



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM PHONE + BLUETOOTH & WLAN 2.4GHZ B/G/N

MODEL NUMBER: GT-I9060/DS

FCC ID: A3LGTI9060

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Prepared for

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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 Phone + Bluetooth & WLAN 2.4GHz b/g/n

MODEL: GT-I9060/DS

SERIAL NUMBER: FK-325-E

DATE TESTED: OCTOBER 26 - 29, 2013

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

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services 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.

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PHILIP KIM
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2. TEST METHODOLOGY

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

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 18000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

GSM Phone + Bluetooth & WLAN 2.4GHz b/g/n

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	19.17	82.60
2412 - 2462	802.11g	22.88	194.09
2412 - 2462	802.11n HT20	20.61	115.08

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain 1.23dBi

5.4. SOFTWARE AND FIRMWARE

Software version was 3.4.5-1887255-eng

The firmware used was I9060XXEAMJ5

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 Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

Based on the baseline scan, the worst-case data rates were which provide the highest duty cycle:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	SAMSUNG	ETAOU10EWE	DW1D913DS/7-E	N/A
Earphone	SAMSUNG	N/A	N/A	N/A

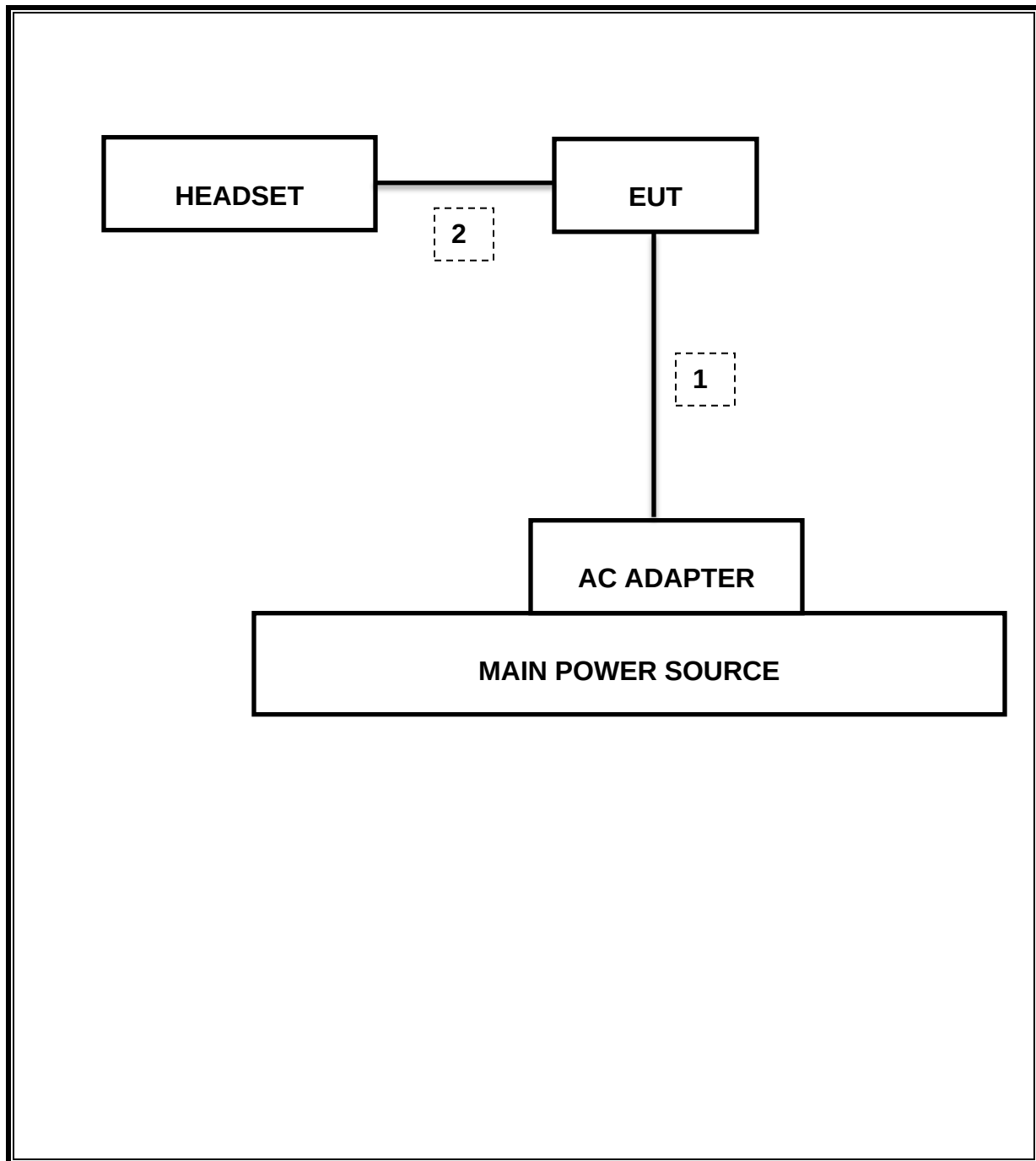
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/14/13	08/14/14
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	C00885	01/16/13	01/16/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/13	10/22/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/13	10/21/14
PXA SIGNAL ANALYZER	Agilent / HP	N9030A	N/A	05/09/13	05/09/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/13	08/08/14
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. MEASUREMENT METHODS

KDB 558074 Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

8. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-210 A8.2(a)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	8.1MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-35.23dBc
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	22.88dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-4.19dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	48.07dBuV/m(PK)
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	48.424dBuV/m(Av)

9. ANTENNA PORT TEST RESULTS

9.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

Reference to KDB 558074 DTS Meas Guidance 8.0: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

9.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.58	0.5
Mid	2437	8.56	0.5
High	2462	8.10	0.5
Worst		8.10	

9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

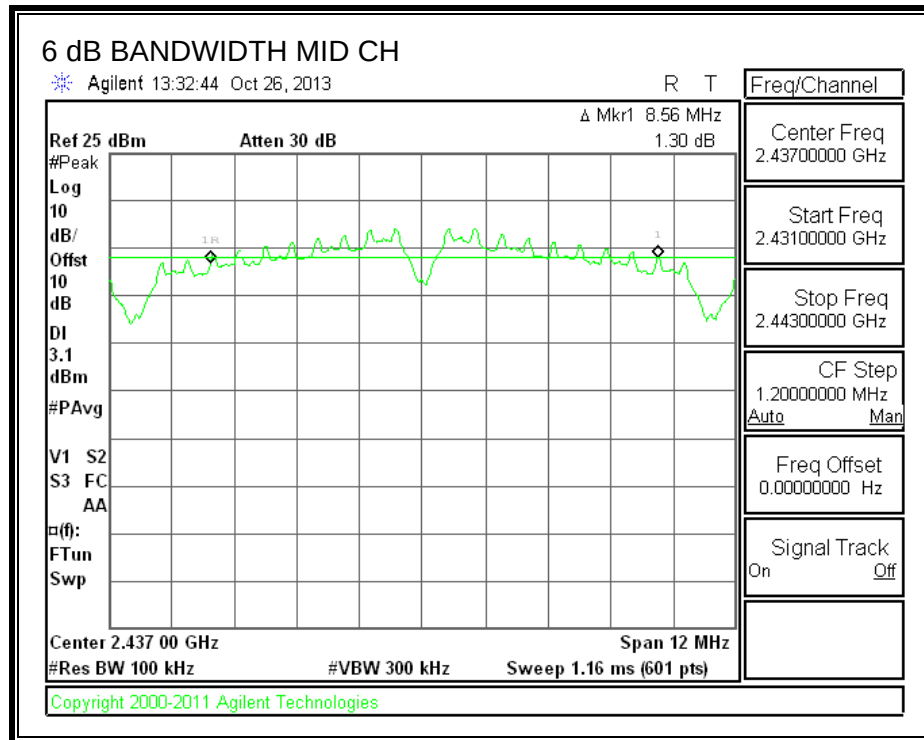
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.17	0.5
Mid	2437	15.17	0.5
High	2462	15.17	0.5
Worst		15.17	

9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

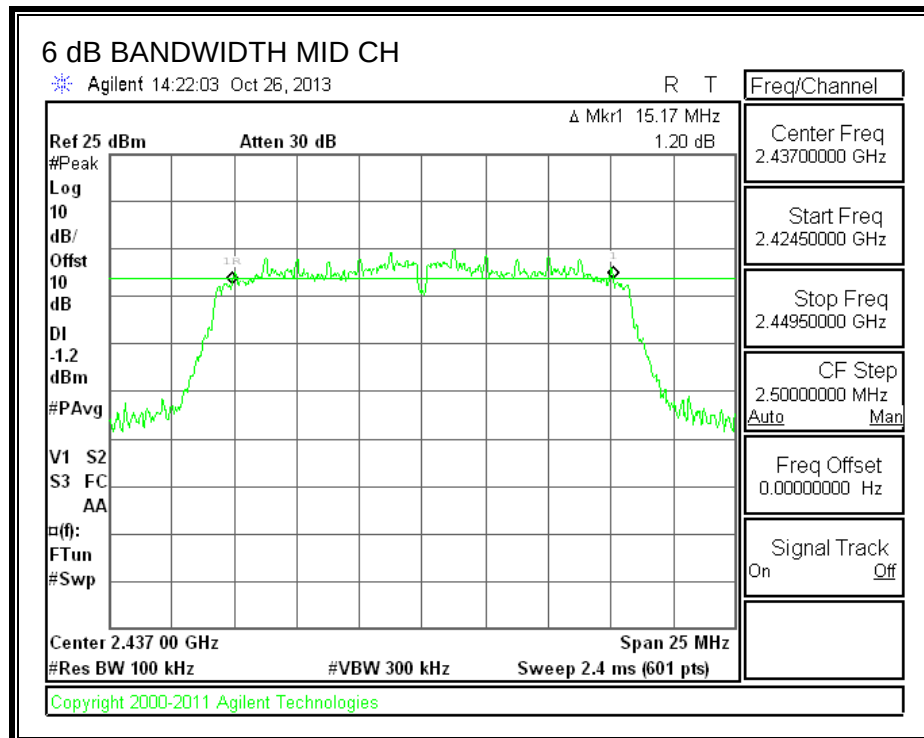
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.17	0.5
Mid	2437	15.17	0.5
High	2462	15.17	0.5
Worst		15.17	

9.1.4. Results

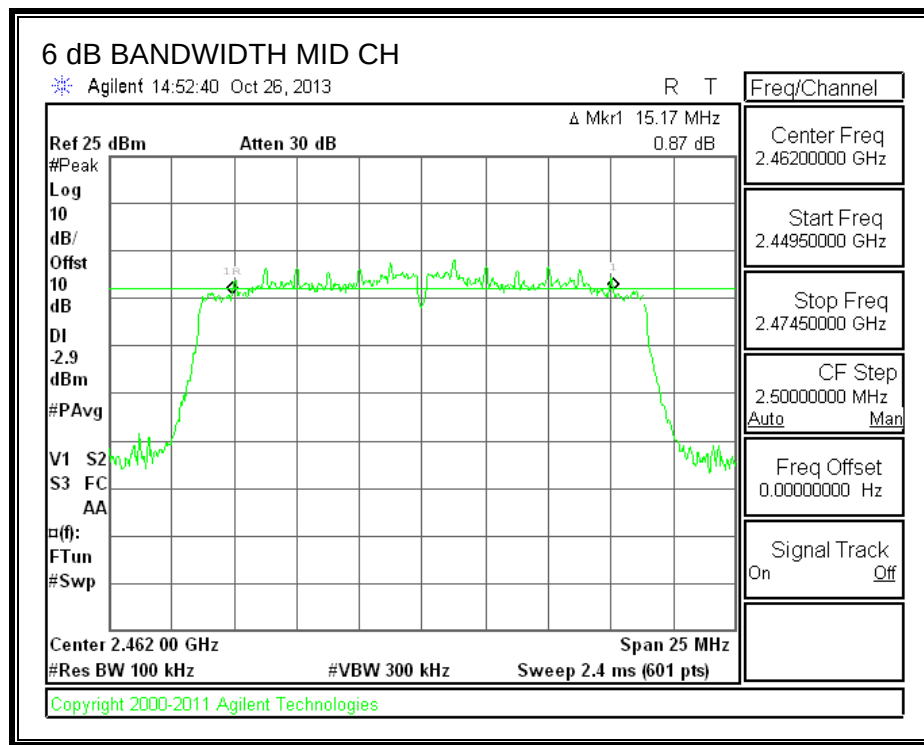
2.4GHz 802.11b 6 dB BANDWIDTH



2.4GHz 802.11g 6 dB BANDWIDTH



2.4 GHz 802.11n 6 dB BANDWIDTH



9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

9.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	13.09
Mid	2437	13.19
High	2462	13.13
Worst		13.19

9.2.1. 802.11g MODE IN THE 2.4 GHz BAND

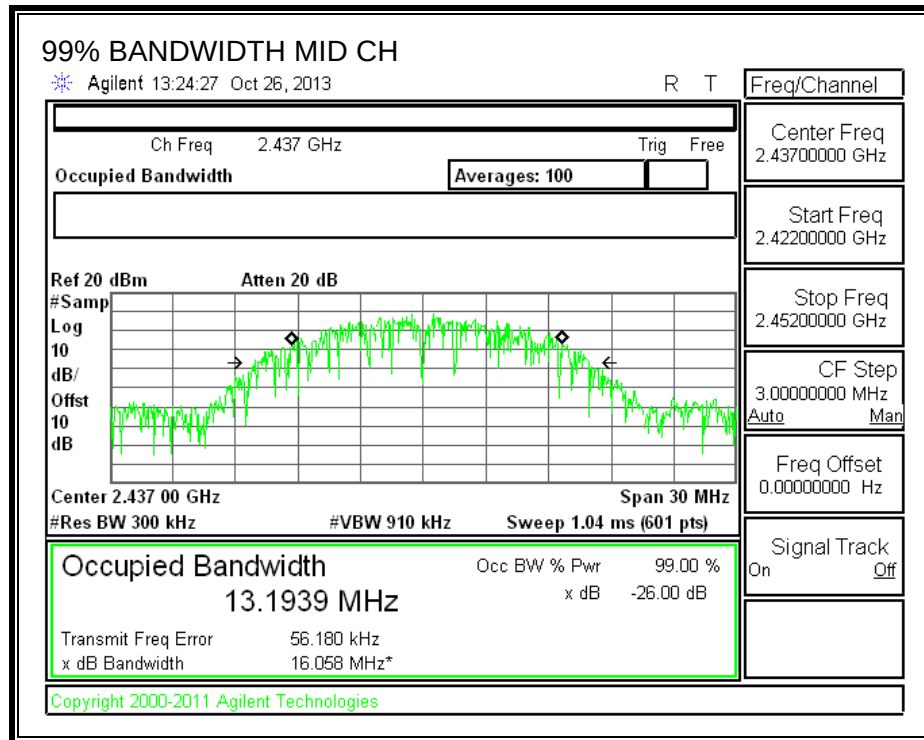
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.11
Mid	2437	16.11
High	2462	16.16
Worst		16.16

9.2.1. 802.11n HT20 MODE IN THE 2.4 GHz BAND

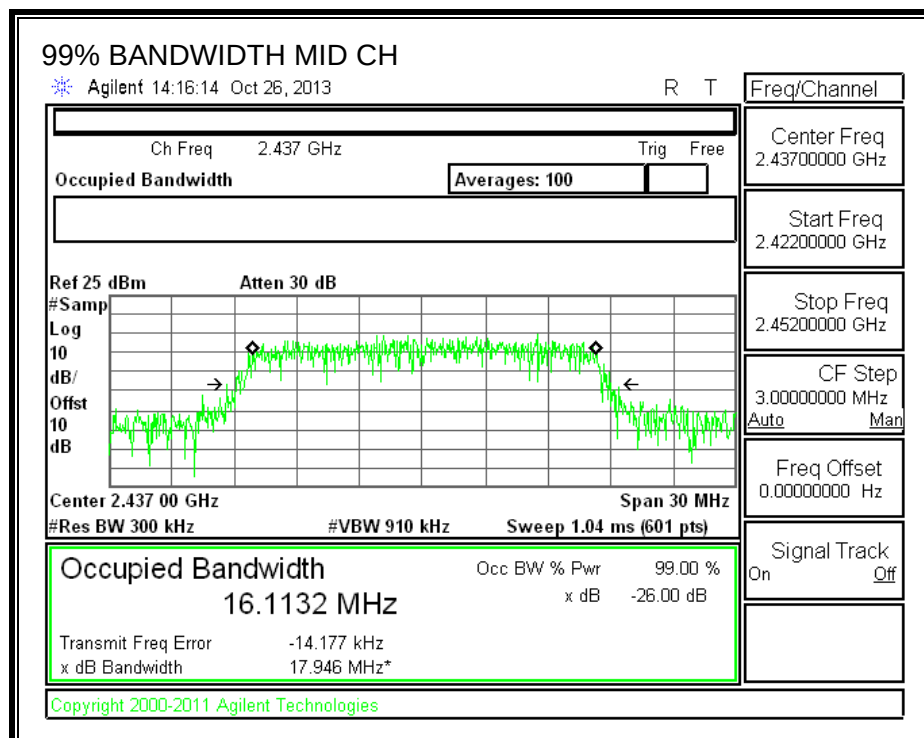
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.36
Mid	2437	17.29
High	2462	17.21
Worst		17.36

9.2.2. Results

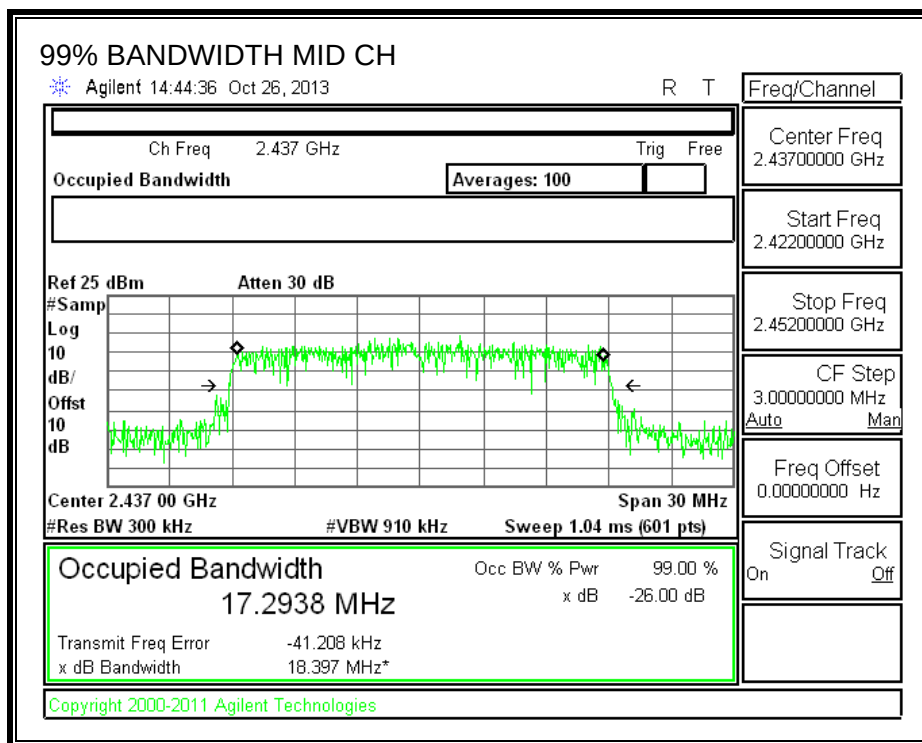
2.4 GHz 802.11b 99% BANDWIDTH



2.4 GHz 802.11g 99% BANDWIDTH



2.4 GHz 802.11n 99% BANDWIDTH



9.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

9.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Power (dBm)
Low	2412	16.40
Mid	2437	16.50
High	2462	16.50

9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Power (dBm)
Low	2412	14.30
Mid	2437	14.40
High	2462	14.50

9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Power (dBm)
Low	2412	12.20
Mid	2437	12.40
High	2462	12.40

9.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

9.4.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.23	30.00	30	36	30.00
Mid	2437	1.23	30.00	30	36	30.00
High	2462	1.23	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	19.17	19.17	30.00	-10.83
Mid	2437	19.09	19.09	30.00	-10.91
High	2462	19.11	19.11	30.00	-10.89
Worst			19.17		

9.4.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.23	30.00	30	36	30.00
Mid	2437	1.23	30.00	30	36	30.00
High	2462	1.23	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	22.82	22.82	30.00	-7.18
Mid	2437	22.70	22.70	30.00	-7.30
High	2462	22.88	22.88	30.00	-7.12
Worst			22.88		

9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

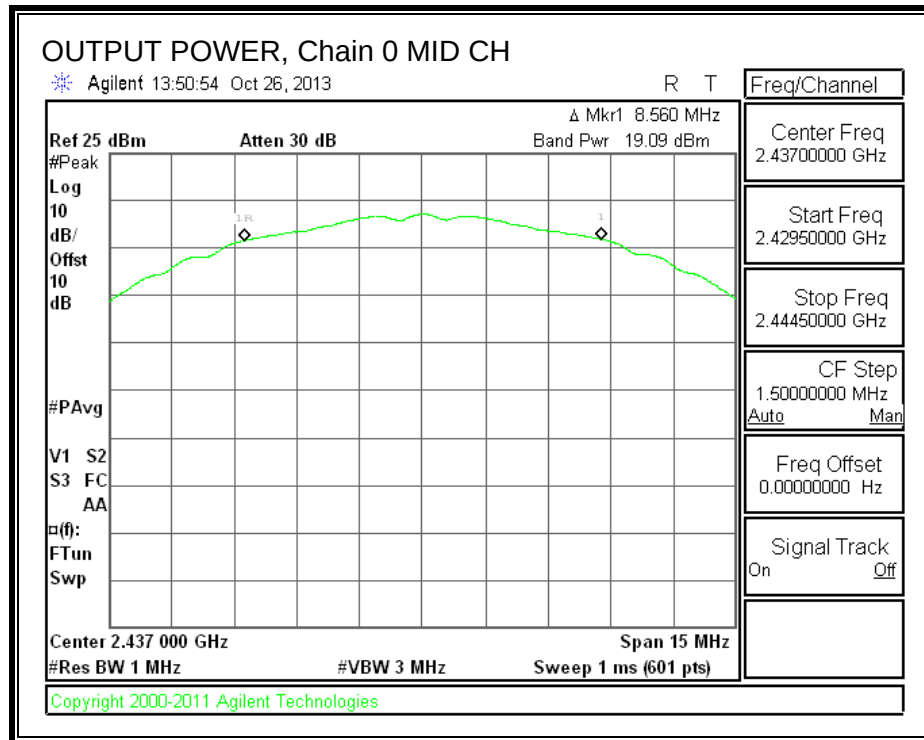
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.23	30.00	30	36	30.00
Mid	2437	1.23	30.00	30	36	30.00
High	2462	1.23	30.00	30	36	30.00

Results

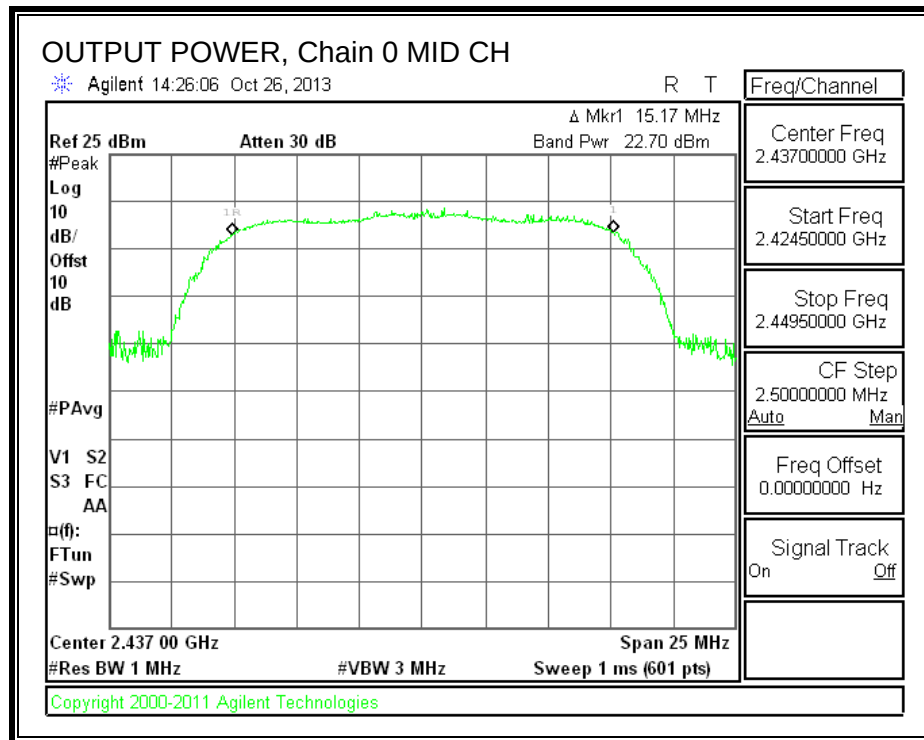
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	20.29	20.29	30.00	-9.71
Mid	2437	20.52	20.52	30.00	-9.48
High	2462	20.61	20.61	30.00	-9.39
Worst			20.61		

