FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC

FCC ID: PY7-PM0941

REPORT NUMBER: 16J22997-E5V3

ISSUE DATE: 4/6/2016

Prepared for

SONY MOBILE COMMUNICATIONS INC.
4-12-3 Higashi-Shinagawa, Shinagawa-Ku
TOKYO, 140-0002, JAPAN

Prepared by

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	3/19/2016	Initial Issue	C. OOI
V2	4/4/2016	Revised Information on Section 5.6 and Section 7	C. OOI
V3	4/6/2016	Revised Page 42 and 43	C. OOI

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 6

2. TEST METHODOLOGY 7

3. FACILITIES AND ACCREDITATION 7

4. CALIBRATION AND UNCERTAINTY 7

4.1. MEASURING INSTRUMENT CALIBRATION 7

4.2. SAMPLE CALCULATION 7

4.3. MEASUREMENT UNCERTAINTY 7

5. EQUIPMENT UNDER TEST 8

5.1. DESCRIPTION OF EUT 8

5.2. MAXIMUM OUTPUT POWER 8

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 8

5.4. SOFTWARE AND FIRMWARE 9

5.5. LIST OF TEST REDUCTION AND MODES 9

5.6. WORST-CASE CONFIGURATION AND MODE 11

5.7. DESCRIPTION OF TEST SETUP 12

6. TEST AND MEASUREMENT EQUIPMENT 14

7. SUMMARY TABLE 15

8. ANTENNA PORT TEST RESULTS 16

8.1. ON TIME AND DUTY CYCLE 16

8.2. ON TIME AND DUTY CYCLE RESULTS 16

8.3. DUTY CYCLE PLOTS 17

8.4. 6 dB BANDWIDTH 19

8.4.1. 802.11a MODE IN THE 5.8 GHz BAND 20
8.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND 20
8.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND 20
8.4.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND 20
8.4.5. 6 dB BANDWIDTH MID CH PLOTS 21

8.5. 26 dB BANDWIDTH 23

8.5.1. 802.11a MODE IN THE 5.2 GHz BAND 23
8.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND 23
8.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND 23
8.5.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND 23
8.5.5. 802.11a MODE IN THE 5.3 GHz BAND 24
8.5.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND 24

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.5.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND 24
8.5.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND 24
8.5.9. 802.11a MODE IN THE 5.5 GHz BAND 25
8.5.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND 25
8.5.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND 25
8.5.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND 25
8.5.13. 26 dB BANDWIDTH PLOTS 26

8.6. 99% BANDWIDTH 30
8.6.1. 802.11a MODE IN THE 5.2 GHz BAND 30
8.6.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND 30
8.6.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND 30
8.6.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND 30
8.6.5. 802.11a MODE IN THE 5.3 GHz BAND 31
8.6.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND 31
8.6.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND 31
8.6.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND 31
8.6.9. 802.11a MODE IN THE 5.5 GHz BAND 32
8.6.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND 32
8.6.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND 32
8.6.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND 32
8.6.13. 802.11a MODE IN THE 5.8 GHz BAND 33
8.6.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND 33
8.6.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND 33
8.6.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND 33
8.6.17. 99% BANDWIDTH PLOTS 34

8.7. OUTPUT POWER AND PSD 40
8.7.1. 802.11a MODE IN THE 5.2 GHz BAND 44
8.7.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND 45
8.7.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND 46
8.7.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND 47
8.7.5. 802.11a MODE IN THE 5.3 GHz BAND 48
8.7.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND 49
8.7.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND 50
8.7.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND 51
8.7.9. 802.11a MODE IN THE 5.5 GHz BAND 52
8.7.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND 53
8.7.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND 54
8.7.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND 55
8.7.13. 802.11a MODE IN THE 5.8 GHz BAND 56
8.7.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND 57
8.7.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND 58
8.7.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND 59
8.7.17. OUTPUT POWER AND PSD PLOTS 60

9. TRANSMITTER ABOVE 1 GHz 66

9.1. 5.2 GHz 67
9.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND 67
9.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND 78

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND.....89
9.1.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.2 GHz BAND 97

9.2. 5.3 GHz 102
9.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND 102
9.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND.....113
9.2.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND.....124
9.2.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.3 GHz BAND 132

9.3. 5.5-5.6 GHz 137
9.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND 137
9.3.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND.....150
9.3.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND.....163
9.3.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.5 GHz BAND 176

9.4. 5.8 GHz 183
9.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.8 GHz BAND 183
9.4.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND.....196
9.4.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND.....209
9.4.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.8 GHz BAND 219

10. WORST-CASE BELOW 1 GHz (in the 5.3 GHz Band).....226

11. AC POWER LINE CONDUCTED EMISSIONS.....228

12. DYNAMIC FREQUENCY SELECTION.....231

12.1. OVERVIEW.....231
12.1.1. LIMITS.....231
12.1.2. TEST AND MEASUREMENT SYSTEM.....235
12.1.3. SETUP OF EUT.....238
12.1.4. DESCRIPTION OF EUT 239

12.2. RESULTS FOR 20 MHz BANDWIDTH.....241
12.2.1. TEST CHANNEL 241
12.2.2. RADAR WAVEFORM AND TRAFFIC.....241
12.2.3. OVERLAPPING CHANNEL TESTS.....244
12.2.4. MOVE AND CLOSING TIME 244

12.3. RESULTS FOR 40 MHz BANDWIDTH.....248
12.3.1. TEST CHANNEL 248
12.3.2. RADAR WAVEFORM AND TRAFFIC.....248
12.3.3. OVERLAPPING CHANNEL TESTS.....251
12.3.4. MOVE AND CLOSING TIME 251

12.4. RESULTS FOR 80 MHz BANDWIDTH.....255
12.4.1. TEST CHANNEL 255
12.4.2. RADAR WAVEFORM AND TRAFFIC.....255
12.4.3. OVERLAPPING CHANNEL TESTS.....258
12.4.4. MOVE AND CLOSING TIME 258
12.4.5. 10-MINUTE BEACON MONITORING PERIOD 262

13. SETUP PHOTOS.....263

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONY MOBILE COMMUNICATIONS, INC.

EUT DESCRIPTION: GSM/WCDMA/LTE PHONE with BT, DTS/UNII a/b/g/n/ac & NFC

SERIAL NUMBER: CB5129YNRK, CB5129YNSJ, CB5129YWP3, CB5129YWGC

DATE TESTED: March 7- 19, 2015

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.

Approved & Released For
UL Verification Services Inc. By:



CHOON OOI
WiSE PROJECT LEAD
CONSUMER TECHNOLOGY DIVISION
UL VERIFICATION SERVICES INC

Prepared By:



JEFFREY WU
WiSE ENGINEER
CONSUMER TECHNOLOGY DIVISION
UL VERIFICATION SERVICES INC

This report shall not be reproduced except in full, without the written approval of 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, and ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
☒ Chamber A(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance,1000 to 6000 MHz	3.86 dB
Radiated Disturbance,6000 to 18000 MHz	4.23 dB
Radiated Disturbance,18000 to 26000 MHz	5.30 dB
Radiated Disturbance,26000 to 40000 MHz	5.23 dB

Uncertainty figures are valid to a confidence level of 95%.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

This EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Total Output Power (dBm)	Total Output Power (mW)
5180 - 5240	802.11n HT20	10.27	10.64
5260 - 5320	802.11n HT20	10.07	10.16
5500 - 5720	802.11n HT20	10.90	12.30
5745 - 5825	802.11n HT20	10.61	11.51
5190 - 5230	802.11n HT40	10.49	11.19
5270 - 5310	802.11n HT40	10.56	11.38
5510 - 5710	802.11n HT40	11.45	13.96
5755 - 5795	802.11n HT40	11.37	13.71
5180 - 5240	802.11a	10.02	10.05
5260 - 5320	802.11a	9.89	9.75
5500 - 5720	802.11a	10.82	12.08
5745 - 5825	802.11a	10.31	10.74
5210	802.11ac VHT80	10.60	11.48
5290	802.11ac VHT80	10.15	10.35
5530 - 5690	802.11ac VHT80	11.89	15.45
5775	802.11ac VHT80	10.77	11.94

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes FPCB antenna, with a maximum as below:

Frequency (MHz)	Peak Antenna Gain (dBi)	
	Core0(Main)	Core1 (Sub)
5180-5320	-4.2	-4.2
5500-5720	-6.0	-3.2
5745-5825	-5.7	-5.4

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5.4. SOFTWARE AND FIRMWARE

The firmware/SW installed in the EUT during testing was SONY, s_atp_xxxx_1_600_7_9

The hardware version was A

The test utility software used during testing was Tera Term, rev 4.8.3(SVN#5602)

5.5. LIST OF TEST REDUCTION AND MODES

Authorized Frequency Band (Antenna Port & Radiated Testing)		
Frequency Range (MHz)	**Mode**	**Covered by**
5180 - 5240	802.11a Legacy 1TX	802.11a CDD 2TX
5180 - 5240	802.11n HT20 1TX	802.11n HT20 CDD 2TX
5180 - 5240	802.11n HT20 STBC 2TX	802.11n HT20 CDD 2TX
5180 - 5240	802.11ac VHT20 1TX	802.11n HT20 CDD 2TX
5180 - 5240	802.11ac VHT20 STBC 2TX	802.11n HT20 CDD 2TX
5190 - 5230	802.11n HT40 1TX	802.11n HT40 CDD 2TX
5190 - 5230	802.11n HT40 STBC 2TX	802.11n HT40 CDD 2TX
5190 - 5230	802.11ac VHT40 1TX	802.11n HT40 CDD 2TX
5190 - 5230	802.11ac VHT40 STBC 2TX	802.11n HT40 CDD 2TX
5210	802.11ac VHT80 1TX	802.11ac VHT80 CDD 2TX
5210	802.11ac VHT80 STBC 2TX	802.11ac VHT80 CDD 2TX

Authorized Frequency Band (Antenna Port & Radiated Testing)		
Frequency Range (MHz)	**Mode**	**Covered by**
5260 - 5320	802.11a Legacy 1TX	802.11a CDD 2TX
5260 - 5320	802.11n HT20 1TX	802.11n HT20 CDD 2TX
5260 - 5320	802.11n HT20 STBC 2TX	802.11n HT20 CDD 2TX
5260 - 5320	802.11ac VHT20 1TX	802.11n HT20 CDD 2TX
5260 - 5320	802.11ac VHT20 STBC 2TX	802.11n HT20 CDD 2TX
5270 - 5310	802.11n HT40 1TX	802.11n HT40 CDD 2TX
5270 - 5310	802.11n HT40 STBC 2TX	802.11n HT40 CDD 2TX
5270 - 5310	802.11ac VHT40 1TX	802.11n HT40 CDD 2TX
5270 - 5310	802.11ac VHT40 STBC 2TX	802.11n HT40 CDD 2TX
5290	802.11ac VHT80 1TX	802.11ac VHT80 CDD 2TX
5290	802.11ac VHT80 STBC 2TX	802.11ac VHT80 CDD 2TX

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Authorized Frequency Band (Antenna Port & Radiated Testing)		
Frequency Range (MHz)	**Mode**	**Covered by**
5500 - 5720	802.11a Legacy 1TX	802.11a CDD 2TX
5500 - 5720	802.11n HT20 1TX	802.11n HT20 CDD 2TX
5500 - 5720	802.11n HT20 STBC 2TX	802.11n HT20 CDD 2TX
5500 - 5720	802.11ac VHT20 1TX	802.11n HT20 CDD 2TX
5500 - 5720	802.11ac VHT20 STBC 2TX	802.11n HT20 CDD 2TX
5510 - 5710	802.11n HT40 1TX	802.11n HT40 CDD 2TX
5510 - 5710	802.11n HT40 STBC 2TX	802.11n HT40 CDD 2TX
5510 - 5710	802.11ac VHT40 1TX	802.11n HT40 CDD 2TX
5510 - 5710	802.11ac VHT40 STBC 2TX	802.11n HT40 CDD 2TX
5530 - 5690	802.11ac VHT80 1TX	802.11ac VHT80 CDD 2TX
5530 - 5690	802.11ac VHT80 STBC 2TX	802.11ac VHT80 CDD 2TX

Authorized Frequency Band (Antenna Port & Radiated Testing)		
Frequency Range (MHz)	**Mode**	**Covered by**
5745 - 5825	802.11a Legacy 1TX	802.11a CDD 2TX
5745 - 5825	802.11n HT20 1TX	802.11n HT20 CDD 2TX
5745 - 5825	802.11n HT20 STBC 2TX	802.11n HT20 CDD 2TX
5745 - 5825	802.11ac VHT20 1TX	802.11n HT20 CDD 2TX
5745 - 5825	802.11ac VHT20 STBC 2TX	802.11n HT20 CDD 2TX
5755 - 5795	802.11n HT40 1TX	802.11n HT40 CDD 2TX
5755 - 5795	802.11n HT40 STBC 2TX	802.11n HT40 CDD 2TX
5755 - 5795	802.11ac VHT40 1TX	802.11n HT40 CDD 2TX
5755 - 5795	802.11ac VHT40 STBC 2TX	802.11n HT40 CDD 2TX
5775	802.11ac VHT80 1TX	802.11ac VHT80 CDD 2TX
5775	802.11ac VHT80 STBC 2TX	802.11ac VHT80 CDD 2TX

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5.6. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the X orientation.

SISO and MIMO mode share same power per chain; therefore only MIMO mode was tested.

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

802.11a mode MMO: 6 Mbps
802.11n HT20 MIMO mode: MCS8
802.11n HT40 MIMO mode: MCS8
802.11ac VHT80 mode MIMO: MCS0

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	SONY	UCH 20 1295-70821	N/A	N/A
Earphone	SONY	N/A	N/A	N/A
DC Power Supplier	Sorensen	XHR60-18	130A01935	N/A
Laptop	Lenovo	T450	PC-04ACGP	N/A
Laptop AC Adapter	Lenovo	ADLX65NLC2A	11S45N025971Z9751KU2U	N/A

I/O CABLES

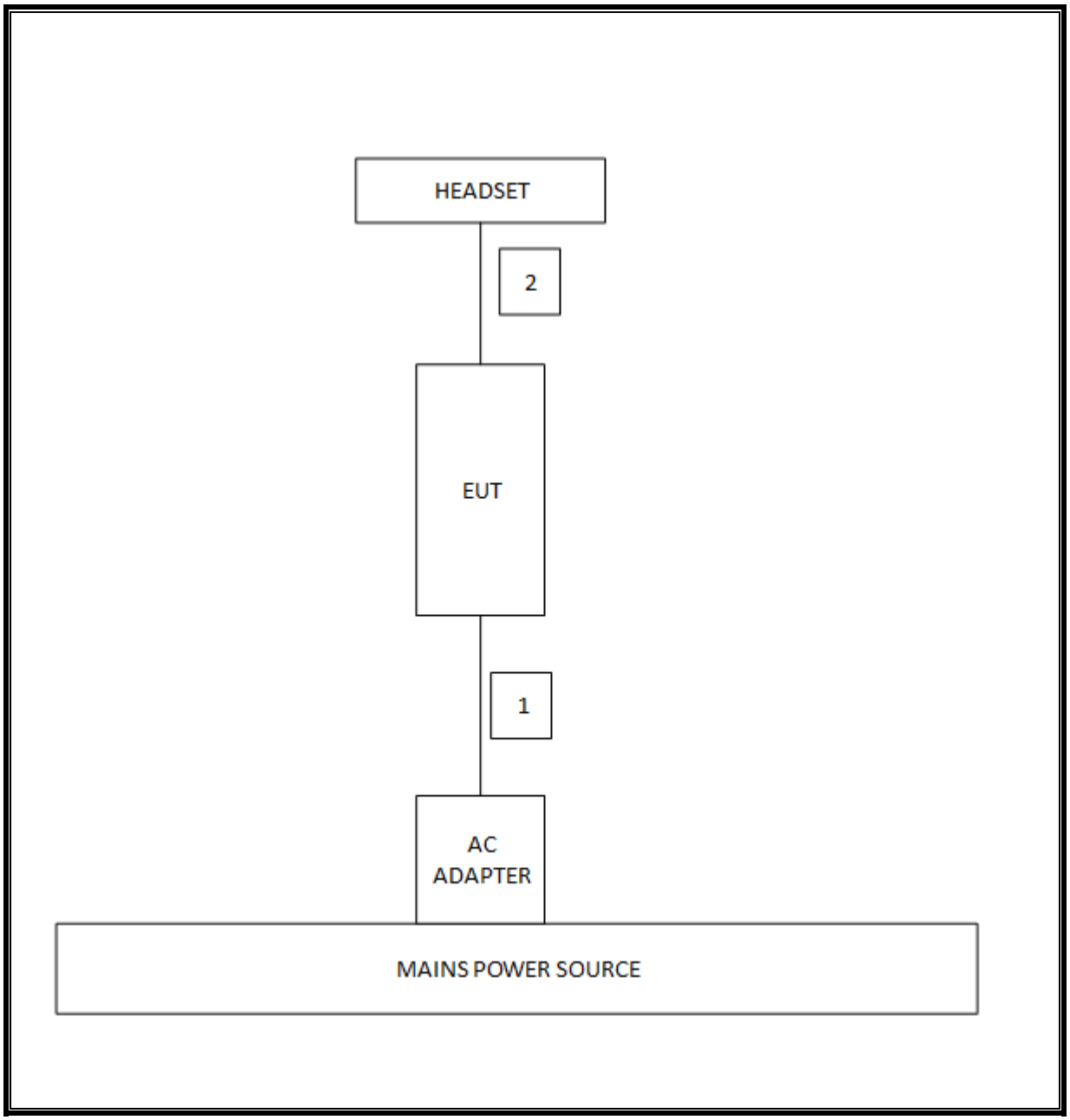
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

SETUP DIAGRAM FOR TESTS



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**T Number**	**Cal Due**
Amplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	493	03/09/17
Amplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	1165	07/20/16
Amplifier, 1-8GHz, 35 dB	Miteq	AMF-4D-01000800-30-29P	1156	03/09/17
Amplifier, 1-8GHz, 35 dB	Miteq	AMF-4D-01000800-30-29P	1172	07/20/16
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	122	01/29/17
Antenna, Horn, 18GHz	ETS Lindgren	3117	344	02/22/17
Antenna, Horn, 18GHz	ETS Lindgren	3117	345	02/22/17
Antenna, Horn, 18GHz	ETS Lindgren	3117	346	02/22/17
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	447	05/12/16
ESR7 EMI Test Receiver 7GHz	Rohde & Schwarz	ESR	1436	12/19/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	485	03/09/17
High Pass Filter 3GHz	Micro-Tronics	HPS17543	486	07/20/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	483	03/09/17
High Pass Filter 6GHz	Micro-Tronics	HPS17542	484	07/20/16
LISN, 30 MHz	FCC	FCC-LISN-50/250-25-2	24	2/9/2017
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	482	03/09/17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	481	07/20/16
Peak / Average Power Sensor	Keysight	N1921A	750	09/17/16
Peak Power Meter	Agilent / HP	N1911A	1268	07/06/17
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	88	04/07/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	99	06/10/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	PRE0126762	03/09/17
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	PRE0126777	12/21/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	907	01/06/17
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	1210	01/07/17

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 4.2, Feb 2, 2016

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

7. SUMMARY TABLE

FCC Part Section	RSS Section	Test Description	Test Limit	Test Condition	Test Result
§15.407 (a)	RSS-247	Occupied Band width (26dB)	N/A	Conducted	Pass
§15.407	RSS-247 6.2.4	6dB Band width (5.8Ghz)	>500KHz		Pass
§15.407 (a)(1)	RSS-247 6.2	TX Cond. Power5.15-5.25	<24dBm (FCC) / <23 dBm or <10+10Log(99% BW) (IC)		Pass
§15.407 (a)(2)	RSS-247 6.2	TX Cond. Power 5.25-5.35 & 5.47-5.725	<24dBm or <11+10log (OBW) (FCC) / <24 dBm or <11+10Log(99% BW) (IC)		Pass
§15.407 (a)(3)	RSS-247 6.2.4	TX Cond. Power 5.725-5.850	<30dBm		Pass
§15.407 (a)(1)	RSS-247 6.2	PSD (5.15-5.25)	<11dBm/MHz (FCC) <10dBm/MHz EIRP (IC)		Pass
§15.407 (a)(2)	RSS-247 6.2	PSD (5.3,5.5GHz)	<11dBm/MHz		Pass
§15.407 (a)(3)	RSS-247 6.2.4	PSD (5.8GHz)	<30dBm per 500kHz		
§15.207(a) §15.407(b)(6)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10		Pass
§15.407(b) & 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	<54dBuV/m	Radiated	Pass
§15.407 (h)(2)	RSS-247 6.3	Dynamic Frequency Selection	N/A	Radiated / Condcuted	Pass

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 D02 v01r01 Section 2 (b)

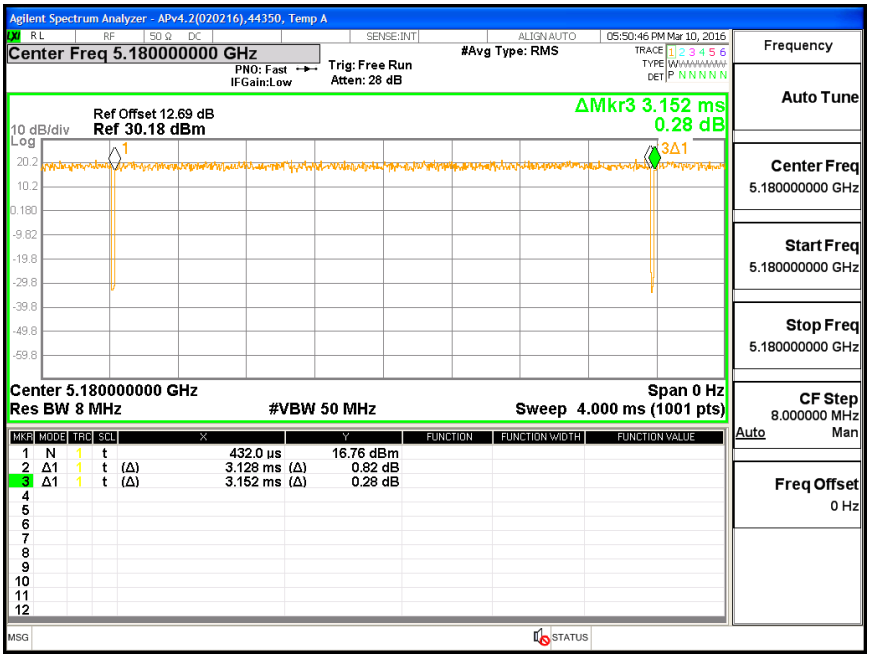
8.2. ON TIME AND DUTY CYCLE RESULTS

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	3.128	3.152	0.992	99.2%	0.00	0.010
802.11ac HT80	0.364	0.386	0.944	94.4%	0.25	2.747
802.11n HT20	1.476	1.498	0.985	98.5%	0.00	0.010
802.11n HT40	0.732	0.753	0.972	97.2%	0.12	1.366

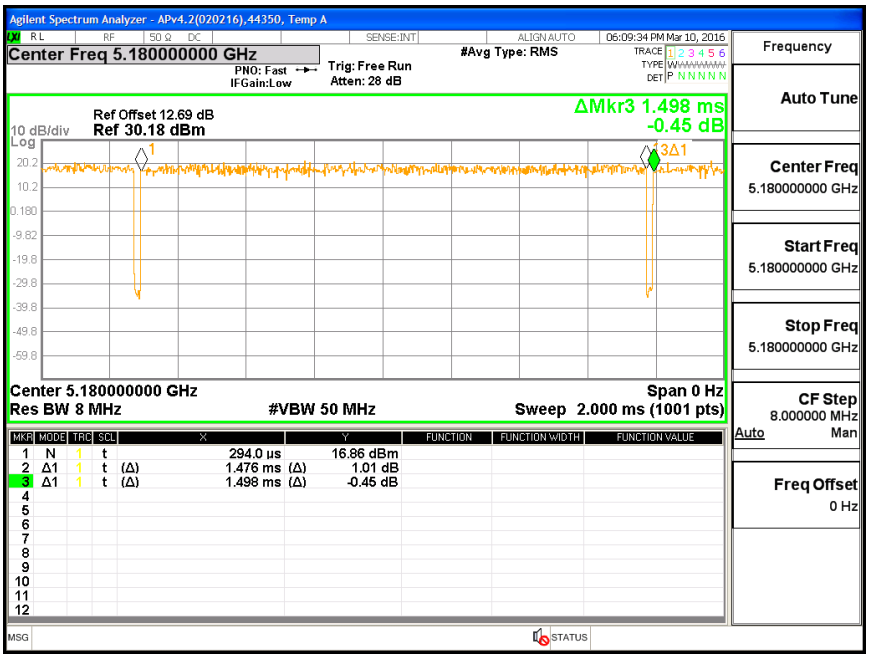
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.3. DUTY CYCLE PLOTS

