



FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM1900 Phone with WiFi/BT

MODEL NUMBER: GT-I9128I

FCC ID: A3LGTI9128I

REPORT NUMBER: 13I15225-4 REVISION A

ISSUE DATE: JULY 29, 2013

Prepared for

**SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA**

Prepared by

**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	6/25/13	Initial Issue	P. Kim
A	7/29/13	Update administrative information	P. Kim

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. MEASURING INSTRUMENT CALIBRATION	5
4.2. SAMPLE CALCULATION	5
4.3. MEASUREMENT UNCERTAINTY	5
5. EQUIPMENT UNDER TEST	6
5.1. DESCRIPTION OF EUT	6
5.2. MAXIMUM OUTPUT POWER.....	6
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	6
5.4. SOFTWARE AND FIRMWARE.....	6
5.5. WORST-CASE CONFIGURATION AND MODE	7
5.1. DESCRIPTION OF TEST SETUP.....	8
6. TEST AND MEASUREMENT EQUIPMENT	11
7. ANTENNA PORT TEST RESULTS	12
7.1. BASIC DATA RATE GFSK MODULATION	12
7.1.1. 20 dB AND 99% BANDWIDTH	12
7.1.1. HOPPING FREQUENCY SEPARATION	16
7.1.1. NUMBER OF HOPPING CHANNELS.....	18
7.1.1. AVERAGE TIME OF OCCUPANCY	22
7.1.1. OUTPUT POWER	27
7.1.1. AVERAGE POWER	30
7.1.1. CONDUCTED SPURIOUS EMISSIONS.....	31
7.1. ENHANCED DATA RATE 8PSK MODULATION	36
7.1.1. 20 dB AND 99% BANDWIDTH	36
7.1.1. OUTPUT POWER	40
7.1.1. AVERAGE POWER	43
7.1.1. CONDUCTED SPURIOUS EMISSIONS.....	44
8. RADIATED TEST RESULTS.....	49
8.1. LIMITS AND PROCEDURE	49
8.2. TRANSMITTER ABOVE 1 GHz	50
8.2.1. BASIC DATA RATE GFSK MODULATION	50
8.2.2. ENHANCED DATA RATE 8PSK MODULATION	65
WORST-CASE BELOW 1 GHz	82
10. SETUP PHOTOS	89

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: GSM1900 Phone with WiFi/BT

MODEL: GT-I9128I

SERIAL NUMBER: 0677A774 (RADIATED)
20A084AD (CONDUCTED)

DATE TESTED: JUNE 13, 2013

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

UL 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 Inc. 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 Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:



PHILIP KIM
WISE PROGRAM MANAGER
UL Verification Services Inc.

Tested By:



STEVEN TRAN
EMC ENGINEER
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, 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 Verification Services Inc. 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:

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

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 an 802.11 B/G/N 1X1 HT20, + BT4.0 (LE) + GSM1900 bar phone.

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	9.70	9.33
2402 - 2480	Enhanced 8PSK	10.23	10.54

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The EUT utilizes a FPCB antenna, with a maximum gain of 0.55 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was REV1.0 and the software was I9128I.001.

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.

5.1. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC ADAPTER	SAMSUNG	ETA0U82CBC	SE1C814AS/A-E	N/A
HEADSET	SAMSUNG	EHS61ASFWE	N/A	N/A

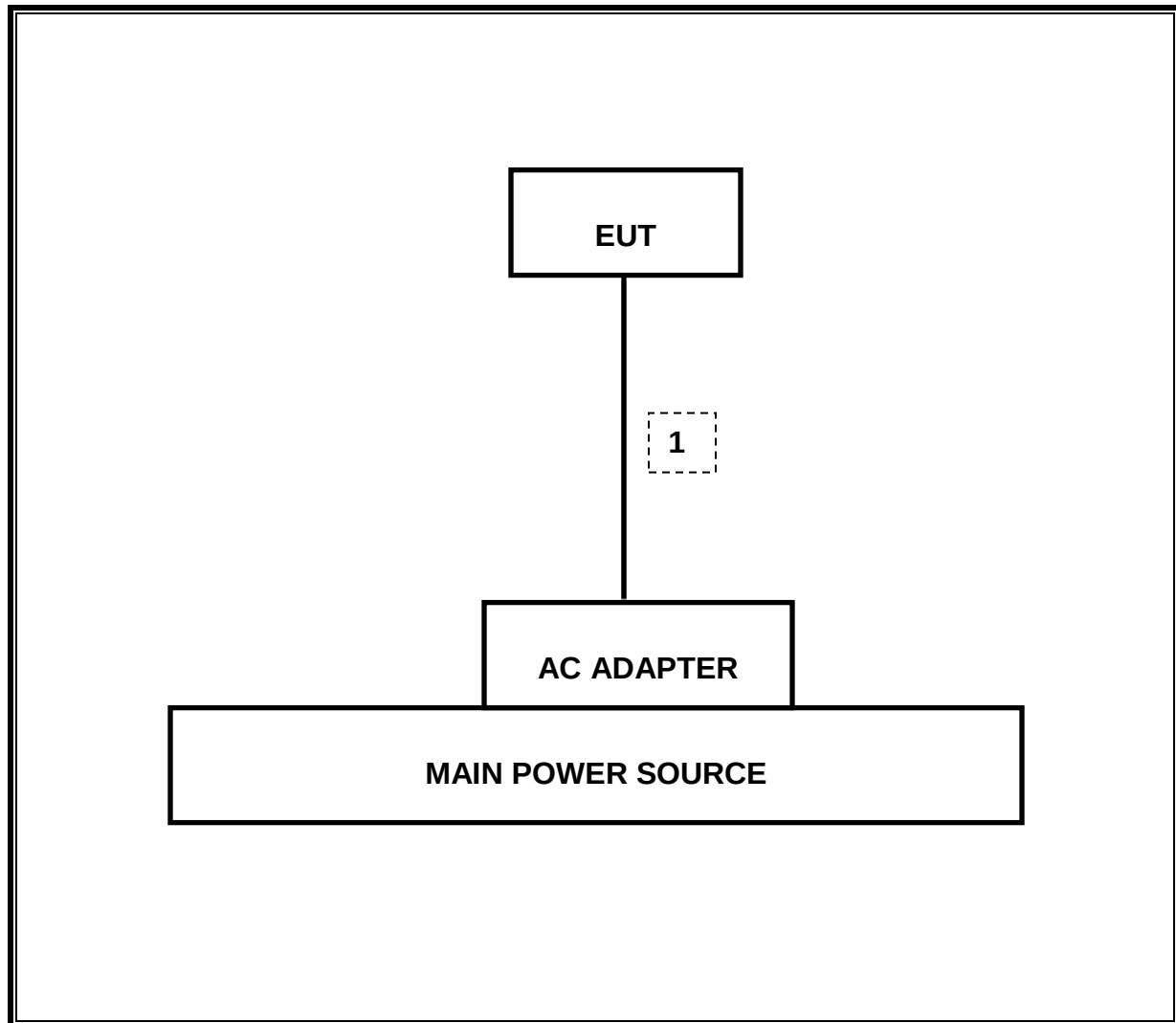
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Shielded	1	N/A

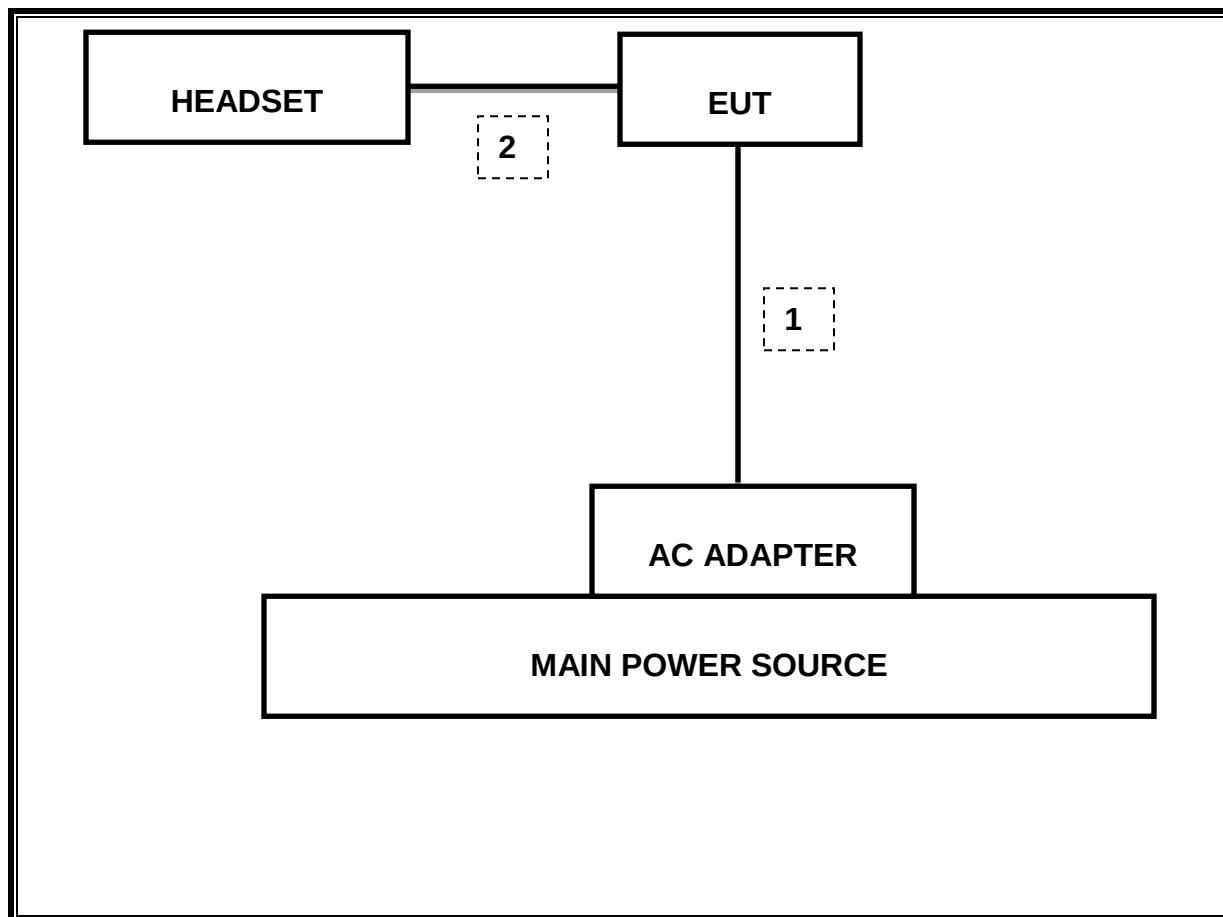
TEST SETUP

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

SETUP DIAGRAM FOR TEST (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, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	03/23/12	03/28/14
Antenna, Horn, 18 GHz	ETS	3117	C01006	12/11/12	12/11/13
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/13	01/28/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/12	10/22/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/12	10/21/13
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	04/11/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/12	12/13/13
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/12	12/13/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/13	01/14/14
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR	CNR

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.

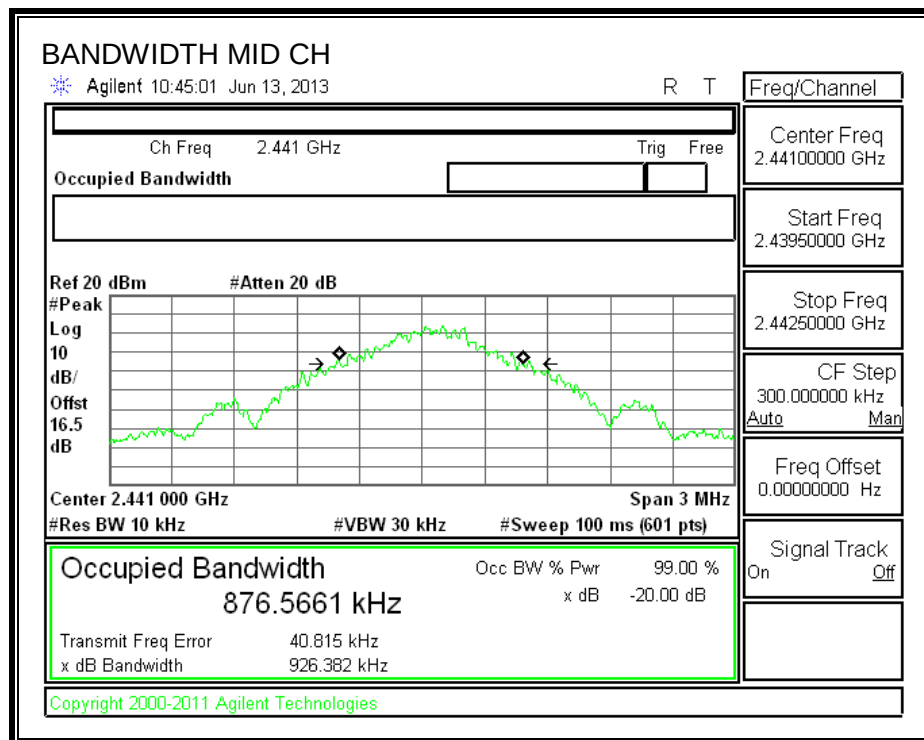
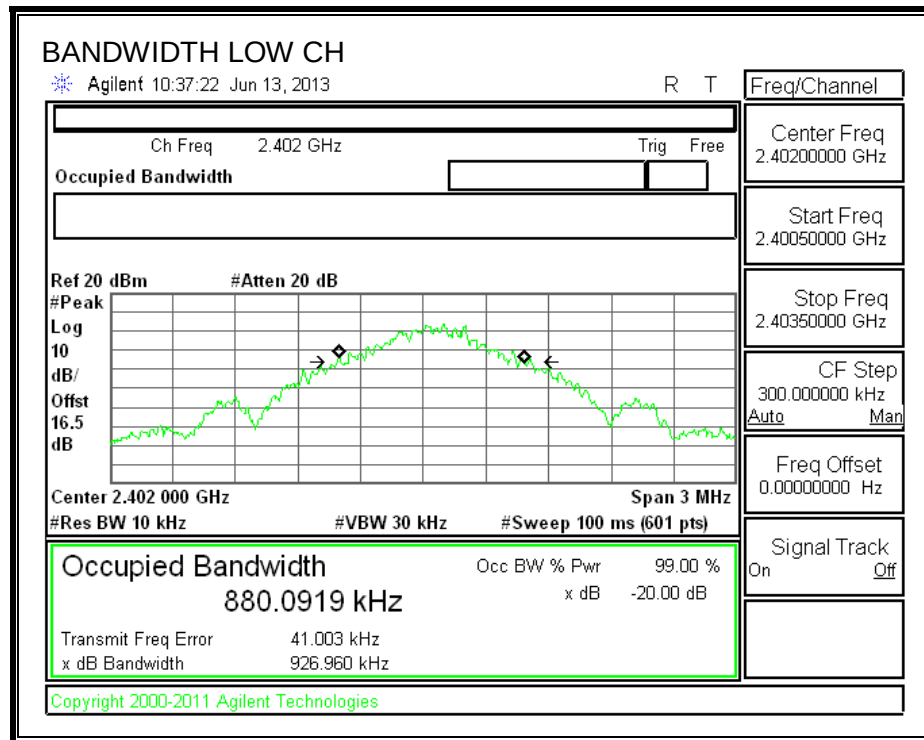
TEST PROCEDURE

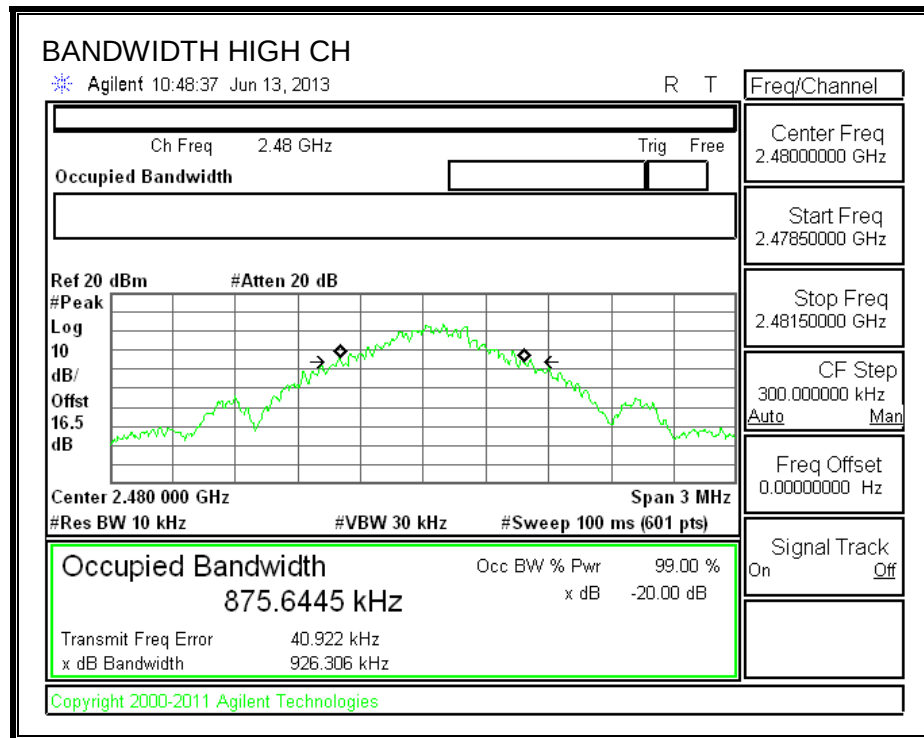
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

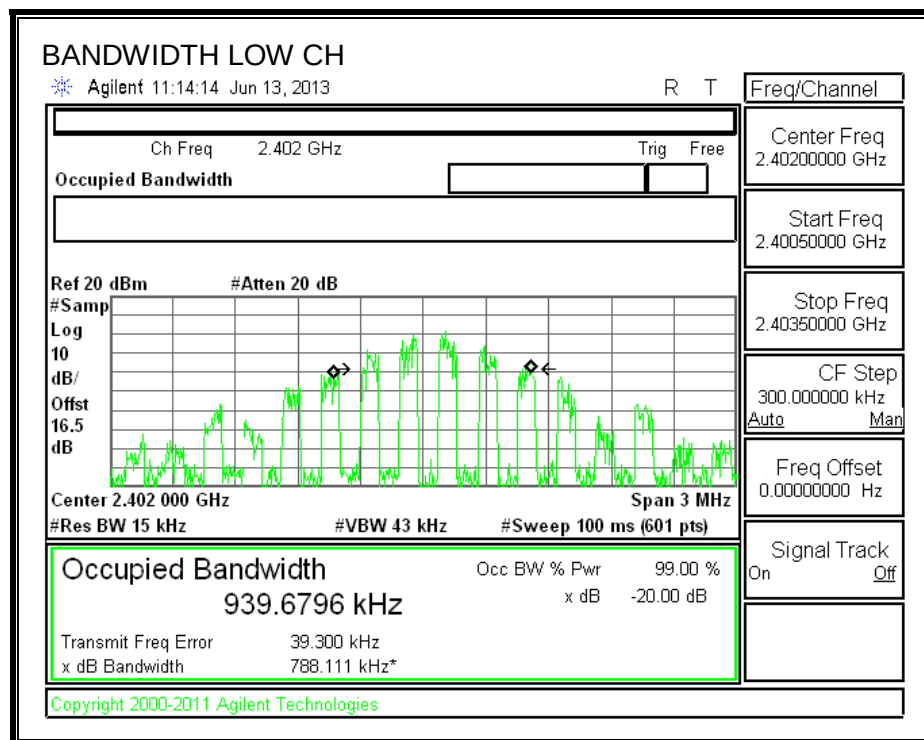
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	926.96	939.6796
Middle	2441	926.382	960.0545
High	2480	926.306	922.5647

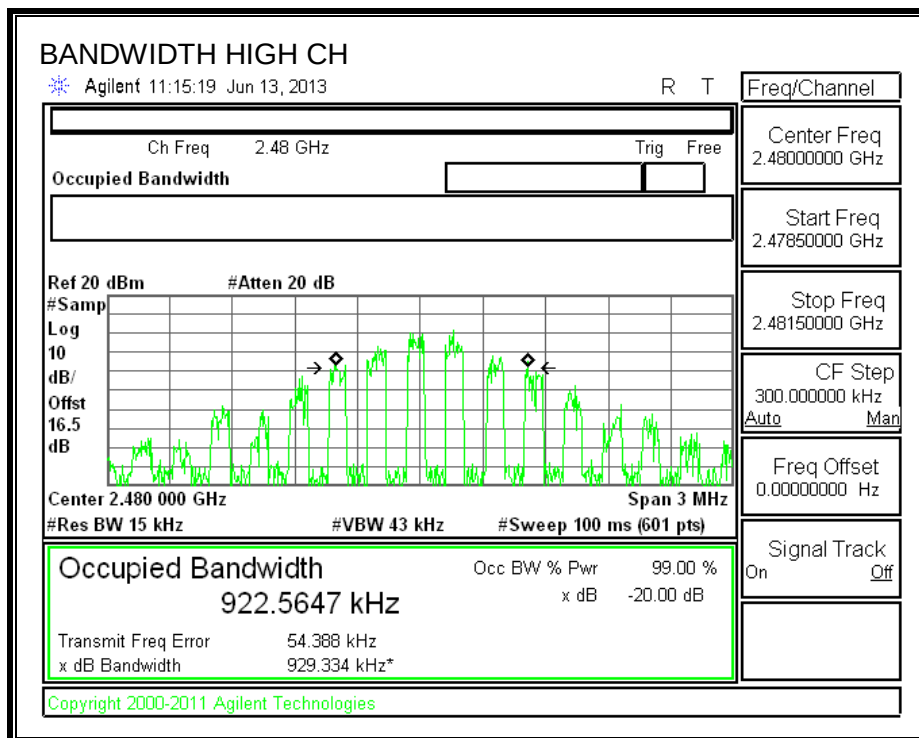
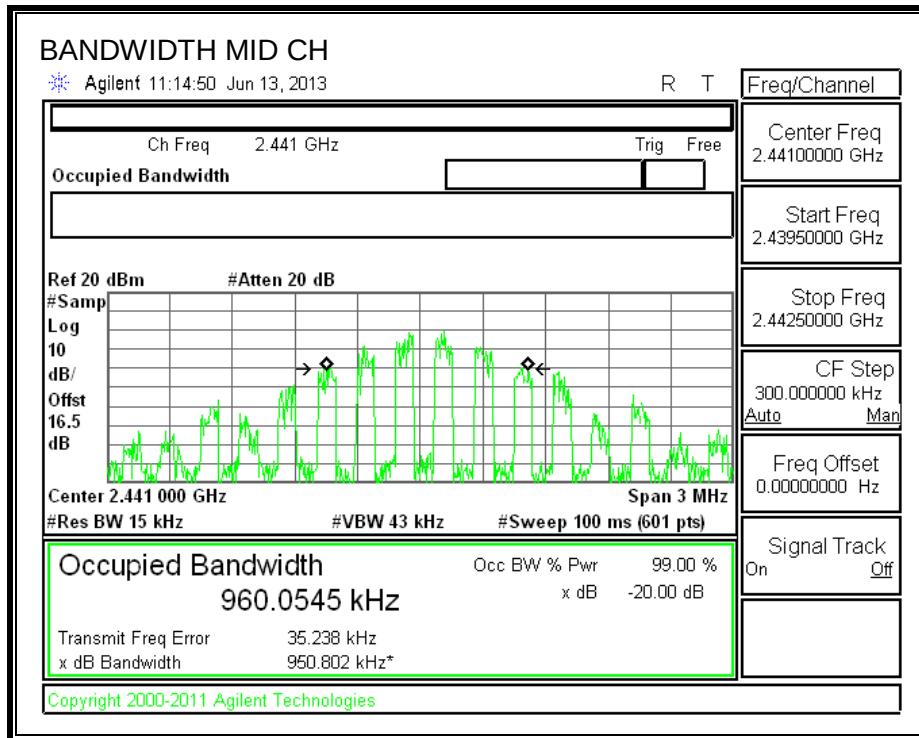
20 dB BANDWIDTH





99% BANDWIDTH





7.1.1. 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.

