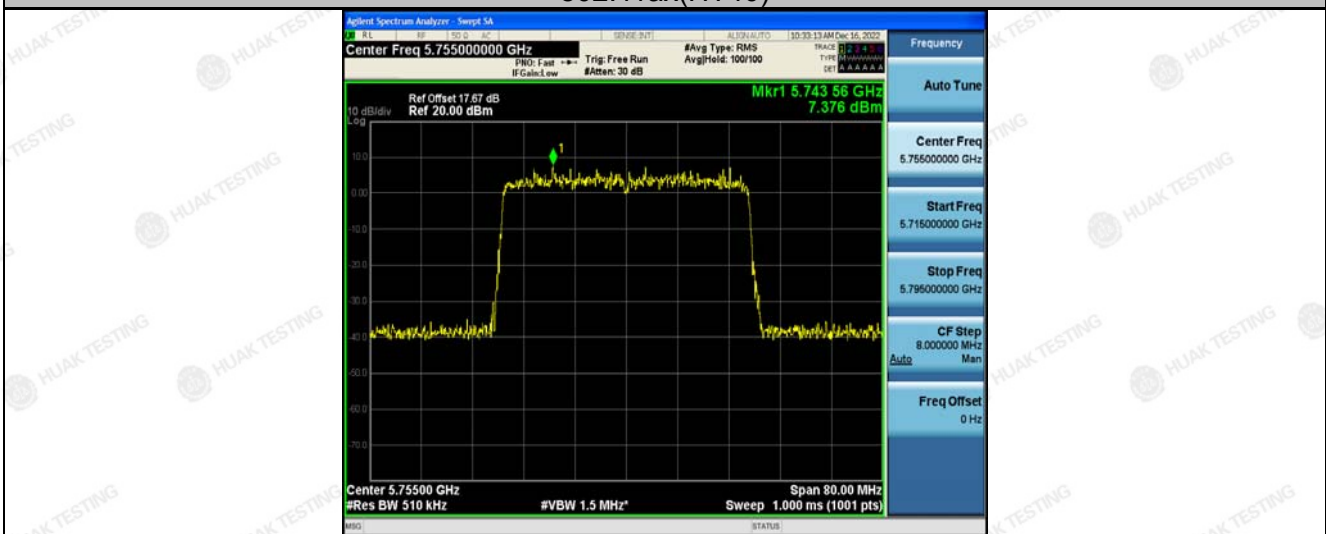




Mid



High
802.11ax(HT40)



Low

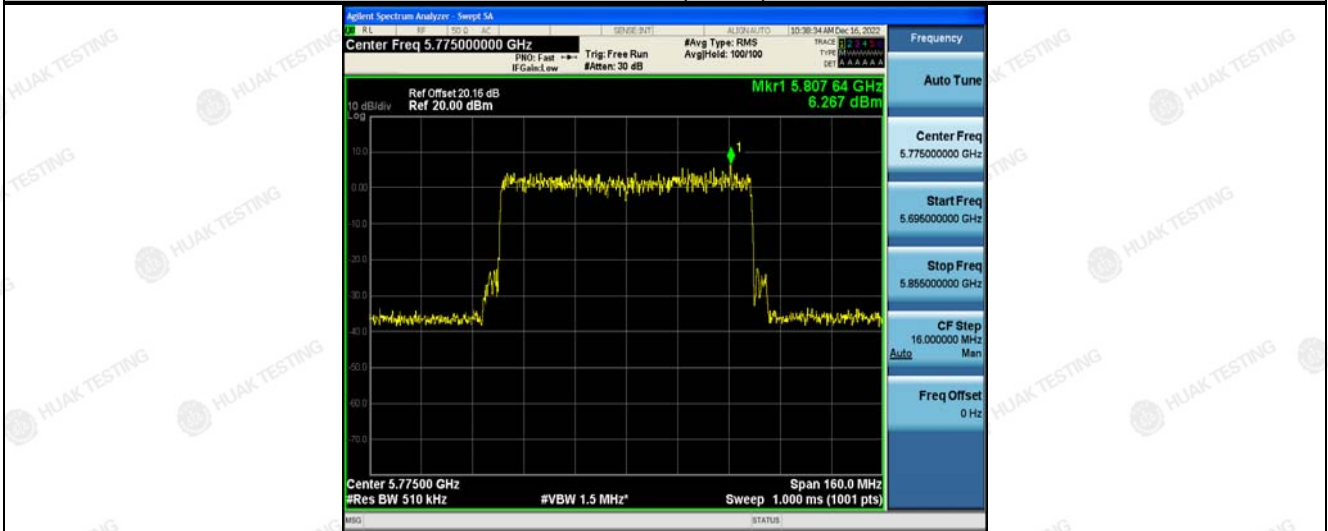
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High
802.11ax(HT80)



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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
11a	CH149	8.05	-0.086	7.964	30	PASS
11a	CH157	8.04	-0.086	7.954	30	PASS
11a	CH161	6.92	-0.086	6.834	30	PASS
11n(HT20)	CH149	8.97	-0.086	8.884	30	PASS
11n(HT20)	CH157	8.05	-0.086	7.964	30	PASS
11n(HT20)	CH161	8.13	-0.086	8.044	30	PASS
11n(HT40)	CH151	6.71	-0.086	6.624	30	PASS
11n(HT40)	CH159	6.43	-0.086	6.344	30	PASS
11ac(HT20)	CH149	8.46	-0.086	8.374	30	PASS
11ac(HT20)	CH157	7.83	-0.086	7.744	30	PASS
11ac(HT20)	CH161	7.33	-0.086	7.244	30	PASS
11ac(HT40)	CH151	7.69	-0.086	7.604	30	PASS
11ac(HT40)	CH159	7.7	-0.086	7.614	30	PASS
11ac(HT80)	CH155	6.55	-0.086	6.464	30	PASS
11ax(HT20)	CH149	9.07	-0.086	8.984	30	PASS
11ax(HT20)	CH157	7.64	-0.086	7.554	30	PASS
11ax(HT20)	CH161	7.92	-0.086	7.834	30	PASS
11ax(HT40)	CH151	7.14	-0.086	7.054	30	PASS
11ax(HT40)	CH159	7.8	-0.086	7.714	30	PASS
11ax(HT80)	CH155	6.24	-0.086	6.154	30	PASS

Note: Power Spectral Density= Level [dBm/510kHz]+ (10log(Limit RBW/Test RBW))

Test plots as follows:



Band IV (5725 – 5850 MHz)

802.11a



Low



Mid



High

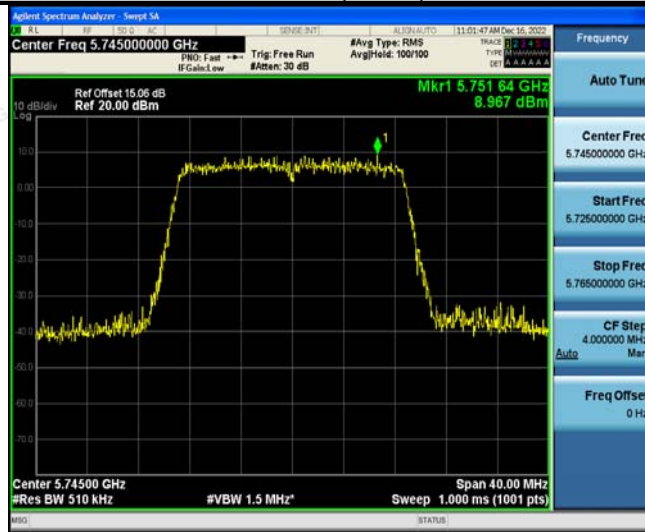
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802.11n(HT20)



Low



Mid



High

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802.11n(HT40)



Low



High

802.11ac(HT20)



Low

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Mid



High

802.11ac(HT40)



Low

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High
802.11ac(T80)



802.11ax(HT20)



Low

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Mid



High
802.11ax(HT40)



Low

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High
802.11ax(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
11n(HT20)	CH149	12.03	30	PASS
11n(HT20)	CH157	11.08	30	PASS
11n(HT20)	CH161	10.66	30	PASS
11n(HT40)	CH151	9.70	30	PASS
11n(HT40)	CH159	9.12	30	PASS
11ac(HT20)	CH149	11.56	30	PASS
11ac(HT20)	CH157	10.84	30	PASS
11ac(HT20)	CH161	10.33	30	PASS
11ac(HT40)	CH151	9.99	30	PASS
11ac(HT40)	CH159	10.39	30	PASS
11ac(HT80)	CH155	9.56	30	PASS
11ax(HT20)	CH149	12.16	30	PASS
11ax(HT20)	CH157	10.89	30	PASS
11ax(HT20)	CH161	11.45	30	PASS
11ax(HT40)	CH151	10.27	30	PASS
11ax(HT40)	CH159	11.10	30	PASS
11ax(HT80)	CH155	9.27	30	PASS
Note: 1 According to KDB 662911, Result power = $10\log(10^{(ant1/10)}+10^{(ant2/10)})$. 2 Result unit: W, The end result is converted to units of dBm.				

Note: This product supports antenna 1 and antenna 2 launch, but only support 802.11 n/ac/ax for MIMO mode, not support 802.11 a for MIMO mode.

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:	<p>(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 bands should complies 15.209.</p>
Test Setup:	<p>The diagram illustrates the test setup within an anechoic chamber. An EUT (Equipment Under Test) is placed on a turn table at a height of 1.5 m. The turn table is positioned 3 m away from an antenna tower. The antenna tower has an antenna feed point at a height of 1-4 m. A ground plane is shown at the base of the chamber. A receiver and amplifier (Amp.) are connected to the antenna tower.</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none"> 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



4.6.2. Test Instruments

Radiated Emission Test Site (966)

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESRP3	HKE-005	Feb. 18, 2022	Feb. 17, 2023
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2022	Feb. 17, 2023
Preamplifier	EMCI	EMC051845S E	HKE-015	Feb. 18, 2022	Feb. 17, 2023
Preamplifier	Agilent	83051A	HKE-016	Feb. 18, 2022	Feb. 17, 2023
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 18, 2022	Feb. 17, 2023
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	Feb. 18, 2022	Feb. 17, 2023
Horn antenna	Schwarzbeck	9120D	HKE-013	Feb. 18, 2022	Feb. 17, 2023
Antenna Mast	Keleto	CC-A-4M	N/A	N/A	N/A
Position controller	Taiwan MF	MF7802	HKE-011	Feb. 18, 2022	Feb. 17, 2023
Radiated test software	Tonscend	TS+ Rev 2.5.0.0	HKE-082	N/A	N/A
RF cable (9KHz-1GHz)	Times	381806-001	N/A	N/A	N/A
Hf antenna	Schwarzbeck	LB-180400-KF	HKE-031	Feb. 18, 2022	Feb. 17, 2023
RF cable	Tonscend	1-18G	HKE-099	Feb. 18, 2022	Feb. 17, 2023
RF cable	Times	1-40G	HKE-034	Feb. 18, 2022	Feb. 17, 2023
Horn Antenna	Schwarzbeck	BBHA 9170	HKE-017	Feb. 18, 2022	Feb. 17, 2023
Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 18, 2022	Feb. 17, 2023

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



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	55.68	-2.06	53.62	68.2	-14.58	peak
5700	84.29	-1.96	82.33	105.2	-22.87	peak
5720	90.13	-2.87	87.26	110.8	-23.54	peak
5725	107.22	-2.14	105.08	122.2	-17.12	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	54.74	-2.06	52.68	68.2	-15.52	peak
5700	85.13	-1.96	83.17	105.2	-22.03	peak
5720	89.97	-2.87	87.1	110.8	-23.7	peak
5725	107.52	-2.14	105.38	122.2	-16.82	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	102.6	-1.97	100.63	122.2	-21.57	peak
5855	92.47	-2.13	90.34	110.8	-20.46	peak
5875	82.72	-2.65	80.07	105.2	-25.13	peak
5925	52.53	-2.28	50.25	68.2	-17.95	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	101.18	-1.97	99.21	122.2	-22.99	peak
5855	91.4	-2.13	89.27	110.8	-21.53	peak
5875	82.81	-2.65	80.16	105.2	-25.04	peak
5925	51.53	-2.28	49.25	68.2	-18.95	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11n20 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	56.04	-2.06	53.98	68.2	-14.22	
5700	87.04	-1.96	85.08	105.2	-20.12	peak
5720	89.44	-2.87	86.57	110.8	-24.23	peak
5725	107.76	-2.14	105.62	122.2	-16.58	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.15	-2.06	54.09	68.2	-14.11	
5700	85.88	-1.96	83.92	105.2	-21.28	peak
5720	91.59	-2.87	88.72	110.8	-22.08	peak
5725	106.29	-2.14	104.15	122.2	-18.05	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	99.85	-1.97	97.88	122.2	-24.32	peak
5855	90.78	-2.13	88.65	110.8	-22.15	peak
5875	84.66	-2.65	82.01	105.2	-23.19	peak
5925	50.67	-2.28	48.39	68.2	-19.81	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	99.78	-1.97	97.81	122.2	-24.39	peak
5855	91.38	-2.13	89.25	110.8	-21.55	peak
5875	84.27	-2.65	81.62	105.2	-23.58	peak
5925	50.62	-2.28	48.34	68.2	-19.86	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	55.96	-2.06	53.9	68.2	-14.3	peak
5700	84.19	-1.96	82.23	105.2	-22.97	peak
5720	90.38	-2.87	87.51	110.8	-23.29	peak
5725	107.21	-2.14	105.07	122.2	-17.13	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.2	-2.06	54.14	68.2	-14.06	peak
5700	85.48	-1.96	83.52	105.2	-21.68	peak
5720	89.66	-2.87	86.79	110.8	-24.01	peak
5725	108.02	-2.14	105.88	122.2	-16.32	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	101.79	-1.97	99.82	122.2	-22.38	peak
5855	92.49	-2.13	90.36	110.8	-20.44	peak
5875	82.94	-2.65	80.29	105.2	-24.91	peak
5925	52.17	-2.28	49.89	68.2	-18.31	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	102.08	-1.97	100.11	122.2	-22.09	peak
5855	92.53	-2.13	90.4	110.8	-20.4	peak
5875	84.6	-2.65	81.95	105.2	-23.25	peak
5925	52	-2.28	49.72	68.2	-18.48	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11ac20 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	53.51	-2.06	51.45	68.2	-16.75	peak
5700	84.84	-1.96	82.88	105.2	-22.32	peak
5720	91.35	-2.87	88.48	110.8	-22.32	peak
5725	108.45	-2.14	106.31	122.2	-15.89	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	55.47	-2.06	53.41	68.2	-14.79	peak
5700	86.1	-1.96	84.14	105.2	-21.06	peak
5720	89.46	-2.87	86.59	110.8	-24.21	peak
5725	108.72	-2.14	106.58	122.2	-15.62	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	99.78	-1.97	97.81	122.2	-24.39	peak
5855	91.74	-2.13	89.61	110.8	-21.19	peak
5875	82.7	-2.65	80.05	105.2	-25.15	peak
5925	53.17	-2.28	50.89	68.2	-17.31	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	101.51	-1.97	99.54	122.2	-22.66	peak
5855	90.89	-2.13	88.76	110.8	-22.04	peak
5875	82.58	-2.65	79.93	105.2	-25.27	peak
5925	52.28	-2.28	50	68.2	-18.2	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11ac40 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	55.86	-2.06	53.8	68.2	-14.4	
5700	84.61	-1.96	82.65	105.2	-22.55	peak
5720	92.07	-2.87	89.2	110.8	-21.6	peak
5725	108.77	-2.14	106.63	122.2	-15.57	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.05	-2.06	53.99	68.2	-14.21	
5700	85.09	-1.96	83.13	105.2	-22.07	peak
5720	91.54	-2.87	88.67	110.8	-22.13	peak
5725	109.05	-2.14	106.91	122.2	-15.29	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	99.81	-1.97	97.84	122.2	-24.36	peak
5855	92.39	-2.13	90.26	110.8	-20.54	peak
5875	83.13	-2.65	80.48	105.2	-24.72	peak
5925	50.85	-2.28	48.57	68.2	-19.63	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	100.44	-1.97	98.47	122.2	-23.73	peak
5855	91.63	-2.13	89.5	110.8	-21.3	peak
5875	84.82	-2.65	82.17	105.2	-23.03	peak
5925	53.4	-2.28	51.12	68.2	-17.08	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11ac80 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	56.24	-2.06	54.18	68.2	-14.02	peak
5700	86.71	-1.96	84.75	105.2	-20.45	peak
5720	90.88	-2.87	88.01	110.8	-22.79	peak
5725	106.43	-2.14	104.29	122.2	-17.91	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	53.35	-2.06	51.29	68.2	-16.91	peak
5700	85.36	-1.96	83.4	105.2	-21.8	peak
5720	90.3	-2.87	87.43	110.8	-23.37	peak
5725	108.9	-2.14	106.76	122.2	-15.44	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	99.84	-1.97	97.87	122.2	-24.33	peak
5855	92.89	-2.13	90.76	110.8	-20.04	peak
5875	84.77	-2.65	82.12	105.2	-23.08	peak
5925	52.84	-2.28	50.56	68.2	-17.64	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	99.87	-1.97	97.9	122.2	-24.3	peak
5855	92.96	-2.13	90.83	110.8	-19.97	peak
5875	83.31	-2.65	80.66	105.2	-24.54	peak
5925	52.34	-2.28	50.06	68.2	-18.14	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11ax20 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	55.12	-2.06	53.06	68.2	-15.14	peak
5700	84.37	-1.96	82.41	105.2	-22.79	peak
5720	89.4	-2.87	86.53	110.8	-24.27	peak
5725	107.83	-2.14	105.69	122.2	-16.51	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	55.68	-2.06	53.62	68.2	-14.58	peak
5700	84.8	-1.96	82.84	105.2	-22.36	peak
5720	91.59	-2.87	88.72	110.8	-22.08	peak
5725	108.33	-2.14	106.19	122.2	-16.01	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	100.84	-1.97	98.87	122.2	-23.33	peak
5855	92.45	-2.13	90.32	110.8	-20.48	peak
5875	83.92	-2.65	81.27	105.2	-23.93	peak
5925	51.5	-2.28	49.22	68.2	-18.98	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	102.37	-1.97	100.4	122.2	-21.8	peak
5855	90.33	-2.13	88.2	110.8	-22.6	peak
5875	84.85	-2.65	82.2	105.2	-23	peak
5925	52.39	-2.28	50.11	68.2	-18.09	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11ax40 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	54.28	-2.06	52.22	68.2	-15.98	peak
5700	85.45	-1.96	83.49	105.2	-21.71	peak
5720	90.26	-2.87	87.39	110.8	-23.41	peak
5725	107.2	-2.14	105.06	122.2	-17.14	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	54.02	-2.06	51.96	68.2	-16.24	peak
5700	86.14	-1.96	84.18	105.2	-21.02	peak
5720	90.03	-2.87	87.16	110.8	-23.64	peak
5725	107.51	-2.14	105.37	122.2	-16.83	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	102.01	-1.97	100.04	122.2	-22.16	peak
5855	90.51	-2.13	88.38	110.8	-22.42	peak
5875	82.91	-2.65	80.26	105.2	-24.94	peak
5925	53.09	-2.28	50.81	68.2	-17.39	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	100.26	-1.97	98.29	122.2	-23.91	peak
5855	92.12	-2.13	89.99	110.8	-20.81	peak
5875	84.08	-2.65	81.43	105.2	-23.77	peak
5925	51.94	-2.28	49.66	68.2	-18.54	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



Operation Mode: 802.11ax80 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	54.29	-2.06	52.23	68.2	-15.97	
5700	86.26	-1.96	84.3	105.2	-20.9	peak
5720	89.88	-2.87	87.01	110.8	-23.79	peak
5725	108.73	-2.14	106.59	122.2	-15.61	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	53.57	-2.06	51.51	68.2	-16.69	
5700	84.95	-1.96	82.99	105.2	-22.21	peak
5720	91.94	-2.87	89.07	110.8	-21.73	peak
5725	108.8	-2.14	106.66	122.2	-15.54	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	101.86	-1.97	99.89	122.2	-22.31	peak
5855	91.69	-2.13	89.56	110.8	-21.24	peak
5875	82.89	-2.65	80.24	105.2	-24.96	peak
5925	51.24	-2.28	48.96	68.2	-19.24	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

Vertical:

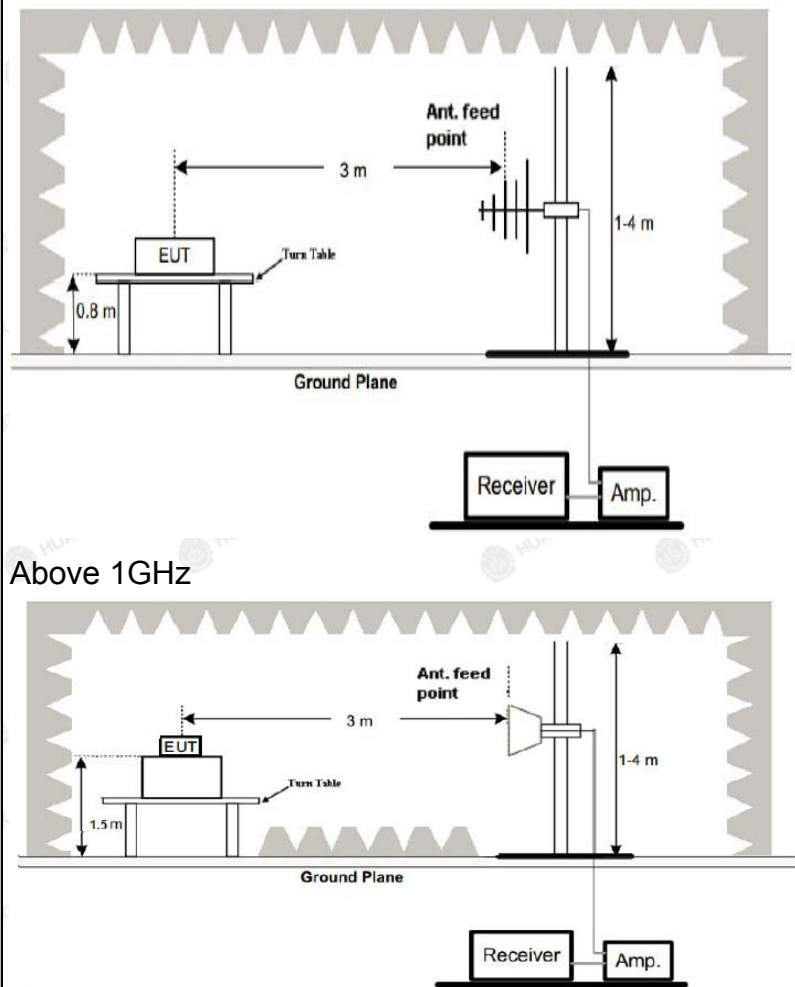
Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
5850	101.35	-1.97	99.38	122.2	-22.82	peak
5855	92.86	-2.13	90.73	110.8	-20.07	peak
5875	82.44	-2.65	79.79	105.2	-25.41	peak
5925	51.42	-2.28	49.14	68.2	-19.06	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

4.7. SPURIOUS EMISSION

4.7.1.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205				
Test Method:	KDB 789033 D02 v02r01				
Frequency Range:	9kHz to 40GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Operation mode:	Transmitting mode with modulation				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit:	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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 bands should comply 15.209.</p>				
Test setup:	<p>For radiated emissions below 30MHz</p> <p>30MHz to 1GHz</p>				

**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.
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 be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test results:	PASS



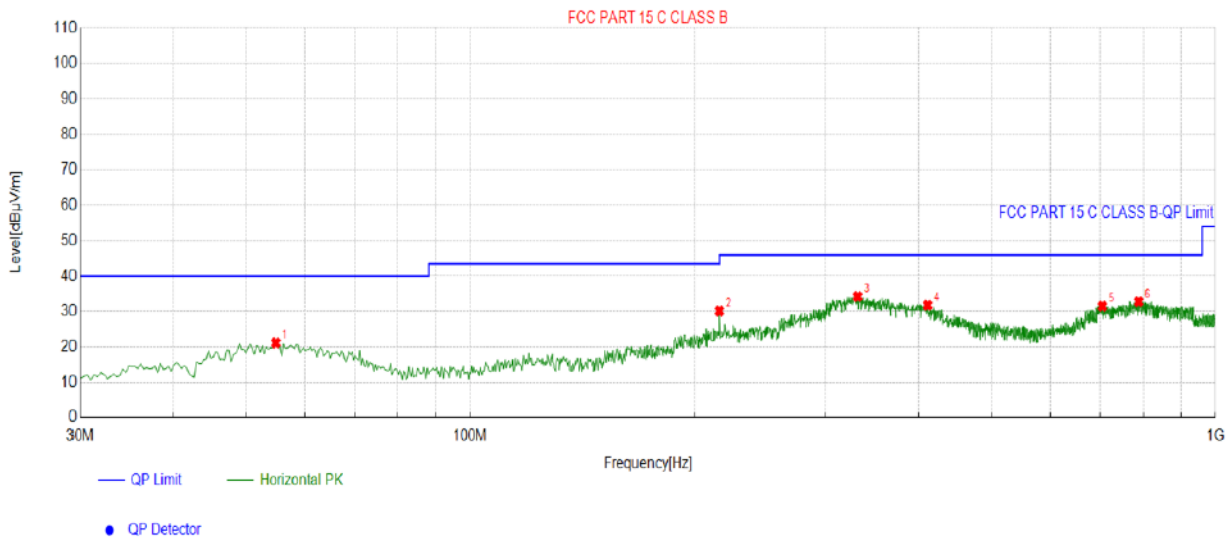
4.7.2. Test Data

test mode: TX 802.11a 5745MHz

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

Below 1GHz

Horizontal

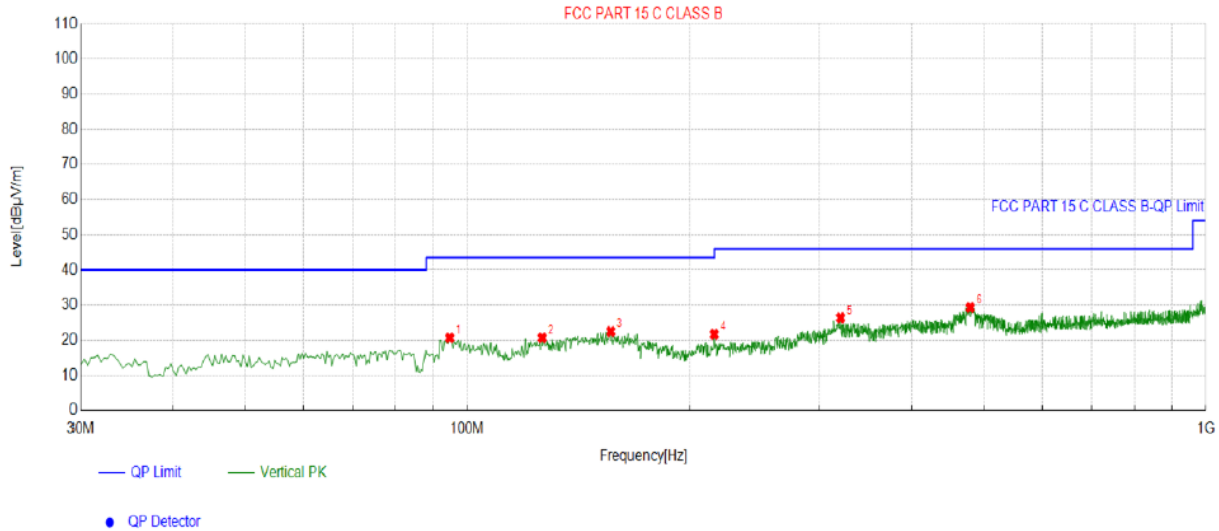


Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	54.9050	-14.32	35.46	21.14	40.00	18.86	100	24	Horizontal
2	215.9787	-14.41	44.58	30.17	43.50	13.33	100	136	Horizontal
3	331.1237	-11.57	45.83	34.26	46.00	11.74	100	11	Horizontal
4	411.0137	-9.15	40.95	31.80	46.00	14.20	100	21	Horizontal
5	705.3451	-3.65	35.15	31.50	46.00	14.50	100	84	Horizontal
6	788.7929	-2.18	34.98	32.80	46.00	13.20	100	285	Horizontal

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



Vertical



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	94.6882	-16.63	37.30	20.67	43.50	22.83	100	169	Vertical
2	126.3855	-16.24	36.92	20.68	43.50	22.82	100	117	Vertical
3	156.4655	-18.23	40.74	22.51	43.50	20.99	100	353	Vertical
4	215.9787	-14.41	36.10	21.69	43.50	21.81	100	117	Vertical
5	320.1267	-11.71	38.07	26.36	46.00	19.64	100	6	Vertical
6	479.5832	-7.79	37.07	29.28	46.00	16.72	100	305	Vertical

Remark: Factor = Cable loss + Antenna factor – 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)
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- 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



Above 1GHz

RADIATED EMISSION TEST

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

LOW CH 149 (802.11 a Mode with 5.8G)/5745

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
3368	50.11	-4.59	45.52	68.2	-22.68	
11096	48.73	4.21	52.94	74	-21.06	peak
11096	37.1	4.21	41.31	54	-12.69	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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
3368	57.04	-4.59	52.45	68.2	-15.75	
11096	53.46	4.21	57.67	74	-16.33	peak
11096	33.36	4.21	37.57	54	-16.43	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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	57.96	-4.59	53.37	68.2	-14.83	peak
10523	53.36	4.21	57.57	68.2	-10.63	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	57.83	-4.59	53.24	68.2	-14.96	peak
10523	54.25	4.21	58.46	68.2	-9.74	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



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

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2705	59	-4.59	54.41	74	-19.59	peak
2705	47.15	-4.59	42.56	54	-11.44	AVG
11717	52.32	4.84	57.16	74	-16.84	peak
11717	35.33	4.84	40.17	54	-13.83	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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
2705	60.32	-4.59	55.73	74	-18.27	peak
2705	45.49	-4.59	40.9	54	-13.1	AVG
11717	51.5	4.84	56.34	74	-17.66	peak
11717	36.95	4.84	41.79	54	-12.21	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11n20 Mode

LOW CH 149

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	59.35	-4.59	54.76	68.2	-13.44	peak
11096	54.16	4.21	58.37	74	-15.63	peak
11096	38.64	4.21	42.85	54	-11.15	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	61.72	-4.59	57.13	68.2	-11.07	peak
11096	53.19	4.21	57.4	74	-16.6	peak
11096	36.99	4.21	41.2	54	-12.8	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



MID CH157

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
3172	54.16	-4.59	49.57	68.2	-18.63	peak
10523	53.67	4.21	57.88	68.2	-10.32	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.91	-4.59	52.32	68.2	-15.88	peak
10523	54.61	4.21	58.82	68.2	-9.38	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



HIGH CH165

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2705	58.97	-4.59	54.38	74	-19.62	
2705	48.91	-4.59	44.32	54	-9.68	AVG
11717	51.47	4.84	56.31	74	-17.69	peak
11717	37.33	4.84	42.17	54	-11.83	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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
2705	59.01	-4.59	54.42	74	-19.58	
2705	45.99	-4.59	41.4	54	-12.6	AVG
11717	50.58	4.84	55.42	74	-18.58	peak
11717	36.03	4.84	40.87	54	-13.13	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11n40 Mode

LOW CH 151

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3368	58.66	-4.59	54.07	68.2	-14.13	
11096	57.94	4.21	62.15	74	-11.85	peak
11096	39.16	4.21	43.37	54	-10.63	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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
3368	64.16	-4.59	59.57	68.2	-8.63	
11096	56.92	4.21	61.13	74	-12.87	peak
11096	38.49	4.21	42.7	54	-11.3	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



MID CH159

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
3172	54.16	-4.59	49.57	68.2	-18.63	peak
10523	54.18	4.21	58.39	68.2	-9.81	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.14	-4.59	51.55	68.2	-16.65	peak
10523	51.11	4.21	55.32	68.2	-12.88	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11ac20 Mode

LOW CH 149

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	58.26	-4.59	53.67	68.2	-14.53	peak
11096	50.64	4.21	54.85	74	-19.15	peak
11096	35.23	4.21	39.44	54	-14.56	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	60.55	-4.59	55.96	68.2	-12.24	peak
11096	51.12	4.21	55.33	74	-18.67	peak
11096	35.49	4.21	39.7	54	-14.3	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



MID CH157

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
3172	59.1	-4.59	54.51	68.2	-13.69	peak
10523	50.88	4.21	55.09	68.2	-13.11	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	58.85	-4.59	54.26	68.2	-13.94	peak
10523	51.15	4.21	55.36	68.2	-12.84	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



HIGH CH165

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2705	56.98	-4.59	52.39	74	-21.61	peak
2705	47.56	-4.59	42.97	54	-11.03	AVG
11717	52.48	4.84	57.32	74	-16.68	peak
11717	36.11	4.84	40.95	54	-13.05	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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
2705	58.44	-4.59	53.85	74	-20.15	peak
2705	48.9	-4.59	44.31	54	-9.69	AVG
11717	52.28	4.84	57.12	74	-16.88	peak
11717	38.61	4.84	43.45	54	-10.55	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11ac40 Mode

LOW CH 151

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	61.08	-4.59	56.49	68.2	-11.71	peak
11096	55.29	4.21	59.5	74	-14.5	peak
11096	33.91	4.21	38.12	54	-15.88	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	59.74	-4.59	55.15	68.2	-13.05	peak
11096	55.37	4.21	59.58	74	-14.42	peak
11096	34.09	4.21	38.3	54	-15.7	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



5.8G 802.11ac80 Mode

CH 155

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	58.77	-4.59	54.18	68.2	-14.02	peak
11096	55.18	4.21	59.39	74	-14.61	peak
11096	36.35	4.21	40.56	54	-13.44	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	59	-4.59	54.41	68.2	-13.79	peak
11096	55.73	4.21	59.94	74	-14.06	peak
11096	33.88	4.21	38.09	54	-15.91	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11ax20 Mode

LOW CH 149

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	59.97	-4.59	55.38	68.2	-12.82	peak
11096	55.19	4.21	59.4	74	-14.6	peak
11096	33.8	4.21	38.01	54	-15.99	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	60.04	-4.59	55.45	68.2	-12.75	peak
11096	54.62	4.21	58.83	74	-15.17	peak
11096	35.05	4.21	39.26	54	-14.74	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



MID CH157

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
3172	58.74	-4.59	54.15	68.2	-14.05	peak
10523	53.16	4.21	57.37	68.2	-10.83	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.19	-4.59	51.6	68.2	-16.6	peak
10523	52.28	4.21	56.49	68.2	-11.71	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



HIGH CH165

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2705	57.55	-4.59	52.96	74	-21.04	peak
2705	49.73	-4.59	45.14	54	-8.86	AVG
11717	52.5	4.84	57.34	74	-16.66	peak
11717	38.13	4.84	42.97	54	-11.03	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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
2705	56.37	-4.59	51.78	74	-22.22	peak
2705	47.15	-4.59	42.56	54	-11.44	AVG
11717	53.16	4.84	58	74	-16	peak
11717	37.19	4.84	42.03	54	-11.97	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11ax40 Mode

LOW CH 151

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	59.19	-4.59	54.6	68.2	-13.6	peak
11096	53.91	4.21	58.12	74	-15.88	peak
11096	34.4	4.21	38.61	54	-15.39	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	61.23	-4.59	56.64	68.2	-11.56	peak
11096	53.68	4.21	57.89	74	-16.11	peak
11096	36.18	4.21	40.39	54	-13.61	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



MID CH159

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
3172	58.29	-4.59	53.7	68.2	-14.5	peak
10523	52.41	4.21	56.62	68.2	-11.58	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.19	-4.59	51.6	68.2	-16.6	peak
10523	53.46	4.21	57.67	68.2	-10.53	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



MID CH159

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3172	60.47	-4.59	55.88	68.2	-12.32	peak
10523	51.08	4.21	55.29	68.2	-12.91	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	56.19	-4.59	51.6	68.2	-16.6	peak
10523	52.34	4.21	56.55	68.2	-11.65	peak

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



5.8G 802.11ax80 Mode

CH 155

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3368	57.26	-4.59	52.67	68.2	-15.53	peak
11096	54.21	4.21	58.42	74	-15.58	peak
11096	50.97	4.21	55.18	54	1.18	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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	54.72	-4.59	50.13	68.2	-18.07	peak
11096	55.43	4.21	59.64	74	-14.36	peak
11096	35.59	4.21	39.8	54	-14.2	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; 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.



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:	<pre> graph LR SA[Spectrum Analyzer] --- EUT[EUT] subgraph TC [Temperature Chamber] EUT end P[AC/DC Power supply] --- EUT </pre>
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



Test Result as follows:

Mode	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	4.5V	5745.007	7	5825.002	2
	5V	5744.988	-12	5825.025	25
	5.5V	5745.015	15	5825.038	38

Mode	Temperature (°C)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	-30	5744.962	-38	5824.992	-8
	-20	5744.954	-46	5825.045	45
	-10	5744.967	-33	5824.994	-6
	0	5745.032	32	5824.995	-5
	10	5744.991	-9	5824.985	-15
	20	5745.043	43	5825.009	9
	30	5745.046	46	5824.974	-26
	40	5744.983	-17	5825.020	20
	50	5744.965	-35	5824.974	-26

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

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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.

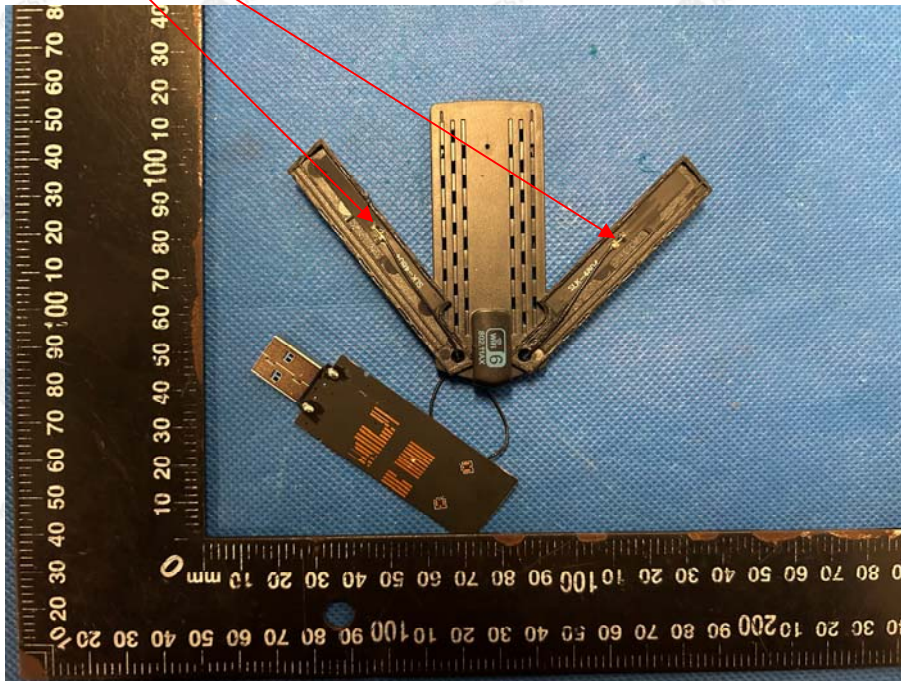
Refer to statement below for compliance.

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 FPC 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: 2.31dBi and Antenna port 2: 2.31dBi.

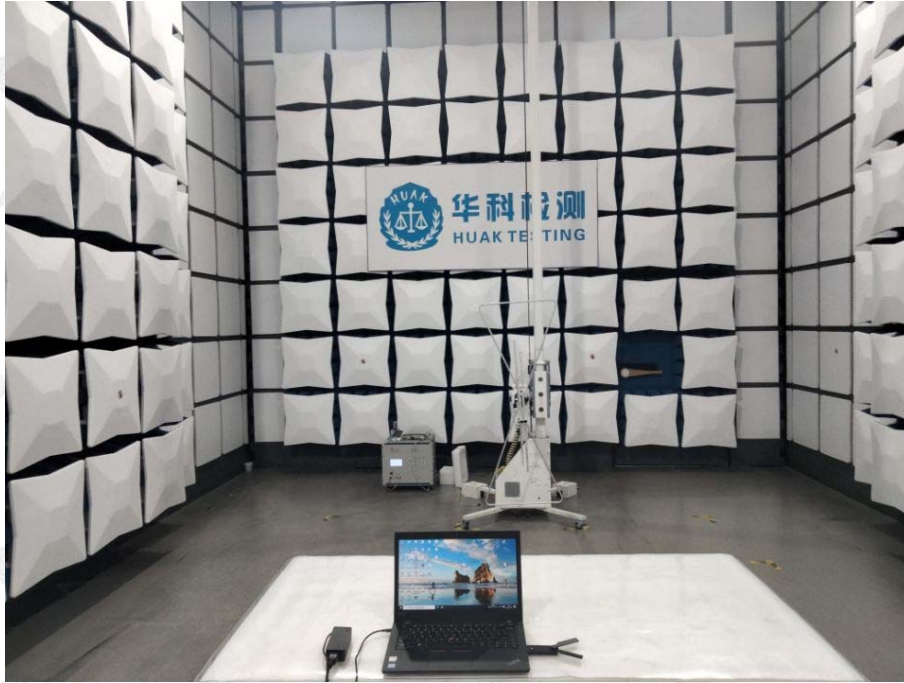
ANTENNA





5. PHOTOGRAPHS OF TEST SETUP

Radiated Emission



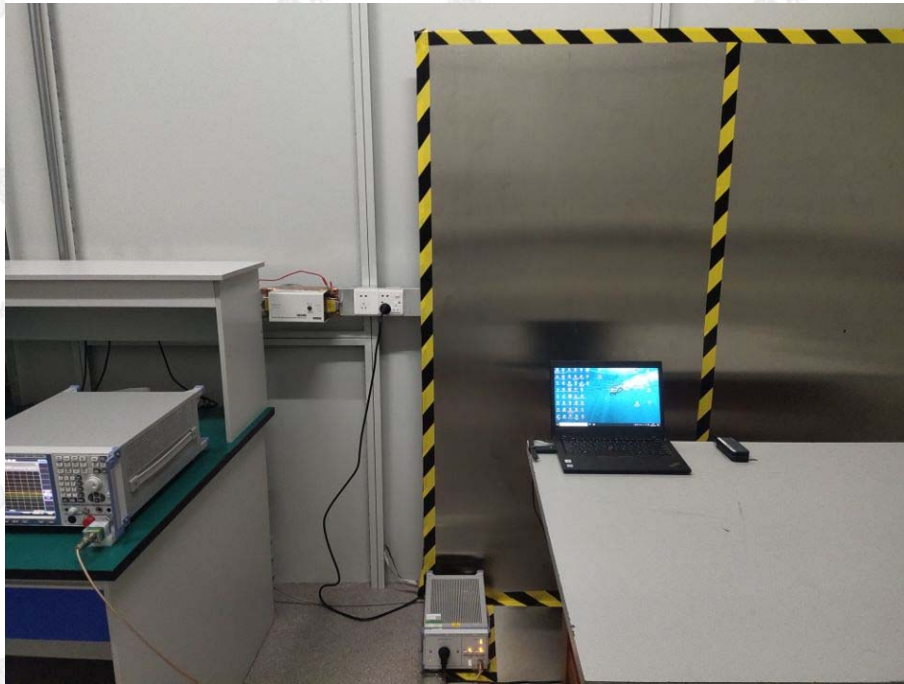
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Conducted Emission



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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-----