FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM/UMTS BAR PHONE WITH 802.11BGN, BLUETOOTH AND BLE

MODEL NUMBER: GT-S7270L

FCC ID: A3LGTS7270L

REPORT NUMBER: 13I15068-3

ISSUE DATE: MAY 22, 2013

Prepared for

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416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	5/22/2013	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO, 443-742, SOUTH KOREA
EUT DESCRIPTION:	GSM/UMTS BAR PHONE WITH 802.11BGN, BT & BLE
MODEL:	GT-S7270L
SERIAL NUMBER:	1624866 (CONDUCTED) AND 1624864 (RADIATED)
DATE TESTED:	MAY4 TO 7, 2013

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

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

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WiSE LAB TECHNICIAN
UL Verification Services

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 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.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:

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	3.52 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 bar-style cell phone featuring 802.11 bgn 1x1+ BT4.0 +basic rates +EDR+GSM/WCDMA850/1900MHz.

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	12.80	19.05
2402 - 2480	Enhanced 8PSK	13.19	20.84

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 0.51 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was REV 1.0 and the software was S7270L.010

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were 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 Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung Electronics	ETA0U10JBS	DW2D203DS/7-E	DoC
Headset	Samsung Electronics	N/A	N/A	DoC

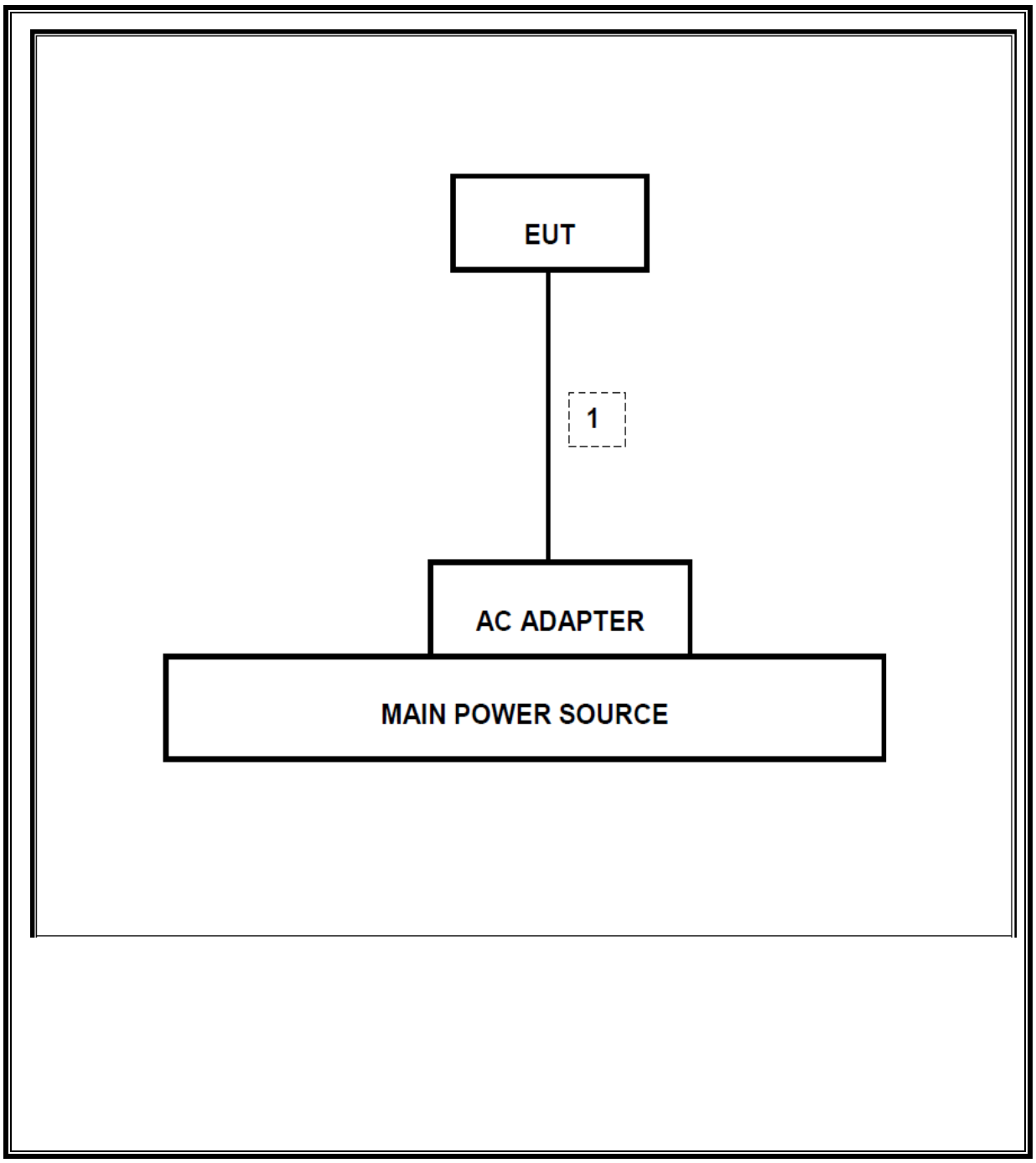
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	USB	Shielded	1.6m	N/A
2	Headset	1	Audio	Shielded	1.5m	N/A

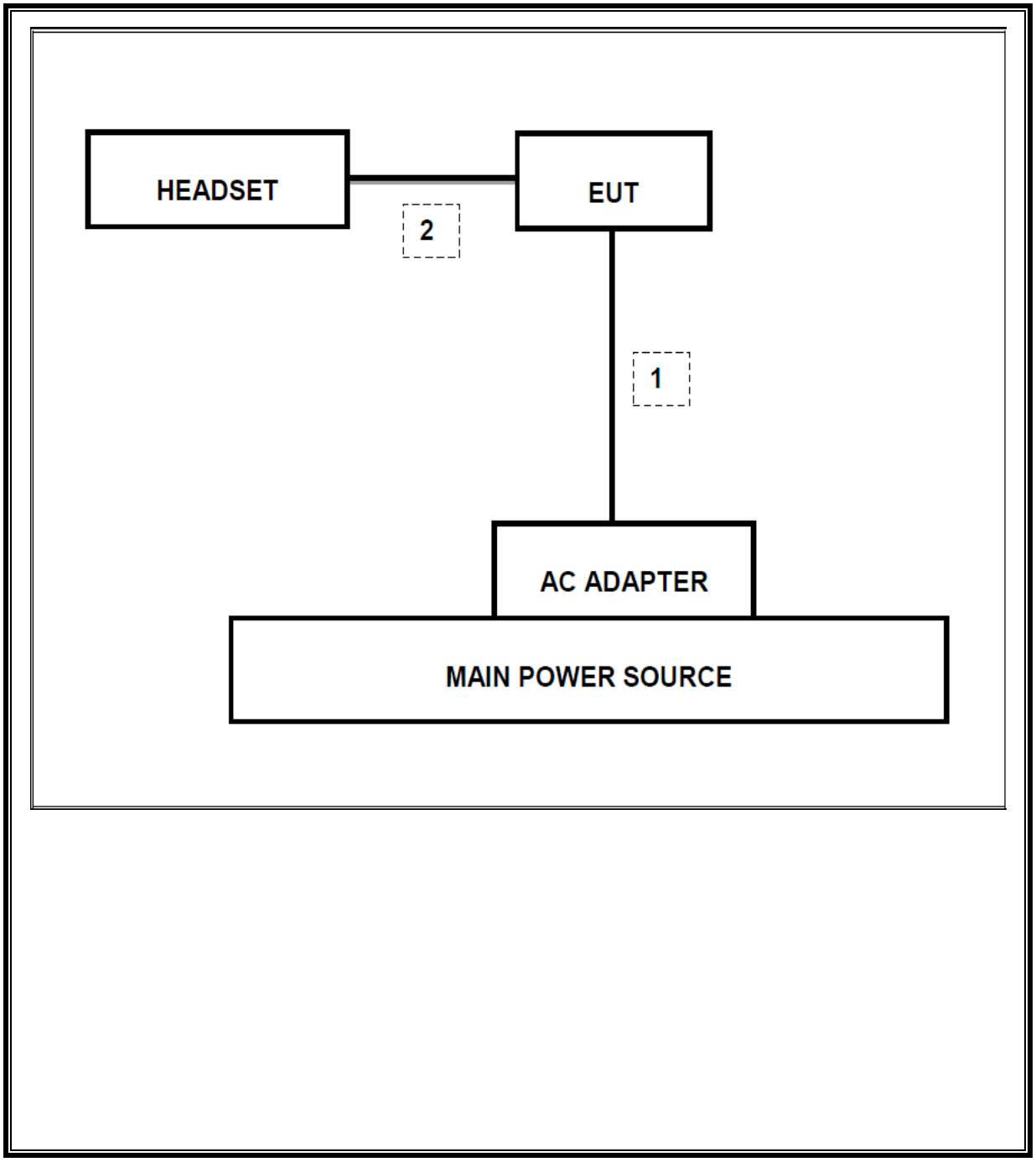
TEST SETUP

The EUT is a standalone with an AC adapter that was tested in the worst case orientation and configuration, where applicable, during the tests. The software exercised the radio.

SETUP DIAGRAM FOR TESTS (Conducted Setup)



SETUP DIAGRAM FOR Test (Radiated Setup)



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 Date**	**Cal Due**
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/12	09/20/13
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	07/28/12	07/28/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/12	10/21/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/21/12	10/21/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	02/21/13	02/21/14
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR	CNR
Bilog 30-2000MHz	Sunol	JB1	C01071	07/26/12	07/26/13
Power Meter	HP	437B	T226	06/25/12	06/25/13
Power Sensor	HP	8481A	T233	06/26/12	06/26/13
LISN, 30 MHz	FCC	LISN-50/250-25-	N02625	01/14/13	01/14/14
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BI	N02481	03/07/12	03/07/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13
CBT Bluetooth Tester	R & S	CBT	None	05/15/12	05/15/13

7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

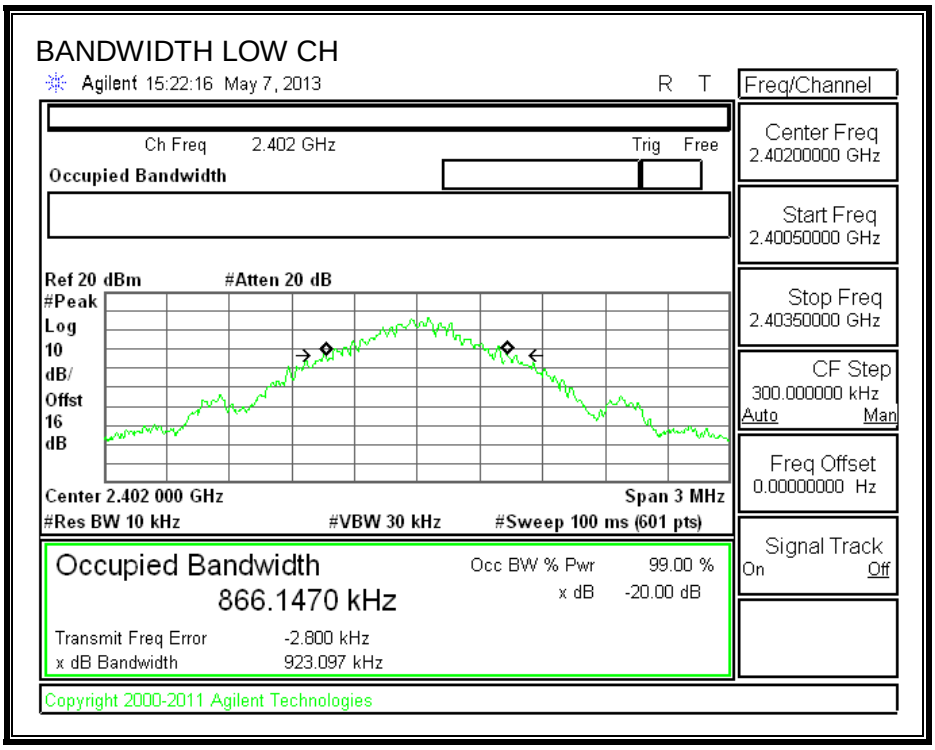
TEST PROCEDURE

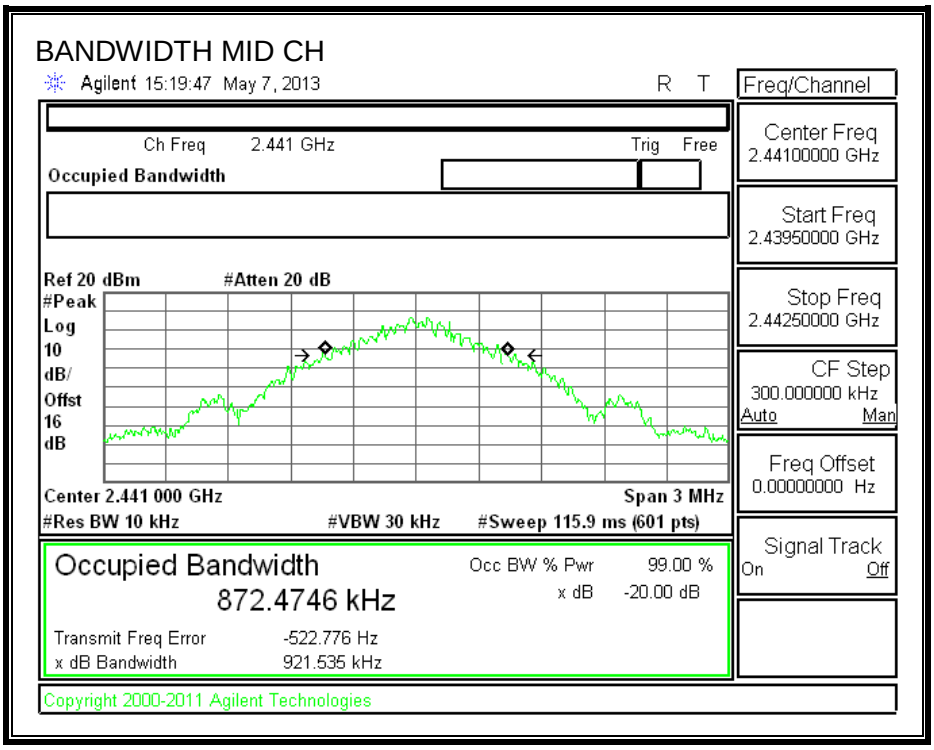
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

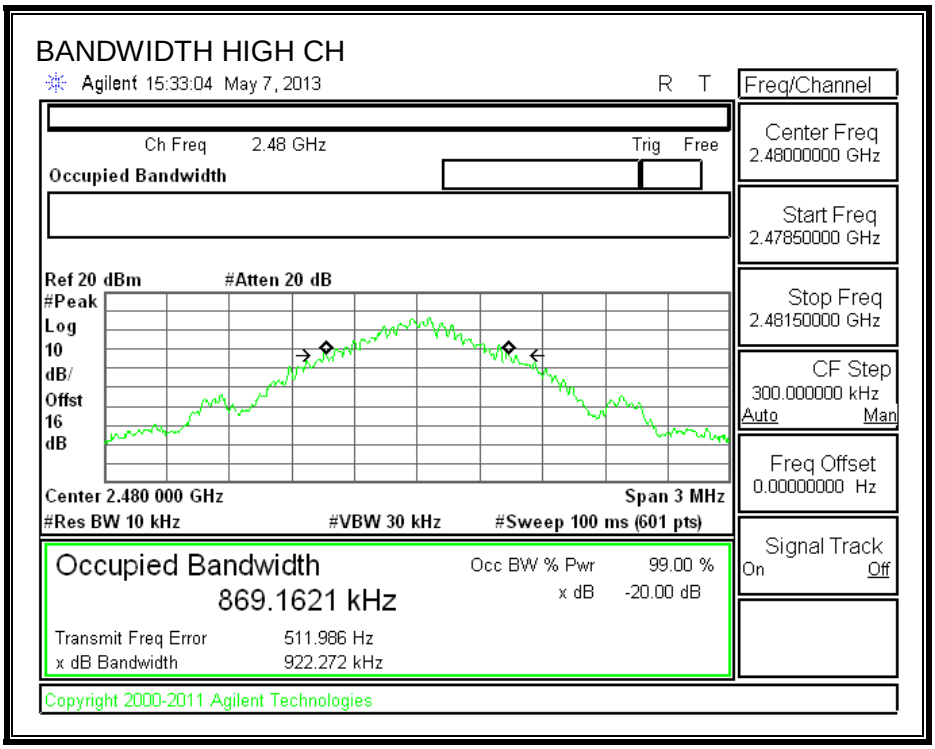
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	923.097	866.147
Middle	2441	921.535	872.474
High	2480	922.272	869.162

20 dB AND 99% BANDWIDTH







7.1.2. 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 hoping channel, whichever is greater.

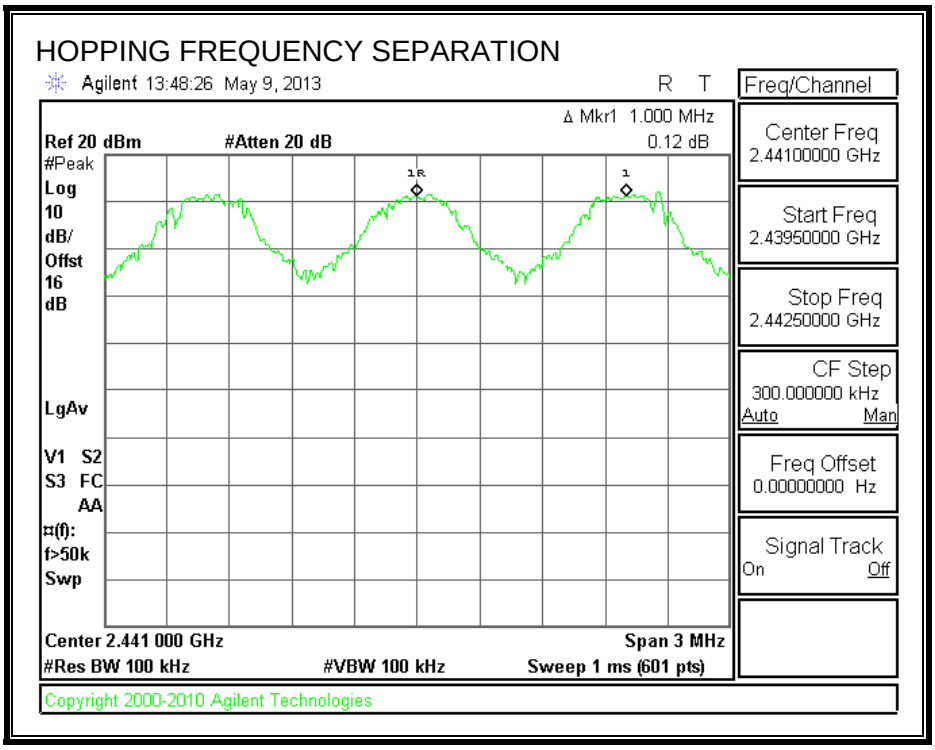
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



7.1.3. 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

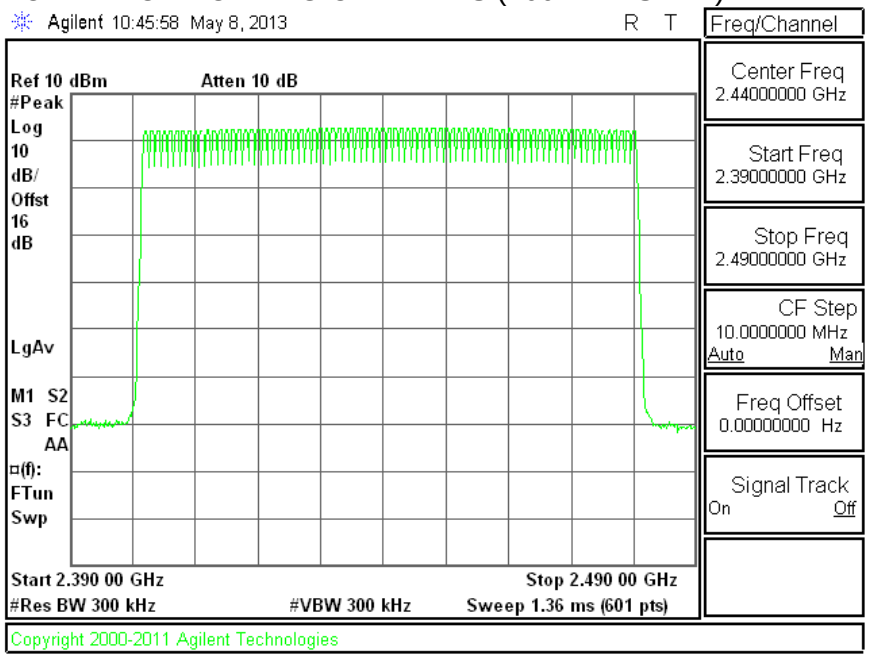
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

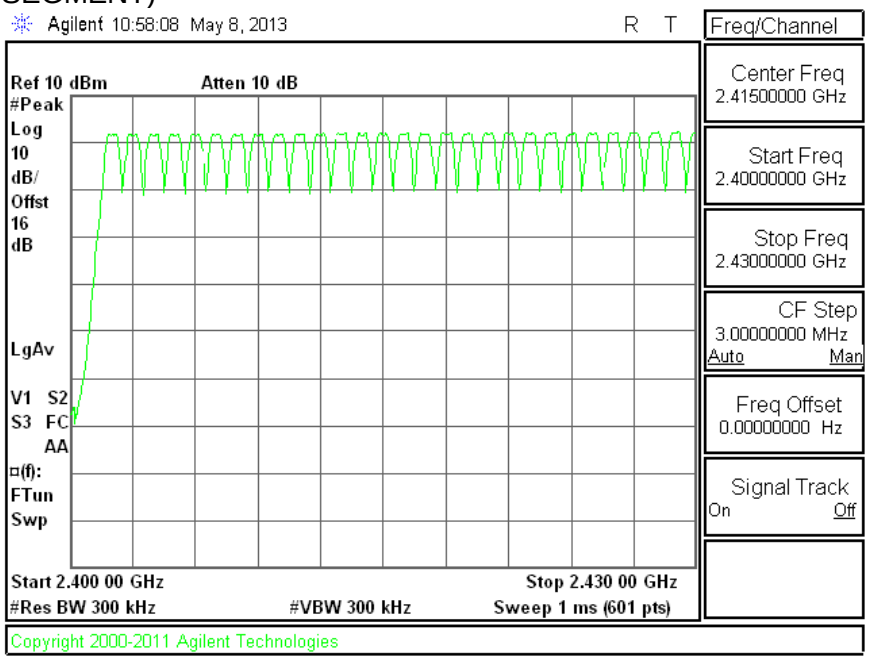
Normal Mode: 79 Channels observed.
AFH Mode: 20 Channels declared.

NUMBER OF HOPPING CHANNELS

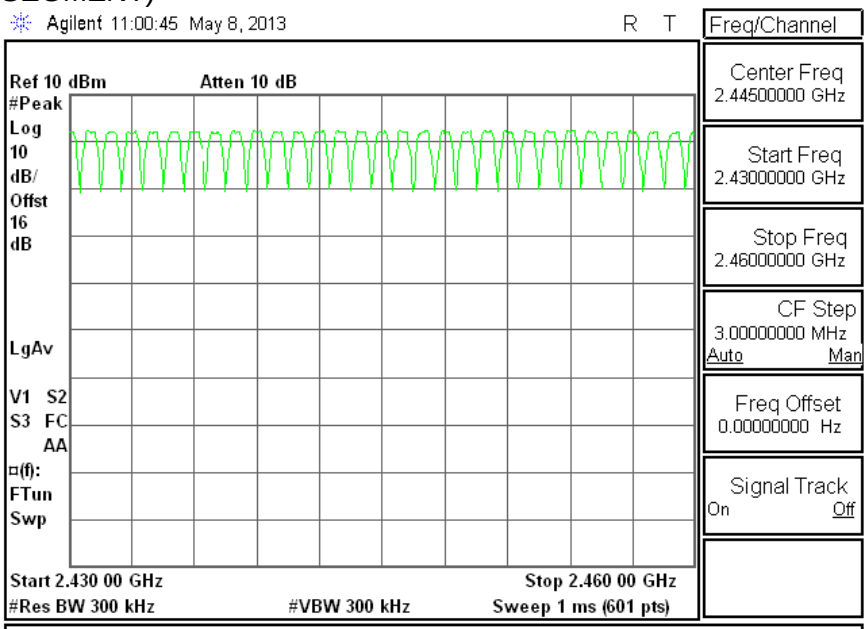
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



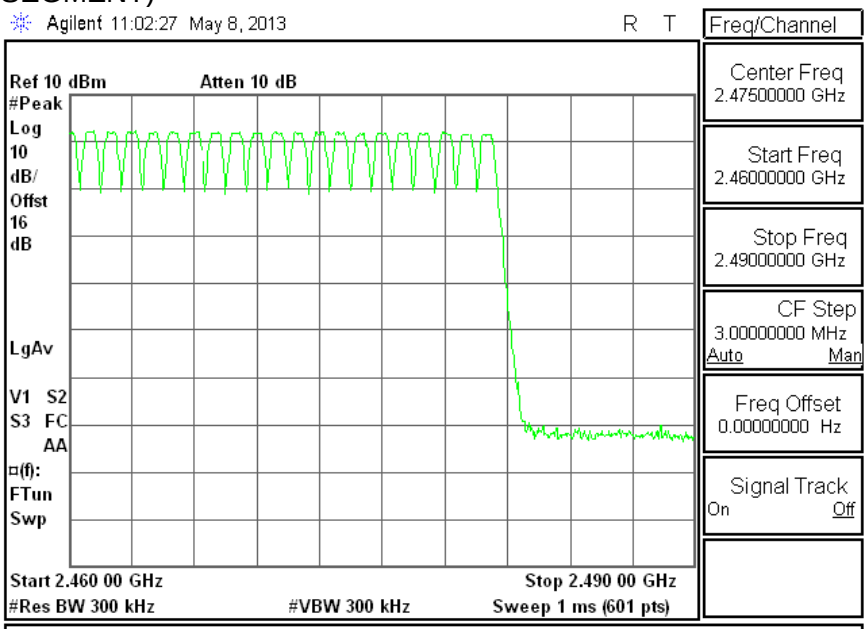
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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



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



7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

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.

