TEST REPORT

Reference No.	:	WTX23X06132437W003
FCC ID	:	2BAHU2023022
Applicant	:	DIALN PRODUCTS INC
Address	:	8312 Page Ave, St. Louis, Missouri, 63130, USA
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	Smart Phone
Model No.	:	X65
Standards	:	FCC Part 15.407
Date of Receipt sample	:	2023-06-19
Date of Test	:	2023-06-19 to 2023-07-18
Date of Issue	:	2023-07-18
Test Report Form No.	:	WTX_Part 15_407W
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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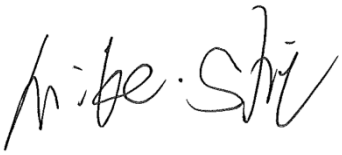
Tested by:



Mike Shi

Approved by:

Silin Chen

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Report version

Version No.	Date of issue	Description
Rev.00	2023-07-18	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Smart Phone
Trade Name:	DIALN
Model No.:	X65
Adding Model(s):	/
Rated Voltage:	Type-C Port:DC5V Battery:DC3.85V
Battery Capacity:	4500mAh
Adapter Model:	Model:TPA-46050200UU Input:AC100-220V~50/60Hz 0.3A Output: DC5V,2000mA
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n-HT20, 802.11n-HT40, 802.11ac-VHT80
Frequency Range:	5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz
RF Output Power:	10.18dBm (Conducted)
Type of Modulation:	BPSK, QPSK,16QAM,64QAM
Type of Antenna:	FPC Antenna
Antenna Gain:	-1.5dBi
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
KDB789033 D02 v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-Nii) Devices Part 15, Subparte.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Enter "*#*#3646633#*#*" into the calculator to enter the engineer mode, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180	5200	5240	5260	5300	5320	5500	5580	5700	5720	5745	5785	5825
802.11a 6Mbps	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default
802.11n-HT20 MCS0	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default

Mode	NCB: 40MHz									
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795
802.11n-HT40 MCS0	Default	Default	Default	Default	Default	Default	Default	Default	Default	Default

Mode	NCB: 80MHz					
	5210	5290	5530	5610	5690	5775
802.11ac-VHT80 MCS0/Nss2	Default	Default	Default	Default	Default	Default

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is mai ntained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz, 5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz, 5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5270MHz,5310MHz,5510MHz,5590MHz,5670MHz, 5755MHz,5795MHz
TM4	802.11ac-VHT80	5210MHz,5290MHz,5530MHz,5610MHz,5775MHz
Note: 802.11ac-VHT20, 802.11ac-VHT40 covered by 802.11n-HT20 an802.11n-HT40.		

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.0	Shielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Headset Cable	1.2	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	ASUS	FA5061C	M8NRCX057996349

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.9 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1022A1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2023-02-25	2024-02-24
WTXE1005A1005	Spectrum Analyzer	Agilent	N9020A	US47140102	2023-02-25	2024-02-24
WTXE1084A1001	Spectrum Analyzer	Agilent	N9020A	MY54320548	2023-02-25	2024-02-24
WTXE1044A1001	Signal Generator	Agilent	83752A	3610A01453	2023-02-25	2024-02-24
WTXE1045A1001	Vector Signal Generator	Agilent	N5182A	MY47070202	2023-02-25	2024-02-24
WTXE1018A1001	Power Divider	Weinschel	1506A	PM204	2023-02-25	2024-02-24
WTXE1045A1001	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2023-02-25	2024-02-24
☐Chamber A: Below 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
WTXE1007A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
WTXE1007A1001	Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
WTXE1010A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010A1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐Chamber A: Above 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
WTXE1007A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
WTXE1065A1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010A1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18

WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A101 79	2023-02-25	2024-02-24
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☒Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☒Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103A 1005	Horn Antenna	POAM	RTF-11A	LP228060 221	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☒Conducted Room 1#						
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-224	2023-02-25	2024-02-24
☐Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
WTXE1003A	LISN	Rohde &	ENV 216	100097	2023-02-25	2024-02-24

1003		Schwarz				

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
15.407 (c)	Automatically Discontinue Transmission	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§15.407(b)(1),(2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

N/A: Not applicable.

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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.

3.2 Evaluation Information

This product has an FPC Antenna, fulfill the requirement of this section.

4. Automatically Discontinue Transmission

4.1 Standard Applicable

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

4.2 Summary of Test Results

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

5. Power Spectral Density

5.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11 dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, 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 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.
For devices operating in the bands 5.15-5.25GHz, 5.25-5.35GHz, and 5.47-5.725GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85GHz, the rules specify a measurement bandwidth of 500kHz. Many spectrum analyzers do not have 500kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500kHz, “provided that the measured power is integrated over the full

reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1MHz, or 500kHz). If measurements are performed using a reduced resolution bandwidth (< 1MHz, or < 500kHz) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100kHz for the sections 5.c) and 5.d) above, since RBW=100kHZ is available on nearly all spectrum analyzers.

5.3 Summary of Test Results/Plots

Please refer to Appendix A

6. Emission Bandwidth and Occupied Bandwidth

6.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, 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 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

6.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.

c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26dB 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%.

2. Minimum Emission Bandwidth for the band 5.725-5.85GHz Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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 6dB relative to the maximum level measured in the fundamental emission.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth
The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 * RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.3 Summary of Test Results/Plots

Please refer to Appendix B

7. Maximum Conducted Output Power

7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, 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 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

7.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1MHz.

(iii) Set VBW ≥ 3MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that

narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

7.3 Summary of Test Results/Plots

Please refer to Appendix C

8. Radiated Spurious Emissions

8.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(4) For transmitters operating in the 5.725-5.85GHz band:

(i) All emissions shall be limited to a level of −27dBm/MHz at 75MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

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If radiated measurements are performed, field strength is then converted to EIRP as follows:

EIRP = ((E*d)^2) / 30

where:

• E is the field strength in V/m;

• d is the measurement distance in meters;

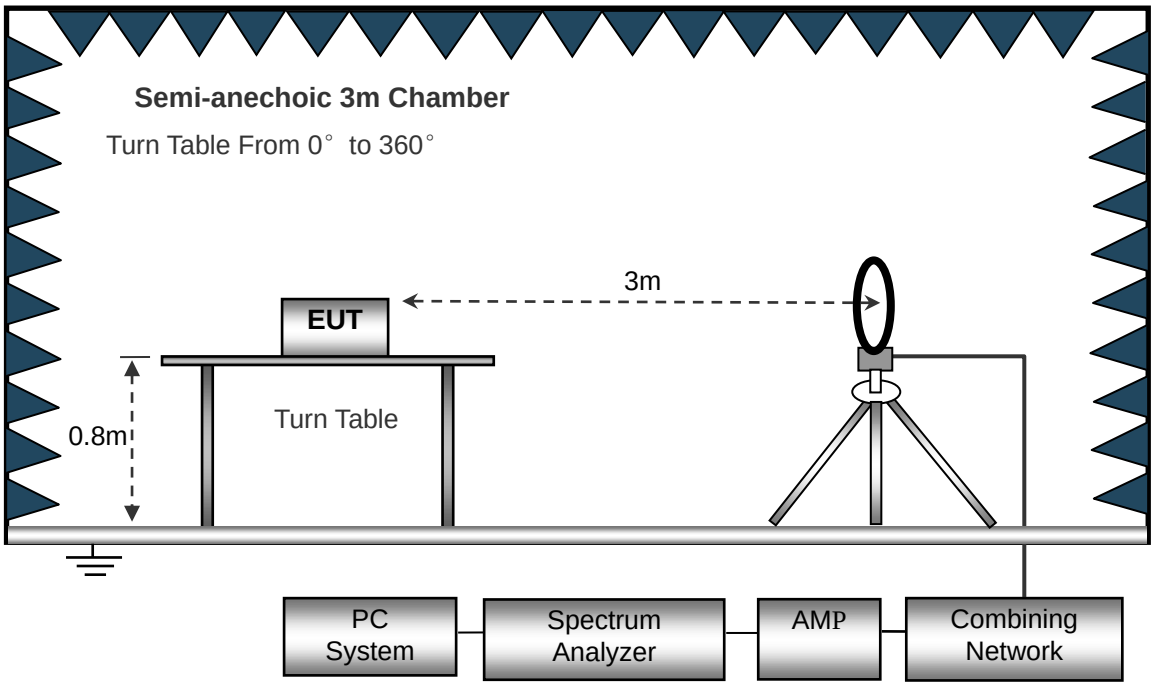
• EIRP is the equivalent isotropically radiated power in watts.

8.2 Test Procedure

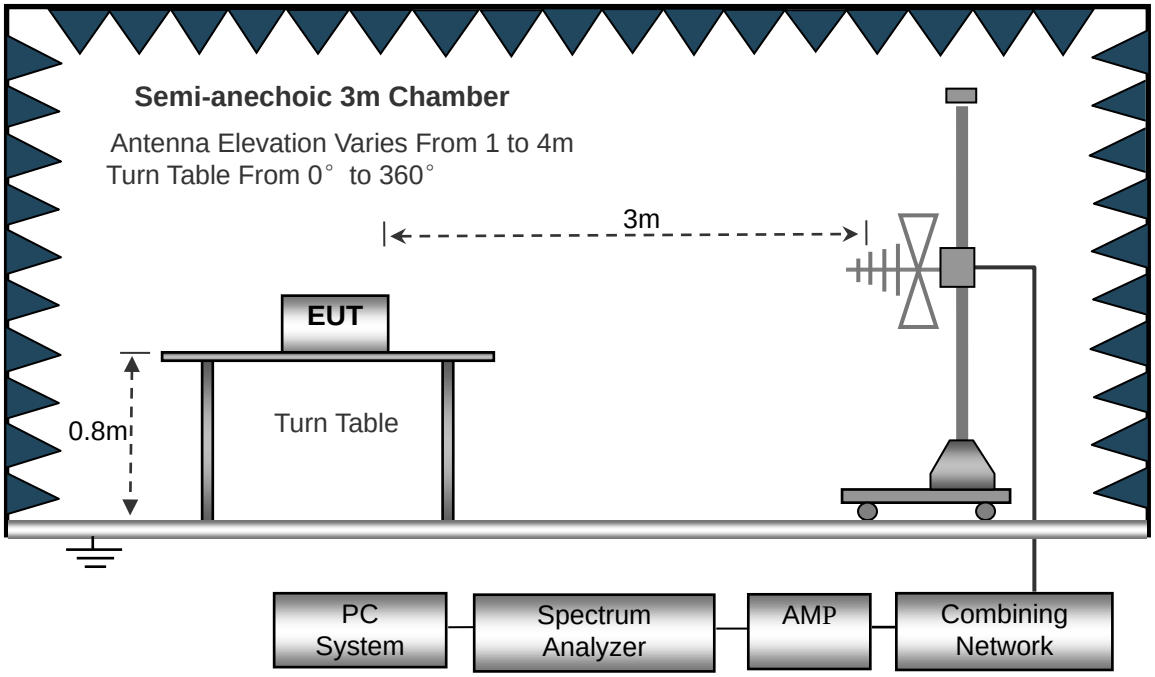
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

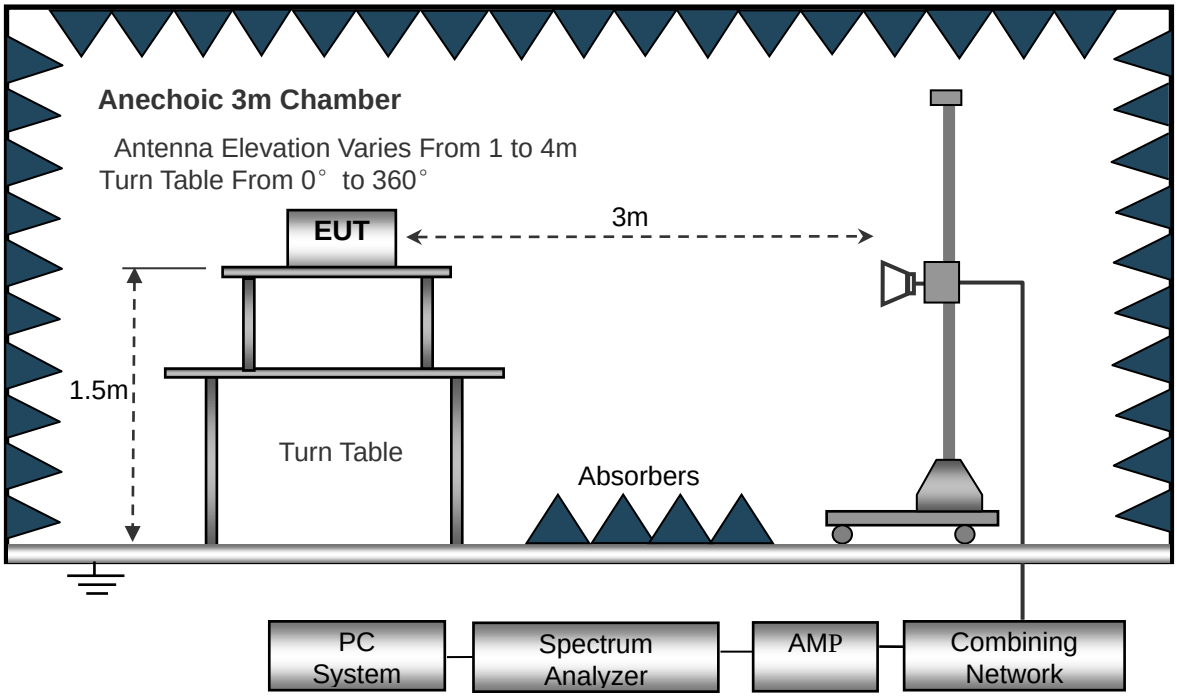
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1GHz.



8.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

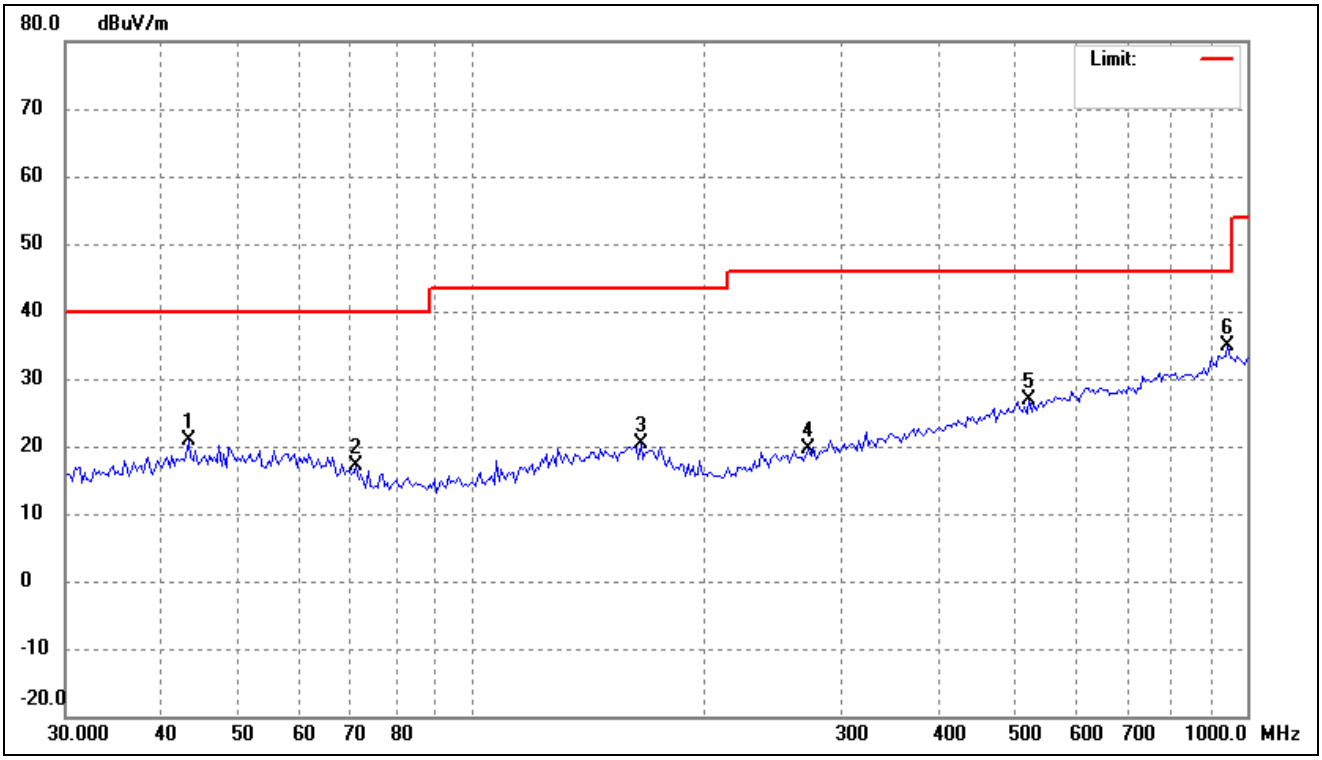
Margin = Corr. Ampl. – FCC Part 15 Limit

8.5 Summary of Test Results/Plots

Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

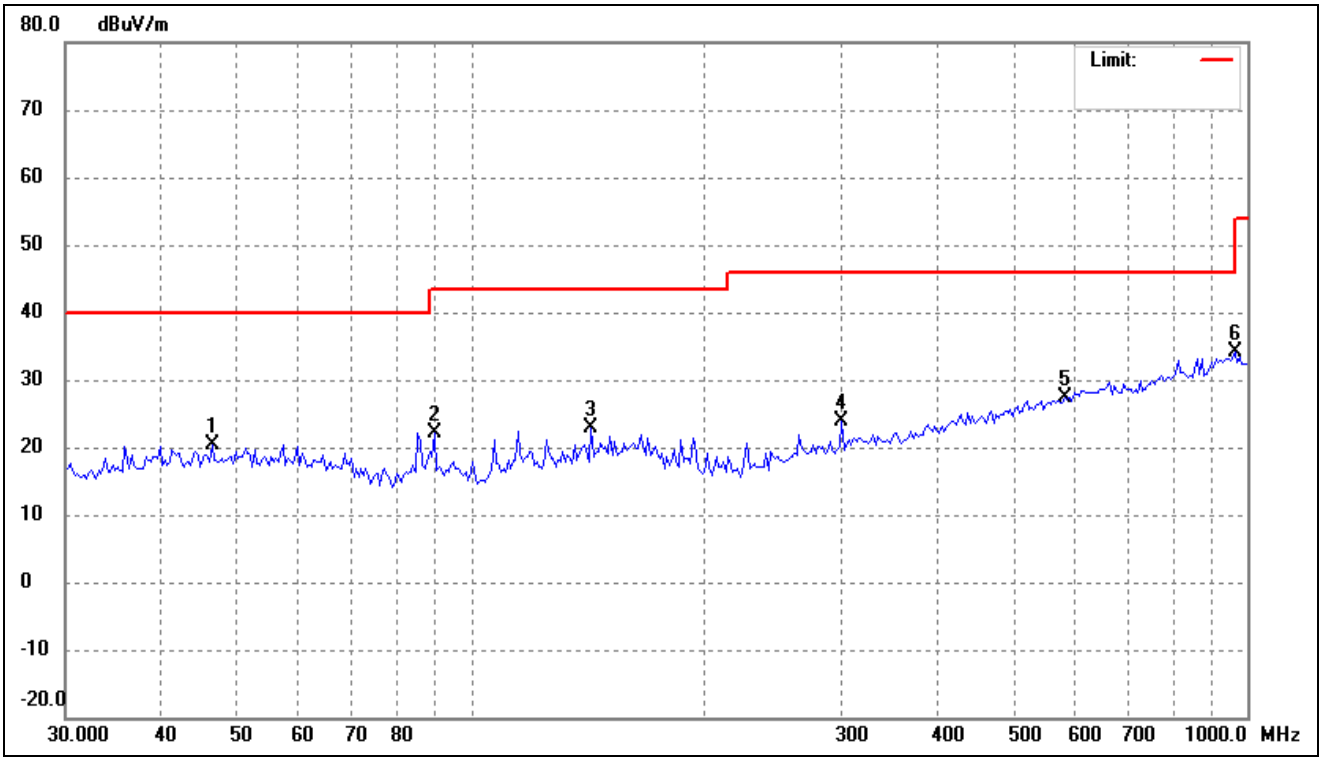
- Spurious Emission From 30MHz to 1GHz
- 5150-5250MHz

802.11a(Worst case)			
Test Channel	5180MHz(Worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	43.2333	29.31	-8.47	20.84	40.00	-19.16	-	-	peak
2	71.2033	28.04	-11.03	17.01	40.00	-22.99	-	-	peak
3	165.4716	29.19	-8.76	20.43	43.50	-23.07	-	-	peak
4	272.5246	28.94	-9.22	19.72	46.00	-26.28	-	-	peak
5	523.8763	30.42	-3.53	26.89	46.00	-19.11	-	-	peak
6	945.3336	32.80	2.15	34.95	46.00	-11.05	-	-	peak

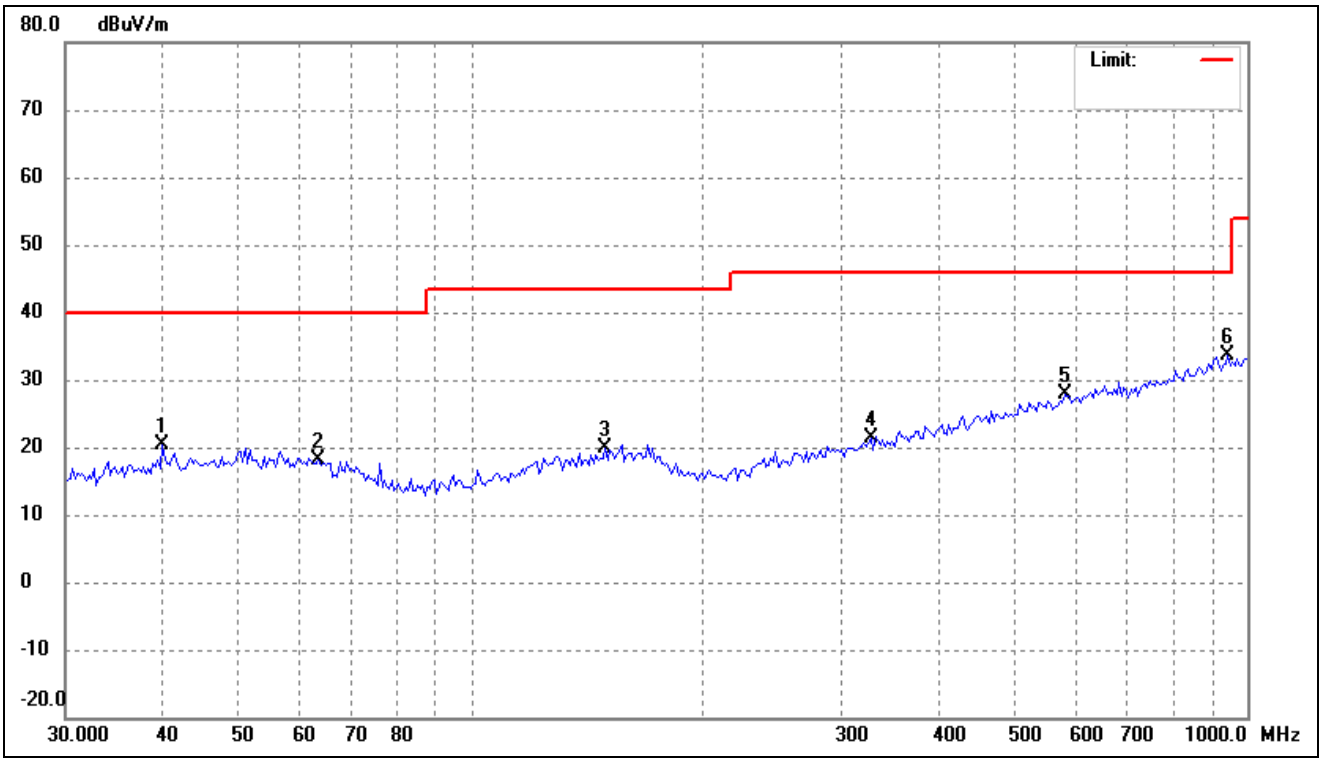
802.11a(Worst case)			
Test Channel	5180MHz(Worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	46.3806	28.73	-8.37	20.36	40.00	-19.64	-	-	peak
2	89.7866	35.18	-13.10	22.08	43.50	-21.42	-	-	peak
3	142.7692	31.98	-9.20	22.78	43.50	-20.72	-	-	peak
4	300.6988	32.02	-8.24	23.78	46.00	-22.22	-	-	peak
5	582.1122	29.54	-2.11	27.43	46.00	-18.57	-	-	peak
6	965.4742	31.82	2.27	34.09	54.00	-19.91	-	-	peak

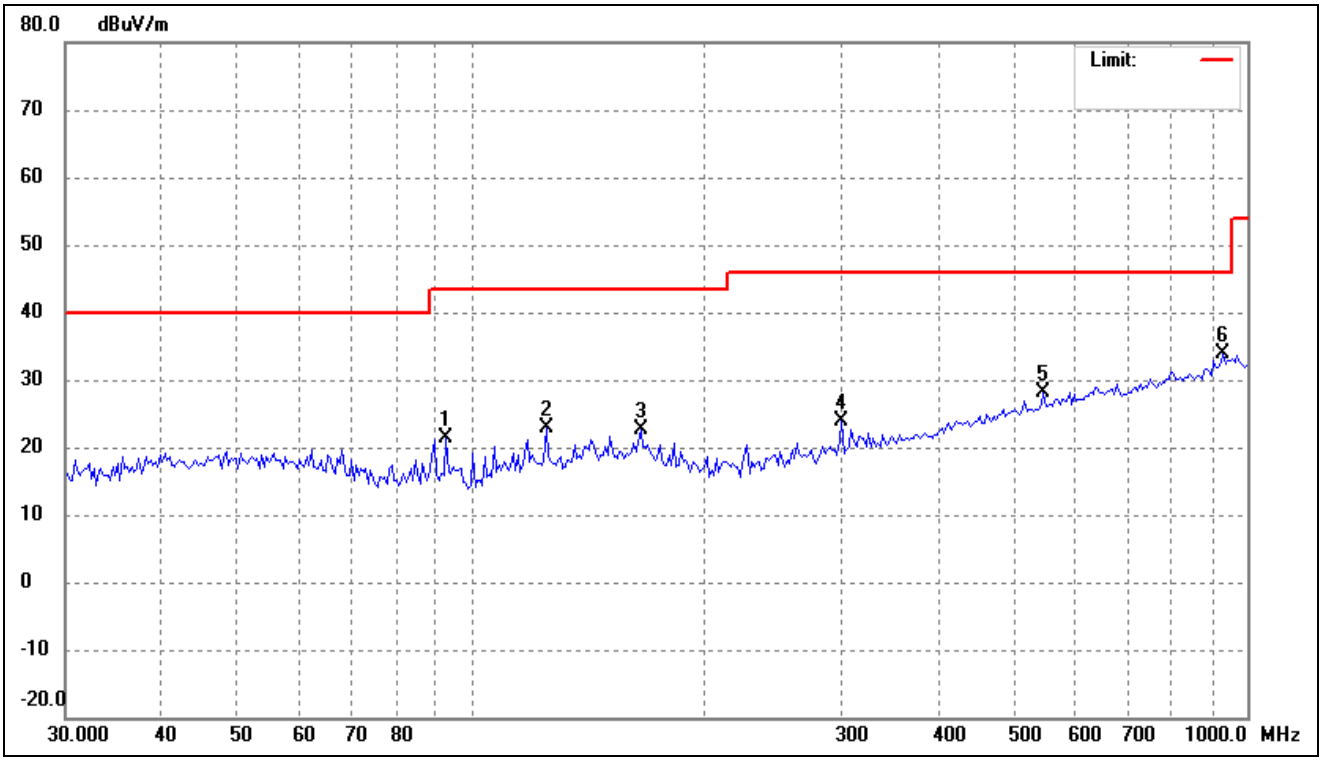
➢ 5250-5350MHz

802.11a(worst case)			
Test Channel	5260MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.0173	28.94	-8.47	20.47	40.00	-19.53	-	-	peak
2	63.6312	27.78	-9.59	18.19	40.00	-21.81	-	-	peak
3	148.9175	28.53	-8.68	19.85	43.50	-23.65	-	-	peak
4	327.1554	28.86	-7.51	21.35	46.00	-24.65	-	-	peak
5	582.1122	30.01	-2.11	27.90	46.00	-18.10	-	-	peak
6	945.3336	31.39	2.15	33.54	46.00	-12.46	-	-	peak

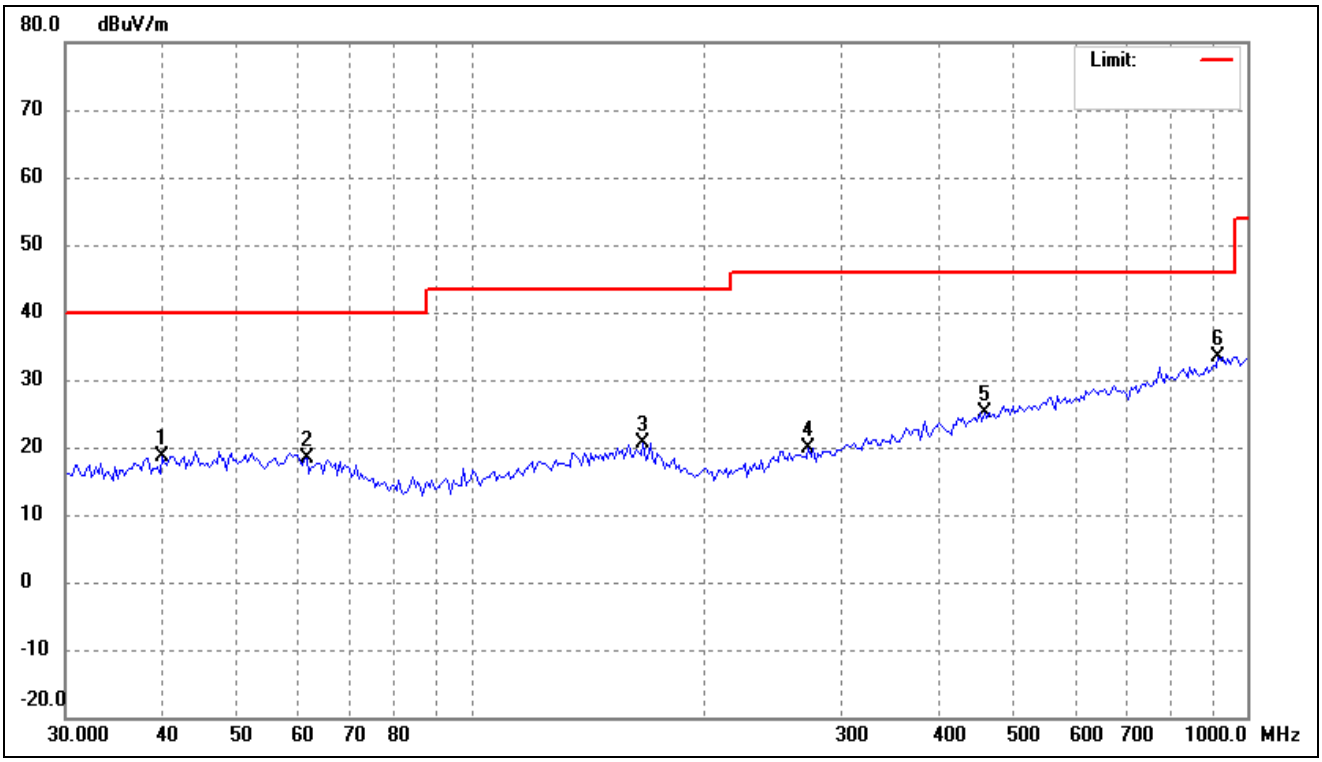
802.11a			
Test Channel	5260MHz(worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	92.9974	34.36	-12.93	21.43	43.50	-22.07	-	-	peak
2	124.9249	33.17	-10.19	22.98	43.50	-20.52	-	-	peak
3	165.4716	31.31	-8.76	22.55	43.50	-20.95	-	-	peak
4	300.6988	32.24	-8.24	24.00	46.00	-22.00	-	-	peak
5	546.4368	30.96	-2.94	28.02	46.00	-17.98	-	-	peak
6	932.1405	31.90	1.87	33.77	46.00	-12.23	-	-	peak

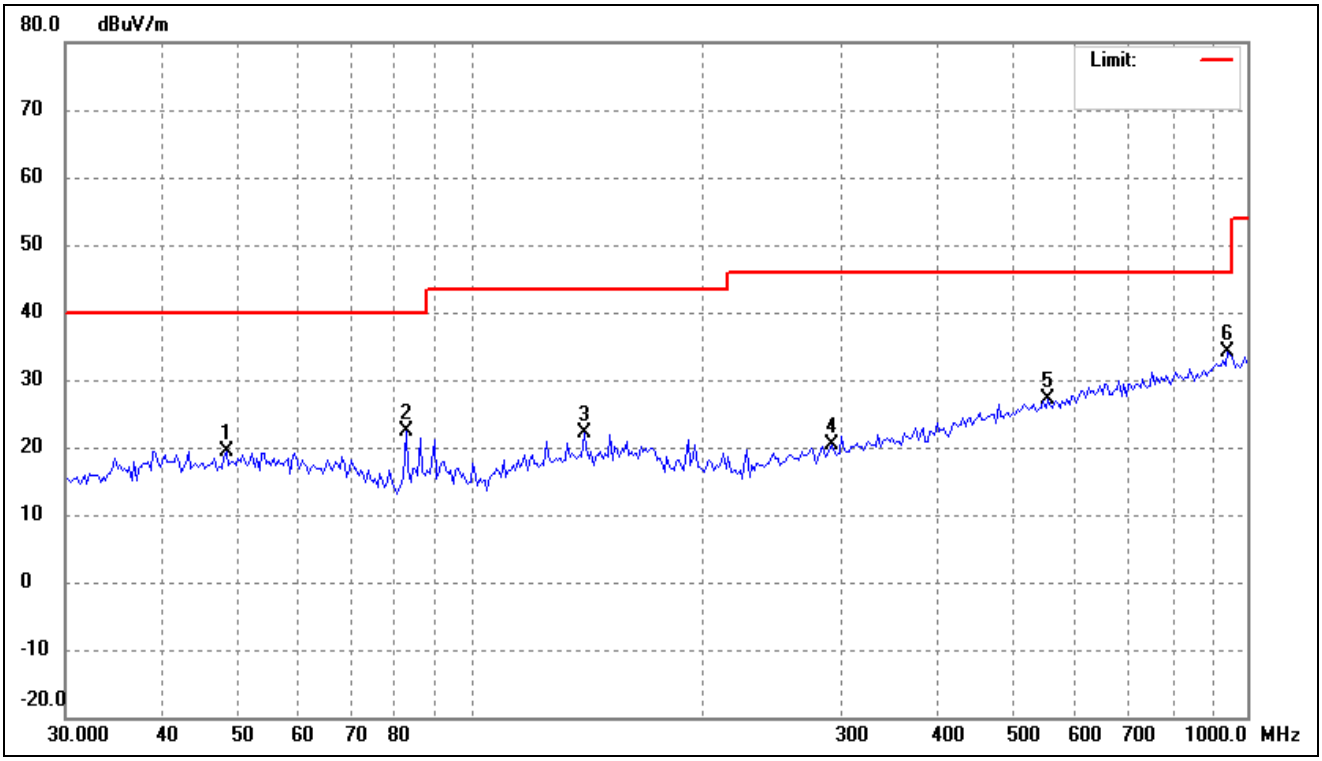
➢ 5470-5725MHz

802.11a(worst case)			
Test Channel	5500MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.0173	27.14	-8.47	18.67	40.00	-21.33	-	-	peak
2	61.4343	27.68	-9.20	18.48	40.00	-21.52	-	-	peak
3	166.6385	29.49	-8.79	20.70	43.50	-22.80	-	-	peak
4	272.5246	28.98	-9.22	19.76	46.00	-26.24	-	-	peak
5	458.3987	29.63	-4.47	25.16	46.00	-20.84	-	-	peak
6	919.1315	31.74	1.59	33.33	46.00	-12.67	-	-	peak

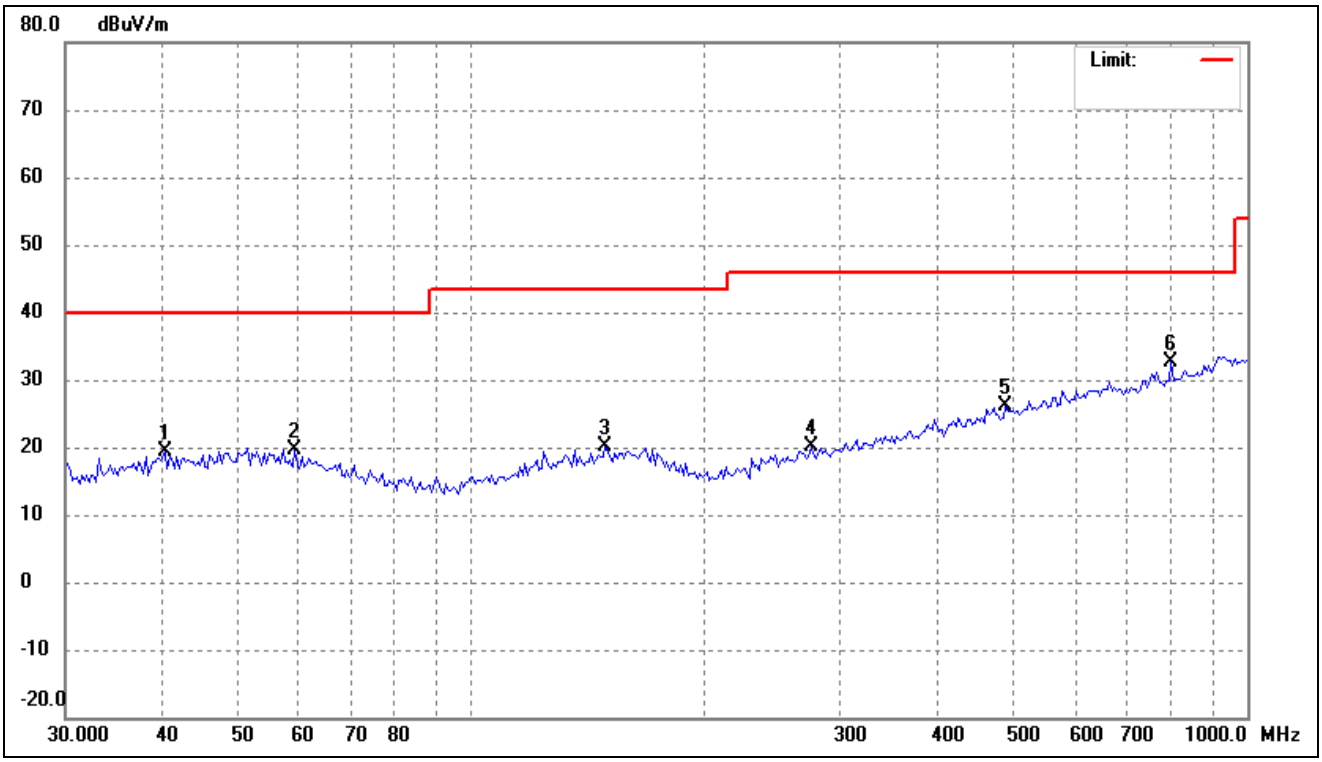
802.11a(worst case)			
Test Channel	5500MHz(worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	48.3780	27.69	-8.21	19.48	40.00	-20.52	-	-	peak
2	82.5257	35.44	-13.00	22.44	40.00	-17.56	-	-	peak
3	139.7909	31.45	-9.44	22.01	43.50	-21.49	-	-	peak
4	292.3643	28.99	-8.52	20.47	46.00	-25.53	-	-	peak
5	554.1708	29.97	-2.75	27.22	46.00	-18.78	-	-	peak
6	945.3336	31.86	2.15	34.01	46.00	-11.99	-	-	peak

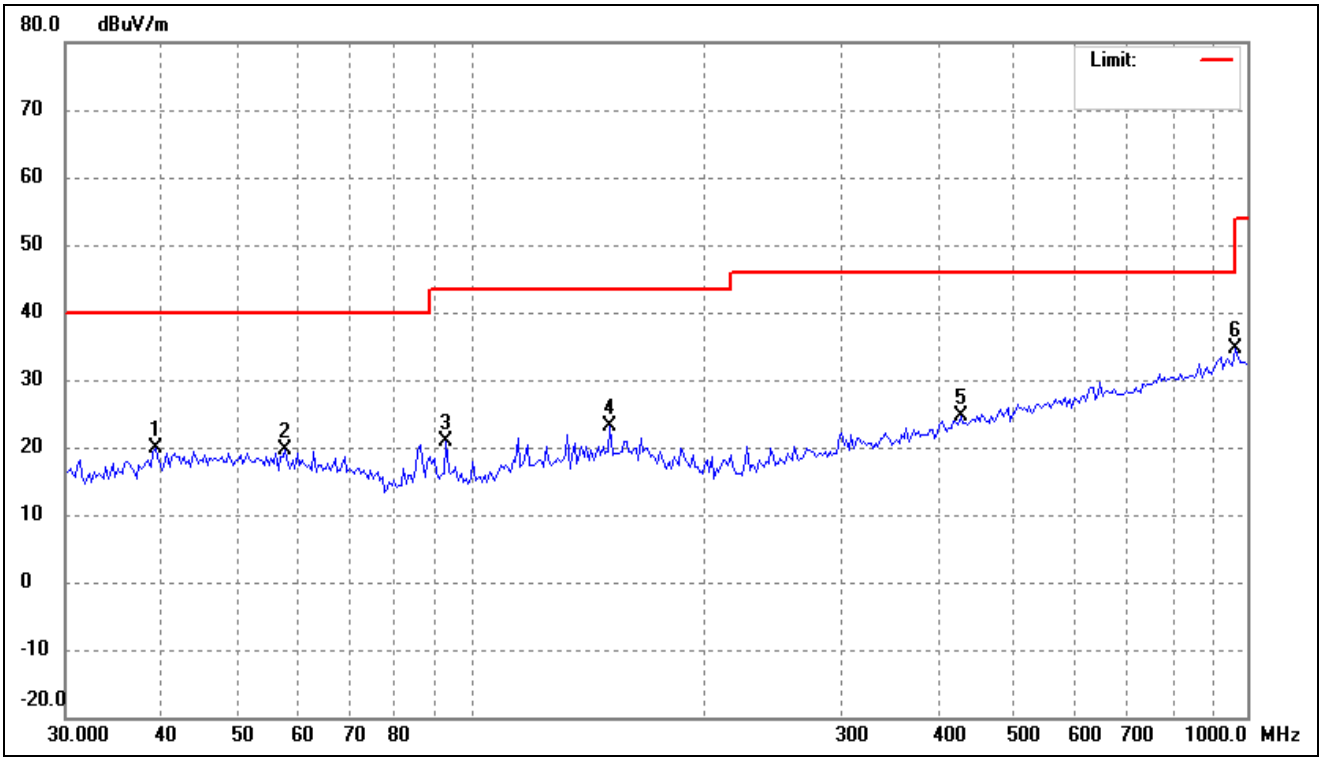
➢ 5725-5850MHz

802.11a(worst case)			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.2995	27.87	-8.48	19.39	40.00	-20.61	-	-	peak
2	59.3133	28.42	-8.90	19.52	40.00	-20.48	-	-	peak
3	148.9175	28.74	-8.68	20.06	43.50	-23.44	-	-	peak
4	274.4464	29.20	-9.13	20.07	46.00	-25.93	-	-	peak
5	488.3263	30.18	-4.06	26.12	46.00	-19.88	-	-	peak
6	798.6205	32.37	0.29	32.66	46.00	-13.34	-	-	peak

802.11a(worst case)			
Test Channel	5745MHz(worst case)	Polarity:	Vertical

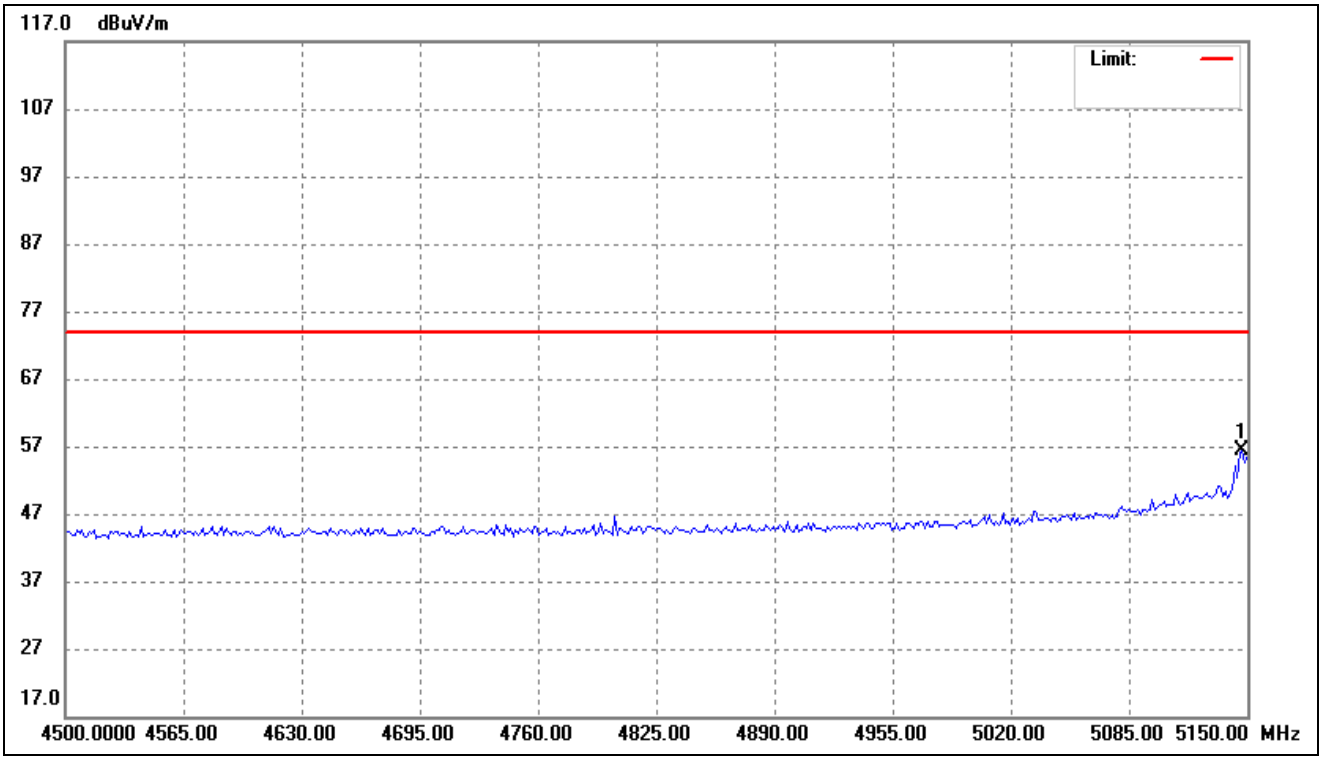


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	39.1825	28.54	-8.65	19.89	40.00	-20.11	-	-	peak
2	57.6693	28.37	-8.79	19.58	40.00	-20.42	-	-	peak
3	92.9974	33.80	-12.93	20.87	43.50	-22.63	-	-	peak
4	151.0252	31.63	-8.61	23.02	43.50	-20.48	-	-	peak
5	427.2920	29.97	-5.22	24.75	46.00	-21.25	-	-	peak
6	965.4742	32.28	2.27	34.55	54.00	-19.45	-	-	peak

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

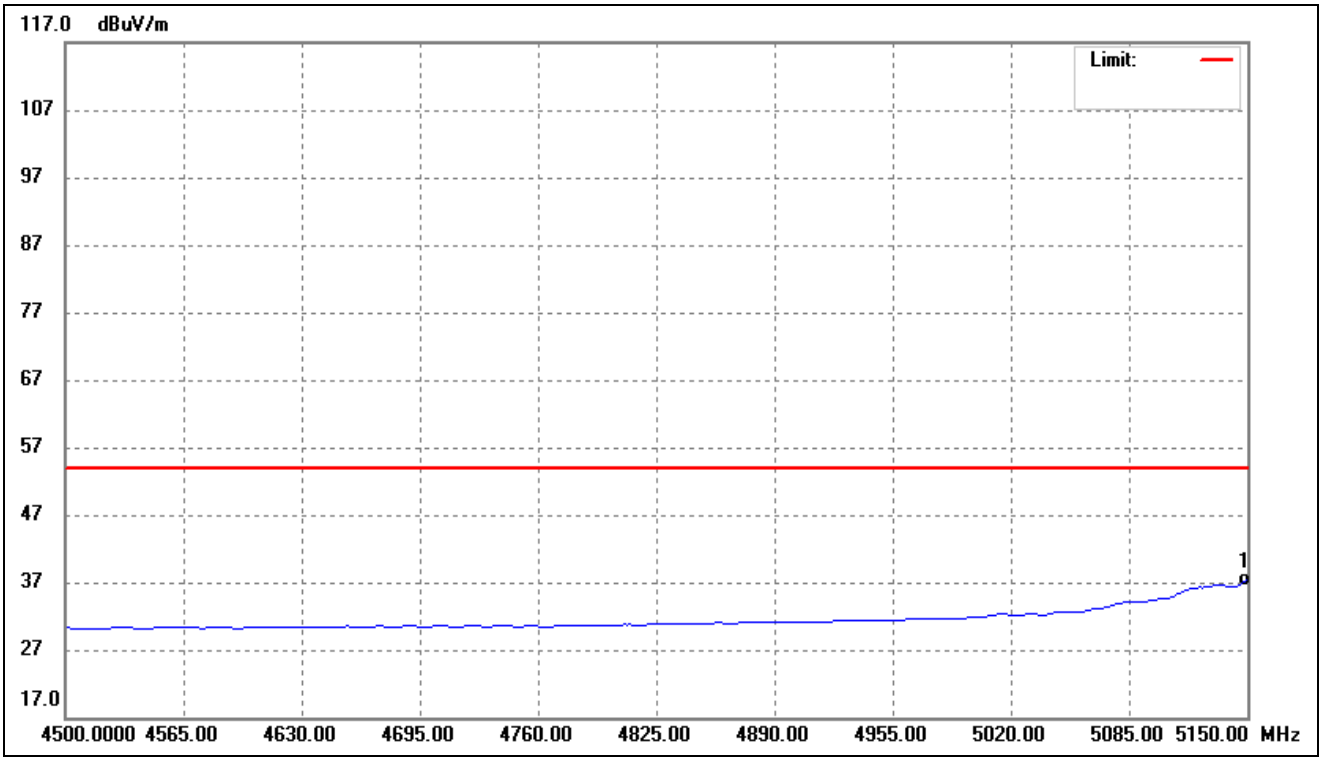
➢ Spurious Emission above 1GHz

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



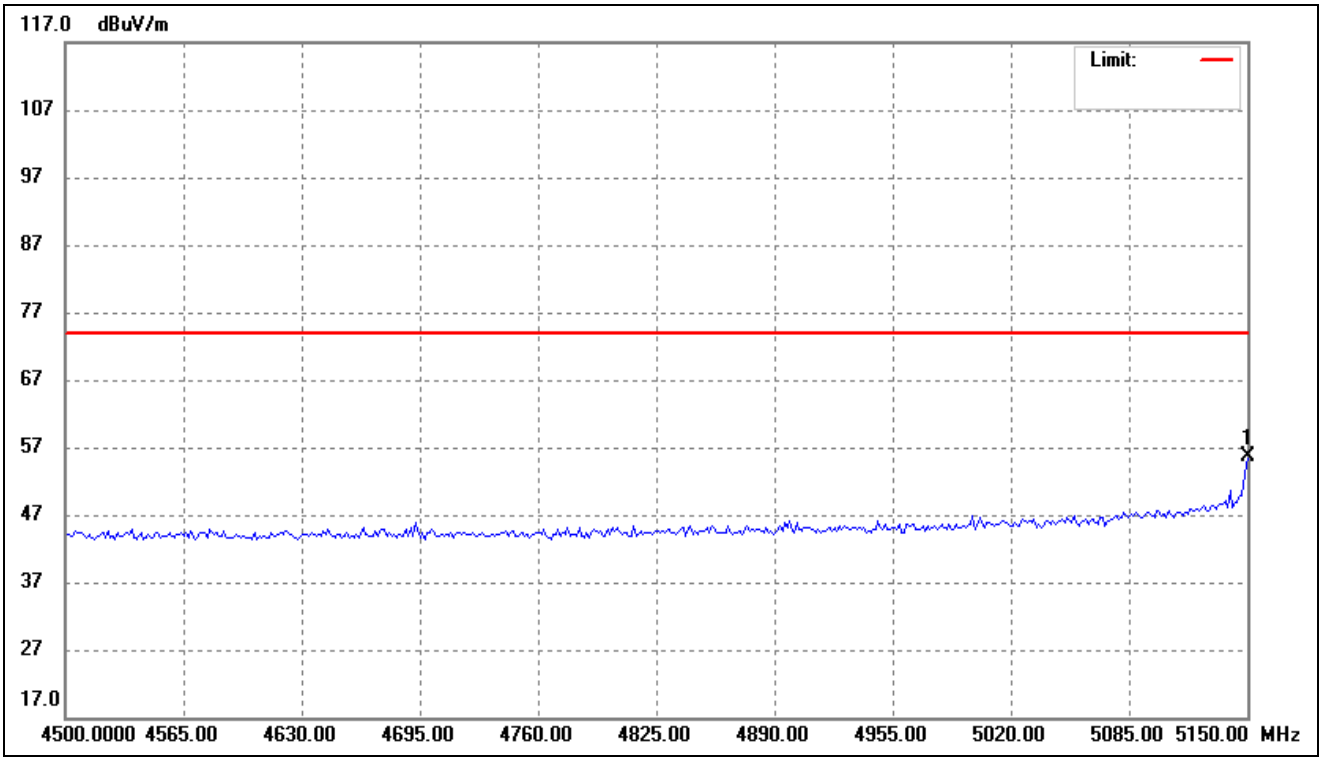
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5147.395	68.02	-11.67	56.35	74.00	-17.65	-	-	peak

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



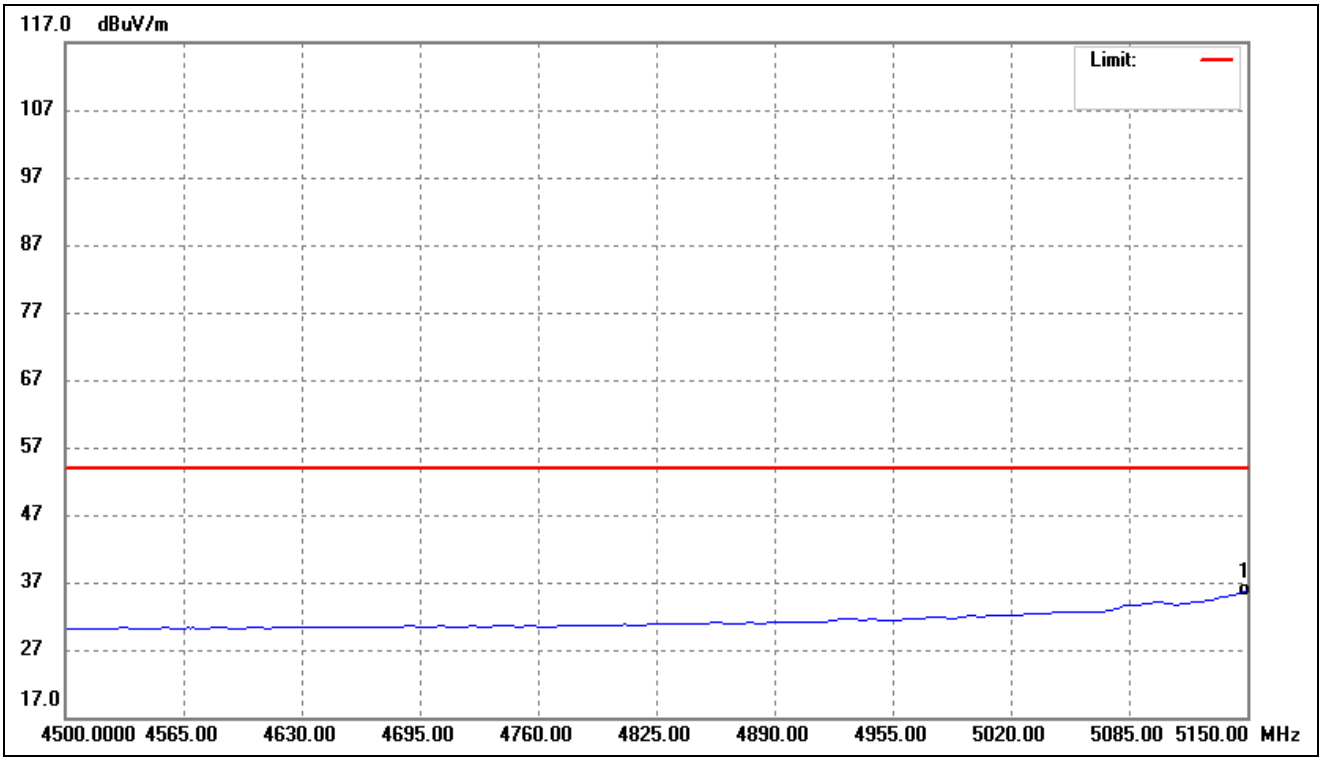
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5150.000	49.07	-11.66	37.41	54.00	-16.59	-	-	AVG

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



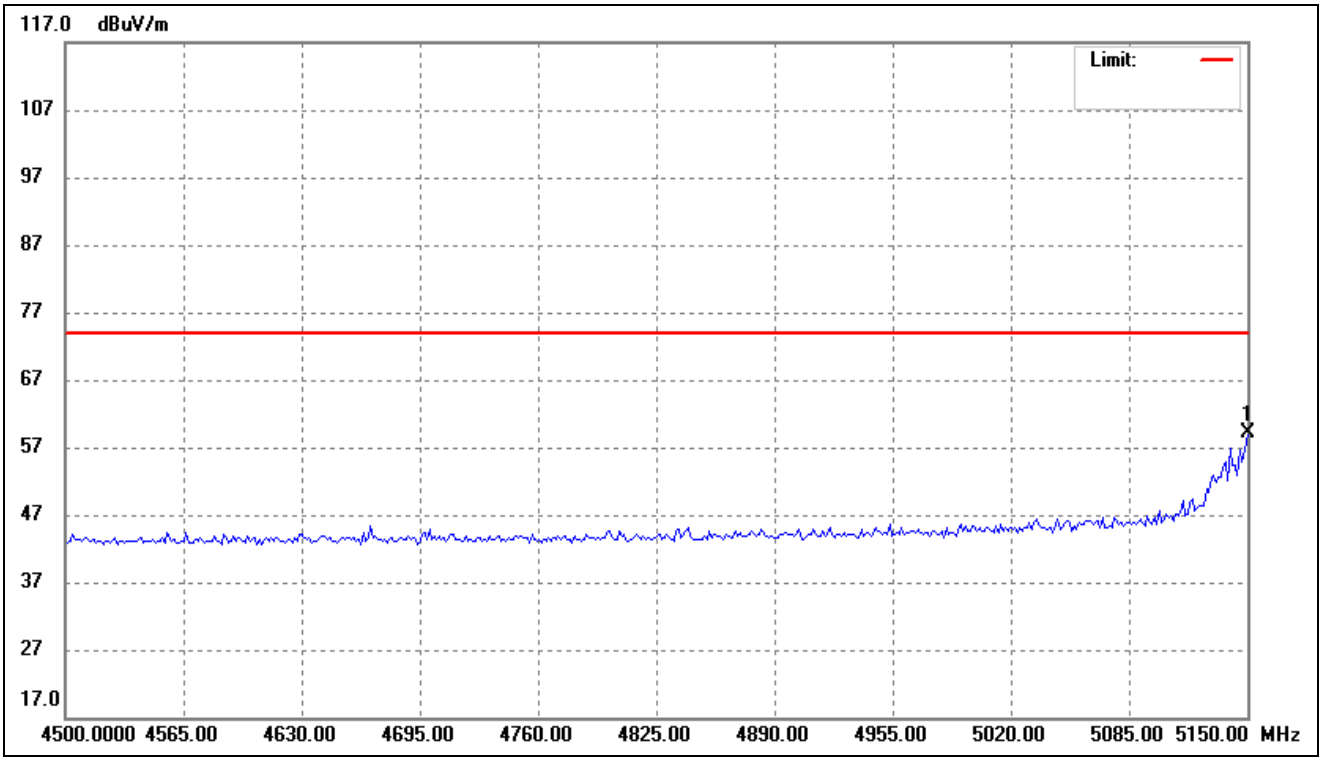
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5150.000	67.37	-11.66	55.71	74.00	-18.29	-	-	peak

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



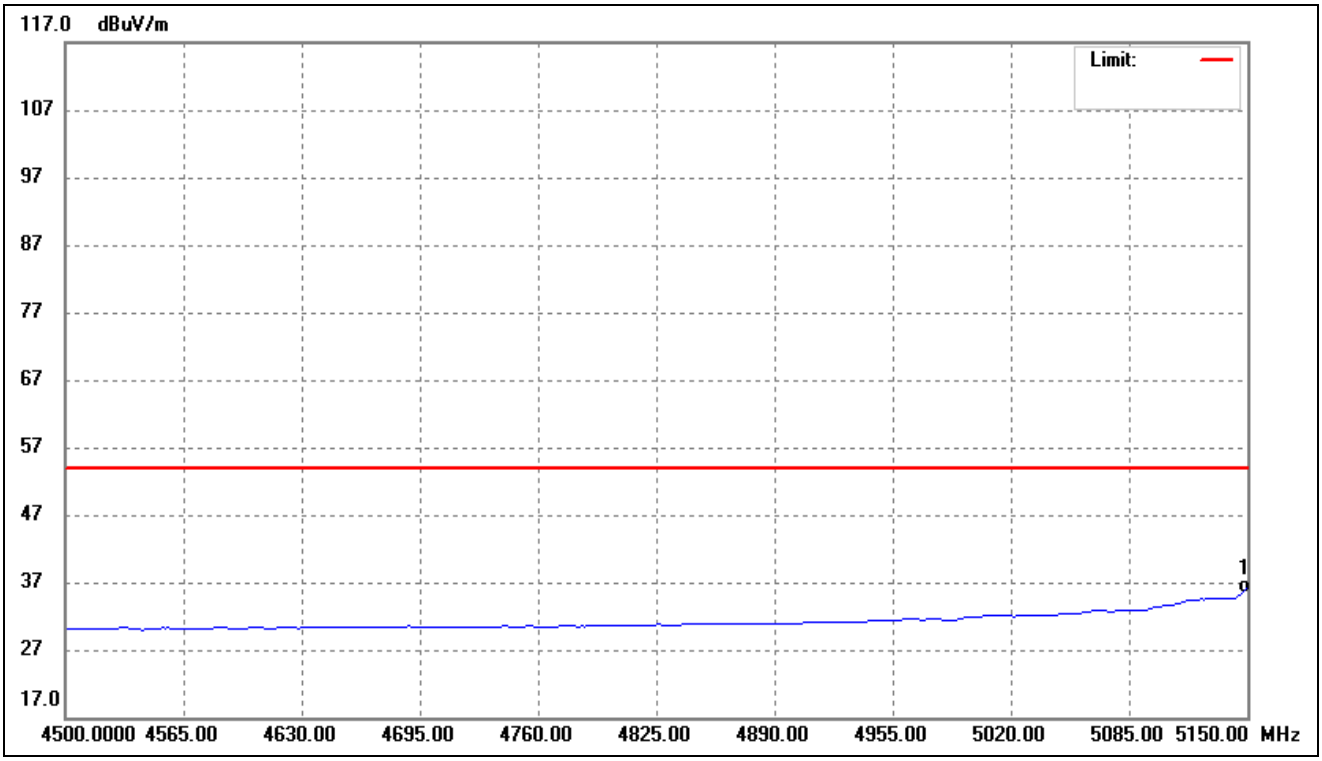
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5150.000	47.51	-11.66	35.85	54.00	-18.15	-	-	AVG

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



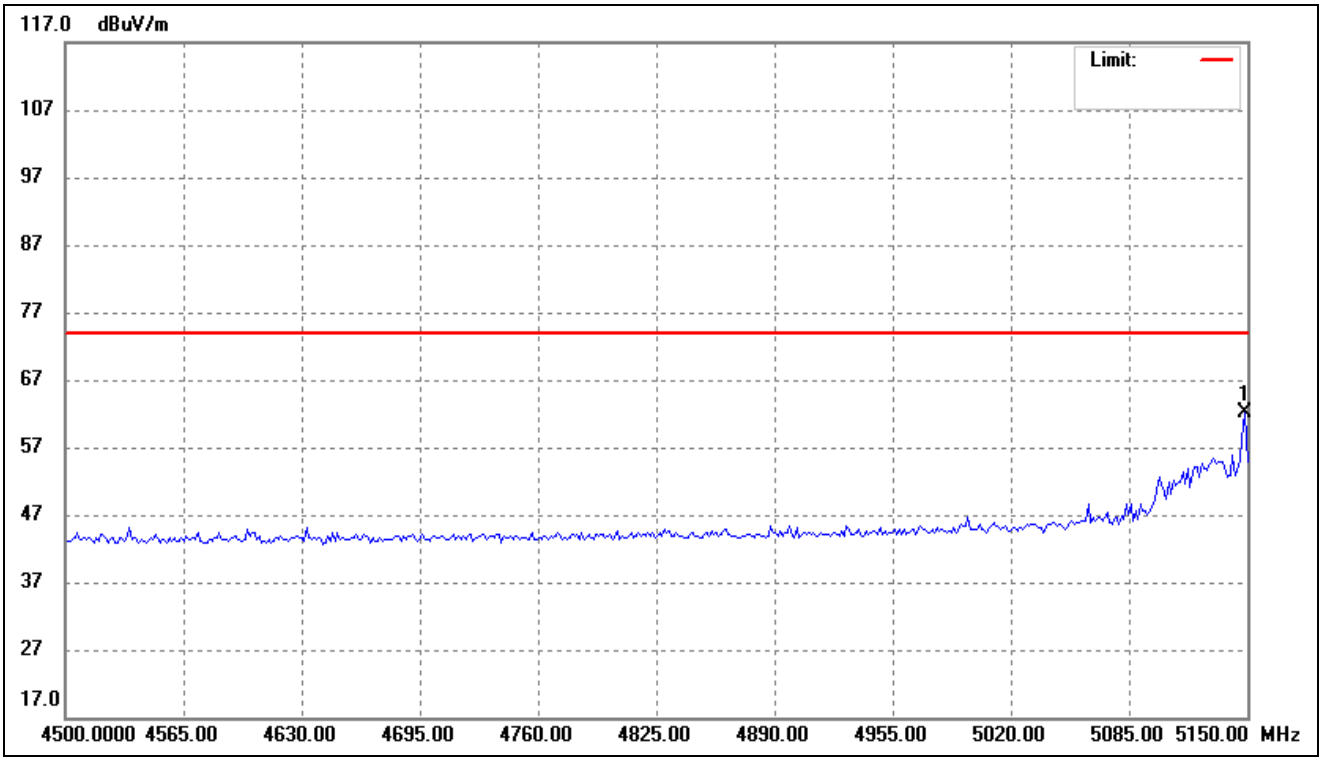
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5150.000	70.78	-11.66	59.12	74.00	-14.88	-	-	peak

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



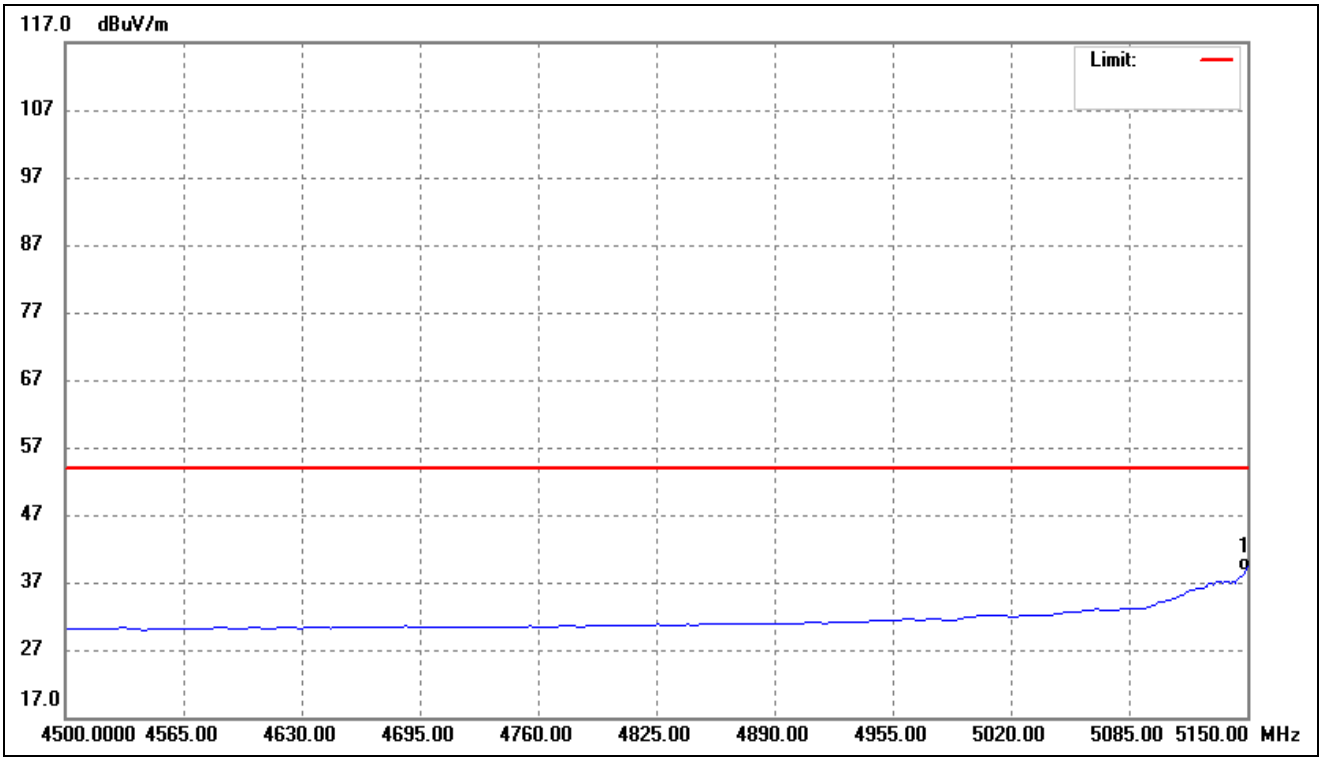
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5150.000	48.08	-11.66	36.42	54.00	-17.58	-	-	AVG

802.11ac-VHT80- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



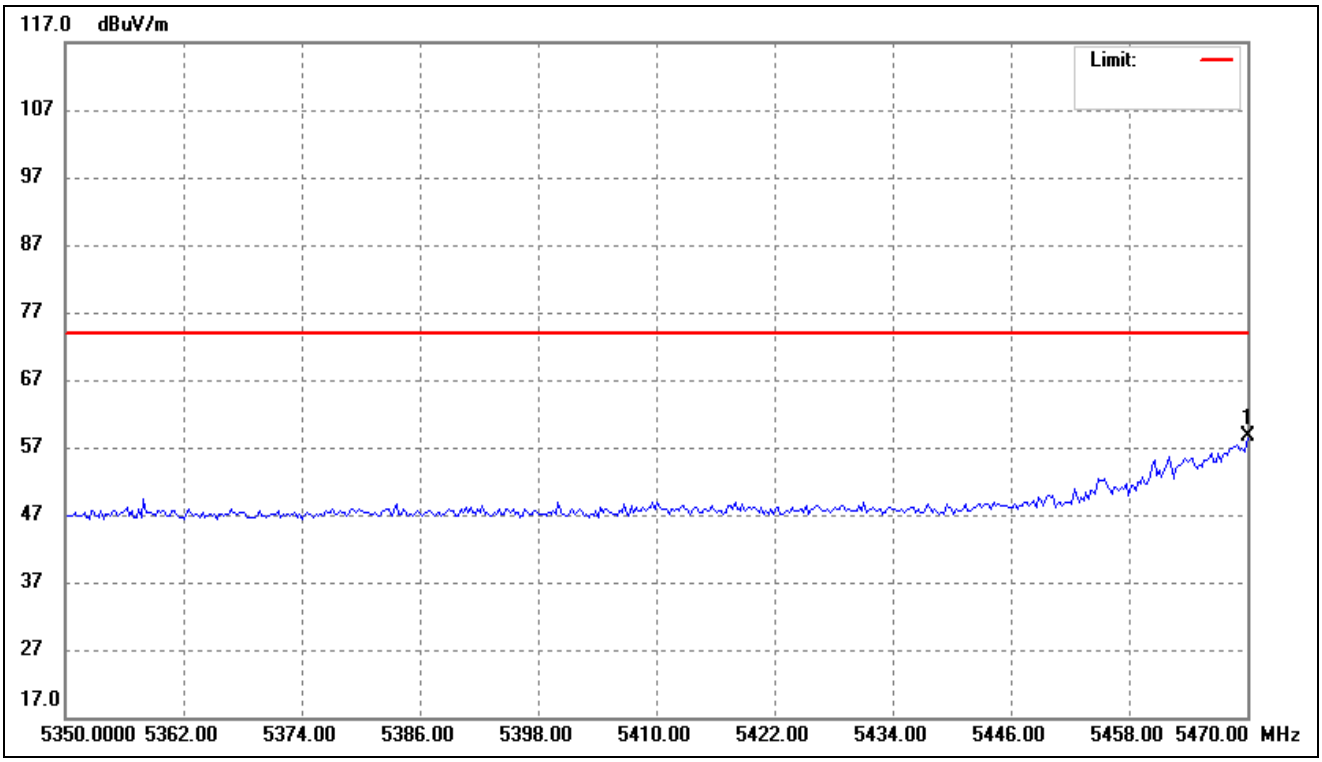
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5148.697	73.68	-11.66	62.02	74.00	-11.98	-	-	peak

802.11ac-VHT80- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Horizontal(worst case)



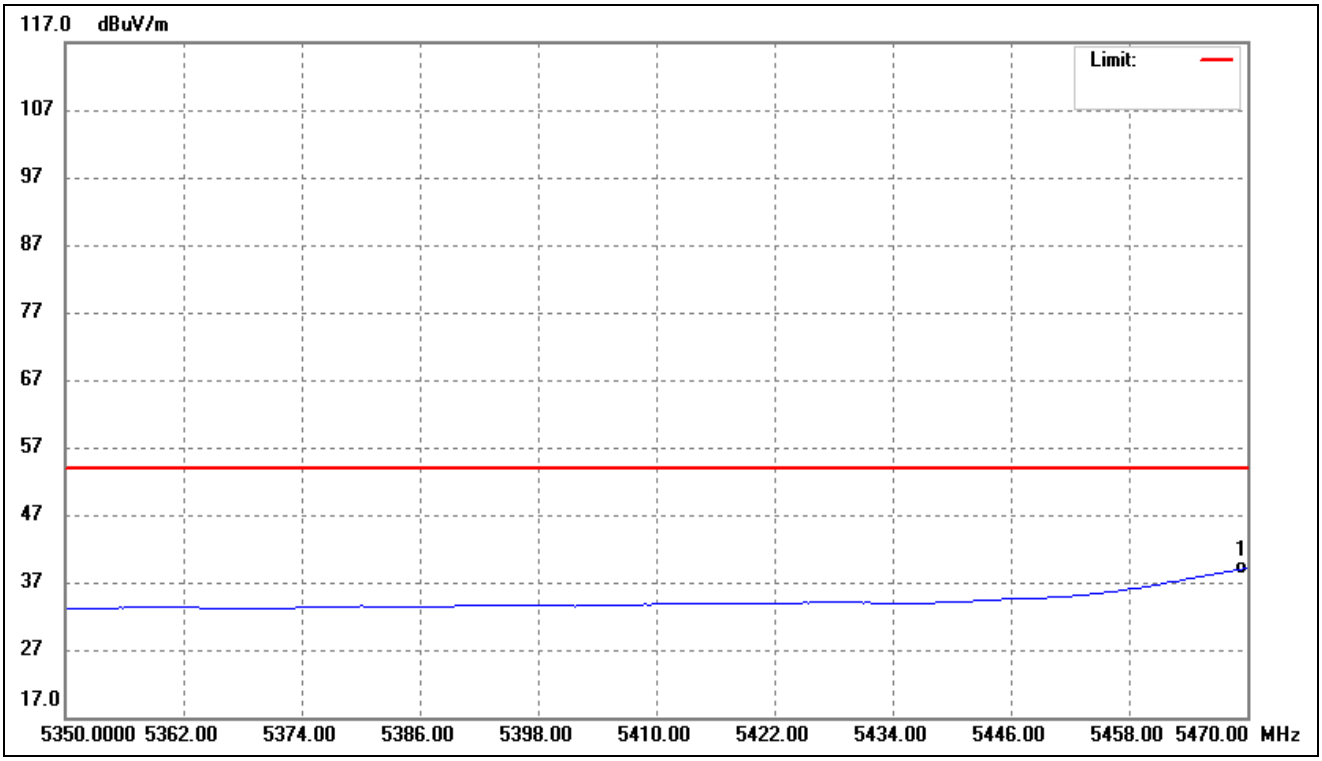
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5150.000	51.22	-11.66	39.56	54.00	-14.44	-	-	AVG

802.11a- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



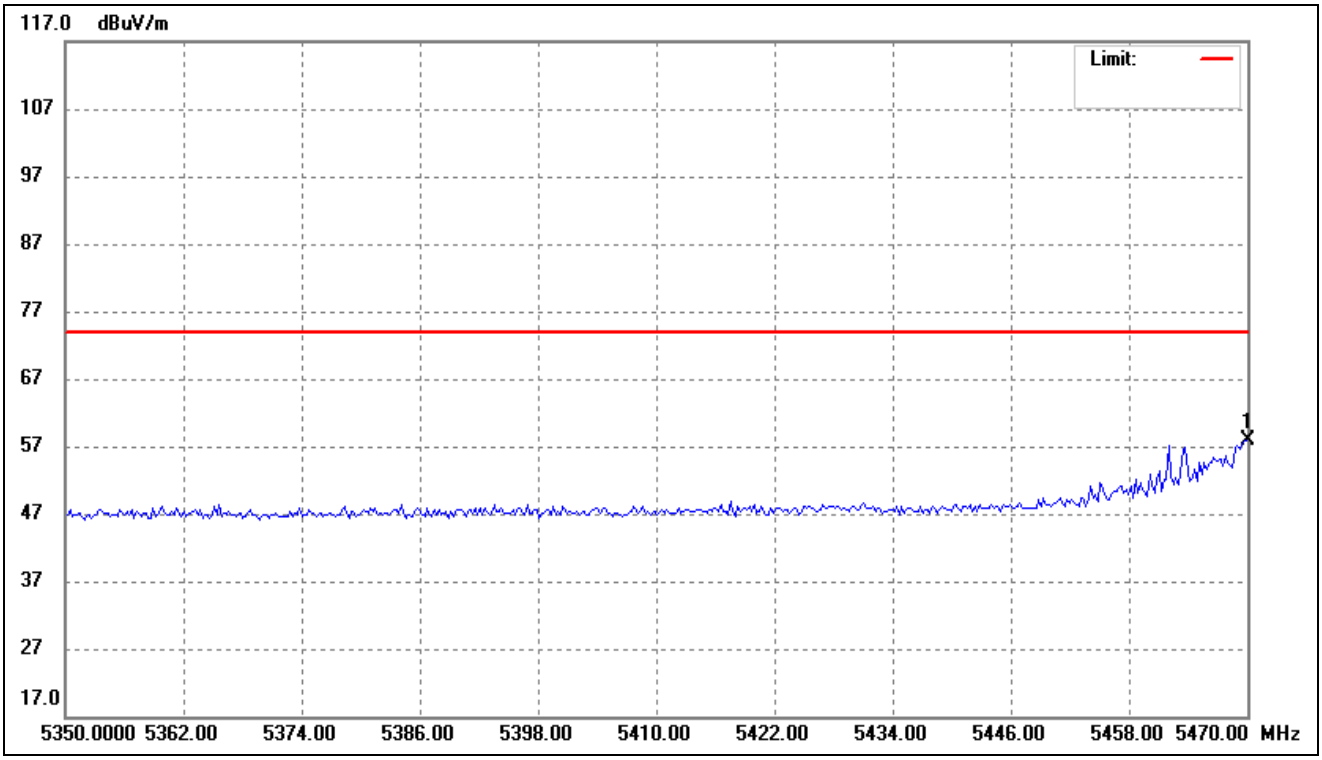
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5470.000	68.62	-10.08	58.54	74.00	-15.46	-	-	peak

802.11a- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



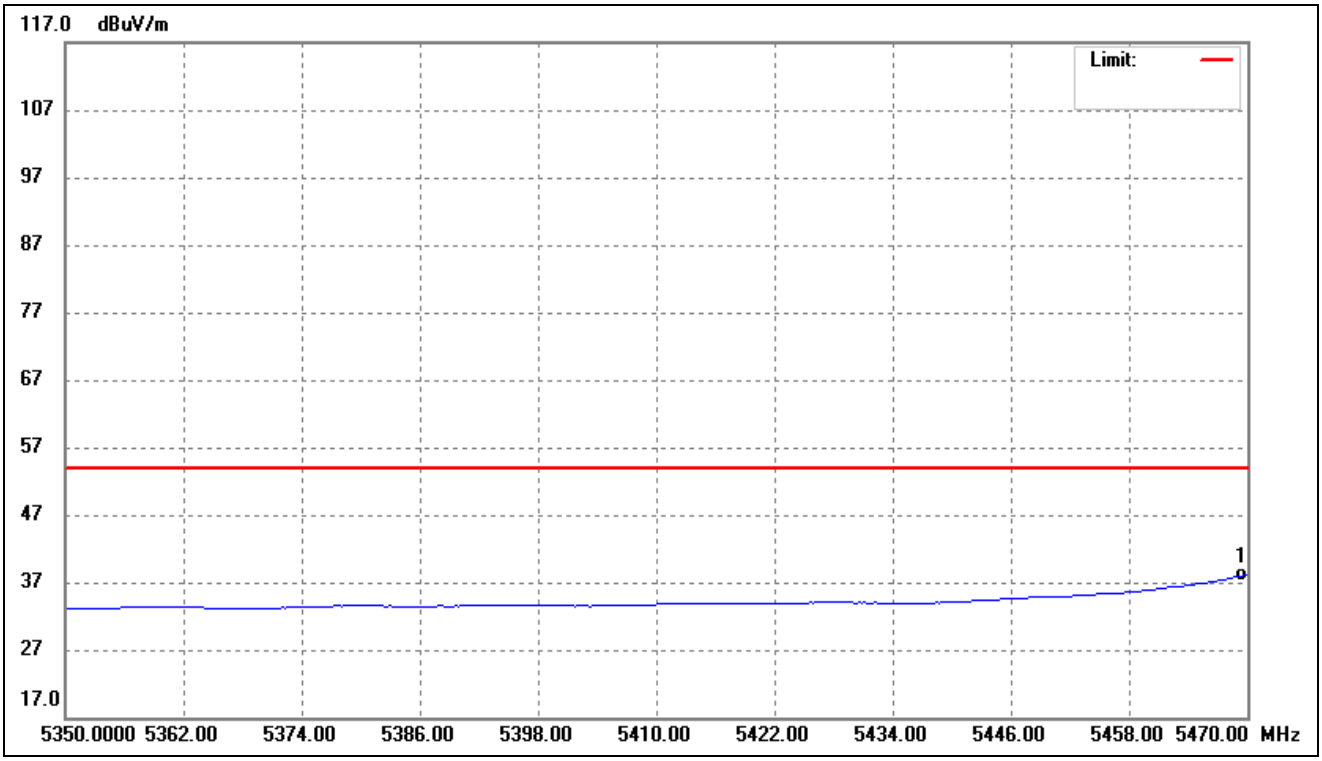
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5470.000	49.23	-10.08	39.15	54.00	-14.85	-	-	AVG

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



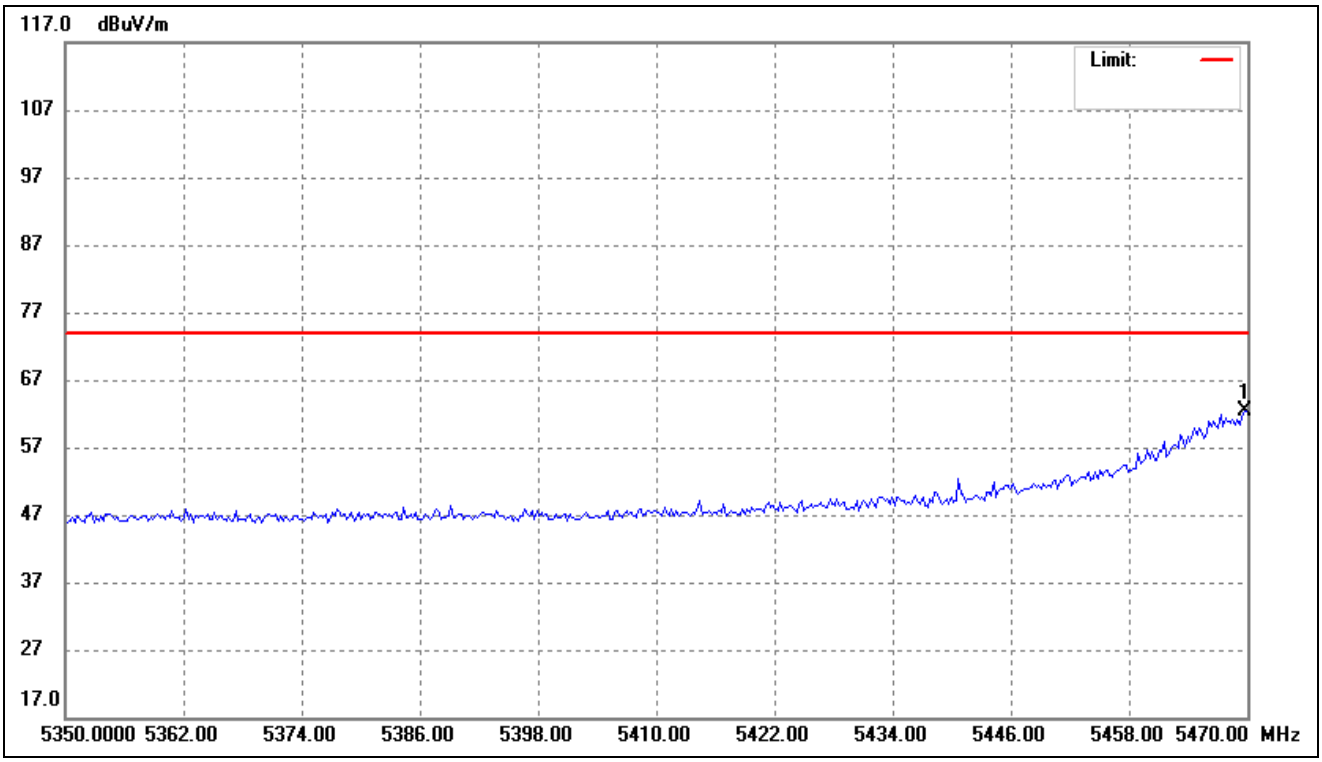
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5470.000	67.98	-10.08	57.90	74.00	-16.10	-	-	peak

