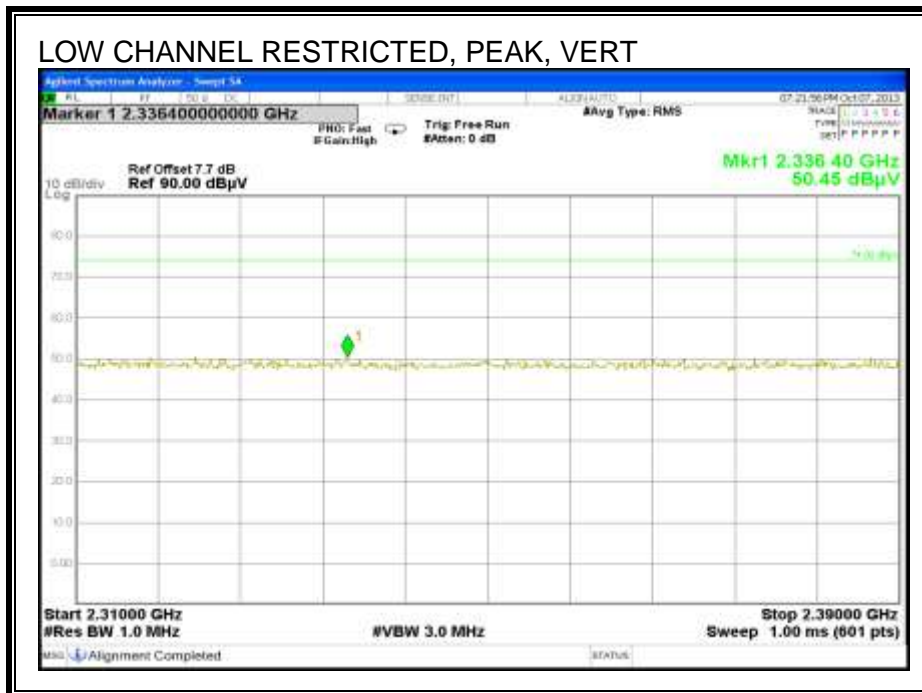
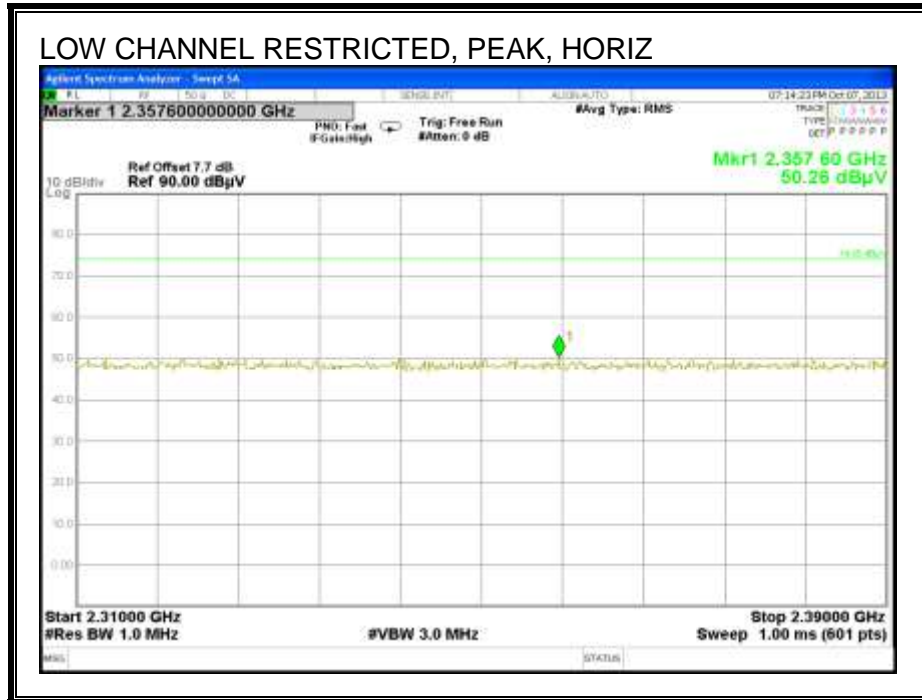
RESULTS

For the Band edge measurement, there is no need for the average reading since the peak reading passed with the peak limit. The average reading = peak reading – 20*log (1/duty cycle), and the 20*log (1/duty cycle) is greater than 20dB.

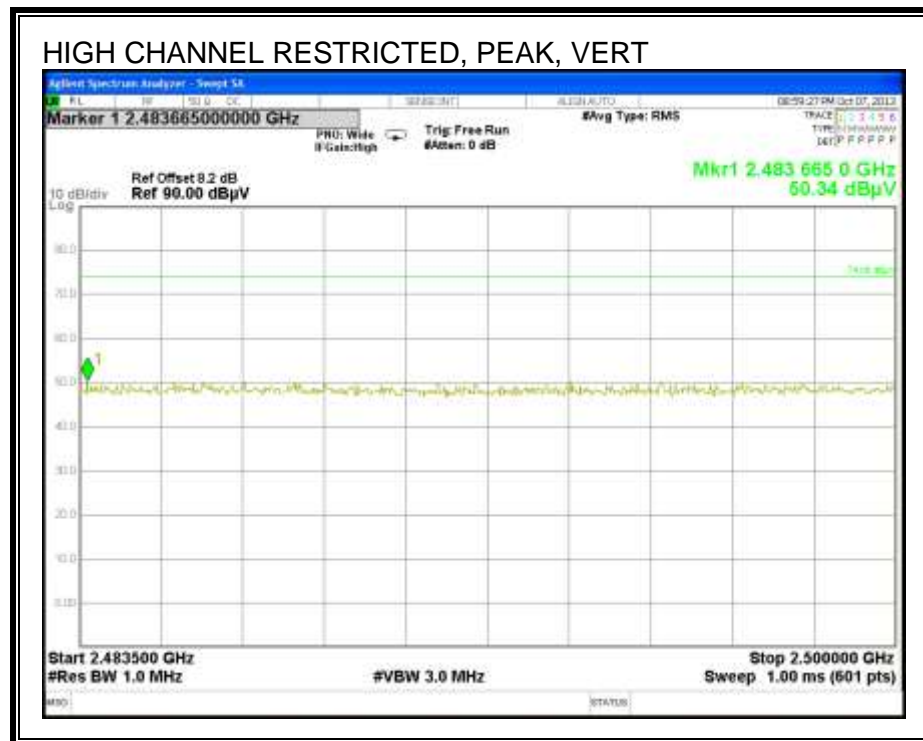
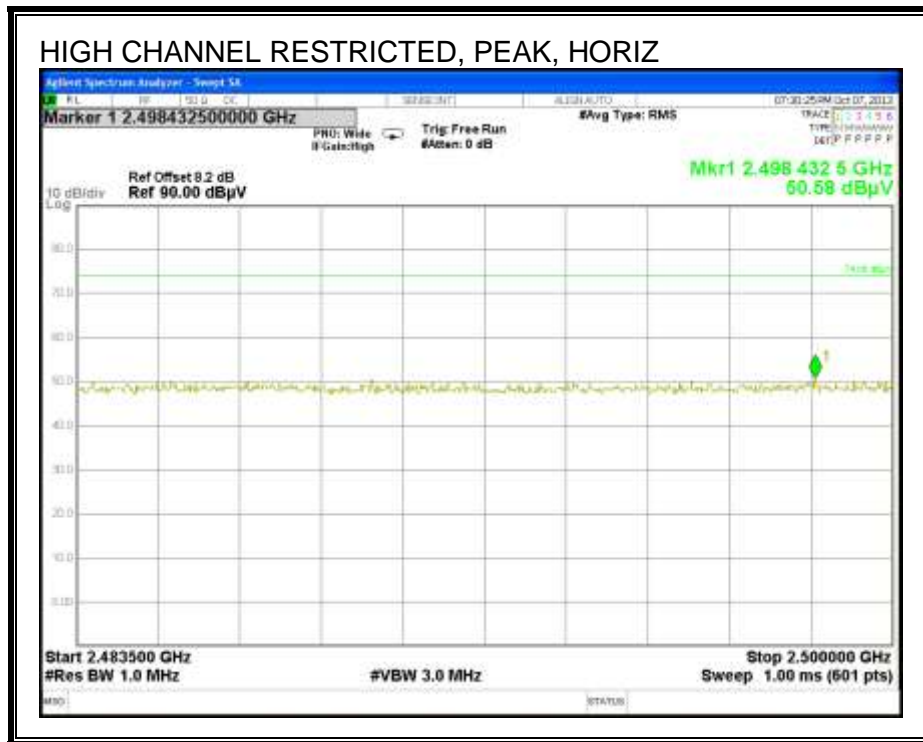
8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

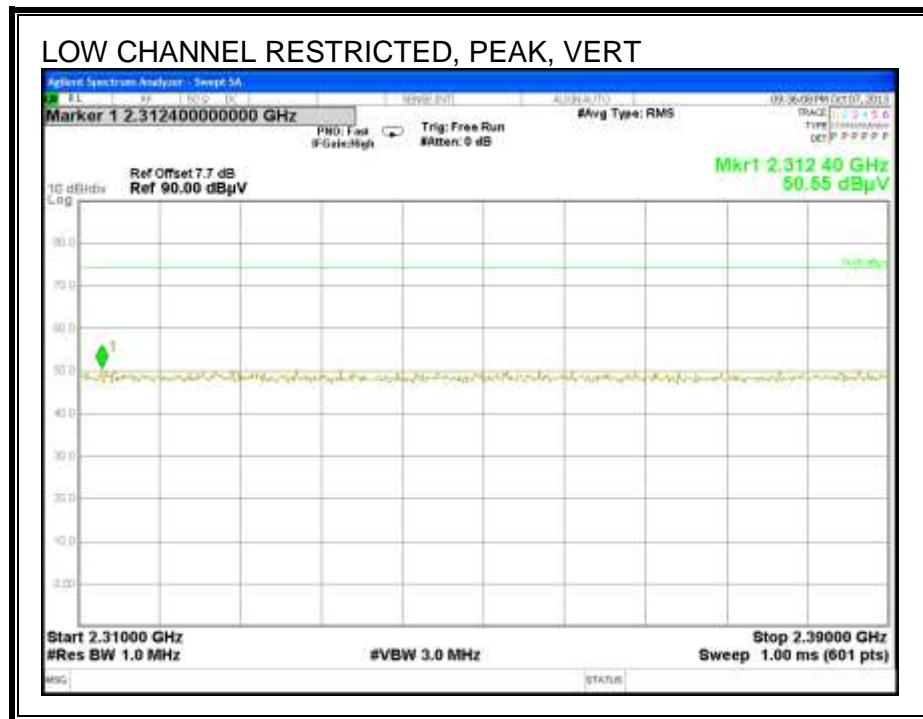
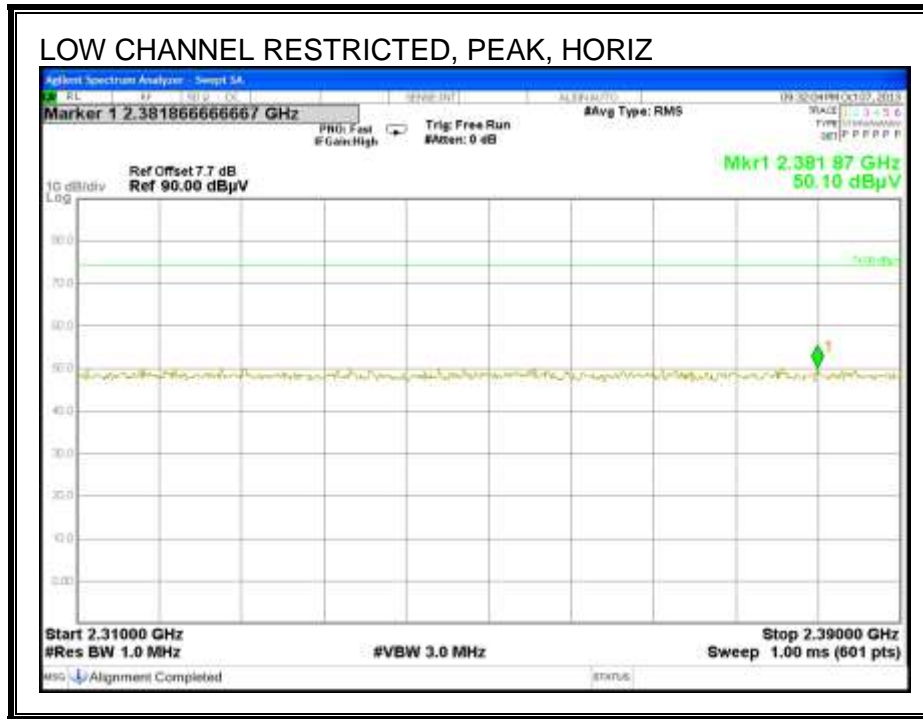


RESTRICTED BANEDGE (HIGH CHANNEL)

