



MEASUREMENT REPORT

FCC PART 15.407/ WLAN 802.11a/n/ac

FCC ID: P27ME221
Application: Sercomm Corporation
Application Type: Certification
Product: Subscriber End Equipment HGW
Model No.: AME-4221SR
Brand Name: Airtel
FCC Classification: Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s): Part15 Subpart E (Section 15.407)
Test Procedure(s): ANSI C63.10-2013, KDB 789033 D02v02r01
KDB 662911 D01v02r01
Test Date: August 16 ~27, 2020

Reviewed By:

Oscar Shi

(Oscar Shi)

Approved By:

Robin Wu

(Robin Wu)



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported here in relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2008RSU023-U2	Rev. 01	Initial Report	09-24-2020	Valid

CONTENTS

Description	Page
General Information	6
1. INTRODUCTION	7
1.1. Scope	7
1.2. MRT Test Location	7
2. PRODUCT INFORMATION	8
2.1. Equipment Description	8
2.2. Product Specification Subjective to this Report.....	8
2.3. Description of Available Antennas.....	9
2.4. Working Frequencies for this Report.....	10
2.5. Test Mode	10
2.6. Duty Cycle	11
2.7. Description of Test Software.....	12
2.8. Power setting of 5G Wi-Fi	12
2.9. EMI Suppression Device(s)/Modifications	13
2.10. Labeling Requirements	14
2.11. Test Environment Condition	14
2.12. Description of Test Configuration	14
2.13. Test System Details	14
3. ANTENNA REQUIREMENTS	16
4. TEST EQUIPMENT CALIBRATION DATE	17
5. MEASUREMENT UNCERTAINTY	19
6. TEST RESULT	20
6.1. Summary	20
6.2. Emission Bandwidth Measurement	21
6.2.1. Test Limit	21
6.2.2. Test Procedure Used.....	21
6.2.3. Test Setting.....	21
6.2.4. Test Setup	21
6.2.5. Test Result.....	22
6.3. 6dB Bandwidth Measurement	29
6.3.1. Test Limit	29
6.3.2. Test Procedure Used.....	29
6.3.3. TestSetting.....	29
6.3.4. Test Setup	29

6.3.5. Test Result.....	30
6.4. Output Power Measurement	35
6.4.1. Test Limit	35
6.4.2. Test Procedure Used	35
6.4.3. Test Setting.....	35
6.4.4. Test Setup	35
6.4.5. Test Result.....	36
6.5. Transmit Power Control.....	38
6.5.1. Test Limit	38
6.5.2. Test Procedure Used	38
6.5.3. Test Setting.....	38
6.5.4. Test Setup	38
6.5.5. Test Result.....	38
6.6. Power Spectral Density Measurement	39
6.6.1. TestLimit	39
6.6.2. Test Procedure Used	39
6.6.3. Test Setting.....	39
6.6.4. Test Setup	40
6.6.5. Test Result.....	41
6.7. Frequency Stability Measurement.....	55
6.7.1. TestLimit	55
6.7.2. Test Procedure Used	55
6.7.3. Test Setup	56
6.7.4. Test Result.....	57
6.8. Radiated Spurious Emission Measurement	58
6.8.1. Test Limit	58
6.8.2. Test Procedure Used	58
6.8.3. Test Setting.....	58
6.8.4. Test Setup	60
6.8.5. Test Result.....	61
6.9. Radiated Restricted Band Edge Measurement	93
6.9.1. Test Limit	93
6.9.2. Test Procedure Used	94
6.9.3. Test Setting.....	95
6.9.4. Test Setup	96
6.9.5. Test Result.....	97
6.10. AC Conducted Emissions Measurement.....	151
6.10.1. TestLimit	151
6.10.2. Test Setup	151

6.10.3. Test Result.....	152
7. CONCLUSION.....	154
Appendix A - Test Setup Photograph.....	155
Appendix B - EUT Photograph	156

General Information

Applicant:	Sercomm Corporation
Applicant Address:	8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.
Manufacturer:	Sercomm Corporation
Manufacturer Address:	8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is an FCC accredited testing laboratory (MRT Designation No. CN1166) on the FCC website.
- MRT facility is an ISED recognized testing laboratory (MRT Reg. No. CN0001) on the ISED website.
- MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the A2LA under the A2LA Program (Cert. No. 3628.01) and CNAS under the CNAS Program (Cert. No. L10551) in EMC, Safety, Radio, Telecommunications and SAR testing.

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Subscriber End Equipment HGW
Model No.	AME-4221SR
Wi-Fi Specification	802.11a/b/g/n/ac
Serial Number	Conducted Sample: SRMEGA000044 Radiated Sample: SRMEGA000001
Accessories	
Adapter	Model No.: MSA-C2000IS12.0-24W-IN Input Power: 90 - 270V ~ 50/60Hz, 0.7A max Output Power: 12Vdc 2.0A

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5775MHz
Type of Modulation:	802.11a/n/ac: OFDM
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps
Maximum Average Output Power:	802.11a: 29.90dBm 802.11n-HT20: 29.78dBm 802.11n-HT40: 29.88dBm 802.11ac-VHT20: 29.76dBm 802.11ac-VHT40: 29.89dBm 802.11ac-VHT80:29.86dBm

Note: For other features of this EUT, test report will be issued separately.

2.3. Description of Available Antennas

Antenna Type	Frequency Band(GHz)	Antenna Gain (dBi)		Directional Gain (dBi)	
		Ant 0	Ant 1	For Power	For PSD
PIFA Antenna	2.4 ~ 2.5	3.30	2.70	3.30	6.31
	5.15 ~ 5.25	3.40	3.40	3.40	6.41
	5.725 ~ 5.85				

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11a/b/g/n/ac mode.

Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log (N_{ANT} / N_{SS})$ dB = 3.01;

- For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB for $N_{ANT} \leq 4$;

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Note 3: The antenna gain is declared by manufacture.

2.4. Working Frequencies for this Report

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	149	5745 MHz	153	5765 MHz
157	5785 MHz	161	5805 MHz	165	5825 MHz

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	151	5755 MHz
159	5795 MHz	--	--	--	--

802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	155	5775 MHz	--	--

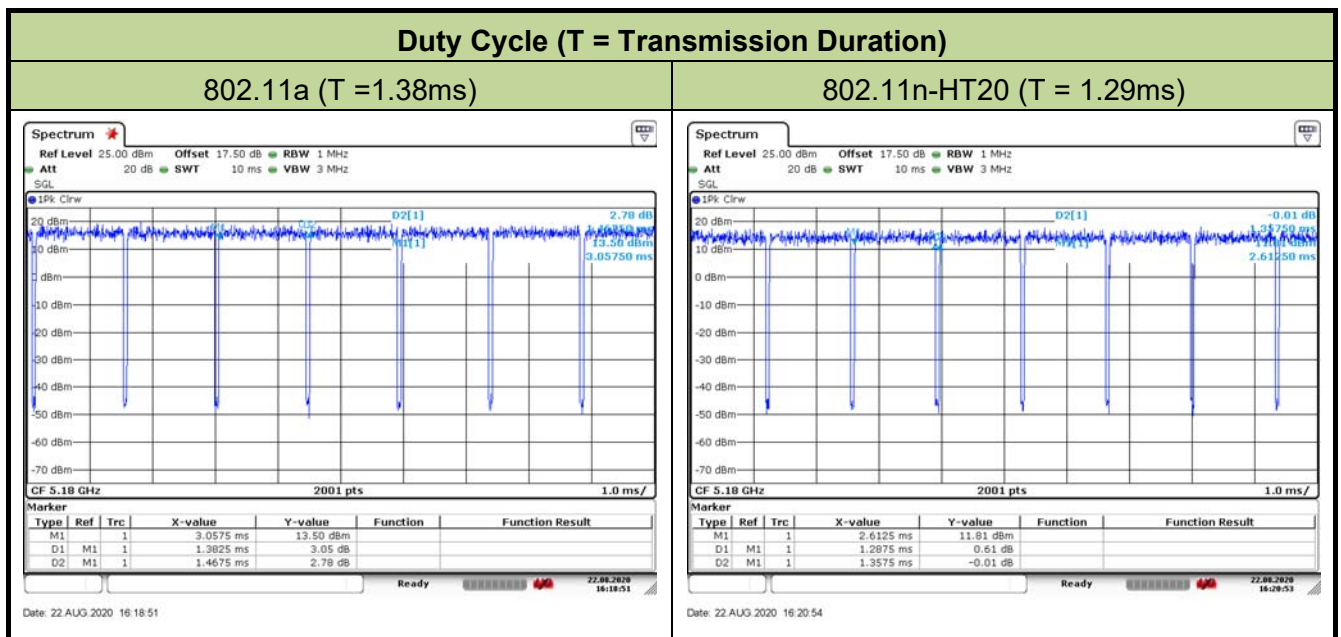
2.5. Test Mode

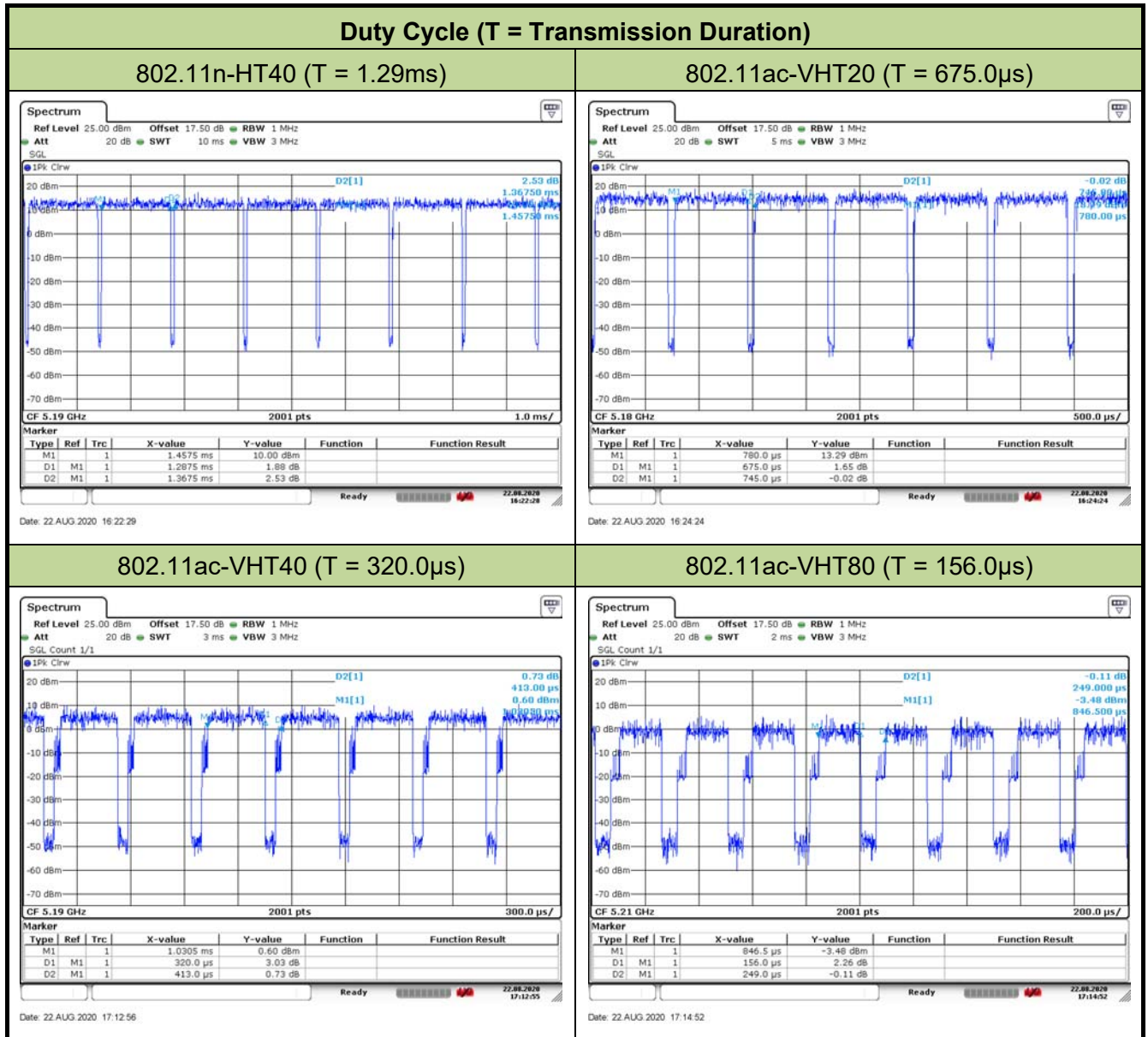
Test Mode	Mode 1: Transmit by 802.11a (6Mbps)
	Mode 2: Transmit by 802.11n-HT20 (MCS0)
	Mode 3: Transmit by 802.11n-HT40 (MCS0)
	Mode 4: Transmit by 802.11ac-VHT20 (MCS0)
	Mode 5: Transmit by 802.11ac-VHT40 (MCS0)
	Mode 6: Transmit by 802.11ac-VHT80 (MCS0)

2.6. Duty Cycle

5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
802.11a	94.21%
802.11n-HT20	94.84%
802.11n-HT40	90.29%
802.11ac-VHT20	90.60%
802.11ac-VHT40	77.48%
802.11ac-VHT80	62.65%





2.7. Description of Test Software

The test utility software used during testing was “QATool_Dbg.exe”, and the version was v5.02. Power parameter value refers to operation description.

2.8. Power setting of 5G Wi-Fi

Model	Ch.	Freq. (MHz)	Power Setting (Hex)	Power Setting (Dec)
a	36	5180	26.0	19.0
	44	5220	28.0	20.0
	48	5240	28.0	20.0

	149	5745	2E	23.0
	157	5785	2E	23.0
	165	5825	2E	23.0
n-HT20	36	5180	27.0	20.0
	44	5220	2B	21.5
	48	5240	2B	21.5
	149	5745	30.0	24.0
	157	5785	30.0	24.0
	165	5825	30.0	24.0
n-HT40	38	5190	23.0	17.5
	46	5230	2E	23.0
	151	5755	30.0	24.0
	159	5795	30.0	24.0
ac-VHT20	36	5180	26.0	19.0
	44	5220	2A	21.0
	48	5240	2A	21.0
	149	5745	2F	23.5
	157	5785	2F	23.5
	165	5825	2F	23.5
ac-VHT40	38	5190	24.0	18.0
	46	5230	2F	23.5
	151	5755	30.0	24.0
	159	5795	30.0	24.0
ac-VHT80	42	5210	20.0	16.0
	155	5775	30.0	24.0

2.9. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.10. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase.

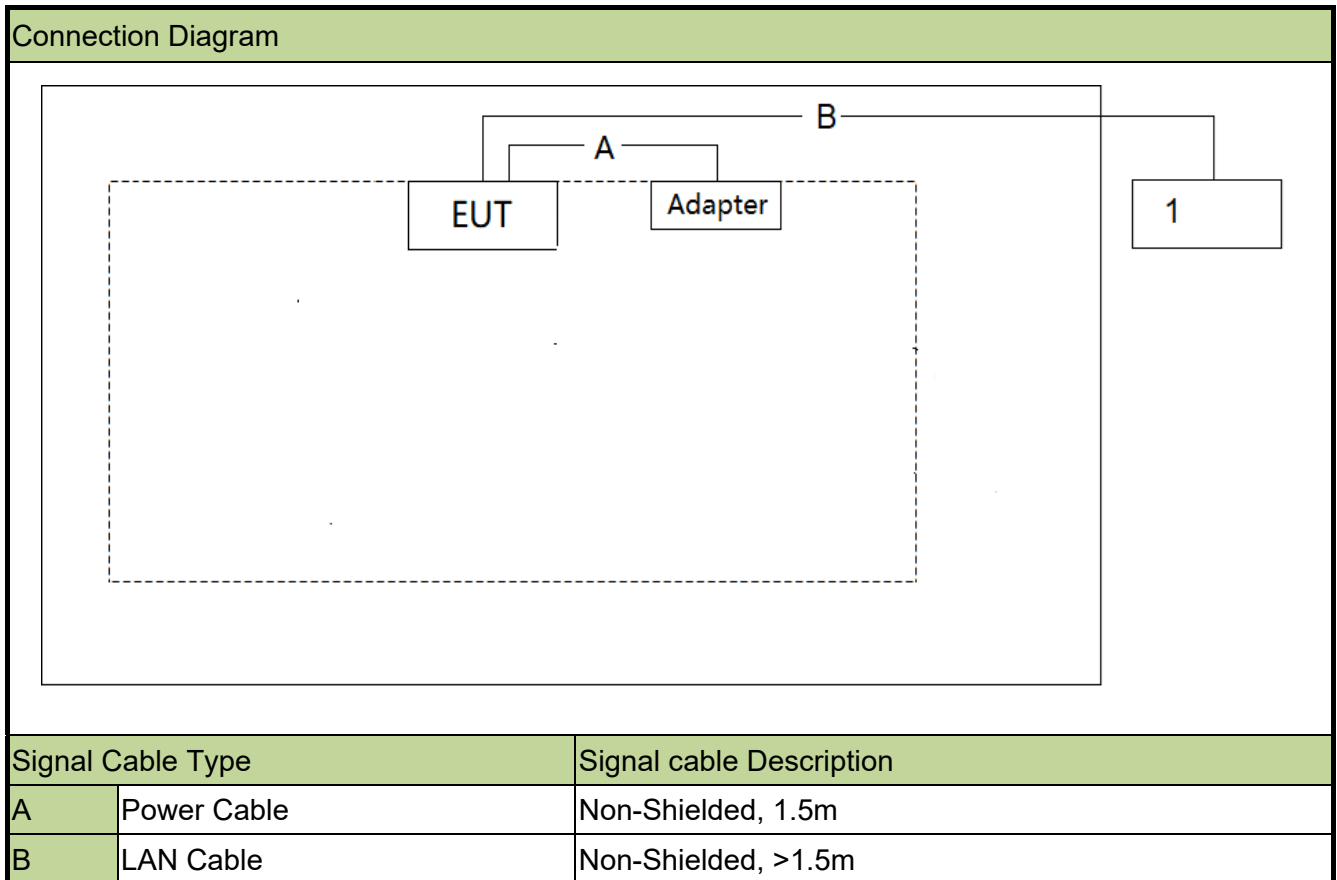
However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

2.11. Test Environment Condition

Ambient Temperature	15°C ~ 35°C
Relative Humidity	20%RH ~75%RH

2.12. Description of Test Configuration

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.



2.13. Test System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including

inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Lenovo	E495	N/A	Non-Shielded, 1.8m

3. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2021/06/11
Four-Line V-Network	R&S	ENV432	MRTSUE06615	1 year	2020/11/11
Impedance Stabilization Network	TESEQ	ISN T200A	MRTSUE06004	1 year	2021/01/04
Impedance Stabilization Network	TESEQ	ISN T800	MRTSUE06005	1 year	2021/01/04
Impedance Stabilization Network	TESEQ	ISN T8-CAT6	MRTSUE06006	1 year	2021/01/04
V-Network	R&S	ESH3-Z6	MRTSUE06187	1 year	2021/04/14
V-Network	R&S	ESH3-Z6	MRTSUE06188	1 year	2021/04/14
RF Current Probe	R&S	EZ-17	MRTSUE06190	1 year	2021/04/14
Thermal Hygrometer	testo	608-H1	MRTSUE06404	1 year	2021/07/26

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/04/03
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/29
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	EMC Instruments corporation	EMC051845S E	MRTSUE06602	1 year	2020/10/07
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2021/07/26
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06213	1 year	2021/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2021/07/02
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/29
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/12/29
Preamplifier	EMC Instruments corporation	EMC051845S E	MRTSUE06602	1 year	2020/10/07
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2021/01/08
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2020/11/18
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/06/11
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2021/06/11
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2021/06/11
Attenuator	MVE	6dB	MRTSUE06534	1 year	2020/12/12
Attenuator	MVE	10dB	MRTSUE06543	1 year	2020/12/12
Modulation Analyzer	HP	HP8901A	MRTSUE06098	1 year	2020/10/10
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2020/11/07
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2020/11/07
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2021/07/26

Software	Version	Function
EMI Software	V3	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.28%

6. TEST RESULT

6.1. Summary

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 6.2
15.407(e)	6dB Bandwidth	$\geq 500\text{kHz}$		Pass	Section 6.3
15.407(a)(1)(ii), (3)	Maximum Conducted Output Power	U-NII-1: $\leq 1\text{W}$ U-NII-3: $\leq 1\text{W}$		Pass	Section 6.4
15.407(h)(1)	Transmit Power Control	$\leq 24\text{dBm}$		N/A	Section 6.5
15.407(a)(1)(ii), (3)	Power Spectral Density	Refer to Section 6.6		Pass	Section 6.6
15.407(g)	Frequency Stability	N/A		Pass	Section 6.7
15.407(b)(1), (4)(i)	Undesirable Emissions	Refer to Section 6.9	Radiated	Pass	Section 6.8 Section 6.9
15.205, 15.209 15.407(b)(b)(1), (4)(i)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Pass	
15.207	AC Conducted Emissions 150kHz-30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 6.10

Notes:

- 1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 2) The test results shown in the following sections represent the worst case emissions.
- 3) Test Items “26dB Bandwidth” & “6dB Bandwidth” have been assessed MIMO transmission, and showed the worst test data in this report.
- 4) “N/A” means that the test item is not applicable, and the details refer to relevant section.