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



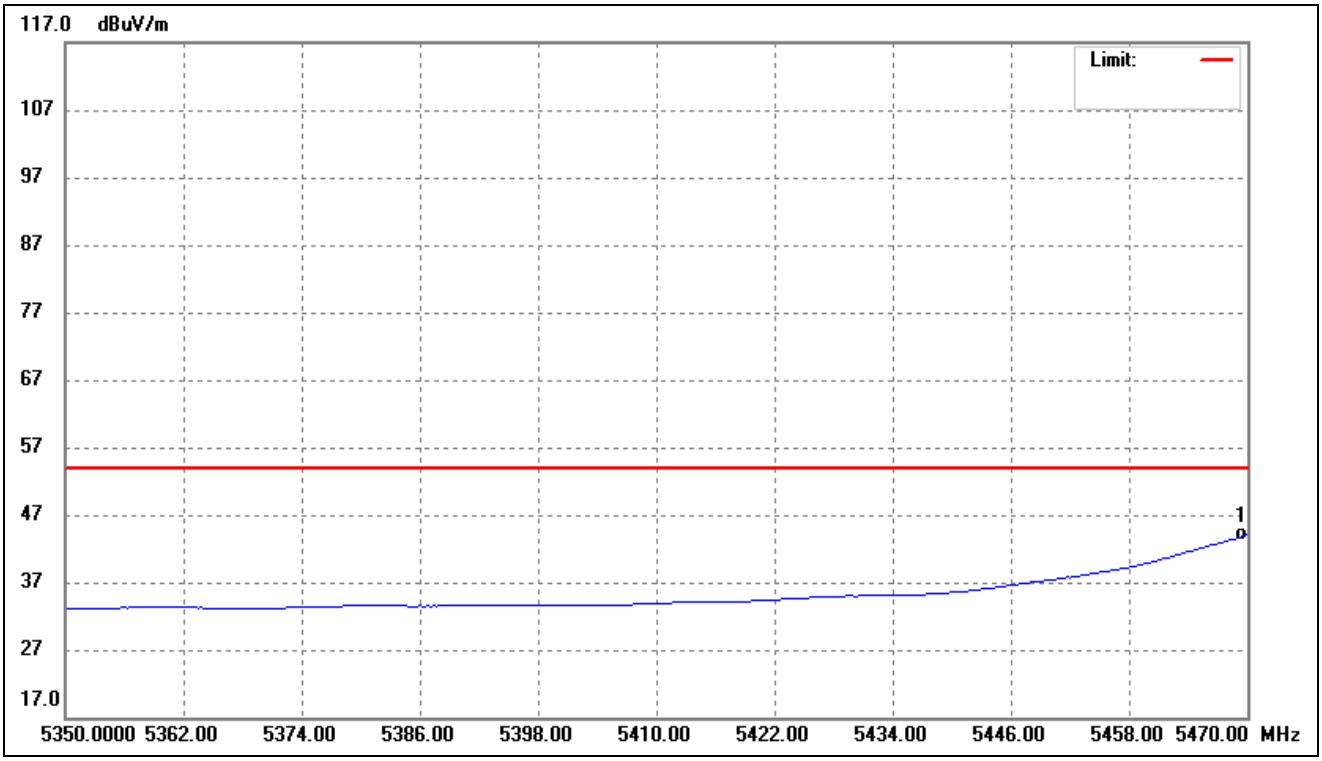
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5470.000	48.28	-10.08	38.20	54.00	-15.80	-	-	AVG

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



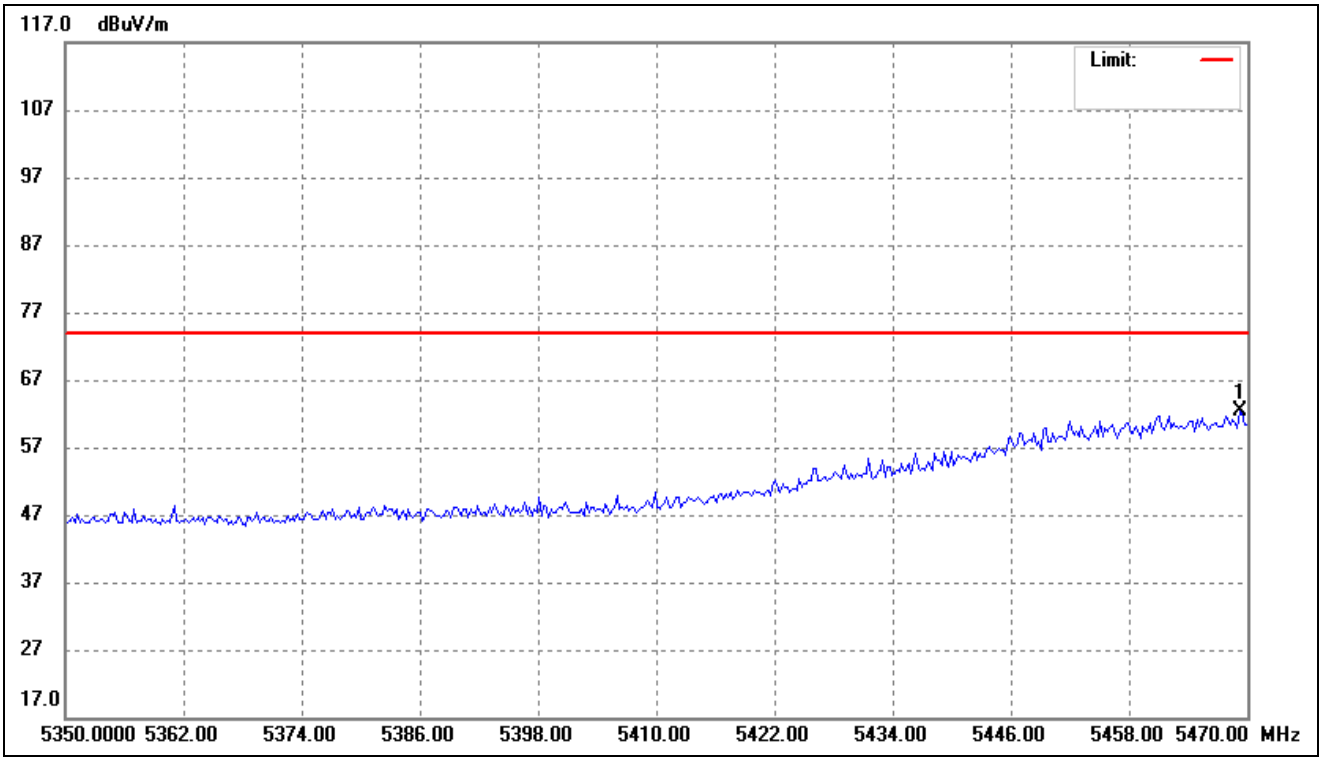
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5469.760	72.37	-10.09	62.28	74.00	-11.72	-	-	peak

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



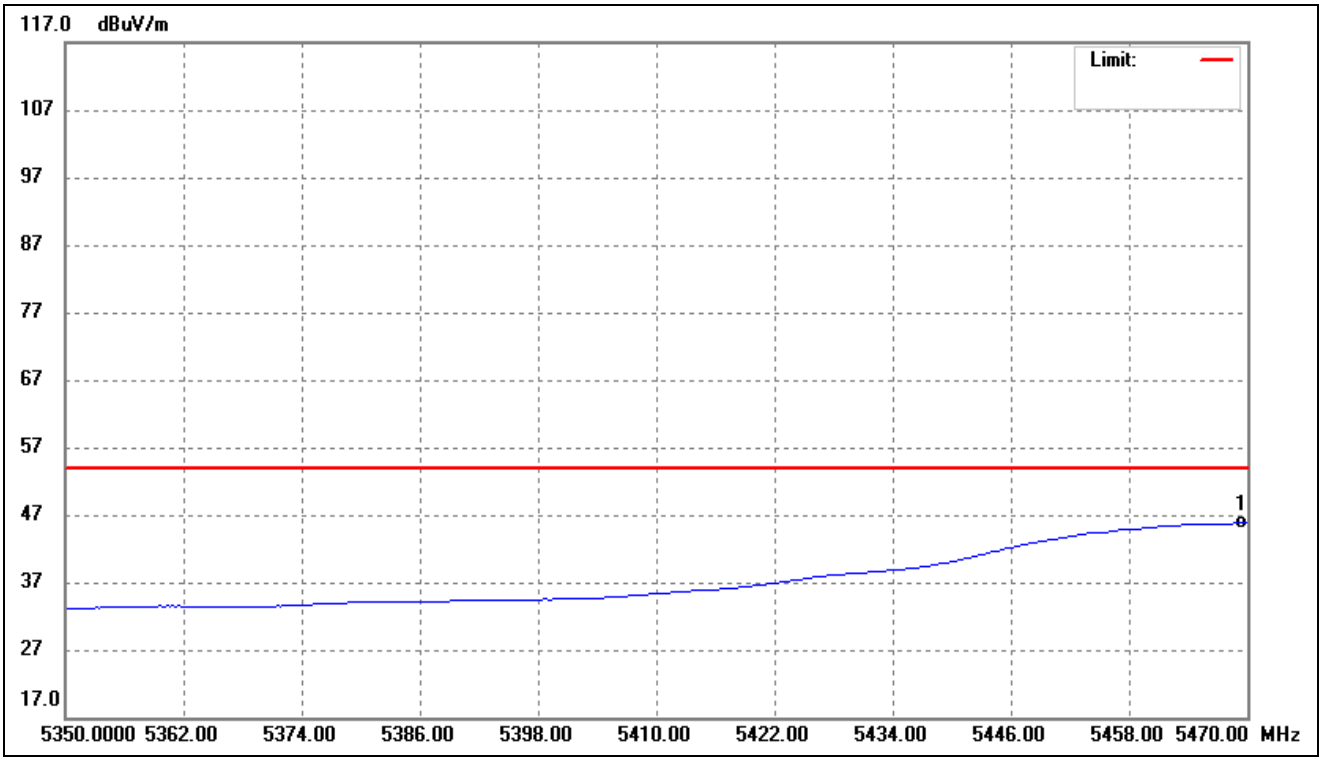
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5470.000	54.11	-10.08	44.03	54.00	-9.97	-	-	AVG

802.11ac-VHT80- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5469.279	72.39	-10.09	62.30	74.00	-11.70	-	-	peak

802.11ac-VHT80- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal(worst case)



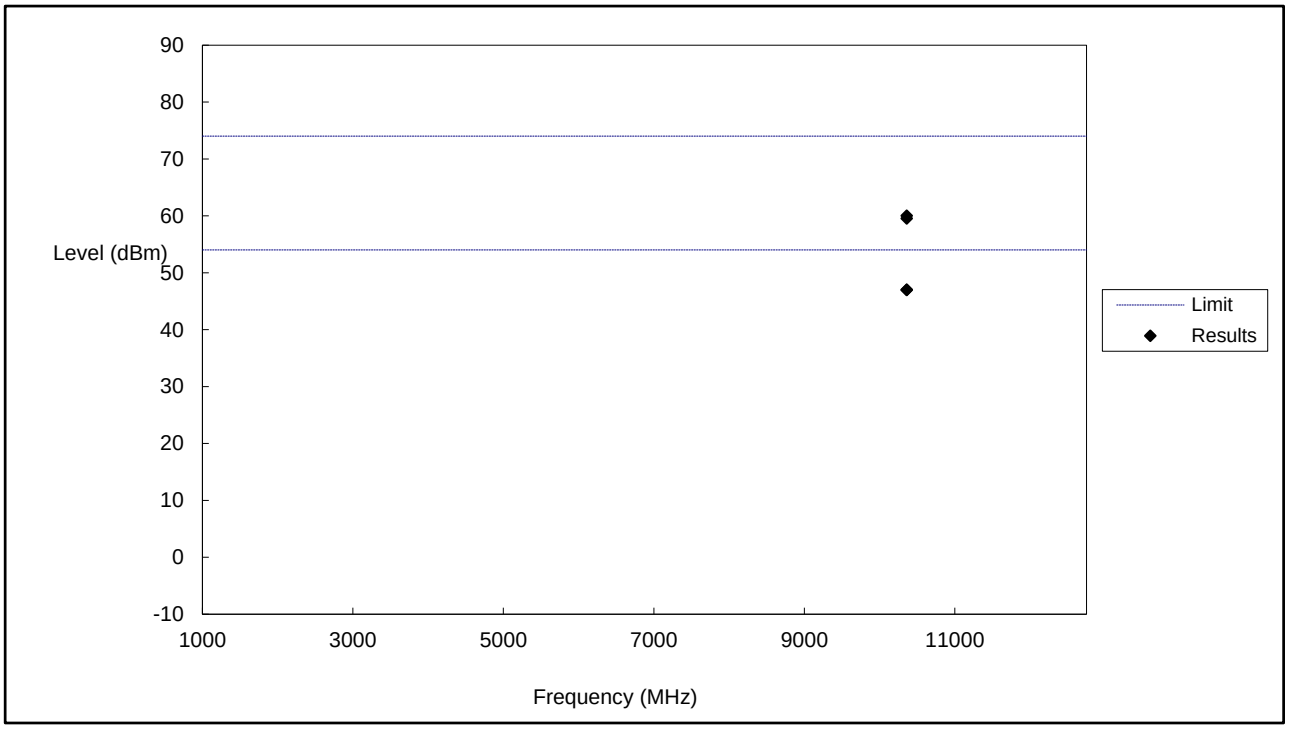
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5469.760	56.03	-10.09	45.94	54.00	-8.06	-	-	AVG

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

Remark: '-'Means' the test Degree and Height is not recorded by the test software and only show the worst case in the test report.

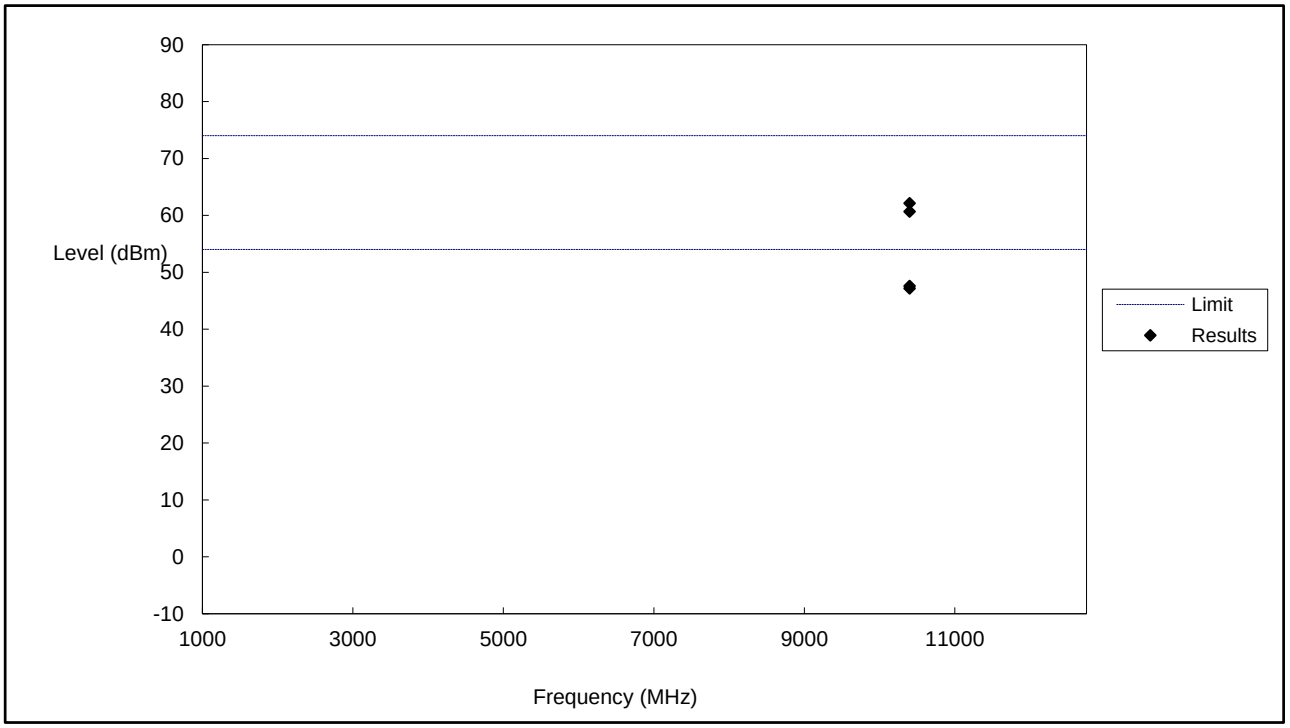
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11a)
- Harmonics And Spurious Emissions

Low Channel (5180MHz)



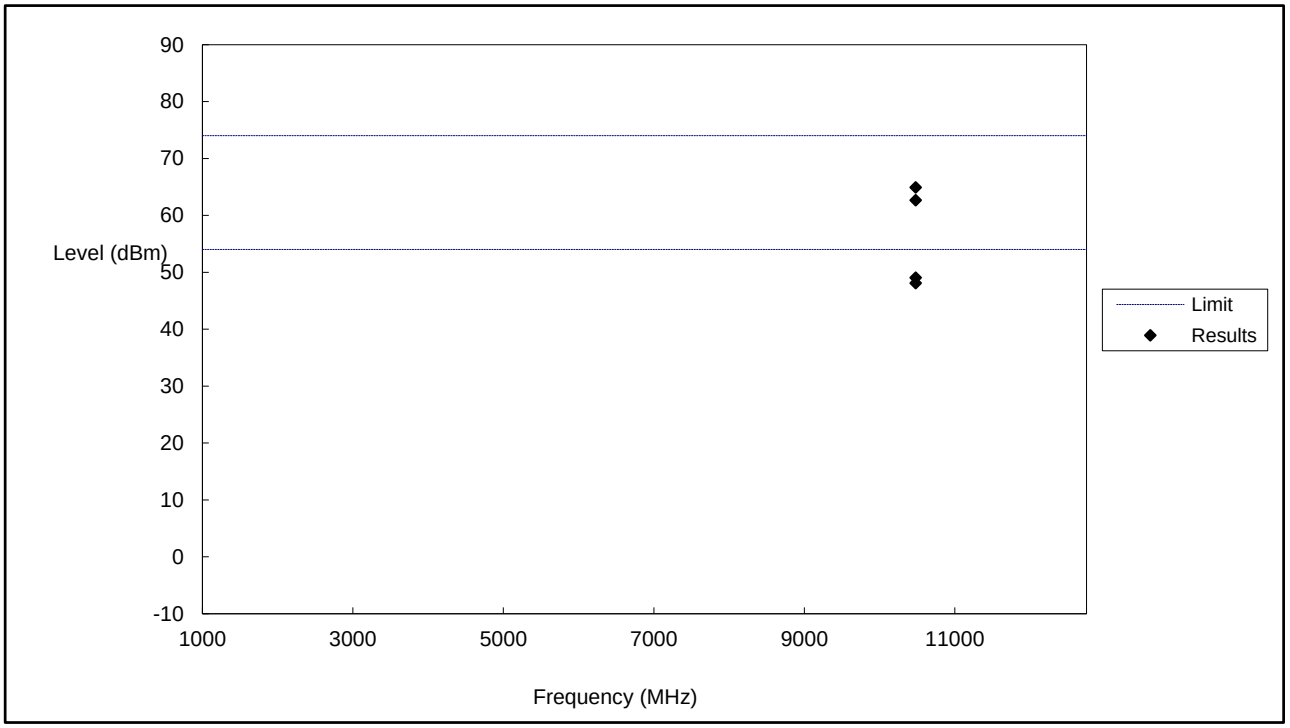
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10360	59.54	74	-14.46	H	RMS
2	10360	46.97	54	-7.03	H	RMS
1	10360	60.03	74	-13.97	V	RMS
2	10360	47.01	54	-6.99	V	RMS

Middle Channel (5200MHz)



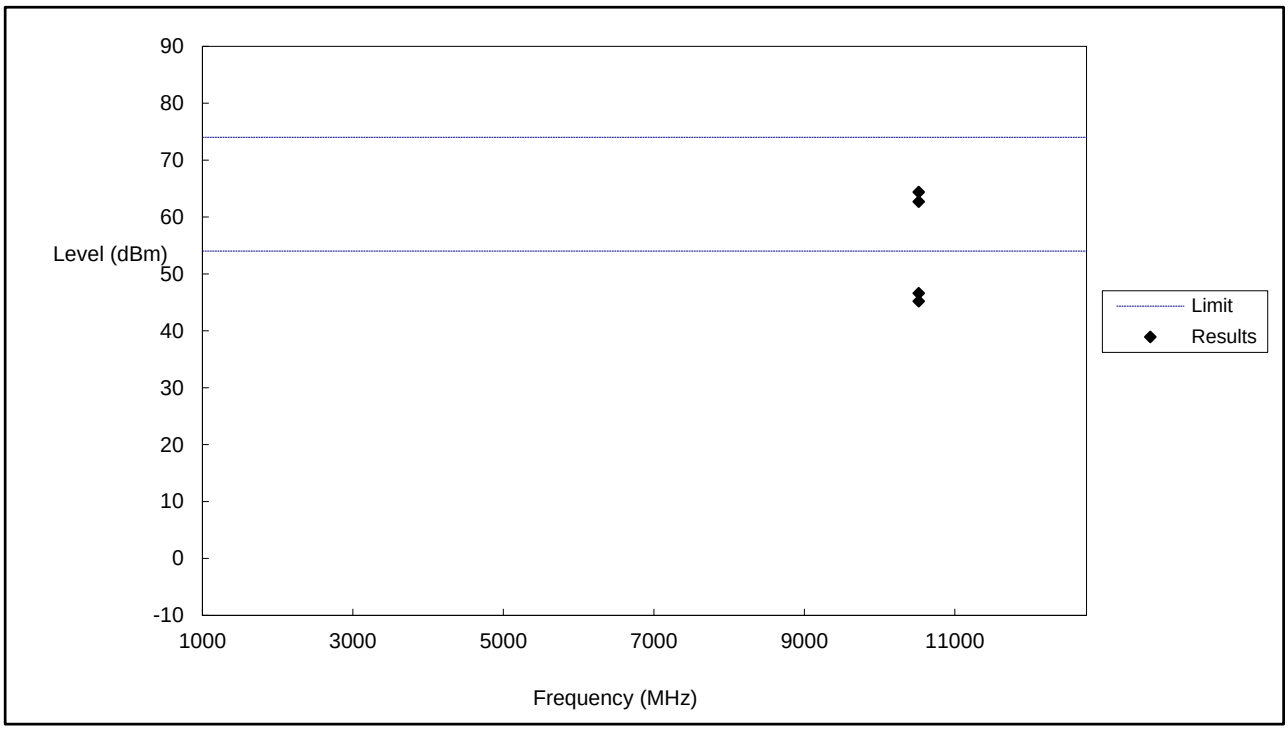
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10400	60.66	74	-13.34	H	RMS
2	10400	47.58	54	-6.42	H	RMS
1	10400	62.14	74	-11.86	V	RMS
2	10400	47.15	54	-6.85	V	RMS

High Channel (5240MHz)



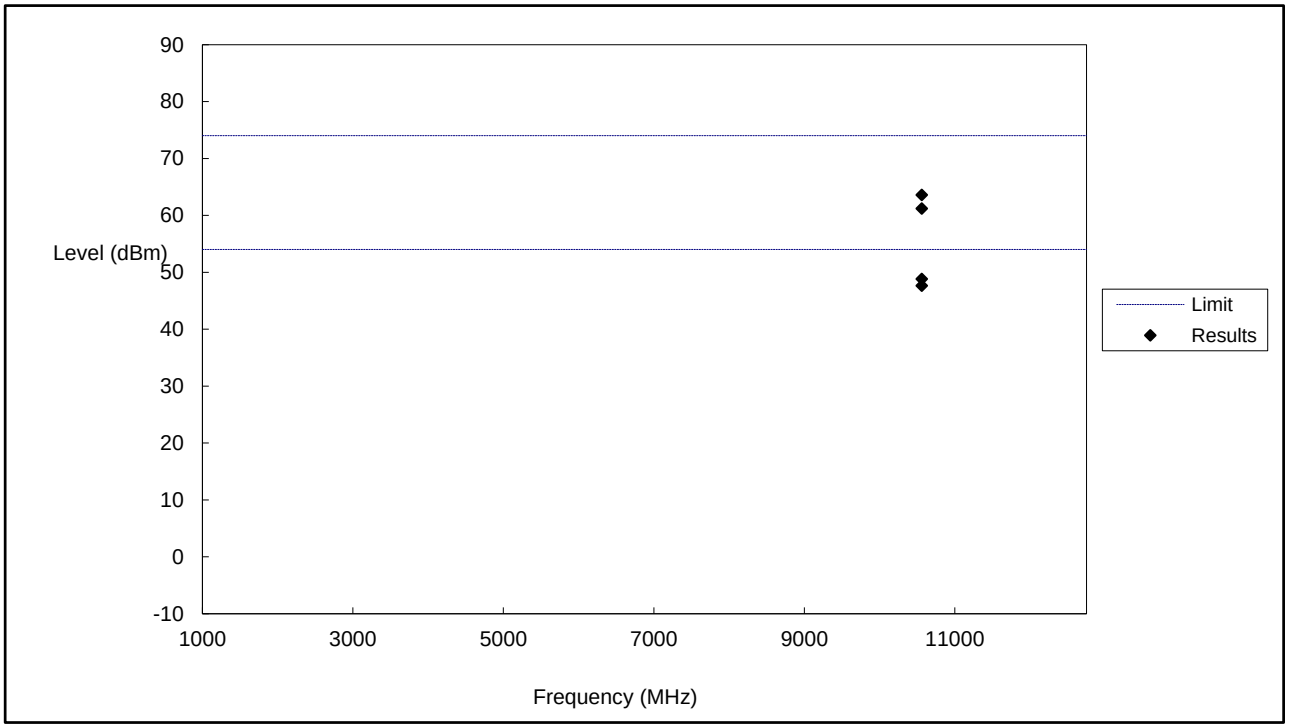
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10480	64.91	74	-9.09	H	RMS
2	10480	48.09	54	-5.91	H	RMS
1	10480	62.65	74	-11.35	V	RMS
2	10480	49.04	54	-4.96	V	RMS

Low Channel (5260MHz)



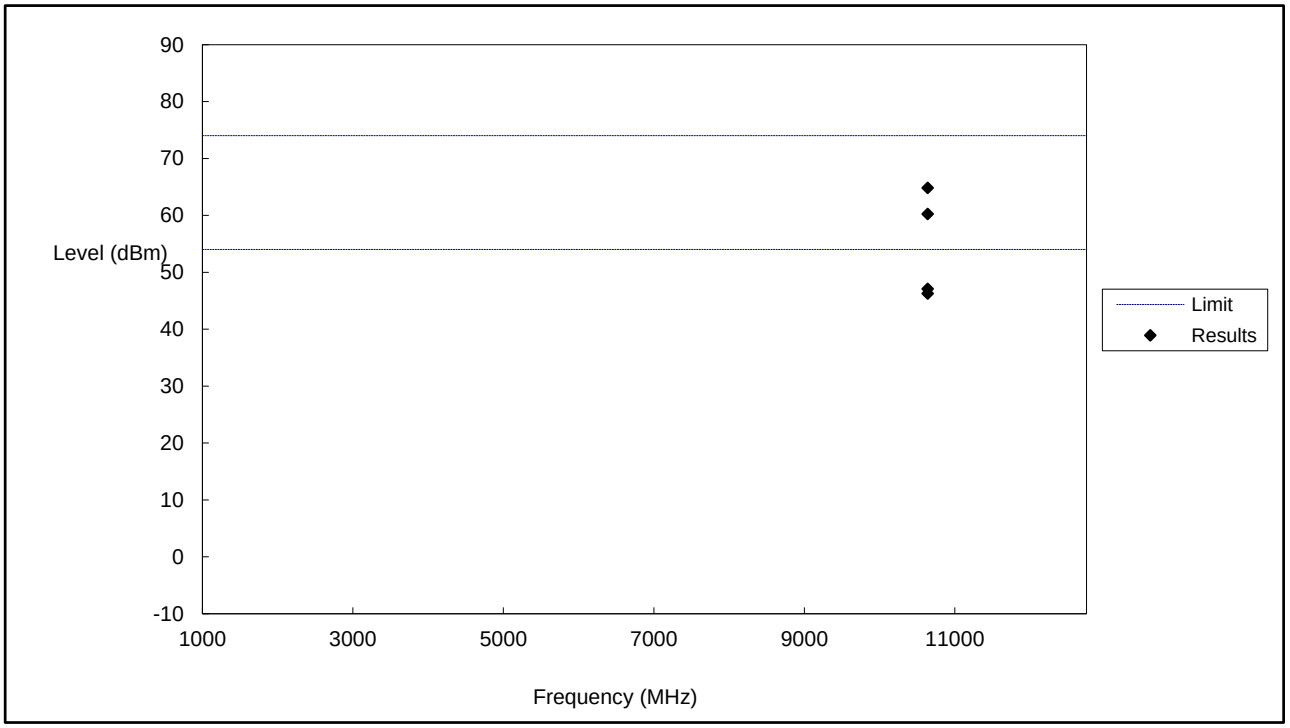
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10520	64.38	74	-9.62	H	RMS
2	10520	46.59	54	-7.41	H	RMS
1	10520	62.70	74	-11.30	V	RMS
2	10520	45.19	54	-8.81	V	RMS

Middle Channel (5280MHz)



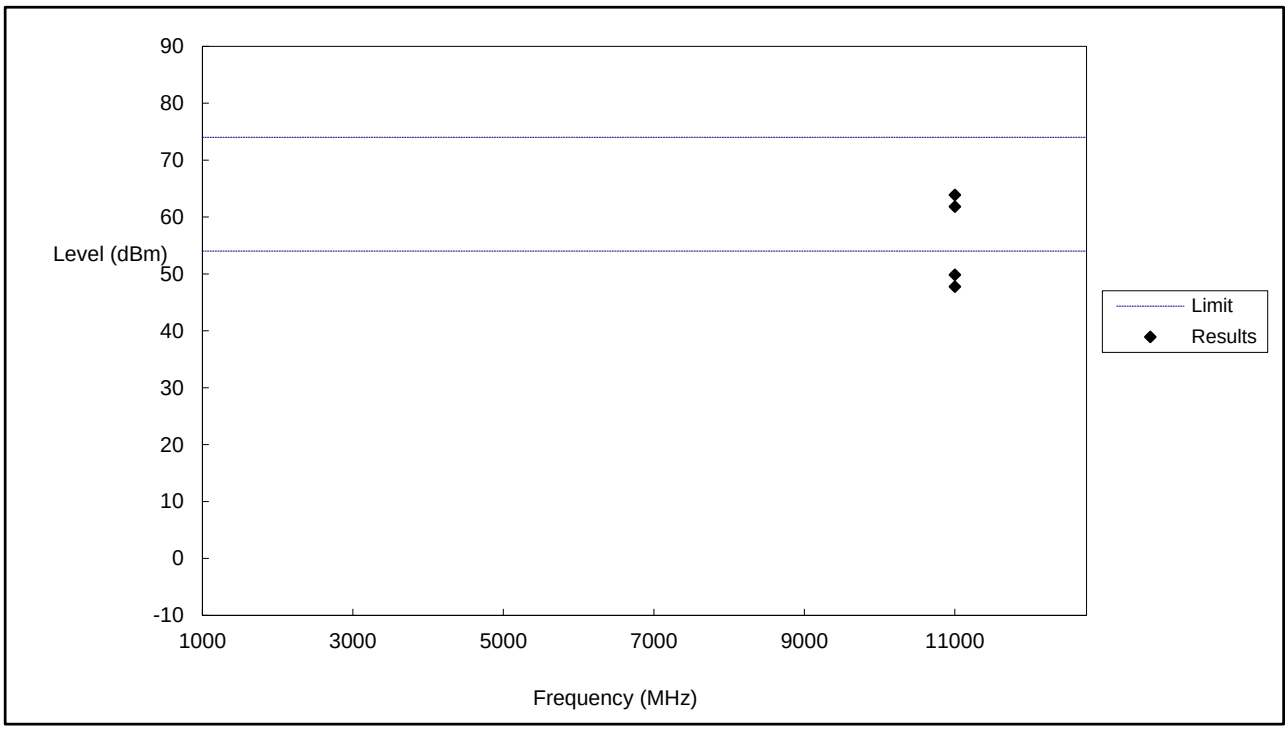
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10560	63.59	74	-10.41	H	RMS
2	10560	47.65	54	-6.35	H	RMS
1	10560	61.19	74	-12.81	V	RMS
2	10560	48.83	54	-5.17	V	RMS

High Channel (5320MHz)



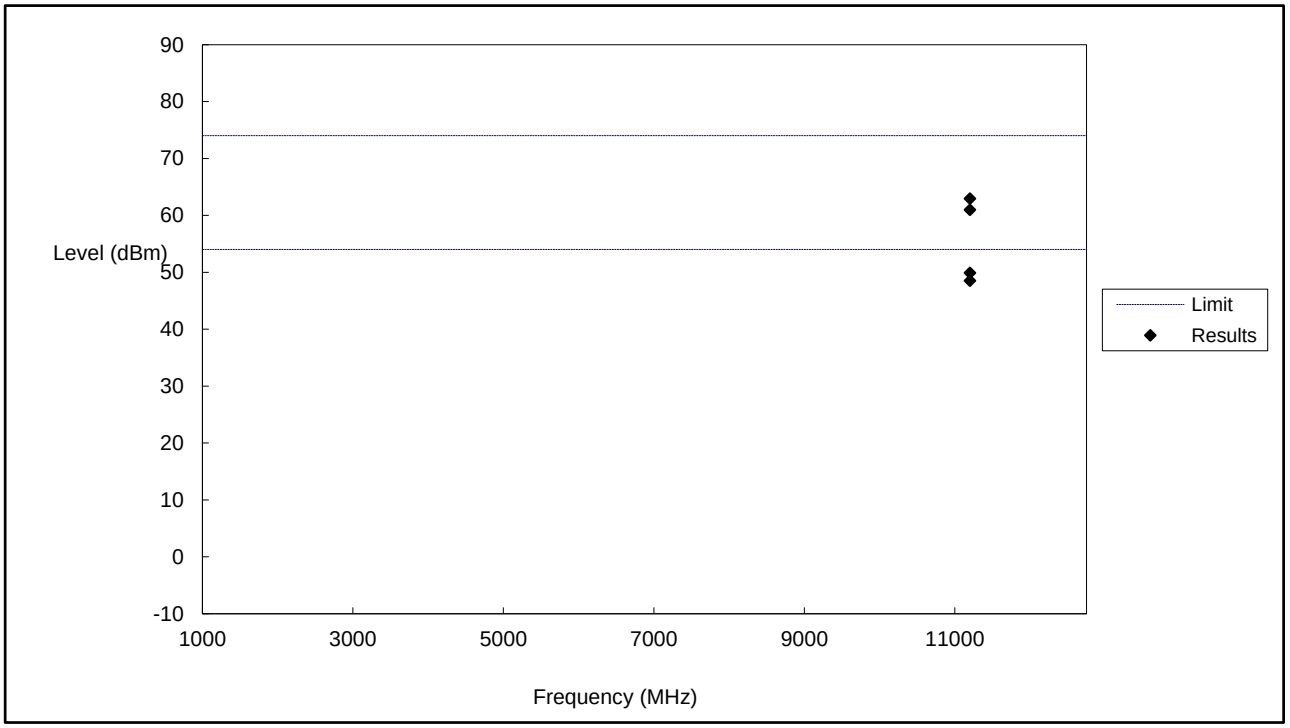
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10640	64.82	74	-9.18	H	RMS
2	10640	46.27	54	-7.73	H	RMS
1	10640	60.24	74	-13.76	V	RMS
2	10640	47.08	54	-6.92	V	RMS

Low Channel (5500MHz)



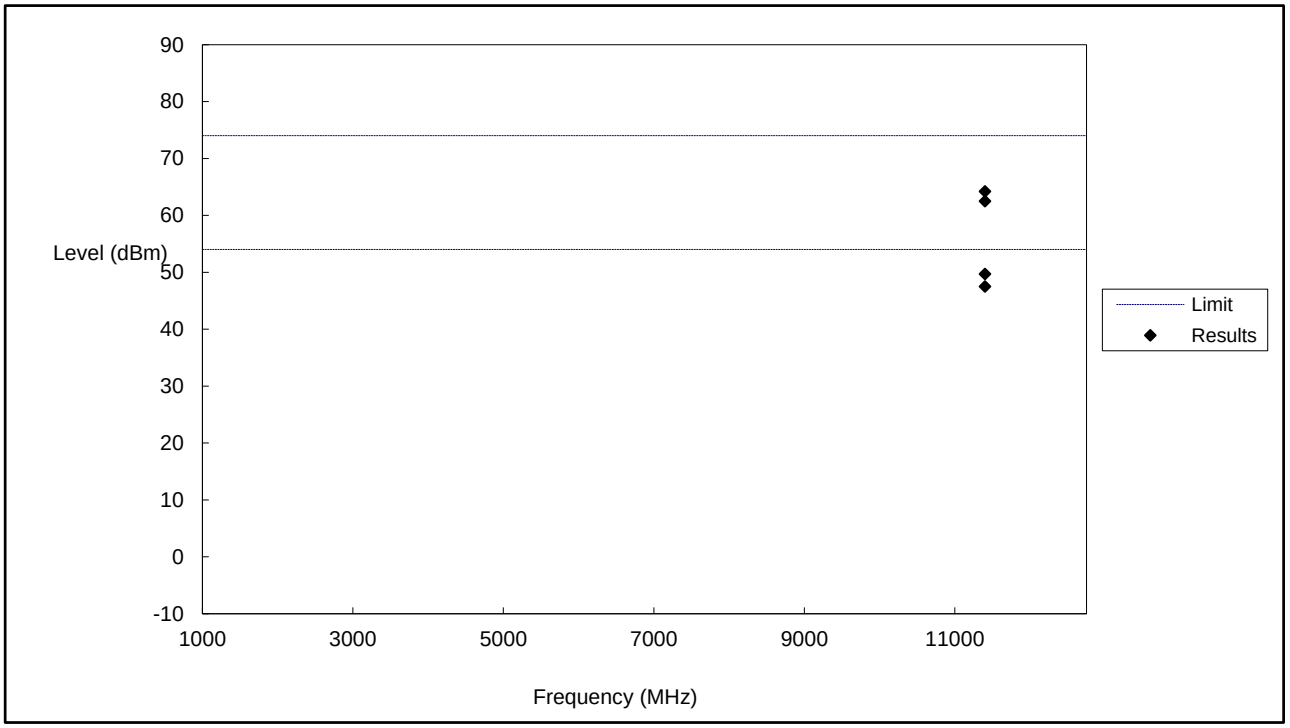
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11000	63.87	74	-10.13	H	RMS
2	11000	49.83	54	-4.17	H	RMS
1	11000	61.83	74	-12.17	V	RMS
2	11000	47.76	54	-6.24	V	RMS

Middle Channel (5600MHz)



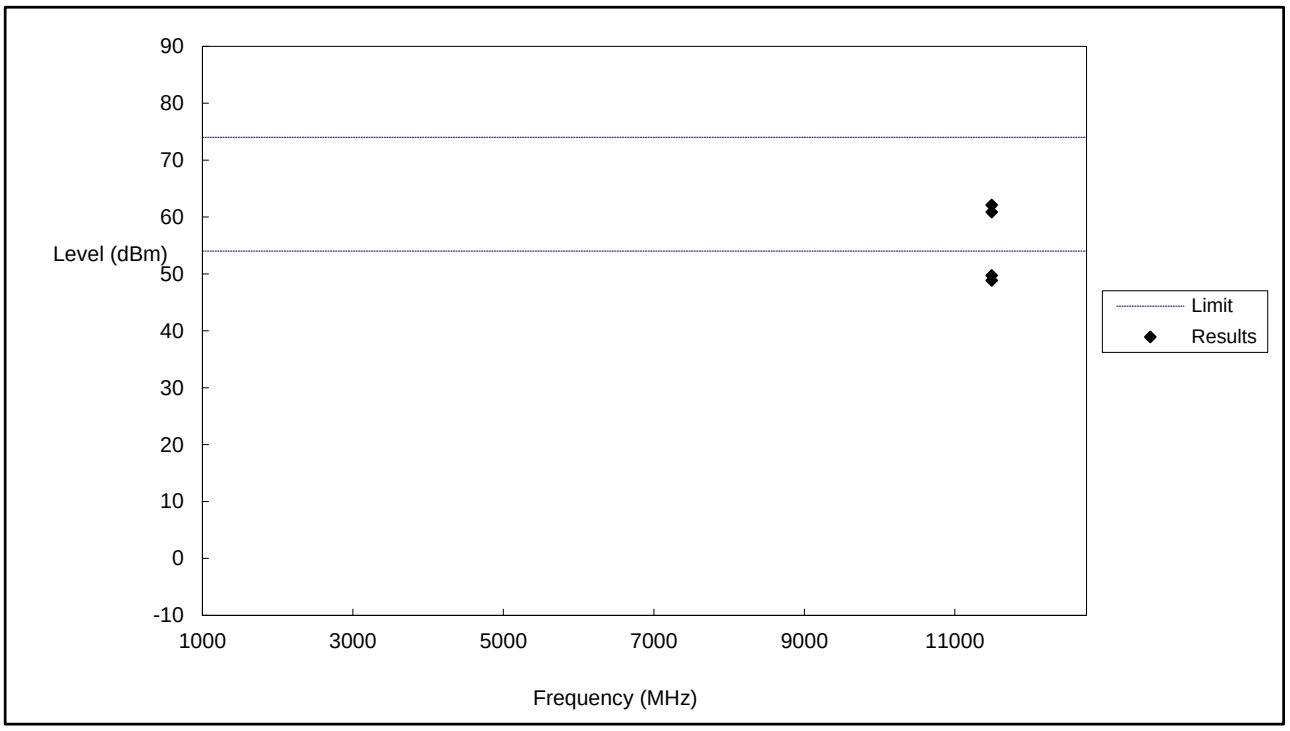
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11200	62.95	74	-11.05	H	RMS
2	11200	48.51	54	-5.49	H	RMS
1	11200	60.97	74	-13.03	V	RMS
2	11200	49.89	54	-4.11	V	RMS

High Channel (5700MHz)



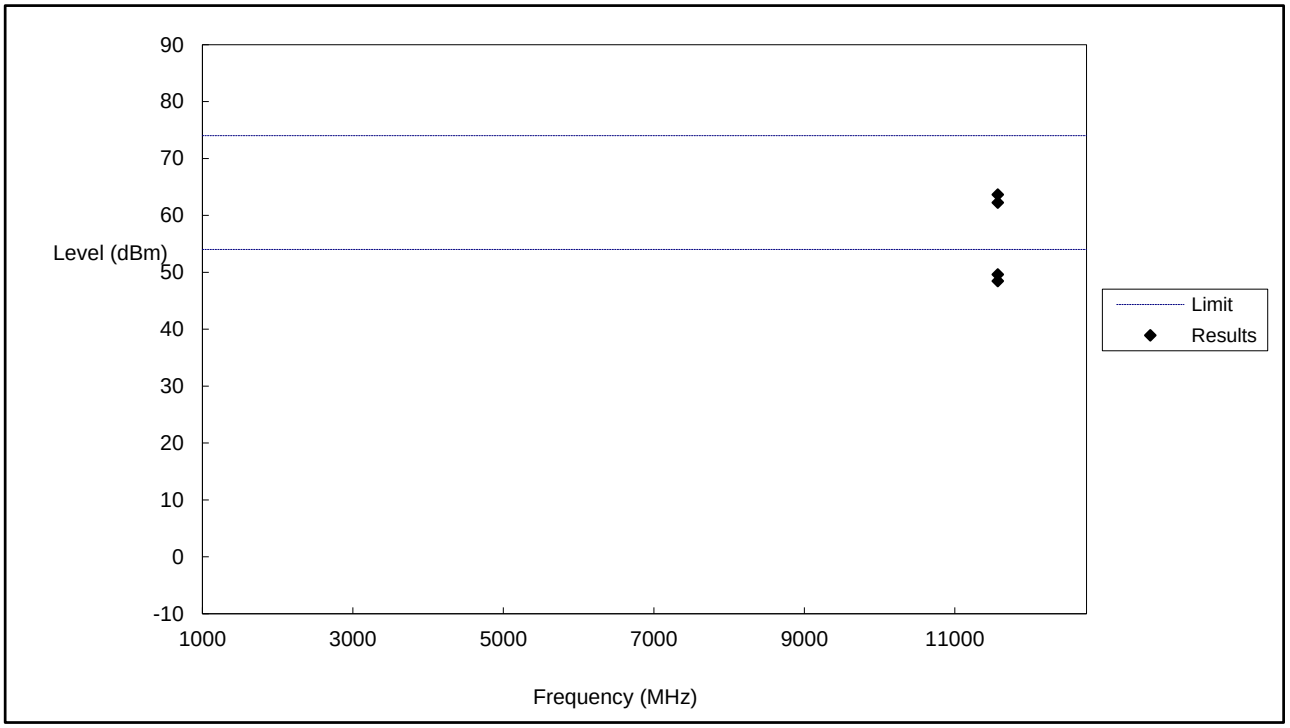
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11400	64.21	74	-9.79	H	RMS
2	11400	47.51	54	-6.49	H	RMS
1	11400	62.48	74	-11.52	V	RMS
2	11400	49.69	54	-4.31	V	RMS

Low Channel (5745MHz)



