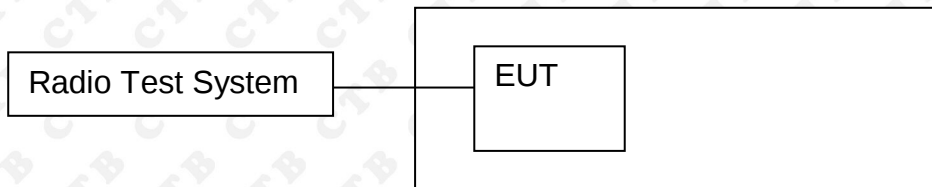


9. COUDUCTED OUTPUT POWER

9.1 Block Diagram Of Test Setup



9.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

9.3 Test procedure

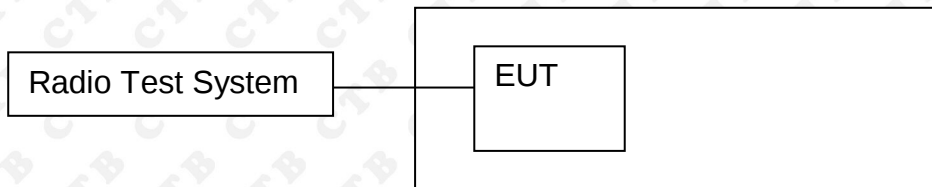
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1MHz. VBW = 3MHz. Sweep = auto; Detector Function = Peak. Channel power function is used
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

9.4 Test Result

Mode	Channel.	Maximum Output Power [dBm] ant 1	Maximum Output Power [dBm] ant 2	Total Power Conducted Output Power(PK)	Limit[dBm]
802.11b	LCH	7.478	7.786	/	30
	MCH	7.42	8.018	/	30
	HCH	7.233	7.736	/	30
802.11g	LCH	6.524	6.625	/	30
	MCH	6.473	6.984	/	30
	HCH	6.44	6.859	/	30
802.11n(HT20)	LCH	6.465	6.142	9.32	30
	MCH	6.387	6.546	9.48	30
	HCH	6.463	6.388	9.44	30
802.11n(HT40)	LCH	5.175	5.55	8.38	30
	MCH	5.575	5.703	8.65	30
	HCH	5.62	5.816	8.73	30

10. 6DB OCCUPIED BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

10.3 Test procedure

1. Rem1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

10.4 Test Result

ANT1:

Test Mode	Frequency	6dB Bandwidth (MHz)	Limit(kHz)	Result
802.11b	LCH	10.673	500	PASS
	MCH	11.063	500	PASS
	HCH	10.206	500	PASS
802.11g	LCH	16.361	500	PASS
	MCH	16.359	500	PASS
	HCH	16.357	500	PASS
802.11n(HT20)	LCH	17.61	500	PASS
	MCH	17.595	500	PASS
	HCH	17.565	500	PASS
802.11n(HT40)	LCH	36.378	500	PASS
	MCH	36.327	500	PASS
	HCH	36.111	500	PASS

ANT2:

Test Mode	Frequency	6dB Bandwidth (MHz)	Limit(kHz)	Result
802.11b	LCH	9.951	500	PASS
	MCH	10.094	500	PASS
	HCH	11.062	500	PASS
802.11g	LCH	16.343	500	PASS
	MCH	16.381	500	PASS
	HCH	16.337	500	PASS
802.11n(HT20)	LCH	17.339	500	PASS
	MCH	17.602	500	PASS
	HCH	17.591	500	PASS
802.11n(HT40)	LCH	36.317	500	PASS
	MCH	36.378	500	PASS
	HCH	36.34	500	PASS

ANT1:
Test Graph:

Graphs

802.11b /LCH

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.412000000 GHz

Ref Offset 6.91 dB
Ref 26.91 dBm

Mkr3 2.417351 GHz
-16.668 dBm

Center 2.412 GHz
#Res BW 100 kHz

#VBW 300 kHz

Span 30 MHz
Sweep 2.933 ms

Occupied Bandwidth	Total Power	9.17 dBm
14.746 MHz		
Transmit Freq Error	14.400 kHz	OBW Power
x dB Bandwidth	10.67 MHz	x dB
		-6.00 dB

802.11b /MCH

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.437000000 GHz

Ref Offset 6.96 dB
Ref 26.96 dBm

Mkr3 2.442518 GHz
-15.837 dBm

Center 2.437 GHz
#Res BW 100 kHz

#VBW 300 kHz

Span 30 MHz
Sweep 2.933 ms

Occupied Bandwidth	Total Power	9.23 dBm
14.777 MHz		
Transmit Freq Error	-13.736 kHz	OBW Power
x dB Bandwidth	11.06 MHz	x dB
		-6.00 dB

802.11b/HCH

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.462000000 GHz

Ref Offset 6.96 dB
Ref 26.96 dBm

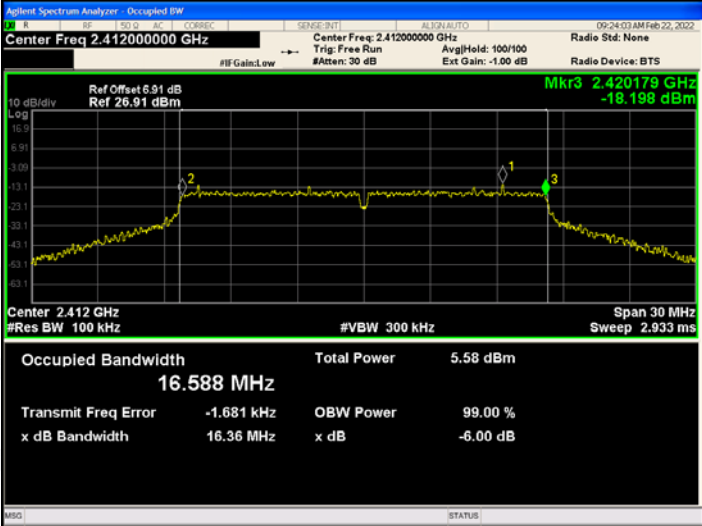
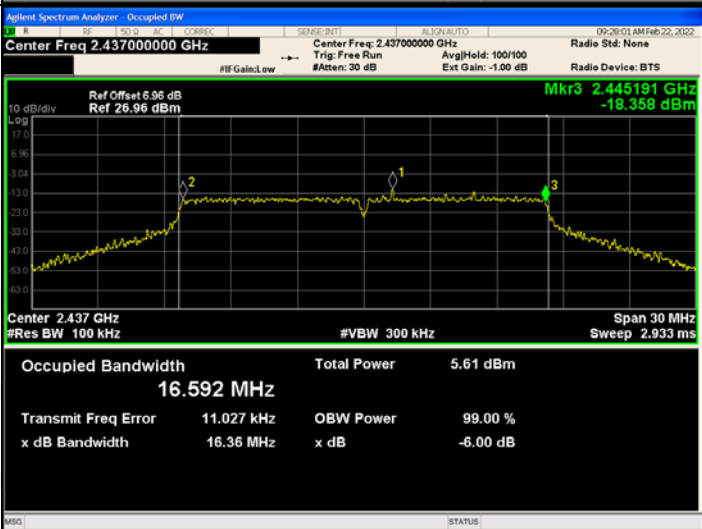
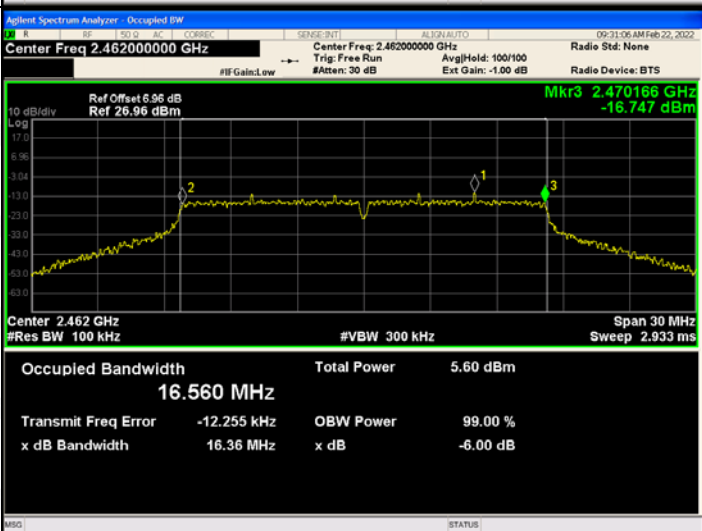
Mkr3 2.467095 GHz
-16.280 dBm

