FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER: SM-G355HN
FCC ID: A3LSMG355HN

REPORT NUMBER: 14I17986-4 REVISION A

ISSUE DATE: June 19, 2014

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	6/18/14	Initial issue	P. Zhang
A	6/19/14	Updated statement	P. Zhang

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 5

2. TEST METHODOLOGY 6

3. FACILITIES AND ACCREDITATION 6

4. CALIBRATION AND UNCERTAINTY 6

4.1. MEASURING INSTRUMENT CALIBRATION 6

4.2. SAMPLE CALCULATION 6

4.3. MEASUREMENT UNCERTAINTY 6

5. EQUIPMENT UNDER TEST 7

5.1. DESCRIPTION OF EUT 7

5.2. MAXIMUM OUTPUT POWER 7

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 7

5.4. WORST-CASE CONFIGURATION AND MODE 8

5.5. DESCRIPTION OF TEST SETUP 9

6. TEST AND MEASUREMENT EQUIPMENT 11

7. MEASUREMENT METHODS 12

8. SUMMARY TABLE 13

9. ANTENNA PORT TEST RESULTS 14

9.1. 6 dB BANDWIDTH 14

9.1.1. 802.11b MODE IN THE 2.4 GHz BAND 15
9.1.2. 802.11g MODE IN THE 2.4 GHz BAND 15
9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND 15
9.1.4. PLOTS 16

9.2. 99% BANDWIDTH 19

9.2.1. 802.11b MODE IN THE 2.4 GHz BAND 19
9.2.2. 802.11g MODE IN THE 2.4 GHz BAND 19
9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND 19
9.2.1. PLOTS 20

9.3. AVERAGE POWER 23

9.3.1. 802.11b MODE IN THE 2.4 GHz BAND 24
9.3.2. 802.11g MODE IN THE 2.4 GHz BAND 24
9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND 24

9.4. OUTPUT POWER 25

9.4.1. 802.11b MODE IN THE 2.4 GHz BAND 26
9.4.2. 802.11g MODE IN THE 2.4 GHz BAND 26
9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND 26
9.4.1. PLOTS 28

9.5. PSD 31

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9.5.1. 802.11b MODE IN THE 2.4 GHz BAND 31
9.5.2. 802.11g MODE IN THE 2.4 GHz BAND 31
9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND 31
9.5.1. PLOTS 32

9.6. OUT-OF-BAND EMISSIONS 35
9.6.1. 802.11b MODE IN THE 2.4 GHz BAND 36
9.6.2. 802.11g MODE IN THE 2.4 GHz BAND 42
9.6.3. 802.11n MODE IN THE 2.4 GHz BAND 48

10. RADIATED TEST RESULTS 54

10.1. LIMITS AND PROCEDURE 54

10.2. TRANSMITTER ABOVE 1 GHz 55
10.2.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND 55
10.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND 68
10.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND 81

10.3. WORST-CASE BELOW 1 GHz 94

11. AC POWER LINE CONDUCTED EMISSIONS 97

12. SETUP PHOTOS 101

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1. ATTESTATION OF TEST RESULTS

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

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

MODEL: SM-G355HN

SERIAL NUMBER: FL-164-C, FL-230-A (Radiated), FL-164-D (Conducted),

DATE TESTED: April 25 – June 18, 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.

Approved & Released
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.4-2009.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC.

The model FCC ID: A3LSMG355HN shares the same enclosure and circuit board as mode FCC ID: A3LSMG355H. The WWAN/WLAN/Bluetooth/WWAN circuitry and layout, are almost identical between the two units. The WLAN/Bluetooth antenna and surrounding circuitry is the same between these two units.

Conducted test results have been re-used for A3LSMG355HN after confirming the performance is the same.

Radiated emissions were fully re-evaluated since Main Antenna pattern have been changed for A3LSMG355HN. Other differences between the two FCC IDs are NFC chipset being added for A3LSMG355HN. NFC has been fully tested for FCC ID: A3LSMG355HN.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	18.92	77.98
2412 - 2462	802.11g	22.05	160.32
2412 - 2462	802.11n HT20	19.93	98.40

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.4 dBi.

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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

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	G355H	N/A	N/A
Earphone	Samsung	G355H	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.

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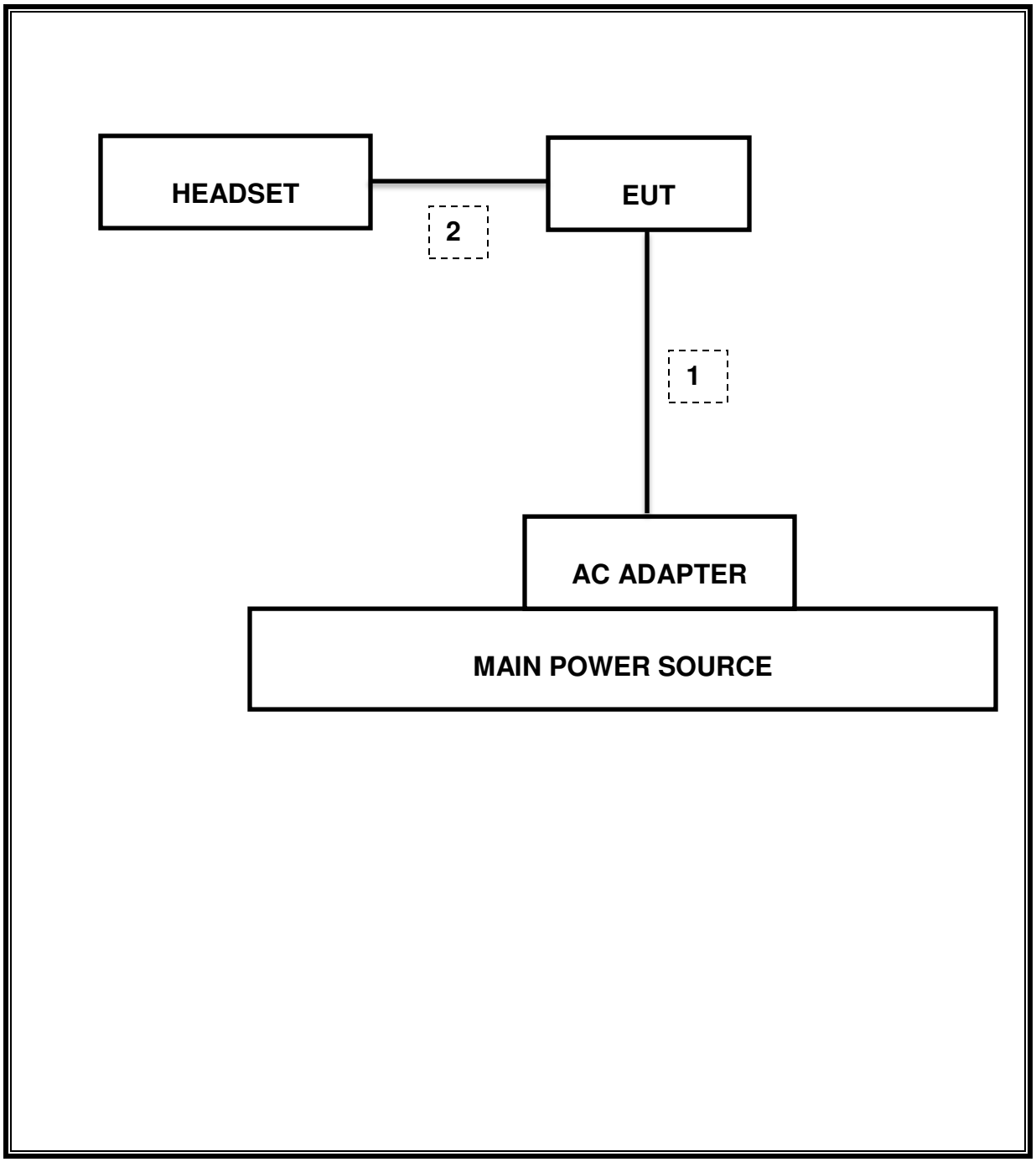
SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/14/14
Antenna, Horn, 18 GHz	ETS	3117	C01006	12/11/14
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/14
PXA SIGNAL ANALYZER	Agilent / HP	N9030A	N/A	05/09/15
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/15
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/2014
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/2014

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7. MEASUREMENT METHODS

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

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

For Band edge testing: resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements.

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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	8.04MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-34.59dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	22.05dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-5.12dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	49.77dBuV/m
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	48.41dBuV/m

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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 to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

RESULTS

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9.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.57	0.5
Mid	2437	8.04	0.5
High	2462	8.49	0.5
Worst		8.04	

9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.18	0.5
Mid	2437	15.12	0.5
High	2462	15.12	0.5
Worst		15.12	

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	15.06	0.5
Mid	2437	15.03	0.5
High	2462	15.15	0.5
Worst		15.03	

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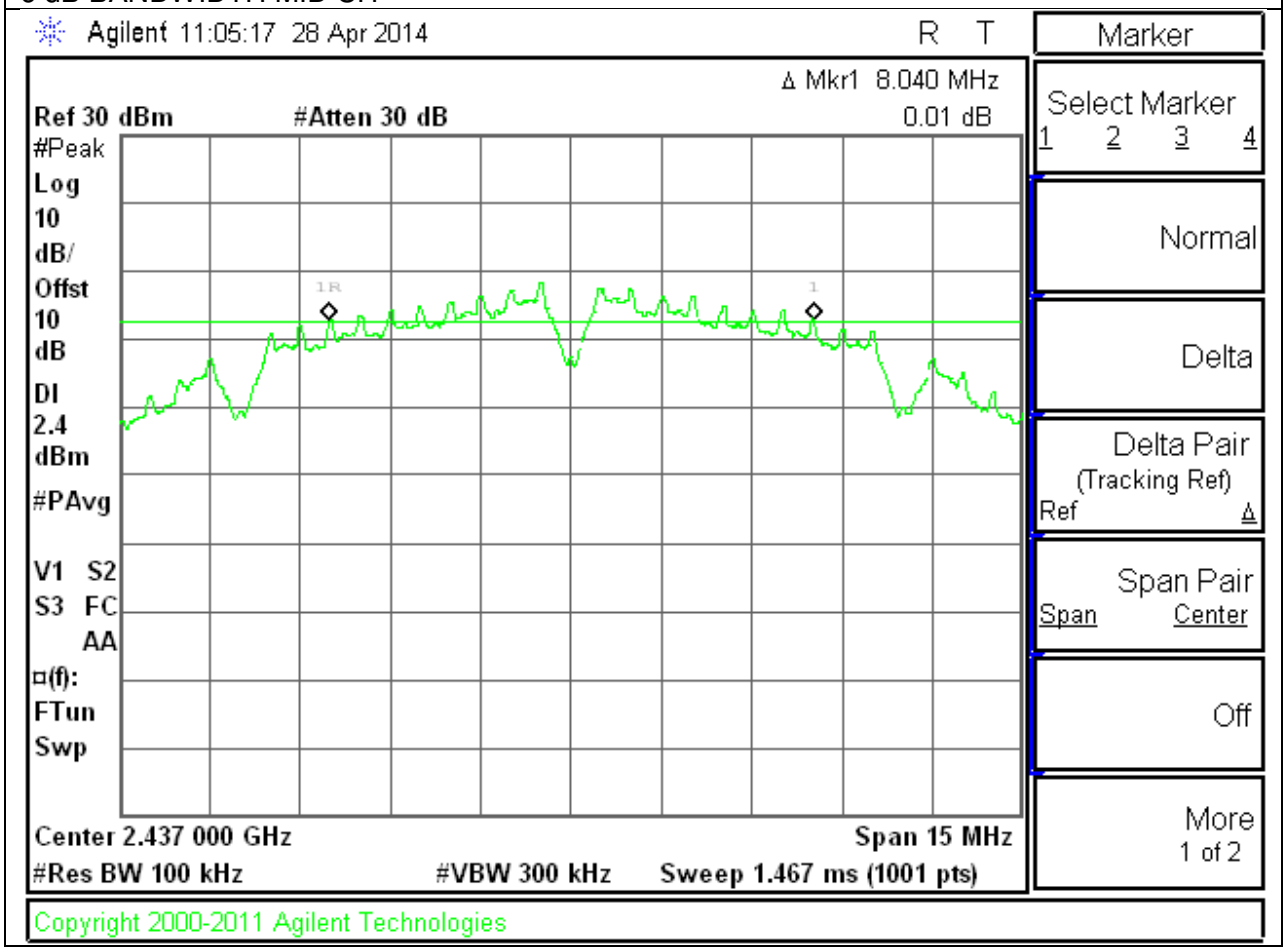
9.1.4. PLOTS

802.11b 6 dB BANDWIDTH

6 dB BANDWIDTH MID CH



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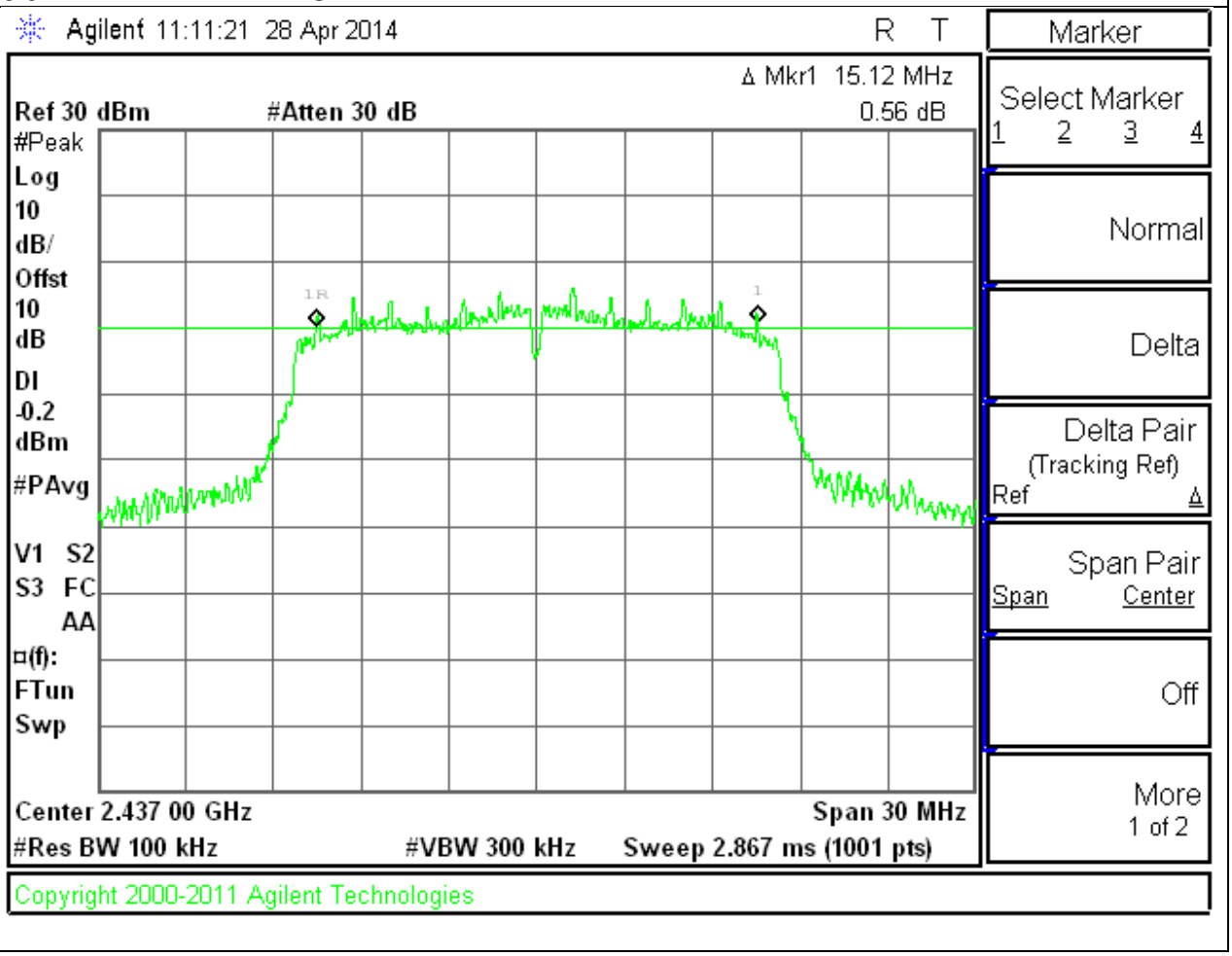
802.11g 6 dB BANDWIDTH

6 dB BANDWIDTH MID CH



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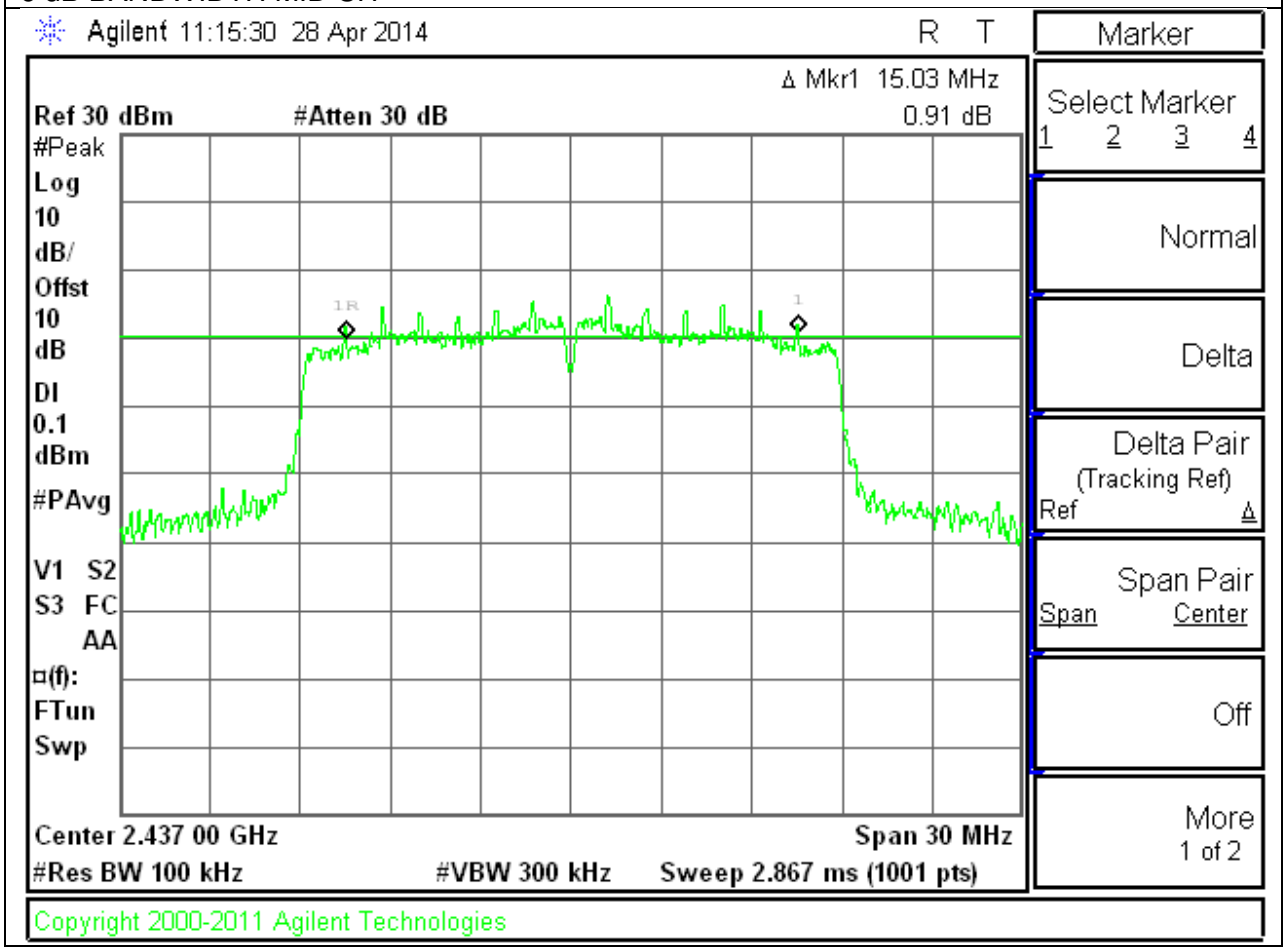
802.11n 6 dB BANDWIDTH

6 dB BANDWIDTH MID CH



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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	12.77
Mid	2437	12.69
High	2462	12.65
Worst		12.77

9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.04
Mid	2437	16.14
High	2462	16.19
Worst		16.19

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.28
Mid	2437	17.23
High	2462	17.31
Worst		17.31

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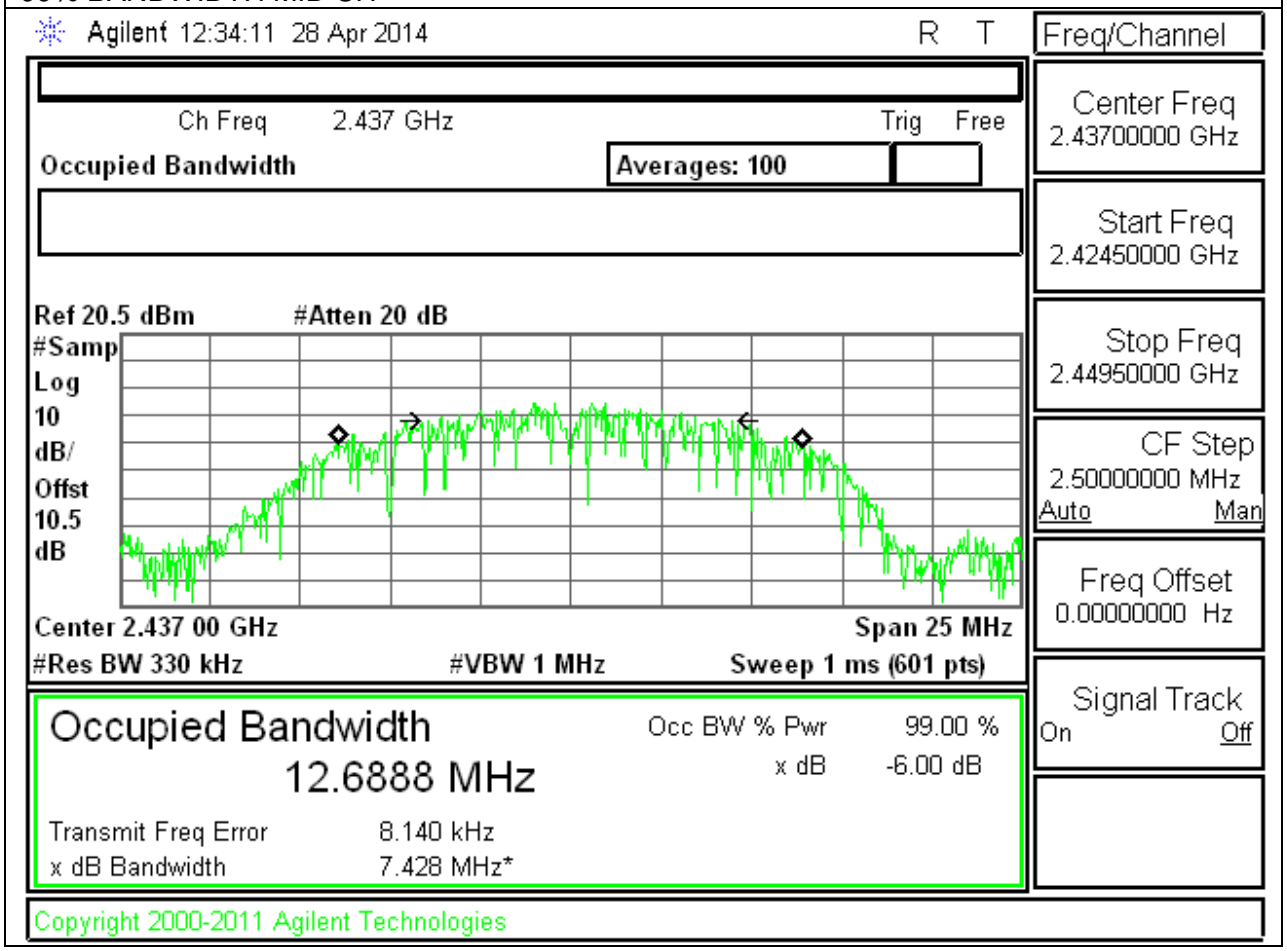
9.2.1. PLOTS

802.11b 99% BANDWIDTH

99% BANDWIDTH MID CH



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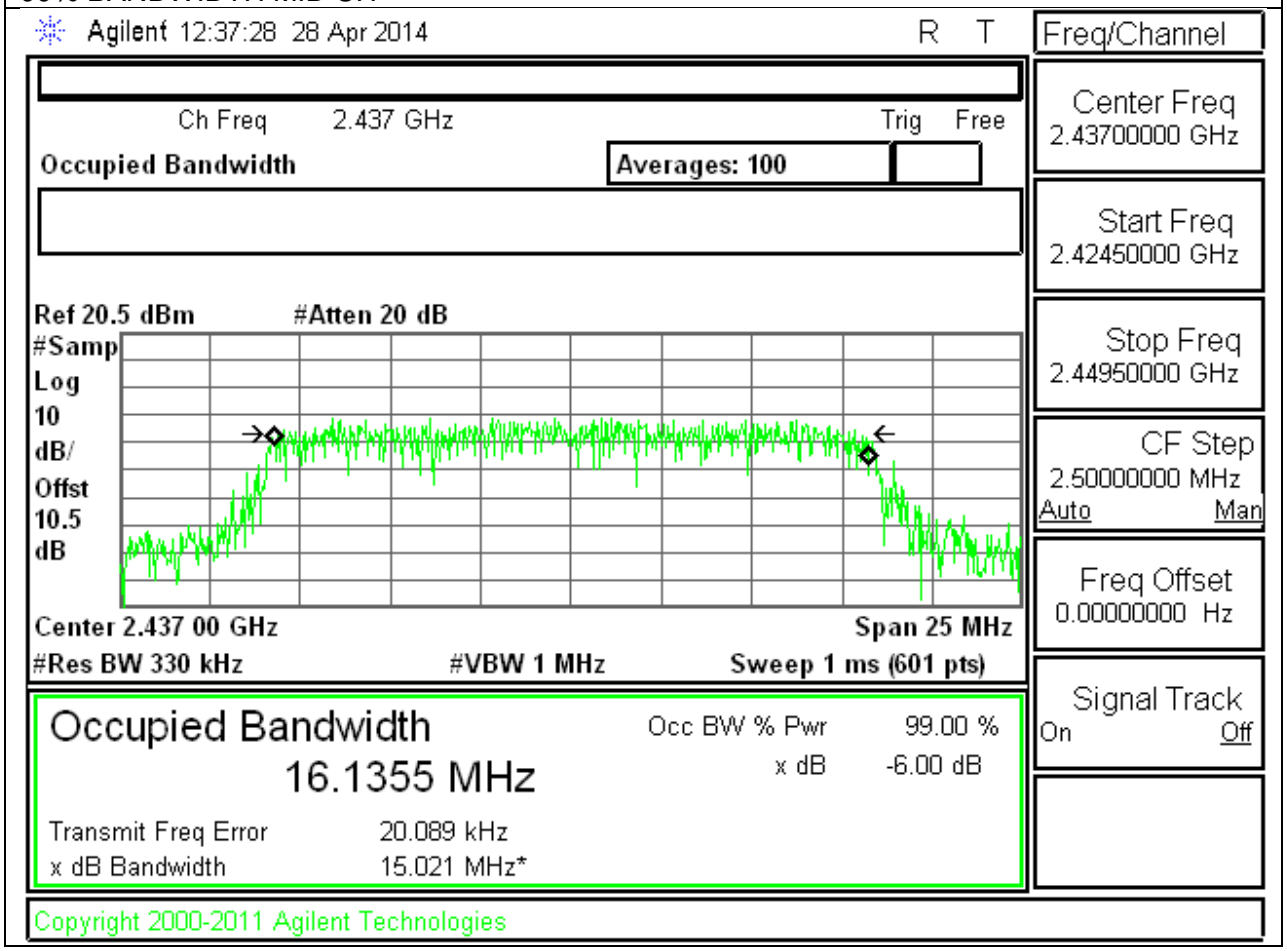
802.11g 99% BANDWIDTH

99% BANDWIDTH MID CH



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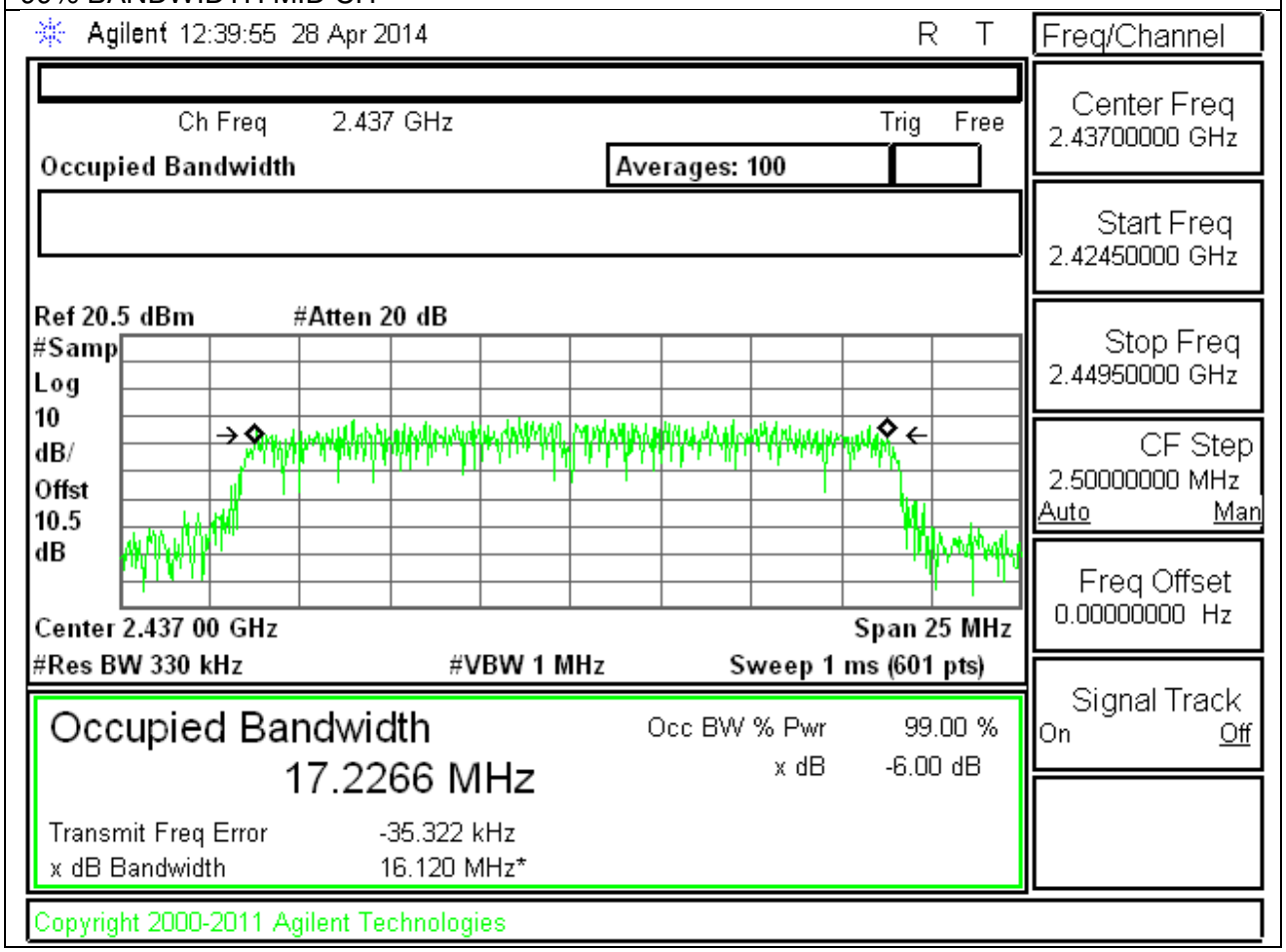
802.11n 99% BANDWIDTH

99% BANDWIDTH MID CH



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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

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9.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	16.40
Mid	2437	16.50
High	2462	16.40
Worst		16.500

9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	13.80
Mid	2437	14.00
High	2462	13.90
Worst		14.000

9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	11.70
Mid	2437	11.90
High	2462	11.90
Worst		11.900

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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.