DUTY CYCLE 802.11a MODE

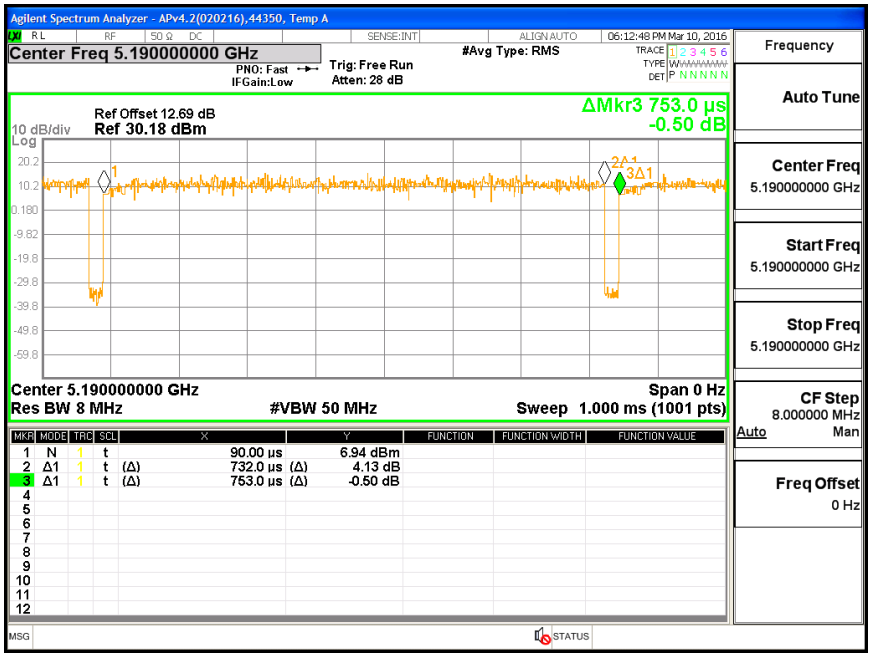


DUTY CYCLE 802.11n HT20 MODE

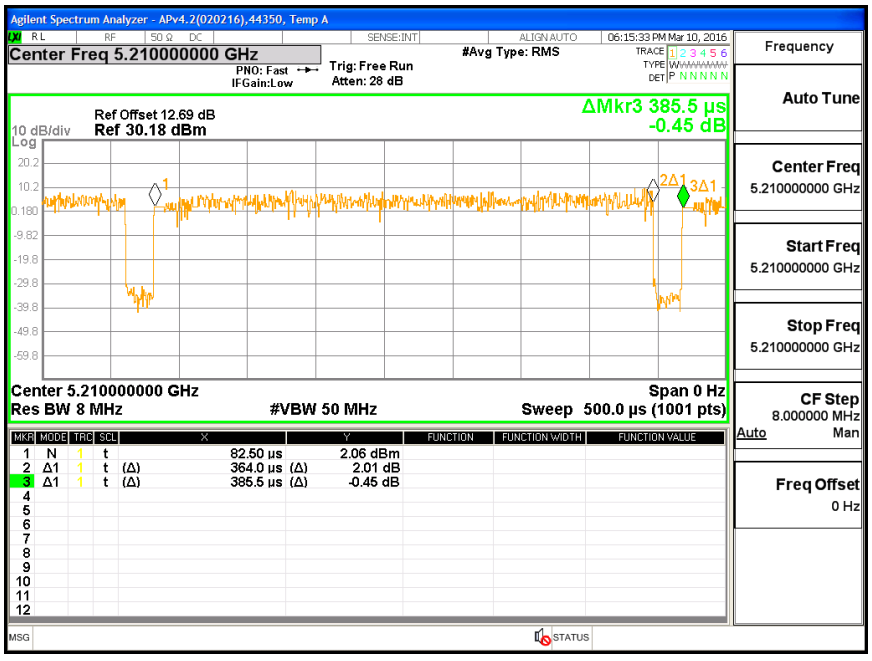


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

DUTY CYCLE 802.11n HT40 MODE



DUTY CYCLE 802.11ac HT80 MODE



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.4. **6 dB BANDWIDTH**

LIMITS

FCC §15.407
RSS-247 6.2.4
The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

KDB 789033 D02 v01r01 Section C (2)

RESULTS

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.4.1. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency	6 dB Bandwidth CHAIN 0	6 dB Bandwidth CHAIN 1	Minimum Limit
	(MHz)	(MHz)	(MHz)	(MHz)
Low	5745	16.375	16.325	0.5
Mid	5785	16.325	16.275	0.5
High	5825	16.325	16.375	0.5

8.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency	6 dB Bandwidth CHAIN 0	6 dB Bandwidth CHAIN 1	Minimum Limit
	(MHz)	(MHz)	(MHz)	(MHz)
Low	5745	17.550	17.577	0.5
Mid	5785	17.550	17.577	0.5
High	5825	17.550	17.631	0.5

8.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency	6 dB Bandwidth CHAIN 0	6 dB Bandwidth CHAIN 1	Minimum Limit
	(MHz)	(MHz)	(MHz)	(MHz)
Low	5755	36.300	36.080	0.5
High	5795	36.410	35.748	0.5

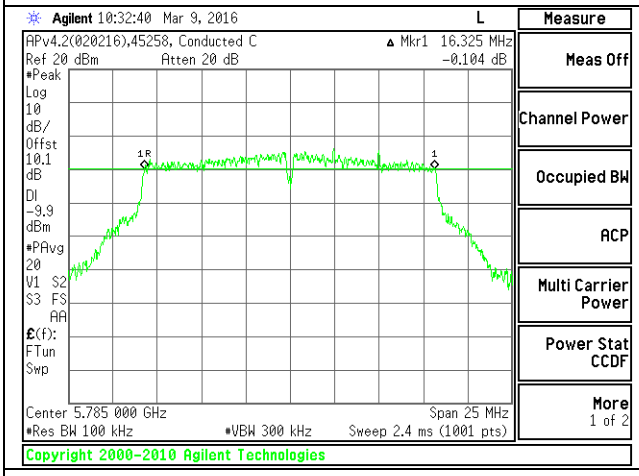
8.4.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency	6 dB Bandwidth CHAIN 0	6 dB Bandwidth CHAIN 1	Minimum Limit
	(MHz)	(MHz)	(MHz)	(MHz)
Low	5775	75.470	75.810	0.5

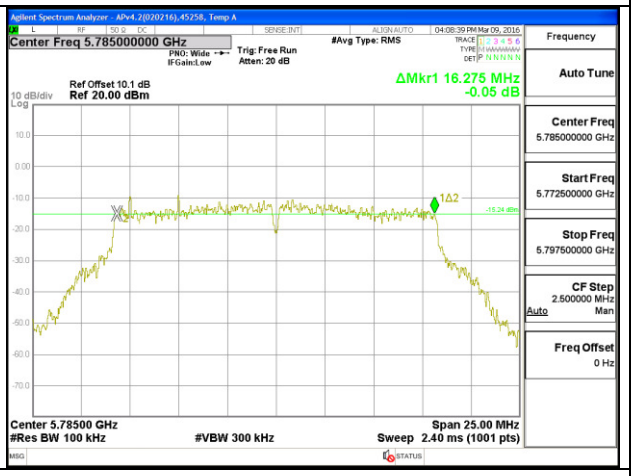
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.4.5. 6 dB BANDWIDTH MID CH PLOTS

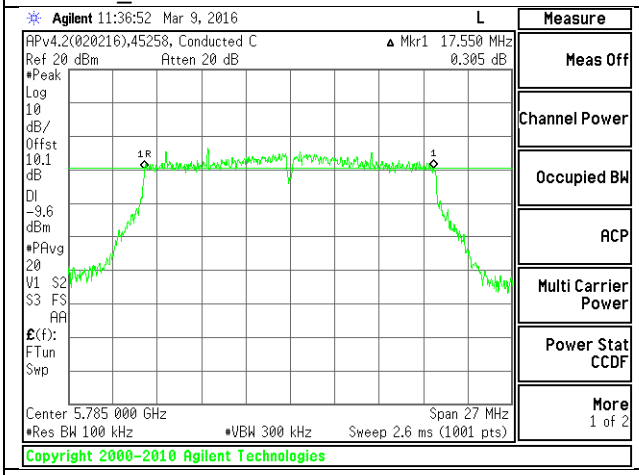
6dB 11a 5.8 Chain 0 Mid Ch



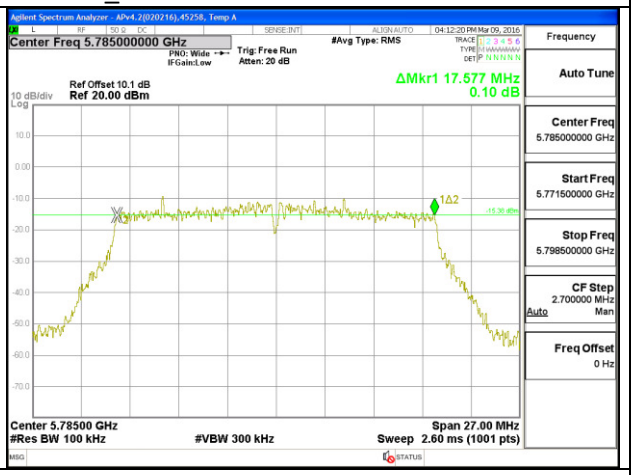
6dB 11a 5.8 Chain 1 Mid Ch



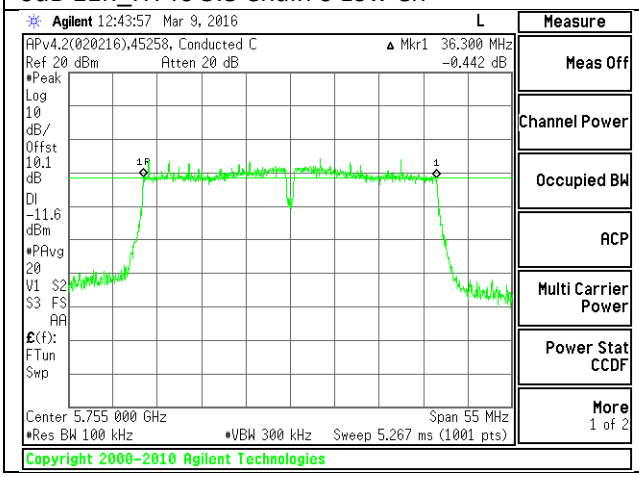
6dB 11n_HT20 5.8 Chain 0 Mid Ch



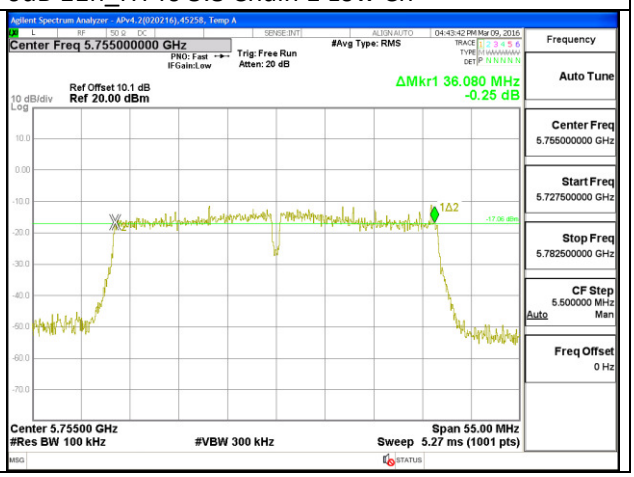
6dB 11n_HT20 5.8 Chain 1 Mid Ch



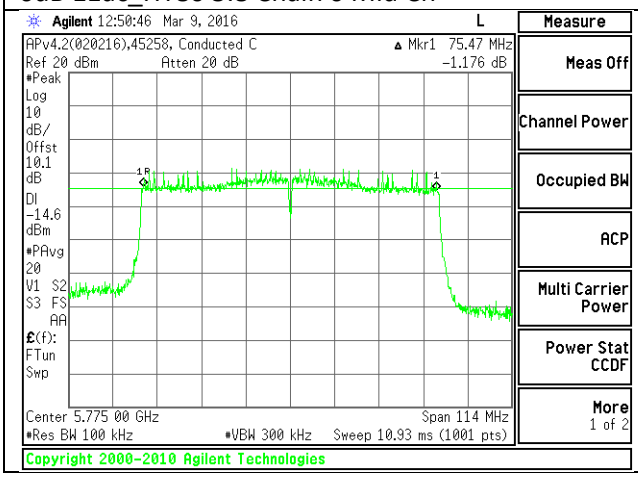
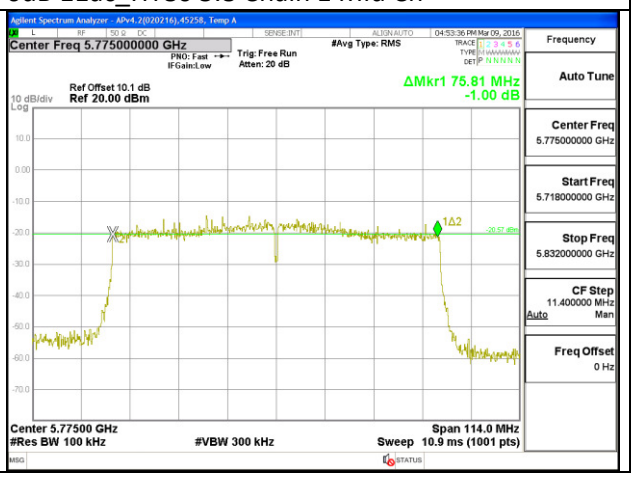
6dB 11n_HT40 5.8 Chain 0 Low Ch



6dB 11n_HT40 5.8 Chain 1 Low Ch



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

6dB 11ac_HT80 5.8 Chain 0 Mid Ch	6dB 11ac_HT80 5.8 Chain 1 Mid Ch
	

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.5. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

KDB 789033 D02 v01r01 Section C (1)

RESULTS

8.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	21.5820	21.5490
Mid	5200	21.6150	21.5160
High	5240	21.6150	21.5160

8.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	21.7800	21.7470
Mid	5200	21.8130	21.7800
High	5240	21.8130	21.8460

8.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5190	40.3820	40.6260
High	5230	40.3820	40.5040

8.5.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5210	82.2120	82.2120

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.5.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	21.6150	21.5490
Mid	5300	21.6150	21.5160
High	5320	21.5820	21.5820

8.5.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	21.8130	21.5820
Mid	5300	21.7470	21.5820
High	5320	21.8460	21.6150

8.5.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	40.2600	40.3210
High	5310	40.4430	40.5040

8.5.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5290	82.2120	82.5840

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.5.9. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	21.6150	21.5490
Mid	5580	21.5820	21.5820
High	5700	21.5820	21.5490
144	5720	21.7140	21.5820

8.5.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	21.9120	21.8460
Mid	5580	21.9450	21.8460
High	5700	21.7470	21.8130
144	5720	22.2020	21.8790

8.5.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5510	40.5040	40.2600
Mid	5550	40.3820	40.2600
High	5670	40.4430	40.3820
142	5710	40.8580	40.1380

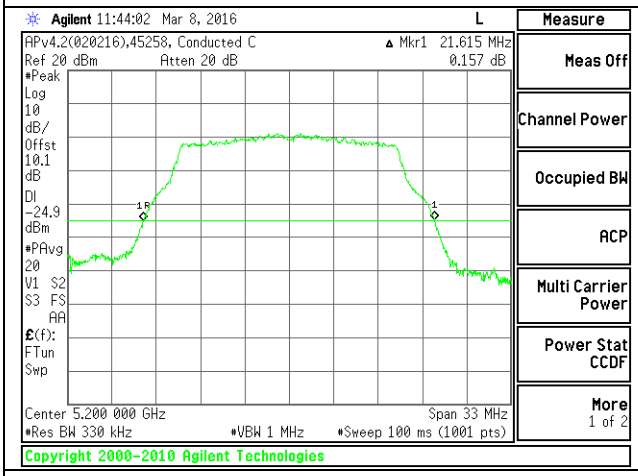
8.5.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5530	82.2120	82.2120
Mid	5610	82.2120	82.3360
138	5690	82.8750	83.0000

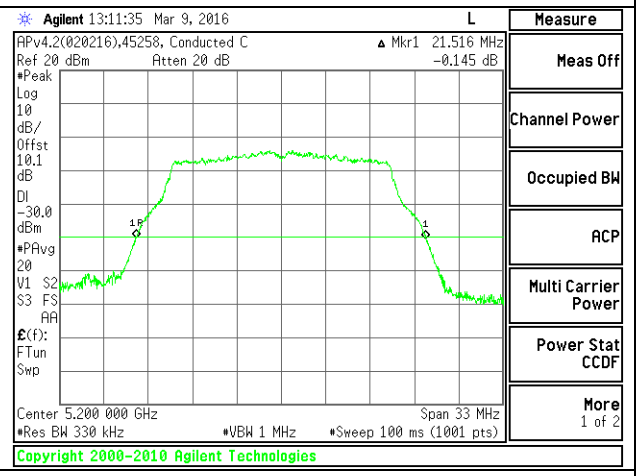
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.5.13. 26 dB BANDWIDTH PLOTS

