



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER: SM-G110B/DS, SM-G110B

FCC ID: A3LSMG110B

REPORT NUMBER: 14I17675-4 REVISION B

ISSUE DATE: MAY 28, 2014

Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	5/5/14	Initial Issue	P. Zhang
A	5/23/14	Updated statement	P. Zhang
B	5/28/14	Updated statement	P. Zhang

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

MODEL: SM-G110B/DS, SM-G110B

SERIAL NUMBER: FL-053-A (Conducted), FL-053-C (Radiated)

DATE TESTED: APRIL 29 – MAY 5, 2014

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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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 C63.4-2009.

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

The EUT is a GSM/WCDMA Phone + Bluetooth & WLAN 2.4GHz b/g/n; SM-G110B/DS is the dual SIM model and SM-G110B is the single SIM model. SM-G110B/DS consider as the worst case and reported final test result.

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	18.56	71.78
2412 - 2462	802.11g	20.65	116.14
2412 - 2462	802.11n HT20	18.58	72.11

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.26 dBi.

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

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20mode: MCS0

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

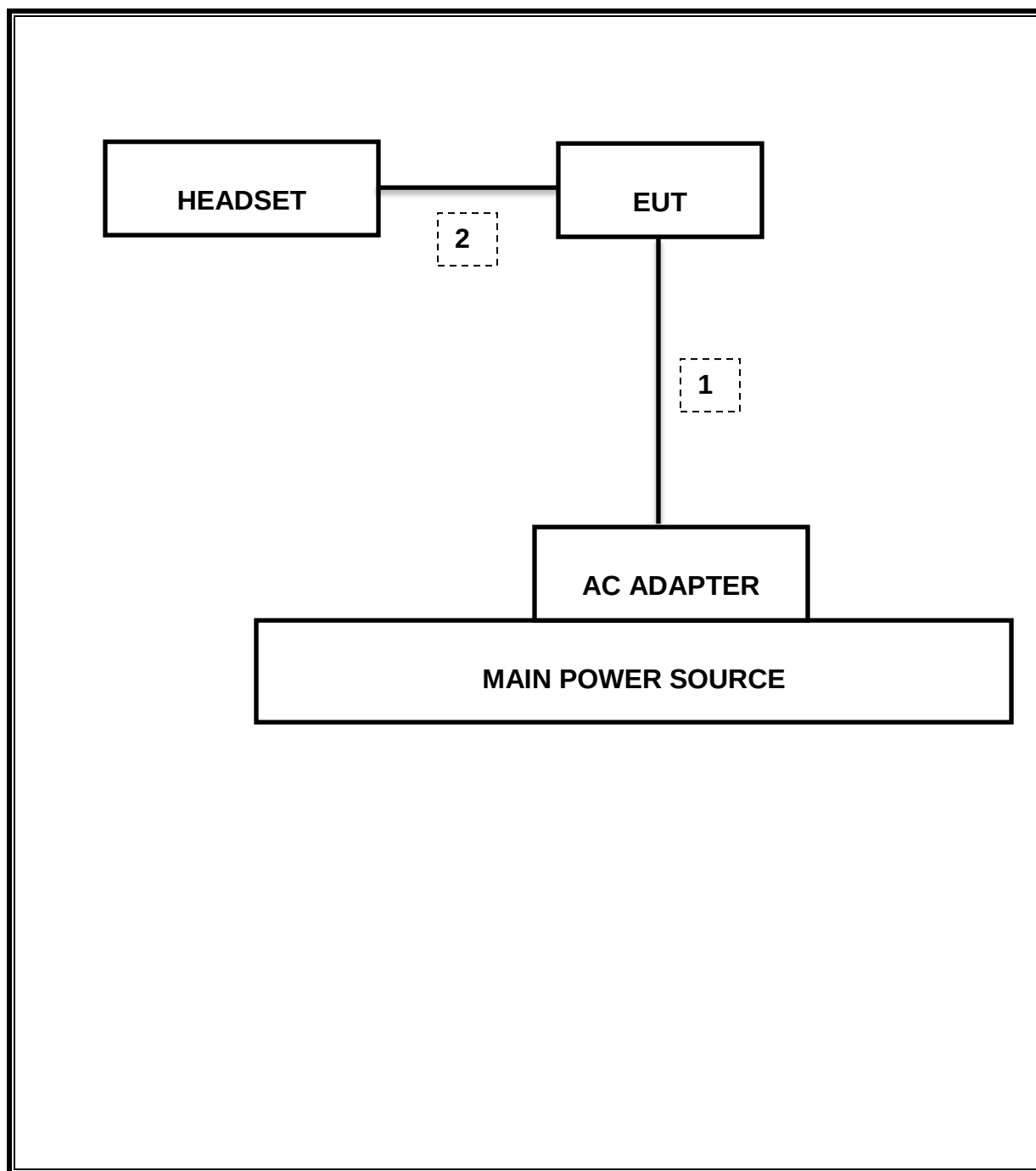
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETA3U30	N/A	N/A
Earphone	Samsung	N/A	N/A	N/A

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 Due
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/14/14
Antenna, Horn, 18 GHz	ETS	3117	C01006	12/11/14
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/14
PXA SIGNAL ANALYZER	Agilent / HP	N9030A	N/A	05/09/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/15
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Peak Power Meter	Agilent / HP	N1911A	T379	02/07/15
Peak / Average Power Sensor	Agilent / HP	N1921A	T748	03/10/15

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r01:Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

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

For Band edge testing: 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.

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	8.98MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-23.97dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	20.65dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-6.80dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	38.75dBuV/m
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	51.09dBuV/m

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 D01 DTS Meas Guidance v03r01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100 kHz, 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	9.00	0.5
Mid	2437	8.98	0.5
High	2462	9.03	0.5
Worst		8.98	

9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

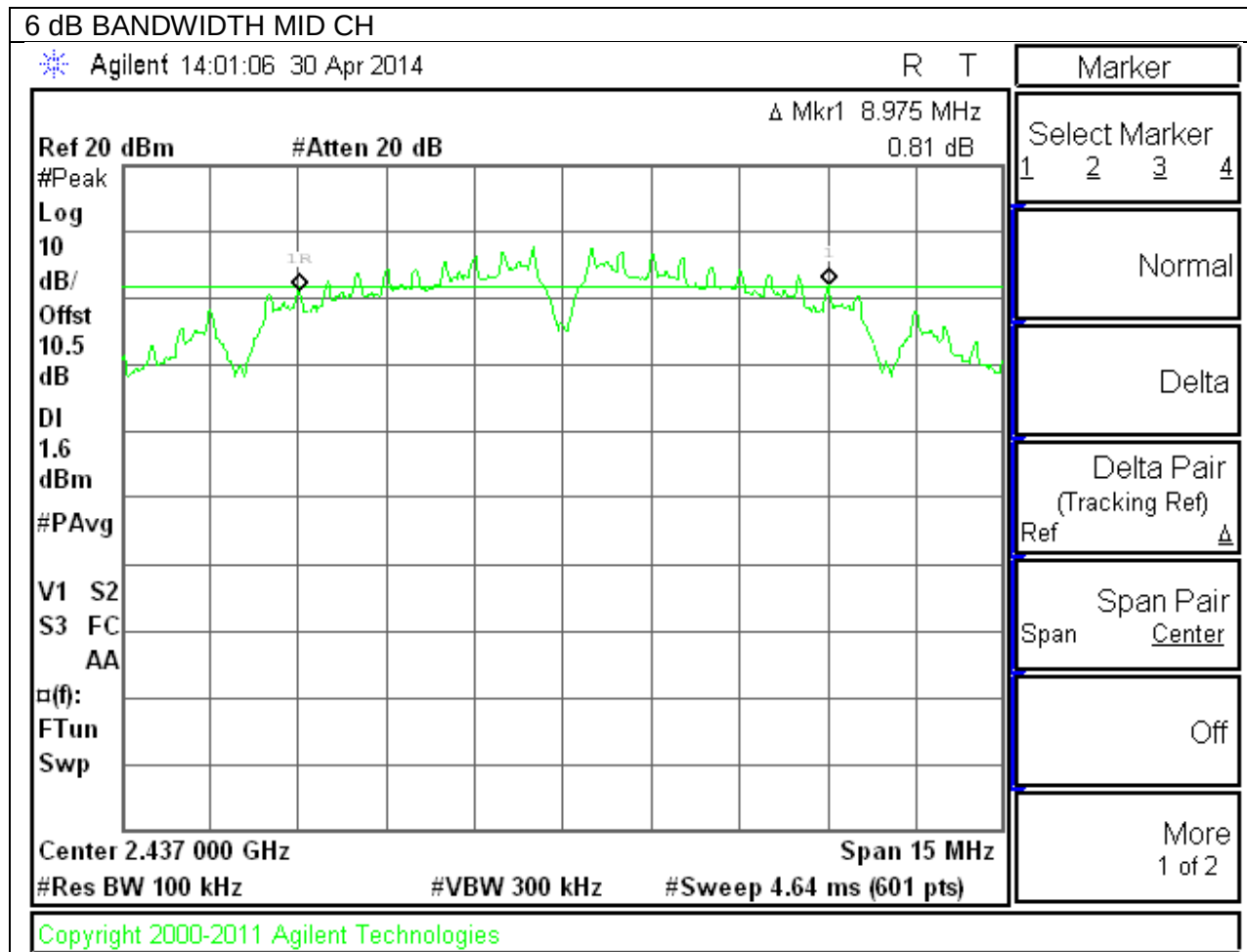
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.46	0.5
Mid	2437	16.42	0.5
High	2462	16.42	0.5
Worst		16.42	

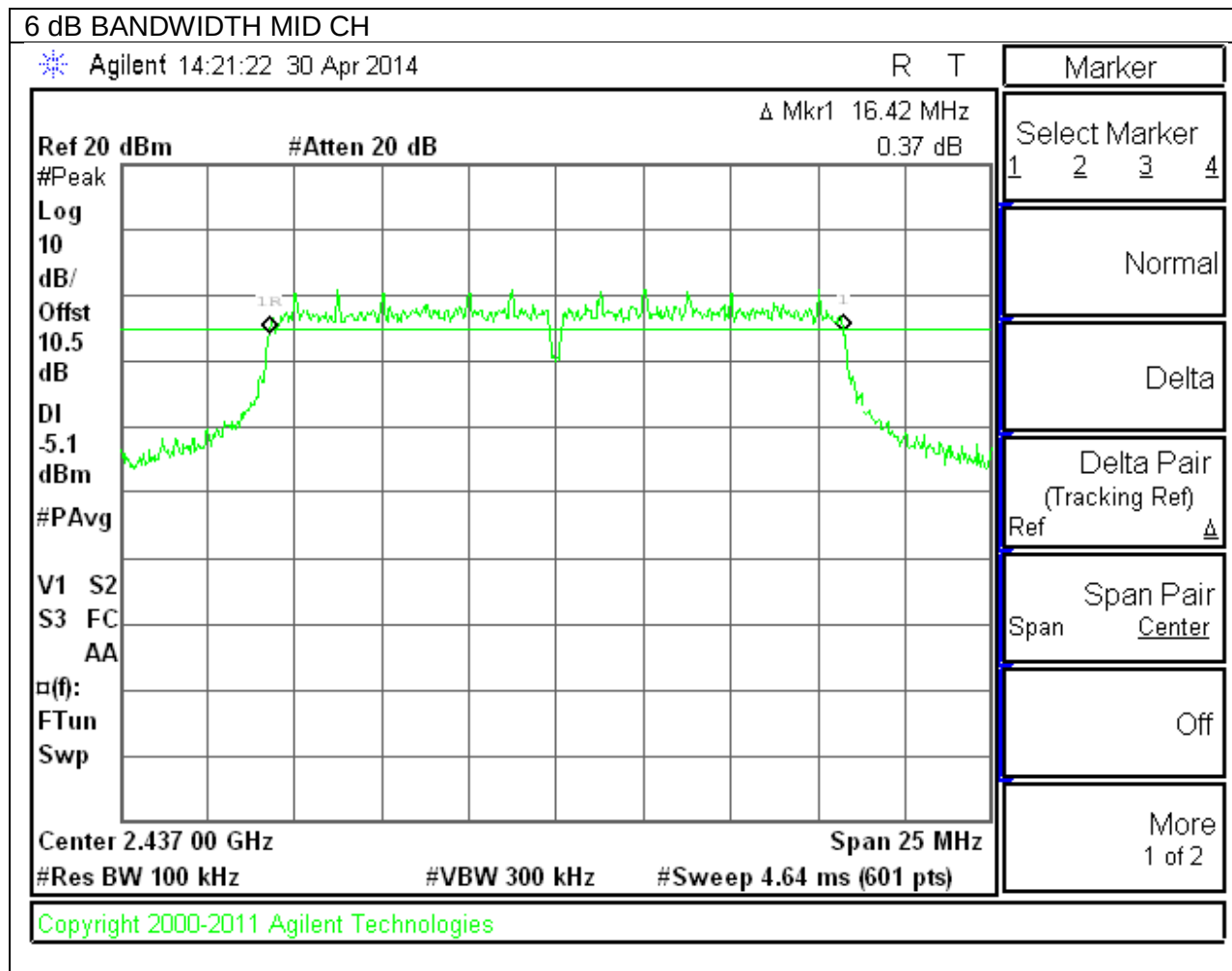
9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.67	0.5
Mid	2437	17.67	0.5
High	2462	17.62	0.5
Worst		17.62	

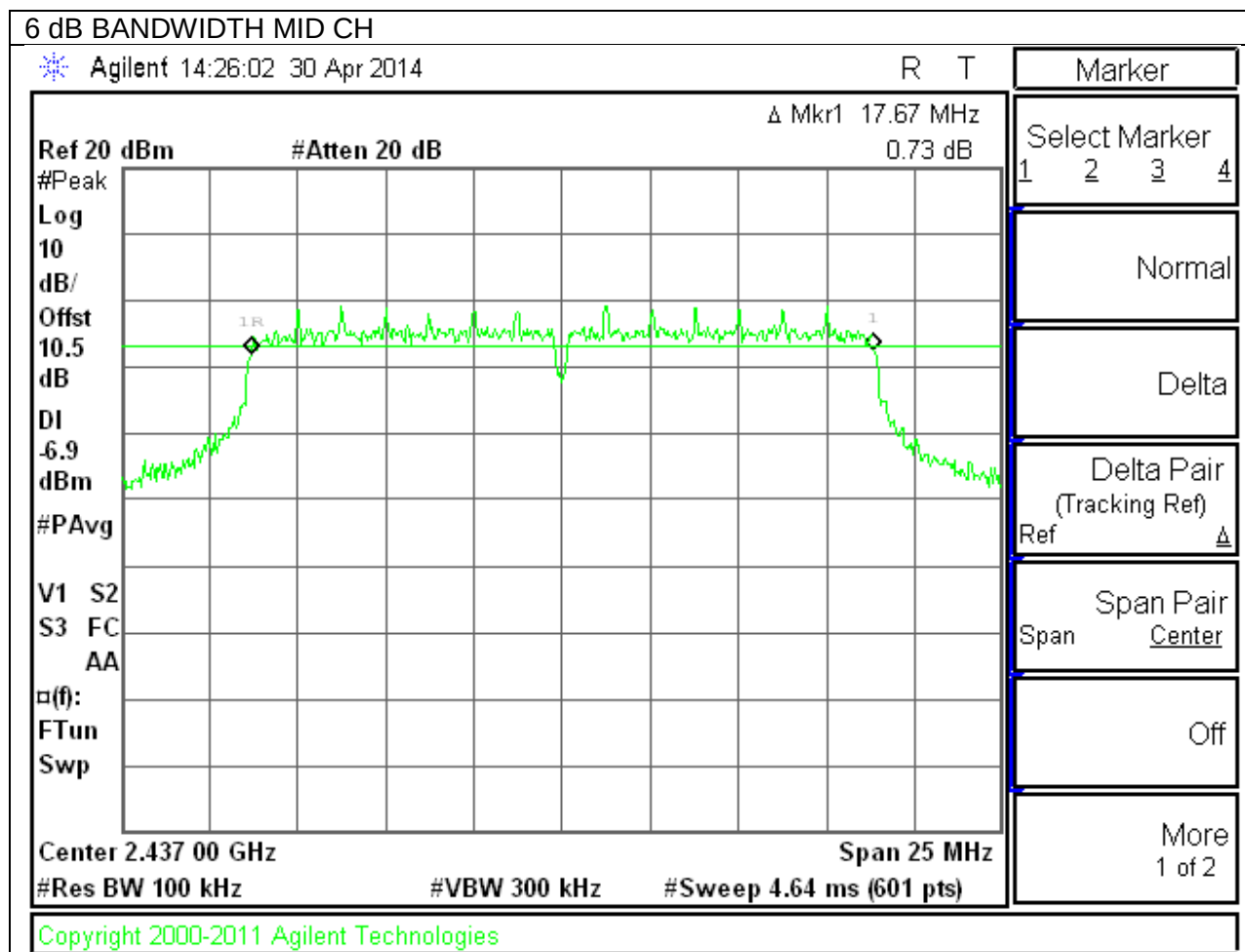
9.1.4. PLOTS

802.11b 6 dB BANDWIDTH



802.11g 6 dB BANDWIDTH

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	13.82
Mid	2437	13.81
High	2462	13.81
Worst		13.82

9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

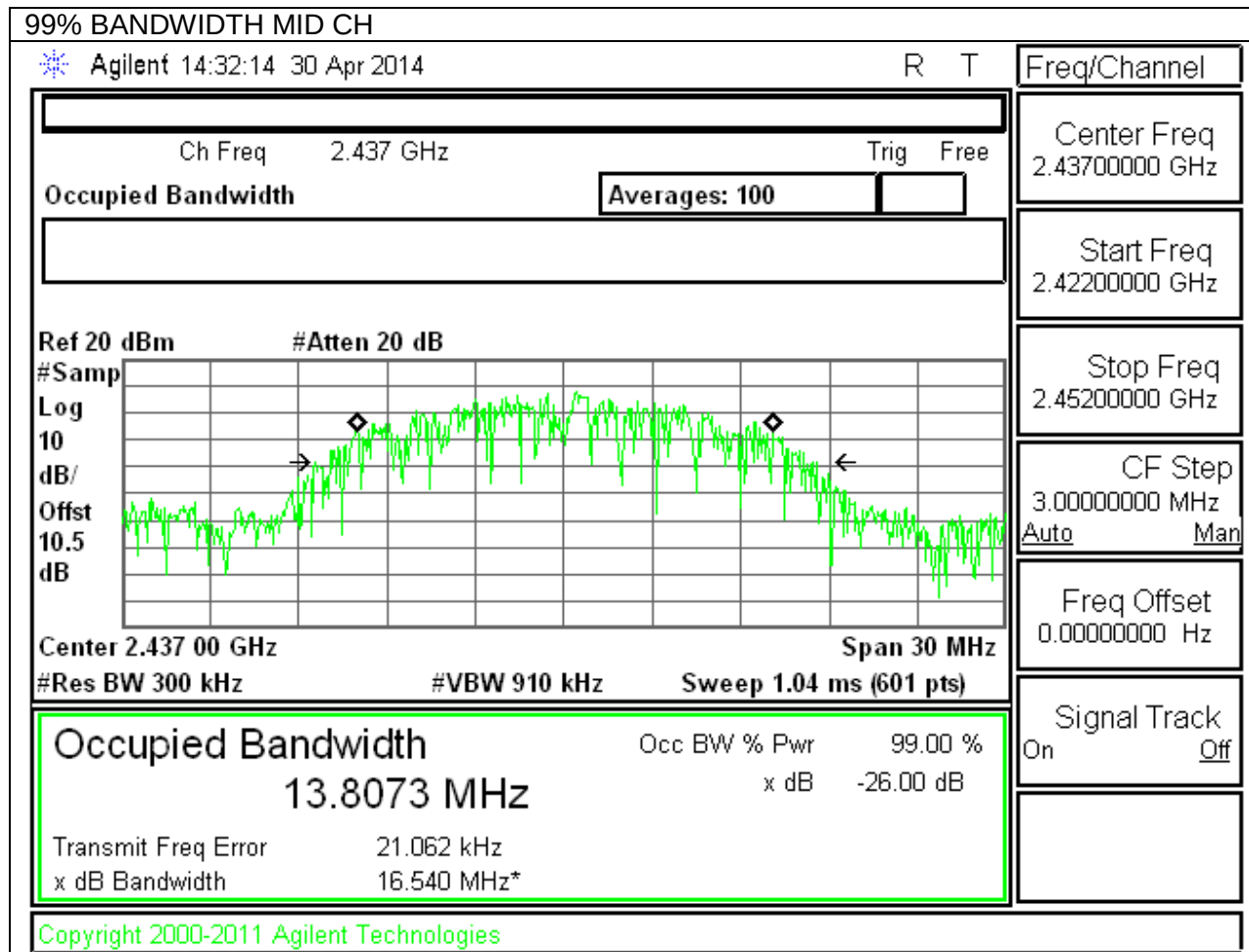
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.43
Mid	2437	16.38
High	2462	16.38
Worst		16.43

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

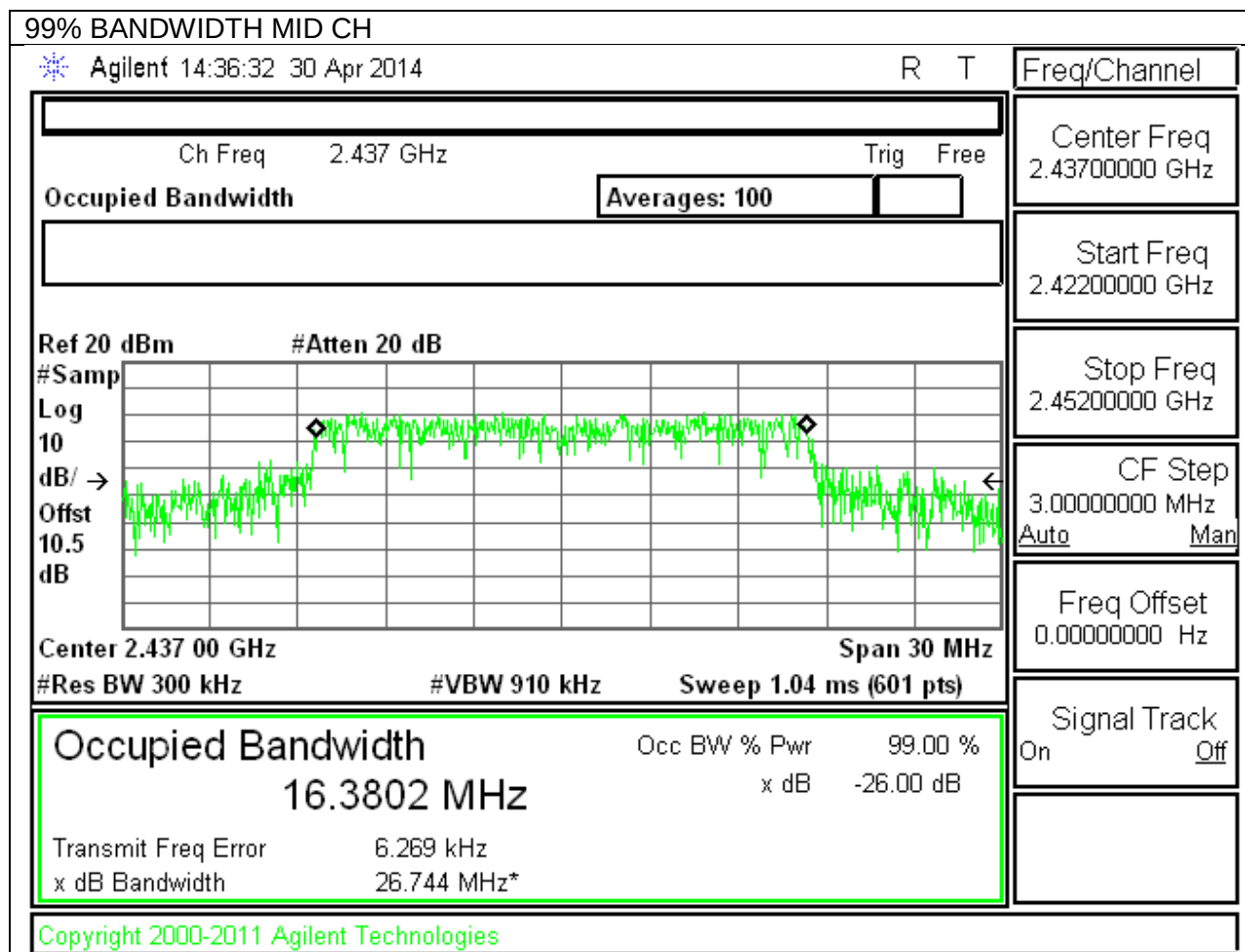
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.67
Mid	2437	17.59
High	2462	17.39
Worst		17.67

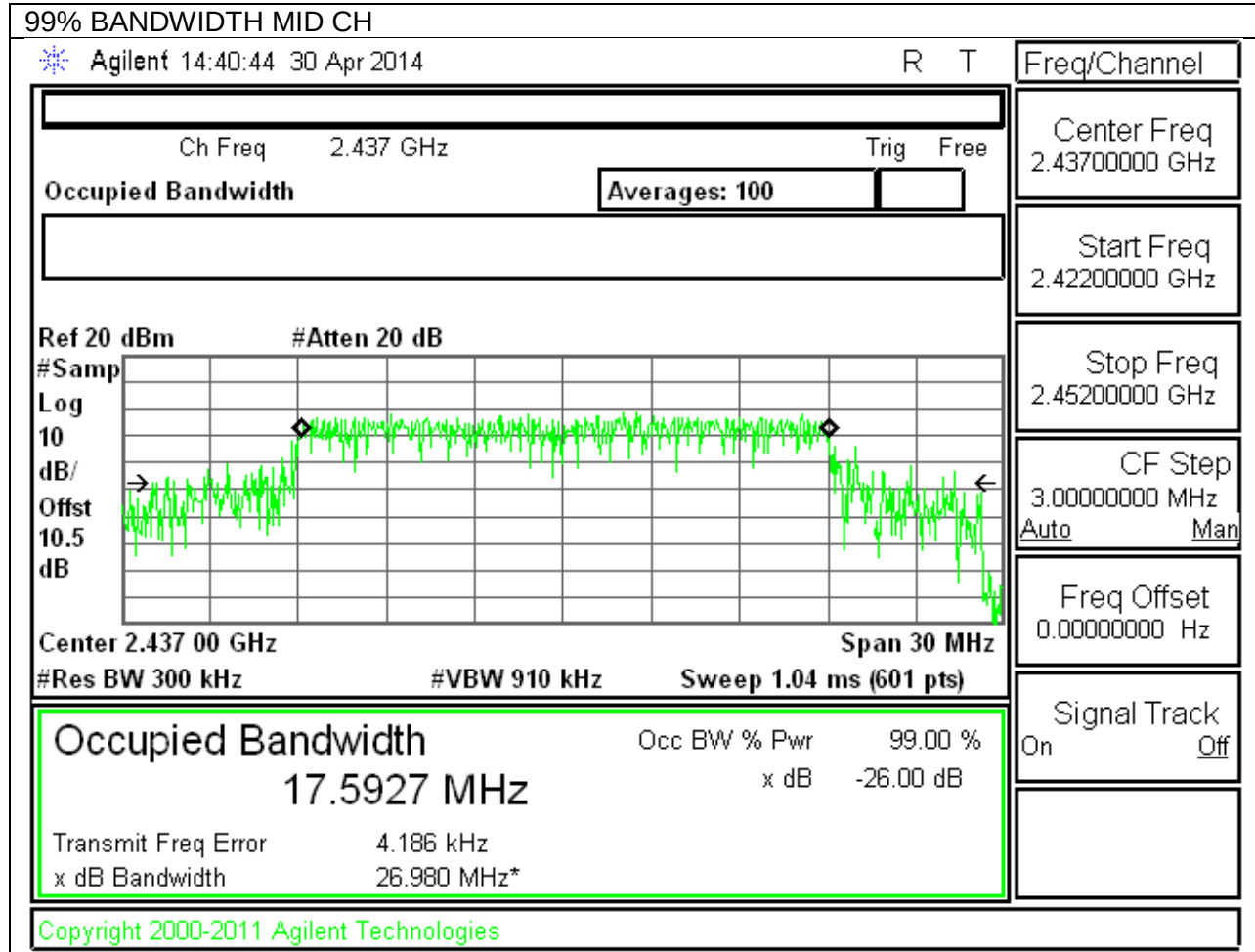
9.2.1. PLOTS

802.11b 99% BANDWIDTH



802.11g 99% BANDWIDTH



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 10.2 dB (including 10 dB pad and 0.2 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)	Avg Power (dBm)
Low	2412	17.50
Mid	2437	17.50
High	2462	17.50
Worst		17.500