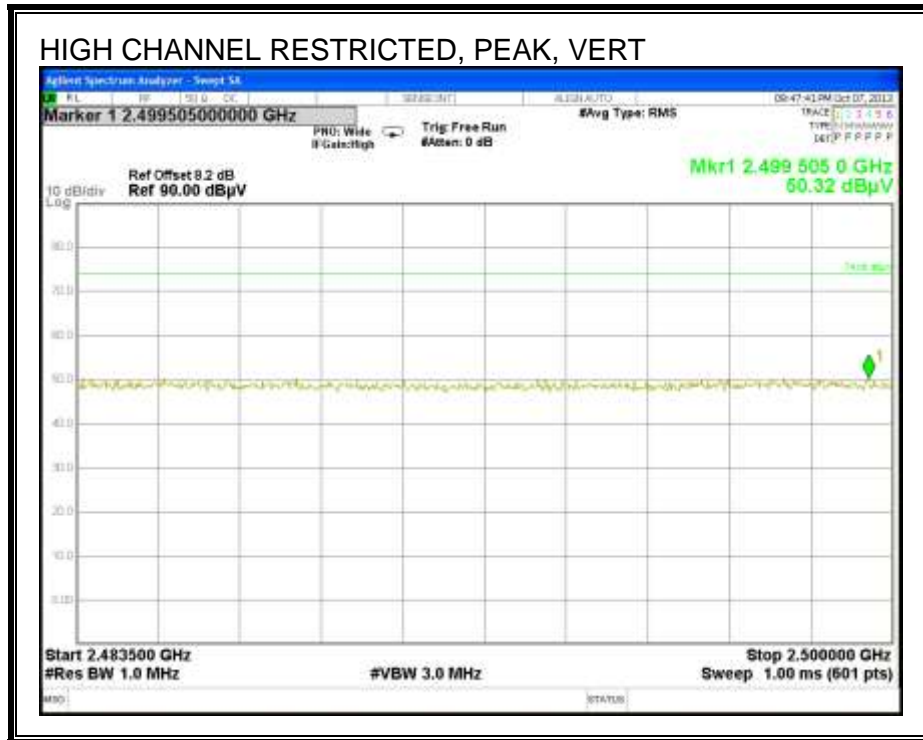
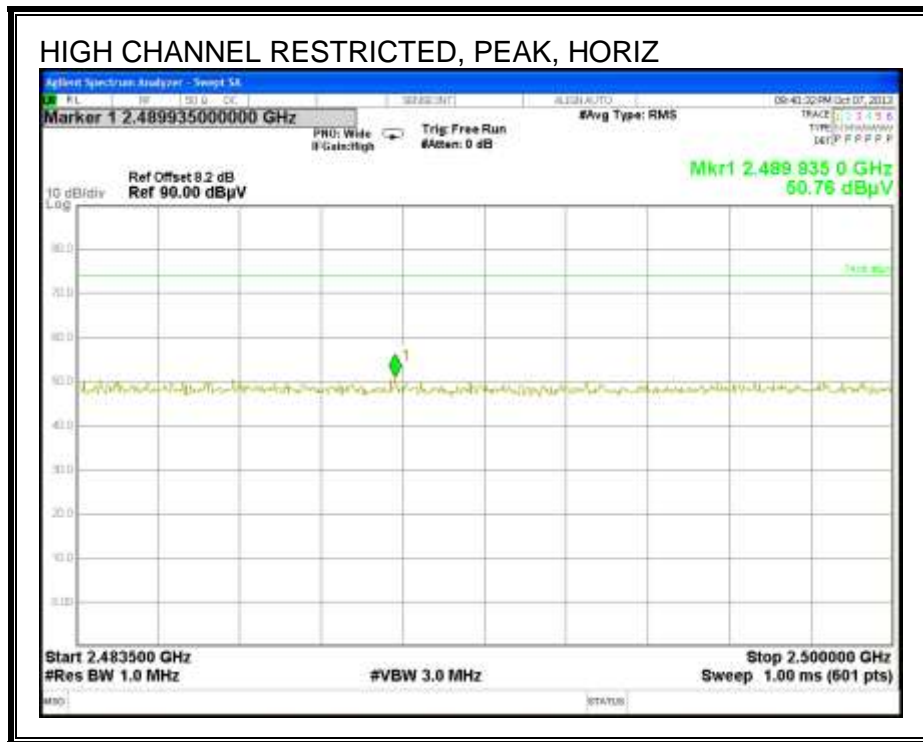


8.2.2. ENHANCED DATA RATE QPSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

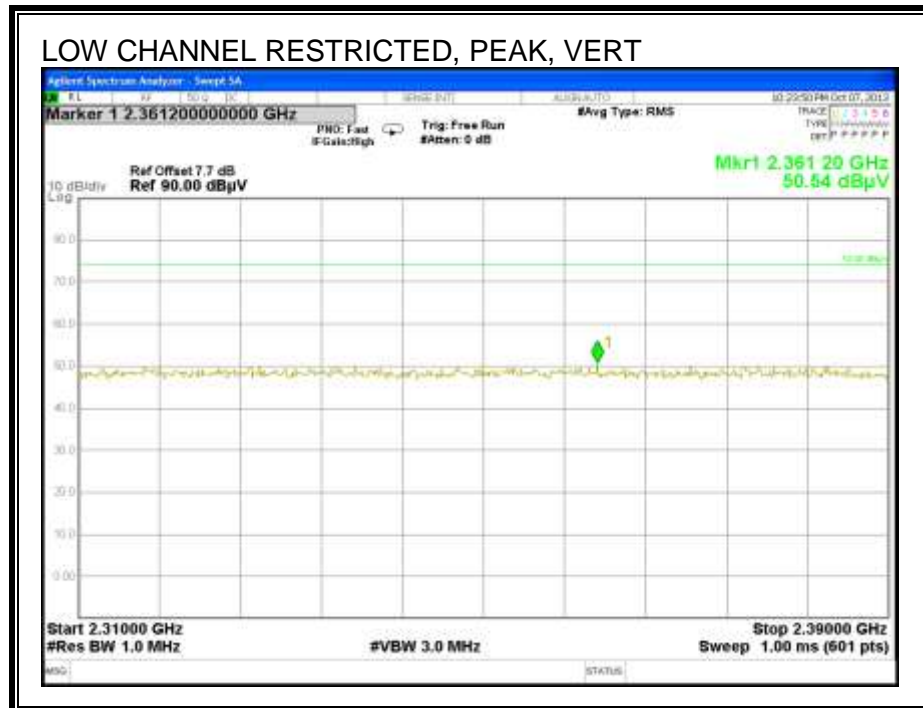
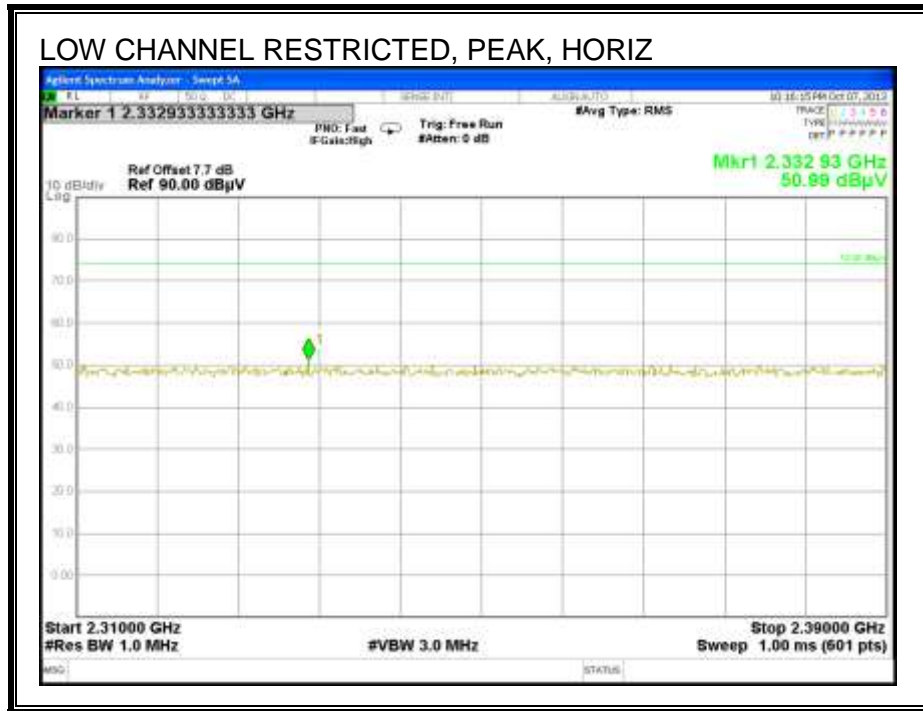


RESTRICTED BANDEDGE (HIGH CHANNEL)

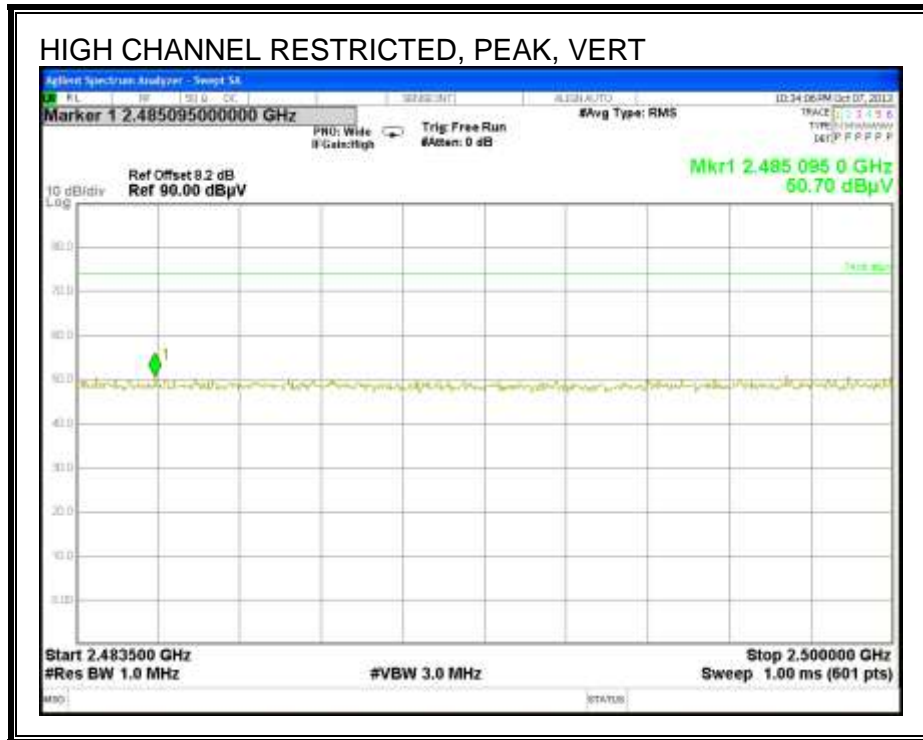
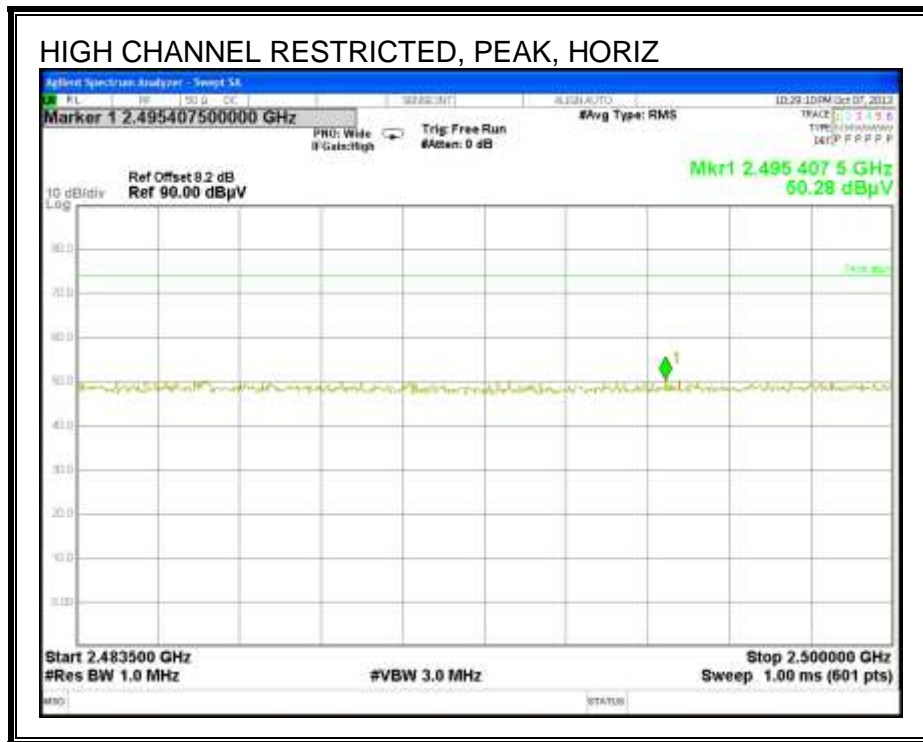


