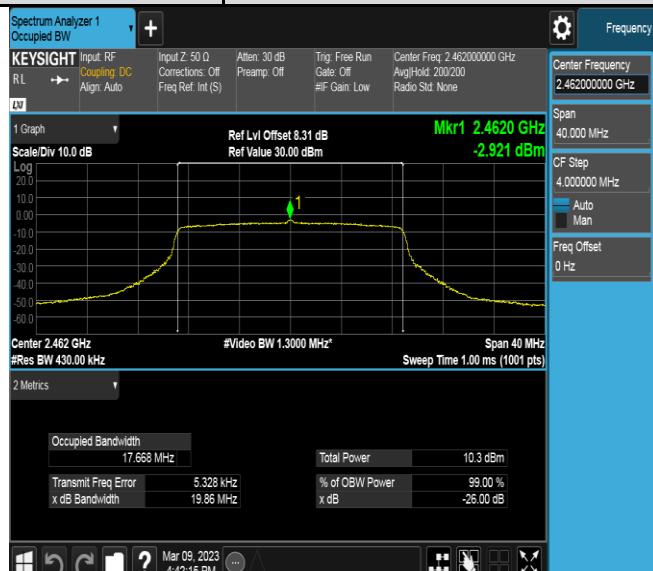


Test Mode	Test Channel	Verdict
11N HT20	LCH	PASS
		

Test Mode	Test Channel	Verdict
11N HT20	MCH	PASS
		

Test Mode	Test Channel	Verdict
11N HT20	HCH	PASS
		

Test Mode	Test Channel	Verdict
11N HT40	LCH	PASS
		

Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
		

Test Mode	Test Channel	Verdict
11N HT40	HCH	PASS
		

7.3. CONDUCTED OUTPUT POWER

LIMITS

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

TEST PROCEDURE

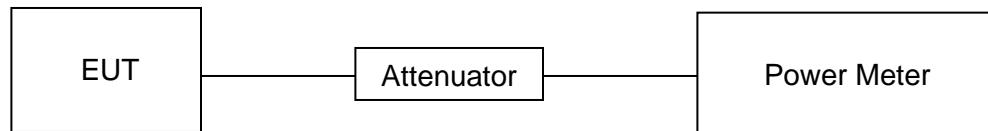
Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure the power of each channel.

AVG Detector use for AVG result.

TEST SETUP



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	58.5%
Atmosphere Pressure	102kpa	Test Voltage	DC5V

TEST RESULTS TABLE

Test Mode	Antenna	Frequency [MHz]	Average Power[dBm]	Verdict
11B	Ant1	LCH	16.16	PASS
	Ant2	LCH	11.49	PASS
	Ant1	MCH	16.47	PASS
	Ant2	MCH	11.53	PASS
	Ant1	HCH	16.45	PASS
	Ant2	HCH	10.80	PASS
11G	Ant1	LCH	15.63	PASS
	Ant2	LCH	12.87	PASS
	Ant1	MCH	15.97	PASS
	Ant2	MCH	12.63	PASS
	Ant1	HCH	15.60	PASS
	Ant2	HCH	12.02	PASS
11N20MIMO	Ant1	LCH	13.93	PASS
	Ant2	LCH	11.19	PASS
	total	MCH	15.78	PASS
	Ant1	MCH	14.28	PASS
	Ant2	HCH	10.96	PASS
	total	HCH	15.94	PASS
	Ant1	LCH	13.92	PASS
	Ant2	LCH	10.30	PASS
	total	MCH	15.49	PASS
11N40MIMO	Ant1	MCH	13.25	PASS
	Ant2	HCH	9.94	PASS
	total	HCH	14.91	PASS
	Ant1	LCH	13.01	PASS
	Ant2	LCH	9.68	PASS
	total	MCH	14.67	PASS
	Ant1	MCH	12.95	PASS
	Ant2	HCH	9.43	PASS
	total	HCH	14.55	PASS

Remark:

- 1) For all the test results has been adjusted the duty cycle factor.
- 2) For Correction Factor is refer to the result in section 7.1

7.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

TEST PROCEDURE

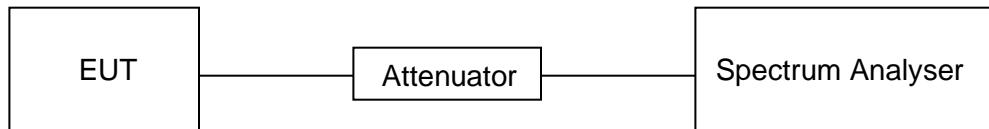
Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	$1.5 \times \text{DTS bandwidth}$
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	58.5%
Atmosphere Pressure	102kpa	Test Voltage	DC5V

TEST RESULTS TABLE

TestMode	Antenna	Test Channel	Maximum Peak power spectral density (dBm/30kHz)	Verdict
11B	Ant1	LCH	0.54	PASS
	Ant2	LCH	-3.54	PASS
	Ant1	MCH	0.83	PASS
	Ant2	MCH	-3.45	PASS
	Ant1	HCH	0.84	PASS
	Ant2	HCH	-4.18	PASS
11G	Ant1	LCH	-0.88	PASS
	Ant2	LCH	0.46	PASS
	Ant1	MCH	-0.49	PASS
	Ant2	MCH	0.29	PASS
	Ant1	HCH	-0.86	PASS
	Ant2	HCH	-0.39	PASS
11N20MIMO	Ant1	LCH	-2.2	PASS
	Ant2	LCH	-2.18	PASS
	total	LCH	0.82	PASS
	Ant1	MCH	-1.68	PASS
	Ant2	MCH	-2.39	PASS
	total	MCH	0.99	PASS
	Ant1	HCH	-2.09	PASS
	Ant2	HCH	-3.08	PASS
	total	HCH	0.45	PASS
11N40MIMO	Ant1	LCH	-4.57	PASS
	Ant2	LCH	-3.08	PASS
	total	LCH	-0.75	PASS
	Ant1	MCH	-4.44	PASS
	Ant2	MCH	-3.18	PASS
	total	MCH	-0.75	PASS
	Ant1	HCH	-5.07	PASS
	Ant2	HCH	-3.76	PASS
	total	HCH	-1.36	PASS

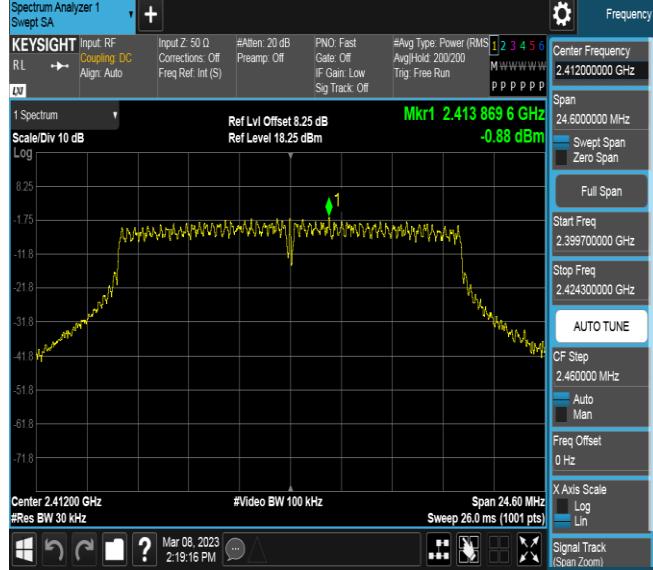
TEST GRAPHS

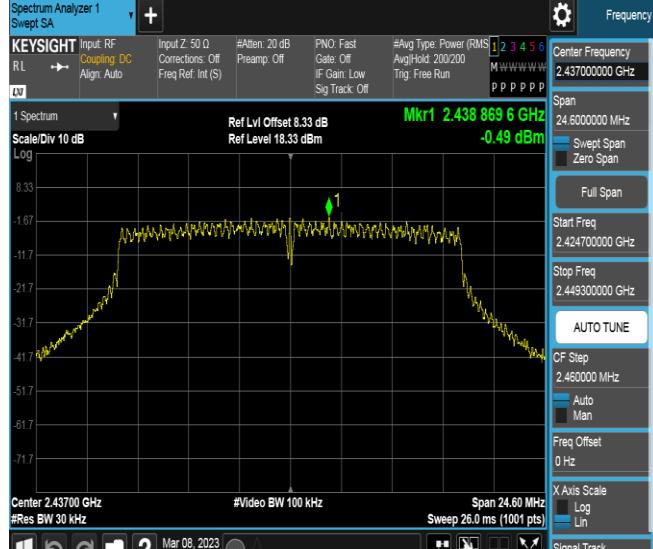
1) For Antenna 1 Part:

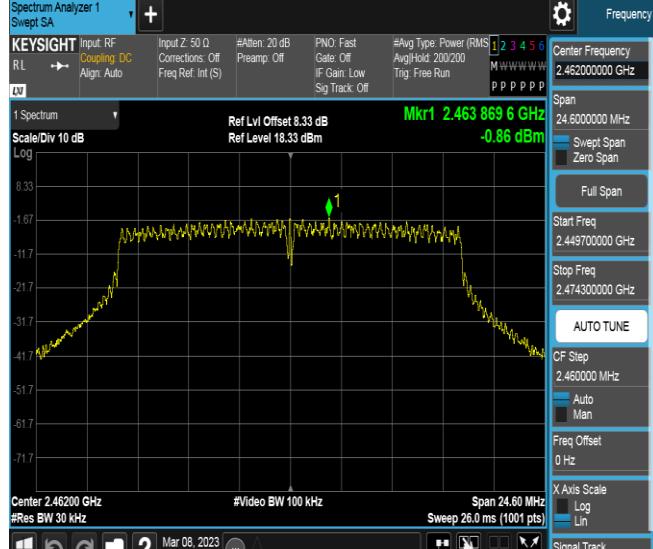
Test Mode	Test Channel	Verdict
11B	LCH	PASS
 <p>Spectrum Analyzer 1 Swept SA</p> <p>KEYSIGHT Input: RF Coupling: DC Input Z: 50 Ω #Atten: 20 dB PNO: Best Wide #Avg Type: Power (RMS) 1 2 3 4 5 6</p> <p>R.L. Align: Auto Corrections: Off Preamp: Off Gate: Off Avg/Hold: 200/200 IF Gain: Low Trig: Free Run</p> <p>Ref Lvl Offset: 8.25 dB Ref Level: 18.25 dB</p> <p>1 Spectrum Scale/Div: 10 dB</p> <p>Mkr1 2.412 696 GHz 0.54 dBm</p> <p>Center: 2.412000 GHz #Video BW: 100 kHz Span: 15.12 MHz Sweep: 16.0 ms (1001 pts)</p> <p>#Res BW: 30 kHz</p> <p>Mar 08, 2023 2:09:12 PM</p>		

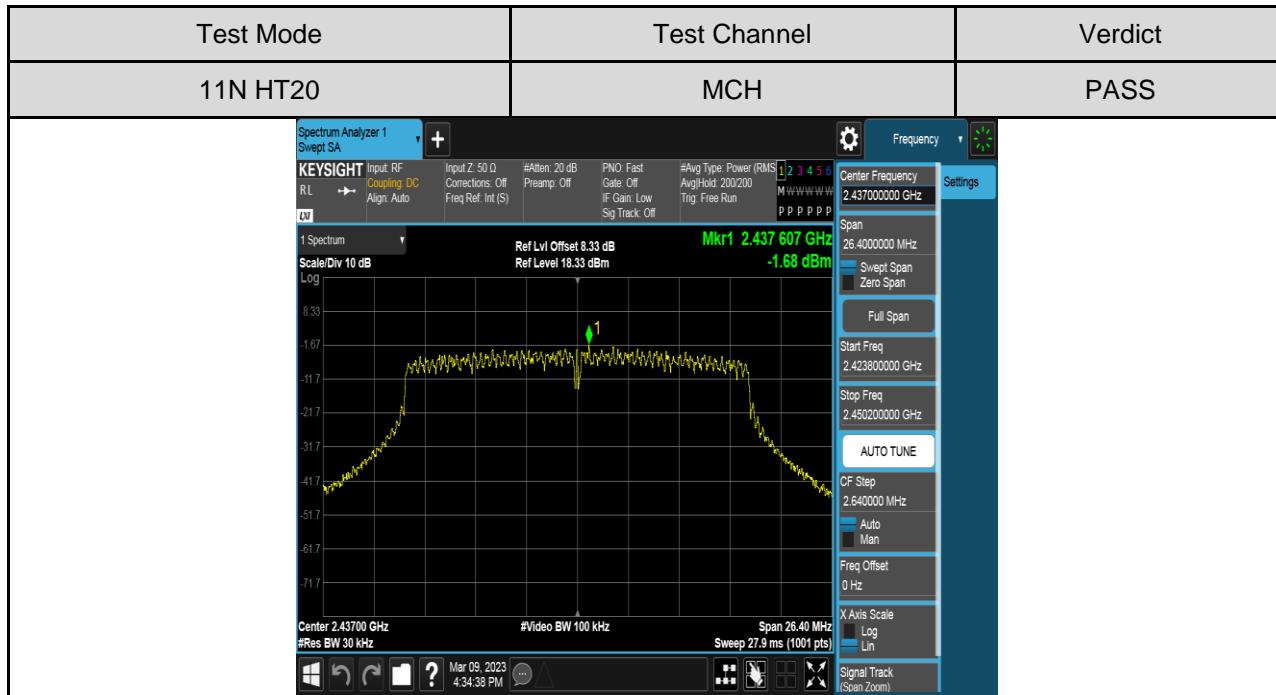
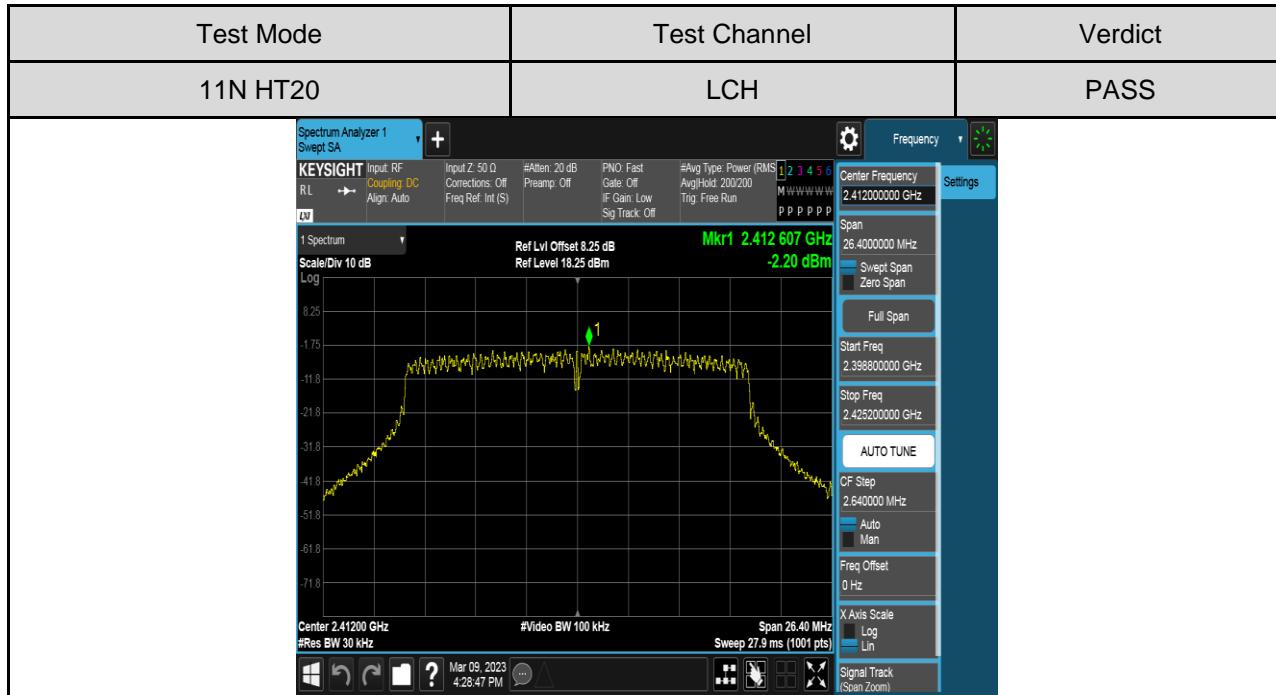
Test Mode	Test Channel	Verdict
11B	MCH	PASS
 <p>Spectrum Analyzer 1 Swept SA</p> <p>KEYSIGHT Input: RF Coupling: DC Input Z: 50 Ω #Atten: 20 dB PNO: Best Wide #Avg Type: Power (RMS) 1 2 3 4 5 6</p> <p>R.L. Align: Auto Corrections: Off Preamp: Off Gate: Off Avg/Hold: 200/200 IF Gain: Low Trig: Free Run</p> <p>Ref Lvl Offset: 8.33 dB Ref Level: 18.33 dB</p> <p>1 Spectrum Scale/Div: 10 dB</p> <p>Mkr1 2.437 696 GHz 0.83 dBm</p> <p>Center: 2.437000 GHz #Video BW: 100 kHz Span: 15.12 MHz Sweep: 16.0 ms (1001 pts)</p> <p>#Res BW: 30 kHz</p> <p>Mar 08, 2023 2:12:25 PM</p>		

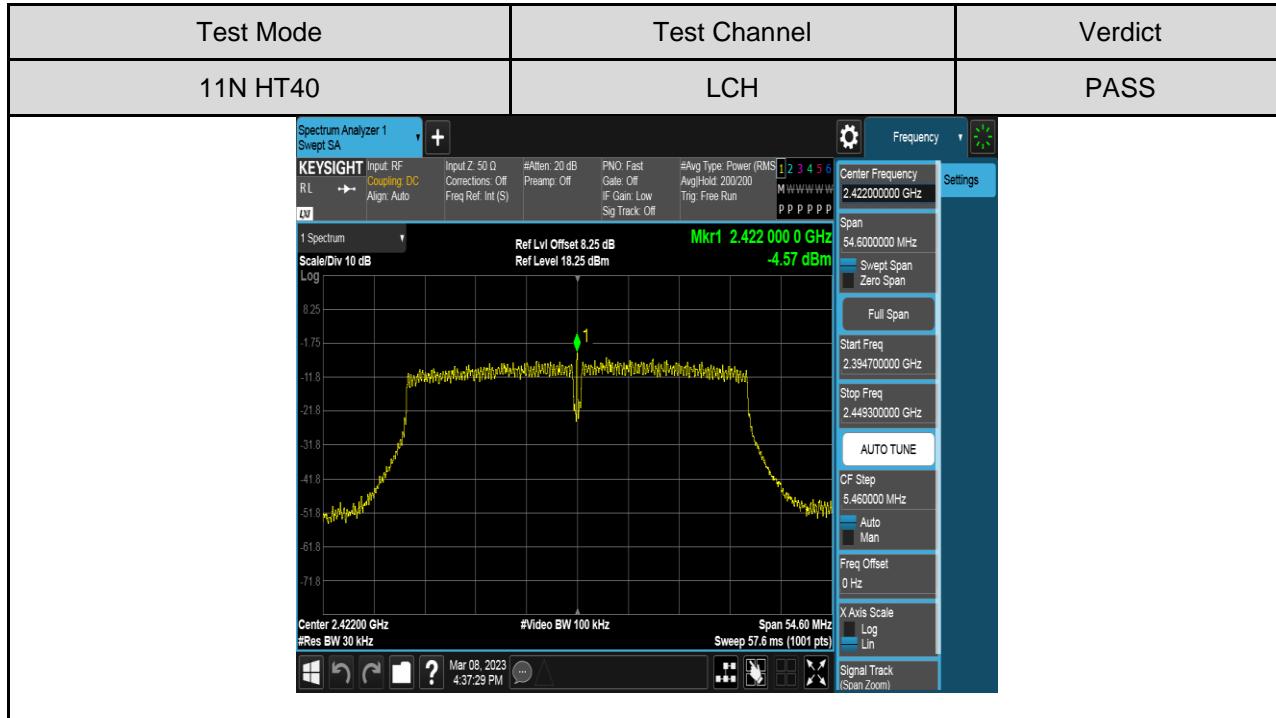
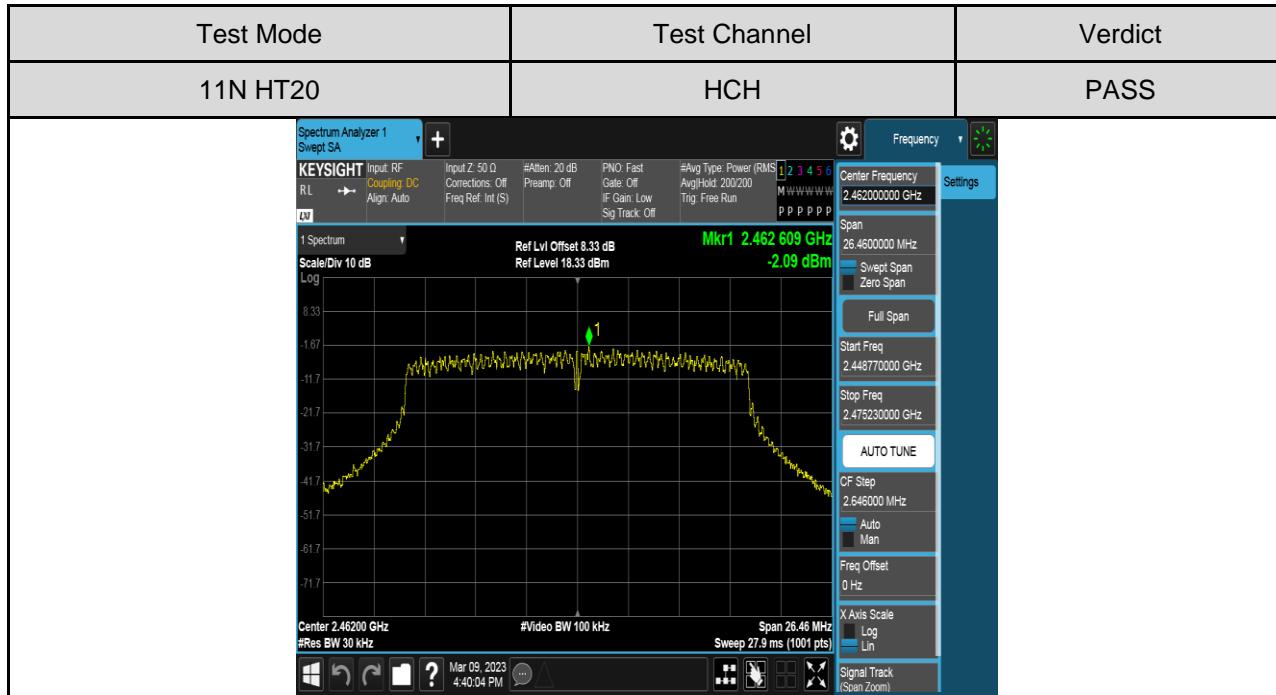
Test Mode	Test Channel	Verdict
11B	HCH	PASS
		

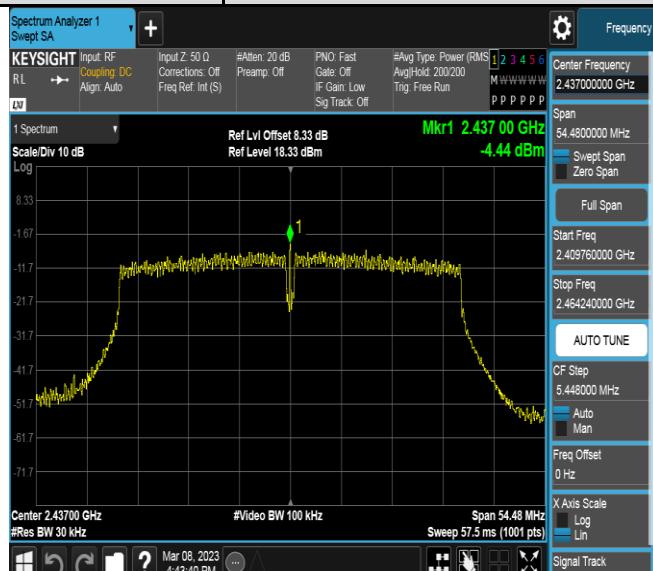
Test Mode	Test Channel	Verdict
11G	LCH	PASS
		

Test Mode	Test Channel	Verdict
11G	MCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface. The main display shows a spectrum with a single sharp peak at 2.4388696 GHz, labeled 'Mkr1'. The peak is -0.49 dBm. The x-axis is labeled 'Center 2.43700 GHz' and 'Span 24.60 MHz'. The y-axis is labeled 'Scale/Div 10 dB' and 'Log'. The status bar at the bottom shows 'Mar 08, 2023 2:22:50 PM'. The right side of the screen is a vertical stack of control panels for 'Frequency', 'Settings', and other parameters.</p>		

Test Mode	Test Channel	Verdict
11G	HCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface, identical to the one above but for the HCH channel. It displays a single peak at 2.4638696 GHz, labeled 'Mkr1', with a power of -0.86 dBm. The x-axis is labeled 'Center 2.46200 GHz' and 'Span 24.60 MHz'. The y-axis is labeled 'Scale/Div 10 dB' and 'Log'. The status bar at the bottom shows 'Mar 08, 2023 2:25:47 PM'. The right side of the screen is a vertical stack of control panels for 'Frequency', 'Settings', and other parameters.</p>		





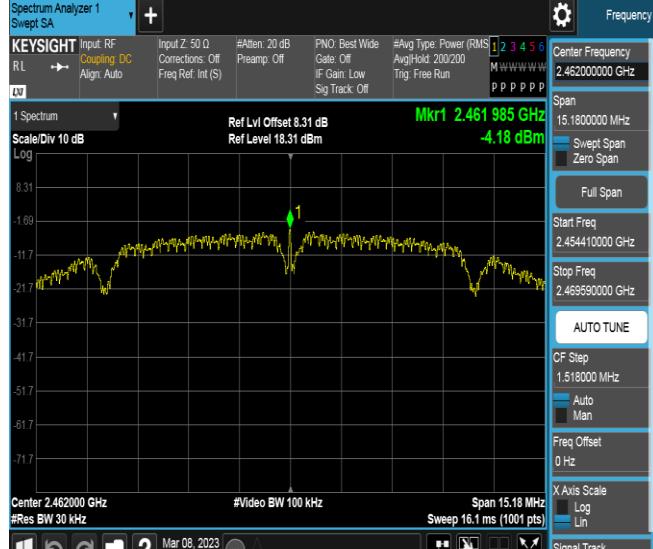
Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface. The main display shows a spectrum with a sharp peak at 2.43700 GHz. The left panel displays various measurement parameters: Input RF Coupling: DC, Input Z: 50 Ω, #Atten: 20 dB, PNO: Fast, #Avg Type: Power (RMS), #Avg Hold: 200/200, IF Gain: Low, IF Track: Off, and Trig: Free Run. The right panel shows the frequency range from 2.43700000 GHz to 2.464240000 GHz, with the center frequency set to 2.43700000 GHz. The span is 54.48 MHz, and the video bandwidth is 100 kHz. The x-axis scale is logarithmic (Log), and the signal track is set to span zoom. The spectrum plot shows a reference level of 18.33 dBm and a marker level of -4.44 dBm. The bottom status bar shows the date as Mar 08, 2023, and the time as 4:43:40 PM.</p>		

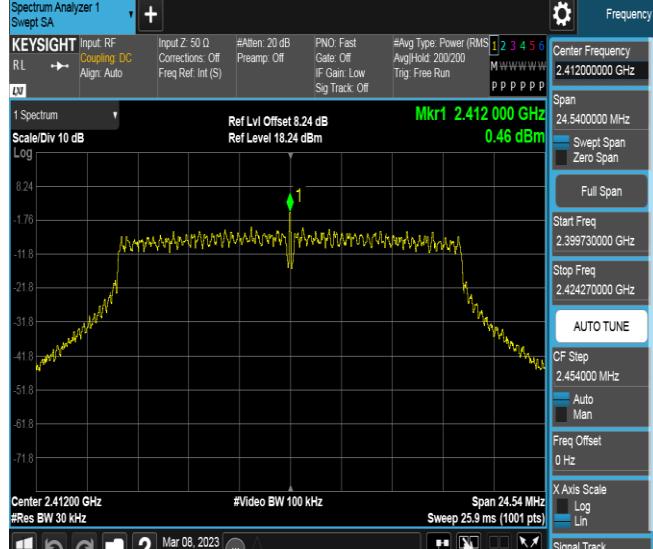
Test Mode	Test Channel	Verdict
11N HT40	HCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface for the HCH channel. The main display shows a spectrum with a sharp peak at 2.45200 GHz. The left panel displays various measurement parameters: Input RF Coupling: DC, Input Z: 50 Ω, #Atten: 20 dB, PNO: Fast, #Avg Type: Power (RMS), #Avg Hold: 200/200, IF Gain: Low, IF Track: Off, and Trig: Free Run. The right panel shows the frequency range from 2.424760000 GHz to 2.479240000 GHz, with the center frequency set to 2.45200000 GHz. The span is 54.48 MHz, and the video bandwidth is 100 kHz. The x-axis scale is logarithmic (Log), and the signal track is set to span zoom. The spectrum plot shows a reference level of 18.33 dBm and a marker level of -5.07 dBm. The bottom status bar shows the date as Mar 08, 2023, and the time as 4:49:21 PM.</p>		

2) For Antenna 2 Part:

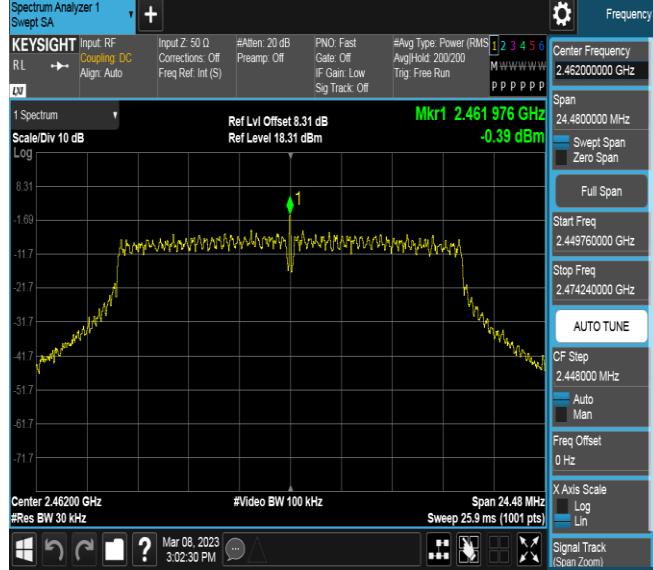
Test Mode	Test Channel	Verdict
11B	LCH	PASS
 <p>This screenshot shows a Keysight Spectrum Analyzer interface. The center frequency is set to 2.4120000 GHz. The span is 15.18 MHz, and the video bandwidth is 100 kHz. The signal level is -3.54 dBm. The x-axis scale is logarithmic (Log). The spectrum shows a single sharp peak at the center frequency. The left panel displays various measurement parameters and status indicators. The right panel shows a detailed settings menu for frequency, span, and other parameters.</p>		

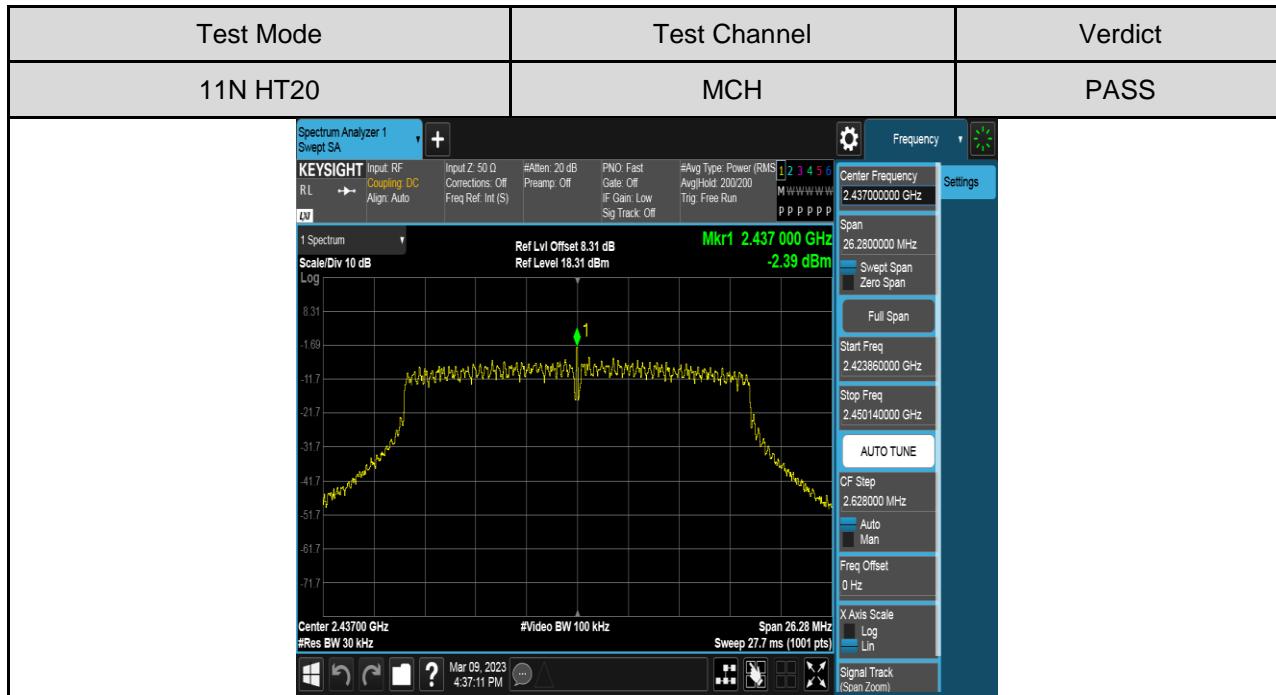
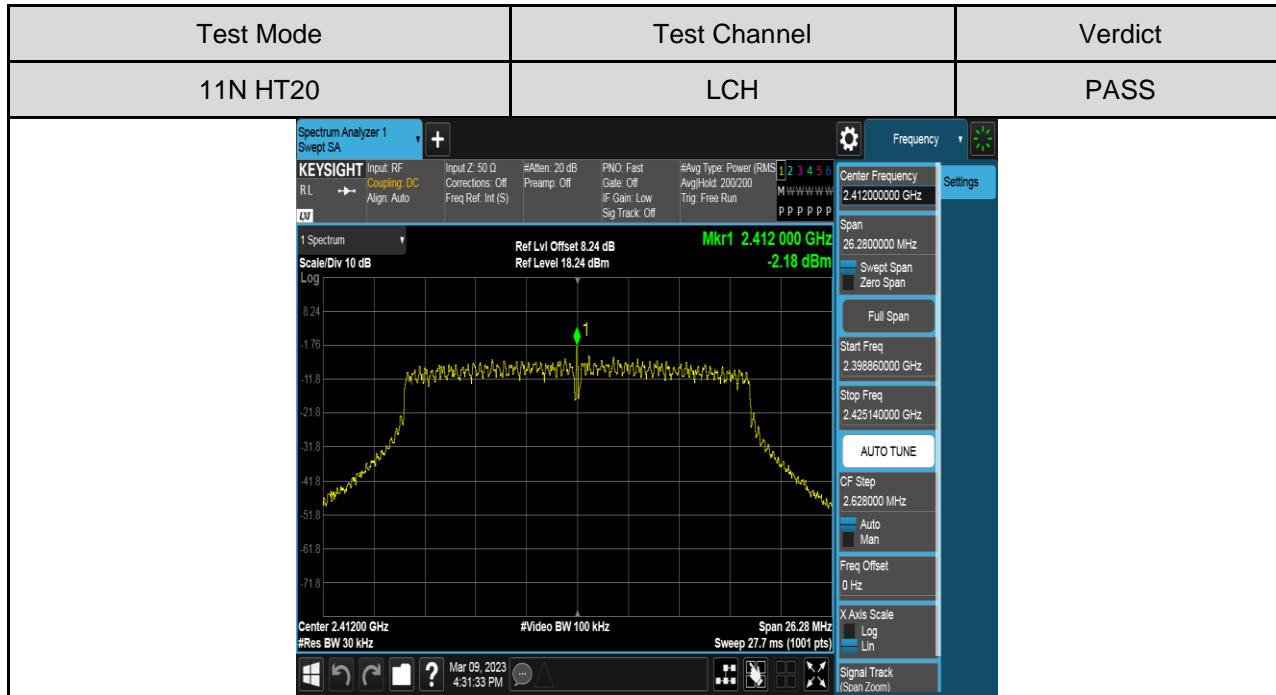
Test Mode	Test Channel	Verdict
11B	MCH	PASS
 <p>This screenshot shows a Keysight Spectrum Analyzer interface. The center frequency is set to 2.4370000 GHz. The span is 15.18 MHz, and the video bandwidth is 100 kHz. The signal level is -3.45 dBm. The x-axis scale is logarithmic (Log). The spectrum shows a single sharp peak at the center frequency. The left panel displays various measurement parameters and status indicators. The right panel shows a detailed settings menu for frequency, span, and other parameters.</p>		

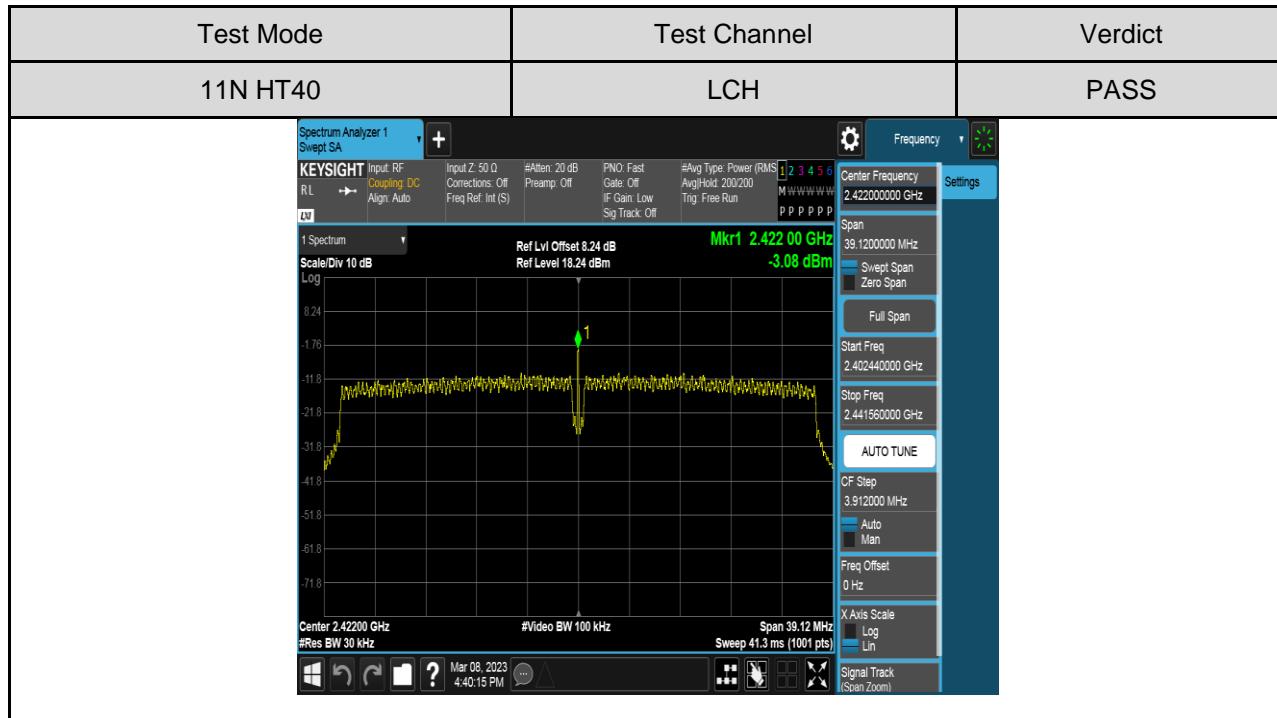
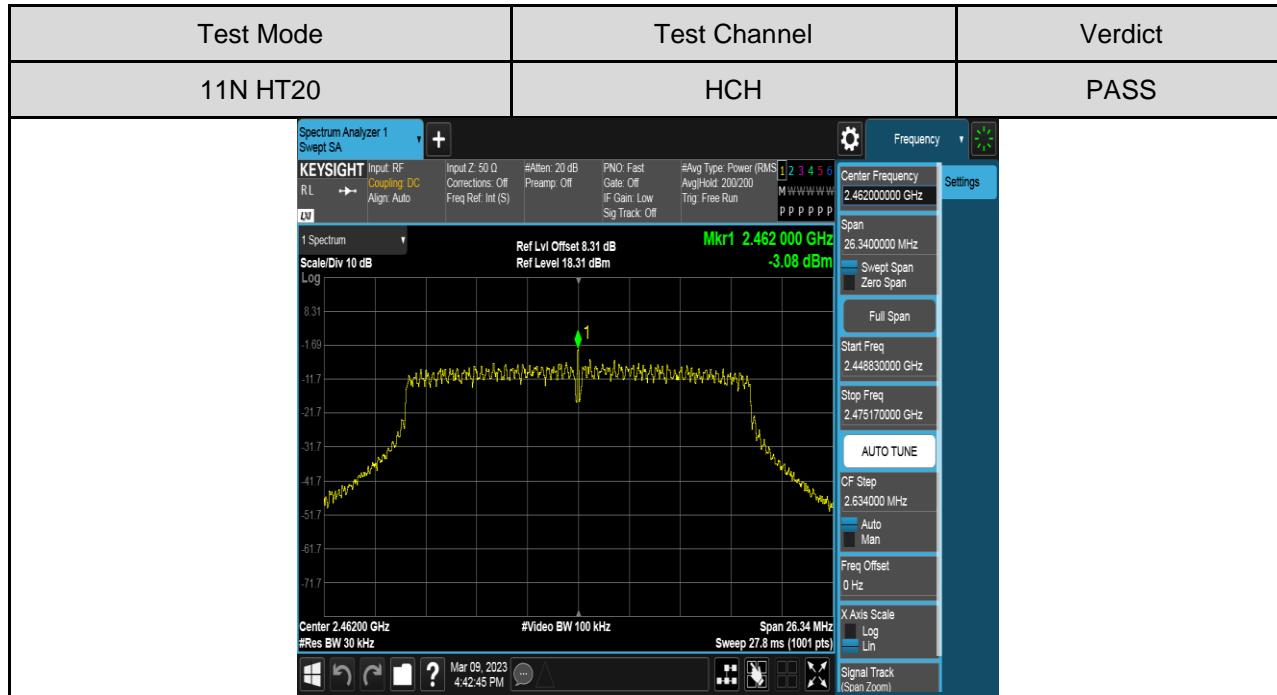
Test Mode	Test Channel	Verdict
11B	HCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface. The main display shows a spectrum with a single sharp peak at 2.461985 GHz, labeled 'Mkr1'. The measurement parameters are: Ref Lvl Offset 8.31 dB, Ref Level 18.31 dBm, Scale/Div 10 dB, and Log scale. The test parameters are: Center 2.462000 GHz, #Video BW 100 kHz, Span 15.18 MHz, Sweep 16.1 ms (1001 pts), and #Res BW 30 kHz. The date and time are Mar 08, 2023, 2:35:00 PM. The right side of the screen displays the 'Settings' menu for frequency, span, and other parameters.</p>		

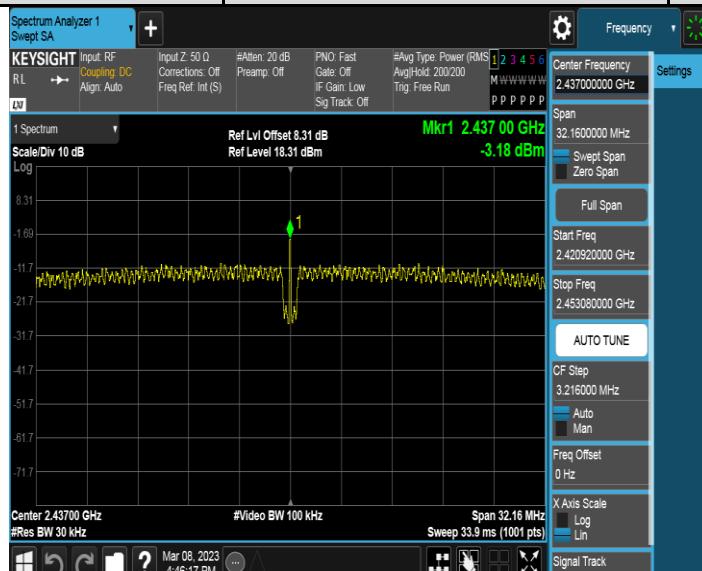
Test Mode	Test Channel	Verdict
11G	LCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface. The main display shows a spectrum with a single sharp peak at 2.412000 GHz, labeled 'Mkr1'. The measurement parameters are: Ref Lvl Offset 8.24 dB, Ref Level 18.24 dBm, Scale/Div 10 dB, and Log scale. The test parameters are: Center 2.412000 GHz, #Video BW 100 kHz, Span 24.54 MHz, Sweep 25.9 ms (1001 pts), and #Res BW 30 kHz. The date and time are Mar 08, 2023, 2:54:25 PM. The right side of the screen displays the 'Settings' menu for frequency, span, and other parameters.</p>		

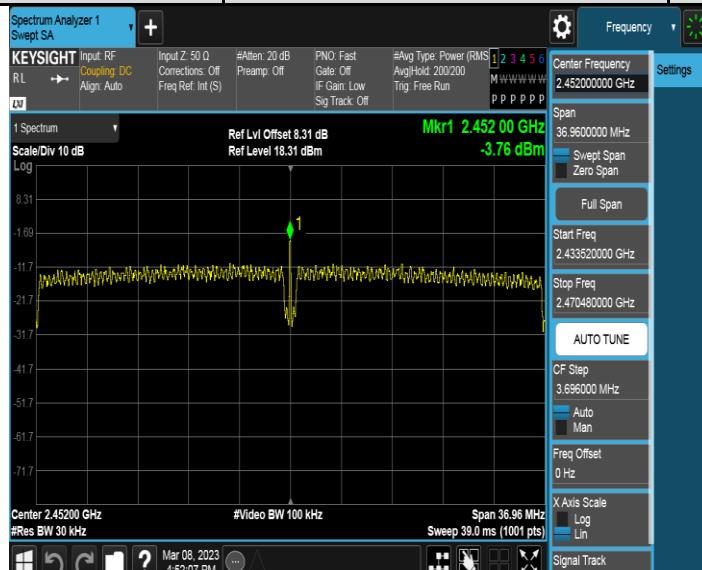
Test Mode	Test Channel	Verdict
11G	MCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface. The main display shows a spectrum with a single sharp peak at 2.436976 GHz, labeled 'Mkr1'. The y-axis ranges from -41.7 dB to 8.31 dB. The x-axis shows a span of 24.54 MHz. The left panel displays various measurement parameters: Input: RF, Coupling: DC, R.L.: Align: Auto, Input Z: 50 Ω, Corrections: Off, Freq Ref: Int (S), #Atten: 20 dB, Preamp: Off, PNO: Fast, Gate: Off, IF Gain: Low, Sig Track: Off, #Avg Type: Power (RMS), Avg/Hold: 200/200, Trig: Free Run. The right panel shows frequency settings: Center Frequency 2.43700000 GHz, Span 24.540000 MHz, and a list of frequency markers (1, 2, 3, 4, 5, 6) with their corresponding values. The bottom status bar shows the date and time: Mar 08, 2023 2:58:43 PM.</p>		

Test Mode	Test Channel	Verdict
11G	HCH	PASS
 <p>Detailed description: This screenshot shows a Keysight Spectrum Analyzer interface for the HCH channel. The main display shows a spectrum with a single sharp peak at 2.461976 GHz, labeled 'Mkr1'. The y-axis ranges from -41.7 dB to 8.31 dB. The x-axis shows a span of 24.48 MHz. The left panel displays various measurement parameters: Input: RF, Coupling: DC, R.L.: Align: Auto, Input Z: 50 Ω, Corrections: Off, Freq Ref: Int (S), #Atten: 20 dB, Preamp: Off, PNO: Fast, Gate: Off, IF Gain: Low, Sig Track: Off, #Avg Type: Power (RMS), Avg/Hold: 200/200, Trig: Free Run. The right panel shows frequency settings: Center Frequency 2.46200000 GHz, Span 24.480000 MHz, and a list of frequency markers (1, 2, 3, 4, 5, 6) with their corresponding values. The bottom status bar shows the date and time: Mar 08, 2023 3:02:30 PM.</p>		





Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
		

Test Mode	Test Channel	Verdict
11N HT40	HCH	PASS
		

7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) Subpart C, RSS-247		
Section	Test Item	Limit
FCC §15.247 (d) RSS-247 Clause 5.5 RSS-GEN Clause 6.13	Conducted Bandedge and Spurious Emissions	30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

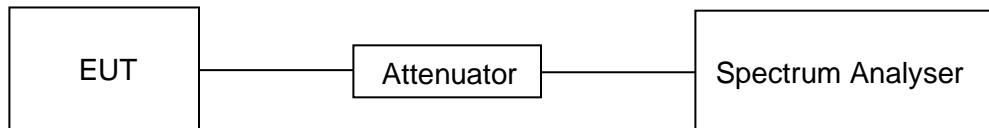
Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	$\geq 3 \times$ RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	$\geq 3 \times$ RBW
measurement points	\geq span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.

TEST SETUP



TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	58.5%
Atmosphere Pressure	102kpa	Test Voltage	DC5V

PART 1: REFERENCE LEVEL MEASUREMENT
TEST RESULTS TABLE

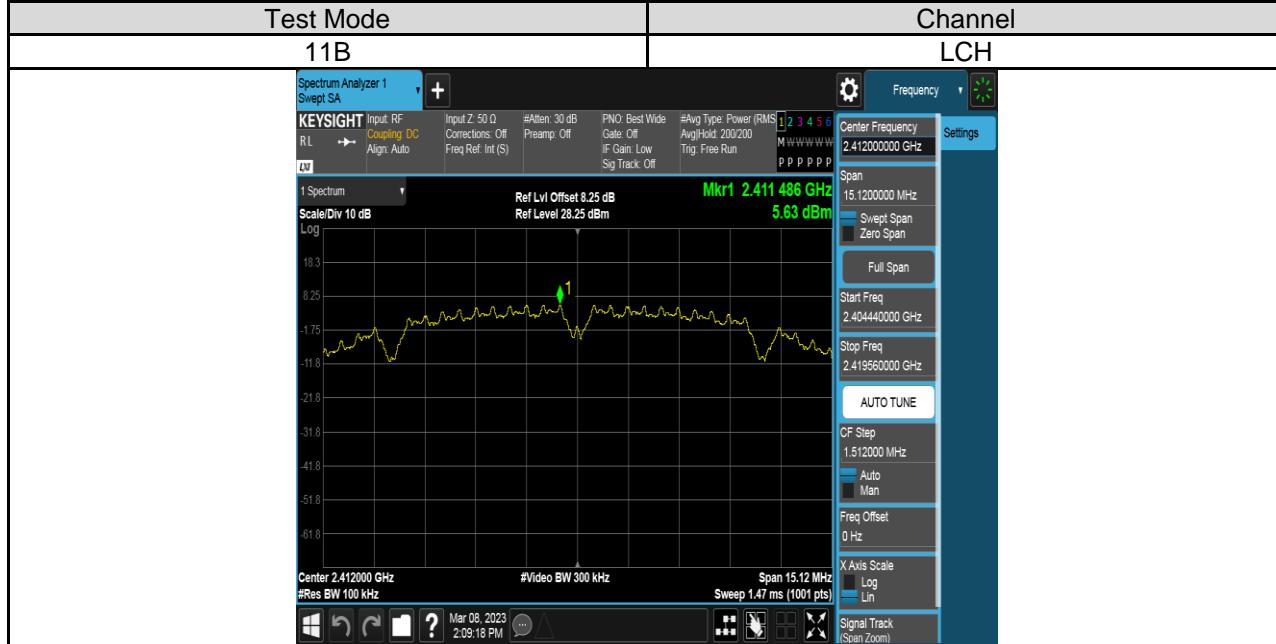
Test Mode	Test Antenna	Channel	Pref(dBm)	Puw(dBm)	Verdict
11B	Antenna 1	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
	Antenna 2	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
11G	Antenna 1	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
	Antenna 2	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
11N20 MIMO	Antenna 1	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
	Antenna 2	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
11N40 MIMO	Antenna 1	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS
	Antenna 2	LCH	See the test graphs	<Limit	PASS
		MCH	See the test graphs	<Limit	PASS
		HCH	See the test graphs	<Limit	PASS

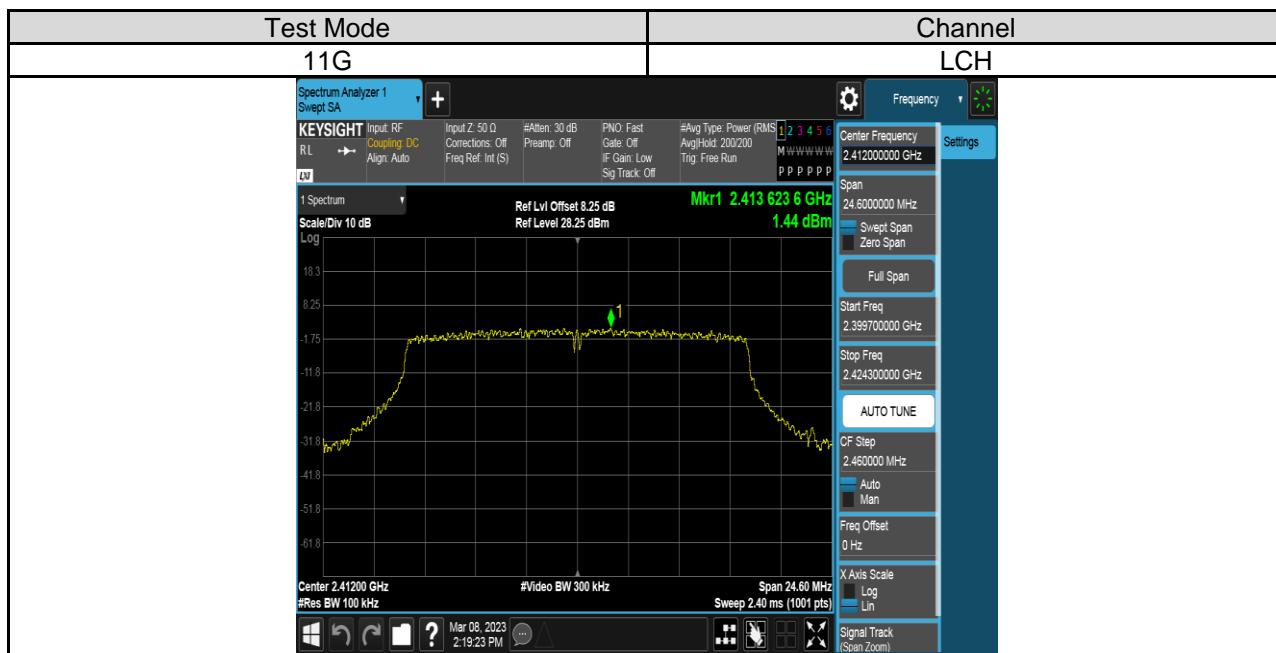
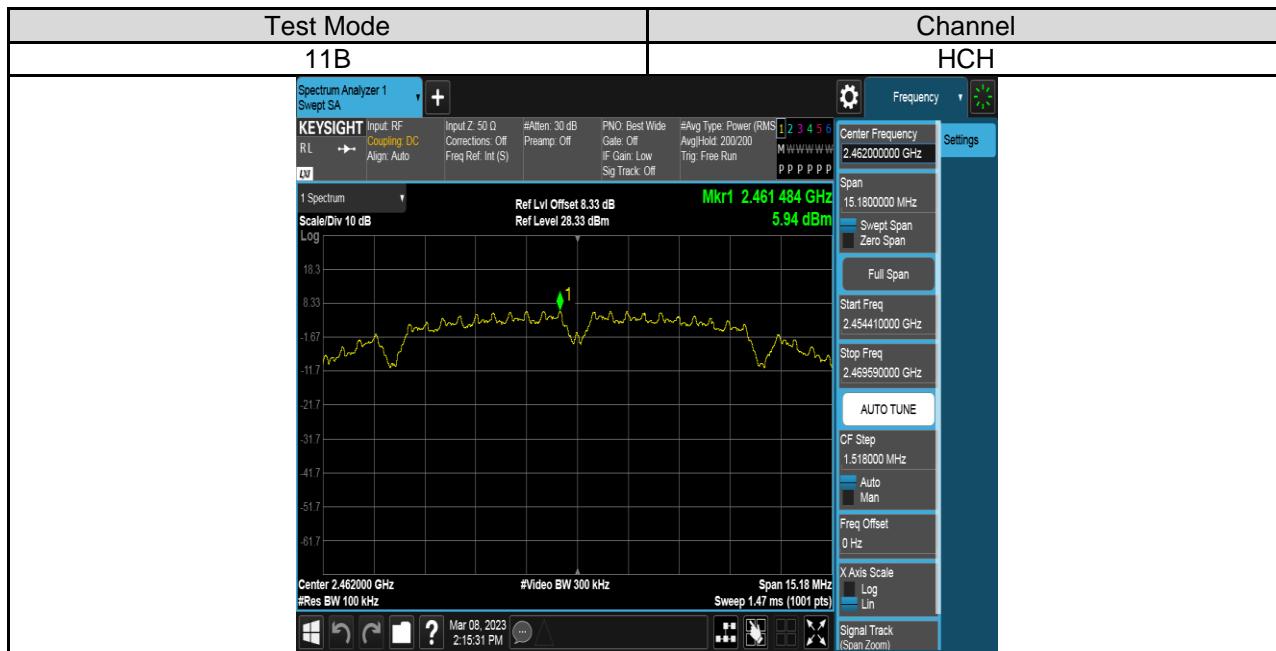
Remark:

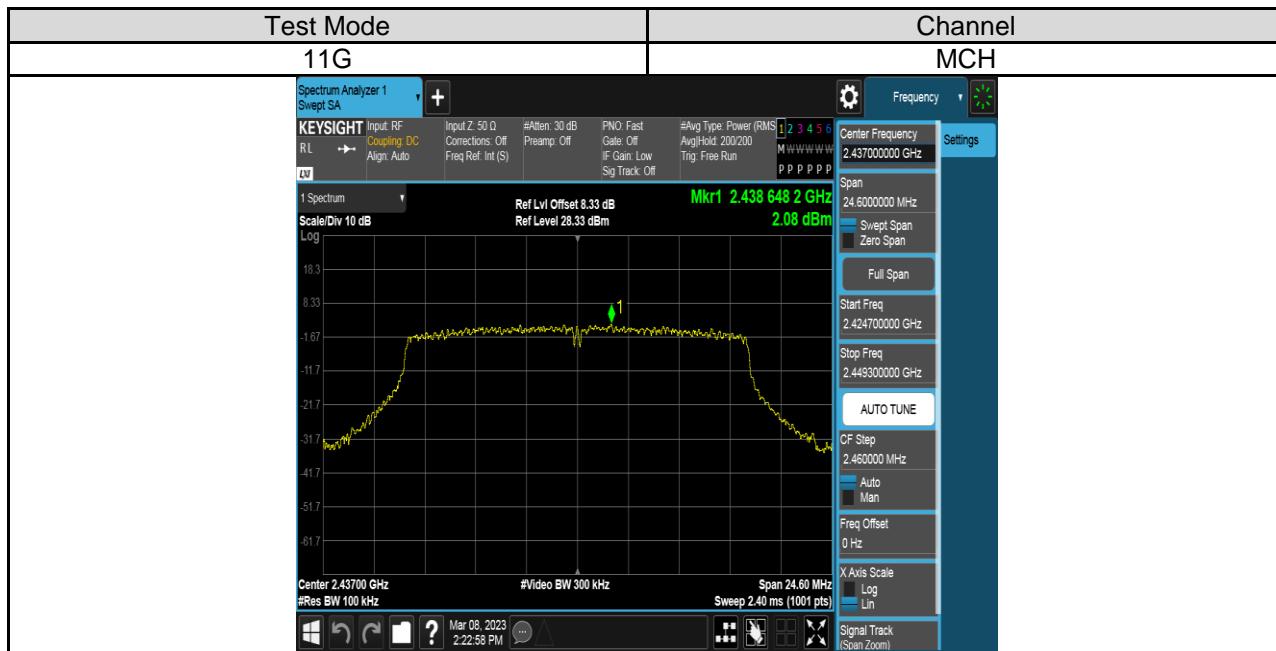
- 1) For this product, it has five antennas, but only two antennas for M8822CU3 RF module. For this M8822CU3 RF module, only the 802.11N HT20 and 802.11N HT40 modes can support both the SISO and MIMO technical. For the modes of 11B&11G only support SISO mode..
- 2) Through pre-testing all the test modes of 11N 20 and 11N40, including SISO and MIMO, but only the data if worse case is included in this test report.

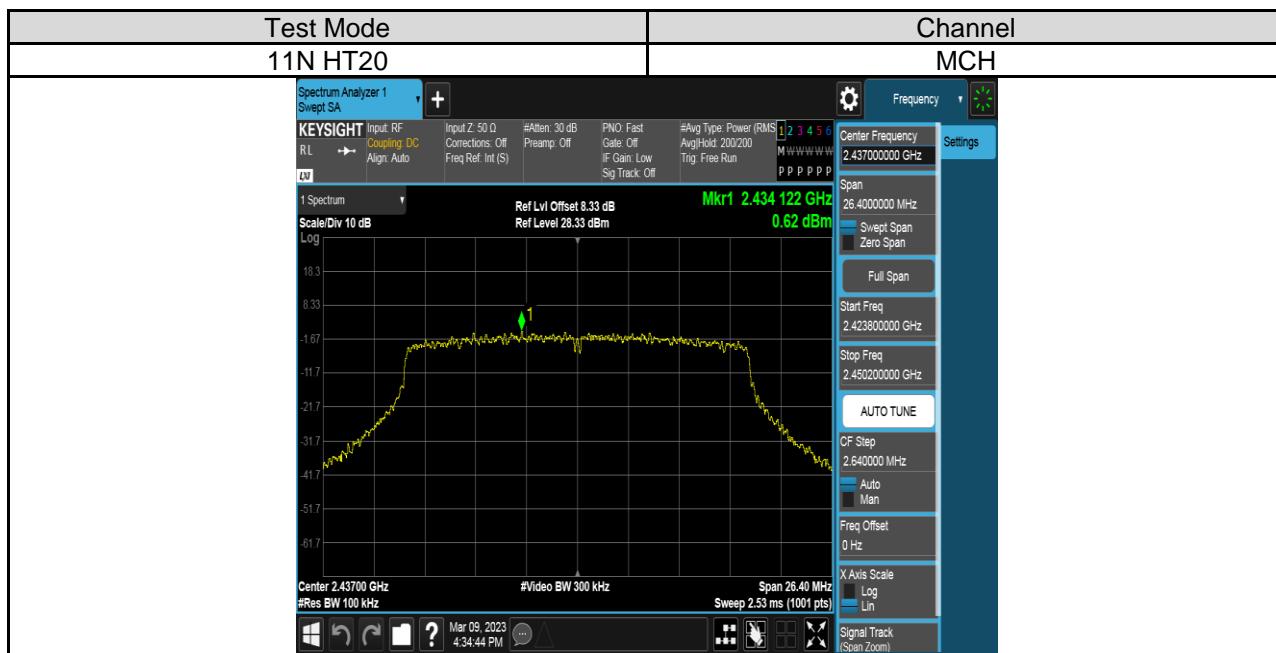
TEST GRAPHS

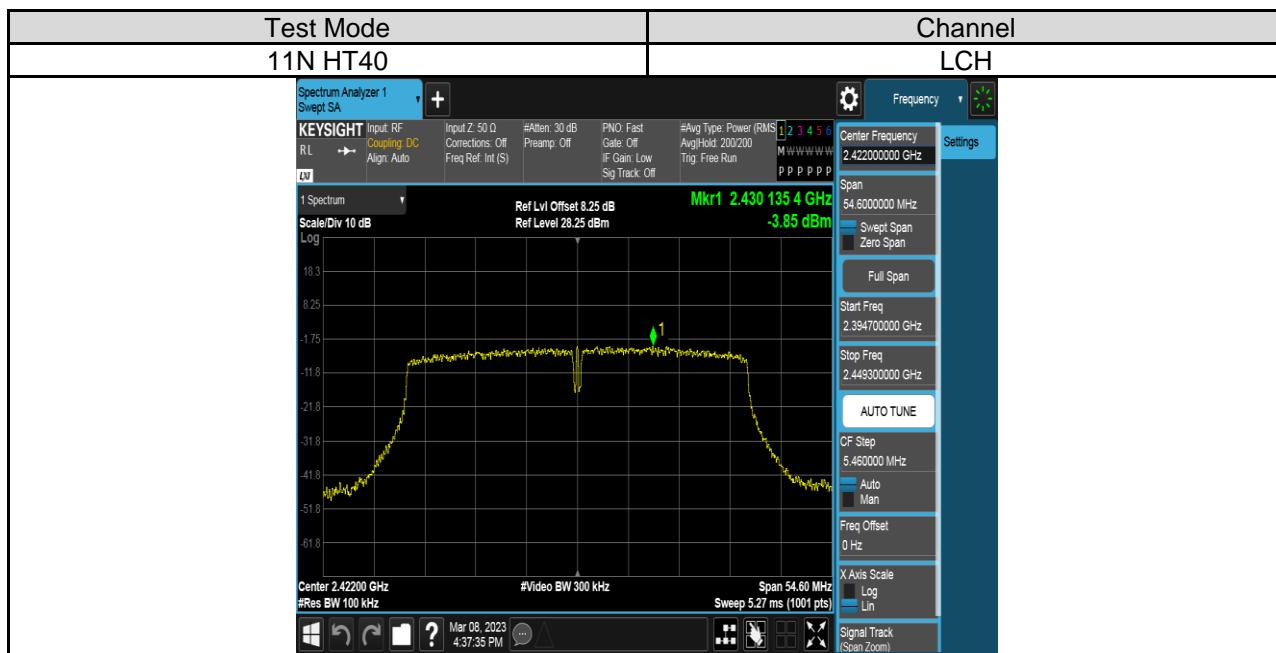
1) For Antenna 1 Part:













2) For Antenna 2 Part:
