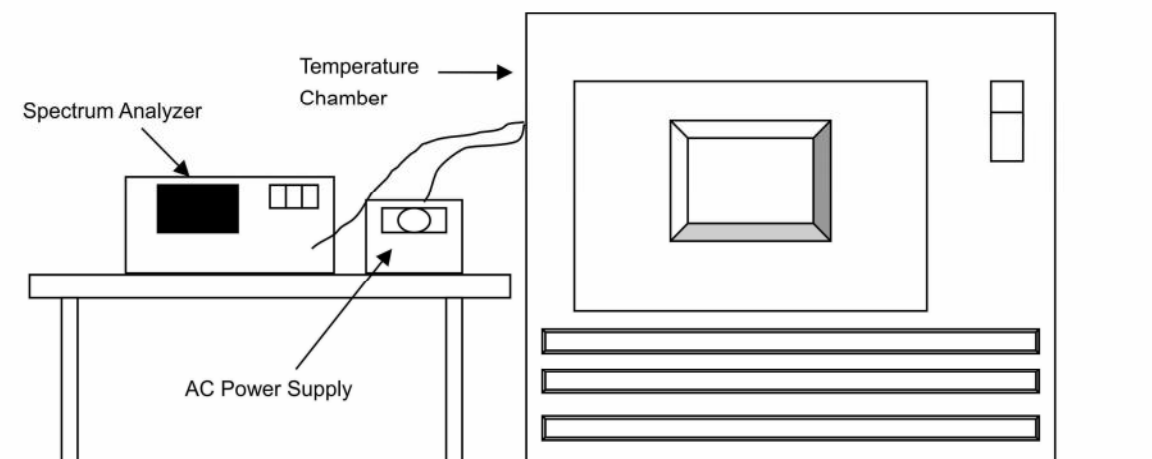


4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 01, 2020	May 31, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021
AC Power Supply Extch	CFW-105	E000603	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step d with every 10 degrees reduction until the lowest temperature achieved.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
60	120	5180.0109	Pass	5180.0106	Pass	5180.0125	Pass	5180.0122	Pass
50	120	5180.0033	Pass	5180.0013	Pass	5180.0032	Pass	5179.9998	Pass
40	120	5179.9785	Pass	5179.9783	Pass	5179.9821	Pass	5179.9772	Pass
30	120	5180.0024	Pass	5180.004	Pass	5180.0009	Pass	5180.002	Pass
20	120	5179.9791	Pass	5179.9814	Pass	5179.9784	Pass	5179.979	Pass
10	120	5180.0147	Pass	5180.0132	Pass	5180.0103	Pass	5180.0098	Pass
0	120	5180.0148	Pass	5180.0124	Pass	5180.0148	Pass	5180.0126	Pass
-10	120	5180.0181	Pass	5180.0182	Pass	5180.0178	Pass	5180.0162	Pass
-20	120	5180.0132	Pass	5180.0104	Pass	5180.0125	Pass	5180.0084	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5179.9781	Pass	5179.9807	Pass	5179.9792	Pass	5179.9781	Pass
	120	5179.9791	Pass	5179.9814	Pass	5179.9784	Pass	5179.979	Pass
	102	5179.9791	Pass	5179.9816	Pass	5179.9782	Pass	5179.9782	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 (For U-NII-3)	3.24	3.26	0.5	Pass
149	5745	16.34	16.38	0.5	Pass
157	5785	16.34	16.38	0.5	Pass
165	5825	16.36	16.38	0.5	Pass

For CH144 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

802.11ax (HE20)_Full RU

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 (For U-NII-3)	4.62	4.61	0.5	Pass
149	5745	18.72	18.85	0.5	Pass
157	5785	18.81	18.85	0.5	Pass
165	5825	18.75	18.90	0.5	Pass

For CH144 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

802.11ax (HE40)_Full RU

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 (For U-NII-3)	3.86	3.26	0.5	Pass
151	5755	35.32	36.30	0.5	Pass
159	5795	36.43	35.68	0.5	Pass

For CH142 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

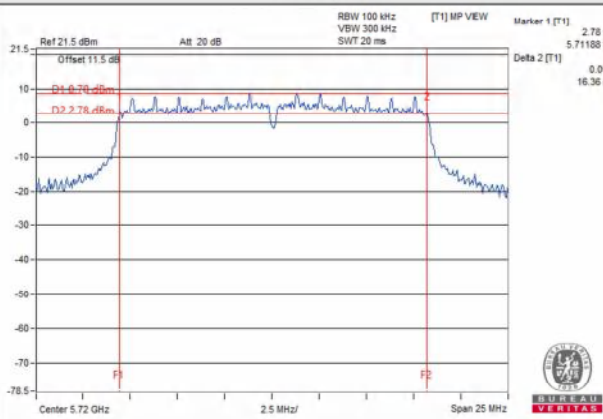
802.11ax (HE80)_Full RU

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 (For U-NII-3)	2.76	2.73	0.5	Pass
155	5775	75.45	75.38	0.5	Pass

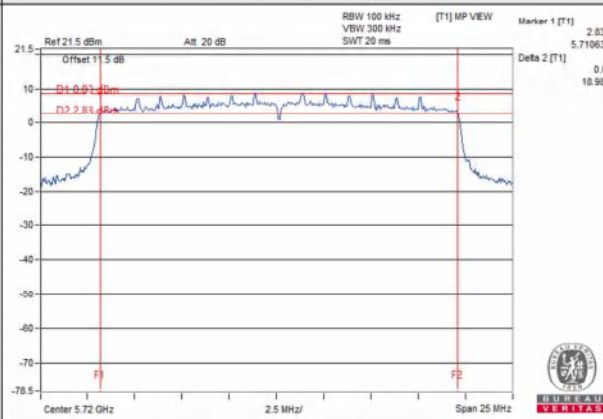
For CH138 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

Spectrum Plot of Worst Value

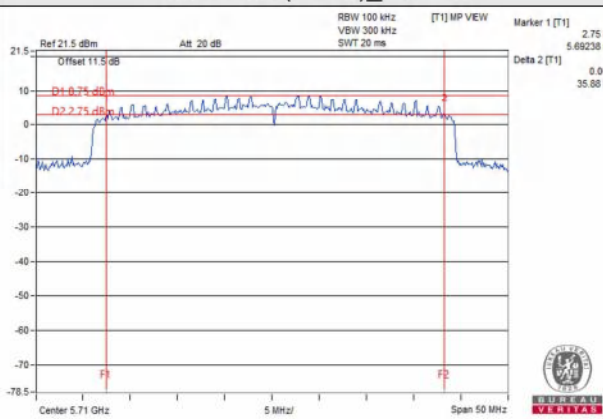
802.11a



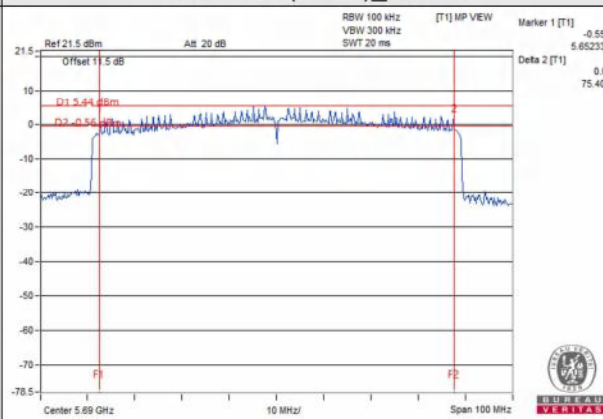
802.11ax (HE20)_RU52



802.11ax (HE40)_Full RU



802.11ax (HE80)_Full RU

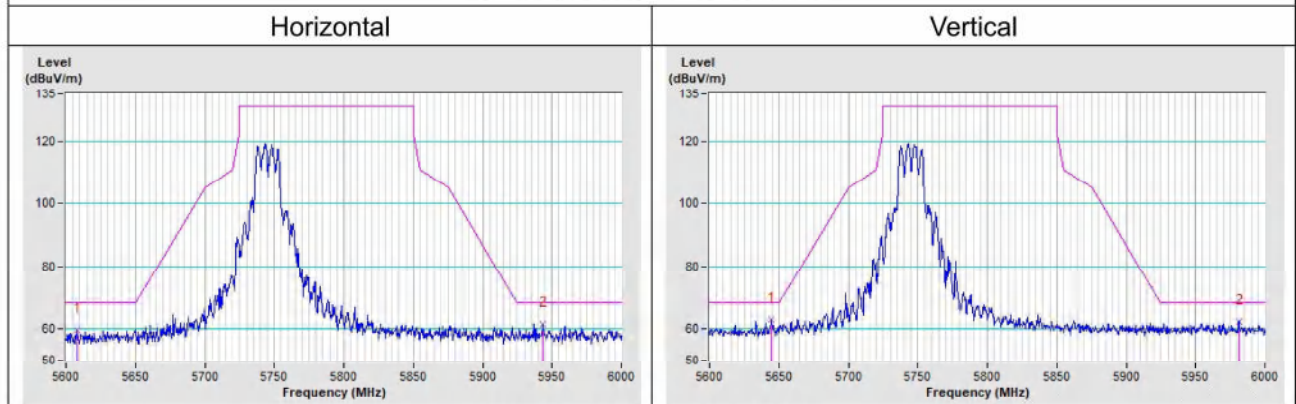


5 Pictures of Test Arrangements

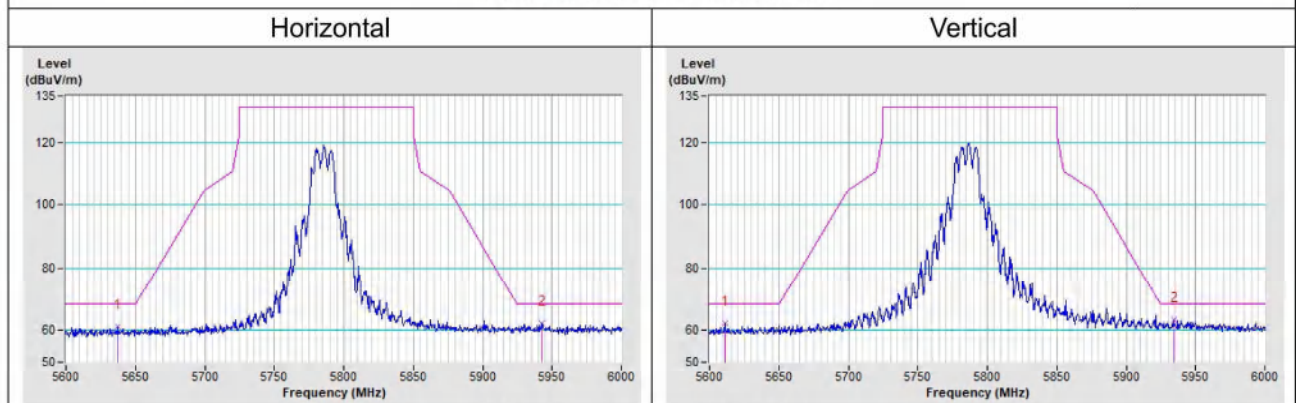
Please refer to the attached file (Test Setup Photo).

Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

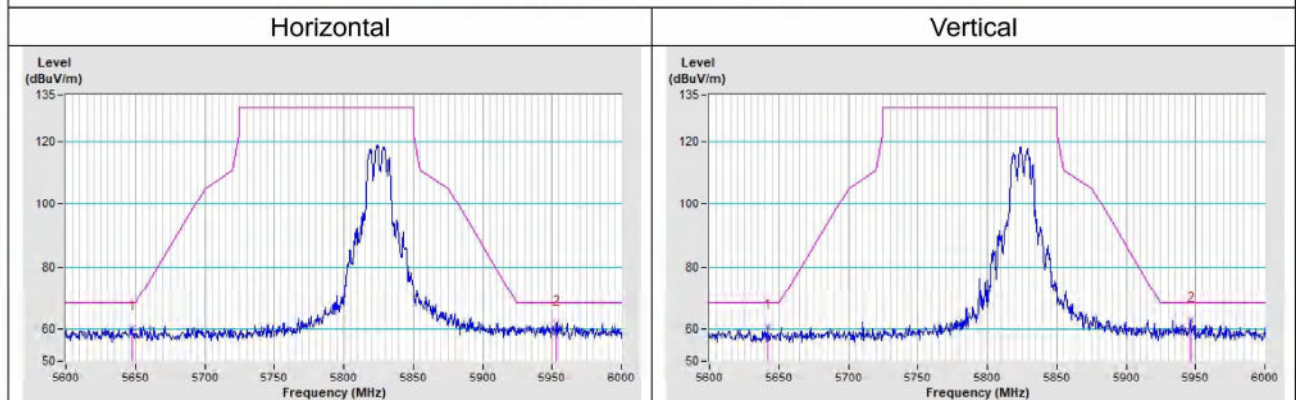
802.11a CH 149 : 5745 MHz



802.11a CH 157 : 5785 MHz

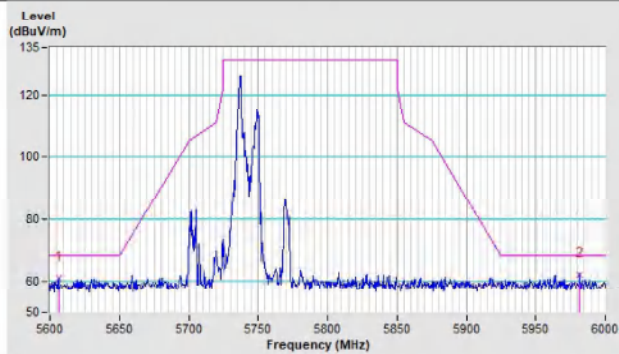


802.11a CH 165 : 5825 MHz

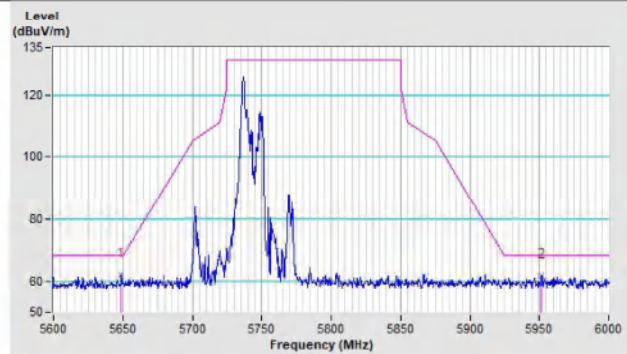


802.11ax (HE20)_RU26 CH 149 : 5745 MHz

Horizontal

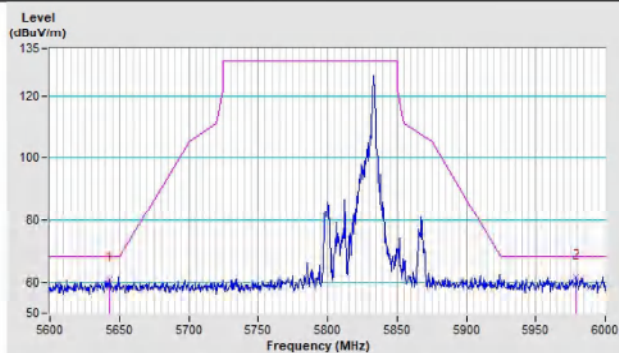


Vertical

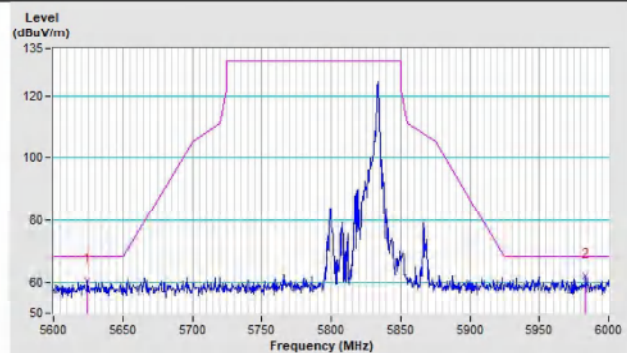


802.11ax (HE20)_RU26 CH 165 : 5825 MHz

Horizontal

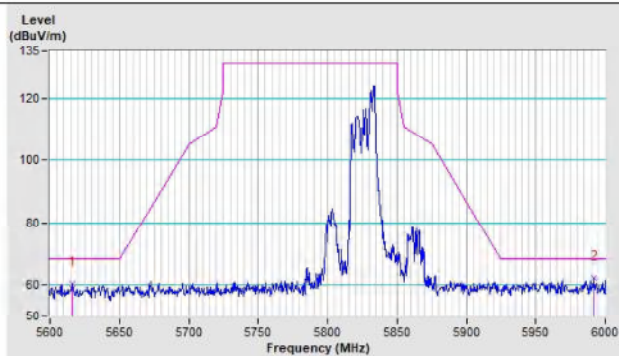


Vertical

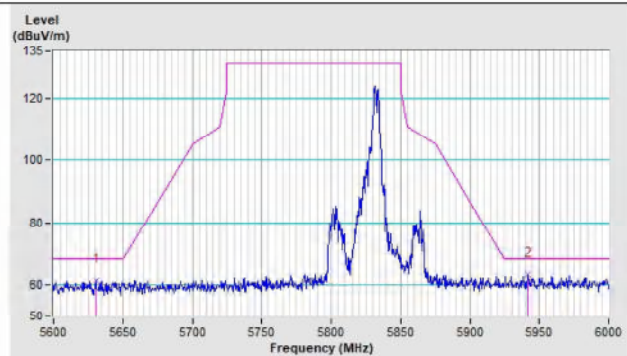


802.11ax (HE20)_RU52 CH 165 : 5825 MHz

Horizontal

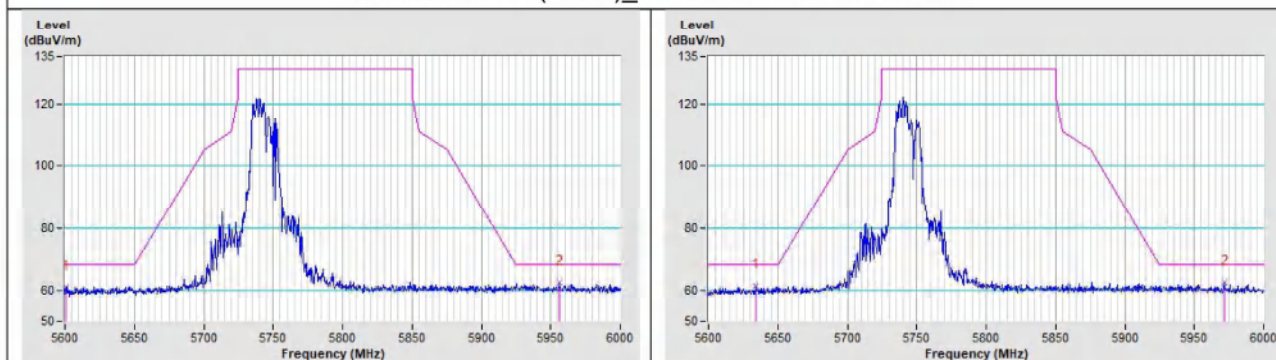


Vertical



Horizontal

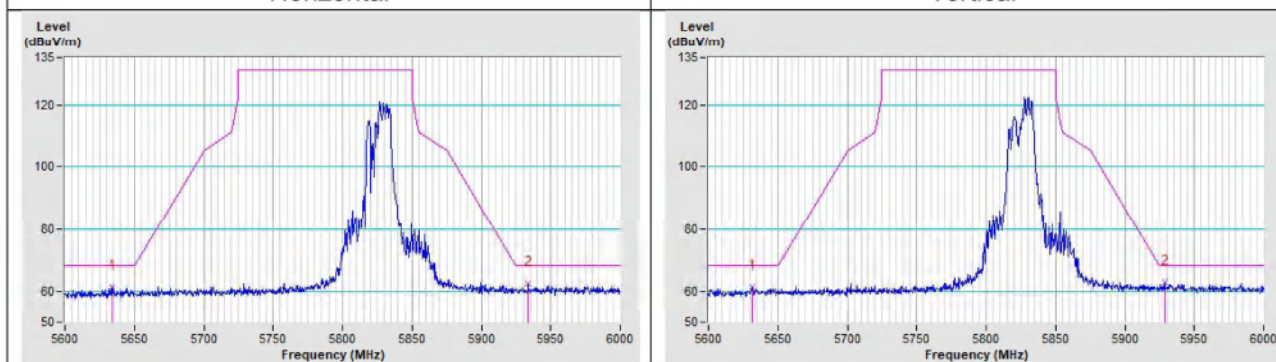
Vertical802.11ax (HE20)_RU106 CH 149 : 5745 MHz



802.11ax (HE20)_RU106 CH 165 : 5825 MHz

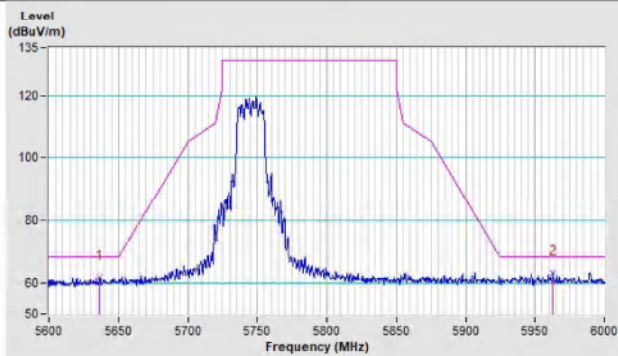
Horizontal

Vertical

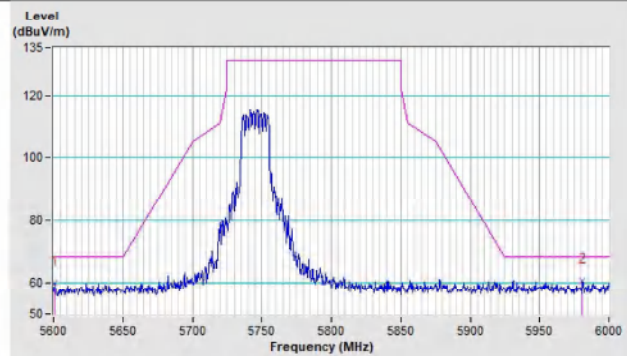


802.11ax (HE20)_Full RU CH 149 : 5745 MHz

Horizontal

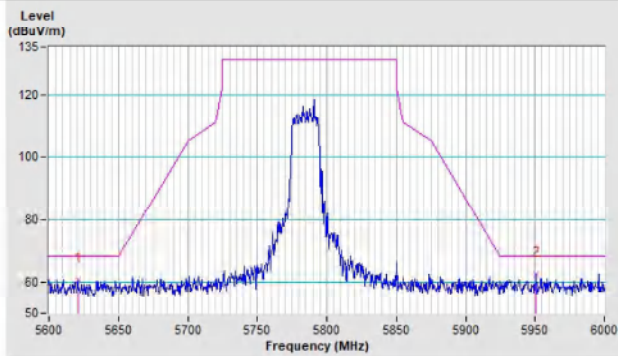


Vertical

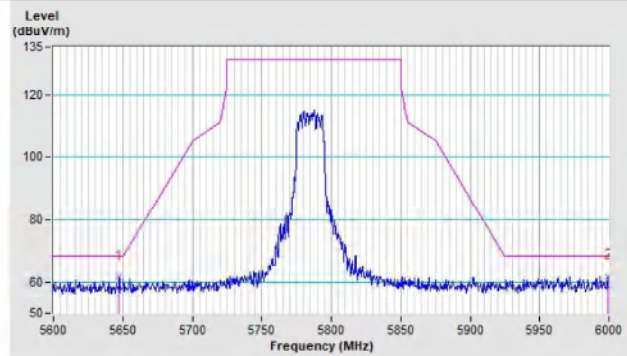


802.11ax (HE20)_Full RU CH 157 : 5785 MHz

Horizontal

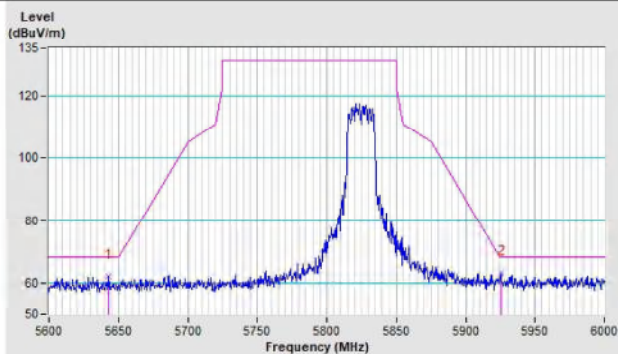


Vertical

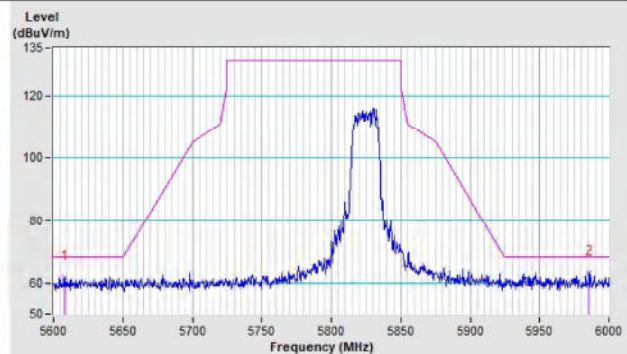


802.11ax (HE20)_Full RU CH 165 : 5825 MHz

Horizontal

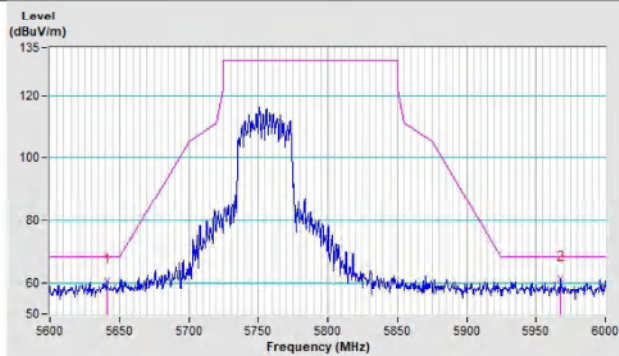


Vertical

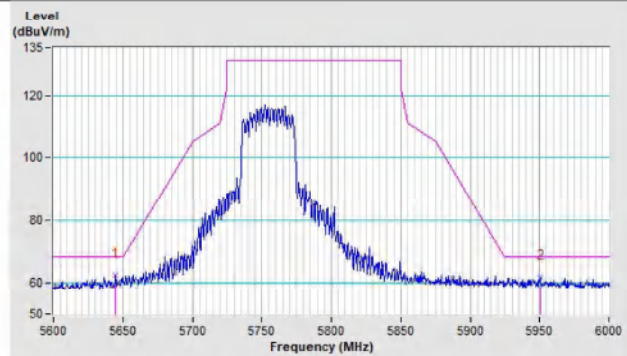


802.11ax (HE40)_Full RU CH 151 : 5755 MHz

Horizontal

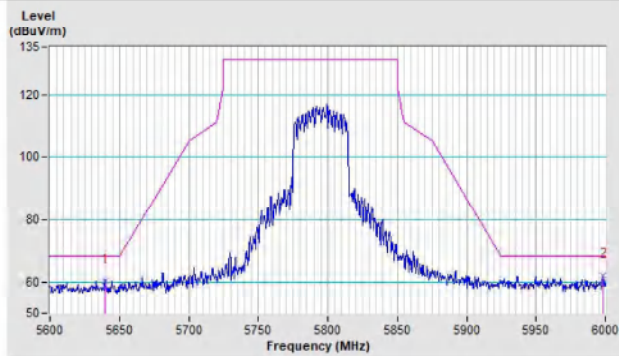


Vertical

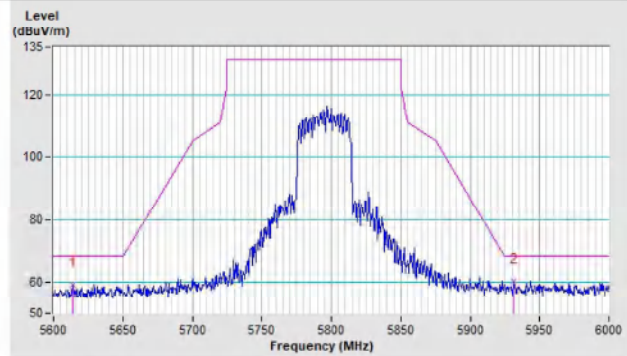


802.11ax (HE40)_Full RU CH 159 : 5795 MHz

Horizontal

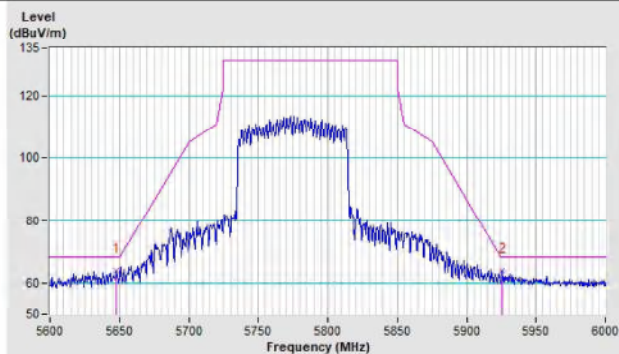


Vertical

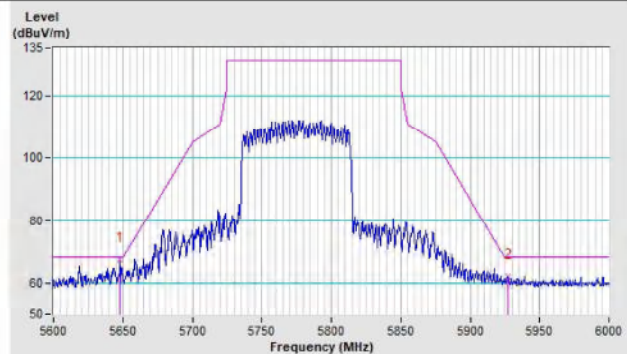


802.11ax (HE80)_Full RU CH 155 : 5775 MHz

Horizontal



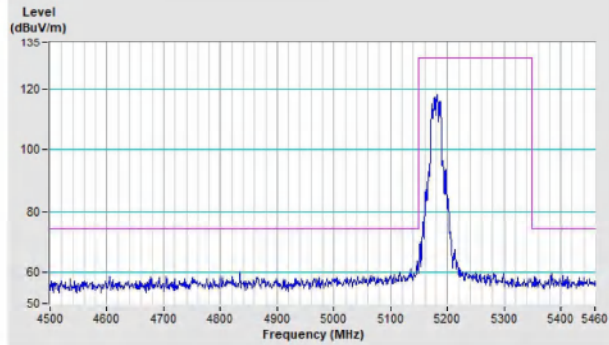
Vertical



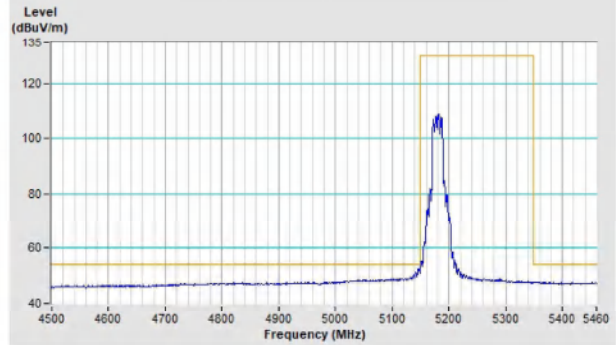
Annex B - Band Edge Measurement

802.11a Channel 36

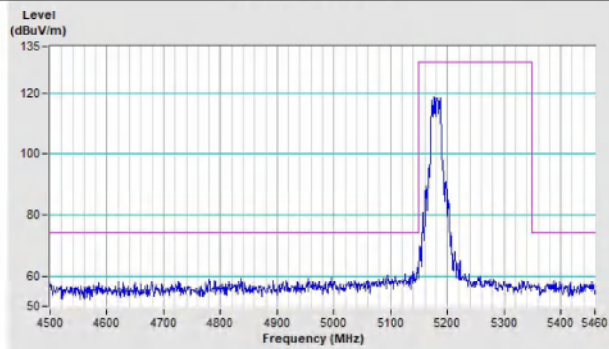
Horizontal (Peak)



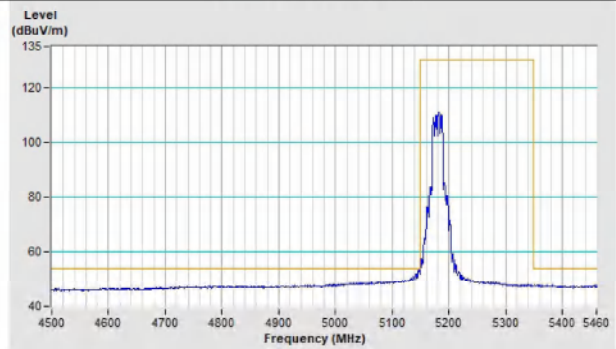
Horizontal (Average)



Vertical (Peak)

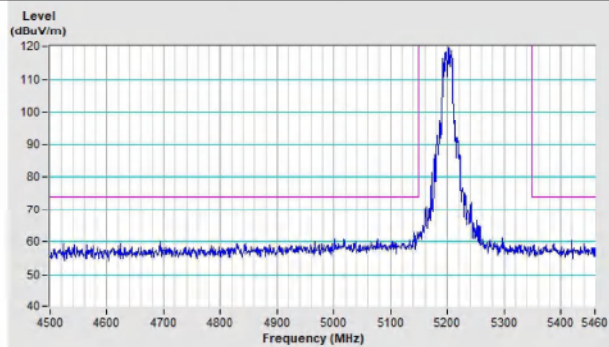


Vertical (Average)

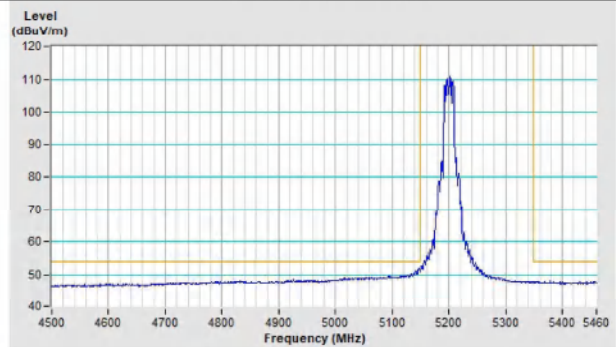


802.11a Channel 40

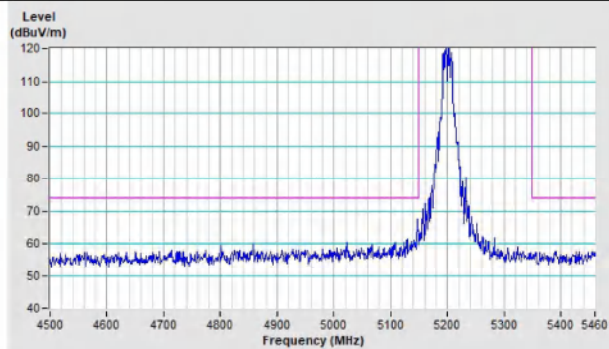
Horizontal (Peak)



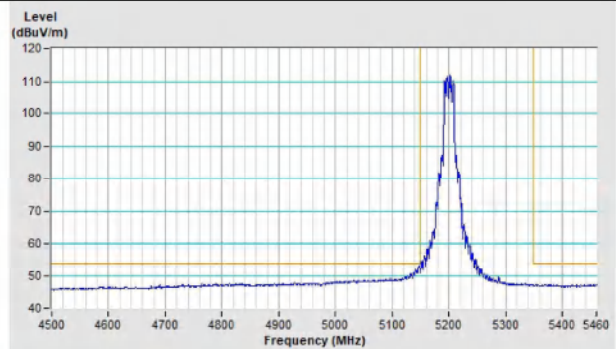
Horizontal (Average)



Vertical (Peak)

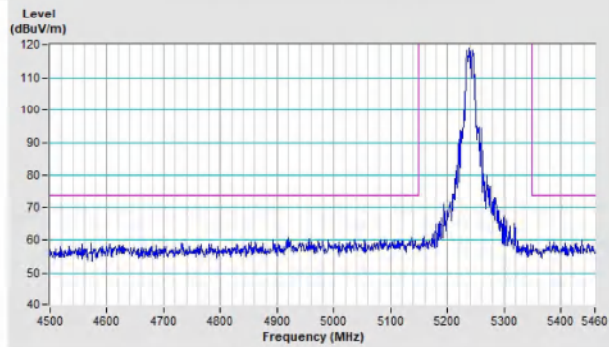


Vertical (Average)

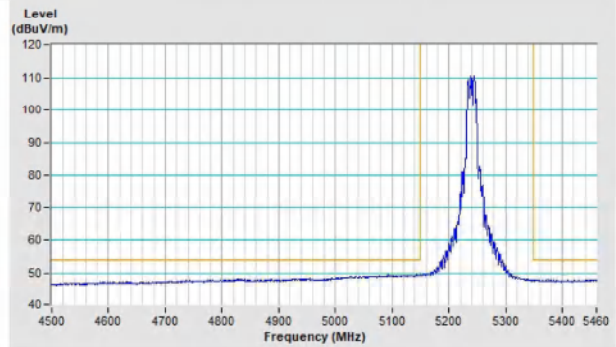


802.11a Channel 48

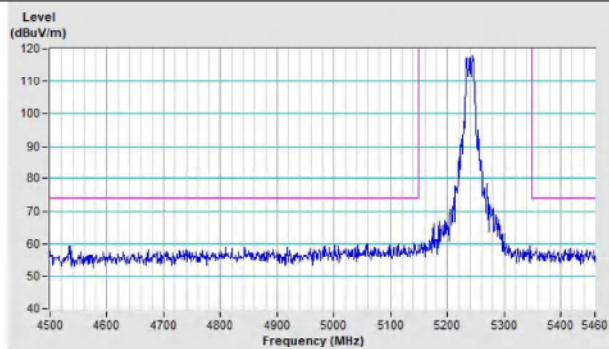
Horizontal (Peak)



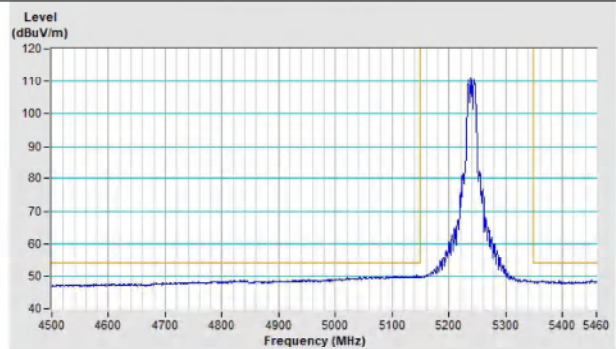
Horizontal (Average)



Vertical (Peak)

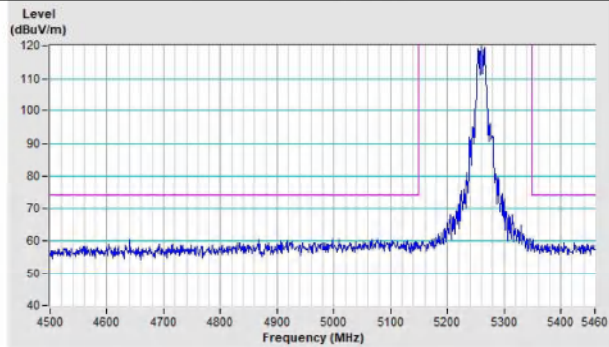


Vertical (Average)

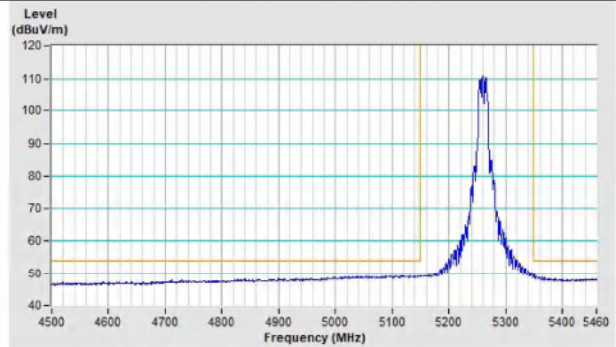


802.11a Channel 52

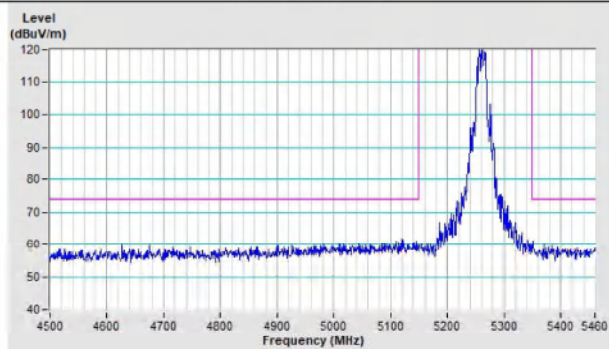
Horizontal (Peak)



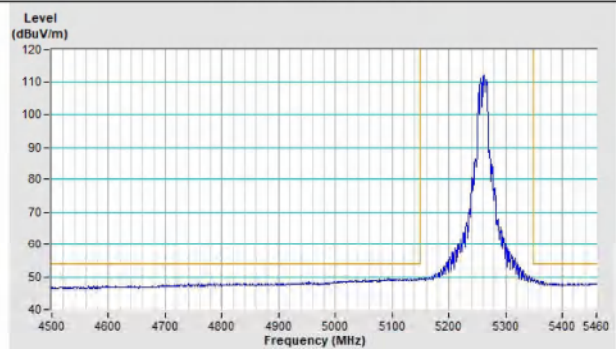
Horizontal (Average)



Vertical (Peak)

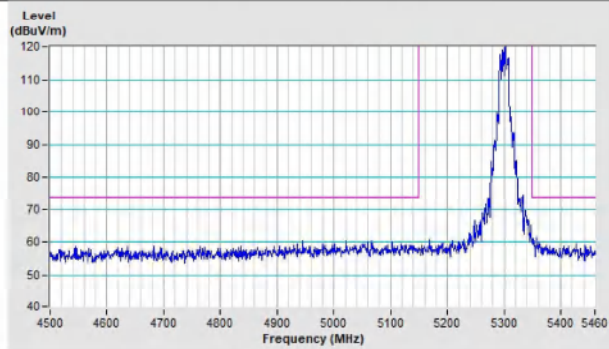


Vertical (Average)

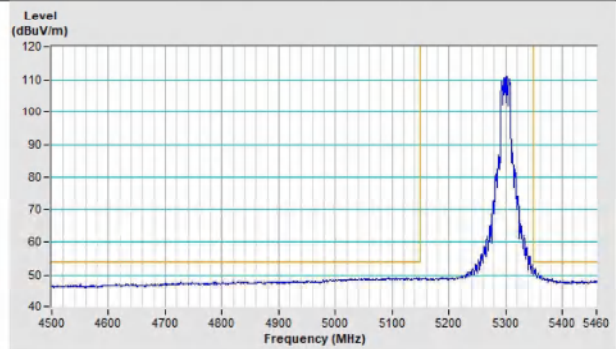


802.11a Channel 60

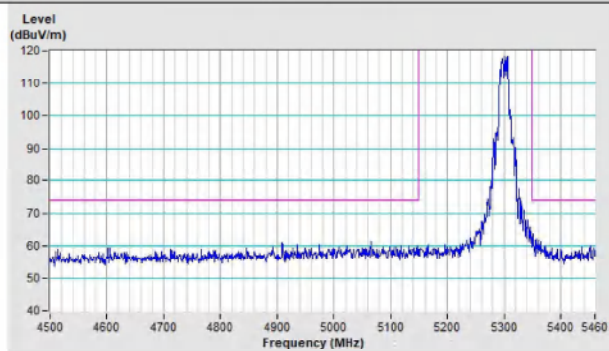
Horizontal (Peak)



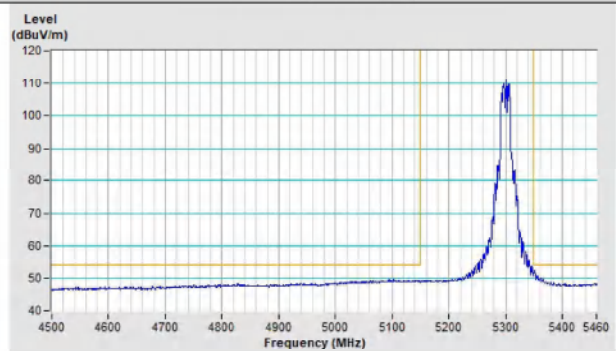
Horizontal (Average)



Vertical (Peak)

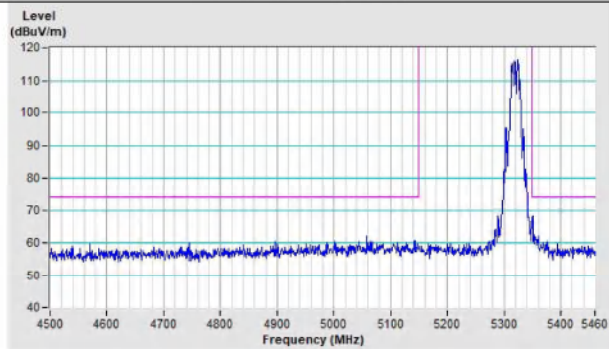


Vertical (Average)

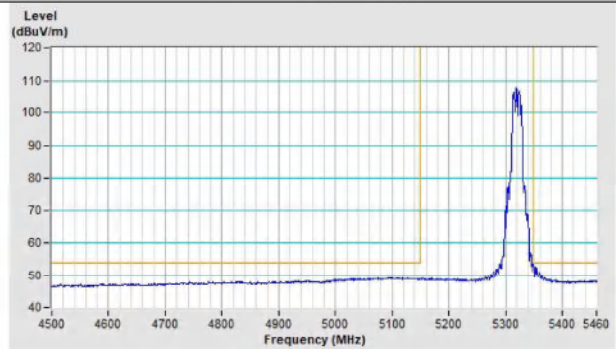


802.11a Channel 64

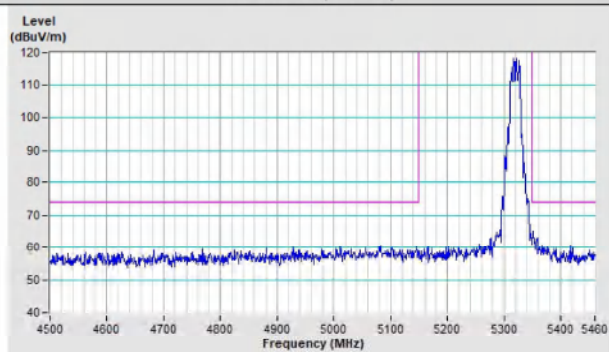
Horizontal (Peak)



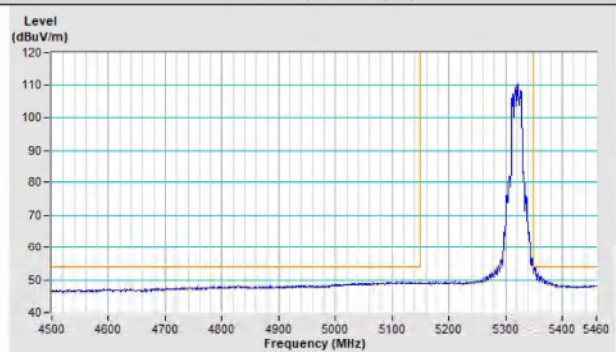
Horizontal (Average)



Vertical (Peak)

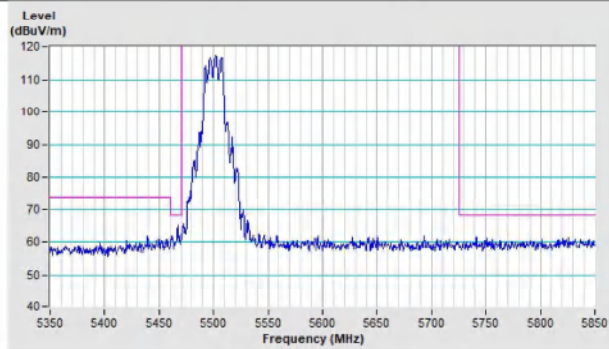


Vertical (Average)

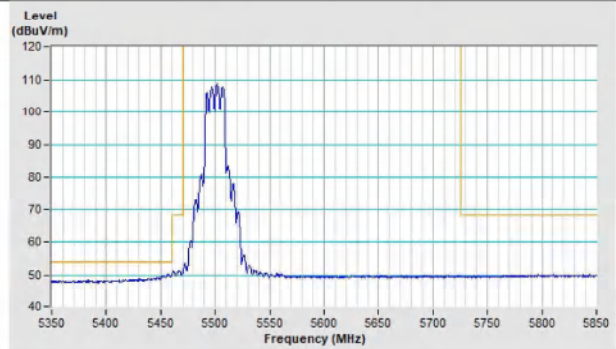


802.11a Channel 100

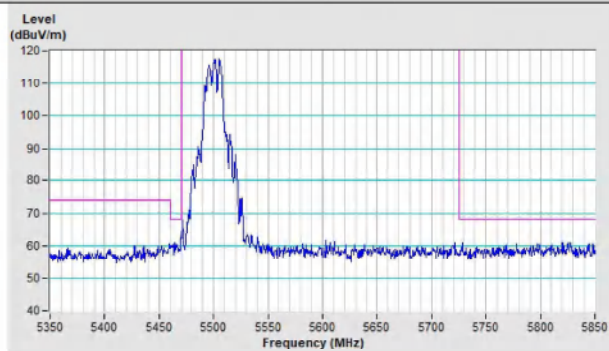
Horizontal (Peak)



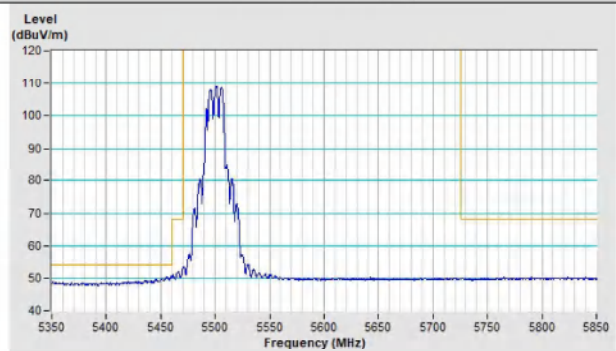
Horizontal (Average)



Vertical (Peak)

