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INDUSTRY CANADA RSS-247 ISSUE 1**

CERTIFICATION TEST REPORT

FOR

BT + BLE + NORDIC and WLAN DTS/UNII a/b/g/n/ac

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Prepared for

Valve Corporation

10900 NE 4TH ST, SUITE 500

BELLEVUE, WA 98004, U.S.A.

Prepared by

UL VERIFICATION SERVICES INC.

47173 BENICIA STREET

FREMONT, CA 94538, U.S.A.

TEL: (510) 771-1000

FAX: (510) 661-0888



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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	7
2. TEST METHODOLOGY	8
3. FACILITIES AND ACCREDITATION	8
4. CALIBRATION AND UNCERTAINTY	8
4.1. MEASURING INSTRUMENT CALIBRATION	8
4.2. SAMPLE CALCULATION	8
4.3. MEASUREMENT UNCERTAINTY	8
5. EQUIPMENT UNDER TEST	9
5.1. DESCRIPTION OF EUT	9
5.2. MAXIMUM OUTPUT POWER.....	9
5.3. AVERAGE POWER.....	11
5.4. DESCRIPTION OF AVAILABLE ANTENNAS	12
5.5. WORST-CASE CONFIGURATION AND MODE	13
5.6. DESCRIPTION OF TEST SETUP.....	14
6. TEST AND MEASUREMENT EQUIPMENT	16
7. SUMMARY TABLE	17
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS	18
8.1. ON TIME AND DUTY CYCLE RESULTS.....	18
8.2. DUTY CYCLE PLOTS	18
9. MEASUREMENT METHOD.....	21
10. ANTENNA PORT TEST RESULTS SISO.....	22
10.1. 6 dB BANDWIDTH	22
10.1.1. 802.11a MODE IN THE 5.8 GHz BAND	23
10.1.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND	23
10.1.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND	23
10.1.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND	23
10.1.5. 6 dB BANDWIDTH MID CH PLOTS.....	24
10.2. 26 dB BANDWIDTH	25
10.2.1. 802.11a MODE IN THE 5.2 GHz BAND	25
10.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND	25
10.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND	25
10.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND	25
10.2.5. 802.11a MODE IN THE 5.3 GHz BAND	26
10.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND	26
10.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND	26
10.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND	26

10.2.9.	802.11a MODE IN THE 5.5 GHz BAND	27
10.2.10.	802.11n HT20 MODE IN THE 5.5 GHz BAND	27
10.2.11.	802.11n HT40 MODE IN THE 5.5 GHz BAND	27
10.2.12.	802.11ac VHT80 MODE IN THE 5.5 GHz BAND	27
10.2.13.	802.11a MODE IN THE 5.8 GHz BAND	28
10.2.14.	802.11n HT20 MODE IN THE 5.8 GHz BAND	28
10.2.15.	802.11n HT40 MODE IN THE 5.8 GHz BAND	28
10.2.16.	802.11ac VHT80 MODE IN THE 5.8 GHz BAND	28
10.2.17.	26 dB BANDWIDTH PLOTS	29
10.3.	99% BANDWIDTH	33
10.3.1.	802.11a MODE IN THE 5.2 GHz BAND	33
10.3.2.	802.11n HT20 MODE IN THE 5.2 GHz BAND	33
10.3.3.	802.11n HT40 MODE IN THE 5.2 GHz BAND	33
10.3.4.	802.11ac VHT80 MODE IN THE 5.2 GHz BAND	33
10.3.5.	802.11a MODE IN THE 5.3 GHz BAND	34
10.3.6.	802.11n HT20 MODE IN THE 5.3 GHz BAND	34
10.3.7.	802.11n HT40 MODE IN THE 5.3 GHz BAND	34
10.3.8.	802.11ac VHT80 MODE IN THE 5.3 GHz BAND	34
10.3.9.	802.11a MODE IN THE 5.5 GHz BAND	35
10.3.10.	802.11n HT20 MODE IN THE 5.5 GHz BAND	35
10.3.11.	802.11n HT40 MODE IN THE 5.5 GHz BAND	35
10.3.12.	802.11ac VHT80 MODE IN THE 5.5 GHz BAND	35
10.3.13.	802.11a MODE IN THE 5.8 GHz BAND	36
10.3.14.	802.11n HT20 MODE IN THE 5.8 GHz BAND	36
10.3.15.	802.11n HT40 MODE IN THE 5.8 GHz BAND	36
10.3.16.	802.11ac VHT80 MODE IN THE 5.8 GHz BAND	36
10.3.17.	99% BANDWIDTH PLOTS	37
10.4.	OUTPUT POWER AND PPSD	41
10.4.1.	802.11a MODE IN THE 5.2 GHz BAND	42
10.4.2.	802.11n HT20 MODE IN THE 5.2 GHz BAND	43
10.4.3.	802.11n HT40 MODE IN THE 5.2 GHz BAND	44
10.4.4.	802.11ac HT80 MODE IN THE 5.2 GHz BAND	45
10.4.5.	802.11a MODE IN THE 5.3 GHz BAND	46
10.4.6.	802.11n HT20 MODE IN THE 5.3 GHz BAND	47
10.4.7.	802.11n HT40 MODE IN THE 5.3 GHz BAND	48
10.4.8.	802.11ac HT80 MODE IN THE 5.3 GHz BAND	49
10.4.9.	802.11a MODE IN THE 5.5 GHz BAND	50
10.4.10.	802.11n HT20 MODE IN THE 5.5 GHz BAND	51
10.4.11.	802.11n HT40 MODE IN THE 5.5 GHz BAND	52
10.4.12.	802.11ac HT80 MODE IN THE 5.5 GHz BAND	52
10.4.13.	802.11a MODE IN THE 5.8 GHz BAND	54
10.4.14.	802.11n HT20 MODE IN THE 5.8 GHz BAND	55
10.4.15.	802.11n HT40 MODE IN THE 5.8 GHz BAND	56
10.4.16.	802.11ac HT80 MODE IN THE 5.8 GHz BAND	57
10.4.17.	OUTPUT POWER AND PPSD PLOTS, Chain 0	58
11.	ANTENNA PORT TEST RESULTS MIMO	62
11.1.	6 dB BANDWIDTH	62
11.1.1.	802.11n HT20 MODE IN THE 5.8 GHz BAND	62
11.1.2.	802.11n HT40 MODE IN THE 5.8 GHz BAND	62
11.1.3.	802.11ac HT80 MODE IN THE 5.8 GHz BAND	62
11.1.4.	6 dB BANDWIDTH MID CH PLOTS	64

11.2.	26 dB BANDWIDTH	65
11.2.1.	802.11n HT20 MODE IN THE 5.2 GHz BAND	65
11.2.2.	802.11n HT40 MODE IN THE 5.2 GHz BAND	65
11.2.3.	802.11ac HT80 MODE IN THE 5.2 GHz BAND	65
11.2.1.	802.11n HT20 MODE IN THE 5.3 GHz BAND	66
11.2.2.	802.11n HT40 MODE IN THE 5.3 GHz BAND	66
11.2.3.	802.11ac HT80 MODE IN THE 5.3 GHz BAND	66
11.2.4.	802.11n HT20 MODE IN THE 5.5 GHz BAND	67
11.2.5.	802.11n HT40 MODE IN THE 5.5 GHz BAND	67
11.2.6.	802.11ac HT80 MODE IN THE 5.5 GHz BAND	67
11.2.7.	802.11n HT20 MODE IN THE 5.8 GHz BAND	68
11.2.8.	802.11n HT40 MODE IN THE 5.8 GHz BAND	68
11.2.9.	802.11ac HT80 MODE IN THE 5.8 GHz BAND	68
11.2.1.	26 dB BANDWIDTH PLOTS	69
11.3.	99% BANDWIDTH	73
11.3.1.	802.11n HT20 MODE IN THE 5.2 GHz BAND	73
11.3.2.	802.11n HT40 MODE IN THE 5.2 GHz BAND	73
11.3.3.	802.11ac HT80 MODE IN THE 5.2 GHz BAND	73
11.3.4.	802.11n HT20 MODE IN THE 5.3 GHz BAND	73
11.3.5.	802.11n HT40 MODE IN THE 5.3 GHz BAND	74
11.3.6.	802.11ac HT80 MODE IN THE 5.3 GHz BAND	74
11.3.7.	802.11n HT20 MODE IN THE 5.5 GHz BAND	74
11.3.8.	802.11n HT40 MODE IN THE 5.5 GHz BAND	74
11.3.9.	802.11ac HT80 MODE IN THE 5.5 GHz BAND	74
11.3.10.	802.11n HT20 MODE IN THE 5.8 GHz BAND	75
11.3.11.	802.11n HT40 MODE IN THE 5.8 GHz BAND	75
11.3.12.	802.11ac HT80 MODE IN THE 5.8 GHz BAND	75
11.3.1.	99% BANDWIDTH PLOTS	76
11.4.	AVERAGE POWER	80
11.4.1.	802.11n HT20 MODE IN THE 5.2 GHz BAND	80
11.4.2.	802.11n HT40 MODE IN THE 5.2 GHz BAND	80
11.4.3.	802.11ac HT80 MODE IN THE 5.2 GHz BAND	80
11.4.4.	802.11n HT20 MODE IN THE 5.3 GHz BAND	81
11.4.5.	802.11n HT40 MODE IN THE 5.3 GHz BAND	81
11.4.6.	802.11ac HT80 MODE IN THE 5.3 GHz BAND	81
11.4.7.	802.11n HT20 MODE IN THE 5.5 GHz BAND	82
11.4.8.	802.11n HT40 MODE IN THE 5.5 GHz BAND	82
11.4.9.	802.11ac HT80 MODE IN THE 5.5 GHz BAND	82
11.4.10.	802.11n HT20 MODE IN THE 5.8 GHz BAND	83
11.4.11.	802.11n HT40 MODE IN THE 5.8 GHz BAND	83
11.4.12.	802.11ac HT80 MODE IN THE 5.8 GHz BAND	83
11.5.	OUTPUT POWER AND PPSD	84
11.5.1.	802.11n HT20 MODE IN THE 5.2 GHz BAND	86
11.5.2.	802.11n HT40 MODE IN THE 5.2 GHz BAND	87
11.5.3.	802.11ac HT80 MODE IN THE 5.2 GHz BAND	88
11.5.2.	802.11n HT20 MODE IN THE 5.3 GHz BAND	89
11.5.3.	802.11n HT40 MODE IN THE 5.3 GHz BAND	90
11.5.4.	802.11ac HT80 MODE IN THE 5.3 GHz BAND	91
11.5.6.	802.11n HT20 MODE IN THE 5.5 GHz BAND	92
11.5.7.	802.11n HT40 MODE IN THE 5.5 GHz BAND	93
11.5.8.	802.11ac HT80 MODE IN THE 5.5 GHz BAND	94
11.5.10.	802.11n HT20 MODE IN THE 5.8 GHz BAND	95

11.5.11. 802.11n HT40 MODE IN THE 5.8 GHz BAND	96
11.5.12. 802.11ac HT80 MODE IN THE 5.8 GHz BAND	97
11.5.13. OUTPUT POWER AND PPSD PLOTS	98
12. TRANSMITTER ABOVE 1 GHz SISO (Chain 0)	102
12.1. 5.2 GHz	103
12.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND	103
12.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND	114
12.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND	125
12.1.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.2 GHz BAND	133
12.2. 5.3 GHz	138
12.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND	138
12.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND	149
12.2.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND	160
12.2.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.3 GHz BAND	168
12.3. 5.5-5.6 GHz	173
12.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND	173
12.3.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND	186
12.3.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND	199
12.3.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.5 GHz BAND	212
12.4. 5.8 GHz	217
12.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.8 GHz BAND	217
12.4.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND	230
12.4.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND	243
12.4.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.8 GHz BAND	253
13. TRANSMITTER ABOVE 1 GHz MIMO	260
13.1. 5.2 GHz	261
13.1.1. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND	261
13.1.2. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND	272
13.1.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.2 GHz BAND	280
13.1. 5.3 GHz	285
13.1.1. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND	285
13.1.2. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND	296
13.1.3. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.3 GHz BAND	304
13.2. 5.5-5.6 GHz	309
13.2.1. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND	309
13.2.2. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND	322
13.2.3. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.5 GHz BAND	335
13.3. 5.8 GHz	340
13.3.1. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND	340
13.3.2. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND	353
13.3.3. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.8 GHz BAND	363
14. WORST-CASE BELOW 1 GHz (in the 5.3 GHz Band)	370
15. AC POWER LINE CONDUCTED EMISSIONS	373
16. SETUP PHOTOS	378

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: VALVE

EUT DESCRIPTION: BT+BLE+NORDIC and WLAN DTS/UNII a/b/g/n/ac

MODEL: 1003

SERIAL NUMBER: FL524000A0 (Conducted); FL524000E3 (Radiated)

DATE TESTED: May 23 – July 28, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	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:



PENG ZHANG
CONSUMER TECHNOLOGY DIVISION
PROJECT LEAD
UL Verification Services Inc.

Tested By:



JONATHAN HSU
CONSUMER TECHNOLOGY DIVISION
TEST ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2009 for IC and ANSI C63.10-2013 for FCC, RSS-GEN Issue 4, RSS-247 Issue 1.

Testing for radiated emissions above 1GHz was performed with the EUT elevated at 1.5m instead of 0.8m. 1.5m is the required height in ANSI C63.10:2013 as referenced by RSS GEN issue 4. This test height has been permitted by FCC as discussed in FCC/TCB conference call in December 2014.

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
☐ Chamber A(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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 18000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a BT+BLE+NORDIC and DTS/UNII a/b/g/n/ac.

5.2. MAXIMUM OUTPUT POWER

Note: The power declared in the report are the worst case power & that production unit will not carry higher power listed in the report.

The transmitter has a maximum total conducted output power as follows:

SISO

Frequency Range (MHz)	Mode	Total Output Power (dBm)	Total Output Power (mW)
5180-5240	802.11a	14.67	29.31
5180-5240	802.11n HT20	14.48	28.05
5190-5230	802.11n HT40	9.66	9.25
5210	802.11ac HT80	8.91	7.78
5260-5320	802.11a	15.54	35.81
5260-5320	802.11n HT20	15.33	34.12
5270-5310	802.11n HT40	10.35	10.84
5290	802.11ac HT80	6.94	4.94
5500-5700	802.11a	15.95	39.36
5500-5700	802.11n HT20	15.96	39.45
5510-5670	802.11n HT40	15.83	38.28
5530	802.11ac HT80	8.74	7.48
5745-5825	802.11a	15.16	32.81
5745-5825	802.11n HT20	15.23	33.34
5755-5795	802.11n HT40	15.86	38.55
5775	802.11ac HT80	8.39	6.90

MIMO

Frequency Range (MHz)	Mode	Total Output Power (dBm)	Total Output Power (mW)
5180-5240	802.11n HT20	13.9	24.55
5190-5230	802.11n HT40	10.23	10.54
5210	802.11ac HT80	8.57	7.19
5260-5320	802.11n HT20	17.91	61.80
5270-5310	802.11n HT40	12.43	17.50
5290	802.11ac HT80	7.1	5.13
5500-5700	802.11a	15.95	39.36
5500-5700	802.11n HT20	18.55	71.61
5510-5670	802.11n HT40	18.37	68.71
5530	802.11ac HT80	8.32	6.79
5745-5825	802.11a	15.16	32.81
5745-5825	802.11n HT20	17.56	57.02
5755-5795	802.11n HT40	16.71	46.88
5775	802.11ac HT80	7.18	5.22

5.3. AVERAGE POWER

AVERAGE POWER SISO

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pw r (Chain 0) (dBm)	Avg Pw r (Chain 1) (dBm)
UNII-1	802.11a	6 Mbps	36	5180	11.3	11.1
			40	5200	13.9	14.2
			48	5240	13.6	14.1
	802.11n (HT20)	6.5 Mbps	36	5180	13.2	13.4
			40	5200	14.0	14.4
			48	5240	13.7	14.1
	802.11n (HT40)	13.5 Mbps	38	5190	8.5	8.6
			46	5230	8.5	8.0
	802.11ac (VHT80)	29.3 Mbps	42	5210	8.1	8.1
UNII-2A	802.11a	6 Mbps	52	5260	14.0	13.9
			60	5300	14.4	14.1
			64	5320	12.1	11.6
	802.11n (HT20)	6.5 Mbps	52	5260	14.1	14.0
			60	5300	14.5	14.2
			64	5320	12.9	12.5
	802.11n (HT40)	13.5 Mbps	54	5270	8.1	8.2
			62	5310	8.9	8.5
	802.11ac (VHT80)	29.3 Mbps	58	5290	5.2	4.9
UNII-2C	802.11a	6 Mbps	100	5500	10.0	9.9
			116	5580	15.4	14.5
			140	5700	9.0	9.3
	802.11n (HT20)	6.5 Mbps	100	5500	12.0	12.2
			116	5580	15.4	14.6
			140	5700	12.0	12.2
	802.11n (HT40)	13.5 Mbps	102	5510	9.6	9.5
			110	5550	14.3	14.2
	802.11ac (VHT80)	29.3 Mbps	134	5670	13.4	13.2
UNII-3 or §15.247	802.11a	6 Mbps	106	5530	7.6	7.8
			149	5745	7.8	8.0
			157	5785	14.3	14.2
	802.11n (HT20)	6.5 Mbps	165	5825	8.8	9.0
			149	5745	12.2	12.9
			157	5785	14.0	14.2
	802.11n (HT40)	13.5 Mbps	165	5825	13.9	13.3
			151	5755	7.7	8.4
	802.11ac (VHT80)	29.3 Mbps	159	5795	14.1	14.4
			155	5775	6.3	7.2

AVERAGE POWER MIMO

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr Chain 0 (dBm)	Avg Pwr Chain 1 (dBm)
UNII-1	802.11n (HT20)	6.5 Mbps	36	5180	10.8	10.3
			40	5200	11.1	11.5
			48	5240	11.2	11.3
	802.11n (HT40)	13.5 Mbps	38	5190	6.8	7.1
			46	5230	6.8	6.7
	802.11ac (VHT80)	29.3 Mbps	42	5210	6.1	6.2
UNII-2A	802.11n (HT20)	6.5 Mbps	52	5260	14.0	14.2
			60	5300	14.5	14.5
			64	5320	12.9	13.0
	802.11n (HT40)	13.5 Mbps	54	5270	8.6	8.6
			62	5310	9.1	8.9
	802.11ac (VHT80)	29.3 Mbps	58	5290	5.2	5.0
UNII-2C	802.11n (HT20)	6.5 Mbps	100	5500	12.7	12.7
			116	5580	15.3	14.7
			140	5700	9.1	9.7
	802.11n (HT40)	13.5 Mbps	102	5510	8.2	8.7
			110	5550	14.6	14.3
			134	5670	11.7	11.5
UNII-3 or §15.247	802.11n (HT20)	6.5 Mbps	106	5530	5.9	6.2
			149	5745	12.7	12.8
			157	5785	14.2	14.5
	802.11n (HT40)	13.5 Mbps	165	5825	11.9	11.7
			151	5755	8.2	8.9
			159	5795	13.4	13.3
	802.11ac (VHT80)	29.3 Mbps	155	5775	4.3	5.1

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two embedded antennas, for diversity and MIMO requirements. The maximum gains are listed below:

BAND	Frequency (MHz)	Antenna/ Chain	Antenna Gain (dBi)
5 GHz/WiFi	5150 - 5850 MHz	ANT 1 (Chain 0)	4.3
		ANT 2 (Chain 1)	3.9

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that the X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the X orientation.

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

802.11a mode: 6 Mbps

802.11n HT20mode: MCS0

802.11n HT40mode: MCS0

802.11ac VHT80mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

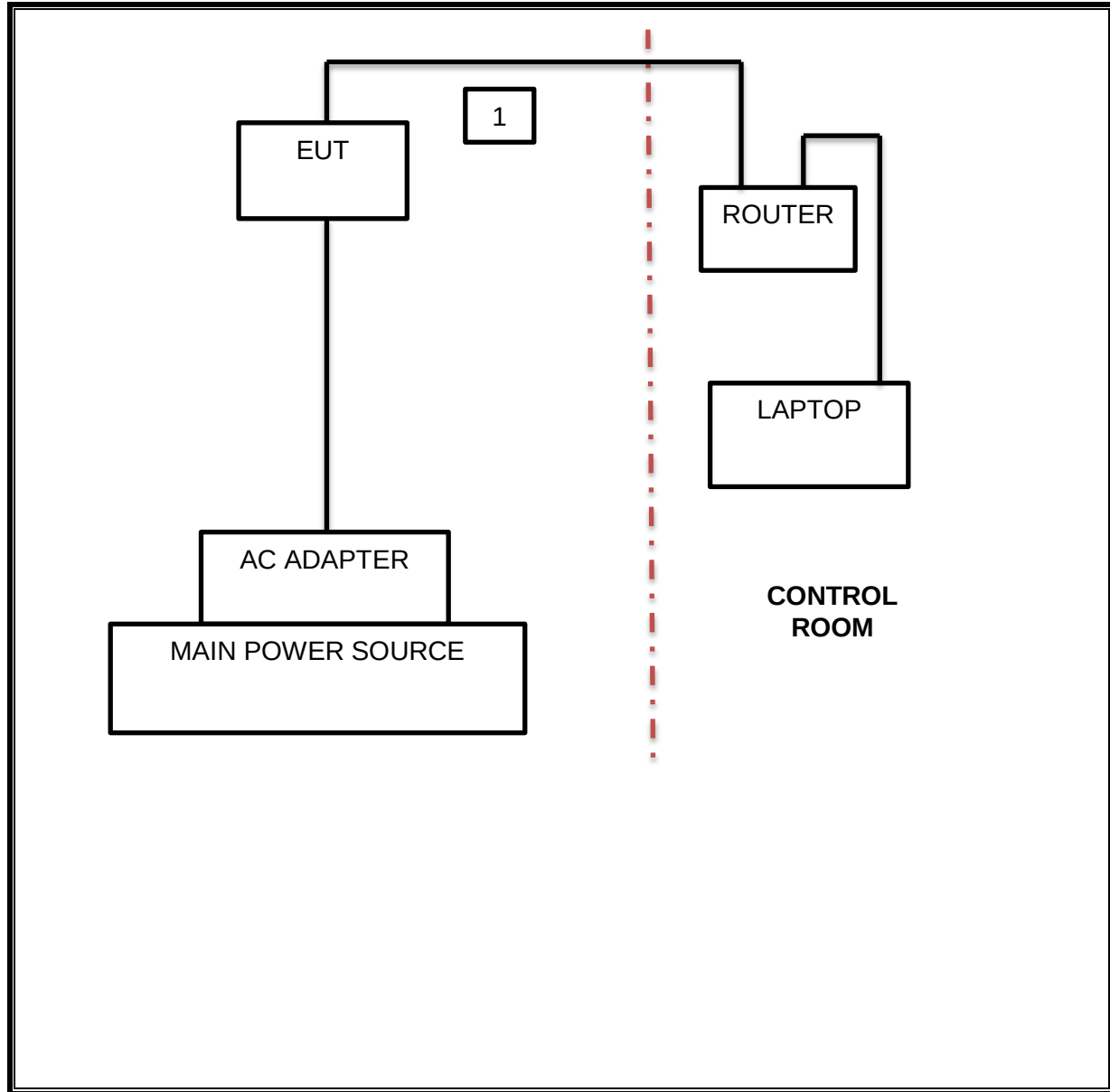
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC ADAPTER	CHICONY	A15-012N1A	N/A	N/A
LAPTOP	DELL	N/A	N/A	N/A
LAPTOP	DELL	N/A	N/A	N/A
ROUTER	NETGEAR	N600	N/A	N/A
ROUTER	D-LINK	DIR-655B1	N/A	N/A

I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Ethernet	1	RJ-45	Unshielded	5m	N/A

TEST SETUP

The EUT is setup as a stand-alone device.

SETUP DIAGRAM FOR TESTS

6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
Spectrum Analyzer, 9KHz-40GHz	HP	8564E	C00986	04/01/16
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/15
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/15
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/21/16
Antenna, Horn, 18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/15
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/16
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/16
RF Preamplifier, 100KHz -> 1300MHz	HP	8447D	T10	01/06/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/29/16
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	08/20/15
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T420	04/29/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	T426	04/29/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T424	04/29/16

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Version 9.5, 07/22/14
Conducted Software	UL	UL EMC	Version 9.5, 05/17/14
CLT Software	UL	UL RF	Version 1.0, 02/02/15
Antenna Port Software	UL	UL RF	Version 2.1.1.1, 1/20/15

7. SUMMARY TABLE

FCC Part Section	RSS Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.407 (a)	RSS-247	Occupied Band width (26dB)	N/A	Conducted	Pass	81.92 MHz
15.407	RSS-247 6.2.4	6dB Band width (5.8Ghz)	500KHz		Pass	17.58 MHz
15.407 (a)(2)	RSS-247 6.2	TX Cond. Power 5.15-2.25, 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(OBW)		Pass	18.55 dBm
15.407 (a)(3)	RSS-247 6.2.4	TX Cond. Power 5.725-5.825	< 30dBm or 17+10Log(OBW)		Pass	17.56 dBm
15.407 (a)(5)	RSS-247 6.2	PSD (5.2,5.3,5.5GHz)	<11dBm		Pass	7.19 dBm
15.407 (a)(5)	RSS-247 6.2.4	PSD (5.8GHz)	30dBm per 500kHz		Pass	3.42 dBm
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	60.12 dBuV
15.407 (b) & 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	< 54dBuV/m		Pass	52.94 dBuV/m (Av)
15.407 (h)(2)	RSS-247 6.3	Dynamic Frequency Selection	N/A	Radiated / Conducted	Pass	N/A

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

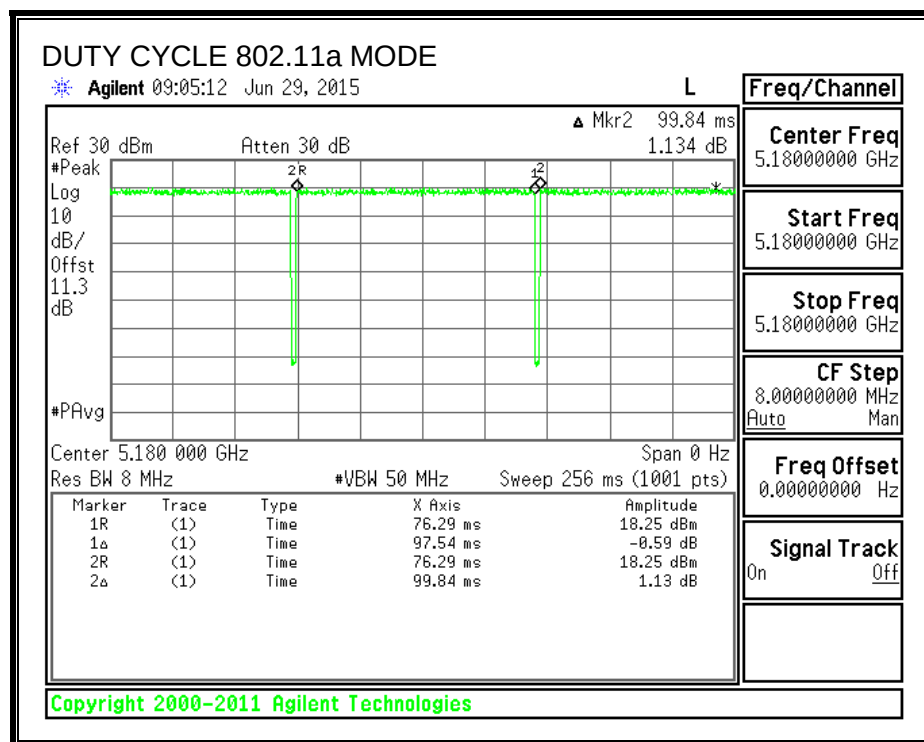
PROCEDURE

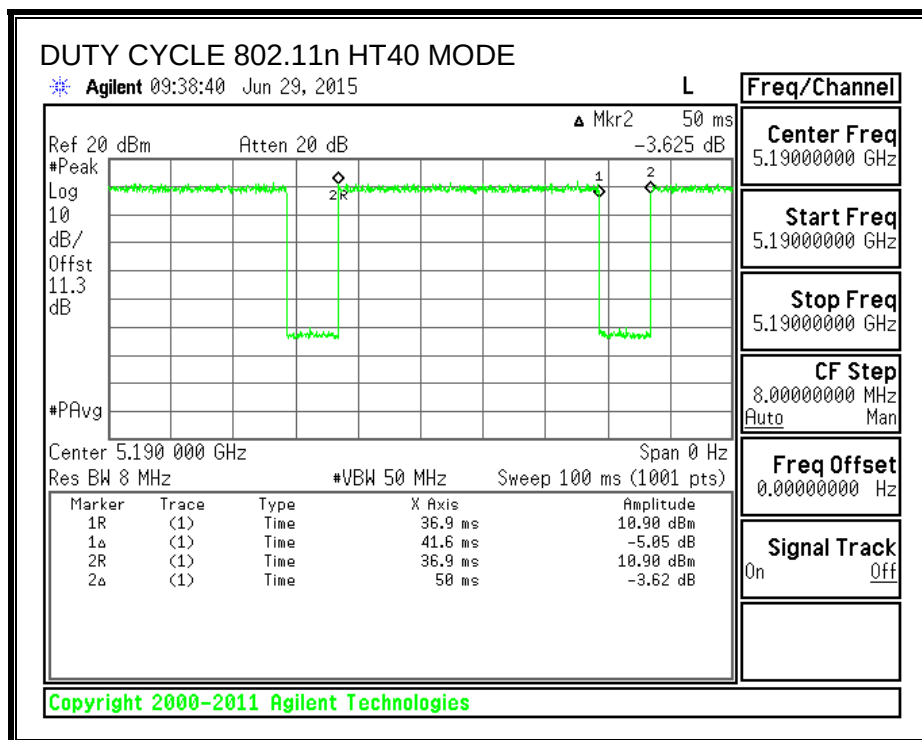
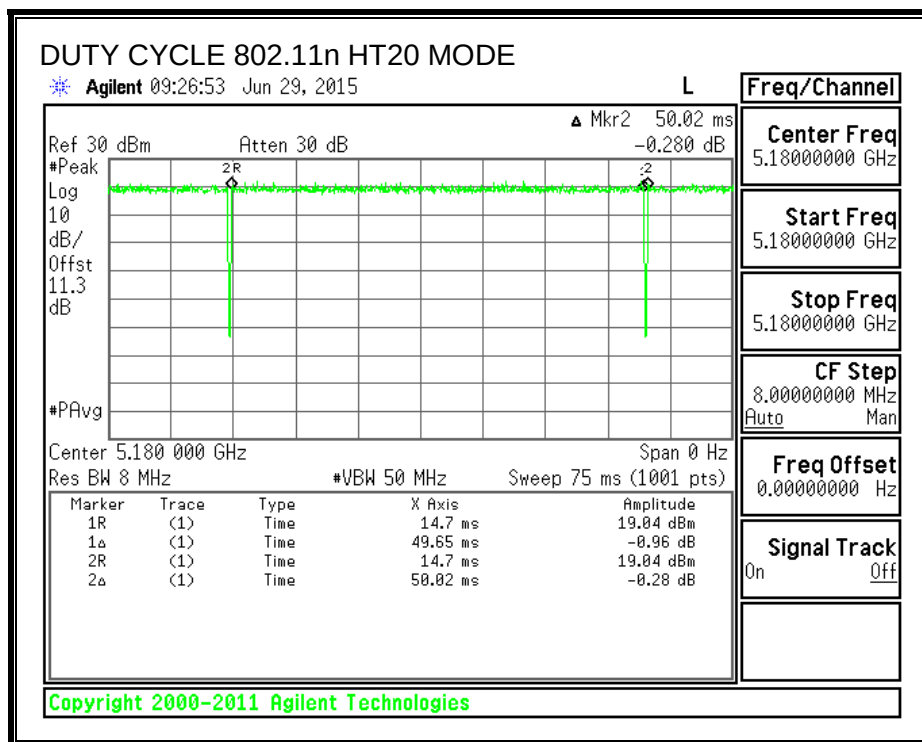
KDB 789033 Zero-Span Spectrum Analyzer Method.