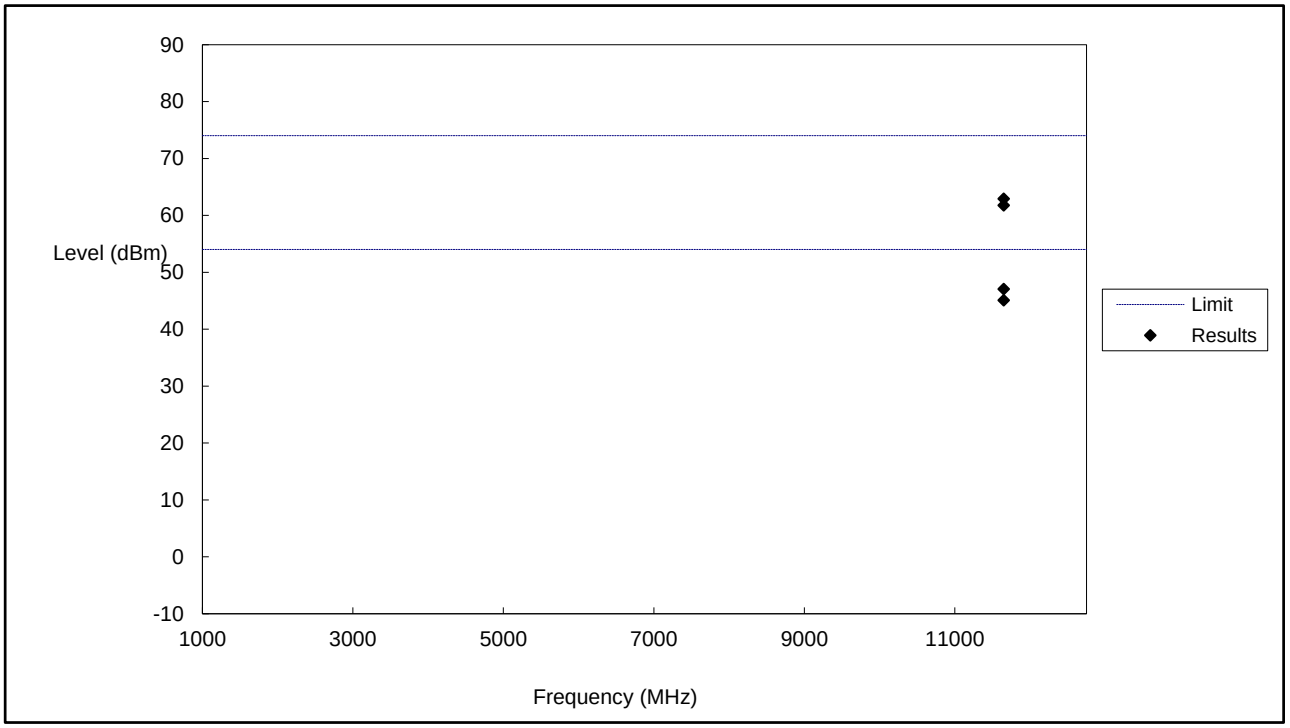
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11490	60.87	74	-13.13	H	RMS
2	11490	49.72	54	-4.28	H	RMS
1	11490	62.11	74	-11.89	V	RMS
2	11490	48.85	54	-5.15	V	RMS

Middle Channel (5785MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11570	63.65	74	-10.35	H	RMS
2	11570	48.47	54	-5.53	H	RMS
1	11570	62.25	74	-11.75	V	RMS
2	11570	49.61	54	-4.39	V	RMS

High Channel (5825MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11650	62.92	74	-11.08	H	RMS
2	11650	45.09	54	-8.91	H	RMS
1	11650	61.75	74	-12.25	V	RMS
2	11650	47.05	54	-6.95	V	RMS

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.58	-27
Highest	Above 5350	-40.38	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.72	-27
Highest	Above 5350	-43.08	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

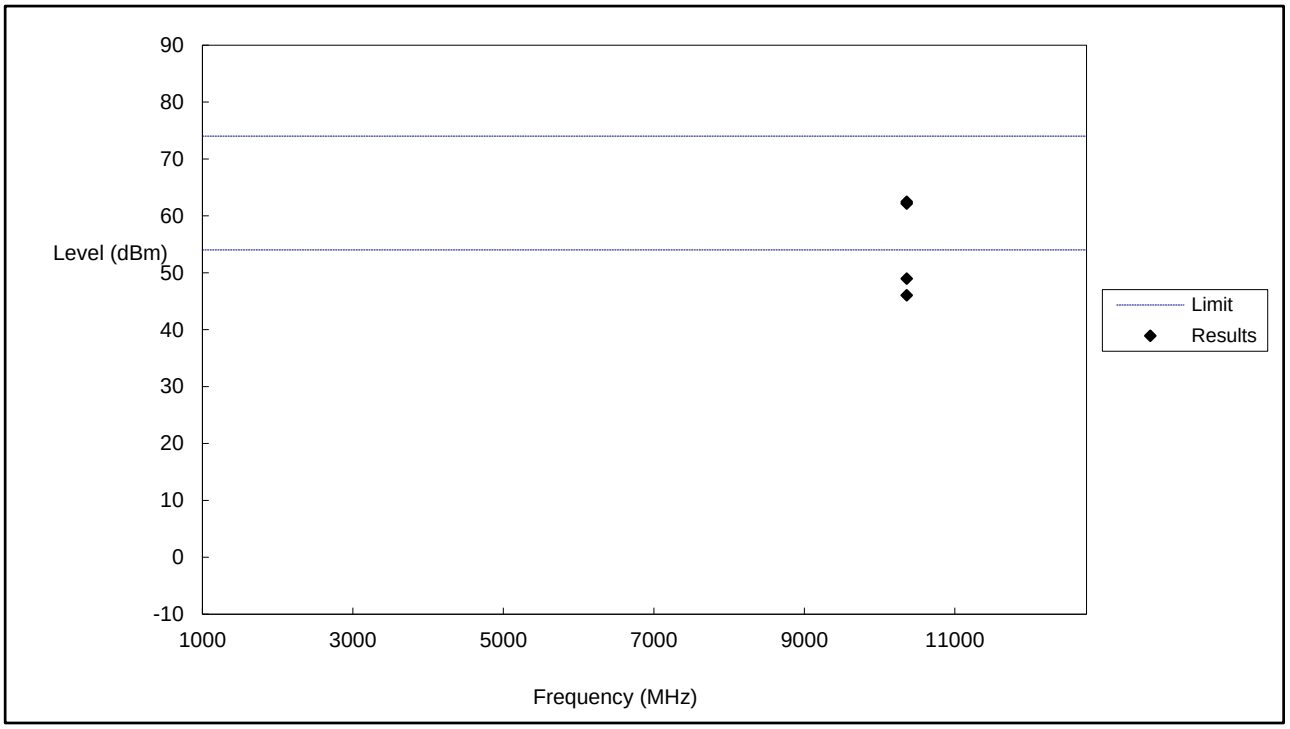
Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-39.04	-27
Highest	Above 5725	-41.34	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-45.06	-27
	5650 to 5700	-35.01	-27 to -17
	5700 to 5720	-26.63	-17 to 15.6
	5720 to 5725	-16.86	15.6 to 27
Highest	5850 to 5855	-14.82	27 to 15.6
	5855 to 5875	-27.13	15.6 to -17
	5875 to 5925	-35.74	-17 to -27
	Above 5925	-39.85	-27
Note: the data just list the worst cases			

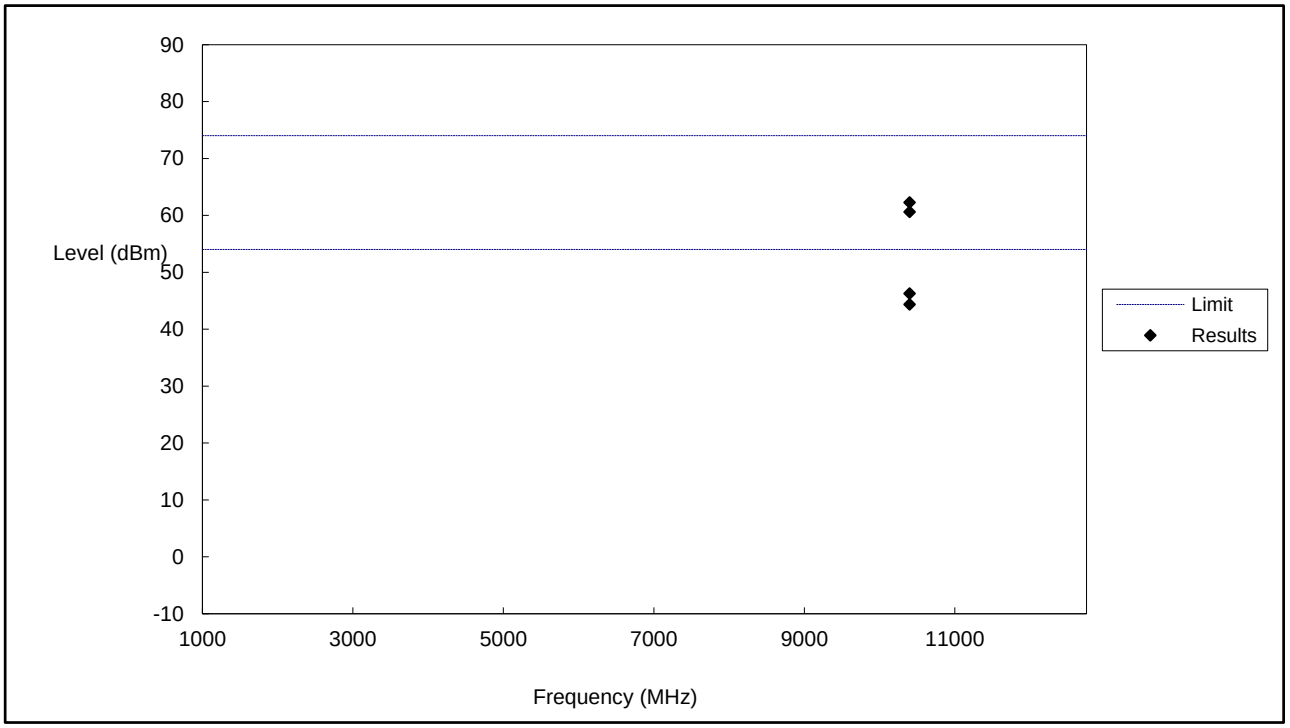
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11n-HT20)
- Harmonics And Spurious Emissions

Low Channel (5180MHz)



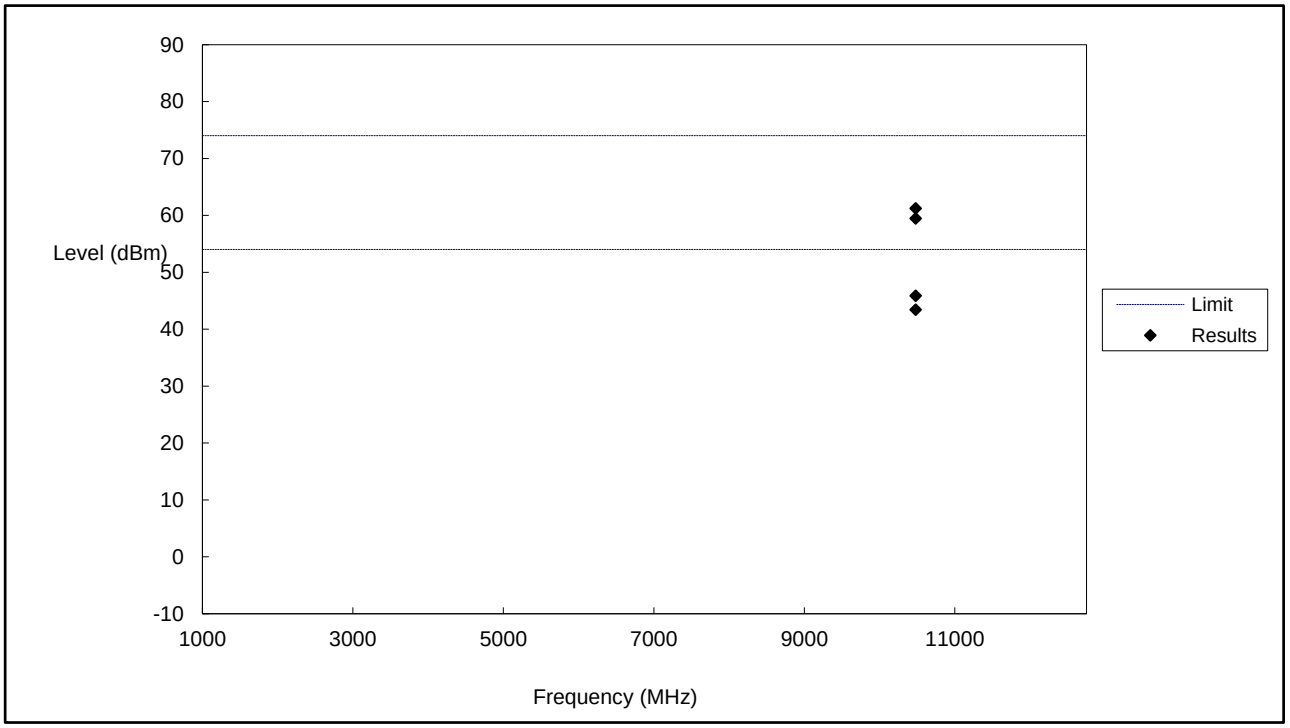
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10360	62.15	74	-11.85	H	RMS
2	10360	46.04	54	-7.96	H	RMS
1	10360	62.47	74	-11.53	V	RMS
2	10360	48.95	54	-5.05	V	RMS

Middle Channel (5200MHz)



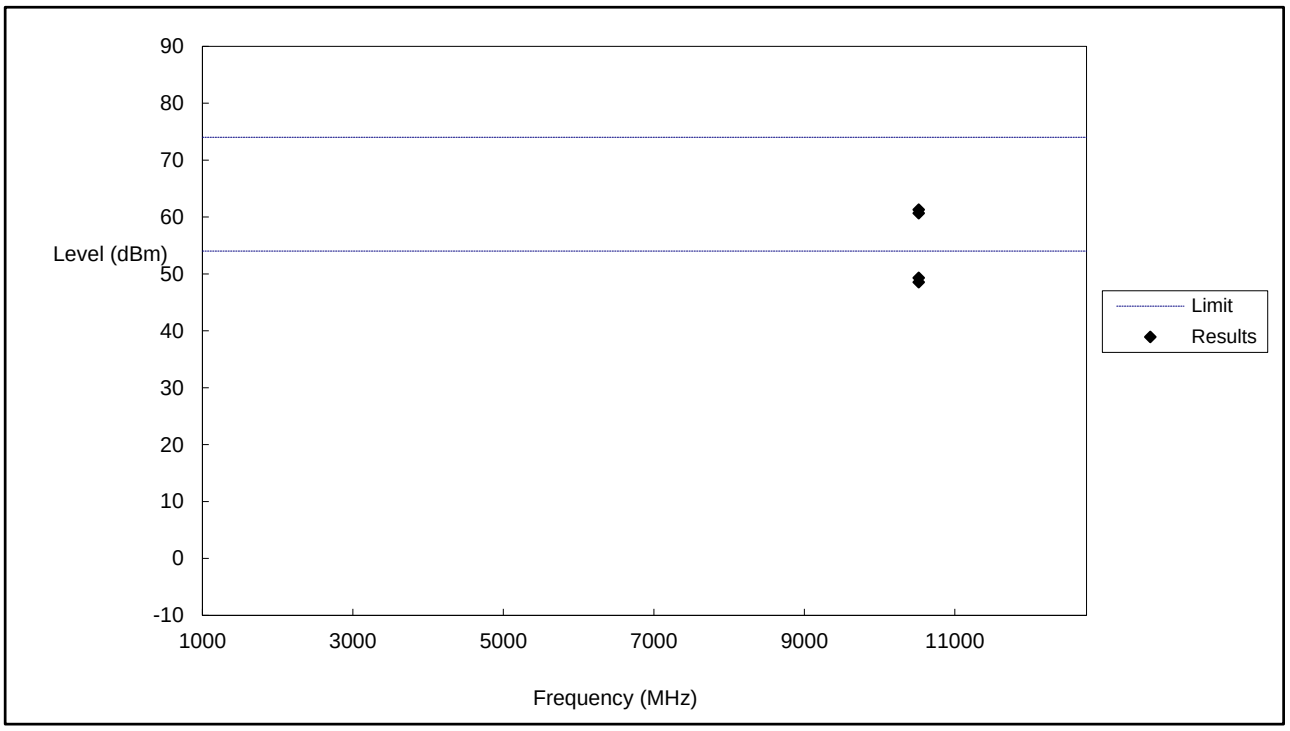
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10400	62.28	74	-11.72	H	RMS
2	10400	46.27	54	-7.73	H	RMS
1	10400	60.60	74	-13.40	V	RMS
2	10400	44.36	54	-9.64	V	RMS

High Channel (5240MHz)



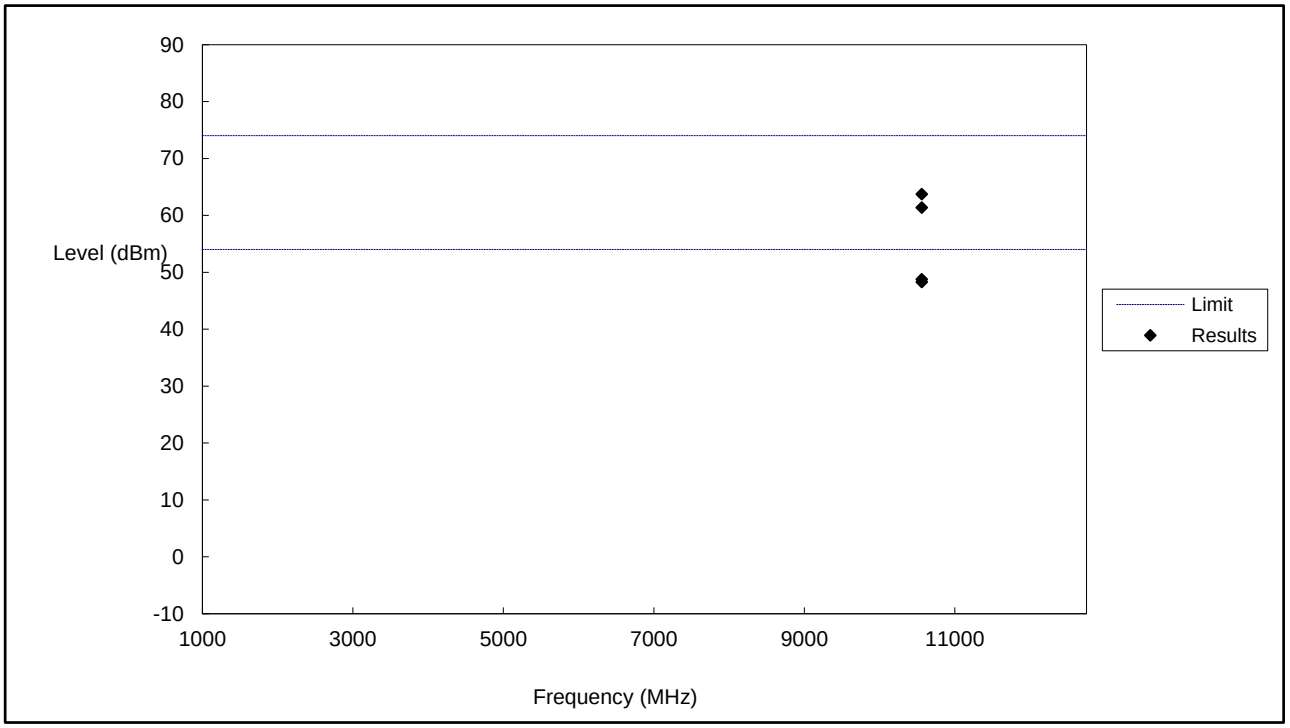
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10480	59.45	74	-14.55	H	RMS
2	10480	45.87	54	-8.13	H	RMS
1	10480	61.22	74	-12.78	V	RMS
2	10480	43.42	54	-10.58	V	RMS

Low Channel (5260MHz)



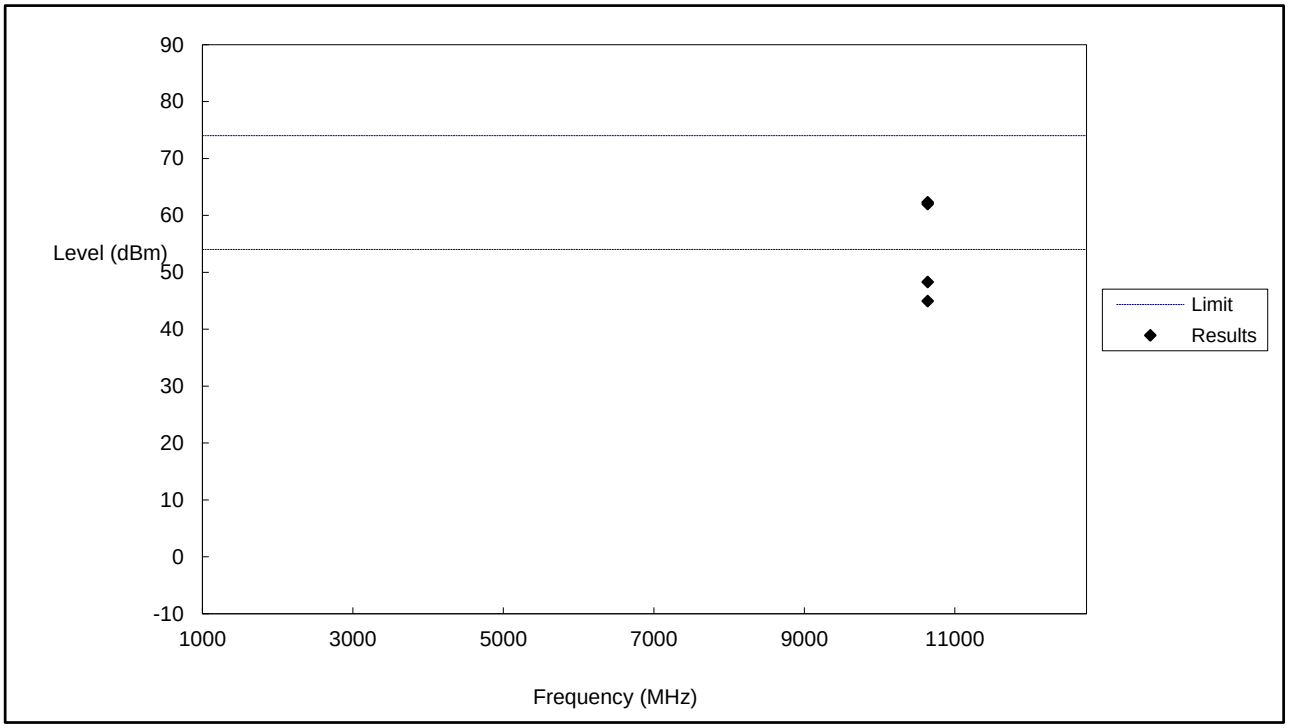
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10520	61.29	74	-12.71	H	RMS
2	10520	48.53	54	-5.47	H	RMS
1	10520	60.67	74	-13.33	V	RMS
2	10520	49.30	54	-4.70	V	RMS

Middle Channel (5280MHz)



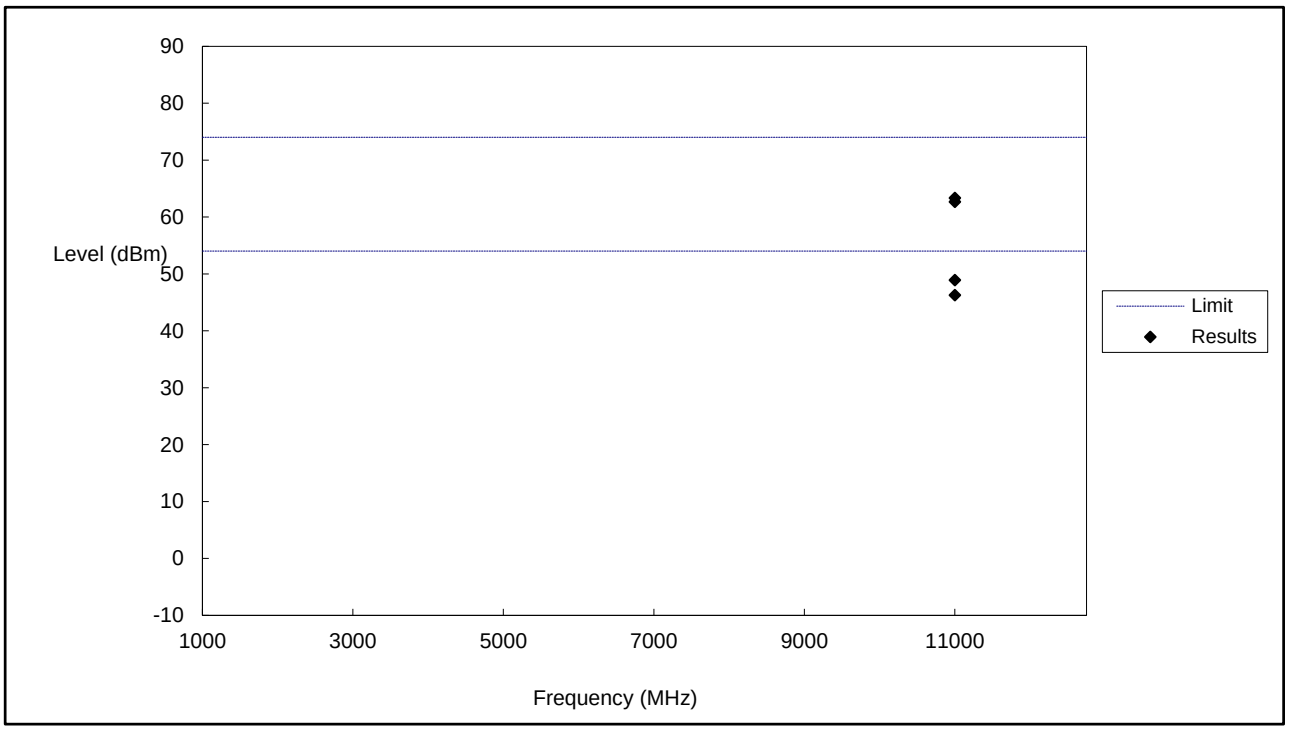
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10560	63.72	74	-10.28	H	RMS
2	10560	48.29	54	-5.71	H	RMS
1	10560	61.38	74	-12.62	V	RMS
2	10560	48.77	54	-5.23	V	RMS

High Channel (5320MHz)



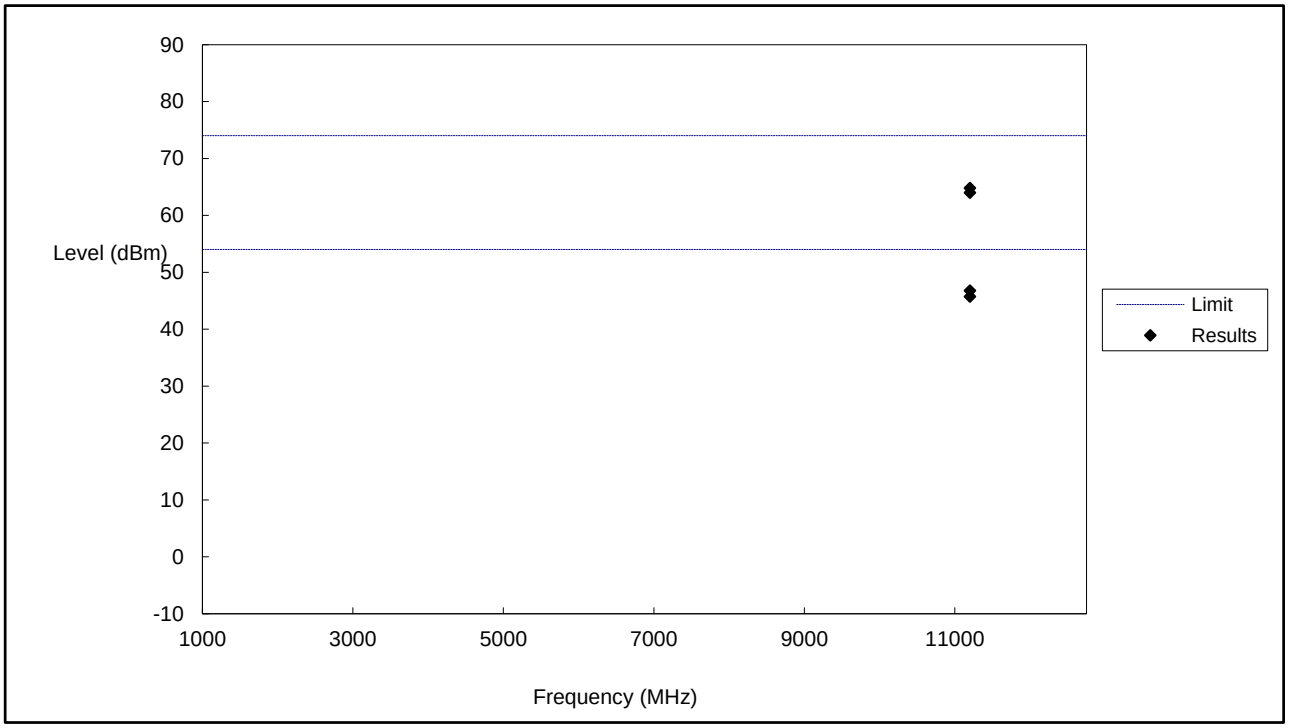
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10640	61.98	74	-12.02	H	RMS
2	10640	44.95	54	-9.05	H	RMS
1	10640	62.31	74	-11.69	V	RMS
2	10640	48.29	54	-5.71	V	RMS

Low Channel (5500MHz)



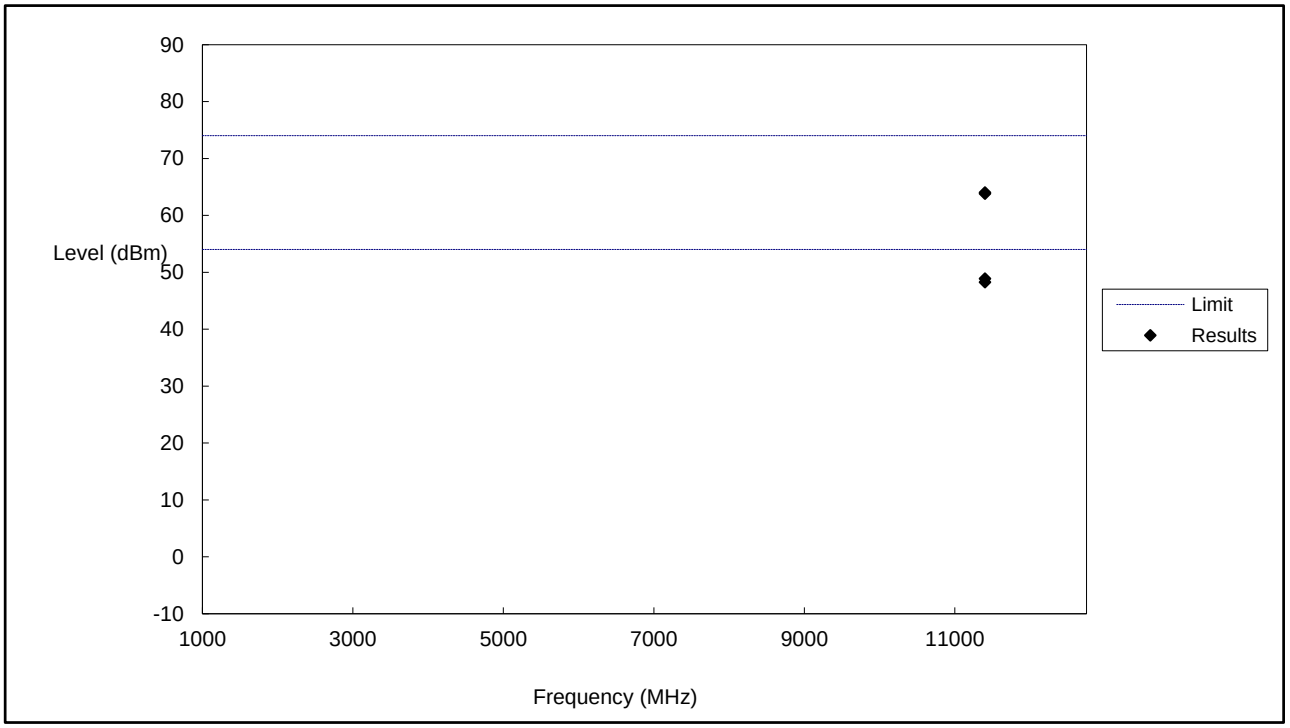
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11000	63.33	74	-10.67	H	RMS
2	11000	46.26	54	-7.74	H	RMS
1	11000	62.65	74	-11.35	V	RMS
2	11000	48.92	54	-5.08	V	RMS

Middle Channel (5600MHz)



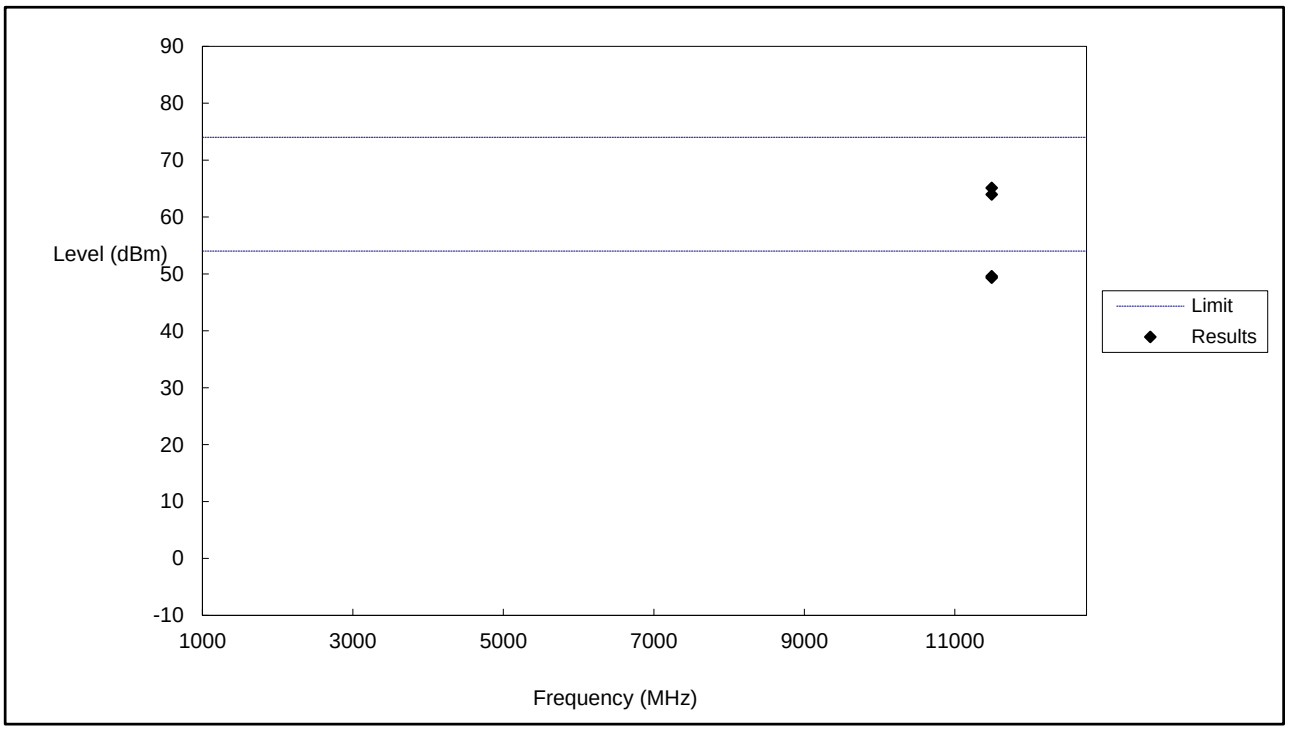
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11200	64.79	74	-9.21	H	RMS
2	11200	45.73	54	-8.27	H	RMS
1	11200	63.99	74	-10.01	V	RMS
2	11200	46.78	54	-7.22	V	RMS

High Channel (5700MHz)



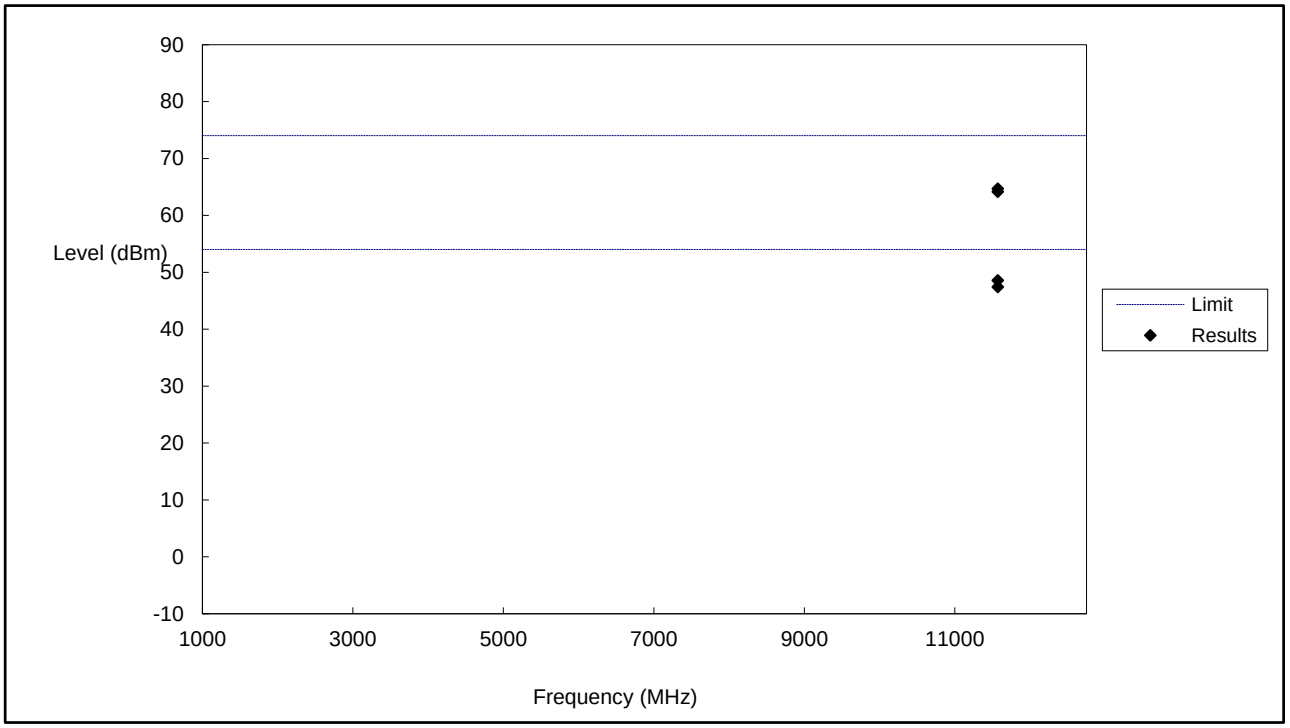
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11400	63.81	74	-10.19	H	RMS
2	11400	48.89	54	-5.11	H	RMS
1	11400	64.00	74	-10.00	V	RMS
2	11400	48.27	54	-5.73	V	RMS

Low Channel (5745MHz)



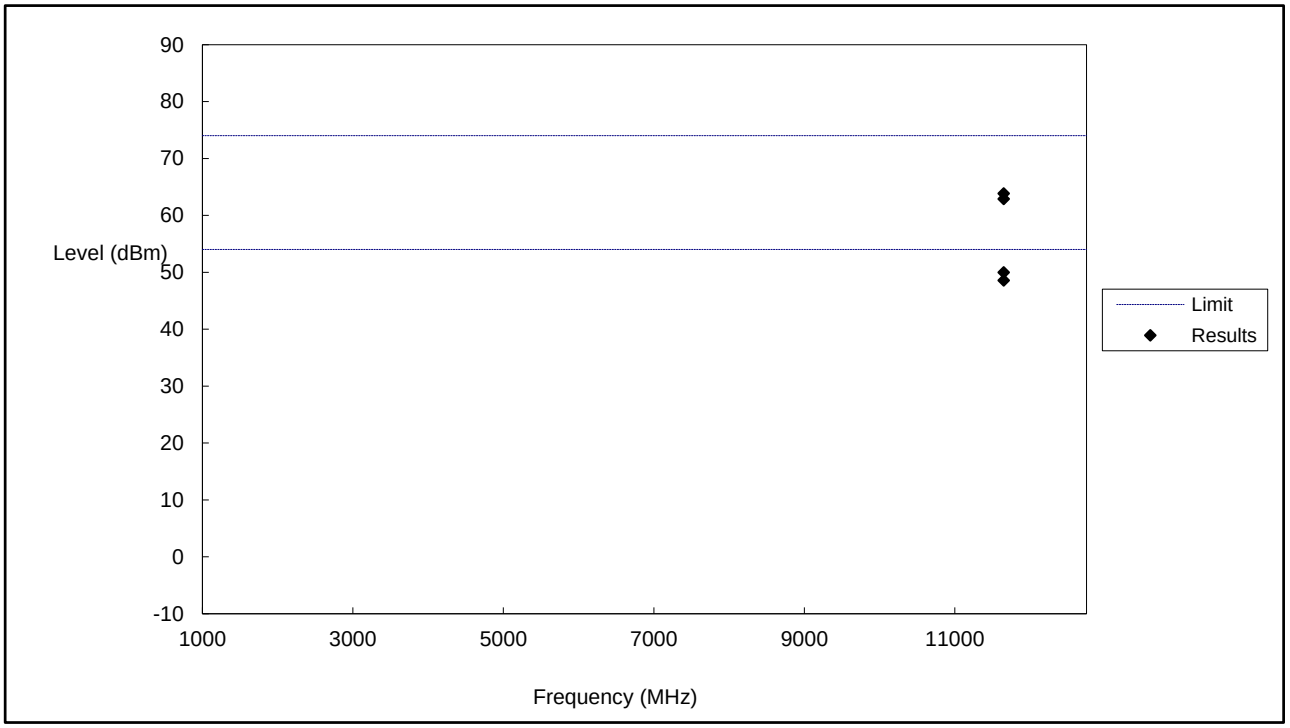
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11490	65.10	74	-8.90	H	RMS
2	11490	49.32	54	-4.68	H	RMS
1	11490	63.97	74	-10.03	V	RMS
2	11490	49.59	54	-4.41	V	RMS

Middle Channel (5785MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11570	64.70	74	-9.30	H	RMS
2	11570	48.56	54	-5.44	H	RMS
1	11570	64.15	74	-9.85	V	RMS
2	11570	47.42	54	-6.58	V	RMS

High Channel (5825MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11650	63.85	74	-10.15	H	RMS
2	11650	48.56	54	-5.44	H	RMS
1	11650	62.89	74	-11.11	V	RMS
2	11650	49.97	54	-4.03	V	RMS

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-40.40	-27
Highest	Above 5350	-39.64	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.04	-27
Highest	Above 5350	-40.71	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-37.27	-27
Highest	Above 5725	-38.99	-27
Note: the data just list the worst cases			

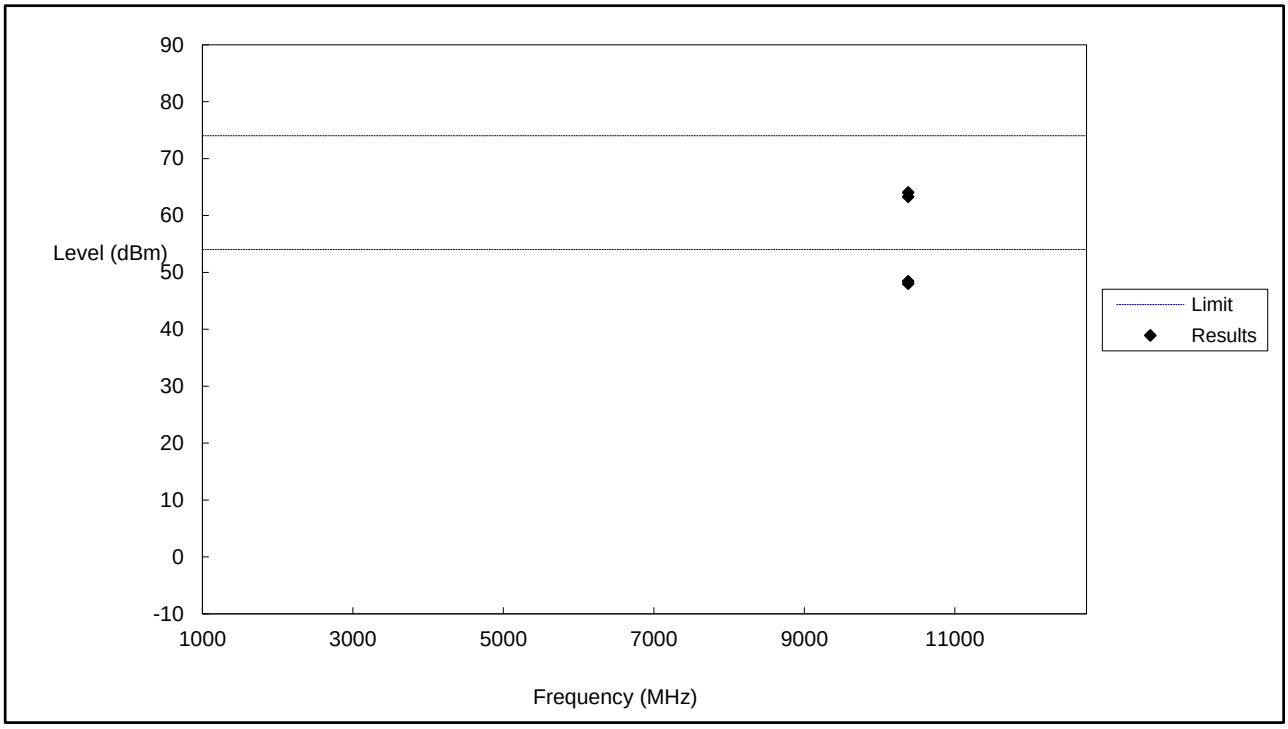
- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-45.98	-27
	5650 to 5700	-34.71	-27 to -17
	5700 to 5720	-26.27	-17 to 15.6
	5720 to 5725	-17.40	15.6 to 27
Highest	5850 to 5855	-13.43	27 to 15.6
	5855 to 5875	-27.26	15.6 to -17
	5875 to 5925	-36.13	-17 to -27
	Above 5925	-38.48	-27
Note: the data just list the worst cases			