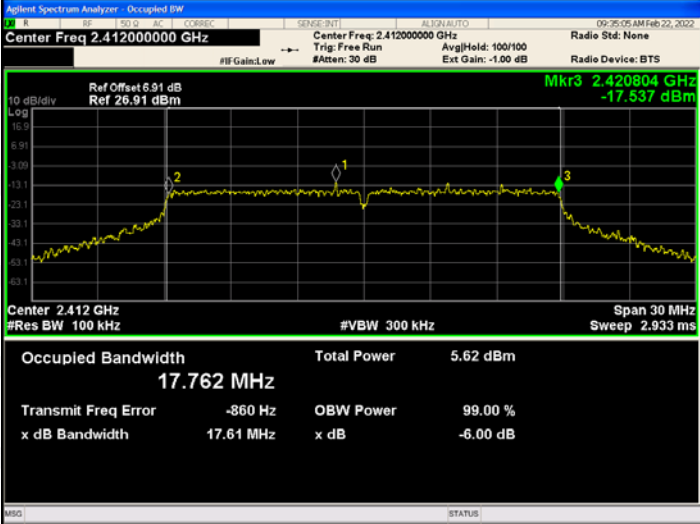
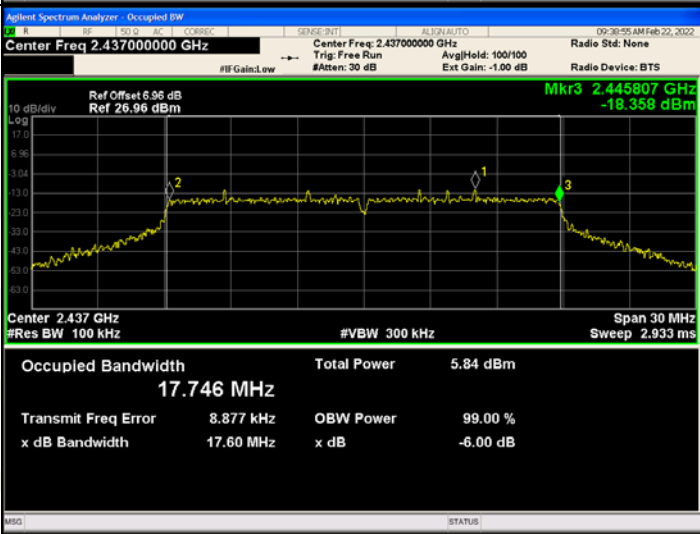
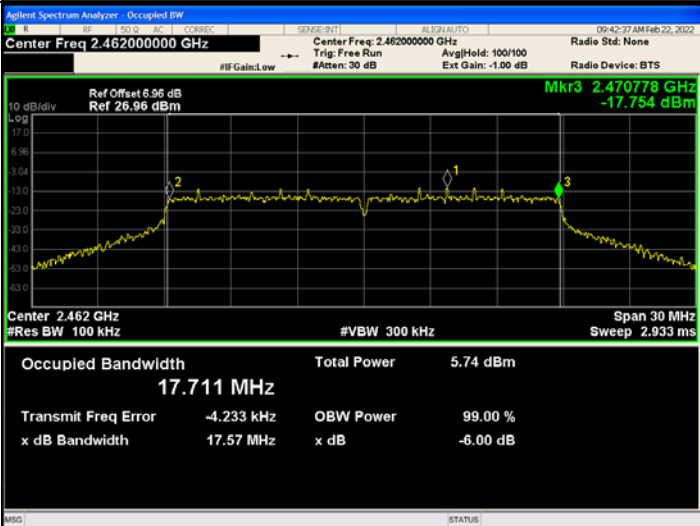
Center 2.462 GHz
#Res BW 100 kHz

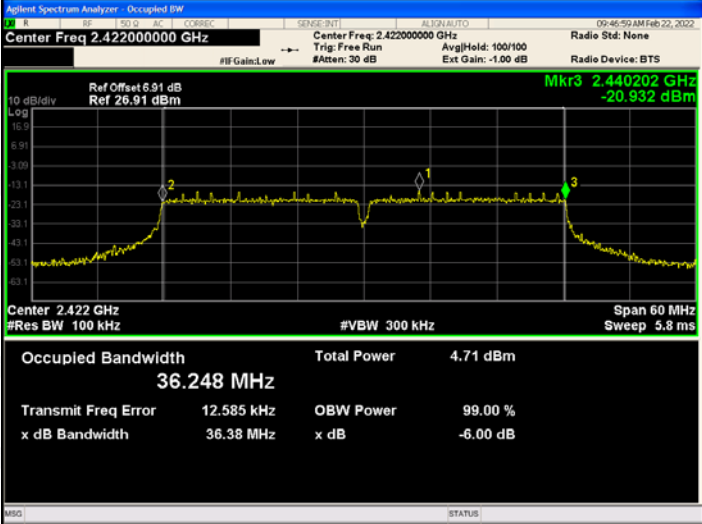
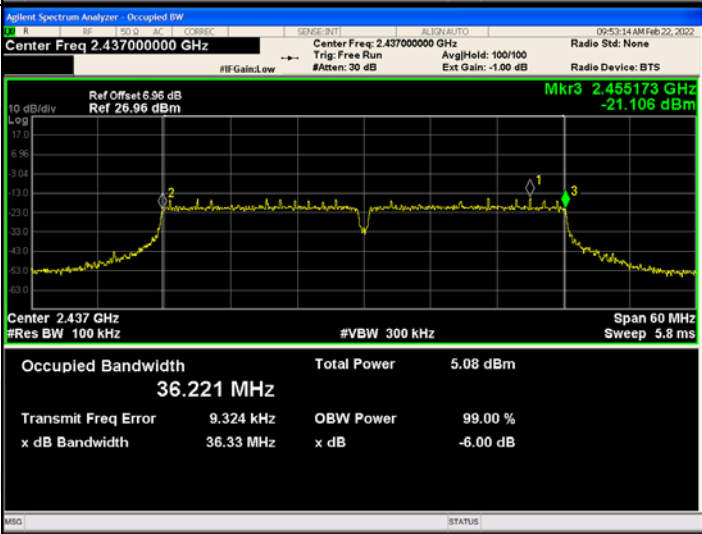
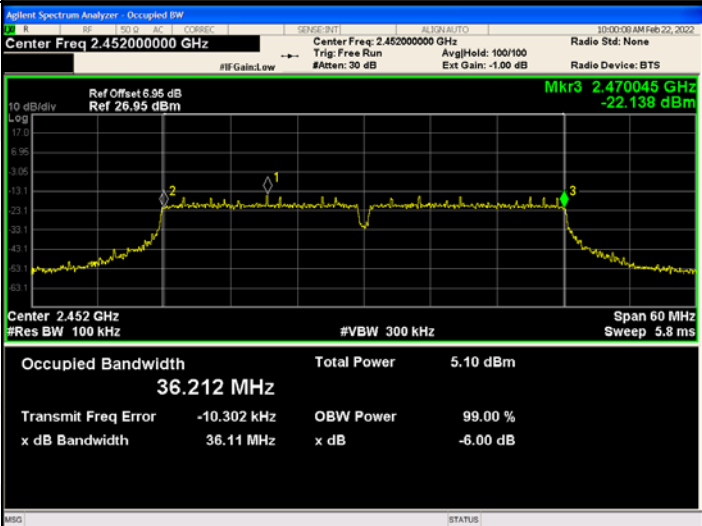
#VBW 300 kHz

Span 30 MHz
Sweep 2.933 ms

Occupied Bandwidth	Total Power	9.08 dBm
14.732 MHz		
Transmit Freq Error	-7.913 kHz	OBW Power
x dB Bandwidth	10.21 MHz	x dB
		-6.00 dB

802.11g/LCH	
802.11g/MCH	
802.11g/HCH	

802.11n(HT20)/LC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.41200000 GHz Ref Offset 6.91 dB Ref 26.91 dBm Mkr3 2.420804 GHz -17.537 dBm Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.762 MHz Total Power 5.62 dBm Transmit Freq Error -860 Hz OBW Power 99.00 % x dB Bandwidth 17.61 MHz x dB -6.00 dB
802.11n(HT20)/MC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.43700000 GHz Ref Offset 6.96 dB Ref 26.96 dBm Mkr3 2.445807 GHz -18.358 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.746 MHz Total Power 5.84 dBm Transmit Freq Error 8.877 kHz OBW Power 99.00 % x dB Bandwidth 17.60 MHz x dB -6.00 dB
802.11n(HT20)/HC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.46200000 GHz Ref Offset 6.96 dB Ref 26.96 dBm Mkr3 2.470778 GHz -17.754 dBm Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.711 MHz Total Power 5.74 dBm Transmit Freq Error -4.233 kHz OBW Power 99.00 % x dB Bandwidth 17.57 MHz x dB -6.00 dB