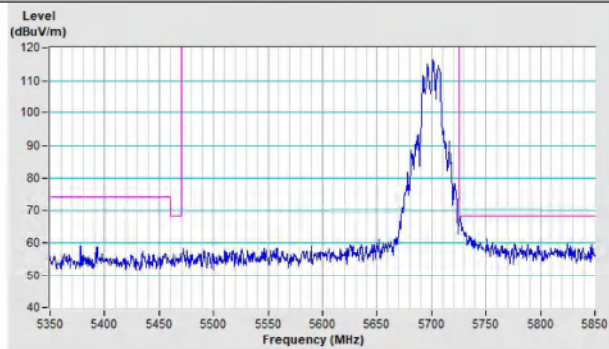


Vertical (Average)

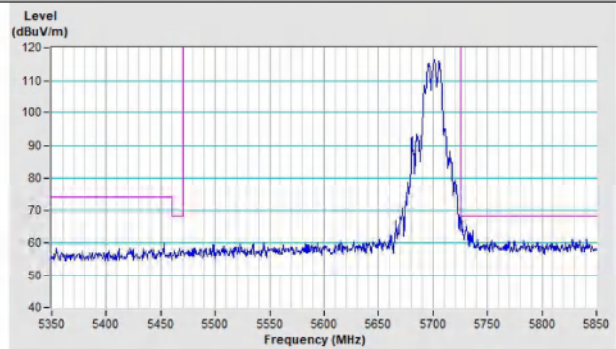


802.11a Channel 140

Horizontal (Peak)

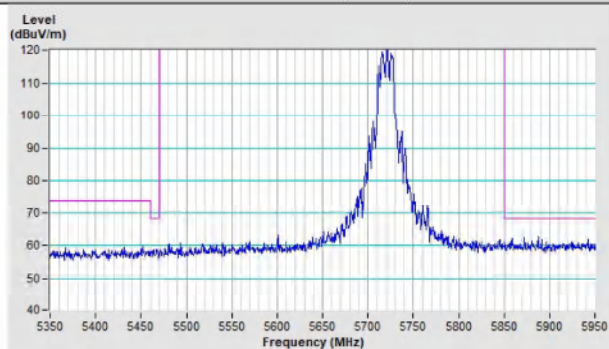


Vertical (Peak)

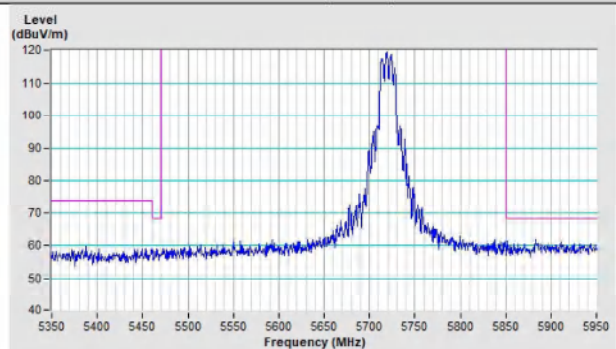


802.11a Channel 144

Horizontal (Peak)

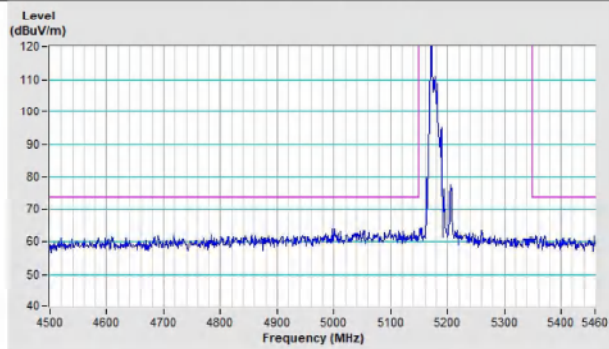


Vertical (Peak)

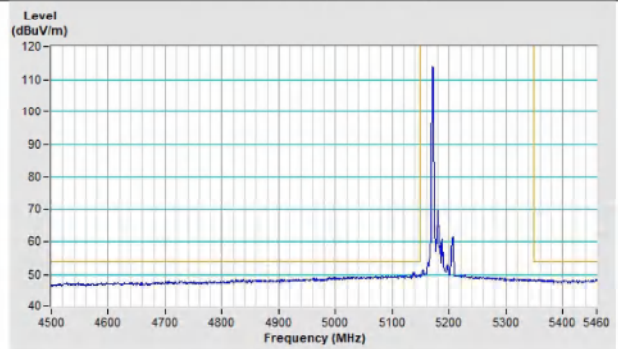


802.11ax (HE20)_RU26 Channel 36

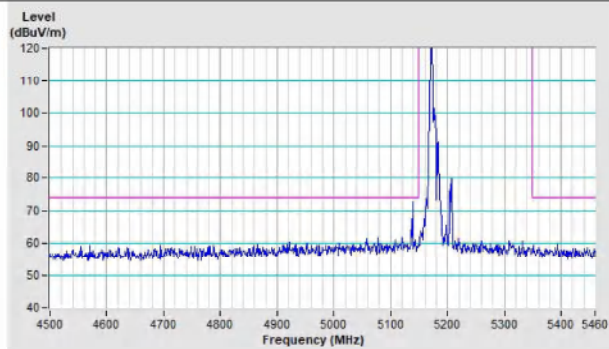
Horizontal (Peak)



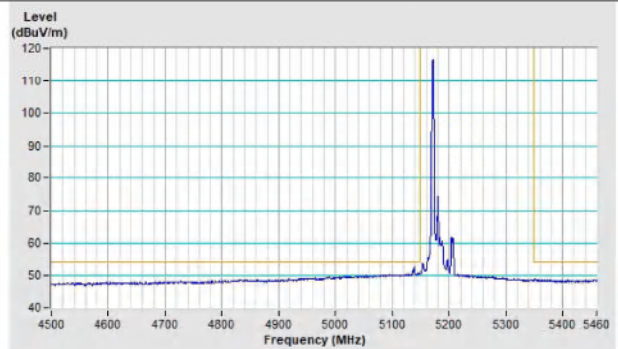
Horizontal (Average)



Vertical (Peak)

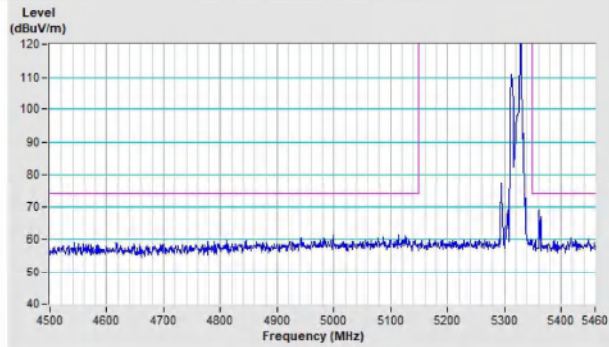


Vertical (Average)

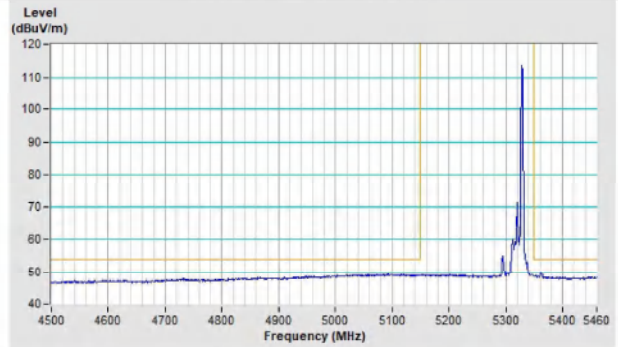


802.11ax (HE20)_RU26 Channel 64

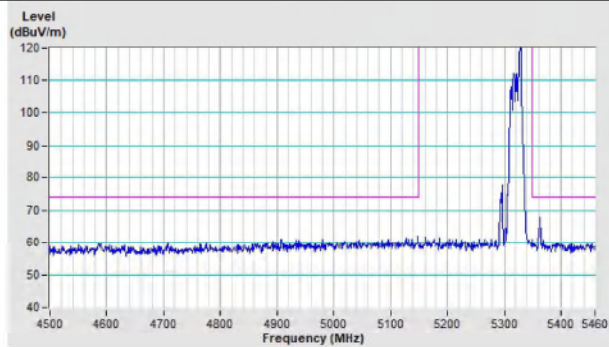
Horizontal (Peak)



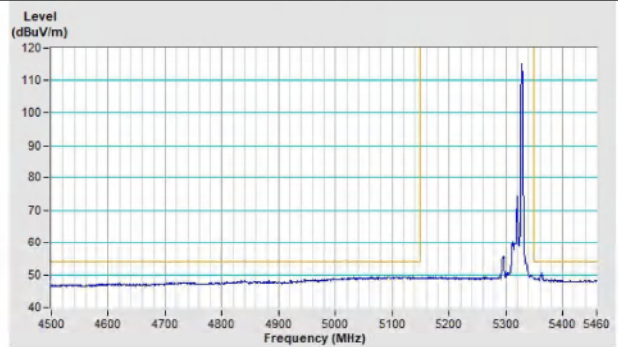
Horizontal (Average)



Vertical (Peak)

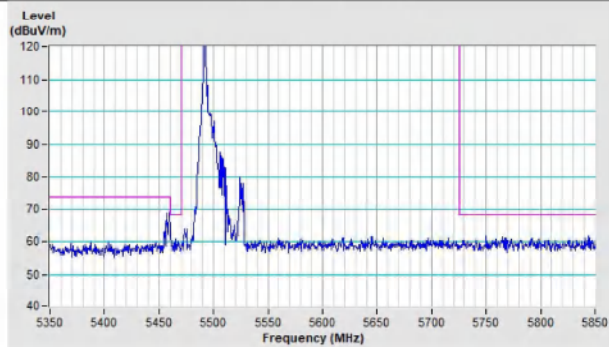


Vertical (Average)

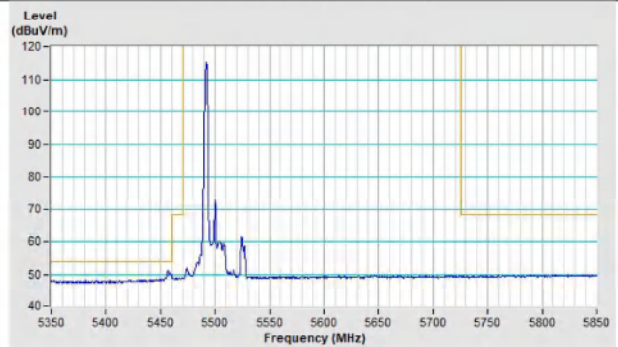


802.11ax (HE20)_RU26 Channel 100

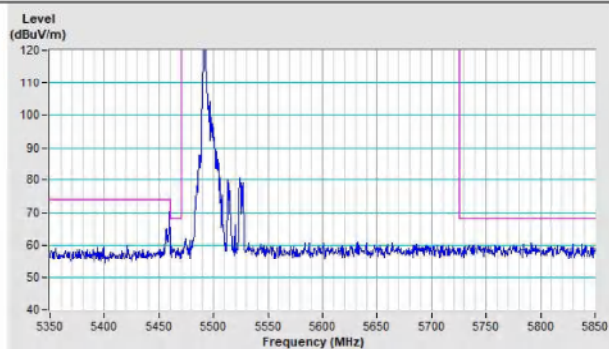
Horizontal (Peak)



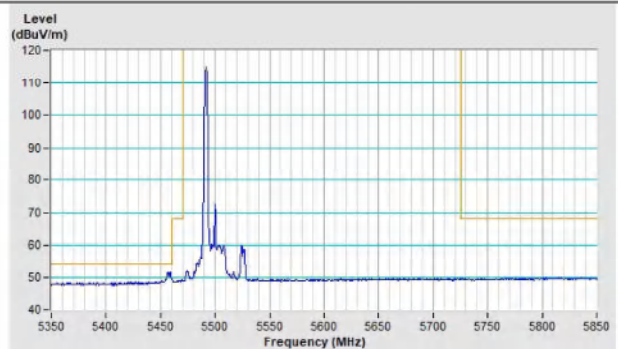
Horizontal (Average)



Vertical (Peak)

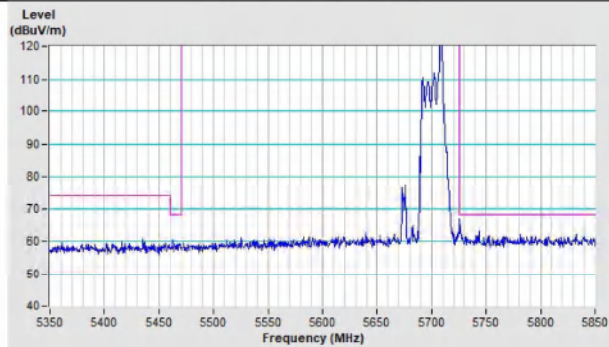


Vertical (Average)

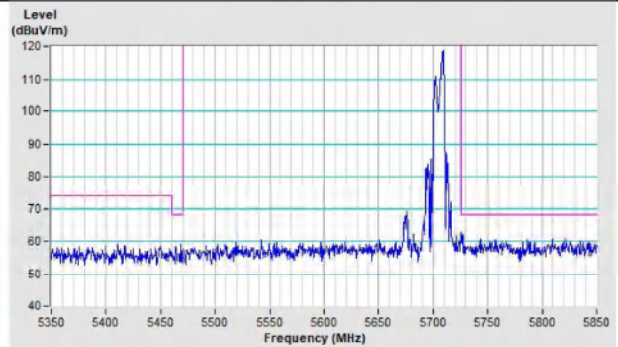


802.11ax (HE20)_RU26 Channel 140

Horizontal (Peak)

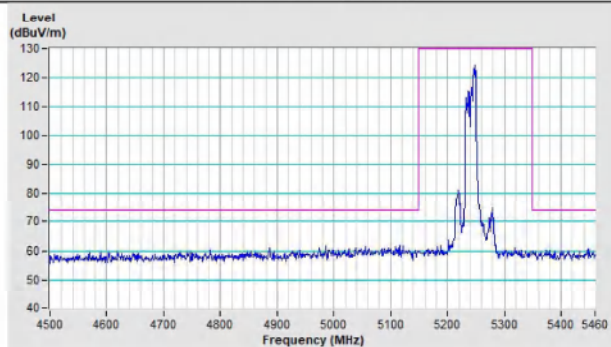


Vertical (Peak)

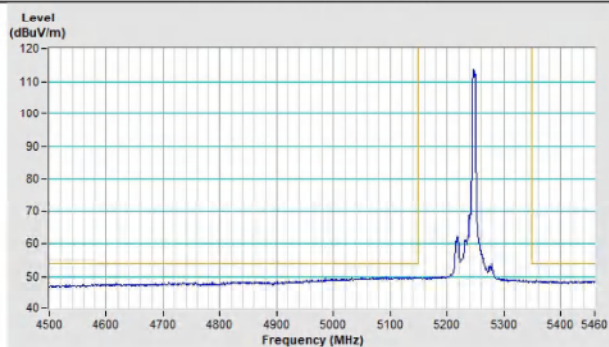


802.11ax (HE20)_RU52 Channel 48

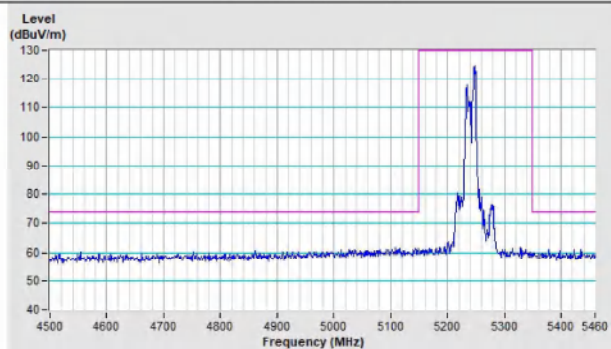
Horizontal (Peak)



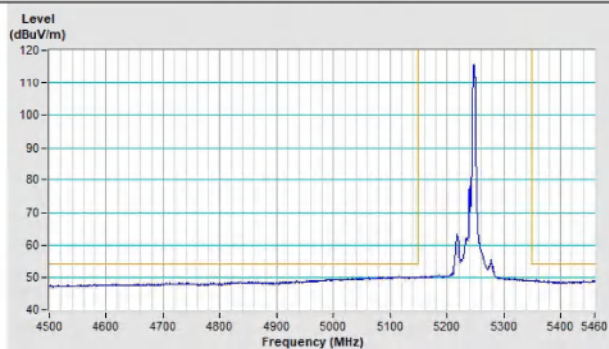
Horizontal (Average)



Vertical (Peak)

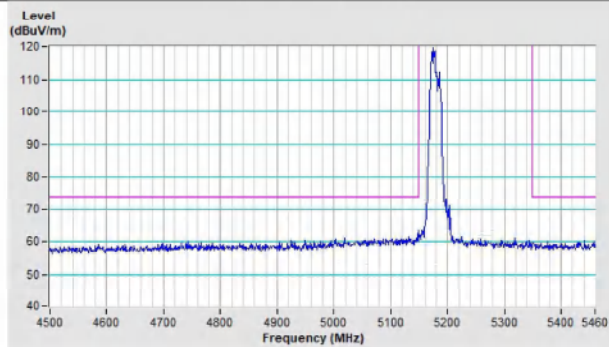


Vertical (Average)