9.4.4. PLOTS

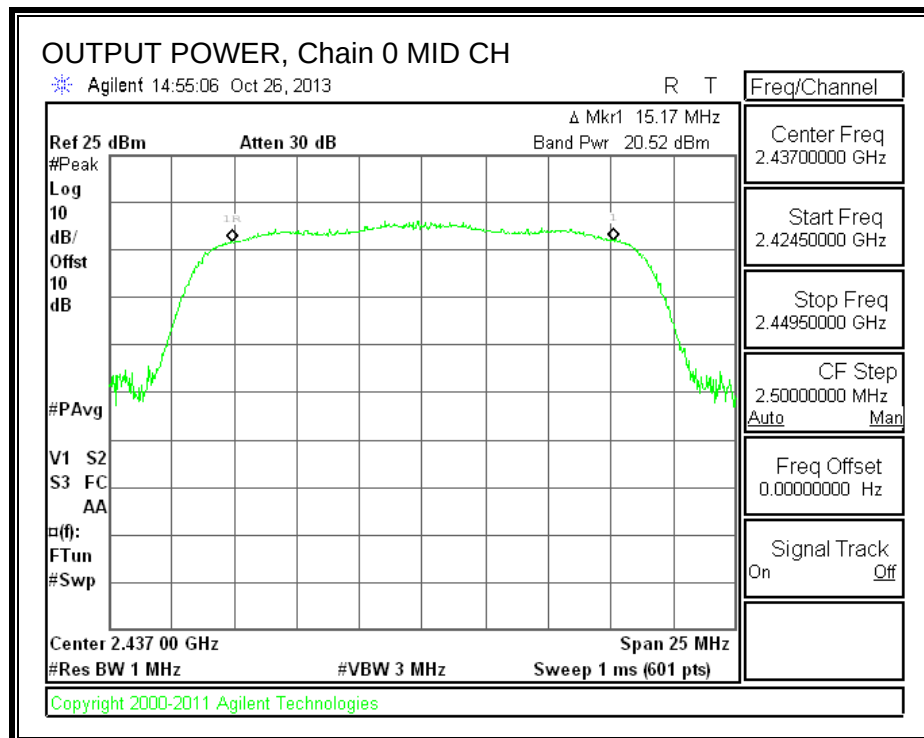
2.4 GHz 802.11b OUTPUT POWER, Chain 0



2.4 GHz 802.11g OUTPUT POWER, Chain 0



2.4 GHz 802.11n OUTPUT POWER, Chain 0



9.5. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

9.5.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-4.79	8.0	-12.8
Mid	2437	-4.19	8.0	-12.2
High	2462	-5.32	8.0	-13.3

9.5.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-9.98	8.0	-18.0
Mid	2437	-9.30	8.0	-17.3
High	2462	-8.98	8.0	-17.0

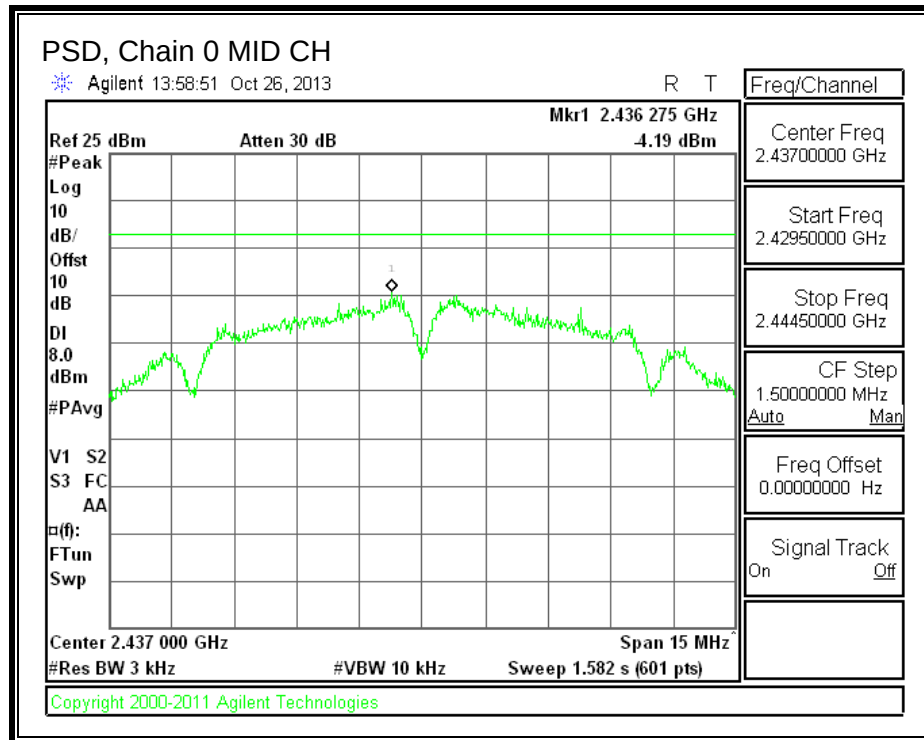
9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

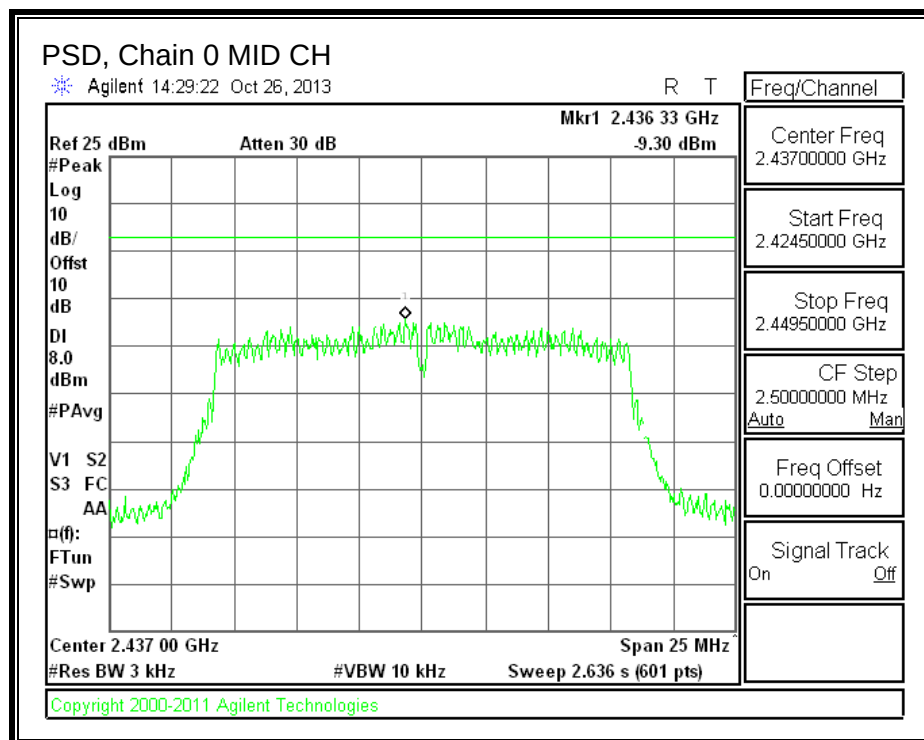
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-11.77	8.0	-19.8
Mid	2437	-12.09	8.0	-20.1
High	2462	-11.66	8.0	-19.7

9.5.4. Results

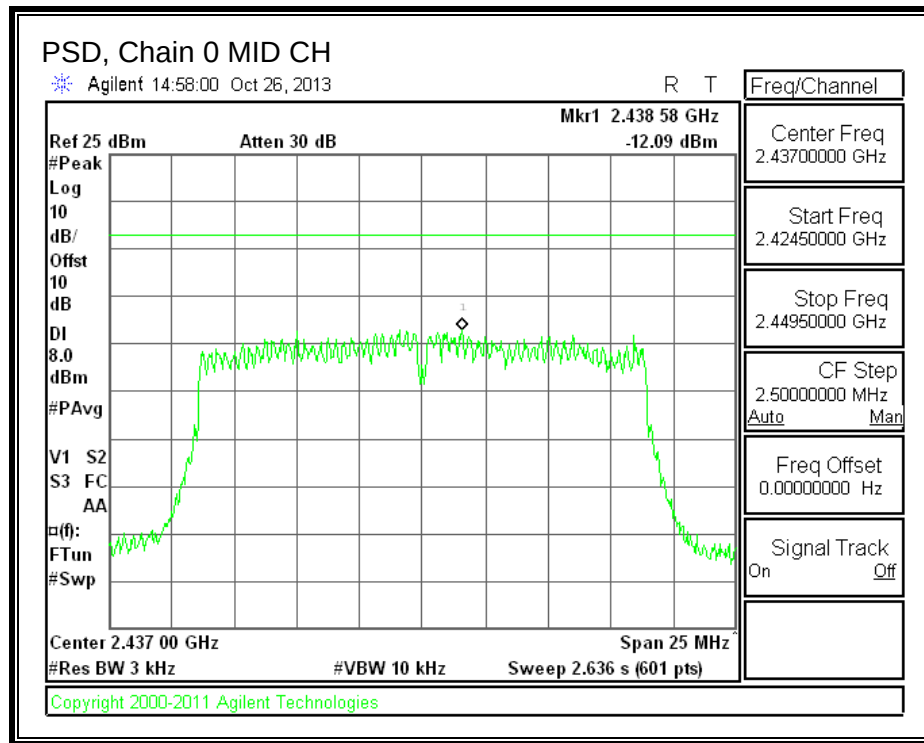
2.4GHz 802.11b PSD, Chain 0



2.4GHz 802.11g PSD, Chain 0



2.4GHz 802.11n PSD, Chain 0



9.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

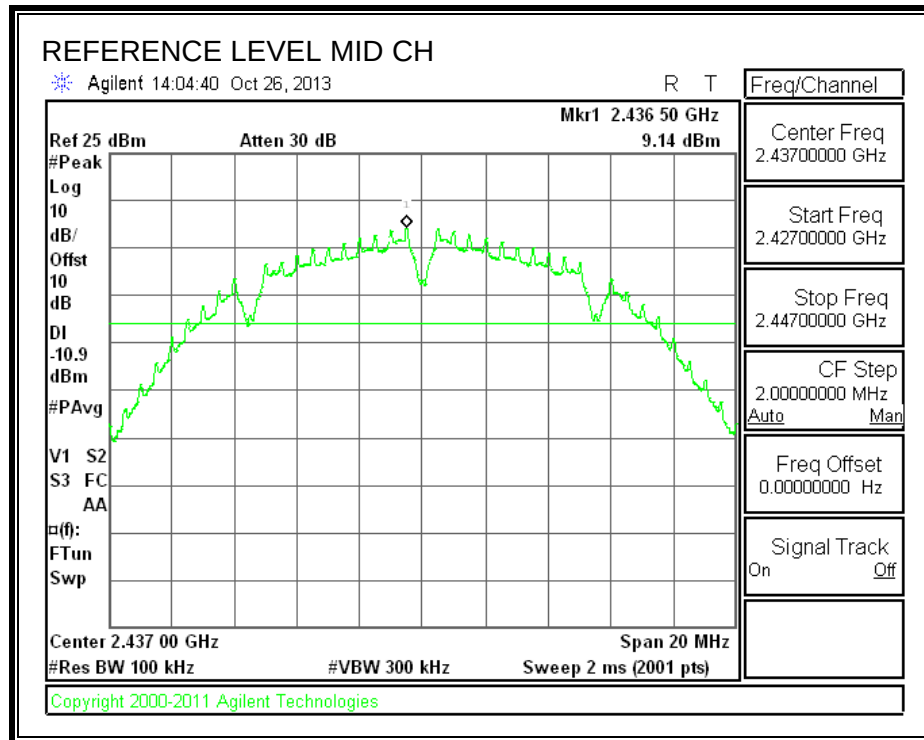
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

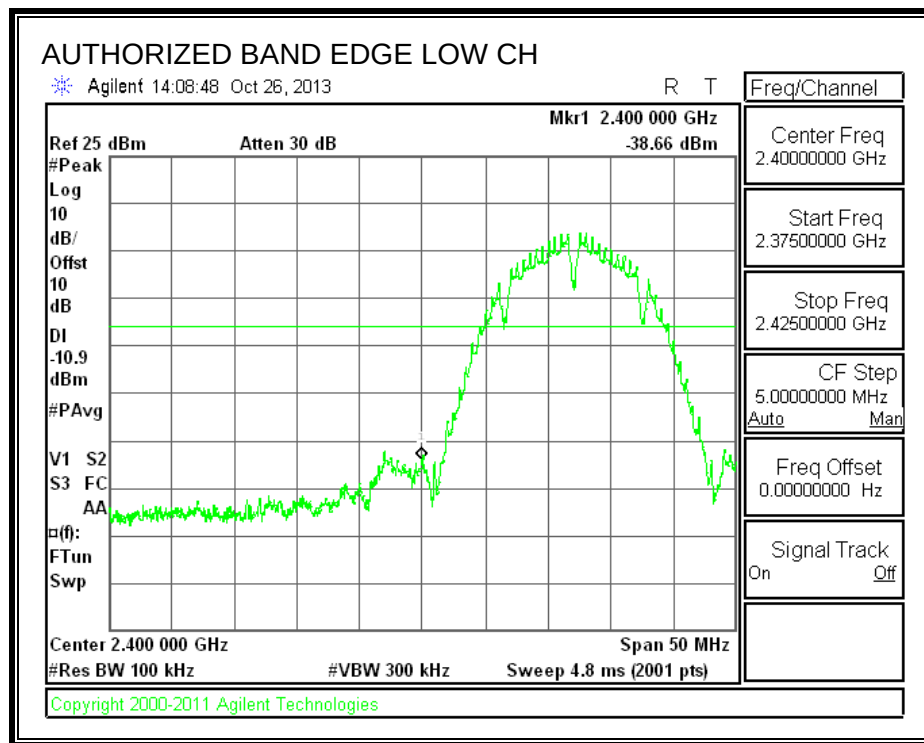
RESULTS

9.6.1. 802.11b MODE IN THE 2.4 GHz BAND

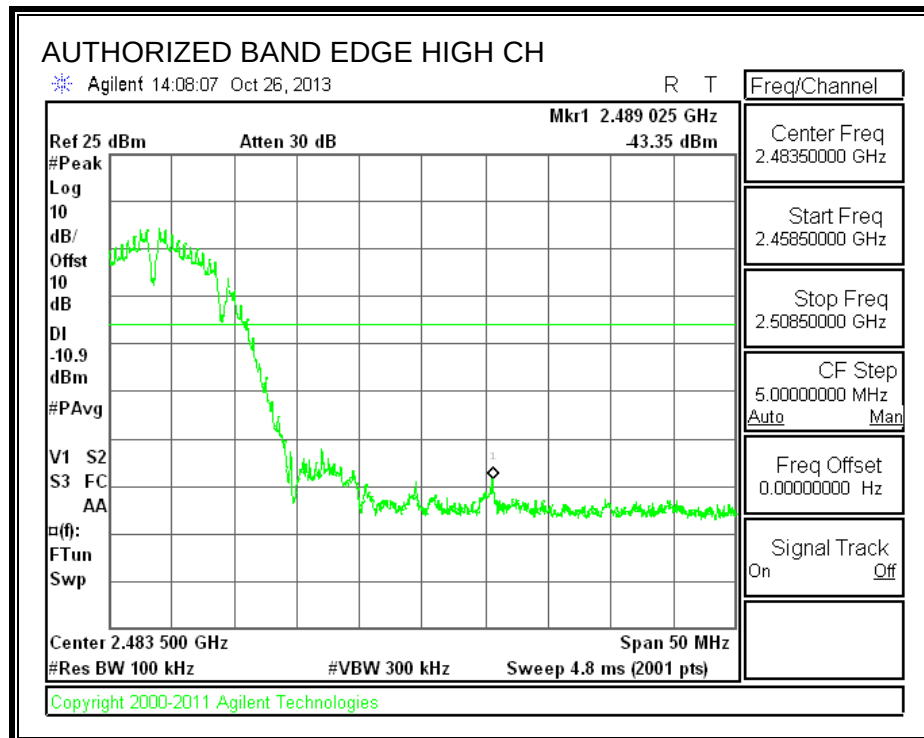
IN-BAND REFERENCE LEVEL



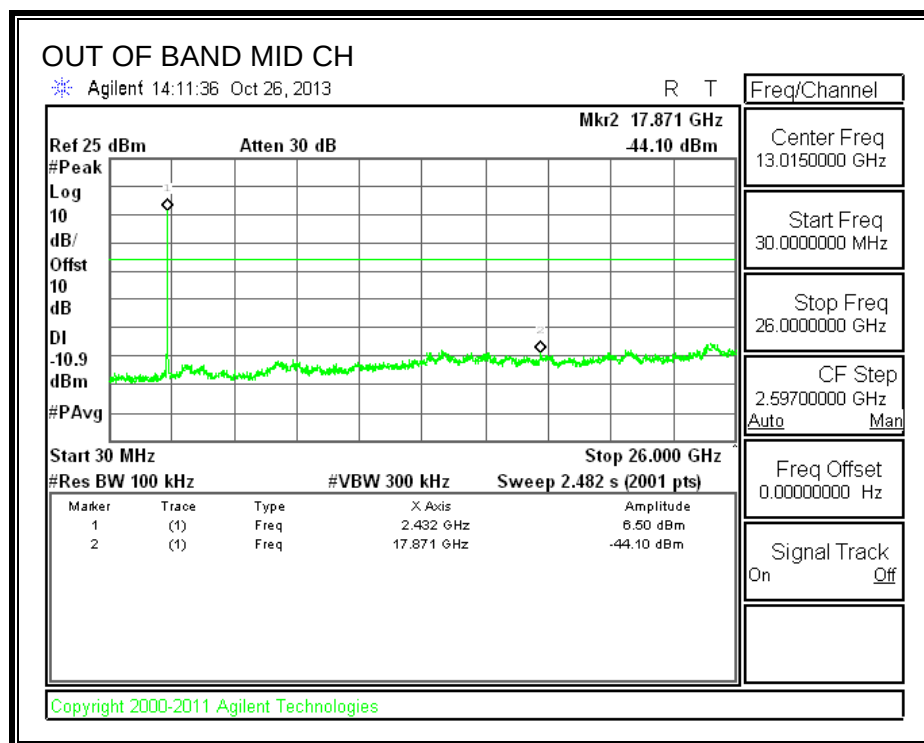
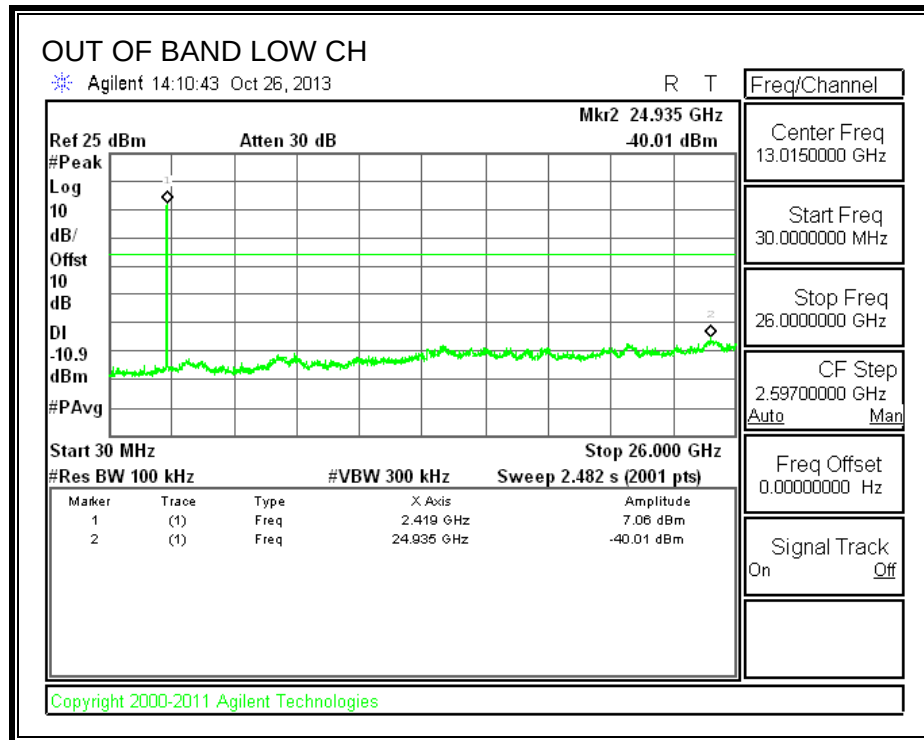
LOW CHANNEL BANDEGE