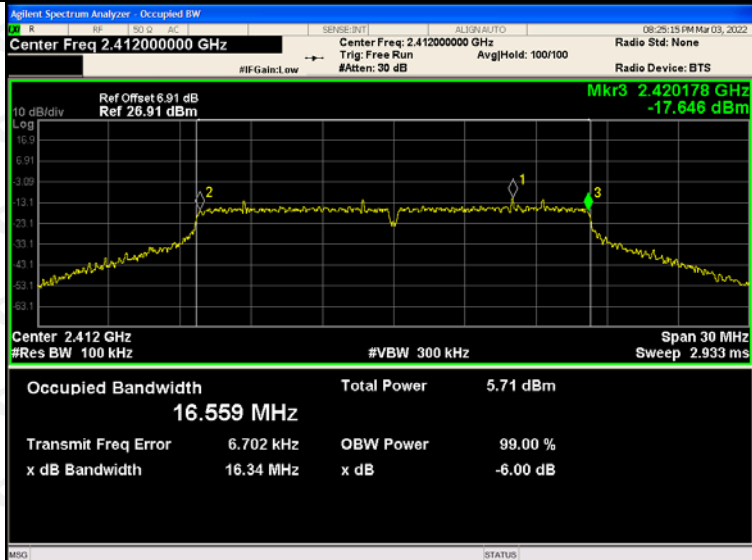
802.11n(HT40)/LC H	
802.11n(HT40)/MC H	
802.11n(HT40)/HC H	

ANT2:

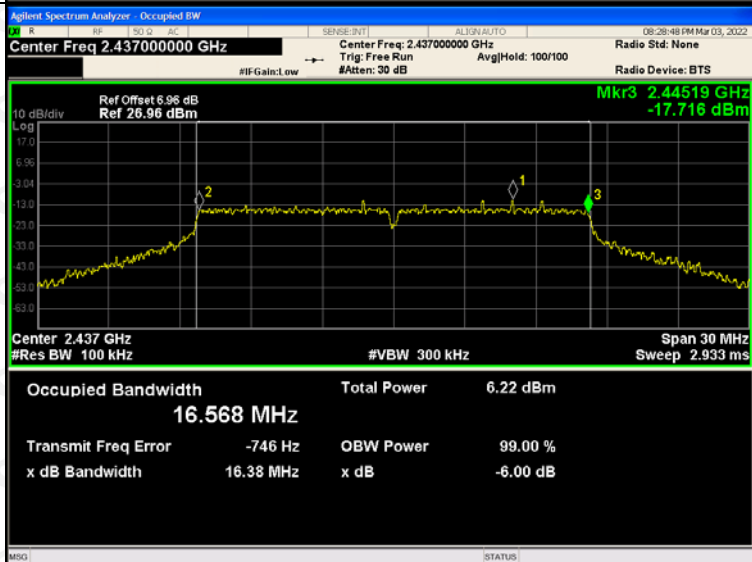
Test Graph:



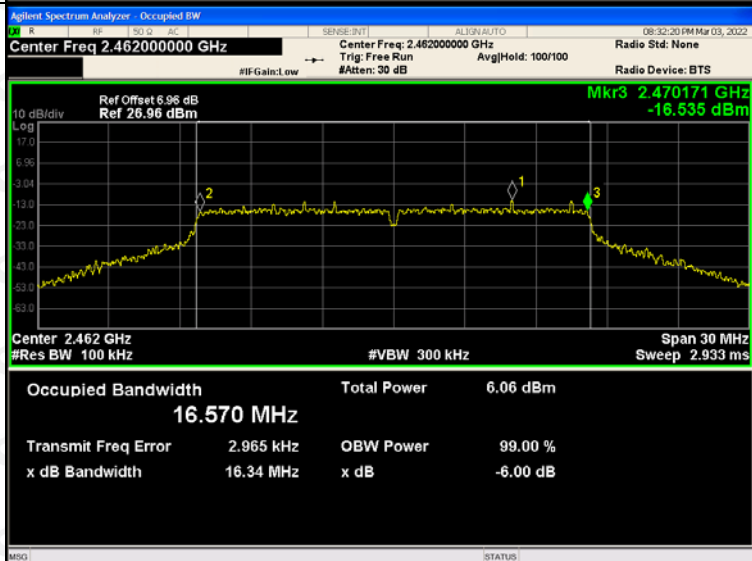
802.11g/LCH

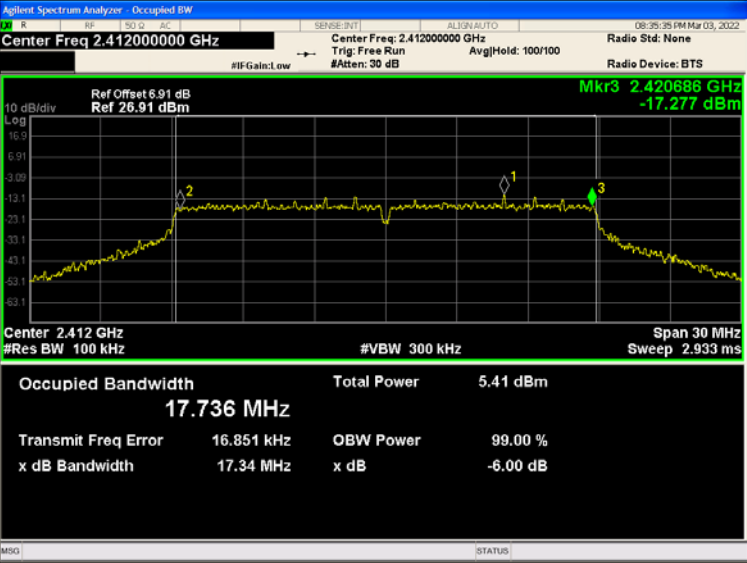
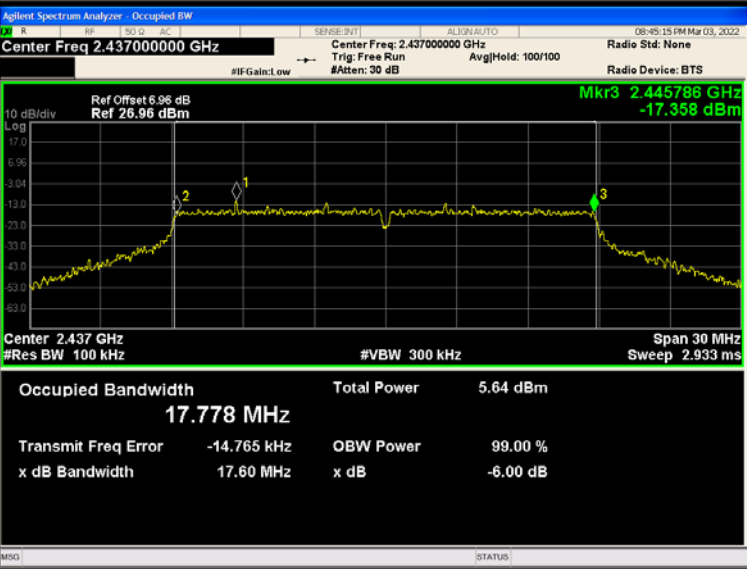
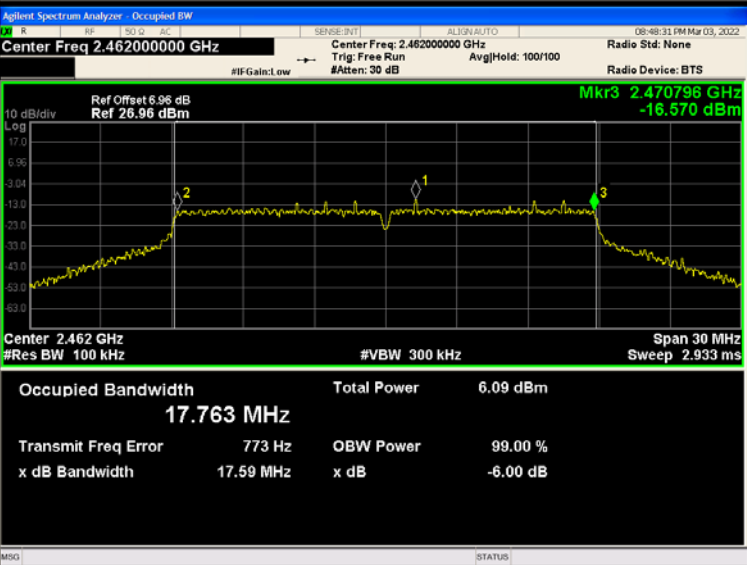