9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	13.10
Mid	2437	13.20
High	2462	13.20
Worst		13.200

9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	12.10
Mid	2437	12.10
High	2462	12.10
Worst		12.100

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	-1.26	30.00	30	36	30.00
Mid	2437	-1.26	30.00	30	36	30.00
High	2462	-1.26	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	18.56	18.56	30.00	-11.44
Mid	2437	18.31	18.31	30.00	-11.69
High	2462	18.51	18.51	30.00	-11.49
Worst			18.56		

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	-1.26	30.00	30	36	30.00
Mid	2437	-1.26	30.00	30	36	30.00
High	2462	-1.26	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	20.65	20.65	30.00	-9.35
Mid	2437	20.57	20.57	30.00	-9.43
High	2462	20.41	20.41	30.00	-9.59
Worst			20.65		

9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

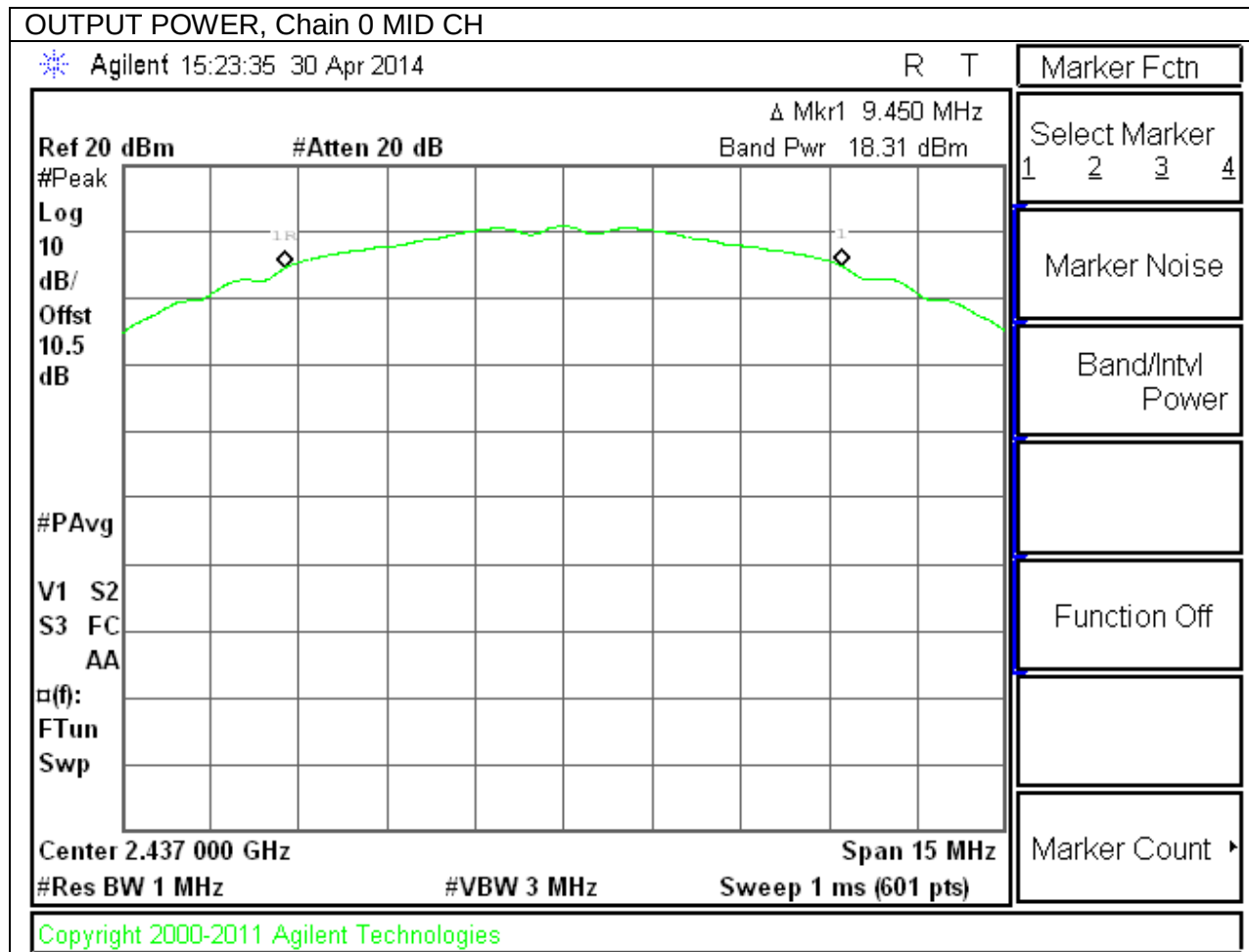
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.26	30.00	30	36	30.00
Mid	2437	-1.26	30.00	30	36	30.00
High	2462	-1.26	30.00	30	36	30.00

Results

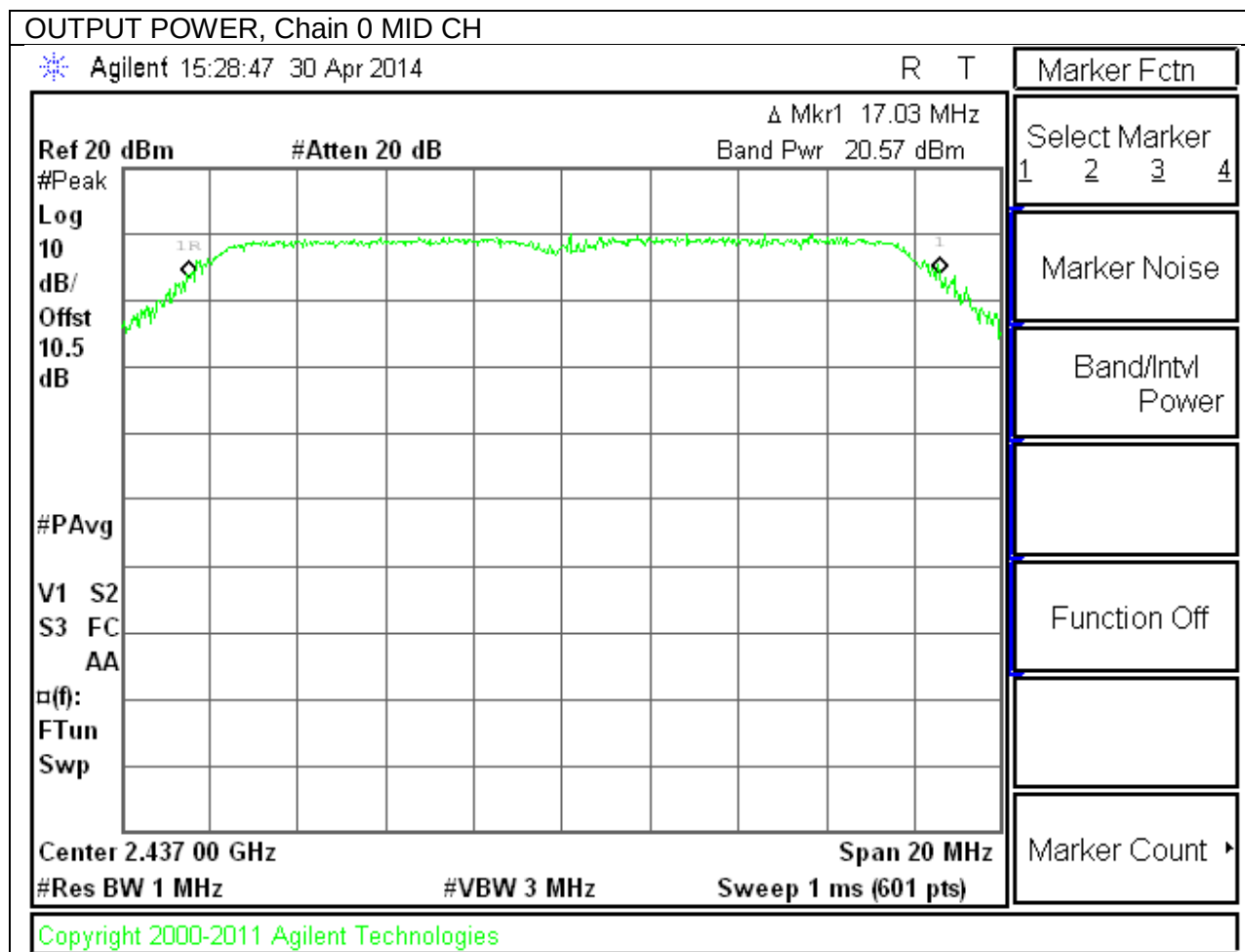
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	18.58	18.58	30.00	-11.42
Mid	2437	18.48	18.48	30.00	-11.52
High	2462	18.52	18.52	30.00	-11.48
Worst			18.58		

9.4.1. PLOTS

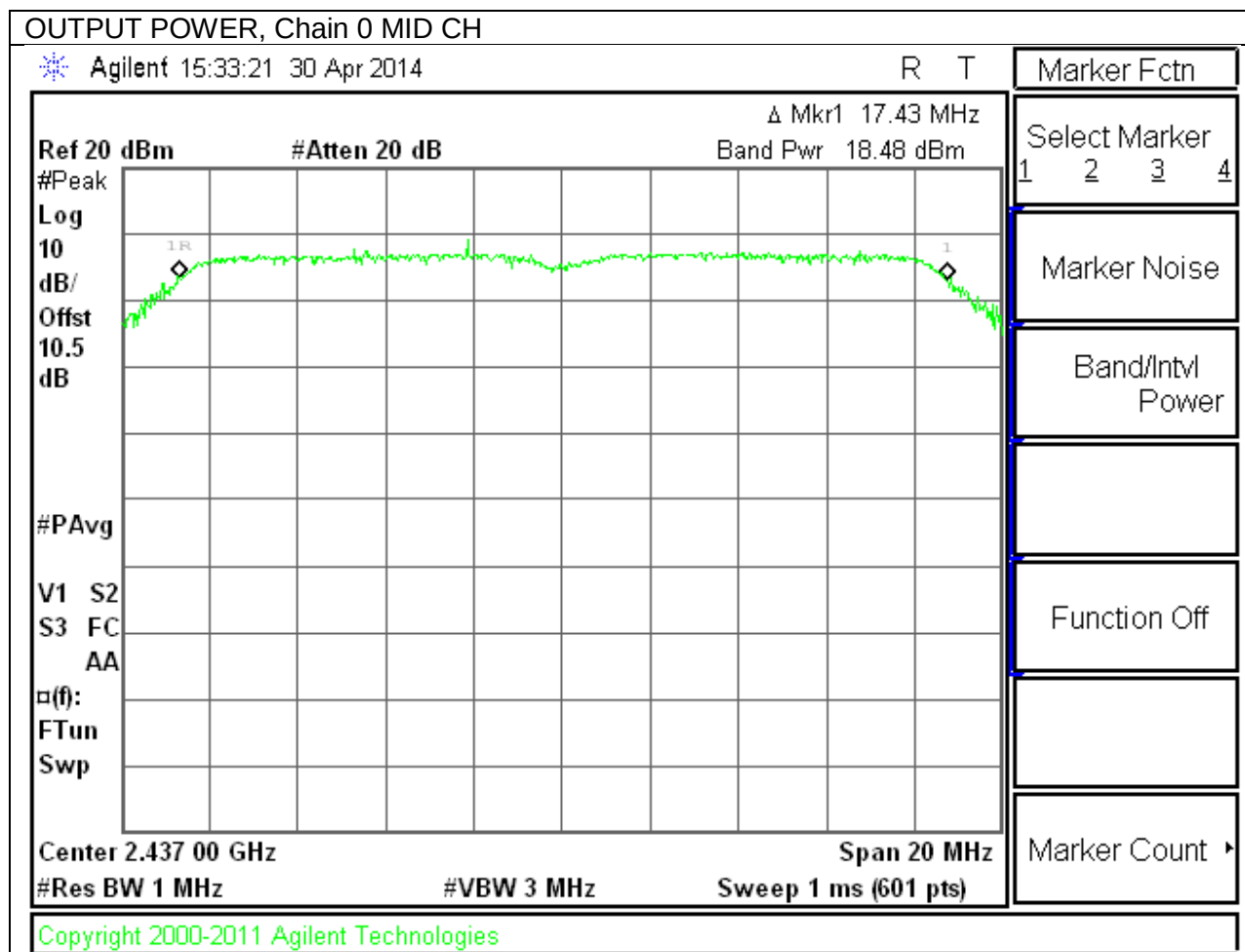
802.11b OUTPUT POWER, Chain 0



802.11g OUTPUT POWER, Chain 0



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	-6.92	8.0	-14.9
Mid	2437	-7.30	8.0	-15.3
High	2462	-6.80	8.0	-14.8

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	-12.95	8.0	-21.0
Mid	2437	-12.86	8.0	-20.9
High	2462	-13.21	8.0	-21.2

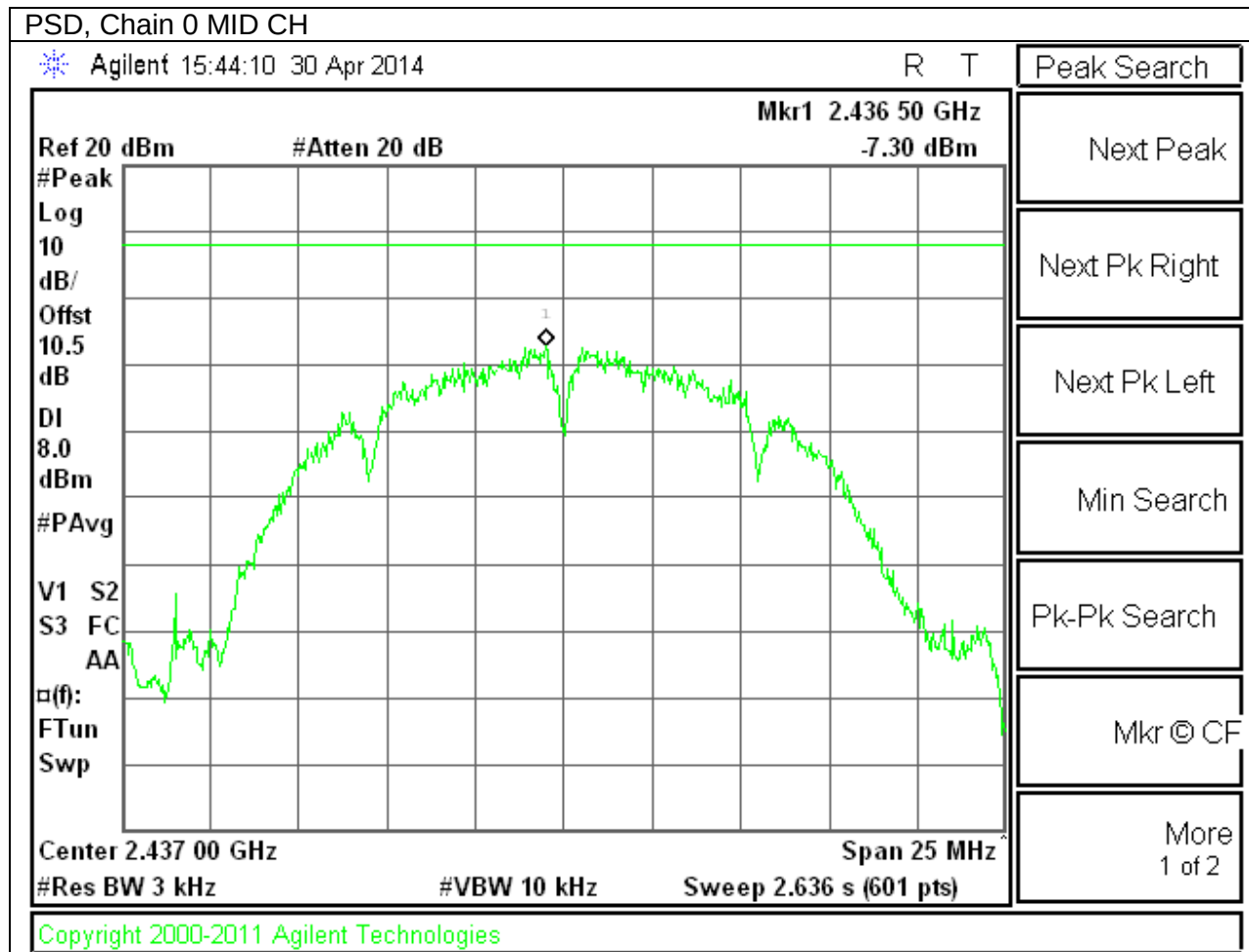
9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

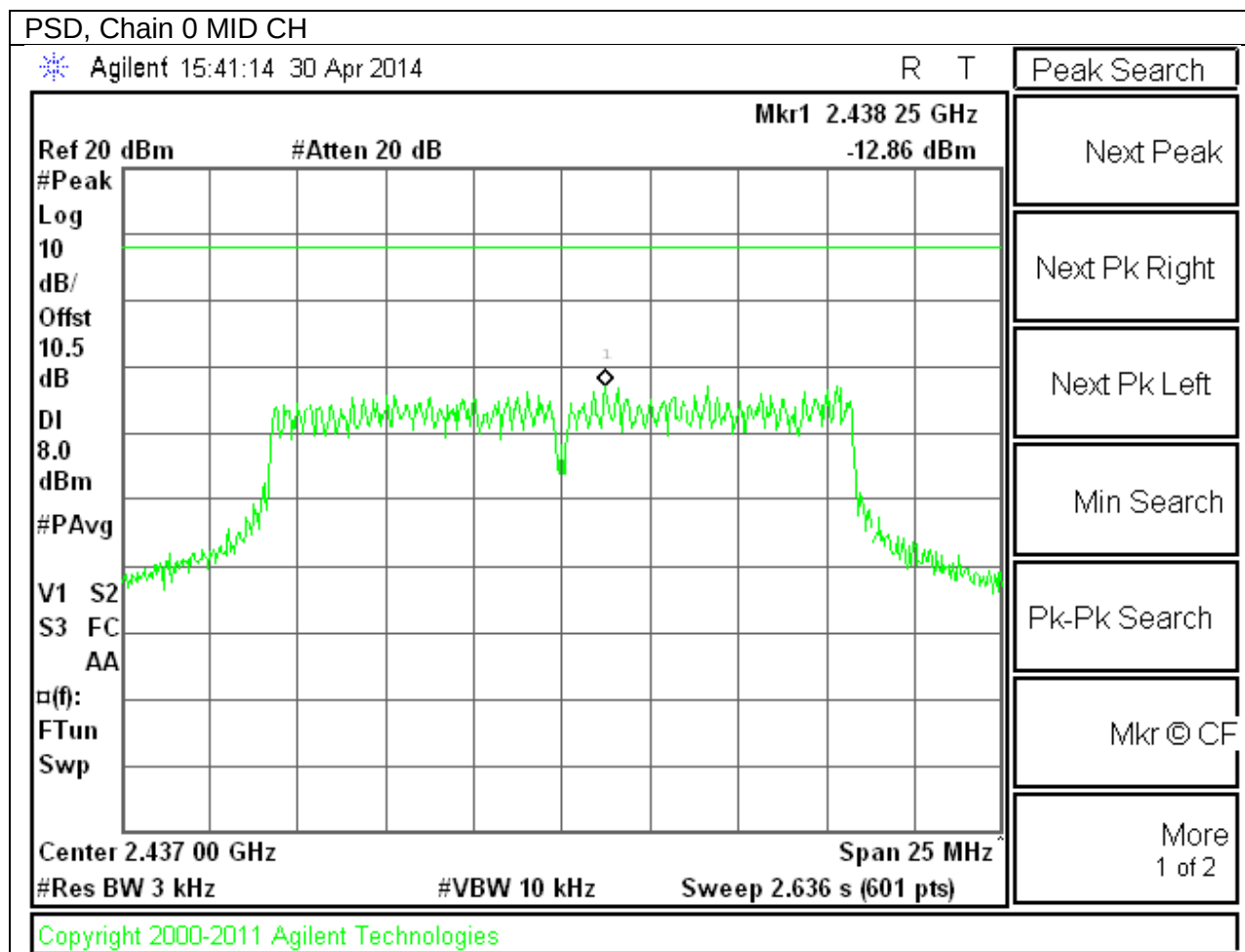
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-14.81	8.0	-22.8
Mid	2437	-14.49	8.0	-22.5
High	2462	-14.89	8.0	-22.9

9.5.1. PLOTS

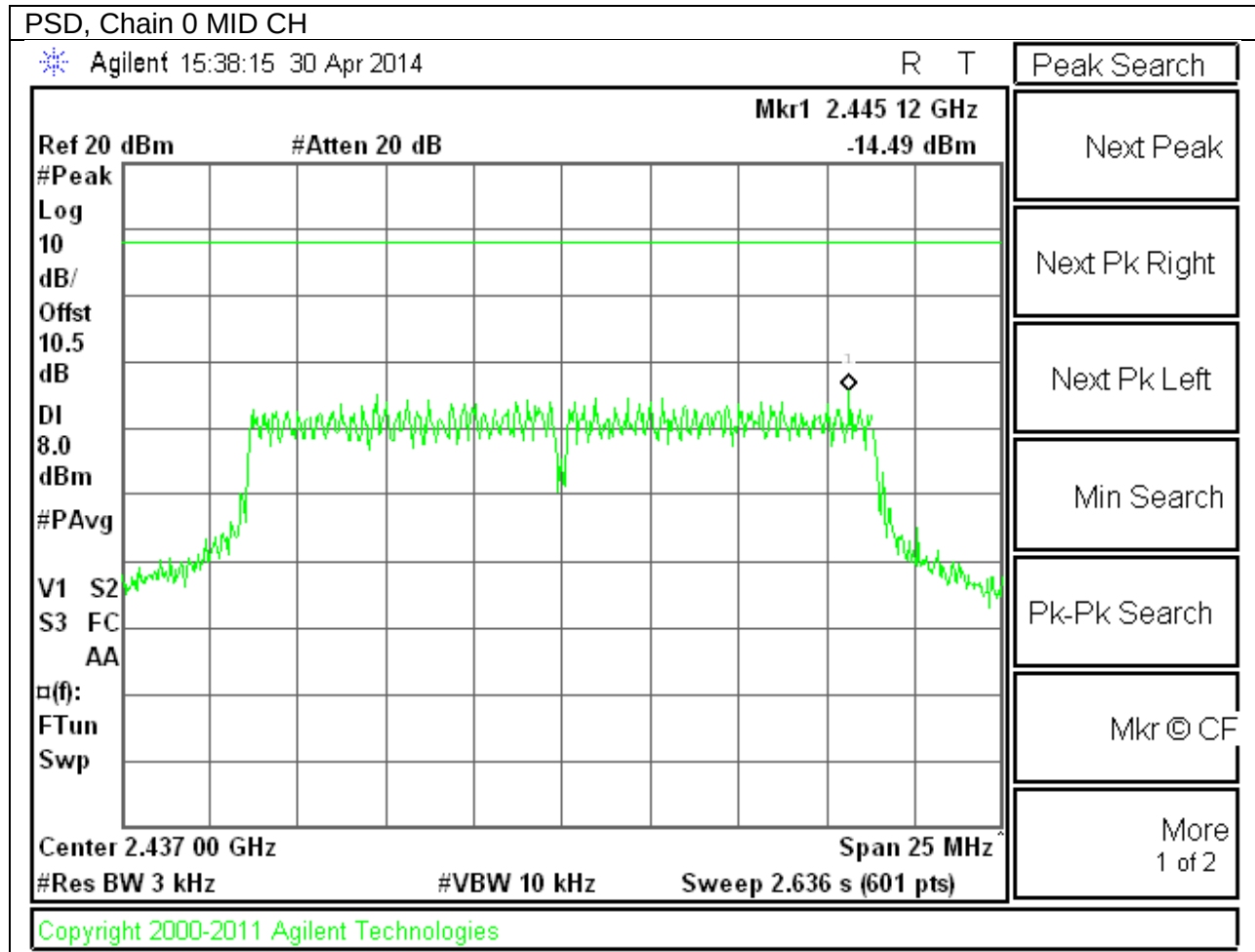
802.11b PSD, Chain 0



802.11g PSD, Chain 0



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.

