

Mid



High

802.11n(HT20)



Low



Mid



High

802.11n(HT40)



Low



High

Band IV (5725 – 5850 MHz) for antenna 2

802.11a



Low

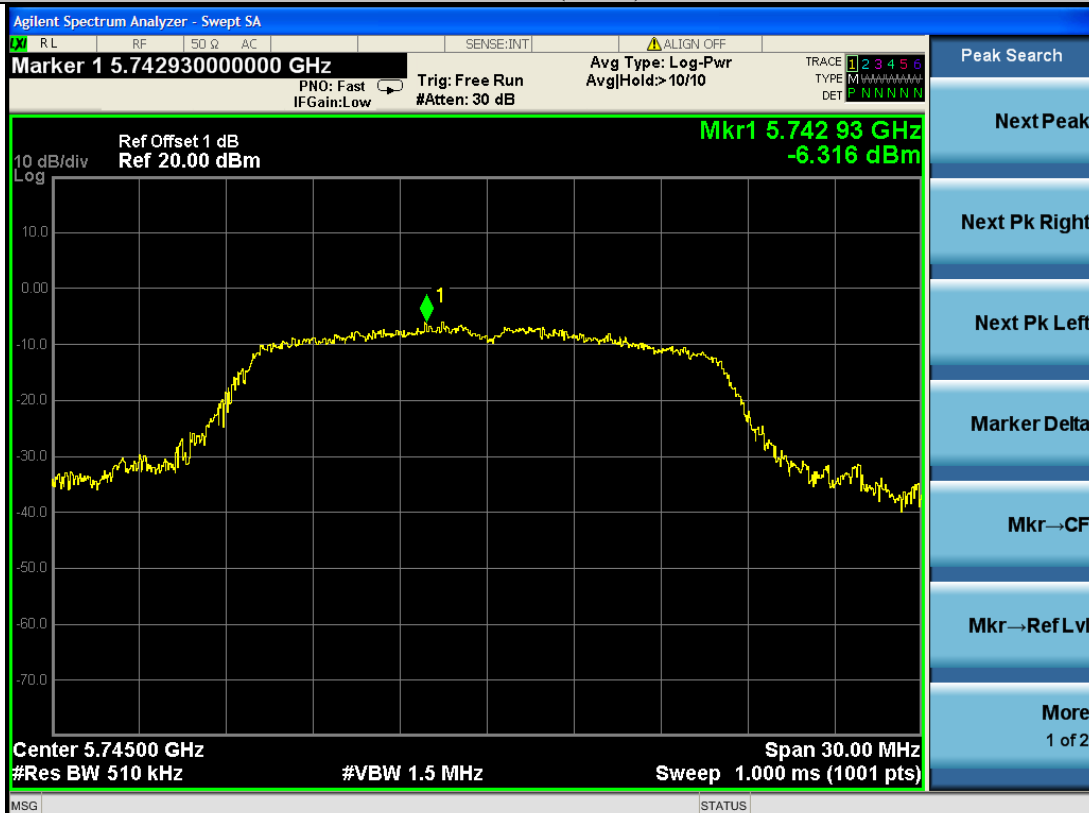


Mid



High

802.11n(HT20)



Low



Mid



High

802.11n(HT40)



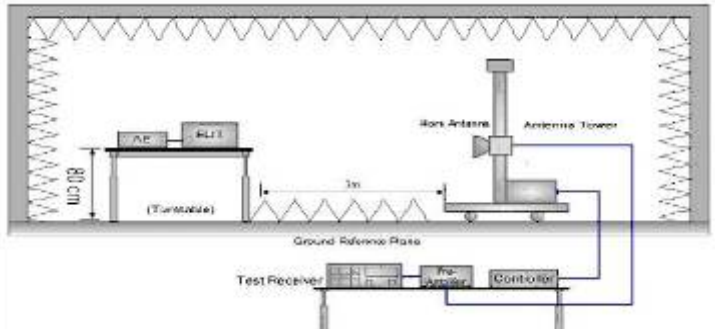
Low



High

6.7. Emission mask

6.7.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407
Test Method:	ANSI C63.10 2013
Limit:	<p>For transmitters operating in the 5.725-5.85 GHz band:</p> <p>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.</p> <p>For band IV (other un-restricted band): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIRP}(\text{dBm}) = -27 \text{ dBm}$</p> <p>$E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 105.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIRP}(\text{dBm}) = 10 \text{ dBm}$</p> <p>$E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 122.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIRP}(\text{dBm}) = 27 \text{ dBm}$</p>
Test Setup:	
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