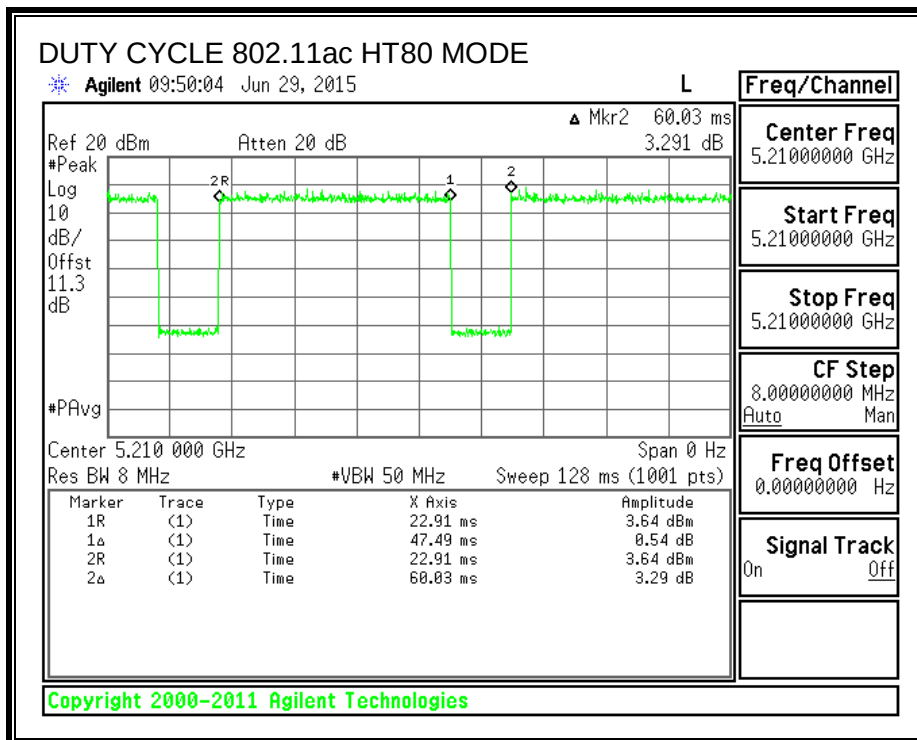
8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11a	97.54	99.84	0.977	97.7%	0.10	0.010
802.11n HT20	49.65	50	0.993	99.3%	0.00	0.010
802.11n HT40	41.60	50	0.832	83.2%	0.80	0.024
802.11ac HT80	47.49	60	0.791	79.1%	1.02	0.021

8.2. DUTY CYCLE PLOTS







9. MEASUREMENT METHOD

789033 D02 General UNII Test Procedures New Rules v01

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used for power and PPSD

The Duty Cycle is less than 98% and consistent, KDB 789033 Method AD with Power RMS Averaging and duty cycle correction is used.

10. ANTENNA PORT TEST RESULTS SISO

10.1. 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

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

10.1.1. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.450	0.5
Mid	5785	16.575	0.5
High	5825	16.375	0.5
Worst		16.375	

10.1.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

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

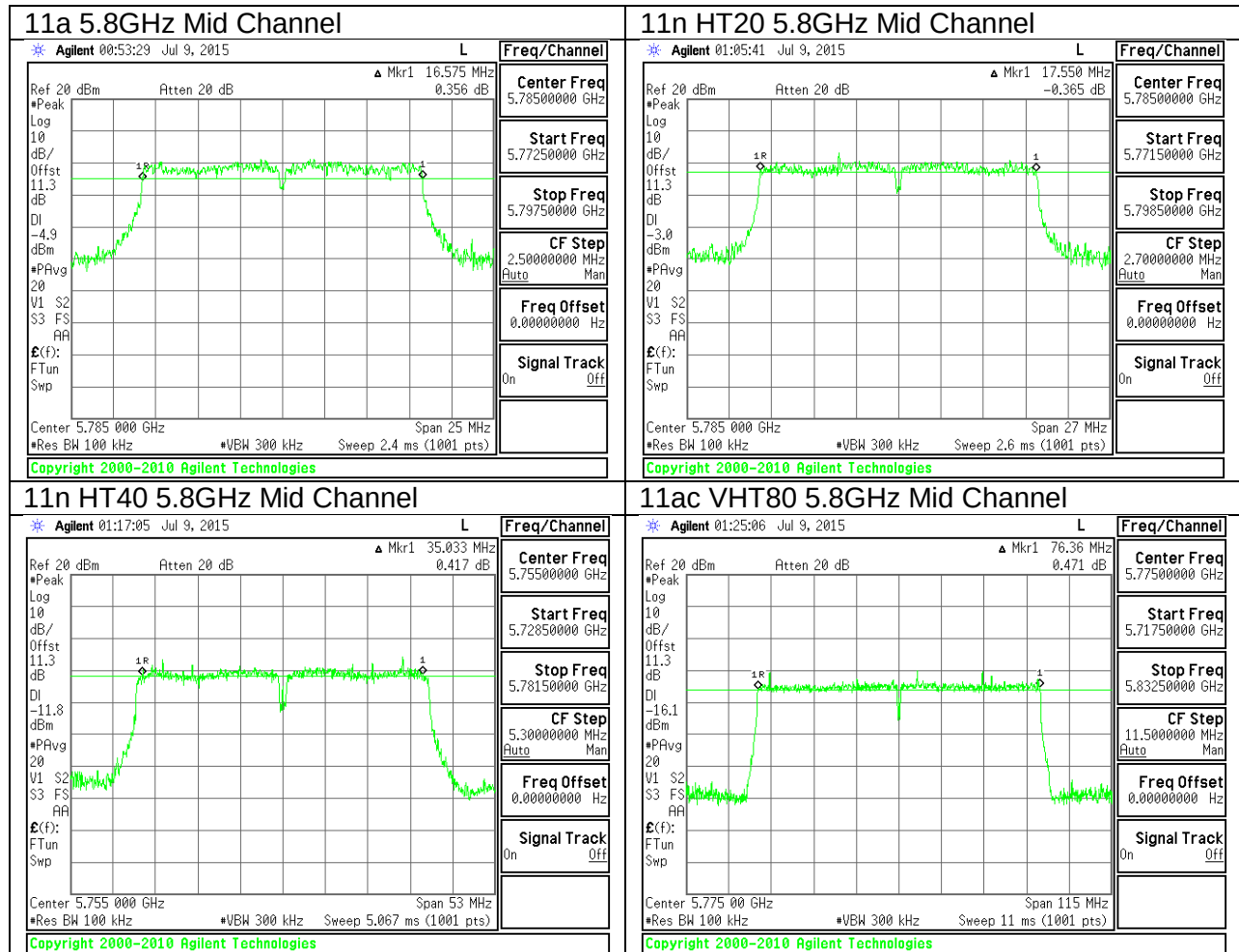
10.1.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	35.033	0.5
High	5795	35.694	0.5
Worst		35.033	

10.1.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	76.360	0.5
Worst		76.360	

10.1.5. 6 dB BANDWIDTH MID CH PLOTS



10.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	19.74
Mid	5200	19.80
High	5240	19.56
Worst		19.80

10.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	20.27
Mid	5200	21.81
High	5240	21.52
Worst		21.81

10.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5190	40.98
High	5230	40.08
Worst		40.98

10.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5210	81.92
Worst		81.92

10.2.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	20.80
Mid	5300	20.98
High	5320	19.71
Worst		20.98

10.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	23.94
Mid	5300	30.41
High	5320	20.15
Worst		30.41

10.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	40.08
High	5310	40.44
Worst		40.44

10.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5290	81.43
Worst		81.43

10.2.9. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	19.44
Mid	5580	26.08
High	5700	19.53
Worst		26.08

10.2.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	20.24
Mid	5580	31.16
High	5700	19.98
Worst		31.16

10.2.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.32
Mid	5550	60.42
High	5670	40.98
Worst		60.42

10.2.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5530	81.67
Worst		81.67

10.2.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	19.65
Mid	5785	22.47
High	5825	19.26
Worst		22.47

10.2.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	19.95
Mid	5785	26.49
High	5825	26.16
Worst		26.49

10.2.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

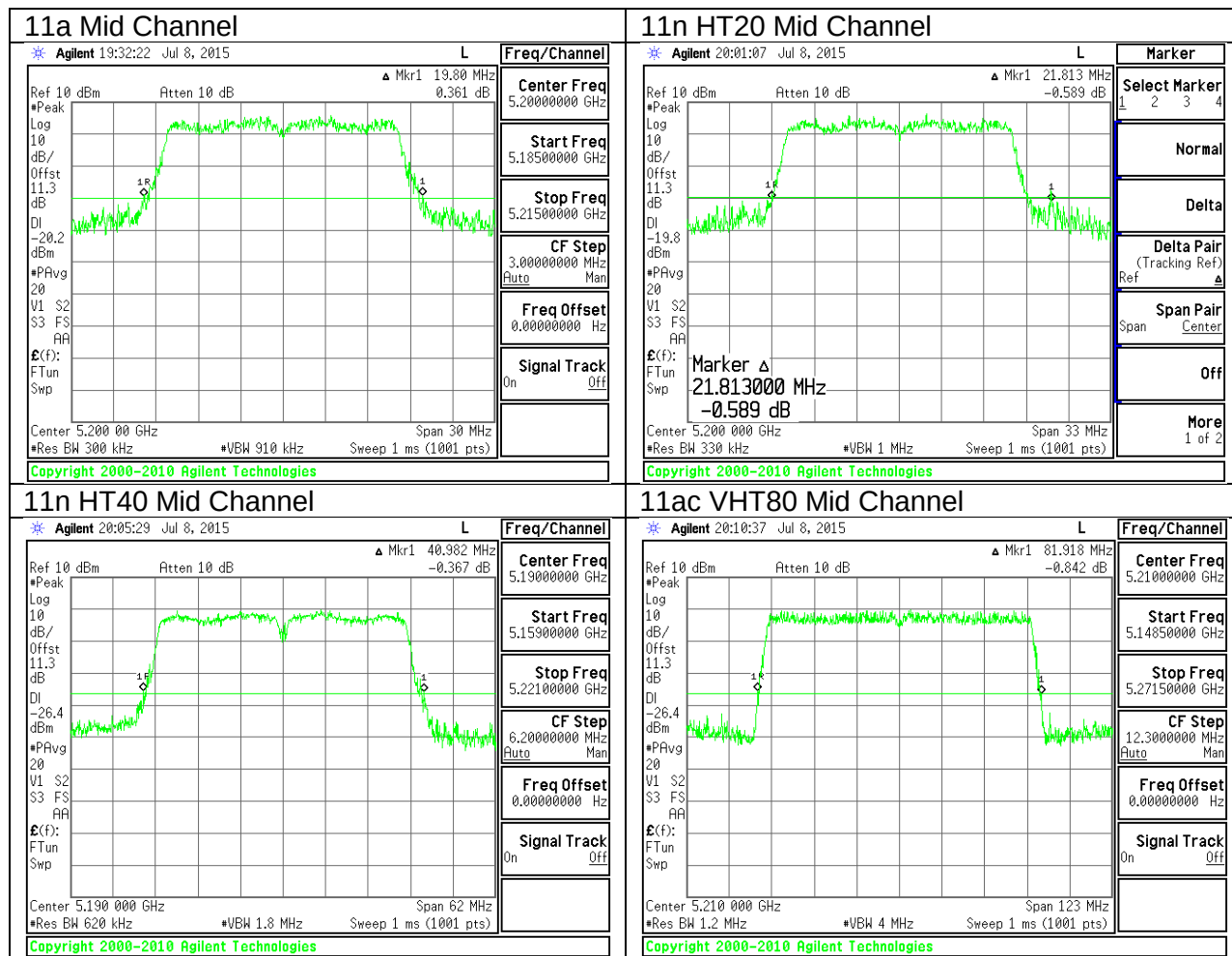
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5755	40.44
High	5795	66.10
Worst		66.10

10.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

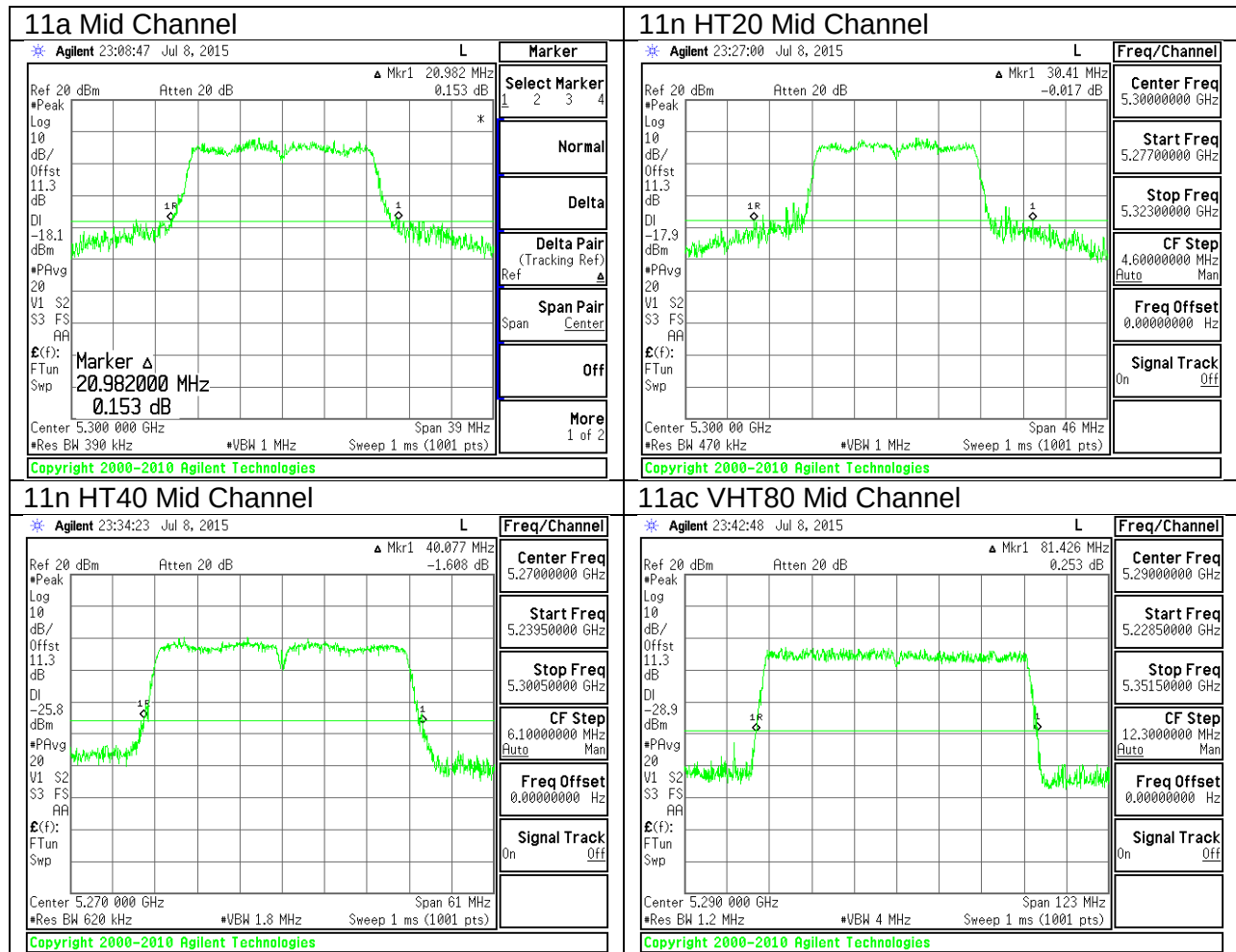
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5775	81.43
Worst		81.43

10.2.17. 26 dB BANDWIDTH PLOTS

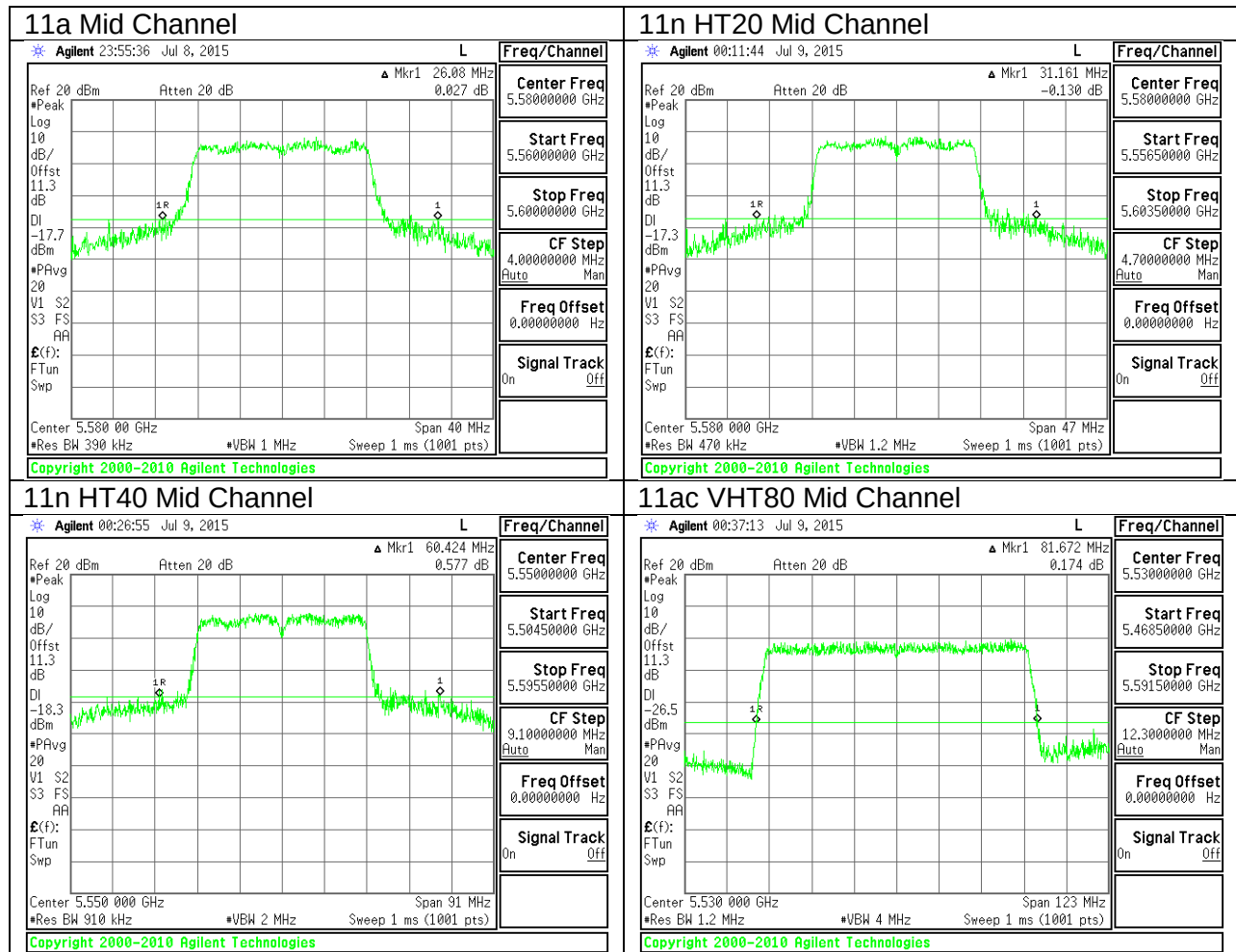
5.2 GHz



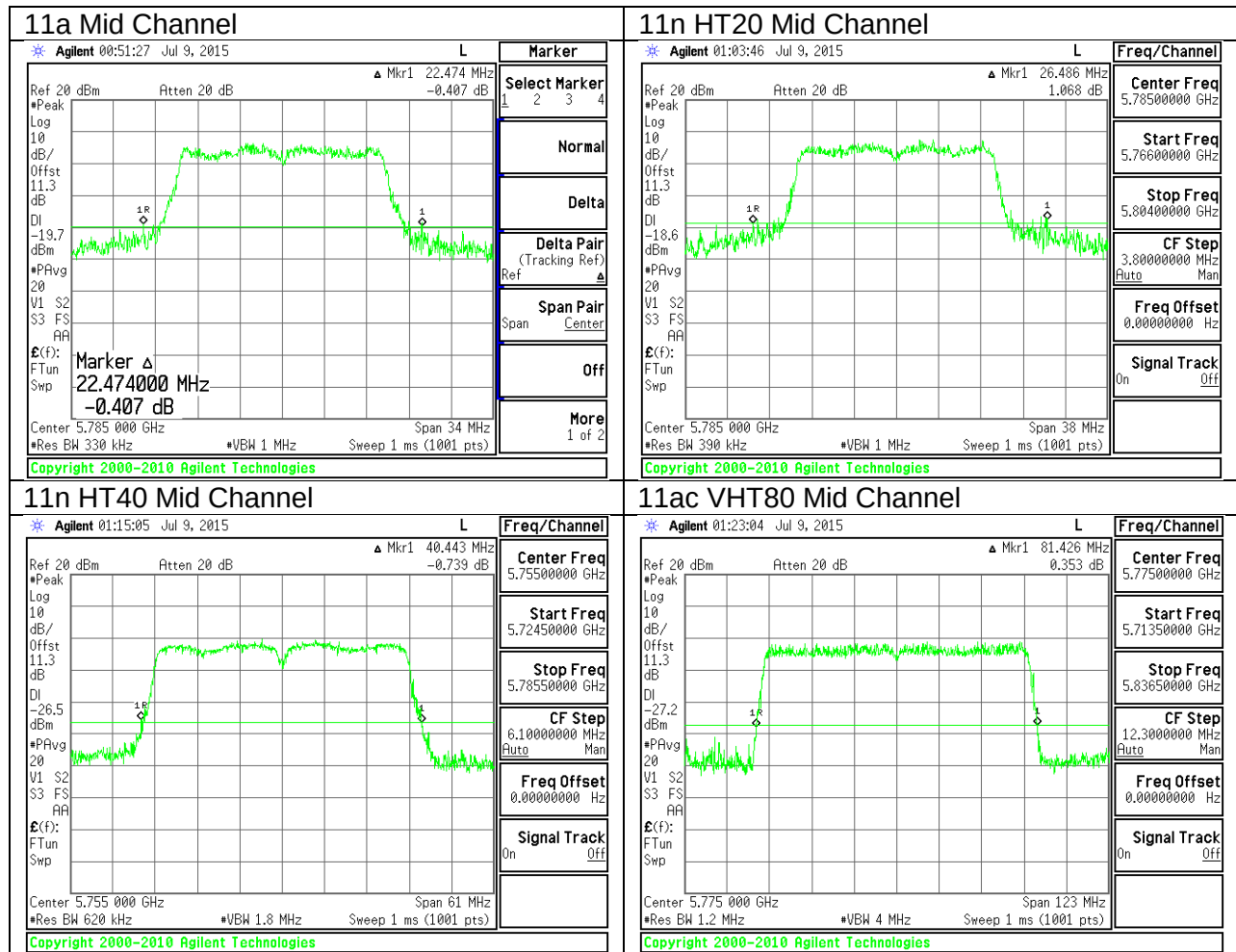
5.3 GHz



5.5 GHz



5.8 GHz



10.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.59
Mid	5200	16.66
High	5240	16.69
Worst		16.69

10.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.71
Mid	5200	17.73
High	5240	17.71
Worst		17.73

10.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.08
High	5230	36.12
Worst		36.12

10.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5210	76.03
Worst		76.03

10.3.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.69
Mid	5300	16.66
High	5320	16.61
Worst		16.69

10.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.73
Mid	5300	17.75
High	5320	17.70
Worst		17.75

10.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.18
High	5310	36.12
Worst		36.18

10.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5290	76.02
Worst		76.02

10.3.9. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.55
Mid	5580	16.75
High	5700	16.72
Worst		16.75

10.3.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.67
Mid	5580	17.75
High	5700	17.69
Worst		17.75

10.3.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.21
Mid	5550	36.30
High	5670	36.16
Worst		36.30

10.3.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5530	76.05
Worst		76.05

10.3.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.65
Mid	5785	16.61
High	5825	16.58
Worst		16.65

10.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.70
Mid	5785	17.72
High	5825	17.69
Worst		17.72

10.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

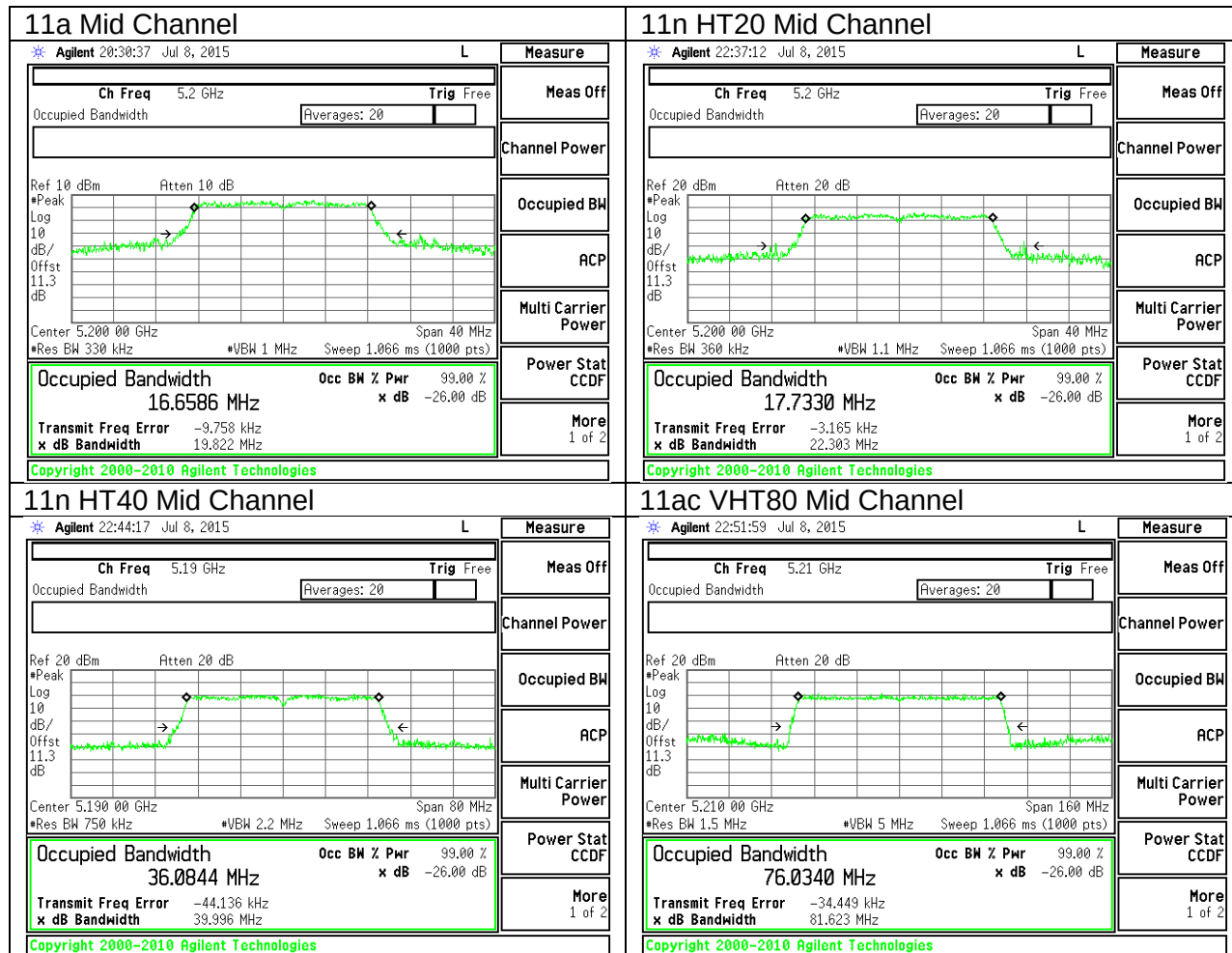
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.10
High	5795	36.22
Worst		36.22

10.3.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

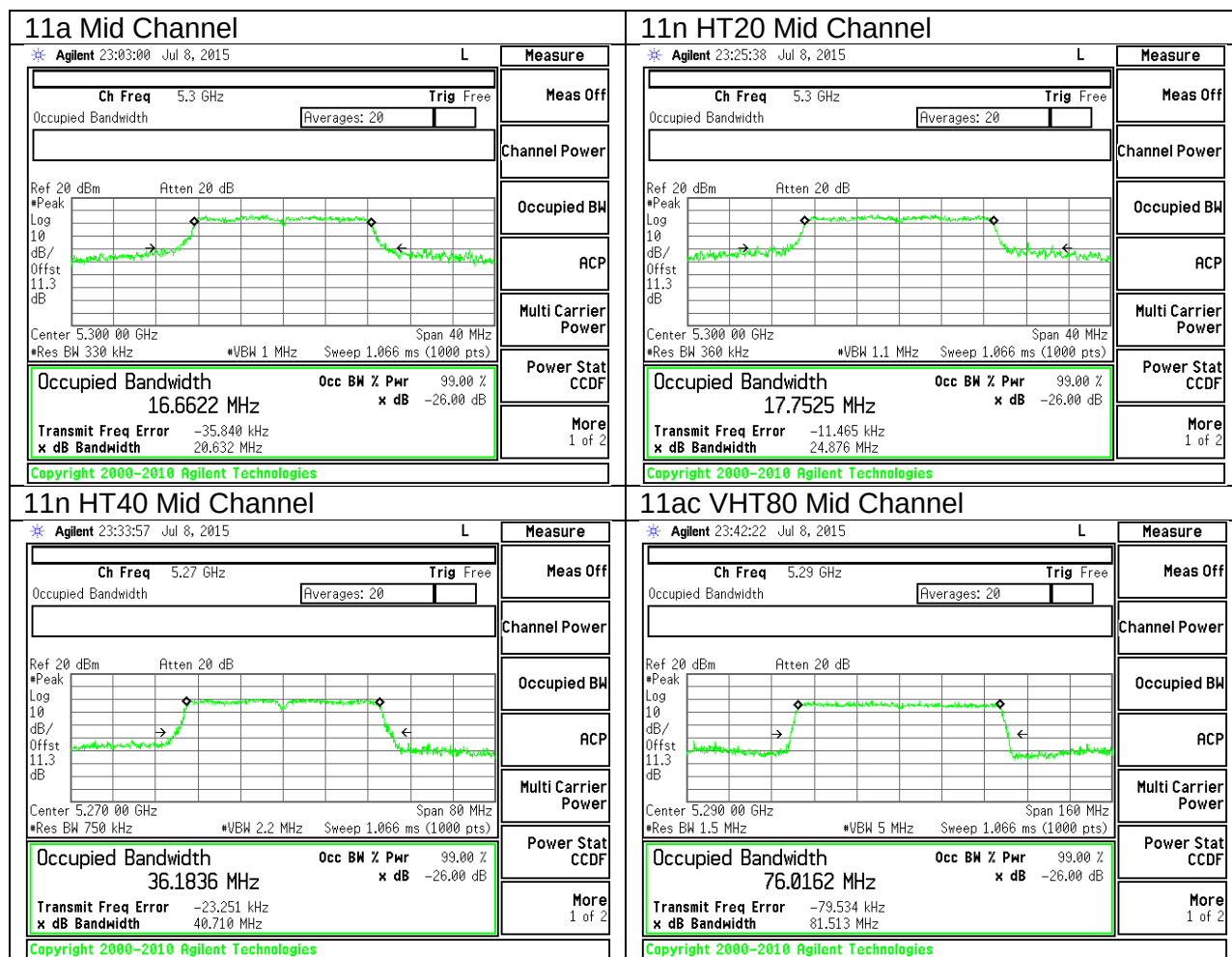
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5775	76.19
Worst		76.19

10.3.17. 99% BANDWIDTH PLOTS

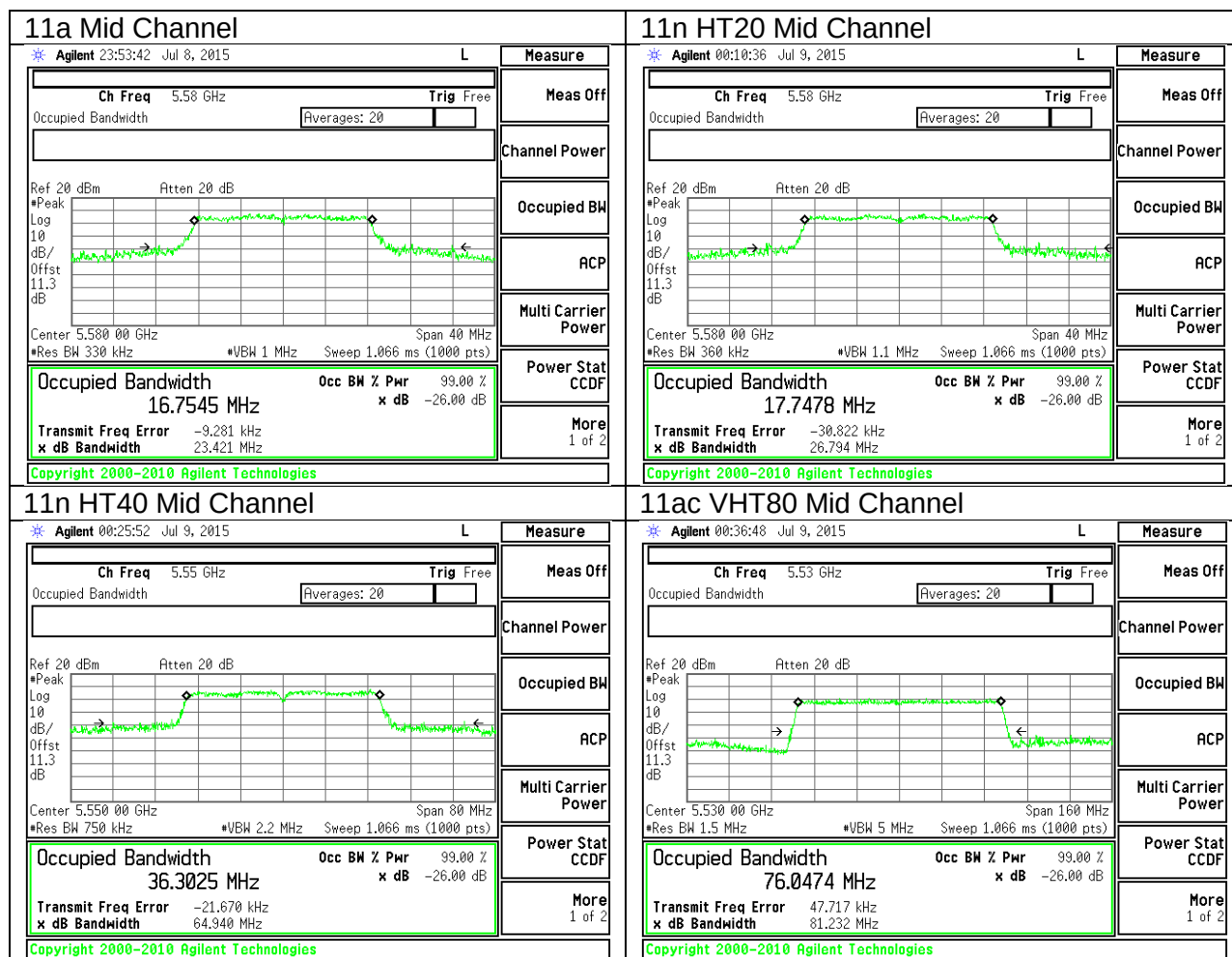
5.2 GHz



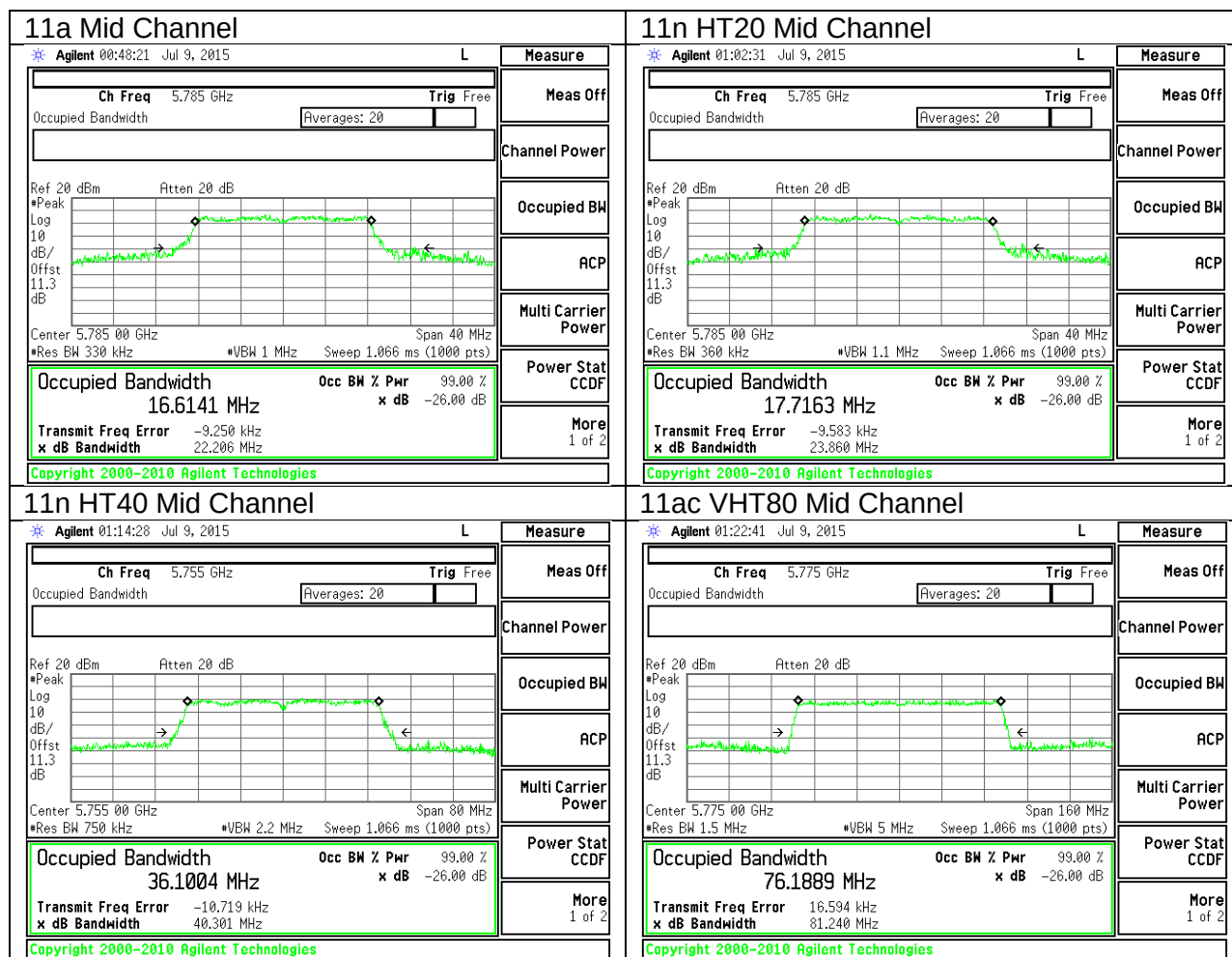
5.3 GHz



5.5 GHz



5.8 GHz



10.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1) (2) (3)

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

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.