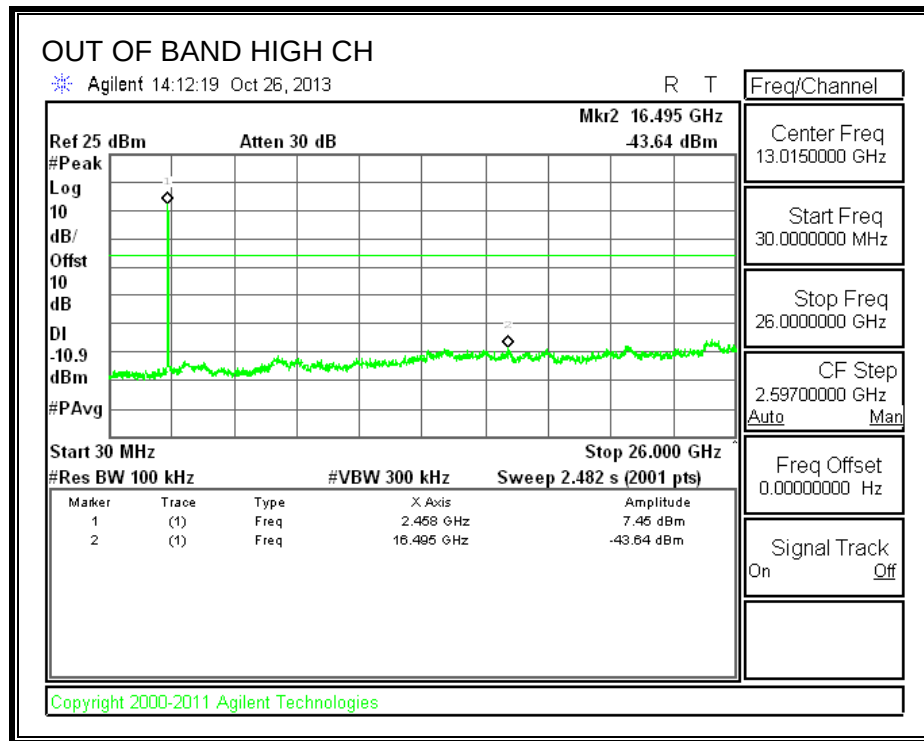


HIGH CHANNEL BANDEGE



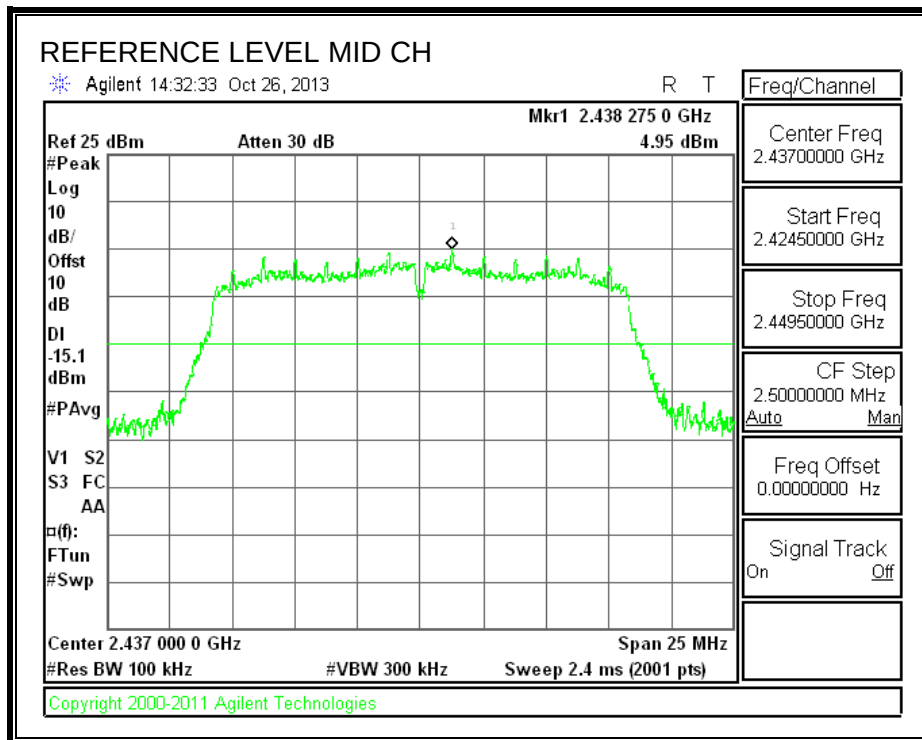
OUT-OF-BAND EMISSIONS



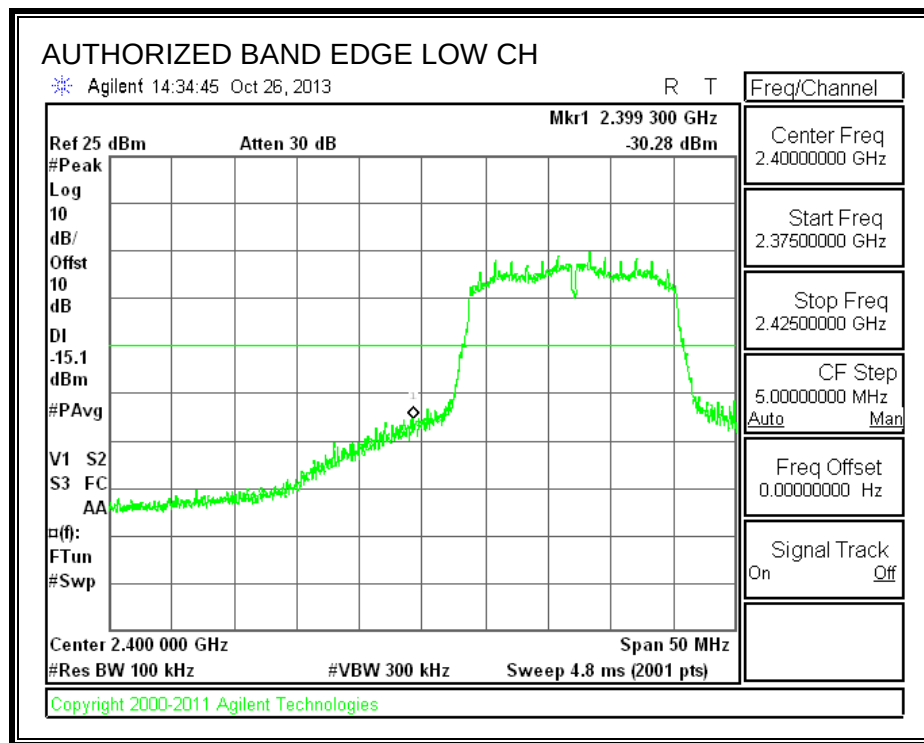


9.6.1. 802.11g MODE IN THE 2.4 GHz BAND

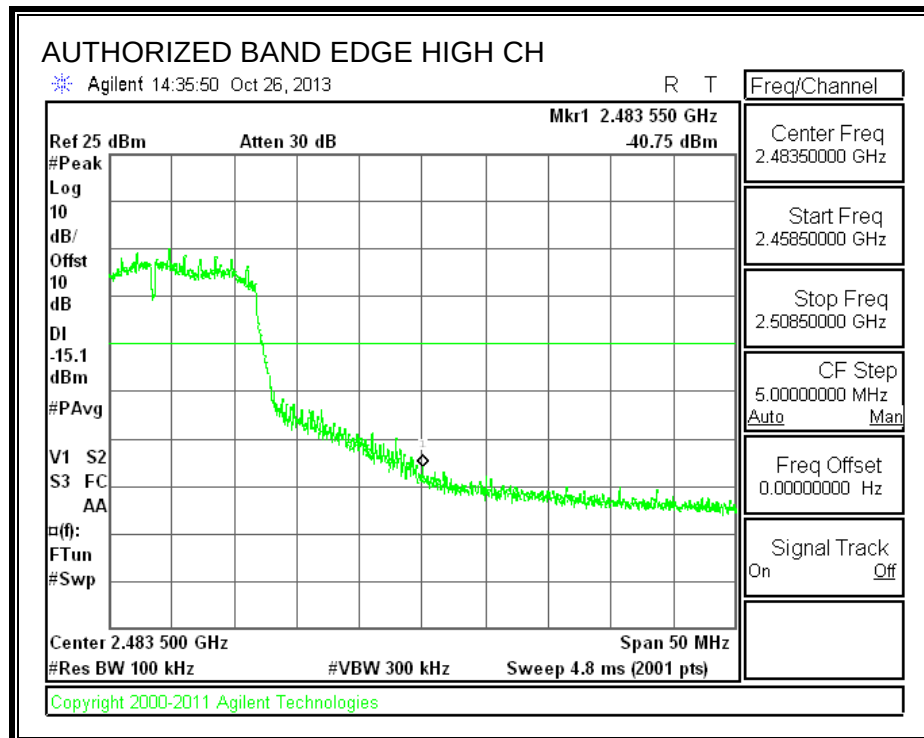
IN-BAND REFERENCE LEVEL



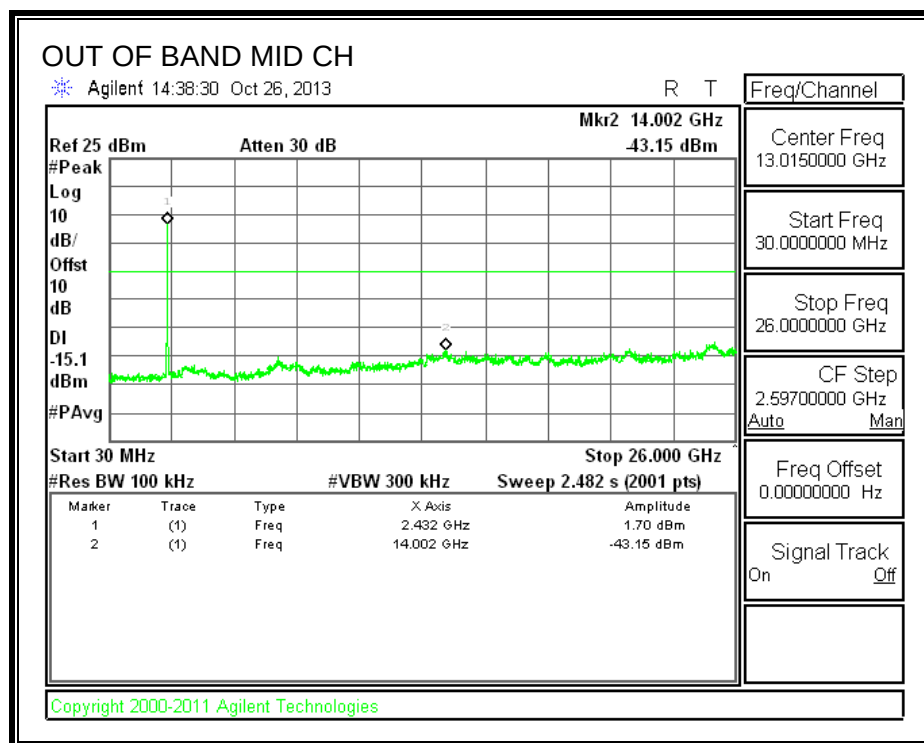
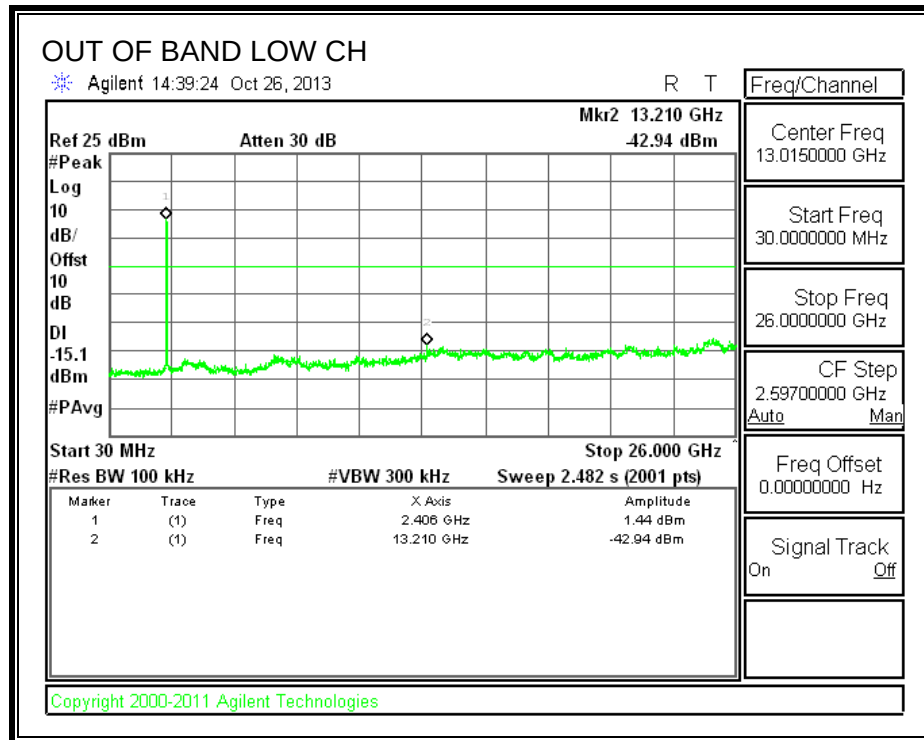
LOW CHANNEL BANDEDGE

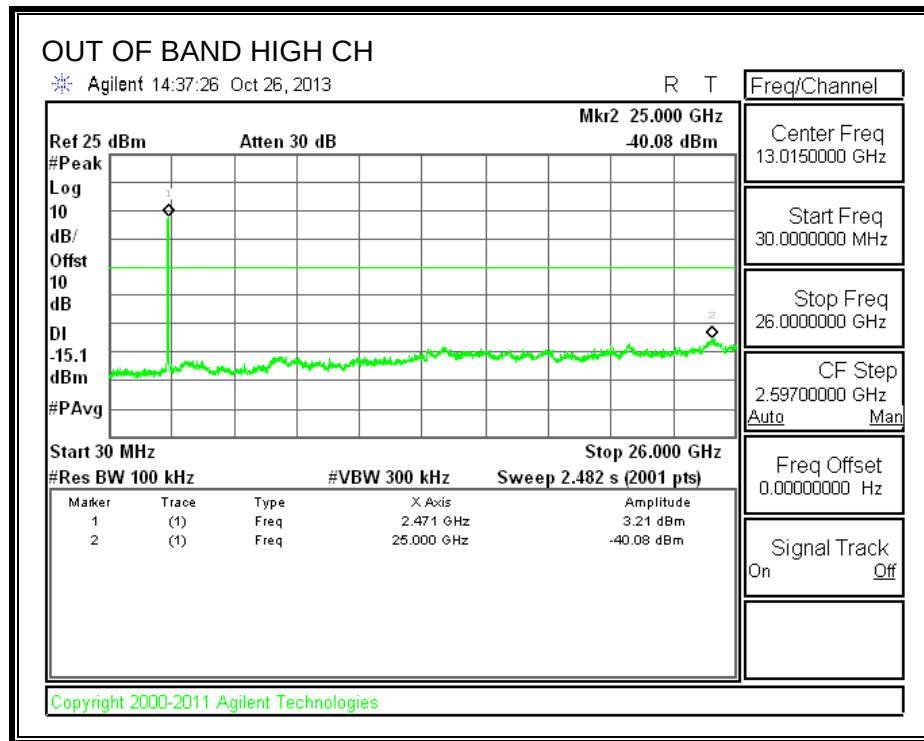


HIGH CHANNEL BANDEDGE



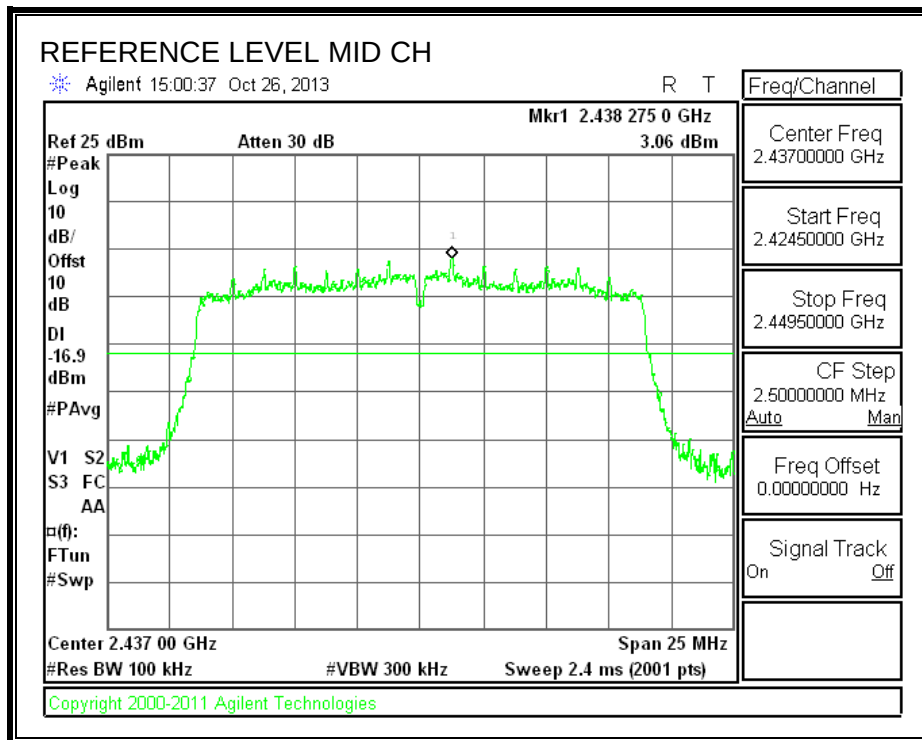
OUT-OF-BAND EMISSIONS



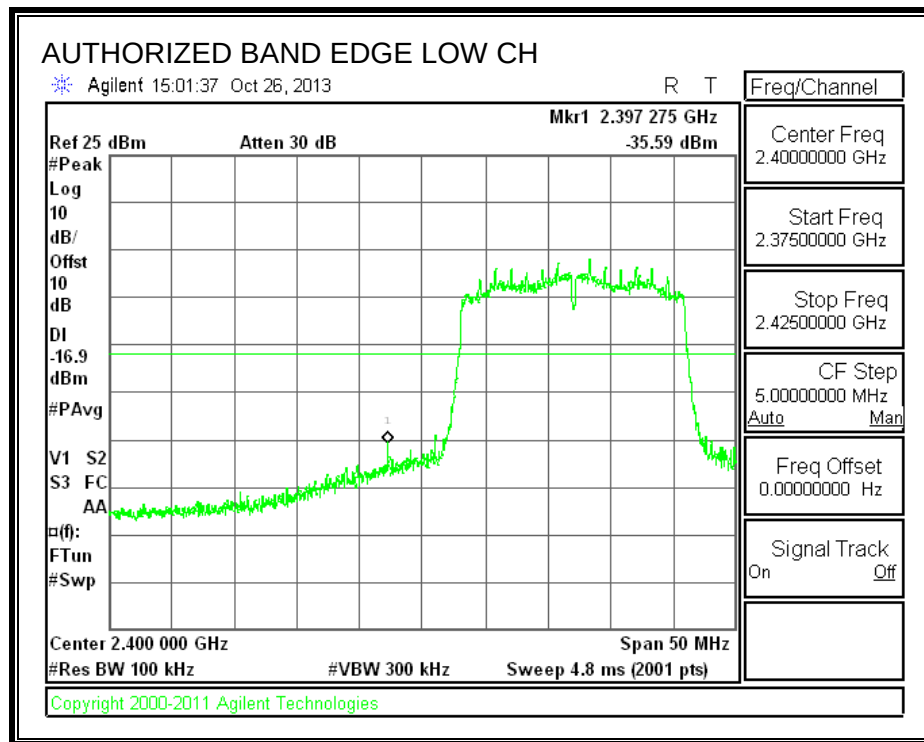


9.6.1. 802.11n MODE IN THE 2.4 GHz BAND

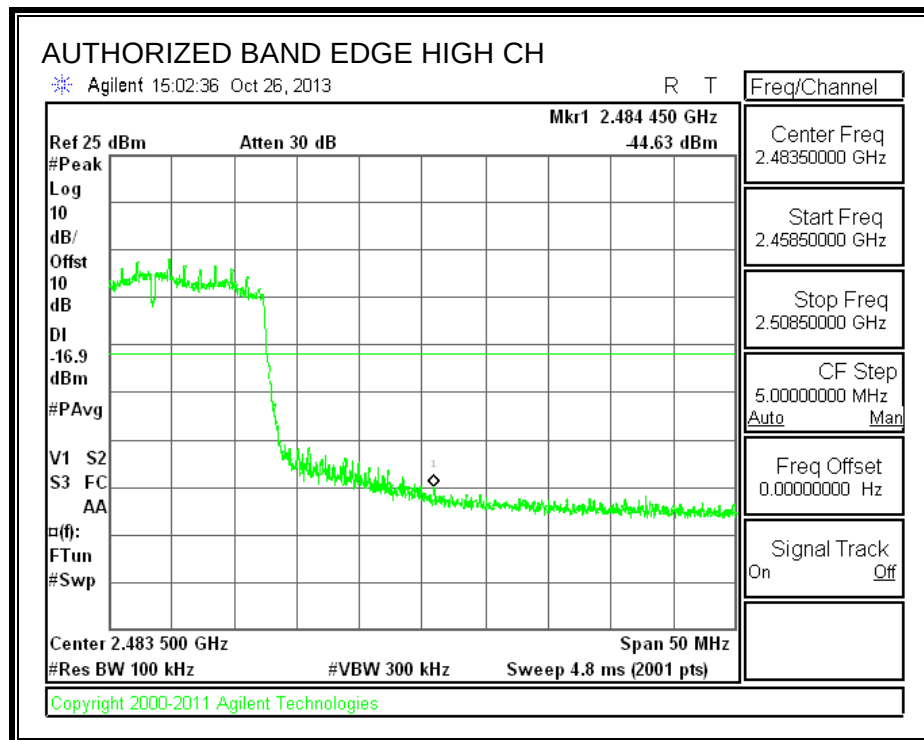
IN-BAND REFERENCE LEVEL



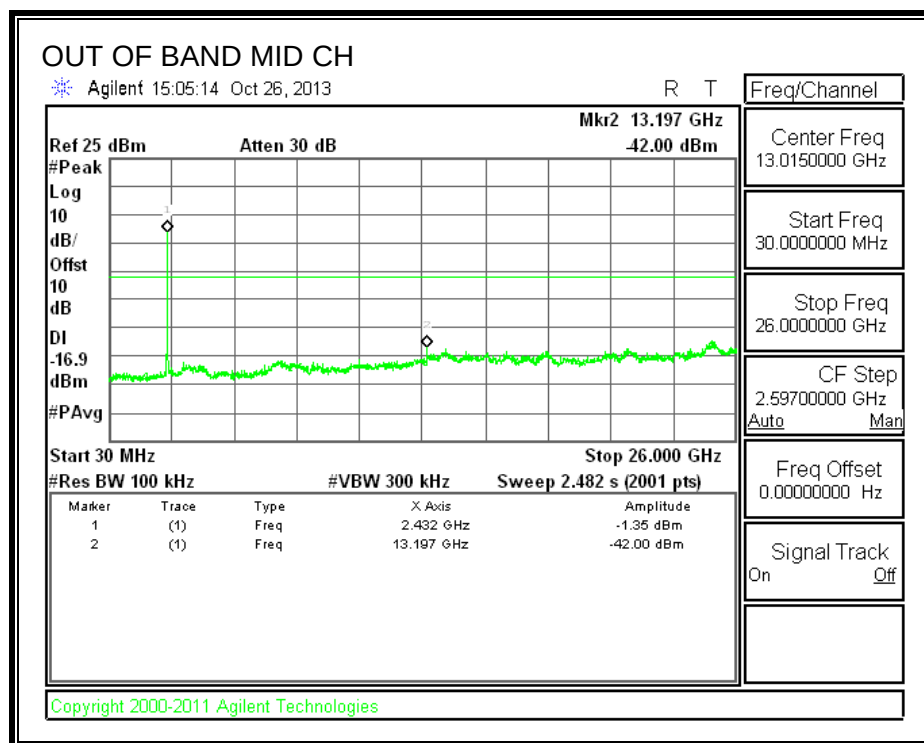
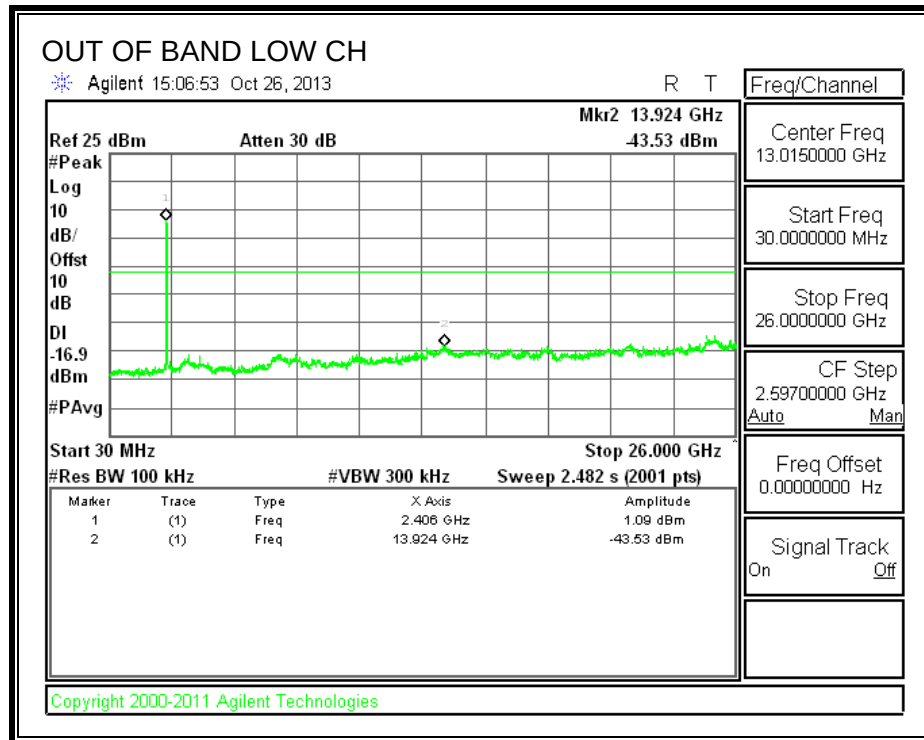
LOW CHANNEL BANDEDGE

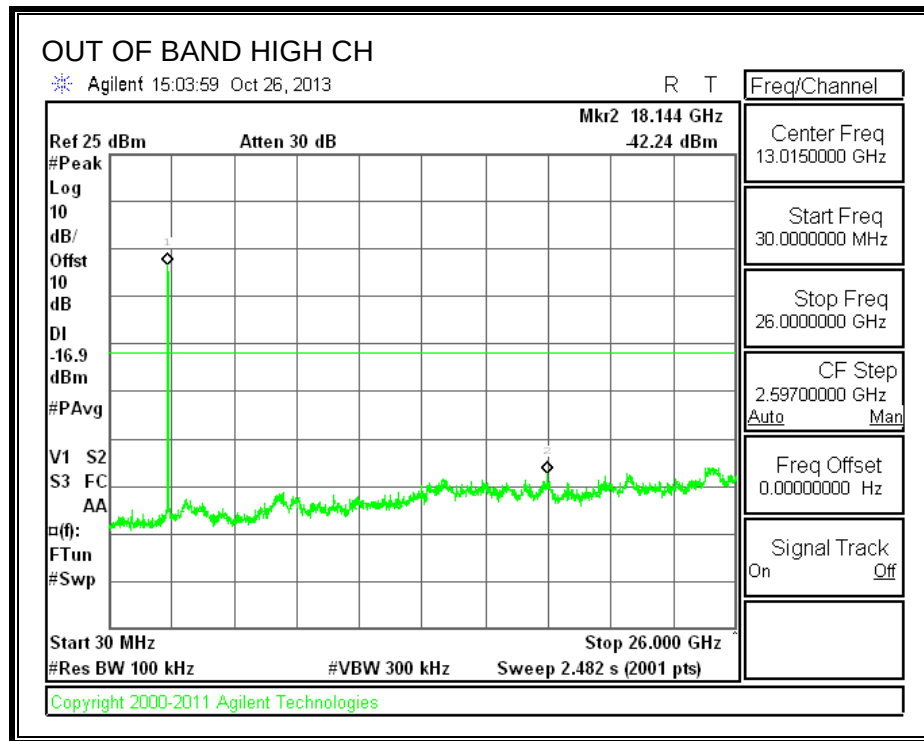


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





9.6.1. RADIATED TEST RESULTS

9.7. 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.