	<p>value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>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.</p> <p>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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, quasipeak or average method as specified and then reported in a data sheet.</p>
Test Result:	PASS

6.7.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ	200061	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHW ARZ	FSP40	100056	Sep. 27, 2018
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 27, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	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).

6.7.3. Test Data

NOTE: All the test modes completed for test. The worst case MIMO mode of Radiated Band Edge test; the test data of this mode was reported.

For MIMO antenna port 1 and part 2 Radiated Band Edge Test:

Operation Mode: 802.11a Mode with 5.8G TX CH Low for Ant.1
Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5650	56.39	-2.03	54.36	88.2	-33.84	peak
5650	/	-2.03	/	68.2	/	AVG
5700	53.43	-2.01	51.42	125.2	-73.78	peak
5700	/	-2.01	/	105.2	/	AVG
5720	52.54	-2.01	50.53	142.2	-91.67	peak
5720	/	-2.01	/	122.2	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5650	54.59	-2.03	52.56	88.2	-35.64	peak
5650	/	-2.03	/	68.2	/	AVG
5700	53.42	-2.01	51.41	125.2	-73.79	peak
5700	/	-2.01	/	105.2	/	AVG
5720	54.53	-2.01	52.52	142.2	-89.68	peak
5720	/	-2.01	/	122.2	/	AVG

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

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5830	74.55	-1.97	72.58	142.2	-69.62	peak
5830	/	-1.97	/	122.2	/	AVG
5850	53.36	-1.97	51.39	125.2	-73.81	peak
5850	/	-1.97	/	105.2	/	AVG
5900	55.32	-1.94	53.38	88.2	-34.82	peak
5900	/	-1.94	/	68.2	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5830	78.24	-1.97	76.27	142.2	-65.93	peak
5830	/	-1.97	/	122.2	/	AVG
5850	55.99	-1.97	54.02	125.2	-71.18	peak
5850	/	-1.97	/	105.2	/	AVG
5900	57.20	-1.94	55.26	88.2	-32.94	peak
5900	/	-1.94	/	68.2	/	AVG

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

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	56.60	-2.03	54.57	88.2	-33.63	peak
5650	/	-2.03	/	68.2	/	AVG
5700	52.37	-2.01	50.36	125.2	-74.84	peak
5700	/	-2.01	/	105.2	/	AVG
5720	52.24	-2.01	50.23	142.2	-91.97	peak
5720	/	-2.01	/	122.2	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	55.06	-2.03	53.03	88.2	-35.17	peak
5650	/	-2.03	/	68.2	/	AVG
5700	54.76	-2.01	52.75	125.2	-72.45	peak
5700	/	-2.01	/	105.2	/	AVG
5720	52.43	-2.01	50.42	142.2	-91.78	peak
5720	/	-2.01	/	122.2	/	AVG

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

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)	
5830	72.94	-1.97	70.97	142.2	-71.23	peak
5830	/	-1.97	/	122.2	/	AVG
5850	54.20	-1.97	52.23	125.2	-72.97	peak
5850	/	-1.97	/	105.2	/	AVG
5900	53.35	-1.94	51.41	88.2	-36.79	peak
5900	/	-1.94	/	68.2	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5830	73.76	-1.97	71.79	142.2	-70.41	peak
5830	/	-1.97	/	122.2	/	AVG
5850	51.29	-1.97	49.32	125.2	-75.88	peak
5850	/	-1.97	/	105.2	/	AVG
5900	53.66	-1.94	51.72	88.2	-36.48	peak
5900	/	-1.94	/	68.2	/	AVG