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.

RSS-247

Band 5150-5250 MHz:

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, 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 $11 + 10 \log_{10} B$, 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 $17 + 10 \log_{10} B$, 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 $11 + 10 \log_{10} B$, 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 $17 + 10 \log_{10} B$, 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-multipoint [Footnote3](#) systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

DIRECTIONAL ANTENNA GAIN

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

Test Methodology

RESULTS

10.4.1. 802.11a MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	19.74	16.59	4.30
Mid	5200	19.80	16.66	4.30
High	5240	19.56	16.69	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	23.95	22.20	17.90	17.90	11.00	10.00	5.70
Mid	5200	23.97	22.22	17.92	17.92	11.00	10.00	5.70
High	5240	23.91	22.22	17.92	17.92	11.00	10.00	5.70

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	12.091	12.19	17.90	-5.71
Mid	5200	14.567	14.67	17.92	-3.25
High	5240	14.456	14.56	17.92	-3.37

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	1.034	1.13	5.70	-4.57
Mid	5200	3.412	3.51	5.70	-2.19
High	5240	3.292	3.39	5.70	-2.31

10.4.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	20.27	17.71	4.30
Mid	5200	21.81	17.73	4.30
High	5240	21.52	17.71	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	22.48	18.18	18.18	11.00	10.00	5.70
Mid	5200	24.00	22.49	18.19	18.19	11.00	10.00	5.70
High	5240	24.00	22.48	18.18	18.18	11.00	10.00	5.70

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

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.892	13.89	18.18	-4.29
Mid	5200	14.480	14.48	18.19	-3.71
High	5240	14.362	14.36	18.18	-3.82

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	2.638	2.64	5.70	-3.06
Mid	5200	3.037	3.04	5.70	-2.66
High	5240	2.937	2.94	5.70	-2.76

10.4.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	40.98	36.08	4.30
High	5310	40.08	36.12	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	10.00	5.70
High	5310	24.00	24.00	30.00	24.00	11.00	10.00	5.70

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	8.86	9.66	24.00	-14.34
High	5310	8.37	9.17	24.00	-14.83

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-5.57	-4.77	5.70	-10.47
High	5310	-6.08	-5.28	5.70	-10.98

10.4.4. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5210	81.92	76.03	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5210	24.00	23.00	18.70	18.70	11.00	10.00	5.70
Duty Cycle CF (dB)		1.02	Included in Calculations of Corr'd Power & PPSP					

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5210	7.889	8.91	18.70	-9.79

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5210	-10.426	-9.41	5.70	-15.11

10.4.5. 802.11a MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.80	16.69	4.30
Mid	5300	20.98	16.66	4.30
High	5320	19.71	16.61	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.22	29.22	23.22	11.00	11.00	11.00
Mid	5300	24.00	23.22	29.22	23.22	11.00	11.00	11.00
High	5320	23.95	23.20	29.20	23.20	11.00	11.00	11.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd Power & PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.918	15.02	23.22	-8.21
Mid	5300	15.437	15.54	23.22	-7.68
High	5320	12.572	12.67	23.20	-10.53

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.756	3.86	11.00	-7.14
Mid	5300	4.254	4.35	11.00	-6.65
High	5320	1.418	1.52	11.00	-9.48

10.4.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	23.94	17.73	4.30
Mid	5300	30.41	17.75	4.30
High	5320	20.15	17.70	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.49	29.49	23.49	11.00	11.00	11.00
Mid	5300	24.00	23.49	29.49	23.49	11.00	11.00	11.00
High	5320	24.00	23.48	29.48	23.48	11.00	11.00	11.00

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

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.914	14.91	23.49	-8.57
Mid	5300	15.329	15.33	23.49	-8.16
High	5320	13.538	13.54	23.48	-9.94

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.489	3.49	11.00	-7.51
Mid	5300	3.893	3.89	11.00	-7.11
High	5320	2.140	2.14	11.00	-8.86

10.4.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	40.08	36.18	4.30
High	5310	40.44	36.12	4.30

Limits

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

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	8.66	9.46	24.00	-14.54
High	5310	9.55	10.35	24.00	-13.65

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-5.78	-4.98	11.00	-15.98
High	5310	-4.85	-4.05	11.00	-15.05

10.4.8. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5290	81.43	76.02	

Limits

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

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5290	5.92	6.94	24.00	-17.06

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5290	-12.06	-11.04	11.00	-22.04

10.4.9. 802.11a MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	19.44	16.55	4.30
Mid	5580	26.08	16.75	4.30
High	5700	19.53	16.72	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	23.89	23.19	29.19	23.19	11.00	11.00	11.00
Mid	5580	24.00	23.24	29.24	23.24	11.00	11.00	11.00
High	5700	23.91	23.23	29.23	23.23	11.00	11.00	11.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	10.408	10.51	23.19	-12.68
Mid	5580	15.851	15.95	23.24	-7.29
High	5700	10.203	10.30	23.23	-12.93

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	-0.434	-0.33	11.00	-11.33
Mid	5580	4.718	4.82	11.00	-6.18
High	5700	-0.958	-0.86	11.00	-11.86

10.4.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	20.24	17.67	4.30
Mid	5580	31.16	17.75	4.30
High	5700	19.98	17.69	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.47	29.47	23.47	11.00	11.00	11.00
Mid	5580	24.00	23.49	29.49	23.49	11.00	11.00	11.00
High	5700	24.00	23.48	29.48	23.48	11.00	11.00	11.00

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

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	12.392	12.39	23.47	-11.08
Mid	5580	15.957	15.96	23.49	-7.53
High	5700	13.193	13.19	23.48	-10.28

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	1.012	1.01	11.00	-9.99
Mid	5580	4.568	4.57	11.00	-6.43
High	5700	1.790	1.79	11.00	-9.21

10.4.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	40.32	36.21	4.30
Mid	5550	60.42	36.30	4.30
High	5670	40.98	36.16	4.30

Limits

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

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	9.386	10.19	24.00	-13.81
Mid	5550	15.032	15.83	24.00	-8.17
High	5670	14.275	15.08	24.00	-8.93

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-4.983	-4.18	11.00	-15.18
Mid	5550	0.748	1.55	11.00	-9.45
High	5670	-0.108	0.69	11.00	-10.31

10.4.12. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5530	81.67	76.05	4.30

Limits

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

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	7.72	8.74	24.00	-15.26

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-10.30	-9.28	11.00	-20.28

10.4.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5745	19.65	16.65	4.30
Mid	5785	22.47	16.61	4.30
High	5825	19.26	16.58	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	29.93	29.21	35.21	29.21	30.00	17.00	17.00
Mid	5785	30.00	29.20	35.20	29.20	30.00	17.00	17.00
High	5825	29.85	29.20	35.20	29.20	30.00	17.00	17.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	8.45	8.55	29.21	-20.66
Mid	5785	15.06	15.16	29.20	-14.05
High	5825	10.09	10.19	29.20	-19.00

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	-5.49	-5.39	17.00	-22.39
Mid	5785	1.13	1.23	17.00	-15.77
High	5825	-3.85	-3.75	17.00	-20.75

10.4.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5745	19.95	17.70	4.30
Mid	5785	26.49	17.72	4.30
High	5825	26.16	17.69	4.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	30.00	29.48	35.48	29.48	30.00	17.00	17.00
Mid	5785	30.00	29.48	35.48	29.48	30.00	17.00	17.00
High	5825	30.00	29.48	35.48	29.48	30.00	17.00	17.00

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

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.38	13.38	29.48	-16.10
Mid	5785	15.23	15.23	29.48	-14.25
High	5825	14.78	14.78	29.48	-14.69

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	-0.80	-0.80	17.00	-17.80
Mid	5785	1.01	1.01	17.00	-15.99
High	5825	0.57	0.57	17.00	-16.43

10.4.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5755	40.44	36.10	4.30
High	5795	66.10	36.22	4.30

Limits

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

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	8.47	9.27	30.00	-20.73
High	5795	15.06	15.86	30.00	-14.14

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5755	-8.74	-7.94	17.00	-24.94
High	5795	-2.12	-1.32	17.00	-18.32

10.4.16. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5775	81.43	76.19	4.30

Limits

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

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PSD
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Output Power Results

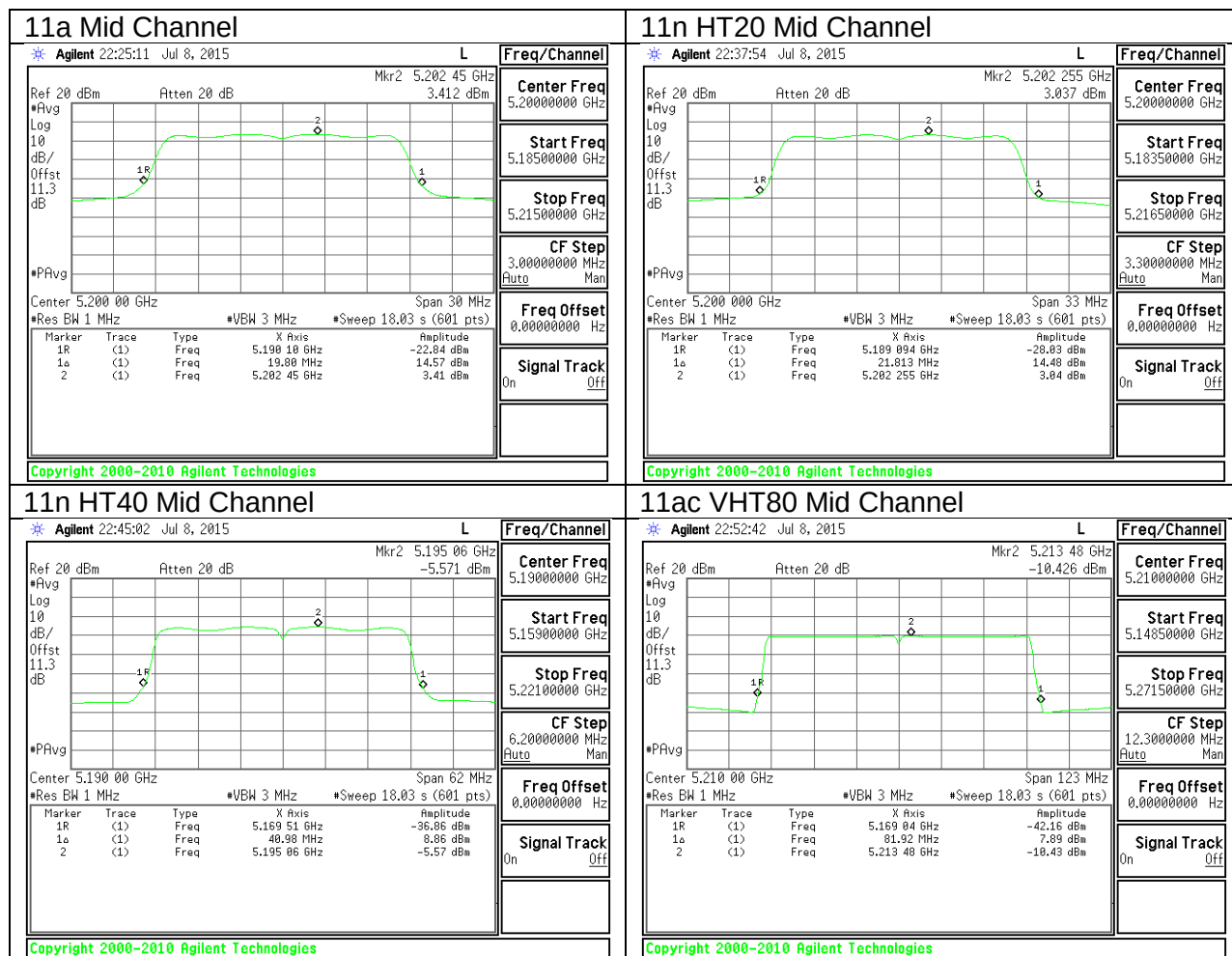
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5775	7.37	8.39	30.00	-21.61

PPSD Results

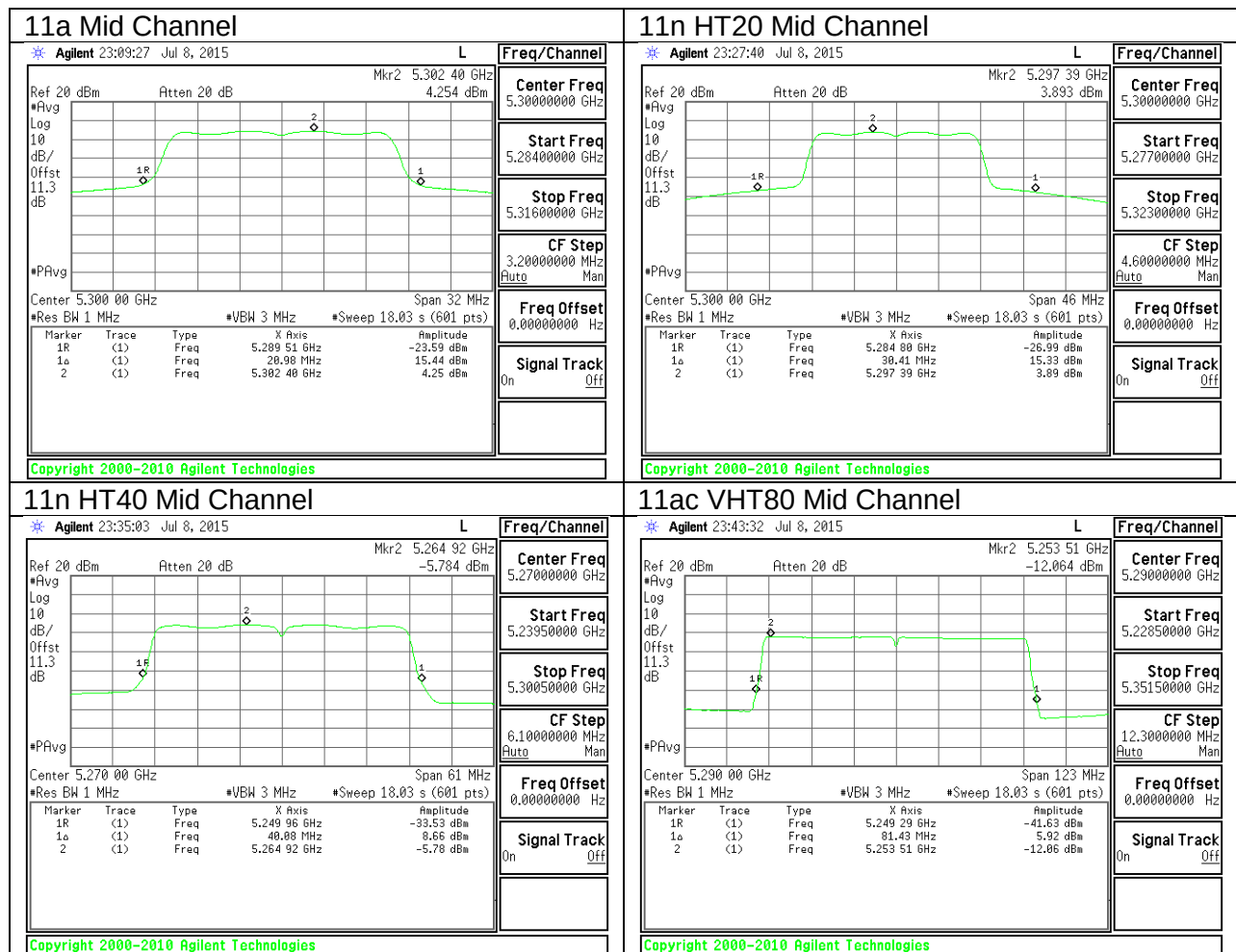
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5775	-13.67	-12.65	17.00	-29.65

10.4.17. OUTPUT POWER AND PPSD PLOTS, Chain 0

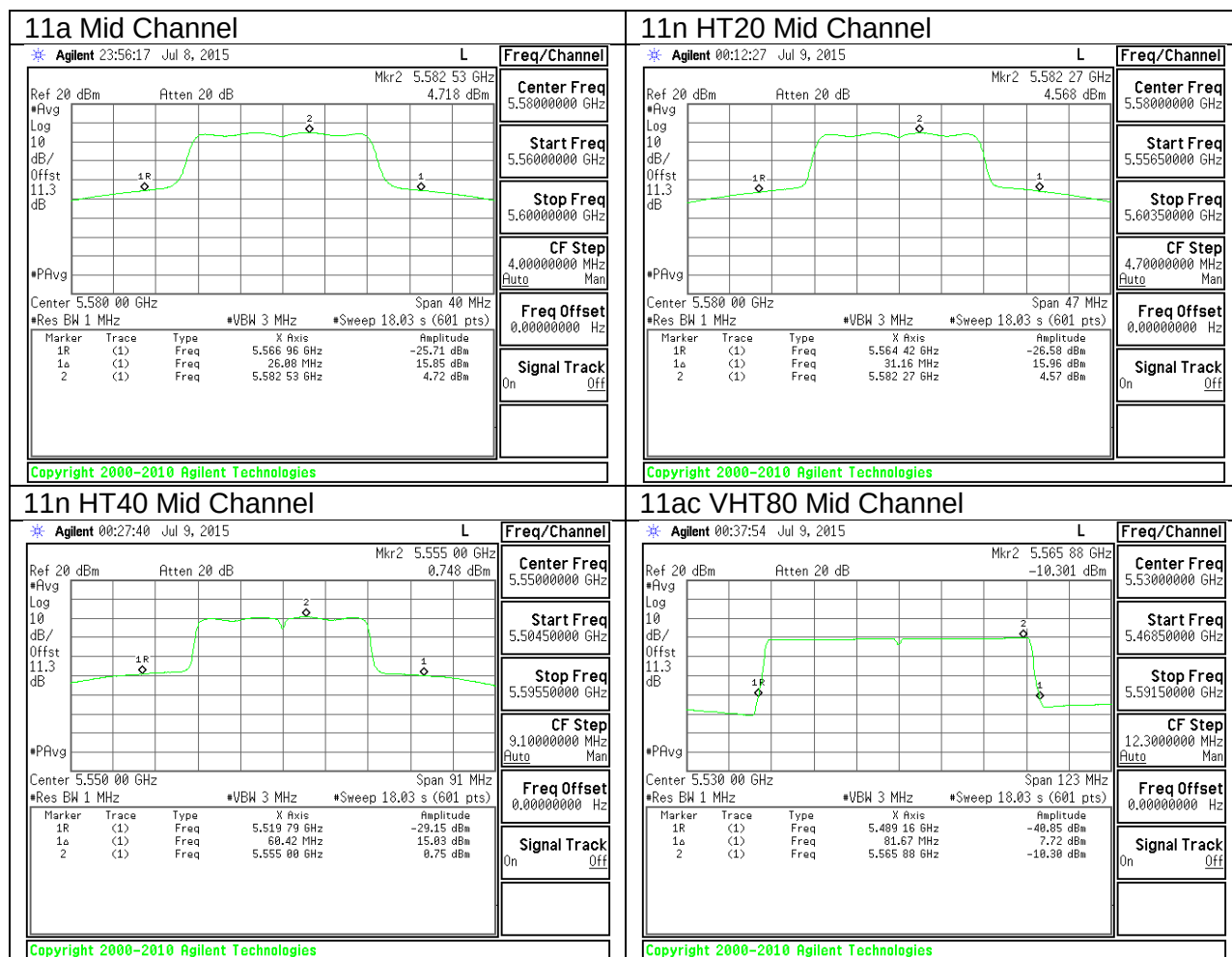
5.2 GHz



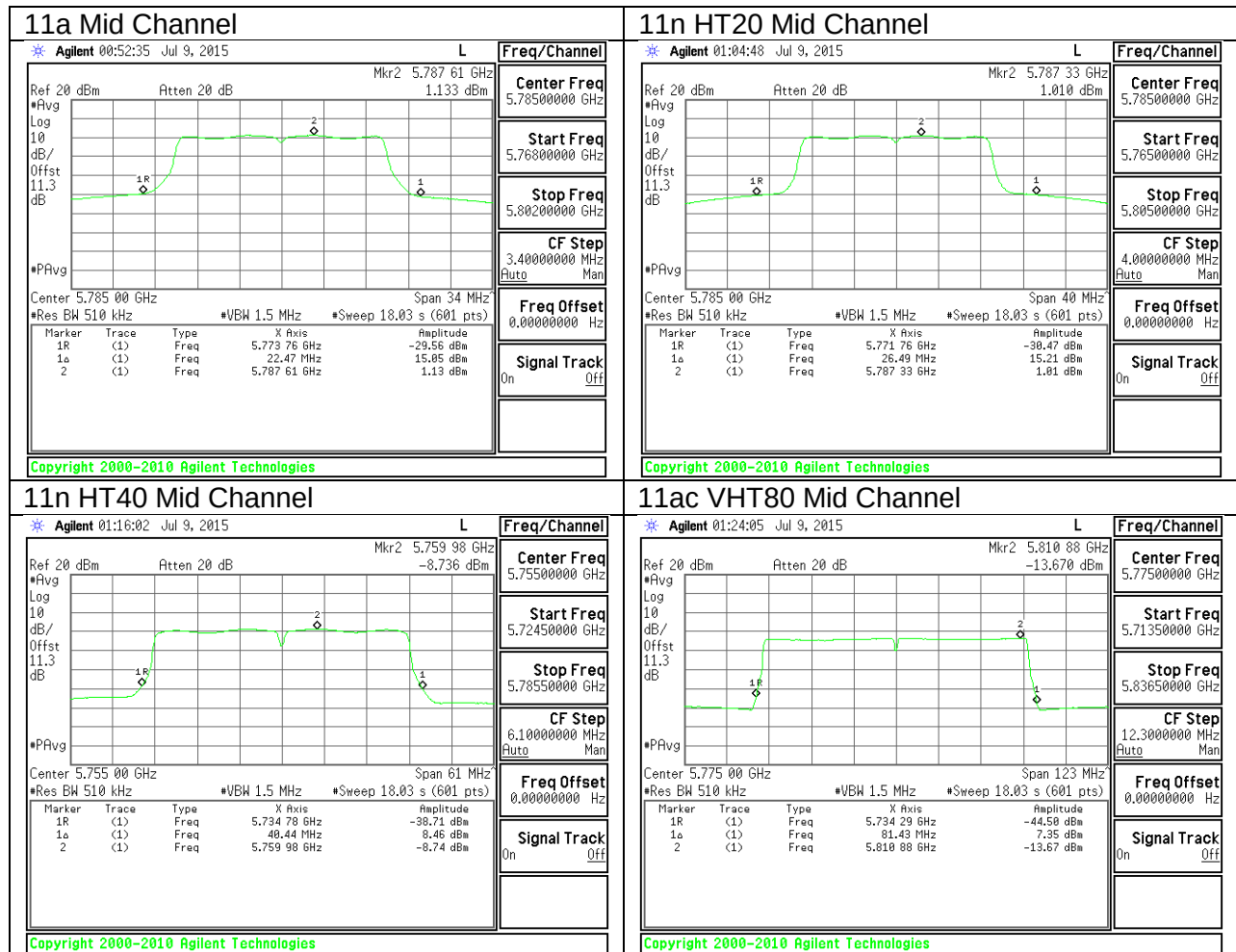
5.3 GHz



5.5 GHz



5.8 GHz



11. ANTENNA PORT TEST RESULTS MIMO

11.1. 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

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100 kHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

11.1.1. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth CHAIN 0 (MHz)	6 dB Bandwidth CHAIN 1 (MHz)	Minimum Limit (MHz)
Low	5745	17.69	17.60	0.5
Mid	5785	17.66	17.71	0.5
High	5825	17.58	17.69	0.5
Worst		17.58	17.60	

11.1.2. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth CHAIN 0 (MHz)	6 dB Bandwidth CHAIN 1 (MHz)	Minimum Limit (MHz)
Low	5755	35.80	35.19	0.5
High	5795	36.36	36.30	0.5
Worst		35.80	35.19	0.5

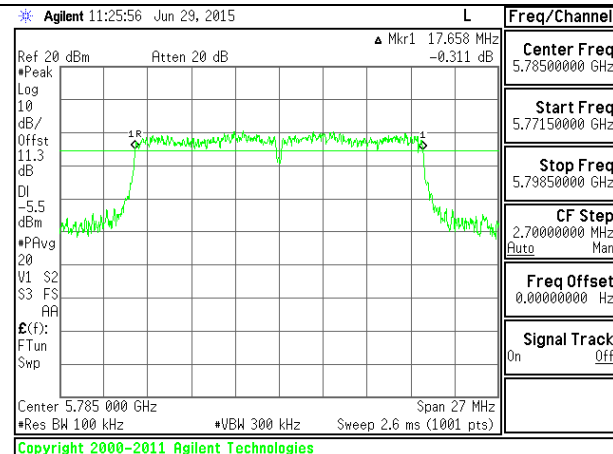
11.1.3. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth CHAIN 0(MHz)	6 dB Bandwidth CHAIN 1(MHz)	Minimum Limit (MHz)
Low	5775	76.36	76.36	0.5
Worst		76.36	76.36	0.5

11.1.4. 6 dB BANDWIDTH MID CH PLOTS

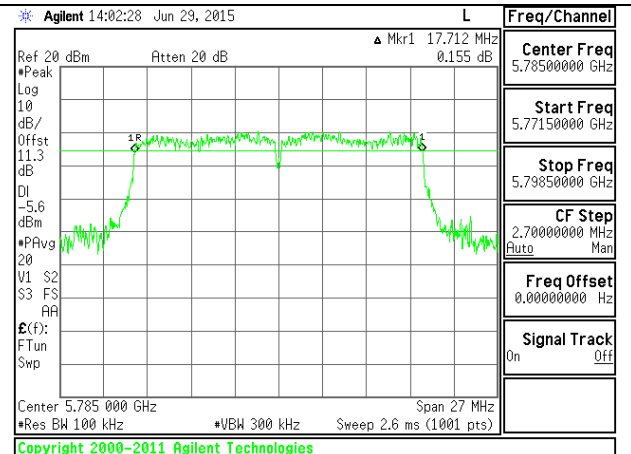
CHAIN 0

11n HT20 5.8 Mid Ch

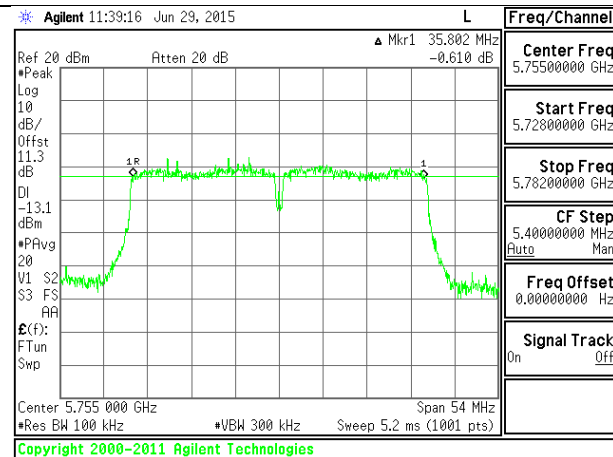


CHAIN 1

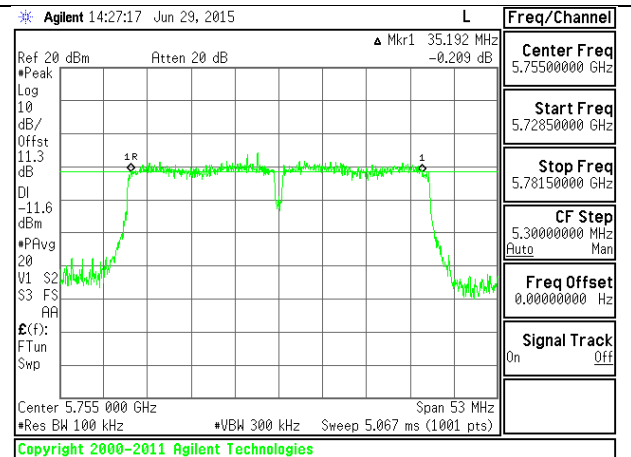
11n HT20 5.8 Mid Ch



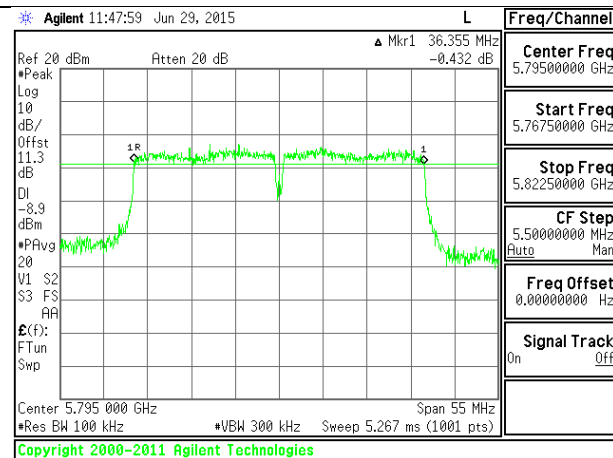
11n HT40 5.8 Mid Ch



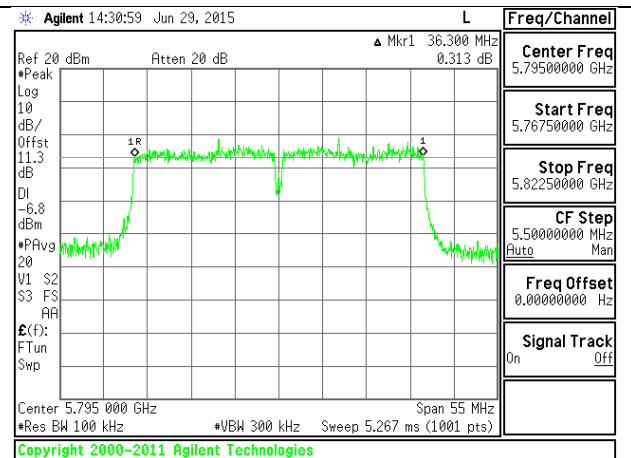
11n HT40 5.8 Mid Ch



11ac HT80 5.8 Mid Ch



11ac HT80 5.8 Mid Ch



11.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

11.2.1. 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	20.0	19.8
Mid	5200	26.3	20.8
High	5240	27.6	19.9