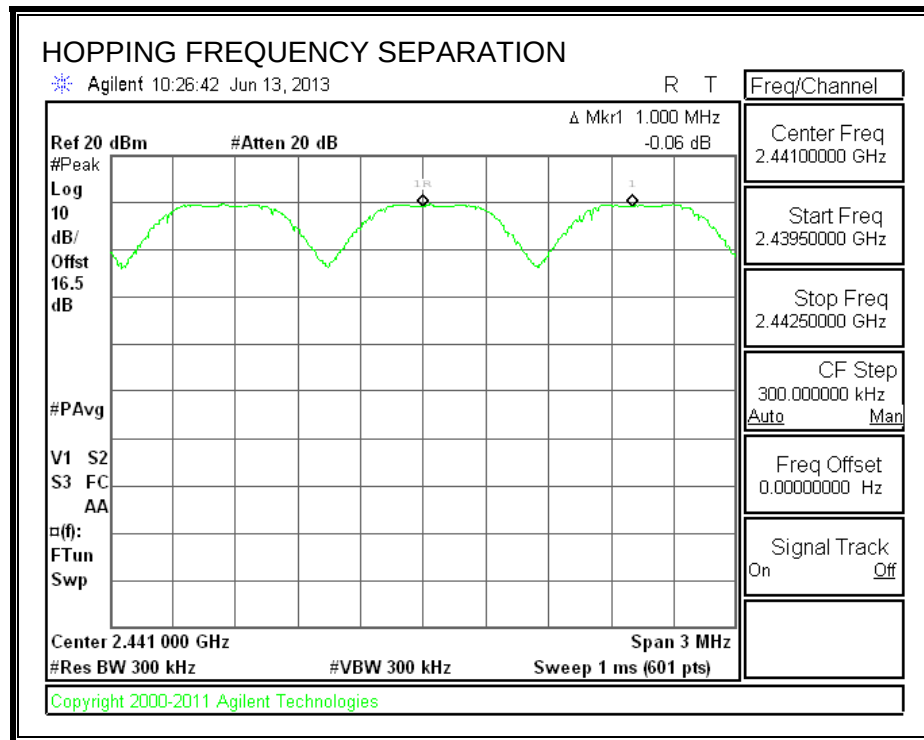
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

RESULTS

HOPPING FREQUENCY SEPARATION



7.1.1. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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

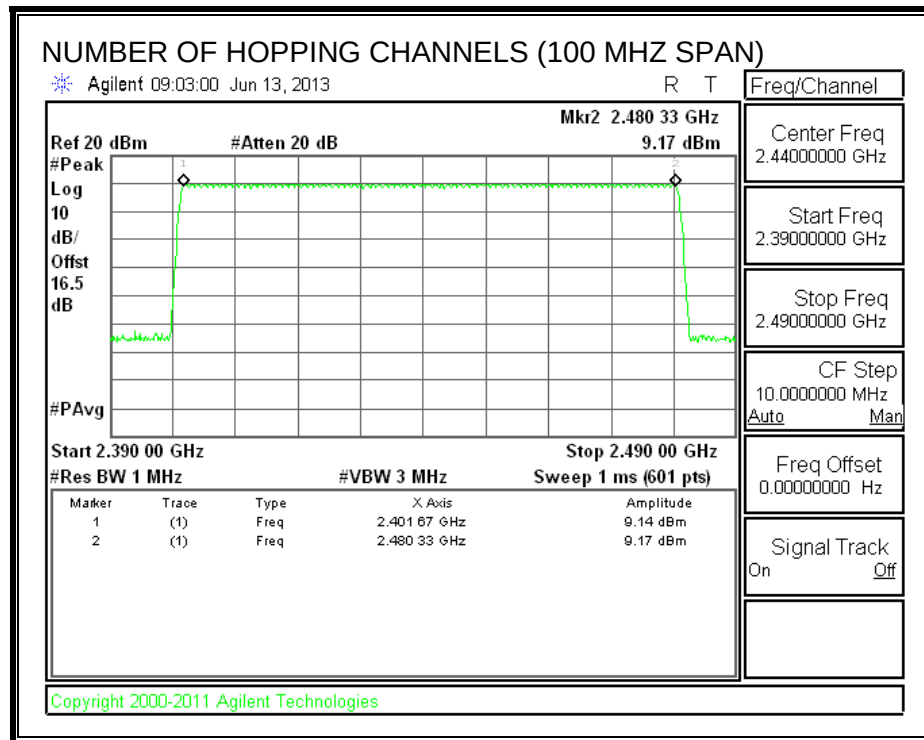
TEST PROCEDURE

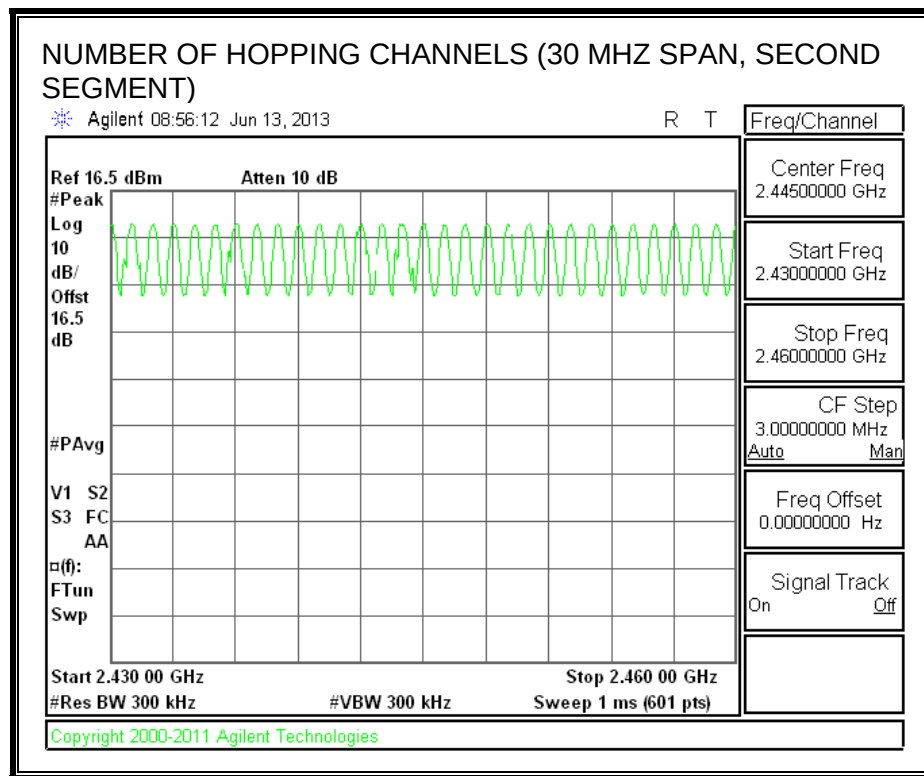
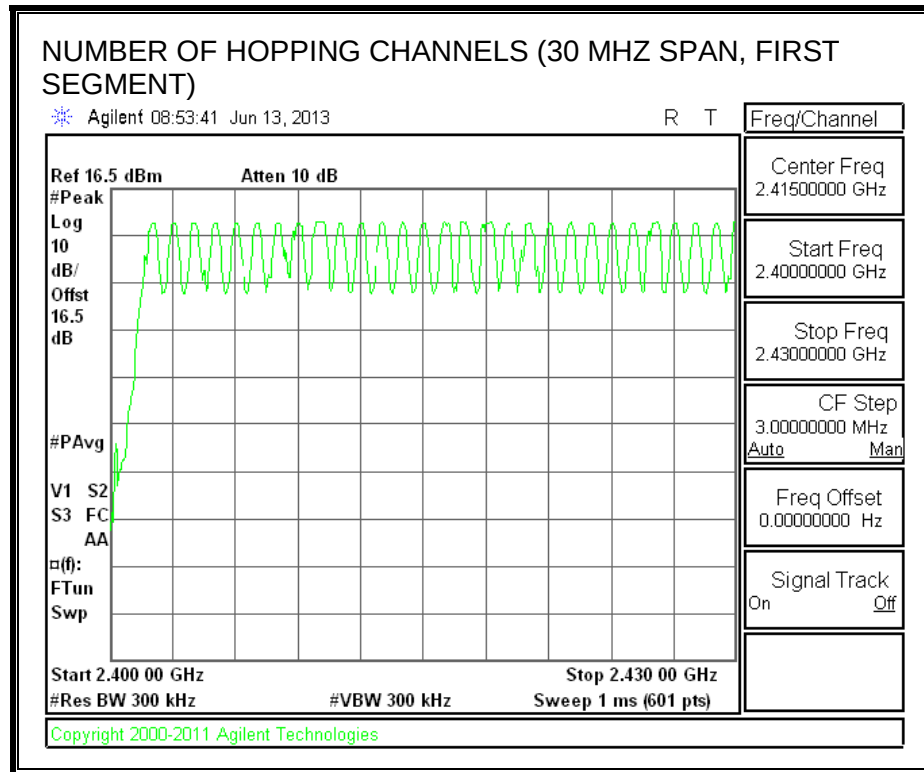
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

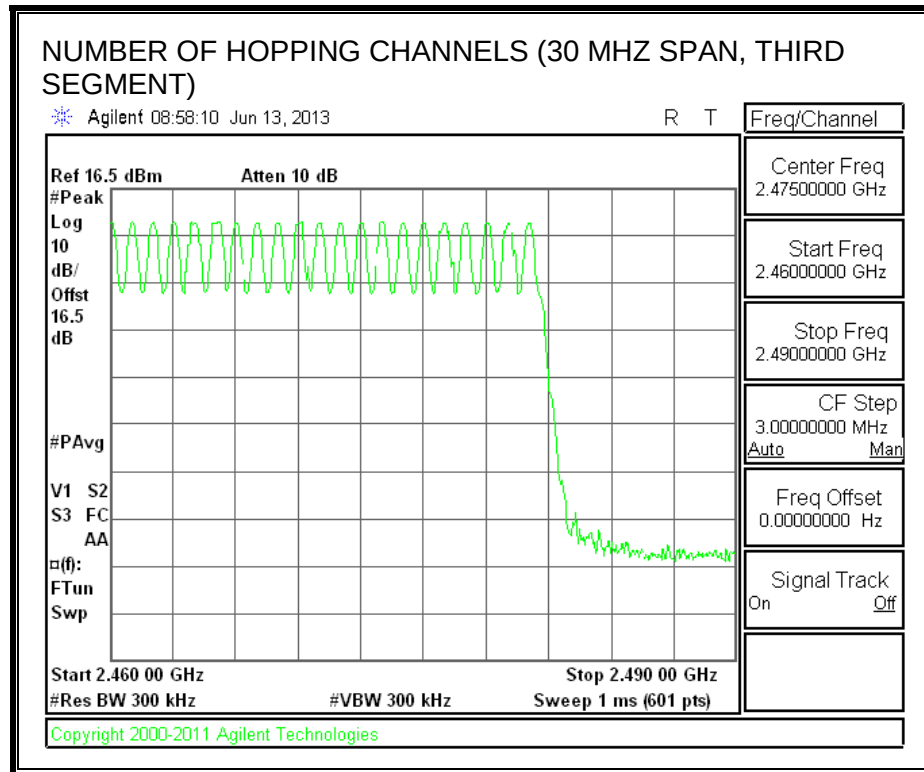
RESULTS

79 Channels observed.

NUMBER OF HOPPING CHANNELS







7.1.1. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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

TEST PROCEDURE

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

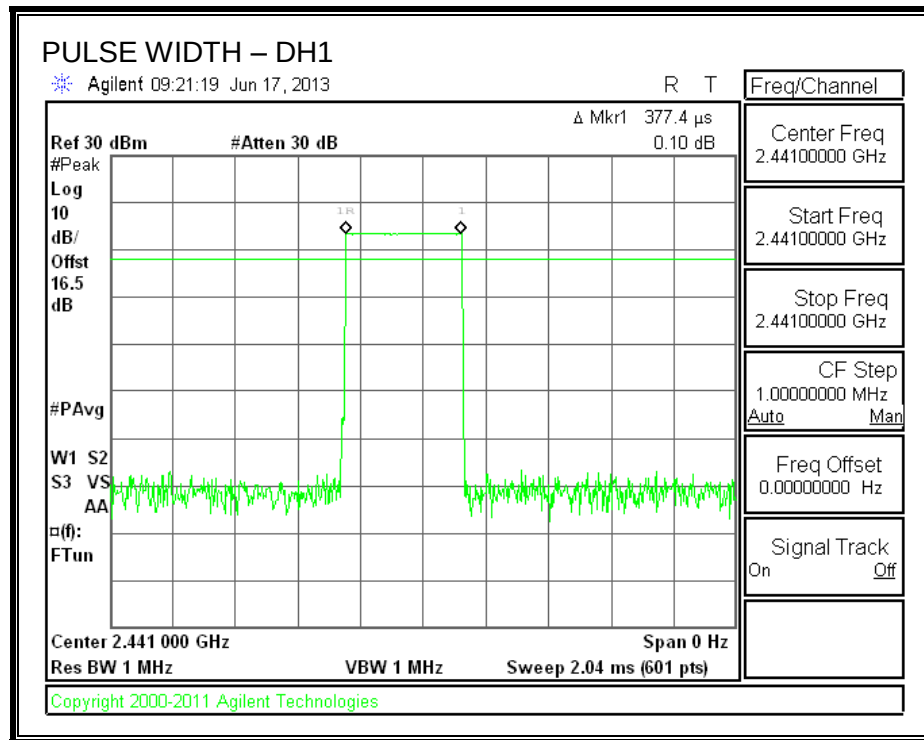
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

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

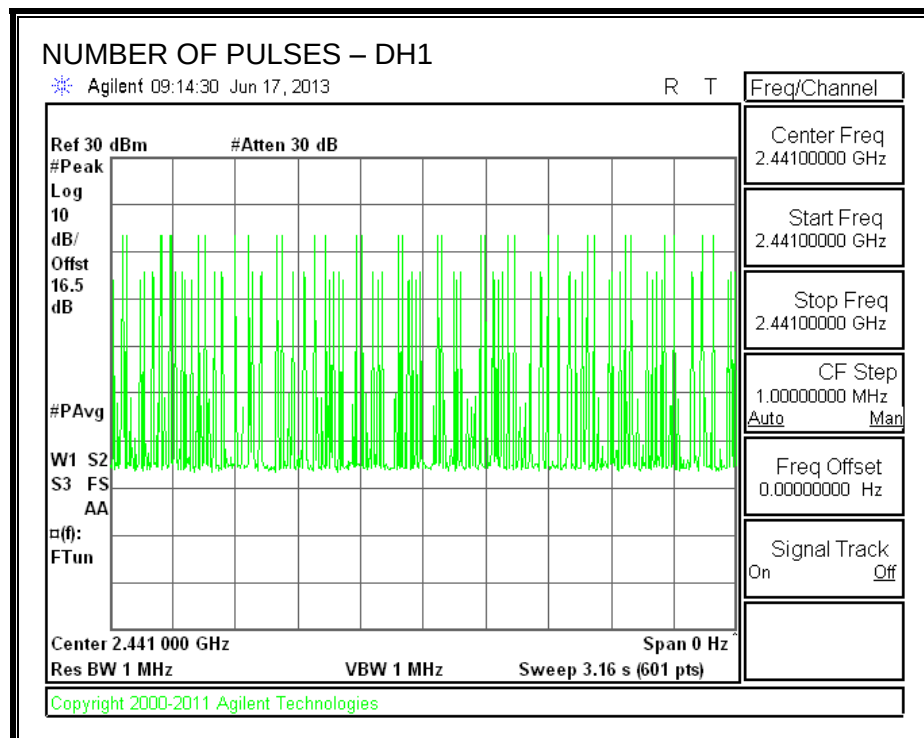
RESULTS

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	0.3774	32	0.121	0.4	-0.279
DH3	1.637	13	0.213	0.4	-0.187
DH5	2.876	6	0.173	0.4	-0.227
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	0.3774	64	0.242	0.4	-0.158
DH3	1.637	21	0.344	0.4	-0.056
DH5	2.876	13	0.374	0.4	-0.026

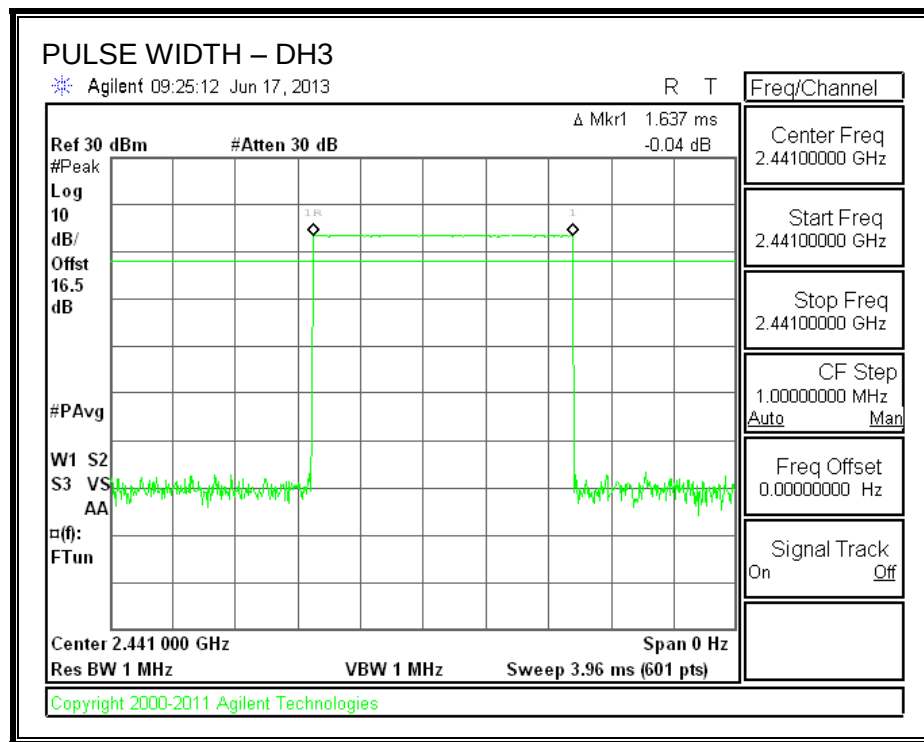
PULSE WIDTH - DH1



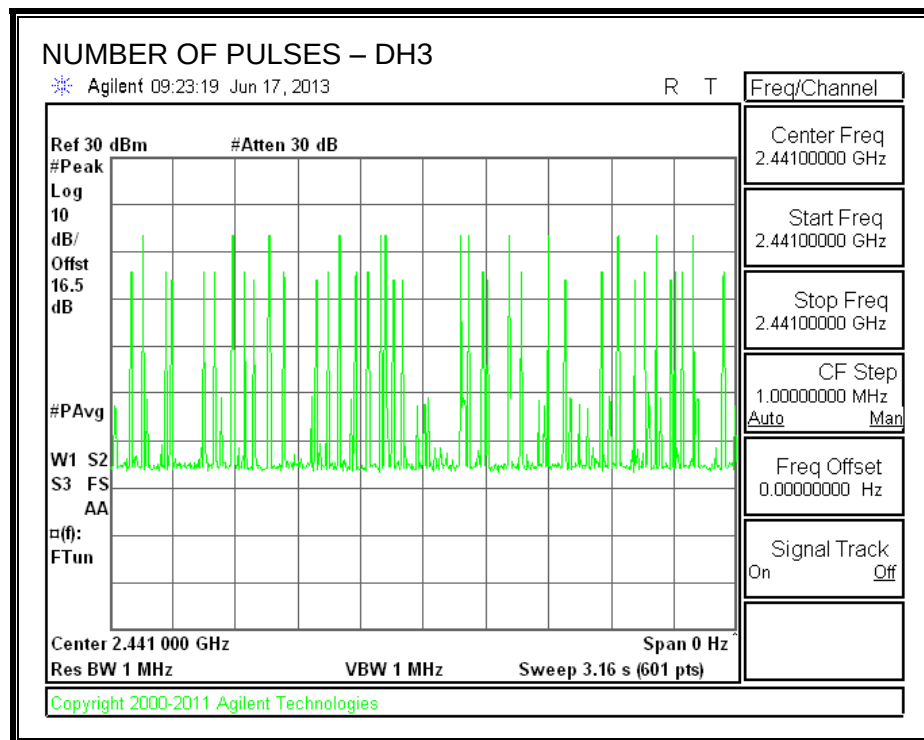
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



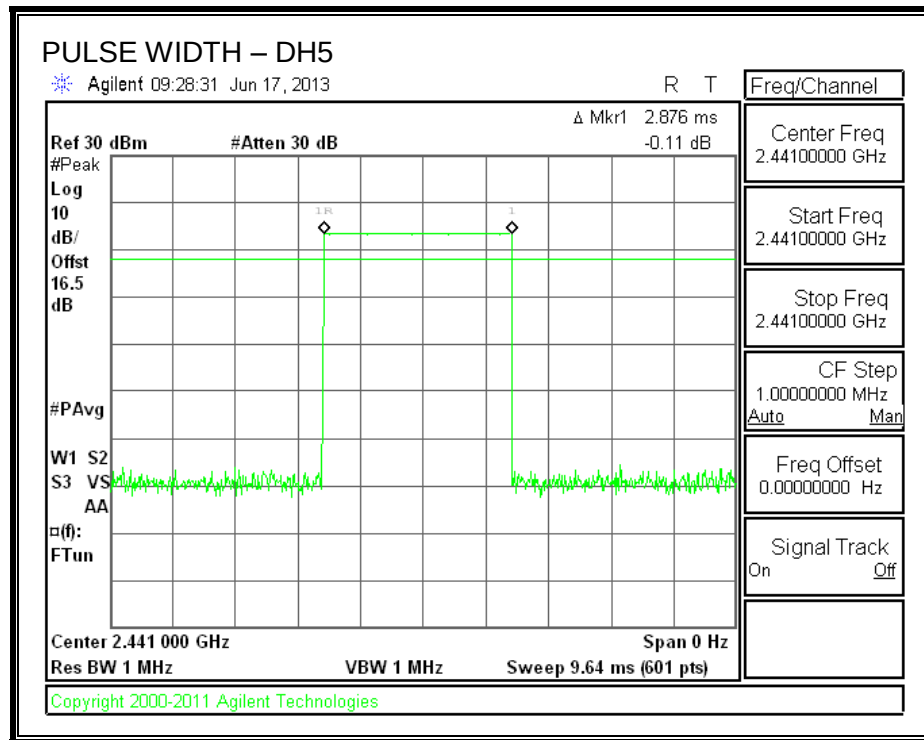
PULSE WIDTH – DH3



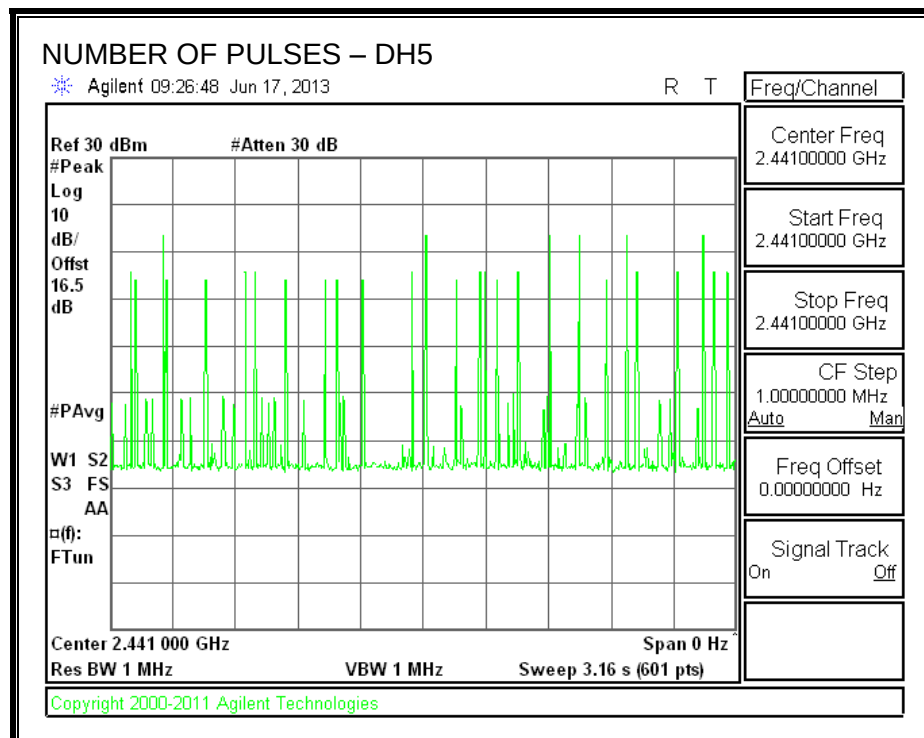
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



7.1.1. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

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

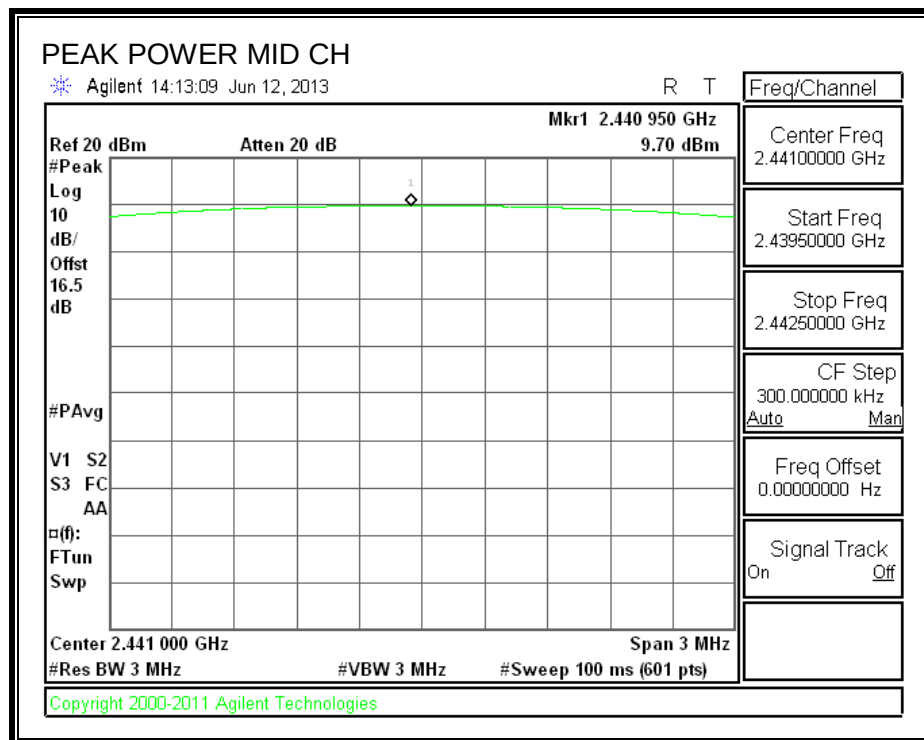
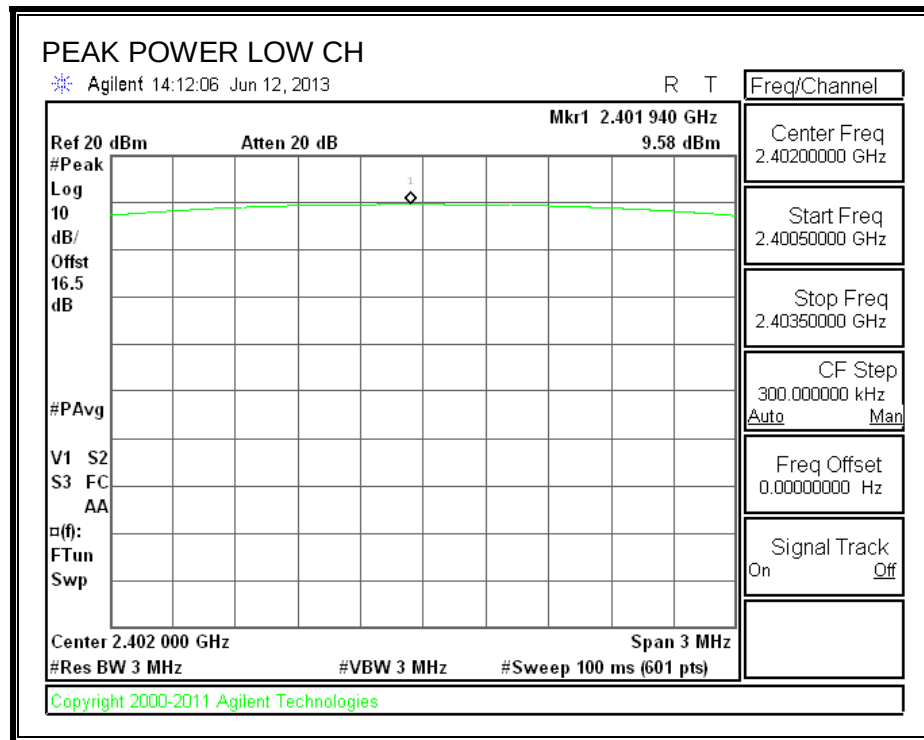
TEST PROCEDURE