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; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor= $10\log(1/x)$.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

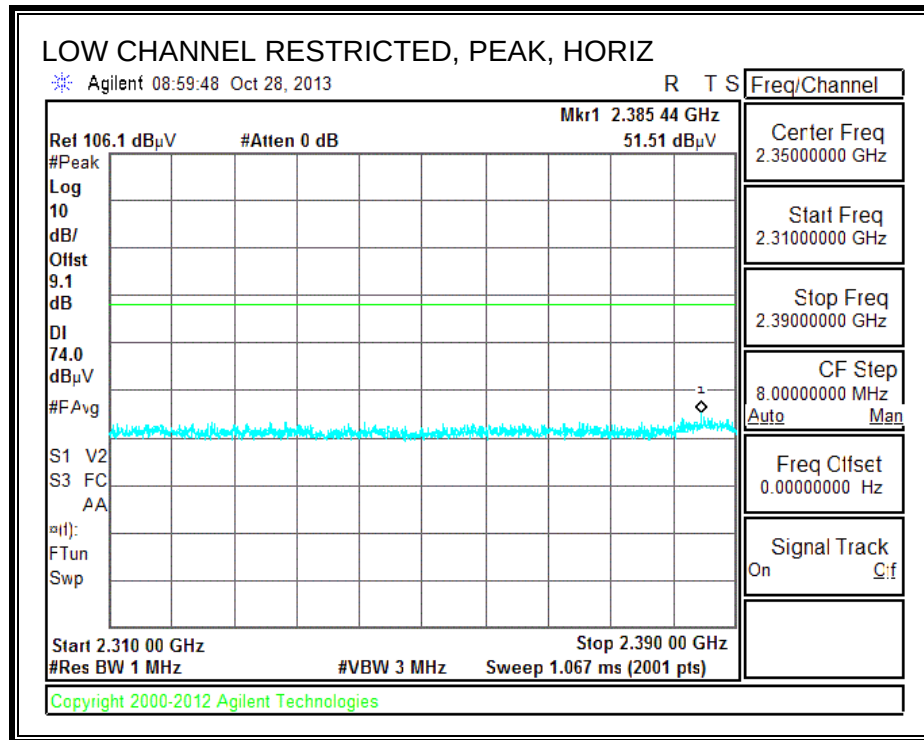
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

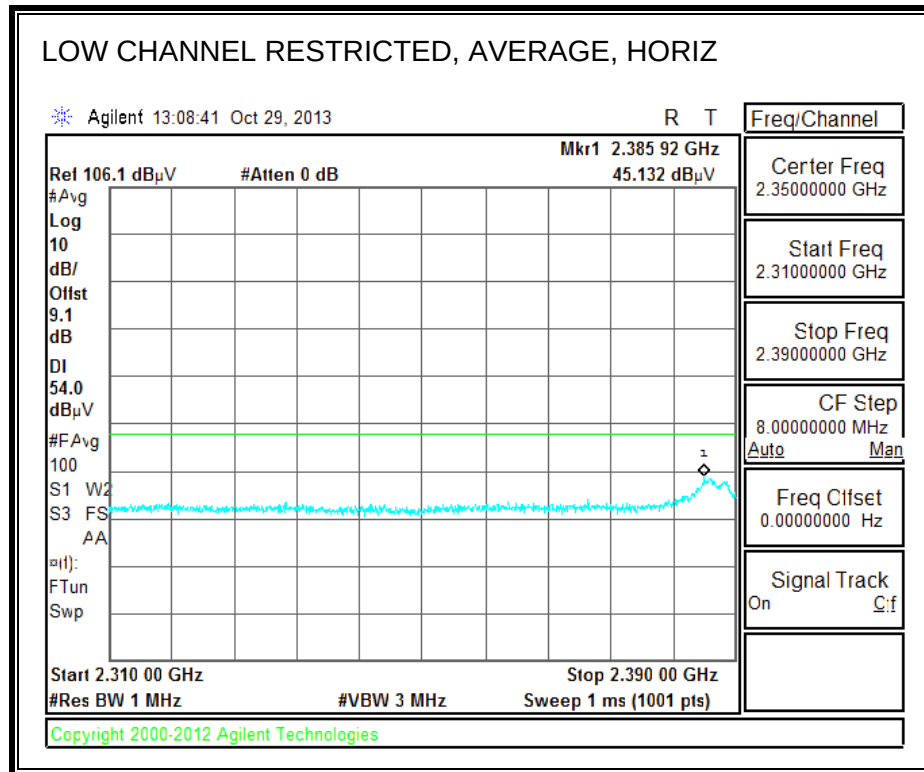
9.8. TRANSMITTER ABOVE 1 GHz

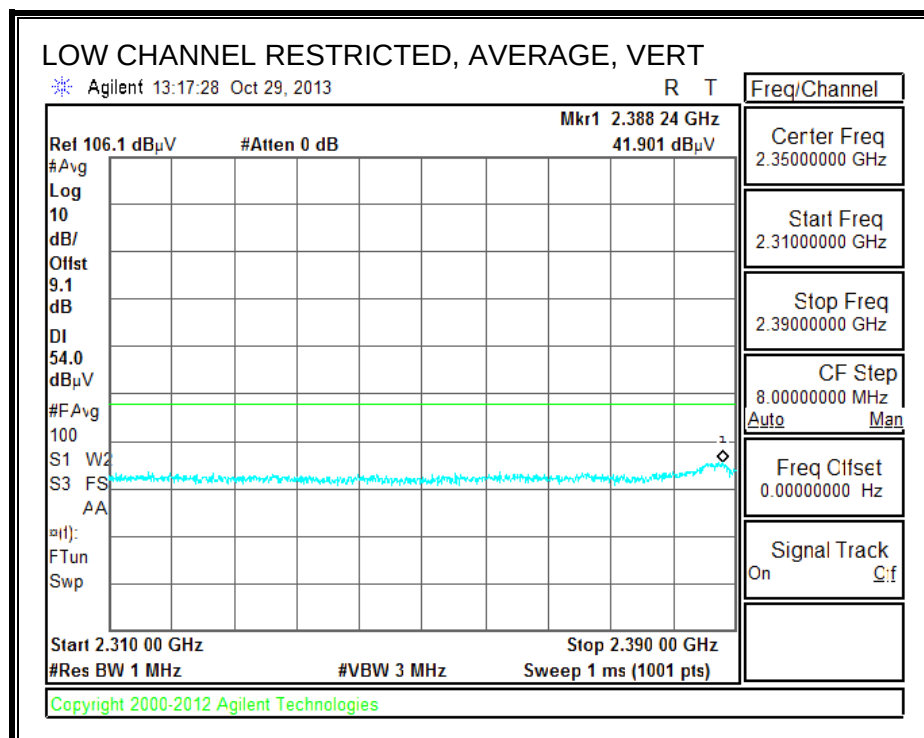
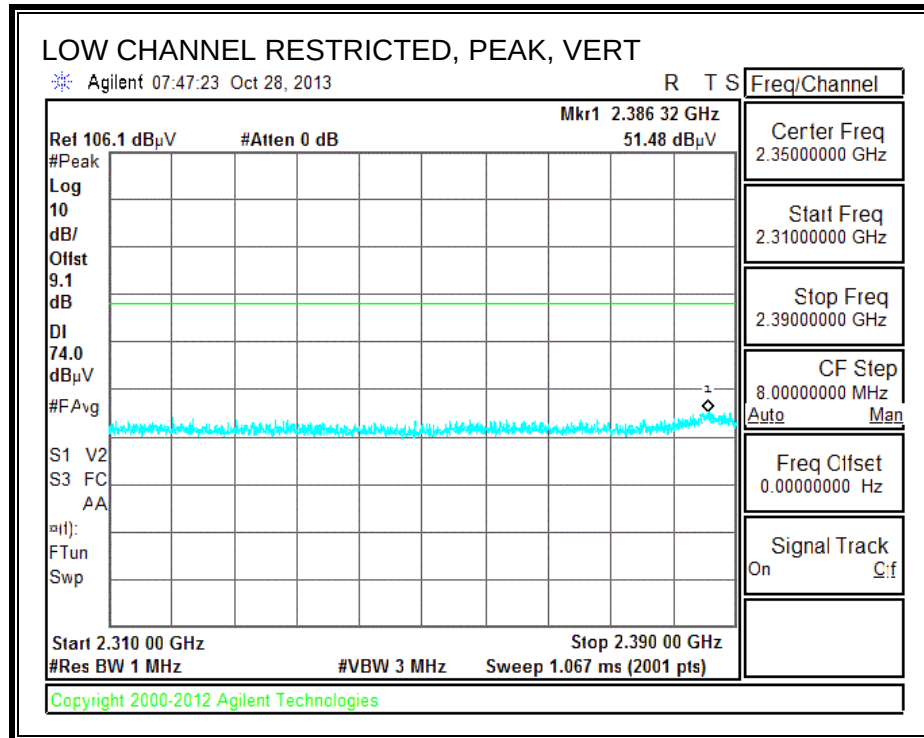
9.8.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

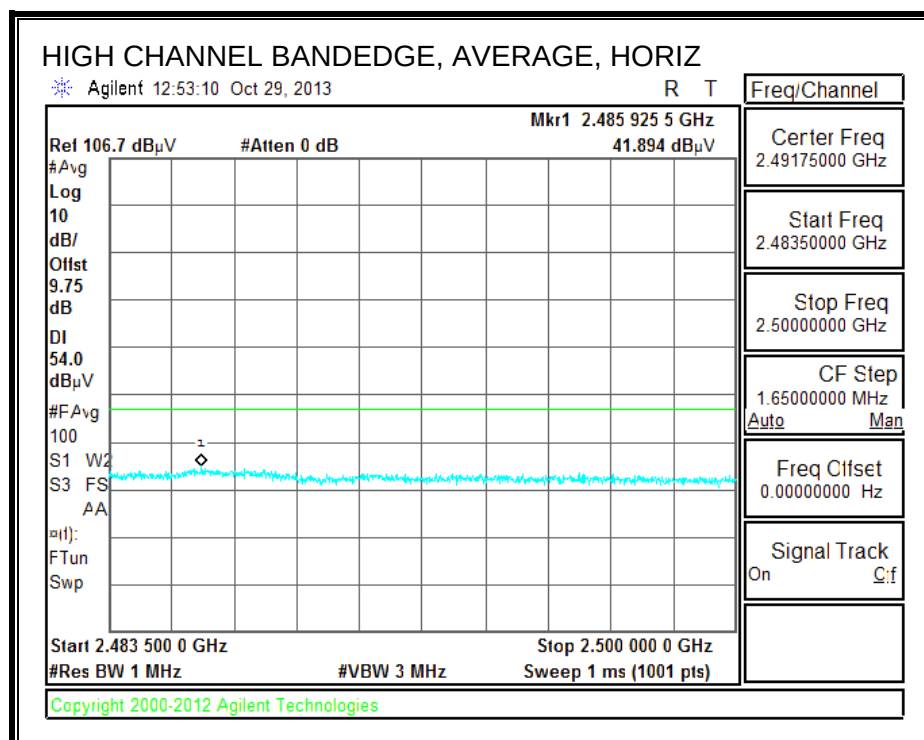
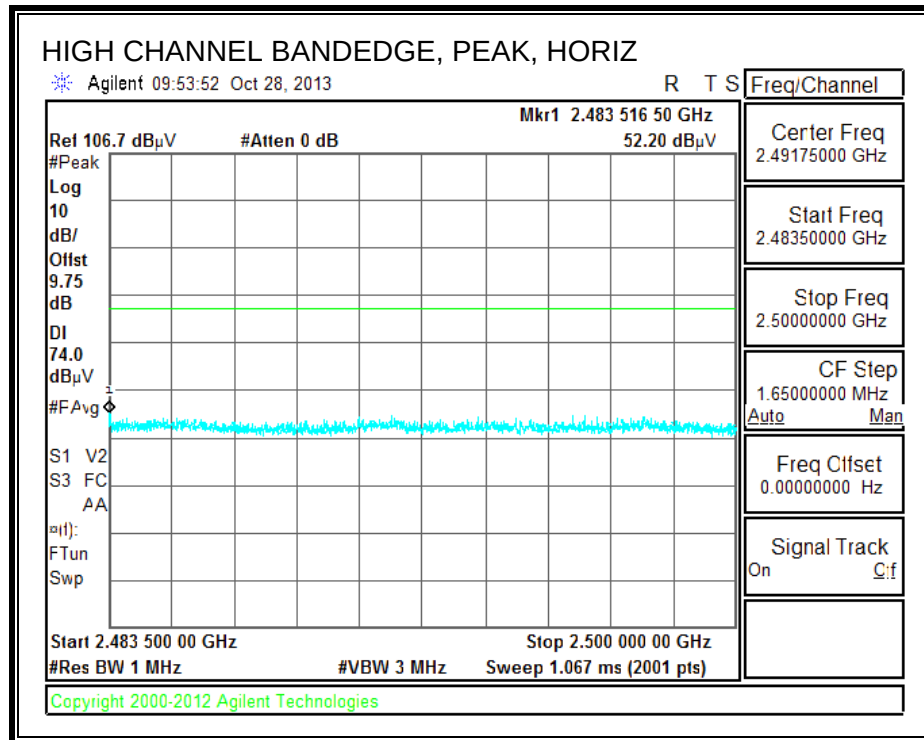
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

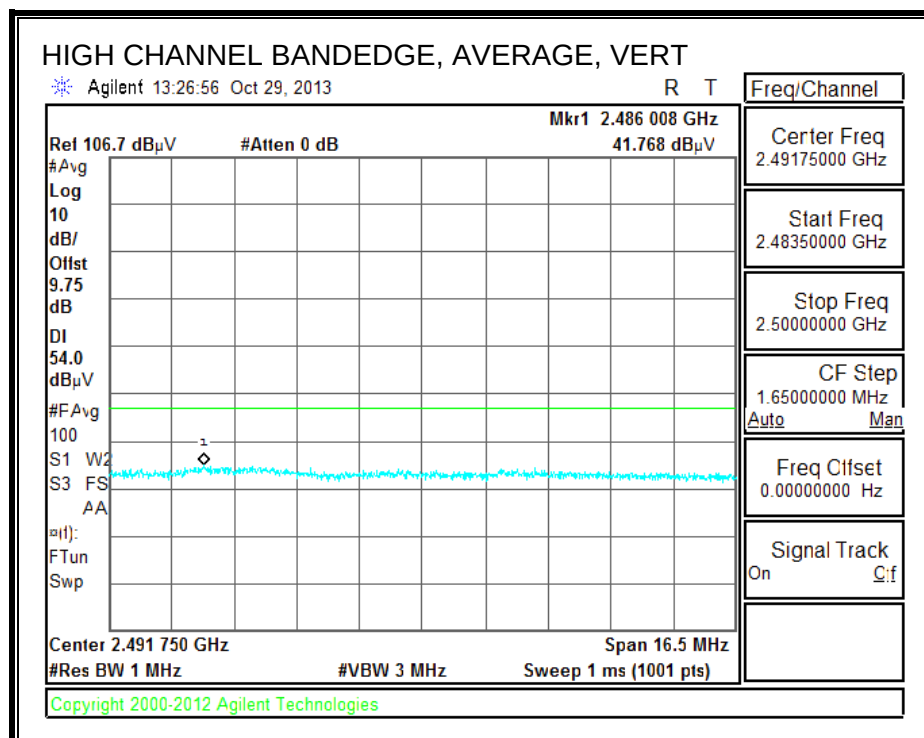
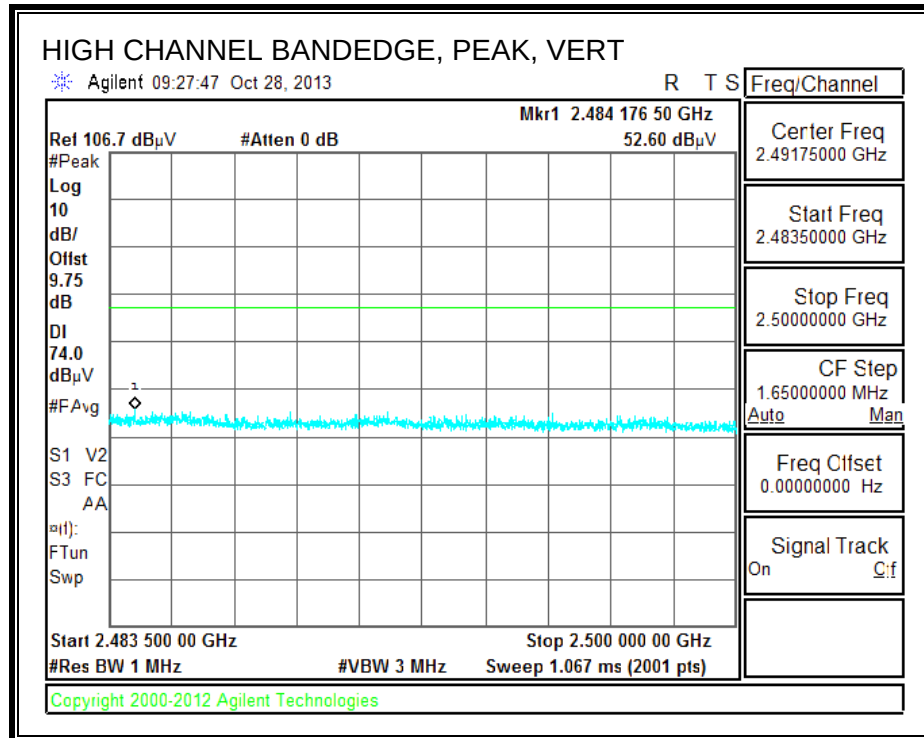






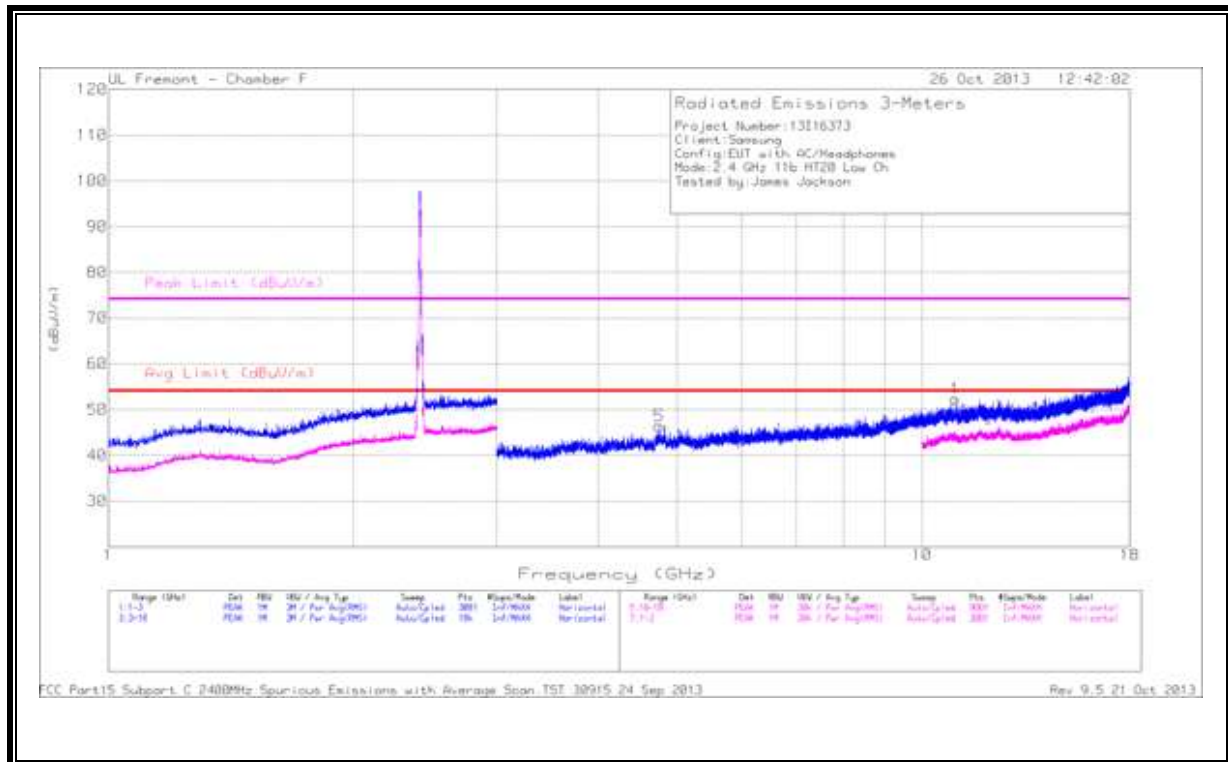
AUTHORIZED BANDEDGE (HIGH CHANNEL)



