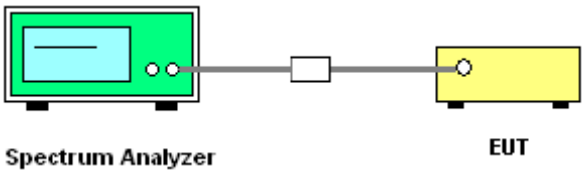
4.4. 26dB Bandwidth and 99% Occupied Bandwidth

4.4.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	No restriction limits
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth RBW = 1% EBW, VBW≥3RBW, In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	N/A

4.4.2. Test Instruments

RF Test Room					
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

4.4.3. Test Result

N/A

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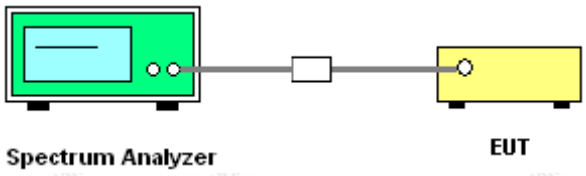
4.5. Power Spectral Density

4.5.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F
Limit:	≤30.00dBm/500KHz for Band IV 5725MHz-5850MHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 2. Set RBW = 510 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS. 3. Allow the sweeps to continue until the trace stabilizes. 4. Use the peak marker function to determine the maximum amplitude level. 5. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.
Test Result:	PASS

4.5.2. Test Instruments

RF Test Room					
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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4.5.3. Test data

ANT. 1

Configuration Band IV (5725 - 5850 MHz)						
Mode	Test Channel	Level [dBm/510kHz]	10log(500/510)	Power Spectral Density	Limit (dBm/500kHz)	Result
802.11a	CH149	-0.88	-0.086	-0.966	30	PASS
802.11a	CH157	-0.12	-0.086	-0.206	30	PASS
802.11a	CH165	0.40	-0.086	0.314	30	PASS
802.11n HT20	CH149	-0.66	-0.086	-0.746	30	PASS
802.11n HT20	CH157	-0.93	-0.086	-1.016	30	PASS
802.11n HT20	CH165	0.62	-0.086	0.534	30	PASS
802.11n HT40	CH151	-3.17	-0.086	-3.256	30	PASS
802.11n HT40	CH159	-3.04	-0.086	-3.126	30	PASS
802.11ac HT20	CH149	-0.48	-0.086	-0.566	30	PASS
802.11ac HT20	CH157	-0.20	-0.086	-0.286	30	PASS
802.11ac HT20	CH165	0.38	-0.086	0.294	30	PASS
802.11ac HT40	CH151	-2.27	-0.086	-2.356	30	PASS
802.11ac HT40	CH159	-2.76	-0.086	-2.846	30	PASS
802.11ac HT80	CH155	-4.08	-0.086	-4.166	30	PASS

***Note*: 1.Power Spectral Density= Level [dBm/510kHz]+（10log(Limit RBW/Test RBW)）**
2. Instrument attenuation and cable loss See test diagram

Test plots as follows:

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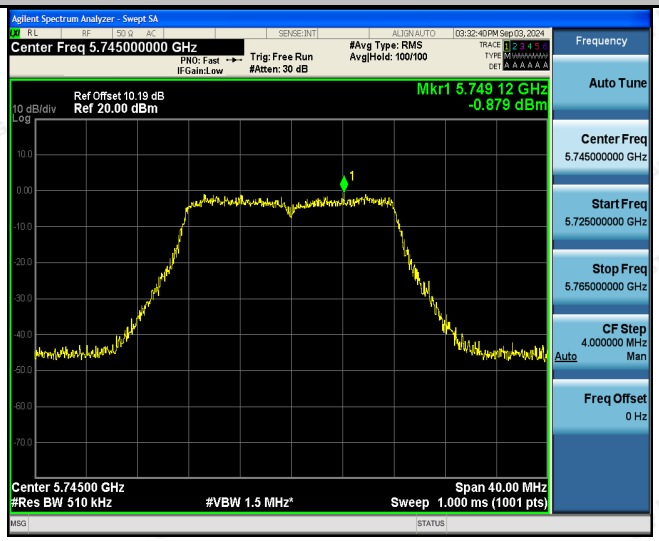
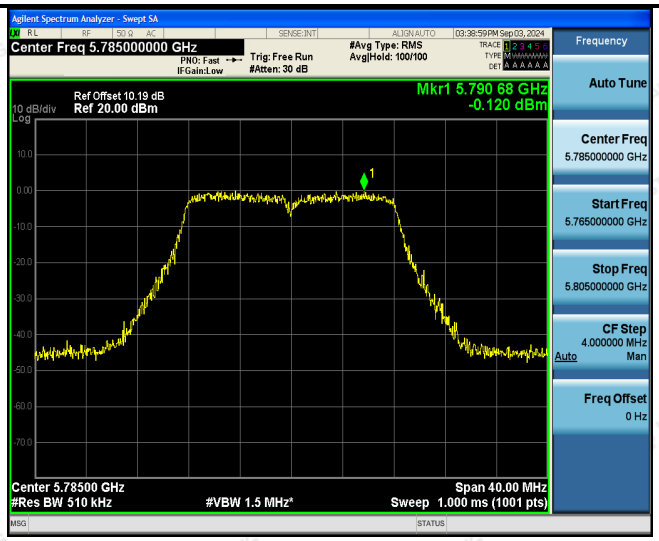
Band IV (5725 – 5850 MHz)

802.11a

Low

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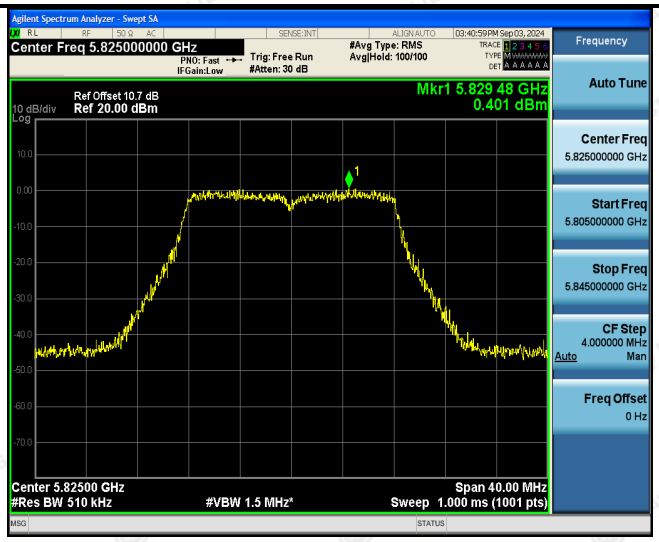
High

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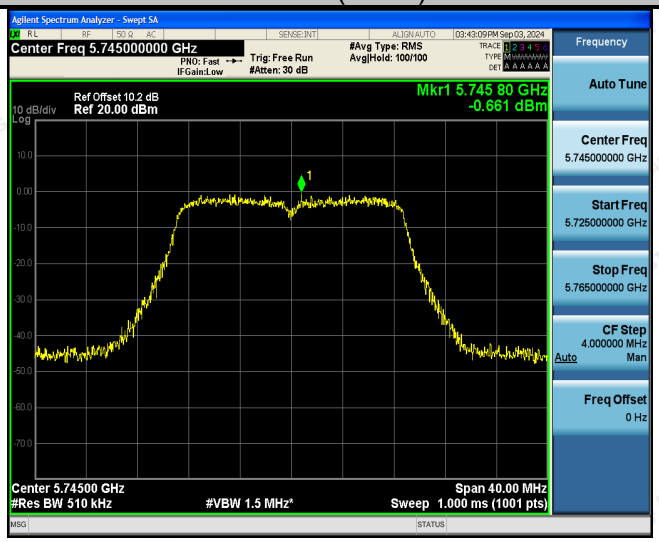
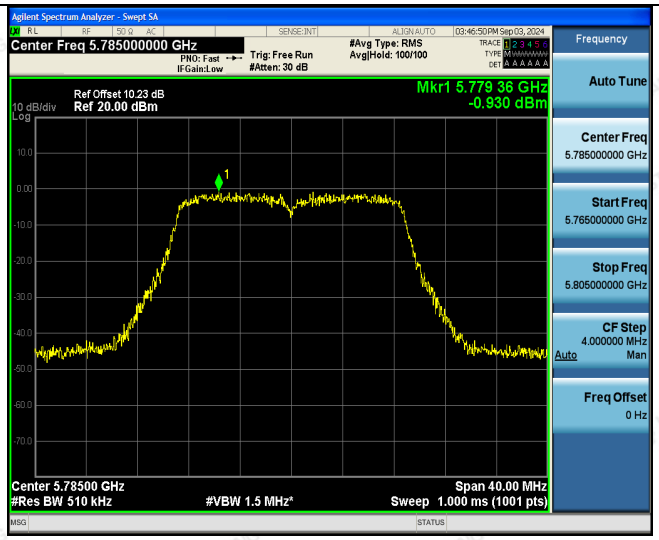
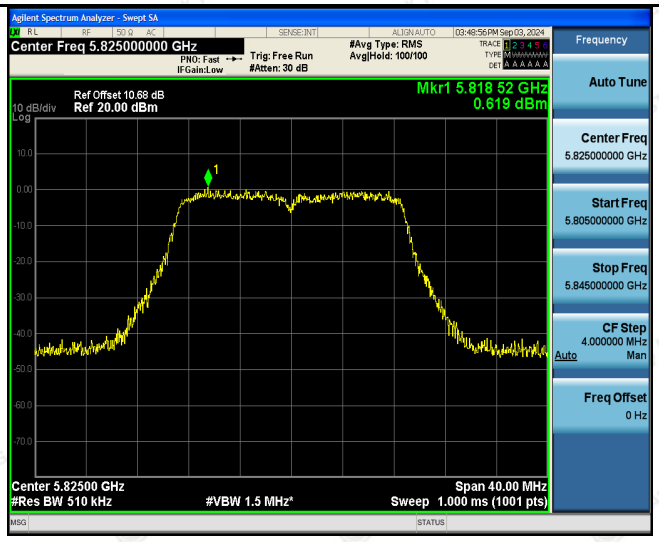
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

802.11n(HT20)
 Low
 Mid
 High

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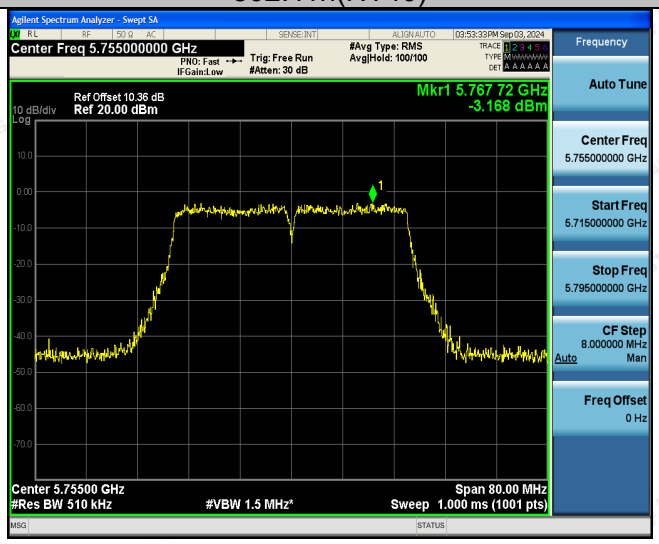
802.11n(HT40)

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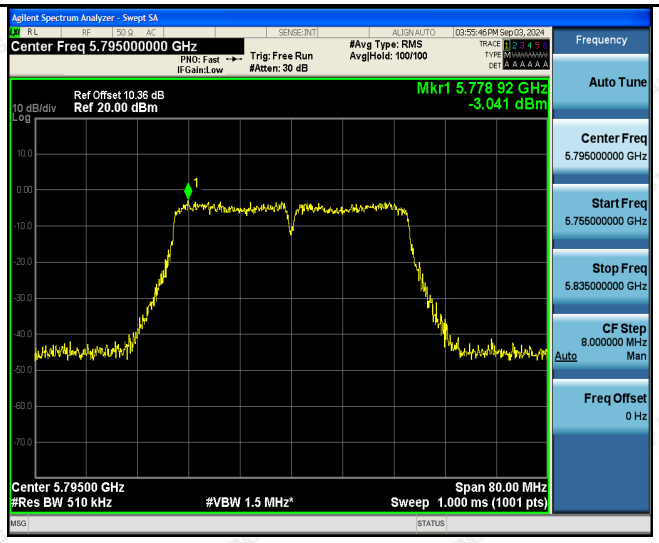
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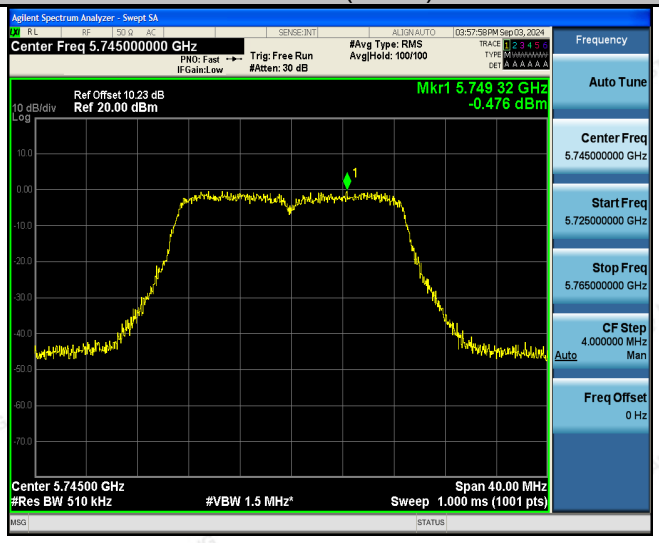
802.11ac(HT20)

Low

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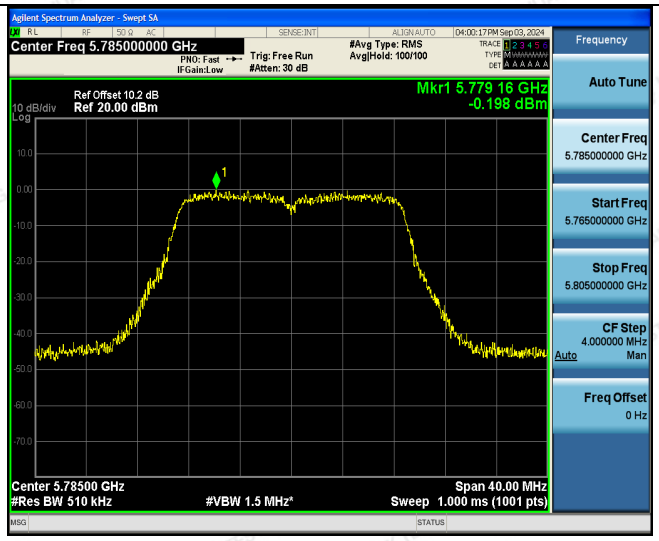
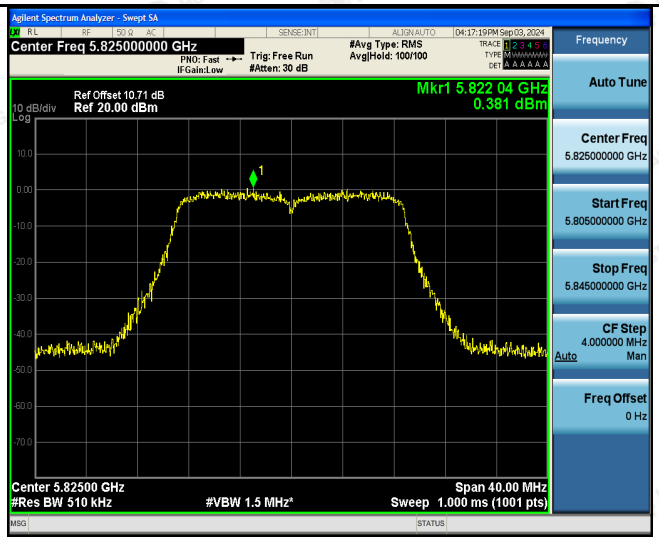
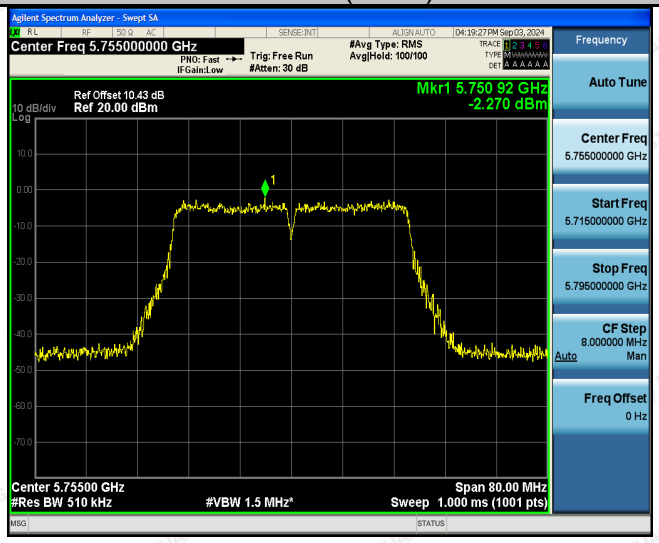


Mid



High

802.11ac(HT40)



Low

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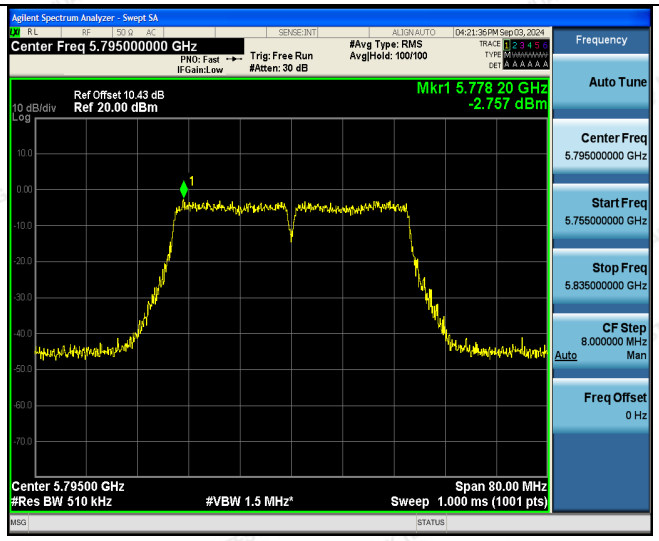
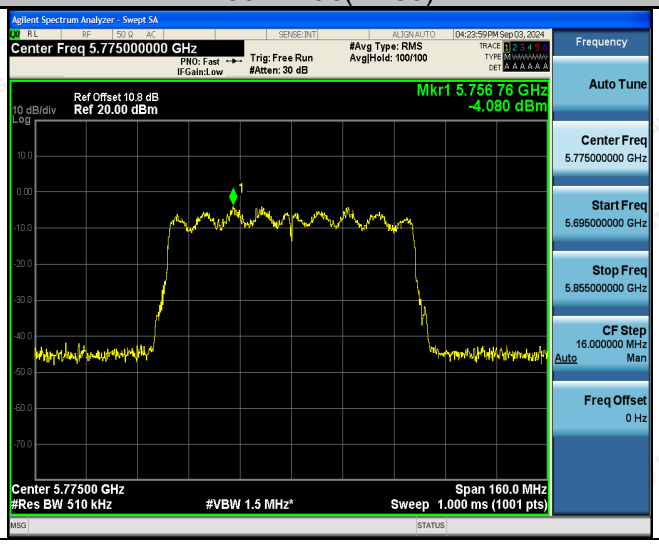


High

802.11ac(HT80)



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ANT. 2

Configuration Band IV (5725 - 5850 MHz)						
Mode	Test Channel	Level [dBm/510kHz]	10log(500/510)	Power Spectral Density	Limit (dBm/500kHz)	Result
802.11a	CH149	-0.13	-0.086	-0.216	30	PASS
802.11a	CH157	0.18	-0.086	0.094	30	PASS
802.11a	CH161	0.84	-0.086	0.754	30	PASS
802.11n HT20	CH149	0.61	-0.086	0.524	30	PASS
802.11n HT20	CH157	0.24	-0.086	0.154	30	PASS
802.11n HT20	CH161	0.52	-0.086	0.434	30	PASS
802.11n HT40	CH151	-2.36	-0.086	-2.446	30	PASS
802.11n HT40	CH159	-2.31	-0.086	-2.396	30	PASS
802.11ac HT20	CH149	0.30	-0.086	0.214	30	PASS
802.11ac HT20	CH157	0.18	-0.086	0.094	30	PASS
802.11ac HT20	CH161	0.53	-0.086	0.444	30	PASS
802.11ac HT40	CH151	-2.23	-0.086	-2.316	30	PASS
802.11ac HT40	CH159	-2.18	-0.086	-2.266	30	PASS
802.11ac HT80	CH155	-4.21	-0.086	-4.296	30	PASS

***Note*: 1.Power Spectral Density= Level [dBm/510kHz]+（10log(Limit RBW/Test RBW)）**
2. Instrument attenuation and cable loss See test diagram

Test plots as follows:

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Band IV (5725 – 5850 MHz)

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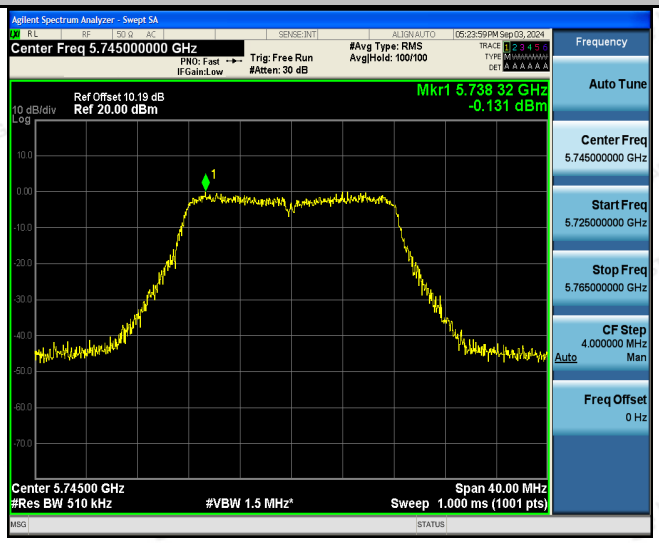
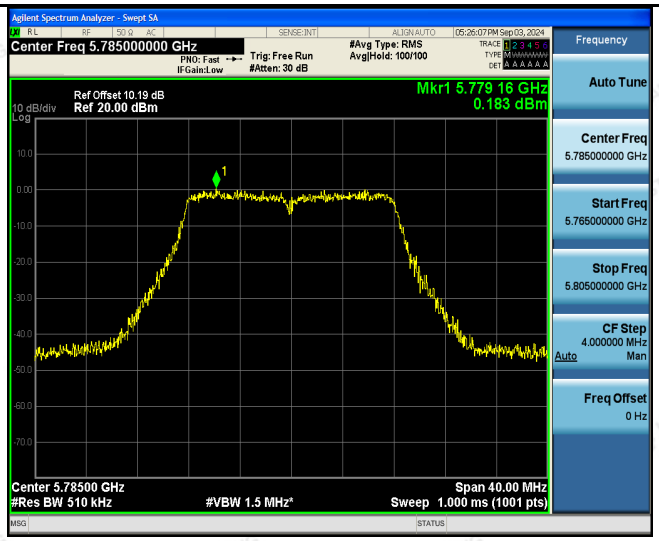
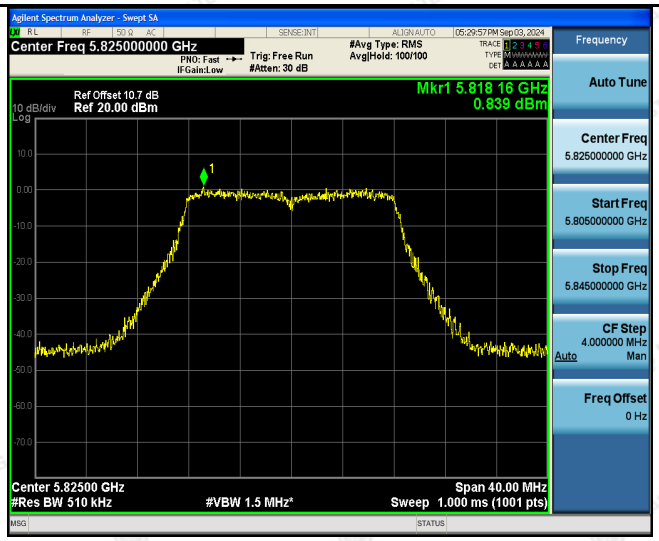
 Low
 Mid
 High

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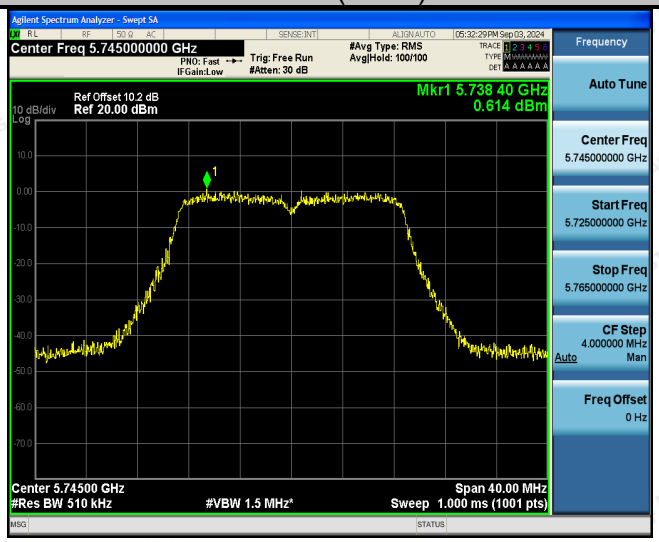
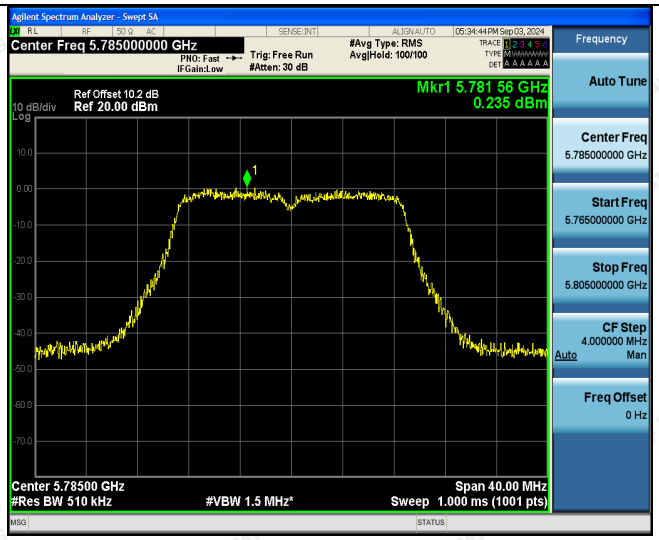
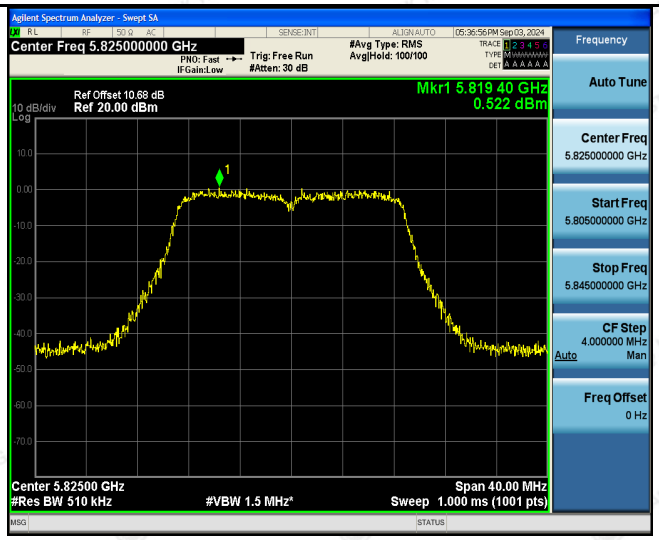
802.11n(HT20)
 Low
 Mid
 High

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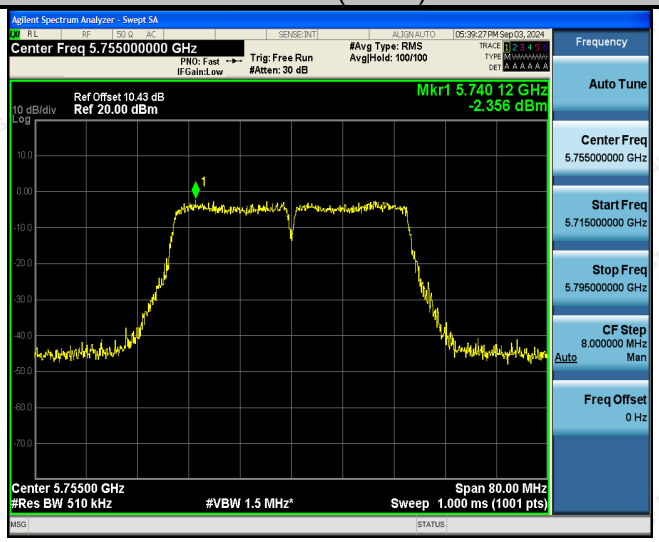
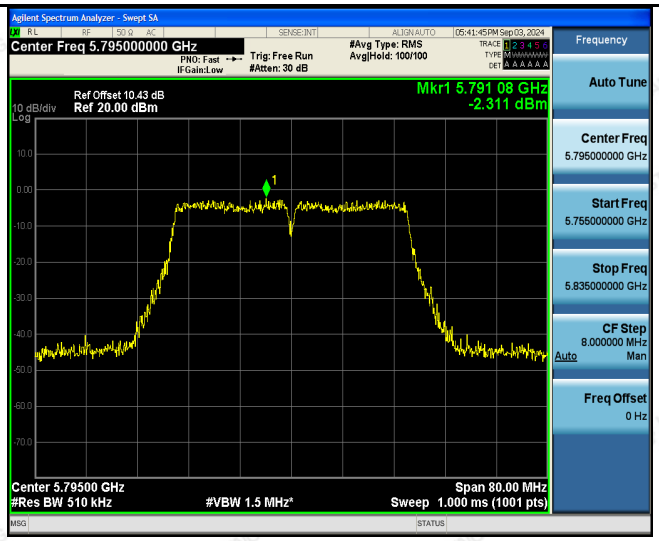
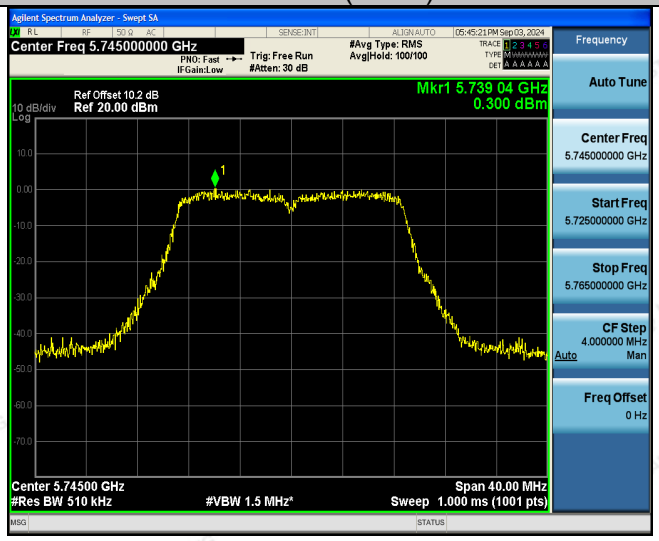
802.11n(HT40)
 Low
 High
802.11ac(HT20)
 Low

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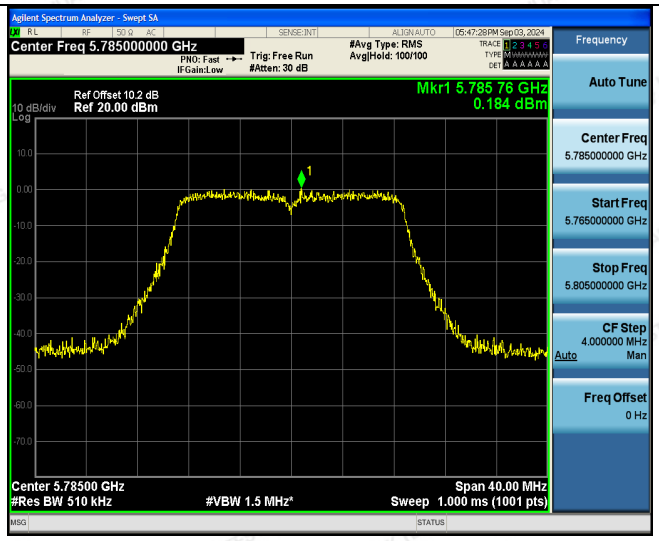

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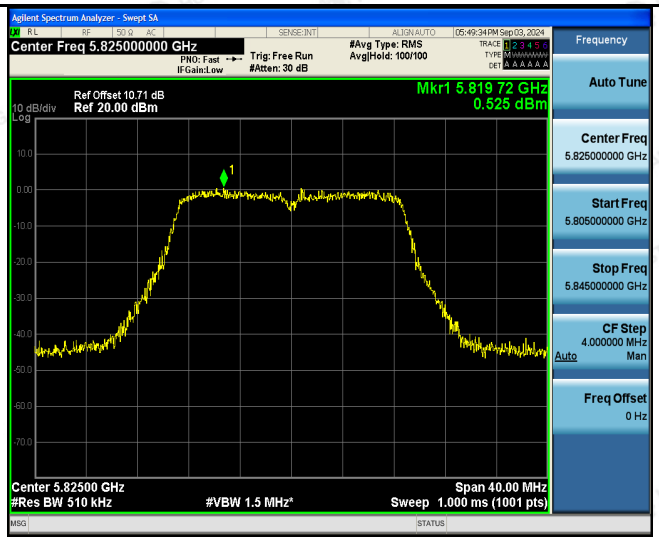
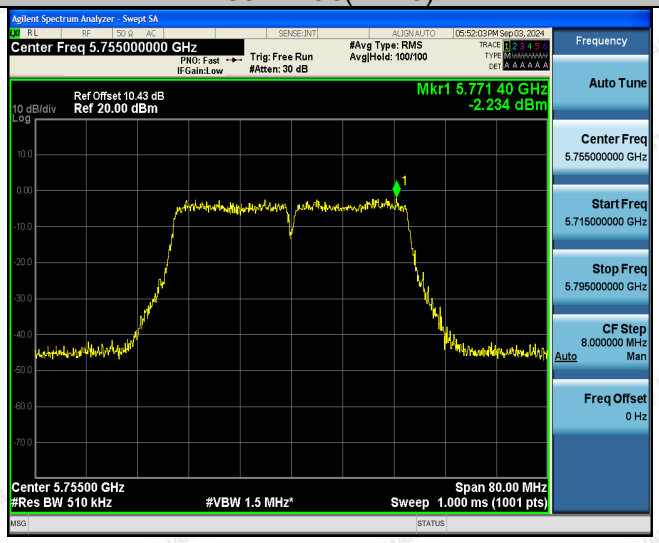


High

802.11ac(HT40)



Low

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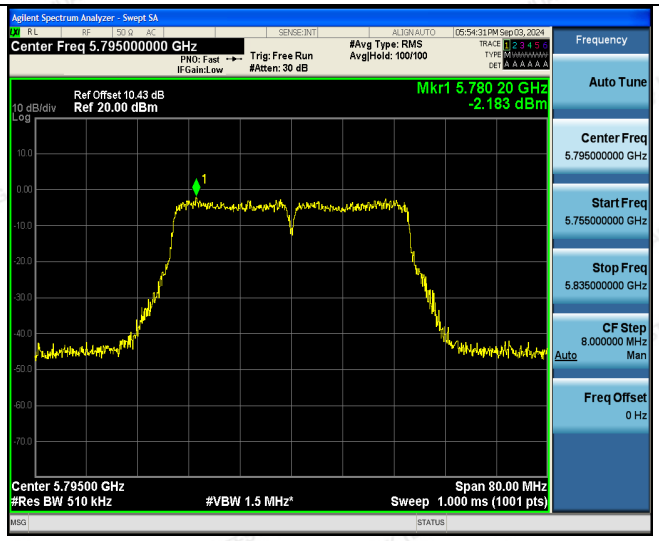
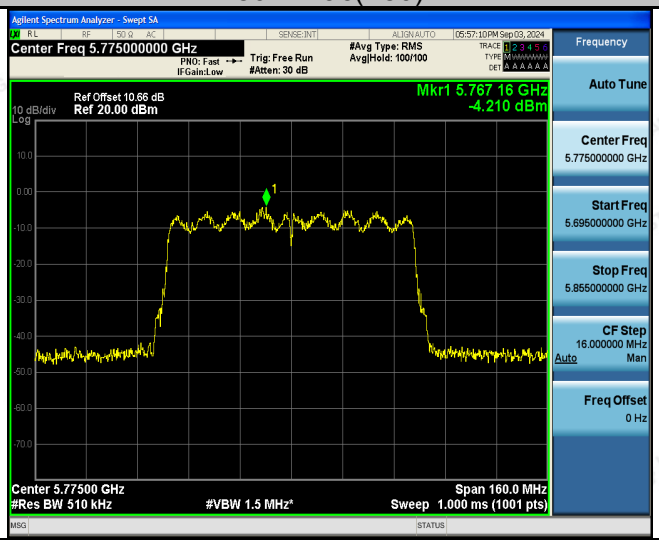


High

802.11ac(T80)



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For MIMO antenna port 1+antenna port 2

Configuration Band IV (5725 - 5850 MHz)				
Mode	Test Channel	Power Density (dBm)	Limit (dBm)	Result
802.11n(HT20)	CH149	2.95	28.28	PASS
802.11n(HT20)	CH157	2.62	28.28	PASS
802.11n(HT20)	CH161	3.49	28.28	PASS
802.11n(HT40)	CH151	0.18	28.28	PASS
802.11n(HT40)	CH159	0.26	28.28	PASS
802.11ac(HT20)	CH149	2.85	28.28	PASS
802.11ac(HT20)	CH157	2.92	28.28	PASS
802.11ac(HT20)	CH161	3.38	28.28	PASS
802.11ac(HT40)	CH151	0.67	28.28	PASS
802.11ac(HT40)	CH159	0.46	28.28	PASS
802.11ac(HT80)	CH155	-1.22	28.28	PASS

Note: 1 According to KDB 662911, Result power = $10\log(10^{(ant1/10}+10^{(ant2/10)+}10^{(ant3/10}+10^{(ant4/10)})$.
2 Result unit: W, The end result is converted to units of dBm.
Limit=30dBm-(direction gain-6dBi)=30-(4.71+10log2-6)=28.28dBm
3 This product supports antenna 1, and antenna 2 launch, but only support 802.11 n/ac for MIMO mode, not support 802.11 a for MIMO mode.

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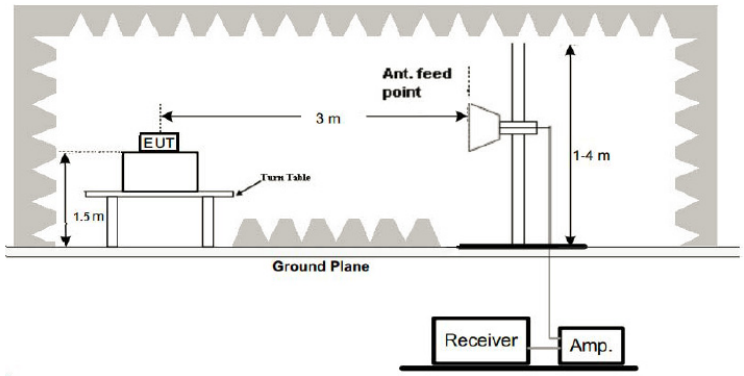
4.6. Band Edge

4.6.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407
Test Method:	ANSI C63.10 2013
Limit:	(1)For transmitters operating in the 5.725-5.85 GHz band: (i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. The limit of frequency below 1GHz and which fall in restricted ba nds should complies 15.209.
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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	6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi peak or average method as specified and then reported in a data sheet.
Test Result:	PASS

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4.6.2. Test Instruments

Radiated Emission Test Site (966)					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 20, 2024	Feb. 19, 2025
Preamplifier	EMCI	EMC051845S	HKE-006	Feb. 20, 2024	Feb. 19, 2025
Preamplifier	Schwarzbeck	BBV 9743	HKE-016	Feb. 20, 2024	Feb. 19, 2025
Preamplifier	A.H. Systems	SAS-574	HKE-182	Feb. 20, 2024	Feb. 19, 2025
6dB Attenuator	Pasternack	6db	HKE-184	Feb. 20, 2024	Feb. 19, 2025
EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 20, 2024	Feb. 19, 2025
Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 21, 2024	Feb. 20, 2026
Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 21, 2024	Feb. 20, 2026
Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 21, 2024	Feb. 20, 2026
EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	N/A	N/A
RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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4.6.3. Test Data

All modes of operation were investigated and the worst-case emissions of ANT.1 are reported.

Operation Mode: 802.11a Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	53.22	-2.06	51.16	68.2	-17.04	peak
5700	85.51	-1.96	83.55	105.2	-21.65	peak
5720	92.44	-2.87	89.57	110.8	-21.23	peak
5725	108.33	-2.14	106.19	122.2	-16.01	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	55.89	-2.06	53.83	68.2	-14.37	peak
5700	87.23	-1.96	85.27	105.2	-19.93	peak
5720	93.16	-2.87	90.29	110.8	-20.51	peak
5725	108.16	-2.14	106.02	122.2	-16.18	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: TX CH High with 5.8G

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5850	107.32	-1.97	105.35	122.2	-16.85	peak
5855	90.32	-2.13	88.19	110.8	-22.61	peak
5875	83.62	-2.65	80.97	105.2	-24.23	peak
5925	50.99	-2.28	48.71	68.2	-19.49	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5850	102.01	-1.97	100.04	122.2	-22.16	peak
5855	91.96	-2.13	89.83	110.8	-20.97	peak
5875	85.69	-2.65	83.04	105.2	-22.16	peak
5925	55.01	-2.28	52.73	68.2	-15.47	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: 802.11n20 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	54.91	-2.06	52.85	68.2	-15.35	peak
5700	87.82	-1.96	85.86	105.2	-19.34	peak
5720	94.06	-2.87	91.19	110.8	-19.61	peak
5725	111.02	-2.14	108.88	122.2	-13.32	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	55.06	-2.06	53	68.2	-15.2	peak
5700	96.64	-1.96	94.68	105.2	-10.52	peak
5720	91.83	-2.87	88.96	110.8	-21.84	peak
5725	111.51	-2.14	109.37	122.2	-12.83	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: TX CH High with 5.8G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	107.63	-1.97	105.66	122.2	-16.54	peak
5855	90.46	-2.13	88.33	110.8	-22.47	peak
5875	94.71	-2.65	92.06	105.2	-13.14	peak
5925	52.79	-2.28	50.51	68.2	-17.69	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	104.45	-1.97	102.48	122.2	-19.72	peak
5855	92.55	-2.13	90.42	110.8	-20.38	peak
5875	86.14	-2.65	83.49	105.2	-21.71	peak
5925	53.48	-2.28	51.2	68.2	-17	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: 802.11n40 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	55.85	-2.06	53.79	68.2	-14.41	peak
5700	93.21	-1.96	91.25	105.2	-13.95	peak
5720	91.45	-2.87	88.58	110.8	-22.22	peak
5725	107.22	-2.14	105.08	122.2	-17.12	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	57.48	-2.06	55.42	68.2	-12.78	peak
5700	91.67	-1.96	89.71	105.2	-15.49	peak
5720	95.76	-2.87	92.89	110.8	-17.91	peak
5725	106.34	-2.14	104.2	122.2	-18	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: TX CH High with 5.8G

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5850	104.47	-1.97	102.5	122.2	-19.7	peak
5855	91.62	-2.13	89.49	110.8	-21.31	peak
5875	87.86	-2.65	85.21	105.2	-19.99	peak
5925	52.42	-2.28	50.14	68.2	-18.06	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5850	105.21	-1.97	103.24	122.2	-18.96	peak
5855	91.34	-2.13	89.21	110.8	-21.59	peak
5875	86.35	-2.65	83.7	105.2	-21.5	peak
5925	51.38	-2.28	49.1	68.2	-19.1	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: 802.11ac20 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	54.74	-2.06	52.68	68.2	-15.52	peak
5700	85.83	-1.96	83.87	105.2	-21.33	peak
5720	92.98	-2.87	90.11	110.8	-20.69	peak
5725	108.05	-2.14	105.91	122.2	-16.29	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	57.22	-2.06	55.16	68.2	-13.04	peak
5700	87.07	-1.96	85.11	105.2	-20.09	peak
5720	93.28	-2.87	90.41	110.8	-20.39	peak
5725	109.46	-2.14	107.32	122.2	-14.88	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: TX CH High with 5.8G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	110.47	-1.97	108.5	122.2	-13.7	peak
5855	92.19	-2.13	90.06	110.8	-20.74	peak
5875	86.42	-2.65	83.77	105.2	-21.43	peak
5925	50.52	-2.28	48.24	68.2	-19.96	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	107.69	-1.97	105.72	122.2	-16.48	peak
5855	91.16	-2.13	89.03	110.8	-21.77	peak
5875	88.15	-2.65	85.5	105.2	-19.7	peak
5925	53.02	-2.28	50.74	68.2	-17.46	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: 802.11ac40 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	54.66	-2.06	52.6	68.2	-15.6	peak
5700	86.58	-1.96	84.62	105.2	-20.58	peak
5720	93.59	-2.87	90.72	110.8	-20.08	peak
5725	106.88	-2.14	104.74	122.2	-17.46	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	53.81	-2.06	51.75	68.2	-16.45	peak
5700	85.67	-1.96	83.71	105.2	-21.49	peak
5720	92.24	-2.87	89.37	110.8	-21.43	peak
5725	108.82	-2.14	106.68	122.2	-15.52	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: TX CH High with 5.8G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	109.58	-1.97	107.61	122.2	-14.59	peak
5855	91.59	-2.13	89.46	110.8	-21.34	peak
5875	84.44	-2.65	81.79	105.2	-23.41	peak
5925	54.18	-2.28	51.9	68.2	-16.3	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	110.67	-1.97	108.7	122.2	-13.5	peak
5855	90.78	-2.13	88.65	110.8	-22.15	peak
5875	86.84	-2.65	84.19	105.2	-21.01	peak
5925	56.95	-2.28	54.67	68.2	-13.53	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: 802.11ac80 Mode with 5.8G TX CH Low

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5650	55.87	-2.06	53.81	68.2	-14.39	peak
5700	85.74	-1.96	83.78	105.2	-21.42	peak
5720	91.63	-2.87	88.76	110.8	-22.04	peak
5725	108.61	-2.14	106.47	122.2	-15.73	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5650	56.53	-2.06	54.47	68.2	-13.73	peak
5700	87.31	-1.96	85.35	105.2	-19.85	peak
5720	92.81	-2.87	89.94	110.8	-20.86	peak
5725	108.42	-2.14	106.28	122.2	-15.92	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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Operation Mode: TX CH High with 5.8G

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5850	111.21	-1.97	109.24	122.2	-12.96	peak
5855	91.27	-2.13	89.14	110.8	-21.66	peak
5875	86.47	-2.65	83.82	105.2	-21.38	peak
5925	51.91	-2.28	49.63	68.2	-18.57	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5850	109.22	-1.97	107.25	122.2	-14.95	peak
5855	93.09	-2.13	90.96	110.8	-19.84	peak
5875	87.63	-2.65	84.98	105.2	-20.22	peak
5925	55.59	-2.28	53.31	68.2	-14.89	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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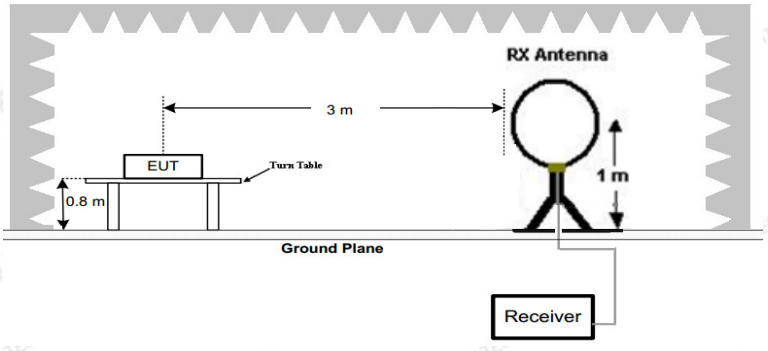
4.7. Spurious Emission

4.7.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 v02r01</td></tr>
<tr><td>Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
The limit of frequency below 1GHz and which fall in restricted b ands should complies 15.209.</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 
</td></tr>
</table>

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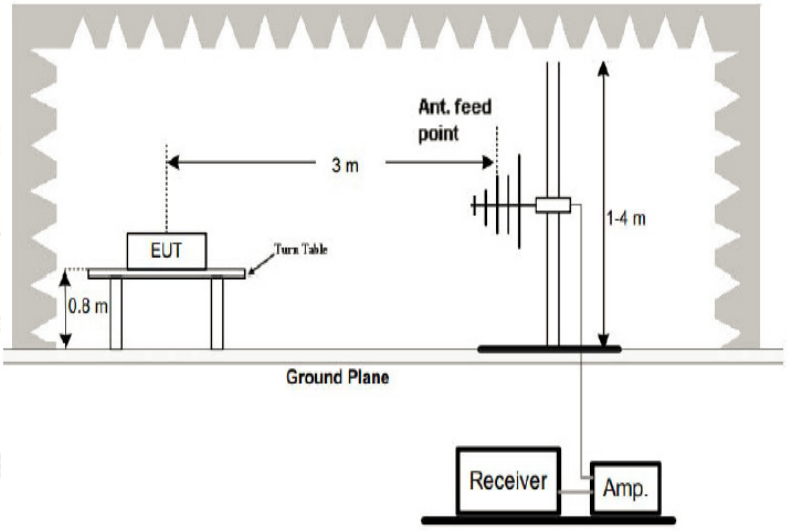
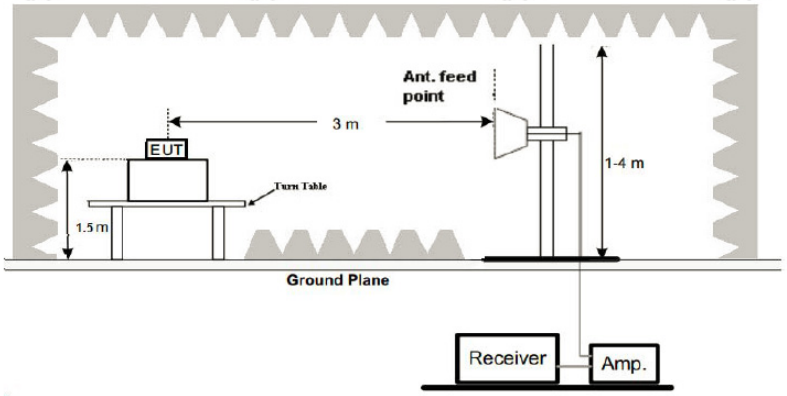
	30MHz to 1GHz  Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.

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	5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test results:	PASS

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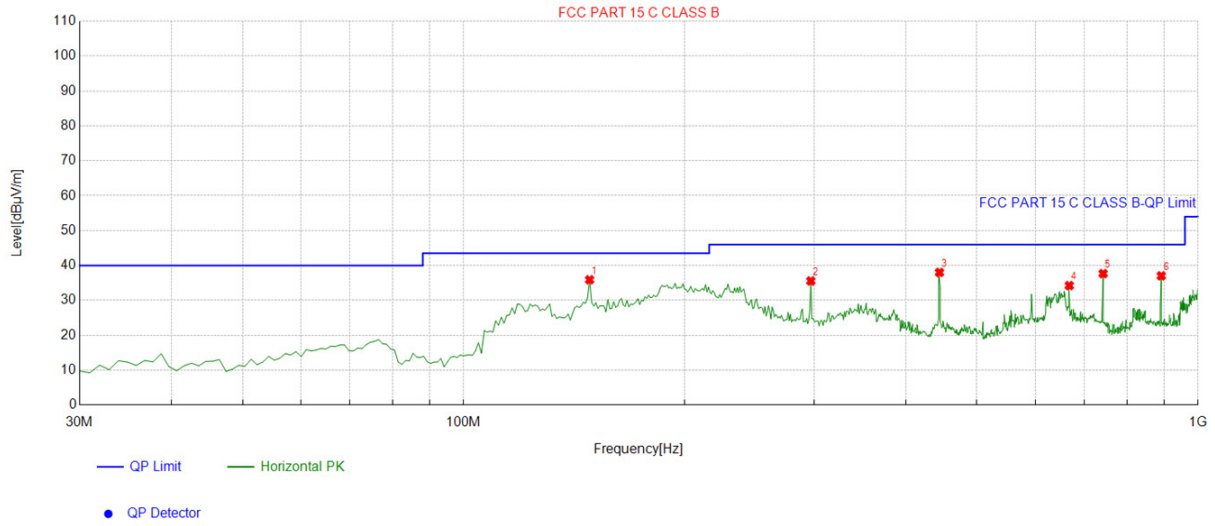
4.7.2. Test Data

All the test modes completed for test. The worst case of Radiated Emission; the test data of this mode was reported.

Below 1GHz

Horizontal



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	148.45845	-18.14	54.05	35.91	43.50	7.59	100	90	Horizontal
2	297.01701	-11.84	47.41	35.57	46.00	10.43	100	215	Horizontal
3	444.60460	-8.64	46.65	38.01	46.00	7.99	100	184	Horizontal
4	667.92792	-4.52	38.76	34.24	46.00	11.76	100	156	Horizontal
5	742.69269	-3.41	41.08	37.67	46.00	8.33	100	330	Horizontal
6	891.25125	-1.49	38.52	37.03	46.00	8.97	100	226	Horizontal

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

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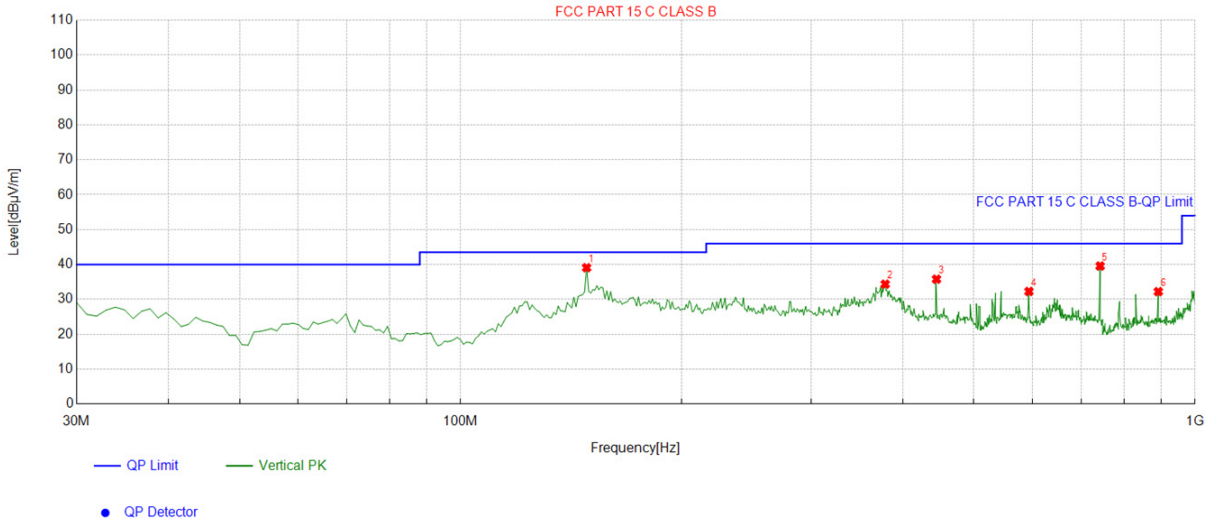
Vertical



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	148.45845	-18.14	57.21	39.07	43.50	4.43	100	162	Vertical
2	378.57857	-9.47	43.82	34.35	46.00	11.65	100	344	Vertical
3	444.60460	-8.64	44.43	35.79	46.00	10.21	100	134	Vertical
4	594.13413	-5.06	37.33	32.27	46.00	13.73	100	51	Vertical
5	742.69269	-3.41	42.96	39.55	46.00	6.45	100	40	Vertical
6	891.25125	-1.49	33.71	32.22	46.00	13.78	100	330	Vertical

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

Harmonics and Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: *1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor*

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

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LOW CH 149 (802.11 a Mode with 5.8G)/5745
All modes of operation were investigated and the worst-case of Ant.1 are reported.

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	53.22	-4.59	48.63	68.2	-19.57	peak
11096	50.04	4.21	54.25	74	-19.75	peak
11096	41.52	4.21	45.73	54	-8.27	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	57.61	-4.59	53.02	68.2	-15.18	peak
11096	52.28	4.21	56.49	74	-17.51	peak
11096	40.49	4.21	44.7	54	-9.3	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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MID CH157 (802.11 a Mode with 5.8G)/5785

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	55.75	-4.59	51.16	68.2	-17.04	peak
10523	51.59	4.21	55.8	68.2	-12.4	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	54.88	-4.59	50.29	68.2	-17.91	peak
10523	52.41	4.21	56.62	68.2	-11.58	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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HIGH CH 165 (802.11a Mode with 5.8G)/5825

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2705	57.05	-4.59	52.46	74	-21.54	peak
2705	46.82	-4.59	42.23	54	-11.77	AVG
11717	53.93	4.84	58.77	74	-15.23	peak
11717	43.59	4.84	48.43	54	-5.57	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2705	58.15	-4.59	53.56	74	-20.44	peak
2705	44.03	-4.59	39.44	54	-14.56	AVG
11717	51.07	4.84	55.91	74	-18.09	peak
11717	41.65	4.84	46.49	54	-7.51	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Remark:
(1) Measuring frequencies from 1 GHz to the 40 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

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5.8G 802.11n20 Mode
All modes of operation were investigated and the worst-case of MIMO are reported.
LOW CH 149

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	59.31	-4.59	54.72	68.2	-13.48	peak
11096	54.32	4.21	58.53	74	-15.47	peak
11096	42.19	4.21	46.4	54	-7.6	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	60.35	-4.59	55.76	68.2	-12.44	peak
11096	54.19	4.21	58.4	74	-15.6	peak
11096	43.18	4.21	47.39	54	-6.61	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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MID CH157

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	59.39	-4.59	54.8	68.2	-13.4	peak
10523	52.36	4.21	56.57	68.2	-11.63	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	54.74	-4.59	50.15	68.2	-18.05	peak
10523	52.43	4.21	56.64	68.2	-11.56	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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HIGH CH165

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2705	57.61	-4.59	53.02	74	-20.98	peak
2705	46.85	-4.59	42.26	54	-11.74	AVG
11717	53.32	4.84	58.16	74	-15.84	peak
11717	44.18	4.84	49.02	54	-4.98	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2705	57.67	-4.59	53.08	74	-20.92	peak
2705	46.87	-4.59	42.28	54	-11.72	AVG
11717	54.29	4.84	59.13	74	-14.87	peak
11717	41.89	4.84	46.73	54	-7.27	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Remark：
(1) Measuring frequencies from 1 GHz to the 40 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

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5.8G 802.11n40 Mode
All modes of operation were investigated and the worst-case of MIMO are reported.
LOW CH 151

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	61.18	-4.59	56.59	68.2	-11.61	peak
11096	59.19	4.21	63.4	74	-10.6	peak
11096	40.29	4.21	44.5	54	-9.5	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	61.65	-4.59	57.06	68.2	-11.14	peak
11096	56.22	4.21	60.43	74	-13.57	peak
11096	43.18	4.21	47.39	54	-6.61	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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MID CH159

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	56.93	-4.59	52.34	68.2	-15.86	peak
10523	52.47	4.21	56.68	68.2	-11.52	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	56.22	-4.59	51.63	68.2	-16.57	peak
10523	50.74	4.21	54.95	68.2	-13.25	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Remark：
(1) Measuring frequencies from 1 GHz to the 40 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

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5.8G 802.11ac20 Mode
All modes of operation were investigated and the worst-case of MIMO are reported.
LOW CH 149

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	62.36	-4.59	57.77	68.2	-10.43	peak
11096	51.61	4.21	55.82	74	-18.18	peak
11096	42.18	4.21	46.39	54	-7.61	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	61.03	-4.59	56.44	68.2	-11.76	peak
11096	55.92	4.21	60.13	74	-13.87	peak
11096	40.73	4.21	44.94	54	-9.06	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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MID CH157

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	61.34	-4.59	56.75	68.2	-11.45	peak
10523	52.08	4.21	56.29	68.2	-11.91	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	60.84	-4.59	56.25	68.2	-11.95	peak
10523	55.32	4.21	59.53	68.2	-8.67	peak
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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HIGH CH165

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2705	58.96	-4.59	54.37	74	-19.63	peak
2705	47.98	-4.59	43.39	54	-10.61	AVG
11717	55.12	4.84	59.96	74	-14.04	peak
11717	43.16	4.84	48	54	-6	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2705	58.32	-4.59	53.73	74	-20.27	peak
2705	44.19	-4.59	39.6	54	-14.4	AVG
11717	54.17	4.84	59.01	74	-14.99	peak
11717	42.32	4.84	47.16	54	-6.84	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Remark：
(1) Measuring frequencies from 1 GHz to the 40 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

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5.8G 802.11ac40 Mode
All modes of operation were investigated and the worst-case of MIMO are reported.
LOW CH 151

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	60.62	-4.59	56.03	68.2	-12.17	peak
11096	55.19	4.21	59.4	74	-14.6	peak
11096	41.95	4.21	46.16	54	-7.84	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	60.43	-4.59	55.84	68.2	-12.36	peak
11096	53.97	4.21	58.18	74	-15.82	peak
11096	44.19	4.21	48.4	54	-5.6	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

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5.8G 802.11ac80 Mode
All modes of operation were investigated and the worst-case of MIMO are reported.
CH 155

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	61.48	-4.59	56.89	68.2	-11.31	peak
11096	55.31	4.21	59.52	74	-14.48	peak
11096	41.26	4.21	45.47	54	-8.53	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	61.06	-4.59	56.47	68.2	-11.73	peak
11096	54.82	4.21	59.03	74	-14.97	peak
11096	42.28	4.21	46.49	54	-7.51	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.						

Remark：
(1) Measuring frequencies from 1 GHz to the 40 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

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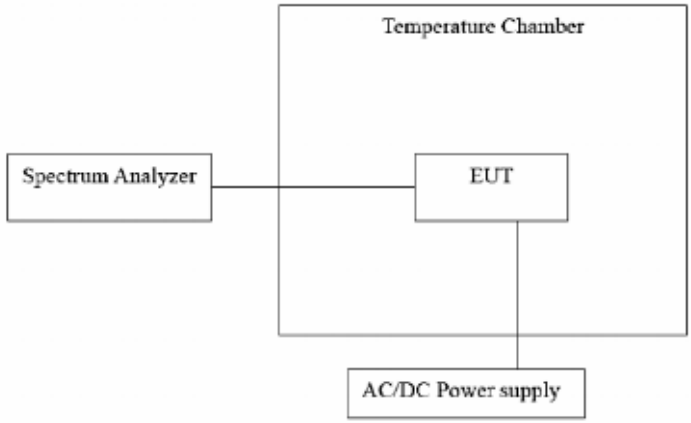
4.8. Frequency Stability Measurement

4.8.1. Test Specification

Test Requirement:	FCC Part15 Section 15.407(g)
Test Method:	ANSI C63.10: 2013
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Setup:	
Test Procedure:	The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Test Result:	PASS
Remark:	N/A

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Test Result as follows:

Mode	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	4.25V	5744.986	-14	5824.993	-7
	5.0V	5744.977	-23	5825.012	12
	5.75V	5744.991	-9	5824.988	-12

Mode	Temperature (℃)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	-30	5745.015	15	5825.008	8
	-20	5745.009	9	5824.966	-34
	-10	5745.022	22	5824.975	-25
	0	5744.979	-21	5824.983	-17
	10	5744.981	-19	5824.995	-5
	20	5744.989	-11	5824.979	-21
	30	5744.974	-26	5825.021	21
	40	5745.011	11	5825.016	16
	50	5744.969	-31	5824.977	-23

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4.9. Antenna Requirement

Standard Applicable
For intentional device, according to FCC 47 CFR 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. And according to FCC 47 CFR Section 15.249, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction
The antenna used in this product is a External Antenna, which have non-standard antenna jack. It conforms to the standard requirements. and the best case gain of the antenna is Antenna port 1:4.71dBi and Antenna port 2:4.71dBi.

WIFI Antenna

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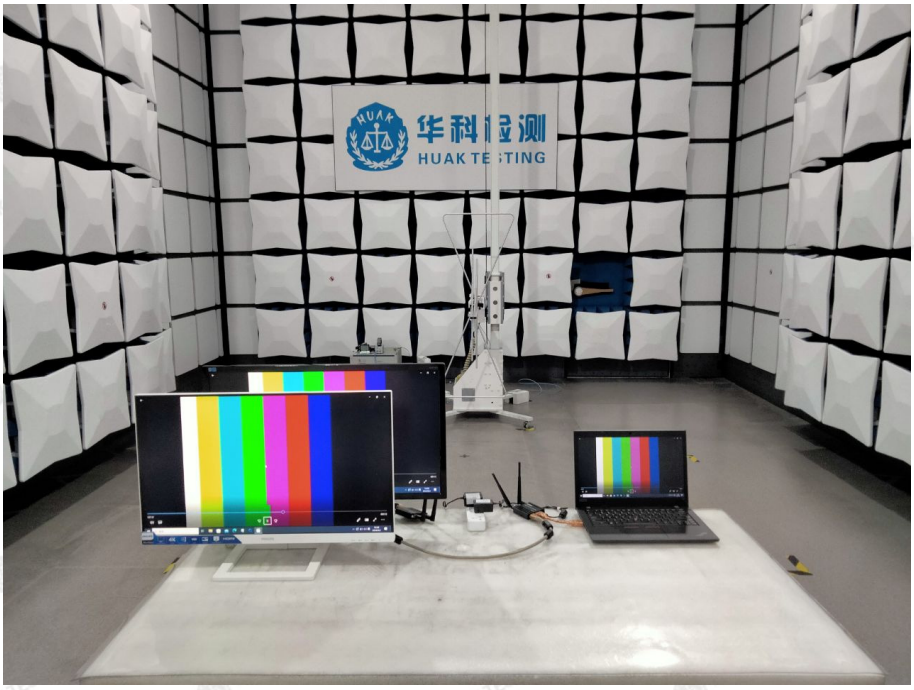
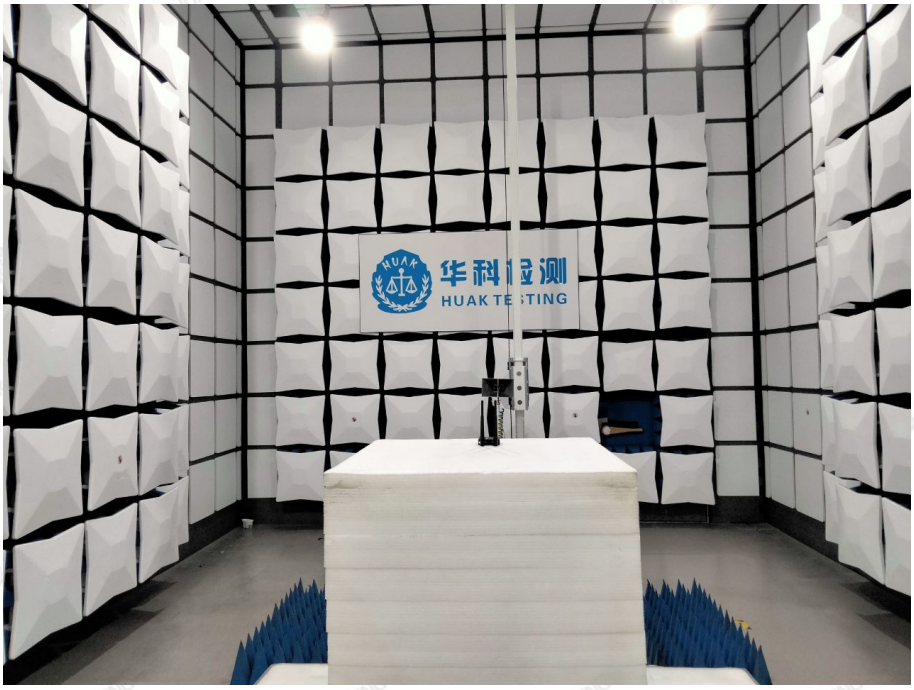
5. Photographs of Test Setup

Radiated Emission





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Conducted Emission

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6. Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos

---------End of test report---------

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