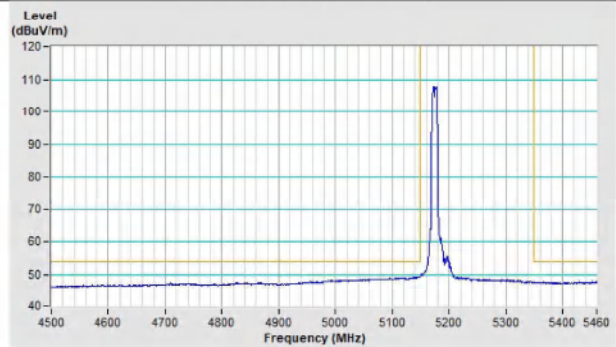


802.11ax (HE20)_RU106 Channel 36

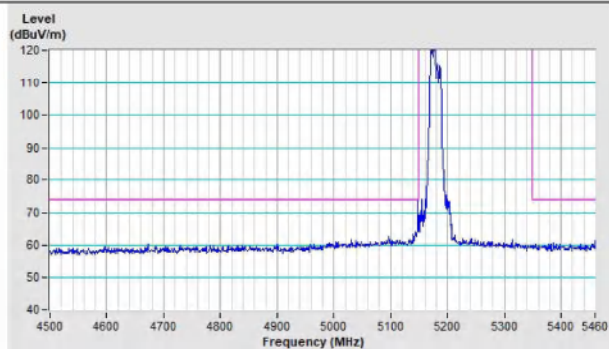
Horizontal (Peak)



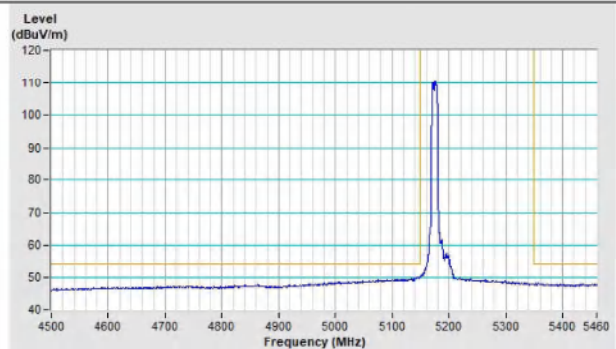
Horizontal (Average)



Vertical (Peak)

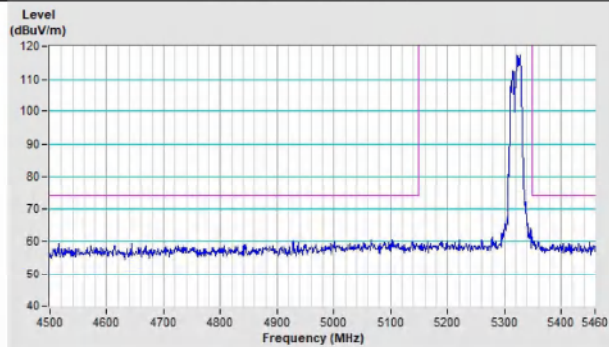


Vertical (Average)

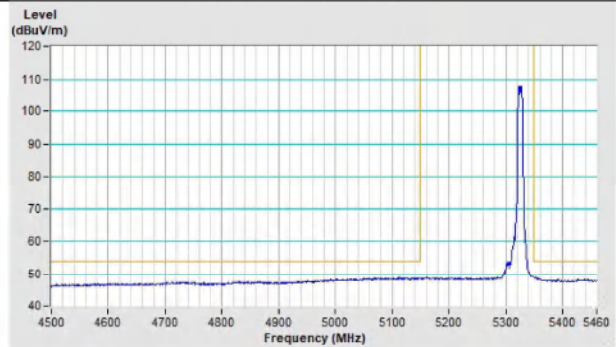


802.11ax (HE20)_RU106 Channel 64

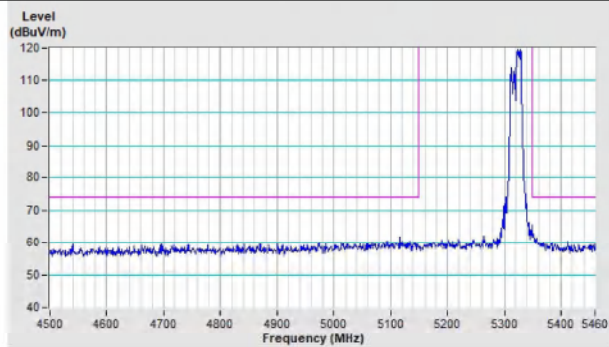
Horizontal (Peak)



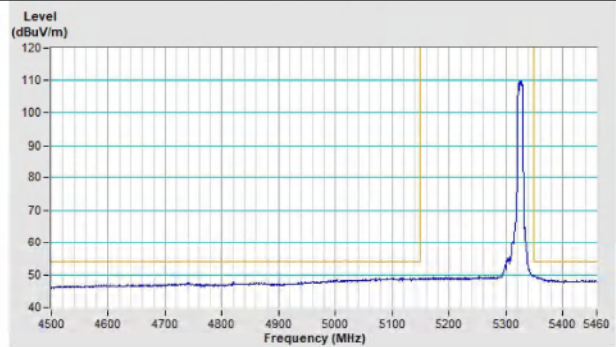
Horizontal (Average)



Vertical (Peak)

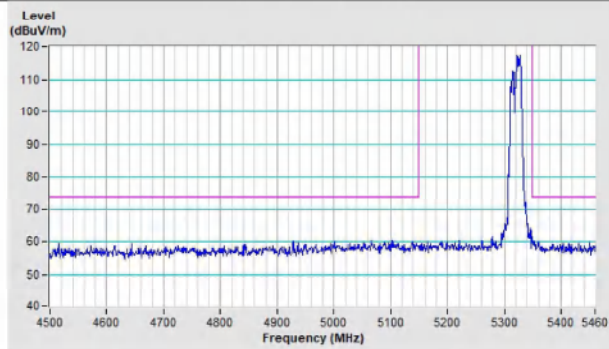


Vertical (Average)

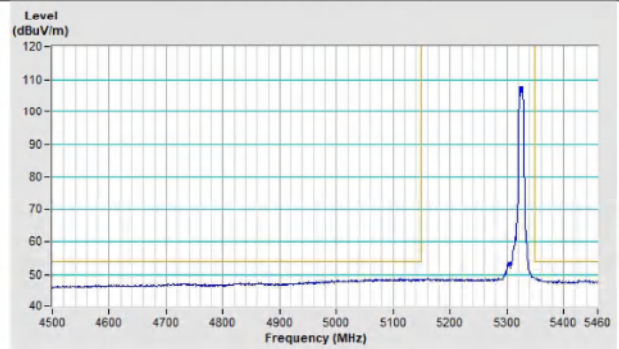


802.11ax (HE20)_RU106 Channel 100

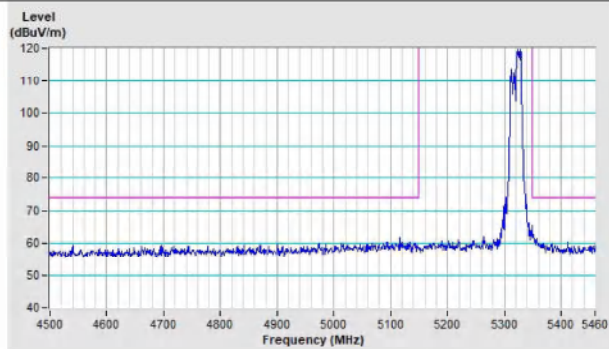
Horizontal (Peak)



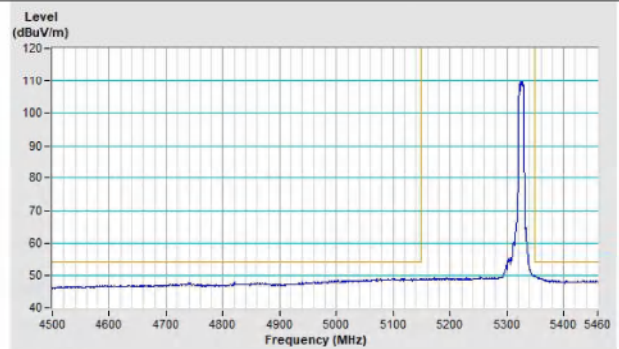
Horizontal (Average)



Vertical (Peak)

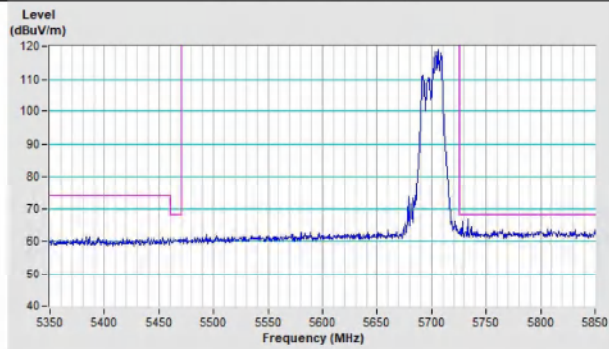


Vertical (Average)

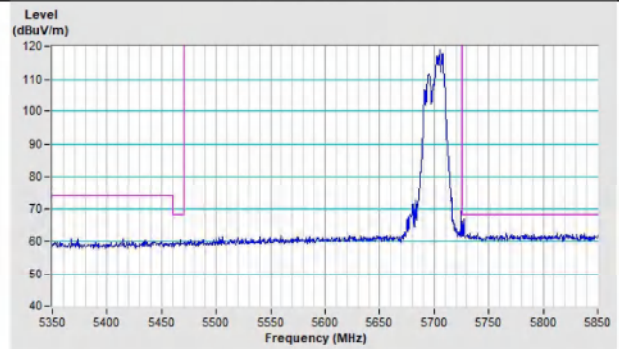


802.11ax (HE20)_RU106 Channel 140

Horizontal (Peak)

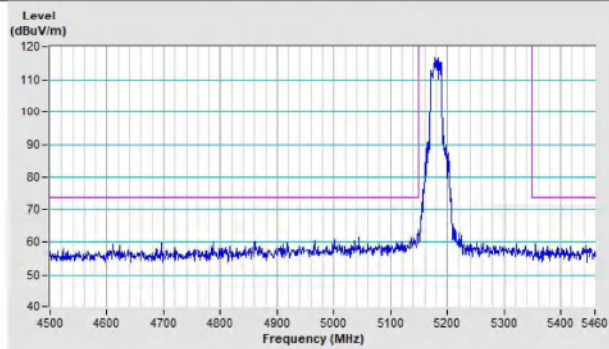


Vertical (Peak)

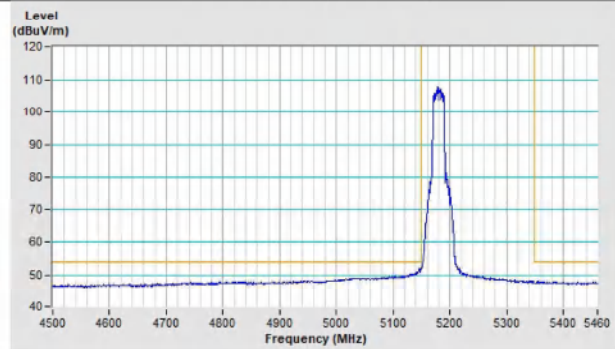


802.11ax (HE20)_Full RU Channel 36

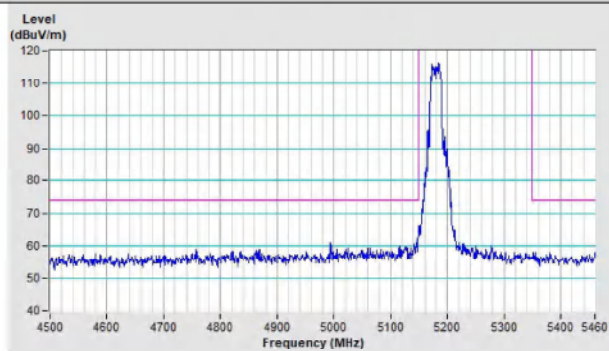
Horizontal (Peak)



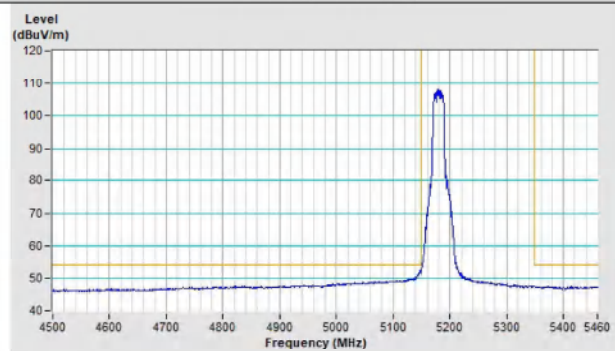
Horizontal (Average)



Vertical (Peak)

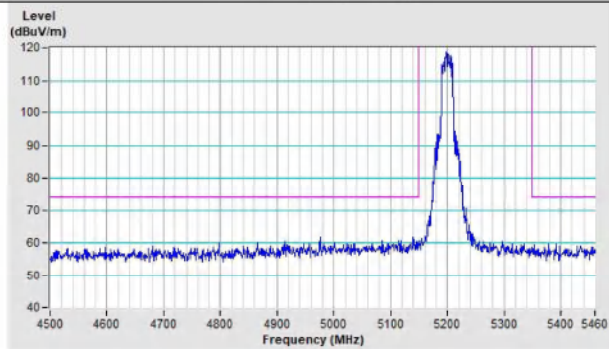


Vertical (Average)

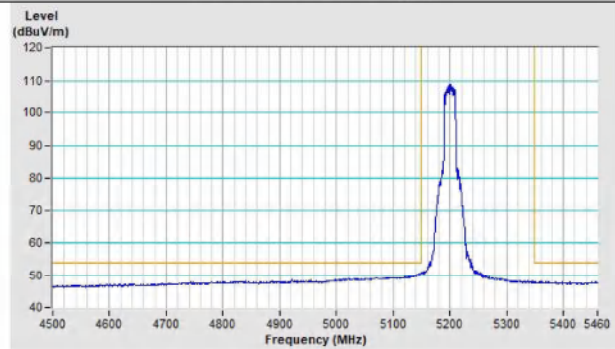


802.11ax (HE20)_Full RU Channel 40

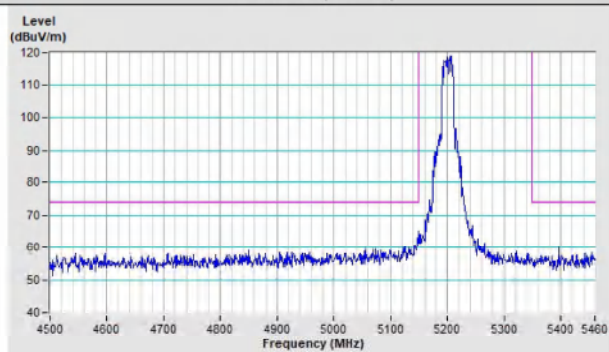
Horizontal (Peak)



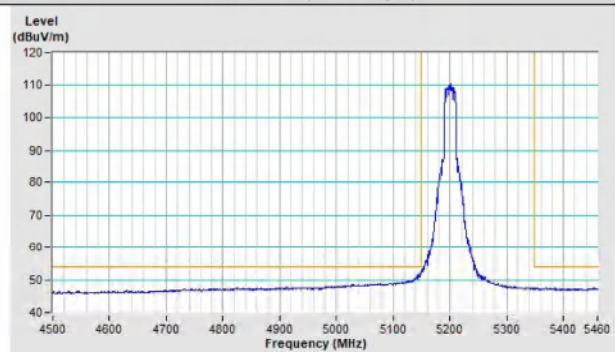
Horizontal (Average)



Vertical (Peak)

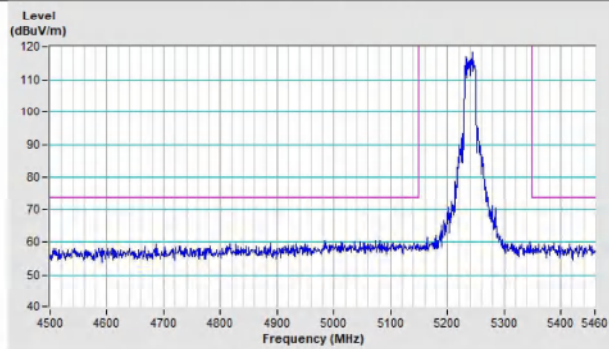


Vertical (Average)

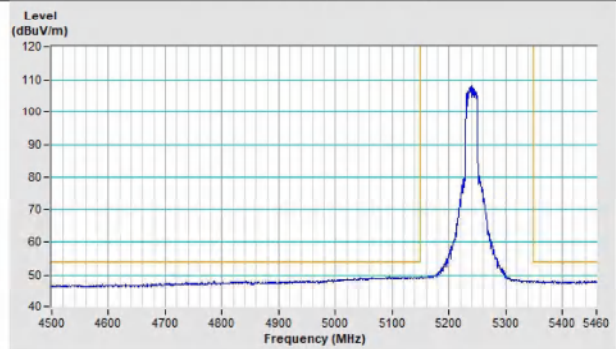


802.11ax (HE20)_Full RU Channel 48

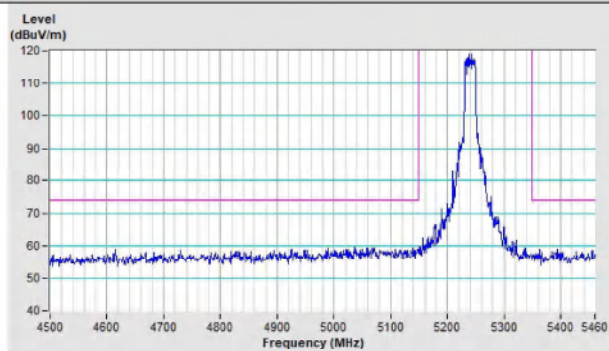
Horizontal (Peak)



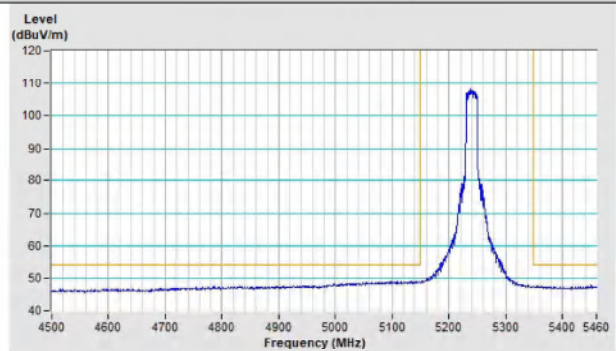
Horizontal (Average)



Vertical (Peak)

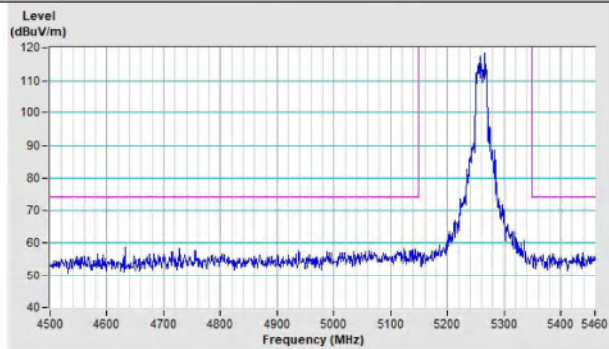


Vertical (Average)

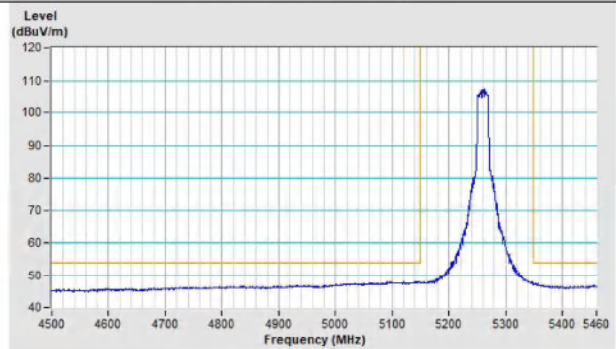


802.11ax (HE20)_Full RU Channel 52

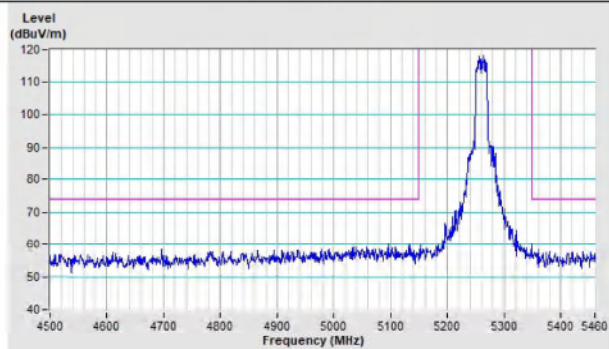
Horizontal (Peak)



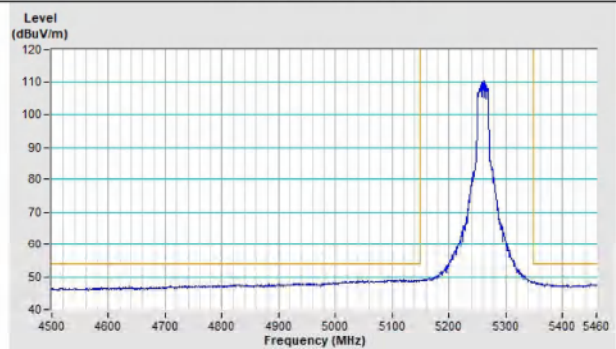
Horizontal (Average)



Vertical (Peak)

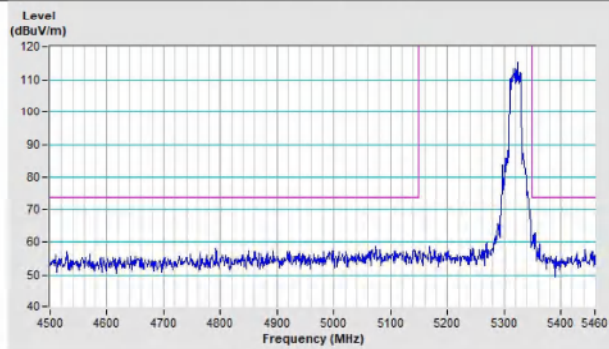


Vertical (Average)

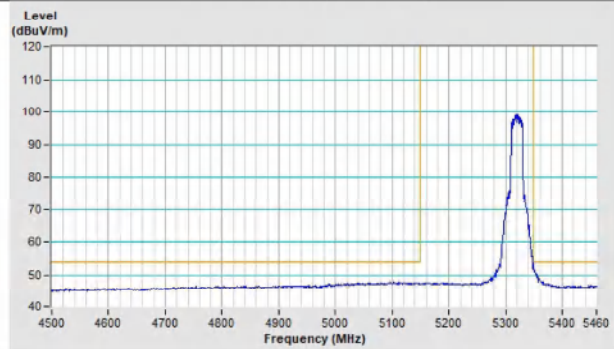


802.11ax (HE20)_Full RU Channel 64

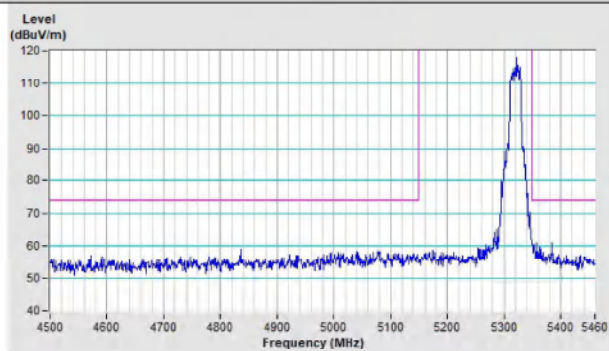
Horizontal (Peak)



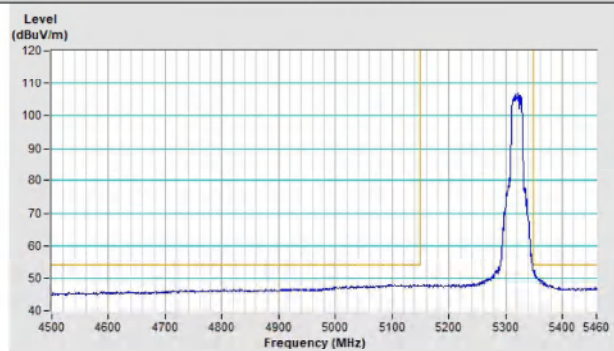
Horizontal (Average)



Vertical (Peak)

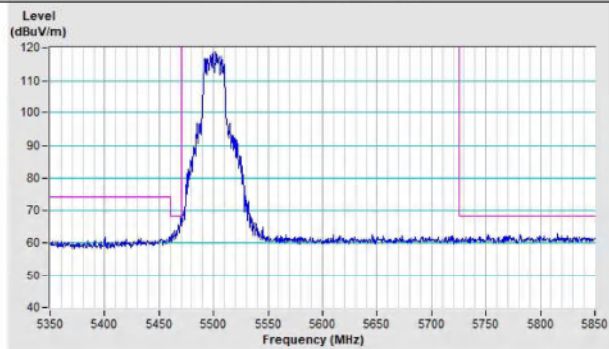


Vertical (Average)

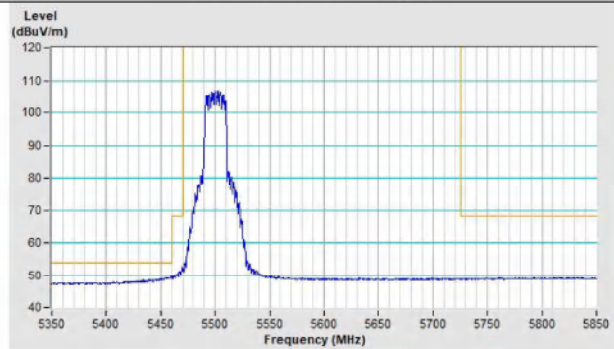


802.11ax (HE20)_Full RU Channel 100

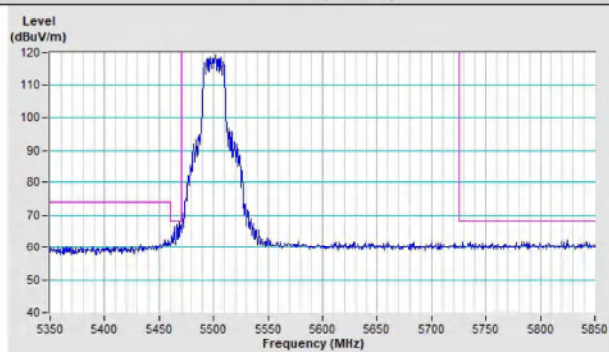
Horizontal (Peak)



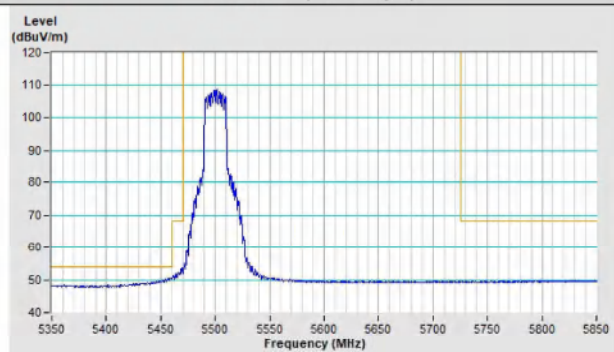
Horizontal (Average)



Vertical (Peak)

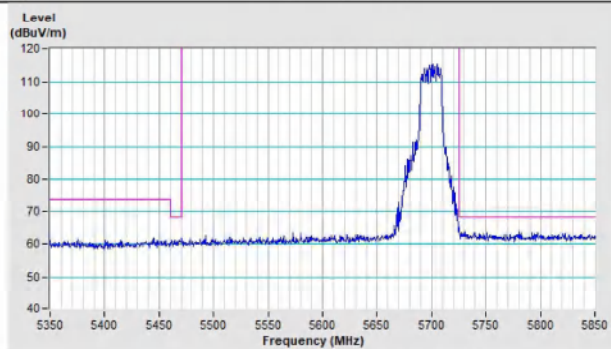


Vertical (Average)

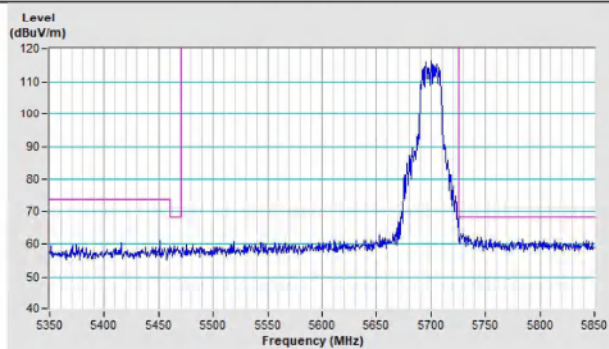


802.11ax (HE20)_Full RU Channel 140

Horizontal (Peak)

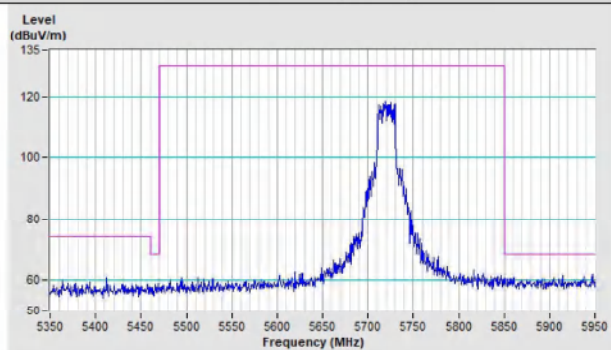


Vertical (Peak)

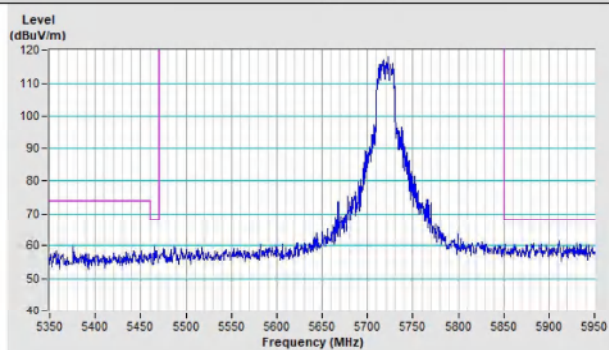


802.11ax (HE20)_Full RU Channel 144

Horizontal (Peak)

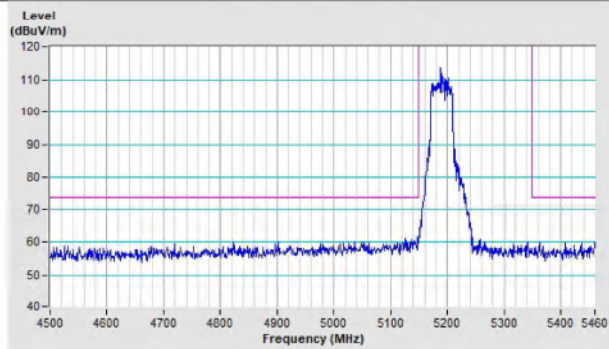


Vertical (Peak)

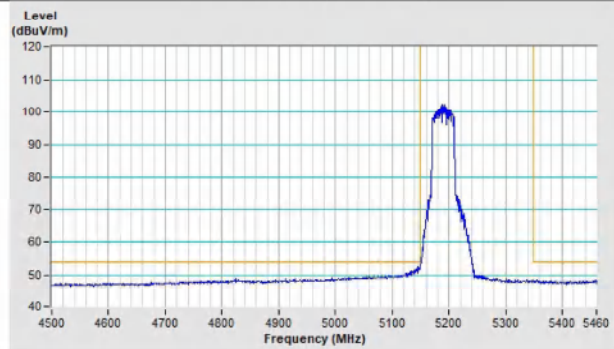


802.11ax (HE40)_Full RU Channel 38

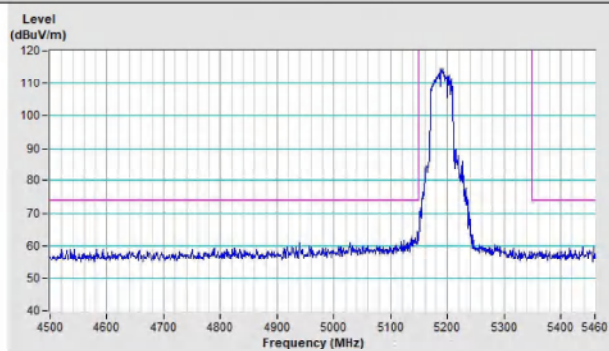
Horizontal (Peak)



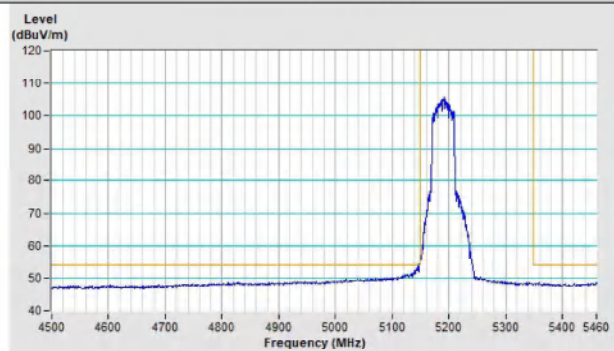
Horizontal (Average)



Vertical (Peak)