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

Operation Mode: 802.11n40 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	53.59	-2.03	51.56	88.2	-36.64	peak
5650	/	-2.03	/	68.2	/	AVG
5700	54.10	-2.01	52.09	125.2	-73.11	peak
5700	/	-2.01	/	105.2	/	AVG
5720	55.04	-2.01	53.03	142.2	-89.17	peak
5720	/	-2.01	/	122.2	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5650	53.87	-2.03	51.84	88.2	-36.36	peak
5650	/	-2.03	/	68.2	/	AVG
5700	55.05	-2.01	53.04	125.2	-72.16	peak
5700	/	-2.01	/	105.2	/	AVG
5720	51.67	-2.01	49.66	142.2	-92.54	peak
5720	/	-2.01	/	122.2	/	AVG

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

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5830	75.53	-1.97	73.56	142.2	-68.64	peak
5830	/	-1.97	/	122.2	/	AVG
5850	55.85	-1.97	53.88	125.2	-71.32	peak
5850	/	-1.97	/	105.2	/	AVG
5900	54.88	-1.94	52.94	88.2	-35.26	peak
5900	/	-1.94	/	68.2	/	AVG

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

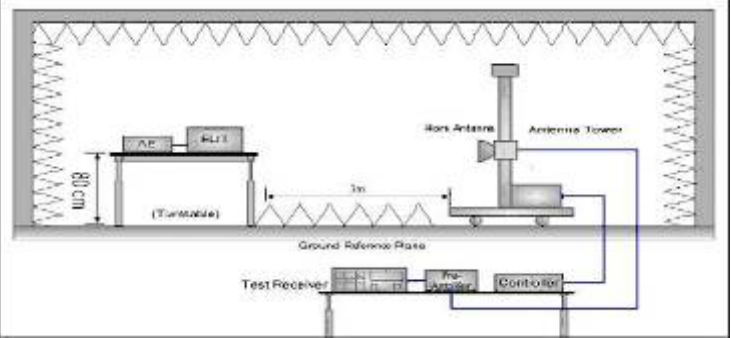
Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5830	77.75	-1.97	75.78	142.2	-66.42	peak
5830	/	-1.97	/	122.2	/	AVG
5850	54.25	-1.97	52.28	125.2	-72.92	peak
5850	/	-1.97	/	105.2	/	AVG
5900	54.70	-1.94	52.76	88.2	-35.44	peak
5900	/	-1.94	/	68.2	/	AVG

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

6.8. Band edge

6.8.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407
Test Method:	ANSI C63.10 2013
Limit:	For band I&II&III: $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2$ dB $\mu\text{V}/\text{m}$, for EIRP(dBm)= -27dBm For band IV(5715-5725MHz&5850-5860MHz): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 78.2$ dB $\mu\text{V}/\text{m}$, for EIRP(dBm)= -17dBm ; For band IV(other un-restricted band): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2$ dB $\mu\text{V}/\text{m}$, for EIRP(dBm)= -27dBm
Test Setup:	
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. 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, quasipeak or average method as specified and then reported in a data sheet.
Test Result:	PASS

6.8.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ	200061	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHW ARZ	FSP40	100056	Sep. 27, 2018
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 27, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	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).

6.8.3. Test Data

NOTE: All the test modes completed for test. The worst case MIMO mode of Radiated Band Edge test; the test data of this mode was reported.

For MIMO antenna port 1 and part 2 Radiated Band Edge Test:

Operation Mode: 802.11a Mode with 5.2G TX CH Low for Ant.1

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.28	-2.49	49.79	74	-24.21	peak
5150	/	-2.49	/	54	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	50.77	-2.49	48.28	74	-25.72	peak
5150	/	-2.49	/	54	/	AVG

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

Operation Mode: TX CH High with 5.2G
Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5250	53.87	-2.28	51.59	74	-22.41	peak
5250	/	-2.28	/	54	/	AVG
5350	50.12	-2.11	48.01	74	-25.99	peak
5350	/	-2.11	/	54	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5250	53.94	-2.28	51.66	74	-22.34	peak
5250	/	-2.28	/	54	/	AVG
5350	51.43	-2.11	49.32	74	-24.68	peak
5350	/	-2.11	/	54	/	AVG