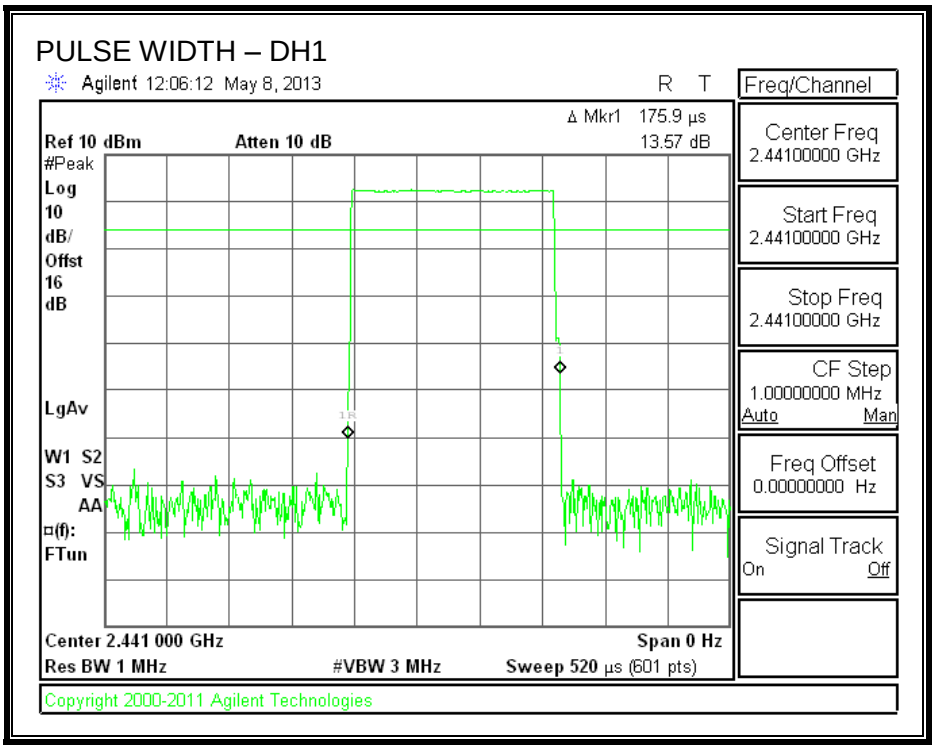
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

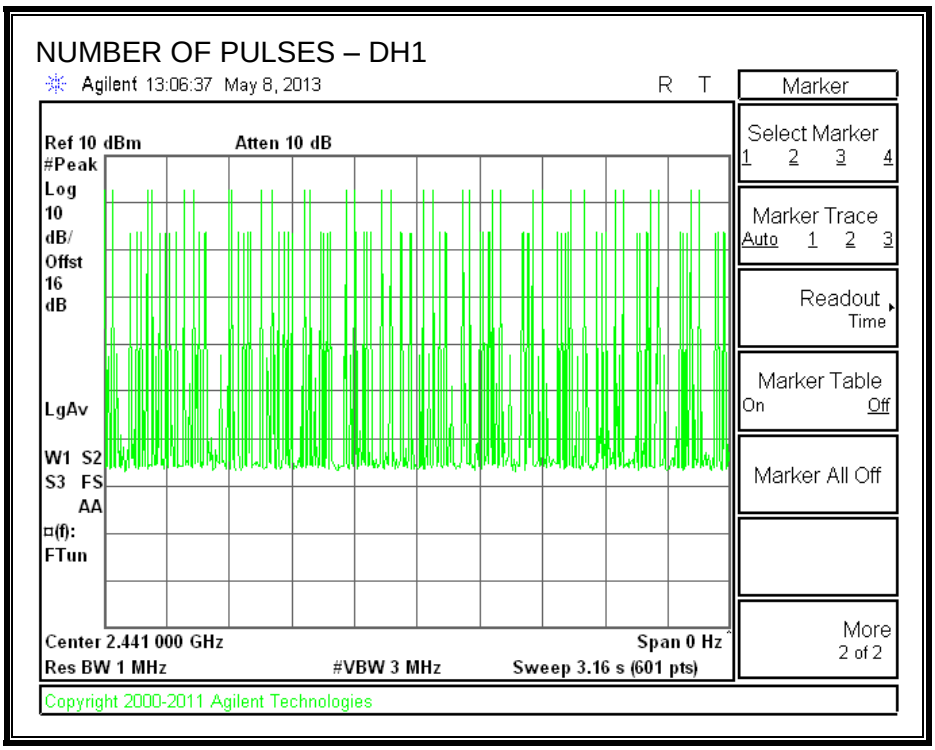
RESULTS

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	0.176	32	0.056	0.4	-0.344
DH3	1.650	14	0.231	0.4	-0.169
DH5	2.875	8	0.230	0.4	-0.170
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.176	64	0.113	0.4	-0.287
DH3	1.65	21	0.347	0.4	-0.054
DH5	2.875	13	0.374	0.4	-0.026

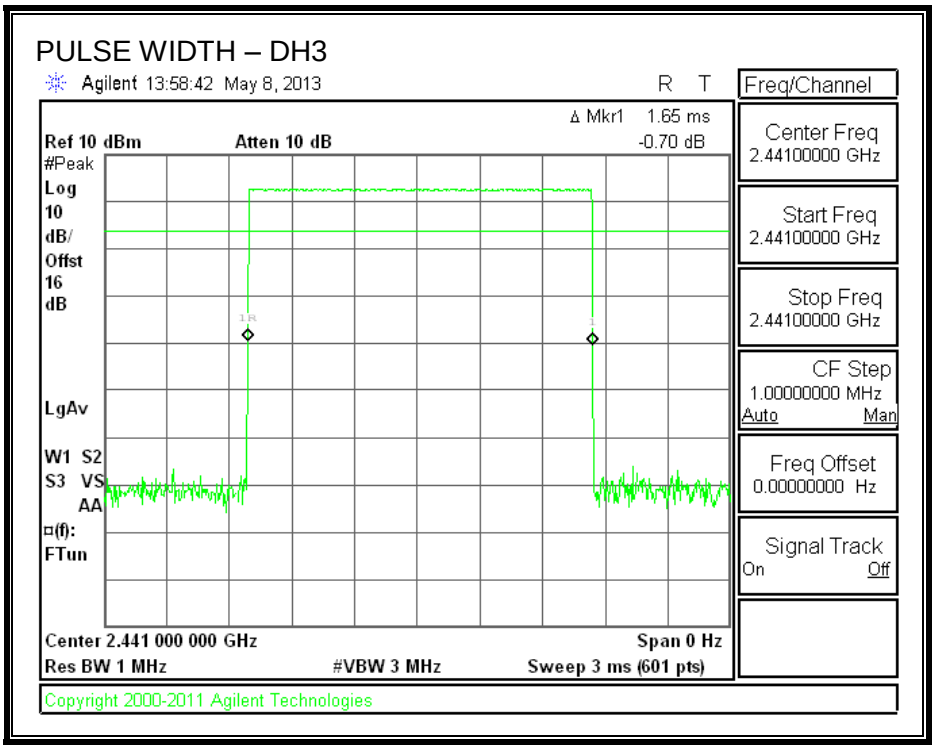
PULSE WIDTH - DH1



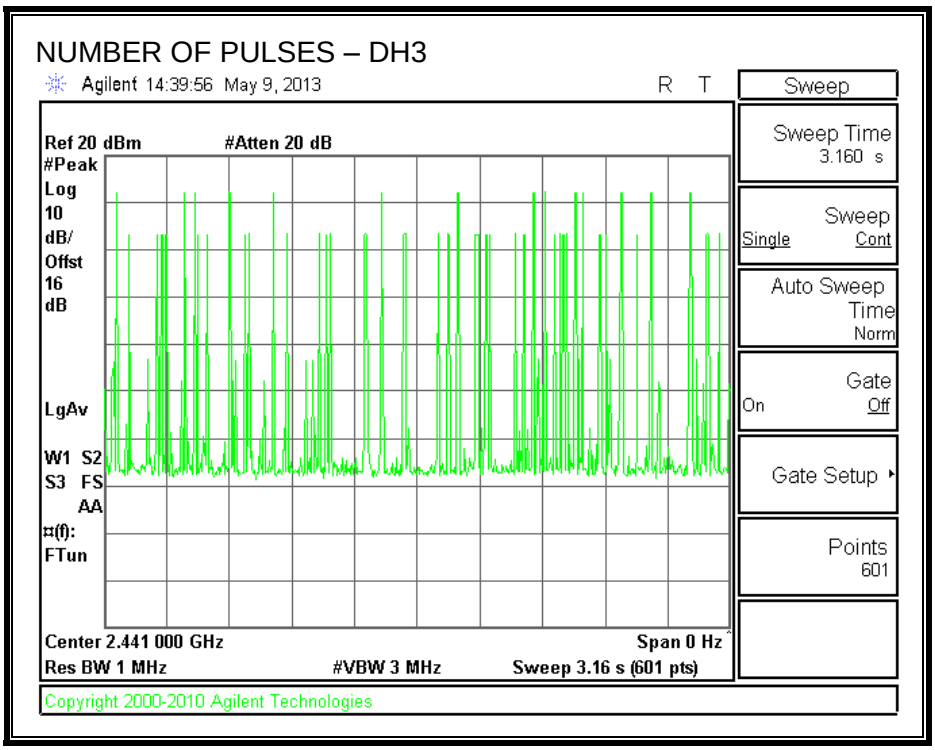
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



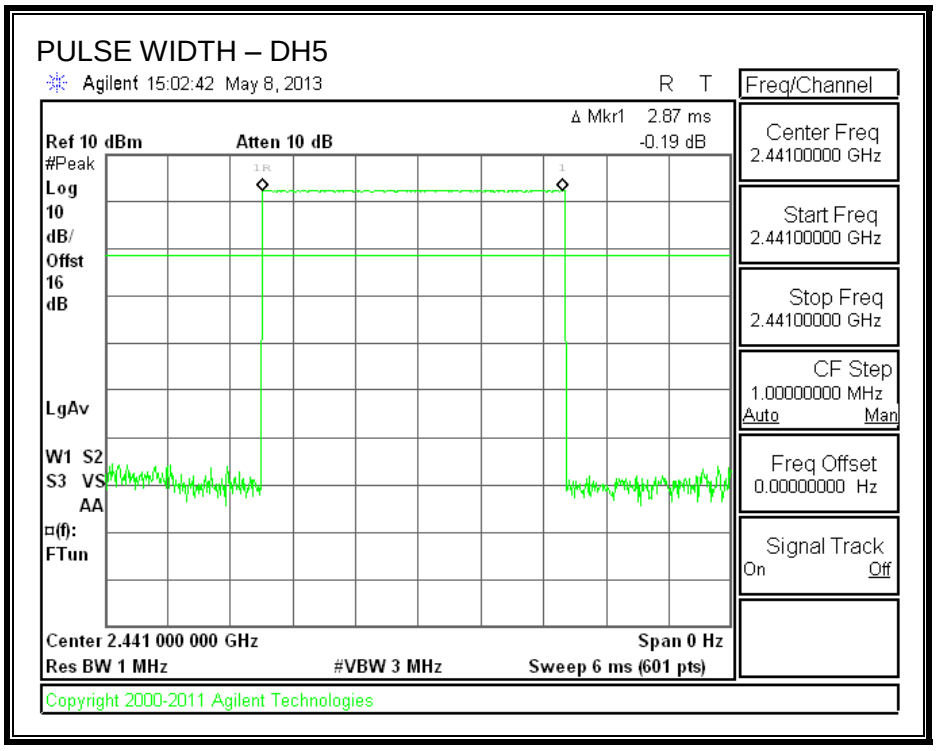
PULSE WIDTH – DH3



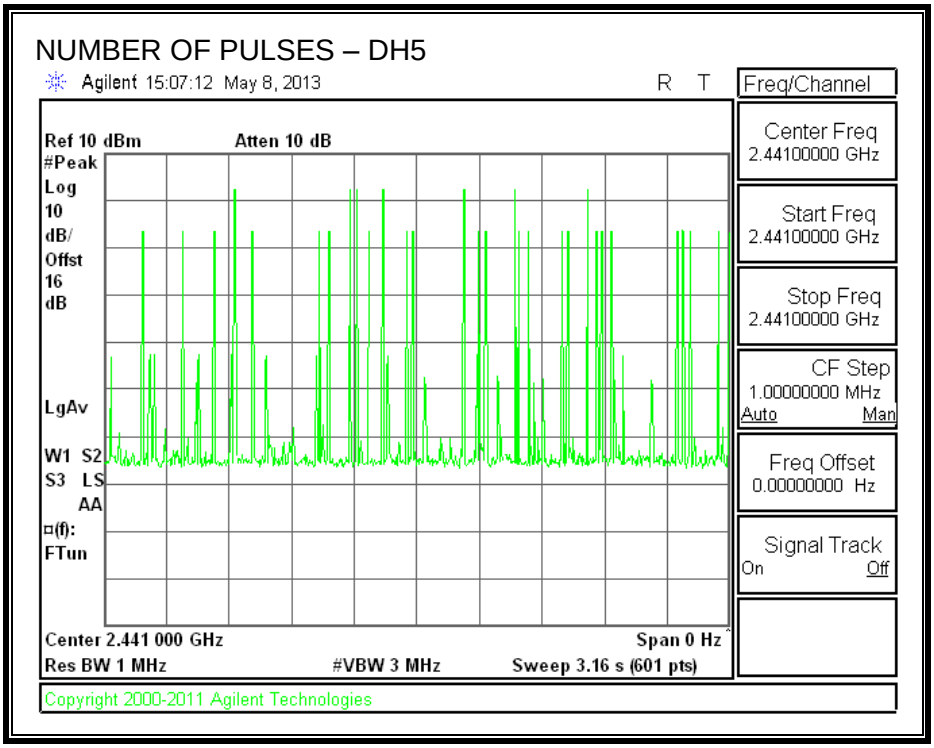
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



7.1.5. 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 10.68 dB (including 10 dB pad and 0.68 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	11.30
Middle	2441	11.50
High	2480	11.20

7.1.6. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

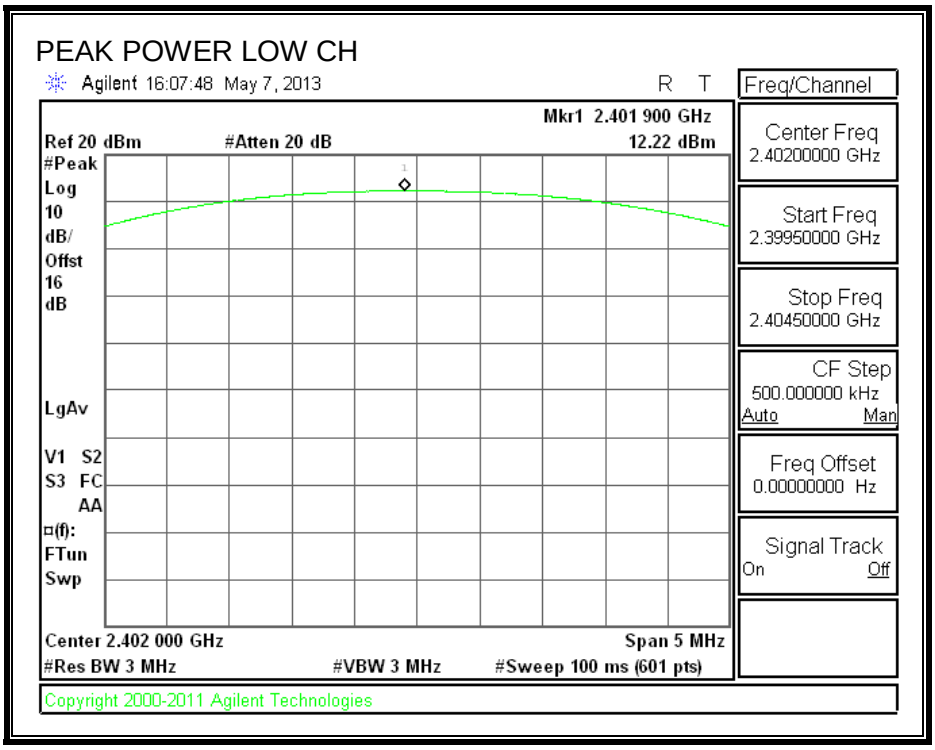
TEST PROCEDURE

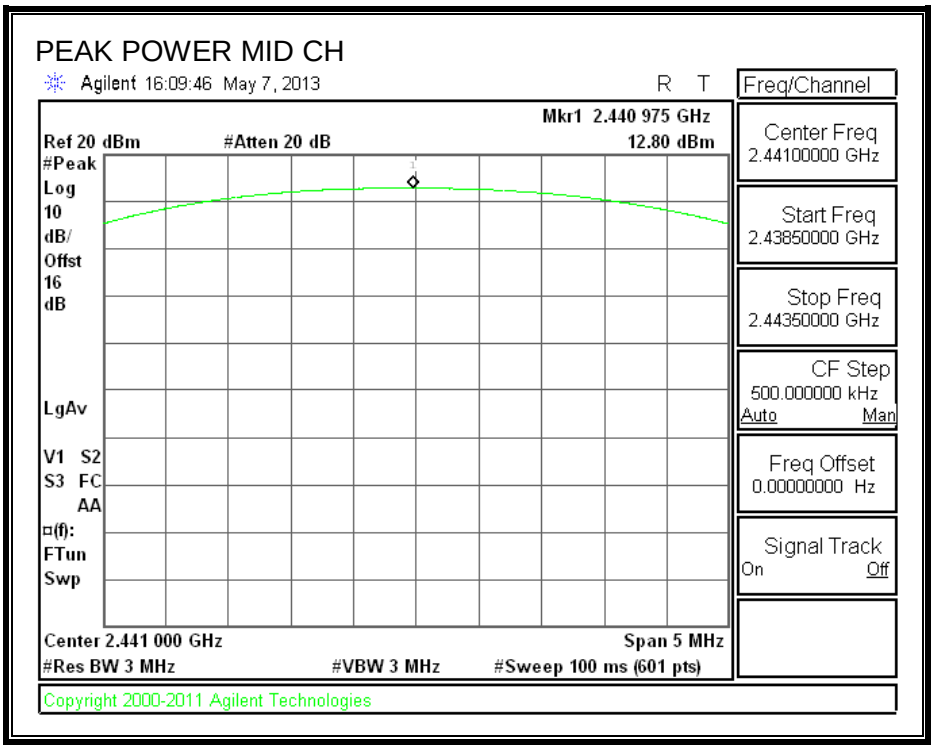
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

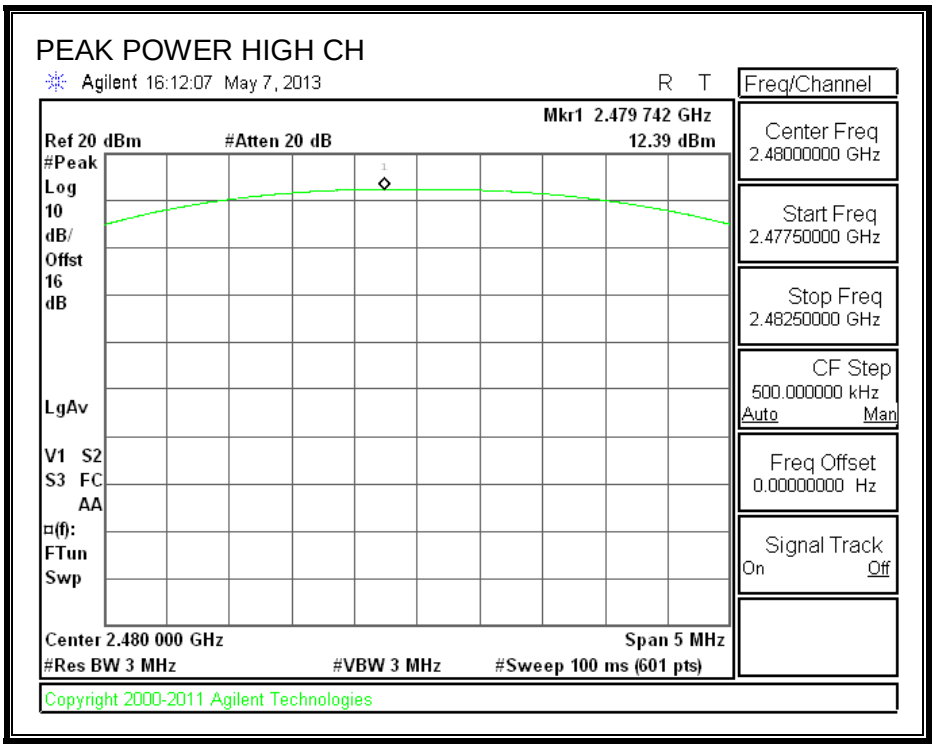
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.22	30	-17.78
Middle	2441	12.80	30	-17.20
High	2480	12.39	30	-17.61

OUTPUT POWER







7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

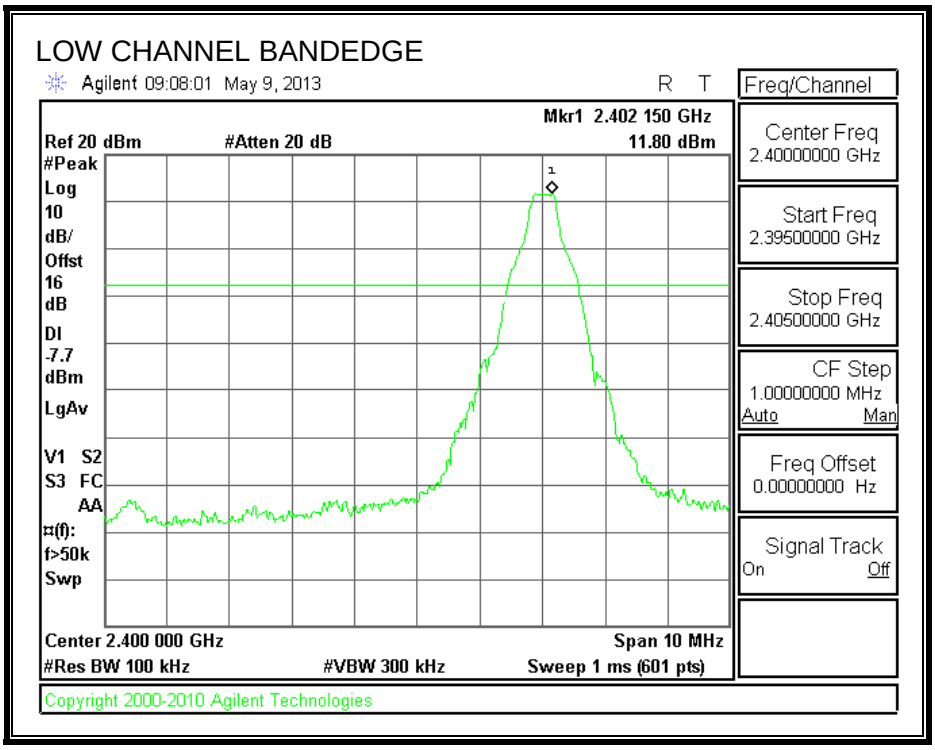
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

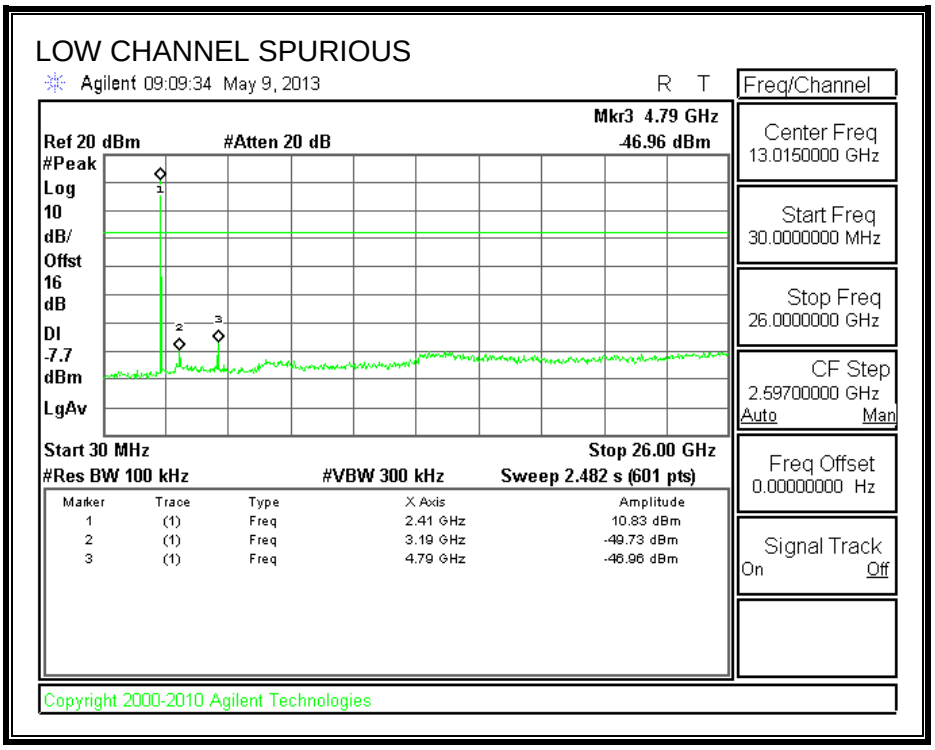
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

