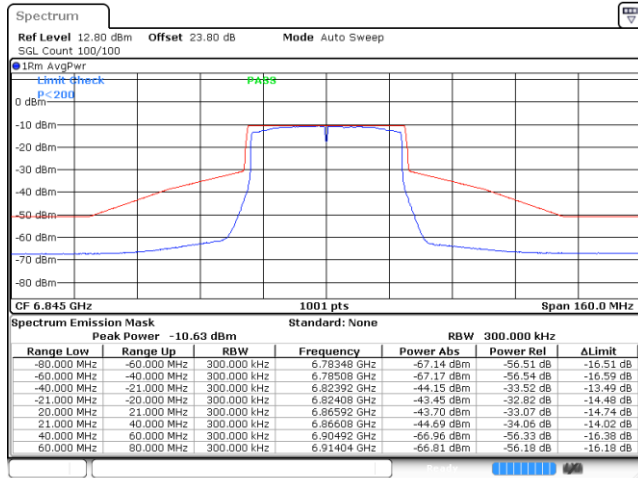


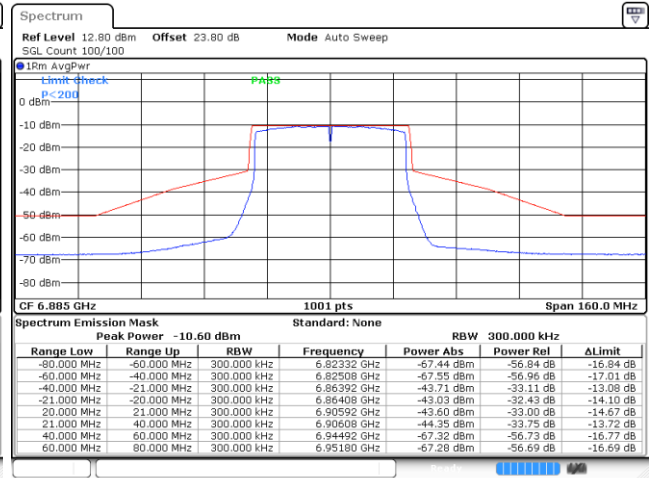


Plot on Channel 6845MHz



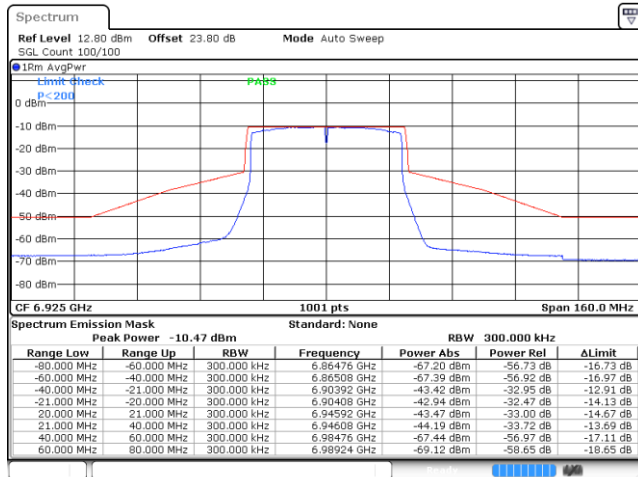
Date: 30 SEP.2021 23:46:23

Plot on Channel 6885MHz



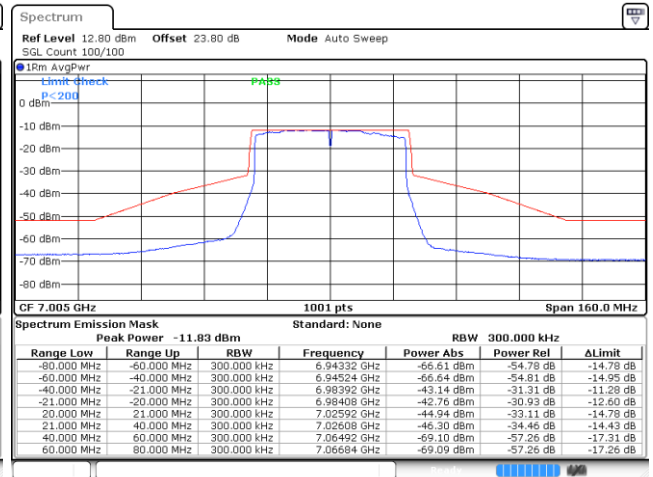
Date: 1.OCT.2021 00:02:26

Plot on Channel 6925MHz



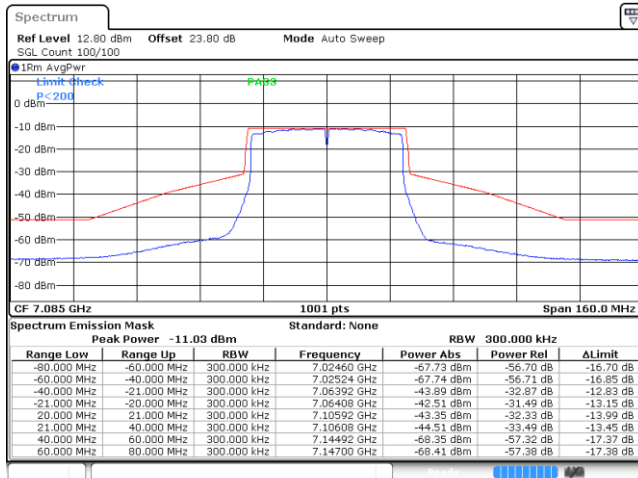
Date: 1.OCT.2021 00:18:04

Plot on Channel 7005MHz



Date: 1.OCT.2021 00:31:45

Plot on Channel 7085MHz

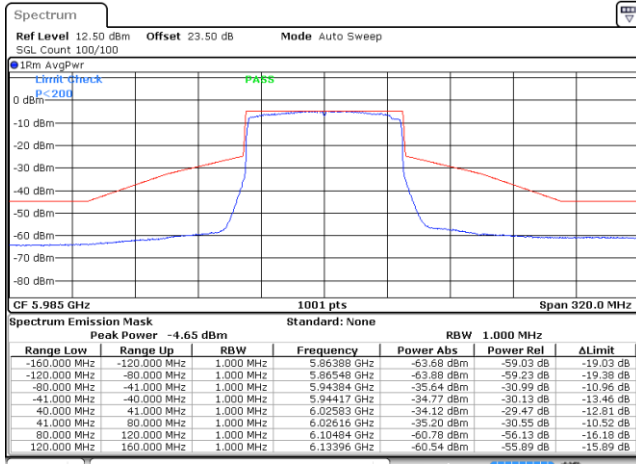


Date: 1.OCT.2021 00:45:54



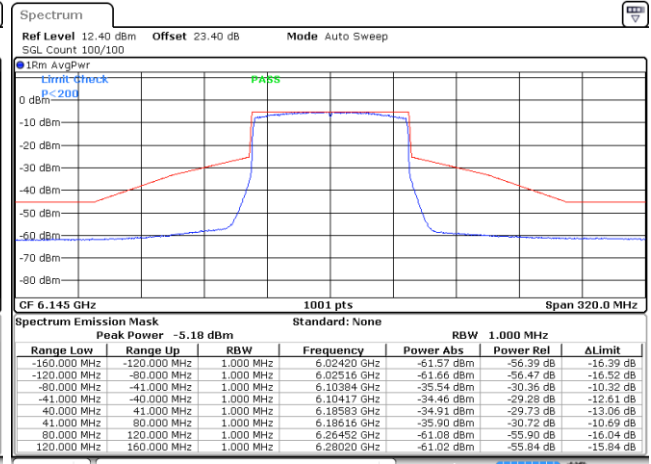
EUT Mode : 802.11ax HE80

Plot on Channel 5985MHz



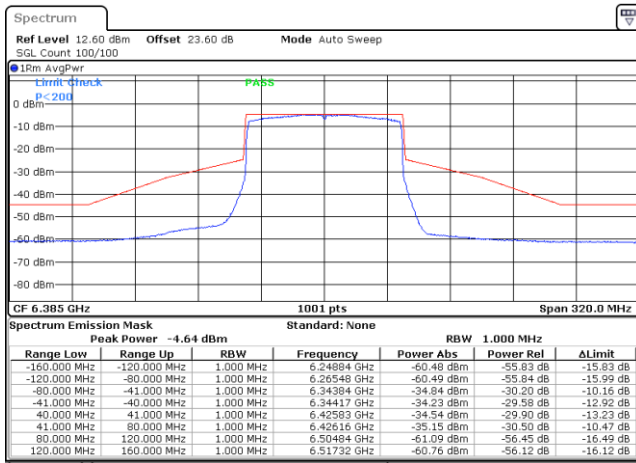
Date: 1.OCT.2021 01:02:43

Plot on Channel 6145MHz



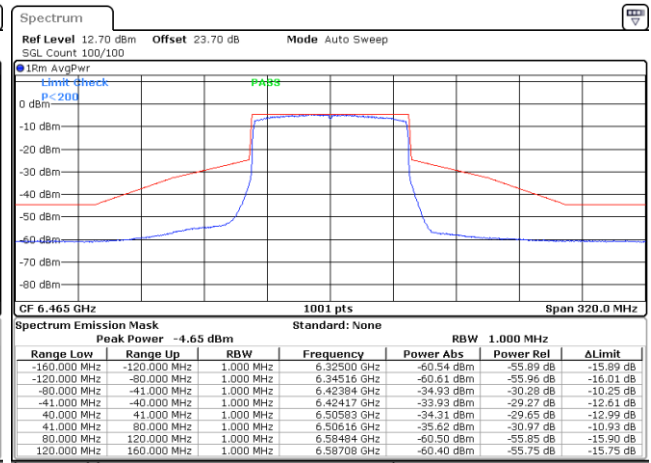
Date: 1.OCT.2021 01:15:53

Plot on Channel 6385MHz



Date: 1.OCT.2021 01:29:45

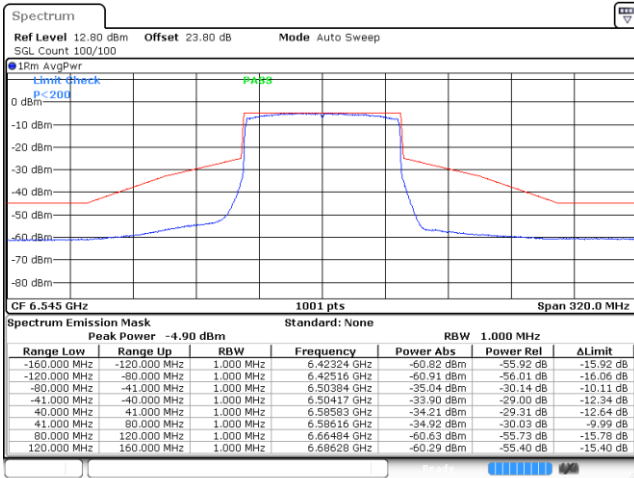
Plot on Channel 6465MHz



Date: 1.OCT.2021 01:45:52

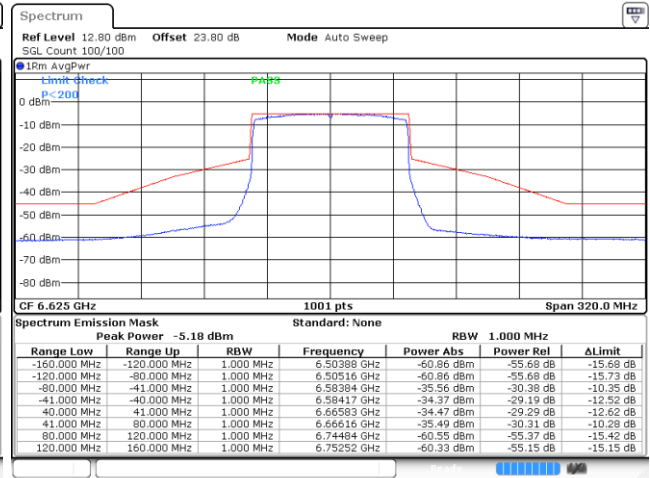


Plot on Channel 6545MHz



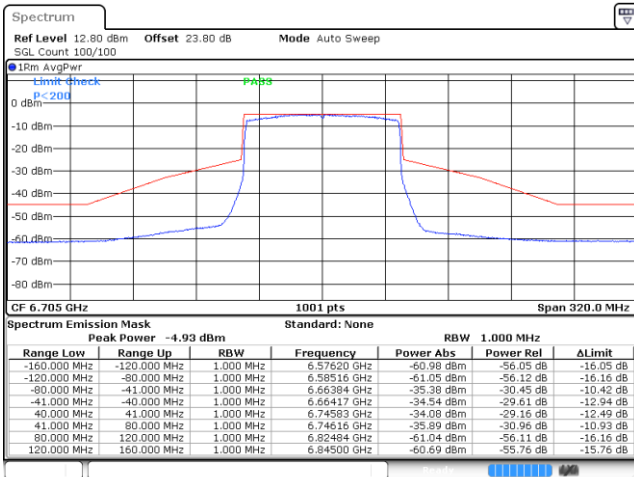
Date: 1.OCT.2021 02:01:57

Plot on Channel 6625MHz



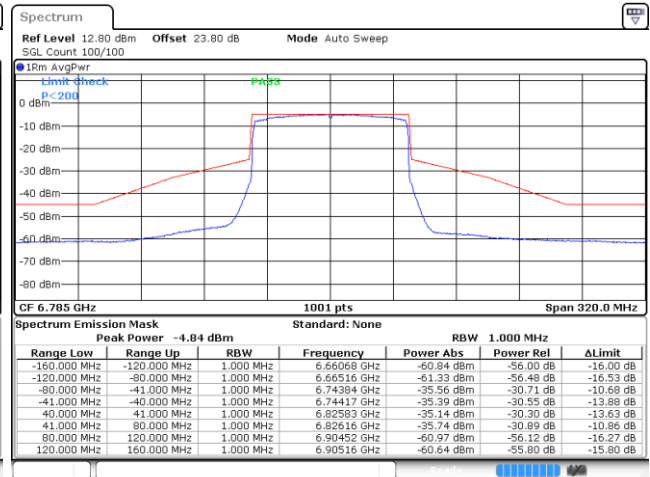
Date: 1.OCT.2021 02:15:14

Plot on Channel 6705MHz



Date: 1.OCT.2021 18:48:59

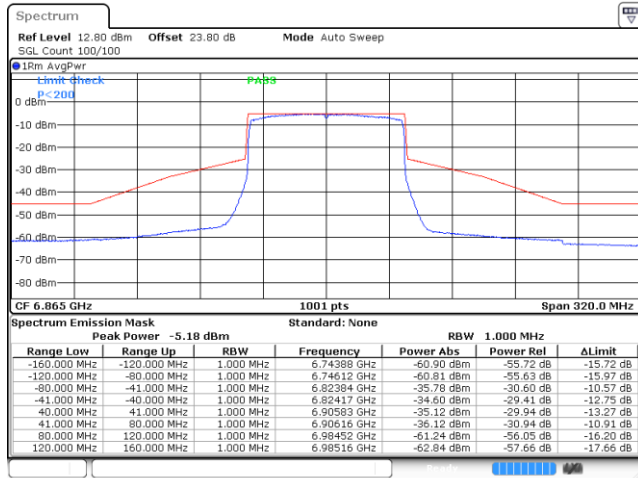
Plot on Channel 6785MHz



Date: 1.OCT.2021 19:05:18

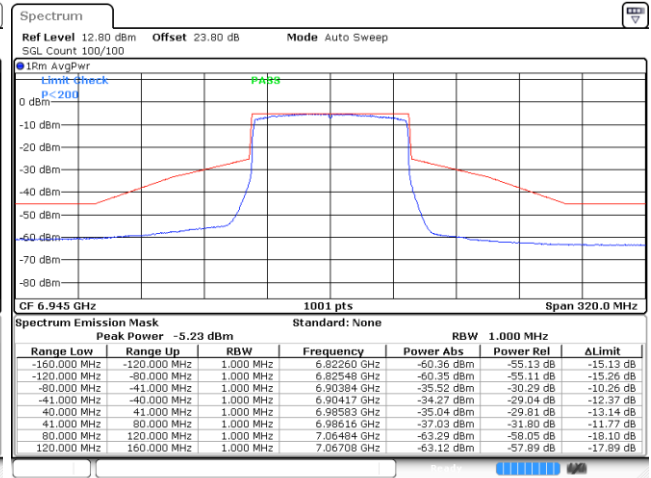


Plot on Channel 6865MHz



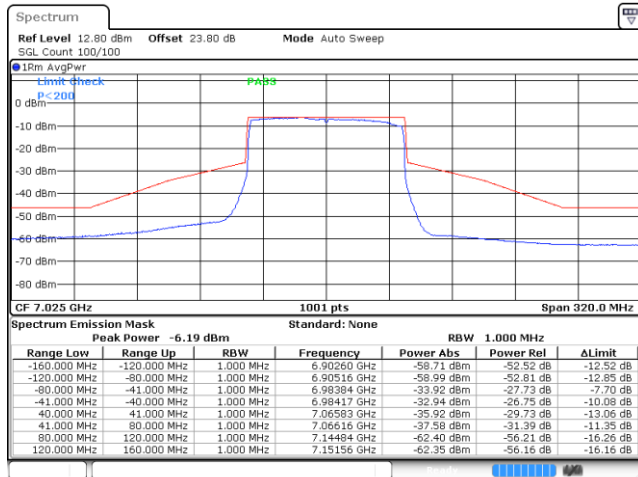
Date: 1.OCT.2021 19:20:53

Plot on Channel 6945MHz



Date: 1.OCT.2021 19:34:41

Plot on Channel 7025MHz

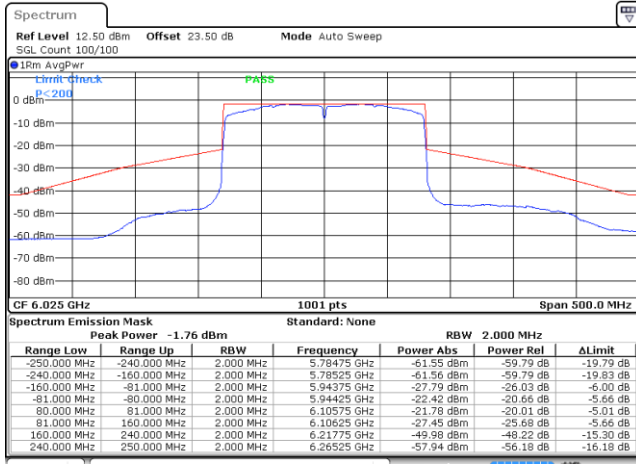


Date: 1.OCT.2021 19:54:58



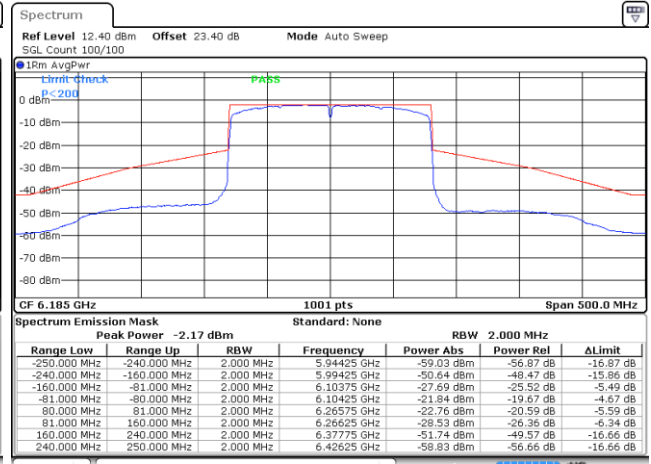
EUT Mode : 802.11ax HE160

Plot on Channel 6025MHz