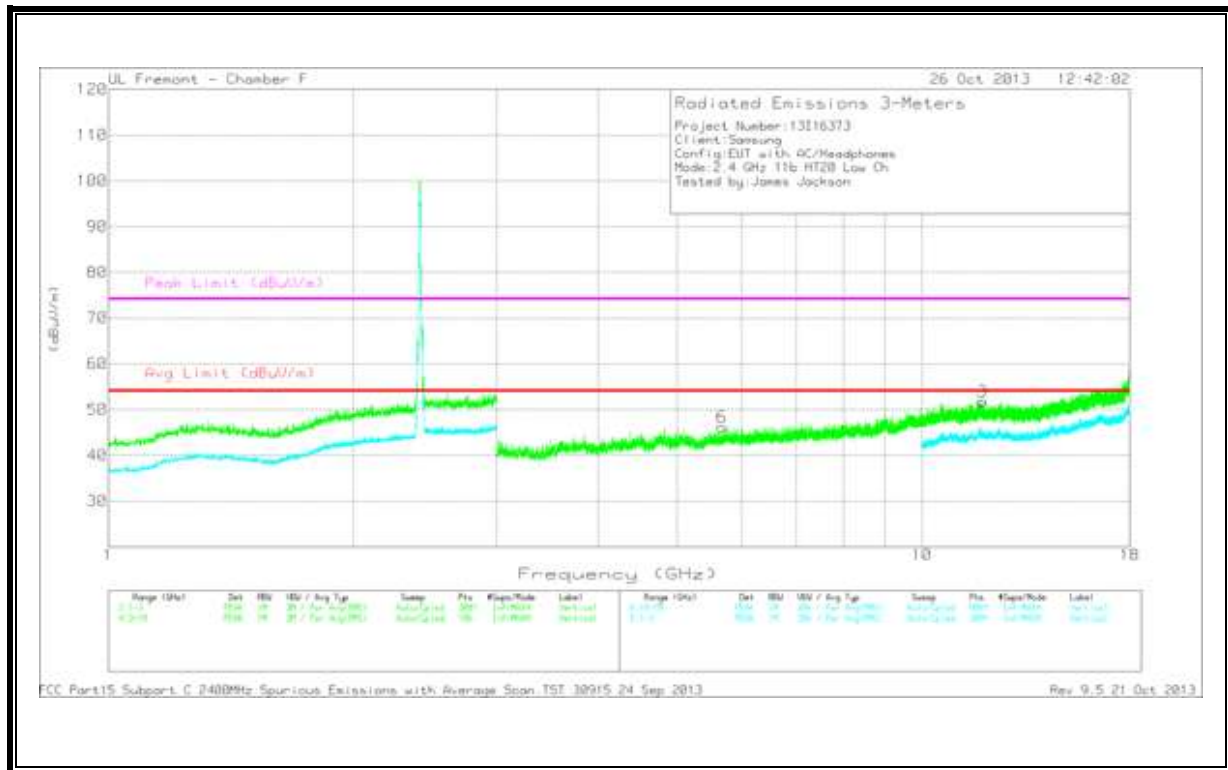


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



VERTICAL



LOW CHANNEL DATA

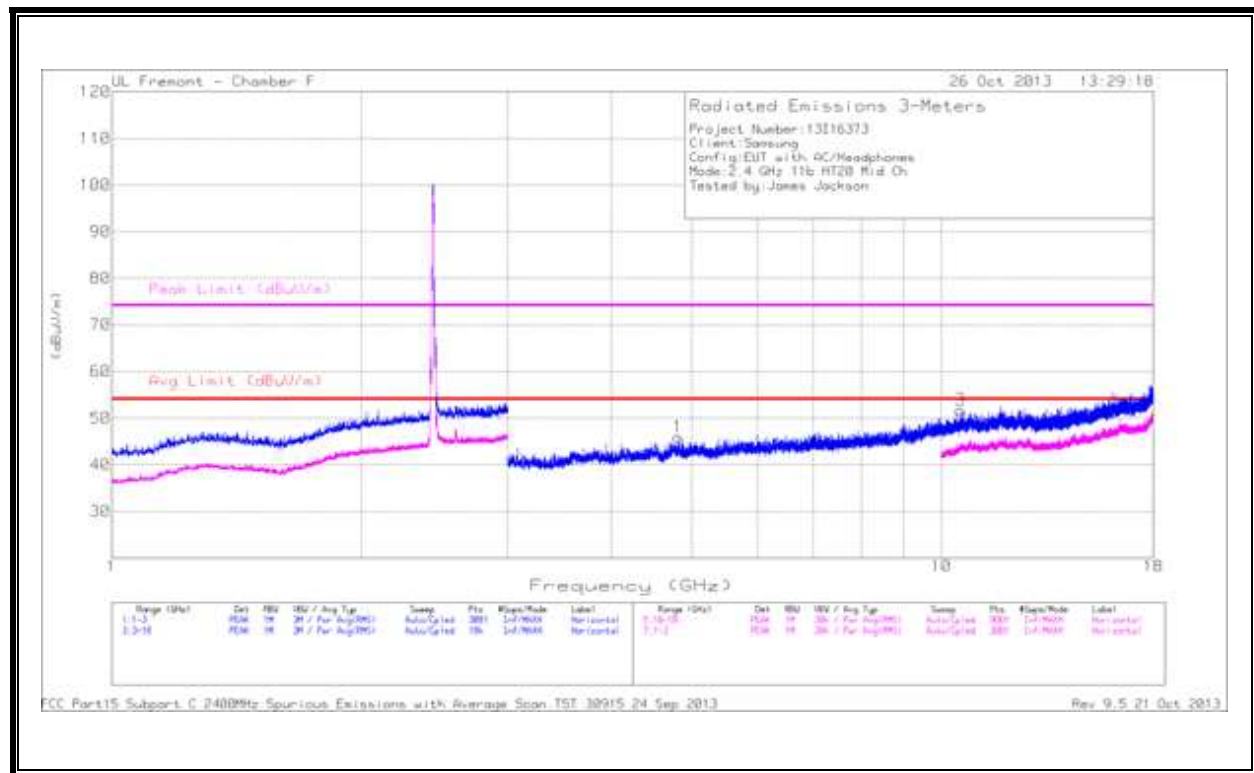
Trace Markers

Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	10.984	36.03	PK	38.7	-22.4	52.33	53.97	-1.64	74	-21.67	0-360	199	H
5	4.751	40.69	PK	34.1	-28.4	46.39	53.97	-7.58	74	-27.61	0-360	100	H
3	11.871	34.96	PK	39.3	-22.5	51.76	53.97	-2.21	74	-22.24	0-360	101	V
6	5.68	38.54	PK	34.8	-27.2	46.14	53.97	-7.83	74	-27.86	0-360	101	V
2	10.99	27.92	Avg	38.7	-22.5	44.12	53.97	-9.85	74	-29.88	0-360	100	H
4	11.886	28.53	Avg	39.3	-22.8	45.03	53.97	-8.94	74	-28.97	0-360	101	V

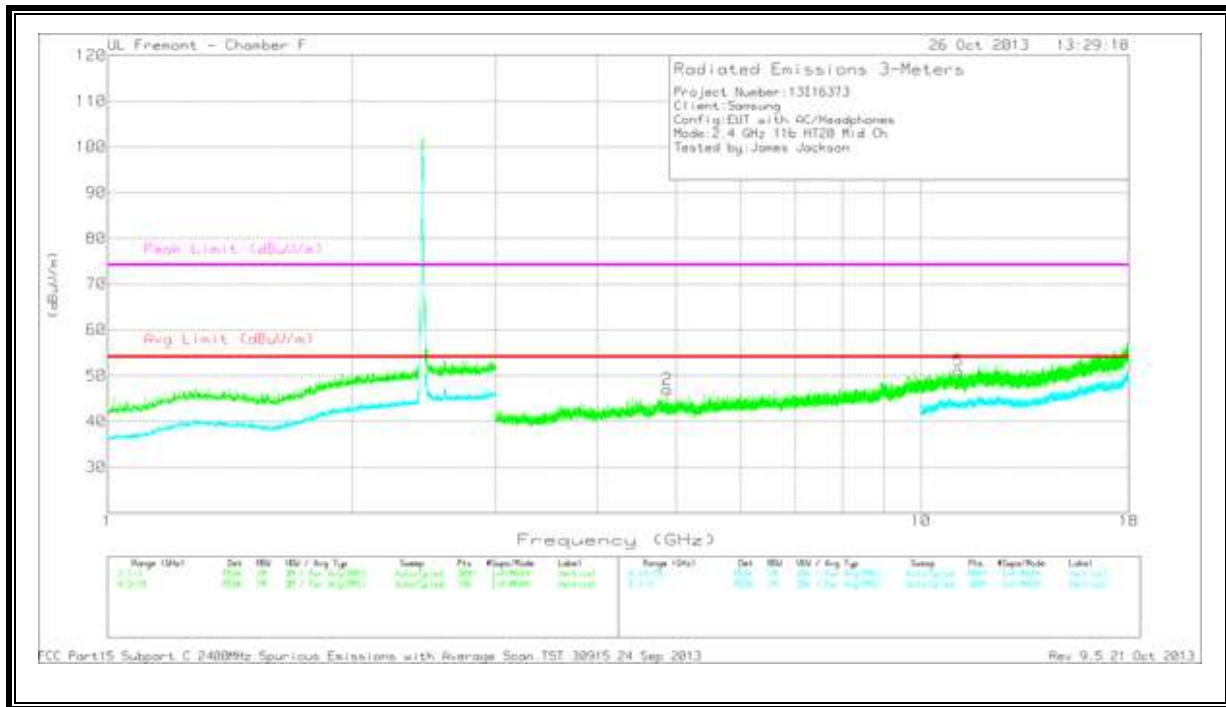
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

MID CHANNEL
HORIZONTAL



VERTICAL



MID CHANNEL DATA

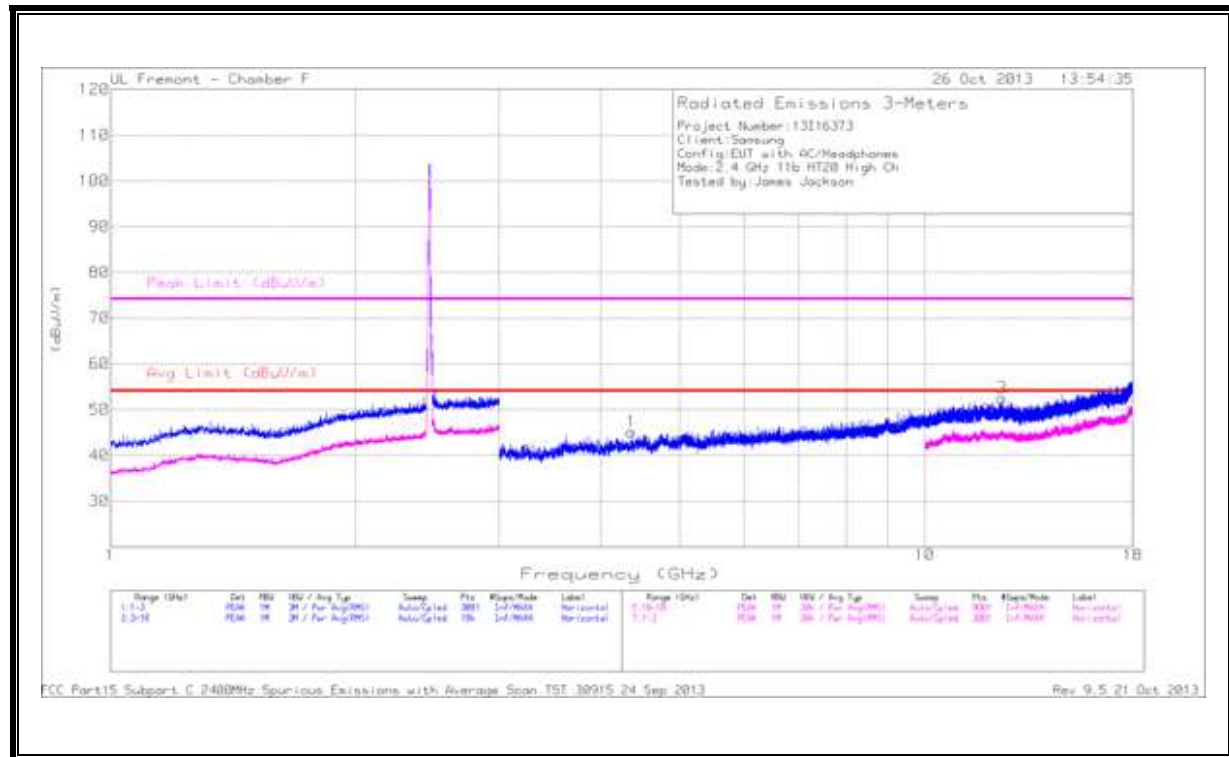
Trace Markers

Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.812	39.07	PK	34.1	-27.3	45.87	53.97	-8.1	74	-28.13	0-360	199	H
3	10.548	35.1	PK	38.4	-21.8	51.7	53.97	-2.27	74	-22.3	0-360	199	H
2	4.875	41.26	PK	34	-28.3	46.96	53.97	-7.01	74	-27.04	0-360	101	V
5	11.117	35.3	PK	38.6	-22.8	51.1	53.97	-2.87	74	-22.9	0-360	101	V
4	10.546	27.78	Avg	38.4	-21.8	44.38	53.97	-9.59	74	-29.62	0-360	100	H
6	11.132	27.83	Avg	38.6	-22.7	43.73	53.97	-10.24	74	-30.27	0-360	101	V

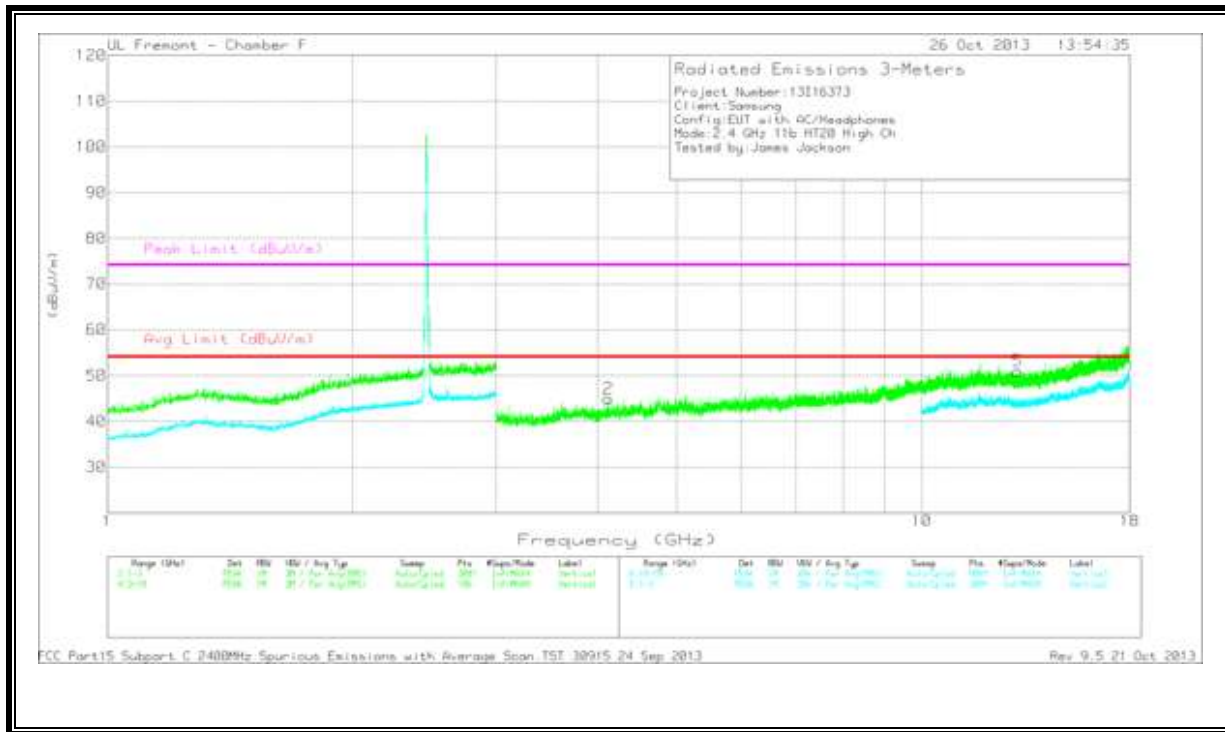
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

HIGH CHANNEL
HORIZONTAL



VERTICAL



HIGH CHANNEL DATA

Trace Markers

Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.361	40.85	PK	33.6	-29.3	45.15	53.97	-8.82	74	-28.85	0-360	199	H
3	12.434	35.7	PK	39.3	-22.5	52.5	53.97	-1.47	74	-21.5	0-360	100	H
2	4.12	40.35	PK	33.4	-28.8	44.95	53.97	-9.02	74	-29.05	0-360	101	V
5	13.119	36.12	PK	39.1	-24.2	51.02	53.97	-2.95	74	-22.98	0-360	201	V
4	12.422	28.59	Avg	39.3	-22.3	45.59	53.97	-8.38	74	-28.41	0-360	199	H
6	13.113	29.65	Avg	39.1	-24.2	44.55	53.97	-9.42	74	-29.45	0-360	101	V

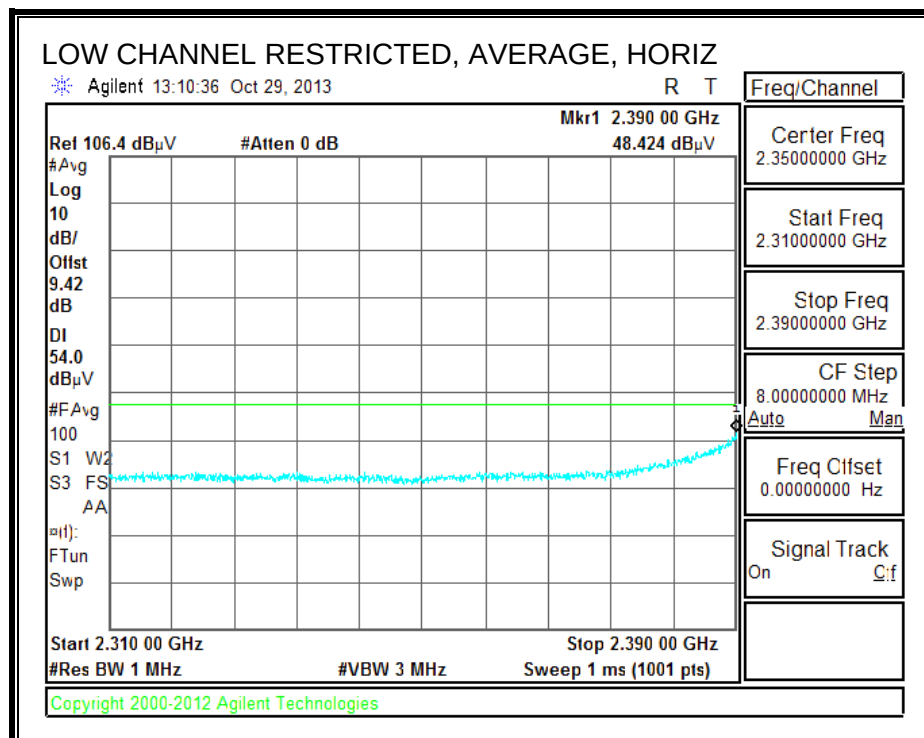
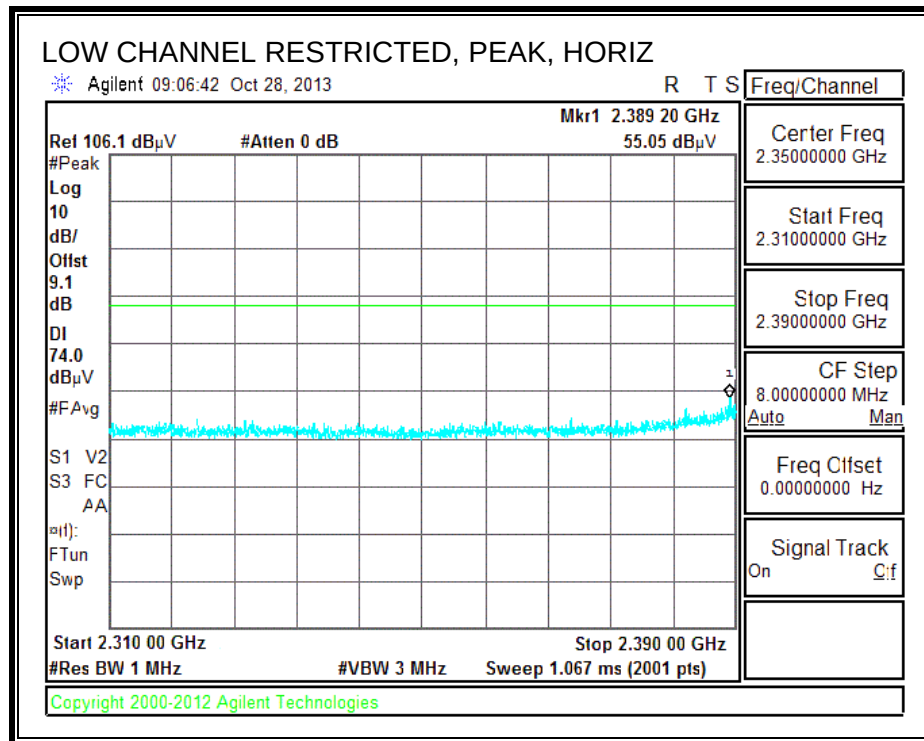
PK - Peak detector

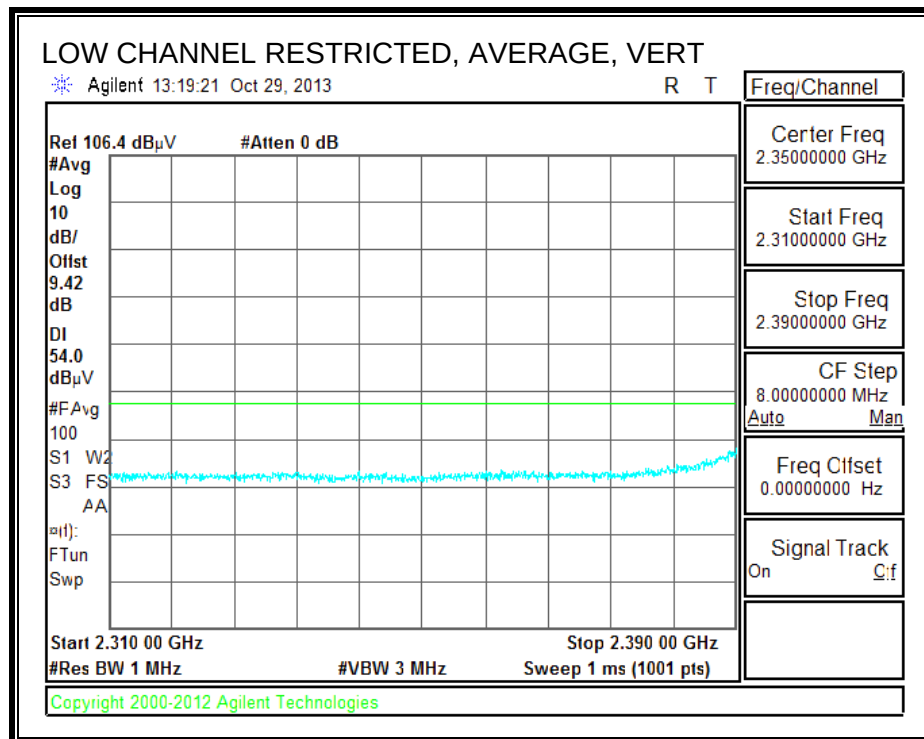
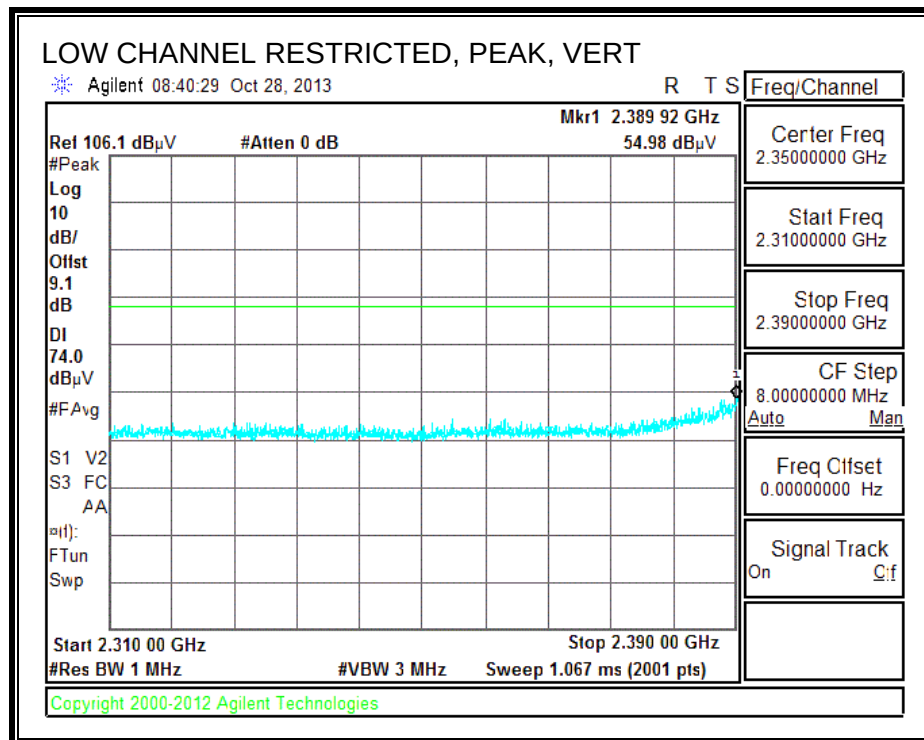
Avg - Video bandwidth < Resolution bandwidth