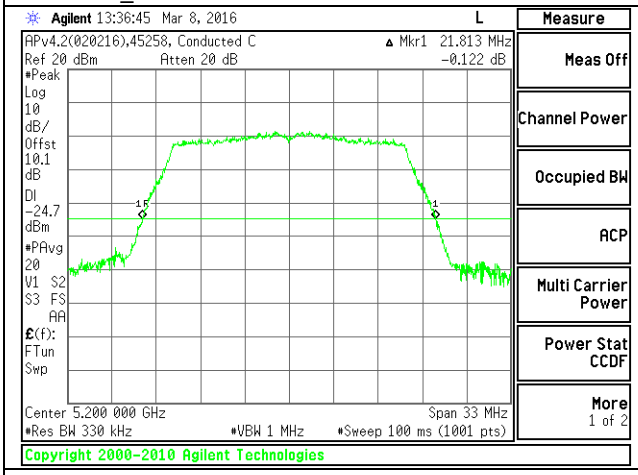
26dB 11a 5.2 Chain 0 Mid Ch



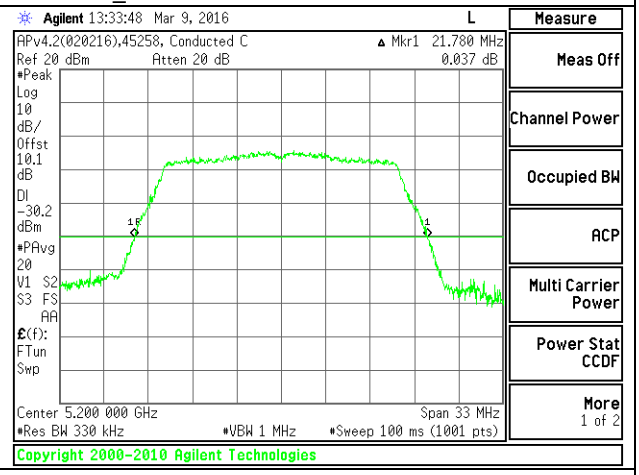
26dB 11a 5.2 Chain 1 Mid Ch



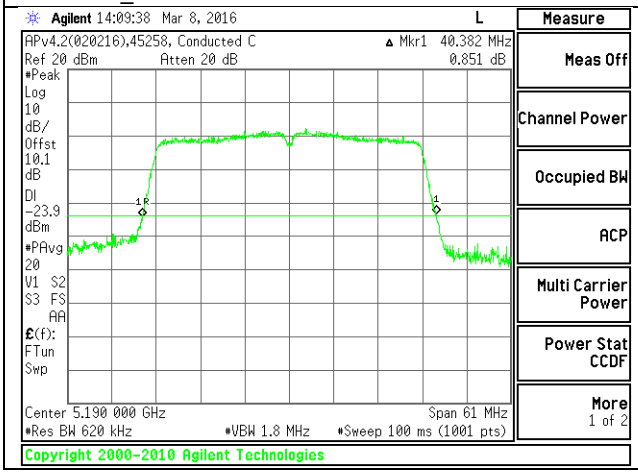
26dB 11n_HT20 5.2 Chain 0 Mid Ch



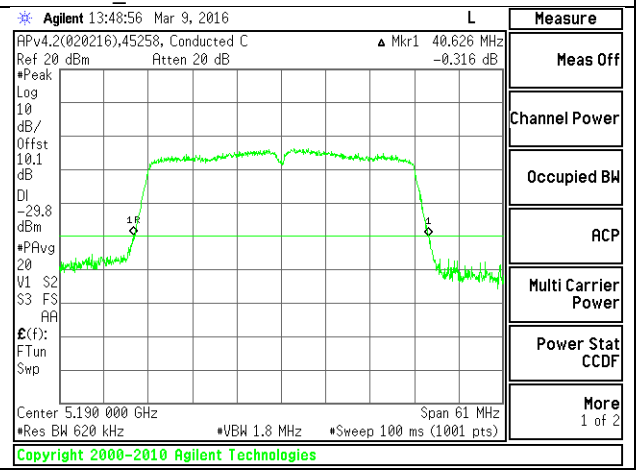
26dB 11n_HT20 5.2 Chain 1 Mid Ch



26dB 11n_HT40 5.2 Chain 0 Low Ch

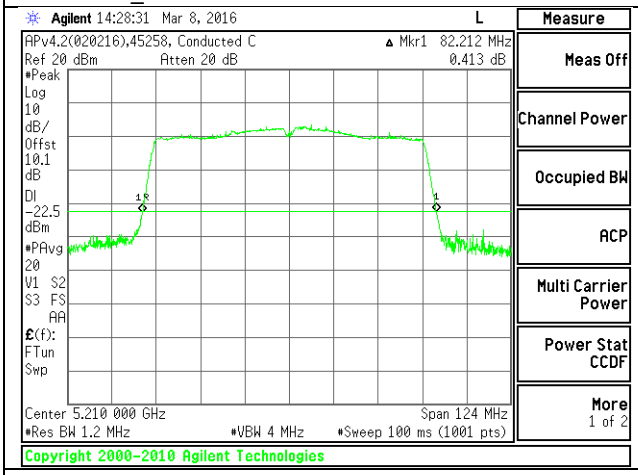


26dB 11n_HT40 5.2 Chain 1 Low Ch

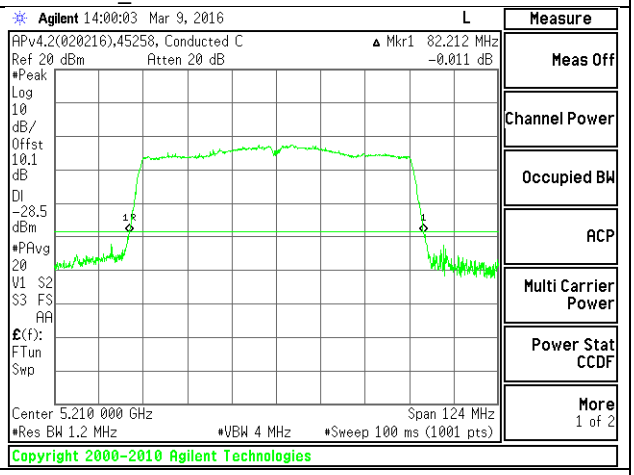


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

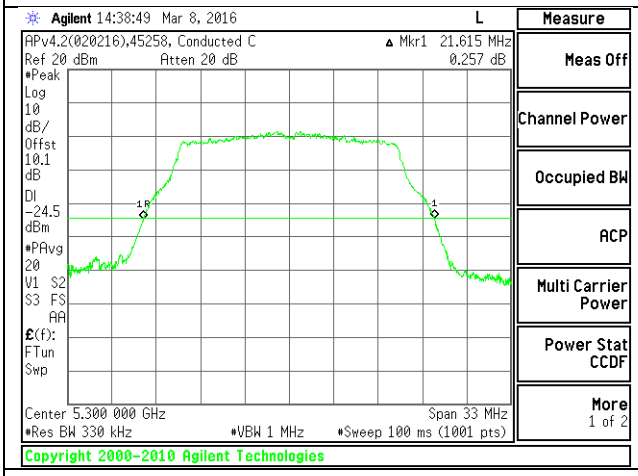
26dB 11ac_HT80 5.2 Chain 0 Mid Ch



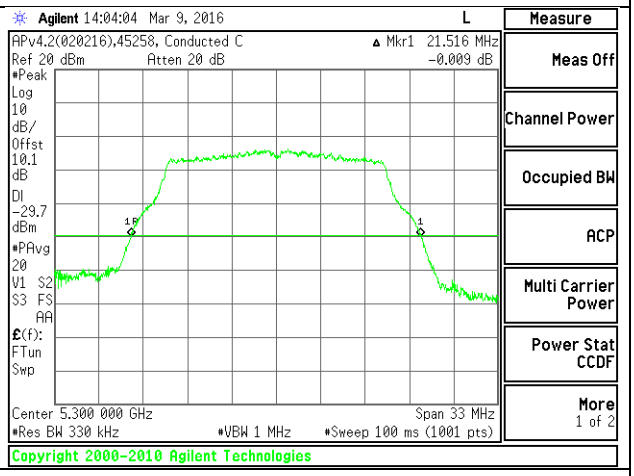
26dB 11ac_HT80 5.2 Chain 1 Mid Ch



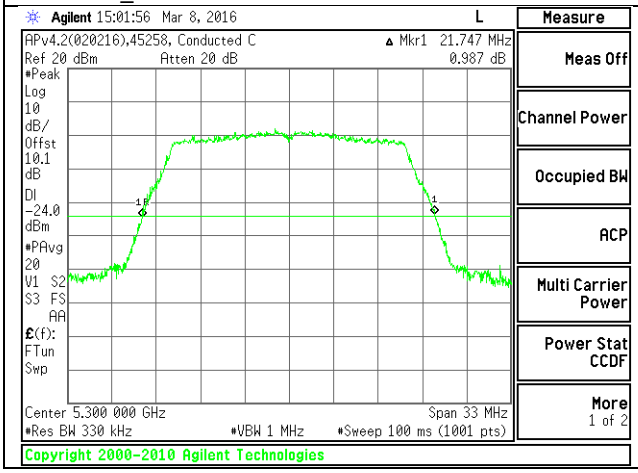
26dB 11a 5.3 Chain 0 Mid Ch



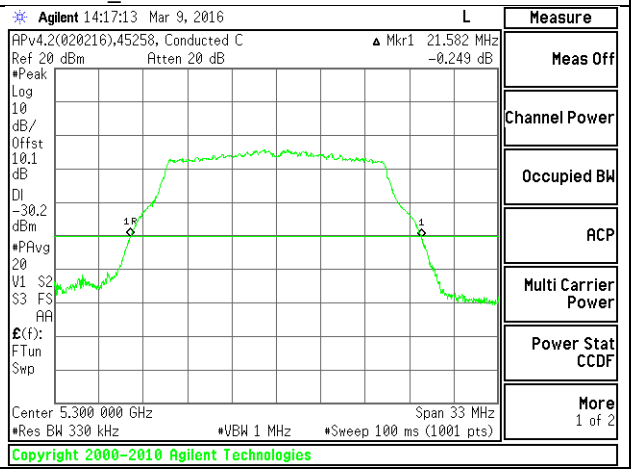
26dB 11a 5.3 Chain 1 Mid Ch



26dB 11n_HT20 5.3 Chain 0 Mid Ch

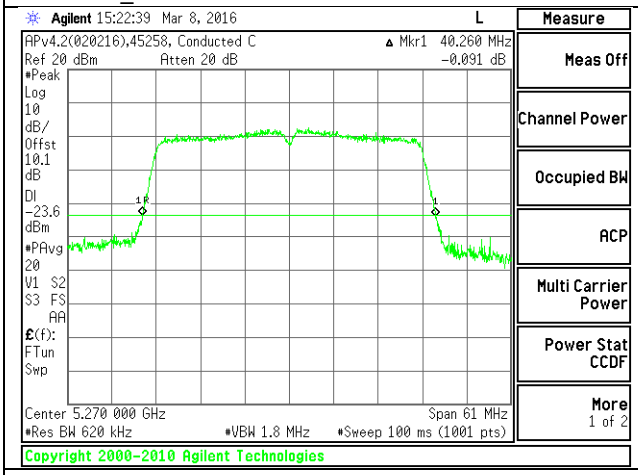


26dB 11n_HT20 5.3 Chain 1 Mid Ch

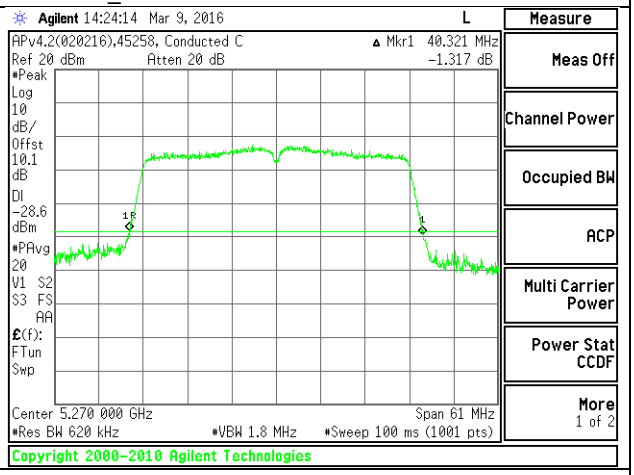


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

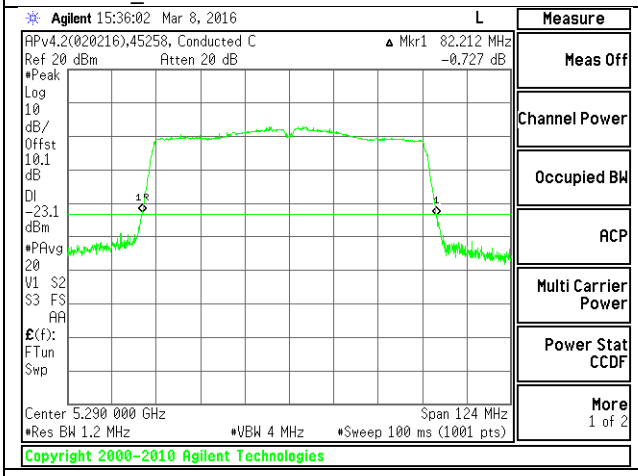
26dB 11n_HT40 5.3 Chain 0 Low Ch



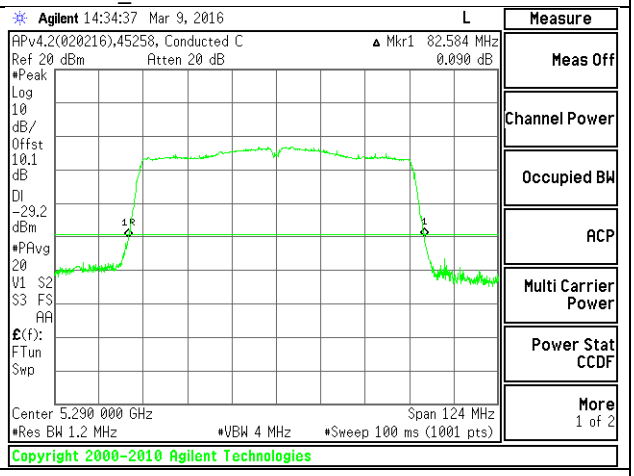
26dB 11n_HT40 5.3 Chain 1 Low Ch



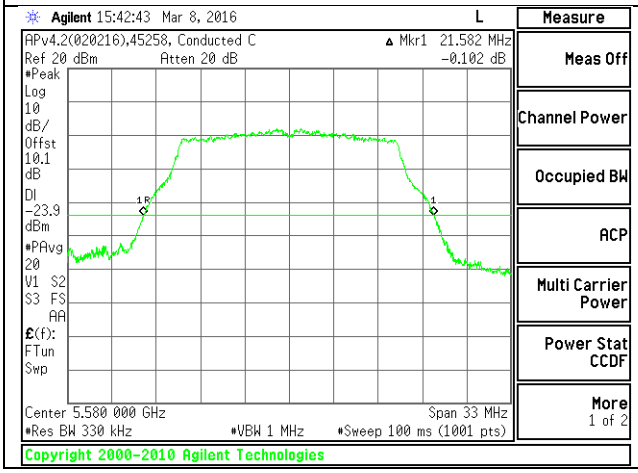
26dB 11ac_HT80 5.3 Chain 0 Mid Ch



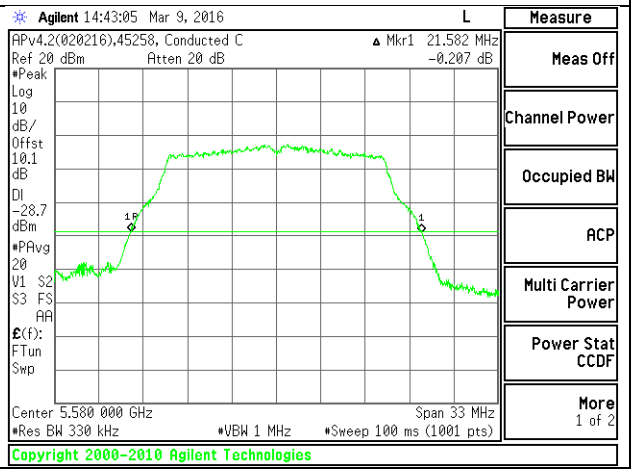
26dB 11ac_HT80 5.3 Chain 1 Mid Ch



26dB 11a 5.5 Chain 0 Mid Ch

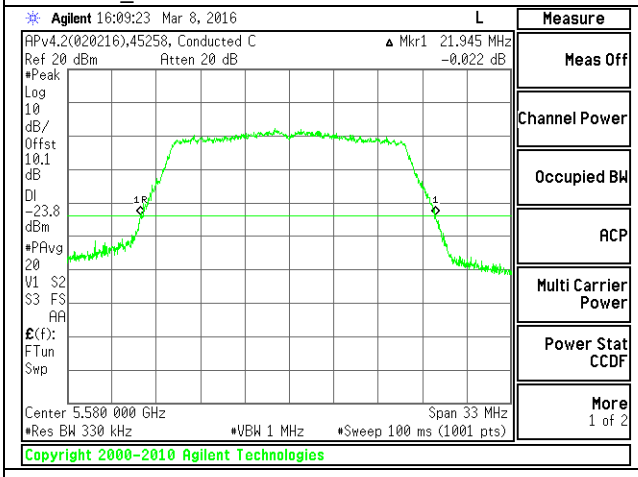


26dB 11a 5.5 Chain 1 Mid Ch

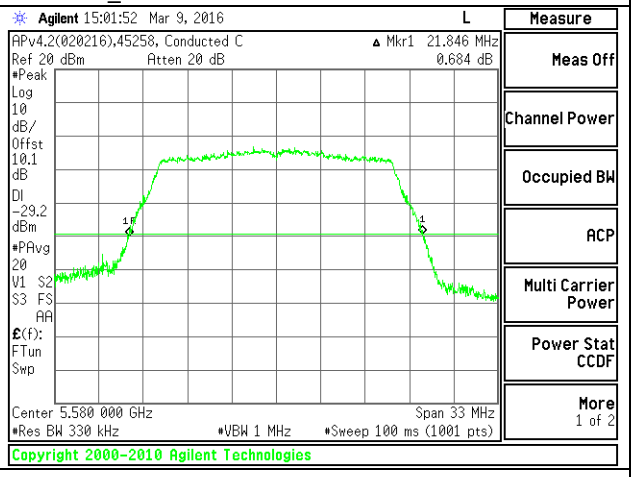


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

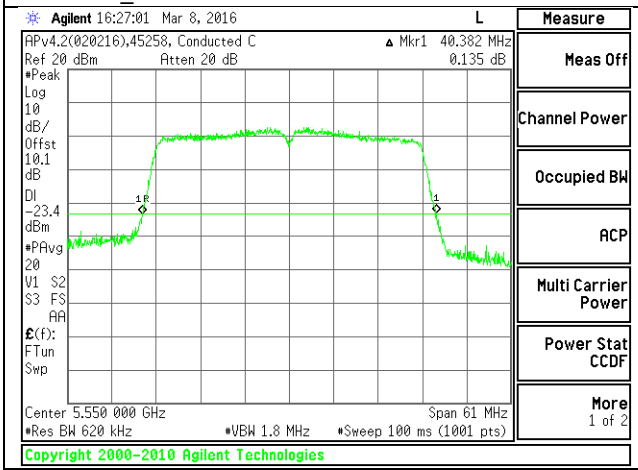
26dB 11n_HT20 5.5 Chain 0 Mid Ch



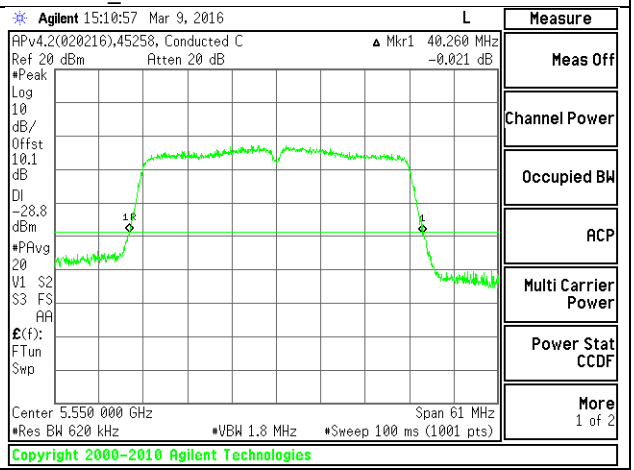
26dB 11n_HT20 5.5 Chain 1 Mid Ch



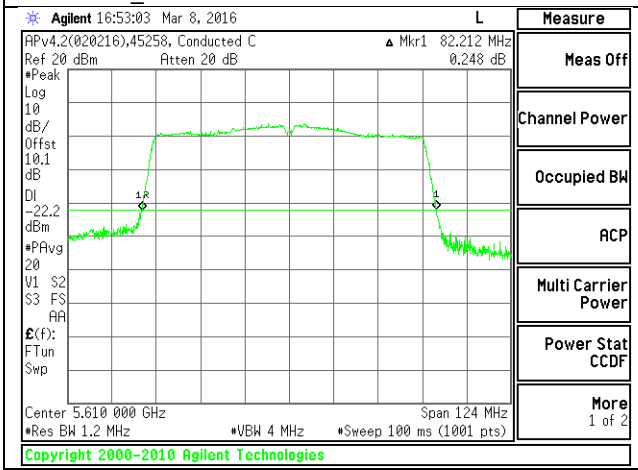
26dB 11n_HT40 5.5 Chain 0 Mid Ch



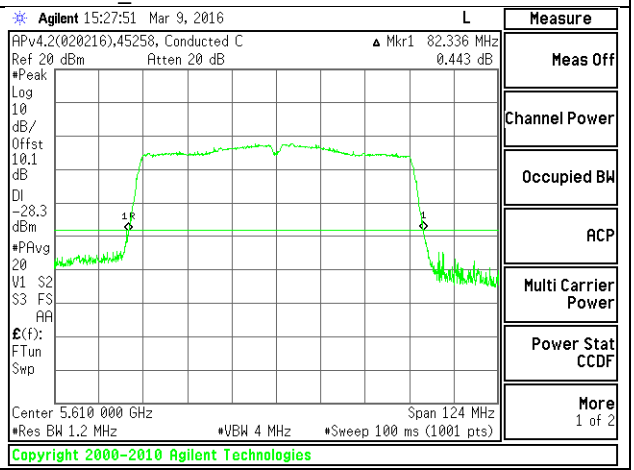
26dB 11n_HT40 5.5 Chain 1 Mid Ch



26dB 11ac_HT80 5.5 Chain 0 Mid Ch



26dB 11ac_HT80 5.5 Chain 1 Mid Ch



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.6. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

KDB 789033 D02 v01r01 Section D

RESULTS

8.6.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	16.4745	16.4738
Mid	5200	16.4674	16.4882
High	5240	16.4855	16.4900

8.6.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.7203	17.6053
Mid	5200	17.6705	17.6797
High	5240	17.6982	17.7110

8.6.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5190	36.2782	36.2065
High	5230	36.2157	36.2889

8.6.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5210	75.4857	75.5926

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.6.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	16.4939	16.5072
Mid	5300	16.4999	16.4895
High	5320	16.4944	16.4687

8.6.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.6967	17.7670
Mid	5300	17.6560	17.6550
High	5320	17.6343	17.7640

8.6.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5270	36.2662	36.2451
High	5310	36.2715	36.1504

8.6.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5290	75.4485	75.5988

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.6.9. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	16.4531	16.4694
Mid	5580	16.4584	16.5166
High	5700	16.4752	16.5078
144	5720	16.4630	16.6190

8.6.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	17.7105	17.6100
Mid	5580	17.6802	17.6982
High	5700	17.6797	17.7098
144	5720	17.8210	17.7150

8.6.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5510	36.2629	36.1796
Mid	5550	36.1641	36.2502
High	5670	36.1966	36.2642
142	5710	36.3970	36.3640

8.6.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5530	75.4650	75.5826
Mid	5610	75.4748	75.6668
138	5690	76.0630	76.1870

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.6.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	16.5095	16.4958
Mid	5785	16.4884	16.4932
High	5825	16.4974	16.4972

8.6.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	17.6504	17.6426
Mid	5785	17.6915	17.7880
High	5825	17.6606	17.7740

8.6.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5755	36.2801	36.2730
High	5795	36.1330	36.1780

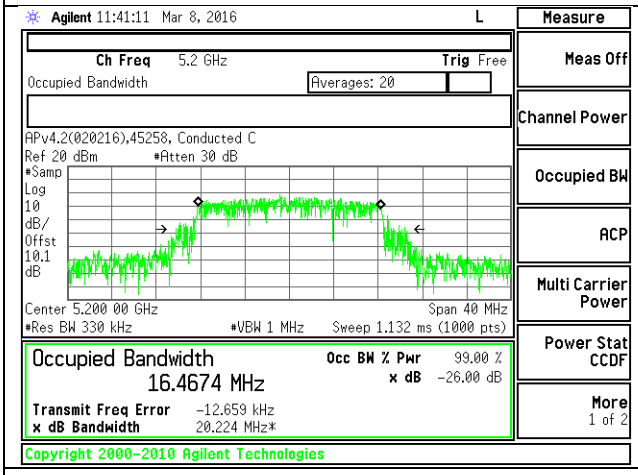
8.6.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5775	75.5607	75.9850

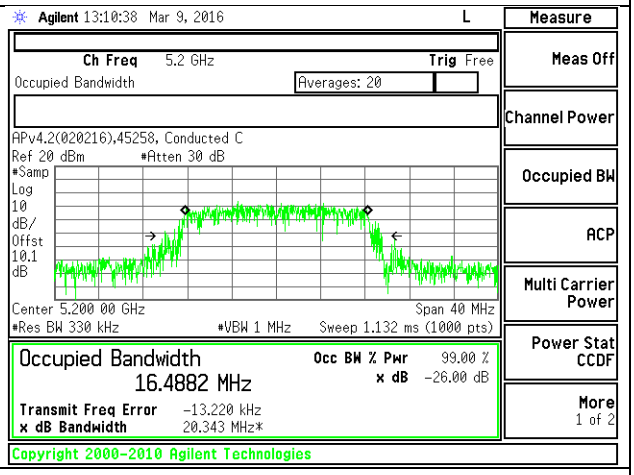
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.6.17. 99% BANDWIDTH PLOTS

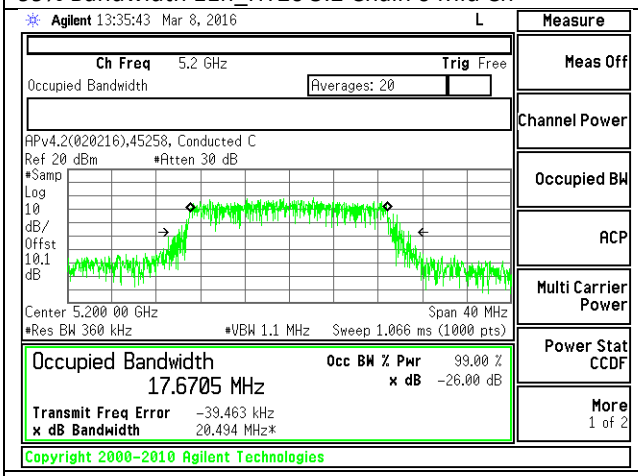
99% Bandwidth 11a 5.2 Chain 0 Mid Ch



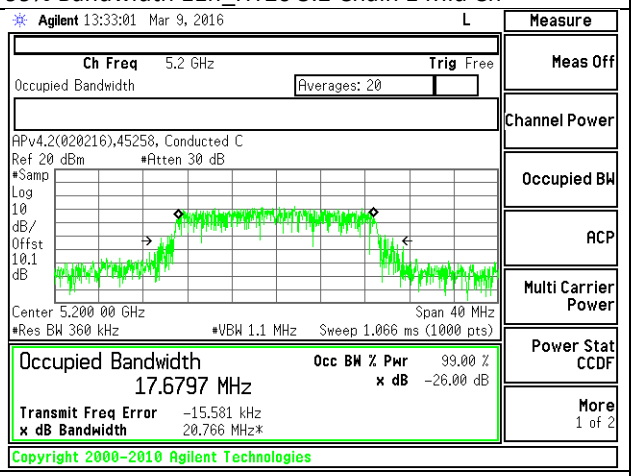
99% Bandwidth 11a 5.2 Chain 1 Mid Ch



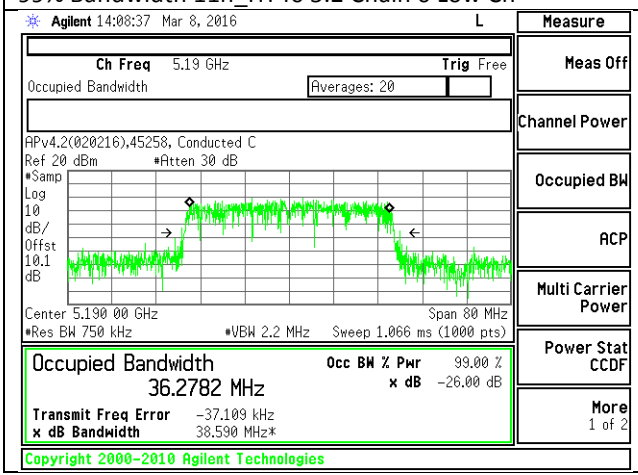
99% Bandwidth 11n_HT20 5.2 Chain 0 Mid Ch



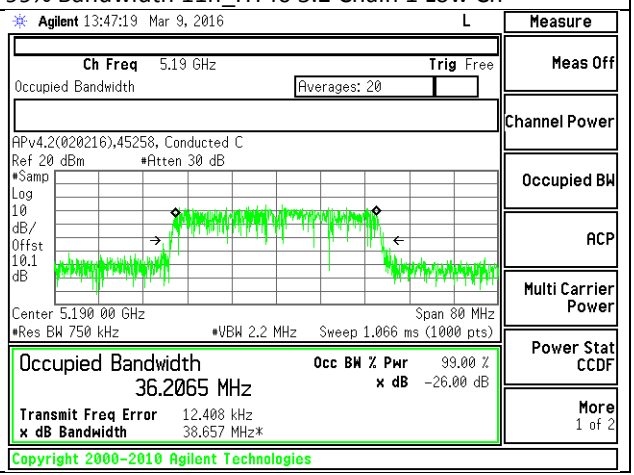
99% Bandwidth 11n_HT20 5.2 Chain 1 Mid Ch