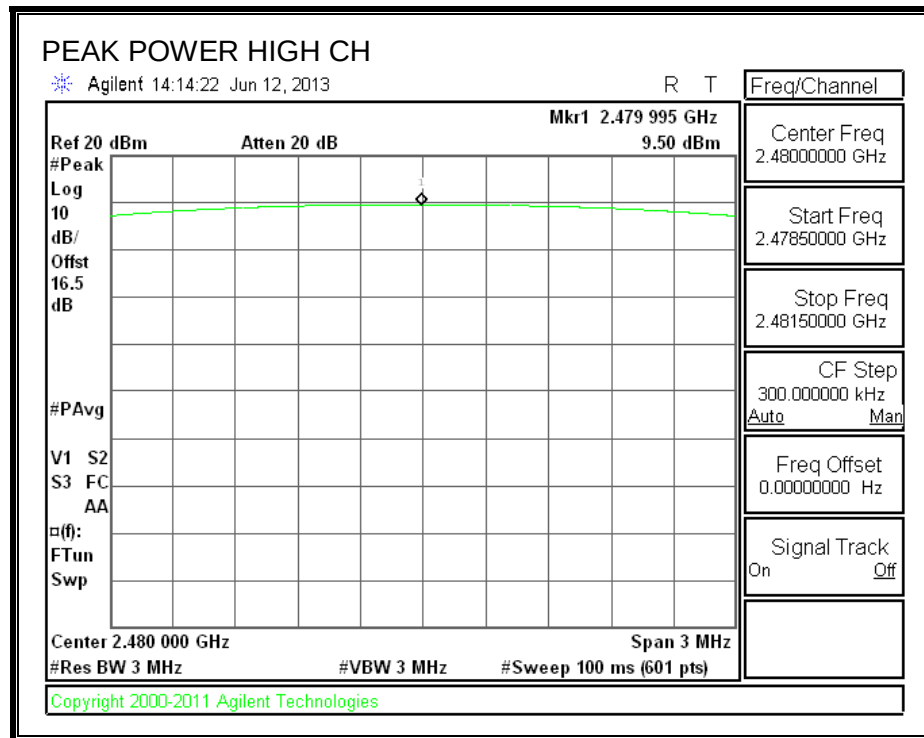
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.58	30	-20.42
Middle	2441	9.70	30	-20.30
High	2480	9.50	30	-20.50

OUTPUT POWER





7.1.1. 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 0 dB was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.60
Middle	2441	9.60
High	2480	9.50

7.1.1. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

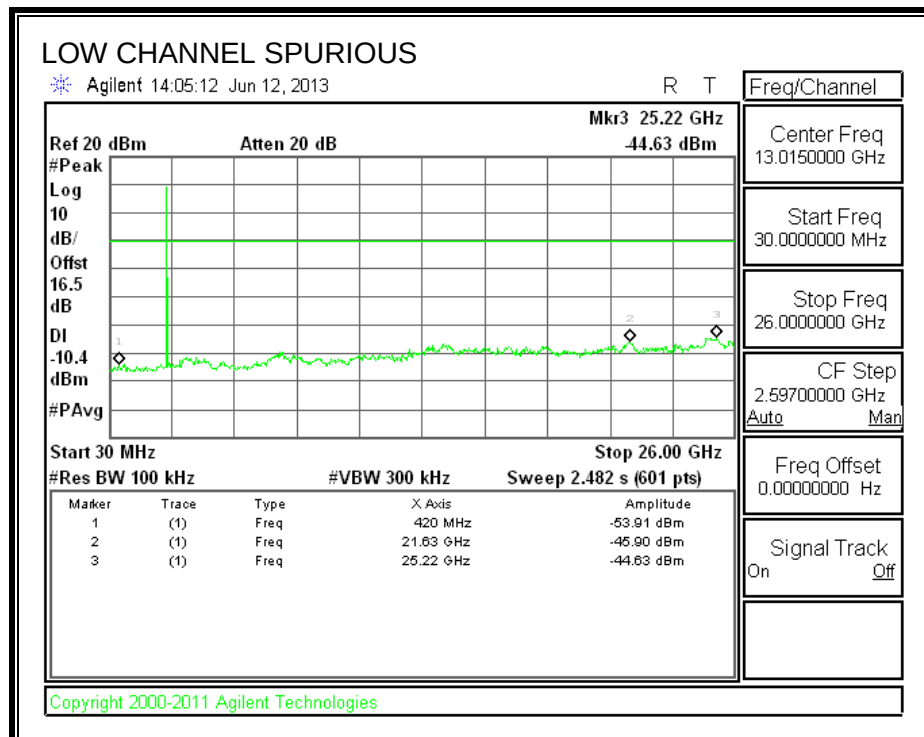
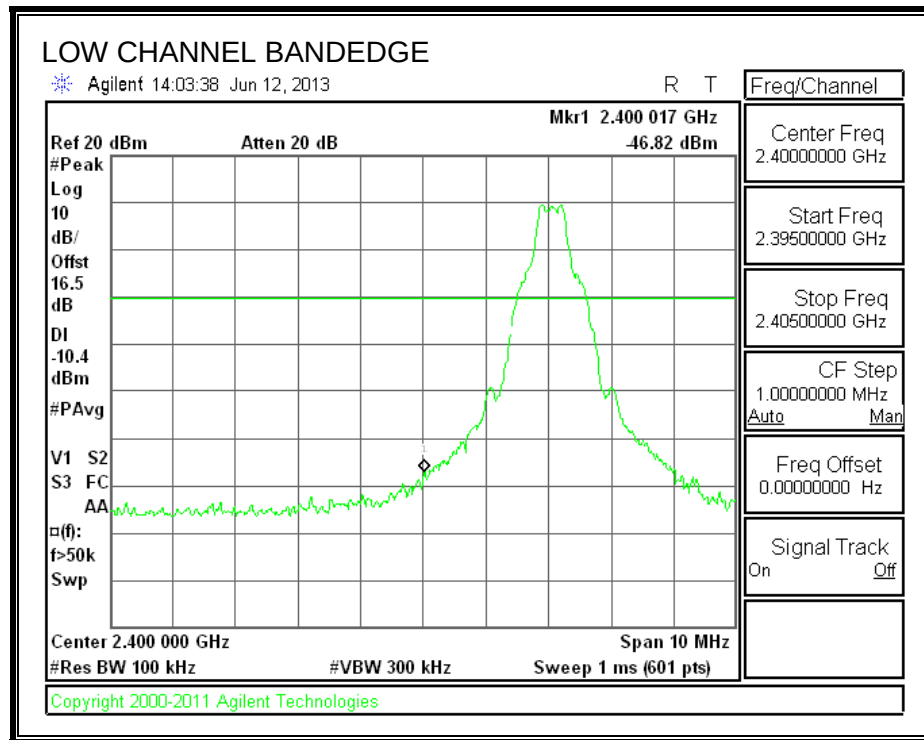
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

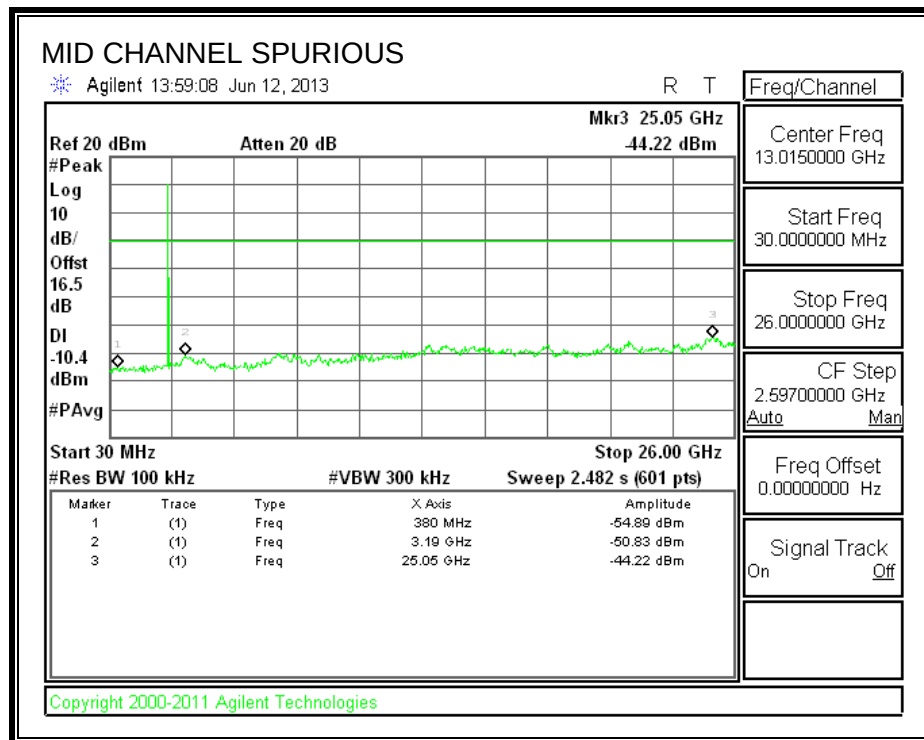
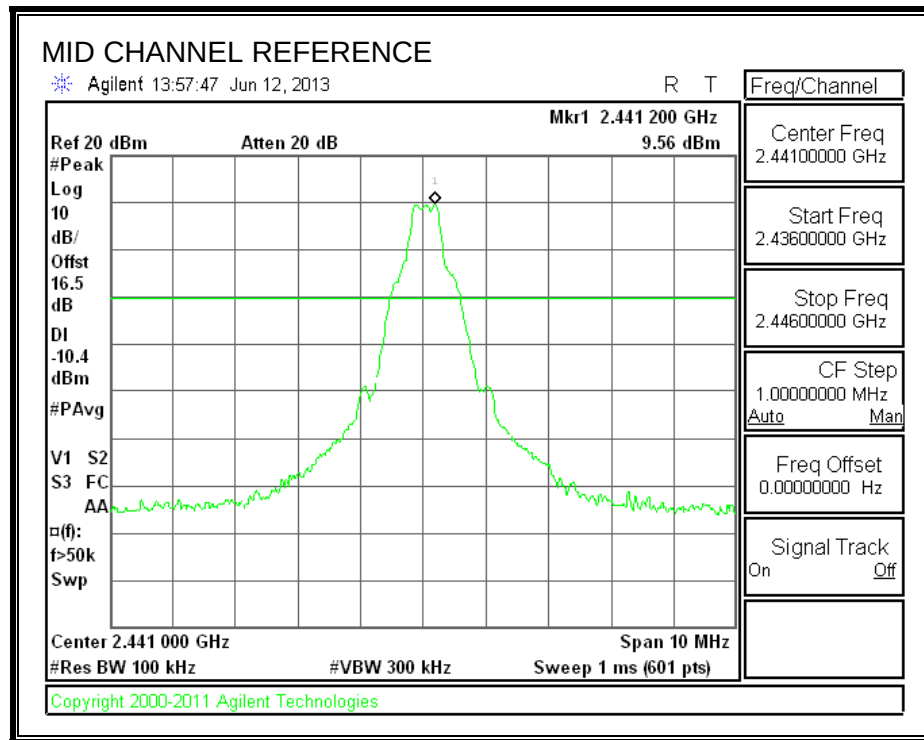
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

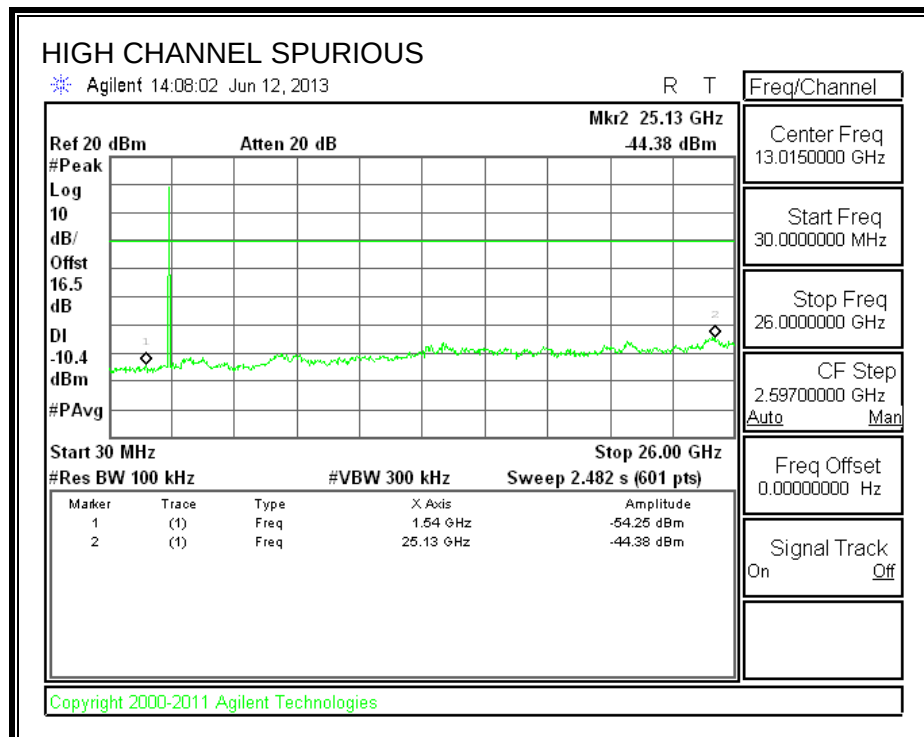
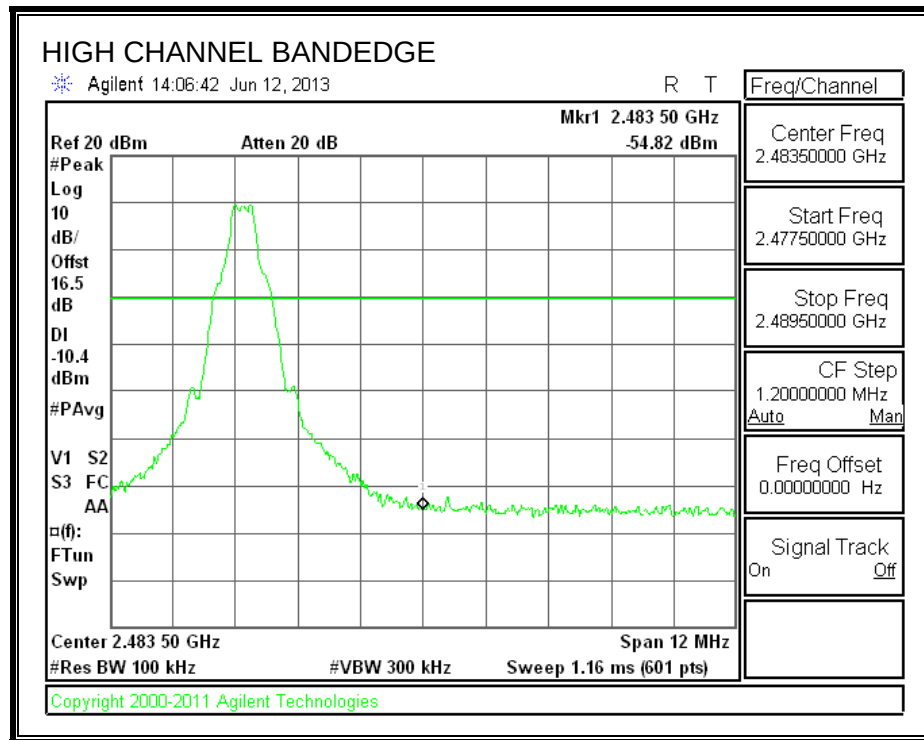
SPURIOUS EMISSIONS, LOW CHANNEL



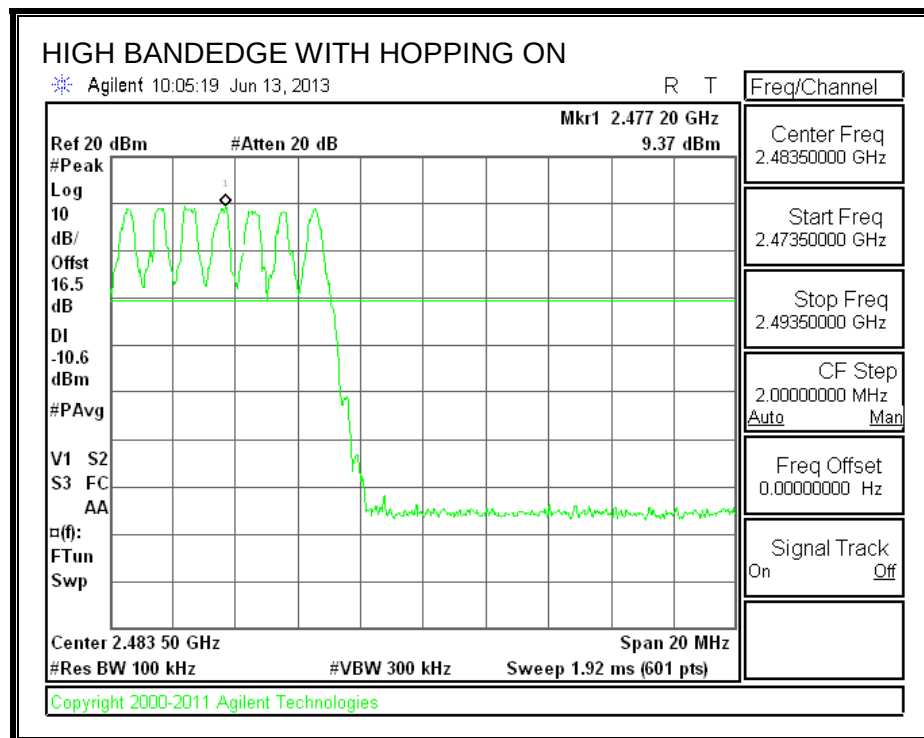
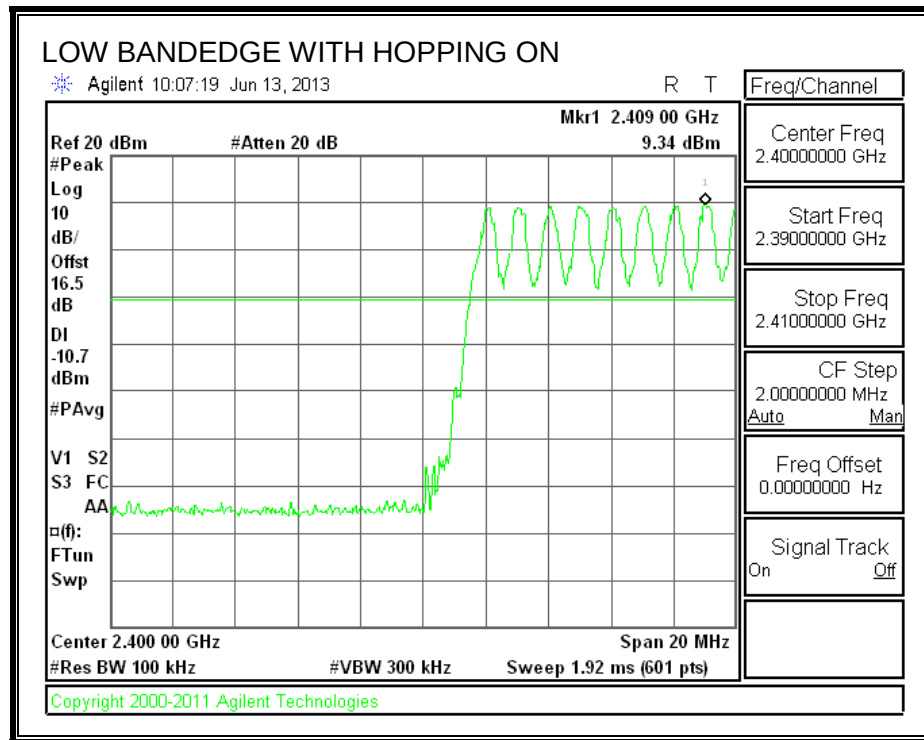
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



7.1. ENHANCED DATA RATE 8PSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

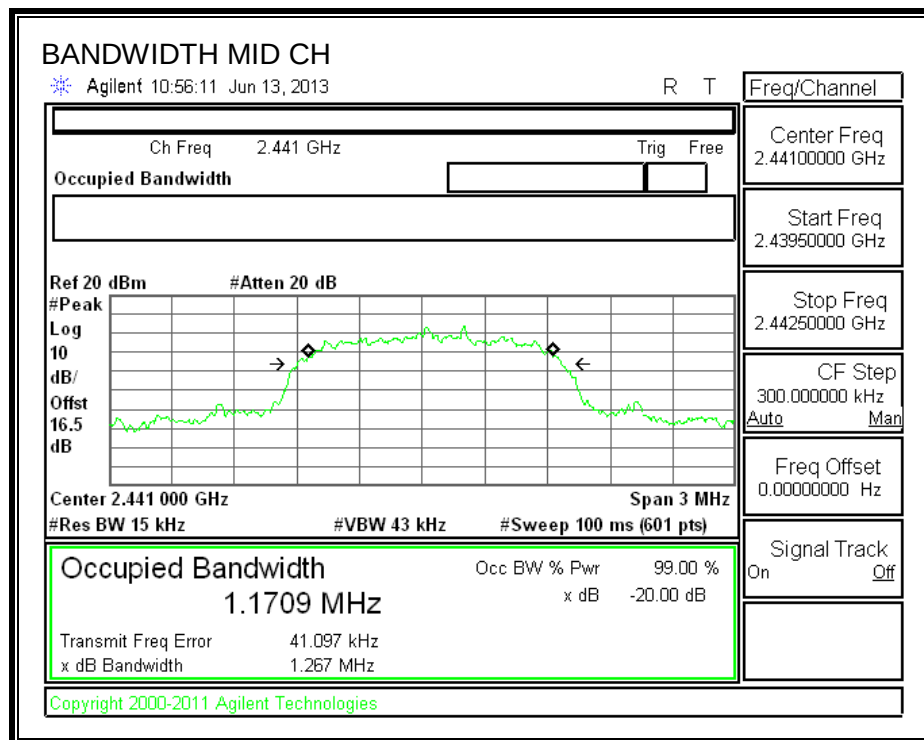
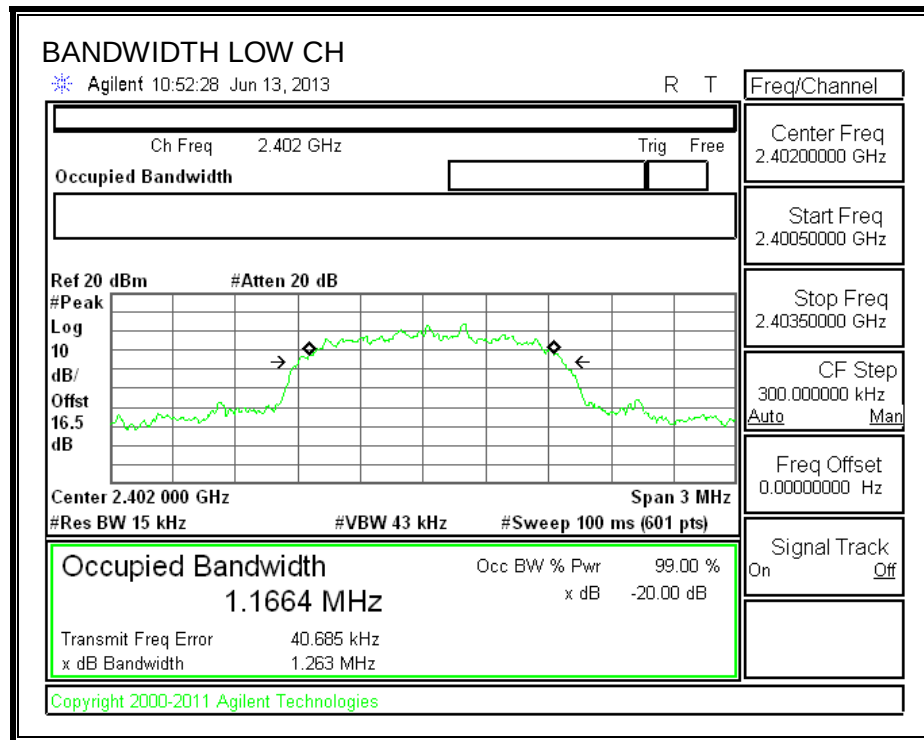
TEST PROCEDURE

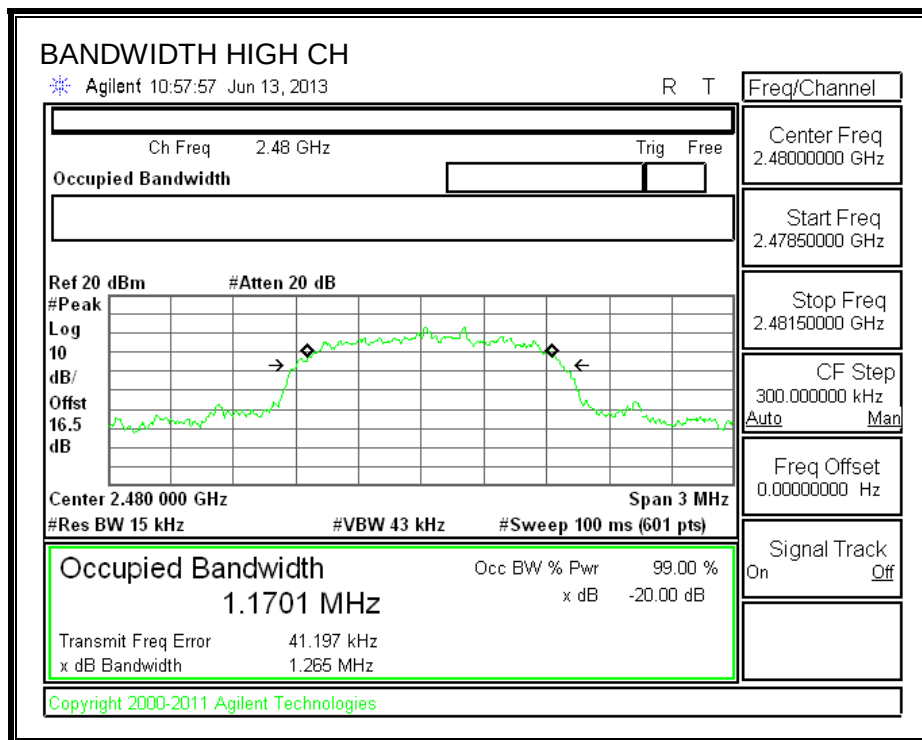
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