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

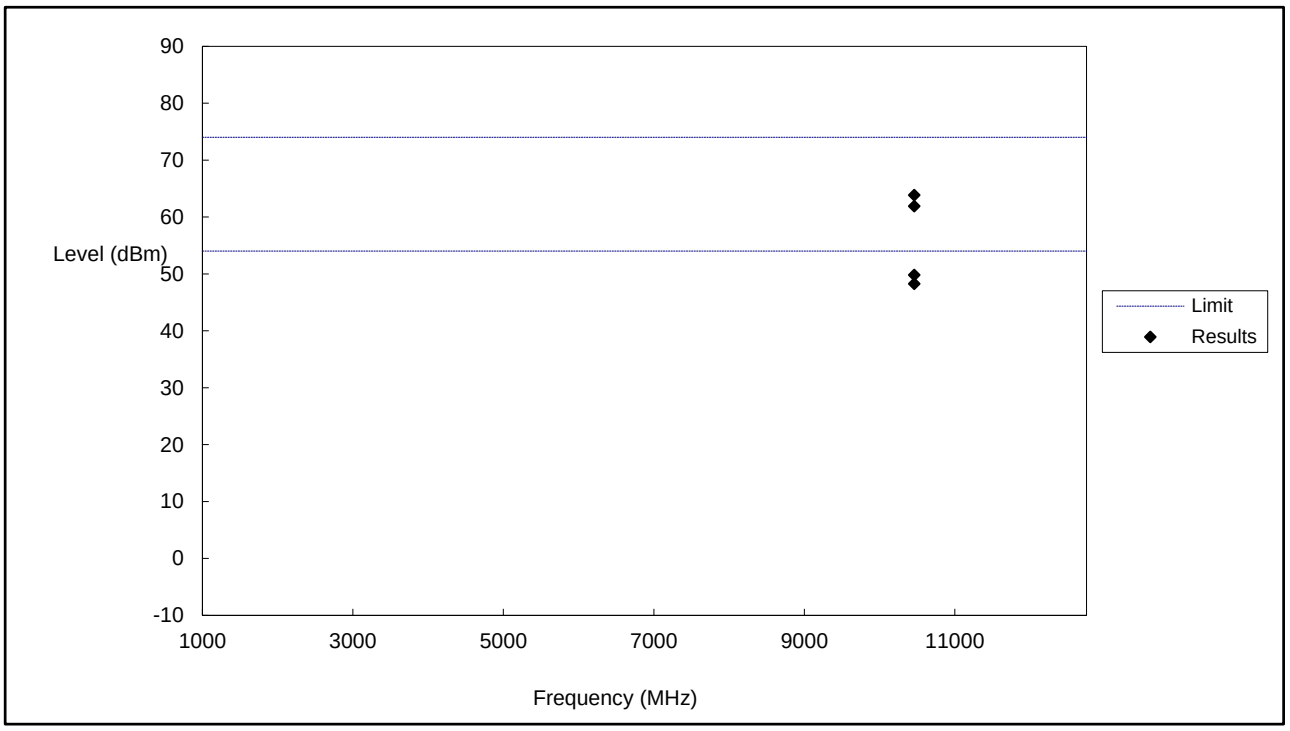
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11n-HT40)
- Harmonics And Spurious Emissions

Low Channel (5190MHz)



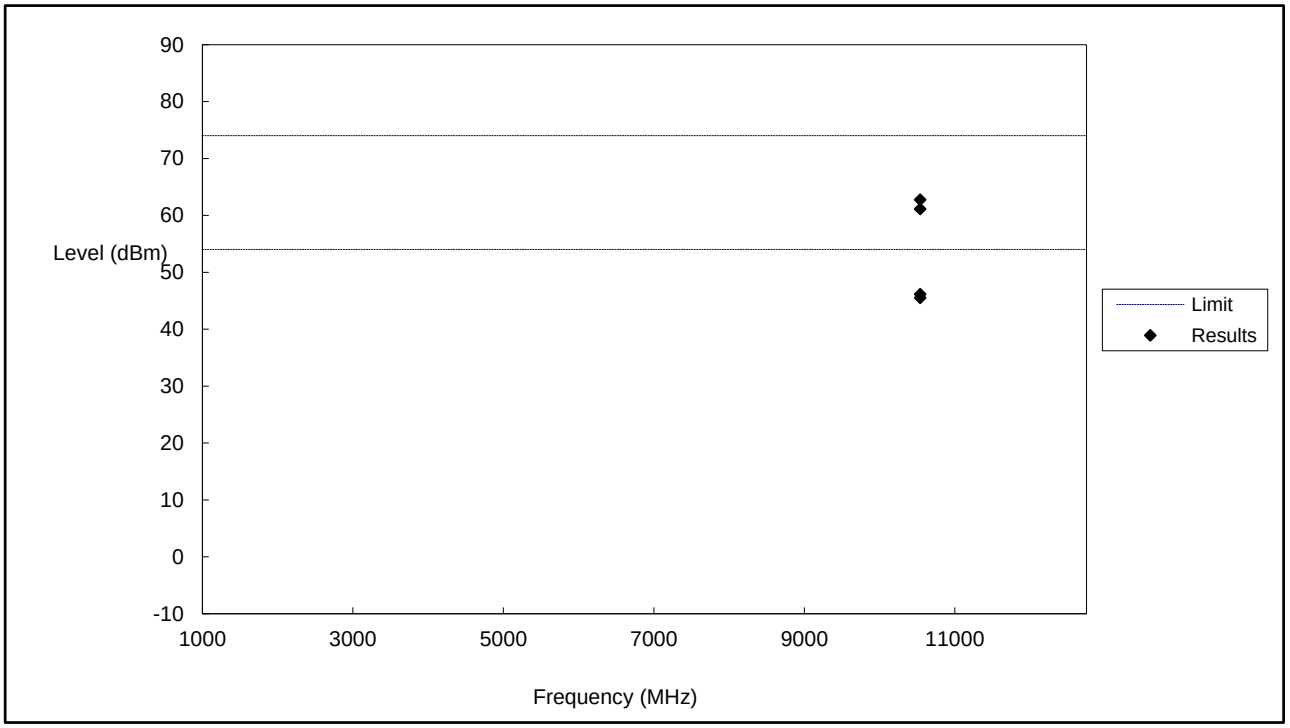
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10380	63.27	74	-10.73	H	RMS
2	10380	48.42	54	-5.58	H	RMS
1	10380	64.04	74	-9.96	V	RMS
2	10380	48.00	54	-6.00	V	RMS

High Channel (5230MHz)



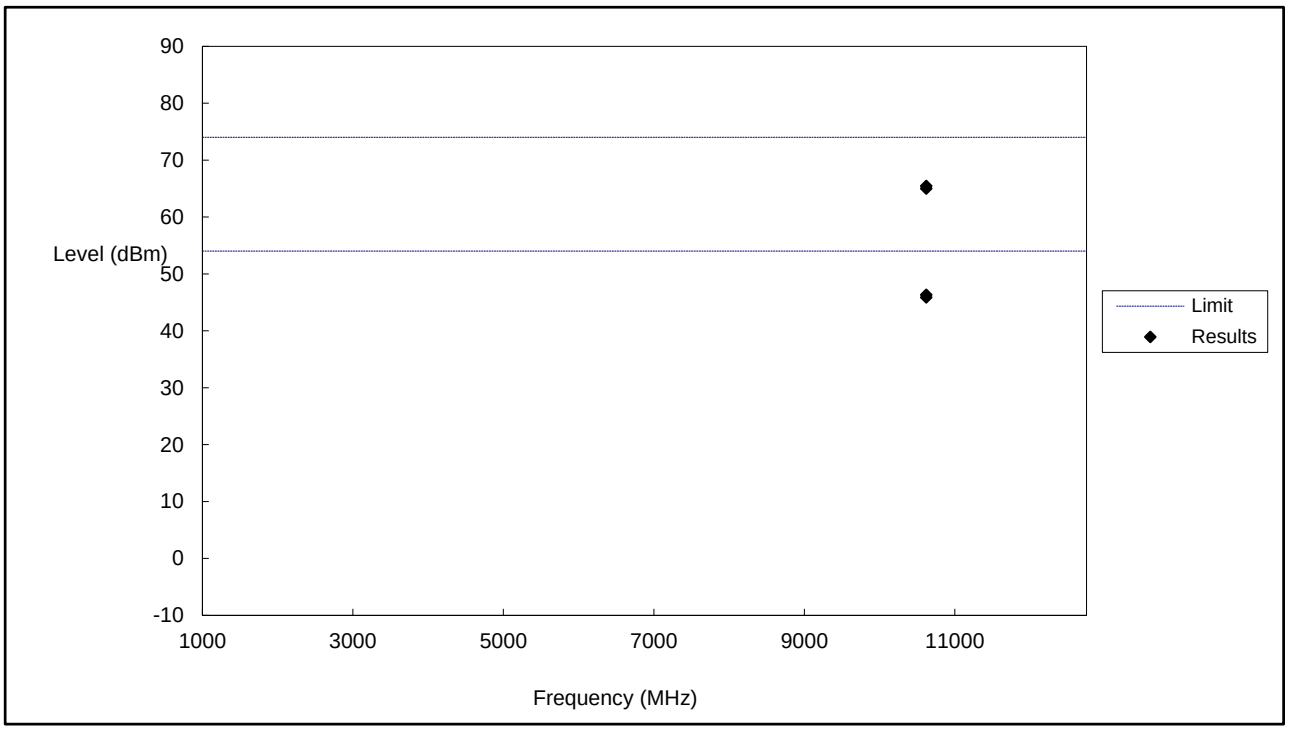
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10460	63.83	74	-10.17	H	RMS
2	10460	49.82	54	-4.18	H	RMS
1	10460	61.89	74	-12.11	V	RMS
2	10460	48.26	54	-5.74	V	RMS

Low Channel (5270MHz)



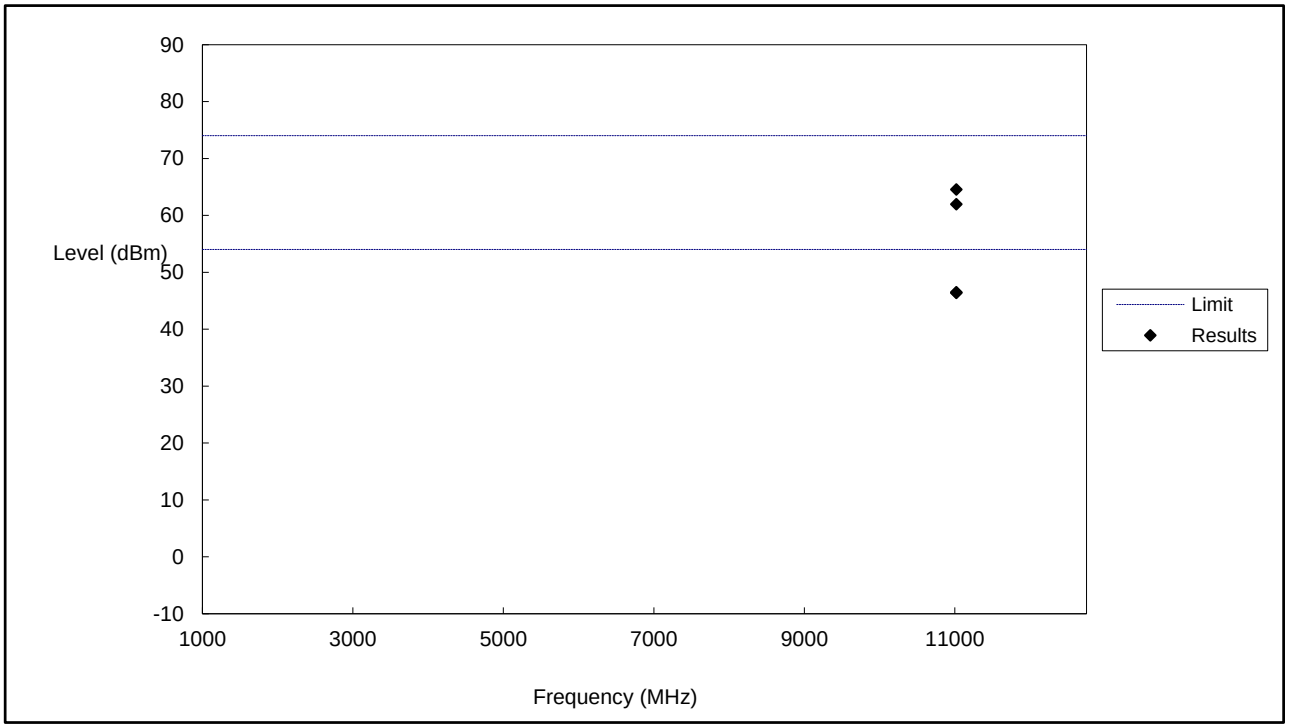
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10540	62.75	74	-11.25	H	RMS
2	10540	46.14	54	-7.86	H	RMS
1	10540	61.12	74	-12.88	V	RMS
2	10540	45.49	54	-8.51	V	RMS

High Channel (5310MHz)



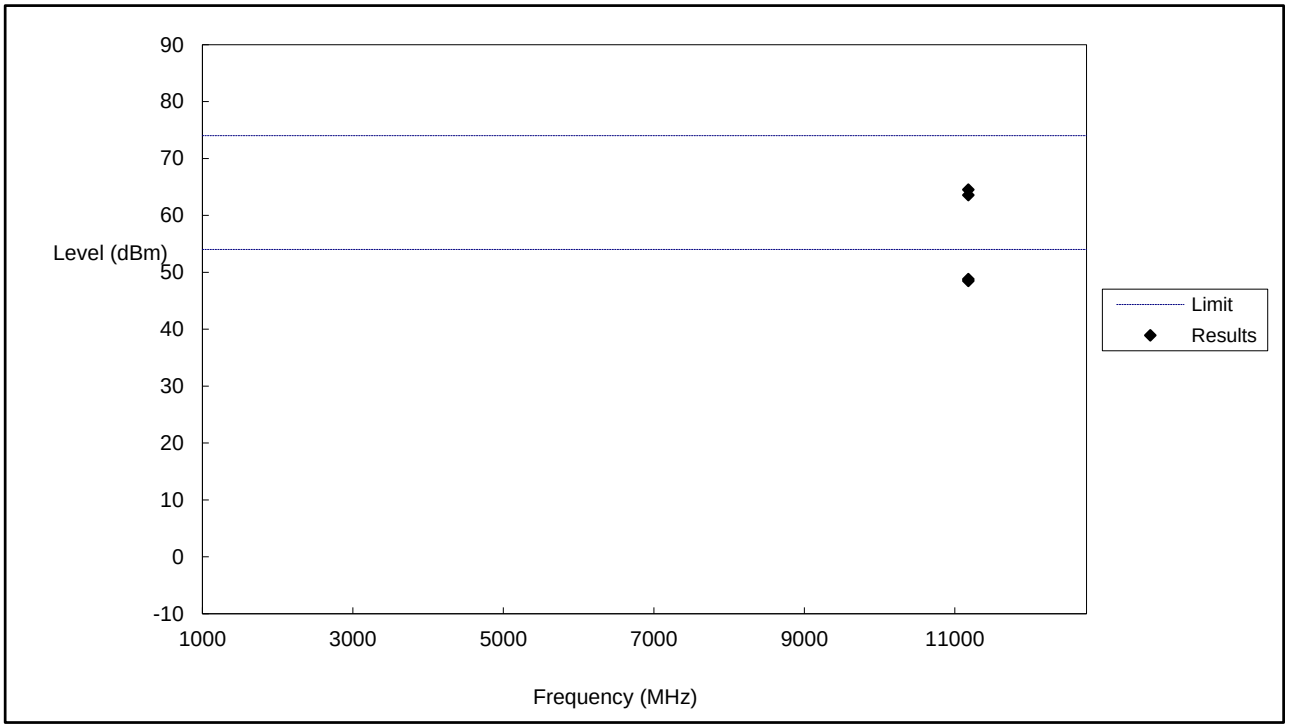
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10620	64.99	74	-9.01	H	RMS
2	10620	46.31	54	-7.69	H	RMS
1	10620	65.46	74	-8.54	V	RMS
2	10620	45.87	54	-8.13	V	RMS

Low Channel (5510MHz)



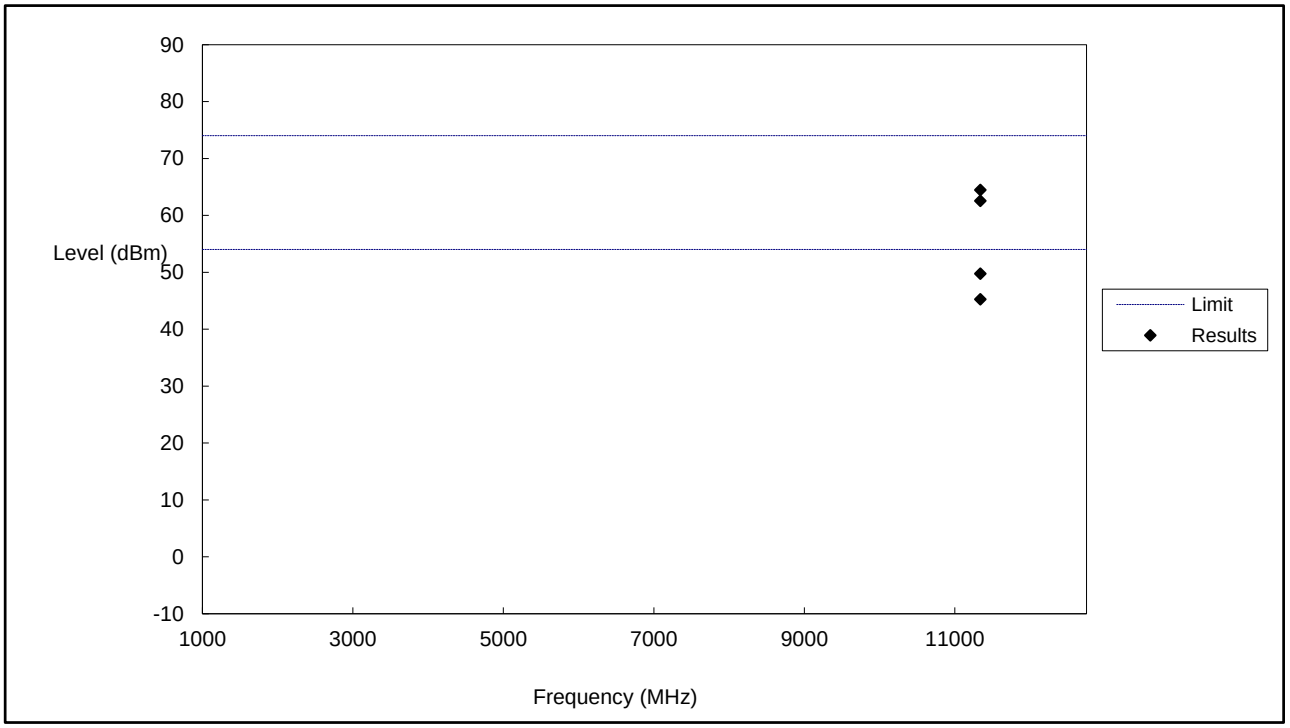
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11020	64.56	74	-9.44	H	RMS
2	11020	46.48	54	-7.52	H	RMS
1	11020	61.96	74	-12.04	V	RMS
2	11020	46.38	54	-7.62	V	RMS

Middle Channel (5590MHz)



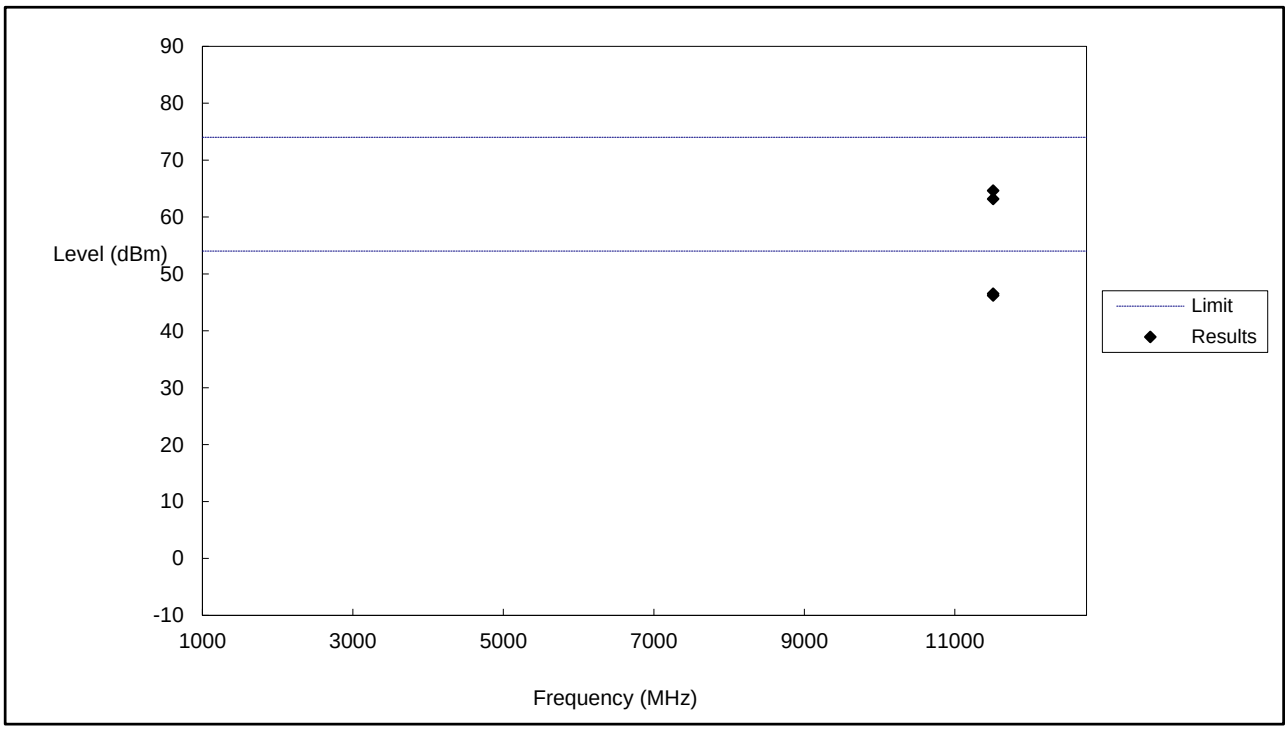
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11180	63.56	74	-10.44	H	RMS
2	11180	48.49	54	-5.51	H	RMS
1	11180	64.53	74	-9.47	V	RMS
2	11180	48.79	54	-5.21	V	RMS

High Channel (5670MHz)



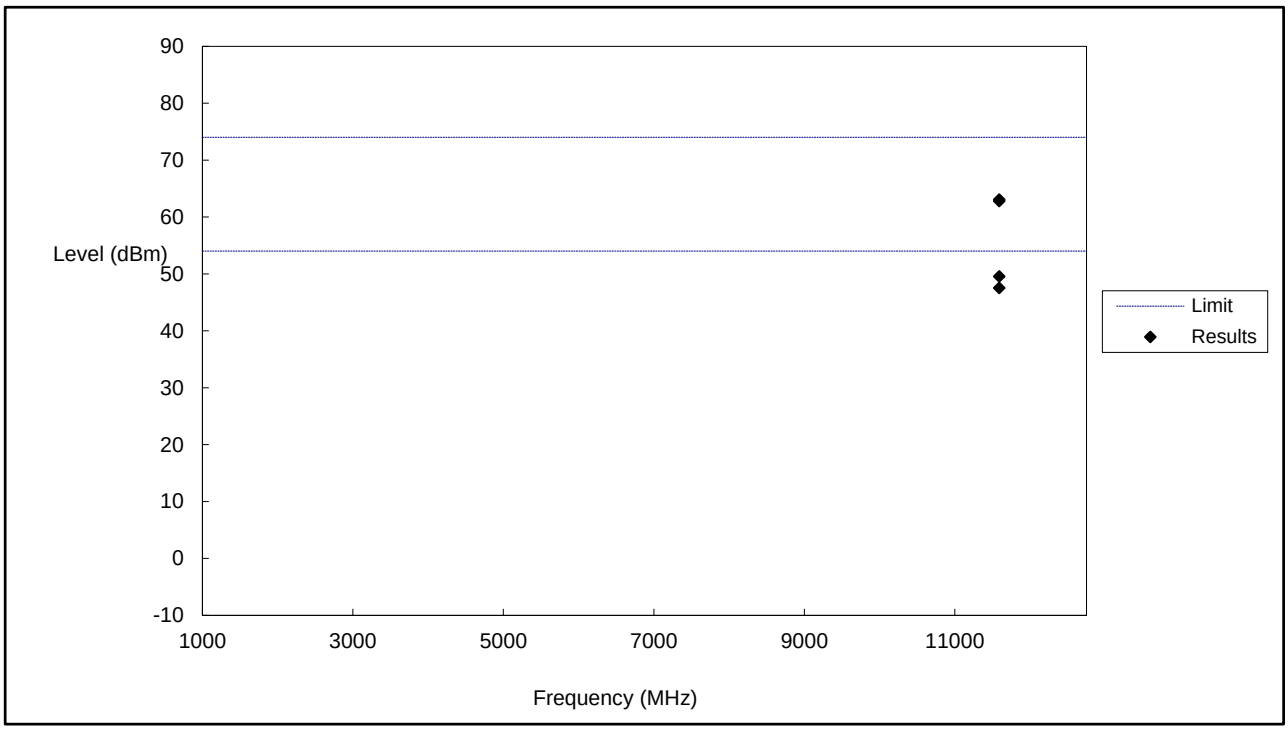
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11340	62.54	74	-11.46	H	RMS
2	11340	49.75	54	-4.25	H	RMS
1	11340	64.46	74	-9.54	V	RMS
2	11340	45.25	54	-8.75	V	RMS

Low Channel (5755MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11510	64.62	74	-9.38	H	RMS
2	11510	46.51	54	-7.49	H	RMS
1	11510	63.18	74	-10.82	V	RMS
2	11510	46.21	54	-7.79	V	RMS

High Channel (5795MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11590	63.07	74	-10.93	H	RMS
2	11590	47.52	54	-6.48	H	RMS
1	11590	62.79	74	-11.21	V	RMS
2	11590	49.56	54	-4.44	V	RMS

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.60	-27
Highest	Above 5350	-40.35	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-40.71	-27
Highest	Above 5350	-39.60	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

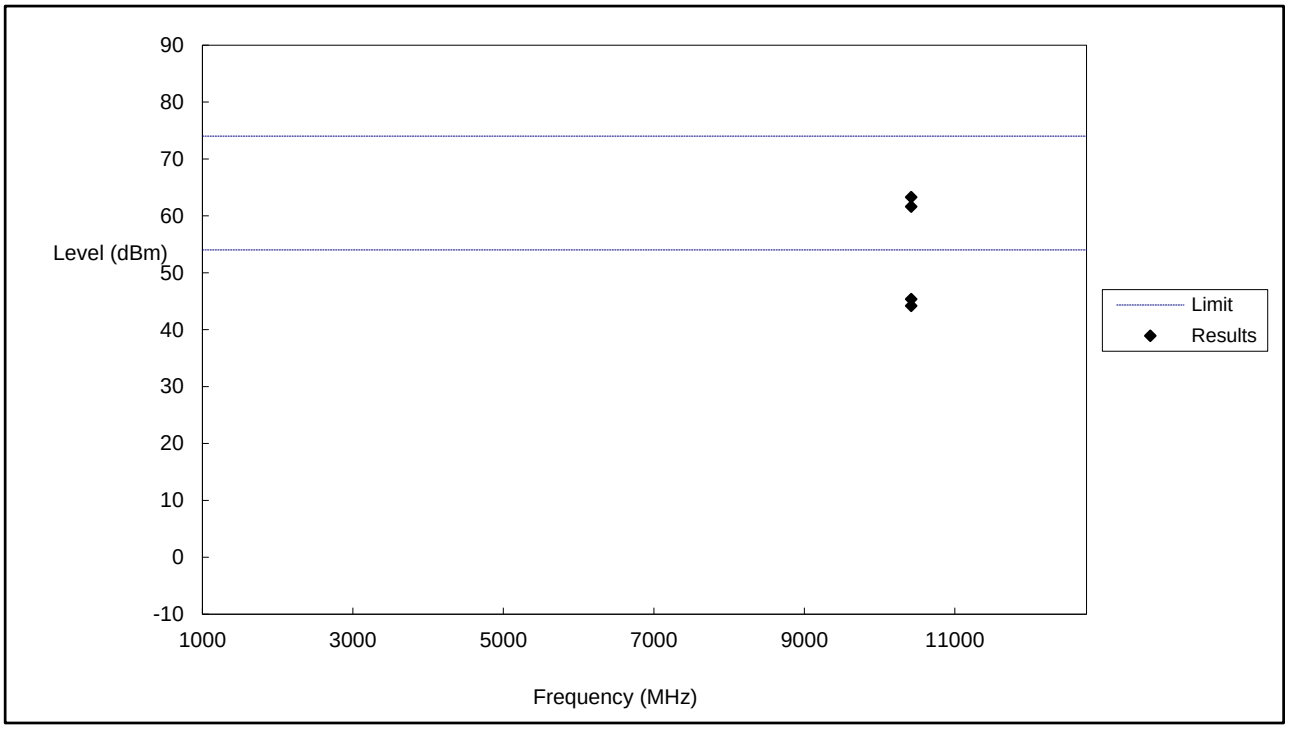
Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-39.79	-27
Highest	Above 5725	-38.64	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-45.51	-27
	5650 to 5700	-35.52	-27 to -17
	5700 to 5720	-26.25	-17 to 15.6
	5720 to 5725	-17.04	15.6 to 27
Highest	5850 to 5855	-13.83	27 to 15.6
	5855 to 5875	-26.67	15.6 to -17
	5875 to 5925	-35.92	-17 to -27
	Above 5925	-38.94	-27
Note: the data just list the worst cases			

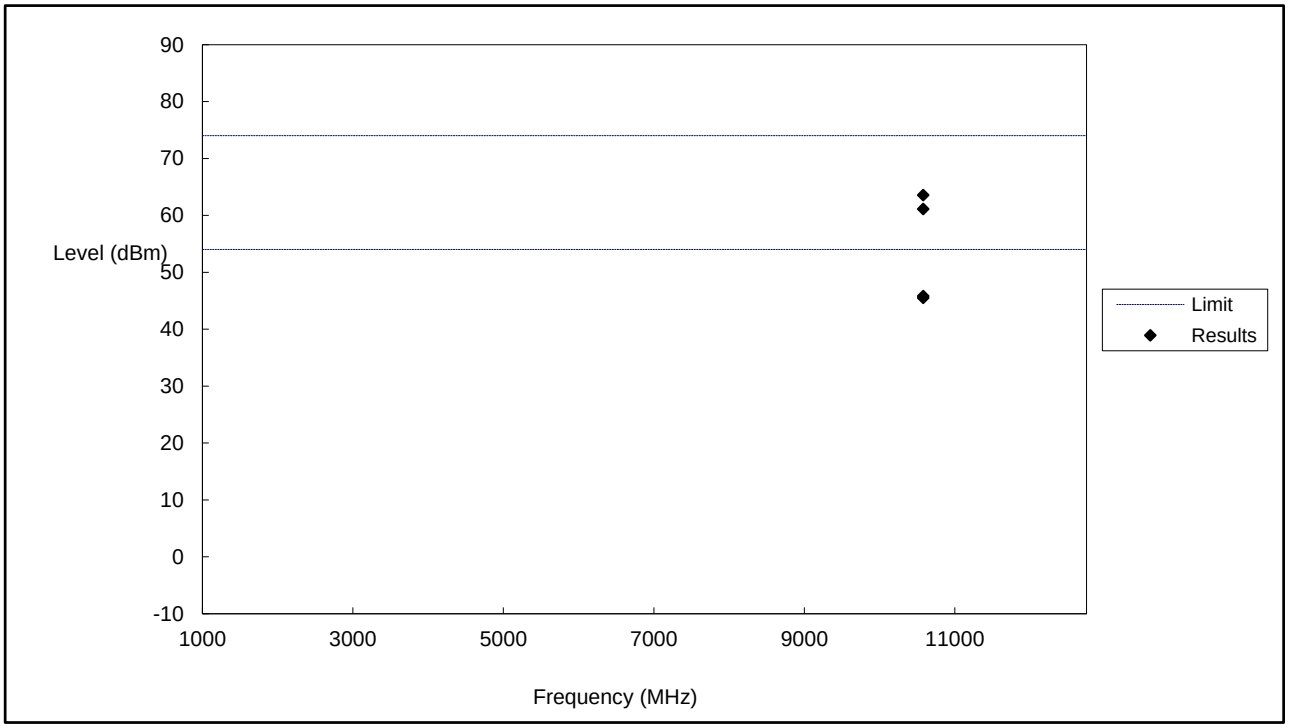
- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11ac-VHT80)
- Harmonics And Spurious Emissions

5210MHz



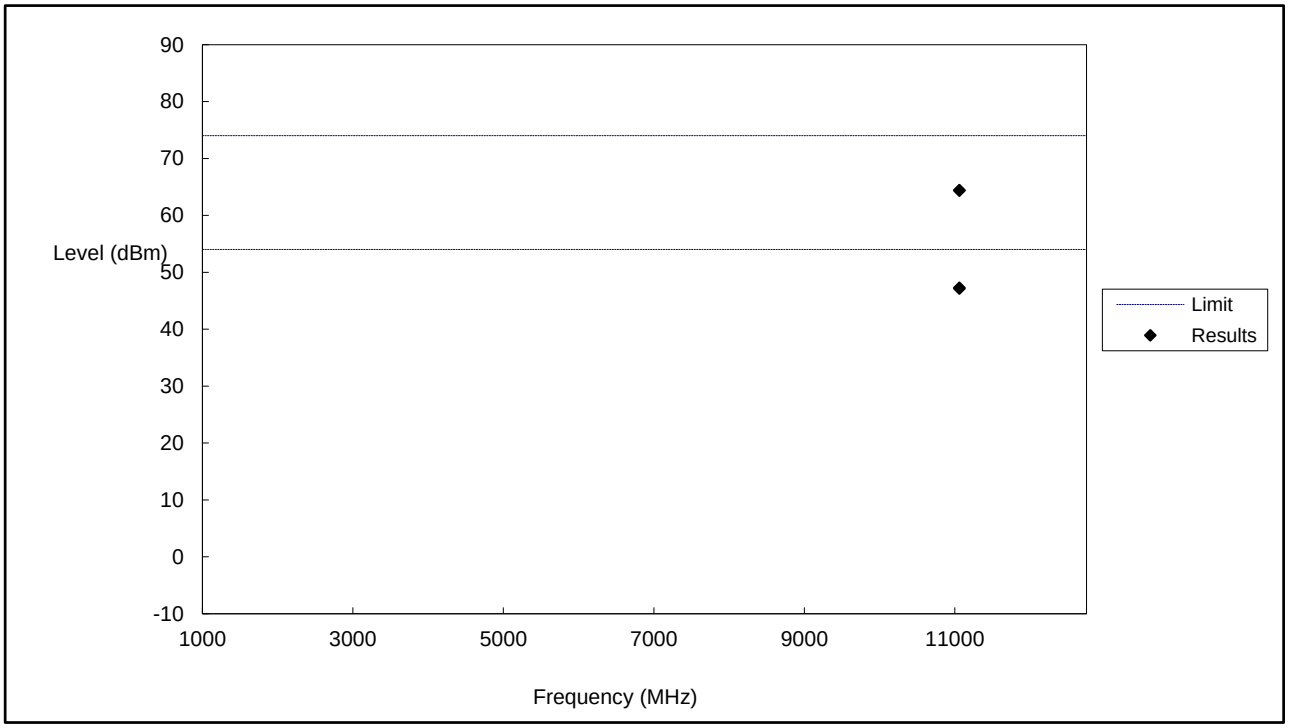
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10420	63.29	74	-10.71	H	RMS
2	10420	45.37	54	-8.63	H	RMS
1	10420	61.63	74	-12.37	V	RMS
2	10420	44.19	54	-9.81	V	RMS

5290MHz



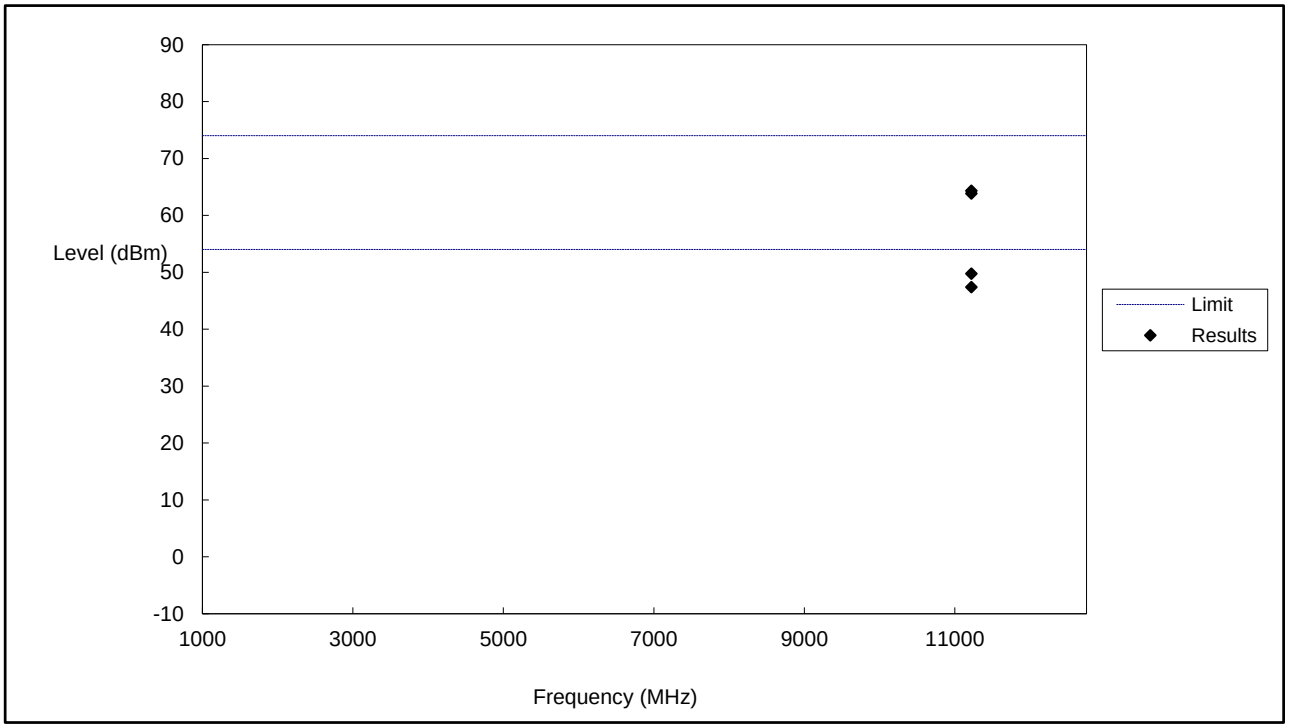
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	10580	63.55	74	-10.45	H	RMS
2	10580	45.49	54	-8.51	H	RMS
1	10580	61.12	74	-12.88	V	RMS
2	10580	45.82	54	-8.18	V	RMS

Low Channel (5530MHz)



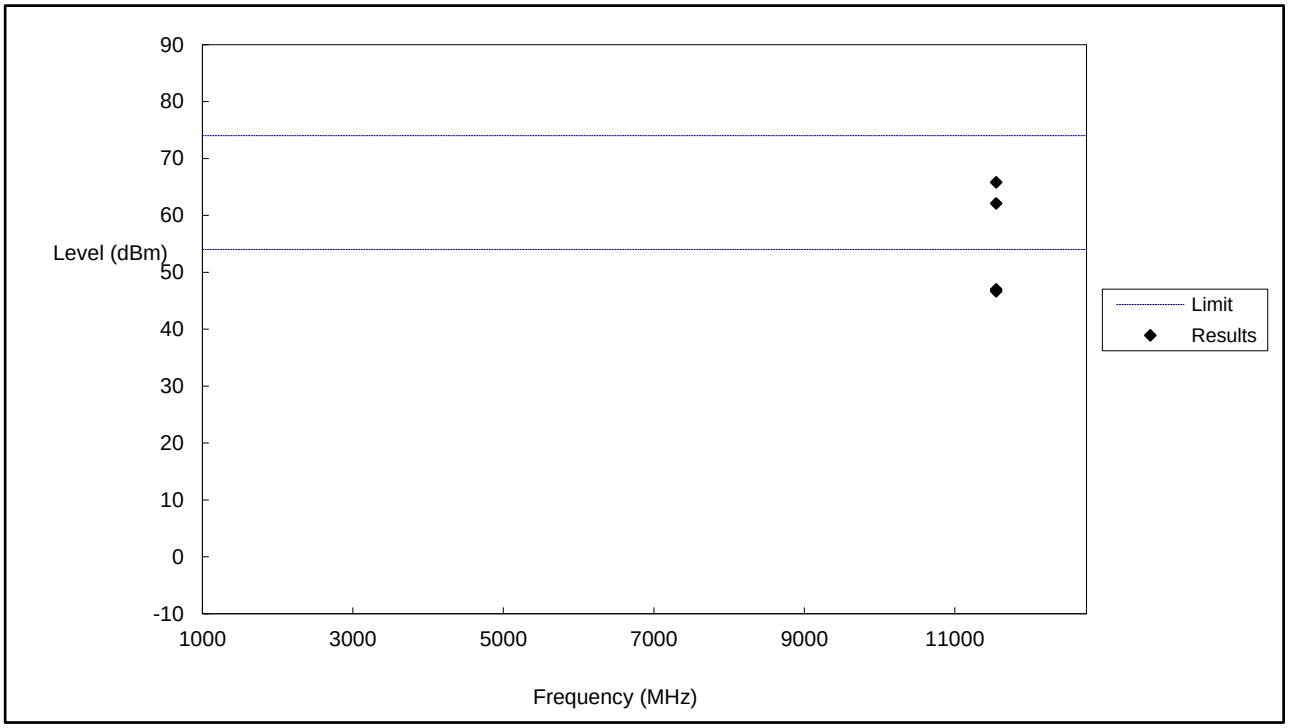
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11060	64.43	74	-9.57	H	RMS
2	11060	47.14	54	-6.86	H	RMS
1	11060	64.35	74	-9.65	V	RMS
2	11060	47.28	54	-6.72	V	RMS

High Channel (5610MHz)



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11220	64.32	74	-9.68	H	RMS
2	11220	49.76	54	-4.24	H	RMS
1	11220	63.85	74	-10.15	V	RMS
2	11220	47.38	54	-6.62	V	RMS

5775MHz



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	11550	65.82	74	-8.18	H	RMS
2	11550	46.65	54	-7.35	H	RMS
1	11550	62.11	74	-11.89	V	RMS
2	11550	47.00	54	-7.00	V	RMS

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-42.04	-27
Highest	Above 5350	-37.96	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-42.53	-27
Highest	Above 5350	-40.33	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-39.04	-27
Highest	Above 5725	-37.84	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5650	-46.53	-27
	5650 to 5700	-35.00	-27 to -17
	5700 to 5720	-26.93	-17 to 15.6
	5720 to 5725	-17.30	15.6 to 27
Highest	5850 to 5855	-13.57	27 to 15.6
	5855 to 5875	-26.66	15.6 to -17
	5875 to 5925	-35.93	-17 to -27
	Above 5925	-38.49	-27
Note: the data just list the worst cases			

Note: Testing is carried out with frequency rang 9kHz to 40Ghz, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Frequency Stability

9.1 Standard Applicable

According to §15.407(g), manufacturers 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 users manual.