99% Bandwidth 11n_HT40 5.2 Chain 0 Low Ch

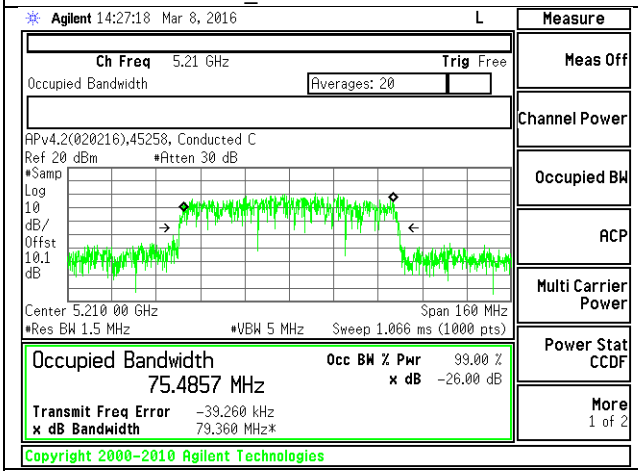


99% Bandwidth 11n_HT40 5.2 Chain 1 Low Ch

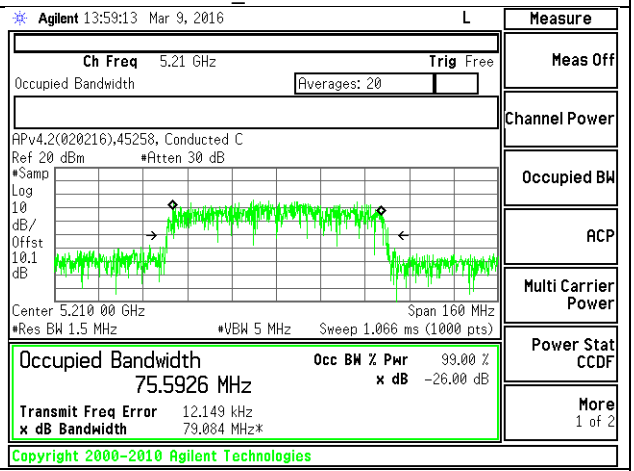


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

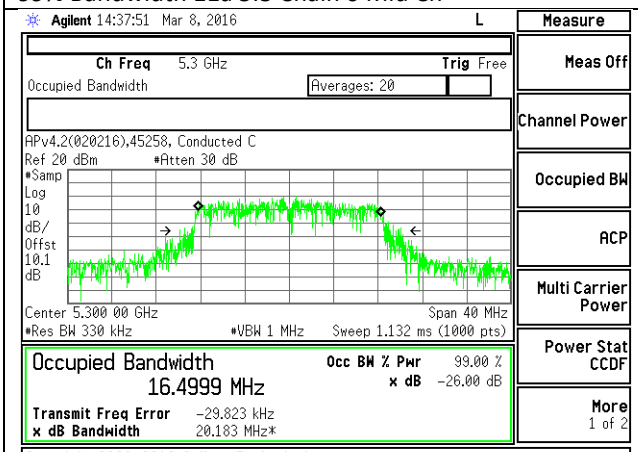
99% Bandwidth 11ac_HT80 5.2 Chain 0 Mid Ch



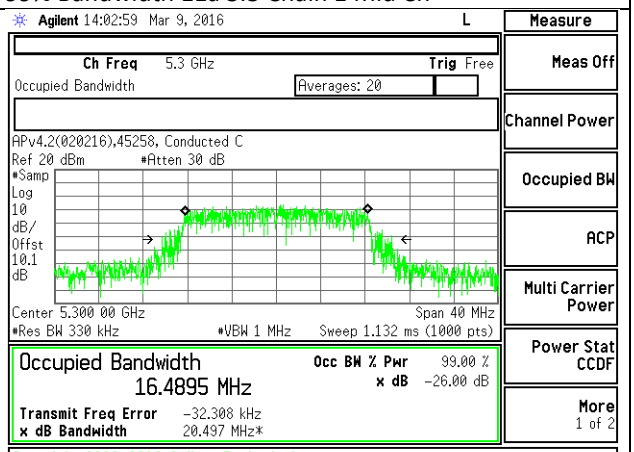
99% Bandwidth 11ac_HT80 5.2 Chain 1 Mid Ch



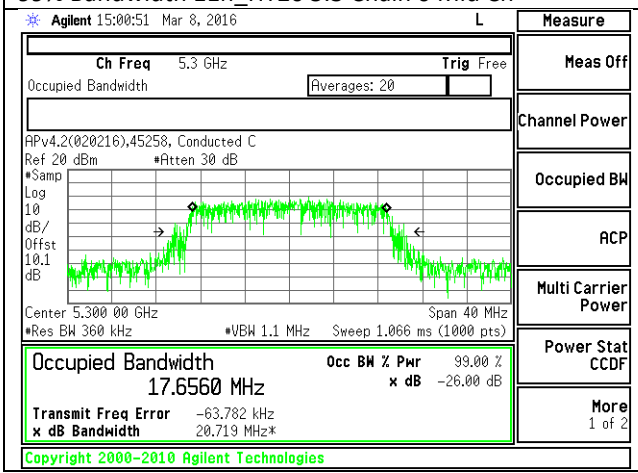
99% Bandwidth 11a 5.3 Chain 0 Mid Ch



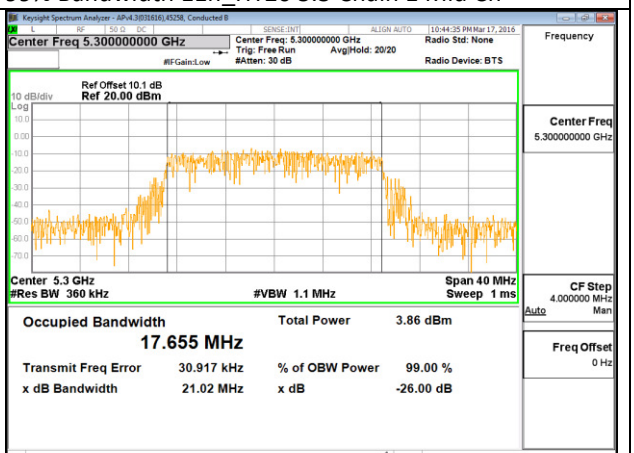
99% Bandwidth 11a 5.3 Chain 1 Mid Ch



99% Bandwidth 11n_HT20 5.3 Chain 0 Mid Ch

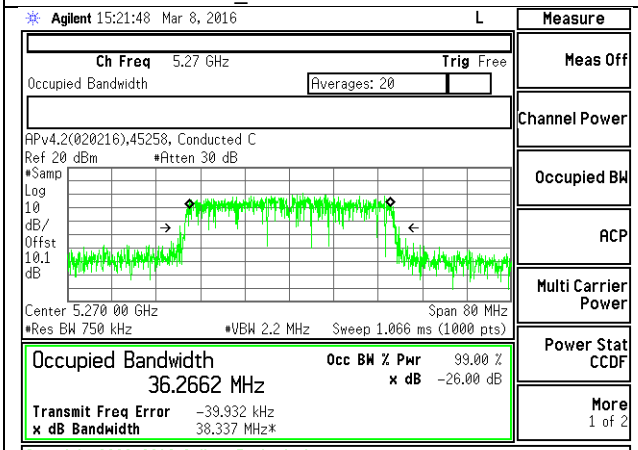


99% Bandwidth 11n_HT20 5.3 Chain 1 Mid Ch

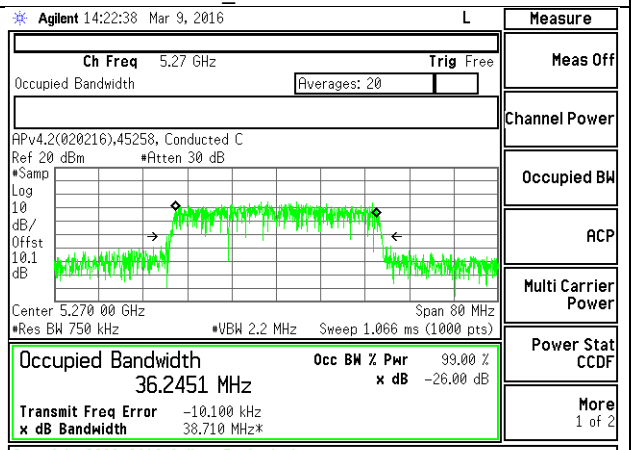


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

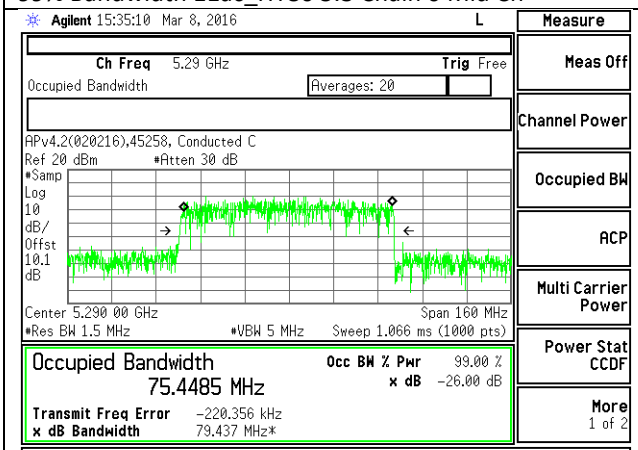
99% Bandwidth 11n_HT40 5.3 Chain 0 Low Ch



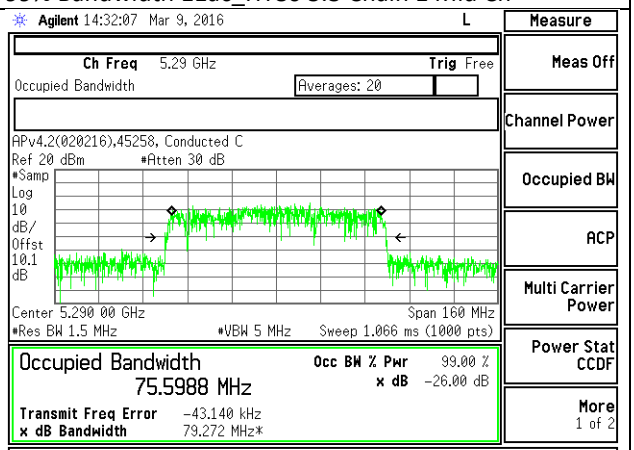
99% Bandwidth 11n_HT40 5.3 Chain 1 Low Ch



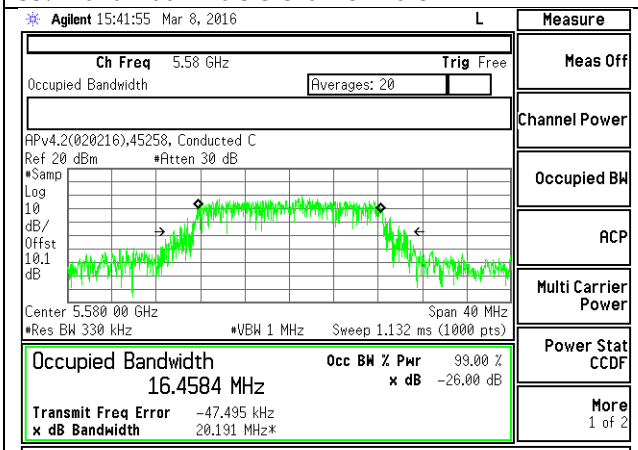
99% Bandwidth 11ac_HT80 5.3 Chain 0 Mid Ch



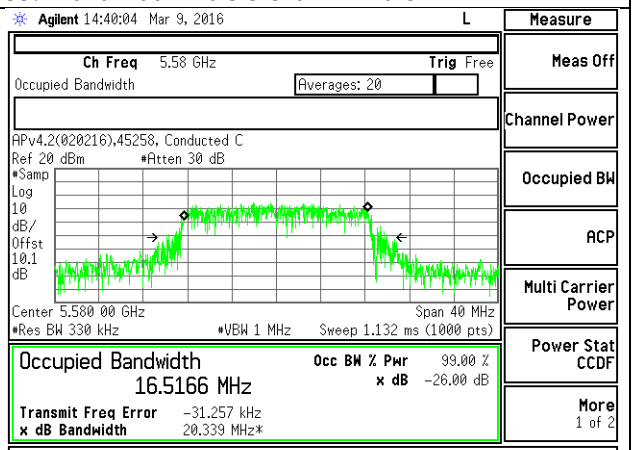
99% Bandwidth 11ac_HT80 5.3 Chain 1 Mid Ch



99% Bandwidth 11a 5.5 Chain 0 Mid Ch

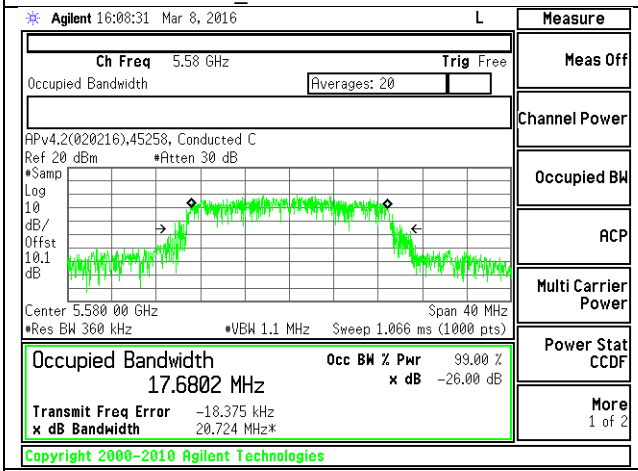


99% Bandwidth 11a 5.5 Chain 1 Mid Ch

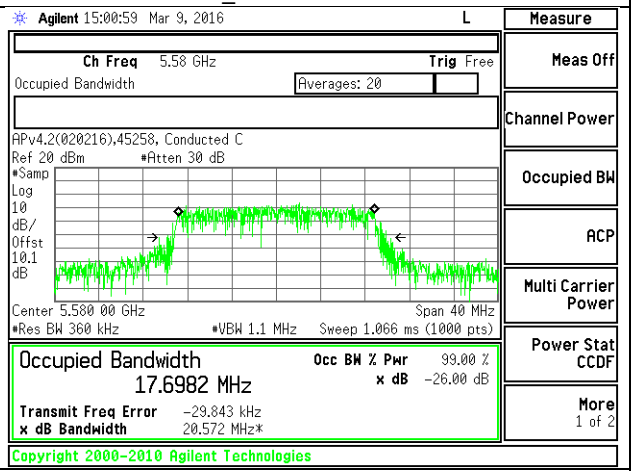


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

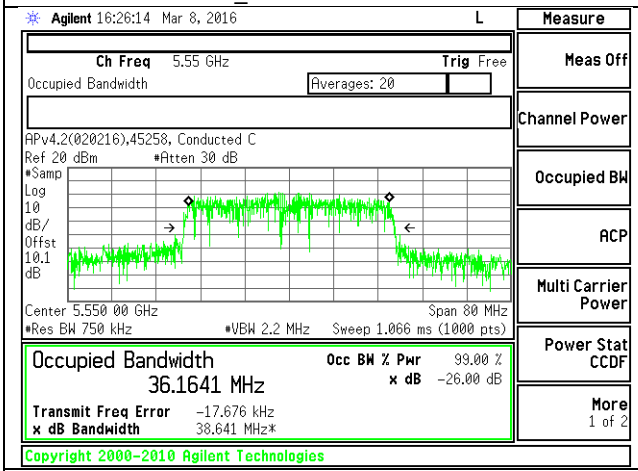
99% Bandwidth 11n_HT20 5.5 Chain 0 Mid Ch



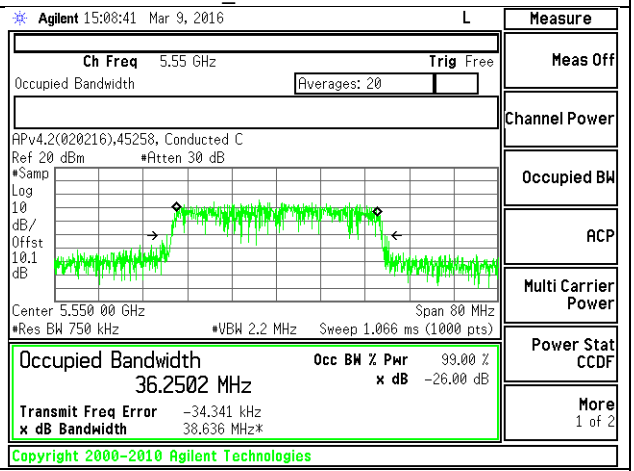
99% Bandwidth 11n_HT20 5.5 Chain 1 Mid Ch



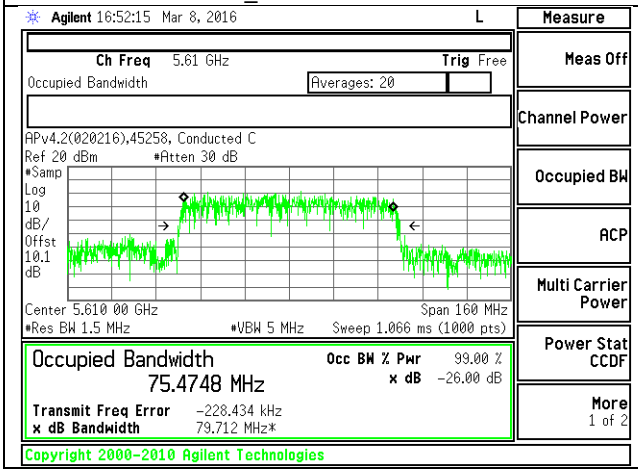
99% Bandwidth 11n_HT40 5.5 Chain 0 Mid Ch



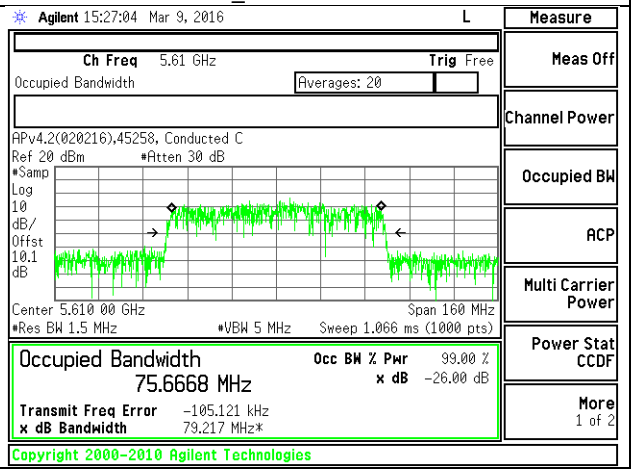
99% Bandwidth 11n_HT40 5.5 Chain 1 Mid Ch



99% Bandwidth 11ac_HT80 5.2 Chain 0 Mid Ch

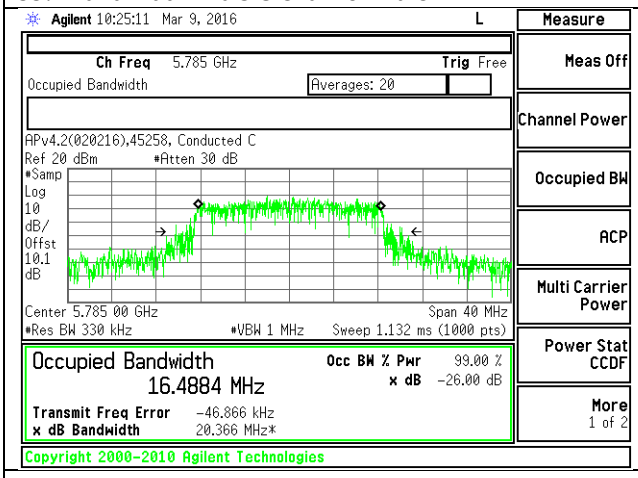


99% Bandwidth 11ac_HT80 5.2 Chain 1 Mid Ch

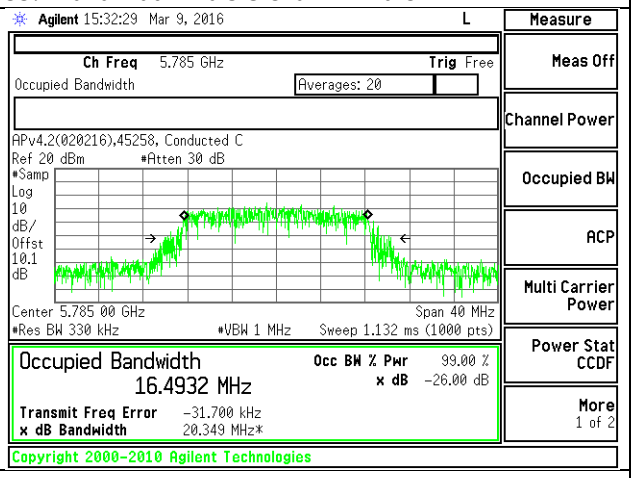


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

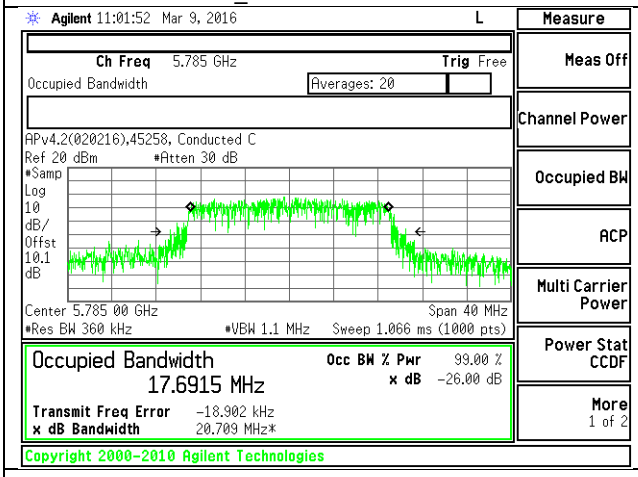
99% Bandwidth 11a 5.8 Chain 0 Mid Ch



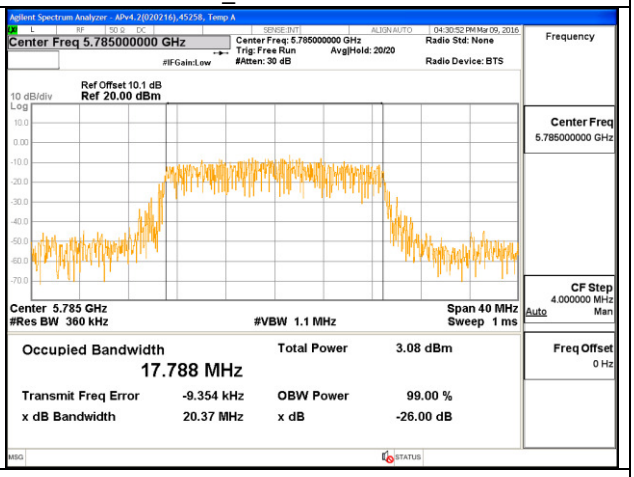
99% Bandwidth 11a 5.8 Chain 1 Mid Ch



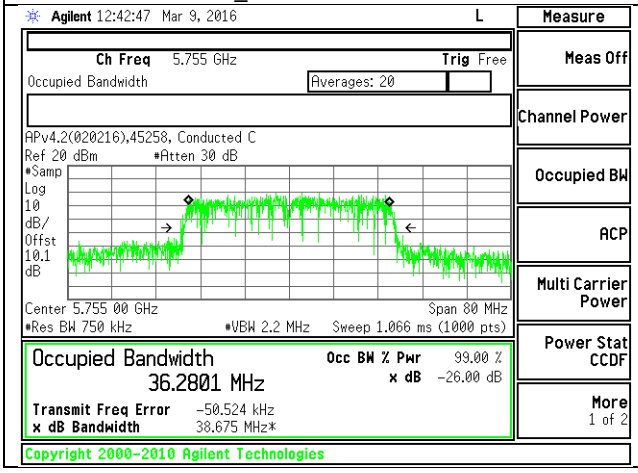
99% Bandwidth 11n_HT20 5.8 Chain 0 Mid Ch