11.2.2. 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	40.4	40.2
High	5230	40.3	40.1

11.2.3. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5210	81.7	81.1

11.2.1. 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	28.7	22.4
Mid	5300	39.2	23.9
High	5320	19.8	19.7

11.2.2. 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	40.7	40.1
High	5310	40.2	39.7

11.2.3. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5290	81.4	81.0

11.2.4. 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	20.2	19.9
Mid	5580	38.1	25.7
High	5700	19.9	19.8

11.2.5. 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	40.1	39.8
Mid	5550	72.8	44.4
High	5670	40.2	40.4

11.2.6. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5530	81.4	80.8

11.2.7. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5745	19.9	19.7
Mid	5785	32.2	20.0
High	5825	19.8	20.0

11.2.8. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5755	40.2	40.0
High	5795	55.5	40.5

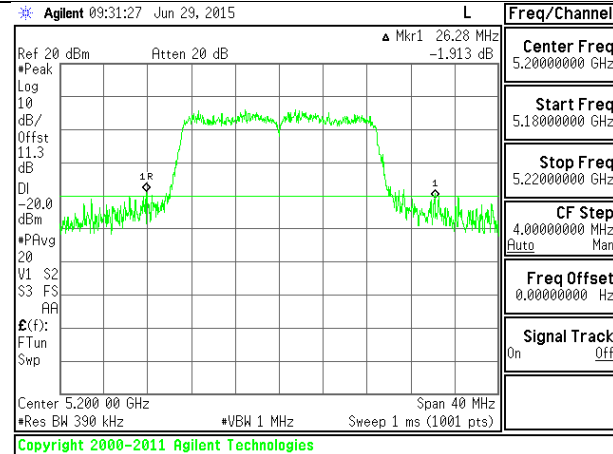
11.2.9. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5775	81.7	81.5

11.2.1. 26 dB BANDWIDTH PLOTS 5.2 GHz

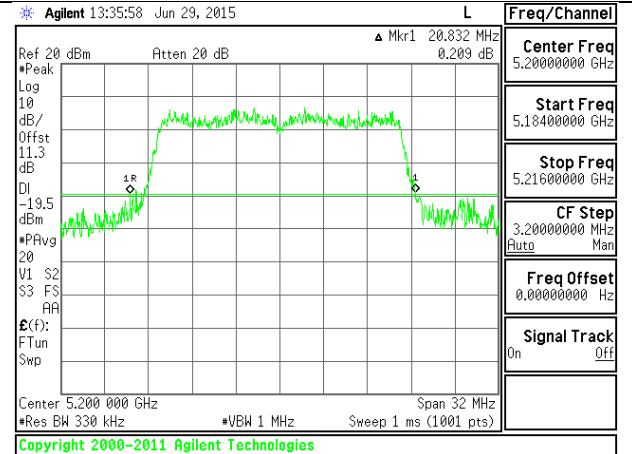
CHAIN 0

11n HT20 Mid Ch

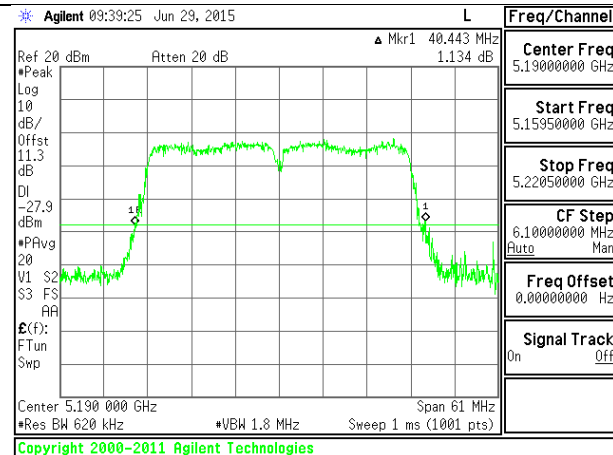


CHAIN 1

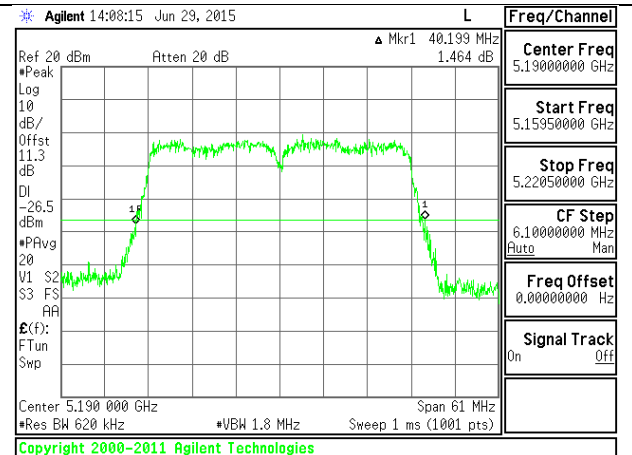
11n HT20 Mid Ch



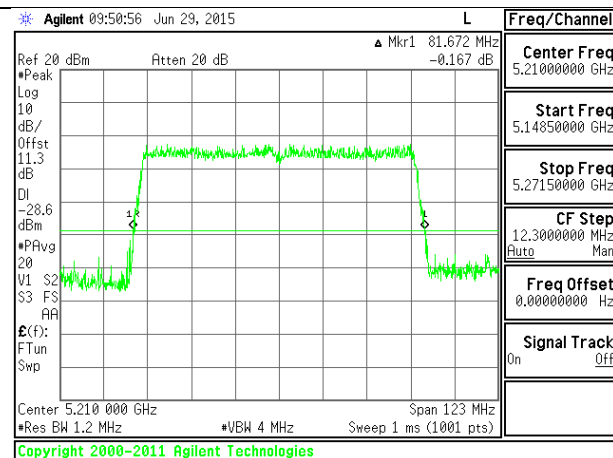
11n HT40 Mid Ch



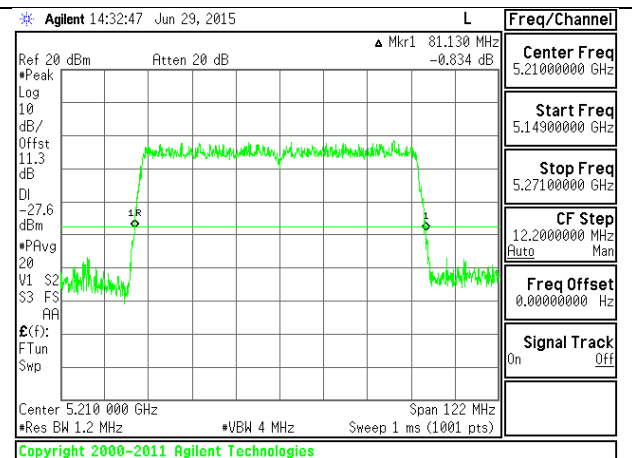
11n HT40 Mid Ch



11ac HT80 Mid Ch



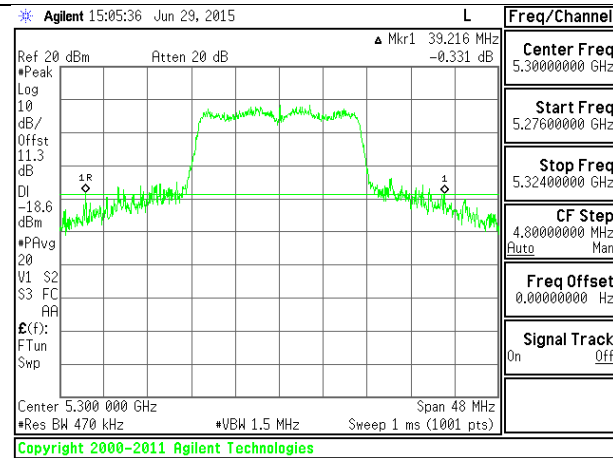
11ac HT80 Mid Ch



5.3 GHz

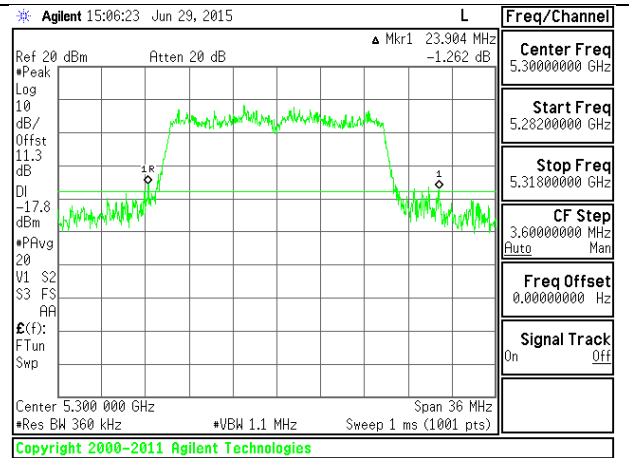
CHAIN 0

11n HT20 Mid Ch

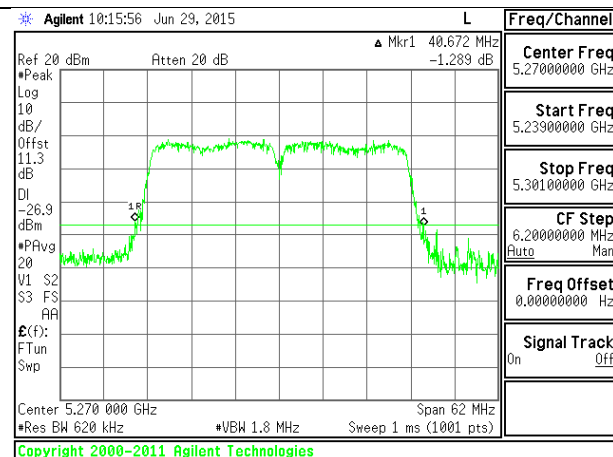


CHAIN 1

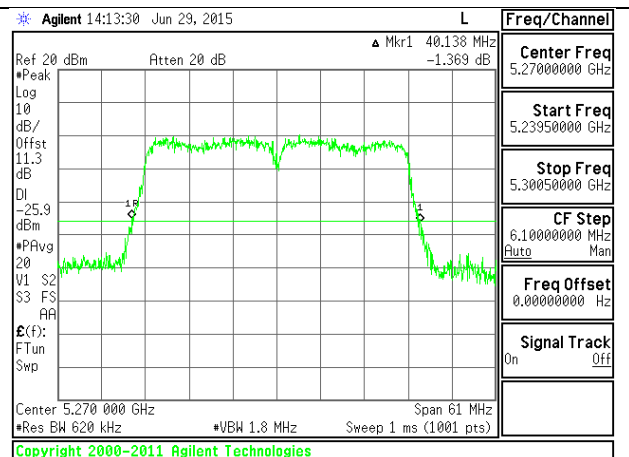
11n HT20 Mid Ch



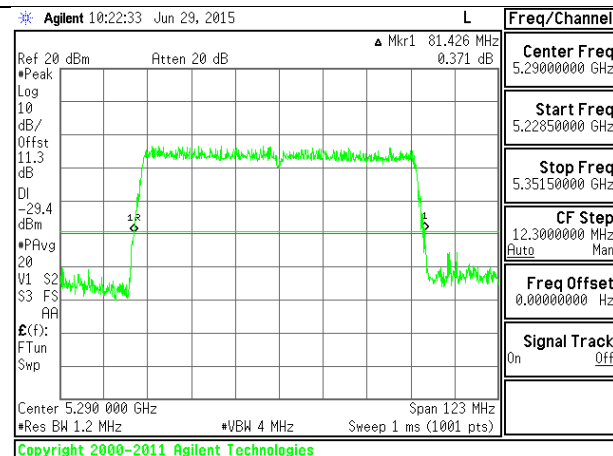
11n HT40 Mid Ch



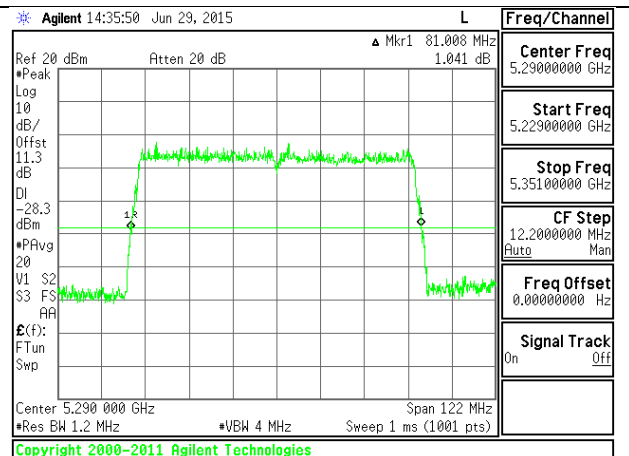
11n HT40 Mid Ch



11ac HT80 Mid Ch



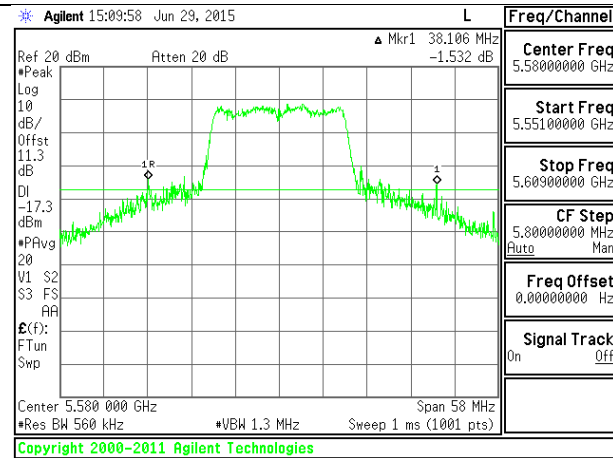
11ac HT80 Mid Ch



5.5 GHz

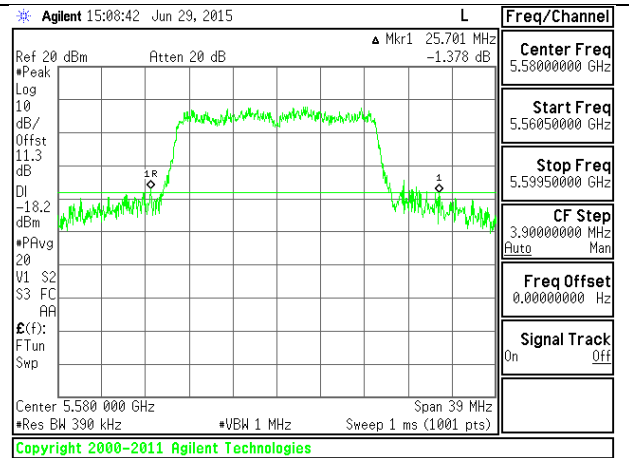
CHAIN 0

11n HT20 Mid Ch

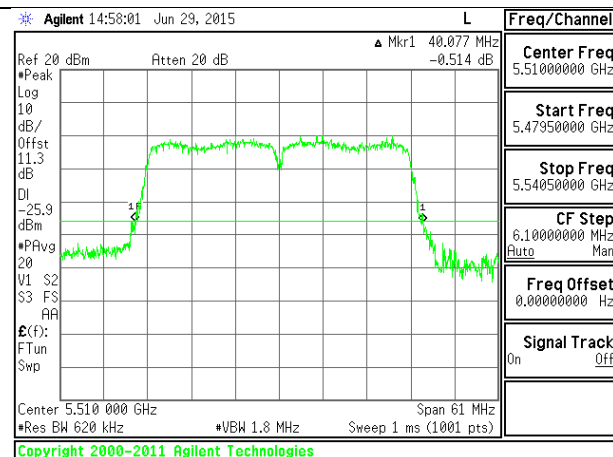


CHAIN 1

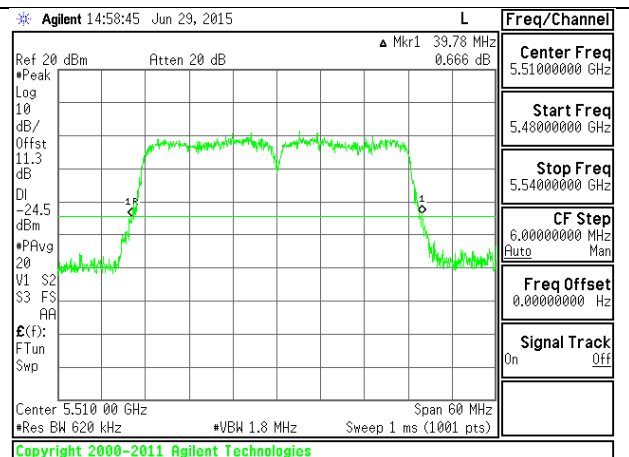
11n HT20 Mid Ch



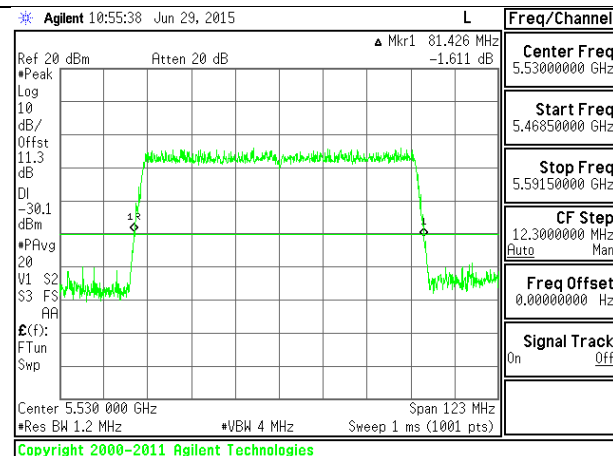
11n HT40 Mid Ch



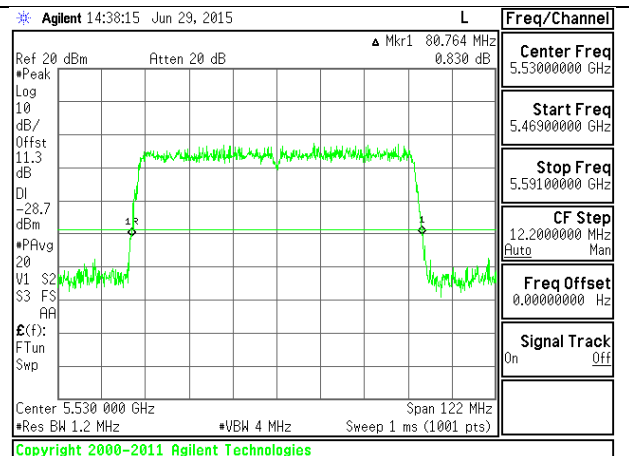
11n HT40 Mid Ch



11ac HT80 Mid Ch



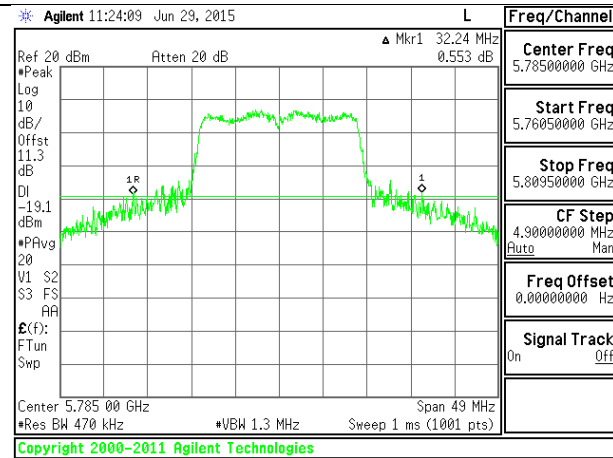
11ac HT80 Mid Ch



5.8 GHz

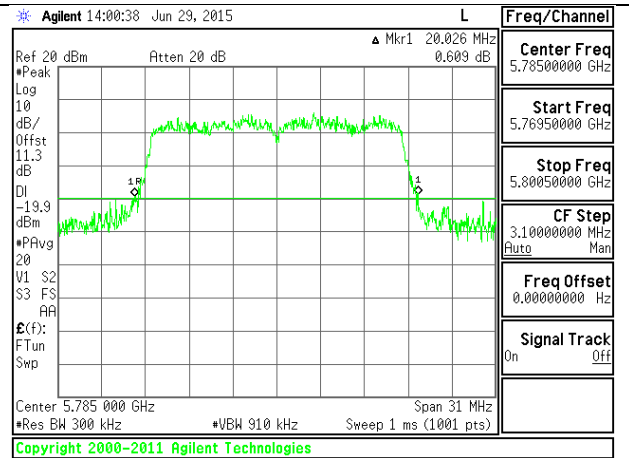
CHAIN 0

11n HT20 Mid Ch

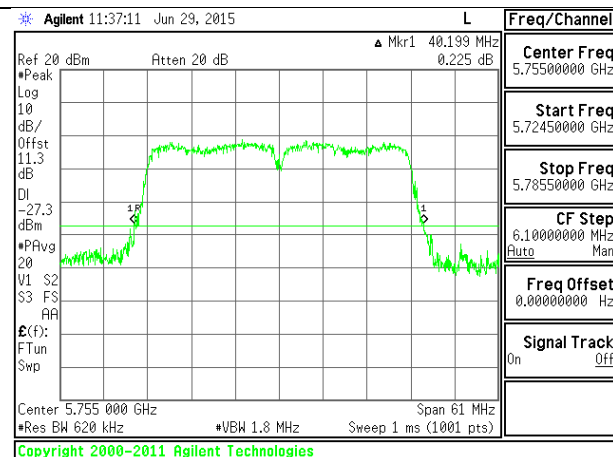


CHAIN 1

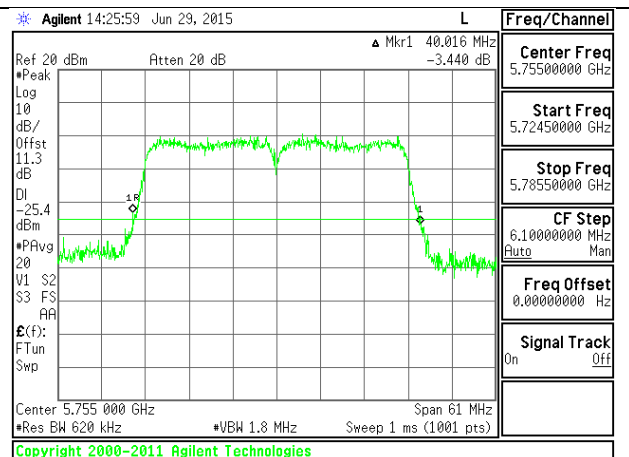
11n HT20 Mid Ch



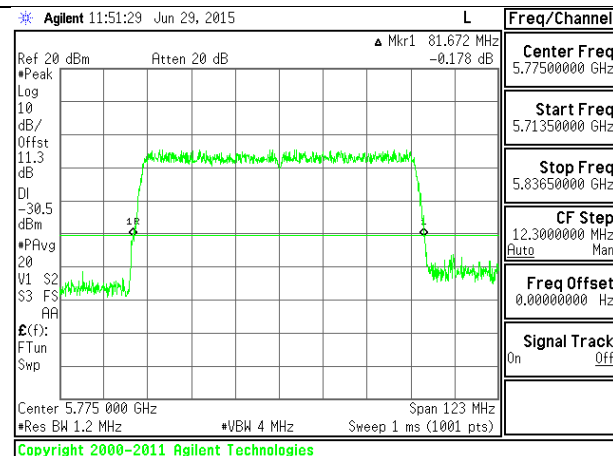
11n HT40 Mid Ch



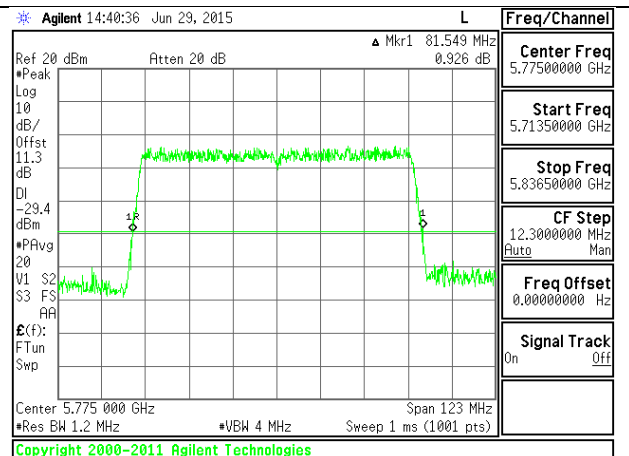
11n HT40 Mid Ch



11ac HT80 Mid Ch



11ac HT80 Mid Ch



11.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

11.3.1. 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	17.7	17.7
Mid	5200	17.7	17.7
High	5240	17.7	17.7

11.3.2. 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	36.1	36.2
High	5230	36.2	36.2

11.3.3. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5210	75.9	76.0

11.3.4. 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	17.8	17.8
Mid	5300	17.8	17.7
High	5320	17.7	17.7

11.3.5. 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	36.1	36.1
High	5310	36.1	39.2

11.3.6. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5290	76.1	112.6

11.3.7. 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	17.7	17.7
Mid	5580	17.9	17.7
High	5700	17.7	17.7

11.3.8. 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	36.1	36.1
Mid	5550	36.3	36.2
High	5670	36.2	36.1

11.3.9. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5530	82.2	76.1

11.3.10. 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	17.7	17.7
Mid	5785	17.7	17.7
High	5825	17.7	17.7

11.3.11. 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	36.2	39.4
High	5795	39.4	36.1

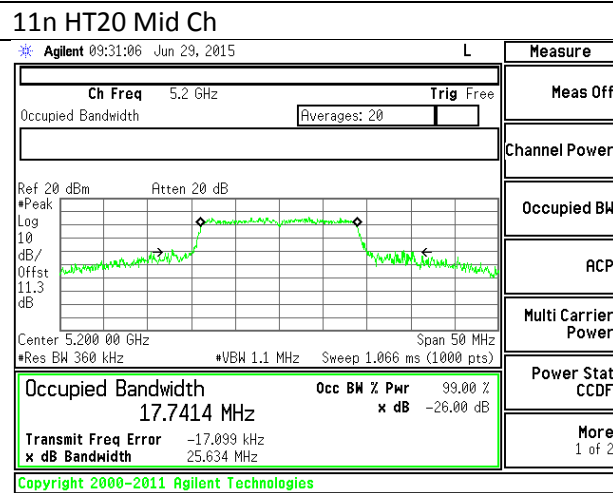
11.3.12. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5775	76.1	76.3