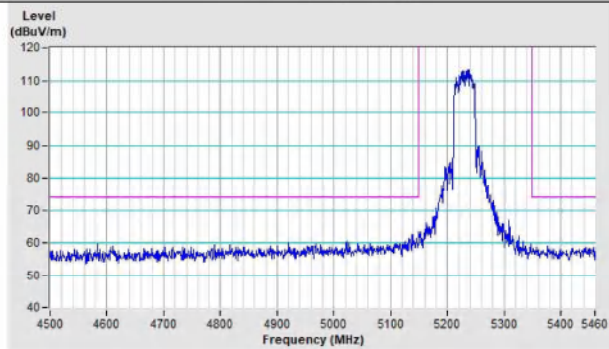


Vertical (Average)

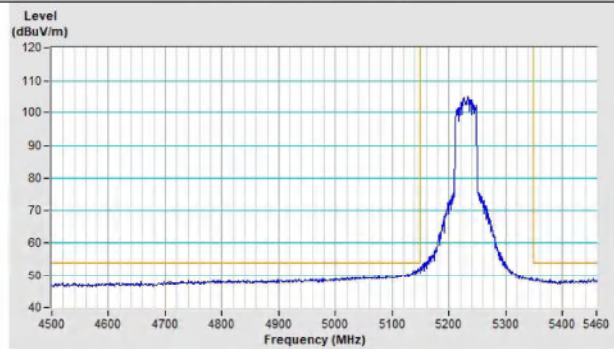


802.11ax (HE40)_Full RU Channel 46

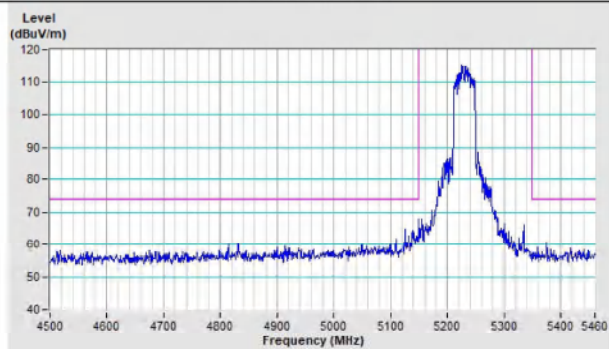
Horizontal (Peak)



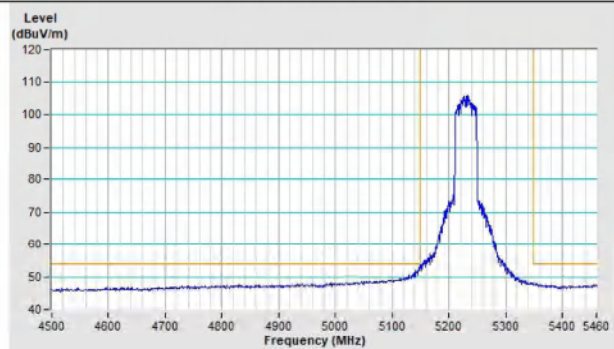
Horizontal (Average)



Vertical (Peak)

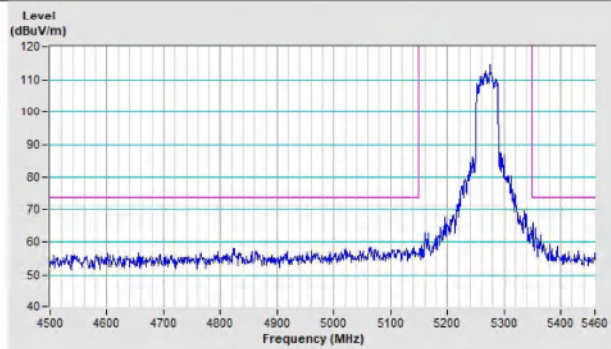


Vertical (Average)

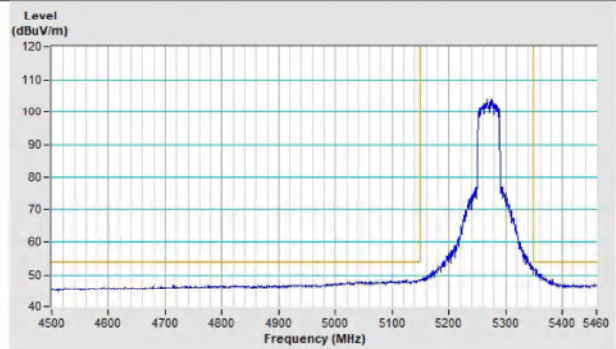


802.11ax (HE40)_Full RU Channel 54

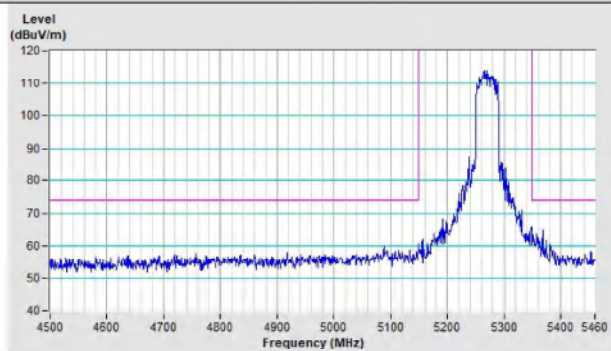
Horizontal (Peak)



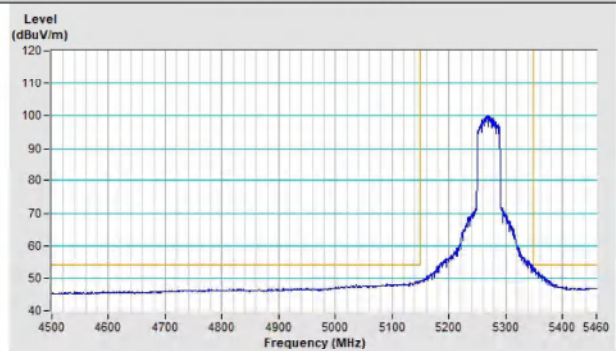
Horizontal (Average)



Vertical (Peak)

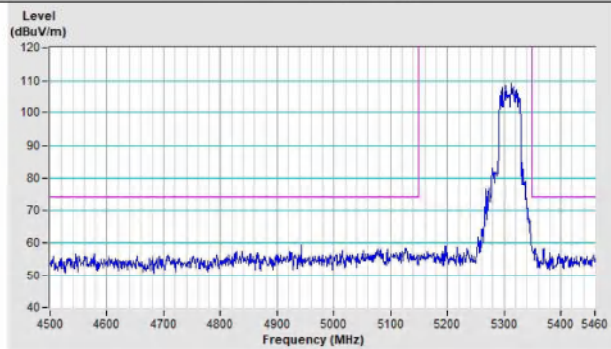


Vertical (Average)

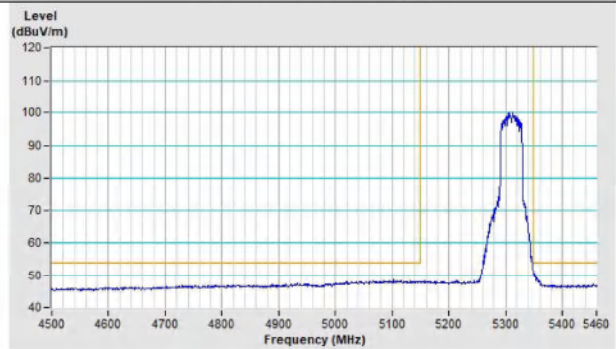


802.11ax (HE40)_Full RU Channel 62

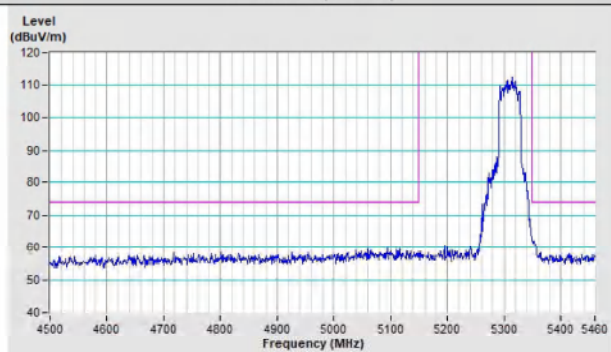
Horizontal (Peak)



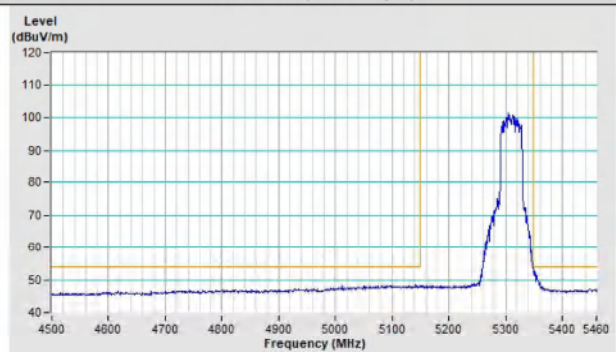
Horizontal (Average)



Vertical (Peak)

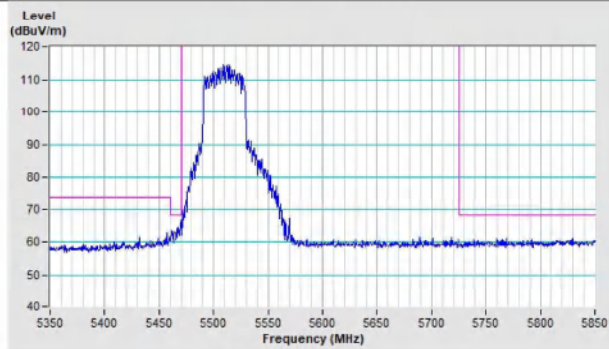


Vertical (Average)

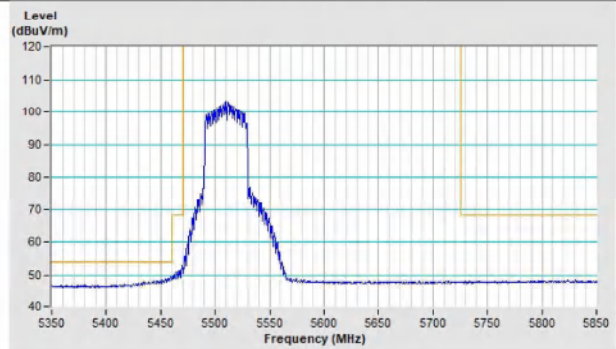


802.11ax (HE40)_Full RU Channel 102

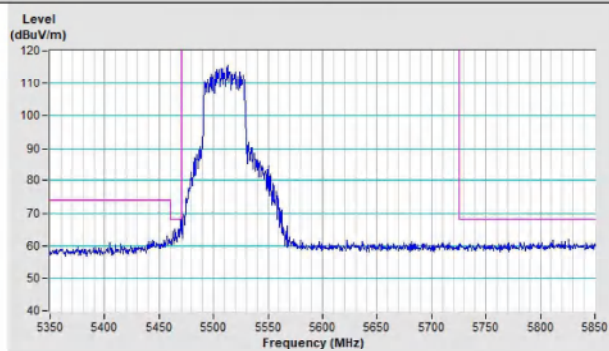
Horizontal (Peak)



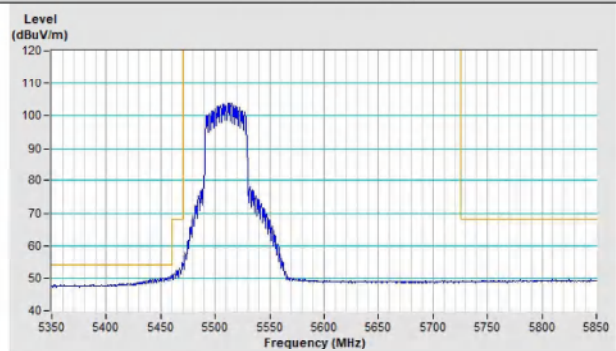
Horizontal (Average)



Vertical (Peak)

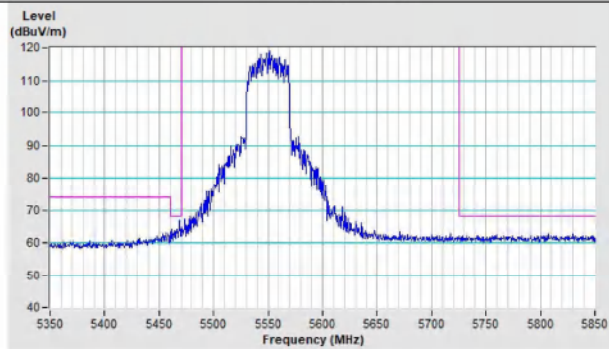


Vertical (Average)

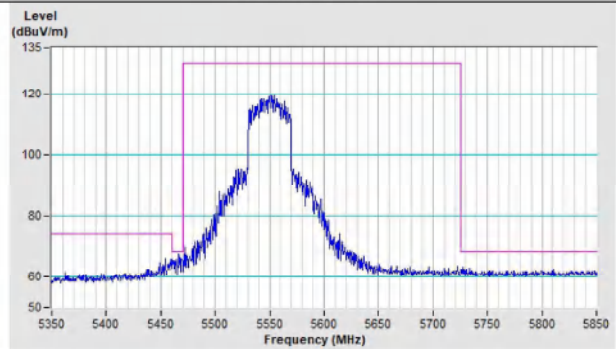


802.11ax (HE40)_Full RU Channel 110

Horizontal (Peak)

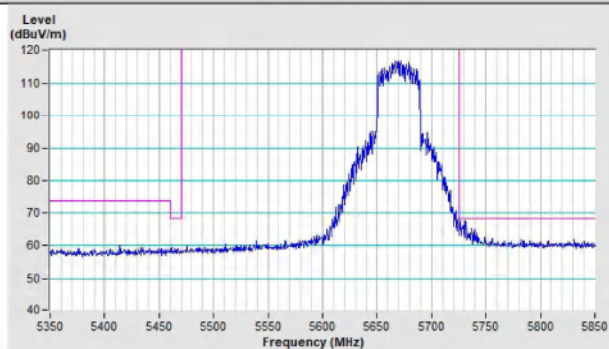


Vertical (Peak)

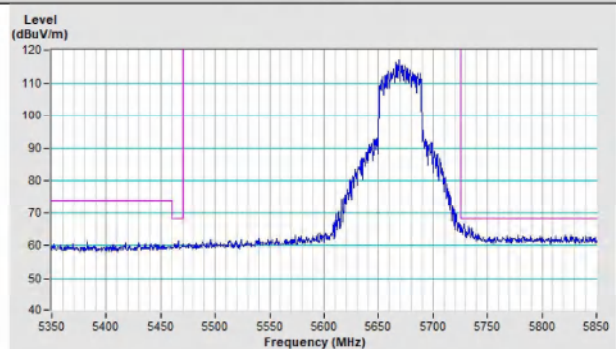


802.11ax (HE40)_Full RU Channel 134

Horizontal (Peak)

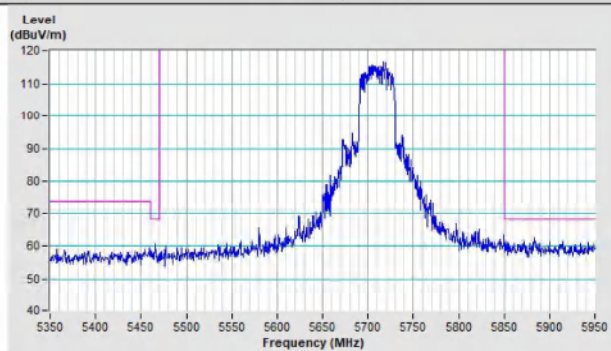


Vertical (Peak)

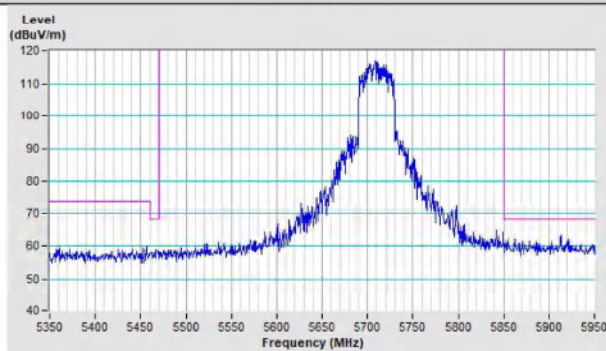


802.11ax (HE40)_Full RU Channel 142

Horizontal (Peak)

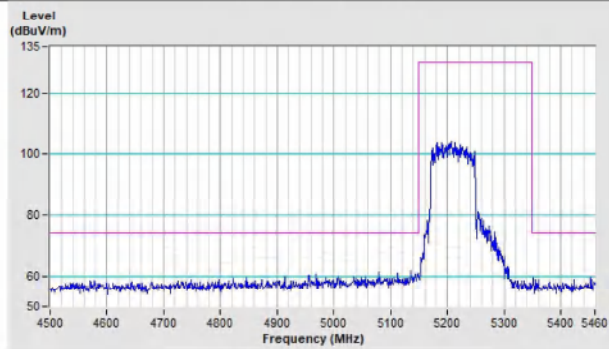


Vertical (Peak)