9.2 Test Procedure

According to §2.1055, the following test procedure was performed.
The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.
The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

9.3 Summary of Test Results/Plots

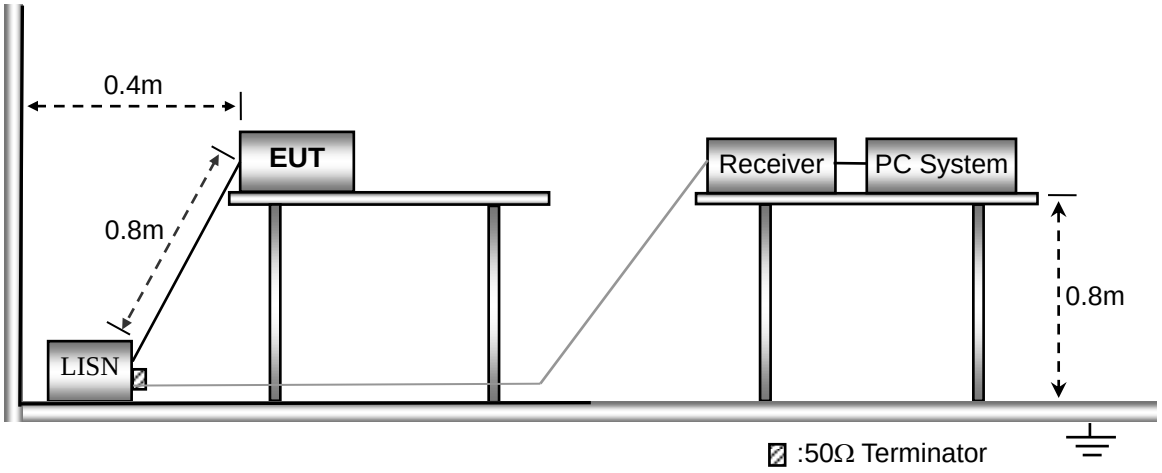
Please refer to Appendix D

10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

10.2 Basic Test Setup Block Diagram



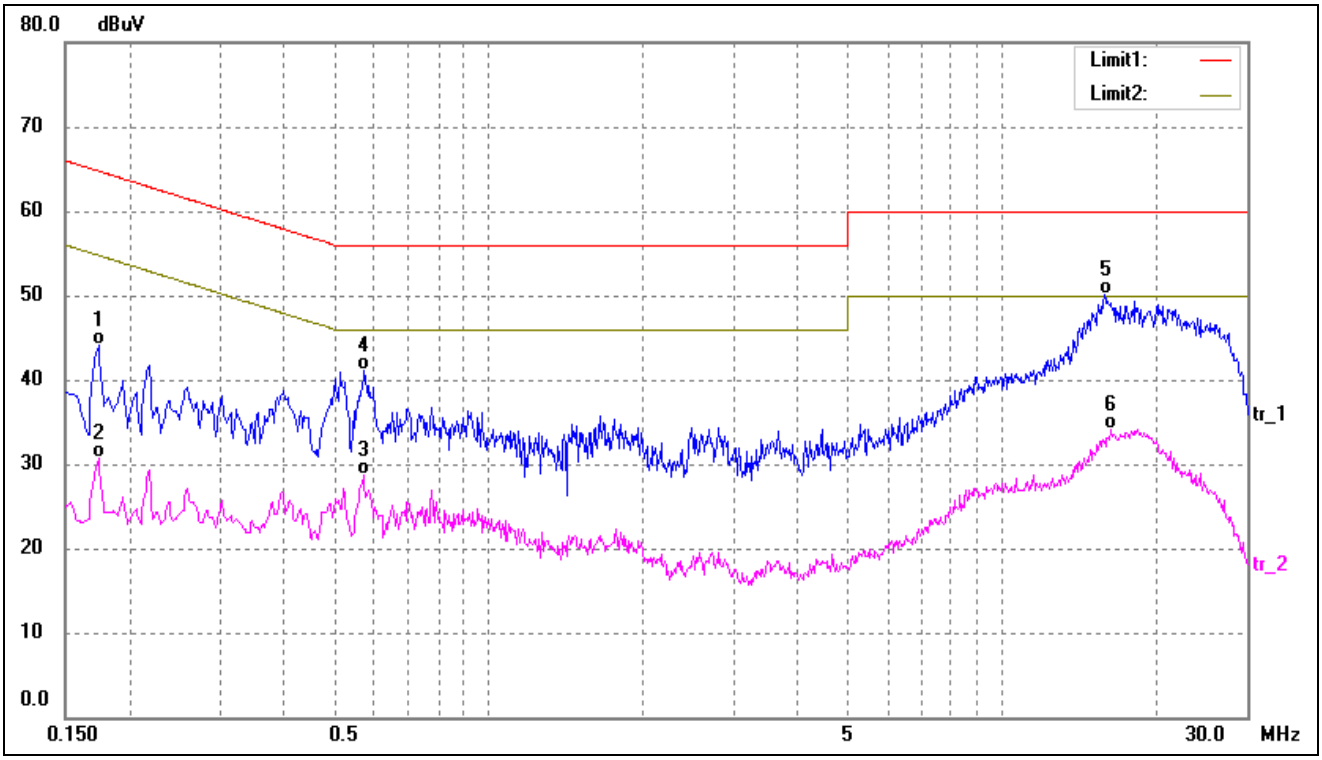
10.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150kHz
Stop Frequency 30MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Quasi-Peak Adapter Bandwidth 9kHz
Quasi-Peak Adapter Mode ..... Normal

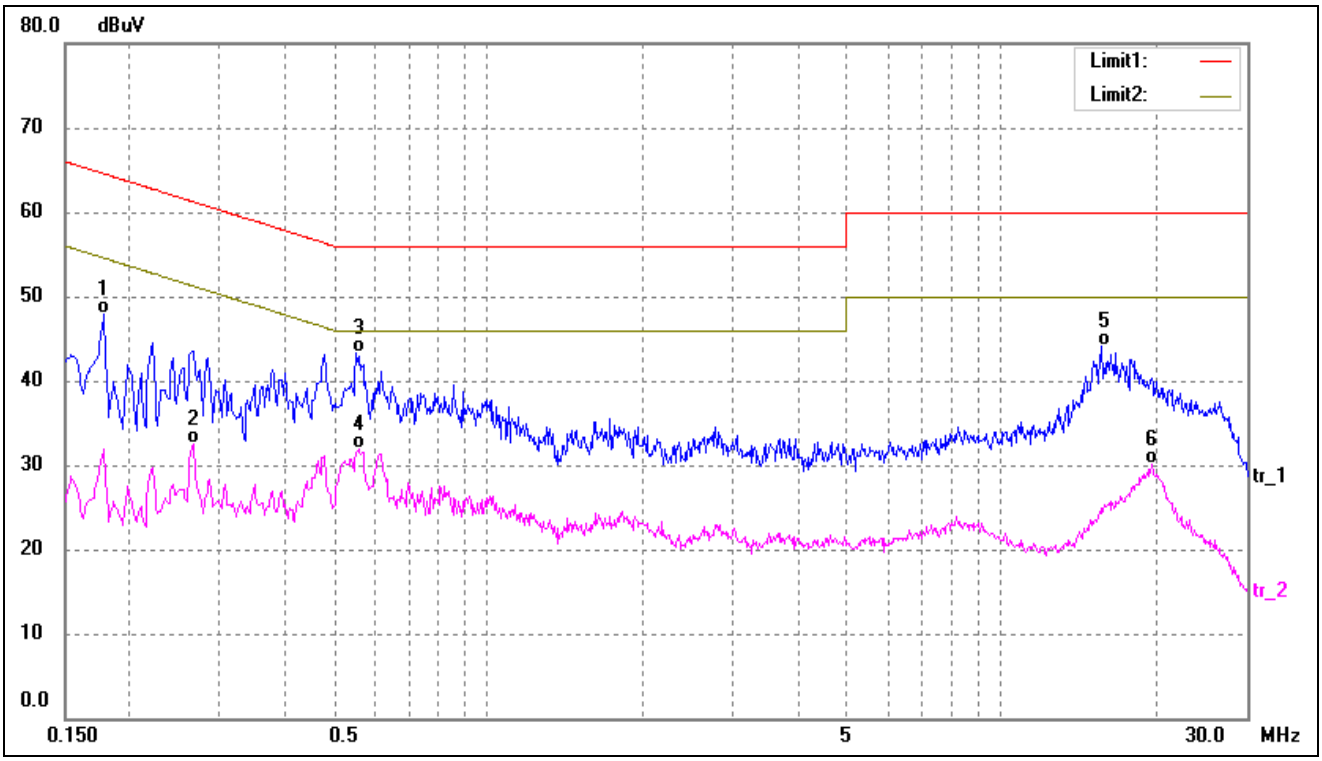
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1740	33.62	10.39	44.01	64.77	-20.76	QP
2	0.1740	20.30	10.39	30.69	54.77	-24.08	AVG
3	0.5700	18.49	10.22	28.71	46.00	-17.29	AVG
4	0.5740	30.80	10.22	41.02	56.00	-14.98	QP
5*	15.8420	39.78	10.25	50.03	60.00	-9.97	QP
6	16.3900	23.89	10.27	34.16	50.00	-15.84	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1780	37.50	10.39	47.89	64.58	-16.69	QP
2	0.2660	22.26	10.33	32.59	51.24	-18.65	AVG
3*	0.5540	33.17	10.22	43.39	56.00	-12.61	QP
4	0.5580	21.70	10.22	31.92	46.00	-14.08	AVG
5	15.6540	33.80	10.24	44.04	60.00	-15.96	QP
6	19.6020	19.72	10.37	30.09	50.00	-19.91	AVG

APPENDIX SUMMARY

Project No.	WTX23X06132437W	Test Engineer	Timi Huang
Start date	2023/7/3	Finish date	2023/7/4
Temperature	23℃	Humidity	46%
RF specifications	U-NII		

APPENDIX	Description of Test Item	Result
A	Power Spectral Density	Compliant
B	Emission Bandwidth and Occupied Bandwidth	Compliant
C	Maximum Conducted Output Power	Compliant
D	Frequency Stability	Compliant

APPENDIX A

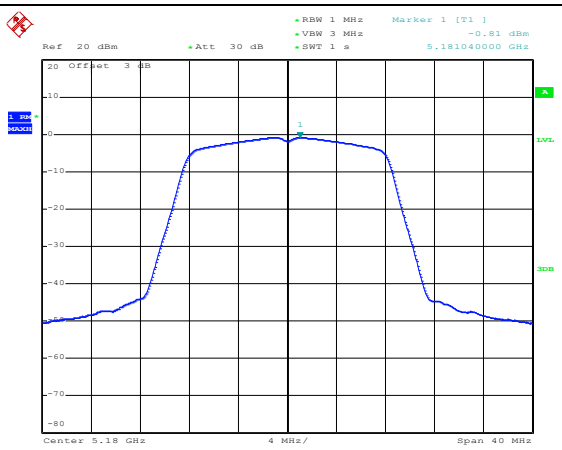
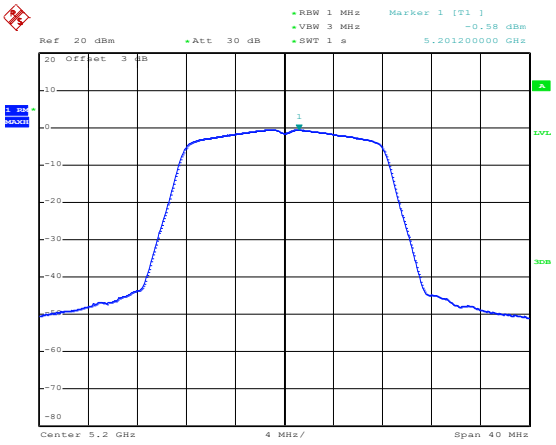
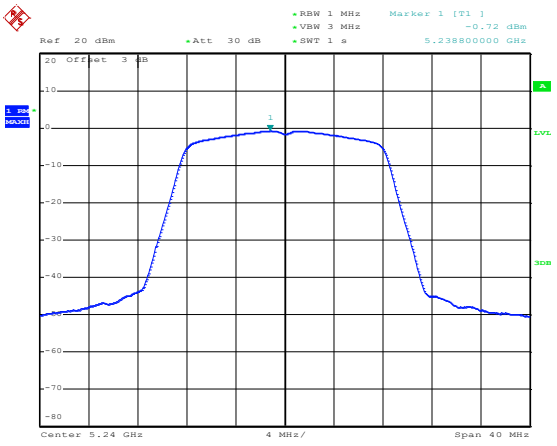
Power Spectral Density			
U-NII-1:5150-5250MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	-0.81	11
	5200	-0.58	11
	5240	-0.72	11
802.11n-HT20	5180	-1.36	11
	5200	-1.17	11
	5240	-1.27	11
802.11n-HT40	5190	-3.92	11
	5230	-3.97	11
802.11ac-VHT80	5210	-7.61	11

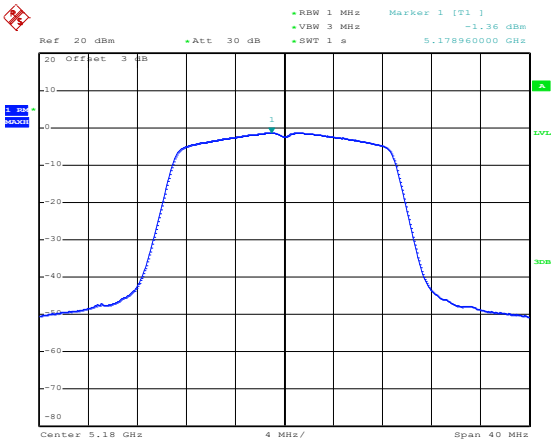
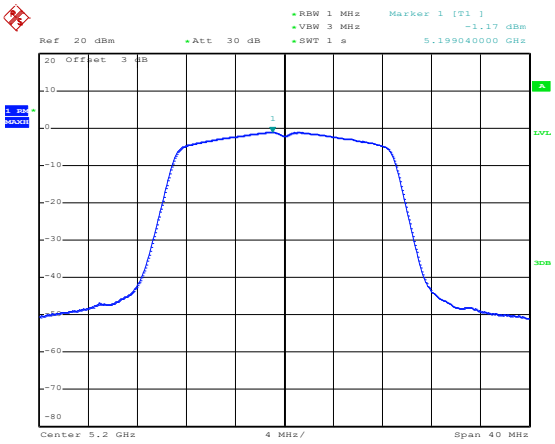
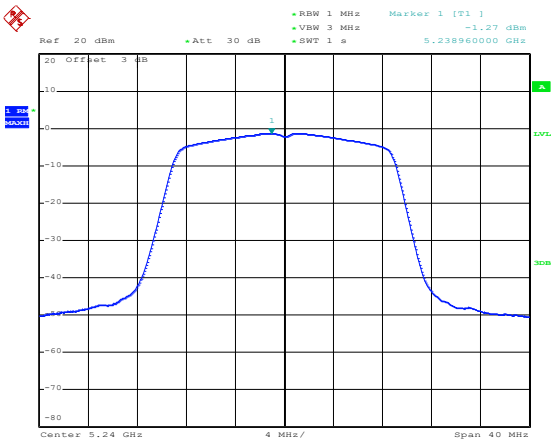
U-NII-2A: 5250-5350MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5260	-1.24	11
	5280	-1.14	11
	5320	-2.02	11
802.11n-HT20	5260	-1.60	11
	5280	-1.78	11
	5320	-2.34	11
802.11n-HT40	5270	-4.61	11
	5310	-5.07	11
802.11ac-VHT80	5290	-8.24	11

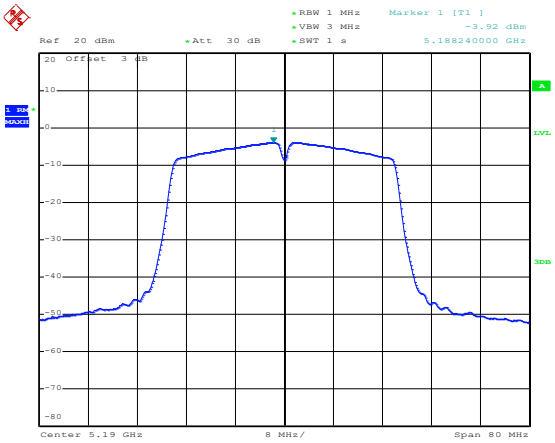
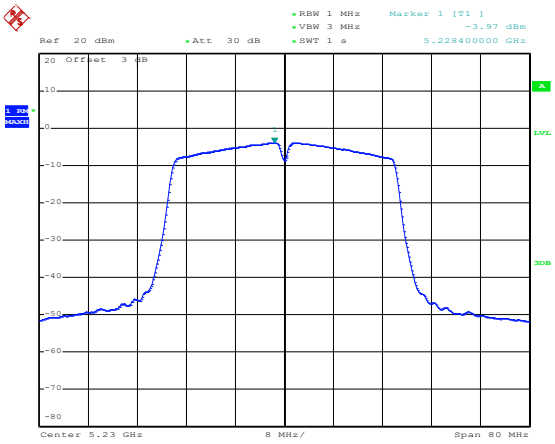
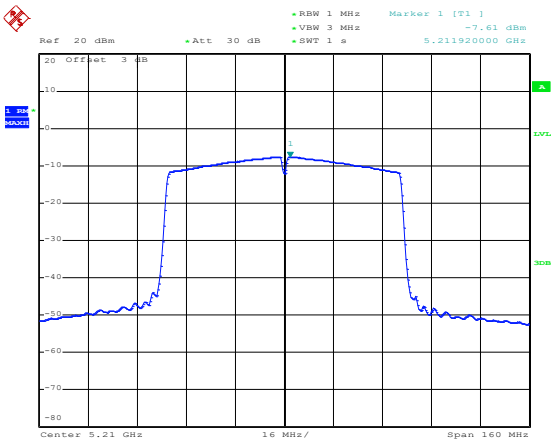
U-NII-2C: 5470-5725MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5500	-2.73	11
	5600	-3.17	11
	5700	-4.15	11
802.11n-HT20	5500	-2.68	11
	5600	-2.73	11
	5700	-3.73	11
802.11n-HT40	5510	-5.36	11
	5590	-5.44	11
	5670	-6.51	11
802.11ac-VHT80	5530	-9.31	11
	5610	-9.81	11

U-NII-3: 5725-5850MHz					
Operating mode	Test Channel	Power Spectral Density dBm/300kHz	Factor	Power Spectral Density* dBm/500kHz	Limit dBm/500kHz
802.11a	5745	-3.94	2.22	-1.72	30
	5785	-3.66	2.22	-1.44	30
	5825	-3.31	2.22	-1.09	30
802.11n-HT20	5745	-4.30	2.22	-2.08	30
	5785	-3.96	2.22	-1.74	30
	5825	-3.63	2.22	-1.41	30
802.11n-HT40	5755	-7.15	2.22	-4.93	30
	5795	-6.75	2.22	-4.53	30
802.11ac-VHT80	5775	-10.22	2.22	-8.00	30
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22					

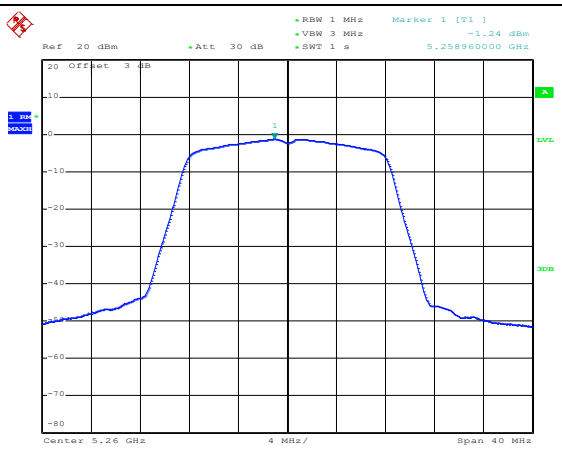
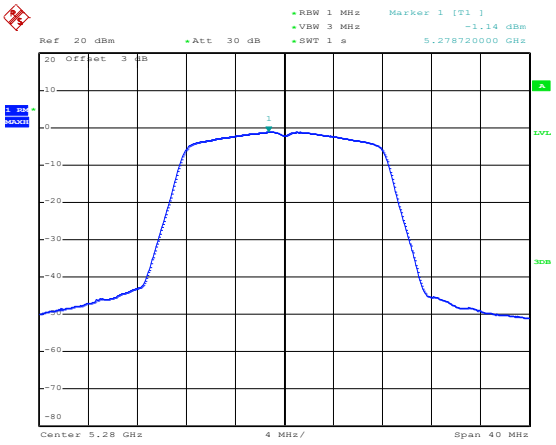
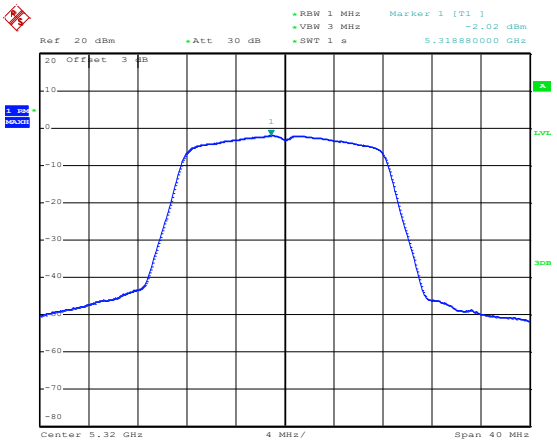
5150-5250MHz

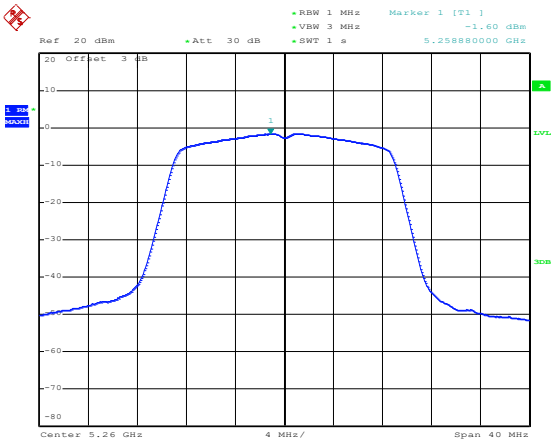
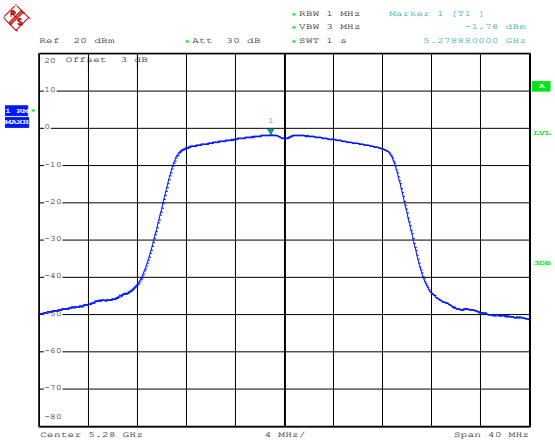
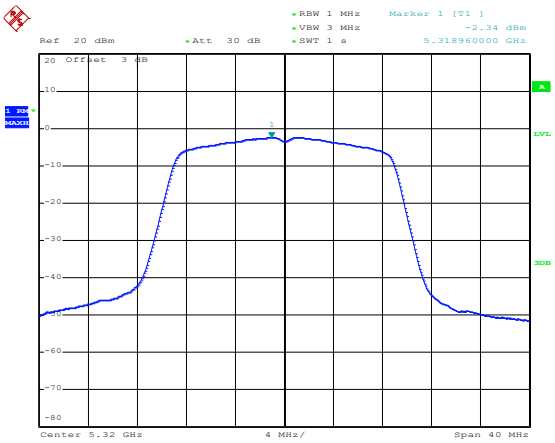
802.11a-Low	
802.11a-Middle	
802.11a-High	

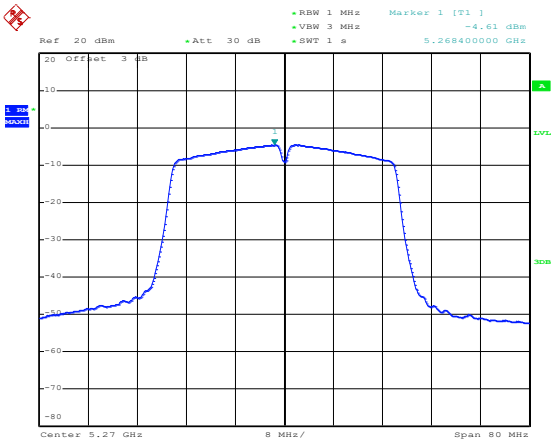
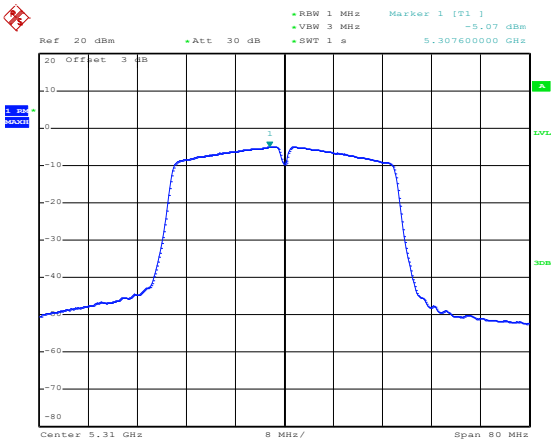
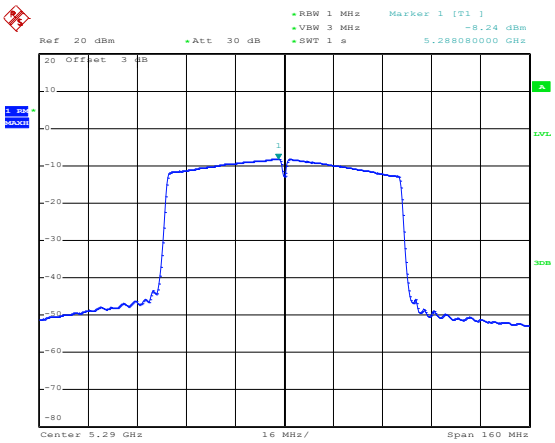
802.11n-HT20-Low	 Date: 3.JUL.2023 20:09:52
802.11n-HT20-Middle	 Date: 3.JUL.2023 20:10:04
802.11n-HT20-High	 Date: 3.JUL.2023 20:10:16

802.11n-HT40-Low	 Date: 3.JUL.2023 20:10:36
802.11n-HT40-High	 Date: 3.JUL.2023 20:10:55
802.11ac-VHT80-Low	 Date: 3.JUL.2023 20:07:21

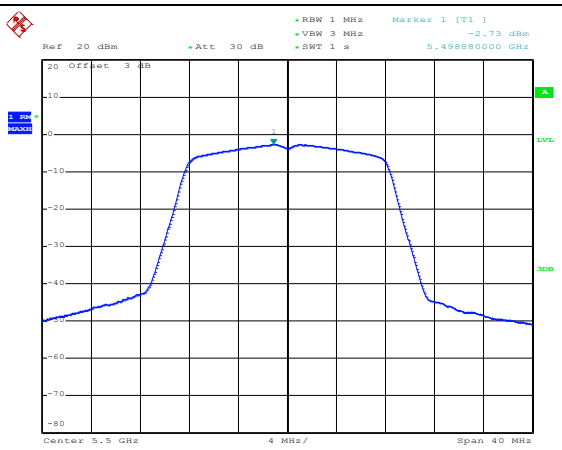
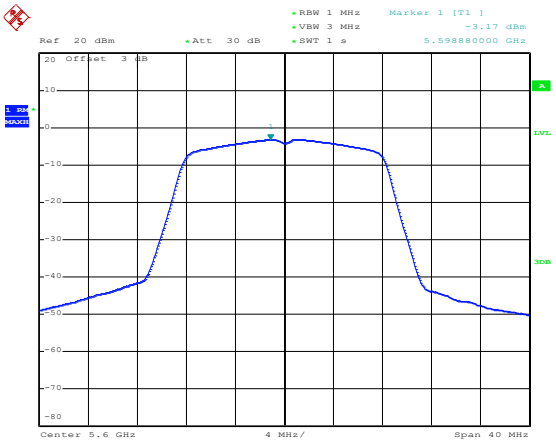
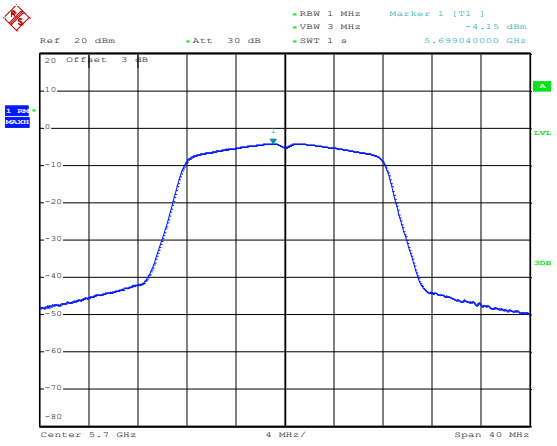
5250-5350MHz

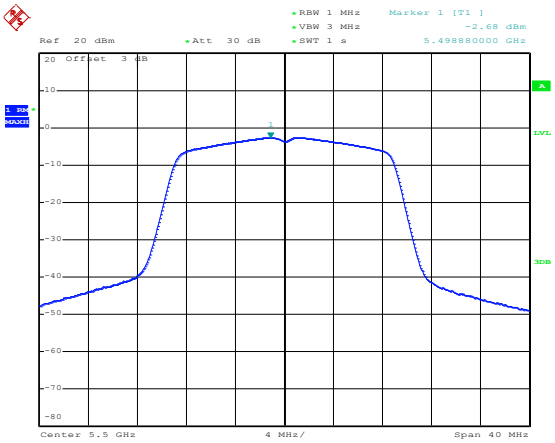
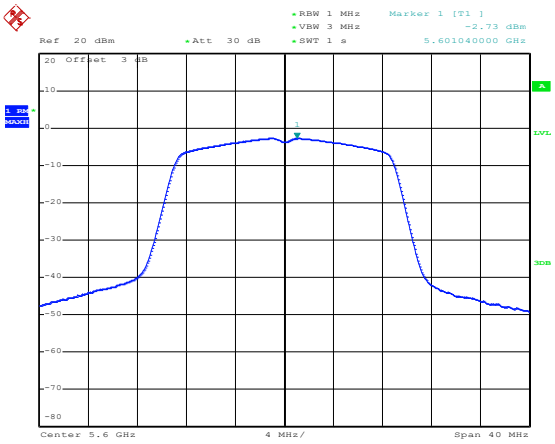
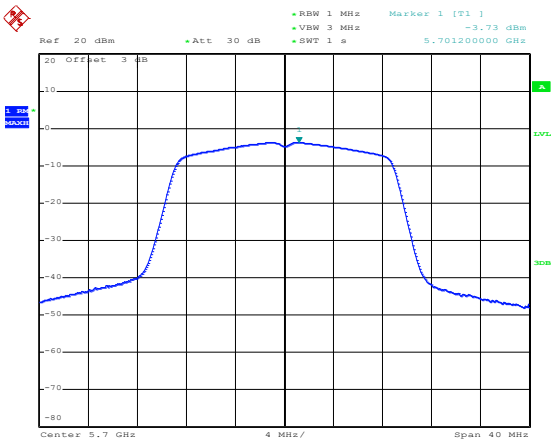
802.11a-Low	 Date: 4.JUL.2023 09:04:24
802.11a-Middle	 Date: 4.JUL.2023 09:04:39
802.11a-High	 Date: 4.JUL.2023 09:04:53

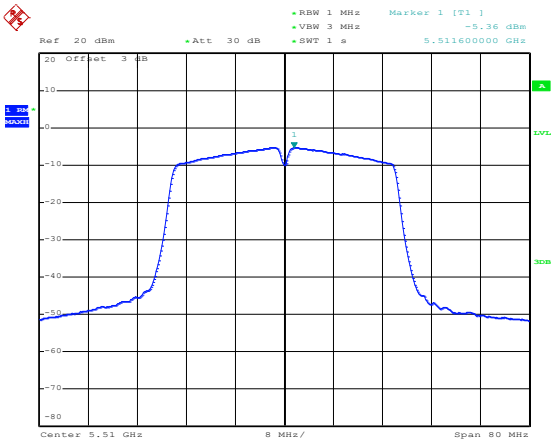
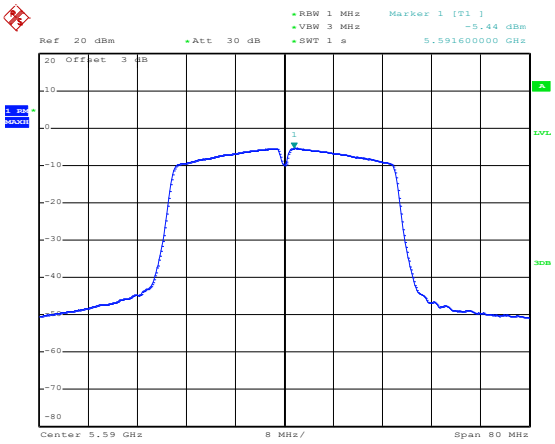
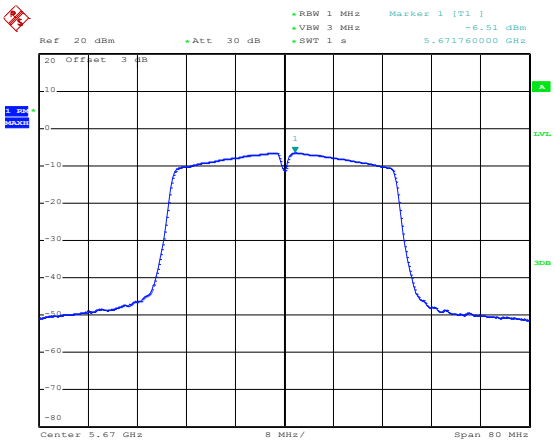
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

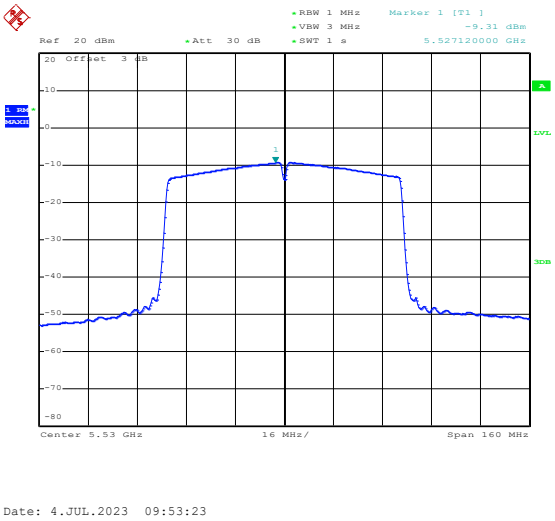
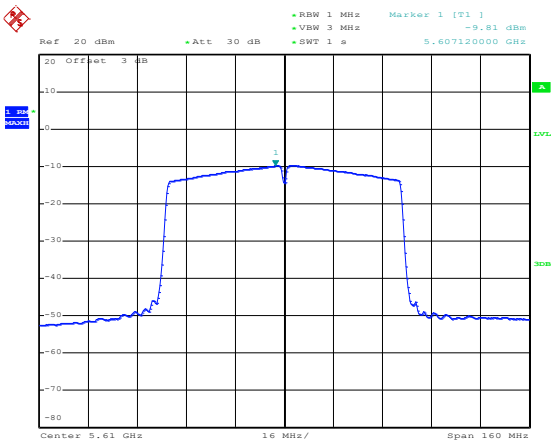
802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-VHT80-Low	

5470-5725MHz

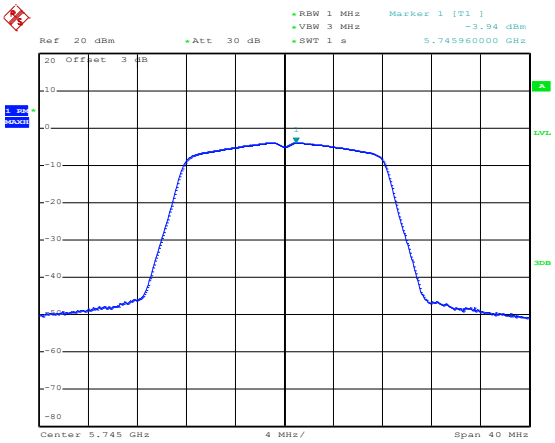
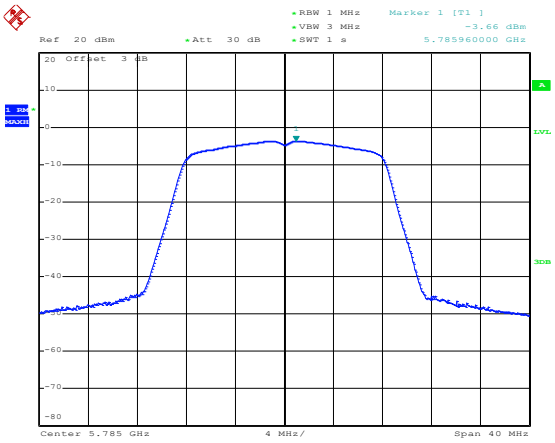
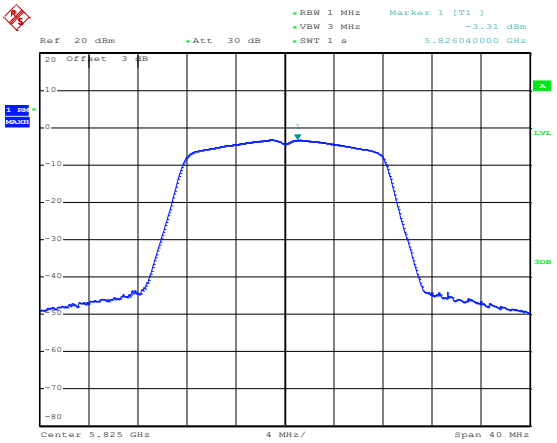
802.11a-Low	
802.11a-Middle	
802.11a-High	

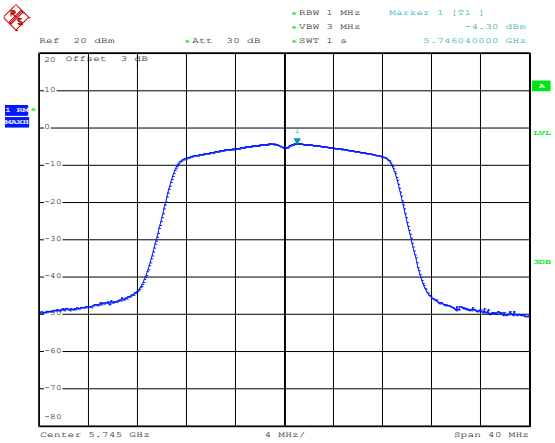
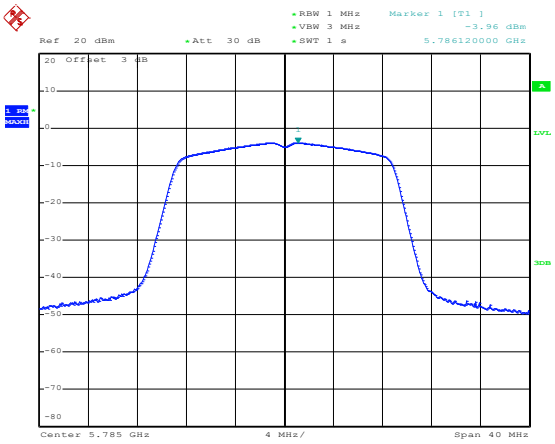
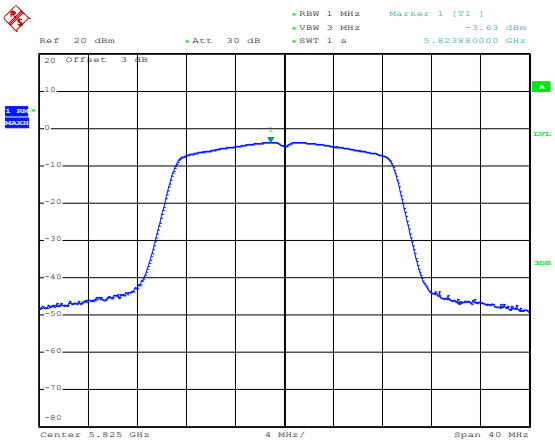
802.11n-HT20-Low	 Date: 4.JUL.2023 09:58:19
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:58:36
802.11n-HT20-High	 Date: 4.JUL.2023 09:58:47

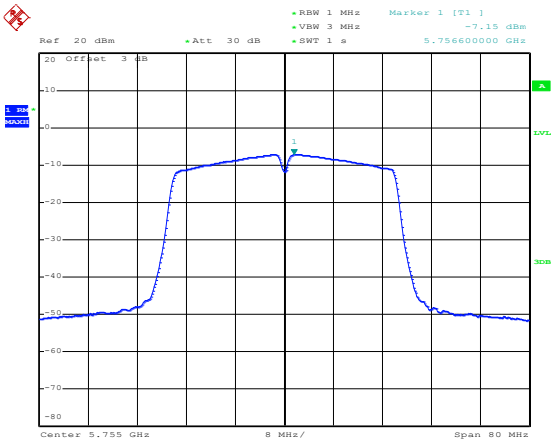
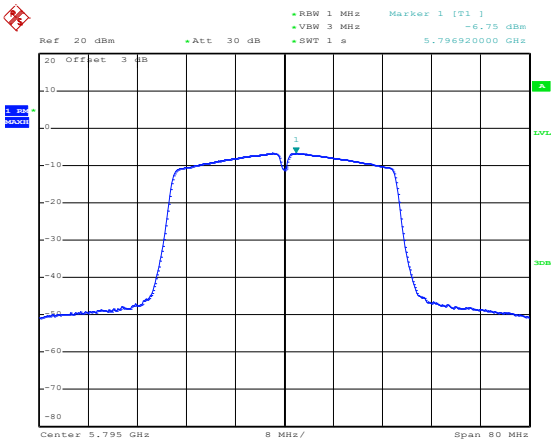
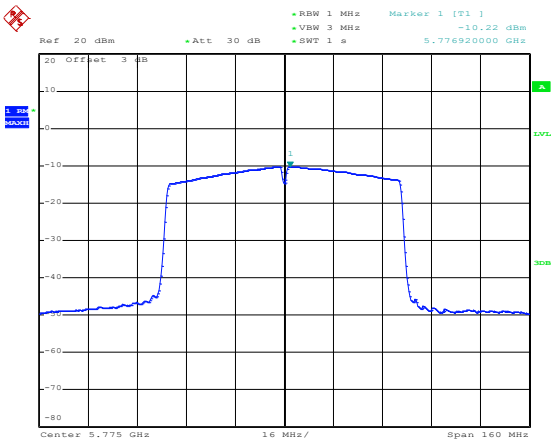
802.11n-HT40-Low	
802.11n-HT40- Middle	
802.11n-HT40-High	

802.11ac-VHT80-Low	
802.11ac-VHT80-High	

5725-5850MHz

802.11a-Low	
802.11a-Middle	
802.11a-High	

802.11n-HT20-Low	 Date: 4.JUL.2023 09:10:13
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:10:26
802.11n-HT20-High	 Date: 4.JUL.2023 09:10:38

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-VHT80-Low	

APPENDIX B

Emission Bandwidth and Occupied Bandwidth

U-NII-1:5150-5250MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5180	20.4	16.8	Pass
	5200	20.4	16.8	Pass
	5240	20.4	16.8	Pass
802.11n-HT20	5180	20.6	17.8	Pass
	5200	20.6	17.8	Pass
	5240	20.7	17.8	Pass
802.11n-HT40	5190	40.4	36.4	Pass
	5230	40.6	36.6	Pass
802.11ac-VHT80	5210	81.6	75.2	Pass