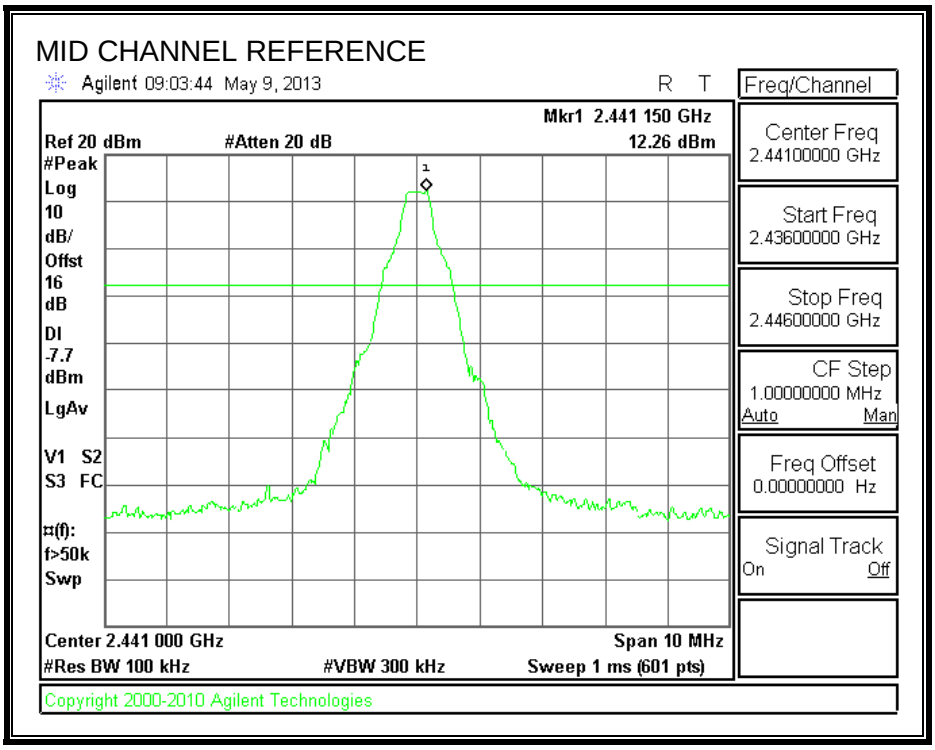
RESULTS

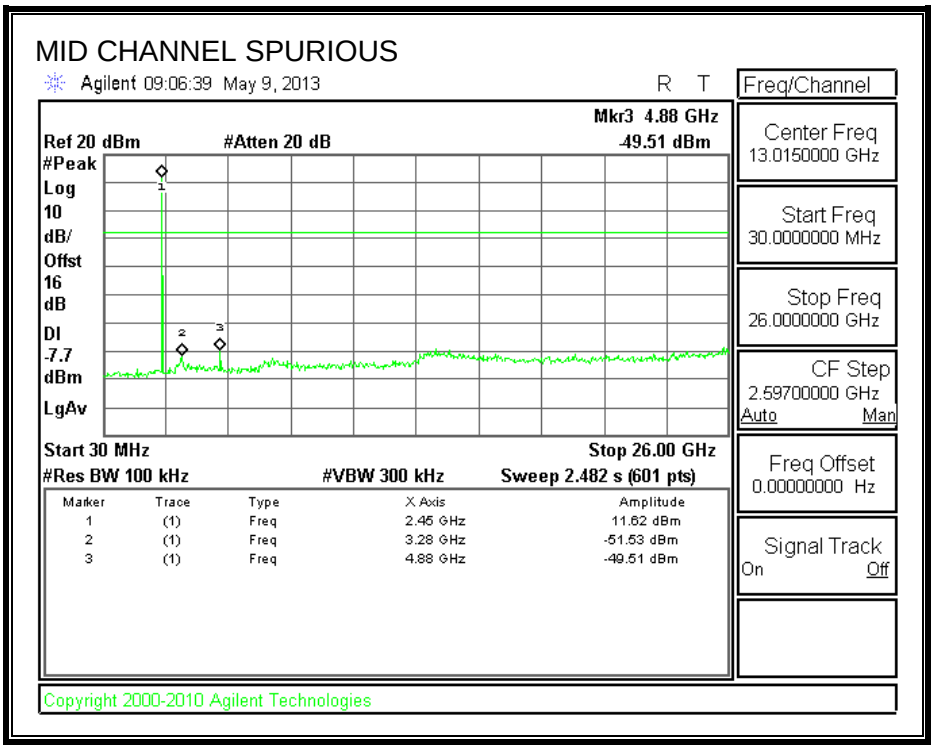
SPURIOUS EMISSIONS, LOW CHANNEL



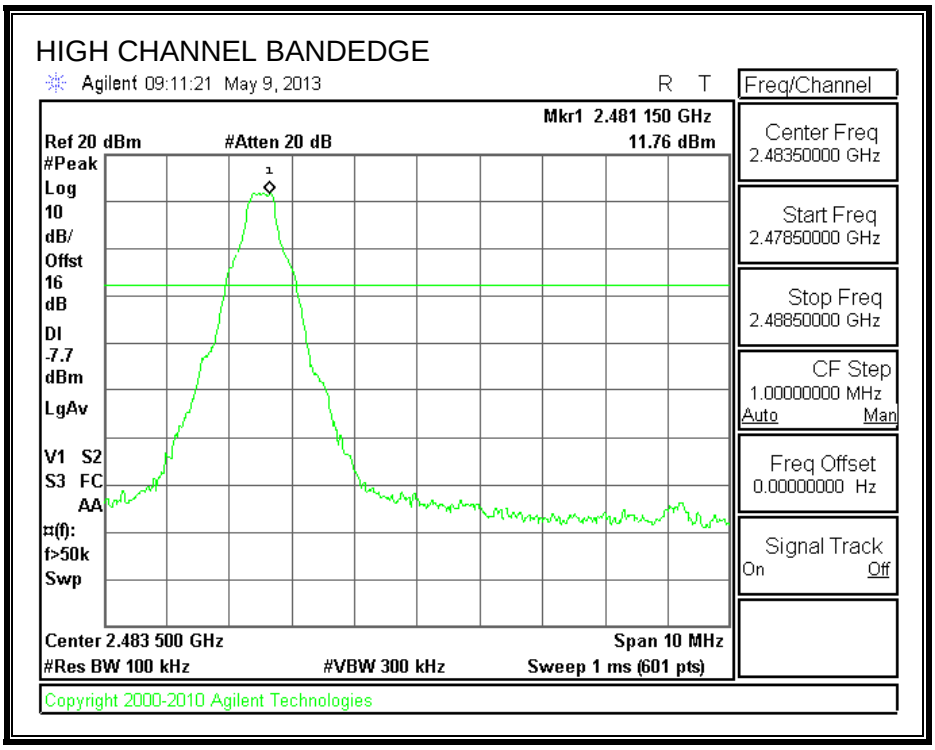


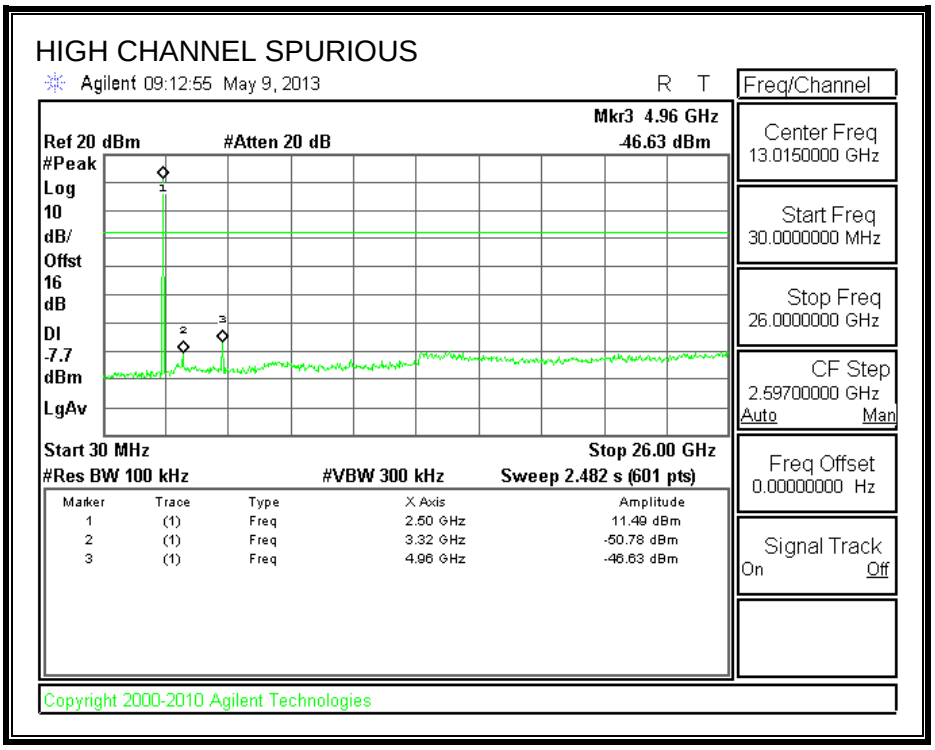
SPURIOUS EMISSIONS, MID CHANNEL





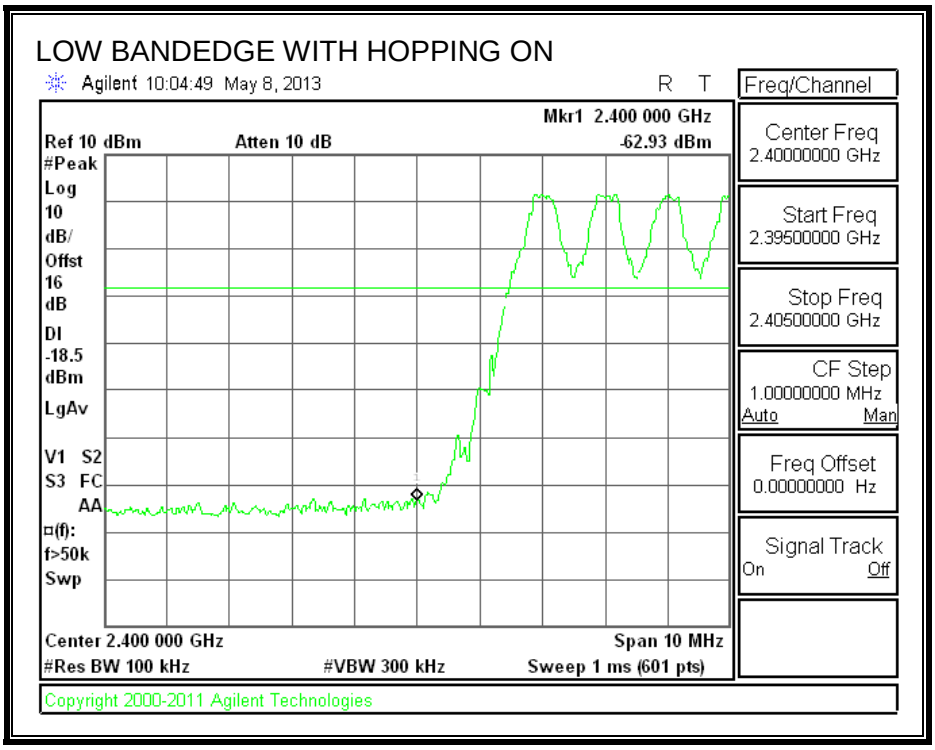
SPURIOUS EMISSIONS, HIGH CHANNEL



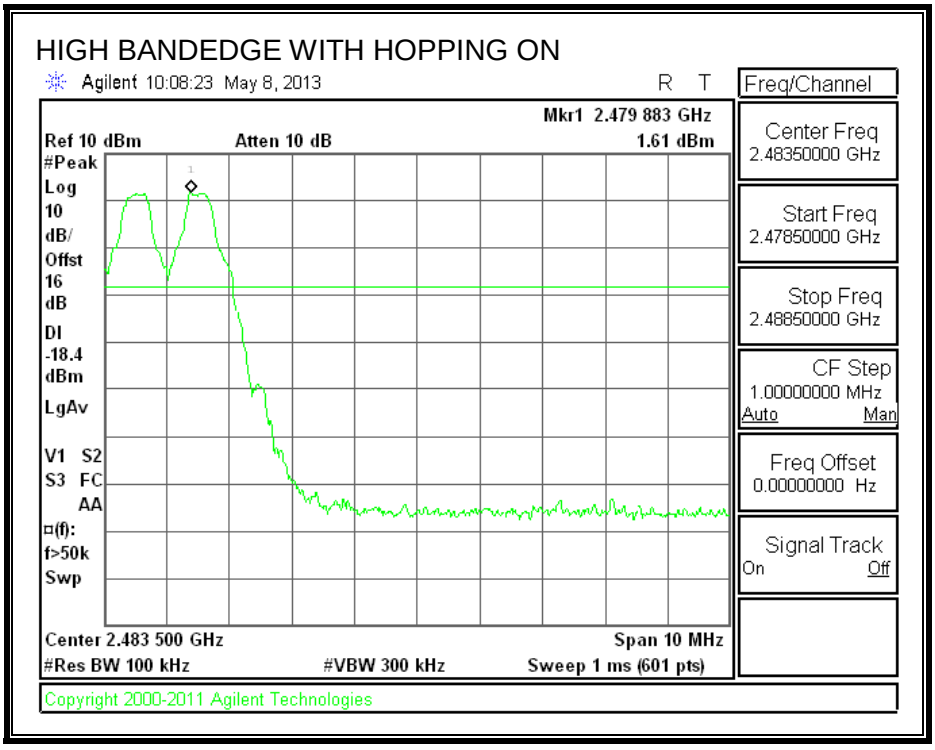


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



7.2. ENHANCED DATA RATE 8PSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

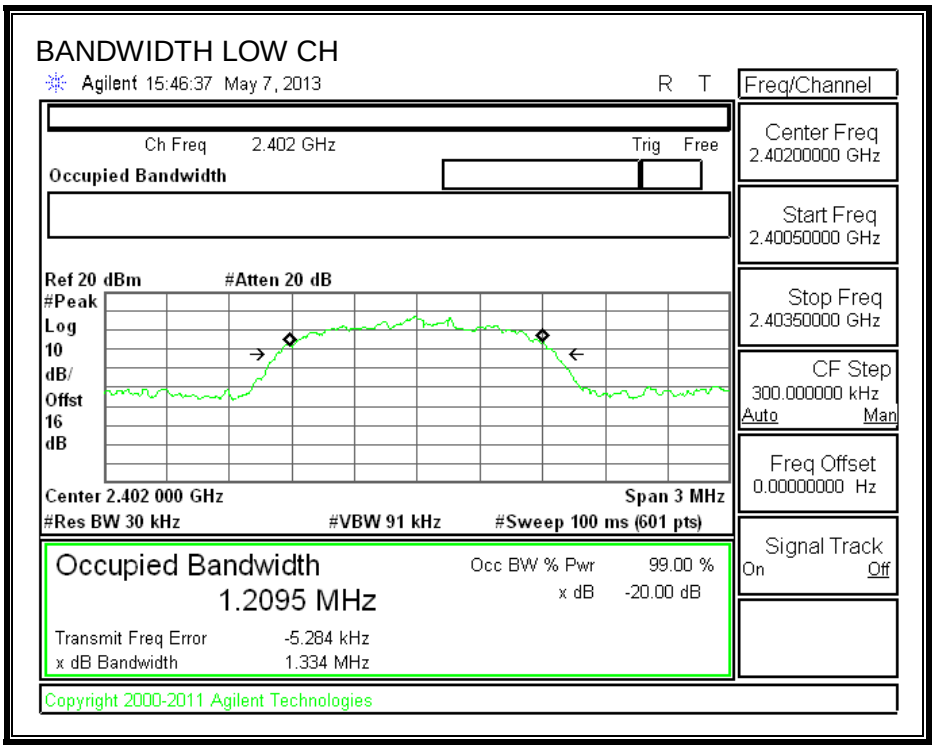
TEST PROCEDURE

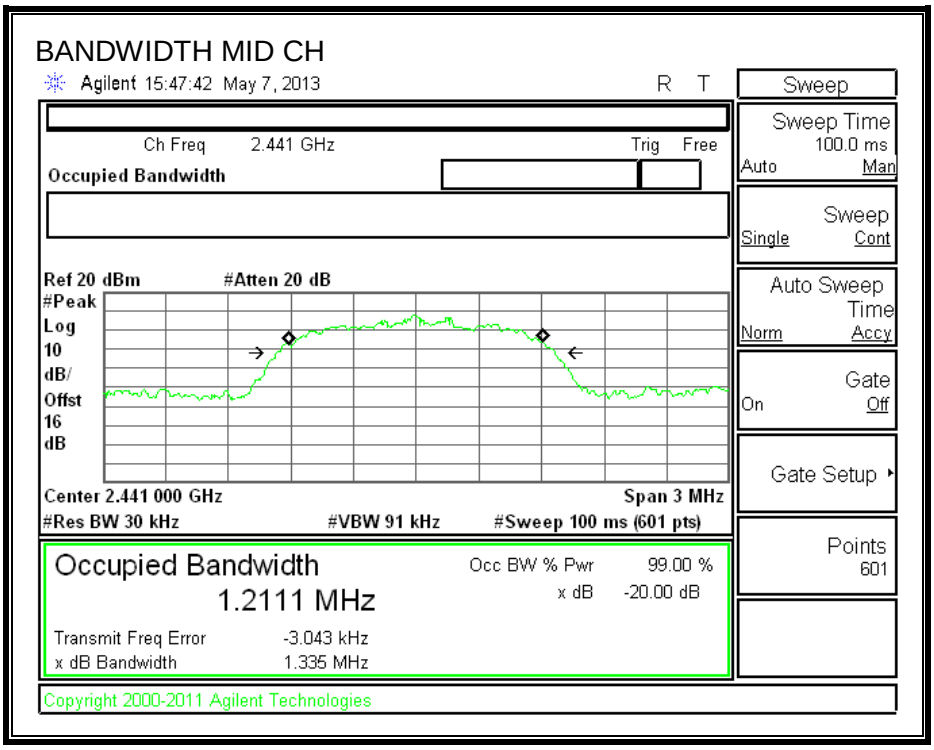
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

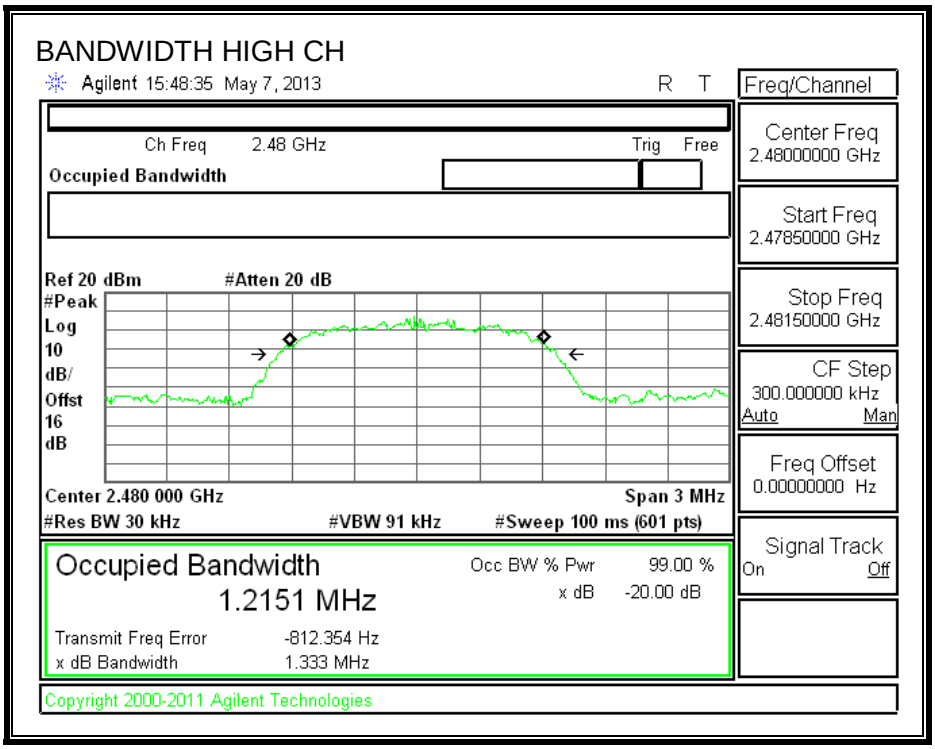
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	1.334	1.2095
Middle	2441	1.335	1.2111
High	2480	1.333	1.2151

20 dB AND 99% BANDWIDTH







7.2.2. 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 hoping channel, whichever is greater.

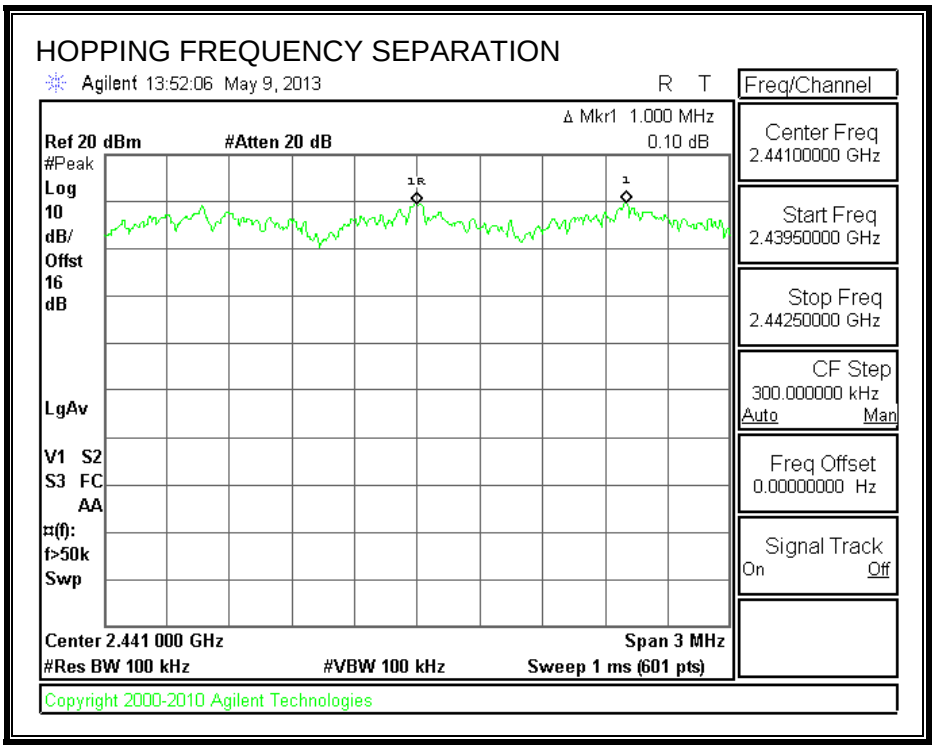
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



7.2.3. 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

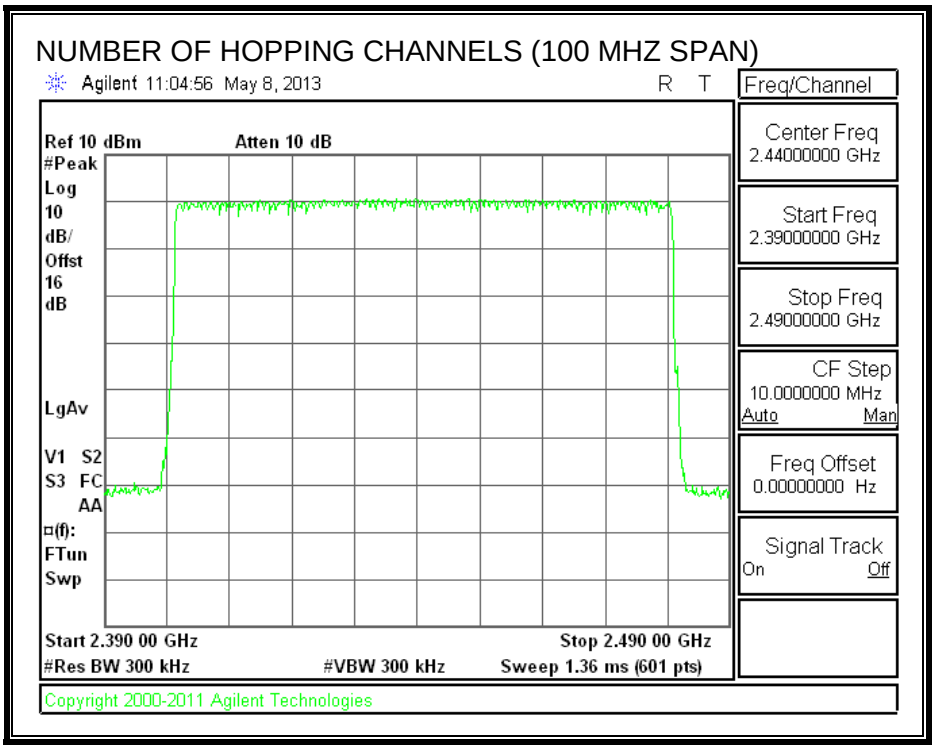
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

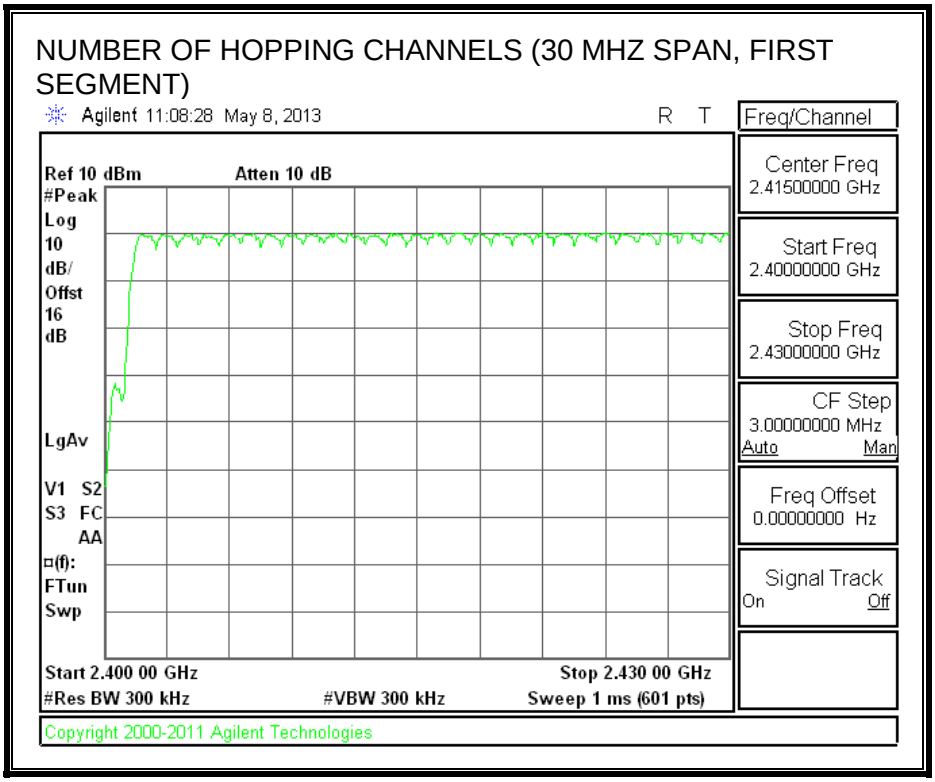
Normal Mode: 79 Channels observed.
AFH Mode: 20 Channels declared.