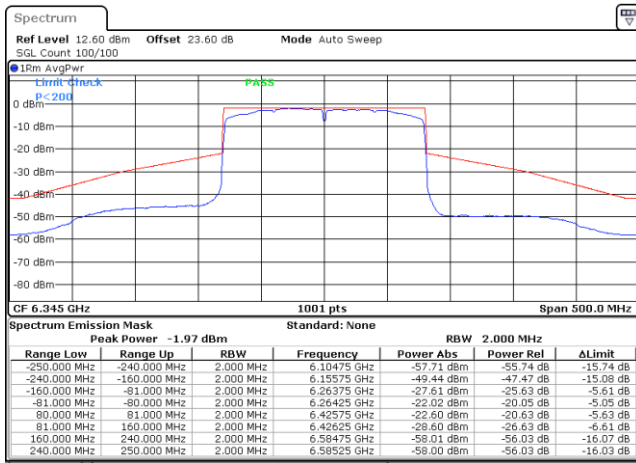
Date: 1.OCT.2021 20:15:40

Plot on Channel 6185MHz



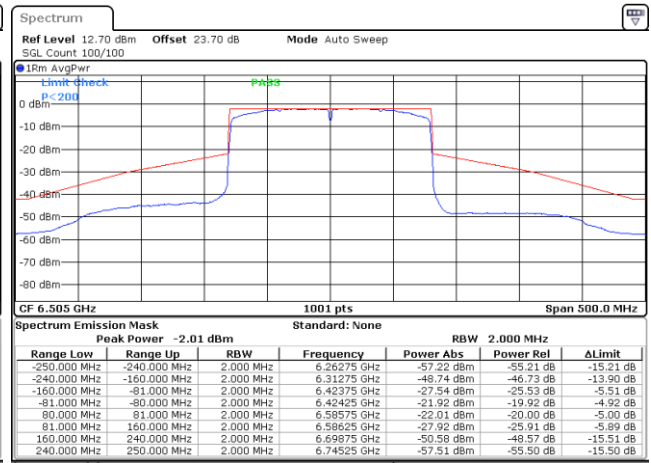
Date: 1.OCT.2021 20:34:29

Plot on Channel 6345MHz



Date: 1.OCT.2021 20:49:00

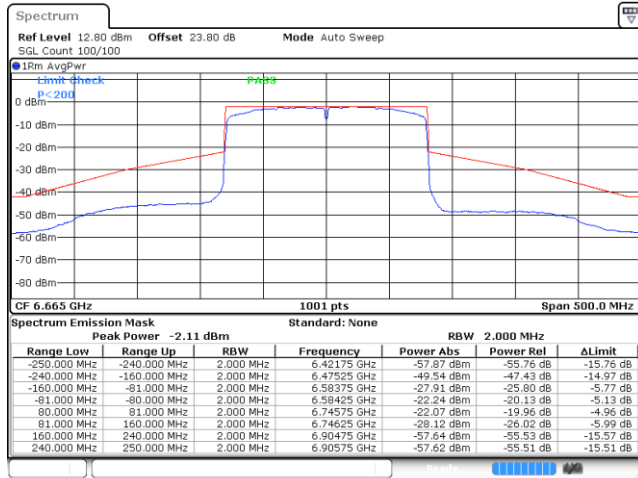
Plot on Channel 6505MHz



Date: 1.OCT.2021 21:01:12

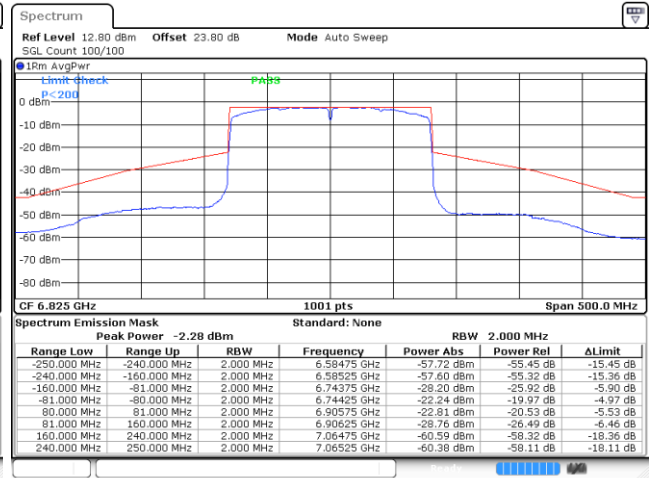


Plot on Channel 6665MHz



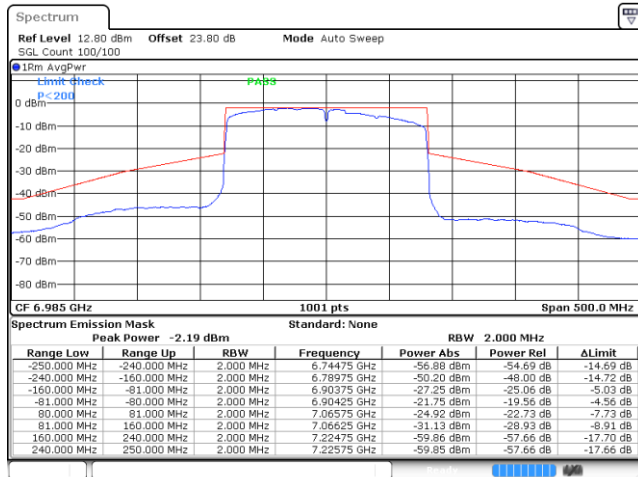
Date: 1.OCT.2021 22:40:06

Plot on Channel 6825MHz



Date: 1.OCT.2021 22:58:01

Plot on Channel 6985MHz



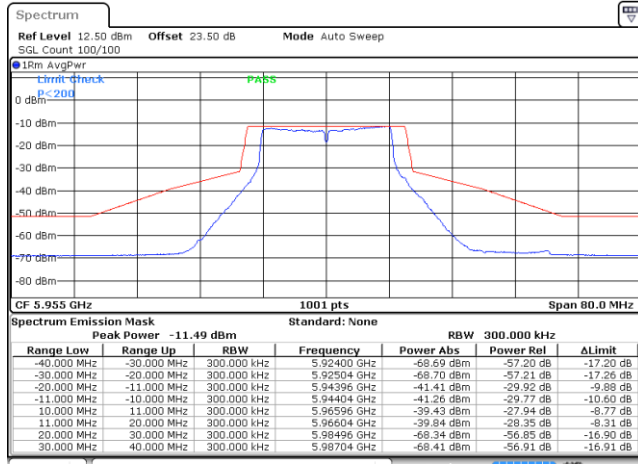
Date: 1.OCT.2021 23:16:43



MIMO <Ant. F+G(G)>

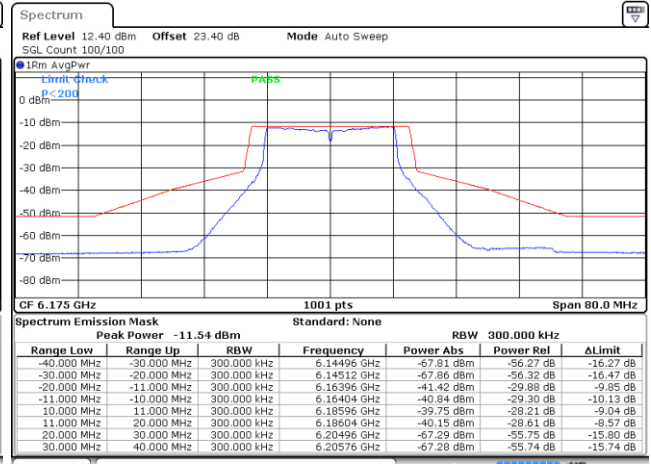
EUT Mode : 802.11a

Plot on Channel 5955MHz



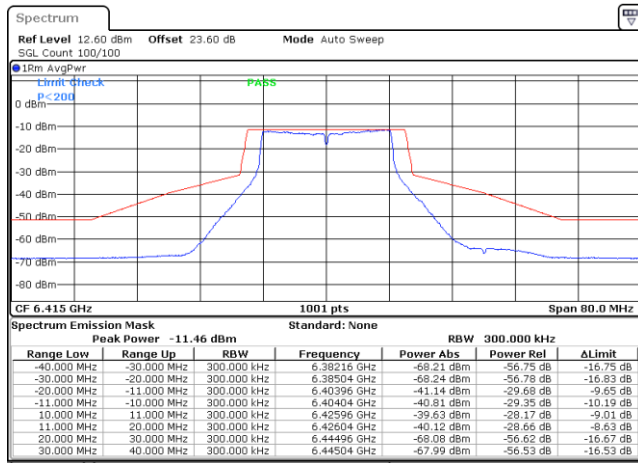
Date: 1.NOV.2021 19:55:51

Plot on Channel 6175MHz



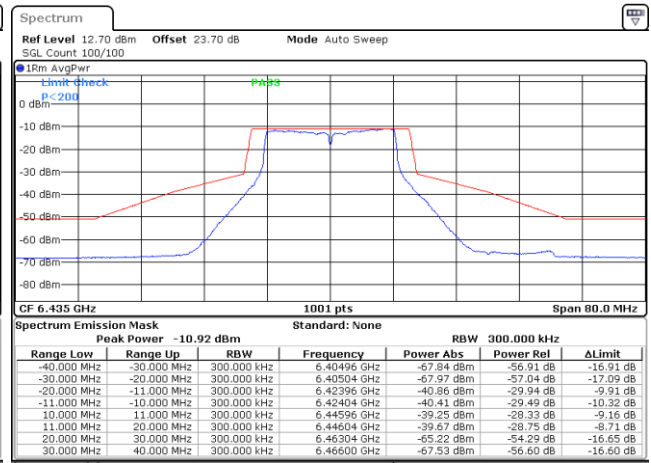
Date: 1.NOV.2021 20:09:08

Plot on Channel 6415MHz



Date: 1.NOV.2021 23:04:11

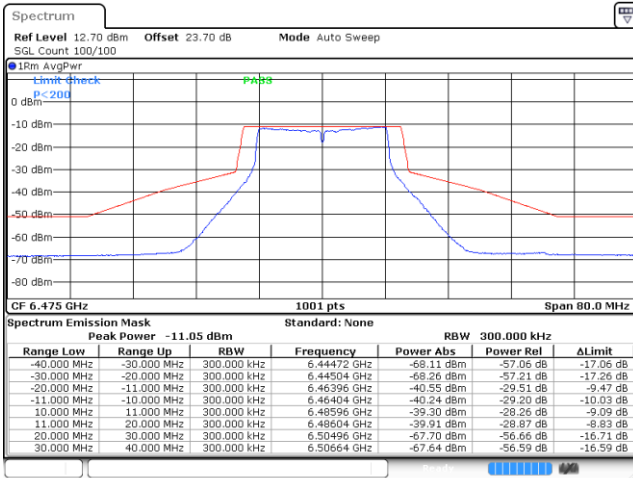
Plot on Channel 6435MHz



Date: 2.NOV.2021 23:22:59

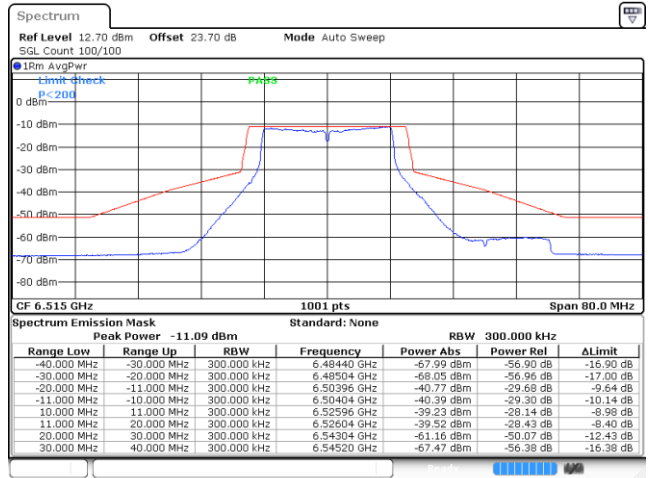


Plot on Channel 6475MHz



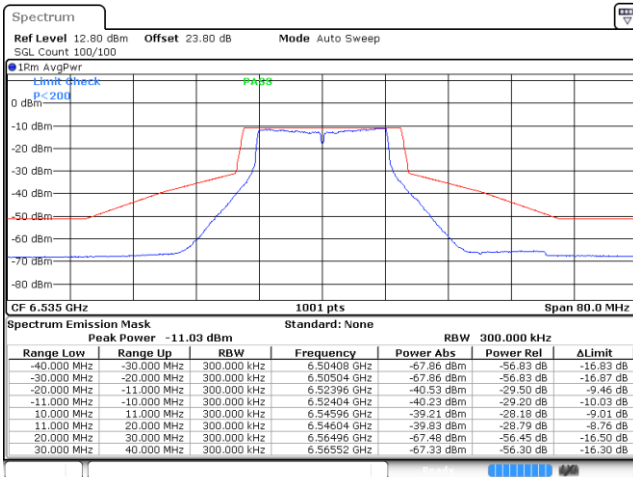
Date: 9 NOV 2021 22:56:41

Plot on Channel 6515MHz



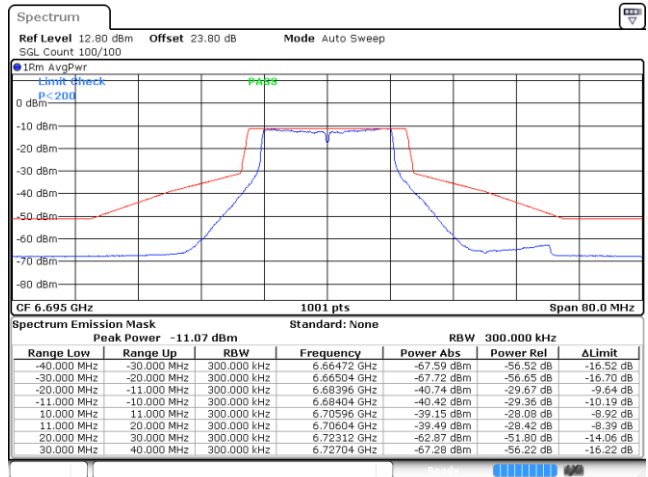
Date: 9 NOV 2021 23:15:29

Plot on Channel 6535MHz



Date: 9 NOV 2021 23:49:59

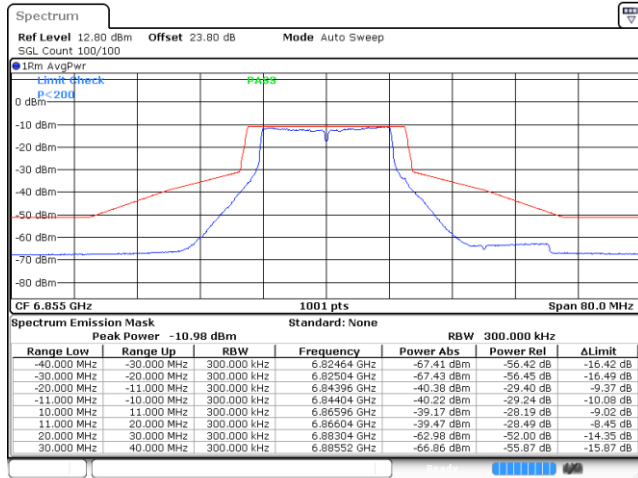
Plot on Channel 6695MHz



Date: 10 NOV 2021 00:11:39

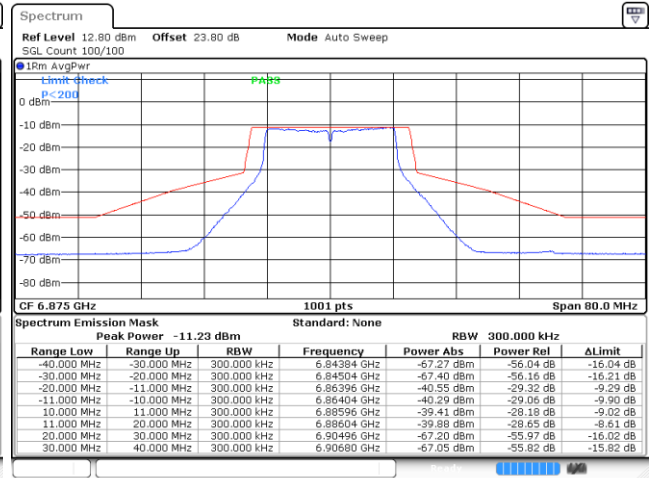


Plot on Channel 6855MHz



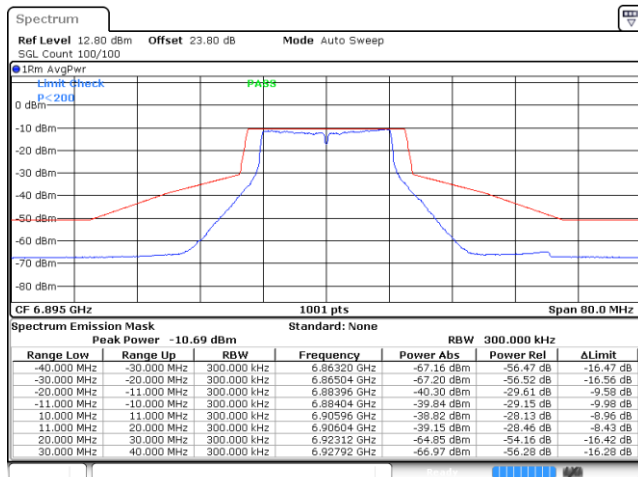
Date: 10 NOV 2021 00:43:33

Plot on Channel 6875MHz



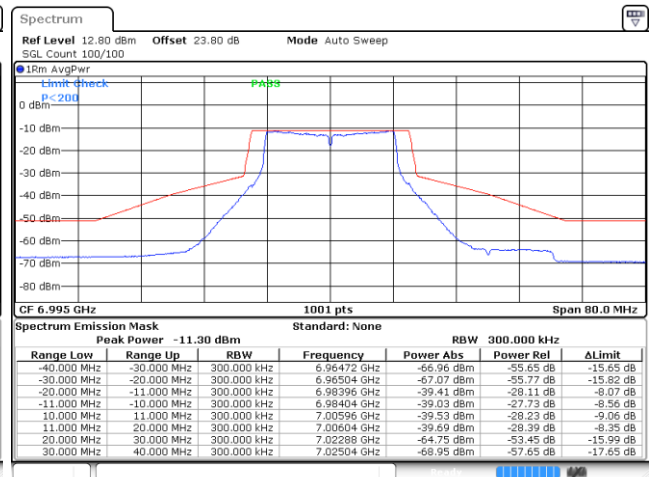
Date: 10 NOV 2021 01:02:44

Plot on Channel 6895MHz



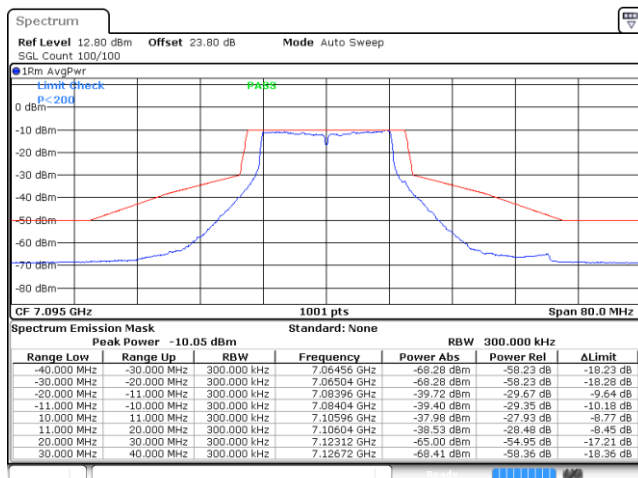
Date: 10 NOV 2021 01:22:44