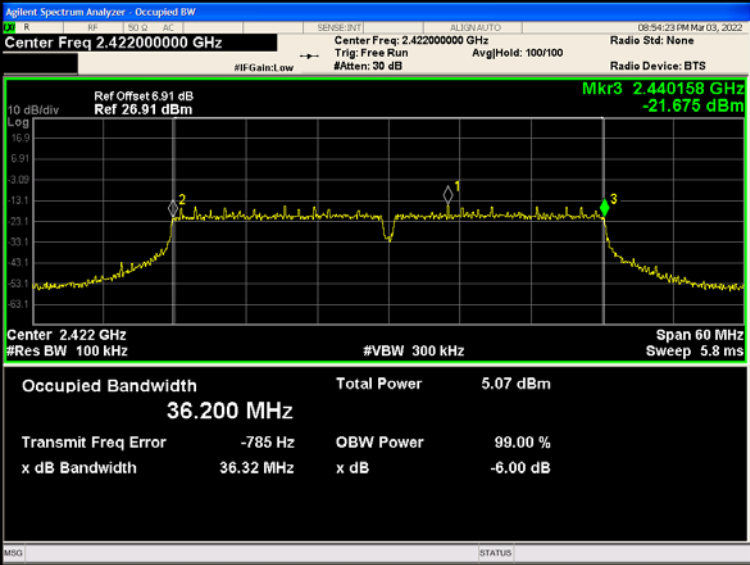
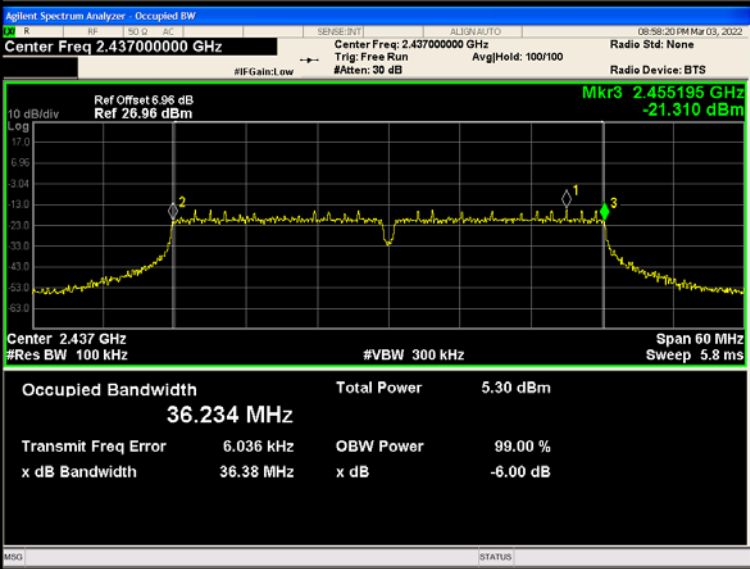
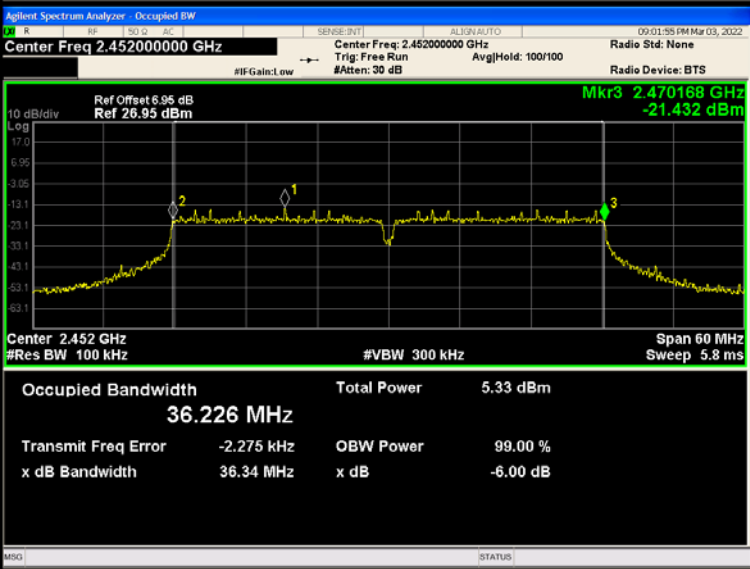
802.11g/MCH



802.11g/HCH

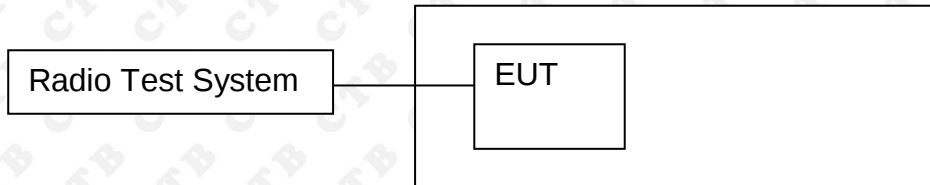


802.11n(HT20)/LC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.41200000 GHz Ref Offset: 6.91 dB Ref: 26.91 dBm Mkr3: 2.420686 GHz -17.277 dBm Center: 2.412 GHz #Res BW: 100 kHz #VBW: 300 kHz Span: 30 MHz Sweep: 2.933 ms <table border="1"> <tr> <td>Occupied Bandwidth</td><td>Total Power</td></tr> <tr> <td>17.736 MHz</td><td>5.41 dBm</td></tr> <tr> <td>Transmit Freq Error</td><td>OBW Power</td></tr> <tr> <td>16.851 kHz</td><td>99.00 %</td></tr> <tr> <td>x dB Bandwidth</td><td>x dB</td></tr> <tr> <td>17.34 MHz</td><td>-6.00 dB</td></tr> </table>	Occupied Bandwidth	Total Power	17.736 MHz	5.41 dBm	Transmit Freq Error	OBW Power	16.851 kHz	99.00 %	x dB Bandwidth	x dB	17.34 MHz	-6.00 dB
Occupied Bandwidth	Total Power												
17.736 MHz	5.41 dBm												
Transmit Freq Error	OBW Power												
16.851 kHz	99.00 %												
x dB Bandwidth	x dB												
17.34 MHz	-6.00 dB												
802.11n(HT20)/MC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.43700000 GHz Ref Offset: 6.96 dB Ref: 26.96 dBm Mkr3: 2.445786 GHz -17.358 dBm Center: 2.437 GHz #Res BW: 100 kHz #VBW: 300 kHz Span: 30 MHz Sweep: 2.933 ms <table border="1"> <tr> <td>Occupied Bandwidth</td><td>Total Power</td></tr> <tr> <td>17.778 MHz</td><td>5.64 dBm</td></tr> <tr> <td>Transmit Freq Error</td><td>OBW Power</td></tr> <tr> <td>-14.765 kHz</td><td>99.00 %</td></tr> <tr> <td>x dB Bandwidth</td><td>x dB</td></tr> <tr> <td>17.60 MHz</td><td>-6.00 dB</td></tr> </table>	Occupied Bandwidth	Total Power	17.778 MHz	5.64 dBm	Transmit Freq Error	OBW Power	-14.765 kHz	99.00 %	x dB Bandwidth	x dB	17.60 MHz	-6.00 dB
Occupied Bandwidth	Total Power												
17.778 MHz	5.64 dBm												
Transmit Freq Error	OBW Power												
-14.765 kHz	99.00 %												
x dB Bandwidth	x dB												
17.60 MHz	-6.00 dB												
802.11n(HT20)/HC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.46200000 GHz Ref Offset: 6.96 dB Ref: 26.96 dBm Mkr3: 2.470796 GHz -16.570 dBm Center: 2.462 GHz #Res BW: 100 kHz #VBW: 300 kHz Span: 30 MHz Sweep: 2.933 ms <table border="1"> <tr> <td>Occupied Bandwidth</td><td>Total Power</td></tr> <tr> <td>17.763 MHz</td><td>6.09 dBm</td></tr> <tr> <td>Transmit Freq Error</td><td>OBW Power</td></tr> <tr> <td>773 Hz</td><td>99.00 %</td></tr> <tr> <td>x dB Bandwidth</td><td>x dB</td></tr> <tr> <td>17.59 MHz</td><td>-6.00 dB</td></tr> </table>	Occupied Bandwidth	Total Power	17.763 MHz	6.09 dBm	Transmit Freq Error	OBW Power	773 Hz	99.00 %	x dB Bandwidth	x dB	17.59 MHz	-6.00 dB
Occupied Bandwidth	Total Power												
17.763 MHz	6.09 dBm												
Transmit Freq Error	OBW Power												
773 Hz	99.00 %												
x dB Bandwidth	x dB												
17.59 MHz	-6.00 dB												

802.11n(HT40)/LC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.422000000 GHz Ref Offset 6.91 dB Ref 26.91 dBm Mkr3 2.440168 GHz -21.675 dBm Center 2.422 GHz #Res BW 100 kHz #VBW 300 kHz Span 60 MHz Sweep 5.8 ms Occupied Bandwidth 36.200 MHz Total Power 5.07 dBm Transmit Freq Error -785 Hz OBW Power 99.00 % x dB Bandwidth 36.32 MHz x dB -6.00 dB
802.11n(HT40)/MC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Ref Offset 6.96 dB Ref 26.96 dBm Mkr3 2.455195 GHz -21.310 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 60 MHz Sweep 5.8 ms Occupied Bandwidth 36.234 MHz Total Power 5.30 dBm Transmit Freq Error 6.036 kHz OBW Power 99.00 % x dB Bandwidth 36.38 MHz x dB -6.00 dB
802.11n(HT40)/HC H	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.452000000 GHz Ref Offset 6.96 dB Ref 26.95 dBm Mkr3 2.470168 GHz -21.432 dBm Center 2.452 GHz #Res BW 100 kHz #VBW 300 kHz Span 60 MHz Sweep 5.8 ms Occupied Bandwidth 36.226 MHz Total Power 5.33 dBm Transmit Freq Error -2.275 kHz OBW Power 99.00 % x dB Bandwidth 36.34 MHz x dB -6.00 dB

11. POWER SPECTRAL DENSITY

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

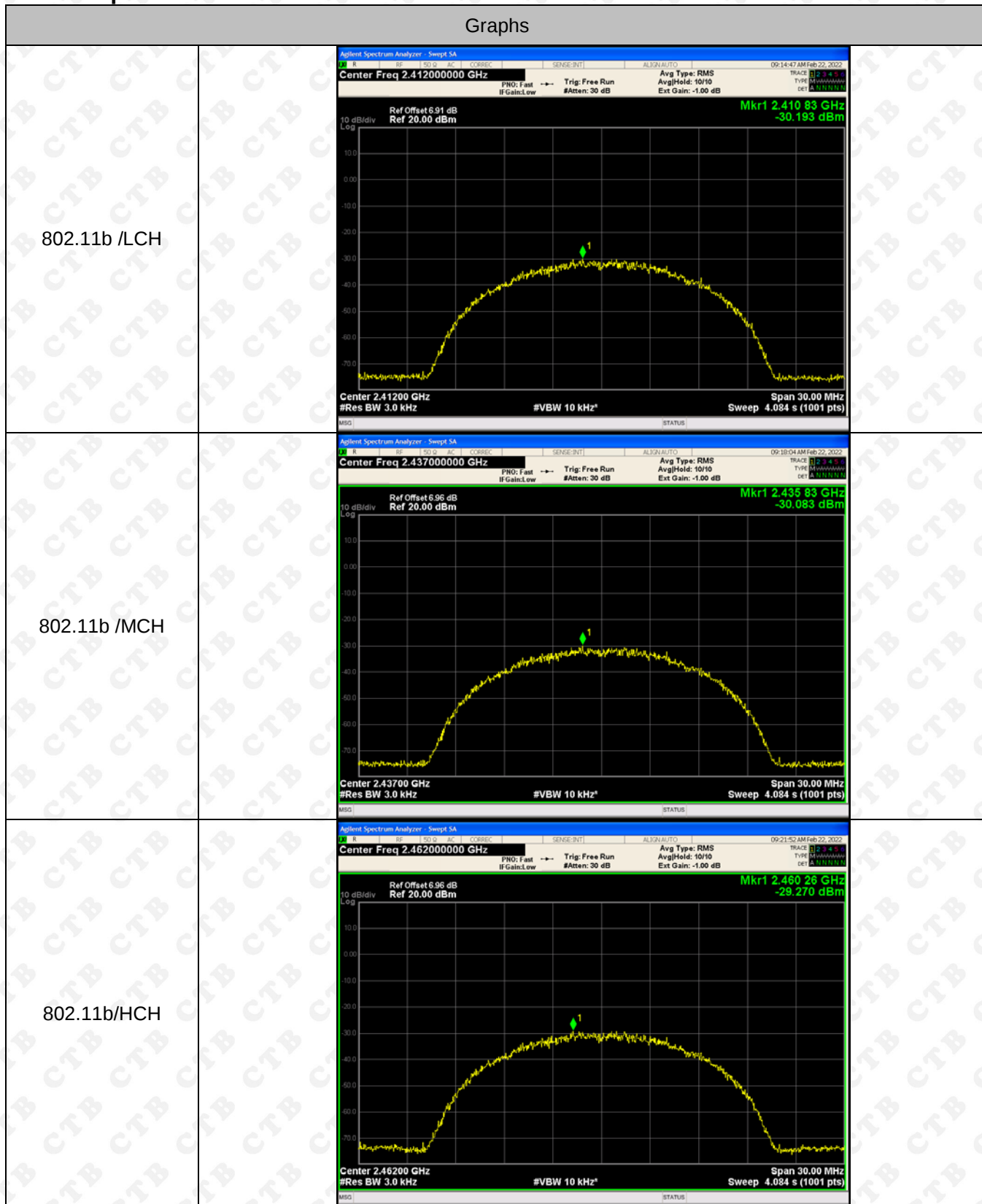
11.3 Test procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = Peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

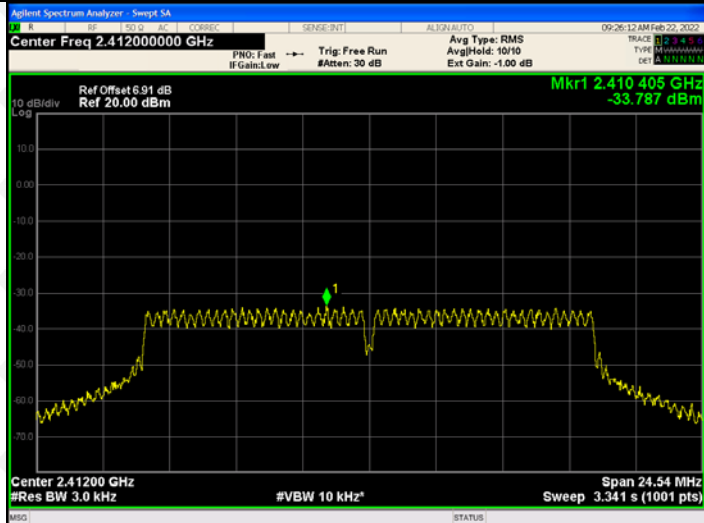
11.4 Test Result

Mode	Channel.	Power Spectral Density [dBm /3KHz] ANT 1	Power Spectral Density [dBm /3KHz] ANT 2	Power Spectral Density [dBm /3KHz] Total	Limit(dBm)
802.11b	LCH	-30.193	-21.584	/	8
	MCH	-30.083	-21.374	/	8
	HCH	-29.27	-21.683	/	8
802.11g	LCH	-33.787	-25.798	/	8
	MCH	-34.158	-25.967	/	8
	HCH	-34.093	-25.891	/	8
802.11n(H T20)	LCH	-34.032	-26.412	-25.719	8
	MCH	-33.753	-26.558	-25.800	8
	HCH	-33.93	-25.447	-24.871	8
802.11n(H T40)	LCH	-39.588	-28.861	-28.508	8
	MCH	-39.108	-29.812	-29.329	8
	HCH	-39.253	-29.111	-28.710	8

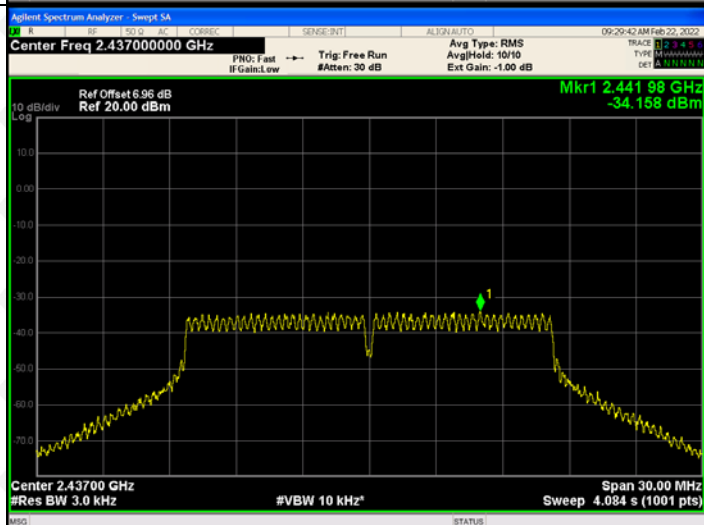
ANT1: Test Graph



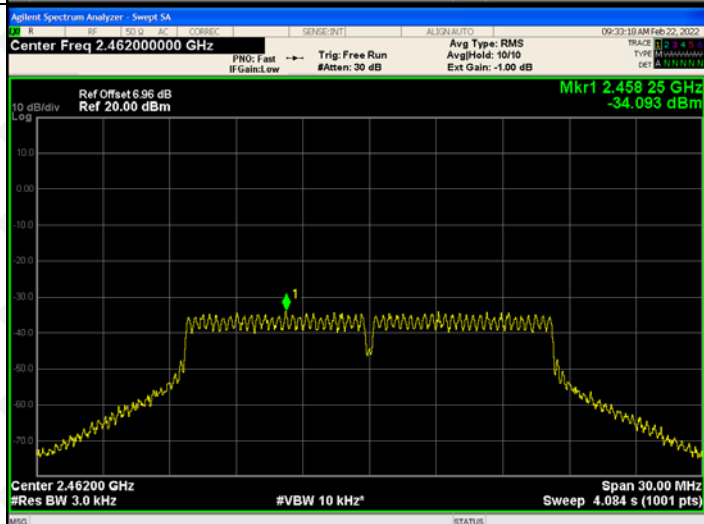
802.11g/LCH

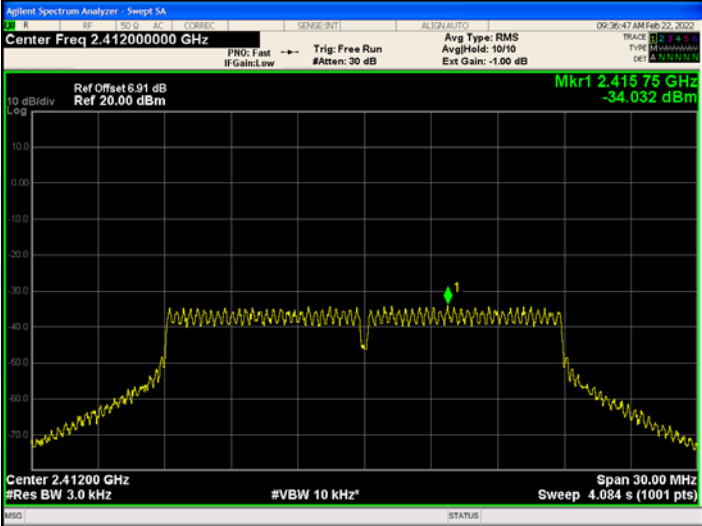
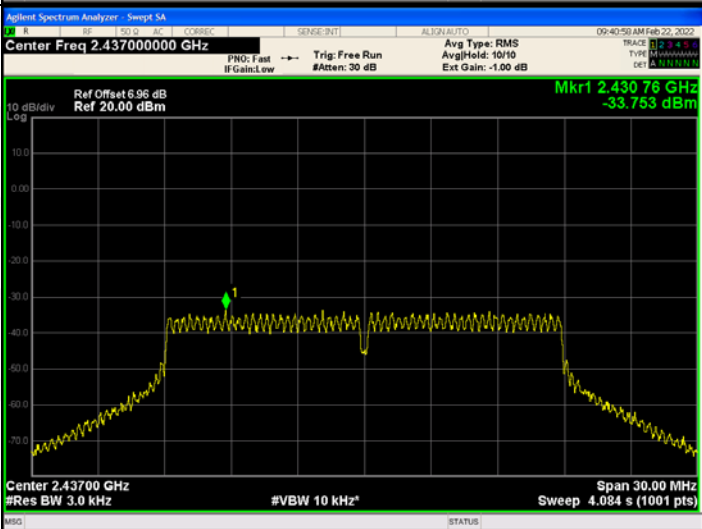
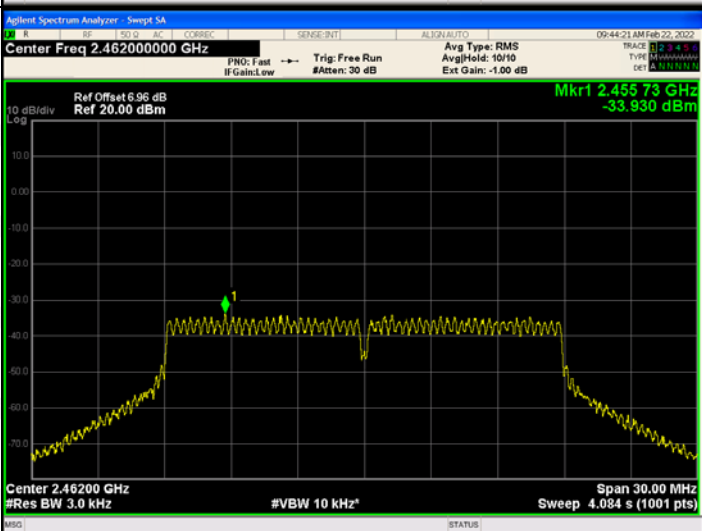


802.11g/MCH



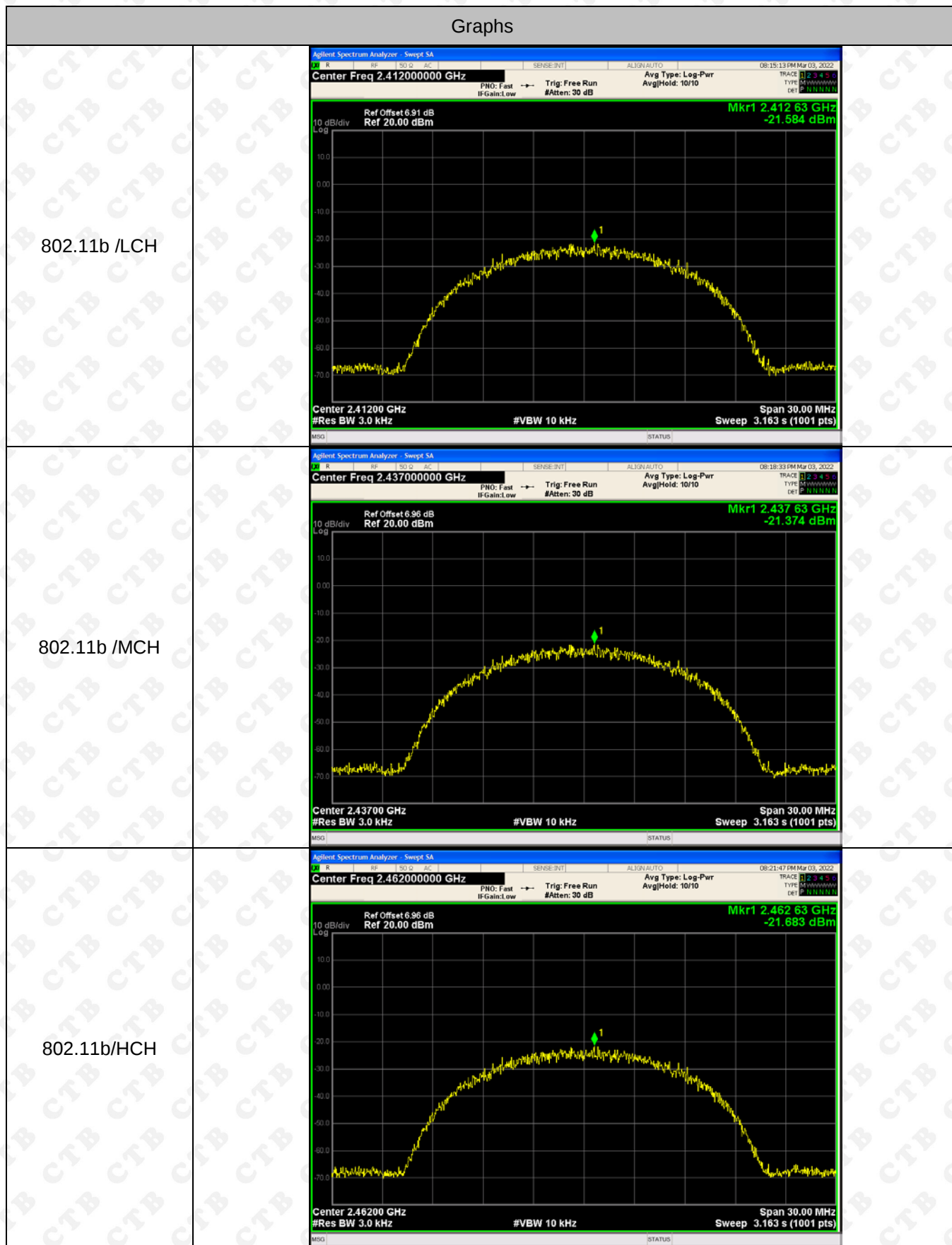
802.11g/HCH

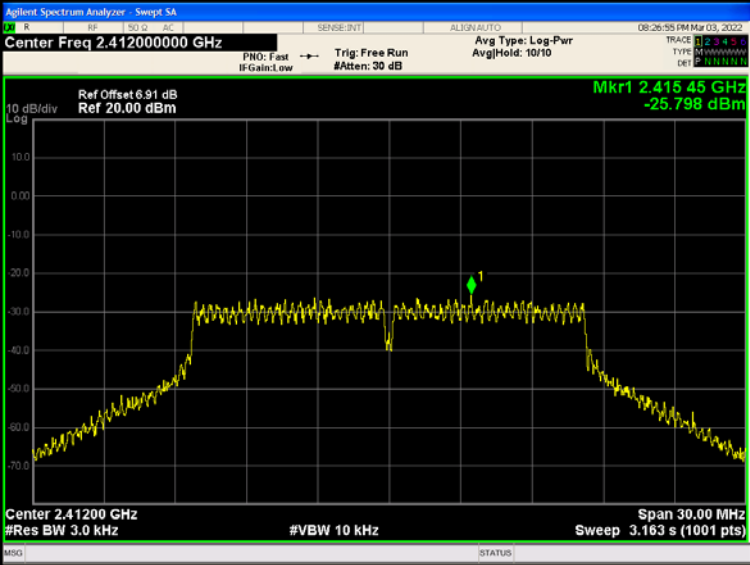
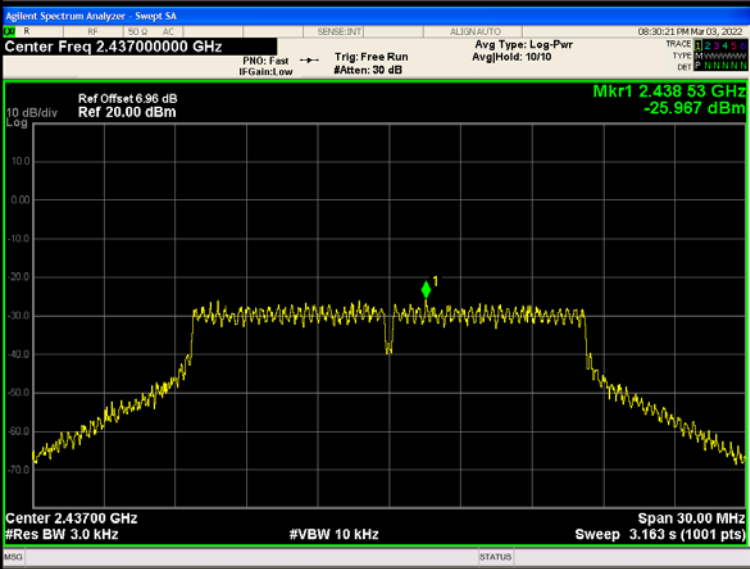
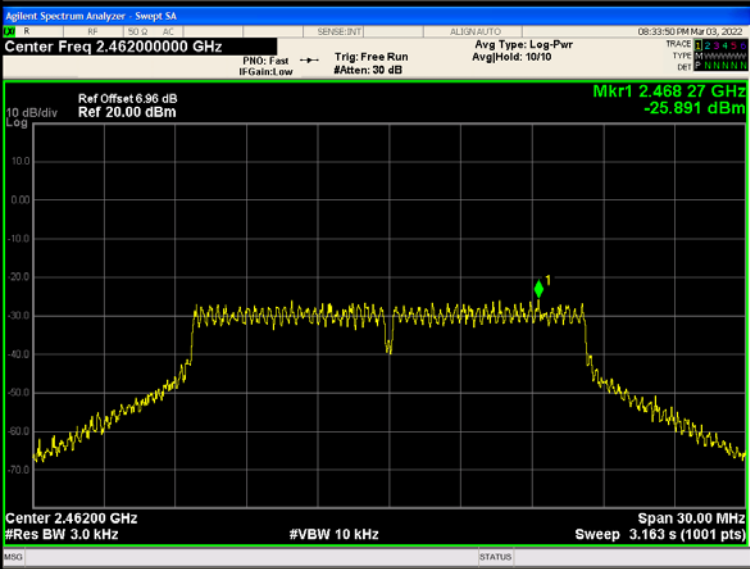


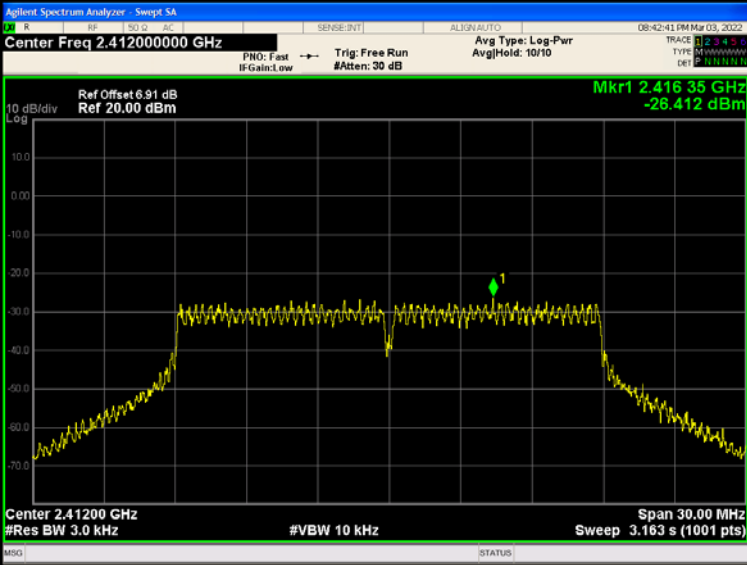
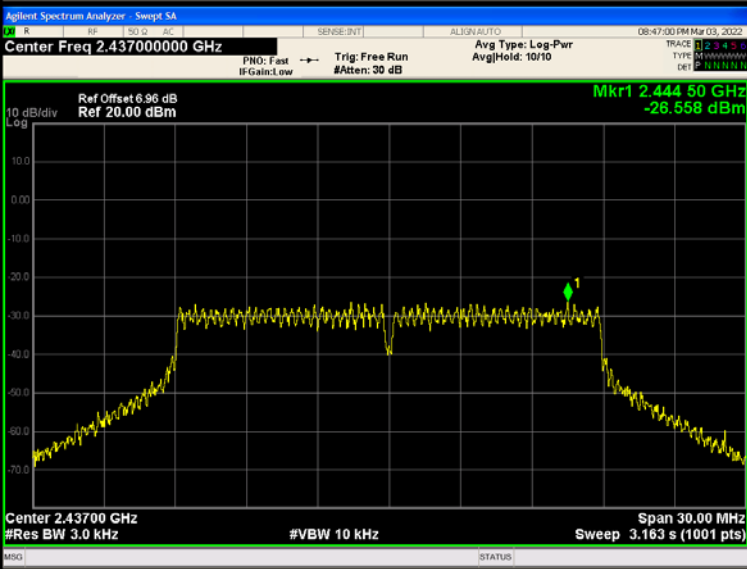
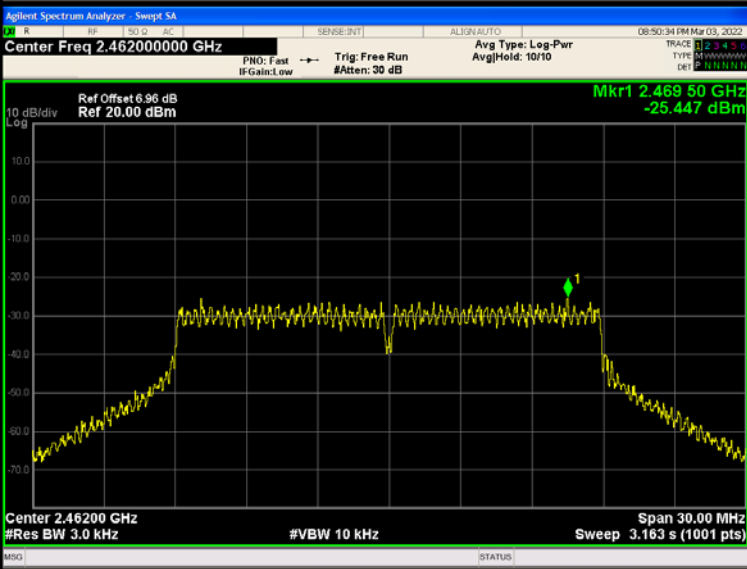
802.11n(HT20)/LC H	
802.11n(HT20)/MC H	
802.11n(HT20)/HC H	

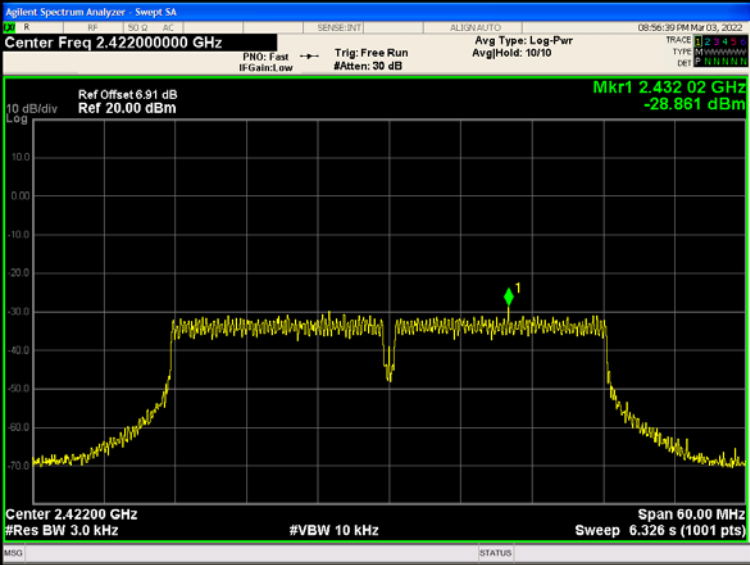
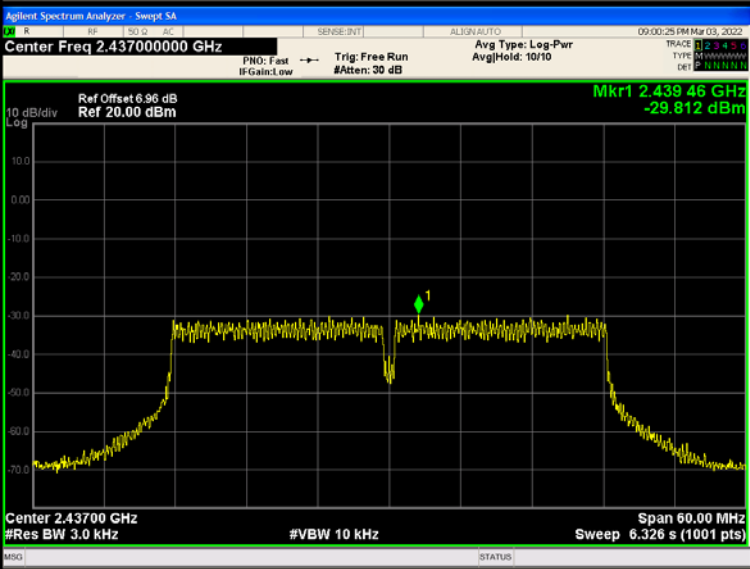
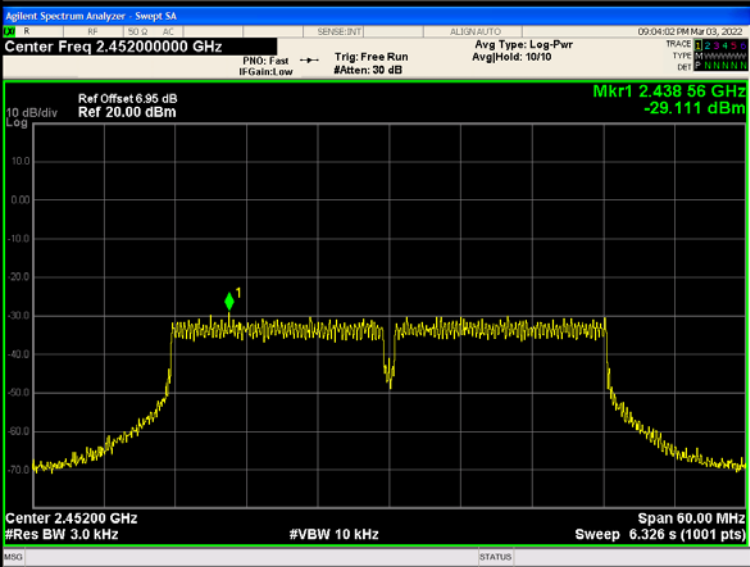
802.11n(HT40)/LC H		
802.11n(HT40)/MC H		
802.11n(HT40)/HC H		

ANT 2: Test Graph



802.11g/LCH	 Agilent Spectrum Analyzer - Swept SA Center Freq 2.41200000 GHz Ref Offset 6.91 dB Ref 20.00 dBm Mkr1 2.41545 GHz -25.798 dBm Center 2.41200 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts)
802.11g/MCH	 Agilent Spectrum Analyzer - Swept SA Center Freq 2.43700000 GHz Ref Offset 6.96 dB Ref 20.00 dBm Mkr1 2.43853 GHz -25.967 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts)
802.11g/HCH	 Agilent Spectrum Analyzer - Swept SA Center Freq 2.46200000 GHz Ref Offset 6.96 dB Ref 20.00 dBm Mkr1 2.46827 GHz -25.891 dBm Center 2.46200 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts)

802.11n(HT20)/LC H	
802.11n(HT20)/MC H	
802.11n(HT20)/HC H	

802.11n(HT40)/LC H	
802.11n(HT40)/MC H	
802.11n(HT40)/HC H	

12. ANTENNA REQUIREMENT

15.203 requirement:

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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is Internal antenna and no consideration of replacement. The best case gain of the antenna is 1.0dBi.

13. EUT PHOTOGRAPHS

External Photos

EUT Photo 1



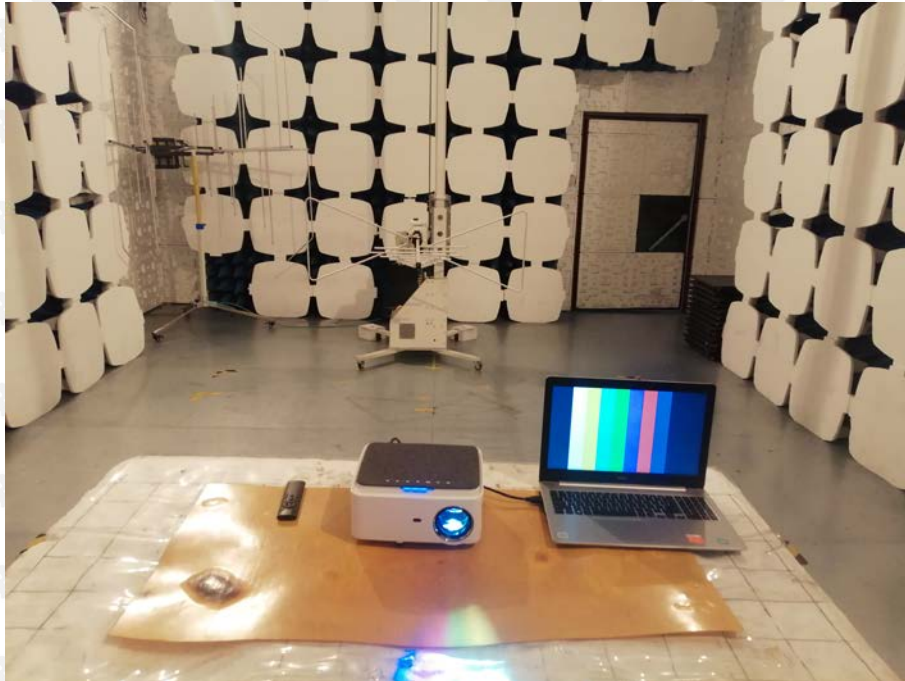
EUT Photo 2



14. EUT TEST SETUP PHOTOGRAPHS

Radiated Emission

Below 1G



Above 1G



Conducted Emission



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