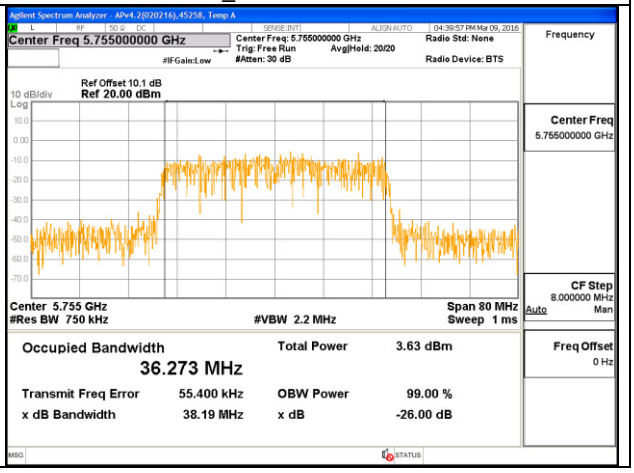
99% Bandwidth 11n_HT20 5.8 Chain 1 Mid Ch



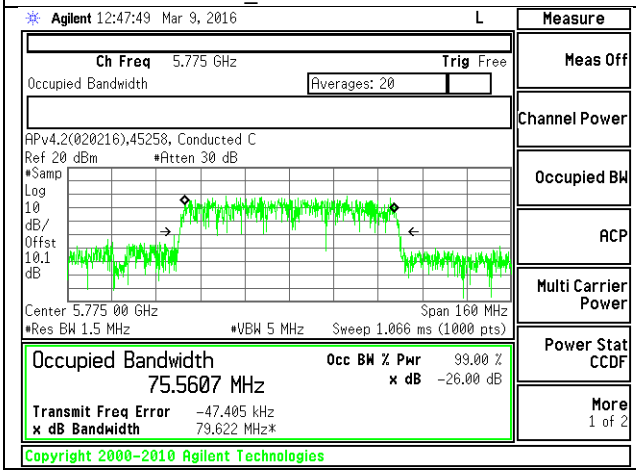
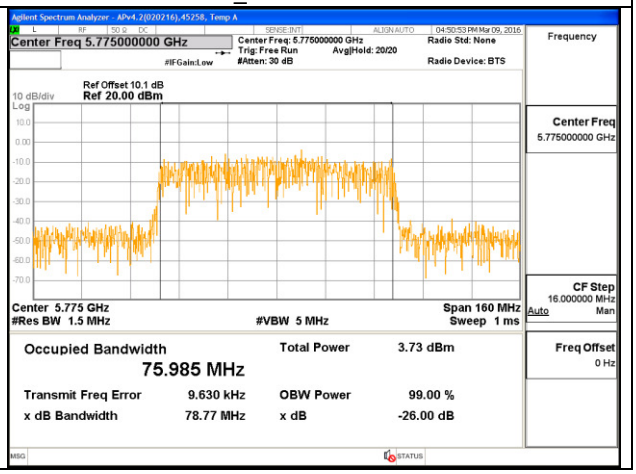
99% Bandwidth 11n_HT40 5.8 Chain 0 Low Ch



99% Bandwidth 11n_HT40 5.8 Chain 1 Low Ch



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

99% Bandwidth 11ac_HT80 5.8 Chain 0 Mid Ch	99% Bandwidth 11ac_HT80 5.8 Chain 1 Mid Ch
	

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands 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 megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

RSS-247

Band 5150-5250 MHz:

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Band 5250-5350 MHz:

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Bands 5470-5600 MHz and 5650-5725 MHz:

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Band 5725-5850 MHz:

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipointFootnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

TEST PROCEDURE

Maximum Output Power

KDB 789033 D02 v01r01 Section E (b) Method PM-G (Measurement using a gated RF average power meter)

Power Spectral Density

KDB 789033 D02 v01r01 Section F

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

DIRECTIONAL ANTENNA GAIN

The uncorrelated chain directional gain is:

5180-5240

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
-4.20	-4.20	-4.20

5260-5320

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
-4.20	-4.20	-4.20

5500-5700

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
-6.00	-3.20	-4.38

5745-5825

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
-5.70	-5.40	-5.55

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

The correlated chain directional gain is:

5180-5240

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
-4.20	-4.20	-1.19

5260-5300

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
-4.20	-4.20	-1.19

5550-5700

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
-6.00	-3.20	-1.48

5745-5825

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
-5.70	-5.40	-2.54

RESULTS

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.1. 802.11a MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	-4.20	-1.19	24.00	11.00
Mid	5200	-4.20	-1.19	24.00	11.00
High	5240	-4.20	-1.19	24.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	8.70	4.10	9.99	24.00	-14.01
Mid	5200	8.40	4.20	9.80	24.00	-14.20
High	5240	8.80	3.90	10.02	24.00	-13.98

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-1.425	-6.170	-0.17	11.00	-11.17
Mid	5200	-1.639	-6.132	-0.32	11.00	-11.32
High	5240	-1.548	-6.097	-0.24	11.00	-11.24

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	-4.20	-1.19	24.00	11.00
Mid	5200	-4.20	-1.19	24.00	11.00
High	5240	-4.20	-1.19	24.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	9.10	4.00	10.27	24.00	-13.73
Mid	5200	8.80	4.10	10.07	24.00	-13.93
High	5240	8.80	4.10	10.07	24.00	-13.93

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-1.675	-6.248	-0.38	11.00	-11.38
Mid	5200	-1.740	-6.599	-0.51	11.00	-11.51
High	5240	-1.698	-6.624	-0.49	11.00	-11.49

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5190	-4.20	-1.19	24.00	11.00
High	5230	-4.20	-1.19	24.00	11.00

Duty Cycle CF (dB)	0.12	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	9.30	4.30	10.49	24.00	-13.51
High	5230	9.20	4.50	10.47	24.00	-13.53

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-4.133	-8.975	-2.78	11.00	-13.78
High	5230	-4.272	-9.115	-2.92	11.00	-13.92

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5210	-4.20	-1.19	24.00	11.00

Duty Cycle CF (dB)	0.25	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	9.50	4.10	10.60	24.00	-13.40

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-7.065	-4.174	-2.12	11.00	-13.12

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.5. 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5260	21.5490	16.4939	-4.20	-1.19
Mid	5300	21.5160	16.4895	-4.20	-1.19
High	5320	21.5820	16.4687	-4.20	-1.19

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	24.00	23.17	29.17	23.17	11.00	11.00	11.00
Mid	5300	24.00	23.17	29.17	23.17	11.00	11.00	11.00
High	5320	24.00	23.17	29.17	23.17	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	8.60	4.00	9.89	23.17	-13.28
Mid	5300	8.30	3.90	9.65	23.17	-13.53
High	5320	8.40	4.00	9.75	23.17	-13.42

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	-1.530	-6.563	-0.34	11.00	-11.34
Mid	5300	-2.103	-6.911	-0.86	11.00	-11.86
High	5320	-2.051	-6.804	-0.80	11.00	-11.80

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.6. 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5260	21.5820	17.6967	-4.20	-1.19
Mid	5300	21.5820	17.6550	-4.20	-1.19
High	5320	51.6150	17.6343	-4.20	-1.19

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	24.00	23.48	29.48	23.48	11.00	11.00	11.00
Mid	5300	24.00	23.47	29.47	23.47	11.00	11.00	11.00
High	5320	24.00	23.46	29.46	23.46	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	8.80	4.10	10.07	23.48	-13.41
Mid	5300	8.50	4.00	9.82	23.47	-13.65
High	5320	8.80	4.10	10.07	23.46	-13.40

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	-1.877	-6.531	-0.60	11.00	-11.60
Mid	5300	-2.104	-7.049	-0.90	11.00	-11.90
High	5320	-2.182	-6.895	-0.92	11.00	-11.92

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.7. 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5270	40.2600	36.2451	-4.20	-1.19
High	5310	40.4430	36.1504	-4.20	-1.19

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD 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)	0.12	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	9.50	3.90	10.56	24.00	-13.44
High	5310	9.30	4.10	10.45	24.00	-13.55

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	-4.242	-9.740	-3.04	11.00	-14.04
High	5310	-4.309	-9.764	-3.10	11.00	-14.10

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.8. 802.11ac VHT80 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 for Power (dBi)	Directional Gain for PSD (dBi)
Mid	5290	82.2120	75.4485	-4.20	-1.19

Limits

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

Duty Cycle CF (dB)	0.25	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	9.00	3.80	10.15	24.00	-13.85

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-7.790	-12.780	-6.34	11.00	-17.34

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.9. 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5500	21.5490	16.4531	-4.38	-1.48
Mid	5580	21.5820	16.4584	-4.38	-1.48
High	5700	21.5490	16.4752	-4.38	-1.48
144	5720	21.5820	16.4630	-4.38	-1.48

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5500	24.00	23.16	29.16	23.16	11.00	11.00	11.00
Mid	5580	24.00	23.16	29.16	23.16	11.00	11.00	11.00
High	5700	24.00	23.17	29.17	23.17	11.00	11.00	11.00
144	5720	24.00	23.17	29.17	23.17	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	9.10	4.30	10.34	23.16	-12.82
Mid	5580	9.70	4.40	10.82	23.16	-12.34
High	5700	9.40	4.60	10.64	23.17	-12.53
144	5720	9.40	4.30	10.57	23.17	-12.60

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	-1.190	-6.746	-0.124	11.00	-11.12
Mid	5580	-1.103	-6.186	0.071	11.00	-10.93
High	5700	-1.344	-6.420	-0.169	11.00	-11.17
144	5720	-1.705	-6.909	-0.560	11.00	-11.56

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.10. 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5500	21.8460	17.6100	-4.38	-1.48
Mid	5580	21.8460	17.6802	-4.38	-1.48
High	5700	21.7470	17.6797	-4.38	-1.48
144	5720	21.8790	17.7150	-4.38	-1.48

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5500	24.00	23.46	29.46	23.46	11.00	11.00	11.00
Mid	5580	24.00	23.47	29.47	23.47	11.00	11.00	11.00
High	5700	24.00	23.47	29.47	23.47	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	9.50	4.00	10.58	23.46	-12.88
Mid	5580	9.80	4.40	10.90	23.47	-12.57
High	5700	9.40	4.20	10.55	23.47	-12.93
144	5720	9.20	4.20	10.39	23.48	-13.09

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	-1.833	-7.118	-0.706	11.00	-11.71
Mid	5580	-1.691	-6.471	-0.444	11.00	-11.44
High	5700	-1.711	-6.576	-0.485	11.00	-11.48
144	5720	-2.163	-7.272	-0.996	11.00	-12.00

Note**:** the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.11. 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5510	40.2600	36.1796	-4.38	-1.48
Mid	5550	40.2600	36.1641	-4.38	-1.48
High	5670	40.3820	36.1966	-4.38	-1.48
142	5710	40.1380	36.3640	-4.38	-1.48

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	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
142	5710	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.12	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	10.00	4.90	11.17	24.00	-12.83
Mid	5550	10.20	5.20	11.39	24.00	-12.61
High	5670	10.30	5.10	11.45	24.00	-12.55
142	5710	9.40	4.80	10.69	24.00	-13.31

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-4.076	-8.990	-2.74	11.00	-13.74
Mid	5550	-4.079	-8.746	-2.68	11.00	-13.68
High	5670	-3.573	-8.328	-2.20	11.00	-13.20
142	5710	-4.108	-8.880	-2.74	11.00	-13.74

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.12. 802.11ac VHT80 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 for Power (dBi)	Directional Gain for PSD (dBi)
Low	5530	82.2120	75.4650	-4.38	-1.48
High	5610	82.2120	75.4748	-4.38	-1.48
138	5690	82.8750	76.0630	-4.38	-1.48

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD 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
138	5690	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.25	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	10.10	5.00	11.27	24.00	-12.73
High	5610	10.90	5.00	11.89	24.00	-12.11
138	5690	10.90	5.00	11.89	24.00	-12.11

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5530	-6.603	-11.859	-5.220	11.00	-16.22
High	5610	-6.357	-11.387	-4.921	11.00	-15.92
138	5690	-7.092	-12.002	-5.627	11.00	-16.63

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.13. 802.11a MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBm)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Low	5745	-5.55	-2.54	30.00	30.00
Mid	5785	-5.55	-2.54	30.00	30.00
High	5825	-5.55	-2.54	30.00	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	9.30	3.50	10.31	30.00	-19.69
Mid	5785	9.10	3.40	10.14	30.00	-19.86
High	5825	9.10	3.30	10.11	30.00	-19.89

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	-3.609	-9.461	-2.606	30.00	-32.61
Mid	5785	-3.827	-9.332	-2.750	30.00	-32.75
High	5825	-3.875	-9.629	-2.851	30.00	-32.85

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBm)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Low	5745	-5.55	-2.54	30.00	30.00
Mid	5785	-5.55	-2.54	30.00	30.00
High	5825	-5.55	-2.54	30.00	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	9.60	3.80	10.61	30.00	-19.39
Mid	5785	9.10	3.60	10.18	30.00	-19.82
High	5825	9.00	3.20	10.01	30.00	-19.99

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	-4.026	-9.662	-2.977	30.00	-32.98
Mid	5785	-4.092	-9.779	-3.054	30.00	-33.05
High	5825	-3.812	-9.848	-2.846	30.00	-32.85

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBm)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Low	5755	-5.55	-2.54	30.00	30.00
High	5795	-5.55	-2.54	30.00	30.00

Duty Cycle CF (dB)	0.12	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	10.40	4.40	11.37	30.00	-18.63
High	5795	10.30	4.30	11.27	30.00	-18.73

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	-6.290	-11.963	-5.129	30.00	-35.13
High	5795	-6.706	-11.942	-5.448	30.00	-35.45

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBm)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Mid	5775	-5.55	-2.54	30.00	30.00

Duty Cycle CF (dB)	0.25	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	9.40	4.10	10.77	30.00	-19.23

PSD Results

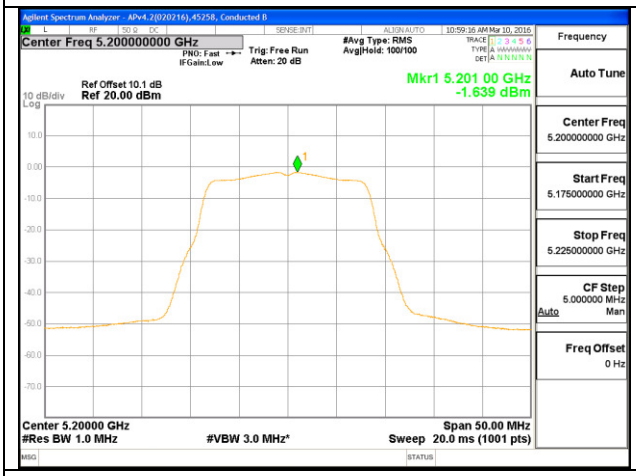
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5775	-10.112	-15.338	-8.722	30.00	-38.72

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

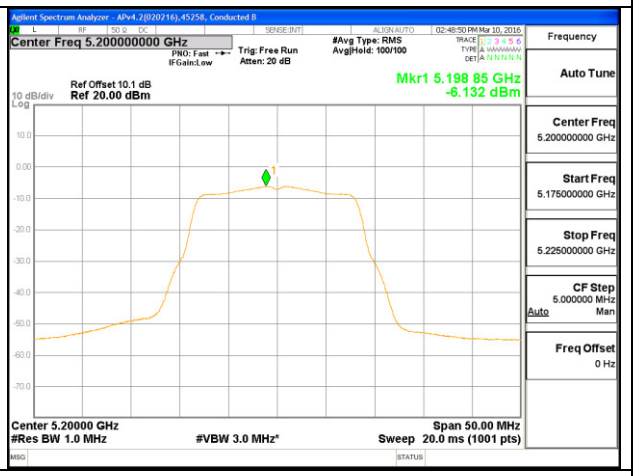
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.7.17. OUTPUT POWER AND PSD PLOTS