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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	-1.40	30.00	30	36	30.00
Mid	2437	-1.40	30.00	30	36	30.00
High	2462	-1.40	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	18.92	18.92	30.00	-11.08
Mid	2437	18.91	18.91	30.00	-11.09
High	2462	18.83	18.83	30.00	-11.17
Worst			18.92		

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	-1.40	30.00	30	36	30.00
Mid	2437	-1.40	30.00	30	36	30.00
High	2462	-1.40	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	21.96	21.96	30.00	-8.04
Mid	2437	21.97	21.97	30.00	-8.03
High	2462	22.05	22.05	30.00	-7.95
Worst			22.05		

9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

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Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.40	30.00	30	36	30.00
Mid	2437	-1.40	30.00	30	36	30.00
High	2462	-1.40	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	19.83	19.83	30.00	-10.17
Mid	2437	19.93	19.93	30.00	-10.07
High	2462	19.72	19.72	30.00	-10.28
Worst			19.93		

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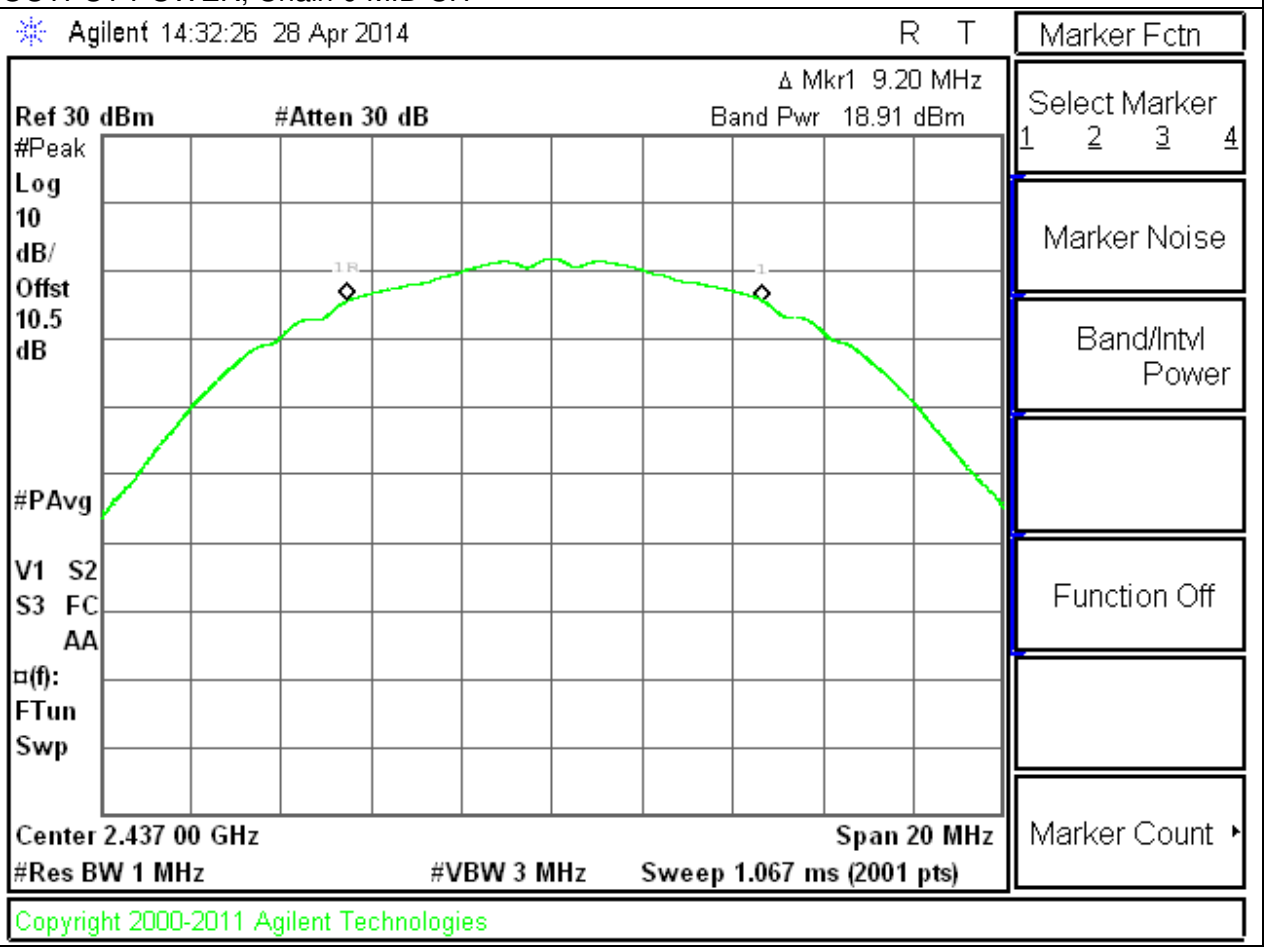
9.4.1. PLOTS

802.11b OUTPUT POWER, Chain 0

OUTPUT POWER, Chain 0 MID CH



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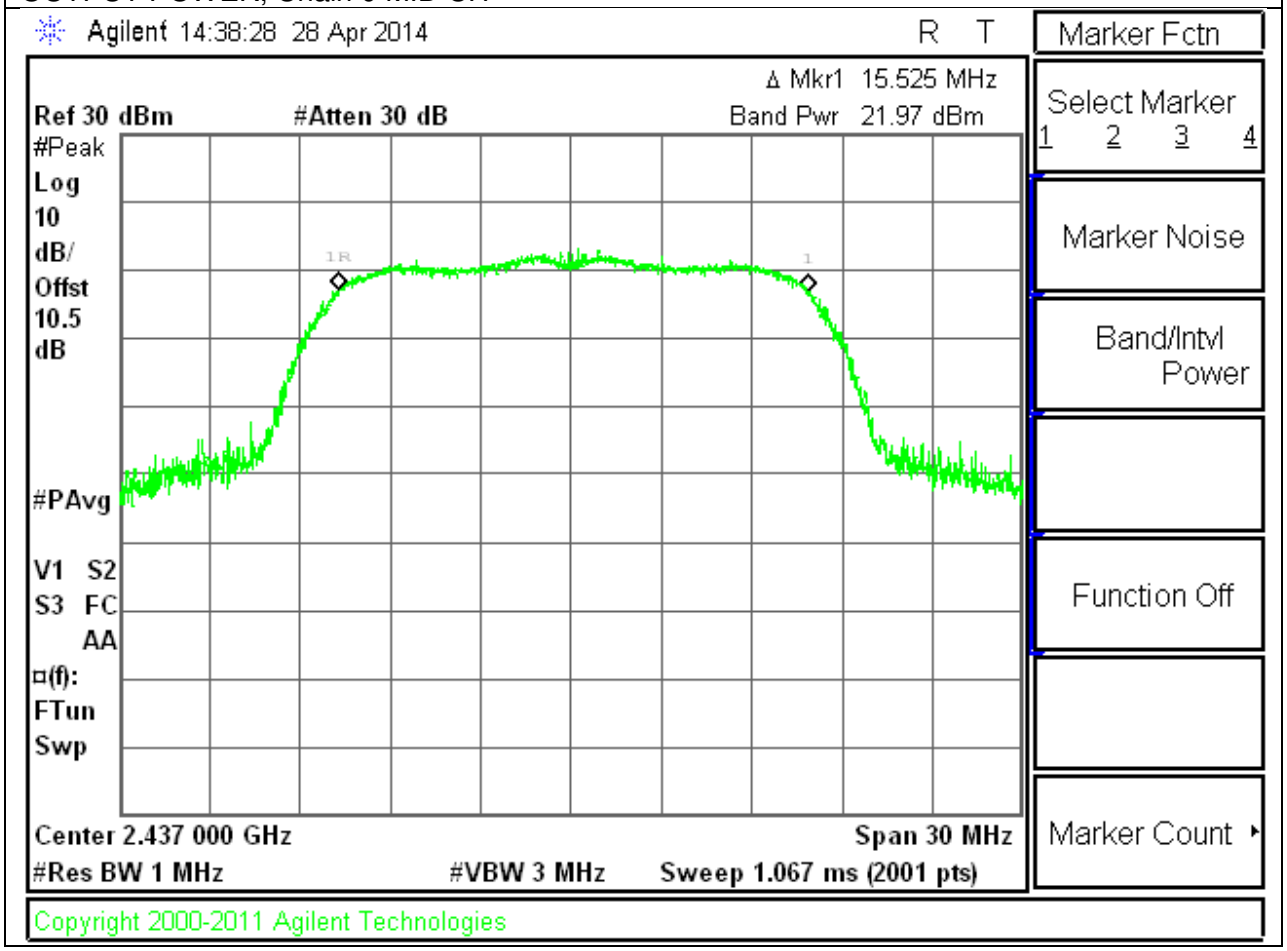
802.11g OUTPUT POWER, Chain 0

OUTPUT POWER, Chain 0 MID CH



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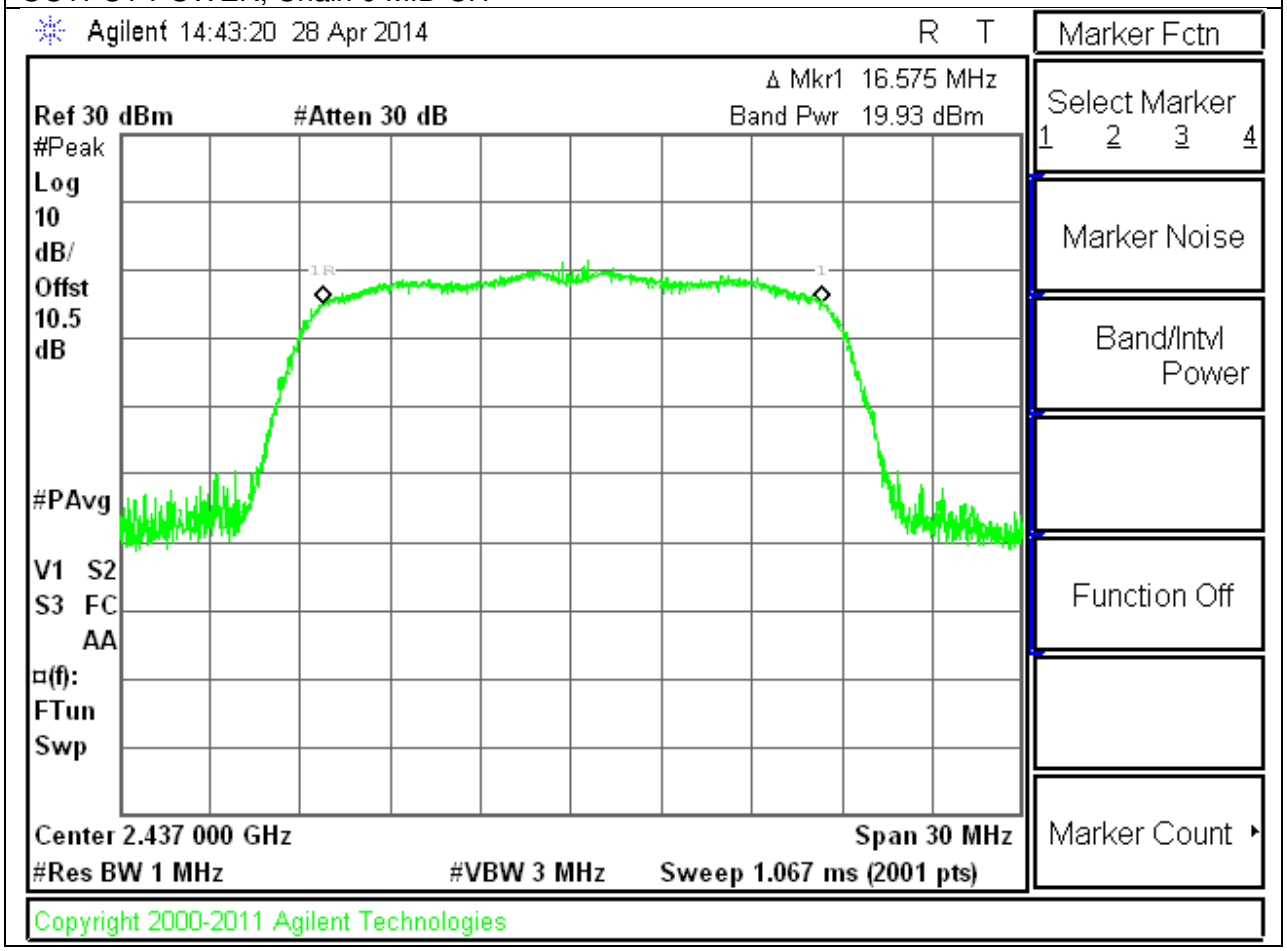
802.11n OUTPUT POWER, Chain 0

OUTPUT POWER, Chain 0 MID CH



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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	-5.12	8.0	-13.1
Mid	2437	-5.86	8.0	-13.9
High	2462	-5.56	8.0	-13.6

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	-10.47	8.0	-18.5
Mid	2437	-9.31	8.0	-17.3
High	2462	-9.73	8.0	-17.7

9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-11.99	8.0	-20.0
Mid	2437	-12.01	8.0	-20.0
High	2462	-9.55	8.0	-17.6

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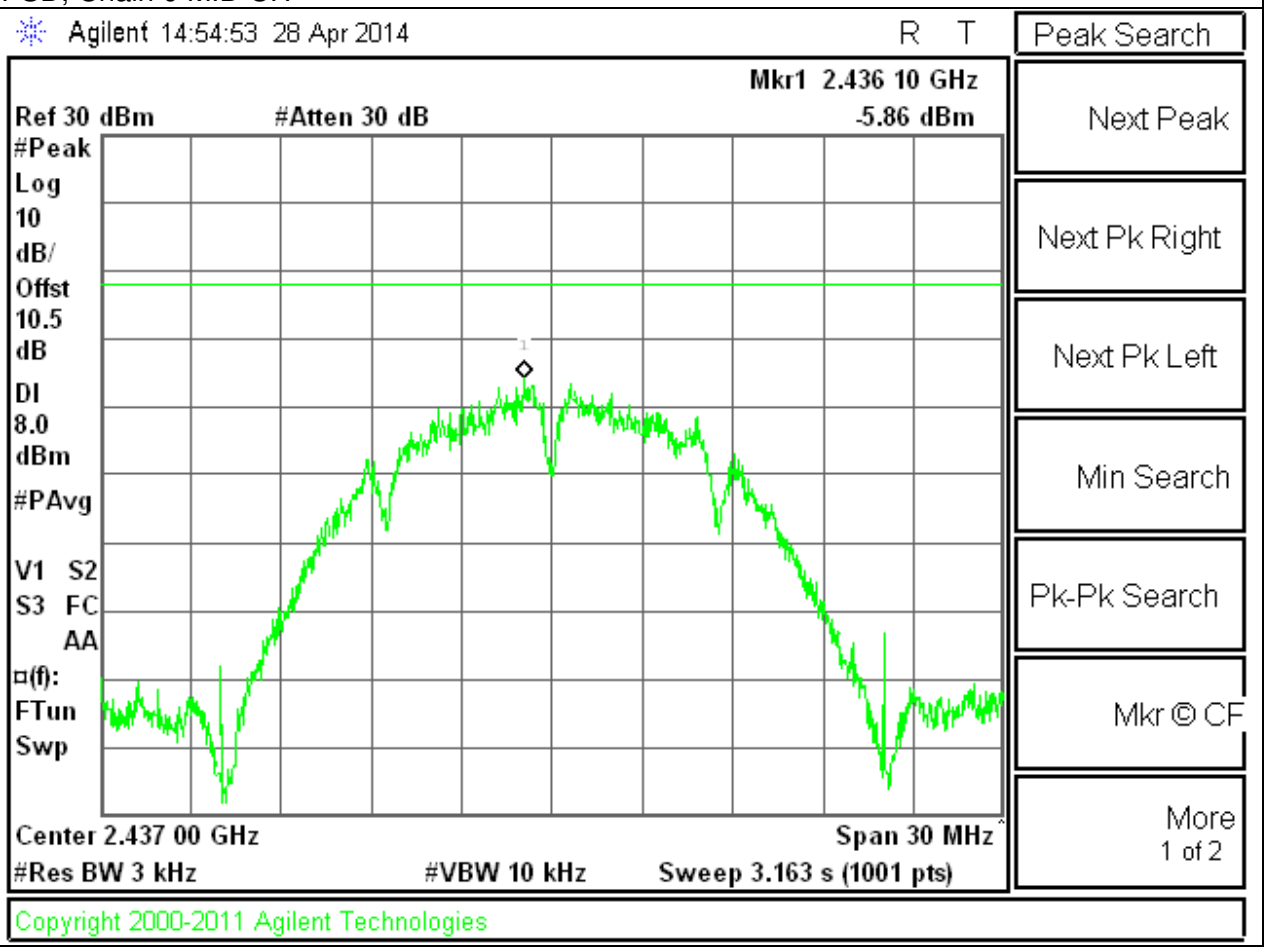
9.5.1. PLOTS

802.11b PSD, Chain 0

PSD, Chain 0 MID CH



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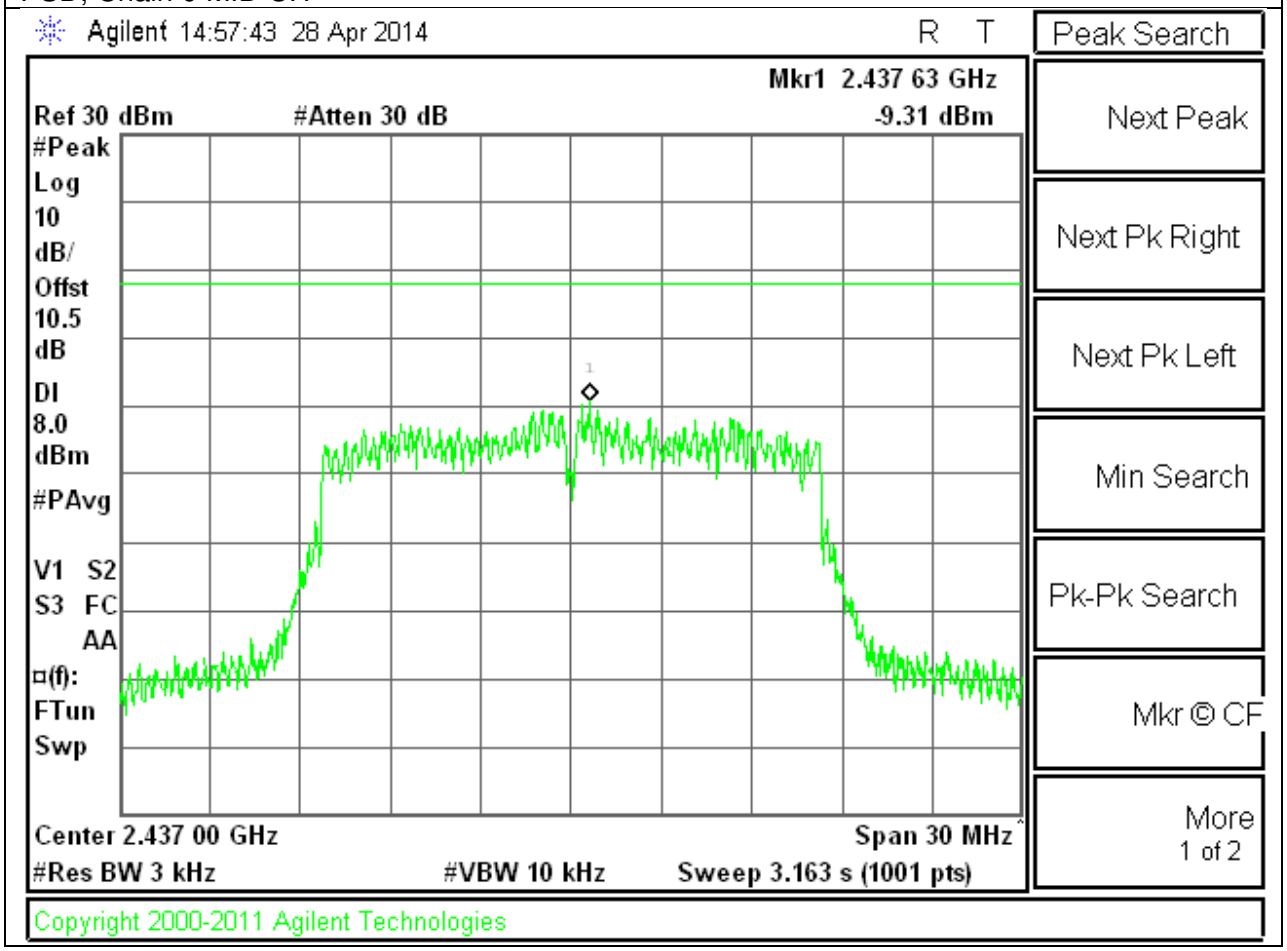
802.11g PSD, Chain 0

PSD, Chain 0 MID CH



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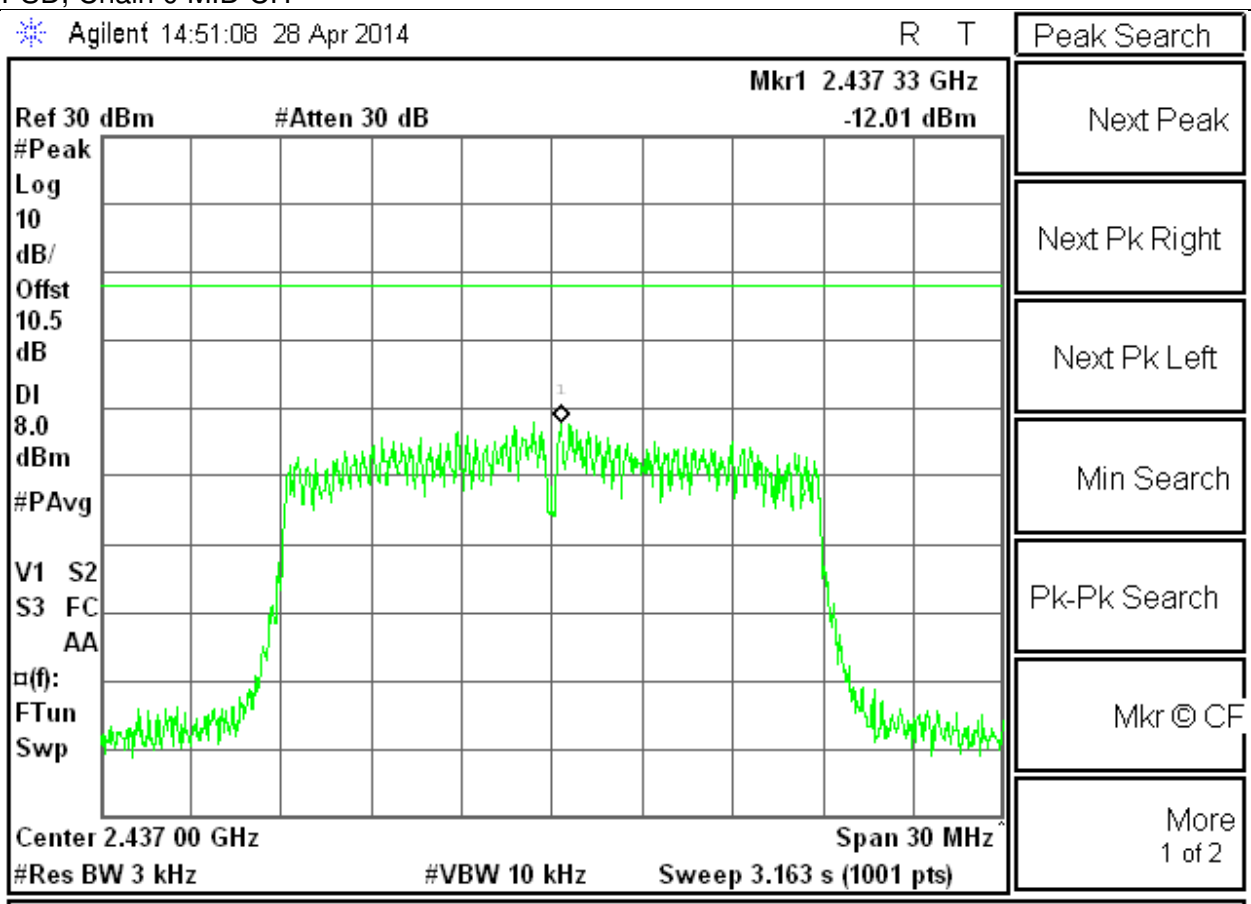
802.11n PSD, Chain 0

PSD, Chain 0 MID CH



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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.

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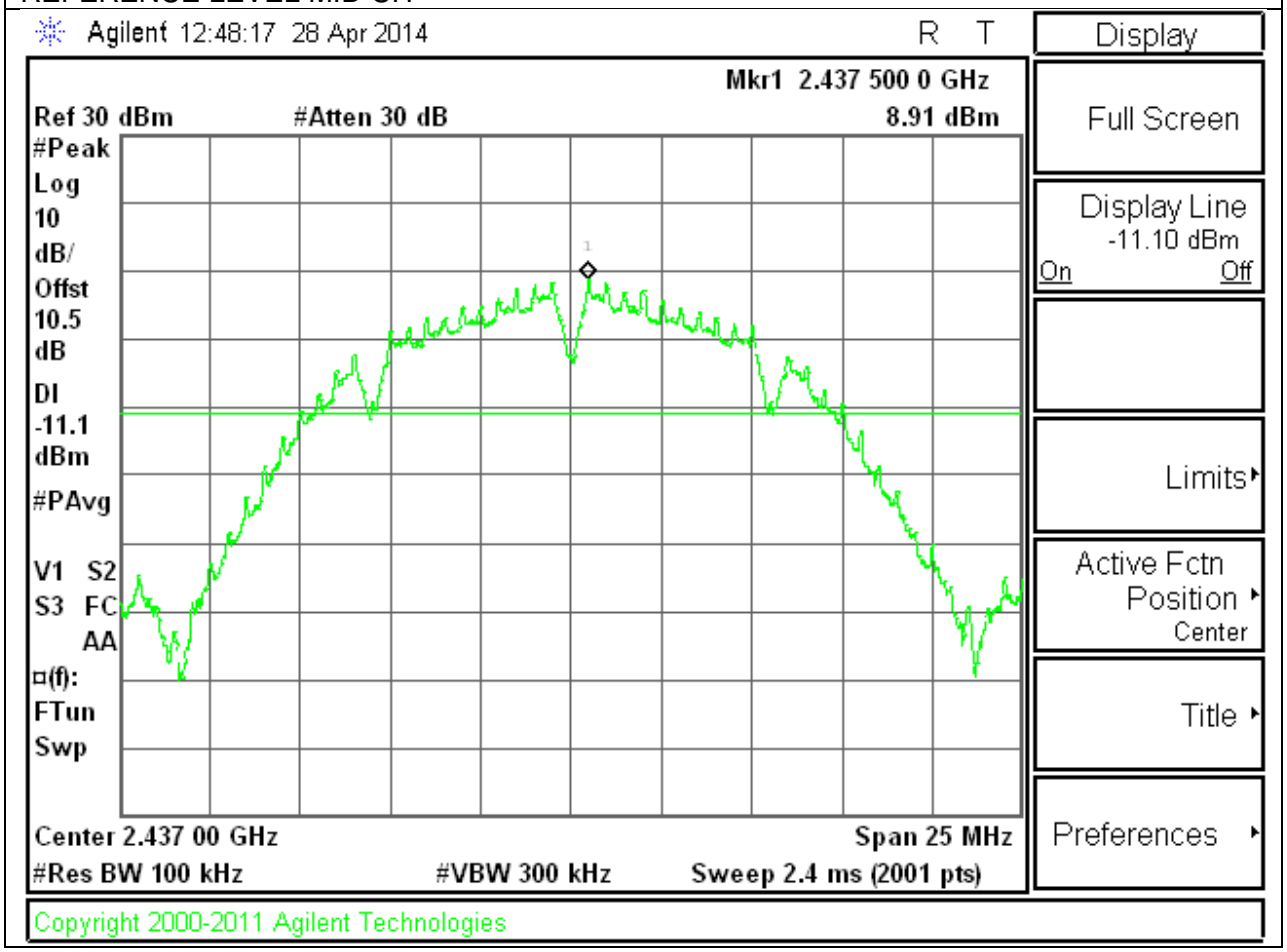
RESULTS

9.6.1. 802.11b MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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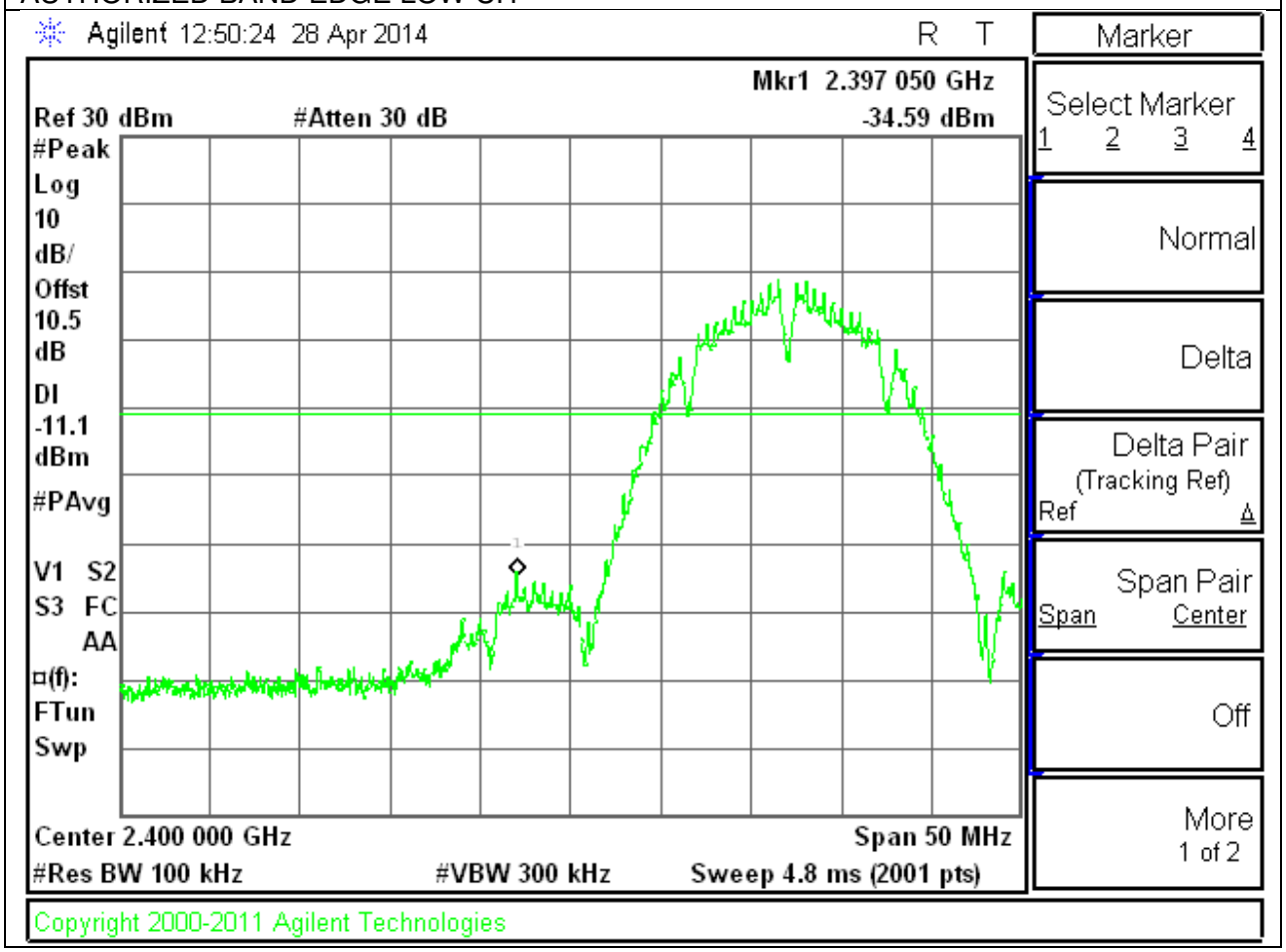
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



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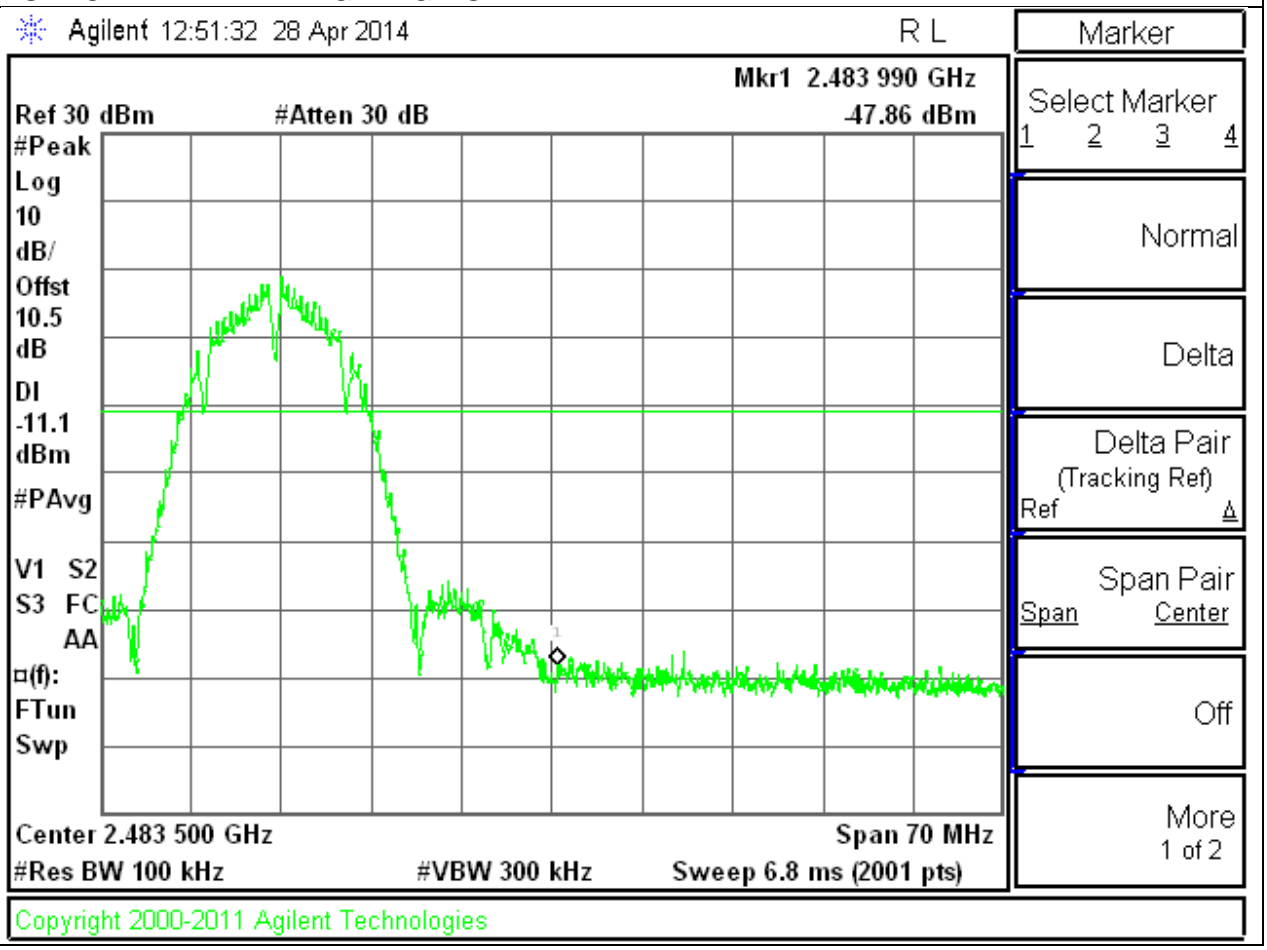
HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH



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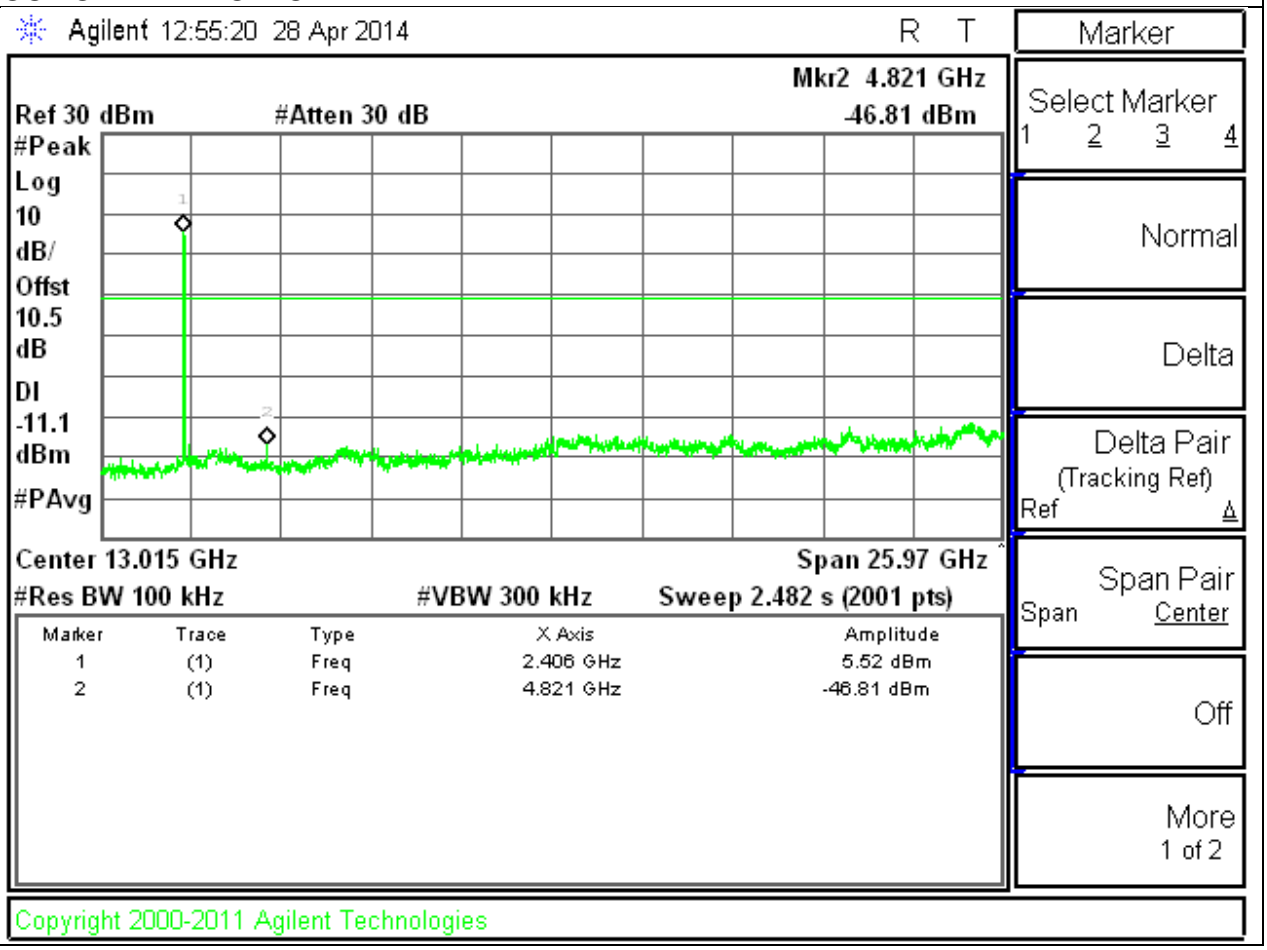
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH

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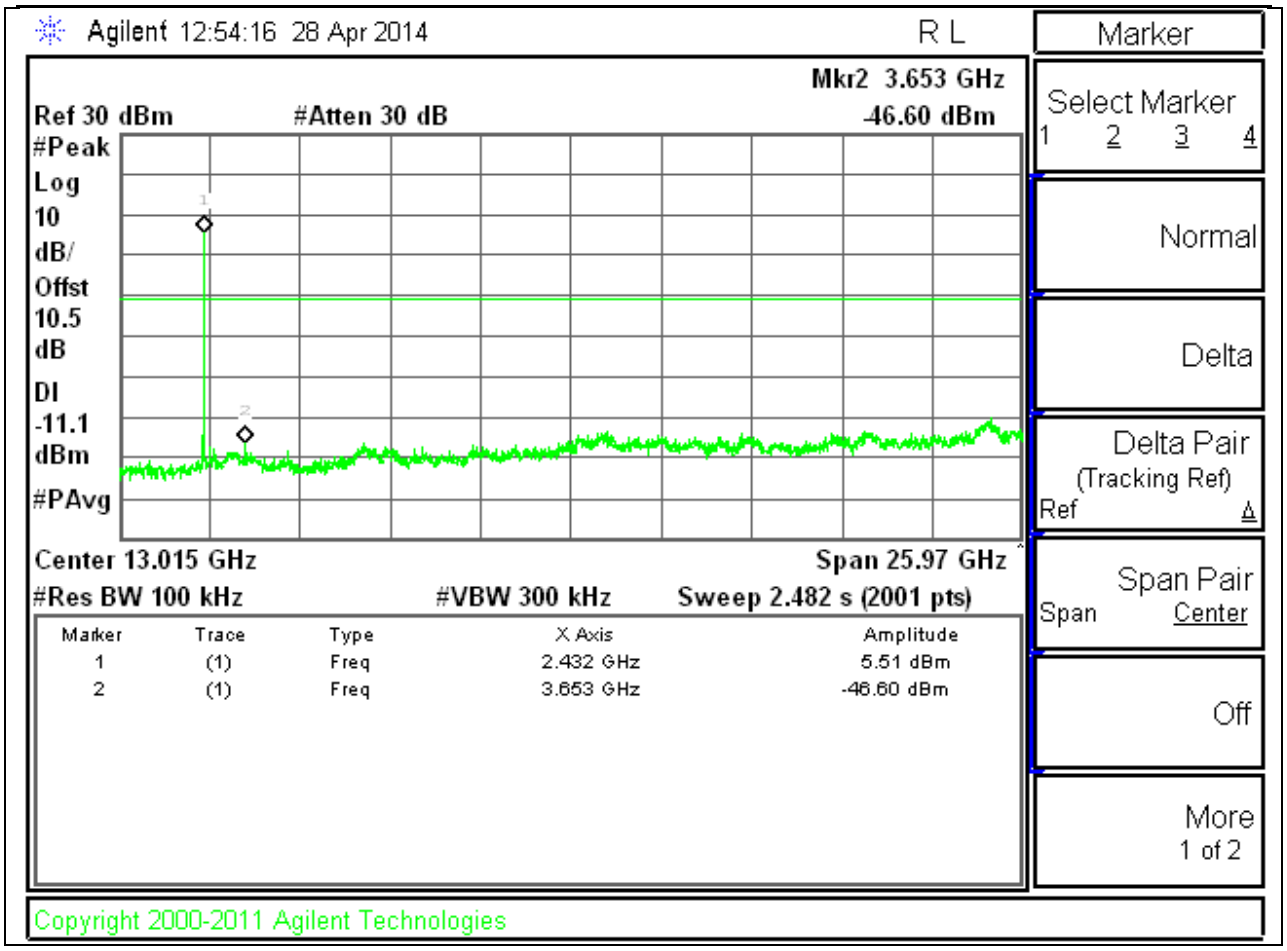

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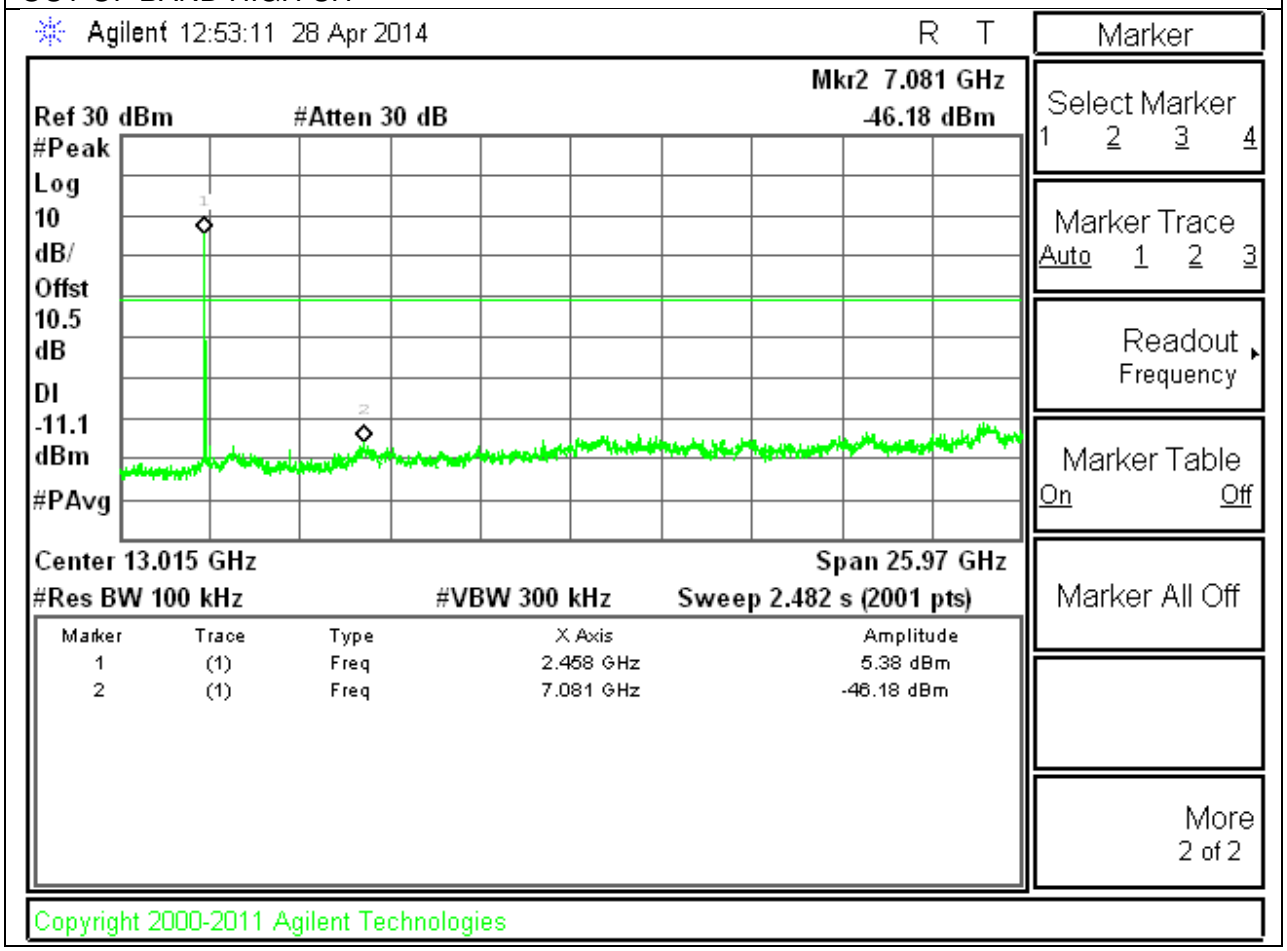
OUT OF BAND HIGH CH



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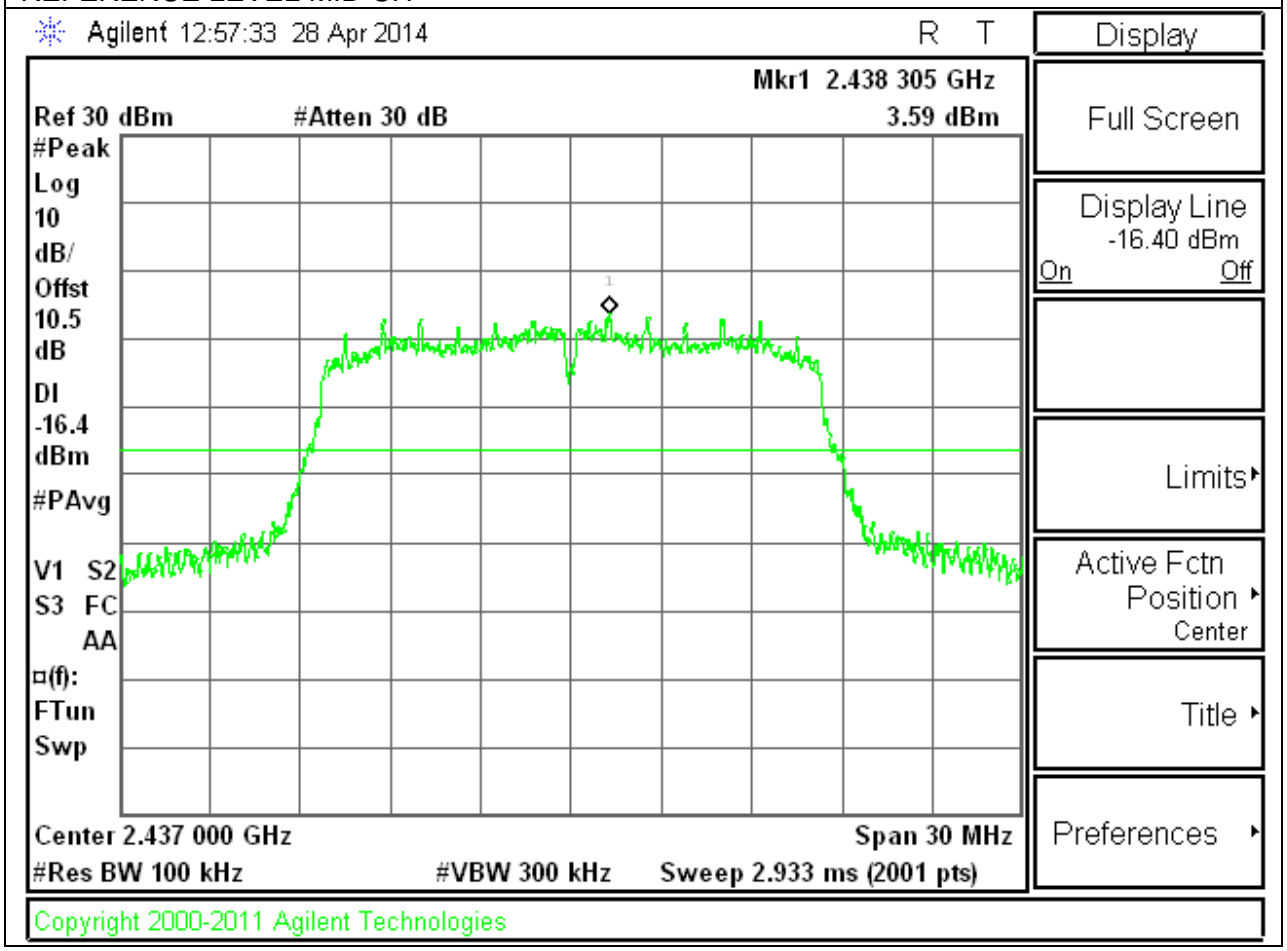
9.6.2. 802.11g MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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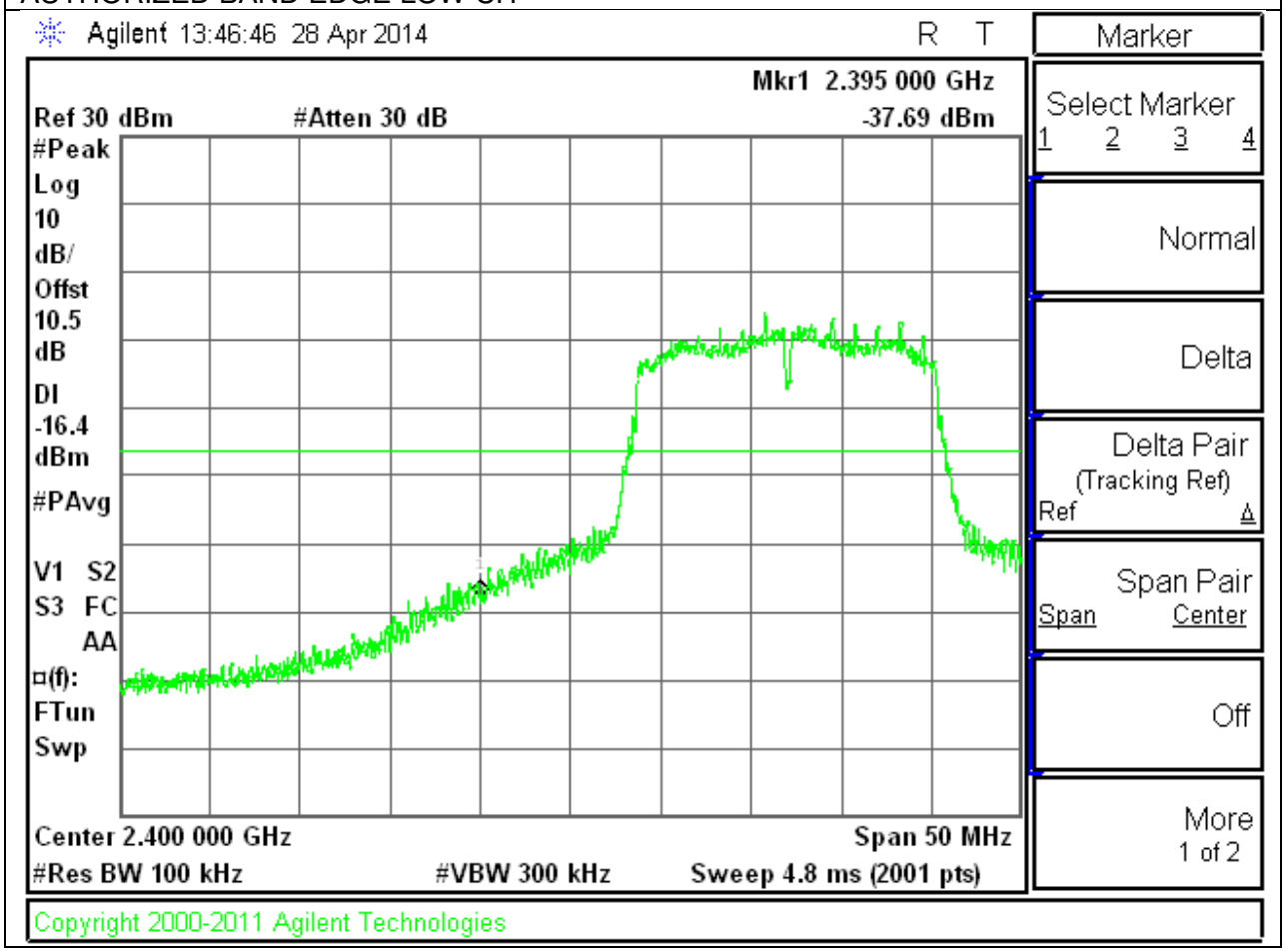
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH

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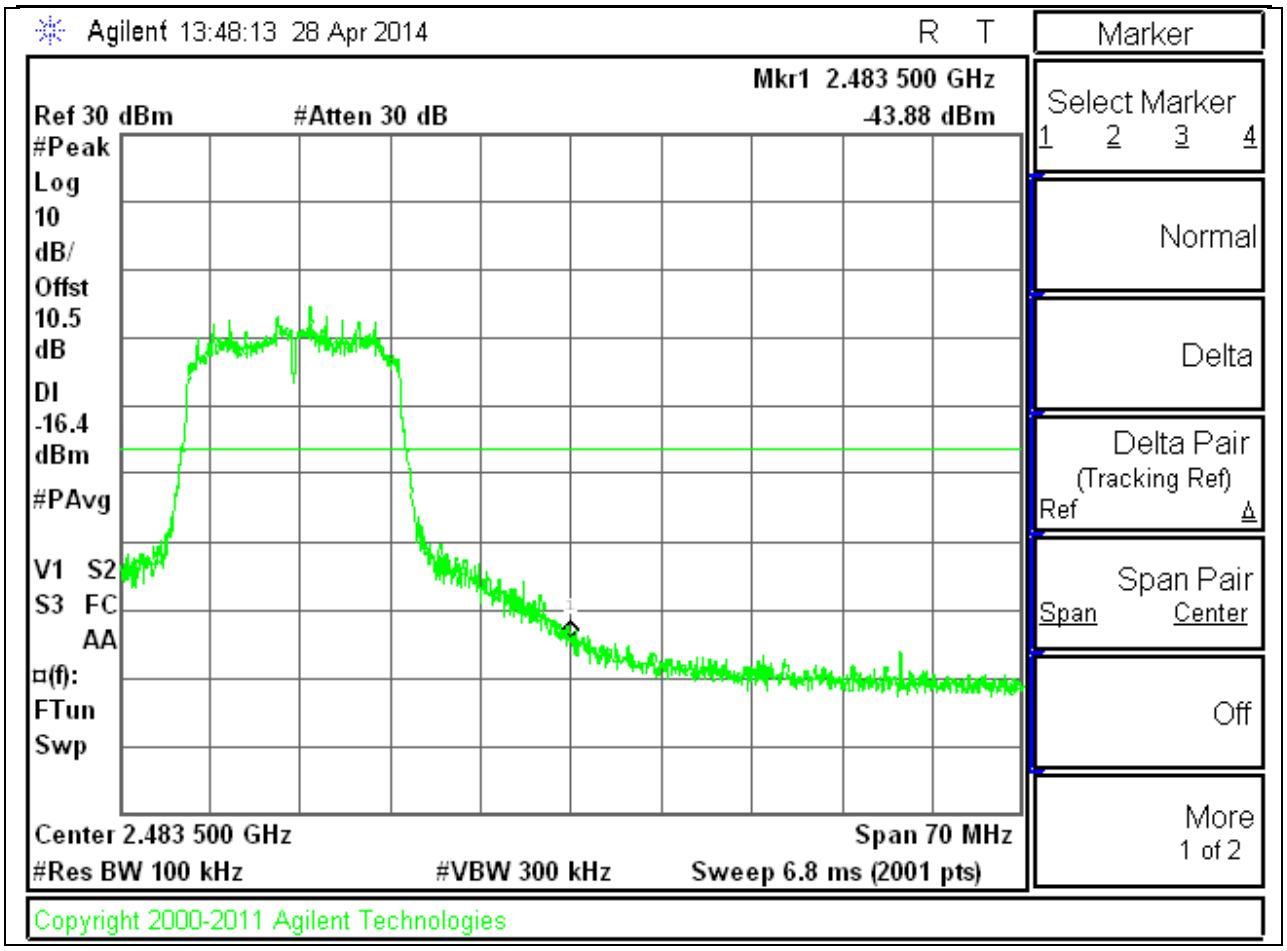

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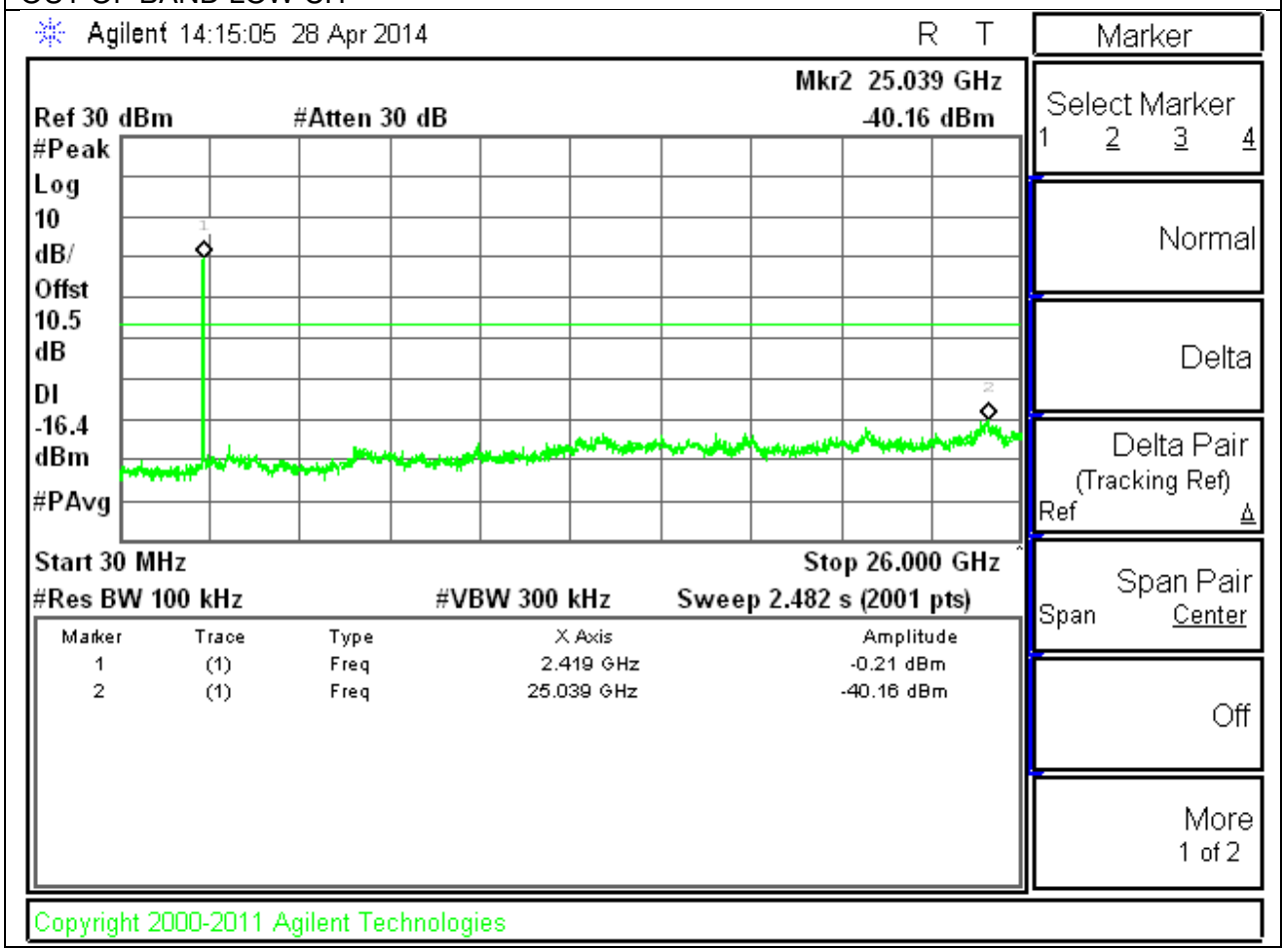
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH

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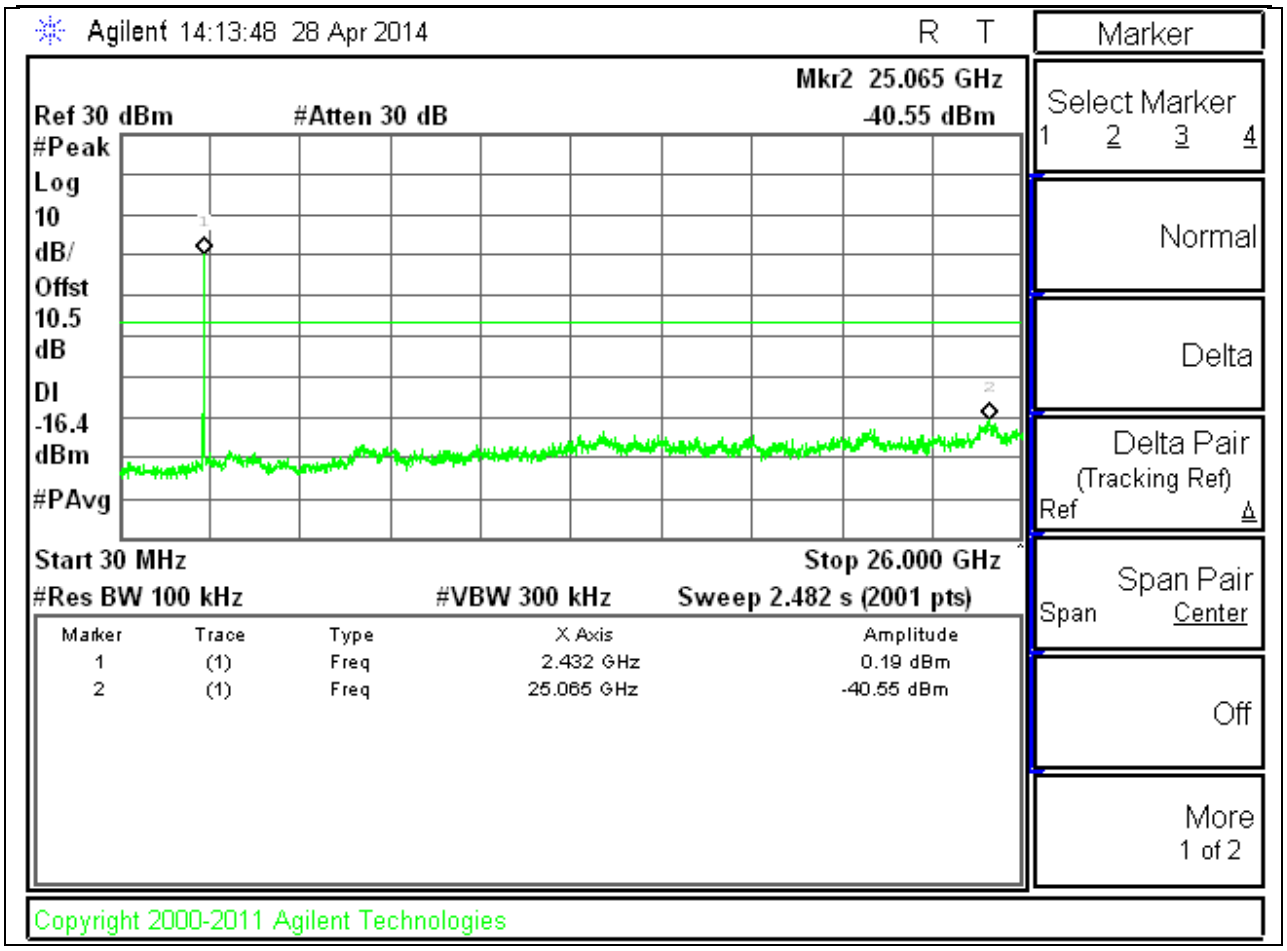

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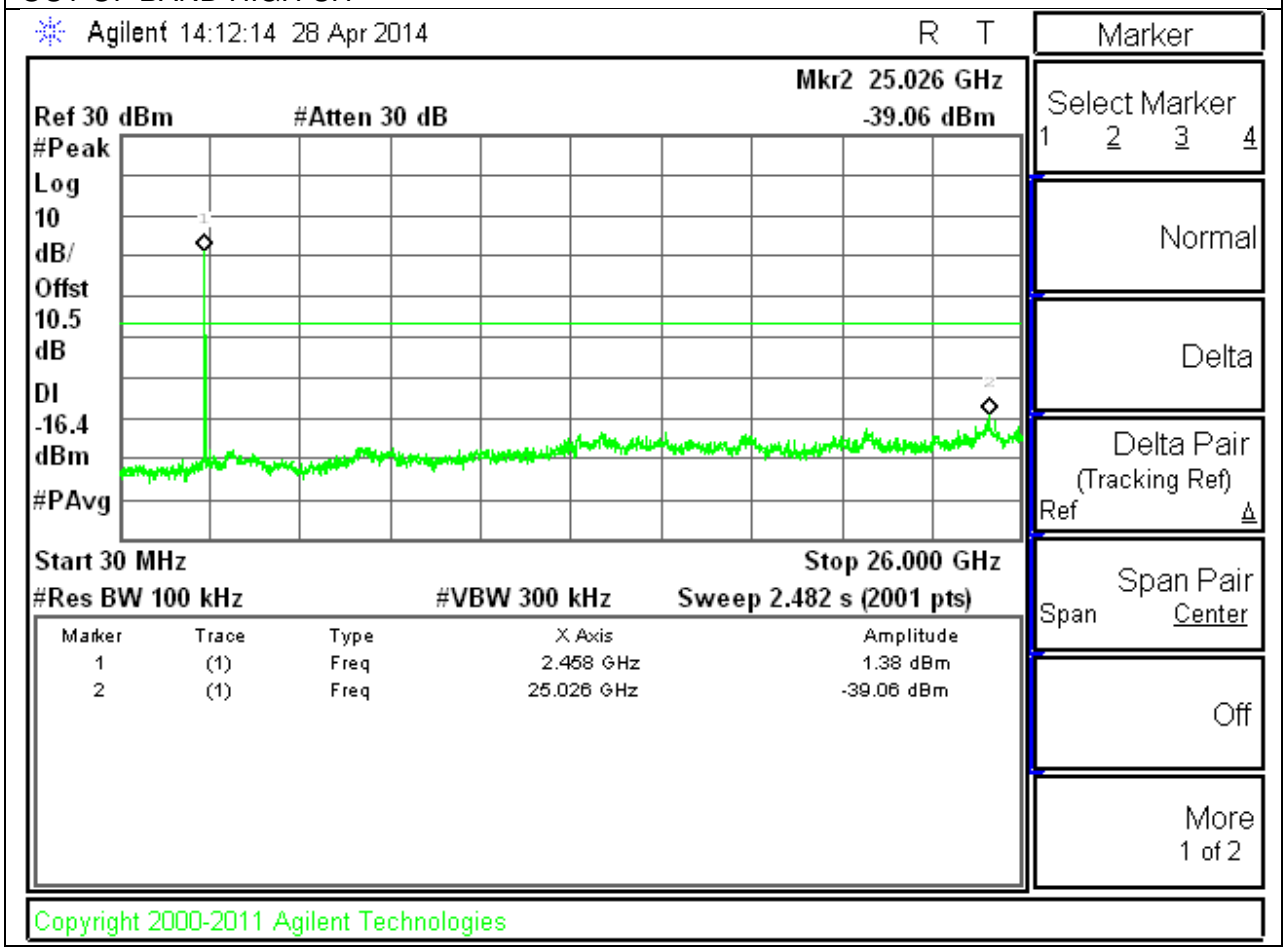
OUT OF BAND HIGH CH



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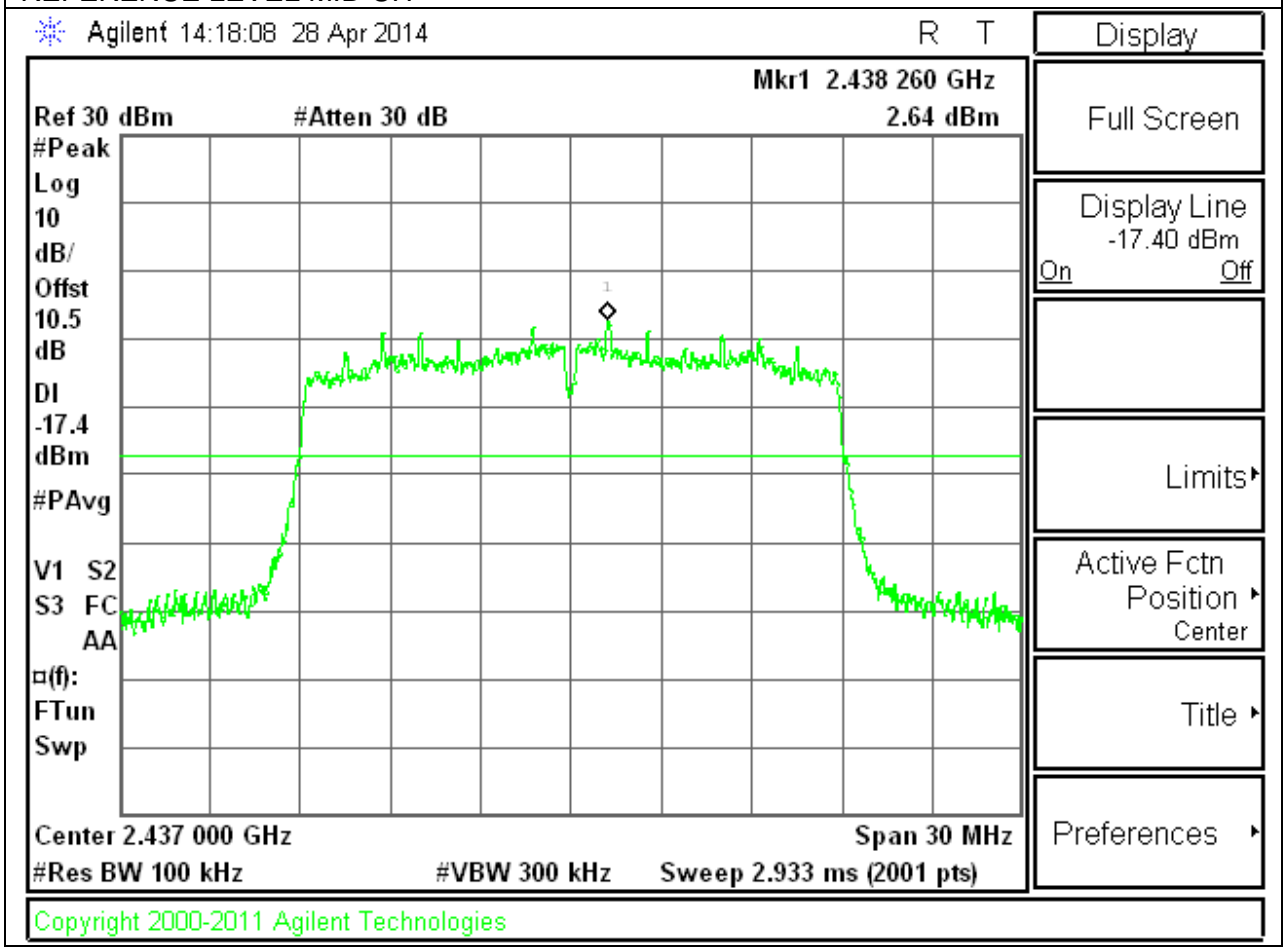
9.6.3. 802.11n MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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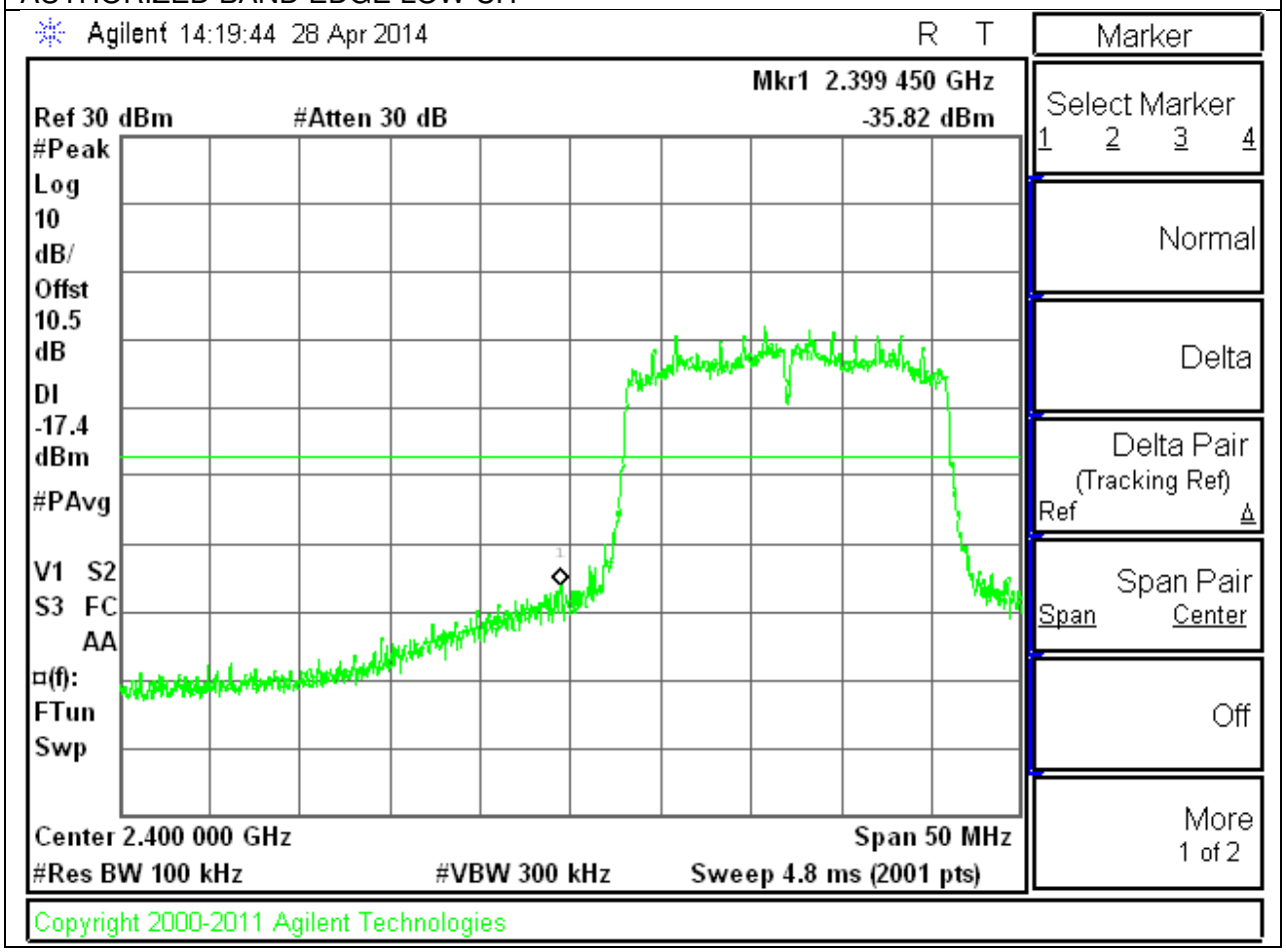
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



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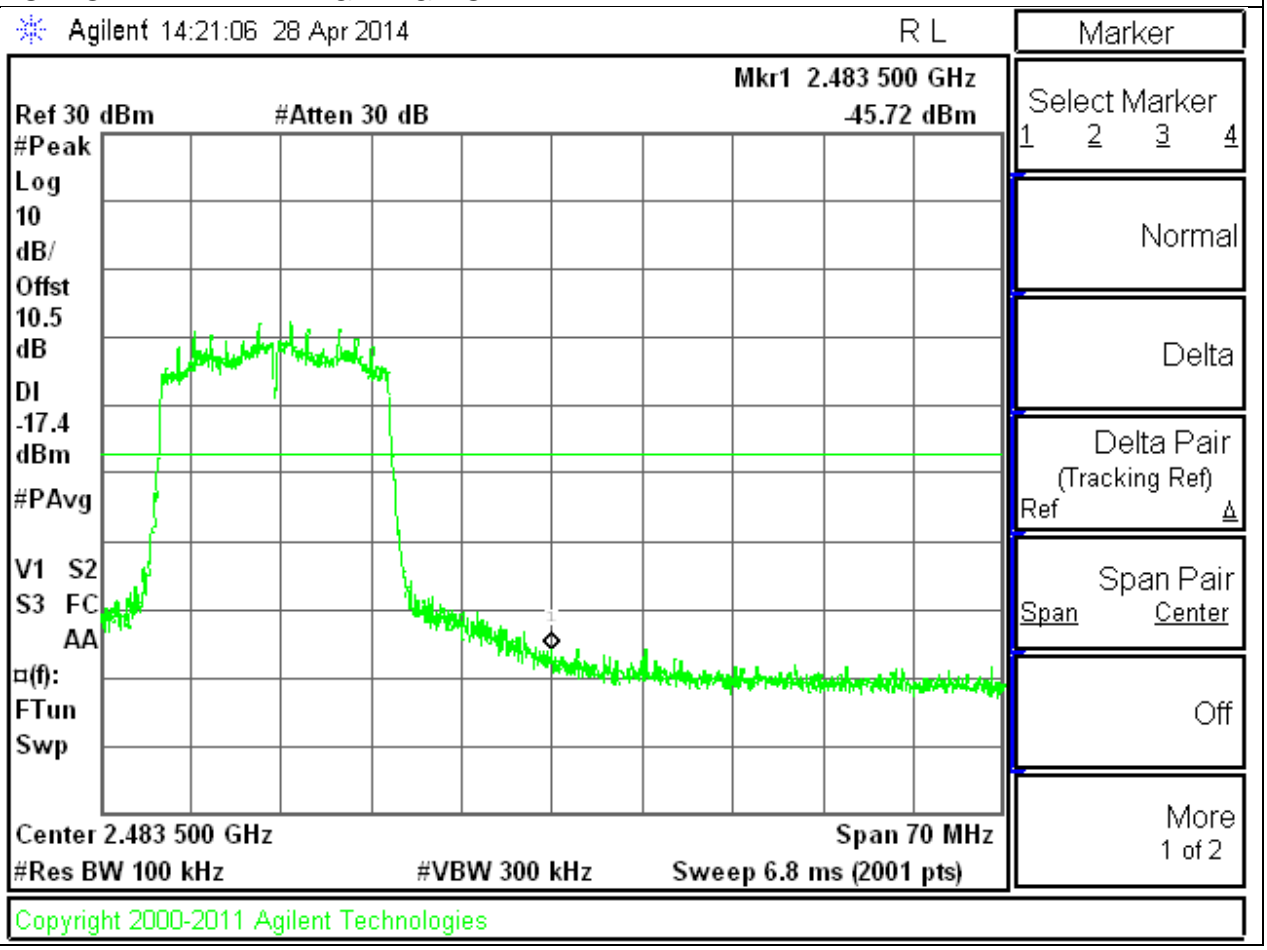
HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH



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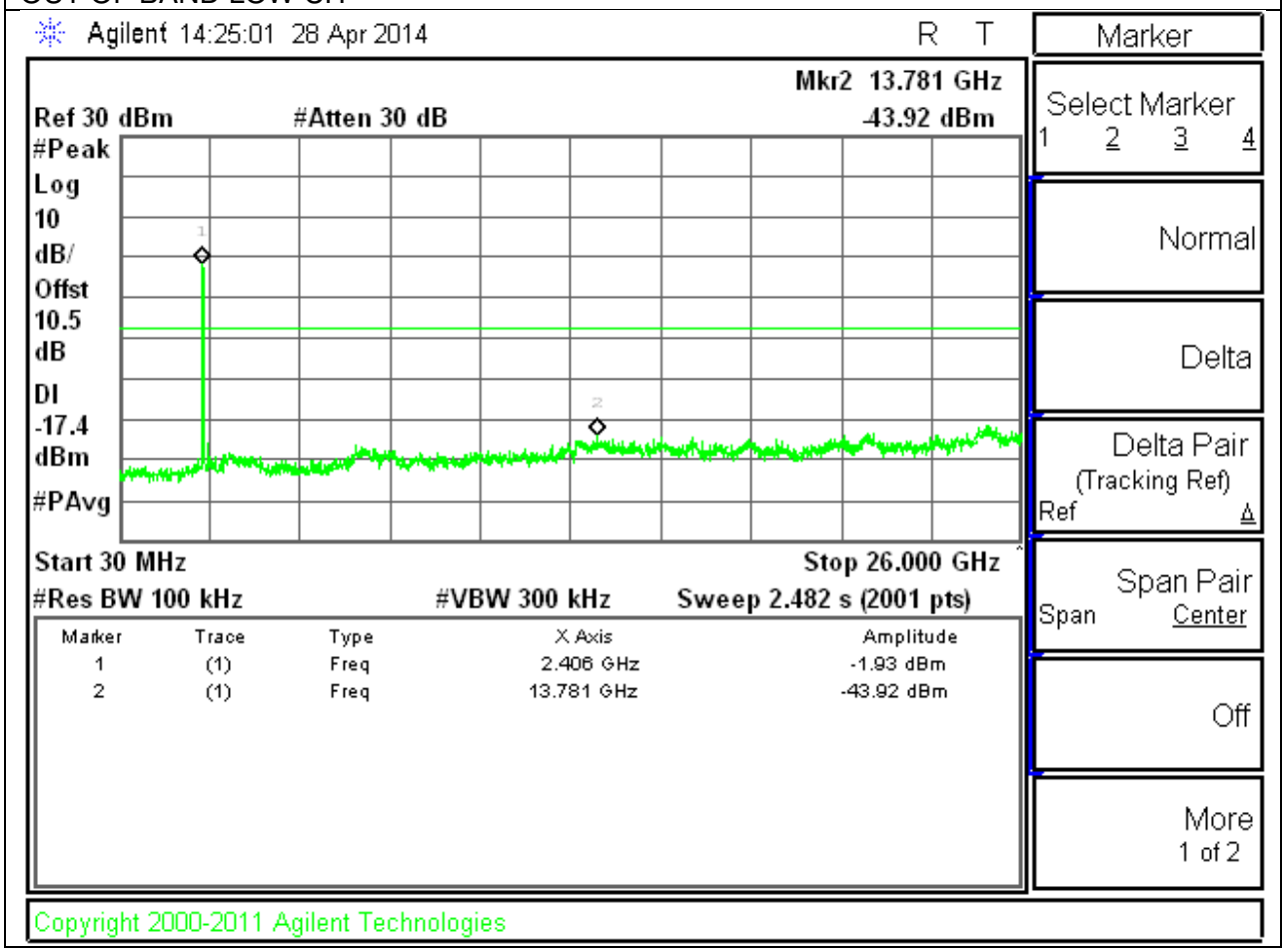
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH

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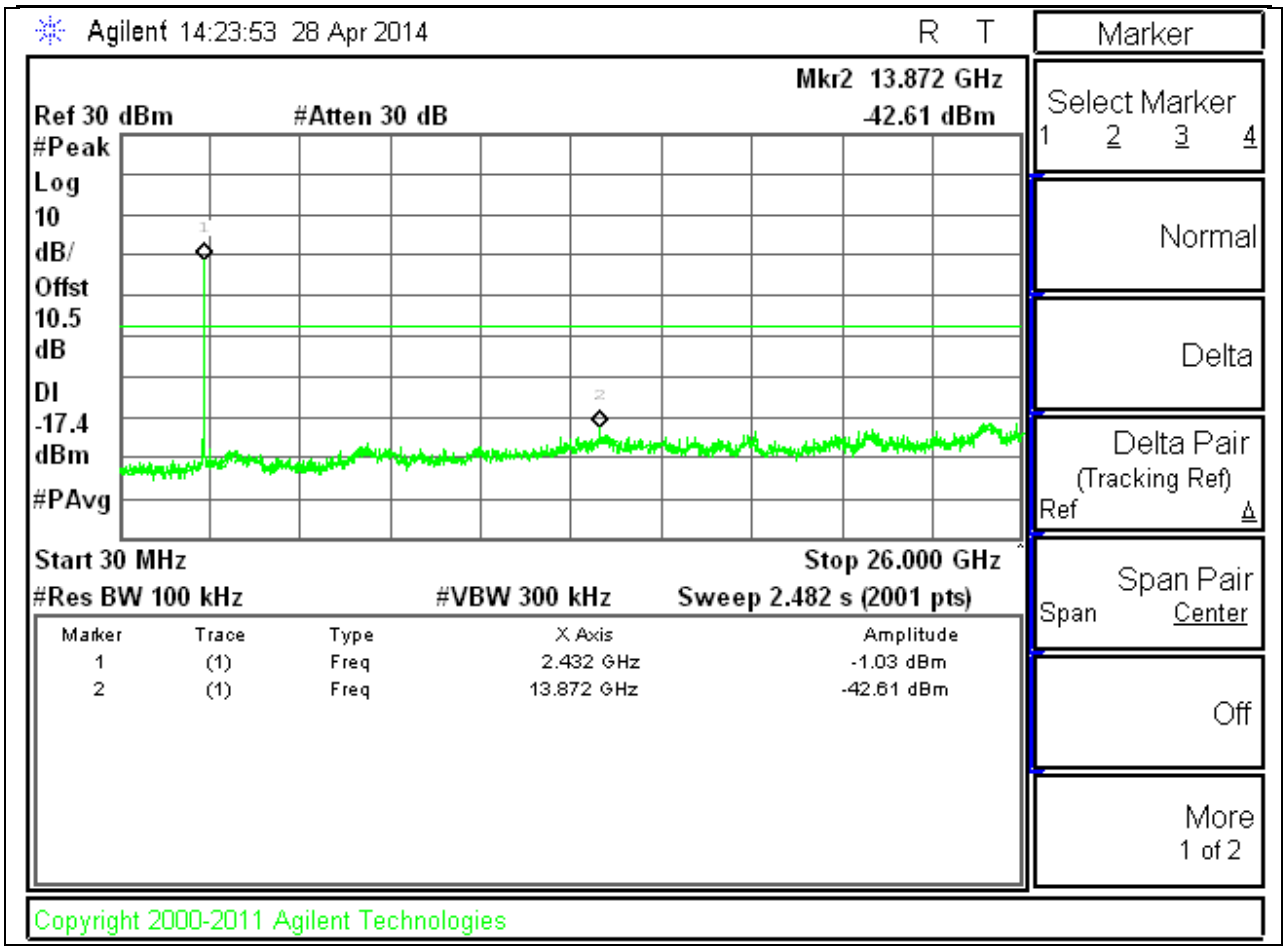

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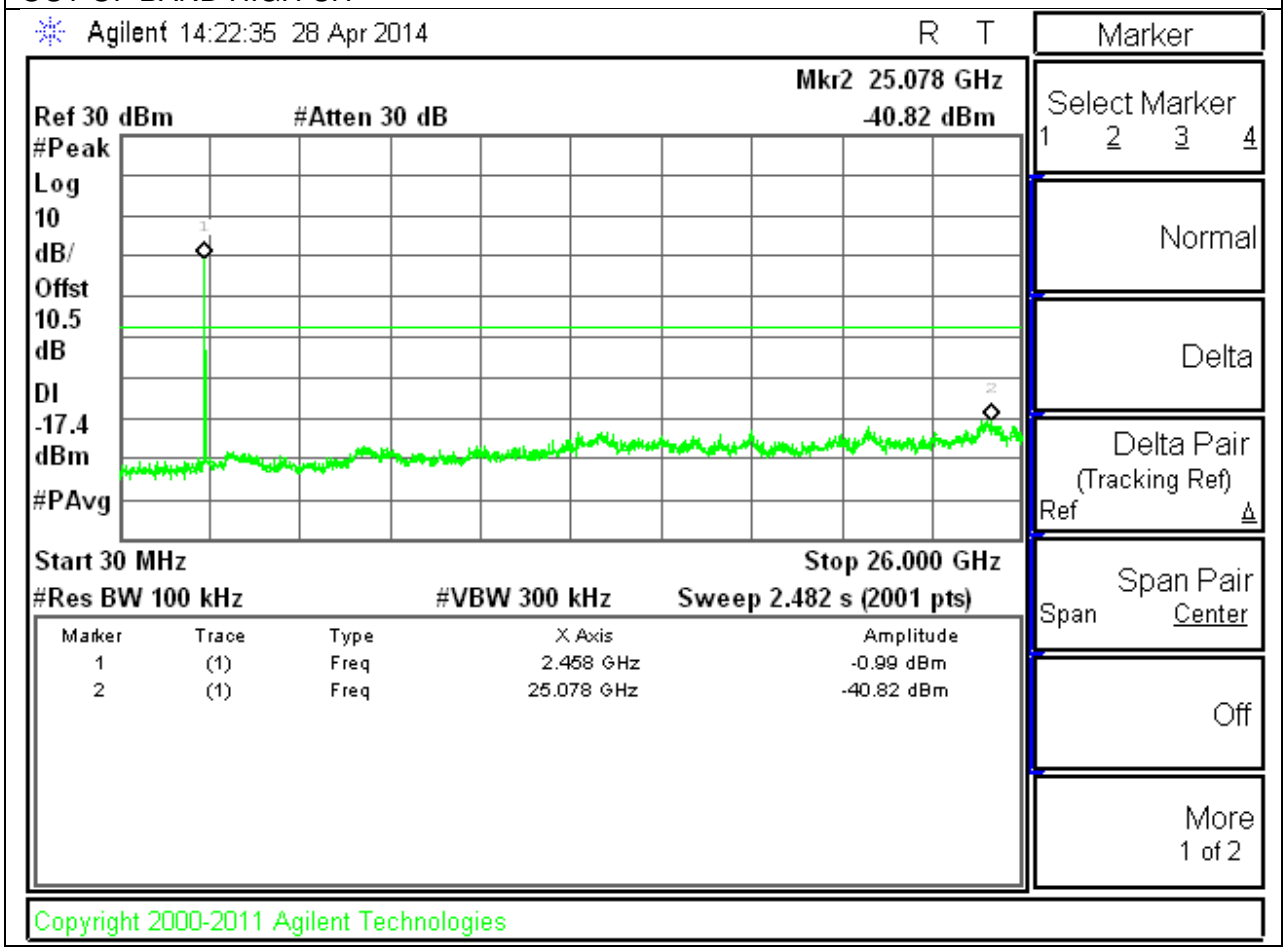
OUT OF BAND HIGH CH



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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= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%); G mode = 0.36dB; N mode = 0.36dB.

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

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

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

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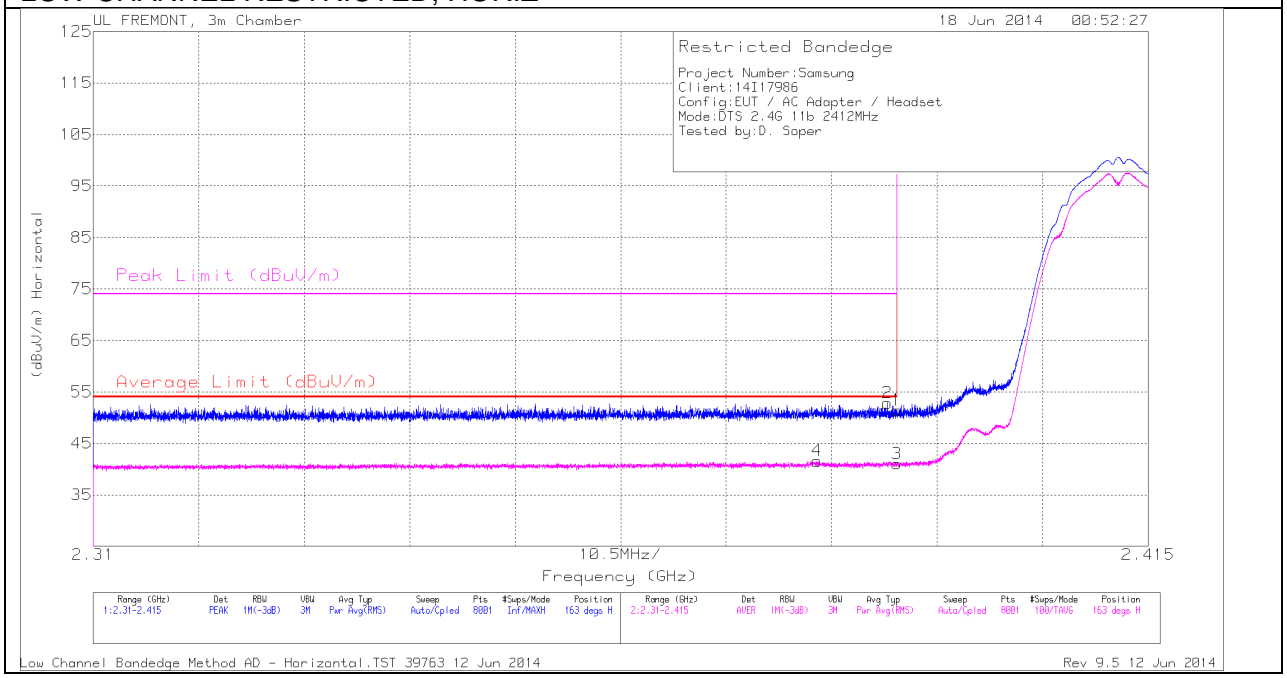
10.2. TRANSMITTER ABOVE 1 GHz

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

LOW CHANNEL RESTRICTED, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.39	40.45	PK	32.1	-21.1	51.45	-	-	74	-22.55	163	378	H
2	2.389	41.85	PK	32.1	-21.1	52.85	-	-	74	-21.15	163	378	H
3	2.39	30.01	RMS	32.1	-21.1	41.01	54	-12.99	-	-	163	378	H
4	2.382	30.6	RMS	32.1	-21.1	41.6	54	-12.4	-	-	163	378	H

PK - Peak detector

RMS - RMS detection

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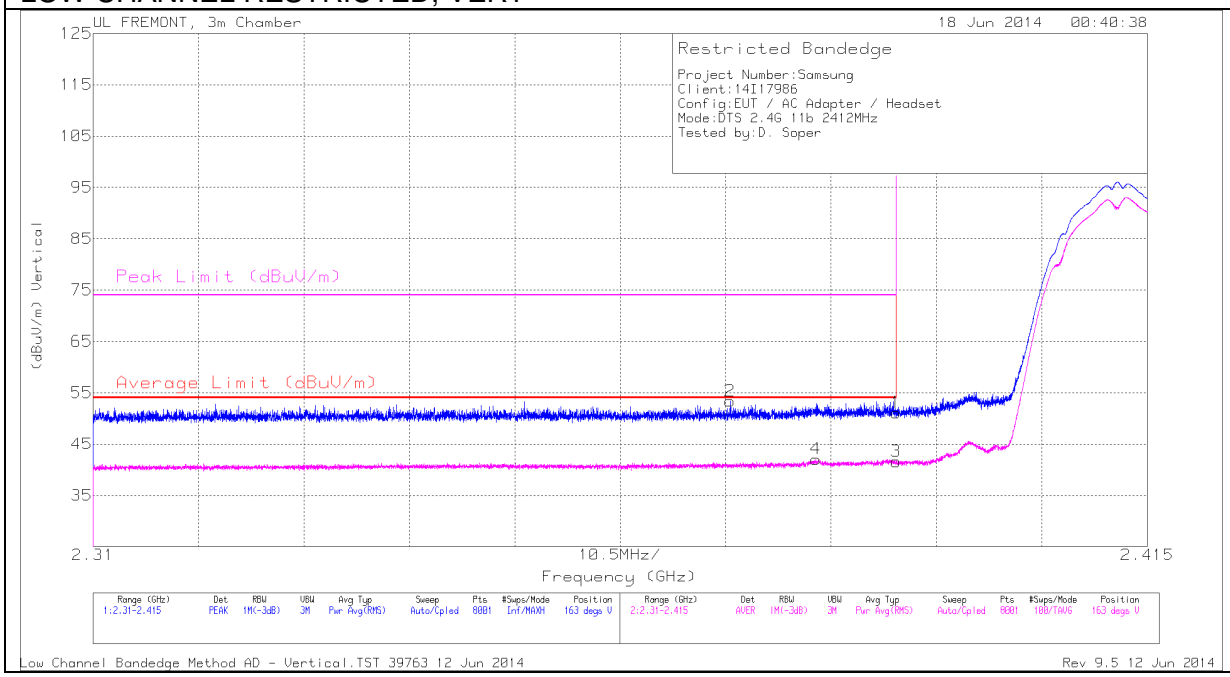
LOW CHANNEL RESTRICTED, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.373	42.47	PK	32	-21.1	53.37	-	-	74	-20.63	163	125	V
4	2.382	31.08	RMS	32.1	-21.1	42.08	54	-11.92	-	-	163	125	V
1	2.39	40.09	PK	32.1	-21.1	51.09	-	-	74	-22.91	163	125	V
3	2.39	30.61	RMS	32.1	-21.1	41.61	54	-12.39	-	-	163	125	V

PK - Peak detector

RMS - RMS detection

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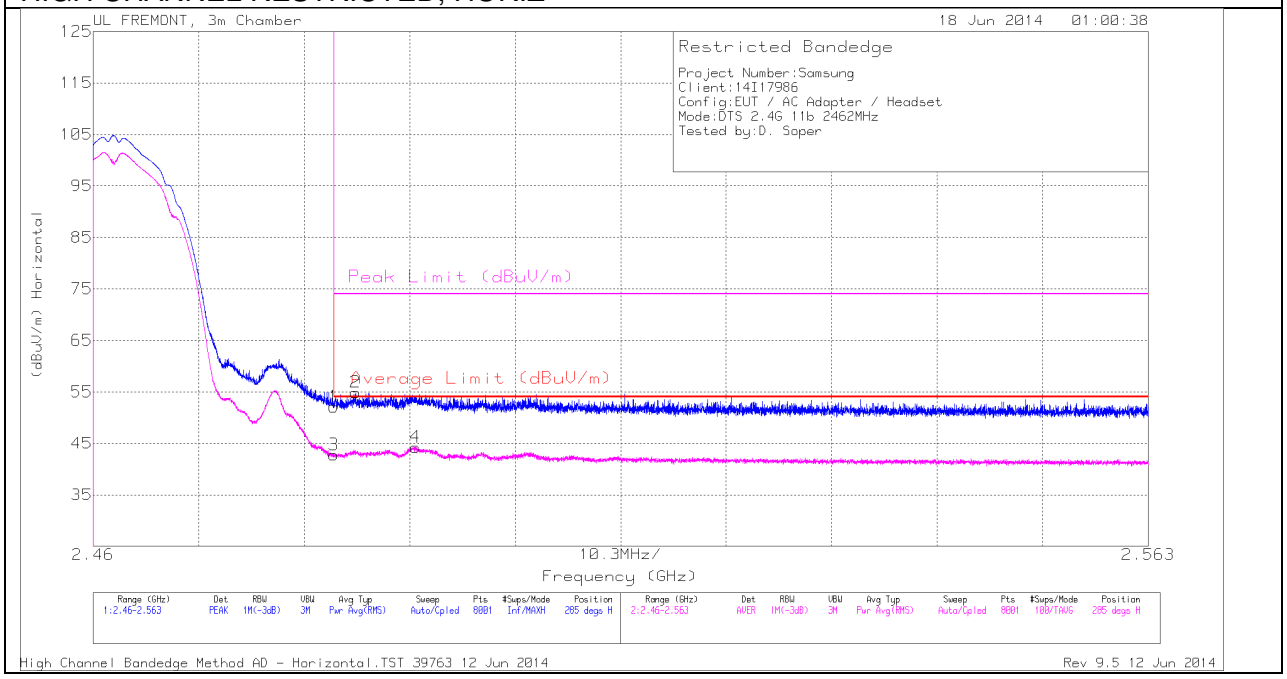
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	40.62	PK	32.3	-20.8	52.12	-	-	74	-21.88	285	374	H
3	2.484	31.27	RMS	32.3	-20.8	42.77	54	-11.23	-	-	285	374	H
2	2.486	43.41	PK	32.3	-20.8	54.91	-	-	74	-19.09	285	374	H
4	2.491	32.76	RMS	32.3	-20.8	44.26	54	-9.74	-	-	285	374	H

PK - Peak detector

RMS - RMS detection

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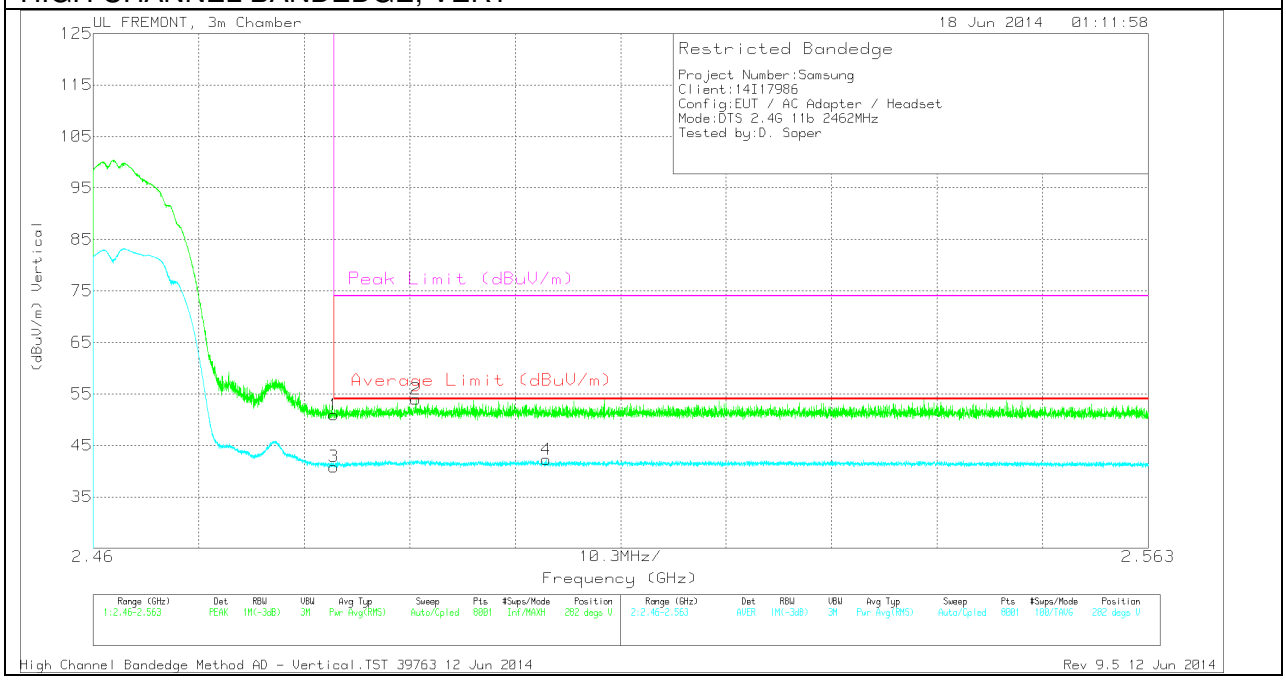
HIGH CHANNEL BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity	1
2.484	29.36	RMS	32.3	-20.8	40.86	54	-13.14	-	-	282	371	V	4
2.504	30.63	RMS	32.3	-20.7	42.23	54	-11.77	-	-	282	371	V	
2.484	39.44	PK	32.3	-20.8	50.94	-	-	74	-23.06	282	371	V	2
2.492	42.48	PK	32.3	-20.8	53.98	-	-	74	-20.02	282	371	V	3

PK - Peak detector

RMS - RMS detection

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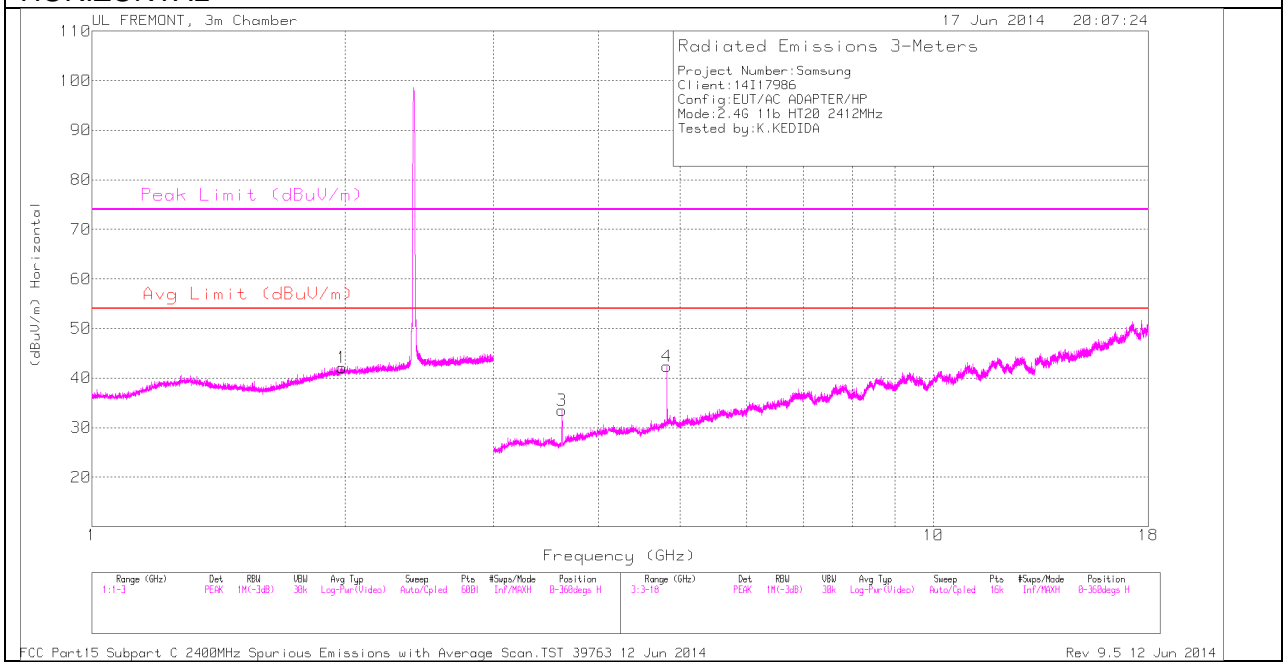
HARMONICS AND SPURIOUS EMISSIONS

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.

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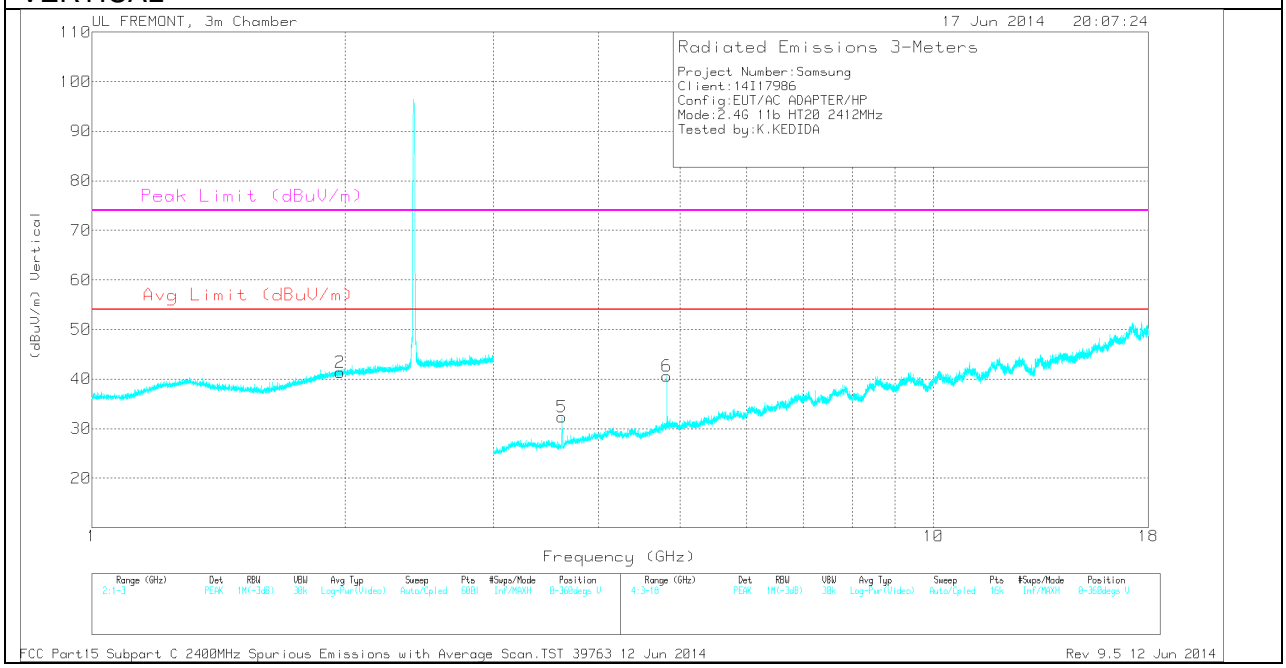
LOW CHANNEL
VERTICAL



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

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	1.971	31.31	PK	31.5	-21.5	41.31	-	-	-	-	0-360	200	V
1	1.981	32.11	PK	31.5	-21.5	42.11	-	-	-	-	0-360	100	H
3	3.617	29.47	PK	33	-29	33.47	-	-	74	-40.53	0-360	200	H
5	3.617	28.4	PK	33	-29	32.4	-	-	74	-41.6	0-360	200	V
4	4.824	35.53	PK	34	-27.2	42.33	-	-	74	-31.67	0-360	200	H
6	4.824	33.82	PK	34	-27.2	40.62	-	-	74	-33.38	0-360	200	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3.617	32.16	MAv1	33	-29	36.16	54	-17.84	-	-	68	309	H
3.618	39.3	PK2	33	-29	43.3	-	-	74	-30.7	68	309	H
4.824	41.19	PK2	34	-27.2	47.99	-	-	74	-26.01	41	246	H
4.824	36.64	MAv1	34	-27.2	43.44	54	-10.56	-	-	41	246	H

PK2 - KDB558074 Method: Maximum Peak

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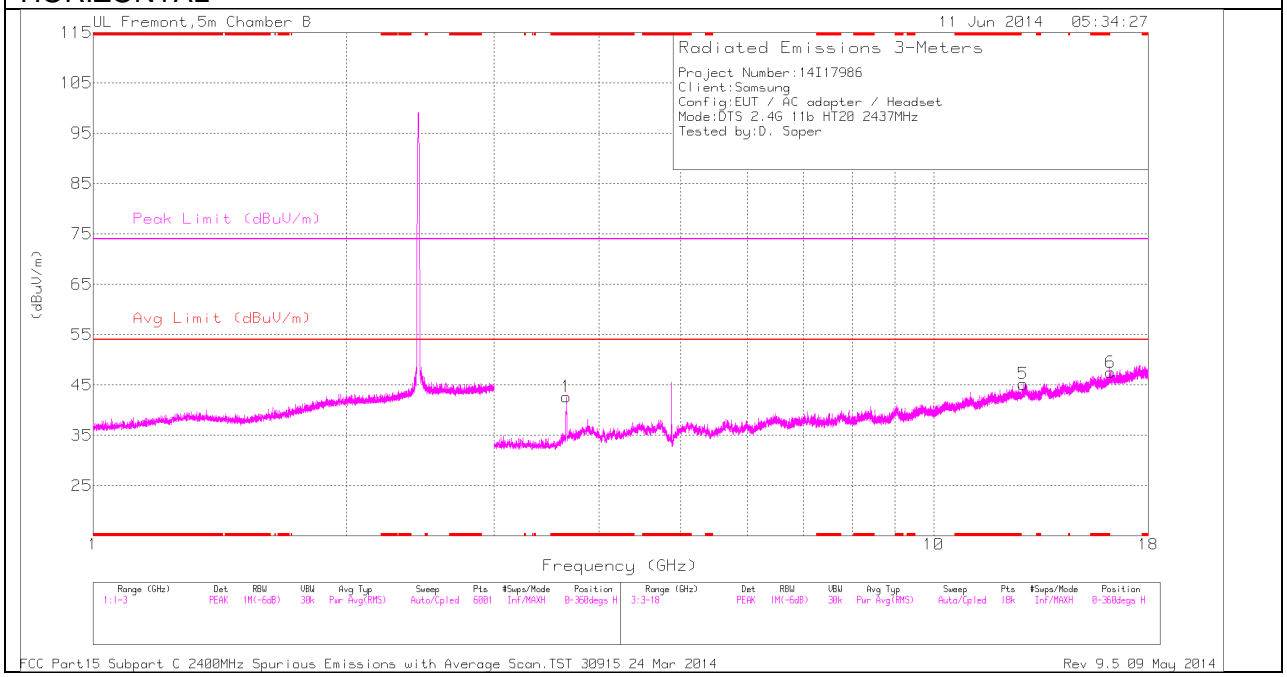
MID CHANNEL
HORIZONTAL



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

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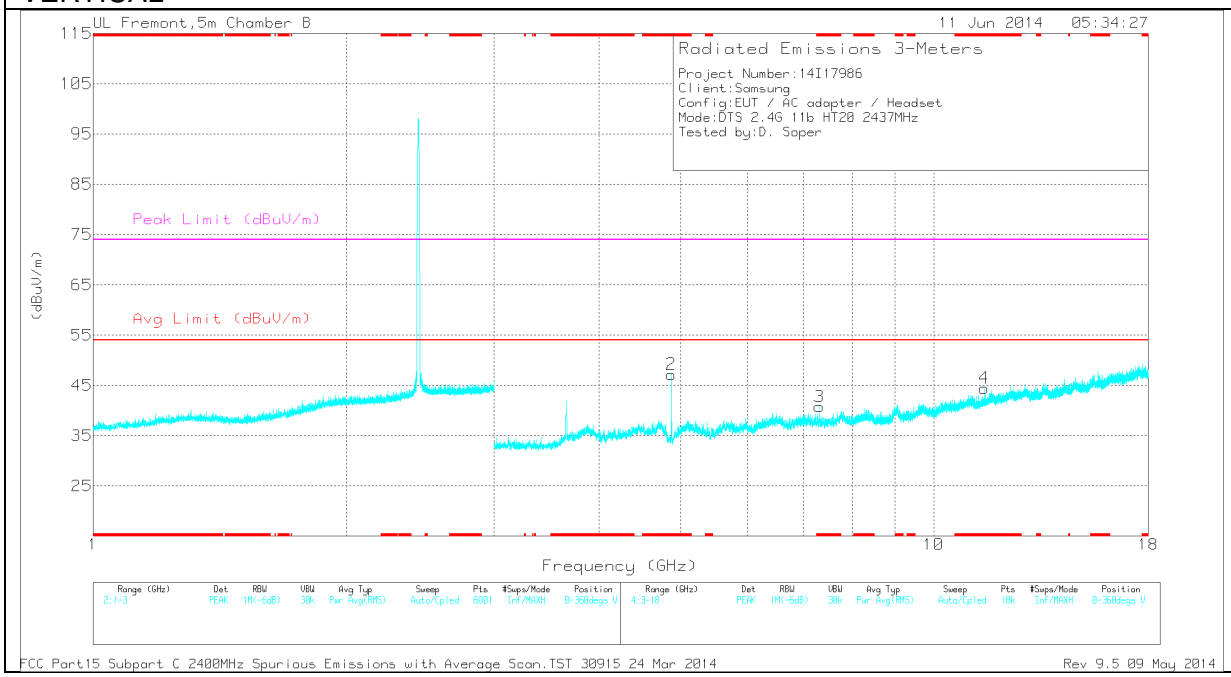
MID CHANNEL
VERTICAL



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

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.656	40.57	PK	33.2	-31.1	42.67	-	-	74	-31.33	0-360	201	H
2	* 4.874	43.49	PK	34.2	-30.5	47.19	-	-	74	-26.81	0-360	200	V
3	* 7.311	33.26	PK	35.6	-28.1	40.76	-	-	74	-33.24	0-360	200	V
4	* 11.482	28.35	PK	38	-21.9	44.45	-	-	74	-29.55	0-360	100	V
5	12.776	27.23	PK	39.2	-21.2	45.23	-	-	-	-	0-360	100	H
6	16.238	26.3	PK	41.1	-19.9	47.5	-	-	-	-	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 T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.655	47.27	PK2	33.2	-31.1	49.37	-	-	74	-24.63	110	276	H
* 3.655	39.77	MAv1	33.2	-31.1	41.87	54	-12.13	-	-	110	276	H
* 4.874	48.45	PK2	34.2	-30.5	52.15	-	-	74	-21.85	356	217	V
* 4.874	44.71	MAv1	34.2	-30.5	48.41	54	-5.59	-	-	356	217	V

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

PK2 - KDB558074 Method: Maximum Peak

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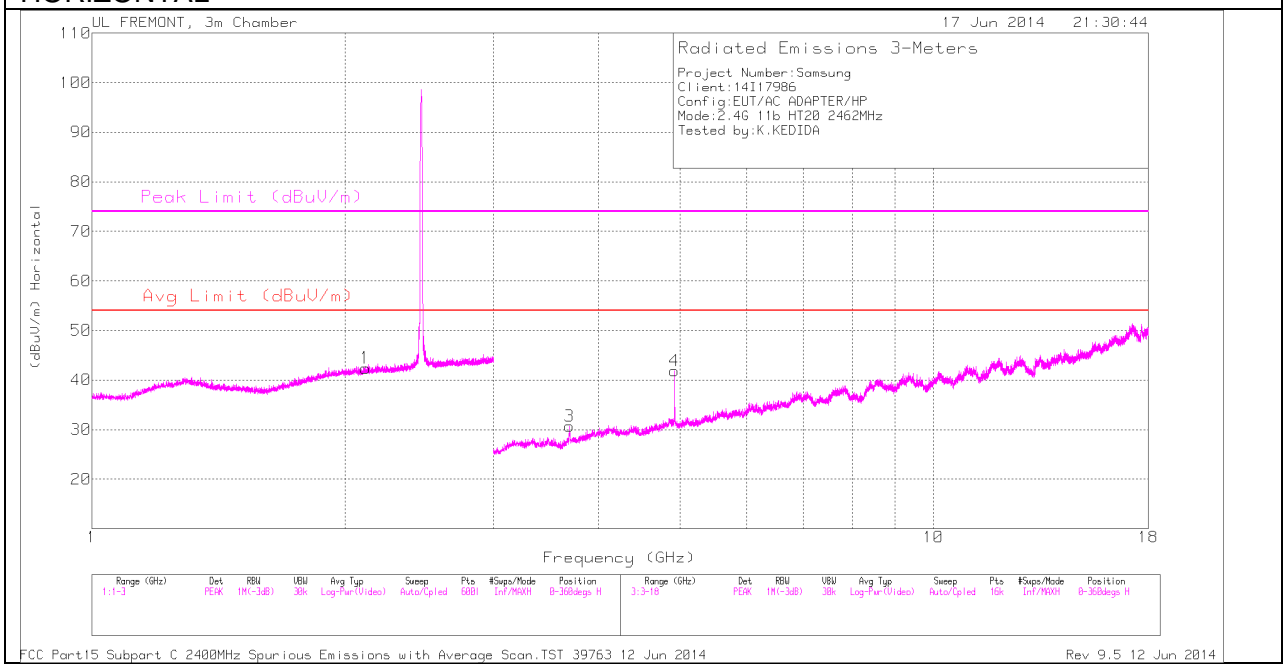
HIGH CHANNEL
HORIZONTAL



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

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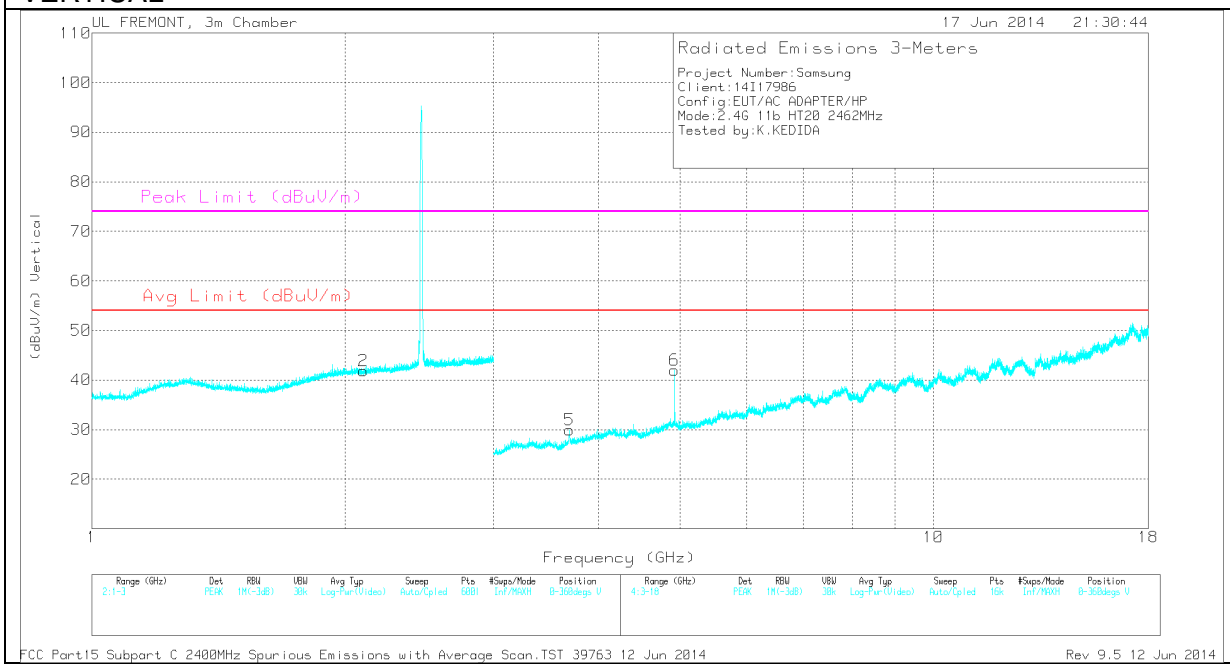
HIGH CHANNEL
VERTICAL



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

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.1	31.58	PK	31.5	-21.2	41.88	-	-	-	-	0-360	100	V
1	2.114	31.94	PK	31.6	-21.1	42.44	-	-	-	-	0-360	100	H
3	3.693	25.58	PK	33.2	-28.1	30.68	-	-	74	-43.32	0-360	100	H
5	3.694	24.87	PK	33.2	-28.1	29.97	-	-	74	-44.03	0-360	200	V
4	4.924	34.95	PK	34	-27.1	41.85	-	-	74	-32.15	0-360	100	H
6	4.924	35.15	PK	34	-27.1	42.05	-	-	74	-31.95	0-360	200	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3.693	36.17	PK2	33.2	-28.1	41.27	-	-	74	-32.73	13	302	H
3.693	26	MAv1	33.2	-28.1	31.1	54	-22.9	-	-	13	302	H
4.924	41.59	PK2	34	-27.1	48.49	-	-	74	-25.51	300	212	H
4.924	36.44	MAv1	34	-27.1	43.34	54	-10.66	-	-	300	212	H
4.924	40.61	PK2	34	-27.1	47.51	-	-	74	-26.49	351	332	V
4.924	35.93	MAv1	34	-27.1	42.83	54	-11.17	-	-	351	332	V

PK2 - KDB558074 Method: Maximum Peak

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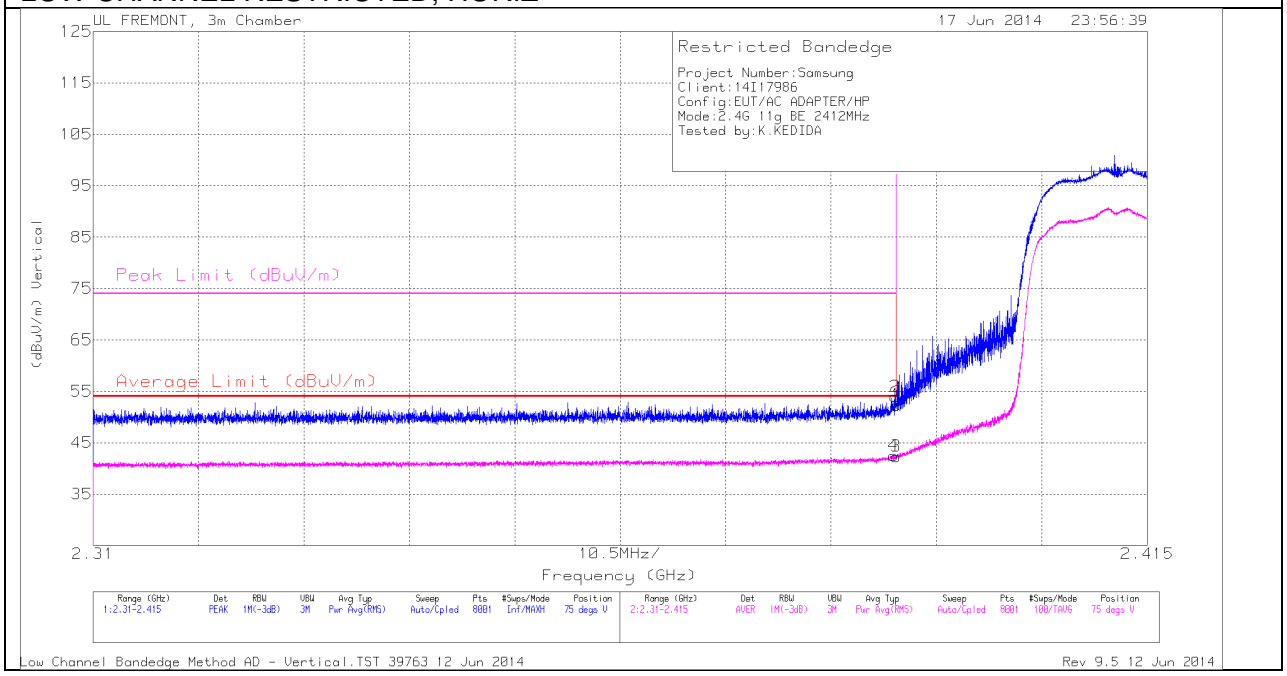
10.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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	41.33	PK	32.1	-21.1	0	52.33	-	-	74	-21.67	75	170	V
2	2.39	42.96	PK	32.1	-21.1	0	53.96	-	-	74	-20.04	75	170	V
3	2.39	30.96	RMS	32.1	-21.1	.36	42.32	54	-11.68	-	-	75	170	V
4	2.39	31.15	RMS	32.1	-21.1	.36	42.51	54	-11.49	-	-	75	170	V

PK - Peak detector

RMS - RMS detection

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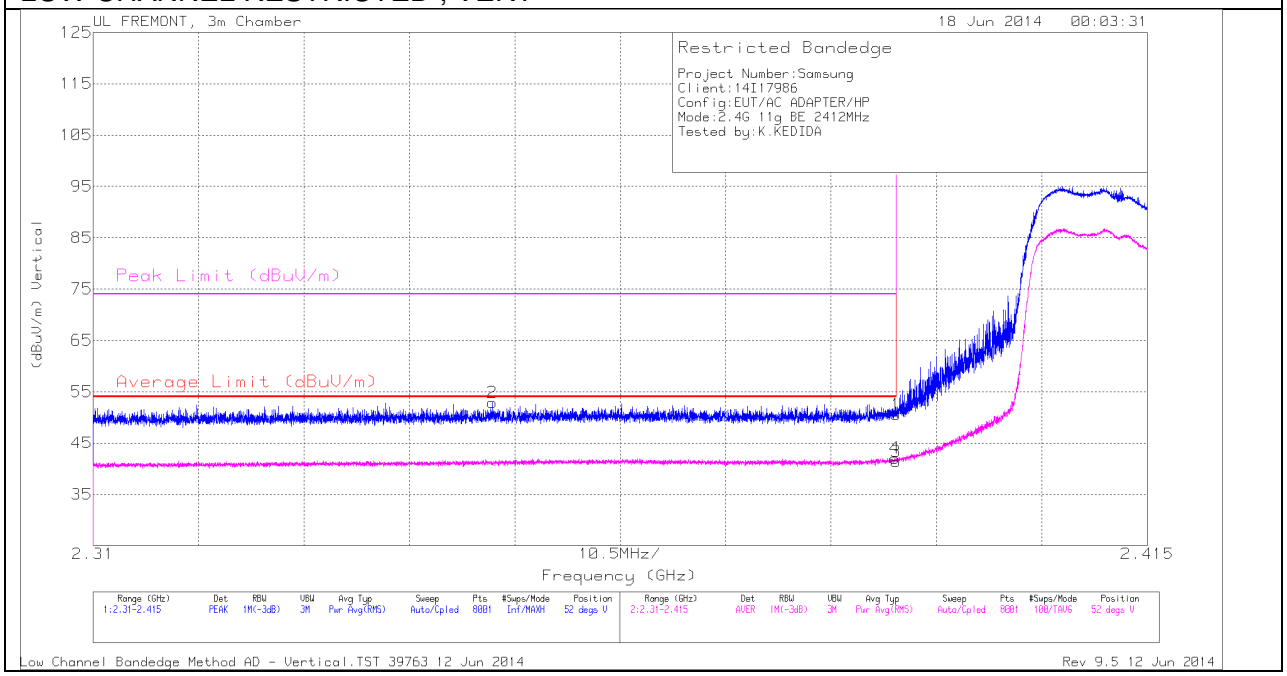
LOW CHANNEL RESTRICTED , VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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
2	2.35	42.07	PK	32	-21.2	0	52.87	-	-	74	-21.13	52	321	V
1	2.39	39.54	PK	32.1	-21.1	0	50.54	-	-	74	-23.46	52	321	V
3	2.39	30.04	RMS	32.1	-21.1	.36	41.4	54	-12.6	-	-	52	321	V
4	2.39	30.68	RMS	32.1	-21.1	.36	42.04	54	-11.96	-	-	52	321	V

PK - Peak detector

RMS - RMS detection

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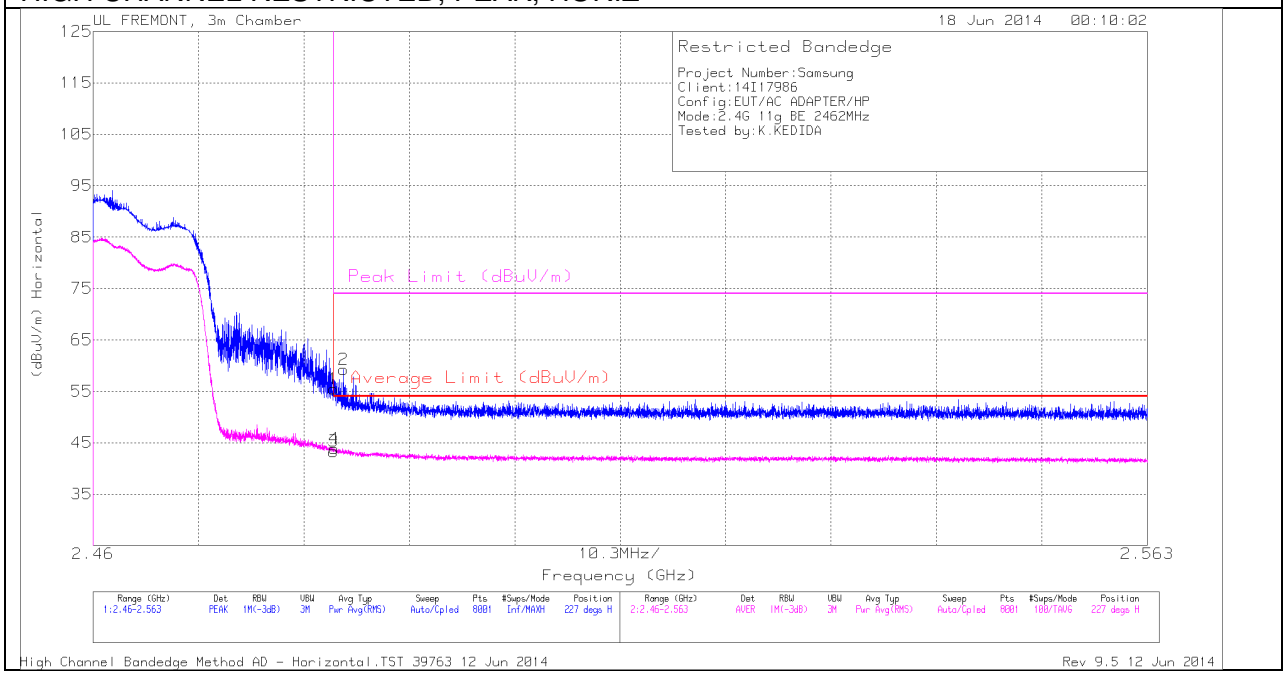
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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	43.95	PK	32.3	-20.8	0	55.45	-	-	74	-18.55	227	324	H
2	2.484	47.73	PK	32.3	-20.8	0	59.23	-	-	74	-14.77	227	324	H
3	2.484	31.45	RMS	32.3	-20.8	.36	43.31	54	-10.69	-	-	227	324	H
4	2.484	31.99	RMS	32.3	-20.8	.36	43.85	54	-10.15	-	-	227	324	H

PK - Peak detector

RMS - RMS detection

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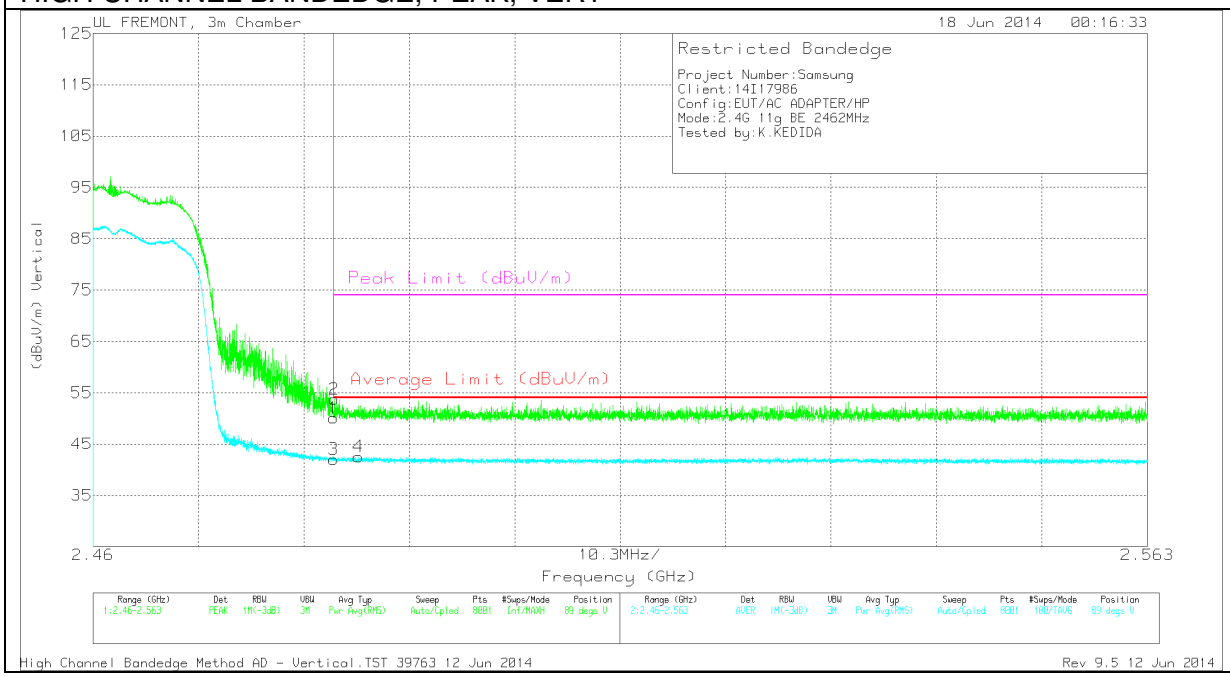
HIGH CHANNEL BANDEDGE, PEAK, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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	38.58	PK	32.3	-20.8	0	50.08	-	-	74	-23.92	89	125	V
2	2.484	42.23	PK	32.3	-20.8	0	53.73	-	-	74	-20.27	89	125	V
3	2.484	30.18	RMS	32.3	-20.8	.36	42.04	54	-11.96	-	-	89	125	V
4	2.486	30.68	RMS	32.3	-20.8	.36	42.54	54	-11.46	-	-	89	125	V

PK - Peak detector

RMS - RMS detection

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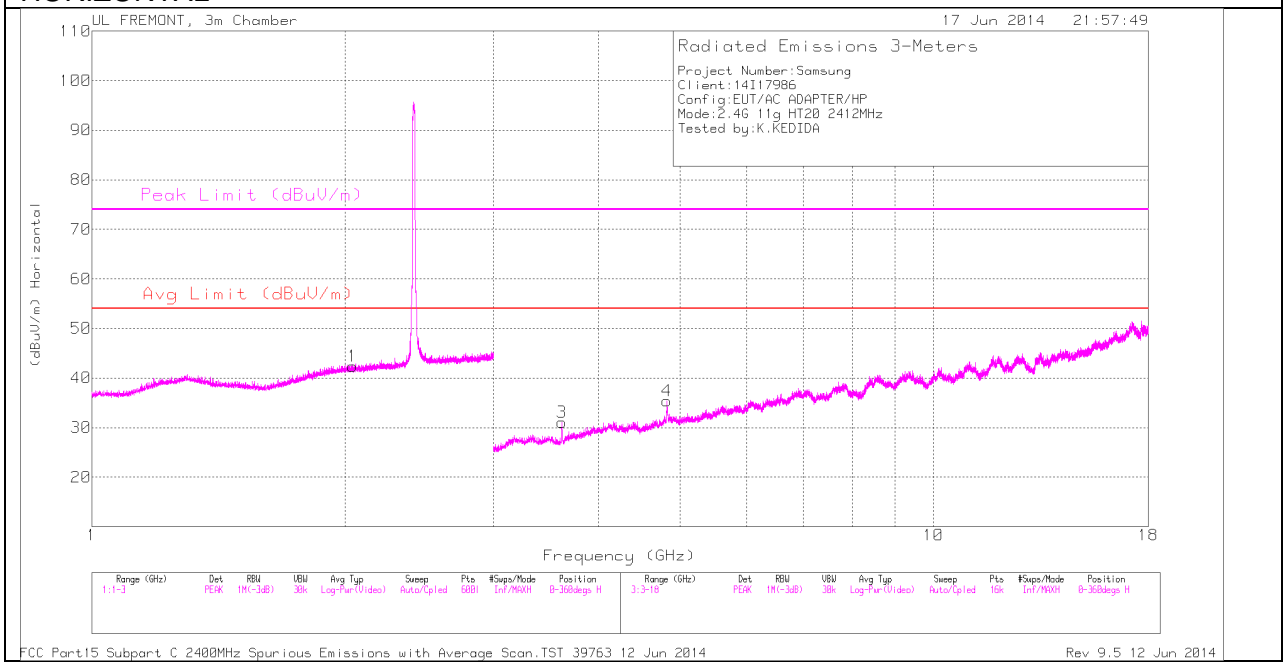
HARMONICS AND SPURIOUS EMISSIONS

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.

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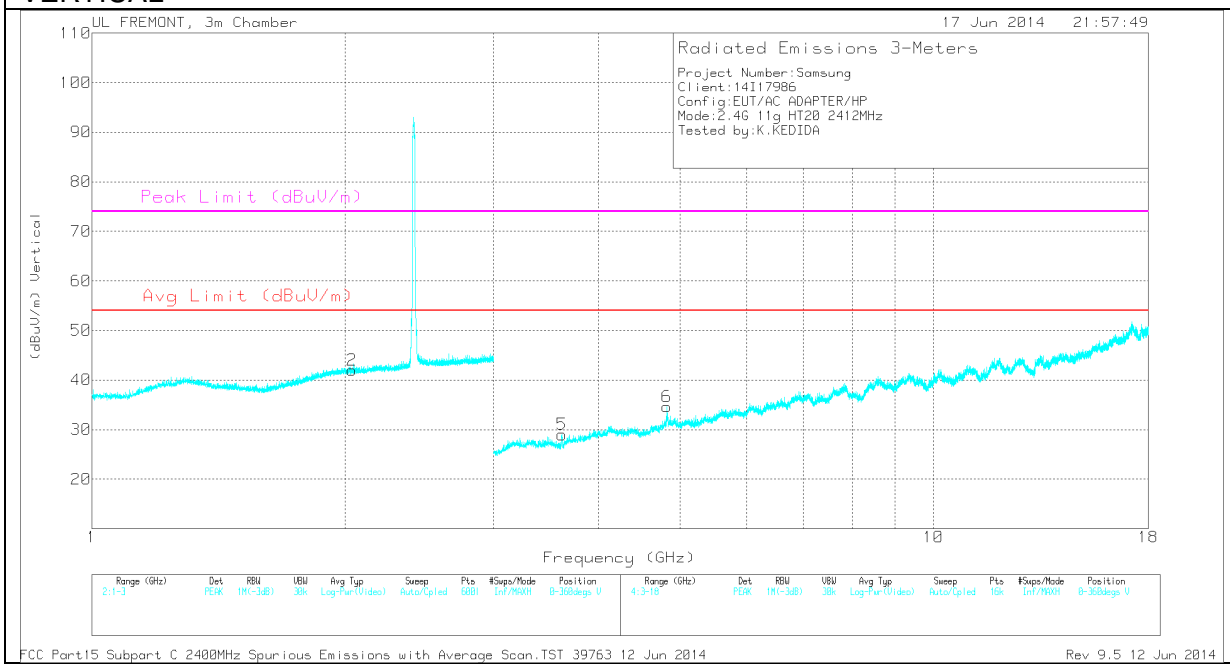
LOW CHANNEL
VERTICAL



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

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.038	31.69	PK	31.6	-21.3	41.99	-	-	-	-	0-360	200	V
1	2.042	32.02	PK	31.6	-21.3	42.32	-	-	-	-	0-360	100	H
3	3.618	27.08	PK	33	-29	31.08	-	-	74	-42.92	0-360	200	H
5	3.619	24.89	PK	33	-28.9	28.99	-	-	74	-45.01	0-360	100	V
4	4.824	28.55	PK	34	-27.2	35.35	-	-	74	-38.65	0-360	200	H
6	4.824	27.81	PK	34	-27.2	34.61	-	-	74	-39.39	0-360	200	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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
3.618	28.64	MAv1	33	-29	0	32.64	54	-21.36	-	-	58	311	H
3.619	38.85	PK2	33	-28.9	.36	42.95	-	-	74	-31.05	58	311	H
4.821	38.35	PK2	34	-27.2	0	45.15	-	-	74	-28.85	261	173	H
4.824	26.19	MAv1	34	-27.2	.36	32.99	54	-21.01	-	-	261	173	H

PK2 - KDB558074 Method: Maximum Peak

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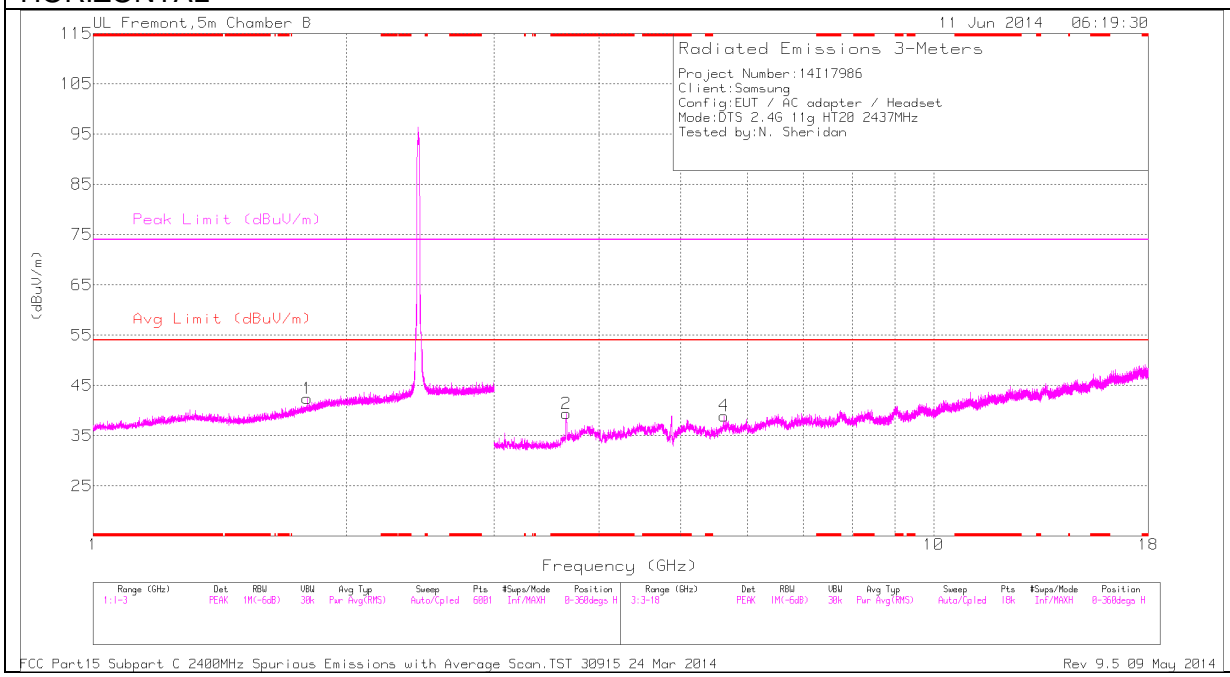
MID CHANNEL
HORIZONTAL