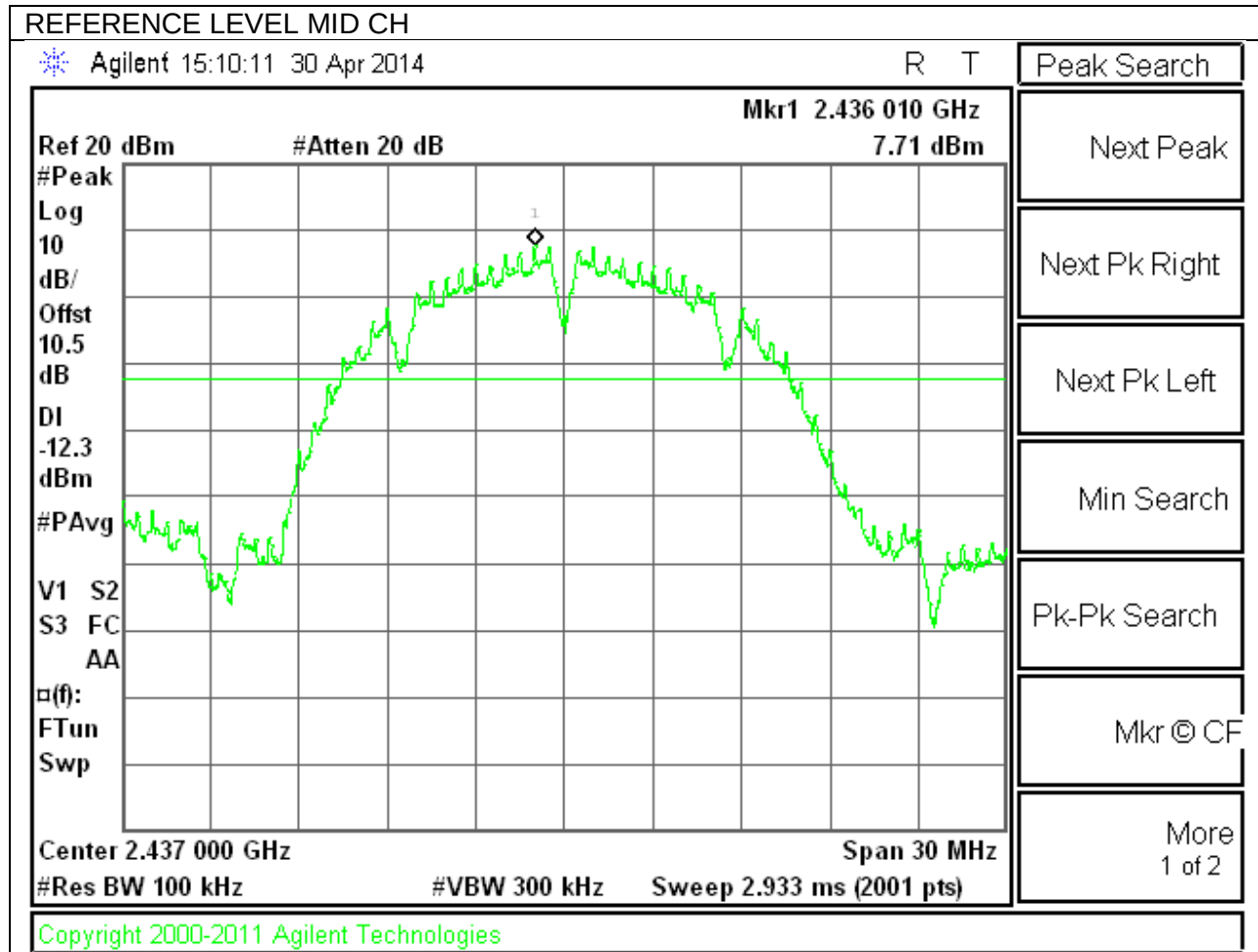
TEST PROCEDURE

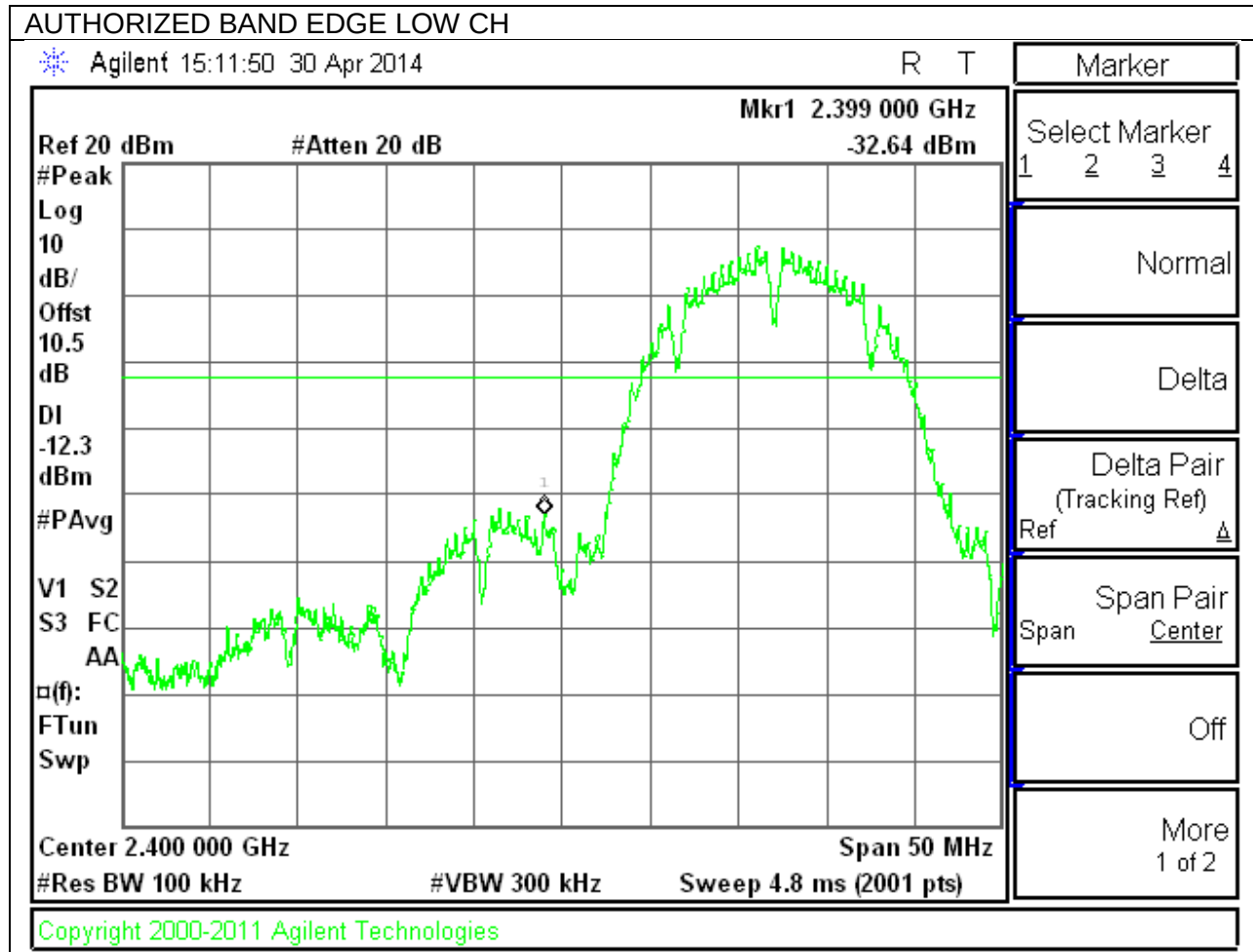
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

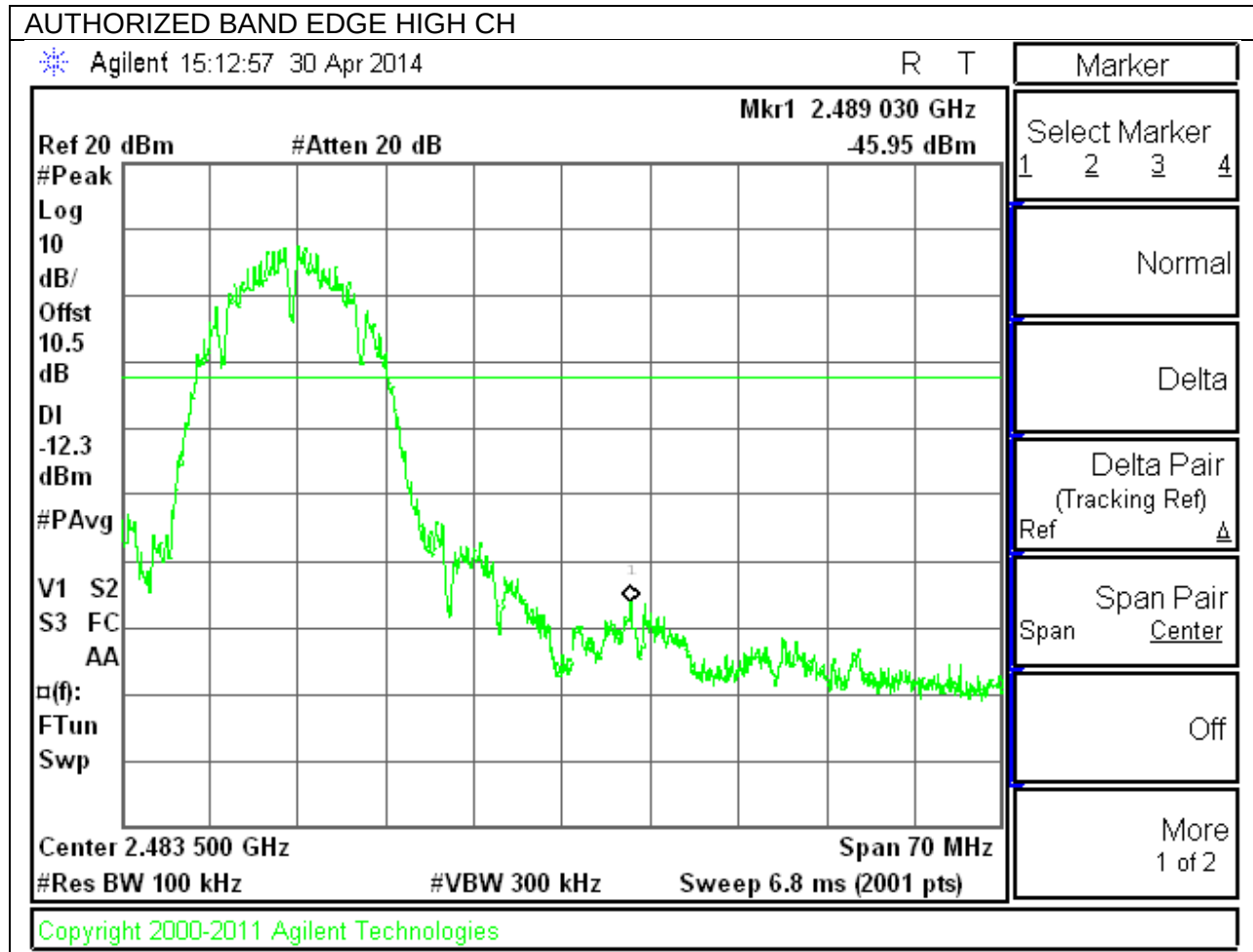
RESULTS

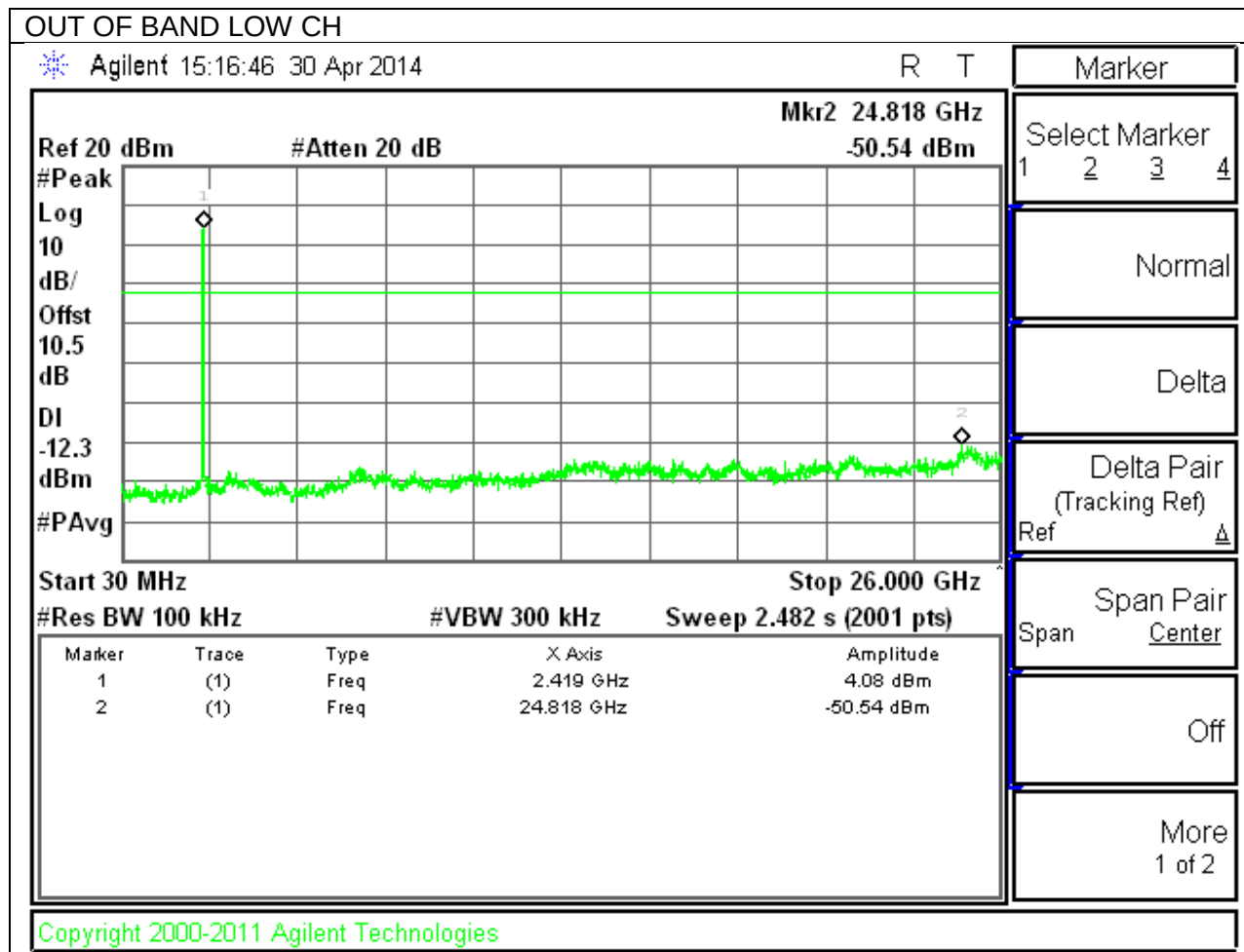
9.6.1. 802.11b MODE IN THE 2.4 GHz BAND

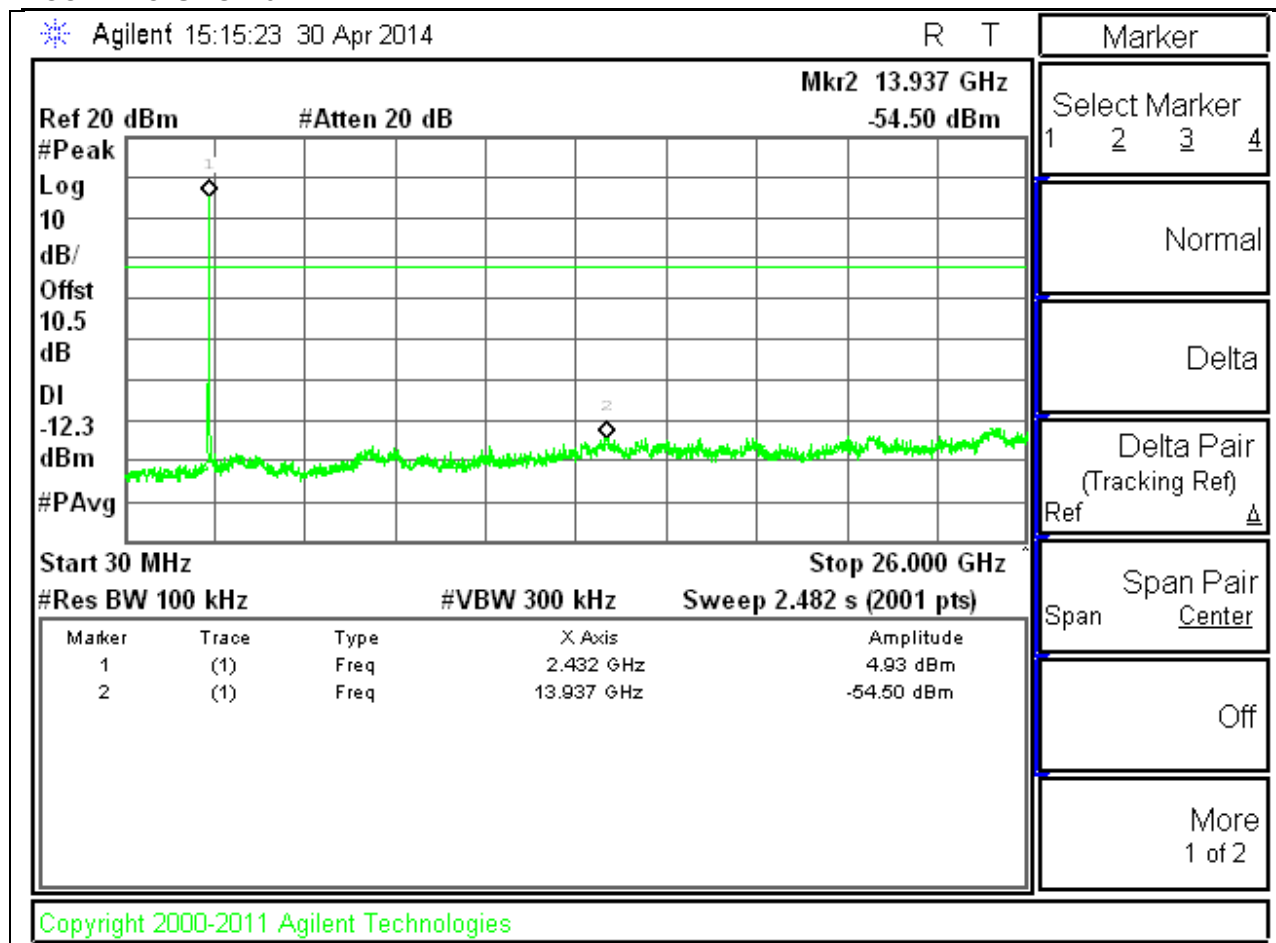
IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE

HIGH CHANNEL BANDEDGE

OUT-OF-BAND EMISSIONS**OUT OF BAND MID CH**

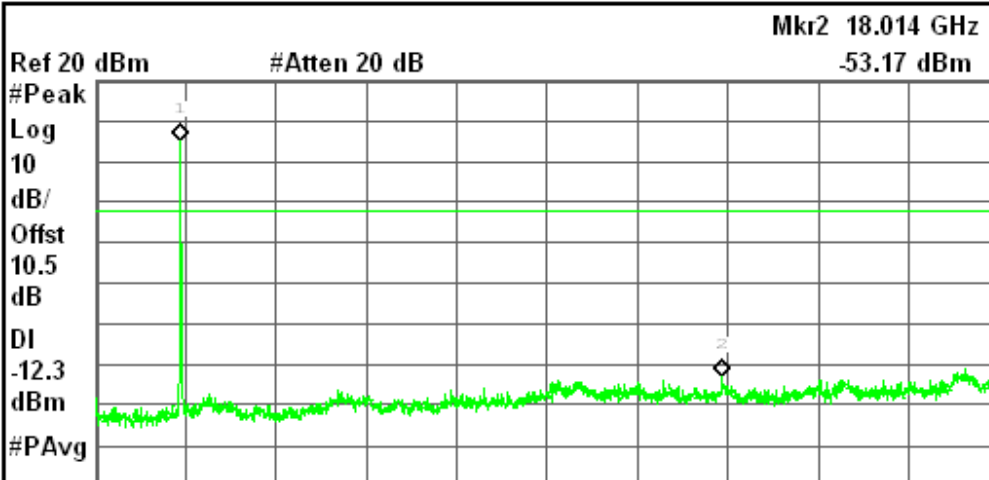


OUT OF BAND HIGH CH

Agilent 15:14:12 30 Apr 2014

R T

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Span Center

Off

More
1 of 2

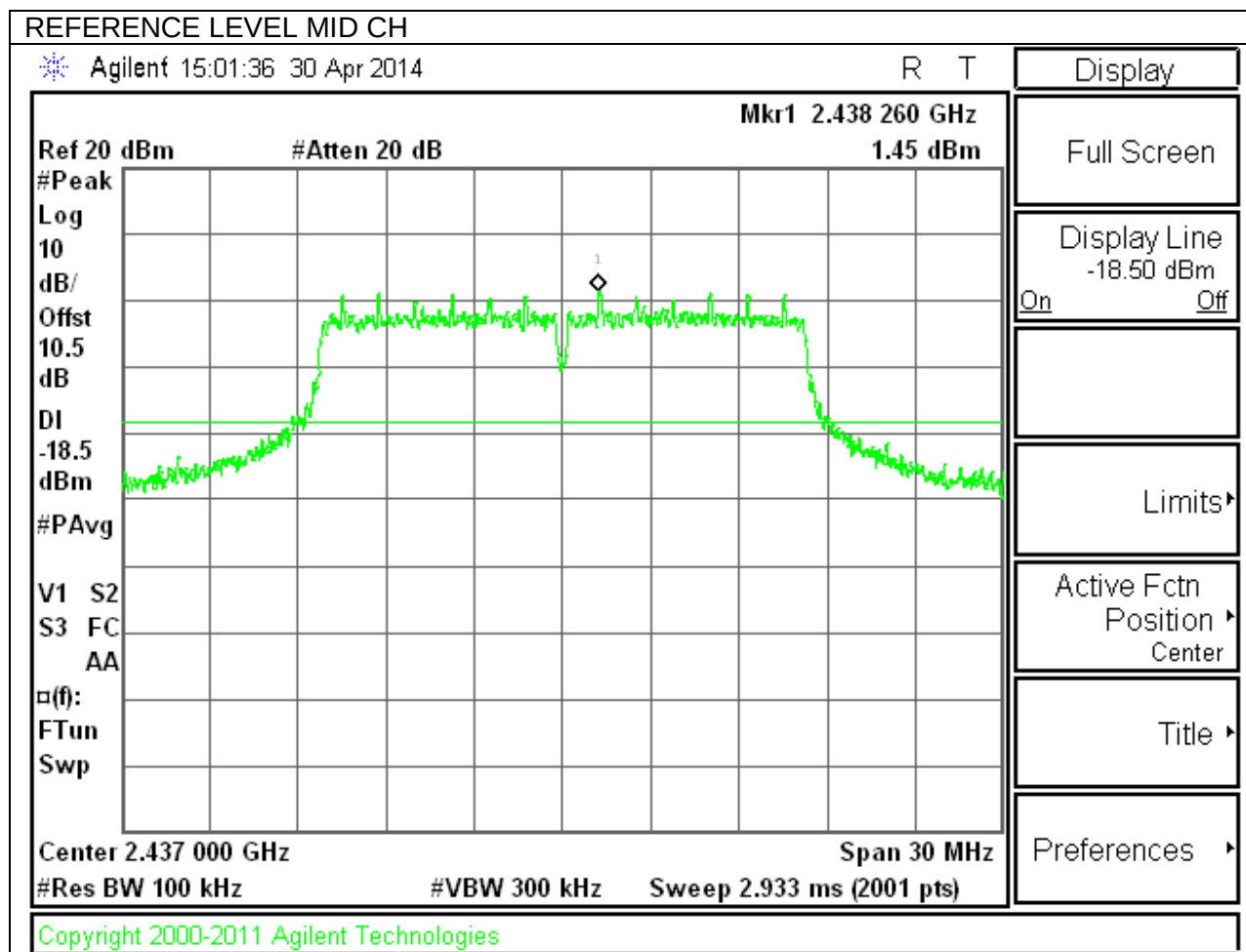
Start 30 MHz Stop 26.000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.482 s (2001 pts)

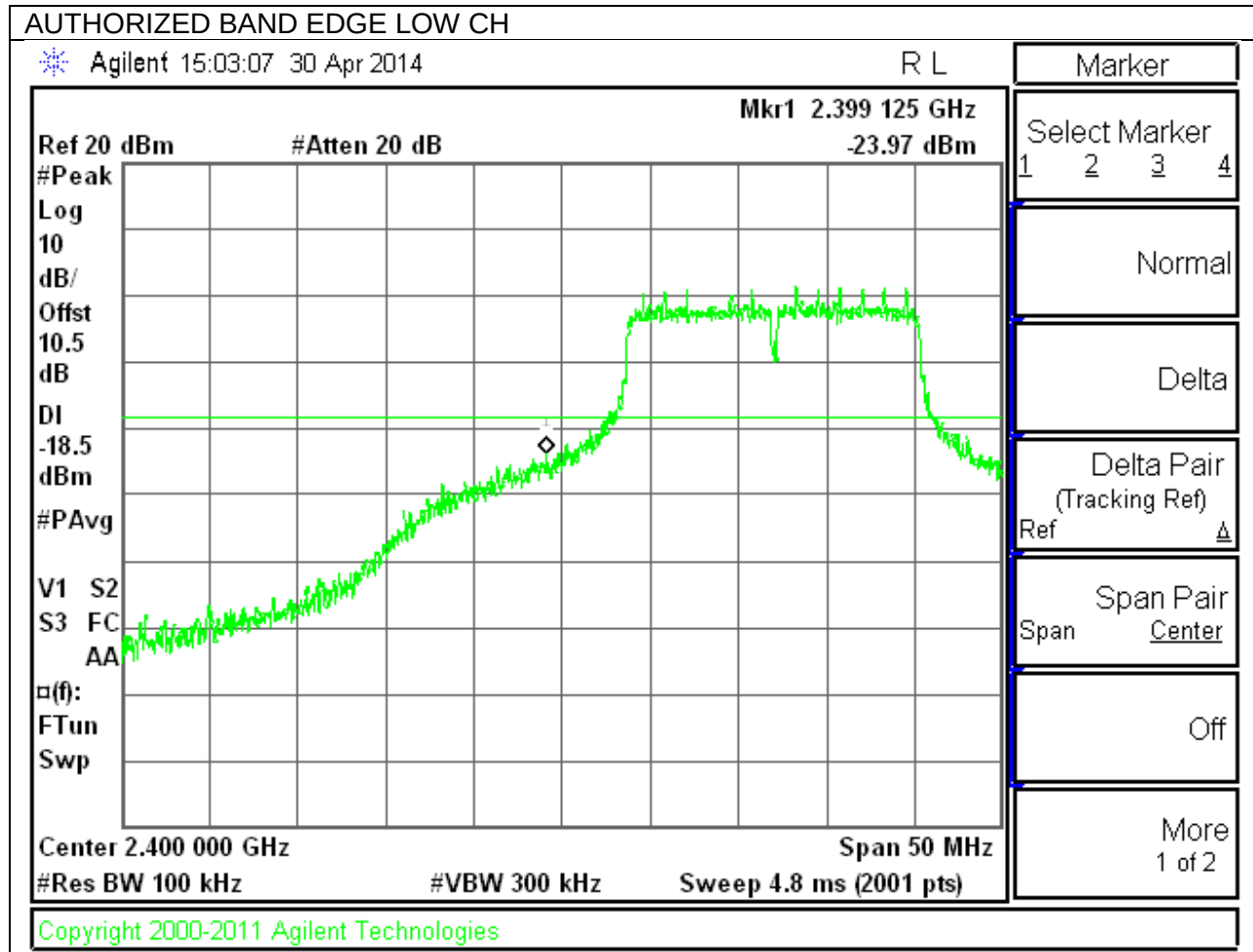
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.458 GHz	5.32 dBm
2	(1)	Freq	18.014 GHz	-53.17 dBm

