



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER: SM-G313MU

FCC ID: A3LSMG313MU

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Prepared for

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC

MODEL: SM-G313MU

SERIAL NUMBER: FL-215-D (Conducted), FL-215-B (Radiated)

DATE TESTED: JUNE 5-6, 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, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☐ Chamber F

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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/LTE Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC.

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	16.67	46.45
2412 - 2462	802.11g	19.98	99.54
2412 - 2462	802.11n HT20	19.65	92.26

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.56 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	ETA0U10JBS	N/A	N/A
Earphone	SAMSUNG	N/A	N/A	N/A

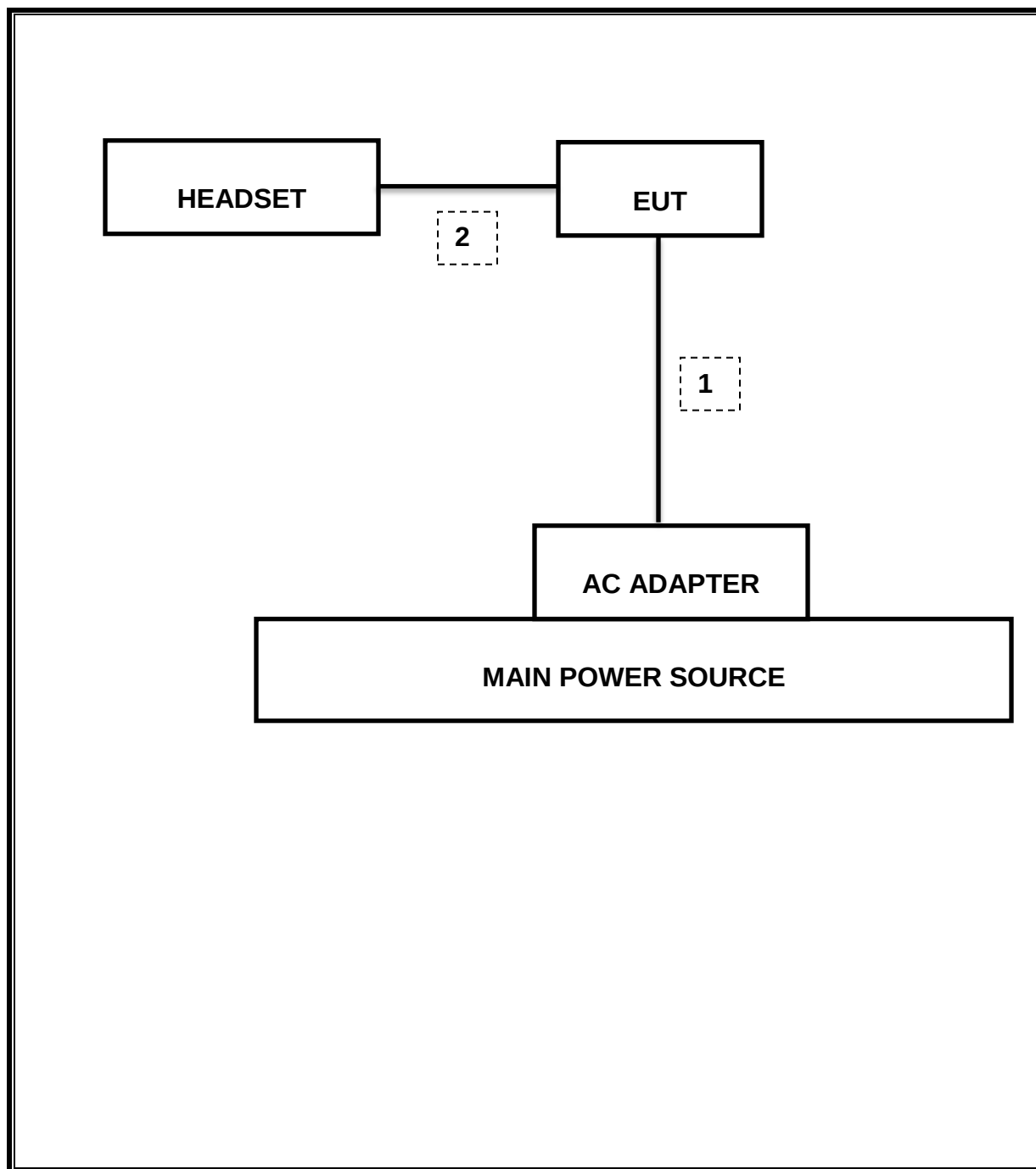
I/O CABLES

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
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/14
Spectrum Analyzer, 9KHz-40GHz	HP	8564E	C00986	04/01/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/14
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/21/15
Antenna, Horn, 18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/14
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/15
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/15
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/14
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	08/20/14
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	F00219	05/23/15
High Pass Filter 5GHz	Micro-Tronics	HPS17542	F00222	05/22/15
High Pass Filter 6GHz	Micro-Tronics	HPM17543	F00224	05/22/15

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.

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

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

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	8.10MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-31.68dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	19.98dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-7.26dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	40.37dBuV(AV)
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	45.35dBuV/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 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	9.58	0.5
Mid	2437	9.08	0.5
High	2462	8.10	0.5
Worst		8.10	

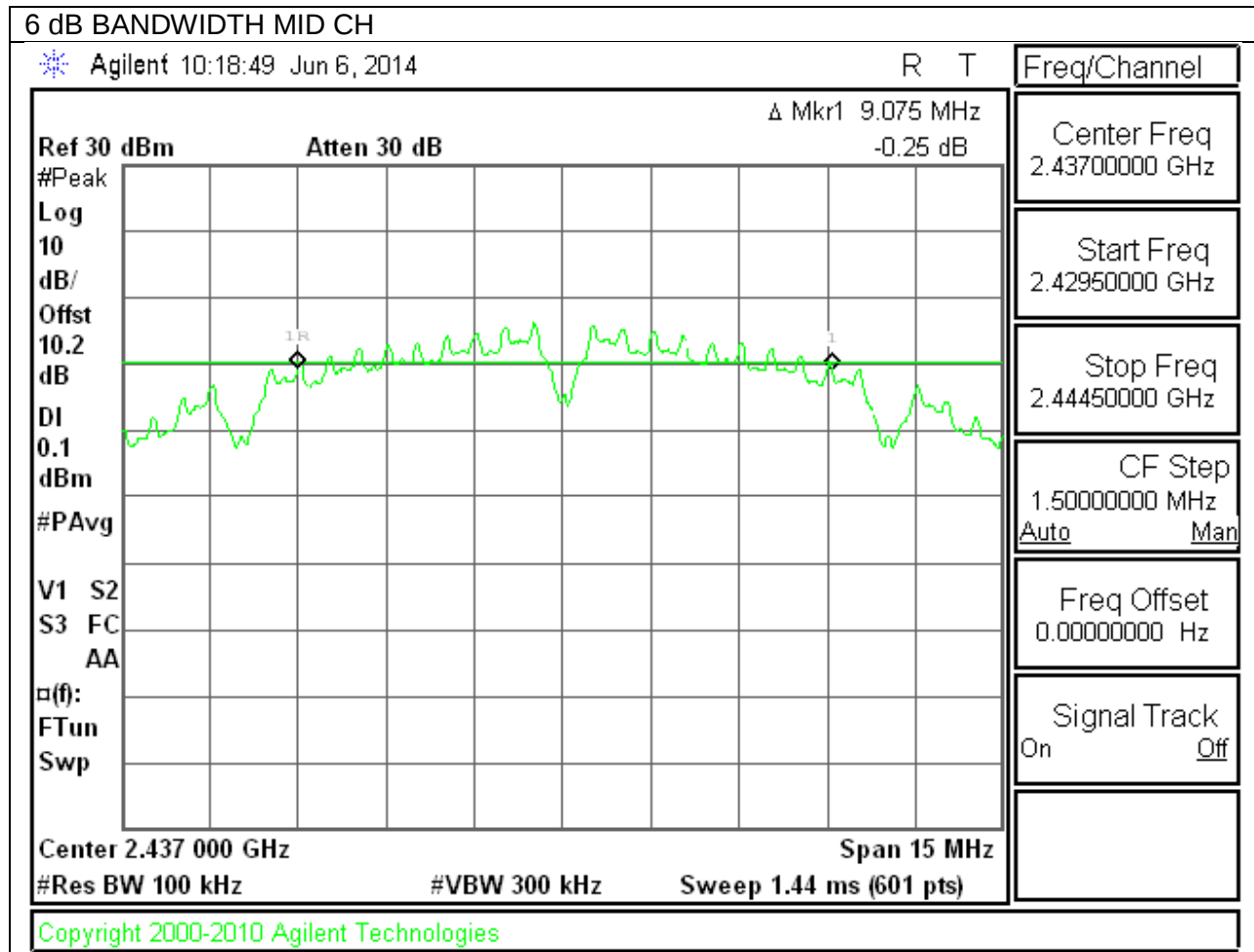
9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.17	0.5
Mid	2437	15.21	0.5
High	2462	15.17	0.5
Worst		15.17	

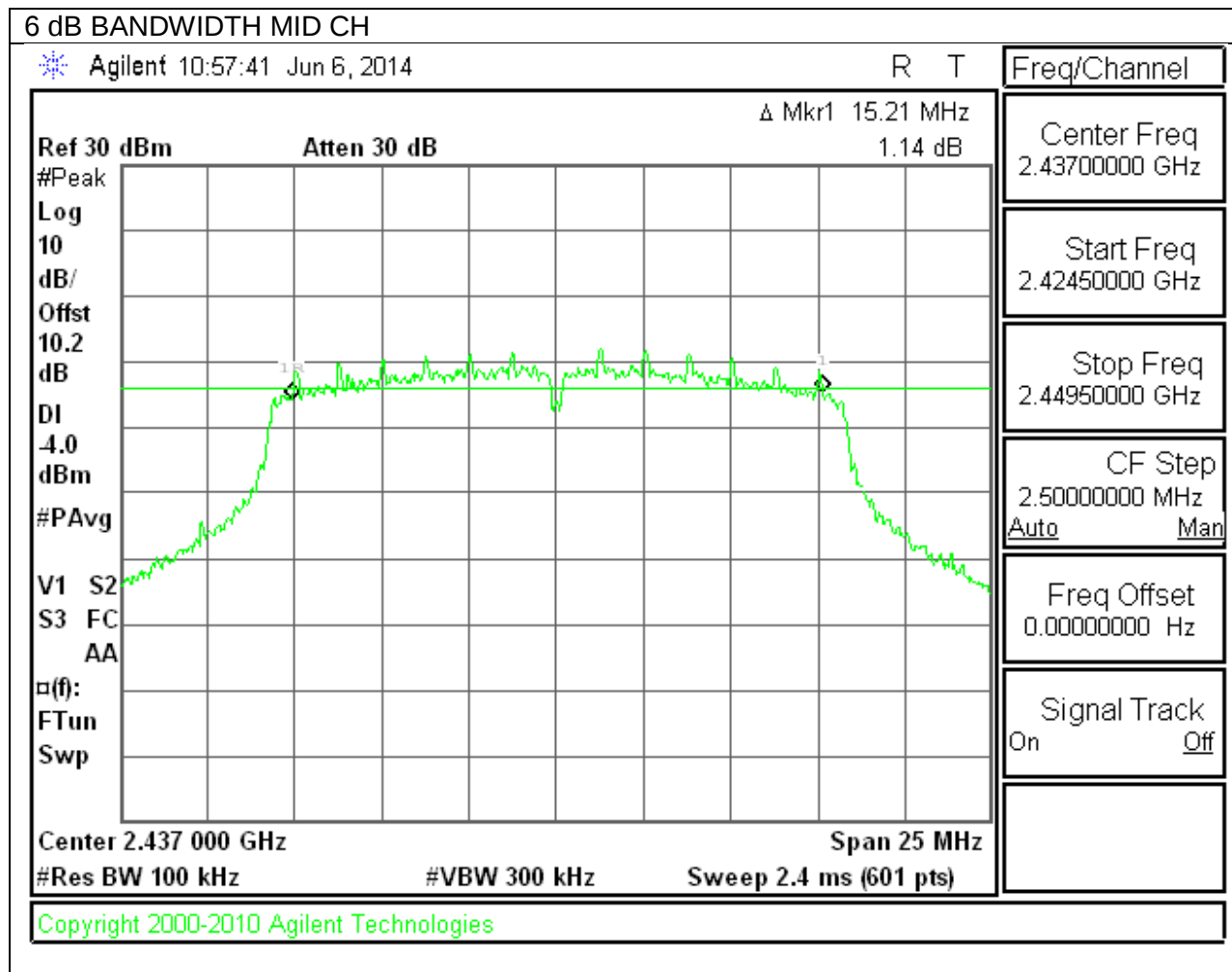
9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.13	0.5
Mid	2437	15.15	0.5
High	2462	15.15	0.5
Worst		15.13	

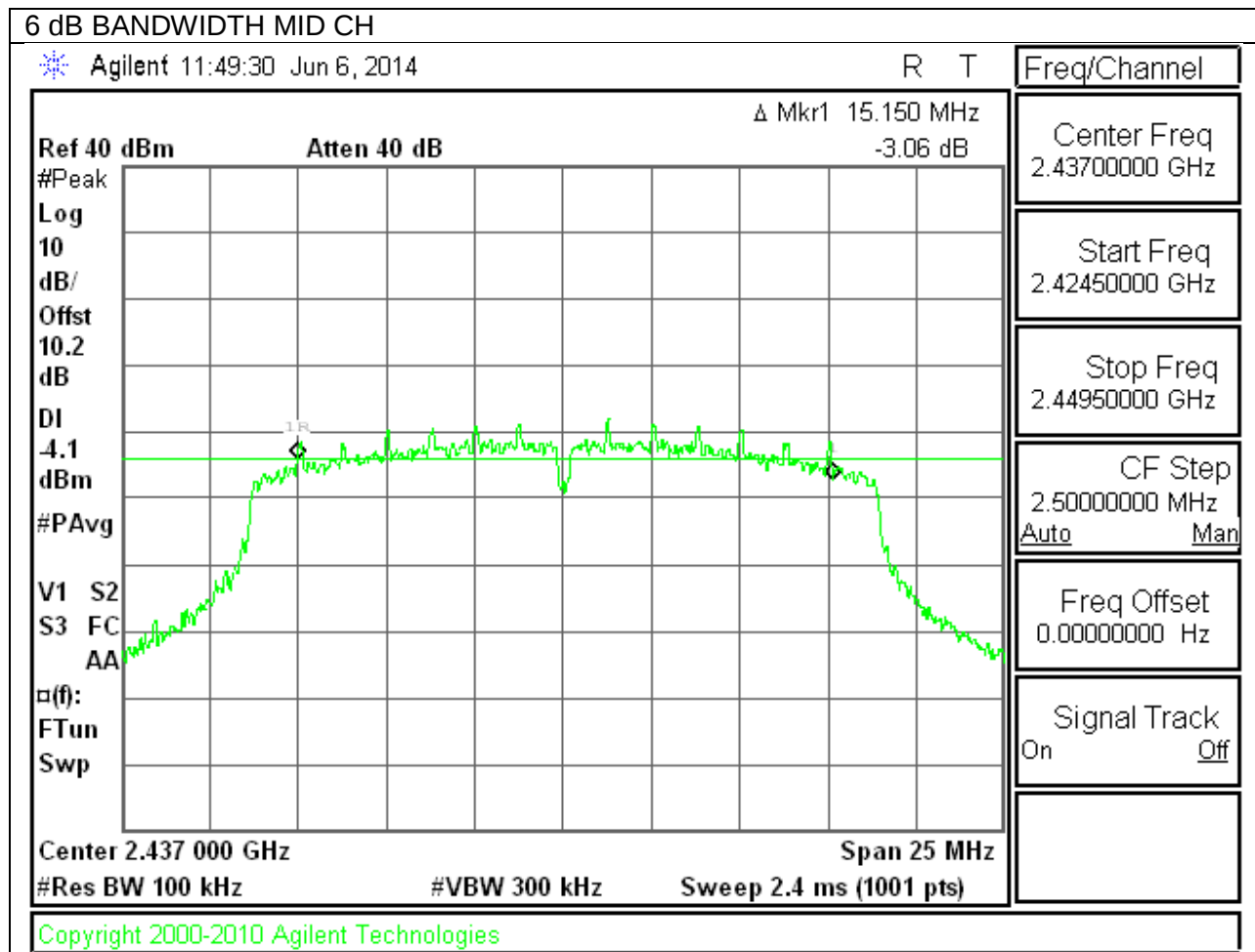
802.11b 6 dB BANDWIDTH



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	14.28
Mid	2437	14.11
High	2462	14.03
Worst		14.28

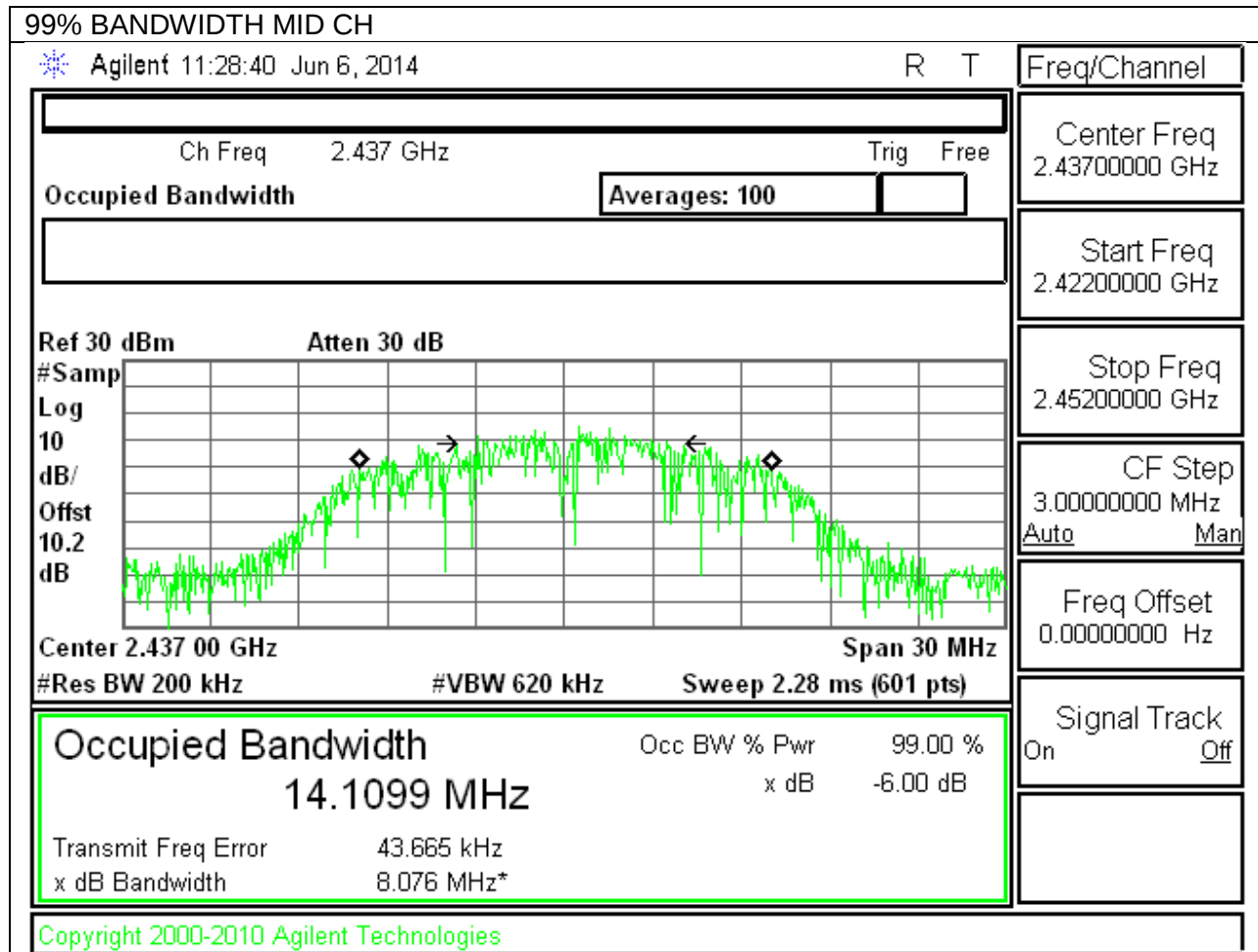
9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.27
Mid	2437	16.47
High	2462	16.57
Worst		16.57

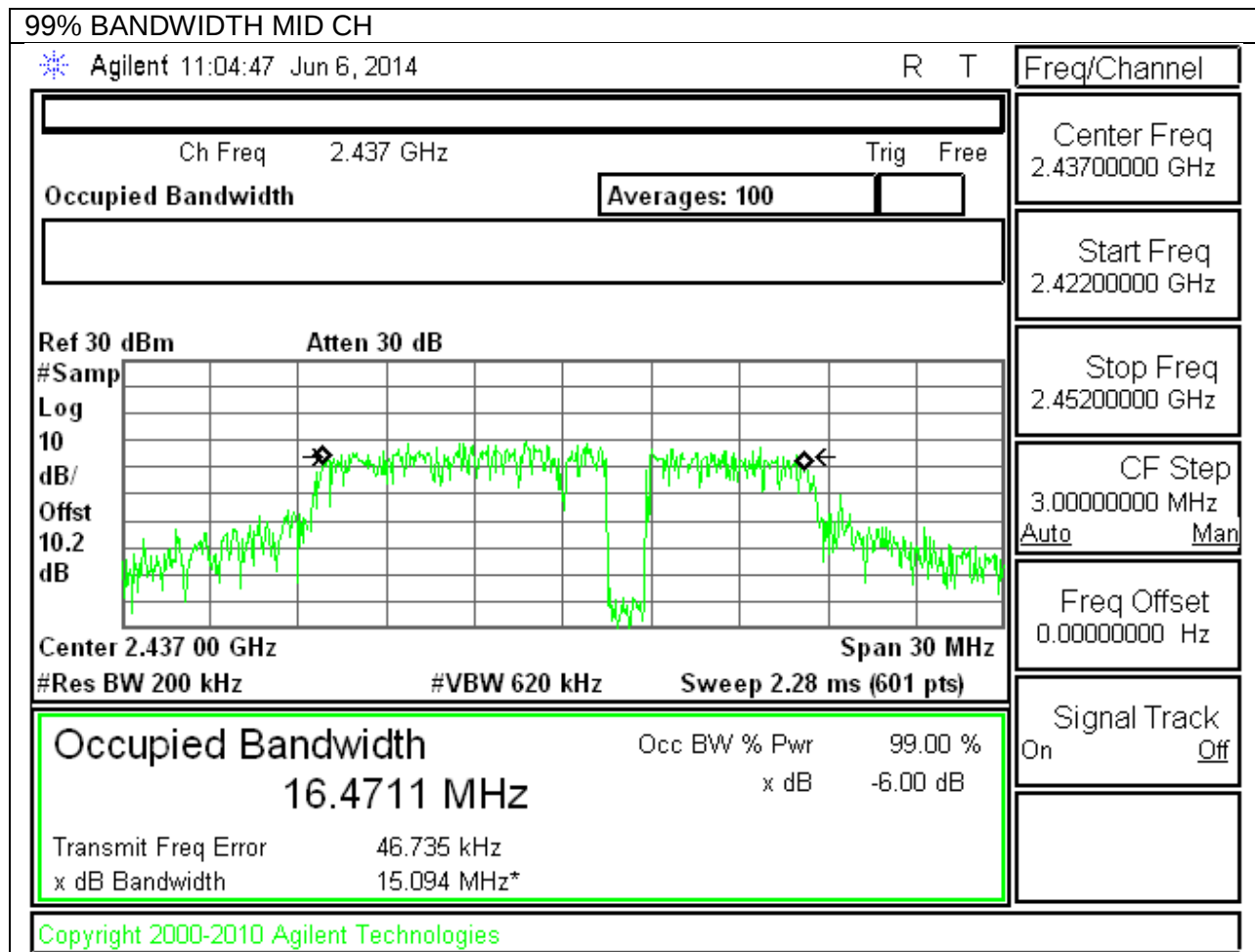
9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.44
Mid	2437	17.34
High	2462	17.53
Worst		17.53

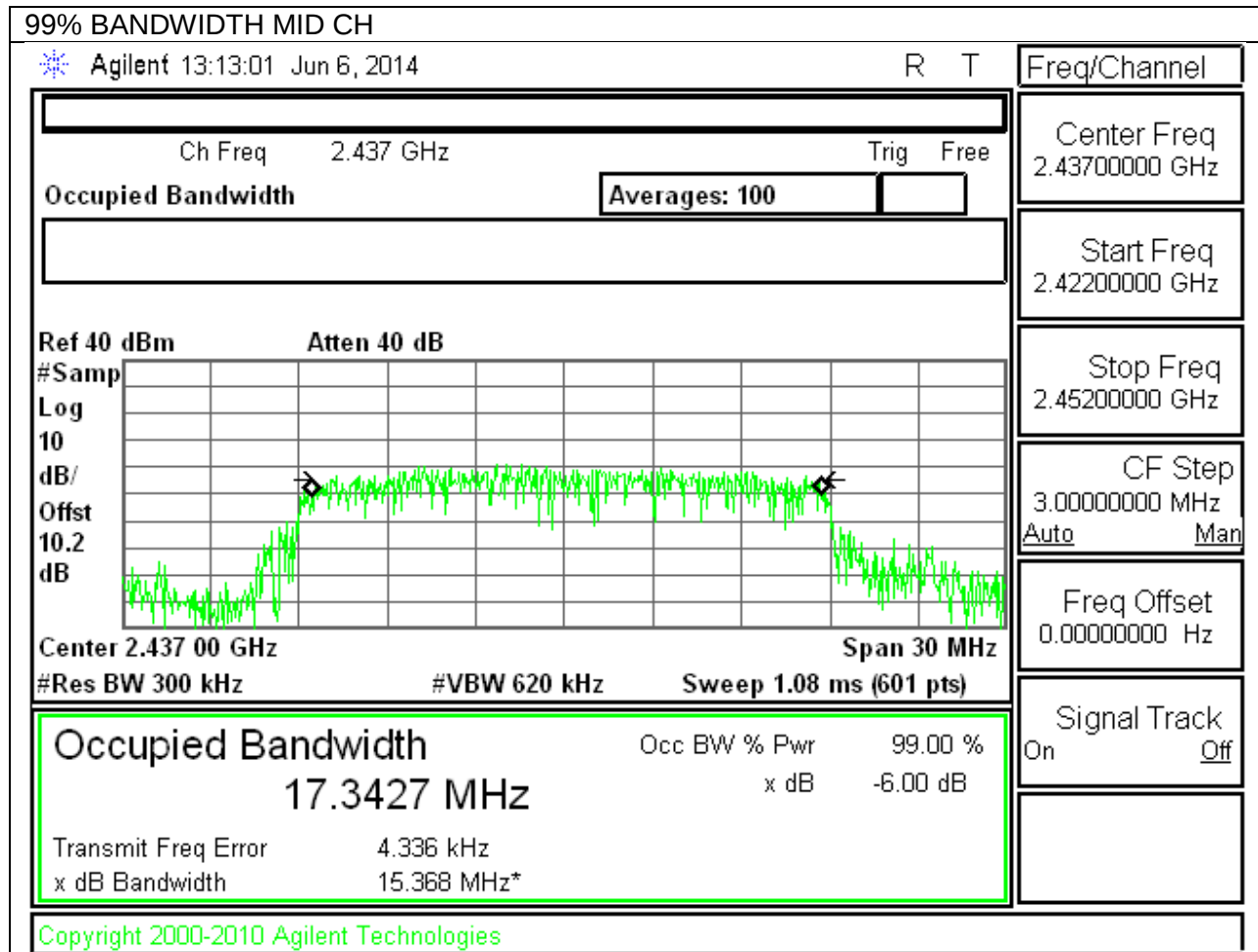
802.11b 99% BANDWIDTH



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	13.60
Mid	2437	13.60
High	2462	13.60
Worst		13.600

9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	11.70
Mid	2437	11.70
High	2462	11.70
Worst		11.700

9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	11.50
Mid	2437	11.50
High	2462	11.50
Worst		11.500

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	-1.56	30.00	30	36	30.00
Mid	2437	-1.56	30.00	30	36	30.00
High	2462	-1.56	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	16.37	16.37	30.00	-13.63
Mid	2437	16.67	16.67	30.00	-13.33
High	2462	16.09	16.09	30.00	-13.91
Worst			16.67		

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	-1.56	30.00	30	36	30.00
Mid	2437	-1.56	30.00	30	36	30.00
High	2462	-1.56	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	19.88	19.88	30.00	-10.12
Mid	2437	19.77	19.77	30.00	-10.23
High	2462	19.98	19.98	30.00	-10.02
Worst			19.98		

9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

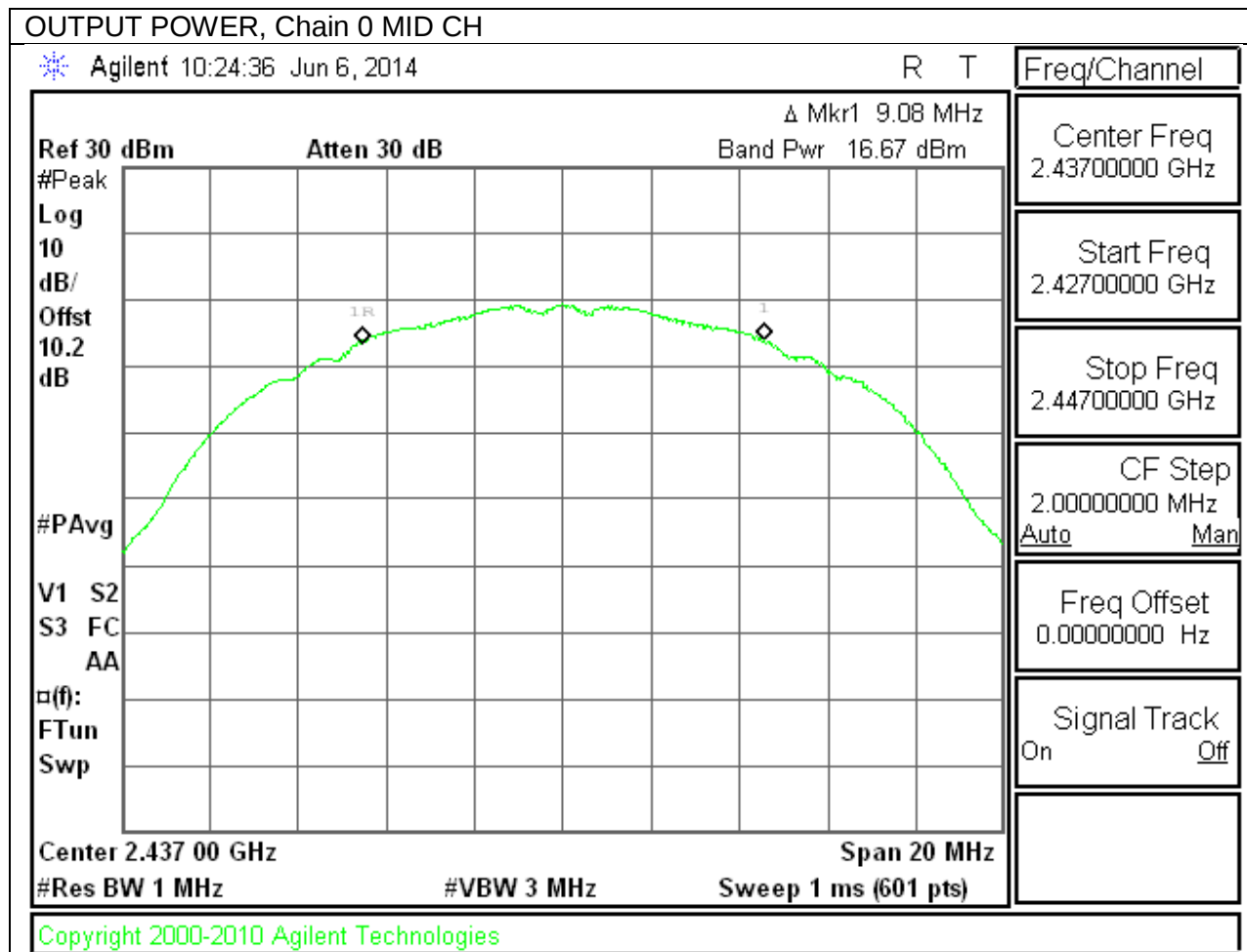
Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.56	30.00	30	36	30.00
Mid	2437	-1.56	30.00	30	36	30.00
High	2462	-1.56	30.00	30	36	30.00

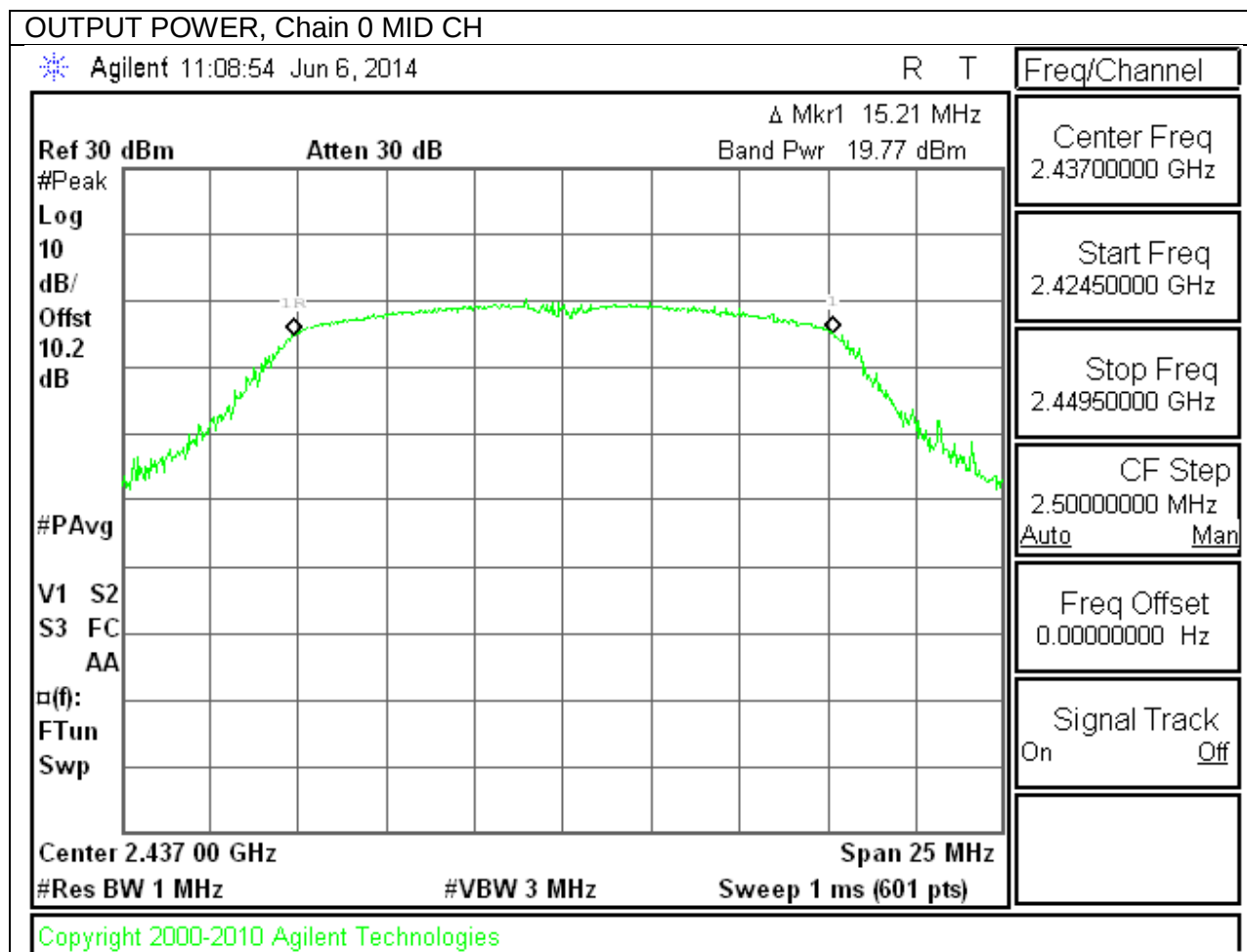
Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	19.65	19.65	30.00	-10.35
Mid	2437	19.48	19.48	30.00	-10.52
High	2462	19.62	19.62	30.00	-10.38
Worst			19.65		

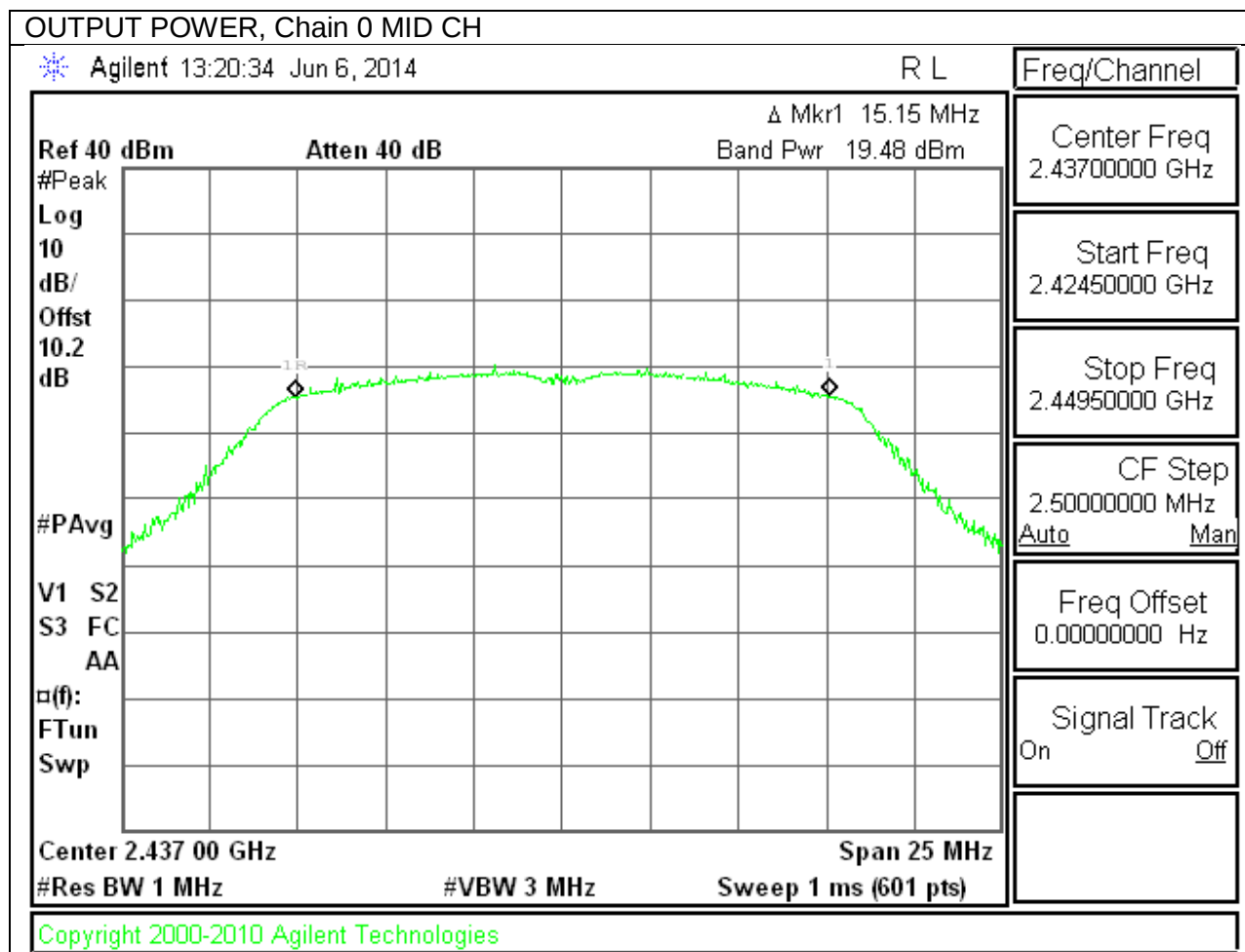
802.11b OUTPUT POWER, Chain 0



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	-8.93	8.0	-16.9
Mid	2437	-7.62	8.0	-15.6
High	2462	-7.26	8.0	-15.3

9.5.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

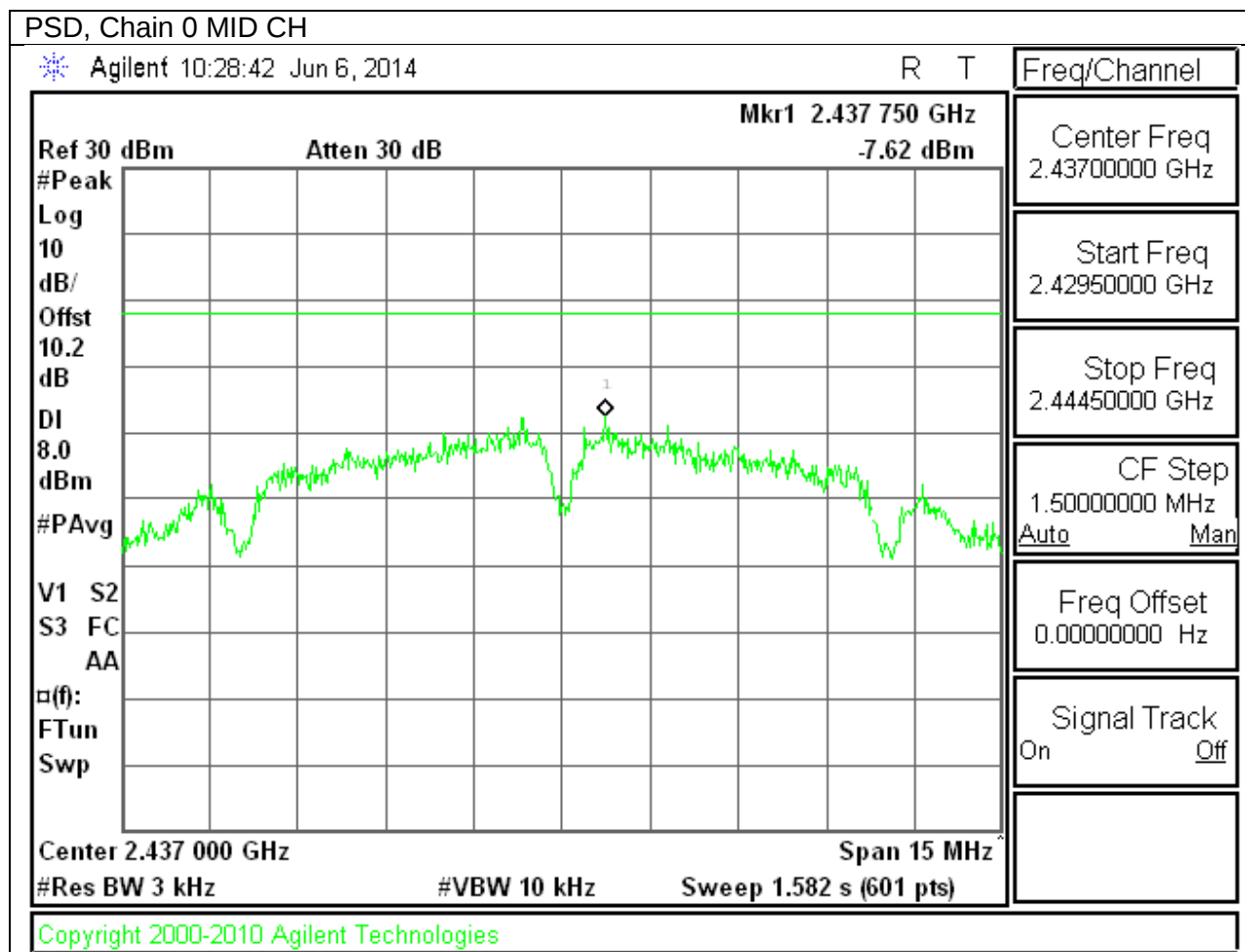
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-12.93	8.0	-20.9
Mid	2437	-12.79	8.0	-20.8
High	2462	-12.94	8.0	-20.9

9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

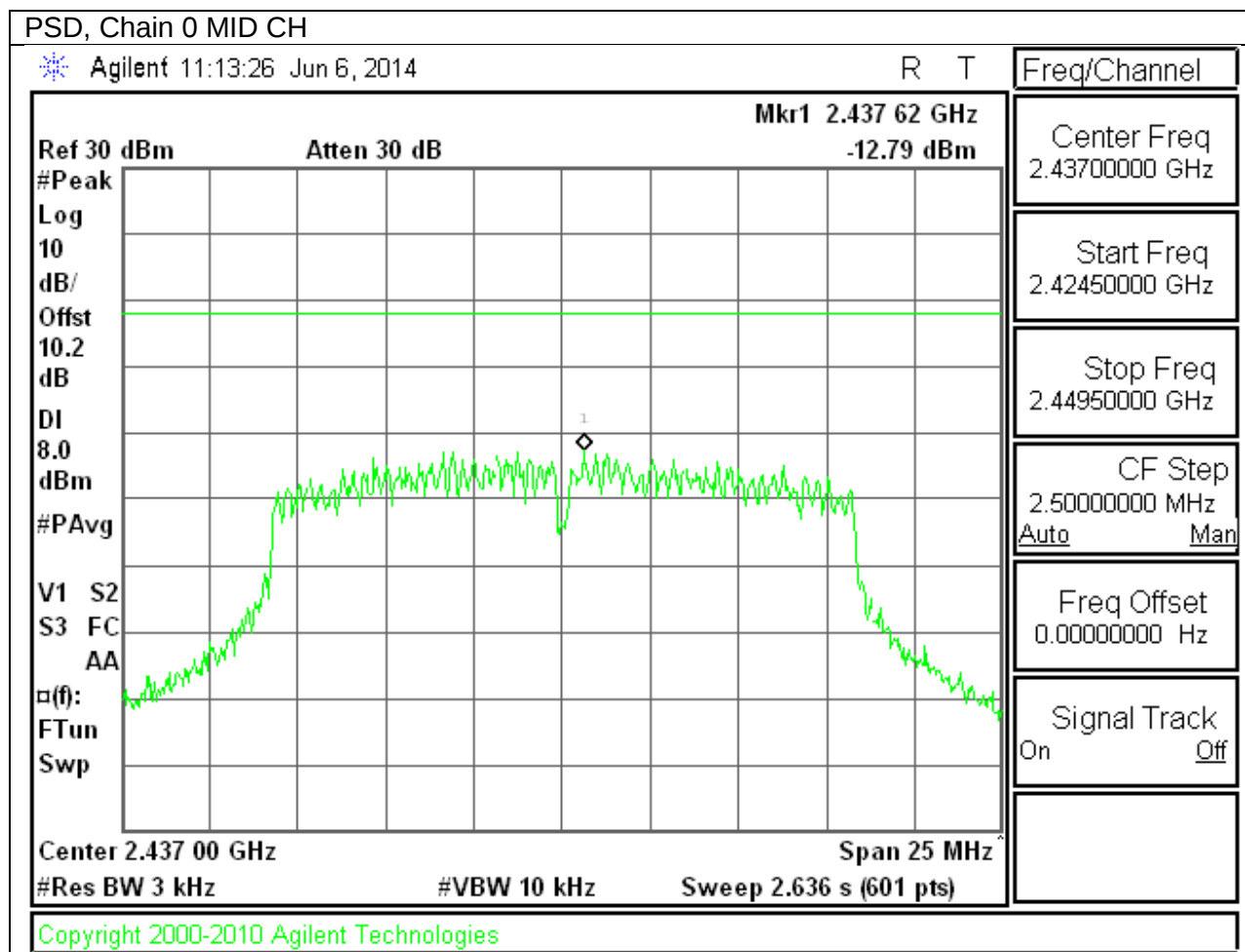
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-12.75	8.0	-20.8
Mid	2437	-12.11	8.0	-20.1
High	2462	-12.57	8.0	-20.6

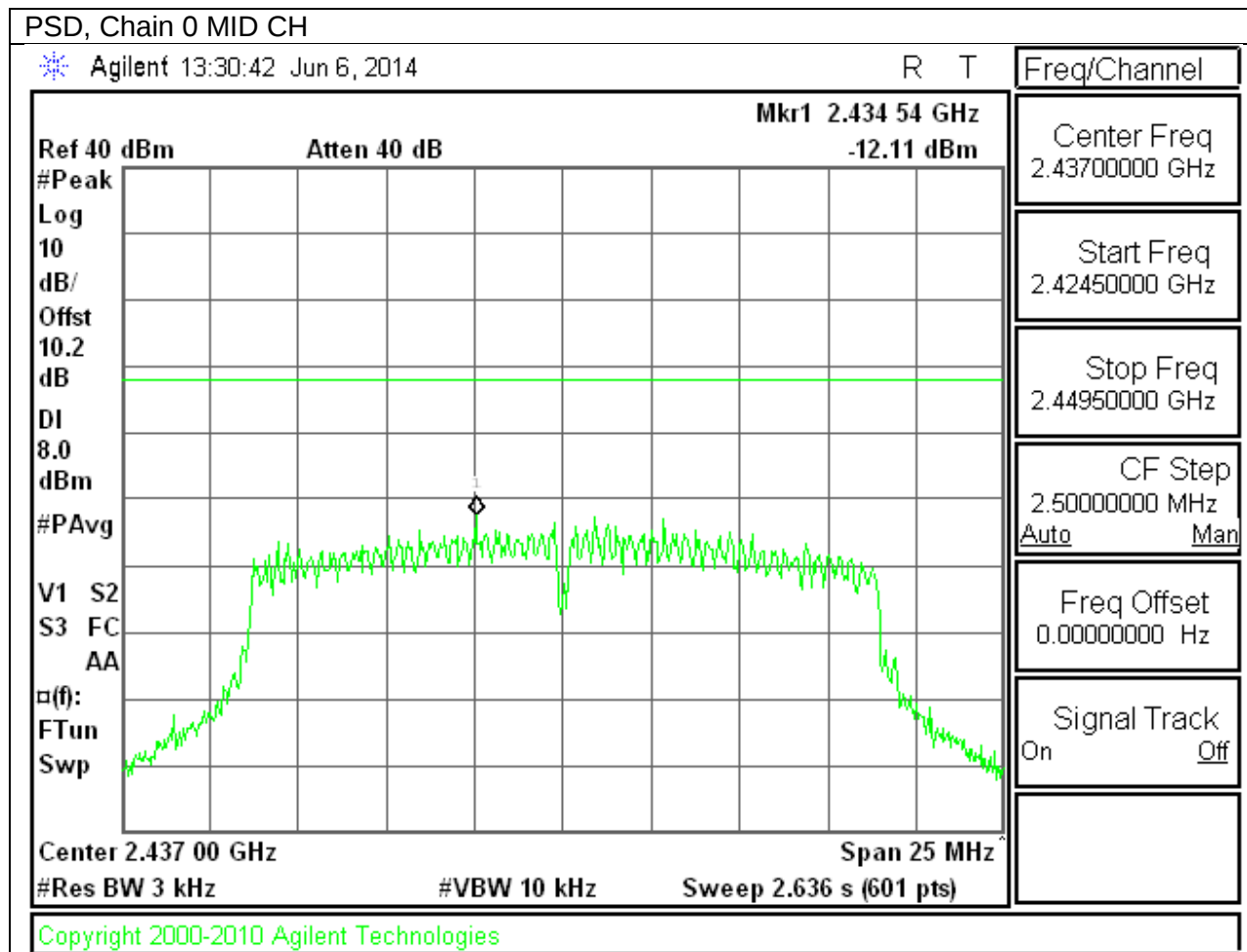
802.11b PSD, Chain 0



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.

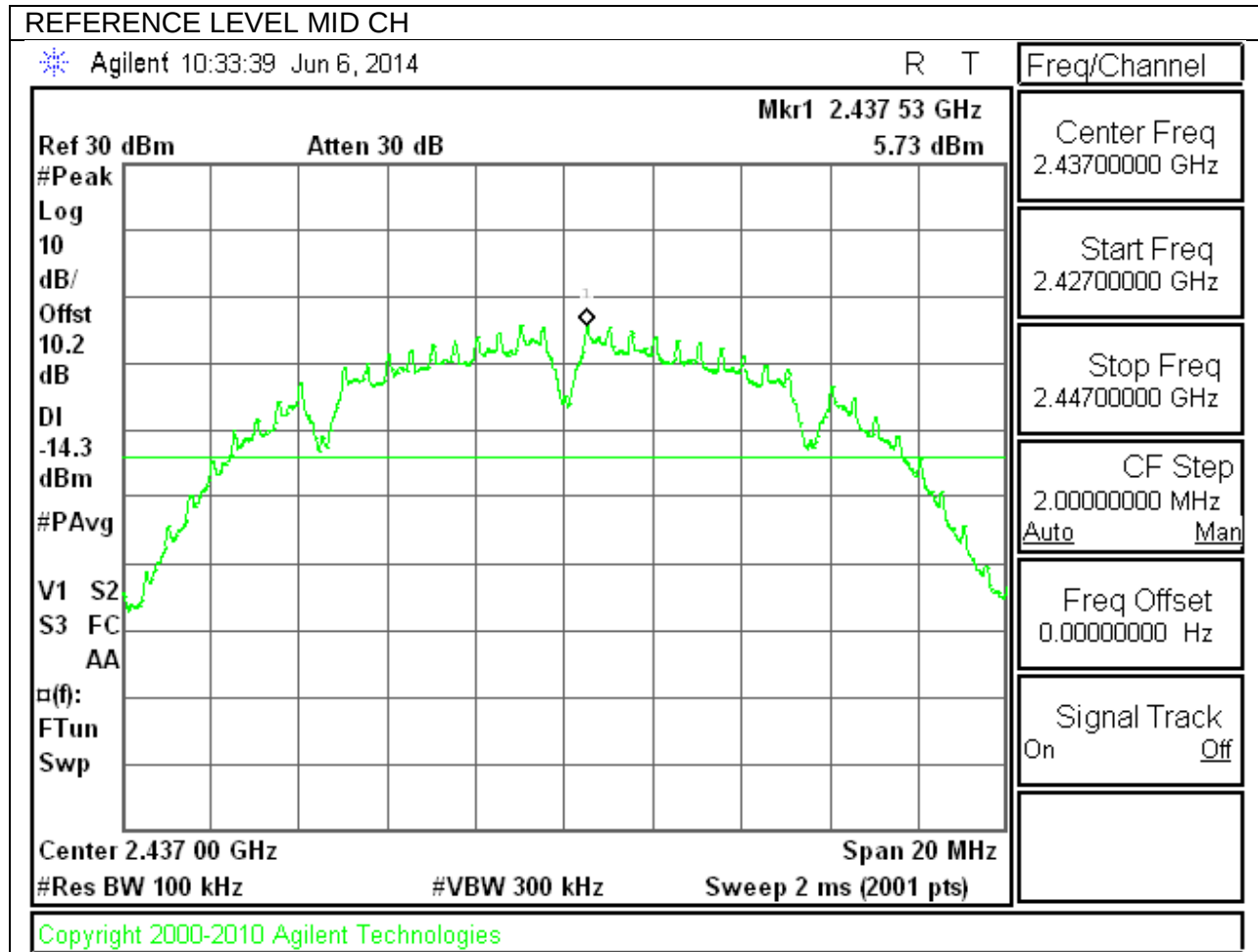
TEST PROCEDURE

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.

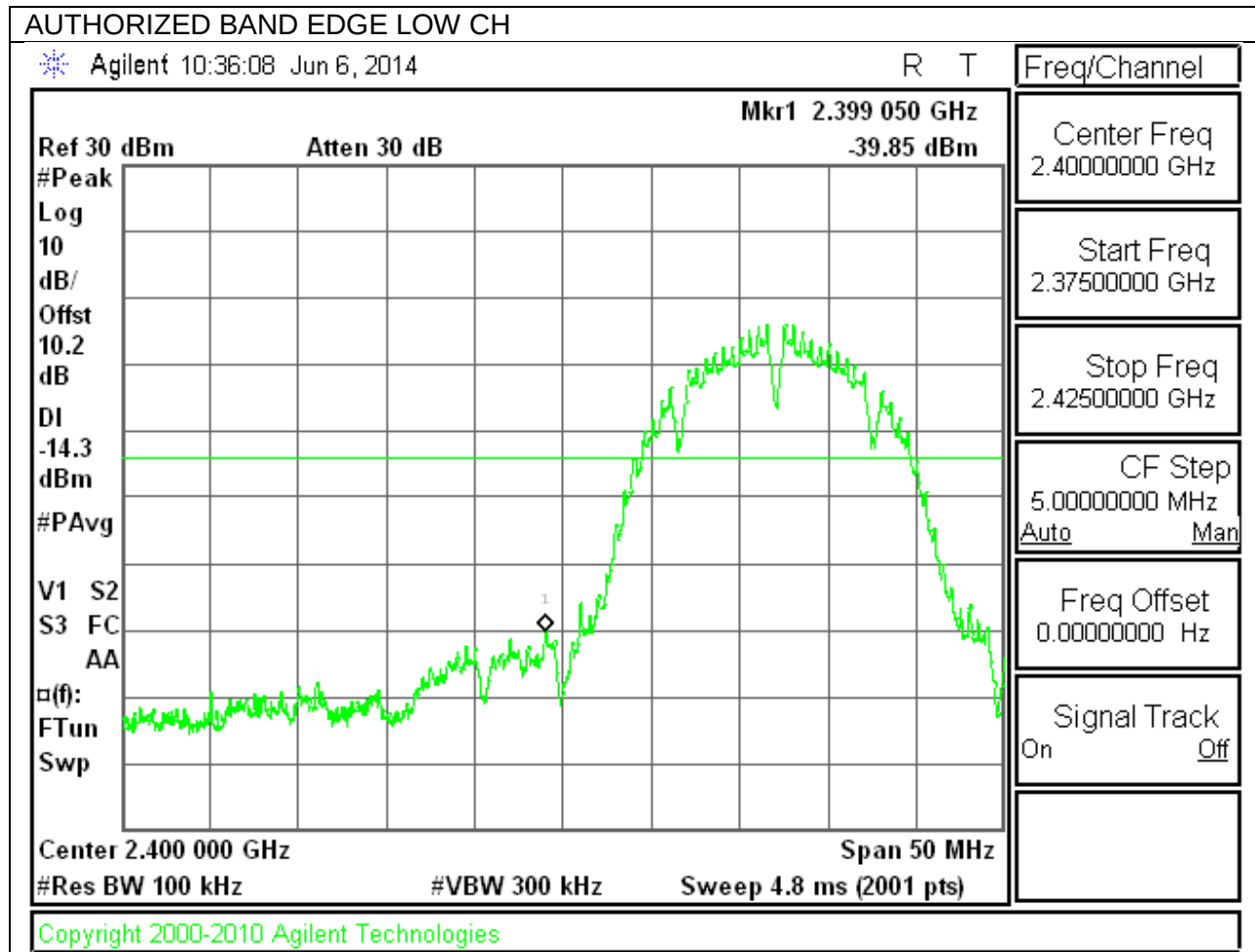
RESULTS

9.6.1. 802.11b MODE IN THE 2.4 GHz BAND

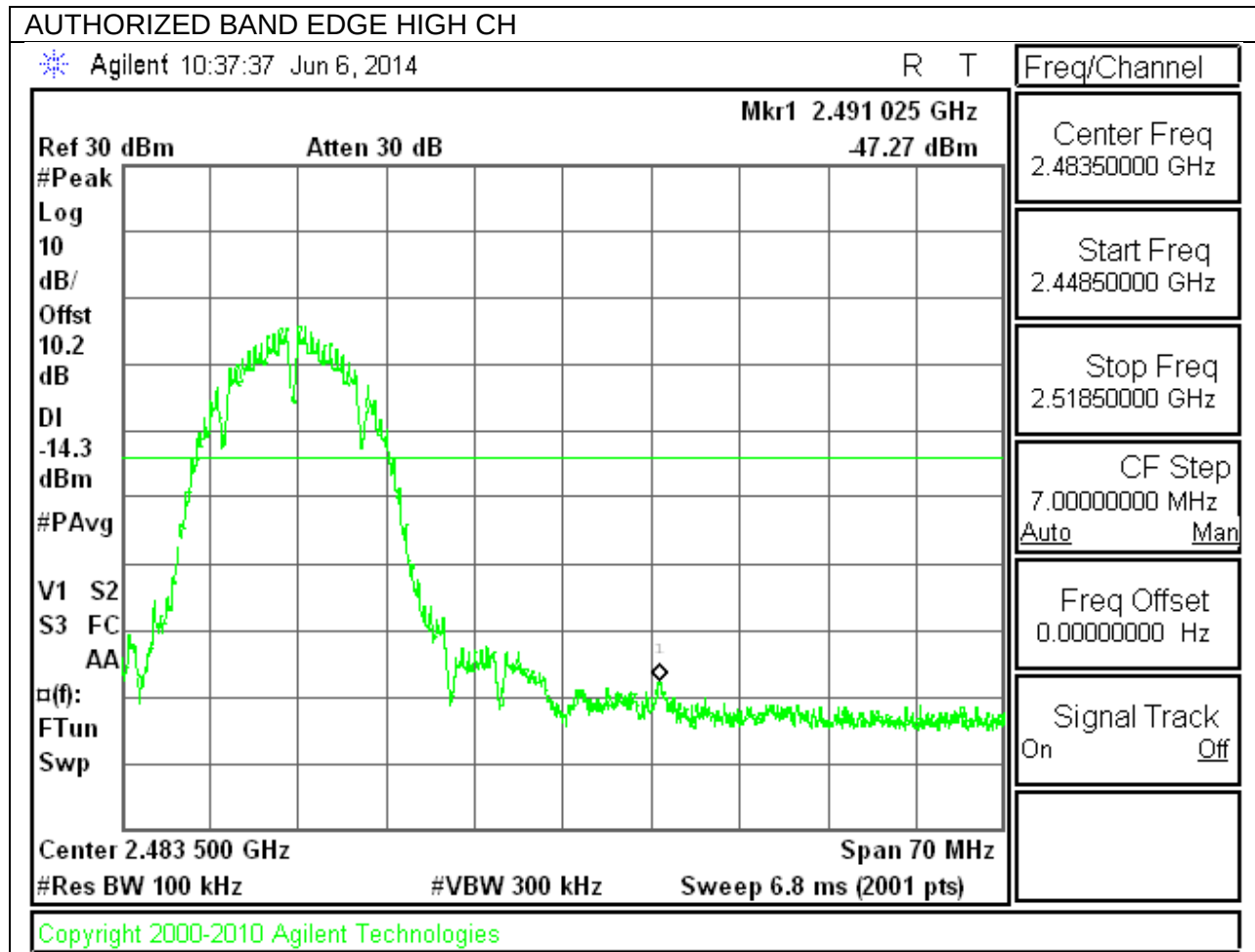
IN-BAND REFERENCE LEVEL



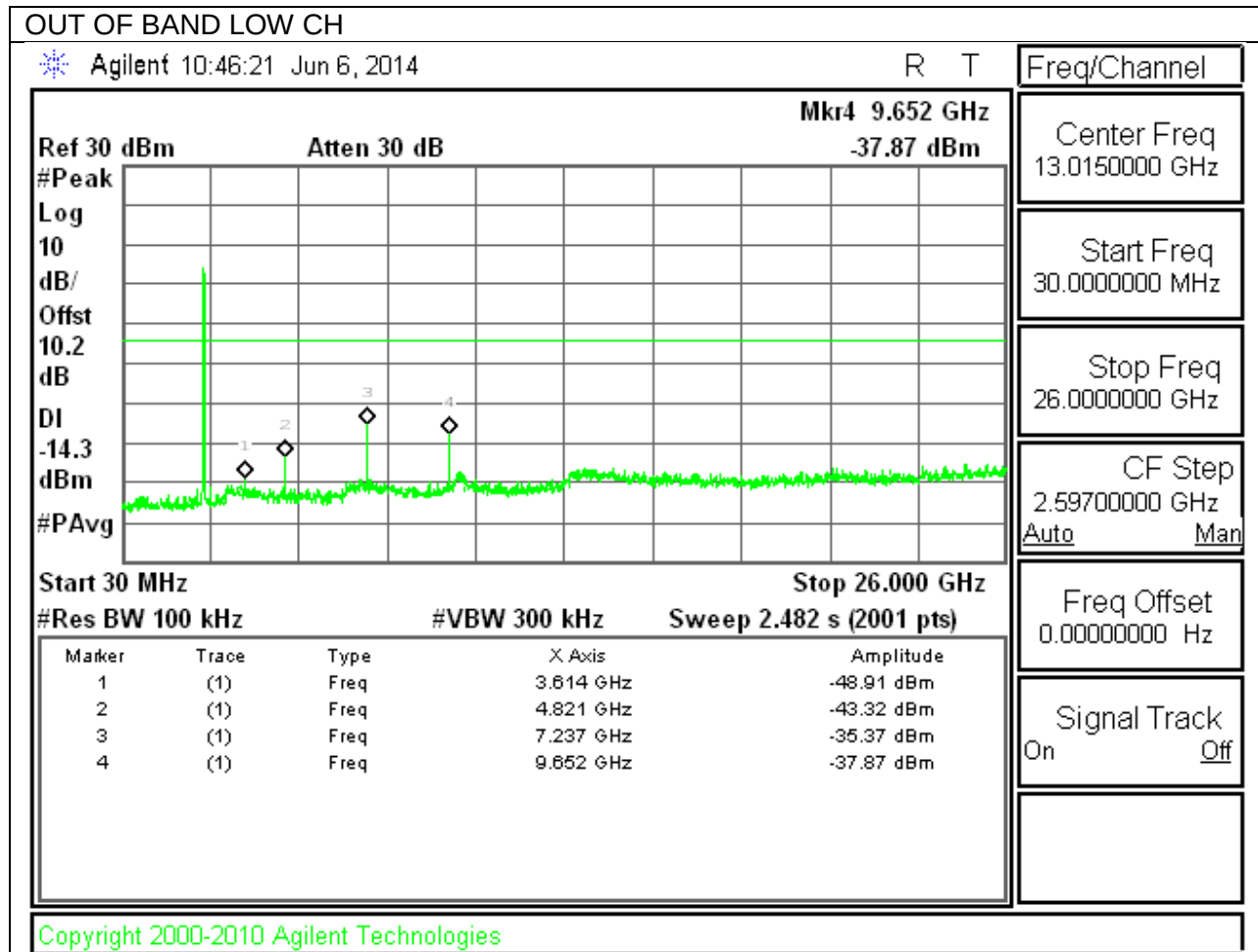
LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS



OUT OF BAND MID CH

Agilent 10:45:08 Jun 6, 2014

R T

Freq/Channel

Ref 30 dBm

Atten 30 dB

Mkr4 9.743 GHz

-38.71 dBm

#Peak

Log

10

dB/

Offst

10.2

dB

DI

-14.3

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	3.653 GHz	-48.65 dBm
2	(1)	Freq	4.873 GHz	-40.64 dBm
3	(1)	Freq	7.315 GHz	-31.68 dBm
4	(1)	Freq	9.743 GHz	-38.71 dBm

Center Freq
13.0150000 GHz

Start Freq
30.0000000 MHz

Stop Freq
26.0000000 GHz

CF Step
2.59700000 GHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

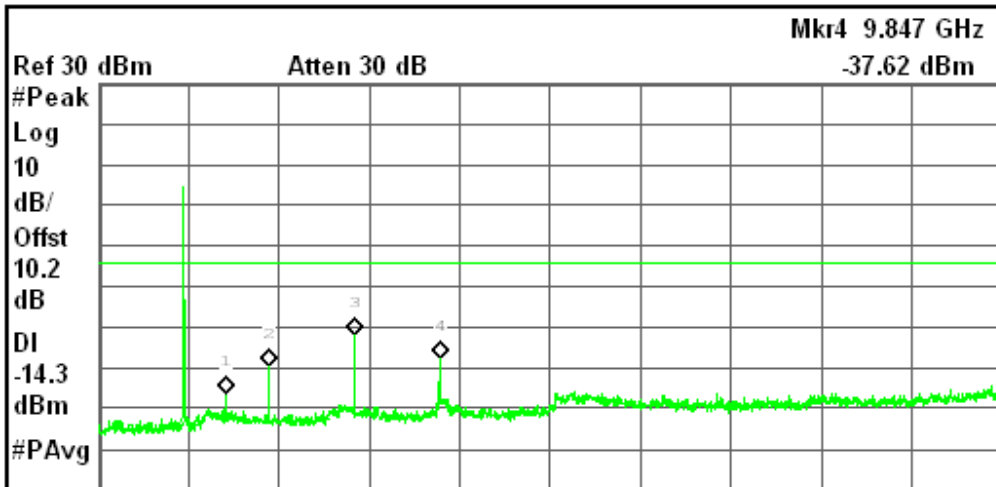
Copyright 2000-2010 Agilent Technologies

OUT OF BAND HIGH CH

Agilent 10:43:29 Jun 6, 2014

R T

Freq/Channel



Center Freq
13.0150000 GHz

Start Freq
30.0000000 MHz

Stop Freq
26.0000000 GHz

CF Step
2.59700000 GHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

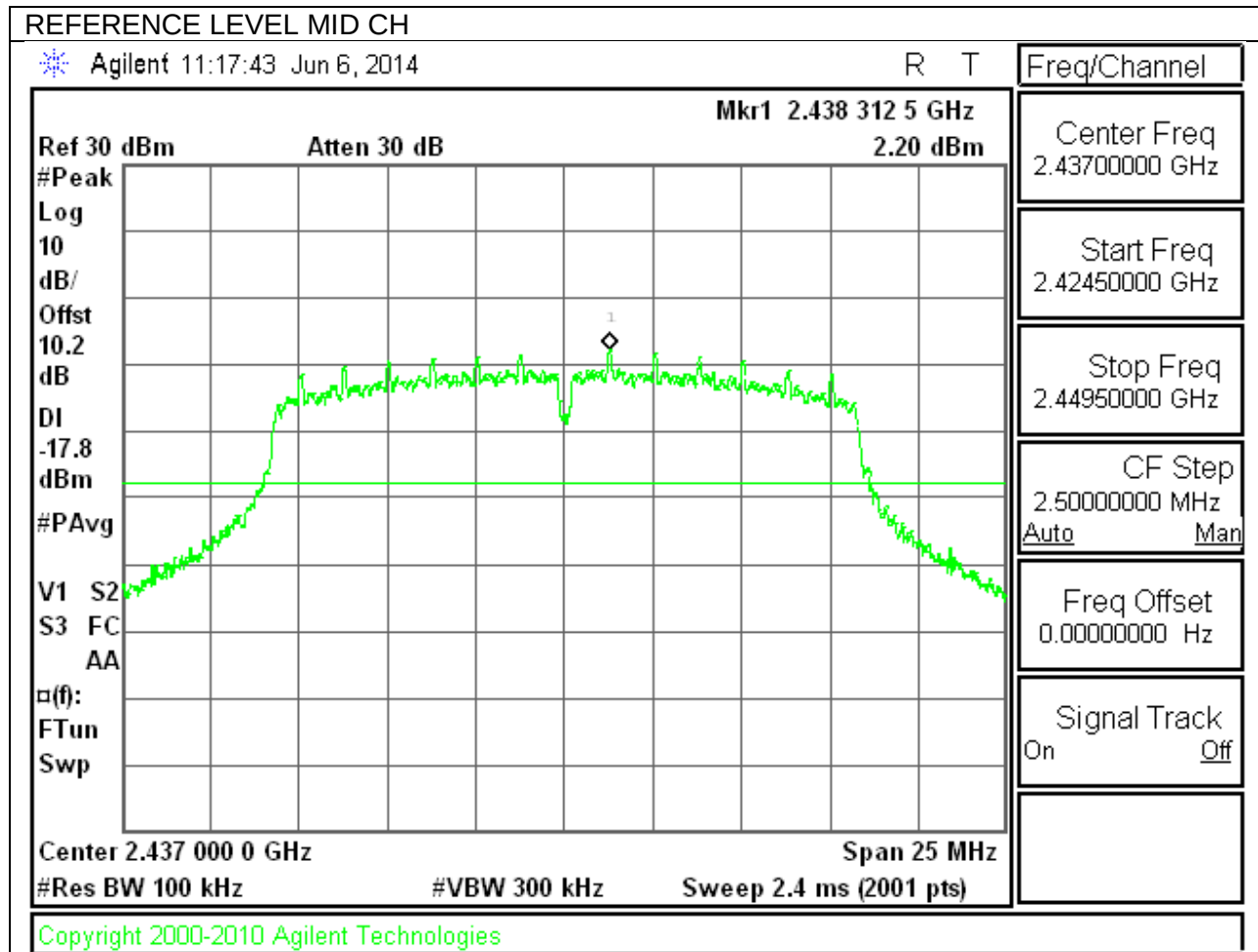
Start 30 MHz Stop 26.000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.482 s (2001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	3.692 GHz	-46.49 dBm
2	(1)	Freq	4.925 GHz	-39.87 dBm
3	(1)	Freq	7.392 GHz	-31.94 dBm
4	(1)	Freq	9.847 GHz	-37.62 dBm

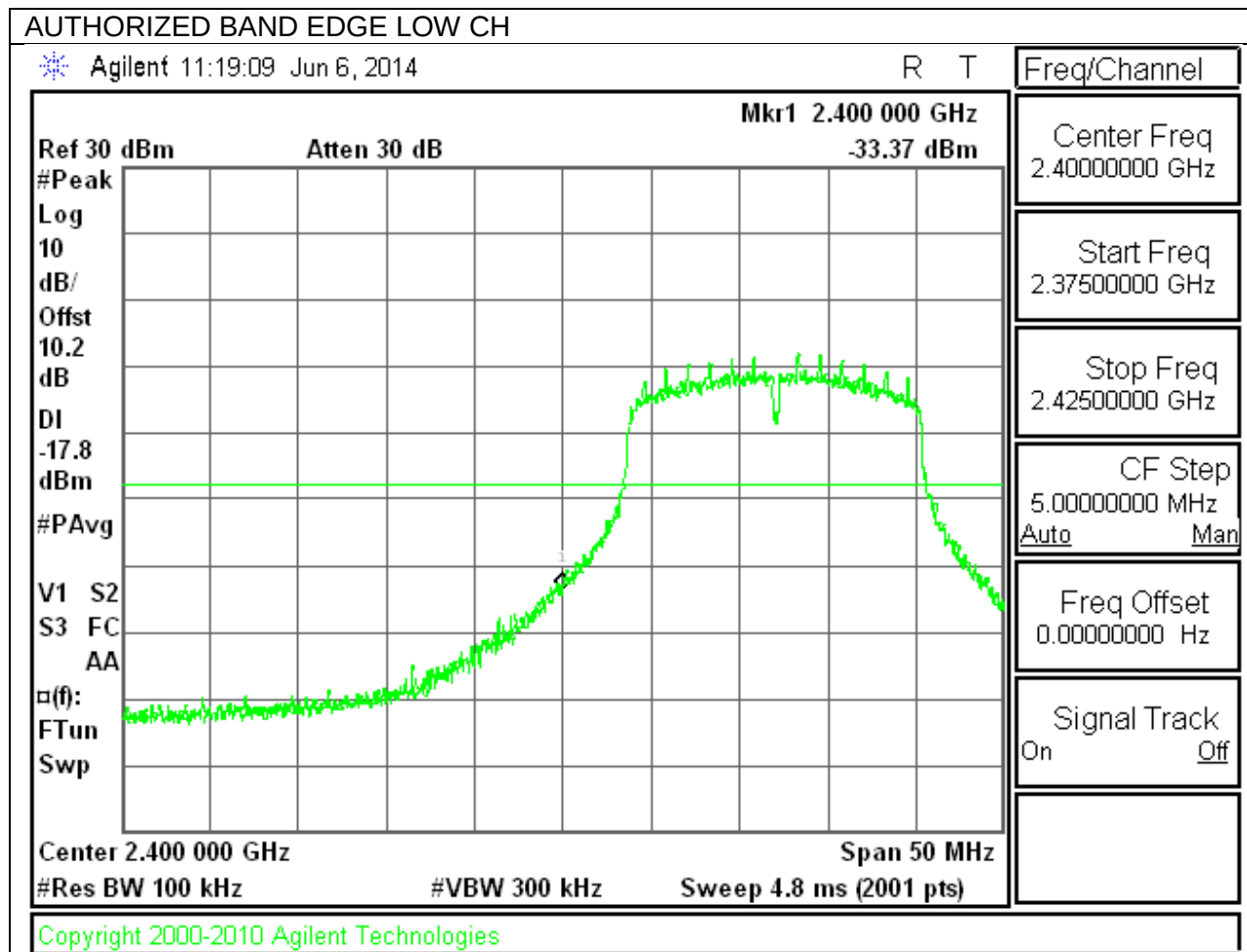
Copyright 2000-2010 Agilent Technologies

9.6.2. 802.11g MODE IN THE 2.4 GHz BAND

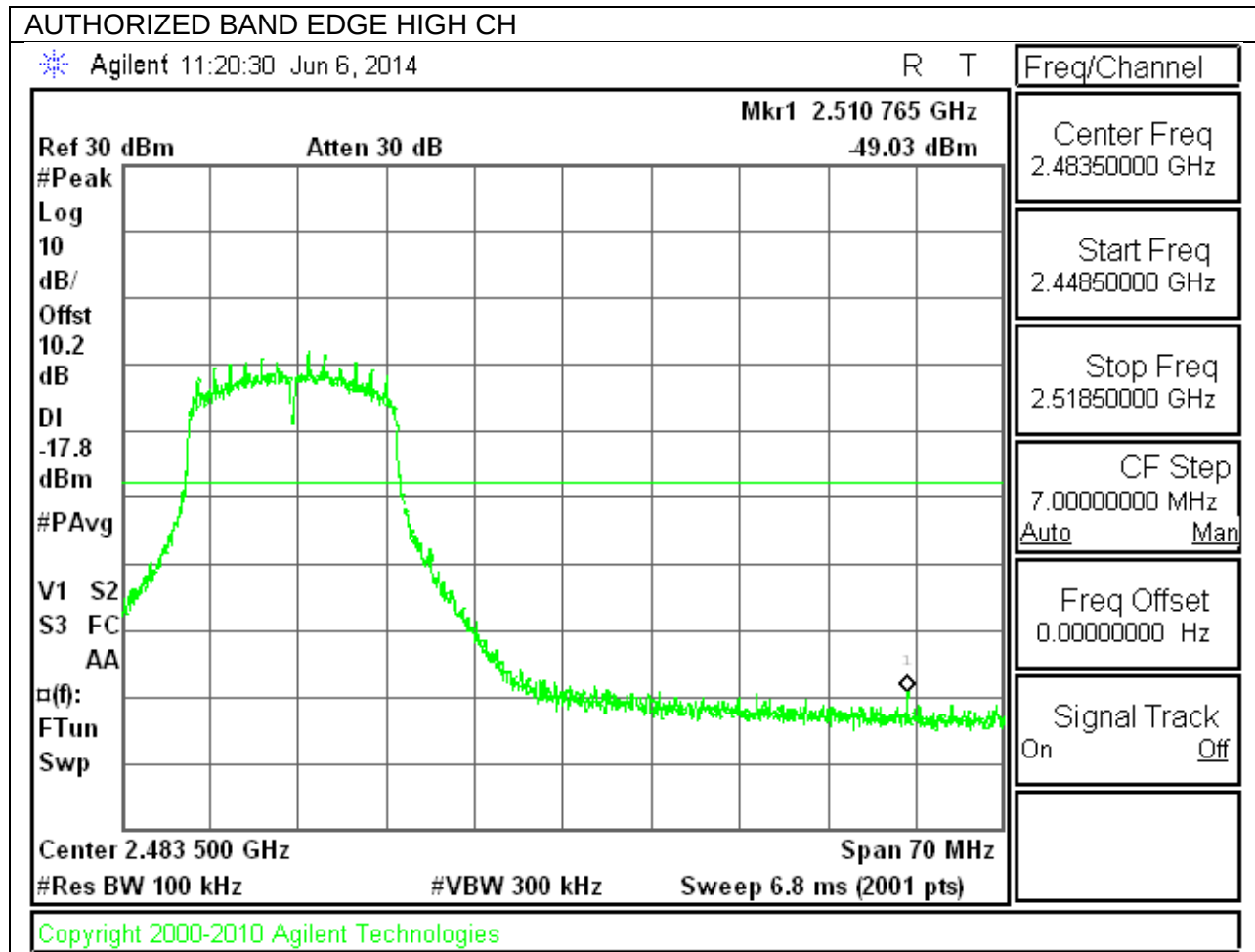
IN-BAND REFERENCE LEVEL



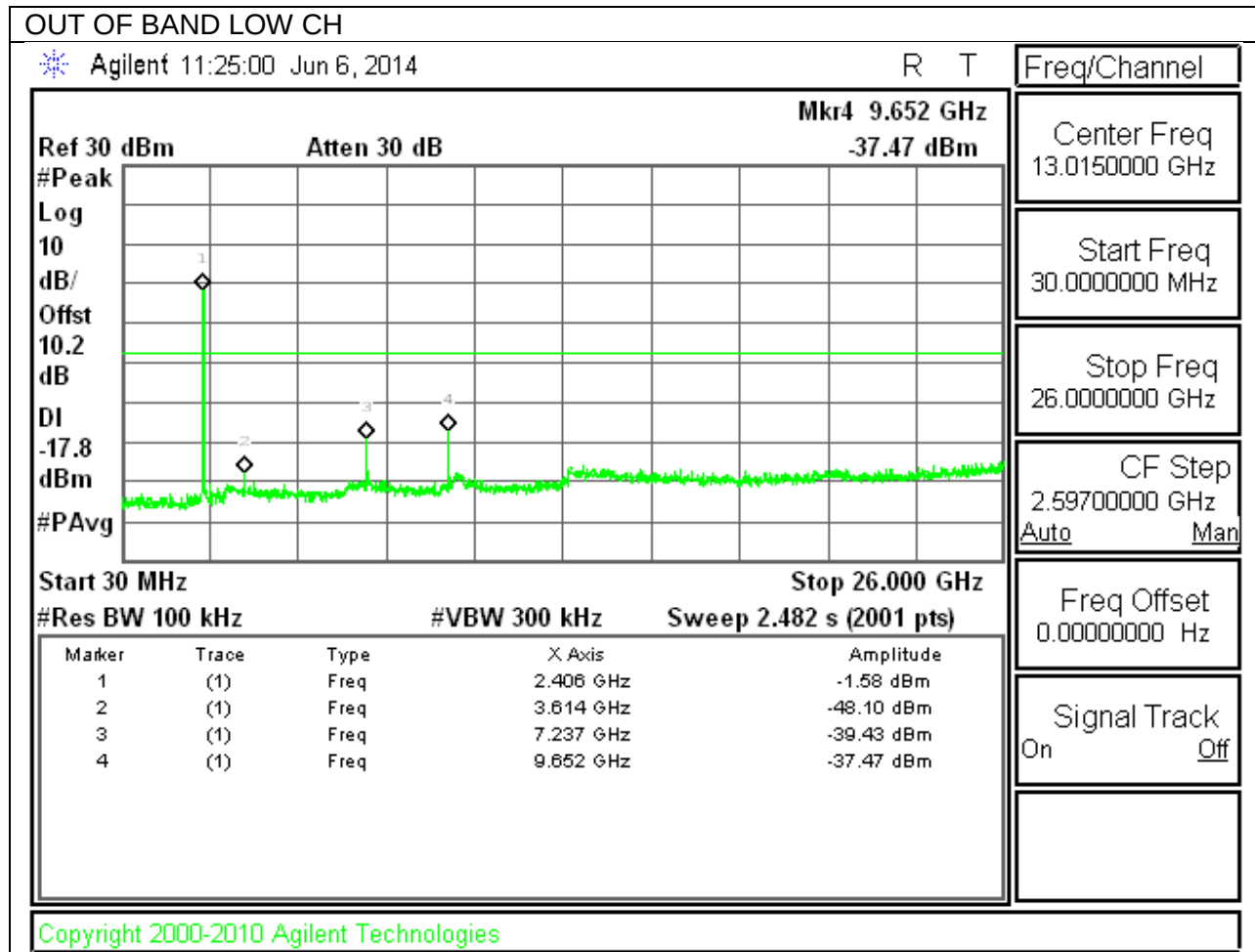
LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS

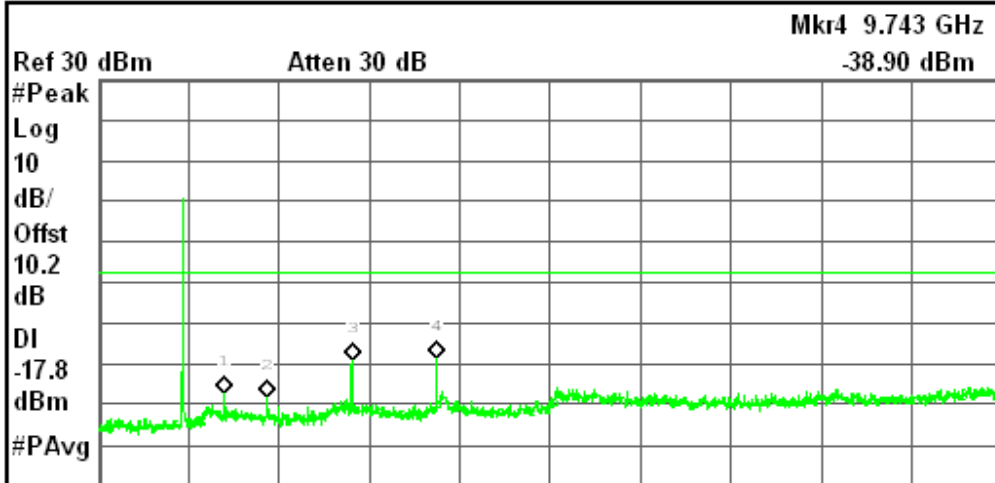


OUT OF BAND MID CH

Agilent 11:23:38 Jun 6, 2014

R T

Freq/Channel



Center Freq
13.0150000 GHz

Start Freq
30.0000000 MHz

Stop Freq
26.0000000 GHz

CF Step
2.59700000 GHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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	3.653 GHz	-47.61 dBm
2	(1)	Freq	4.873 GHz	-48.30 dBm
3	(1)	Freq	7.315 GHz	-39.46 dBm
4	(1)	Freq	9.743 GHz	-38.90 dBm

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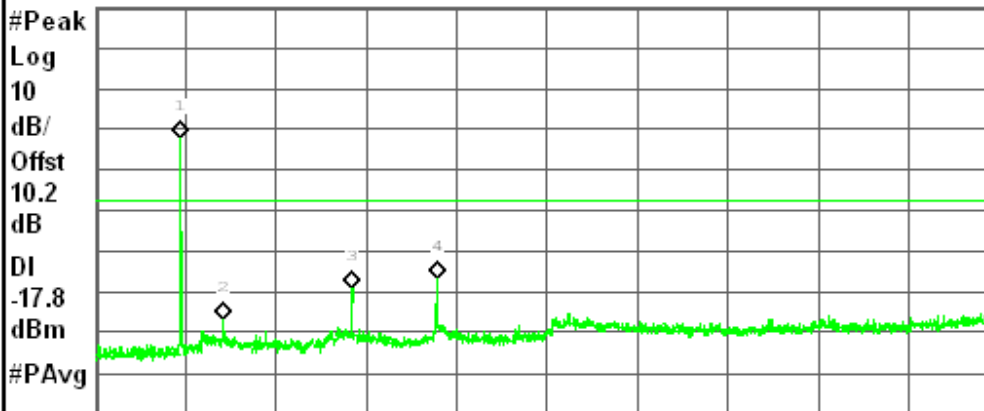
OUT OF BAND HIGH CH

Agilent 11:22:23 Jun 6, 2014

R T

Freq/Channel

Ref 30 dBm Atten 30 dB Mkr4 9.847 GHz -36.91 dBm



Center Freq
13.0150000 GHz

Start Freq
30.0000000 MHz

Stop Freq
26.0000000 GHz

CF Step
2.59700000 GHz
Auto Man

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

Freq Offset
0.0000000 Hz

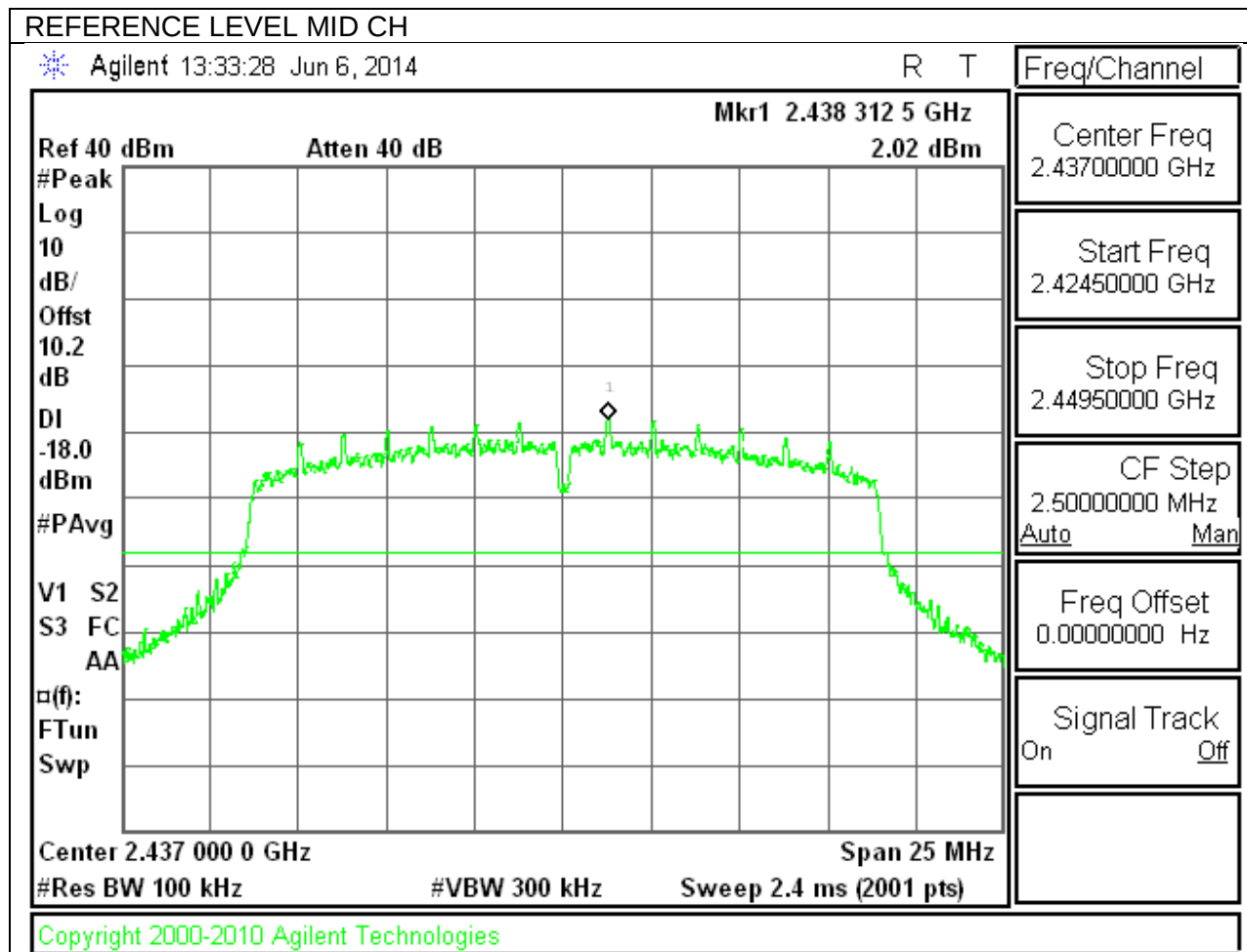
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.458 GHz	-2.37 dBm
2	(1)	Freq	3.692 GHz	-47.00 dBm
3	(1)	Freq	7.392 GHz	-39.24 dBm
4	(1)	Freq	9.847 GHz	-36.91 dBm

Signal Track
On Off

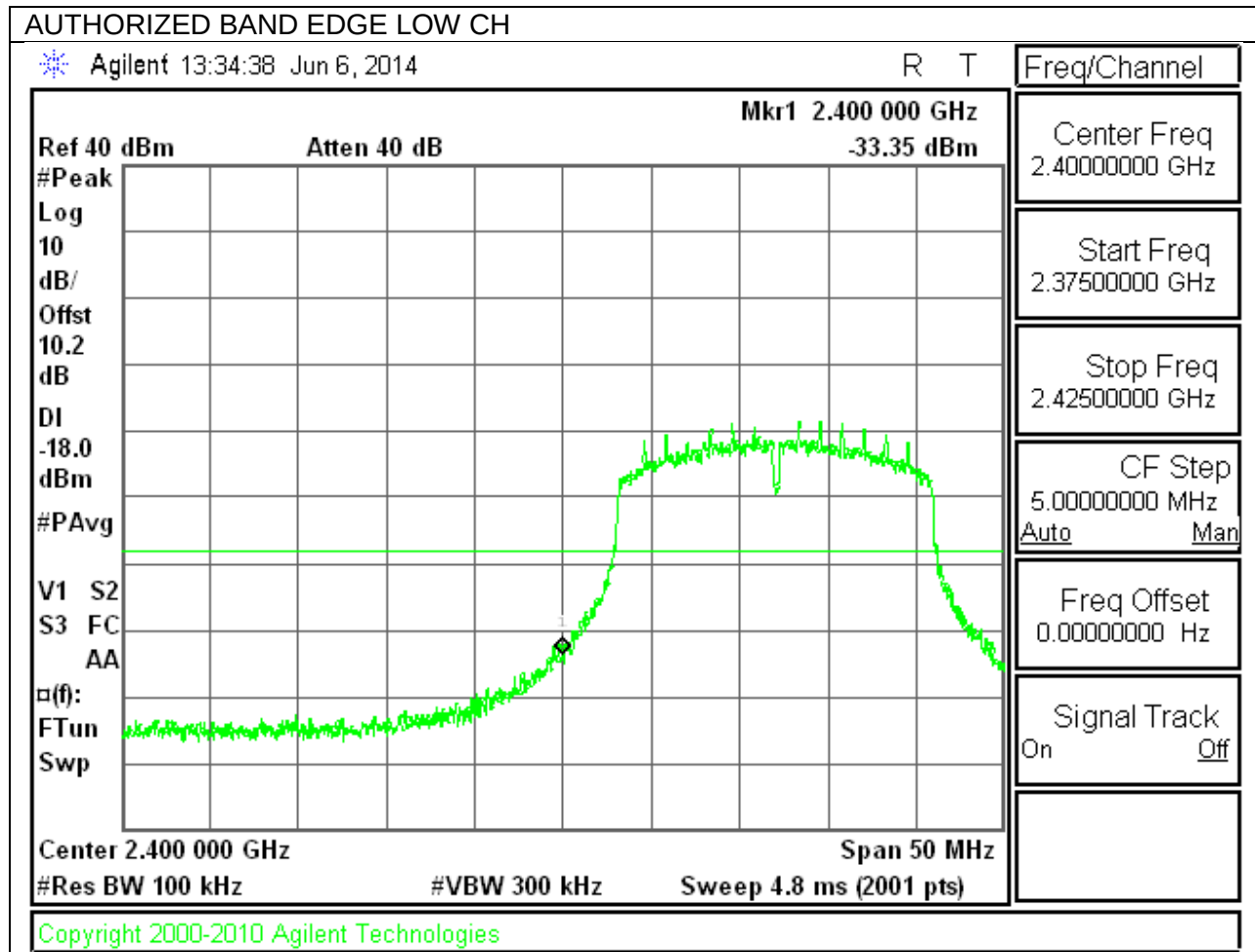
Copyright 2000-2010 Agilent Technologies

9.6.3. 802.11n MODE IN THE 2.4 GHz BAND

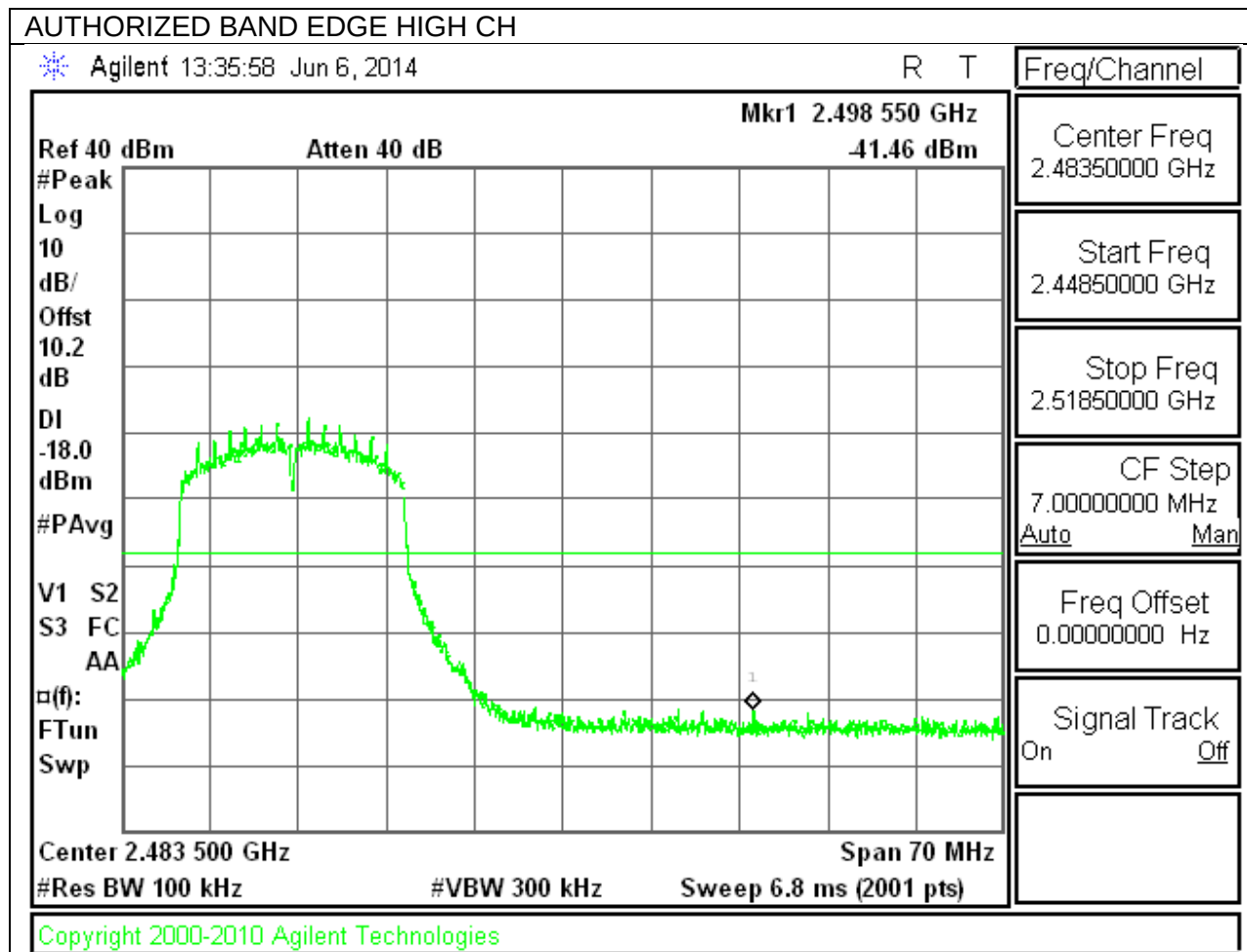
IN-BAND REFERENCE LEVEL



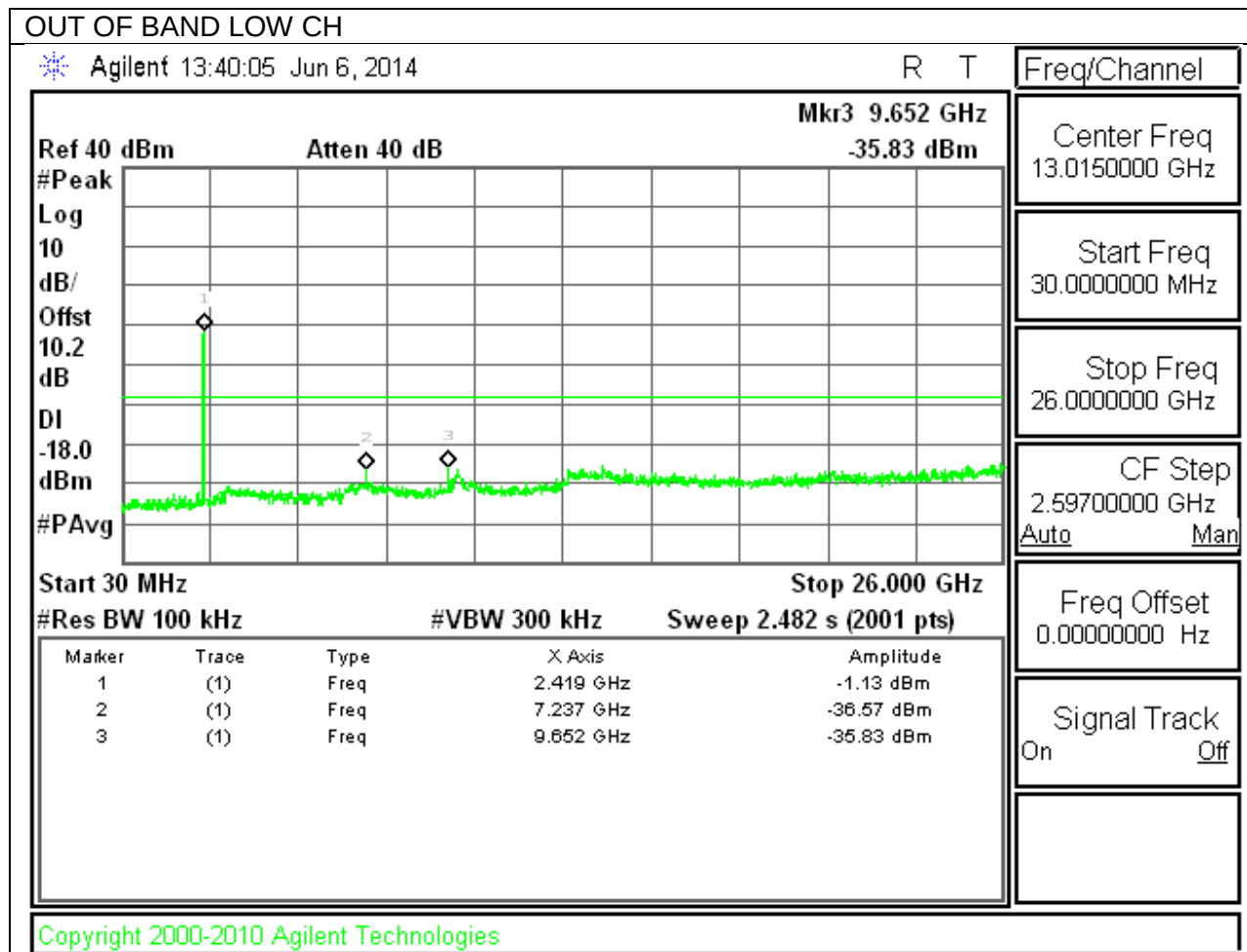
LOW CHANNEL BANDEDGE

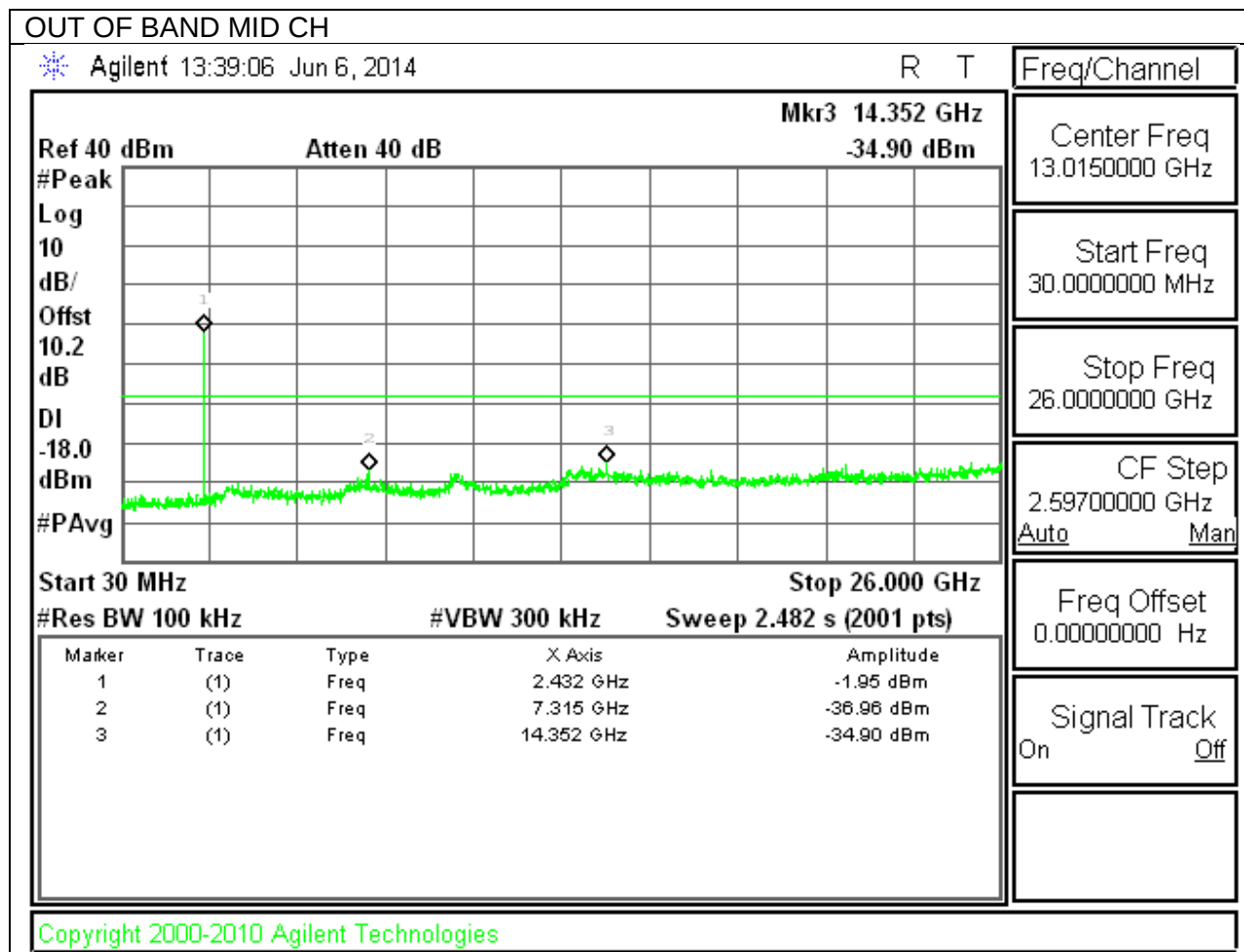


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS



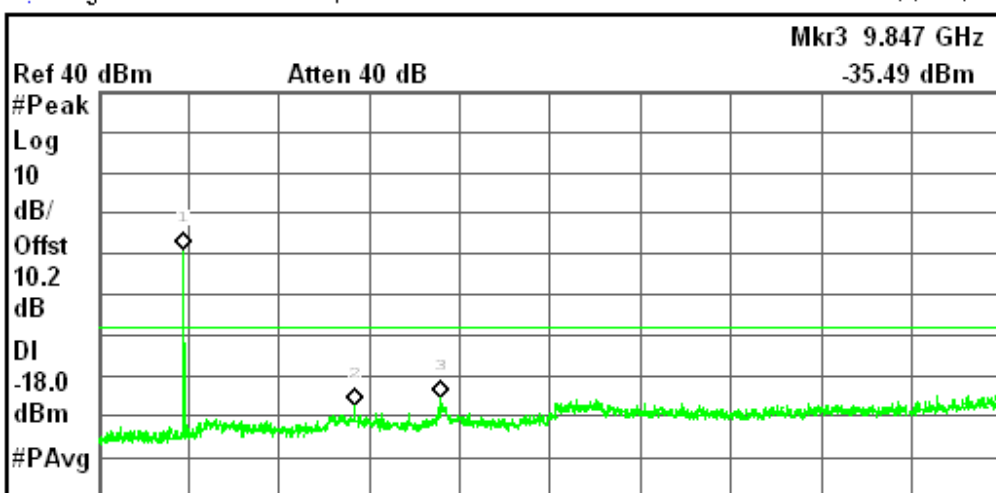


OUT OF BAND HIGH CH

Agilent 13:38:01 Jun 6, 2014

R T

Freq/Channel



Center Freq
13.0150000 GHz

Start Freq
30.0000000 MHz

Stop Freq
26.0000000 GHz

CF Step
2.59700000 GHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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	0.86 dBm
2	(1)	Freq	7.392 GHz	-37.39 dBm
3	(1)	Freq	9.847 GHz	-35.49 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 = 0.4dB.

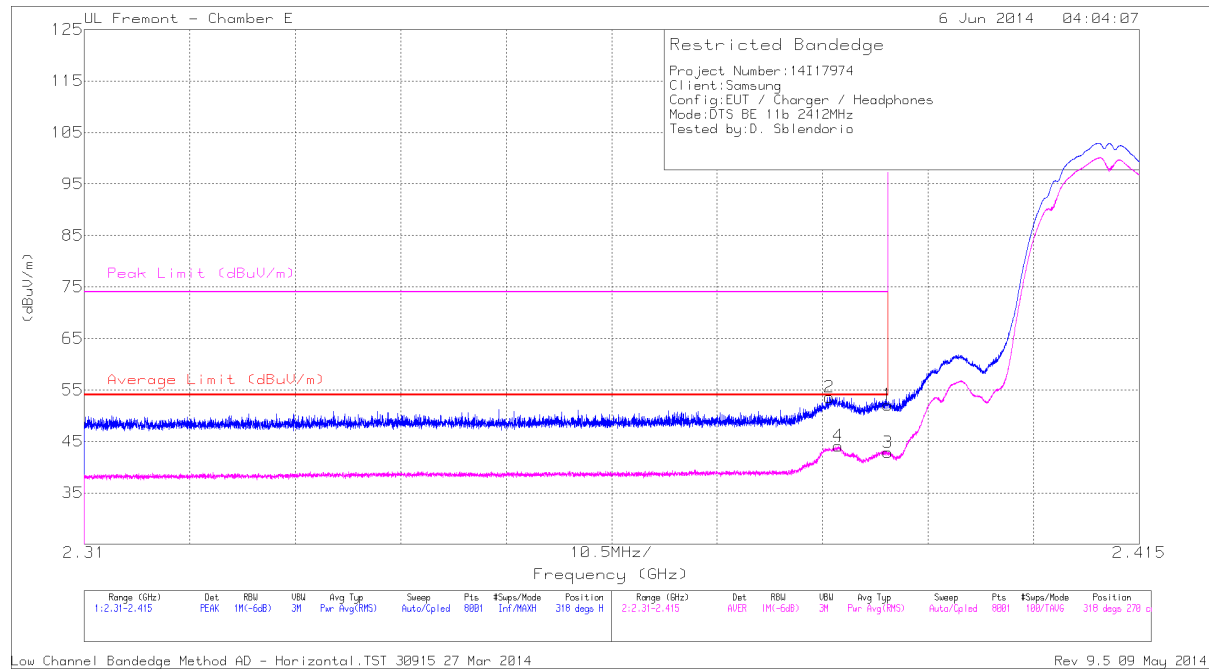
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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)

HORIZONTAL



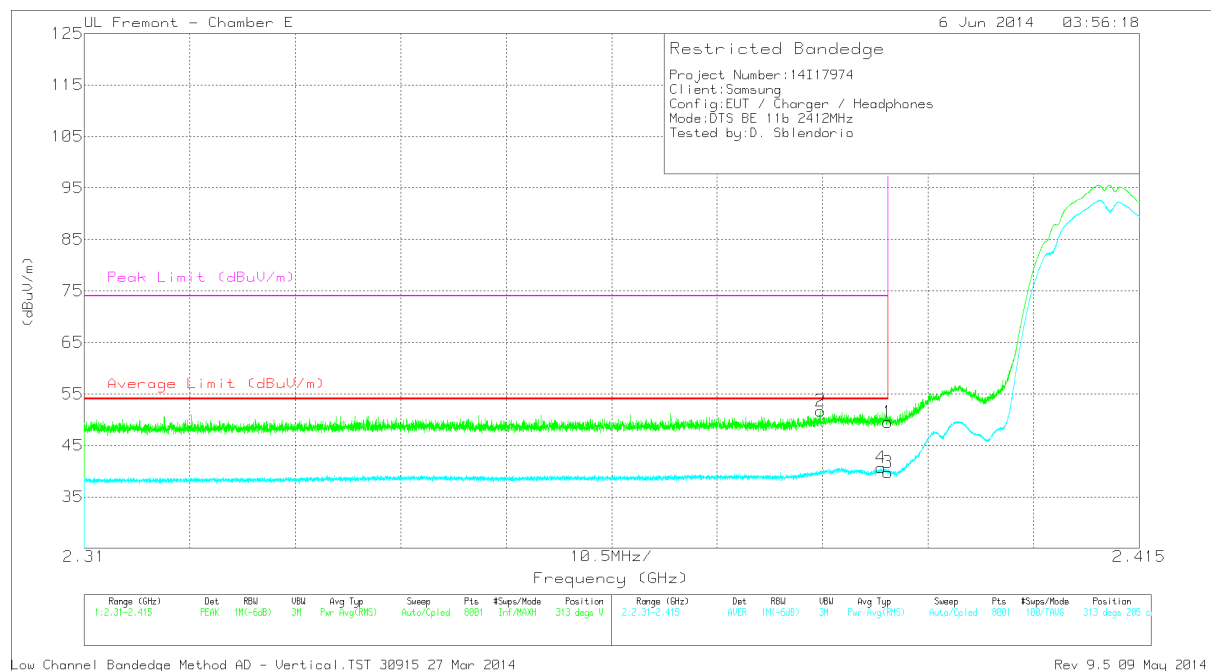
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	44.76	PK	32	-24.7	52.06	-	-	74	-21.94	318	270	H
2	* 2.384	46.28	PK	31.9	-24.6	53.58	-	-	74	-20.42	318	270	H
3	* 2.39	35.56	RMS	32	-24.7	42.86	54	-11.14	-	-	318	270	H
4	* 2.385	36.81	RMS	31.9	-24.6	44.11	54	-9.89	-	-	318	270	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fitr/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	42.24	PK	32	-24.7	49.54	-	-	74	-24.46	313	285	V
2	* 2.383	44.39	PK	31.9	-24.6	51.69	-	-	74	-22.31	313	285	V
3	* 2.39	32.43	RMS	32	-24.7	39.73	54	-14.27	-	-	313	285	V
4	* 2.389	33.4	RMS	32	-24.7	40.7	54	-13.3	-	-	313	285	V

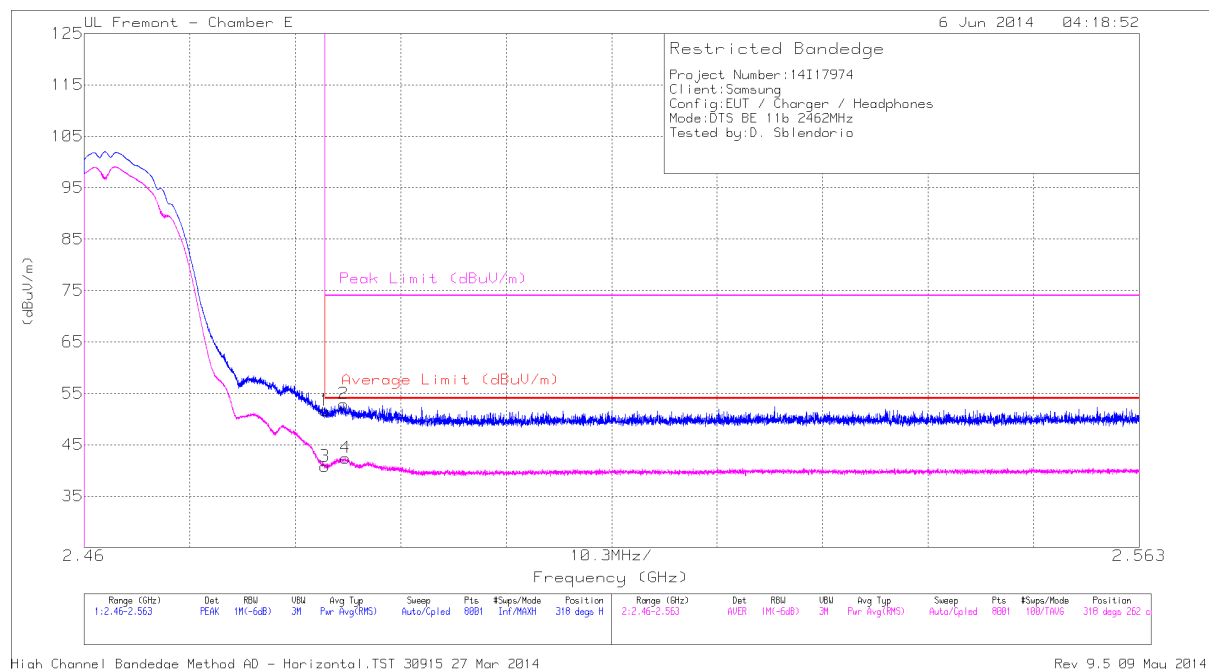
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL



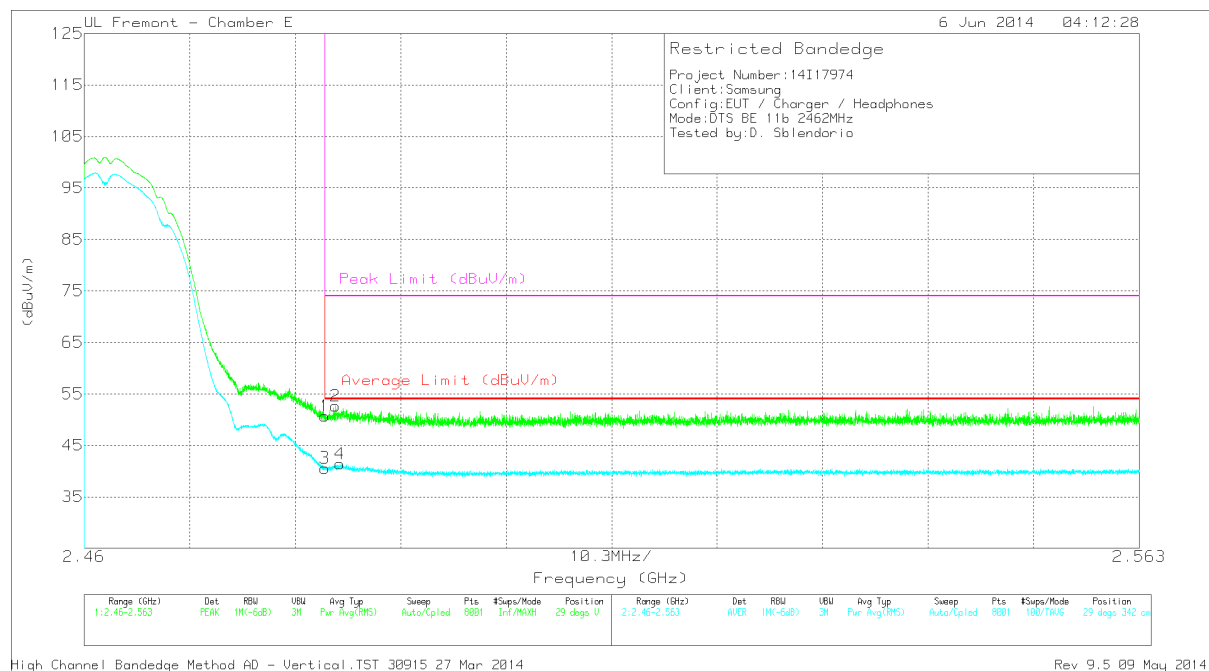
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.69	PK	32.3	-24.3	51.69	-	-	74	-22.31	318	262	H
2	* 2.485	44.95	PK	32.3	-24.3	52.95	-	-	74	-21.05	318	262	H
3	* 2.484	32.82	RMS	32.3	-24.3	40.82	54	-13.18	-	-	318	262	H
4	* 2.486	34.45	RMS	32.3	-24.3	42.45	54	-11.55	-	-	318	262	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL



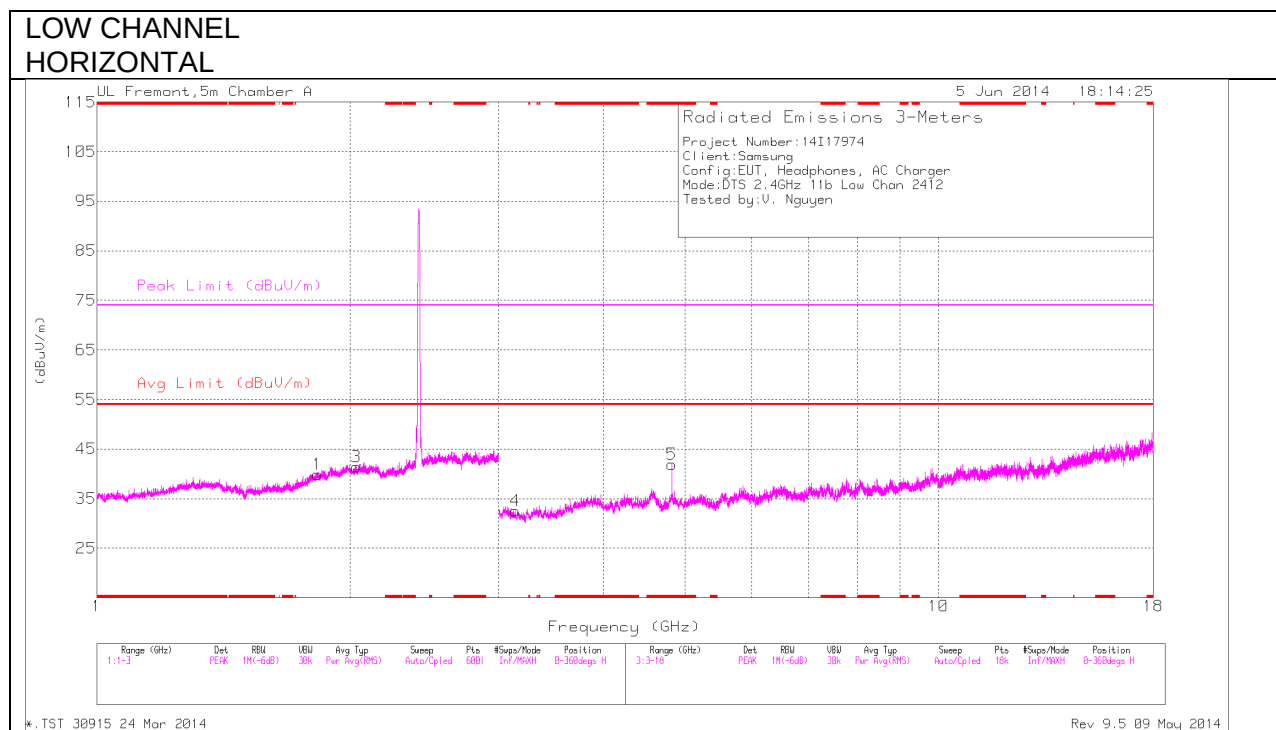
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.69	PK	32.3	-24.3	50.69	-	-	74	-23.31	29	342	V
2	* 2.485	44.63	PK	32.3	-24.3	52.63	-	-	74	-21.37	29	342	V
3	* 2.484	32.58	RMS	32.3	-24.3	40.58	54	-13.42	-	-	29	342	V
4	* 2.485	33.42	RMS	32.3	-24.3	41.42	54	-12.58	-	-	29	342	V

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

PK - Peak detector

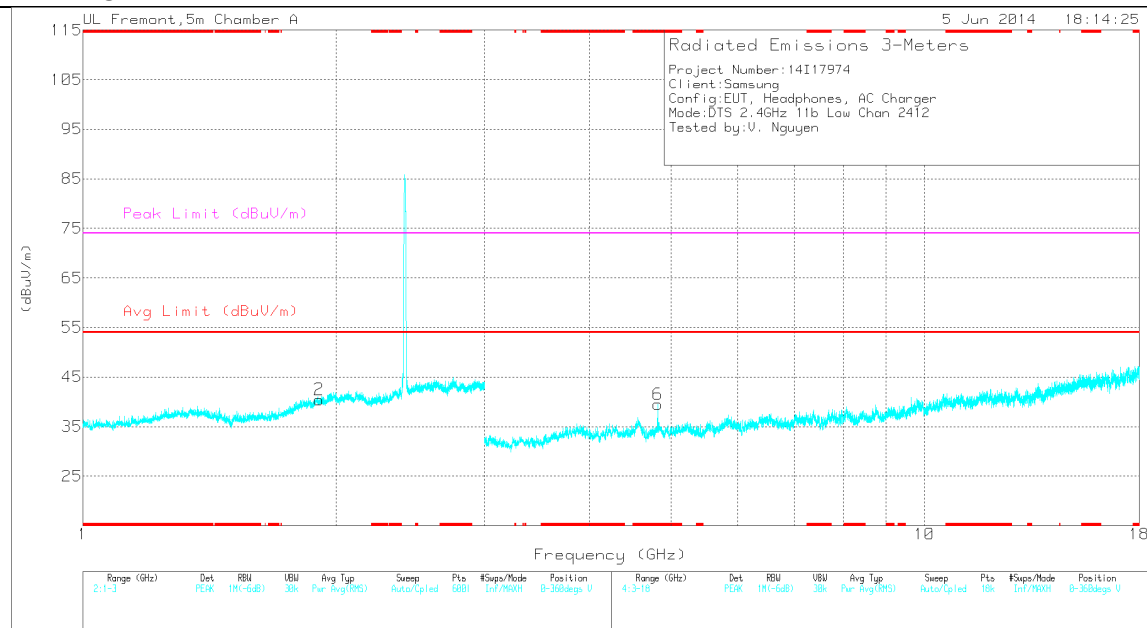
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 4.824	37.35	PK	34	-29.4	0	41.95	-	-	74	-32.05	0-360	100	H
6	* 4.824	34.89	PK	34	-29.4	0	39.49	-	-	74	-34.51	0-360	201	V
1	1.827	33.94	PK	30.9	-24.9	0	39.94	-	-	-	-	0-360	333	H
2	1.908	33.96	PK	31.7	-25.2	0	40.46	-	-	-	-	0-360	200	V
3	2.035	34.41	PK	32	-25	0	41.41	-	-	-	-	0-360	333	H
4	3.142	31.27	PK	32.7	-31.4	0	32.57	-	-	-	-	0-360	200	H

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

PK - Peak detector

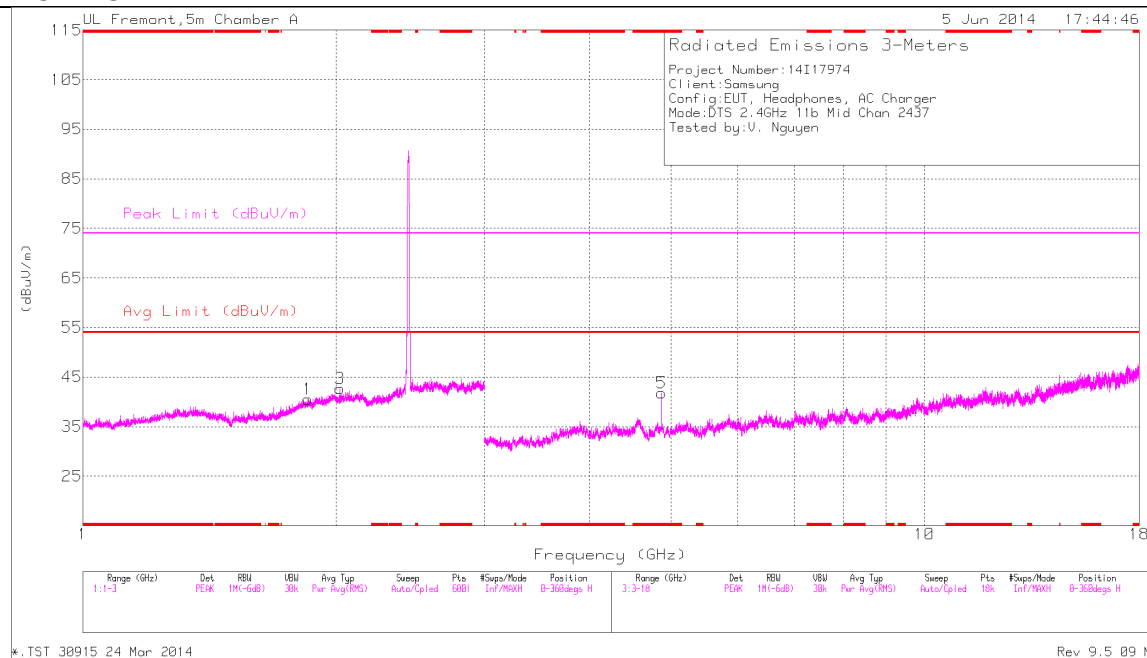
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	43.13	PK2	34	-29.4	47.73	-	-	74	-26.27	323	152	H
* 4.824	37.27	MAV1	34	-29.4	41.97	54	-12.03	-	-	323	152	H
* 4.824	42.08	PK2	34	-29.4	46.68	-	-	74	-27.32	241	343	V
* 4.824	36.68	MAV1	34	-29.4	41.38	54	-12.62	-	-	241	343	V

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

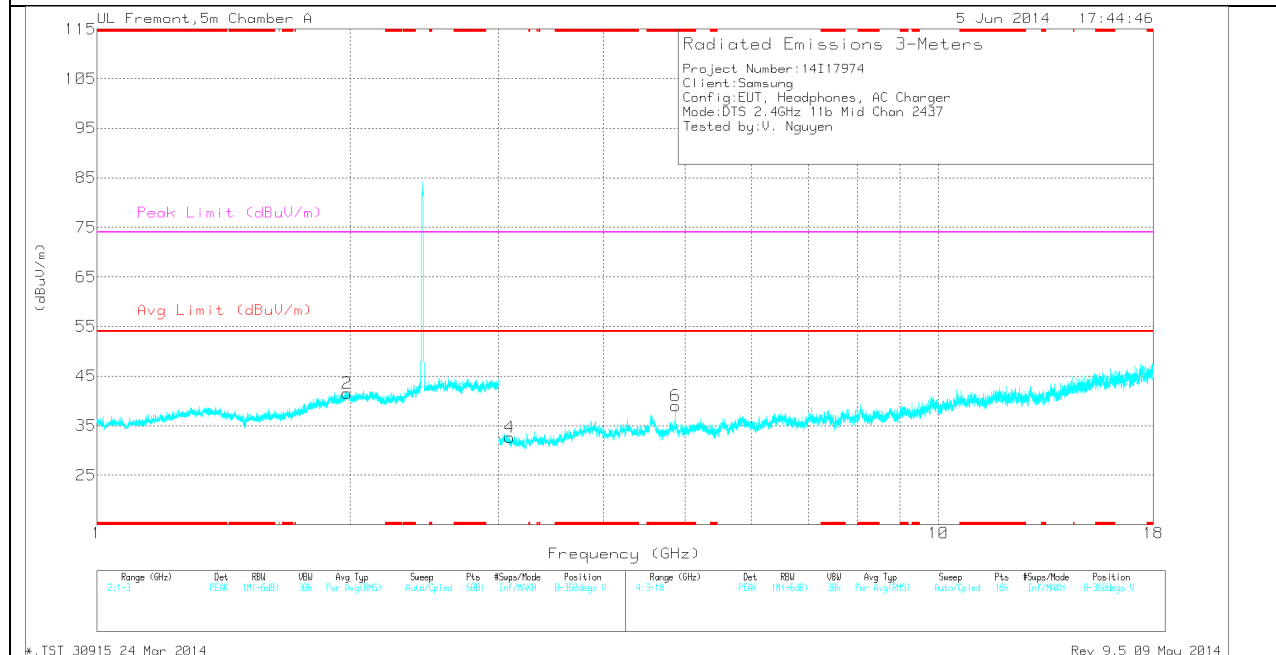
PK2 - KDB558074 Method: Maximum Peak

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 4.874	36.15	PK	34	-28.3	0	41.85	-	-	74	-32.15	0-360	100	H
6	* 4.874	33.25	PK	34	-28.3	0	38.95	-	-	74	-35.05	0-360	200	V
1	1.85	34.64	PK	31.1	-25.2	0	40.54	-	-	-	-	0-360	200	H
2	1.983	34	PK	32	-24.5	0	41.5	-	-	-	-	0-360	200	V
3	2.02	35.84	PK	32	-25.2	0	42.64	-	-	-	-	0-360	200	H
4	3.093	30.78	PK	32.8	-30.9	0	32.68	-	-	-	-	0-360	100	V

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

PK - Peak detector

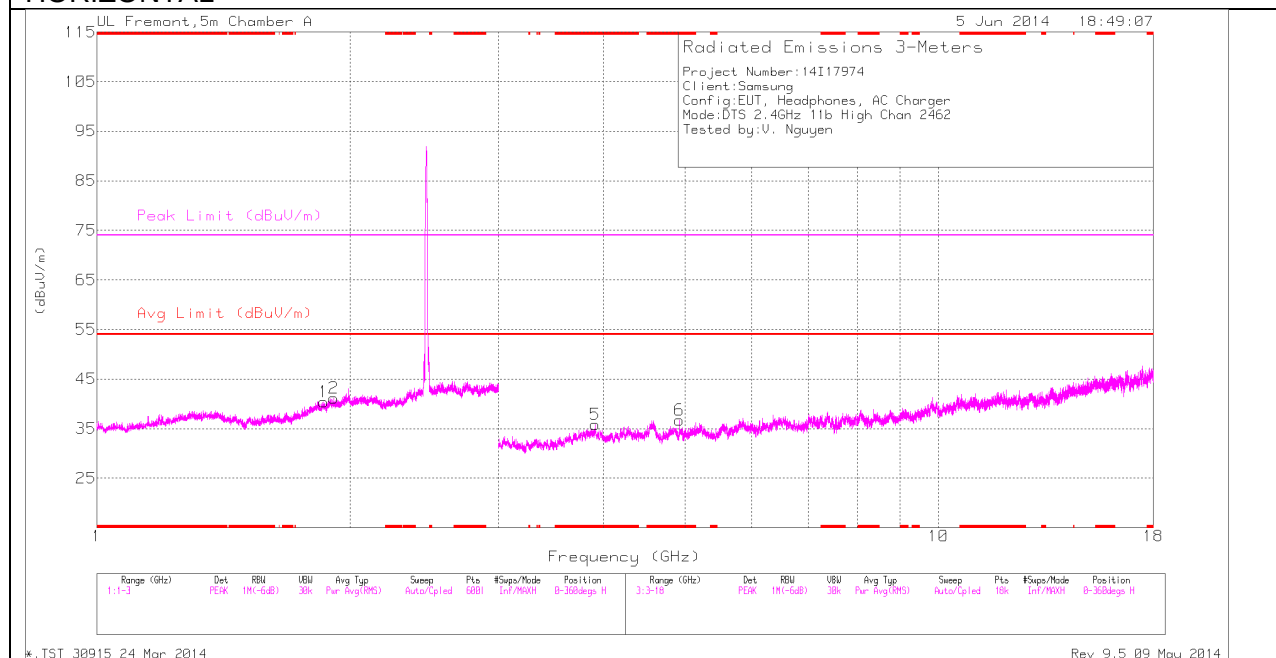
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	40.9	PK2	34	-28.3	46.6	-	-	74	-27.4	329	105	H
* 4.874	35.21	MAV1	34	-28.3	41.01	54	-12.99	-	-	329	105	H
* 4.874	40.75	PK2	34	-28.3	46.45	-	-	74	-27.55	220	333	V
* 4.874	34.38	MAV1	34	-28.3	40.18	54	-13.82	-	-	220	333	V

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

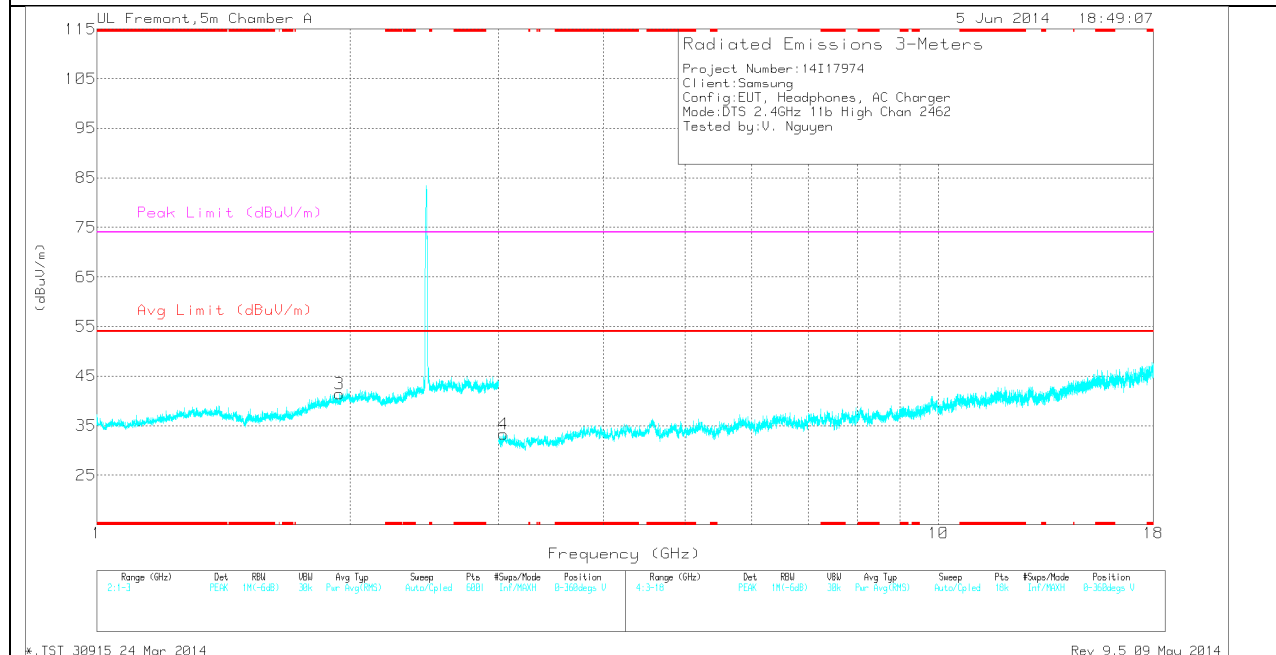
PK2 - KDB558074 Method: Maximum Peak

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 3.906	32.45	PK	33.8	-30.4	0	35.85	-	-	74	-38.15	0-360	200	H
6	* 4.924	31.85	PK	33.9	-29	0	36.75	-	-	74	-37.25	0-360	100	H
1	1.861	34.31	PK	31.2	-25.1	0	40.41	-	-	-	-	0-360	242	H
2	1.911	34.57	PK	31.7	-25.1	0	41.17	-	-	-	-	0-360	242	H
3	1.941	34.96	PK	31.8	-25.4	0	41.36	-	-	-	-	0-360	100	V
4	3.041	31	PK	32.8	-30.5	0	33.3	-	-	-	-	0-360	200	V

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

PK - Peak detector

Radiated Emissions

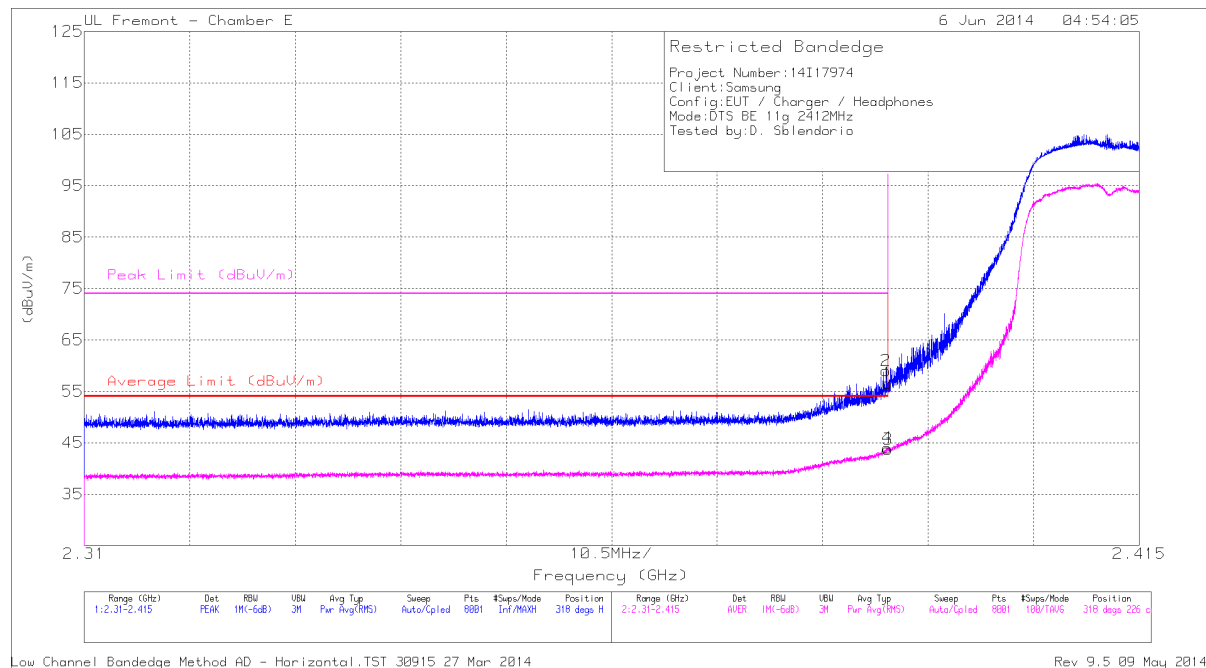
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	39.89	PK2	33.9	-29	44.79	-	-	74	-29.21	321	102	H
* 4.924	31.27	MAV1	33.9	-29	36.27	54	-17.73	-	-	321	102	H
* 3.902	39.14	PK2	33.8	-30.5	42.44	-	-	74	-31.56	138	354	V
* 3.901	27.96	MAV1	33.8	-30.5	31.36	54	-22.64	-	-	138	354	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)

HORIZONTAL



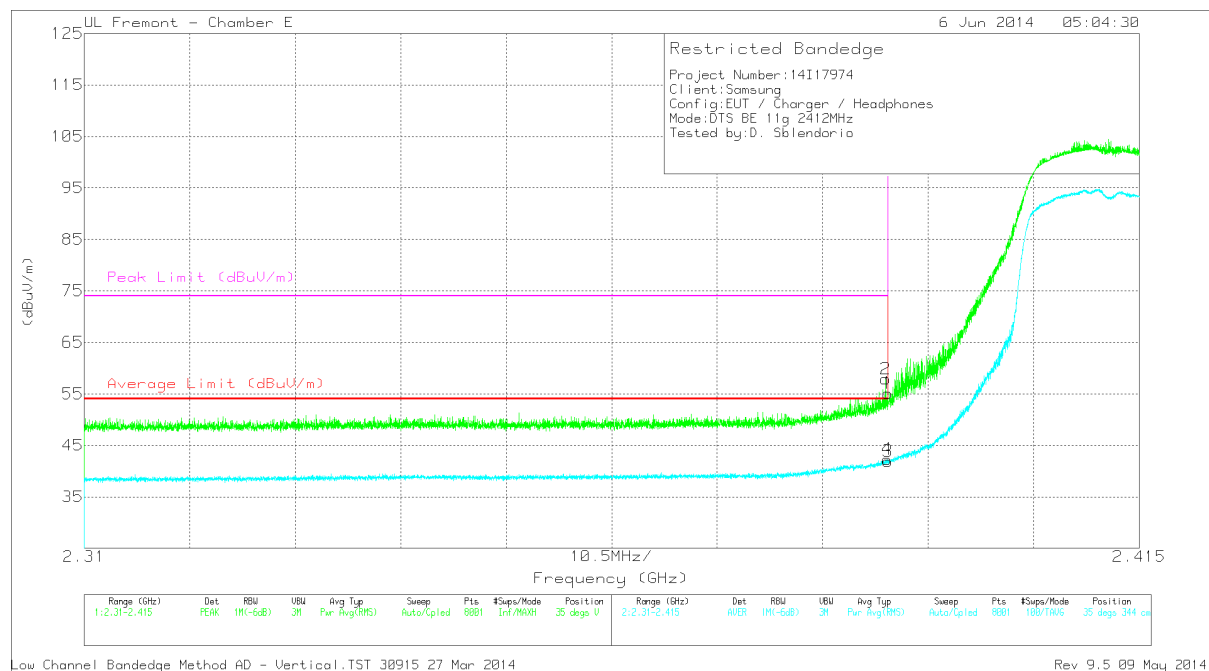
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	49.25	PK	32	-24.7	0	56.55	-	-	74	-17.45	318	226	H
2	* 2.39	51.68	PK	32	-24.7	0	58.98	-	-	74	-15.02	318	226	H
3	* 2.39	36.12	RMS	32	-24.7	.3	43.72	54	-10.28	-	-	318	226	H
4	* 2.39	36.37	RMS	32	-24.7	.3	43.97	54	-10.03	-	-	318	226	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL



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	47.84	PK	32	-24.7	0	55.14	-	-	74	-18.86	35	344	V
2	* 2.39	50.61	PK	32	-24.7	0	57.91	-	-	74	-16.09	35	344	V
3	* 2.39	34.32	RMS	32	-24.7	.3	41.92	54	-12.08	-	-	35	344	V
4	* 2.39	34.7	RMS	32	-24.7	.3	42.3	54	-11.7	-	-	35	344	V

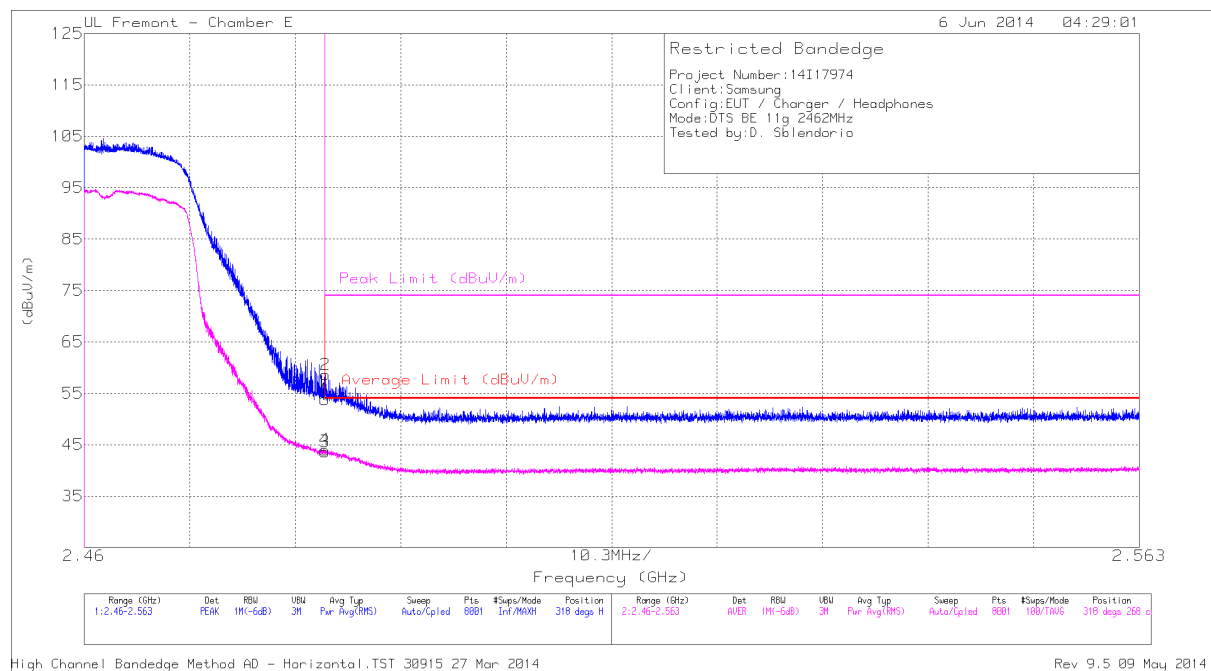
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL



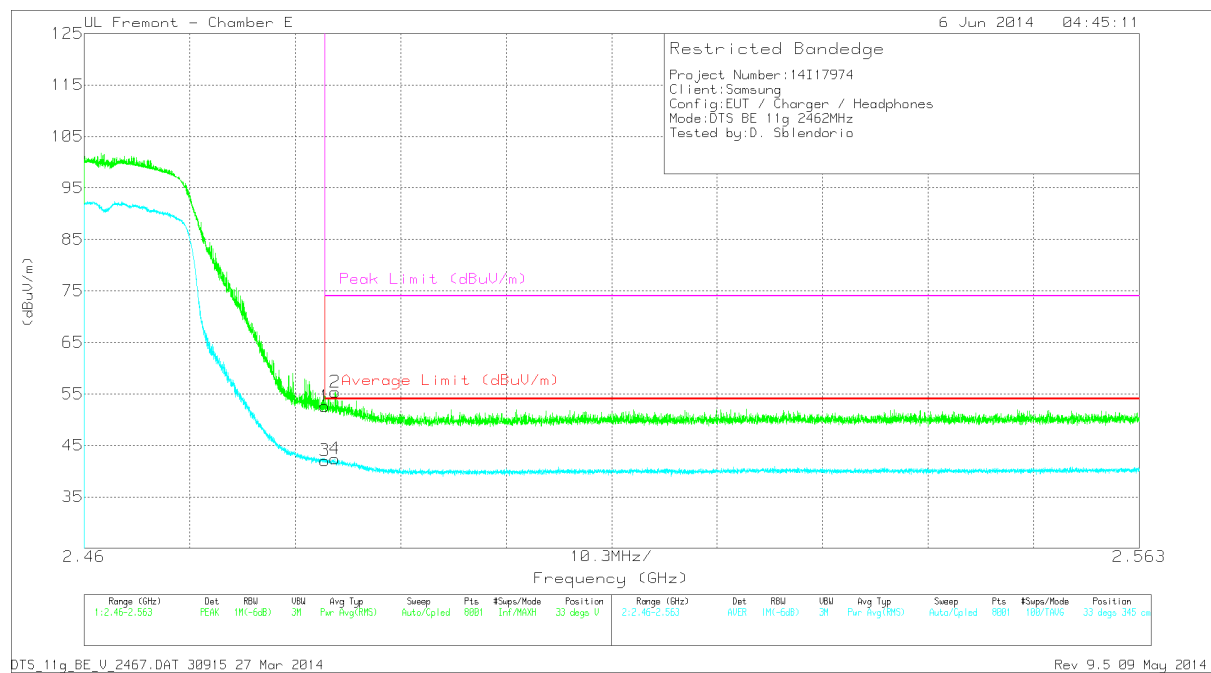
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.83	PK	32.3	-24.3	0	53.83	-	-	74	-20.17	318	268	H
2	* 2.484	50.63	PK	32.3	-24.3	0	58.63	-	-	74	-15.37	318	268	H
3	* 2.484	35.33	RMS	32.3	-24.3	.3	43.63	54	-10.37	-	-	318	268	H
4	* 2.484	35.7	RMS	32.3	-24.3	.3	44	54	-10	-	-	318	268	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL



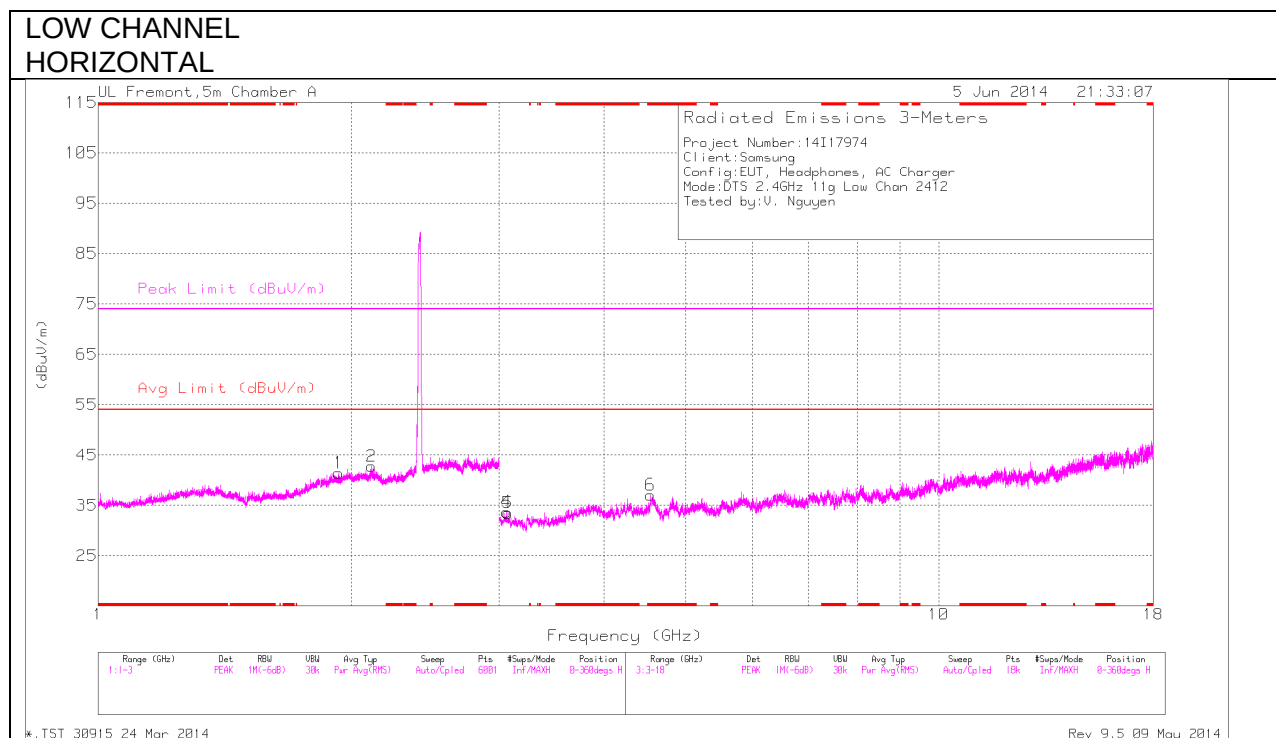
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	44.61	PK	32.3	-24.3	0	52.61	-	-	74	-21.39	33	345	V
2	* 2.485	47.36	PK	32.3	-24.3	0	55.36	-	-	74	-18.64	33	345	V
3	* 2.484	33.75	RMS	32.3	-24.3	.3	42.05	54	-11.95	-	-	33	345	V
4	* 2.484	34.11	RMS	32.3	-24.3	.3	42.41	54	-11.59	-	-	33	345	V

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

PK - Peak detector

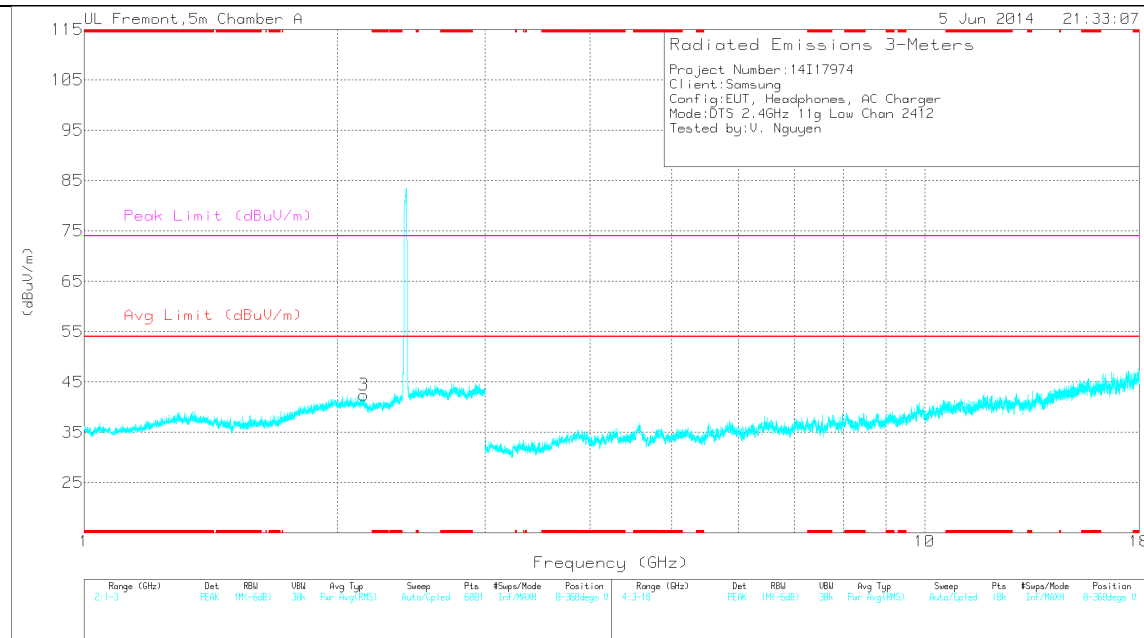
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 4.543	31.66	PK	33.9	-28.5	0	37.06	-	-	74	-36.94	0-360	201	H
1	1.932	35.03	PK	31.8	-25.4	0	41.43	-	-	-	-	0-360	100	H
2	2.115	35.15	PK	31.7	-24.1	0	42.75	-	-	-	-	0-360	199	H
3	2.151	35.15	PK	31.5	-24.2	0	42.45	-	-	-	-	0-360	100	V
4	3.063	31.8	PK	32.8	-30.9	0	33.7	-	-	-	-	0-360	100	H
5	3.073	31.39	PK	32.8	-30.7	0	33.49	-	-	-	-	0-360	100	H

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

PK - Peak detector

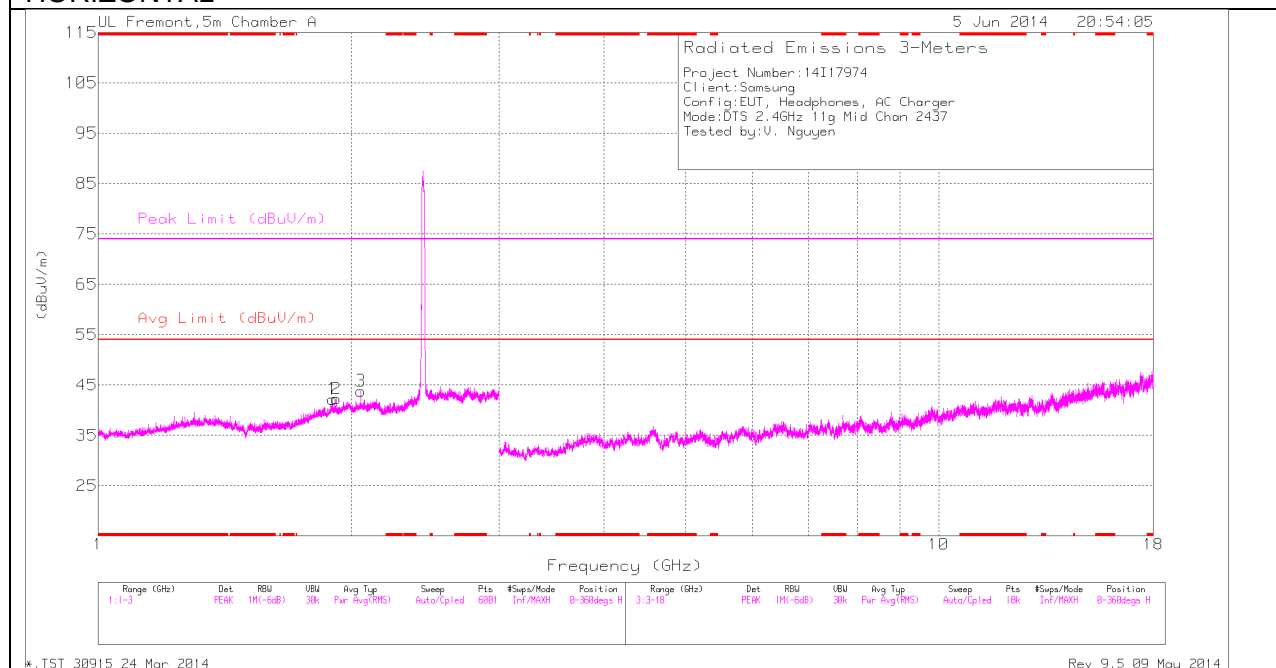
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.55	38.5	PK2	33.9	-28.5	0	43.9	-	-	74	-30.1	103	187	H
* 4.551	26.93	MAV1	33.9	-28.5	.3	32.63	54	-21.37	-	-	103	187	H

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

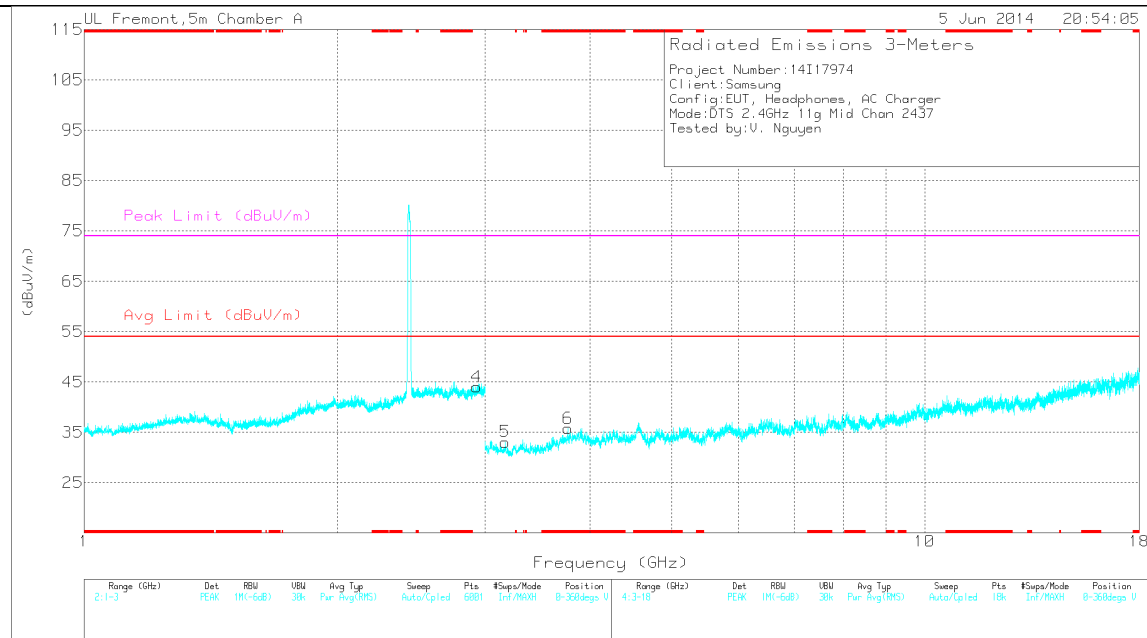
PK2 - KDB558074 Method: Maximum Peak

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 T136 (dB/m)	Amp/Cb/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 3.765	32.39	PK	33.5	-30.1	0	35.79	-	-	74	-38.21	0-360	200	V
1	1.9	35.68	PK	31.6	-25.1	0	42.18	-	-	-	-	0-360	200	H
2	1.92	35.87	PK	31.7	-25.3	0	42.27	-	-	-	-	0-360	200	H
3	2.054	36.4	PK	31.9	-24.5	0	43.8	-	-	-	-	0-360	200	H
4	2.931	34	PK	32.7	-22.7	0	44	-	-	-	-	0-360	201	V
5	3.167	31.4	PK	32.7	-31	0	33.1	-	-	-	-	0-360	100	V

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

PK - Peak detector

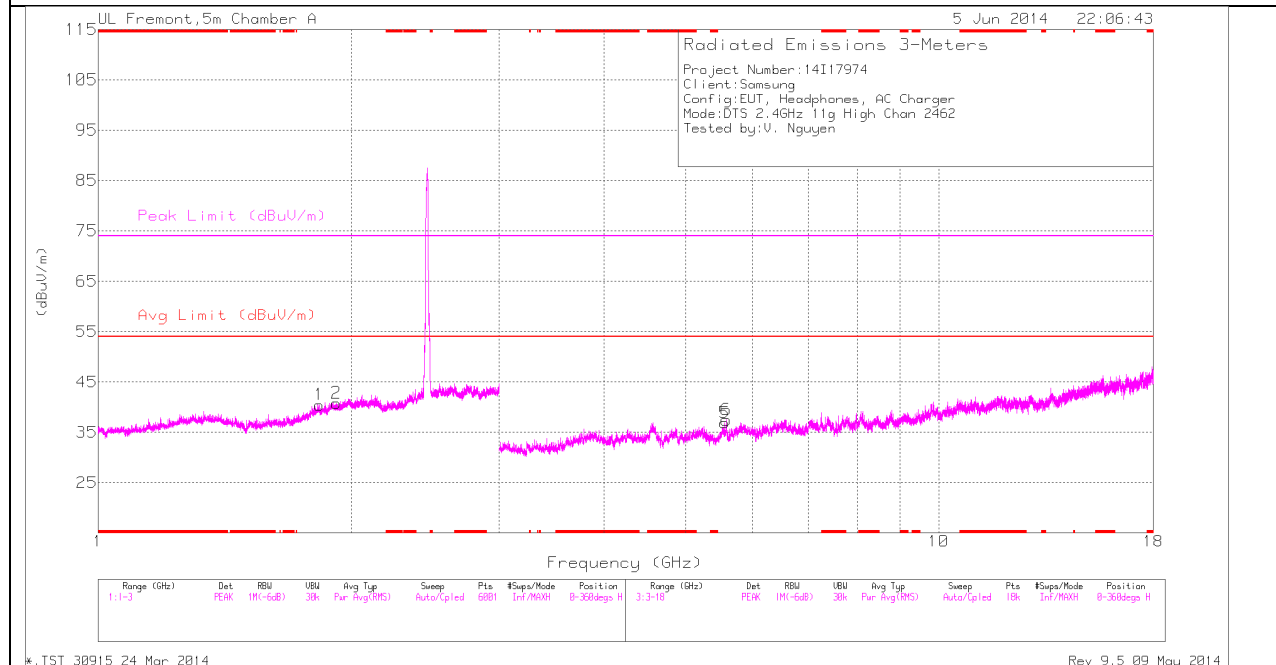
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.045	30.73	MAV1	31.9	-24.9	.3	38.03	-	-	-	-	152	254	H
2.051	43.43	PK2	31.9	-24.5	0	50.83	-	-	-	-	152	254	H
* 3.769	39.58	PK2	33.6	-30.6	0	42.58	-	-	74	-31.42	26	221	V
* 3.757	27.97	MAV1	33.5	-30.5	.3	31.27	54	-22.73	-	-	26	221	V

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

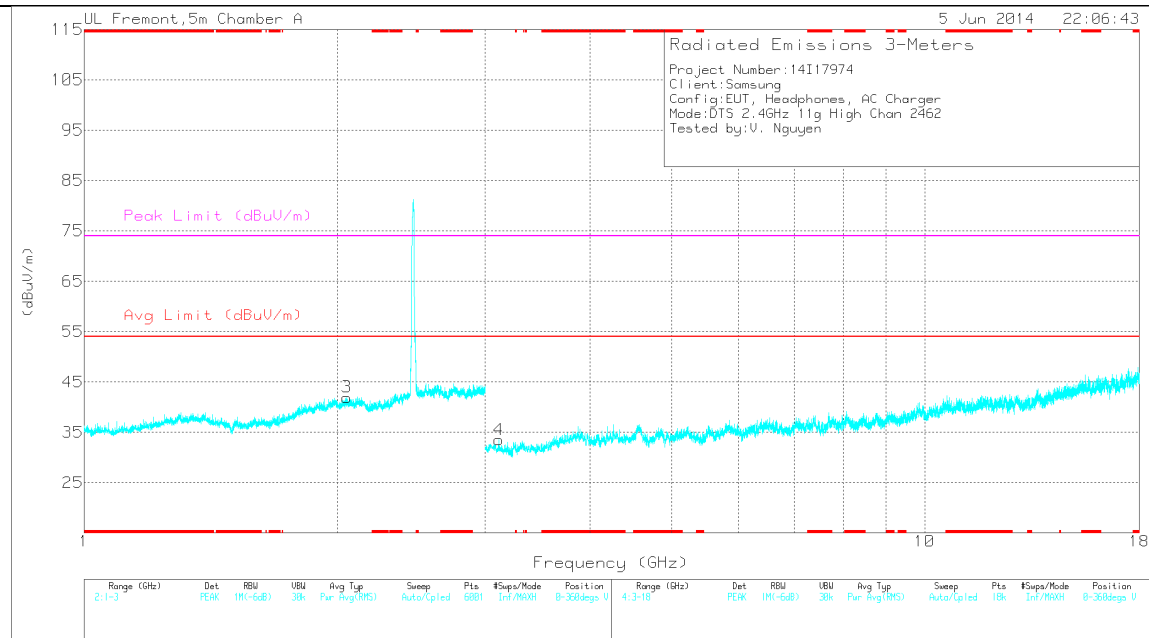
PK2 - KDB558074 Method: Maximum Peak

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.833	34.66	PK	30.9	-25.1	0	40.46	-	-	-	-	0-360	100	H
2	1.92	34.31	PK	31.7	-25.2	0	40.81	-	-	-	-	0-360	200	H
3	2.053	34.47	PK	31.9	-24.4	0	41.97	-	-	-	-	0-360	200	V
4	3.113	32.03	PK	32.8	-31.3	0	33.53	-	-	-	-	0-360	100	V
5	5.562	30.72	PK	34.4	-28.2	0	36.92	-	-	-	-	0-360	100	H
6	5.588	31.78	PK	34.4	-28.7	0	37.48	-	-	-	-	0-360	100	H

PK - Peak detector

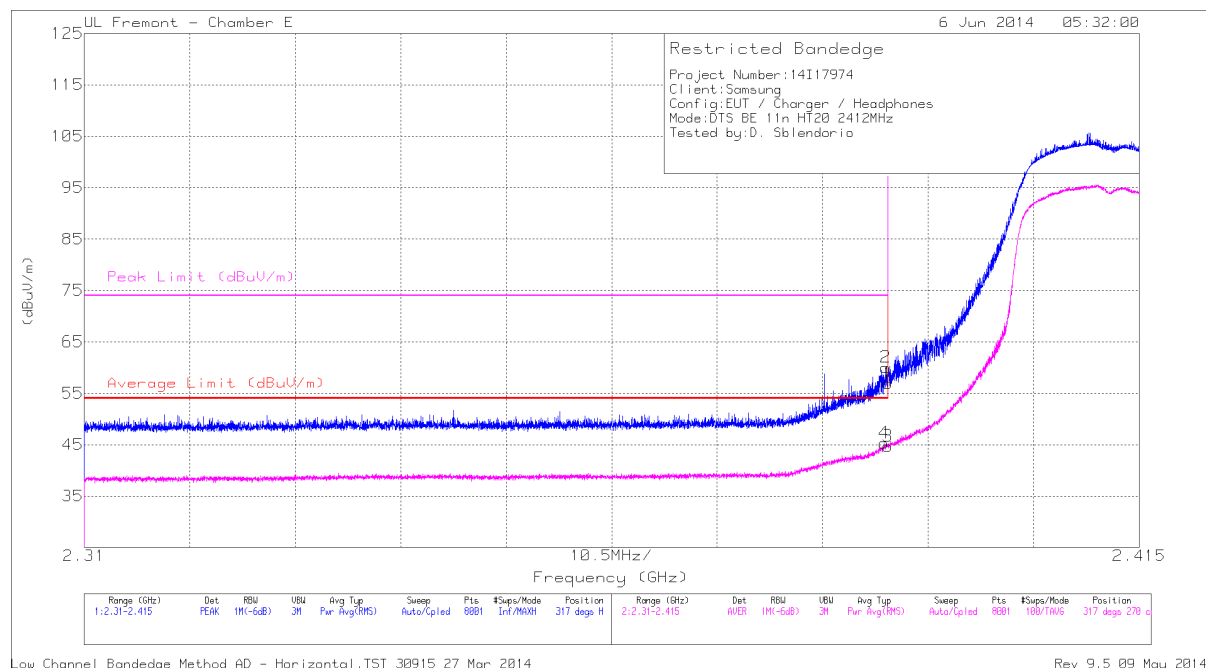
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.043	30.79	MAV1	31.9	-25	.3	37.99	-	-	-	-	122	227	V
2.052	42.82	PK2	31.9	-24.4	0	50.32	-	-	-	-	122	227	V

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)

HORIZONTAL



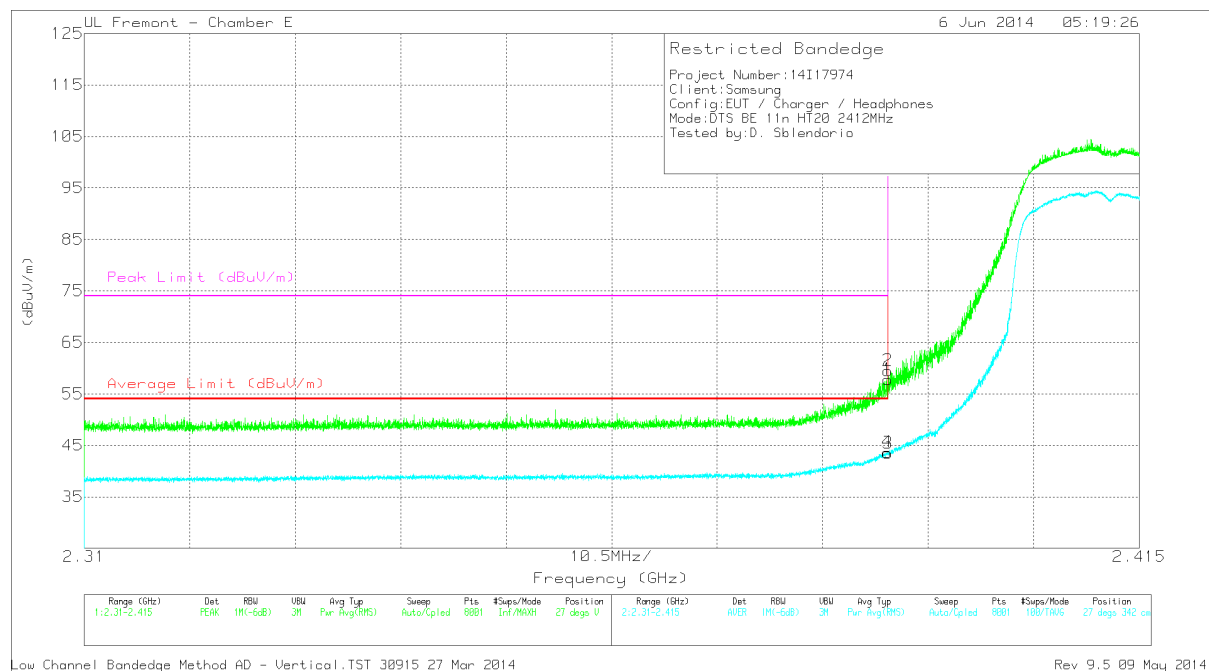
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	49.63	PK	32	-24.7	0	56.93	-	-	74	-17.07	317	270	H
2	* 2.39	52.74	PK	32	-24.7	0	60.04	-	-	74	-13.96	317	270	H
3	* 2.39	37.03	RMS	32	-24.7	.4	44.73	54	-9.27	-	-	317	270	H
4	* 2.39	37.65	RMS	32	-24.7	.4	45.35	54	-8.65	-	-	317	270	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fitter/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	50.52	PK	32	-24.7	0	57.82	-	-	74	-16.18	27	342	V
2	* 2.39	52.22	PK	32	-24.7	0	59.52	-	-	74	-14.48	27	342	V
3	* 2.39	35.81	RMS	32	-24.7	.4	43.51	54	-10.49	-	-	27	342	V
4	* 2.39	35.97	RMS	32	-24.7	.4	43.67	54	-10.33	-	-	27	342	V

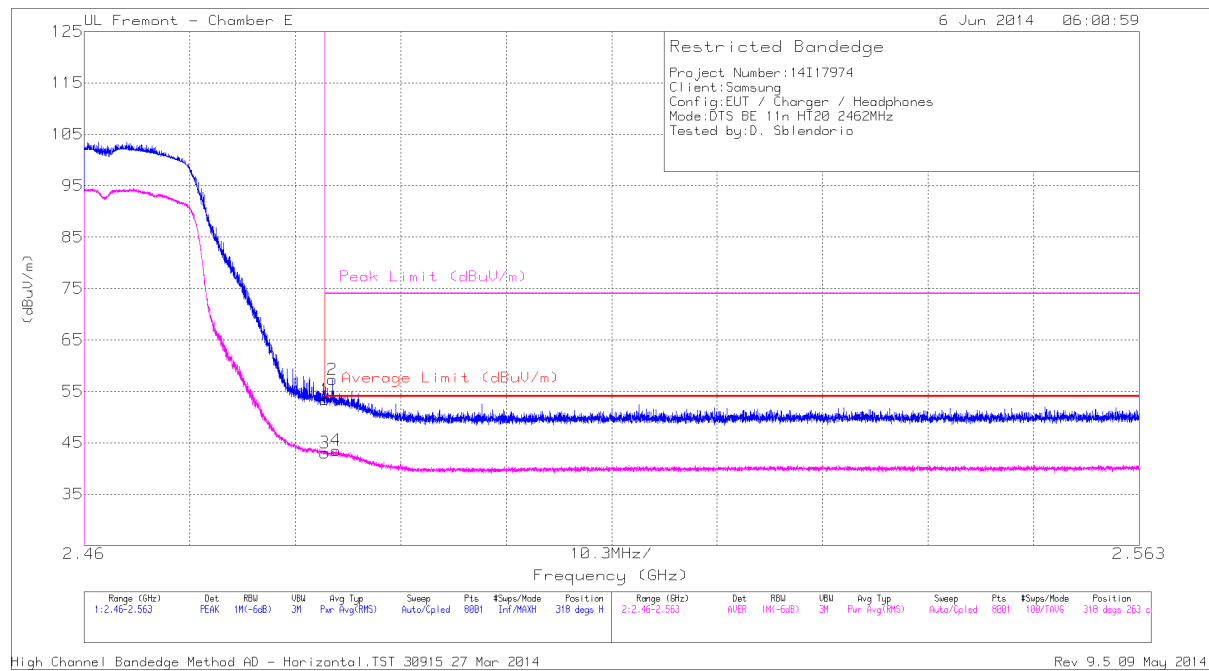
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL



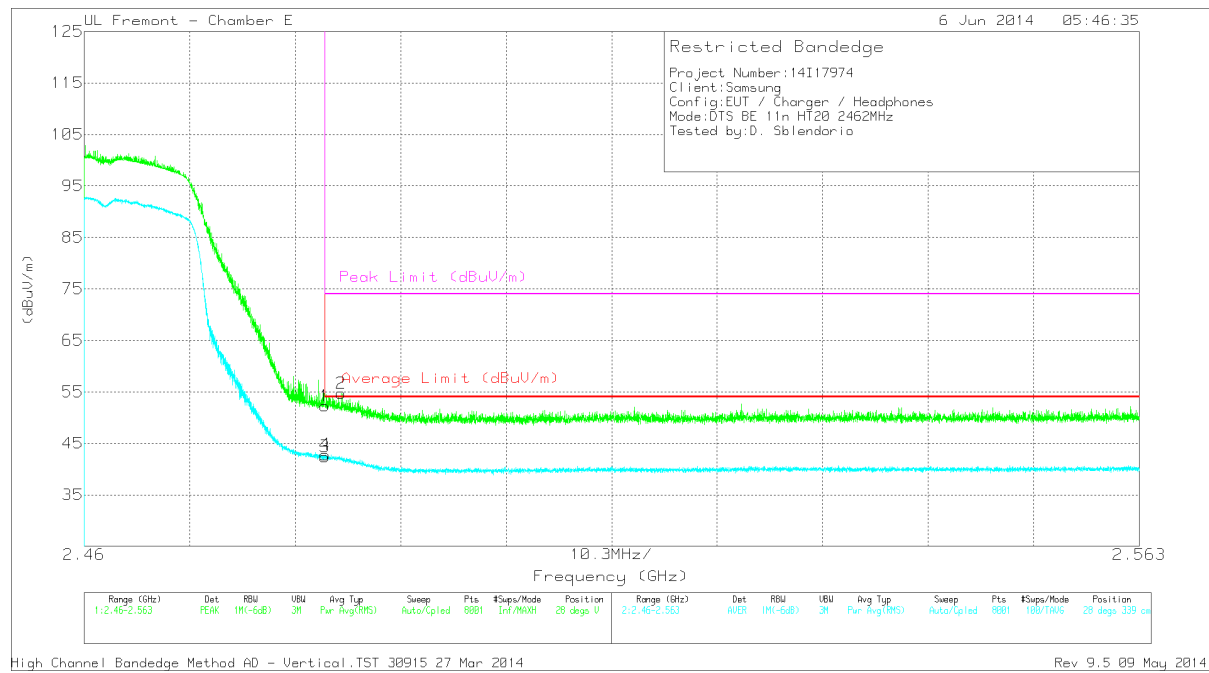
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.38	PK	32.3	-24.3	0	53.38	-	-	74	-20.62	318	263	H
2	* 2.484	49.3	PK	32.3	-24.3	0	57.3	-	-	74	-16.7	318	263	H
3	* 2.484	34.61	RMS	32.3	-24.3	.4	43.01	54	-10.99	-	-	318	263	H
4	* 2.485	35.12	RMS	32.3	-24.3	.4	43.52	54	-10.48	-	-	318	263	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL



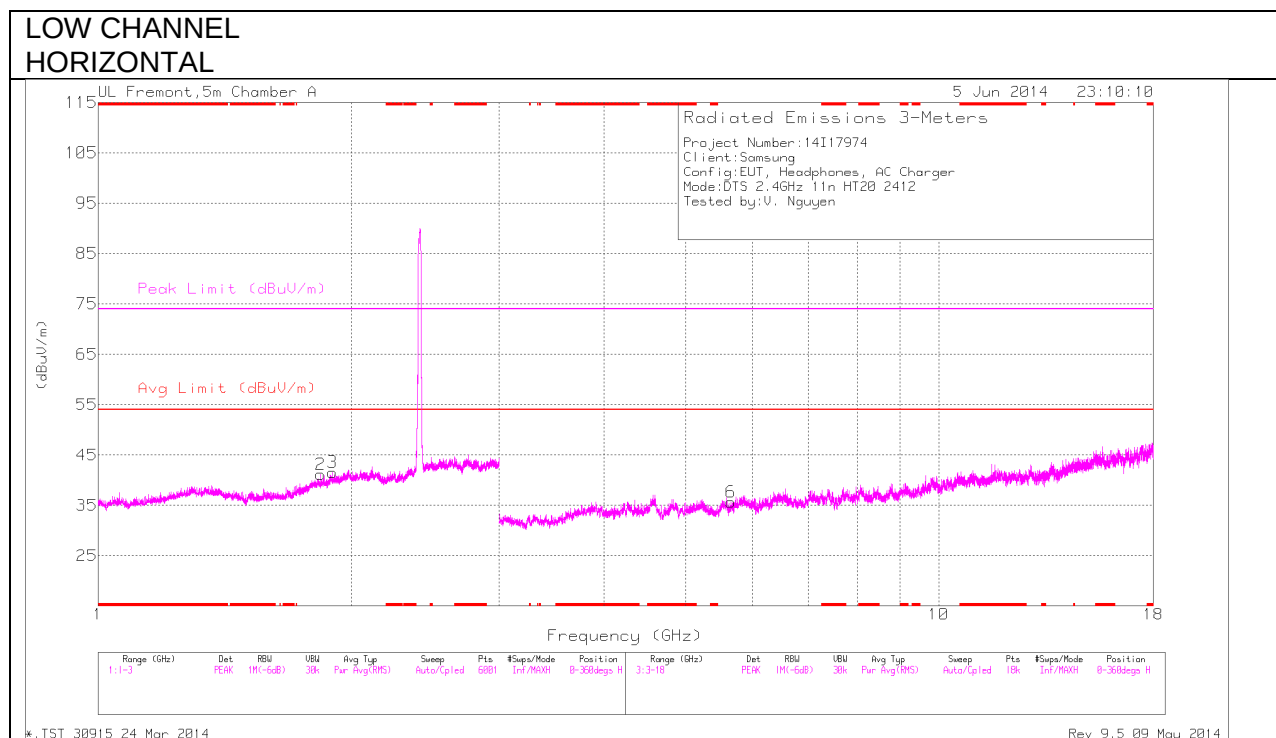
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	44.26	PK	32.3	-24.3	0	52.26	-	-	74	-21.74	28	339	V
2	* 2.485	46.7	PK	32.3	-24.3	0	54.7	-	-	74	-19.3	28	339	V
3	* 2.484	34	RMS	32.3	-24.3	.4	42.4	54	-11.6	-	-	28	339	V
4	* 2.484	34.37	RMS	32.3	-24.3	.4	42.77	54	-11.23	-	-	28	339	V

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

PK - Peak detector

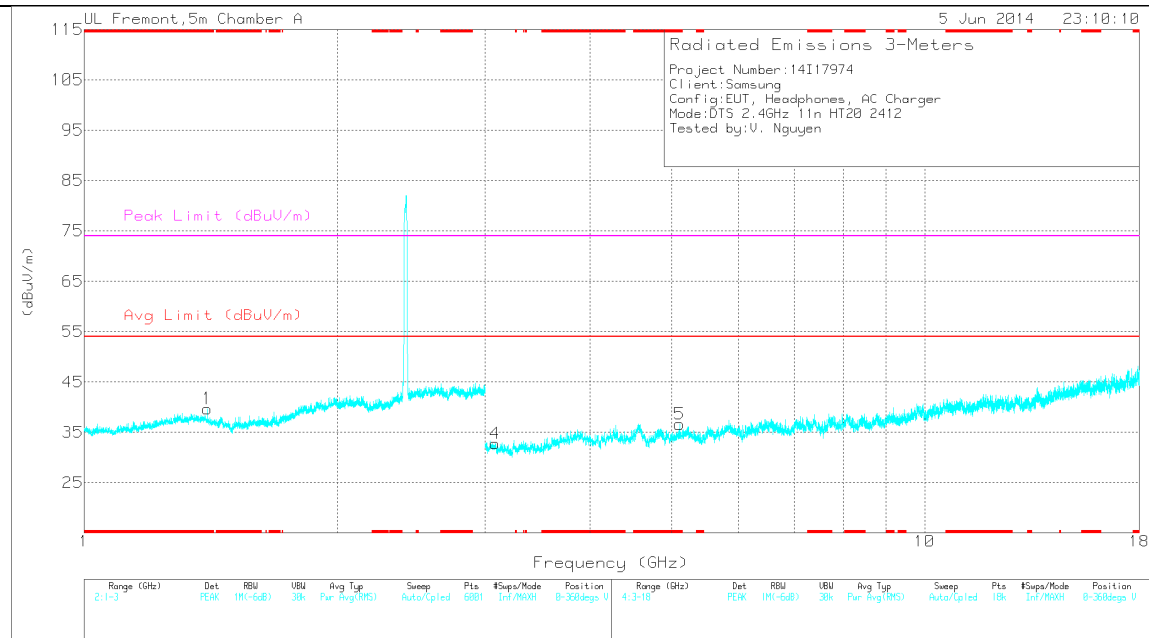
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.402	36.48	PK	29.8	-26.6	0	39.68	-	-	74	-34.32	0-360	100	V
5	* 5.11	33.02	PK	33.9	-30.3	0	36.62	-	-	74	-37.38	0-360	201	V
2	1.84	35.66	PK	31	-25.5	0	41.16	-	-	-	-	0-360	200	H
3	1.902	35.05	PK	31.7	-25.2	0	41.55	-	-	-	-	0-360	100	H
4	3.084	30.57	PK	32.8	-30.6	0	32.77	-	-	-	-	0-360	201	V
6	5.663	30.67	PK	34.5	-29.5	0	35.67	-	-	-	-	0-360	201	H

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

PK - Peak detector

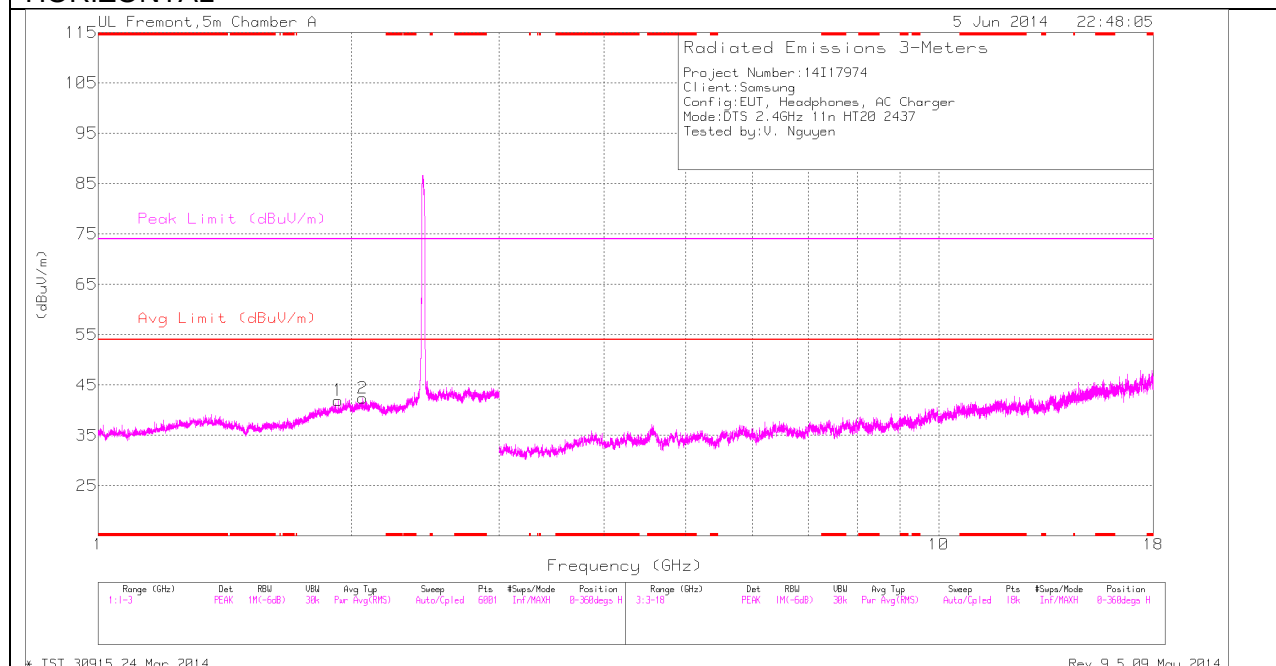
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.399	43.71	PK2	29.8	-26.5	0	47.01	-	-	74	-26.99	308	399	V
* 1.394	31.61	MAV1	29.8	-26.4	.4	35.31	54	-18.69	-	-	308	399	V
* 5.103	39.56	PK2	33.8	-30.5	0	42.86	-	-	74	-31.14	75	229	V
* 5.115	28.16	MAV1	33.9	-30.3	.4	32.06	54	-21.94	-	-	75	229	V

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

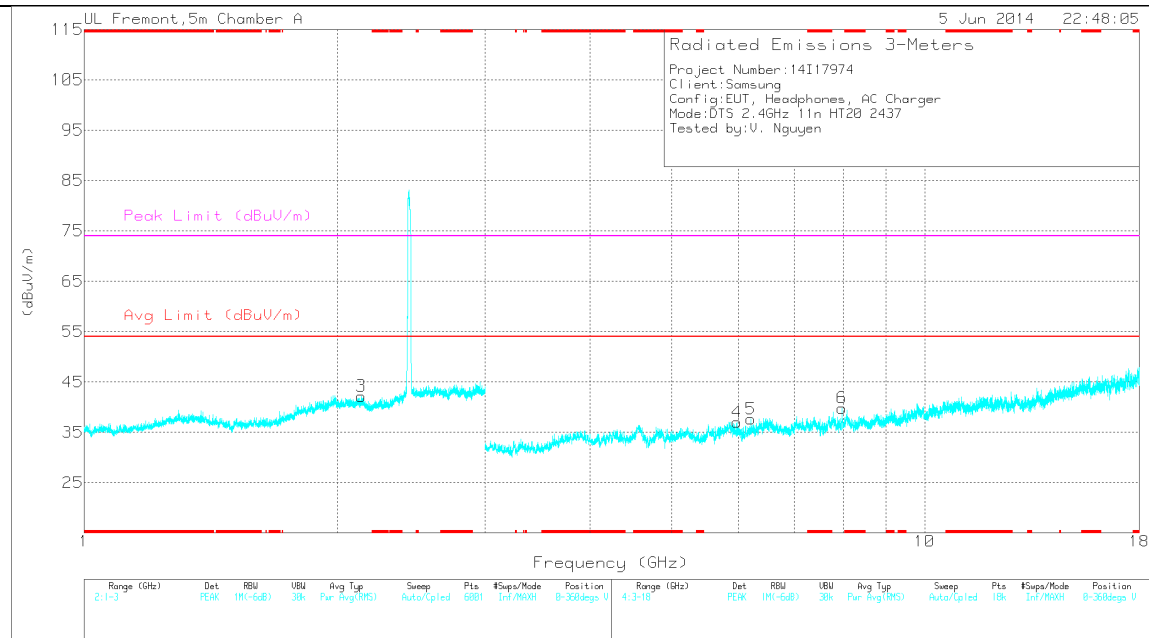
PK2 - KDB558074 Method: Maximum Peak

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.931	35.54	PK	31.8	-25.4	0	41.94	-	-	-	-	0-360	100	H
2	2.066	35.2	PK	31.9	-24.7	0	42.4	-	-	-	-	0-360	100	H
3	2.137	34.79	PK	31.6	-24.2	0	42.19	-	-	-	-	0-360	100	V
4	5.983	30.6	PK	35.3	-28.9	0	37	-	-	-	-	0-360	100	V
5	6.216	29.85	PK	35.4	-27.6	0	37.65	-	-	-	-	0-360	100	V
6	7.978	29.74	PK	35.5	-25.4	0	39.84	-	-	-	-	0-360	100	V

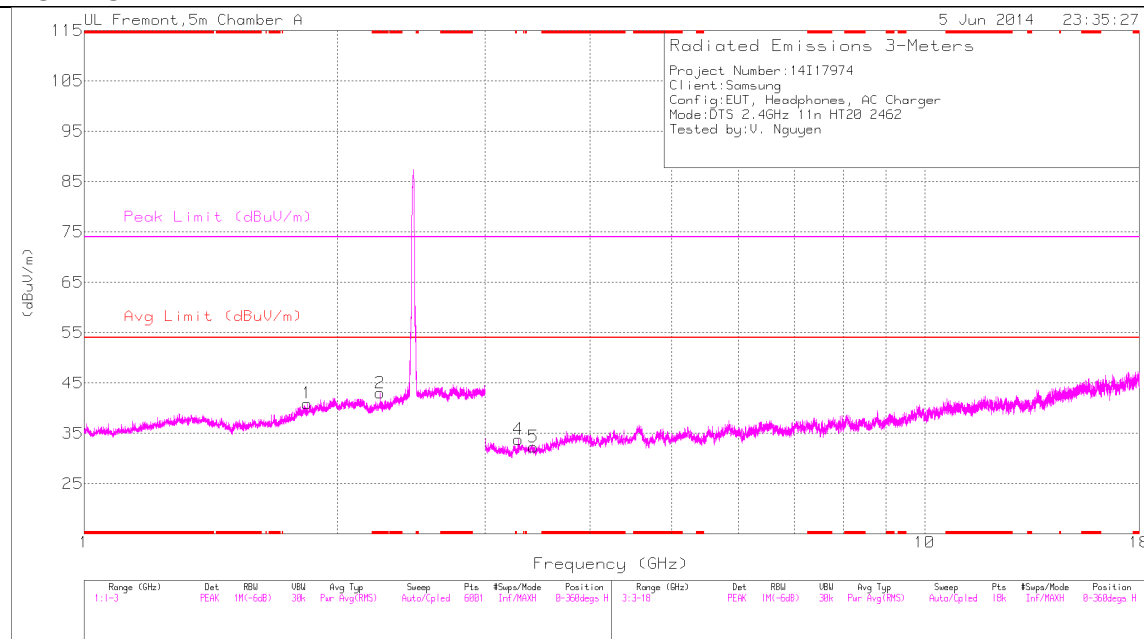
PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.059	42.61	PK2	31.9	-24.6	0	49.91	-	-	-	-	313	104	H
2.075	30.75	MAV1	31.8	-24.6	.4	38.25	-	-	-	-	313	104	H

PK2 - KDB558074 Method: Maximum Peak

HIGH CHANNEL HORIZONTAL

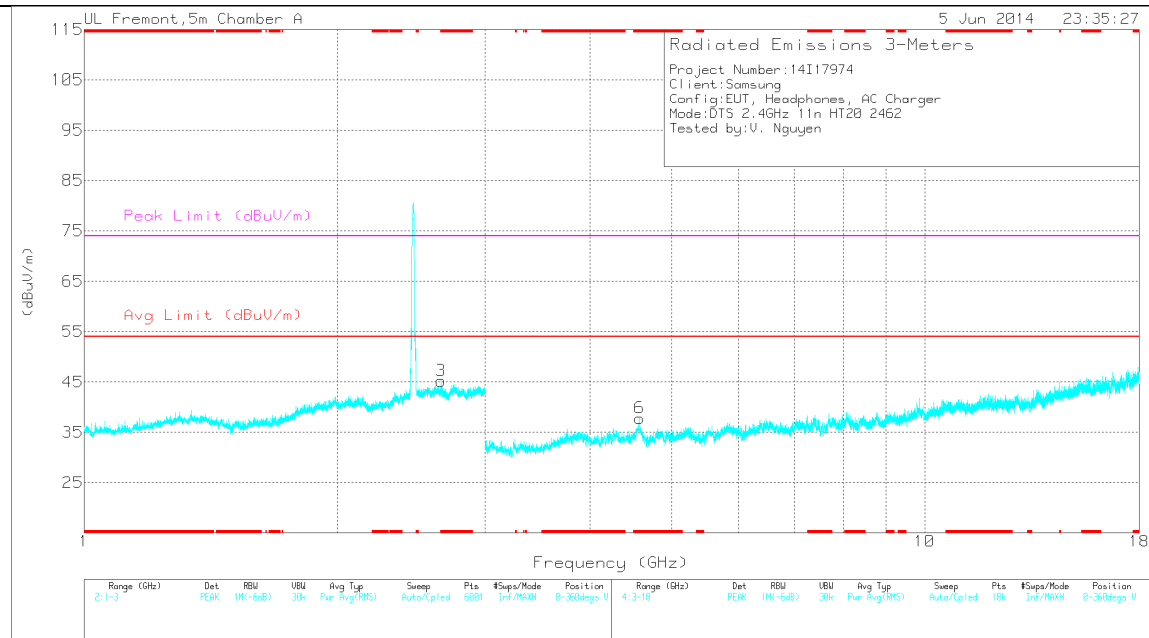


K.TST 30915 24 Mar 2014

Rev 9.5 09 May 2014

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



W.TST 30915 24 Mar 2014

Rev 9.5 09 May 2014

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.25	35.82	PK	31.4	-24.2	0	43.02	-	-	74	-30.98	0-360	200	H
3	* 2.659	35.44	PK	32.8	-23	0	45.24	-	-	74	-28.76	0-360	100	V
6	* 4.578	32.44	PK	34	-28.6	0	37.84	-	-	74	-36.16	0-360	200	V
1	1.843	35.37	PK	31	-25.4	0	40.97	-	-	-	-	0-360	100	H
4	3.284	32.21	PK	32.9	-31.3	0	33.81	-	-	-	-	0-360	100	H
5	3.423	30.33	PK	33	-31	0	32.33	-	-	-	-	0-360	201	H

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

PK - Peak detector

Radiated Emissions

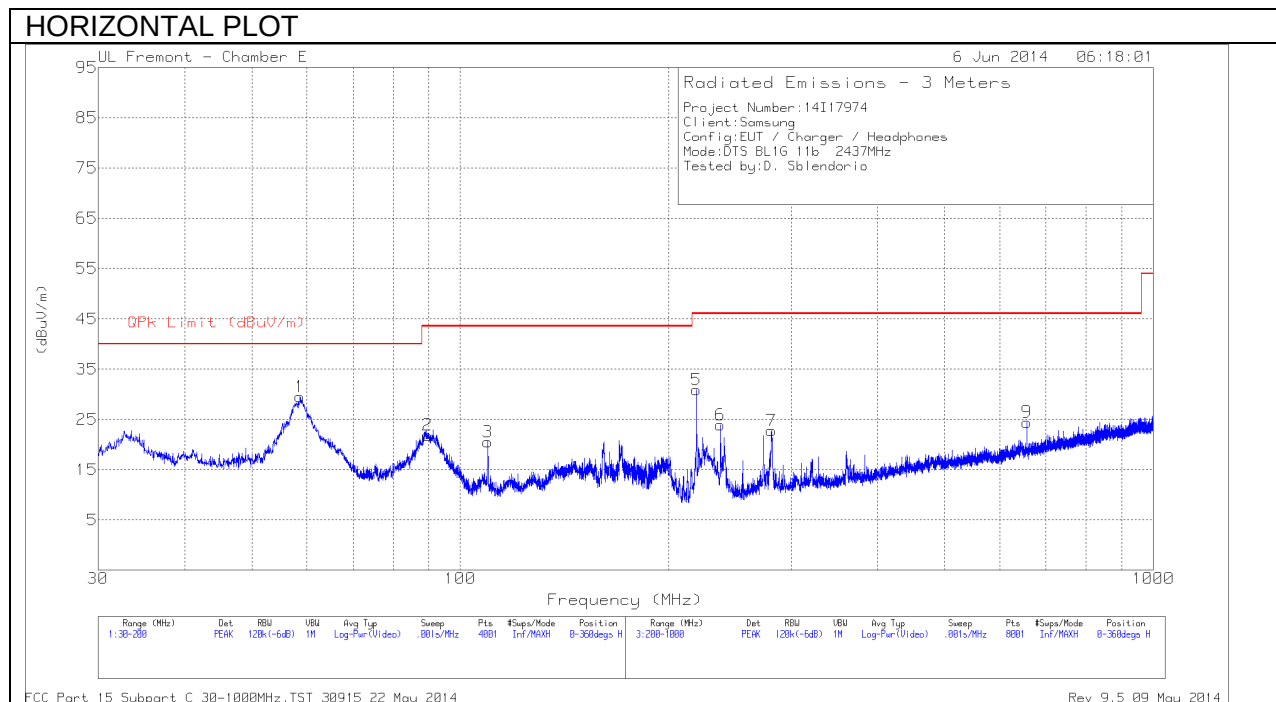
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.258	42.46	PK2	31.4	-24.5	0	49.36	-	-	74	-24.64	220	258	H
* 2.248	30.48	MAV1	31.4	-24.2	.4	37.98	54	-16.02	-	-	220	258	H
* 2.659	41.99	PK2	32.8	-23	0	51.79	-	-	74	-22.21	302	148	V
* 2.66	30.41	MAV1	32.8	-23.1	.4	40.41	54	-13.59	-	-	302	148	V
* 4.576	40.06	PK2	34	-28.6	0	45.46	-	-	74	-28.54	340	150	V
* 4.579	28.41	MAV1	34	-28.6	.4	34.11	54	-19.89	-	-	340	150	V

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

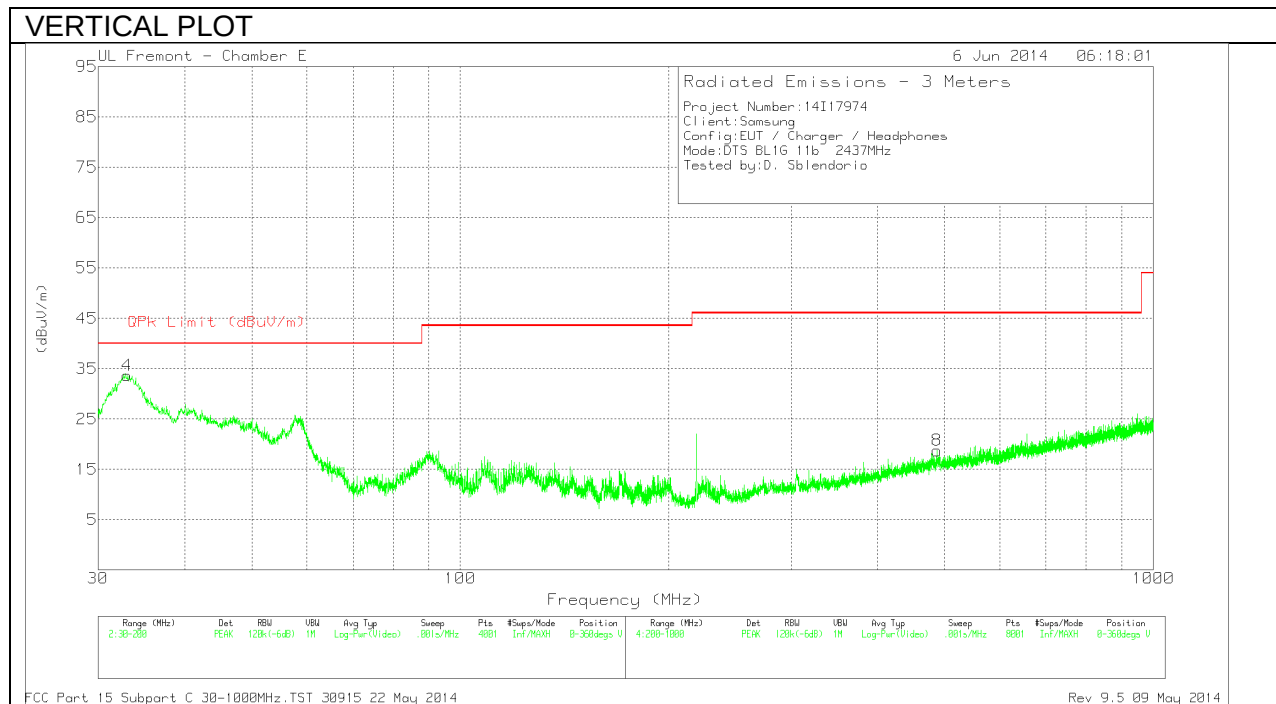
PK2 - KDB558074 Method: Maximum Peak

10.3. WORST-CASE BELOW 1 GHz

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



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



Below 1G Data

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
3	* 109.56	39.4	PK	12.4	-31.3	20.5	43.52	-23.02	0-360	200	H
7	* 281.2	39.88	PK	13.3	-30.4	22.78	46.02	-23.24	0-360	100	H
4	33.06	46.24	PK	19.2	-31.8	33.64	40	-6.36	0-360	100	V
1	58.6875	53.7	PK	7.4	-31.6	29.5	40	-10.5	0-360	400	H
2	89.67	45.56	PK	7.7	-31.4	21.86	43.52	-21.66	0-360	301	H
5	219.1	50.77	PK	10.7	-30.6	30.87	46.02	-15.15	0-360	100	H
6	237.3	43.11	PK	11.4	-30.6	23.91	46.02	-22.11	0-360	100	H
8	487.2	30.73	PK	17.6	-29.6	18.73	46.02	-27.29	0-360	200	V
9	657.3	34.24	PK	19.6	-29.4	24.44	46.02	-21.58	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

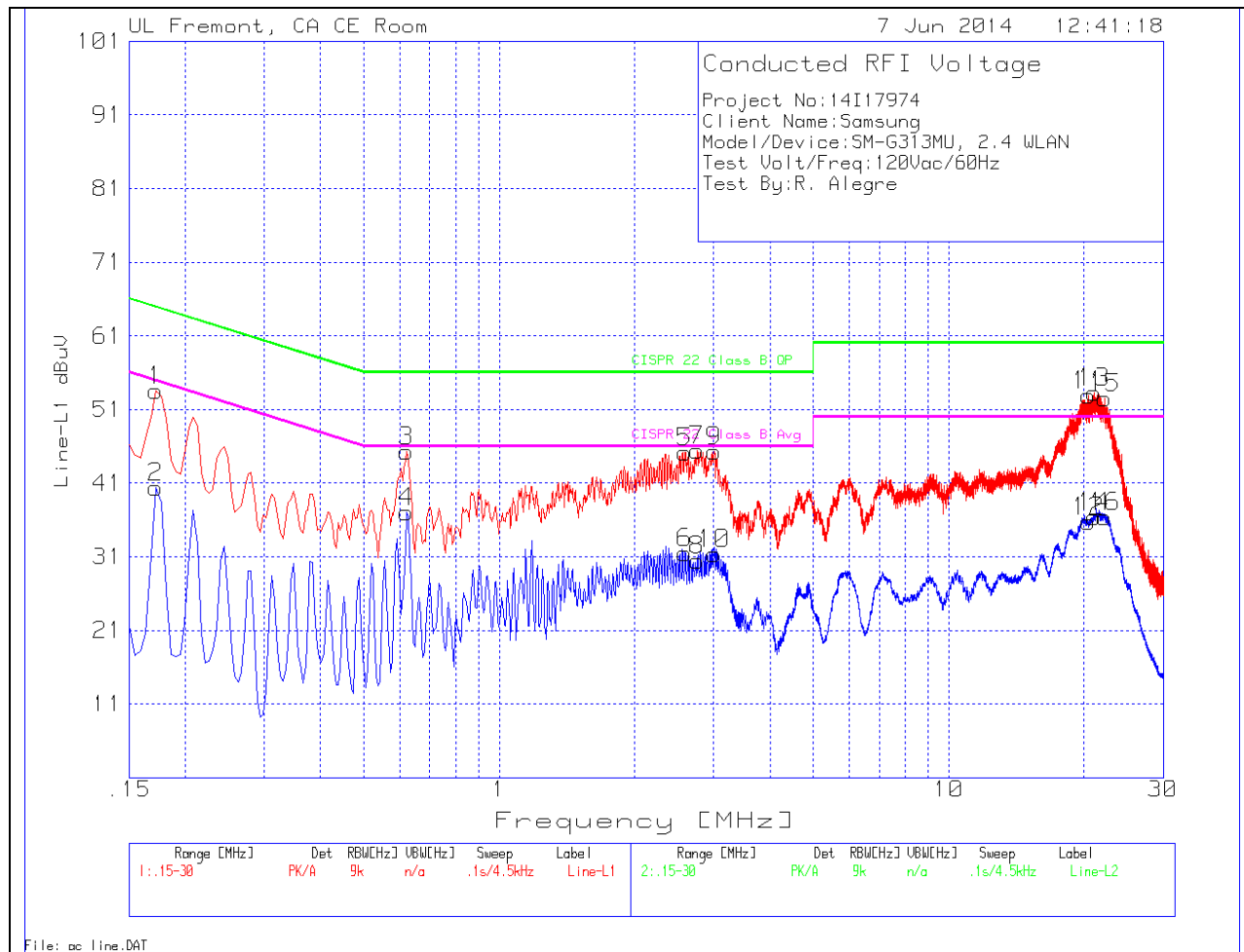
Line-L1 .15 - 30MHz

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	.1725	52.3	PK	1.2	0	53.5	64.8	-11.3	-	-
2	.1725	39.17	Av	1.2	0	40.37	-	-	54.8	-14.43
3	.6225	44.95	PK	.3	0	45.25	56	-10.75	-	-
4	.6225	36.77	Av	.3	0	37.07	-	-	46	-8.93
5	2.59125	44.92	PK	.2	.1	45.22	56	-10.78	-	-
6	2.59125	31.19	Av	.2	.1	31.49	-	-	46	-14.51
7	2.76	45.1	PK	.2	.1	45.4	56	-10.6	-	-
8	2.76	30.21	Av	.2	.1	30.51	-	-	46	-15.49
9	3.003	44.98	PK	.2	.1	45.28	56	-10.72	-	-
10	3.003	31.04	Av	.2	.1	31.34	-	-	46	-14.66
11	20.427	52.37	PK	.3	.2	52.87	60	-7.13	-	-
12	20.427	35.21	Av	.3	.2	35.71	-	-	50	-14.29
13	21.102	52.81	PK	.3	.2	53.31	60	-6.69	-	-
14	21.102	35.89	Av	.3	.2	36.39	-	-	50	-13.61
15	22.272	51.94	PK	.3	.3	52.54	60	-7.46	-	-
16	22.272	35.8	Av	.3	.3	36.4	-	-	50	-13.6

Line-L2 .15 - 30MHz

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)
17	.15	43.77	PK	1.5	0	45.27	66	-20.73	-	-
18	.15	26.75	Av	1.5	0	28.25	-	-	56	-27.75
19	.168	42.24	PK	1.3	0	43.54	65.1	-21.56	-	-
20	.168	23.53	Av	1.3	0	24.83	-	-	55.1	-30.27
21	.4785	35.61	PK	.4	0	36.01	56.4	-20.39	-	-
22	.4785	22.92	Av	.4	0	23.32	-	-	46.4	-23.08
23	.609	42.61	PK	.3	0	42.91	56	-13.09	-	-
24	.609	31.94	Av	.3	0	32.24	-	-	46	-13.76
27	2.0085	40.08	PK	.2	.1	40.38	56	-15.62	-	-
28	2.0085	25.7	Av	.2	.1	26	-	-	46	-20
25	2.904	40.86	PK	.2	.1	41.16	56	-14.84	-	-
26	2.904	26.35	Av	.2	.1	26.65	-	-	46	-19.35
29	3.156	39.33	PK	.2	.1	39.63	56	-16.37	-	-
30	3.156	22.95	Av	.2	.1	23.25	-	-	46	-22.75
33	20.157	46.93	PK	.3	.2	47.43	60	-12.57	-	-
34	20.157	29.43	Av	.3	.2	29.93	-	-	50	-20.07
31	21.4575	47.65	PK	.3	.2	48.15	60	-11.85	-	-
32	21.4575	30.6	Av	.3	.2	31.1	-	-	50	-18.9
35	23.0325	45.97	PK	.3	.2	46.47	60	-13.53	-	-
36	23.0325	28.71	Av	.3	.2	29.21	-	-	50	-20.79

LINE 1 RESULTS



LINE 2 RESULTS