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

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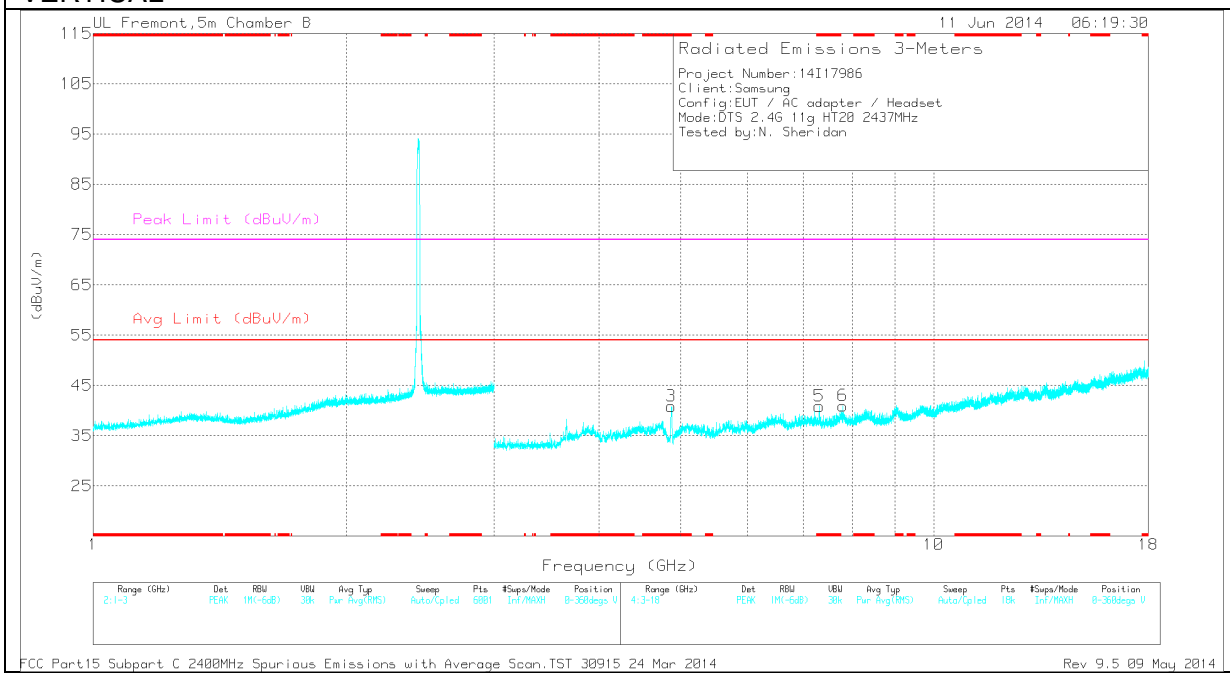
MID CHANNEL
VERTICAL



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

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /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	* 3.656	37.31	PK	33.2	-31.1	0	39.41	-	-	74	-34.59	0-360	201	H
3	* 4.875	37.15	PK	34.2	-30.5	0	40.85	-	-	74	-33.15	0-360	201	V
5	* 7.31	33.36	PK	35.6	-28.1	0	40.86	-	-	74	-33.14	0-360	201	V
1	1.798	35.98	PK	30.1	-23.7	0	42.38	-	-	-	-	0-360	100	H
4	5.628	33.56	PK	34.5	-29.1	0	38.96	-	-	-	-	0-360	101	H
6	7.795	31.16	PK	35.7	-25.9	0	40.96	-	-	-	-	0-360	101	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/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
* 3.656	42.3	PK2	33.2	-31.1	0	44.4	-	-	74	-29.6	359	202	H
* 3.655	31.42	MAv1	33.2	-31.1	.36	33.72	54	-20.28	-	-	359	202	H
* 4.874	48.65	PK2	34.2	-30.5	0	52.35	-	-	74	-21.65	359	202	V
* 4.875	36.06	MAv1	34.2	-30.5	.36	39.96	54	-14.04	-	-	359	202	V

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

PK2 - KDB558074 Method: Maximum Peak

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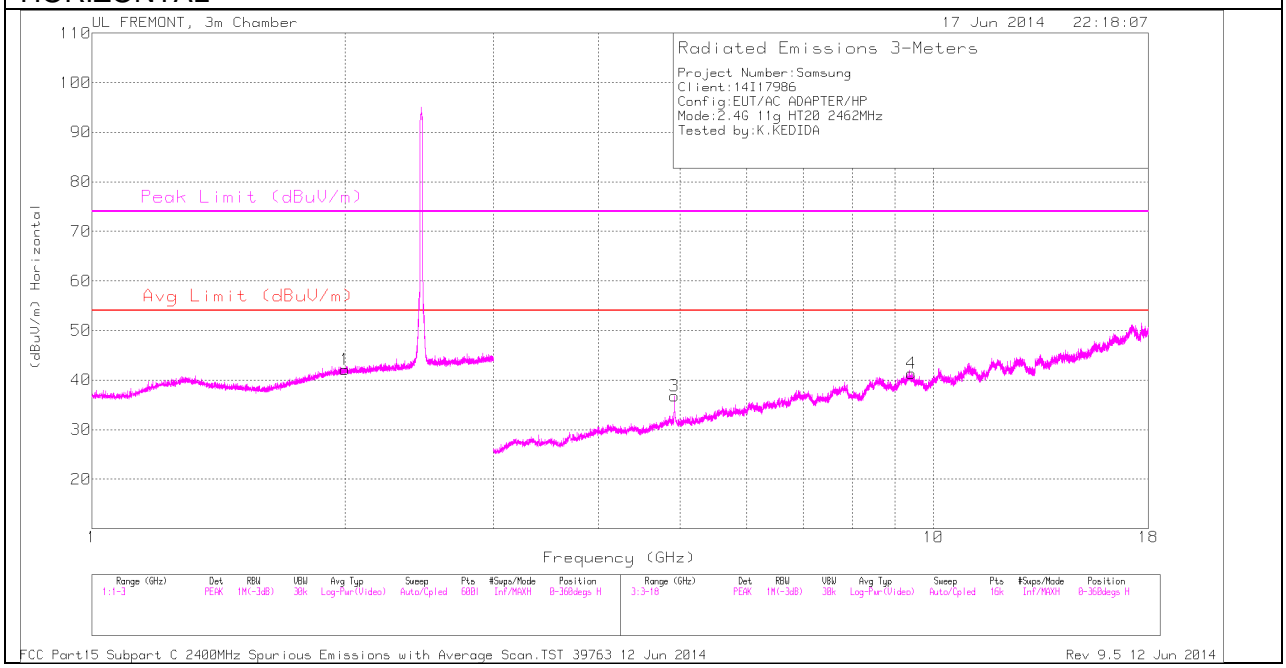
HIGH CHANNEL
HORIZONTAL



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

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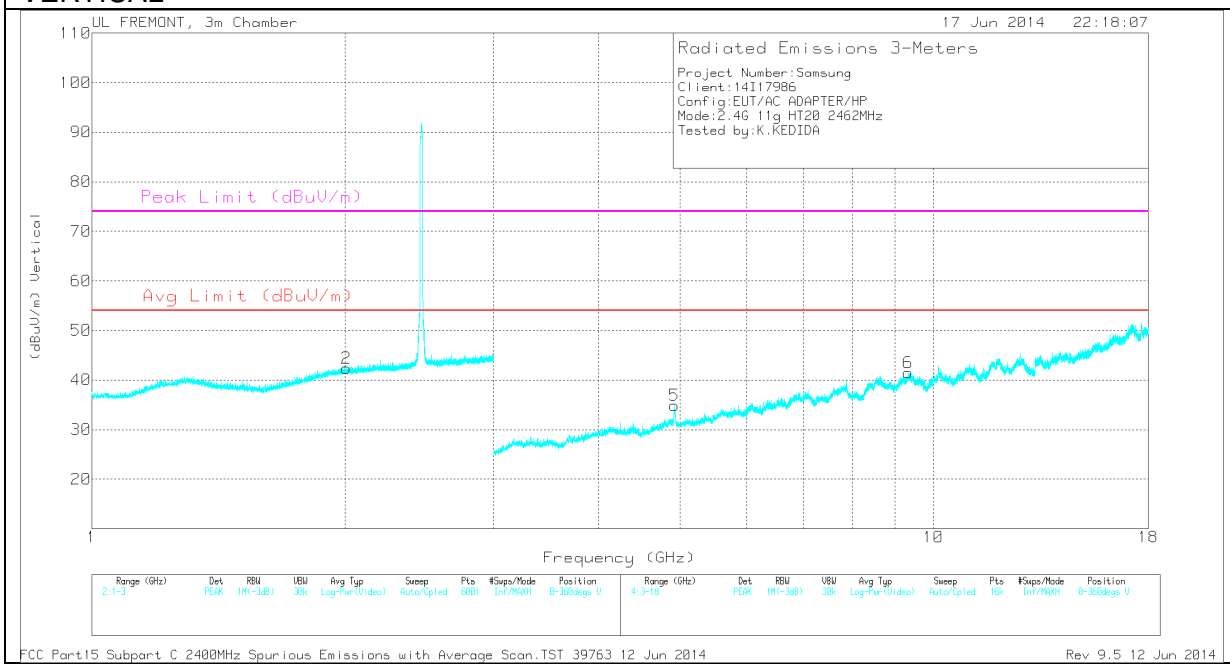
HIGH CHANNEL
VERTICAL



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

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.999	32.07	PK	31.6	-21.5	42.17	-	-	-	-	0-360	200	H
2	2.006	32.23	PK	31.6	-21.4	42.43	-	-	-	-	0-360	100	V
5	4.921	27.91	PK	34	-27	34.91	-	-	74	-39.09	0-360	200	V
3	4.923	29.92	PK	34	-27.1	36.82	-	-	74	-37.18	0-360	100	H
6	9.325	26.37	PK	36.4	-21.3	41.47	-	-	74	-32.53	0-360	200	V
4	9.407	26	PK	36.4	-21	41.4	-	-	74	-32.6	0-360	200	H

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/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
4.924	26.41	MAv1	34	-27.1	.36	33.31	54	-20.69	-	-	312	101	H
4.924	41.43	PK2	34	-27.1	0	48.33	-	-	74	-25.67	272	206	V
4.924	28.47	MAv1	34	-27.1	.36	35.37	54	-18.63	-	-	272	206	V
4.927	38.67	PK2	34	-27.2	0	45.47	-	-	74	-28.53	312	101	H

PK2 - KDB558074 Method: Maximum Peak

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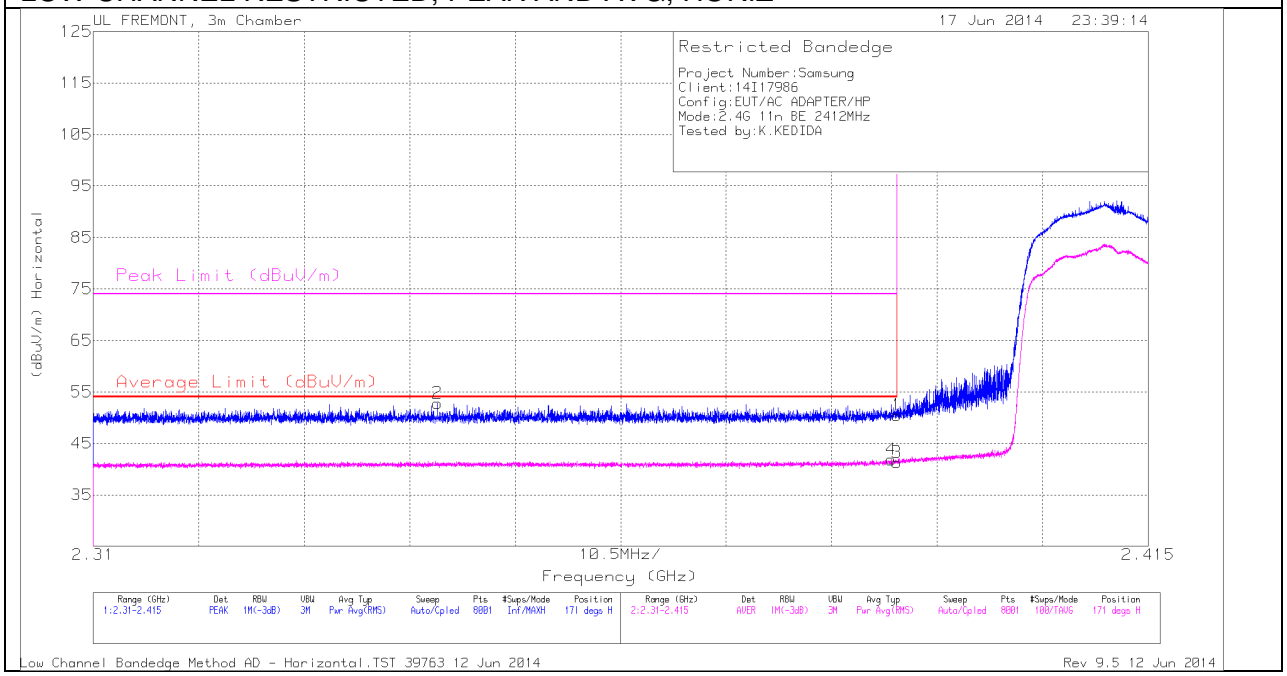
10.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK AND AVG, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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
2	2.344	42.02	PK	32	-21.2	0	52.82	-	-	74	-21.18	171	372	H
4	2.389	30.5	RMS	32.1	-21.1	.36	41.86	54	-12.14	-	-	171	372	H
1	2.39	39.51	PK	32.1	-21.1	0	50.51	-	-	74	-23.49	171	372	H
3	2.39	29.94	RMS	32.1	-21.1	.36	41.3	54	-12.7	-	-	171	372	H

PK - Peak detector

RMS - RMS detection

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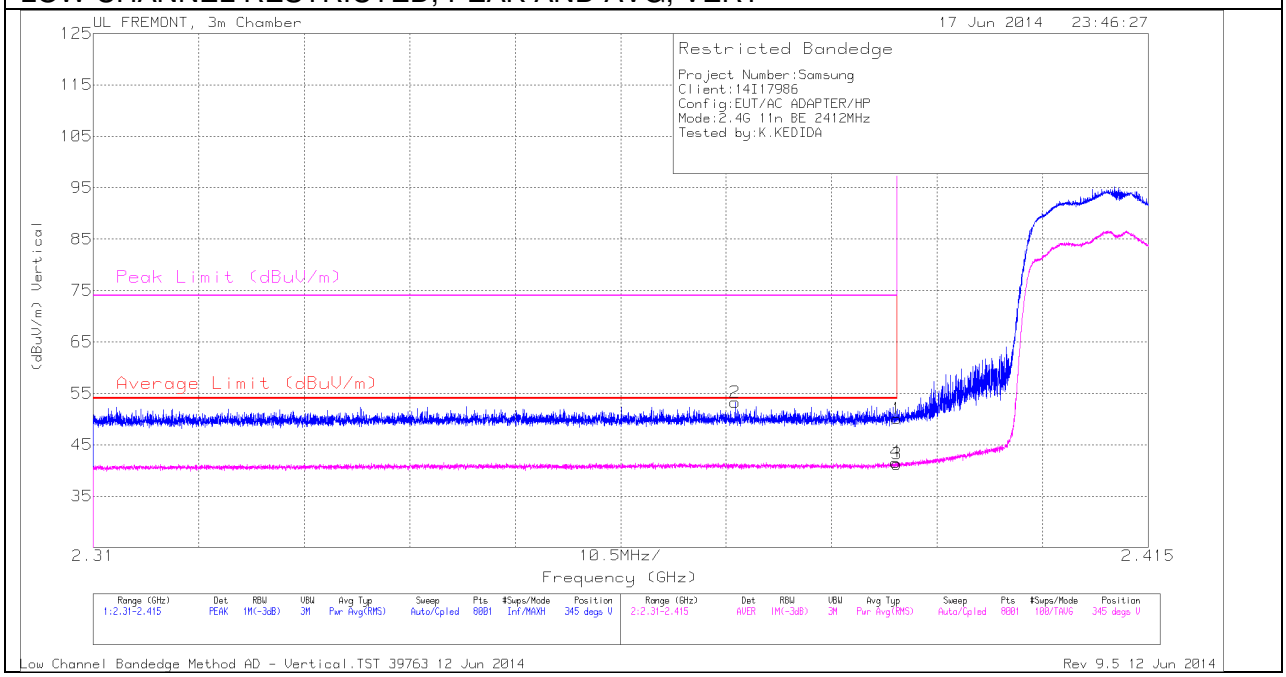
LOW CHANNEL RESTRICTED, PEAK AND AVG, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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
2	2.374	42.36	PK	32	-21.1	0	53.26	-	-	74	-20.74	345	103	V
1	2.39	39.05	PK	32.1	-21.1	0	50.05	-	-	74	-23.95	345	103	V
3	2.39	29.89	RMS	32.1	-21.1	.36	41.25	54	-12.75	-	-	345	103	V
4	2.39	30.23	RMS	32.1	-21.1	.36	41.59	54	-12.41	-	-	345	103	V

PK - Peak detector

RMS - RMS detection

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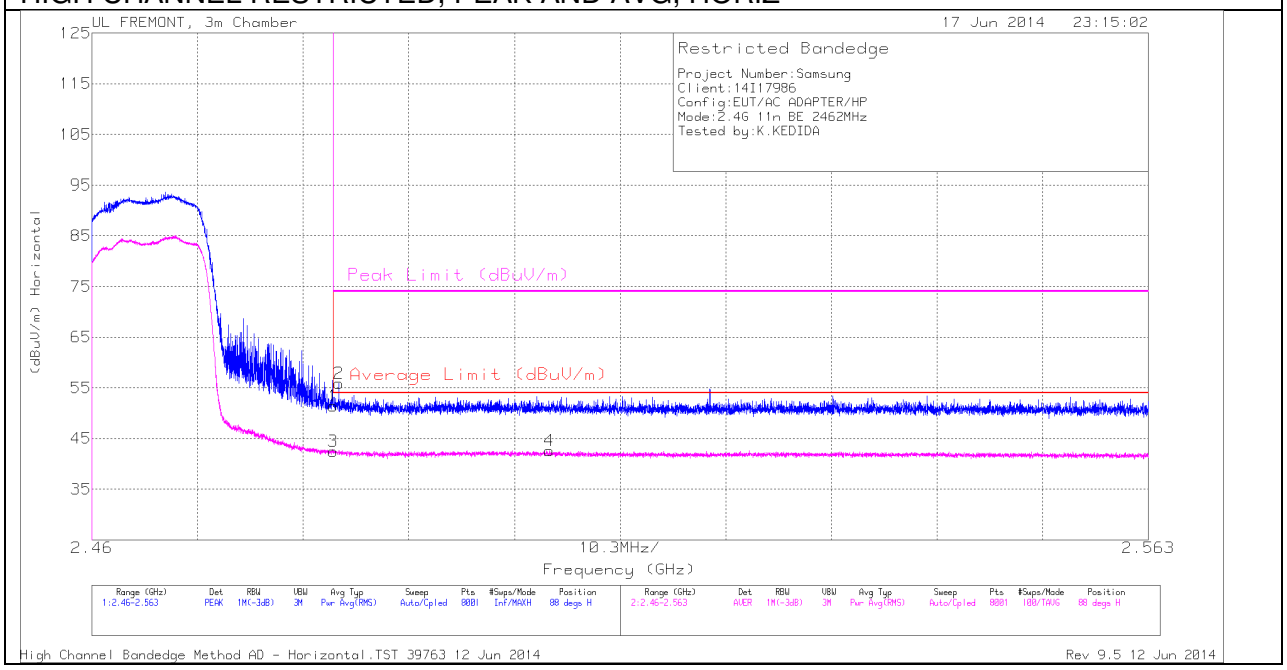
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL RESTRICTED, PEAK AND AVG, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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	39.86	PK	32.3	-20.8	0	51.36	-	-	74	-22.64	88	137	H
2	2.484	44.34	PK	32.3	-20.8	0	55.84	-	-	74	-18.16	88	137	H
3	2.484	30.63	RMS	32.3	-20.8	.36	42.49	54	-11.51	-	-	88	137	H
4	2.505	30.67	RMS	32.3	-20.7	.36	42.63	54	-11.37	-	-	88	137	H

PK - Peak detector

RMS - RMS detection

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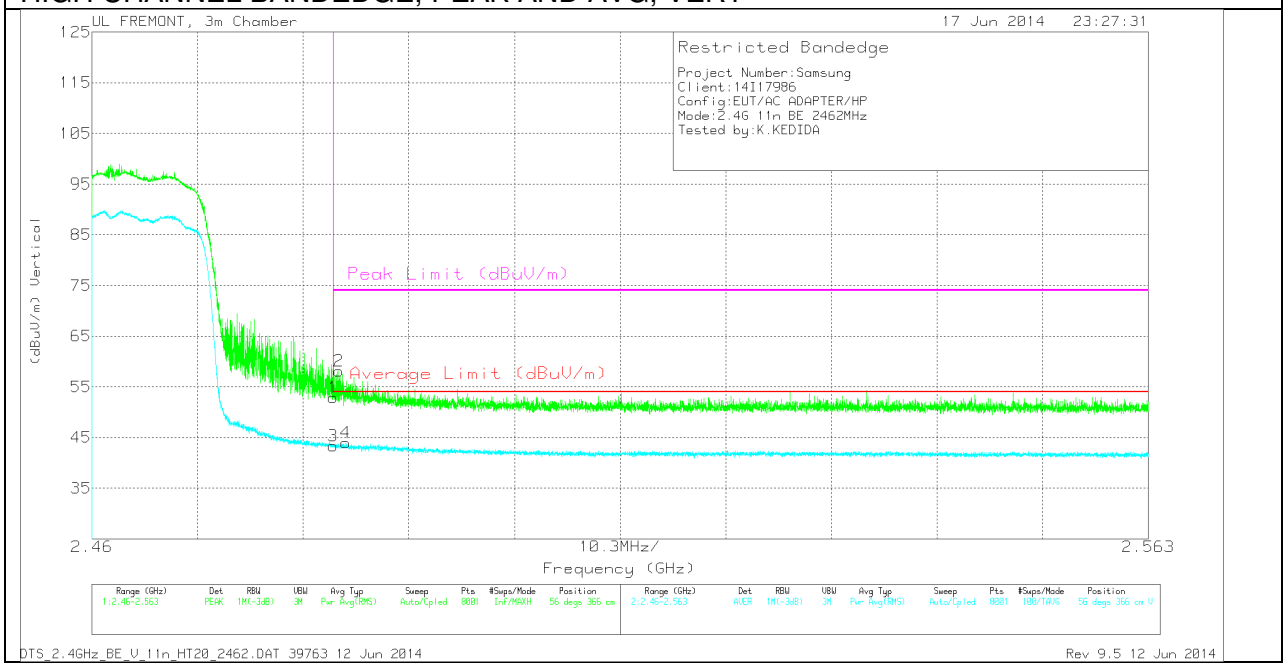
HIGH CHANNEL BANDEDGE, PEAK AND AVG, VERT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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	41.44	PK	32.3	-20.8	0	52.94	-	-	74	-21.06	56	366	V
2	2.484	46.58	PK	32.3	-20.8	0	58.08	-	-	74	-15.92	56	366	V
3	2.484	31.43	RMS	32.3	-20.8	.36	43.29	54	-10.71	-	-	56	366	V
4	2.485	32.11	RMS	32.3	-20.8	.36	43.97	54	-10.03	-	-	56	366	V

PK - Peak detector
RMS - RMS detection

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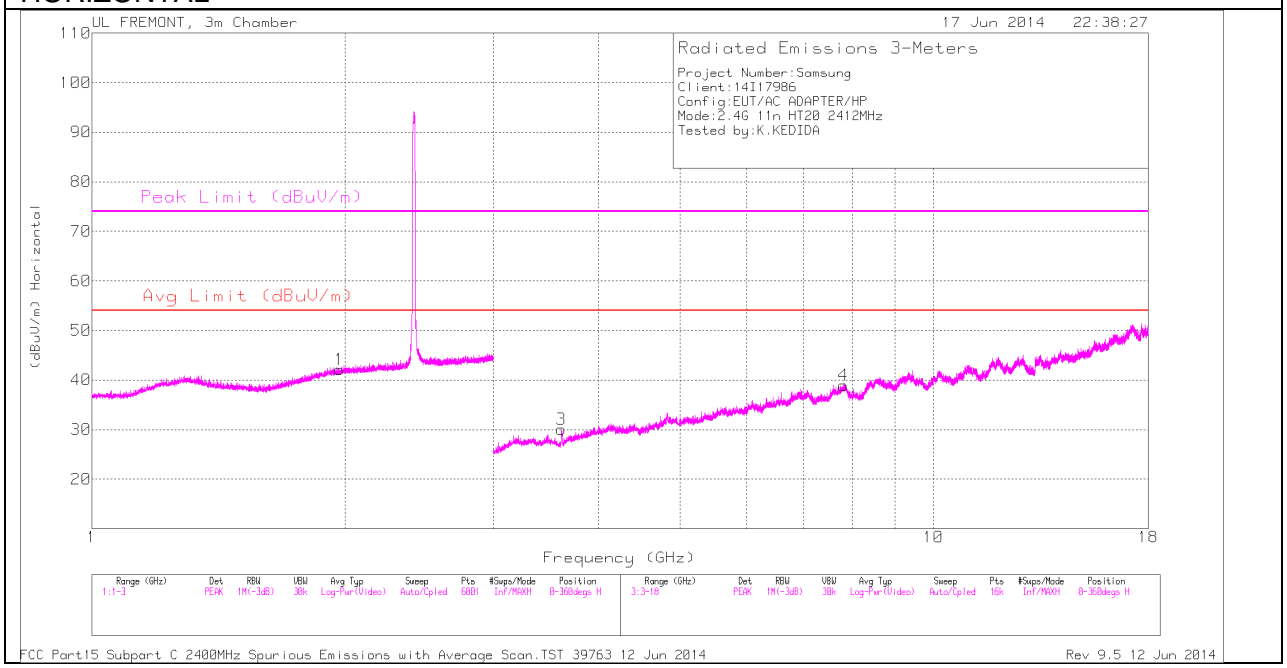
HARMONICS AND SPURIOUS EMISSIONS

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.