Plot on Channel 6995MHz



Date: 10 NOV 2021 01:38:27

Plot on Channel 7095MHz

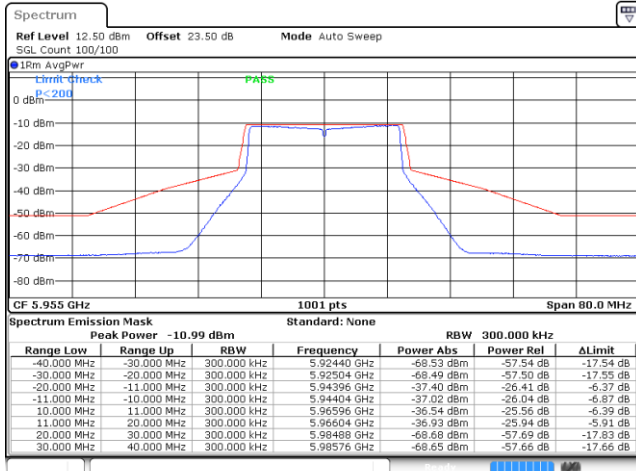


Date: 23 NOV 2021 19:22:03



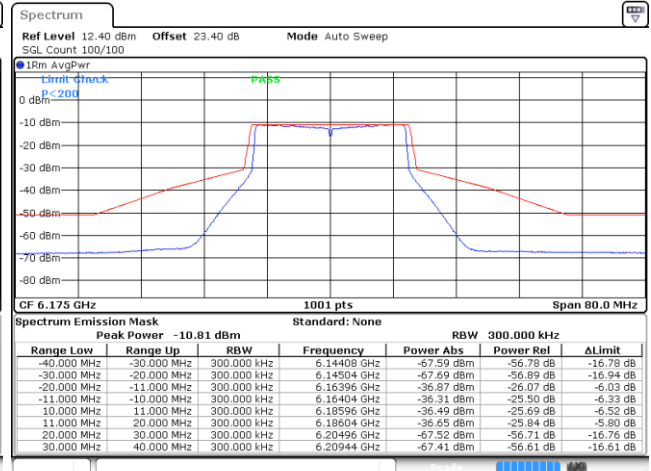
EUT Mode : 802.11ax HE20

Plot on Channel 5955MHz



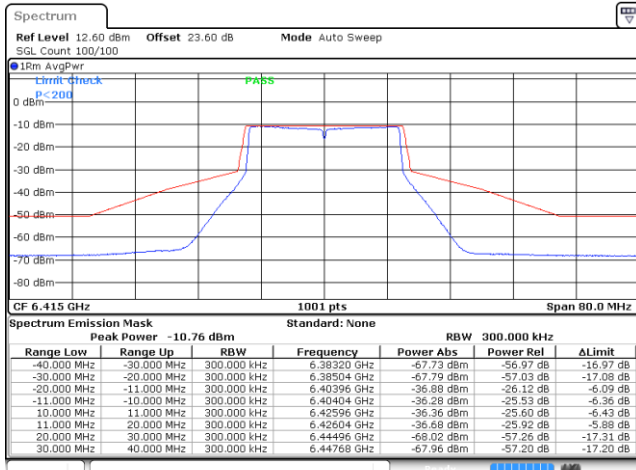
Date: 24 SEP.2021 22:49:40

Plot on Channel 6175MHz



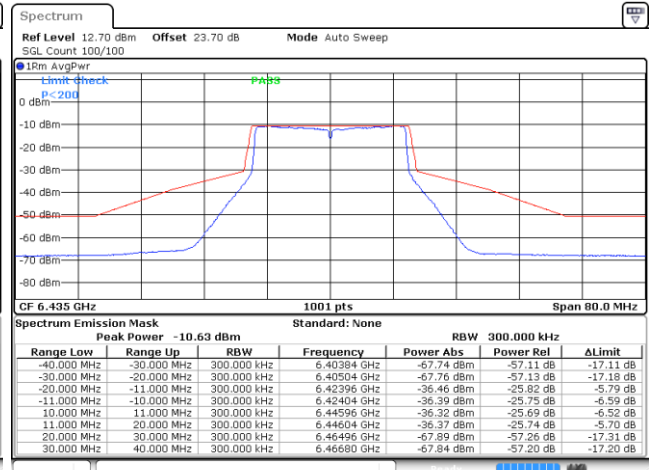
Date: 24 SEP.2021 23:19:05

Plot on Channel 6415MHz



Date: 24 SEP.2021 23:43:31

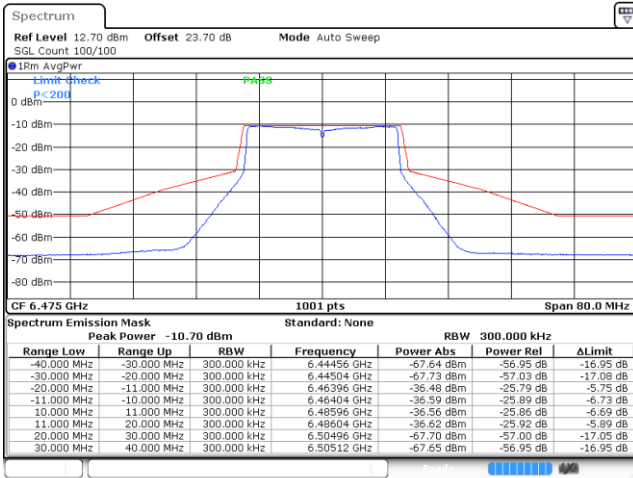
Plot on Channel 6435MHz



Date: 25 SEP.2021 00:10:16

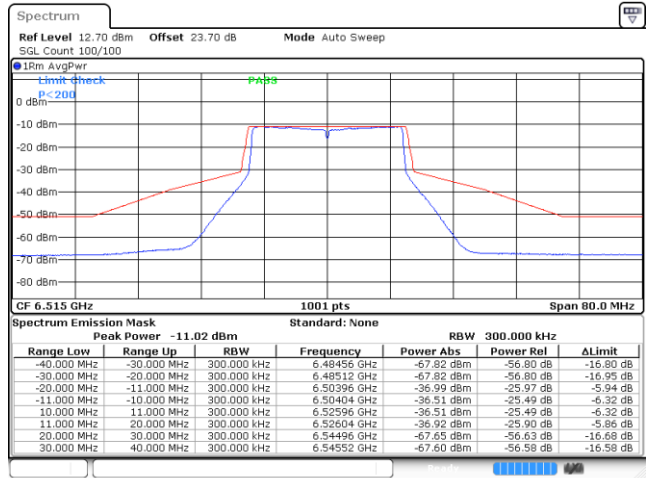


Plot on Channel 6475MHz



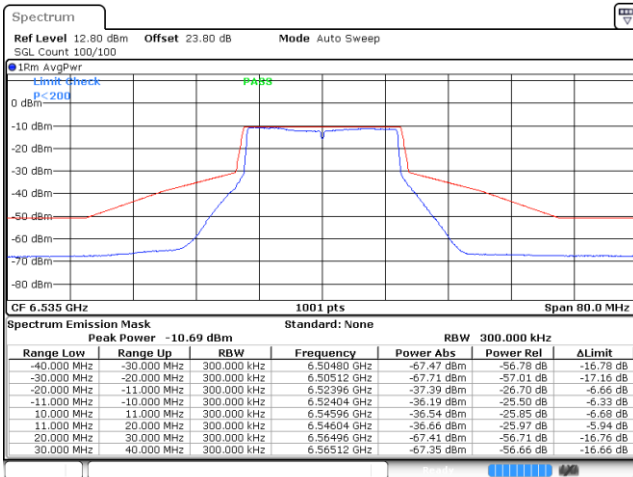
Date: 25.SEP.2021 00:27:46

Plot on Channel 6515MHz



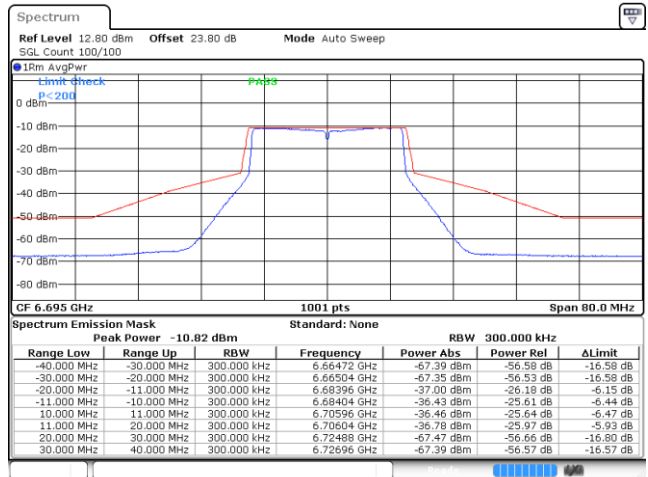
Date: 25.SEP.2021 01:16:19

Plot on Channel 6535MHz



Date: 25.SEP.2021 01:33:11

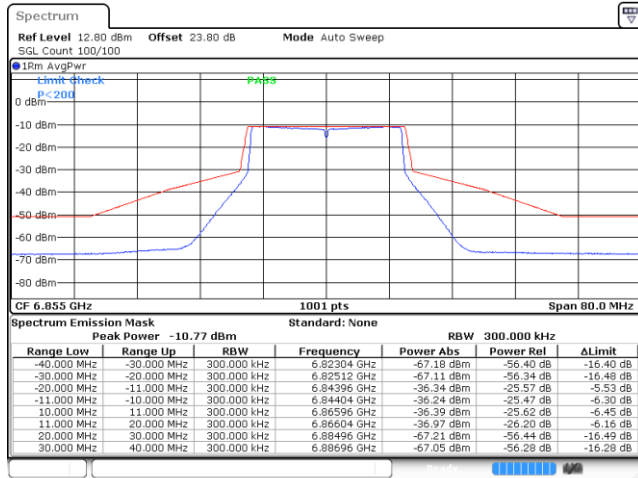
Plot on Channel 6695MHz



Date: 25.SEP.2021 01:51:49

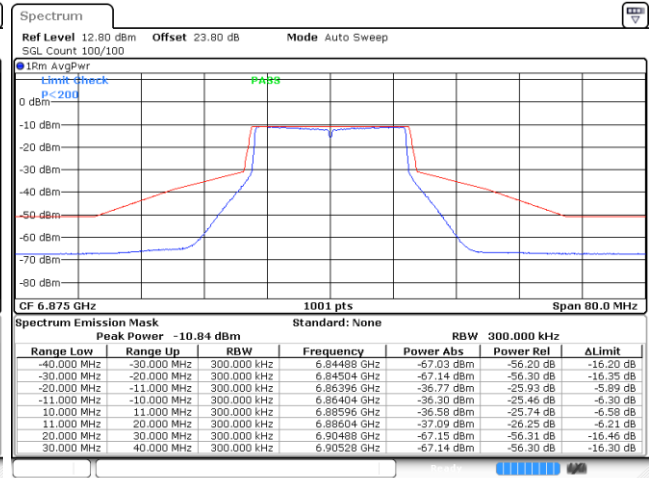


Plot on Channel 6855MHz



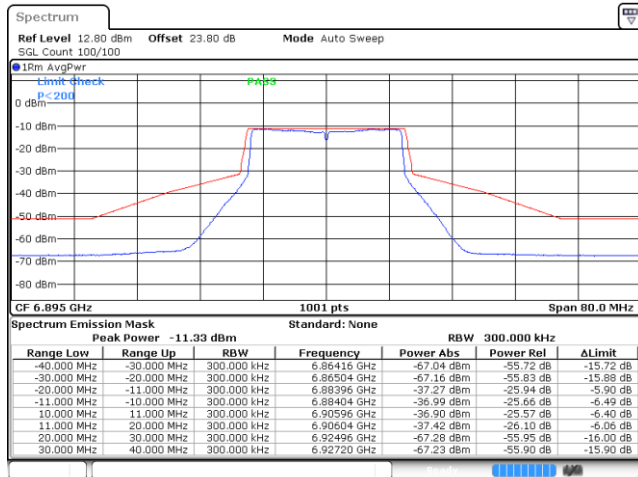
Date: 25.SEP.2021 02:06:08

Plot on Channel 6875MHz



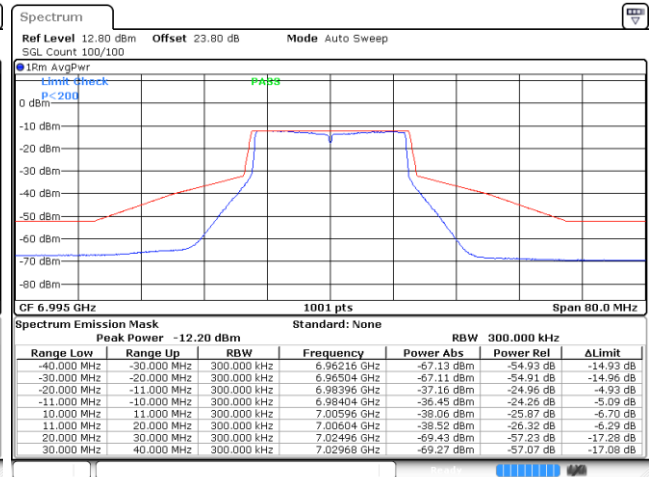
Date: 25.SEP.2021 02:25:55

Plot on Channel 6895MHz



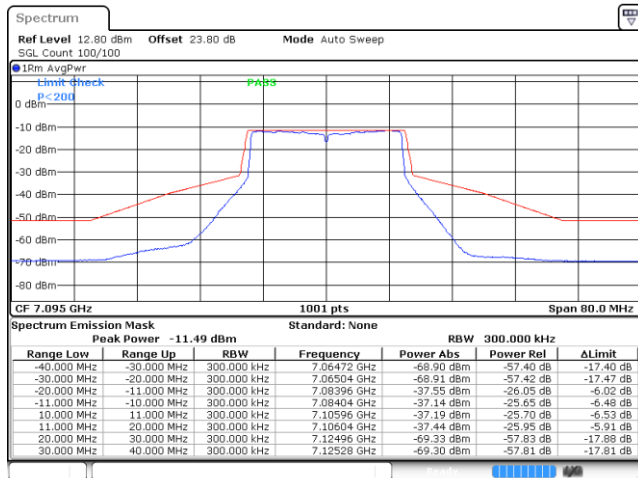
Date: 27.SEP.2021 18:53:43

Plot on Channel 6995MHz



Date: 30.SEP.2021 19:19:16

Plot on Channel 7095MHz

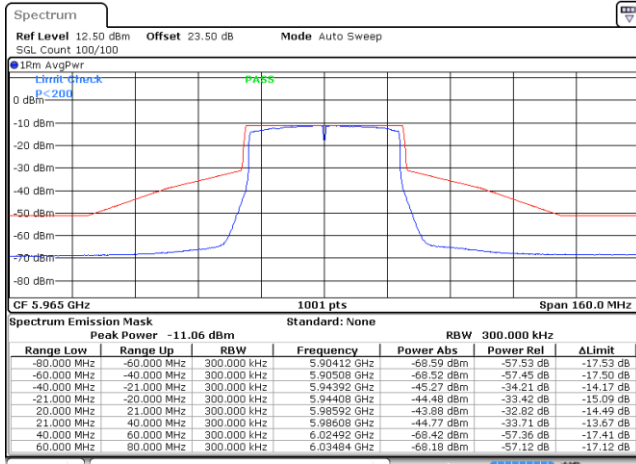


Date: 30.SEP.2021 19:49:52



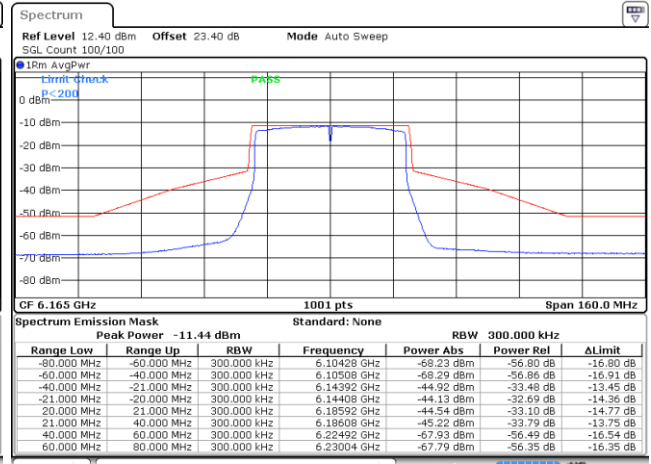
EUT Mode : 802.11ax HE40

Plot on Channel 5965MHz



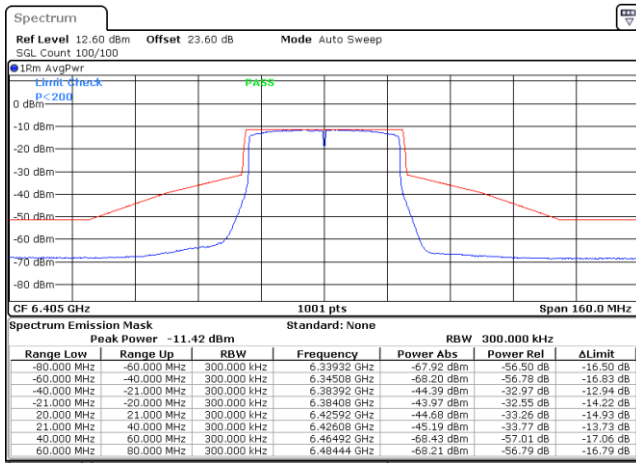
Date: 30 SEP.2021 20:32:33

Plot on Channel 6165MHz



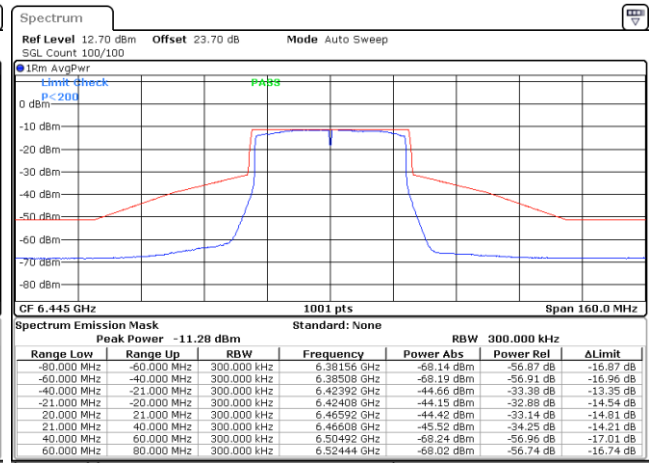
Date: 30 SEP.2021 20:48:33

Plot on Channel 6405MHz



Date: 30 SEP.2021 21:01:55

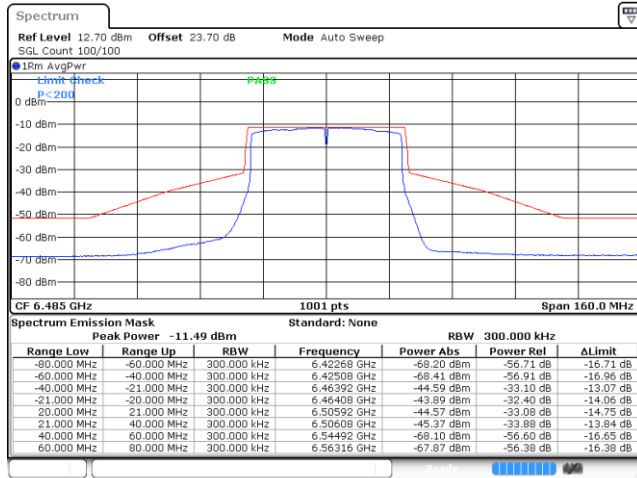
Plot on Channel 6445MHz



Date: 30 SEP.2021 22:37:02

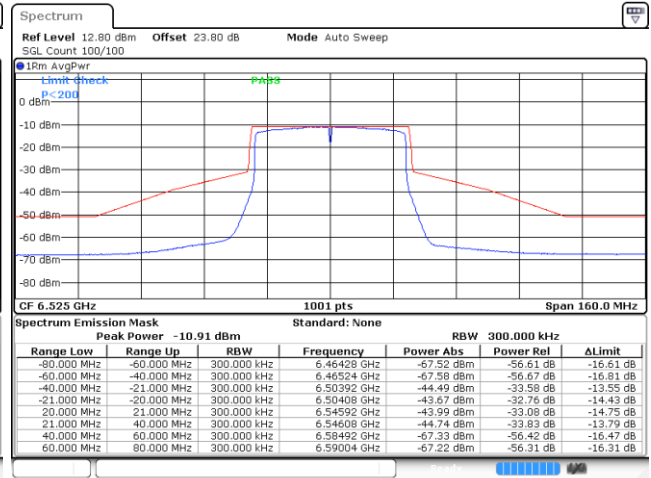


Plot on Channel 6485MHz



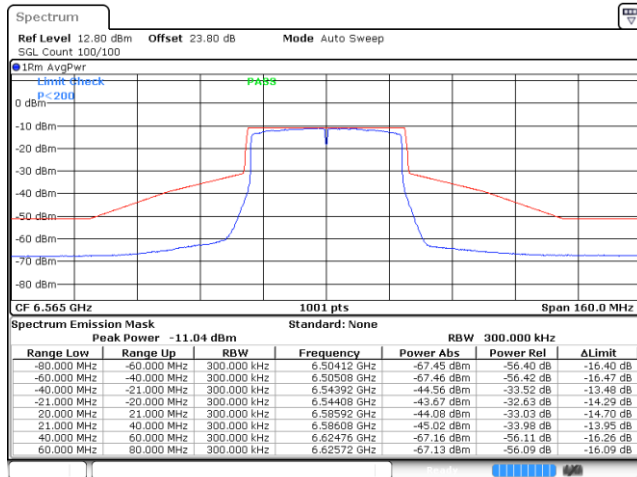
Date: 30 SEP.2021 22:50:49

Plot on Channel 6525MHz



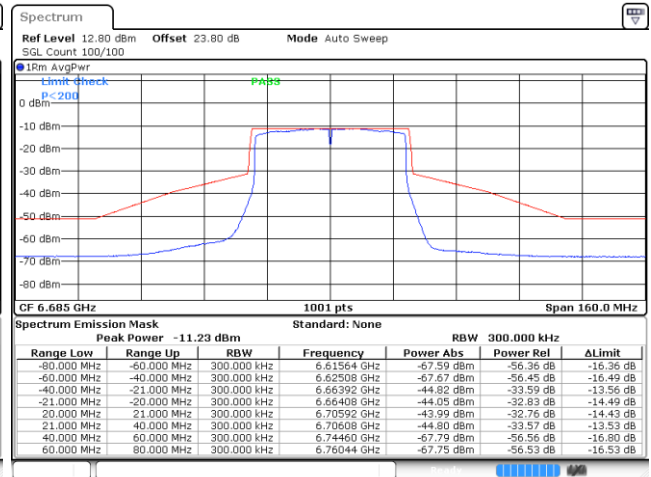
Date: 30 SEP.2021 23:03:42

Plot on Channel 6565MHz



Date: 30 SEP.2021 23:19:16

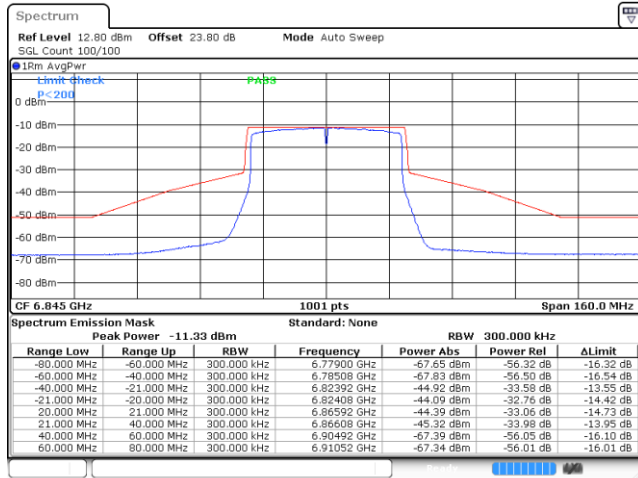
Plot on Channel 6685MHz



Date: 30 SEP.2021 23:34:56

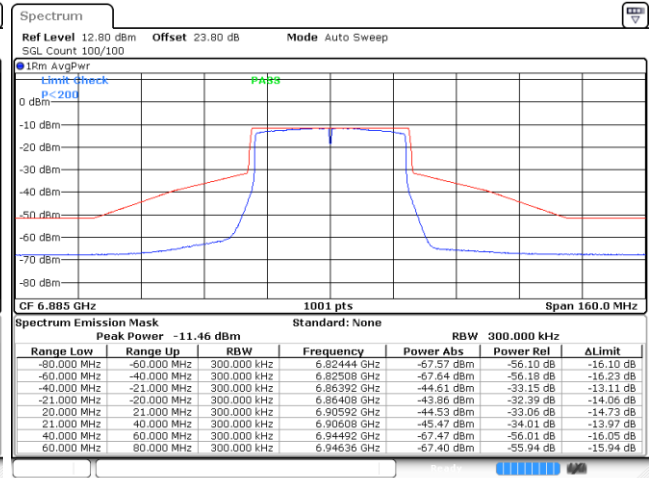


Plot on Channel 6845MHz



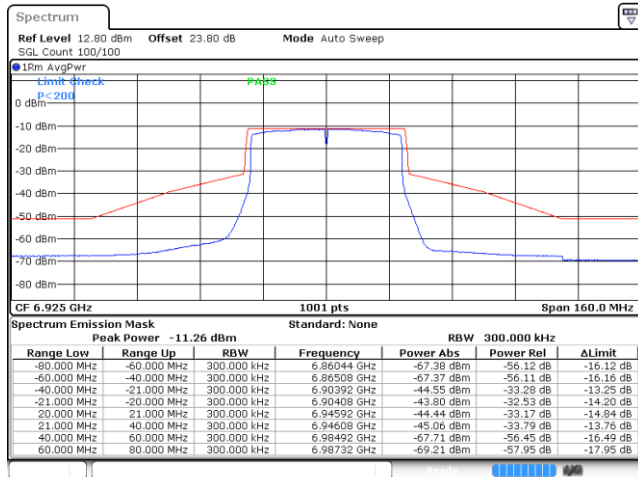
Date: 30 SEP.2021 23:51:18

Plot on Channel 6885MHz



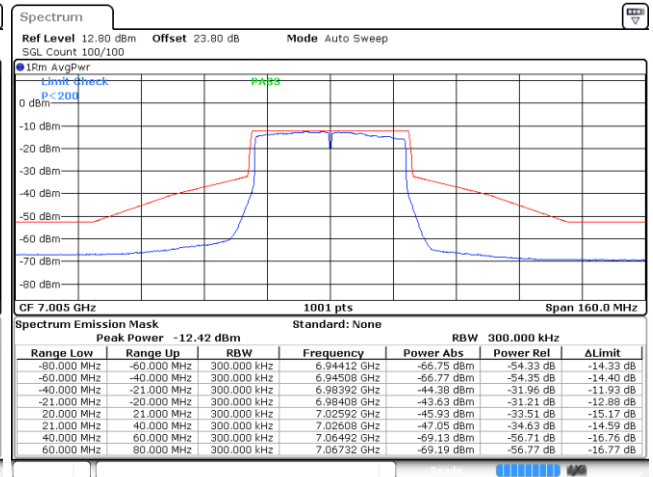
Date: 1.OCT.2021 00:05:39

Plot on Channel 6925MHz



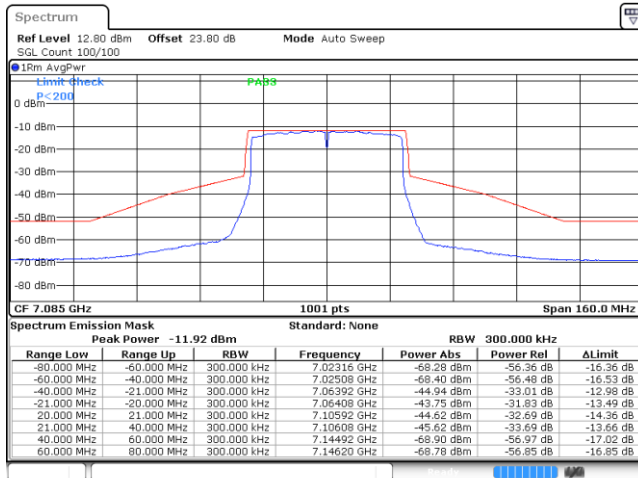
Date: 1.OCT.2021 00:21:05

Plot on Channel 7005MHz



Date: 1.OCT.2021 00:35:24

Plot on Channel 7085MHz

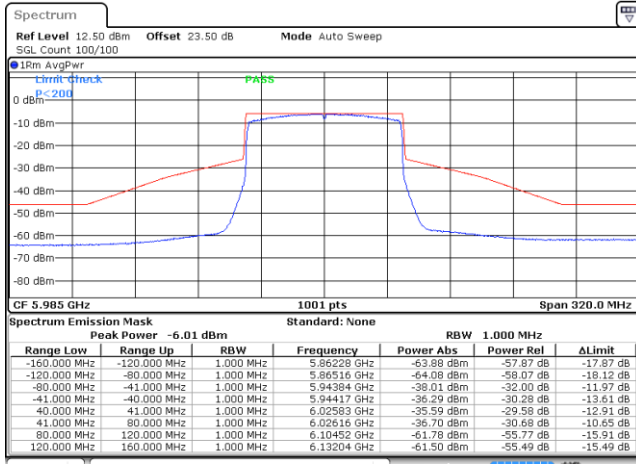


Date: 1.OCT.2021 00:48:58



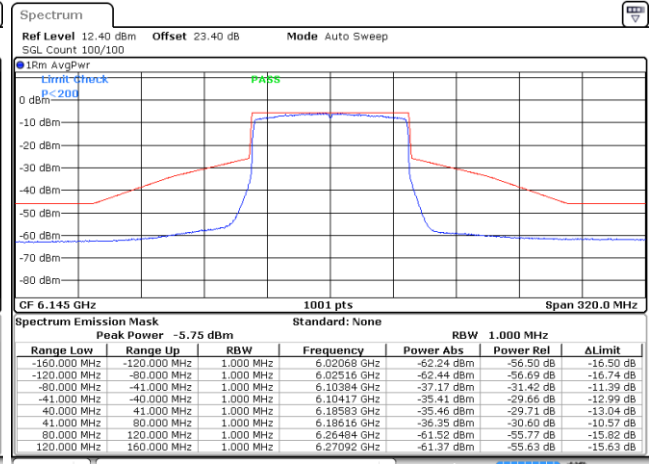
EUT Mode : 802.11ax HE80

Plot on Channel 5985MHz



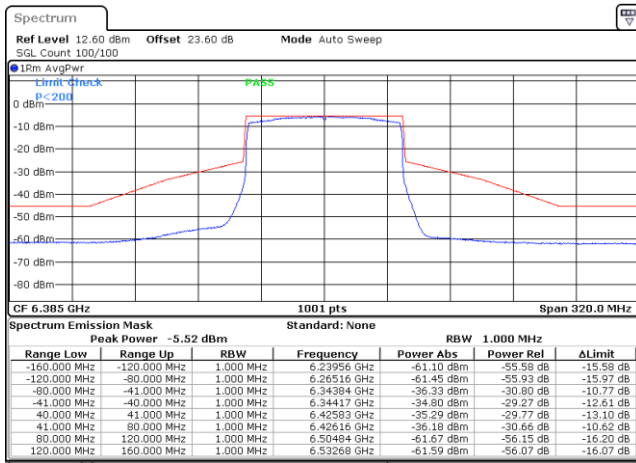
Date: 1.OCT.2021 01:05:34

Plot on Channel 6145MHz



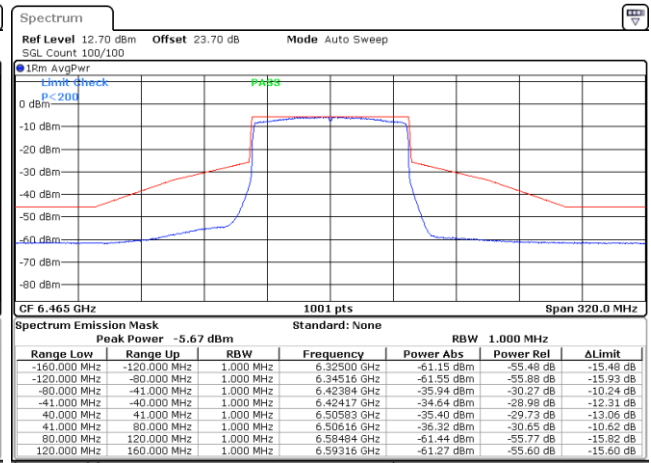
Date: 1.OCT.2021 01:18:57

Plot on Channel 6385MHz



Date: 1.OCT.2021 01:35:32

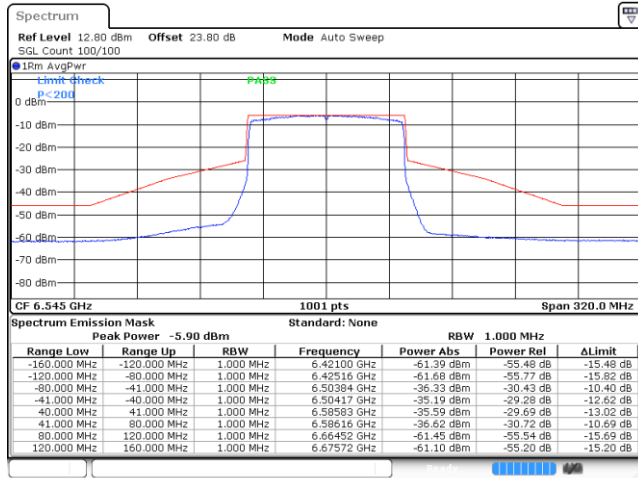
Plot on Channel 6465MHz



Date: 1.OCT.2021 01:48:58

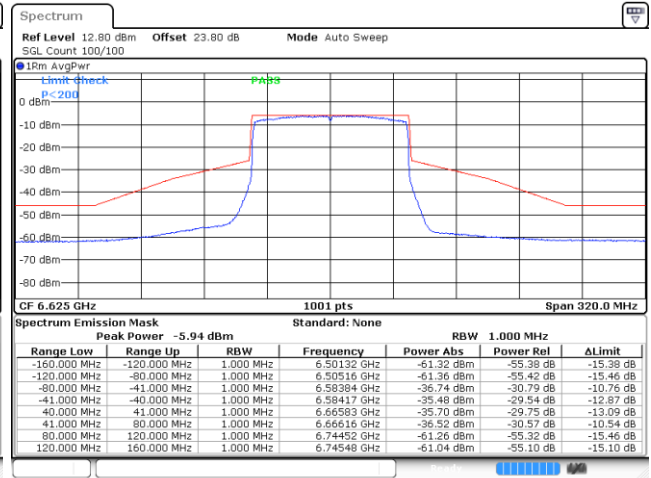


Plot on Channel 6545MHz



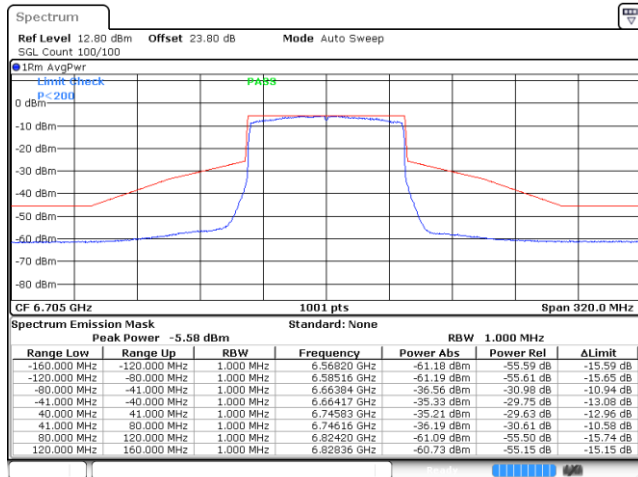
Date: 1.OCT.2021 02:06:31

Plot on Channel 6625MHz



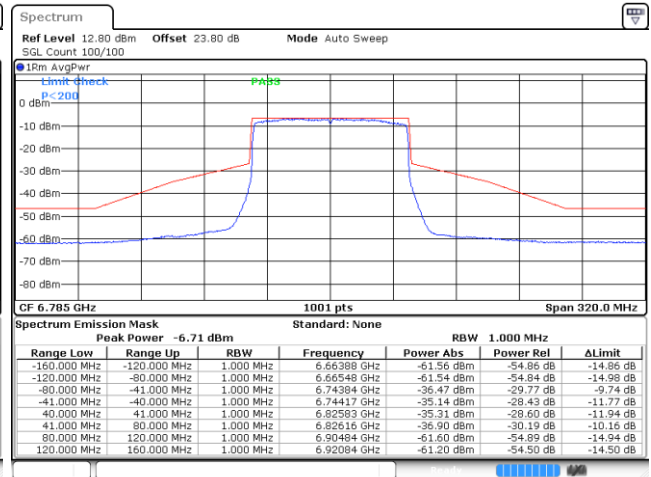
Date: 1.OCT.2021 02:17:47

Plot on Channel 6705MHz



Date: 1.OCT.2021 18:52:48

