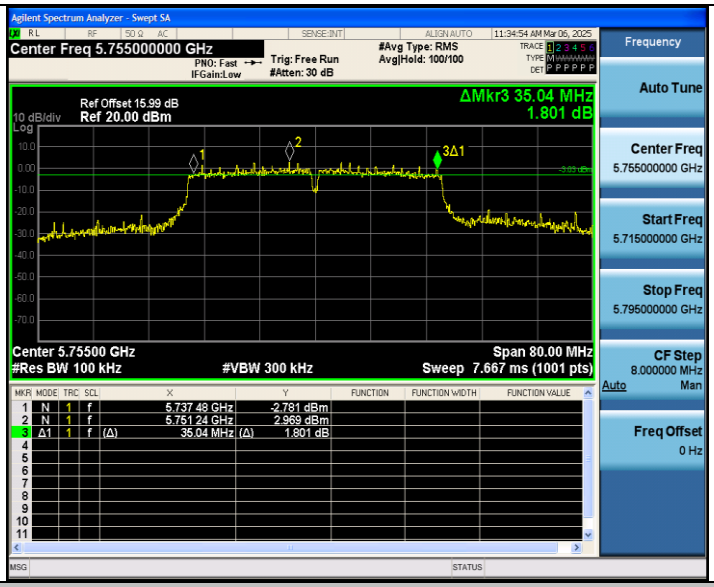
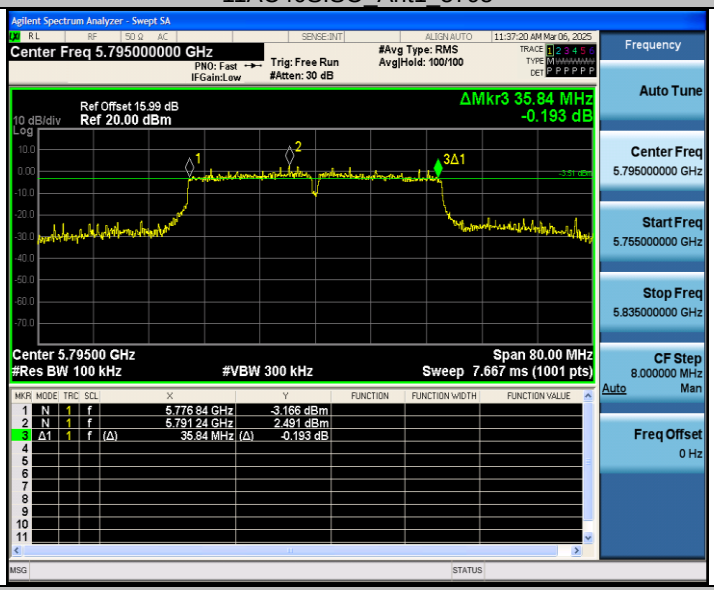
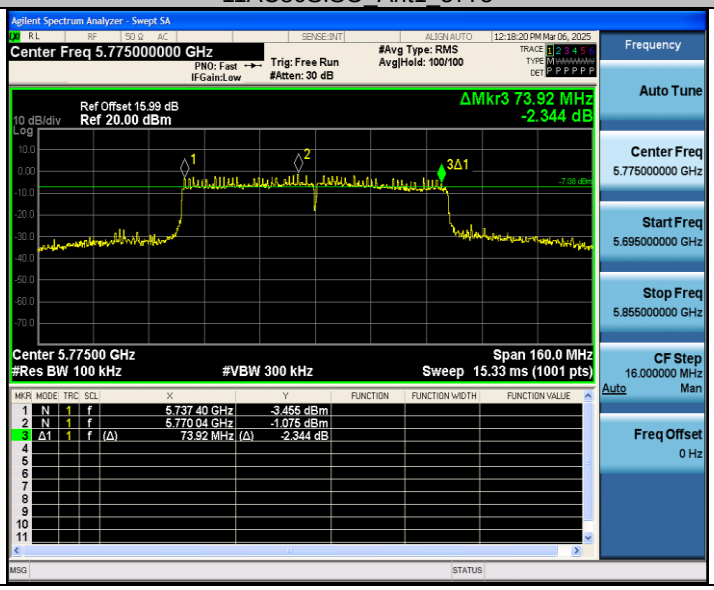


11AC40SISO_Ant1_5795



11AC80SISO_Ant1_5775



3.5. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a)

Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	Fixed: 1 Watt (30dBm) Mobile and Portable: 250mW (24dBm)	5150~5250
	250mW (24dBm)	5250~5350
	250mW (24dBm)	5500~5700
	1 Watt (30dBm)	5725~5850

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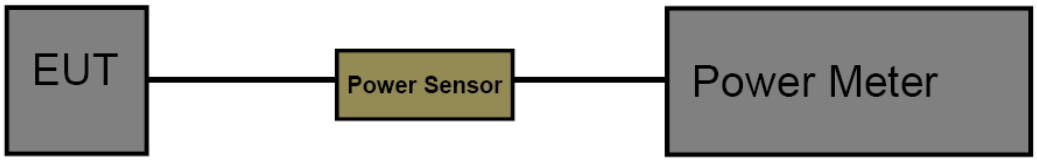
IC Power&PSD Limit					
Frequency	Type of devices	Maximum Conducted Output Power	EIRP Output Power	Conducted Power Spectral Density	EIRP Power Spectral Density
5150MHz-5250MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices		200mW or 10 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		10dBm/MHz
5250MHz-5350MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5470MHz-5600MHz 5650MHz-5725MHz	ALL Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5725MHz-5850MHz	ALL Devices	1W		30dBm/500KHz	

Test Configuration



Test Procedure

The measurement is according to section 3 of KDB 789033 D02 General UNII Test Procedures New Rules V02r01.

Test Mode

Please refer to the clause 2.4.

Test Result

Test Mode	Freq(MHz)	Conducted Output Power [dBm]	Limit [dBm]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11A	5180	16.80	≤24	19.30	≤23	PASS
	5200	16.81	≤24	19.31	≤23	PASS
	5240	17.01	≤24	19.51	≤23	PASS
	5260	17.15	≤24	19.65	≤30	PASS
	5280	16.65	≤24	19.15	≤30	PASS
	5320	16.80	≤24	19.30	≤30	PASS
	5500	16.81	≤24	19.31	≤30	PASS
	5580	16.96	≤24	19.46	≤30	PASS
	5700	17.31	≤24	19.81	≤30	PASS
	5745	17.30	≤30	/	/	PASS
	5785	17.41	≤30	/	/	PASS
	5825	17.63	≤30	/	/	PASS
11N20SISO	5180	16.72	≤24	19.22	≤23	PASS
	5200	16.73	≤24	19.23	≤23	PASS
	5240	17.07	≤24	19.57	≤23	PASS
	5260	16.88	≤24	19.38	≤30	PASS
	5280	16.97	≤24	19.47	≤30	PASS
	5320	16.84	≤24	19.34	≤30	PASS
	5500	16.52	≤24	19.02	≤30	PASS
	5580	16.74	≤24	19.24	≤30	PASS
	5700	17.16	≤24	19.66	≤30	PASS
	5745	17.33	≤30	/	/	PASS
	5785	17.23	≤30	/	/	PASS
	5825	17.42	≤30	/	/	PASS
11N40SISO	5190	16.11	≤24	18.61	≤23	PASS
	5230	16.30	≤24	18.80	≤23	PASS
	5270	16.25	≤24	18.75	≤30	PASS
	5310	15.79	≤24	18.29	≤30	PASS
	5510	15.85	≤24	18.35	≤30	PASS
	5550	16.00	≤24	18.50	≤30	PASS
	5670	16.08	≤24	18.58	≤30	PASS
	5755	16.11	≤30	/	/	PASS
	5795	16.14	≤30	/	/	PASS
11AC20SISO	5180	17.28	≤24	19.78	≤23	PASS
	5200	17.31	≤24	19.81	≤23	PASS

	5240	17.54	≤24	20.04	≤23	PASS
	5260	17.12	≤24	19.62	≤30	PASS
	5280	17.08	≤24	19.58	≤30	PASS
	5320	17.11	≤24	19.61	≤30	PASS
	5500	17.13	≤24	19.63	≤30	PASS
	5580	17.00	≤24	19.50	≤30	PASS
	5700	17.32	≤24	19.82	≤30	PASS
	5745	17.48	≤30	/	/	PASS
	5785	17.40	≤30	/	/	PASS
	5825	17.51	≤30	/	/	PASS
11AC40SISO	5190	16.41	≤24	18.91	≤23	PASS
	5230	16.52	≤24	19.02	≤23	PASS
	5270	16.47	≤24	18.97	≤30	PASS
	5310	15.90	≤24	18.40	≤30	PASS
	5510	16.02	≤24	18.52	≤30	PASS
	5550	16.13	≤24	18.63	≤30	PASS
	5670	16.24	≤24	18.74	≤30	PASS
	5755	16.56	≤30	/	/	PASS
	5795	16.34	≤30	/	/	PASS
11AC80SISO	5210	15.23	≤24	17.73	≤23	PASS
	5290	15.06	≤24	17.56	≤30	PASS
	5530	14.76	≤24	17.26	≤30	PASS
	5610	14.84	≤24	17.34	≤30	PASS
	5775	15.17	≤30	/	/	PASS

3.6. Power Spectral Density

Limit

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a)

For the 5.15~5.25GHz band:

- Outdoor AP

  The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.
  If G_{Tx}>6dBi, then PSD =17-(G_{Tx}-6).

- Indoor AP

  The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.
  If G_{Tx}>6dBi, then PSD =17-(G_{Tx}-6).

- Point-to-point AP

  The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.
  If G_{Tx}>23dBi, then PSD =17-(G_{Tx}-23).

- Client devices

  The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz.
  If G_{Tx}>6dBi, then PSD =11-(G_{Tx}-6).

For the 5.25~5.35GHz band:

The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz.
If G_{Tx}>6dBi, then PSD =11-(G_{Tx}-6).

For the 5.47~5.725GHz band:

The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz.
If G_{Tx}>6dBi, then PSD =11-(G_{Tx}-6).

For the 5.725~5.85GHz band:

- Point-to-multipoint systems (P2M)

  The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.
  If G_{Tx}>6dBi, then PSD =30-(G_{Tx}-6).

- Point-to-point systems (P2P)

  The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.

Note: G_{Tx}: EUT Antenna gain.

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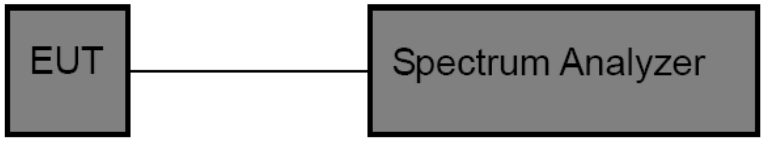
IC Power@PSD Limit					
Frequency	Type of devices	Maximum Conducted Output Power	EIRP Output Power	Conducted Power Spectral Density	EIRP Power Spectral Density
5150MHz-5250MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices		200mW or 10 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		10dBm/MHz
5250MHz-5350MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5470MHz-5600MHz 5650MHz-5725MHz	ALL Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5725MHz-5850MHz	ALL Devices	1W		30dBm/500KHz	

Test Configuration



Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to KDB 789033 D02 General UNII Test Procedures New Rules V02r01.

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Set analyzer center frequency to transmitting frequency.
(3) Set the span to encompass the entire emissions bandwidth (EBW) (alternatively, the entire 99% OBW) of the signal.
(4) RBW=1MHz for devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz RBW=500kHz for devices operating in the band 5.725-5.85 GHz.
(5) Set the VBW to: ≥ 3 RBW
(6) Detector: AVG
(7) Trace: Max Hold and View
(7) Sweep time: auto
(8) Trace average at least 100 traces in power averaging.
(9) User the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.

NOTE: The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

Test Mode

Please refer to the clause 2.4.

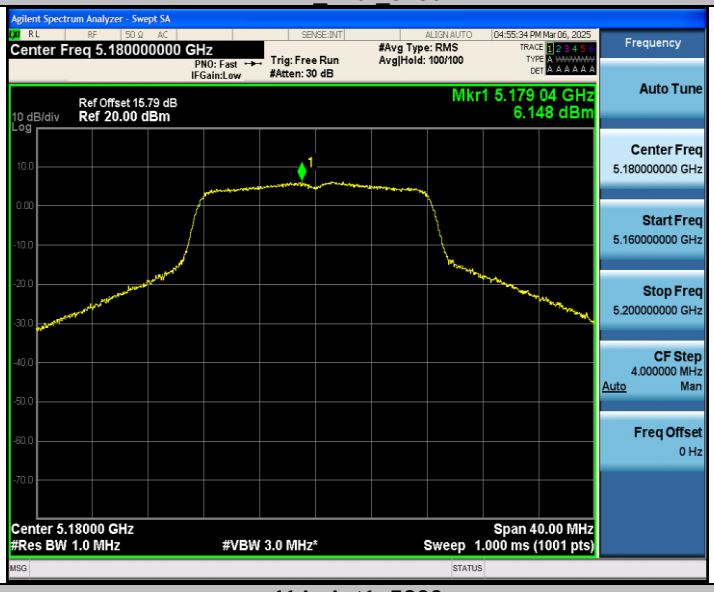
Test Result

Test Mode	Freq(MHz)	Conducted PSD [dBm/MHz]	Conducted PSD Limit [dBm/MHz]	Conducted PSD Limit [dBm/500kHz]	EIRP PSD [dBm/MHz]	EIRP PSD Limit [dBm/MHz]	Verdict
11A	5180	6.24	≤11	/	8.74	≤10	PASS
	5200	6.33	≤11	/	8.83	≤10	PASS
	5240	6.51	≤11	/	9.01	≤10	PASS
	5260	6.66	≤11	/	/	/	PASS
	5280	6.09	≤11	/	/	/	PASS
	5320	6.34	≤11	/	/	/	PASS
	5500	6.31	≤11	/	/	/	PASS
	5580	6.62	≤11	/	/	/	PASS
	5700	6.81	≤11	/	/	/	PASS
	5745	4.12	/	≤30	/	/	PASS
	5785	3.36	/	≤30	/	/	PASS
	5825	4.14	/	≤30	/	/	PASS
11AC20SISO	5180	6.43	≤11	/	8.93	≤10	PASS
	5200	6.65	≤11	/	9.15	≤10	PASS
	5240	6.84	≤11	/	9.34	≤10	PASS
	5260	6.35	≤11	/	/	/	PASS
	5280	6.23	≤11	/	/	/	PASS
	5320	6.13	≤11	/	/	/	PASS
	5500	6.38	≤11	/	/	/	PASS
	5580	6.23	≤11	/	/	/	PASS
	5700	6.48	≤11	/	/	/	PASS
	5745	3.75	/	≤30	/	/	PASS
	5785	3.34	/	≤30	/	/	PASS
	5825	4.21	/	≤30	/	/	PASS
11AC40SISO	5190	2.48	≤11	/	4.98	≤10	PASS
	5230	2.66	≤11	/	5.16	≤10	PASS
	5270	2.09	≤11	/	/	/	PASS
	5310	2.25	≤11	/	/	/	PASS
	5510	2.88	≤11	/	/	/	PASS
	5550	2.60	≤11	/	/	/	PASS
	5670	2.39	≤11	/	/	/	PASS
	5755	0.43	/	≤30	/	/	PASS
	5795	-0.06	/	≤30	/	/	PASS
11AC80SISO	5210	-1.65	≤11	/	0.85	≤10	PASS
	5290	-1.63	≤11	/	/	/	PASS
	5530	-1.91	≤11	/	/	/	PASS
	5610	-1.65	≤11	/	/	/	PASS
	5775	-3.98	/	≤30	/	/	PASS

Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.
2.The Duty Cycle Factor and RBW Factor is compensated in the graph.

Test Graphs

11A_Ant1_5180



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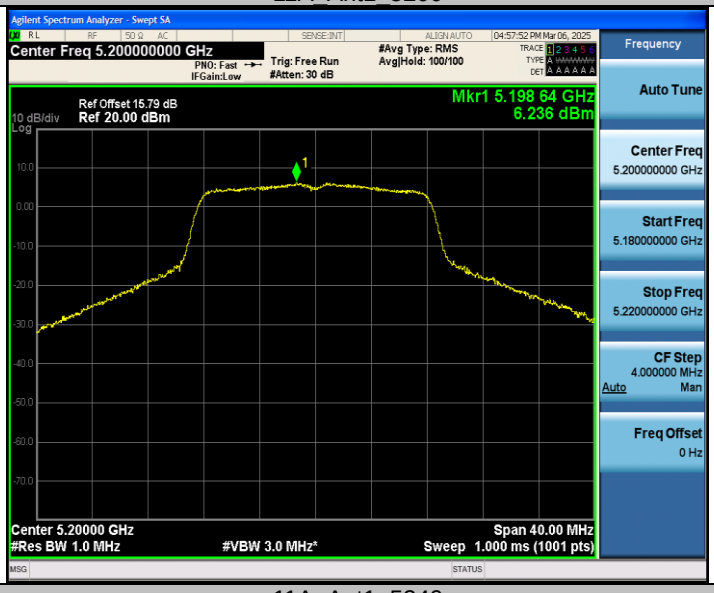

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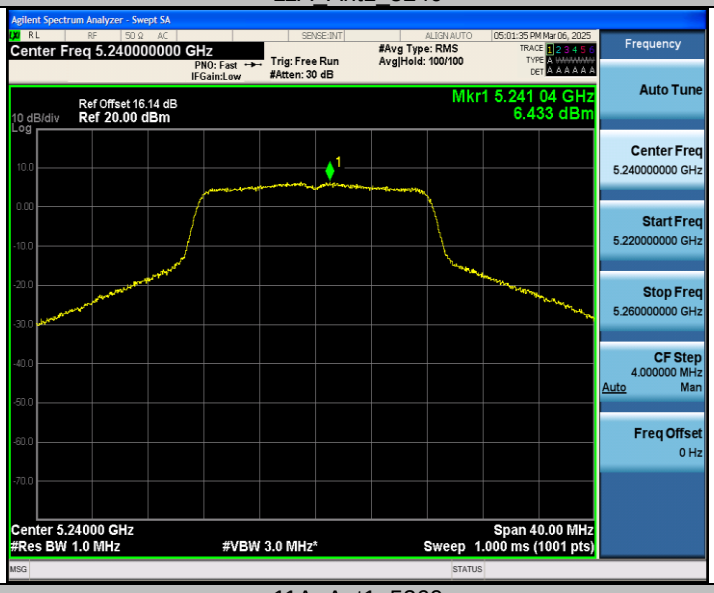

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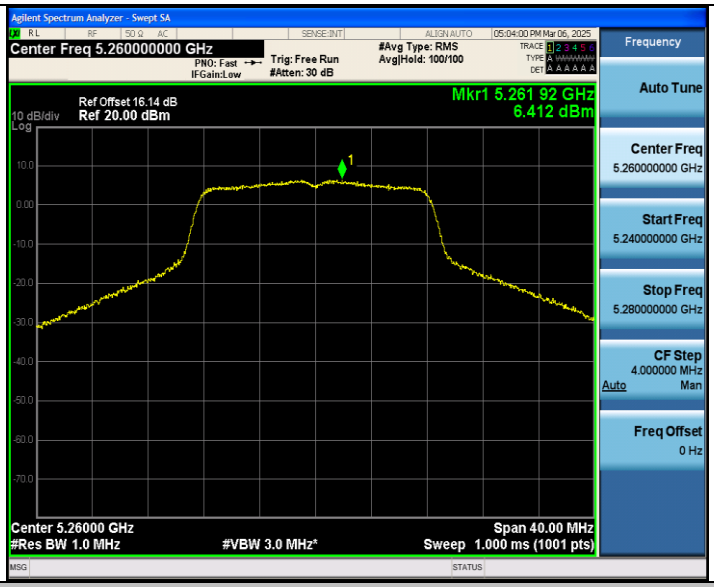
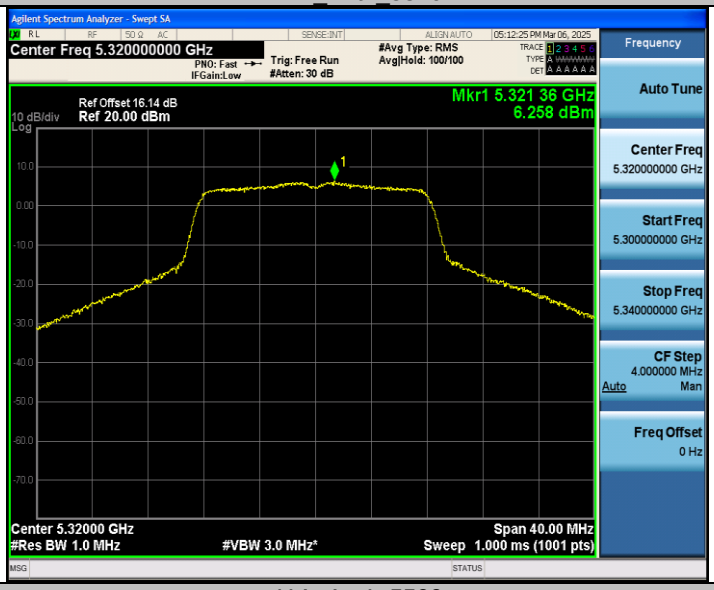


11A_Ant1_5280

11A_Ant1_5320



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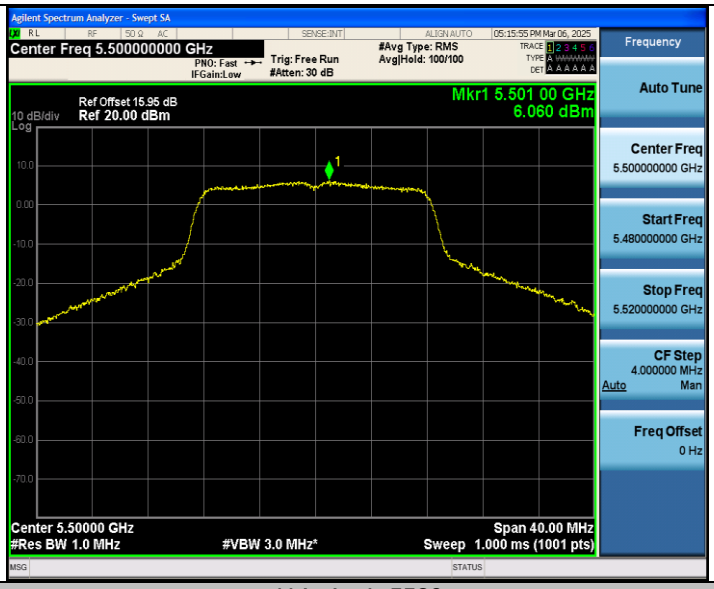
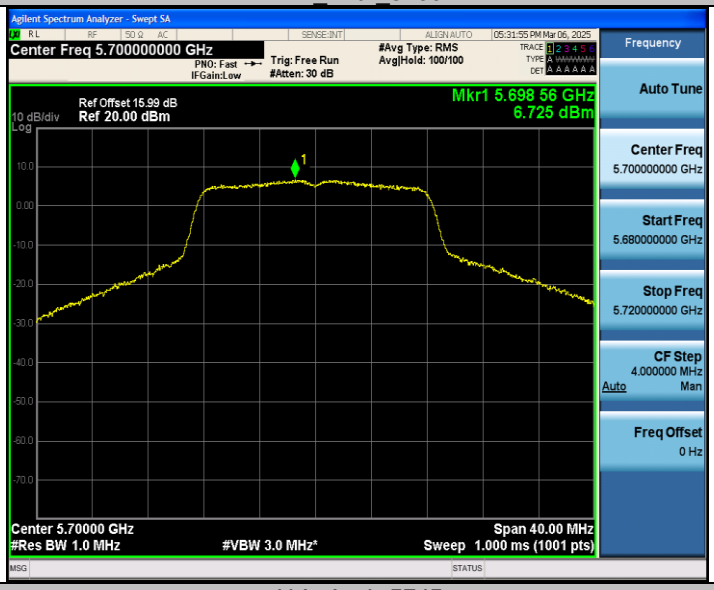


11A_Ant1_5580

11A_Ant1_5700



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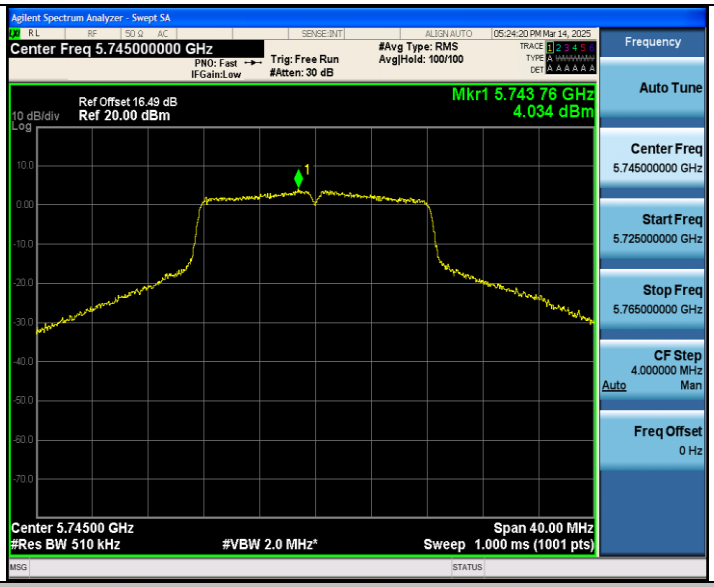

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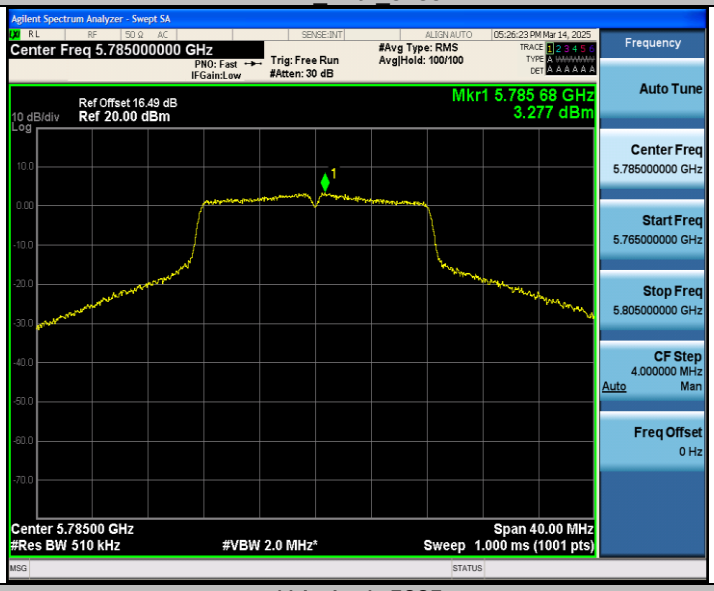
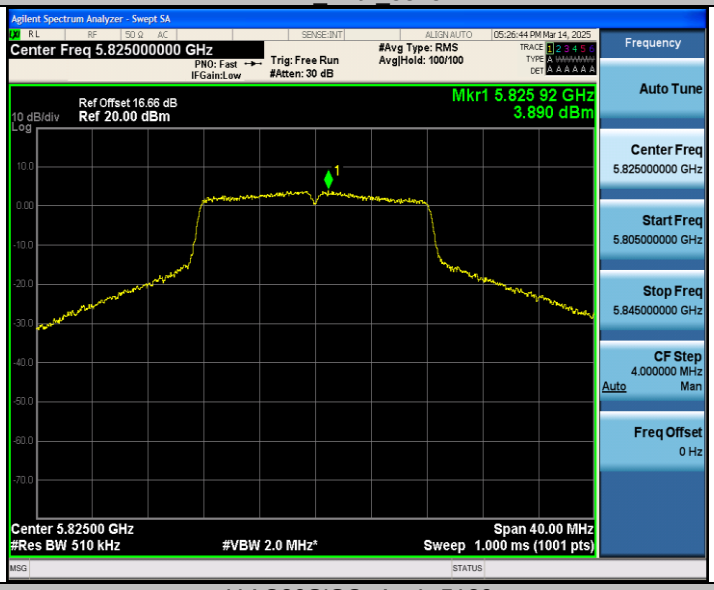


11A_Ant1_5825



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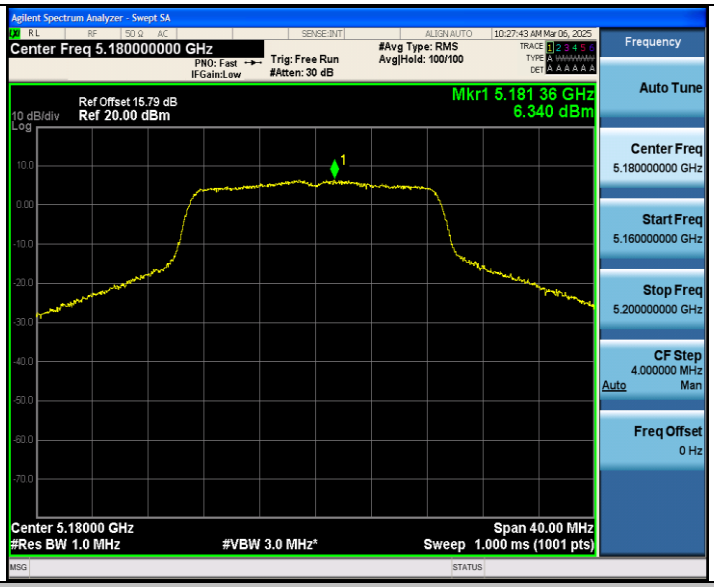

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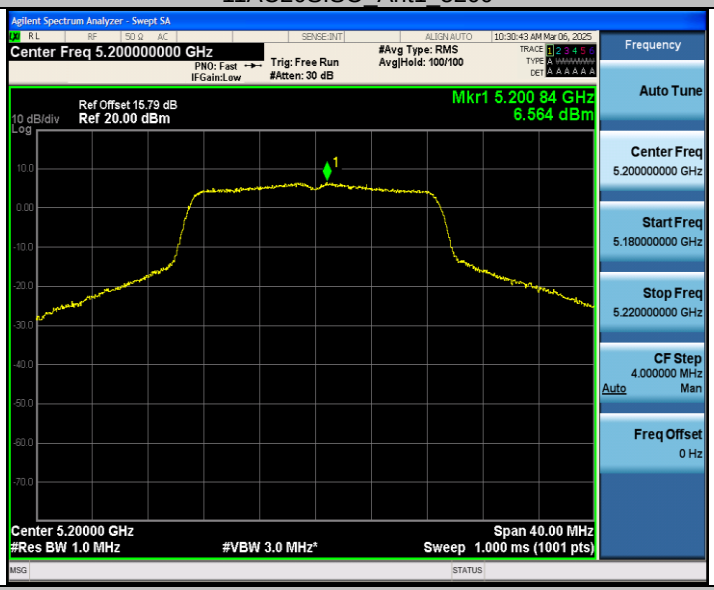

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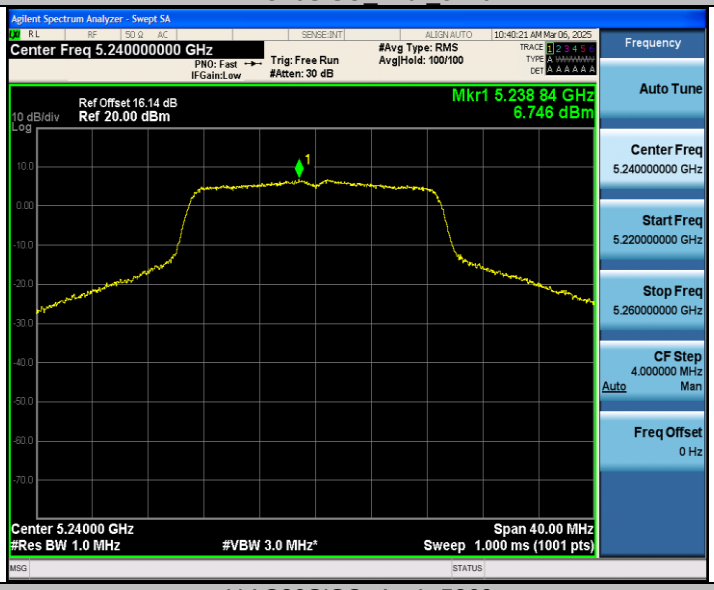

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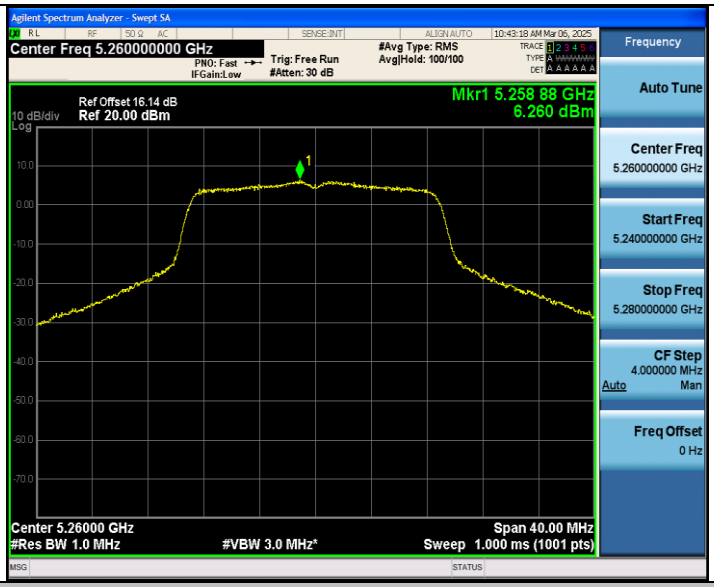

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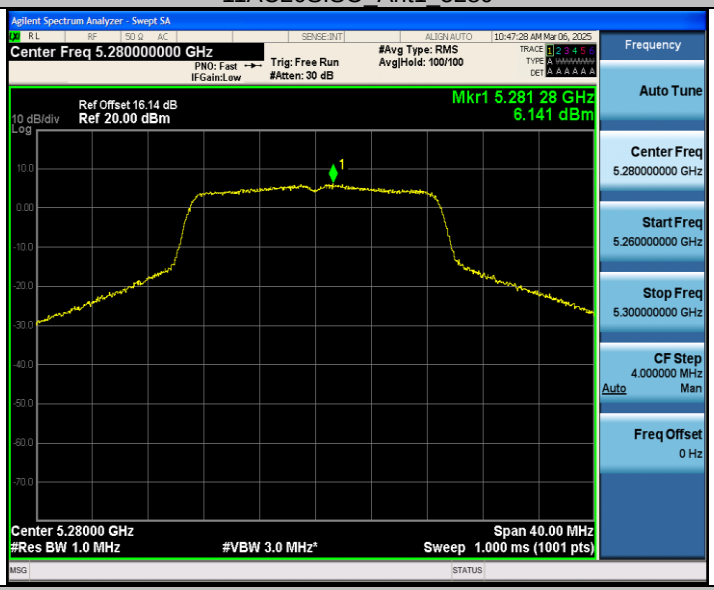

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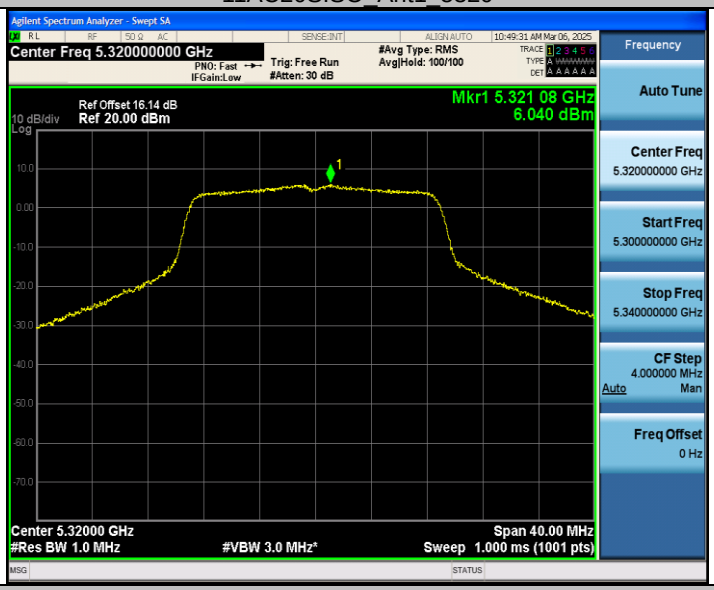
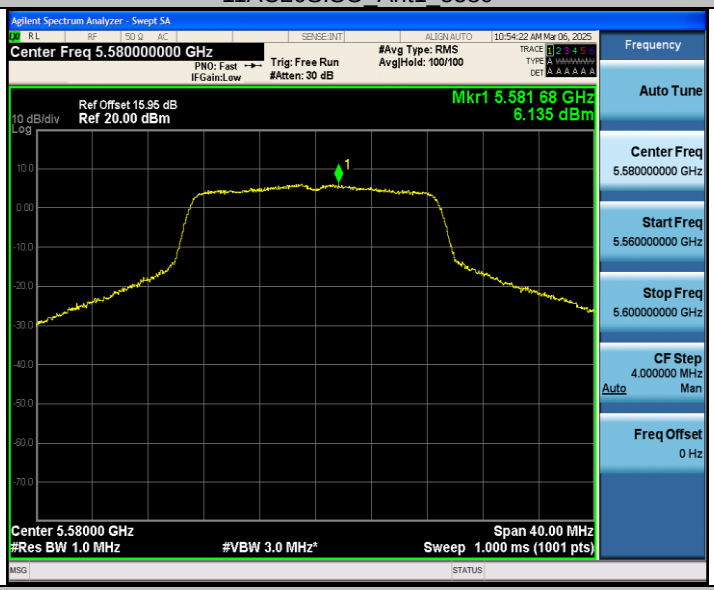


11AC20SISO_Ant1_5500

11AC20SISO_Ant1_5580



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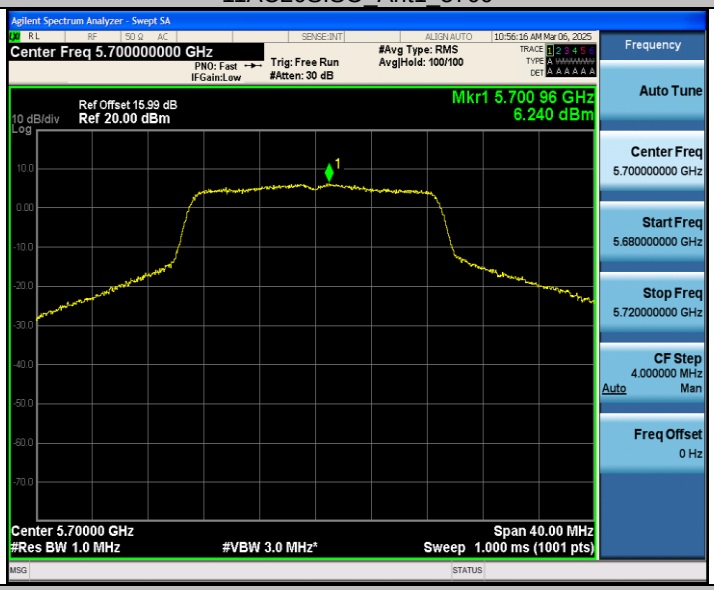

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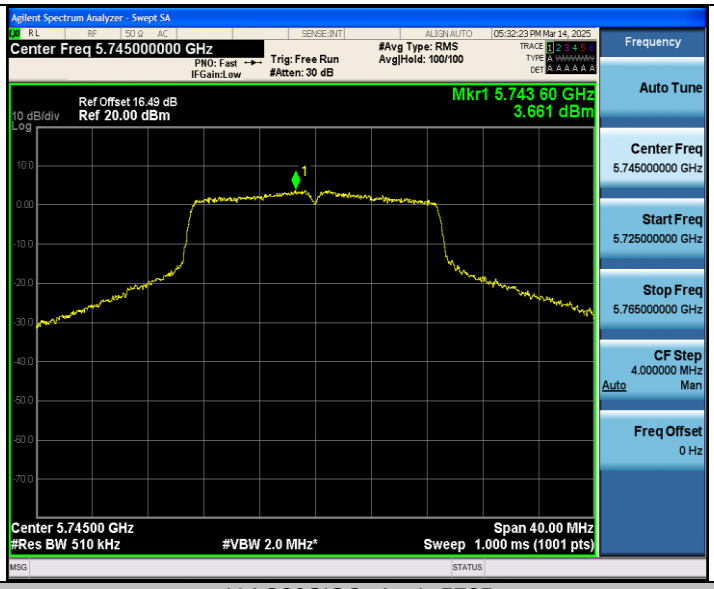

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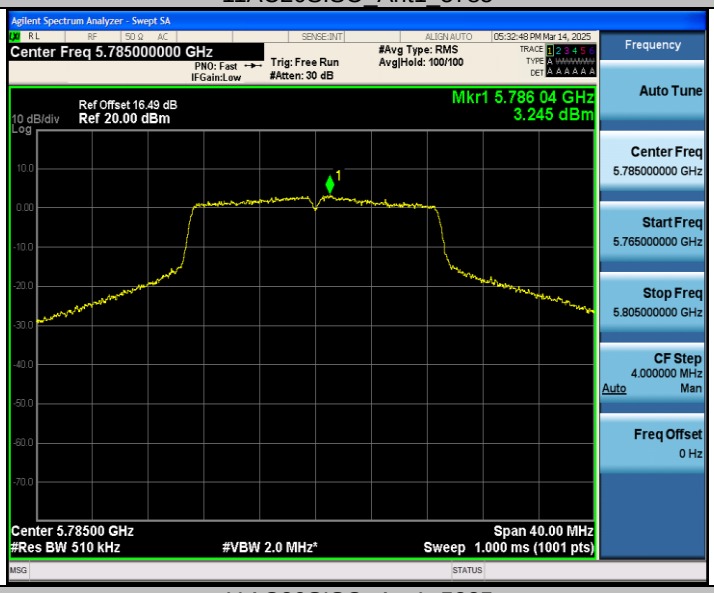

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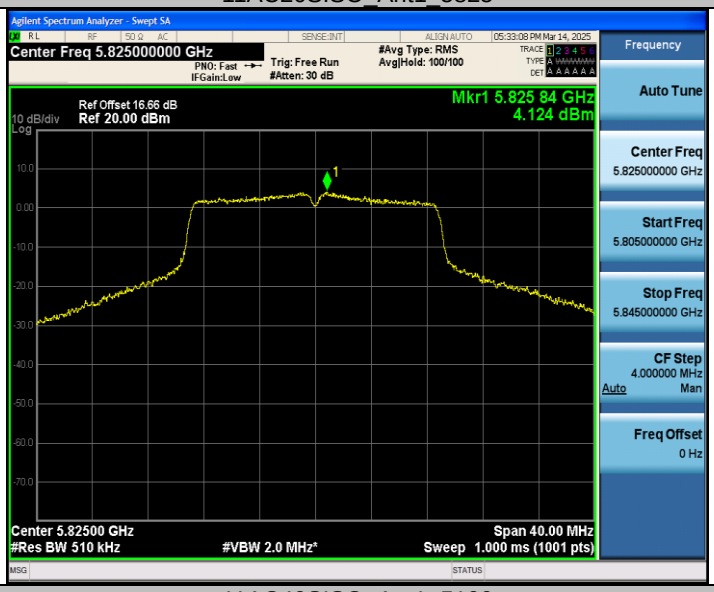

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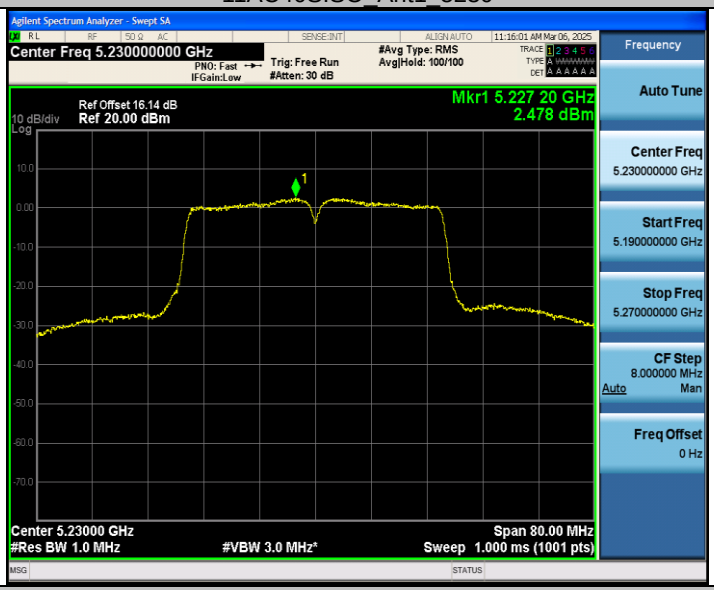
11AC40SISO_Ant1_5230



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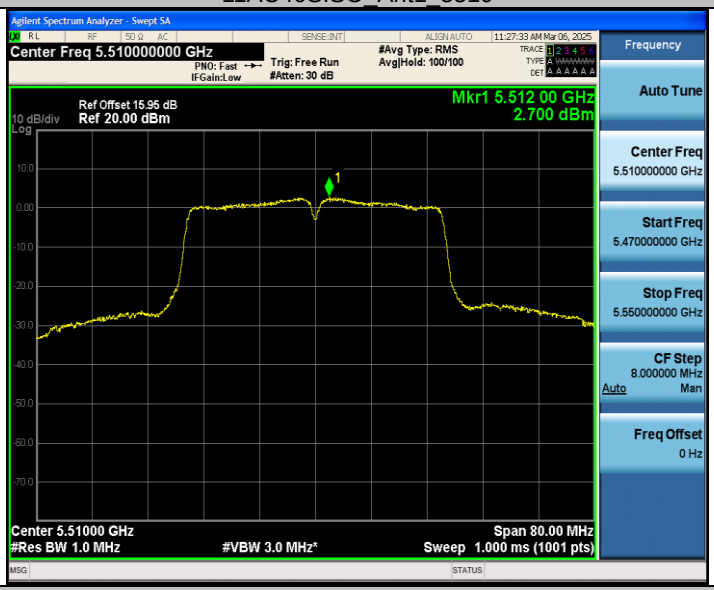
11AC40SISO_Ant1_5310

11AC40SISO_Ant1_5510



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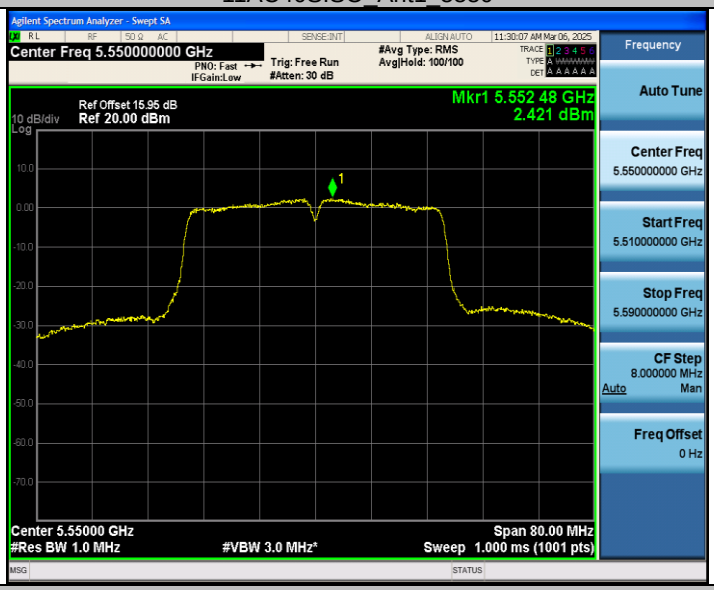
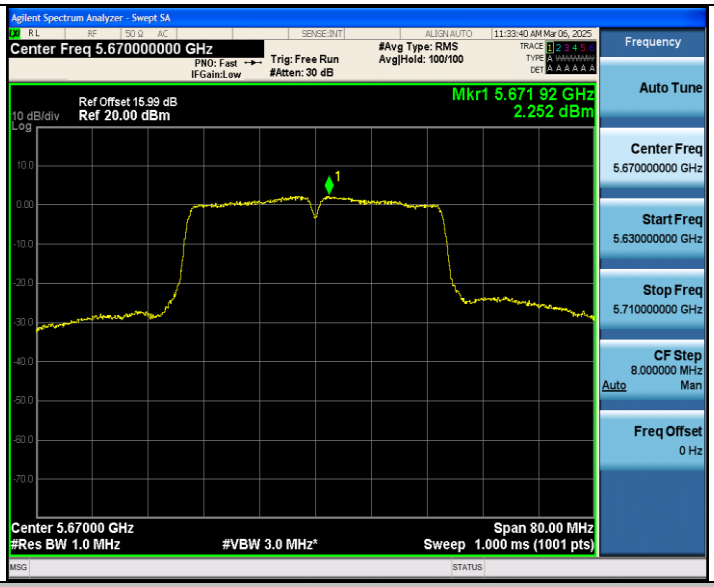
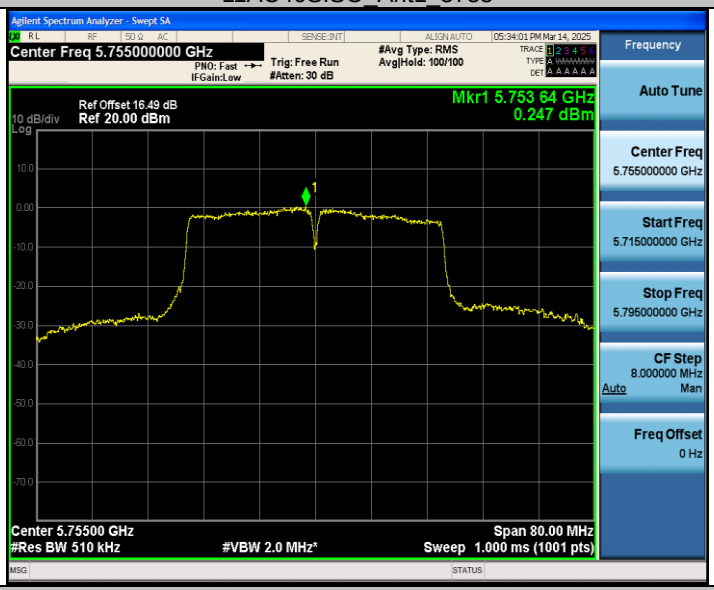


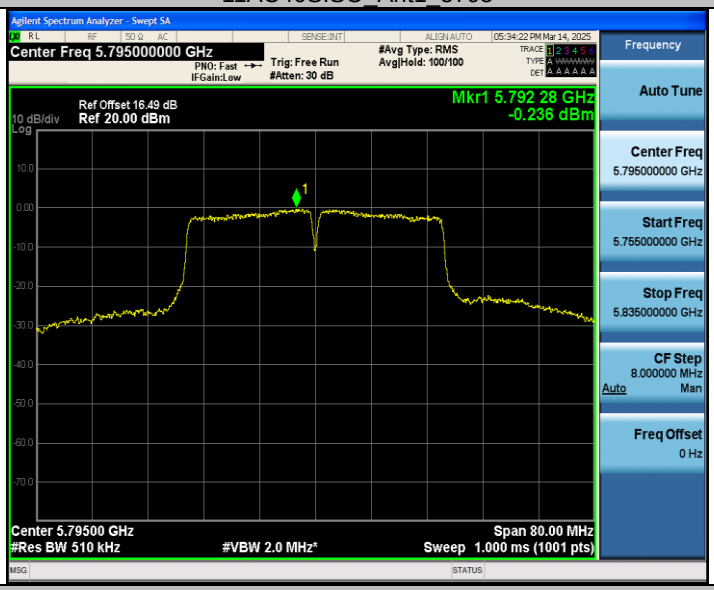
11AC40SISO_Ant1_5670



11AC40SISO_Ant1_5755



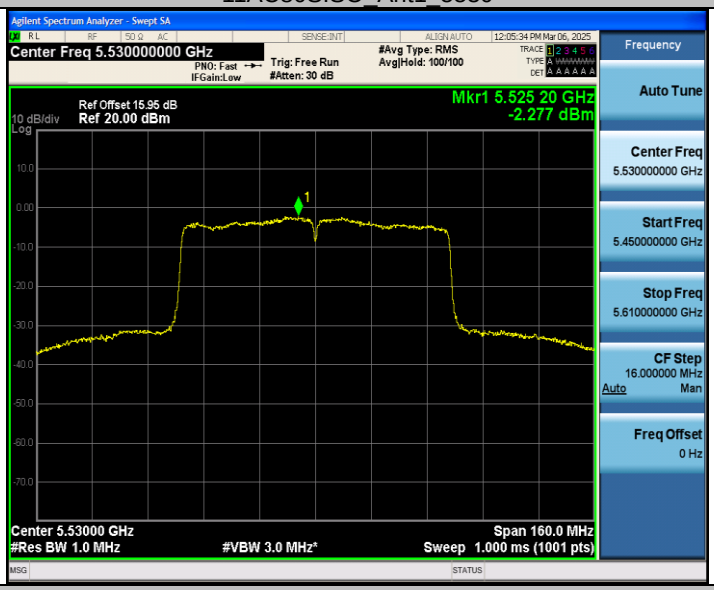
11AC40SISO_Ant1_5795



11AC80SISO_Ant1_5210

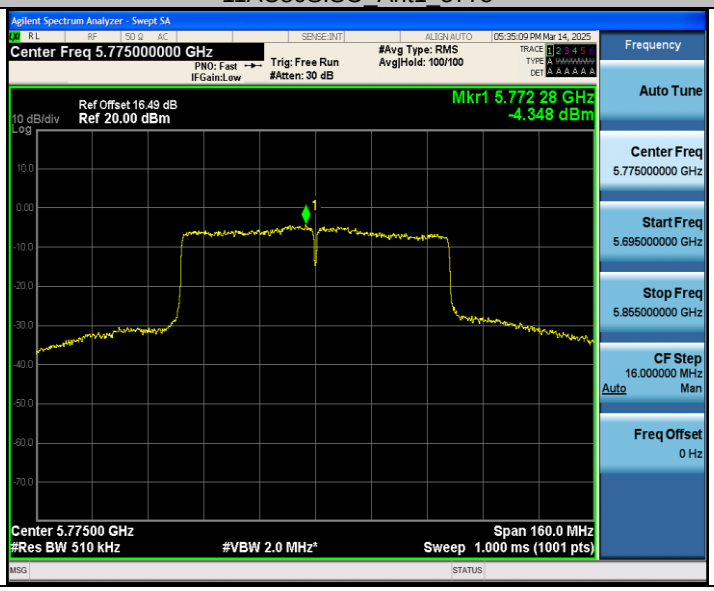
11AC80SISO_Ant1_5290

11AC80SISO_Ant1_5530



11AC80SISO_Ant1_5610

11AC80SISO_Ant1_5775



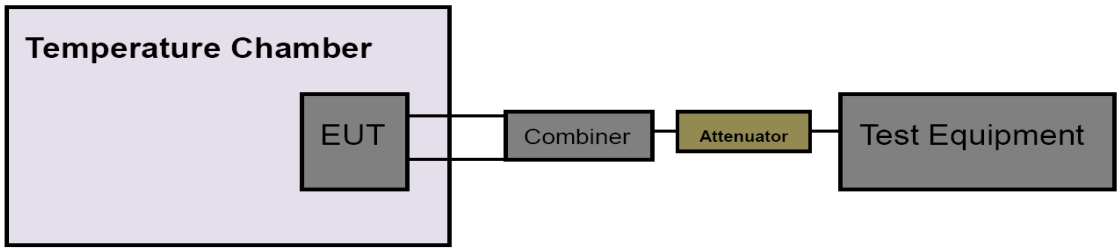
3.7. Frequency Stability

Limit

FCC CFR Title 47 Part 15 Subpart E Section 15.407(g) / RSS-Gen 6.11

Test Item	Limit	Frequency Range (MHz)
Frequency Stability	Specified in the user's manual, the transmitter center frequency tolerance shall be ±20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)	5150~5250
		5250~5350
		5500~5700
		5725~5850

Test Configuration



Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above.

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Set analyzer center frequency to transmitting frequency.
(3) Set the span to encompass the entire emissions bandwidth (EBW) of the signal.
(4) Set the RBW to: 8MHz, VBW=8MHz with peak detector and max hold settings.
(5) The test extreme voltage is to change the primary supply voltage from 3.85Vdc percent of the nominal value.
(6) Extreme temperature is 0℃~40℃

NOTE: The EUT was set to continuously transmitting in continuously un-modulation transmitting mode.

Test Mode

Please refer to the clause 2.4.

Test Result

Voltage								
Test Mode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20M Bandwidth	Ant1	5180	NV	NT	-30500.00	-5.888031	20	PASS
			LV	NT	-29500.00	-5.694981	20	PASS
			HV	NT	-30500.00	-5.888031	20	PASS
		5200	NV	NT	-30500.00	-5.865385	20	PASS
			LV	NT	-31000.00	-5.961538	20	PASS
			HV	NT	-30500.00	-5.865385	20	PASS
		5240	NV	NT	-30500.00	-5.820611	20	PASS
			LV	NT	-31500.00	-6.011450	20	PASS
			HV	NT	-31500.00	-6.011450	20	PASS
		5260	NV	NT	-31000.00	-5.893536	20	PASS
			LV	NT	-31000.00	-5.893536	20	PASS
			HV	NT	-31500.00	-5.988593	20	PASS
		5280	NV	NT	-30000.00	-5.681818	20	PASS
			LV	NT	-30500.00	-5.776515	20	PASS
			HV	NT	-30500.00	-5.776515	20	PASS
		5320	NV	NT	-30000.00	-5.639098	20	PASS
			LV	NT	-30500.00	-5.733083	20	PASS
			HV	NT	-31500.00	-5.921053	20	PASS
		5500	NV	NT	-30500.00	-5.545455	20	PASS
			LV	NT	-31500.00	-5.727273	20	PASS
			HV	NT	-32000.00	-5.818182	20	PASS
		5580	NV	NT	-32000.00	-5.734767	20	PASS
			LV	NT	-32500.00	-5.824373	20	PASS
			HV	NT	-32000.00	-5.734767	20	PASS
		5700	NV	NT	-33000.00	-5.789474	20	PASS
			LV	NT	-33500.00	-5.877193	20	PASS
			HV	NT	-32500.00	-5.701754	20	PASS
		5745	NV	NT	-33500.00	-5.831158	20	PASS
			LV	NT	-34000.00	-5.918190	20	PASS
			HV	NT	-34000.00	-5.918190	20	PASS
		5785	NV	NT	-32500.00	-5.617978	20	PASS
			LV	NT	-34000.00	-5.877269	20	PASS
			HV	NT	-34000.00	-5.877269	20	PASS
		5825	NV	NT	-34000.00	-5.836910	20	PASS
			LV	NT	-35000.00	-6.008584	20	PASS
			HV	NT	-34500.00	-5.922747	20	PASS
40M Bandwidth	Ant1	5190	NV	NT	-28500.00	-5.491329	20	PASS
			LV	NT	-30000.00	-5.780347	20	PASS
			HV	NT	-30000.00	-5.780347	20	PASS
		5230	NV	NT	-31000.00	-5.927342	20	PASS
			LV	NT	-31000.00	-5.927342	20	PASS
			HV	NT	-31000.00	-5.927342	20	PASS
		5270	NV	NT	-31500.00	-5.977230	20	PASS
			LV	NT	-32000.00	-6.072106	20	PASS
			HV	NT	-31500.00	-5.977230	20	PASS
		5310	NV	NT	-31000.00	-5.838041	20	PASS
			LV	NT	-31000.00	-5.838041	20	PASS
			HV	NT	-32000.00	-6.026365	20	PASS
		5510	NV	NT	-32000.00	-5.807623	20	PASS
			LV	NT	-32000.00	-5.807623	20	PASS
			HV	NT	-32500.00	-5.898367	20	PASS
		5550	NV	NT	-31500.00	-5.675676	20	PASS
			LV	NT	-31500.00	-5.675676	20	PASS
			HV	NT	-32000.00	-5.765766	20	PASS
		5670	NV	NT	-33000.00	-5.820106	20	PASS
			LV	NT	-33000.00	-5.820106	20	PASS
			HV	NT	-33000.00	-5.820106	20	PASS
		5755	NV	NT	-33500.00	-5.821025	20	PASS
			LV	NT	-34500.00	-5.994787	20	PASS
			HV	NT	-34000.00	-5.907906	20	PASS

		5795	NV	NT	-34500.00	-5.953408	20	PASS
			LV	NT	-34500.00	-5.953408	20	PASS
			HV	NT	-35000.00	-6.039689	20	PASS
80M Bandwidth	Ant1	5210	NV	NT	-30500.00	-5.854127	20	PASS
			LV	NT	-31000.00	-5.950096	20	PASS
			HV	NT	-30500.00	-5.854127	20	PASS
		5530	NV	NT	-33000.00	-5.967450	20	PASS
			LV	NT	-33500.00	-6.057866	20	PASS
			HV	NT	-33500.00	-6.057866	20	PASS
		5610	NV	NT	-34000.00	-6.060606	20	PASS
			LV	NT	-34000.00	-6.060606	20	PASS
			HV	NT	-34000.00	-6.060606	20	PASS
		5775	NV	NT	-35500.00	-6.147186	20	PASS
			LV	NT	-35000.00	-6.060606	20	PASS
			HV	NT	-36000.00	-6.233766	20	PASS

Temperature								
Test Mode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20M Bandwidth	Ant1	5180	NV	0	-31000.00	-5.984556	20	PASS
			NV	10	-30500.00	-5.888031	20	PASS
			NV	20	-30500.00	-5.888031	20	PASS
			NV	30	-30500.00	-5.888031	20	PASS
			NV	40	-30000.00	-5.791506	20	PASS
		5200	NV	0	-31000.00	-5.961538	20	PASS
			NV	10	-31000.00	-5.961538	20	PASS
			NV	20	-31500.00	-6.057692	20	PASS
			NV	30	-31500.00	-6.057692	20	PASS
			NV	40	-31500.00	-6.057692	20	PASS
		5240	NV	0	-30500.00	-5.820611	20	PASS
			NV	10	-31000.00	-5.916031	20	PASS
			NV	20	-31000.00	-5.916031	20	PASS
			NV	30	-32000.00	-6.106870	20	PASS
			NV	40	-31500.00	-6.011450	20	PASS
		5260	NV	0	-31000.00	-5.893536	20	PASS
			NV	10	-31000.00	-5.893536	20	PASS
			NV	20	-31000.00	-5.893536	20	PASS
			NV	30	-30500.00	-5.798479	20	PASS
			NV	40	-31500.00	-5.988593	20	PASS
		5280	NV	0	-31000.00	-5.871212	20	PASS
			NV	10	-31500.00	-5.965909	20	PASS
			NV	20	-30500.00	-5.776515	20	PASS
			NV	30	-31000.00	-5.871212	20	PASS
			NV	40	-31500.00	-5.965909	20	PASS
		5320	NV	0	-32000.00	-6.015038	20	PASS
			NV	10	-31000.00	-5.827068	20	PASS
			NV	20	-31500.00	-5.921053	20	PASS
			NV	30	-31000.00	-5.827068	20	PASS
			NV	40	-31000.00	-5.827068	20	PASS
		5500	NV	0	-32000.00	-5.818182	20	PASS
			NV	10	-31500.00	-5.727273	20	PASS
			NV	20	-32500.00	-5.909091	20	PASS
			NV	30	-32500.00	-5.909091	20	PASS
			NV	40	-32000.00	-5.818182	20	PASS
		5580	NV	0	-32500.00	-5.824373	20	PASS
			NV	10	-32000.00	-5.734767	20	PASS
			NV	20	-32500.00	-5.824373	20	PASS
			NV	30	-32000.00	-5.734767	20	PASS
			NV	40	-33000.00	-5.913978	20	PASS
		5700	NV	0	-33000.00	-5.789474	20	PASS
			NV	10	-34000.00	-5.964912	20	PASS
			NV	20	-34000.00	-5.964912	20	PASS
			NV	30	-34500.00	-6.052632	20	PASS
			NV	40	-34500.00	-6.052632	20	PASS

		5745	NV	0	-34500.00	-6.005222	20	PASS
			NV	10	-34000.00	-5.918190	20	PASS
			NV	20	-34500.00	-6.005222	20	PASS
			NV	30	-34500.00	-6.005222	20	PASS
			NV	40	-34000.00	-5.918190	20	PASS
		5785	NV	0	-34500.00	-5.963699	20	PASS
			NV	10	-34000.00	-5.877269	20	PASS
			NV	20	-34500.00	-5.963699	20	PASS
			NV	30	-33500.00	-5.790838	20	PASS
			NV	40	-34500.00	-5.963699	20	PASS
		5825	NV	0	-34500.00	-5.922747	20	PASS
			NV	10	-34500.00	-5.922747	20	PASS
			NV	20	-34500.00	-5.922747	20	PASS
			NV	30	-34000.00	-5.836910	20	PASS
			NV	40	-35000.00	-6.008584	20	PASS
40M Bandwidth	Ant1	5190	NV	0	-30500.00	-5.876686	20	PASS
			NV	10	-31000.00	-5.973025	20	PASS
			NV	20	-31500.00	-6.069364	20	PASS
			NV	30	-30000.00	-5.780347	20	PASS
			NV	40	-31000.00	-5.973025	20	PASS
		5230	NV	0	-31500.00	-6.022945	20	PASS
			NV	10	-31500.00	-6.022945	20	PASS
			NV	20	-31500.00	-6.022945	20	PASS
			NV	30	-31000.00	-5.927342	20	PASS
			NV	40	-31000.00	-5.927342	20	PASS
		5270	NV	0	-32500.00	-6.166983	20	PASS
			NV	10	-32000.00	-6.072106	20	PASS
			NV	20	-32000.00	-6.072106	20	PASS
			NV	30	-32500.00	-6.166983	20	PASS
			NV	40	-32500.00	-6.166983	20	PASS
		5310	NV	0	-32500.00	-6.120527	20	PASS
			NV	10	-31000.00	-5.838041	20	PASS
			NV	20	-32500.00	-6.120527	20	PASS
			NV	30	-31500.00	-5.932203	20	PASS
			NV	40	-32000.00	-6.026365	20	PASS
		5510	NV	0	-32000.00	-5.807623	20	PASS
			NV	10	-31500.00	-5.716878	20	PASS
			NV	20	-32500.00	-5.898367	20	PASS
			NV	30	-33500.00	-6.079855	20	PASS
			NV	40	-33000.00	-5.989111	20	PASS
		5550	NV	0	-32500.00	-5.855856	20	PASS
			NV	10	-32000.00	-5.765766	20	PASS
			NV	20	-32000.00	-5.765766	20	PASS
			NV	30	-32500.00	-5.855856	20	PASS
			NV	40	-32000.00	-5.765766	20	PASS
		5670	NV	0	-33500.00	-5.908289	20	PASS
			NV	10	-33000.00	-5.820106	20	PASS
			NV	20	-33000.00	-5.820106	20	PASS
			NV	30	-34000.00	-5.996473	20	PASS
			NV	40	-33500.00	-5.908289	20	PASS
		5755	NV	0	-35000.00	-6.081668	20	PASS
			NV	10	-34500.00	-5.994787	20	PASS
			NV	20	-34000.00	-5.907906	20	PASS
			NV	30	-34500.00	-5.994787	20	PASS
			NV	40	-34000.00	-5.907906	20	PASS
		5795	NV	0	-36000.00	-6.212252	20	PASS
			NV	10	-35000.00	-6.039689	20	PASS
			NV	20	-35500.00	-6.125971	20	PASS
			NV	30	-35500.00	-6.125971	20	PASS
			NV	40	-36000.00	-6.212252	20	PASS
80M Bandwidth	Ant1	5210	NV	0	-31500.00	-6.046065	20	PASS
			NV	10	-31500.00	-6.046065	20	PASS
			NV	20	-32000.00	-6.142035	20	PASS
			NV	30	-32500.00	-6.238004	20	PASS
			NV	40	-32000.00	-6.142035	20	PASS

		5530	NV	0	-33500.00	-6.057866	20	PASS
			NV	10	-33500.00	-6.057866	20	PASS
			NV	20	-34000.00	-6.148282	20	PASS
			NV	30	-34000.00	-6.148282	20	PASS
			NV	40	-33500.00	-6.057866	20	PASS
		5610	NV	0	-34500.00	-6.149733	20	PASS
			NV	10	-34500.00	-6.149733	20	PASS
			NV	20	-35500.00	-6.327986	20	PASS
			NV	30	-35500.00	-6.327986	20	PASS
			NV	40	-34500.00	-6.149733	20	PASS
		5775	NV	0	-35500.00	-6.147186	20	PASS
			NV	10	-36000.00	-6.233766	20	PASS
			NV	20	-35000.00	-6.060606	20	PASS
			NV	30	-36000.00	-6.233766	20	PASS
			NV	40	-35000.00	-6.060606	20	PASS

3.8. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of 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.

Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

RSS-Gen Issue 5 Section 6.8
The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power(e.i.r.p.) limits specified in the applicable standard (RSS) for licence-exempt apparatus.

Result

PASS.
The EUT has 1 antenna: a PIFA Antenna for 5G WIFI.
Note: ☒Antenna use a permanently attached antenna which is not replaceable.
☐Not using a standard antenna jack or electrical connector for antenna replacement.
☐The antenna has to be professionally installed (please provide method of installation).
Which in accordance to RSS-Gen 6.8, please refer to the internal photos.

3.9. Dynamic Frequency Selection

Requirement

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Limit

1. DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

2. DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 μsec is selected, the number of pulses would be Round up $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{3066}\right)\right\}$ = Round up {17.2} = 18.

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type wave forms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

For the Frequency Hopping Radar Type, the same Burst parameters are used for each wave form. The hopping sequence is different for each wave form and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

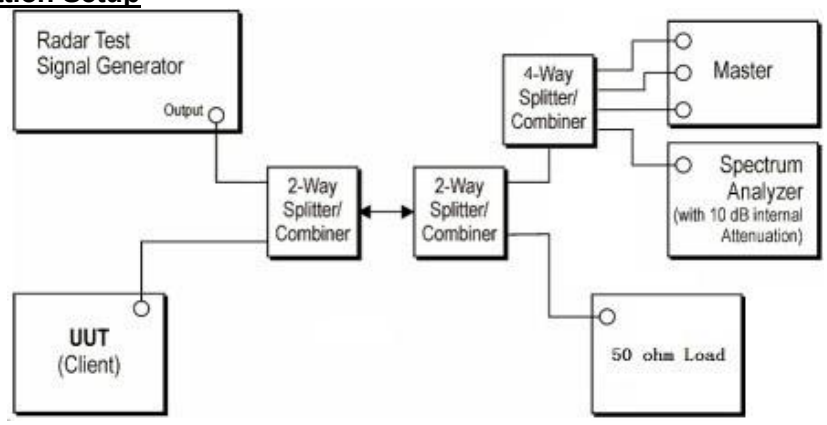
The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250–5724MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

Calibration of Radar Waveform

Radar Waveform Calibration Procedure

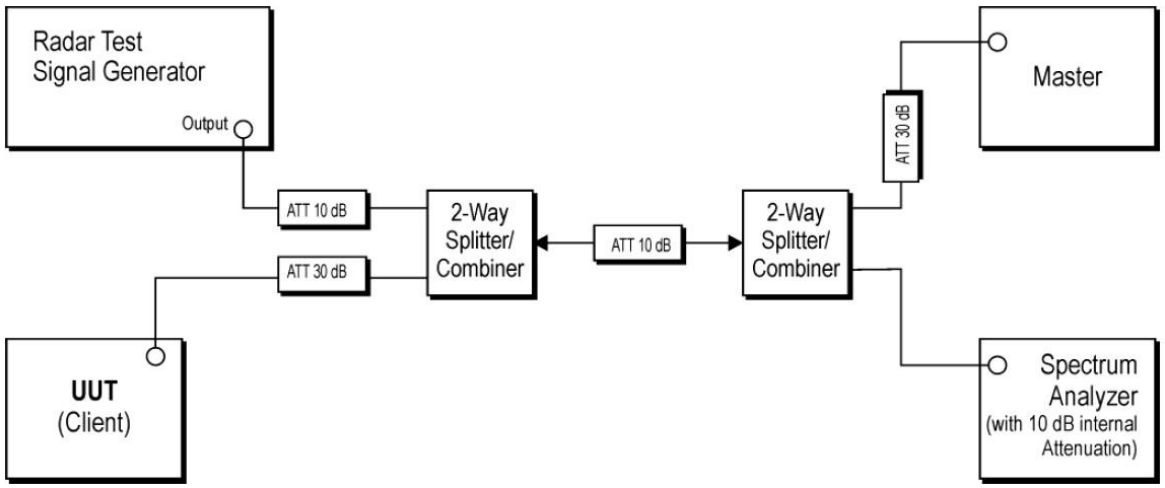
1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master.
2) The interference Radar Detection Threshold Level is -62dBm + 2.5dBi +1dB = -58.5dBm that had been taken into account the output power range and antenna gain.
3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.
4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was -62dBm + 2.5dBi +1dB = -58.5dBm. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup

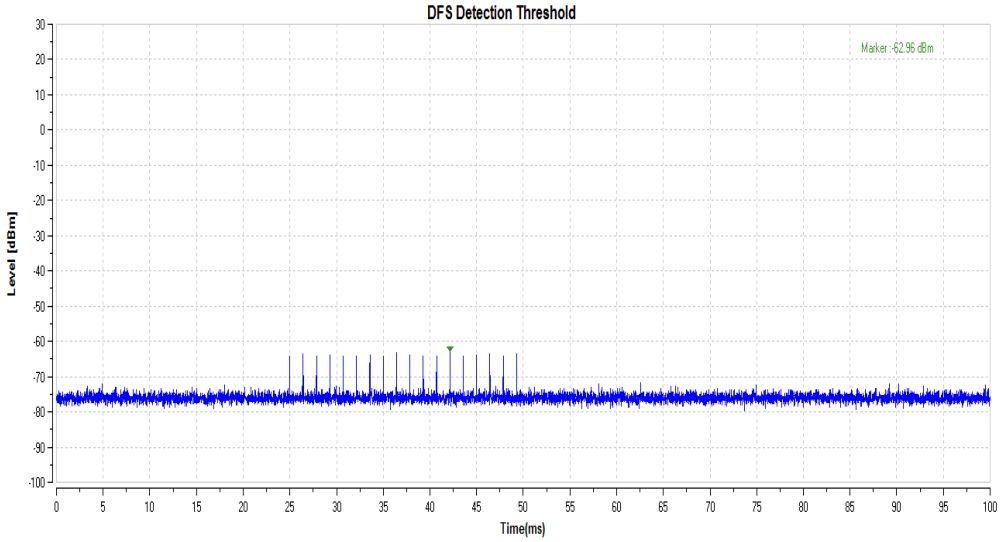
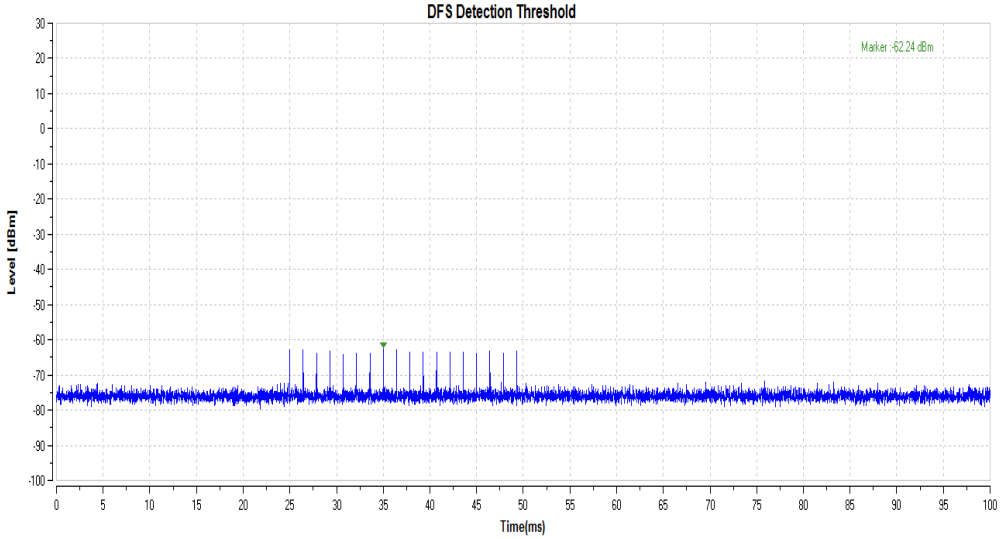


Test Configuration

Setup for Client with injection at the Master



Radar Waveform Calibration Result

Reference DFS test signal	
802.11A_5320	
802.11A_5500	

Test Procedure

1. The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel

Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type

7. Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (0.3ms) =S (12000ms) / B (4000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C (ms)= N X Dwell (0.3ms); where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Test Mode

Please refer to the clause 2.4.

Test Result

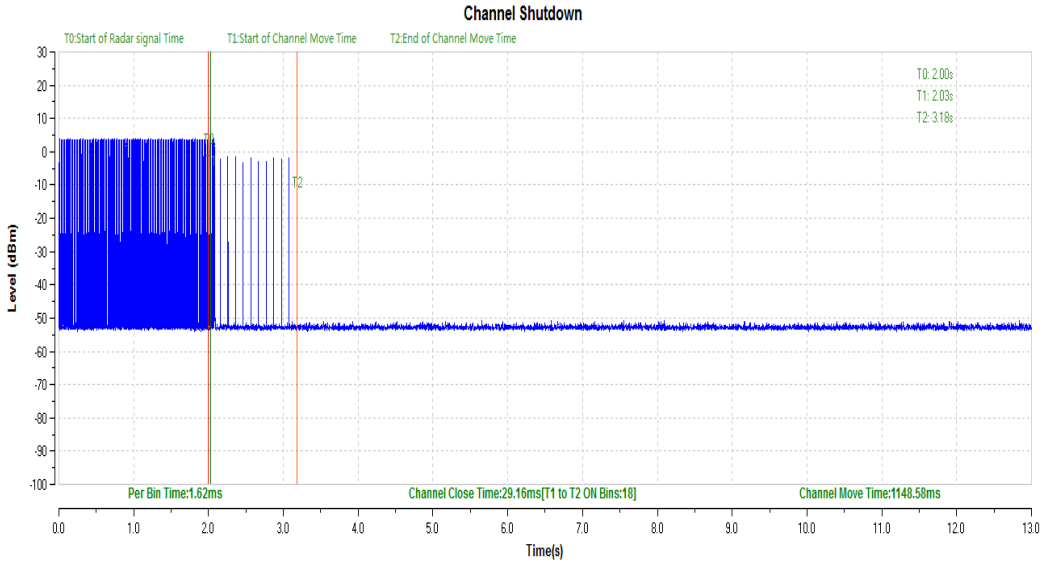
☒ **Passed** ☐ **Not Applicable**

The product in this report belongs to Client Without Radar Detection.

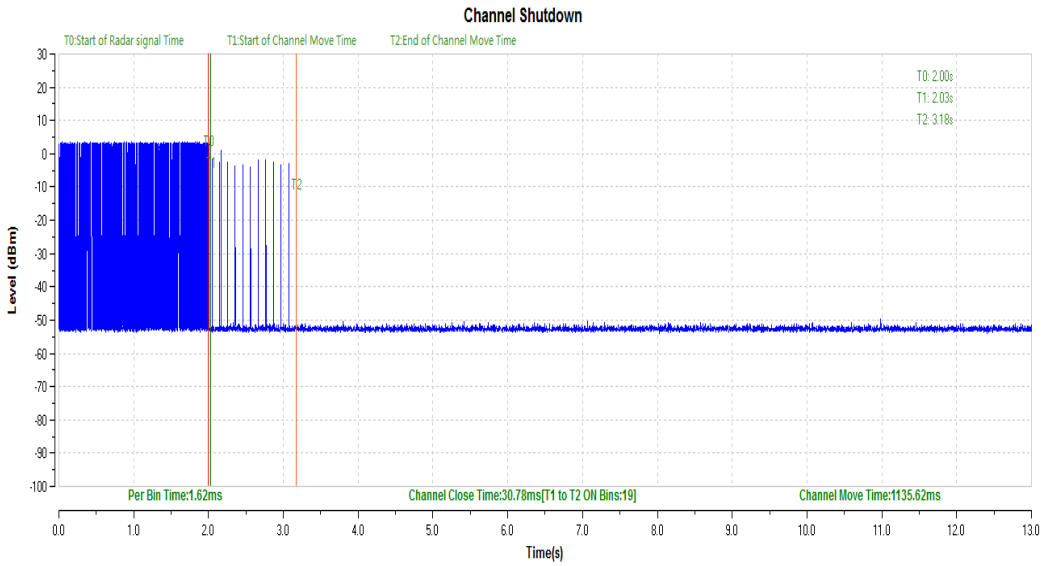
Test Mode	Frequency[MHz]	CCT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
802.11A	5320	29.16	200+60	1148.58	10000	PASS
	5500	30.78	200+60	1135.62	10000	PASS

Test Mode	Frequency[MHz]	Result	Limit[s]	Verdict
802.11A	5320	see test graph	≥1800	PASS
	5500	see test graph	≥1800	PASS

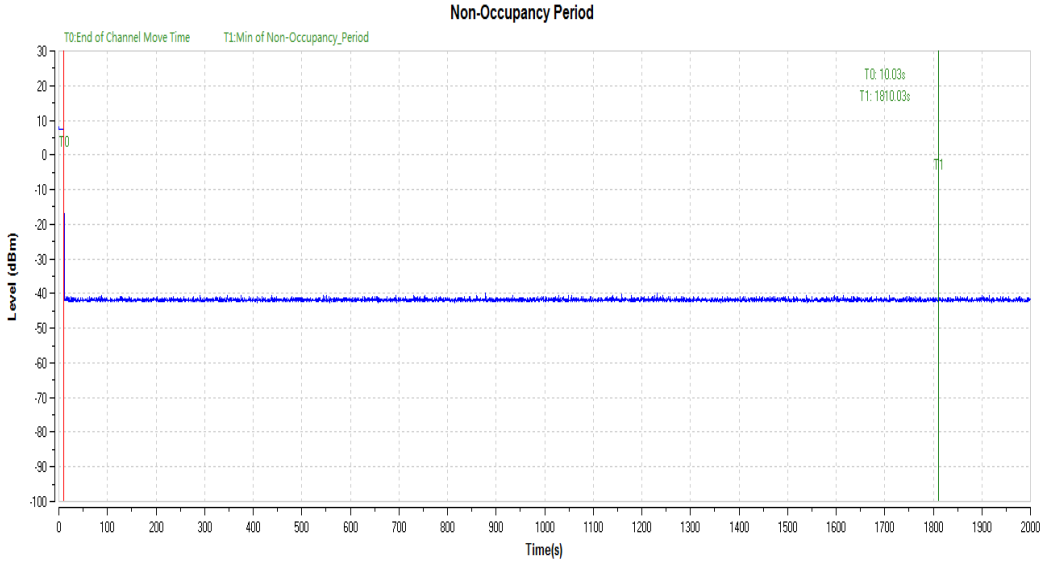
11A_5320



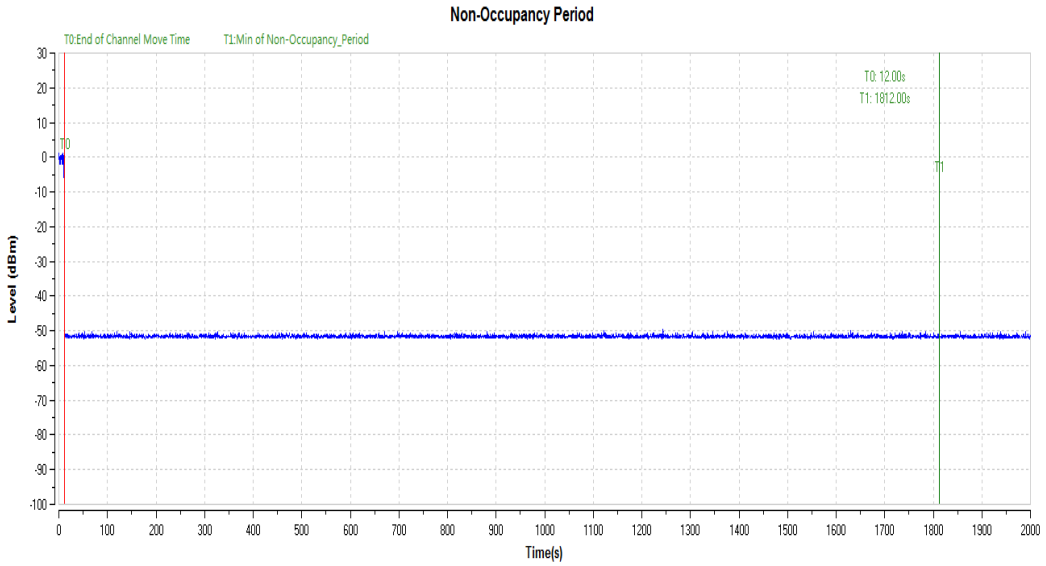
11A_5500



802.11A_5320



802.11A_5500



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