NUMBER OF HOPPING CHANNELS

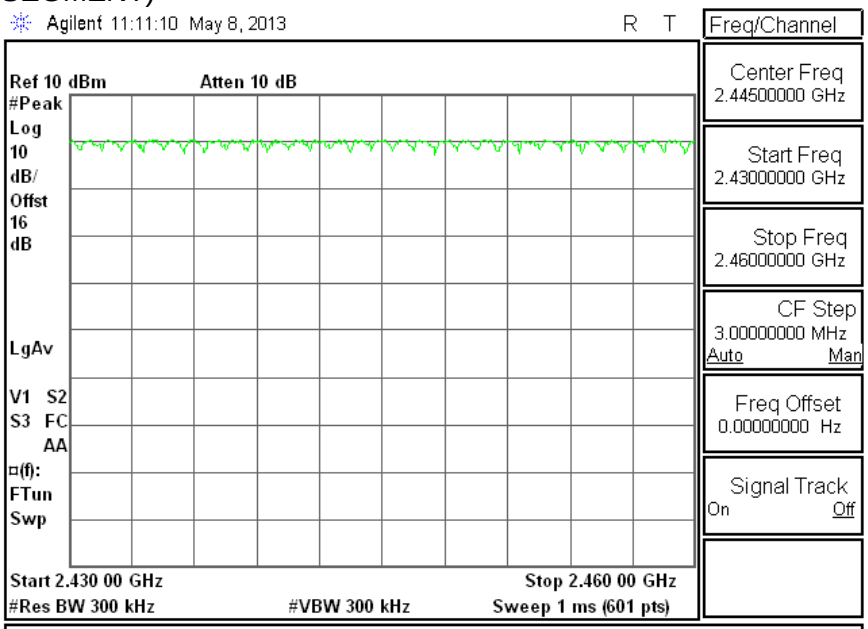
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



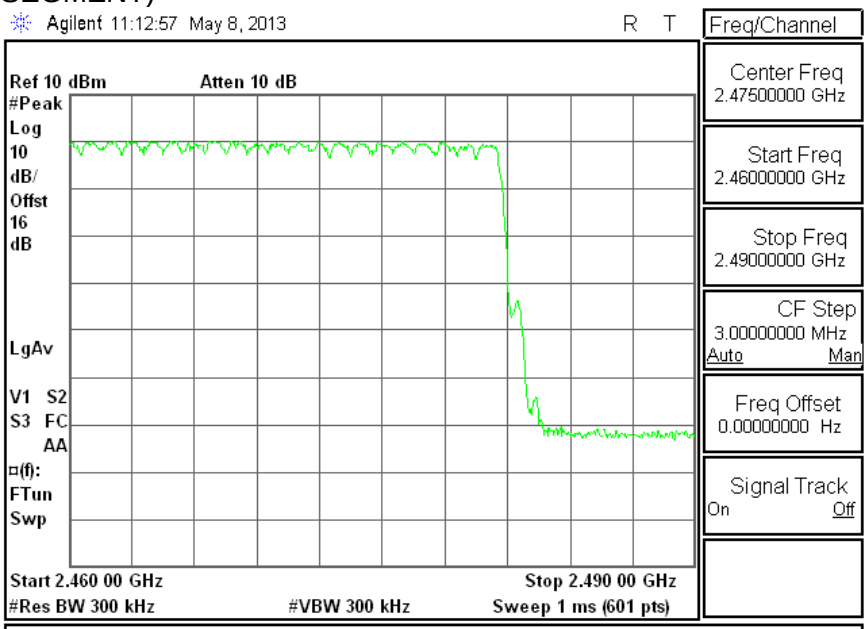
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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



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



7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

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

TEST PROCEDURE

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

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

RESULTS

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

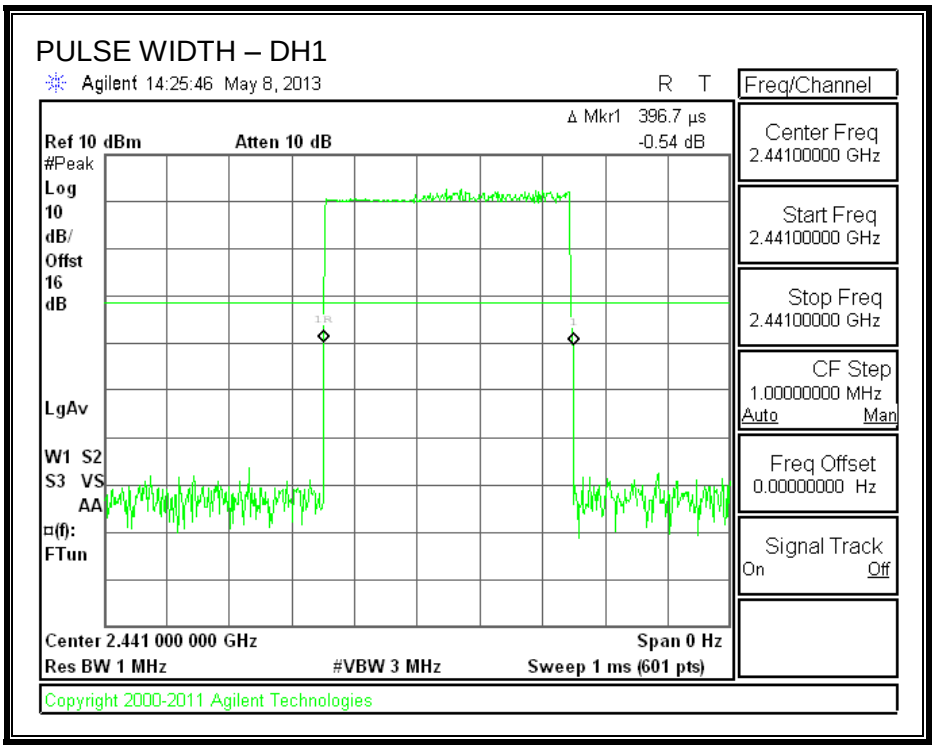
8PSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.396	31	0.123	0.4	-0.277
DH3	1.646	18	0.296	0.4	-0.104
DH5	2.900	10	0.290	0.4	-0.110

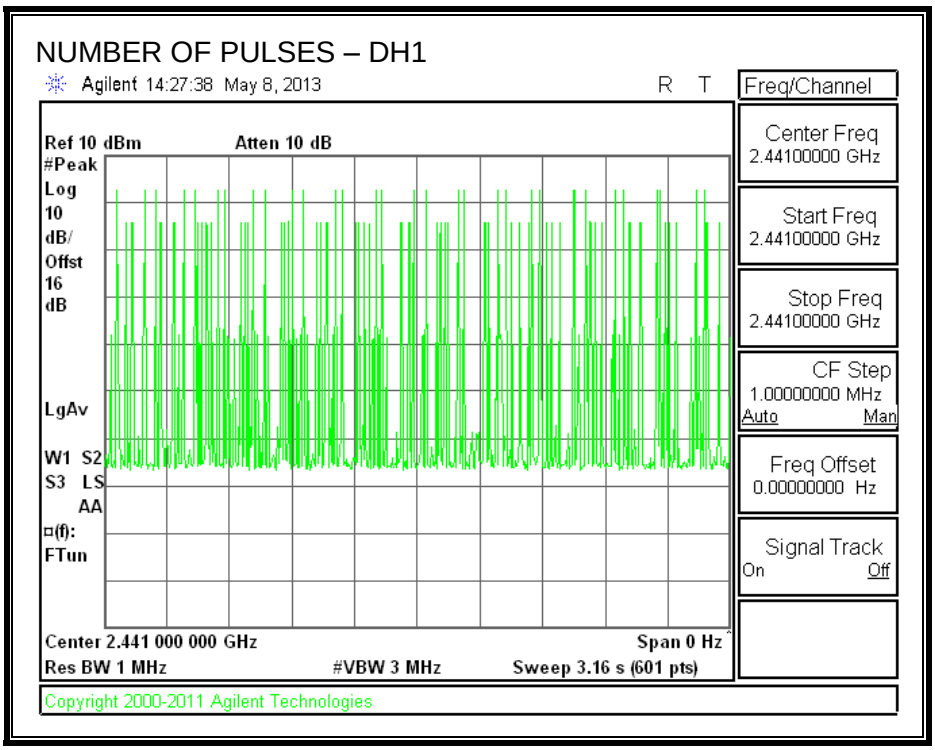
Note: for AFH (8PSK) mode, please refer to the results of AFH (GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate on page 22 demonstrates compliance with channel occupancy when AFH is employed

.

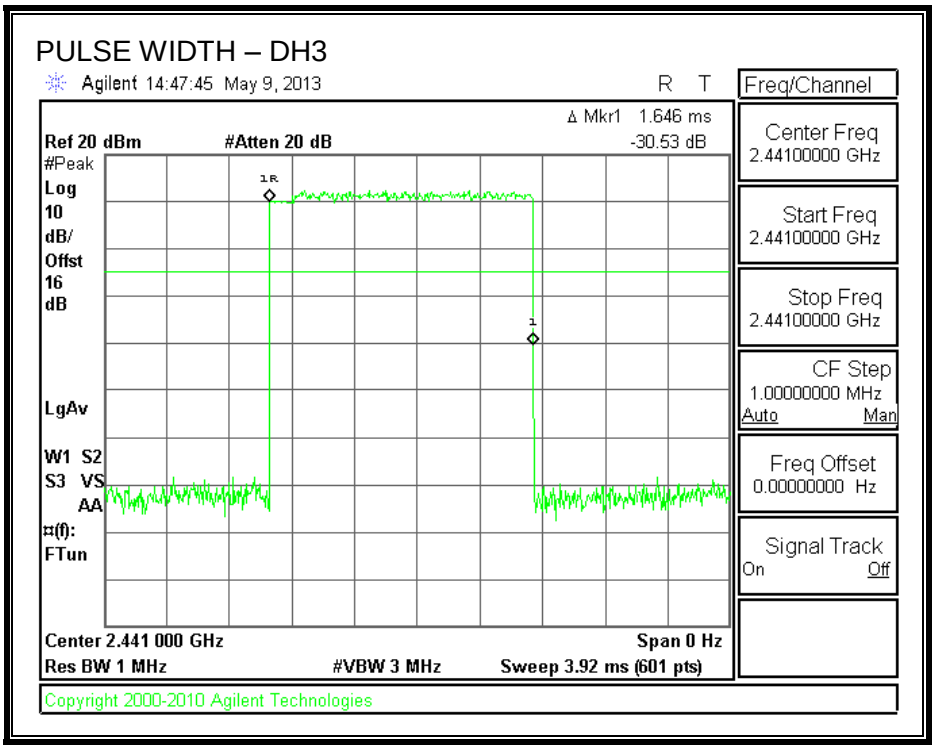
PULSE WIDTH - DH1



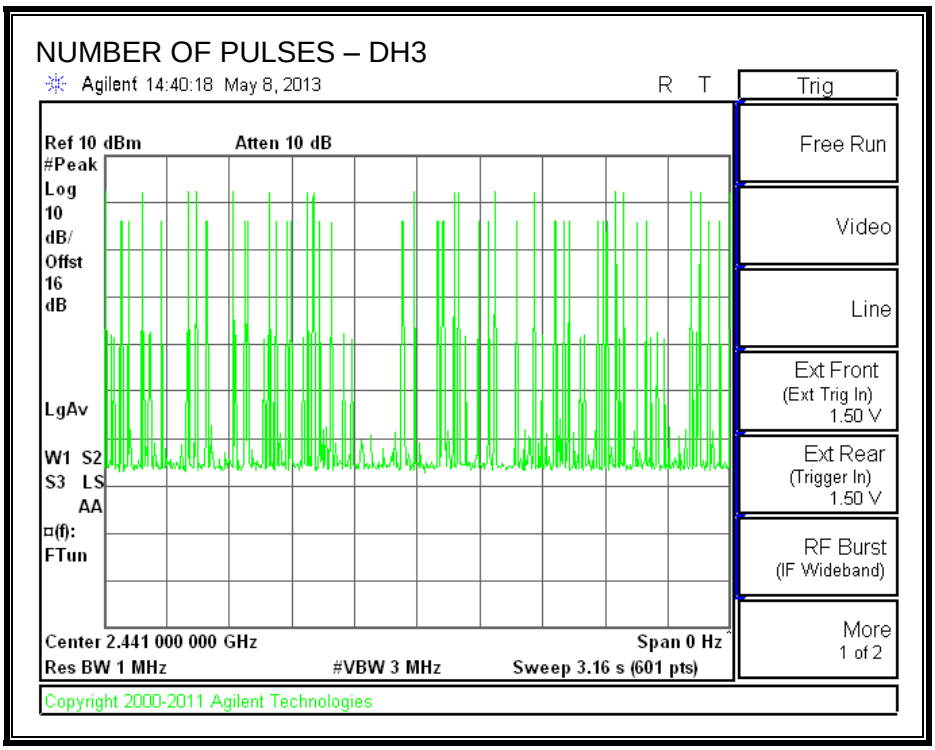
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



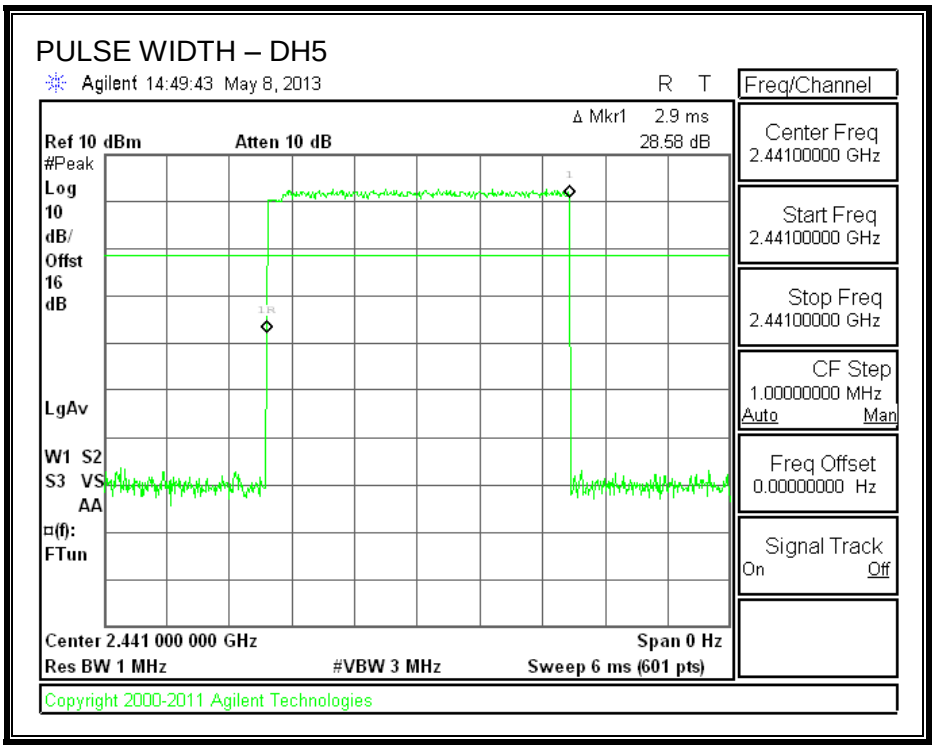
PULSE WIDTH – DH3



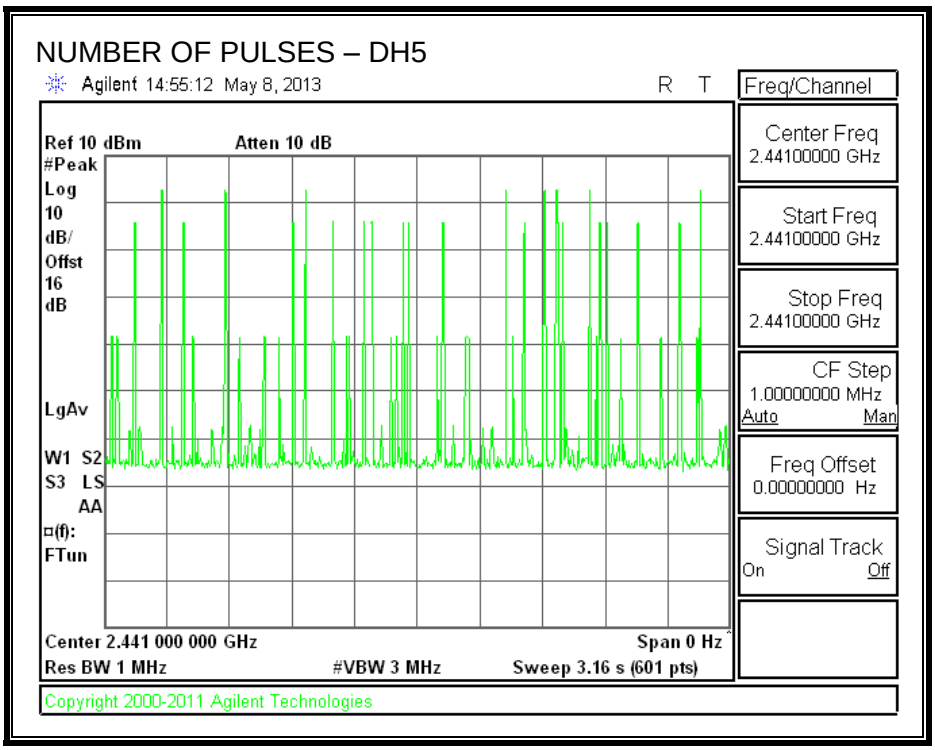
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



7.2.5. 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 10.68 dB (including 10 dB pad and 0.68 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.10
Middle	2441	9.50
High	2480	9.10

7.2.6. OUTPUT POWER

LIMIT

§15.247 (b) (1)

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

TEST PROCEDURE

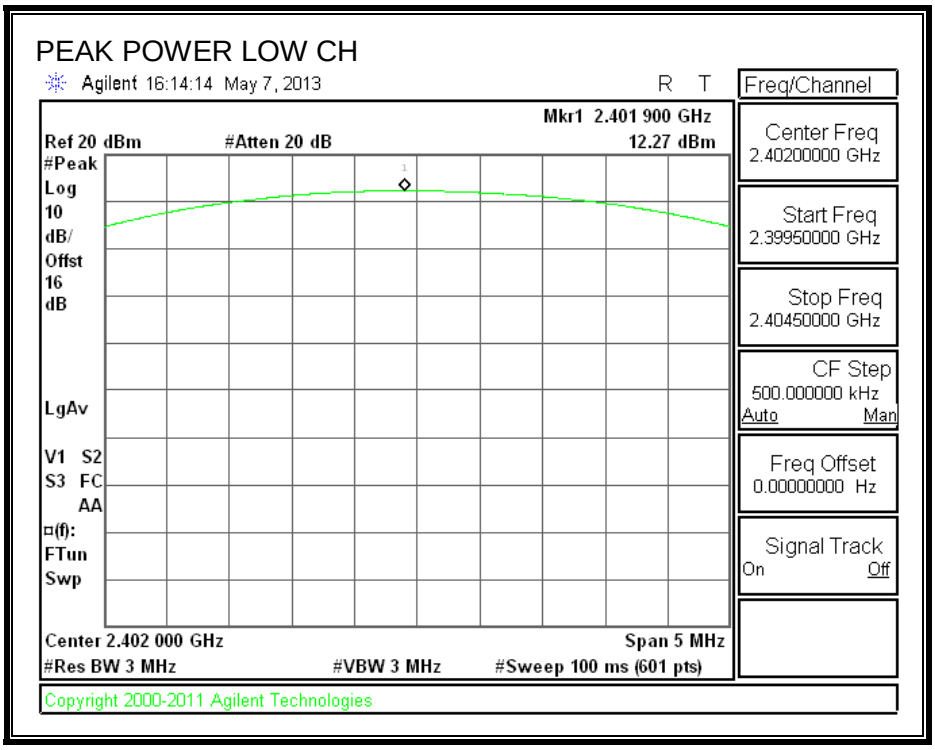
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

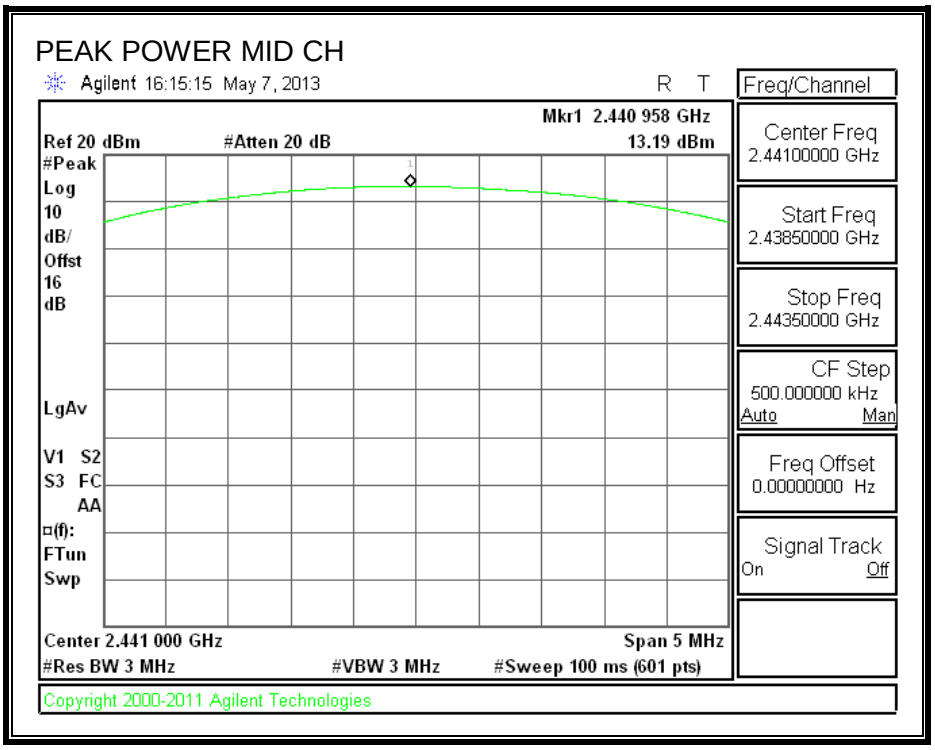
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.27	30	-17.73
Middle	2441	13.19	30	-16.81
High	2480	12.79	30	-17.21

OUTPUT POWER

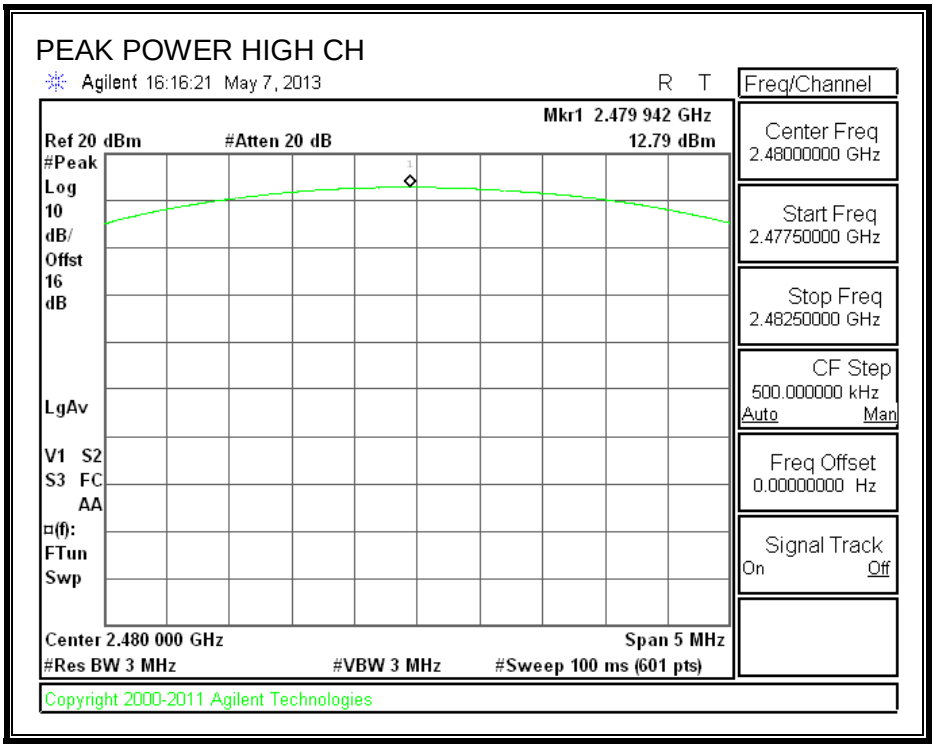
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

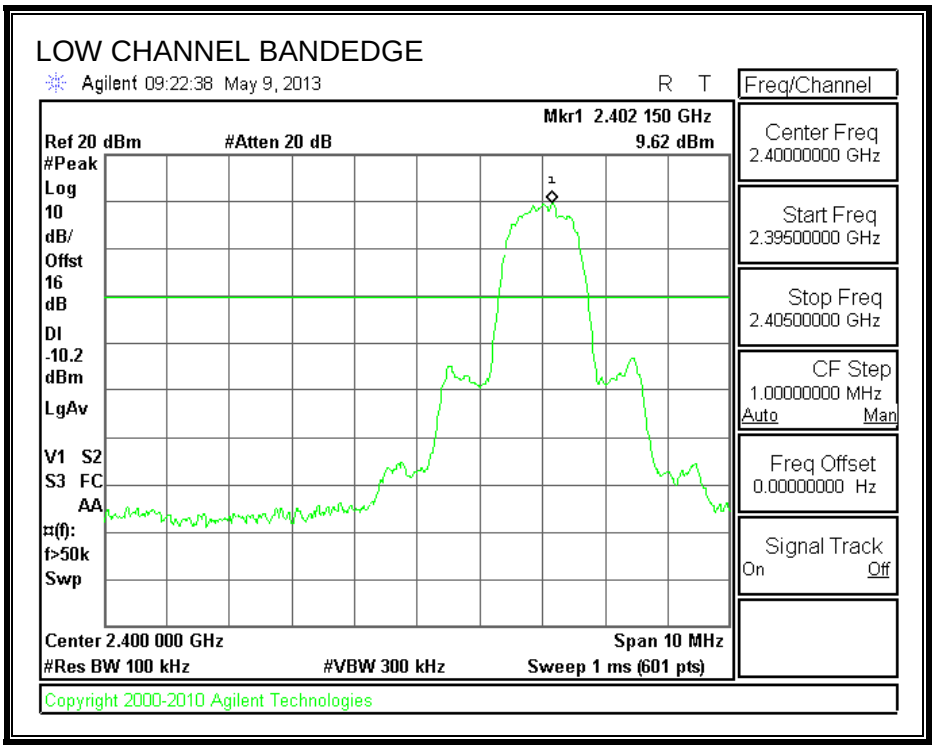
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

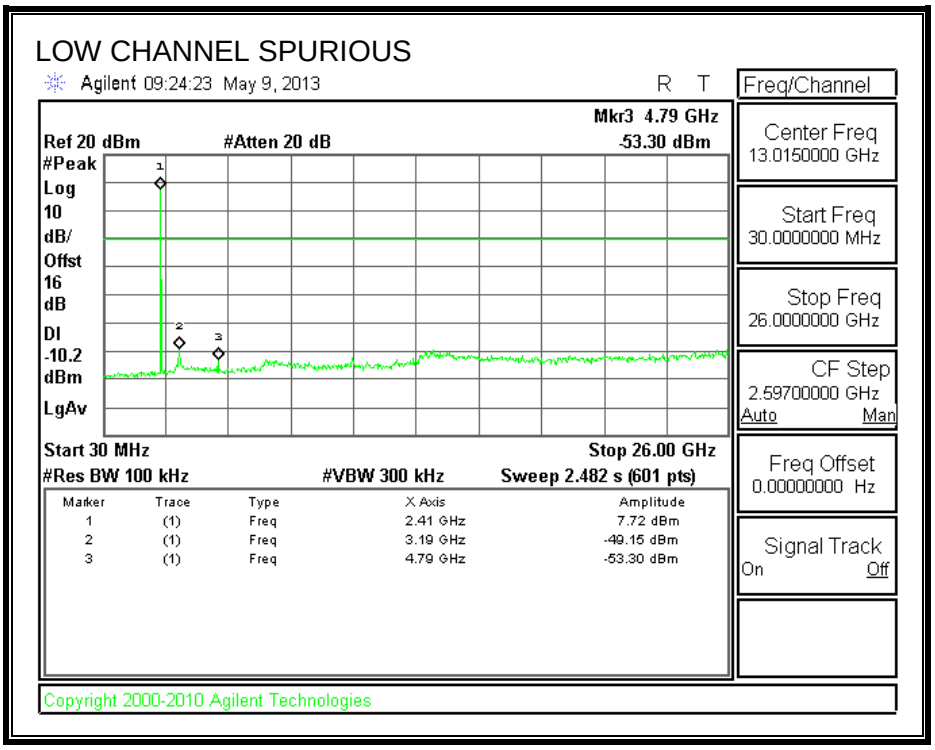
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