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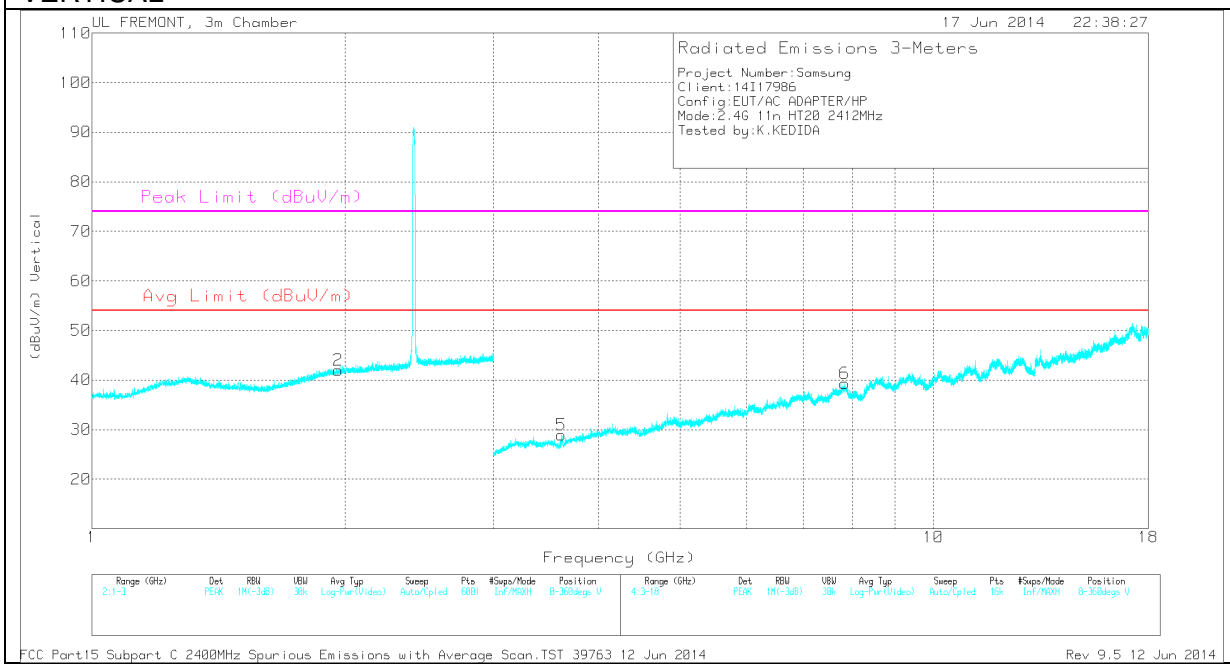
LOW CHANNEL
VERTICAL



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

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	1.961	32.04	PK	31.5	-21.5	42.04	-	-	-	-	0-360	100	V
1	1.97	32.13	PK	31.5	-21.5	42.13	-	-	-	-	0-360	100	H
5	3.612	24.9	PK	33	-29	28.9	-	-	74	-45.1	0-360	100	V
3	3.613	26.11	PK	33	-29	30.11	-	-	74	-43.89	0-360	200	H
4	7.816	26.55	PK	35.8	-23.4	38.95	-	-	-	-	0-360	100	H
6	7.838	26.34	PK	35.8	-22.8	39.34	-	-	-	-	0-360	200	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	DC Corr (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3.617	37.8	PK2	33	-29	41.8	0	-	-	74	-32.2	60	311	H
3.618	27.78	MAv1	33	-29	31.78	.4	54	-22.22	-	-	60	311	H
3.618	38.11	PK2	33	-28.9	42.21	0	-	-	74	-31.79	60	311	H

PK2 - KDB558074 Method: Maximum Peak

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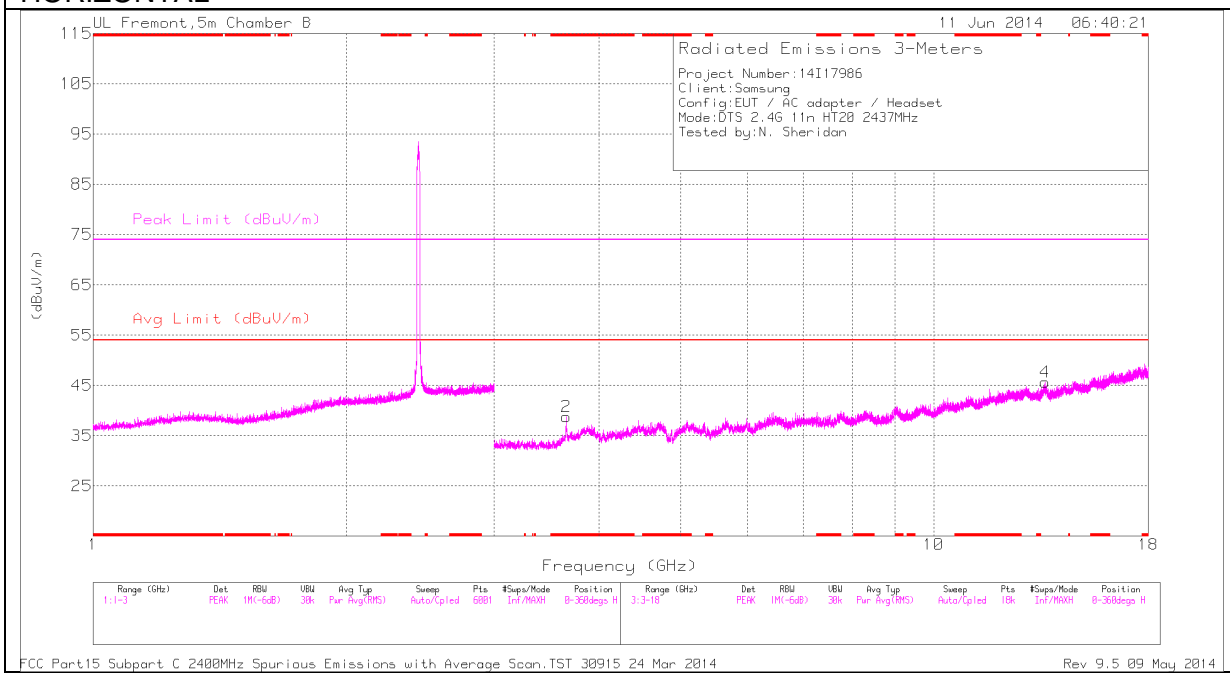
MID CHANNEL
HORIZONTAL



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

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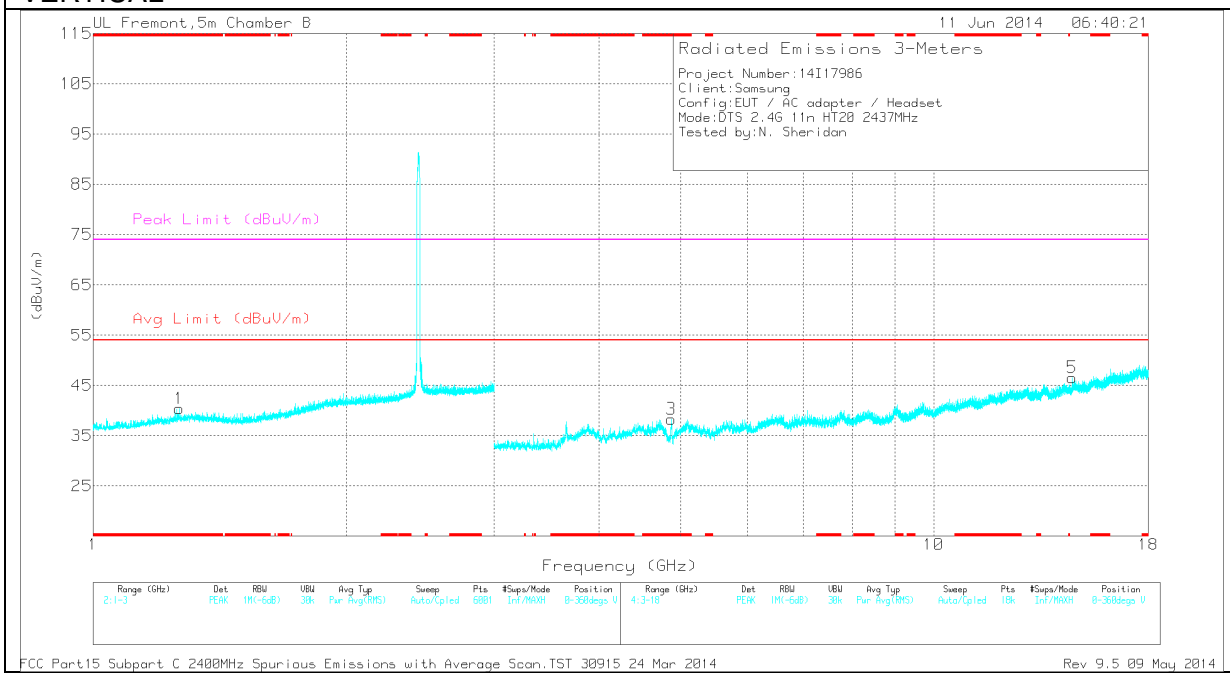
MID CHANNEL
VERTICAL



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

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr /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	* 1.266	36.39	PK	28.6	-24.6	0	40.39	-	-	74	-33.61	0-360	101	V
2	* 3.656	36.67	PK	33.2	-31.1	0	38.77	-	-	74	-35.23	0-360	201	H
3	* 4.873	34.6	PK	34.2	-30.5	0	38.3	-	-	74	-35.7	0-360	201	V
4	13.564	26.96	PK	38.9	-20.2	0	45.66	-	-	-	-	0-360	101	H
5	14.609	27.64	PK	39.4	-20.5	0	46.54	-	-	-	-	0-360	201	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/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
* 3.656	46.29	PK2	33.2	-31.1	0	48.39	-	-	74	-25.61	123	268	H
* 3.655	35.99	MAv1	33.2	-31.1	.4	38.49	54	-15.51	-	-	123	268	H
* 4.872	40.44	PK2	34.2	-30.5	0	44.14	-	-	74	-29.86	123	202	V
* 4.873	29.84	MAv1	34.2	-30.5	.4	33.94	54	-20.06	-	-	123	202	V

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

PK2 - KDB558074 Method: Maximum Peak

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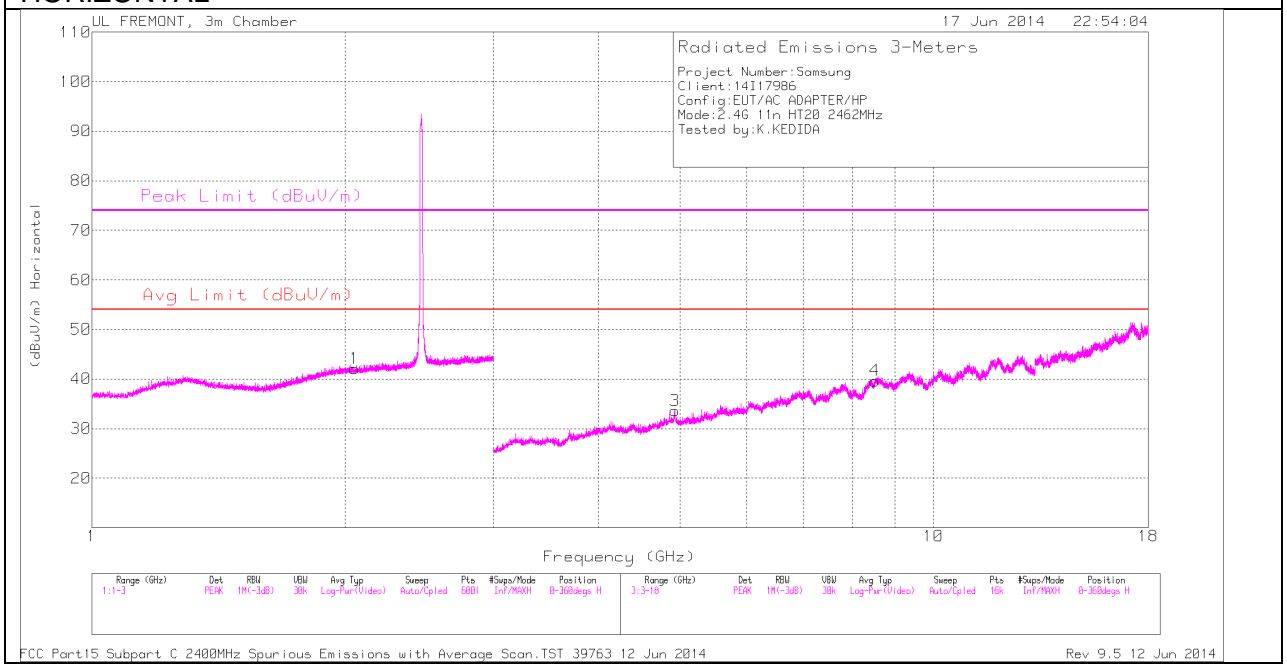
HIGH CHANNEL
HORIZONTAL



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

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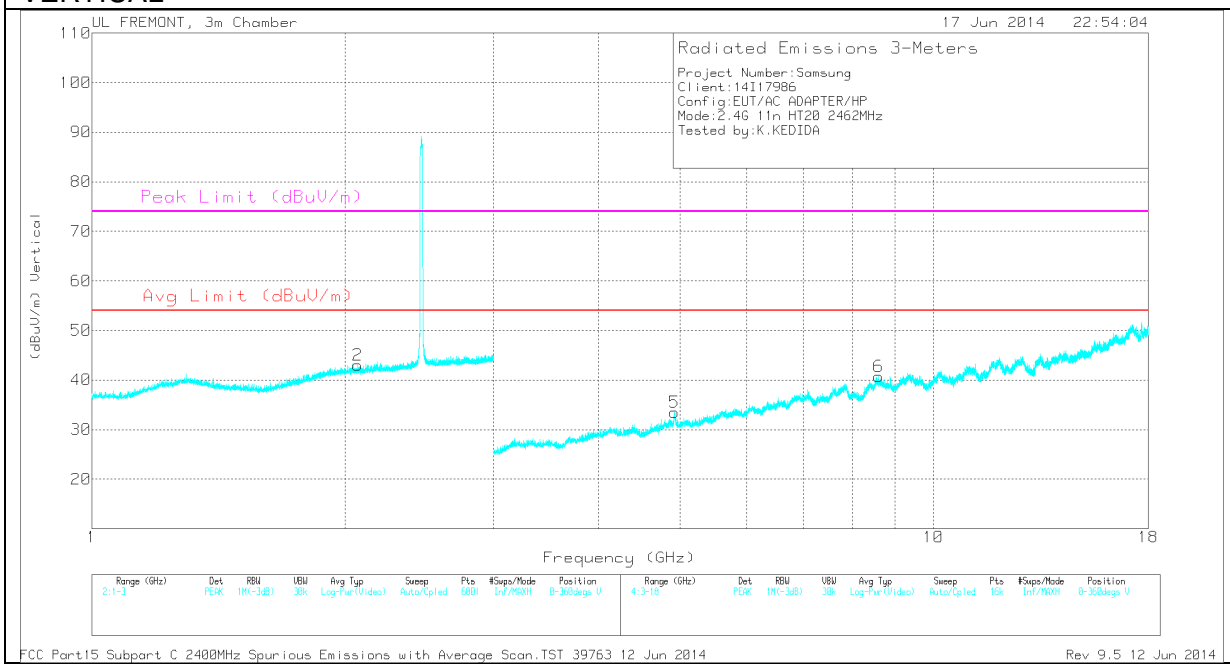
HIGH CHANNEL
VERTICAL



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

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HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.052	31.86	PK	31.6	-21.3	42.16	-	-	-	-	0-360	200	H
2	2.07	32.57	PK	31.6	-21.2	42.97	-	-	-	-	0-360	100	V
5	4.921	26.48	PK	34	-27	33.48	-	-	74	-40.52	0-360	200	V
3	4.93	26.83	PK	34	-27.2	33.63	-	-	74	-40.37	0-360	100	H
4	8.517	27.25	PK	35.8	-23.4	39.65	-	-	-	-	0-360	100	H
6	8.612	26.84	PK	35.8	-21.9	40.74	-	-	-	-	0-360	100	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4.932	35.2	PK2	34	-27.2	42	-	-	74	-32	0	100	H
8.518	36.87	PK2	35.8	-23.4	49.27	-	-	-	-	0	100	H

PK2 - KDB558074 Method: Maximum Peak

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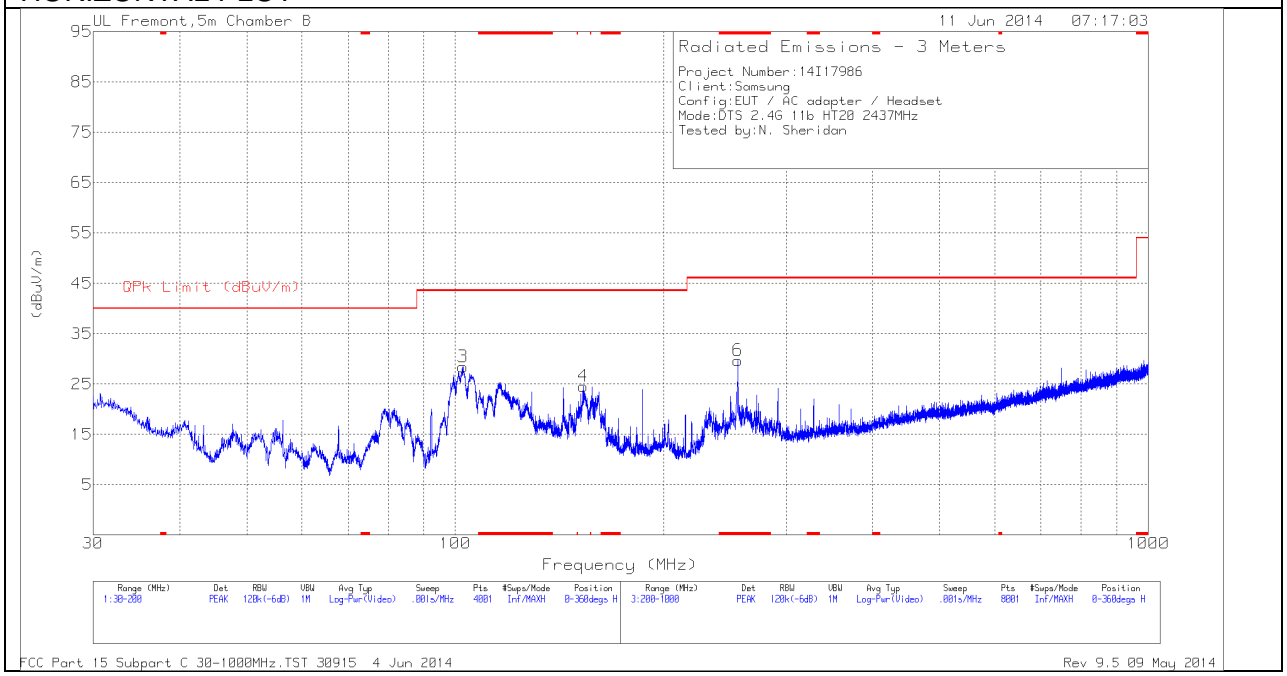
10.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



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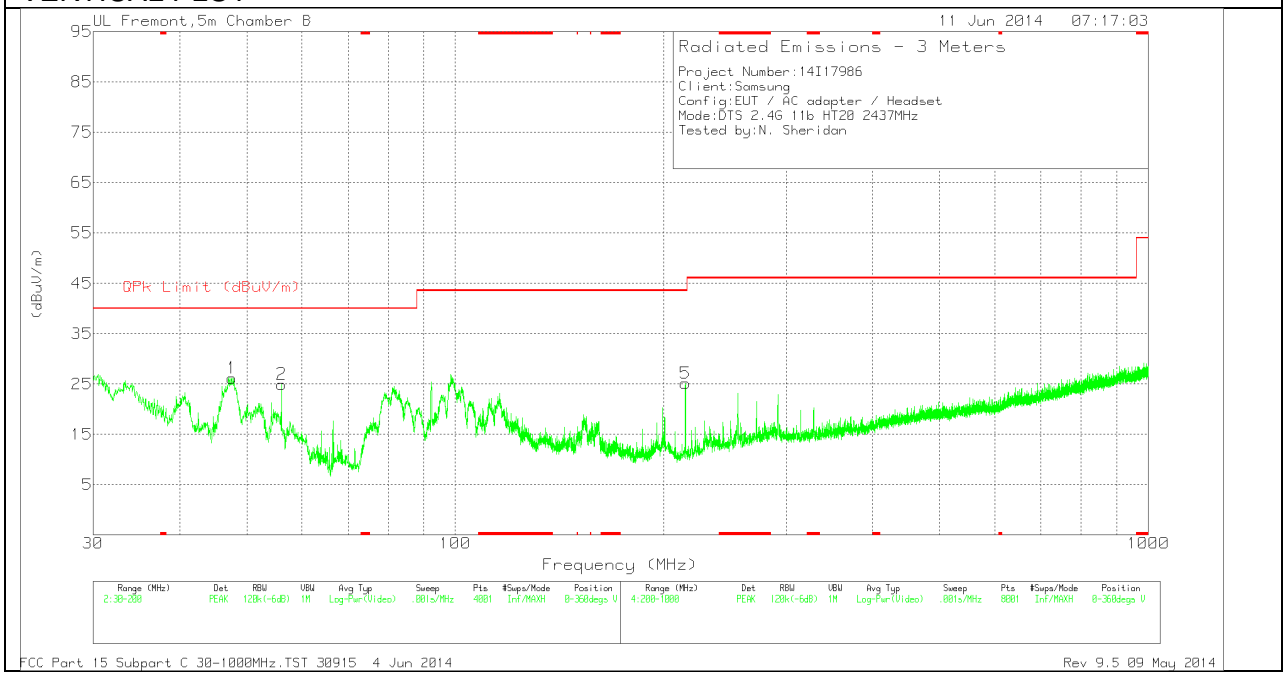
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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Below 1G Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 255.6	44.3	PK	11.7	-26.3	29.7	46.02	-16.32	0-360	101	H
1	47.595	45.77	PK	9	-28.6	26.17	40	-13.83	0-360	101	V
2	56.1375	46.23	PK	7.2	-28.5	24.93	40	-15.07	0-360	101	V
3	102.5475	45.54	PK	10.9	-28	28.44	43.52	-15.08	0-360	300	H
4	152.8675	39.68	PK	12.3	-27.4	24.58	43.52	-18.94	0-360	200	H
5	214.8	41.35	PK	10.6	-26.8	25.15	43.52	-18.37	0-360	200	V

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

PK - Peak detector

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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.

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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	48.57	PK	1.2	0	49.77	64.8	-15.03	-	-
2	.1725	27.1	Av	1.2	0	28.3	-	-	54.8	-26.5
3	.3795	37.9	PK	.4	0	38.3	58.3	-20	-	-
4	.3795	19.17	Av	.4	0	19.57	-	-	48.3	-28.73
5	.501	35.09	PK	.3	0	35.39	56	-20.61	-	-
6	.501	22.45	Av	.3	0	22.75	-	-	46	-23.25
7	.564	40.25	PK	.3	0	40.55	56	-15.45	-	-
8	.564	34.13	Av	.3	0	34.43	-	-	46	-11.57
9	1.1985	29.86	PK	.2	.1	30.16	56	-25.84	-	-
10	1.1985	19.96	Av	.2	.1	20.26	-	-	46	-25.74
11	2.0085	27.9	PK	.2	.1	28.2	56	-27.8	-	-
12	2.0085	15.63	Av	.2	.1	15.93	-	-	46	-30.07
13	7.251	27.72	PK	.2	.1	28.02	60	-31.98	-	-
14	7.251	11.21	Av	.2	.1	11.51	-	-	50	-38.49
15	29.2875	28.2	PK	.3	.3	28.8	60	-31.2	-	-
16	29.2875	14.05	Av	.3	.3	14.65	-	-	50	-35.35
17	29.787	28.78	PK	.3	.3	29.38	60	-30.62	-	-
18	29.787	15.24	Av	.3	.3	15.84	-	-	50	-34.16

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)
19	.168	47.37	PK	1.3	0	48.67	65.1	-16.43	-	-
20	.168	21.94	Av	1.3	0	23.24	-	-	55.1	-31.86
21	.312	41.17	PK	.6	0	41.77	59.9	-18.13	-	-
22	.312	15.93	Av	.6	0	16.53	-	-	49.9	-33.37
23	.51	32.67	PK	.4	0	33.07	56	-22.93	-	-
24	.51	18.76	Av	.4	0	19.16	-	-	46	-26.84
25	.564	41.2	PK	.3	0	41.5	56	-14.5	-	-
26	.564	29.18	Av	.3	0	29.48	-	-	46	-16.52
27	.69	29.98	PK	.3	0	30.28	56	-25.72	-	-
28	.69	12.68	Av	.3	0	12.98	-	-	46	-33.02
29	1.068	21.99	PK	.3	.1	22.39	56	-33.61	-	-
30	1.068	10.04	Av	.3	.1	10.44	-	-	46	-35.56
31	2.0625	18.52	PK	.2	.1	18.82	56	-37.18	-	-
32	2.0625	2.66	Av	.2	.1	2.96	-	-	46	-43.04
33	3.381	18.7	PK	.2	.1	19	56	-37	-	-
34	3.381	5.07	Av	.2	.1	5.37	-	-	46	-40.63
35	4.848	19.75	PK	.2	.1	20.05	56	-35.95	-	-
36	4.848	4.18	Av	.2	.1	4.48	-	-	46	-41.52
37	8.376	29.7	PK	.2	.1	30	60	-30	-	-
38	8.376	10.1	Av	.2	.1	10.4	-	-	50	-39.6
39	29.238	28.78	PK	.3	.3	29.38	60	-30.62	-	-
40	29.238	16.15	Av	.3	.3	16.75	-	-	50	-33.25
41	29.967	28.97	PK	.3	.3	29.57	60	-30.43	-	-
42	29.967	15.13	Av	.3	.3	15.73	-	-	50	-34.27

PK - Peak detector
Av - average detection

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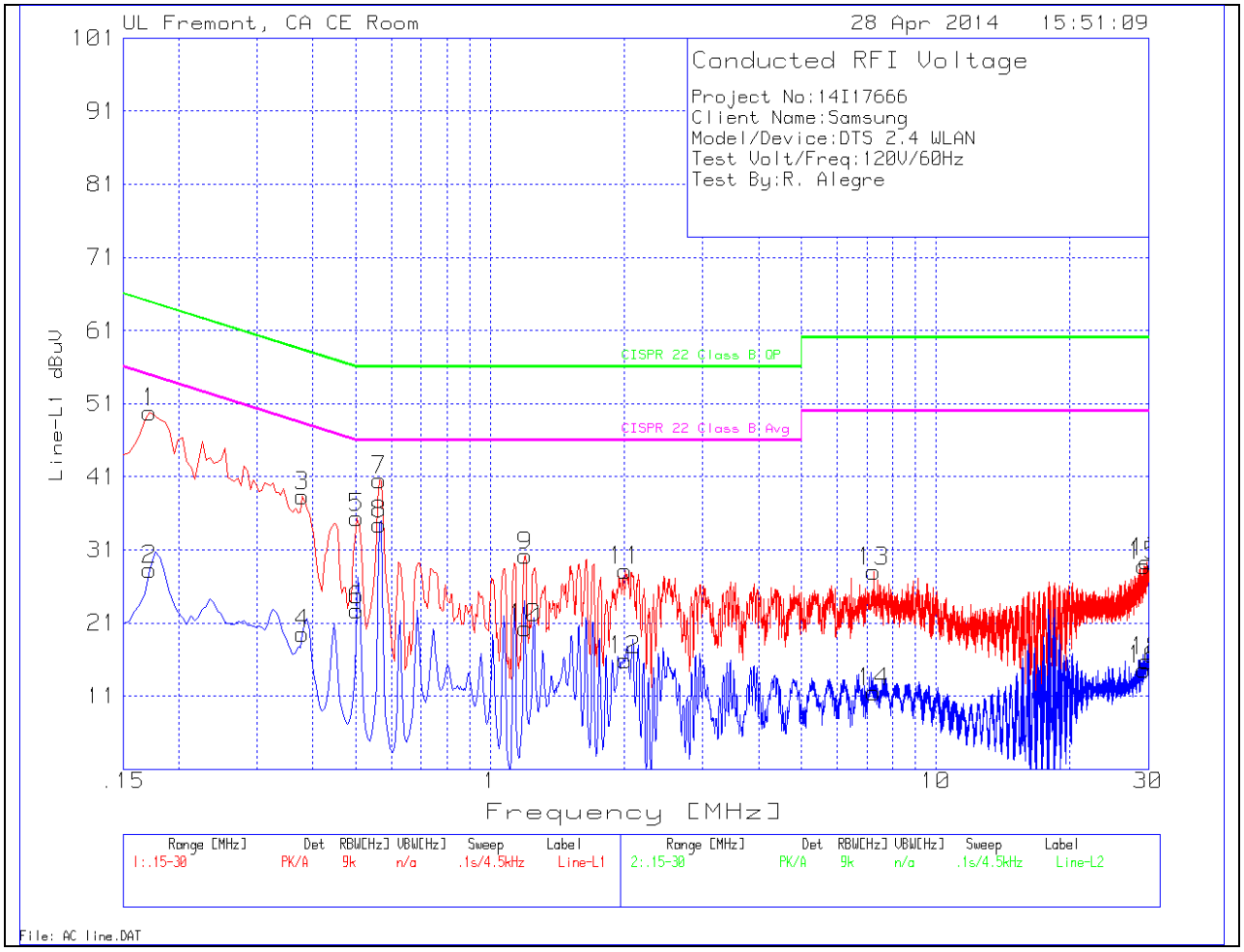
LINE 1 RESULTS



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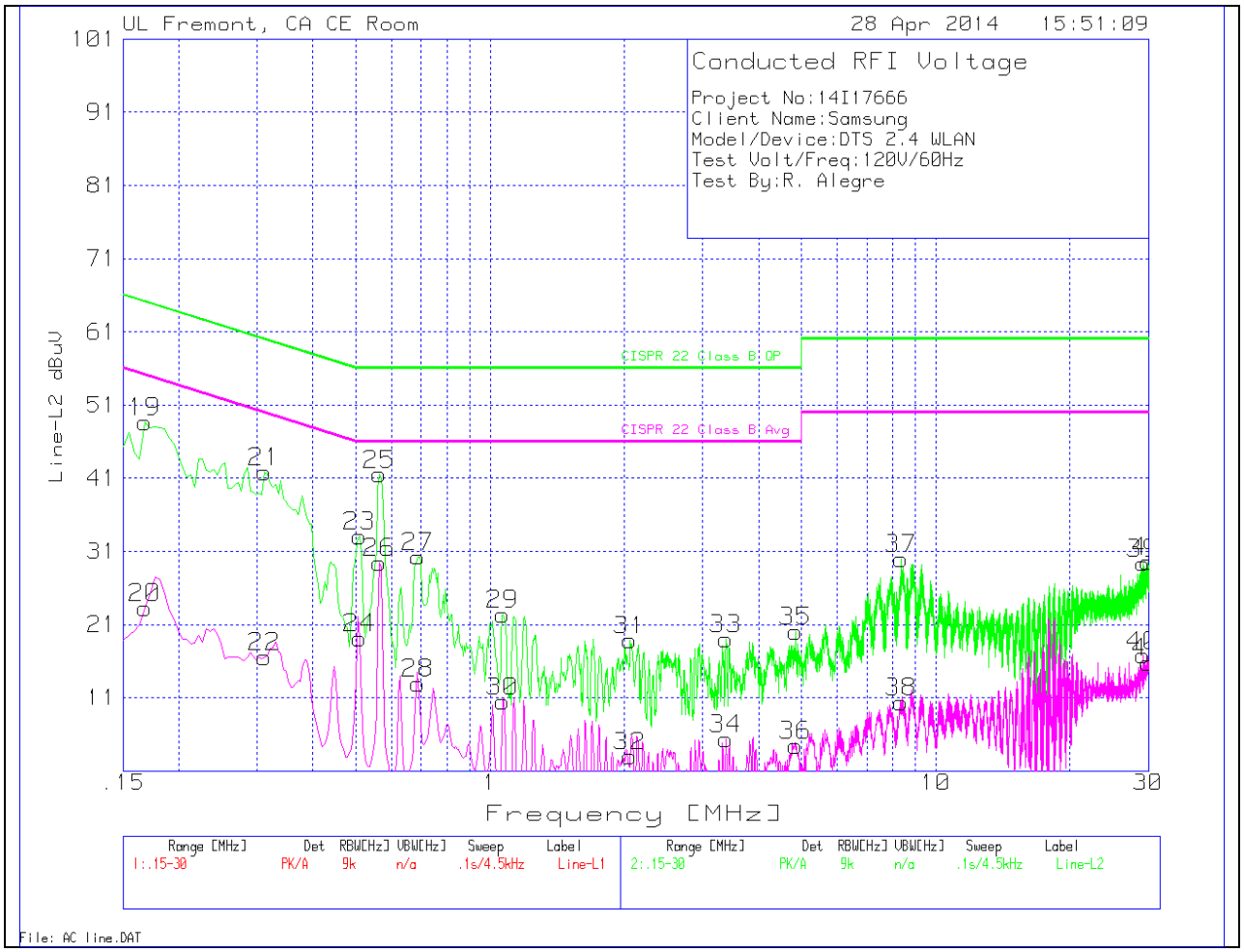
LINE 2 RESULTS



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