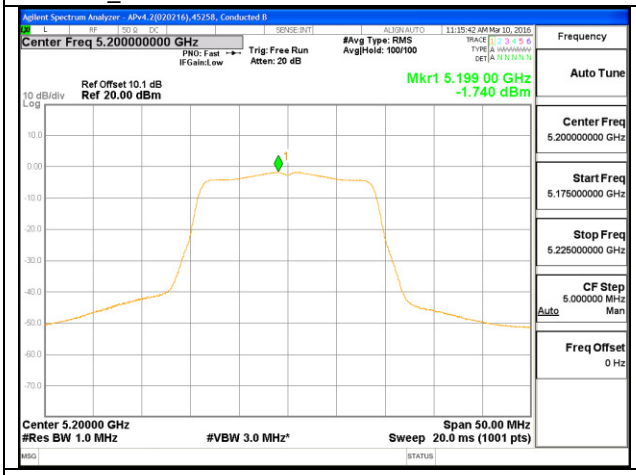
PSD 11a 5.2 Chain 0 Mid Ch



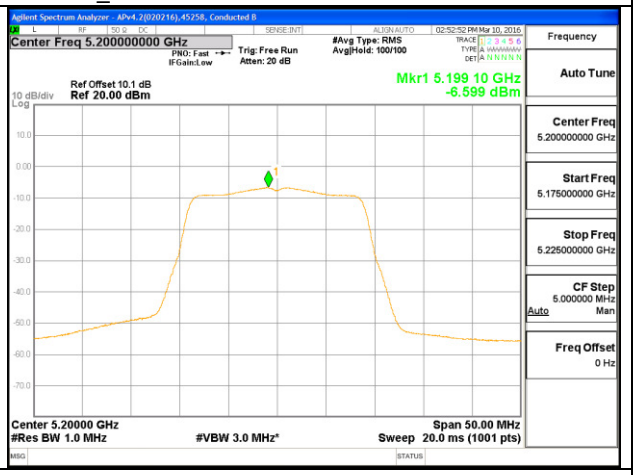
PSD 11a 5.2 Chain 1 Mid Ch



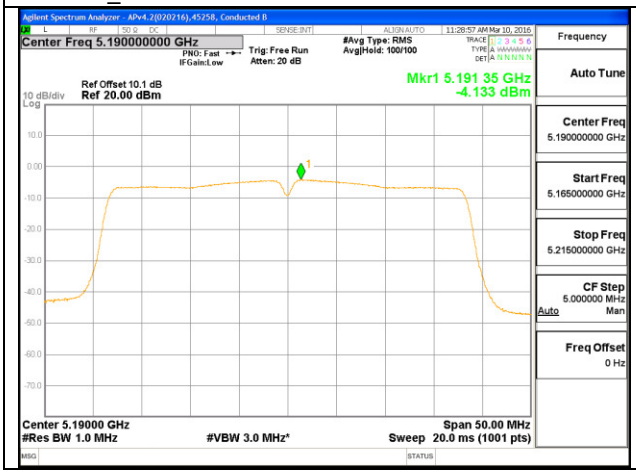
PSD 11n_HT20 5.2 Chain 0 Mid Ch



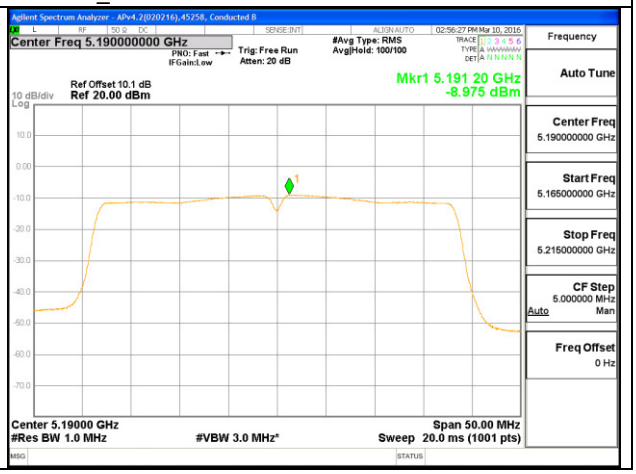
PSD 11n_HT20 5.2 Chain 1 Mid Ch



PSD 11n_HT40 5.2 Chain 0 Low Ch

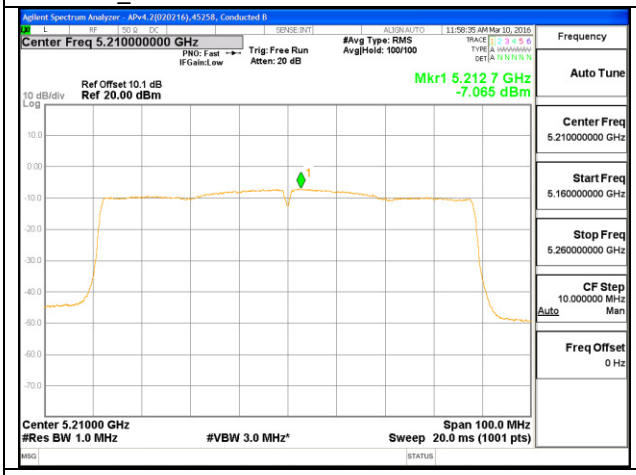


PSD 11n_HT40 5.2 Chain 1 Low Ch

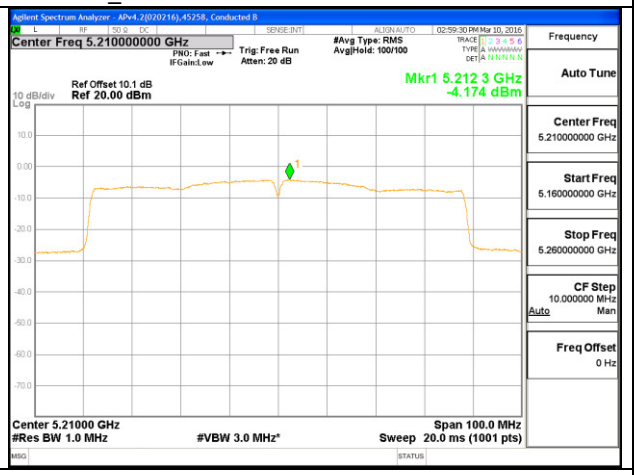


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

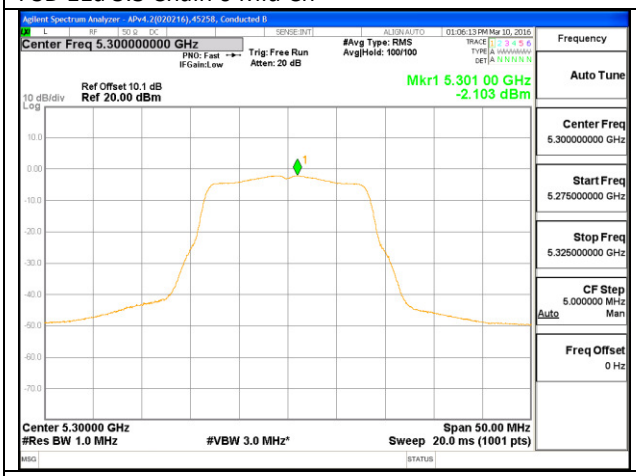
PSD 11ac_HT80 5.2 Chain 0 Mid Ch



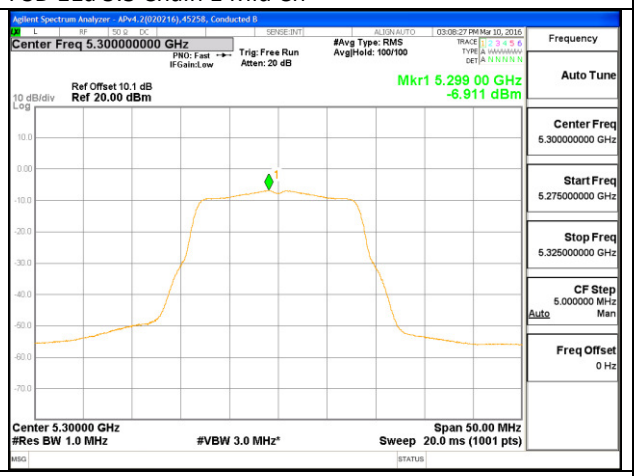
PSD 11ac_HT80 5.2 Chain 1 Mid Ch



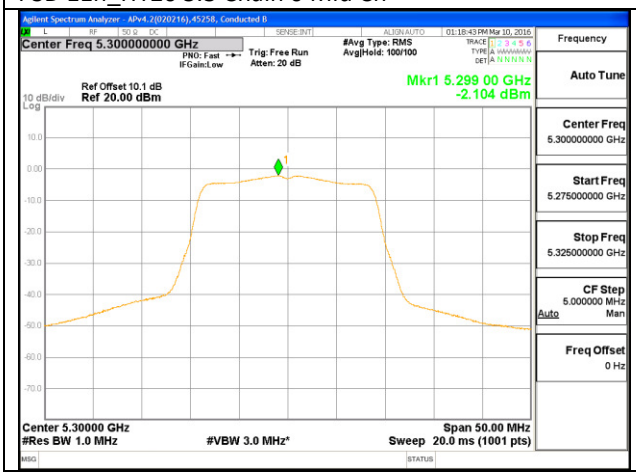
PSD 11a 5.3 Chain 0 Mid Ch



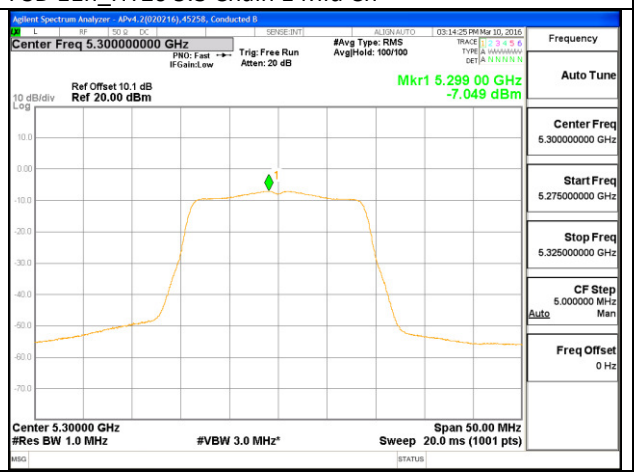
PSD 11a 5.3 Chain 1 Mid Ch



PSD 11n_HT20 5.3 Chain 0 Mid Ch

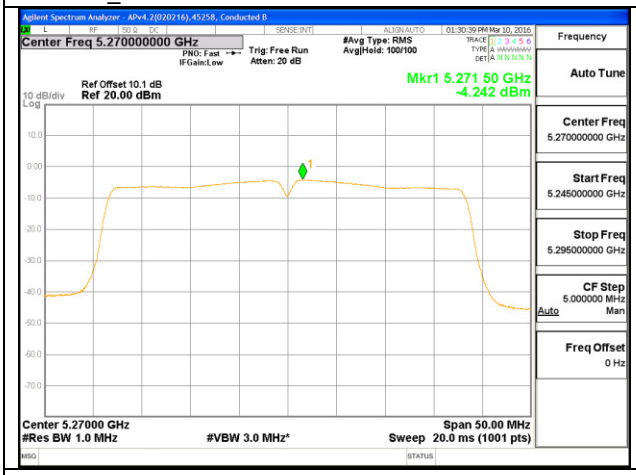


PSD 11n_HT20 5.3 Chain 1 Mid Ch

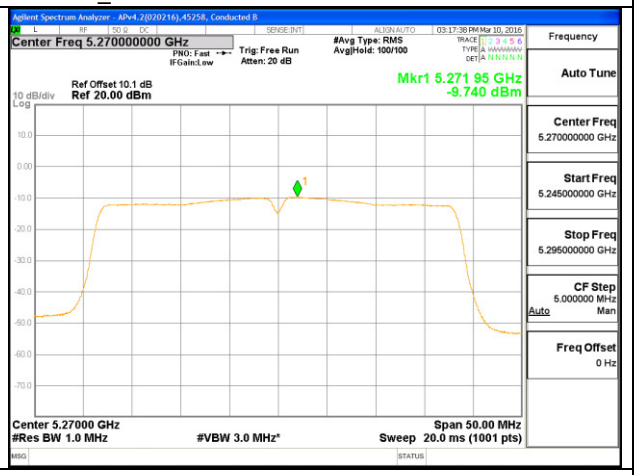


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

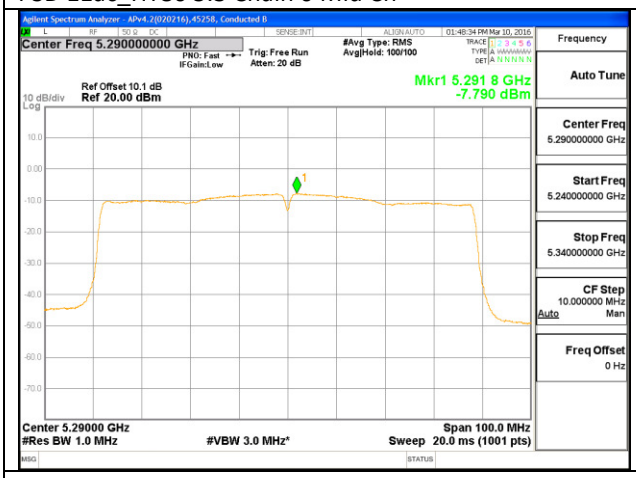
PSD 11n_HT40 5.3 Chain 0 Low Ch



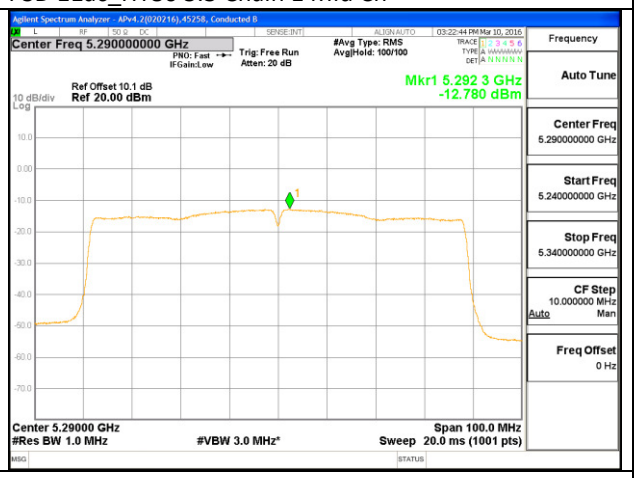
PSD 11n_HT40 5.3 Chain 1 Low Ch



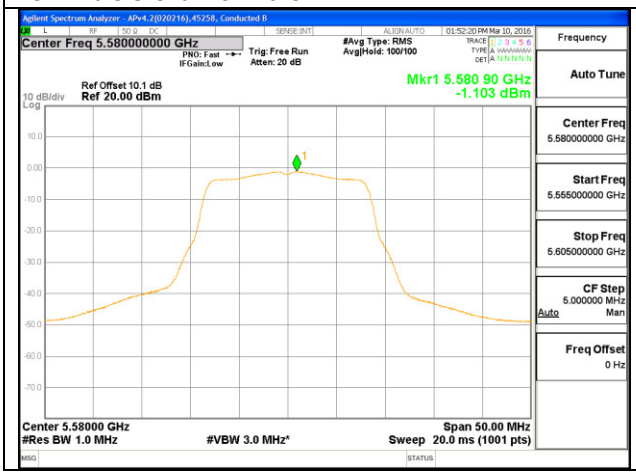
PSD 11ac_HT80 5.3 Chain 0 Mid Ch



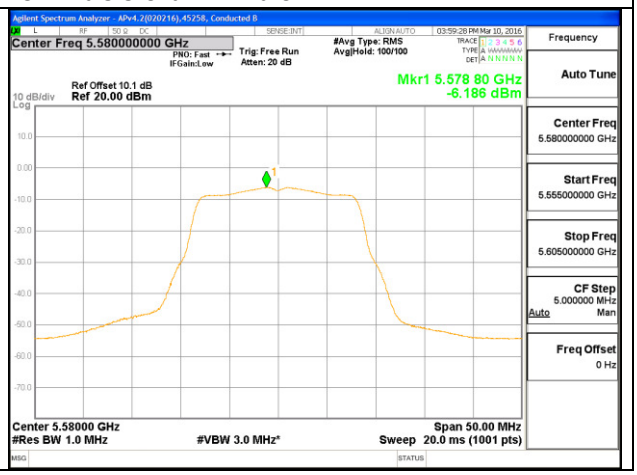
PSD 11ac_HT80 5.3 Chain 1 Mid Ch



PSD 11a 5.5 Chain 0 Mid Ch

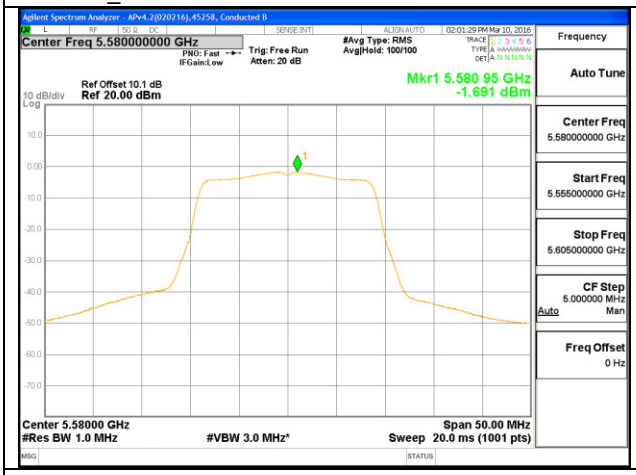


PSD 11a 5.5 Chain 1 Mid Ch

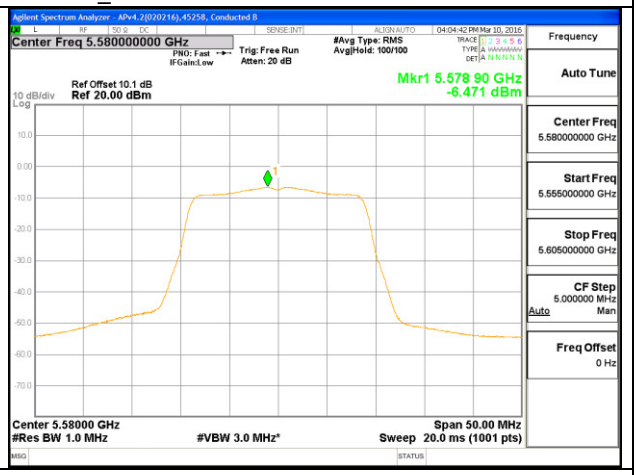


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

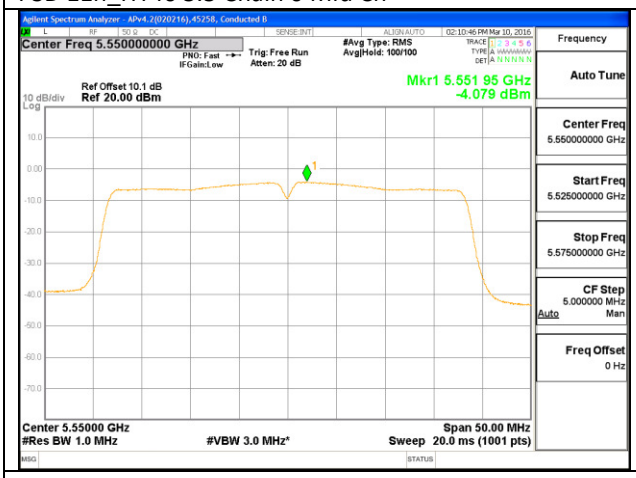
PSD 11n_HT20 5.5 Chain 0 Mid Ch



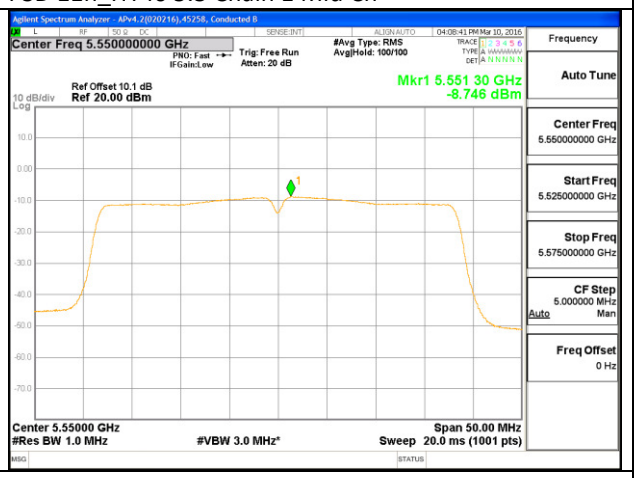
PSD 11n_HT20 5.5 Chain 1 Mid Ch



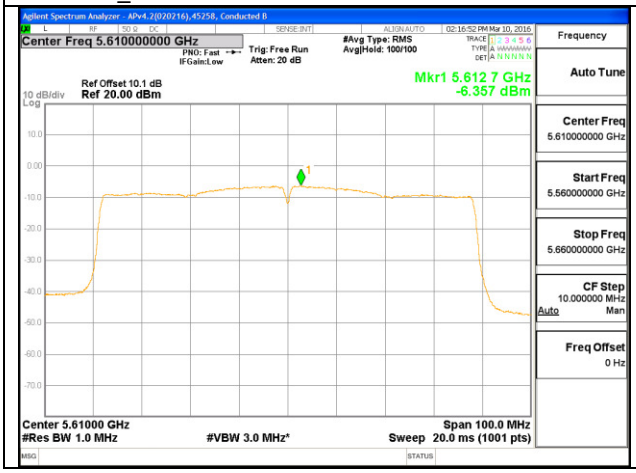
PSD 11n_HT40 5.5 Chain 0 Mid Ch



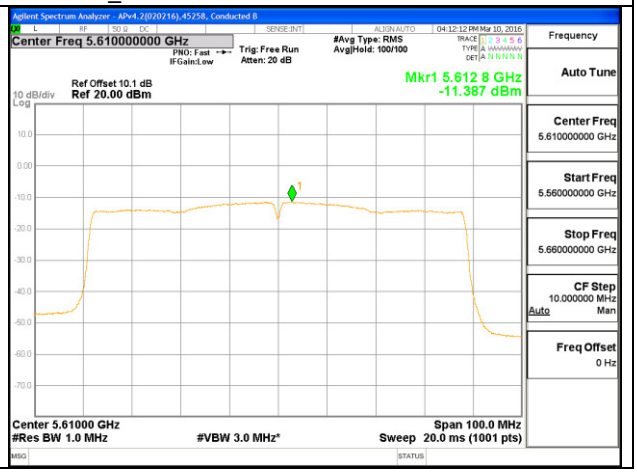
PSD 11n_HT40 5.5 Chain 1 Mid Ch



PSD 11ac_HT80 5.5 Chain 0 Mid Ch

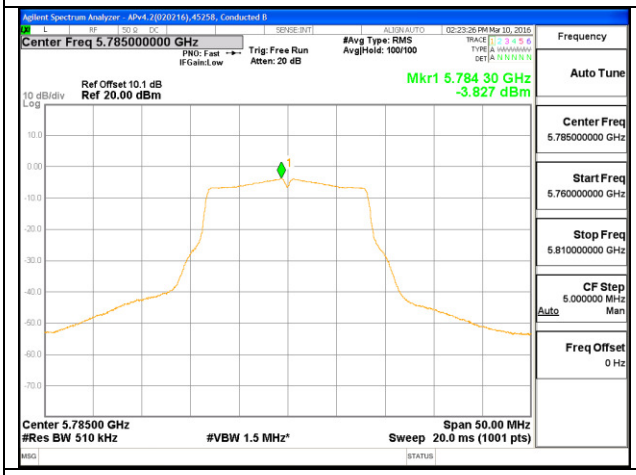


PSD 11ac_HT80 5.5 Chain 1 Mid Ch

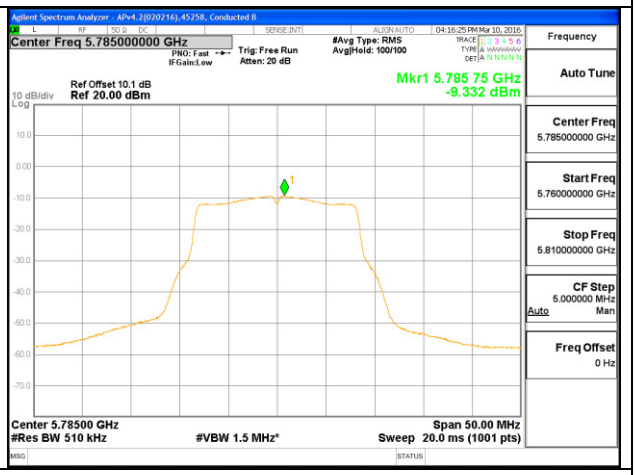


This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

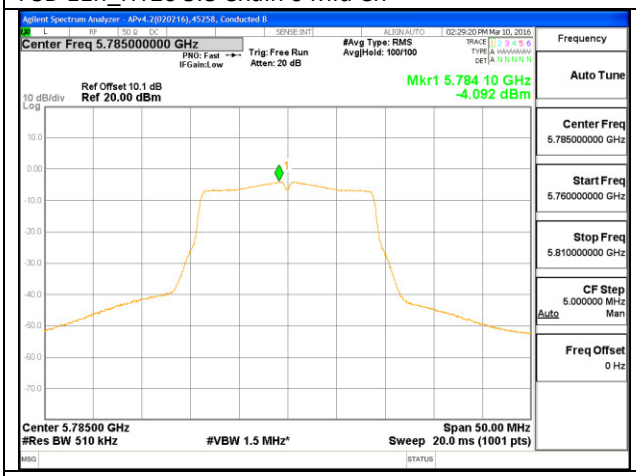
PSD 11a 5.8 Chain 0 Mid Ch



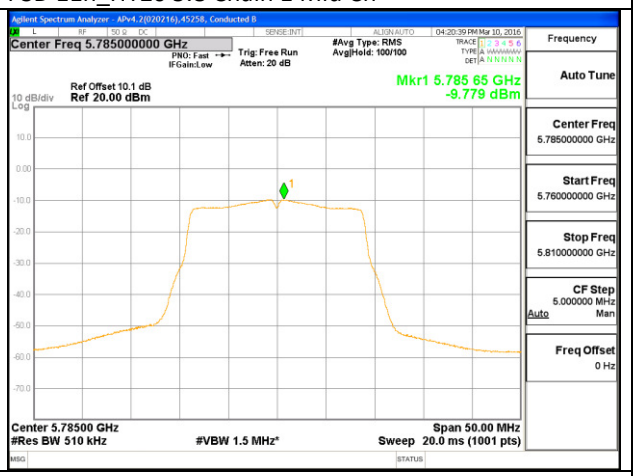
PSD 11a 5.8 Chain 1 Mid Ch



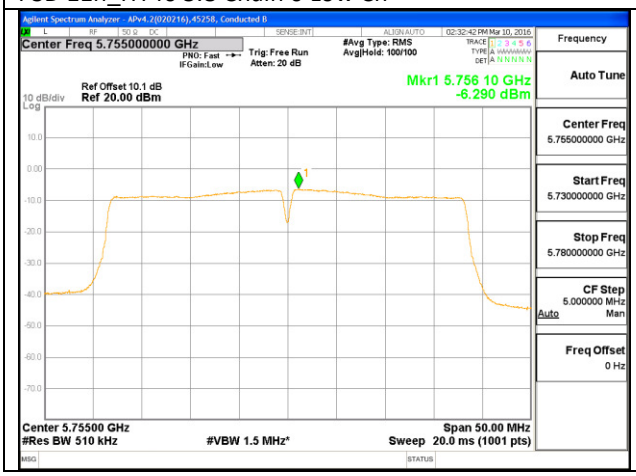
PSD 11n_HT20 5.8 Chain 0 Mid Ch



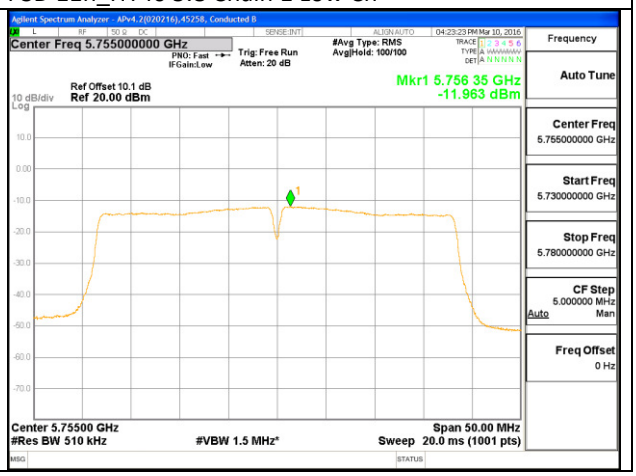
PSD 11n_HT20 5.8 Chain 1 Mid Ch



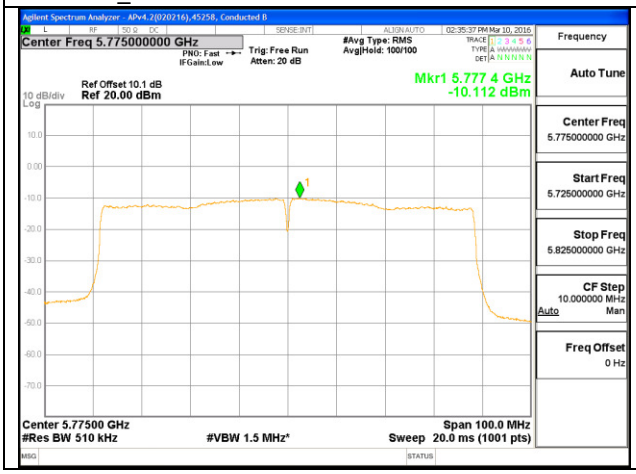
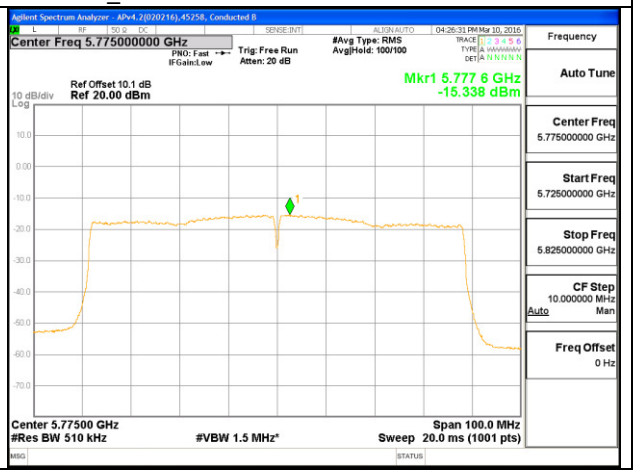
PSD 11n_HT40 5.8 Chain 0 Low Ch



PSD 11n_HT40 5.8 Chain 1 Low Ch



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

PSD 11ac_HT80 5.8 Chain 0 Mid Ch	PSD 11ac_HT80 5.8 Chain 1 Mid Ch
	

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9. TRANSMITTER ABOVE 1 GHz

LIMITS

FCC §15.205 and §15.209
IC RSS-GEN Clause 8.9 (Transmitter)

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 for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Reference to KDB 789033 UNII part H) 6) d) Method VB:
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.