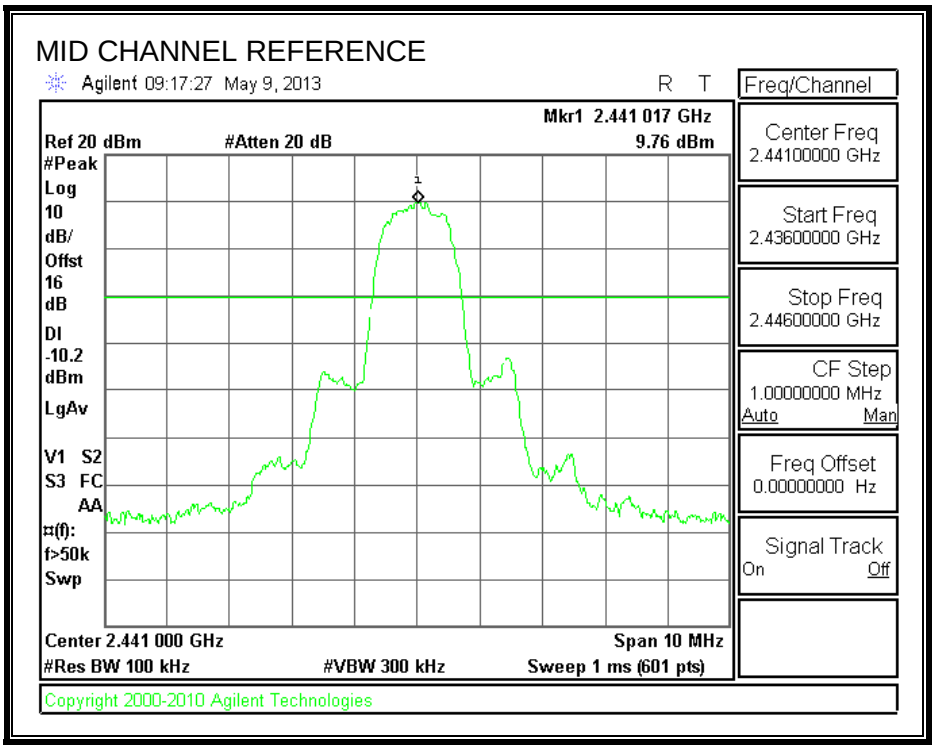
RESULTS

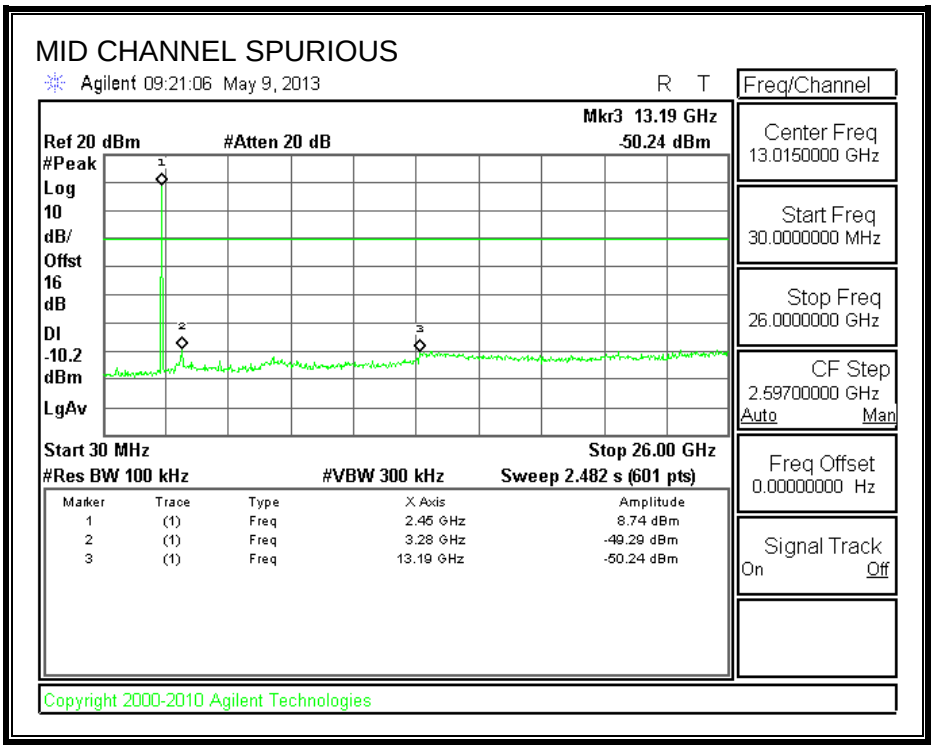
SPURIOUS EMISSIONS, LOW CHANNEL



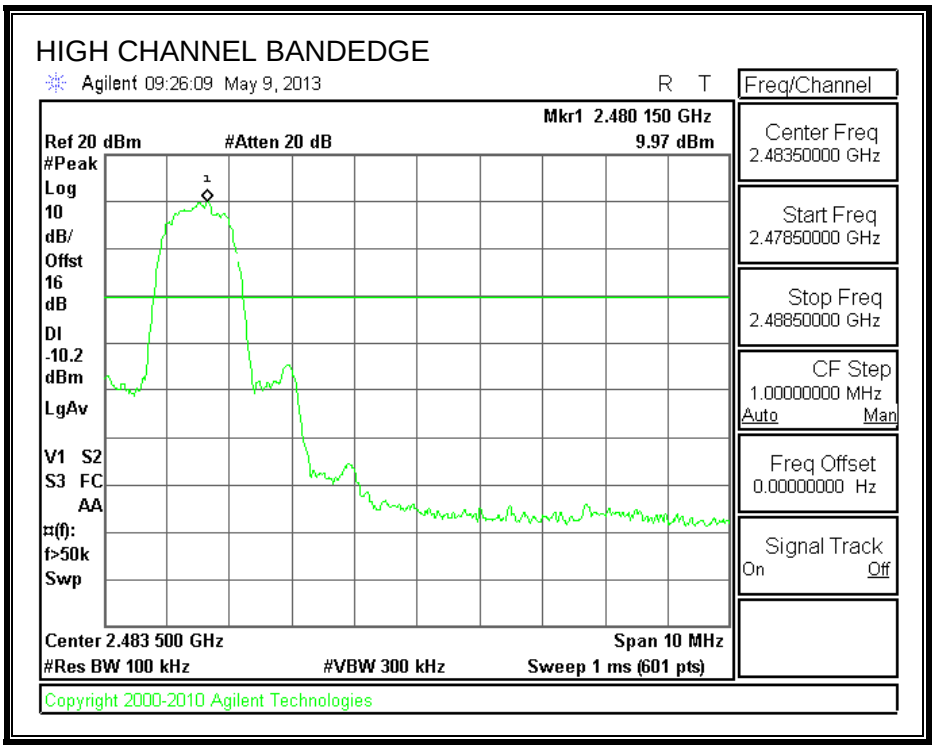


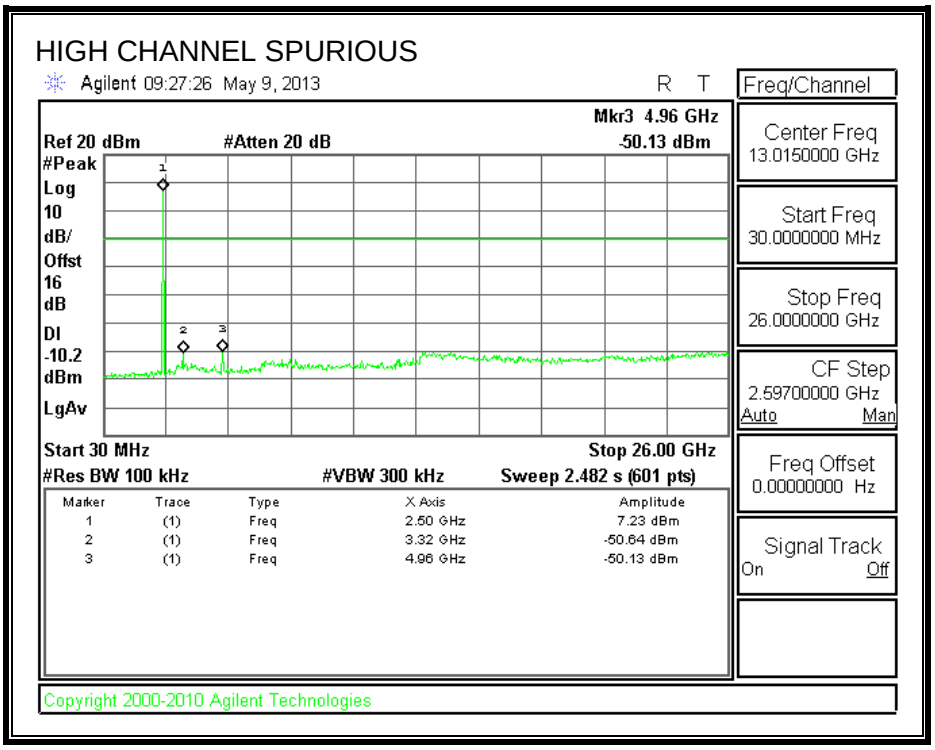
SPURIOUS EMISSIONS, MID CHANNEL





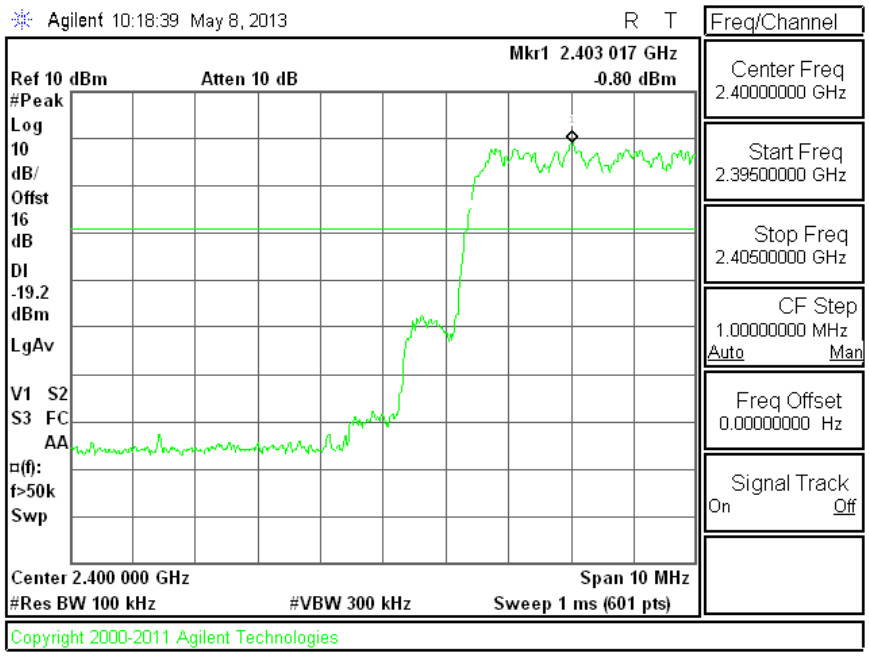
SPURIOUS EMISSIONS, HIGH CHANNEL



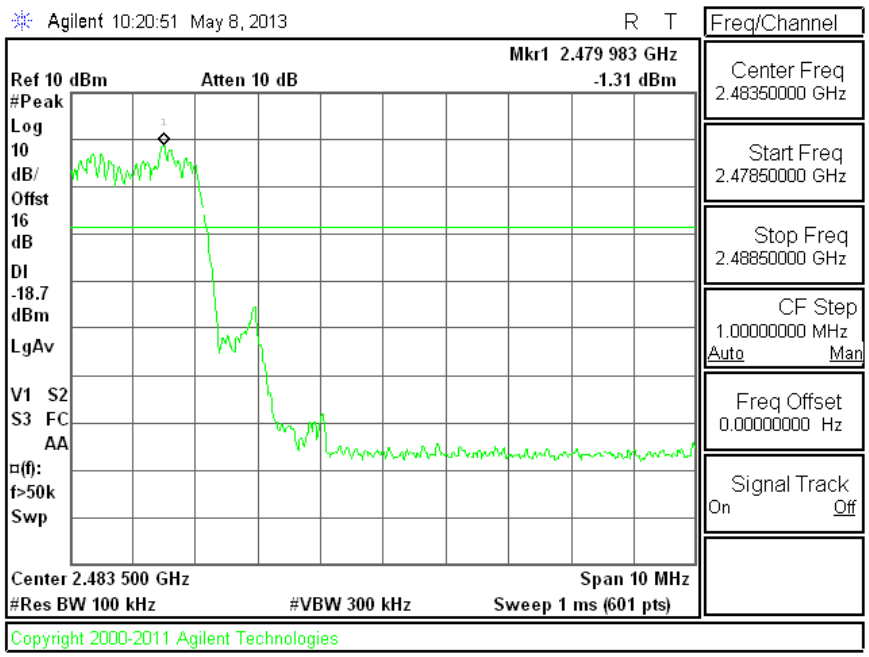


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

TEST PROCEDURE

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

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

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

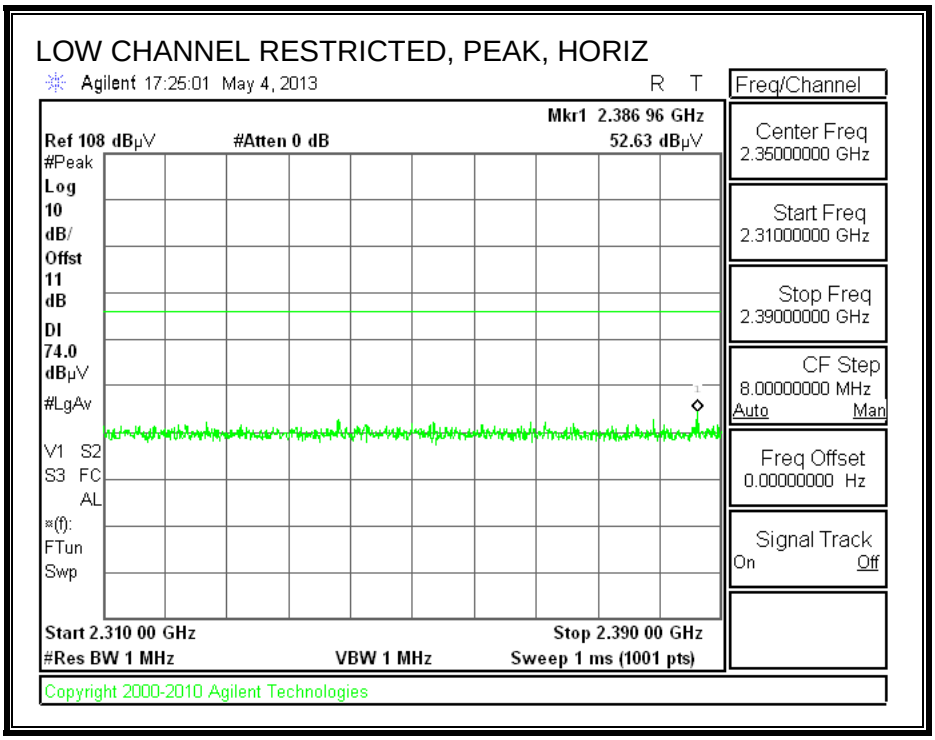
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

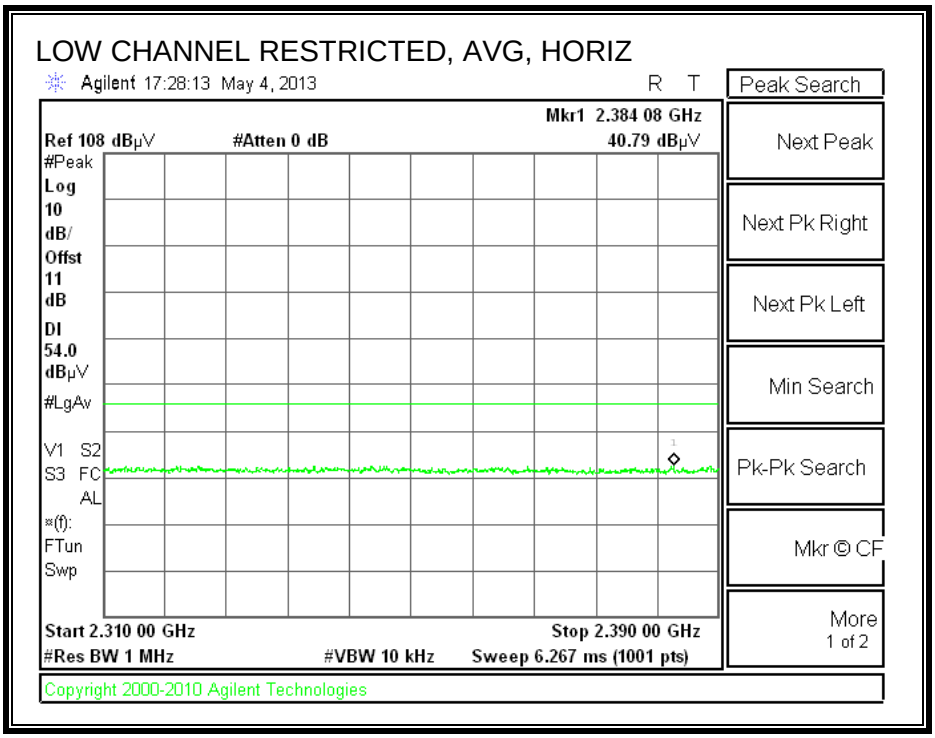
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

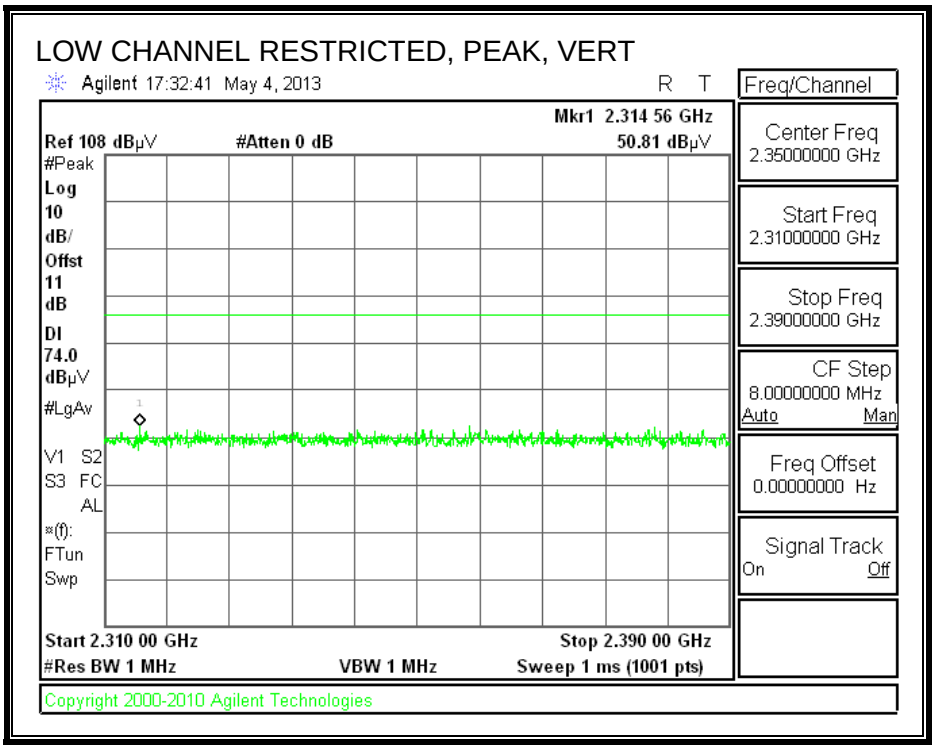
8.2.1. BASIC DATA RATE GFSK MODULATION

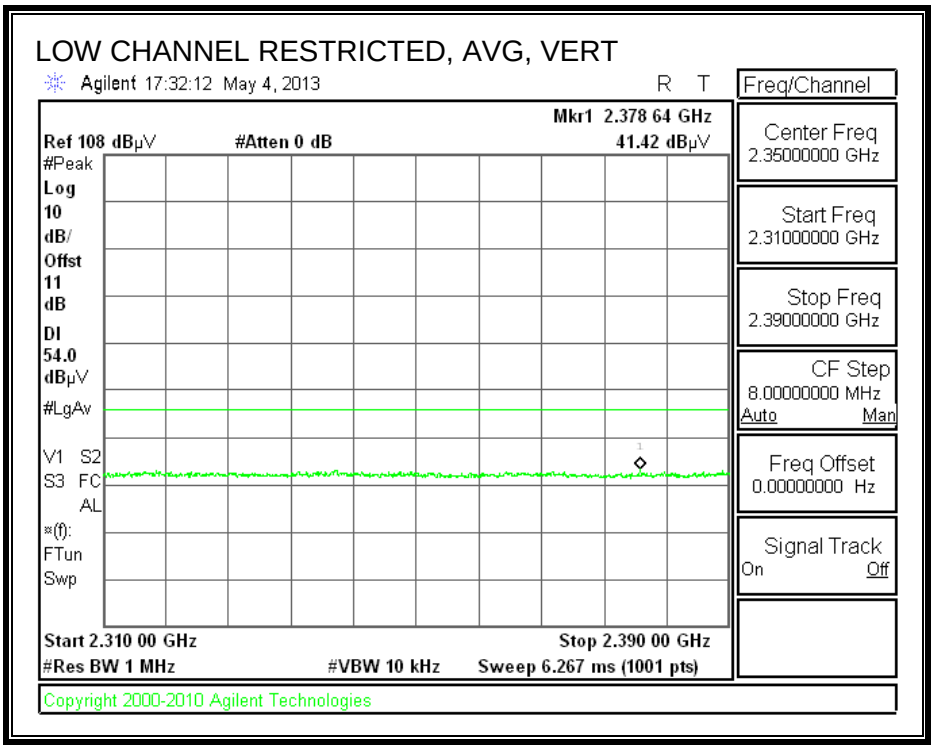
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



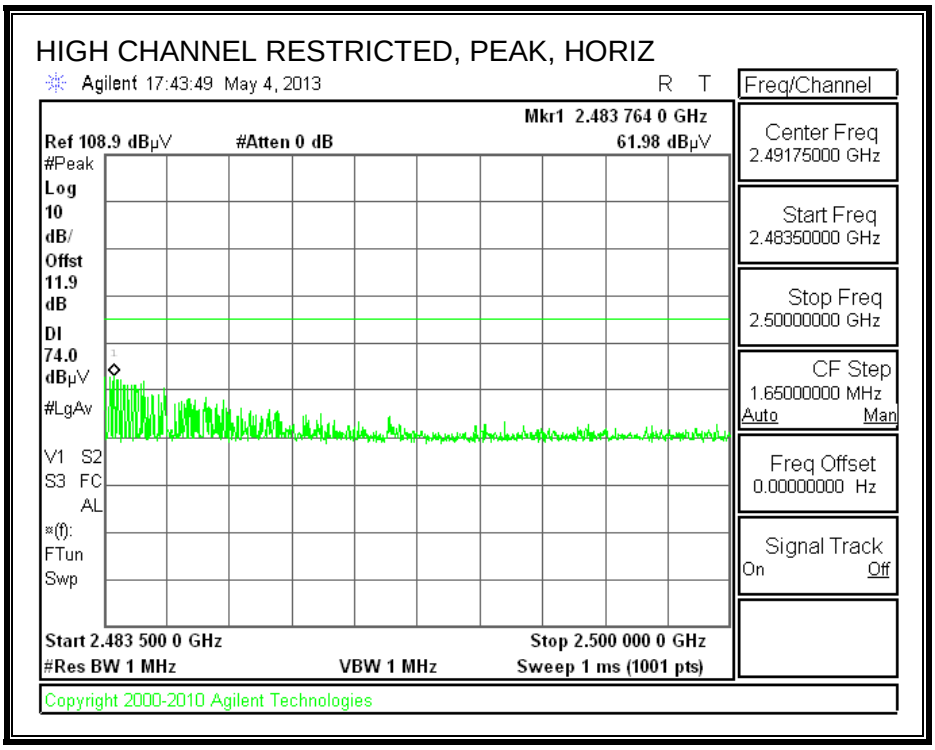


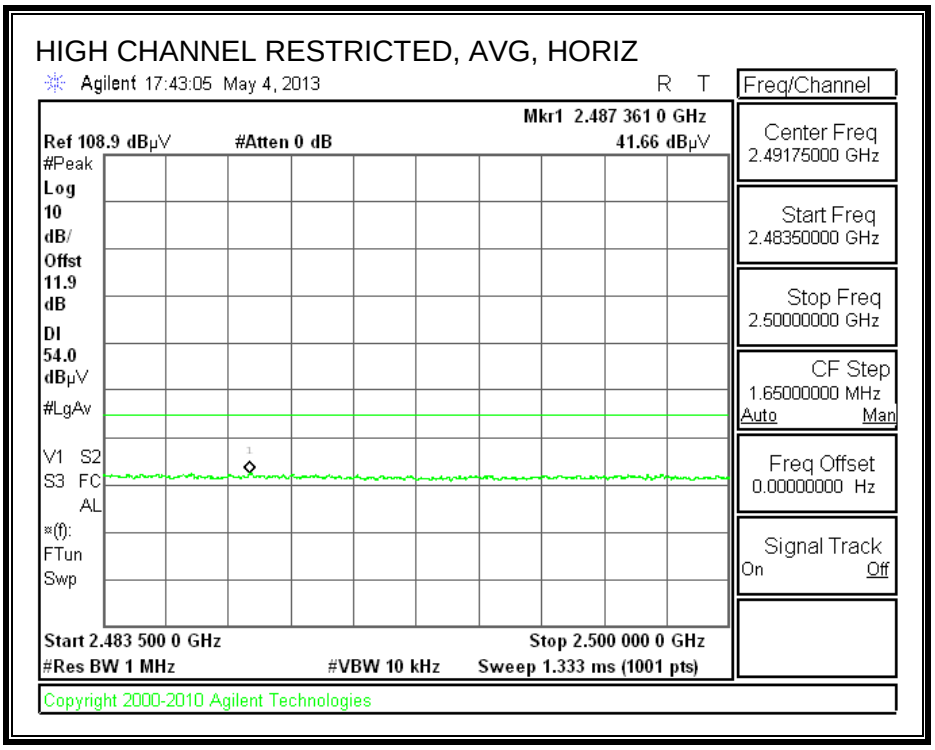
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



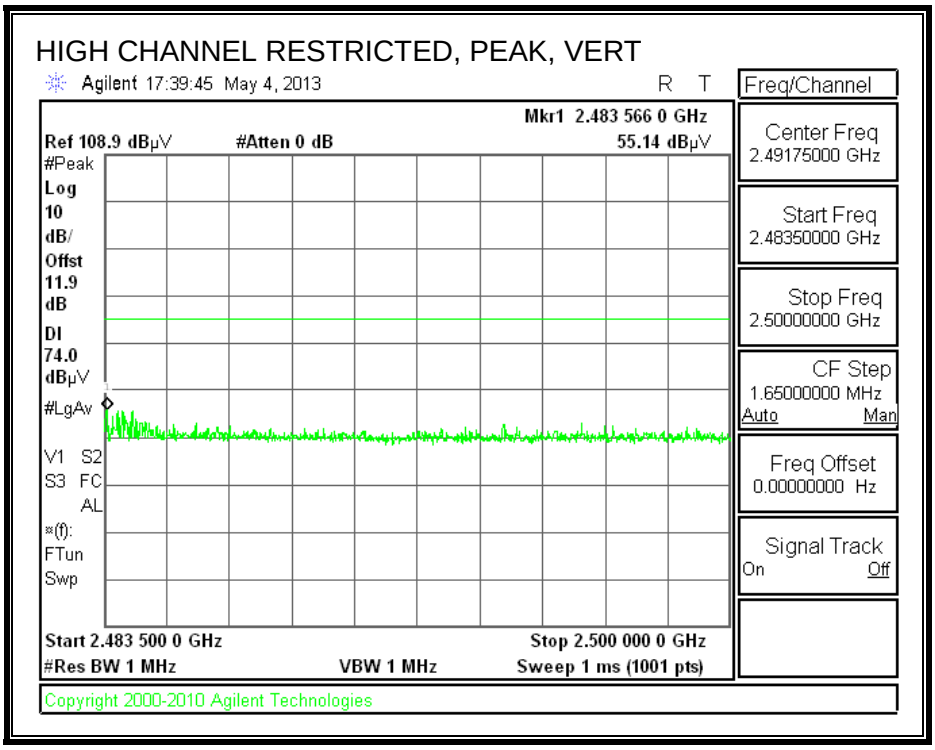


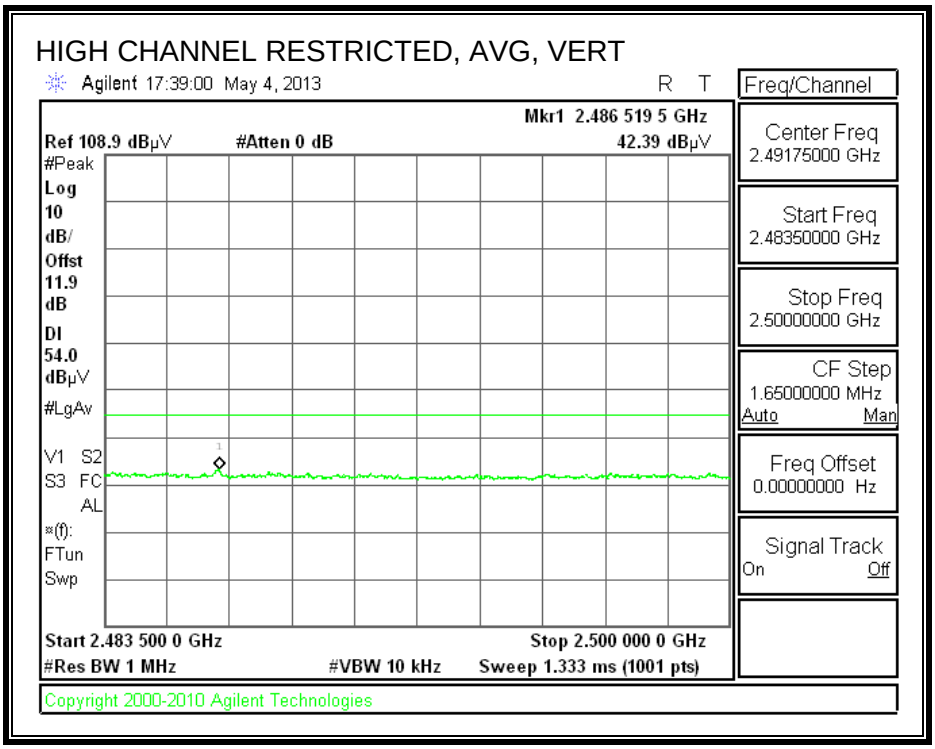
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