8.2.3. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

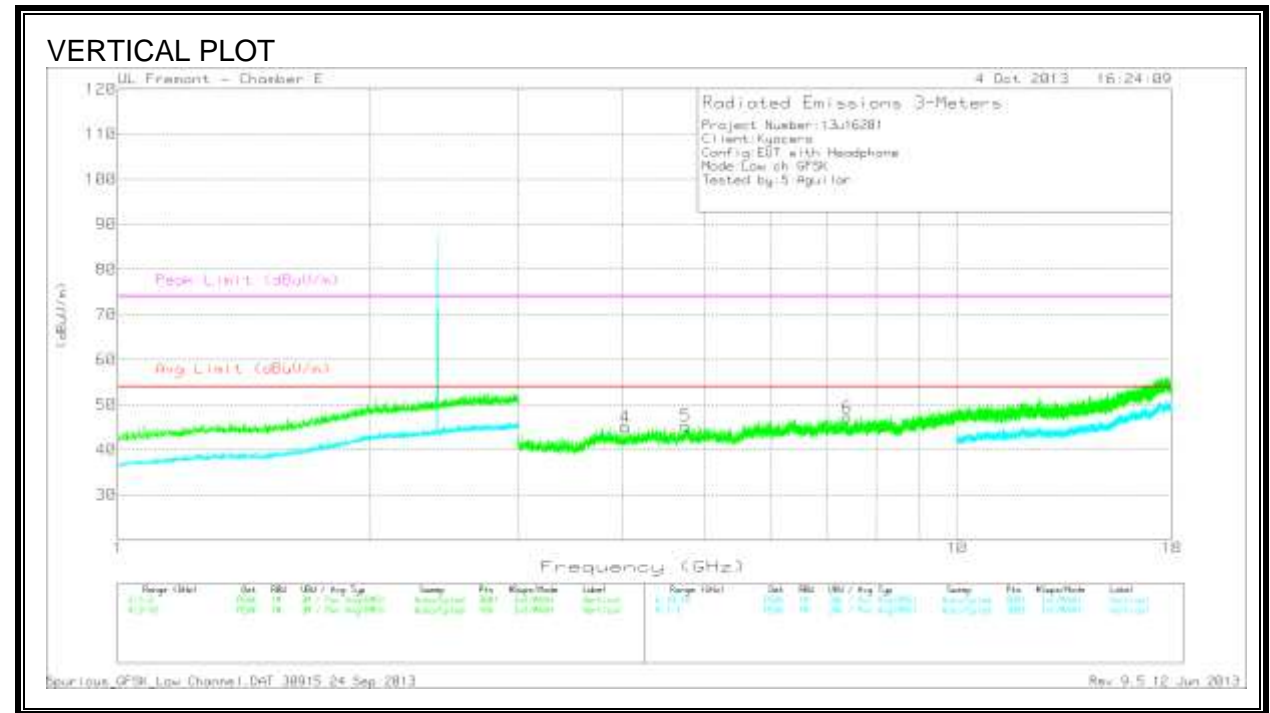
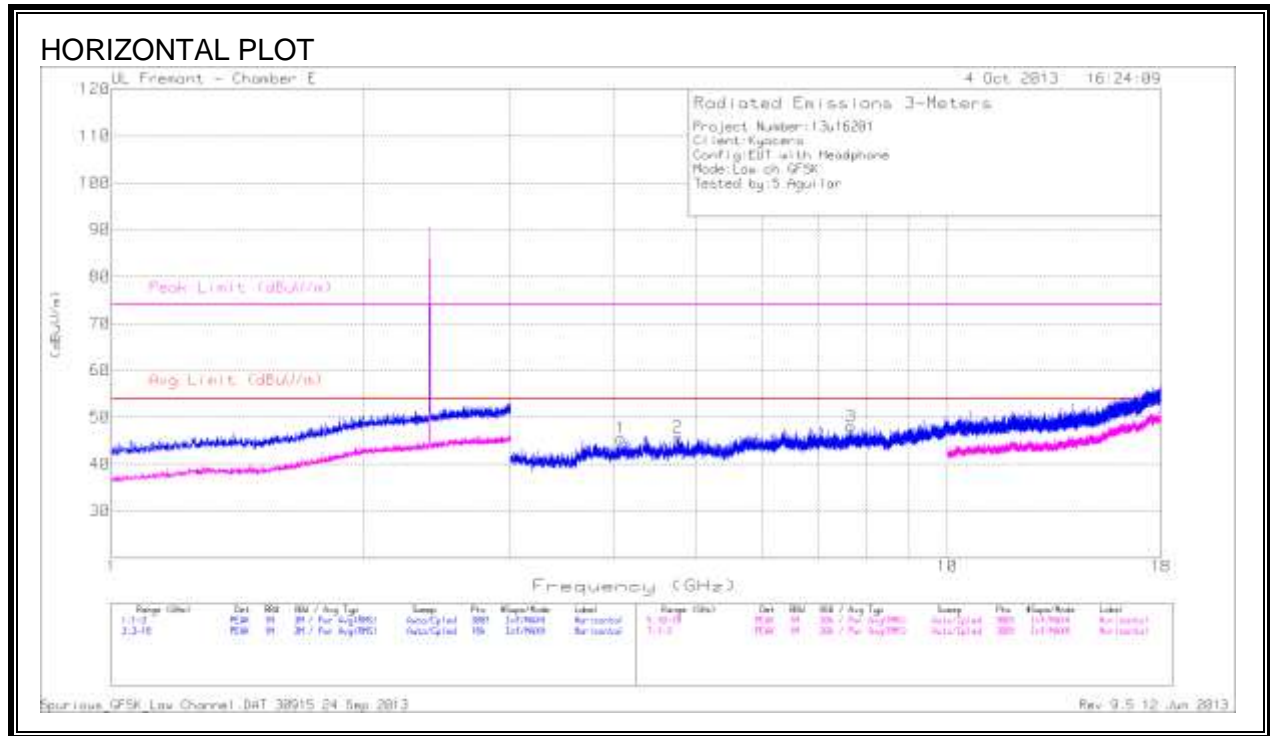


RESTRICTED BANDEDGE (HIGH CHANNEL)



8.2.4. HARMONICS AND SPURIOUS EMISSIONS GFSK

LOW CHANNEL

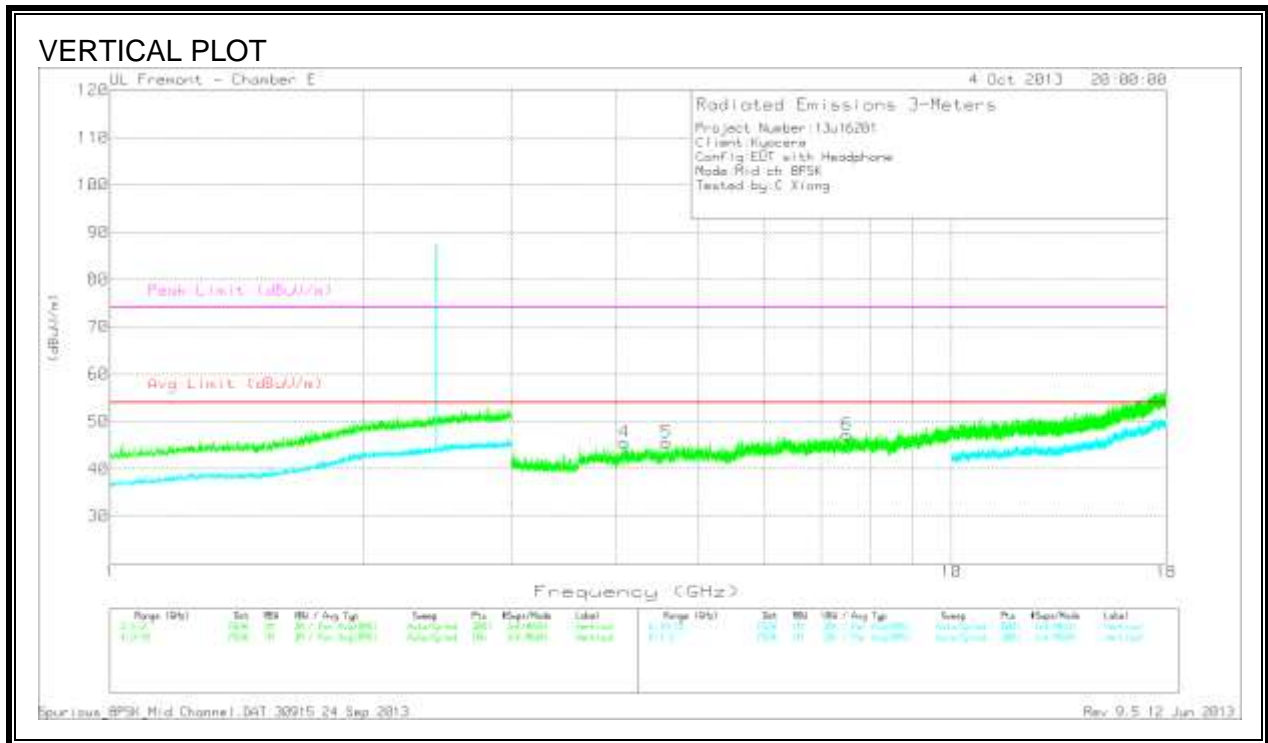
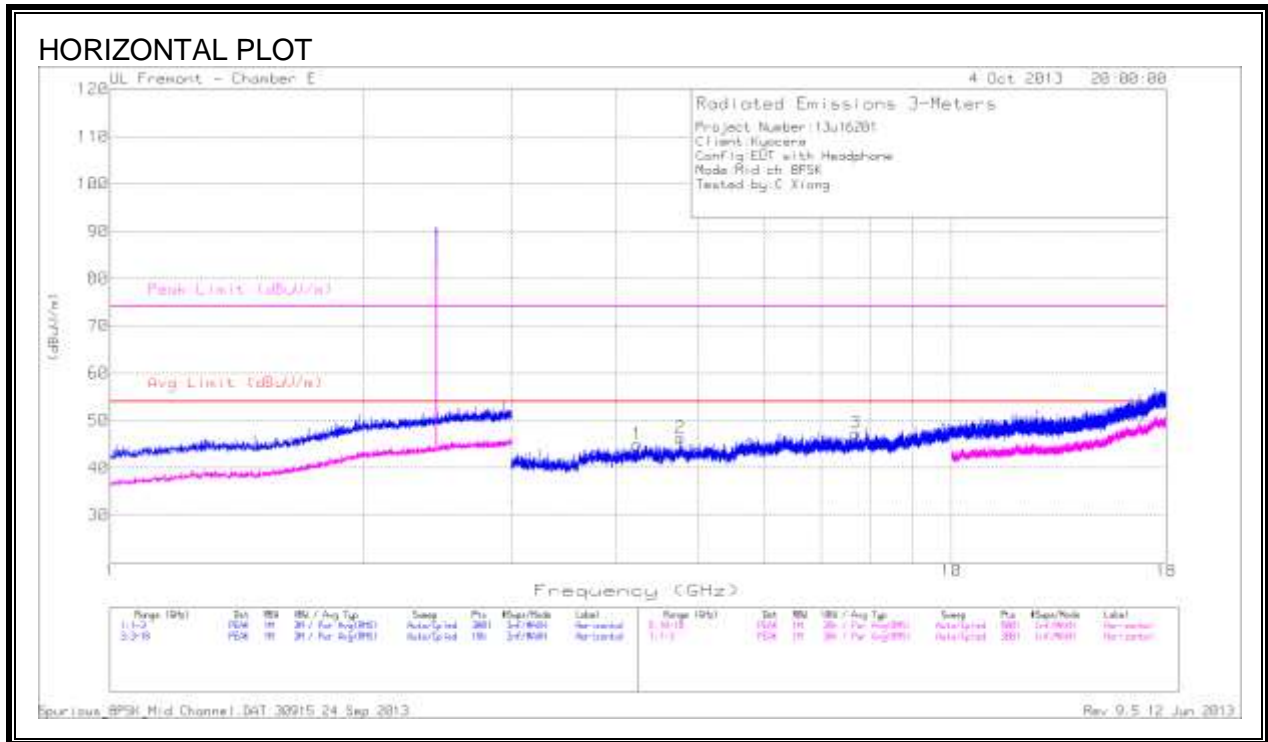


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3 GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	4.068	41.76	PK	33.9	-30.2	45.46	53.97	-8.51	74	-28.54	199	H
2	4.764	41.88	PK	34.4	-30.6	45.68	53.97	-8.29	74	-28.32	199	H
3	7.664	39.07	PK	36.2	-27.2	48.07	53.97	-5.90	74	-25.93	100	H
4	4.027	42.04	PK	33.8	-30.8	45.04	53.97	-8.93	74	-28.96	200	V
5	4.748	41.65	PK	34.4	-30.7	45.35	53.97	-8.62	74	-28.65	200	V
6	7.400	38.65	PK	36.1	-27.6	47.15	53.97	-6.82	74	-26.85	101	V

PK - Peak detector

MID CHANNEL

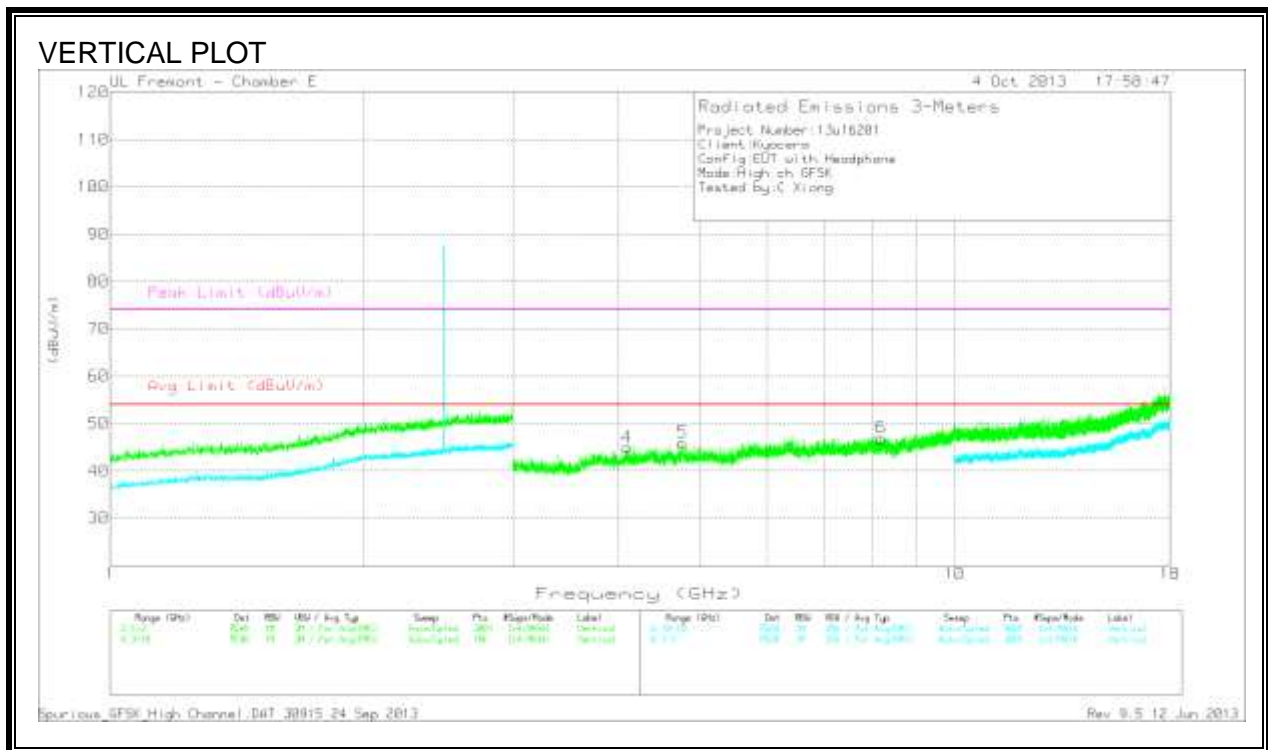
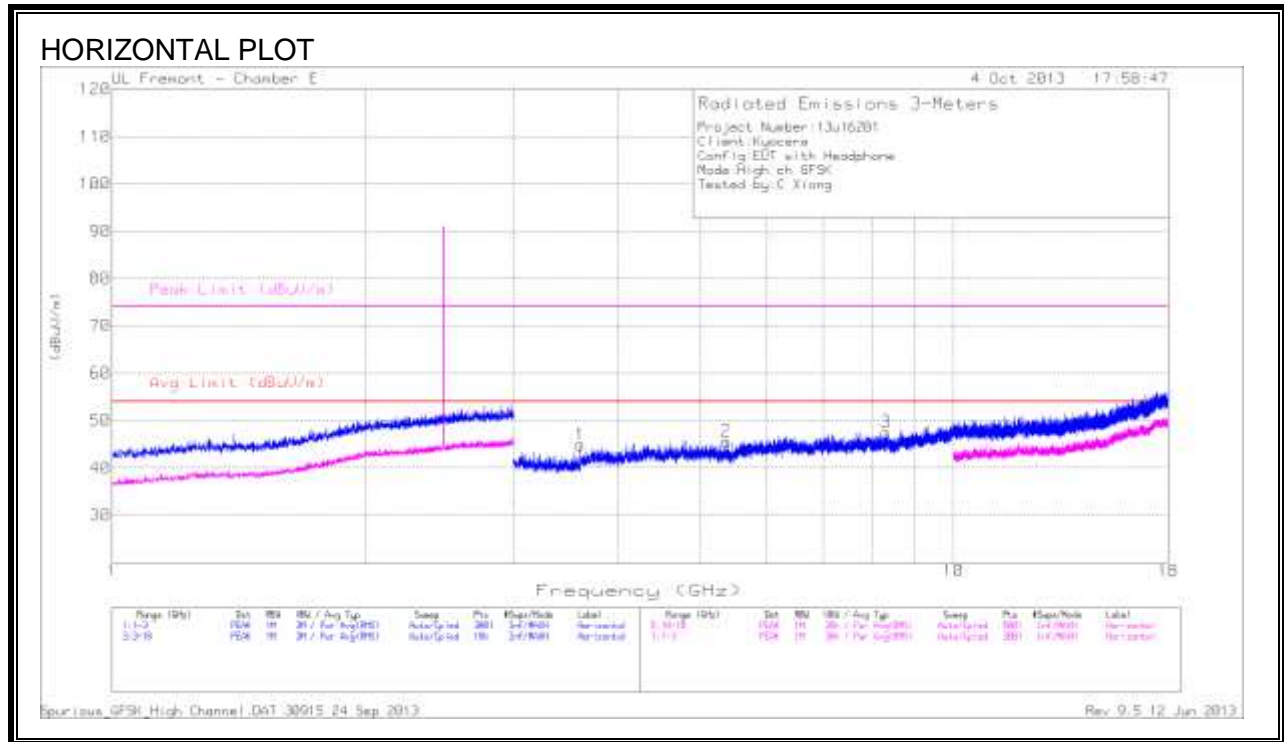