6.2. Emission Bandwidth Measurement

6.2.1. Test Limit

N/A

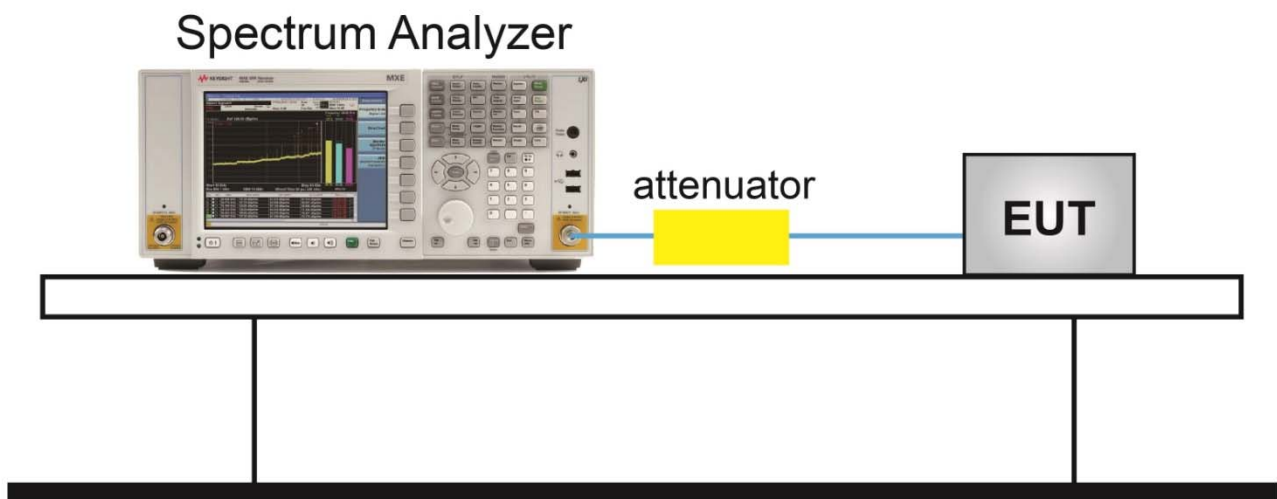
6.2.2. Test Procedure Used

KDB 789033 D02v02r01 -Section C.1

6.2.3. Test Setting

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.2.4. Test Setup



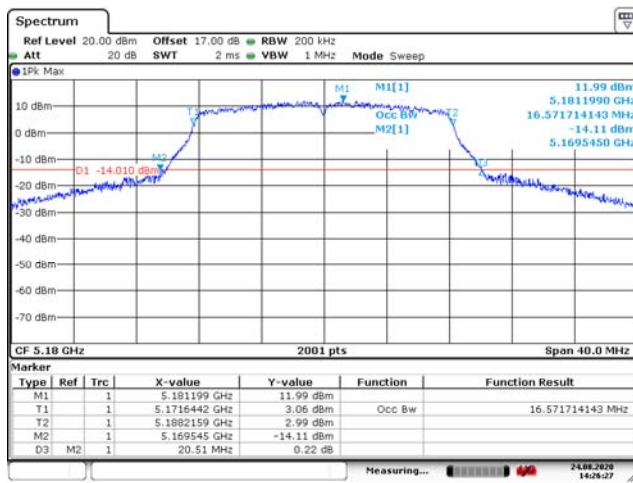
6.2.5. Test Result

Product	Subscriber End Equipment HGW	Test Engineer	Milo Li
Test Site	TR3	Test Date	2020/08/24

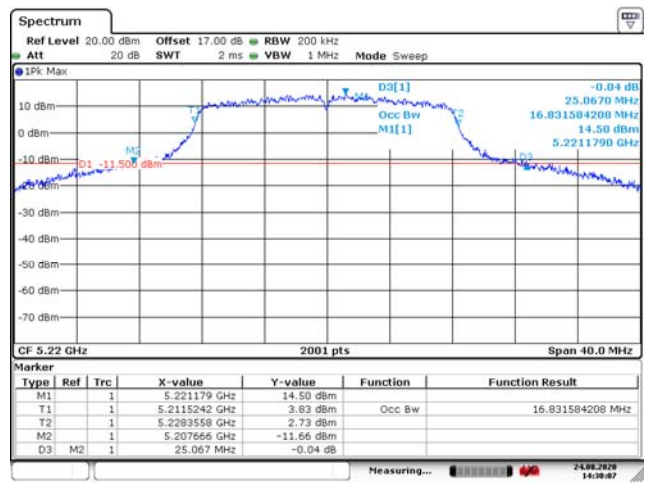
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
Ant 0 / Ant 0 + 1					
802.11a	6Mbps	36	5180	16.57	20.51
802.11a	6Mbps	44	5220	16.83	25.07
802.11a	6Mbps	48	5240	16.71	25.02
802.11a	6Mbps	149	5745	22.25	36.68
802.11a	6Mbps	157	5785	21.87	36.66
802.11a	6Mbps	165	5825	22.67	38.00
802.11n-HT20	MCS0	36	5180	17.65	21.79
802.11n-HT20	MCS0	44	5220	17.83	27.81
802.11n-HT20	MCS0	48	5240	17.81	28.26
802.11n-HT20	MCS0	149	5745	22.67	37.24
802.11n-HT20	MCS0	157	5785	20.99	36.04
802.11n-HT20	MCS0	165	5825	22.29	37.82
802.11n-HT40	MCS0	38	5190	36.18	41.14
802.11n-HT40	MCS0	46	5230	37.26	72.70
802.11n-HT40	MCS0	151	5755	46.28	81.69
802.11n-HT40	MCS0	159	5795	44.57	84.09
802.11ac-VHT20	MCS0	36	5180	17.65	23.49
802.11ac-VHT20	MCS0	44	5220	17.77	25.81
802.11ac-VHT20	MCS0	48	5240	17.77	26.14
802.11ac-VHT20	MCS0	149	5745	20.63	36.46
802.11ac-VHT20	MCS0	157	5785	20.03	35.14
802.11ac-VHT20	MCS0	165	5825	21.03	37.54
802.11ac-VHT40	MCS0	38	5190	36.18	41.01
802.11ac-VHT40	MCS0	46	5230	38.46	76.73
802.11ac-VHT40	MCS0	151	5755	47.23	81.53
802.11ac-VHT40	MCS0	159	5795	45.07	80.36
802.11ac-VHT80	MCS0	42	5210	75.24	81.64
802.11ac-VHT80	MCS0	155	5775	85.80	76.66

802.11a 26dB Bandwidth

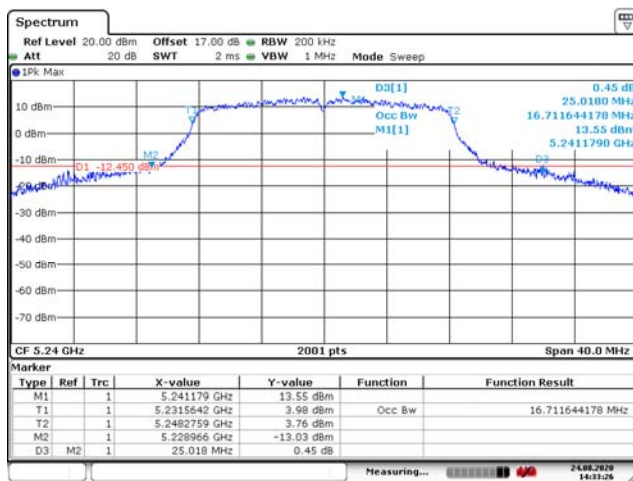
Channel 36 (5180MHz)



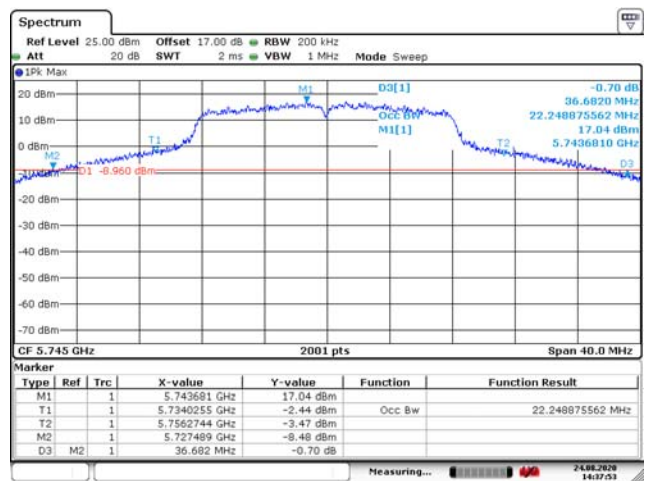
Channel 44 (5220MHz)



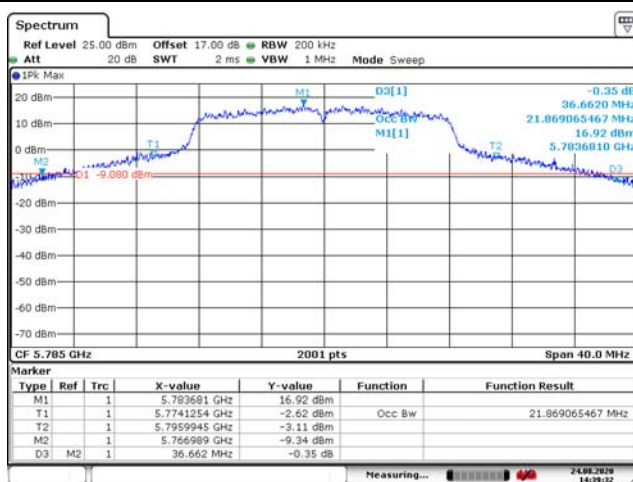
Channel 48 (5240MHz)



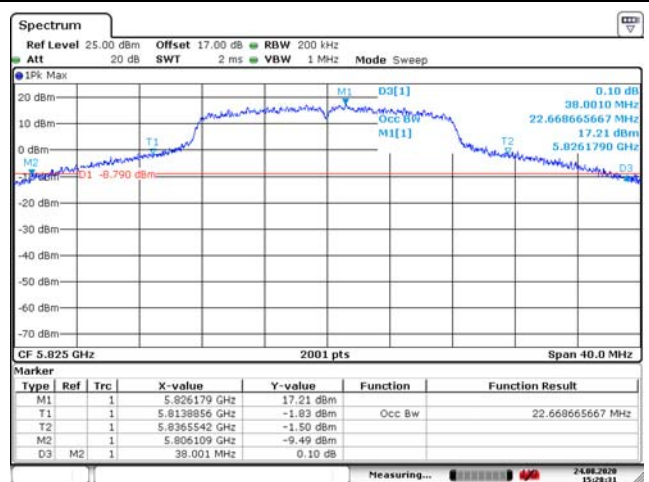
Channel 149 (5745MHz)



Channel 157 (5785MHz)

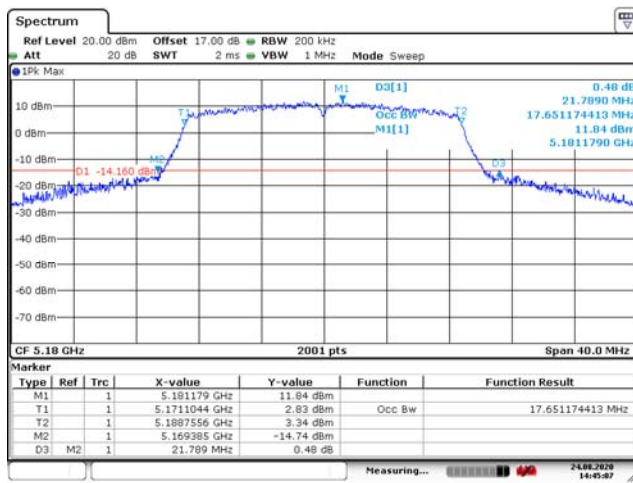


Channel 165 (5825MHz)

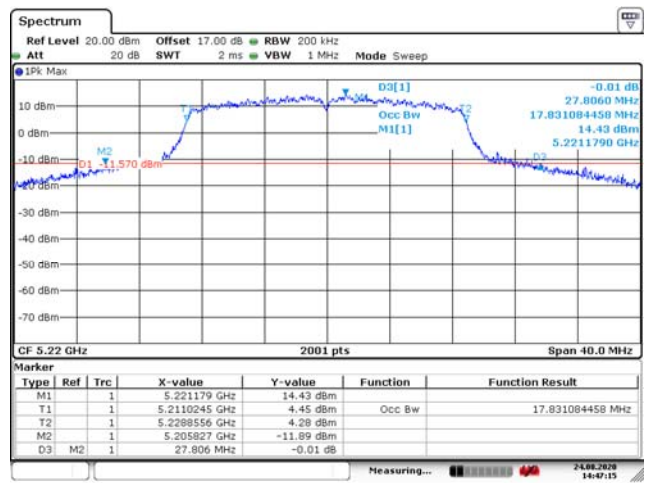


802.11n-HT20 26dB Bandwidth

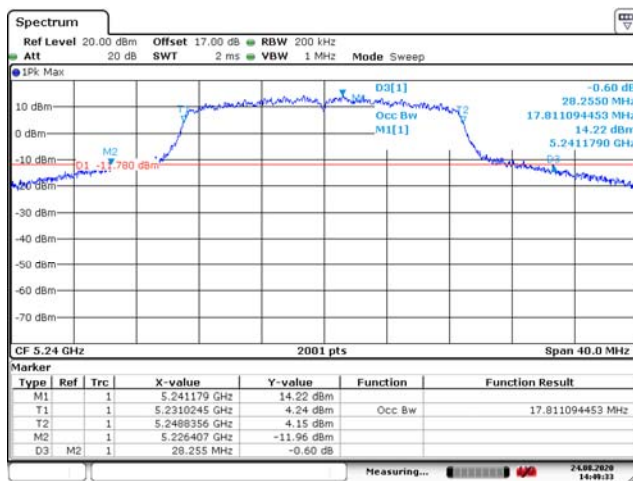
Channel 36 (5180MHz)



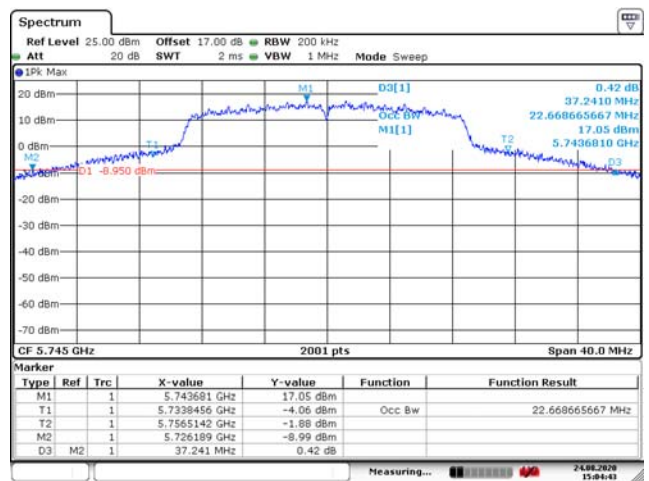
Channel 44 (5220MHz)



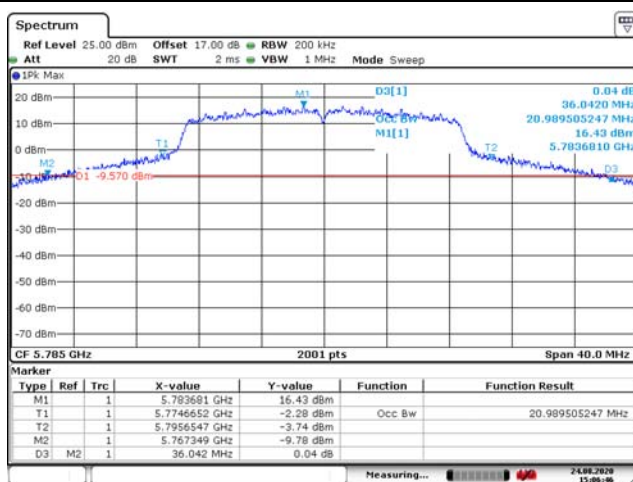
Channel 48 (5240MHz)



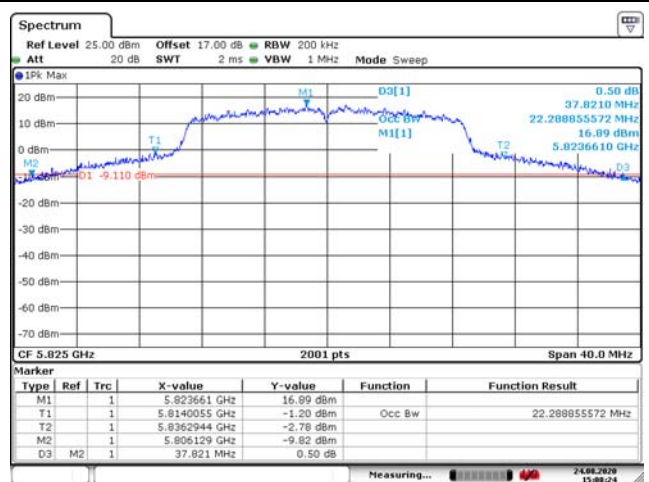
Channel 149 (5745MHz)



Channel 157 (5785MHz)

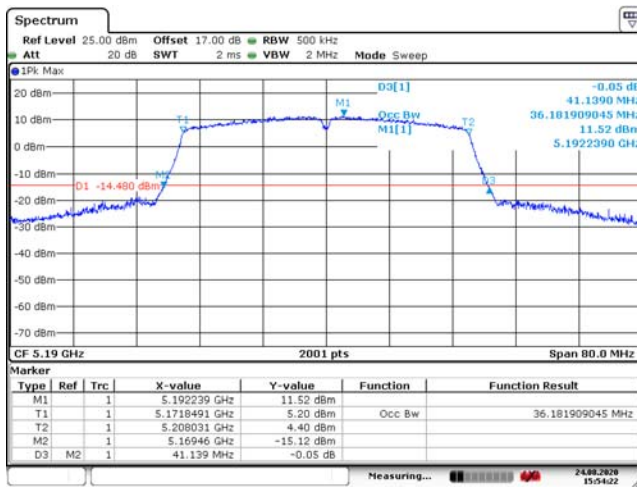


Channel 165 (5825MHz)

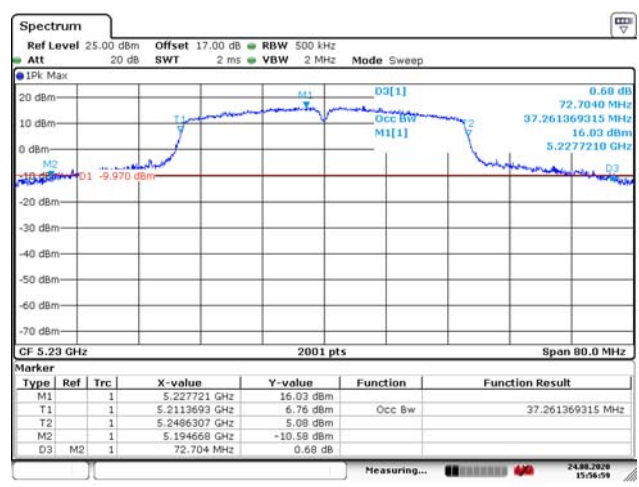


802.11n-HT40 26dB Bandwidth

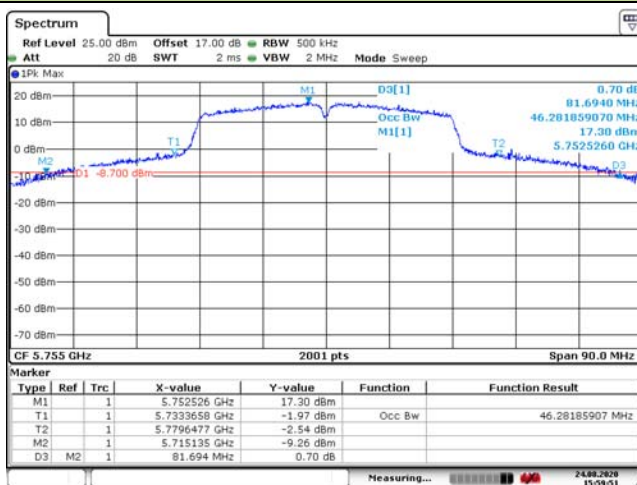
Channel 38 (5190MHz)



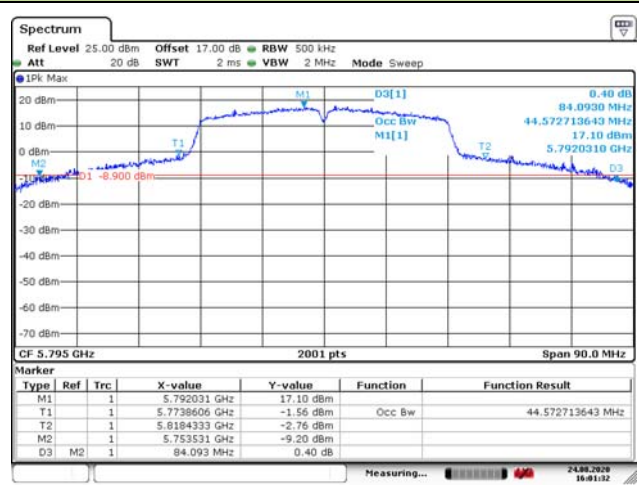
Channel 46 (5230MHz)



Channel 151 (5755MHz)

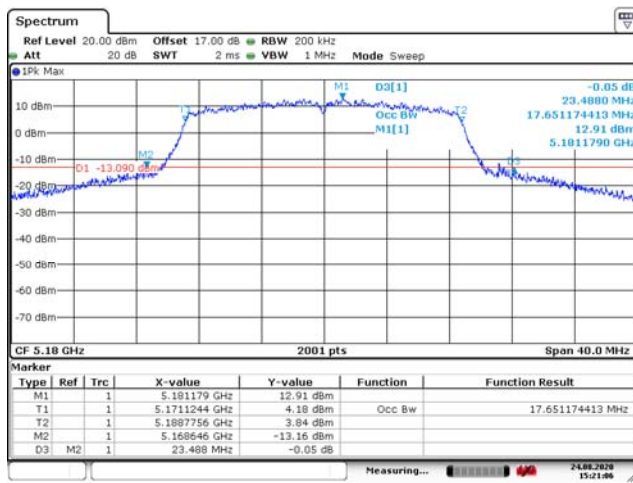


Channel 159 (5795MHz)

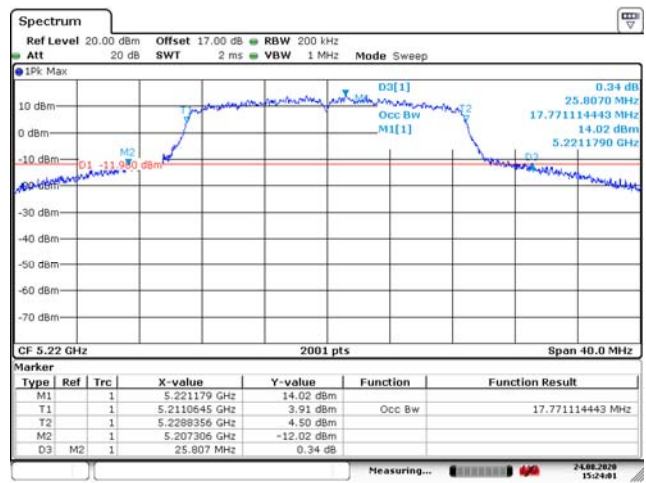


802.11ac-VHT20 26dB Bandwidth

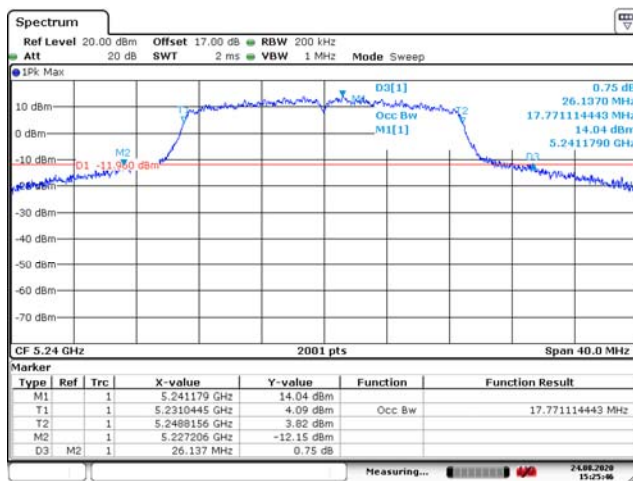
Channel 36 (5180MHz)