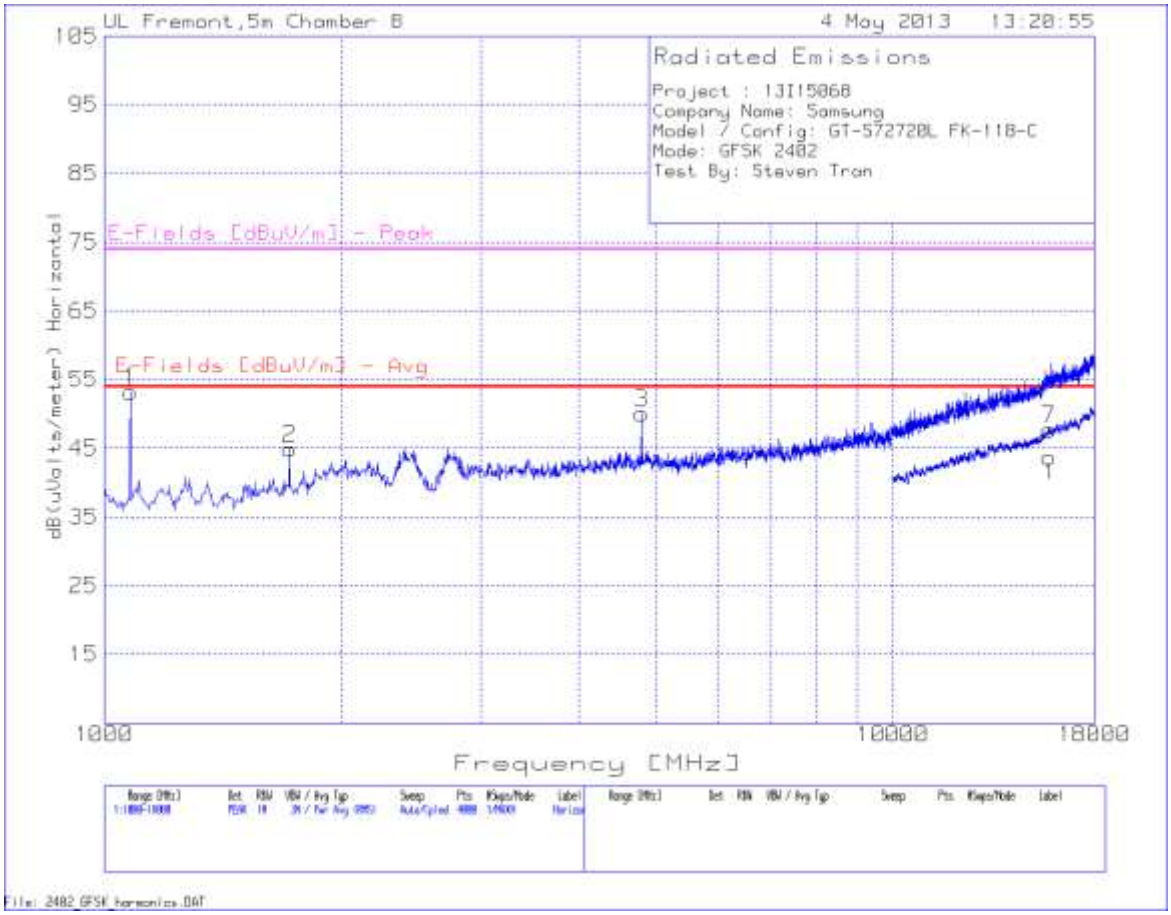
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



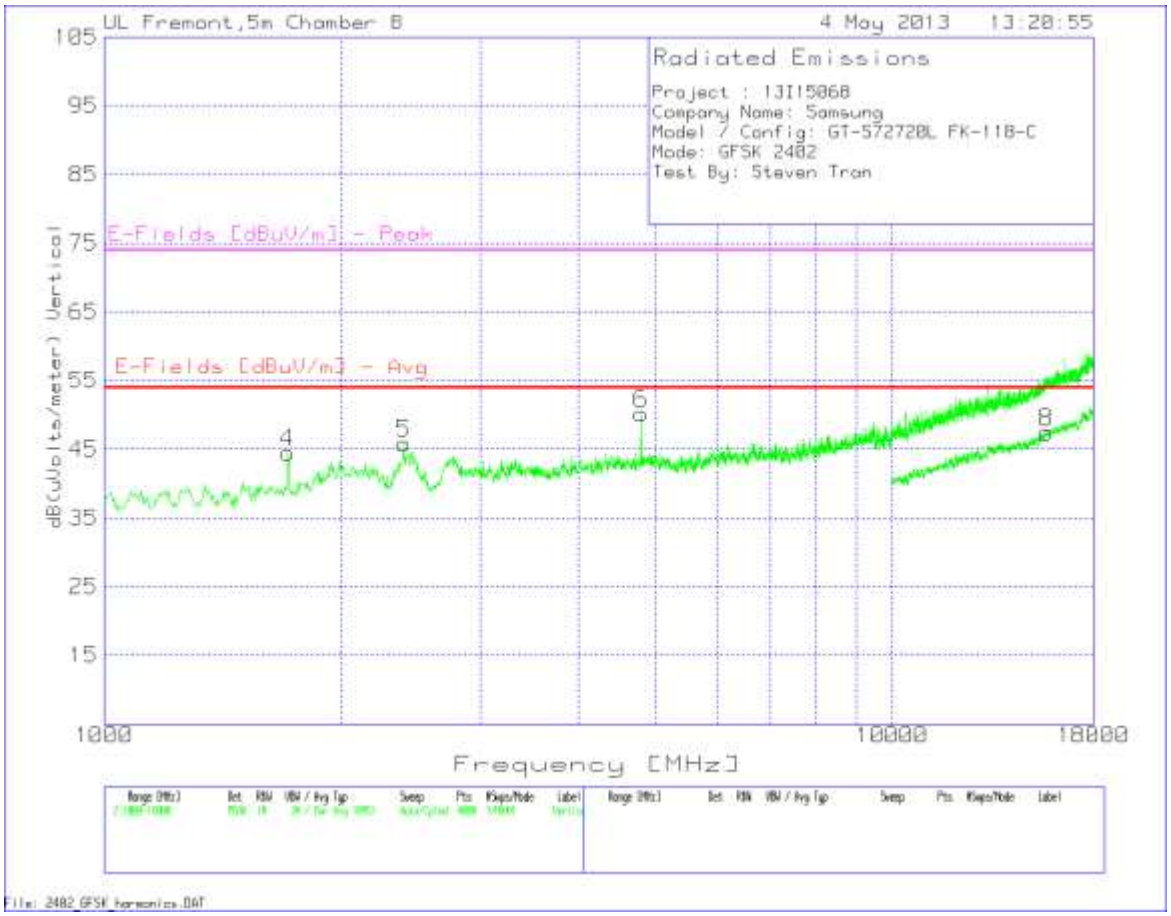


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



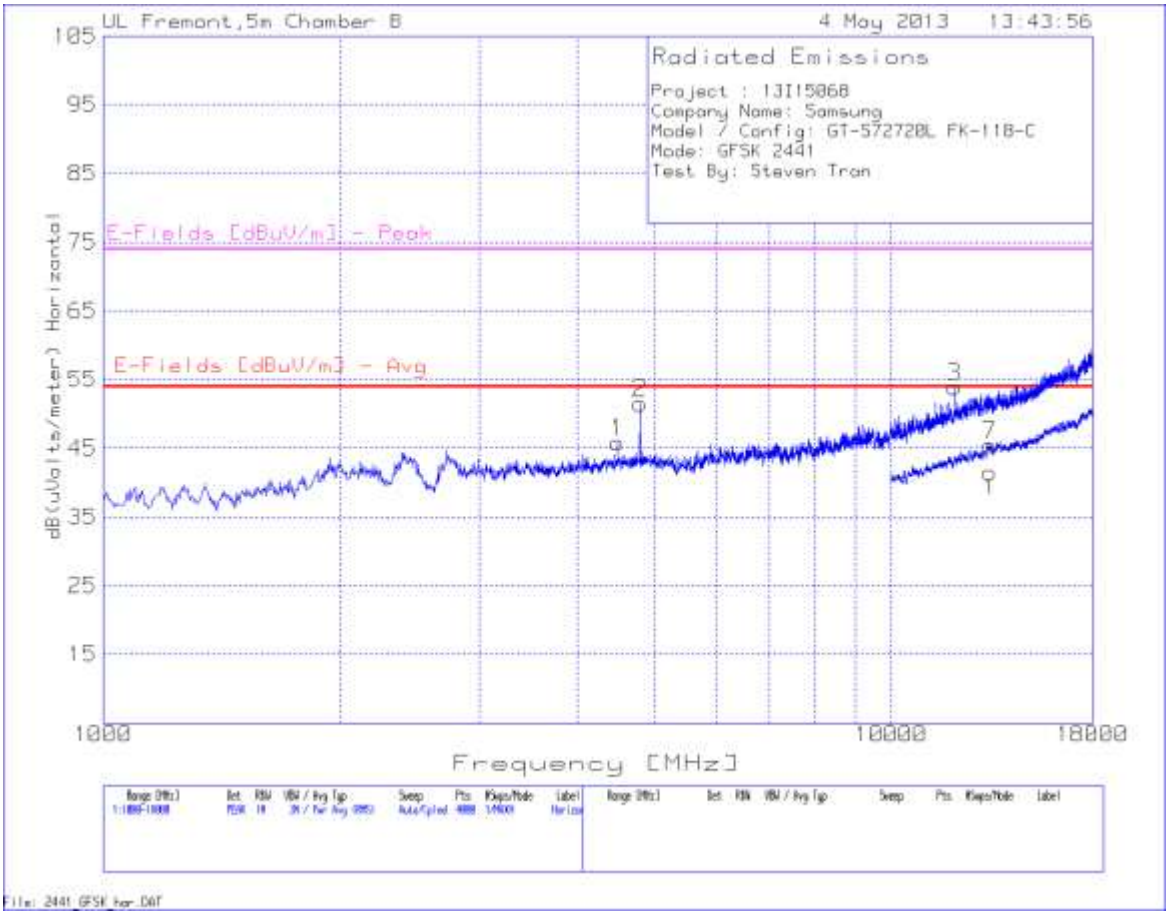
LOW CHANNEL HORIZONTAL AND VERTICAL DATA

Project : 13I15068
Company Name: Samsung
Model / Config: GT-S72720L FK-118-C
Mode: GFSK 2402
Test By: Steven Tran

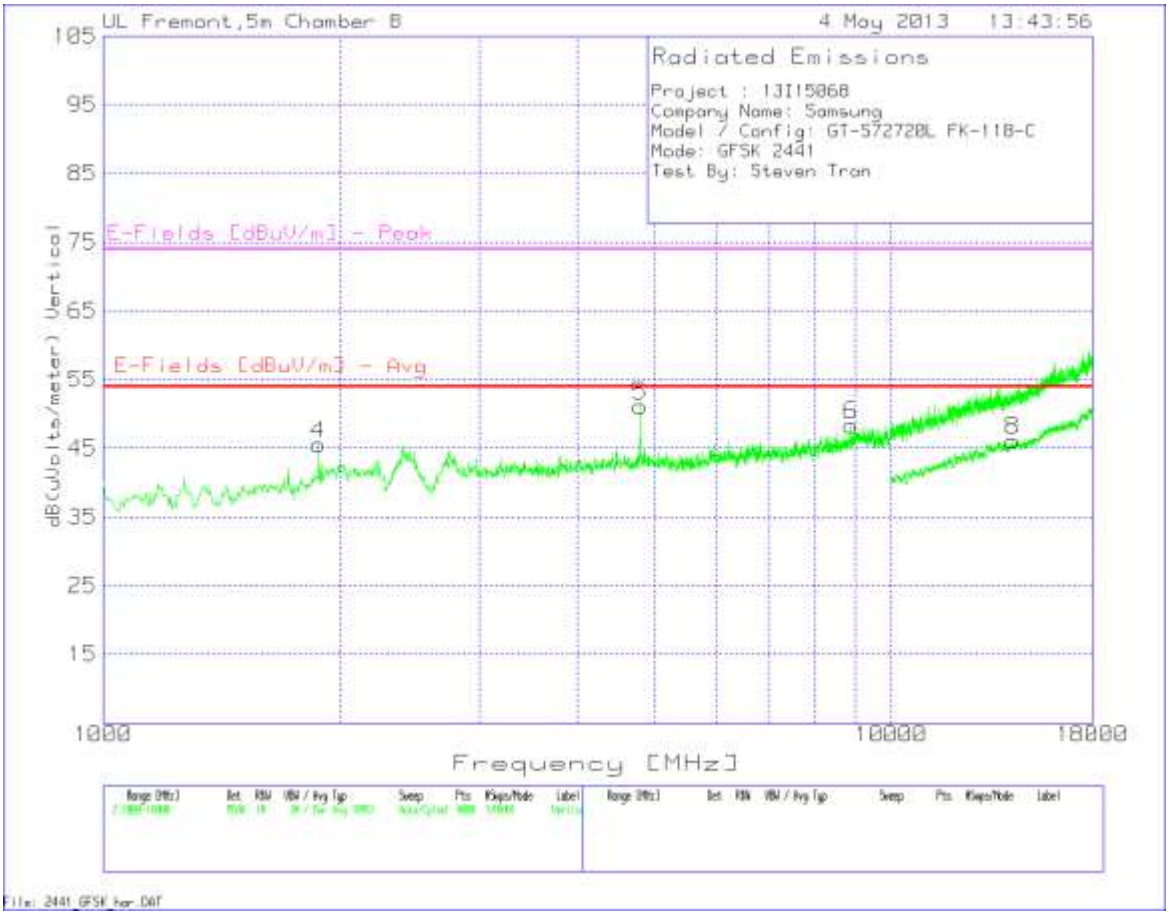
Marker No.	Test Frequency	Meter Reading	Detector	T345 Ant Factor [dB/m]	T145 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	1080.689	57.81	PK	27.8	-35.9	3.2	0.3	53.21	53.97	-0.76	74	-20.79	200	Horz
2	1717.712	45.49	PK	29.9	-35.1	3.9	0.7	44.89	53.97	-9.08	74	-29.11	200	Horz
3	4800.899	43.06	PK	34.7	-34.9	7	0.2	50.06	53.97	-3.91	74	-23.94	104	Horz
Vertical 1000 - 18000MHz														
4	1709.218	45.37	PK	29.8	-35.1	3.9	0.6	44.57	53.97	-9.4	74	-29.43	100	Vert
5	2401.449	42.99	PK	32.3	-35	4.6	0.9	45.79	53.97	-8.18	74	-28.21	100	Vert
6	4800.899	43.19	PK	34.7	-34.9	7	0.2	50.19	53.97	-3.78	74	-23.81	200	Vert
Horizontal 10000 - 18000MHz														
7	15789.105	25.41	PK	41.3	-32.9	13.6	0.3	47.71	53.97	-6.26	74	-26.29	100	Horz
Vertical 10000 - 18000MHz														
8	15705.147	25.17	PK	41.2	-32.9	13.6	0.4	47.47	53.97	-6.5	74	-26.53	200	Vert

PK - Peak detector
Av - Average detector

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



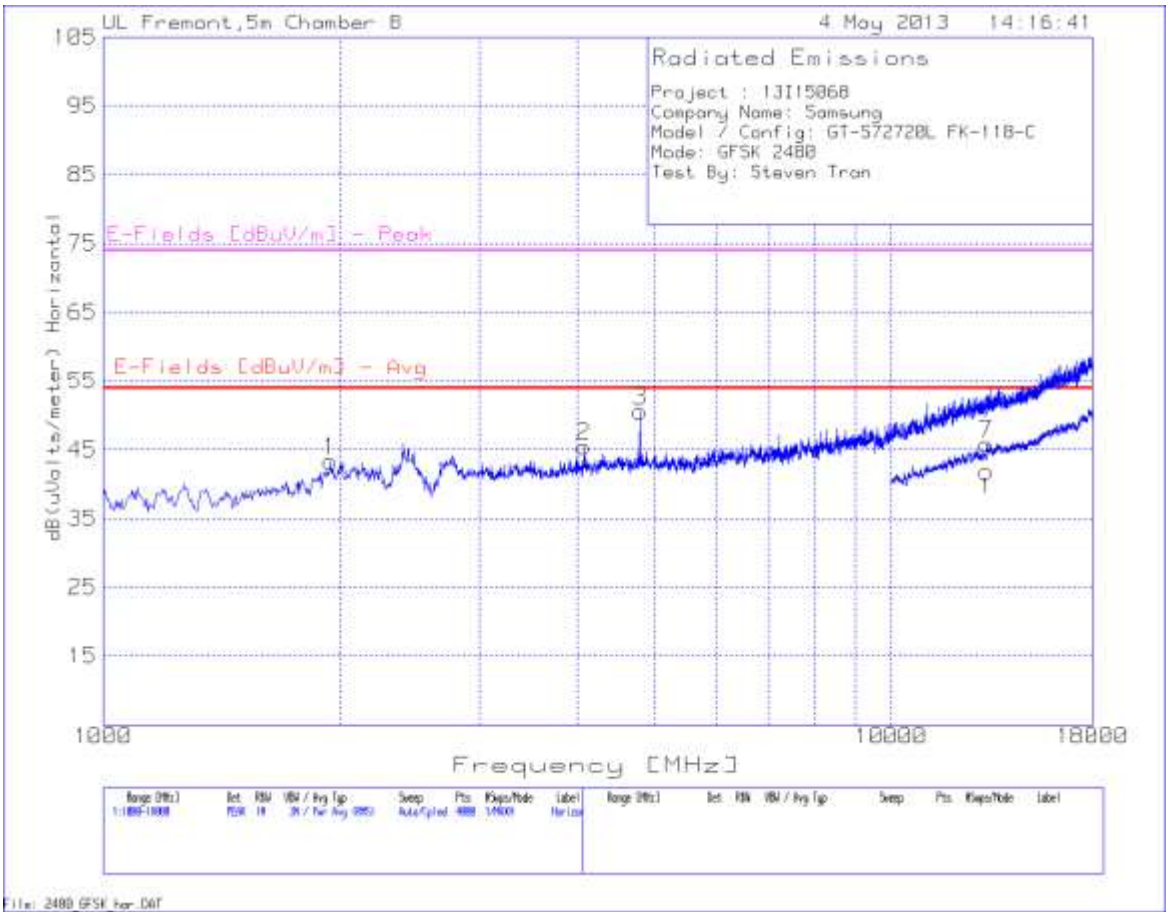
MID CHANNEL HORIZONTAL AND VERTICAL DATA

Project : 13I15068
Company Name: Samsung
Model / Config: GT-S72720L FK-118-C
Mode: GFSK 2441
Test By: Steven Tran

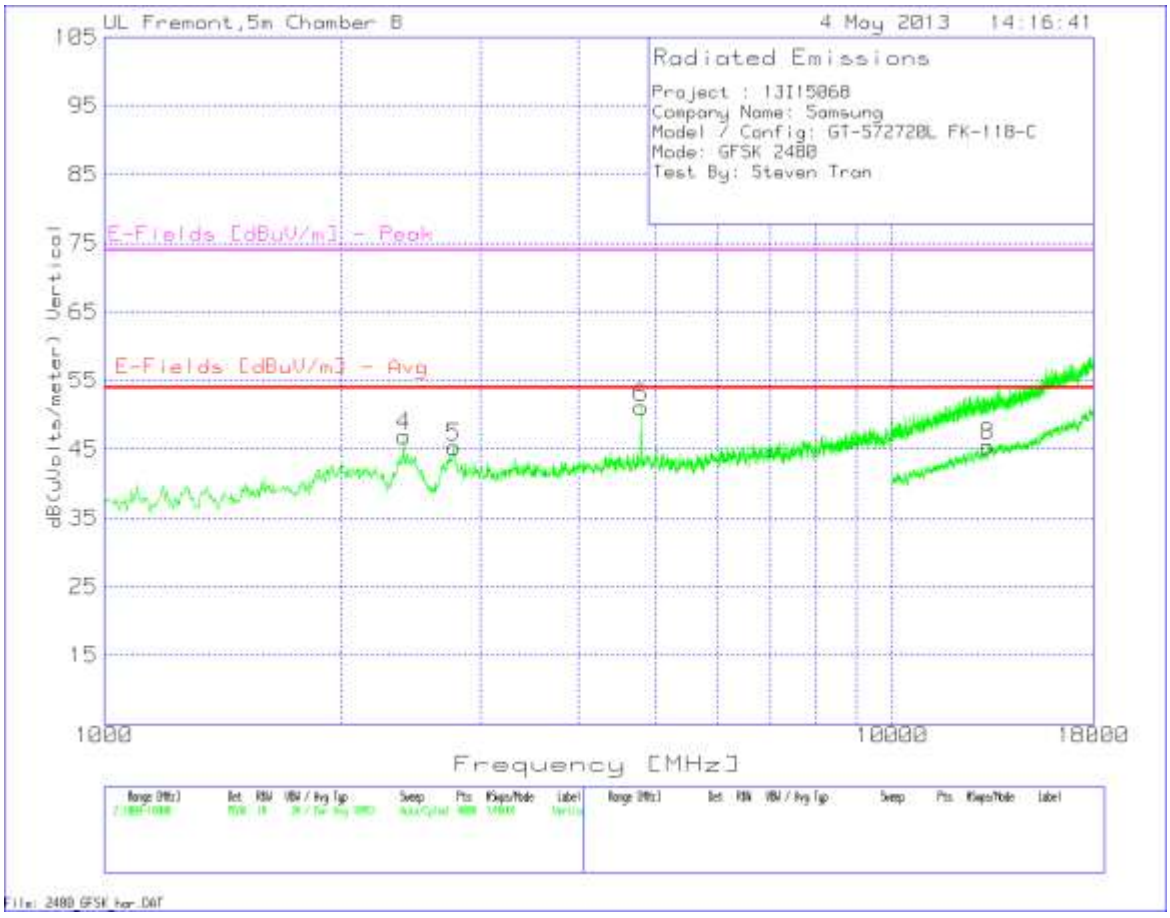
Marker No.	Test Frequency	Meter Reading	Detector	T345 Ant Factor [dB/m]	T145 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolts/ meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	4495.129	39.22	PK	34.5	-34.9	6.7	0.3	45.82	53.97	-8.15	74	-28.18	100	Horz
2	4800.899	44.59	PK	34.7	-34.9	7	0.2	51.59	53.97	-2.38	74	-22.41	100	Horz
3	12024.731	35.76	PK	39.2	-33.3	11.6	0.7	53.96	53.97	-0.01	74	-20.04	100	Horz
Vertical 1000 - 18000MHz														
4	1879.091	44.62	PK	31	-35	4.1	0.8	45.52	53.97	-8.45	74	-28.48	200	Vert
5	4800.899	44.17	PK	34.7	-34.9	7	0.2	51.17	53.97	-2.8	74	-22.83	200	Vert
6	8899.076	36.8	PK	36.6	-35.3	9.8	0.4	48.3	53.97	-5.67	74	-25.7	100	Vert
Horizontal 10000 - 18000MHz														
7	13346.327	25.56	PK	39.1	-31.9	12.3	0.4	45.46	53.97	-8.51	74	-28.54	200	Horz
Vertical 10000 - 18000MHz														
8	14273.863	25.79	PK	39.5	-32.4	12.8	0.4	46.09	53.97	-7.88	74	-27.91	200	Vert
Average														
Test Frequency	**Meter Reading**	**Detector**	**T345 Ant Factor [dB/m]**	**T145 Preamp Gain [dB]**	**Cable Factor [dB]**	**T160 BRF [dB]**	**dB(uVolts/meter)**	**E-Fields [dBuV/m] - Avg**	**Margin (dB)**	**E-Fields [dBuV/m] - Peak**	**Margin (dB)**	**Azimuth [Degs]**	**Height [cm]**	**Polarity**
Horizontal 1000 - 18000MHz														
4803.259	27.43	MAv1	34.7	-34.9	7	0.2	34.43	53.97	-19.54	74	-39.57	40	240	Horz

PK - Peak detector
Av - Average detector

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



HIGH CHANNEL HORIZONTAL AND VERTICAL DATA

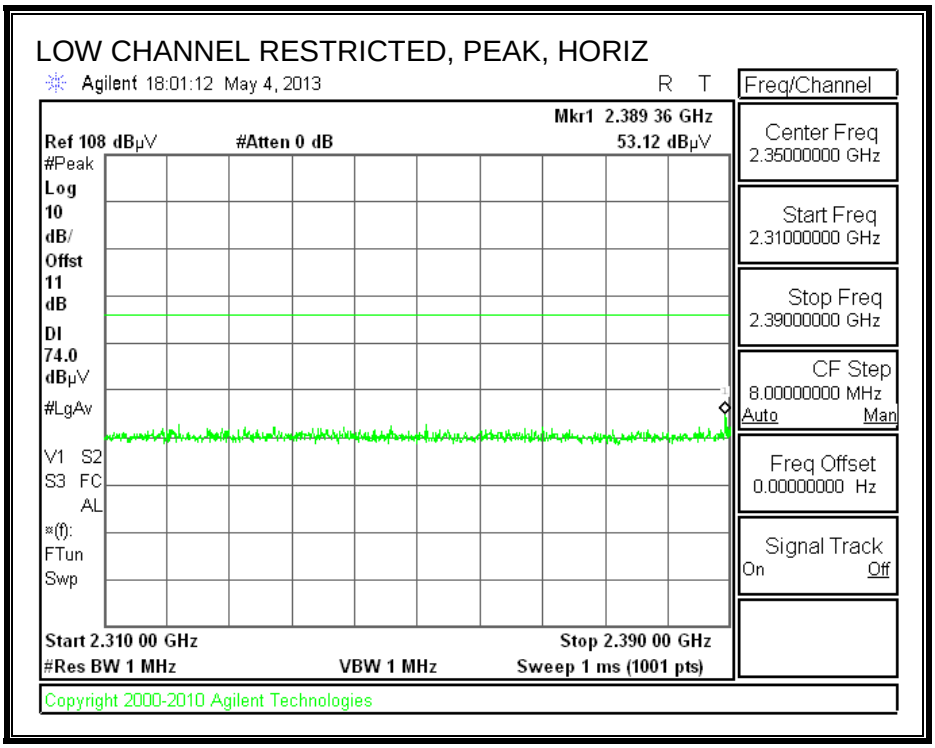
Project : 13I15068
Company Name: Samsung
Model / Config: GT-S72720L FK-118-C
Mode: GFSK 2480
Test By: Steven Tran