9.8.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

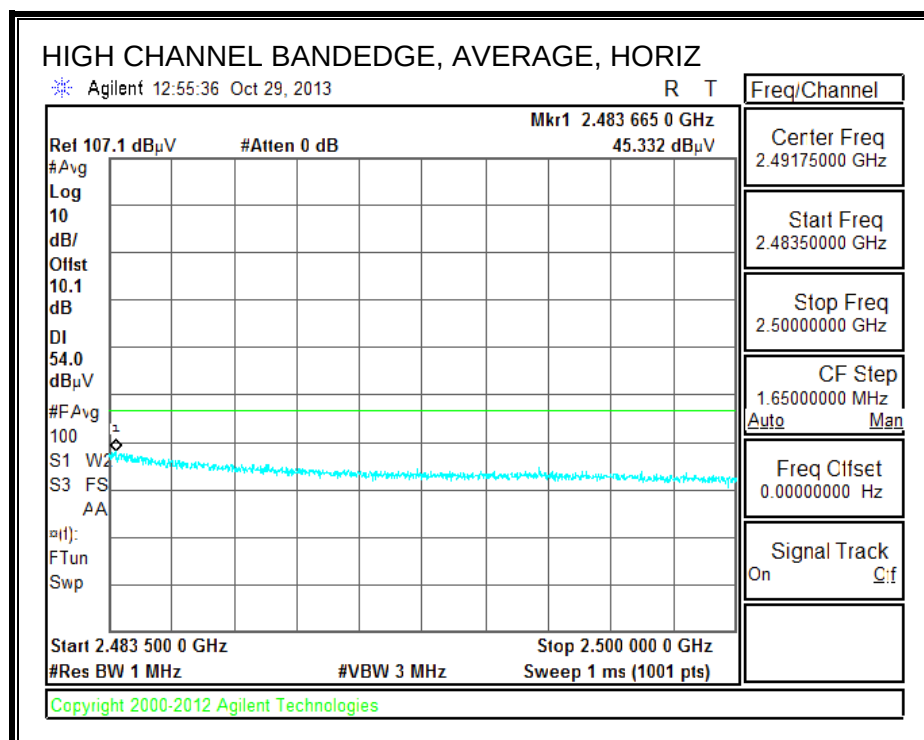
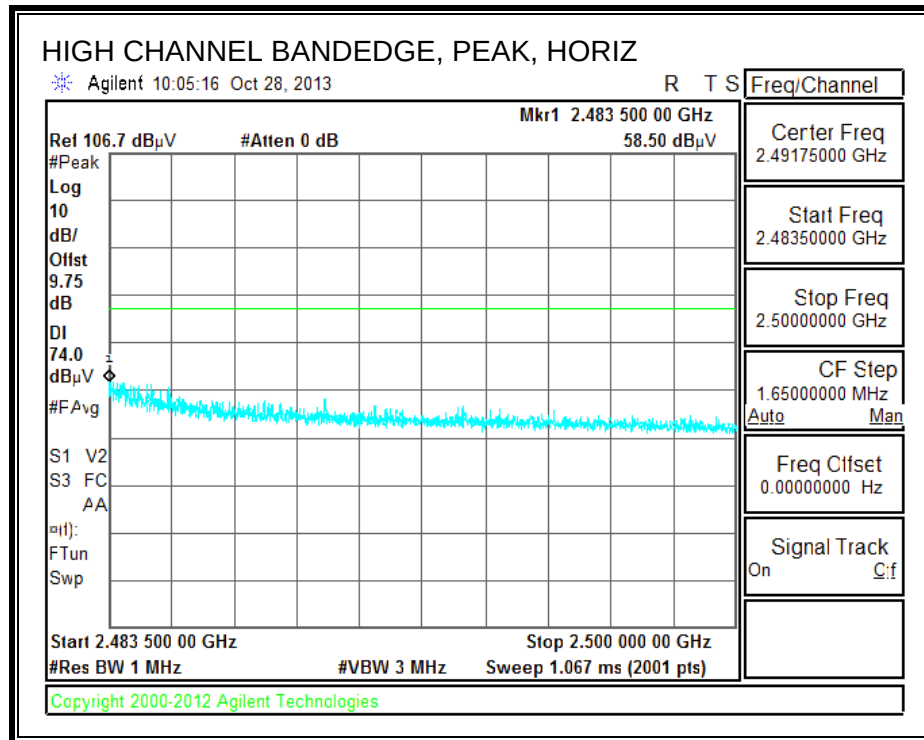
RESTRICTED BANDEDGE (LOW CHANNEL)

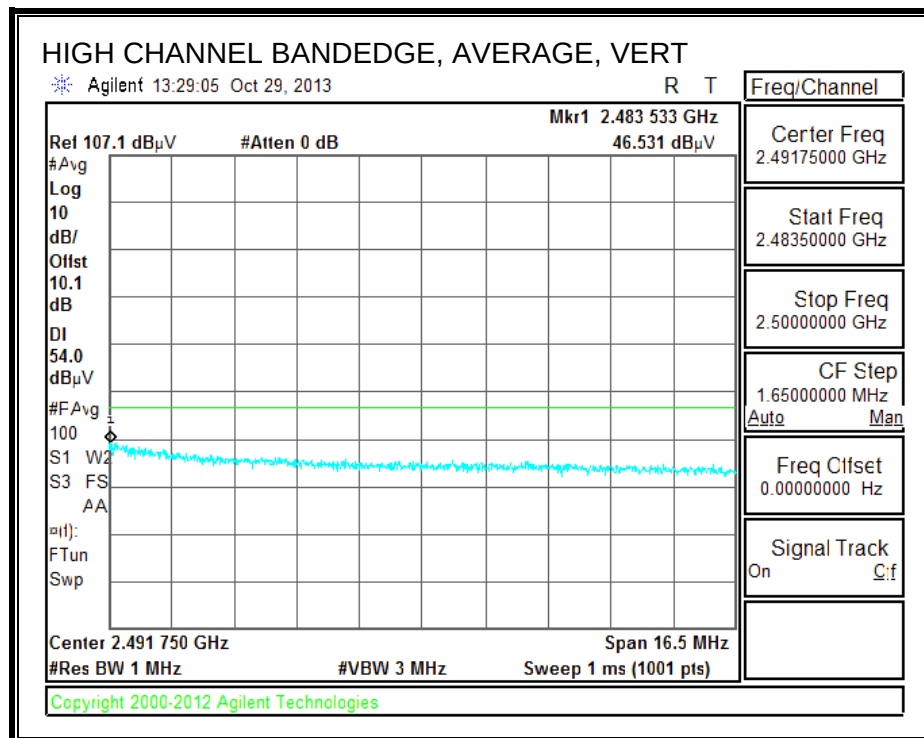
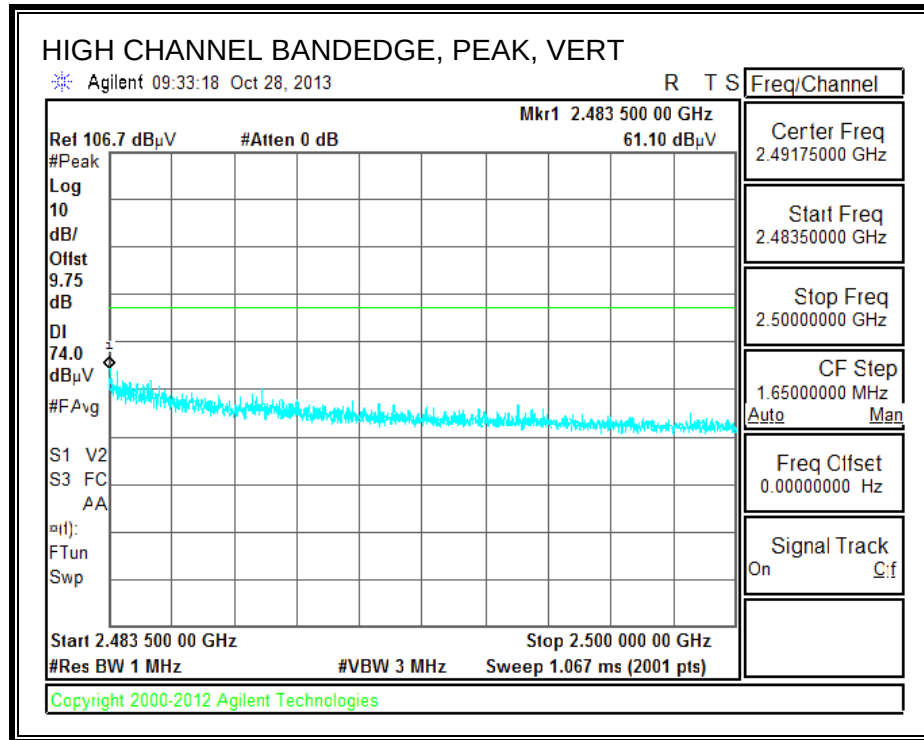
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.





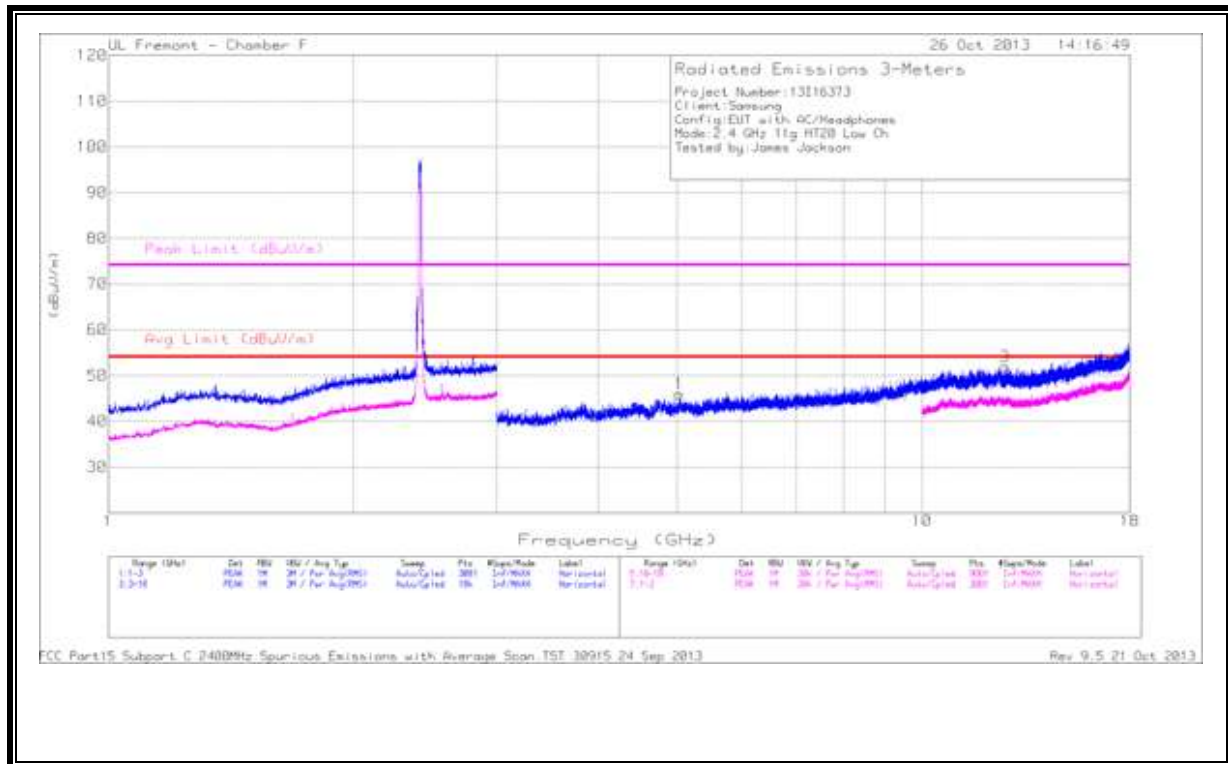
AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



LOW CHANNEL DATA

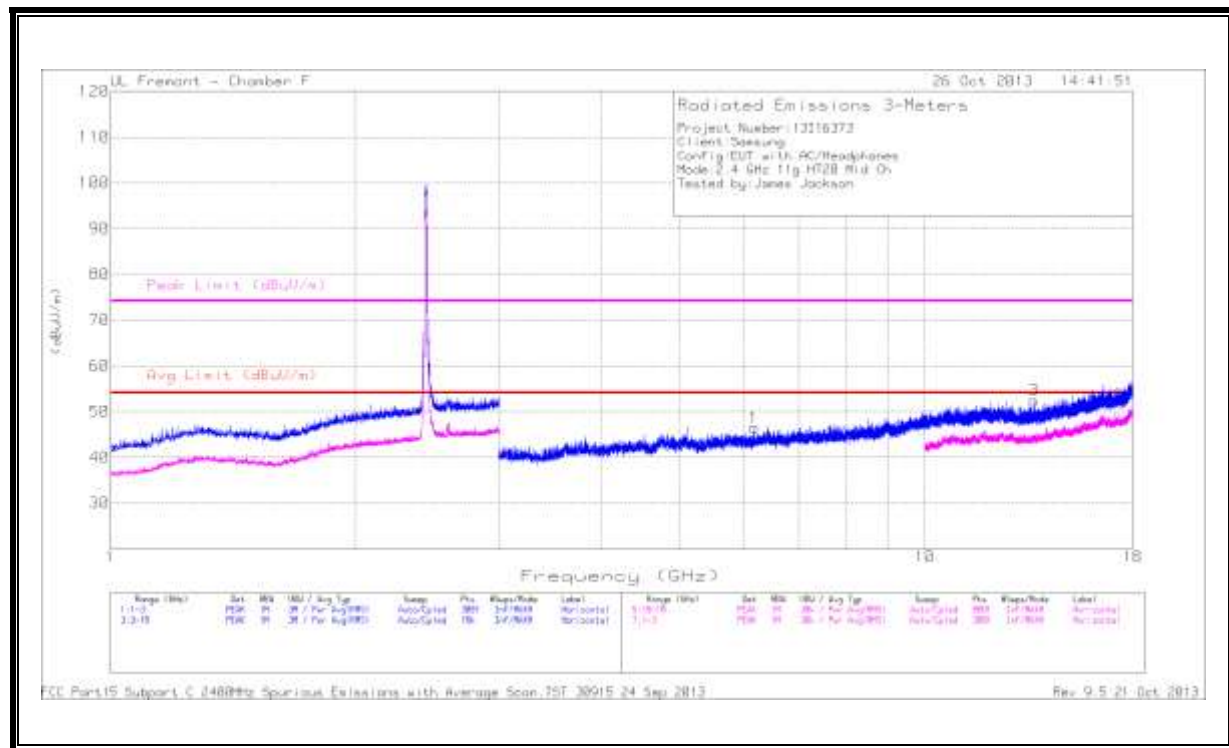
Trace Markers

Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.032	39.74	PK	34.1	-27.9	45.94	53.97	-8.03	74	-28.06	0-360	100	H
3	12.645	36.23	PK	39.5	-23.8	51.93	53.97	-2.04	74	-22.07	0-360	100	H
2	7.91	37.34	PK	35.9	-25.7	47.54	53.97	-6.43	74	-26.46	0-360	201	V
5	13.269	36.66	PK	39.3	-24.1	51.86	53.97	-2.11	74	-22.14	0-360	201	V
4	12.643	28.86	Avg	39.5	-23.7	44.66	53.97	-9.31	74	-29.34	0-360	100	H
6	13.253	29.67	Avg	39.3	-24.1	44.87	53.97	-9.1	74	-29.13	0-360	101	V

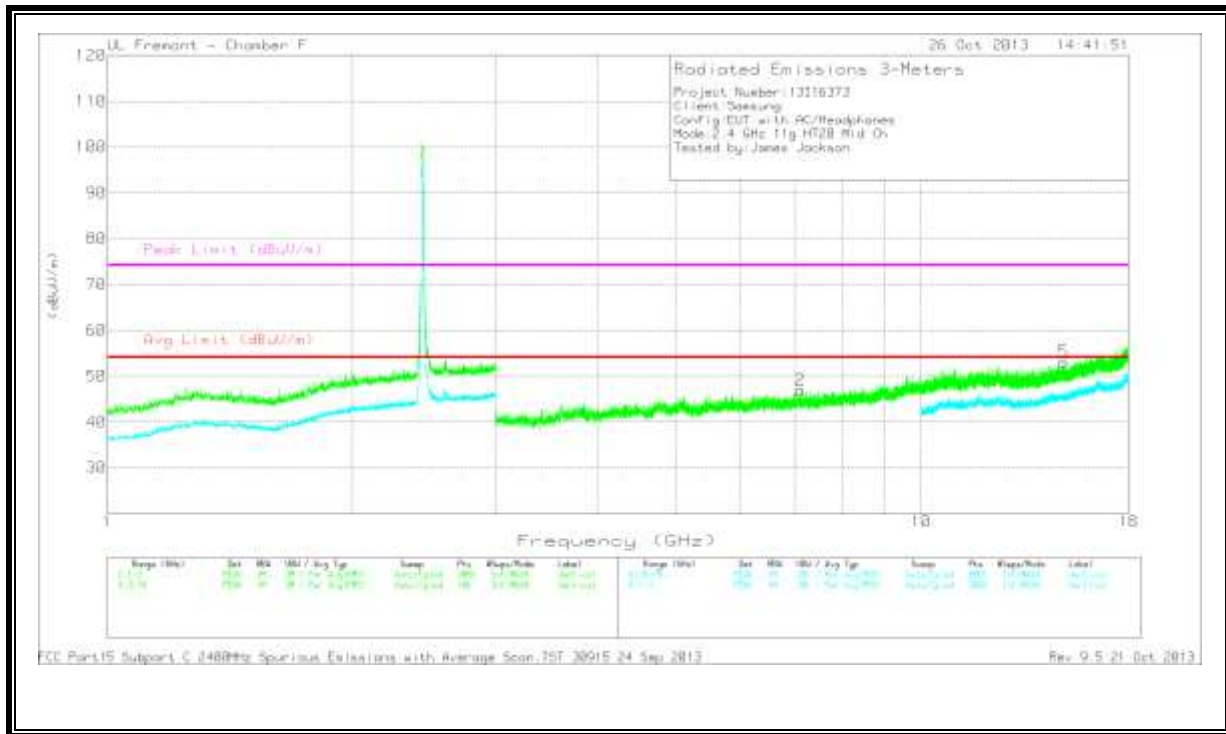
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

MID CHANNEL
HORIZONTAL



VERTICAL



MID CHANNEL DATA

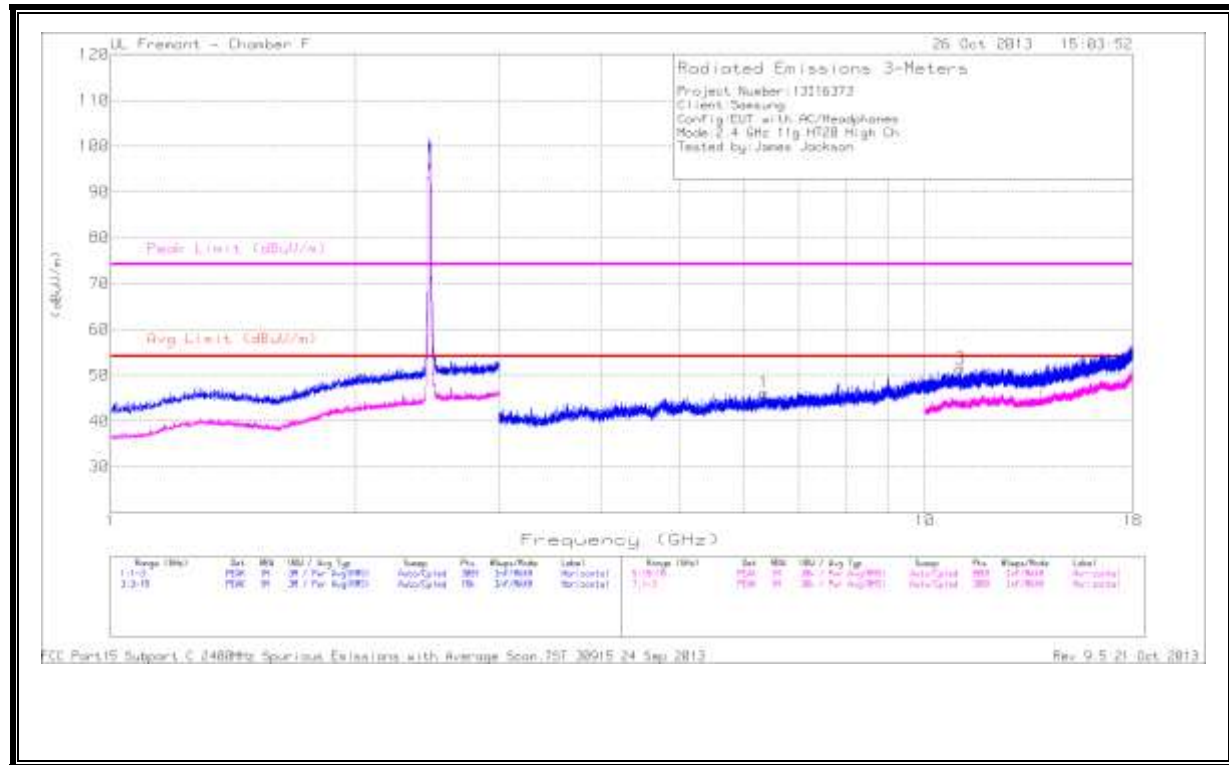
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.17	39.09	PK	35.4	-28	46.49	53.97	-7.48	74	-27.51	0-360	100	H
3	13.617	37.64	PK	39.1	-24.3	52.44	53.97	-1.53	74	-21.56	0-360	100	H
2	7.11	37.62	PK	35.7	-26.4	46.92	53.97	-7.05	74	-27.08	0-360	200	V
5	14.964	37.02	PK	40.1	-24	53.12	53.97	-.85	74	-20.88	0-360	200	V
4	13.635	30.07	Avg	39.1	-24.3	44.87	53.97	-9.1	74	-29.13	0-360	100	H
6	14.966	30.36	Avg	40.1	-24	46.46	53.97	-7.51	74	-27.54	0-360	101	V

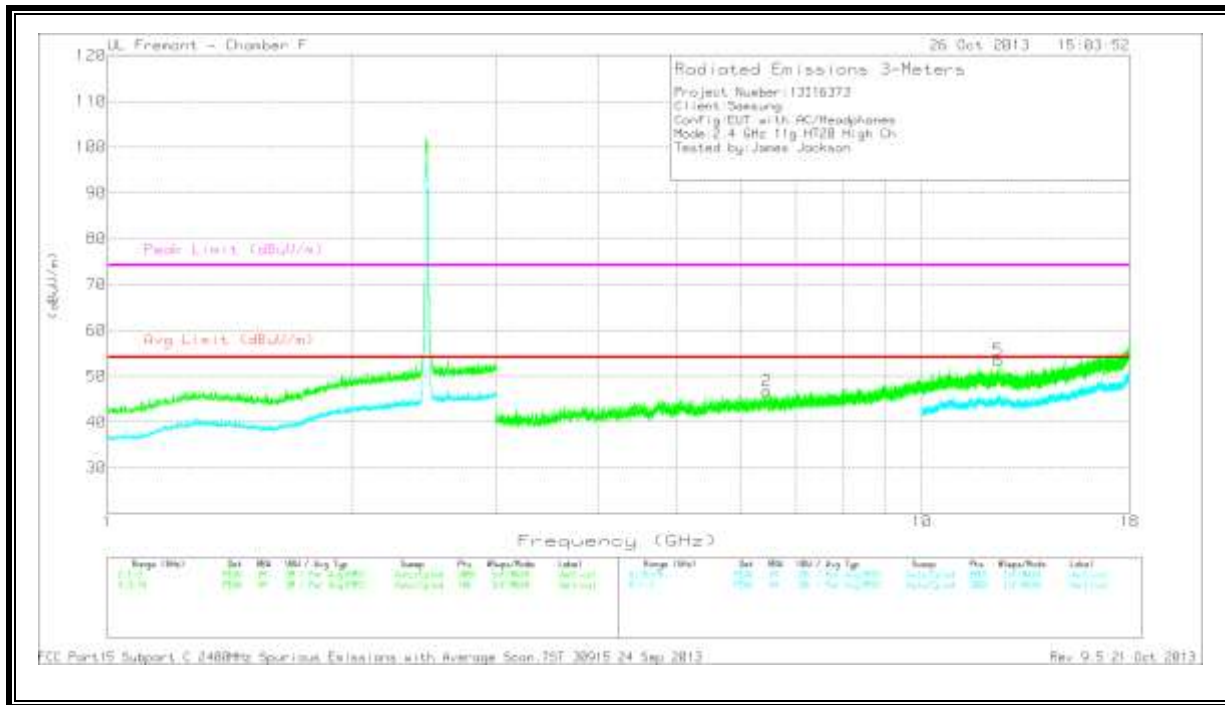
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

HIGH CHANNEL
HORIZONTAL



VERTICAL



HIGH CHANNEL DATA

Trace Markers

Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.347	37.55	PK	35.6	-27	46.15	53.97	-7.82	74	-27.85	0-360	100	H
3	11.058	35.78	PK	38.6	-22.9	51.48	53.97	-2.49	74	-22.52	0-360	199	H
2	6.45	38.16	PK	35.8	-27.2	46.76	53.97	-7.21	74	-27.24	0-360	100	V
5	12.403	36.28	PK	39.3	-22.1	53.48	53.97	-.49	74	-20.52	0-360	201	V
4	11.071	28.51	Avg	38.6	-22.8	44.31	53.97	-9.66	74	-29.69	0-360	199	H
6	12.414	28.48	Avg	39.3	-22.2	45.58	53.97	-8.39	74	-28.42	0-360	101	V