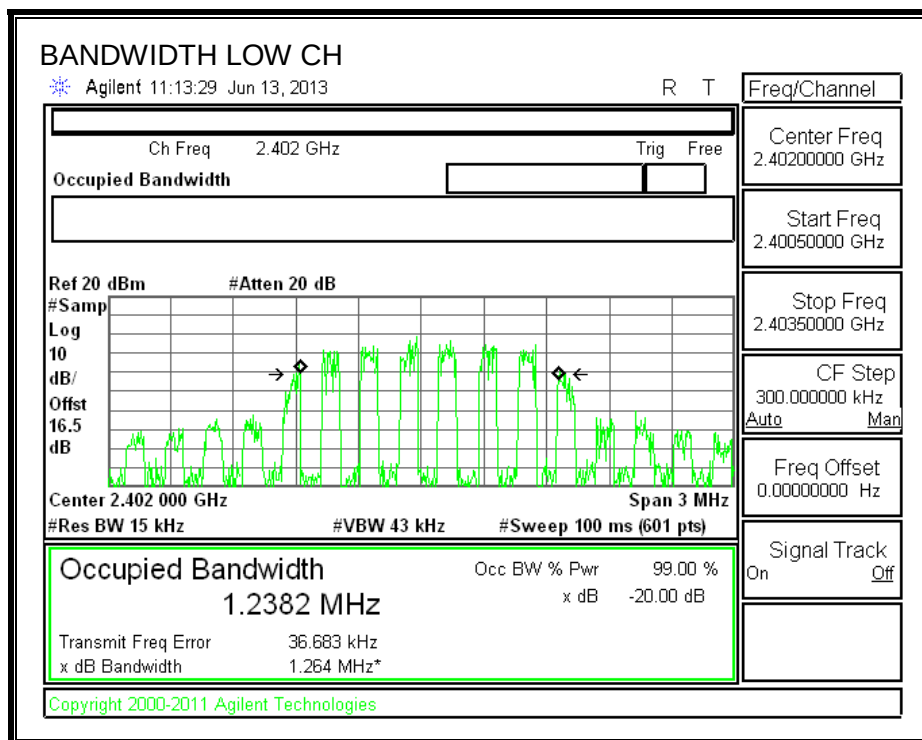
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.263	1.2382
Middle	2441	1.267	1.1501
High	2480	1.265	1.1709

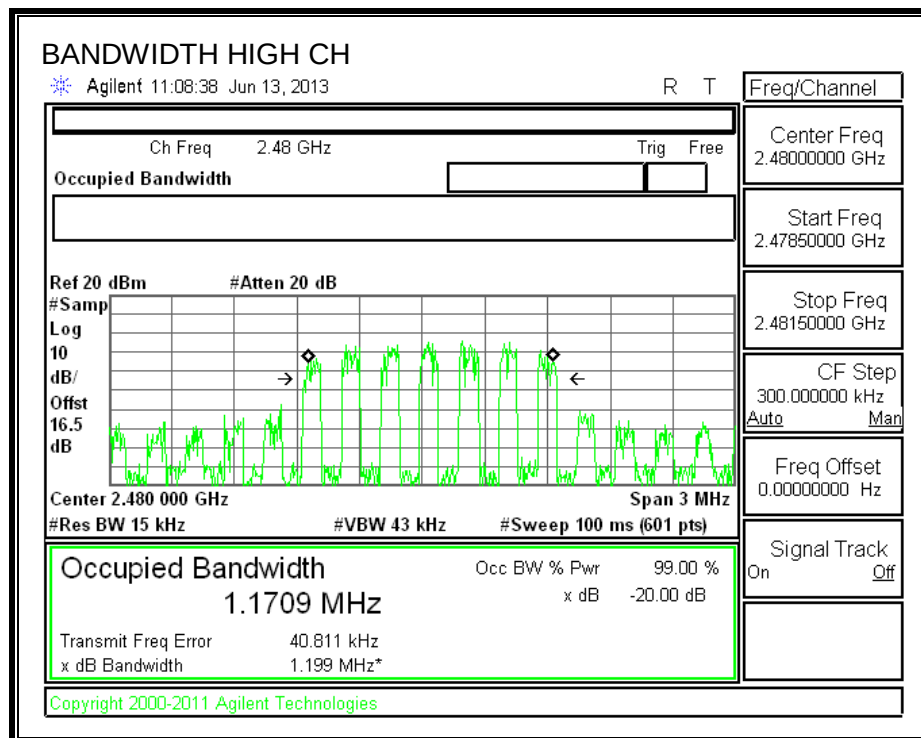
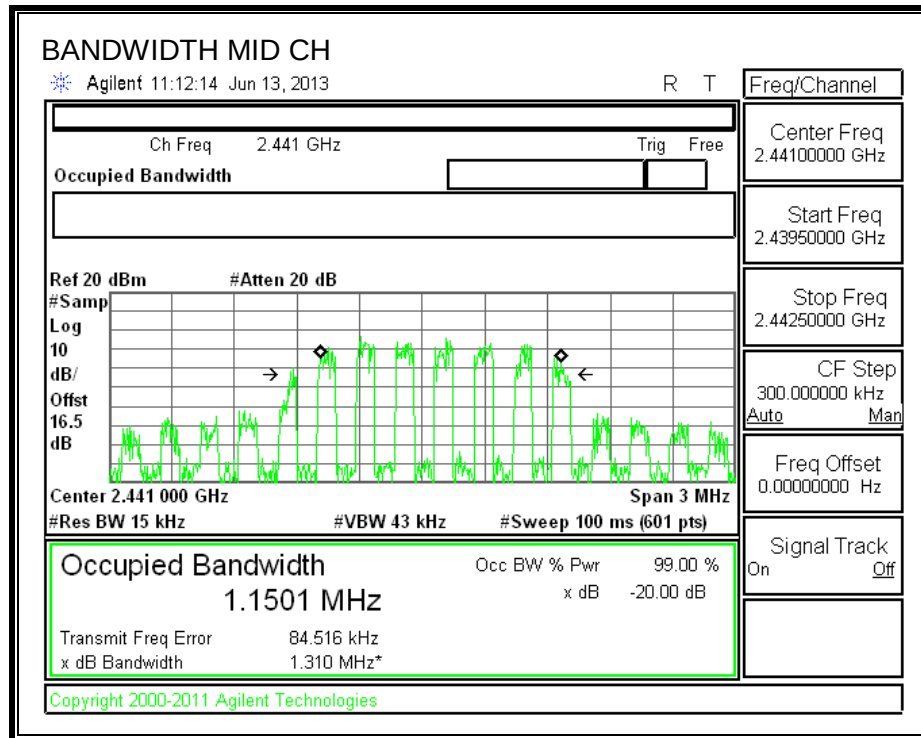
20 dB BANDWIDTH





99% BANDWIDTH





7.1.1. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

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

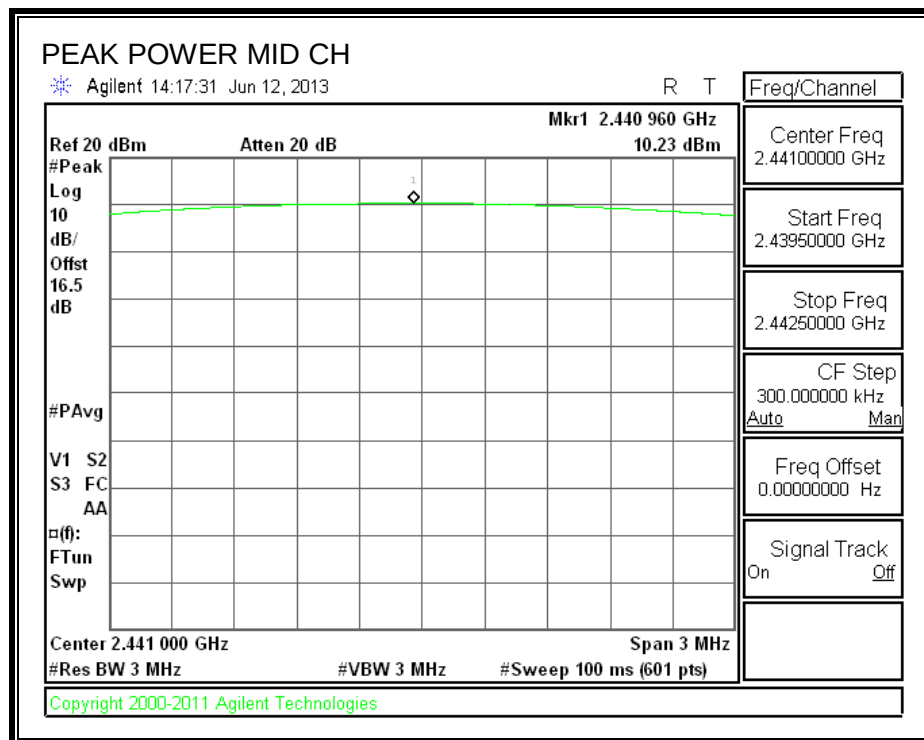
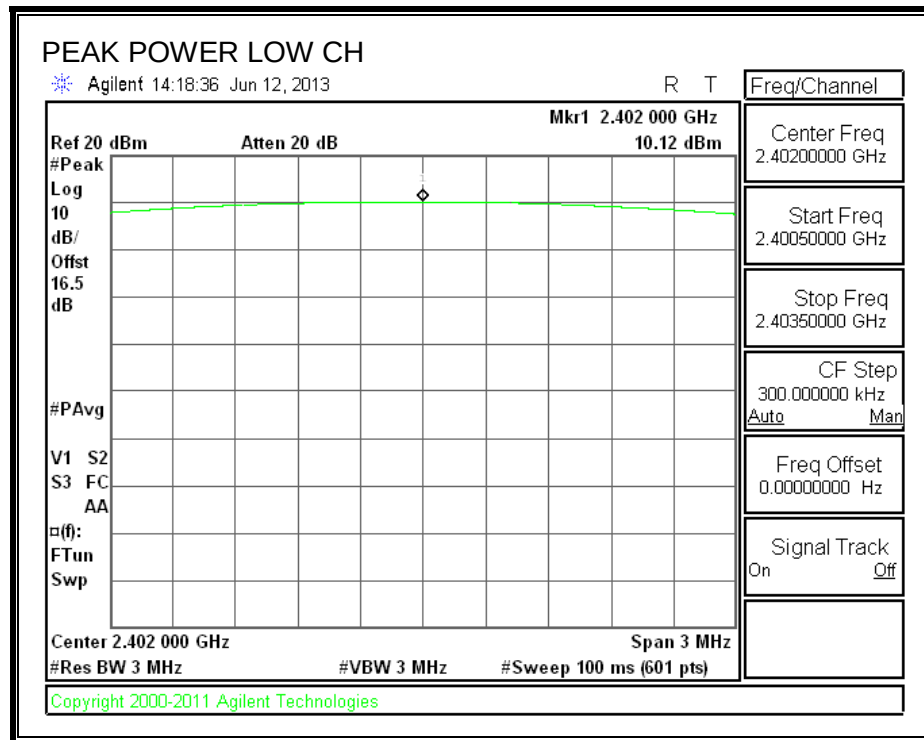
TEST PROCEDURE

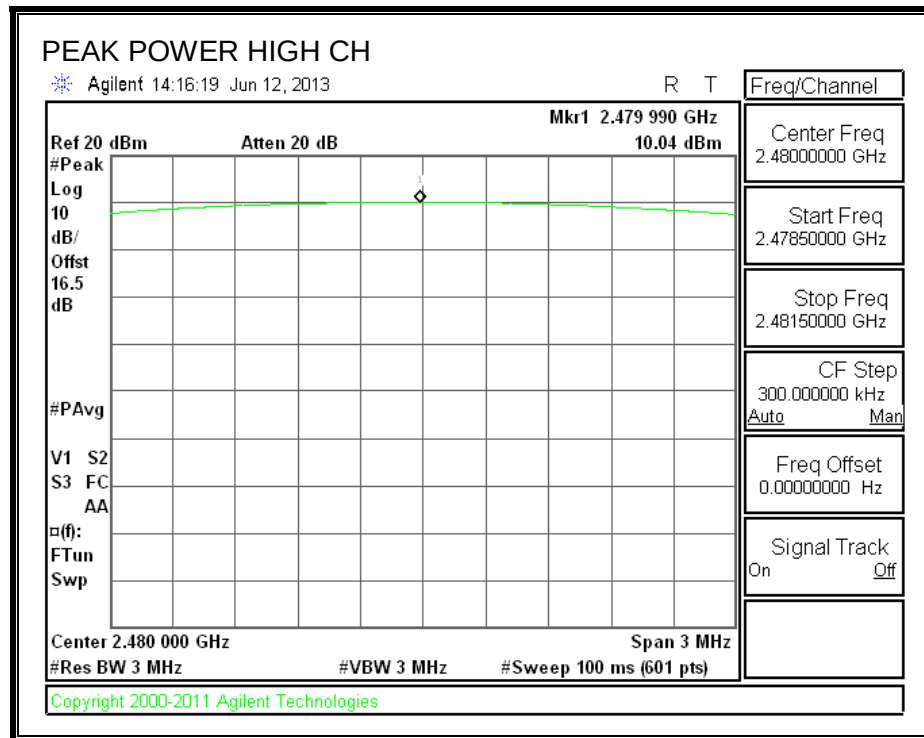
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.12	30	-19.88
Middle	2441	10.23	30	-19.77
High	2480	10.04	30	-19.96

OUTPUT POWER





7.1.1. 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 0 dB was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.20
Middle	2441	8.30
High	2480	8.10

7.1.1. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

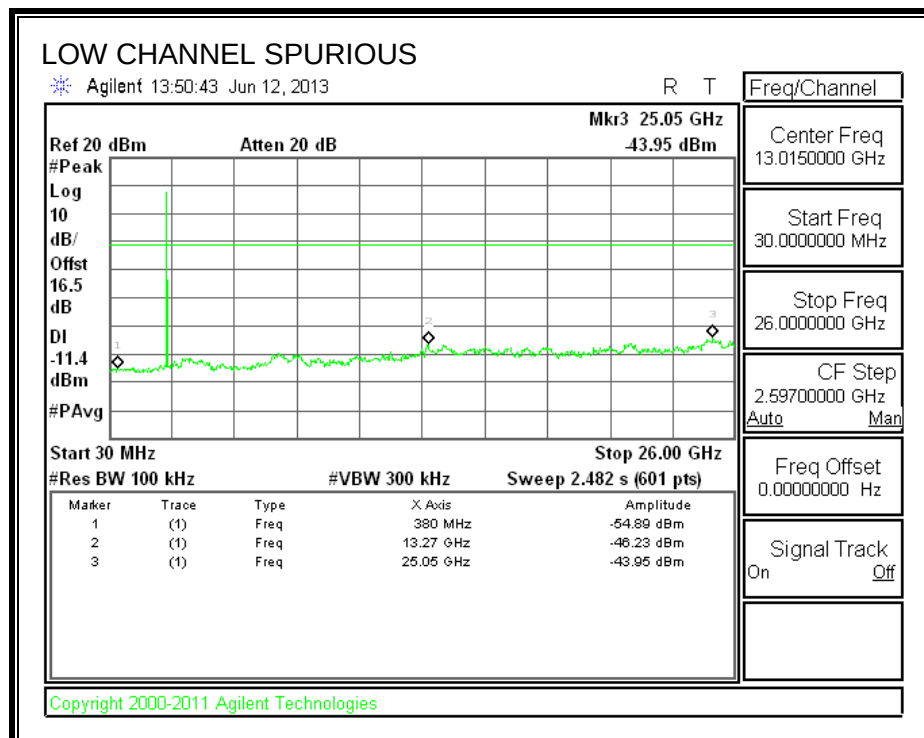
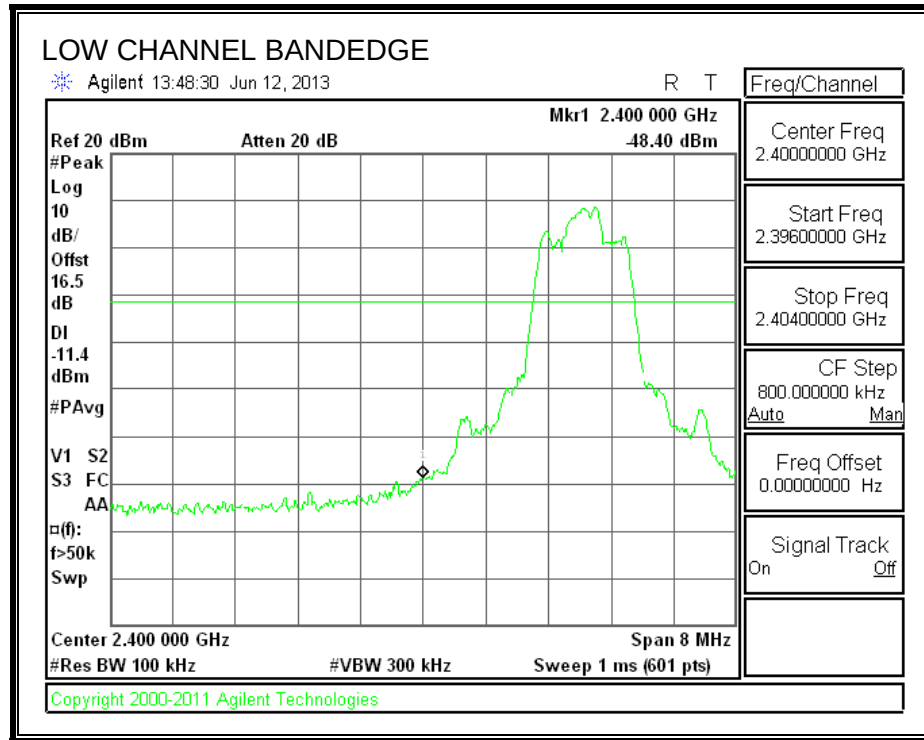
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

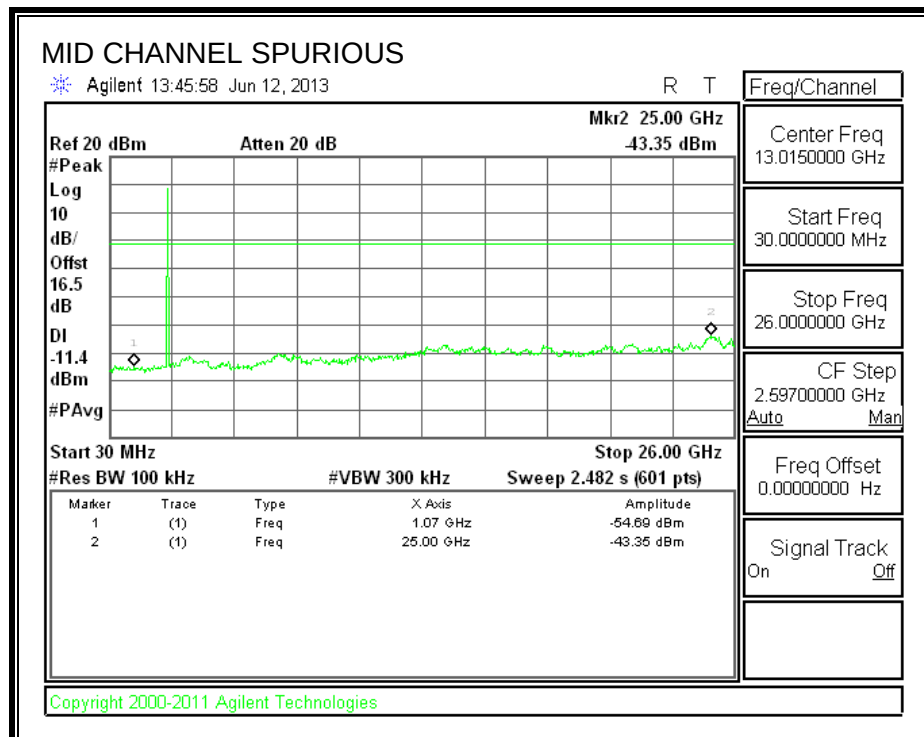
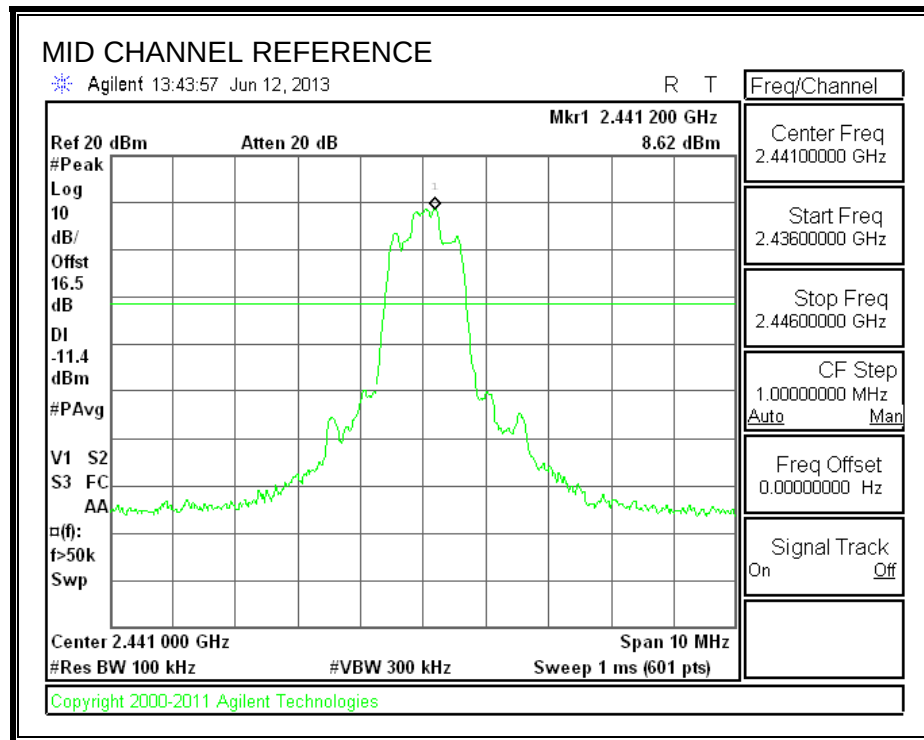
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

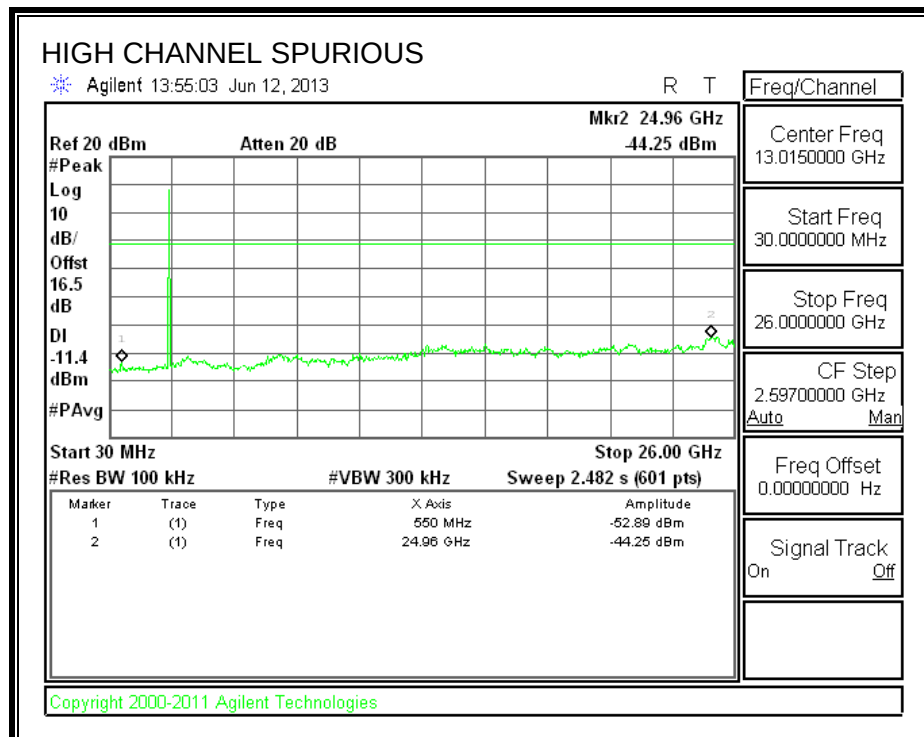
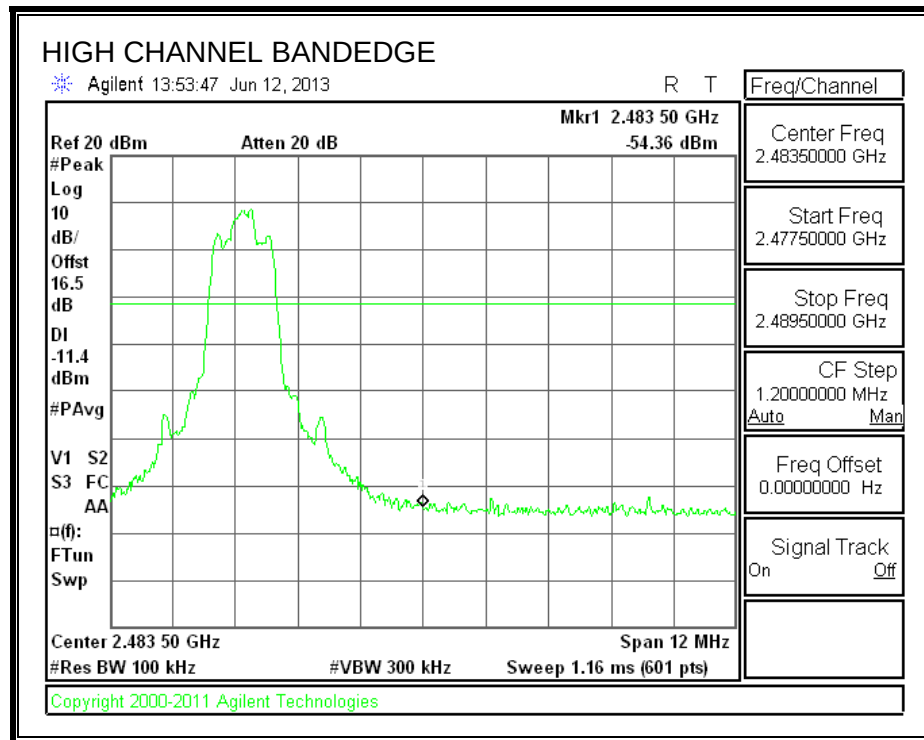
SPURIOUS EMISSIONS, LOW CHANNEL