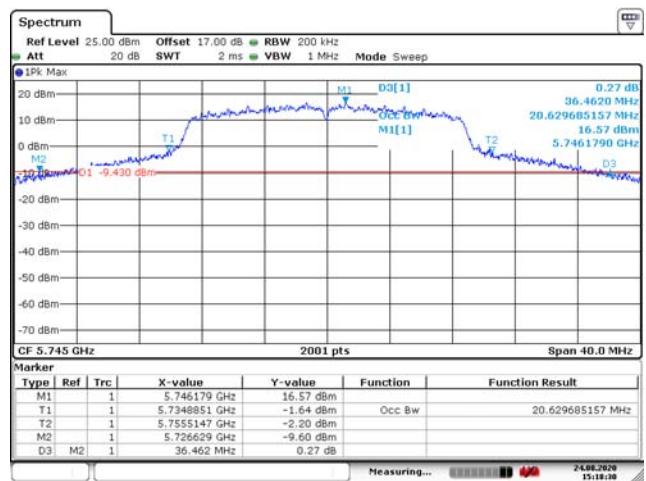
Channel 44 (5220MHz)



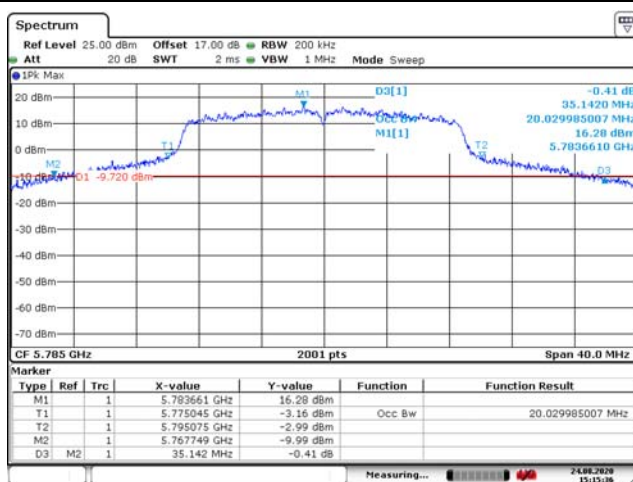
Channel 48 (5240MHz)



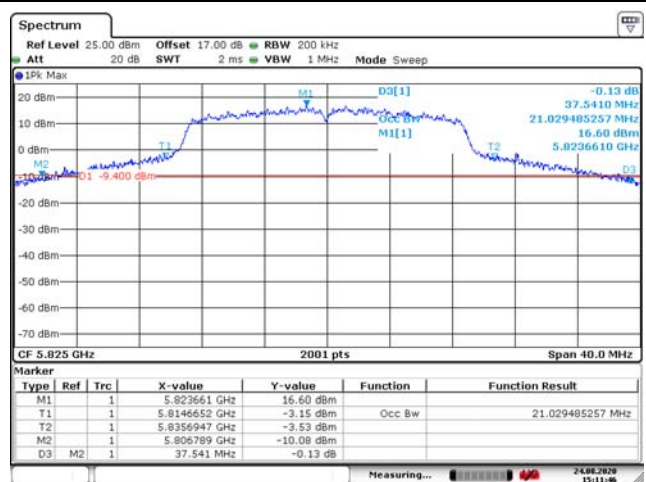
Channel 149 (5745MHz)



Channel 157 (5785MHz)

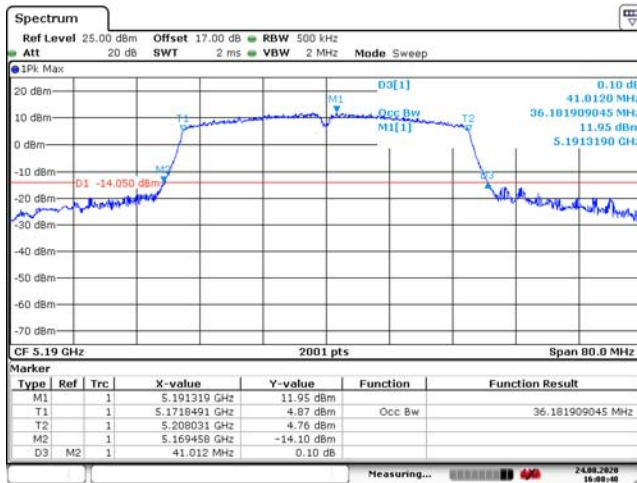


Channel 165 (5825MHz)

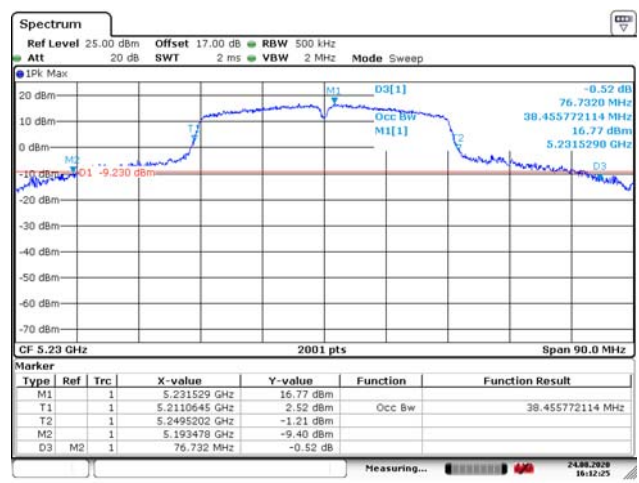


802.11ac-VHT40 26dB Bandwidth

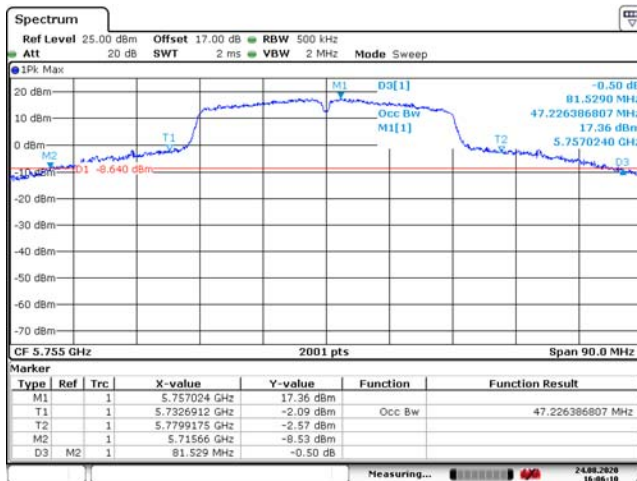
Channel 38 (5190MHz)



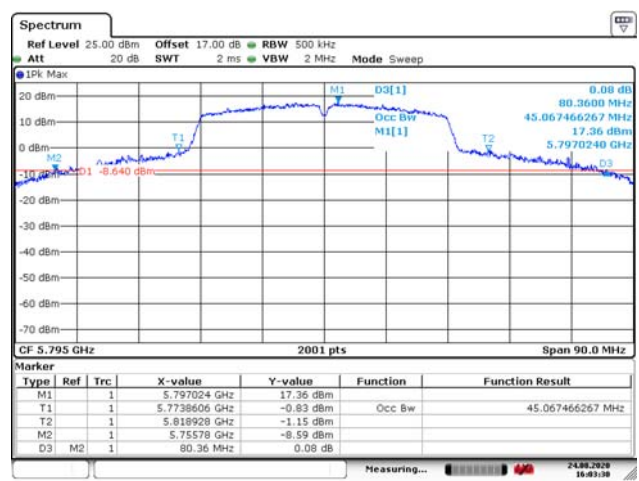
Channel 46 (5230MHz)



Channel 151 (5755MHz)

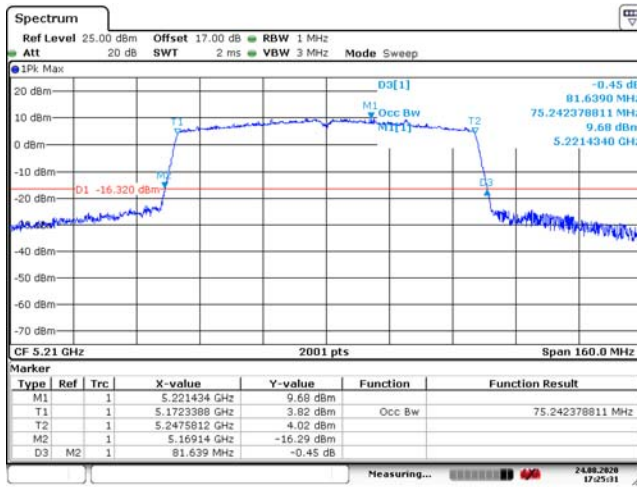


Channel 159 (5795MHz)



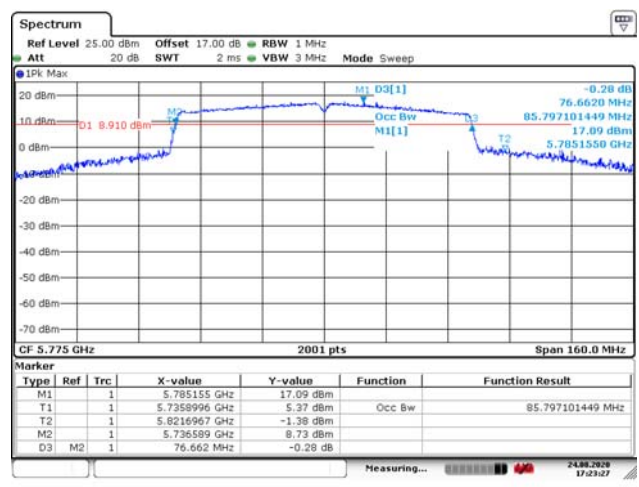
802.11ac-VHT80 26dB Bandwidth

Channel 42 (5210MHz)



Date: 24 AUG 2020 17:25:31

Channel 155 (5775MHz)



Date: 24 AUG 2020 17:25:27

6.3. 6dB Bandwidth Measurement

6.3.1. Test Limit

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

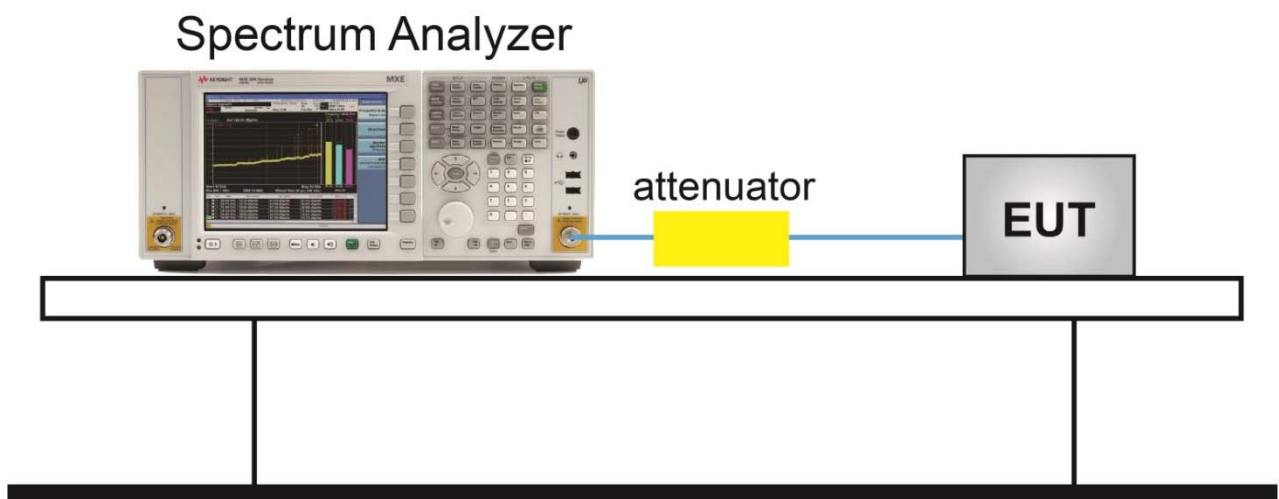
6.3.2. Test Procedure Used

KDB 789033 D02v02r01 - Section C.2

6.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = Max hold.
6. Sweep = Auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3.4. Test Setup



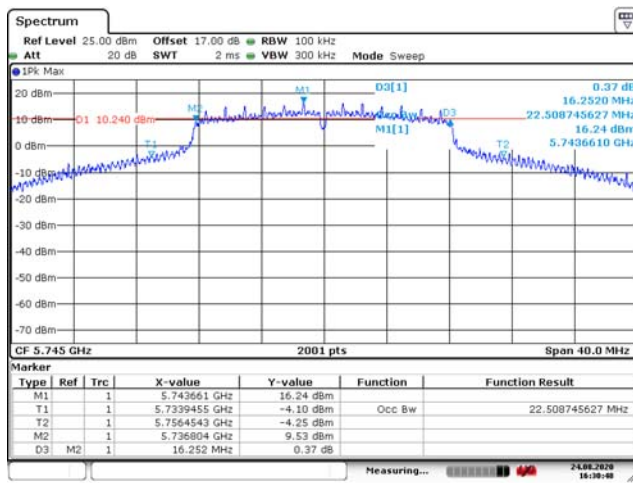
6.3.5. Test Result

Product	Subscriber End Equipment HGW	Test Engineer	Milo Li
Test Site	TR3	Test Date	2020/08/24

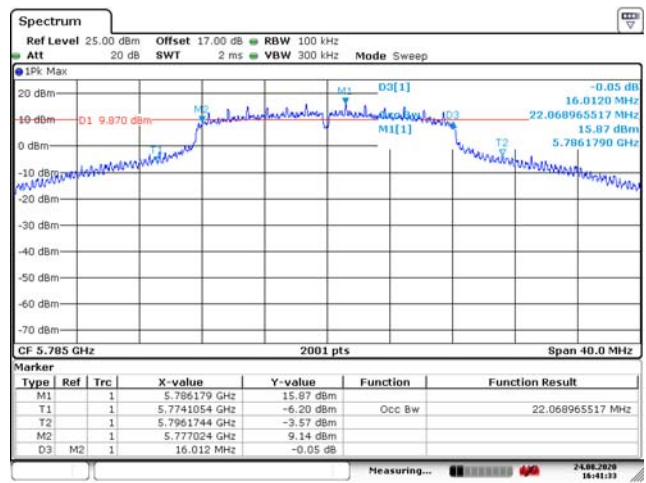
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11a	6Mbps	149	5745	16.25	≥ 0.5	Pass
802.11a	6Mbps	157	5785	16.01	≥ 0.5	Pass
802.11a	6Mbps	165	5825	16.01	≥ 0.5	Pass
802.11n-HT20	MCS0	149	5745	15.67	≥ 0.5	Pass
802.11n-HT20	MCS0	157	5785	15.33	≥ 0.5	Pass
802.11n-HT20	MCS0	165	5825	15.47	≥ 0.5	Pass
802.11n-HT40	MCS0	151	5755	35.08	≥ 0.5	Pass
802.11n-HT40	MCS0	159	5795	35.10	≥ 0.5	Pass
802.11ac-VHT20	MCS0	149	5745	15.37	≥ 0.5	Pass
802.11ac-VHT20	MCS0	157	5785	15.11	≥ 0.5	Pass
802.11ac-VHT20	MCS0	165	5825	15.13	≥ 0.5	Pass
802.11ac-VHT40	MCS0	151	5755	35.12	≥ 0.5	Pass
802.11ac-VHT40	MCS0	159	5795	35.10	≥ 0.5	Pass
802.11ac-VHT80	MCS0	155	5775	75.06	≥ 0.5	Pass

802.11a 6dB Bandwidth

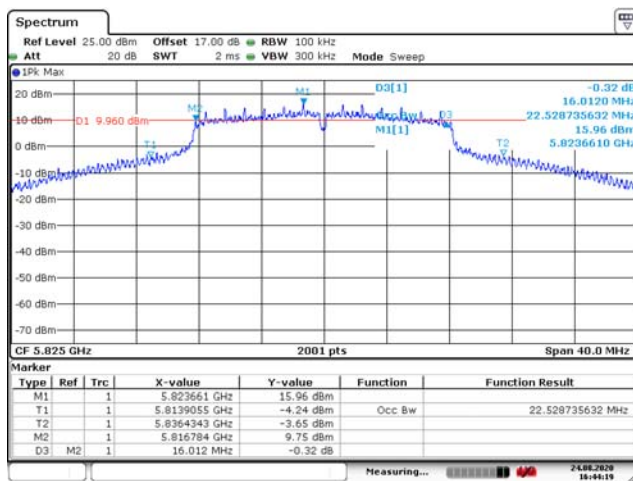
Channel 149 (5745MHz)



Channel 157 (5785MHz)

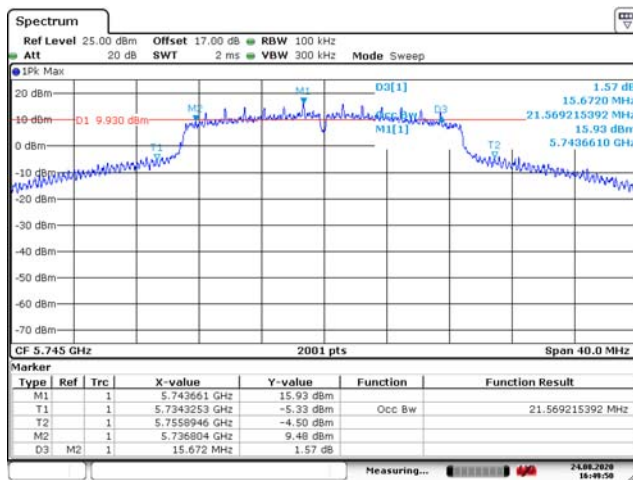


Channel 165 (5825MHz)



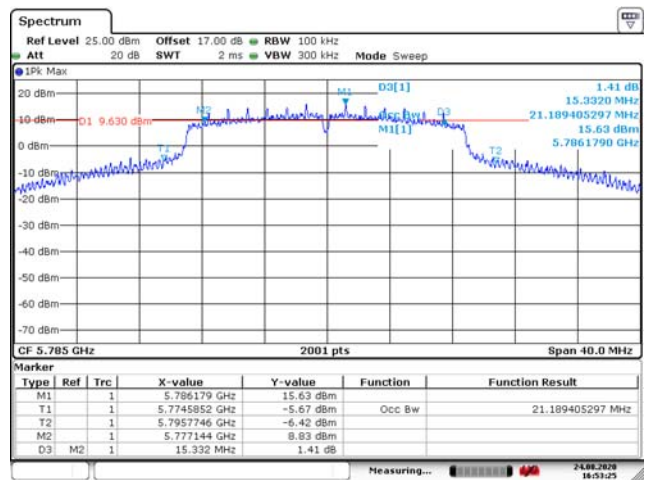
802.11n-HT20 6dB Bandwidth

Channel 149 (5745MHz)



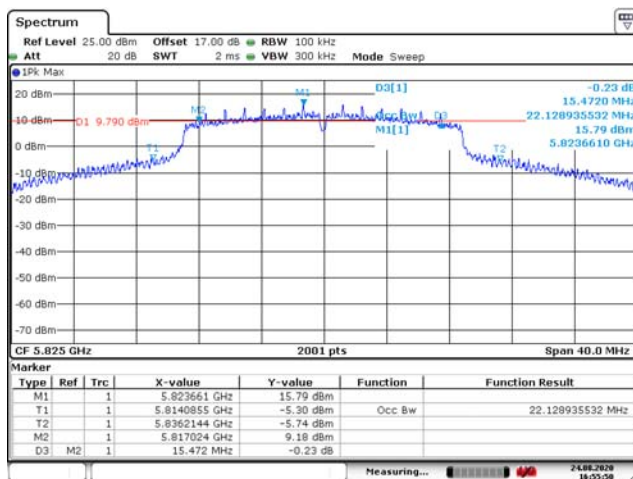
Date: 24 AUG 2020 16:49:50

Channel 157 (5785MHz)



Date: 24 AUG 2020 16:53:25

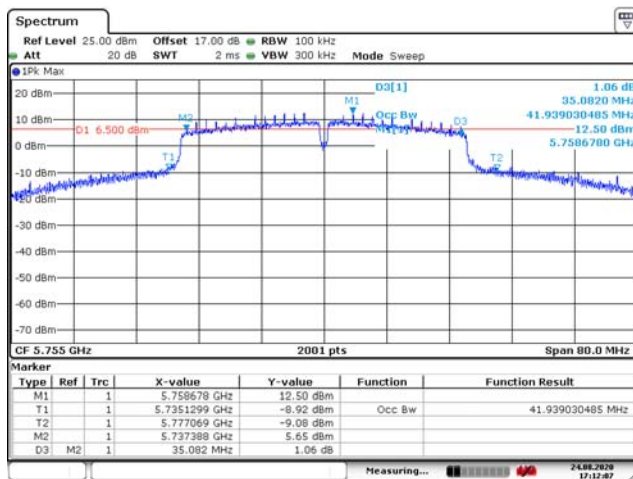
Channel 165 (5825MHz)



Date: 24 AUG 2020 16:55:51

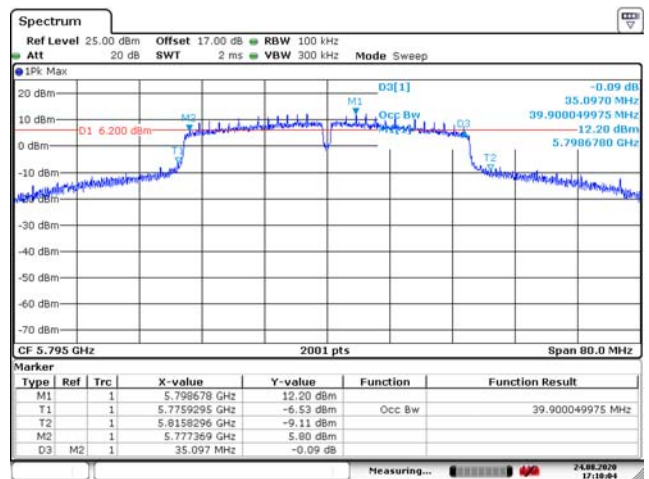
802.11n-HT40 6dB Bandwidth

Channel 151 (5755MHz)



Date: 24 AUG 2020 17:12:07

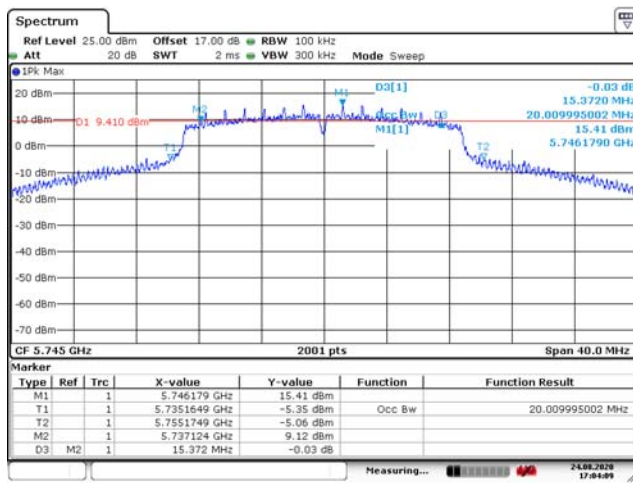
Channel 159 (5795MHz)



