FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR
GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, ANT+ & NFC

FCC ID: PY7PM-0810
IC: 4170B-PM0810

REPORT NUMBER: 14U17929-5 REVISION A

ISSUE DATE: 2014-07-28

Prepared for
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NYA VATTENTORNET MOBILVAGEN 10
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
-	7/21/14	Initial Issue	M. Antola
A	7/28/14	Updated 99% bandwidth data table	P. Zhang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONY MOBILE COMMUNICATIONS, INC.

EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, ANT+ & NFC

SERIAL NUMBER: 1906287

DATE TESTED: 7/2/14/ - 7/28/14

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	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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UL Verification Services Inc.

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 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address.

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.

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/1002550.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:

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%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac + NFC & ANT+.

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)
5180-5240	802.11a	15.44	34.99
5180-5240	802.11n HT20	15.24	33.42
5190-5230	802.11n HT40	13.48	22.28
5210	802.11ac HT80	12.55	17.99
5260-5320	802.11a	15.39	34.59
5260-5320	802.11n HT20	15.47	35.24
5270-5310	802.11n HT40	13.62	23.01
5290	802.11ac HT80	12.66	18.45
5500-5700	802.11a	15.43	34.91
5500-5700	802.11n HT20	15.69	37.07
5510-5670	802.11n HT40	13.48	22.28
5530	802.11ac HT80	12.64	18.37
5745-5825	802.11a	15.31	33.96
5745-5805	802.11n HT20	15.2	33.11
5755-5795	802.11n HT40	13.54	22.59
5775	802.11ac HT80	12.51	17.82

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna for the 802.11a, 802.11n/ac HT20, 802.11n/ac HT40, 802.11n/ac HT80 modes with maximum peak gains as described below:

Band of Operation (MHz)	Antenna Gain (dBi)
5150-5250	-1.0
5250-5350	-1.0
5500-5700	-0.6
5745-5850	-0.5

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

Based on customer feedback, the worst-case data rates were:

802.11a mode: 6 Mbps
802.11n/ac HT20mode: MCS0
802.11n/ac HT40mode: MCS0
802.11ac HT80mode: MCS0

All conducted testing was performed in n-mode only for HT20/40, which covers ac-mode testing.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Sony	EP880	3514W01 S08489 SEM 060	DoC
Earphone	Sony	MH410c	14071EB60060A84	DoC
MHL cabel	Sony	N/A	N/A	N/A

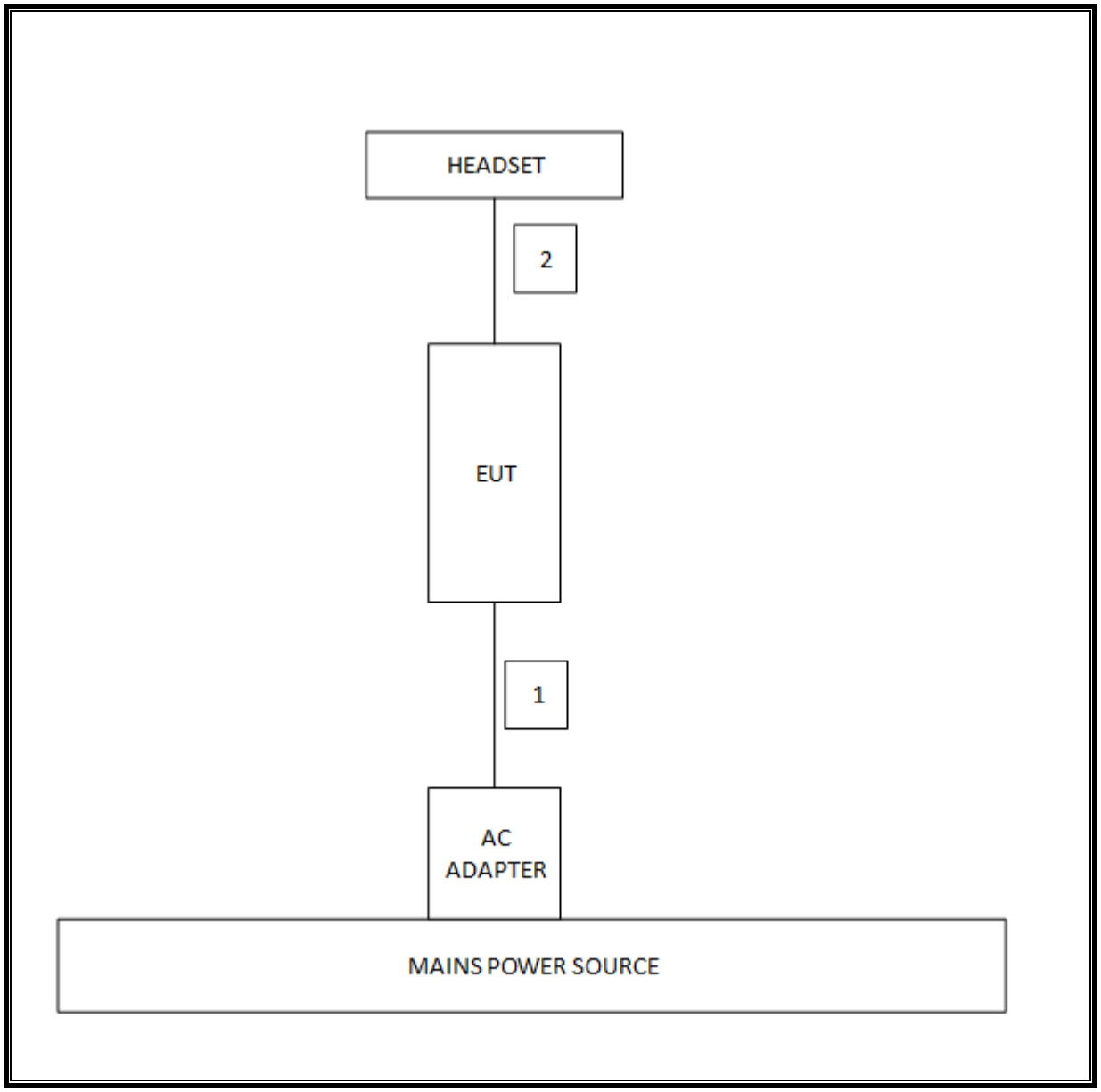
I/O CABLES

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

TEST SETUP

The EUT is setup as a stand-alone device.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

UL – Melville Equipment

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESCI7	75141	2014-01-29	2015-01-31
Hybrid Antenna	Sunol	JB-1	84106	2014-02-19	2015-02-19
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Multimeter	Fluke	87V	44547	2014-01-29	2015-01-31
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2014-06-12	2015-06-12
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07 (26°)**	8933	2008-11-24	See * below
Horn Antenna (12-18 GHz)	ETS	3160-08 (26°)**	8932	2007-09-27	See * below
Horn Antenna (18-26.5 GHz)	ETS	3160-09 (27°)**	8947	2007-09-26	See * below
Horn Antenna (26.5-40 GHz)	ETS	3160-10 (27°)**	73004	2007-09-26	See * below
Horn Antenna	EMCO	3115	ME5A-766		
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22
Multimeter	Fluke	87V	44547	2014-01-29	2015-01-31

* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration.

Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

** - Number in parentheses denotes antenna beam width.

UL – Fremont Equipment

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

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)	Occupied Band width (26dB)	N/A	Conducted	Pass	20.35
2.1051, 15.407 (b)	Band Edge / Conducted Spurious Emission	54dBuV/m (avg)		Pass	N/A
15.407 (a)(2)	TX Cond. Power5.15-2.25, 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(OBW)		Pass	15.69dBm
15.407 (a)(3)	TX Cond. Power 5.725-5.825	< 30dBm or 17+10Log(OBW)		Pass	15.31dBm
15.407 (a)(5)	PSD	<11dBm		Pass	4.13dBm
15.207 (a)	AC Power Line conducted emissions	Section 10		Pass	40.2dBuV
15.407 (b) & 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	46.83dBuV/m
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Radiated / Conducted	Pass	N/A

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

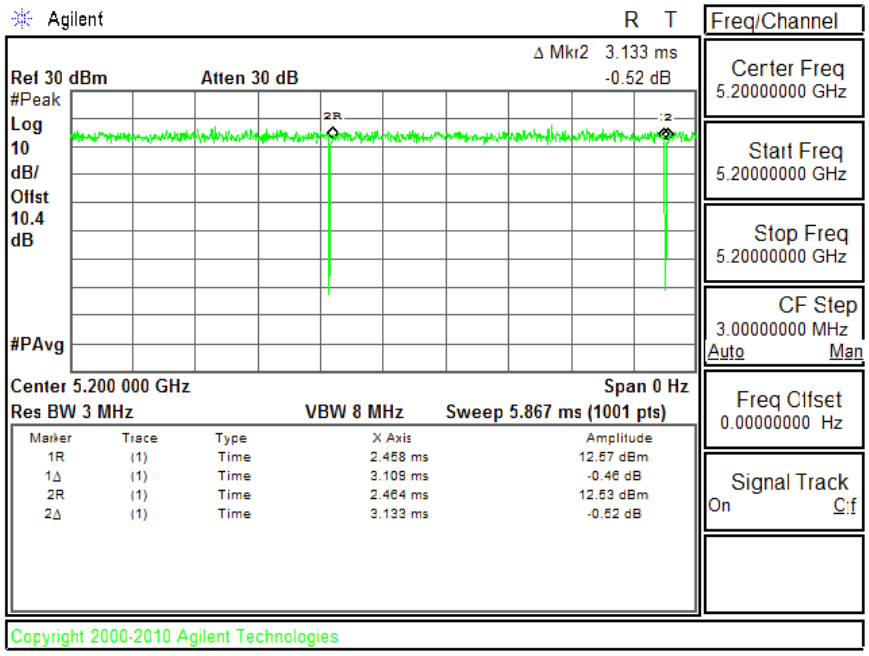
KDB 789033 Zero-Span Spectrum Analyzer Method.

8.1. ON TIME AND DUTY CYCLE RESULTS

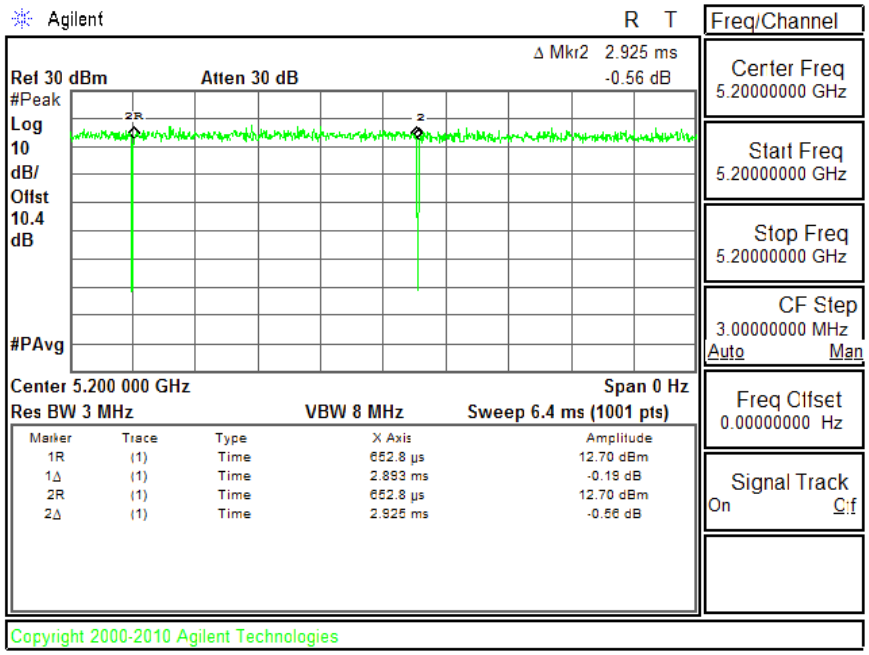
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11a	3.11	3.13	0.992	99.2%	0.00	0.010
802.11ac HT20	2.90	3	0.990	99.0%	0.00	0.010
802.11ac HT40	1.38	1	0.960	96.0%	0.18	0.723
802.11ac HT80	0.65	1	0.933	93.3%	0.30	1.529
802.11n HT20	2.89	3	0.989	98.9%	0.00	0.010
802.11n HT40	1.38	1	0.962	96.2%	0.17	0.723

8.2. DUTY CYCLE PLOTS

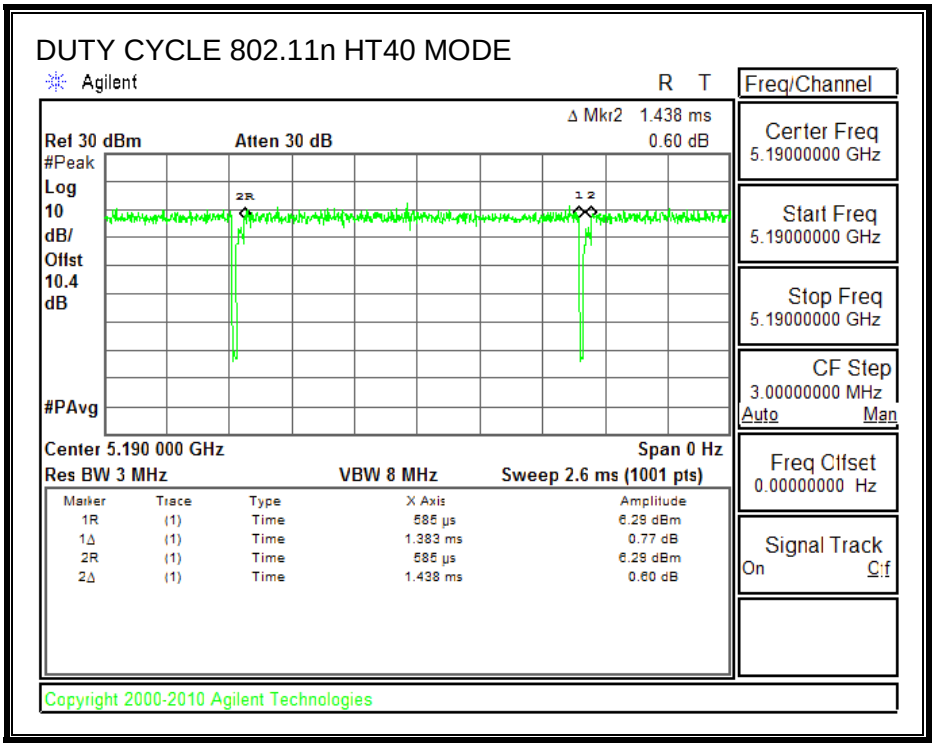
DUTY CYCLE 802.11a MODE



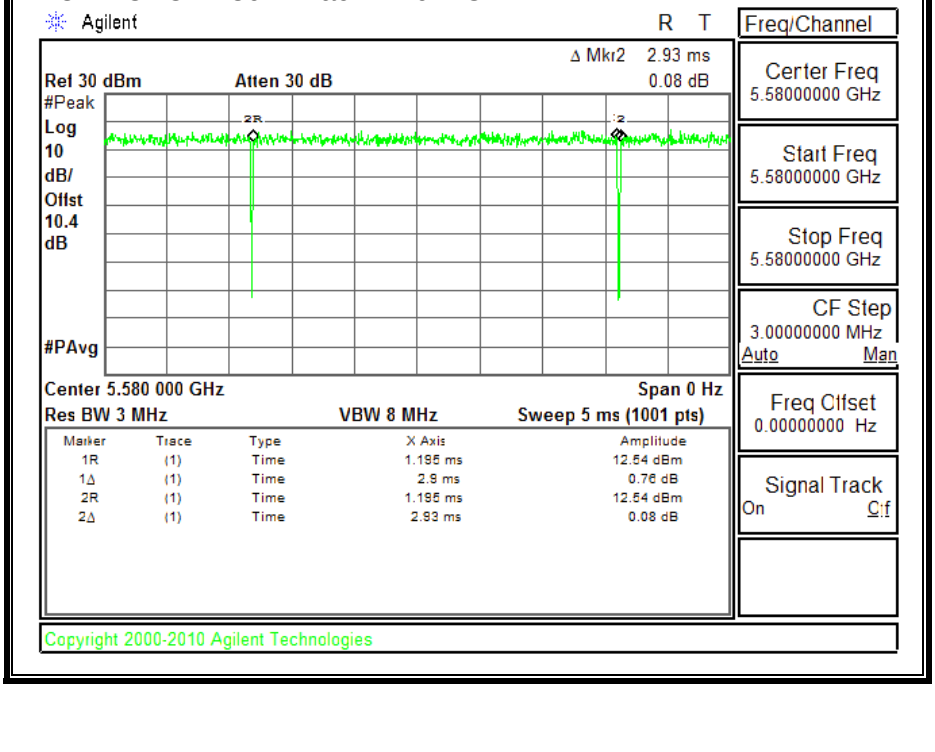
DUTY CYCLE 802.11n HT20 MODE



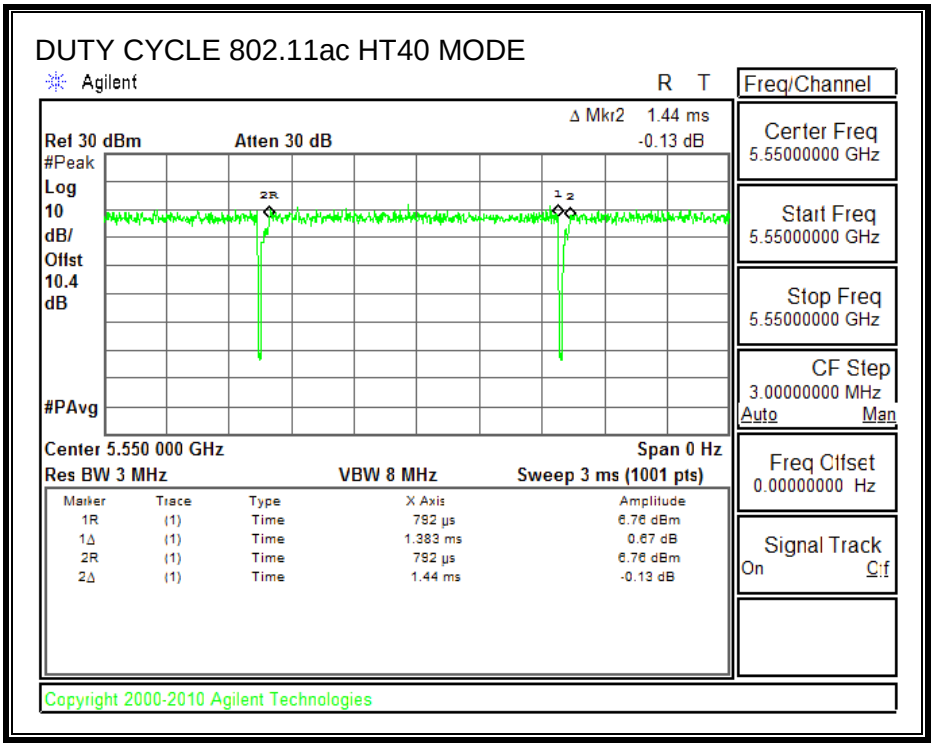
DUTY CYCLE 802.11n HT40 MODE



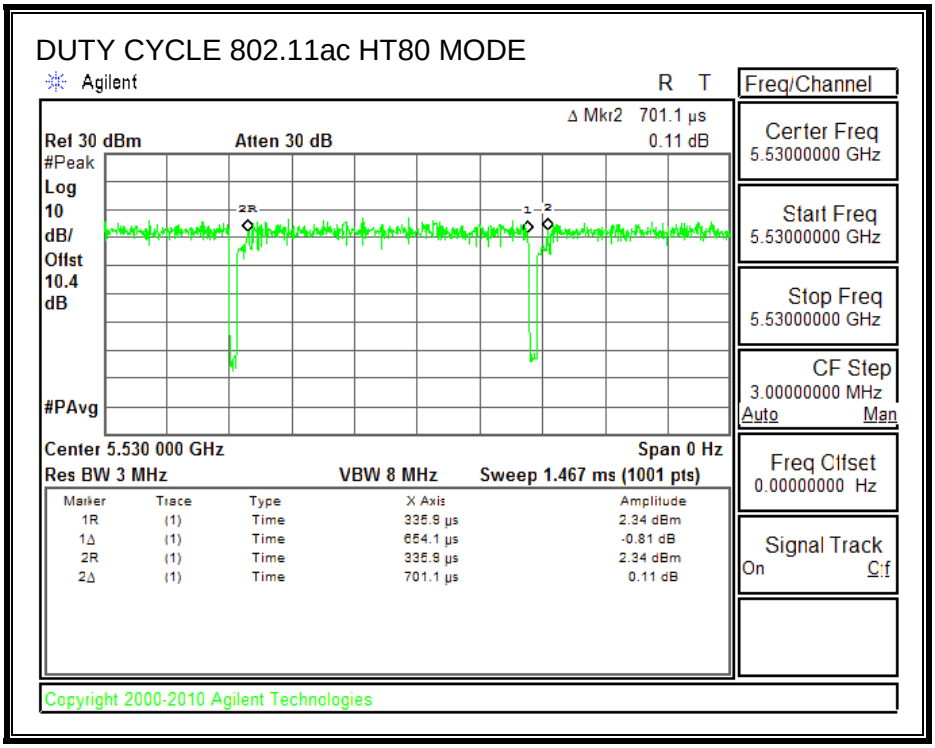
DUTY CYCLE 802.11ac HT20 MODE



DUTY CYCLE 802.11ac HT40 MODE



DUTY CYCLE 802.11ac HT80 MODE



9. MEASUREMENT METHOD

26 dB and 6dB Emission BW: KDB 789033 D02 v01, Section C.

99% Occupied BW: KDB 789033 D02 v01, Section D.

Conducted Output Power: KDB 789033 D02 v01, Section E.2.d and E.3.b (Method PM-G).

Power Spectral Density: KDB 789033 D02 v01, Section F.

Unwanted emissions in restricted bands: KDB 789033 D02 v01, Sections G and H.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01, Sections G and H.

10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407

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

TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v01: 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

10.1.1. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.50	0.5
Mid	5785	16.55	0.5
High	5825	16.50	0.5
Worst		16.50	

10.1.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.75	0.5
Mid	5785	17.75	0.5
High	5825	17.85	0.5
Worst		17.75	

10.1.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

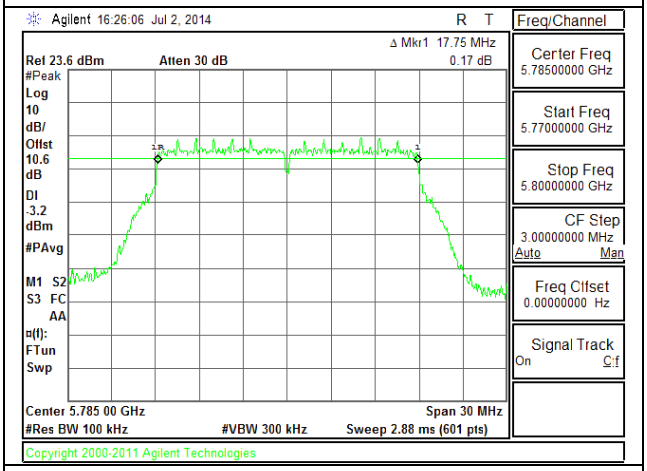
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	36.60	0.5
High	5795	36.60	0.5
Worst		36.60	0.5

10.1.1. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

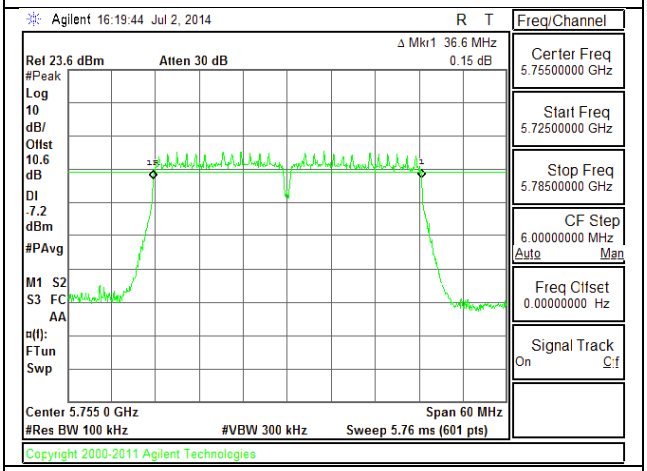
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
mid	5775	76.25	0.5
Worst		76.25	0.5

10.1.2. 6dB Bandwidth Plots

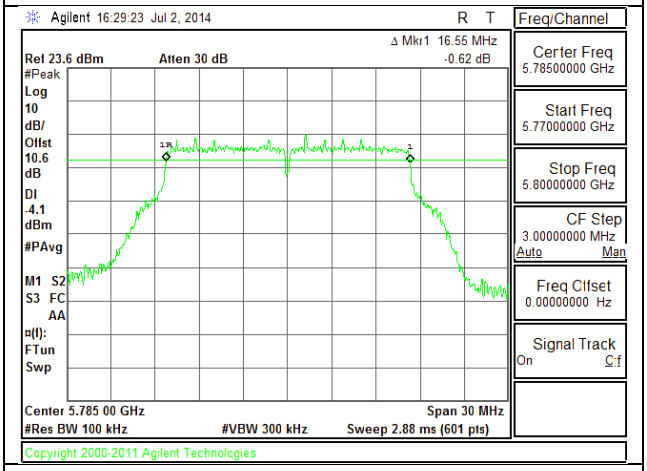
11n HT20 5.8 Mid Ch



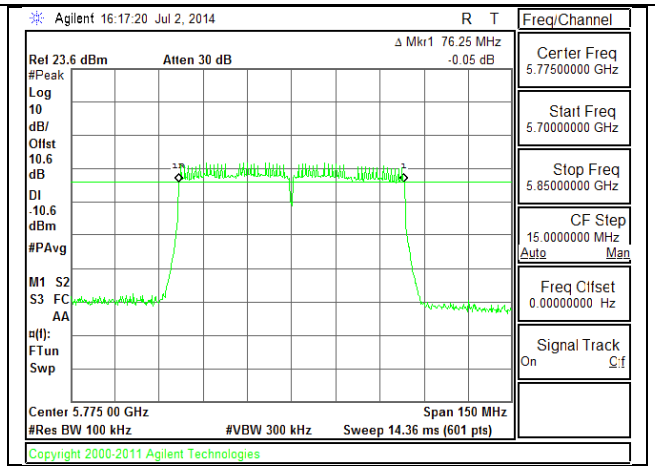
11n HT40 5.8 Mid Ch



11a 5.8 Mid Ch



11ac 5.8 Mid Ch



10.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.00
Mid	5200	21.92
High	5240	21.83
Worst		22.00

10.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.08
Mid	5200	22.00
High	5240	22.08
Worst		22.08

10.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	40.670
Mid	5230	40.800
Worst		40.800

10.2.4. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5210	82.800

10.2.1. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.75
Mid	5300	21.67
High	5320	21.92
Worst		21.92

10.2.1. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	22.17
Mid	5300	22.08
High	5320	22.25
Worst		22.25

10.2.2. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	40.7
High	5310	40.5
Worst		40.7

10.2.3. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5290	82.400

10.2.4. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.920
Mid	5580	21.920
High	5700	21.920
Worst		21.920

10.2.5. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	22.330
Mid	5580	22.250
High	5700	22.080
Worst		22.330

10.2.6. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.8
Mid	5590	40.3
High	5670	40.5
Worst		40.8

10.2.7. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5530	82.600
High	5610	82.400
Worst		82.6

10.2.8. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	20.550
Mid	5785	20.450
High	5825	20.350
Worst		20.550

10.2.9. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	20.700
Mid	5785	20.950
High	5825	20.700
Worst		20.950

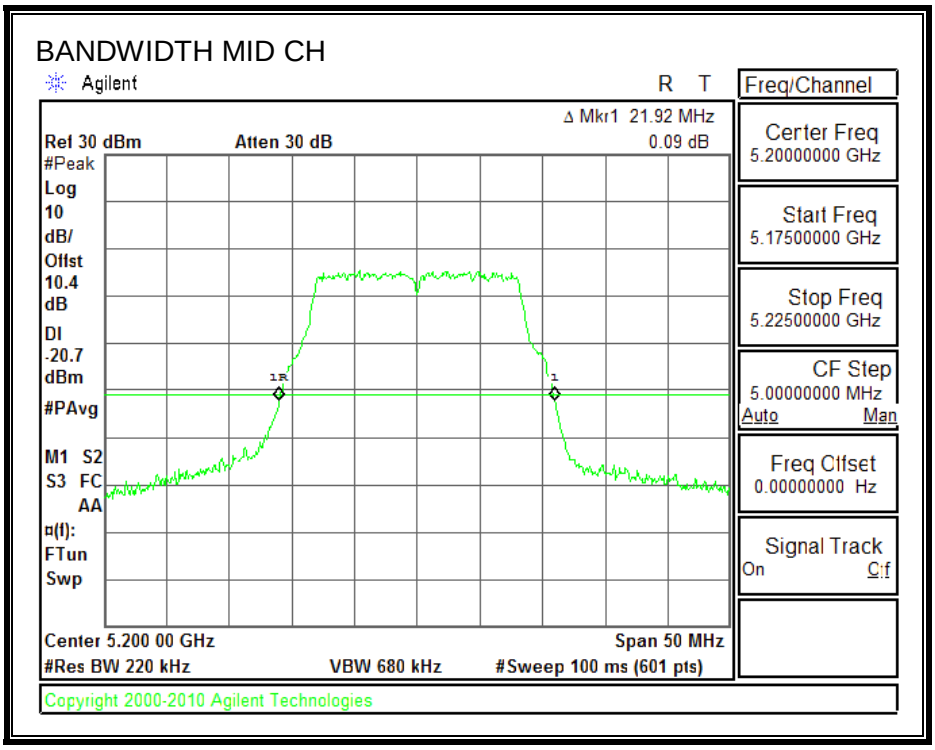
10.2.10. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5755	39.1
High	5795	39.2
Worst		39.2

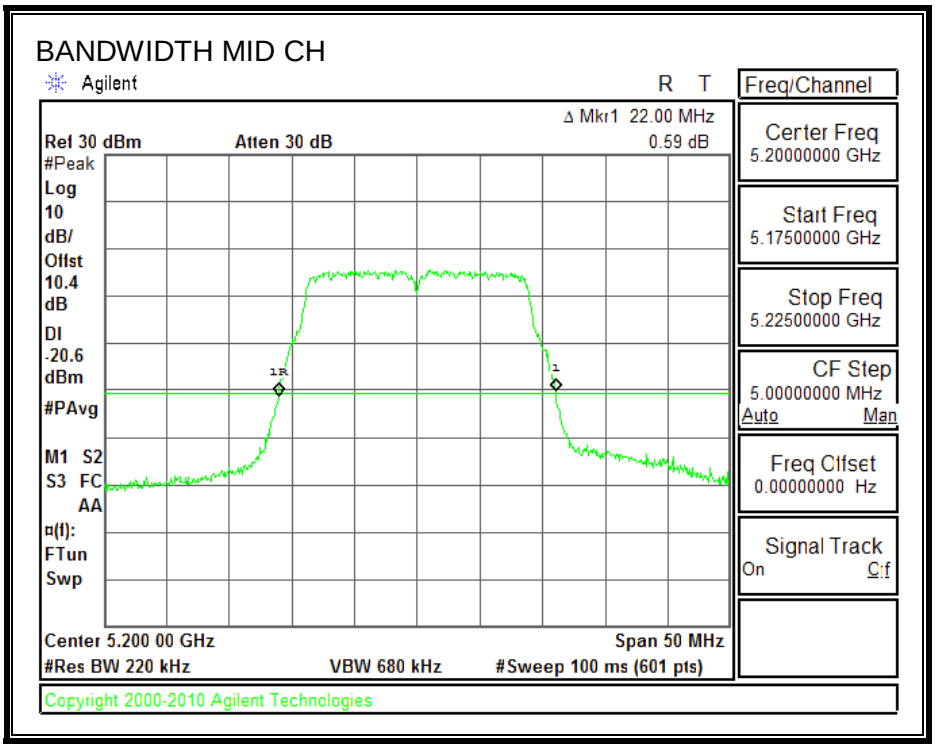
10.2.11. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5775	80.5

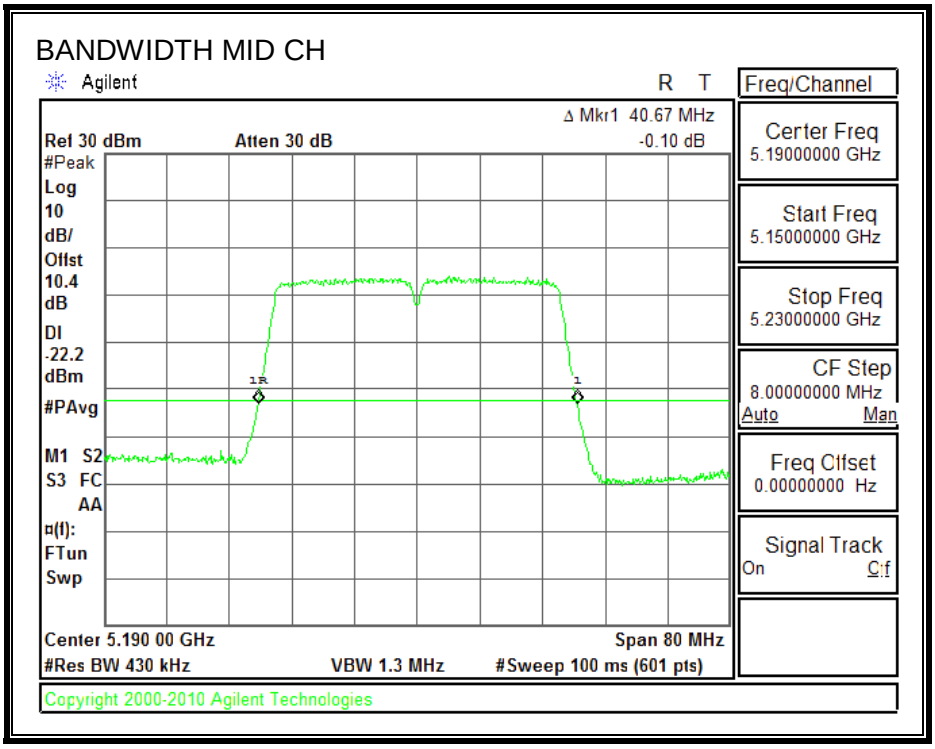
802.11a 5.2G 26 dB BANDWIDTH



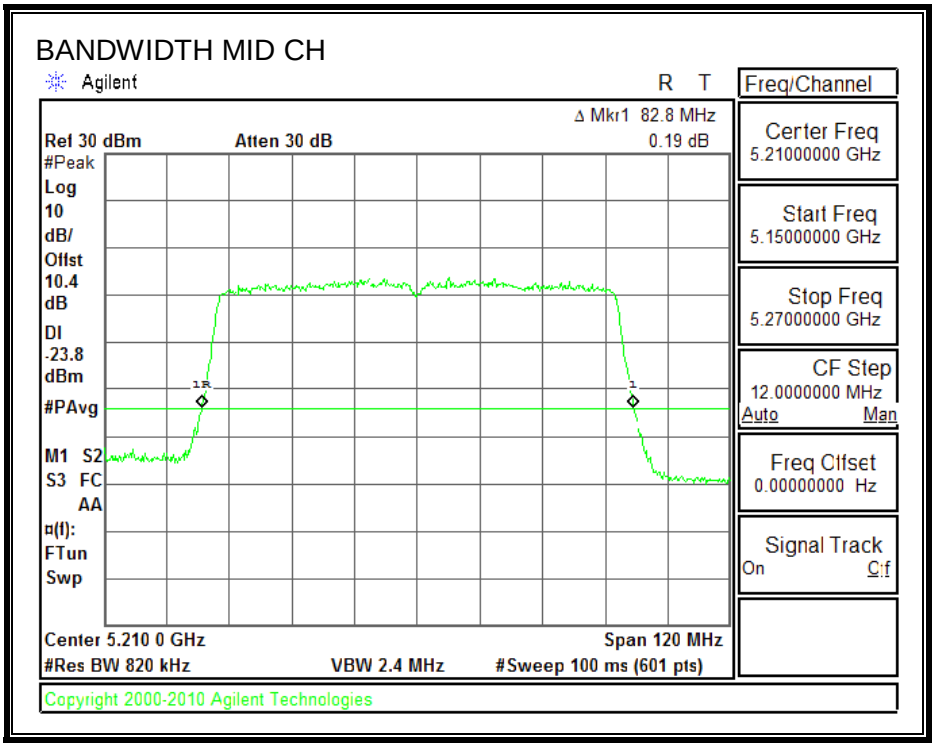
802.11n HT20 5.2G 26 dB BANDWIDTH



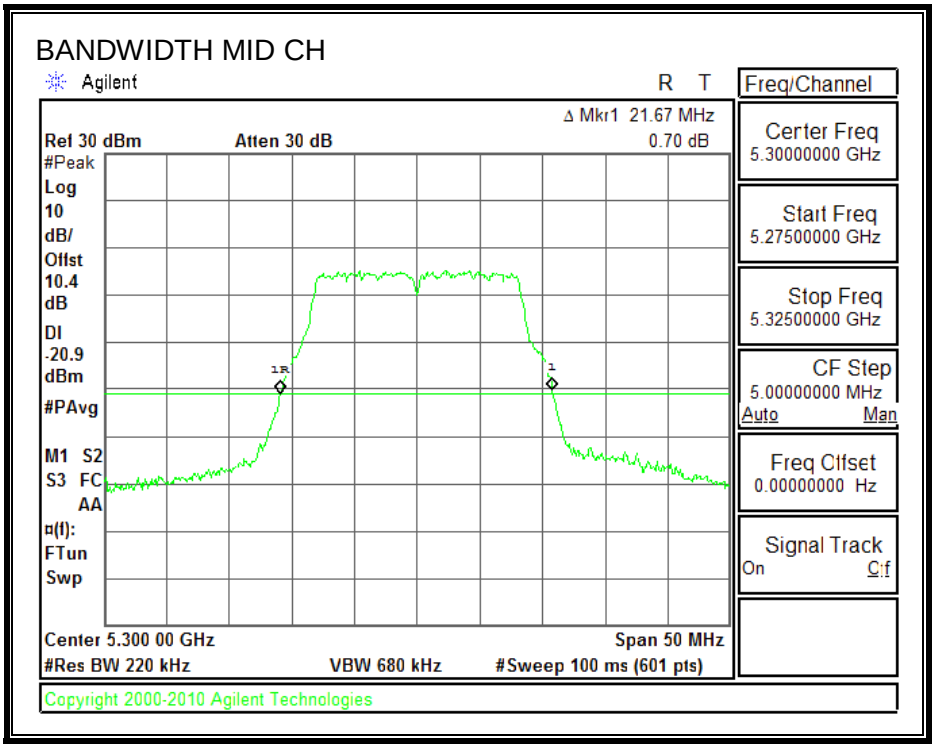
802.11n HT40 5.2G 26 dB BANDWIDTH



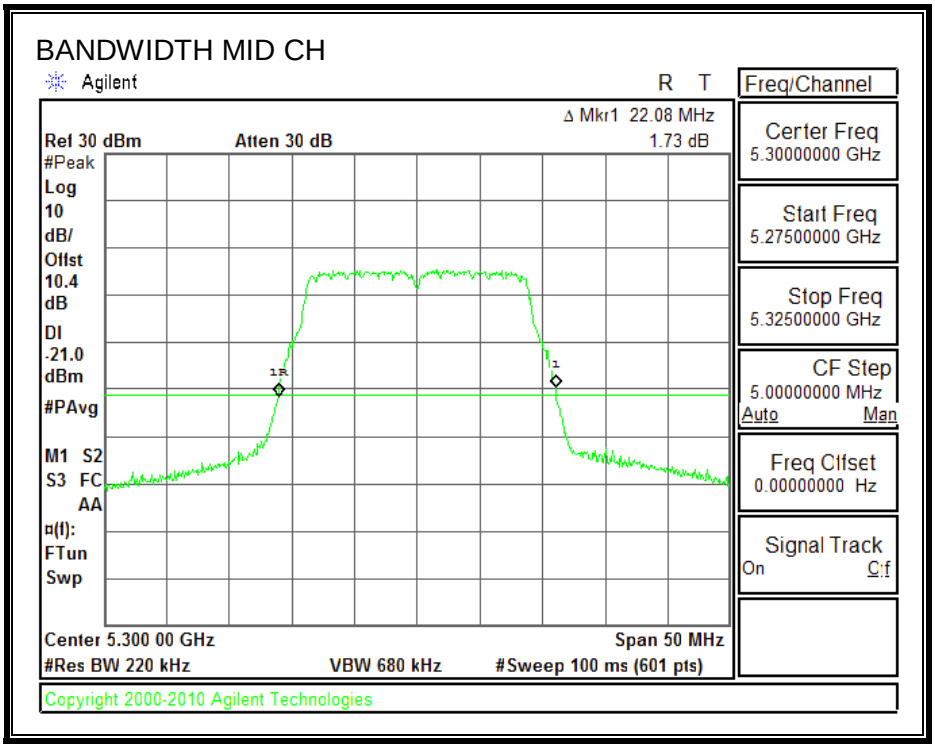
802.11ac HT80 5.2G 26 dB BANDWIDTH



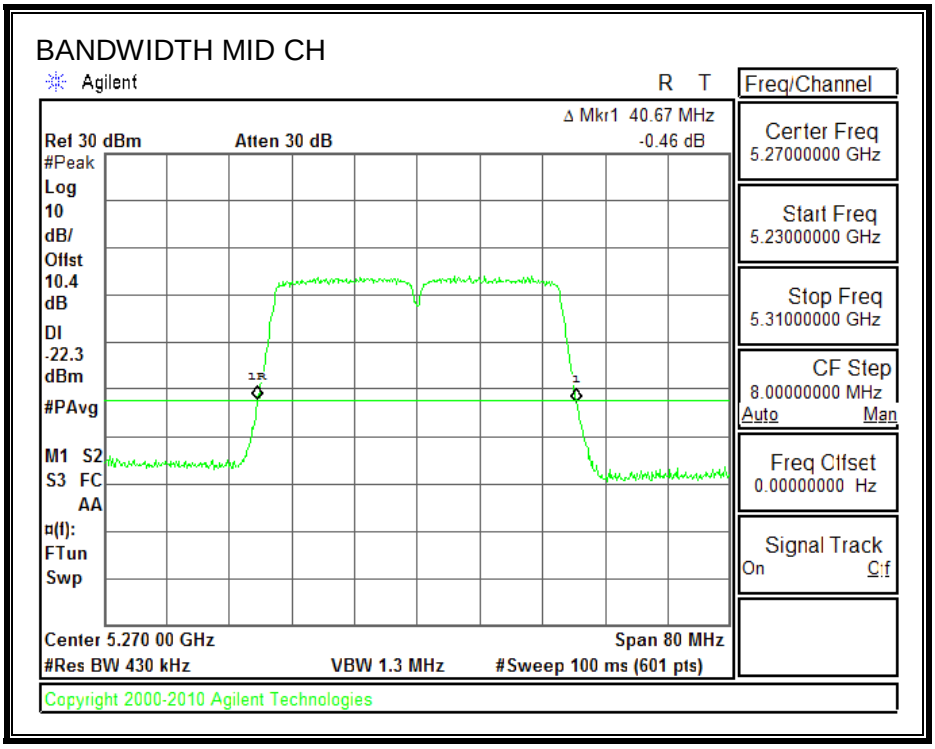
802.11a 5.3G 26 dB BANDWIDTH



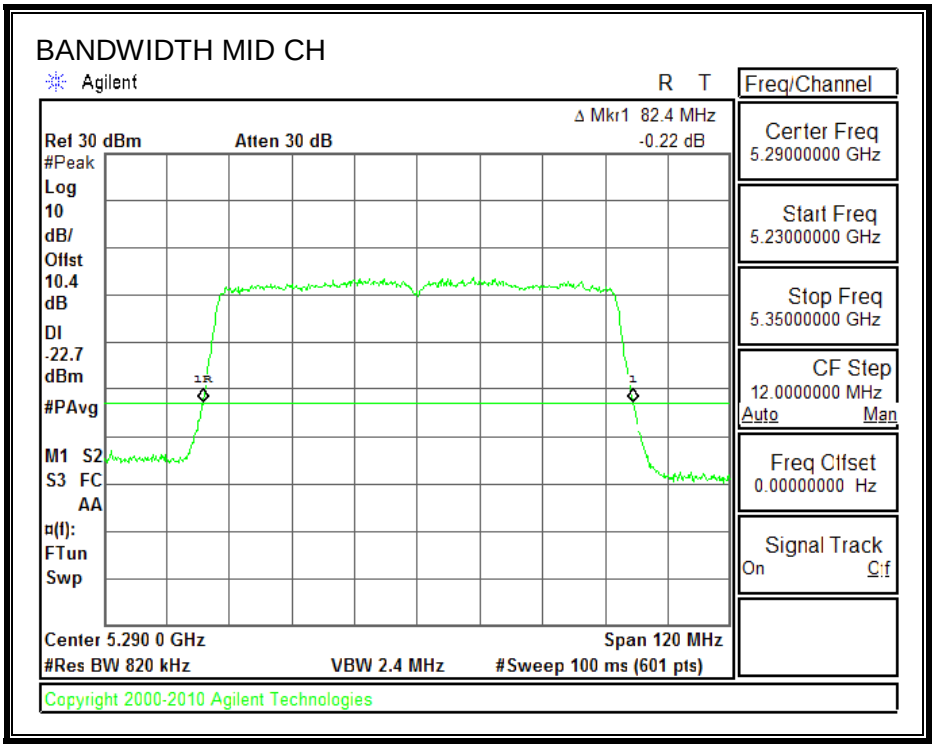
802.11n HT20 5.3G 26 dB BANDWIDTH



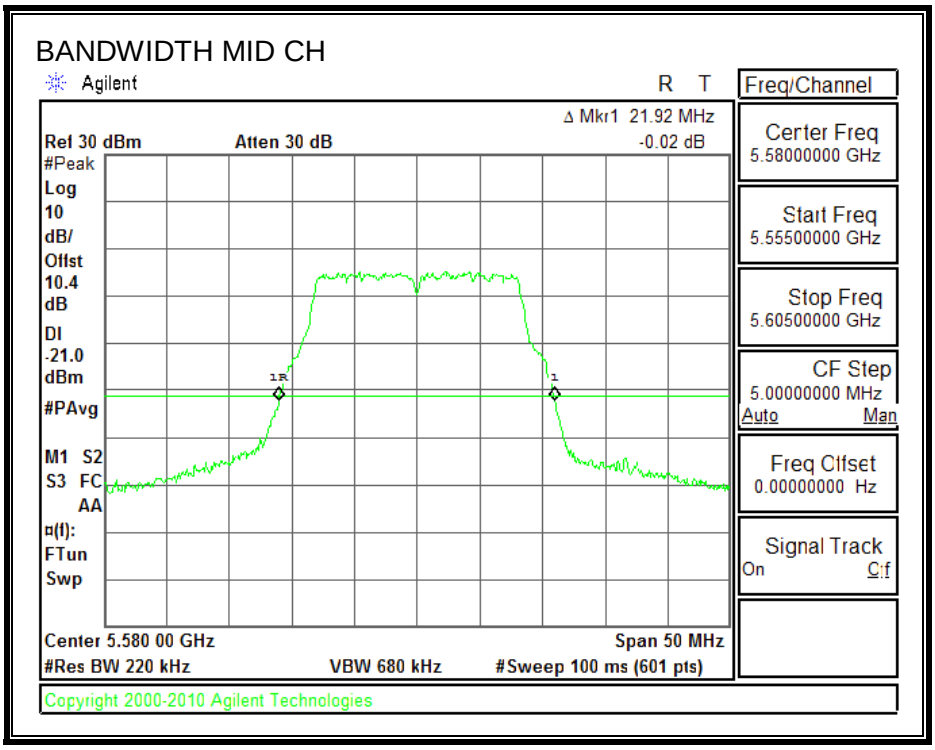
802.11n HT40 5.3G 26 dB BANDWIDTH



802.11ac HT80 5.3G 26 dB BANDWIDTH



802.11a 5.5G 26 dB BANDWIDTH



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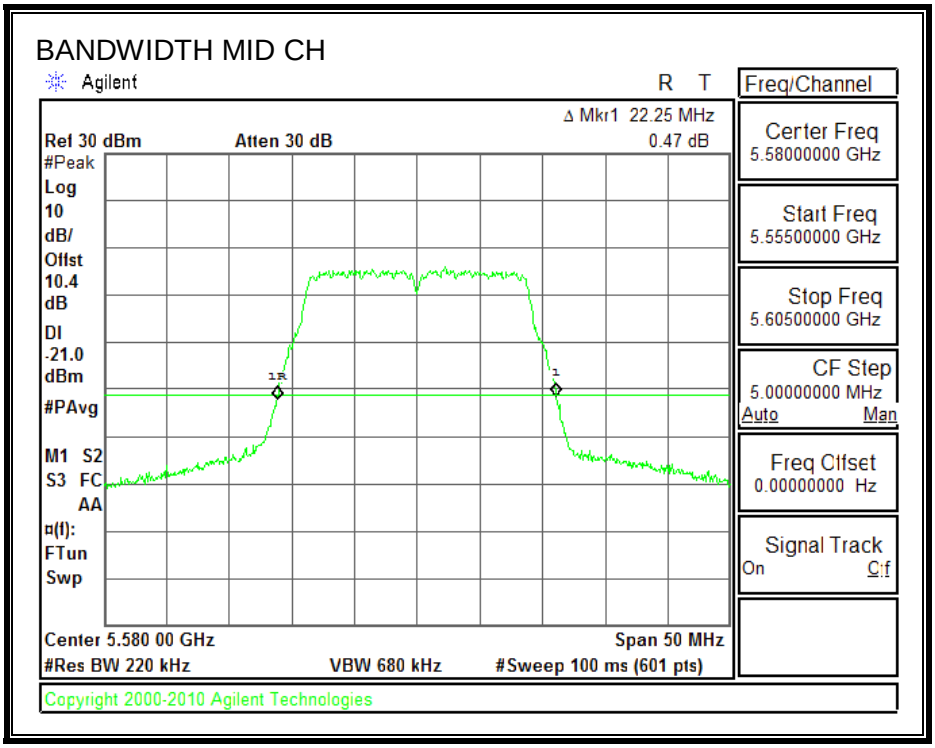

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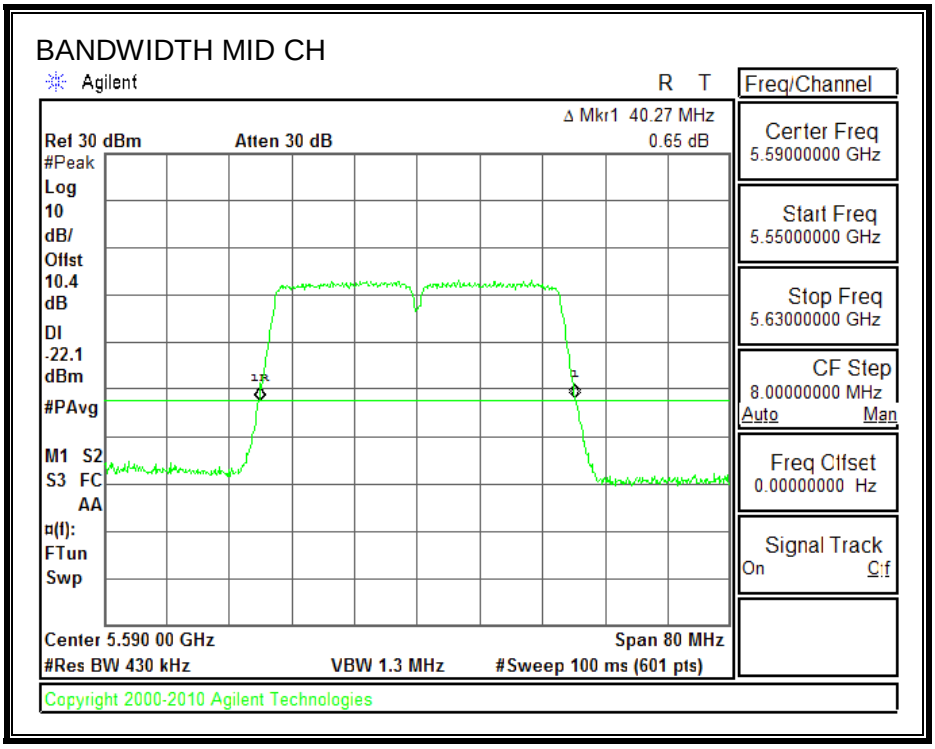

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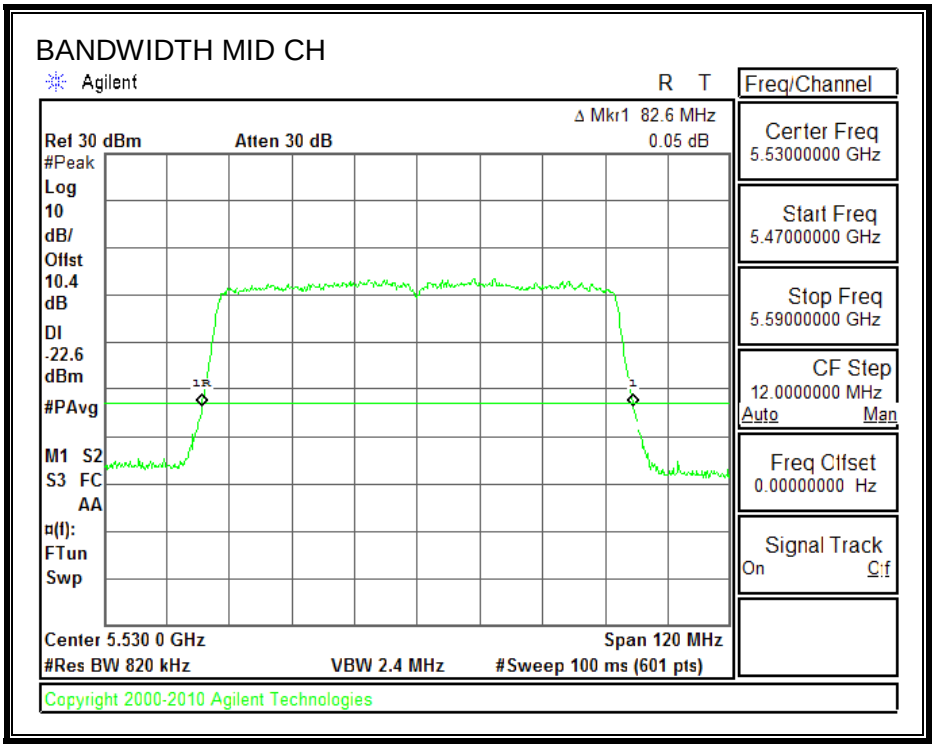
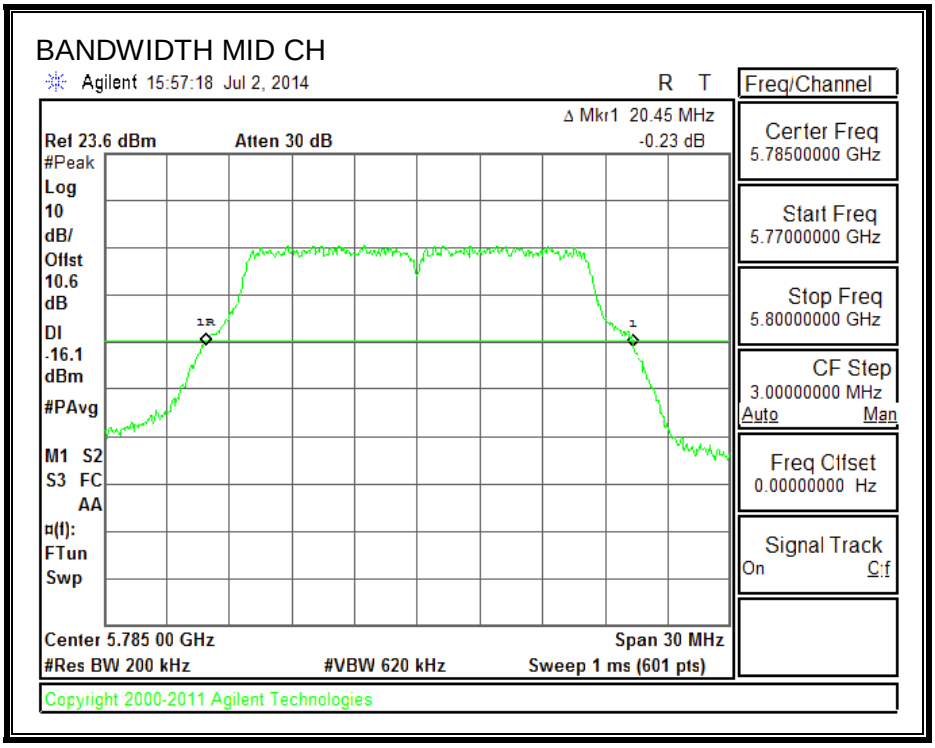
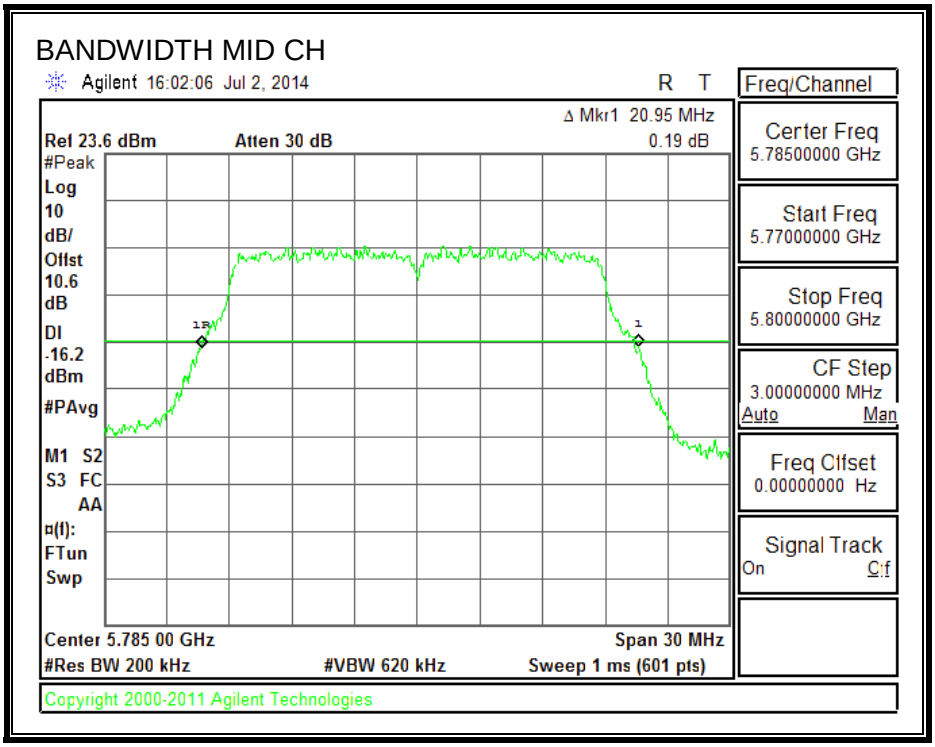


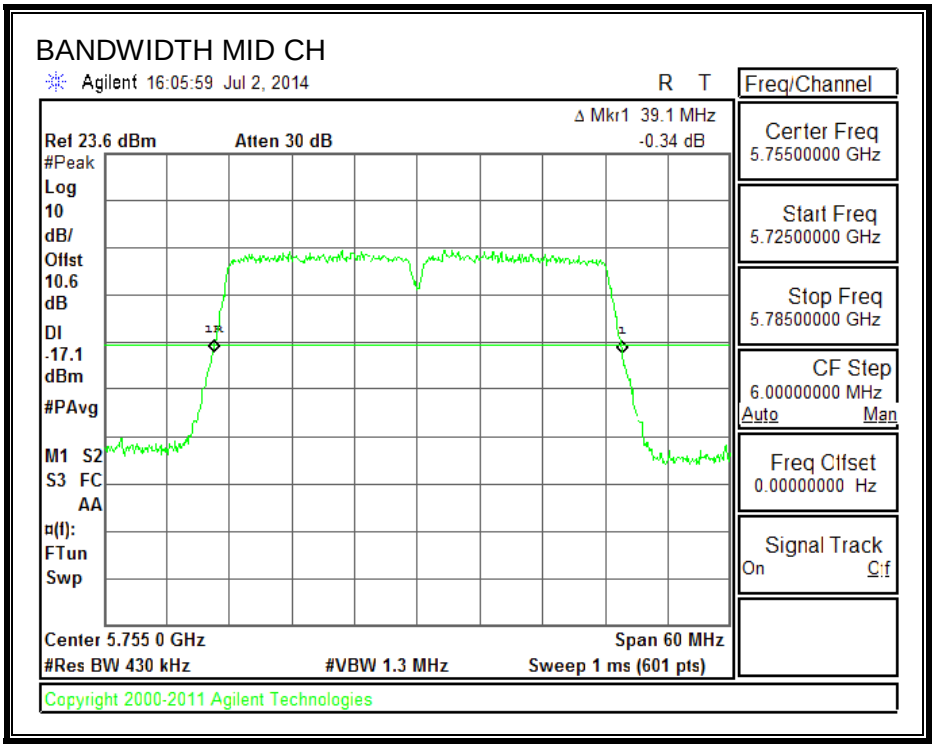
802.11a 5.8G 26 dB BANDWIDTH



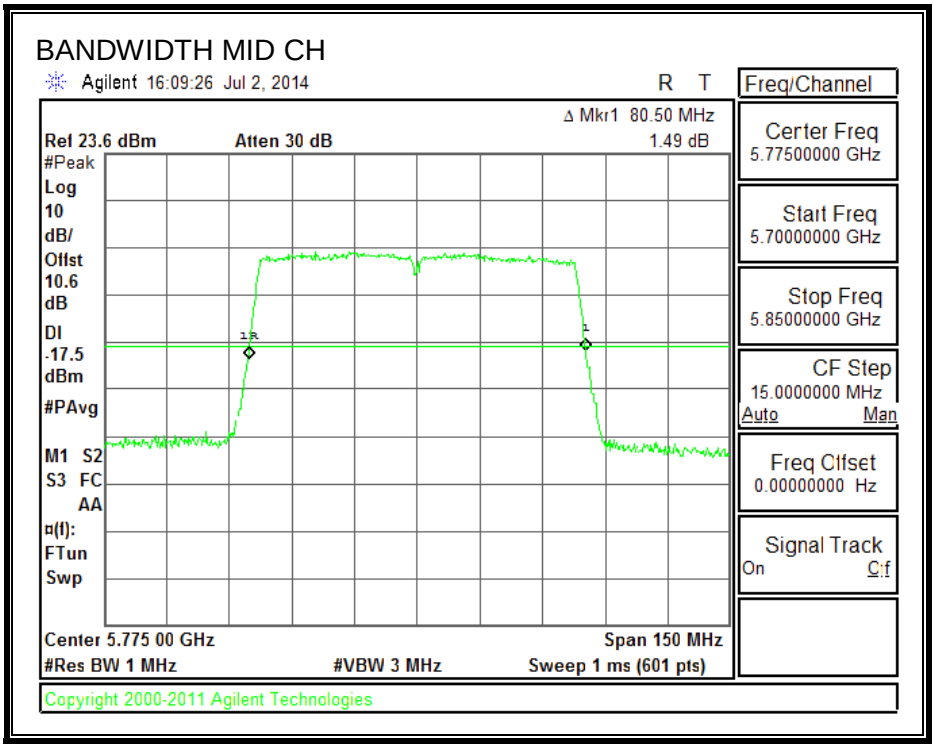
802.11n HT20 5.8G 26 dB BANDWIDTH



802.11n HT40 5.8G 26 dB BANDWIDTH



802.11ac HT80 5.8G 26 dB BANDWIDTH



10.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.67
Mid	5200	16.69
High	5240	16.65
Worst		16.69

10.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.85
Mid	5200	17.86
High	5240	17.86
Worst		17.86

10.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.138
Mid	5230	36.162
Worst		36.162

10.3.4. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5210	75.478

10.3.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.68
Mid	5300	16.67
High	5320	16.66
Worst		16.68

10.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.84
Mid	5300	17.87
High	5320	17.87
Worst		17.87

10.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.2
High	5310	36.2
Worst		36.2

10.3.8. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5290	75.462

10.3.9. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.665
Mid	5580	16.663
High	5700	16.684
Worst		16.684

10.3.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.860
Mid	5580	17.853
High	5700	17.846
Worst		17.860

10.3.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.2
Mid	5590	36.2
High	5670	36.1
Worst		36.2

10.3.12. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5530	75.491
High	5610	75.521
Worst		75.5

10.3.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.676
Mid	5785	16.690
High	5825	16.678
Worst		16.690

10.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.844
Mid	5785	17.866
High	5825	17.850
Worst		17.866

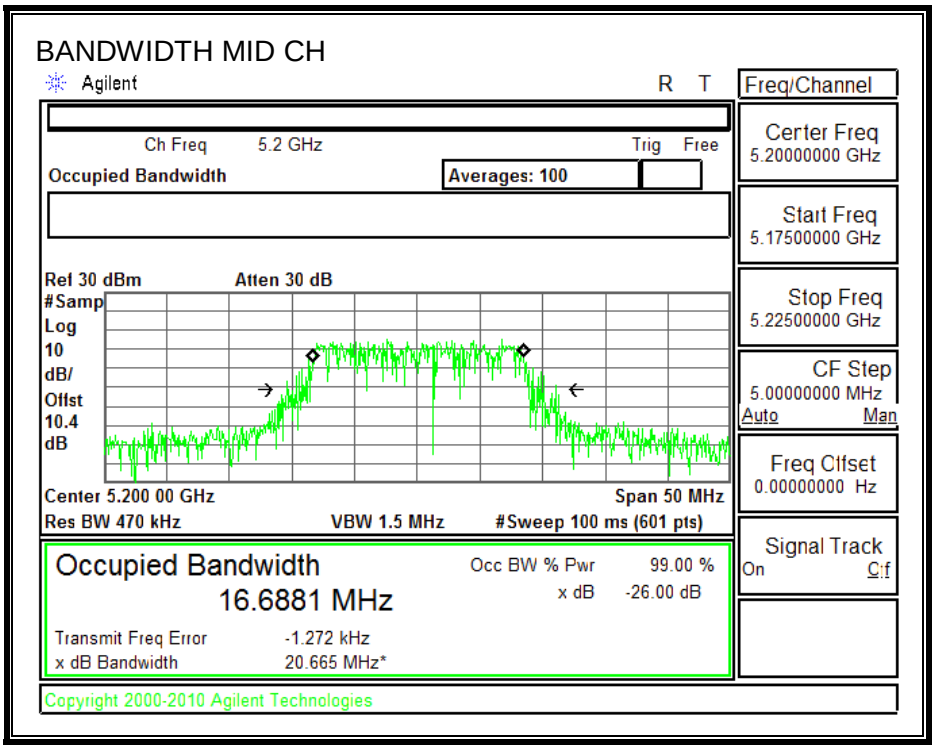
10.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.2
High	5795	36.1
Worst		36.2

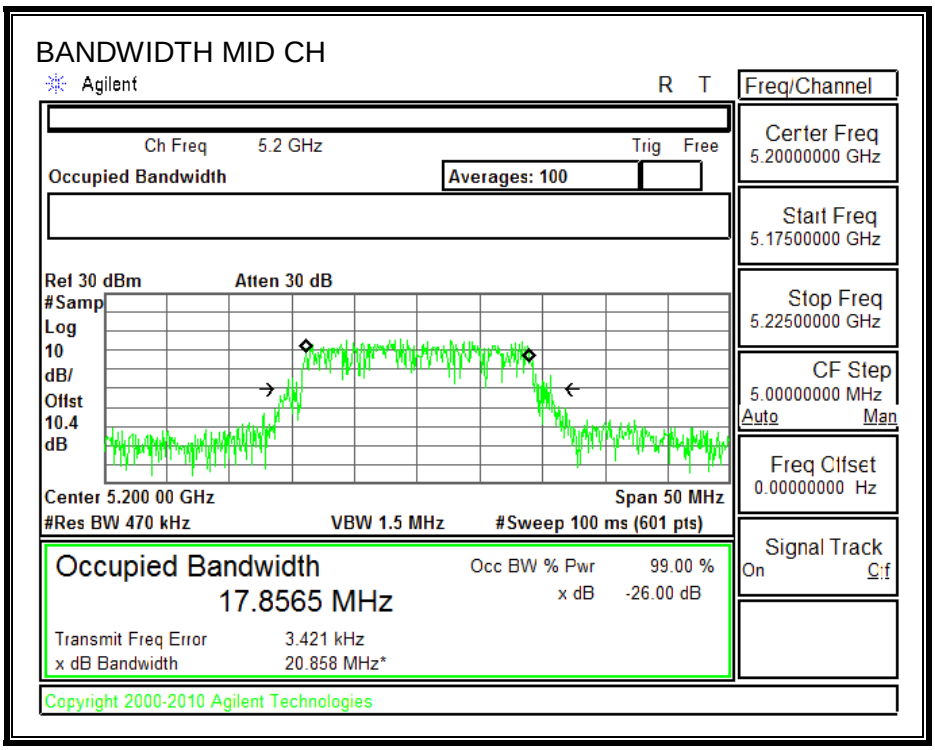
10.3.16. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5775	75.5

802.11a 5.2G 99% BANDWIDTH



802.11n HT20 5.2G 99% BANDWIDTH



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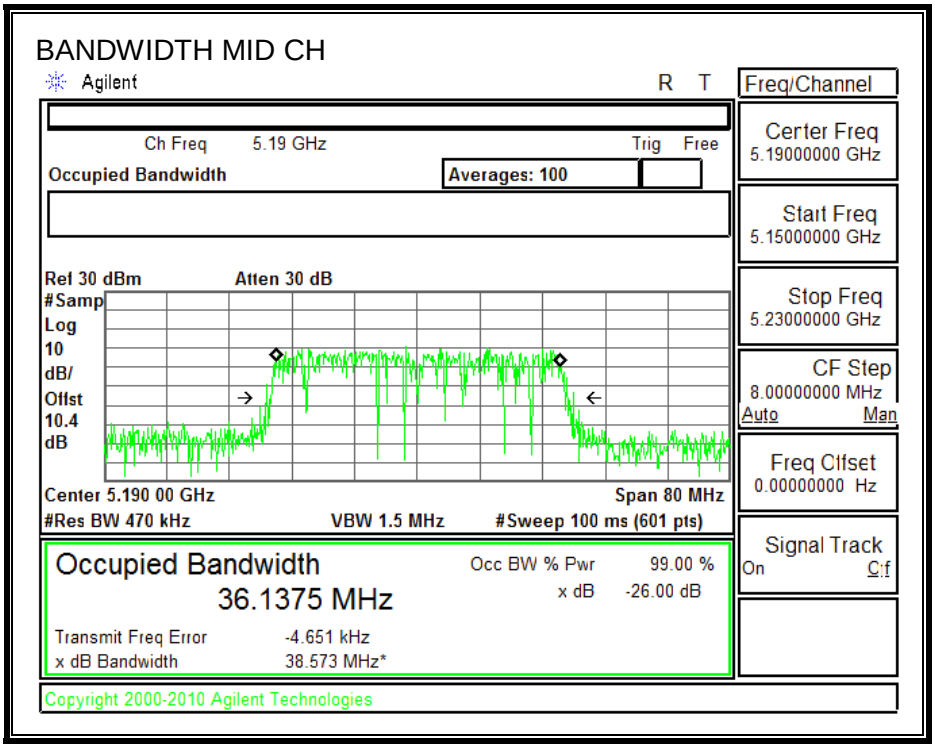

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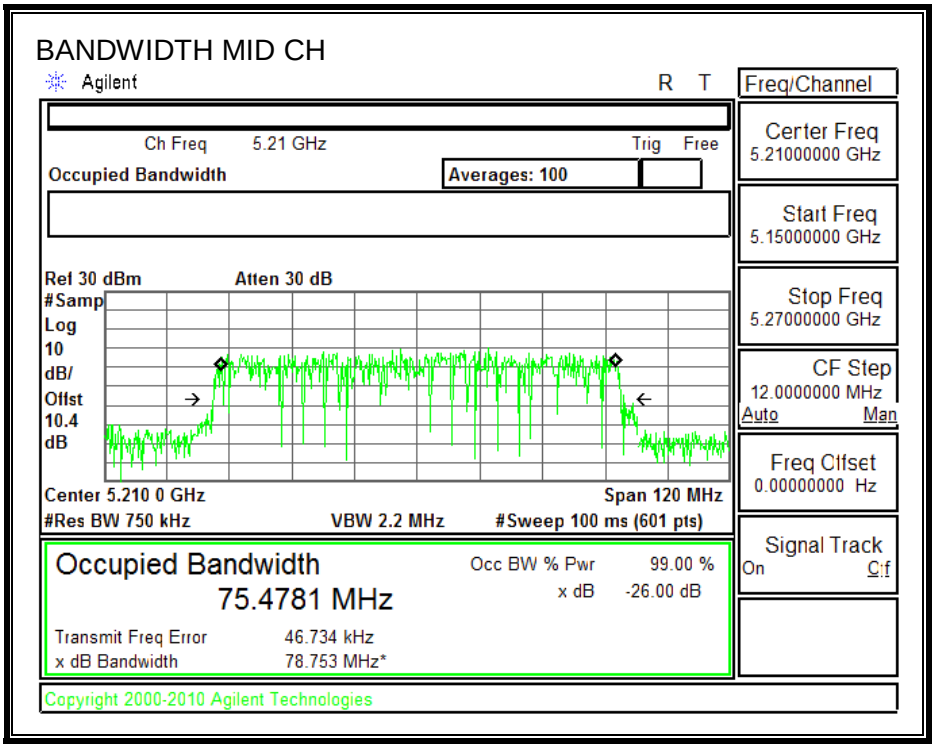

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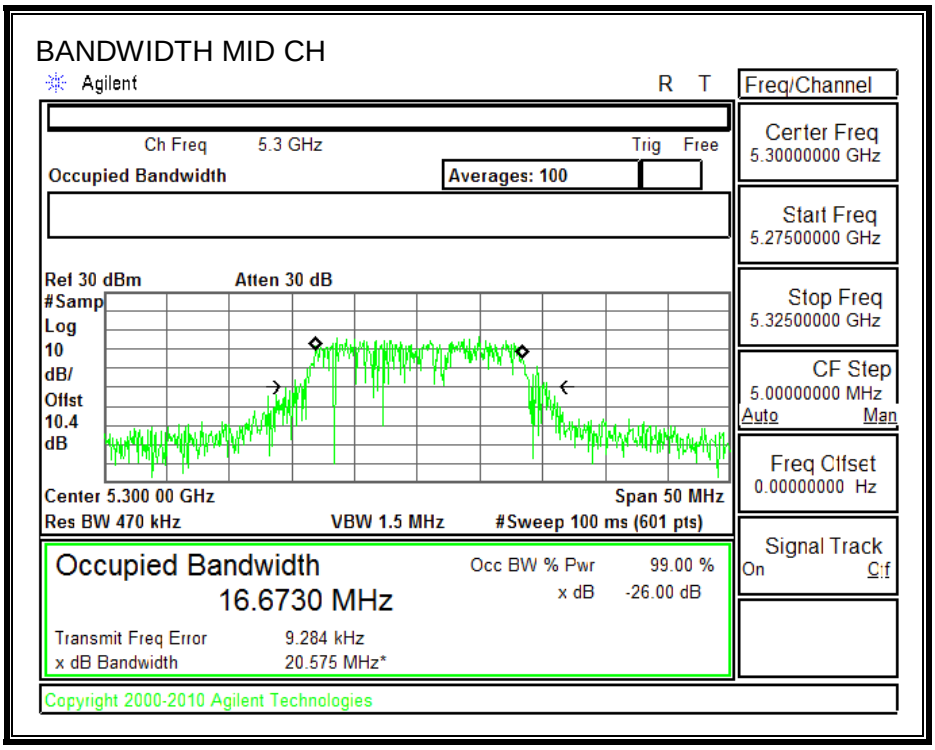

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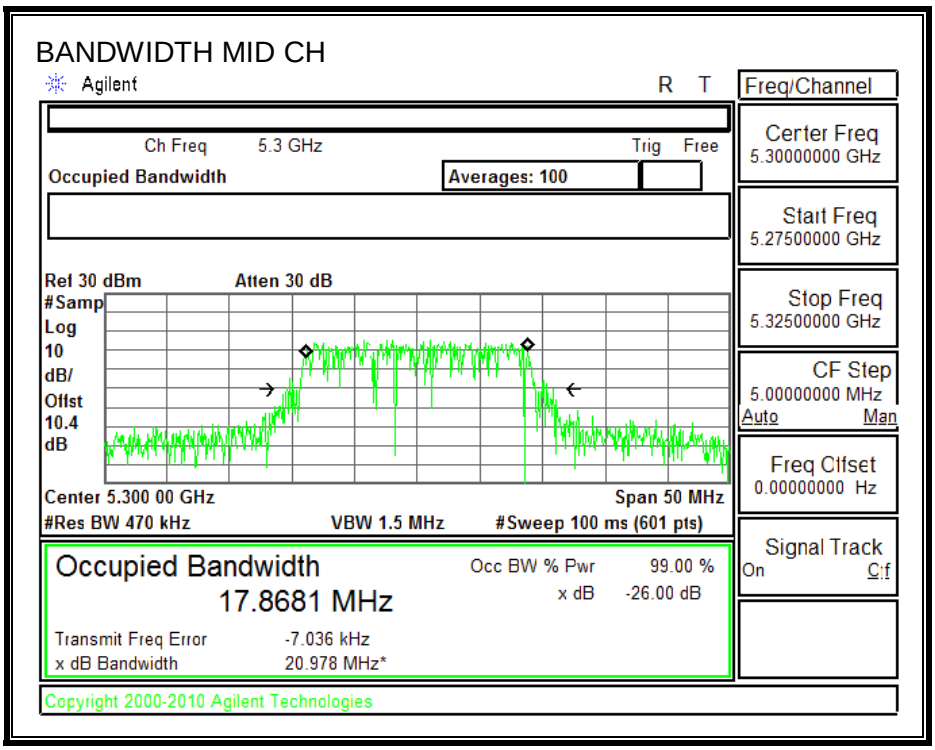

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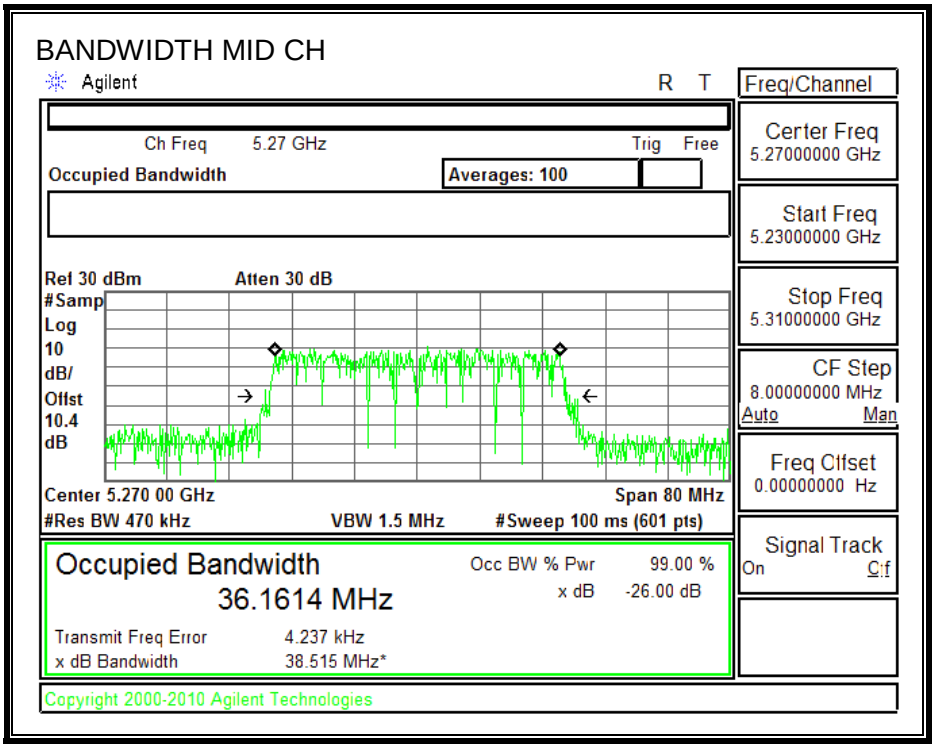
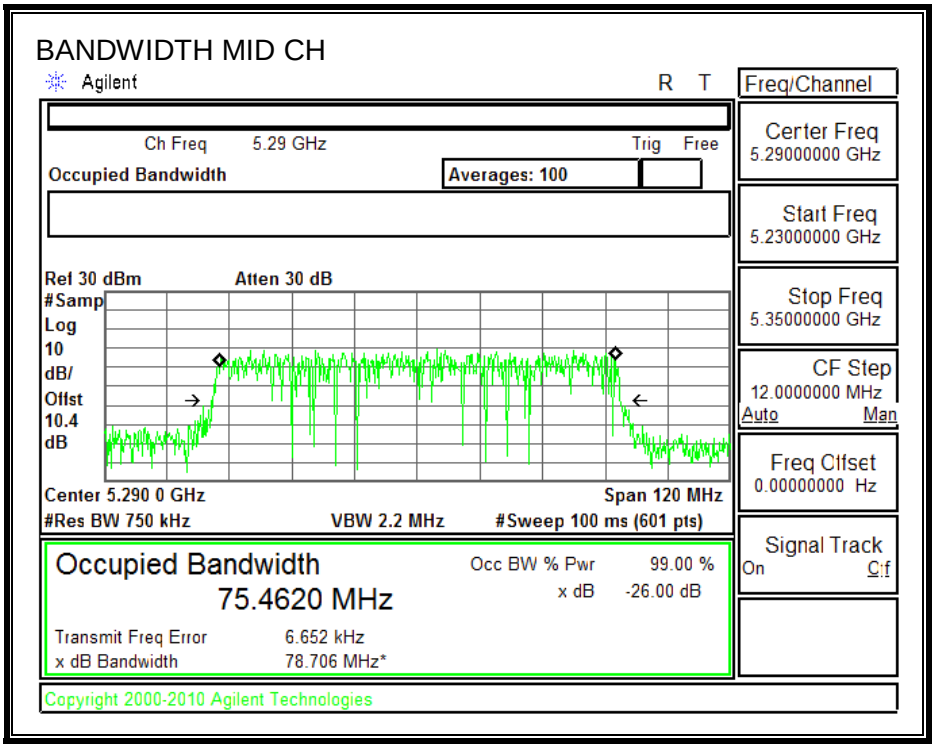
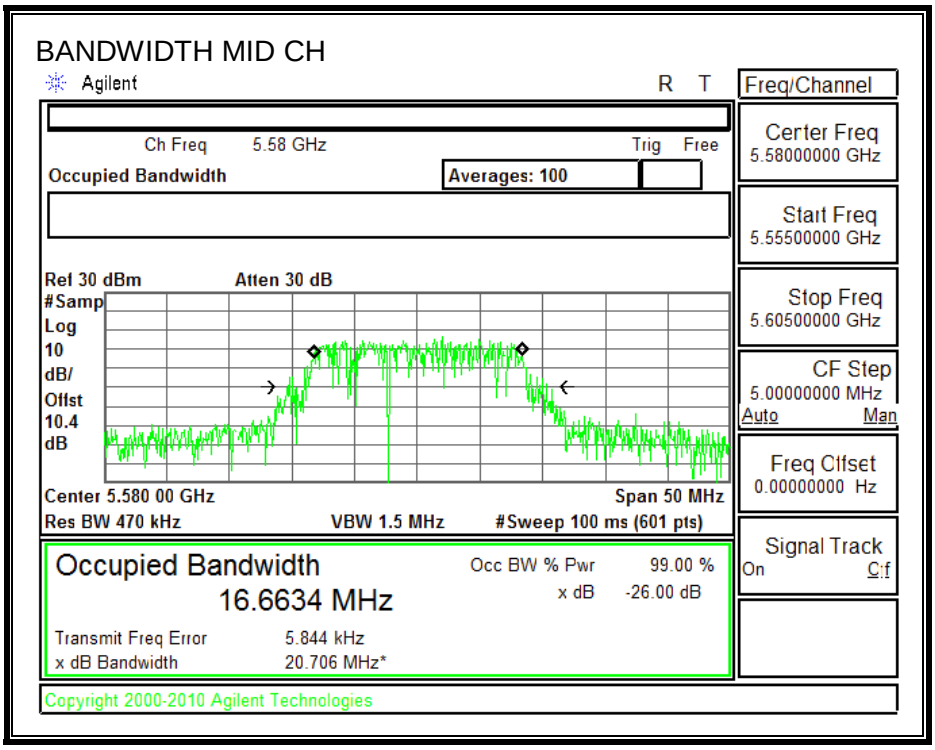


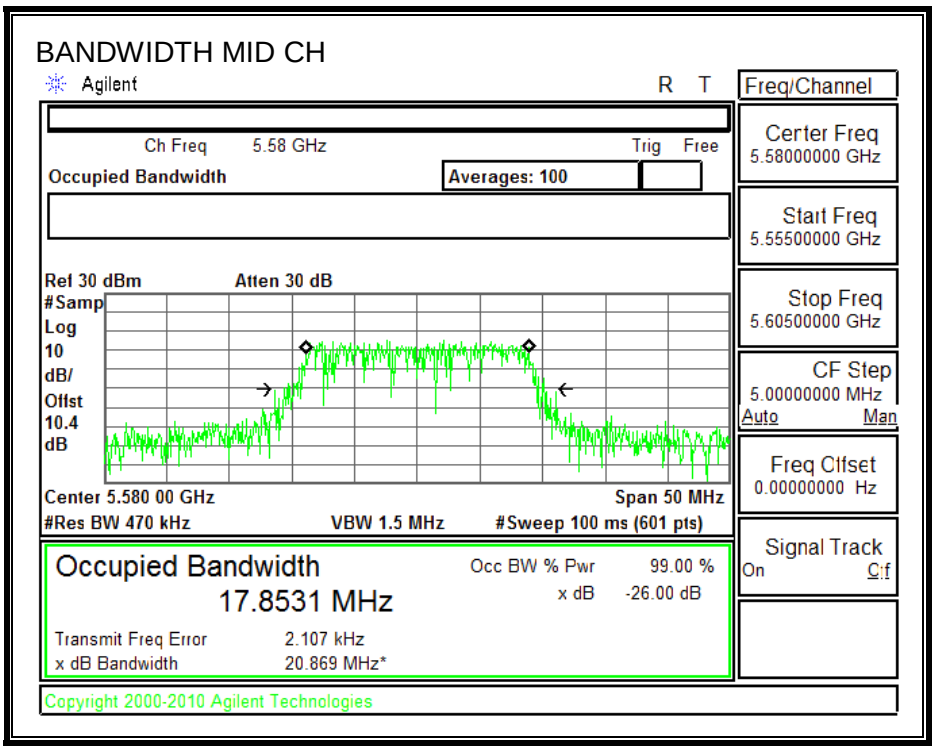
802.11ac HT80 5.3G 99% BANDWIDTH



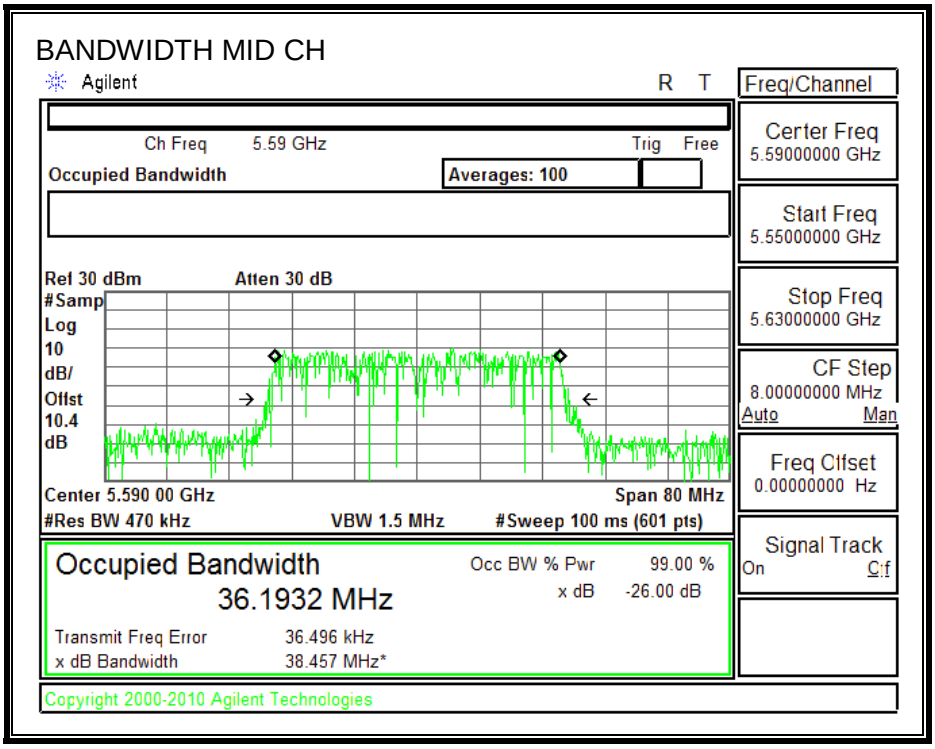
802.11a 5.5G 99% BANDWIDTH



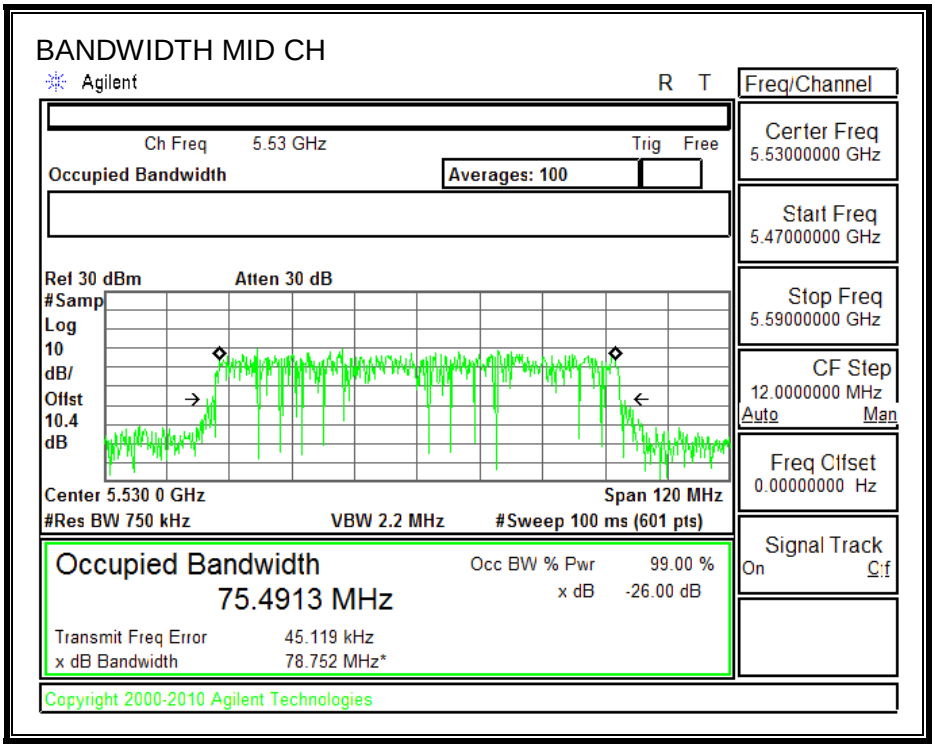
802.11n HT20 5.5G 99% BANDWIDTH



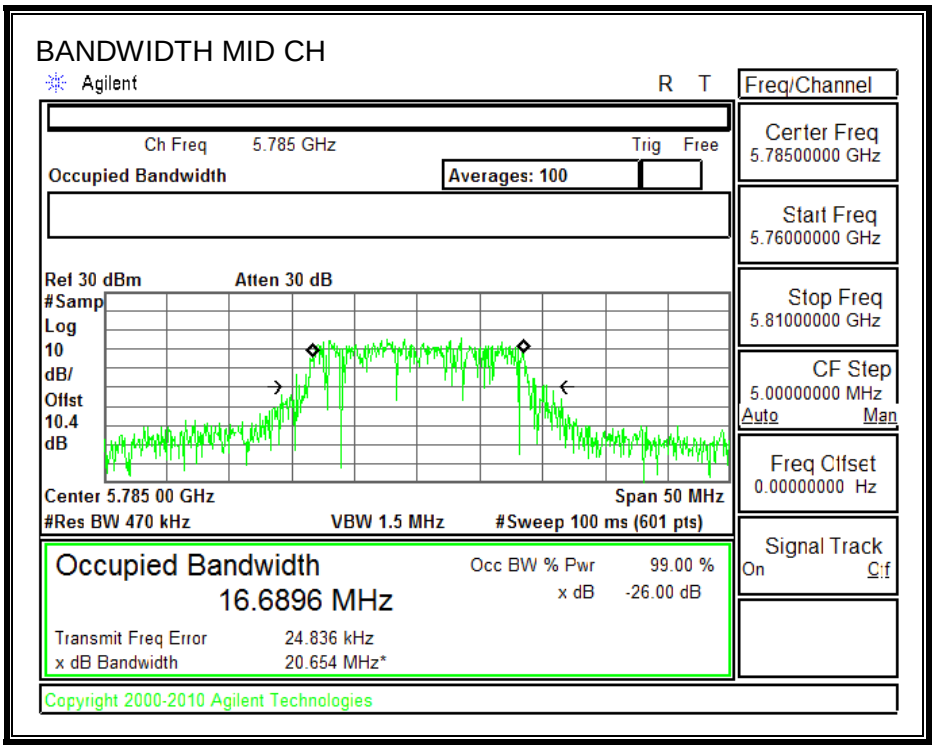
802.11n HT40 5.5G 99% BANDWIDTH



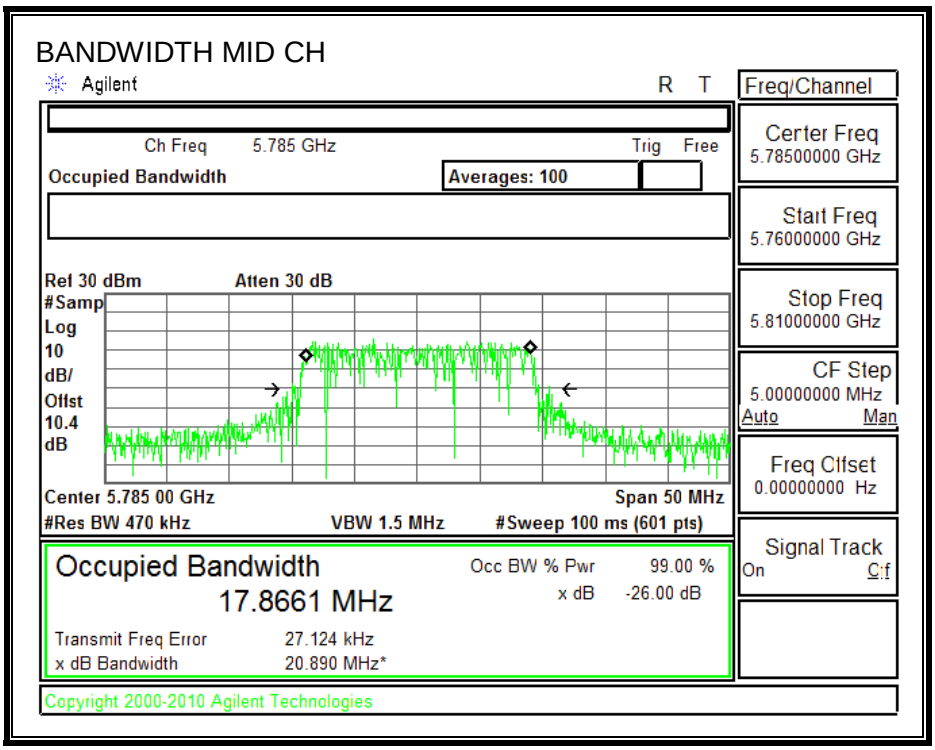
802.11ac HT80 5.5G 99% BANDWIDTH



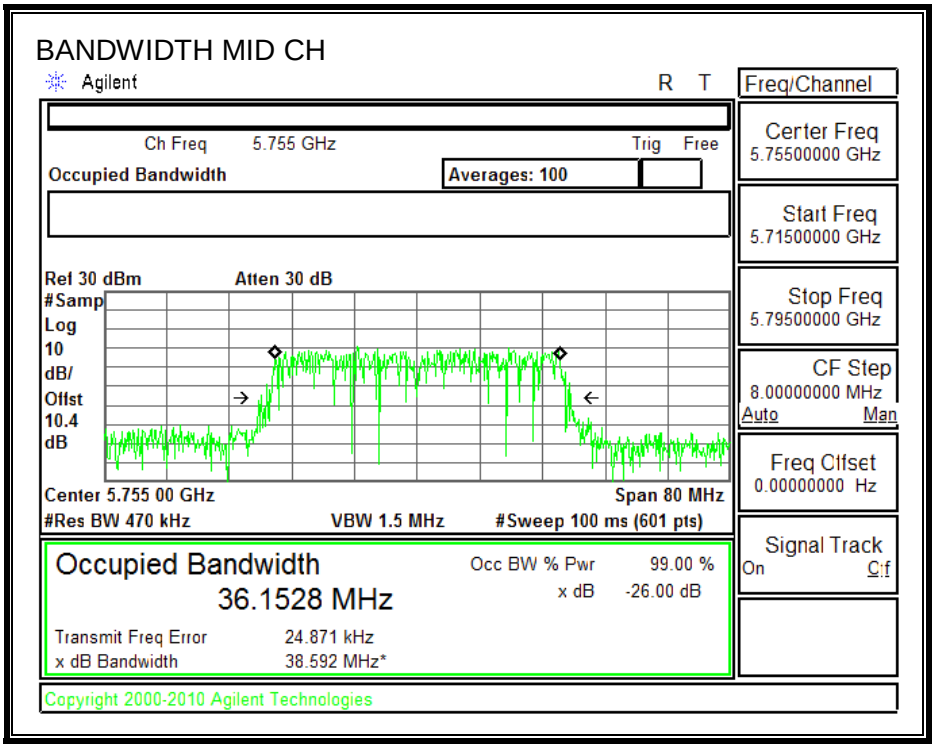
802.11a 5.8G 99% BANDWIDTH



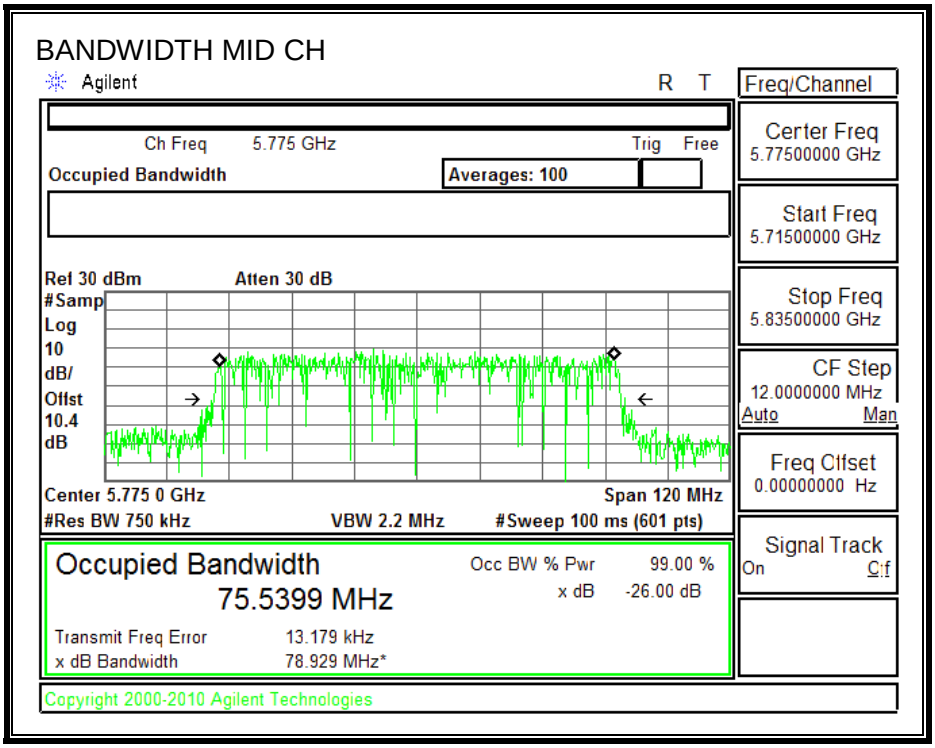
802.11n HT20 5.8G 99% BANDWIDTH



802.11n HT40 5.8G 99% BANDWIDTH



802.11ac HT80 5.8G 99% BANDWIDTH



10.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

10.4.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	14.90
Mid	5200	14.70
High	5240	14.60
Worst		14.90

10.4.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	14.70
Mid	5200	14.70
High	5240	14.70
Worst		14.70

10.4.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5190	12.600
Mid	5230	12.600
Worst		12.600

10.4.4. 802.11ac HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	14.70
Mid	5200	14.60
High	5240	14.70
Worst		14.70

10.4.5. 802.11ac HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5190	12.700
Mid	5230	12.600
Worst		12.700

10.4.6. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5210	11.400

10.4.7. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	14.80
Mid	5300	14.70
High	5320	14.60
Worst		14.80

10.4.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	15.00
Mid	5300	14.90
High	5320	14.40
Worst		15.00

10.4.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5270	12.8
High	5310	12.8
Worst		12.8

10.4.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	15.00
Mid	5300	14.90
High	5320	14.50
Worst		15.00

10.4.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5270	12.8
High	5310	12.7
Worst		12.8

10.4.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5290	11.600

10.4.13. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	15.000
Mid	5580	15.000
High	5700	14.900
Worst		15.000

10.4.14. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	15.000
Mid	5580	14.900
High	5700	15.000
Worst		15.000

10.4.15. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5510	12.9
Mid	5590	12.9
High	5670	12.8
Worst		12.9

10.4.16. 802.11ac HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	15.000
Mid	5580	15.000
High	5700	14.700
Worst		15.000

10.4.17. 802.11ac HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5510	12.9
Mid	5590	12.9
High	5670	12.9
Worst		12.9

10.4.18. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5530	11.800
High	5610	11.800
Worst		11.8

10.4.19. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	14.900
Mid	5785	14.400
High	5825	14.400
Worst		14.900

10.4.20. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	14.900
Mid	5785	14.600
High	5825	14.500
Worst		14.900

10.4.21. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5755	12.5
High	5795	12.5
Worst		12.5

10.4.22. 802.11ac HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	14.800
Mid	5785	14.500
High	5825	14.600
Worst		14.800

10.4.23. 802.11ac HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5755	12.5
High	5795	12.5
Worst		12.5

10.4.24. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5775	11.3

10.5. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Test Methodology

RESULTS

10.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	22.000	16.670	-1.00
Mid	5200	21.920	16.690	-1.00
High	5240	21.830	16.650	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	23.22	24.22	23.22	11.00	10.00	10.00
Mid	5200	24.00	23.22	24.22	23.22	11.00	10.00	10.00
High	5240	24.00	23.21	24.21	23.21	11.00	10.00	10.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	15.438	15.44	23.22	-7.78
Mid	5200	15.098	15.10	23.22	-8.13
High	5240	15.380	15.38	23.21	-7.83

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	3.670	3.67	10.00	-6.33
Mid	5200	3.360	3.36	10.00	-6.64
High	5240	3.400	3.40	10.00	-6.60

10.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	22.080	17.850	-1.00
Mid	5200	22.000	17.860	-1.00
High	5240	22.080	17.860	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	23.52	24.52	23.52	11.00	10.00	10.00
Mid	5200	24.00	23.52	24.52	23.52	11.00	10.00	10.00
High	5240	24.00	23.52	24.52	23.52	11.00	10.00	10.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	15.237	15.24	23.52	-8.28
Mid	5200	15.284	15.28	23.52	-8.23
High	5240	15.183	15.18	23.52	-8.34

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	3.690	3.69	10.00	-6.31
Mid	5200	3.630	3.63	10.00	-6.37
High	5240	3.400	3.40	10.00	-6.60

10.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	40.67	36.138	-1.00
Mid	5230	40.8	36.162	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	24.00	23.00	24.00	24.00	11.00	10.00	11.00
Mid	5230	24.00	23.00	24.00	24.00	11.00	10.00	11.00
Duty Cycle CF (dB)		0.17	Included in Calculations of Corr'd Power & PPSD					

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	13.313	13.48	24.00	-10.52
Mid	5230	13.308	13.48	24.00	-10.52

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-1.280	-1.11	11.00	-12.11
Mid	5230	-1.270	-1.10	11.00	-12.10

10.5.4. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5210	82.200	81.000	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5210	24.00	23.00	24.00	24.00	11.00	10.00	11.00
Duty Cycle CF (dB)		0.30	Included in Calculations of Corr'd Power & PPSD					

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5210	12.250	12.55	24.00	-11.45

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5210	-5.180	-4.88	11.00	-15.88

10.5.5. 802.11a MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.75	16.680	-1.00
Mid	5300	21.67	16.670	-1.00
High	5320	21.92	16.660	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.22	29.22	23.22	11.00	11.00	11.00
Mid	5300	24.00	23.22	29.22	23.22	11.00	11.00	11.00
High	5320	24.00	23.22	29.22	23.22	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.384	15.38	23.22	-7.84
Mid	5300	15.389	15.39	23.22	-7.83
High	5320	15.182	15.18	23.22	-8.03

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	4.130	4.13	11.00	-6.87
Mid	5300	4.120	4.12	11.00	-6.88
High	5320	3.840	3.84	11.00	-7.16

10.5.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	22.17	17.840	-1.00
Mid	5300	22.08	17.870	-1.00
High	5320	22.25	17.870	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.51	29.51	23.51	11.00	11.00	11.00
Mid	5300	24.00	23.52	29.52	23.52	11.00	11.00	11.00
High	5320	24.00	23.52	29.52	23.52	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.469	15.47	23.51	-8.04
Mid	5300	15.332	15.33	23.52	-8.19
High	5320	15.230	15.23	23.52	-8.29

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.890	3.89	11.00	-7.11
Mid	5300	3.760	3.76	11.00	-7.24
High	5320	3.660	3.66	11.00	-7.34

10.5.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	40.7	36.2	-1.00
High	5310	40.5	36.2	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.17	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	13.45	13.62	24.00	-10.38
High	5310	13.24	13.41	24.00	-10.60

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-1.22	-1.05	11.00	-12.05
High	5310	-1.38	-1.21	11.00	-12.21

10.5.8. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5290	82.4	75.5	-1.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5290	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.30	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5290	12.36	12.66	24.00	-11.34

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5290	-5.29	-4.99	11.00	-15.99

10.5.9. 802.11a MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.92	16.665	-0.60
Mid	5580	21.92	16.663	-0.60
High	5700	21.92	16.684	-0.60

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.22	29.22	23.22	11.00	11.00	11.00
Mid	5580	24.00	23.22	29.22	23.22	11.00	11.00	11.00
High	5700	24.00	23.22	29.22	23.22	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	15.253	15.25	23.22	-7.97
Mid	5580	15.128	15.13	23.22	-8.09
High	5700	15.430	15.43	23.22	-7.79

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.850	3.85	11.00	-7.15
Mid	5580	3.820	3.82	11.00	-7.18
High	5700	4.110	4.11	11.00	-6.89

10.5.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	22.33	17.860	-0.60
Mid	5580	22.25	17.853	-0.60
High	5700	22.08	17.846	-0.60

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.52	29.52	23.52	11.00	11.00	11.00
Mid	5580	24.00	23.52	29.52	23.52	11.00	11.00	11.00
High	5700	24.00	23.52	29.52	23.52	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	15.106	15.11	23.52	-8.41
Mid	5580	15.321	15.32	23.52	-8.20
High	5700	15.685	15.69	23.52	-7.83

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.550	3.55	11.00	-7.45
Mid	5580	3.740	3.74	11.00	-7.26
High	5700	4.050	4.05	11.00	-6.95

10.5.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	40.8	36.200	-0.60
Mid	5590	40.3	36.200	-0.60
High	5670	40.5	36.100	-0.60

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5590	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.17	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	13.308	13.48	24.00	-10.52
Mid	5590	12.674	12.84	24.00	-11.16
High	5670	12.674	12.84	24.00	-11.16

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-1.210	-1.04	11.00	-12.04
Mid	5590	-1.990	-1.82	11.00	-12.82
High	5670	-1.990	-1.82	11.00	-12.82

10.5.12. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5530	82.600	75.491	-0.60
High	5610	82.400	75.521	-0.60

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5610	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.30	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	12.342	12.64	24.00	-11.36
High	5610	12.041	12.34	24.00	-11.66

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-5.160	-4.86	11.00	-15.86
High	5610	-5.580	-5.28	11.00	-16.28

10.5.13. 802.11a MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5745	20.6	16.7	-0.50
Mid	5785	20.5	16.7	-0.50
High	5825	20.4	16.7	-0.50

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	30.00	29.22	35.22	29.22	30.00	17.00	17.00
Mid	5785	30.00	29.22	35.22	29.22	30.00	17.00	17.00
High	5825	30.00	29.22	35.22	29.22	30.00	17.00	17.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	15.31	15.31	29.22	-13.91
Mid	5785	15.21	15.21	29.22	-14.02
High	5825	15.05	15.05	29.22	-14.17

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	3.42	3.42	17.00	-13.58
Mid	5785	3.75	3.75	17.00	-13.25
High	5825	3.70	3.70	17.00	-13.30

10.5.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5745	20.7	17.8	-0.50
Mid	5785	21.0	17.9	-0.50
High	5825	20.7	17.9	-0.50

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	30.00	29.51	35.51	29.51	30.00	17.00	17.00
Mid	5785	30.00	29.52	35.52	29.52	30.00	17.00	17.00
High	5825	30.00	29.52	35.52	29.52	30.00	17.00	17.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	15.20	15.20	29.51	-14.31
Mid	5785	15.02	15.02	29.52	-14.50
High	5825	15.06	15.06	29.52	-14.46

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	3.54	3.54	17.00	-13.46
Mid	5785	3.42	3.42	17.00	-13.58
High	5825	3.44	3.44	17.00	-13.56

10.5.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5755	39.1	36.2	-0.50
High	5795	39.2	36.1	-0.50

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5755	30.00	30.00	36.00	30.00	30.00	17.00	17.00
High	5795	30.00	30.00	36.00	30.00	30.00	17.00	17.00

Duty Cycle CF (dB)	0.17	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	13.37	13.54	30.00	-16.46
High	5795	13.01	13.18	30.00	-16.82

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5755	-1.39	-1.22	17.00	-18.22
High	5795	-1.75	-1.58	17.00	-18.58

10.5.16. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5775	80.5	75.5	-0.50

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5775	30.00	30.00	36.00	30.00	30.00	17.00	17.00

Duty Cycle CF (dB)	0.30	Included in Calculations of Corr'd Power & PPSD

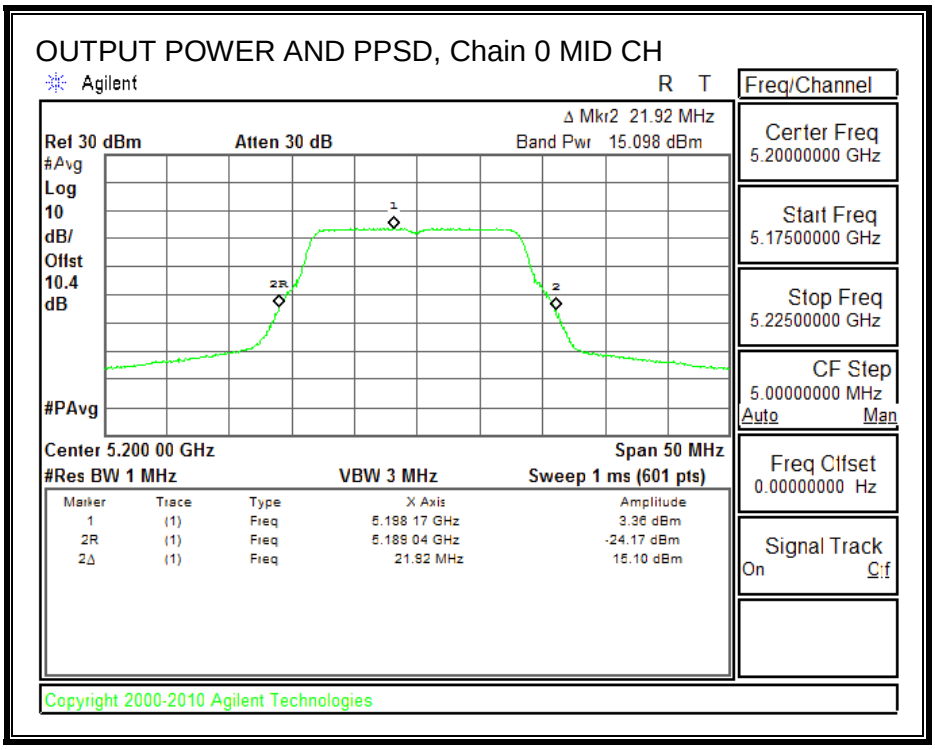
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5775	12.21	12.51	30.00	-17.49

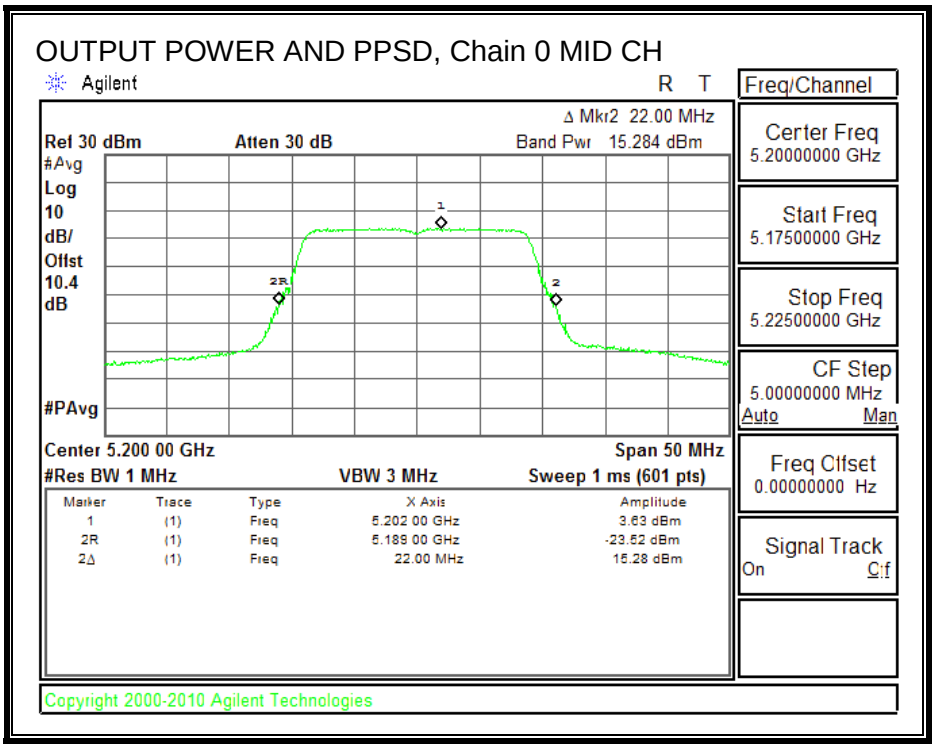
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5775	-5.41	-5.11	17.00	-22.11

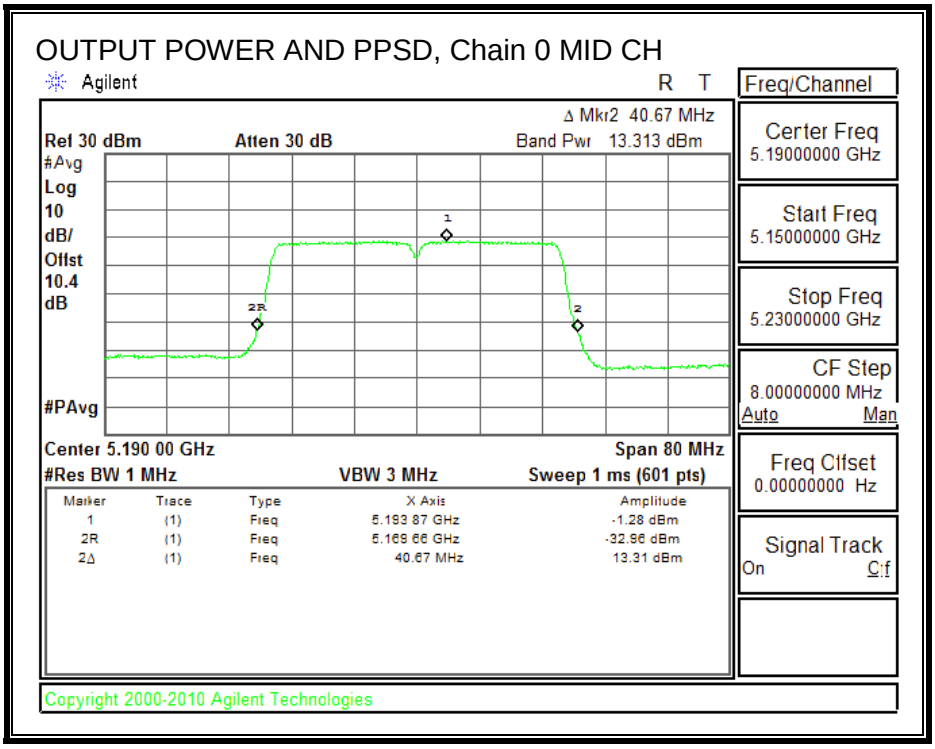
802.11a 5.2G OUTPUT POWER AND PPSD, Chain 0



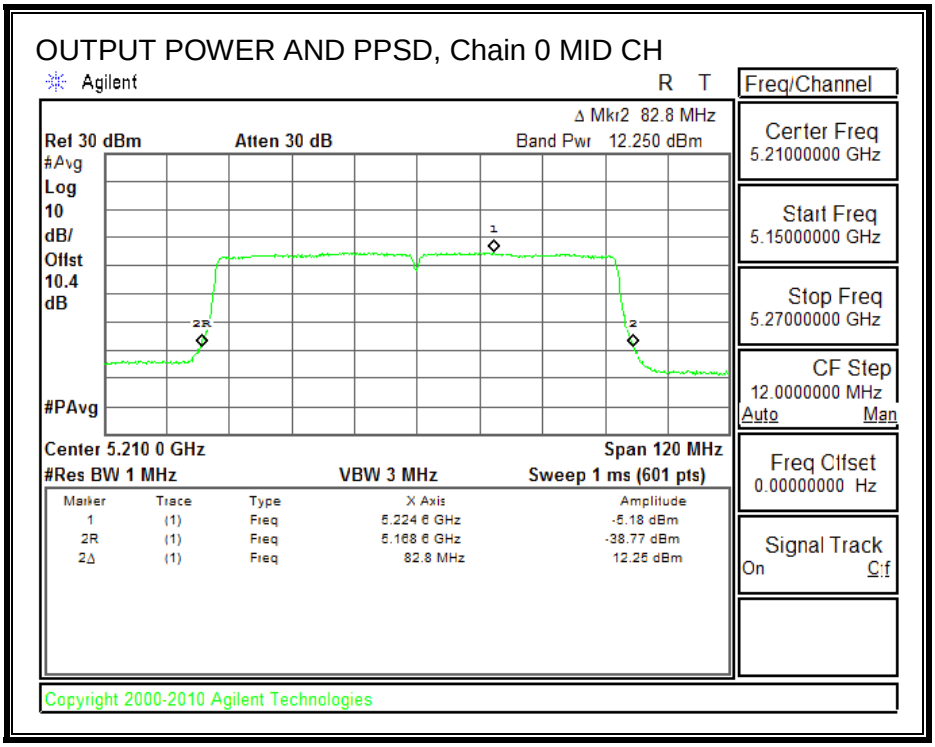
802.11n HT20 5.2G OUTPUT POWER AND PPSD, Chain 0



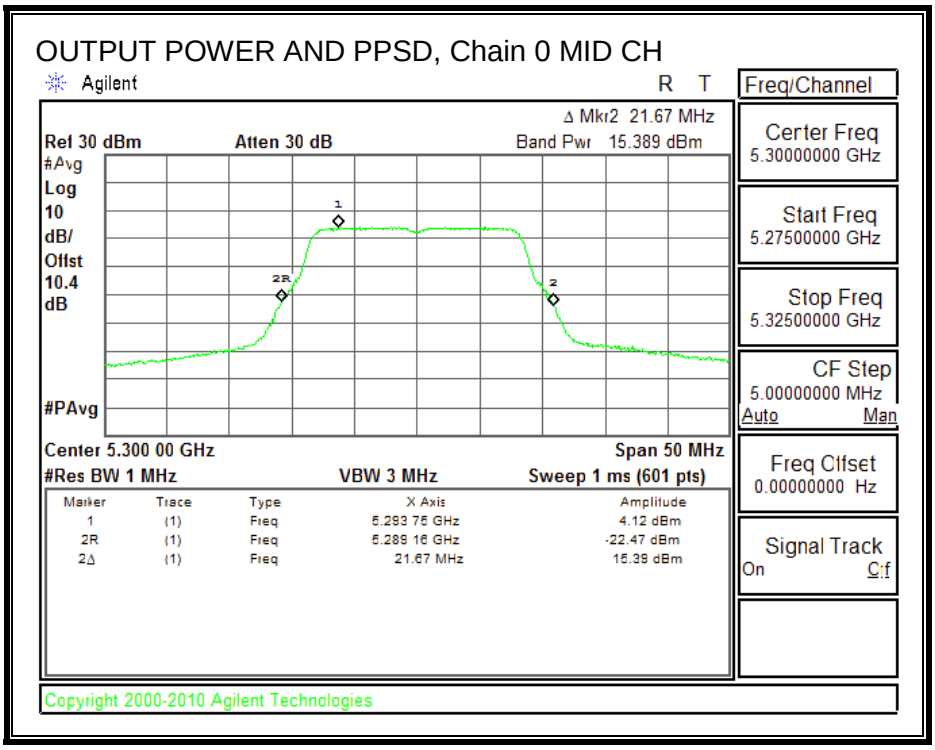
802.11n HT40 5.2G OUTPUT POWER AND PPSD, Chain 0



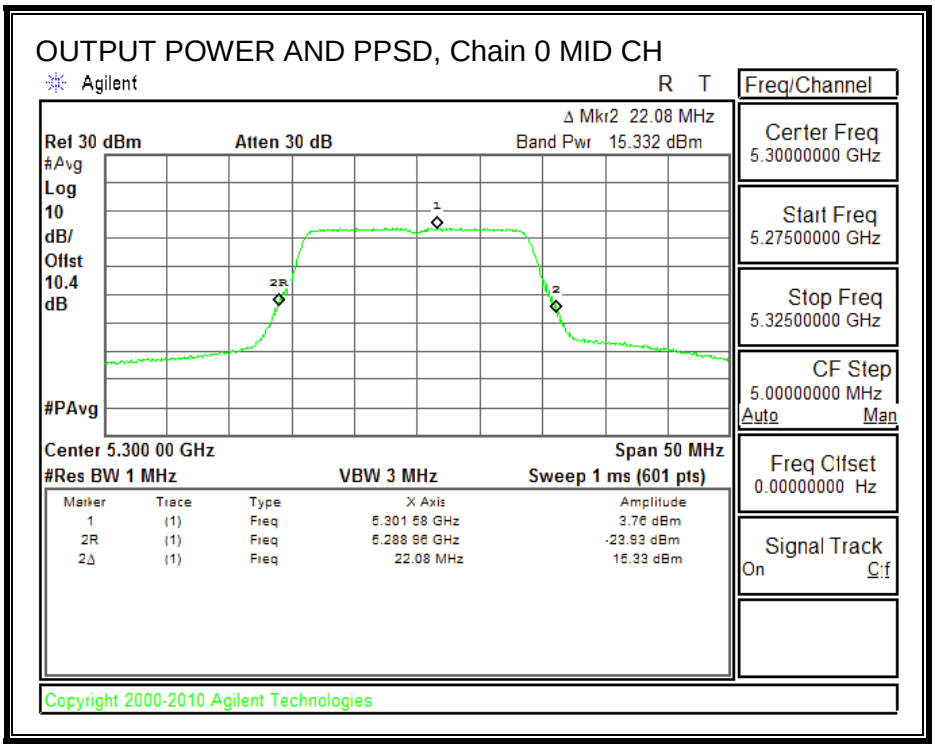
802.11ac HT80 5.2G OUTPUT POWER AND PPSD, Chain 0



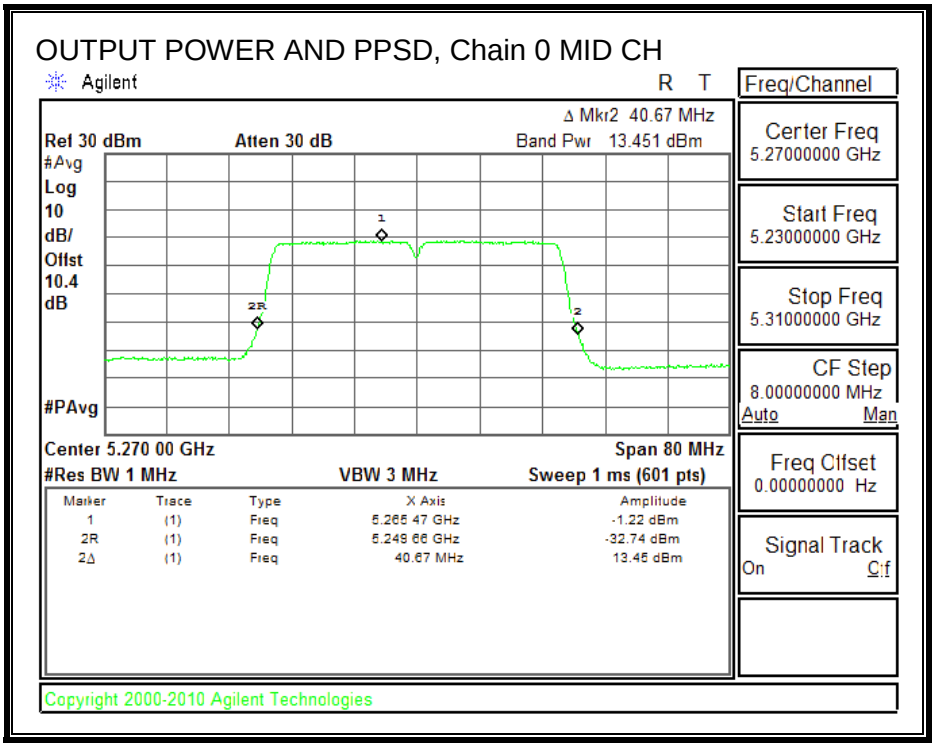
802.11a 5.3G OUTPUT POWER AND PPSD, Chain 0



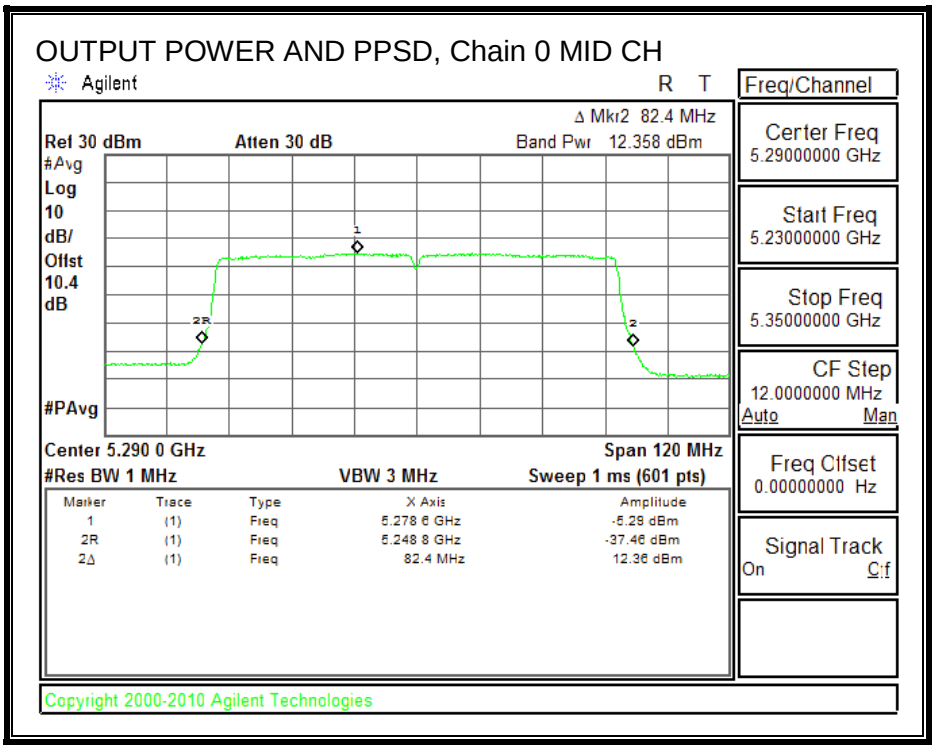
802.11n HT20 5.3G OUTPUT POWER AND PPSD, Chain 0



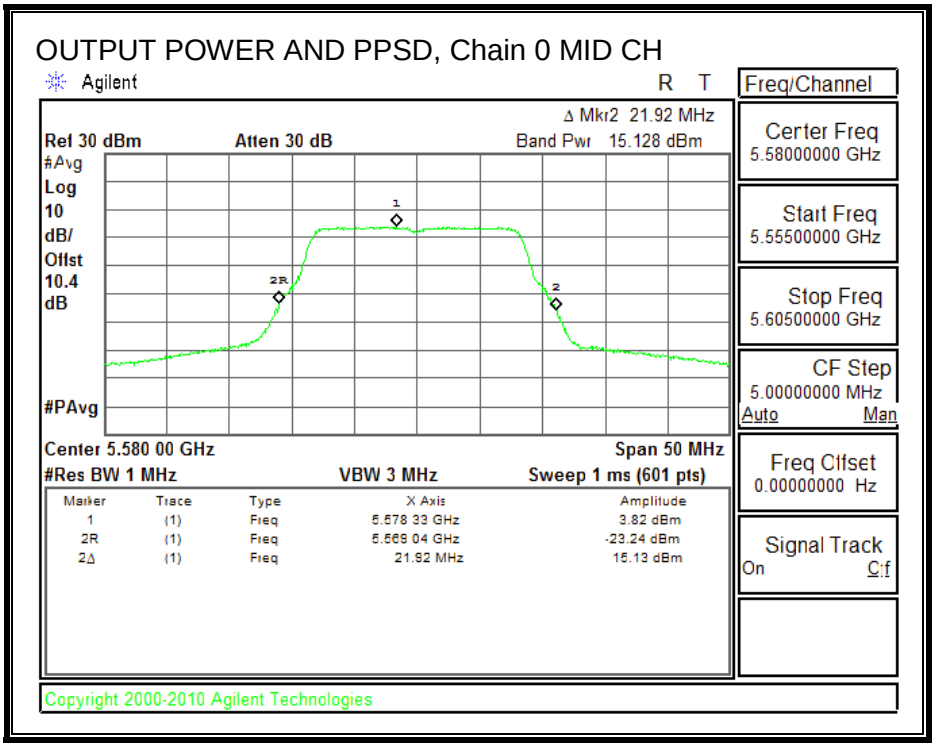
802.11n HT40 5.3G OUTPUT POWER AND PPSD, Chain 0



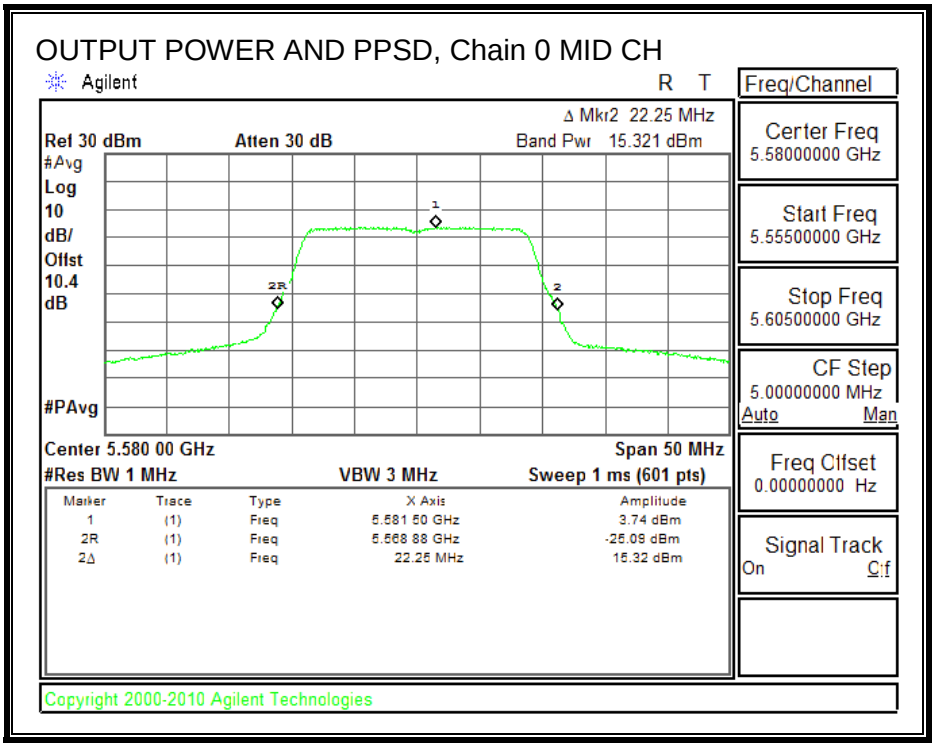
802.11ac HT80 5.3G OUTPUT POWER AND PPSD, Chain 0



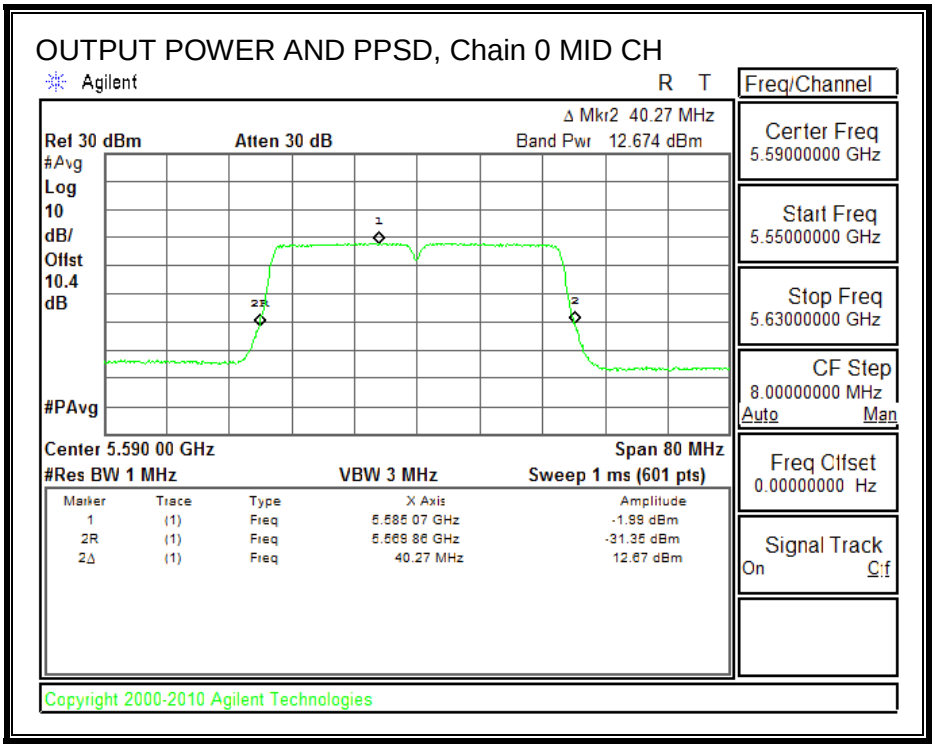
802.11a 5.5G OUTPUT POWER AND PPSD, Chain 0



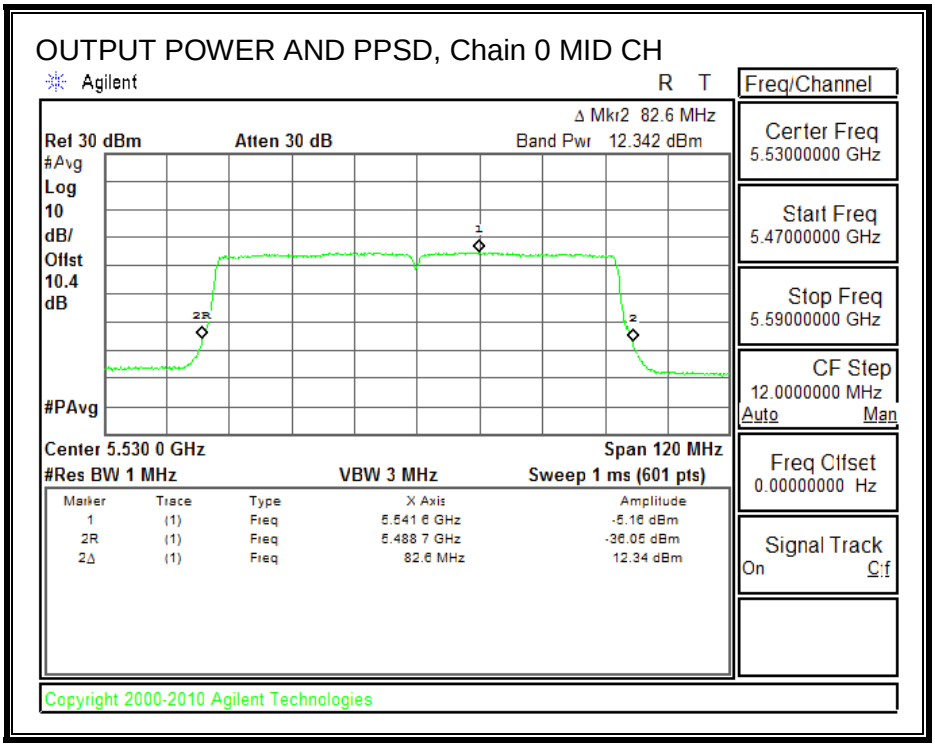
802.11n HT20 5.5G OUTPUT POWER AND PPSD, Chain 0



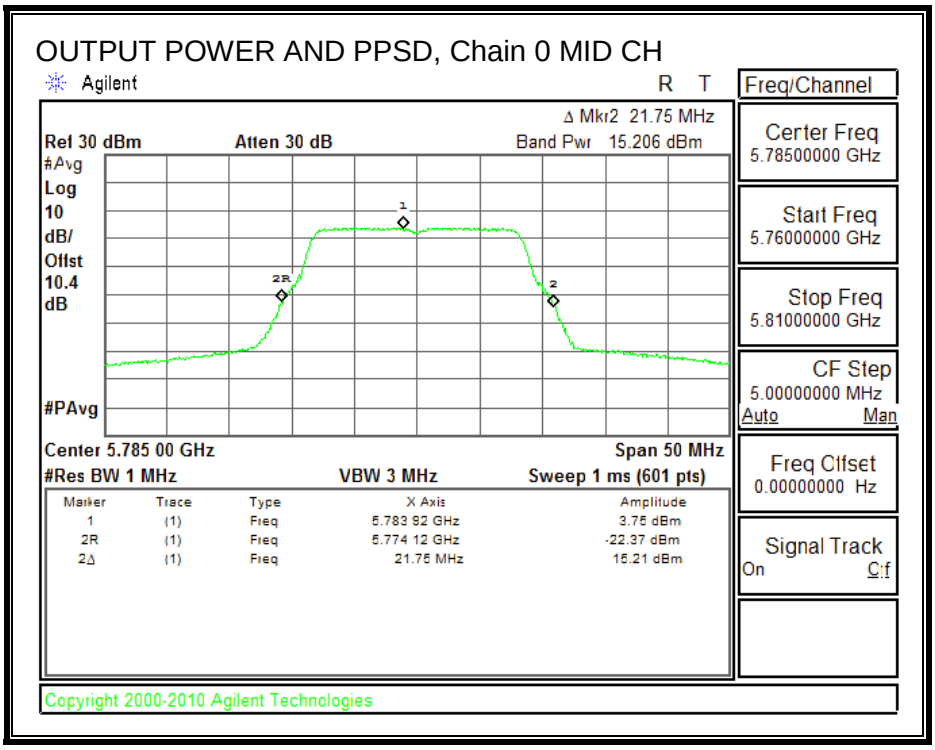
802.11n HT40 5.5G OUTPUT POWER AND PPSD, Chain 0



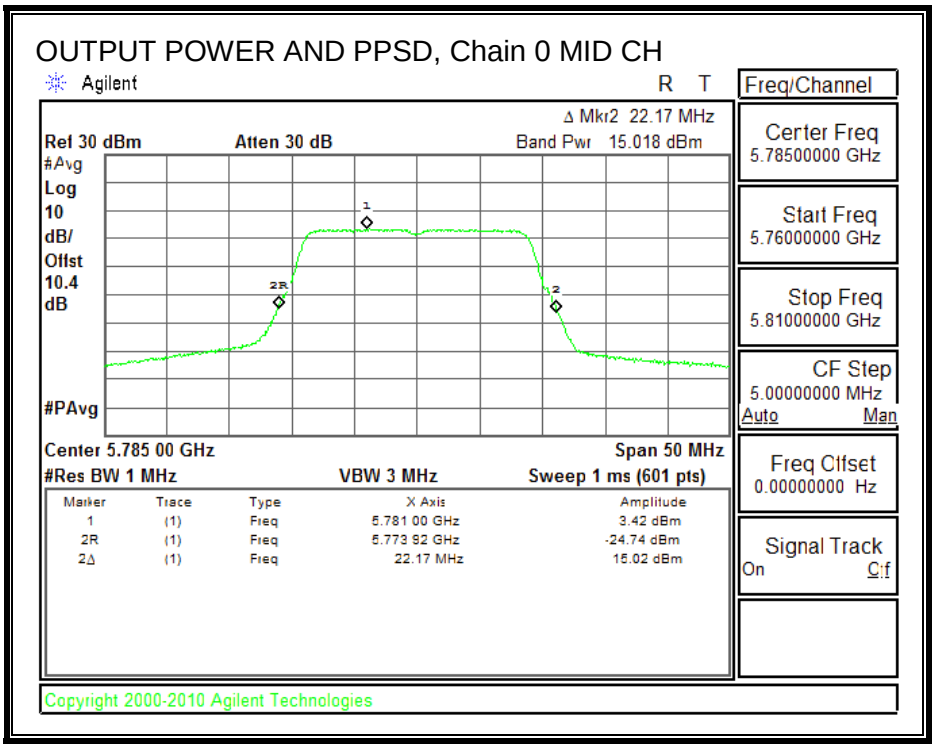
802.11ac HT80 5.5G OUTPUT POWER AND PPSD, Chain 0



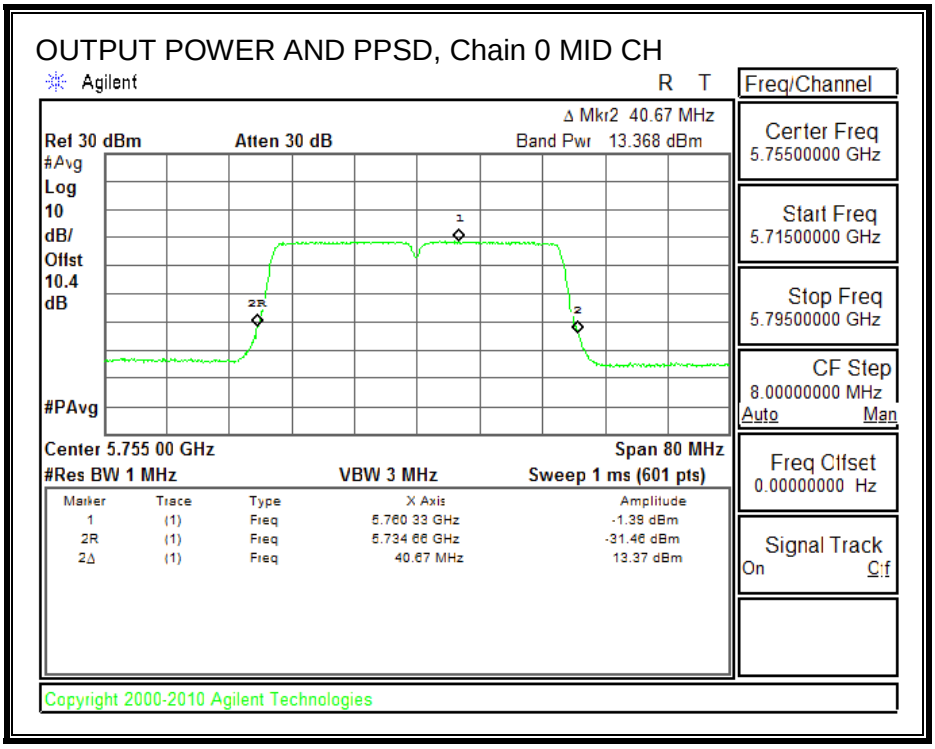
802.11a 5.8G OUTPUT POWER AND PPSD, Chain 0



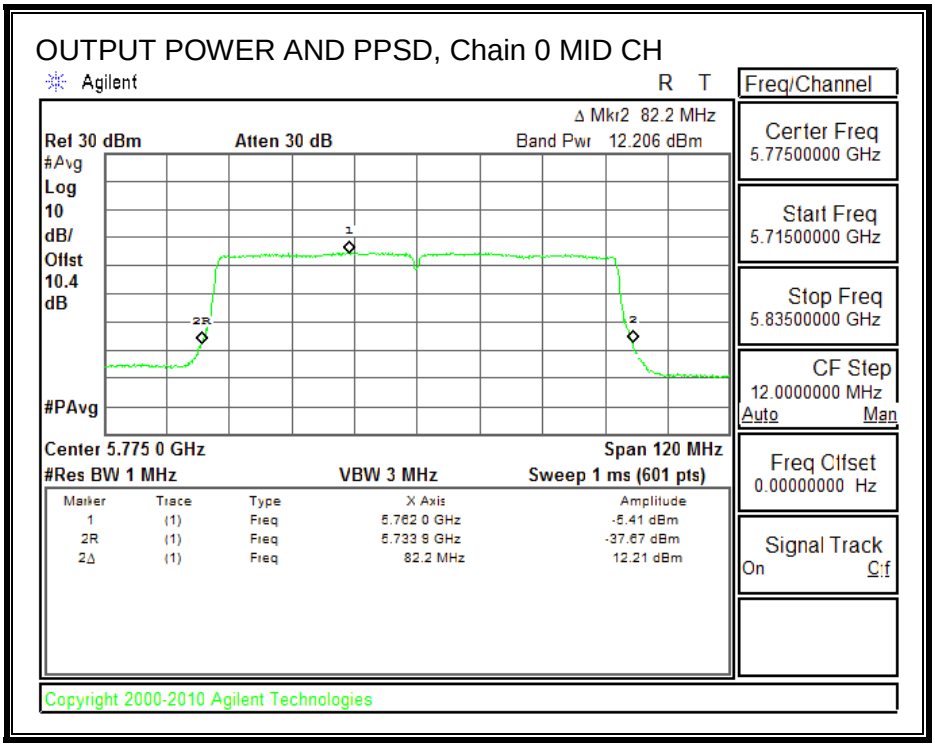
802.11n HT20 5.8G OUTPUT POWER AND PPSD, Chain 0



802.11n HT40 5.8G OUTPUT POWER AND PPSD, Chain 0



802.11ac HT80 5.8G OUTPUT POWER AND PPSD, Chain 0



11. TRANSMITTER ABOVE 1 GHz

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 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 to the reading offset for average measurements, where appropriate.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

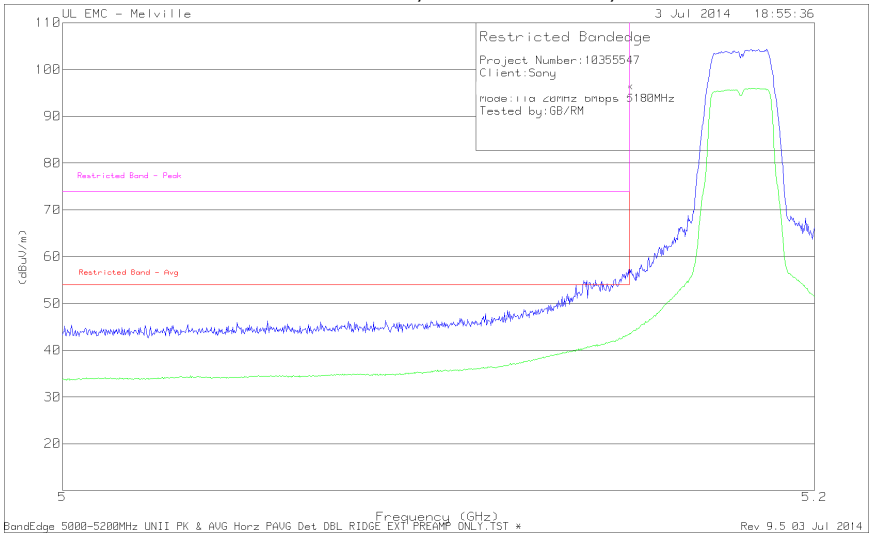
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

11.1. 5.2 GHz

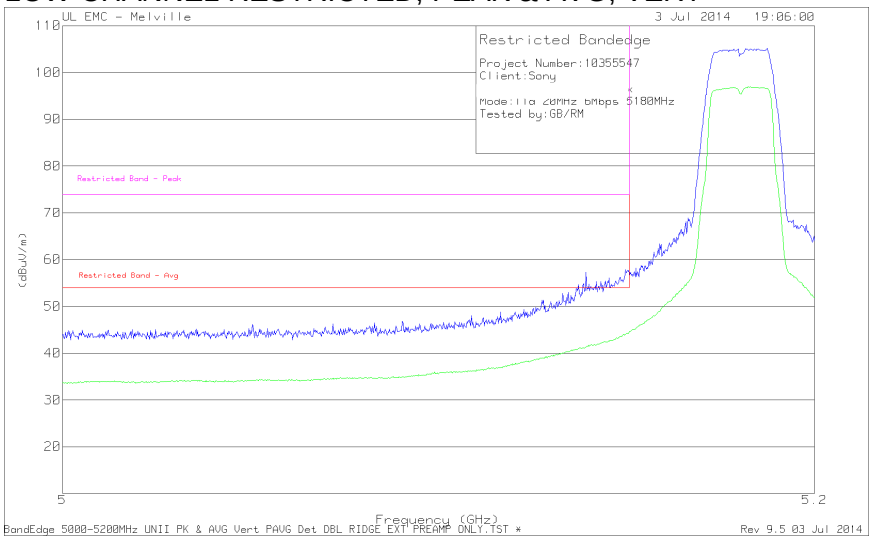
11.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

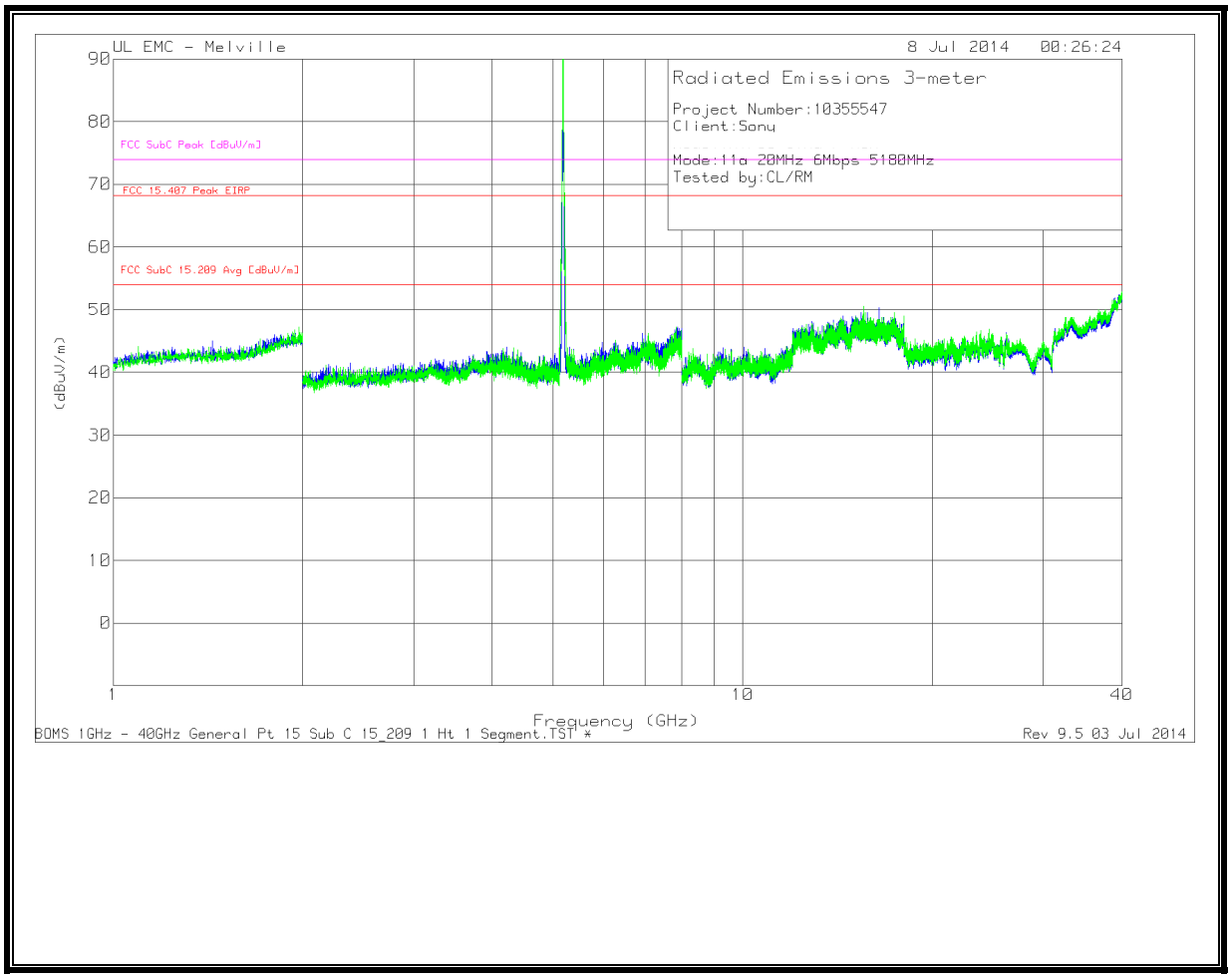


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT



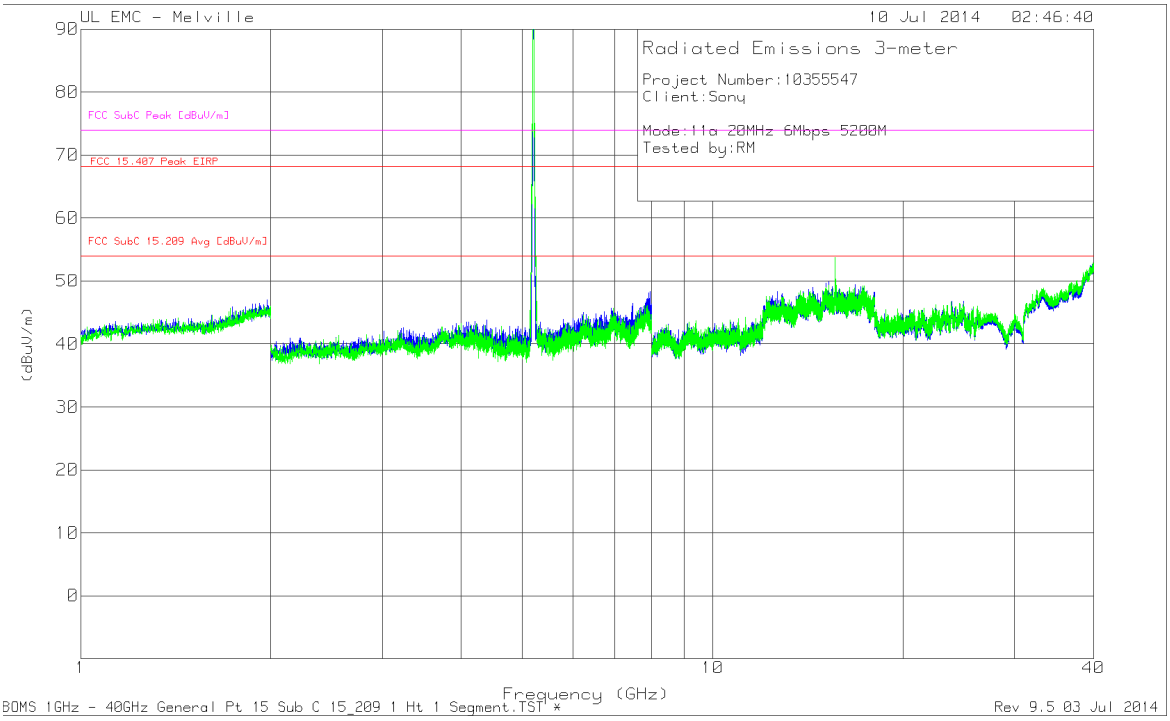
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.602	49.51	AD1	37.3	-45.94	40.87	54	-13.13	-	-	-	-	71	100	H
* 15.602	51.18	AD1	37.3	-45.94	42.54	54	-11.46	-	-	-	-	91	110	V
* 15.602	63.57	PK1	37.3	-45.94	54.93	-	-	74	-19.07	68.2	-13.27	71	100	H
* 15.602	65.74	PK1	37.3	-45.94	57.1	-	-	74	-16.9	68.2	-11.1	91	110	V

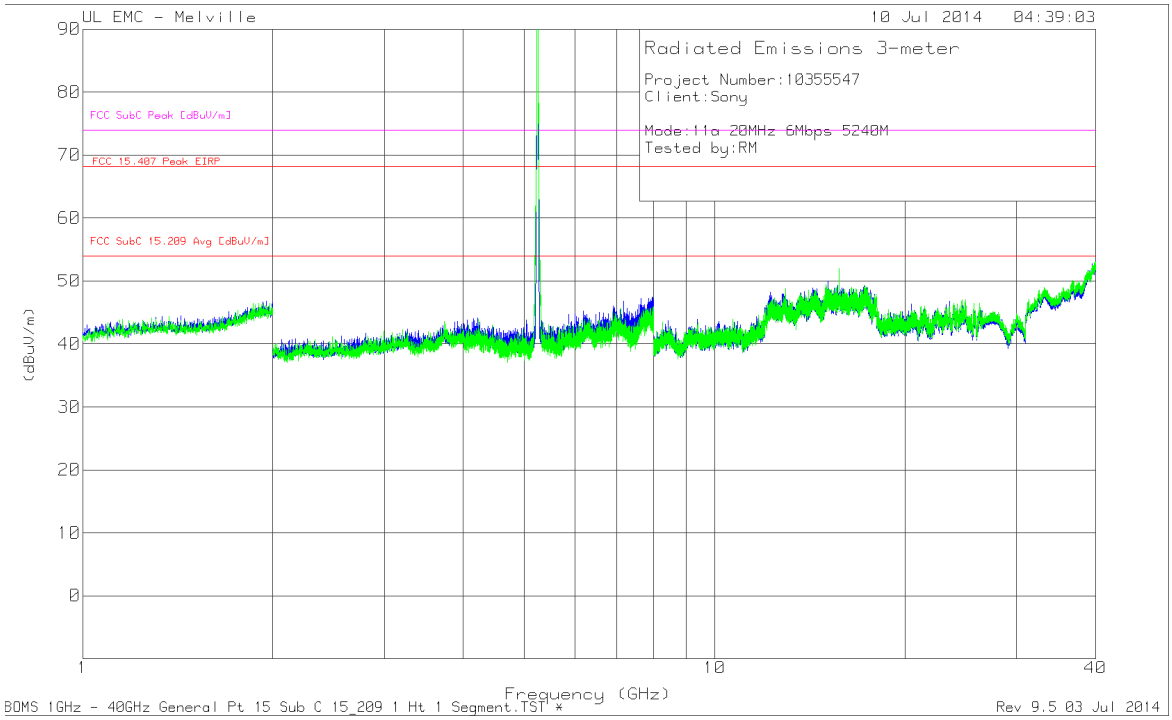
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

HIGH CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.722	50.53	AD1	37.4	-46.61	41.32	54	-12.68	-	-	-	-	58	101	H
* 15.722	52.39	AD1	37.4	-46.61	43.18	54	-10.82	-	-	-	-	90	119	V
* 15.722	64.67	PK1	37.4	-46.61	55.46	-	-	74	-18.54	68.2	-12.74	58	101	H
* 15.722	66.15	PK1	37.4	-46.61	56.94	-	-	74	-17.06	68.2	-11.26	90	119	V

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

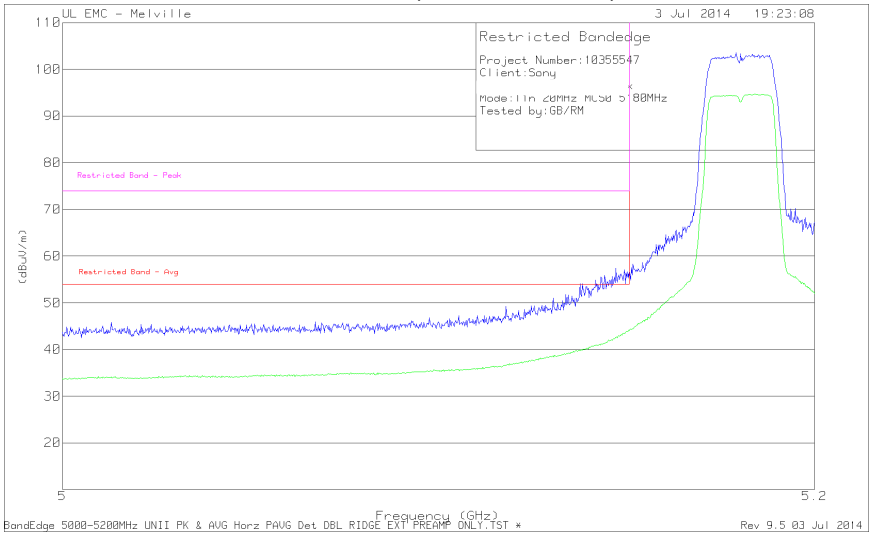
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

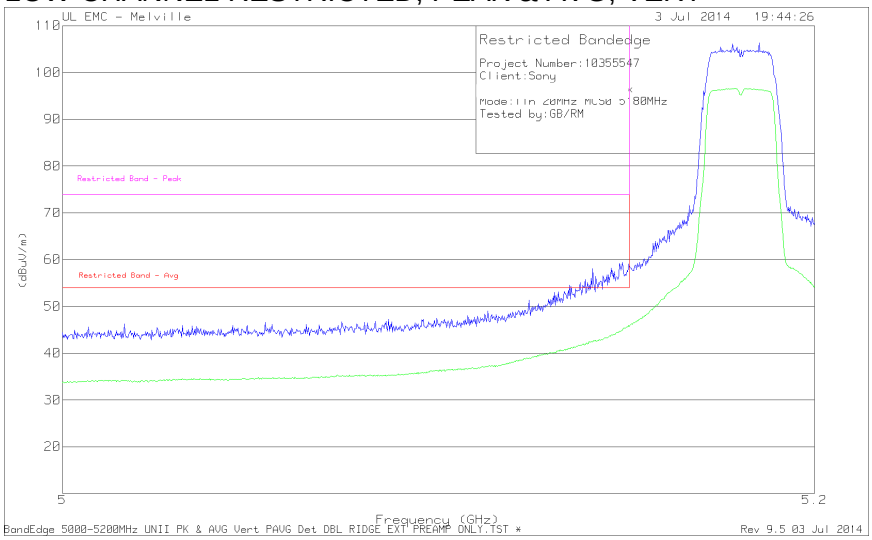
Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

11.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

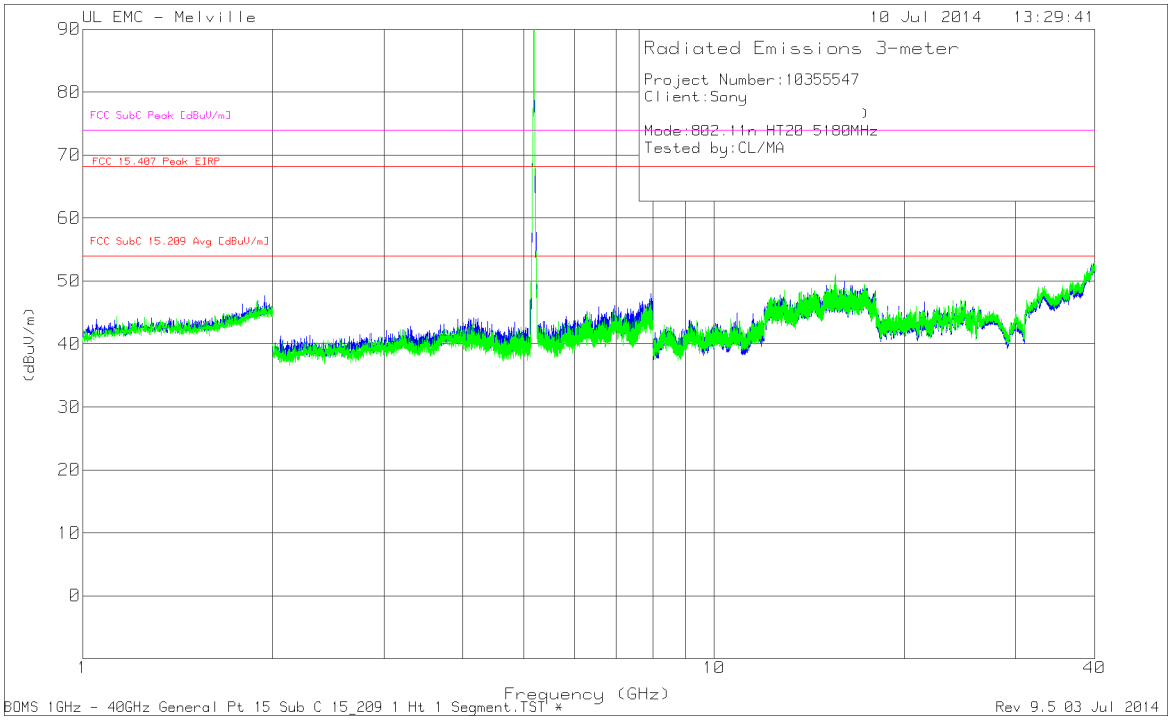


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.54	50.36	AD1	37.3	-45.99	41.67	54	-12.33	-	-	-	-	99	110	V
* 15.539	48	AD1	37.3	-45.99	39.31	54	-14.69	-	-	-	-	66	110	H
* 15.548	62.81	PK1	37.3	-46.05	54.06	-	-	74	-19.94	68.2	-14.14	99	110	V
* 15.531	60.31	PK1	37.3	-45.91	51.7	-	-	74	-22.3	68.2	-16.5	66	110	H

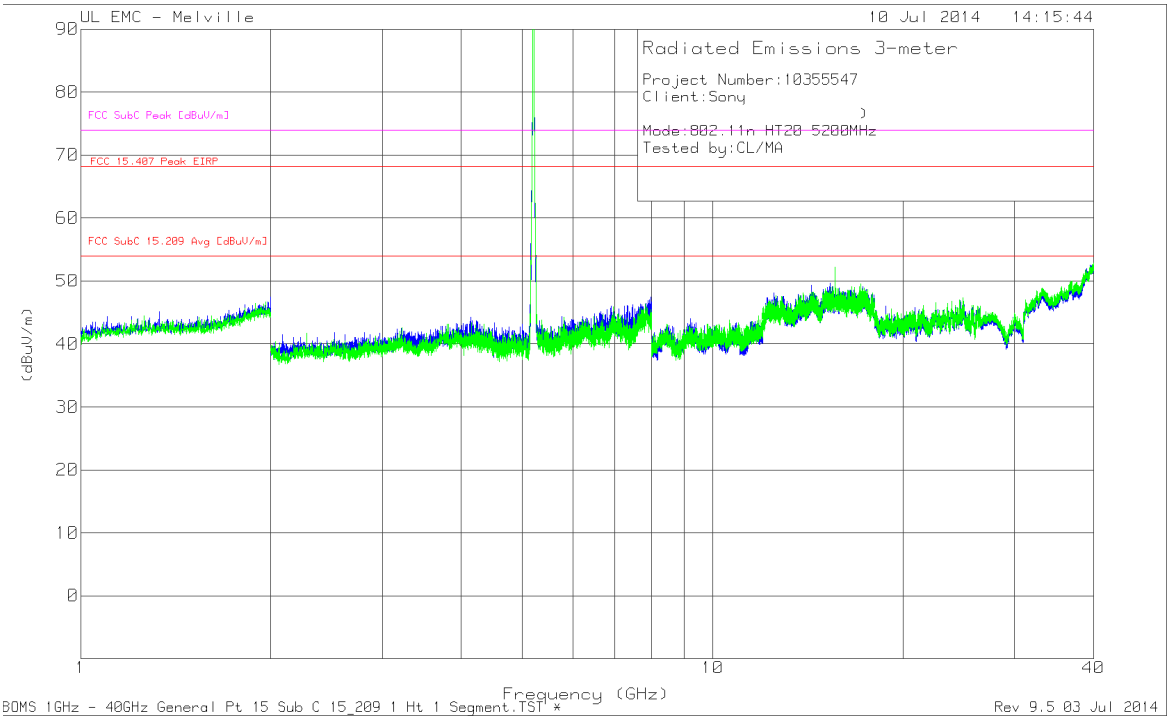
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.6	51.43	AD1	37.3	-45.95	42.78	54	-11.22	-	-	-	-	95	104	V
* 15.602	46.91	AD1	37.3	-45.94	38.27	54	-15.73	-	-	-	-	24	338	H
* 15.602	63.58	PK1	37.3	-45.94	54.94	-	-	74	-19.06	68.2	-13.26	95	104	V
* 15.602	58.58	PK1	37.3	-45.94	49.94	-	-	74	-24.06	68.2	-18.26	24	338	H

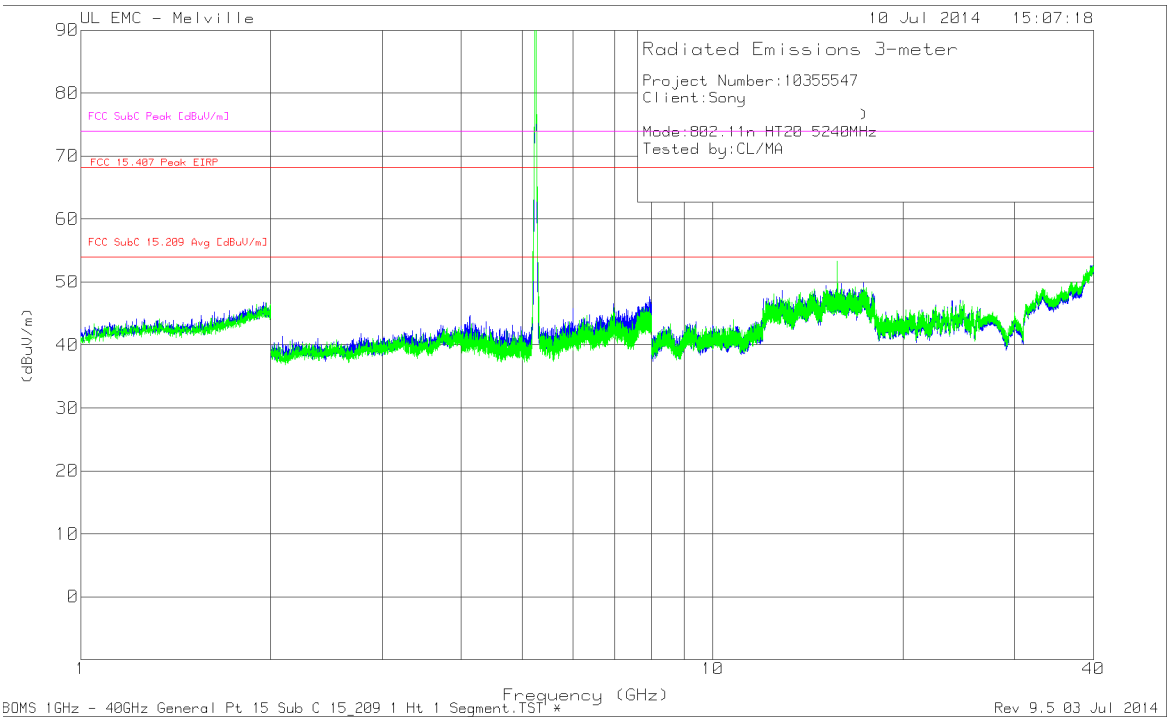
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

HIGH CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.72	50.38	AD1	37.4	-46.6	41.18	54	-12.82	-	-	-	-	64	117	H
* 15.721	49.16	AD1	37.4	-46.6	39.96	54	-14.04	-	-	-	-	54	341	V
* 15.72	62.6	PK1	37.4	-46.6	53.4	-	-	74	-20.6	68.2	-14.8	64	117	H
* 15.722	61.2	PK1	37.4	-46.61	51.99	-	-	74	-22.01	68.2	-16.21	54	341	V

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

PK1 - KDB789033 Method: Peak

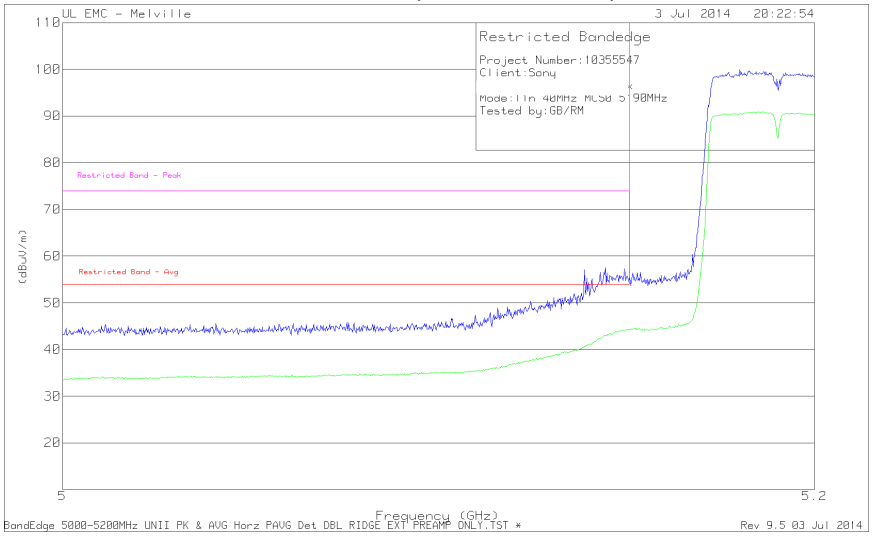
AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

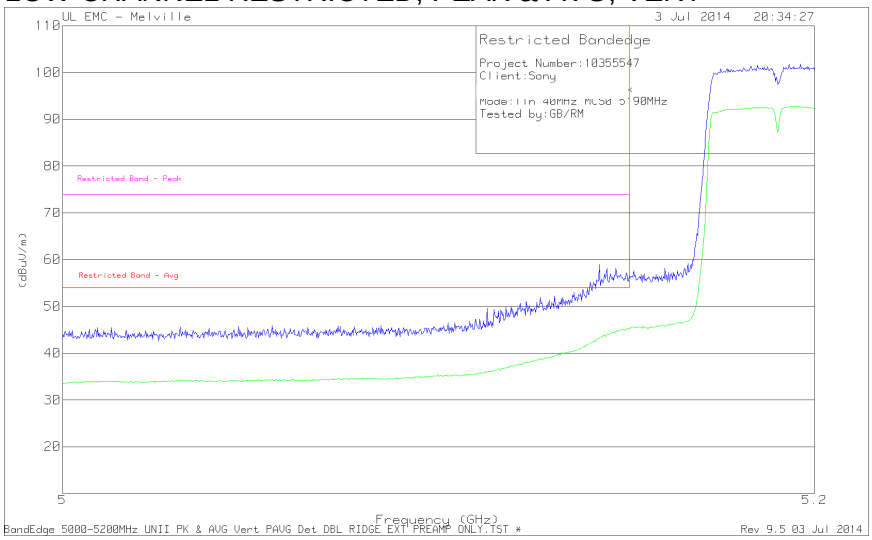
11.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

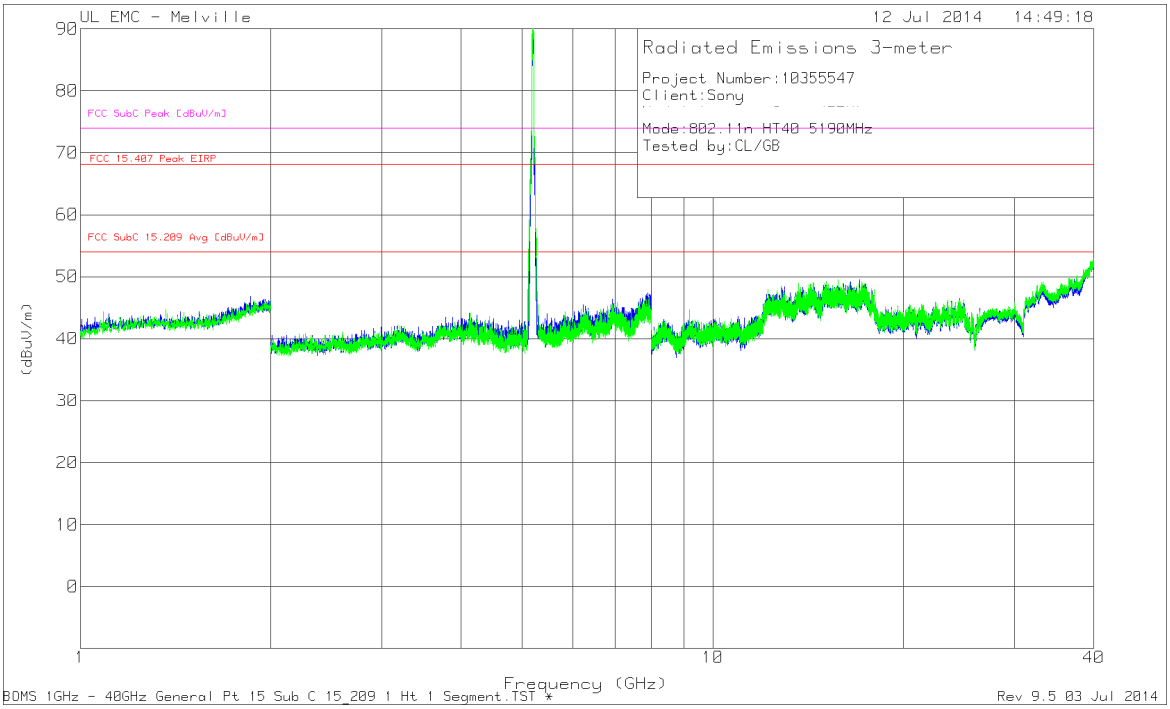


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT



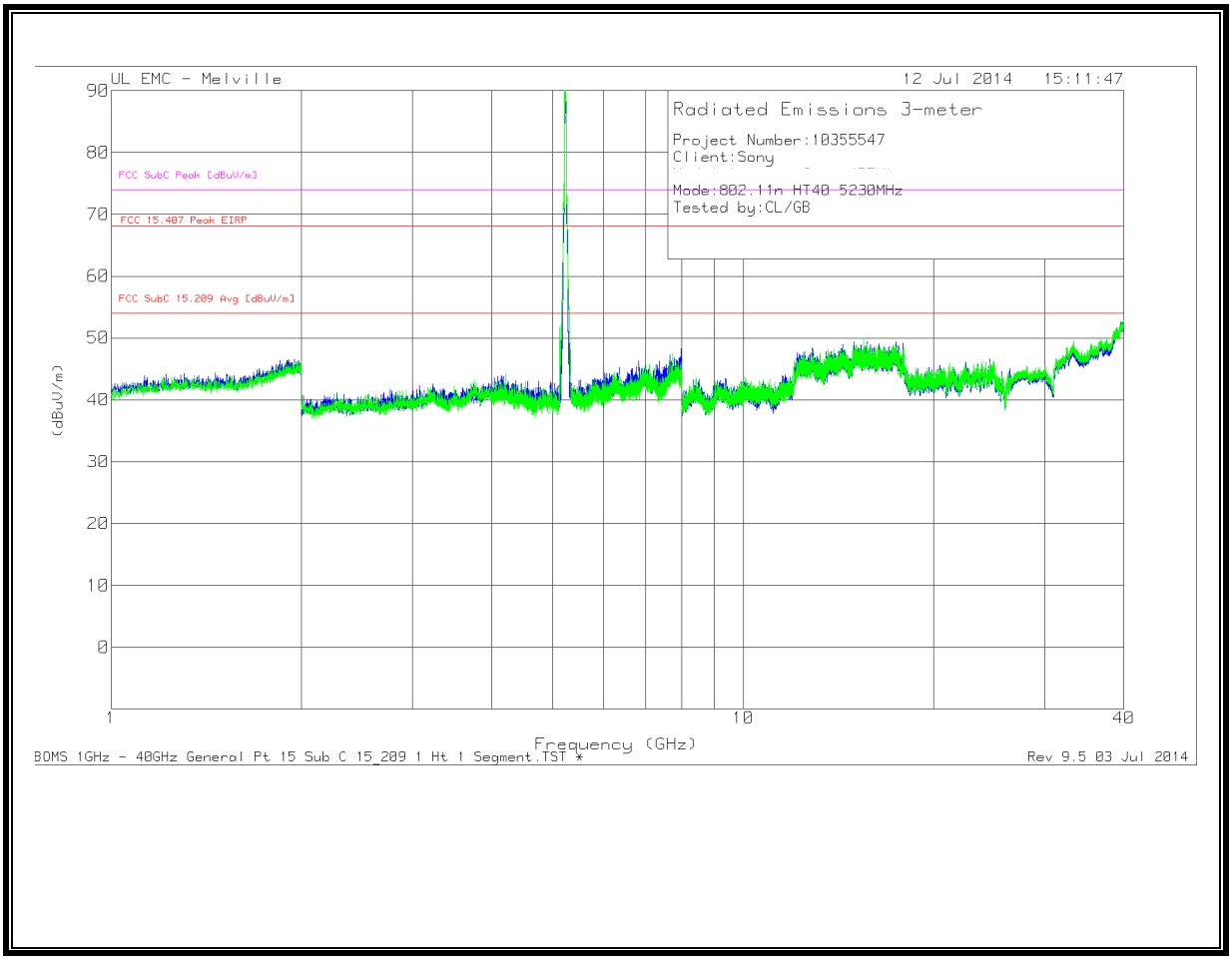
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL

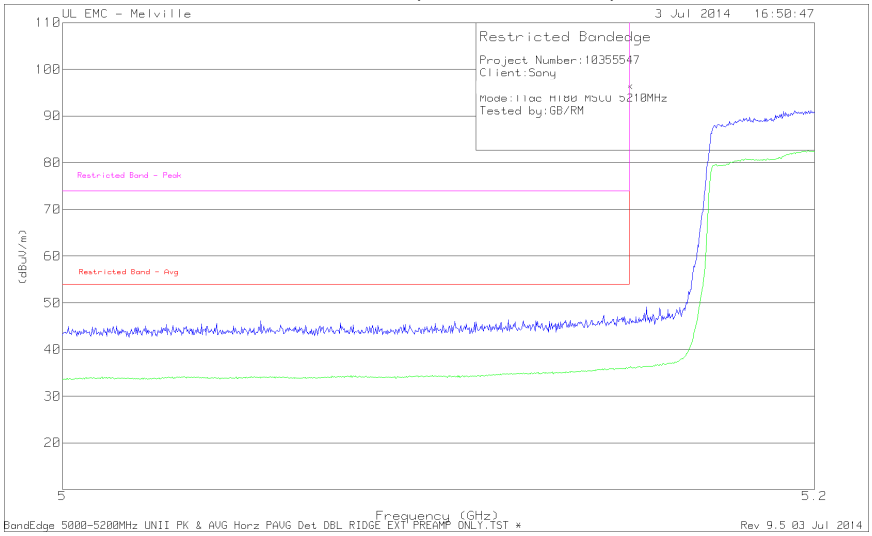


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

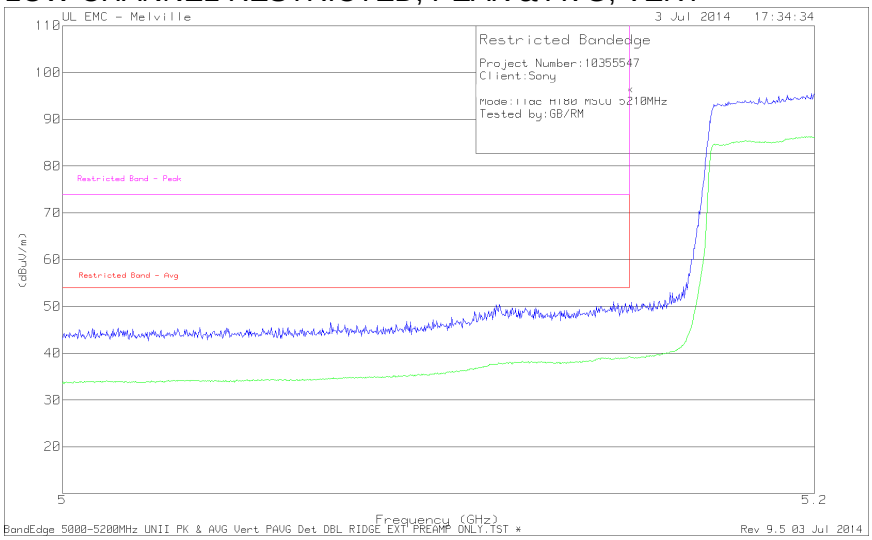
11.1.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

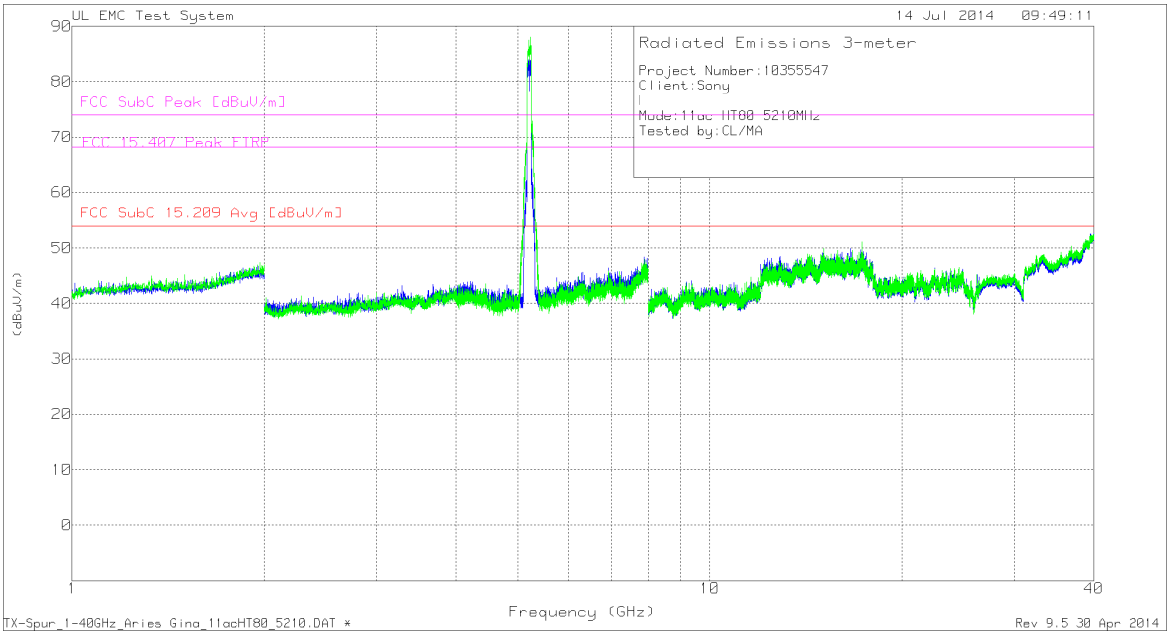


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



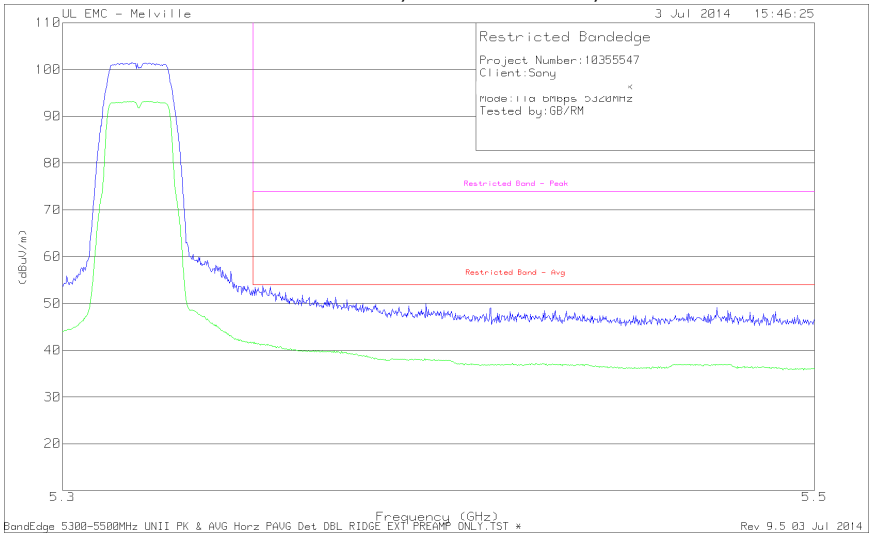
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

11.2. 5.3 GHz

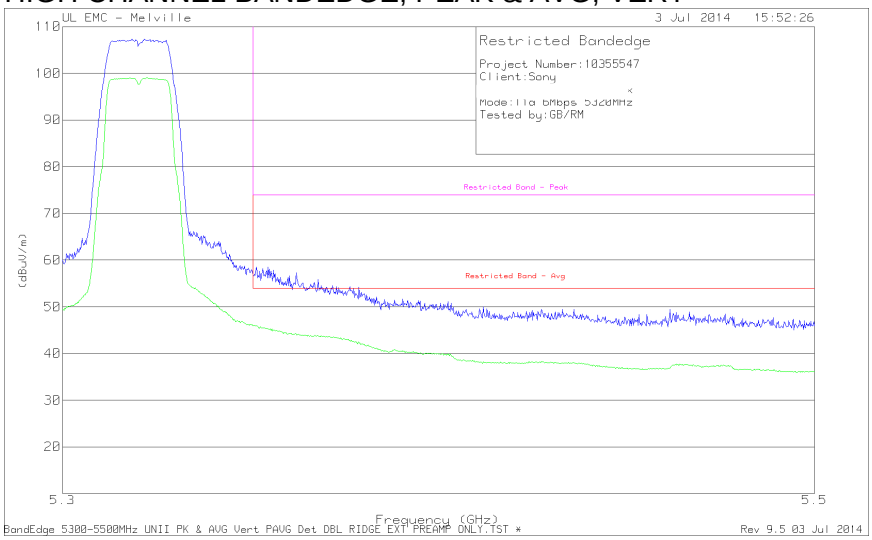
11.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK & AVG, HORIZ

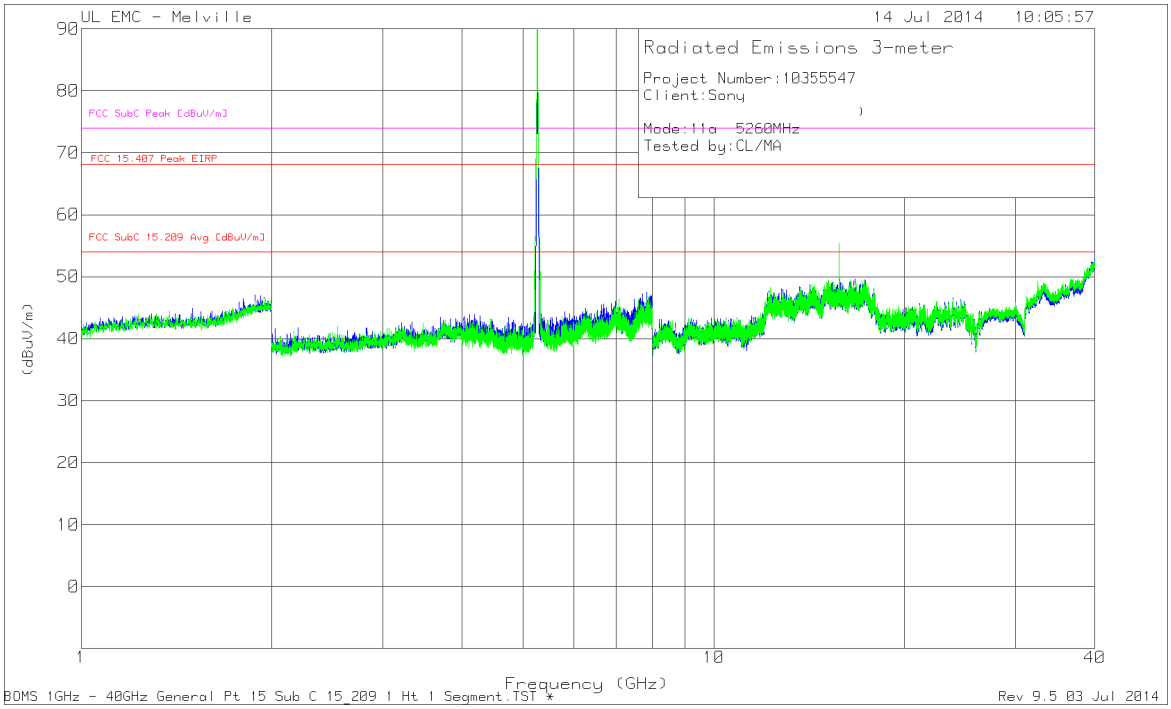


HIGH CHANNEL BANDEDGE, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.78	51.18	AD1	37.3	-46.85	41.63	54	-12.37	-	-	-	-	72	125	H
* 15.78	53.42	AD1	37.3	-46.85	43.87	54	-10.13	-	-	-	-	80	115	V
* 15.78	64.06	PK1	37.3	-46.85	54.51	-	-	74	-19.49	68.2	-13.69	72	125	H
* 15.78	65.29	PK1	37.3	-46.85	55.74	-	-	74	-18.26	68.2	-12.46	80	115	V

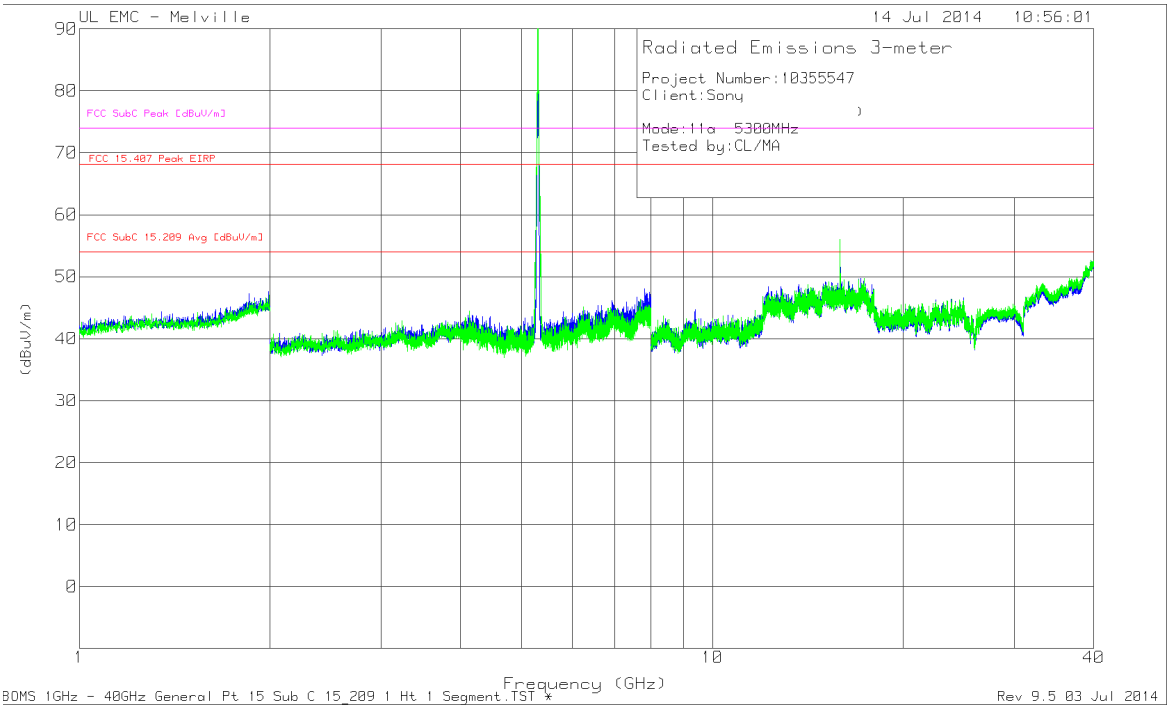
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.9	55.32	AD1	37.3	-46.81	45.81	54	-8.19	-	-	-	-	144	135	H
* 15.9	55.08	AD1	37.3	-46.81	45.57	54	-8.43	-	-	-	-	74	151	V
* 15.9	67.06	PK1	37.3	-46.81	57.55	-	-	74	-16.45	68.2	-10.65	144	135	H
* 15.9	66.84	PK1	37.3	-46.81	57.33	-	-	74	-16.67	68.2	-10.87	74	151	V

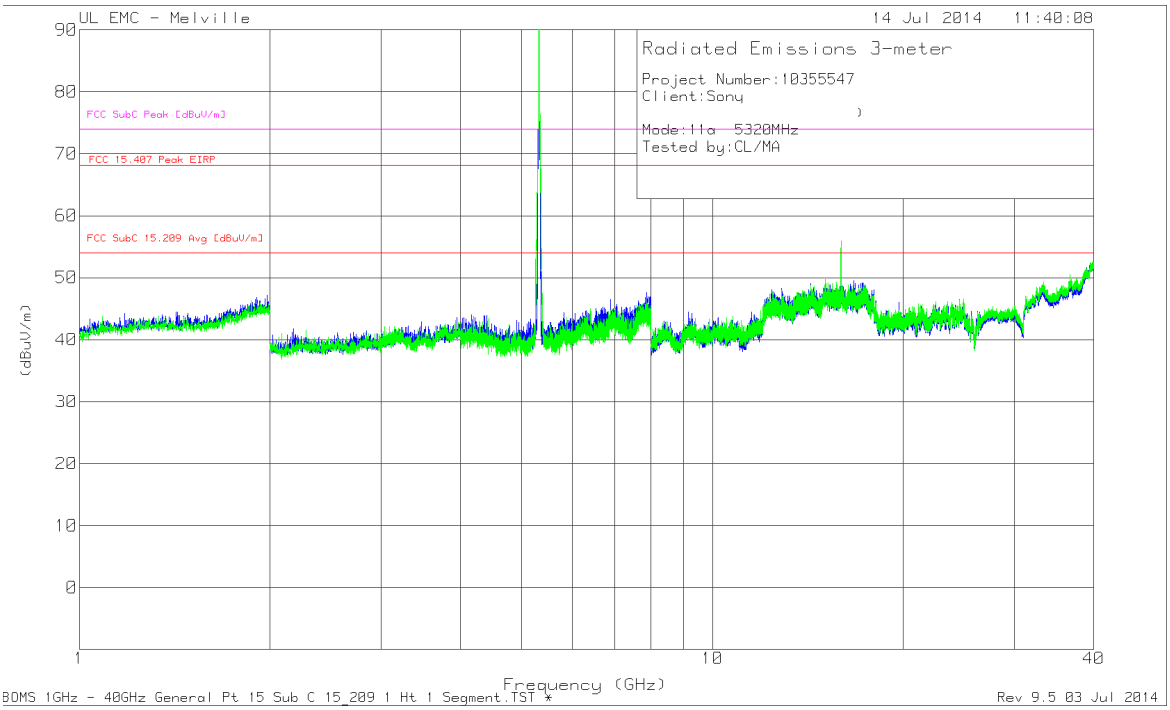
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

HIGH CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.96	54.21	AD1	37.3	-46.9	44.61	54	-9.39	-	-	-	-	161	152	H
* 15.96	56.43	AD1	37.3	-46.9	46.83	54	-7.17	-	-	-	-	93	162	V
* 15.96	66.55	PK1	37.3	-46.9	56.95	-	-	74	-17.05	68.2	-11.25	161	152	H
* 15.96	68.5	PK1	37.3	-46.9	58.9	-	-	74	-15.1	68.2	-9.3	93	162	V

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

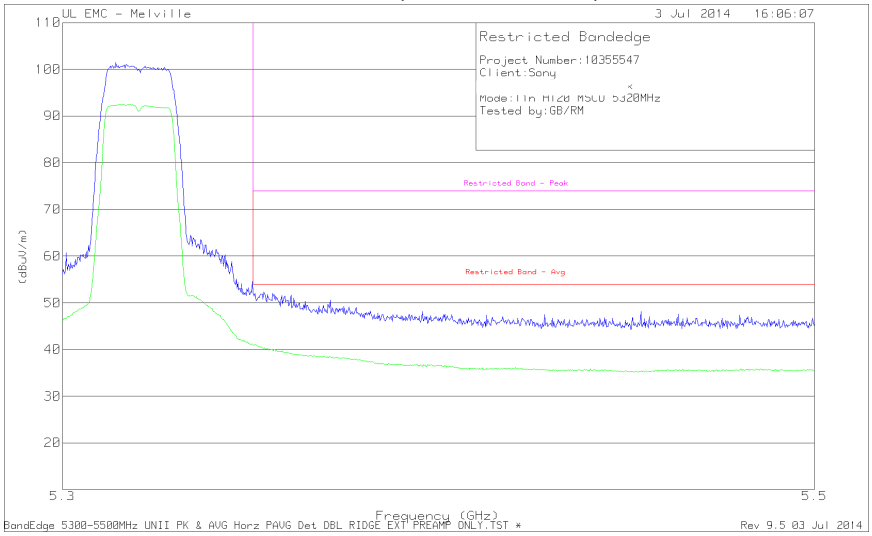
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

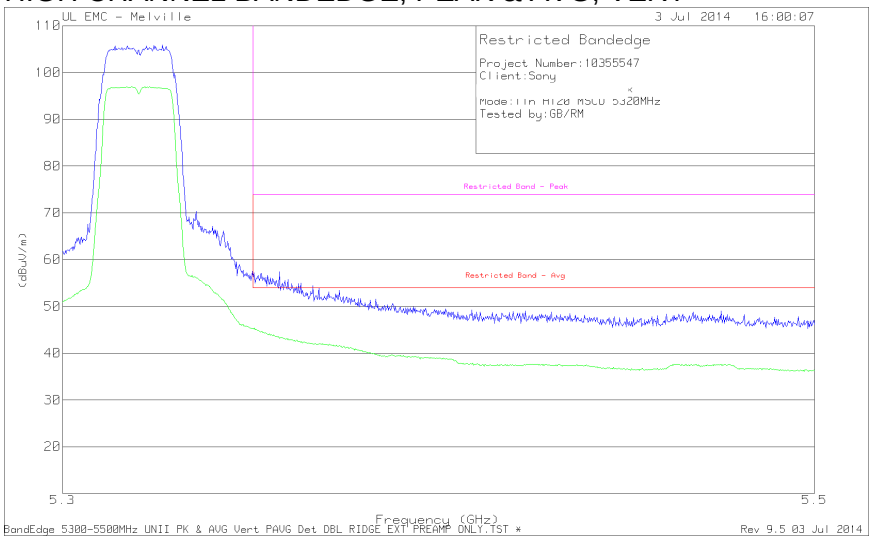
Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

11.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK & AVG, HORIZ

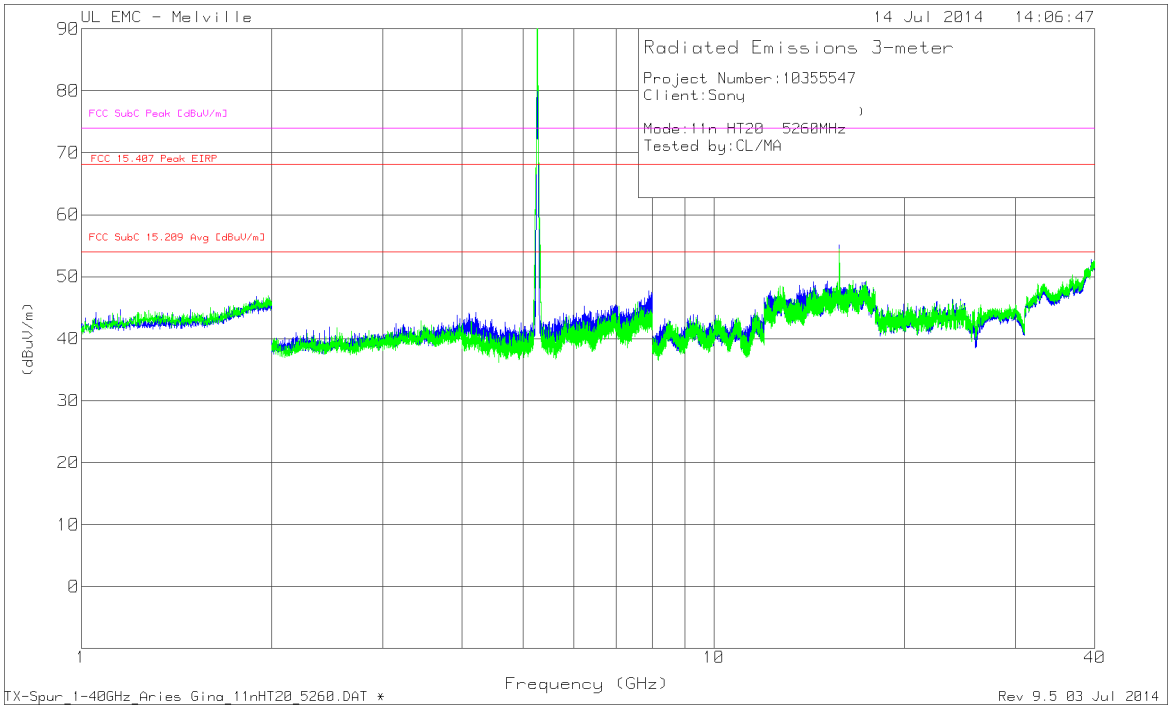


HIGH CHANNEL BANDEDGE, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.78	54.41	AD1	37.3	-46.85	44.86	54	-9.14	-	-	-	-	103	107	V
* 15.78	51.08	AD1	37.3	-46.85	41.53	54	-12.47	-	-	-	-	84	383	H
* 15.78	67.74	PK1	37.3	-46.85	58.19	-	-	74	-15.81	68.2	-10.01	103	107	V
* 15.778	63.68	PK1	37.3	-46.84	54.14	-	-	74	-19.86	68.2	-14.06	84	383	H

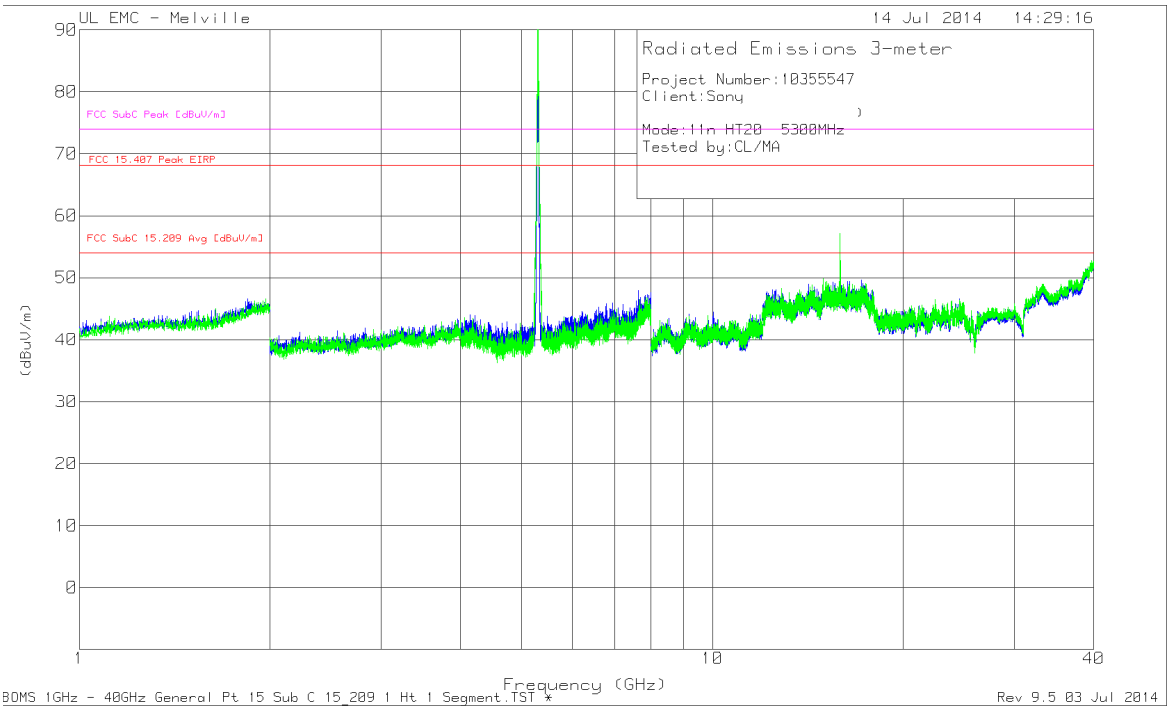
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.9	52.38	AD1	37.3	-46.81	42.87	54	-11.13	-	-	-	-	49	126	H
* 15.9	55.27	AD1	37.3	-46.81	45.76	54	-8.24	-	-	-	-	67	117	V
* 15.9	65.1	PK1	37.3	-46.81	55.59	-	-	74	-18.41	68.2	-12.61	49	126	H
* 15.9	68.05	PK1	37.3	-46.81	58.54	-	-	74	-15.46	68.2	-9.66	67	117	V

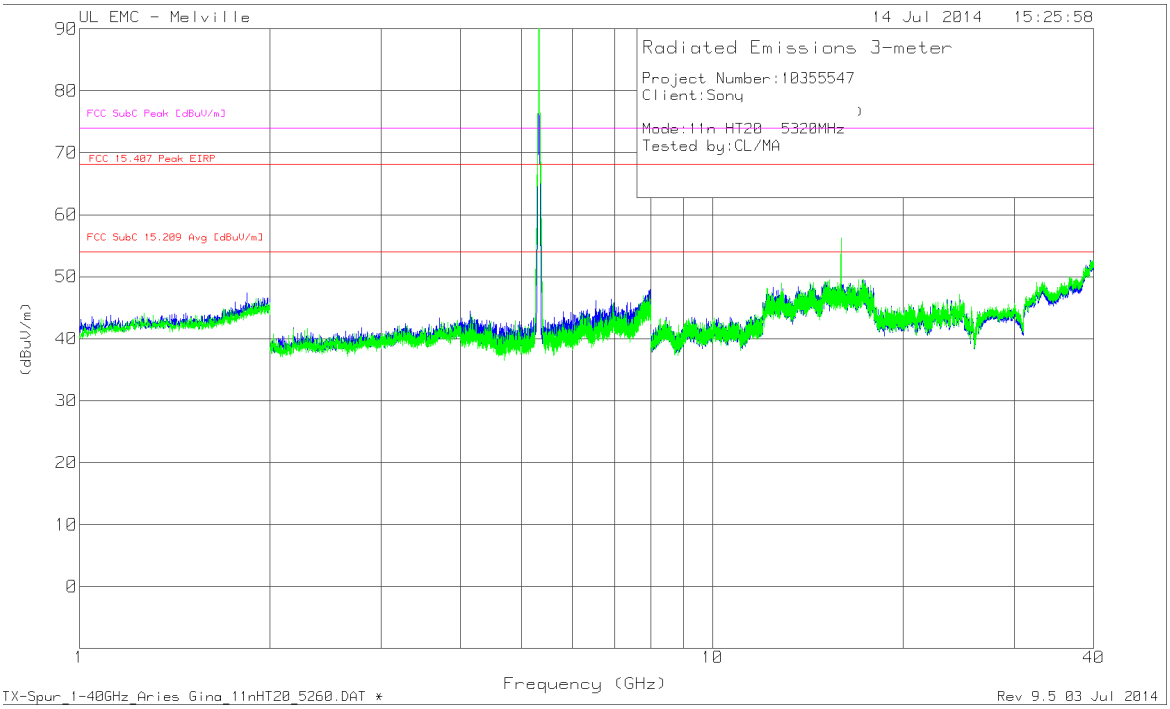
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor .

HIGH CHANNEL
HORIZONTAL & VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	Gain/Loss (dB)	Corrected Reading (dBuV/m)	FCC SubC 15.209 Avg [dBuV/m]	Margin (dB)	FCC SubC Peak [dBuV/m]	PK Margin (dB)	FCC 15.407 Peak EIRP	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.96	51.83	AD1	37.3	-46.9	42.23	54	-11.77	-	-	-	-	107	111	H
* 15.96	55.37	AD1	37.3	-46.9	45.77	54	-8.23	-	-	-	-	112	162	V
* 15.96	64.44	PK1	37.3	-46.9	54.84	-	-	74	-19.16	68.2	-13.36	107	111	H
* 15.96	68.17	PK1	37.3	-46.9	58.57	-	-	74	-15.43	68.2	-9.63	112	162	V

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

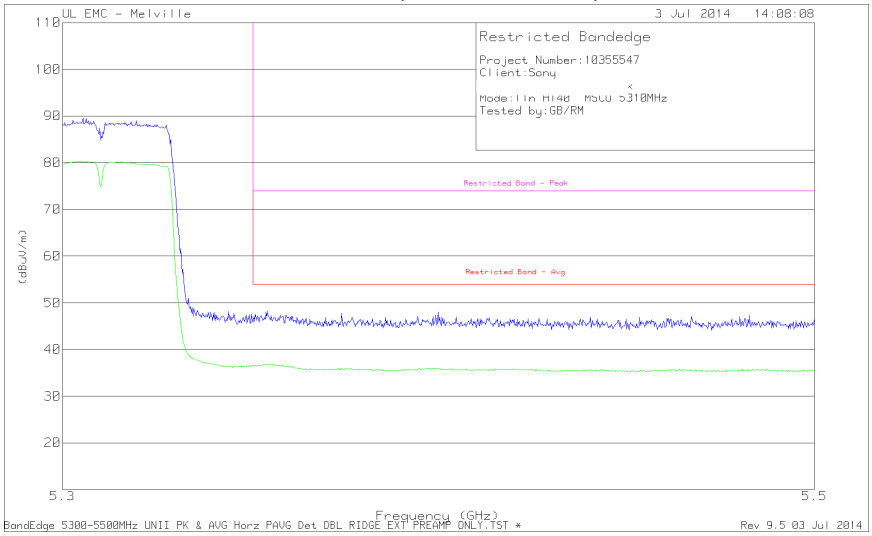
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

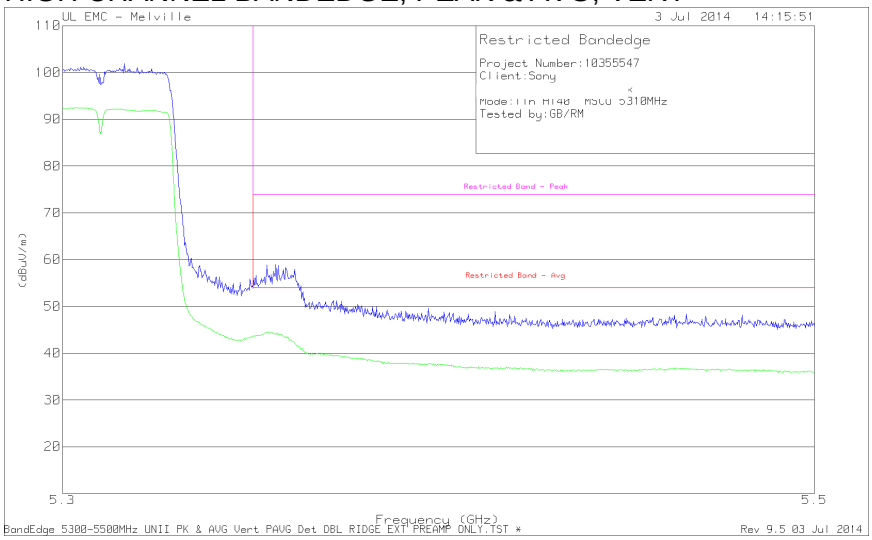
Note: Emission was scanned up to 40GHz; No additional emissions were detected above the noise floor.

11.2.5. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK & AVG, HORIZ

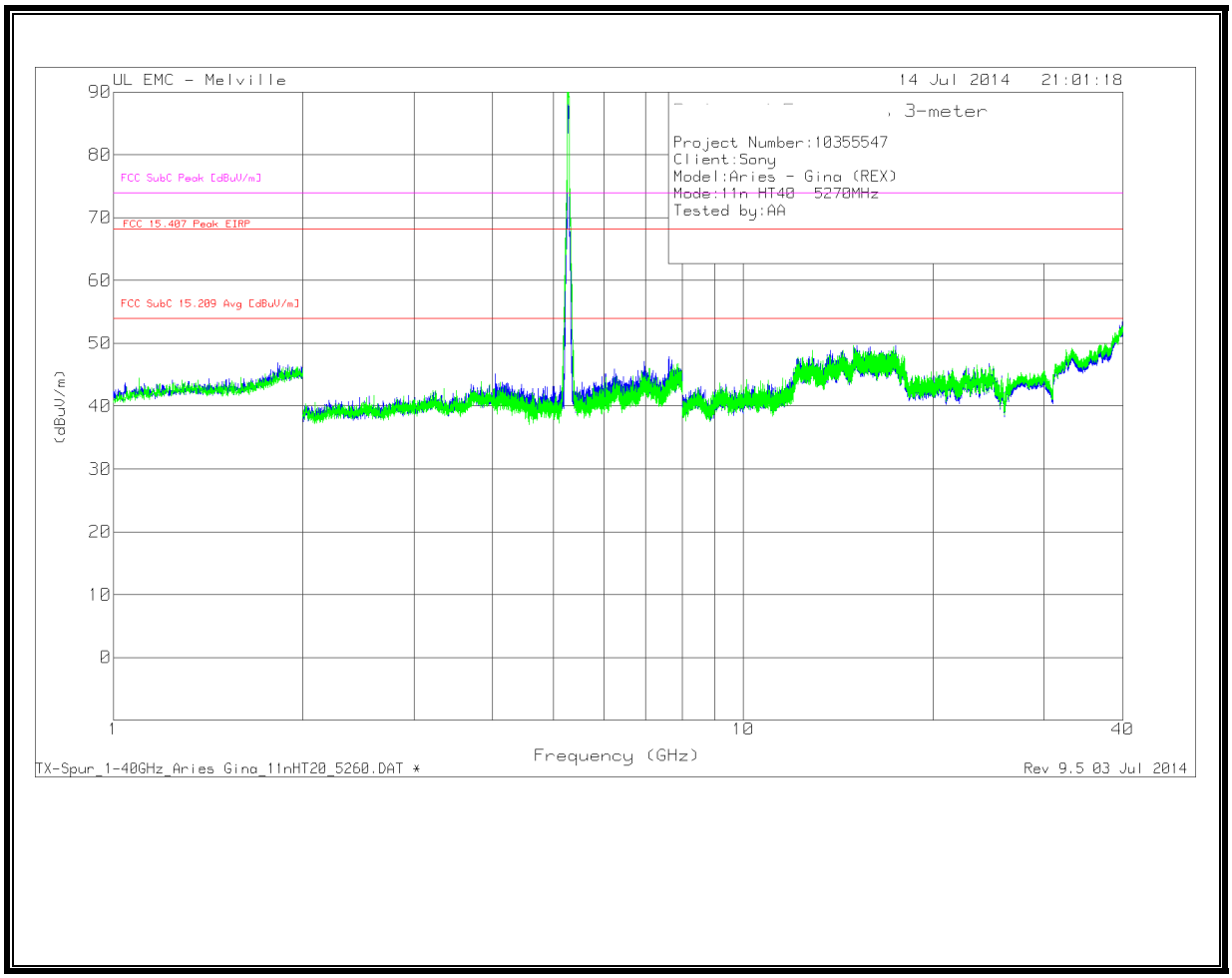


HIGH CHANNEL BANDEDGE, PEAK & AVG, VERT



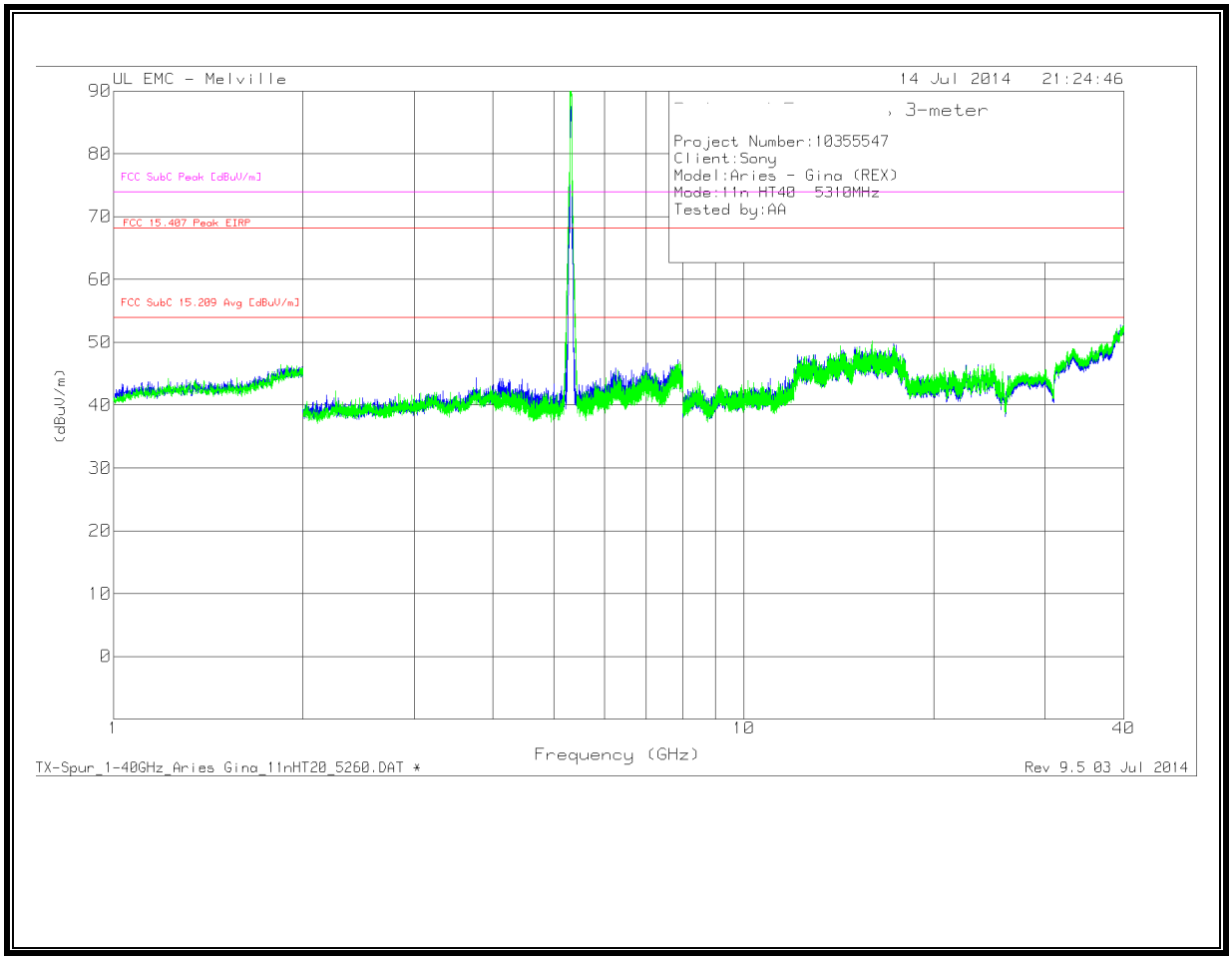
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

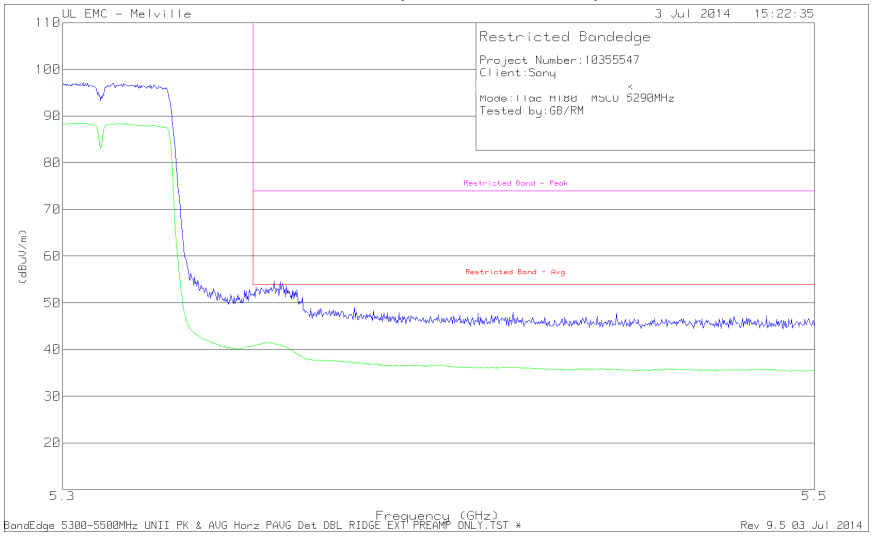
MID CHANNEL
HORIZONTAL & VERTICAL



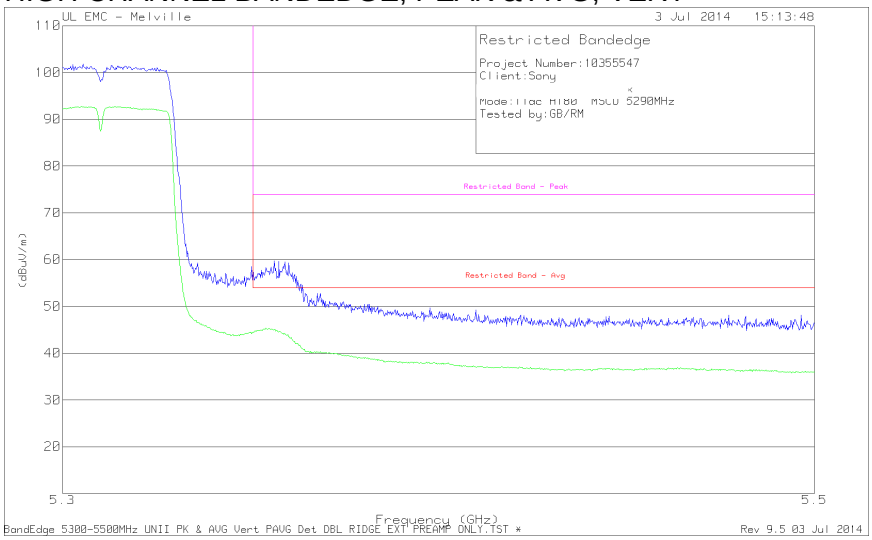
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

11.2.7. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK & AVG, HORIZ

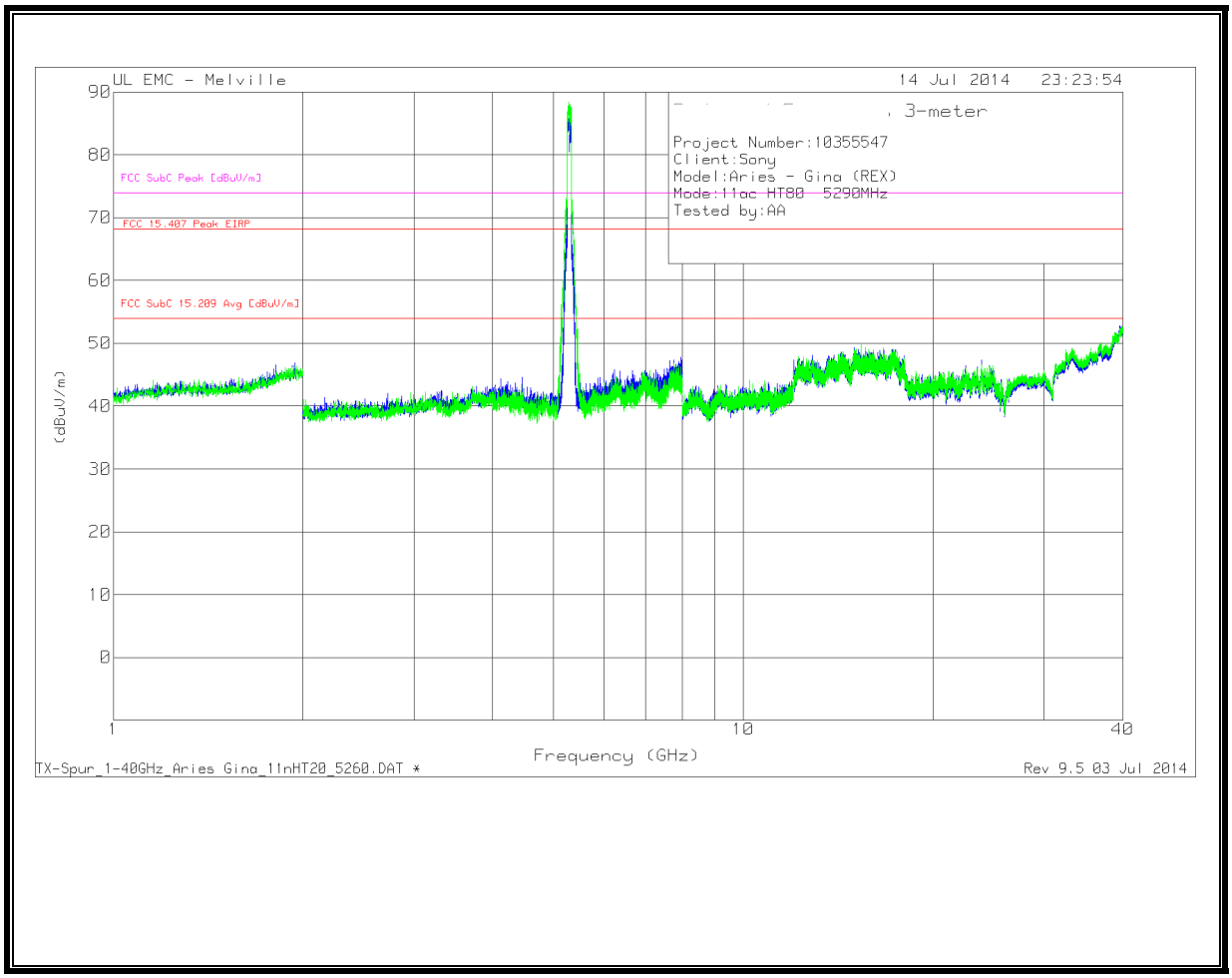


HIGH CHANNEL BANDEDGE, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



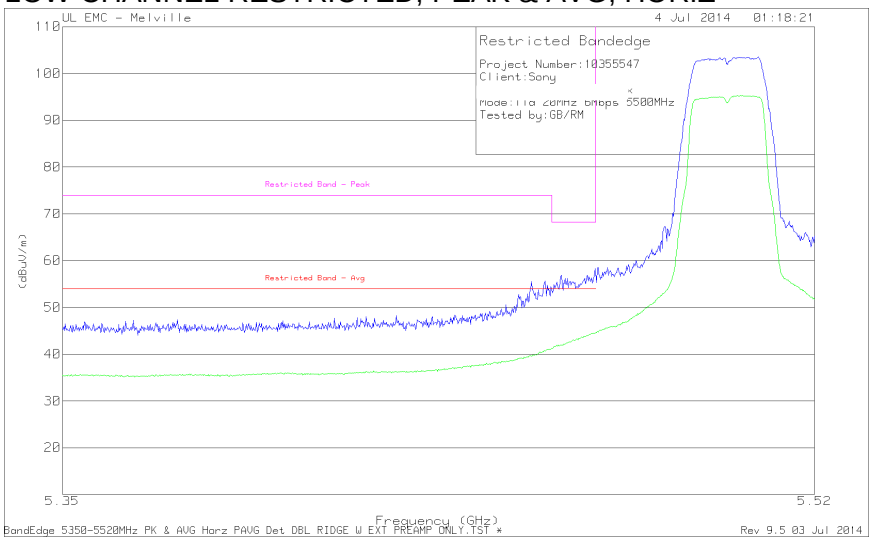
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

11.3. 5.5-5.6 GHz

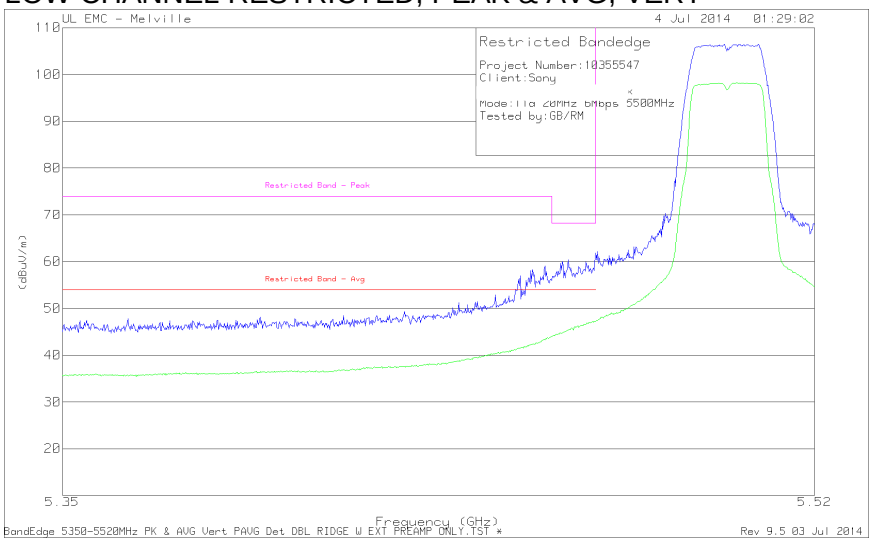
11.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

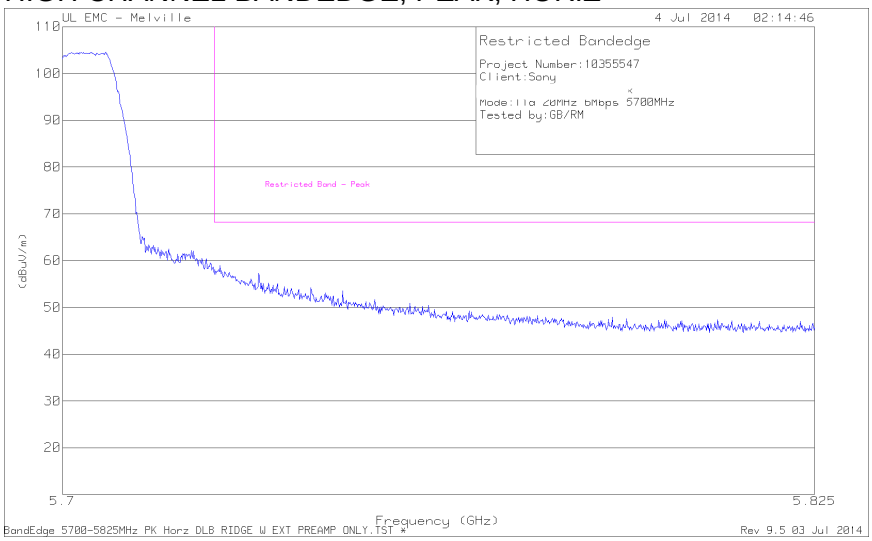


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

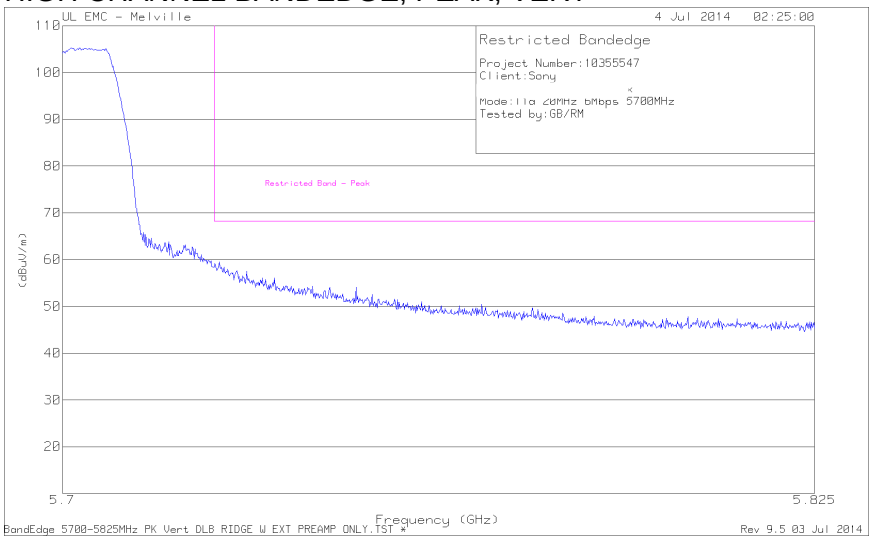


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

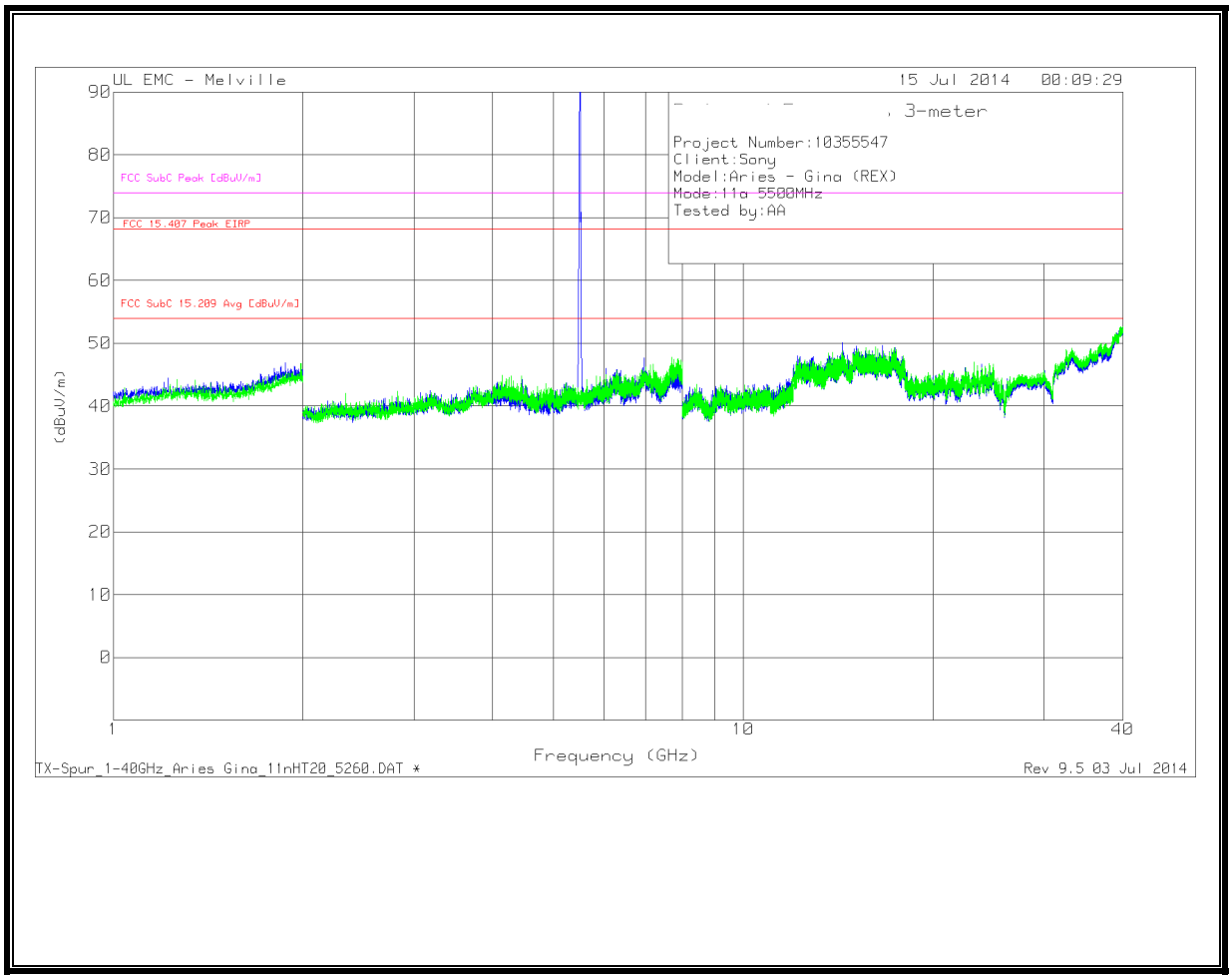


HIGH CHANNEL BANDEDGE, PEAK, VERT



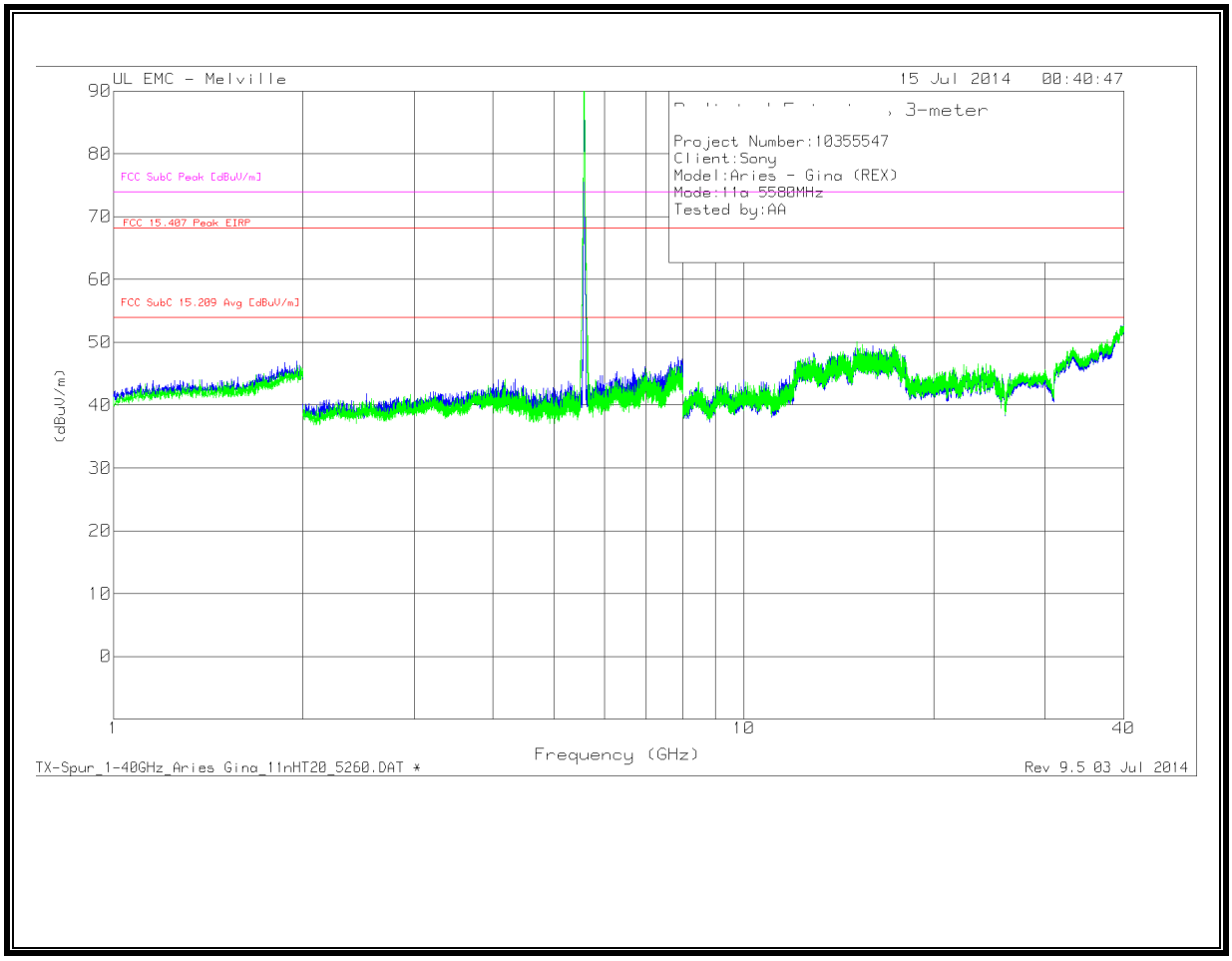
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERICAL



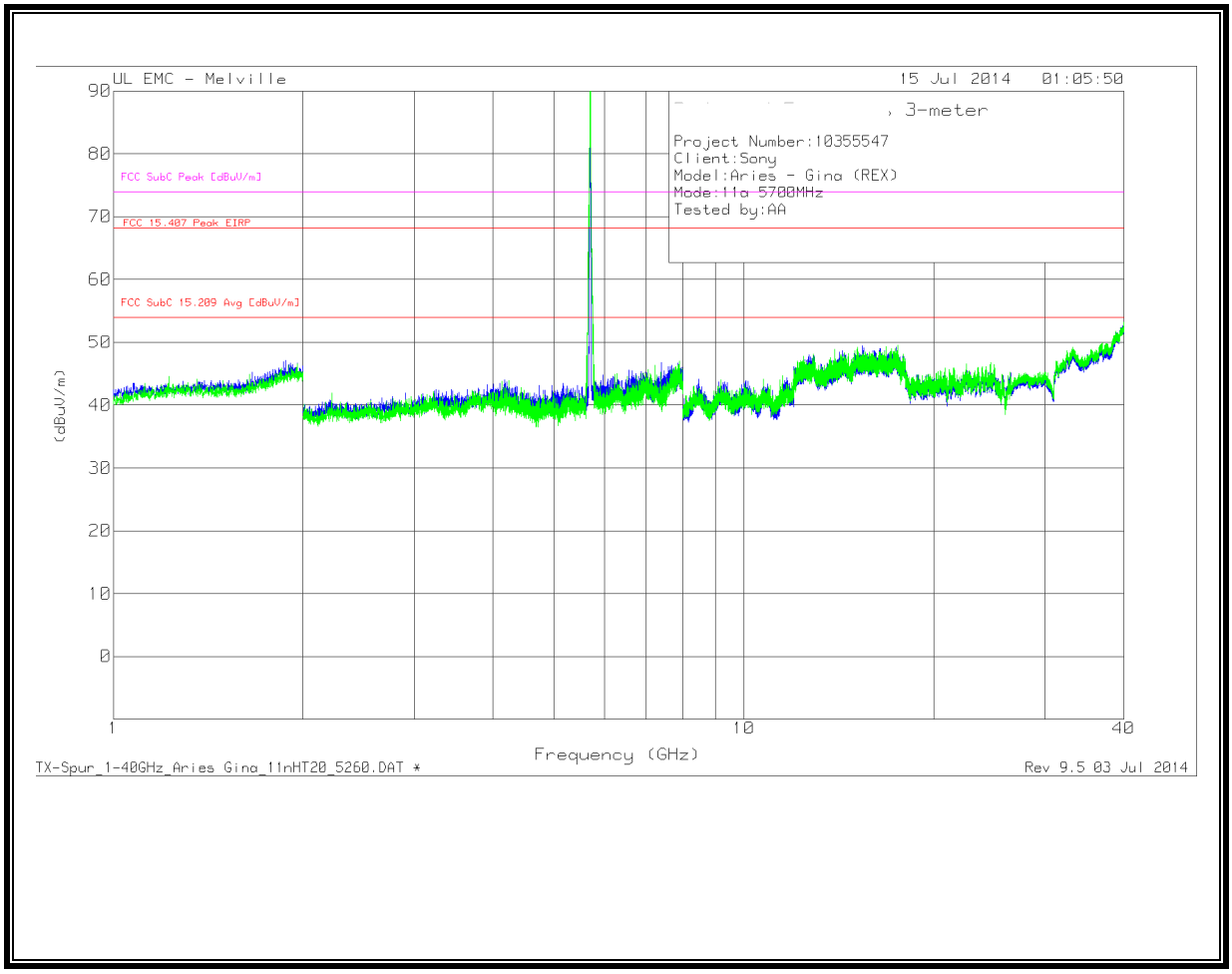
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

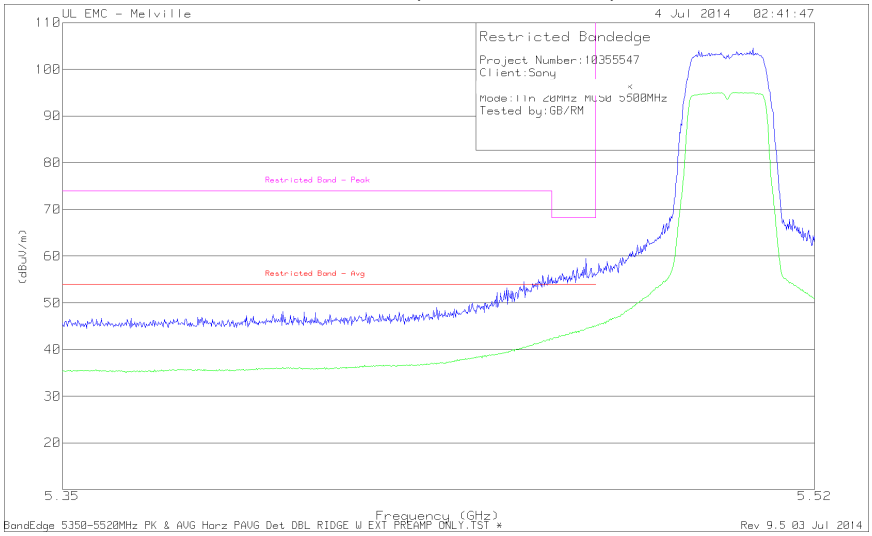
HIGH CHANNEL
HORIZONTAL & VERICAL



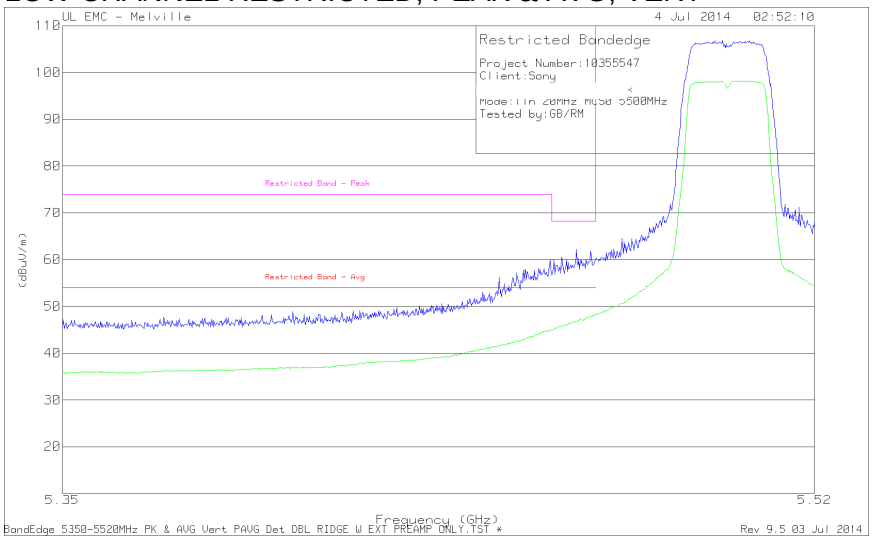
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

11.3.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

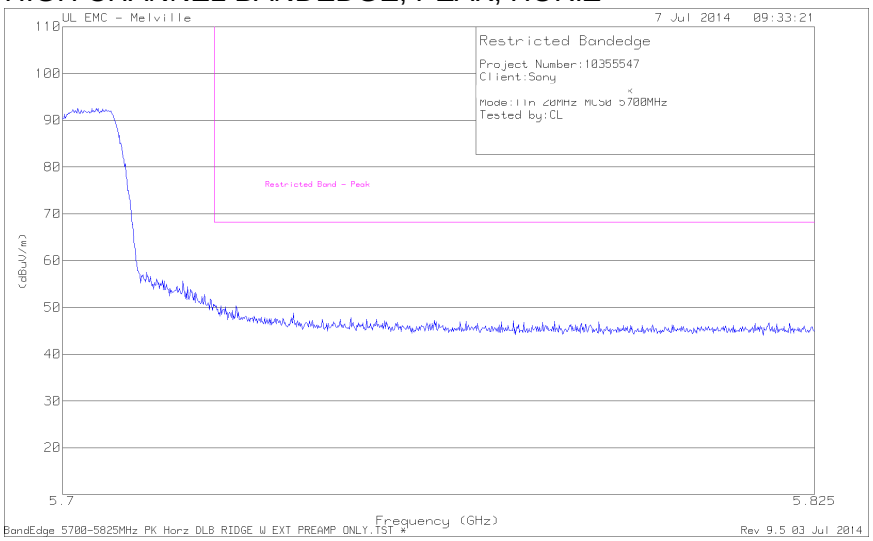


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

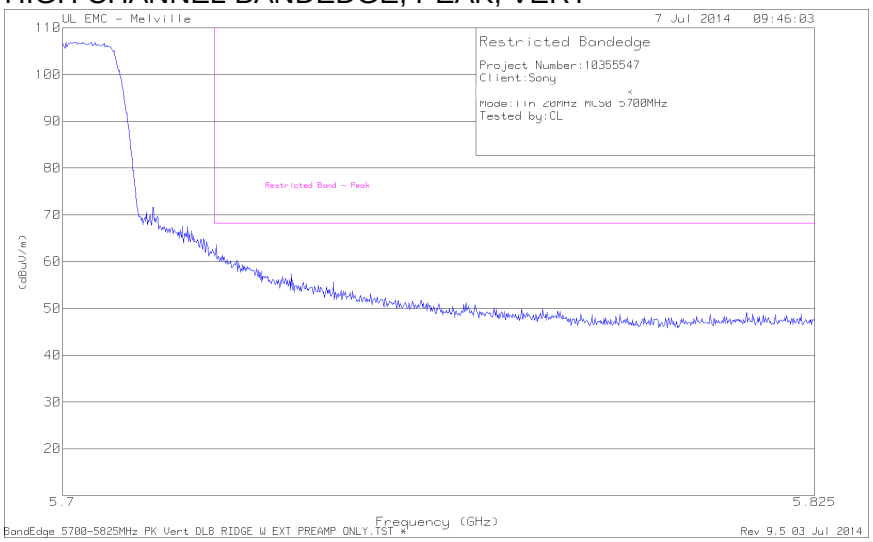


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

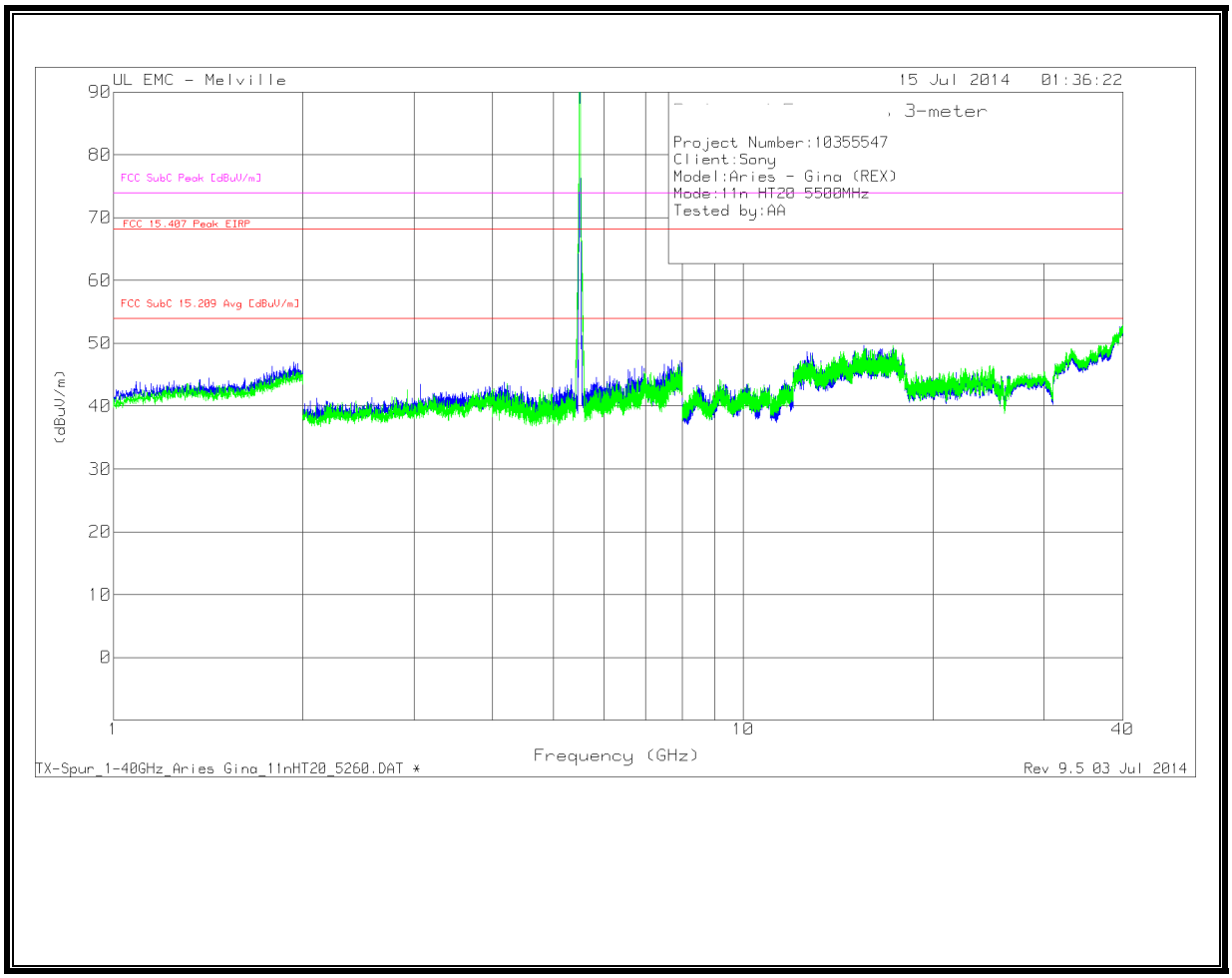


HIGH CHANNEL BANDEDGE, PEAK, VERT



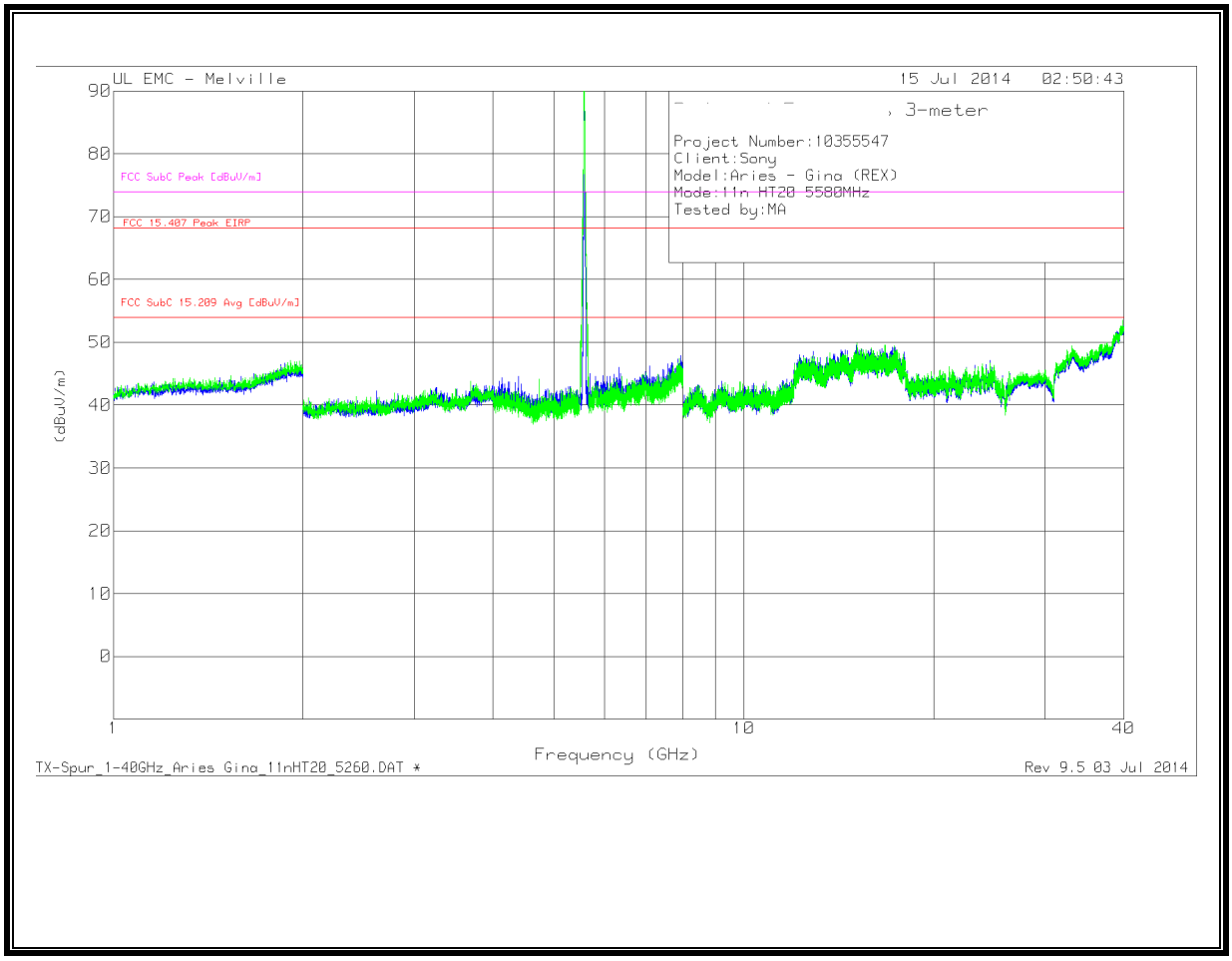
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERICAL



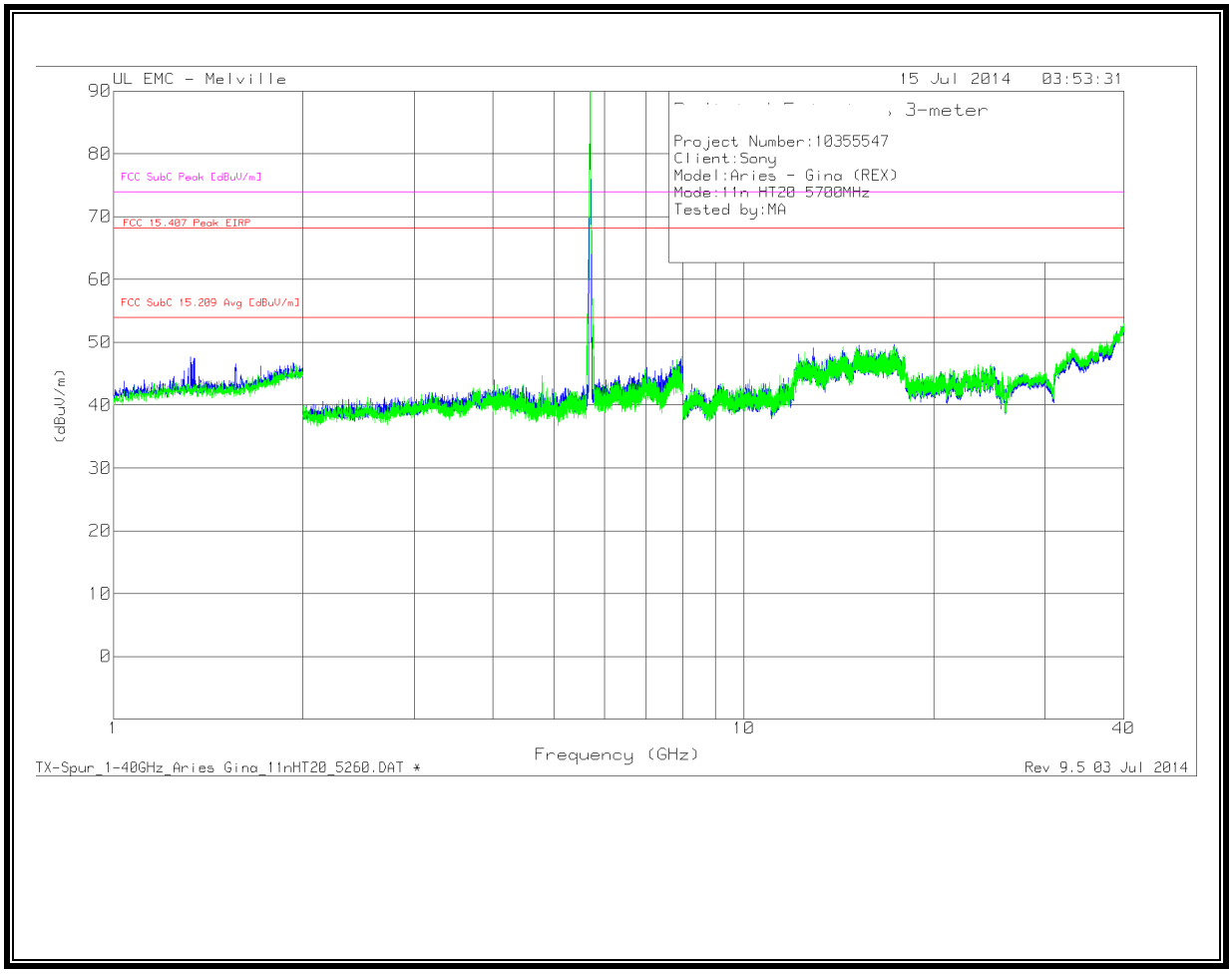
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

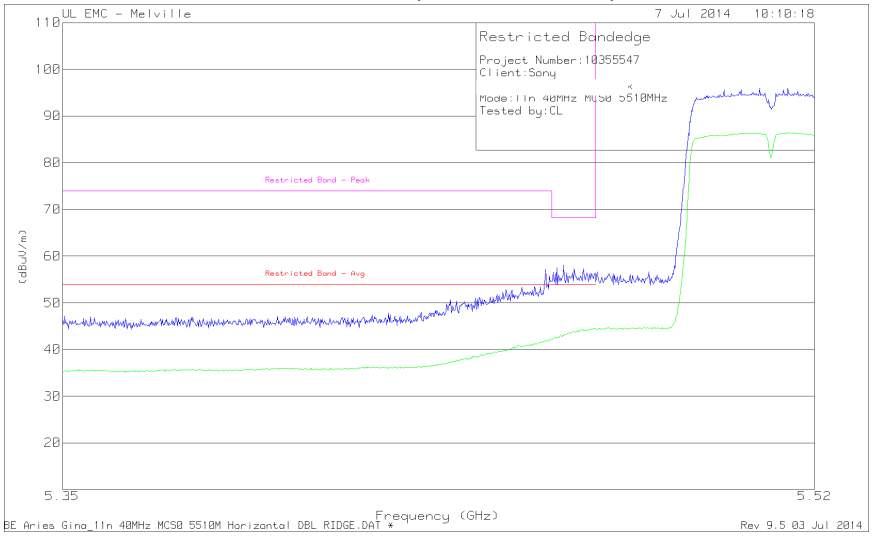
HIGH CHANNEL
HORIZONTAL & VERICAL



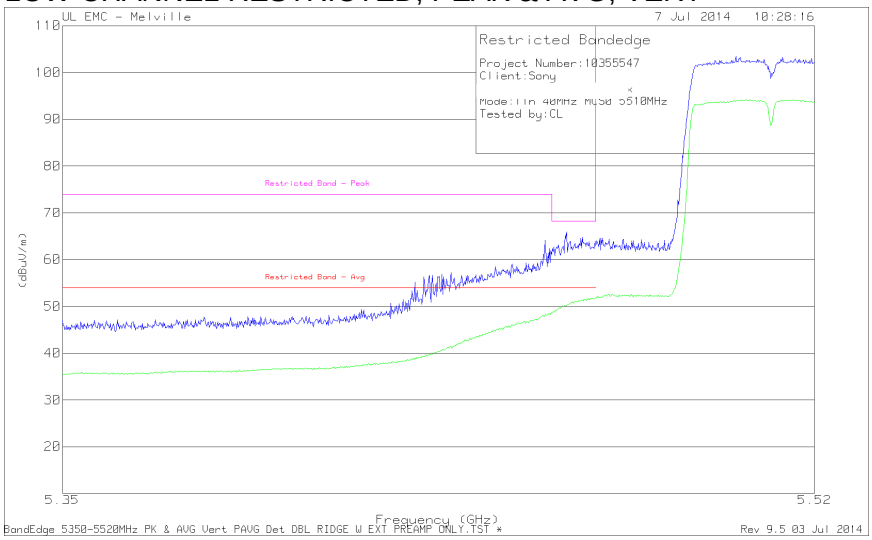
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

11.3.5. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

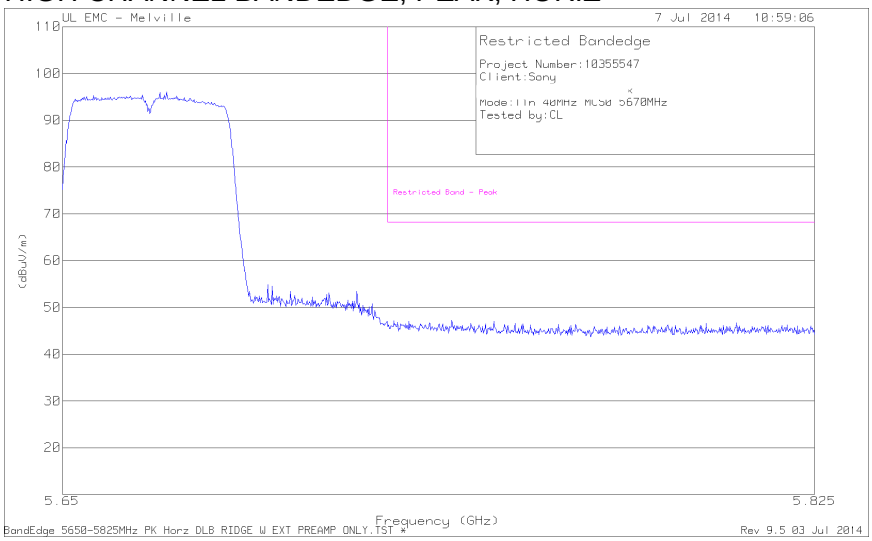


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT

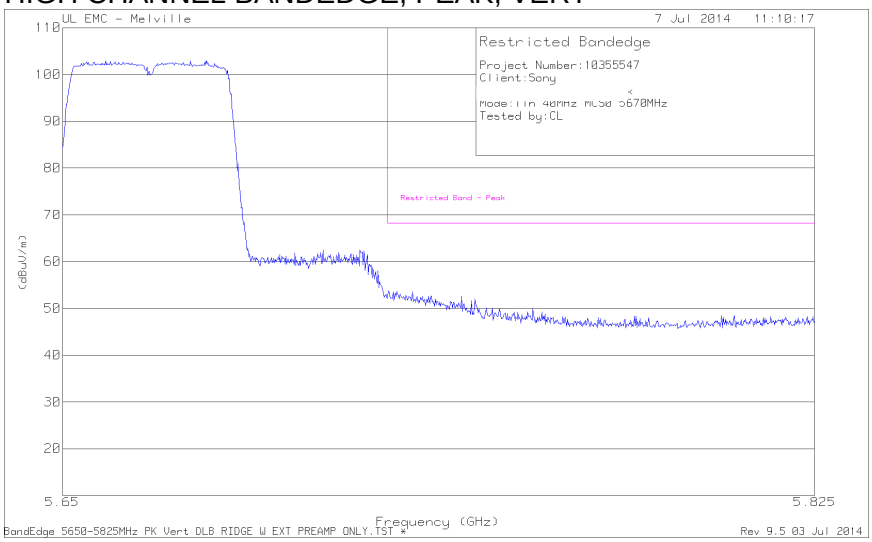


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

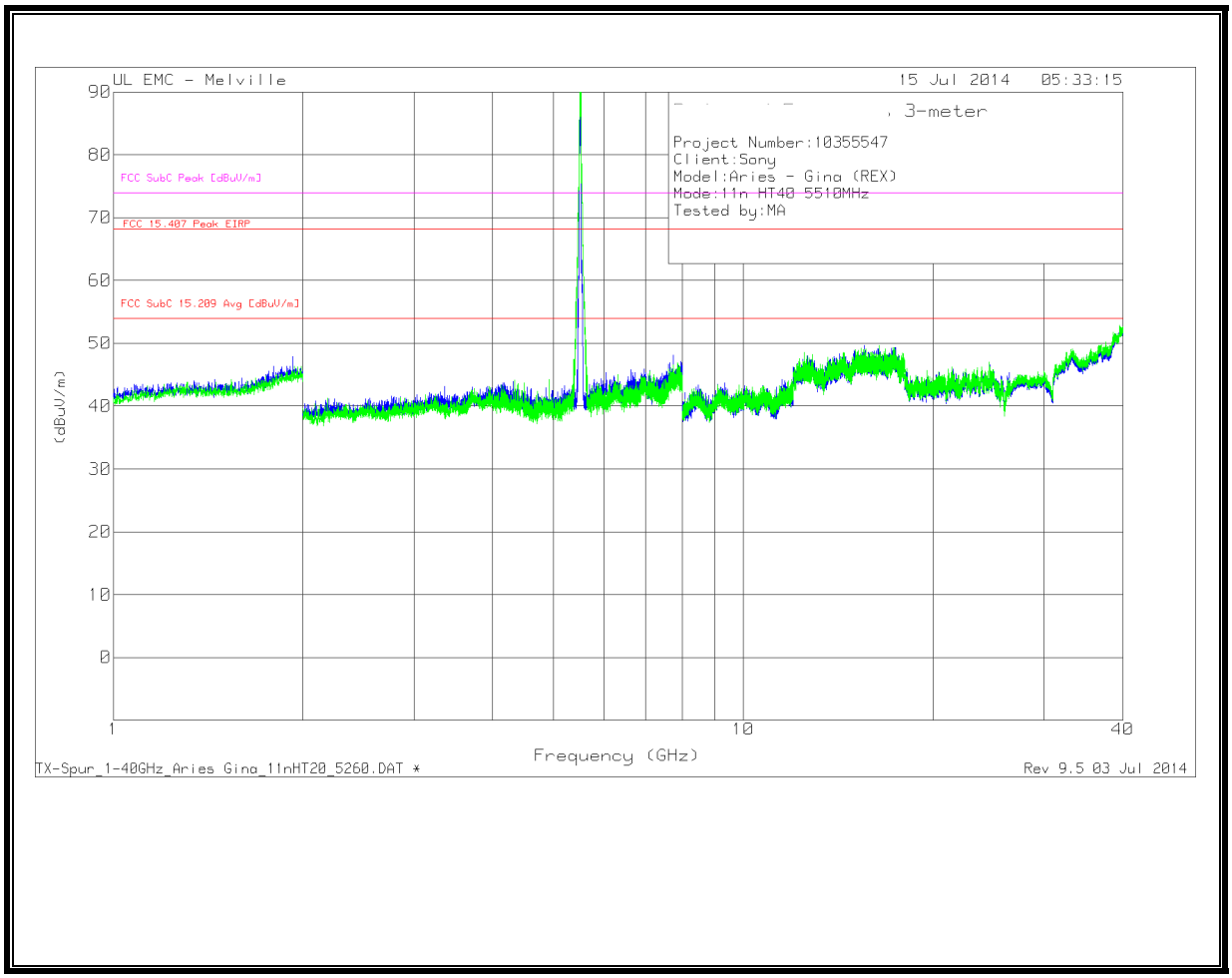


HIGH CHANNEL BANDEDGE, PEAK, VERT



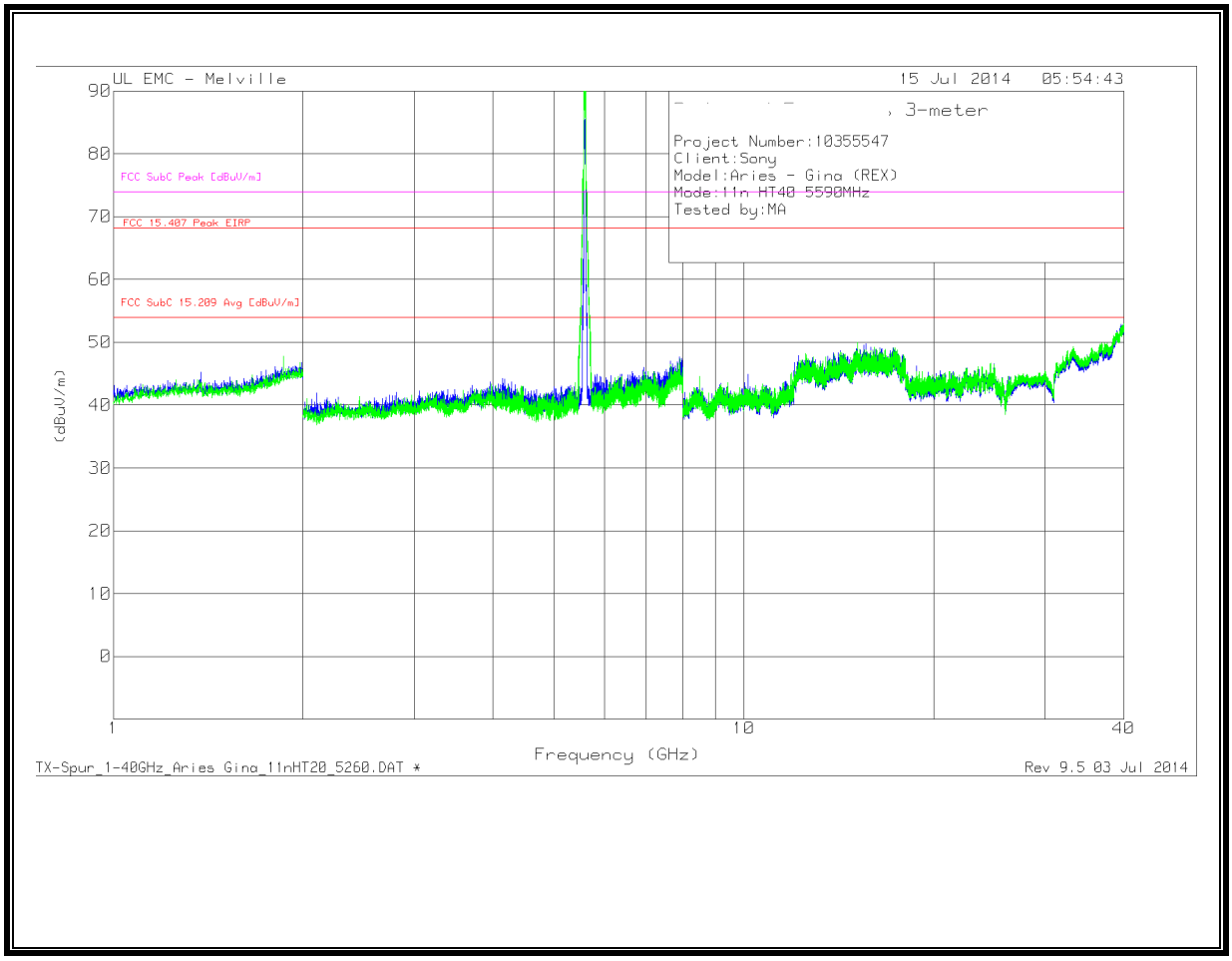
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERICAL



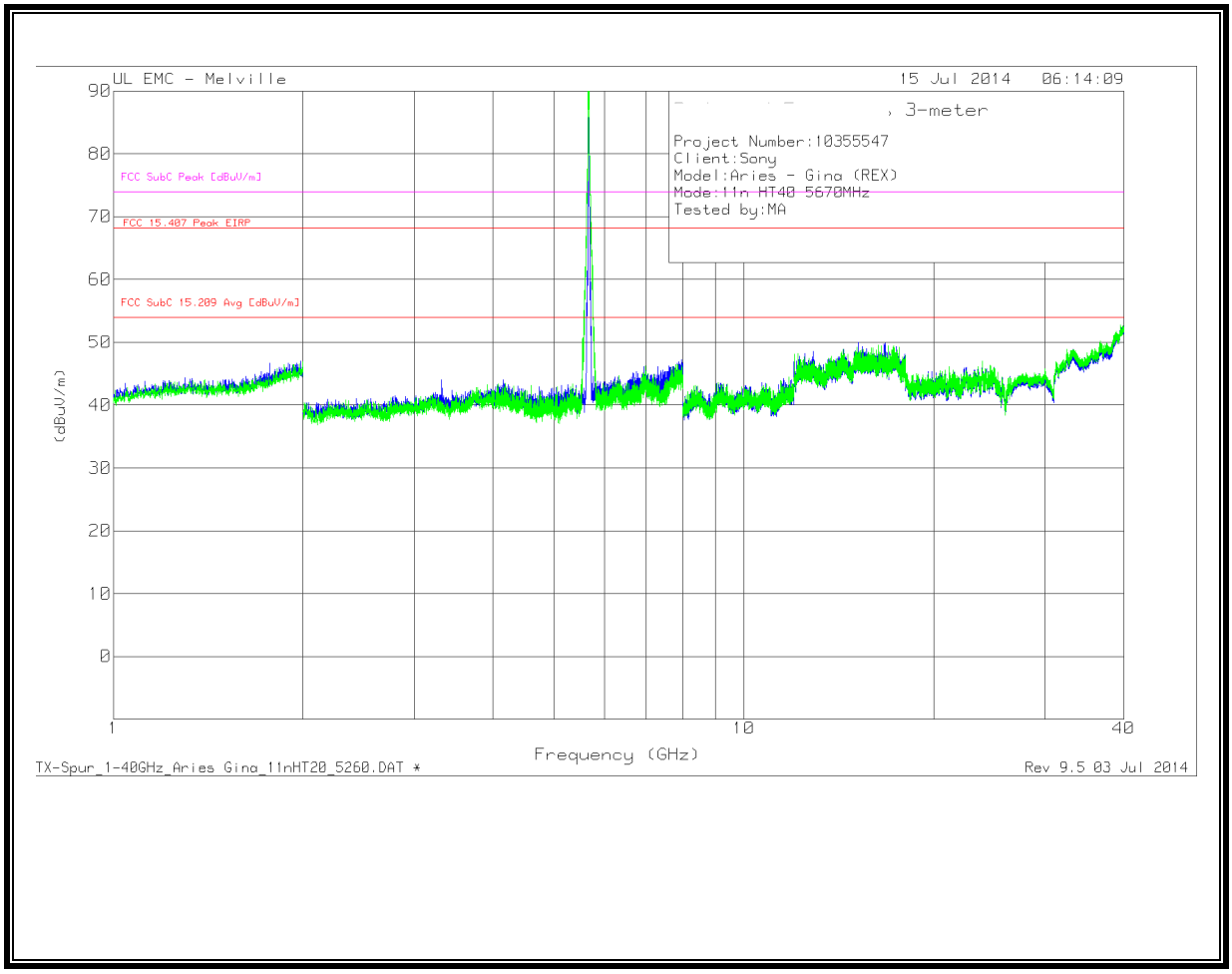
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

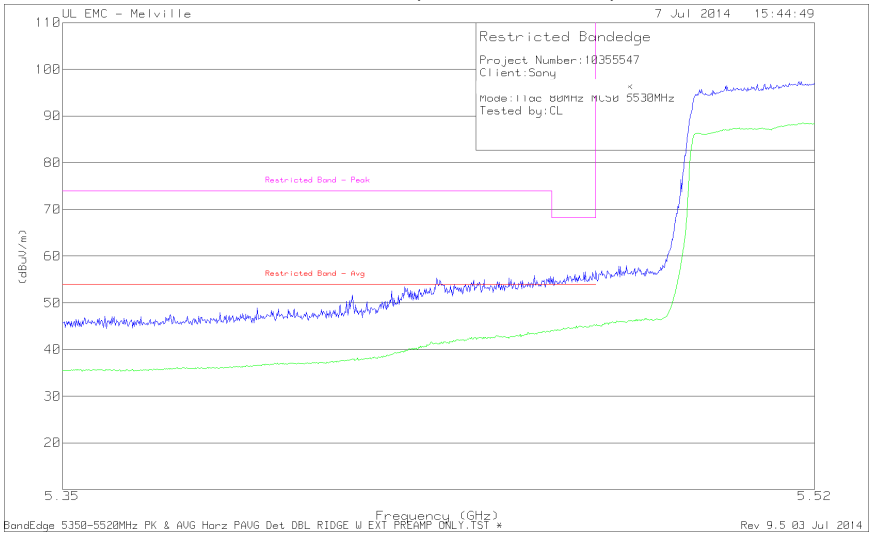
HIGH CHANNEL
HORIZONTAL & VERICAL



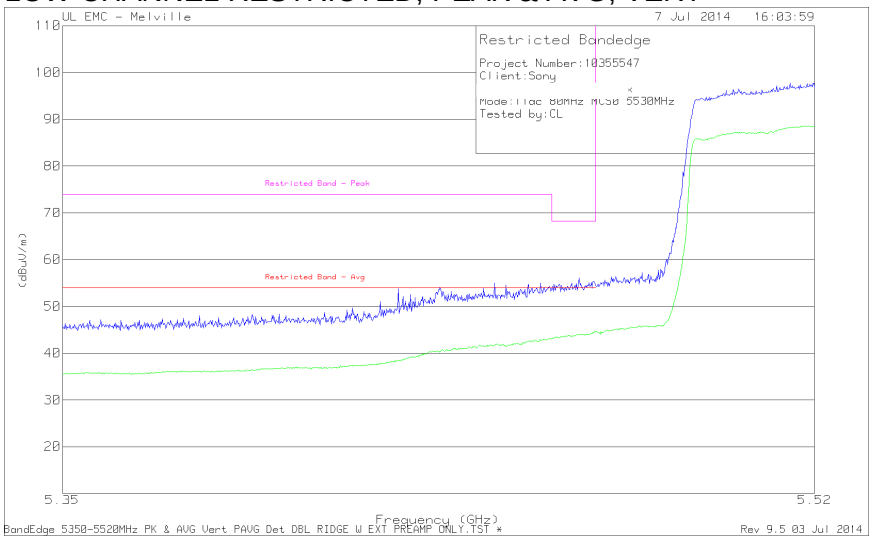
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

11.3.7. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK & AVG, HORIZ

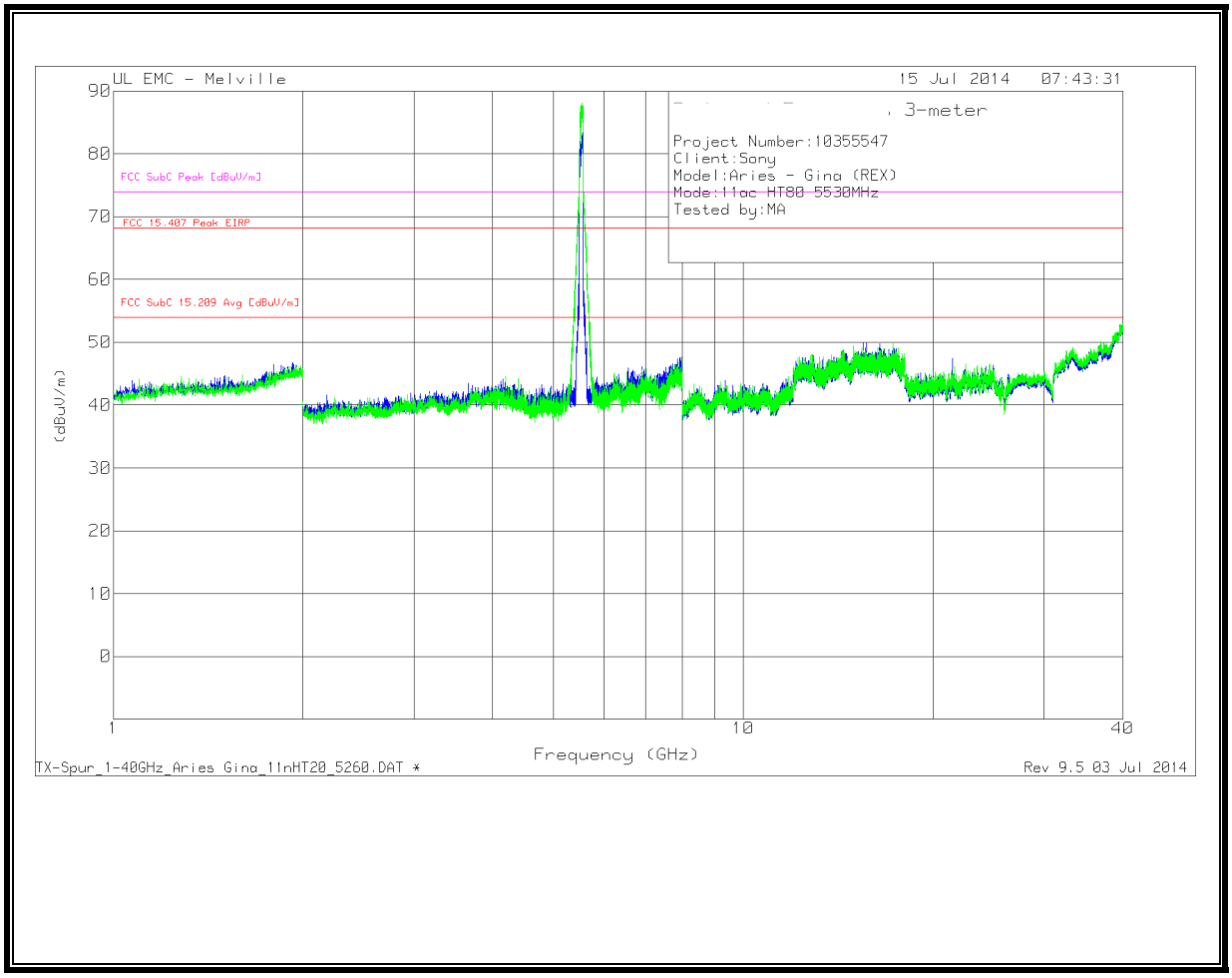


LOW CHANNEL RESTRICTED, PEAK & AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



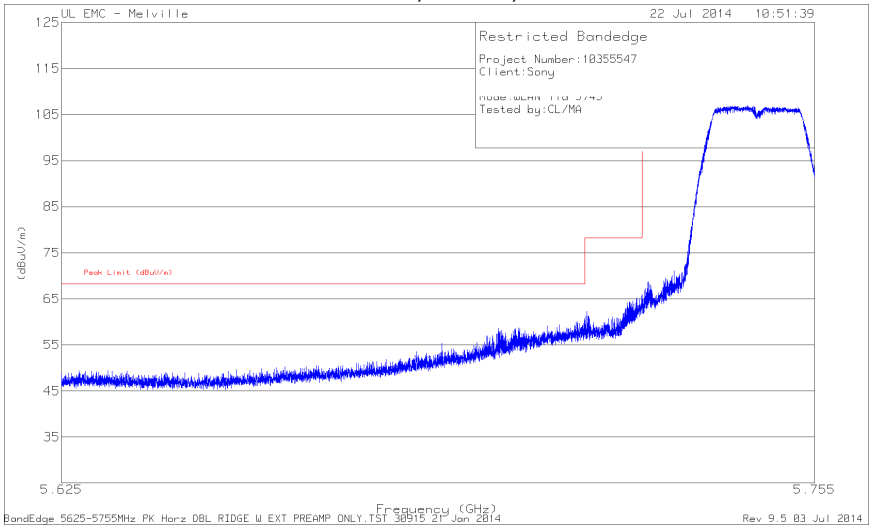
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

11.4. 5.8 GHz

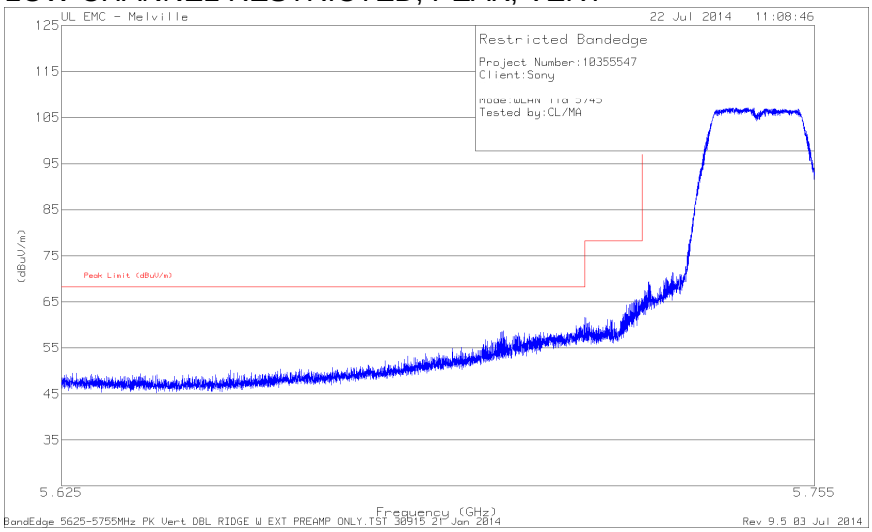
11.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ

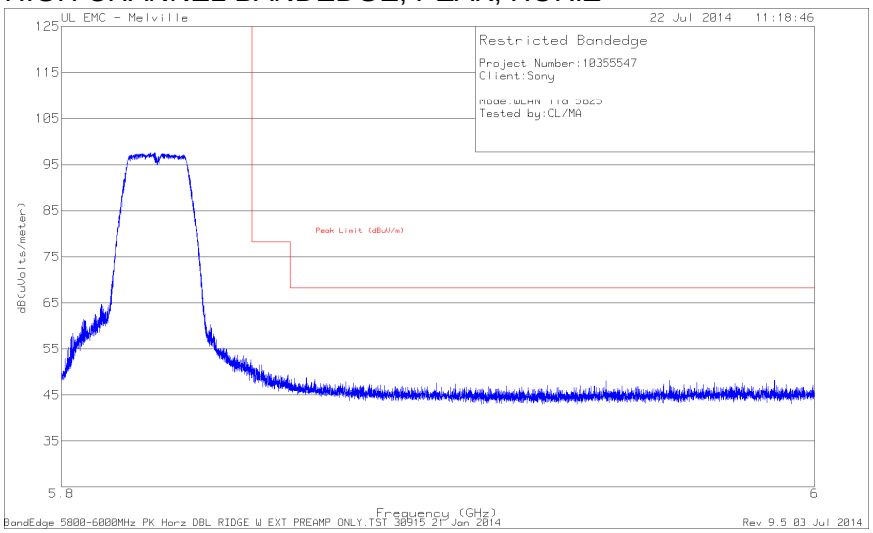


LOW CHANNEL RESTRICTED, PEAK, VERT

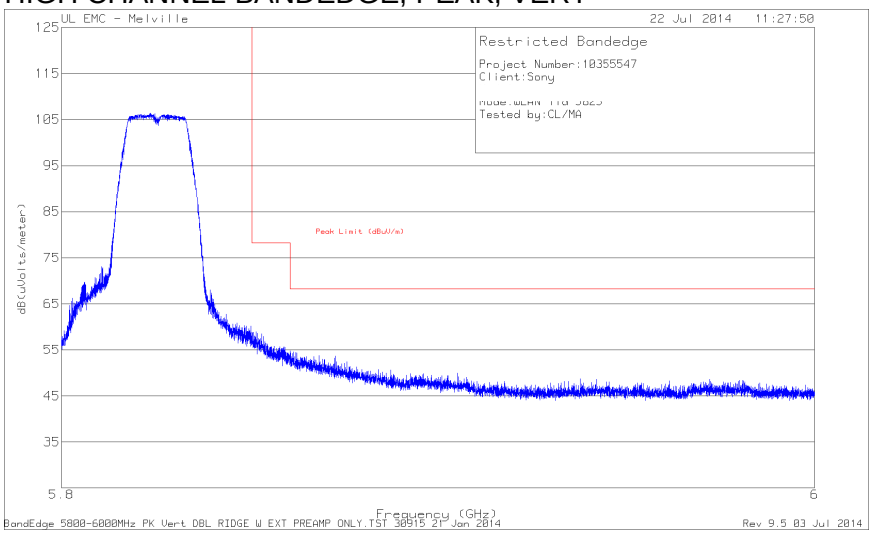


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

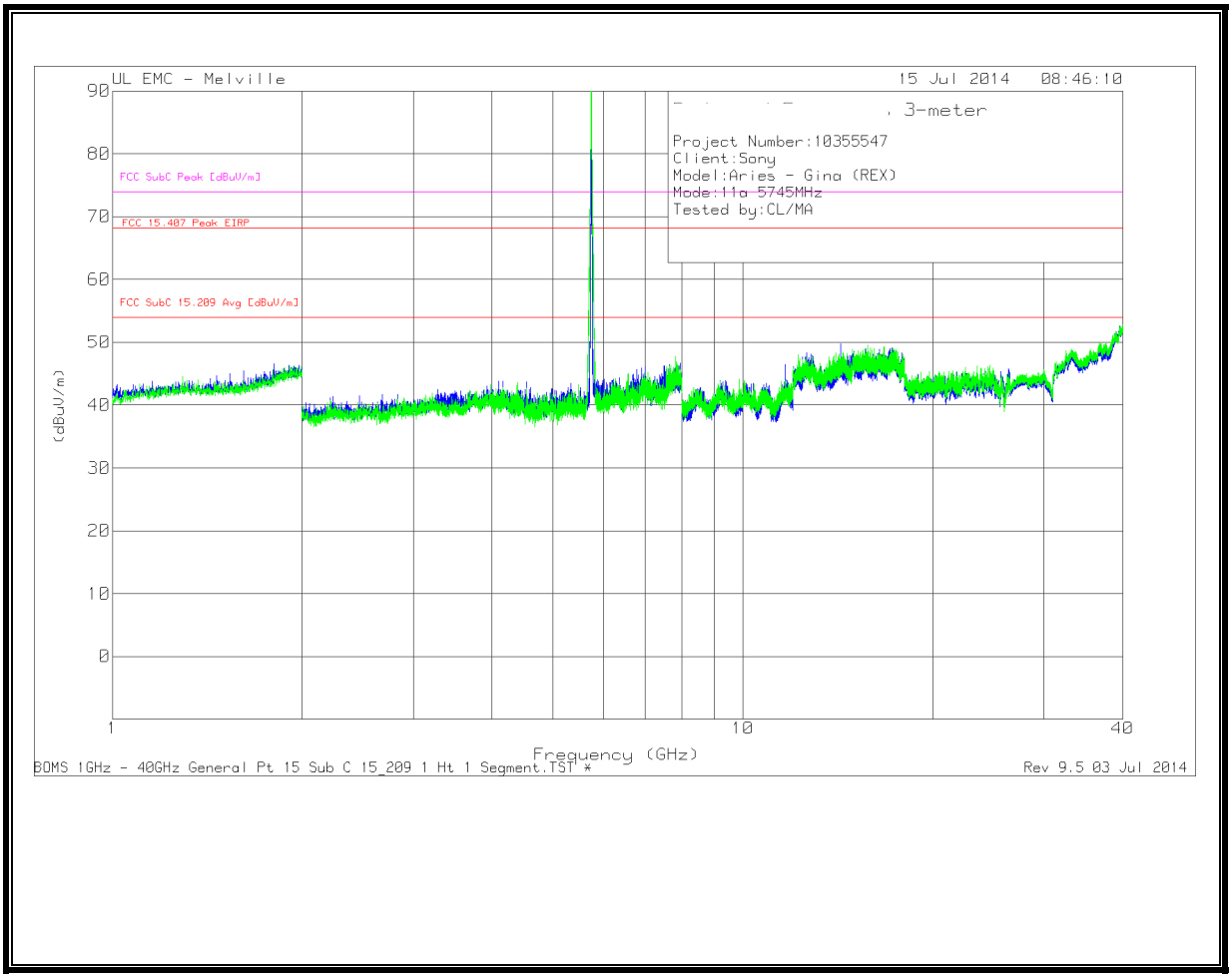


HIGH CHANNEL BANDEDGE, PEAK, VERT



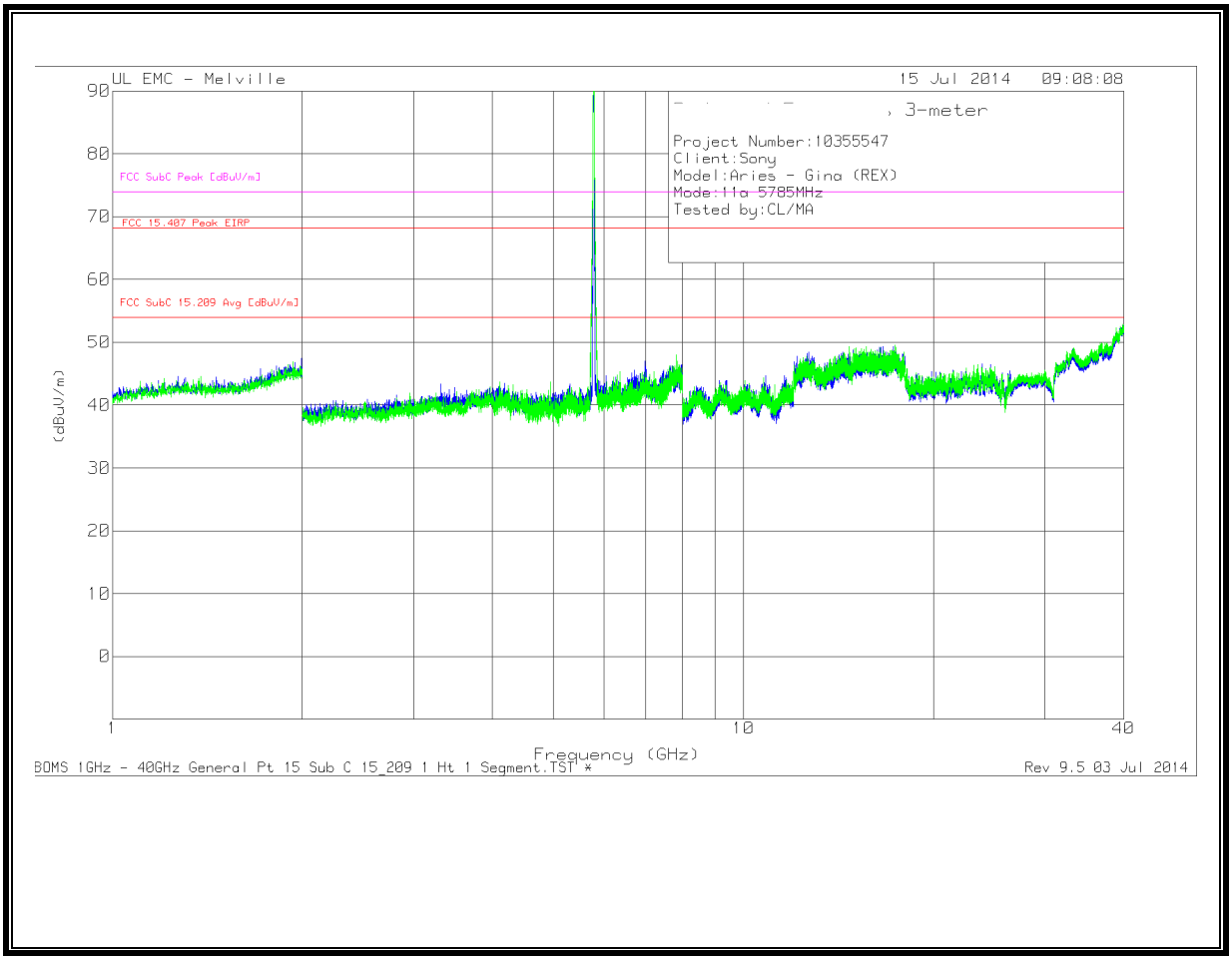
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



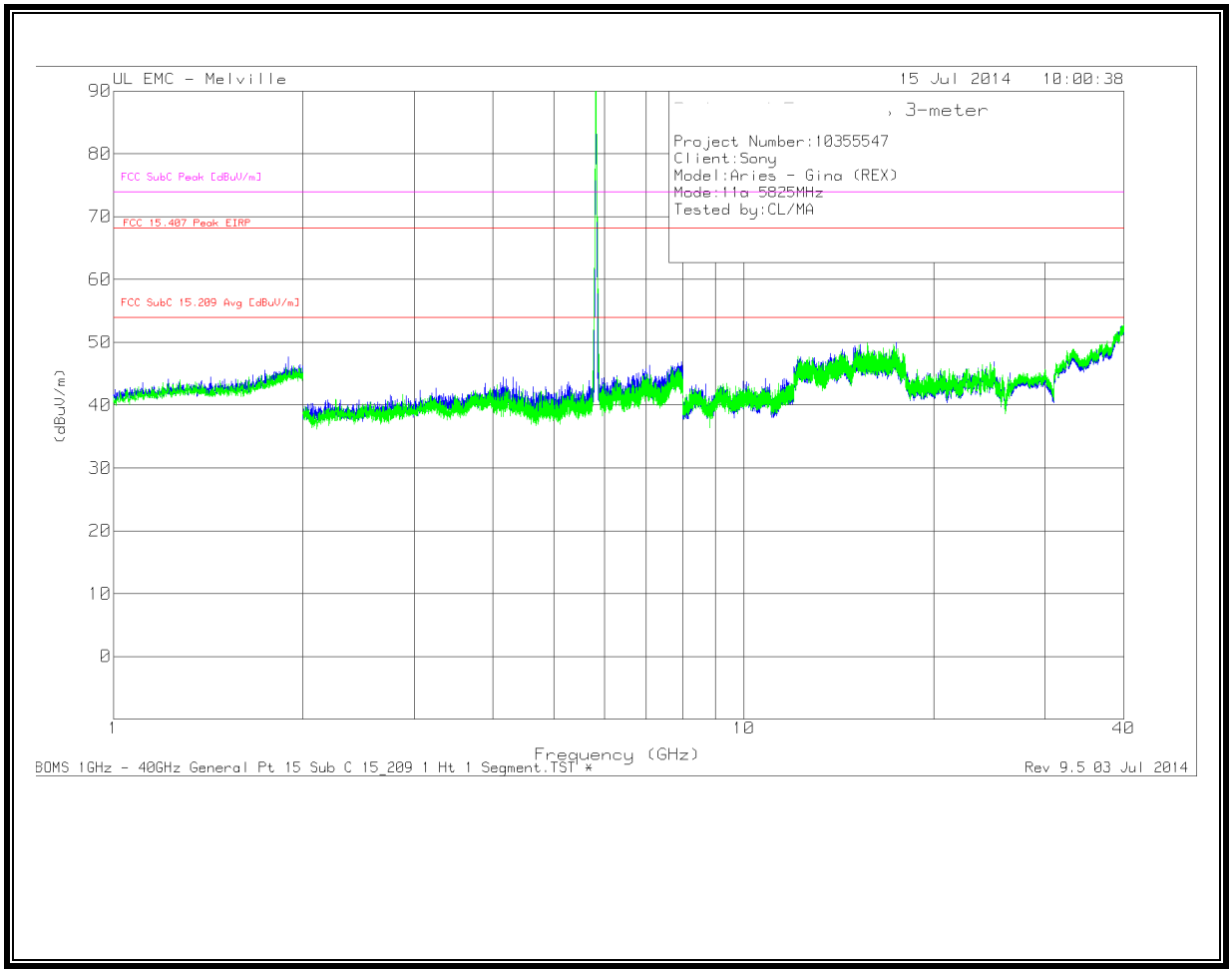
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

HIGH CHANNEL
HORIZONTAL & VERTICAL

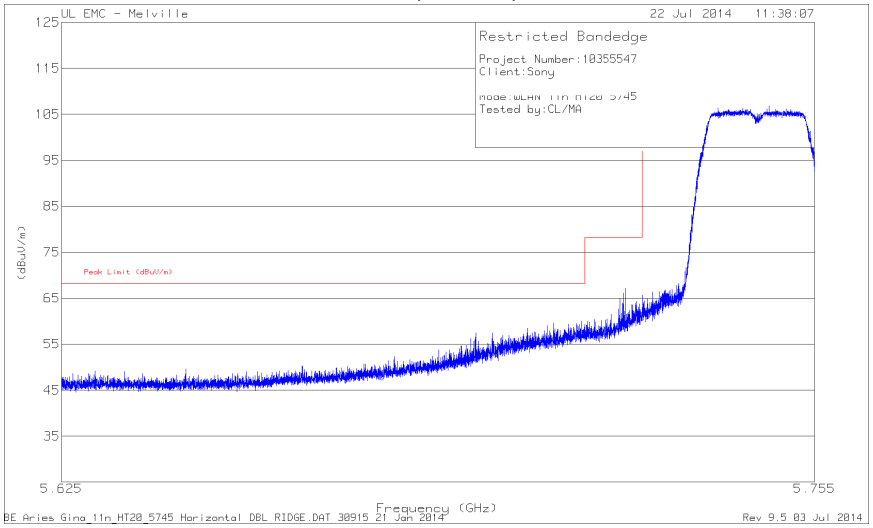


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

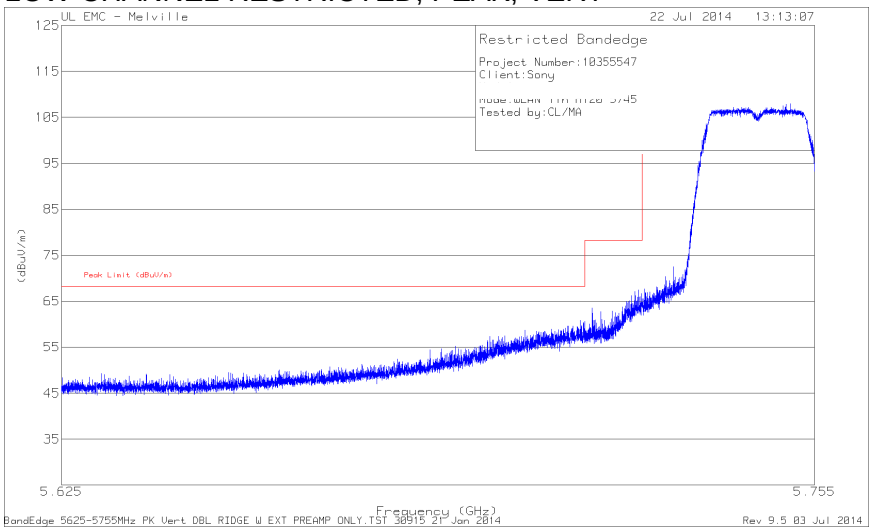
11.4.1. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ

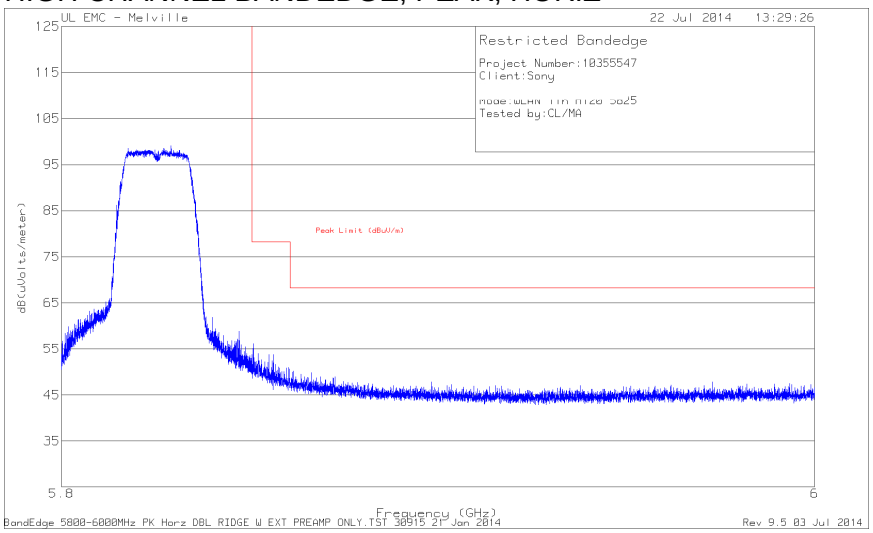


LOW CHANNEL RESTRICTED, PEAK, VERT

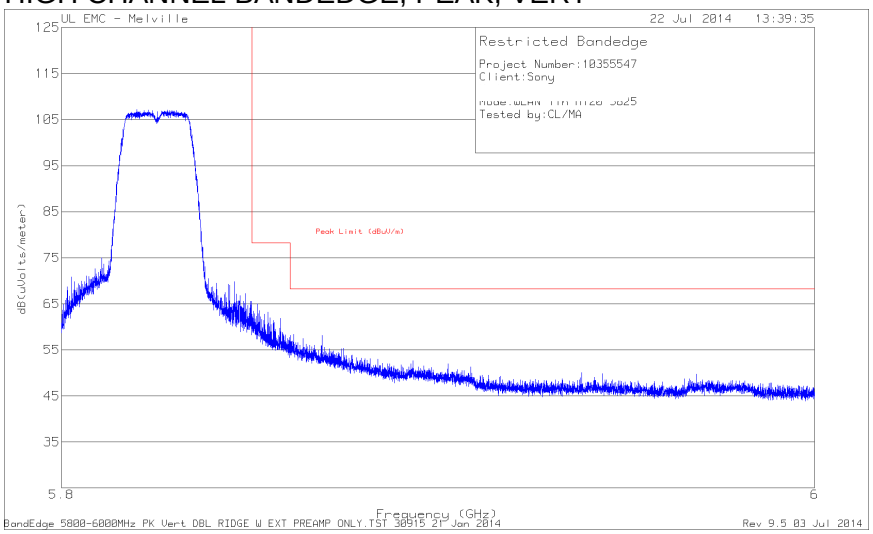


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

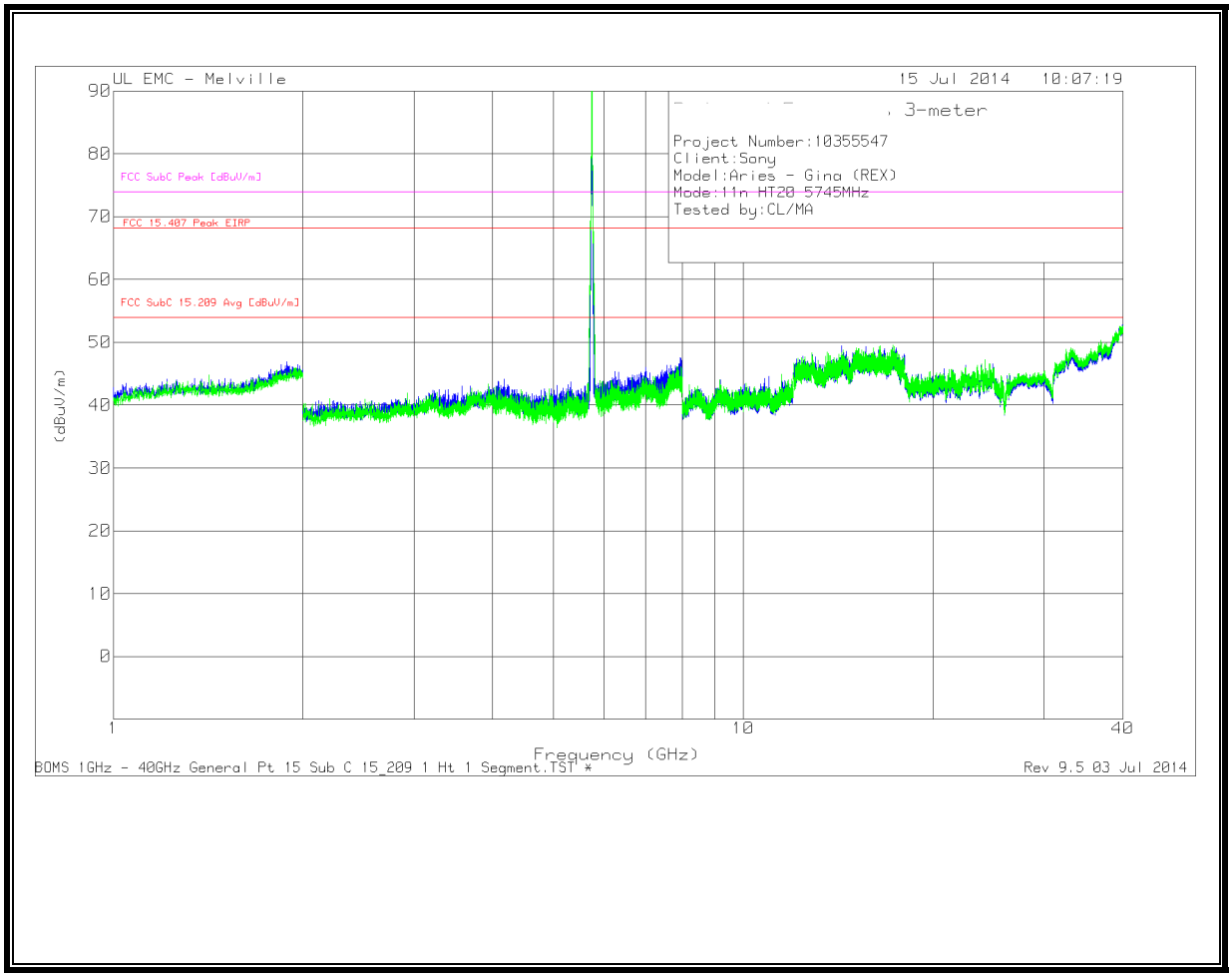


HIGH CHANNEL BANDEDGE, PEAK, VERT



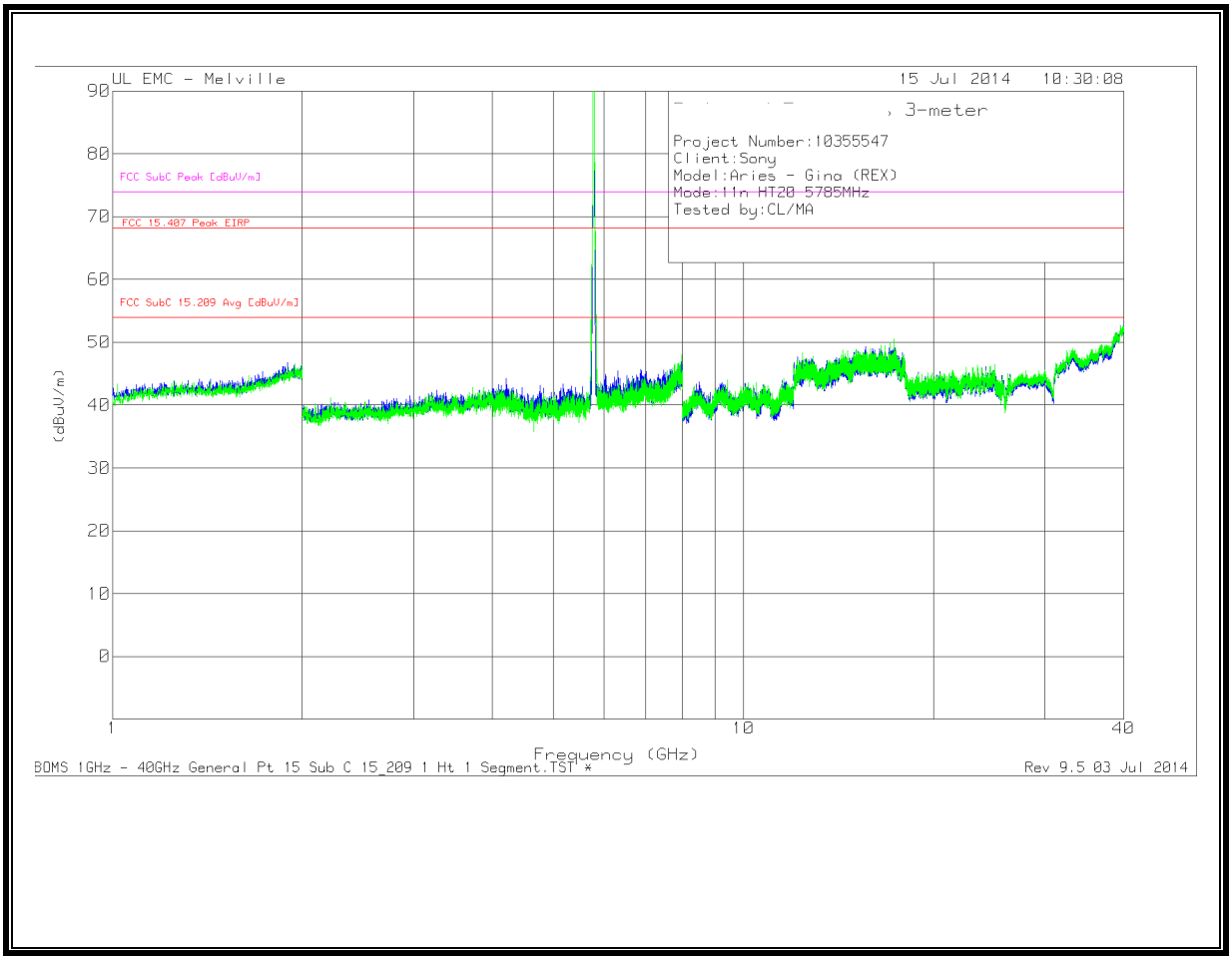
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



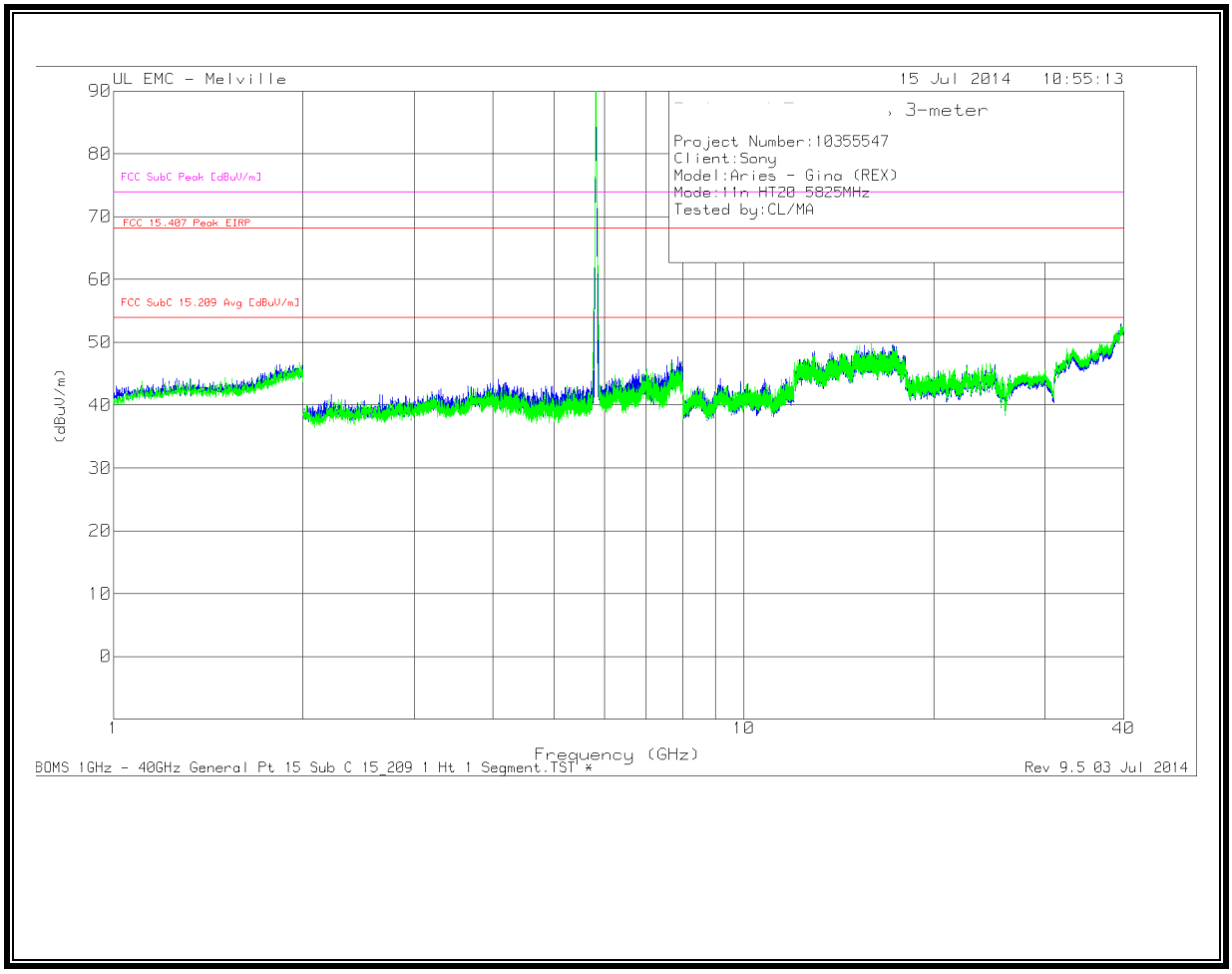
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

MID CHANNEL
HORIZONTAL & VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

HIGH CHANNEL
HORIZONTAL & VERTICAL

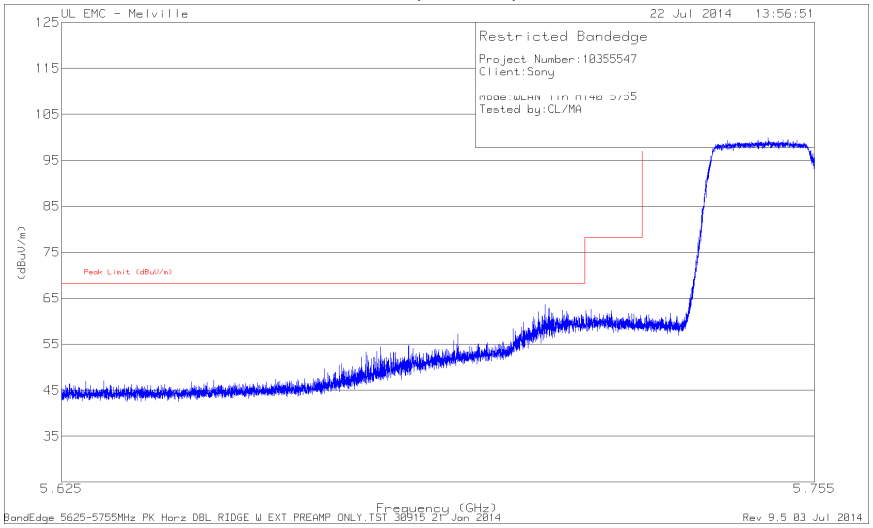


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

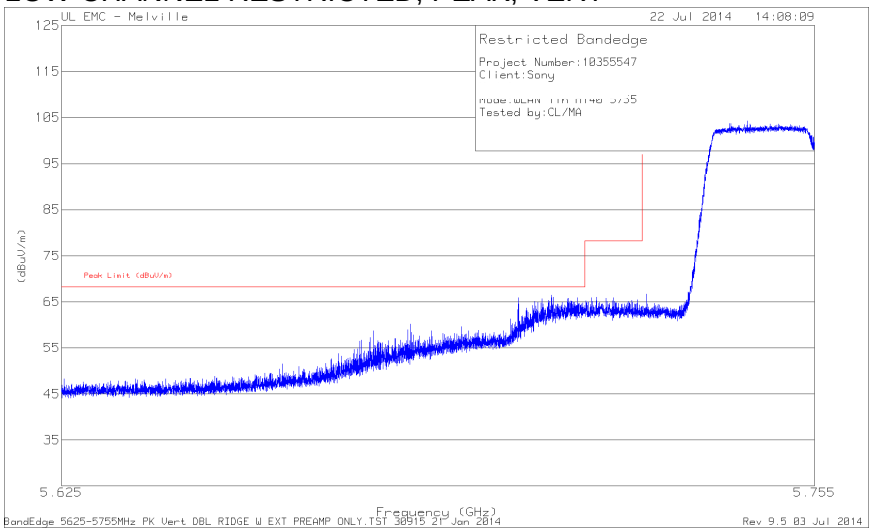
11.4.1. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ

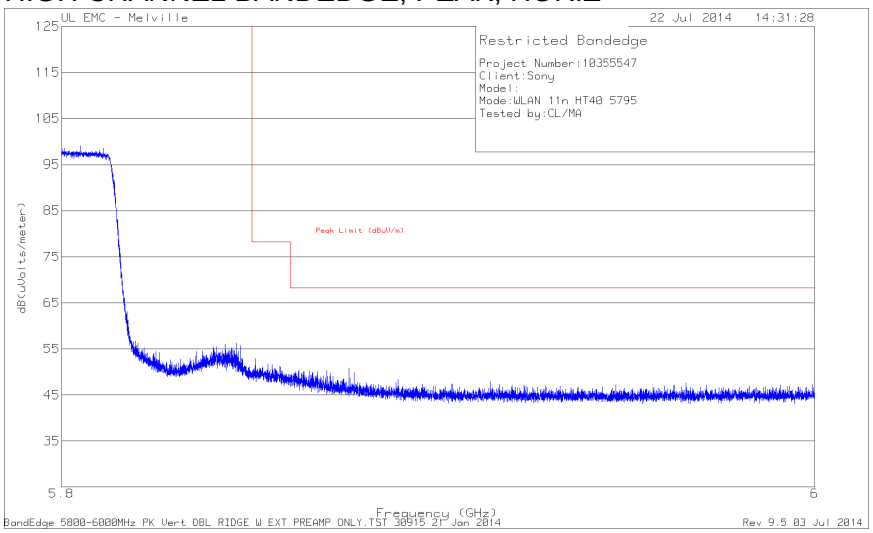


LOW CHANNEL RESTRICTED, PEAK, VERT

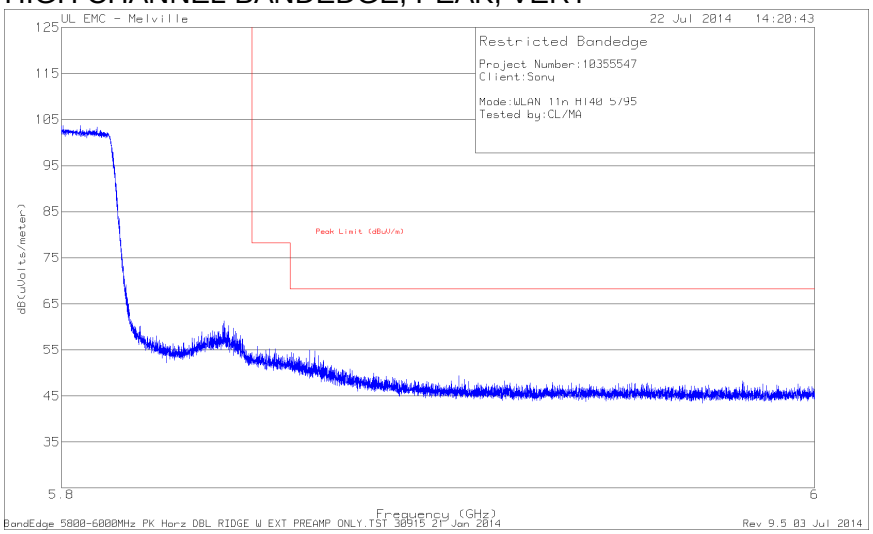


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

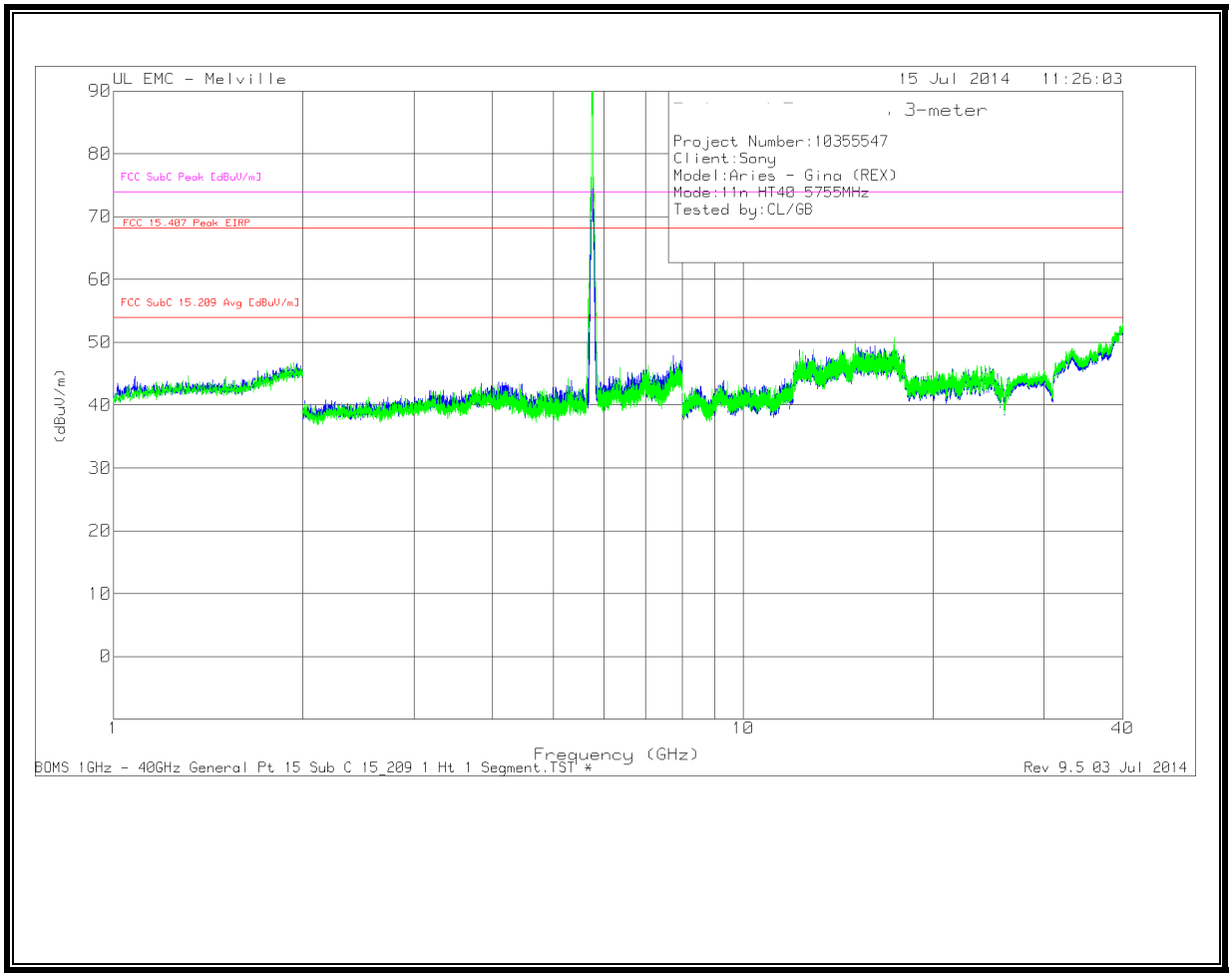


HIGH CHANNEL BANDEDGE, PEAK, VERT



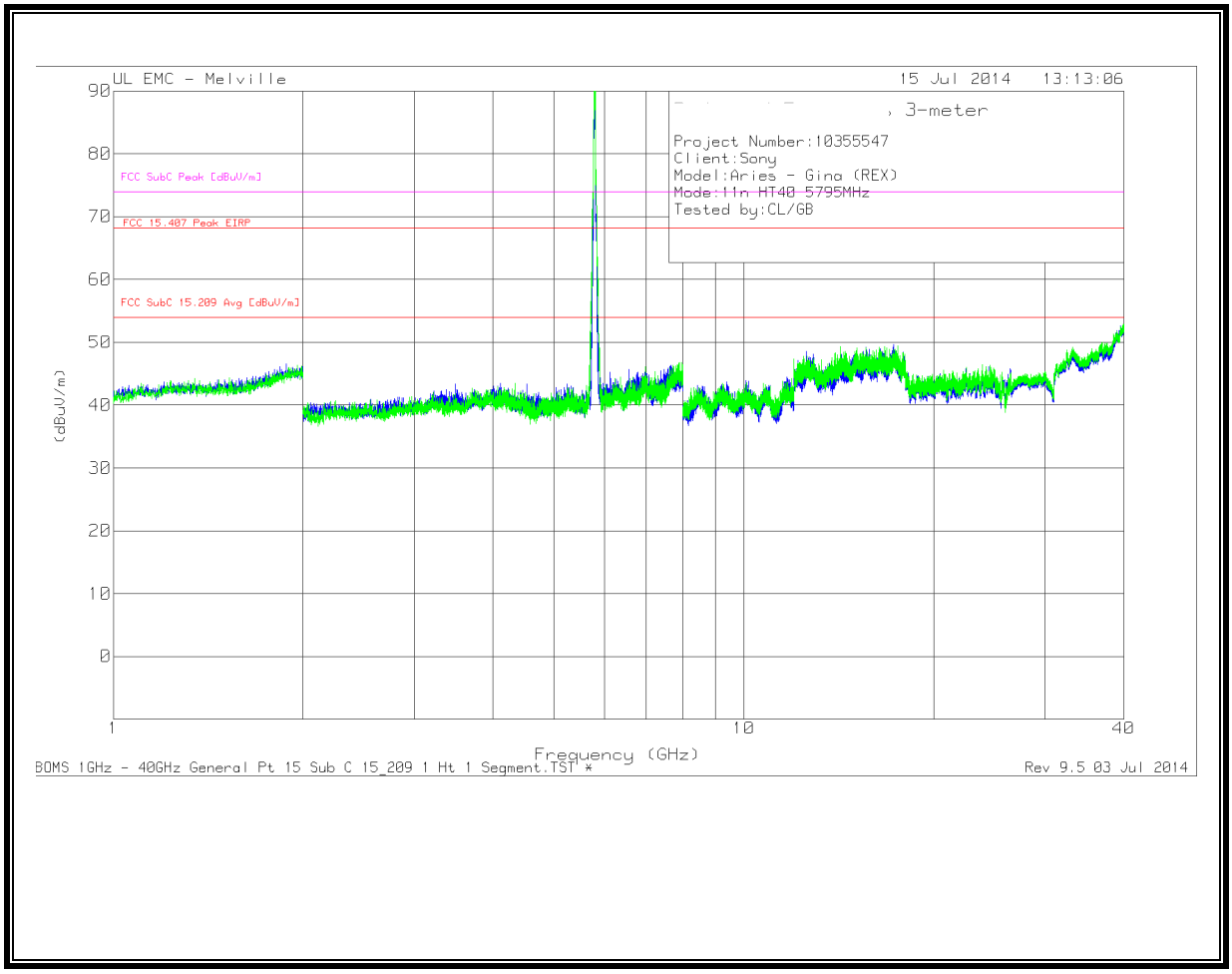
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL & VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

HIGH CHANNEL
HORIZONTAL & VERTICAL

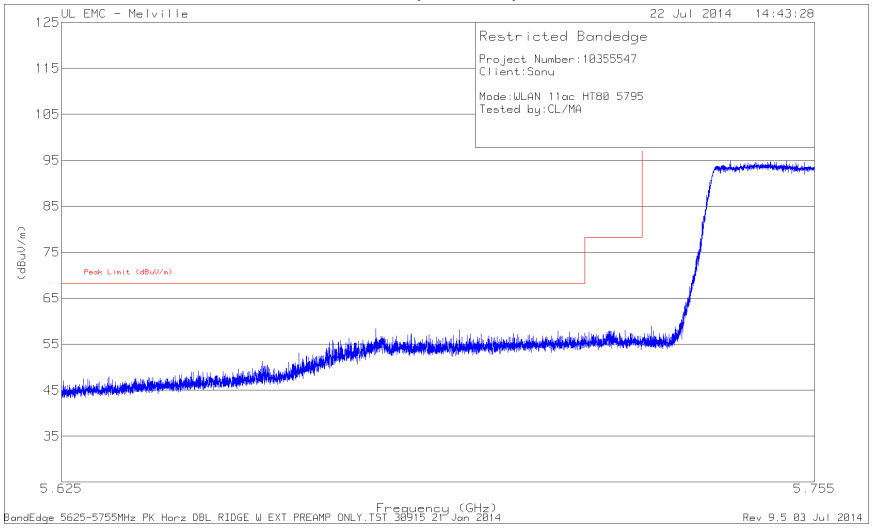


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

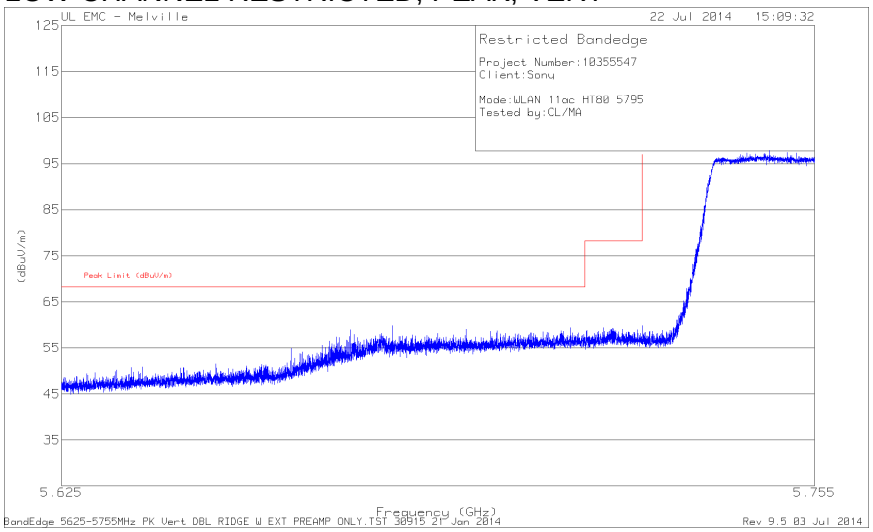
11.4.1. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ

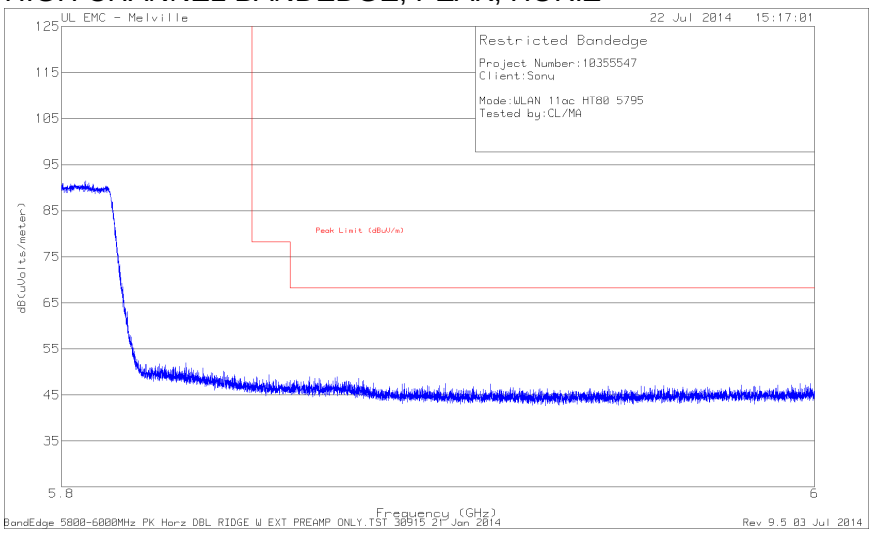


LOW CHANNEL RESTRICTED, PEAK, VERT

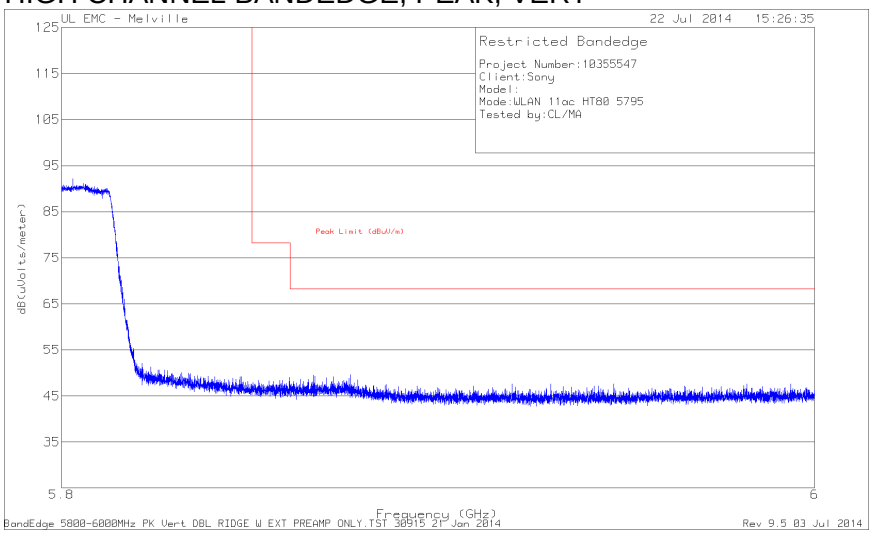


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ

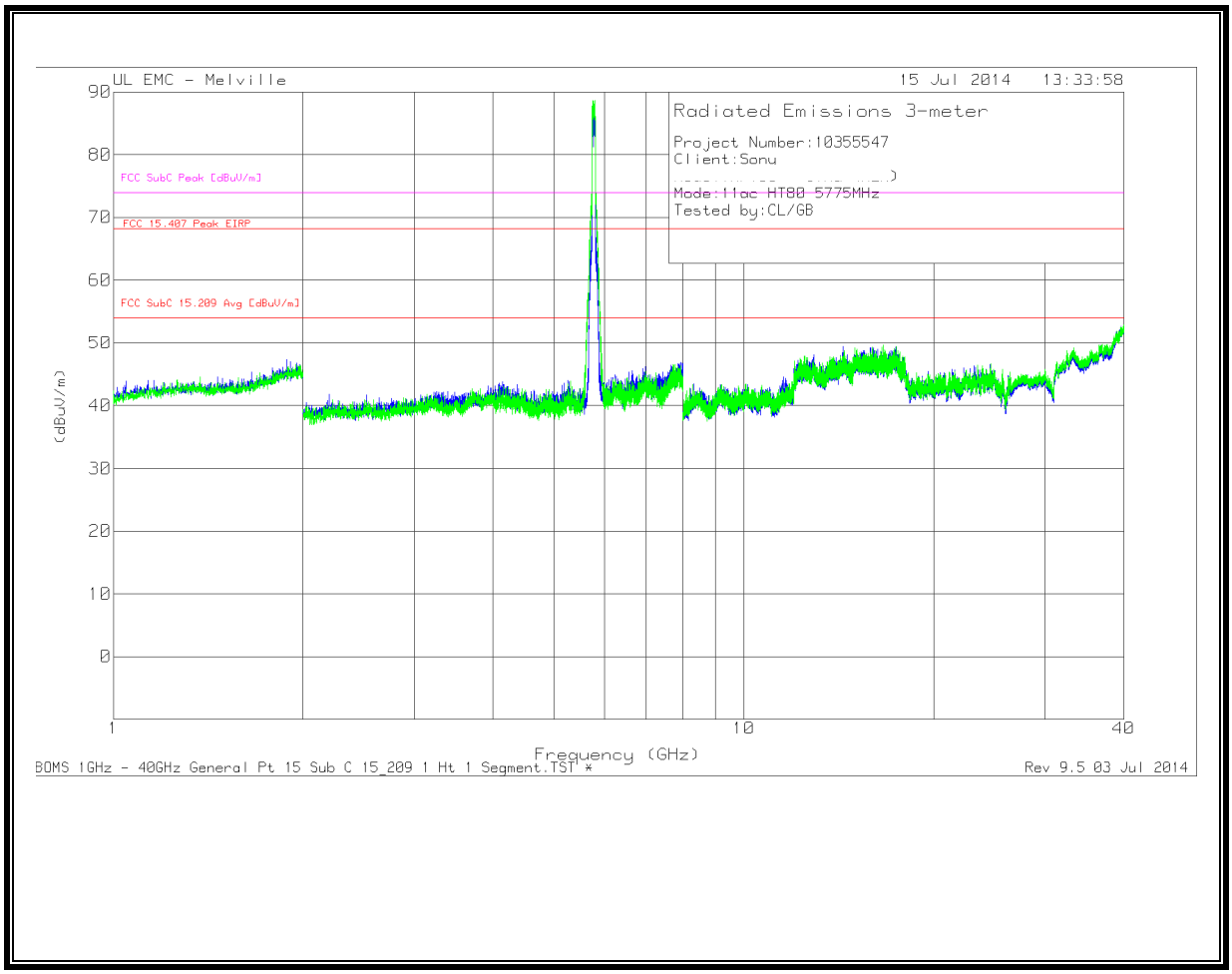


HIGH CHANNEL BANDEDGE, PEAK, VERT



HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL
HORIZONTAL & VERTICAL

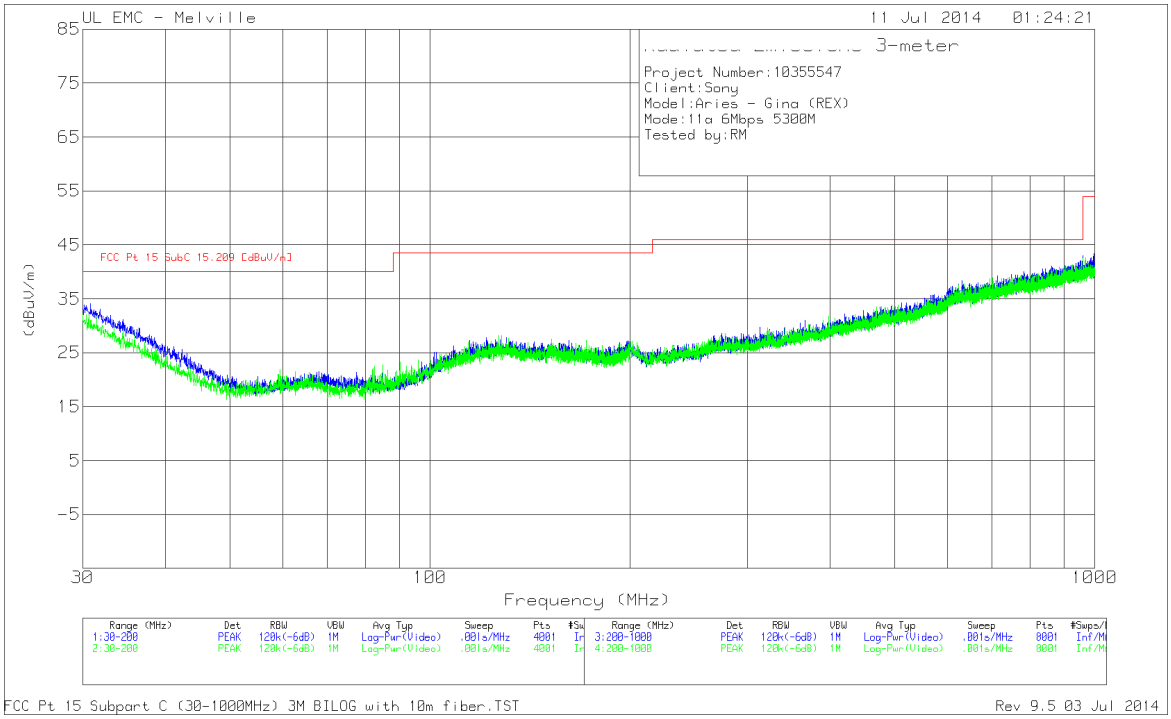


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor.

12. WORST-CASE BELOW 1 GHz

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

HORIZONTAL & VERTICAL PLOT



13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

RESULTS

6 WORST EMISSIONS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.1905	33.03	PK	1	0	34.03	64	-29.97	-	-
2	.1905	16.13	Av	1	0	17.13	-	-	54	-36.87
3	.375	34.63	PK	.4	0	35.03	58.4	-23.37	-	-
4	.375	24.29	Av	.4	0	24.69	-	-	48.4	-23.71
5	1.221	39.47	PK	.2	.1	39.77	56	-16.23	-	-
6	1.221	22.24	Av	.2	.1	22.54	-	-	46	-23.46
7	1.3785	39.9	PK	.2	.1	40.2	56	-15.8	-	-
8	1.3785	21.33	Av	.2	.1	21.63	-	-	46	-24.37
9	5.055	33.66	PK	.2	.1	33.96	60	-26.04	-	-
10	5.055	16.54	Av	.2	.1	16.84	-	-	50	-33.16
11	15.0135	33.57	PK	.3	.2	34.07	60	-25.93	-	-
12	15.0135	16.69	Av	.3	.2	17.19	-	-	50	-32.81

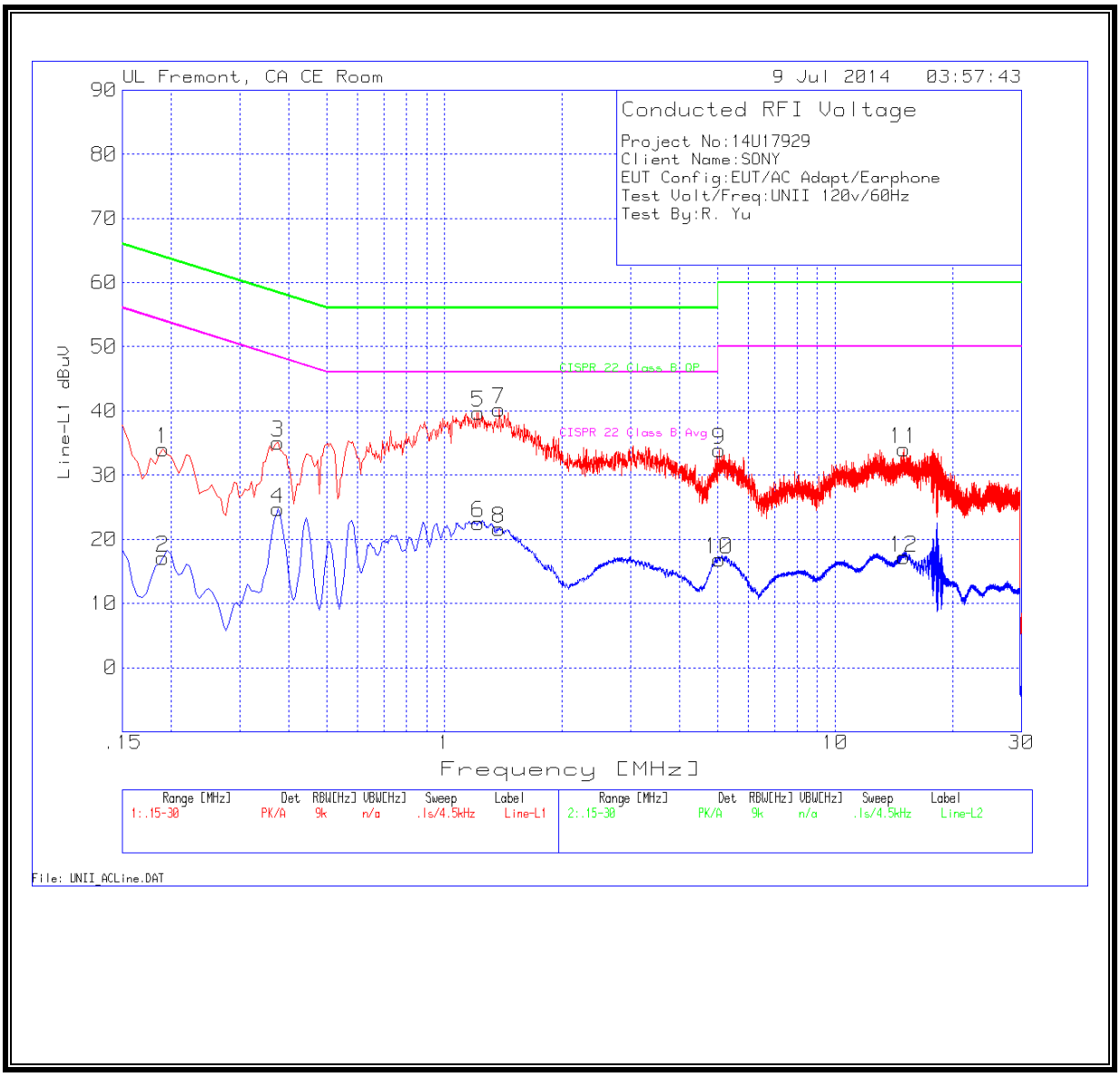
Line-L2 .15 - 30MHz

Trace Markers

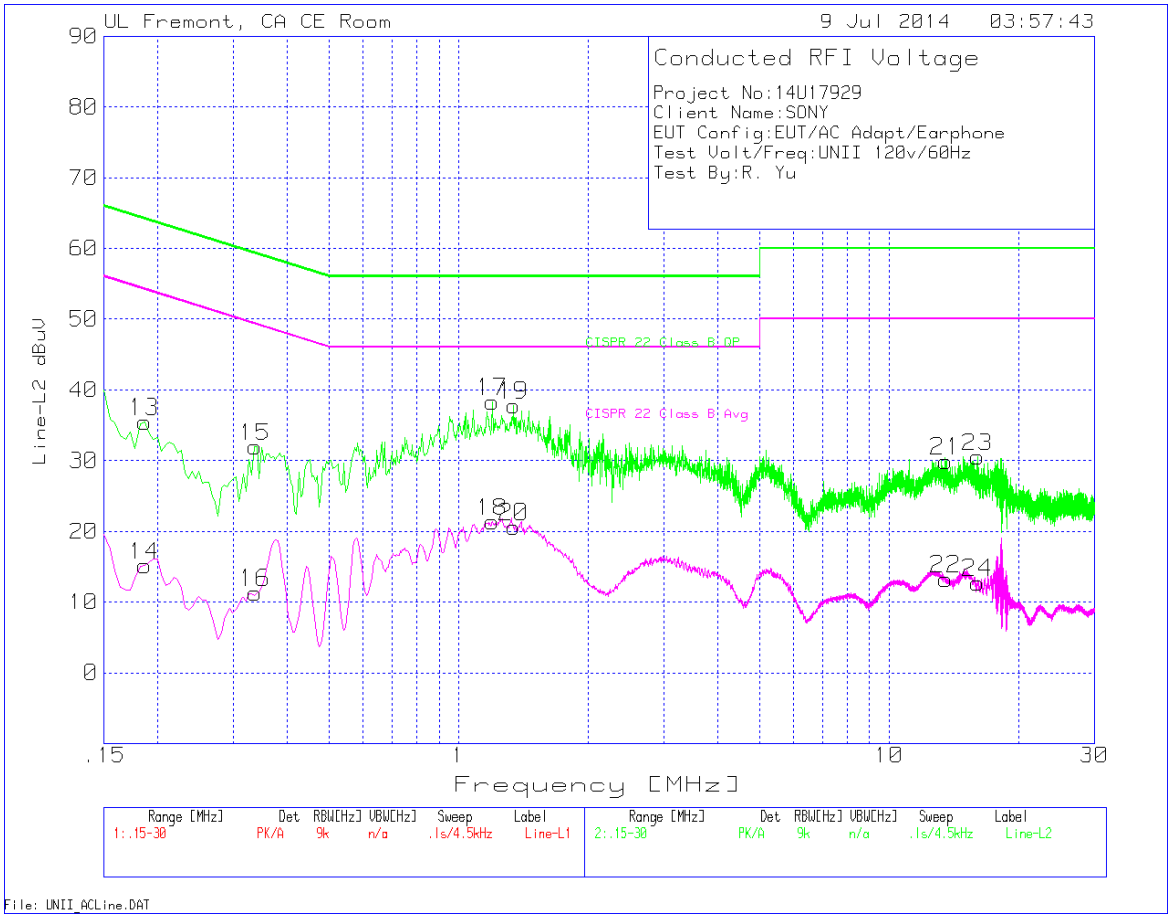
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
13	.186	34.32	PK	1.1	0	35.42	64.2	-28.78	-	-
14	.186	14.03	Av	1.1	0	15.13	-	-	54.2	-39.07
15	.33675	31.42	PK	.5	0	31.92	59.3	-27.38	-	-
16	.33675	10.81	Av	.5	0	11.31	-	-	49.3	-37.99
17	1.1985	37.92	PK	.3	.1	38.32	56	-17.68	-	-
18	1.1985	20.93	Av	.3	.1	21.33	-	-	46	-24.67
19	1.3425	37.59	PK	.2	0	37.79	56	-18.21	-	-
20	1.3425	20.41	Av	.2	0	20.61	-	-	46	-25.39
21	13.515	29.4	PK	.3	.2	29.9	60	-30.1	-	-
22	13.515	12.76	Av	.3	.2	13.26	-	-	50	-36.74
23	16.0665	30	PK	.3	.2	30.5	60	-29.5	-	-
24	16.0665	12.25	Av	.3	.2	12.75	-	-	50	-37.25

PK - Peak detector
Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS



14. DYNAMIC FREQUENCY SELECTION

14.1. OVERVIEW

14.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** …

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

FCC

§15.407 (h) and KDB 905462 D02 “COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION” and KDB 905462 D03 “U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY”

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client **(without DFS)**	Client **(with DFS)**
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.		

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period
The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows: For the Short pulse radar Test Signals this instant is the end of the *Burst*. For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated. For the Long Pulse radar Test Signal this instant is the end of the 12-second period defining the radar transmission. The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10-second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a (of KDB 905462 D02) Test B: 15 unique PRI values randomly selected within the range of 518-3066 μ sec, with a minimum increment of 1 μ sec, excluding PRI values selected in Test A		60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 6 – Long Pulse Radar Test Signal

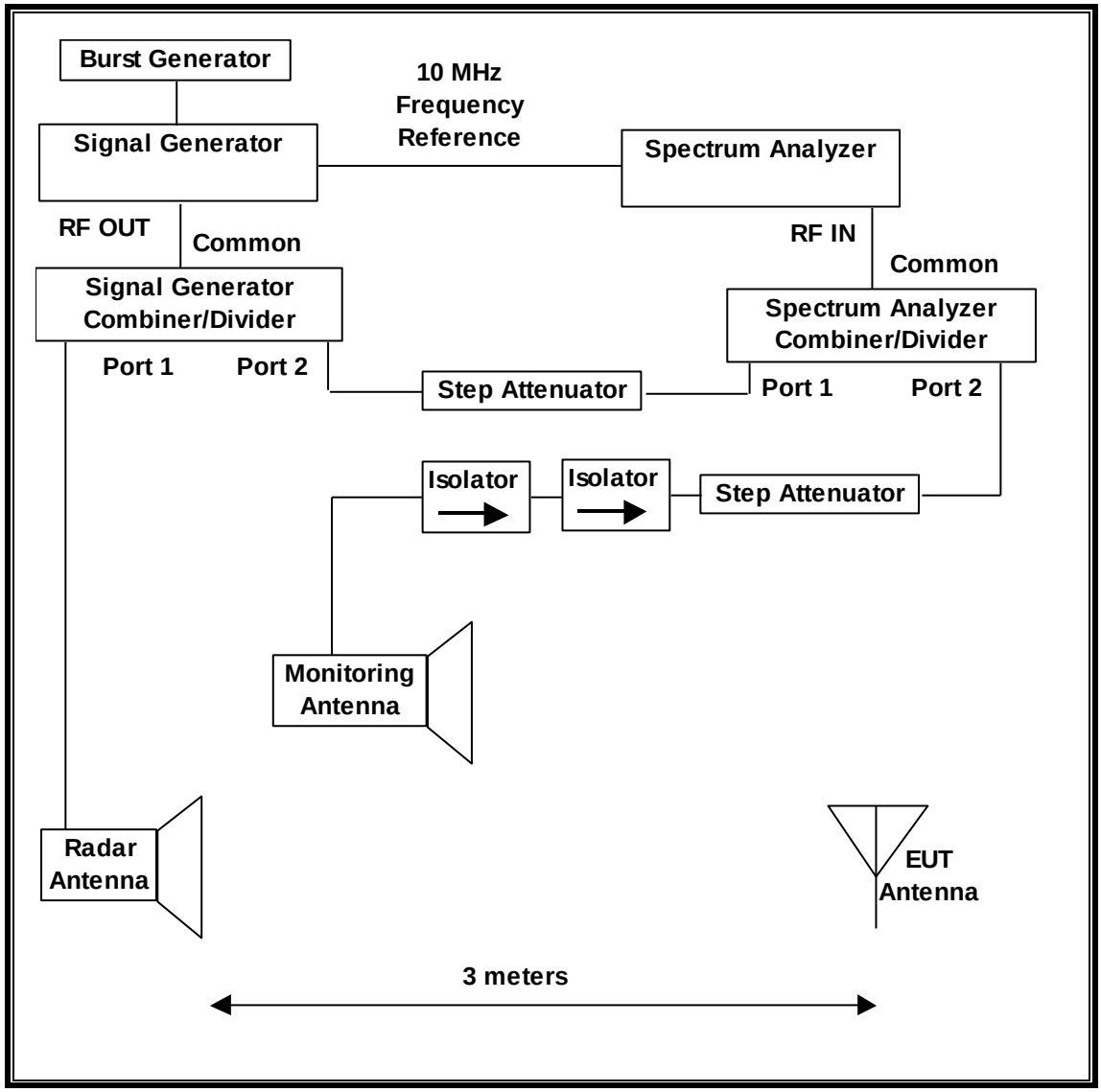
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30

14.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

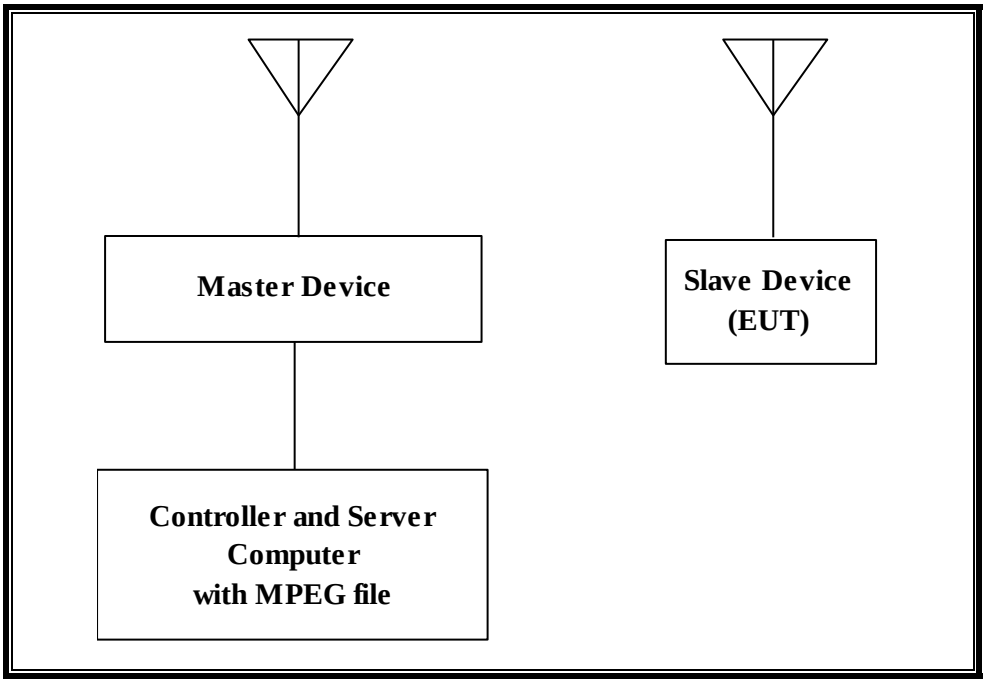
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset Number**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	09/10/14
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	09/12/14

14.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
802.11ac Access Point (Master Device)	Cisco	AIR-CAP3702E-A-K9	FTX181570A6	LDK102087
P.O.E. Injector	Phihong	POE30U-560(G)	PHI170102N2	DoC
Notebook PC (Controller/Server)	Dell	PP18L	10657517725	DoC
AC Adapter (Controller/Server PC)	Dell	LA65SN0-00	CN-ODF263-71615-6AU-1019	DoC

14.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges excluding the 5600-5650 MHz range.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 15.47 dBm EIRP in the 5250-5350 MHz band and 15.69 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of –1 dBi in the 5250-5350 MHz band and –0.6 dBi in the 5470-5725 MHz band.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is –64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests.

WLAN traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11ac architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz. However, pursuant to FCC KDB Publication 848637, “Client devices with 80 MHz BW mode can be tested with an approved master operating in 40 MHz BW mode”. Therefore, 80MHz BW DFS testing was not performed and has been excluded from this report.

The software installed in the access point is AP3G2-K9W7-M Version 15.2(4)JB4.

UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is –64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

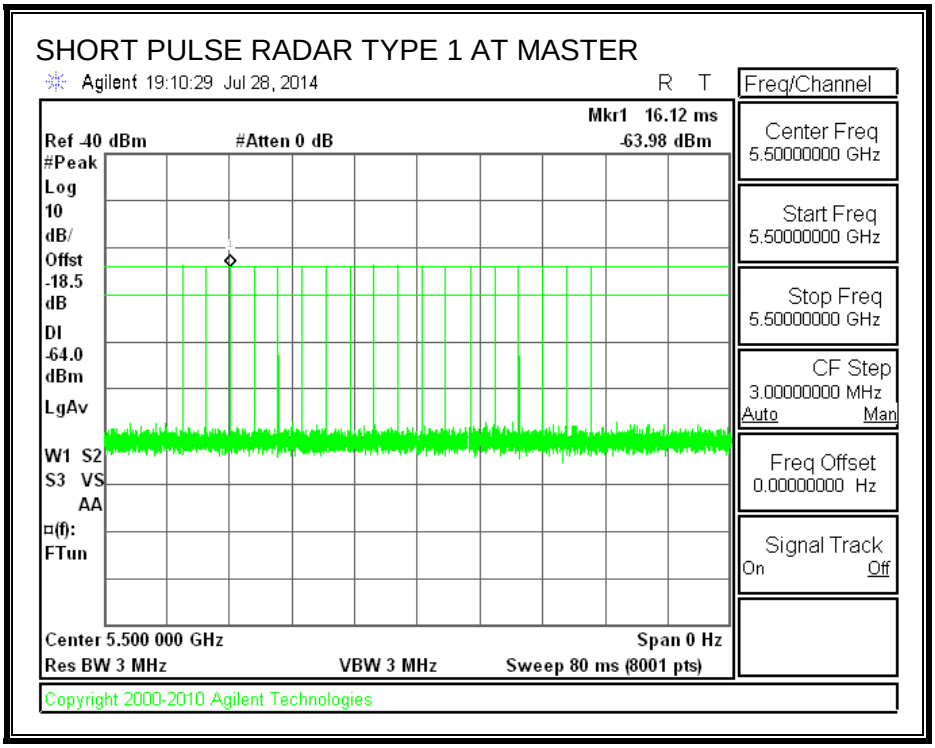
14.2. RESULTS FOR 20 MHz BANDWIDTH

14.2.1. TEST CHANNEL

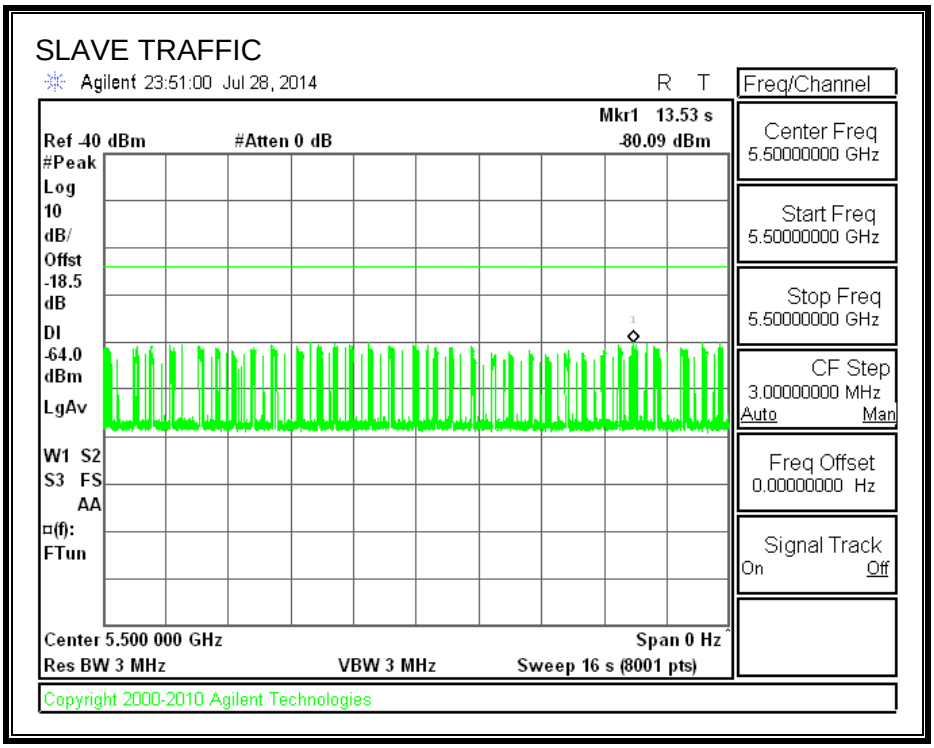
All tests were performed at a channel center frequency of 5500 MHz.

14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



14.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

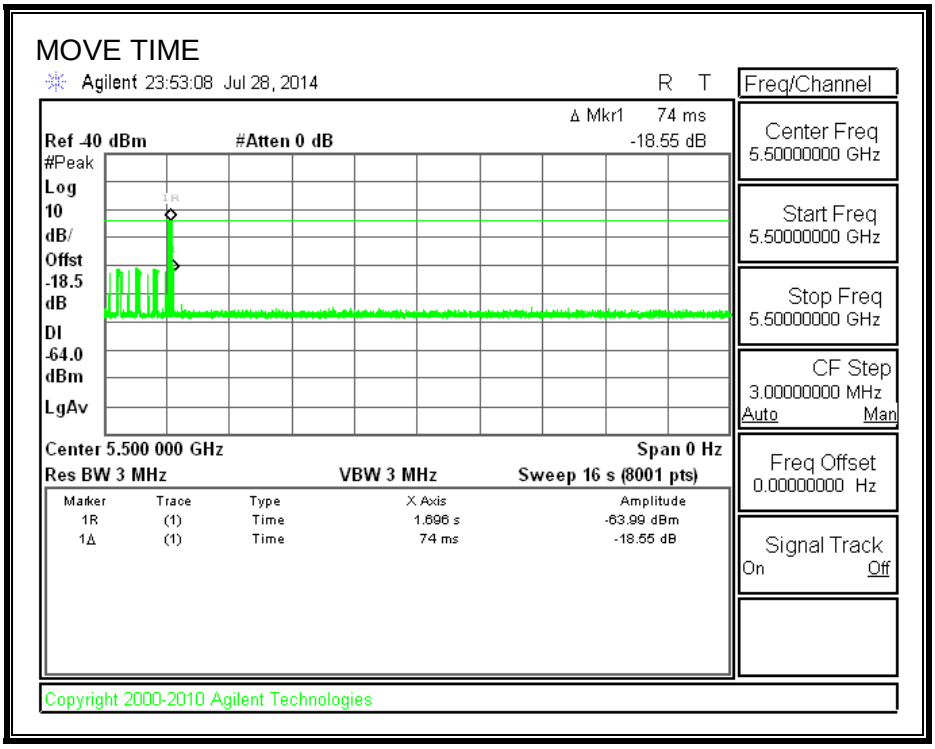
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

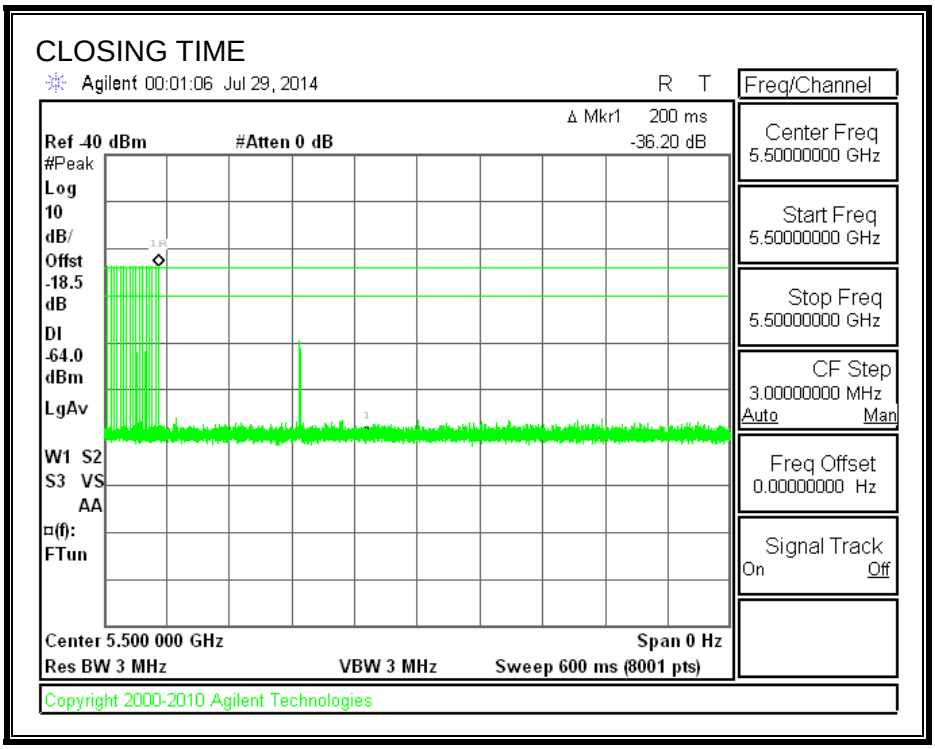
Channel Move Time (sec)	Limit (sec)
0.074	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



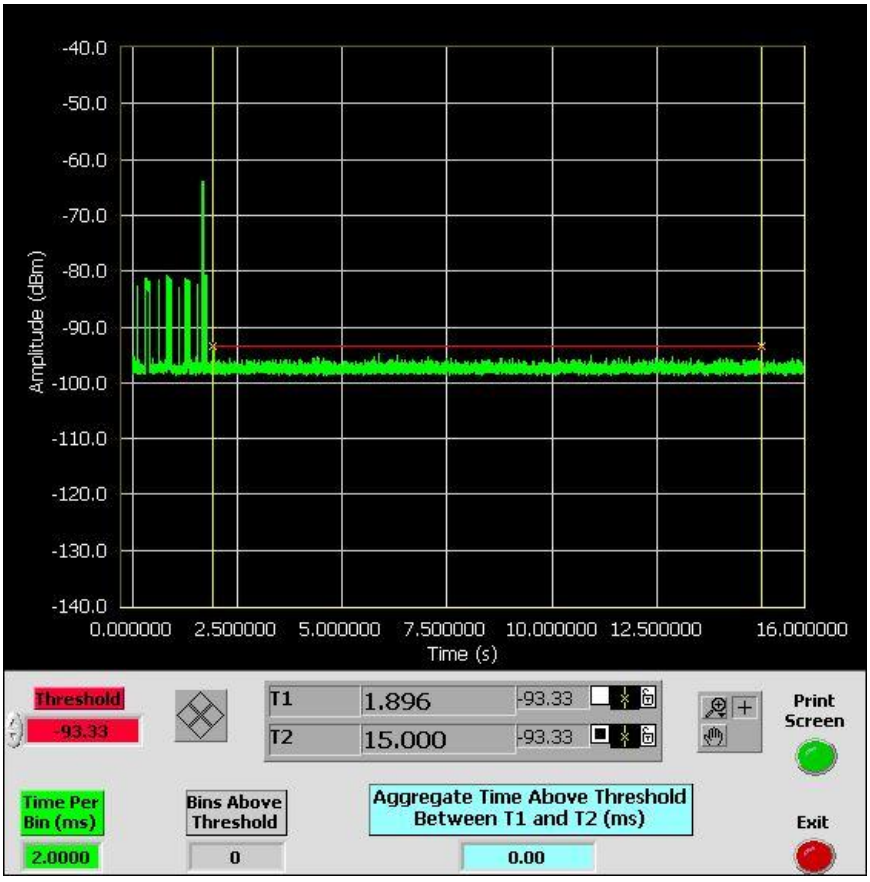
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



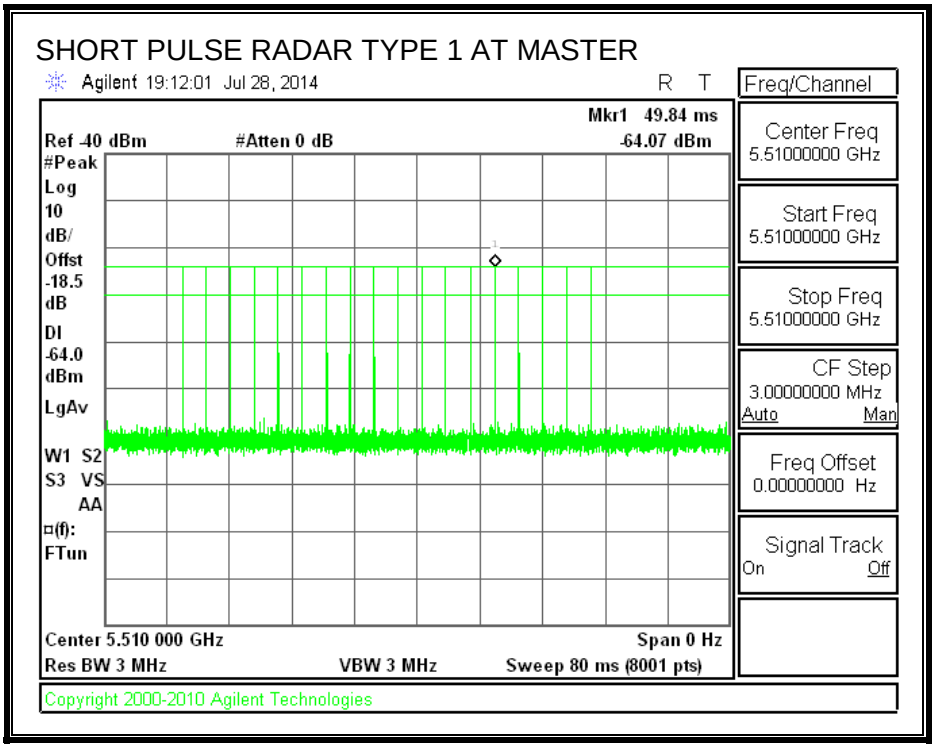
14.3. RESULTS FOR 40 MHz BANDWIDTH

14.3.1. TEST CHANNEL

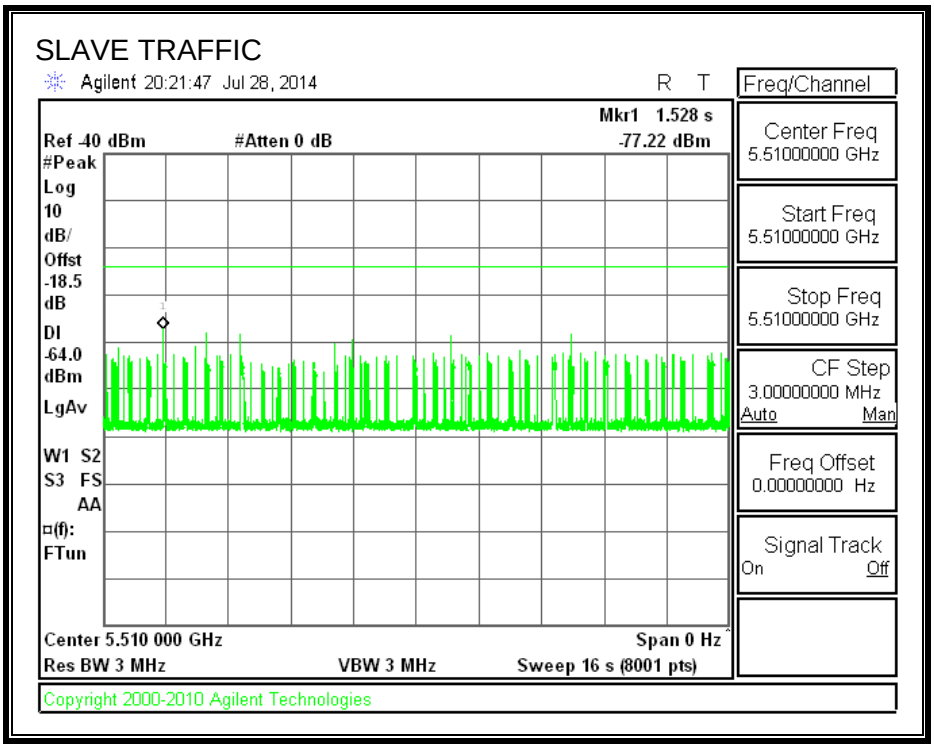
All tests were performed at a channel center frequency of 5510 MHz.

14.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



14.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

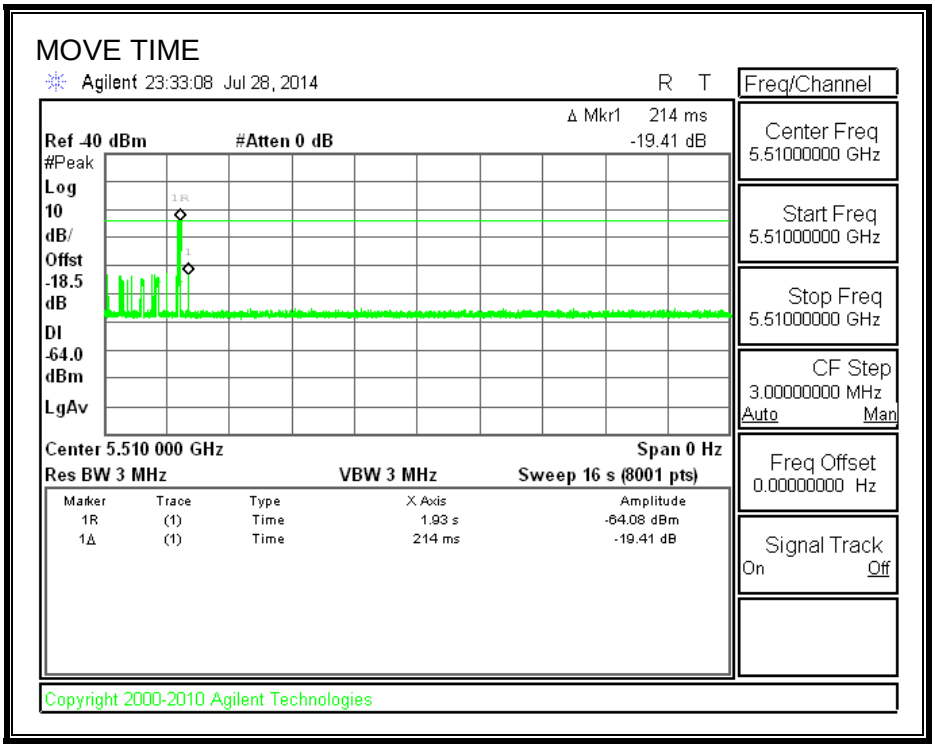
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

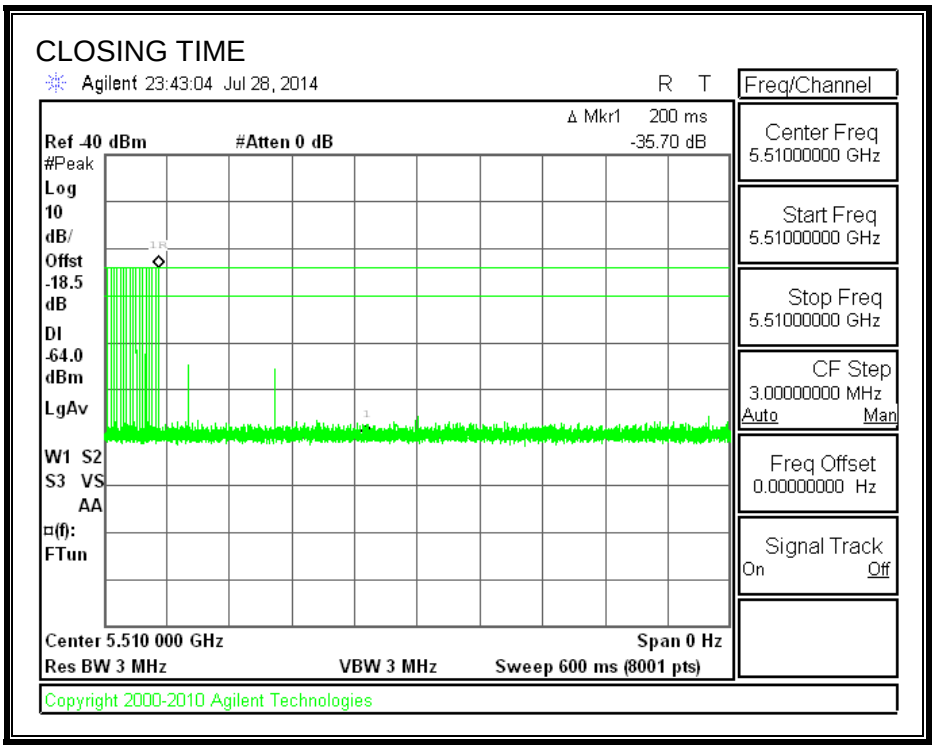
Channel Move Time (sec)	Limit (sec)
0.214	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
2.0	60

MOVE TIME



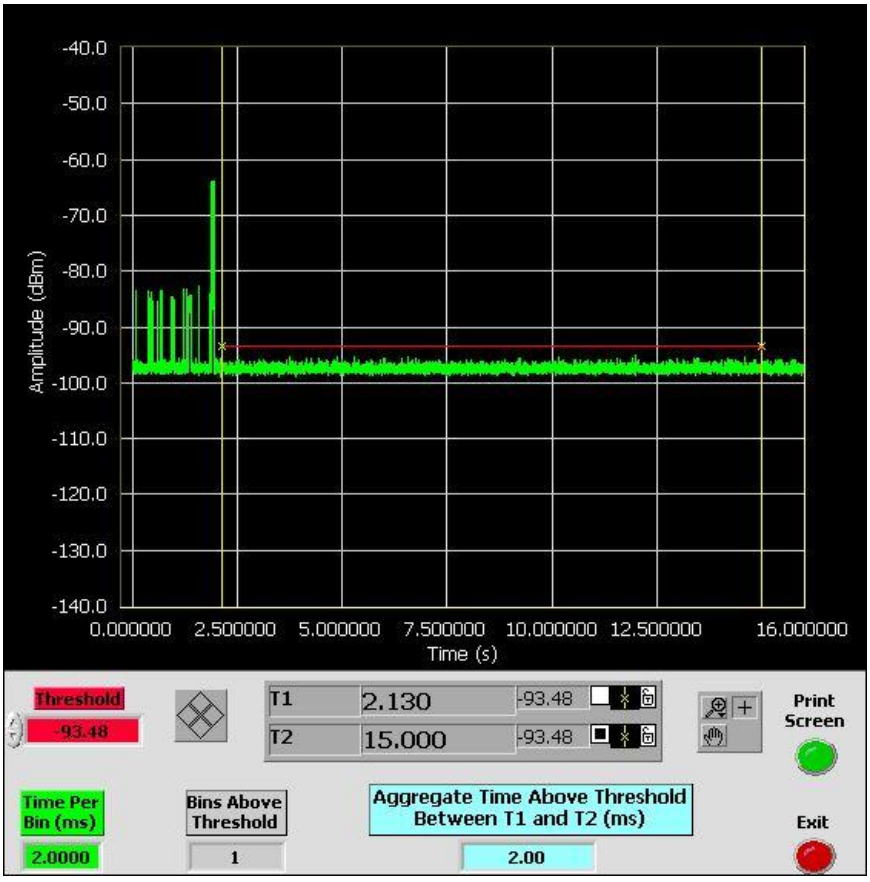
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



14.3.5. NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.