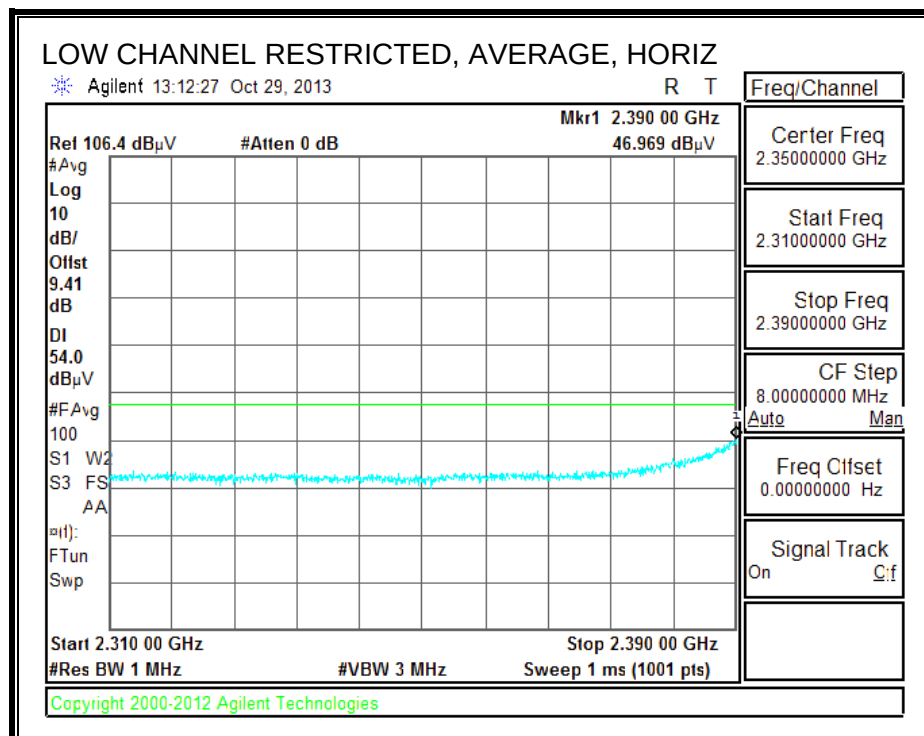
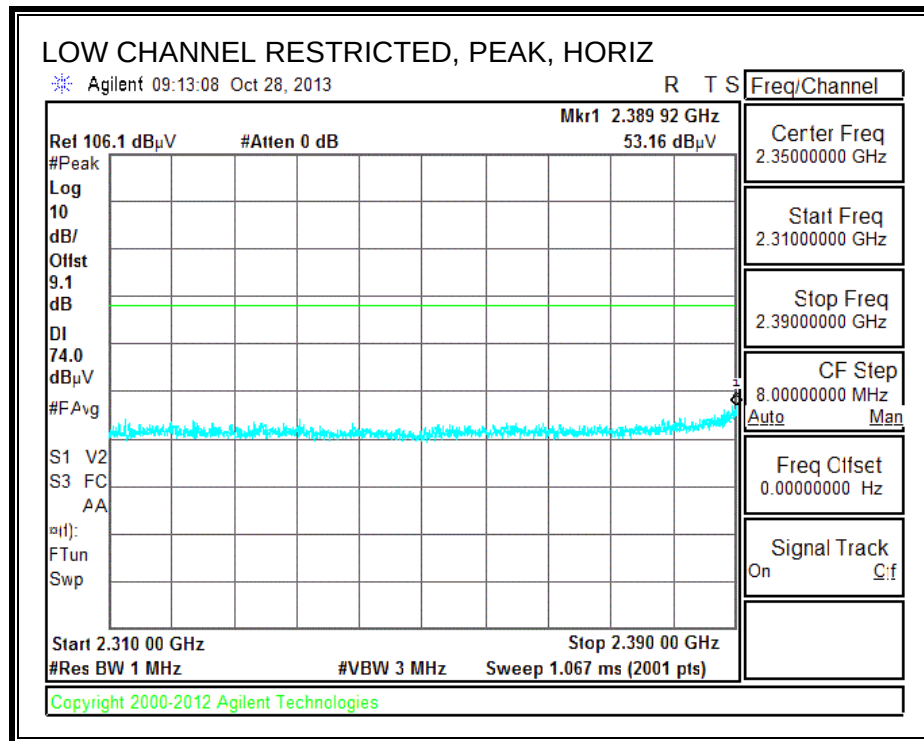
PK - Peak detector

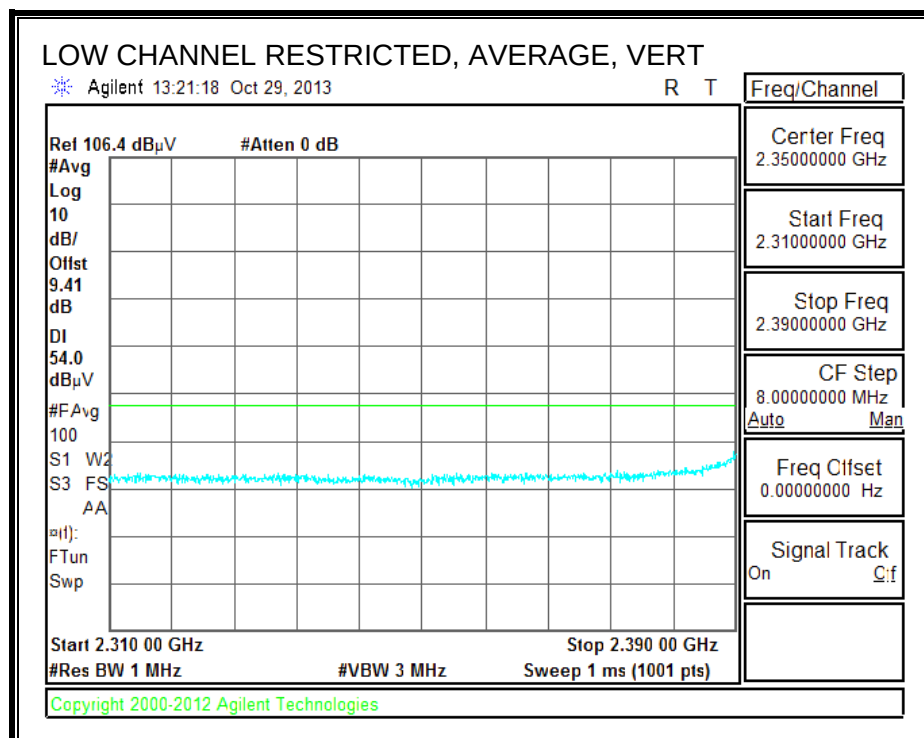
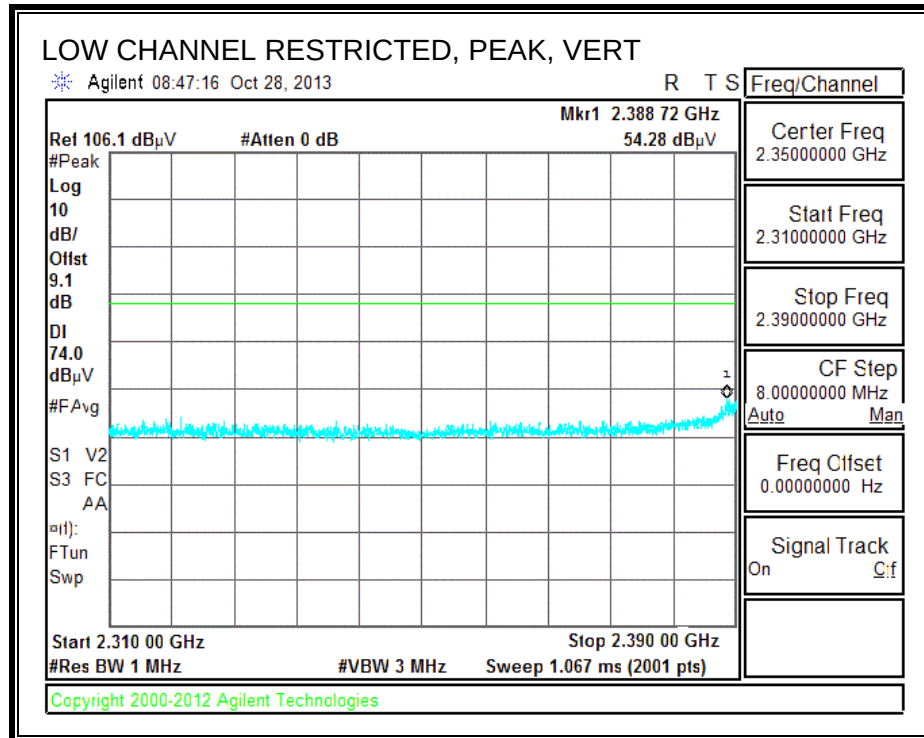
Avg - Video bandwidth < Resolution bandwidth

9.8.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

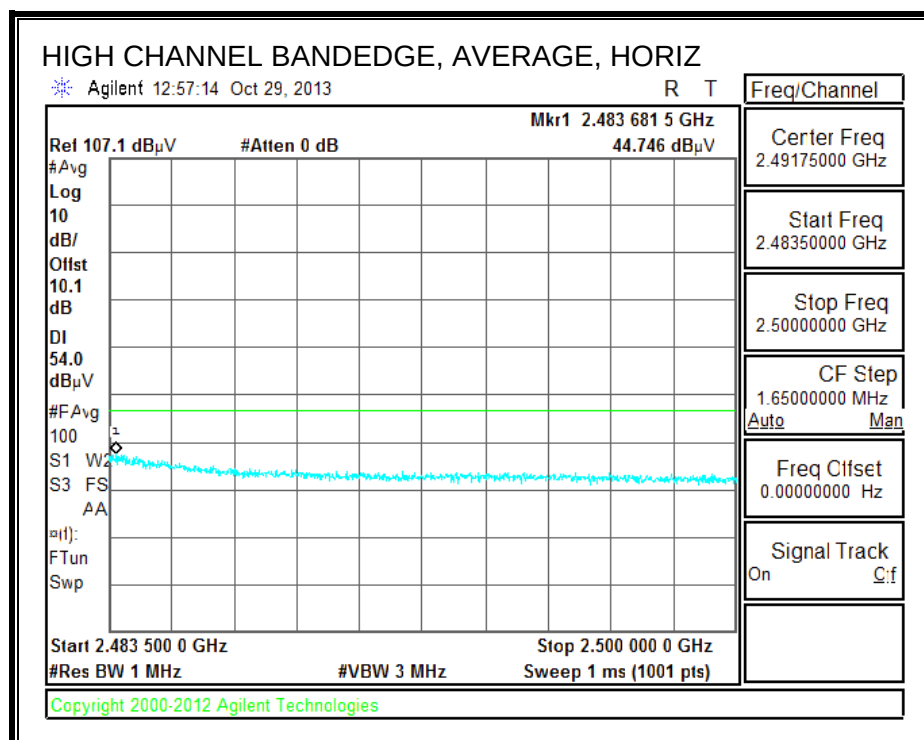
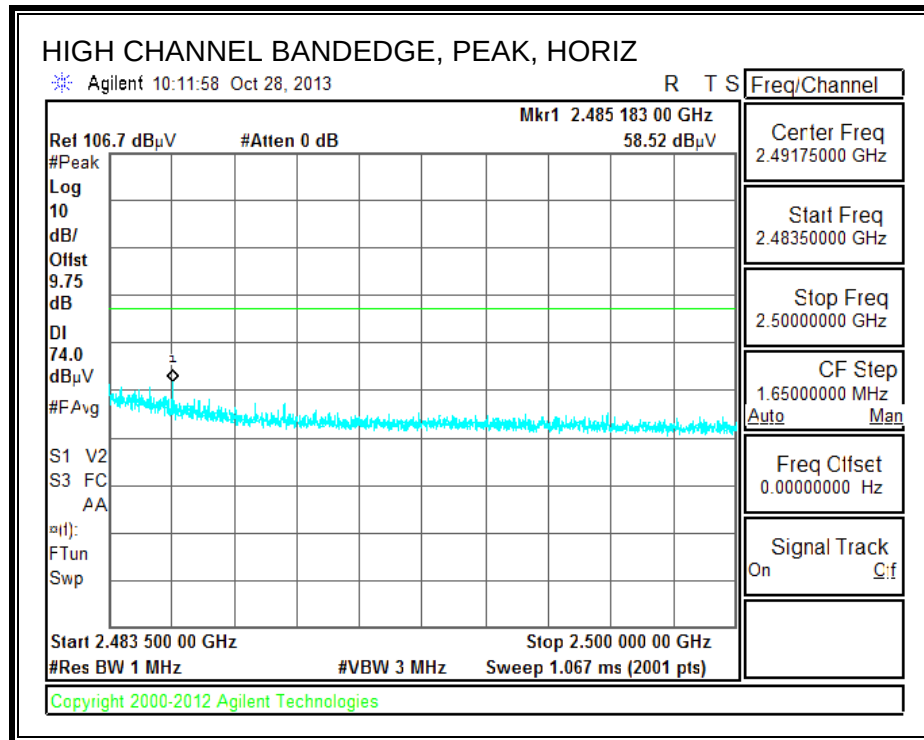
RESTRICTED BANDEDGE (LOW CHANNEL)

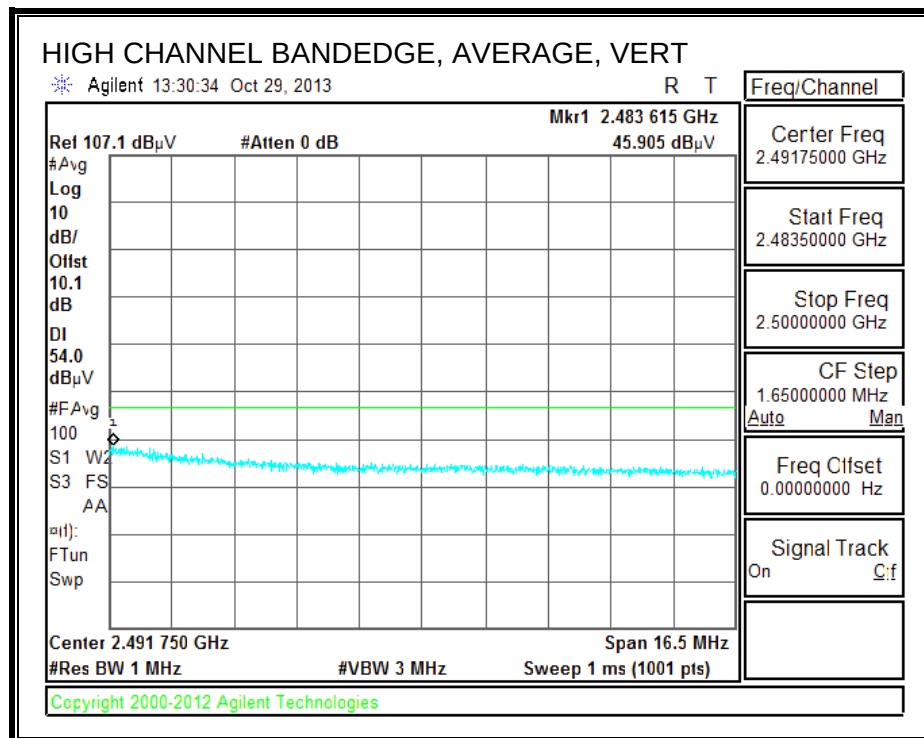
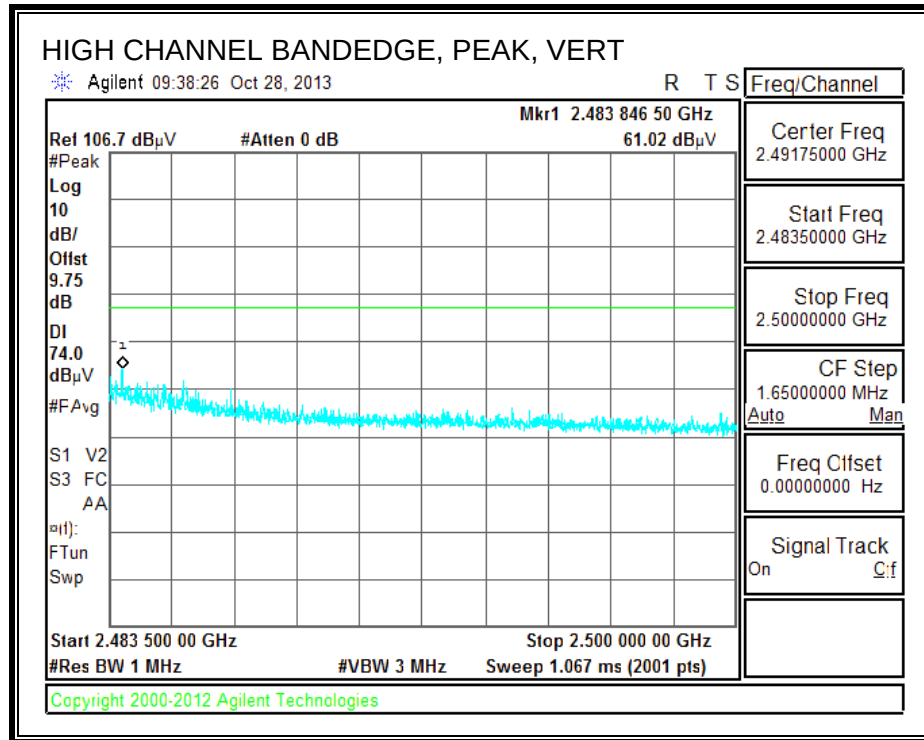
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.





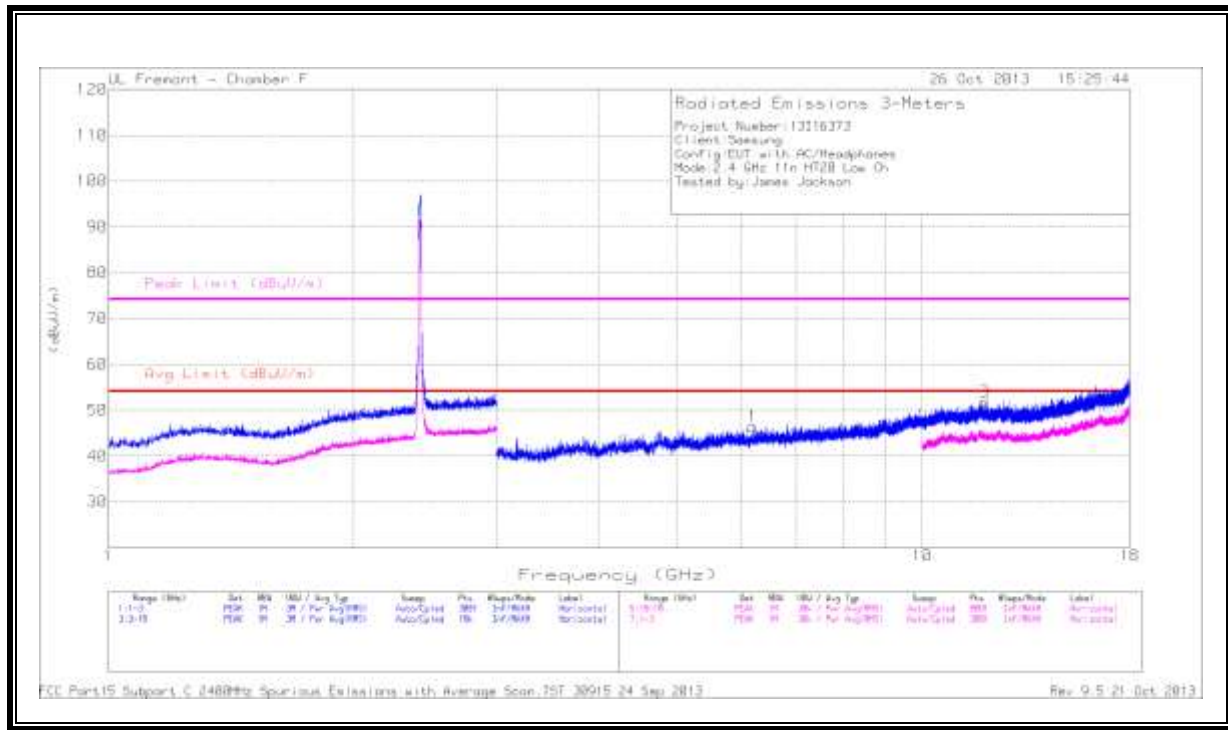
AUTHORIZED BANDEDGE (HIGH CHANNEL)



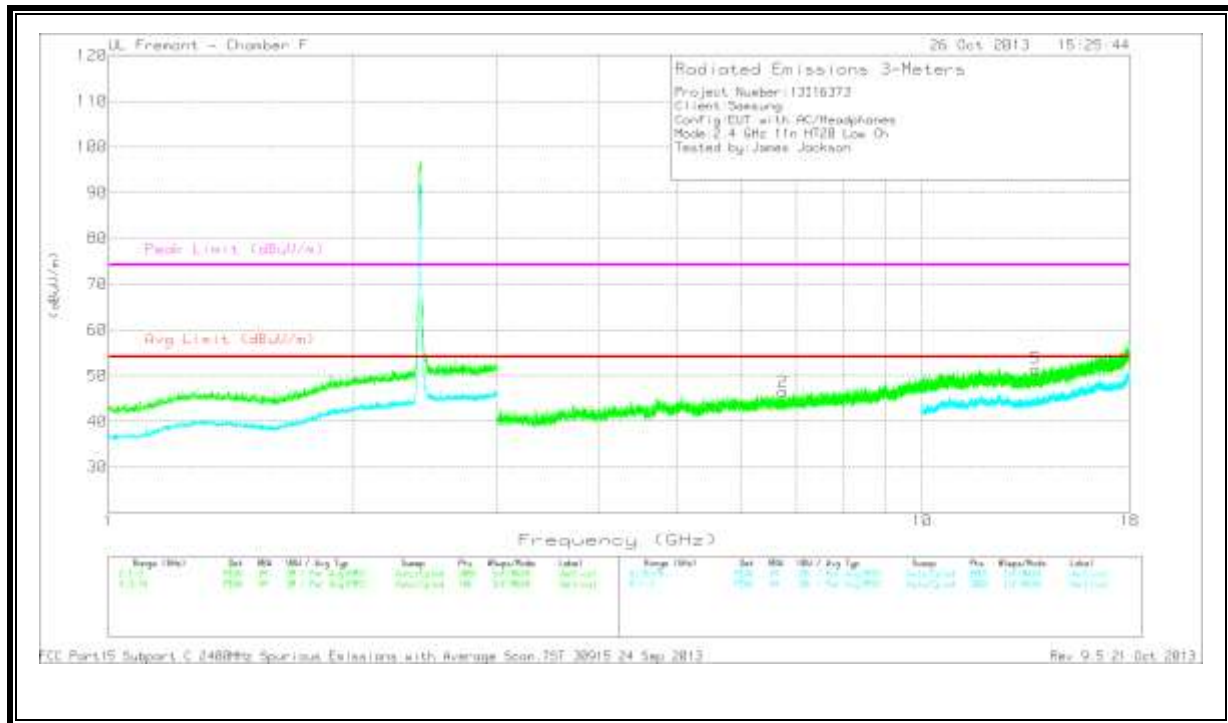


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



VERTICAL



LOW CHANNEL DATA

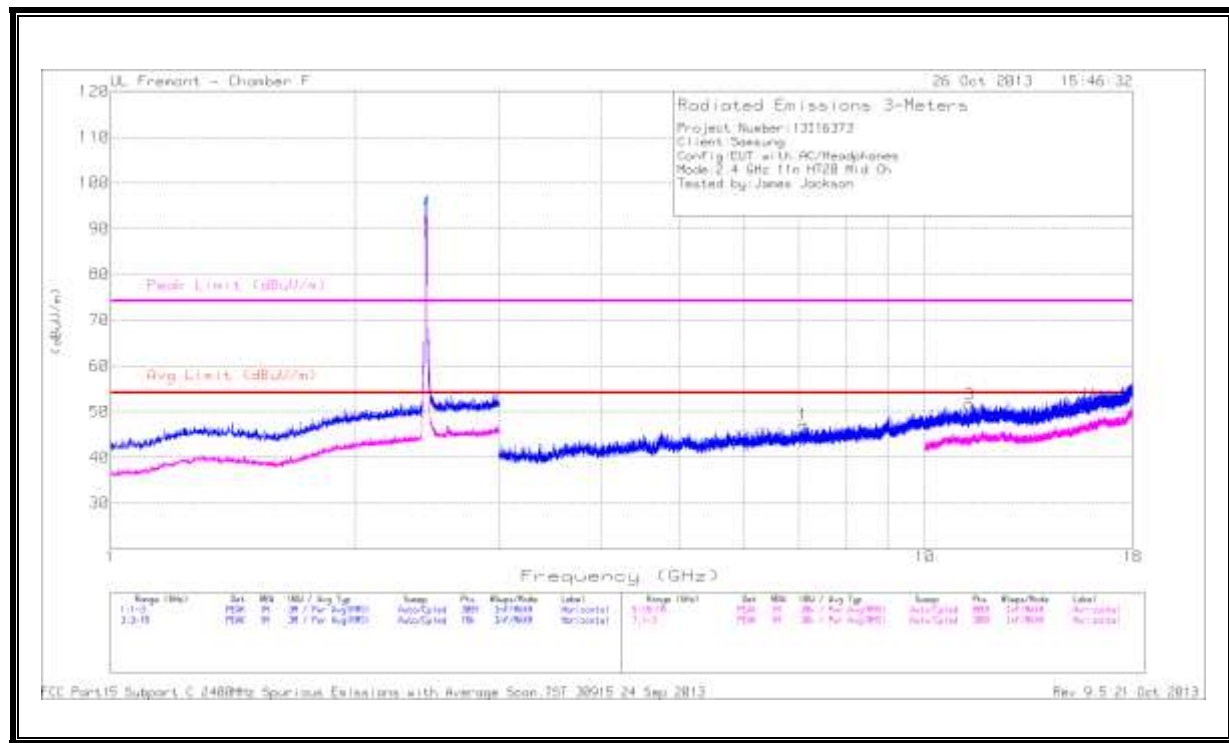
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.194	38.73	PK	35.4	-27.7	46.43	53.97	-7.54	74	-27.57	0-360	199	H
3	11.953	35.7	PK	39.3	-23.3	51.7	53.97	-2.27	74	-22.3	0-360	199	H
2	6.746	37.79	PK	35.8	-27.1	46.49	53.97	-7.48	74	-27.51	0-360	201	V
5	13.796	36.22	PK	39.1	-23.8	51.52	53.97	-2.45	74	-22.48	0-360	201	V
4	11.946	28.77	Avg	39.3	-23.2	44.87	53.97	-9.1	74	-29.13	0-360	199	H
6	13.802	29.65	Avg	39.1	-23.8	44.95	53.97	-9.02	74	-29.05	0-360	200	V

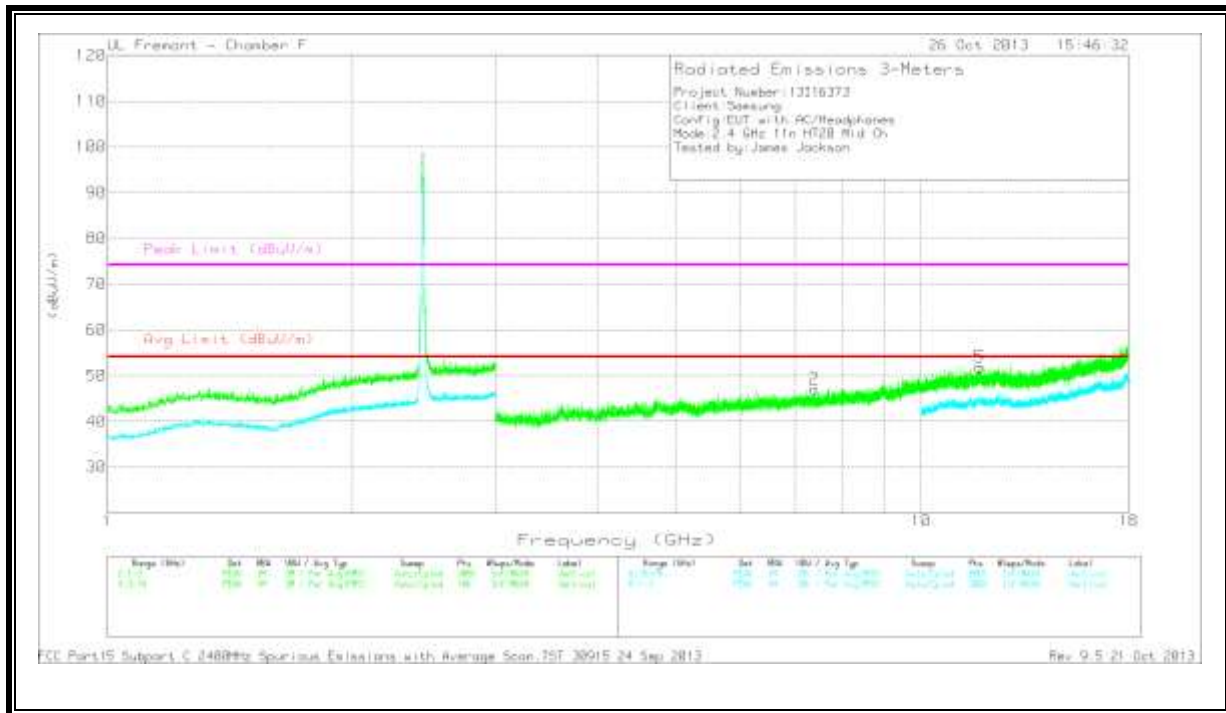
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

MID CHANNEL
HORIZONTAL



VERTICAL



MID CHANNEL DATA

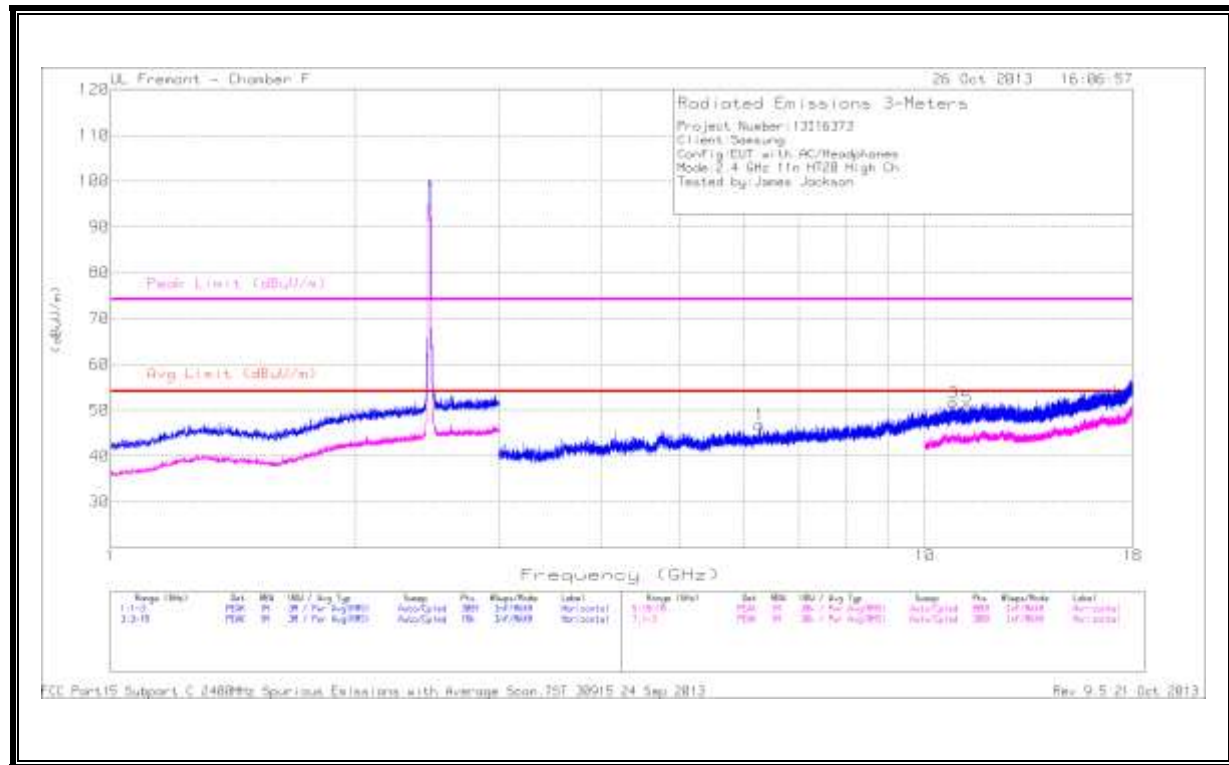
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	7.106	37.77	PK	35.7	-26.4	47.07	53.97	-6.9	74	-26.93	0-360	100	H
3	11.344	35.83	PK	38.7	-23	51.53	53.97	-2.44	74	-22.47	0-360	199	H
2	7.401	37.49	PK	35.7	-26.1	47.09	53.97	-6.88	74	-26.91	0-360	101	V
5	11.799	34.68	PK	39.2	-22	51.88	53.97	-2.09	74	-22.12	0-360	201	V
4	11.351	28.39	Avg	38.7	-22.9	44.19	53.97	-9.78	74	-29.81	0-360	100	H
6	11.805	28.54	Avg	39.2	-22	45.74	53.97	-8.23	74	-28.26	0-360	200	V

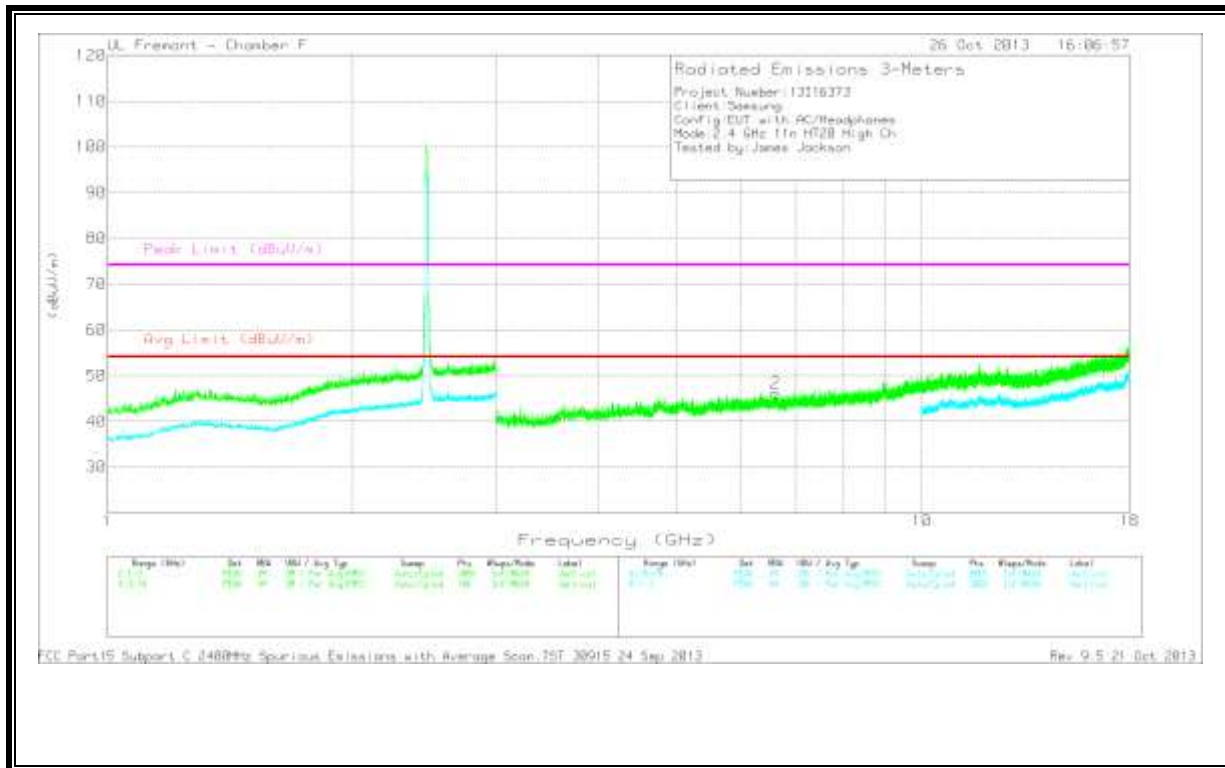
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

HIGH CHANNEL
HORIZONTAL



VERTICAL



HIGH CHANNEL DATA

Trace Markers

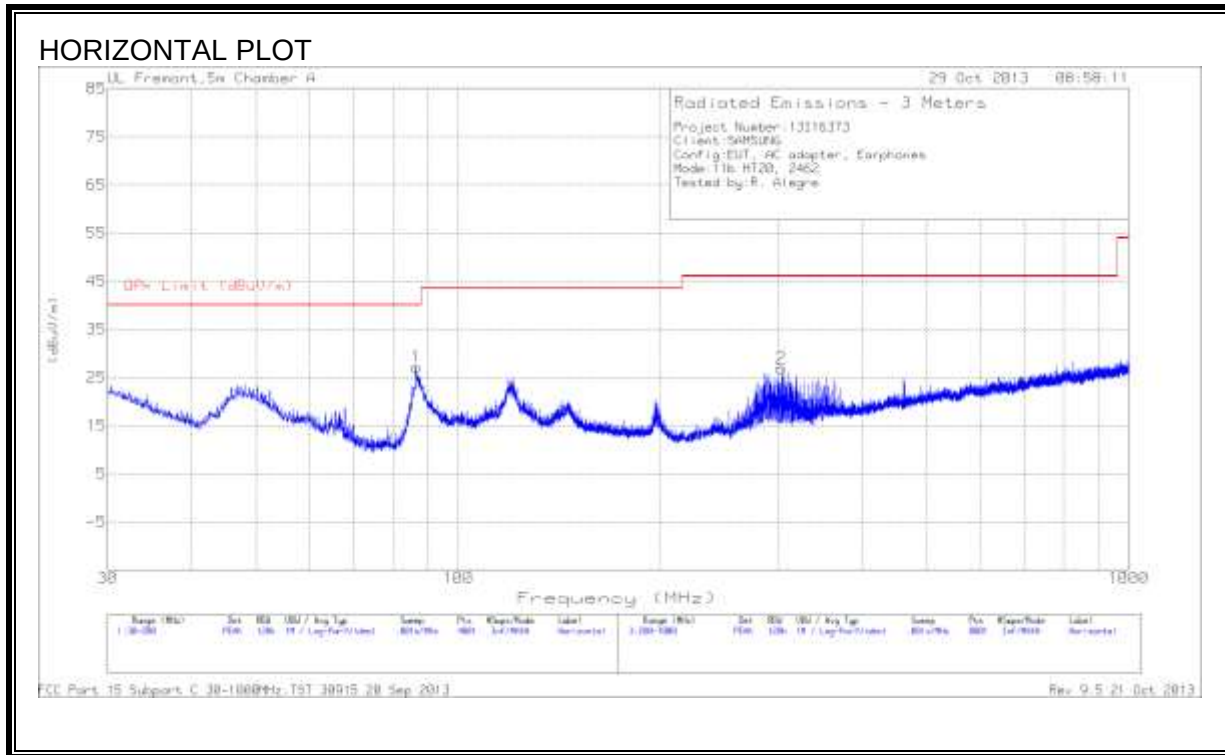
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.27	38.56	PK	35.5	-27.3	46.76	53.97	-7.21	74	-27.24	0-360	199	H
3	10.836	34.62	PK	38.7	-21.7	51.62	53.97	-2.35	74	-22.38	0-360	199	H
5	11.285	34.51	PK	38.6	-22.5	50.61	53.97	-3.36	74	-23.39	0-360	199	H
2	6.613	36.83	PK	35.8	-26.5	46.13	53.97	-7.84	74	-27.87	0-360	200	V
6	11.294	28.48	Avg	38.6	-22.8	44.28	53.97	-9.69	74	-29.72	0-360	199	H
4	10.852	28.81	Avg	38.7	-22	45.51	53.97	-8.46	74	-28.49	0-360	200	V

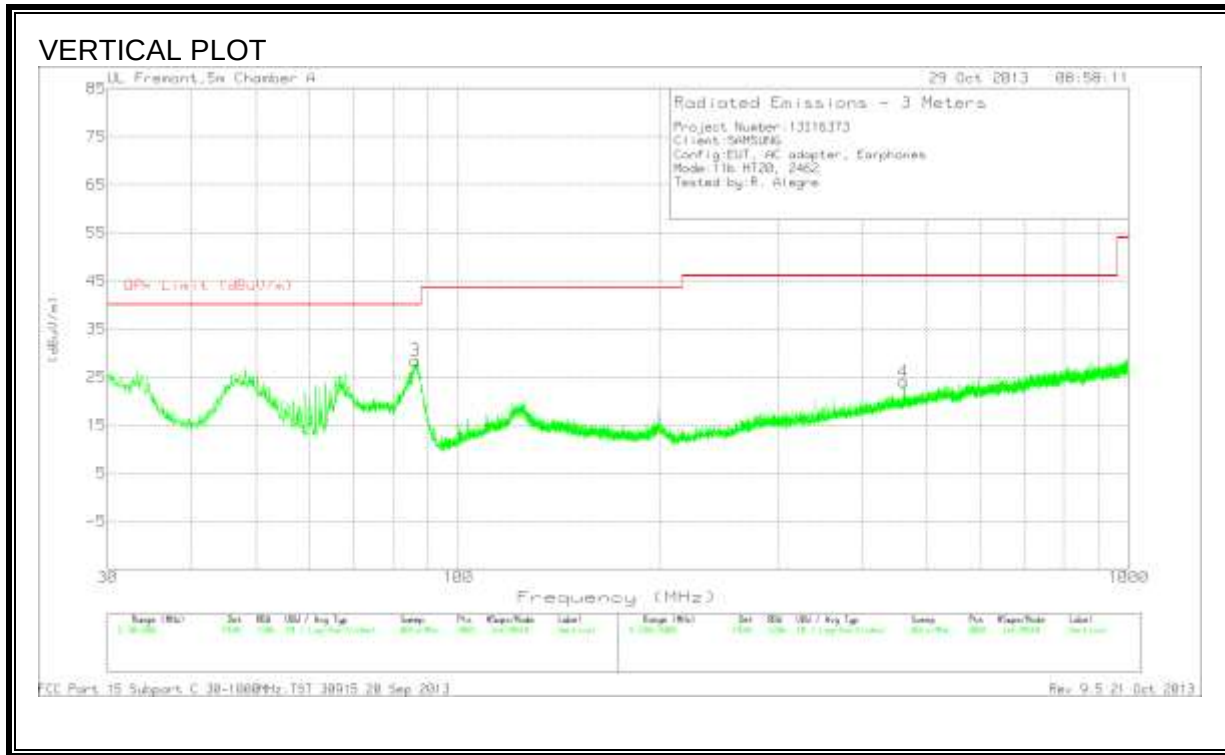
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

9.9. WORST-CASE BELOW 1 GHz

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





Below 1G Data Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	86.61	46.67	PK	7.5	-27	27.17	40	-12.83	0-360	300	H
3	86.27	47.94	PK	7.4	-27	28.34	40	-11.66	0-360	100	V
2	303.6	39.17	PK	13.3	-25.6	26.87	46.02	-19.15	0-360	100	H
4	461.55	32.02	PK	16.7	-24.7	24.02	46.02	-22	0-360	300	V

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 20 Sep 2013 Rev 9.5 21 Oct 2013

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

^{*} Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

RESULTS

6 WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

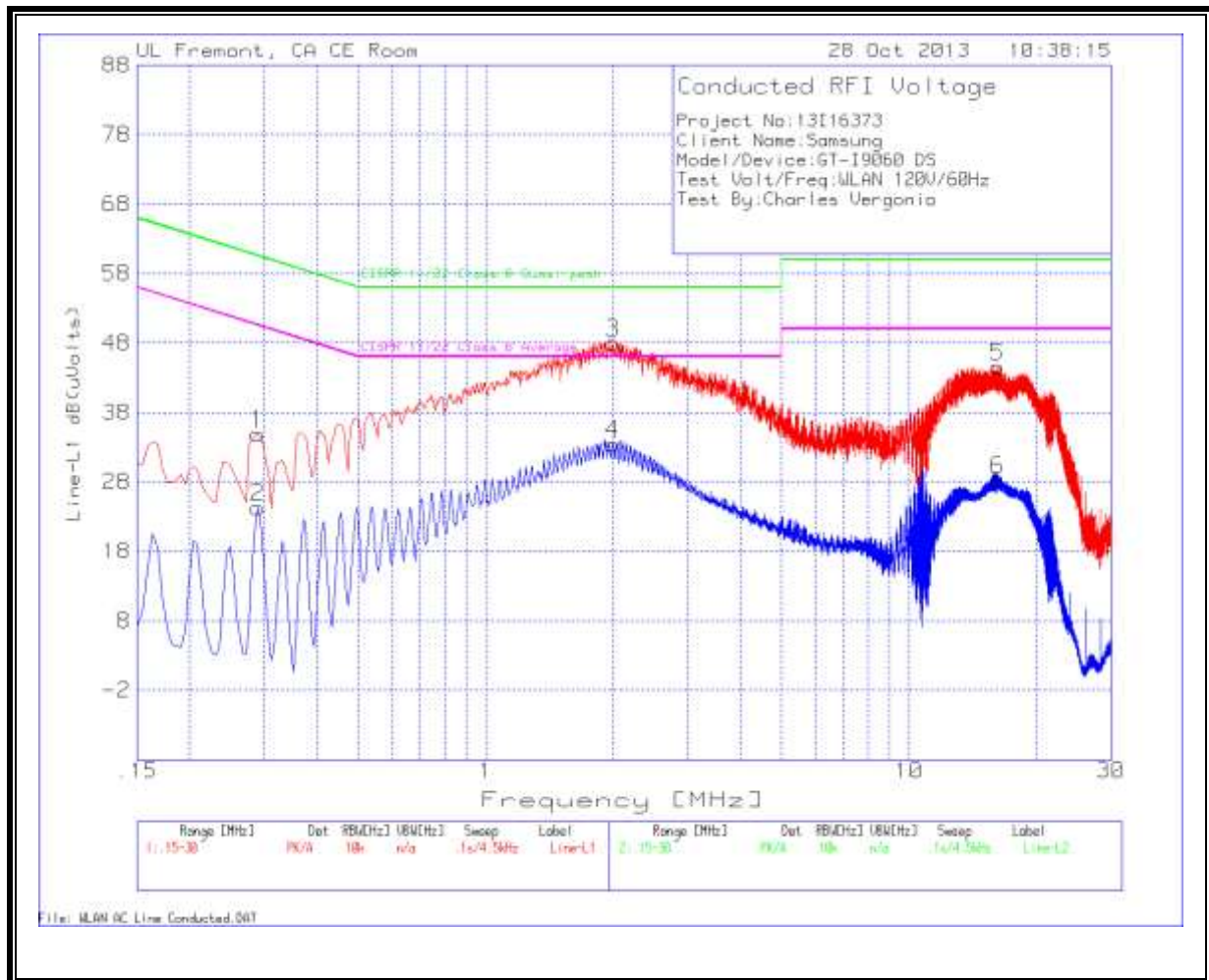
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	.2895	34.77	PK	.1	0	34.87	60.5	-25.63	-	-
2	.2895	24.21	Av	.1	0	24.31	-	-	50.5	-26.19
3	1.995	47.87	PK	.1	.1	48.07	56	-7.93	-	-
4	1.995	33.23	Av	.1	.1	33.43	-	-	46	-12.57
5	16.224	44.21	PK	.2	.2	44.61	60	-15.39	-	-
6	16.224	27.89	Av	.2	.2	28.29	-	-	50	-21.71

Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
7	.447	33.8	PK	.1	0	33.9	56.9	-23	-	-
8	.447	16.38	Av	.1	0	16.48	-	-	46.9	-30.42
9	1.797	44.26	PK	.1	.1	44.46	56	-11.54	-	-
10	1.797	26.94	Av	.1	.1	27.14	-	-	46	-18.86
11	13.4835	41.44	PK	.2	.2	41.84	60	-18.16	-	-
12	13.4835	20.63	Av	.2	.2	21.03	-	-	50	-28.97

LINE 1 RESULTS



LINE 2 RESULTS