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3G Hz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	4.235	42.7	PK	34.0	-31.8	44.9	53.97	-9.07	74	-29.10	199	H
2	4.766	42.49	PK	34.4	-30.6	46.29	53.97	-7.68	74	-27.71	100	H
3	7.697	38.99	PK	36.2	-27.8	47.39	53.97	-6.58	74	-26.61	100	H
4	4.085	41.96	PK	33.9	-30.2	45.66	53.97	-8.31	74	-28.34	101	V
5	4.584	42.37	PK	34.3	-31.1	45.57	53.97	-8.40	74	-28.43	101	V
6	7.506	39.74	PK	36.1	-28.6	47.24	53.97	-6.73	74	-26.76	199	V

PK - Peak detector

HIGH CHANNEL



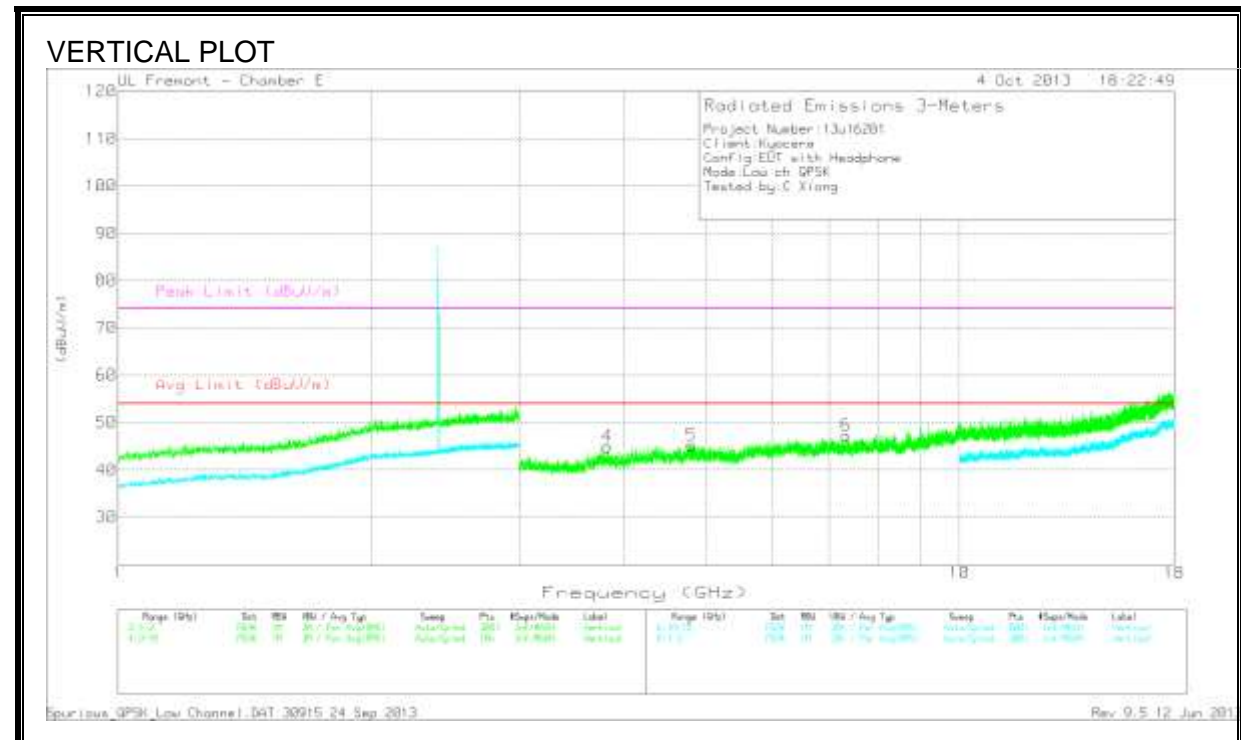
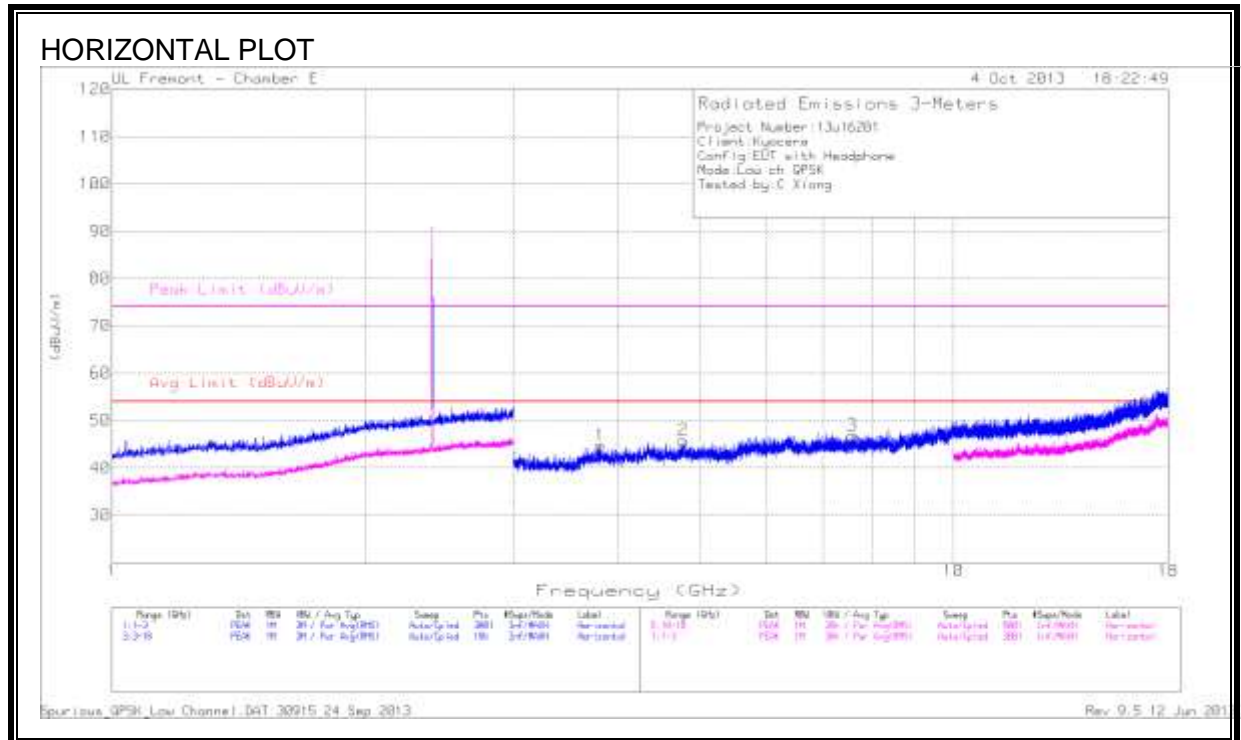
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/3 GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	3.601	43.69	PK	33.3	-32.1	44.89	53.97	-9.08	74	-29.11	100	H
2	5.375	41.21	PK	34.7	-30.3	45.61	53.97	-8.36	74	-28.39	100	H
3	8.316	37.74	PK	36.2	-26.5	47.44	53.97	-6.53	74	-26.56	199	H
4	4.094	41.34	PK	33.9	-30.3	44.94	53.97	-9.03	74	-29.06	200	V
5	4.762	42.07	PK	34.4	-30.6	45.87	53.97	-8.10	74	-28.13	100	V
6	8.181	38.80	PK	36.2	-28.0	47.00	53.97	-6.97	74	-27.00	100	V

PK - Peak detector

8.2.5. HARMONICS AND SPURIOUS EMISSIONS QPSK

LOW CHANNEL

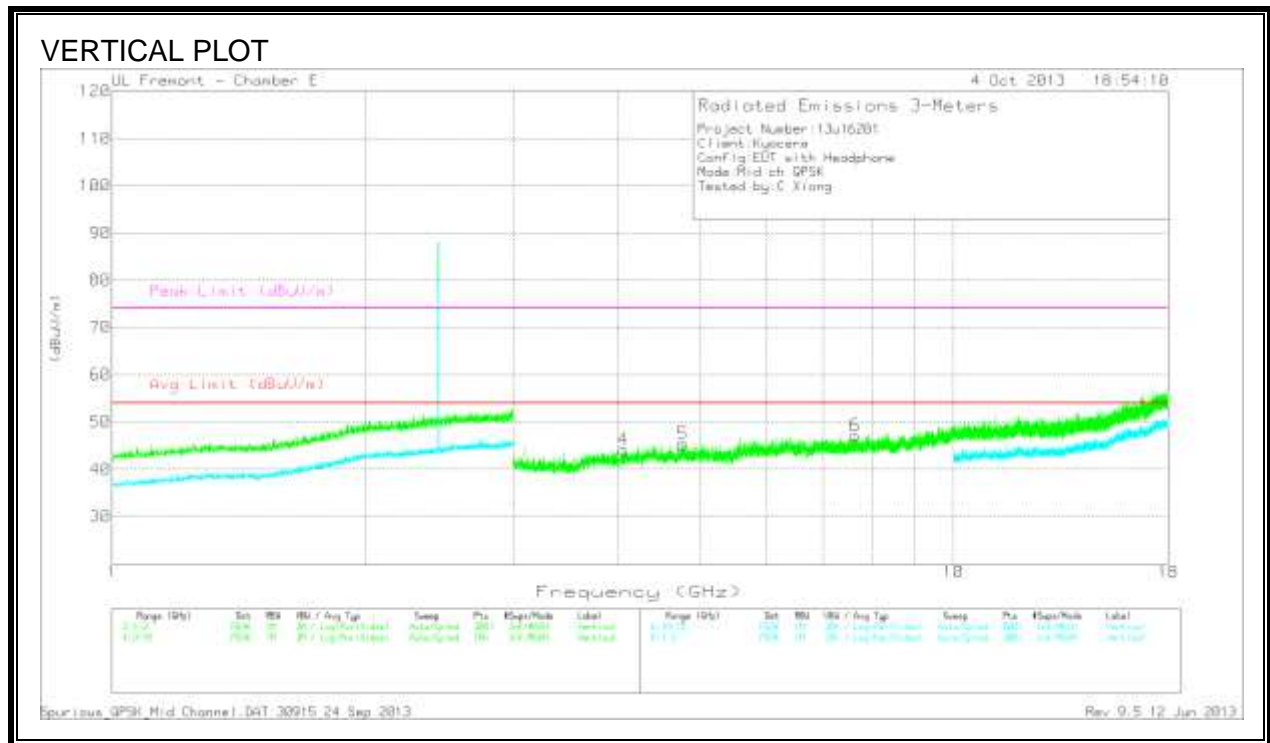
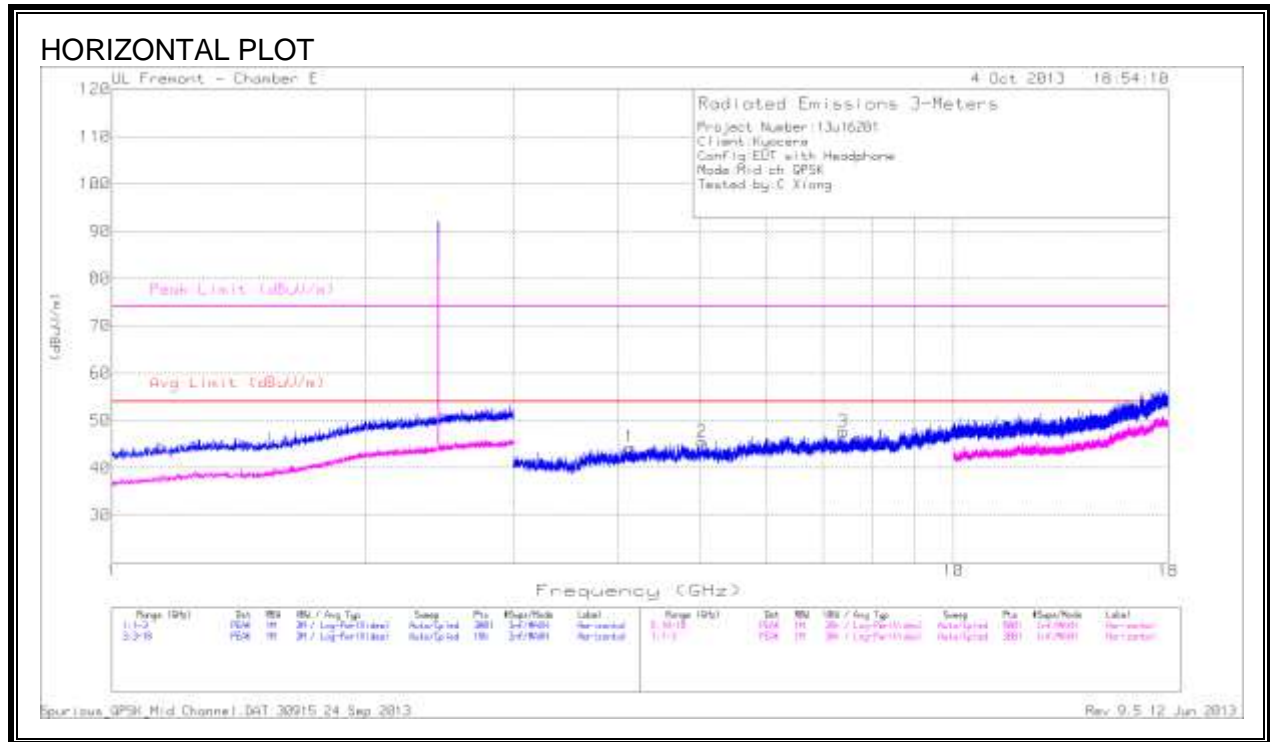