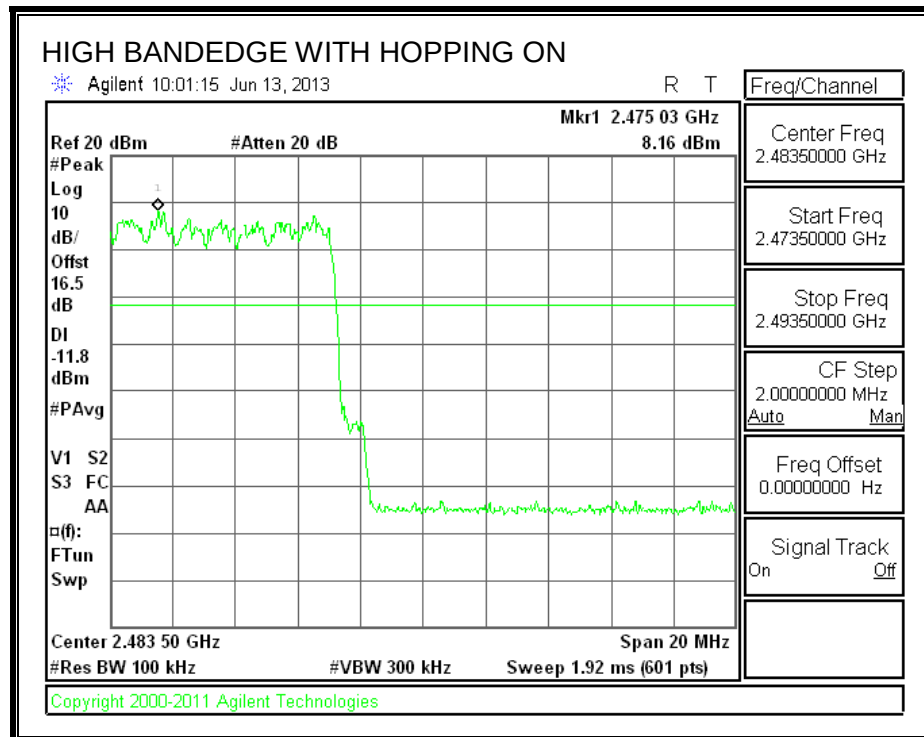
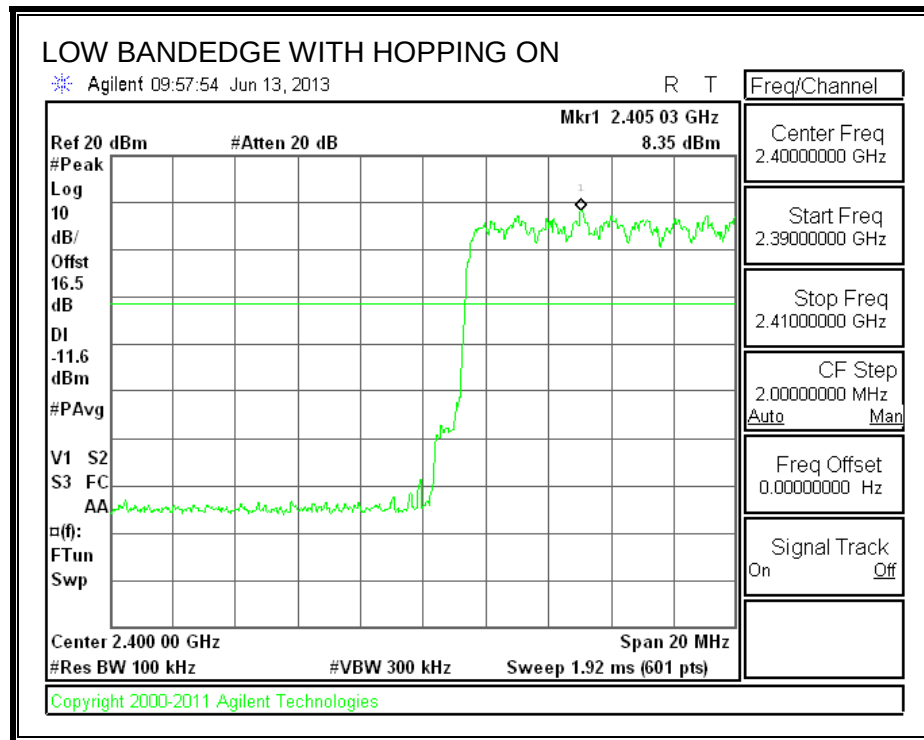
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10-2009. 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 1/T for average measurements.

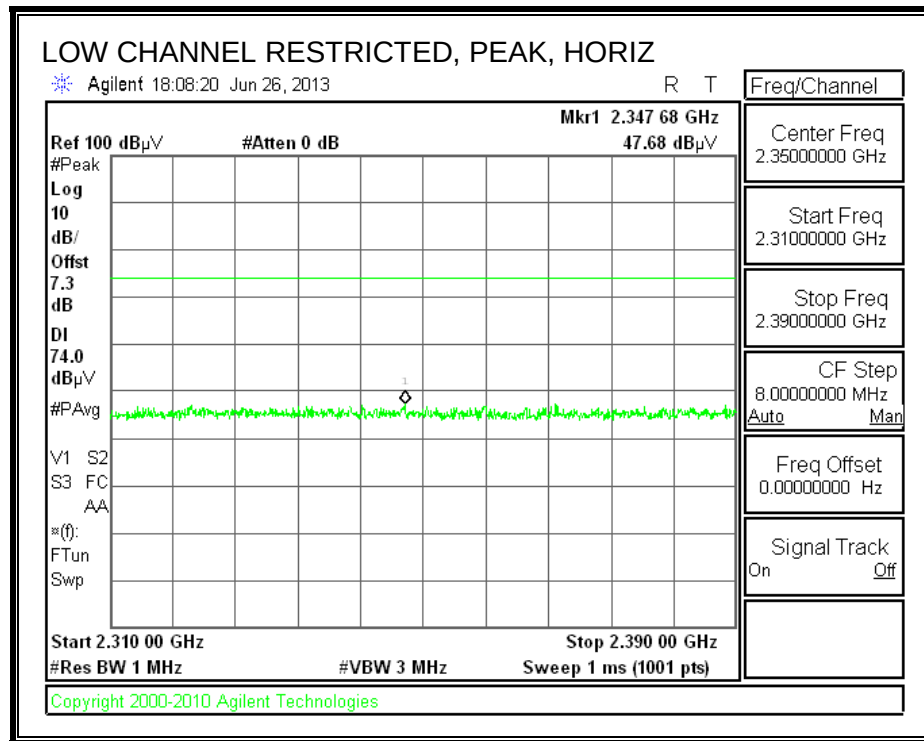
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

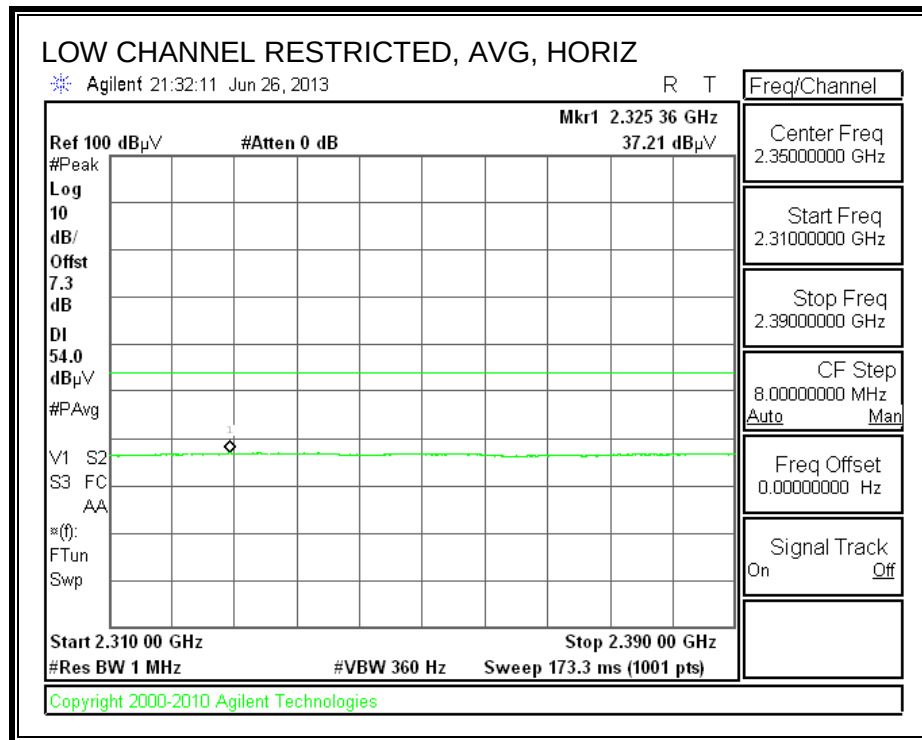
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

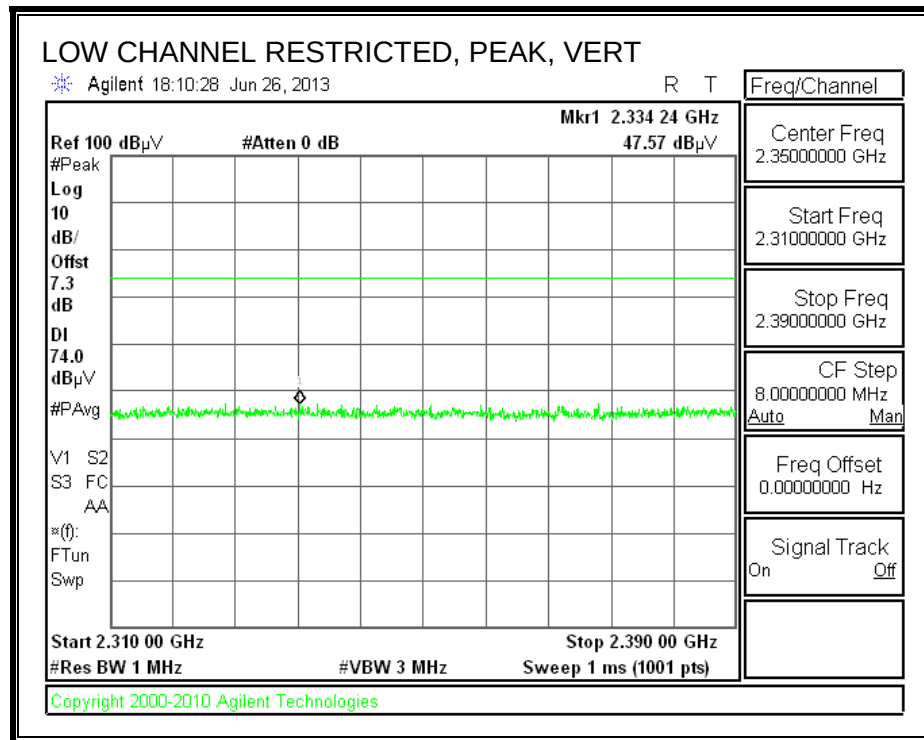
8.2.1. BASIC DATA RATE GFSK MODULATION

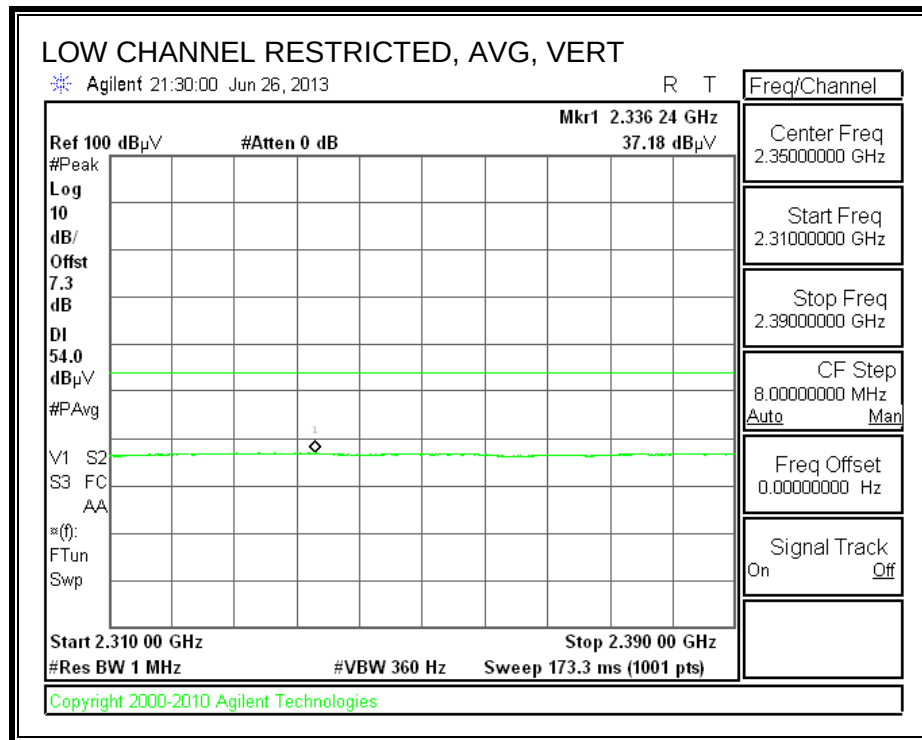
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



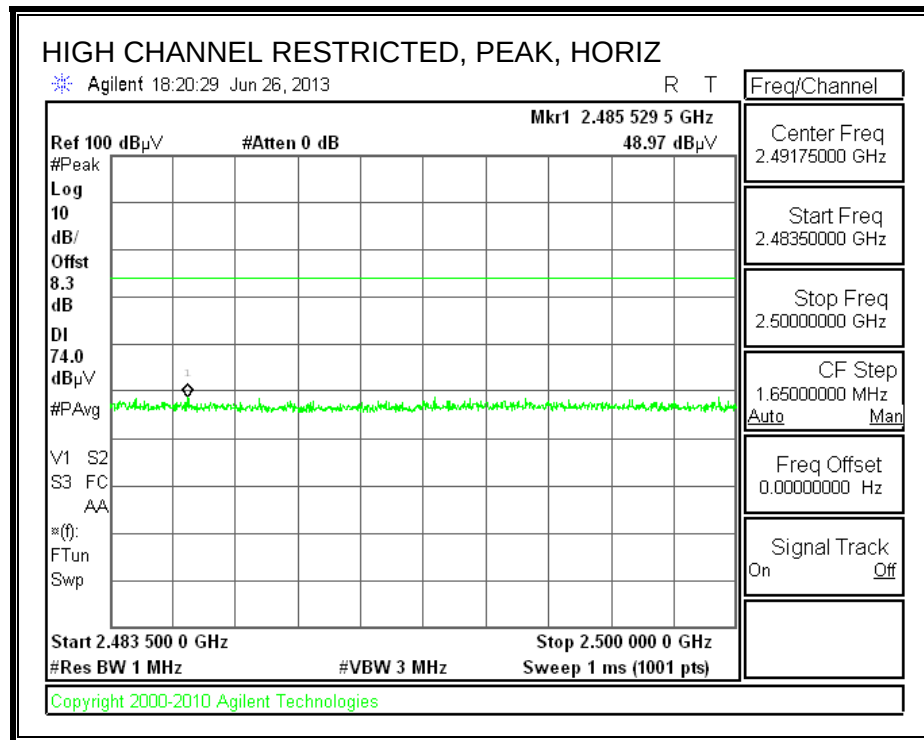


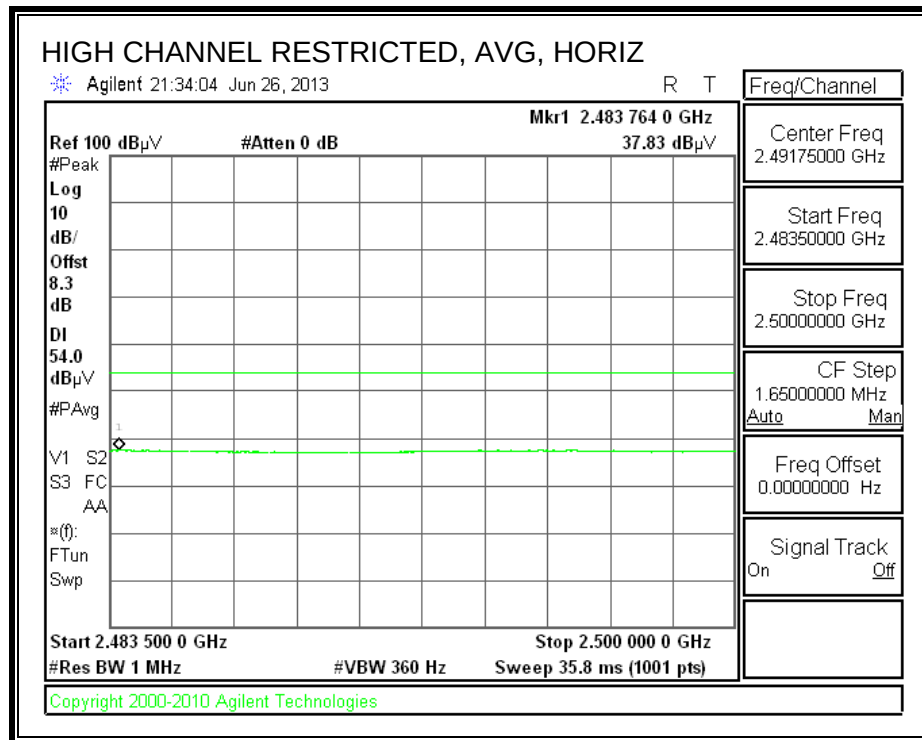
RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



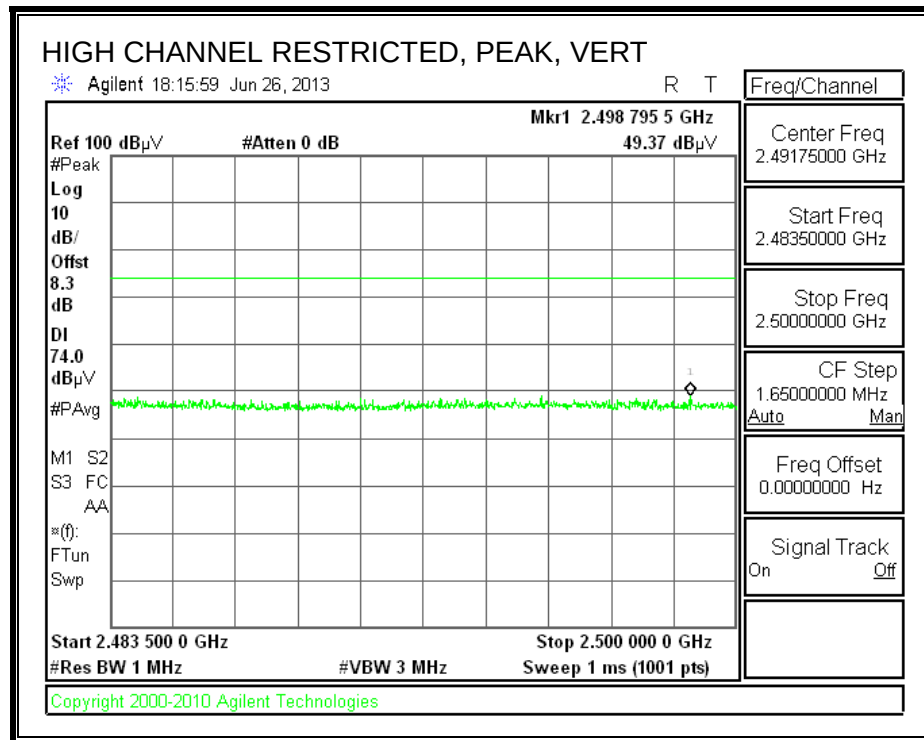


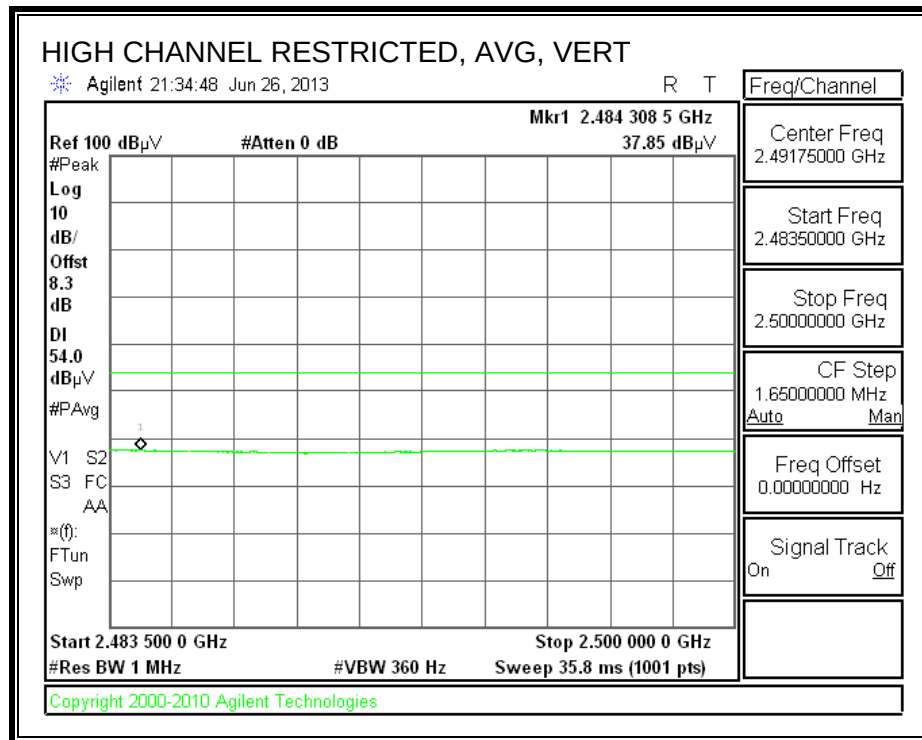
RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)