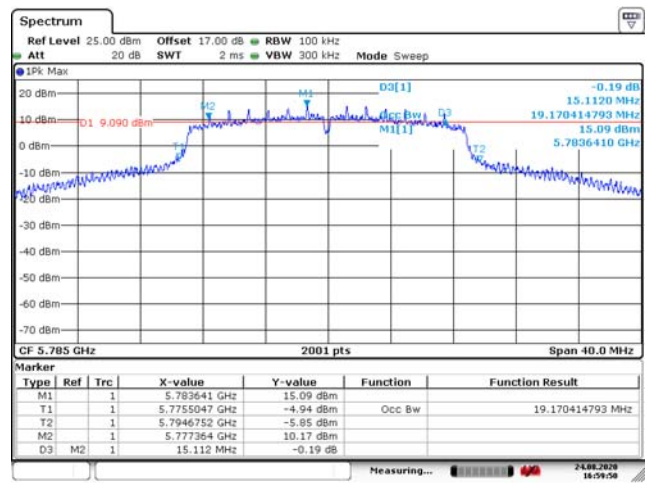
Date: 24 AUG 2020 17:18:04

802.11ac-VHT20 6dB Bandwidth

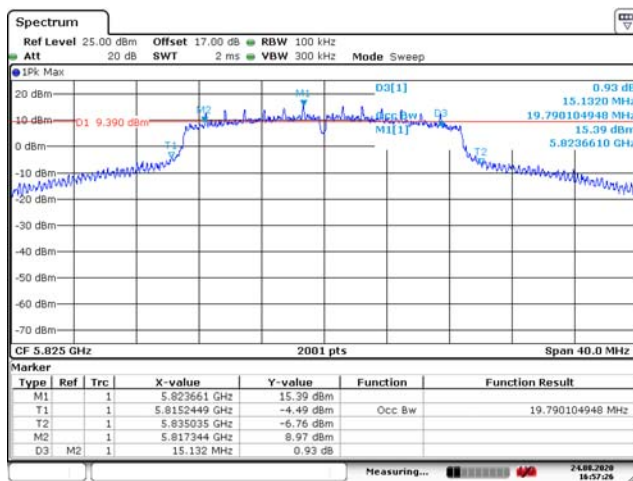
Channel 149 (5745MHz)



Channel 157 (5785MHz)

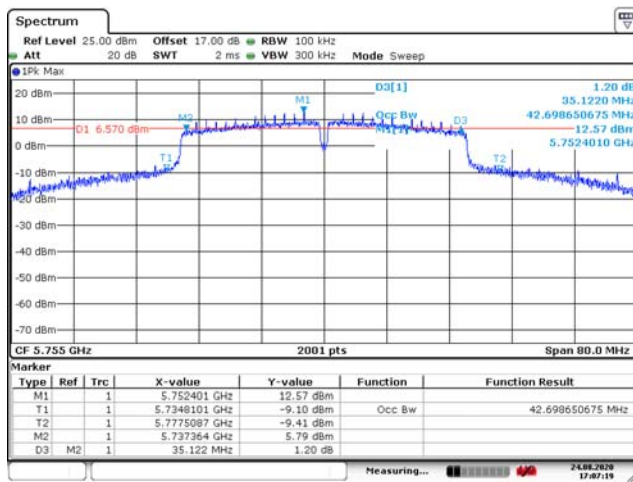


Channel 165 (5825MHz)

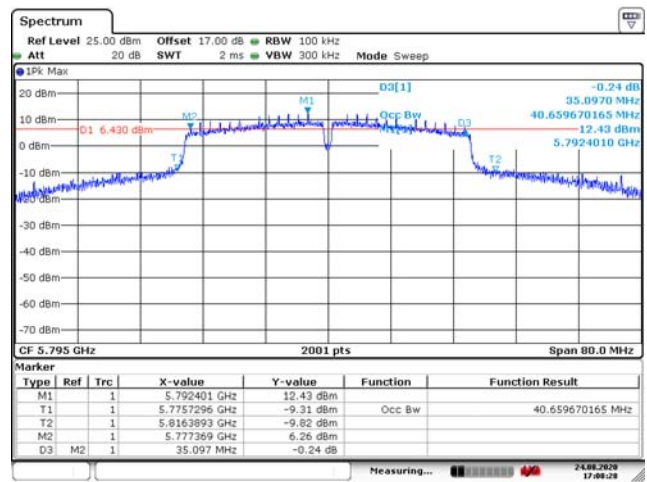


802.11ac-VHT40 6dB Bandwidth

Channel 151 (5755MHz)

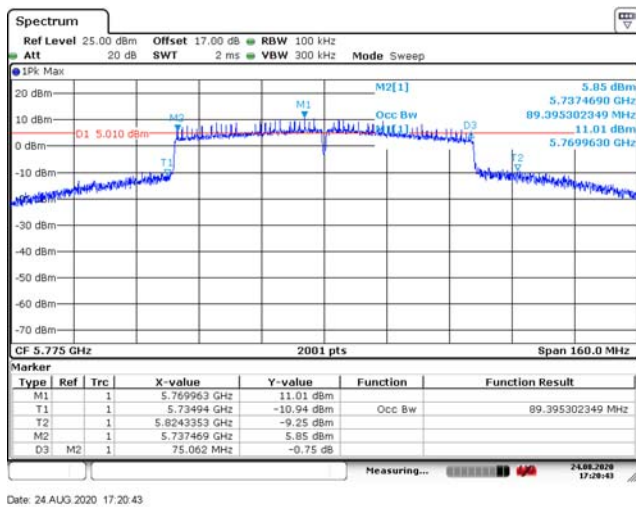


Channel 159 (5795MHz)



802.11ac-VHT80 6dB Bandwidth

Channel 155 (5775MHz)



6.4. Output Power Measurement

6.4.1. Test Limit

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

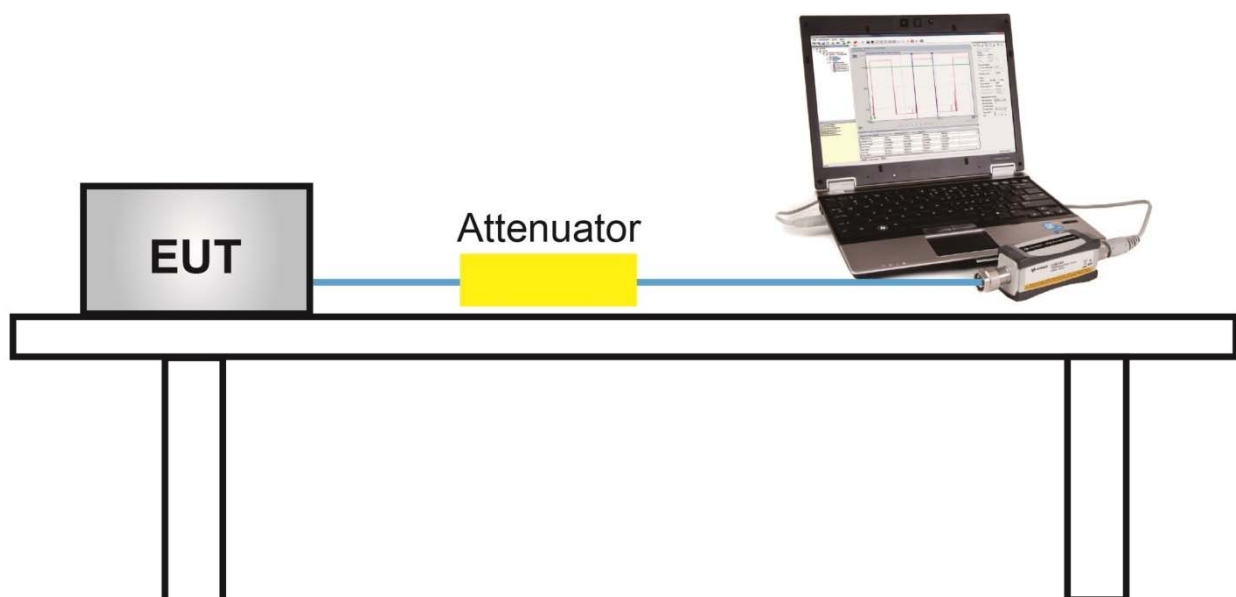
6.4.2. Test Procedure Used

KDB 789033D02v02r01- Section E)3)b) Method PM-G

6.4.3. Test Setting

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

6.4.4. Test Setup



6.4.5. Test Result

Output power test was verified over all data rates of each mode shown as below table, and then choose the maximum output power (gray marker) for final test of each channel.

Output power at various data rates for Ant 0 / Ant 0+1 port:

Test Mode	Bandwidth	Channel No.	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	23.15
				24Mbps	22.93
				54Mbps	22.71
802.11n	20	36	5180	MCS0	22.51
				MCS4	22.27
				MCS8	22.03
802.11n	40	38	5190	MCS0	20.61
				MCS4	20.38
				MCS9	20.11
802.11ac	20	36	5180	MCS0	21.33
				MCS4	21.05
				MCS8	20.88
802.11ac	40	38	5190	MCS0	21.23
				MCS4	21.05
				MCS9	20.83
802.11ac	80	42	5210	MCS0	18.17
				MCS4	18.02
				MCS9	17.84

Product	Subscriber End Equipment HGW	Test Engineer	Milo Li
Test Site	TR3	Test Date	2020/08/22

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Average Power (dBm)	Limit (dBm)	Result
				Ant 0	Ant 1			
802.11a	6Mbps	36	5180	23.15	23.07	26.12	≤ 30.00	Pass
802.11a	6Mbps	44	5220	24.48	24.73	27.62	≤ 30.00	Pass
802.11a	6Mbps	48	5240	24.53	24.61	27.58	≤ 30.00	Pass
802.11a	6Mbps	149	5745	26.63	26.81	29.73	≤ 30.00	Pass
802.11a	6Mbps	157	5785	26.91	26.86	29.90	≤ 30.00	Pass
802.11a	6Mbps	165	5825	26.93	26.84	29.90	≤ 30.00	Pass
802.11n-HT20	MCS0	36	5180	22.51	22.45	25.49	≤ 30.00	Pass
802.11n-HT20	MCS0	44	5220	24.32	24.70	27.52	≤ 30.00	Pass
802.11n-HT20	MCS0	48	5240	24.40	24.75	27.59	≤ 30.00	Pass
802.11n-HT20	MCS0	149	5745	26.68	26.85	29.78	≤ 30.00	Pass
802.11n-HT20	MCS0	157	5785	26.75	26.63	29.70	≤ 30.00	Pass
802.11n-HT20	MCS0	165	5825	26.70	26.60	29.66	≤ 30.00	Pass
802.11n-HT40	MCS0	38	5190	20.61	20.87	23.75	≤ 30.00	Pass
802.11n-HT40	MCS0	46	5230	25.86	25.89	28.89	≤ 30.00	Pass
802.11n-HT40	MCS0	151	5755	26.83	26.90	29.88	≤ 30.00	Pass
802.11n-HT40	MCS0	159	5795	26.74	26.81	29.79	≤ 30.00	Pass
802.11ac-VHT20	MCS0	36	5180	21.33	21.82	24.59	≤ 30.00	Pass
802.11ac-VHT20	MCS0	44	5220	24.17	24.17	27.18	≤ 30.00	Pass
802.11ac-VHT20	MCS0	48	5240	23.94	24.07	27.02	≤ 30.00	Pass
802.11ac-VHT20	MCS0	149	5745	26.87	26.62	29.76	≤ 30.00	Pass
802.11ac-VHT20	MCS0	157	5785	26.61	26.72	29.68	≤ 30.00	Pass
802.11ac-VHT20	MCS0	165	5825	26.65	26.48	29.58	≤ 30.00	Pass
802.11ac-VHT40	MCS0	38	5190	21.23	21.66	24.46	≤ 30.00	Pass
802.11ac-VHT40	MCS0	46	5230	26.43	26.52	29.49	≤ 30.00	Pass
802.11ac-VHT40	MCS0	151	5755	26.81	26.95	29.89	≤ 30.00	Pass
802.11ac-VHT40	MCS0	159	5795	26.71	26.90	29.82	≤ 30.00	Pass
802.11ac-VHT80	MCS0	42	5210	18.17	18.25	21.22	≤ 30.00	Pass
802.11ac-VHT80	MCS0	155	5775	26.94	26.75	29.86	≤ 30.00	Pass

Note: Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{ANT 0 Average Power}/10)} + 10^{(\text{ANT 1 Average Power}/10)}\}$ (dBm).

6.5. Transmit Power Control

6.5.1. Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

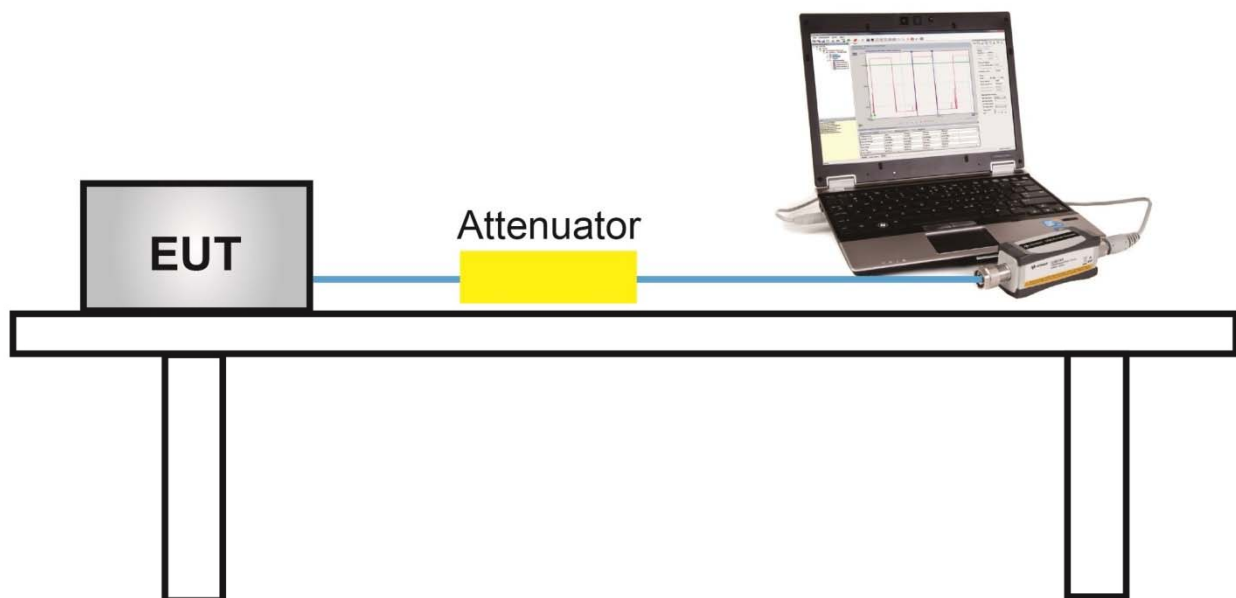
6.5.2. Test Procedure Used

ANSI C63.10-2013- Section 12.3.3.2 Method PM-G

6.5.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

6.5.4. Test Setup



6.5.5. Test Result

A TPC mechanism is not required for U-NII devices operating in the 5.15-5.25 GHz band and the 5.745-5.825 GHz band.

6.6. Power Spectral Density Measurement

6.6.1. Test Limit

For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

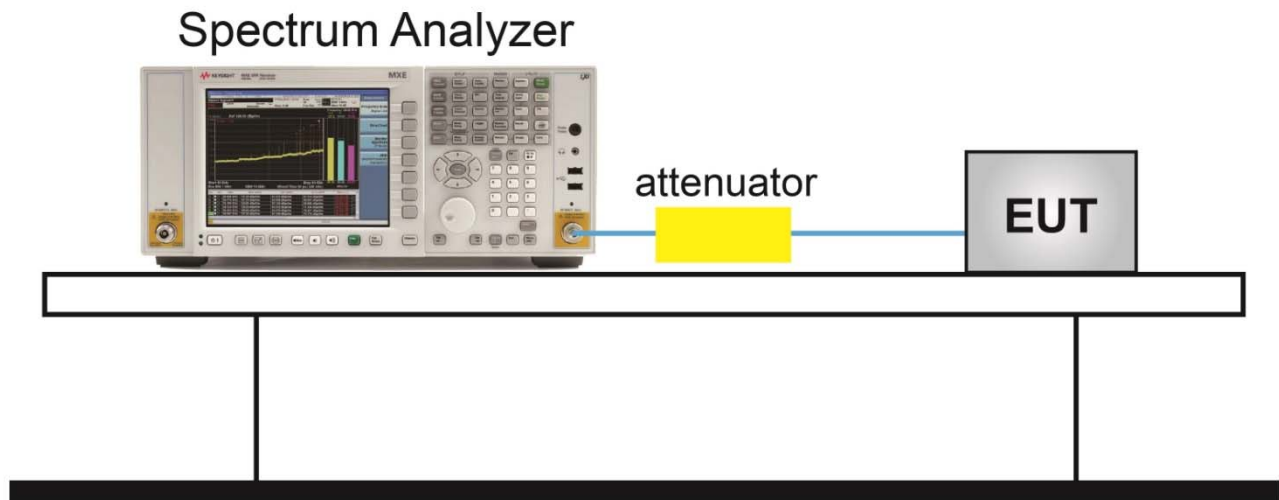
6.6.2. Test Procedure Used

KDB 789033 D02v02r01 - Section F

6.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz
If measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 510kHz
4. VBW = 3MHz
5. Number of sweep points $\geq 2 \times (\text{span} / \text{RBW})$
6. Detector = Power averaging (Average)
7. Trace average at least 100 traces in power averaging (rms) mode
8. Sweep time = Auto
9. Trigger = Free run
10. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
11. Add $10 \cdot \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \cdot \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.

6.6.4. Test Setup



6.6.5. Test Result

Product	Subscriber End Equipment HGW	Test Engineer	Milo Li
Test Site	TR3	Test Date	2020/08/22
Test Item	Power Spectral Density (UNII-Band 1)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)		Duty Cycle (%)	Final PSD (dBm/MHz)	PSD Limit (dBm/MHz)	Result
				Ant 0	Ant 1				
11a	6Mbps	36	5180	12.09	12.52	94.21	15.58	≤16.59	Pass
11a	6Mbps	44	5220	12.89	13.18	94.21	16.31	≤16.59	Pass
11a	6Mbps	48	5240	12.72	13.19	94.21	16.23	≤16.59	Pass
11n-HT20	MCS0	36	5180	10.81	10.93	94.84	14.11	≤16.59	Pass
11n-HT20	MCS0	44	5220	12.90	12.98	94.84	16.18	≤16.59	Pass
11n-HT20	MCS0	48	5240	12.50	12.96	94.84	15.98	≤16.59	Pass
11n-HT40	MCS0	38	5190	5.67	6.17	90.29	9.38	≤16.59	Pass
11n-HT40	MCS0	46	5230	10.77	11.42	90.29	14.56	≤16.59	Pass
11ac-VHT20	MCS0	36	5180	12.07	12.23	90.60	15.59	≤16.59	Pass
11ac-VHT20	MCS0	44	5220	13.19	13.02	90.60	16.54	≤16.59	Pass
11ac-VHT20	MCS0	48	5240	12.43	13.09	90.60	16.21	≤16.59	Pass
11ac-VHT40	MCS0	38	5190	6.40	6.85	77.48	10.75	≤16.59	Pass
11ac-VHT40	MCS0	46	5230	11.45	11.74	77.48	15.72	≤16.59	Pass
11ac-VHT80	MCS0	42	5210	0.88	1.57	62.65	6.28	≤16.59	Pass

Note 1:

When EUT duty cycle > 98%, Final PSD (dBm / MHz) = $10 \cdot \log\{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\}$.

When EUT duty cycle < 98%, Final PSD (dBm / MHz) = $10 \cdot \log\{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\} + 10 \cdot \log(1/Duty\ cycle)$.

Note 2: PSD Limit Calculation as below:

For 5150-5250MHz: PSD Limit = 17 - (6.41 - 6) = 16.59dBm/MHz;

Product	Subscriber End Equipment HGW	Test Engineer	Milo Li
Test Site	TR3	Test Date	2020/08/22
Test Item	Power Spectral Density (UNII-Band 3)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD(dBm/ 500kHz)		Duty Cycle (%)	Final PSD(dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
				Ant 0	Ant 1				
11a	6Mbps	149	5745	13.54	13.14	94.21	16.61	≤29.59	Pass
11a	6Mbps	157	5785	12.80	13.10	94.21	16.22	≤29.59	Pass
11a	6Mbps	165	5825	12.66	12.79	94.21	15.99	≤29.59	Pass
11n-HT20	MCS0	149	5745	12.50	12.43	94.84	15.71	≤29.59	Pass
11n-HT20	MCS0	157	5785	12.31	12.35	94.84	15.57	≤29.59	Pass
11n-HT20	MCS0	165	5825	12.26	12.67	94.84	15.71	≤29.59	Pass
11n-HT40	MCS0	151	5755	9.46	9.52	90.29	12.94	≤29.59	Pass
11n-HT40	MCS0	159	5795	9.28	9.56	90.29	12.88	≤29.59	Pass
11ac-VHT20	MCS0	149	5745	12.68	12.80	90.60	16.18	≤29.59	Pass
11ac-VHT20	MCS0	157	5785	11.93	12.29	90.60	15.55	≤29.59	Pass
11ac-VHT20	MCS0	165	5825	11.93	11.74	90.60	15.28	≤29.59	Pass
11ac-VHT40	MCS0	151	5755	8.90	9.53	77.48	13.34	≤29.59	Pass
11ac-VHT40	MCS0	159	5795	9.04	9.17	77.48	13.22	≤29.59	Pass
11ac-VHT80	MCS0	155	5775	5.58	6.65	62.65	11.19	≤29.59	Pass

Note 1:

When EUT duty cycle > 98%, Final PSD (dBm / 510kHz) = $10 \cdot \log\{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\}$.