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/3G Hz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	3.806	42.38	PK	33.7	-31.4	44.68	53.97	-9.29	74	-29.32	100	H
2	4.775	42.11	PK	34.4	-30.7	45.81	53.97	-8.16	74	-28.19	199	H
3	7.585	38.91	PK	36.1	-28.2	46.81	53.97	-7.16	74	-27.19	199	H
4	3.817	42.52	PK	33.7	-31.3	44.92	53.97	-9.05	74	-29.08	100	V
5	4.804	41.69	PK	34.4	-30.9	45.19	53.97	-8.78	74	-28.81	200	V
6	7.336	38.96	PK	36.0	-27.7	47.26	53.97	-6.71	74	-26.74	200	V

PK - Peak detector

MID CHANNEL

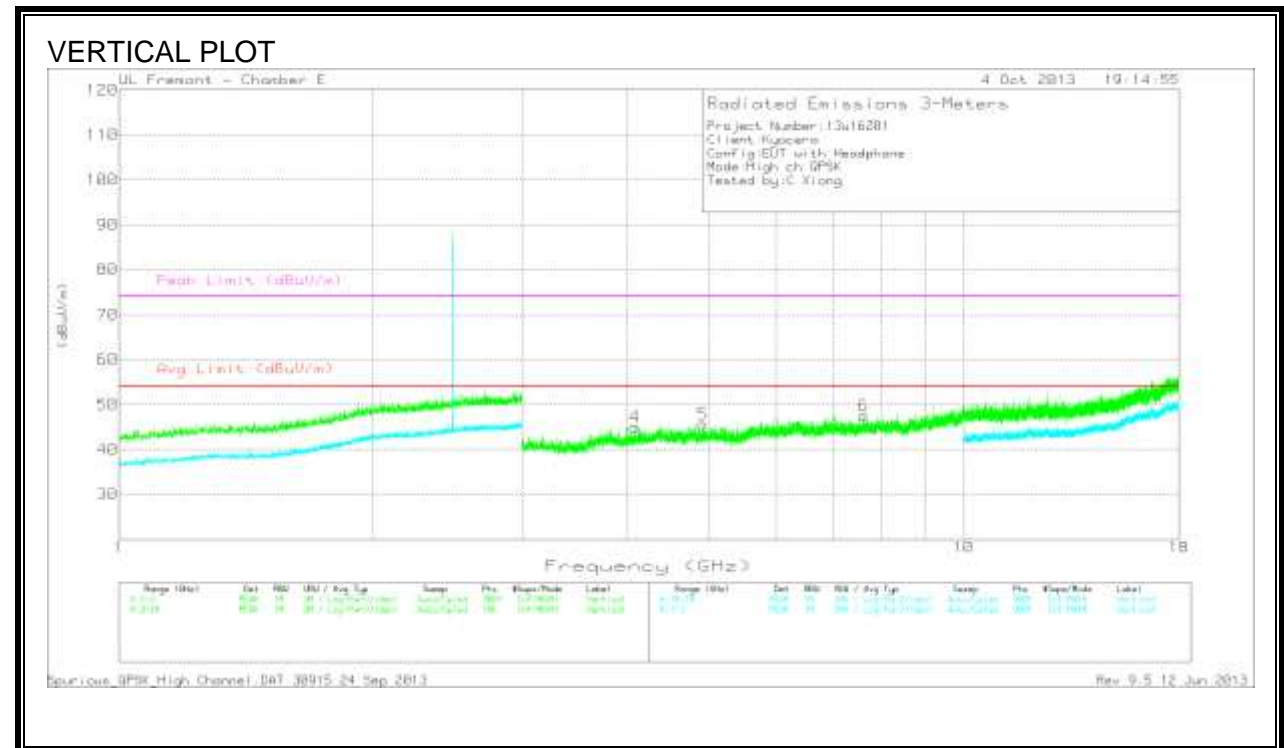
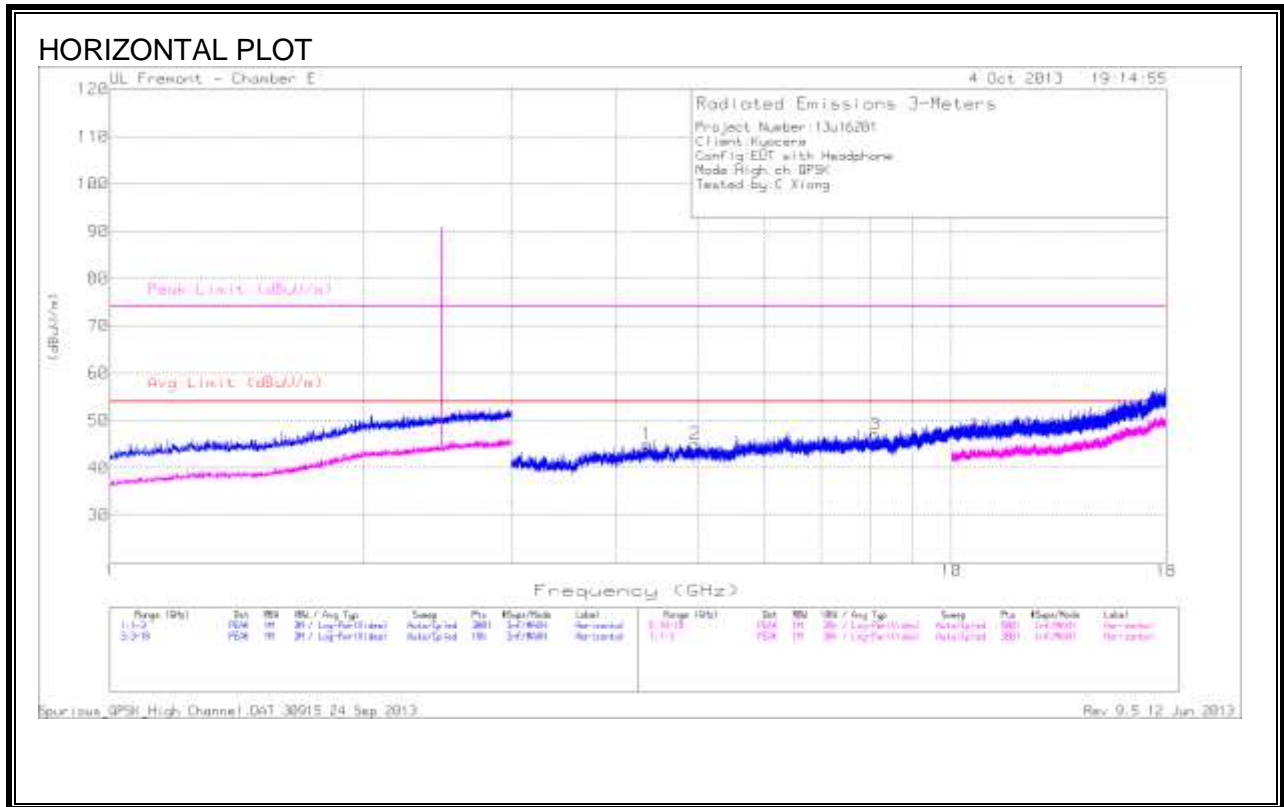


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3 GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	4.123	41.64	PK	33.9	-31.2	44.34	53.97	-9.63	74	-29.66	100	H
2	5.023	41.84	PK	34.4	-30.8	45.44	53.97	-8.53	74	-28.56	100	H
3	7.390	39.20	PK	36.1	-27.6	47.7	53.97	-6.27	74	-26.30	200	H
4	4.052	40.83	PK	33.8	-30.5	44.13	53.97	-9.84	74	-29.87	200	V
5	4.769	41.52	PK	34.4	-30.6	45.32	53.97	-8.65	74	-28.68	100	V
6	7.639	38.47	PK	36.2	-27.6	47.07	53.97	-6.90	74	-26.93	200	V

PK - Peak detector

HIGH CHANNEL



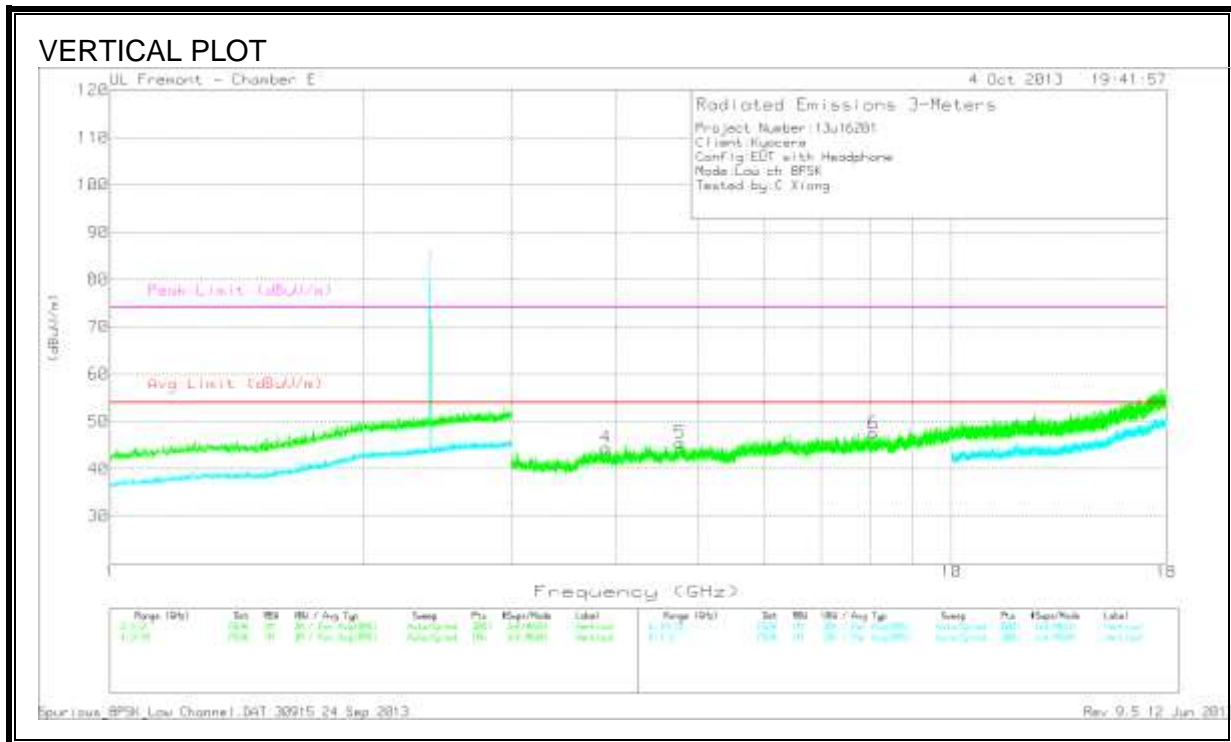
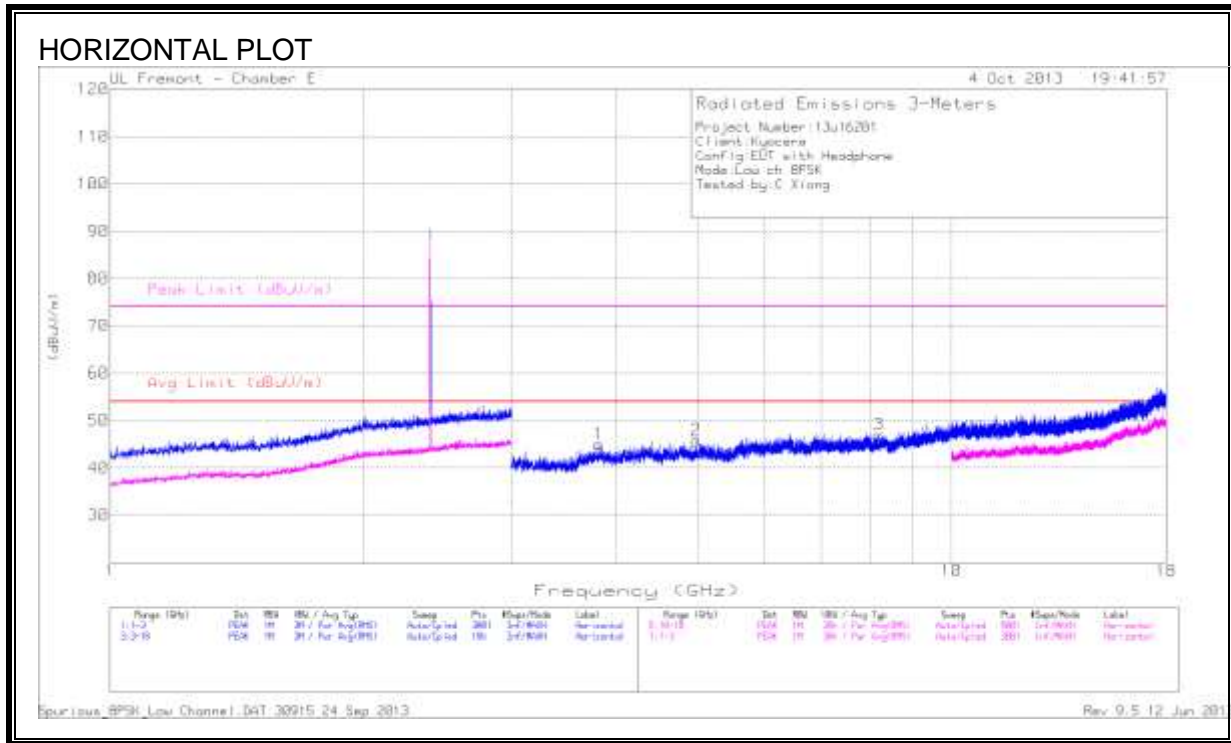
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/CbI/3G Hz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	4.341	41.26	PK	34.1	-30.4	44.96	53.97	-9.01	74	-29.04	199	H
2	4.961	41.33	PK	34.4	-30.8	44.93	53.97	-9.04	74	-29.07	199	H
3	8.116	38.52	PK	36.2	-27.7	47.02	53.97	-6.95	74	-26.98	100	H
4	4.082	41.28	PK	33.9	-30.1	45.08	53.97	-8.89	74	-28.92	199	V
5	4.914	42.02	PK	34.4	-30.8	45.62	53.97	-8.35	74	-28.38	199	V
6	7.621	39.26	PK	36.1	-27.8	47.56	53.97	-6.41	74	-26.44	100	V

PK - Peak detector

8.2.6. HARMONICS AND SPURIOUS EMISSIONS 8PSK

LOW CHANNEL

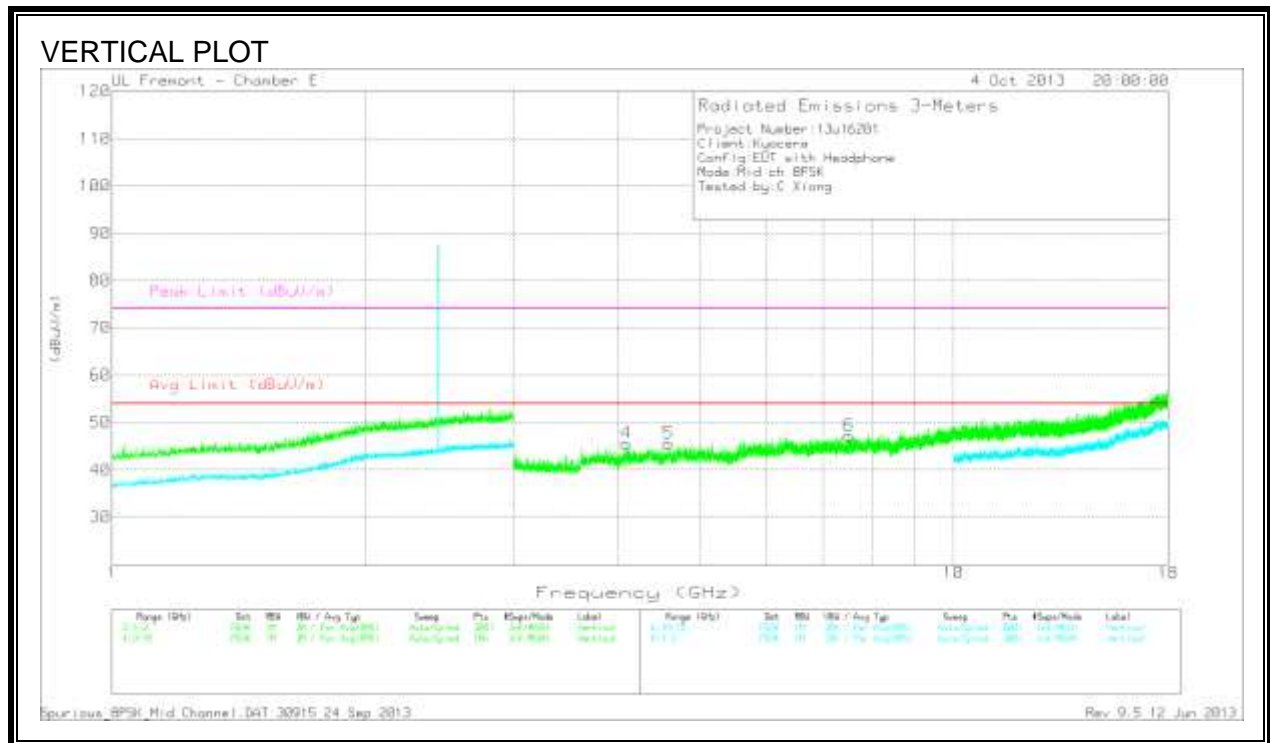
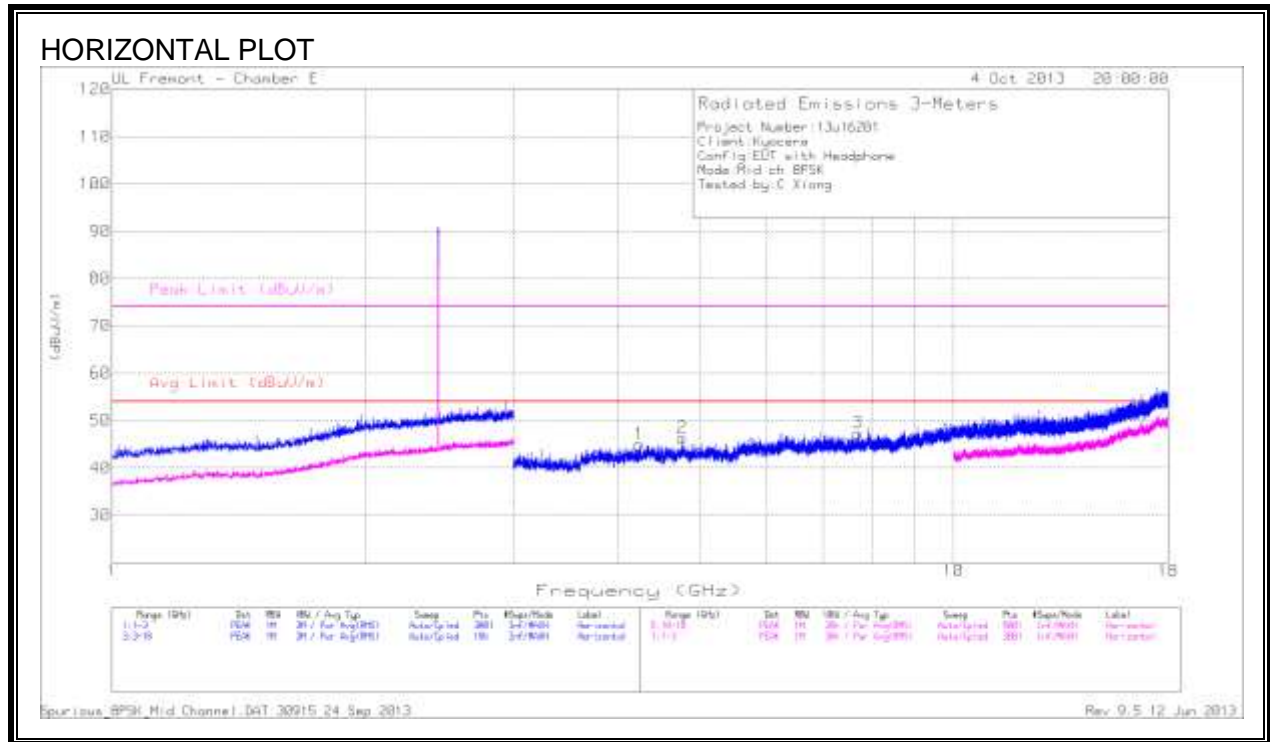


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3 GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	3.811	42.65	PK	33.7	-31.4	44.95	53.97	-9.02	74	-29.05	199	H
2	4.973	42.2	PK	34.4	-30.9	45.7	53.97	-8.27	74	-28.30	199	H
3	8.193	38.81	PK	36.2	-28.0	47.01	53.97	-6.96	74	-26.99	199	H
4	3.885	42.77	PK	33.8	-32.1	44.47	53.97	-9.50	74	-29.53	199	V
5	4.762	41.67	PK	34.4	-30.6	45.47	53.97	-8.50	74	-28.53	199	V
6	8.081	38.97	PK	36.2	-27.7	47.47	53.97	-6.50	74	-26.53	101	V

PK - Peak detector

MID CHANNEL

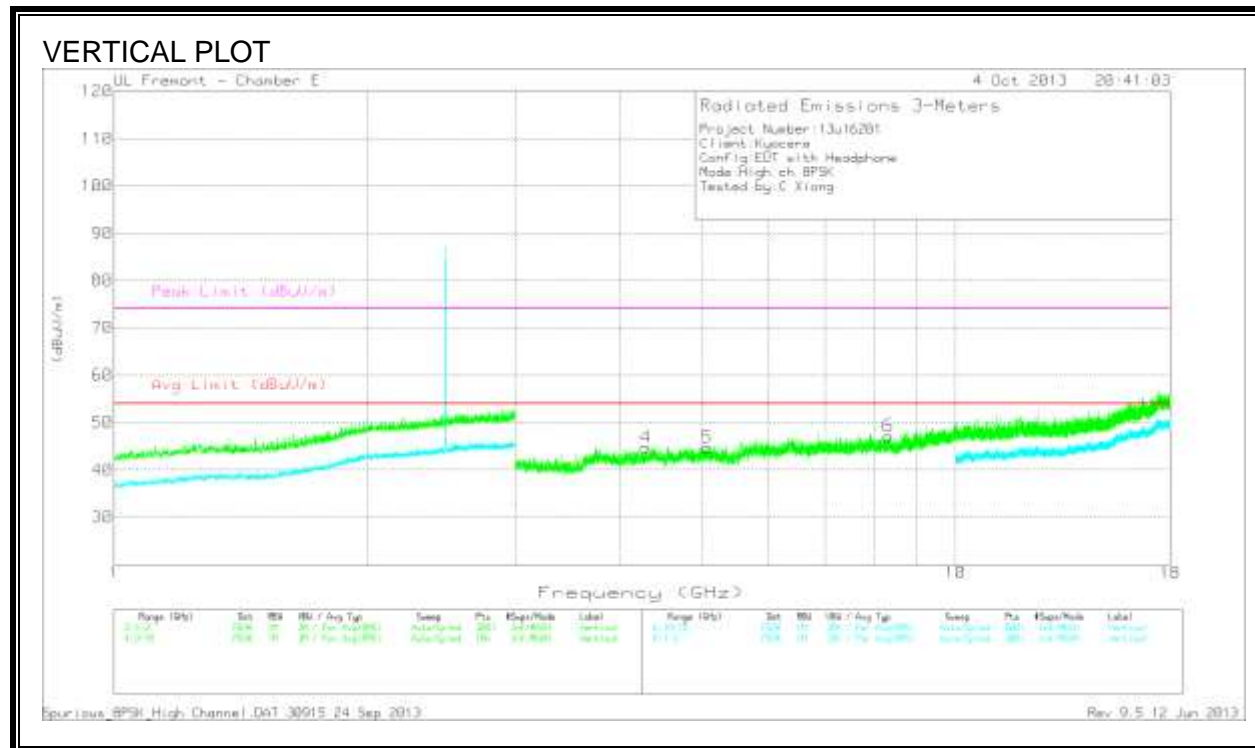
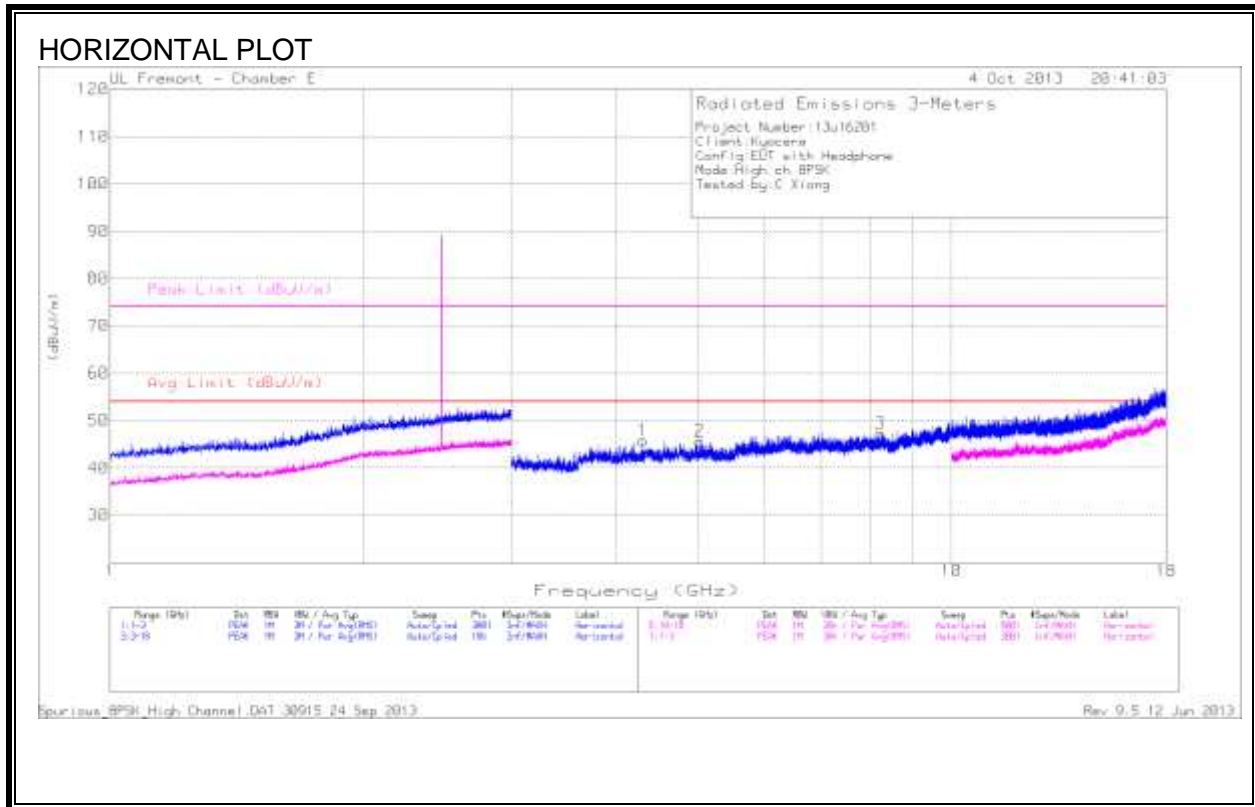