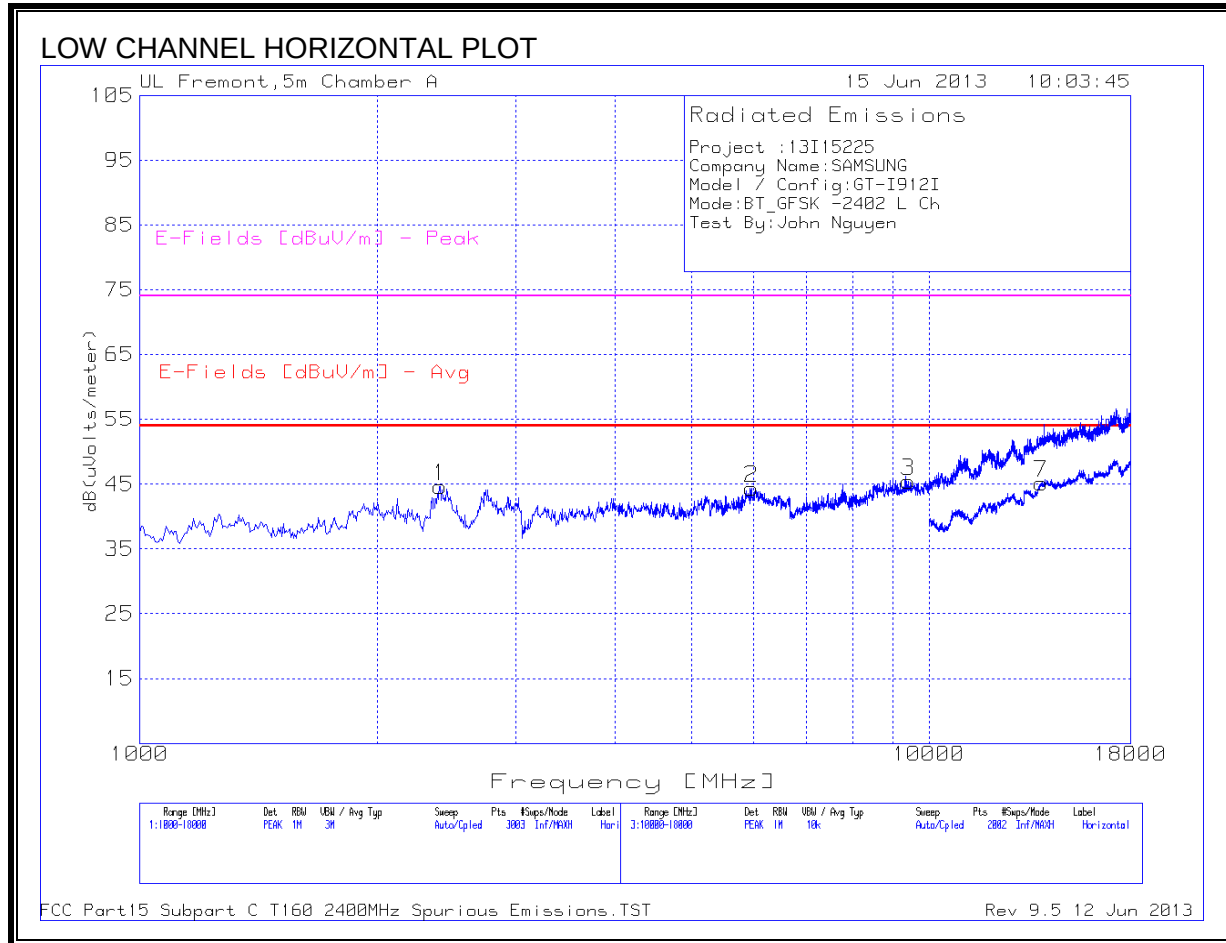


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

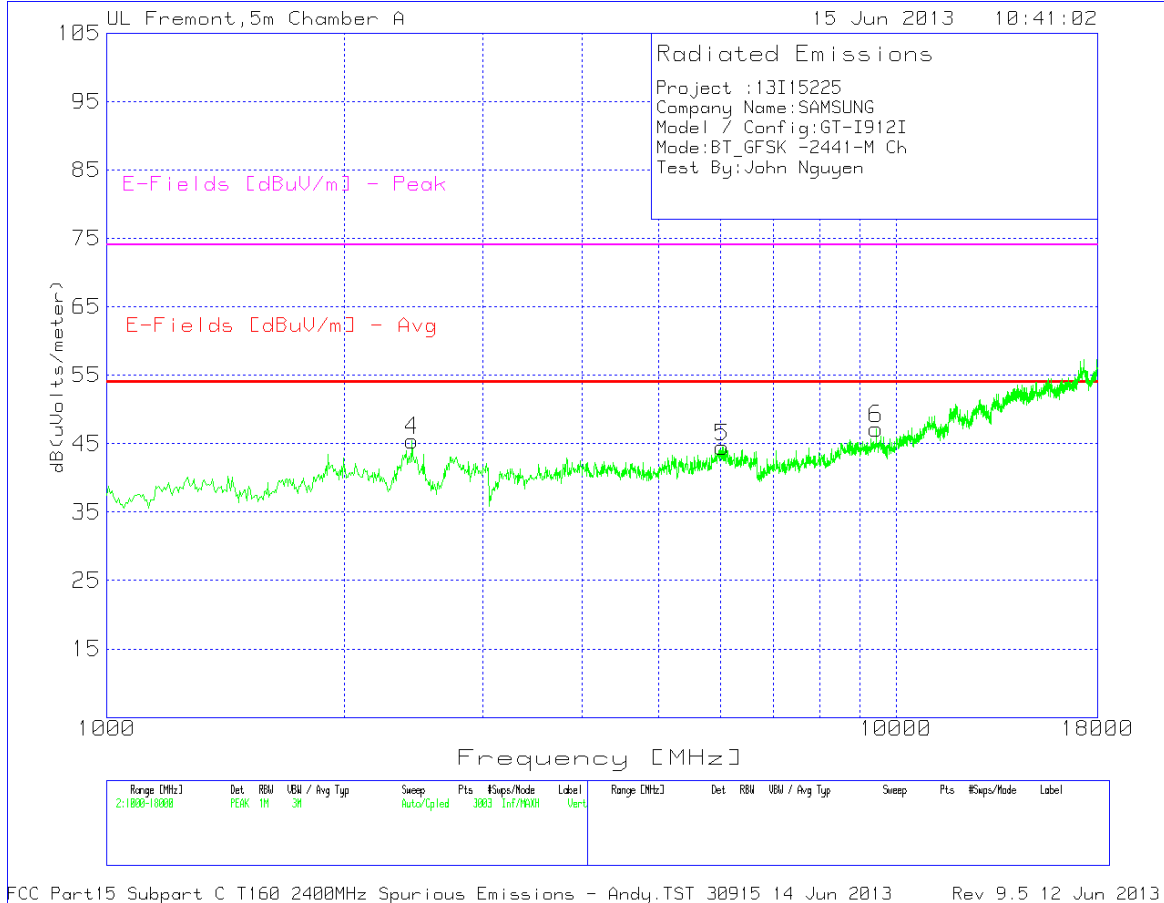




HARMONICS AND SPURIOUS EMISSIONS



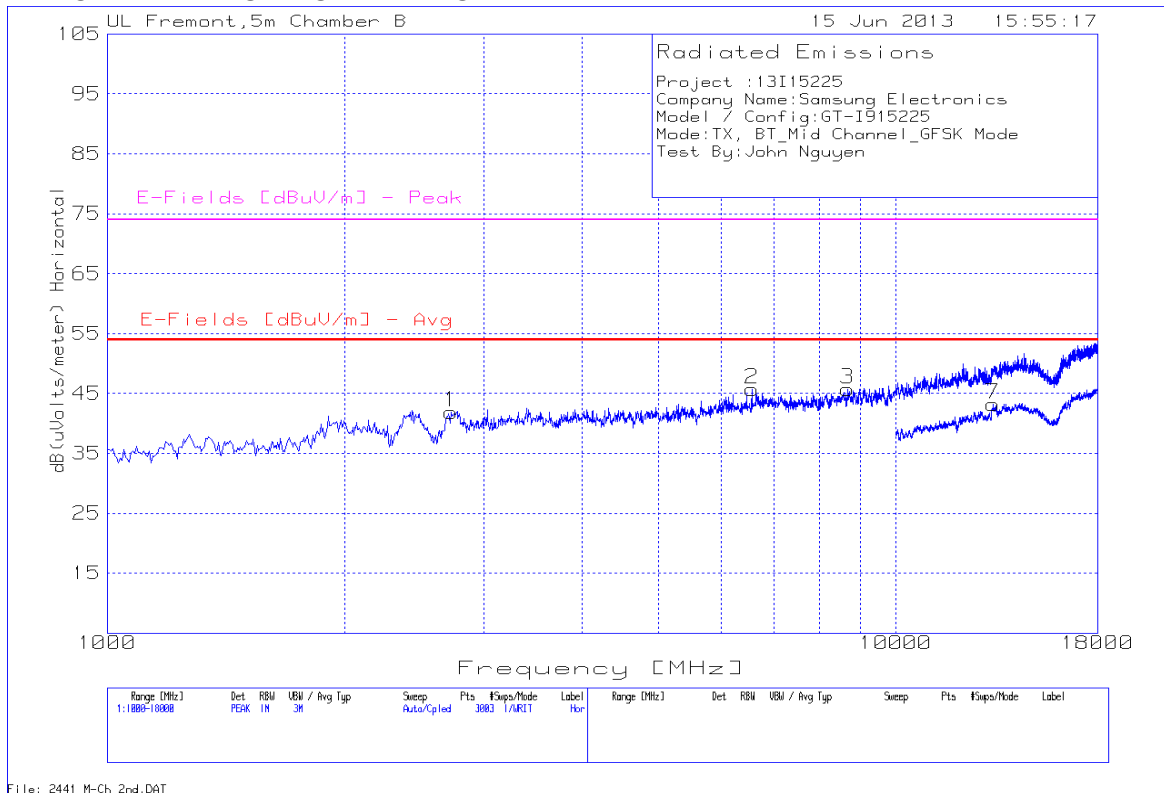
LOW CHANNEL VERTICAL PLOT



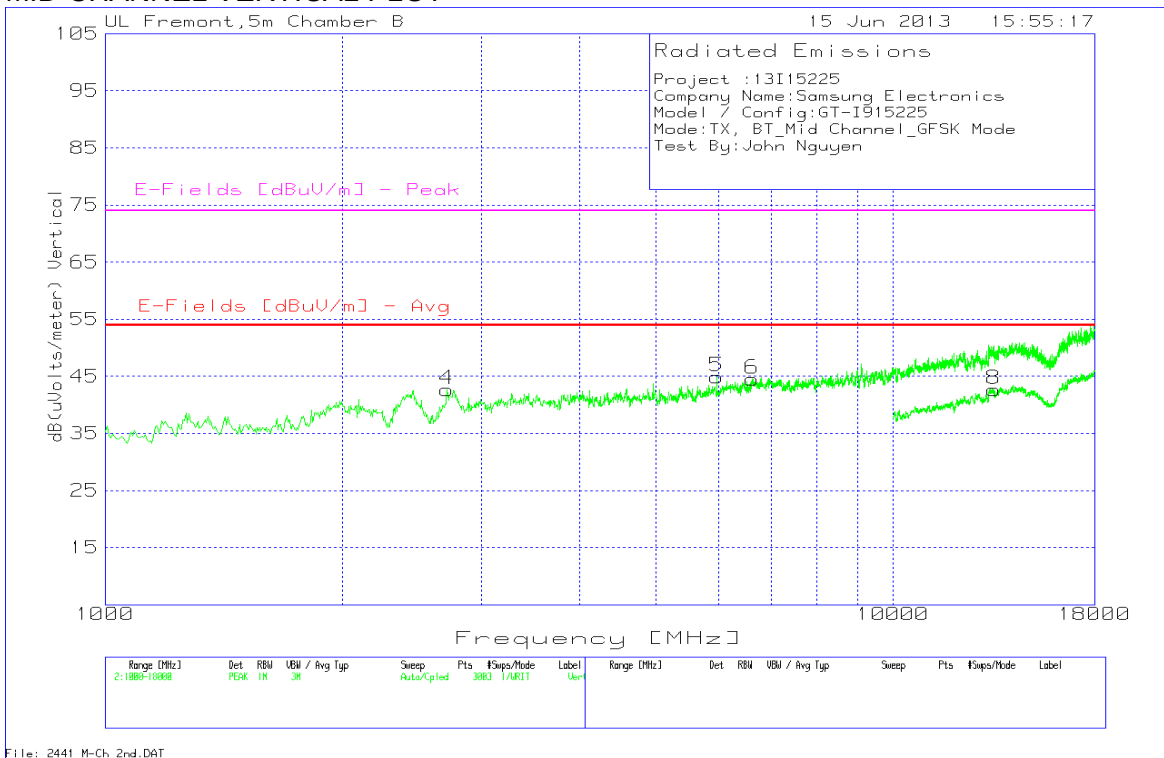
VERTICAL HORIZONTAL DATA

Trace Markers													
Frequency (GHz)	Meter Reading (dBuV)	Det	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height (cm)	Polarity
2.404	44.17	PK	32.1	-36.9	4.4	0.9	44.67	53.97	-9.3	74	-29.33	101	Horz
5.955	36.85	PK	35.2	-35.6	7.7	0.2	44.35	53.97	-9.62	74	-29.65	101	Horz
9.409	34.6	PK	36.4	-36.2	10.1	0.5	45.4	53.97	-8.57	74	-28.6	200	Horz
2.399	44.34	PK	32.1	-36.9	4.4	0.9	44.84	53.97	-9.13	74	-29.16	100	Vert
6.074	36.84	PK	35.3	-35.6	7.8	0.2	44.54	53.97	-9.43	74	-29.46	100	Vert
9.625	35.6	PK	36.7	-36.3	10.2	0.4	46.6	53.97	-7.37	74	-27.4	200	Vert
13.894	27.2	PK	39	-33.8	12.4	0.4	45.2	53.97	-8.77	74	-28.8	100	Horz
13.882	27.35	PK	39	-33.8	12.4	0.4	45.35	53.97	-8.62	74	-28.65	100	Vert
PK - Peak detector													
FCC Part15 Subpart C T160 2400MHz Spurious Emissions.TST Rev 9.5 12 Jun 2013													

MID CHANNEL HORIZONTAL PLOT

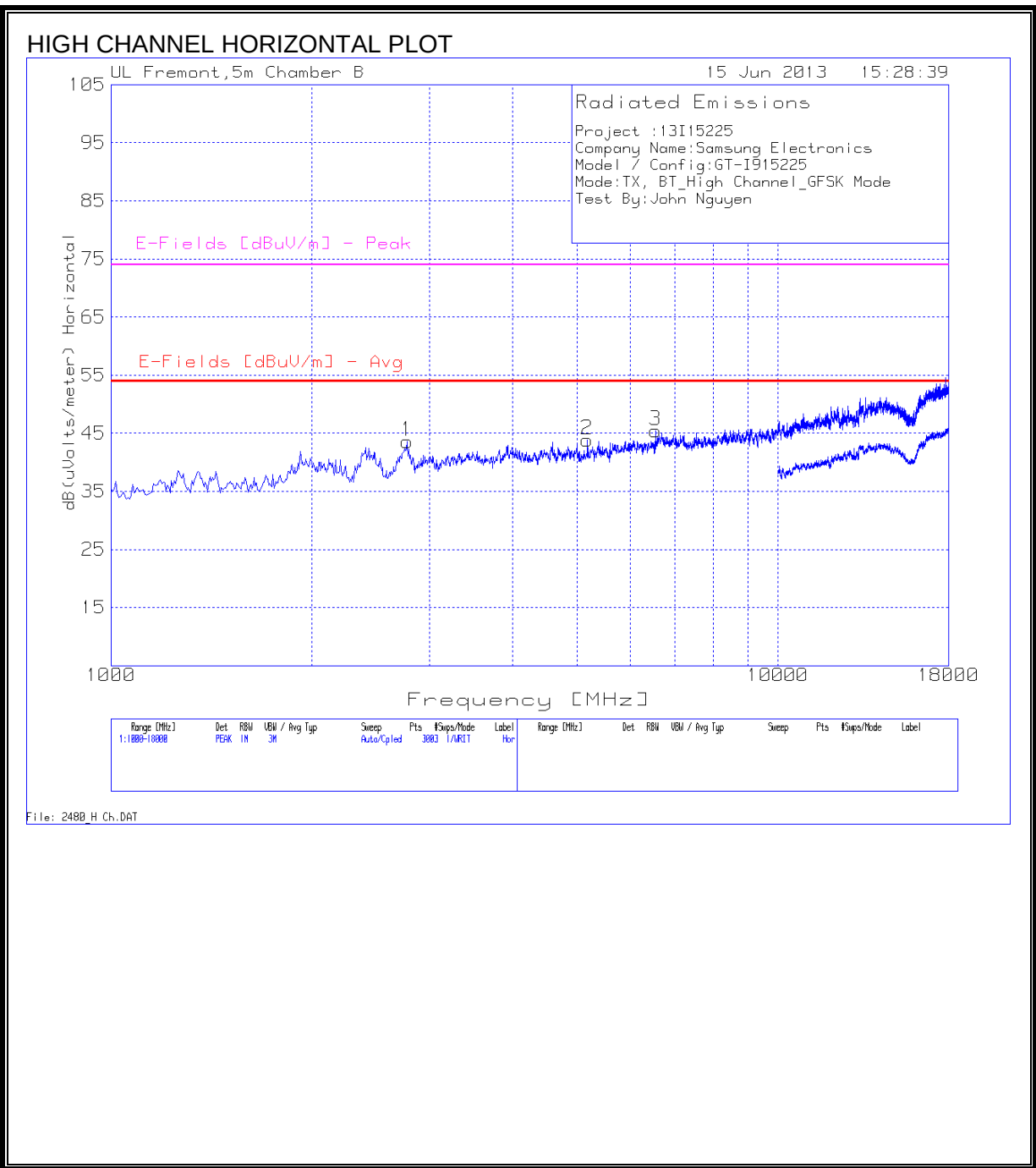


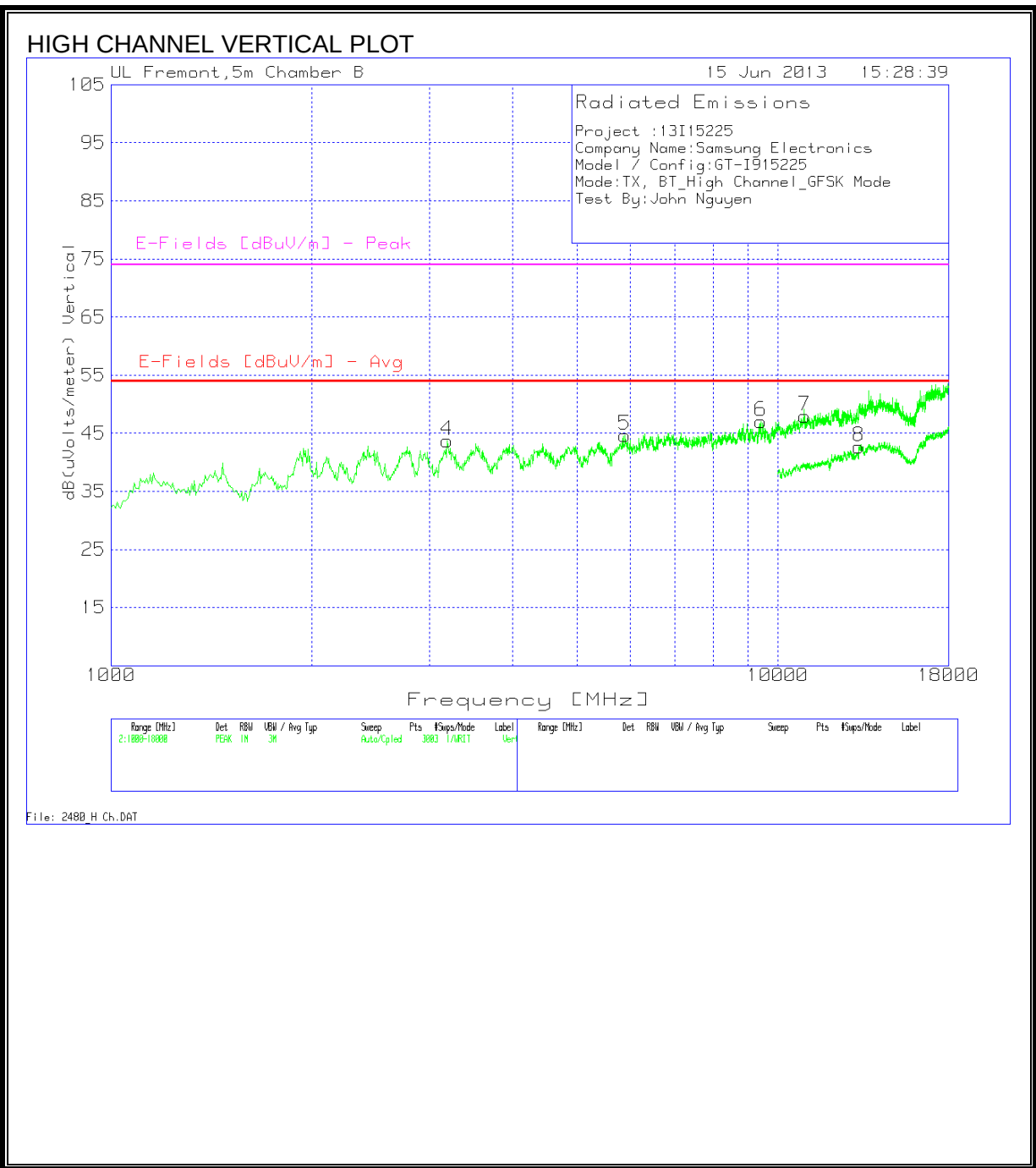
MID CHANNEL VERTICAL PLOT



VERTICAL HORIZONTAL DATA

Trace Markers													
Frequency (GHz)	Meter Reading (dBuV)	Det	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height (cm)	Polarity
2.438	46.57	PK	32.3	-36.9	4.5	0.9	47.37	53.97	-6.6	74	-26.63	101	Horz
6.102	36.22	PK	35.3	-35.6	7.8	0.2	43.92	53.97	-10.05	74	-30.08	101	Horz
9.54	34.31	PK	36.6	-36.2	10.1	0.6	45.41	53.97	-8.56	74	-28.59	200	Horz
2.438	44.67	PK	32.3	-36.9	4.5	0.9	45.47	53.97	-8.5	74	-28.53	100	Vert
6.023	36.96	PK	35.2	-35.6	7.7	0.2	44.46	53.97	-9.51	74	-29.54	200	Vert
9.438	36.3	PK	36.5	-36.2	10.1	0.5	47.2	53.97	-6.77	74	-26.8	200	Vert
Peak detector													
missions - Andy.TST 30915 14 Jun 2013Rev 9.5 12 Jun 2013													





VERTICAL HORIZONTAL DATA

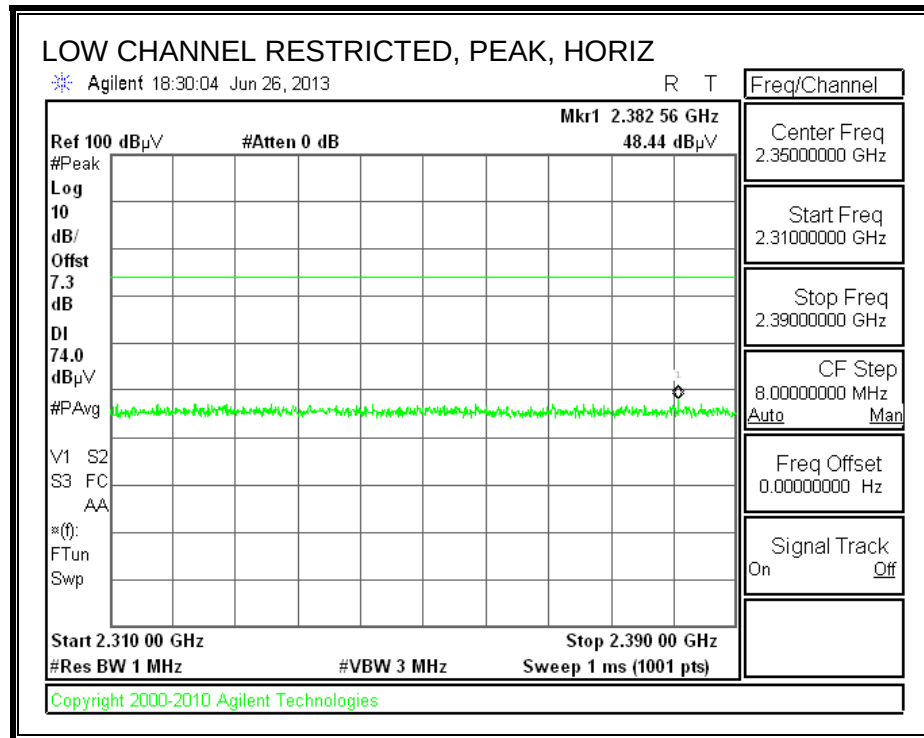
Project :13I15225
Company Name:Samsung Electronics
Model / Config:GT-I915225
Mode:TX, BT_High Channel_GFSK Mode
Test By:John Nguyen

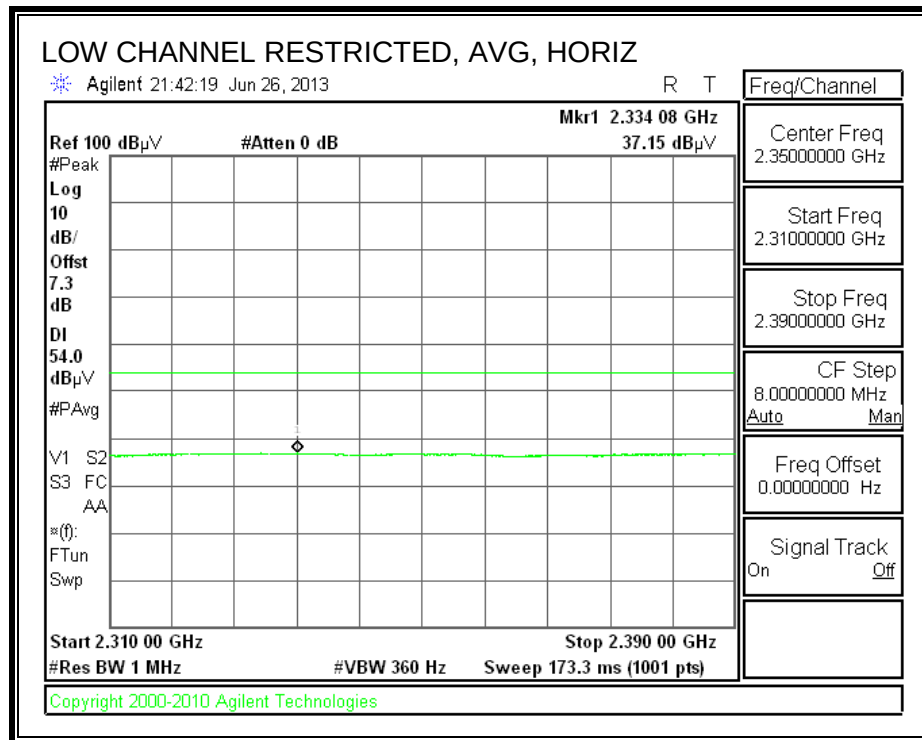
Marker No.	Test Frequency	Meter Reading(dBuV)	Detector	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts /meter)	E-Fields [dBuV/m] Avg	Margin (dB)	E-Fields [dBuV/m] Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz														
1	2778.148	41.96	PK	32.6	-36.7	4.8	0.9	43.56	53.97	-10.41	74	-30.44	101	Horz
2	5179.214	37.92	PK	34.2	-35.5	7	0.2	43.82	53.97	-10.15	74	-30.18	200	Horz
3	6555.296	37.1	PK	35.5	-35.6	8.1	0.3	45.4	53.97	-8.57	74	-28.6	200	Horz
Vertical 1000 - 18000MHz														
4	3191.539	41.17	PK	33.5	-36.6	5.2	0.5	43.77	53.97	-10.2	74	-30.23	200	Vert
5	5892.738	37.33	PK	35.1	-35.6	7.6	0.2	44.63	53.97	-9.34	74	-29.37	200	Vert
6	9415.057	36.22	PK	36.4	-36.2	10.1	0.5	47.02	53.97	-6.95	74	-26.98	200	Vert
7	10966.689	34.23	PK	37.8	-35.6	10.9	0.6	47.93	53.97	-6.04	74	-26.07	100	Vert

Marker No.	Test Frequency	Meter Reading(dBuV)	Detector	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts /meter)	E-Fields [dBuV/m] Avg	Margin (dB)	E-Fields [dBuV/m] Peak	Margin (dB)	Height [cm]	Polarity
Vertical 10000 - 18000MHz														
8	13222.389	25.22	PK	39.1	-34.1	12.1	0.4	42.72	53.97	-11.25	74	-31.28	100	Vert
PK - Peak detector														
QP - Quasi-Peak detector														

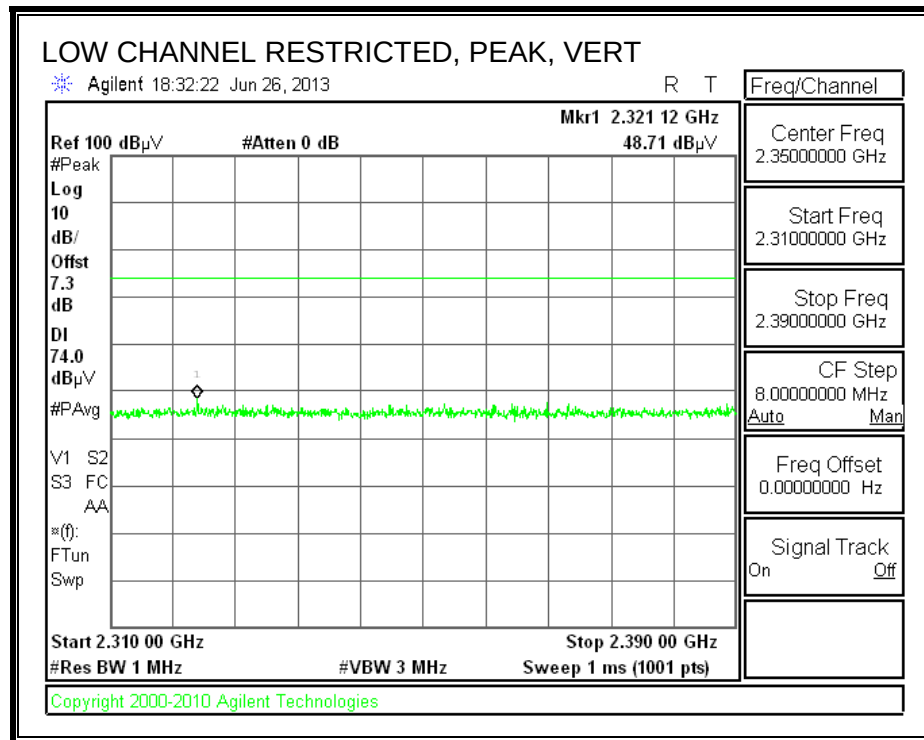
8.2.2. ENHANCED DATA RATE 8PSK MODULATION