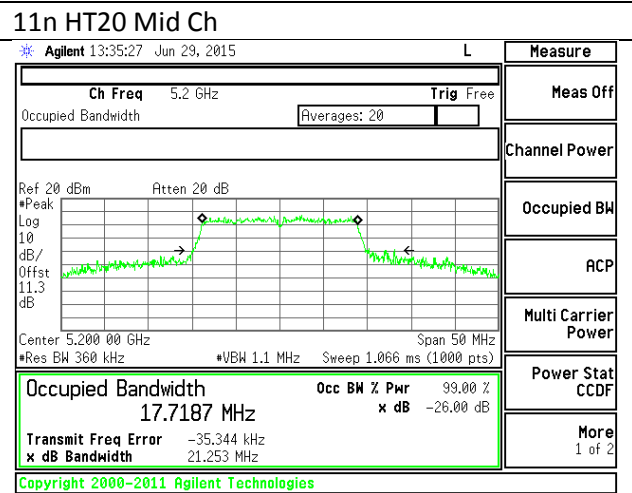
11.3.1. 99% BANDWIDTH PLOTS

5.2 GHz

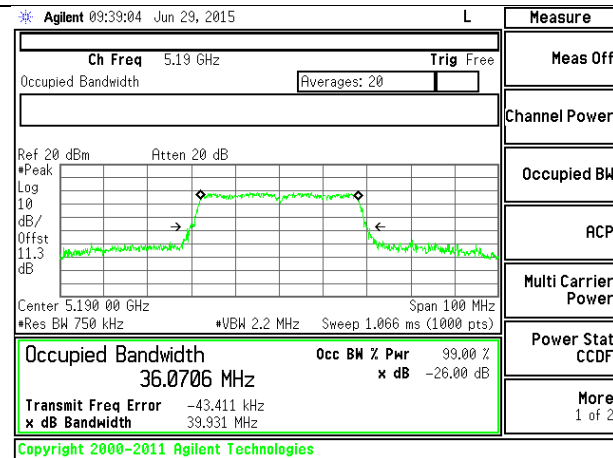
CHAIN 0



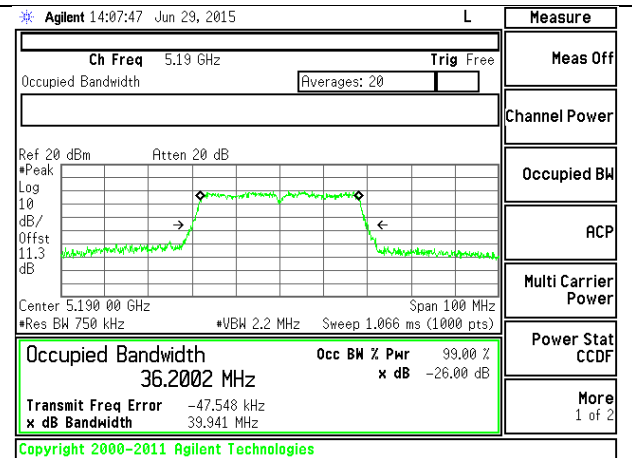
CHAIN 1



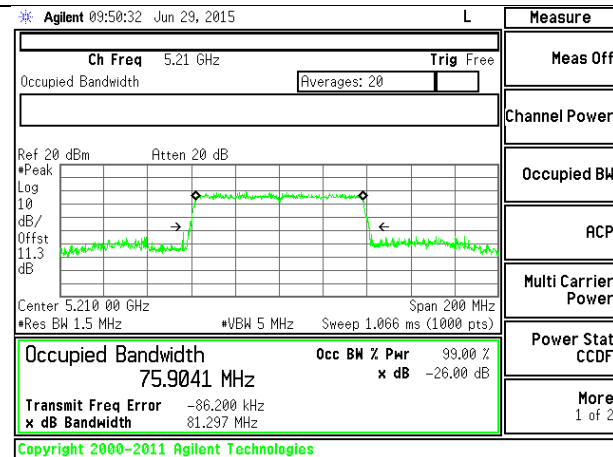
11n HT40 Mid Ch



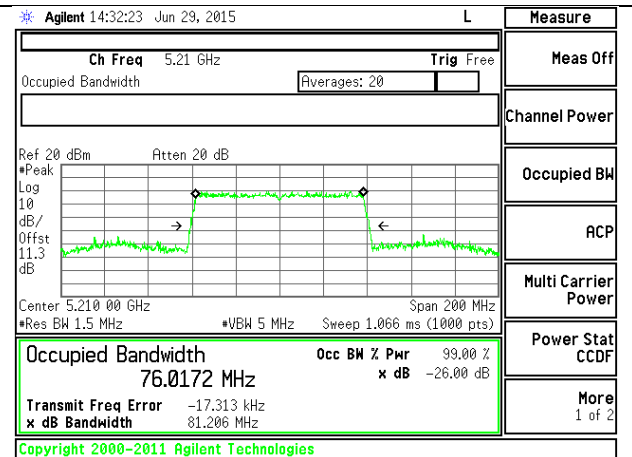
11n HT40 Mid Ch



11ac HT80 Mid Ch



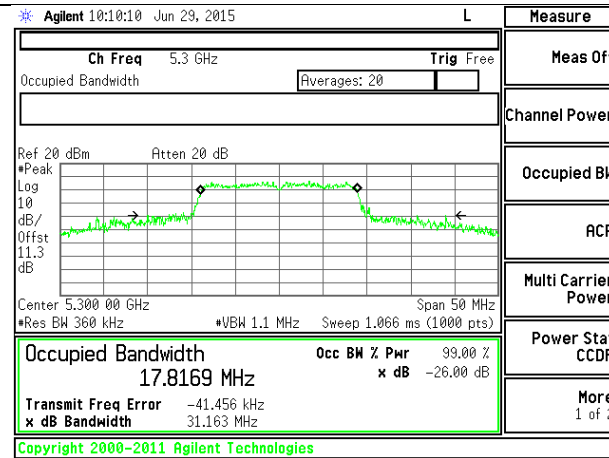
11ac HT80 Mid Ch



5.3 GHz

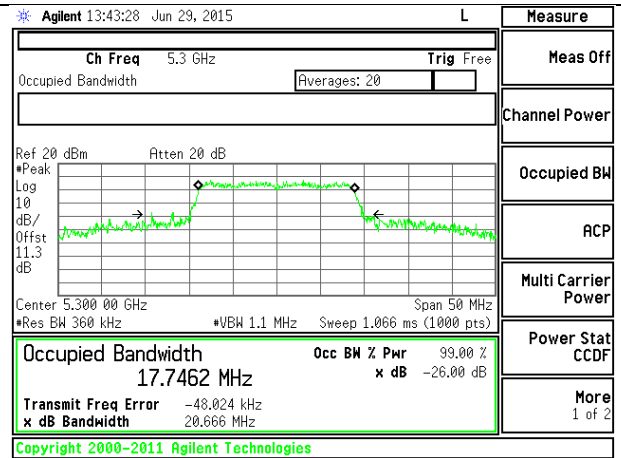
CHAIN 0

11n HT20 Mid Ch

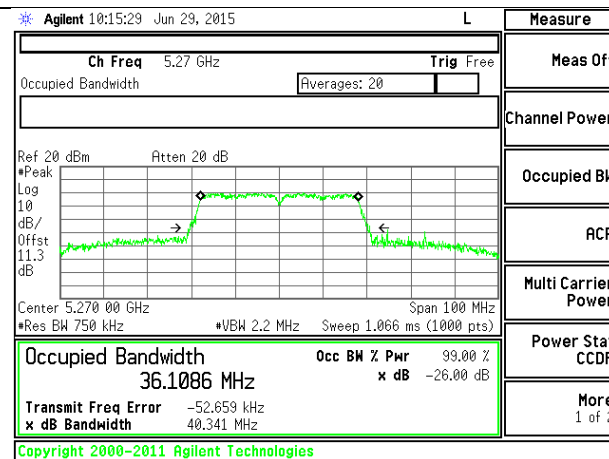


CHAIN 1

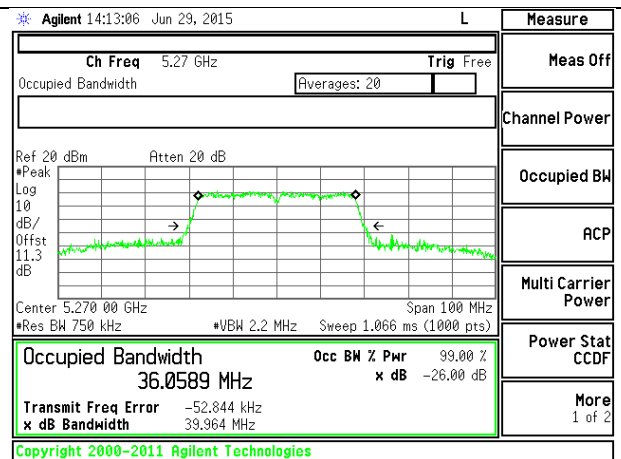
11n HT20 Mid Ch



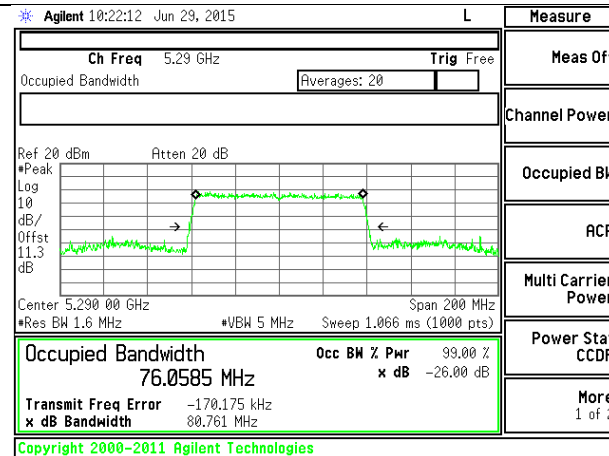
11n HT40 Mid Ch



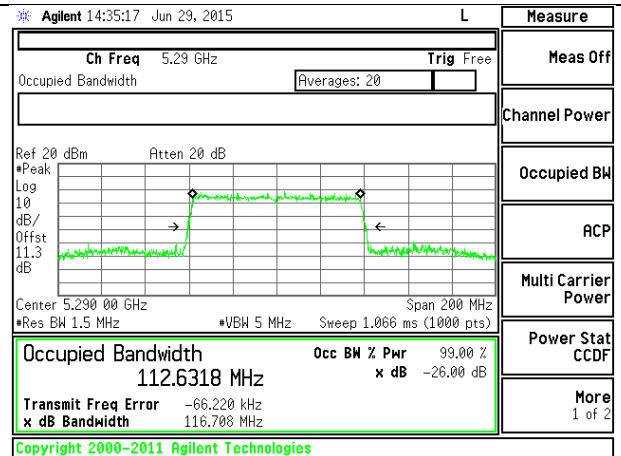
11n HT40 Mid Ch



11ac HT80 Mid Ch



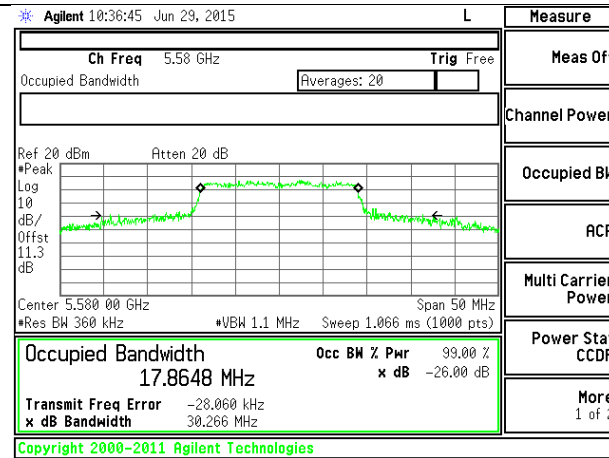
11ac HT80 Mid Ch



5.5 GHz

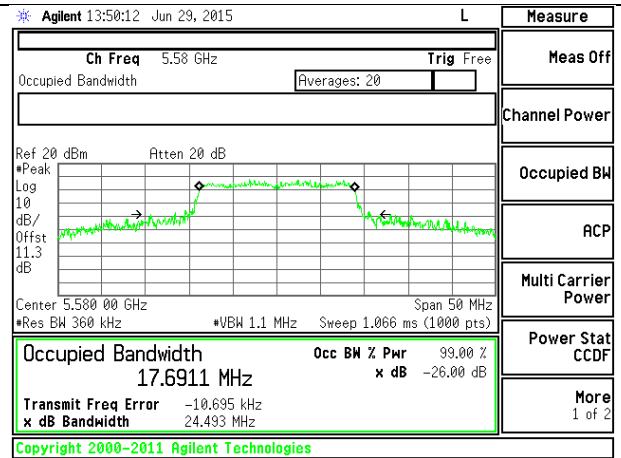
CHAIN 0

11n HT20 Mid Ch

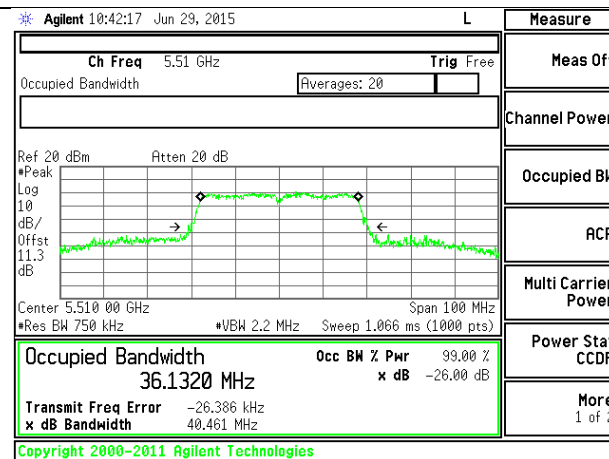


CHAIN 1

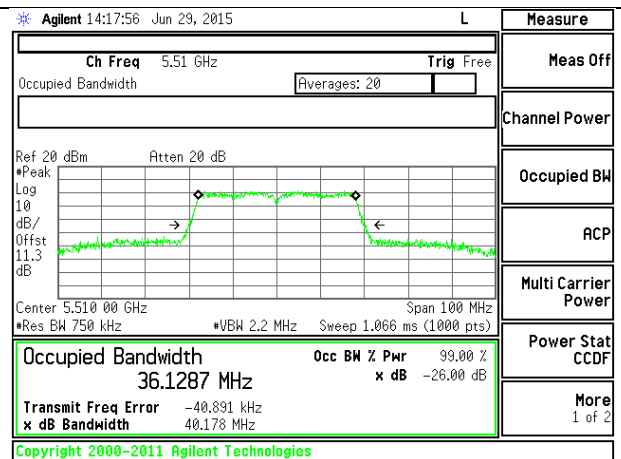
11n HT20 Mid Ch



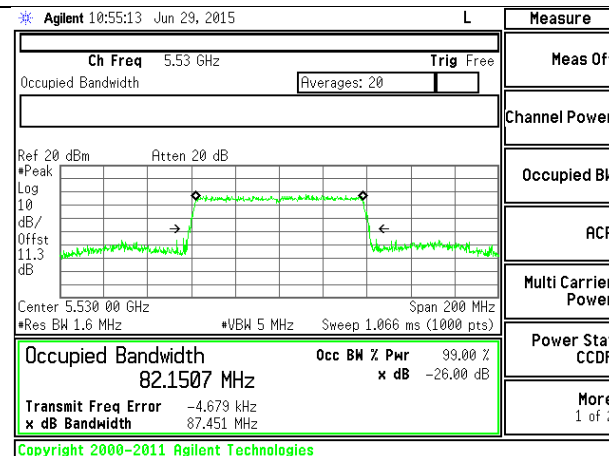
11n HT40 Mid Ch



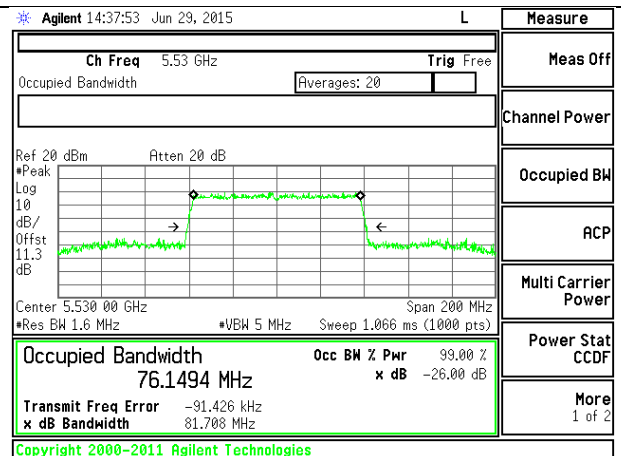
11n HT40 Mid Ch



11ac HT80 Mid Ch



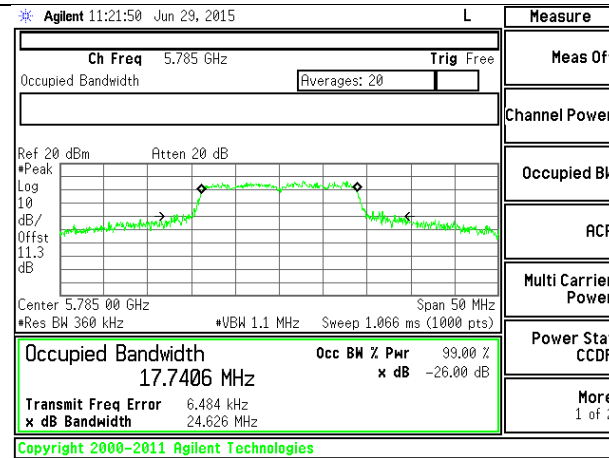
11ac HT80 Mid Ch



5.8 GHz

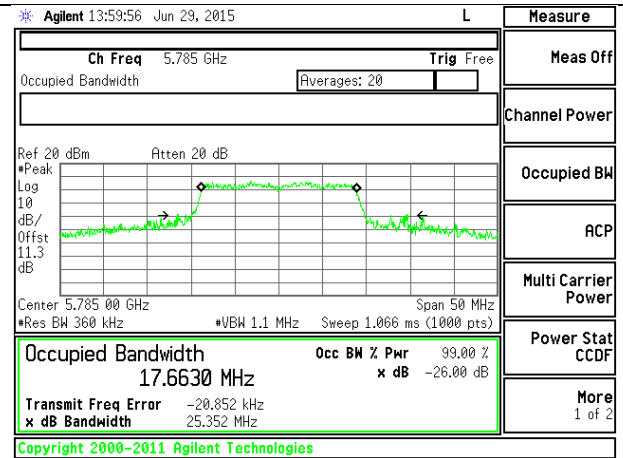
CHAIN 0

11n HT20 Mid Ch

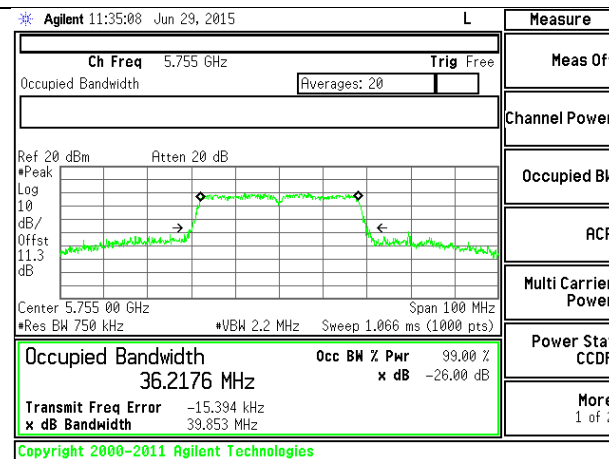


CHAIN 1

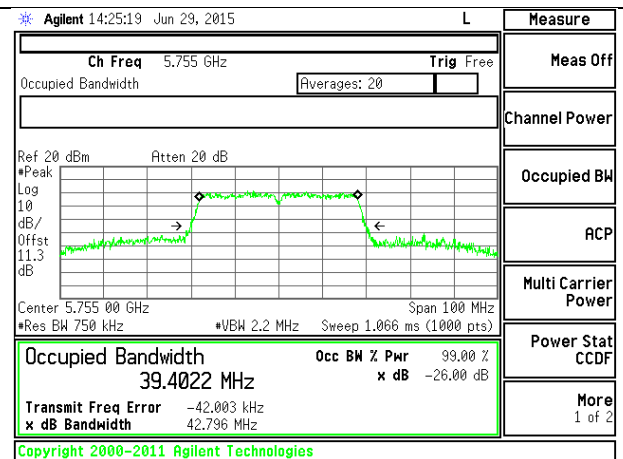
11n HT20 Mid Ch



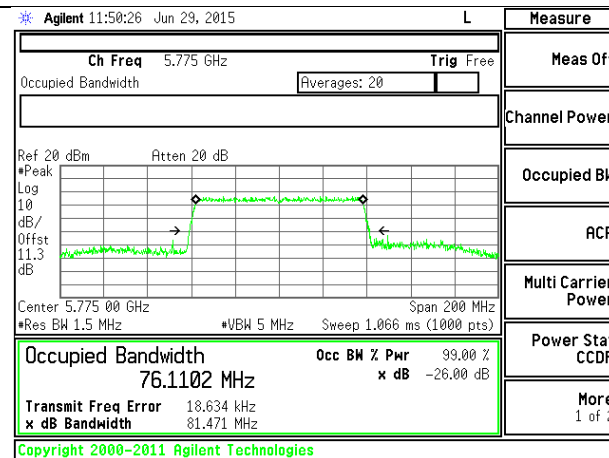
11n HT40 Mid Ch



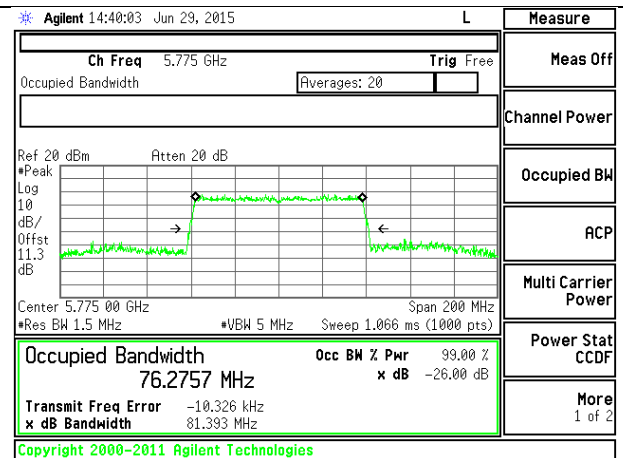
11n HT40 Mid Ch



11ac HT80 Mid Ch



11ac HT80 Mid Ch



11.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

11.4.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5180	13.20	13.50	16.36
Mid	5200	13.80	14.20	17.01
High	5240	13.80	14.20	17.01

11.4.2. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5190	6.80	7.10	9.96
High	5230	6.80	6.70	9.76

11.4.3. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5210	6.10	6.20	9.16

11.4.4. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5260	14.00	14.20	17.11
Mid	5300	14.50	14.50	17.51
High	5320	12.90	13.00	15.96

11.4.5. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5270	8.60	8.60	11.61
High	5310	9.10	8.90	12.01

11.4.6. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5290	5.20	5.00	8.11

11.4.7. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5500	12.70	12.70	15.71
Mid	5580	15.30	14.70	18.02
High	5700	9.10	9.70	12.42

11.4.8. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5510	8.20	8.70	11.47
Mid	5550	14.60	14.60	17.61
High	5670	11.70	11.50	14.61

11.4.9. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5530	5.90	6.20	9.06

11.4.10. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5745	12.70	12.80	15.76
Mid	5785	14.20	14.50	17.36
High	5825	11.90	11.70	14.81

11.4.11. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5755	8.20	8.90	11.57
High	5795	13.40	13.30	16.36

11.4.12. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5775	4.30	5.10	7.73

11.5. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1) (2) (3)

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

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.

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.

RSS-247

Band 5150-5250 MHz:

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, 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 $11 + 10 \log_{10} B$, 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 $17 + 10 \log_{10} B$, 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 $11 + 10 \log_{10} B$, 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 $17 + 10 \log_{10} B$, 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-multipoint [Footnote3](#) systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.30	3.90	4.10

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
4.30	3.90	7.11

Test Methodology

RESULTS

11.5.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5180	19.80	17.7000	4.10	7.11
Mid	5200	20.80	17.7000	4.10	7.11
High	5240	19.90	17.7000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	23.97	22.48	18.38	18.38	9.89	10.00	2.89
Mid	5200	24.00	22.48	18.38	18.38	9.89	10.00	2.89
High	5240	23.99	22.48	18.38	18.38	9.89	10.00	2.89

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD
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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	11.03	10.75	13.90	18.38	-4.48
Mid	5200	9.10	11.83	13.69	18.38	-4.69
High	5240	8.82	11.83	13.59	18.38	-4.79

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.27	-0.52	2.62	2.89	-0.27
Mid	5200	-2.13	0.49	2.38	2.89	-0.51
High	5240	-2.53	0.56	2.30	2.89	-0.59

11.5.2. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5190	40.20	36.1000	4.10	7.11
High	5230	40.10	36.2000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	24.00	23.00	18.90	18.90	9.89	10.00	2.89
High	5230	24.00	23.00	18.90	18.90	9.89	10.00	2.89

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PPSD
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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	6.21	6.62	10.23	18.90	-8.67
High	5230	6.37	6.22	10.11	18.90	-8.79

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-7.99	-7.72	-4.04	2.89	-6.93
High	5230	-7.92	-8.10	-4.20	2.89	-7.09

11.5.3. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5210	81.10	75.9000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5210	24.00	23.00	18.90	18.90	9.89	10.00	2.89

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PPSD
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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	5210	5.04	3.98	8.57	18.90	-10.33

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5210	-13.07	-12.52	-8.76	2.89	-11.65

11.5.2. 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 PPSP (dBi)
Low	5260	22.40	17.8000	4.10	7.11
Mid	5300	23.90	17.7000	4.10	7.11
High	5320	19.70	17.7000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSP Limit (dBm)	IC PSD Limit (dBm)	PPSP Limit (dBm)
Low	5260	24.00	23.50	29.50	23.50	9.89	11.00	9.89
Mid	5300	24.00	23.48	29.48	23.48	9.89	11.00	9.89
High	5320	23.94	23.48	29.48	23.48	9.89	11.00	9.89

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSP
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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	14.57	14.82	17.70	23.50	-5.80
Mid	5300	14.75	15.04	17.91	23.48	-5.57
High	5320	13.22	13.42	16.33	23.48	-7.15

PPSP Results

Channel	Frequency (MHz)	Chain 0 Meas PPSP (dBm)	Chain 1 Meas PPSP (dBm)	Total Corr'd PPSP (dBm)	PPSP Limit (dBm)	PPSP Margin (dB)
Low	5260	3.15	3.45	6.31	9.89	-3.58
Mid	5300	3.35	3.67	6.52	9.89	-3.37
High	5320	1.87	2.04	4.97	9.89	-4.92

11.5.3. 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 PPSD (dBi)
Low	5270	40.10	36.1000	4.10	7.11
High	5310	39.70	36.1000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	9.89	11.00	9.89
High	5310	24.00	24.00	30.00	24.00	9.89	11.00	9.89

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PPSD
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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	7.76	8.16	11.77	24.00	-12.23
High	5310	8.80	8.43	12.43	24.00	-11.57

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-6.22	-6.10	-2.35	9.89	-12.24
High	5310	-5.41	-5.88	-1.83	9.89	-11.72

11.5.4. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSP (dBi)
Low	5290	81.00	76.1000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSP Limit (dBm)	IC PSD Limit (dBm)	PPSP Limit (dBm)
Low	5290	24.00	24.00	30.00	24.00	9.89	11.00	9.89

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PPSP
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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	5290	4.52	0.89	7.10	24.00	-16.90

PPSP Results

Channel	Frequency (MHz)	Chain 0 Meas PPSP (dBm)	Chain 1 Meas PPSP (dBm)	Total Corr'd PPSP (dBm)	PPSP Limit (dBm)	PPSP Margin (dB)
Low	5290	-13.21	-17.08	-10.70	9.89	-20.59

11.5.6. 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 PPSD (dBi)
Low	5500	19.90	17.7000	4.10	7.11
Mid	5580	25.70	17.7000	4.10	7.11
High	5700	19.80	17.7000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	23.99	23.48	29.48	23.48	9.89	11.00	9.89
Mid	5580	24.00	23.48	29.48	23.48	9.89	11.00	9.89
High	5700	23.97	23.48	29.48	23.48	9.89	11.00	9.89

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD
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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	13.51	13.86	16.70	23.48	-6.78
Mid	5580	15.62	15.45	18.55	23.48	-4.93
High	5700	9.31	10.03	12.69	23.48	-10.79

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	2.22	2.50	5.37	9.89	-4.52
Mid	5580	4.31	4.05	7.19	9.89	-2.70
High	5700	-2.07	-1.32	1.33	9.89	-8.56

11.5.7. 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 PPSD (dBi)
Low	5510	39.80	36.1000	4.10	7.11
Mid	5550	44.40	36.2000	4.10	7.11
High	5670	40.20	36.1000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	9.89	11.00	9.89
Mid	5550	24.00	24.00	30.00	24.00	9.89	11.00	9.89
High	5670	24.00	24.00	30.00	24.00	9.89	11.00	9.89

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PPSD
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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	7.57	8.62	11.94	24.00	-12.06
Mid	5550	14.67	14.45	18.37	24.00	-5.63
High	5670	11.90	11.57	15.54	24.00	-8.46

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-6.77	-5.49	-2.27	9.89	-12.16
Mid	5550	0.36	0.40	4.19	9.89	-5.70
High	5670	-2.17	-2.72	1.37	9.89	-8.52

11.5.8. 802.11ac HT80 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5530	81.40	76.1000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	24.00	24.00	30.00	24.00	9.89	11.00	9.89

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PPSD
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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	3.95	4.61	8.32	24.00	-15.68

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-14.19	-12.98	-9.51	9.89	-19.40

11.5.10. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5745	19.70	17.7000	4.10	7.11
Mid	5785	20.00	17.7000	4.10	7.11
High	5825	19.80	17.7000	4.10	7.11

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	29.94	29.48	35.48	29.48	28.89	17.00	17.00
Mid	5785	30.00	29.48	35.48	29.48	28.89	17.00	17.00
High	5825	29.97	29.48	35.48	29.48	28.89	17.00	17.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD
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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	13.03	13.64	16.36	29.48	-13.12
Mid	5785	14.63	14.47	17.56	29.48	-11.92
High	5825	12.41	12.23	15.33	29.48	-14.15

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	-1.05	-0.48	2.26	17.00	-14.74
Mid	5785	0.43	0.39	3.42	17.00	-13.58
High	5825	-1.67	-1.89	1.23	17.00	-15.77

11.5.11. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5755	40.0	36.2000	4.10	7.11
High	5795	40.5	36.1000	4.10	7.11

Limits

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

Duty Cycle CF (dB)	0.80	Included in Calculations of Corr'd Power & PPSD
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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	7.23	7.85	11.36	30.00	-18.64
High	5795	12.54	13.24	16.71	30.00	-13.29

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5755	-9.68	-8.93	-5.48	17.00	-22.48
High	5795	-3.98	-3.43	0.11	17.00	-16.89

11.5.12. 802.11ac HT80 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5775	81.50	76.1000	4.10	7.11

Limits

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

Duty Cycle CF (dB)	1.02	Included in Calculations of Corr'd Power & PPSD
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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	5775	2.88	3.40	7.18	30.00	-22.82

PPSD Results

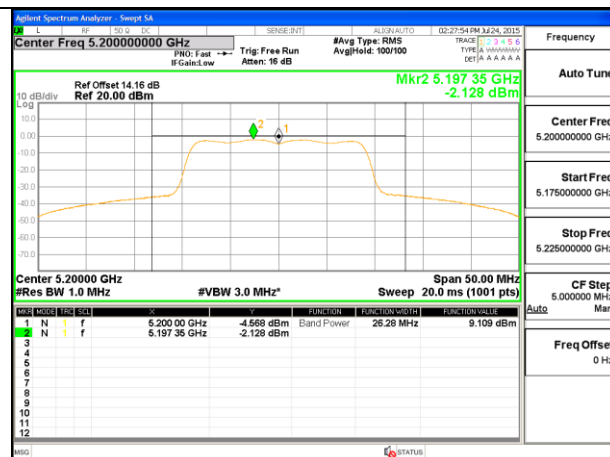
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5775	-17.57	-16.93	-13.21	17.00	-30.21