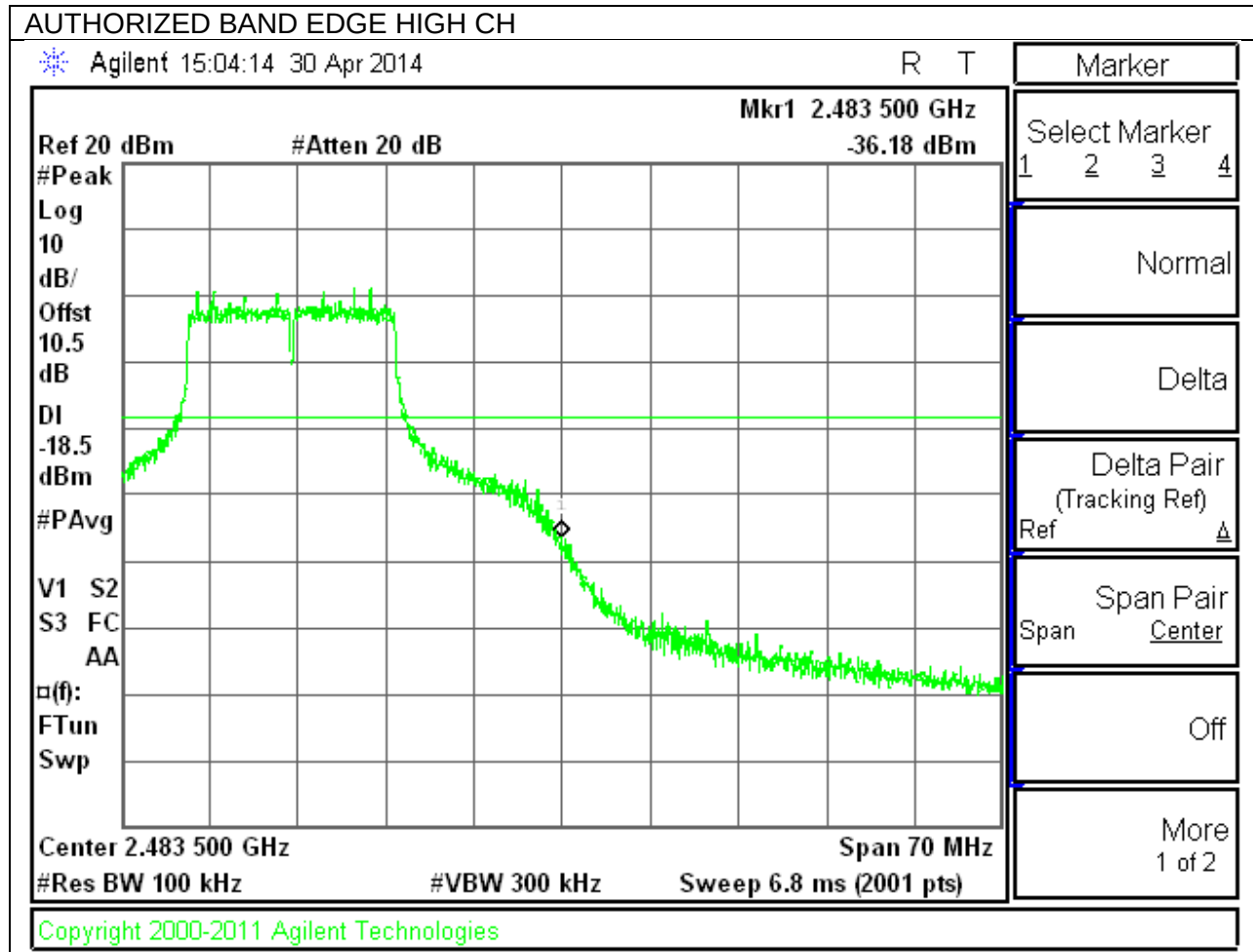
Copyright 2000-2011 Agilent Technologies

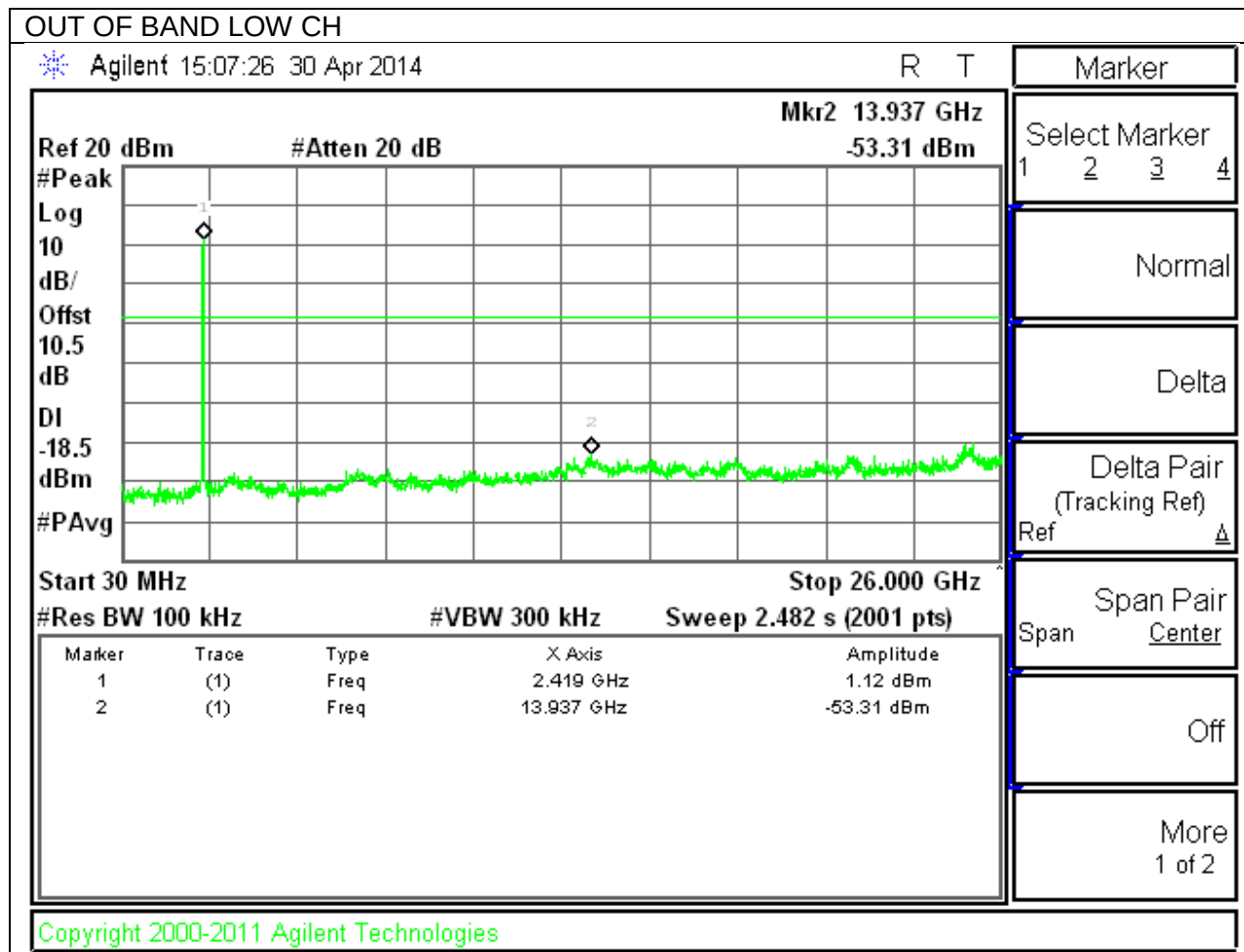
9.6.2. 802.11g MODE IN THE 2.4 GHz BAND

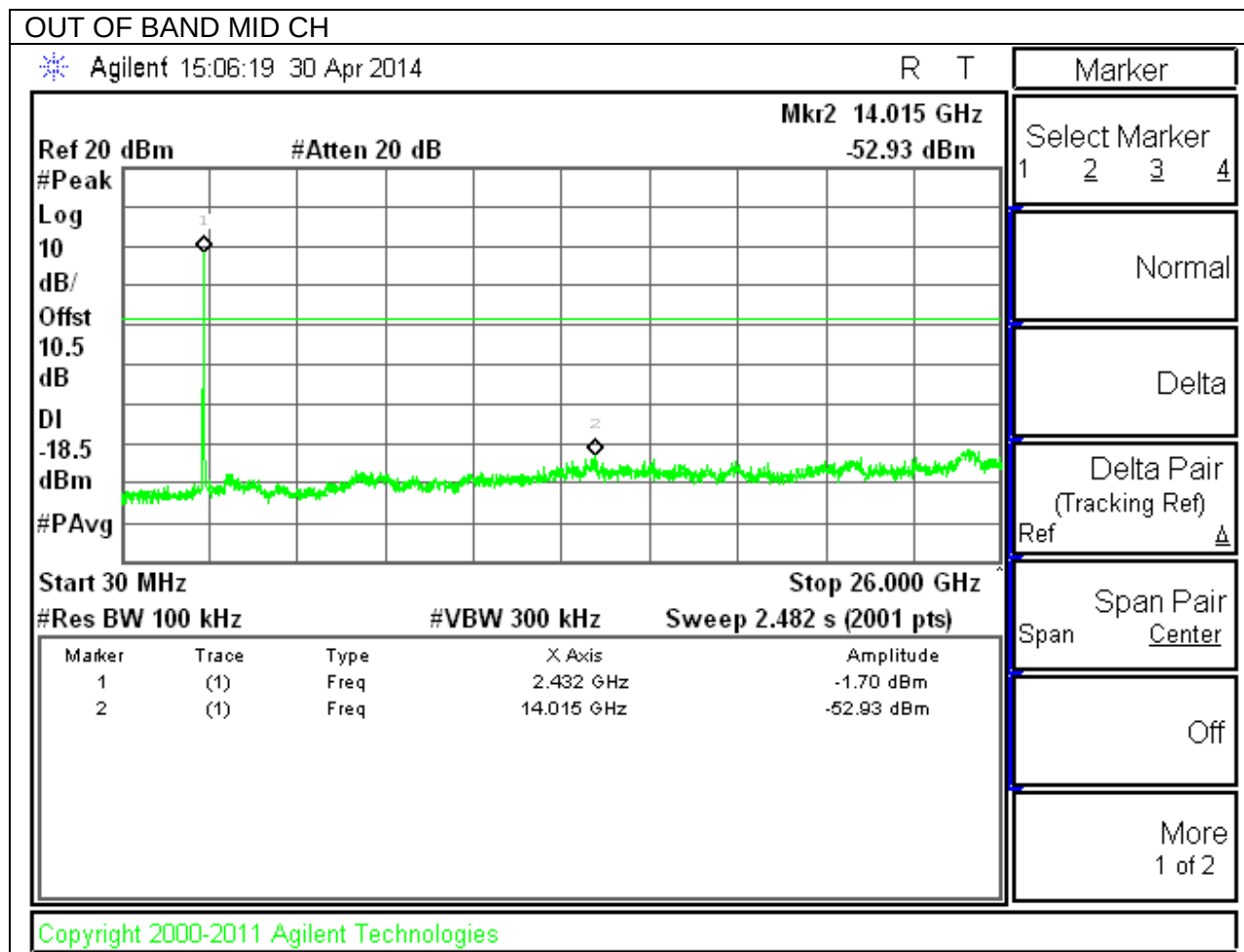
IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE

HIGH CHANNEL BANDEDGE

OUT-OF-BAND EMISSIONS



OUT OF BAND HIGH CH

Agilent 15:05:19 30 Apr 2014

R T

Marker

Ref 20 dBm

#Atten 20 dB

Mkr2 13.353 GHz

-53.69 dBm

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-18.5

dBm

#PAvg

Start 30 MHz

Stop 26.000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 2.482 s (2001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.458 GHz	-1.48 dBm
2	(1)	Freq	13.353 GHz	-53.69 dBm

Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)

Ref ☐

Span Pair
Span ☐ Center ☐

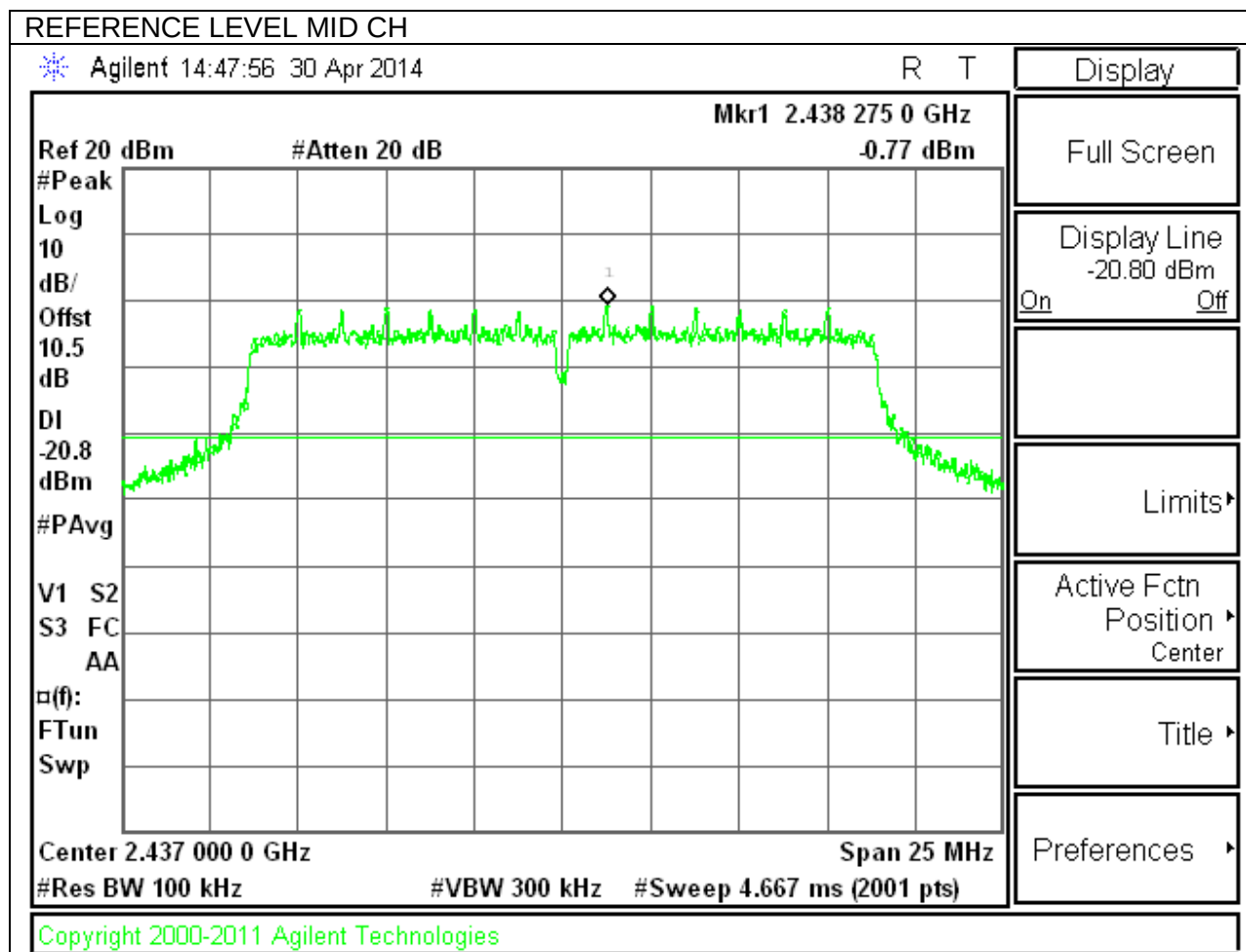
Off

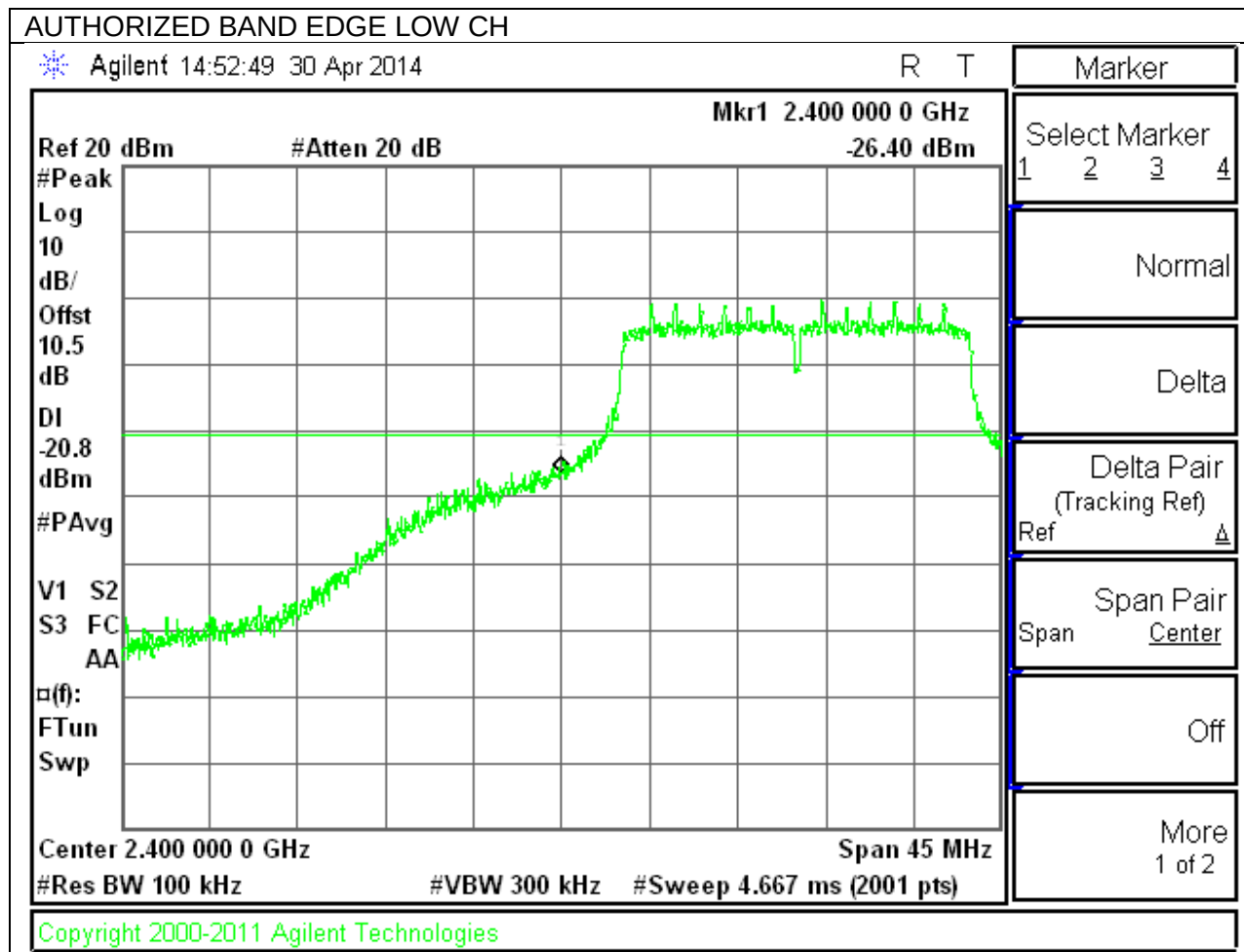
More
1 of 2

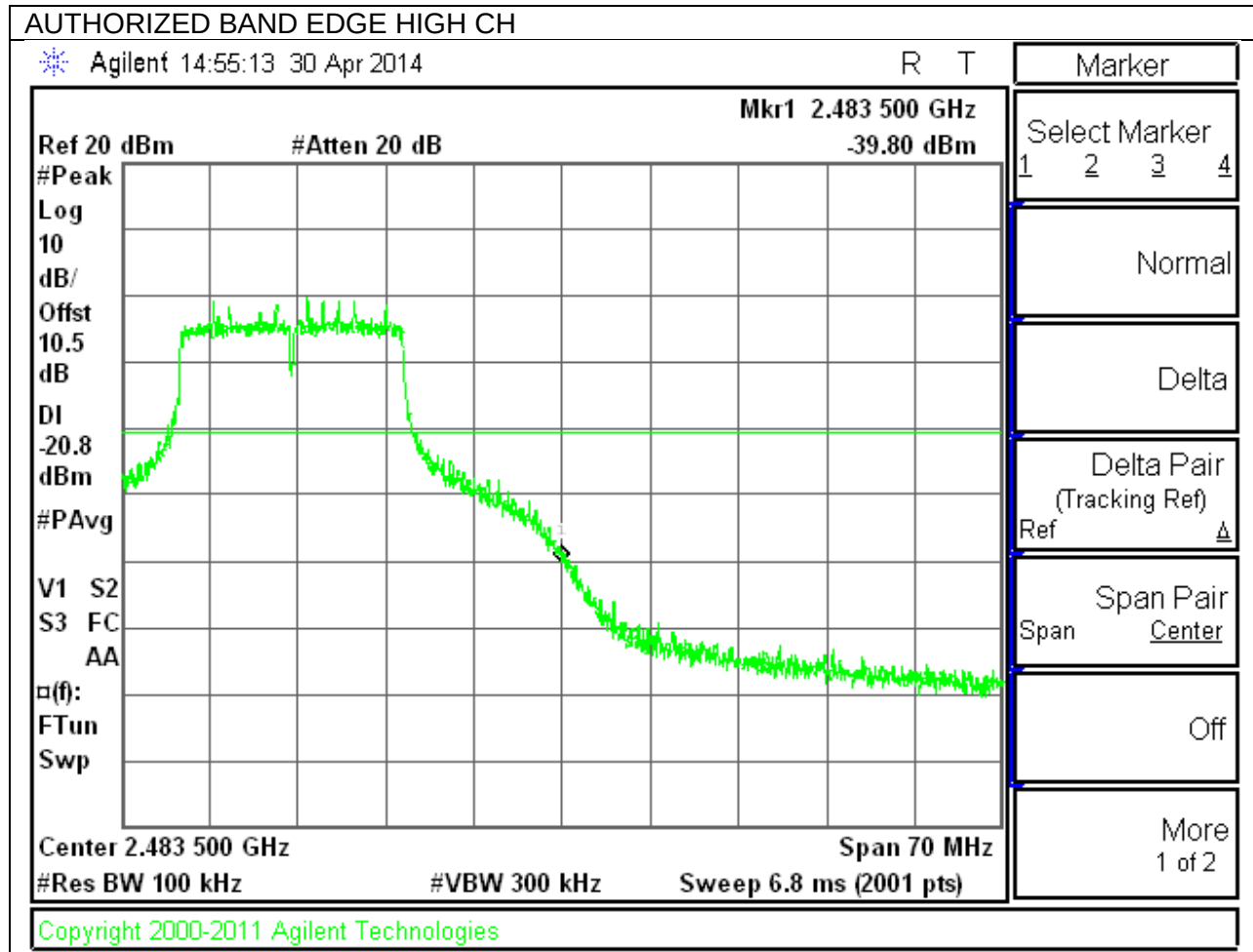
Copyright 2000-2011 Agilent Technologies

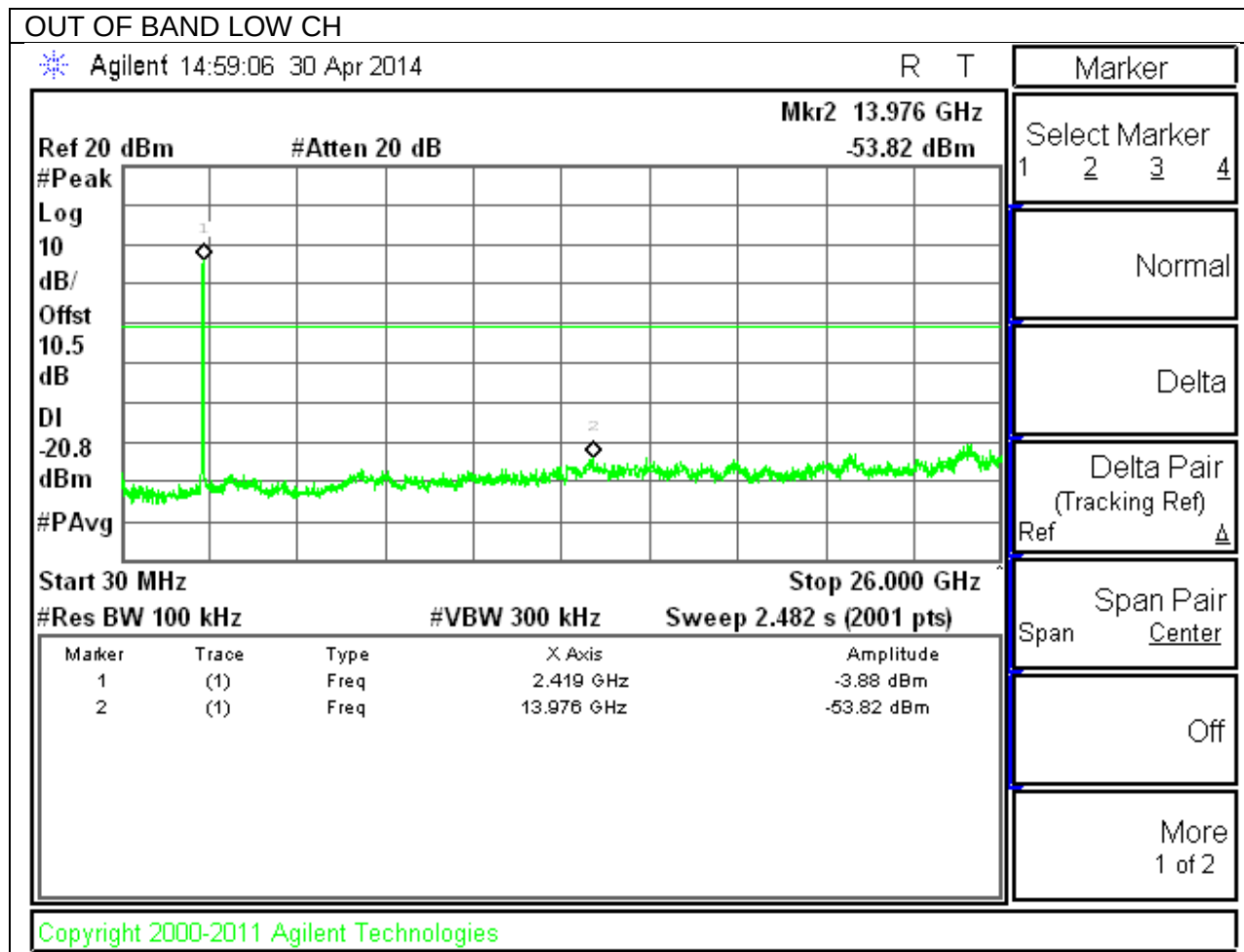
9.6.3. 802.11n MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE

HIGH CHANNEL BANDEDGE

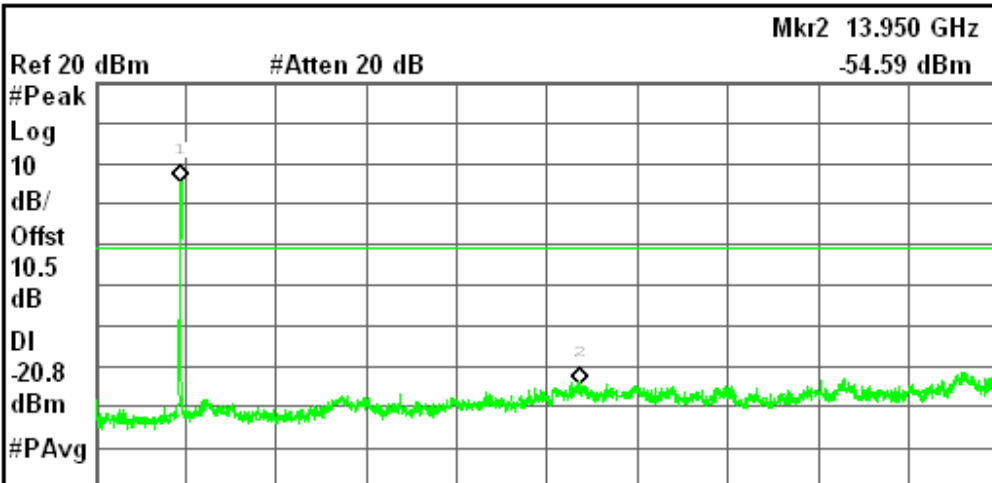
OUT-OF-BAND EMISSIONS

OUT OF BAND MID CH

Agilent 14:57:57 30 Apr 2014

R T

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Δ

Span Pair
Span Center

Off

More
1 of 2

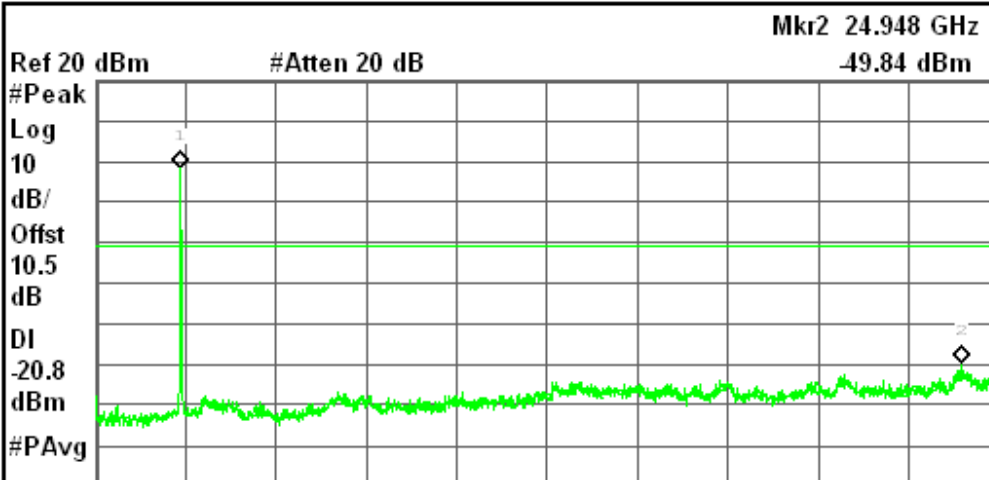
Copyright 2000-2011 Agilent Technologies

OUT OF BAND HIGH CH

Agilent 14:56:36 30 Apr 2014

R T

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Δ

Span Pair
Span Center

Off

More
1 of 2

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.471 GHz	-1.81 dBm
2	(1)	Freq	24.948 GHz	-49.84 dBm

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10. RADIATED TEST RESULTS

10.1. 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.

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= $10\log(1/x)$ For this sample B mode = 0dB (duty cycle >98%); G mode = 0.3dB; N mode = 0.32dB.

For spurious emission measurement traditional method of reduce VBW is followed.

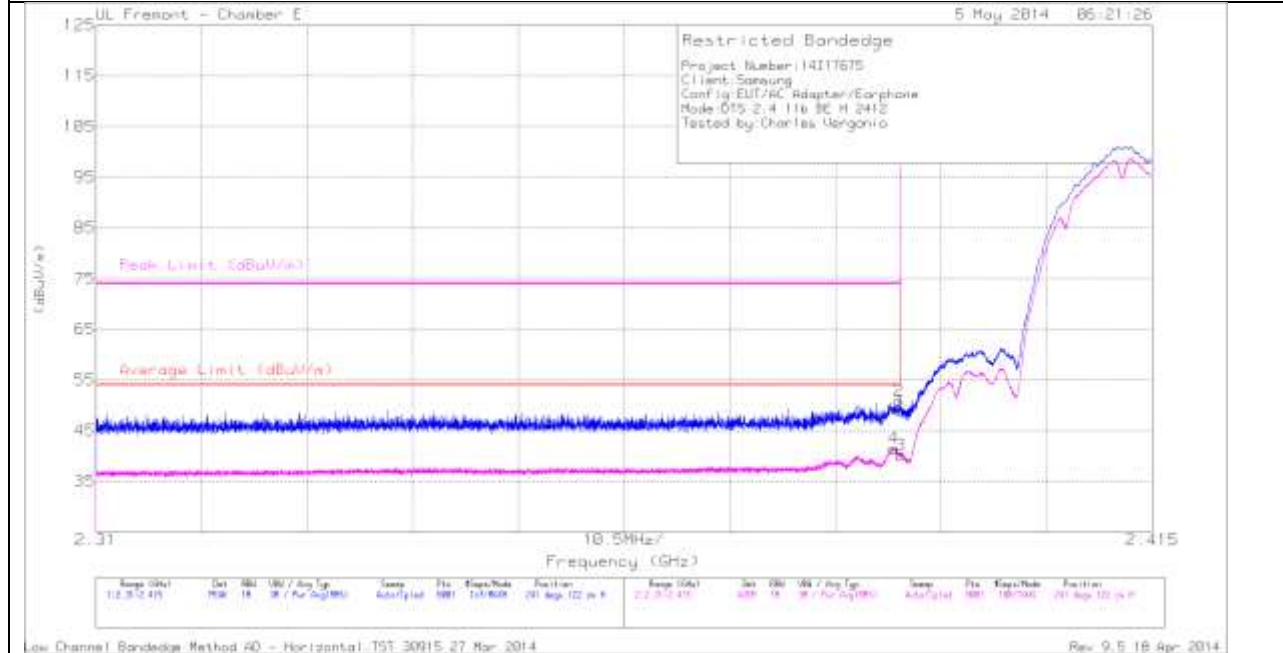
The spectrum from 1GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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.

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED PEAK & AVERAGE, HORIZ



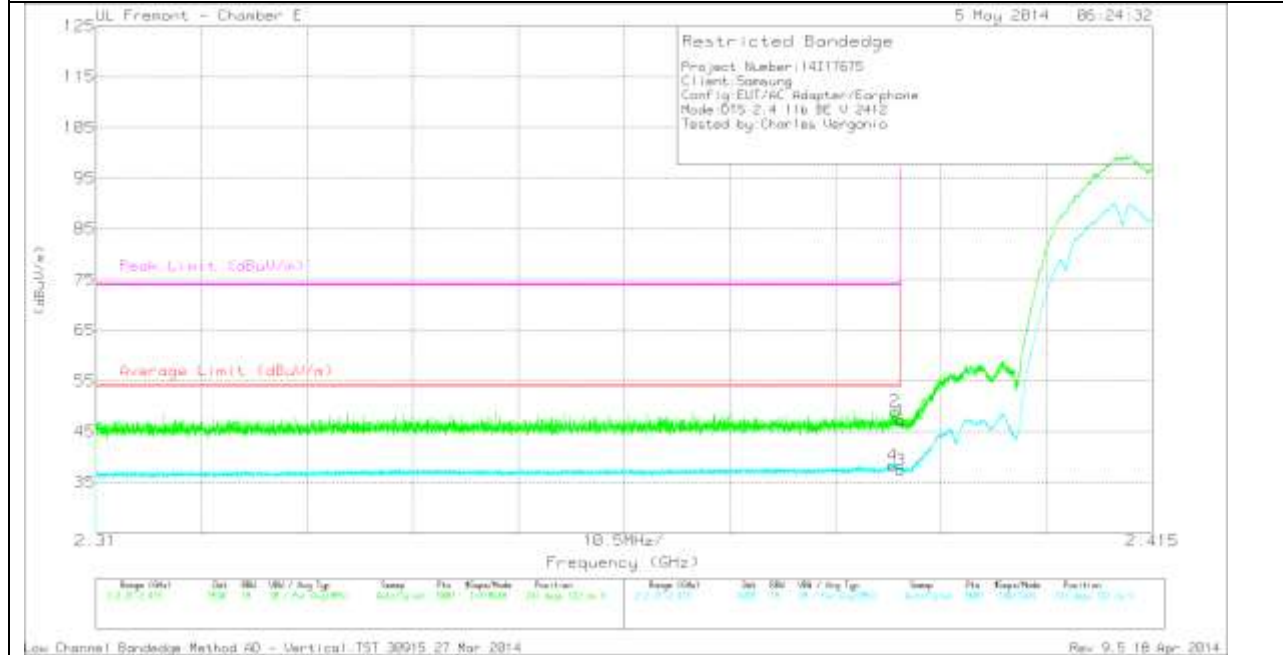
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.63	PK	32	-24.7	48.93	-	-	74	-25.07	241	122	H
2	* 2.39	43.51	PK	32	-24.7	50.81	-	-	74	-23.19	241	122	H
3	* 2.39	32.83	RMS	32	-24.7	40.13	54	-13.87	-	-	241	122	H
4	* 2.389	34.17	RMS	32	-24.7	41.47	54	-12.53	-	-	241	122	H

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

PK - Peak detector

RMS - RMS detection

LOW CHANNEL RESTRICTED PEAK & AVERAGE, VERT

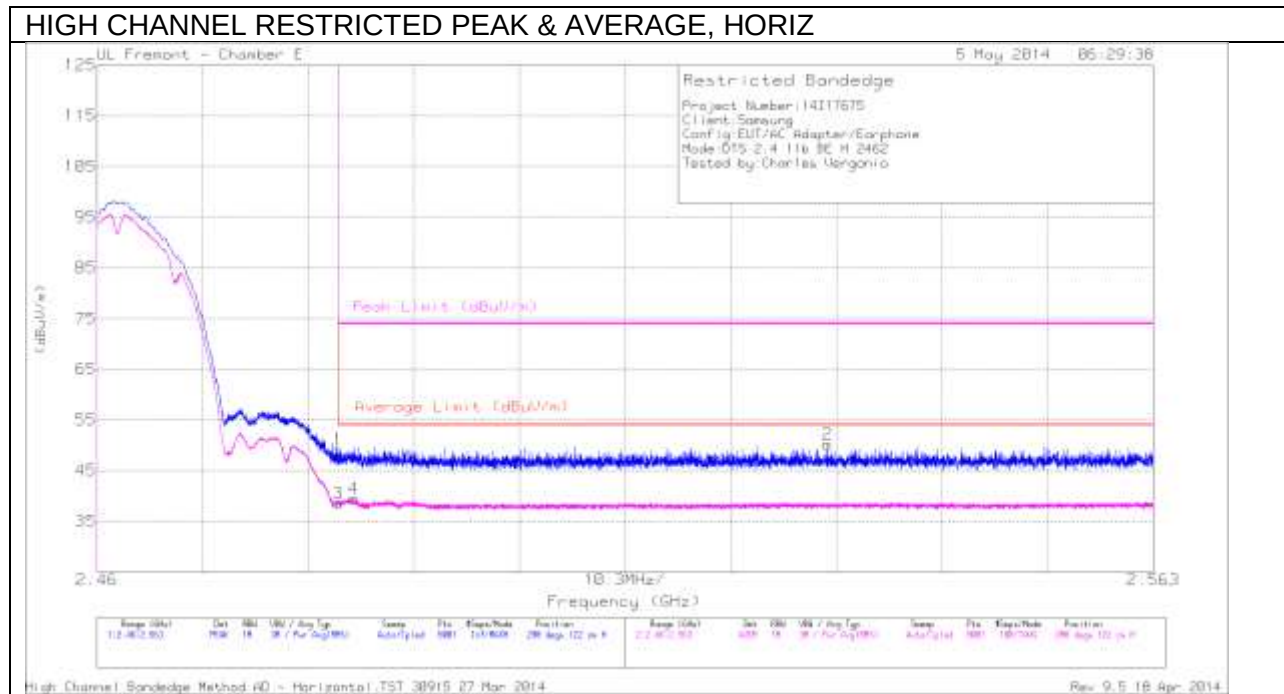


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.85	PK	32	-24.7	47.15	-	-	74	-26.85	241	122	V
2	* 2.389	41.78	PK	32	-24.7	49.08	-	-	74	-24.92	241	122	V
3	* 2.39	30.07	RMS	32	-24.7	37.37	54	-16.63	-	-	241	122	V
4	* 2.389	31.1	RMS	32	-24.7	38.4	54	-15.6	-	-	241	122	V

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

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

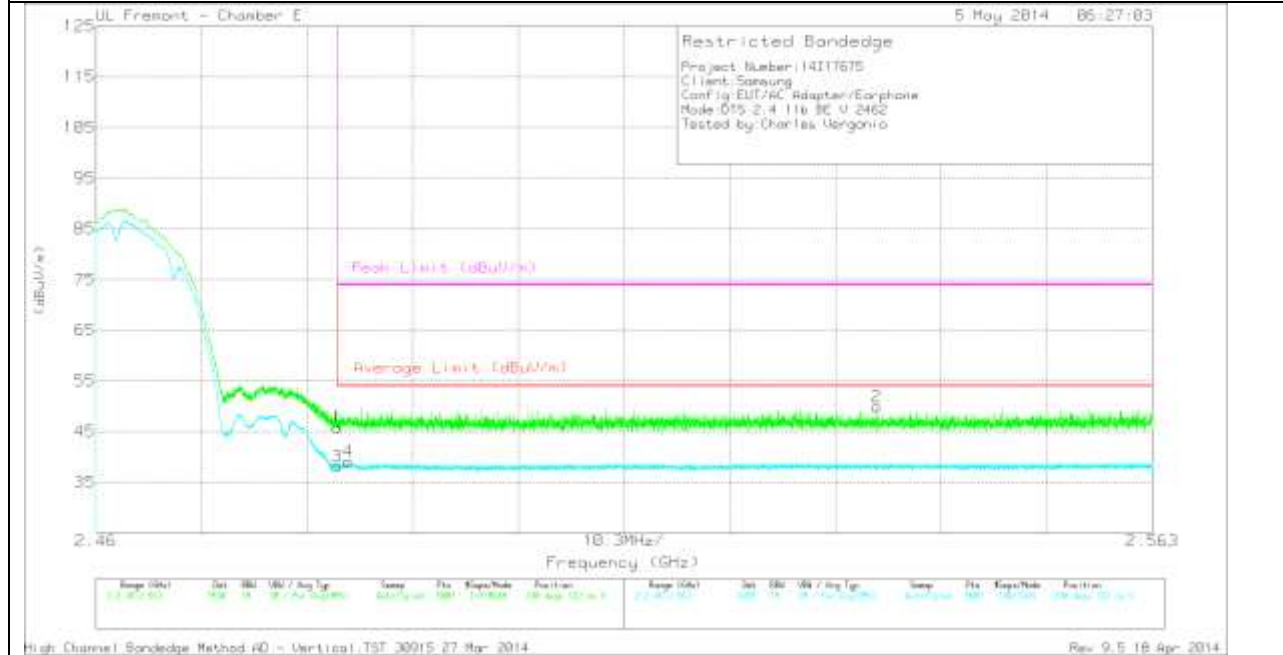
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41	PK	32.3	-24.3	49	-	-	74	-25	288	122	H
3	* 2.484	30.45	RMS	32.3	-24.3	38.45	54	-15.55	-	-	288	122	H
4	* 2.485	31.52	RMS	32.3	-24.3	39.52	54	-14.48	-	-	288	122	H
2	2.531	41.87	PK	32.4	-24.1	50.17	-	-	74	-23.83	288	122	H

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

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.8	PK	32.3	-24.3	45.8	-	-	74	-28.2	240	122	V
3	* 2.484	30.08	RMS	32.3	-24.3	38.08	54	-15.92	-	-	240	122	V
4	* 2.485	31.08	RMS	32.3	-24.3	39.08	54	-14.92	-	-	240	122	V
2	2.536	41.59	PK	32.4	-24.1	49.89	-	-	74	-24.11	240	122	V

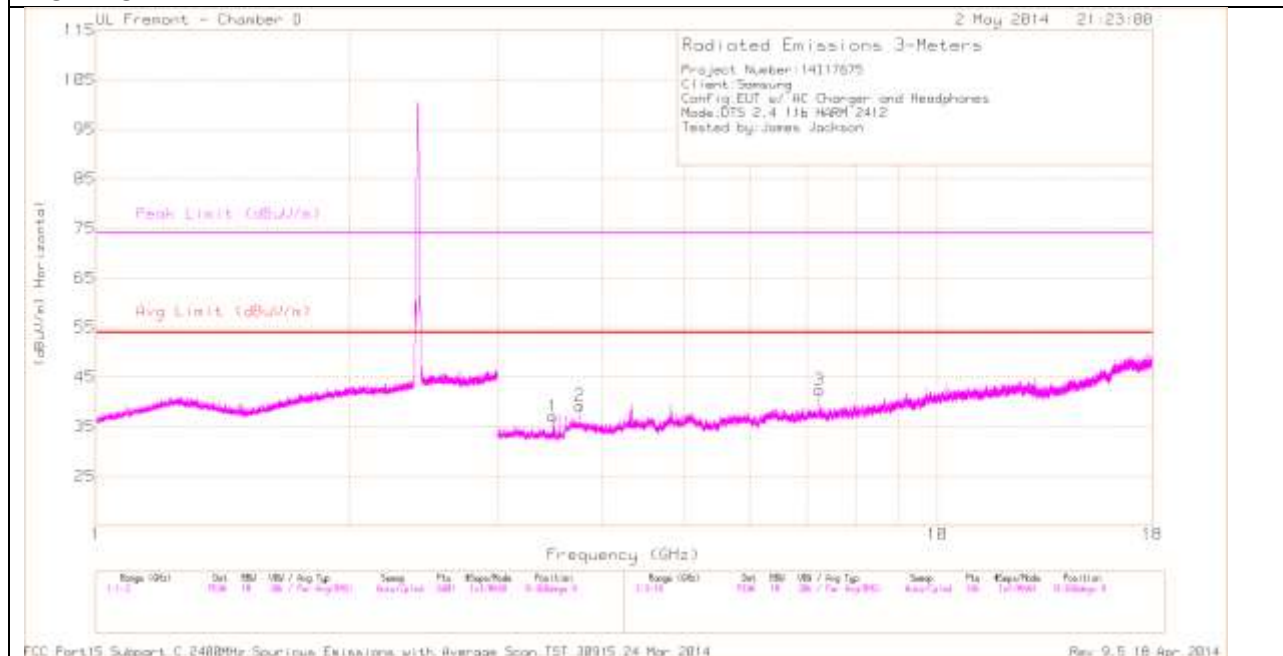
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

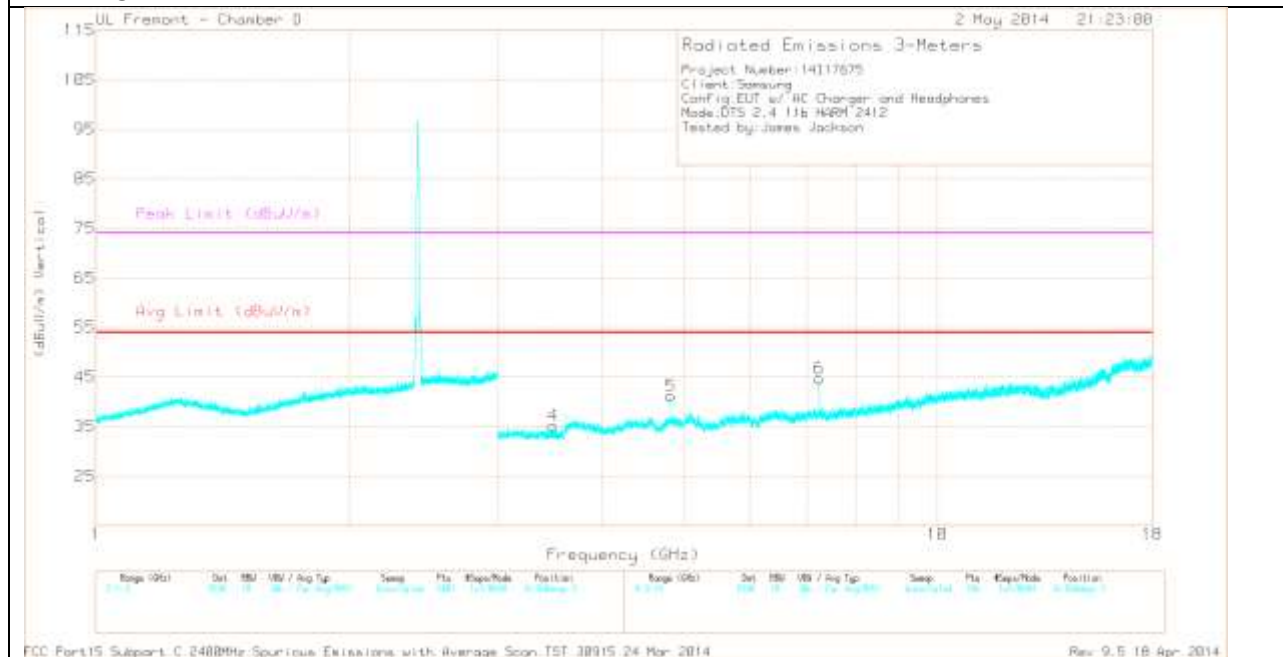
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

LOW CHANNEL
VERTICAL



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

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.757	34.86	PK	32.7	-28.3	39.26	-	-	74	-34.74	0-360	201	H
5	* 4.824	34.35	PK	33.5	-26.7	41.15	-	-	74	-32.85	0-360	201	V
1	3.492	33.28	PK	32.3	-28.5	37.08	-	-	-	-	0-360	201	H
4	3.493	31.41	PK	32.3	-28.5	35.21	-	-	-	-	0-360	201	V
3	7.236	32.44	PK	35.1	-25.1	42.44	-	-	-	-	0-360	201	H
6	7.236	34.74	PK	35.1	-25.1	44.74	-	-	-	-	0-360	201	V

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

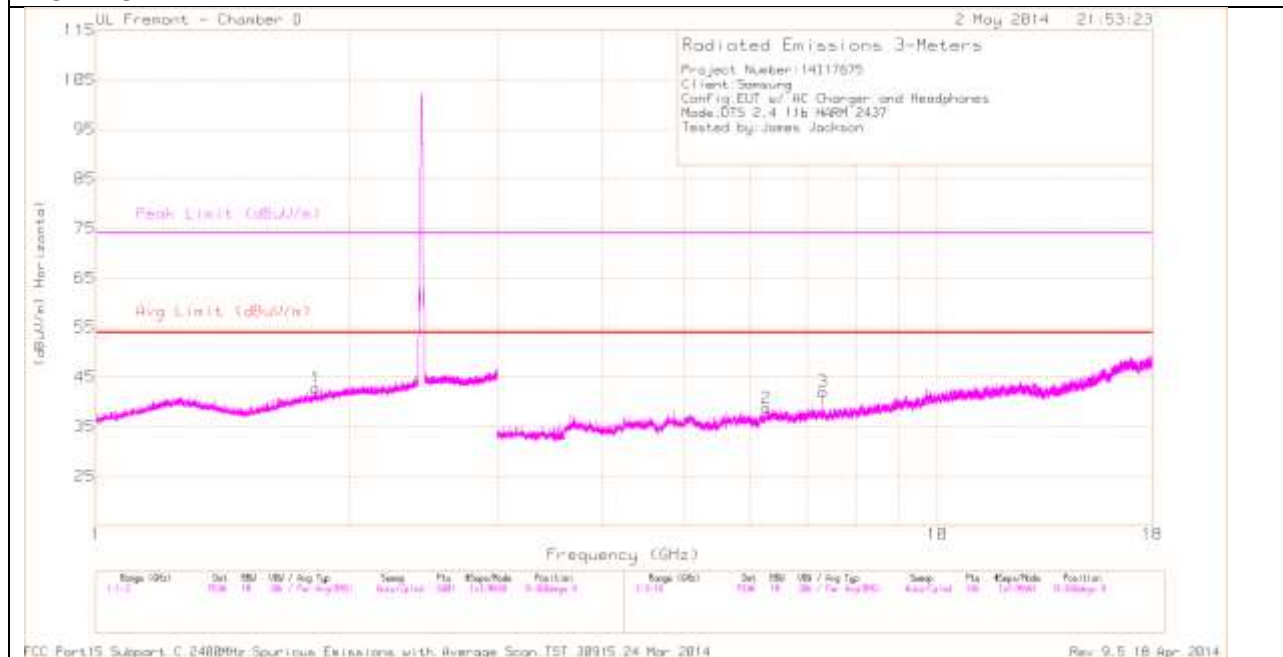
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.754	38.62	PK2	32.7	-28.2	43.12	-	-	74	-30.88	299	277	H
* 3.761	27.33	MAV1	32.7	-28.4	31.63	54	-22.37	-	-	299	277	H
* 4.824	33.22	PK2	33.5	-26.7	40.02	54	-13.98	-	-	82	220	V
* 4.824	29.13	MAV1	33.5	-26.7	35.93	54	-18.07	-	-	82	220	V

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

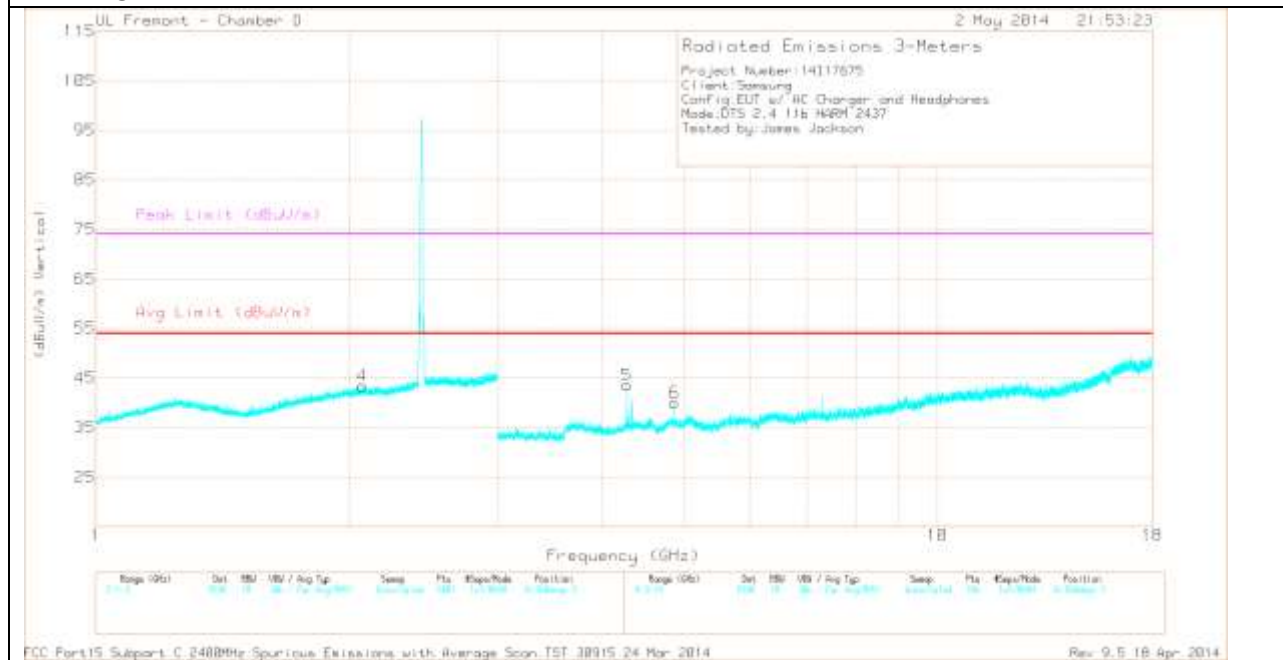
PK2 - KDB558074 Method: Maximum Peak

MID CHANNEL
HORIZONTAL



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

MID CHANNEL
VERTICAL



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

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 7.311	31.7	PK	35.1	-24.8	42	-	-	74	-32	0-360	100	H
5	* 4.274	38.25	PK	33	-27.7	43.55	-	-	74	-30.45	0-360	100	V
6	* 4.874	33.45	PK	33.5	-26.9	40.05	-	-	74	-33.95	0-360	201	V
1	1.824	34.17	PK	29.8	-21.2	42.77	-	-	-	-	0-360	200	H
4	2.073	33.56	PK	30.7	-20.8	43.46	-	-	-	-	0-360	100	V
2	6.264	30.11	PK	34.9	-26.3	38.71	-	-	-	-	0-360	201	H

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

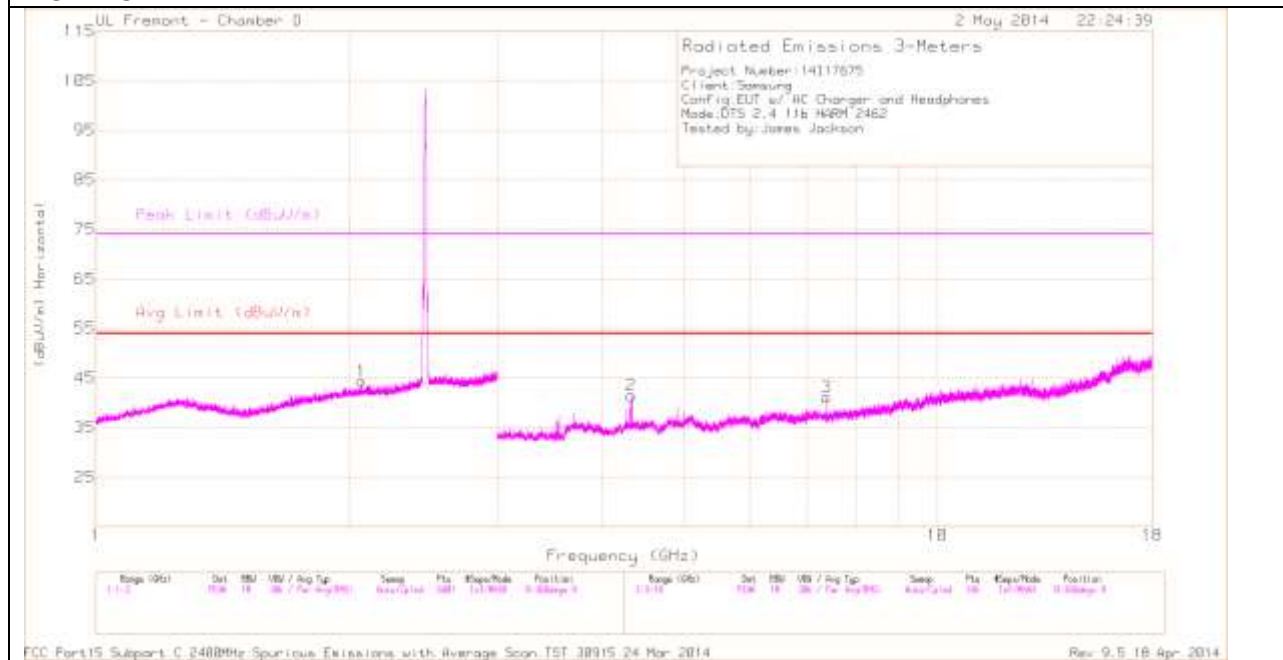
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 7.311	40.02	PK2	35.1	-24.8	50.32	-	-	74	-23.68	94	285	H
* 7.311	32.86	MAV1	35.1	-24.8	43.16	54	-10.84	-	-	94	285	H
* 4.278	38.04	PK2	33	-27.6	43.44	-	-	74	-30.56	233	200	V
* 4.268	26.42	MAV1	32.9	-27.8	31.52	54	-22.48	-	-	233	200	V
* 4.874	37.86	PK2	33.5	-26.9	44.46	-	-	74	-29.54	79	200	V
* 4.874	29.56	MAV1	33.5	-26.9	36.16	54	-17.84	-	-	79	200	V

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

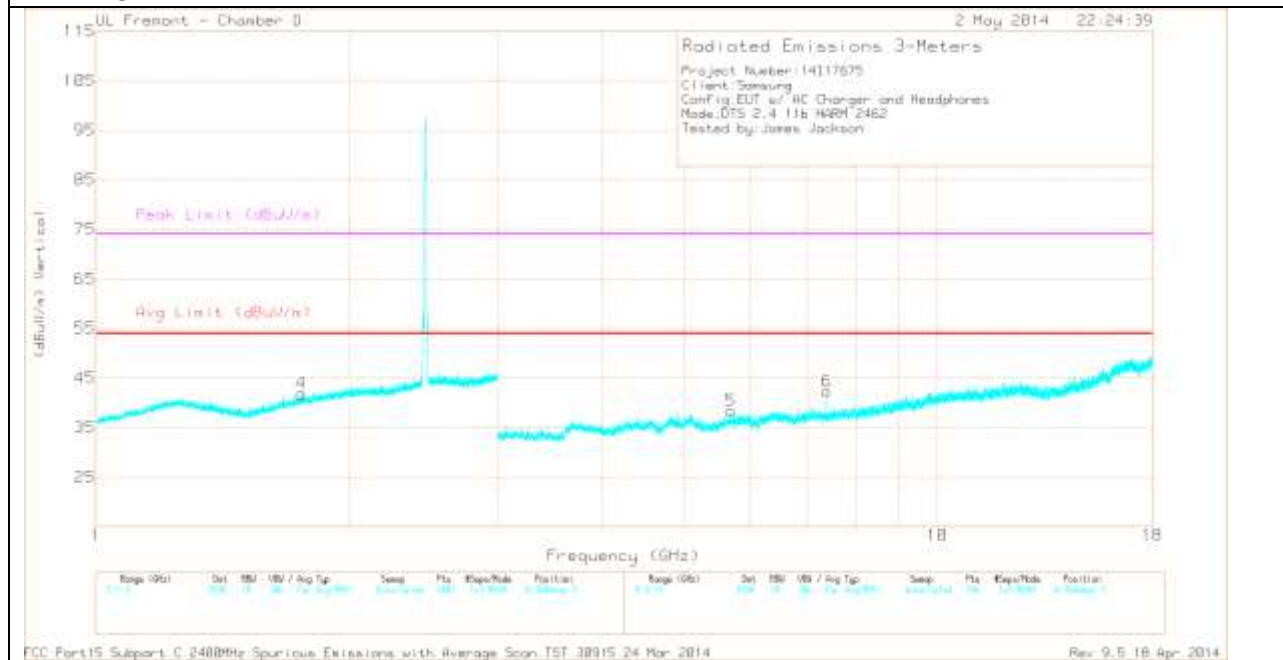
PK2 - KDB558074 Method: Maximum Peak

HIGH CHANNEL
HORIZONTAL



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

HIGH CHANNEL
VERTICAL



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

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.325	35.78	PK	33.1	-27.4	41.48	-	-	74	-32.52	0-360	100	H
3	* 7.386	31.24	PK	35.2	-25.3	41.14	-	-	74	-32.86	0-360	201	H
6	* 7.386	32.44	PK	35.2	-25.3	42.34	-	-	74	-31.66	0-360	201	V
4	1.754	33.66	PK	29.4	-21.2	41.86	-	-	-	-	0-360	201	V
1	2.068	34.52	PK	30.7	-20.9	44.32	-	-	-	-	0-360	200	H
5	5.682	30.82	PK	34.1	-26.5	38.42	-	-	-	-	0-360	100	V

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

PK - Peak detector

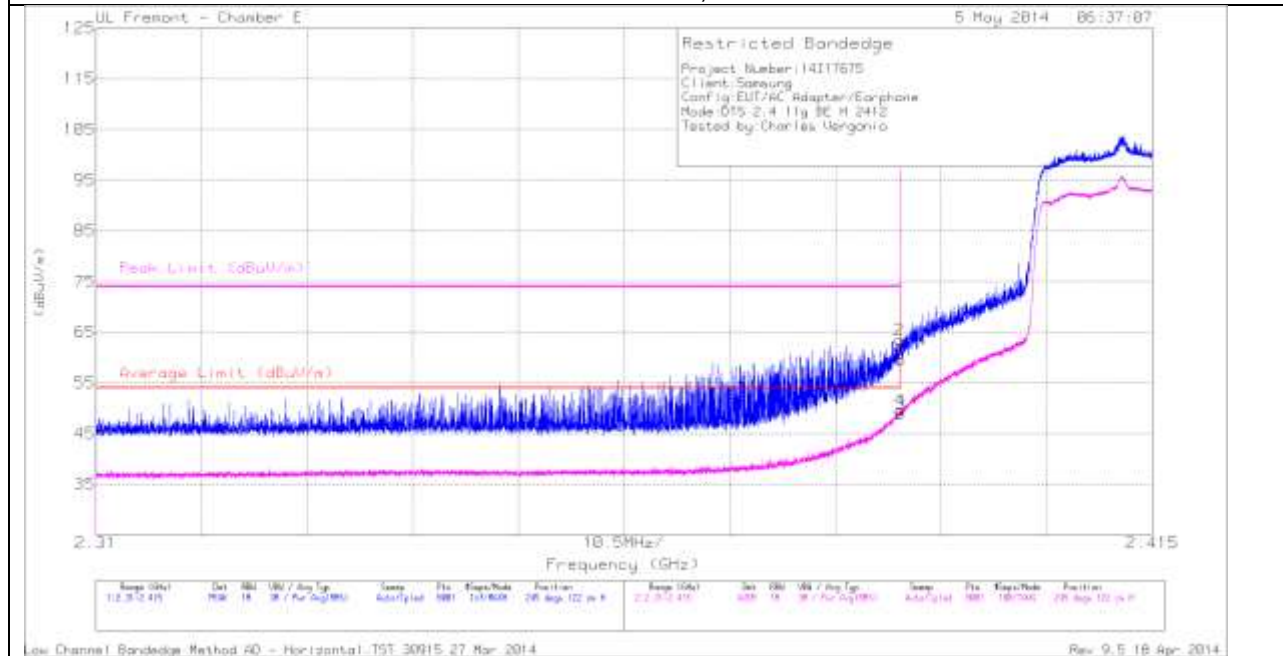
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.329	37.95	PK2	33.1	-27.5	43.55	-	-	74	-30.45	12	373	H
* 4.331	26.21	MAV1	33.1	-27.5	31.81	54	-22.19	-	-	12	373	H
* 7.386	40.05	PK2	35.2	-25.3	49.95	-	-	74	-24.05	211	201	H
* 7.386	30.36	MAV1	35.2	-25.3	40.26	54	-13.74	-	-	211	201	H
* 7.386	41.33	PK2	35.2	-25.3	51.23	-	-	74	-22.77	69	253	V
* 7.386	32.89	MAV1	35.2	-25.3	42.79	54	-11.21	-	-	69	253	V

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

PK2 - KDB558074 Method: Maximum Peak

10.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED PEAK & AVERAGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	52.23	PK	32	-24.7	0	59.53	-	-	74	-14.47	245	122	H
2	* 2.39	56.18	PK	32	-24.7	0	63.48	-	-	74	-10.52	245	122	H
3	* 2.39	41.37	RMS	32	-24.7	.3	48.97	54	-5.03	-	-	245	122	H
4	* 2.39	41.96	RMS	32	-24.7	.3	49.56	54	-4.44	-	-	245	122	H

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

PK - Peak detector

RMS - RMS detection

UL Front - Chamber E

5 May 2014 05:48:04

Restricted Bandedge

Project Number: 14117675

Client: Samsung

Config: EUTRA Adapter/Earphone

Mode: DSS 2.4 11g BE U 2412

Tested by: Charles Vergonio

Peak Limit (dBμV/m)

Average Limit (dBμV/m)

dBμV/m

Frequency (GHz)

2.31 2.415

10.5MHz

Range (Hz)	Det	Ref	Mod / Res Type	Comp	Pre	Range/Mode	Position	Range (dB)	Det	Ref	Mod / Res Type	Comp	Pre	Range/Mode	Position
2.2 2.5 GHz	NR	1A	20 / 100 (dBm)	Auto/Agc	1001	100dB	20.000 100.000	2.2 2.5 GHz	NR	1A	20 / 100 (dBm)	Auto/Agc	1001	100dB	20.000 100.000

Low Channel Bandedge Method 40 - Vertical TST 30015 27 Mar 2014

Rev 9.5 18 Apr 2014

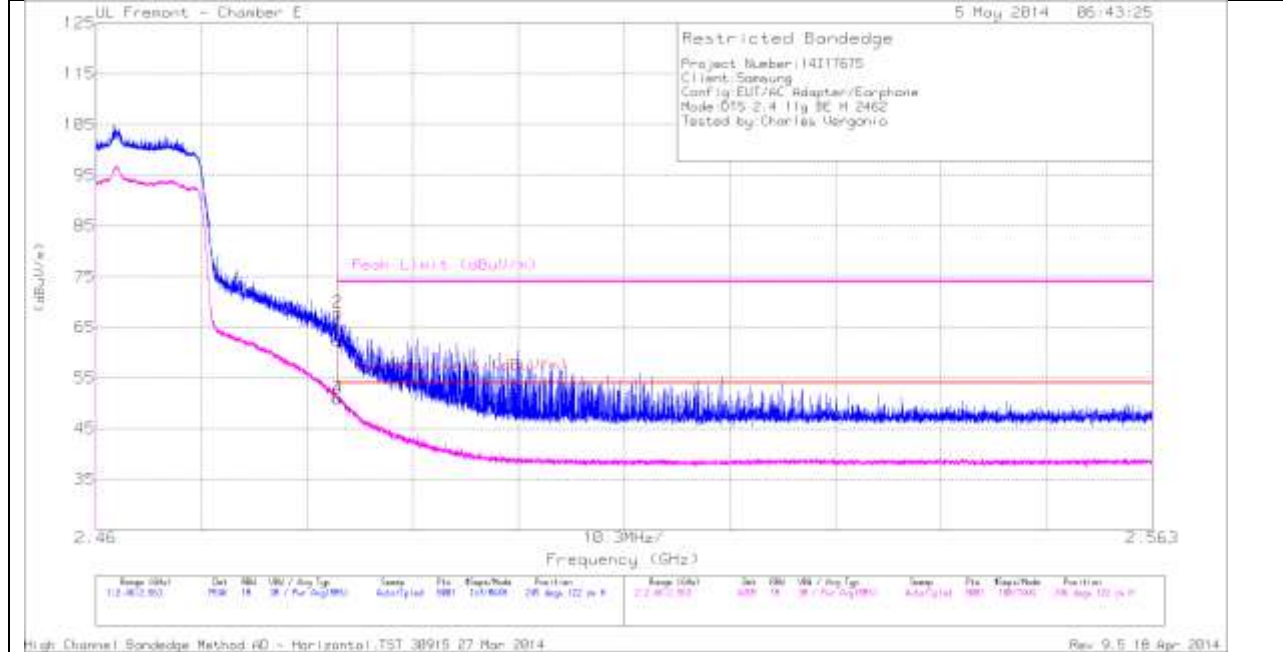
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 1346 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.17	PK	32	-24.7	0	53.47	-	-	74	-20.53	245	122	V
2	* 2.385	52.3	PK	31.9	-24.6	0	59.6	-	-	74	-14.4	245	122	V
3	* 2.39	34.54	RMS	32	-24.7	.3	42.14	54	-11.86	-	-	245	122	V
4	* 2.39	35.42	RMS	32	-24.7	.3	43.02	54	-10.98	-	-	245	122	V

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVERAGE, HORIZ



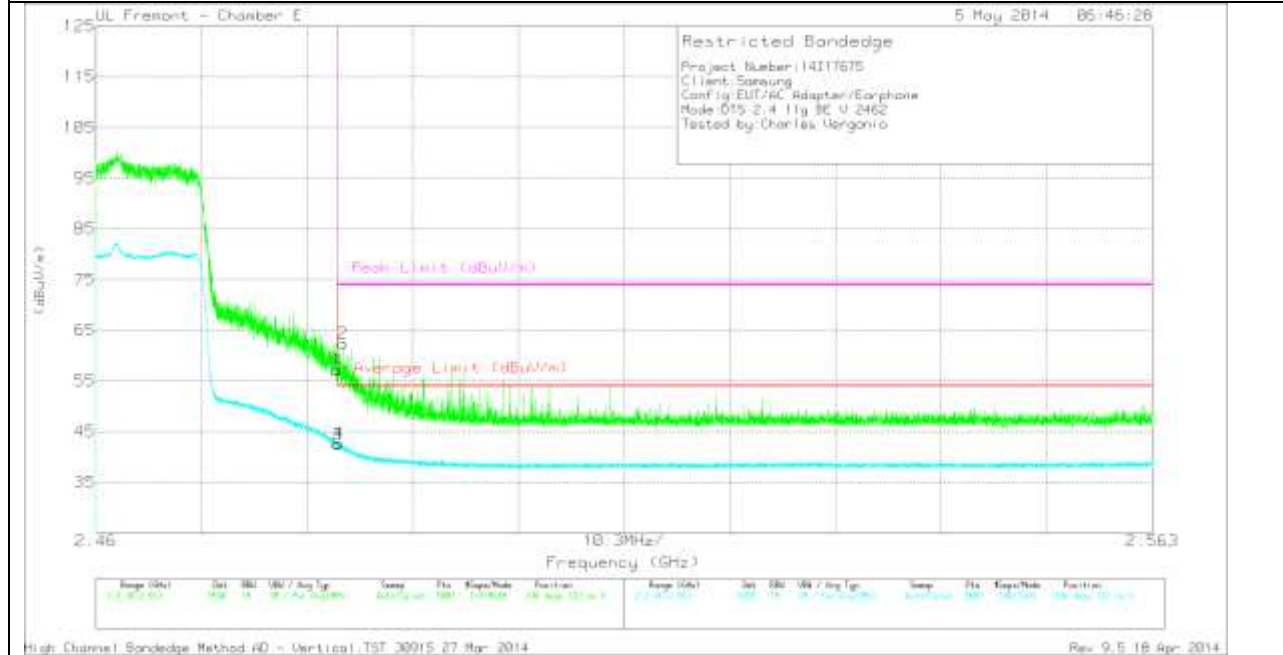
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.42	PK	32.3	-24.3	0	62.42	-	-	74	-11.58	245	122	H
2	* 2.484	59.95	PK	32.3	-24.3	0	67.95	-	-	74	-6.05	245	122	H
3	* 2.484	42.79	RMS	32.3	-24.3	.3	51.09	54	-2.91	-	-	246	122	H
4	* 2.484	42.77	RMS	32.3	-24.3	.3	51.07	54	-2.93	-	-	246	122	H

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

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL BANDEDGE, PEAK & AVERAGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.17	PK	32.3	-24.3	0	57.17	-	-	74	-16.83	246	122	V
2	* 2.484	54.31	PK	32.3	-24.3	0	62.31	-	-	74	-11.69	246	122	V
3	* 2.484	34.21	RMS	32.3	-24.3	.3	42.51	54	-11.49	-	-	246	122	V
4	* 2.484	34.36	RMS	32.3	-24.3	.3	42.66	54	-11.34	-	-	246	122	V

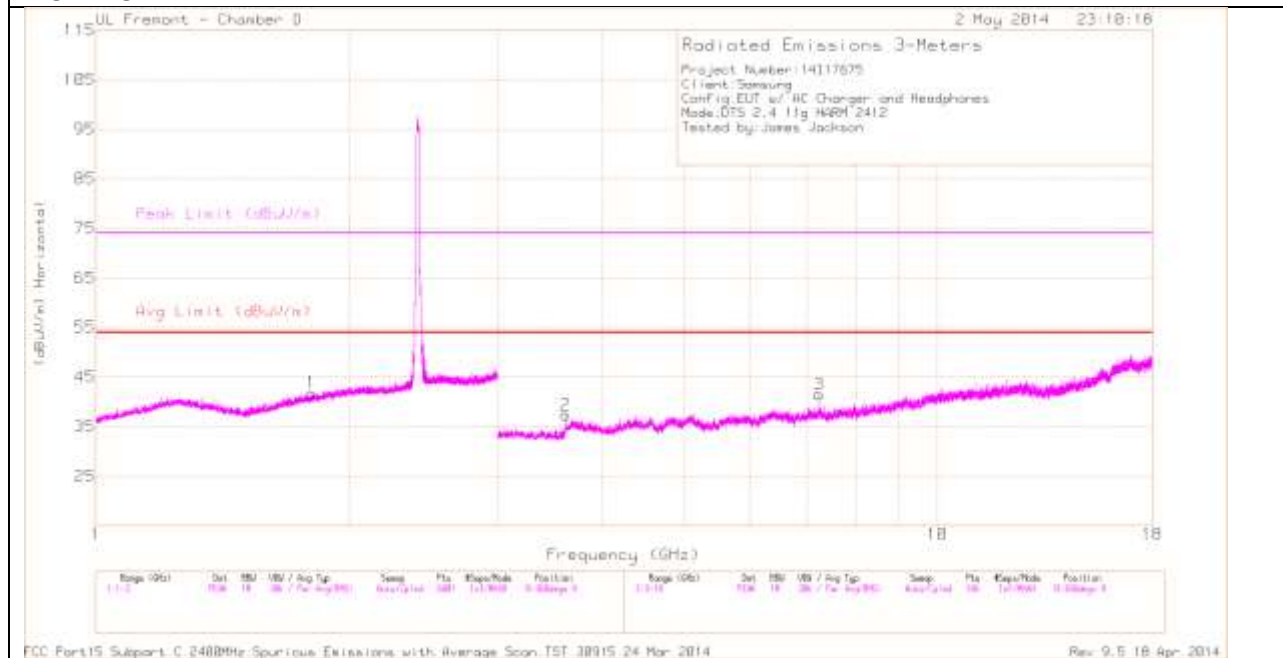
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

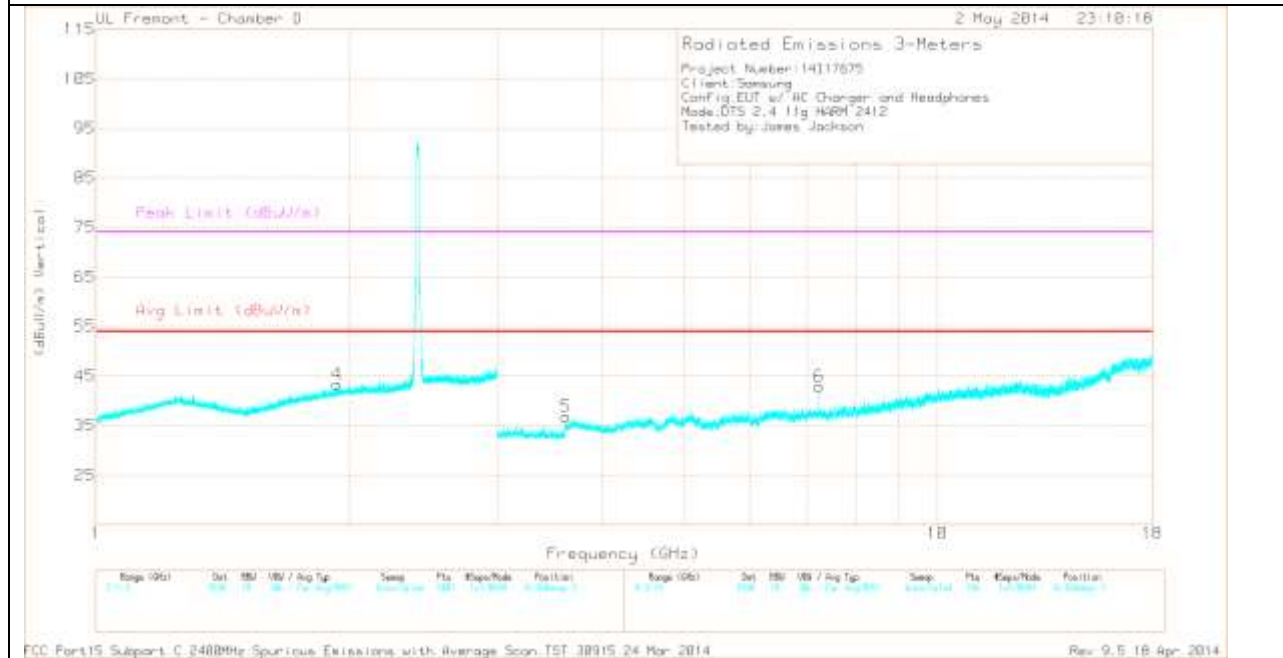
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

LOW CHANNEL
VERTICAL



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

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.618	33.28	PK	32.5	-28.4	37.38	-	-	74	-36.62	0-360	100	H
5	* 3.618	32.77	PK	32.5	-28.4	36.87	-	-	74	-37.13	0-360	100	V
1	1.804	33.45	PK	29.7	-21.3	41.85	-	-	-	-	0-360	100	H
4	1.935	34.18	PK	30.4	-21.2	43.38	-	-	-	-	0-360	100	V
3	7.236	31.55	PK	35.1	-25.1	41.55	-	-	-	-	0-360	100	H
6	7.236	32.99	PK	35.1	-25.1	42.99	-	-	-	-	0-360	201	V

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

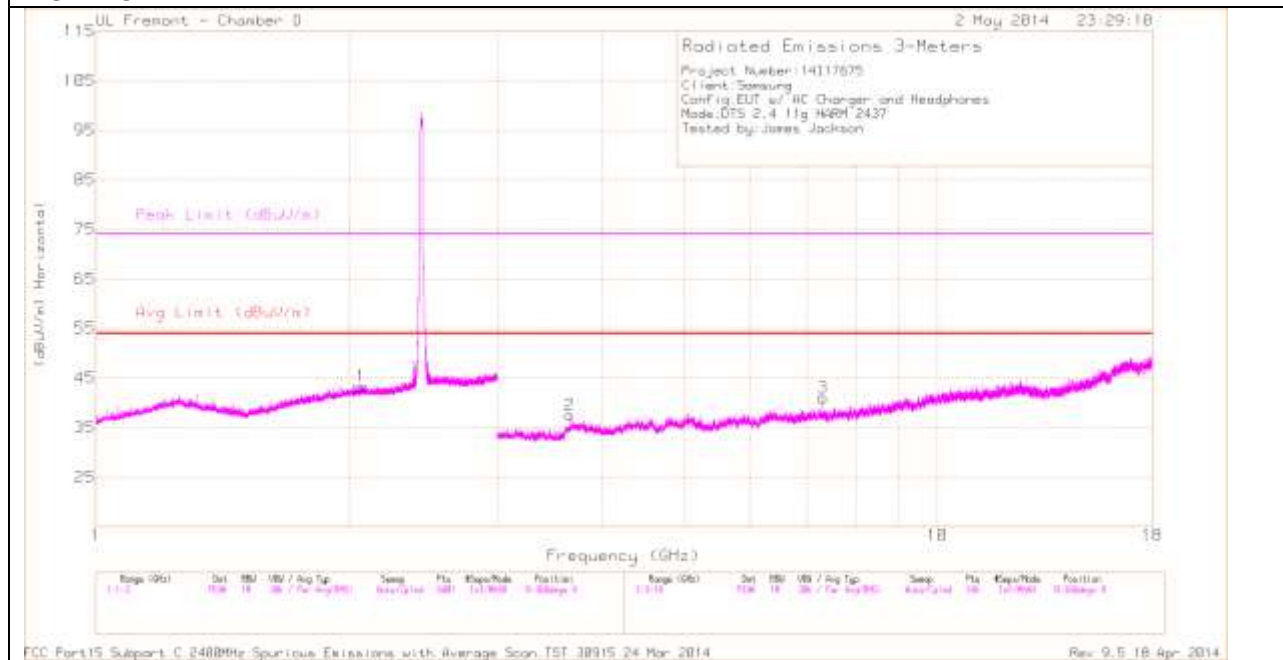
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.618	38.86	PK2	32.5	-28.4	42.96	-	-	74	-31.04	25	153	H
* 3.618	30.83	MAV1	32.5	-28.4	34.93	54	-19.07	-	-	25	153	H
* 3.618	38.77	PK2	32.5	-28.4	42.87	-	-	74	-31.13	12	153	V
* 3.618	29.36	MAV1	32.5	-28.4	33.46	54	-20.54	-	-	12	153	V

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

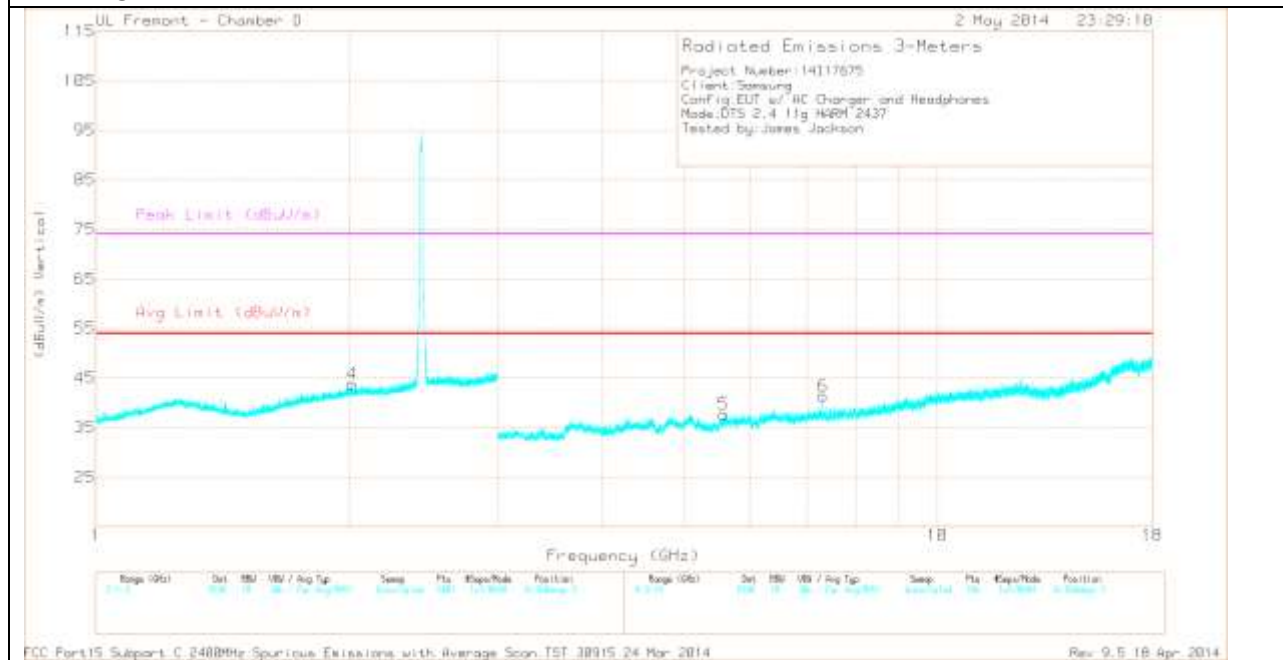
PK2 - KDB558074 Method: Maximum Peak

MID CHANNEL
HORIZONTAL



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

MID CHANNEL
VERTICAL



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

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.656	33.1	PK	32.5	-28.1	37.5	-	-	74	-36.5	0-360	100	H
3	* 7.311	30.68	PK	35.1	-24.8	40.98	-	-	74	-33.02	0-360	100	H
6	* 7.311	31.16	PK	35.1	-24.8	41.46	-	-	74	-32.54	0-360	100	V
4	2.016	34.17	PK	30.7	-21.1	43.77	-	-	-	-	0-360	100	V
1	2.066	33.54	PK	30.7	-20.9	43.34	-	-	-	-	0-360	100	H
5	5.575	31.08	PK	34	-27.3	37.78	-	-	-	-	0-360	100	V

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

PK - Peak detector

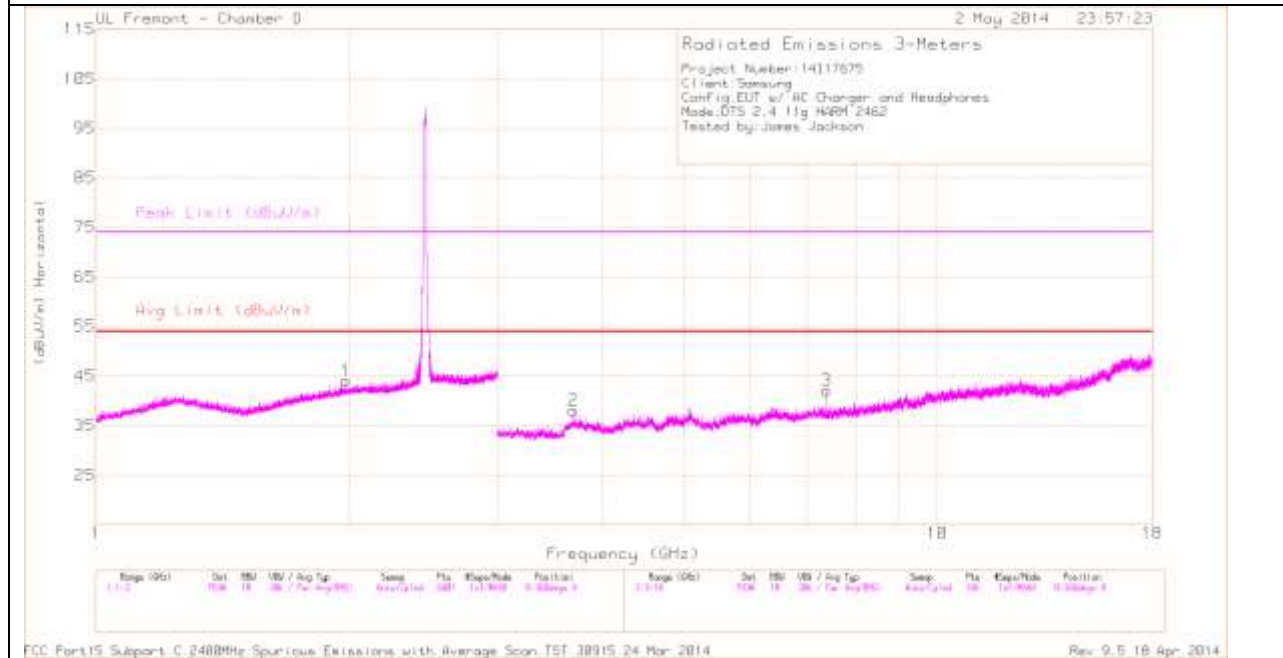
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.656	38.88	PK2	32.5	-28.1	43.28	-	-	74	-30.72	283	305	H
* 3.656	29.64	MAV1	32.5	-28.1	34.04	54	-19.96	-	-	283	305	H
* 7.311	26.01	RMS	35.1	-24.8	36.31	-	-	-	-	195	100	H
* 7.311	40.15	PK2	35.1	-24.8	50.45	-	-	74	-23.55	54	279	V
* 7.311	33.47	MAV1	35.1	-24.8	43.77	54	-10.23	-	-	54	279	V

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

RMS - RMS detection

PK2 - KDB558074 Method: Maximum Peak

HIGH CHANNEL
HORIZONTAL



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

UL Front - Chamber 0

2 May 2014 23:57:23

Radiated Emissions 3-Meters

Project Number: 14117675
 Client: Samsung
 Config: EUT w/ AC Charger and Headphones
 Mode: OFS 2.4 11g NMRM 2462
 Tested by: James Jackson

Peak Limit (dBuV/m)

Avg Limit (dBuV/m)

0.4

dBuV/m

Frequency (GHz)

Range (GHz)	Det	RBW	VBW	Avg Tpe	Scale	File	Wave/Mode	Position
0.1 - 1.0	ENF	10	10	Pre-Avg/Post	dBuV/m	01	11g NMRM	Chamber 0

Range (GHz)	Det	RBW	VBW	Avg Tpe	Scale	File	Wave/Mode	Position
1.0 - 2.5	ENF	10	10	Pre-Avg/Post	dBuV/m	01	11g NMRM	Chamber 0

FCC Part 15 Subpart C 2400MHz Spurious Emissions with Average Scan TST 30015 24 Mar 2014

Rev: 9.5 18 Apr 2014

HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.692	33.43	PK	32.6	-27.9	38.13	-	-	74	-35.87	0-360	100	H
3	* 7.386	32.32	PK	35.2	-25.3	42.22	-	-	74	-31.78	0-360	100	H
5	* 7.386	32.66	PK	35.2	-25.3	42.56	-	-	74	-31.44	0-360	100	V
4	1.94	34.03	PK	30.4	-21.2	43.23	-	-	-	-	0-360	100	V
1	1.983	34.72	PK	30.6	-21.2	44.12	-	-	-	-	0-360	200	H
6	7.894	29.34	PK	35.2	-24.6	39.94	-	-	-	-	0-360	201	V

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

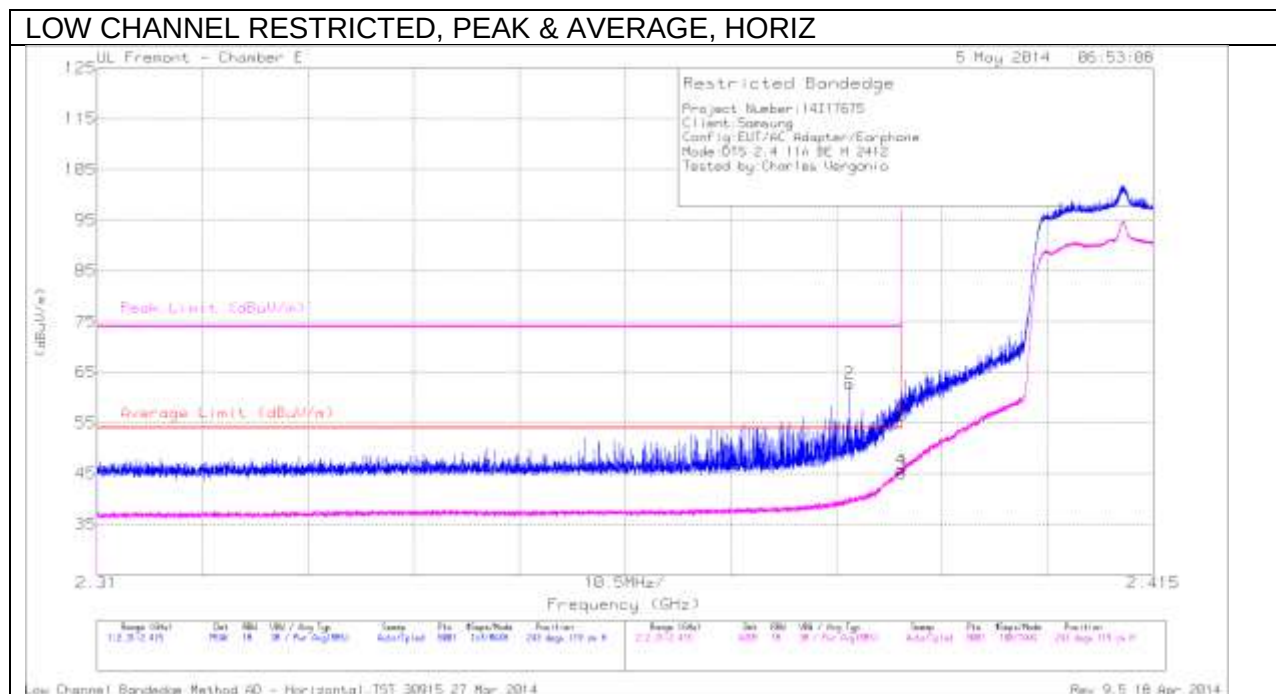
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.693	39.87	PK2	32.6	-27.9	44.57	-	-	74	-29.43	267	281	H
* 3.693	30.29	MAV1	32.6	-27.9	34.99	54	-19.01	-	-	267	281	H
* 7.386	38.6	PK2	35.2	-25.3	48.5	-	-	74	-25.5	96	301	H
* 7.386	31.01	MAV1	35.2	-25.3	40.91	54	-13.09	-	-	96	301	H
* 7.386	40.08	PK2	35.2	-25.3	49.98	-	-	74	-24.02	62	272	V
* 7.386	33.57	MAV1	35.2	-25.3	43.47	54	-10.53	-	-	62	272	V

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

PK2 - KDB558074 Method: Maximum Peak

10.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



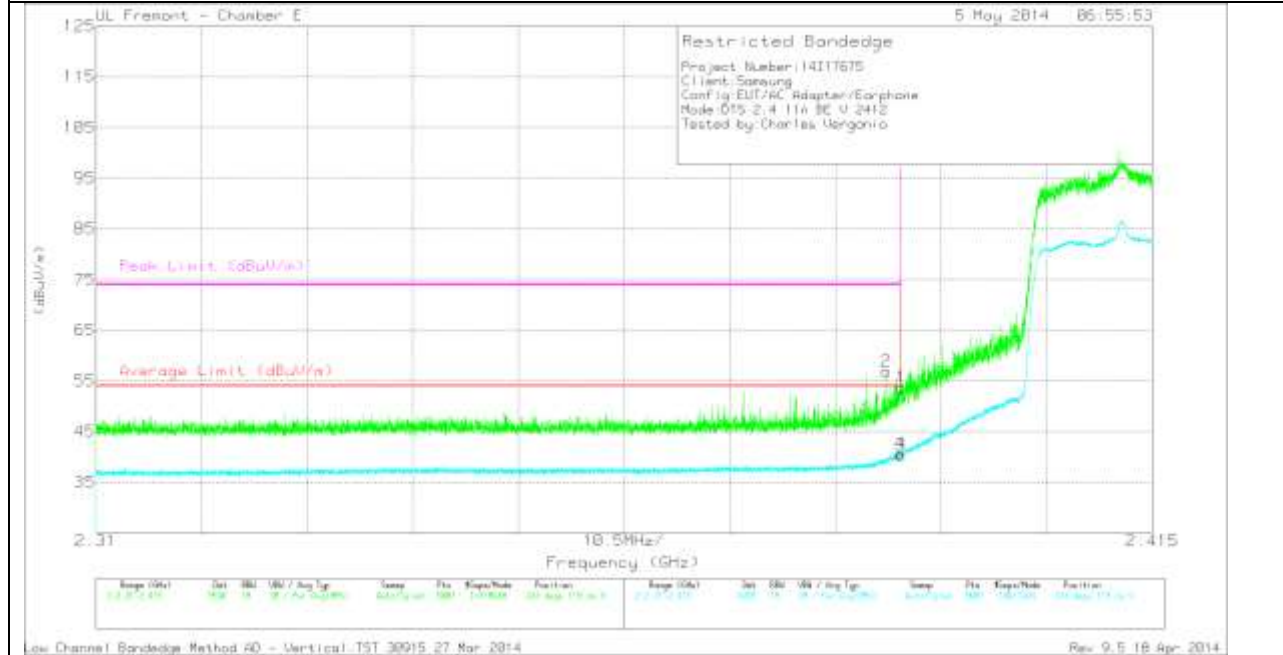
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	49.26	PK	32	-24.7	0	56.56	-	-	74	-17.44	243	119	H
2	* 2.385	55.47	PK	31.9	-24.6	0	62.77	-	-	74	-11.23	243	119	H
3	* 2.39	37.52	RMS	32	-24.7	.3	45.12	54	-8.88	-	-	243	119	H
4	* 2.39	38.08	RMS	32	-24.7	.3	45.68	54	-8.32	-	-	243	119	H

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

PK - Peak detector

RMS - RMS detection

LOW CHANNEL RESTRICTED, PEAK & AVERAGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.42	PK	32	-24.7	0	53.72	-	-	74	-20.28	243	119	V
2	* 2.389	49.57	PK	32	-24.7	0	56.87	-	-	74	-17.13	243	119	V
3	* 2.39	32.8	RMS	32	-24.7	.3	40.4	54	-13.6	-	-	243	119	V
4	* 2.39	33.05	RMS	32	-24.7	.3	40.65	54	-13.35	-	-	243	119	V

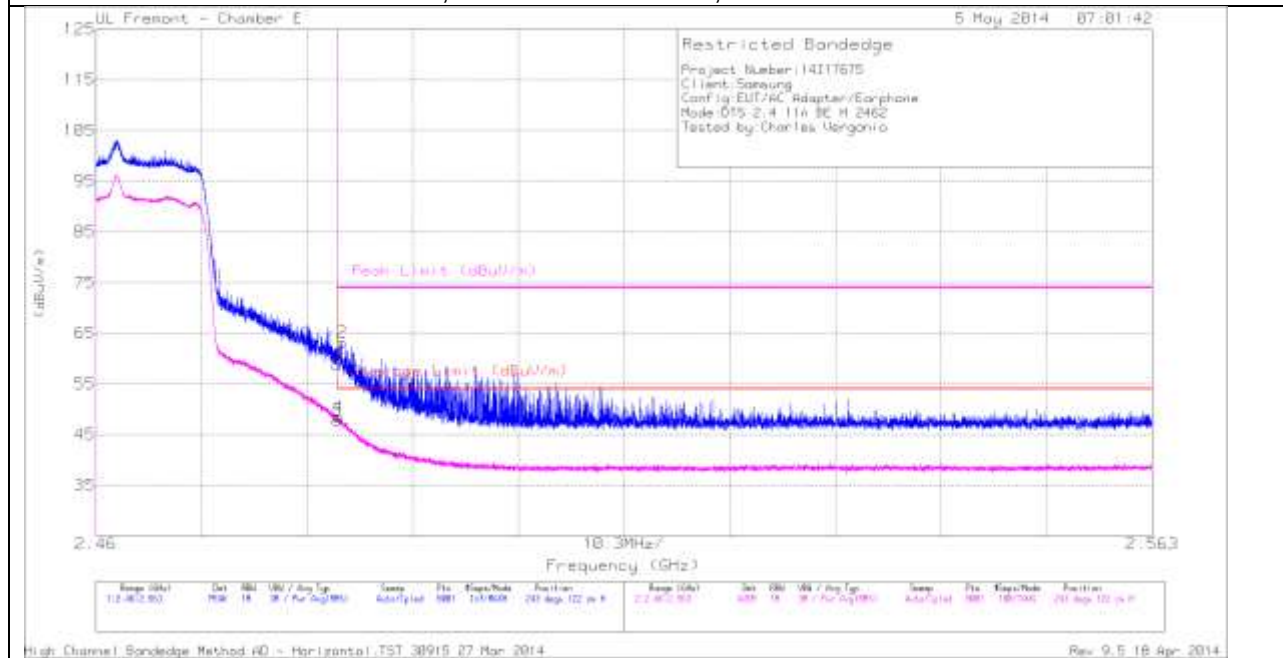
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK & AVERAGE, HORIZ



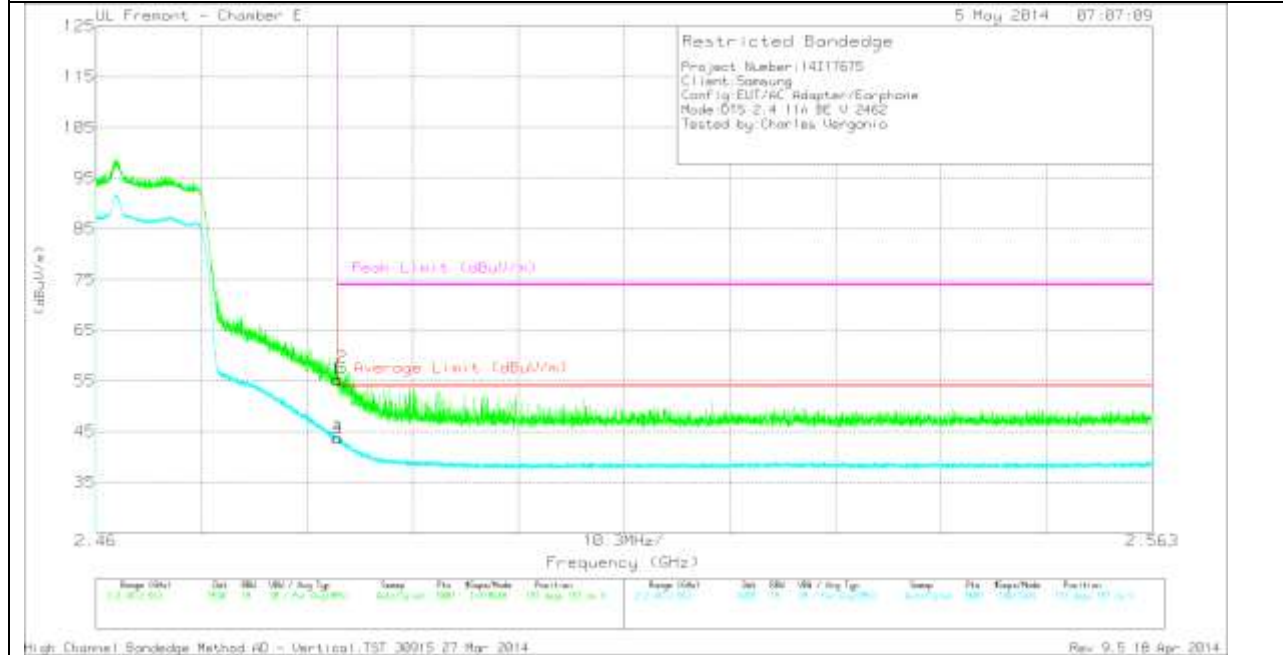
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	50.78	PK	32.3	-24.3	0	58.78	-	-	74	-15.22	243	122	H
2	* 2.484	55.17	PK	32.3	-24.3	0	63.17	-	-	74	-10.83	243	122	H
3	* 2.484	39.46	RMS	32.3	-24.3	.3	47.76	54	-6.24	-	-	243	122	H
4	* 2.484	40.11	RMS	32.3	-24.3	.3	48.41	54	-5.59	-	-	243	122	H

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

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL BANDEDGE, PEAK & AVERAGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.25	PK	32.3	-24.3	0	55.25	-	-	74	-18.75	197	197	V
2	* 2.484	49.59	PK	32.3	-24.3	0	57.59	-	-	74	-16.41	197	197	V
3	* 2.484	35.39	RMS	32.3	-24.3	.3	43.69	54	-10.31	-	-	197	197	V
4	* 2.484	35.36	RMS	32.3	-24.3	.3	43.66	54	-10.34	-	-	197	197	V

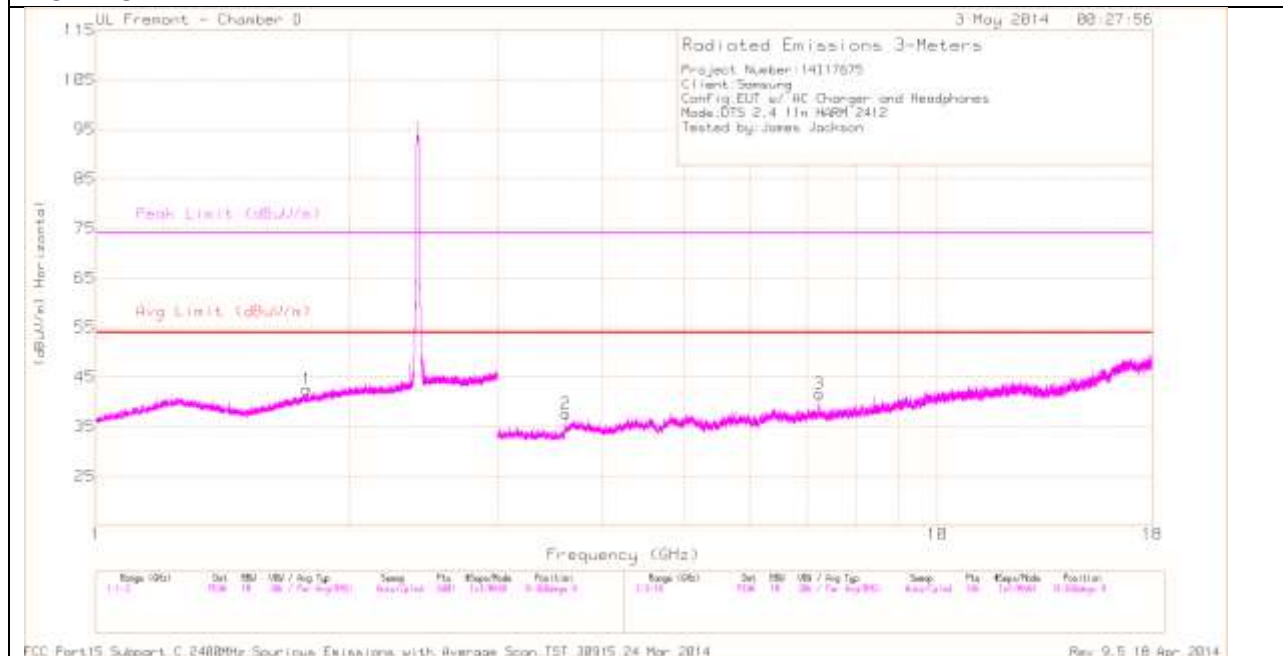
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

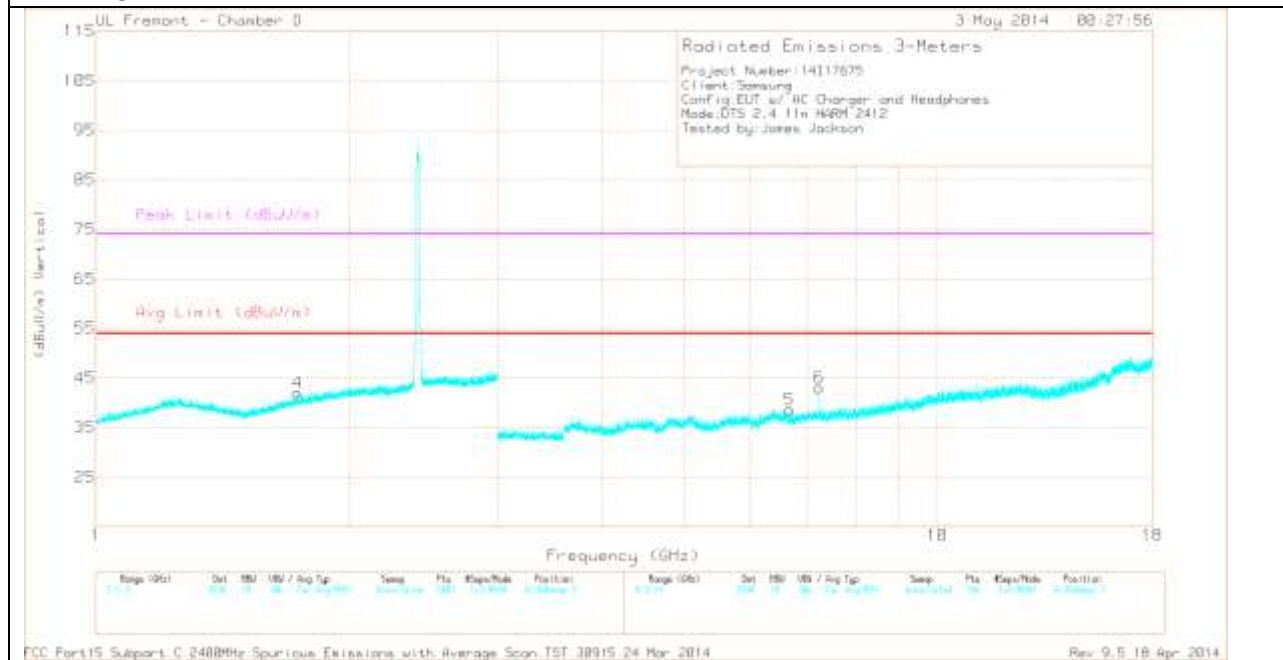
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

LOW CHANNEL
VERTICAL



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

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.618	33.47	PK	32.5	-28.4	37.57	-	-	74	-36.43	0-360	201	H
4	1.738	34.09	PK	29.3	-21.4	41.99	-	-	-	-	0-360	100	V
1	1.781	34.22	PK	29.6	-21.3	42.52	-	-	-	-	0-360	100	H
5	6.676	29.51	PK	35	-25.9	38.61	-	-	-	-	0-360	201	V
3	7.236	31.61	PK	35.1	-25.1	41.61	-	-	-	-	0-360	100	H
6	7.236	33.12	PK	35.1	-25.1	43.12	-	-	-	-	0-360	201	V

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

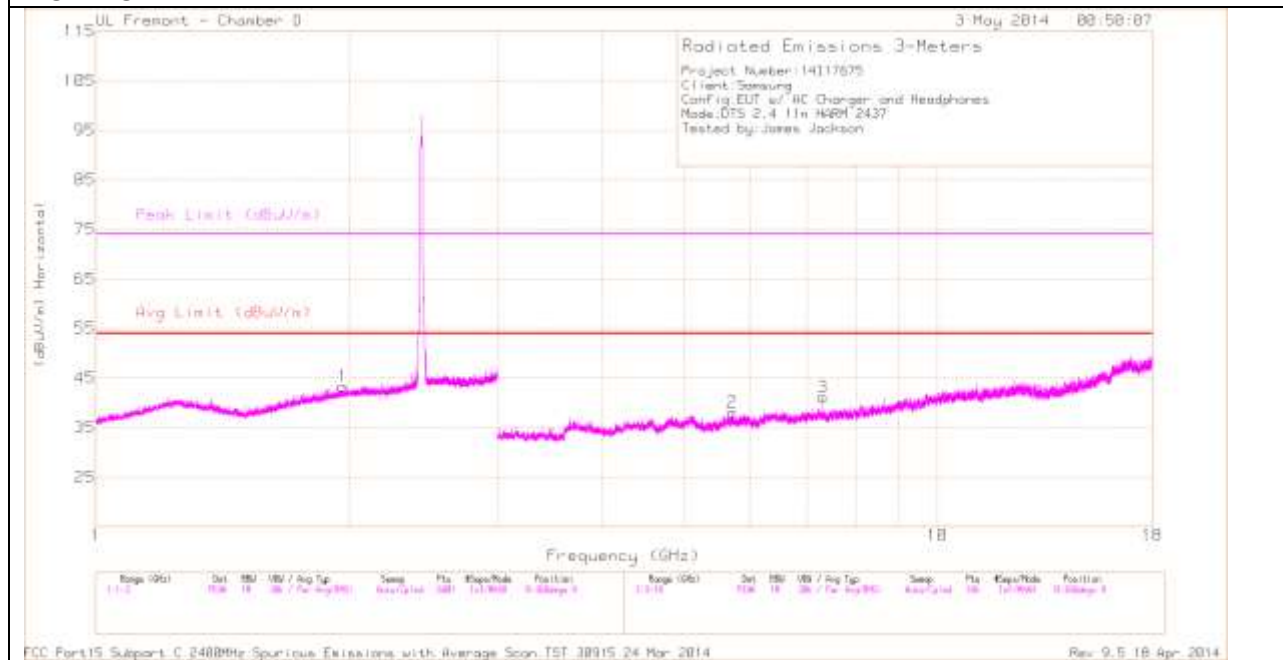
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.618	41.02	PK2	32.5	-28.4	45.12	-	-	74	-28.88	217	319	H
* 3.618	33.15	MAv1	32.5	-28.4	37.25	54	-16.75	-	-	217	319	H

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

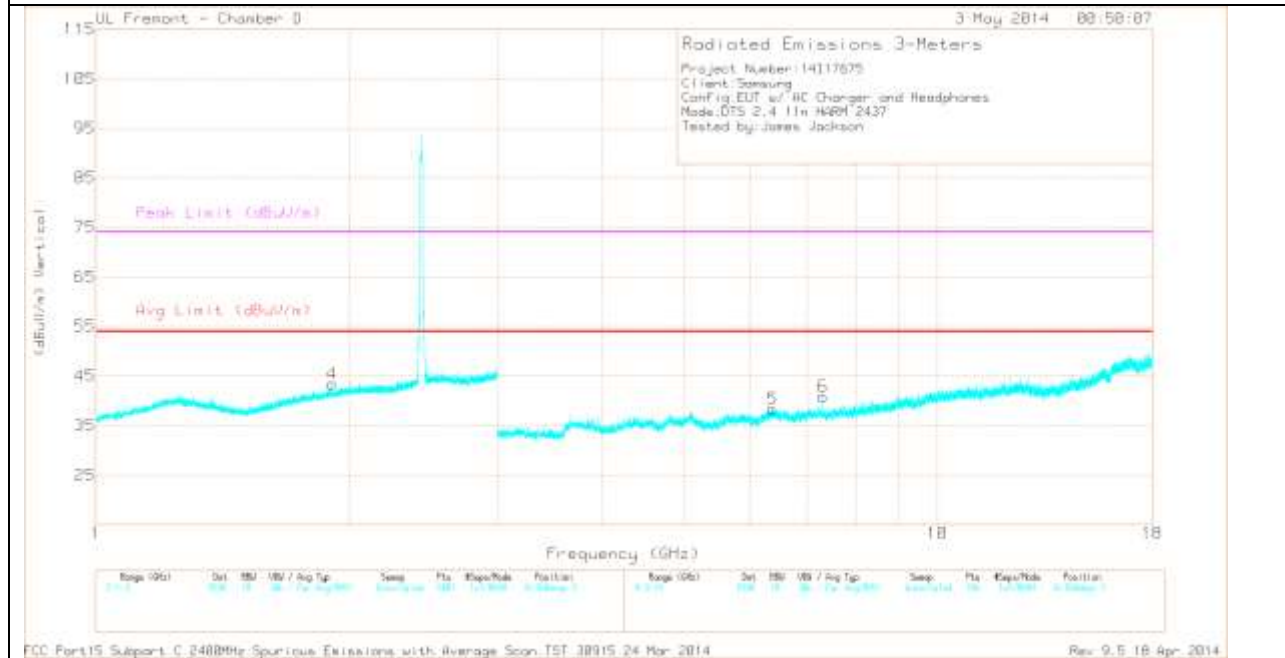
PK2 - KDB558074 Method: Maximum Peak

MID CHANNEL
HORIZONTAL



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

MID CHANNEL
VERTICAL



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

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 7.311	30.9	PK	35.1	-24.8	41.2	-	-	74	-32.8	0-360	201	H
6	* 7.311	30.64	PK	35.1	-24.8	40.94	-	-	74	-33.06	0-360	201	V
4	1.908	34.42	PK	30.2	-21.2	43.42	-	-	-	-	0-360	100	V
1	1.966	33.8	PK	30.5	-21	43.3	-	-	-	-	0-360	319	H
2	5.711	30.61	PK	34.2	-26.7	38.11	-	-	-	-	0-360	201	H
5	6.375	29.82	PK	34.9	-26.3	38.42	-	-	-	-	0-360	201	V

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

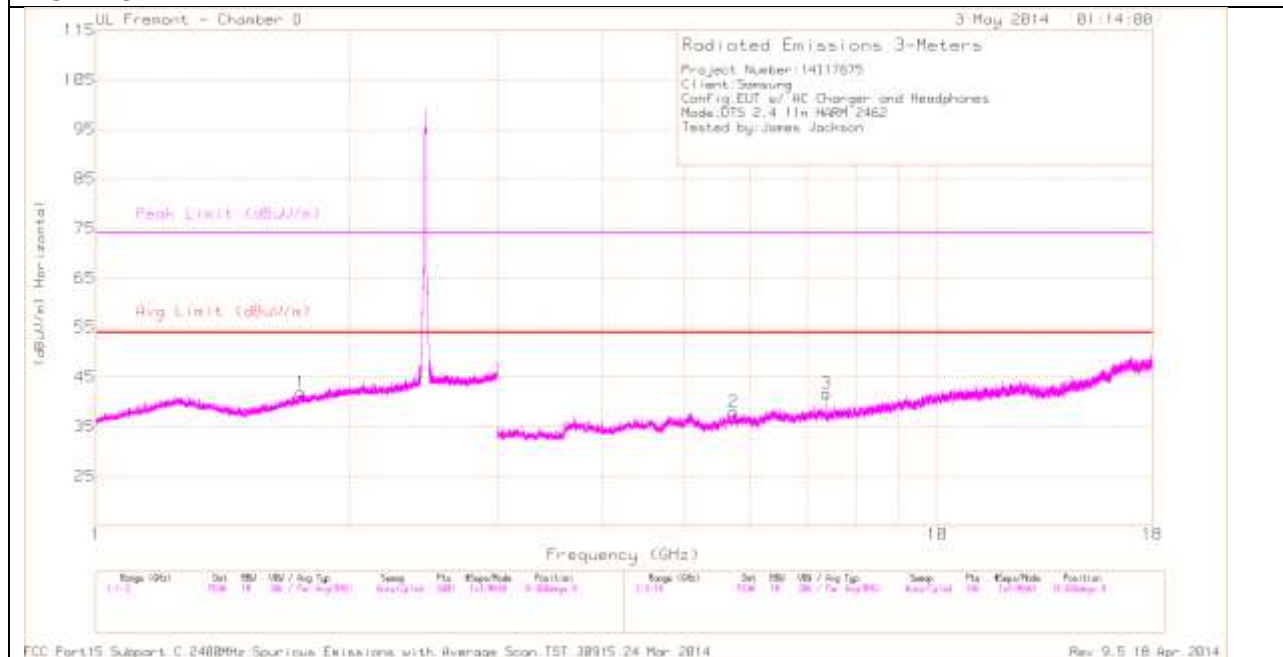
PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 7.311	39.01	PK2	35.1	-24.8	49.31	-	-	74	-24.69	101	291	H
* 7.311	31.96	MAV1	35.1	-24.8	42.26	54	-11.74	-	-	101	291	H
* 7.311	38.4	PK2	35.1	-24.8	48.7	-	-	74	-25.3	197	218	V
* 7.311	31.15	MAV1	35.1	-24.8	41.45	54	-12.55	-	-	197	218	V

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

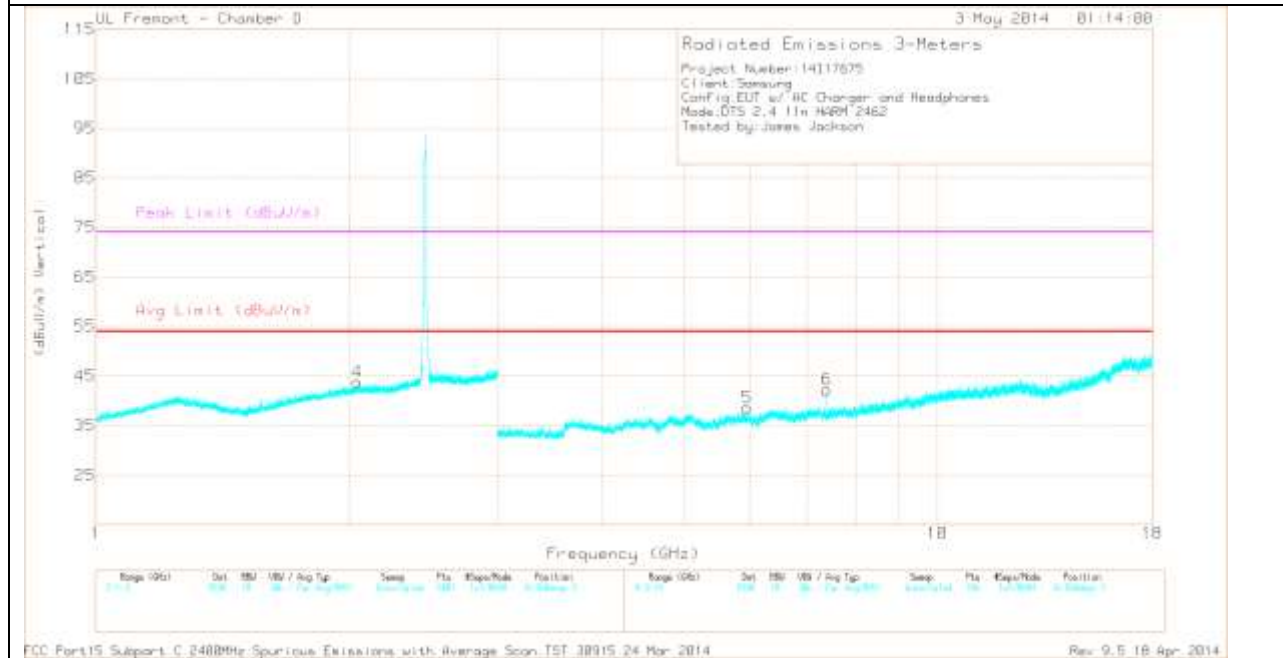
PK2 - KDB558074 Method: Maximum Peak

HIGH CHANNEL HORIZONTAL



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

HIGH CHANNEL
VERTICAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 7.386	31.83	PK	35.2	-25.3	41.73	-	-	74	-32.27	0-360	100	H
6	* 7.386	32.34	PK	35.2	-25.3	42.24	-	-	74	-31.76	0-360	201	V
1	1.75	33.84	PK	29.4	-21.3	41.94	-	-	-	-	0-360	100	H
4	2.045	34.14	PK	30.7	-21	43.84	-	-	-	-	0-360	100	V
2	5.722	30.42	PK	34.2	-26.7	37.92	-	-	-	-	0-360	201	H
5	5.94	30.26	PK	34.5	-26.2	38.56	-	-	-	-	0-360	201	V

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

PK - Peak detector

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 7.386	38.39	PK2	35.2	-25.3	48.29	-	-	74	-25.71	238	109	H
* 7.386	30.53	MAV1	35.2	-25.3	40.43	54	-13.57	-	-	238	109	H
* 7.386	39.72	PK2	35.2	-25.3	49.62	-	-	74	-24.38	48	272	V
* 7.386	33.86	MAV1	35.2	-25.3	43.76	54	-10.24	-	-	48	272	V

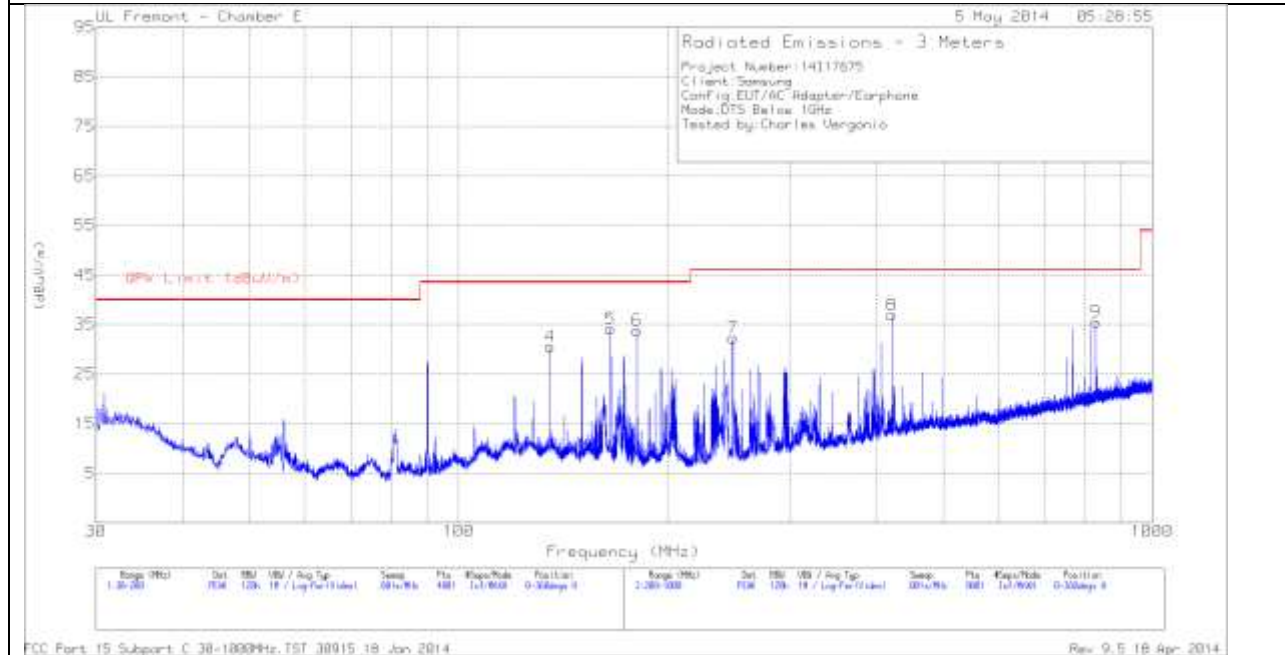
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

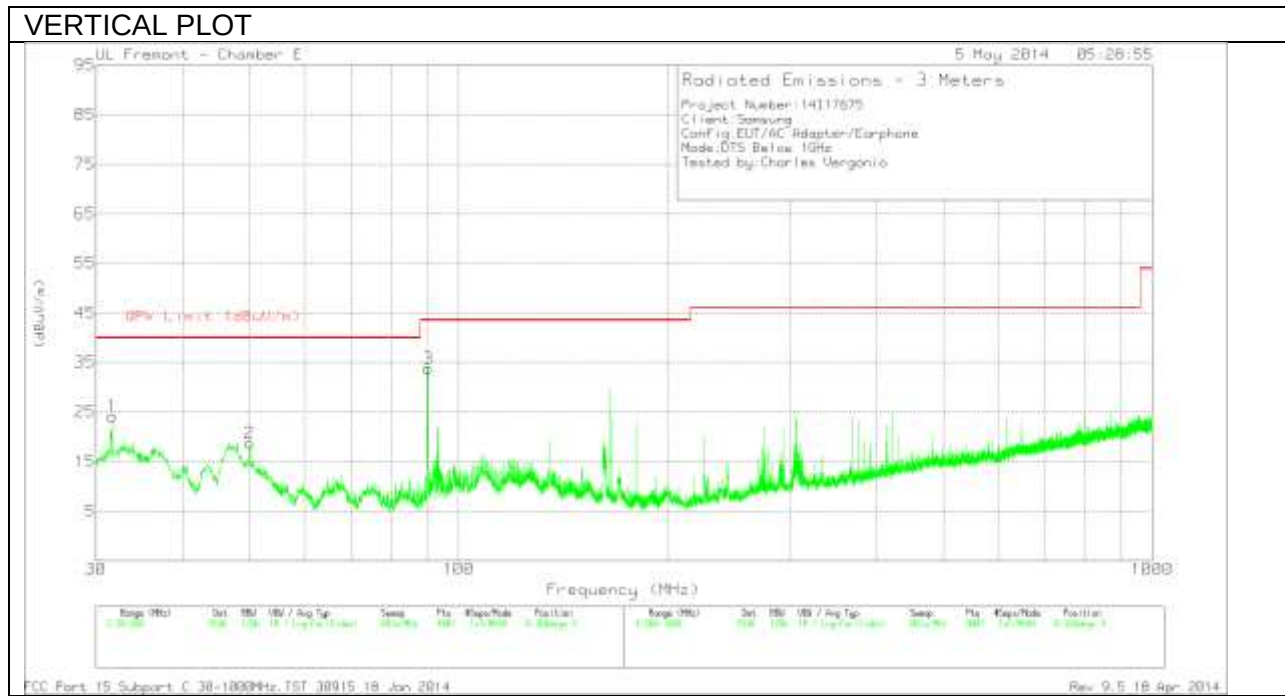
10.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



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



Below 1G Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 135.5275	48.5	PK	13.3	-31.2	30.6	43.52	-12.92	0-360	301	H
5	* 165.66	53.1	PK	11.9	-30.9	34.1	43.52	-9.42	0-360	301	H
7	* 248.5	51.4	PK	11.5	-30.6	32.3	46.02	-13.72	0-360	100	H
1	31.6575	35.7	PK	20.3	-31.8	24.2	40	-15.8	0-360	100	V
2	50.0175	42.45	PK	7.9	-31.6	18.75	40	-21.25	0-360	100	V
3	90.3925	57.5	PK	7.8	-31.4	33.9	43.52	-9.62	0-360	100	V
6	180.705	53.56	PK	11.2	-30.9	33.86	43.52	-9.66	0-360	200	H
8	421.7	50.61	PK	16.2	-29.9	36.91	46.02	-9.11	0-360	200	H
9	828.2	42.48	PK	21.6	-28.6	35.48	46.02	-10.54	0-360	100	H

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

PK - Peak detector

11. 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 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

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.1995	43.46	PK	.9	0	44.36	63.6	-19.24	-	-
2	.1995	25.08	Av	.9	0	25.98	-	-	53.6	-27.62
3	1.644	52.04	PK	.2	.1	52.34	56	-3.66	-	-
4	1.644	35.25	Av	.2	.1	35.55	-	-	46	-10.45
5	1.6935	52.56	PK	.2	.1	52.86	56	-3.14	-	-
6	1.6935	36.14	Av	.2	.1	36.44	-	-	46	-9.56
7	1.7385	52.68	PK	.2	.1	52.98	56	-3.02	-	-
8	1.7385	36.28	Av	.2	.1	36.58	-	-	46	-9.42
9	4.0245	54.21	PK	.2	.1	54.51	56	-1.49	-	-
10	4.0245	38.22	Av	.2	.1	38.52	-	-	46	-7.48
11	4.335	53.76	PK	.2	.1	54.06	56	-1.94	-	-
12	4.335	38.45	Av	.2	.1	38.75	-	-	46	-7.25

Quasi-Peak Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1.6467	46.43	QP	.2	.1	46.73	56	-9.27	-	-
1.6908	46.36	QP	.2	.1	46.66	56	-9.34	-	-
1.7385	46.1	QP	.2	.1	46.4	56	-9.6	-	-
4.0218	46.7	QP	.2	.1	47	56	-9	-	-
4.3323	45.67	QP	.2	.1	45.97	56	-10.03	-	-

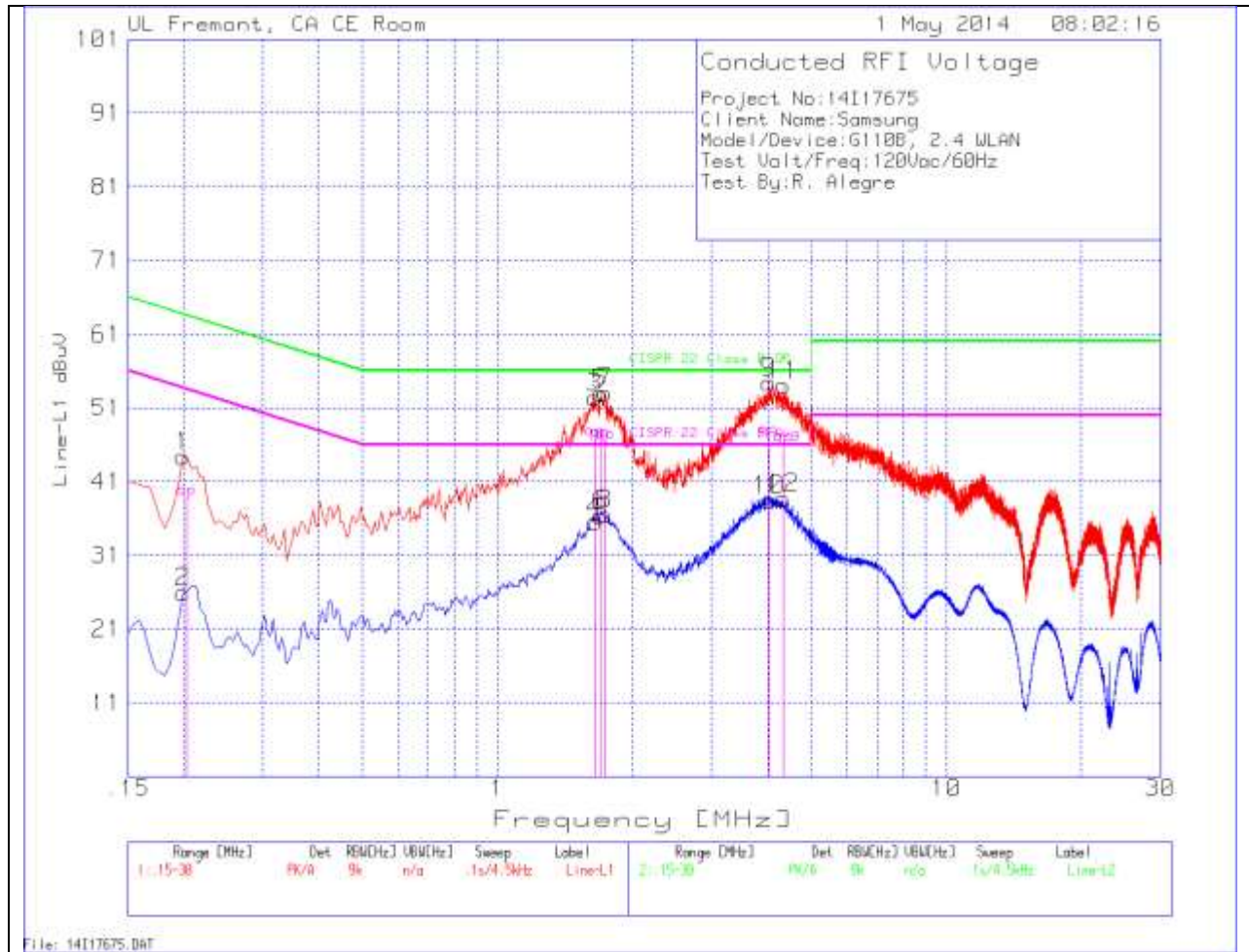
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
13	.204	41.31	PK	1	0	42.31	63.4	-21.09	-	-
14	.204	24.15	Av	1	0	25.15	-	-	53.4	-28.25
15	.4425	41.81	PK	.4	0	42.21	57	-14.79	-	-
16	.4425	20.05	Av	.4	0	20.45	-	-	47	-26.55
17	.5055	43.4	PK	.4	0	43.8	56	-12.2	-	-
18	.5055	21.15	Av	.4	0	21.55	-	-	46	-24.45
19	1.518	53.62	PK	.2	.1	53.92	56	-2.08	-	-
20	1.518	33.46	Av	.2	.1	33.76	-	-	46	-12.24
21	1.59	54.95	PK	.2	.1	55.25	56	-.75	-	-
22	1.59	33.93	Av	.2	.1	34.23	-	-	46	-11.77
23	1.6215	54.96	PK	.2	.1	55.26	56	-.74	-	-
24	1.6215	35.6	Av	.2	.1	35.9	-	-	46	-10.1
25	1.671	56.43	PK	.2	.1	56.73	56	.73	-	-
26	1.671	34.49	Av	.2	.1	34.79	-	-	46	-11.21
27	1.7565	54.72	PK	.2	.1	55.02	56	-.98	-	-
28	1.7565	34.22	Av	.2	.1	34.52	-	-	46	-11.48
29	1.806	52.72	PK	.2	.1	53.02	56	-2.98	-	-
30	1.806	33.18	Av	.2	.1	33.48	-	-	46	-12.52
39	3.75	54.63	PK	.2	.1	54.93	56	-1.07	-	-
40	3.75	34.68	Av	.2	.1	34.98	-	-	46	-11.02
33	4.002	55.22	PK	.2	.1	55.52	56	-.48	-	-
34	4.002	35.3	Av	.2	.1	35.6	-	-	46	-10.4
31	4.065	55.52	PK	.2	.1	55.82	56	-.18	-	-
32	4.065	35.8	Av	.2	.1	36.1	-	-	46	-9.9
35	4.362	54.73	PK	.2	.1	55.03	56	-.97	-	-
36	4.362	35.26	Av	.2	.1	35.56	-	-	46	-10.44
37	4.461	53.62	PK	.2	.1	53.92	56	-2.08	-	-
38	4.461	35.7	Av	.2	.1	36	-	-	46	-10

Quasi-Peak Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1.5216	43.69	QP	.2	.1	43.99	56	-12.01	-	-
1.5936	44.44	QP	.2	.1	44.74	56	-11.26	-	-
1.6215	45.48	QP	.2	.1	45.78	56	-10.22	-	-
1.6701	44.92	QP	.2	.1	45.22	56	-10.78	-	-
1.7601	44.19	QP	.2	.1	44.49	56	-11.51	-	-
1.8051	43.29	QP	.2	.1	43.59	56	-12.41	-	-
3.7536	44.96	QP	.2	.1	45.26	56	-10.74	-	-
4.0011	45.31	QP	.2	.1	45.61	56	-10.39	-	-
4.0641	45.82	QP	.2	.1	46.12	56	-9.88	-	-
4.3602	45.82	QP	.2	.1	46.12	56	-9.88	-	-
4.4619	45.25	QP	.2	.1	45.55	56	-10.45	-	-

LINE 1 RESULTS



LINE 2 RESULTS