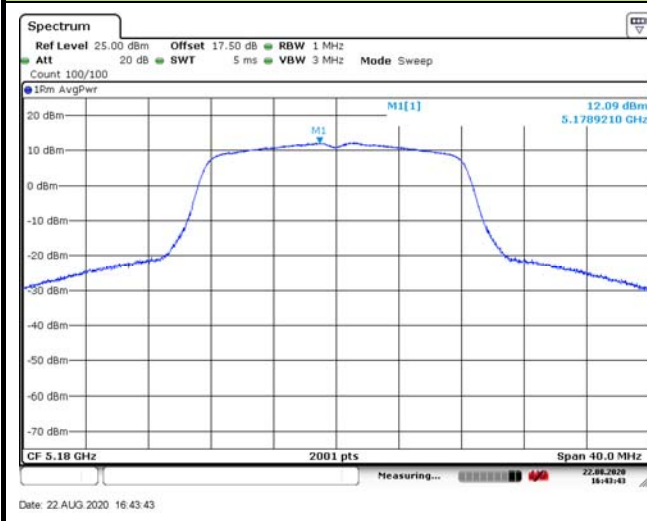
When EUT duty cycle < 98%, Final PSD (dBm / 510kHz) = $10 \cdot \log\{10^{(Ant\ 0\ AVG\ PSD/10)} + 10^{(Ant\ 1\ AVG\ PSD/10)}\}$
+ $10 \cdot \log(1/Duty\ cycle)$.

Note 2: PSD Limit Calculation as below:

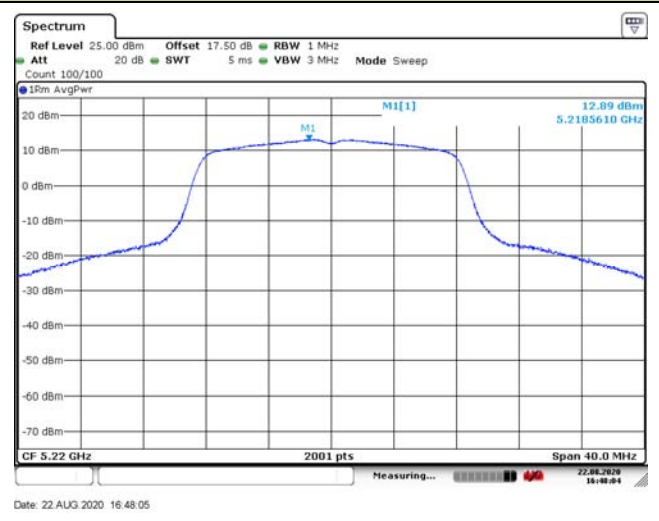
For 5725-5850MHz: PSD Limit = 30 - (6.41 - 6) = 29.59dBm/MHz;

802.11a Power Spectral Density - Ant 0 / Ant 0 + 1

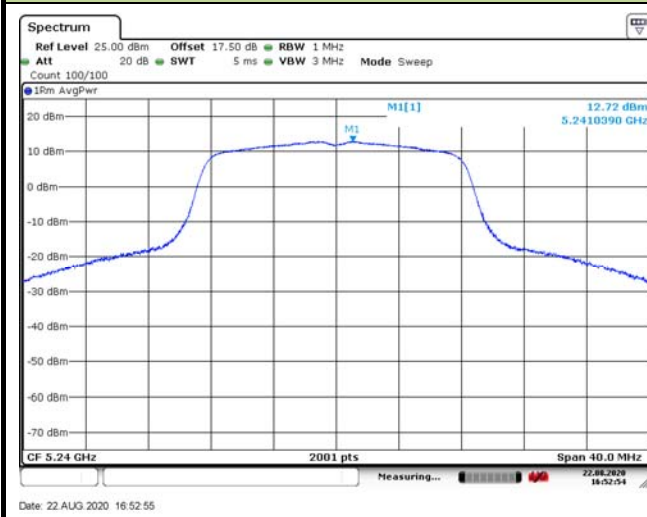
Channel 36 (5180MHz)



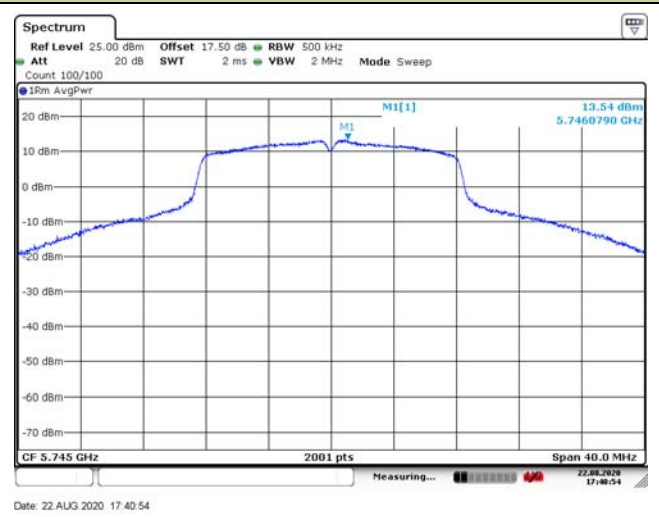
Channel 44 (5220MHz)



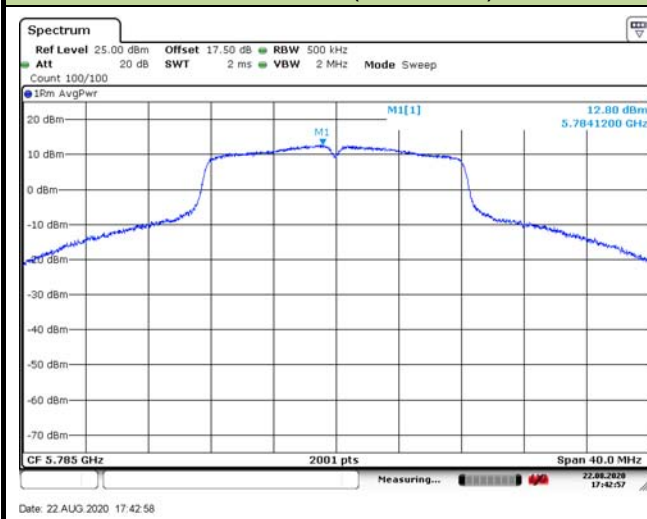
Channel 48 (5240MHz)



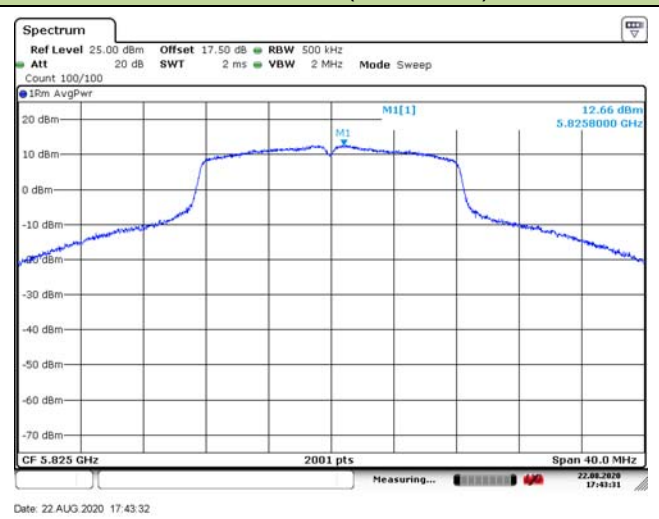
Channel 149 (5745MHz)



Channel 157 (5785MHz)

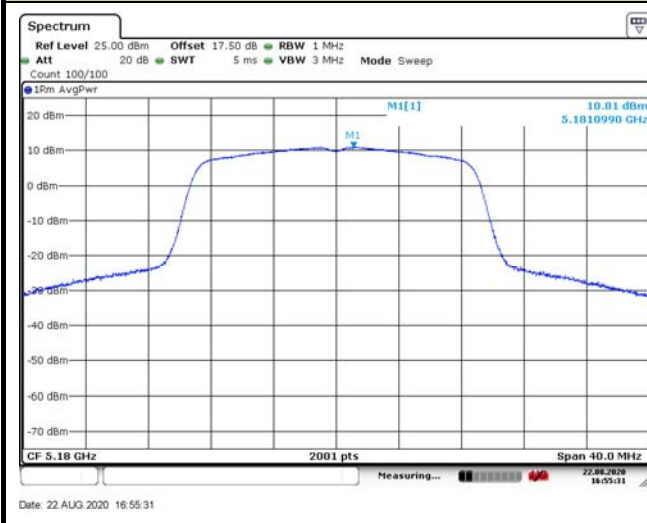


Channel 165 (5825MHz)

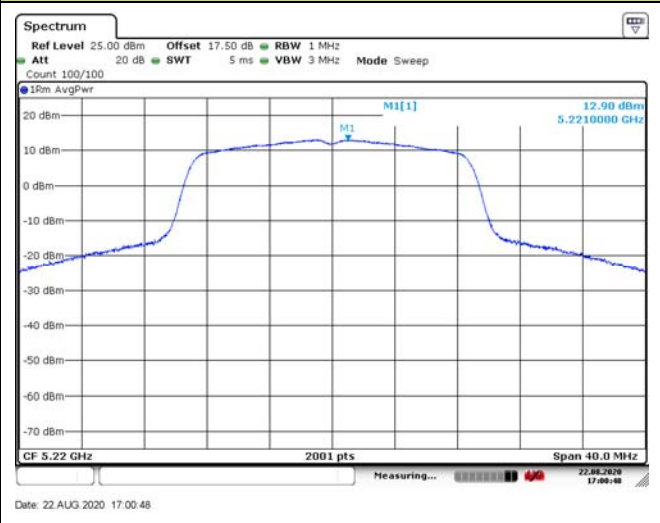


802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1

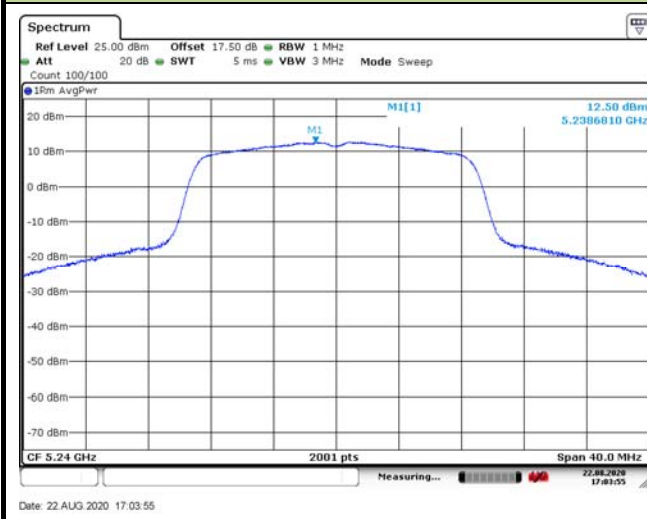
Channel 36 (5180MHz)



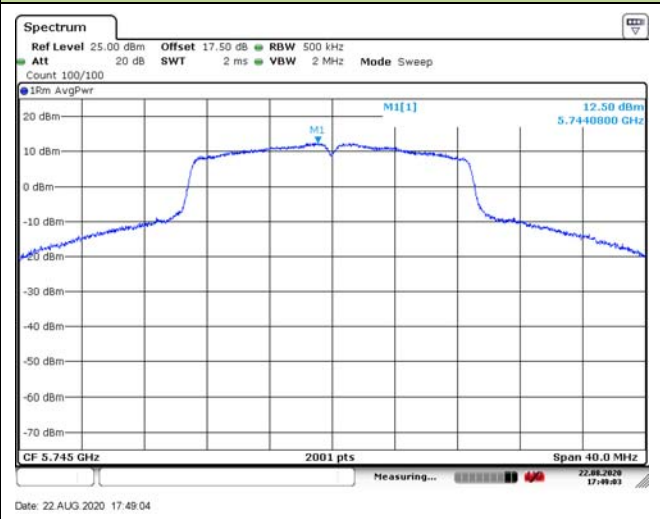
Channel 44 (5220MHz)



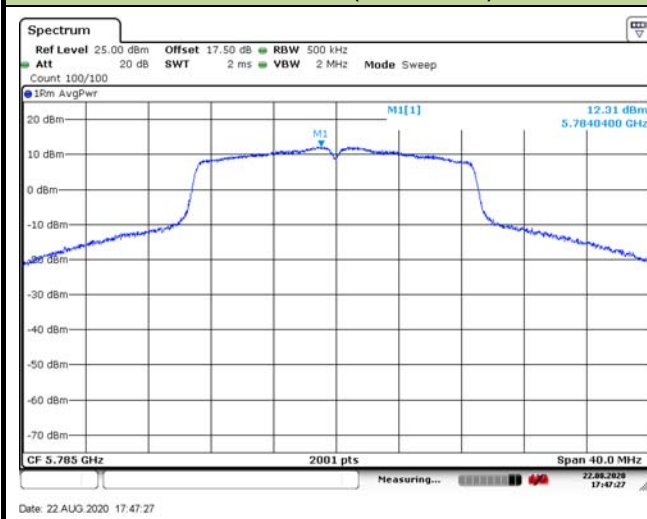
Channel 48 (5240MHz)



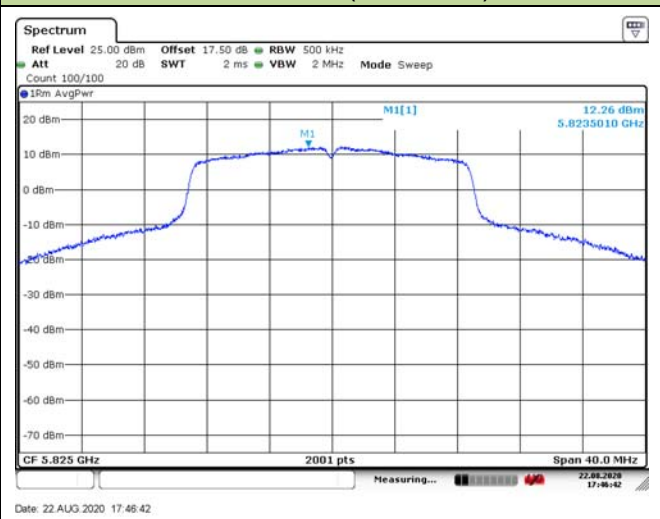
Channel 149 (5745MHz)



Channel 157 (5785MHz)

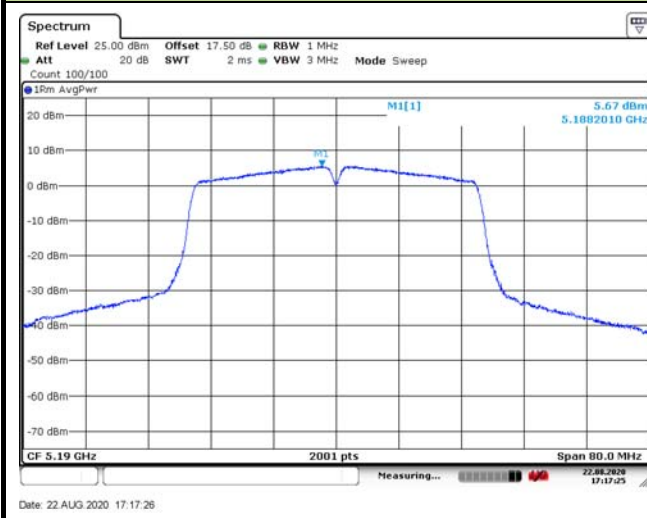


Channel 165 (5825MHz)

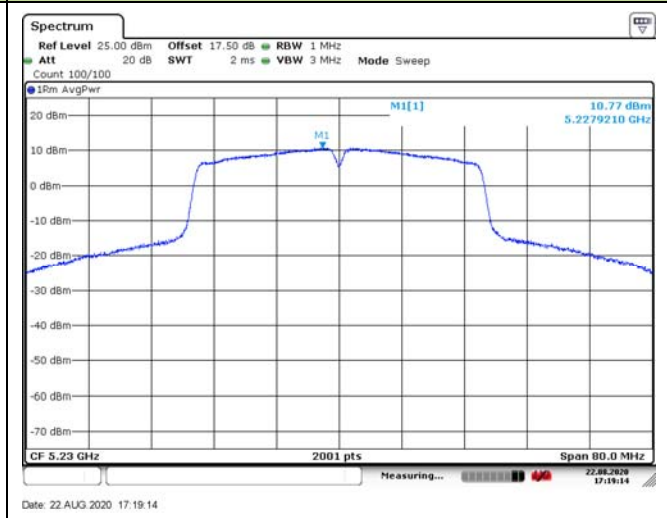


802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0 + 1

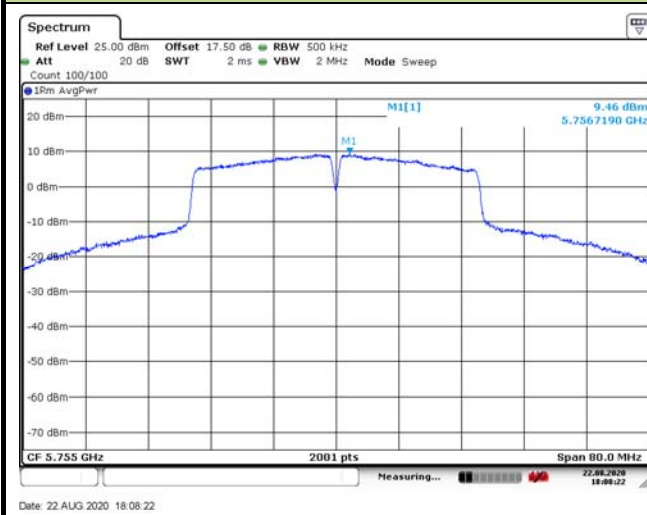
Channel 38 (5190MHz)



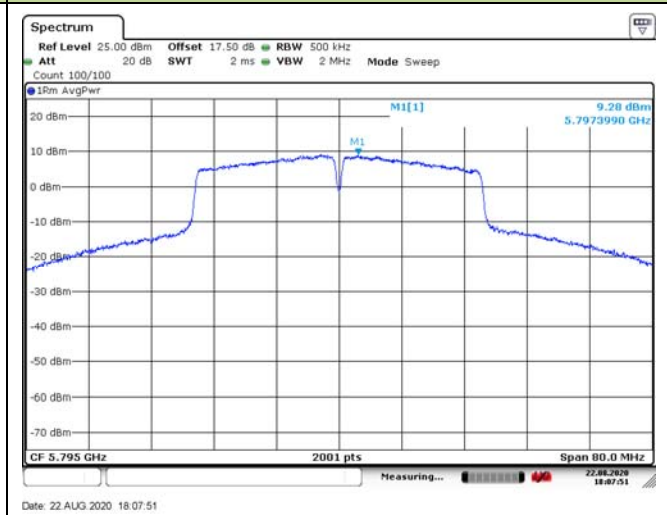
Channel 46 (5230MHz)



Channel 151 (5755MHz)

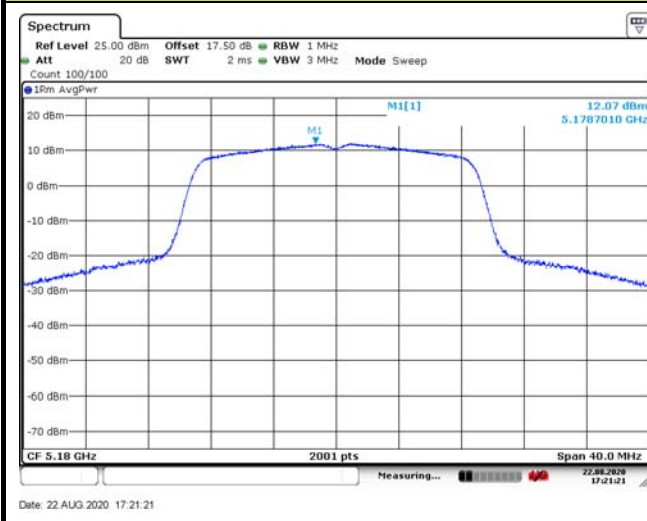


Channel 159 (5795MHz)

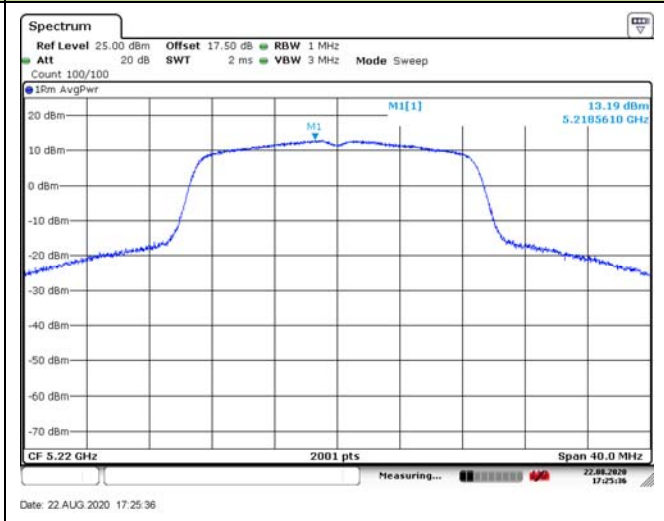


802.11ac-VHT20 Power Spectral Density - Ant 0 / Ant 0 + 1

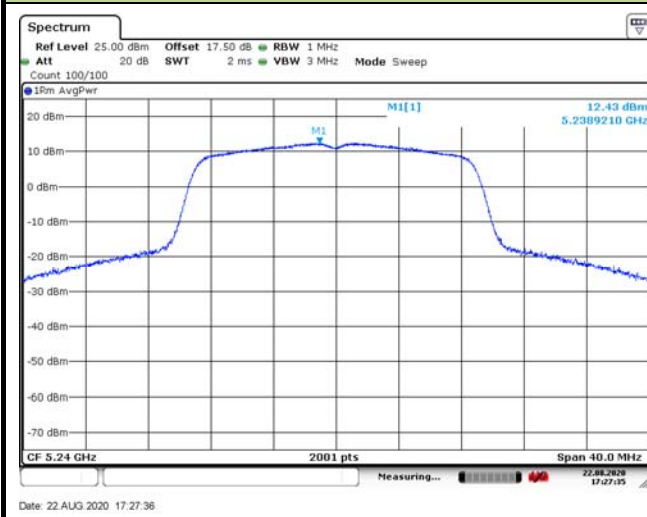
Channel 36 (5180MHz)



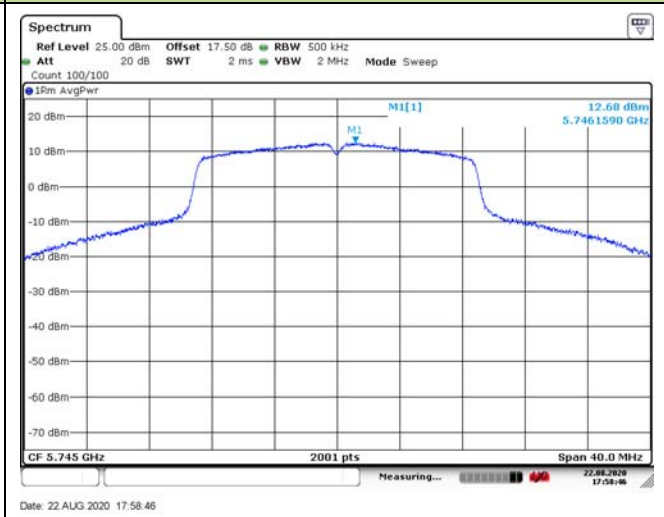
Channel 44 (5220MHz)



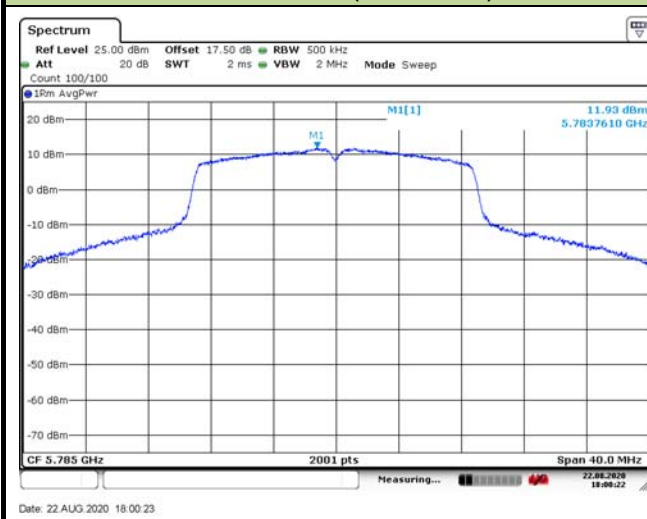
Channel 48 (5240MHz)



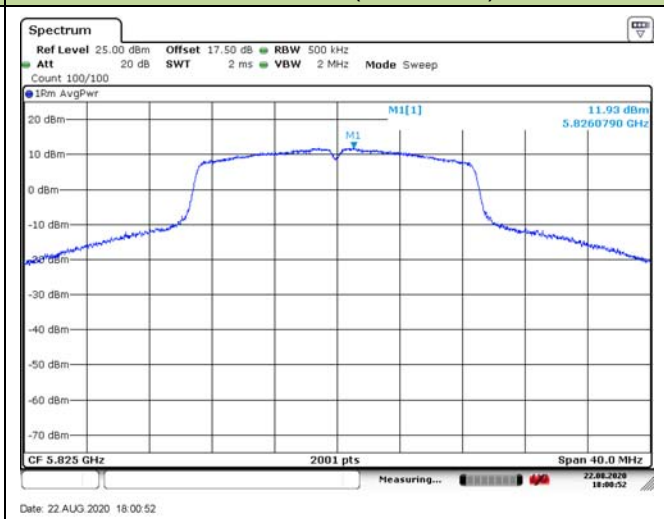
Channel 149 (5745MHz)



Channel 157 (5785MHz)

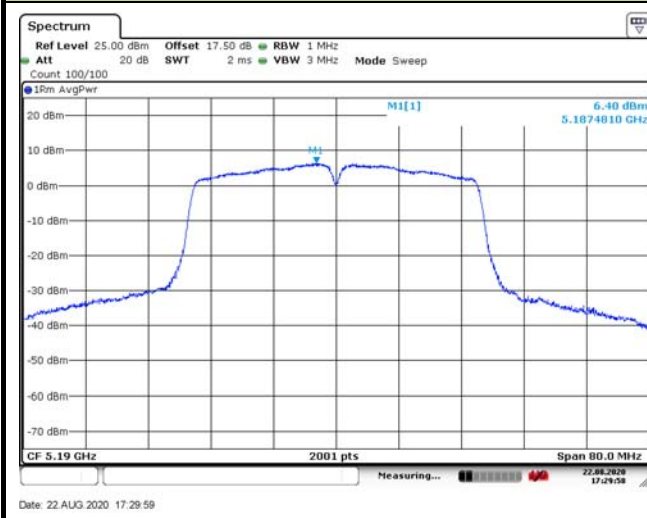


Channel 165 (5825MHz)

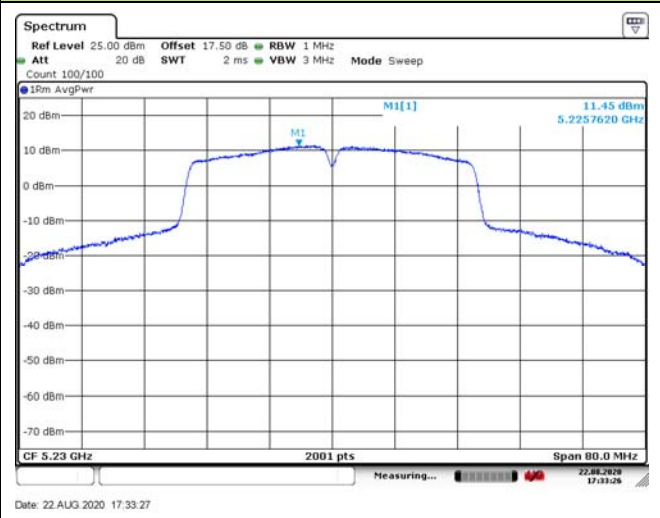


802.11ac-VHT40 Power Spectral Density - Ant 0 / Ant 0 + 1

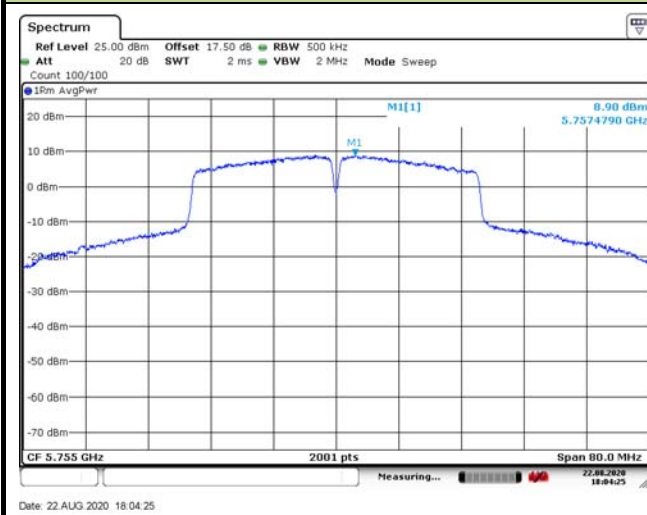
Channel 38 (5190MHz)



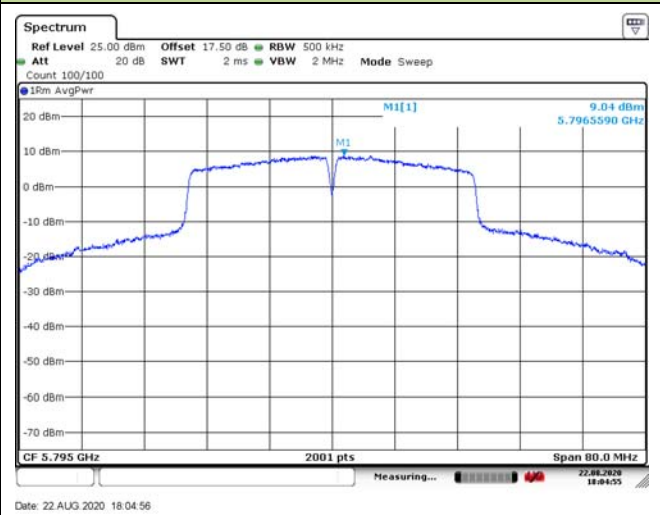
Channel 46 (5230MHz)



Channel 151 (5755MHz)

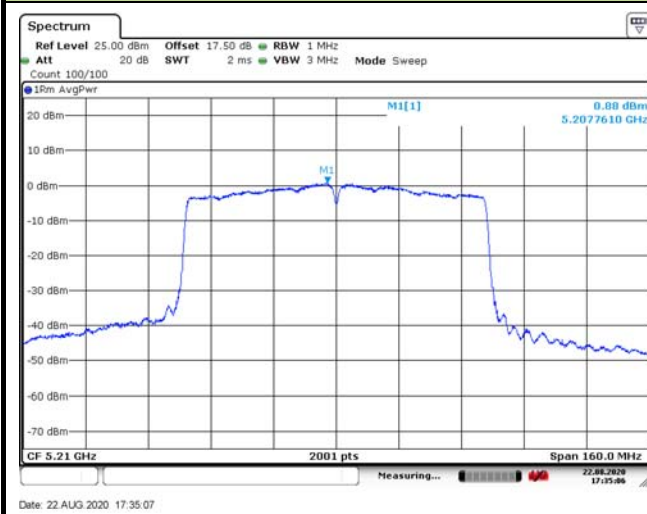


Channel 159 (5795MHz)

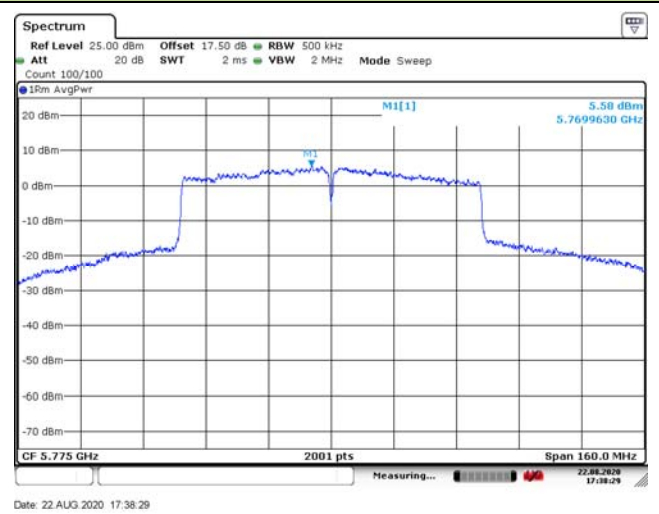


802.11ac-VHT80 Power Spectral Density - Ant 0 / Ant 0 + 1

Channel 42 (5210MHz)

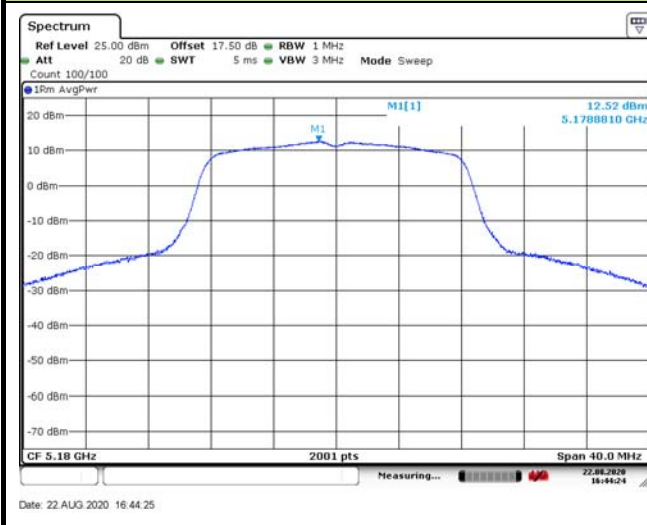


Channel 155 (5775MHz)

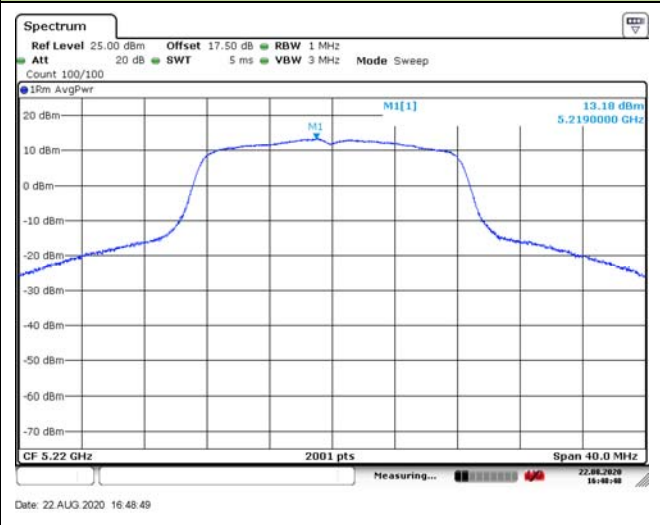


802.11a Power Spectral Density - Ant 1 / Ant 0 + 1

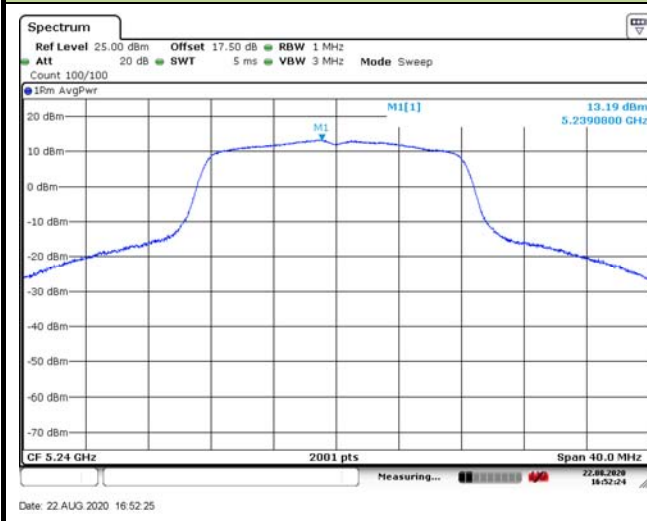
Channel 36 (5180MHz)



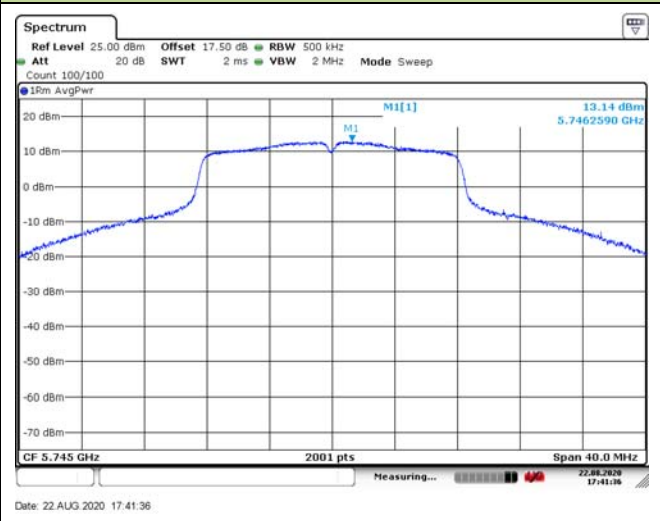
Channel 44 (5220MHz)



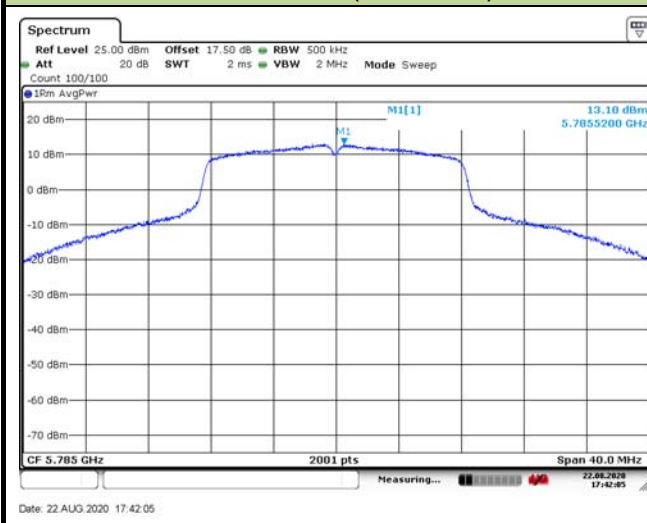
Channel 48 (5240MHz)



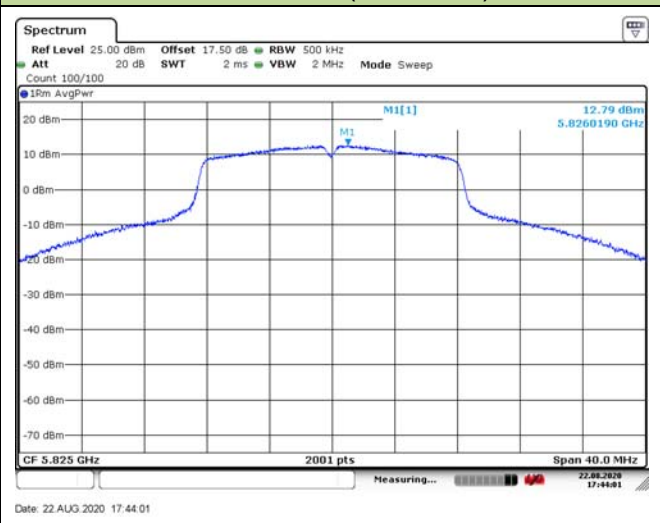
Channel 149 (5745MHz)



Channel 157 (5785MHz)

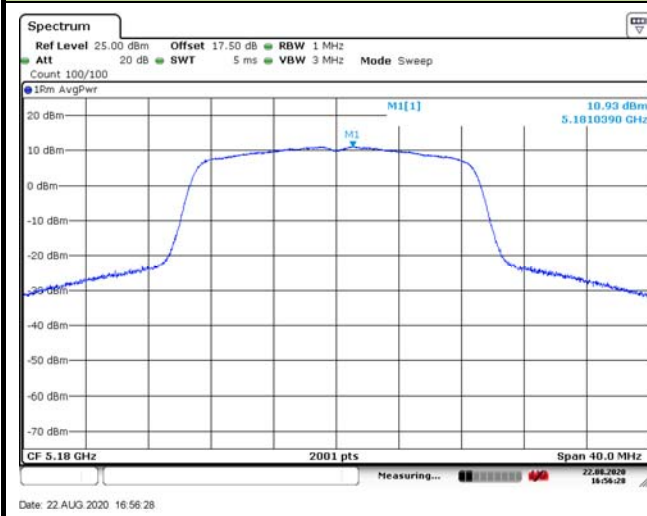


Channel 165 (5825MHz)

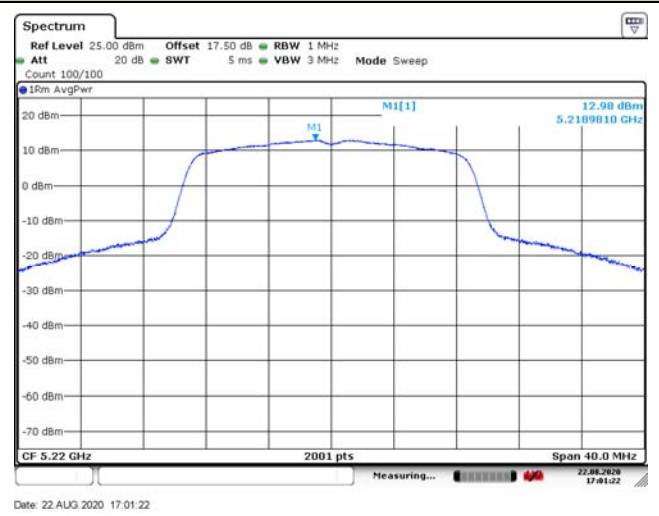


802.11n-HT20 Power Spectral Density - Ant 1 / Ant 0 + 1

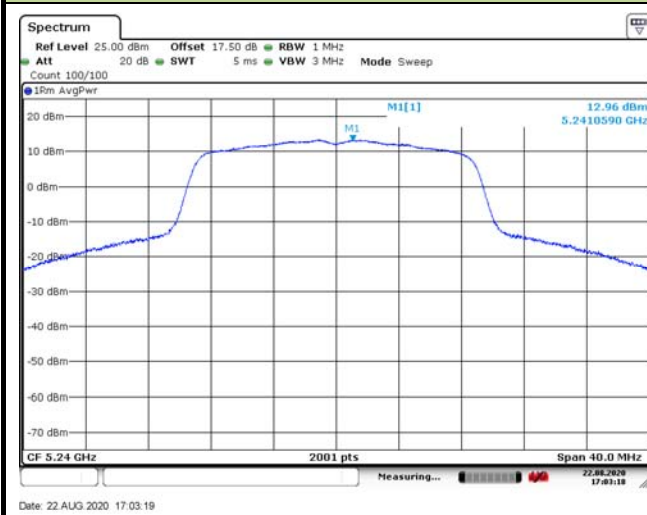
Channel 36 (5180MHz)



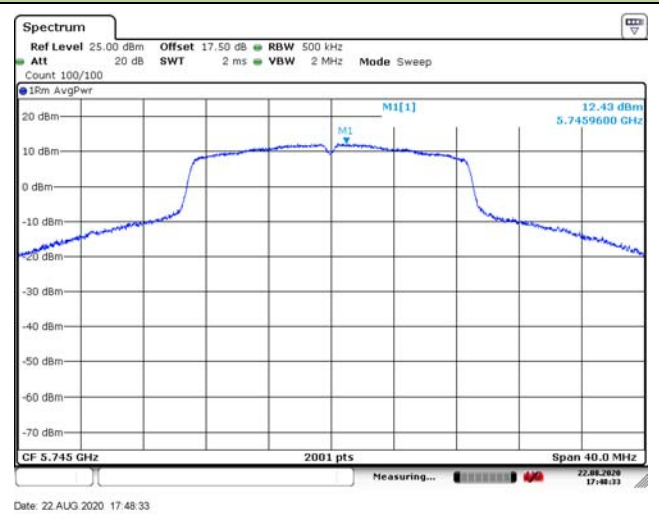
Channel 44 (5220MHz)



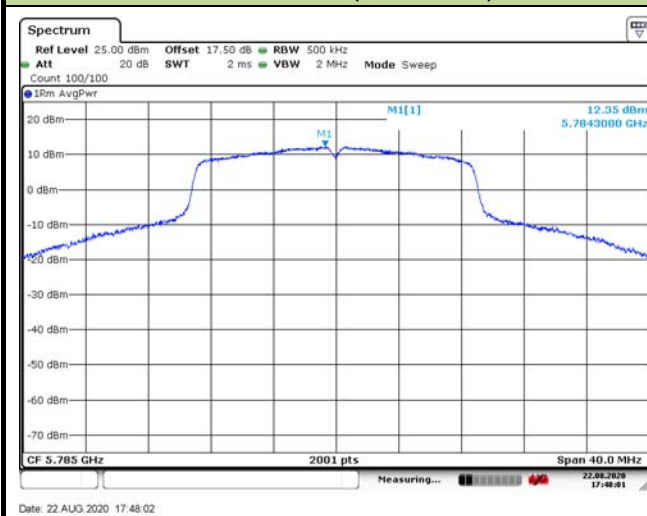
Channel 48 (5240MHz)



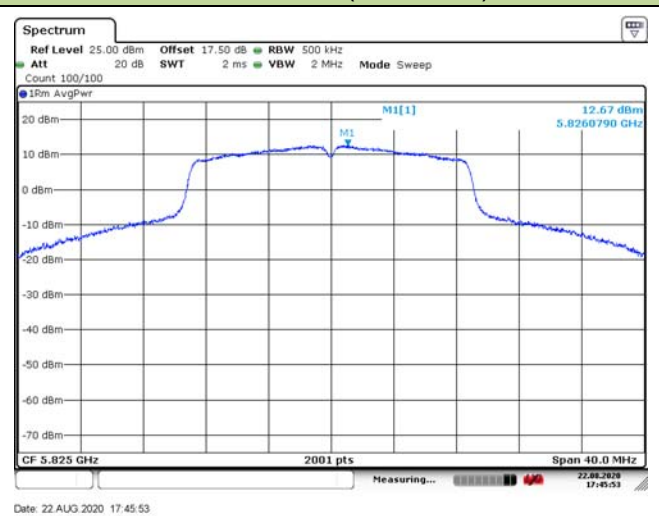
Channel 149 (5745MHz)



Channel 157 (5785MHz)

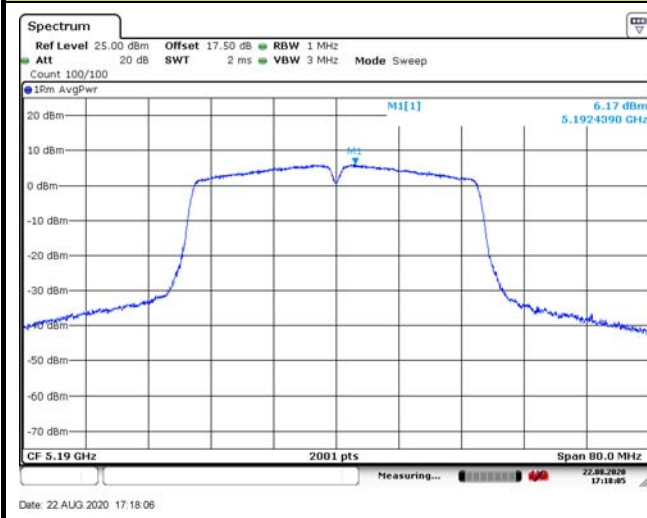


Channel 165 (5825MHz)

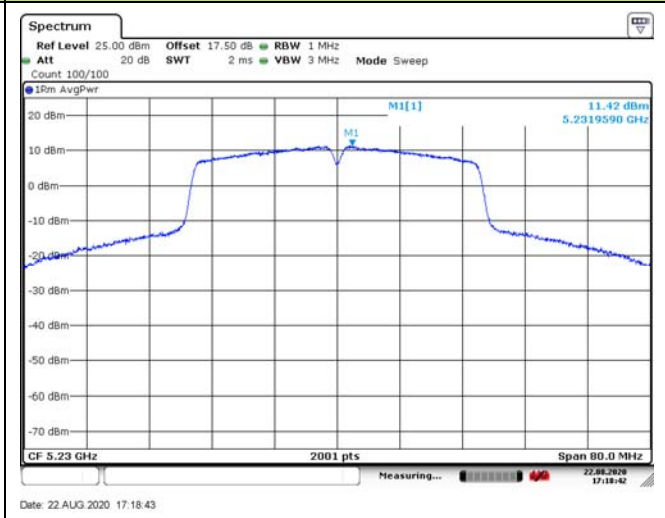


802.11n-HT40 Power Spectral Density - Ant 1 / Ant 0 + 1

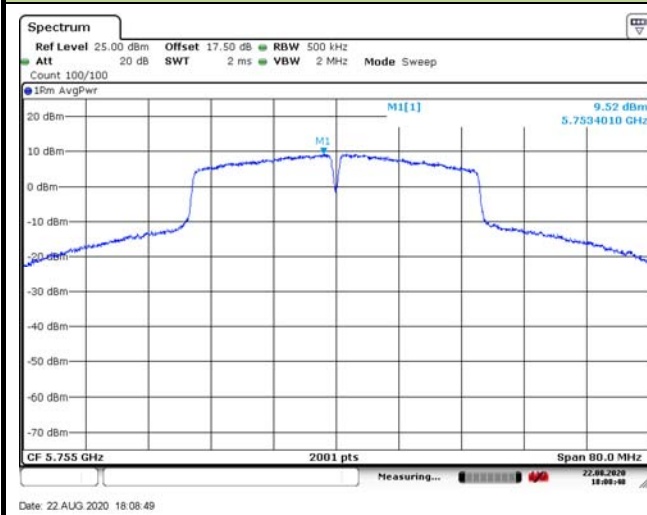
Channel 38 (5190MHz)



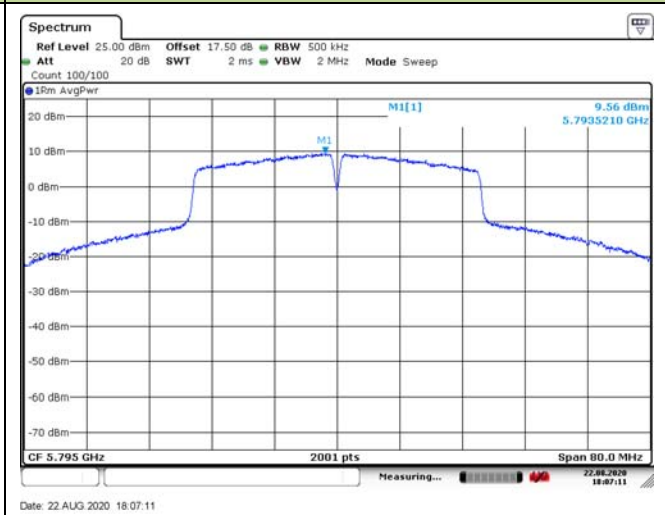
Channel 46 (5230MHz)



Channel 151 (5755MHz)

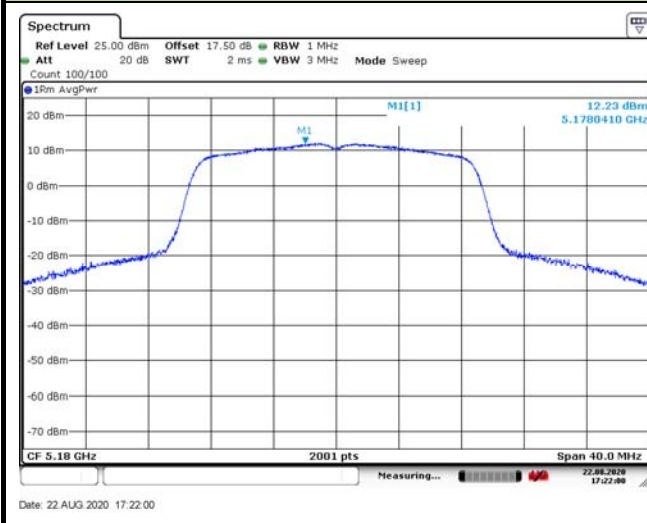


Channel 159 (5795MHz)

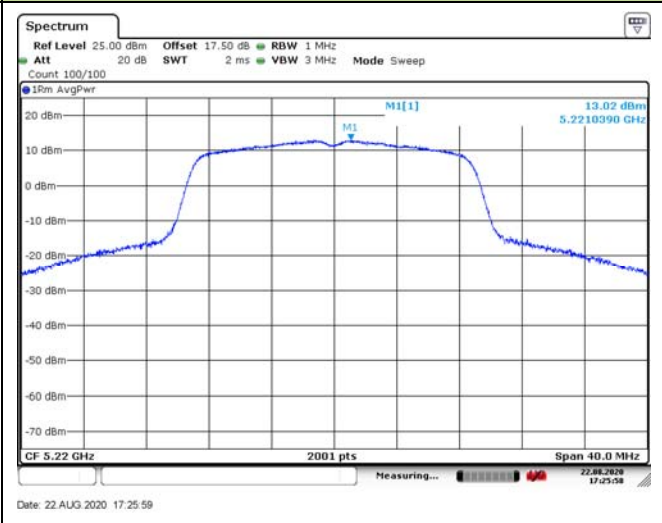


802.11ac-VHT20 Power Spectral Density - Ant 1 / Ant 0 + 1

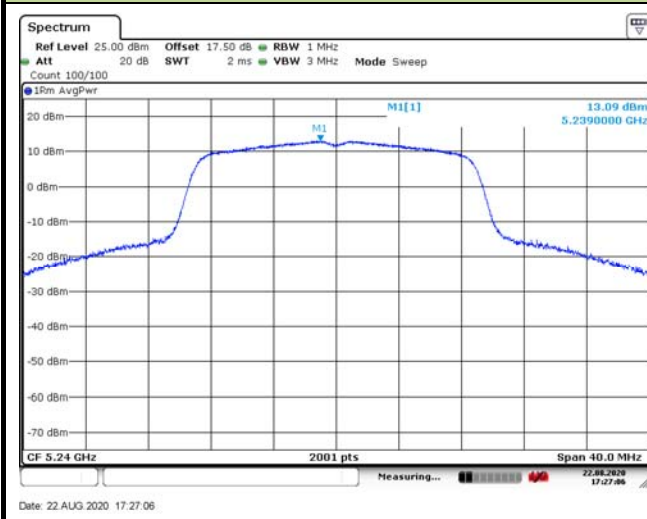
Channel 36 (5180MHz)



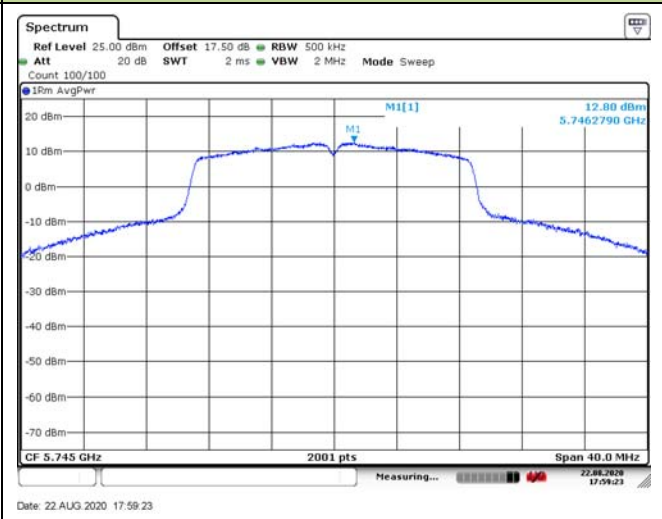
Channel 44 (5220MHz)



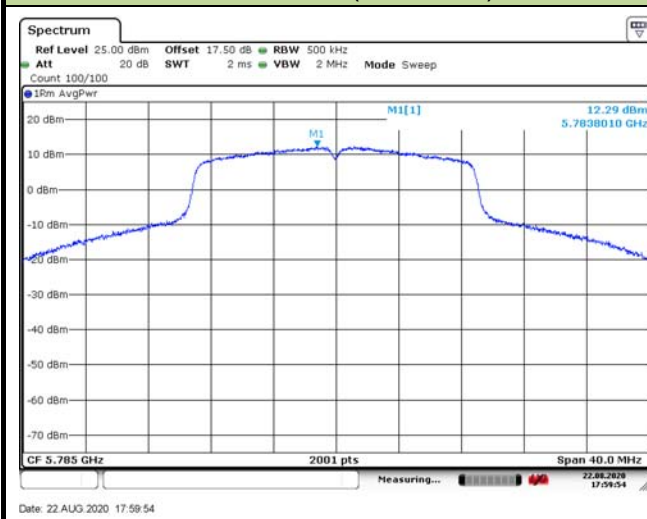
Channel 48 (5240MHz)



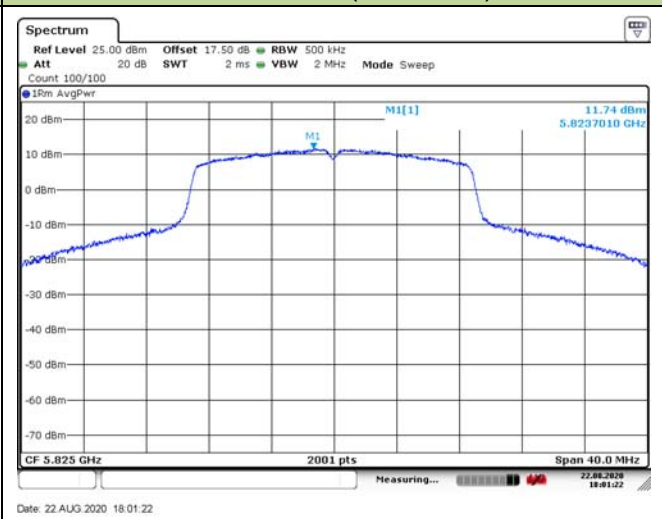
Channel 149 (5745MHz)



Channel 157 (5785MHz)

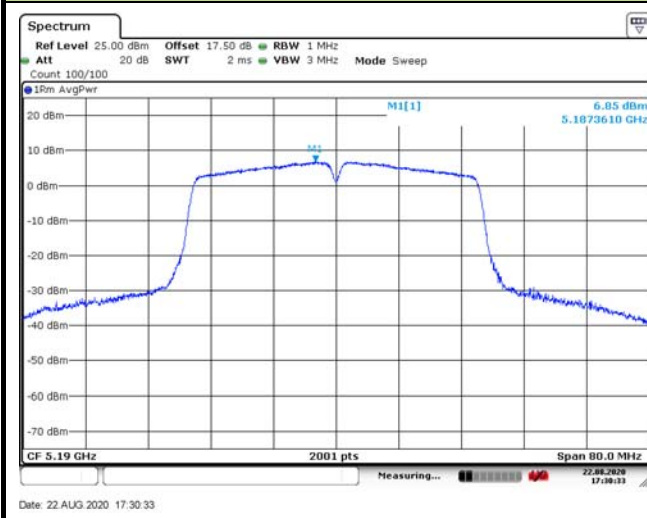


Channel 165 (5825MHz)

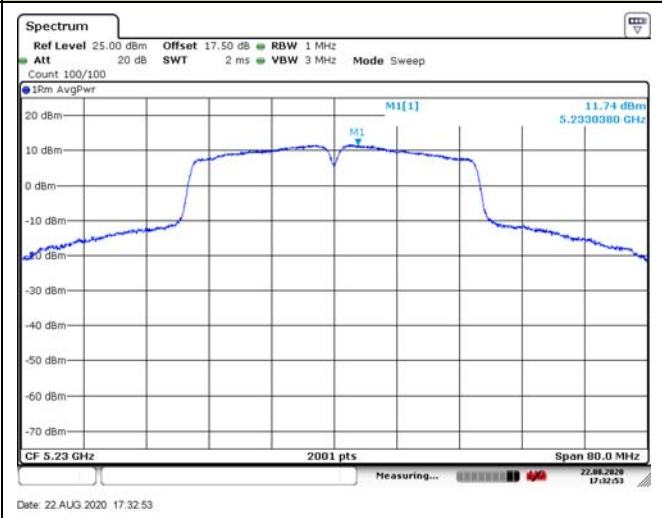


802.11ac-VHT40 Power Spectral Density - Ant 1 / Ant 0 + 1

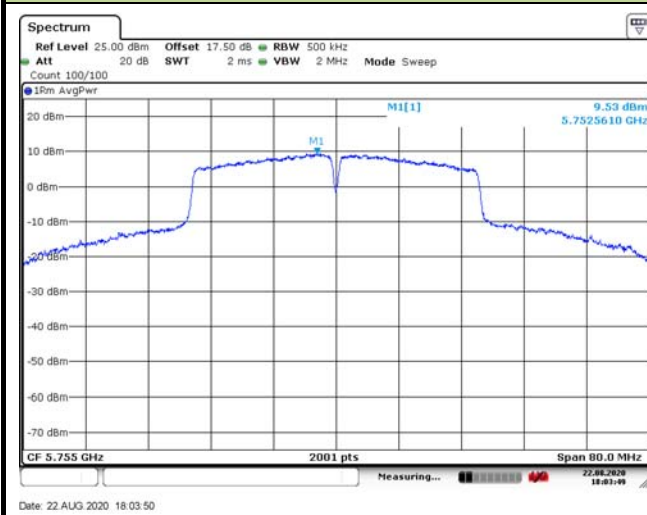
Channel 38 (5190MHz)



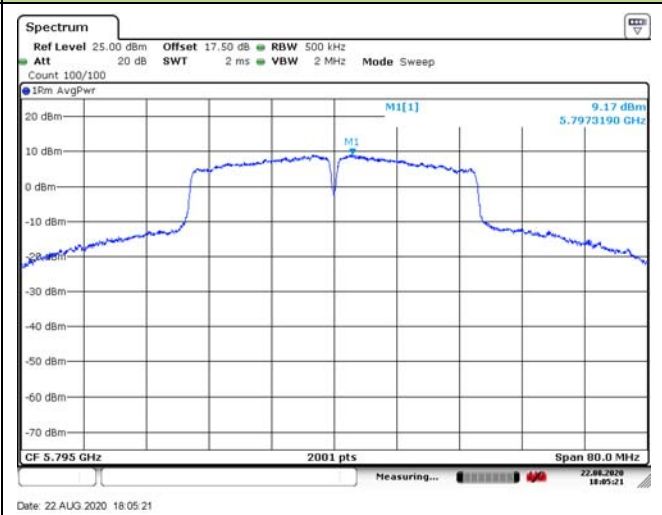
Channel 46 (5230MHz)



Channel 151 (5755MHz)

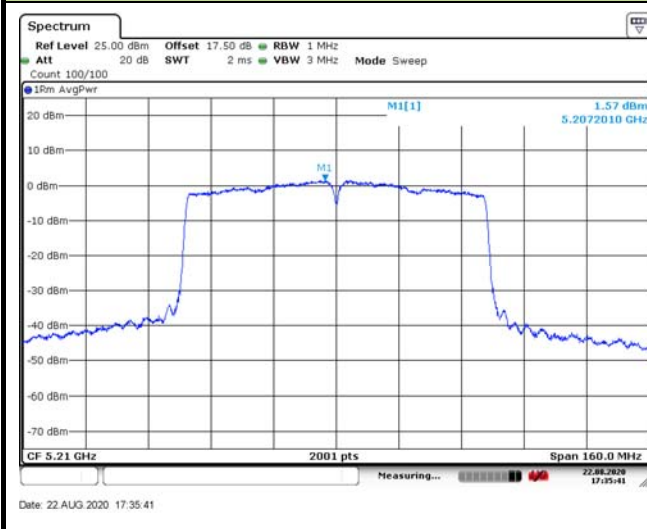


Channel 159 (5795MHz)

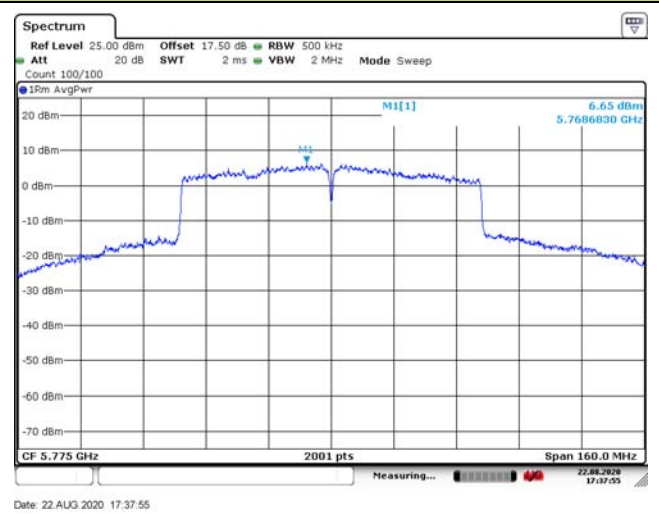


802.11ac-VHT80 Power Spectral Density - Ant 1 / Ant 0 + 1

Channel 42 (5210MHz)



Channel 155 (5775MHz)



6.7. Frequency Stability Measurement

6.7.1. Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

6.7.2. Test Procedure Used

Frequency Stability Under Temperature Variations:

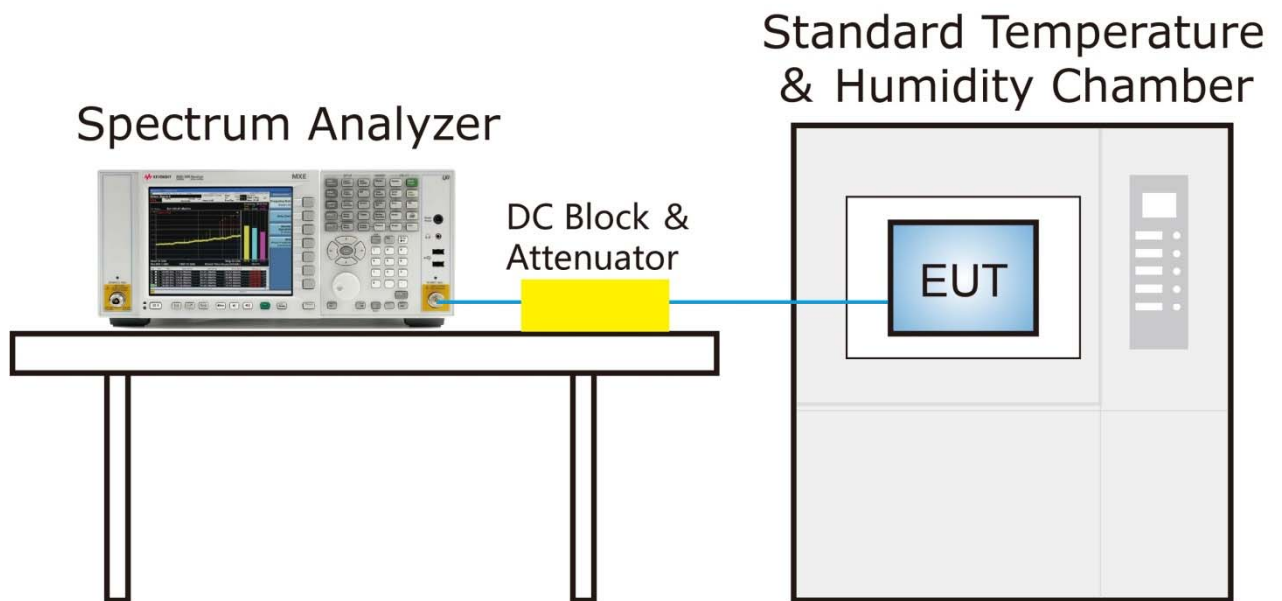
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change. For hand-carried battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

6.7.3. Test Setup



6.7.4. Test Result

Product	Subscriber End Equipment HGW	Test Engineer	Milo Li
Test Site	TR3	Test Time	2020/08/25
Test Mode	5180MHz (Carrier Mode)		

Voltage (%)	Power (V _{AC})	Temp (°C)	Frequency Tolerance (ppm)			
			0 minutes	2 minutes	5 minutes	10 minutes
100%	120	- 30	0.45	0.55	0.46	0.59
		- 20	2.26	2.02	2.12	2.06
		- 10	7.84	7.88	7.62	7.52
		0	6.49	6.21	6.23	6.10
		+ 10	-1.96	-1.84	-1.74	-2.01
		+ 20 (Ref)	-10.56	-10.23	-10.12	-10.07
		+ 30	-10.11	-10.01	-9.88	-9.82
		+ 40	-9.04	-8.88	-8.95	-8.83
		+ 50	-12.67	-12.50	-12.48	-12.35
115%	138	+ 20	-1.51	-1.26	-1.36	-1.29
85%	102	+ 20	-8.75	-8.59	-8.45	-8.56

Note: Frequency Tolerance (ppm) = {[Measured Frequency (MHz) - Declared Frequency (MHz)] / Declared Frequency (MHz)} * 10⁶.

6.8. Radiated Spurious Emission Measurement

6.8.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measured Distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.8.2. Test Procedure Used

KDB 789033 D02v02r01- Section G

6.8.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

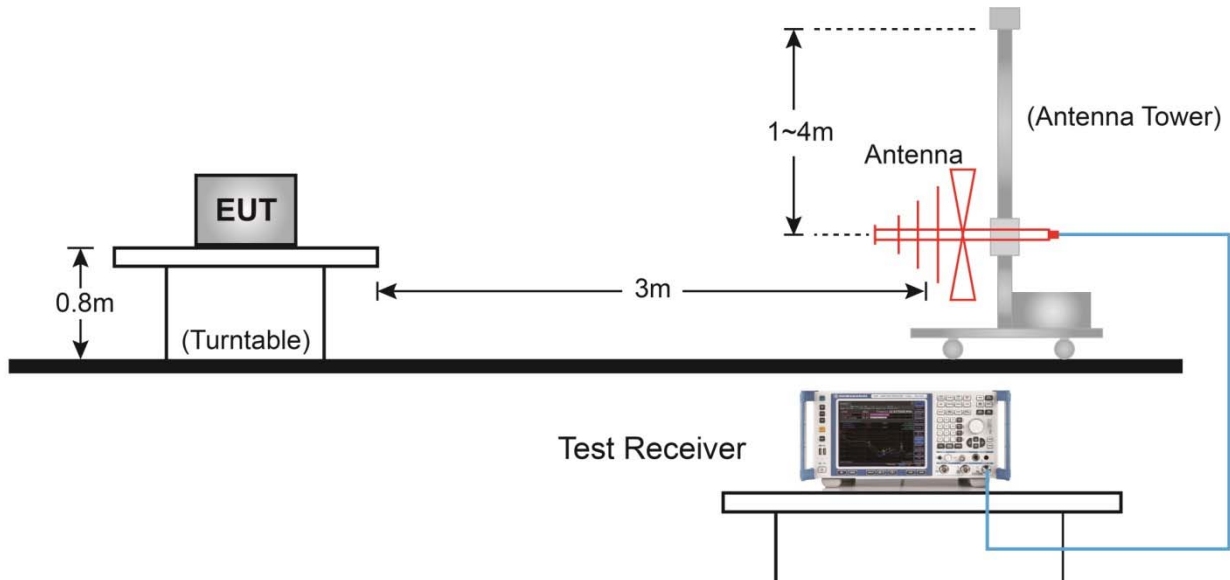
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

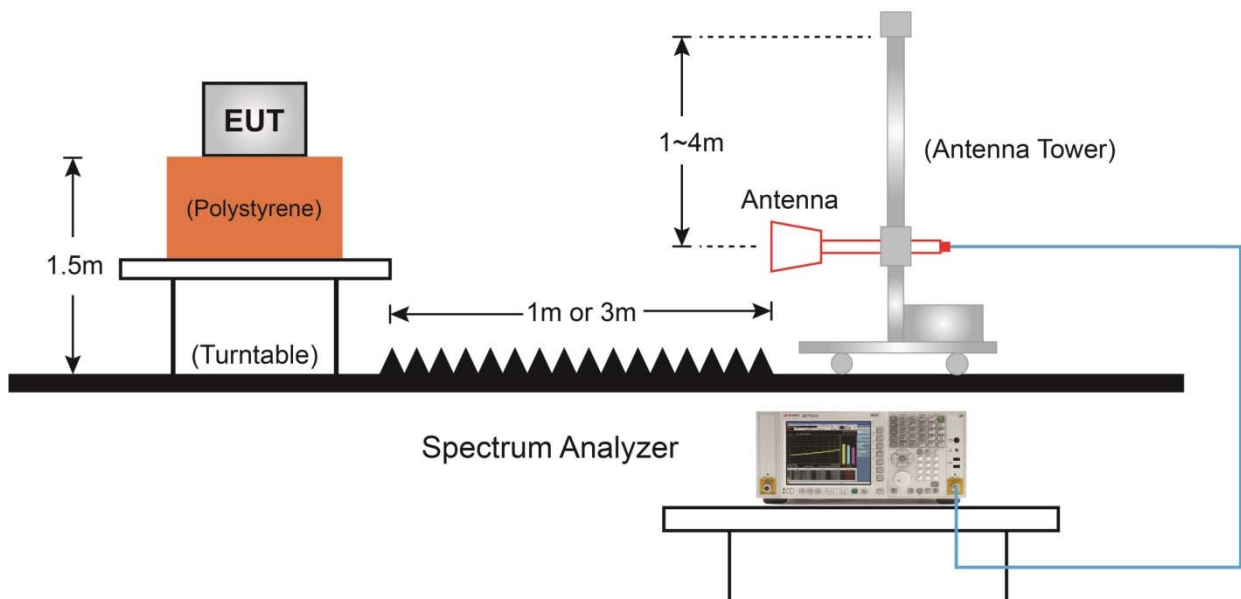
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10Hz
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.8.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.8.5. Test Result

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11a (CDD Mode)	Test Channel	36
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7587.5	37.1	10.7	47.8	74.0	-26.2	Peak	Horizontal
	8208.0	36.8	11.4	48.2	74.0	-25.8	Peak	Horizontal
*	8718.0	35.8	12.8	48.6	68.2	-19.6	Peak	Horizontal
*	9874.0	35.7	15.6	51.3	68.2	-16.9	Peak	Horizontal
	7485.5	37.2	10.8	48.0	74.0	-26.0	Peak	Vertical
	8327.0	37.4	10.9	48.3	74.0	-25.7	Peak	Vertical
*	8667.0	36.0	12.5	48.5	68.2	-19.7	Peak	Vertical
*	9857.0	36.1	15.4	51.5	68.2	-16.7	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11a (CDD Mode)	Test Channel	44
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7349.5	37.3	10.9	48.2	74.0	-25.8	Peak	Horizontal
	8106.0	38.3	11.7	50.0	74.0	-24.0	Peak	Horizontal
*	8820.0	37.2	13.2	50.4	68.2	-17.8	Peak	Horizontal
*	10443.5	41.8	15.9	57.7	68.2	-10.5	Peak	Horizontal
	7383.5	37.0	10.8	47.8	74.0	-26.2	Peak	Vertical
*	8811.5	37.2	13.3	50.5	68.2	-17.7	Peak	Vertical
*	10443.5	50.6	15.9	66.5	68.2	-1.7	Peak	Vertical
	15655.2	40.6	15.2	55.8	74.0	-18.2	Peak	Vertical
	15655.2	34.1	15.2	49.3	54.0	-4.7	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11a (CDD Mode)	Test Channel	48
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7375.0	37.0	10.8	47.8	74.0	-26.2	Peak	Horizontal
	8165.5	36.8	11.5	48.3	74.0	-25.7	Peak	Horizontal
*	8650.0	37.0	12.9	49.9	68.2	-18.3	Peak	Horizontal
*	10477.5	41.0	16.4	57.4	68.2	-10.8	Peak	Horizontal
	7511.0	37.1	10.9	48.0	74.0	-26.0	Peak	Vertical
	8165.5	36.4	11.5	47.9	74.0	-26.1	Peak	Vertical
*	9814.5	34.6	15.3	49.9	68.2	-18.3	Peak	Vertical
*	10307.5	33.5	15.6	49.1	68.2	-19.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11a (CDD Mode)	Test Channel	149
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8352.5	36.1	11.2	47.3	74.0	-26.7	Peak	Horizontal
*	10435.0	35.7	16.4	52.1	68.2	-16.1	Peak	Horizontal
	11490.6	41.3	16.3	57.6	74.0	-16.4	Peak	Horizontal
	11490.6	30.8	16.3	47.1	54.0	-6.9	Average	Horizontal
*	17235.0	42.6	17.4	60.0	68.2	-8.2	Peak	Horizontal
	8174.0	37.4	11.4	48.8	74.0	-25.2	Peak	Vertical
*	9772.0	35.9	15.2	51.1	68.2	-17.1	Peak	Vertical
	11492.4	44.7	16.3	61.0	74.0	-13.0	Peak	Vertical
	11492.4	34.5	16.3	50.8	54.0	-3.2	Average	Vertical
*	17243.5	43.5	17.6	61.1	68.2	-7.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11a (CDD Mode)	Test Channel	157
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7392.0	37.0	10.7	47.7	74.0	-26.3	Peak	Horizontal
	8106.0	36.9	11.7	48.6	74.0	-25.4	Peak	Horizontal
*	9772.0	35.8	15.2	51.0	68.2	-17.2	Peak	Horizontal
*	10358.5	35.3	16.2	51.5	68.2	-16.7	Peak	Horizontal
	7698.0	37.3	10.8	48.1	74.0	-25.9	Peak	Vertical
*	8658.5	35.6	12.8	48.4	68.2	-19.8	Peak	Vertical
*	9721.0	34.3	15.1	49.4	68.2	-18.8	Peak	Vertical
	11570.4	41.3	15.6	56.9	74.0	-17.1	Peak	Vertical
	11570.4	28.4	15.6	44.0	54.0	-10.0	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11a (CDD Mode)	Test Channel	165
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7349.5	37.8	10.9	48.7	74.0	-25.3	Peak	Horizontal
	8208.0	37.2	11.4	48.6	74.0	-25.4	Peak	Horizontal
*	8709.5	36.5	12.9	49.4	68.2	-18.8	Peak	Horizontal
*	9772.0	35.8	15.2	51.0	68.2	-17.2	Peak	Horizontal
	7672.5	37.8	10.7	48.5	74.0	-25.5	Peak	Vertical
*	8820.0	36.7	13.2	49.9	68.2	-18.3	Peak	Vertical
*	10044.0	36.7	15.3	52.0	68.2	-16.2	Peak	Vertical
	11648.0	40.6	15.3	55.9	74.0	-18.1	Peak	Vertical
	11648.0	27.6	15.3	42.9	54.0	-11.1	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT20(CDD Mode)	Test Channel	36
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8199.5	35.9	11.4	47.3	74.0	-26.7	Peak	Horizontal
*	8845.5	35.5	12.7	48.2	68.2	-20.0	Peak	Horizontal
*	10358.5	51.9	16.2	68.1	68.2	-0.1	Peak	Horizontal
	15536.6	45.3	15.0	60.3	74.0	-13.7	Peak	Horizontal
	15536.6	32.9	15.0	47.9	54.0	-6.1	Average	Horizontal
*	8837.0	37.5	12.7	50.2	68.2	-18.0	Peak	Vertical
	9381.0	34.9	14.5	49.4	74.0	-24.6	Peak	Vertical
*	10358.5	45.8	16.2	62.0	68.2	-6.2	Peak	Vertical
	15540.3	44.2	15.0	59.2	74.0	-14.8	Peak	Vertical
	15540.3	33.4	15.0	48.4	54.0	-5.6	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT20 (CDD Mode)	Test Channel	44
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7562.0	37.2	10.8	48.0	74.0	-26.0	Peak	Horizontal
*	8794.5	36.8	12.9	49.7	68.2	-18.5	Peak	Horizontal
*	10435.0	40.1	16.4	56.5	68.2	-11.7	Peak	Horizontal
	15661.0	42.3	15.1	57.4	74.0	-16.6	Peak	Horizontal
	15661.0	32.8	15.1	47.9	54.0	-6.1	Average	Horizontal
	7383.5	36.9	10.8	47.7	74.0	-26.3	Peak	Vertical
*	8701.0	34.8	13.0	47.8	68.2	-20.4	Peak	Vertical
*	10435.0	50.8	16.4	67.2	68.2	-1.0	Peak	Vertical
	15660.0	47.2	15.1	62.3	74.0	-11.7	Peak	Vertical
	15660.0	35.4	15.1	50.5	54.0	-3.5	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT20 (CDD Mode)	Test Channel	48
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8191.0	38.0	11.4	49.4	74.0	-24.6	Peak	Horizontal
*	8667.0	36.4	12.5	48.9	68.2	-19.3	Peak	Horizontal
*	10477.5	40.0	16.4	56.4	68.2	-11.8	Peak	Horizontal
	15722.3	42.4	14.6	57.0	74.0	-17.0	Peak	Horizontal
	15722.3	32.5	14.6	47.1	54.0	-6.9	Average	Horizontal
	8157.0	37.7	11.4	49.1	74.0	-24.9	Peak	Vertical
*	8718.0	34.4	12.8	47.2	68.2	-21.0	Peak	Vertical
*	10477.5	48.5	16.4	64.9	68.2	-3.3	Peak	Vertical
	15718.4	45.8	14.6	60.4	74.0	-13.6	Peak	Vertical
	15718.4	35.6	14.6	50.2	54.0	-3.8	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT20(CDD Mode)	Test Channel	149
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8386.5	34.5	11.1	45.6	74.0	-28.4	Peak	Horizontal
*	8692.5	36.6	13.1	49.7	68.2	-18.5	Peak	Horizontal
*	9857.0	35.2	15.4	50.6	68.2	-17.6	Peak	Horizontal
	11489.2	40.7	16.3	57.0	74.0	-17.0	Peak	Horizontal
	11489.2	30.3	16.3	46.6	54.0	-7.4	Average	Horizontal
	8352.5	36.4	11.2	47.6	74.0	-26.4	Peak	Vertical
*	8837.0	38.4	12.7	51.1	68.2	-17.1	Peak	Vertical
	11491.3	46.4	16.3	62.7	74.0	-11.3	Peak	Vertical
	11491.3	34.6	16.3	50.9	54.0	-3.1	Average	Vertical
*	17235.0	43.2	17.4	60.6	68.2	-7.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT20 (CDD Mode)	Test Channel	157
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8216.5	36.7	11.4	48.1	74.0	-25.9	Peak	Horizontal
*	9236.5	37.8	14.3	52.1	68.2	-16.1	Peak	Horizontal
	11570.8	39.6	15.6	55.2	74.0	-18.8	Peak	Horizontal
	11570.8	28.5	15.6	44.1	54.0	-9.9	Average	Horizontal
*	17362.5	40.4	18.1	58.5	68.2	-9.7	Peak	Horizontal
	8403.5	37.0	11.4	48.4	74.0	-25.6	Peak	Vertical
*	8871.0	37.7	12.9	50.6	68.2	-17.6	Peak	Vertical
	11568.3	42.8	15.6	58.4	74.0	-15.6	Peak	Vertical
	11568.3	32.8	15.6	48.4	54.0	-5.6	Average	Vertical
*	17362.5	41.1	18.1	59.2	68.2	-9.0	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT20 (CDD Mode)	Test Channel	165
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8335.5	36.4	11.0	47.4	74.0	-26.6	Peak	Horizontal
*	9772.0	36.5	15.2	51.7	68.2	-16.5	Peak	Horizontal
*	10205.5	36.0	15.6	51.6	68.2	-16.6	Peak	Horizontal
	11650.5	38.6	15.3	53.9	74.0	-20.1	Peak	Horizontal
	8429.0	34.8	11.4	46.2	74.0	-27.8	Peak	Vertical
*	8709.5	37.0	12.9	49.9	68.2	-18.3	Peak	Vertical
	11648.8	41.5	15.3	56.8	74.0	-17.2	Peak	Vertical
	11648.8	32.1	15.3	47.4	54.0	-6.6	Average	Vertical
*	17473.0	39.5	19.5	59.0	68.2	-9.2	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT40 (CDD Mode)	Test Channel	38
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8250.5	37.0	11.4	48.4	74.0	-25.6	Peak	Horizontal
*	8650.0	36.5	12.9	49.4	68.2	-18.8	Peak	Horizontal
*	10375.5	49.2	15.7	64.9	68.2	-3.3	Peak	Horizontal
	15571.5	39.5	15.2	54.7	74.0	-19.3	Peak	Horizontal
	15571.5	29.5	15.2	44.7	54.0	-9.3	Average	Horizontal
*	8794.5	36.3	12.9	49.2	68.2	-19.0	Peak	Vertical
	9092.0	37.0	13.5	50.5	74.0	-23.5	Peak	Vertical
*	10384.0	43.4	15.7	59.1	68.2	-9.1	Peak	Vertical
	15567.7	43.3	15.1	58.4	74.0	-15.6	Peak	Vertical
	15567.7	30.1	15.1	45.2	54.0	-8.8	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT40 (CDD Mode)	Test Channel	46
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	8701.0	36.2	13.0	49.2	68.2	-19.0	Peak	Horizontal
*	10460.5	38.7	15.9	54.6	68.2	-13.6	Peak	Horizontal
	11259.5	36.9	15.7	52.6	74.0	-21.4	Peak	Horizontal
	15678.5	40.6	15.0	55.6	74.0	-18.4	Peak	Horizontal
	15678.5	31.2	15.0	46.2	54.0	-7.8	Average	Horizontal
*	8684.0	36.7	12.9	49.6	68.2	-18.6	Peak	Vertical
*	10460.5	45.9	15.9	61.8	68.2	-6.4	Peak	Vertical
	11897.0	36.9	15.3	52.2	74.0	-21.8	Peak	Vertical
	15683.5	43.2	15.0	58.2	74.0	-15.8	Peak	Vertical
	15683.5	33.6	15.0	48.6	54.0	-5.4	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT40 (CDD Mode)	Test Channel	151
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8199.5	35.8	11.4	47.2	74.0	-26.8	Peak	Horizontal
*	9678.5	35.5	14.6	50.1	68.2	-18.1	Peak	Horizontal
	11521.5	38.8	15.9	54.7	74.0	-19.3	Peak	Horizontal
	11521.5	27.1	15.9	43.0	54.0	-11.0	Average	Horizontal
*	17209.5	39.4	17.9	57.3	68.2	-10.9	Peak	Horizontal
	8089.0	37.5	11.8	49.3	74.0	-24.7	Peak	Vertical
*	9202.5	37.1	14.1	51.2	68.2	-17.0	Peak	Vertical
	11502.8	41.1	16.1	57.2	74.0	-16.8	Peak	Vertical
	11502.8	31.1	16.1	47.2	54.0	-6.8	Average	Vertical
*	16929.0	41.2	17.4	58.6	68.2	-9.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11n-HT40 (CDD Mode)	Test Channel	159
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8378.0	36.7	11.0	47.7	74.0	-26.3	Peak	Horizontal
*	9661.5	36.2	14.2	50.4	68.2	-17.8	Peak	Horizontal
*	10282.0	36.5	15.8	52.3	68.2	-15.9	Peak	Horizontal
	11507.5	38.1	15.6	53.7	74.0	-20.3	Peak	Horizontal
	11507.5	26.2	15.6	41.8	54.0	-12.2	Average	Horizontal
	8259.0	36.8	11.5	48.3	74.0	-25.7	Peak	Vertical
*	8905.0	36.8	13.1	49.9	68.2	-18.3	Peak	Vertical
	11594.0	40.1	15.6	55.7	74.0	-18.3	Peak	Vertical
	11594.0	30.0	15.6	45.6	54.0	-8.4	Average	Vertical
*	16776.0	41.8	17.8	59.6	68.2	-8.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11ac-VHT20 (CDD Mode)	Test Channel	36
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7443.0	36.9	11.0	47.9	74.0	-26.1	Peak	Horizontal
	8310.0	36.3	11.2	47.5	74.0	-26.5	Peak	Horizontal
*	9891.0	35.4	15.2	50.6	68.2	-17.6	Peak	Horizontal
*	10358.5	38.9	16.2	55.1	68.2	-13.1	Peak	Horizontal
*	8650.0	36.7	12.9	49.6	68.2	-18.6	Peak	Vertical
*	10358.5	46.6	16.2	62.8	68.2	-5.4	Peak	Vertical
	11395.5	36.3	15.8	52.1	74.0	-21.9	Peak	Vertical
	15538.0	45.2	15.0	60.2	74.0	-13.8	Peak	Vertical
	15538.0	29.6	15.0	44.6	54.0	-9.4	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11ac-VHT20 (CDD Mode)	Test Channel	44
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	8667.0	36.3	12.5	48.8	68.2	-19.4	Peak	Horizontal
*	10435.0	39.8	16.4	56.2	68.2	-12.0	Peak	Horizontal
	11497.5	36.6	16.2	52.8	74.0	-21.2	Peak	Horizontal
	15659.0	43.2	15.1	58.3	74.0	-15.7	Peak	Horizontal
	15659.0	31.6	15.1	46.7	54.0	-7.3	Average	Horizontal
	8148.5	37.0	11.3	48.3	74.0	-25.7	Peak	Vertical
*	8871.0	38.3	12.9	51.2	68.2	-17.0	Peak	Vertical
*	10435.0	50.0	16.4	66.4	68.2	-1.8	Peak	Vertical
	15662.5	45.1	15.0	60.1	74.0	-13.9	Peak	Vertical
	15662.5	34.5	15.0	49.5	54.0	-4.5	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11ac-VHT20 (CDD Mode)	Test Channel	48
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8165.5	36.2	11.5	47.7	74.0	-26.3	Peak	Horizontal
*	8786.0	36.1	12.8	48.9	68.2	-19.3	Peak	Horizontal
*	10477.5	39.3	16.4	55.7	68.2	-12.5	Peak	Horizontal
	15720.6	41.1	14.6	55.7	74.0	-18.3	Peak	Horizontal
	15720.6	29.1	14.6	43.7	54.0	-10.3	Average	Horizontal
*	8845.5	35.0	12.7	47.7	68.2	-20.5	Peak	Vertical
	9126.0	35.7	13.6	49.3	74.0	-24.7	Peak	Vertical
*	10477.5	49.9	16.4	66.3	68.2	-1.9	Peak	Vertical
	15719.1	46.2	14.6	60.8	74.0	-13.2	Peak	Vertical
	15719.1	34.1	14.6	48.7	54.0	-5.3	Average	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Subscriber End Equipment HGW	Test Engineer	Buter Shi
Test Site	AC1	Test Date	2020/08/19
Test Mode	802.11ac-VHT20 (CDD Mode)	Test Channel	149
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	8276.0	37.1	11.2	48.3	74.0	-25.7	Peak	Horizontal
*	10137.5	36.1	15.6	51.7	68.2	-16.5	Peak	Horizontal
	11490.0	40.4	16.3	56.7	74.0	-17.3	Peak	Horizontal
	11490.0	29.3	16.3	45.6	54.0	-8.4	Average	Horizontal
*	17235.0	39.6	17.4	57.0	68.2	-11.2	Peak	Horizontal
	8403.5	36.6	11.4	48.0	74.0	-26.0	Peak	Vertical
*	9245.0	36.1	14.2	50.3	68.2	-17.9	Peak	Vertical
	11492.9	47.4	16.3	63.7	74.0	-10.3	Peak	Vertical
	11492.9	34.2	16.3	50.5	54.0	-3.5	Average	Vertical
*	17235.0	42.1	17.4	59.5	68.2	-8.7	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)