11.5.13. OUTPUT POWER AND PPSD PLOTS

5.2 GHz

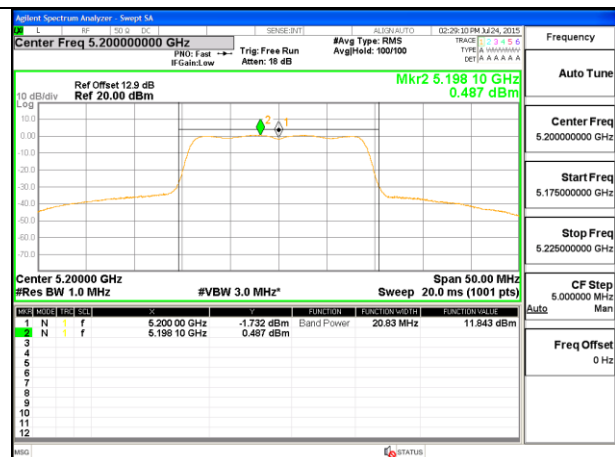
CHAIN 0

11n HT20 Mid Ch

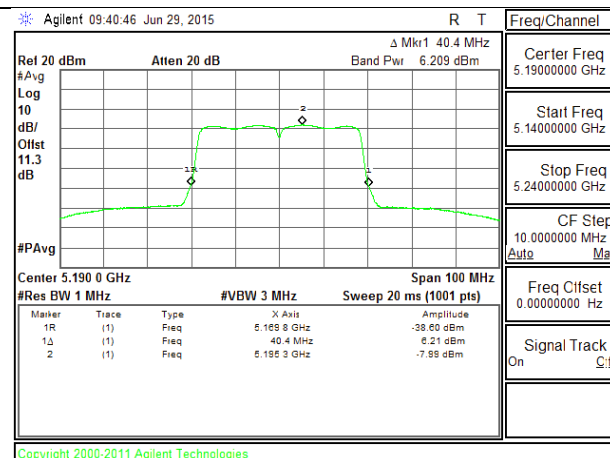


CHAIN 1

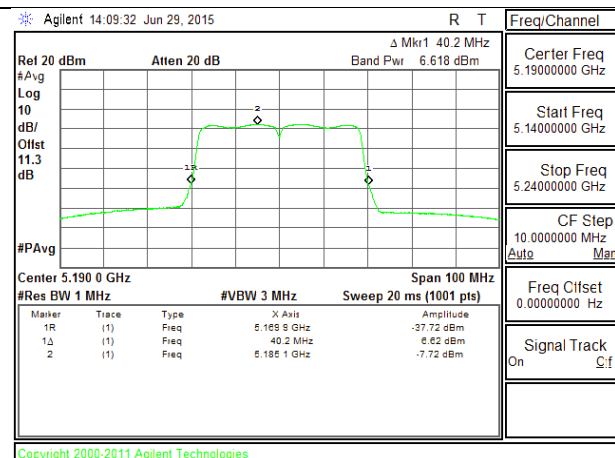
11n HT20 Mid Ch



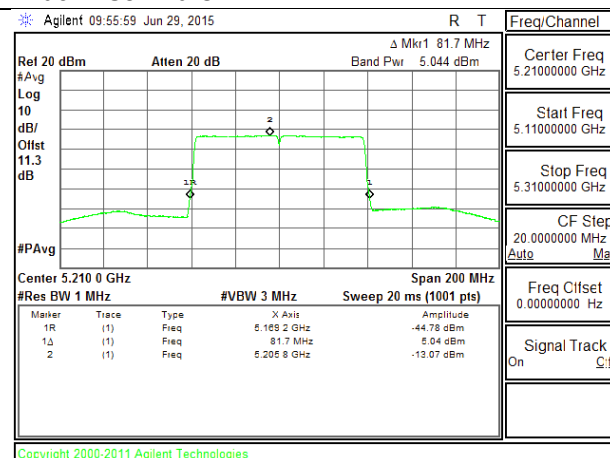
11n HT40 Mid Ch



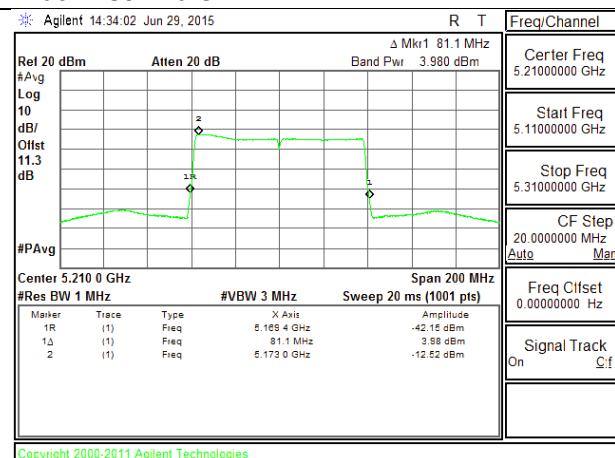
11n HT40 Mid Ch



11ac HT80 Mid Ch



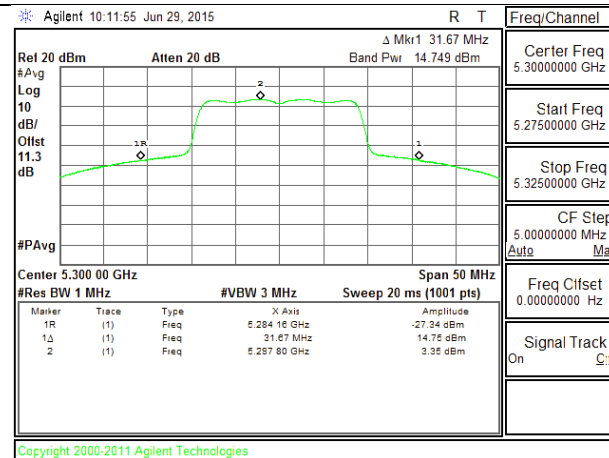
11ac HT80 Mid Ch



5.3 GHz

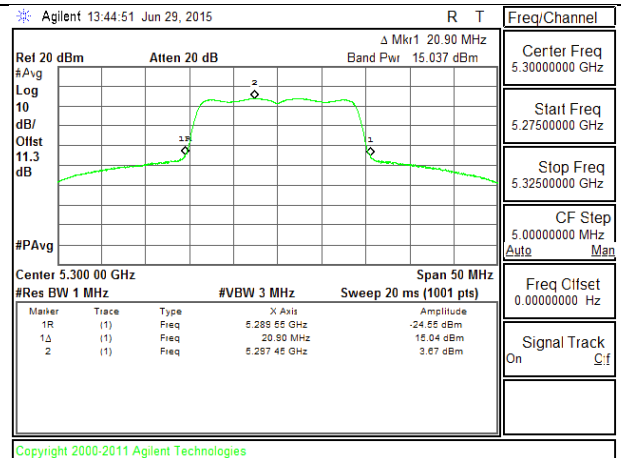
CHAIN 0

11n HT20 Mid Ch

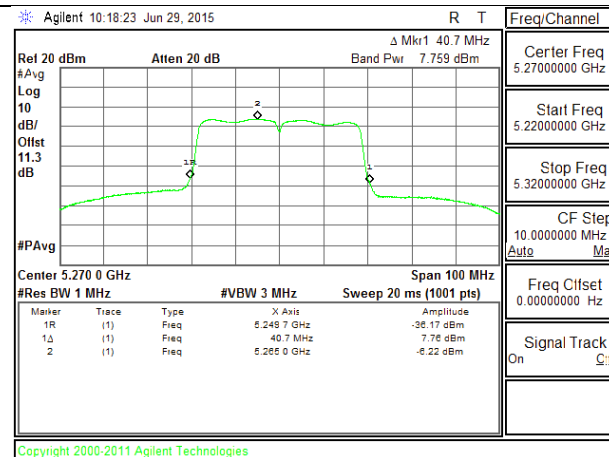


CHAIN 1

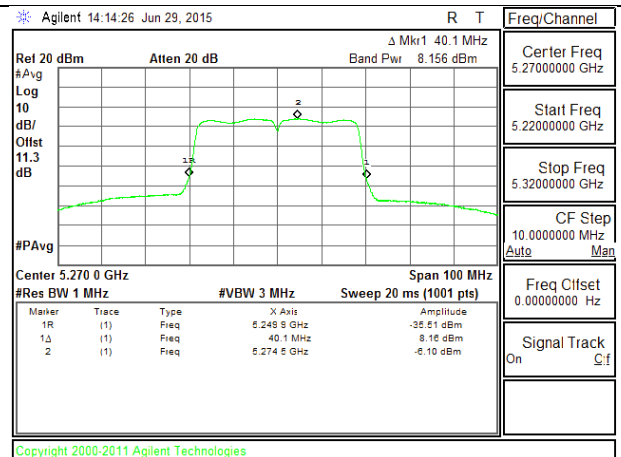
11n HT20 Mid Ch



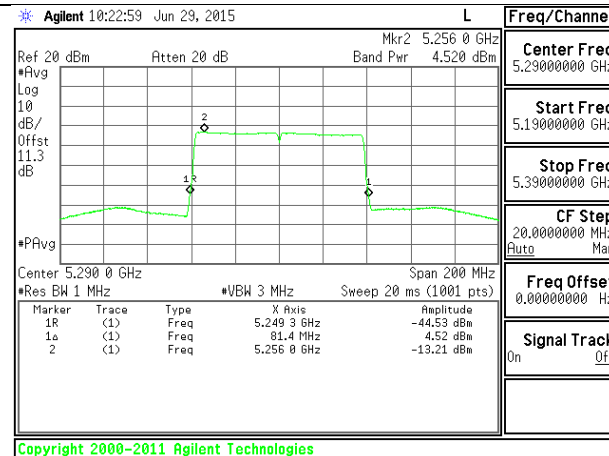
11n HT40 Mid Ch



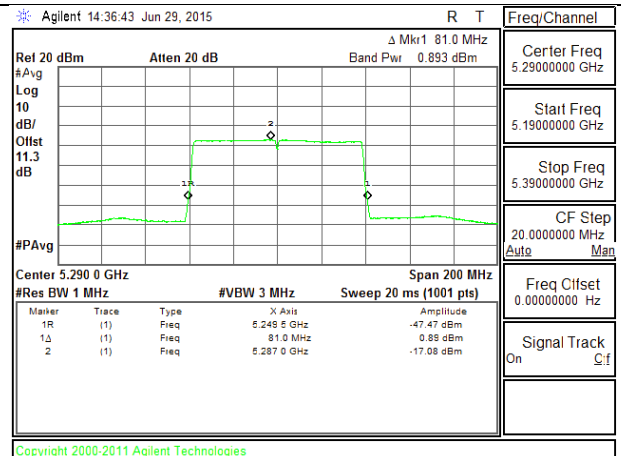
11n HT40 Mid Ch



11ac HT80 Mid Ch



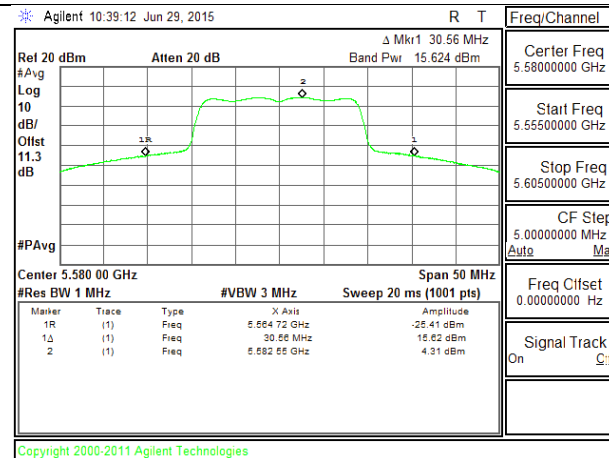
11ac HT80 Mid Ch



5.5 GHz

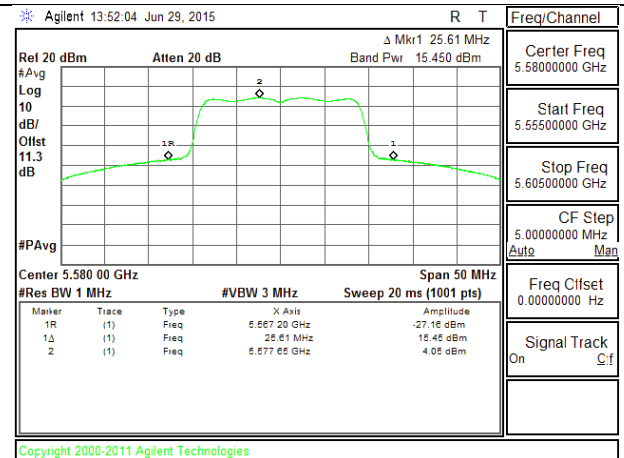
CHAIN 0

11n HT20 Mid Ch

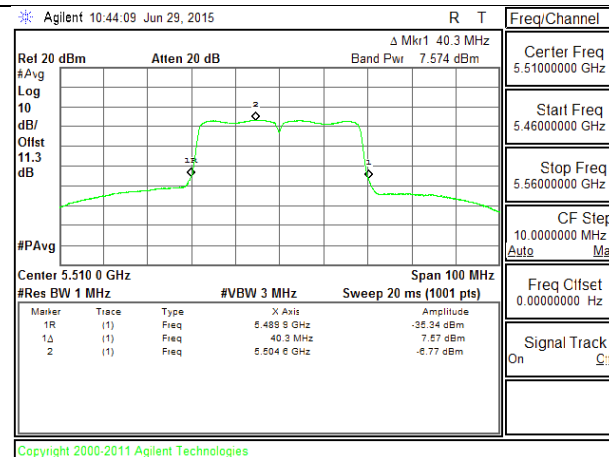


CHAIN 1

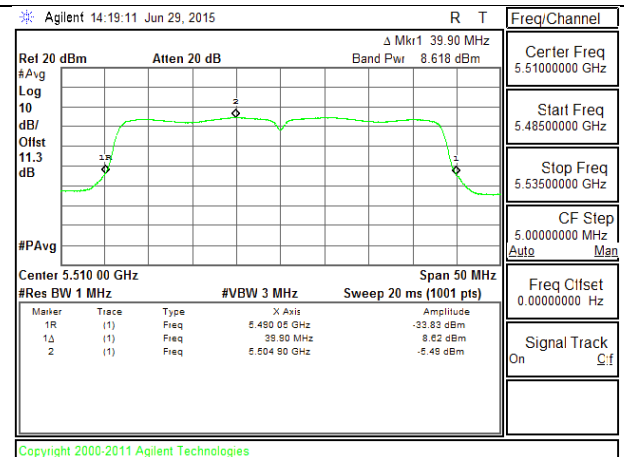
11n HT20 Mid Ch



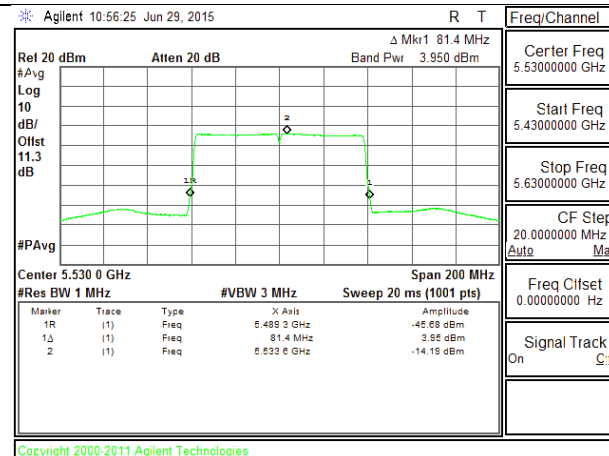
11n HT40 Mid Ch



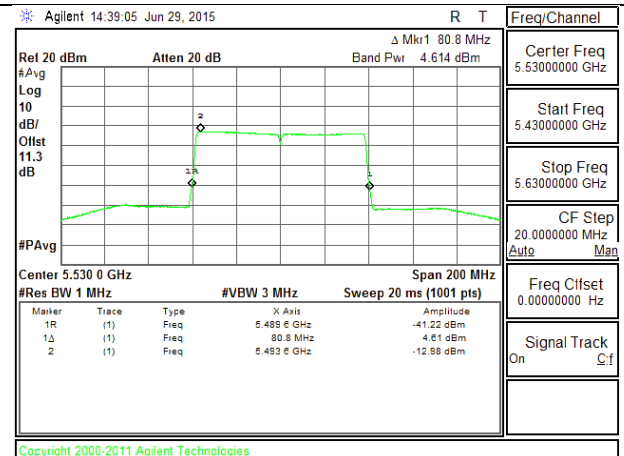
11n HT40 Mid Ch



11ac HT80 Mid Ch



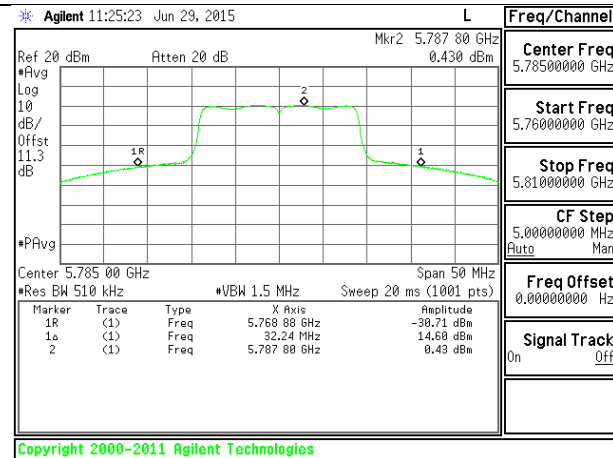
11ac HT80 Mid Ch



5.8 GHz

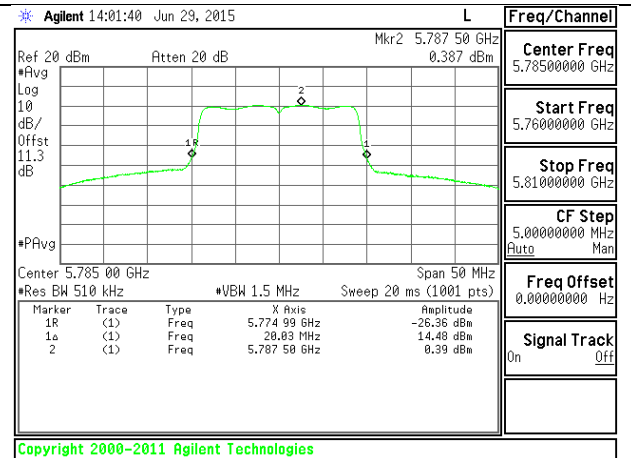
CHAIN 0

11n HT20 Mid Ch

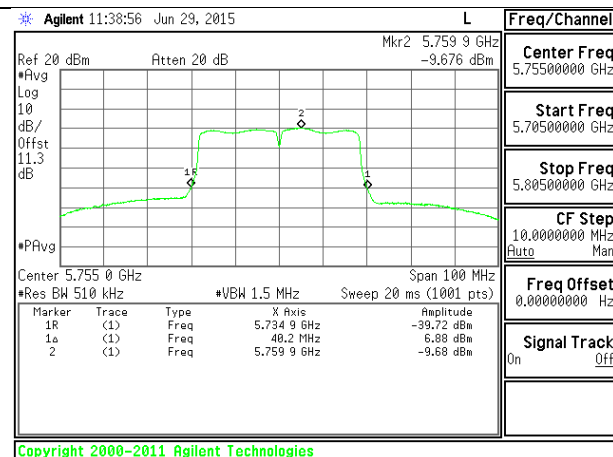


CHAIN 1

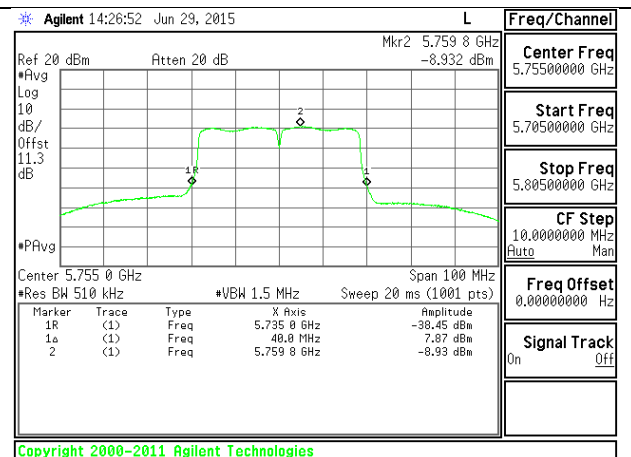
11n HT20 Mid Ch



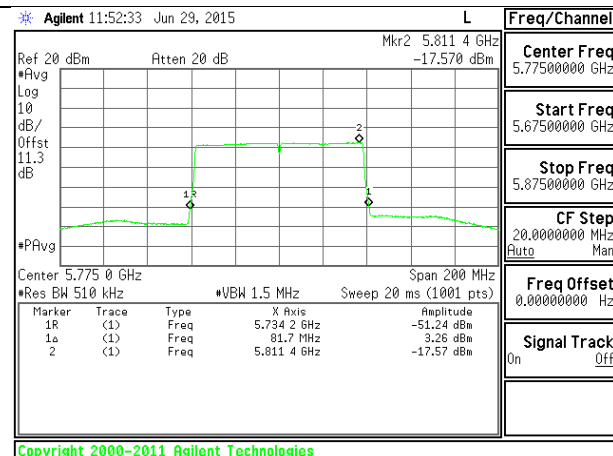
11n HT40 Mid Ch



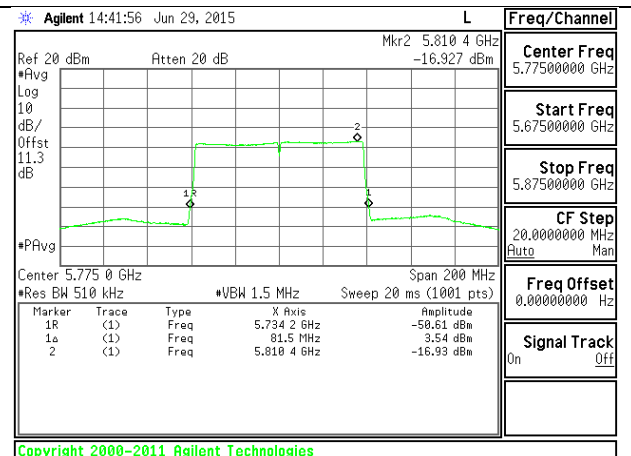
11n HT40 Mid Ch



11ac HT80 Mid Ch



11ac HT80 Mid Ch



12. TRANSMITTER ABOVE 1 GHz SISO (Chain 0)

LIMITS

FCC §15.205 and §15.209

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150cm 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 G) 6) d) Method AD:

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

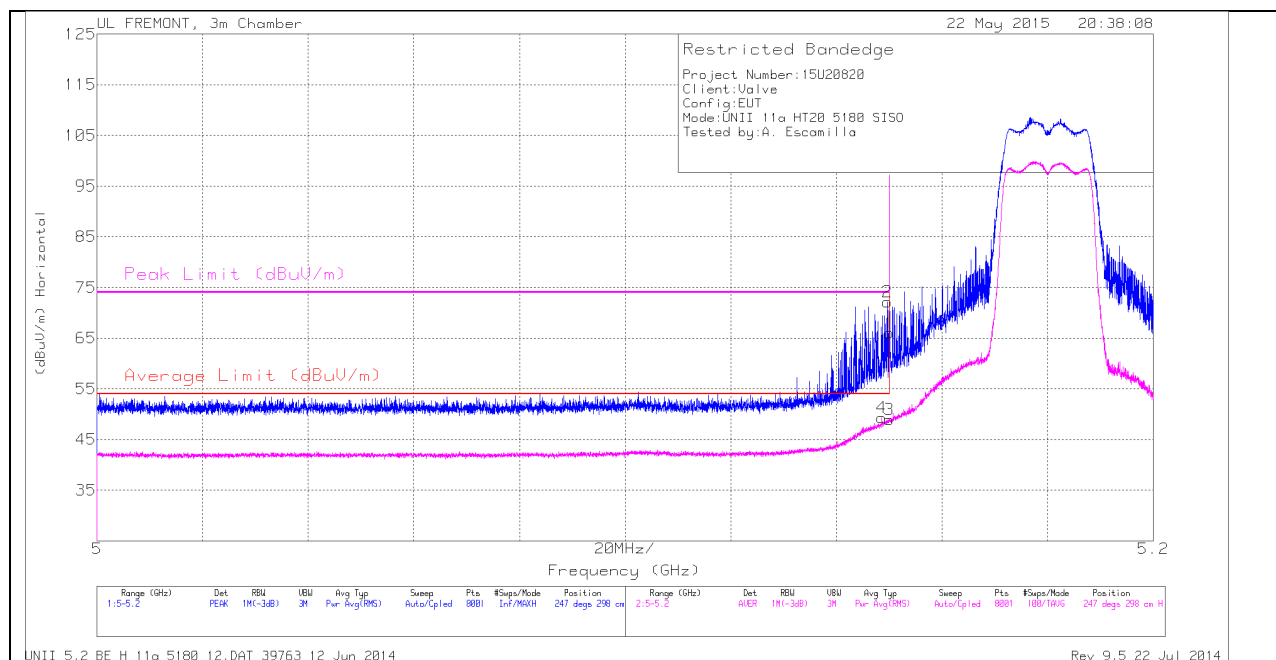
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

12.1. 5.2 GHz

12.1.1. 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 T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	5.149	36.74	RMS	34.2	-21.6	49.34	54	-4.66	-	-	247	298	H
1	5.15	53.49	PK	34.2	-21.6	66.09	-	-	74	-7.91	247	298	H
2	5.15	59.53	PK	34.2	-21.6	72.13	-	-	74	-1.87	247	298	H
3	5.15	36.33	RMS	34.2	-21.6	48.93	54	-5.07	-	-	247	298	H

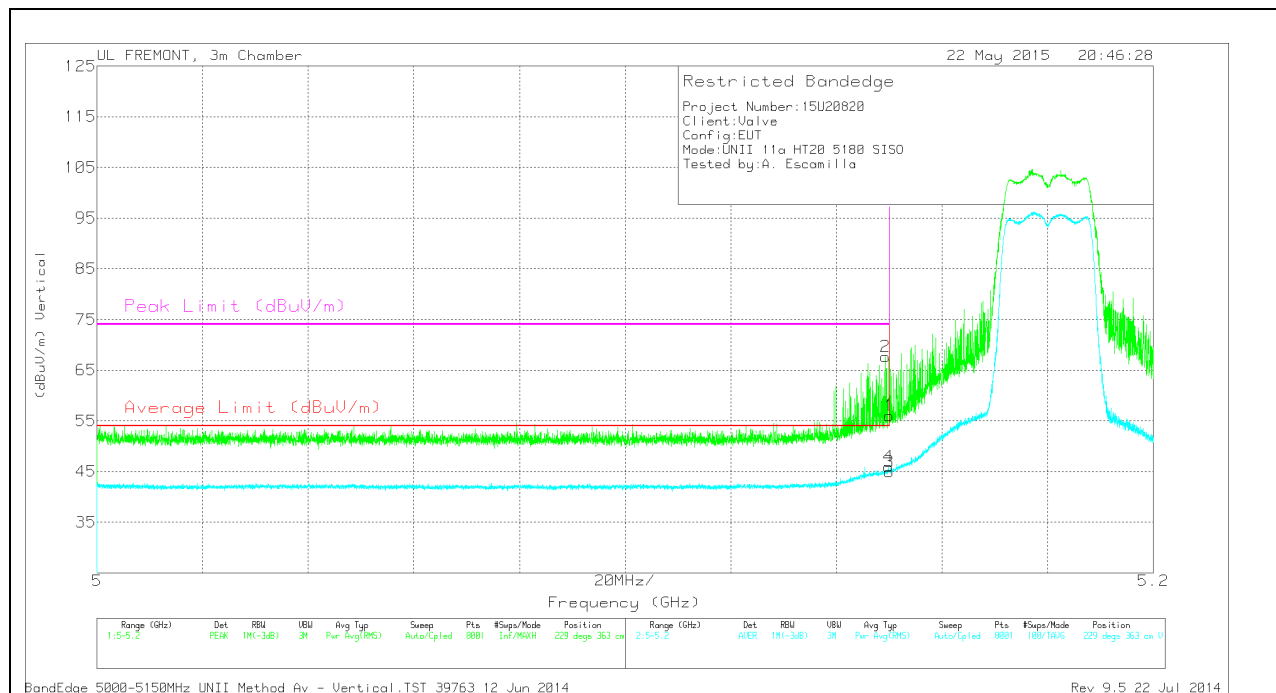
PK - Peak detector

RMS - RMS detection

UNII_5.2_BE_H_11a_5180_12.DAT 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.149	55.13	PK	34.2	-21.6	67.73	-	-	74	-6.27	229	363	V
1	5.15	43.46	PK	34.2	-21.6	56.06	-	-	74	-17.94	229	363	V
3	5.15	32.31	RMS	34.2	-21.6	44.91	54	-9.09	-	-	229	363	V
4	5.15	33.33	RMS	34.2	-21.6	45.93	54	-8.07	-	-	229	363	V

PK - Peak detector

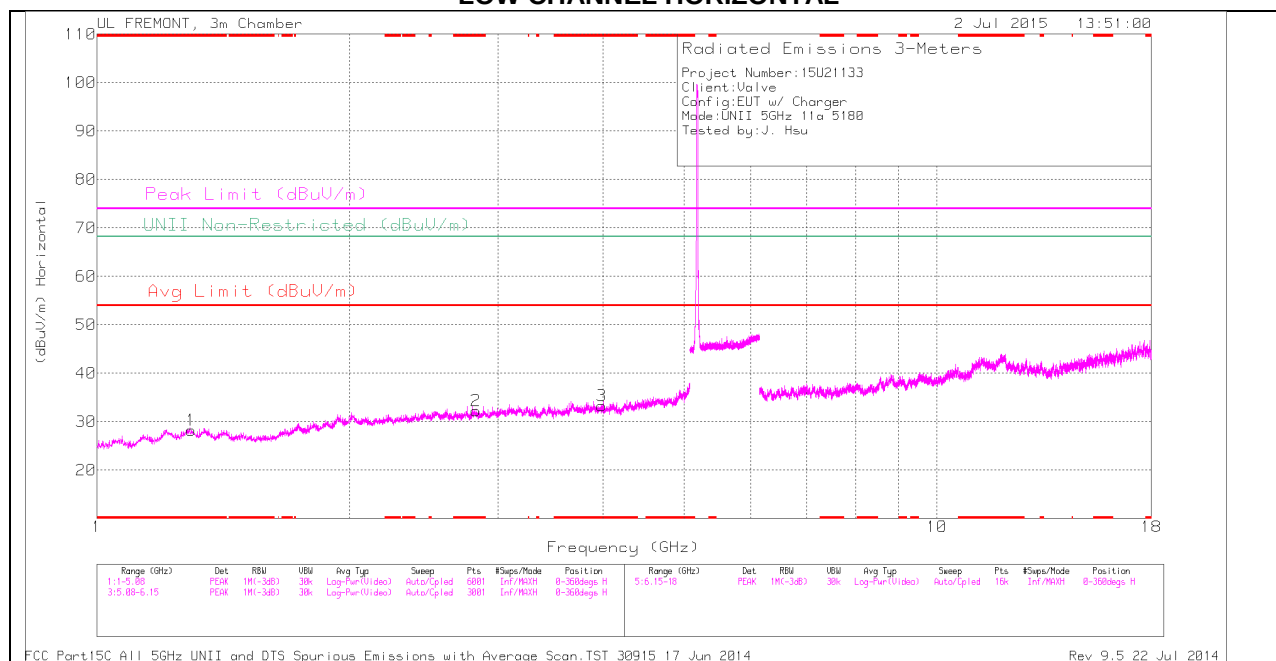
RMS - RMS detection

BandEdge 5000-5150MHz UNII Method Av - Vertical.TST 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

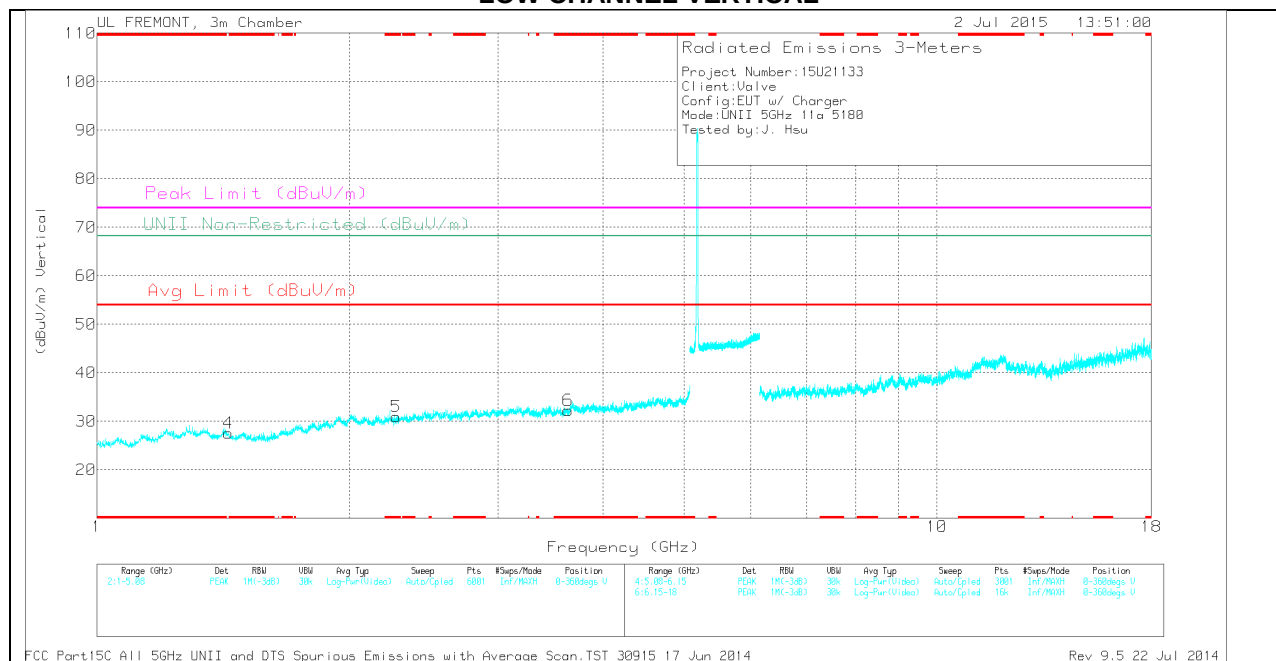
HARMONICS AND SPURIOUS EMISSIONS

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.

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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.295	31.44	PK	29.8	-33	0	28.24	-	-	74	-45.76	-	-	0-360	200	H
2	* 2.825	31.31	PK	32.6	-31.7	0	32.21	-	-	74	-41.79	-	-	0-360	200	H
3	* 3.99	30.98	PK	33.2	-30.9	0	33.28	-	-	74	-40.72	-	-	0-360	100	H
5	* 2.269	30.86	PK	31.6	-31.5	0	30.96	-	-	74	-43.04	-	-	0-360	100	V
6	* 3.638	29.81	PK	32.9	-30.5	0	32.21	-	-	74	-41.79	-	-	0-360	100	V
4	1.434	31.28	PK	28.4	-32.1	0	27.58	-	-	-	-	68.2	-40.62	0-360	200	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.294	41.38	PK1	29.8	-33	0	38.18	-	-	74	-35.82	-	-	360	100	H
* 1.297	29.6	AD1	29.9	-33	.1	26.6	54	-27.4	-	-	-	-	360	100	H
* 2.825	40.7	PK1	32.6	-31.7	0	41.6	-	-	74	-32.4	-	-	360	100	H
* 2.825	29.29	AD1	32.6	-31.7	.1	30.29	54	-23.71	-	-	-	-	360	100	H
* 3.988	40.39	PK1	33.2	-30.9	0	42.69	-	-	74	-31.31	-	-	360	100	H
* 3.989	29.08	AD1	33.2	-30.9	.1	31.48	54	-22.52	-	-	-	-	360	100	H
* 2.271	40.58	PK1	31.6	-31.5	0	40.68	-	-	74	-33.32	-	-	360	100	V
* 2.27	29.1	AD1	31.6	-31.5	.1	29.3	54	-24.7	-	-	-	-	360	100	V
* 3.636	40.21	PK1	32.9	-30.5	0	42.61	-	-	74	-31.39	-	-	360	100	V
* 3.636	28.09	AD1	32.9	-30.5	.1	30.59	54	-23.41	-	-	-	-	360	100	V
1.434	40.8	PK1	28.4	-32.1	0	37.1	-	-	-	-	68.2	-31.1	360	100	V
1.434	29.49	AD1	28.4	-32.1	.1	25.89	-	-	-	-	-	-	360	100	V

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

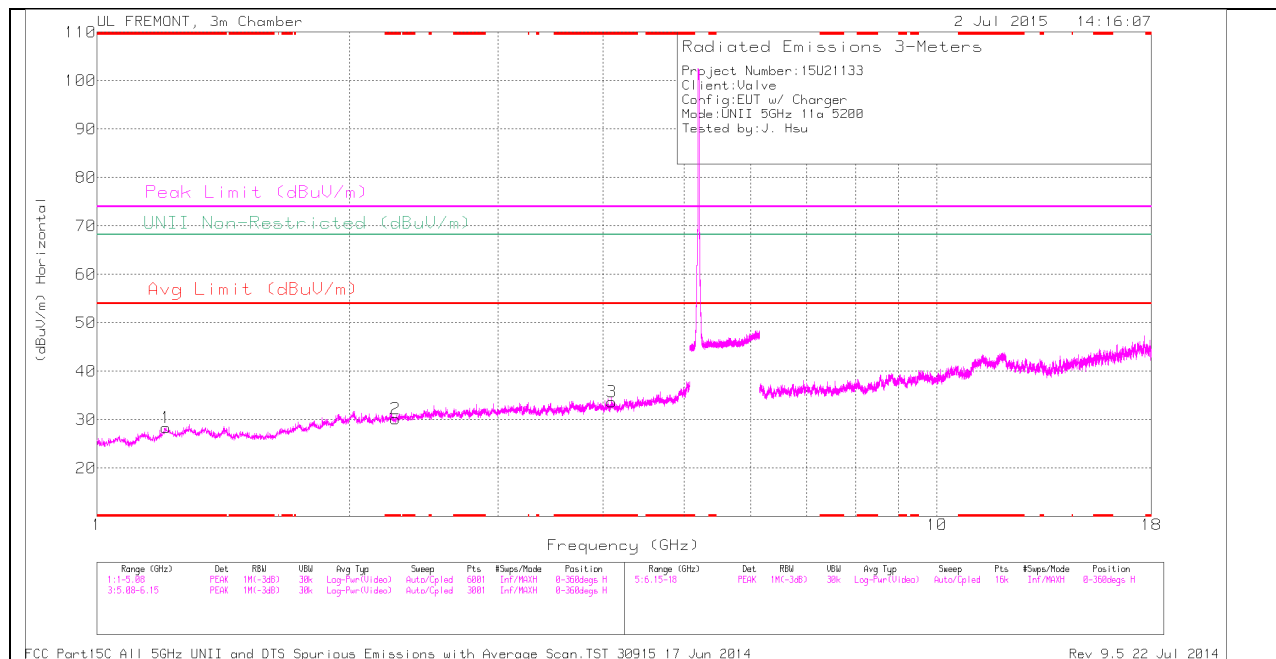
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

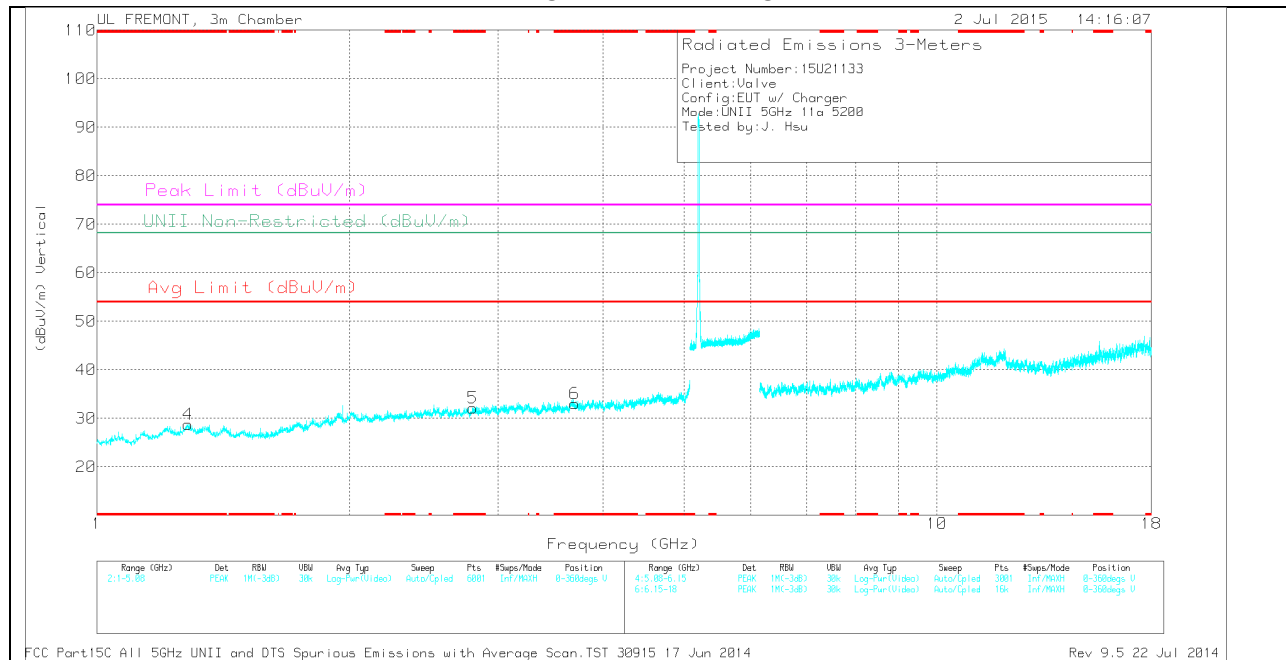
Rev 9.5 22 Jul 2014

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.