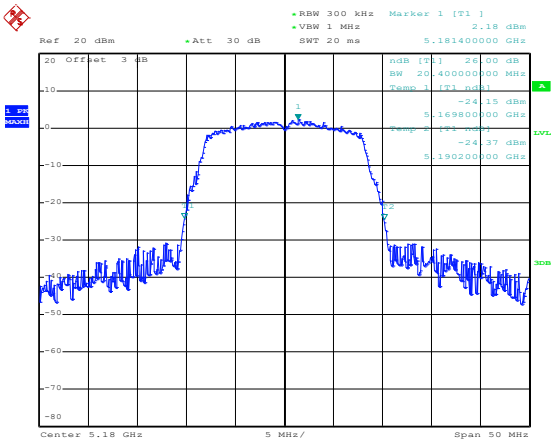
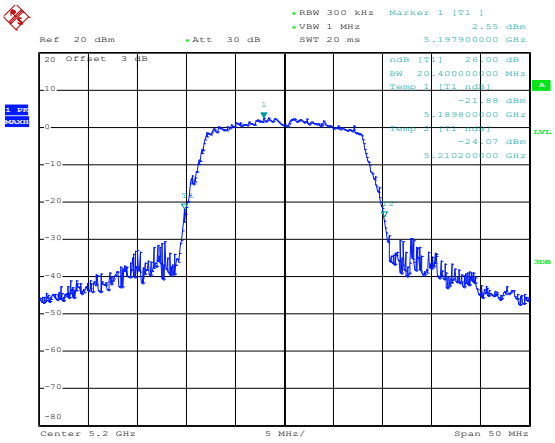
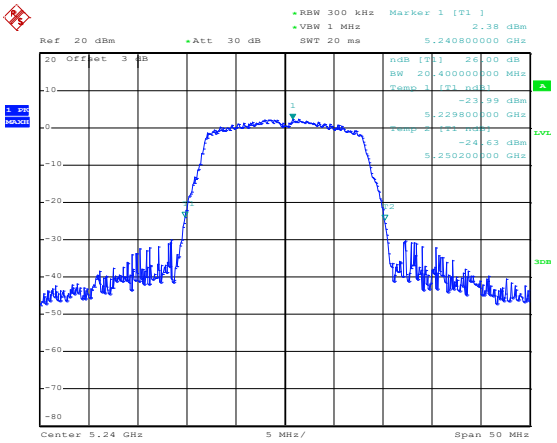
U-NII-2A: 5250-5350MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5260	20.4	16.8	Pass
	5280	20.2	16.8	Pass
	5320	20.4	16.8	Pass
802.11n-HT20	5260	20.6	17.8	Pass
	5280	20.6	17.8	Pass
	5320	20.6	17.8	Pass
802.11n-HT40	5270	40.2	36.6	Pass
	5310	40.4	36.6	Pass
802.11ac-VHT80	5290	82.0	75.6	Pass

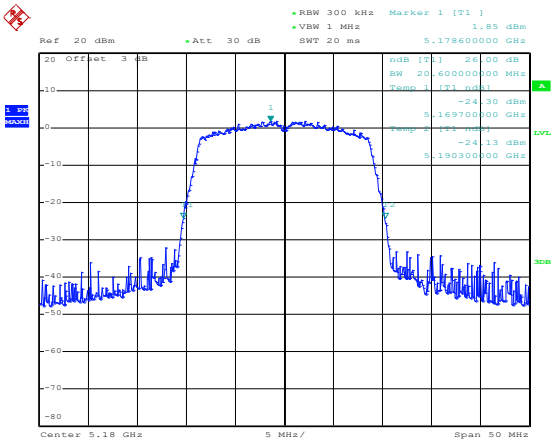
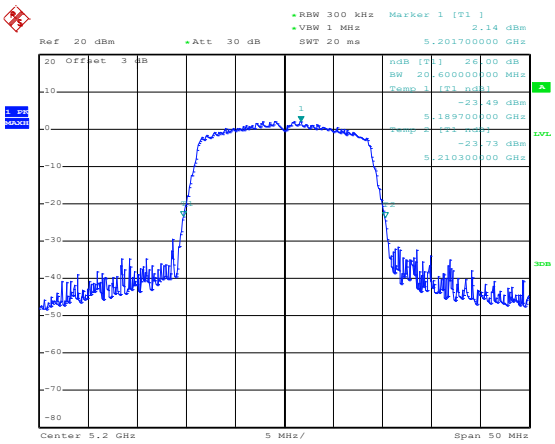
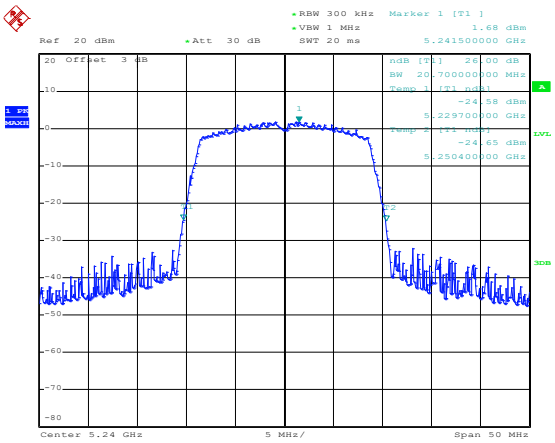
U-NII-2C: 5470-5725MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5500	20.3	16.8	Pass
	5600	20.4	16.9	Pass
	5700	20.4	16.9	Pass
802.11n-HT20	5500	20.7	17.8	Pass
	5600	20.7	17.8	Pass
	5700	20.6	17.8	Pass
802.11n-HT40	5510	40.6	36.6	Pass
	5590	40.6	36.6	Pass
	5670	40.6	36.8	Pass
802.11ac-VHT80	5530	82.0	75.6	Pass
	5610	81.6	75.6	Pass

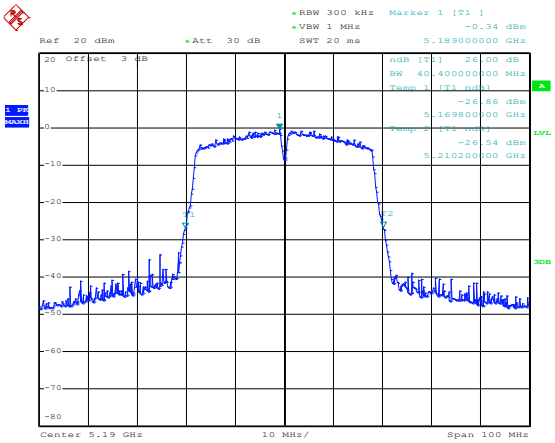
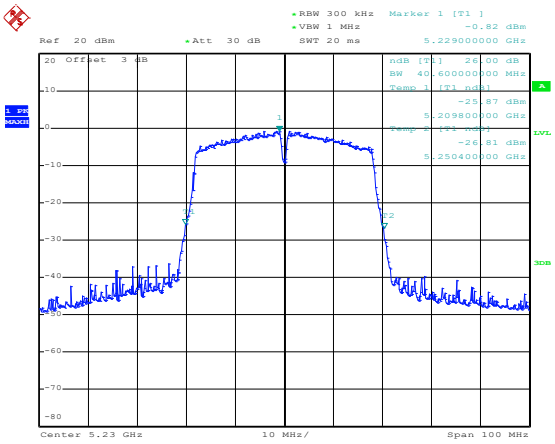
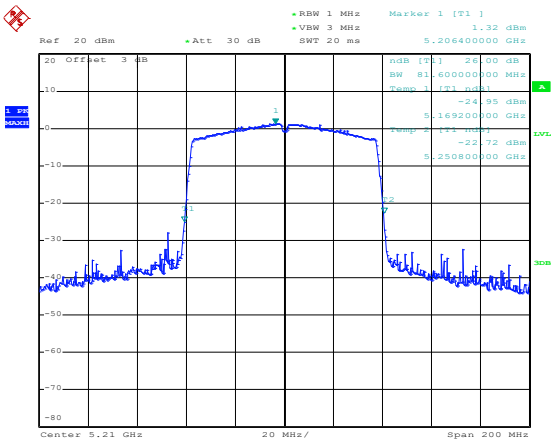
U-NII-3: 5725-5850MHz				
Test Mode	**Test Channel MHz**	**6 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5745	16.6	16.9	≥500
	5785	16.6	16.9	≥500
	5825	16.6	16.8	≥500
802.11n-HT20	5745	17.8	17.9	≥500
	5785	17.8	17.9	≥500
	5825	17.8	17.8	≥500
802.11n-HT40	5755	36.6	36.6	≥500
	5795	36.6	36.6	≥500
802.11ac-VHT80	5775	77.6	75.6	≥500

26 dB BandwidthMHz

5150-5250MHz

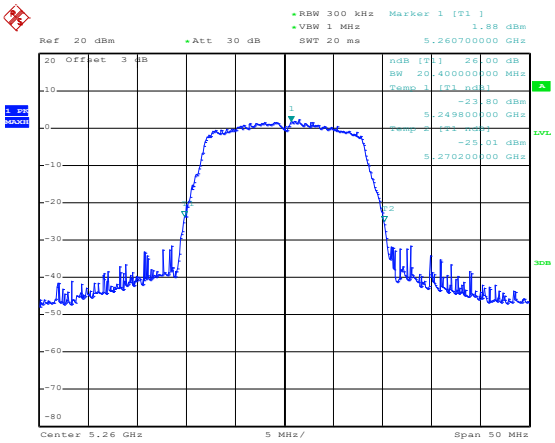
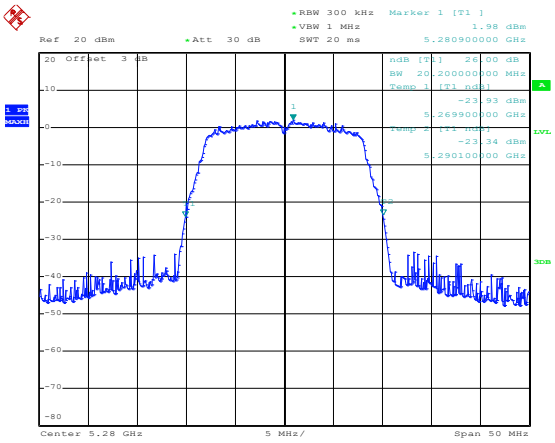
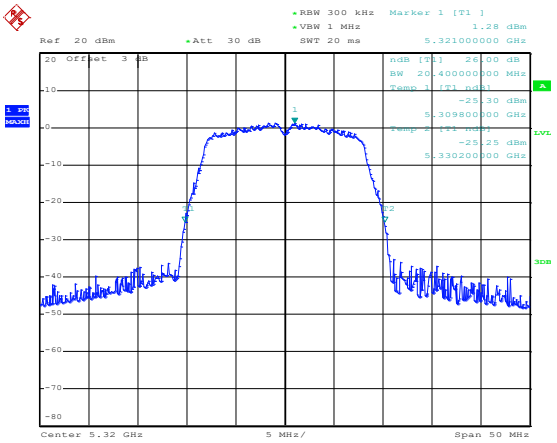
802.11a-Low	
802.11a-Middle	
802.11a-High	

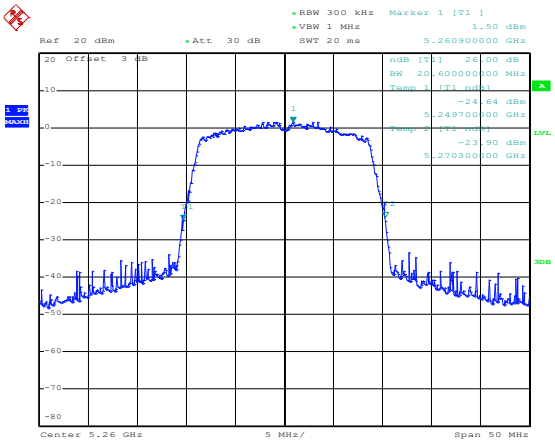
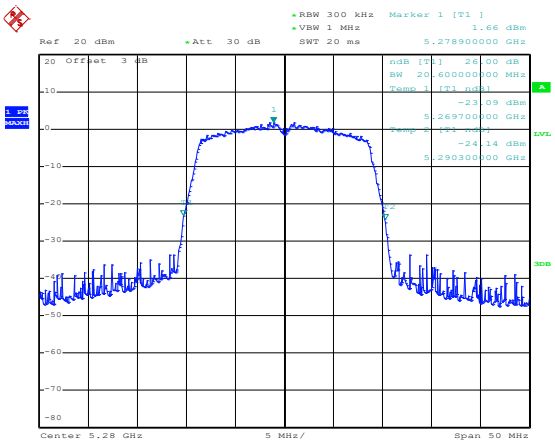
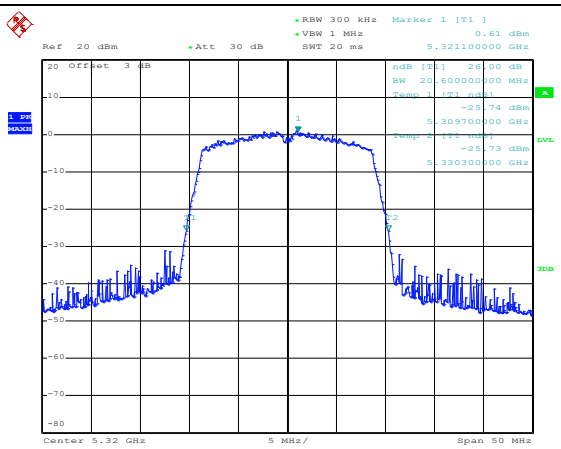
802.11n-HT20-Low	 Date: 3.JUL.2023 20:15:31
802.11n-HT20-Middle	 Date: 3.JUL.2023 20:15:46
802.11n-HT20-High	 Date: 3.JUL.2023 20:16:04

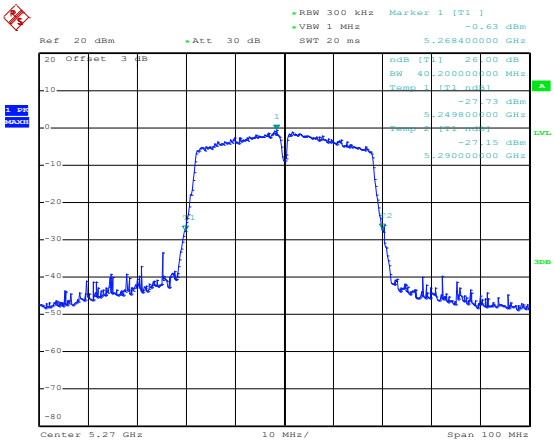
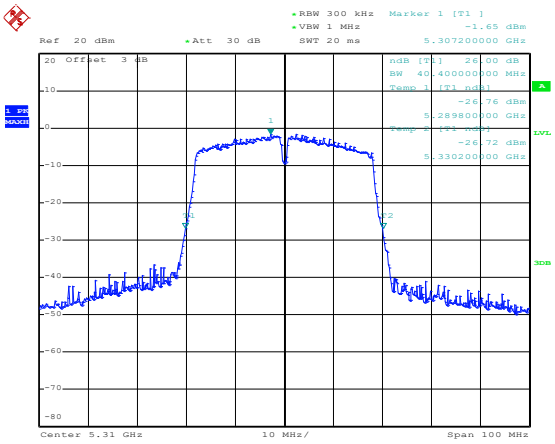
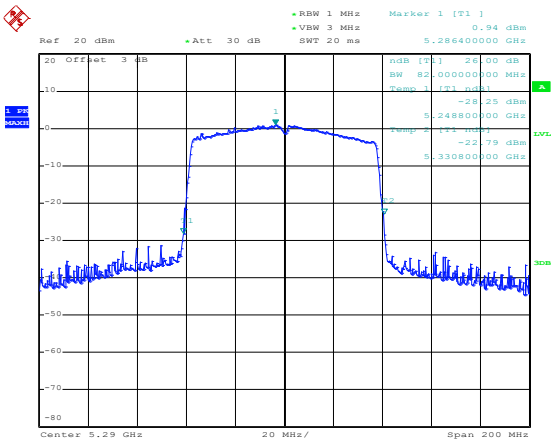
802.11n-HT40-Low	 Date: 3.JUL.2023 20:16:42
802.11n-HT40-High	 Date: 3.JUL.2023 20:17:04
802.11ac-VHT80-Low	 Date: 3.JUL.2023 20:17:31

26 dB BandwidthMHz

5250-5350MHz

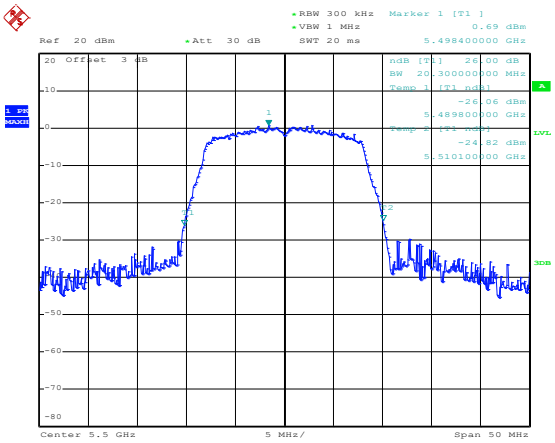
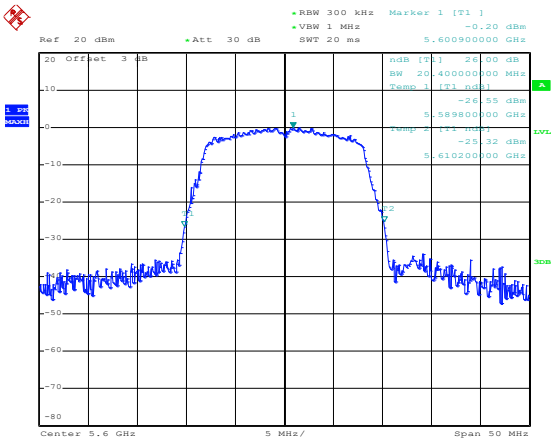
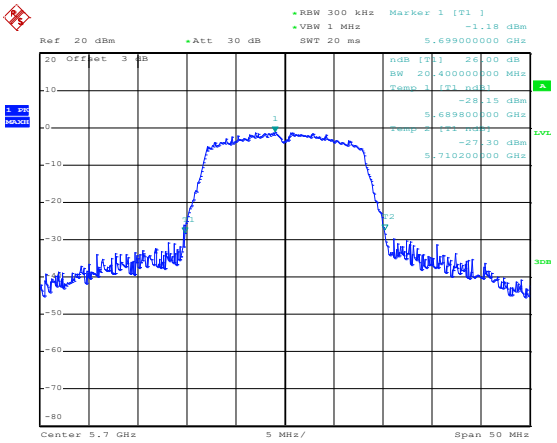
802.11a-Low	 Date: 3.JUL.2023 20:32:32
802.11a-Middle	 Date: 3.JUL.2023 20:32:45
802.11a-High	 Date: 3.JUL.2023 20:32:59

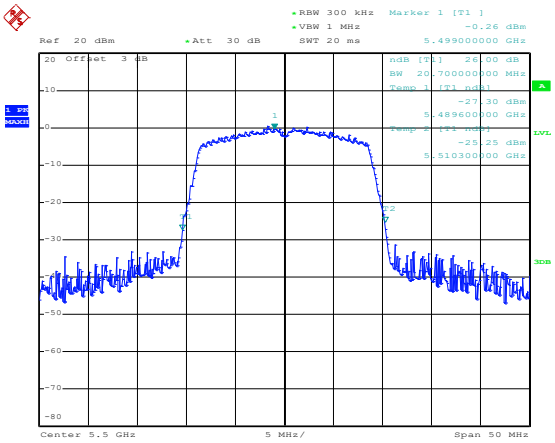
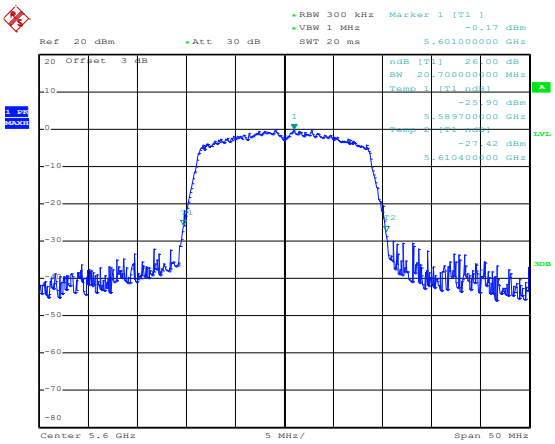
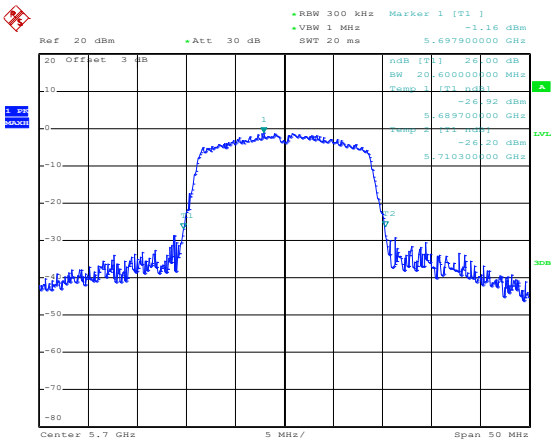
802.11n-HT20-Low	 Date: 3.JUL.2023 20:33:16
802.11n-HT20-Middle	 Date: 3.JUL.2023 20:33:28
802.11n-HT20-High	 Date: 3.JUL.2023 20:33:42

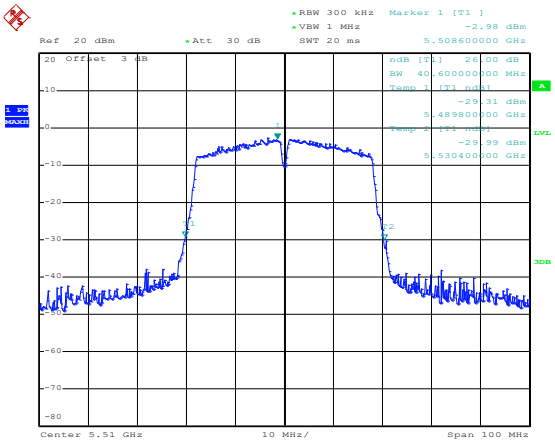
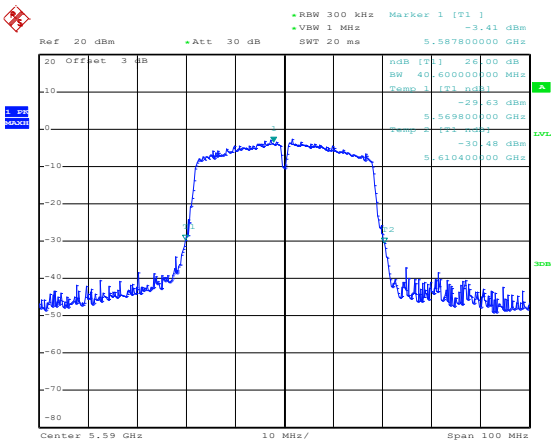
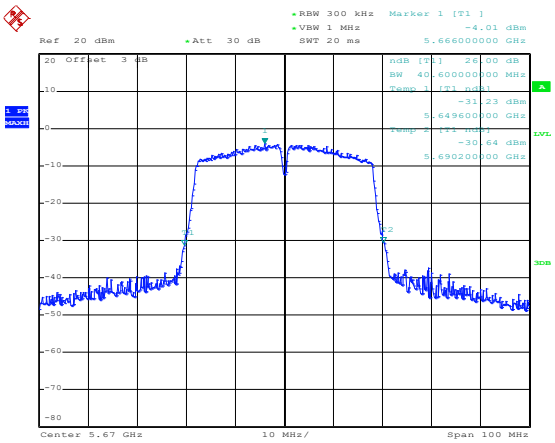
802.11n-HT40-Low	 Date: 3.JUL.2023 20:34:11
802.11n-HT40-High	 Date: 3.JUL.2023 20:34:30
802.11ac-VHT80-Low	 Date: 3.JUL.2023 20:31:56

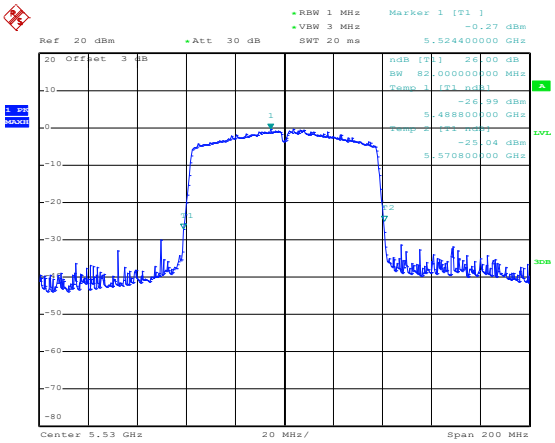
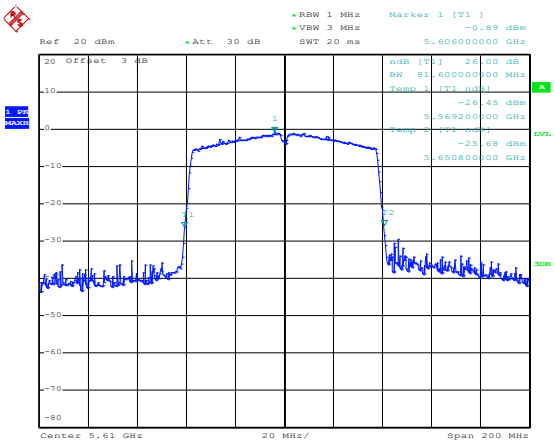
26 dB BandwidthMHz

5470-5725MHz

802.11a-Low	
802.11a-Middle	
802.11a-High	

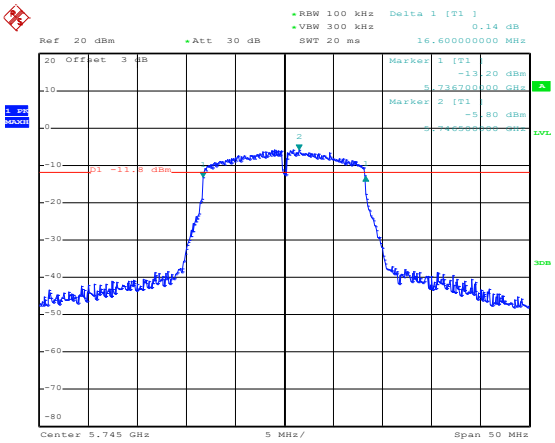
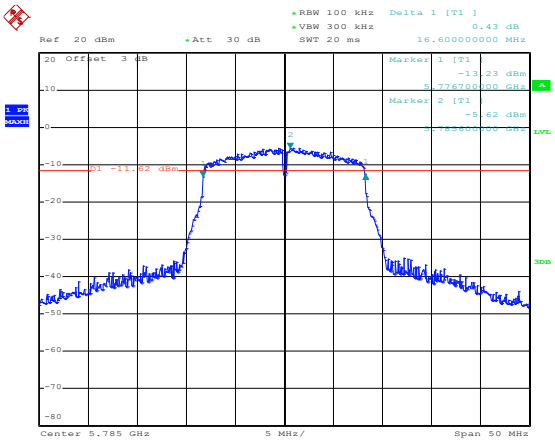
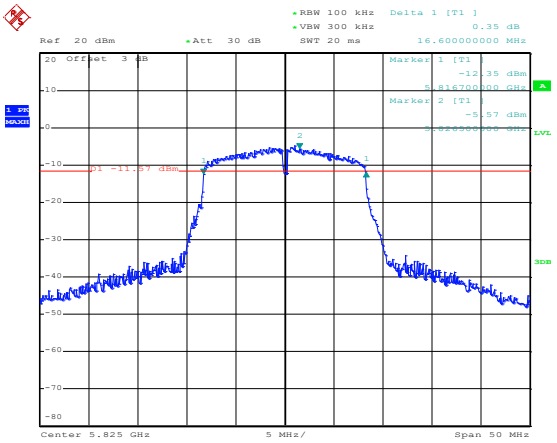
802.11n-HT20-Low	 Date: 4.JUL.2023 09:42:58
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:43:13
802.11n-HT20-High	 Date: 4.JUL.2023 09:43:26

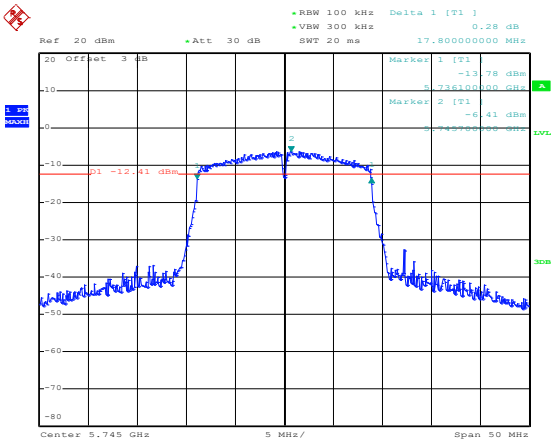
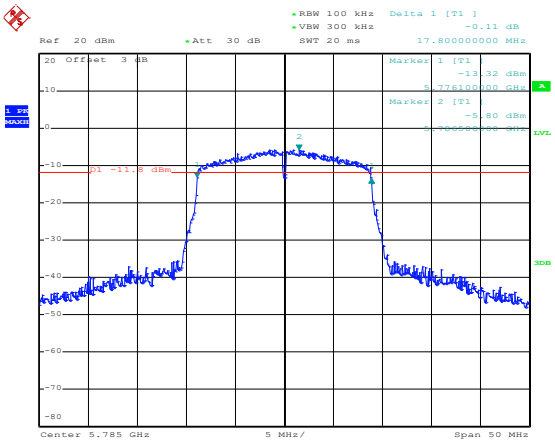
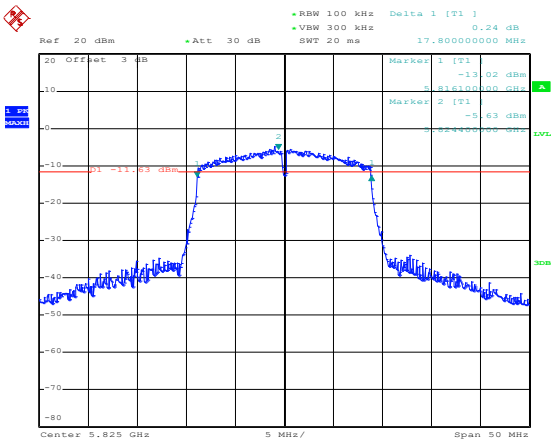
802.11n-HT40-Low	 Date: 4.JUL.2023 09:45:42
802.11n-HT40- Middle	 Date: 4.JUL.2023 09:45:57
802.11n-HT40-High	 Date: 4.JUL.2023 09:46:13

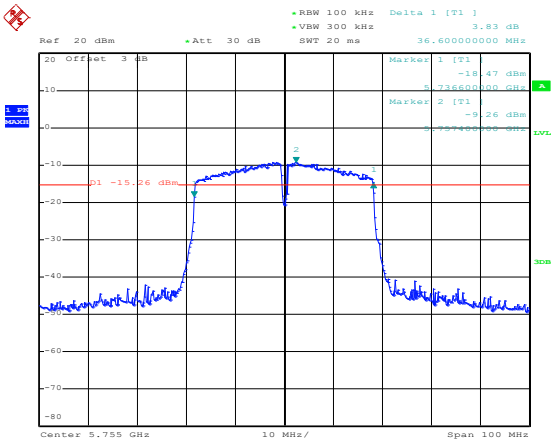
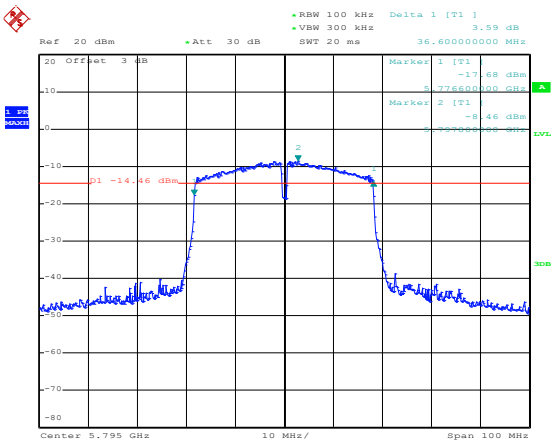
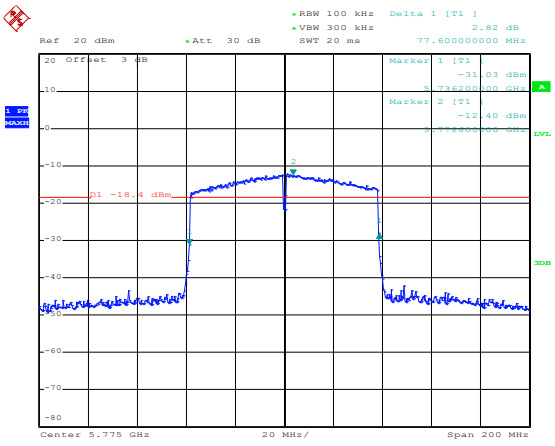
802.11ac-VHT80-Low	
802.11ac-VHT80-High	

6 dB BandwidthMHz

5725-5850MHz

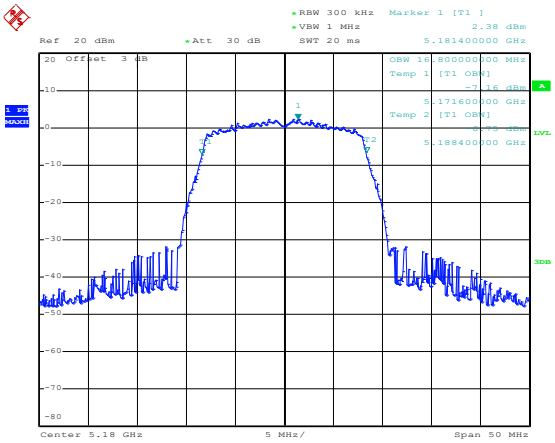
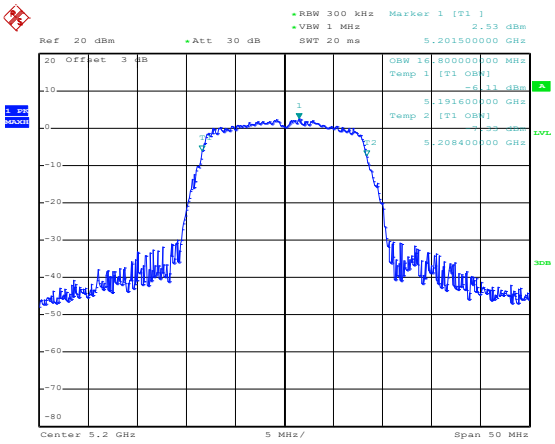
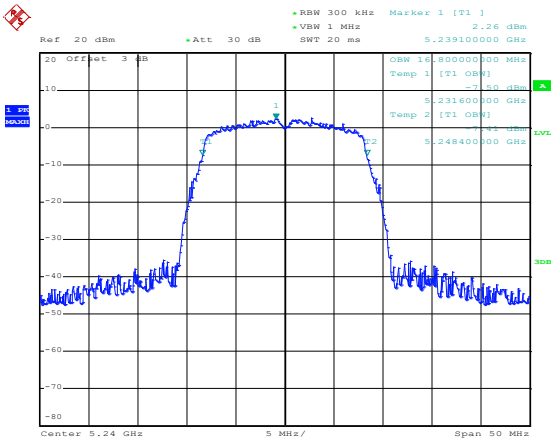
802.11a-Low	
802.11a-Middle	
802.11a-High	

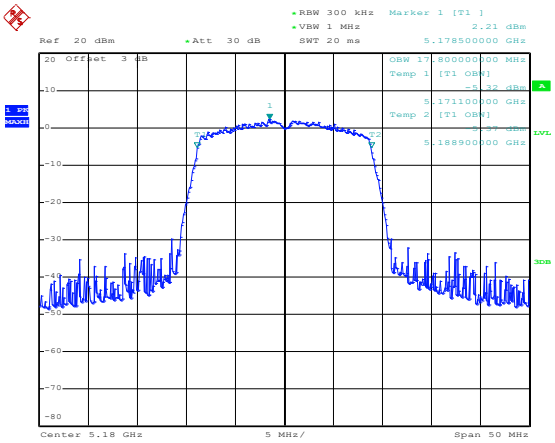
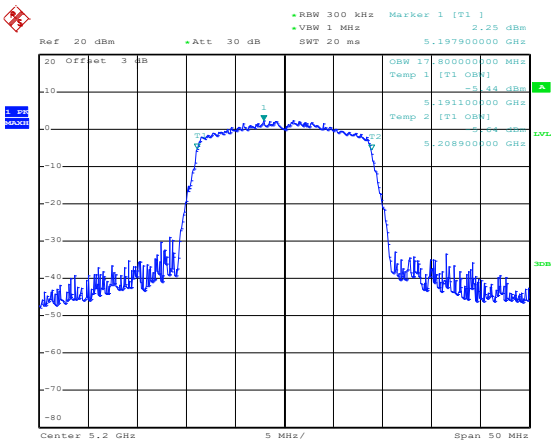
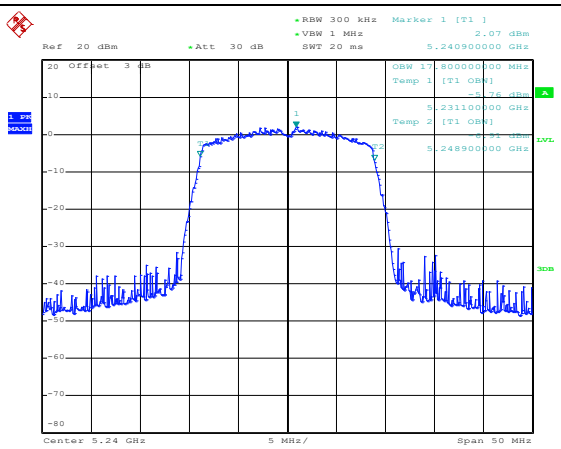
802.11n-HT20-Low	 Date: 4.JUL.2023 09:28:11
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:28:53
802.11n-HT20-High	 Date: 4.JUL.2023 09:29:33

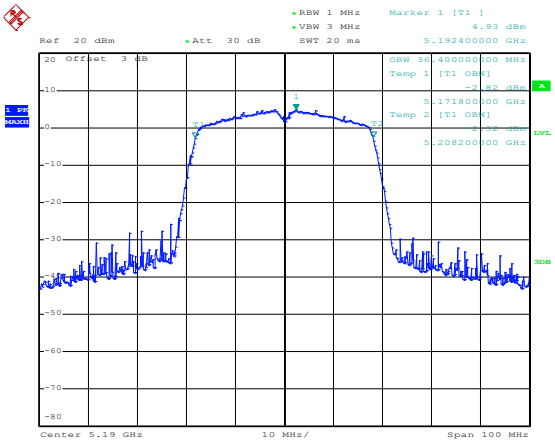
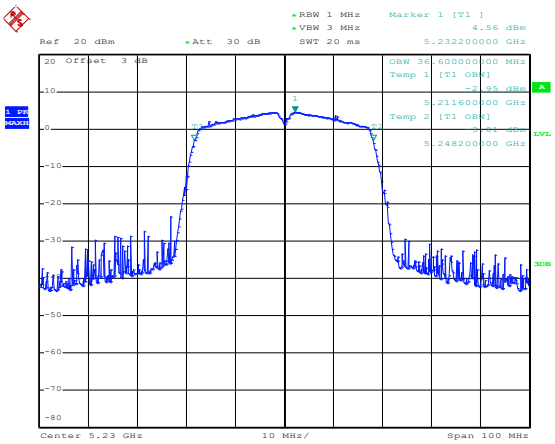
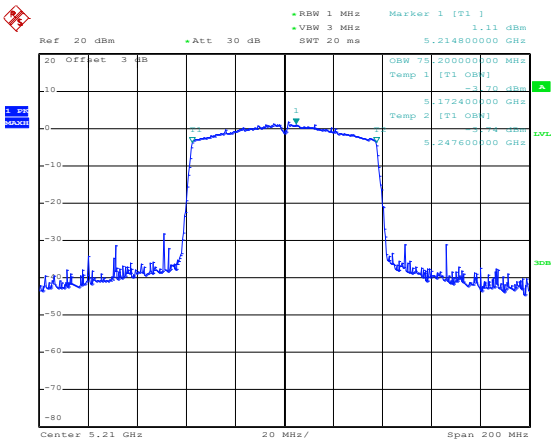
802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-VHT80-Low	

99% BandwidthMHz

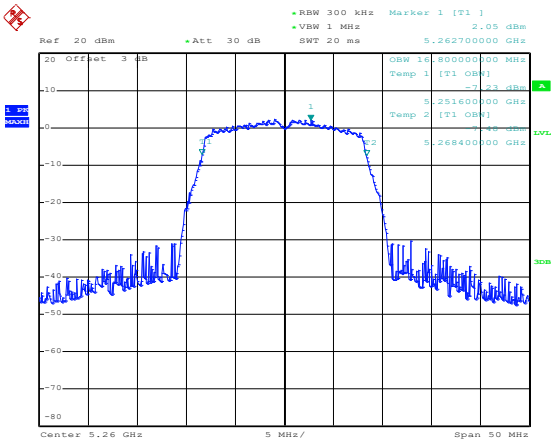
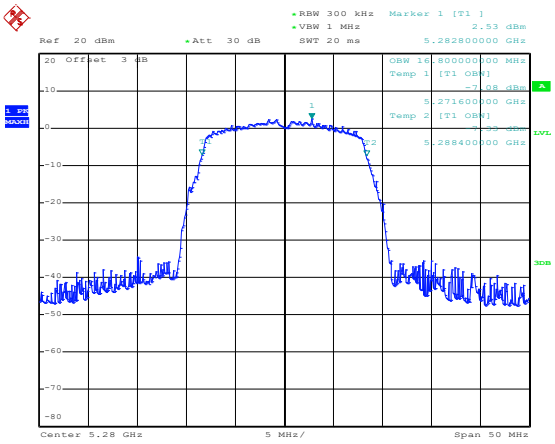
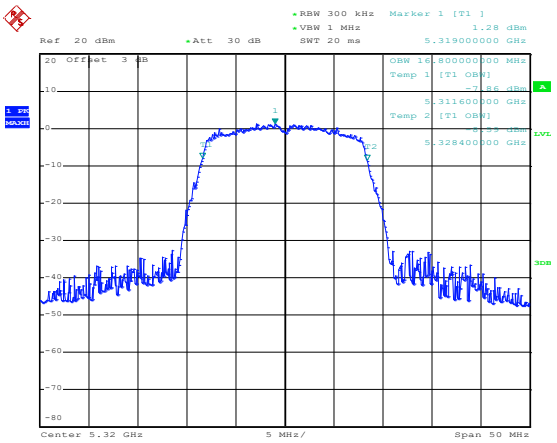
5150-5250MHz

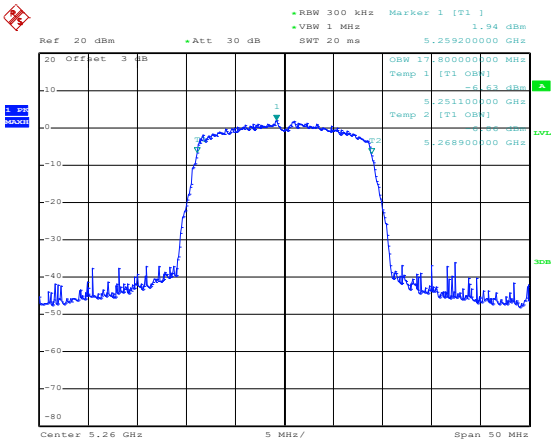
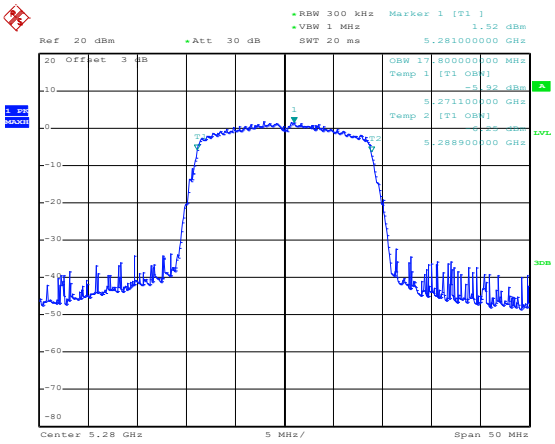
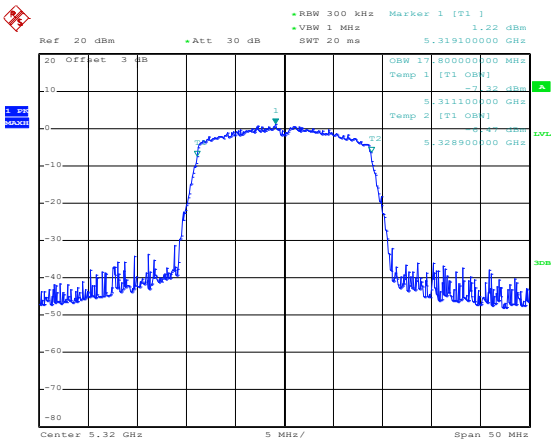
802.11a-Low	 Date: 3.JUL.2023 20:20:15
802.11a-Middle	 Date: 3.JUL.2023 20:22:42
802.11a-High	 Date: 3.JUL.2023 20:23:07