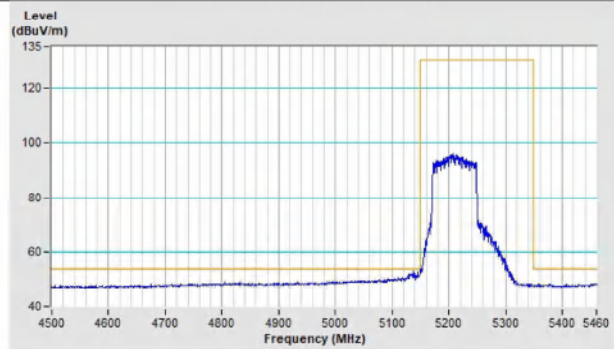


802.11ax (HE80)_Full RU Channel 42

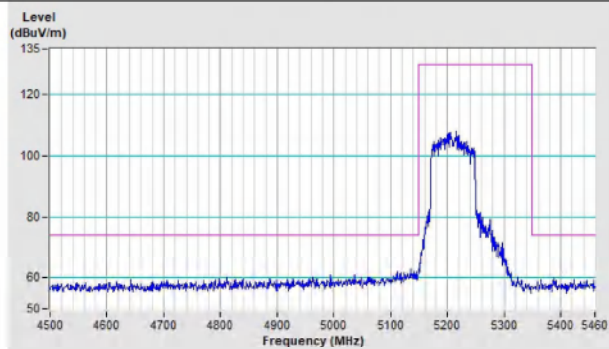
Horizontal (Peak)



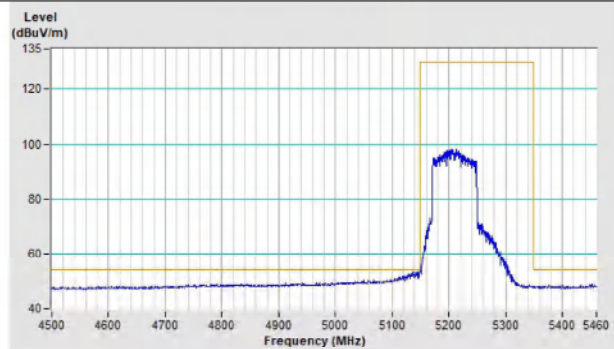
Horizontal (Average)



Vertical (Peak)

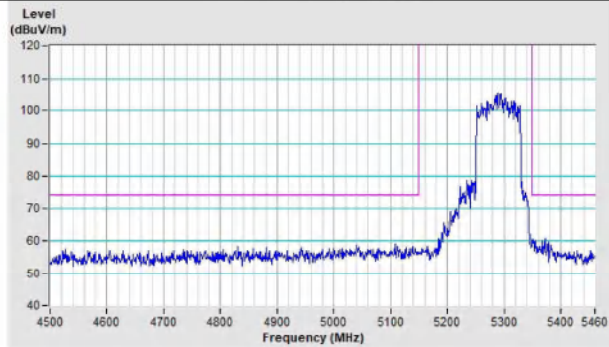


Vertical (Average)

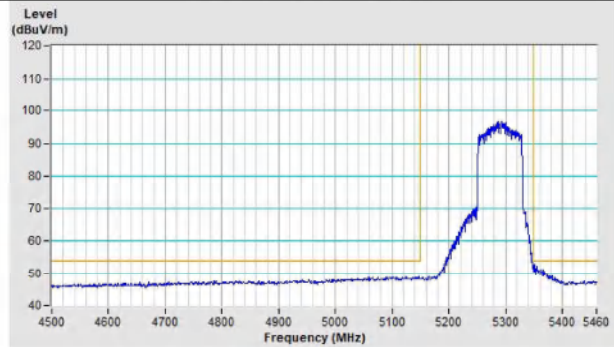


802.11ax (HE80)_Full RU Channel 58

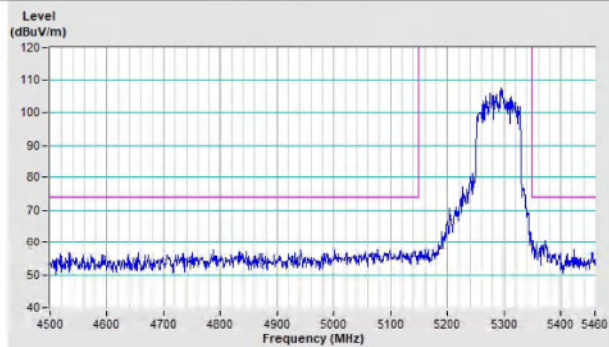
Horizontal (Peak)



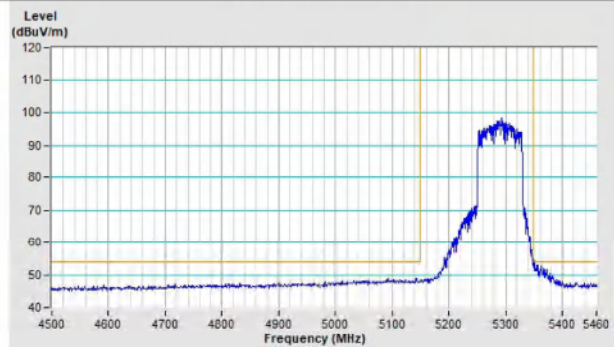
Horizontal (Average)



Vertical (Peak)

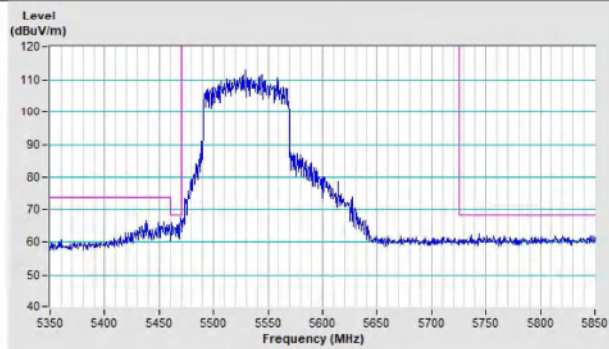


Vertical (Average)

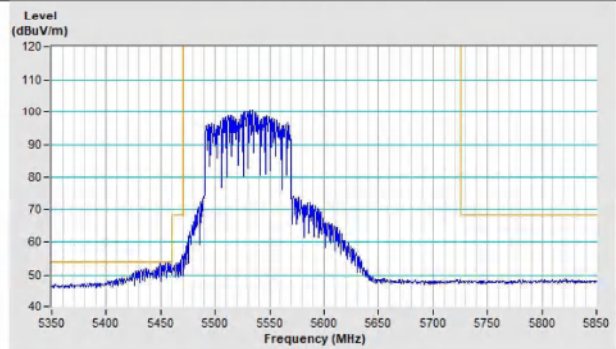


802.11ax (HE80)_Full RU Channel 106

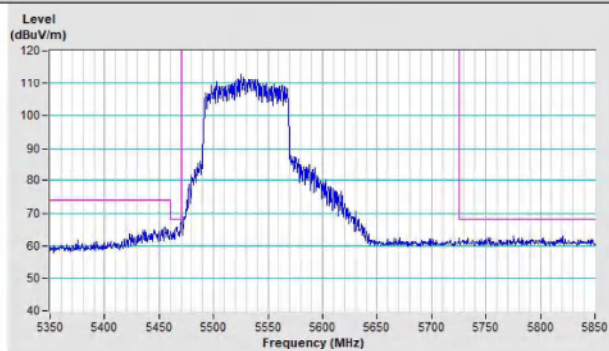
Horizontal (Peak)



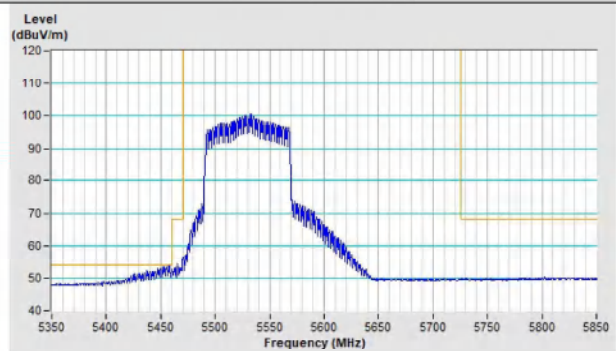
Horizontal (Average)



Vertical (Peak)

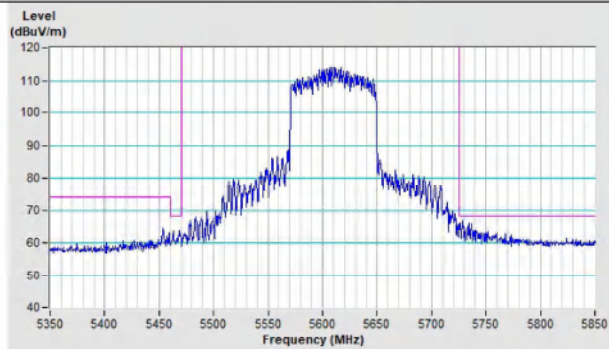


Vertical (Average)

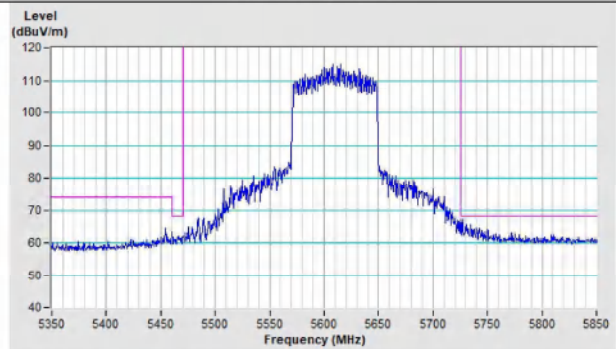


802.11ax (HE80)_Full RU Channel 122

Horizontal (Peak)

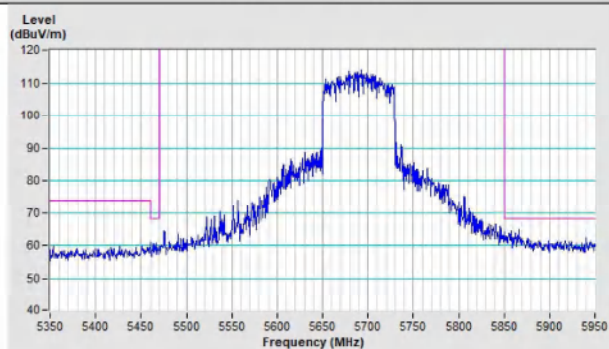


Vertical (Peak)

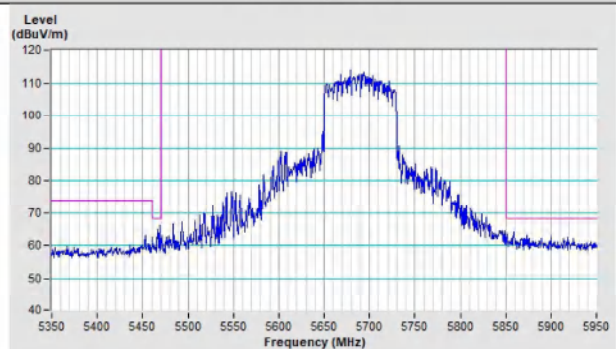


802.11ax (HE80)_Full RU Channel 138

Horizontal (Peak)

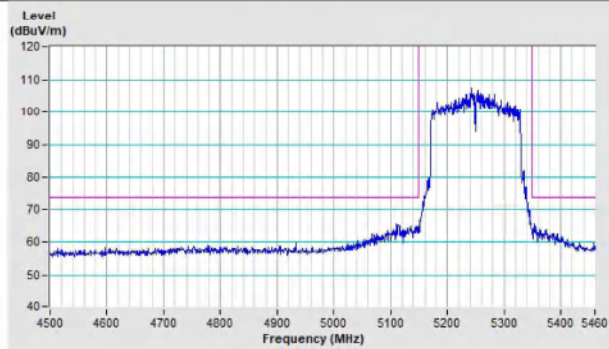


Vertical (Peak)

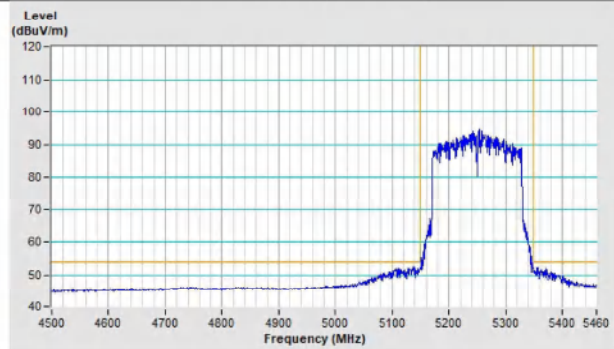


802.11ax (HE160)_Full RU Channel 50

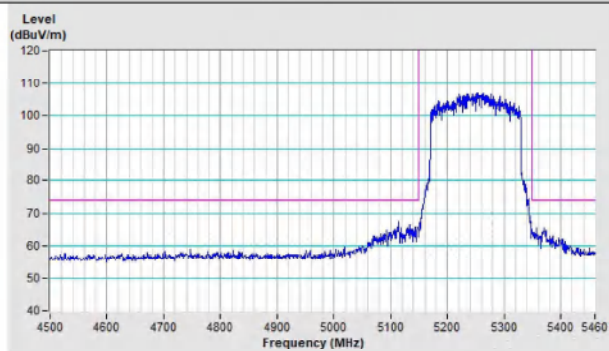
Horizontal (Peak)



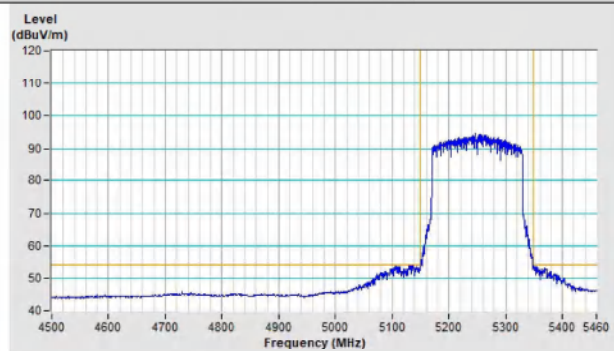
Horizontal (Average)



Vertical (Peak)

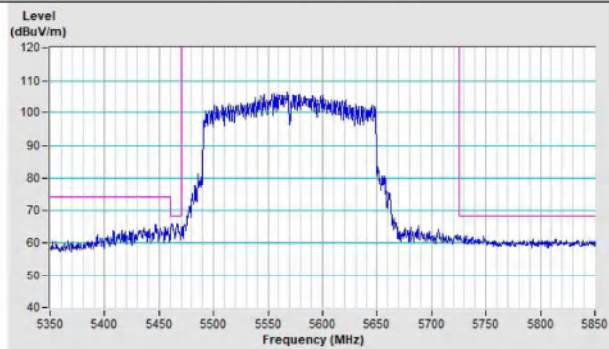


Vertical (Average)

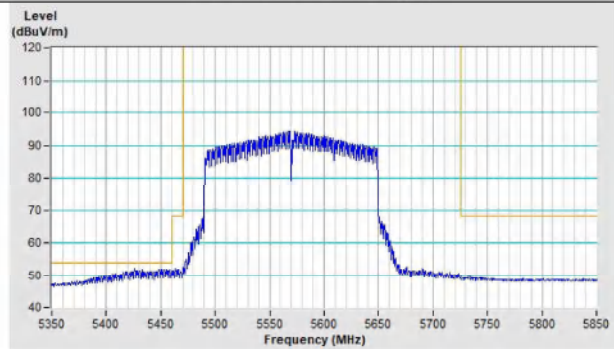


802.11ax (HE160)_Full RU Channel 114

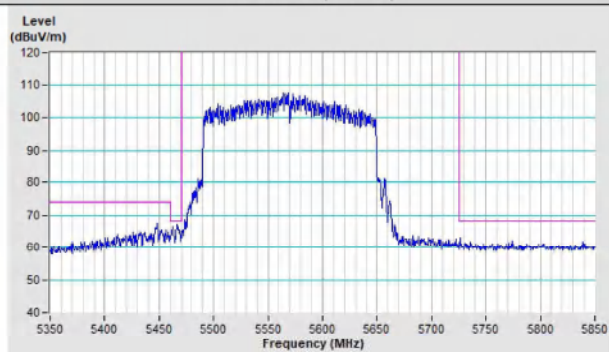
Horizontal (Peak)



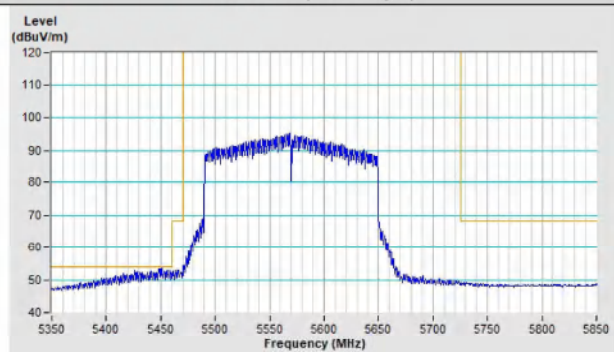
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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