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

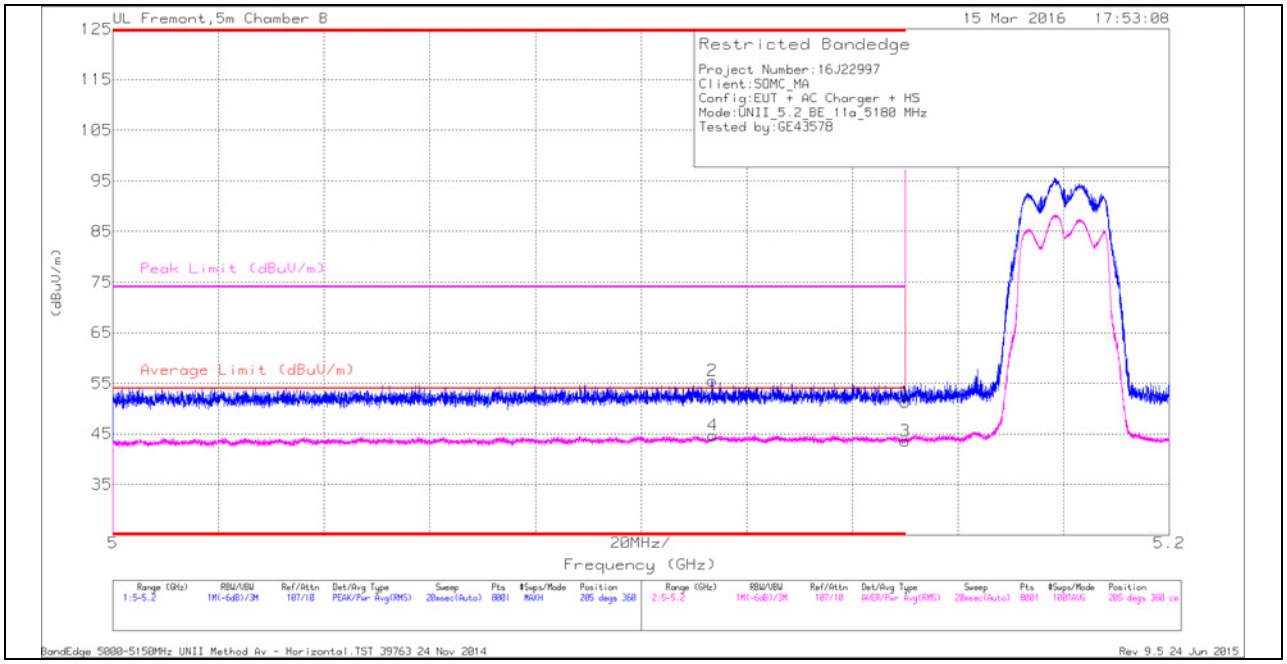
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

9.1. 5.2 GHz

9.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	36.94	Pk	34.3	-19.9	0	51.34	-	-	74	-22.66	205	360	H
2	* 5.113	40.75	Pk	34.2	-19.5	0	55.45	-	-	74	-18.55	205	360	H
3	* 5.15	29.19	RMS	34.3	-19.9	0	43.59	54	-10.41	-	-	205	360	H
4	* 5.114	29.99	RMS	34.2	-19.5	0	44.69	54	-9.31	-	-	205	360	H

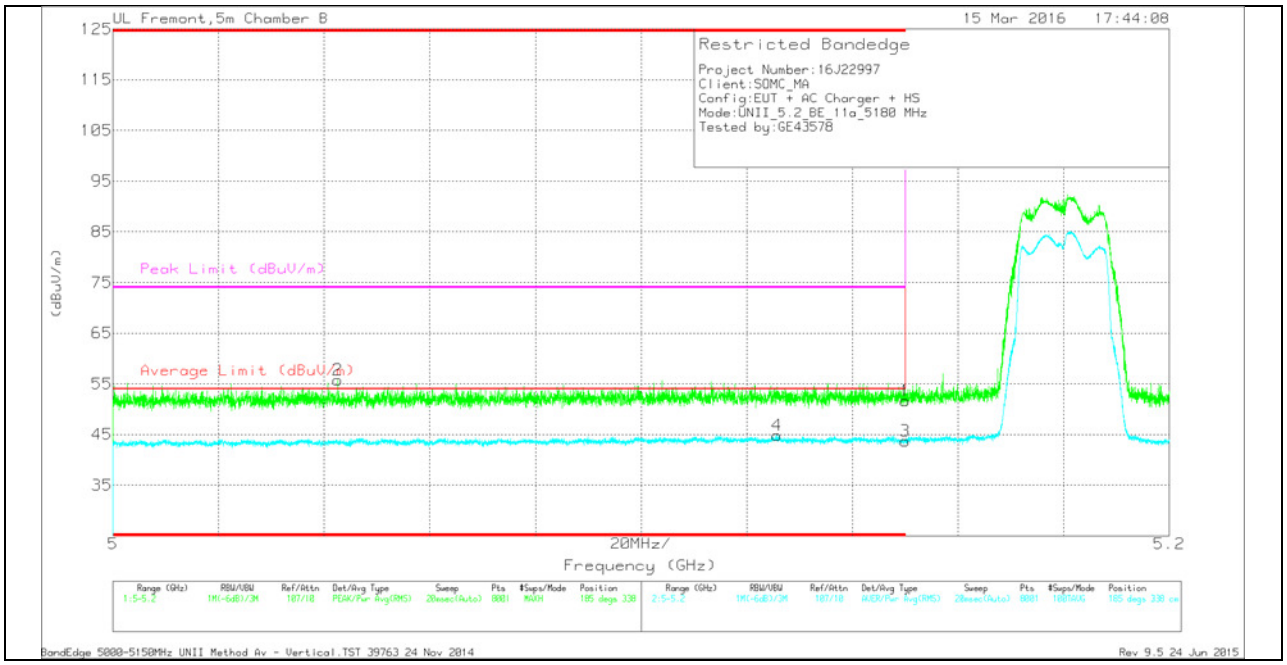
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.25	Pk	34.3	-19.9	0	51.65	-	-	74	-22.35	185	338	V
2	* 5.043	40.97	Pk	34.2	-19.4	0	55.77	-	-	74	-18.23	185	338	V
3	* 5.15	29.28	RMS	34.3	-19.9	0	43.68	54	-10.32	-	-	185	338	V
4	* 5.126	29.8	RMS	34.2	-19.2	0	44.8	54	-9.2	-	-	185	338	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

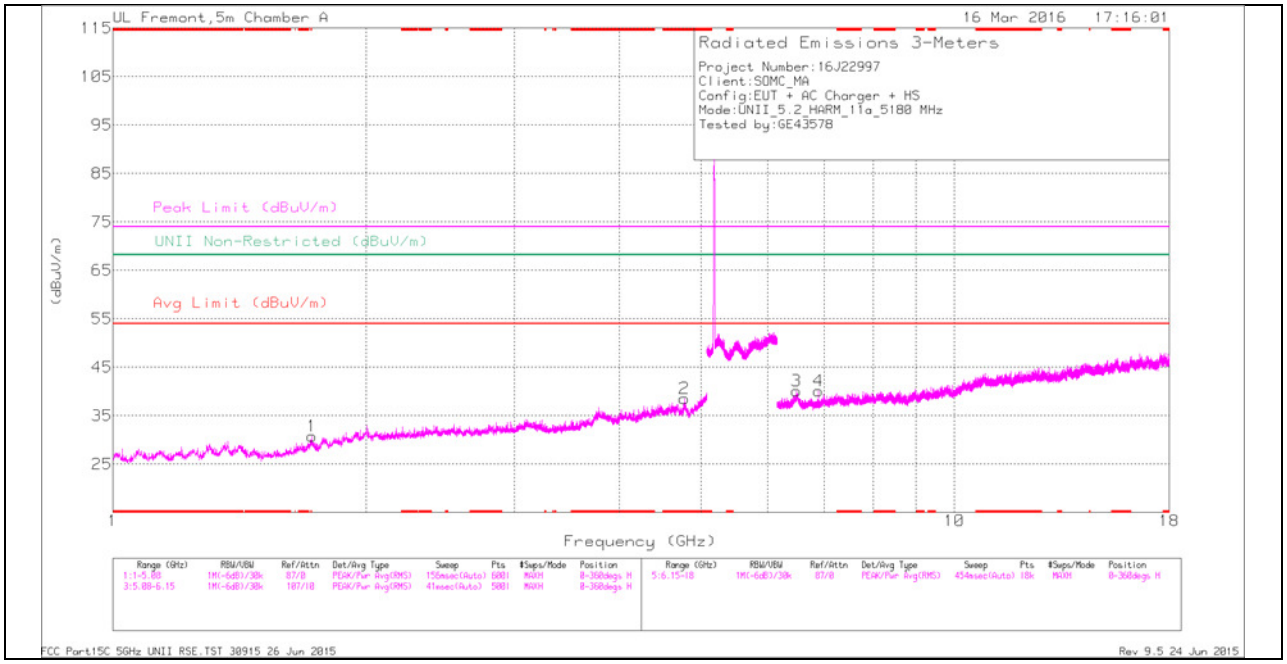
Pk - Peak detector

RMS - RMS detection

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

HARMONICS AND SPURIOUS EMISSIONS

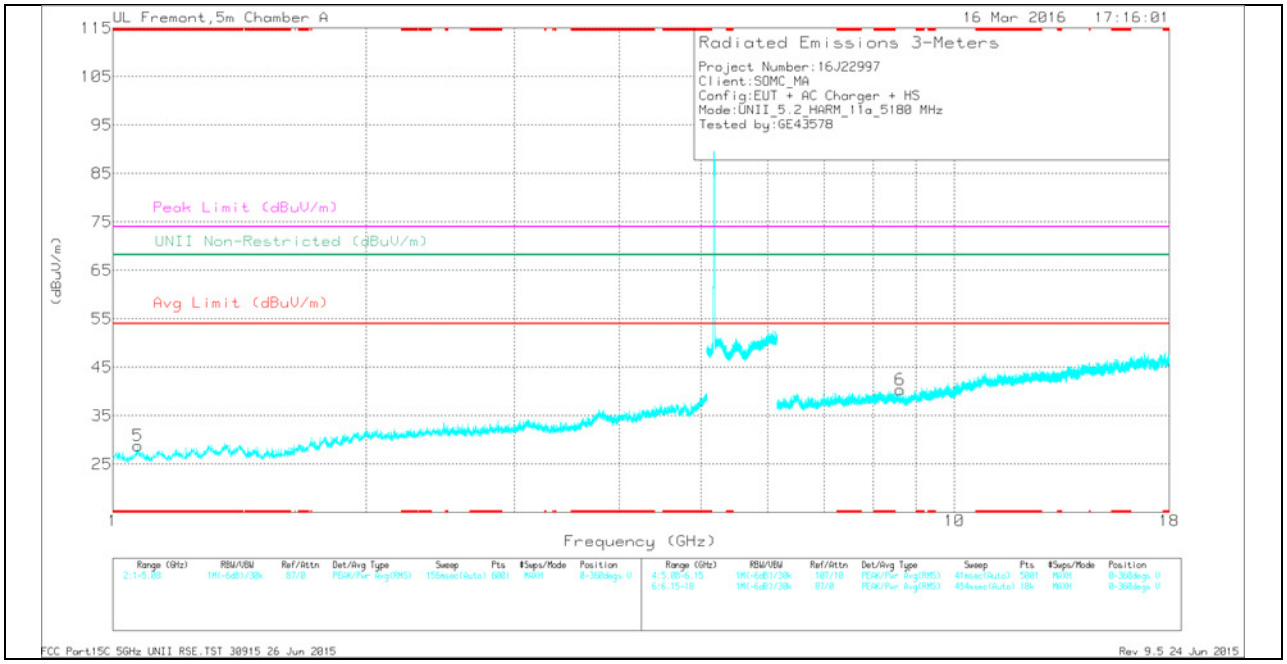
LOW CHANNEL HORIZONTAL



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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LOW CHANNEL 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.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.776	34.31	Pk	34.3	-30	0	38.61	-	-	74	-35.39	-	-	0-360	100	H
5	* 1.071	36.74	Pk	27.7	-35.6	0	28.84	-	-	74	-45.16	-	-	0-360	200	V
1	1.724	35.8	Pk	29.5	-34.5	0	30.8	-	-	-	-	68.2	-37.4	0-360	201	H
3	6.494	30.95	Pk	35.6	-26.4	0	40.15	-	-	-	-	68.2	-28.05	0-360	201	H
4	6.891	31.63	Pk	35.6	-27.1	0	40.13	-	-	-	-	68.2	-28.07	0-360	100	H
6	8.626	29.62	Pk	35.9	-25.2	0	40.32	-	-	-	-	68.2	-27.88	0-360	100	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.775	42.3	PK-U	34.3	-30	0	46.6	-	-	74	-27.4	-	-	334	100	H
* 4.776	30.08	ADR	34.3	-30	0	34.38	54	-19.62	-	-	-	-	334	100	H
* 1.071	44.72	PK-U	27.7	-35.6	0	36.82	-	-	74	-37.18	-	-	160	201	V
* 1.07	32.44	ADR	27.7	-35.6	0	24.54	54	-29.46	-	-	-	-	160	201	V
1.723	43.59	PK-U	29.5	-34.5	0	38.59	-	-	-	-	68.2	-29.61	91	202	H
6.493	39.03	PK-U	35.6	-26.4	0	48.23	-	-	-	-	68.2	-19.97	328	201	H
6.893	37.67	PK-U	35.6	-27.1	0	46.17	-	-	-	-	68.2	-22.03	141	100	H
8.625	37.2	PK-U	35.9	-25.2	0	47.9	-	-	-	-	68.2	-20.3	170	100	V

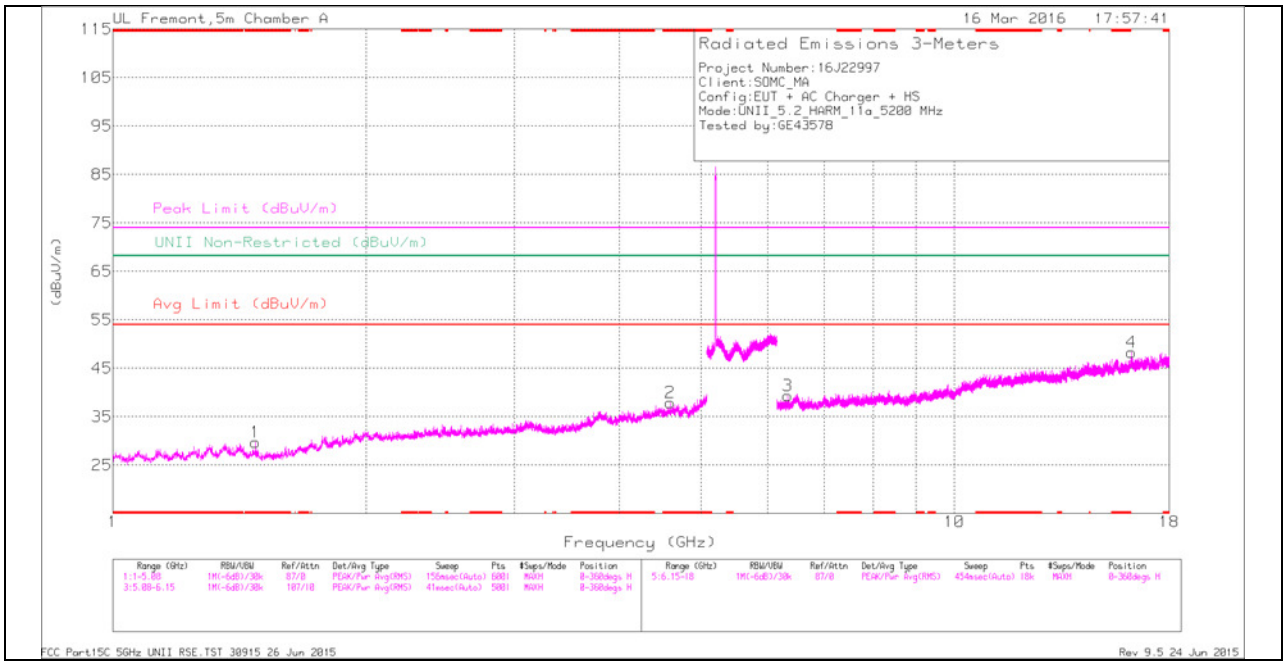
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

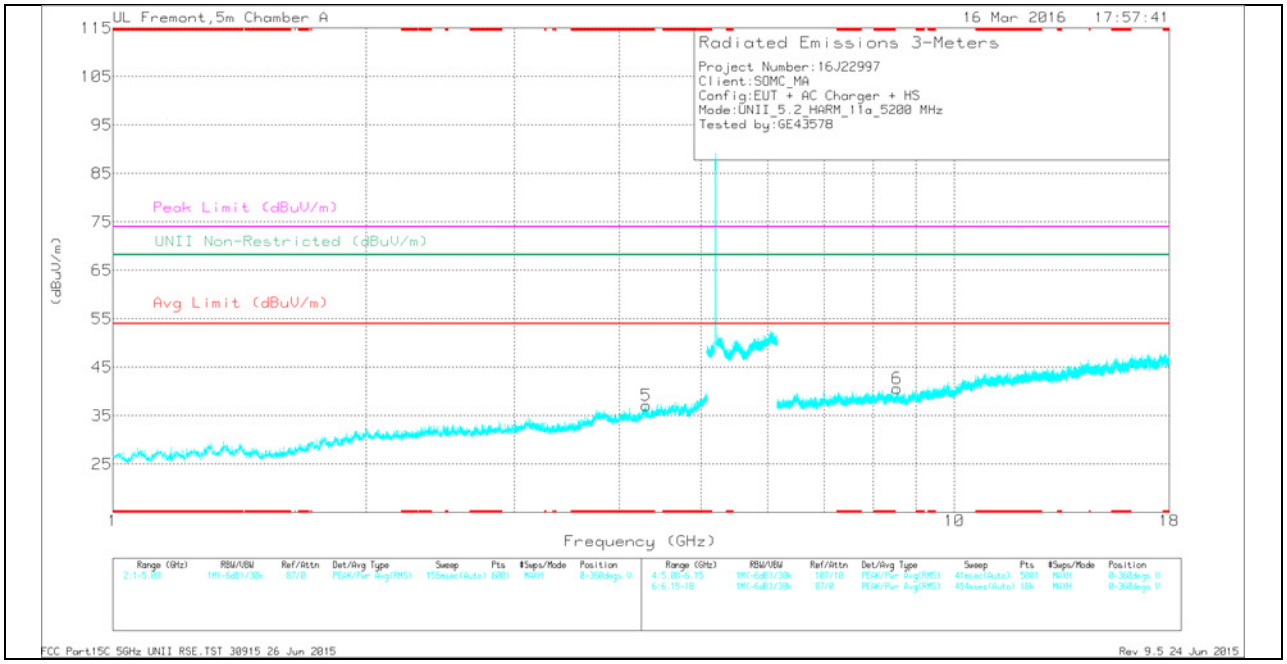
MID CHANNEL HORIZONTAL



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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

MID CHANNEL 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.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.477	36.92	Pk	28.2	-35.4	0	29.72	-	-	74	-44.28	-	-	0-360	100	H
2	* 4.597	33.99	Pk	34.4	-30.5	0	37.89	-	-	74	-36.11	-	-	0-360	100	H
5	* 4.307	34.08	Pk	33.7	-30.7	0	37.08	-	-	74	-36.92	-	-	0-360	100	V
3	6.335	31.68	Pk	35.5	-27.8	0	39.38	-	-	-	-	68.2	-28.82	0-360	201	H
6	8.545	30.48	Pk	35.9	-25.7	0	40.68	-	-	-	-	68.2	-27.52	0-360	200	V
4	16.218	29.48	Pk	40.8	-22	0	48.28	-	-	-	-	68.2	-19.92	0-360	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.478	44.33	PK-U	28.2	-35.4	0	37.13	-	-	74	-36.87	-	-	236	100	H
* 1.476	31.93	ADR	28.2	-35.4	0	24.73	54	-29.27	-	-	-	-	236	100	H
* 4.598	41.51	PK-U	34.4	-30.5	0	45.41	-	-	74	-28.59	-	-	181	100	H
* 4.598	29.89	ADR	34.4	-30.5	0	33.79	54	-20.21	-	-	-	-	181	100	H
* 4.308	41.51	PK-U	33.7	-30.7	0	44.51	-	-	74	-29.49	-	-	194	100	V
* 4.308	29.64	ADR	33.7	-30.7	0	32.64	54	-21.36	-	-	-	-	194	100	V
6.335	39.47	PK-U	35.5	-27.8	0	47.17	-	-	-	-	68.2	-21.03	117	202	H
8.544	37.13	PK-U	35.9	-25.7	0	47.33	-	-	-	-	68.2	-20.87	221	201	V
16.219	36.6	PK-U	40.8	-22	0	55.4	-	-	-	-	68.2	-12.8	355	100	H

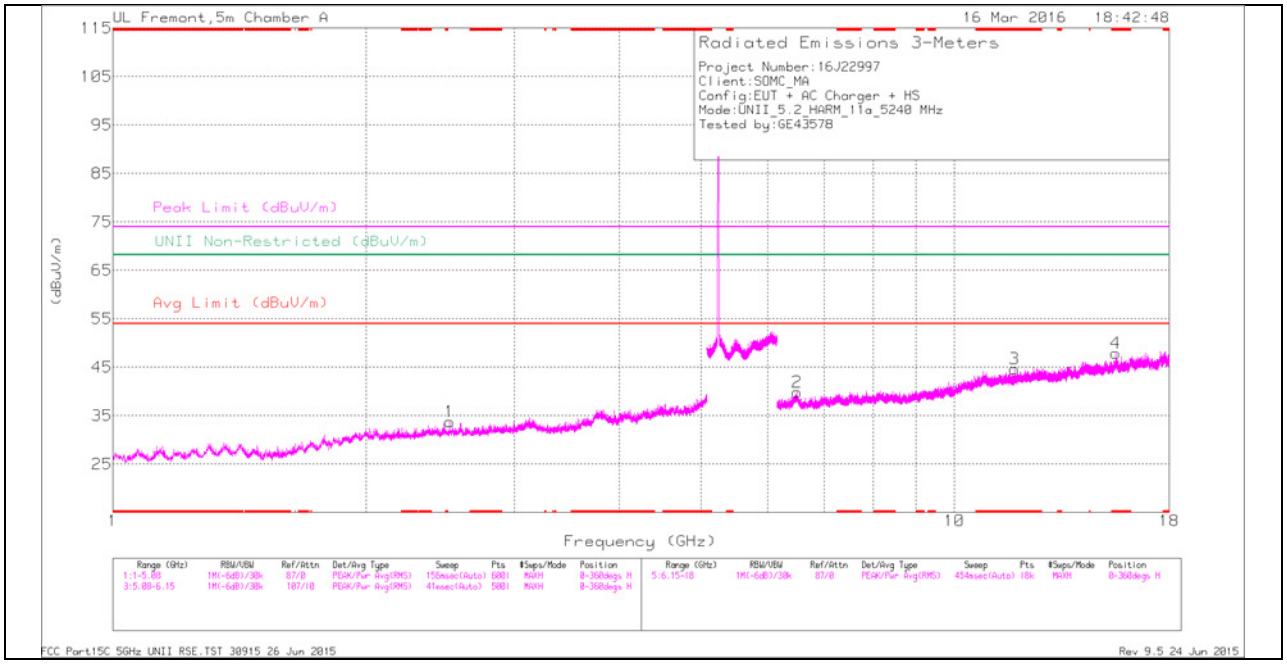
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

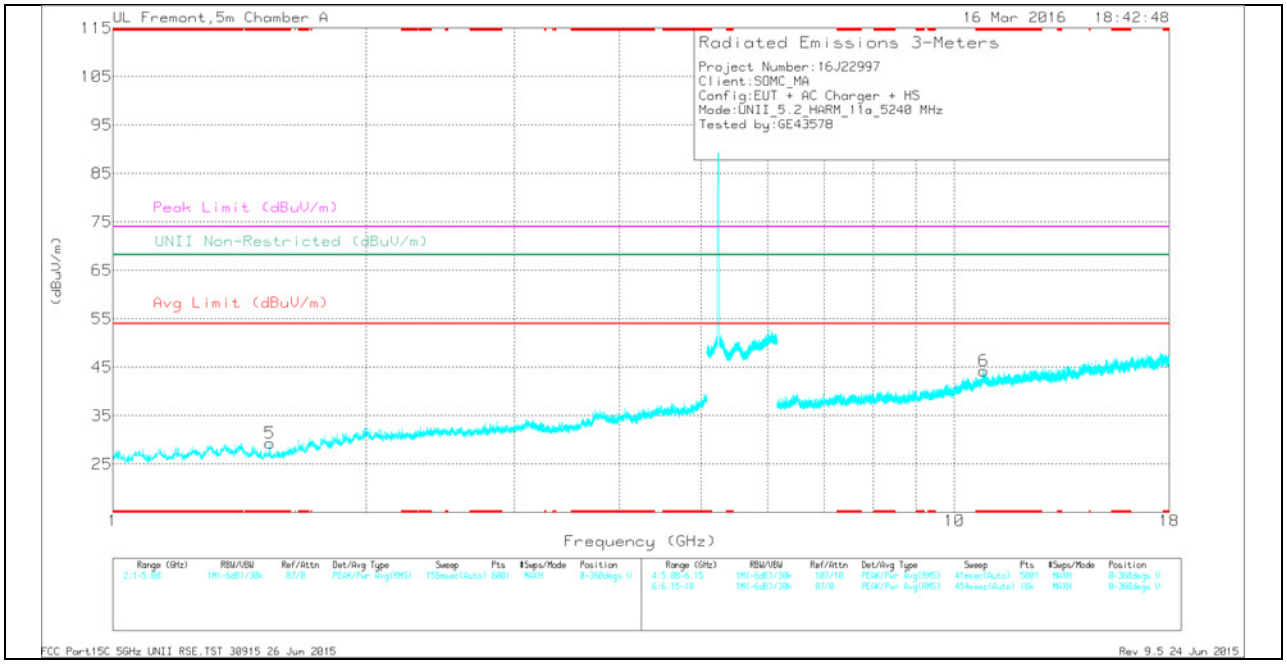
HIGH CHANNEL HORIZONTAL



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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

HIGH CHANNEL 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.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 1.536	37	Pk	28	-35.6	0	29.4	-	-	74	-44.6	-	-	0-360	100	V
3	* 11.783	28.74	Pk	38.6	-22.7	0	44.64	-	-	74	-29.36	-	-	0-360	201	H
4	* 15.549	28.83	Pk	40.1	-21	0	47.93	-	-	74	-26.07	-	-	0-360	100	H
6	* 10.827	28.5	Pk	37.8	-22	0	44.3	-	-	74	-29.7	-	-	0-360	100	V
1	2.512	35.53	Pk	32.5	-34.3	0	33.73	-	-	-	-	68.2	-34.47	0-360	100	H
2	6.5	30.52	Pk	35.6	-26.3	0	39.82	-	-	-	-	68.2	-28.38	0-360	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.536	43.96	PK-U	28	-35.6	0	36.36	-	-	74	-37.64	-	-	244	100	V
* 1.536	31.79	ADR	28	-35.6	0	24.19	54	-29.81	-	-	-	-	244	100	V
* 11.782	35.26	PK-U	38.6	-22.7	0	51.16	-	-	74	-22.84	-	-	328	202	H
* 11.782	23.51	ADR	38.6	-22.7	0	39.41	54	-14.59	-	-	-	-	328	202	H
* 15.549	35.65	PK-U	40.1	-21	0	54.75	-	-	74	-19.25	-	-	245	116	H
* 15.549	23.86	ADR	40.1	-21	0	42.96	54	-11.04	-	-	-	-	245	116	H
* 10.828	36.33	PK-U	37.8	-22	0	52.13	-	-	74	-21.87	-	-	49	100	V
* 10.827	24.02	ADR	37.8	-22	0	39.82	54	-14.18	-	-	-	-	49	100	V
2.513	42.92	PK-U	32.4	-34.3	0	41.02	-	-	-	-	68.2	-27.18	314	100	H
6.5	38.65	PK-U	35.6	-26.3	0	47.95	-	-	-	-	68.2	-20.25	271	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

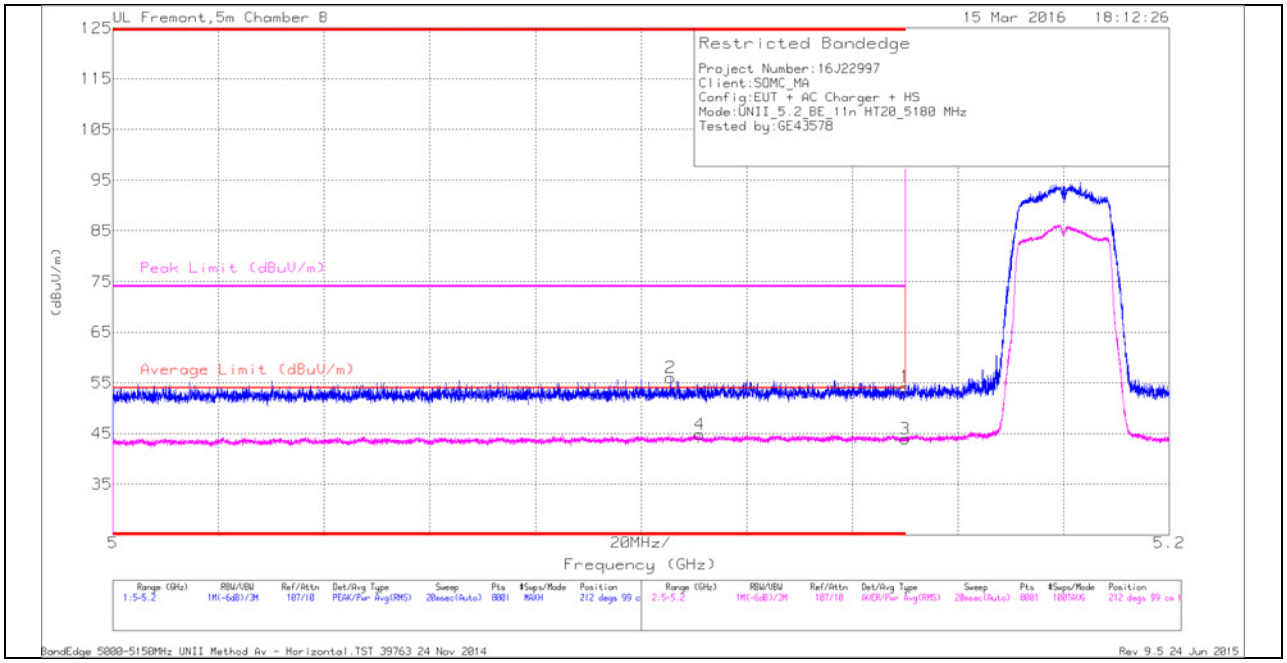
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

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

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	39.8	Pk	34.3	-19.9	0	54.2	-	-	74	-19.8	212	99	H
2	* 5.106	41.25	Pk	34.1	-19.4	0	55.95	-	-	74	-18.05	212	99	H
3	* 5.15	29.56	RMS	34.3	-19.9	0	43.96	54	-10.04	-	-	212	99	H
4	* 5.111	30.02	RMS	34.2	-19.4	0	44.82	54	-9.18	-	-	212	99	H

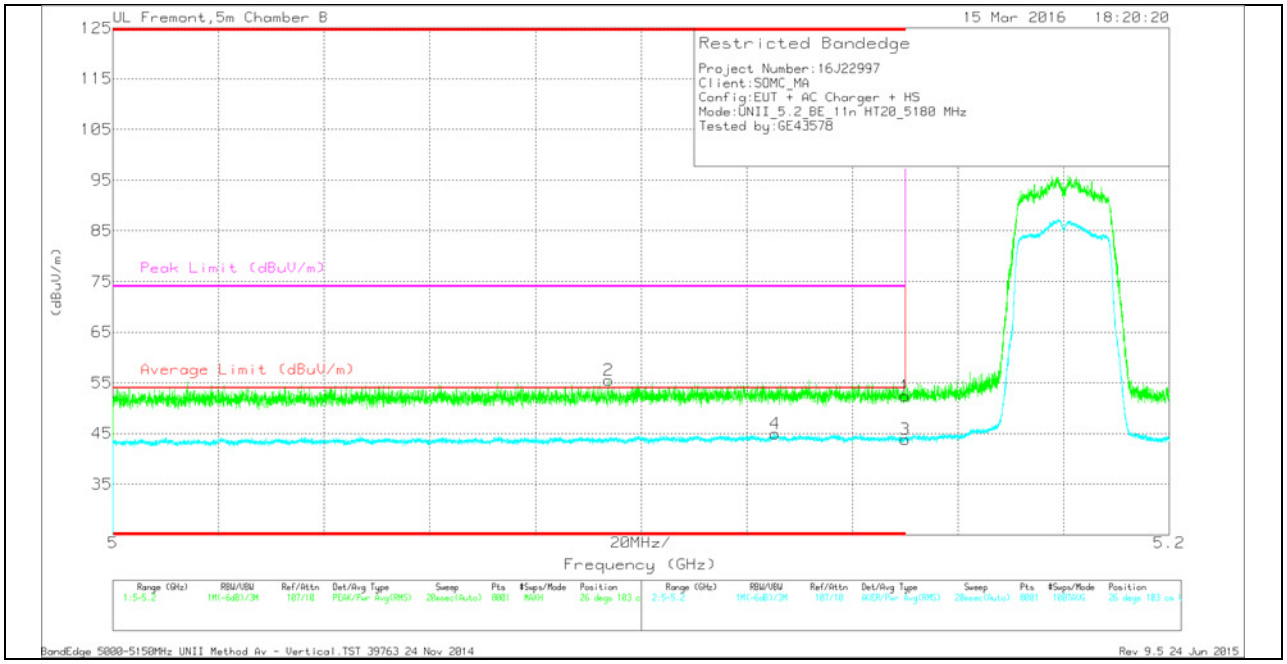
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.96	Pk	34.3	-19.9	0	52.36	-	-	74	-21.64	26	103	V
2	* 5.094	40.94	Pk	34.1	-19.5	0	55.54	-	-	74	-18.46	26	103	V
3	* 5.15	29.42	RMS	34.3	-19.9	0	43.82	54	-10.18	-	-	26	103	V
4	* 5.125	30.04	RMS	34.2	-19.3	0	44.94	54	-9.06	-	-	26	103	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

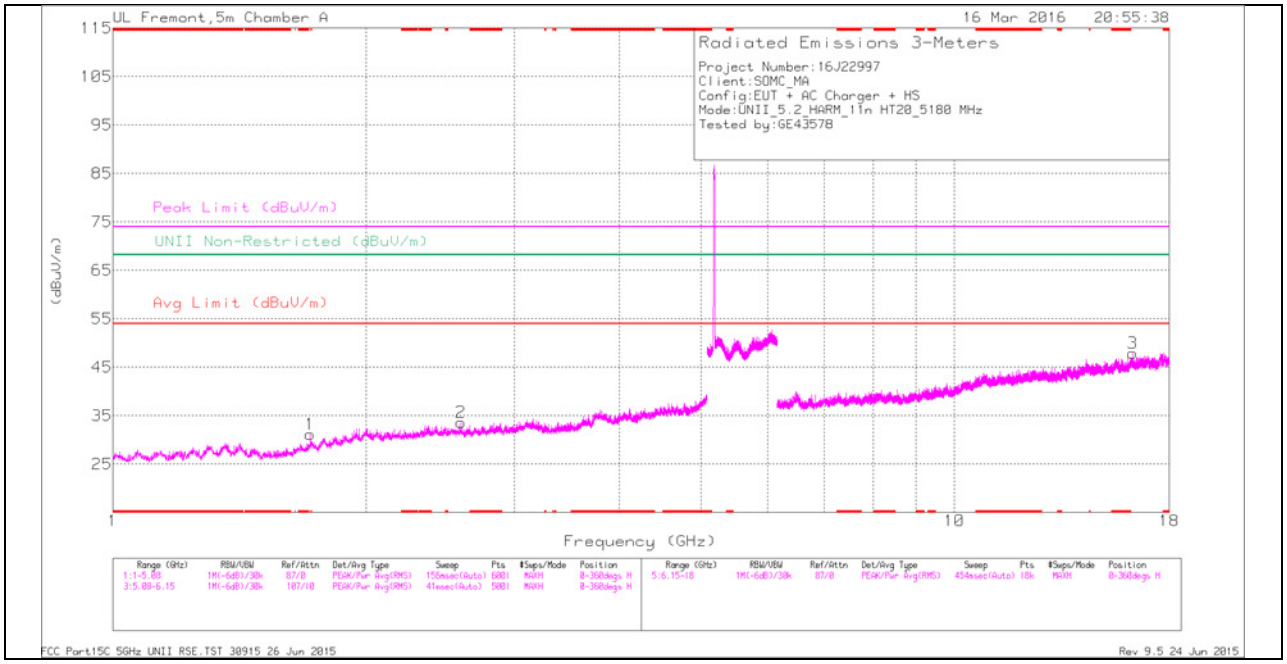
Pk - Peak detector

RMS - RMS detection

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

HARMONICS AND SPURIOUS EMISSIONS

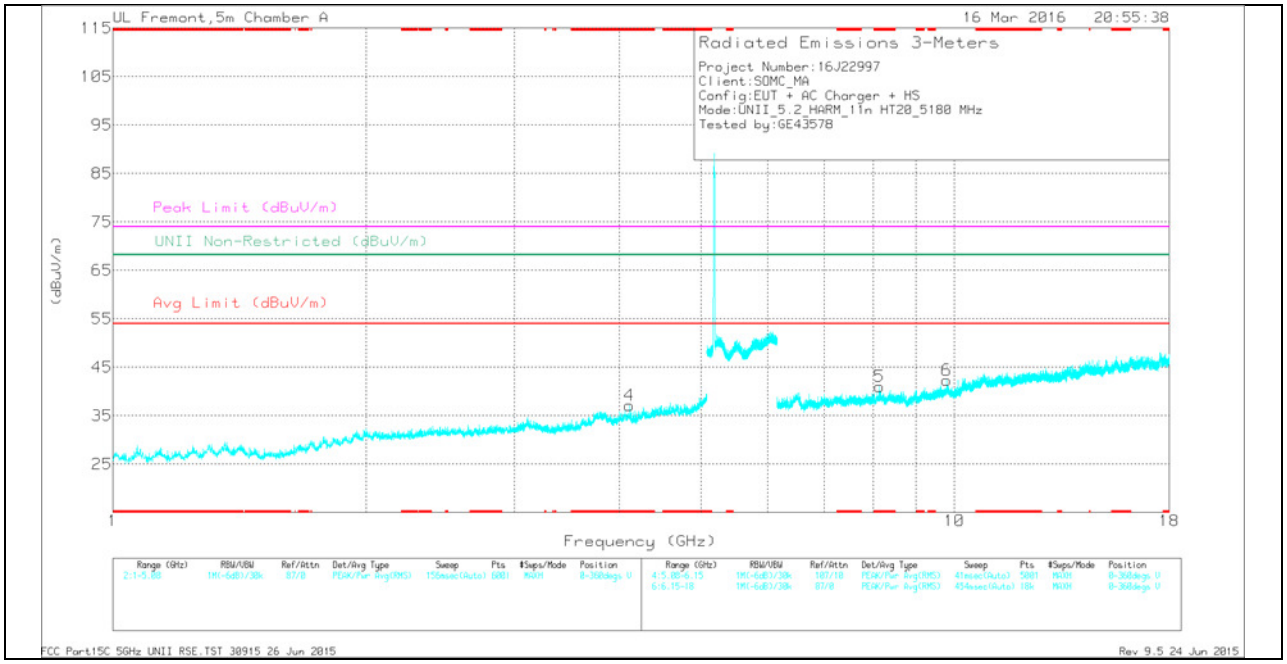
LOW CHANNEL HORIZONTAL



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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LOW CHANNEL 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.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 4.109	35.38	Pk	33.7	-31.9	0	37.18	-	-	74	-36.82	-	-	0-360	200	V
5	* 8.147	30.29	Pk	35.9	-25.2	0	40.99	-	-	74	-33.01	-	-	0-360	200	V
1	1.715	36.31	Pk	29.4	-34.6	0	31.11	-	-	-	-	68.2	-37.09	0-360	100	H
2	2.593	35.23	Pk	32.3	-33.9	0	33.63	-	-	-	-	68.2	-34.57	0-360	201	H
6	9.783	29.17	Pk	36.7	-23.5	0	42.37	-	-	-	-	68.2	-25.83	0-360	100	V
3	16.28	29.18	Pk	40.8	-22.1	0	47.88	-	-	-	-	68.2	-20.32	0-360	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.109	42.42	PK-U	33.7	-31.9	0	44.22	-	-	74	-29.78	-	-	115	202	V
* 4.109	30.37	ADR	33.7	-31.9	0	32.17	54	-21.83	-	-	-	-	115	202	V
* 8.148	37.56	PK-U	35.9	-25.2	0	48.26	-	-	74	-25.74	-	-	225	201	V
* 8.147	26.01	ADR	35.9	-25.2	0	36.71	54	-17.29	-	-	-	-	225	201	V
1.716	44.16	PK-U	29.4	-34.5	0	39.06	-	-	-	-	68.2	-29.14	120	100	H
2.594	42.43	PK-U	32.3	-33.9	0	40.83	-	-	-	-	68.2	-27.37	31	202	H
9.783	35.75	PK-U	36.7	-23.5	0	48.95	-	-	-	-	68.2	-19.25	179	100	V
16.278	35.53	PK-U	40.8	-22.1	0	54.23	-	-	-	-	68.2	-13.97	68	100	H

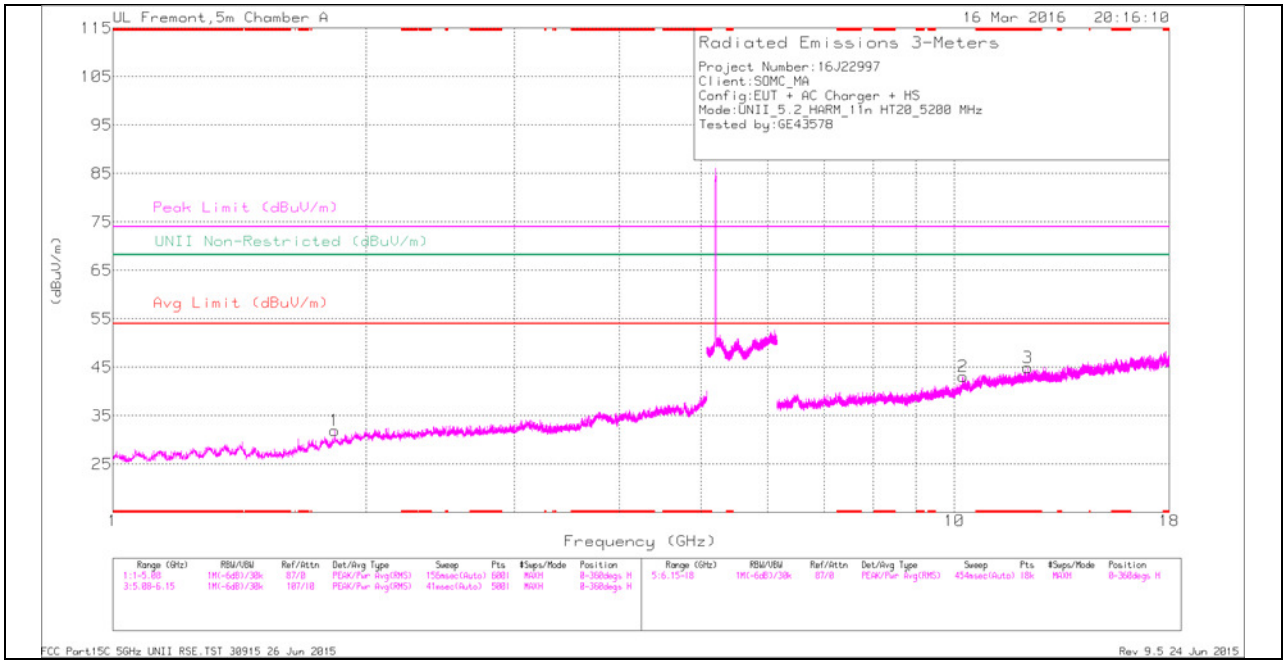
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

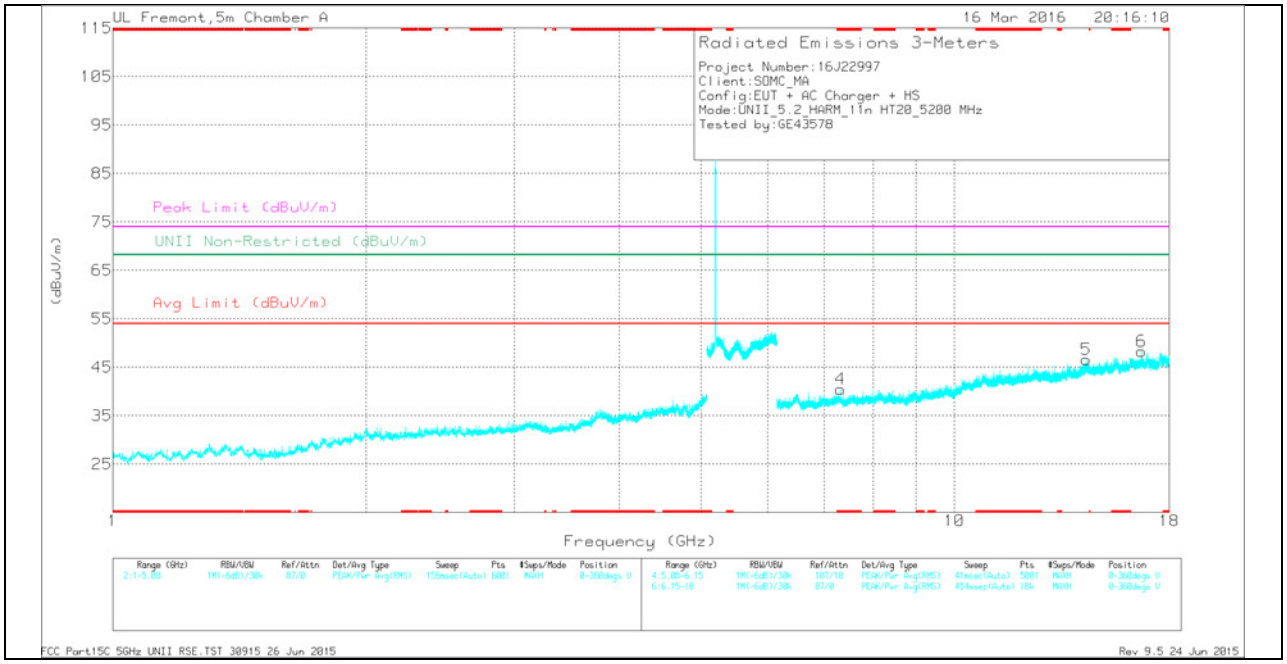
MID CHANNEL HORIZONTAL



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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

MID CHANNEL 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.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 12.223	28.31	Pk	39	-22.4	0	44.91	-	-	74	-29.09	-	-	0-360	100	H
4	* 7.324	30.74	Pk	35.7	-25.9	0	40.54	-	-	74	-33.46	-	-	0-360	100	V
1	1.834	36.5	Pk	30.5	-35.1	0	31.9	-	-	-	-	68.2	-36.3	0-360	100	H
2	10.235	28.26	Pk	37.2	-22.4	0	43.06	-	-	-	-	68.2	-25.14	0-360	100	H
5	14.329	29.73	Pk	39.3	-22.4	0	46.63	-	-	-	-	68.2	-21.57	0-360	100	V
6	16.683	28.84	Pk	41.6	-22.2	0	48.24	-	-	-	-	68.2	-19.96	0-360	200	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 12.222	35.37	PK-U	39	-22.4	0	51.97	-	-	74	-22.03	-	-	114	100	H
* 12.223	23.39	ADR	39	-22.4	0	39.99	54	-14.01	-	-	-	-	114	100	H
* 7.325	37.77	PK-U	35.7	-25.9	0	47.57	-	-	74	-26.43	-	-	71	106	V
* 7.324	25.92	ADR	35.7	-25.9	0	35.72	54	-18.28	-	-	-	-	71	106	V
1.834	43.84	PK-U	30.5	-35.1	0	39.24	-	-	-	-	68.2	-28.96	170	100	H
10.234	34.53	PK-U	37.2	-22.3	0	49.43	-	-	-	-	68.2	-18.77	132	100	H
14.33	36.38	PK-U	39.3	-22.4	0	53.28	-	-	-	-	68.2	-14.92	105	101	V
16.684	34.96	PK-U	41.6	-22.2	0	54.36	-	-	-	-	68.2	-13.84	161	201	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.