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3 GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	4.235	42.70	PK	34.0	-31.8	44.9	53.97	-9.07	74	-29.10	199	H
2	4.766	42.49	PK	34.4	-30.6	46.29	53.97	-7.68	74	-27.71	100	H
3	7.697	38.99	PK	36.2	-27.8	47.39	53.97	-6.58	74	-26.61	100	H
4	4.085	41.96	PK	33.9	-30.2	45.66	53.97	-8.31	74	-28.34	101	V
5	4.584	42.37	PK	34.3	-31.1	45.57	53.97	-8.40	74	-28.43	101	V
6	7.506	39.74	PK	36.1	-28.6	47.24	53.97	-6.73	74	-26.76	199	V

PK - Peak detector

HIGH CHANNEL



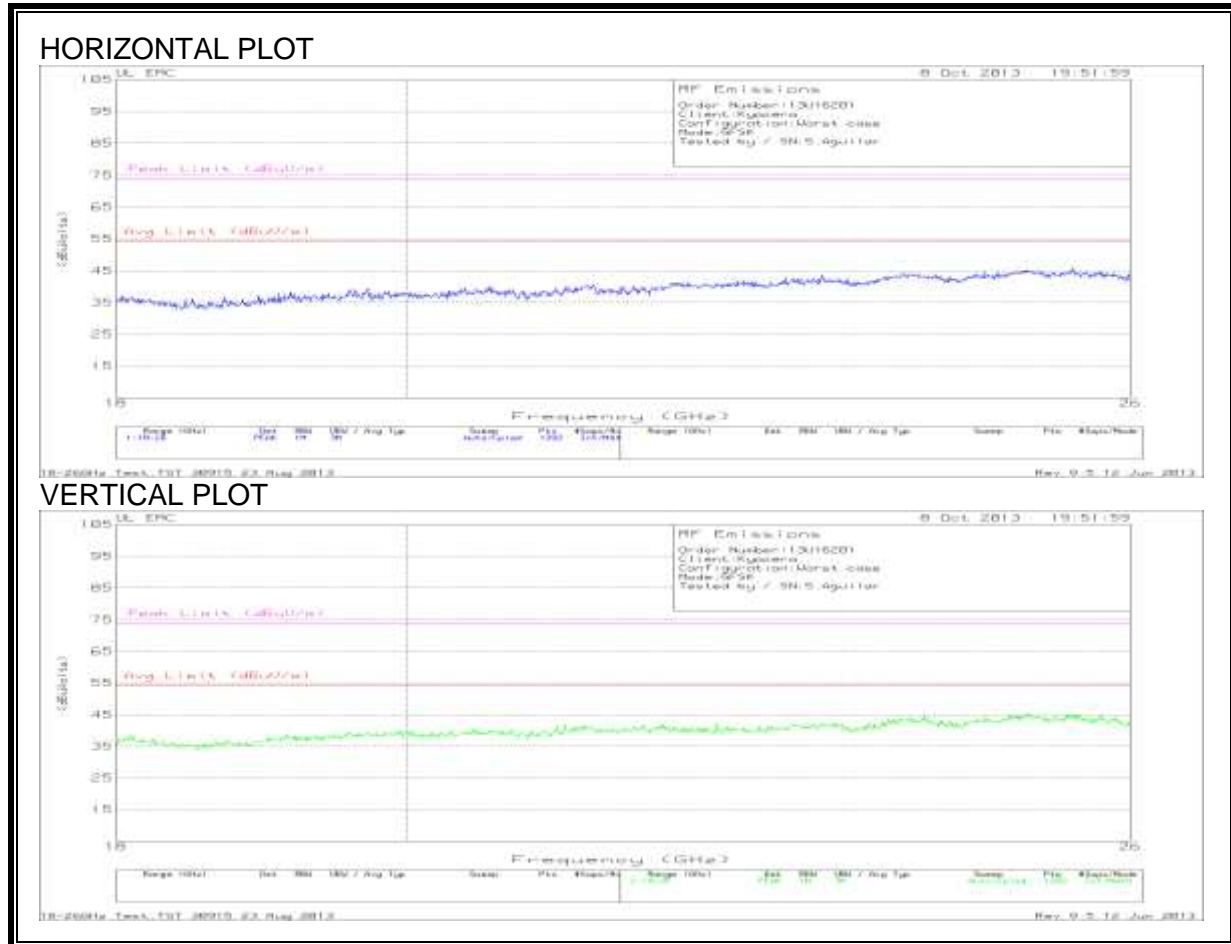
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ 3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	4.300	42.76	PK	34.1	-31.1	45.76	53.97	-8.21	74	-28.24	100	H
2	5.026	42.02	PK	34.4	-30.8	45.62	53.97	-8.35	74	-28.38	100	H
3	8.235	38.26	PK	36.2	-27.2	47.26	53.97	-6.71	74	-26.74	199	H
4	4.287	42.05	PK	34.0	-31.3	44.75	53.97	-9.22	74	-29.25	199	V
5	5.069	40.77	PK	34.5	-30.6	44.67	53.97	-9.30	74	-29.33	101	V
6	8.326	37.52	PK	36.2	-26.6	47.12	53.97	-6.85	74	-26.88	101	V

PK - Peak detector

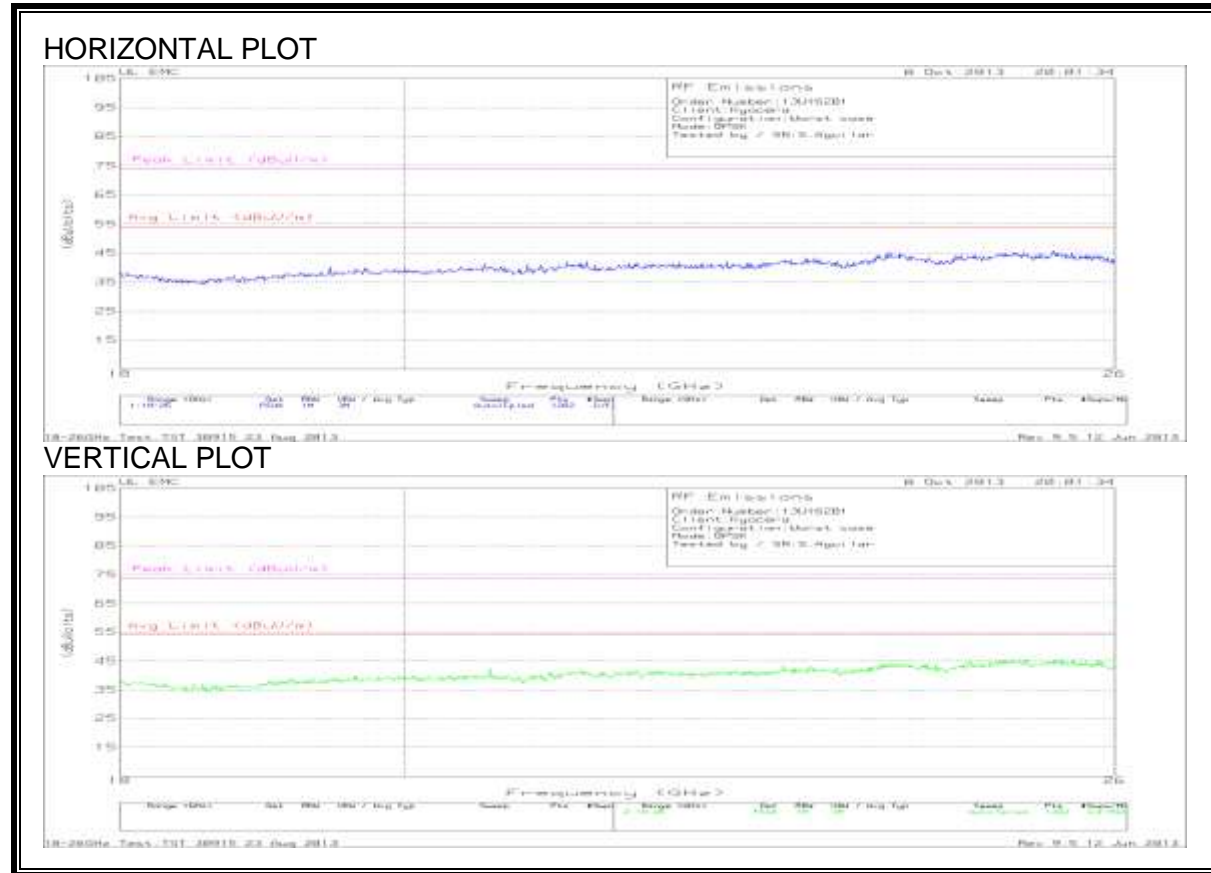
8.3. WORST-CASE ABOVE 18GHz

GFSK



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.592	40.07	PK	32.5	-23.9	-9.5	39.16	54	-14.83	74	-34.83
2	23.246	42.70	PK	33.5	-23.2	-9.5	43.50	54	-10.50	74	-30.50
3	25.460	44.20	PK	33.8	-22.5	-9.5	46.00	54	-8.00	74	-28.00
4	21.177	41.83	PK	33.0	-23.5	-9.5	41.83	54	-12.16	74	-32.16
5	21.337	42.40	PK	33.1	-24	-9.5	42.00	54	-12.00	74	-32.00
6	25.047	43.50	PK	34.1	-22.6	-9.5	45.50	54	-8.50	74	-28.50

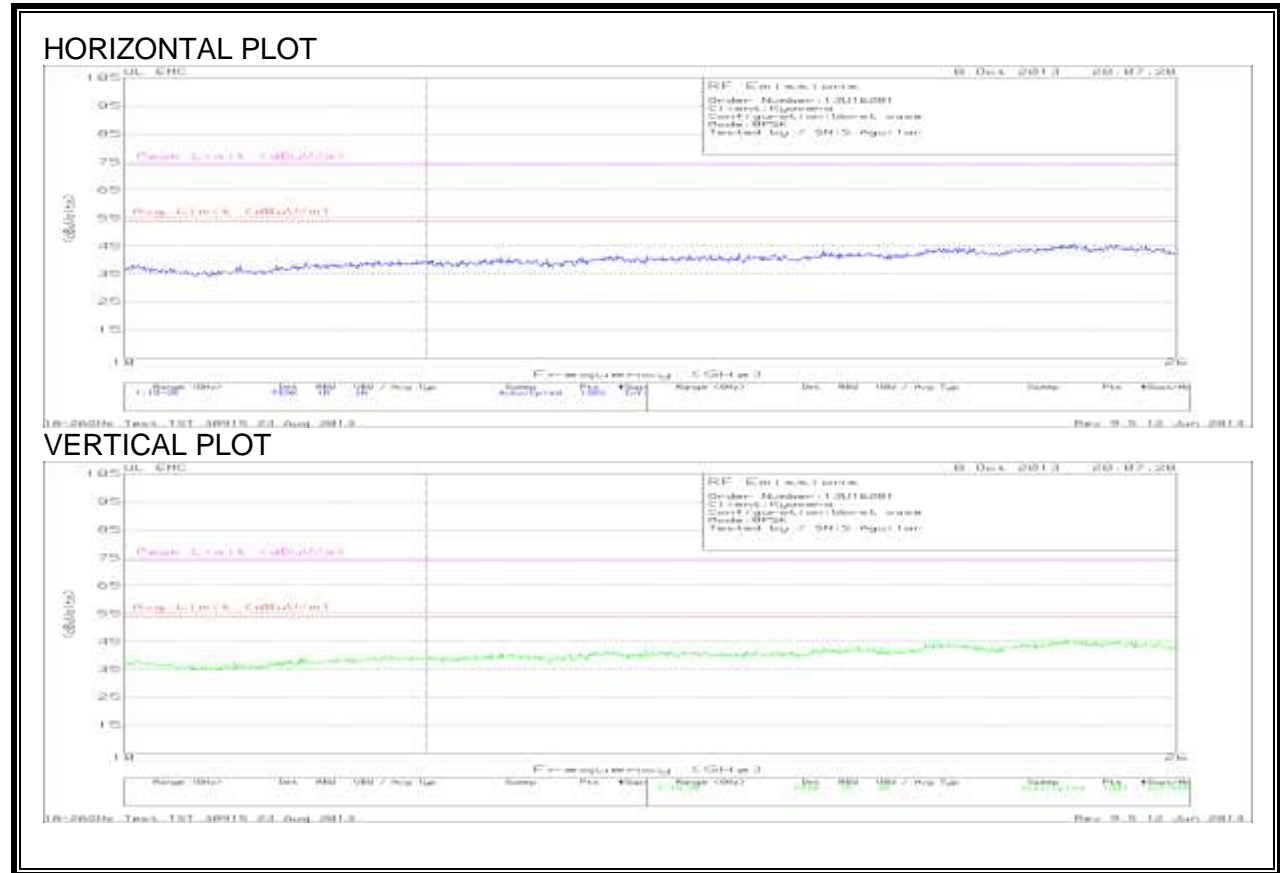
QPSK



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.452	41.17	PK	32.5	-24.0	-9.5	40.16	54	-13.83	74	-33.83
2	23.928	44.23	PK	33.4	-22.8	-9.5	45.33	54	-8.66	74	-28.66
3	25.414	44.43	PK	33.8	-22.9	-9.5	45.83	54	-8.16	74	-28.16
4	20.638	42.43	PK	32.7	-23.3	-9.5	42.33	54	-11.66	74	-31.66
5	23.002	42.60	PK	33.6	-23.2	-9.5	43.50	54	-10.50	74	-30.50
6	25.167	44.20	PK	33.7	-22.9	-9.5	45.50	54	-8.50	74	-28.50