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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cb/ Ftr/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	* 1.209	32.08	PK	29	-32.7	0	28.38	-	-	74	-45.62	-	-	0-360	100	H
2	* 2.268	30.12	PK	31.6	-31.5	0	30.22	-	-	74	-43.78	-	-	0-360	200	H
3	* 4.103	30.53	PK	33.3	-30.2	0	33.63	-	-	74	-40.37	-	-	0-360	100	H
4	* 1.284	32.04	PK	29.7	-33	0	28.74	-	-	74	-45.26	-	-	0-360	100	V
5	* 2.801	31.12	PK	32.6	-31.6	0	32.12	-	-	74	-41.88	-	-	0-360	100	V
6	* 3.703	30.29	PK	33	-30.3	0	32.99	-	-	74	-41.01	-	-	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cb/ Ftr/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
* 1.21	42.2	PK1	29	-32.7	0	38.5	-	-	74	-35.5	-	-	360	100	H
* 1.21	30.1	AD1	29	-32.7	.1	26.5	54	-27.5	-	-	-	-	360	100	H
* 2.267	40.03	PK1	31.6	-31.5	0	40.13	-	-	74	-33.87	-	-	360	100	H
* 2.269	28.83	AD1	31.6	-31.5	.1	29.03	54	-24.97	-	-	-	-	360	100	H
* 4.105	40.07	PK1	33.3	-30.2	0	43.17	-	-	74	-30.83	-	-	360	100	H
* 4.105	28.71	AD1	33.3	-30.2	.1	31.91	54	-22.09	-	-	-	-	360	100	H
* 1.282	41.88	PK1	29.7	-33	0	38.58	-	-	74	-35.42	-	-	360	100	V
* 1.282	29.87	AD1	29.7	-33.1	.1	26.57	54	-27.43	-	-	-	-	360	100	V
* 2.803	41.11	PK1	32.6	-31.6	0	42.11	-	-	74	-31.89	-	-	360	100	V
* 2.8	29.09	AD1	32.6	-31.6	.1	30.19	54	-23.81	-	-	-	-	360	100	V
* 3.703	39.8	PK1	33	-30.3	0	42.5	-	-	74	-31.5	-	-	360	100	V
* 3.704	28.44	AD1	33	-30.3	.1	31.24	54	-22.76	-	-	-	-	360	100	V

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

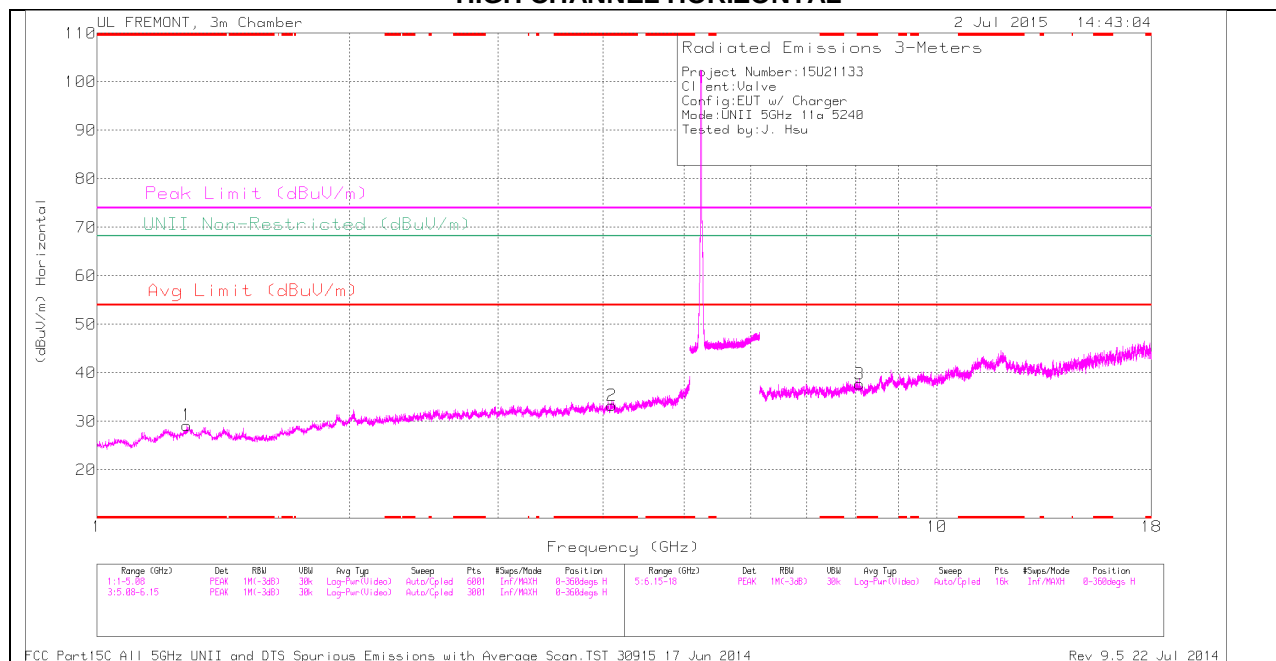
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

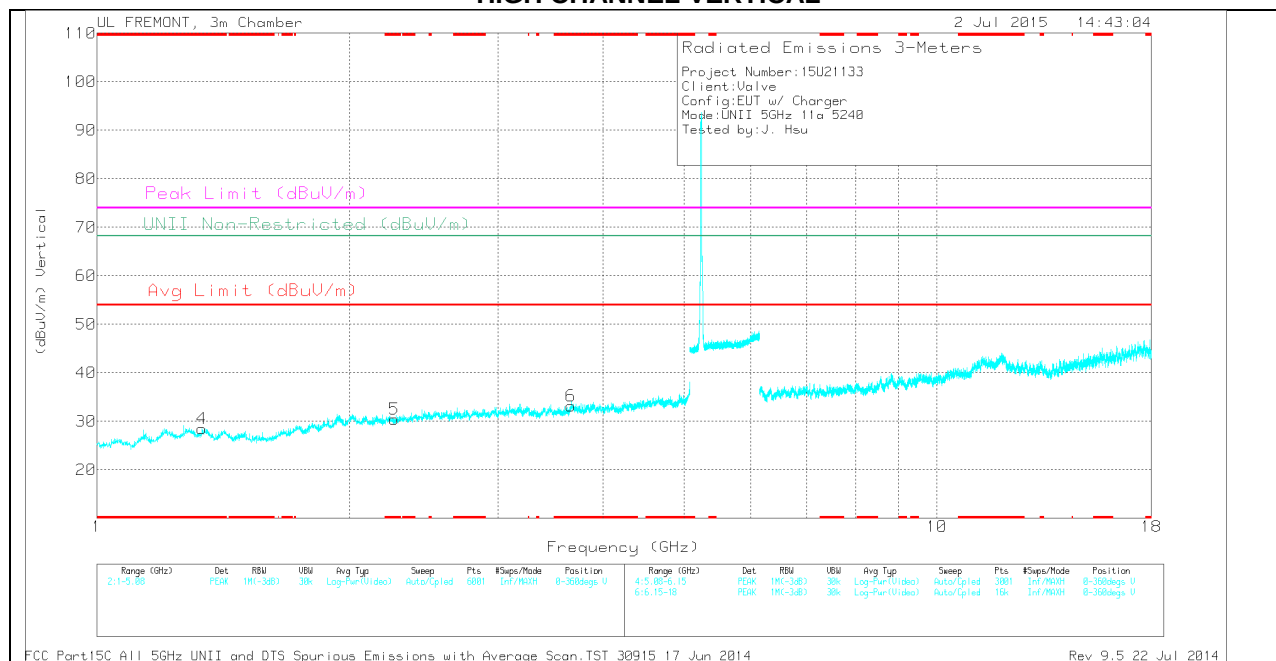
Rev 9.5 22 Jul 2014

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.

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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.28	32.51	PK	29.7	-33	0	29.21	-	-	74	-44.79	-	-	0-360	200	H
2	* 4.104	30.23	PK	33.3	-30.2	0	33.33	-	-	74	-40.67	-	-	0-360	100	H
4	* 1.334	31.88	PK	29.5	-32.9	0	28.48	-	-	74	-45.52	-	-	0-360	100	V
5	* 2.257	30.57	PK	31.5	-31.6	0	30.47	-	-	74	-43.53	-	-	0-360	100	V
6	* 3.664	30.14	PK	32.9	-29.9	0	33.14	-	-	74	-40.86	-	-	0-360	100	V
3	* 8.092	28.27	PK	35.7	-26.2	0	37.77	-	-	74	-36.23	-	-	0-360	200	H

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.281	42.22	PK1	29.7	-33	0	38.92	-	-	74	-35.08	-	-	360	100	H
* 1.281	29.91	AD1	29.7	-33	.1	26.71	54	-27.29	-	-	-	-	360	100	H
* 4.104	40.17	PK1	33.3	-30.2	0	43.27	-	-	74	-30.73	-	-	360	100	H
* 4.102	28.77	AD1	33.3	-30.2	.1	31.97	54	-22.03	-	-	-	-	360	100	H
* 1.335	41.99	PK1	29.4	-32.8	0	38.59	-	-	74	-35.41	-	-	360	100	V
* 1.334	29.79	AD1	29.5	-32.9	.1	26.49	54	-27.51	-	-	-	-	360	100	V
* 2.256	39.88	PK1	31.5	-31.6	0	39.78	-	-	74	-34.22	-	-	360	100	V
* 2.259	28.6	AD1	31.5	-31.6	.1	28.6	54	-25.4	-	-	-	-	360	100	V
* 3.665	40.37	PK1	32.9	-29.8	0	43.47	-	-	74	-30.53	-	-	360	100	V
* 3.664	28.35	AD1	32.9	-29.9	.1	31.45	54	-22.55	-	-	-	-	360	100	V
* 8.093	37.87	PK1	35.7	-26.2	0	47.37	-	-	74	-26.63	-	-	360	100	H
* 8.092	25.96	AD1	35.7	-26.2	.1	35.56	54	-18.44	-	-	-	-	360	100	H

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

PK1 - KDB789033 Method: Peak

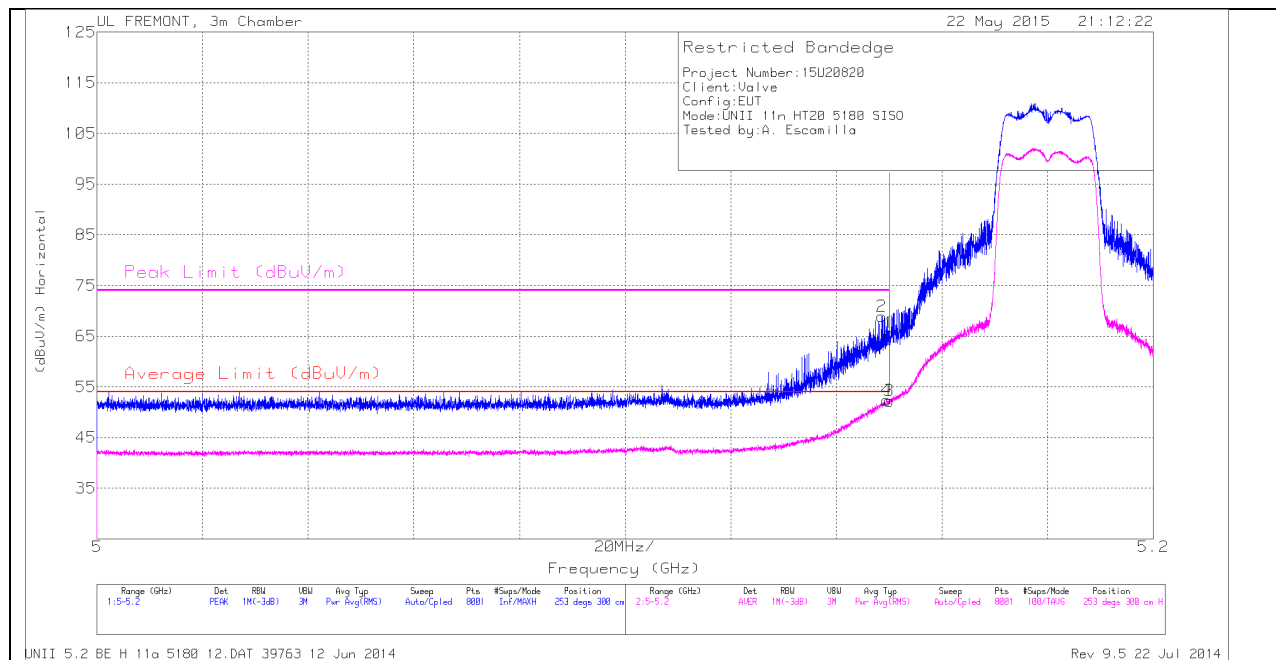
AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

Rev 9.5 22 Jul 2014

12.1.2. 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 T119 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.149	56.31	PK	34.2	-21.6	68.91	-	-	74	-5.09	253	300	H
1	5.15	53.14	PK	34.2	-21.6	65.74	-	-	74	-8.26	253	300	H
3	5.15	39.62	RMS	34.2	-21.6	52.22	54	-1.78	-	-	253	300	H
4	5.15	39.78	RMS	34.2	-21.6	52.38	54	-1.62	-	-	253	300	H

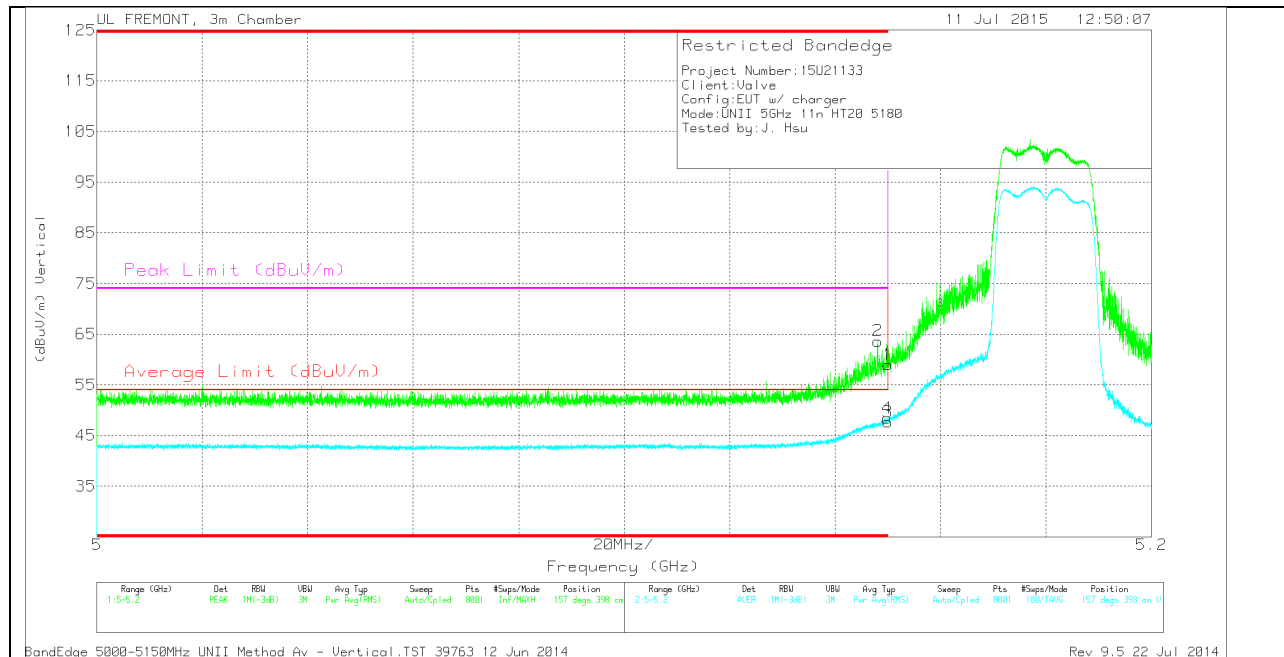
PK - Peak detector

RMS - RMS detection

UNII_5.2_BE_H_11a_5180_12.DAT 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	45.55	PK	34.2	-20.8	58.95	-	-	74	-15.05	157	398	V
2	* 5.148	50.24	PK	34.2	-20.8	63.64	-	-	74	-10.36	157	398	V
3	* 5.15	34.32	RMS	34.2	-20.8	47.72	54	-6.28	-	-	157	398	V
4	* 5.15	35.06	RMS	34.2	-20.8	48.46	54	-5.54	-	-	157	398	V

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

PK - Peak detector

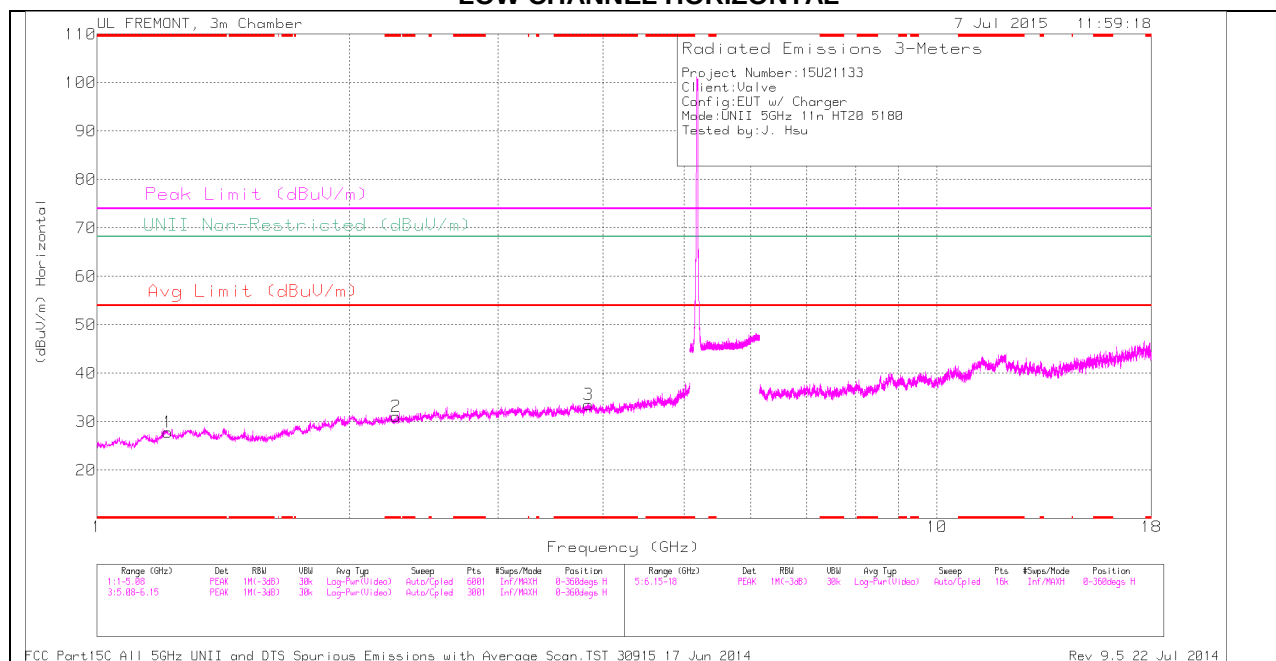
RMS - RMS detection

BandEdge 5000-5150MHz UNII Method Av - Vertical.TST 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

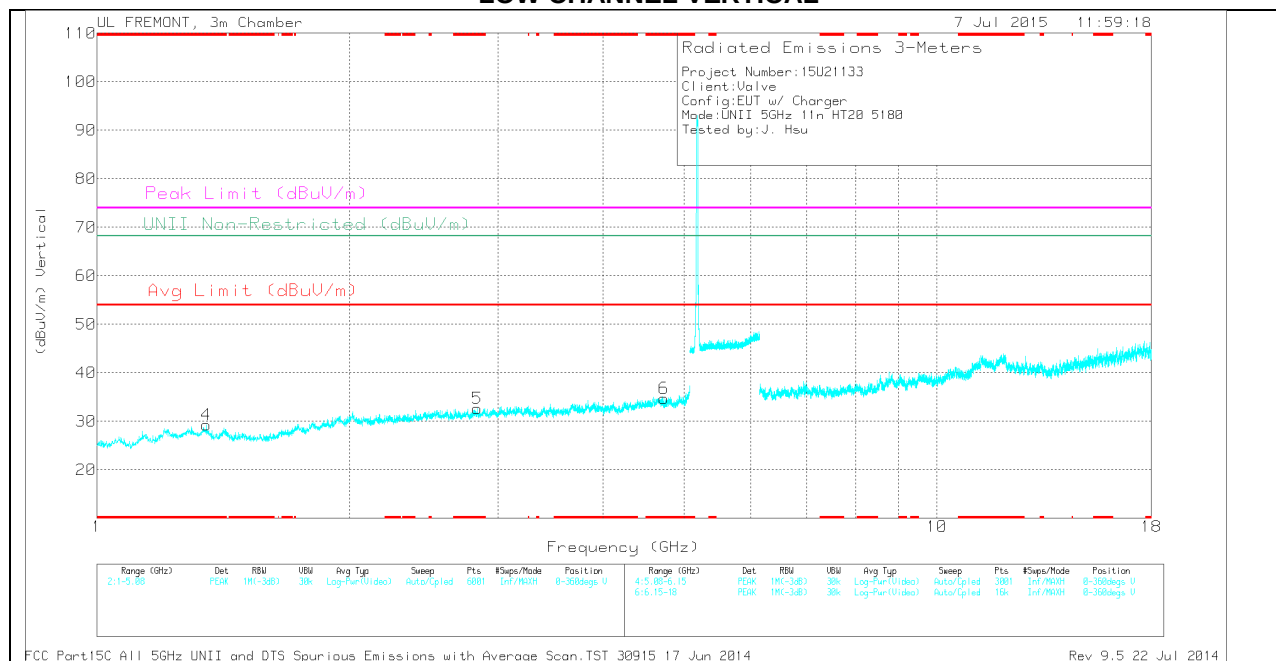
HARMONICS AND SPURIOUS EMISSIONS

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.

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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr /Pad (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	* 1.216	31.48	PK	29.1	-32.7	27.88	-	-	74	-46.12	-	-	0-360	100	H
2	* 2.27	31.02	PK	31.6	-31.5	31.12	-	-	74	-42.88	-	-	0-360	200	H
3	* 3.845	30.66	PK	33.1	-30.2	33.56	-	-	74	-40.44	-	-	0-360	100	H
4	* 1.35	32.67	PK	29.3	-32.7	29.27	-	-	74	-44.73	-	-	0-360	200	V
5	* 2.834	31.83	PK	32.6	-31.8	32.63	-	-	74	-41.37	-	-	0-360	100	V
6	* 4.735	30.87	PK	34	-30.2	34.67	-	-	74	-39.33	-	-	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr /Pad (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
* 1.217	42.07	PK1	29.1	-32.7	38.47	-	-	74	-35.53	-	-	360	100	H
* 1.215	29.85	AD1	29.1	-32.7	26.25	54	-27.75	-	-	-	-	360	100	H
* 2.271	41.02	PK1	31.6	-31.5	41.12	-	-	74	-32.88	-	-	360	100	H
* 2.27	29.17	AD1	31.6	-31.5	29.27	54	-24.73	-	-	-	-	360	100	H
* 3.845	40.48	PK1	33.1	-30.2	43.38	-	-	74	-30.62	-	-	360	100	H
* 3.846	28.74	AD1	33.1	-30.2	31.64	54	-22.36	-	-	-	-	360	100	H
* 1.35	41.89	PK1	29.3	-32.7	38.49	-	-	74	-35.51	-	-	360	100	V
* 1.351	29.99	AD1	29.2	-32.7	26.49	54	-27.51	-	-	-	-	360	100	V
* 2.835	41.03	PK1	32.6	-31.8	41.83	-	-	74	-32.17	-	-	360	100	V
* 2.832	29.26	AD1	32.6	-31.8	30.06	54	-23.94	-	-	-	-	360	100	V
* 4.735	40.22	PK1	34	-30.2	44.02	-	-	74	-29.98	-	-	360	100	V
* 4.734	28.64	AD1	34	-30.1	32.54	54	-21.46	-	-	-	-	360	100	V

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

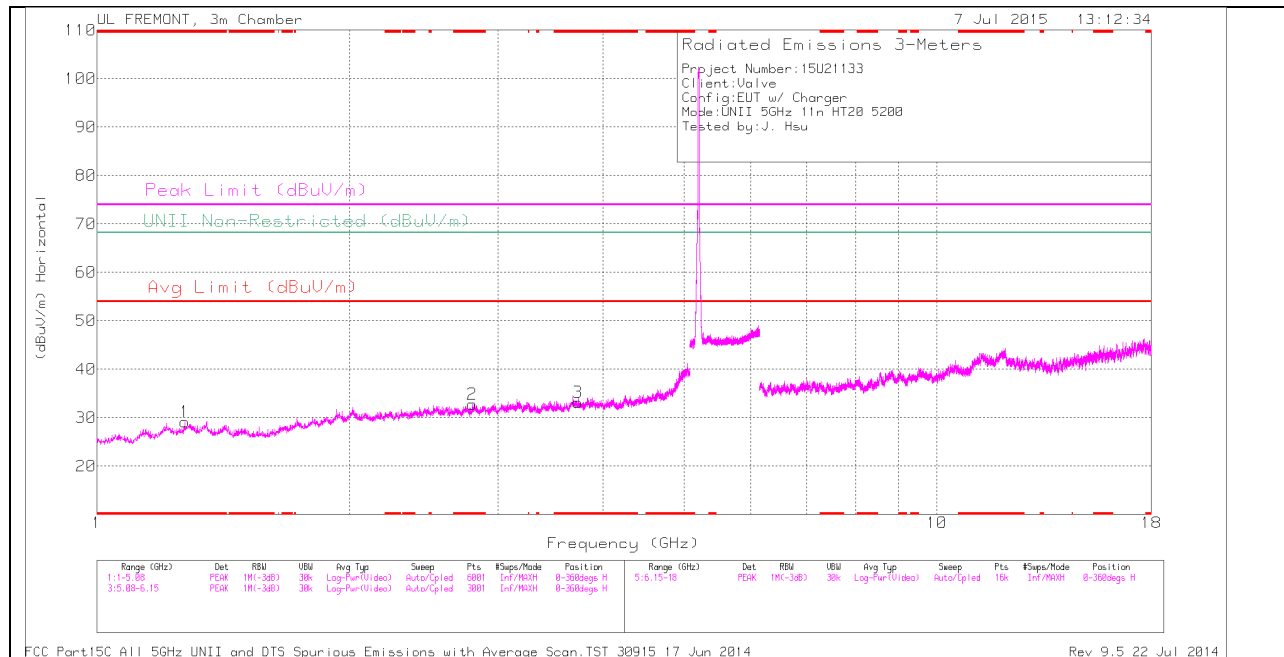
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

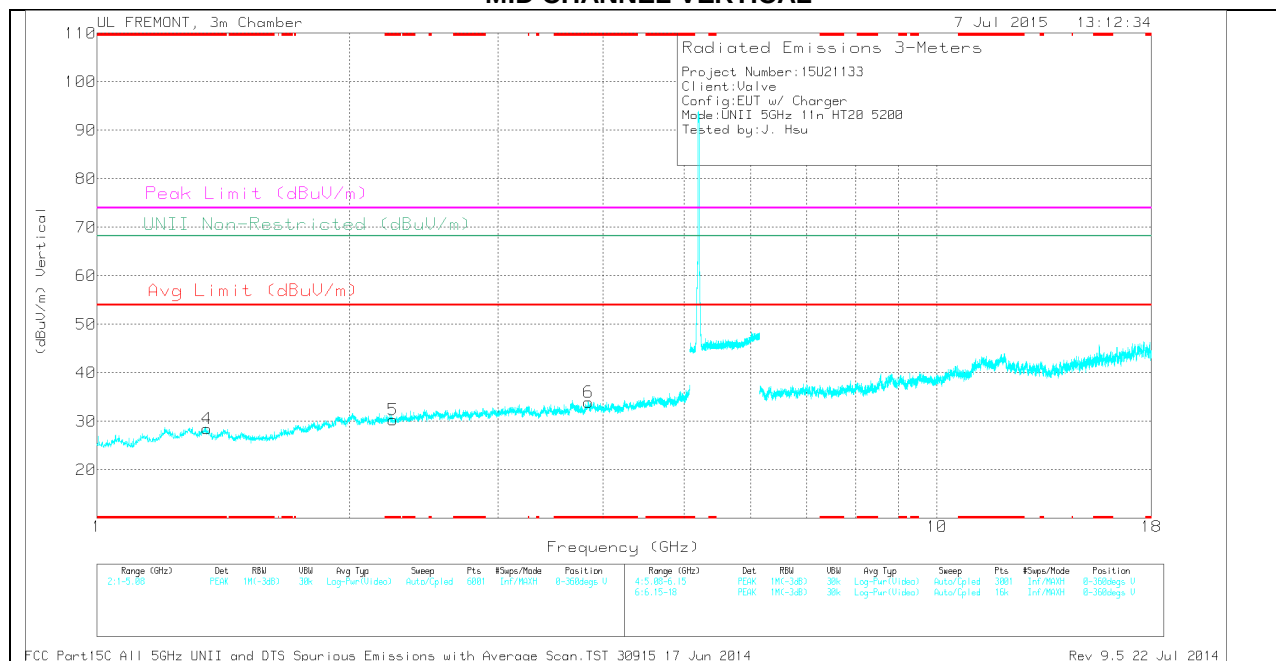
Rev 9.5 22 Jul 2014

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.