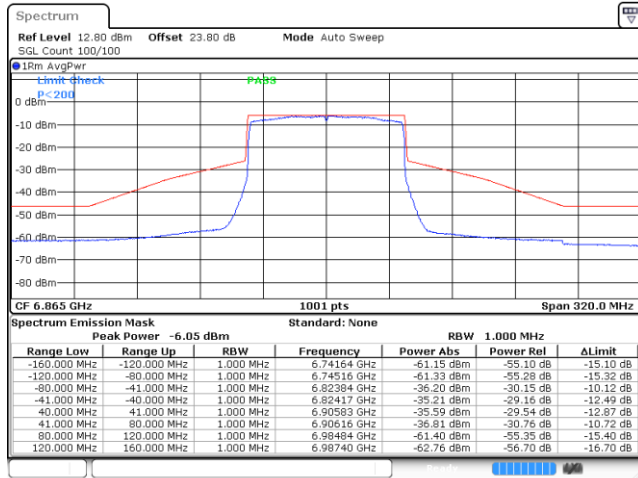
Plot on Channel 6785MHz



Date: 1.OCT.2021 19:08:00

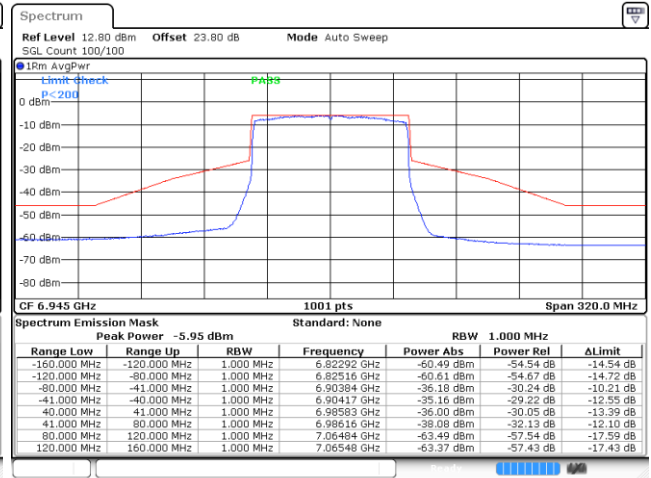


Plot on Channel 6865MHz



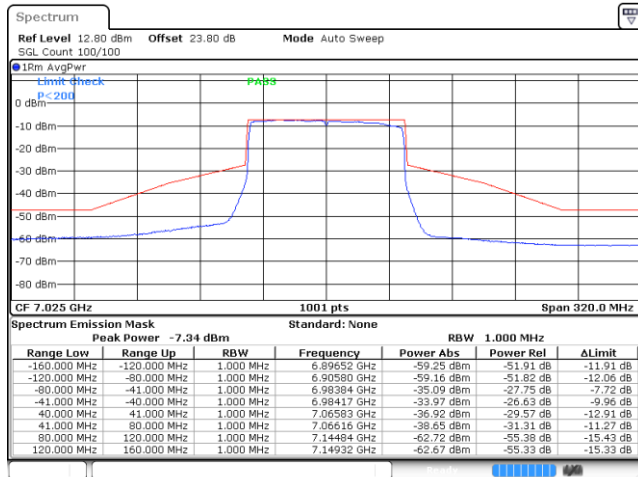
Date: 1.OCT.2021 19:23:40

Plot on Channel 6945MHz



Date: 1.OCT.2021 19:40:45

Plot on Channel 7025MHz

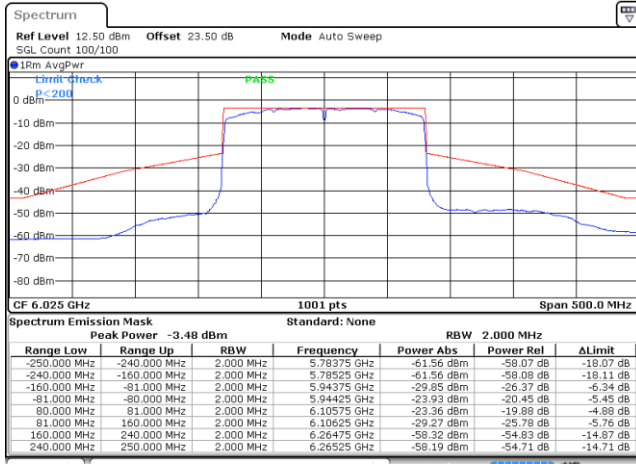


Date: 1.OCT.2021 19:58:16



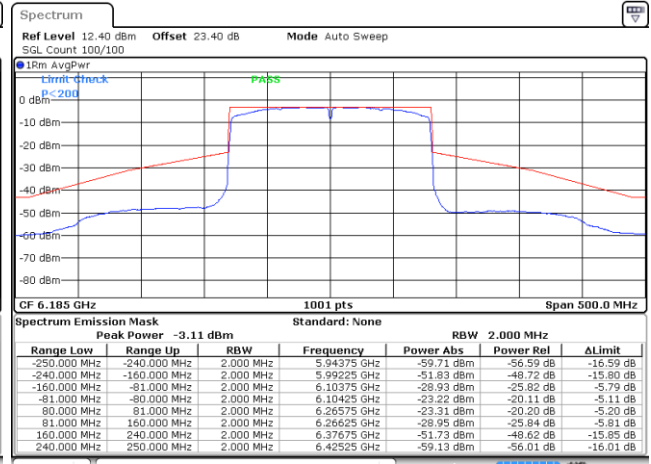
EUT Mode : 802.11ax HE160

Plot on Channel 6025MHz



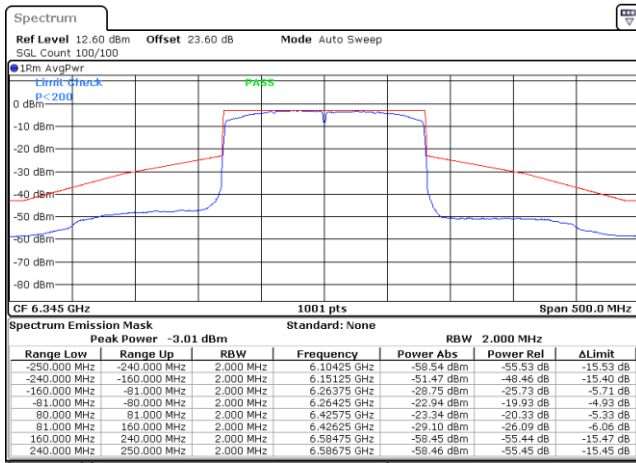
Date: 1.OCT.2021 20:19:58

Plot on Channel 6185MHz



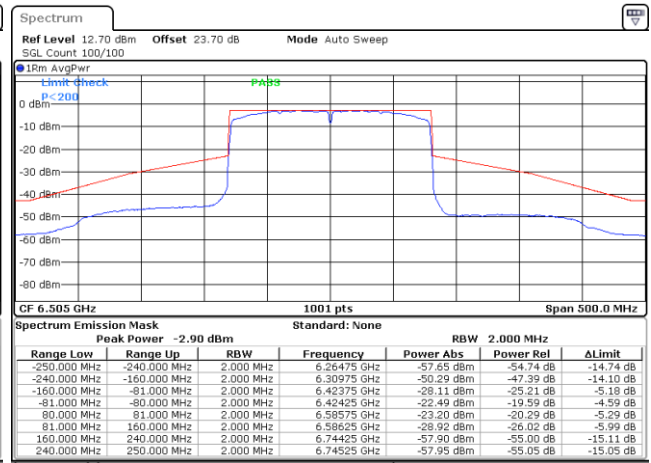
Date: 1.OCT.2021 20:38:21

Plot on Channel 6345MHz



Date: 1.OCT.2021 20:51:52

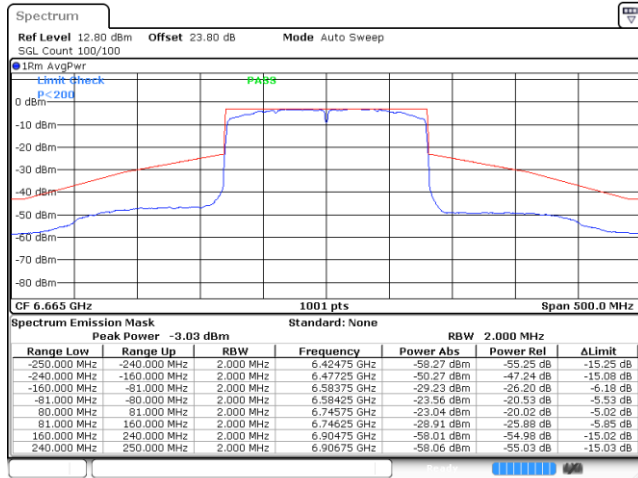
Plot on Channel 6505MHz



Date: 1.OCT.2021 21:04:03

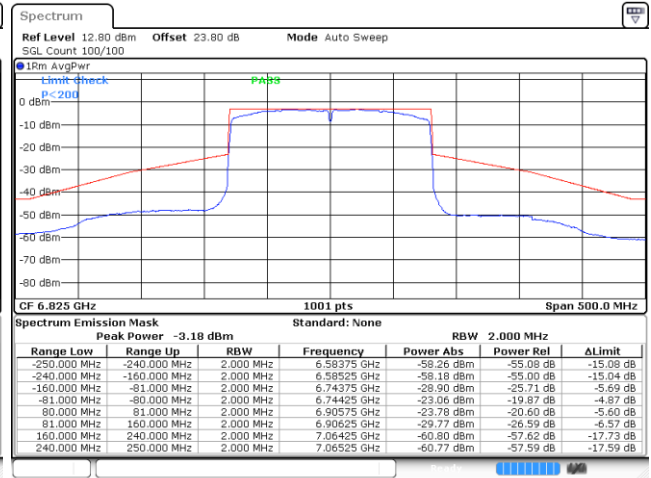


Plot on Channel 6665MHz



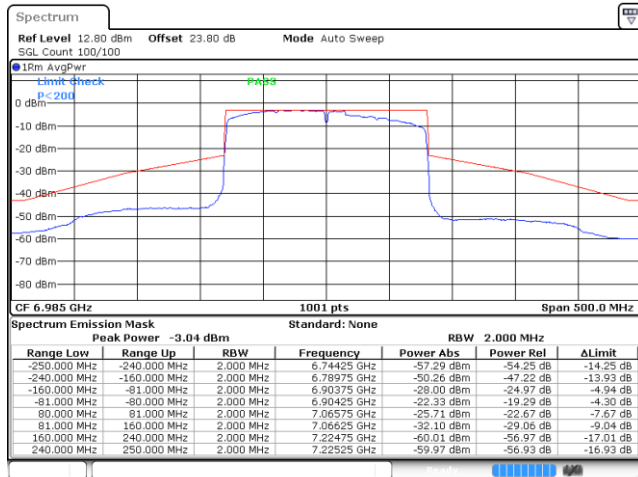
Date: 1.OCT.2021 22:43:09

Plot on Channel 6825MHz



Date: 1.OCT.2021 23:03:14

Plot on Channel 6985MHz



Date: 1.OCT.2021 23:20:07



3.5 Contention Based Protocol

3.5.1 Limit of Contention Based Protocol

<FCC 14-30 CFR 15.407>

(d)(6) Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band must employ a contention-based protocol.

FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel and stay off the channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm). The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain. To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

Table 1. Criteria to determine number of times detection threshold test may be performed

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)
$BW_{Inc} < BW_{EUT} \leq 2BW_{Inc}$	Once	Incumbent transmission is contained within BW_{EUT}
$2BW_{Inc} < BW_{EUT} \leq 4BW_{Inc}$	Twice. Incumbent transmission is contained within BW_{EUT}	Incumbent transmission is located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel
$BW_{EUT} > 4BW_{Inc}$	Three times	Incumbent transmission is located as closely as possible to the lower edge of the EUT channel, in the middle of EUT channel, and as closely as possible to the upper edge of the EUT channel

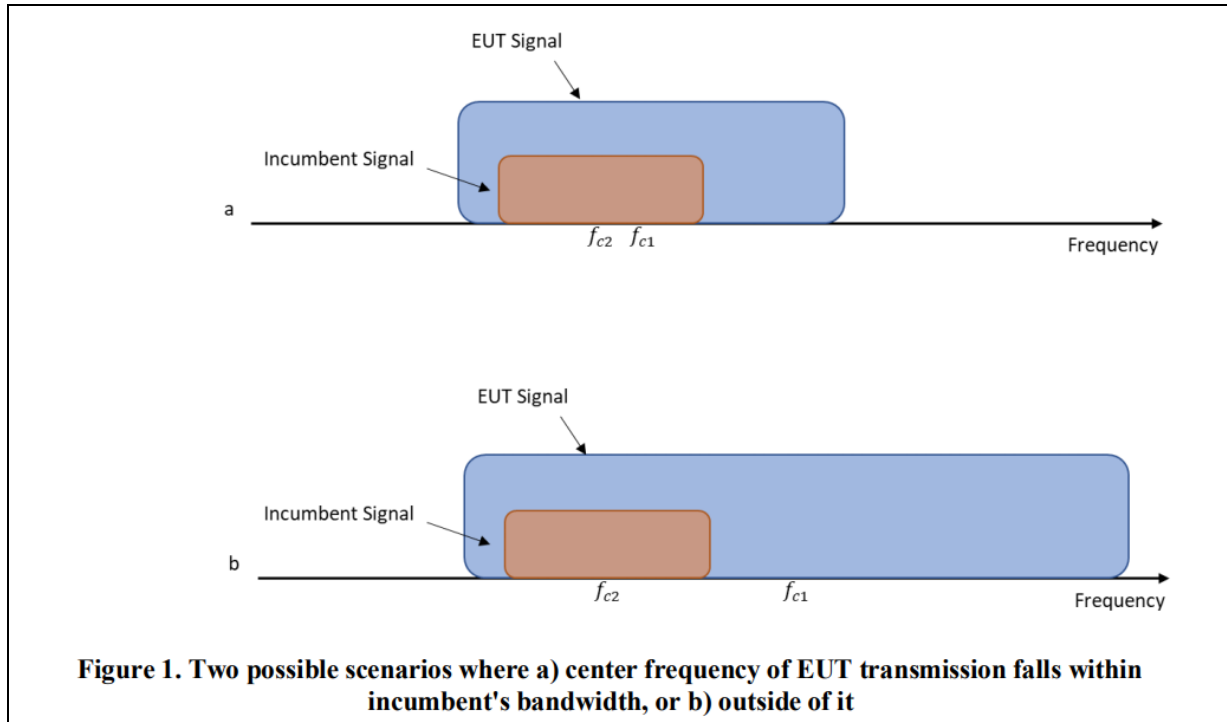
where:

BW_{EUT} : Transmission bandwidth of EUT signal

BW_{Inc} : Transmission bandwidth of the simulated incumbent signal (10 MHz wide AWGN signal)

f_{c1} : Center frequency of EUT transmission

f_{c2} : Center frequency of simulated incumbent signal



3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

The testing follows FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01.

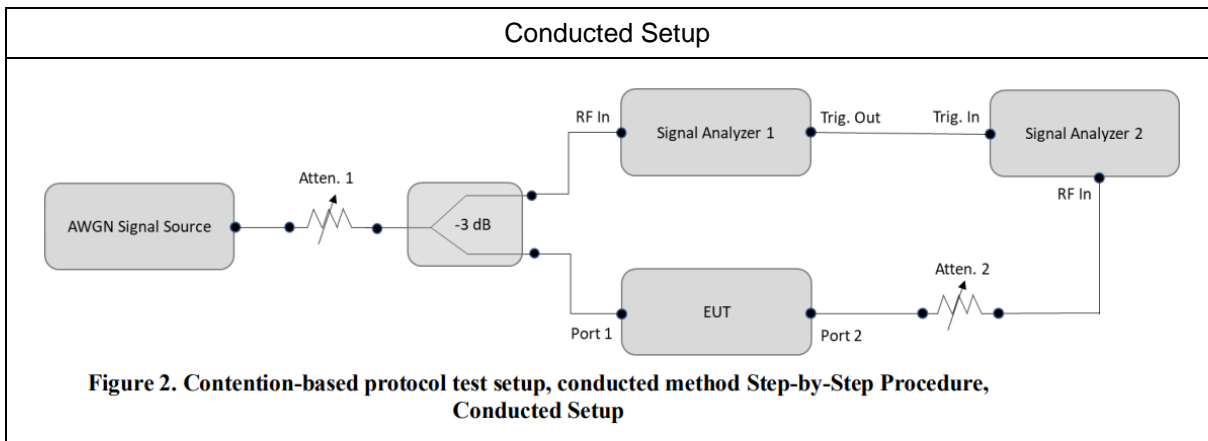
Section I) Contention Based Protocol

Conducted method Step-by-Step Procedure, Conducted Setup

1. Configure the EUT to transmit with a constant duty cycle.
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
3. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT.
4. Connect the output port of the EUT to the signal analyzer 2, as shown in test setup Figure 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
5. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
6. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
7. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in test setup Figure 2.
8. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.

9. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
10. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
11. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.
12. For the contention-based protocol test where only one channel in each supported sub-band needs to be tested. The narrowest and widest bandwidth in each channel shall be measured EUT was driven in MIMO mode, the interferer level was injected to both chains to monitor the performance, while the interferer level is determined according the lowest antenna gain among both antennas (i.e, lower interferer level).

3.5.4 Test Setup



3.5.5 Support Unit used in test configuration and system

Instrument	Brand Name	Model No.	Characteristics
WLAN AP (Client)	MSI	MS-17F3	Wifi
Notebook	HP	Pavilion 15t-cu000	LAN



3.5.6 Test Summary of Contention Based Protocol Test

Test Engineer :	Andy Kao	Temperature :	20.5~22.5°C
		Relative Humidity :	40.5~43.5%

Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Incumbent signal level (dBm)	Detection Rate (%)	Regulated Threshold Level (dBm)	Compensated Threshold Level (dBm)	Margin (dB)	Test result
UNII Band 5	6135	20	6135	-65.17	100	-62	-58.3	6.87	Stop Transmission
				-66.17	< 90	-62	-58.3	7.87	Didn't Stop Transmission
	6185	160	6110	-62.43	100	-62	-58.3	4.13	Stop Transmission
				-63.43	< 90	-62	-58.3	5.13	Didn't Stop Transmission
			6185	-62.18	100	-62	-58.3	3.88	Stop Transmission
				-63.18	< 90	-62	-58.3	4.88	Didn't Stop Transmission
			6260	-63.87	100	-62	-58.3	5.57	Stop Transmission
				-64.87	< 90	-62	-58.3	6.57	Didn't Stop Transmission
UNII Band 6	6455	20	6455	-64.85	100	-62	-58.3	6.55	Stop Transmission
				-65.85	< 90	-62	-58.3	7.55	Didn't Stop Transmission
	6505	160	6430	-61.94	100	-62	-58.3	3.64	Stop Transmission
				-62.94	< 90	-62	-58.3	4.64	Didn't Stop Transmission
			6505	-60.33	100	-62	-58.3	2.03	Stop Transmission
				-61.33	< 90	-62	-58.3	3.03	Didn't Stop Transmission
			6580	-62.06	100	-62	-58.3	3.76	Stop Transmission
				-63.06	< 90	-62	-58.3	4.76	Didn't Stop Transmission



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Incumbent signal level (dBm)	Detection Rate (%)	Regulated Threshold Level (dBm)	Compensated Threshold Level (dBm)	Margin (dB)	Test result	
UNII Band 7	6695	20	6695	-64.23	100	-62	-58.3	5.93	Stop Transmission	
				-65.23	< 90	-62	-58.3	6.93	Didn't Stop Transmission	
	6665	160	6590	-60.39	100	-62	-58.3	2.09	Stop Transmission	
				-61.39	< 90	-62	-58.3	3.09	Didn't Stop Transmission	
			6665	-58.86	100	-62	-58.3	0.56	Stop Transmission	
				-59.86	< 90	-62	-58.3	1.56	Didn't Stop Transmission	
			6740	-62.14	100	-62	-58.3	3.84	Stop Transmission	
				-63.14	< 90	-62	-58.3	4.84	Didn't Stop Transmission	
	UNII Band 8	7015	20	7015	-64.37	100	-62	-58.3	6.07	Stop Transmission
					-65.37	< 90	-62	-58.3	7.07	Didn't Stop Transmission
6985		160	6910	-61.41	100	-62	-58.3	3.11	Stop Transmission	
				-62.41	< 90	-62	-58.3	4.11	Didn't Stop Transmission	
			6985	-60.93	100	-62	-58.3	2.63	Stop Transmission	
				-61.93	< 90	-62	-58.3	3.63	Didn't Stop Transmission	
			7060	-62.72	100	-62	-58.3	4.42	Stop Transmission	
				-63.72	< 90	-62	-58.3	5.42	Didn't Stop Transmission	

Note:

The FCC requirement of the detection limit is -62 dBm which associates, and for this application the detection threshold is modified according to the minimum antenna gain across U-NII-5 to U-NII-8.

Compensated Threshold Level (TL) = -62dBm + minimum antenna gain

Minimum antenna gain = 3.7 dBi

Compensated Threshold Level (TL) = -62 + 3.7 = -58.3 dBm

Margin = Compensated Threshold Level (TL) - Incumbent signal level