PK - Peak detector

8PSK

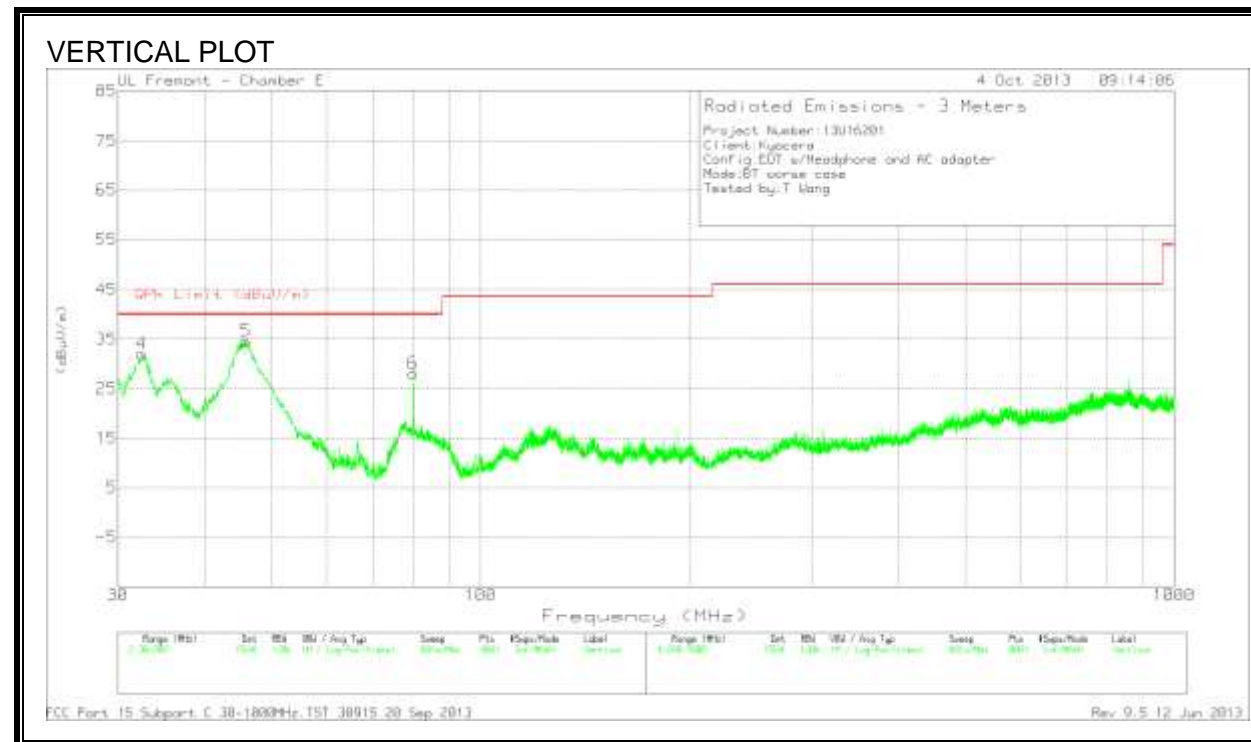
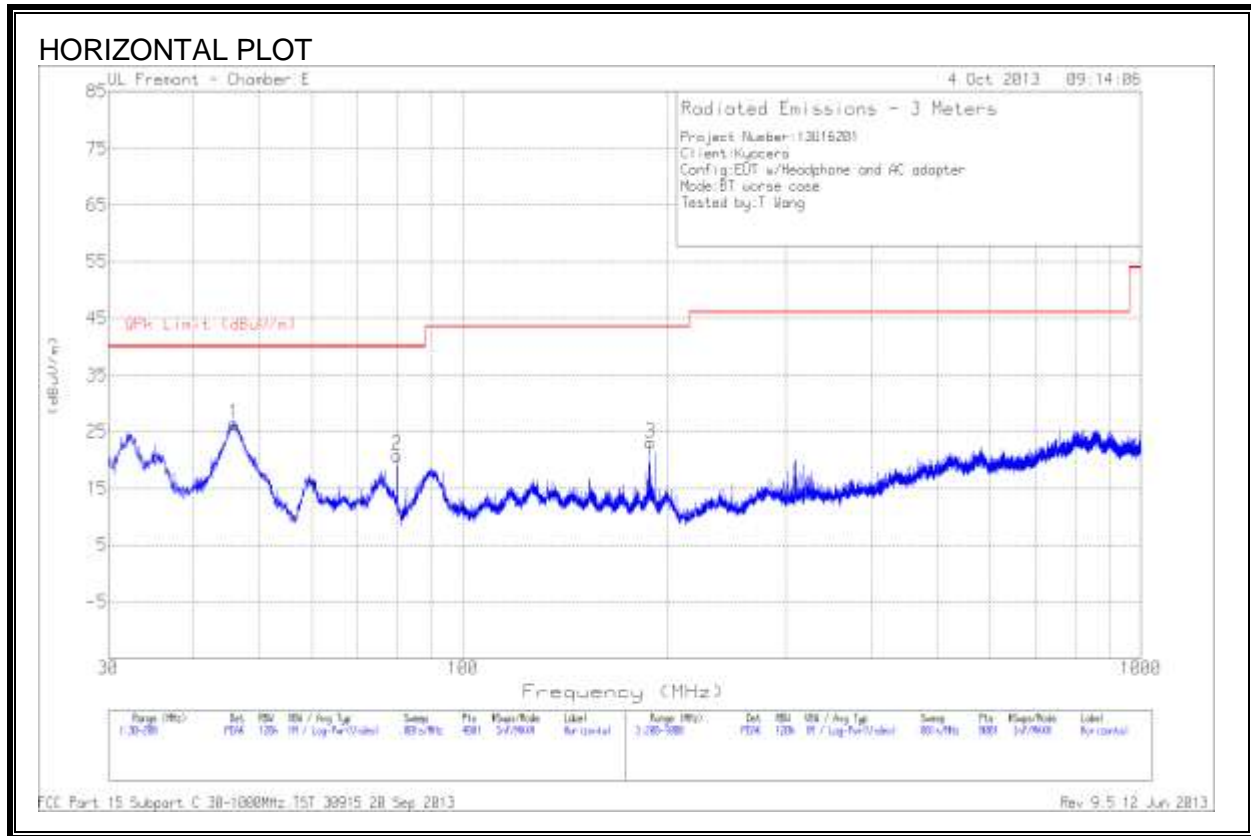


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	21.384	41.77	PK	33.1	-23.7	-9.5	41.66	54	-12.33	74	-32.33
2	22.983	42.70	PK	33.5	-23.2	-9.5	43.50	54	-10.50	74	-30.50
3	25.034	43.53	PK	34.1	-22.8	-9.5	45.33	54	-8.66	74	-28.66
4	21.597	42.60	PK	33.1	-24.2	-9.5	42.00	54	-12.00	74	-32.00
5	23.822	42.47	PK	33.6	-22.4	-9.5	44.16	54	-9.83	74	-29.83
6	25.021	44.23	PK	34.1	-23.0	-9.5	45.83	54	-8.166	74	-28.16

PK - Peak detector

8.4. WORST-CASE BELOW 1 GHz

RADIATED EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T408 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
1	45.895	43.96	PK	10.0	-27.5	26.46	40.00	-13.54	400	H
2	79.980	40.78	PK	7.7	-27.7	20.78	40.00	-19.22	400	H
3	188.95	38.37	PK	11.3	-26.6	23.07	43.52	-20.45	300	H
4	32.465	40.32	PK	19.3	-27.7	31.92	40.00	-8.08	100	V
5	45.852	52.00	PK	10.0	-27.5	34.50	40.00	-5.50	100	V
6	79.980	48.04	PK	7.7	-27.7	28.04	40.00	-11.96	100	V

PK - Peak detector

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T408 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarity
45.85	47.37	QP	10	-27.5	29.87	40.00	-10.13	142	V

QP - Quasi-Peak detector

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	.393	49.62	PK	.1	0	49.72	58	-8.28	-	-
2	.393	43.18	Av	.1	0	43.28	-	-	48.0	-4.72
3	.807	44.63	PK	.1	0	44.73	56	-11.27	-	-
4	.807	35.03	Av	.1	0	35.13	-	-	46.0	-10.87
5	1.014	42.27	PK	.1	0	42.37	56	-13.63	-	-
6	1.014	25.02	Av	.1	0	25.12	-	-	46.0	-20.88

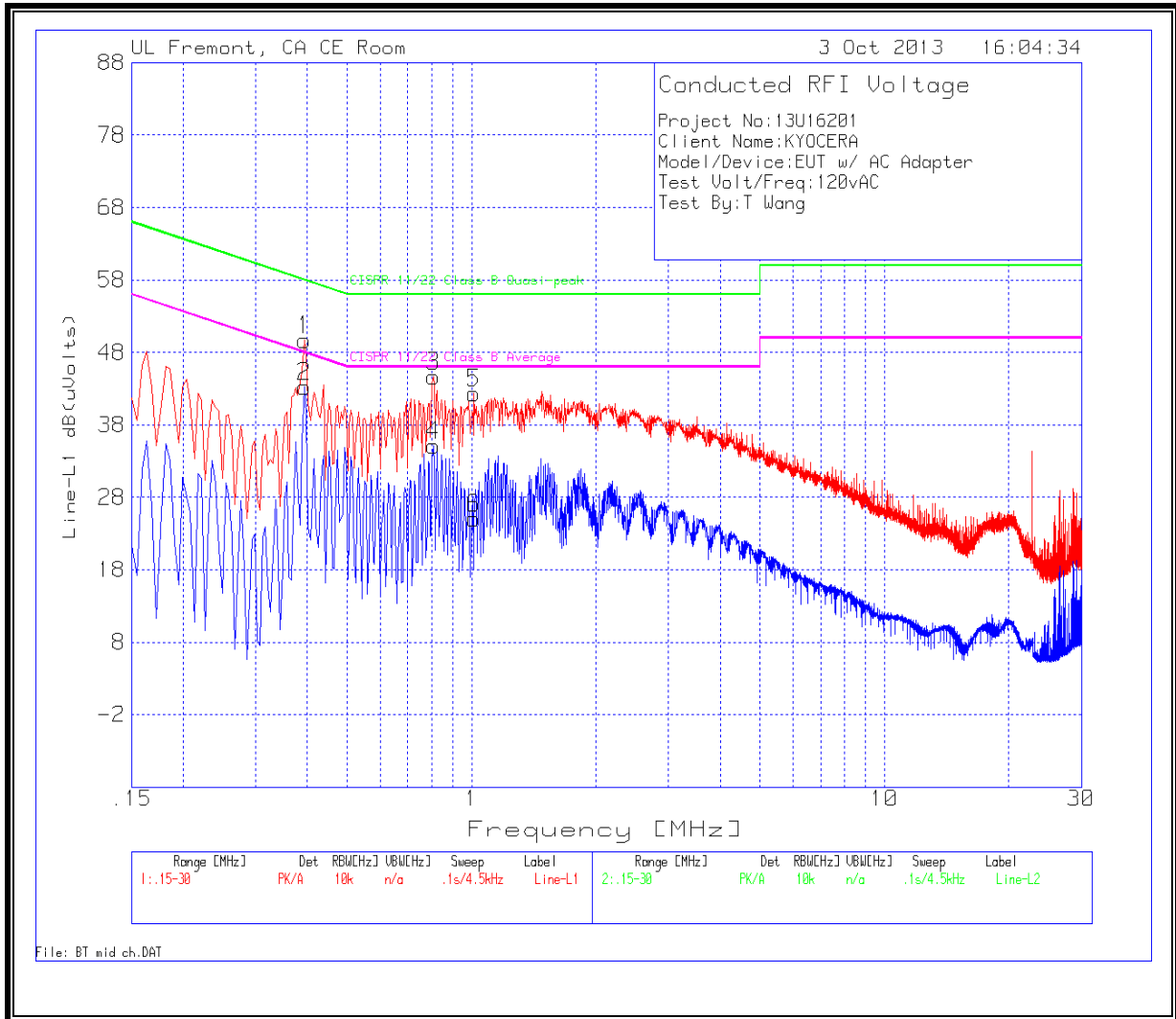
Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
7	.3975	49.58	PK	.1	0	49.68	57.9	-8.22	-	-
8	.3975	36.14	Av	.1	0	36.24	-	-	47.9	-11.66
9	1.491	39.53	PK	.1	.1	39.73	56.0	-16.27	-	-
10	1.491	21.17	Av	.1	.1	21.37	-	-	46.0	-24.63
11	21.327	41.27	PK	.3	.2	41.77	60.0	-18.23	-	-
12	21.327	4.54	Av	.3	.2	5.04	-	-	50.0	-44.96

PK - Peak detector
 Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS