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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cb/Ftr /Pad (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	* 1.273	32.5	PK	29.6	-33	29.1	-	-	74	-44.9	-	-	0-360	100	H
2	* 2.796	31.84	PK	32.6	-31.7	32.74	-	-	74	-41.26	-	-	0-360	100	H
3	* 3.736	30.59	PK	33	-30.4	33.19	-	-	74	-40.81	-	-	0-360	200	H
4	* 1.352	31.99	PK	29.2	-32.7	28.49	-	-	74	-45.51	-	-	0-360	100	V
5	* 2.252	30.46	PK	31.5	-31.6	30.36	-	-	74	-43.64	-	-	0-360	100	V
6	* 3.848	31.01	PK	33.1	-30.2	33.91	-	-	74	-40.09	-	-	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cb/Ftr /Pad (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
* 1.275	41.34	PK1	29.6	-33	37.94	-	-	74	-36.06	-	-	360	100	H
* 1.274	29.75	AD1	29.6	-33	26.35	54	-27.65	-	-	-	-	360	100	H
* 2.794	40.77	PK1	32.6	-31.7	41.67	-	-	74	-32.33	-	-	360	100	H
* 2.796	29.13	AD1	32.6	-31.7	30.03	54	-23.97	-	-	-	-	360	100	H
* 3.737	39.94	PK1	33	-30.4	42.54	-	-	74	-31.46	-	-	360	100	H
* 3.738	28.22	AD1	33	-30.4	30.82	54	-23.18	-	-	-	-	360	100	H
* 1.354	41.65	PK1	29.2	-32.7	38.15	-	-	74	-35.85	-	-	360	100	V
* 1.352	30.04	AD1	29.2	-32.7	26.54	54	-27.46	-	-	-	-	360	100	V
* 2.251	41.07	PK1	31.5	-31.6	40.97	-	-	74	-33.03	-	-	360	100	V
* 2.25	28.92	AD1	31.5	-31.7	28.72	54	-25.28	-	-	-	-	360	100	V
* 3.846	40.21	PK1	33.1	-30.2	43.11	-	-	74	-30.89	-	-	360	100	V
* 3.848	28.79	AD1	33.1	-30.2	31.69	54	-22.31	-	-	-	-	360	100	V

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

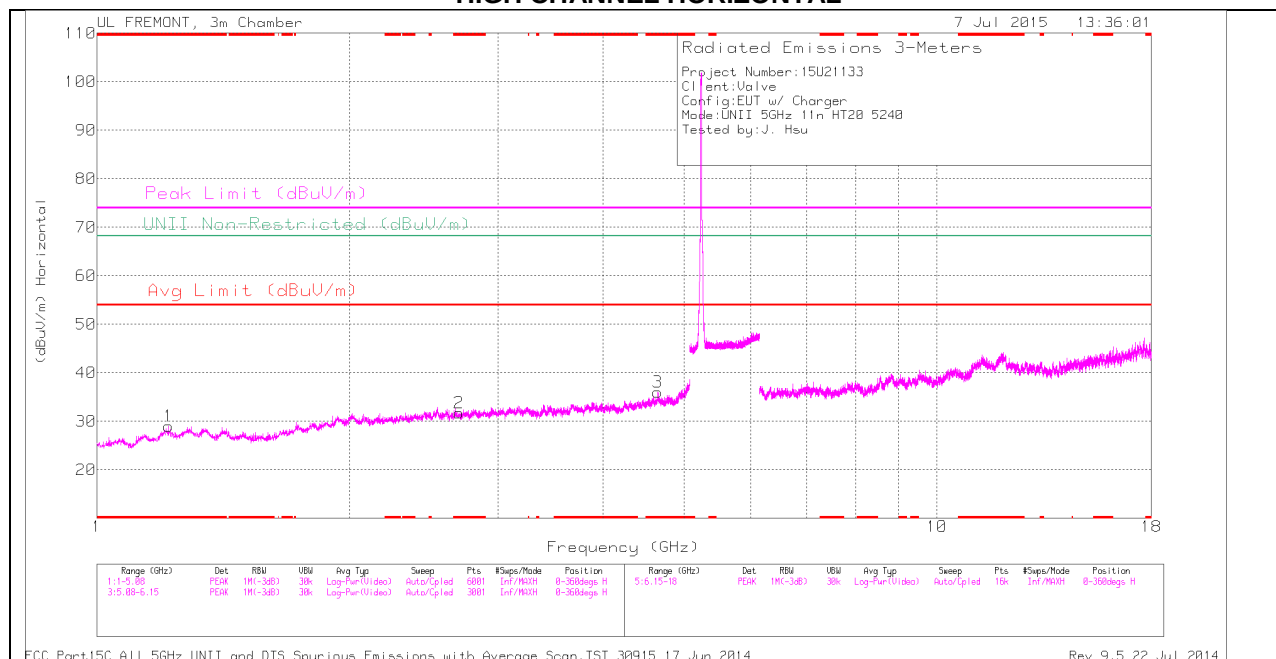
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

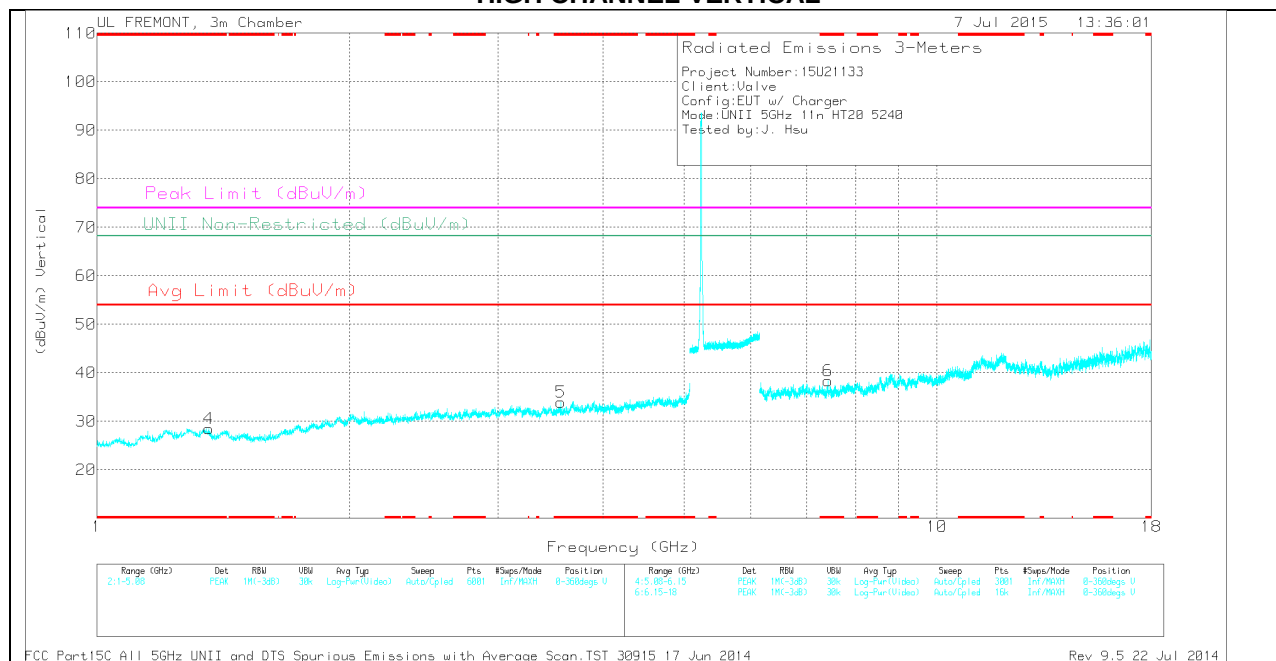
Rev 9.5 22 Jul 2014

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.

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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr /Pad (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	* 1.217	32.66	PK	29.1	-32.7	29.06	-	-	74	-44.94	-	-	0-360	200	H
2	* 2.698	30.99	PK	32.3	-31.5	31.79	-	-	74	-42.21	-	-	0-360	100	H
3	* 4.654	31.56	PK	34	-29.5	36.06	-	-	74	-37.94	-	-	0-360	100	H
4	* 1.36	32.04	PK	29.1	-32.7	28.44	-	-	74	-45.56	-	-	0-360	100	V
5	* 3.564	32.23	PK	32.8	-31.1	33.93	-	-	74	-40.07	-	-	0-360	100	V
6	* 7.412	30.21	PK	35.6	-27.5	38.31	-	-	74	-35.69	-	-	0-360	200	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr /Pad (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
* 1.217	42.42	PK1	29.1	-32.7	38.82	-	-	74	-35.18	-	-	360	100	H
* 1.218	29.98	AD1	29.1	-32.7	26.38	54	-27.62	-	-	-	-	360	100	H
* 2.697	40.67	PK1	32.3	-31.5	41.47	-	-	74	-32.53	-	-	360	100	H
* 2.7	28.98	AD1	32.3	-31.4	29.88	54	-24.12	-	-	-	-	360	100	H
* 4.653	40.62	PK1	34	-29.5	45.12	-	-	74	-28.88	-	-	360	100	H
* 4.654	28.89	AD1	34	-29.5	33.39	54	-20.61	-	-	-	-	360	100	H
* 1.361	40.97	PK1	29.1	-32.7	37.37	-	-	74	-36.63	-	-	360	100	V
* 1.358	29.71	AD1	29.2	-32.7	26.21	54	-27.79	-	-	-	-	360	100	V
* 3.564	40.13	PK1	32.8	-31.1	41.83	-	-	74	-32.17	-	-	360	100	V
* 3.566	28.92	AD1	32.8	-31.1	30.62	54	-23.38	-	-	-	-	360	100	V
* 7.41	38.69	PK1	35.6	-27.4	46.89	-	-	74	-27.11	-	-	360	100	V
* 7.411	27.23	AD1	35.6	-27.5	35.33	54	-18.67	-	-	-	-	360	100	V

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

PK1 - KDB789033 Method: Peak

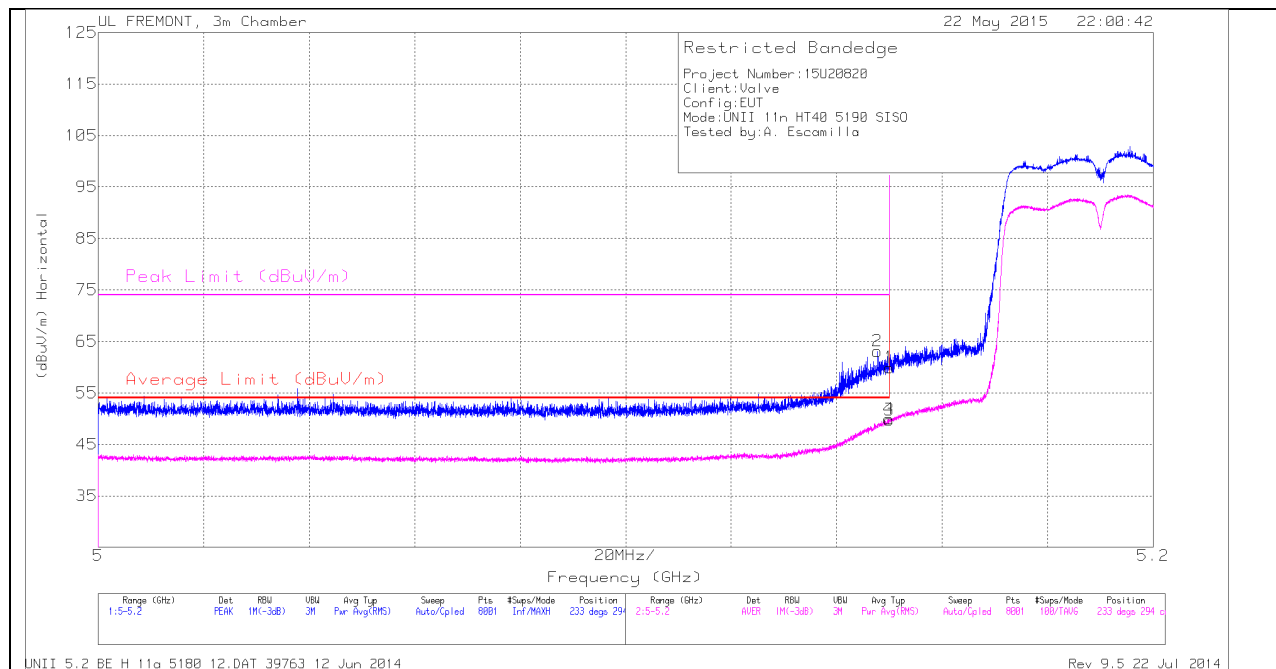
AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

Rev 9.5 22 Jul 2014

12.1.3. TX ABOVE 1 GHz 802.11n HT40 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 T119 (dB/m)	Amp/Cbl/Ftr r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.148	50.5	PK	34.2	-21.6	0	63.1	-	-	74	-10.9	233	294	H
1	5.15	47.29	PK	34.2	-21.6	0	59.89	-	-	74	-14.11	233	294	H
3	5.15	37.16	RMS	34.2	-21.6	.8	49.76	54	-4.24	-	-	233	294	H
4	5.15	37.35	RMS	34.2	-21.6	.8	49.95	54	-4.05	-	-	233	294	H

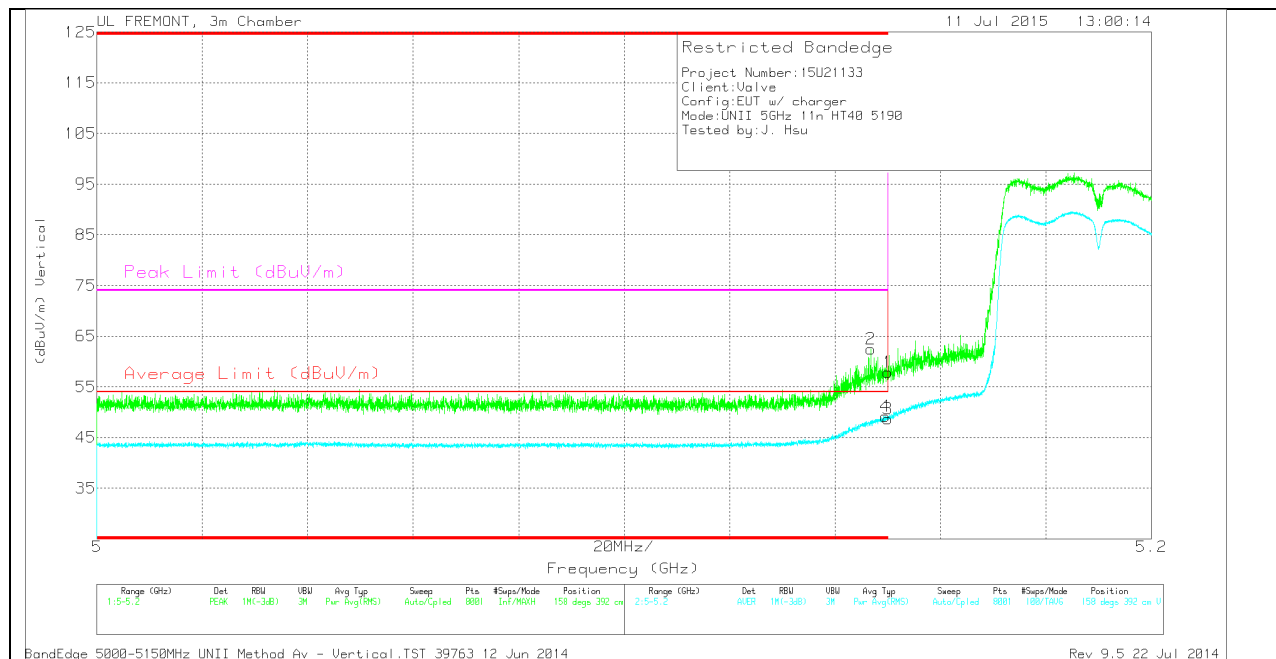
PK - Peak detector

RMS - RMS detection

UNII_5.2_BE_H_11a_5180_12.DAT 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	44.45	PK	34.2	-20.8	0	57.85	-	-	74	-16.15	158	392	V
2	* 5.147	49.11	PK	34.2	-20.8	0	62.51	-	-	74	-11.49	158	392	V
3	* 5.15	34.43	RMS	34.2	-20.8	.8	48.63	54	-5.37	-	-	158	392	V
4	* 5.15	35.03	RMS	34.2	-20.8	.8	49.23	54	-4.77	-	-	158	392	V

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

PK - Peak detector

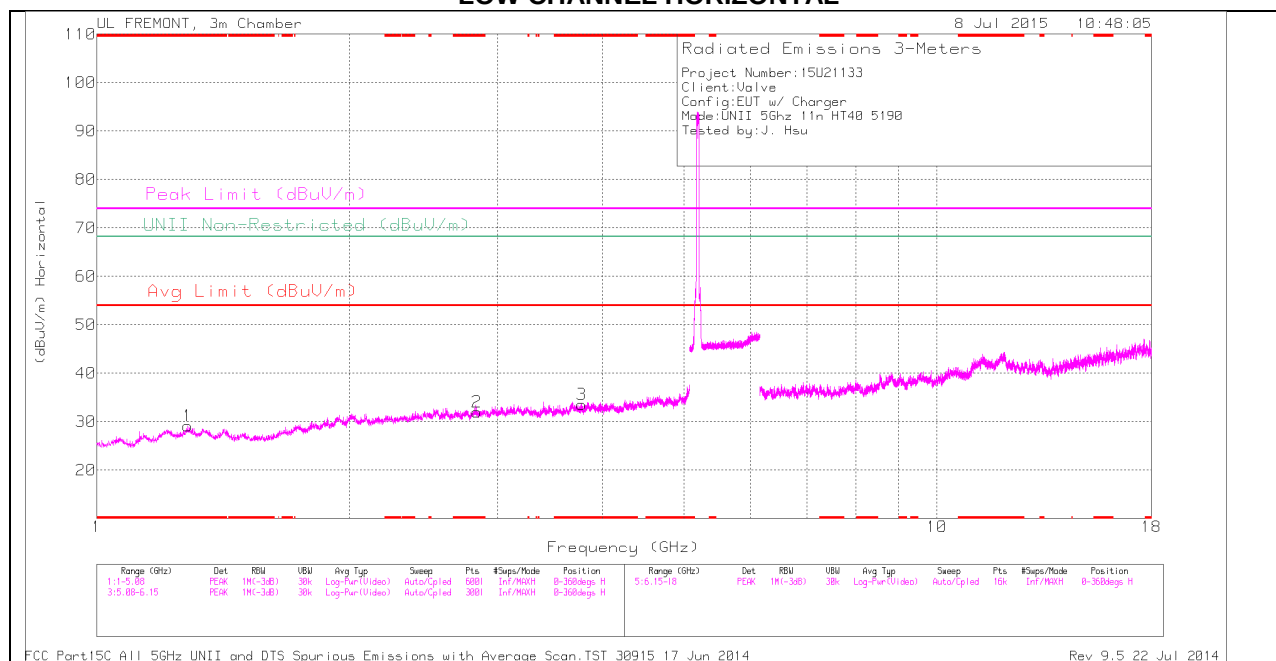
RMS - RMS detection

BandEdge 5000-5150MHz UNII Method Av - Vertical.TST 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

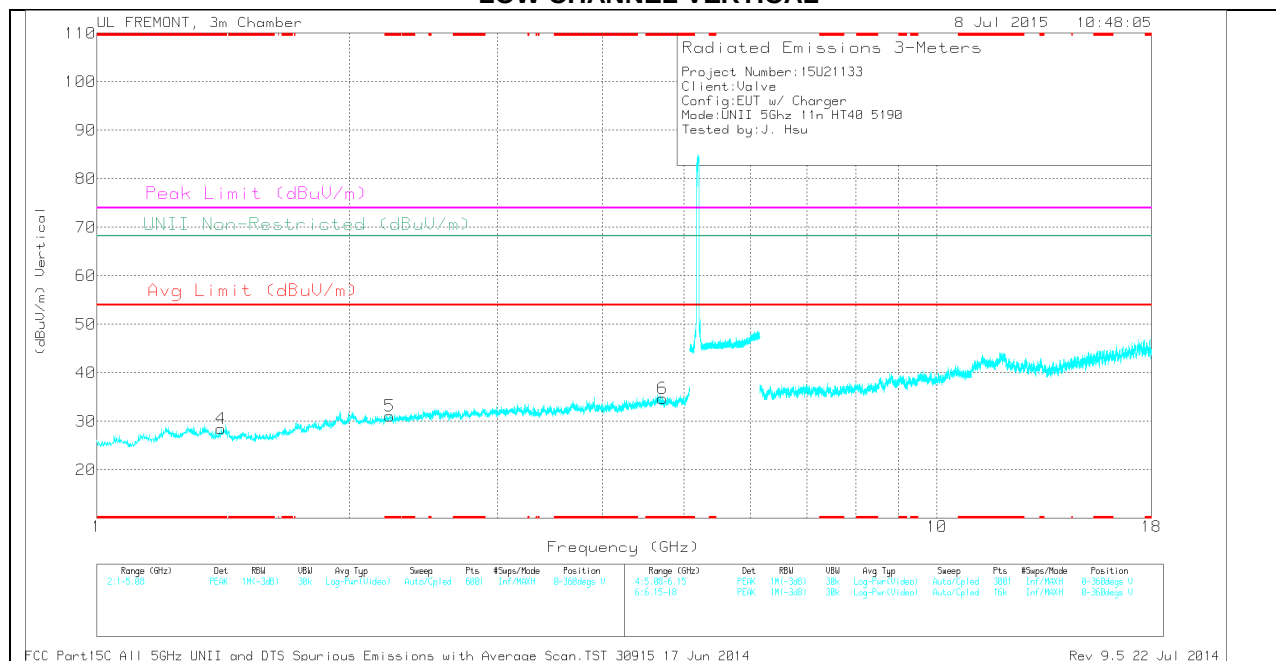
HARMONICS AND SPURIOUS EMISSIONS

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.

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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.283	32.39	PK	29.7	-33	0	29.09	-	-	74	-44.91	-	-	0-360	100	H
2	* 2.835	31.24	PK	32.6	-31.8	0	32.04	-	-	74	-41.96	-	-	0-360	200	H
3	* 3.779	31.36	PK	33.1	-30.9	0	33.56	-	-	74	-40.44	-	-	0-360	200	H
4	* 1.406	32.01	PK	28.6	-32.1	0	28.51	-	-	74	-45.49	-	-	0-360	200	V
5	* 2.232	31.33	PK	31.5	-31.7	0	31.13	-	-	74	-42.87	-	-	0-360	200	V
6	* 4.712	30.56	PK	34.1	-29.9	0	34.76	-	-	74	-39.24	-	-	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.283	41.83	PK1	29.7	-33	0	38.53	-	-	74	-35.47	-	-	360	100	H
* 1.282	30.01	AD1	29.7	-33.1	.8	27.41	54	-26.59	-	-	-	-	360	100	H
* 2.836	40.84	PK1	32.6	-31.8	0	41.64	-	-	74	-32.36	-	-	360	100	H
* 2.834	29.37	AD1	32.6	-31.8	.8	30.97	54	-23.03	-	-	-	-	360	100	H
* 3.778	40.31	PK1	33.1	-30.9	0	42.51	-	-	74	-31.49	-	-	360	100	H
* 3.78	29.04	AD1	33.1	-30.9	.8	32.04	54	-21.96	-	-	-	-	360	100	H
* 1.405	40.9	PK1	28.6	-32.1	0	37.4	-	-	74	-36.6	-	-	360	100	V
* 1.406	29.58	AD1	28.6	-32.1	.8	26.88	54	-27.12	-	-	-	-	360	100	V
* 2.23	41.18	PK1	31.5	-31.7	0	40.98	-	-	74	-33.02	-	-	360	100	V
* 2.231	29.67	AD1	31.5	-31.7	.8	30.27	54	-23.73	-	-	-	-	360	100	V
* 4.713	39.99	PK1	34.1	-29.9	0	44.19	-	-	74	-29.81	-	-	360	100	V
* 4.714	28.77	AD1	34.1	-29.9	.8	33.77	54	-20.23	-	-	-	-	360	100	V

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

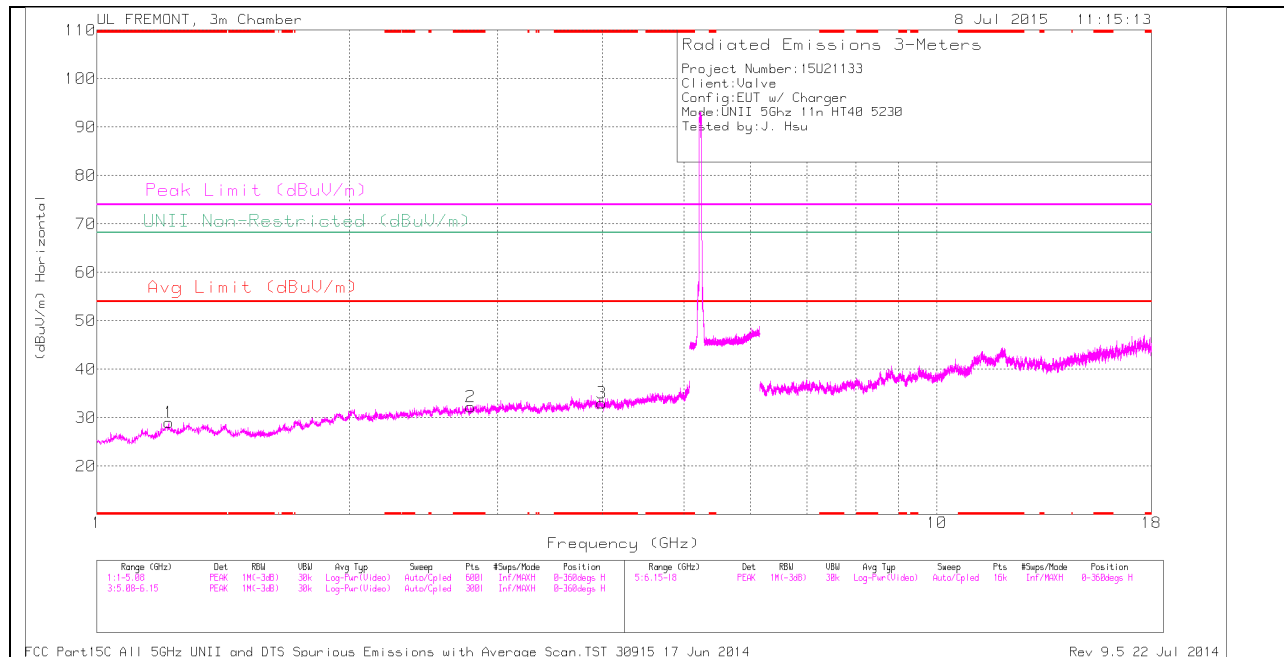
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

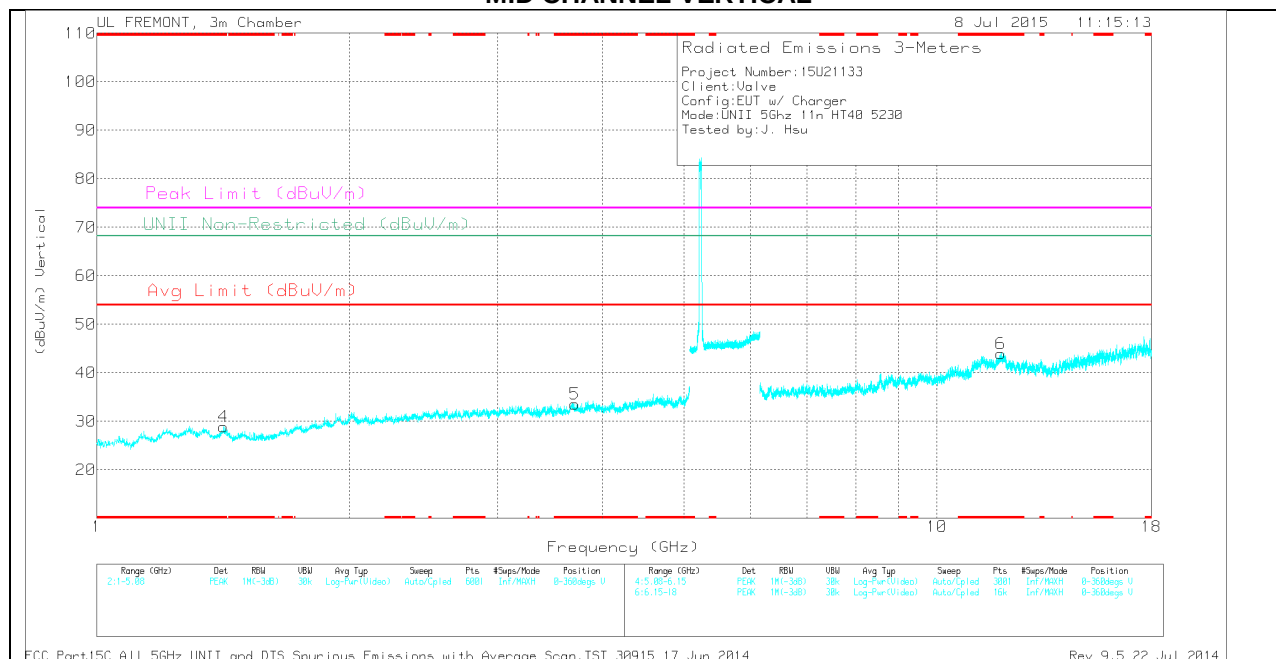
Rev 9.5 22 Jul 2014

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.

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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	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	* 1.218	32.6	PK	29.1	-32.7	0	29	-	-	74	-45	-	-	0-360	200	H
2	* 2.787	31.31	PK	32.6	-31.7	0	32.21	-	-	74	-41.79	-	-	0-360	200	H
3	* 3.989	30.79	PK	33.2	-30.9	0	33.09	-	-	74	-40.91	-	-	0-360	100	H
4	* 1.415	32.47	PK	28.5	-32.1	0	28.87	-	-	74	-45.13	-	-	0-360	200	V
5	* 3.707	30.82	PK	33	-30.3	0	33.52	-	-	74	-40.48	-	-	0-360	100	V
6	* 11.917	28.4	PK	39.1	-23.6	0	43.9	-	-	74	-30.1	-	-	0-360	200	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.216	41.09	PK1	29.1	-32.7	0	37.49	-	-	74	-36.51	-	-	360	100	H
* 1.219	29.97	AD1	29.1	-32.7	.8	27.17	54	-26.83	-	-	-	-	360	100	H
* 2.789	41.1	PK1	32.6	-31.7	0	42	-	-	74	-32	-	-	360	100	H
* 2.788	28.94	AD1	32.6	-31.7	.8	30.64	54	-23.36	-	-	-	-	360	100	H
* 3.988	41.05	PK1	33.2	-30.9	0	43.35	-	-	74	-30.65	-	-	360	100	H
* 3.989	29.2	AD1	33.2	-30.9	.8	32.3	54	-21.7	-	-	-	-	360	100	H
* 1.416	42.3	PK1	28.5	-32.1	0	38.7	-	-	74	-35.3	-	-	360	100	V
* 1.415	29.94	AD1	28.5	-32.1	.8	27.14	54	-26.86	-	-	-	-	360	100	V
* 3.706	39.74	PK1	33	-30.3	0	42.44	-	-	74	-31.56	-	-	360	100	V
* 3.709	28.29	AD1	33	-30.2	.8	31.89	54	-22.11	-	-	-	-	360	100	V
* 11.917	37.38	PK1	39.1	-23.6	0	52.88	-	-	74	-21.12	-	-	360	100	V
* 11.916	25.83	AD1	39.1	-23.6	.8	42.13	54	-11.87	-	-	-	-	360	100	V

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

PK1 - KDB789033 Method: Peak

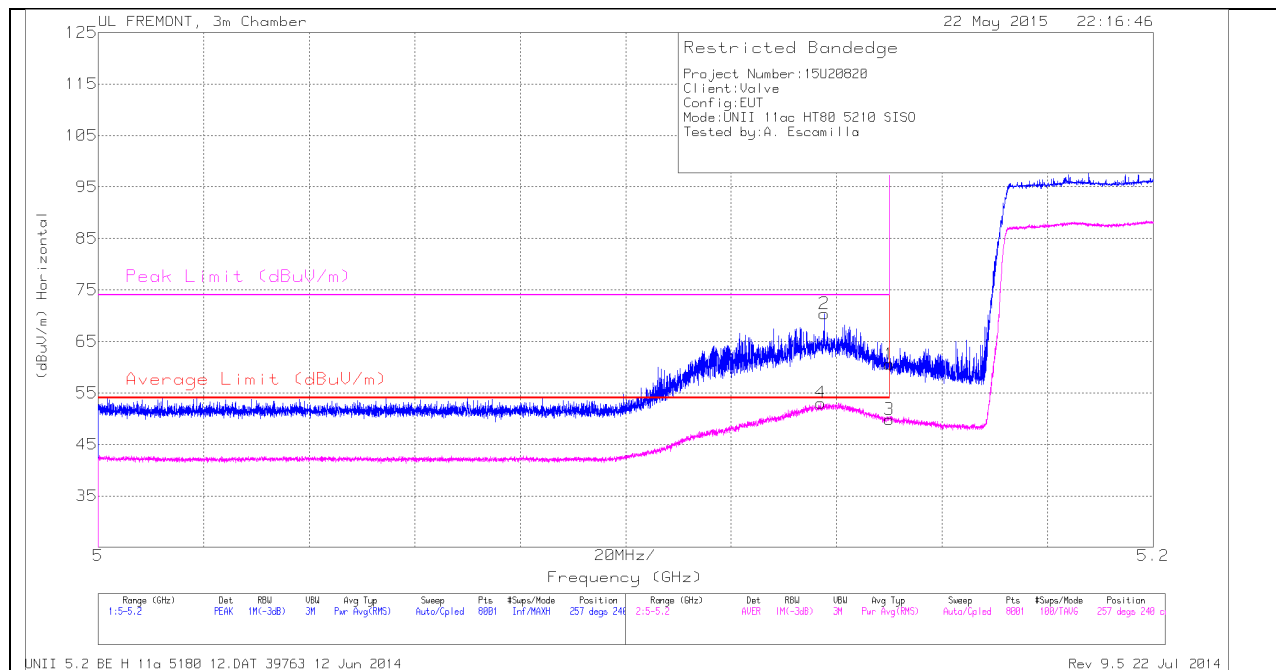
AD1 - KDB789033 Method: AD Primary Power Average

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

Rev 9.5 22 Jul 2014

12.1.4. TX ABOVE 1 GHz 802.11ac HT80 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 T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	5.137	40.47	RMS	34.2	-21.6	1.02	53.07	54	-93	-	-	257	240	H
2	5.138	57.79	PK	34.2	-21.6	0	70.39	-	-	74	-3.61	257	240	H
1	5.15	47.99	PK	34.2	-21.6	0	60.59	-	-	74	-13.41	257	240	H
3	5.15	37.26	RMS	34.2	-21.6	1.02	49.86	54	-4.14	-	-	257	240	H

PK - Peak detector

RMS - RMS detection

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Rev 9.5 22 Jul 2014