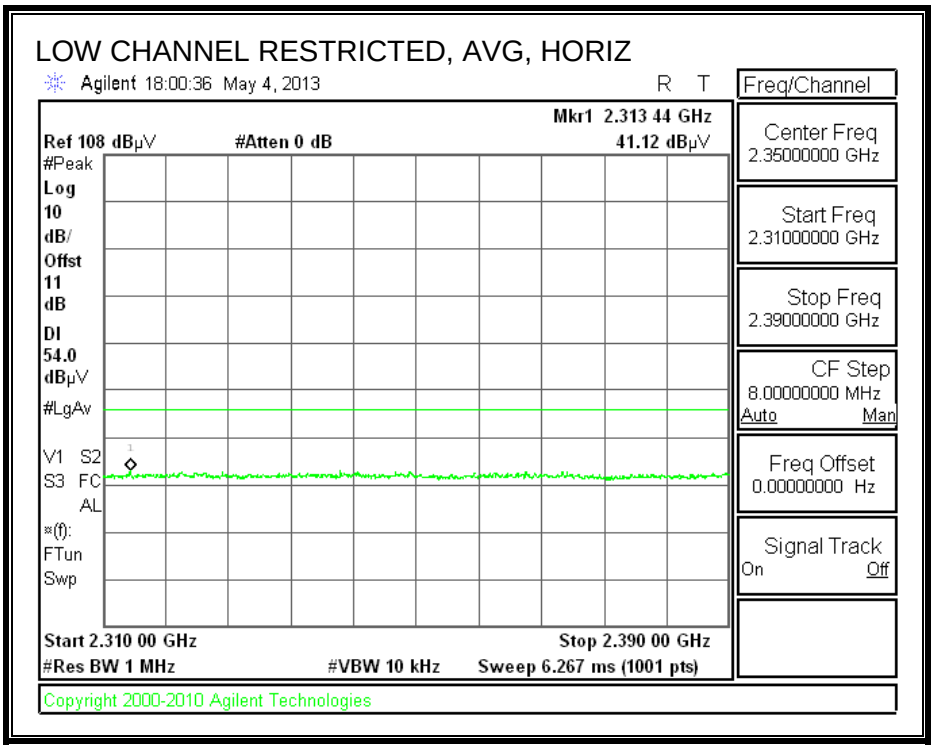
Marker No.	Test Frequency	Meter Reading	Detector	T345 Ant Factor [dB/m]	T145 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	1942.793	41.95	PK	31.4	-35	4.1	0.9	43.35	53.97	-10.62	74	-30.65	100	Horz
2	4078.941	39.7	PK	34	-34.8	6.3	0.3	45.5	53.97	-8.47	74	-28.5	100	Horz
3	4800.899	43.59	PK	34.7	-34.9	7	0.2	50.59	53.97	-3.38	74	-23.41	100	Horz
Vertical 1000 - 18000MHz														
4	2401.449	44.07	PK	32.3	-35	4.6	0.9	46.87	53.97	-7.1	74	-27.13	100	Vert
5	2783.662	41.77	PK	32.8	-35.1	5	0.9	45.37	53.97	-8.6	74	-28.63	200	Vert
6	4800.899	44.1	PK	34.7	-34.9	7	0.2	51.1	53.97	-2.87	74	-22.9	200	Vert
Horizontal 10000 - 18000MHz														
7	13210.395	25.95	PK	39.1	-31.8	12.2	0.4	45.85	53.97	-8.12	74	-28.15	100	Horz
Vertical 10000 - 18000MHz														
8	13222.389	25.58	PK	39.1	-31.8	12.2	0.4	45.48	53.97	-8.49	74	-28.52	100	Vert

PK - Peak detector
Av - Average detector

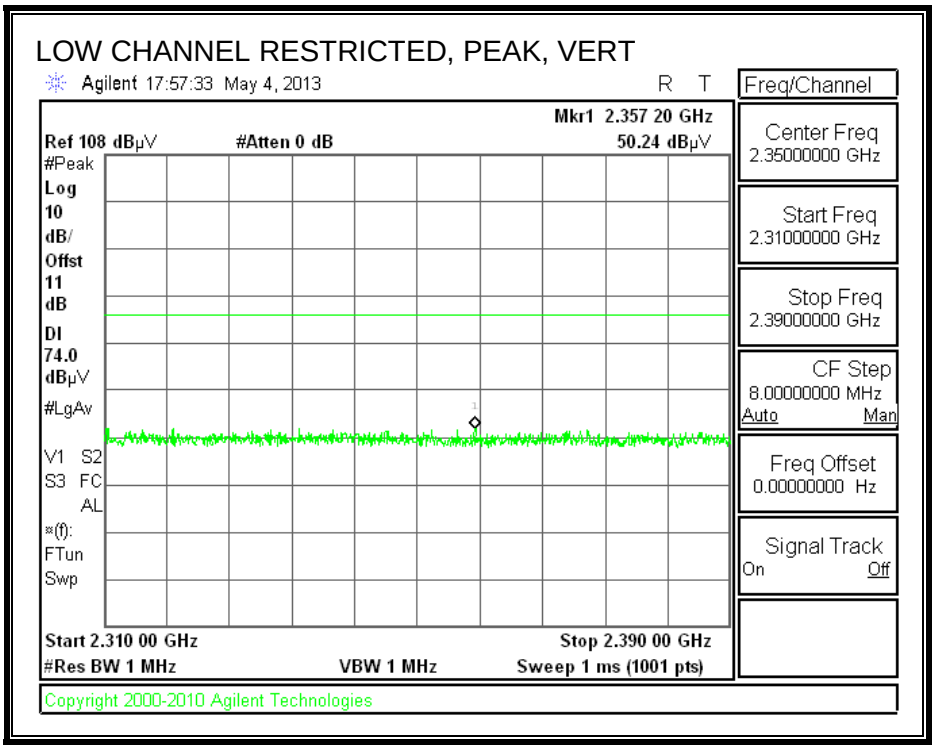
8.2.2. ENHANCED DATA RATE 8PSK MODULATION

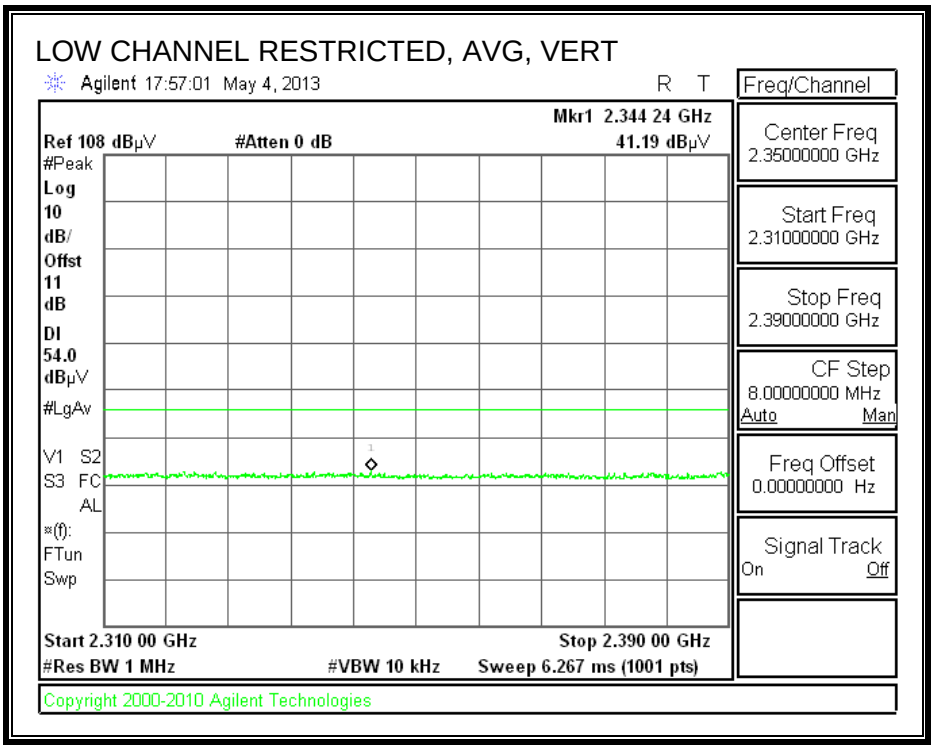
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



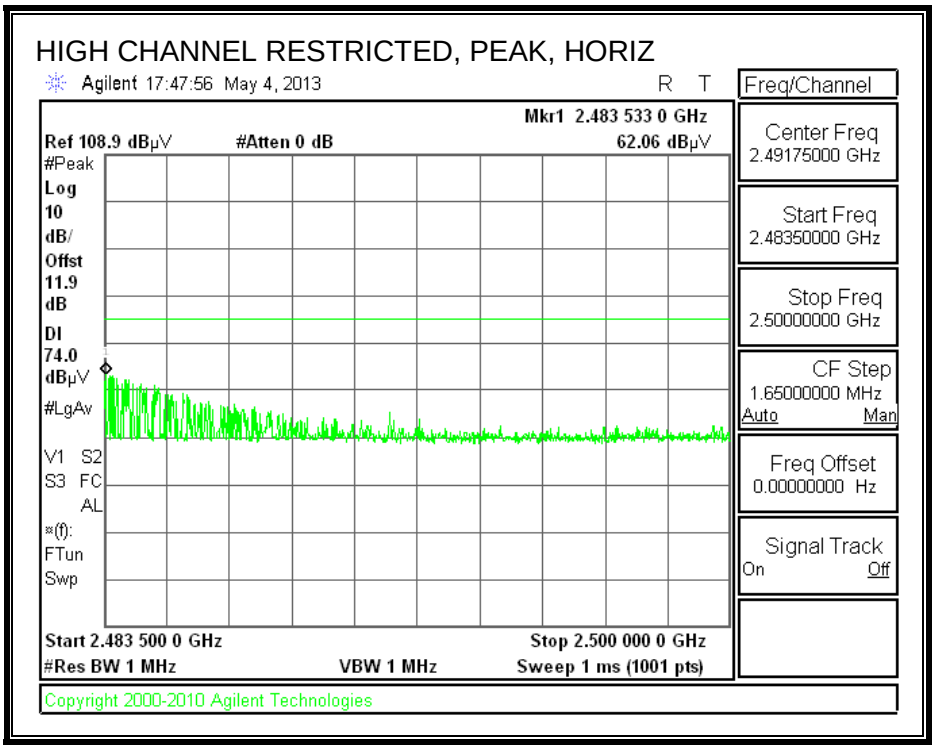


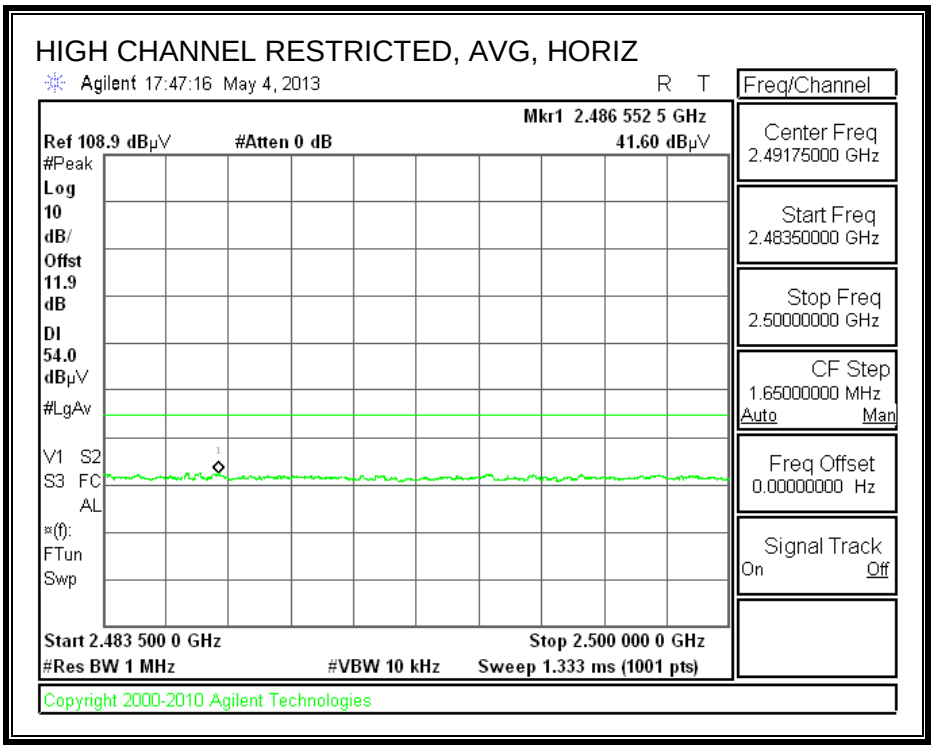
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



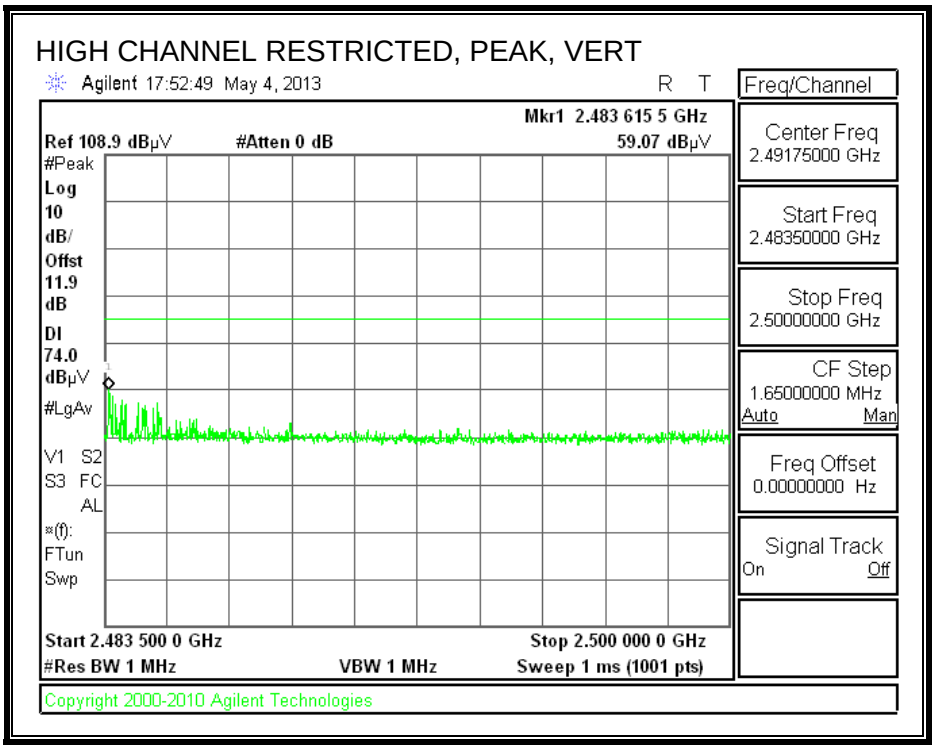


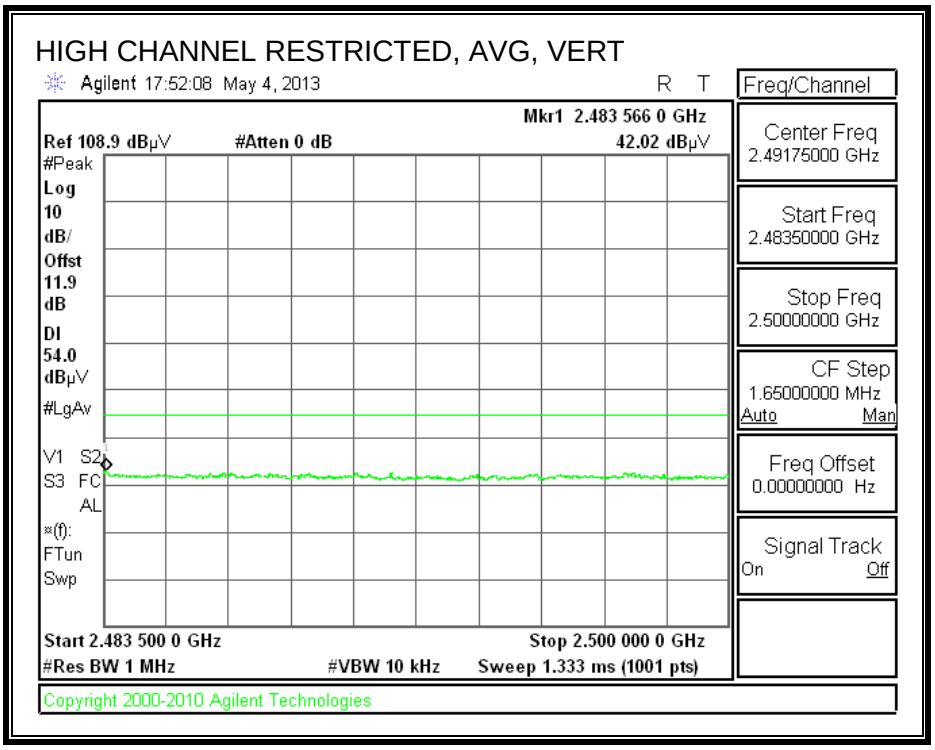
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





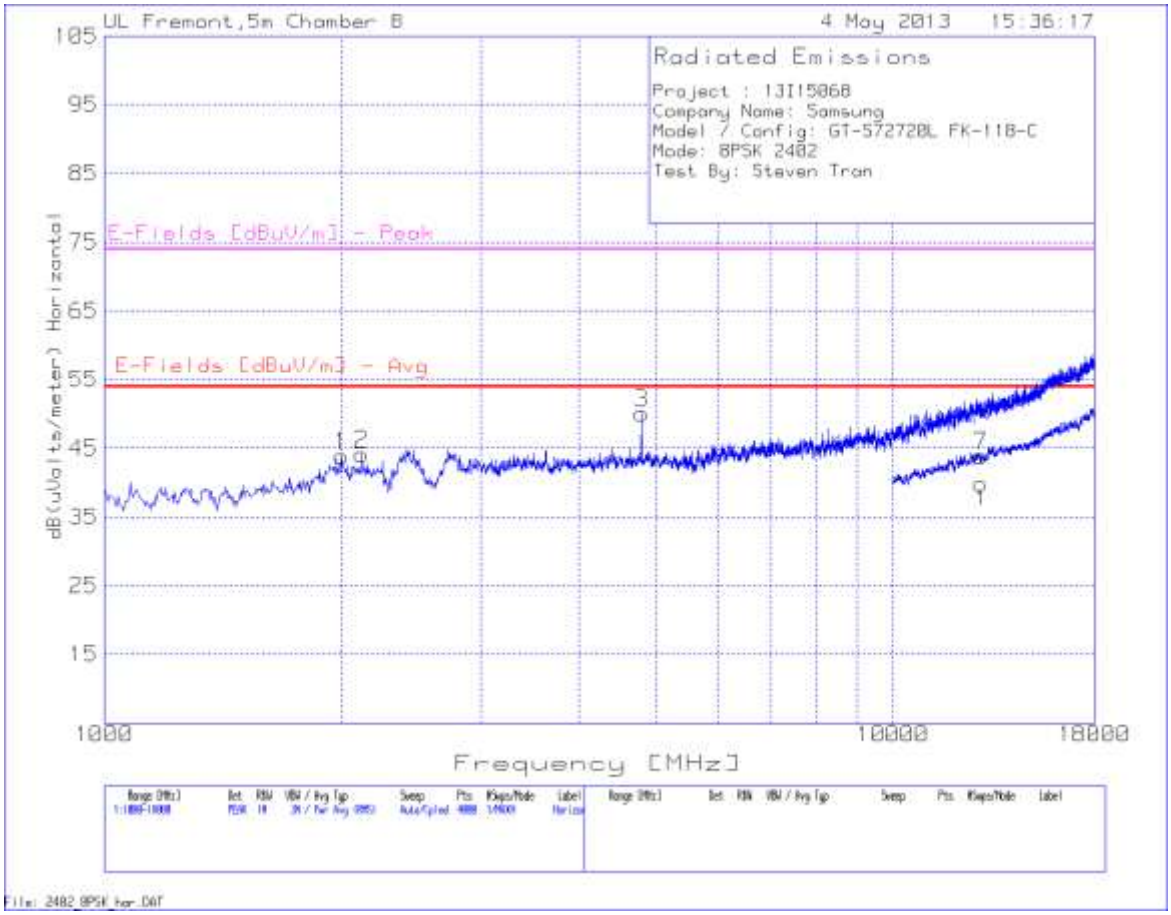
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





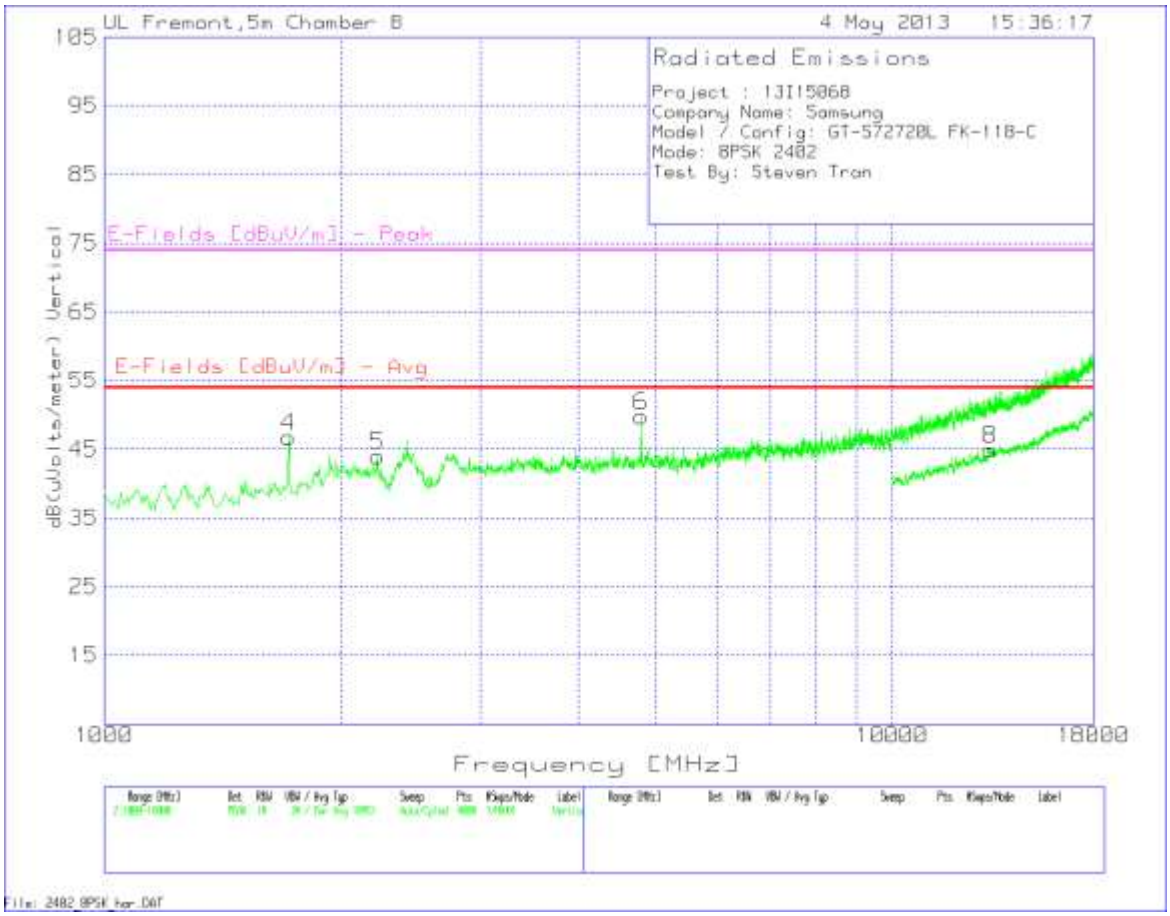
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



VERTICAL

LOW CHANNEL VERTICAL PLOT



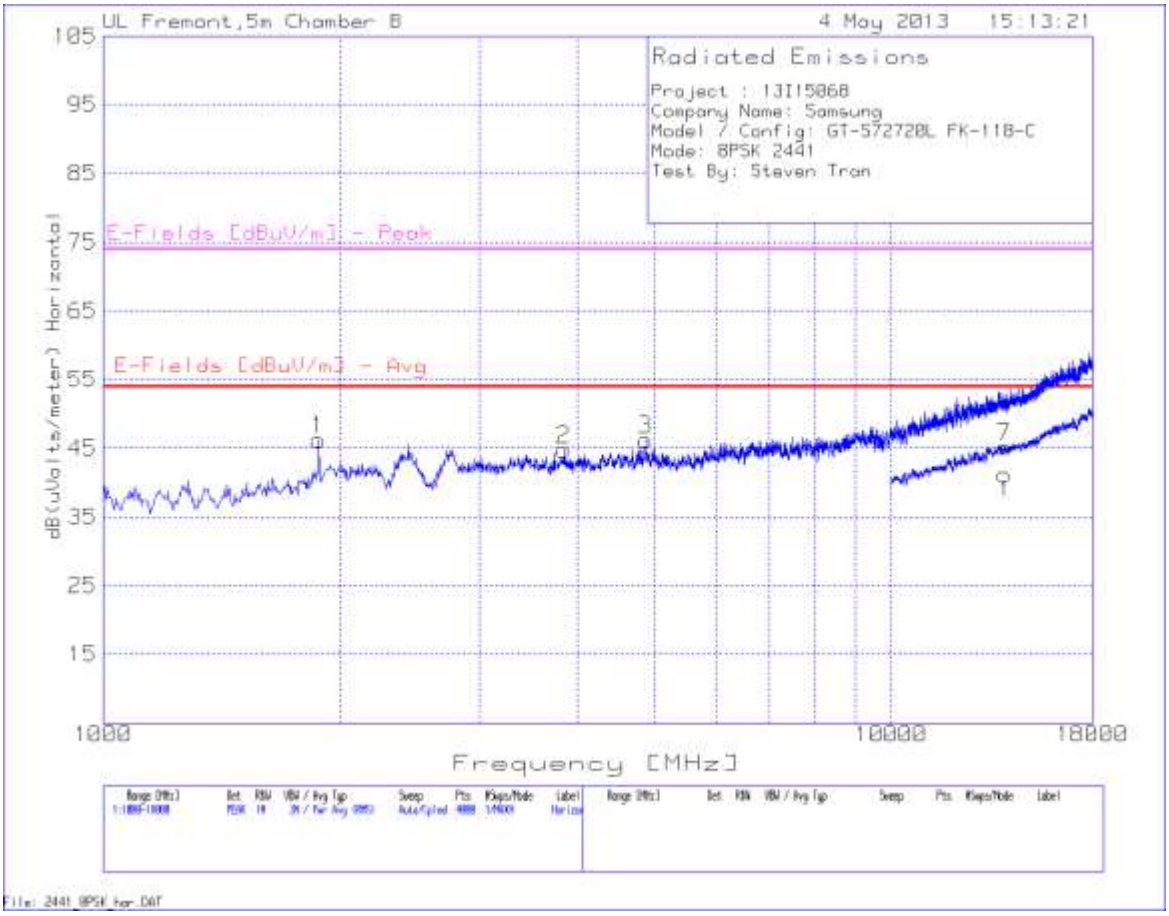
LOW CHANNEL HORIZONTAL AND VERTICAL DATA

Project : 13I15068
Company Name: Samsung
Model / Config: GT-S72720L FK-118-C
Mode: 8PSK 2402
Test By: Steven Tran