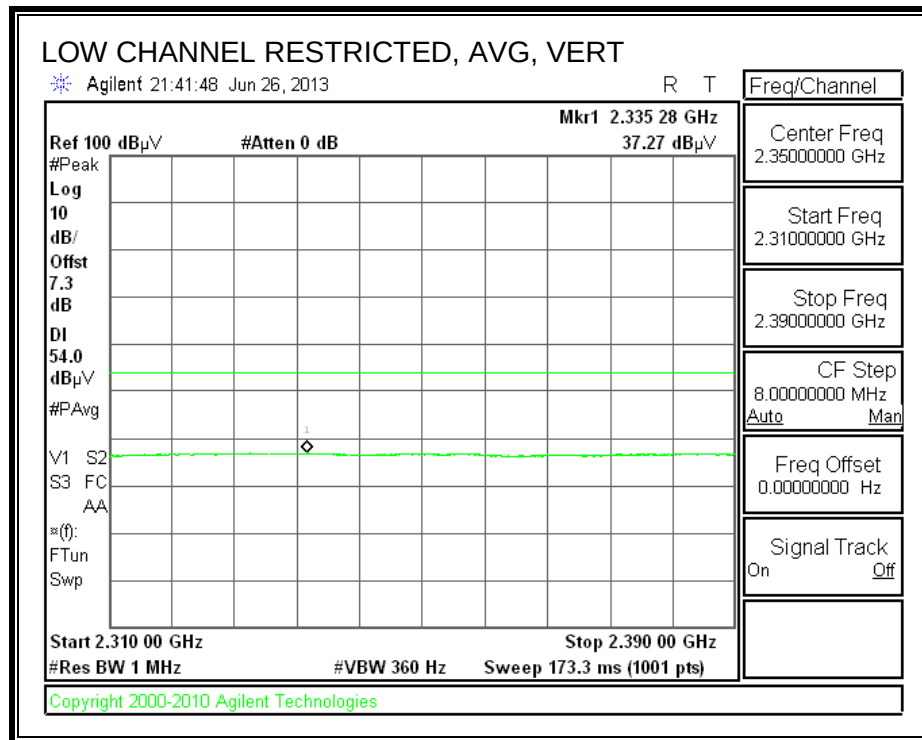
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



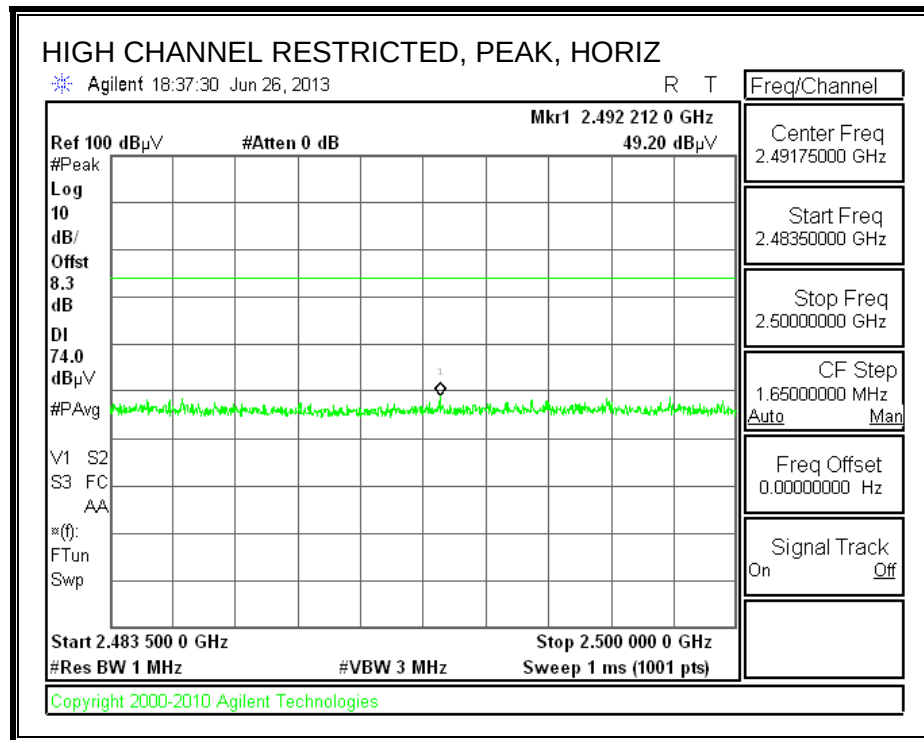


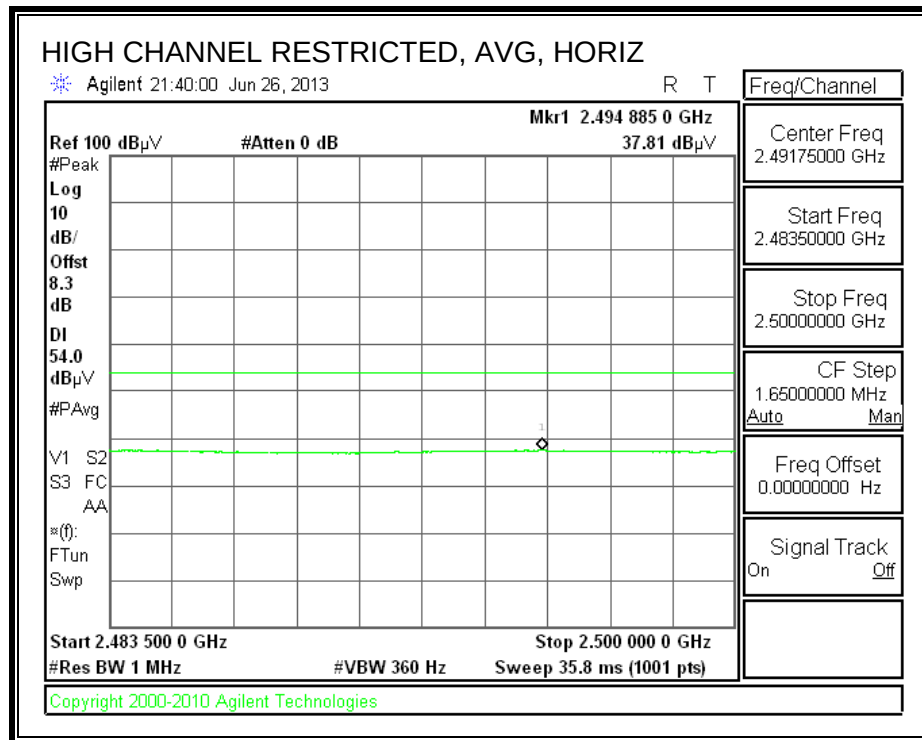
RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



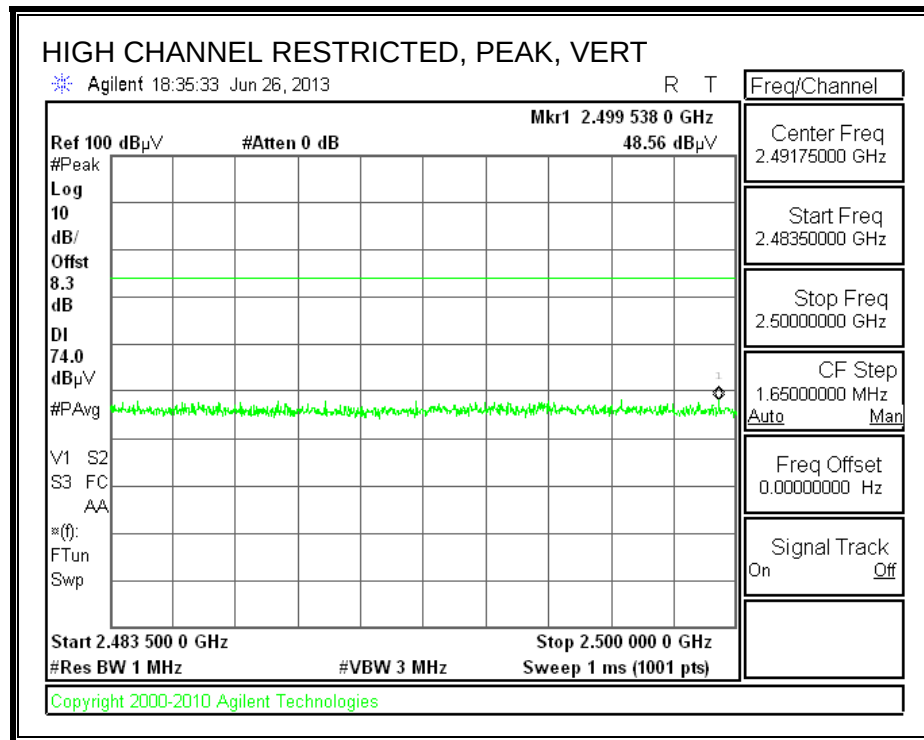


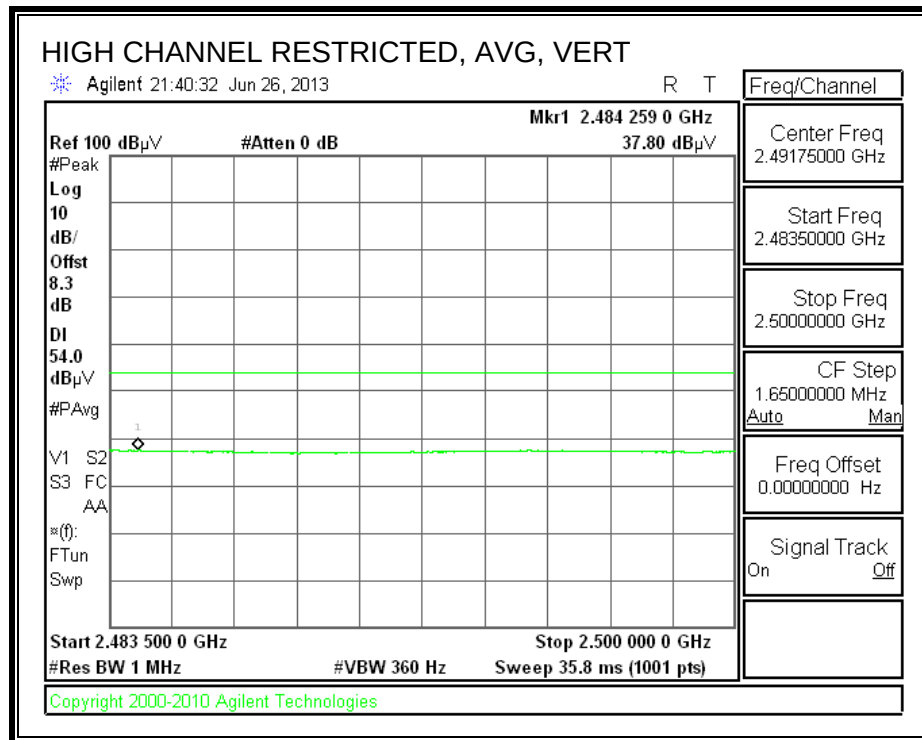
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



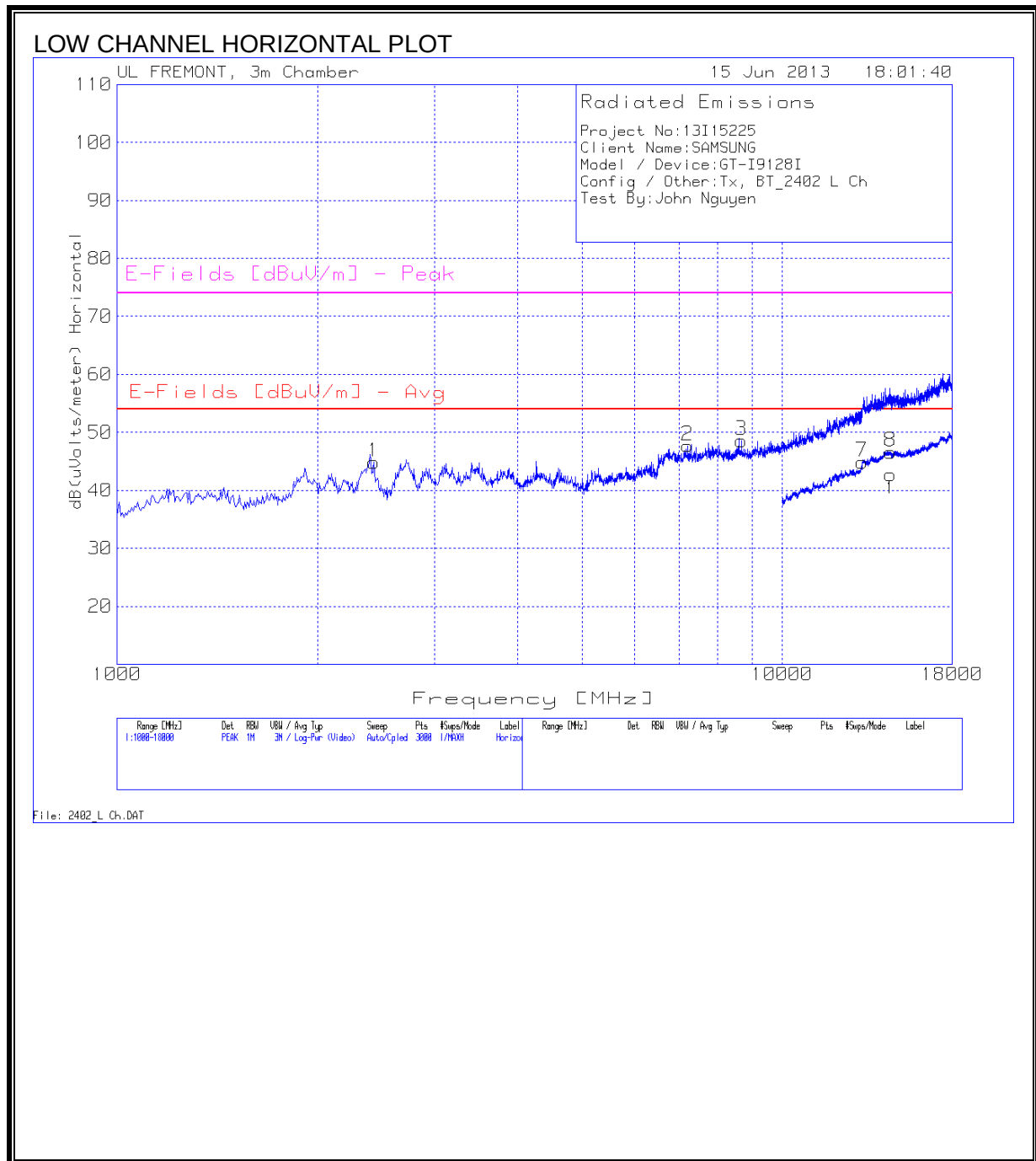


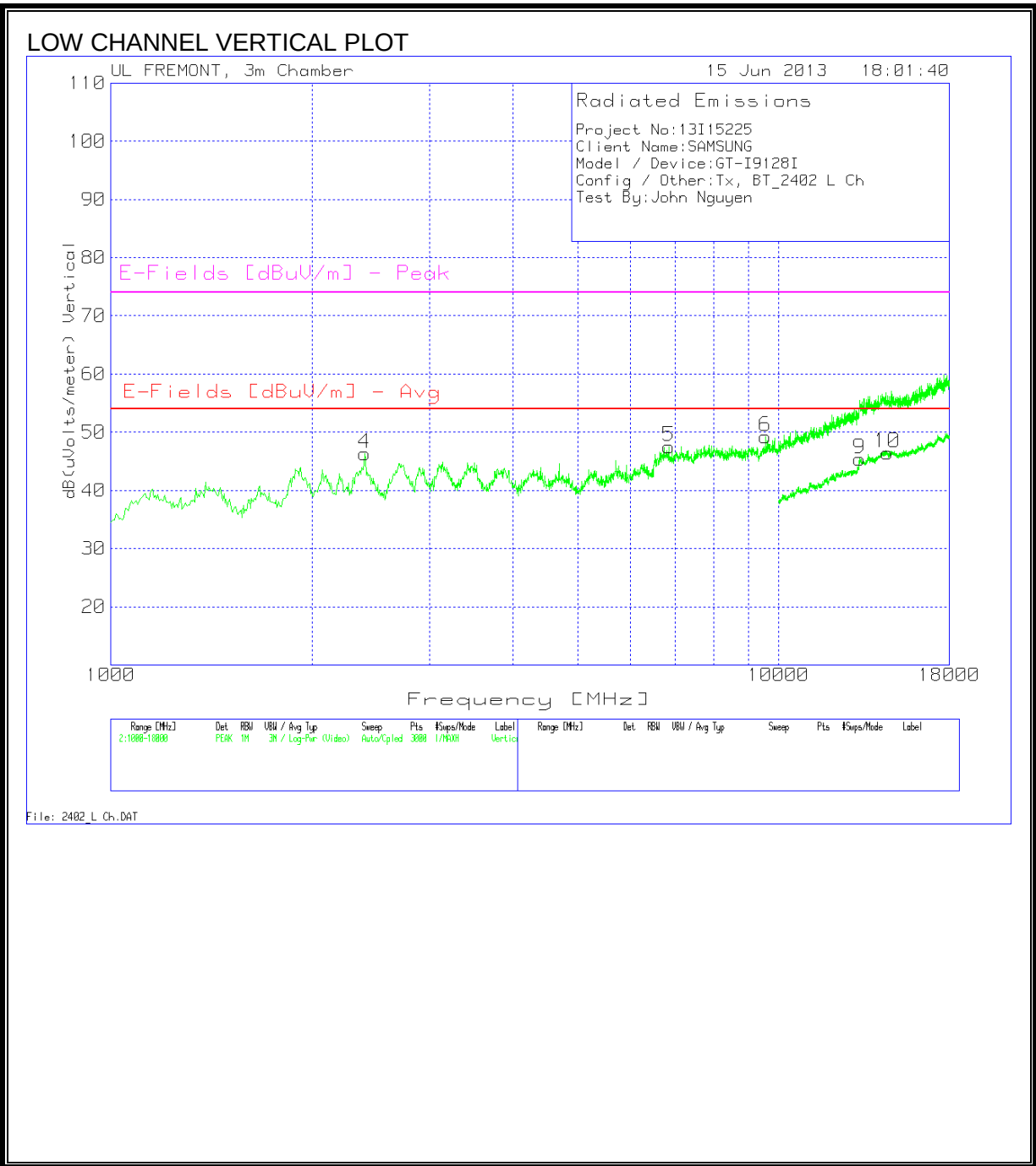
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS





VERTICAL HORIZONTAL DATA

Project No:	13I15225													
Client Name:	SAMSUNG													
Model / Device:	GT-I9128I													
Config / Other:	Tx, BT_2402 L Ch													
Test By:	John Nguyen													

Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [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	2432.712	41.42	PK	32.2	-29.7	0.9	44.82	53.97	-9.15	74	-29.18	101	Horz
2	7200.866	34.92	PK	35.6	-23.1	0.3	47.72	53.97	-6.25	74	-26.28	101	Horz
3	8673.218	34.54	PK	35.8	-22.1	0.4	48.64	53.97	-5.33	74	-25.36	101	Horz
Vertical 1000 - 18000MHz													
4	2398.734	42.99	PK	32.1	-29.7	0.9	46.29	53.97	-7.68	74	-27.71	99	Vert
5	6844.104	34.84	PK	35.6	-23.2	0.3	47.54	53.97	-6.43	74	-26.46	99	Vert
6	9545.303	33.86	PK	36.6	-21.8	0.6	49.26	53.97	-4.71	74	-24.74	99	Vert

Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [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 10000 - 18000MHz													
7	13198.401	22.27	PK	39	-16.8	0.4	44.87	53.97	-9.1	74	-29.13	100	Horz
8	14553.723	22.55	PK	39.7	-16	0.4	46.65	53.97	-7.32	74	-27.35	201	Horz
Vertical 10000 - 18000MHz													
9	13234.383	22.66	PK	39.1	-16.7	0.4	45.46	53.97	-8.51	74	-28.54	200	Vert
10	14549.725	22.42	PK	39.7	-16	0.4	46.52	53.97	-7.45	74	-27.48	200	Vert

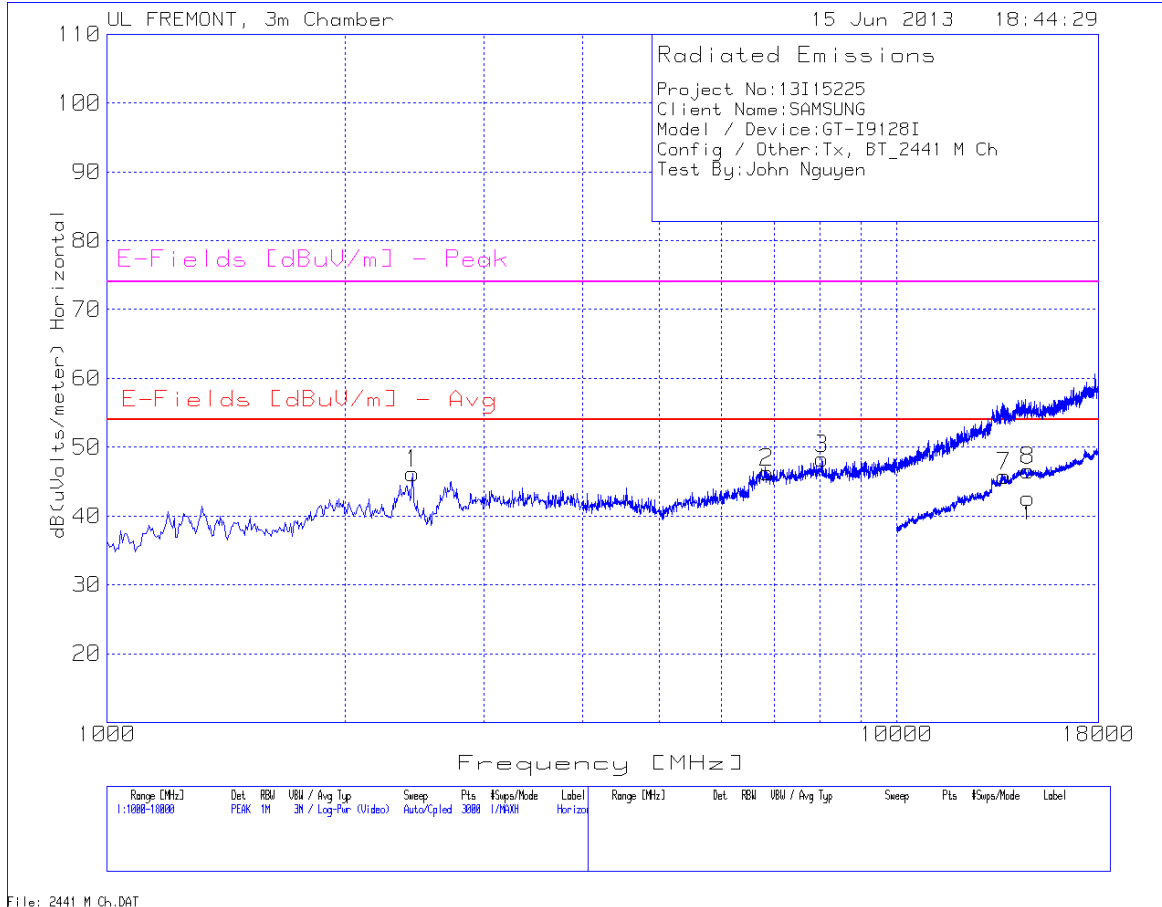
Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [dB]	T160 BRF [dB]	dB(uVolts /meter)	E-Fields [dBuV/m] Avg	Margin (dB)	E-Fields [dBuV/m] Peak	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
Vertical 1000 - 18000MHz													
9543.72	28.53	PK	36.6	-21.8	0.6	43.93	53.97	-10.04	74	-30.07	24	316	Vert

PK - Peak detector

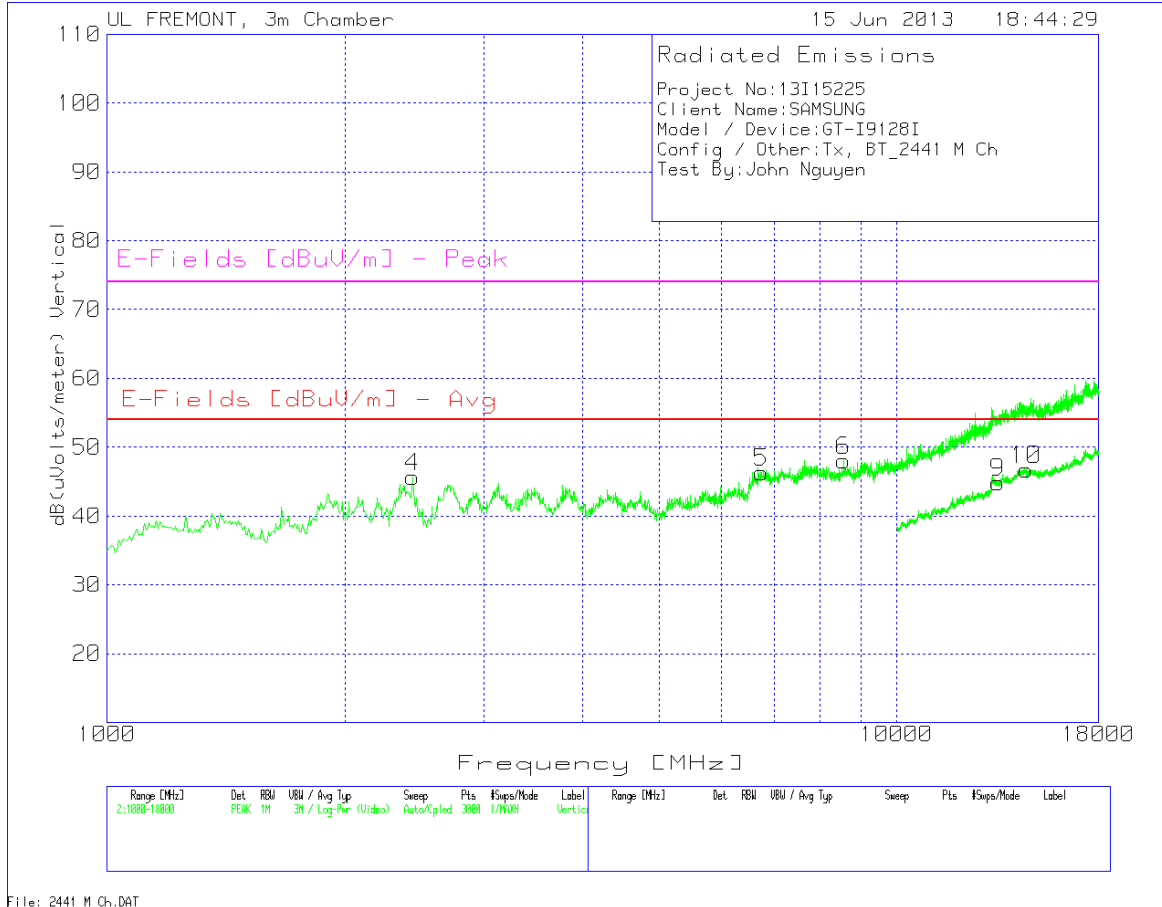
QP - Quasi-Peak detector

Av - Average detector

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



VERTICAL HORIZONTAL DATA

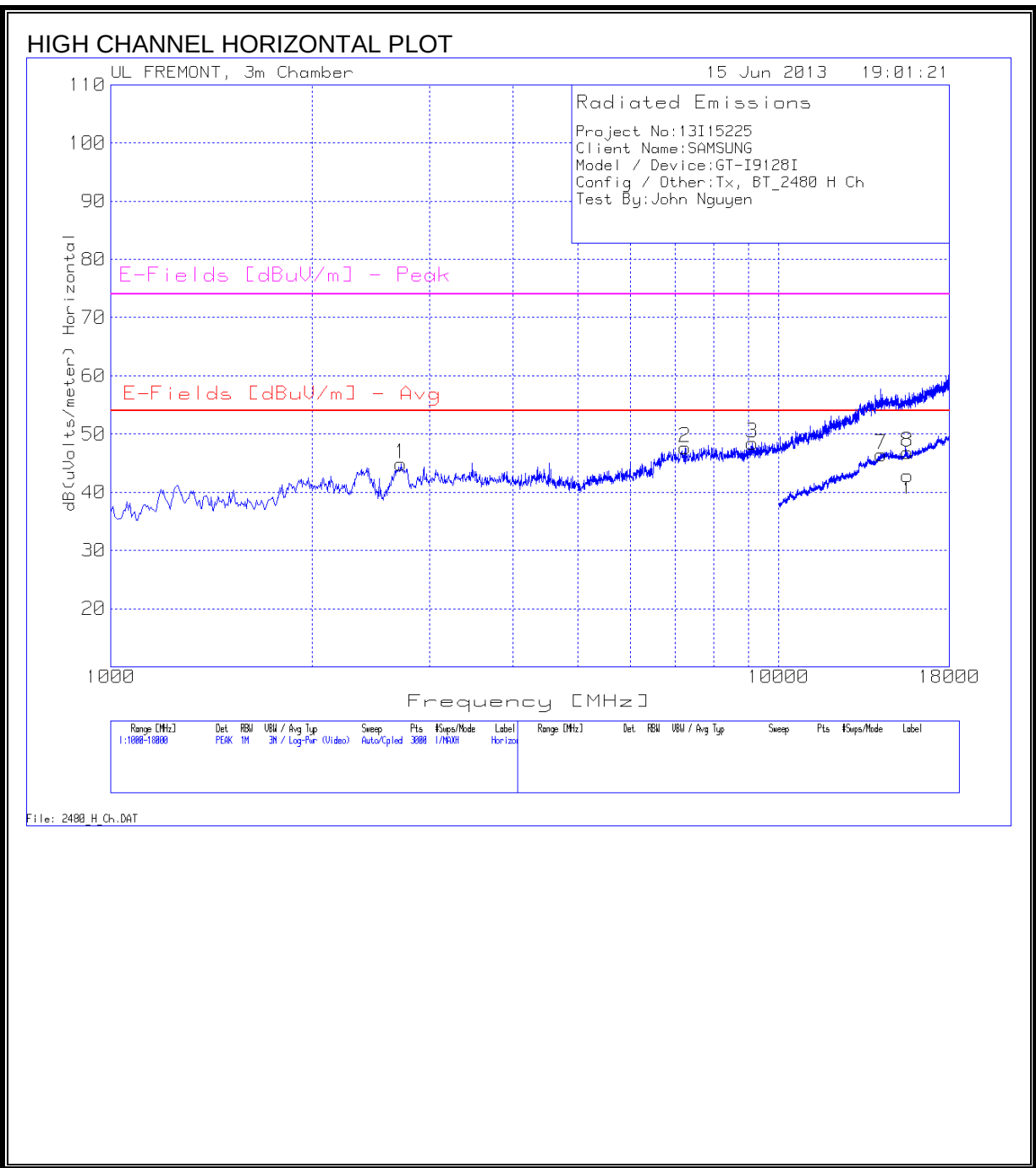
Project No:13I15225													
Client Name:SAMSUNG													
Model / Device:GT-I9128I													
Config / Other:Tx, BT_2441 M Ch													
Test By:John Nguyen													

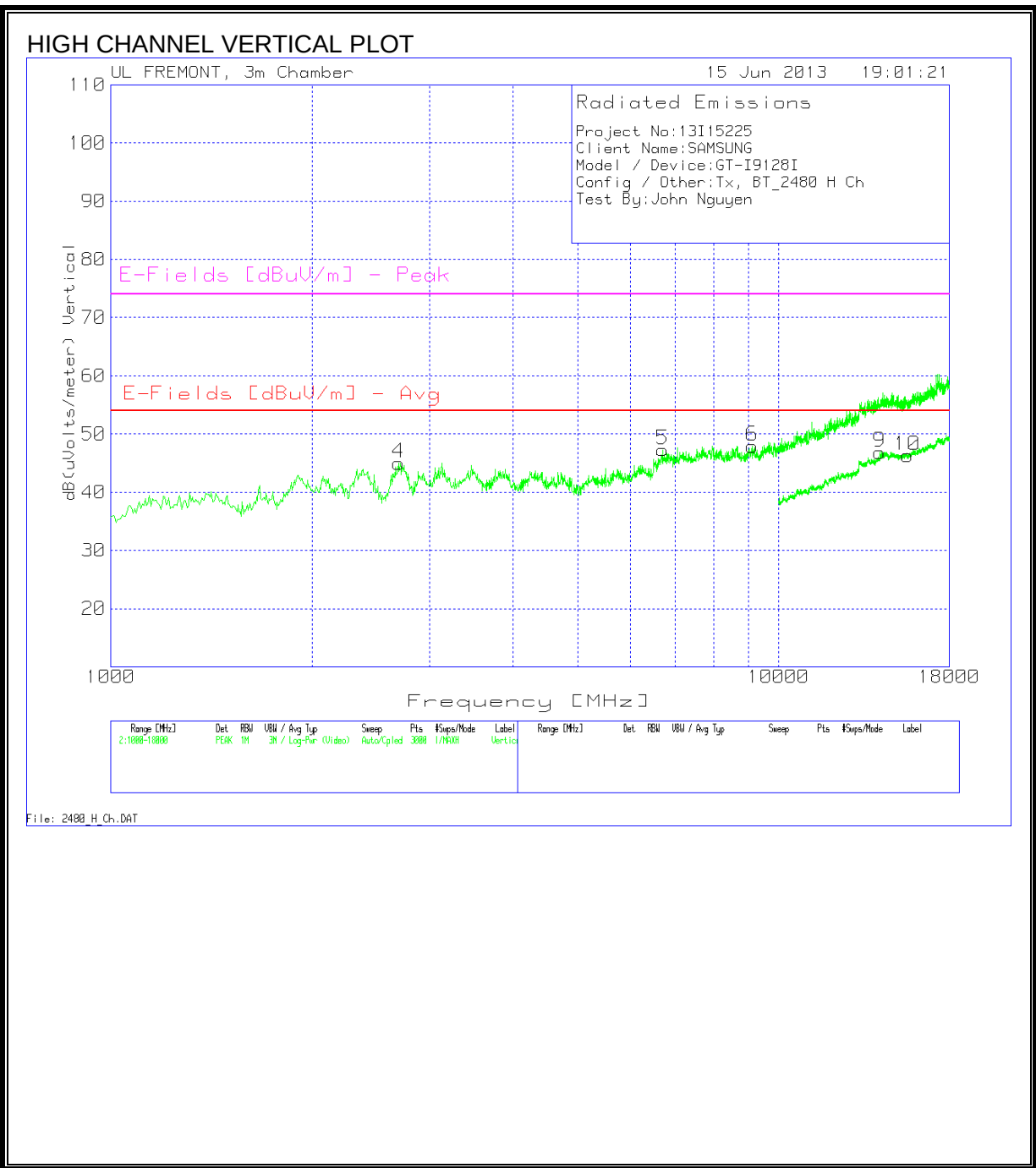
Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [dB]	T160 BRF [dB]	dB(uVolts /meter)	E-Fields [dBuV/m] Avg	Margin (dB)	E-Fields [dBuV/m] Peak	Margin (dB)	Height [cm]	Polarity
Horizontal 1000 - 18000MHz													
1	2438.374	42.66	PK	32.2	-29.6	0.9	46.16	53.97	-7.81	74	-27.84	99	Horz
2	6849.767	33.6	PK	35.6	-23.2	0.3	46.3	53.97	-7.67	74	-27.7	99	Horz
3	8044.637	34.76	PK	35.7	-22.4	0.3	48.36	53.97	-5.61	74	-25.64	99	Horz
Vertical 1000 - 18000MHz													
4	2438.374	42.12	PK	32.2	-29.6	0.9	45.62	53.97	-8.35	74	-28.38	100	Vert
5	6730.846	33.69	PK	35.6	-23.3	0.3	46.29	53.97	-7.68	74	-27.71	100	Vert
6	8559.96	33.91	PK	35.8	-22.1	0.4	48.01	53.97	-5.96	74	-25.99	100	Vert

Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [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 10000 - 18000MHz													
7	13690.155	22.76	PK	38.8	-16	0.3	45.86	53.97	-8.11	74	-28.14	99	Horz
8	14661.669	22.58	PK	39.7	-16.1	0.4	46.58	53.97	-7.39	74	-27.42	201	Horz
Vertical 10000 - 18000MHz													
9	13442.279	21.98	PK	39.1	-16.5	0.3	44.88	53.97	-9.09	74	-29.12	201	Vert
10	14585.707	22.7	PK	39.7	-16.1	0.4	46.7	53.97	-7.27	74	-27.3	99	Vert

PK - Peak detector

QP - Quasi-Peak detector





VERTICAL HORIZONTAL DATA

Project No:13I15225													
Client Name:SAMSUNG													
Model / Device:GT-I9128I													
Config / Other:Tx, BT_2480 H Ch													
Test By:John Nguyen													

Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [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	2715.856	40.35	PK	32.6	-29	0.9	44.85	53.97	-9.12	74	-29.15	100	Horz
2	7246.169	34.83	PK	35.6	-23.1	0.3	47.63	53.97	-6.34	74	-26.37	100	Horz
3	9137.575	33.72	PK	36.2	-22	0.5	48.42	53.97	-5.55	74	-25.58	100	Horz

Vertical 1000 - 18000MHz													
4	2698.867	40.53	PK	32.6	-29	0.9	45.03	53.97	-8.94	74	-28.97	99	Vert
5	6696.869	34.82	PK	35.6	-23.4	0.3	47.32	53.97	-6.65	74	-26.68	201	Vert
6	9120.586	33.25	PK	36.2	-22	0.5	47.95	53.97	-6.02	74	-26.05	99	Vert

Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [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 10000 - 18000MHz													
7	14257.871	22.63	PK	39.2	-15.8	0.4	46.43	53.97	-7.54	74	-27.57	201	Horz
8	15593.203	22.64	PK	40.4	-16.6	0.4	46.84	53.97	-7.13	74	-27.16	201	Horz

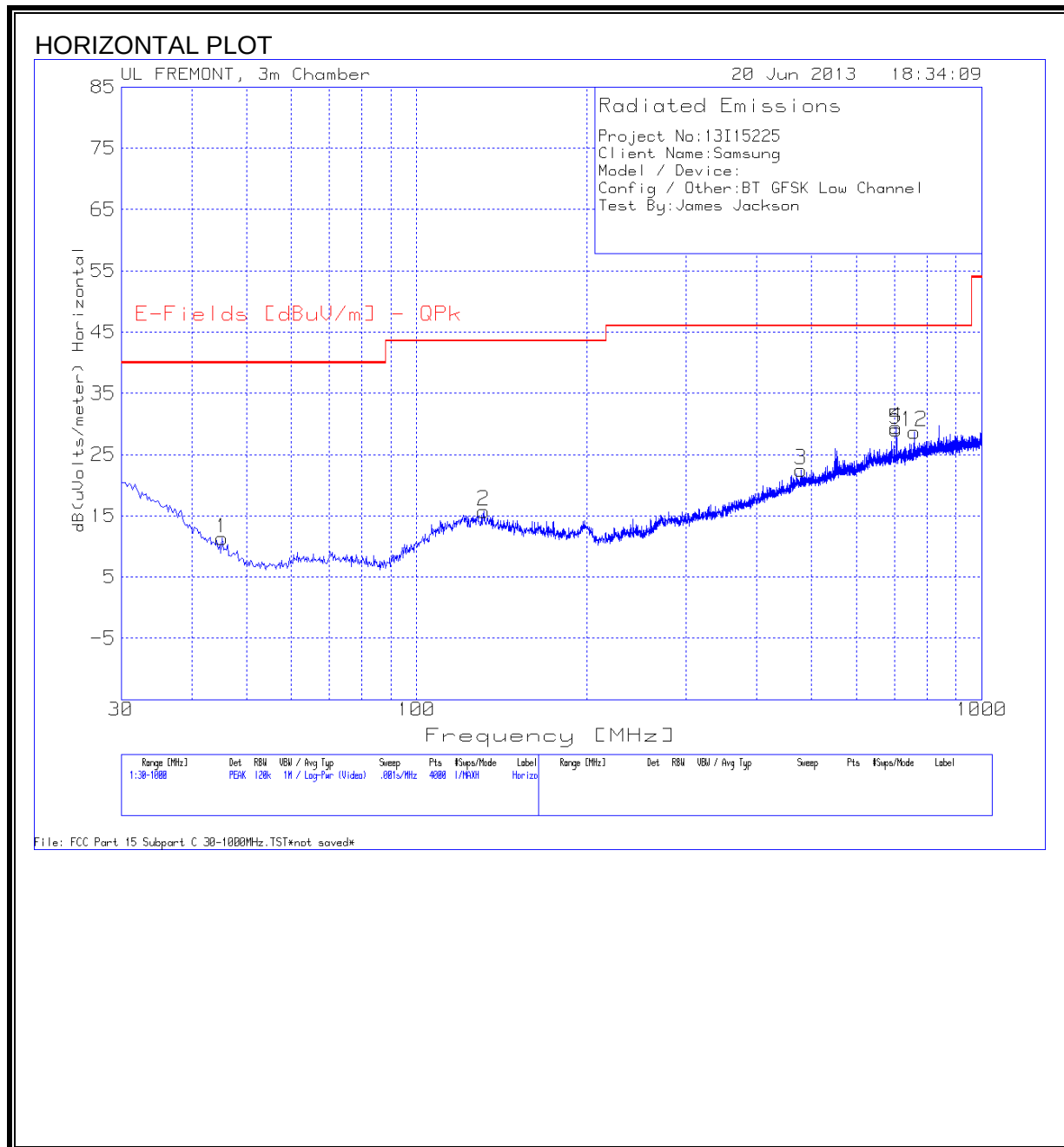
Vertical 10000 - 18000MHz													
9	14177.911	23.2	PK	39.1	-15.8	0.4	46.9	53.97	-7.07	74	-27.1	99	Vert
10	15585.207	22.07	PK	40.4	-16.6	0.4	46.27	53.97	-7.7	74	-27.73	99	Vert

PK - Peak detector

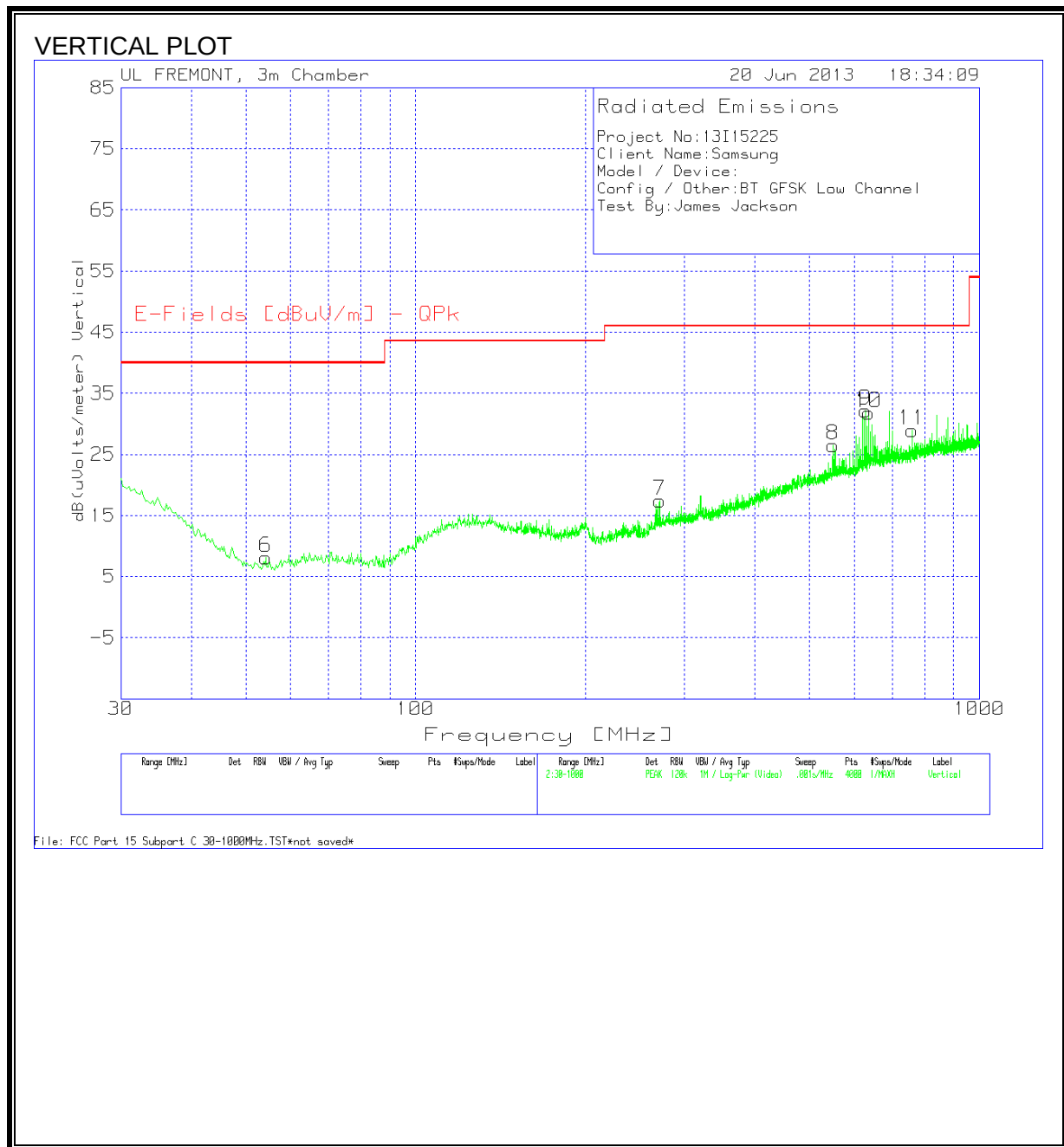
QP - Quasi-Peak detector

WORST-CASE BELOW 1 GHz

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



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



HORIZONTAL AND VERTICAL DATA

Project No:13I15225										
Client Name:Samsung										
Model / Device:										
Config / Other:BT GFSK Low Channel										
Test By:James Jackson										
Horizontal 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
1	45.2661	28.89	PK	9.9	-27.5	11.29	40	-28.71	134	Horz
2	131.289	28.7	PK	13.8	-26.8	15.7	43.52	-27.82	134	Horz
3	479.5004	29.45	PK	17.8	-24.8	22.45	46.02	-23.57	101	Horz
4	705.341	32.01	PK	20.4	-23	29.41	46.02	-16.61	200	Horz
5	706.5526	31.76	PK	20.4	-23.1	29.06	46.02	-16.96	200	Horz
12	760.1049	30.52	PK	20.8	-22.6	28.72	46.02	-17.3	101	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
6	54.2318	28.73	PK	6.8	-27.4	8.13	40	-31.87	201	Vert
7	270.8644	30.21	PK	13.2	-26	17.41	46.02	-28.61	201	Vert
8	550.015	32.29	PK	18.4	-24.2	26.49	46.02	-19.53	200	Vert
9	628.0415	36.19	PK	19.5	-23.5	32.19	46.02	-13.83	149	Vert
10	636.038	35.2	PK	19.7	-23.1	31.8	46.02	-14.22	149	Vert
11	760.1049	30.77	PK	20.8	-22.6	28.97	46.02	-17.05	149	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 C63.10-2009.

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

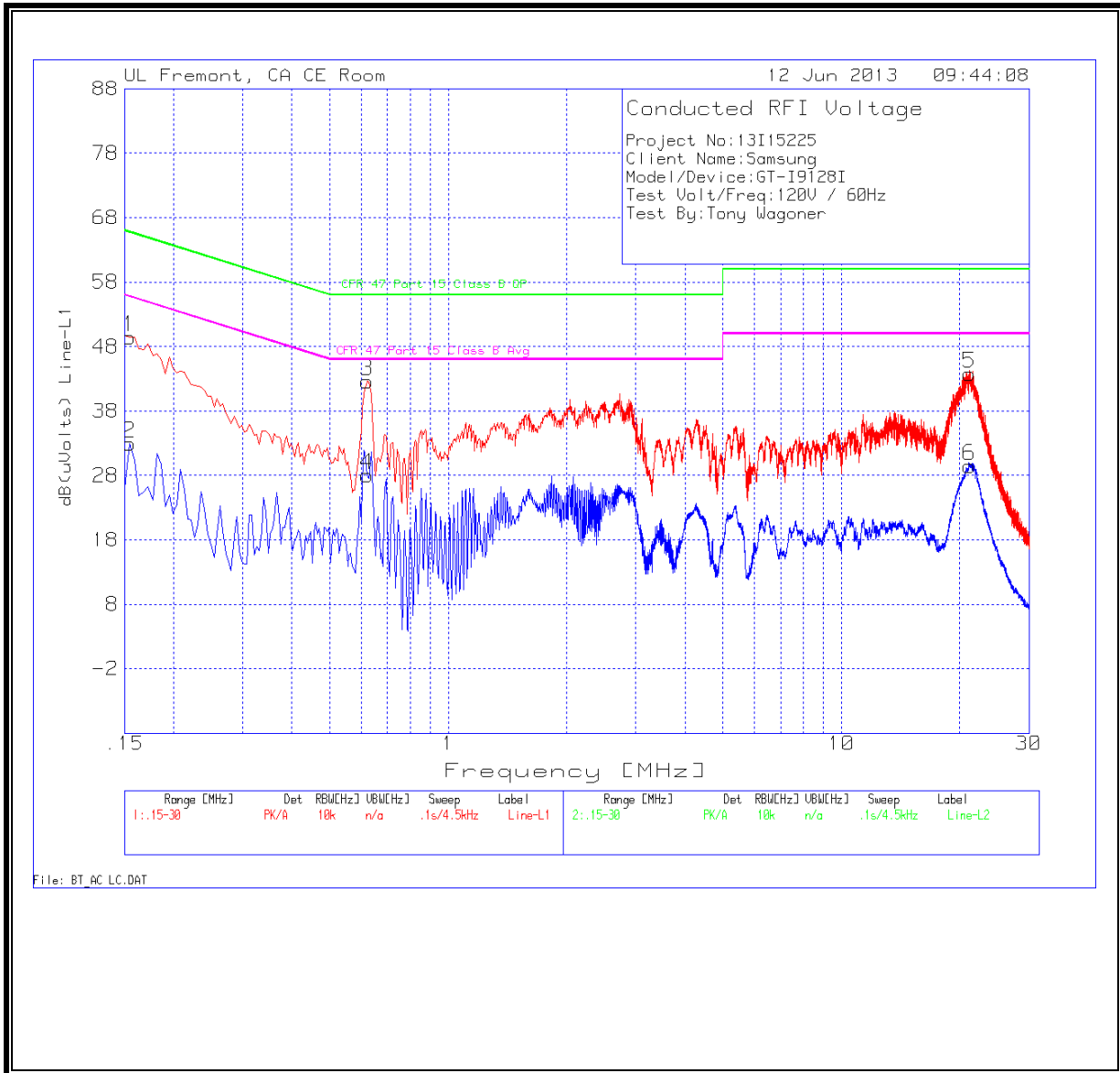
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Project No:	13I15225								
Client Name:	Samsung								
Model/Device:	GT-I9128I								
Test Volt/Freq:	120V / 60Hz								
Test By:	Tony Wagoner								
Line-L1 .15 - 30MHz									
Test Frequenc	Meter Reading	Detector	T24 IL L1.TXT	LC Cables 1&3.TXT	dB(uVolts)	CFR 47 Part 15	Margin	CFR 47 Part 15	Margin
0.1545	49.38	PK	0.1	0	49.48	65.8	-16.32	-	-
0.1545	32.9	Av	0.1	0	33	-	-	55.8	-22.8
0.6225	42.48	PK	0.1	0	42.58	56	-13.42	-	-
0.6225	27.94	Av	0.1	0	28.04	-	-	46	-17.96
21.1515	43.27	PK	0.3	0.2	43.77	60	-16.23	-	-
21.1515	28.99	Av	0.3	0.2	29.49	-	-	50	-20.51
Line-L2 .15 - 30MHz									
Test Frequenc	Meter Reading	Detector	T24 IL L2.TXT	LC Cables 2&3.TXT	dB(uVolts)	CFR 47 Part 15	Margin	CFR 47 Part 15	Margin
0.1545	44.55	PK	0.1	0	44.65	65.8	-21.15	-	-
0.1545	26.11	Av	0.1	0	26.21	-	-	55.8	-29.59
0.6315	38.93	PK	0.1	0	39.03	56	-16.97	-	-
0.6315	30.39	Av	0.1	0	30.49	-	-	46	-15.51
21.723	44.29	PK	0.3	0.2	44.79	60	-15.21	-	-
21.723	27.69	Av	0.3	0.2	28.19	-	-	50	-21.81
PK - Peak detector									
QP - Quasi-Peak detector									
Av - Average detector									

LINE 1 RESULTS



LINE 2 RESULTS