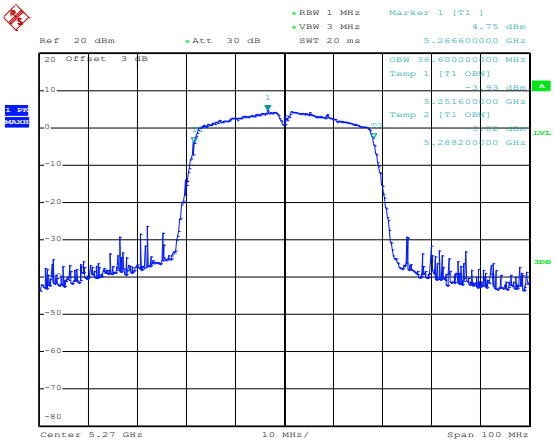
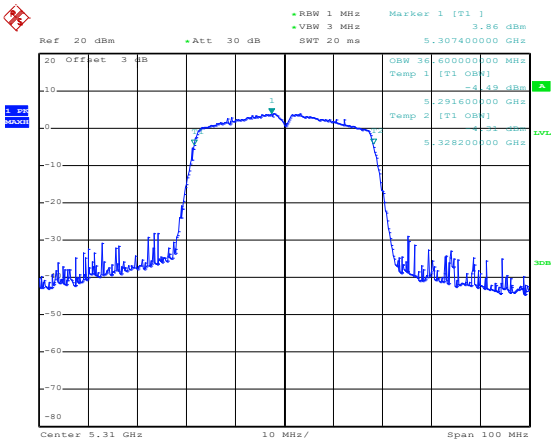
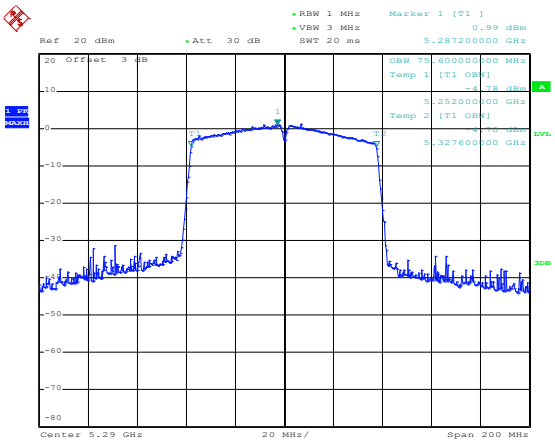
802.11n-HT20-Low	 Date: 3.JUL.2023 20:23:28
802.11n-HT20-Middle	 Date: 3.JUL.2023 20:23:48
802.11n-HT20-High	 Date: 3.JUL.2023 20:24:02

802.11n-HT40-Low	 Date: 3.JUL.2023 20:24:36
802.11n-HT40-High	 Date: 3.JUL.2023 20:24:54
802.11ac-VHT80-Low	 Date: 3.JUL.2023 20:19:23

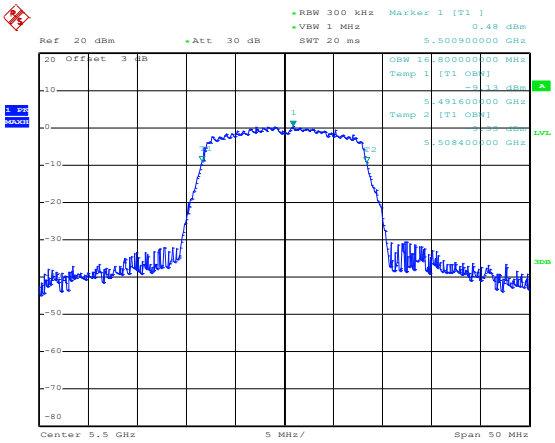
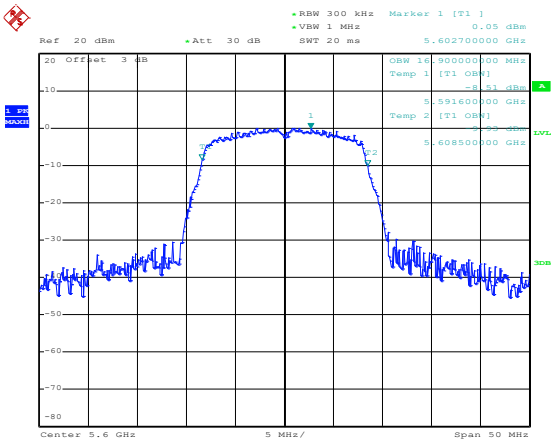
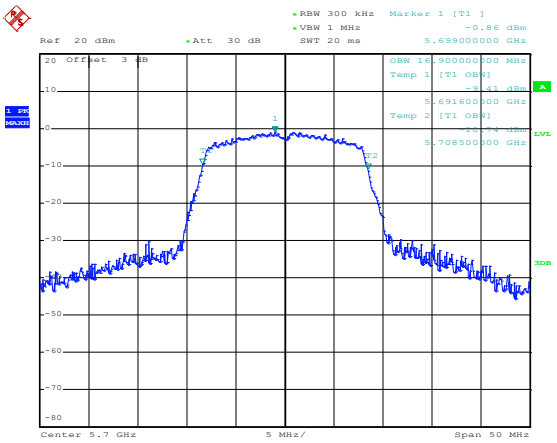
5250-5350MHz

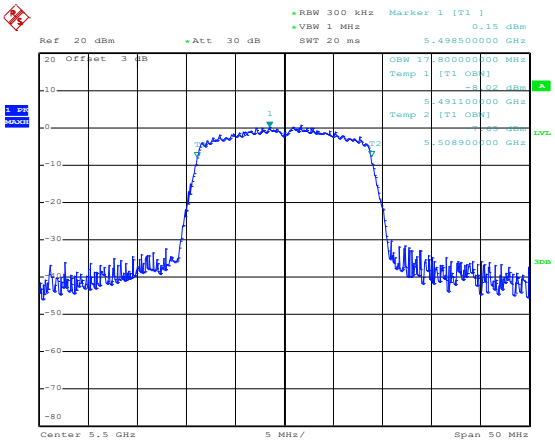
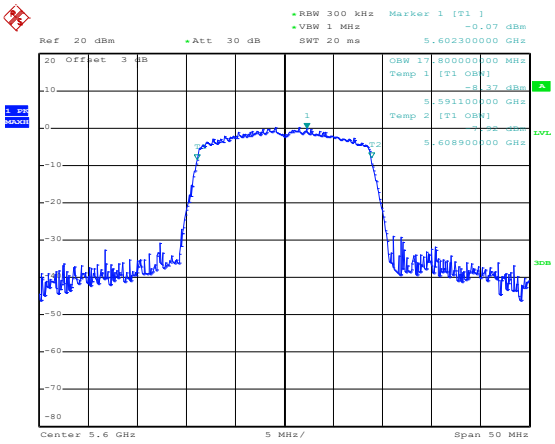
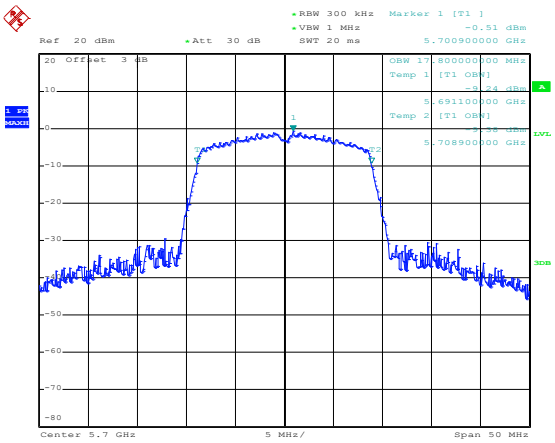
802.11a-Low	 Date: 3.JUL.2023 20:27:50
802.11a-Middle	 Date: 3.JUL.2023 20:28:09
802.11a-High	 Date: 3.JUL.2023 20:28:26

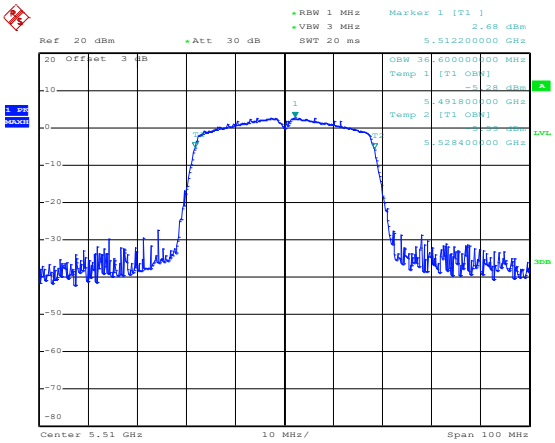
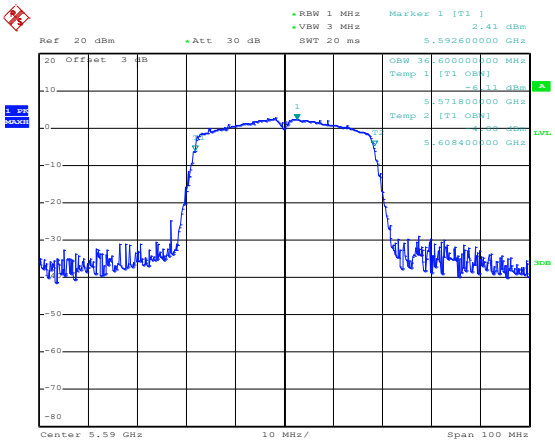
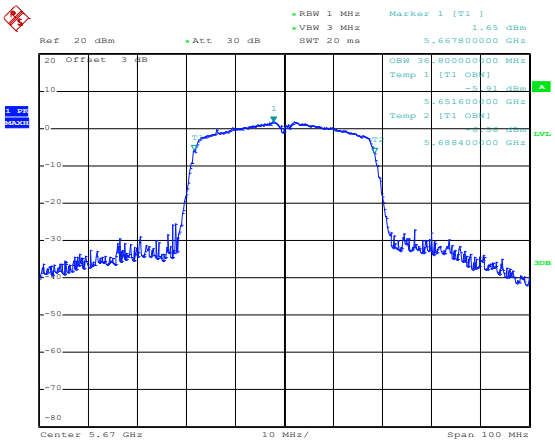
802.11n-HT20-Low	 Date: 3.JUL.2023 20:28:43
802.11n-HT20-Middle	 Date: 3.JUL.2023 20:28:57
802.11n-HT20-High	 Date: 3.JUL.2023 20:29:13

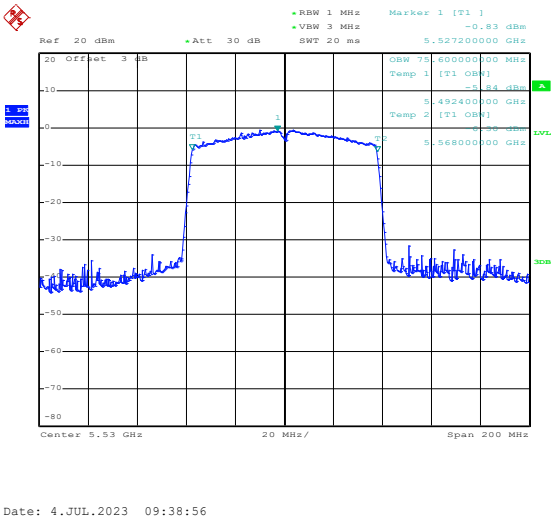
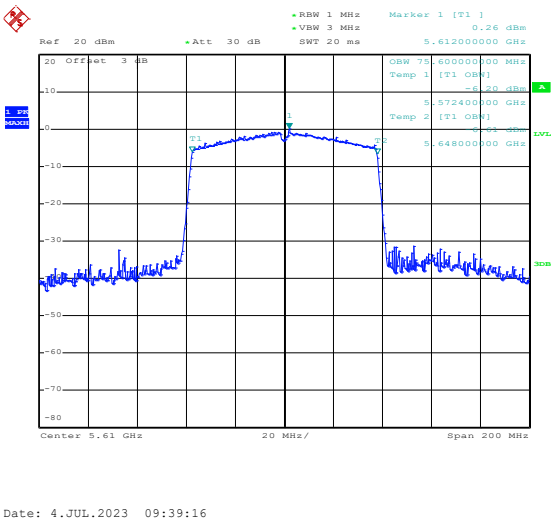
802.11n-HT40-Low	 Date: 3.JUL.2023 20:29:39
802.11n-HT40-High	 Date: 3.JUL.2023 20:29:55
802.11ac-VHT80-Low	 Date: 3.JUL.2023 20:30:23

5470-5725MHz

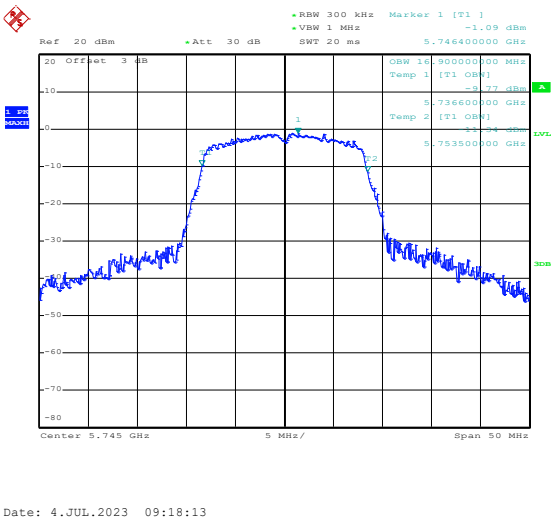
802.11a-Low	
802.11a-Middle	
802.11a-High	

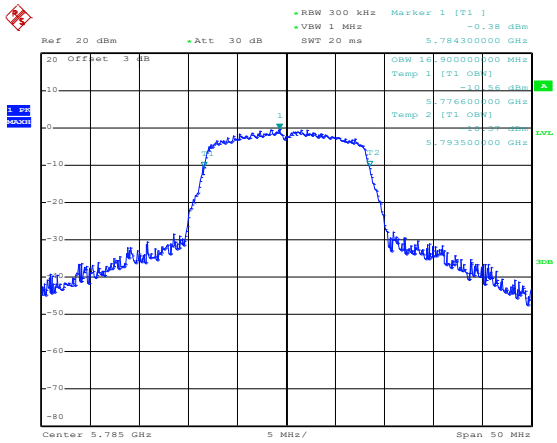
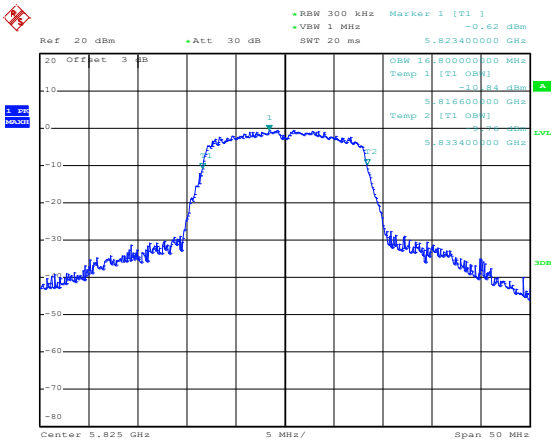
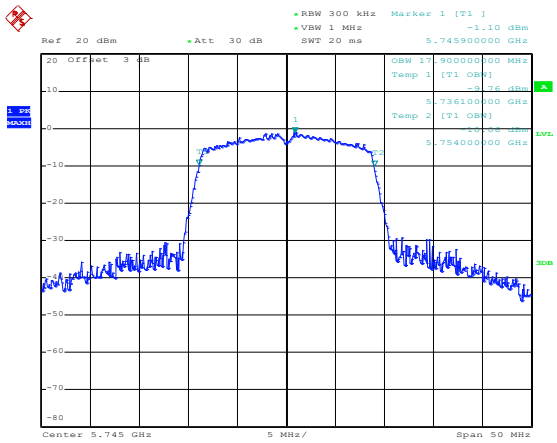
802.11n-HT20-Low	 Date: 4.JUL.2023 09:36:48
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:37:03
802.11n-HT20-High	 Date: 4.JUL.2023 09:37:17

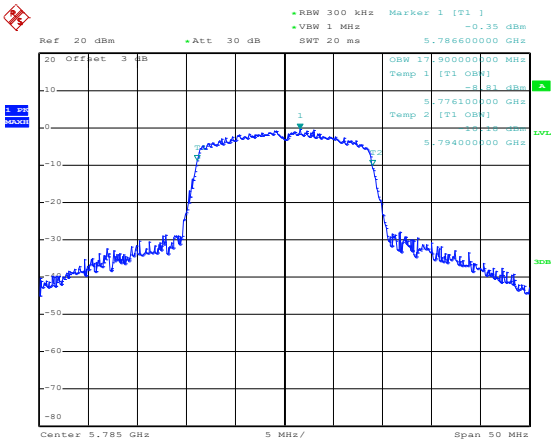
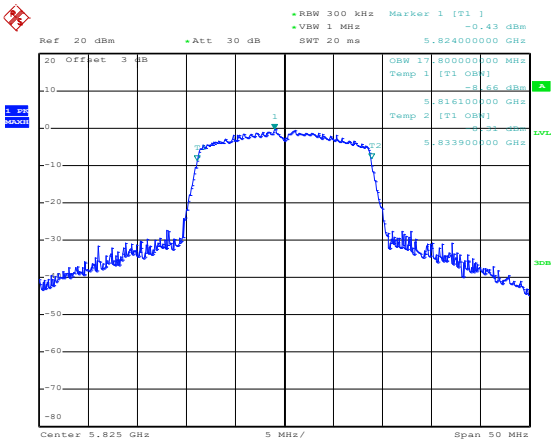
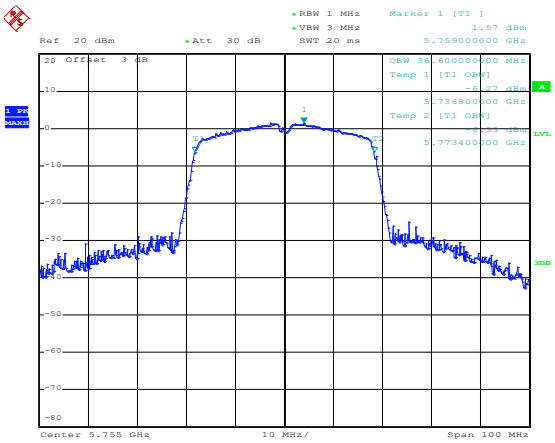
802.11n-HT40-Low	 Date: 4.JUL.2023 09:37:50
802.11n-HT40- Middle	 Date: 4.JUL.2023 09:38:11
802.11n-HT40-High	 Date: 4.JUL.2023 09:38:29

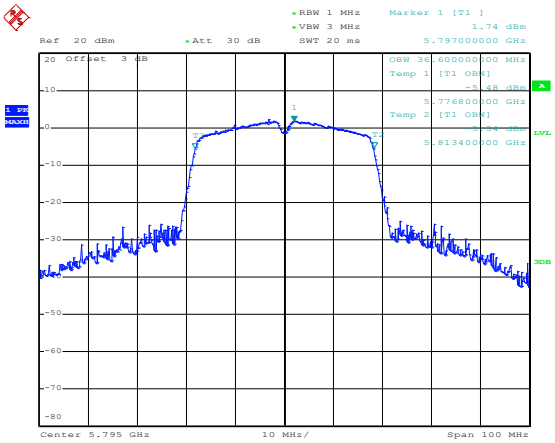
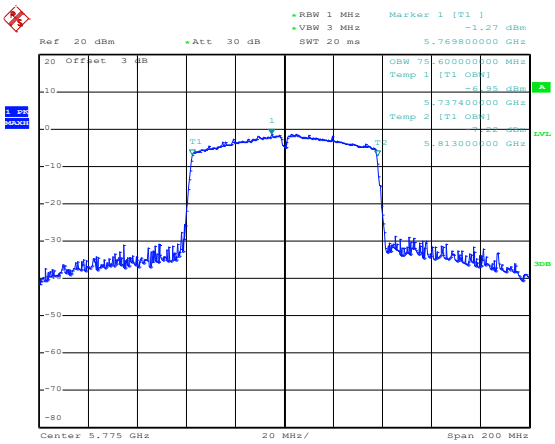
802.11ac-VHT80-Low	
802.11ac-VHT80-High	

5725-5850MHz

802.11a-Low	

802.11a-Middle	
802.11a-High	
802.11n-HT20-Low	

802.11n-HT20-Middle	 Date: 4.JUL.2023 09:19:43
802.11n-HT20-High	 Date: 4.JUL.2023 09:20:01
802.11n-HT40-Low	 Date: 4.JUL.2023 09:20:42

802.11n-HT40-High	 Date: 4.JUL.2023 09:21:00
802.11ac-VHT80-Low	 Date: 4.JUL.2023 09:21:32

APPENDIX C

Maximum Conducted Output Power

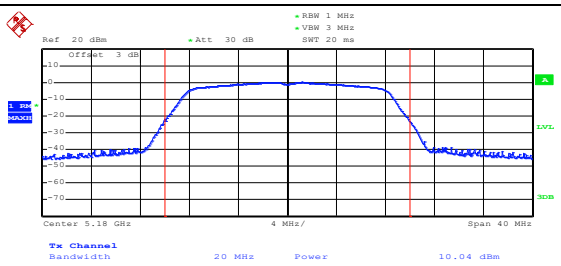
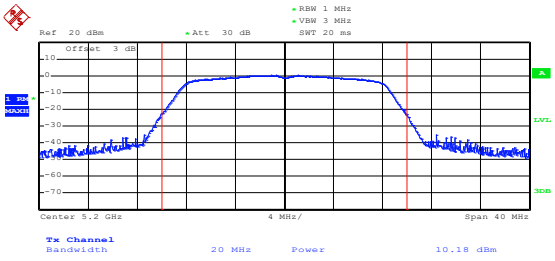
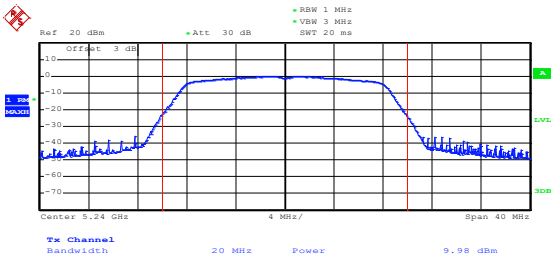
U-NII-1:5150-5250MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5180	10.04	23.98
	5200	10.18	23.98
	5240	9.98	23.98
802.11n-HT20	5180	9.88	23.98
	5200	9.97	23.98
	5240	9.82	23.98
802.11n-HT40	5190	9.99	23.98
	5230	10.04	23.98
802.11ac-VHT80	5210	9.83	23.98

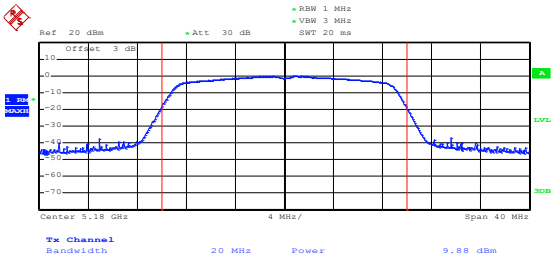
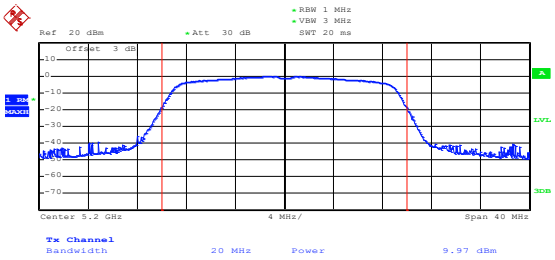
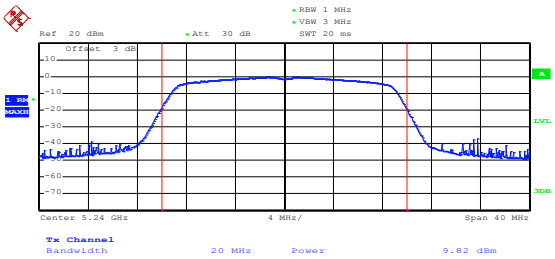
U-NII-2A: 5250-5350MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5260	9.92	23.98
	5280	10.11	23.98
	5320	9.34	23.98
802.11n-HT20	5260	9.94	23.98
	5280	9.72	23.98
	5320	9.19	23.98
802.11n-HT40	5270	9.22	23.98
	5310	8.72	23.98
802.11ac-VHT80	5290	8.95	23.98

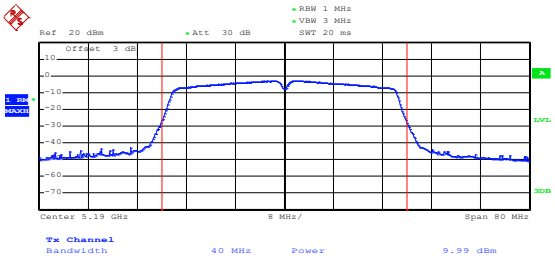
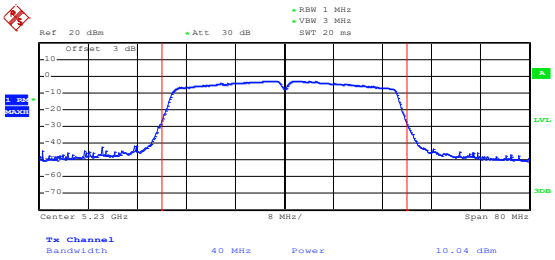
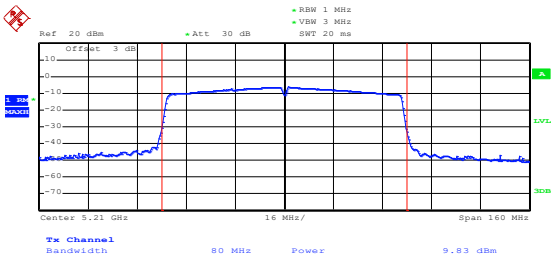
U-NII-2C: 5470-5725MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5500	7.71	23.98
	5600	7.79	23.98
	5700	6.57	23.98
802.11n-HT20	5500	7.75	23.98
	5600	7.43	23.98
	5700	6.50	23.98
802.11n-HT40	5510	7.76	23.98
	5590	7.57	23.98
	5670	6.63	23.98
802.11ac-VHT80	5530	7.47	23.98
	5610	7.25	23.98

U-NII-3: 5725-5850MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5745	6.78	30.00
	5785	7.08	30.00
	5825	7.38	30.00
802.11n-HT20	5745	6.62	30.00
	5785	6.97	30.00
	5825	7.06	30.00
802.11n-HT40	5755	6.48	30.00
	5795	6.85	30.00
802.11ac-VHT80	5775	6.43	30.00

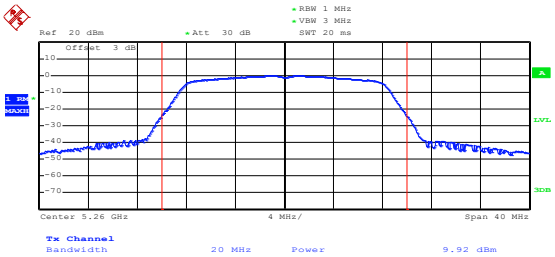
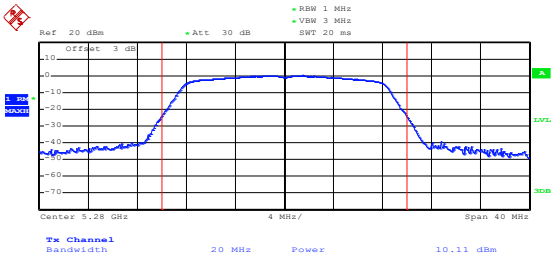
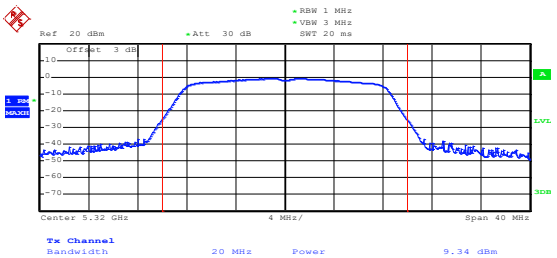
5150-5250MHz

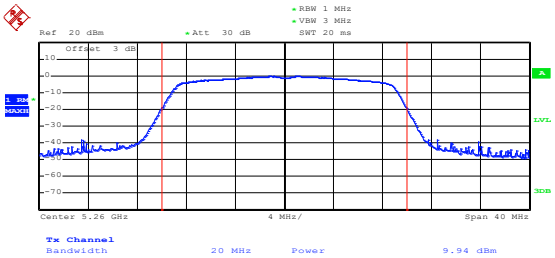
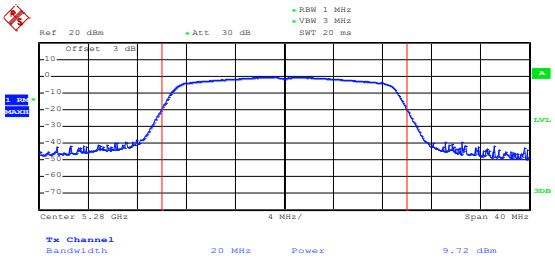
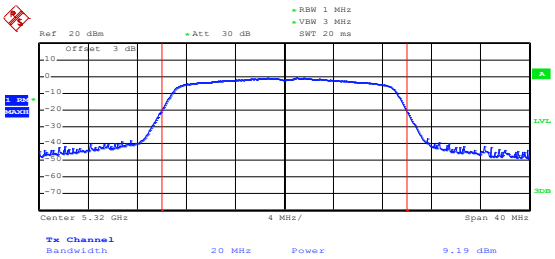
802.11a-Low	 Date: 3.JUL.2023 20:01:59
802.11a-Middle	 Date: 3.JUL.2023 20:02:18
802.11a-High	 Date: 3.JUL.2023 20:02:33

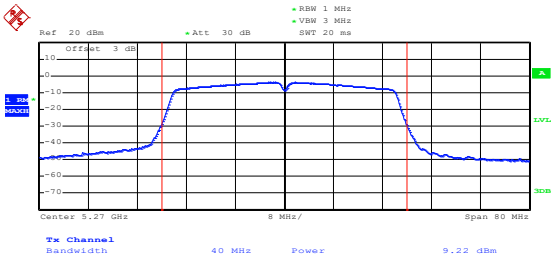
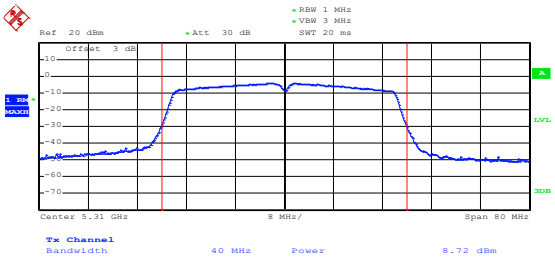
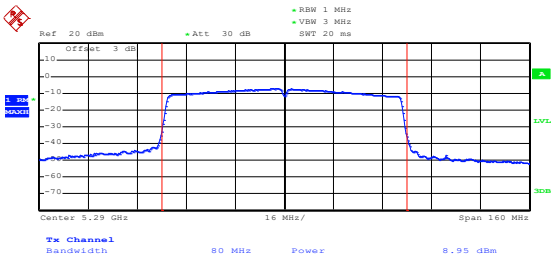
802.11n-HT20-Low	 Date: 3.JUL.2023 20:02:57
802.11n-HT20-Middle	 Date: 3.JUL.2023 20:03:11
802.11n-HT20-High	 Date: 3.JUL.2023 20:03:25

802.11n-HT40-Low	 Date: 3.JUL.2023 20:03:54
802.11n-HT40-High	 Date: 3.JUL.2023 20:04:12
802.11ac-VHT80-Low	 Date: 3.JUL.2023 20:04:43

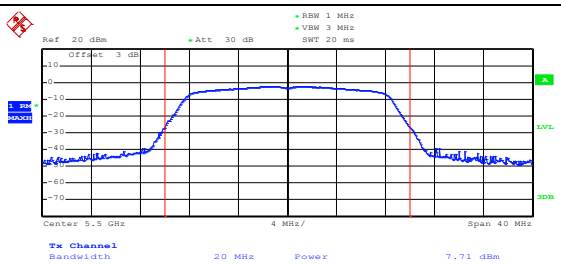
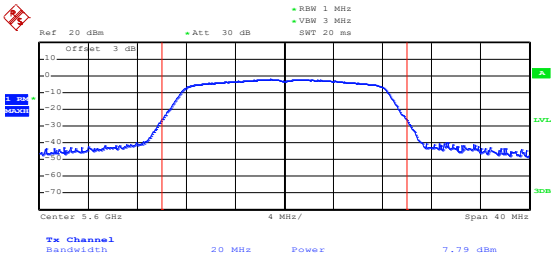
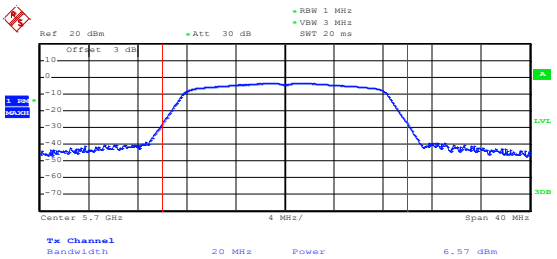
5250-5350MHz

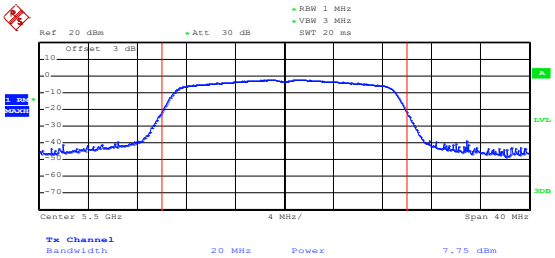
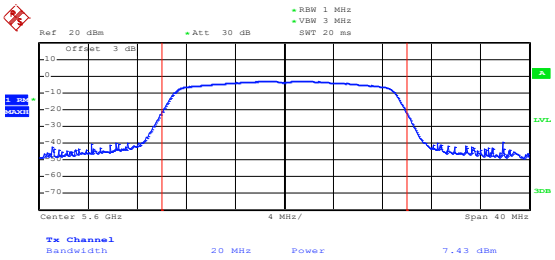
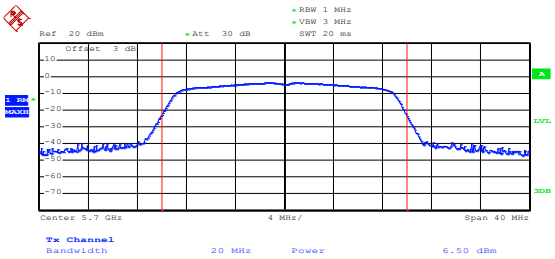
802.11a-Low	 Date: 4.JUL.2023 08:59:20
802.11a-Middle	 Date: 4.JUL.2023 08:59:46
802.11a-High	 Date: 4.JUL.2023 08:59:59

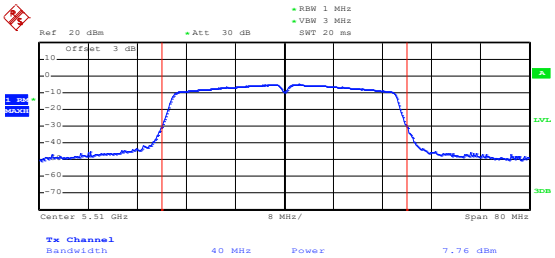
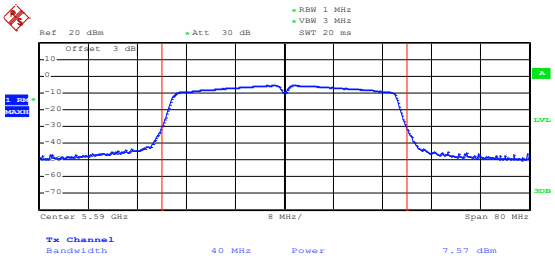
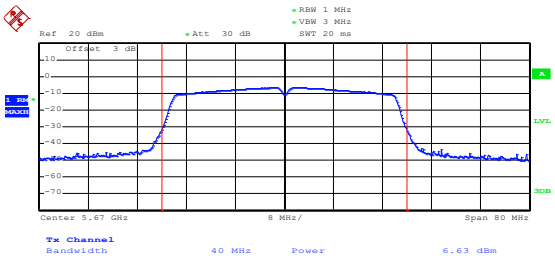
802.11n-HT20-Low	 Date: 4.JUL.2023 09:00:21
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:00:38
802.11n-HT20-High	 Date: 4.JUL.2023 09:00:52

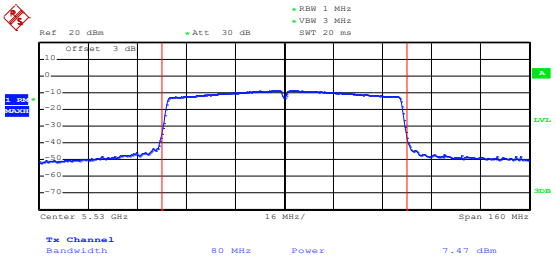
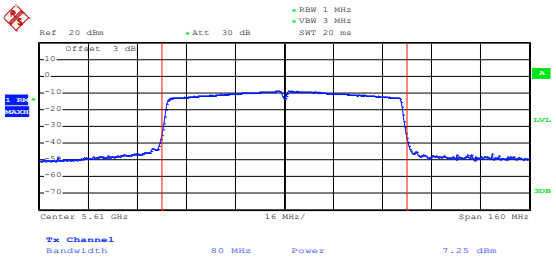
802.11n-HT40-Low	 Date: 4.JUL.2023 09:01:20
802.11n-HT40-High	 Date: 4.JUL.2023 09:01:38
802.11ac-VHT80-Low	 Date: 4.JUL.2023 09:02:04

5470-5725MHz

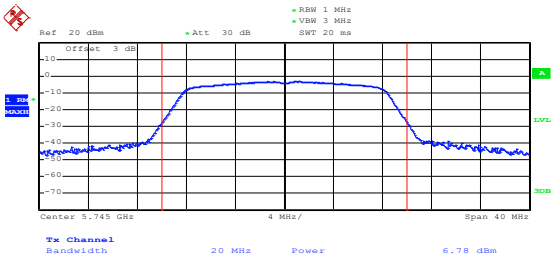
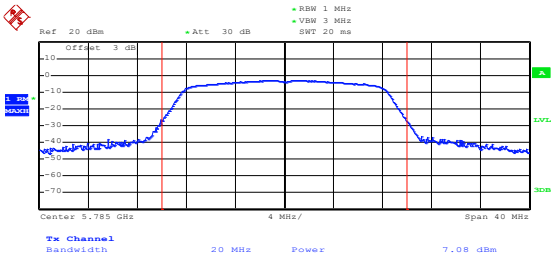
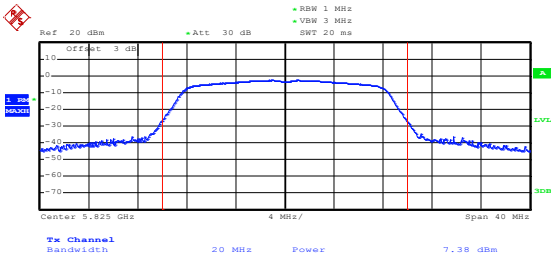
802.11a-Low	 Date: 4.JUL.2023 09:48:35
802.11a-Middle	 Date: 4.JUL.2023 09:48:54
802.11a-High	 Date: 4.JUL.2023 09:49:09

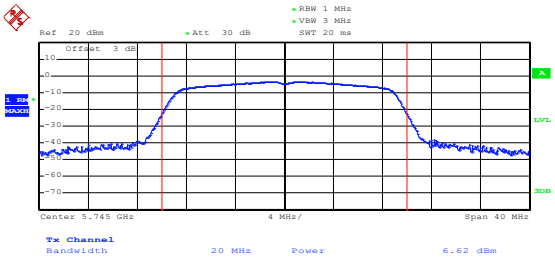
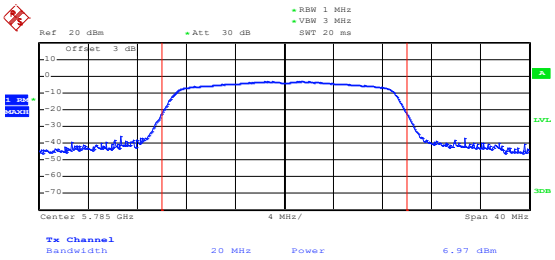
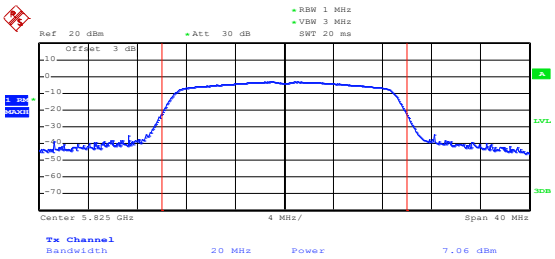
802.11n-HT20-Low	 Date: 4.JUL.2023 09:49:27
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:49:39
802.11n-HT20-High	 Date: 4.JUL.2023 09:49:53

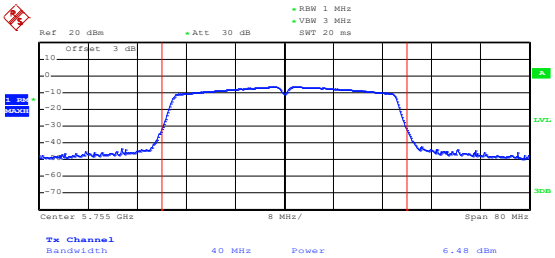
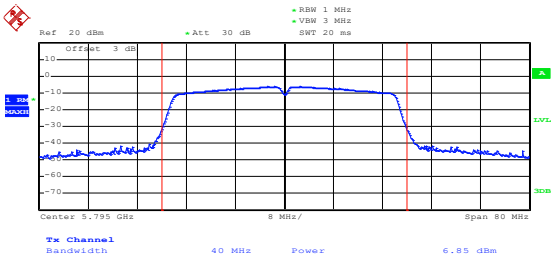
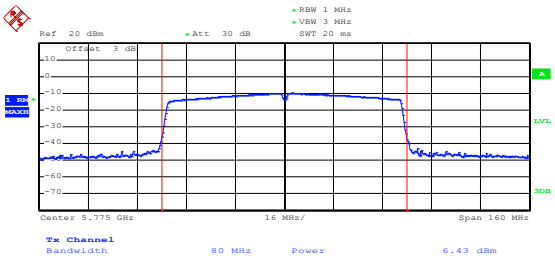
802.11n-HT40-Low	 Date: 4.JUL.2023 09:50:23
802.11n-HT40- Middle	 Date: 4.JUL.2023 09:50:42
802.11n-HT40-High	 Date: 4.JUL.2023 09:50:53

802.11ac-VHT80-Low	 Date: 4.JUL.2023 09:51:19
802.11ac-VHT80-High	 Date: 4.JUL.2023 09:51:34

5725-5850MHz

802.11a-Low	 Date: 4.JUL.2023 09:14:02
802.11a-Middle	 Date: 4.JUL.2023 09:14:20
802.11a-High	 Date: 4.JUL.2023 09:14:33

802.11n-HT20-Low	 Date: 4.JUL.2023 09:14:52
802.11n-HT20-Middle	 Date: 4.JUL.2023 09:15:05
802.11n-HT20-High	 Date: 4.JUL.2023 09:15:20

802.11n-HT40-Low	 Date: 4.JUL.2023 09:15:48
802.11n-HT40-High	 Date: 4.JUL.2023 09:16:02
802.11ac-VHT80-Low	 Date: 4.JUL.2023 09:13:16

APPENDIX D

Frequency Stability

U-NII-1:5150-5250MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	113	0.0217
100%		-20	124	0.0239
100%		-10	117	0.0225
100%		0	135	0.0260
100%		+10	152	0.0293
100%		+20	169	0.0325
100%		+30	151	0.0291
100%		+40	137	0.0264
100%		+50	141	0.0272
Low Battery power	3.5	+20	121	0.0232
High Battery power	4.4	+20	138	0.0265

U-NII-2A: 5250-5350MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	110	0.0209
100%		-20	130	0.0247
100%		-10	124	0.0234
100%		0	129	0.0245
100%		+10	148	0.0281
100%		+20	167	0.0316
100%		+30	159	0.0301
100%		+40	146	0.0276
100%		+50	138	0.0262
Low Battery power	3.5	+20	122	0.0231
High Battery power	4.4	+20	132	0.0250

U-NII-2C: 5470-5725MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	114	0.0204
100%		-20	128	0.0229
100%		-10	123	0.0219
100%		0	130	0.0232
100%		+10	148	0.0264
100%		+20	173	0.0309
100%		+30	155	0.0277
100%		+40	141	0.0252
100%		+50	142	0.0253
Low Battery power	3.5	+20	125	0.0223
High Battery power	4.4	+20	133	0.0237

U-NII-3:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	114	0.0198
100%		-20	124	0.0214
100%		-10	120	0.0208
100%		0	129	0.0222
100%		+10	155	0.0268
100%		+20	170	0.0295
100%		+30	159	0.0274
100%		+40	139	0.0241
100%		+50	144	0.0249
Low Battery power	3.5	+20	126	0.0217
High Battery power	4.4	+20	132	0.0229

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

******* END OF REPORT *******