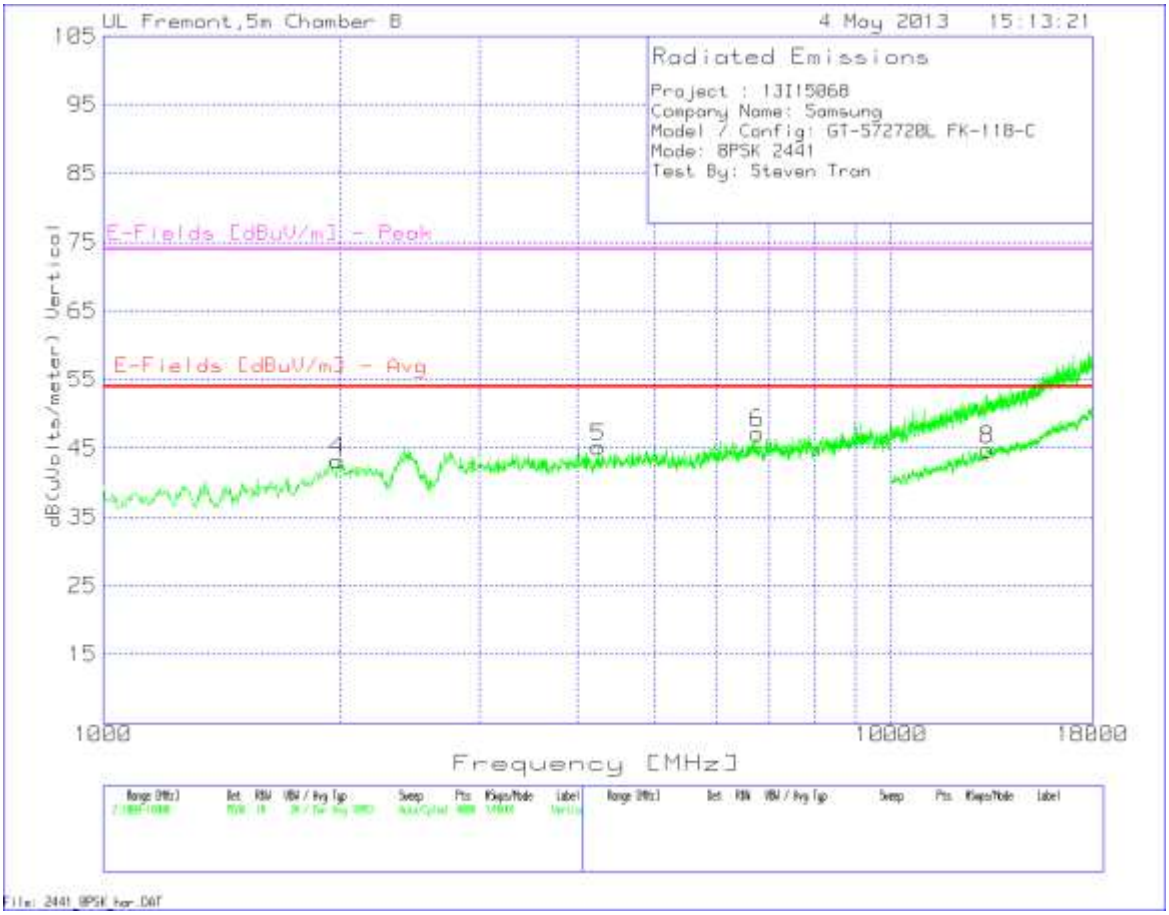
Marker No.	Test Frequency	Meter Reading	Detector	T345 Ant Factor [dB/m]	T145 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	2002.248	41.99	PK	31.8	-35	4.2	0.9	43.89	53.97	-10.08	74	-30.11	100	Horz
2	2121.159	41.98	PK	31.9	-35	4.3	0.9	44.08	53.97	-9.89	74	-29.92	200	Horz
3	4800.899	43.06	PK	34.7	-34.9	7	0.2	50.06	53.97	-3.91	74	-23.94	100	Horz
Vertical 1000 - 18000MHz														
4	1713.465	47.49	PK	29.8	-35.1	3.9	0.7	46.79	53.97	-7.18	74	-27.21	100	Vert
5	2223.083	41.57	PK	32.1	-35	4.4	0.9	43.97	53.97	-10	74	-30.03	100	Vert
6	6737.447	36.77	PK	35.8	-35	8.5	0.3	46.37	53.97	-7.6	74	-27.63	100	Vert
Horizontal 10000 - 18000MHz														
7	13270.365	24.96	PK	39.1	-31.9	12.2	0.4	44.76	53.97	-9.21	74	-29.24	200	Horz
Vertical 10000 - 18000MHz														
8	13326.337	25.12	PK	39.1	-31.9	12.3	0.3	44.92	53.97	-9.05	74	-29.08	100	Vert

PK - Peak detector
Av - Average detector

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



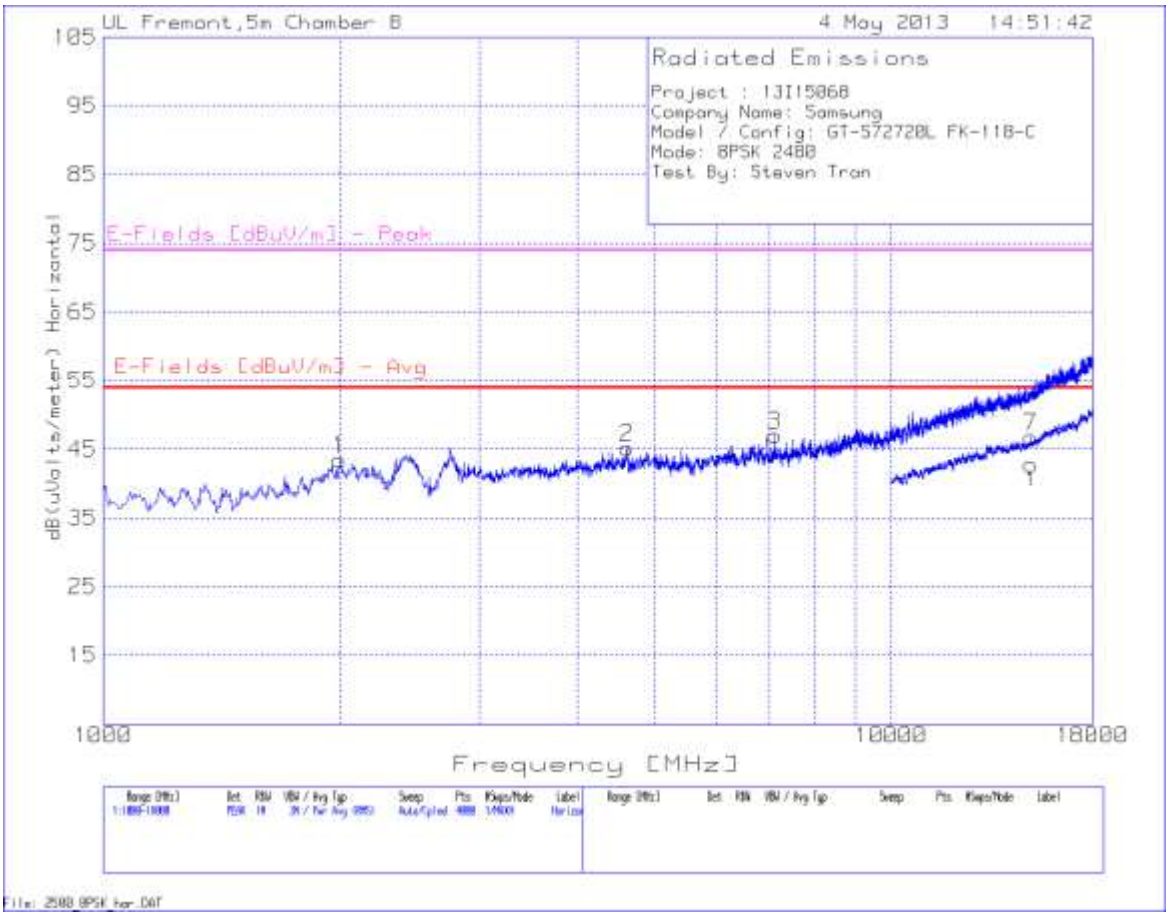
MID CHANNEL HORIZONTAL AND VERTICAL DATA

Project : 13I15068
Company Name: Samsung
Model / Config: GT-S72720L FK-118-C
Mode: 8PSK 2441
Test By: Steven Tran

Marker No.	Test Frequency	Meter Reading	Detector	T345 Ant Factor [dB/m]	T145 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	1879.091	45.38	PK	31	-35	4.1	0.8	46.28	53.97	-7.69	74	-27.72	100	Horz
2	3845.366	39.46	PK	33.8	-34.9	6.1	0.3	44.76	53.97	-9.21	74	-29.24	100	Horz
3	4881.589	39.2	PK	34.6	-34.9	7.1	0.2	46.2	53.97	-7.77	74	-27.8	100	Horz
Vertical 1000 - 18000MHz														
4	1985.261	41.36	PK	31.7	-35	4.2	0.9	43.16	53.97	-10.81	74	-30.84	100	Vert
5	4248.813	39.12	PK	34.1	-34.8	6.5	0.2	45.12	53.97	-8.85	74	-28.88	200	Vert
6	6767.175	37.52	PK	35.8	-35	8.5	0.3	47.12	53.97	-6.85	74	-26.88	100	Vert
Horizontal 10000 - 18000MHz														
7	13934.033	25.14	PK	39.2	-32.1	12.6	0.3	45.14	53.97	-8.83	74	-28.86	100	Horz
Vertical 10000 - 18000MHz														
8	13254.373	24.97	PK	39.1	-31.9	12.2	0.4	44.77	53.97	-9.2	74	-29.23	100	Vert

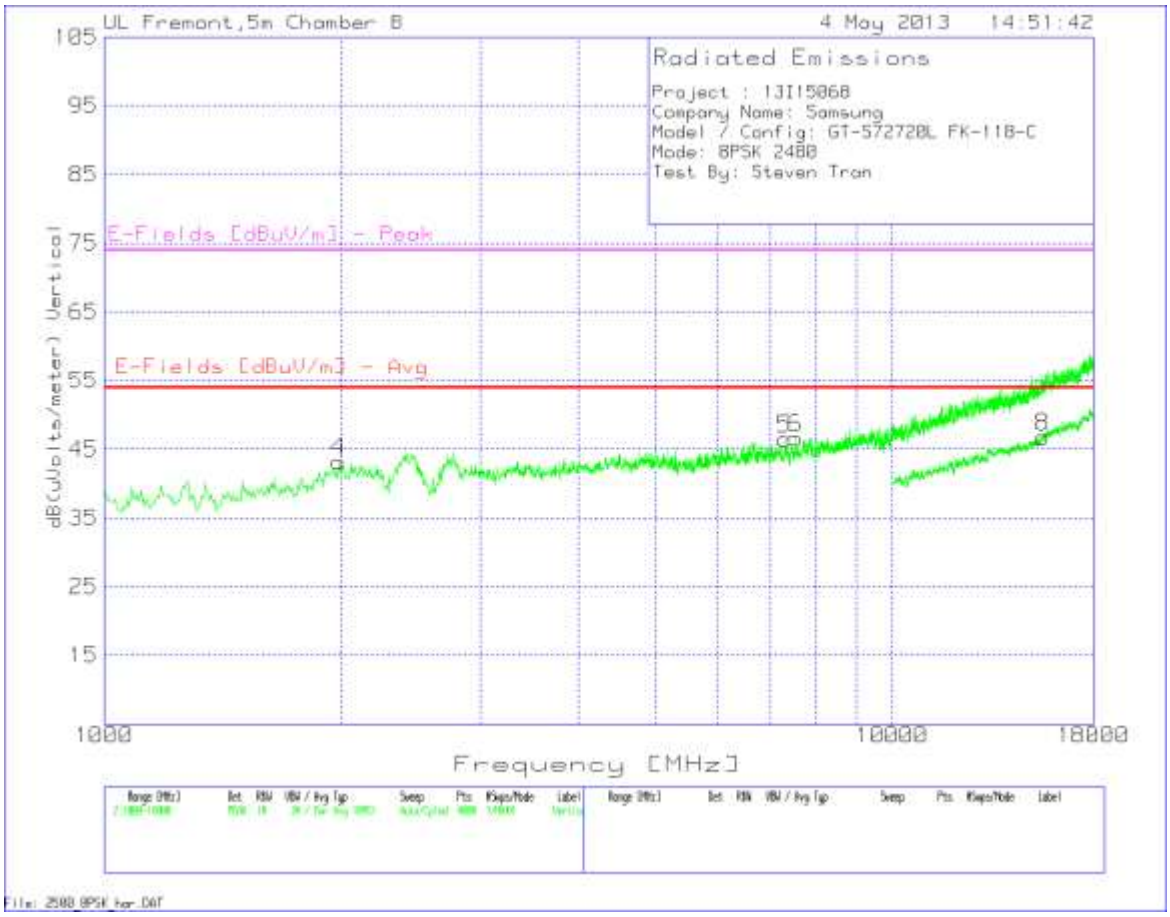
PK - Peak detector
Av - Average detector

HIGH CHANNEL HORIZONTAL PLOT



VERTICAL

HIGH CHANNEL VERTICAL PLOT



HIGH CHANNEL HORIZONTAL AND VERTICAL DATA

Project : 13I15068
Company Name: Samsung
Model / Config: GT-S72720L FK-118-C
Mode: 8PSK 2480
Test By: Steven Tran

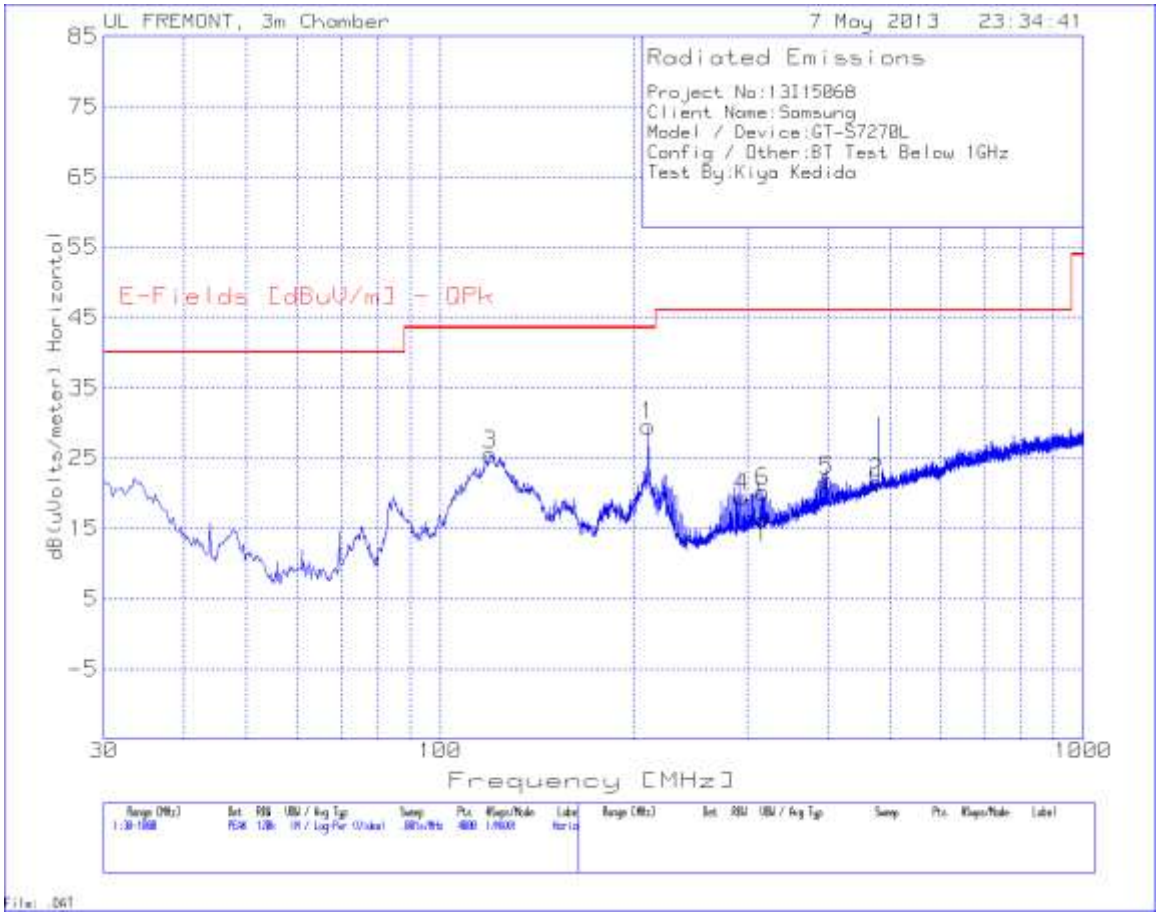
Marker No.	Test Frequency	Meter Reading	Detector	T345 Ant Factor [dB/m]	T145 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	1993.755	41.51	PK	31.8	-35	4.2	0.9	43.41	53.97	-10.56	74	-30.59	200	Horz
2	4622.533	38.42	PK	34.6	-34.9	6.8	0.3	45.22	53.97	-8.75	74	-28.78	200	Horz
3	7115.413	37.19	PK	35.9	-35	8.7	0.3	47.09	53.97	-6.88	74	-26.91	200	Horz
Vertical 1000 - 18000MHz														
4	1985.261	41.45	PK	31.7	-35	4.2	0.9	43.25	53.97	-10.72	74	-30.75	100	Vert
5	7298.026	36.58	PK	35.8	-35	8.9	0.2	46.48	53.97	-7.49	74	-27.52	200	Vert
6	7544.342	36.39	PK	36	-35	9	0.3	46.69	53.97	-7.28	74	-27.31	200	Vert
Horizontal 10000 - 18000MHz														
7	15053.473	25.93	PK	40.1	-32.9	13.2	0.4	46.73	53.97	-7.24	74	-27.27	100	Horz
Vertical 10000 - 18000MHz														
8	15541.229	24.76	PK	41	-32.9	13.5	0.4	46.76	53.97	-7.21	74	-27.24	100	Vert

PK - Peak detector
Av - Average detector

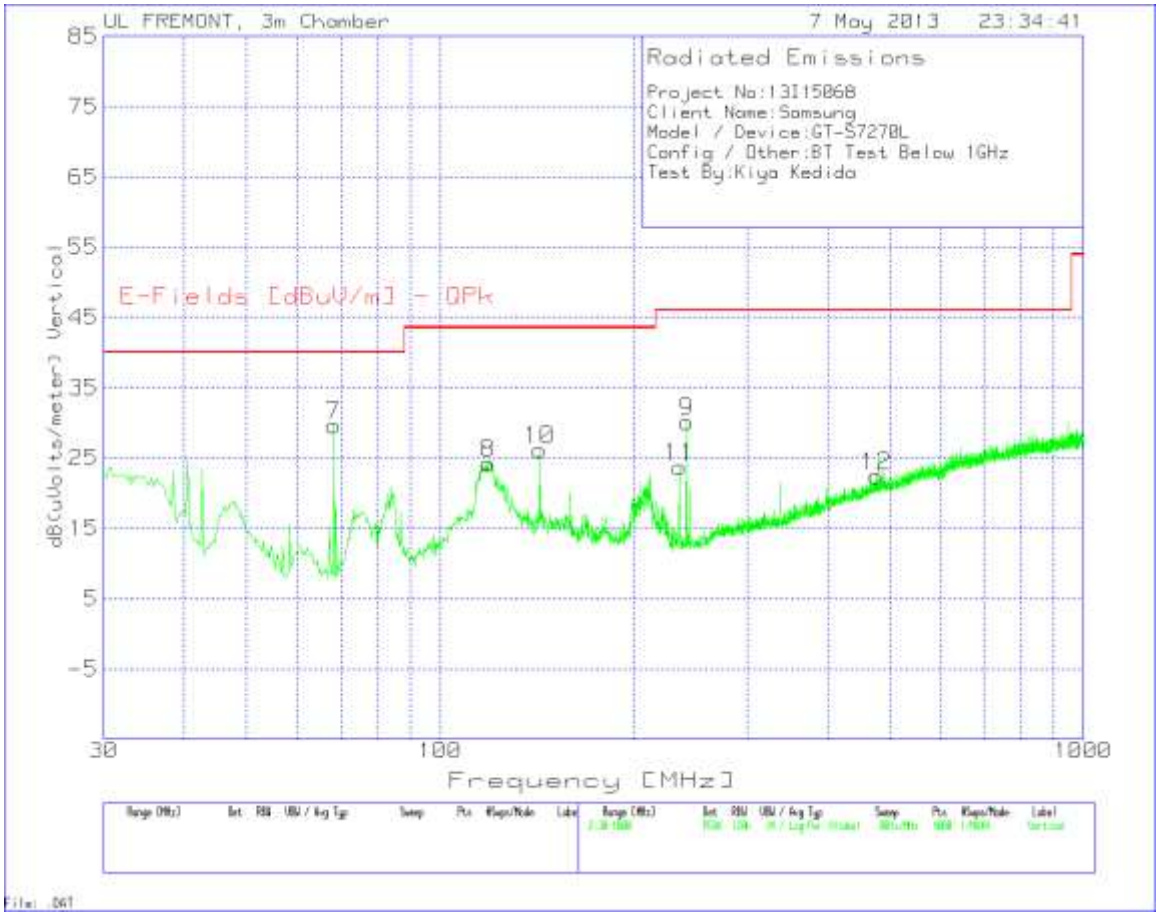
8.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1GHz HOTIZONTAL AND VERTICAL DATA

Project No:13I15068
Client Name:Samsung
Model / Device:GT-S7270L
Config / Other:BT Test Below 1GHz
Test By:Kiya Kedida

Marker No.	Test Frequency	Meter Reading	Detector	T130 Ant Factor [dB/m]	T64 preamp/ cable loss [dB]	dB(uVolts/meter)	E-Fields [dBuV/m] - QPk	Margin (dB)	Height [cm]	Polarity
Horizontal 30 - 1000MHz										
1	210.7694	45.47	PK	10.4	-26.3	29.57	43.52	-13.95	201	Horz
2	477.3195	28.63	PK	17.7	-24.8	21.53	46.02	-24.49	201	Horz
3	119.4154	38.71	PK	13.7	-26.9	25.51	43.52	-18.01	201	Horz
4	294.8539	32.03	PK	13.3	-25.9	19.43	46.02	-26.59	99	Horz
5	399.7777	31.42	PK	15.6	-25.2	21.82	46.02	-24.2	99	Horz
6	316.9048	31.99	PK	13.9	-25.7	20.19	46.02	-25.83	99	Horz
Vertical 30 - 1000MHz										
Marker No.	**Test Frequency**	**Meter Reading**	**Detector**	**T130 Ant Factor [dB/m]**	**T64 preamp/ cable loss [dB]**	**dB(uVolts/meter)**	**E-Fields [dBuV/m] - QPk**	**Margin (dB)**	**Height [cm]**	**Polarity**
7	68.2863	48.85	PK	8.1	-27.3	29.65	40	-10.35	201	Vert
8	118.9308	37.44	PK	13.7	-26.9	24.24	43.52	-19.28	100	Vert
9	241.5438	44.79	PK	11.5	-26.1	30.19	46.02	-15.83	201	Vert
10	142.9203	39.86	PK	13	-26.7	26.16	43.52	-17.36	100	Vert
11	235.4859	38.17	PK	11.4	-25.8	23.77	46.02	-22.25	301	Vert
12	477.3195	29.56	PK	17.7	-24.8	22.46	46.02	-23.56	301	Vert

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

RESULTS

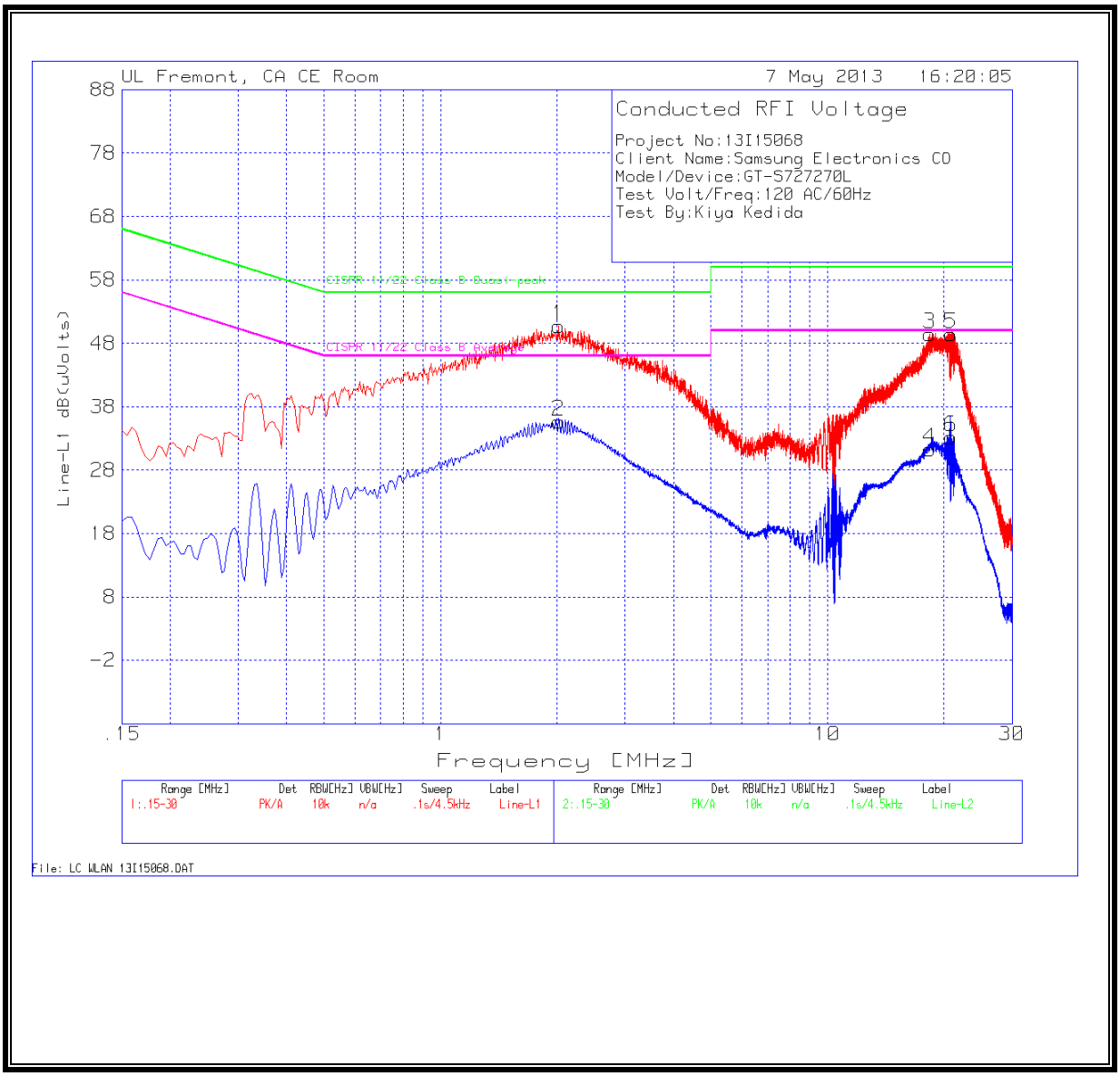
6 WORST EMISSIONS

Project No:13I15068
Client Name:Samsung
Model/Device:GT-S7270L
Test Volt/Freq:160V/60Hz
Test By:Kiya Kedida

Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin	CISPR 11/22 Class B Average	Margin
Line-L1 .15 - 30MHz									
1.923	48.53	PK	0.1	0.1	48.73	56	-7.27	-	-
1.923	33.81	Av	0.1	0.1	34.01	-	-	46	-11.99
18.4425	49.25	PK	0.2	0.2	49.65	60	-10.35	-	-
18.4425	32.56	Av	0.2	0.2	32.96	-	-	50	-17.04
21.066	50.12	PK	0.3	0.2	50.62	60	-9.38	-	-
21.066	32.29	Av	0.3	0.2	32.79	-	-	50	-17.21
Line-L2 .15 - 30MHz									
Test Frequency	**Meter Reading**	**Detector**	**T24 IL L2.TXT (dB)**	**LC Cables 2&3.TXT (dB)**	**dB(uVolts)**	**CISPR 11/22 Class B Quasi-peak**	**Margin**	**CISPR 11/22 Class B Average**	**Margin**
1.905	46.64	PK	0.1	0.1	46.84	56	-9.16	-	-
1.905	28.94	Av	0.1	0.1	29.14	-	-	46	-16.86
2.2425	46.33	PK	0.1	0.1	46.53	56	-9.47	-	-
2.2425	28.27	Av	0.1	0.1	28.47	-	-	46	-17.53
2.751	44.58	PK	0.1	0.1	44.78	56	-11.22	-	-
2.751	26.03	Av	0.1	0.1	26.23	-	-	46	-19.77

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS