



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

802.11a/b/g/n 2.4/5GHz Radio

MODEL NUMBER: ID:093

FCC ID: DKNHG

REPORT NUMBER: 15U20961-E1, REVISION A

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Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	8/10/15	Initial Issue	P. Zhang
A	9/21/15	Update page 12 test method from PK to AVG	P. Zhang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Echostar Technologies LLC
EUT DESCRIPTION: 802.11a/b/g/n 2.4/5GHz Radio
MODEL: ID:093
SERIAL NUMBER: 2161167 (Conducted); 2161165 (Radiated)
DATE TESTED: July 7 – August 12, 2015

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 C63.10-2009 for FCC.

Testing for radiated emissions above 1GHz was performed with the EUT elevated at 1.5m instead of 0.8m. This test height has been permitted by FCC as discussed in FCC/TCB conference call in December 2014.

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 an 802.11a/b/g/n 2.4/5GHz Radio.

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	13.3	21.38
2412 - 2462	802.11g	8	6.31
2412 - 2462	802.11n HT20 MCS0	7.5	5.62

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 2.3 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
Laptop	HP	N/A	N/A	N/A
Laptop Charger	HP	N/A	N/A	N/A

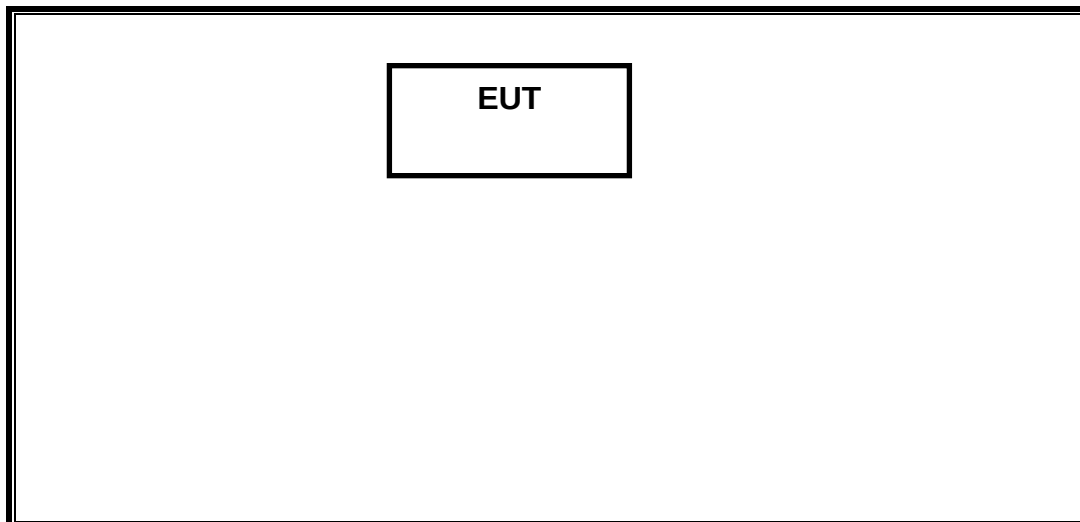
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Ethernet	1	RJ-45	Unshielded	1m	N/A

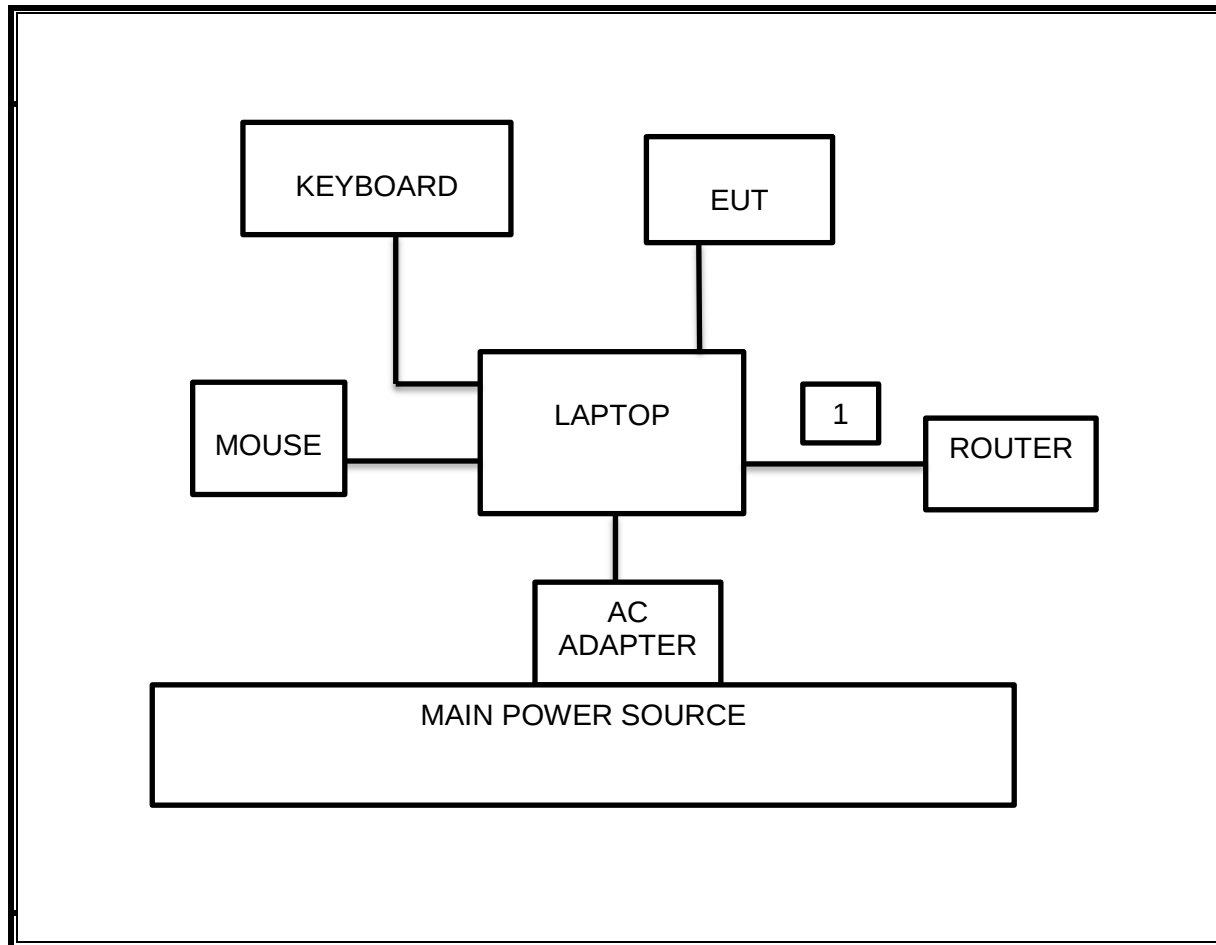
TEST SETUP

The EUT is setup as a stand-alone device.

SETUP DIAGRAM FOR TESTS



SETUP DIAGRAM FOR AC LINE 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	C01171	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/15
RF Preamplifier, 100KHz -> 1300MHz	HP	8447D	T10	01/06/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	None	07/12/16
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/16
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012	
CLT Software	UL	UL RF	Ver 1.0, Feb 2 2015	
Antenna Port Software	UL	UL RF	Ver 2.1.1.1, Jan 20 2015	

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r03: Measurement Procedure AVGPM-G is used for power and AVGPS-3 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	7.10MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-30.53dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	13.3dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-4.66dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	49.42 dBuV
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	53.34dBuV/m

9. ANTENNA PORT TEST RESULTS

9.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

TEST PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r03: 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	7.10	0.5
Mid	2437	7.13	0.5
High	2462	7.11	0.5
Worst		7.10	

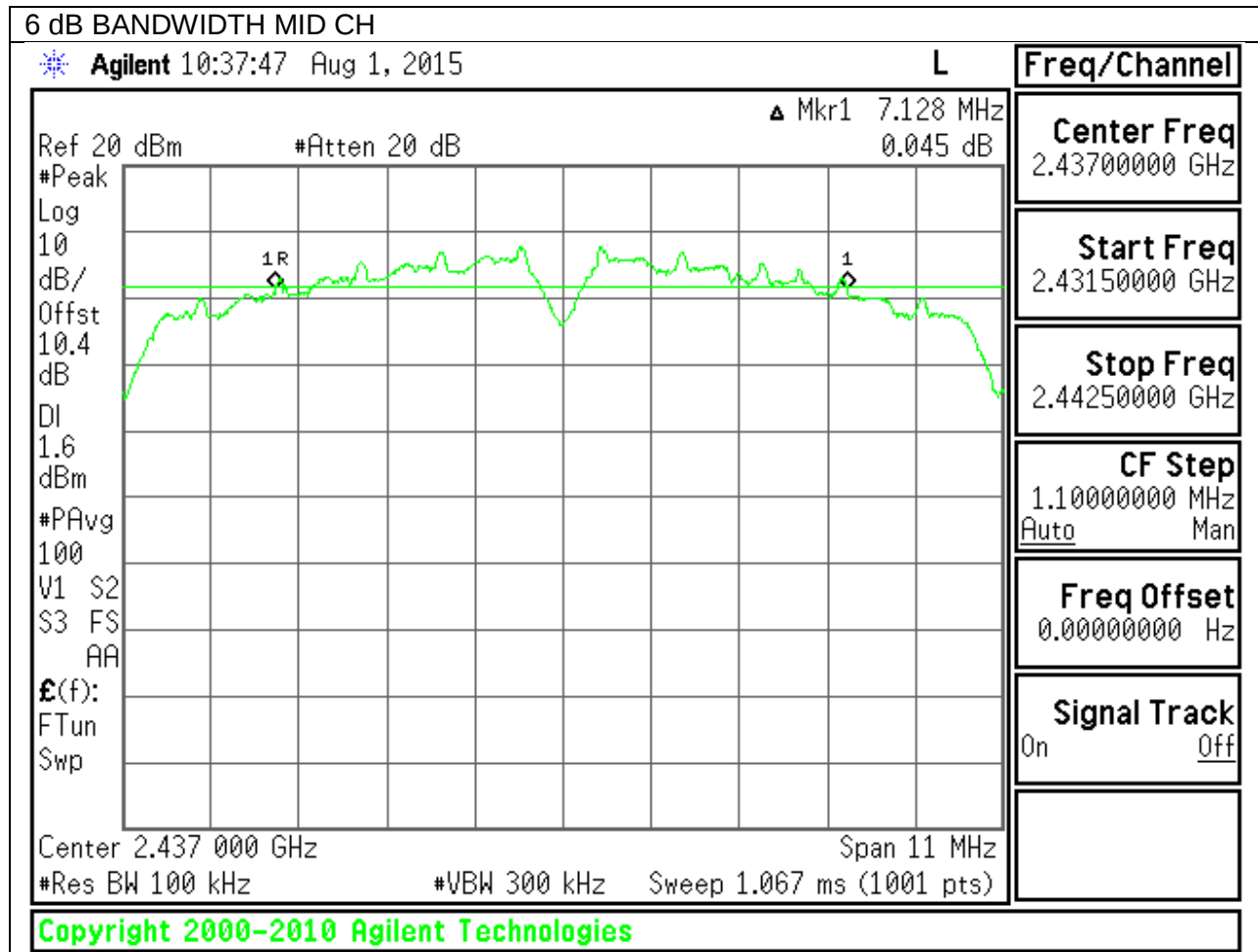
9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.35	0.5
Mid	2437	16.35	0.5
High	2462	16.33	0.5
Worst		16.33	

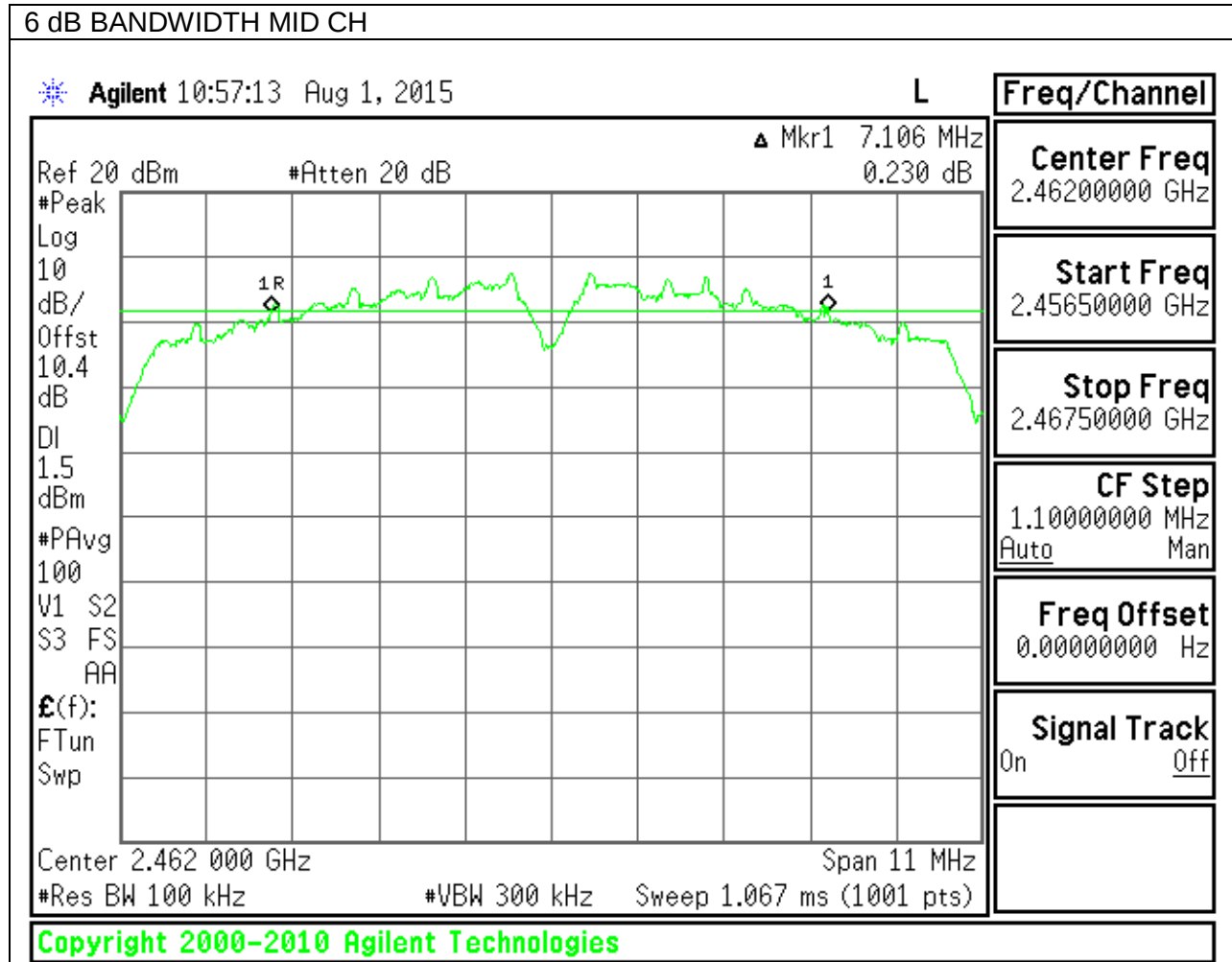
9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.32	0.5
Mid	2437	16.93	0.5
High	2462	16.85	0.5
Worst		16.85	

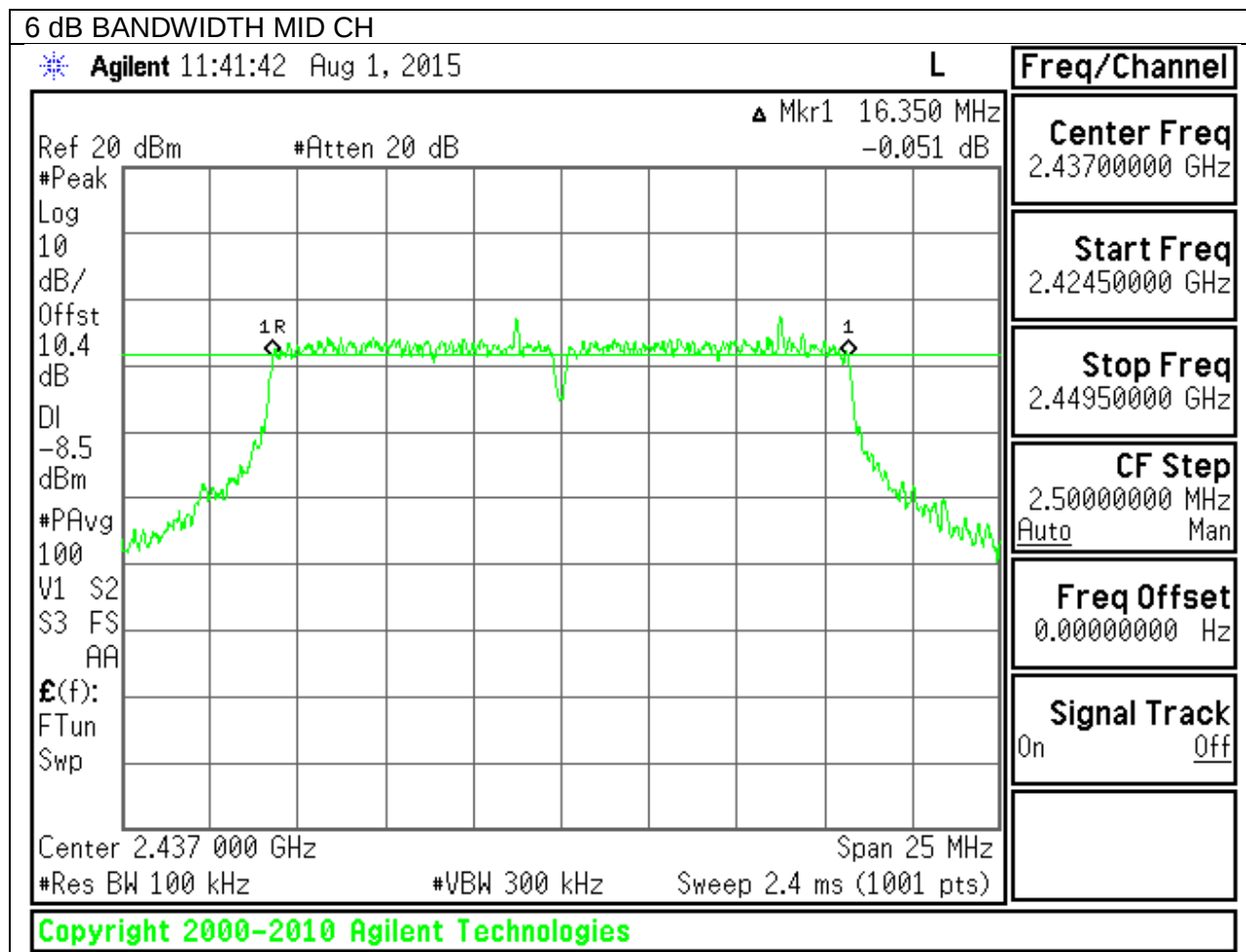
802.11b 6 dB BANDWIDTH



802.11g 6 dB BANDWIDTH



802.11n HT20 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	12.75
Mid	2437	12.61
High	2462	12.55
Worst		12.75

9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.56
Mid	2437	16.48
High	2462	16.52
Worst		16.56

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.61
Mid	2437	17.64
High	2462	17.61
Worst		17.64

9.3. OUTPUT POWER

LIMITS

FCC §15.247

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

9.3.1. 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	2.30	30.00	30	36	30.00
Mid	2437	2.30	30.00	30	36	30.00
High	2462	2.30	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	13.00	13.00	30.00	-17.00
Mid	2437	13.00	13.00	30.00	-17.00
High	2462	13.30	13.30	30.00	-16.70
Worst			13.30		

9.3.2. 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	2.30	30.00	30	36	30.00
Mid	2437	2.30	30.00	30	36	30.00
High	2462	2.30	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	8.00	8.00	30.00	-22.00
Mid	2437	8.00	8.00	30.00	-22.00
High	2462	8.00	8.00	30.00	-22.00
Worst			8.00		

9.3.3. 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	2.30	30.00	30	36	30.00
Mid	2437	2.30	30.00	30	36	30.00
High	2462	2.30	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	7.50	7.50	30.00	-22.50
Mid	2437	7.20	7.20	30.00	-22.80
High	2462	7.30	7.30	30.00	-22.70
Worst			7.50		

9.4. PSD

LIMITS

FCC §15.247

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

9.4.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-4.66	8.0	-12.7
Mid	2437	-4.74	8.0	-12.7
High	2462	-4.75	8.0	-12.7

9.4.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

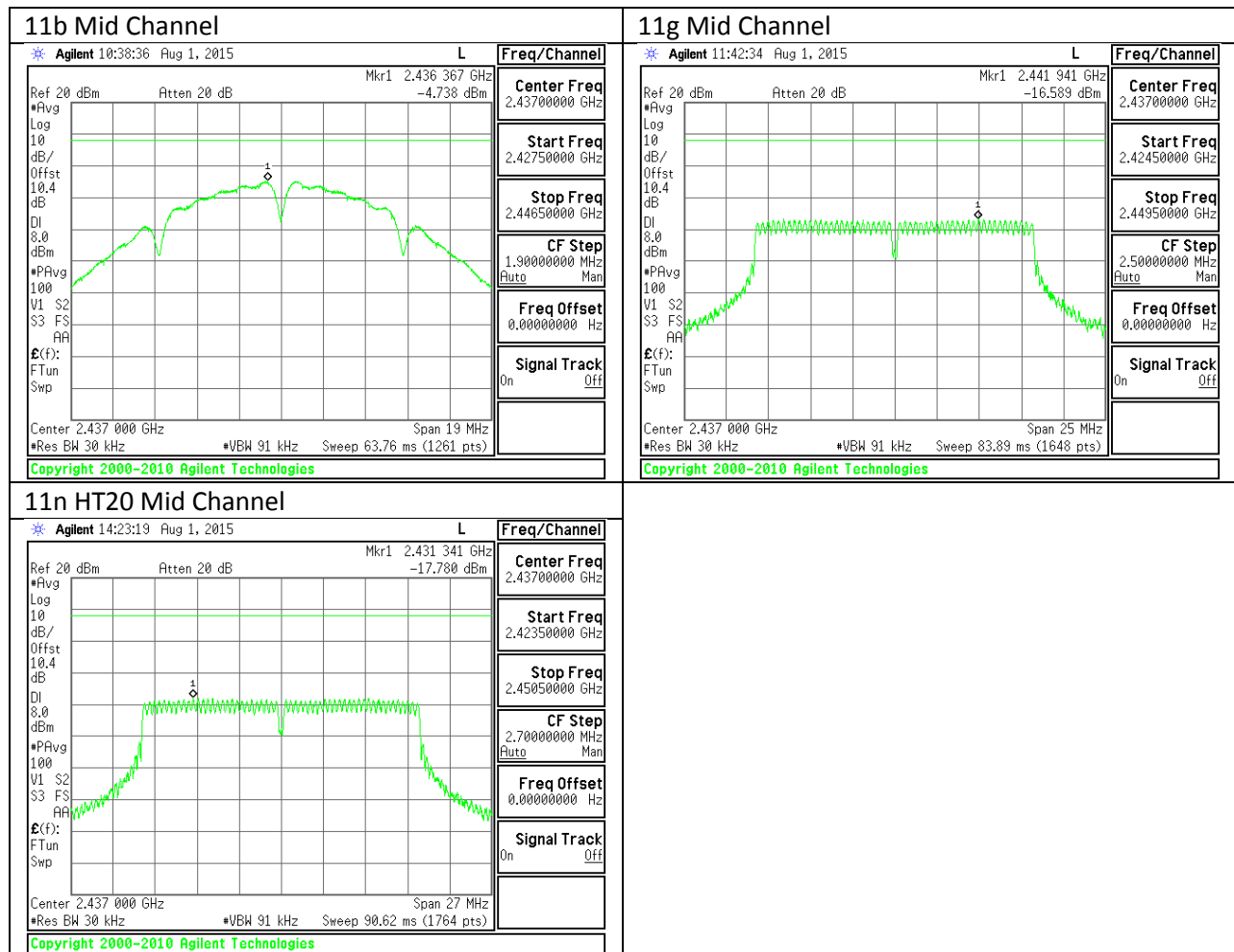
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-16.23	8.0	-24.2
Mid	2437	-16.59	8.0	-24.6
High	2462	-16.95	8.0	-24.9

9.4.3. 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	-17.75	8.0	-25.7
Mid	2437	-17.78	8.0	-25.8
High	2462	-18.01	8.0	-26.0

9.4.4. PSD MID CH PLOTS



9.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

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.

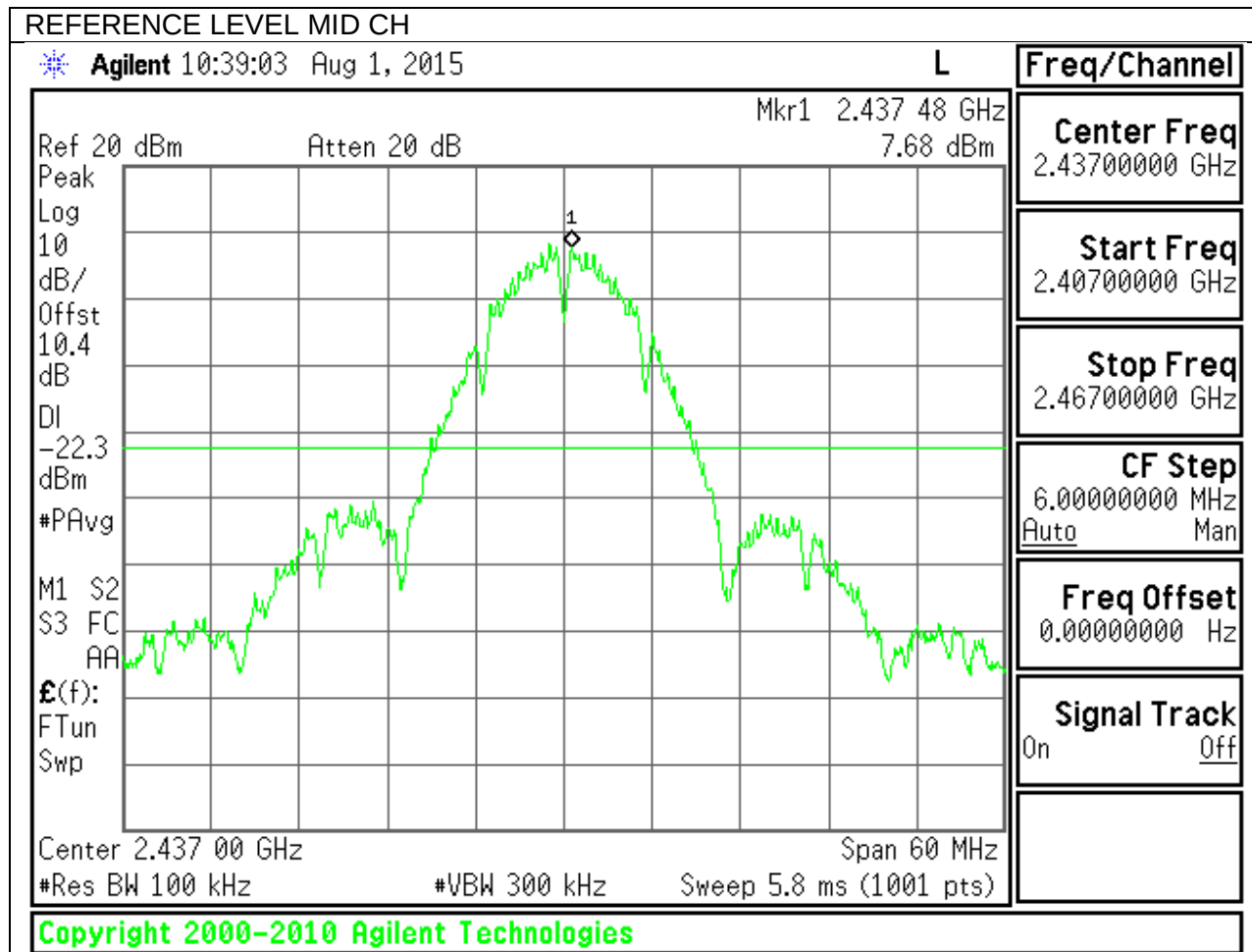
TEST PROCEDURE

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.

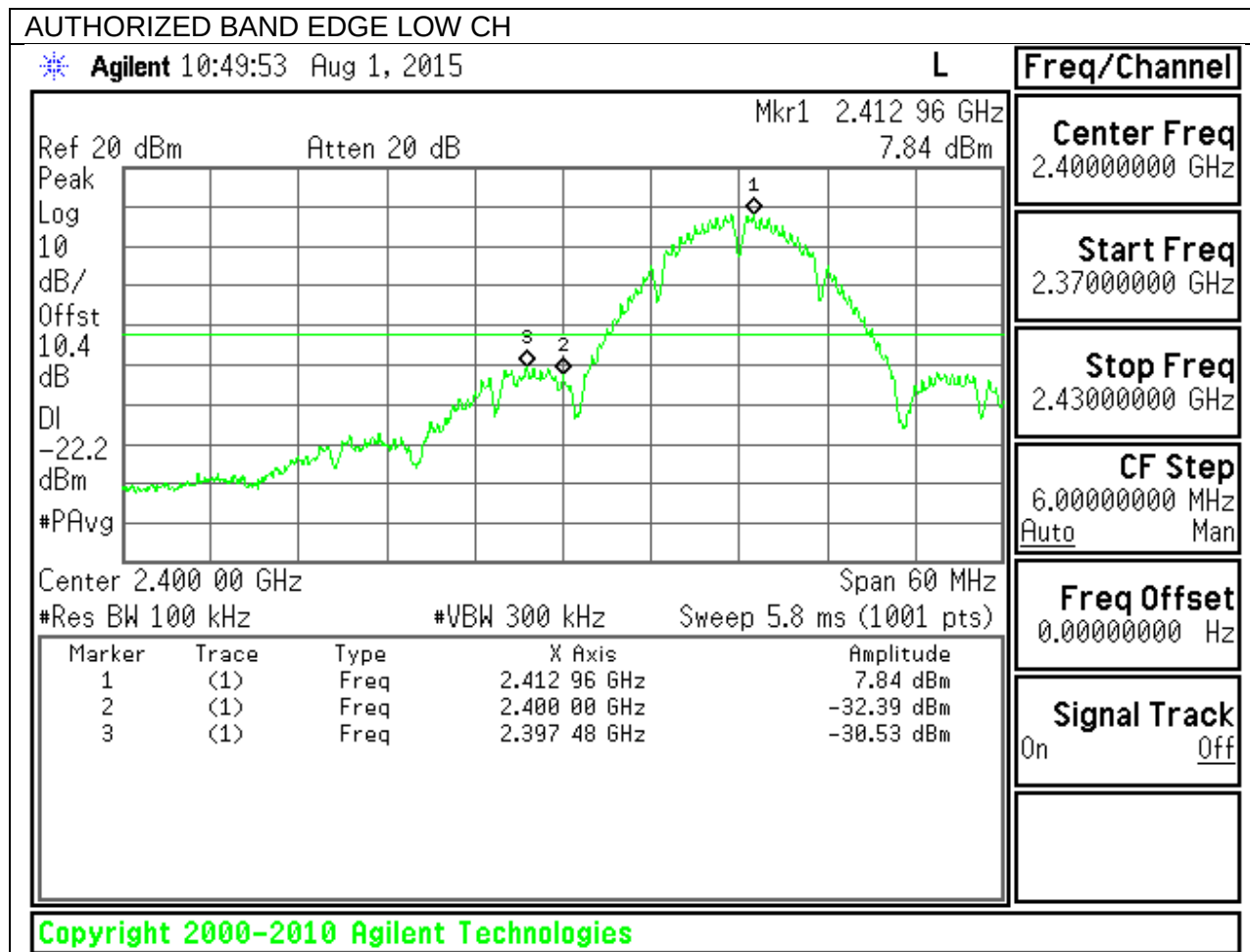
RESULTS

9.5.1. 802.11b MODE IN THE 2.4 GHz BAND

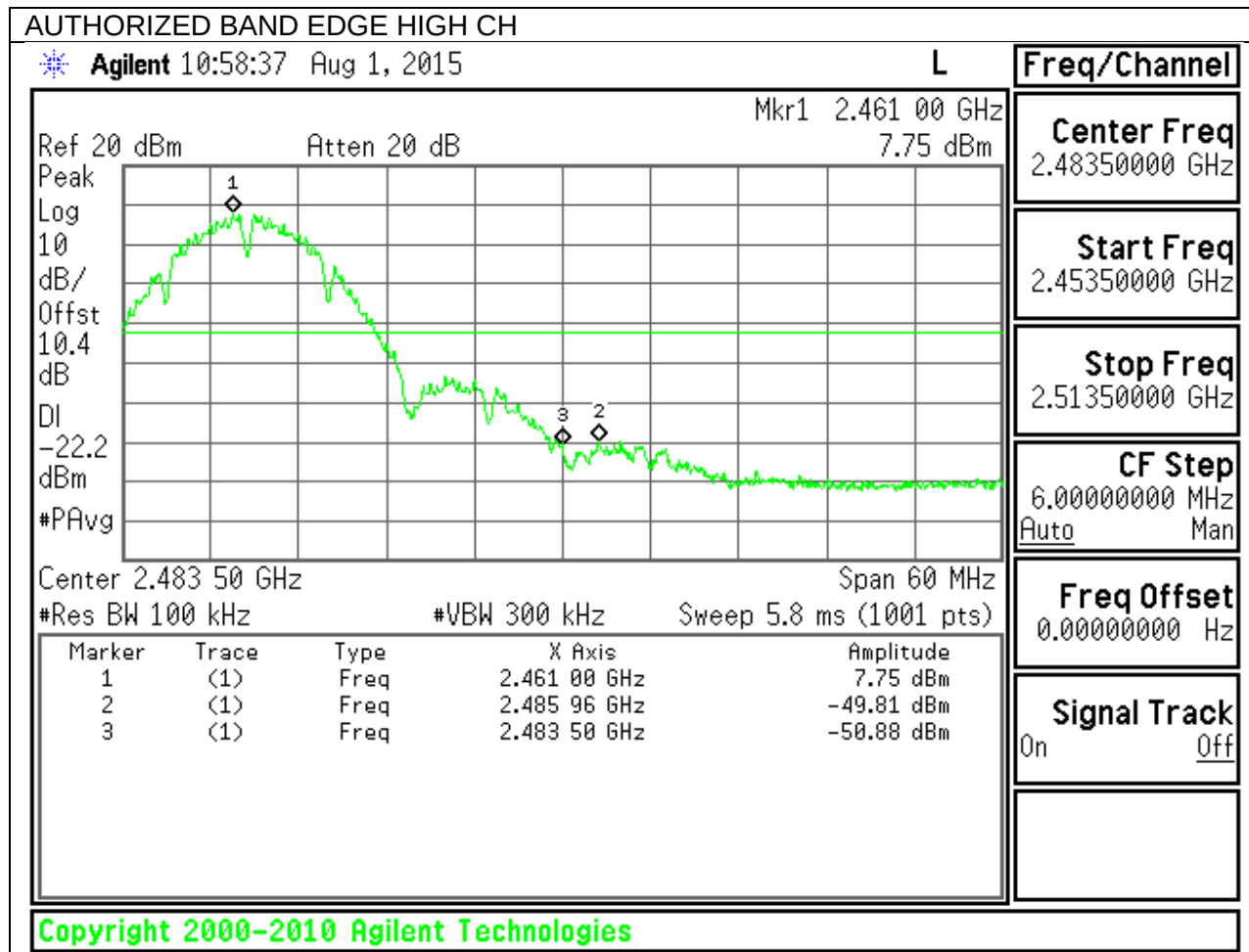
IN-BAND REFERENCE LEVEL



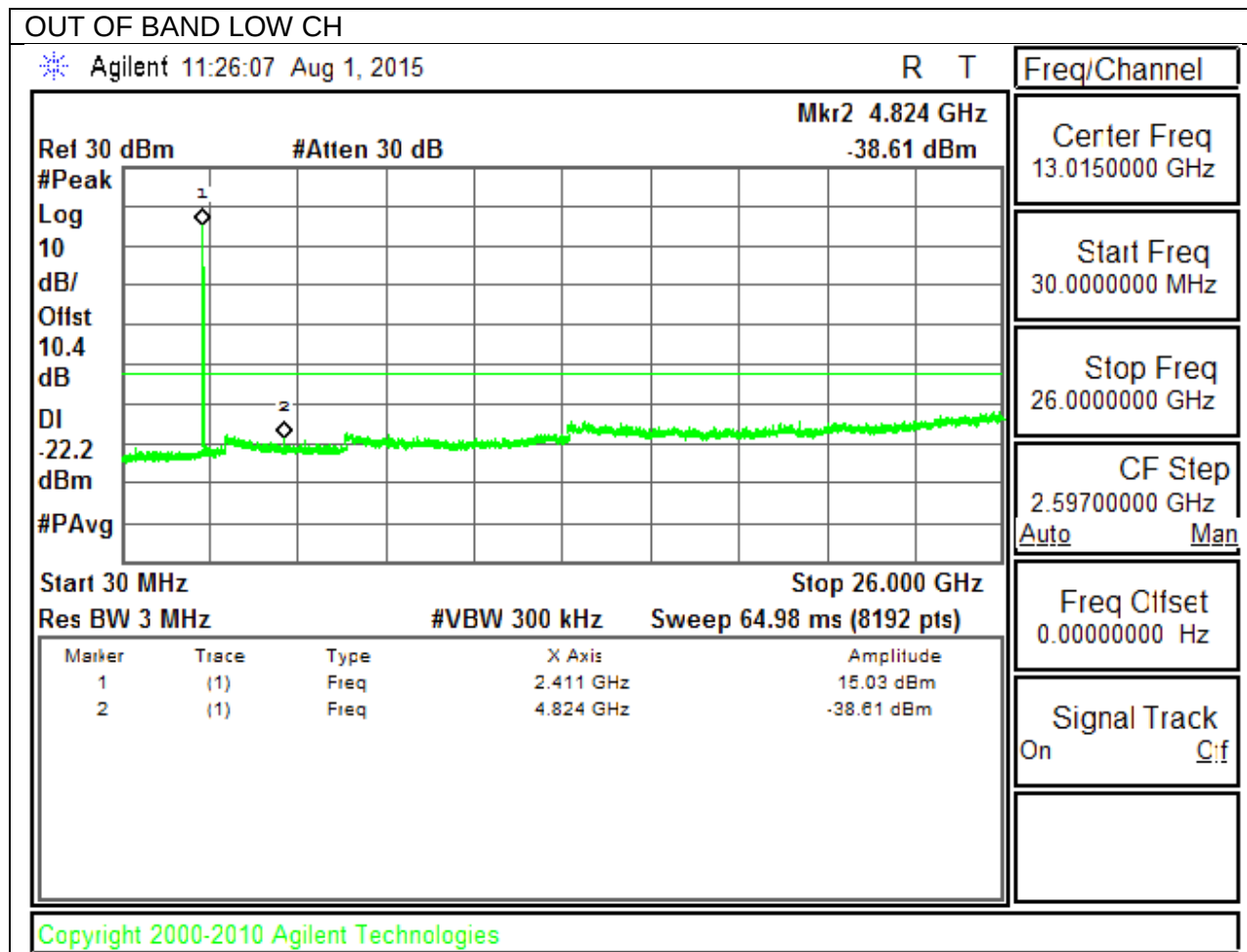
LOW CHANNEL BANDEDGE

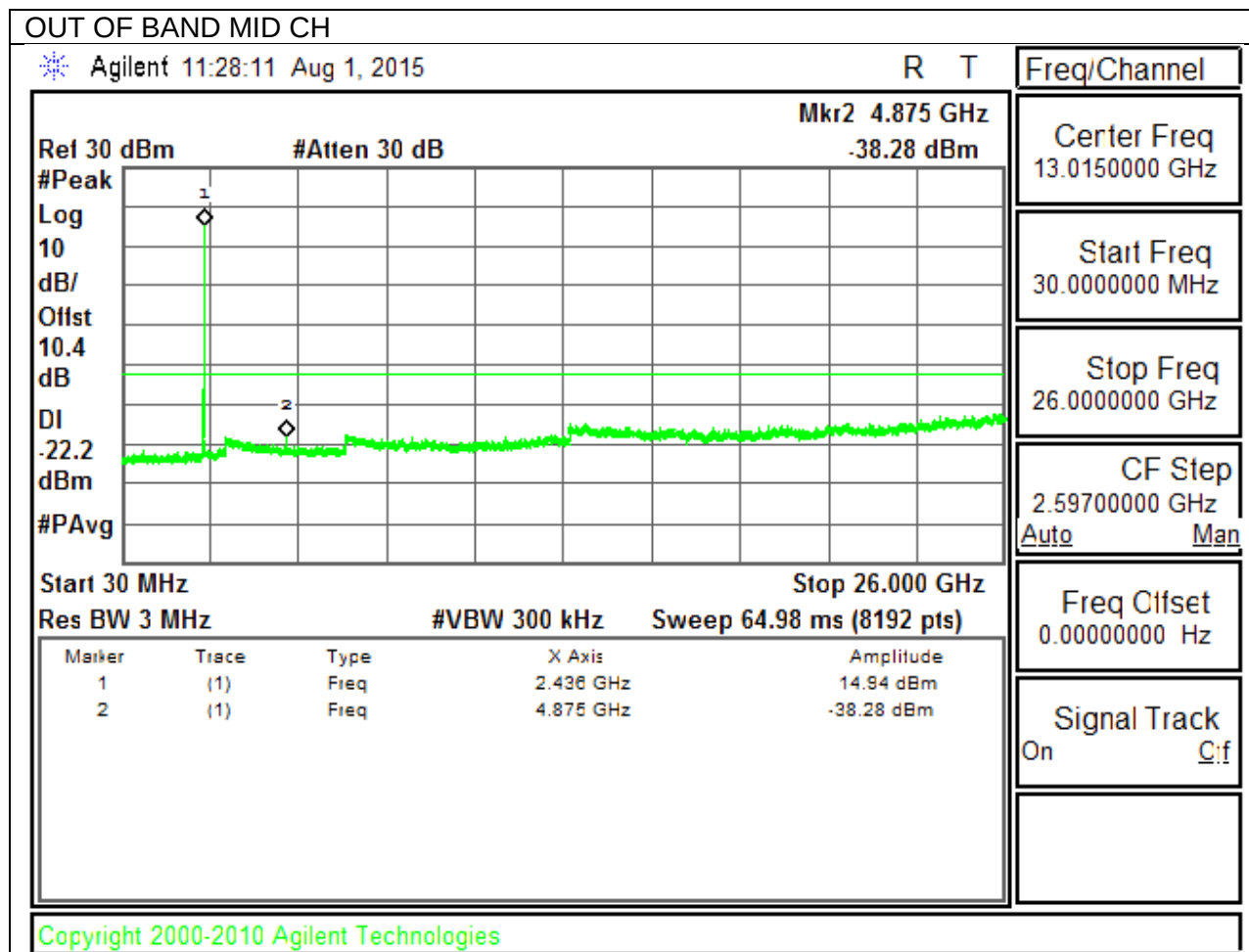


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS



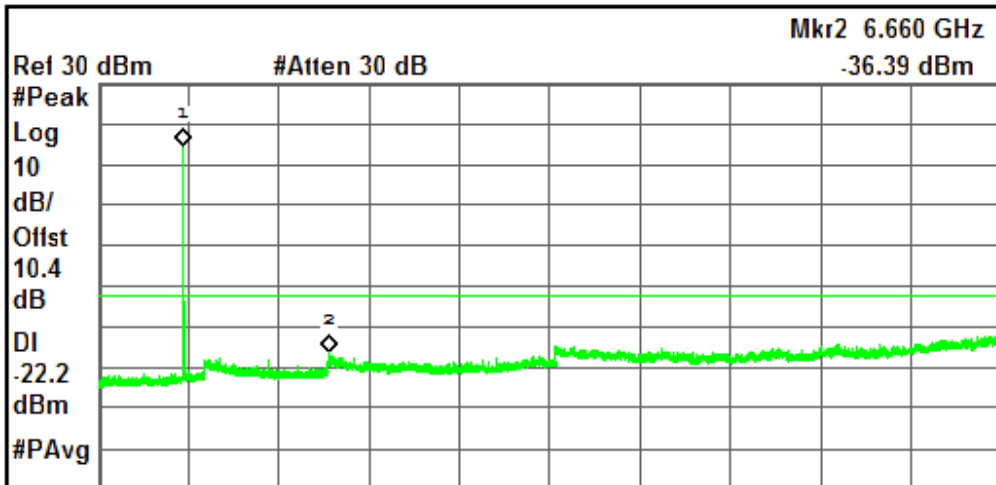


OUT OF BAND HIGH CH

Agilent 11:32:29 Aug 1, 2015

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

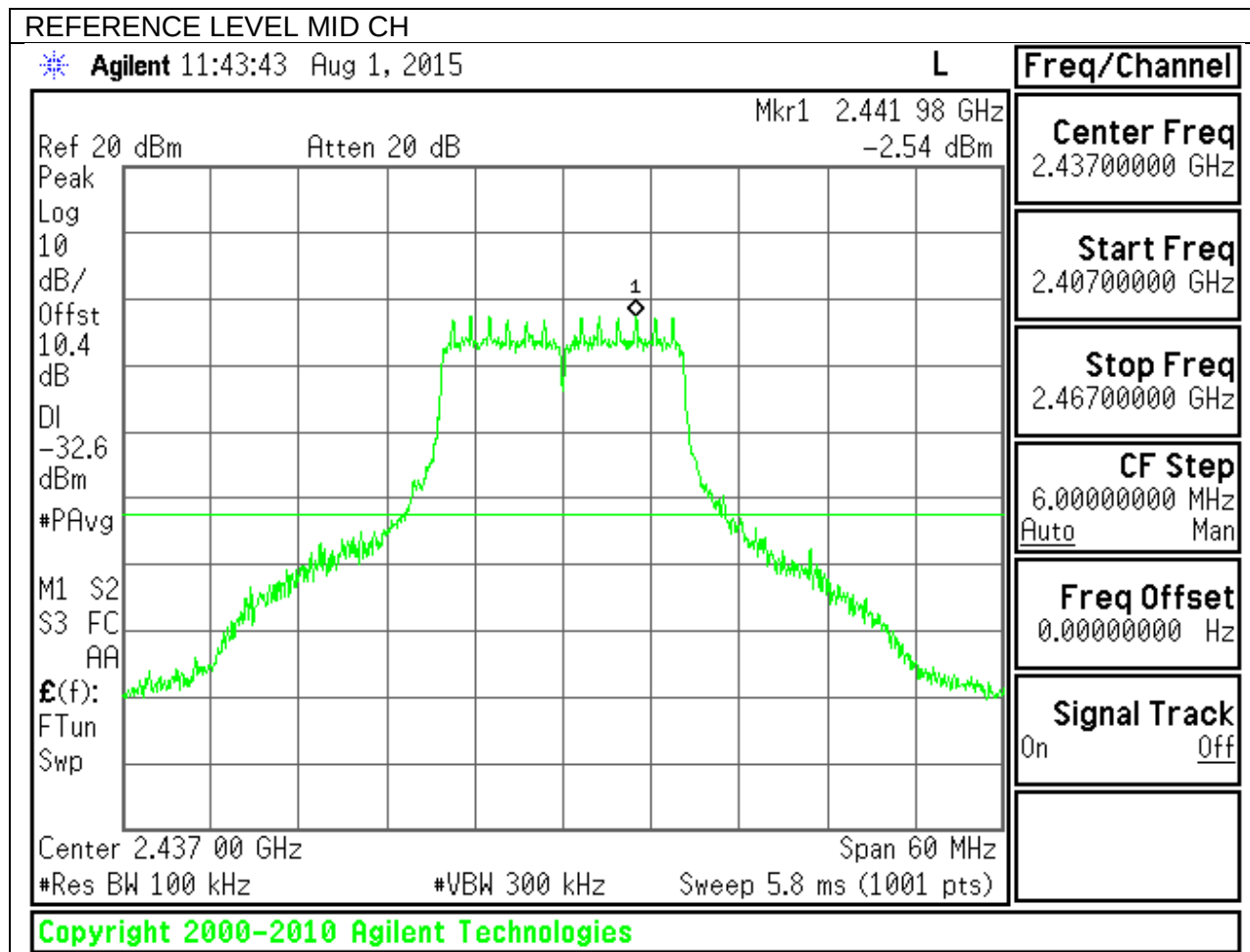
Freq Offset
0.0000000 Hz

Signal Track
On Clf

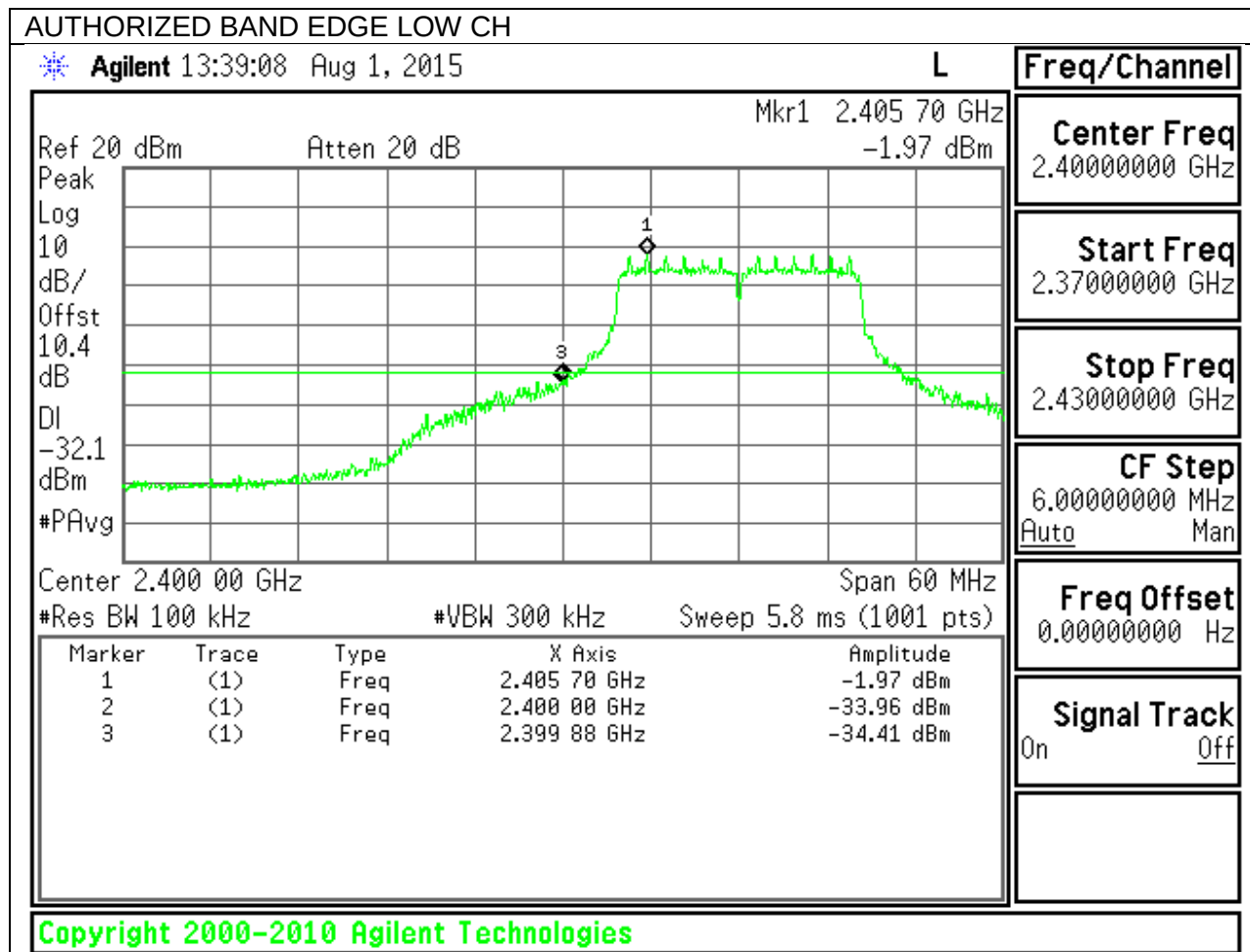
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9.5.2. 802.11g MODE IN THE 2.4 GHz BAND

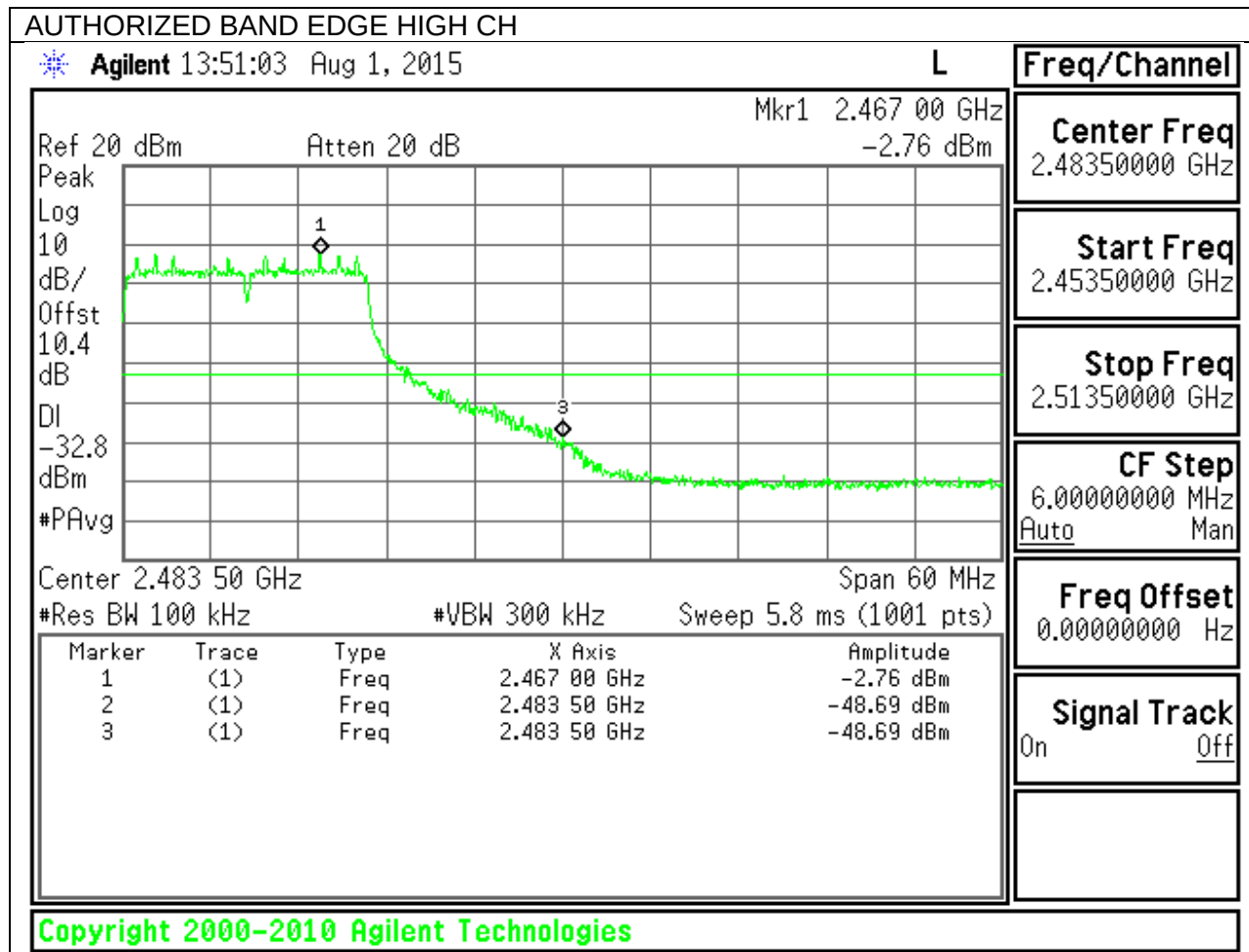
IN-BAND REFERENCE LEVEL



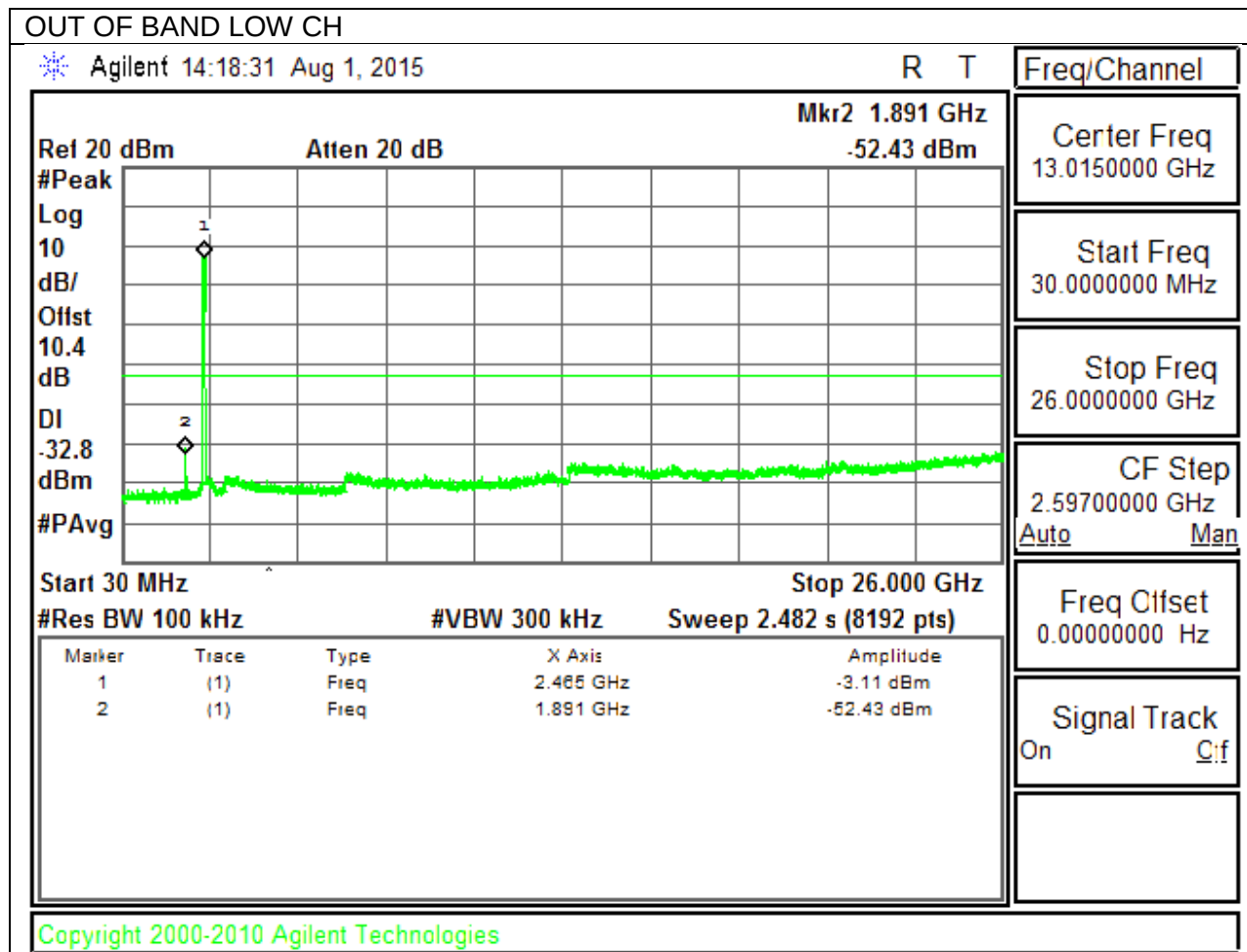
LOW CHANNEL BANDEDGE

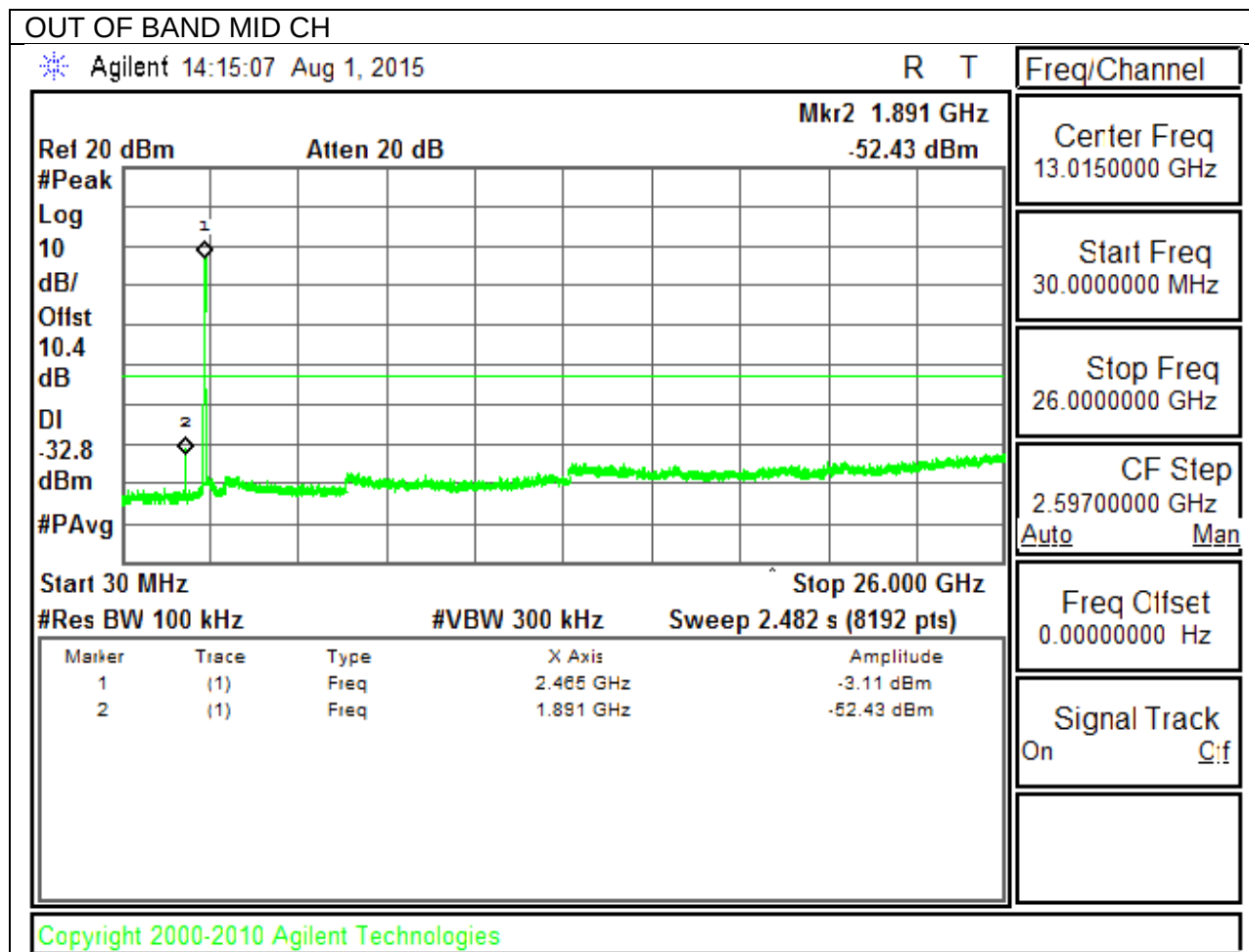


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS



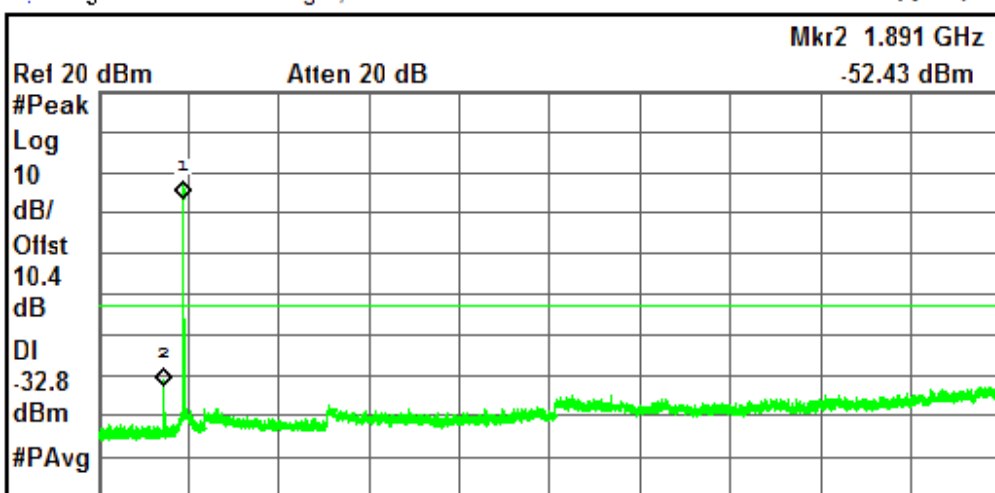


OUT OF BAND HIGH CH

Agilent 14:05:31 Aug 1, 2015

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

Center 13.015 GHz Span 25.97 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.482 s (8192 pts)

Freq Offset
0.00000000 Hz

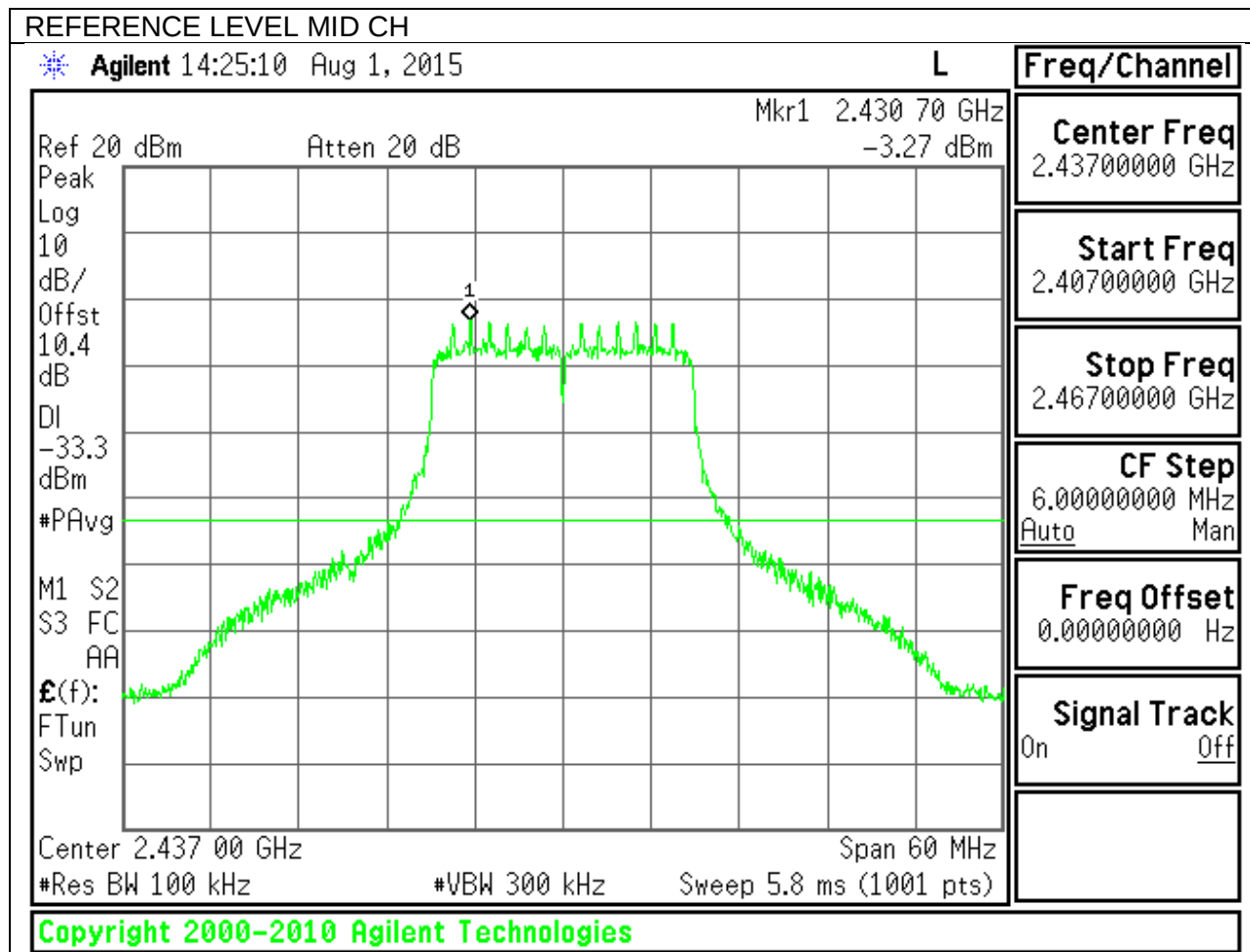
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.465 GHz	-6.49 dBm
2	(1)	Freq	1.891 GHz	-52.43 dBm

Signal Track
On Clf

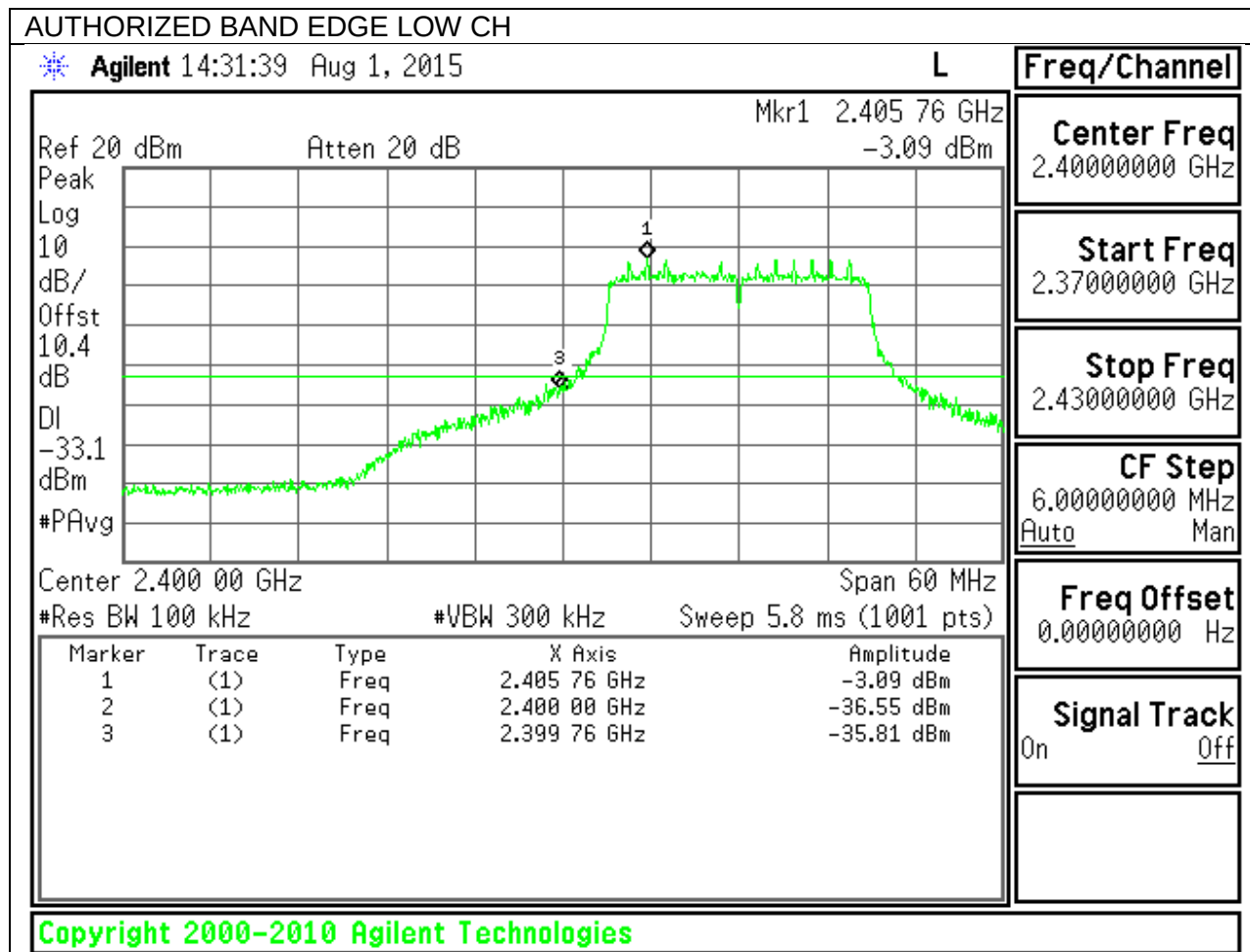
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9.5.3. 802.11n MODE IN THE 2.4 GHz BAND

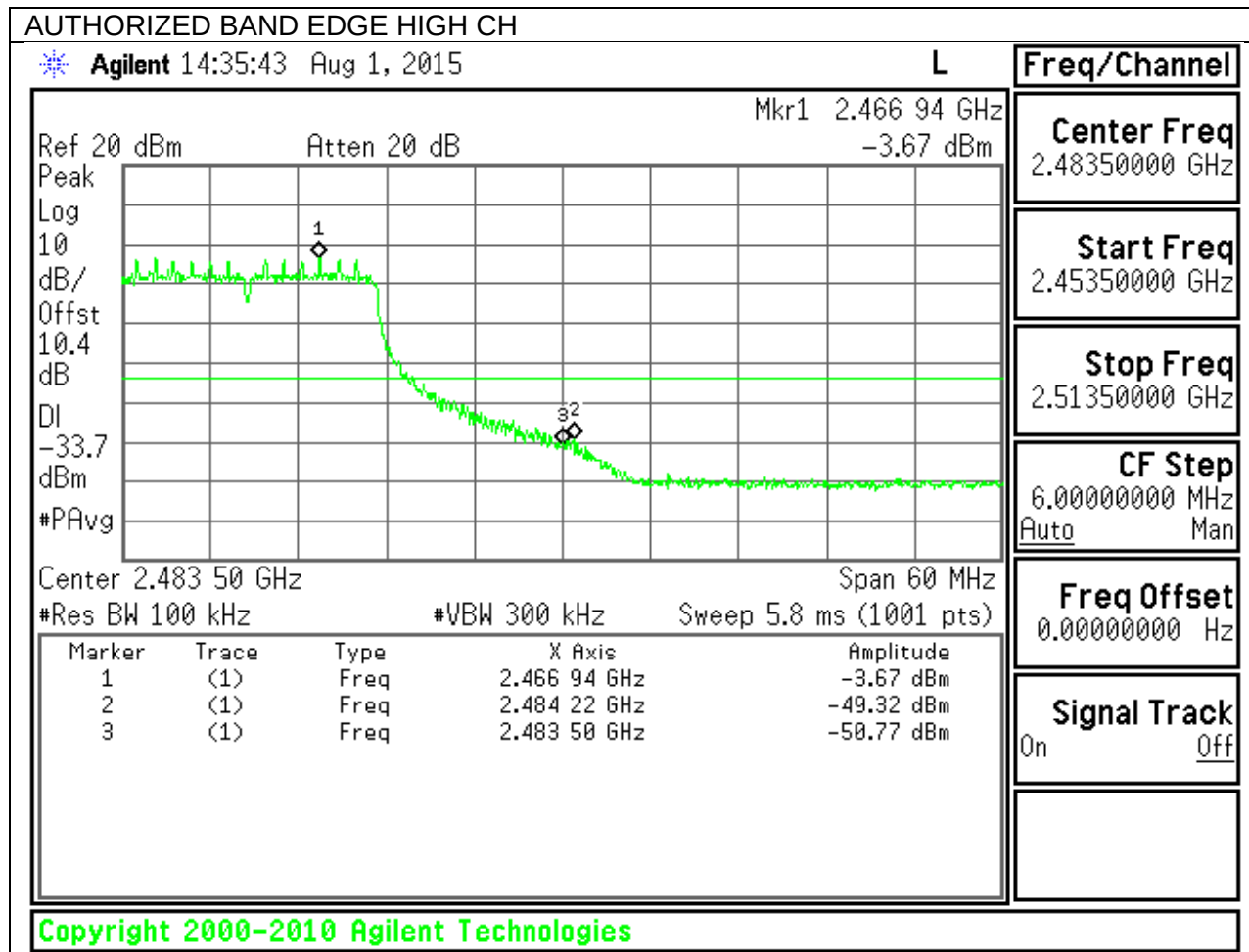
IN-BAND REFERENCE LEVEL



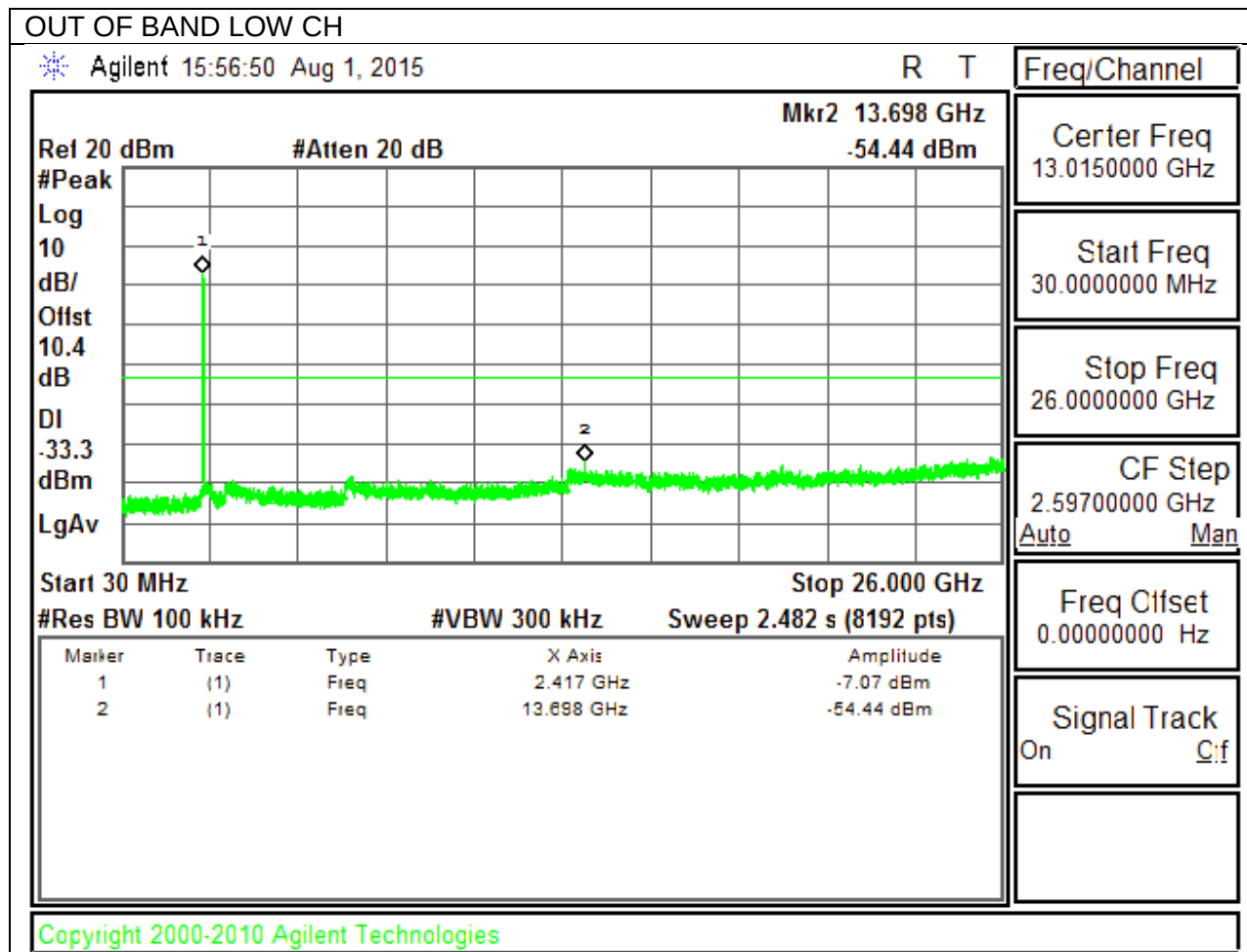
LOW CHANNEL BANDEDGE

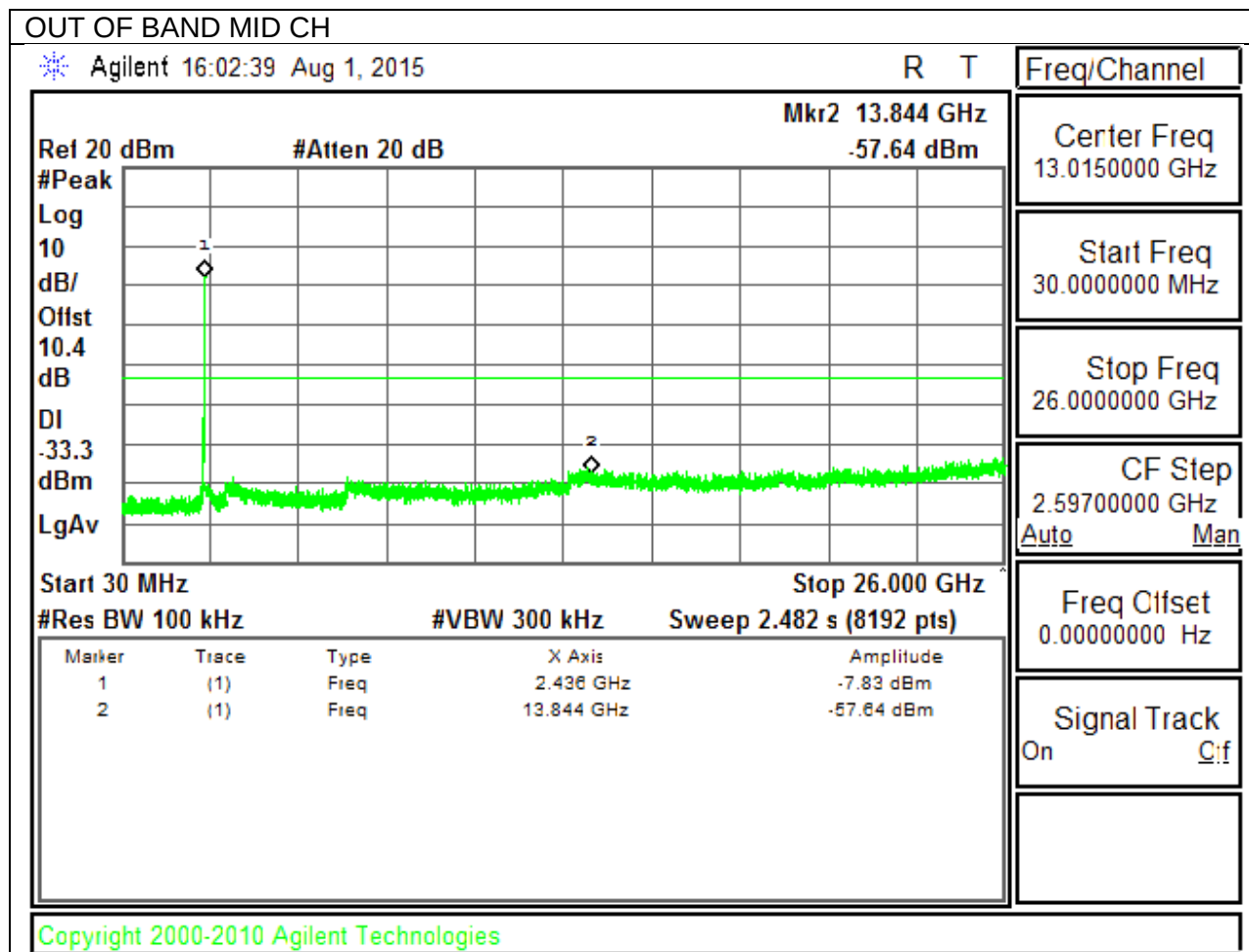


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS

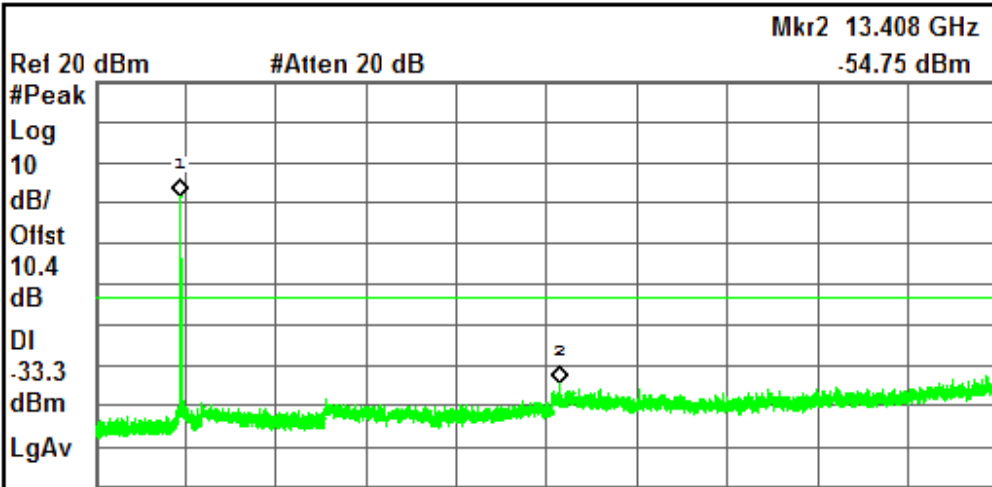




OUT OF BAND HIGH CH

Agilent 16:08:25 Aug 1, 2015

R T



Freq/Channel

Center Freq
13.0130000 GHz

Start Freq
25.9999900 MHz

Stop Freq
26.0000000 GHz

CF Step
2.59740000 GHz
Auto Man

Freq Offset
0.0000000 Hz

Signal Track
On Cif

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10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 150 cm above the ground plane for above 1GHz and 80cm for below 1GHz. 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.

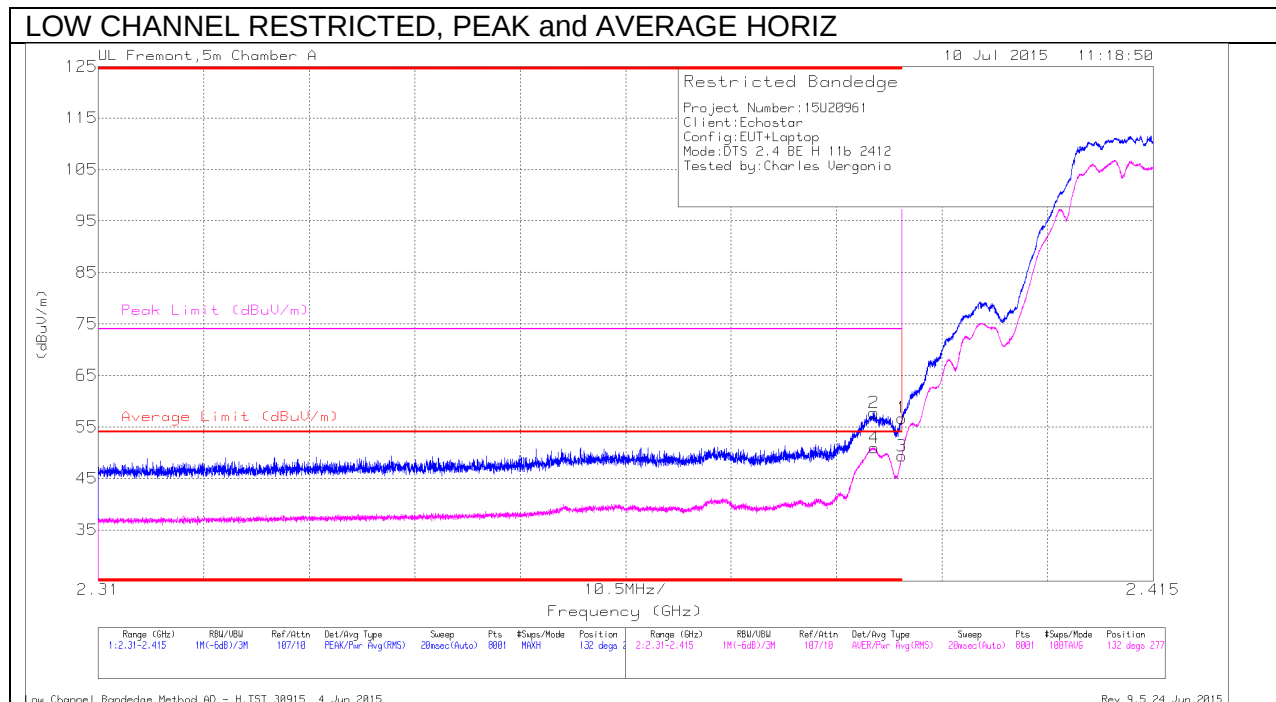
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor= $10\log(1/x)$ For this sample B mode = 0dB (duty cycle >98%); G mode = 0.12dB; N mode = 0.13dB.

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

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

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)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT136 (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
2	* 2.387	50.64	Pk	32	-24.9	57.74	-	-	74	-16.26	132	277	H
4	* 2.387	43.85	RMS	32	-24.9	50.95	54	-3.05	-	-	132	277	H
1	* 2.39	49.64	Pk	32	-24.9	56.74	-	-	74	-17.26	132	277	H
3	* 2.39	42.22	RMS	32	-24.9	49.32	54	-4.68	-	-	132	277	H

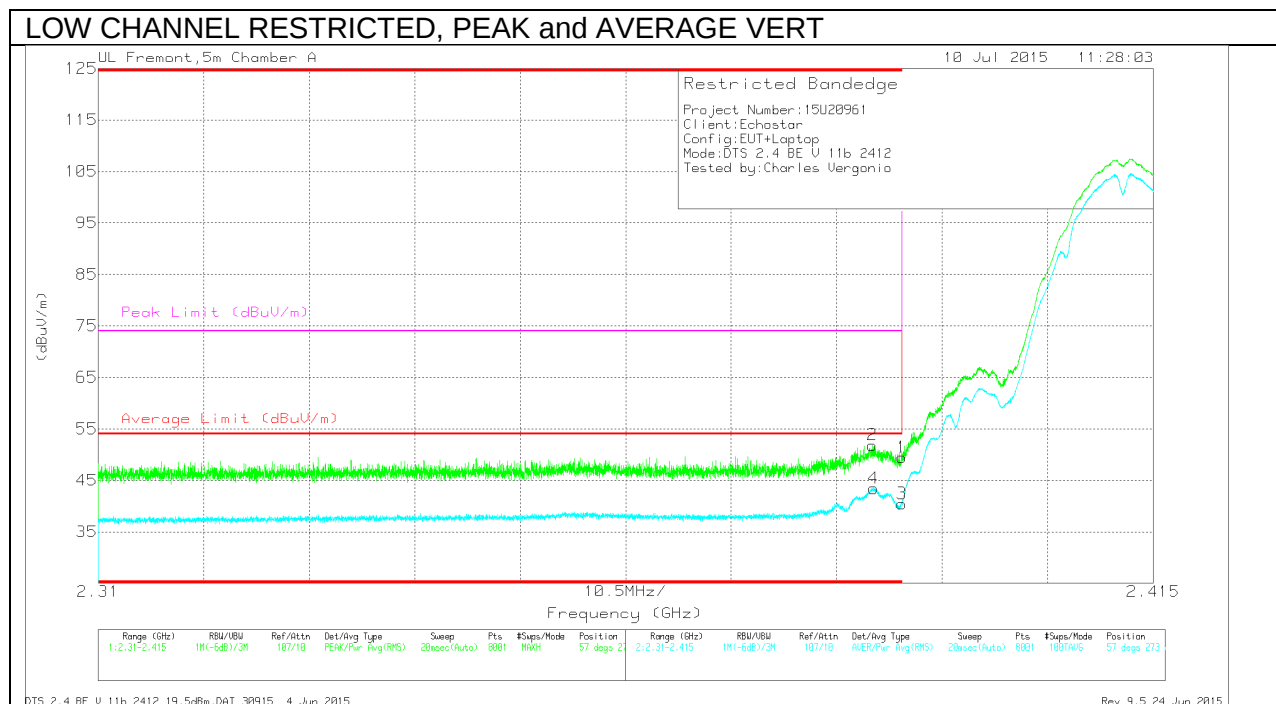
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

Low Channel Bandedge Method AD - H.TST 30915 4 Jun 2015

Rev 9.5 24 Jun 2015



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
2	* 2.387	44.75	Pk	32	-24.9	51.85	-	-	74	-22.15	57	273	V
4	* 2.387	36.35	RMS	32	-24.9	43.45	54	-10.55	-	-	57	273	V
1	* 2.39	42.37	Pk	32	-24.9	49.47	-	-	74	-24.53	57	273	V
3	* 2.39	33.37	RMS	32	-24.9	40.47	54	-13.53	-	-	57	273	V

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

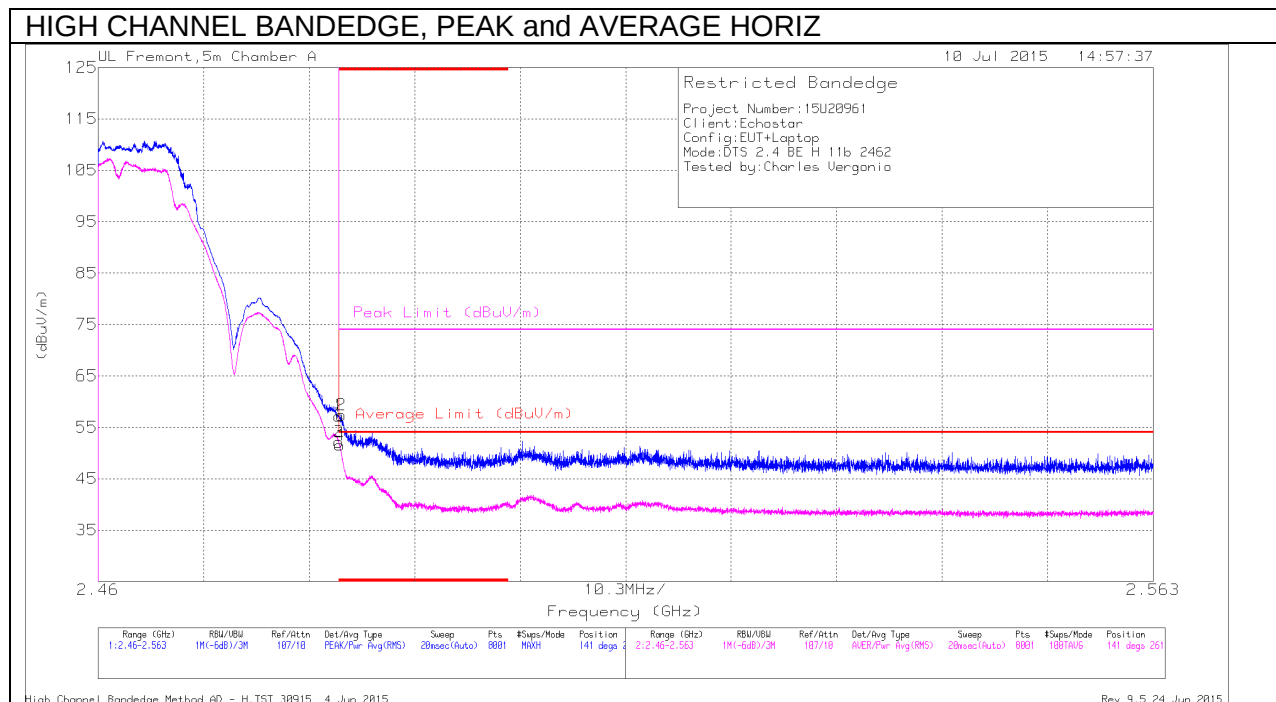
Pk - Peak detector

RMS - RMS detection

DTS_2.4_BE_V_11b_2412_19.5dBm.DAT 30915 4 Jun 2015

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AUTHORIZED BANDEDGE (HIGH CHANNEL)



Trace Markers

Marker	Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Filtr/Pad (dB)	Correct d Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.85	Pk	32.1	-24.8	57.15	-	-	74	-16.85	141	261	H
2	* 2.484	50.07	Pk	32.1	-24.8	57.37	-	-	74	-16.63	141	261	H
3	* 2.484	44.82	RMS	32.1	-24.8	52.12	54	-1.88	-	-	141	261	H
4	* 2.484	44.23	RMS	32.1	-24.8	51.53	54	-2.47	-	-	141	261	H

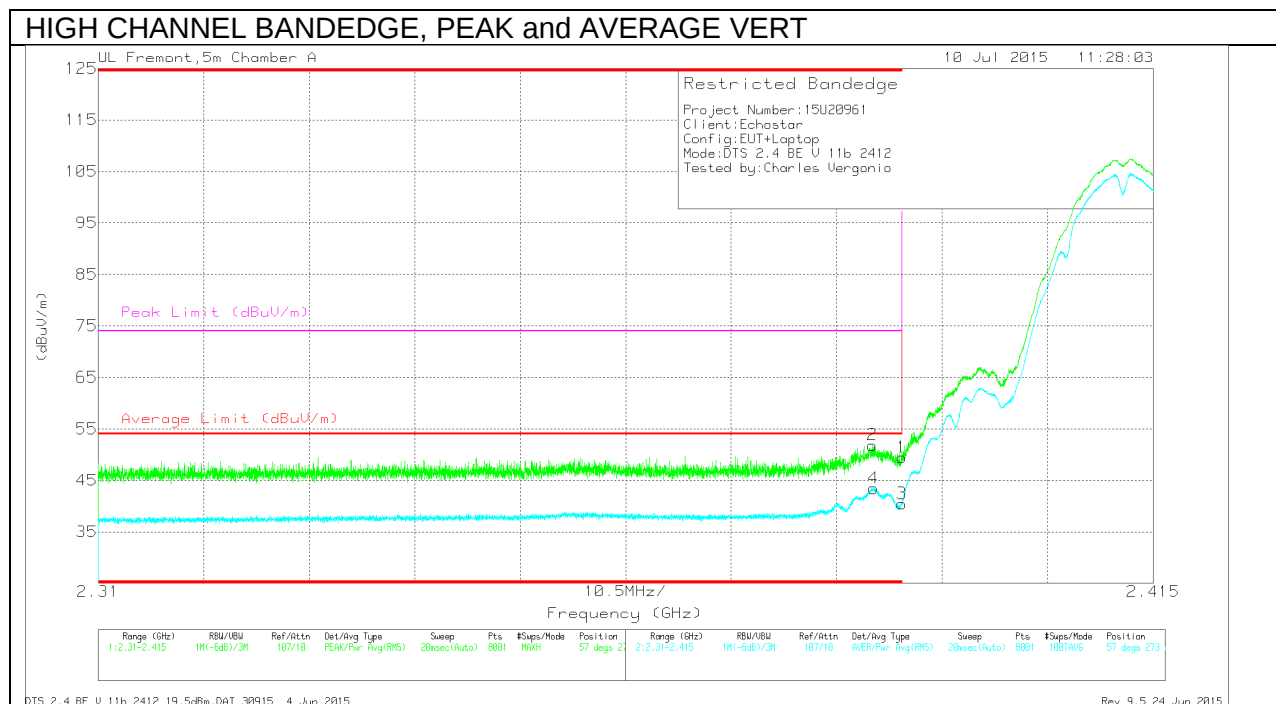
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

High Channel Bandedge Method AD - H.TST 30915 4 Jun 2015

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Trace Markers

Marker	Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Filtr/Pad (dB)	Correcte d Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.387	44.75	Pk	32	-24.9	51.85	-	-	74	-22.15	57	273	V
4	* 2.387	36.35	RMS	32	-24.9	43.45	54	-10.55	-	-	57	273	V
1	* 2.39	42.37	Pk	32	-24.9	49.47	-	-	74	-24.53	57	273	V
3	* 2.39	33.37	RMS	32	-24.9	40.47	54	-13.53	-	-	57	273	V

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

Pk - Peak detector

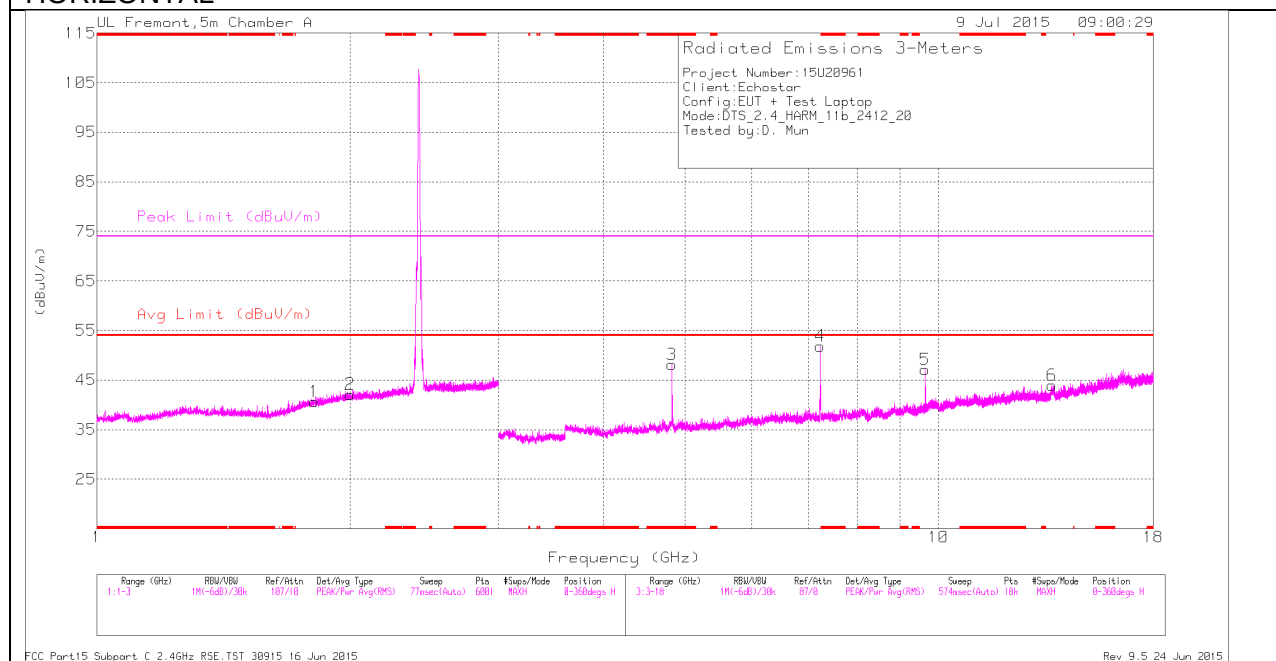
RMS - RMS detection

DTS 2.4 BE V 11b 2412 19.5dBm.DAT 30915 4 Jun 2015

Rev 9.5 24 Jun 2015

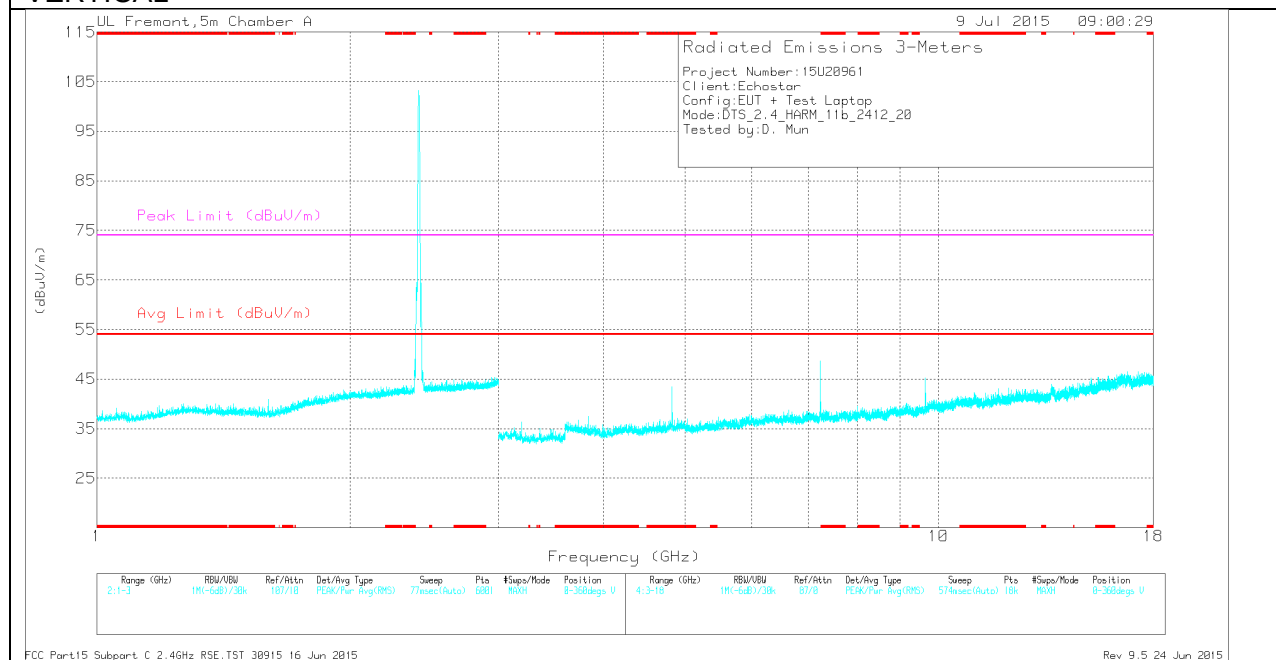
HARMONICS AND SPURIOUS EMISSIONS

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.

Trace Markers

Marker	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
3	* 4.824	45.07	Pk	33.9	-30.8	48.17	-	-	74	-25.83	0-360	201	H
1	1.812	36	Pk	30.1	-25.4	40.7	-	-	-	-	0-360	201	H
2	2	36.31	Pk	31.1	-25.3	42.11	-	-	-	-	0-360	201	H
4	7.235	43.58	Pk	35.5	-27.2	51.88	-	-	-	-	0-360	201	H
5	9.647	35.15	Pk	36.7	-24.7	47.15	-	-	-	-	0-360	201	H
6	13.648	27.85	Pk	38.8	-22.7	43.95	-	-	-	-	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)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	45.24	PK2	33.9	-30.8	48.34	-	-	74	-25.66	1	202	H
* 4.824	37.55	MAV1	33.9	-30.8	40.65	54	-13.35	-	-	1	202	H
1.812	33.04	MAV1	30.1	-25.4	37.74	-	-	-	-	1	202	H
1.814	44.91	PK2	30.1	-25.4	49.61	-	-	-	-	1	202	H
1.998	32.99	MAV1	31.1	-25.3	38.79	-	-	-	-	1	202	H
2	44.5	PK2	31.1	-25.3	50.3	-	-	-	-	1	202	H
2.001	32.88	MAV1	31.1	-25.3	38.68	-	-	-	-	1	202	H
2.002	44.48	PK2	31.1	-25.3	50.28	-	-	-	-	1	202	H
7.235	41.83	PK2	35.5	-27.2	50.13	-	-	-	-	1	202	H
7.235	33.53	MAV1	35.5	-27.2	41.83	-	-	-	-	1	202	H
9.648	37.59	PK2	36.7	-24.8	49.49	-	-	-	-	1	202	H
9.648	28.18	MAV1	36.7	-24.8	40.08	-	-	-	-	1	202	H
13.647	34.92	PK2	38.8	-22.7	51.02	-	-	-	-	1	100	H
13.649	24.09	MAV1	38.8	-22.7	40.19	-	-	-	-	1	100	H

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

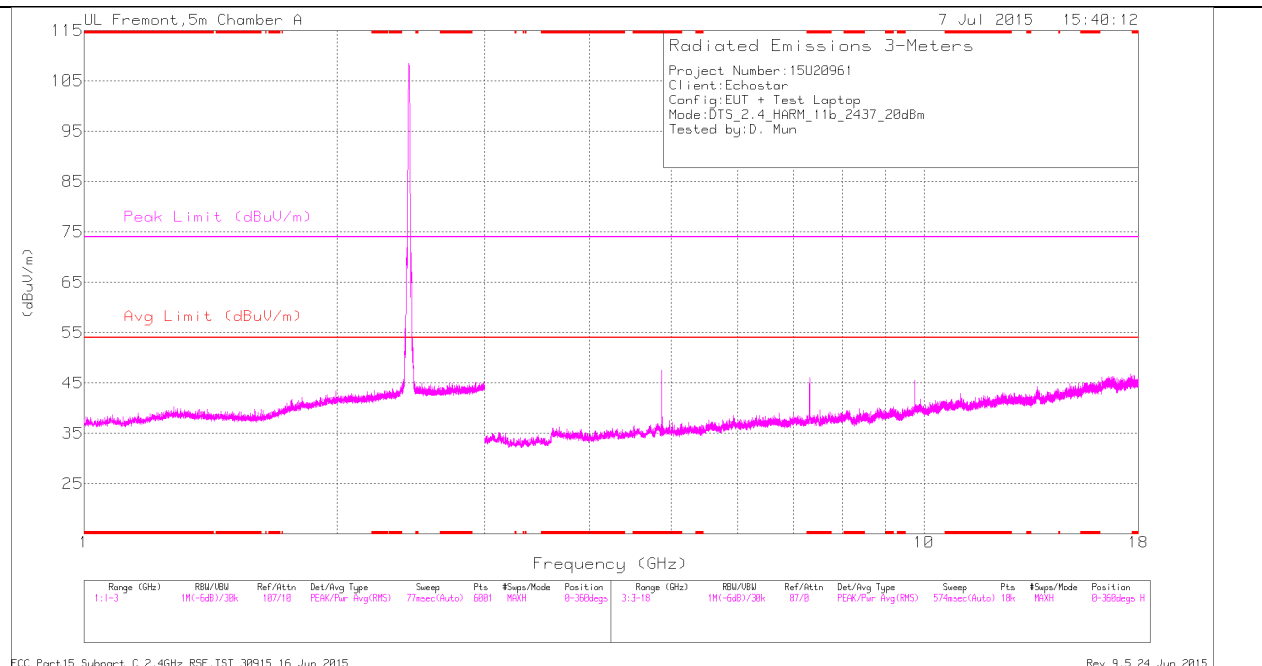
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15 Subpart C 2.4GHz RSE.TST 30915 16 Jun 2015

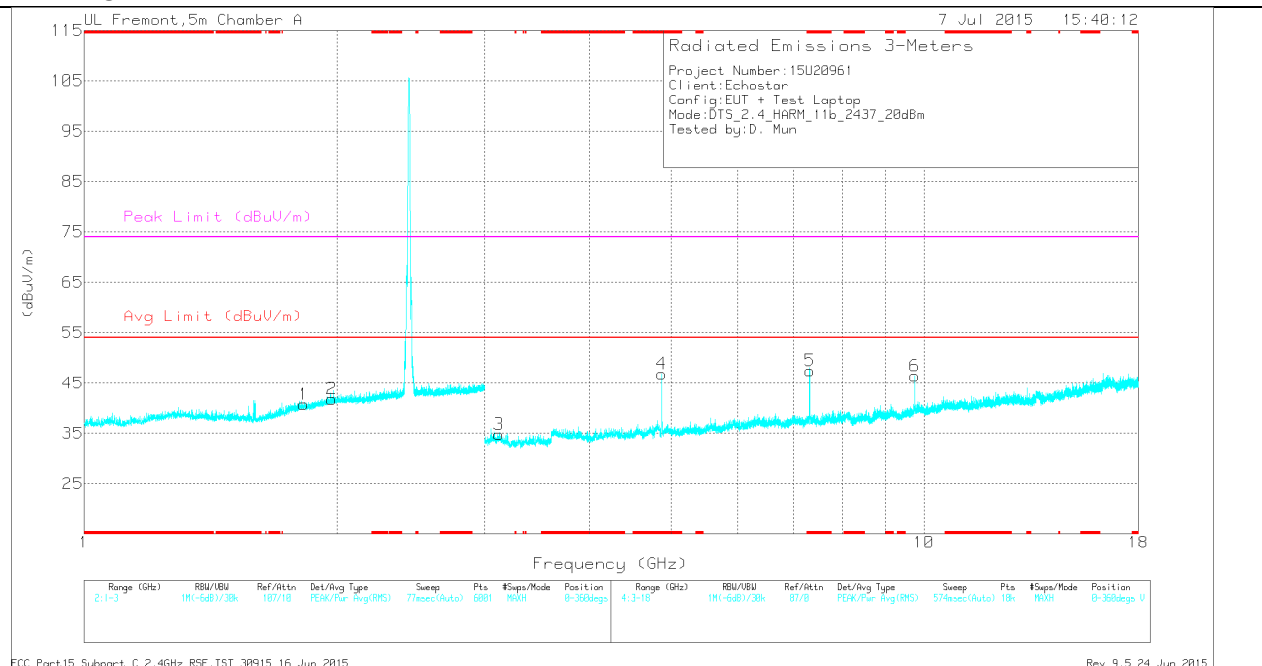
Rev 9.5 24 Jun 2015

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.

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fitr/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	* 4.874	43.02	Pk	33.9	-30.1	46.82	-	-	74	-27.18	0-360	200	V
5	* 7.311	38.54	Pk	35.5	-26.6	47.44	-	-	74	-26.56	0-360	200	V
1	1.826	36.05	Pk	30.2	-25.5	40.75	-	-	-	-	0-360	200	V
2	1.972	36.25	Pk	31	-25.4	41.85	-	-	-	-	0-360	200	V
3	3.118	33.81	Pk	32.9	-31.9	34.81	-	-	-	-	0-360	200	V
6	9.748	33.98	Pk	36.9	-24.5	46.38	-	-	-	-	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/ Fitr/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	47.3	PK2	33.9	-30.1	51.1	-	-	74	-22.9	1	201	V
* 4.874	41.66	MAV1	33.9	-30.1	45.46	54	-8.54	-	-	1	201	V
* 7.31	44.6	PK2	35.5	-26.7	53.4	-	-	74	-20.6	1	201	V
* 7.31	37.73	MAV1	35.5	-26.7	46.53	54	-7.47	-	-	1	201	V
1.826	44.61	PK2	30.2	-25.5	49.31	-	-	-	-	1	201	V
1.826	33.11	MAV1	30.2	-25.5	37.81	-	-	-	-	1	201	V
1.973	44.61	PK2	31	-25.4	50.21	-	-	-	-	1	201	V
1.973	32.91	MAV1	31	-25.3	38.61	-	-	-	-	1	201	V
3.117	42.17	PK2	32.9	-32	43.07	-	-	-	-	1	201	V
3.119	30.64	MAV1	32.9	-31.9	31.64	-	-	-	-	1	201	V
9.748	36.48	PK2	36.9	-24.5	48.88	-	-	-	-	1	201	V
9.748	27.21	MAV1	36.9	-24.5	39.61	-	-	-	-	1	201	V

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

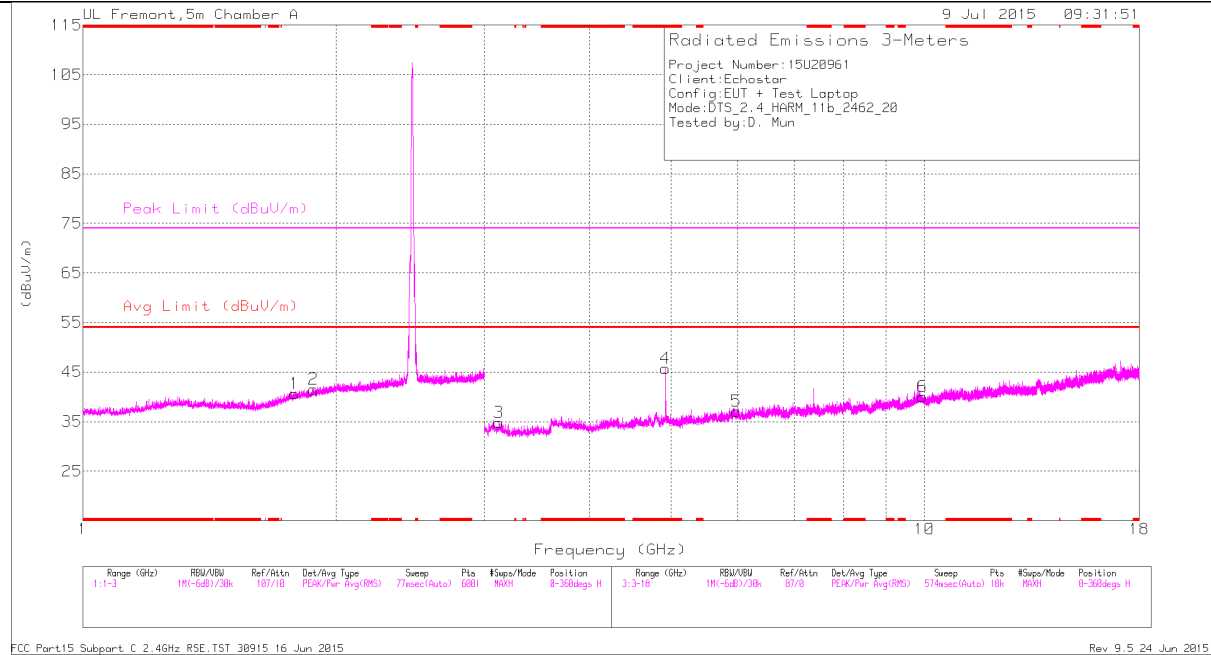
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

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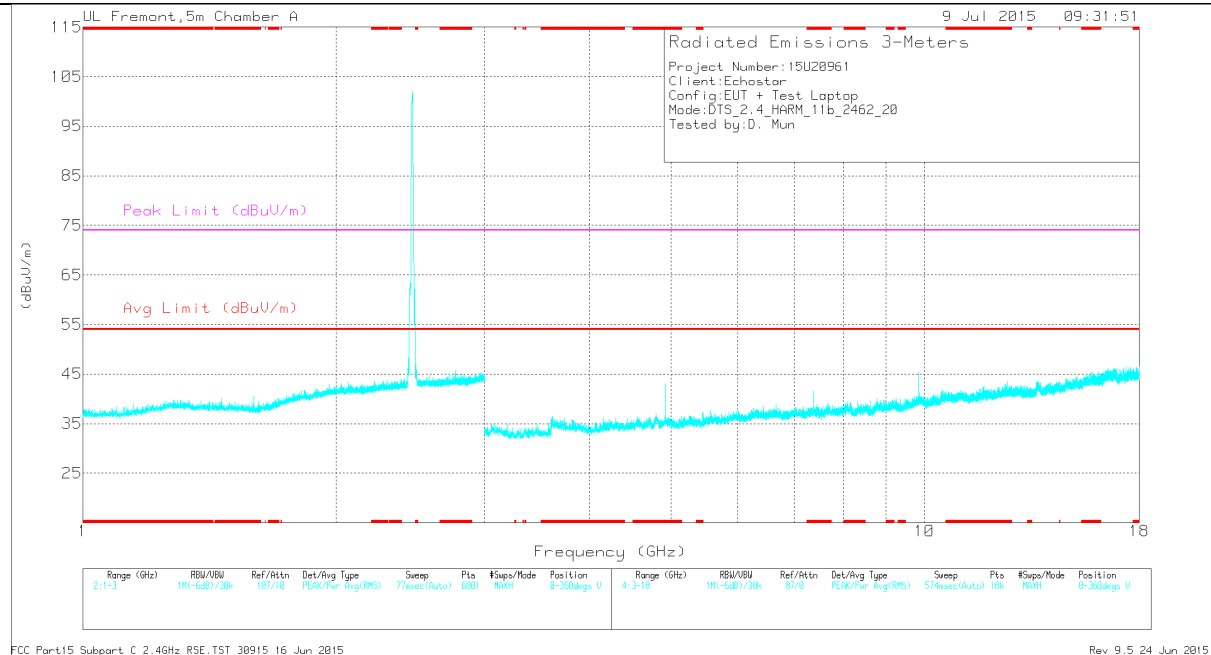
Rev 9.5 24 Jun 2015

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 T136 (dB/m)	Amp/Cbl/ Filt/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	* 4.924	41.43	Pk	33.9	-29.6	45.73	-	-	74	-28.27	0-360	100	H
1	1.785	36.25	Pk	29.8	-25.4	40.65	-	-	-	-	0-360	201	H
2	1.88	36.38	Pk	30.6	-25.5	41.48	-	-	-	-	0-360	100	H
3	3.122	33.84	Pk	32.9	-31.9	34.84	-	-	-	-	0-360	100	H
5	5.976	30.49	Pk	35.3	-28.7	37.09	-	-	-	-	0-360	100	H
6	9.943	26.39	Pk	37	-23.4	39.99	-	-	-	-	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/ Filt/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	44.33	PK2	33.9	-29.6	48.63	-	-	74	-25.37	1	100	H
* 4.924	36.62	MAV1	33.9	-29.6	40.92	54	-13.08	-	-	1	100	H
1.785	33.19	MAV1	29.8	-25.4	37.59	-	-	-	-	1	202	H
1.786	44.32	PK2	29.8	-25.4	48.72	-	-	-	-	1	202	H
1.88	32.79	MAV1	30.6	-25.5	37.89	-	-	-	-	1	100	H
1.881	44.34	PK2	30.7	-25.5	49.54	-	-	-	-	1	100	H
3.12	30.72	MAV1	32.9	-31.9	31.72	-	-	-	-	1	100	H
3.123	42.46	PK2	32.9	-31.9	43.46	-	-	-	-	1	100	H
5.976	38.73	PK2	35.3	-28.8	45.23	-	-	-	-	1	100	H
5.977	27.62	MAV1	35.3	-28.8	34.12	-	-	-	-	1	100	H
9.942	36.01	PK2	37	-23.4	49.61	-	-	-	-	1	100	H
9.943	23.81	MAV1	37	-23.4	37.41	-	-	-	-	1	100	H

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

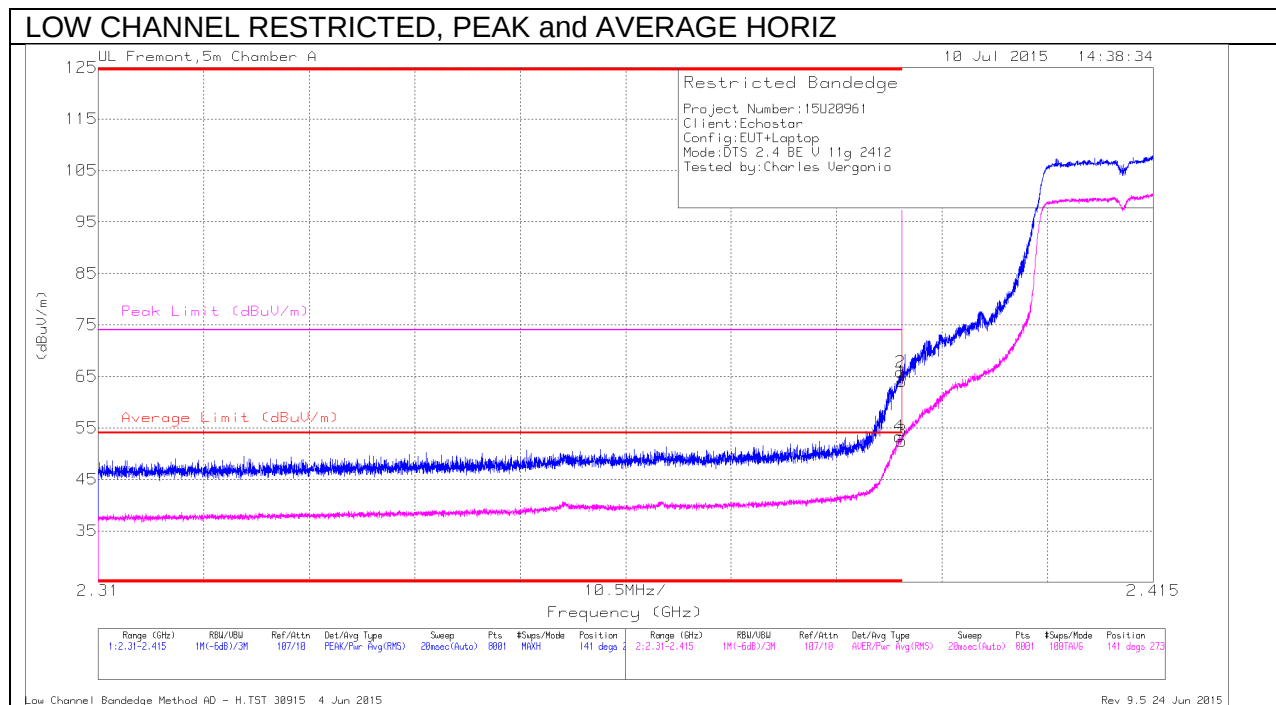
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15 Subpart C 2.4GHz RSE.TST 30915 16 Jun 2015

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



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/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	56.9	Pk	32	-24.9	0	64	-	-	74	-10	141	273	H
2	* 2.39	58.75	Pk	32	-24.9	0	65.85	-	-	74	-8.15	141	273	H
3	* 2.39	45.26	RMS	32	-24.9	.12	52.48	54	-1.52	-	-	141	273	H
4	* 2.39	46.12	RMS	32	-24.9	.12	53.34	54	-0.66	-	-	141	273	H

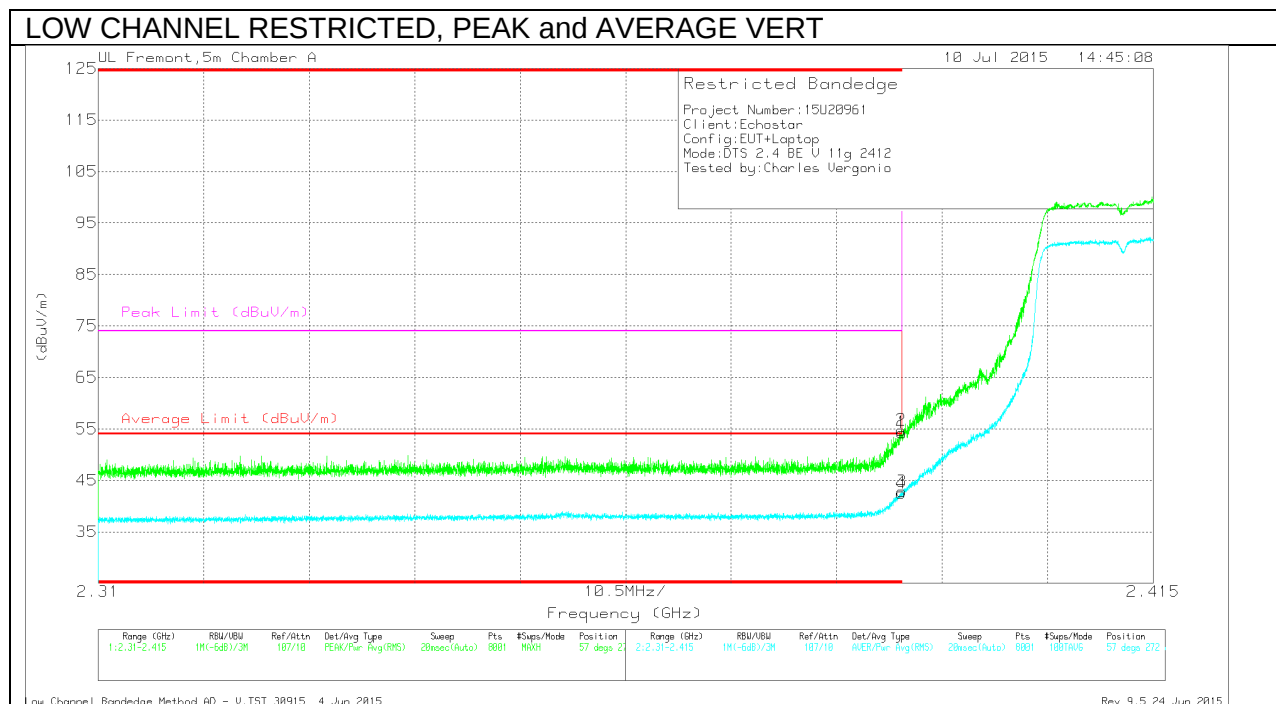
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

Low Channel Bandedge Method AD - H.TST 30915 4 Jun 2015

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Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/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	47.18	Pk	32	-24.9	0	54.28	-	-	74	-19.72	57	272	V
2	* 2.39	47.64	Pk	32	-24.9	0	54.74	-	-	74	-19.26	57	272	V
3	* 2.39	35.64	RMS	32	-24.9	.12	42.86	54	-11.14	-	-	57	272	V
4	* 2.39	35.31	RMS	32	-24.9	.12	42.53	54	-11.47	-	-	57	272	V

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

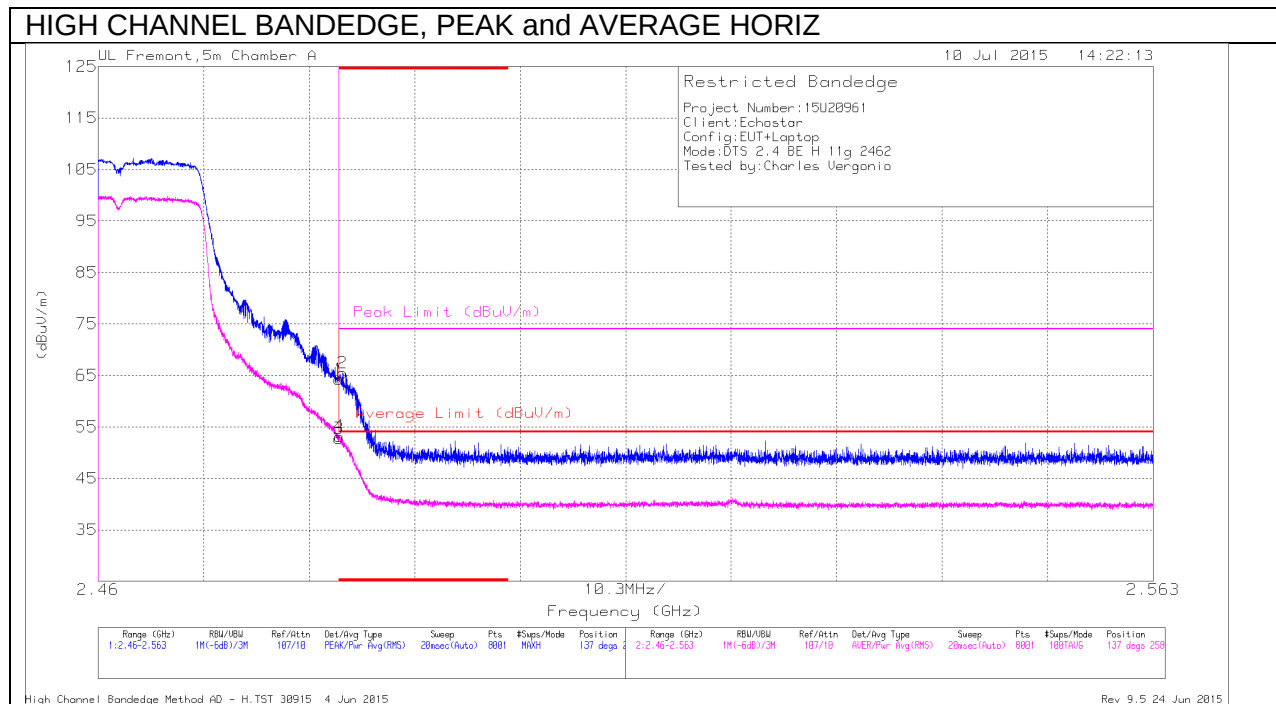
Pk - Peak detector

RMS - RMS detection

Low Channel Bandedge Method AD - V.TST 30915 4 Jun 2015

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AUTHORIZED BANDEDGE (HIGH CHANNEL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI triPad (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	56.94	Pk	32.1	-24.8	0	64.24	-	-	74	-9.76	137	258	H
2	* 2.484	58.15	Pk	32.1	-24.8	0	65.45	-	-	74	-8.55	137	258	H
3	* 2.484	45.34	RMS	32.1	-24.8	.12	52.76	54	-1.24	-	-	137	258	H
4	* 2.484	45.74	RMS	32.1	-24.8	.12	53.16	54	-0.84	-	-	137	258	H

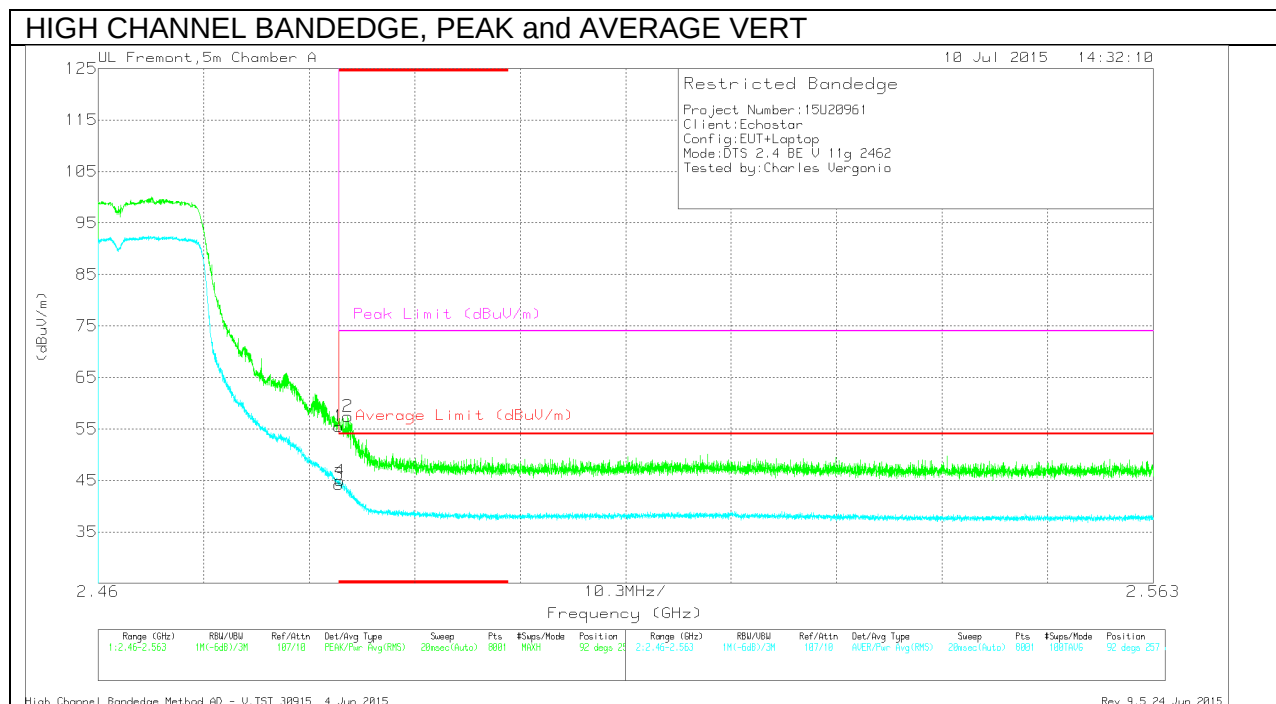
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

High Channel Bandedge Method AD - H.TST 30915 4 Jun 2015

Rev 9.5 24 Jun 2015



Trace Markers

Marker	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	48.22	Pk	32.1	-24.8	0	55.52	-	-	74	-18.48	92	257	V
2	* 2.484	50.16	Pk	32.1	-24.8	0	57.46	-	-	74	-16.54	92	257	V
3	* 2.484	36.83	RMS	32.1	-24.8	.12	44.25	54	-9.75	-	-	92	257	V
4	* 2.484	37.53	RMS	32.1	-24.8	.12	44.95	54	-9.05	-	-	92	257	V

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

Pk - Peak detector

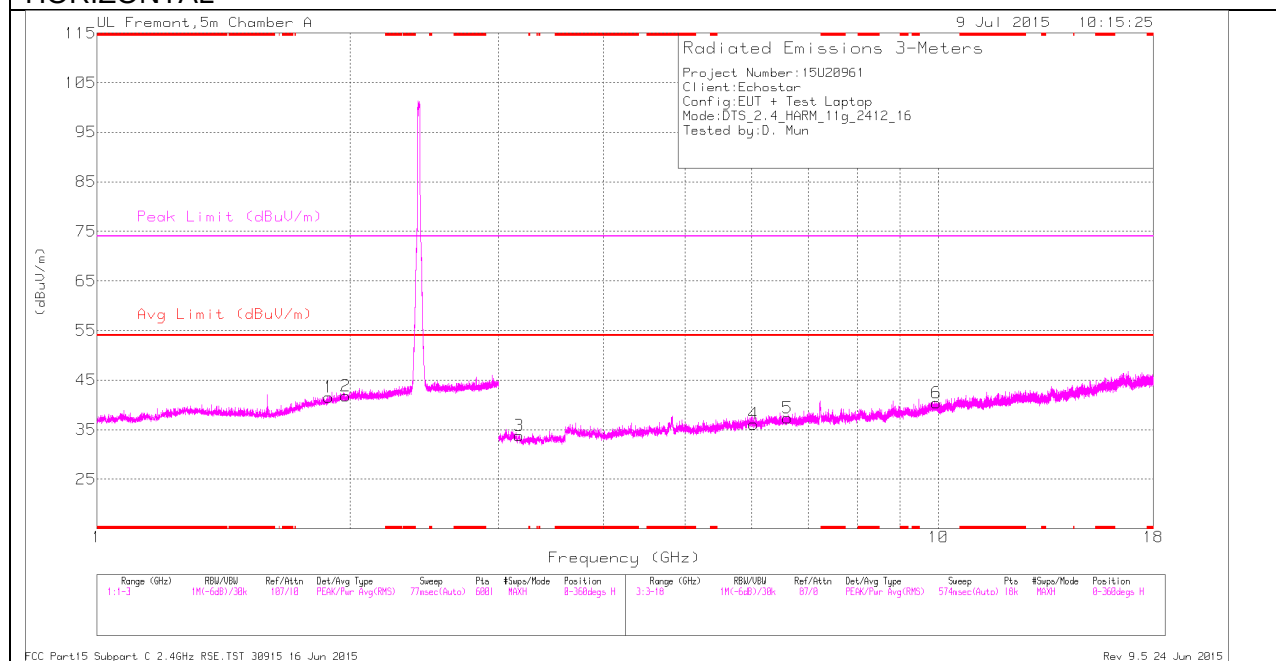
RMS - RMS detection

High Channel Bandedge Method AD - V.TST 30915 4 Jun 2015

Rev 9.5 24 Jun 2015

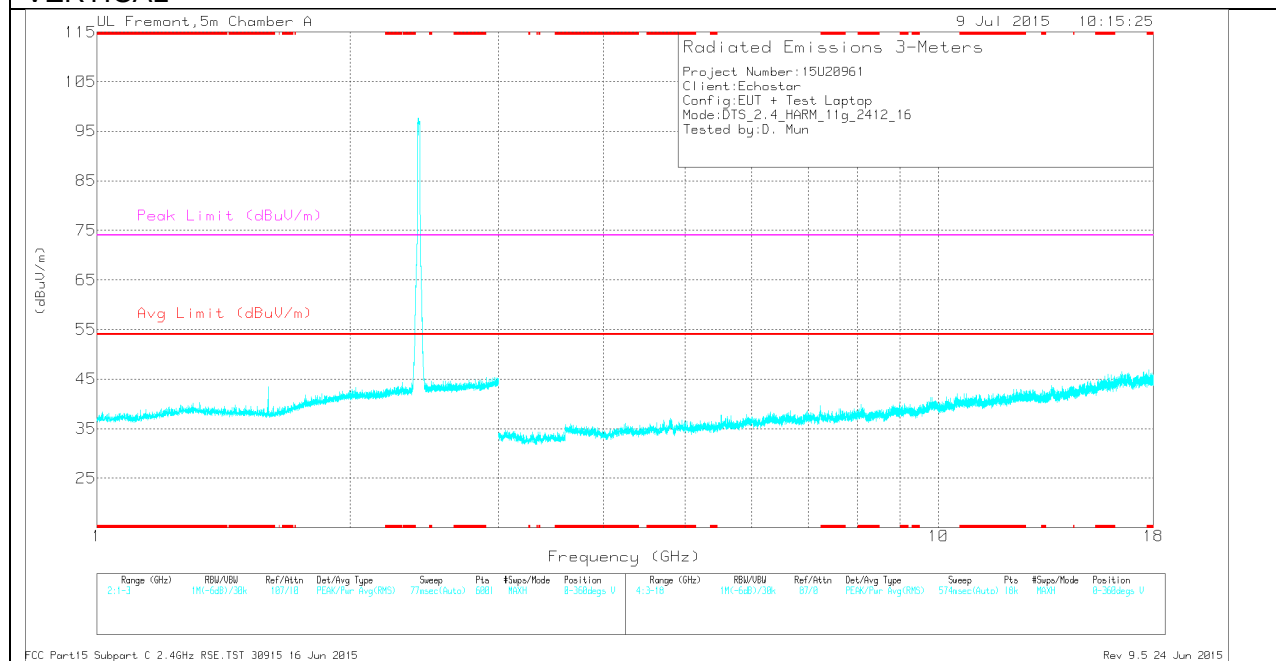
HARMONICS AND SPURIOUS EMISSIONS

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	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.886	36.36	Pk	30.7	-25.5	0	41.56	-	-	-	-	0-360	100	H
2	1.976	35.94	Pk	31.1	-25.3	0	41.74	-	-	-	-	0-360	201	H
3	3.172	33.82	Pk	32.8	-32.8	0	33.82	-	-	-	-	0-360	100	H
4	6.026	29.84	Pk	35.4	-29.1	0	36.14	-	-	-	-	0-360	100	H
5	6.613	29.26	Pk	35.6	-27.5	0	37.36	-	-	-	-	0-360	100	H
6	9.945	26.83	Pk	37	-23.4	0	40.43	-	-	-	-	0-360	100	H

Pk - Peak detector

Radiated Emissions

Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl /Fitr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.887	44.31	PK2	30.7	-25.5	0	49.51	-	-	-	-	1	100	H
1.887	32.9	MAV1	30.7	-25.5	.12	38.22	-	-	-	-	1	100	H
1.977	43.88	PK2	31.1	-25.3	0	49.68	-	-	-	-	1	202	H
1.978	32.8	MAV1	31.1	-25.3	.12	38.72	-	-	-	-	1	202	H
3.171	42.56	PK2	32.8	-32.7	0	42.66	-	-	-	-	1	100	H
3.171	30.86	MAV1	32.8	-32.7	.12	31.08	-	-	-	-	1	100	H
6.611	27.01	MAV1	35.6	-27.5	.12	35.23	-	-	-	-	1	100	H
6.614	38.2	PK2	35.6	-27.5	0	46.3	-	-	-	-	1	100	H
9.946	34.97	PK2	37	-23.4	0	48.57	-	-	-	-	1	100	H
9.946	23.76	MAV1	37	-23.4	.12	37.48	-	-	-	-	1	100	H

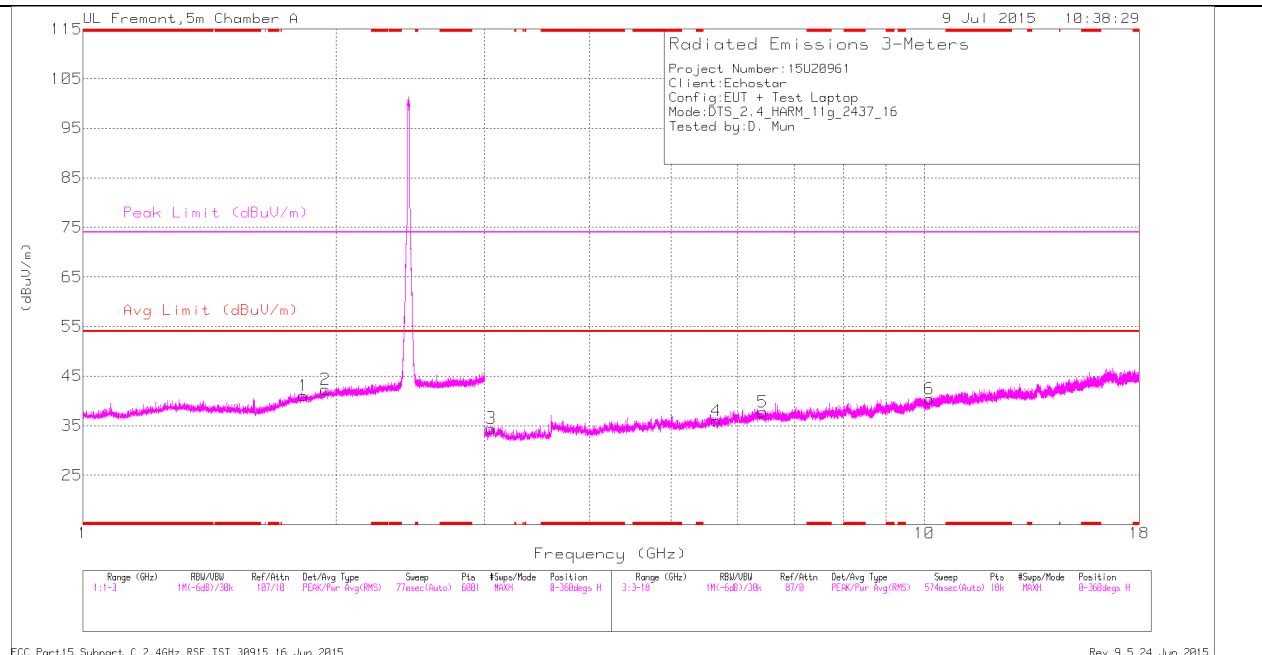
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15 Subpart C 2.4GHz RSE.TST 30915 16 Jun 2015

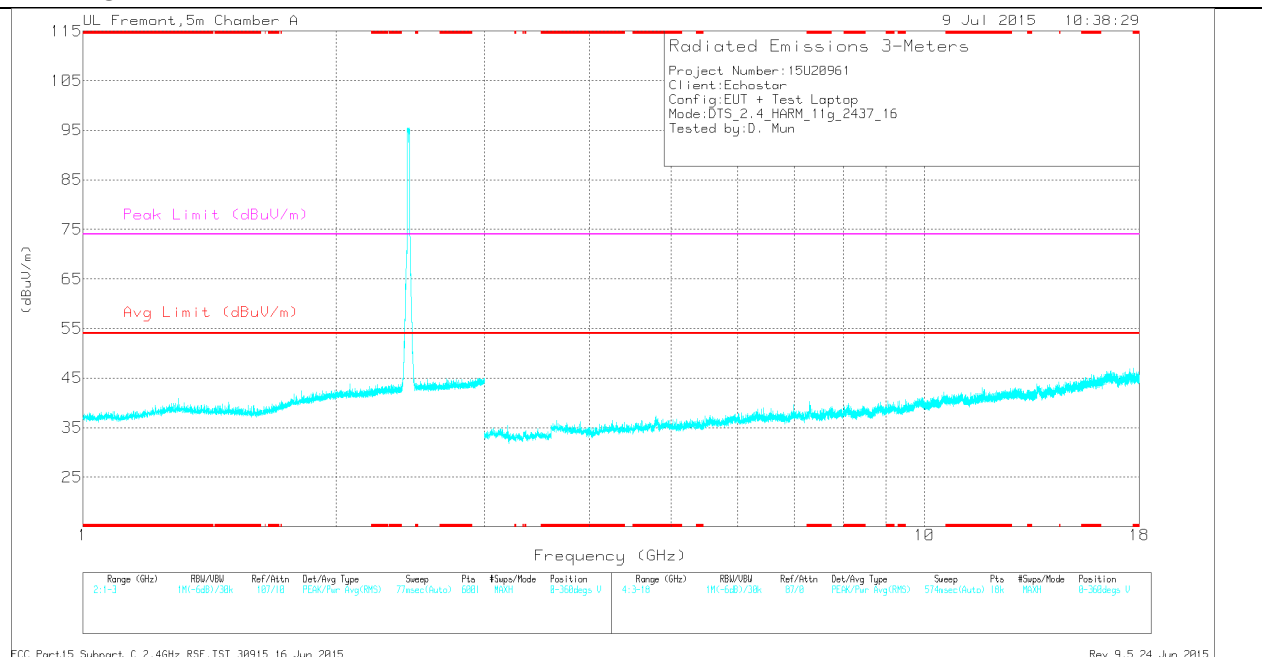
Rev 9.5 24 Jun 2015

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/Cbl/Filtri/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	1.83	36.31	Pk	30.2	-25.5	0	41.01	-	-	-	-	0-360	100	H
2	1.94	36.8	Pk	30.9	-25.4	0	42.3	-	-	-	-	0-360	201	H
3	3.057	33.89	Pk	32.9	-32.3	0	34.49	-	-	-	-	0-360	100	H
4	5.653	30.78	Pk	34.6	-29.4	0	35.98	-	-	-	-	0-360	100	H
5	6.426	30.97	Pk	35.5	-28.7	0	37.77	-	-	-	-	0-360	100	H
6	10.13	27.5	Pk	37.2	-24.3	0	40.4	-	-	-	-	0-360	100	H

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtri/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
1.828	33.11	MAV1	30.2	-25.5	.12	37.93	-	-	-	-	1	100	H
1.83	44.91	PK2	30.2	-25.5	0	49.61	-	-	-	-	1	100	H
1.938	32.72	MAV1	30.9	-25.4	.12	38.34	-	-	-	-	1	202	H
1.941	44.13	PK2	30.9	-25.4	0	49.63	-	-	-	-	1	202	H
3.057	42.99	PK2	32.9	-32.3	0	43.59	-	-	-	-	1	100	H
3.058	31.04	MAV1	32.9	-32.3	.12	31.76	-	-	-	-	1	100	H
5.653	39.74	PK2	34.6	-29.4	0	44.94	-	-	-	-	1	100	H
5.653	28.46	MAV1	34.6	-29.4	.12	33.78	-	-	-	-	1	100	H
6.425	40.04	PK2	35.5	-28.7	0	46.84	-	-	-	-	1	100	H
6.425	27.95	MAV1	35.5	-28.7	.12	34.87	-	-	-	-	1	100	H
10.129	34.96	PK2	37.2	-24.3	0	47.86	-	-	-	-	1	100	H
10.131	24.2	MAV1	37.2	-24.3	.12	37.22	-	-	-	-	1	100	H

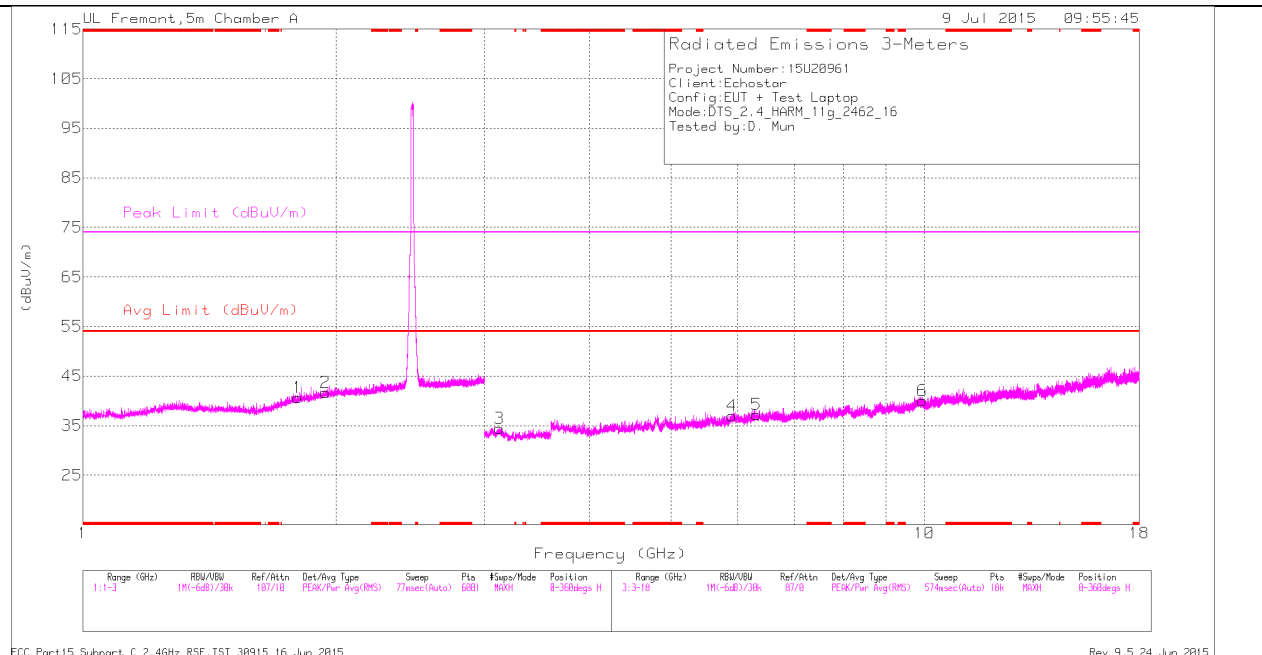
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

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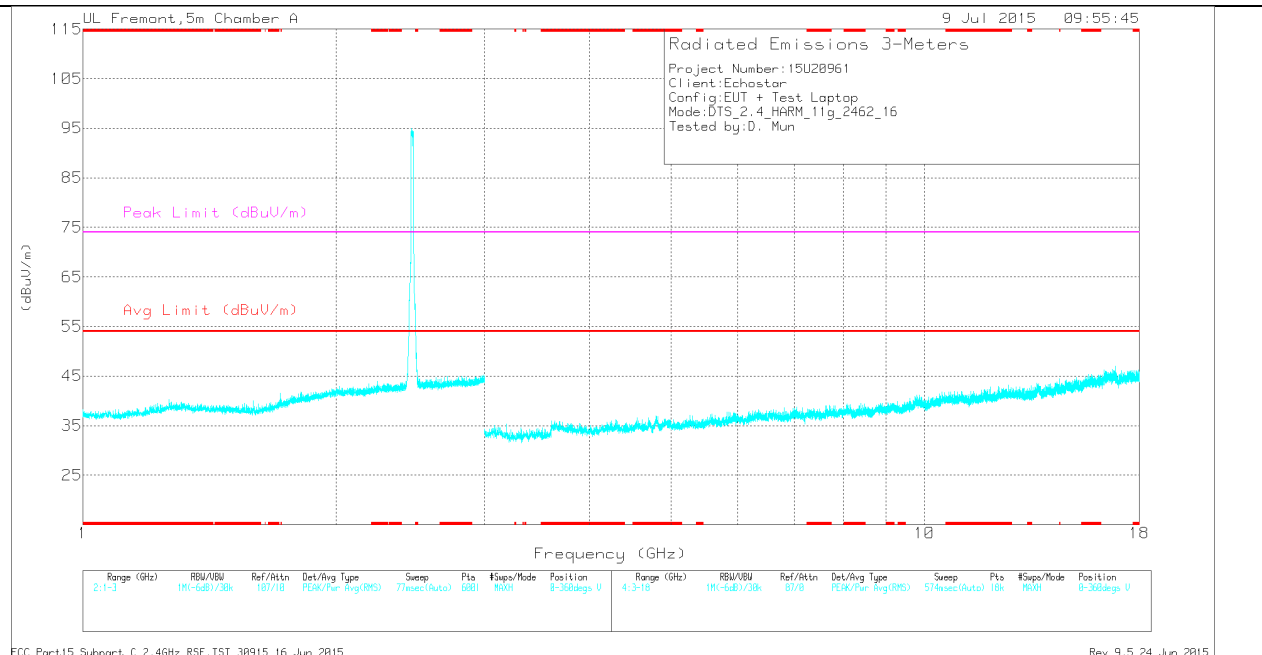
Rev 9.5 24 Jun 2015

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 T136 (dB/m)	Amp/Cbl/Filtri/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	1.799	36.16	Pk	30	-25.5	0	40.66	-	-	-	-	0-360	100	H
2	1.94	36.14	Pk	30.9	-25.4	0	41.64	-	-	-	-	0-360	100	H
3	3.127	33.46	Pk	32.9	-31.9	0	34.46	-	-	-	-	0-360	100	H
4	5.907	30.55	Pk	35.2	-28.8	0	36.95	-	-	-	-	0-360	100	H
5	6.312	29.91	Pk	35.5	-28.2	0	37.21	-	-	-	-	0-360	100	H
6	9.947	26.45	Pk	37	-23.4	0	40.05	-	-	-	-	0-360	100	H

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtri/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
1.799	33.07	MAV1	30	-25.5	.12	37.69	-	-	-	-	1	100	H
1.801	44.38	PK2	30	-25.5	0	48.88	-	-	-	-	1	100	H
1.939	44.01	PK2	30.9	-25.4	0	49.51	-	-	-	-	1	100	H
1.942	32.87	MAV1	30.9	-25.4	.12	38.49	-	-	-	-	1	100	H
3.126	42.49	PK2	32.9	-31.9	0	43.49	-	-	-	-	1	100	H
3.126	30.84	MAV1	32.9	-31.9	.12	31.96	-	-	-	-	1	100	H
5.907	39.53	PK2	35.2	-28.8	0	45.93	-	-	-	-	1	100	H
5.908	27.87	MAV1	35.2	-28.8	.12	34.39	-	-	-	-	1	100	H
6.311	38.91	PK2	35.5	-28.2	0	46.21	-	-	-	-	1	100	H
6.314	27.46	MAV1	35.5	-28.2	.12	34.88	-	-	-	-	1	100	H
9.945	23.85	MAV1	37	-23.4	.12	37.57	-	-	-	-	1	100	H
9.948	34.72	PK2	37	-23.5	0	48.22	-	-	-	-	1	100	H

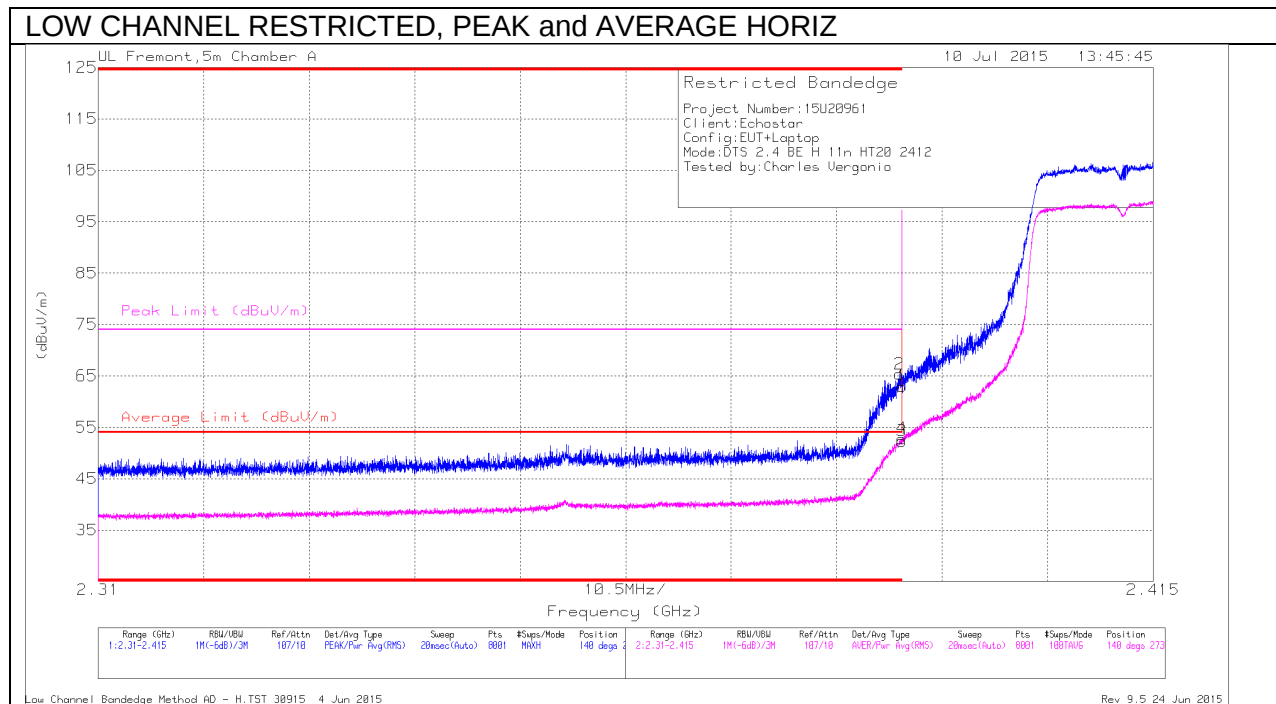
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15 Subpart C 2.4GHz RSE.TST 30915 16 Jun 2015

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



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Chl/FI tr/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	55.84	Pk	32	-24.9	0	62.94	-	-	74	-11.06	140	273	H
2	* 2.39	58.25	Pk	32	-24.9	0	65.35	-	-	74	-8.65	140	273	H
3	* 2.39	45.12	RMS	32	-24.9	.13	52.35	54	-1.65	-	-	140	273	H
4	* 2.39	45.59	RMS	32	-24.9	.13	52.82	54	-1.18	-	-	140	273	H

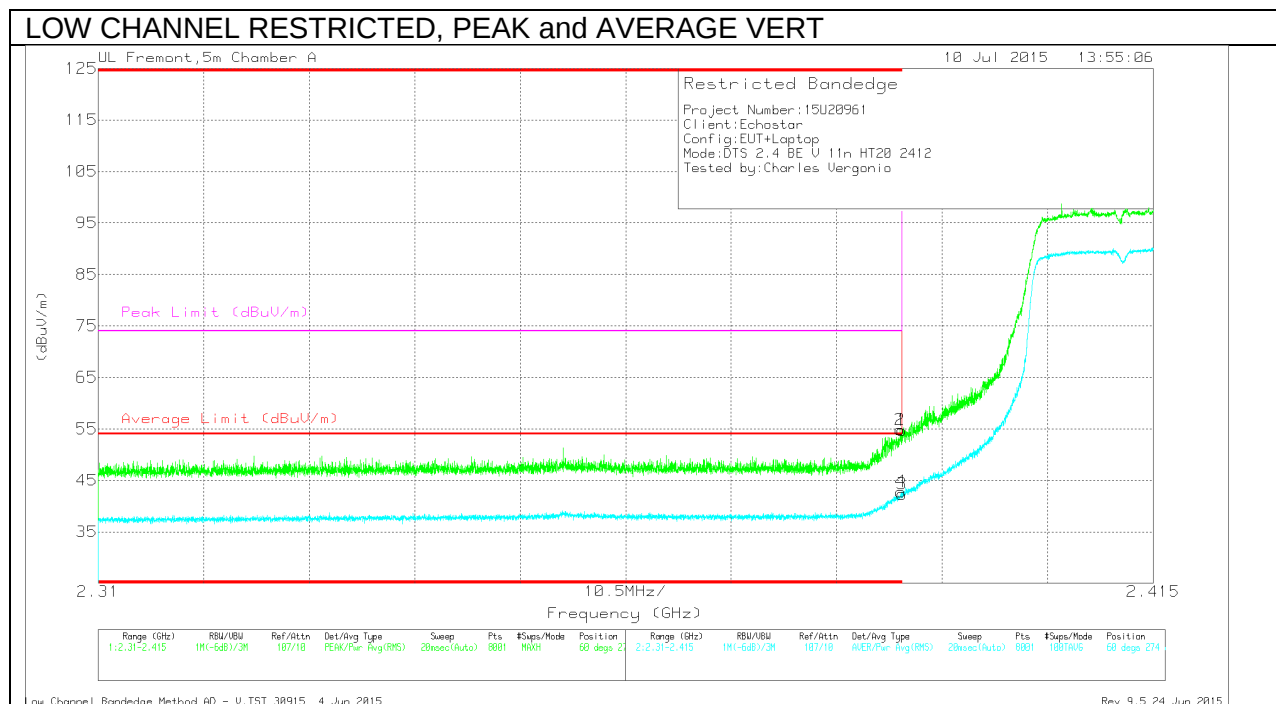
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

Low Channel Bandedge Method AD - H.TST 30915 4 Jun 2015

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Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/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	47.62	Pk	32	-24.9	0	54.72	-	-	74	-19.28	60	274	V
2	* 2.39	47.74	Pk	32	-24.9	0	54.84	-	-	74	-19.16	60	274	V
3	* 2.39	35.1	RMS	32	-24.9	.13	42.33	54	-11.67	-	-	60	274	V
4	* 2.39	35.57	RMS	32	-24.9	.13	42.8	54	-11.2	-	-	60	274	V

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

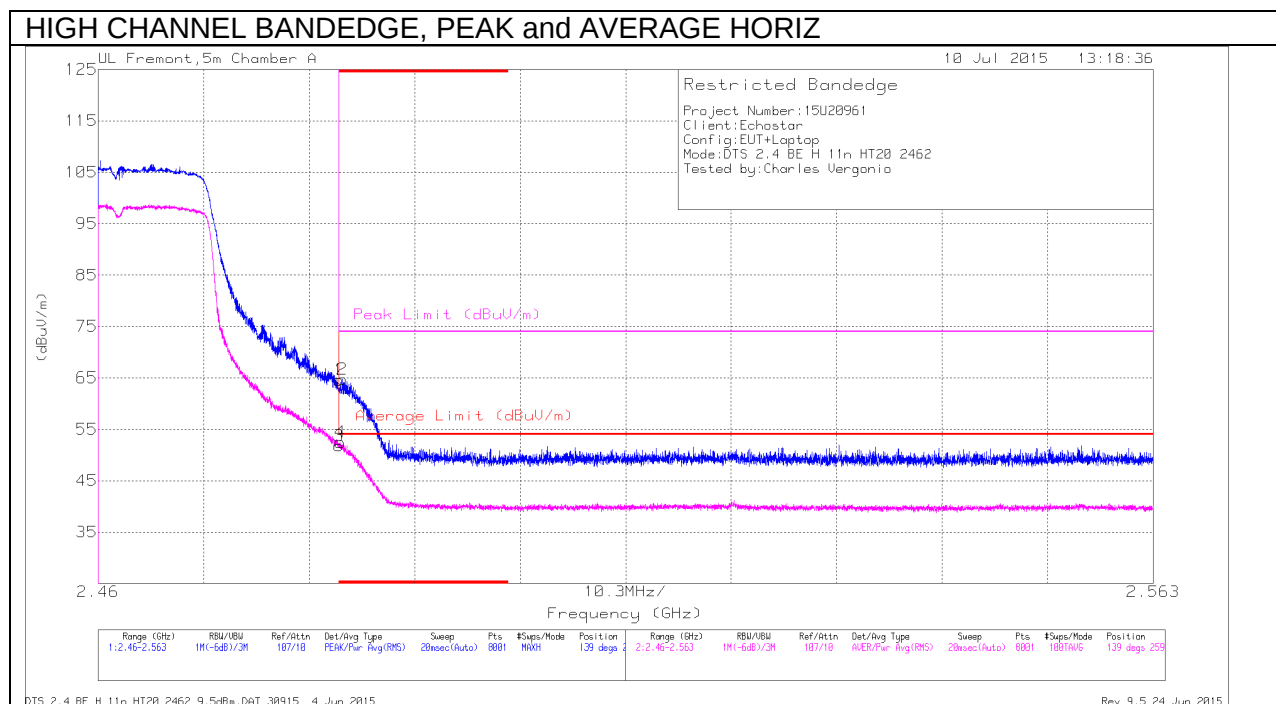
Pk - Peak detector

RMS - RMS detection

Low Channel Bandedge Method AD - V.TST 30915 4 Jun 2015

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AUTHORIZED BANDEDGE (HIGH CHANNEL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/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	57.27	Pk	32.1	-24.8	0	64.57	-	-	74	-9.43	139	259	H
2	* 2.484	57.43	Pk	32.1	-24.8	0	64.73	-	-	74	-9.27	139	259	H
3	* 2.484	44.34	RMS	32.1	-24.8	.13	51.77	54	-2.23	-	-	139	259	H
4	* 2.484	45.04	RMS	32.1	-24.8	.13	52.47	54	-1.53	-	-	139	259	H

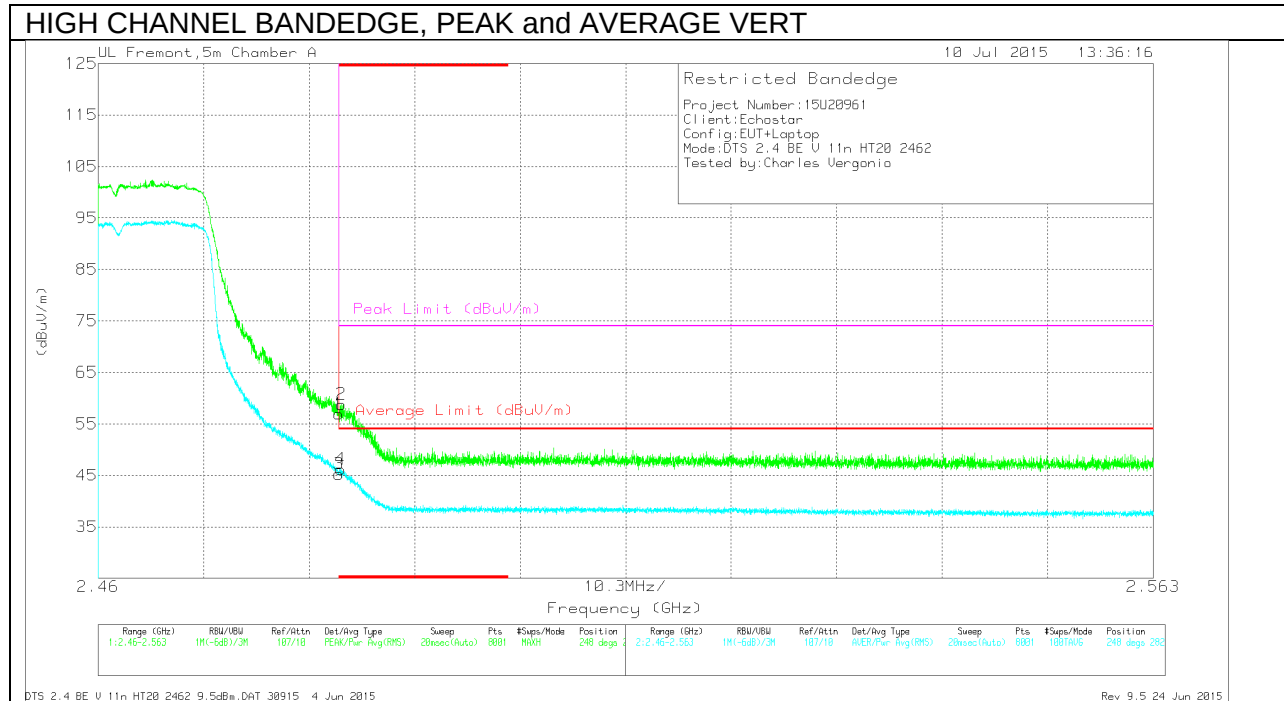
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

DTS_2.4_BE_H_11n_HT20_2462_9.5dBm.DAT 30915 4 Jun 2015

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Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/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	49.6	Pk	32.1	-24.8	0	56.9	-	-	74	-17.1	248	282	V
2	* 2.484	51.5	Pk	32.1	-24.8	0	58.8	-	-	74	-15.2	248	282	V
3	* 2.484	37.97	RMS	32.1	-24.8	.13	45.4	54	-8.6	-	-	248	282	V
4	* 2.484	38.91	RMS	32.1	-24.8	.13	46.34	54	-7.66	-	-	248	282	V

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

Pk - Peak detector

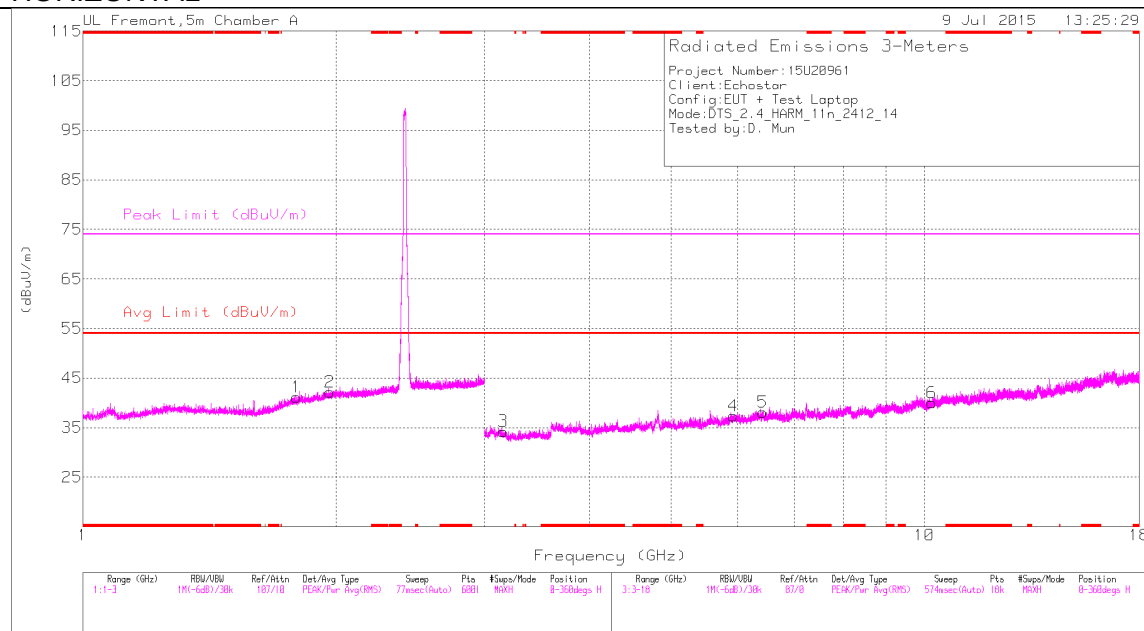
RMS - RMS detection

DTS_2.4_BE_V_11n_HT20_2462_9.5dBm.DAT 30915 4 Jun 2015

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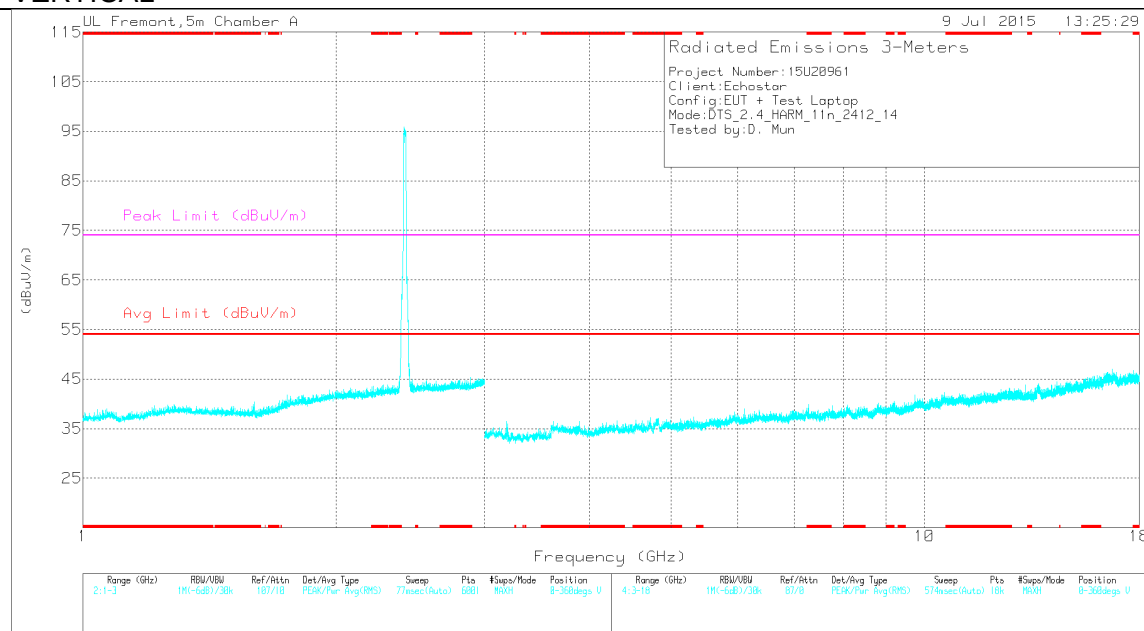
HARMONICS AND SPURIOUS EMISSIONS

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 T136 (dB/m)	Amp/Cbl/Filtri/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	1.795	36.76	Pk	29.9	-25.5	0	41.16	-	-	-	-	0-360	100	H
2	1.964	36.53	Pk	31	-25.4	0	42.13	-	-	-	-	0-360	201	H
3	3.161	33.94	Pk	32.8	-32.5	0	34.24	-	-	-	-	0-360	100	H
4	5.931	30.71	Pk	35.2	-28.6	0	37.31	-	-	-	-	0-360	100	H
5	6.423	31.31	Pk	35.5	-28.7	0	38.11	-	-	-	-	0-360	100	H
6	10.199	26.57	Pk	37.2	-23.8	0	39.97	-	-	-	-	0-360	201	H

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtri/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
1.796	33.42	MAV1	29.9	-25.5	.13	37.95	-	-	-	-	1	100	H
1.797	44.64	PK2	29.9	-25.5	0	49.04	-	-	-	-	1	100	H
1.964	33.09	MAV1	31	-25.4	.13	38.82	-	-	-	-	1	202	H
1.964	44.13	PK2	31	-25.4	0	49.73	-	-	-	-	1	202	H
1.964	32.96	MAV1	31	-25.4	.13	38.69	-	-	-	-	1	202	H
1.964	32.93	MAV1	31	-25.4	.13	38.66	-	-	-	-	1	202	H
1.965	44.6	PK2	31	-25.4	0	50.2	-	-	-	-	1	202	H
1.965	45.25	PK2	31	-25.4	0	50.85	-	-	-	-	1	202	H
3.162	42.19	PK2	32.8	-32.6	0	42.39	-	-	-	-	1	100	H
3.162	30.67	MAV1	32.8	-32.6	.13	31.0	-	-	-	-	1	100	H
5.929	27.97	MAV1	35.2	-28.6	.13	34.7	-	-	-	-	1	100	H
5.93	41.23	PK2	35.2	-28.6	0	47.83	-	-	-	-	1	100	H
6.422	39.63	PK2	35.5	-28.7	0	46.43	-	-	-	-	1	100	H
6.424	28.14	MAV1	35.5	-28.7	.13	35.07	-	-	-	-	1	100	H
10.198	24	MAV1	37.2	-23.8	.13	37.53	-	-	-	-	1	202	H
10.2	35.41	PK2	37.2	-23.8	0	48.81	-	-	-	-	1	202	H

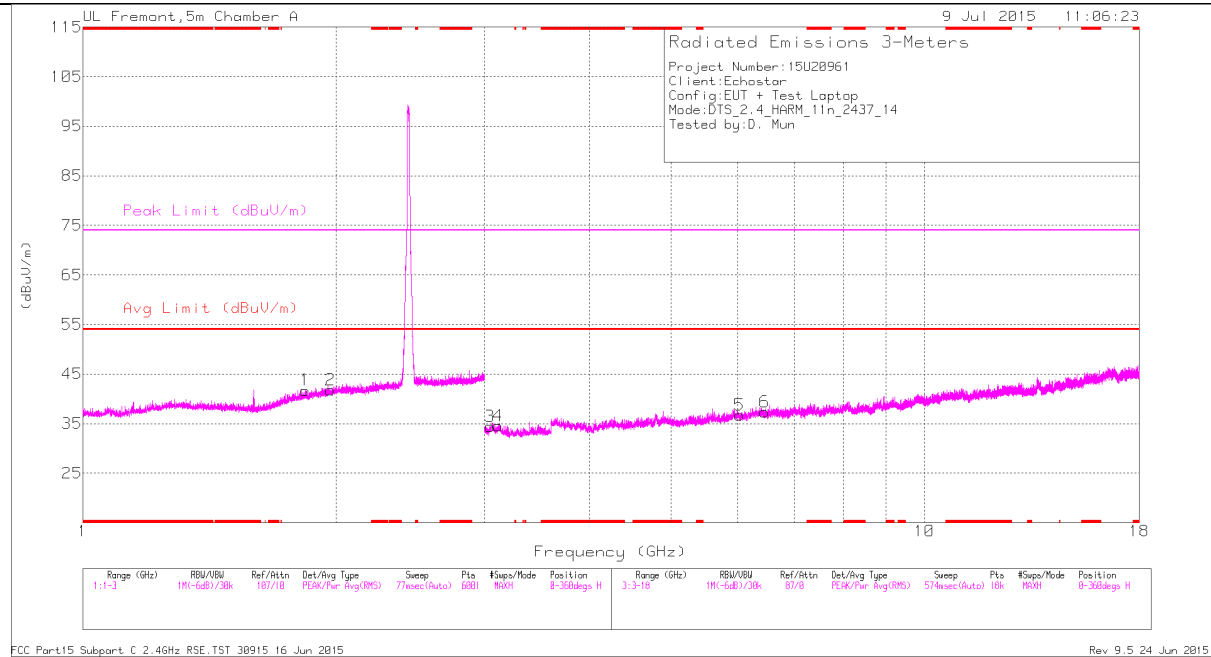
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15 Subpart C 2.4GHz RSE.TST 30915 16 Jun 2015

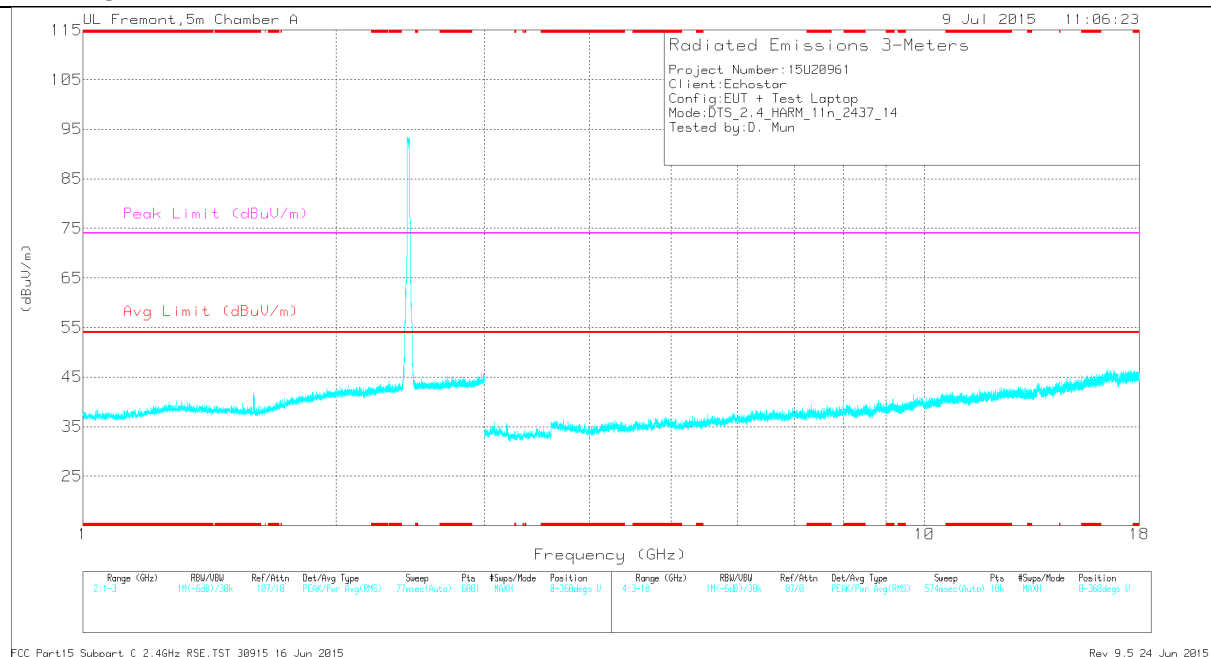
Rev 9.5 24 Jun 2015

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	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.836	36.93	Pk	30.3	-25.5	0	41.73	-	-	-	-	0-360	100	H
2	1.968	36.15	Pk	31	-25.3	0	41.85	-	-	-	-	0-360	201	H
3	3.045	34.18	Pk	32.9	-32.6	0	34.48	-	-	-	-	0-360	201	H
4	3.113	33.61	Pk	32.9	-32	0	34.51	-	-	-	-	0-360	201	H
5	6.026	30.39	Pk	35.4	-29.1	0	36.69	-	-	-	-	0-360	100	H
6	6.462	30.68	Pk	35.5	-28.8	0	37.38	-	-	-	-	0-360	100	H

Pk - Peak detector

Radiated Emissions

Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl /Ftr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.836	33.05	MAV1	30.3	-25.5	.13	37.98	-	-	-	-	1	100	H
1.837	44.66	PK2	30.3	-25.5	0	49.46	-	-	-	-	1	100	H
1.967	32.8	MAV1	31	-25.3	.13	38.63	-	-	-	-	1	202	H
1.969	44.32	PK2	31	-25.3	0	50.02	-	-	-	-	1	202	H
3.045	42.54	PK2	32.9	-32.6	0	42.84	-	-	-	-	1	202	H
3.045	31.18	MAV1	32.9	-32.6	.13	31.61	-	-	-	-	1	202	H
3.112	30.84	MAV1	32.9	-32	.13	31.87	-	-	-	-	1	202	H
3.115	42.79	PK2	32.9	-32	0	43.69	-	-	-	-	1	202	H
6.025	27.77	MAV1	35.4	-29.1	.13	34.2	-	-	-	-	1	100	H
6.026	38.84	PK2	35.4	-29.1	0	45.14	-	-	-	-	1	100	H
6.463	39.51	PK2	35.5	-28.8	0	46.21	-	-	-	-	1	100	H
6.464	27.87	MAV1	35.5	-28.8	.13	34.7	-	-	-	-	1	100	H

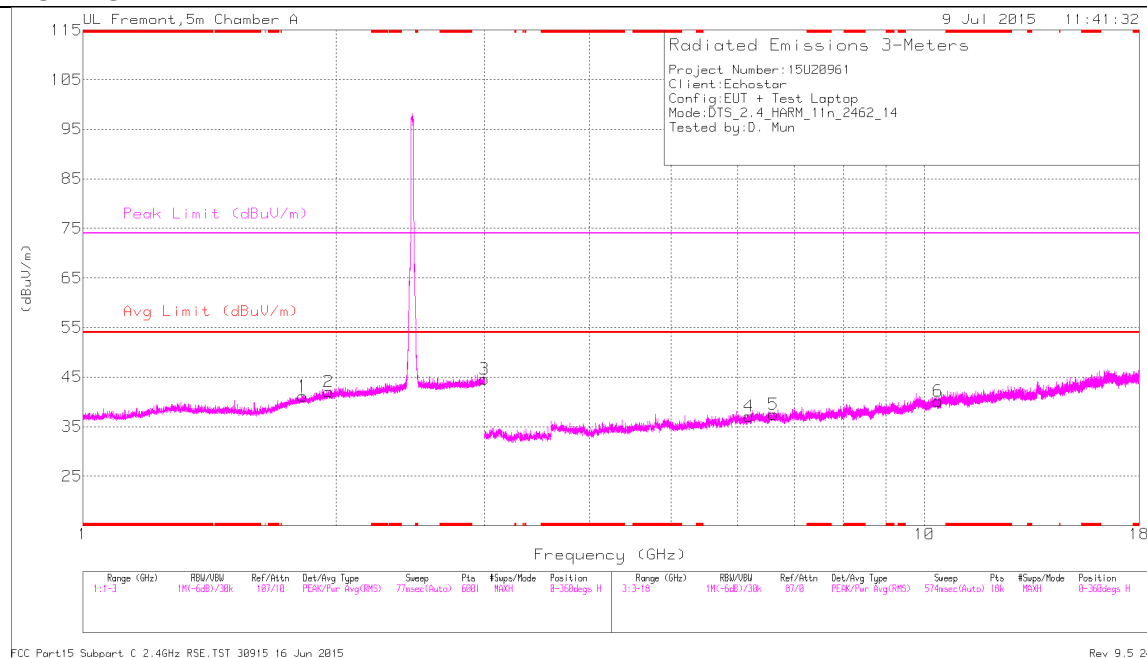
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15 Subpart C 2.4GHz RSE.TST 30915 16 Jun 2015

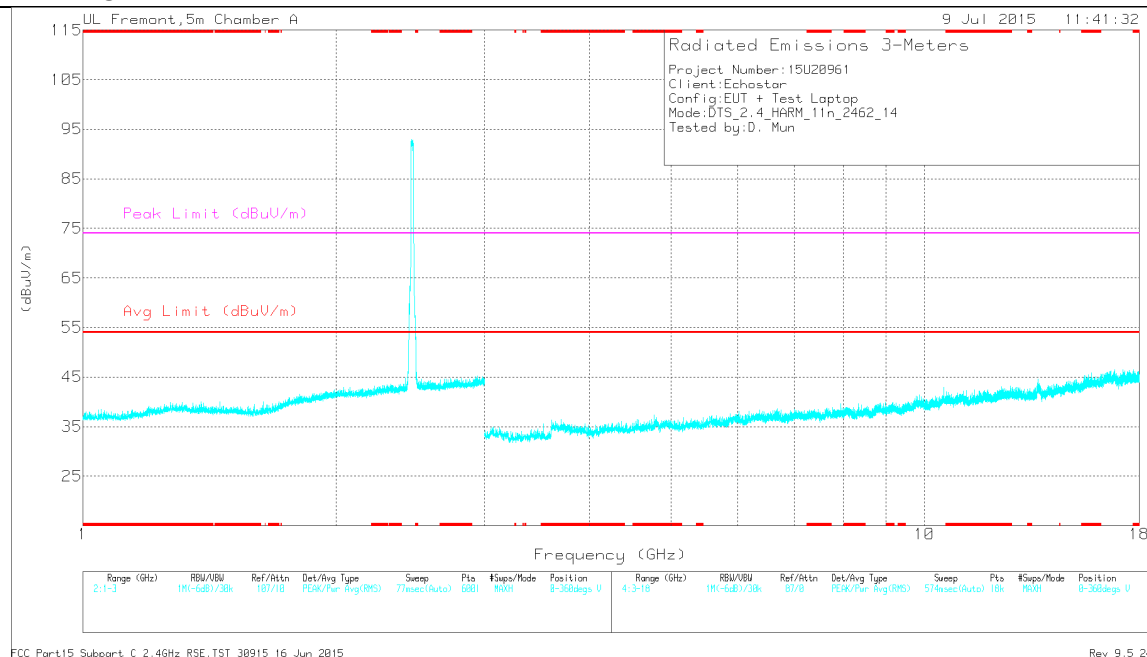
Rev 9.5 24 Jun 2015

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	Frequenc y (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fil tri/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.826	36.49	Pk	30.2	-25.5	0	41.19	-	-	-	-	0-360	100	H
2	1.958	36.42	Pk	31	-25.4	0	42.02	-	-	-	-	0-360	100	H
3	2.999	35.88	Pk	32.9	-24.2	0	44.58	-	-	-	-	0-360	201	H
4	6.185	30.75	Pk	35.4	-29	0	37.15	-	-	-	-	0-360	100	H
5	6.614	29.4	Pk	35.6	-27.5	0	37.5	-	-	-	-	0-360	100	H
6	10.376	26.59	Pk	37.4	-23.9	0	40.09	-	-	-	-	0-360	100	H

Pk - Peak detector

Radiated Emissions

Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl /Filtr/Pad (dB)	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.828	45.03	PK2	30.2	-25.5	0	49.73	-	-	-	-	1	100	H
1.828	33.13	MAV1	30.2	-25.5	.13	37.96	-	-	-	-	1	100	H
1.957	44.72	PK2	31	-25.4	0	50.32	-	-	-	-	1	100	H
1.957	33.08	MAV1	31	-25.4	.13	38.81	-	-	-	-	1	100	H
2.997	32.61	MAV1	32.9	-24.3	.13	41.34	-	-	-	-	1	202	H
2.999	44.35	PK2	32.9	-24.2	0	53.05	-	-	-	-	1	202	H
6.185	39.57	PK2	35.4	-29	0	45.97	-	-	-	-	1	100	H
6.185	27.9	MAV1	35.4	-29	.13	34.43	-	-	-	-	1	100	H
6.612	38.85	PK2	35.6	-27.5	0	46.95	-	-	-	-	1	100	H
6.614	27.03	MAV1	35.6	-27.5	.13	35.26	-	-	-	-	1	100	H
10.375	35.49	PK2	37.4	-23.9	0	48.99	-	-	-	-	1	100	H
10.378	23.83	MAV1	37.4	-23.9	.13	37.46	-	-	-	-	1	100	H

PK2 - KDB558074 Method: Maximum Peak

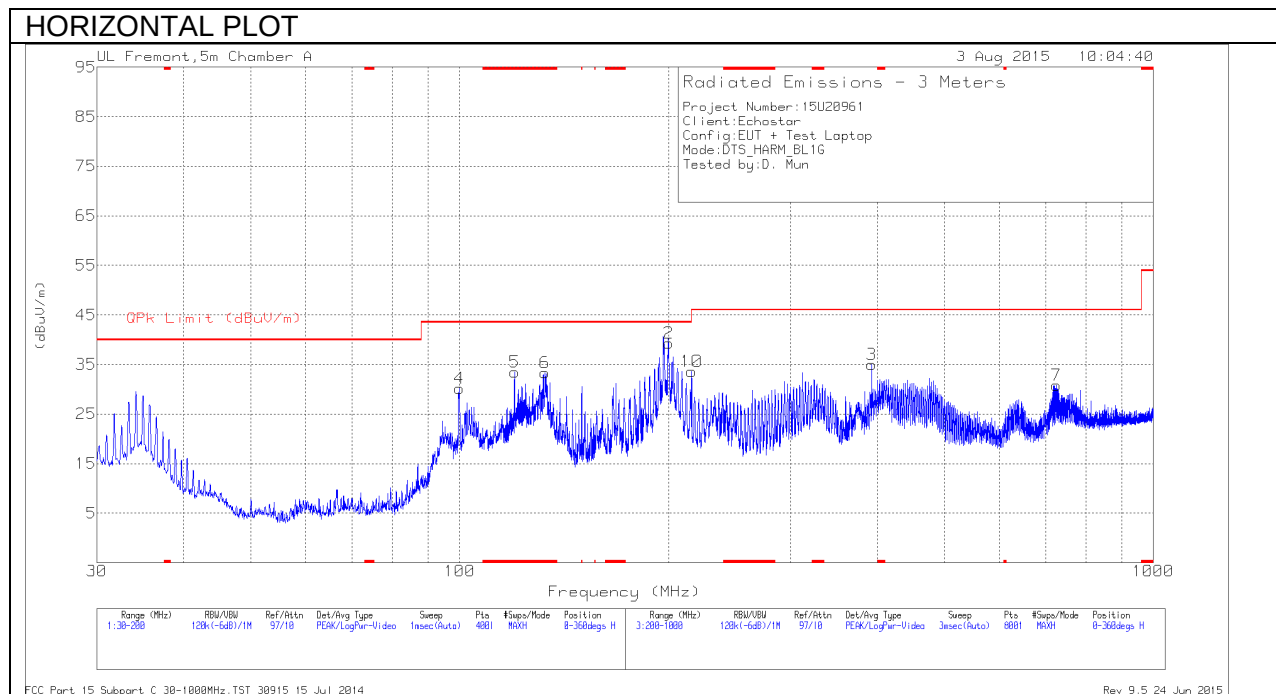
MAV1 - KDB558074 Option 1 Maximum RMS Average

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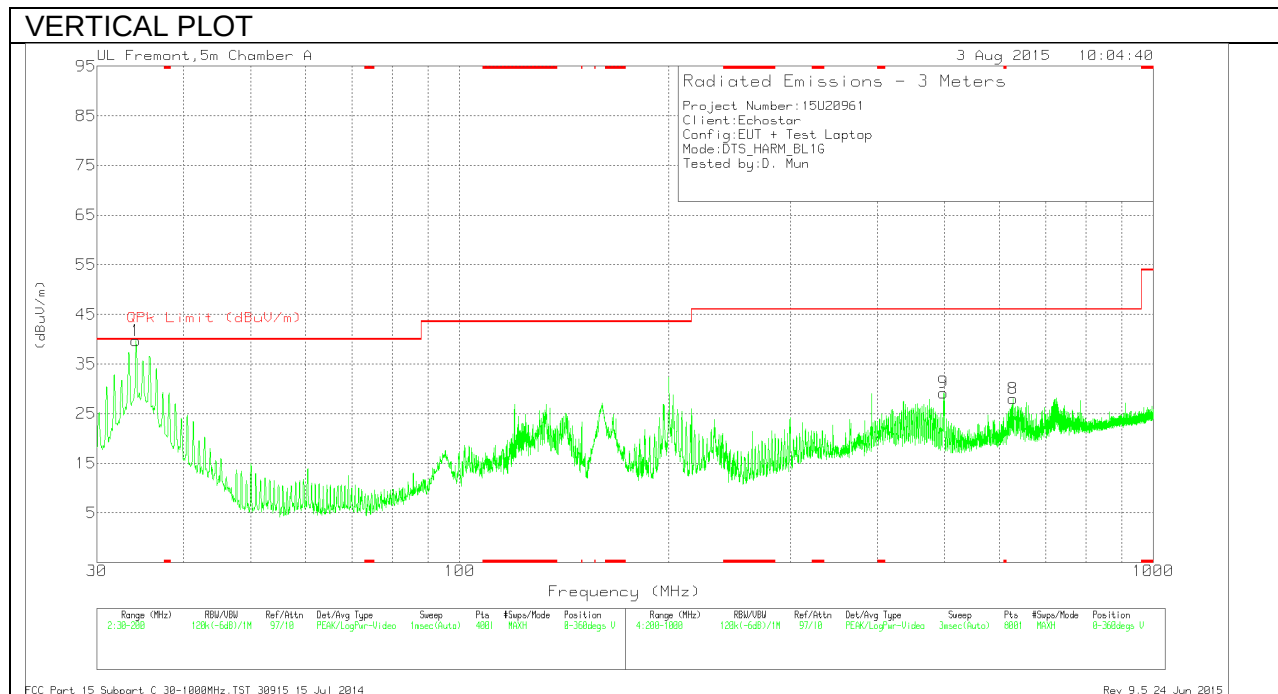
Rev 9.5 24 Jun 2015

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

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 120.015	49.96	Pk	13.9	-30.4	33.46	43.52	-10.06	0-360	199	H
6	* 132.8075	49.6	Pk	14.1	-30.3	33.4	43.52	-10.12	0-360	199	H
1	34.165	52.56	Pk	18.3	-31.2	39.66	40	-3.4	0-360	101	V
4	99.955	51.35	Pk	9.4	-30.6	30.15	43.52	-13.37	0-360	299	H
2	200.1	56.62	Pk	12.6	-29.9	39.32	43.52	-4.2	0-360	101	H
10	216	52.97	Pk	10.5	-29.9	33.57	43.52	-9.95	0-360	101	H
3	392.7	49.05	Pk	15	-29.1	34.95	46.02	-11.07	0-360	101	H
9	497.9	40.42	Pk	17.6	-28.8	29.22	46.02	-16.8	0-360	101	V
8	627.5	37.24	Pk	19.3	-28.5	28.04	46.02	-17.98	0-360	101	V
7	724.4	38.61	Pk	20.3	-28.1	30.81	46.02	-15.21	0-360	101	H

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

Pk - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 15 Jul 2014

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11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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.

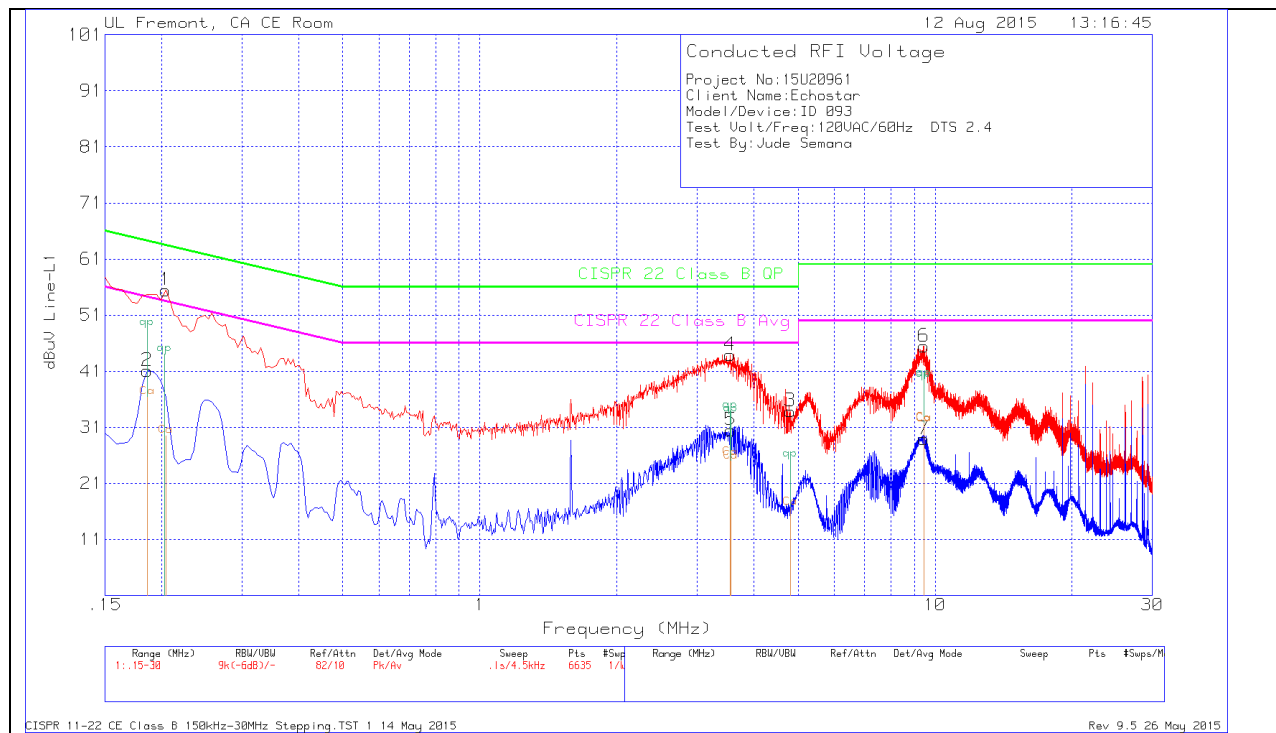
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

Trace Markers

Range 1: Line-L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.20288	28.55	Ca	.9	0	29.45	-	-	53.49	-24.04
.18578	35.38	Ca	1	0	36.38	-	-	54.22	-17.84
4.80638	16.34	Ca	.2	.1	16.64	-	-	46	-29.36
3.54638	25.26	Ca	.2	.1	25.56	-	-	46	-20.44
3.55538	24.62	Ca	.2	.1	24.92	-	-	46	-21.08
9.45128	31.4	Ca	.2	.1	31.7	-	-	50	-18.3
9.44138	31.24	Ca	.2	.1	31.54	-	-	50	-18.46

Ca - CISPR average detection

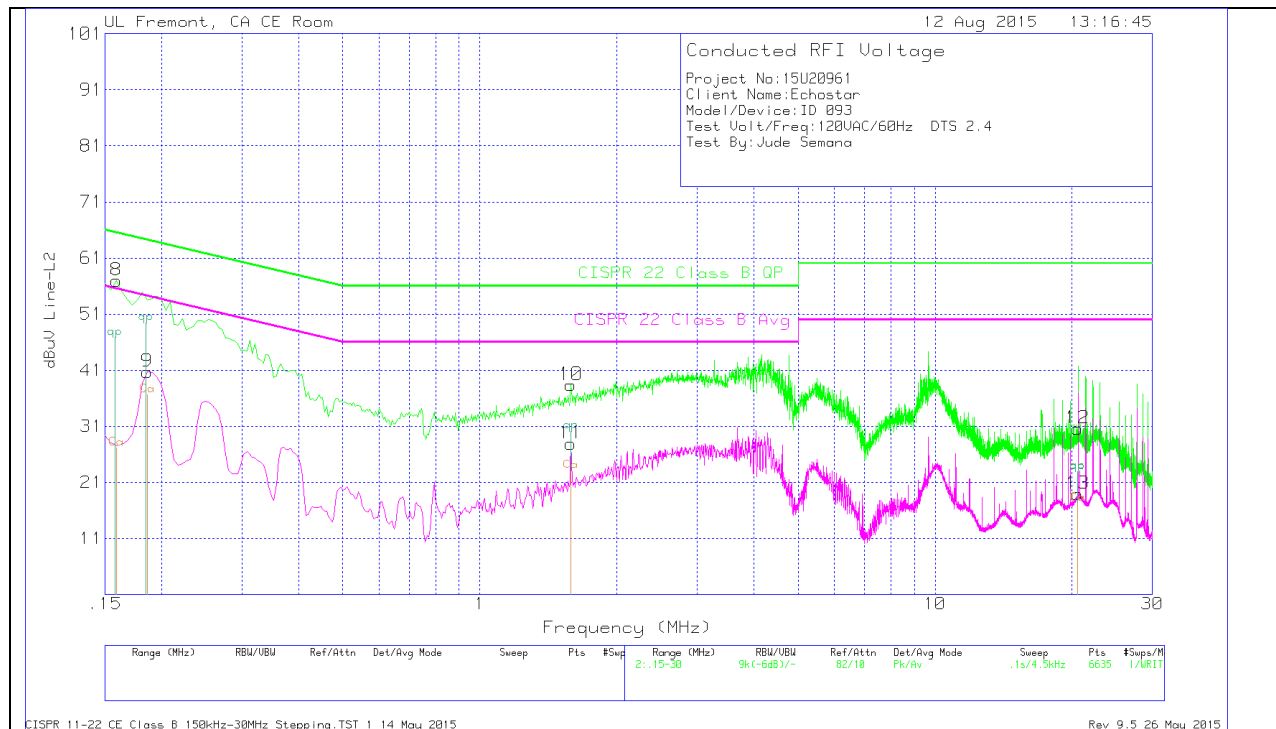
Quasi-Peak Emissions

Range 1: Line-L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.20288	43.14	Qp	.9	0	44.04	63.49	-19.45	-	-
.18578	47.73	Qp	1	0	48.73	64.22	-15.49	-	-
4.80638	24.99	Qp	.2	.1	25.29	56	-30.71	-	-
3.54638	33.65	Qp	.2	.1	33.95	56	-22.05	-	-
3.55538	33.09	Qp	.2	.1	33.39	56	-22.61	-	-
9.45128	39.43	Qp	.2	.1	39.73	60	-20.27	-	-
9.44138	39.19	Qp	.2	.1	39.49	60	-20.51	-	-

Qp - Quasi-Peak detector

LINE 2 PLOT



LINE 2 RESULTS

Trace Markers

Range 2: Line-L2 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.15788	25.71	Ca	1.4	0	27.11	-	-	55.57	-28.46
.18488	35.48	Ca	1.1	0	36.58	-	-	54.26	-17.68
1.58663	22.73	Ca	.2	.1	23.03	-	-	46	-22.97
20.5609	16.68	Ca	.3	.2	17.18	-	-	50	-32.82
20.5753	16.73	Ca	.3	.2	17.23	-	-	50	-32.77

Ca - CISPR average detection

Quasi-Peak Emissions

Range 2: Line-L2 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.15788	45.43	Qp	1.4	0	46.83	65.57	-18.74	-	-
.18488	48.32	Qp	1.1	0	49.42	64.26	-14.84	-	-
1.58663	29.83	Qp	.2	.1	30.13	56	-25.87	-	-
20.5609	22.43	Qp	.3	.2	22.93	60	-37.07	-	-
20.5753	22.36	Qp	.3	.2	22.86	60	-37.14	-	-

Qp - Quasi-Peak detector

CISPR 11-22 CE Class B 150kHz-30MHz Stepping.TST 1 14 May 2015
Rev 9.5 26 May 2015