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

Operation Mode: 802.11n20 Mode with 5.2G TX CH Low
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.72	-2.49	49.23	74	-24.77	peak
5150	/	-2.49	/	54	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	50.64	-2.49	48.15	74	-25.85	peak
5150	/	-2.49	/	54	/	AVG

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

Operation Mode: TX CH High with 5.2G
Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5250	54.03	-2.28	51.75	74	-22.25	peak
5250	/	-2.28	/	54	/	AVG
5350	48.19	-2.11	46.08	74	-27.92	peak
5350	/	-2.11	/	54	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5250	53.00	-2.28	50.72	74	-23.28	peak
5250	/	-2.28	/	54	/	AVG
5350	47.77	-2.11	45.66	74	-28.34	peak
5350	/	-2.11	/	54	/	AVG

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

Operation Mode: 802.11 n40 Mode with 5.2G TX CH Low
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.63	-2.49	50.14	74	-23.86	peak
5150	/	-2.49	/	54	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.07	-2.49	48.58	74	-25.42	peak
5150	/	-2.49	/	54	/	AVG

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

Operation Mode: TX CH High with 5.2G
Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5250	54.47	-2.28	52.19	74	-21.81	peak
5250	/	-2.28	/	54	/	AVG
5350	50.36	-2.11	48.25	74	-25.75	peak
5350	/	-2.11	/	54	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5250	53.71	-2.28	51.43	74	-22.57	peak
5250	/	-2.28	/	54	/	AVG
5350	49.39	-2.11	47.28	74	-26.72	peak
5350	/	-2.11	/	54	/	AVG

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

Operation Mode: 802.11a 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
5460	52.79	-2.06	50.73	74	-23.27	peak
5460	/	-2.06	/	54	/	AVG
5725	49.48	-1.96	47.52	74	-26.48	peak
5725	/	-1.96	/	54	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5460	53.14	-2.06	51.08	74	-22.92	peak
5460	/	-2.06	/	54	/	AVG
5725	46.39	-1.96	44.43	74	-29.57	peak
5725	/	-1.96	/	54	/	AVG

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

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5850	51.03	-1.97	49.06	74	-24.94	peak
5850	/	-1.97	/	54	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5850	51.82	-1.97	49.85	74	-24.15	peak
5850	/	-1.97	/	54	/	AVG

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

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
5460	51.17	-2.06	49.11	74	-24.89	peak
5460	/	-2.06	/	54	/	AVG
5725	48.53	-1.96	46.57	74	-27.43	peak
5725	/	-1.96	/	54	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5460	52.14	-2.06	50.08	74	-23.92	peak
5460	/	-2.06	/	54	/	AVG
5725	49.58	-1.96	47.62	74	-26.38	peak
5725	/	-1.96	/	54	/	AVG

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

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5850	51.35	-1.97	49.38	74	-24.62	peak
5850	/	-1.97	/	54	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5850	51.22	-1.97	49.25	74	-24.75	peak
5850	/	-1.97	/	54	/	AVG

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

Operation Mode: 802.11n40 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
5460	50.20	-2.06	48.14	74	-25.86	peak
5460	/	-2.06	/	54	/	AVG
5725	49.13	-1.96	47.17	74	-26.83	peak
5725	/	-1.96	/	54	/	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
5460	53.50	-2.06	51.44	74	-22.56	peak
5460	/	-2.06	/	54	/	AVG
5725	47.34	-1.96	45.38	74	-28.62	peak
5725	/	-1.96	/	54	/	AVG

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

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5850	51.66	-1.97	49.69	74	-24.31	peak
5850	/	-1.97	/	54	/	AVG

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

Vertical:

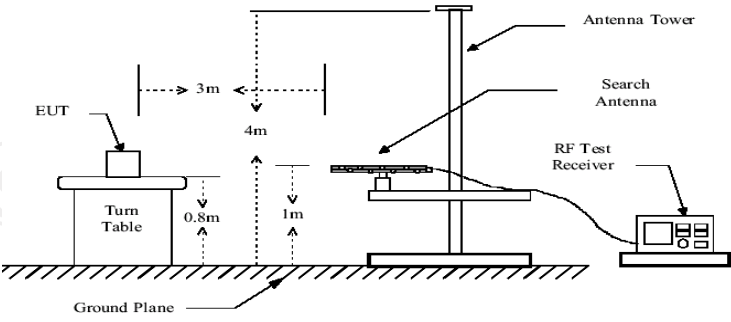
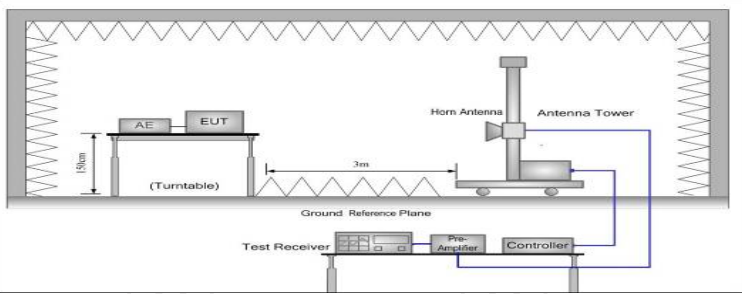
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
5850	52.14	-1.97	50.17	74	-23.83	peak
5850	/	-1.97	/	54	/	AVG

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

6.9. Spurious Emission

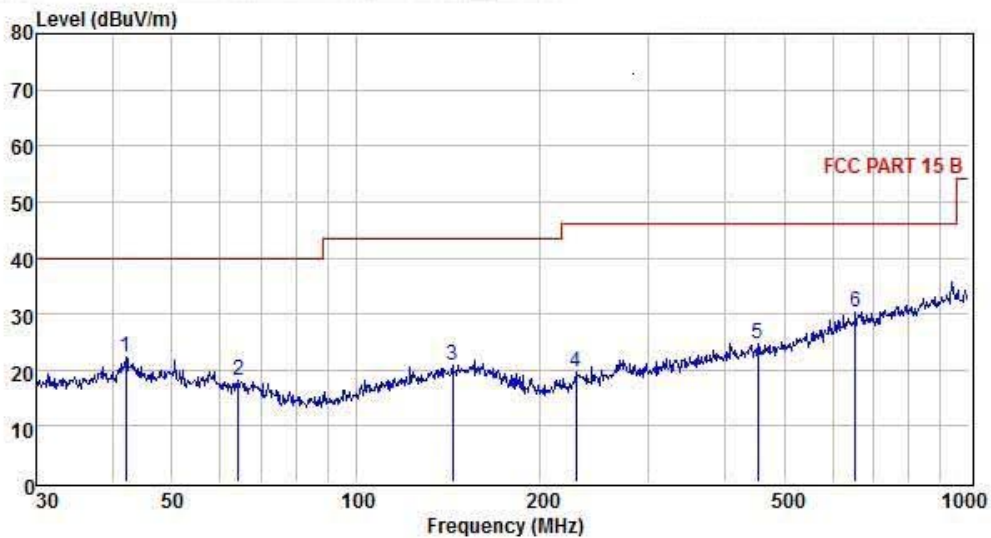
6.9.1.1. Test Specification

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	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit:	Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,				
	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)		
	0.009-0.490	2400/F(KHz)	300		
	0.490-1.705	24000/F(KHz)	30		
	1.705-30	30	30		
	30-88	100	3		
	88-216	150	3		
	216-960	200	3		
	Above 960	500	3		
		Frequency	Limit (dBuV/m @3m)	Detector	
	Above 1G	74.0	Peak		
		54.0	Average		
Test setup:	For radiated emissions below 30MHz				
	<p>The diagram illustrates the test setup for radiated emissions below 30MHz. It shows an EUT (Equipment Under Test) on a turn table, positioned 3m away from a circular antenna. The antenna is mounted on a ground plane. The antenna is connected to a Pre-Amplifier, which is then connected to a Receiver. The Receiver is connected to a Computer.</p>				

	<p>30MHz to 1GHz</p>  <p>Above 1GHz</p> 
<p>Test Procedure:</p>	<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 rotating 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. 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.
<p>Test results:</p>	<p>PASS</p>

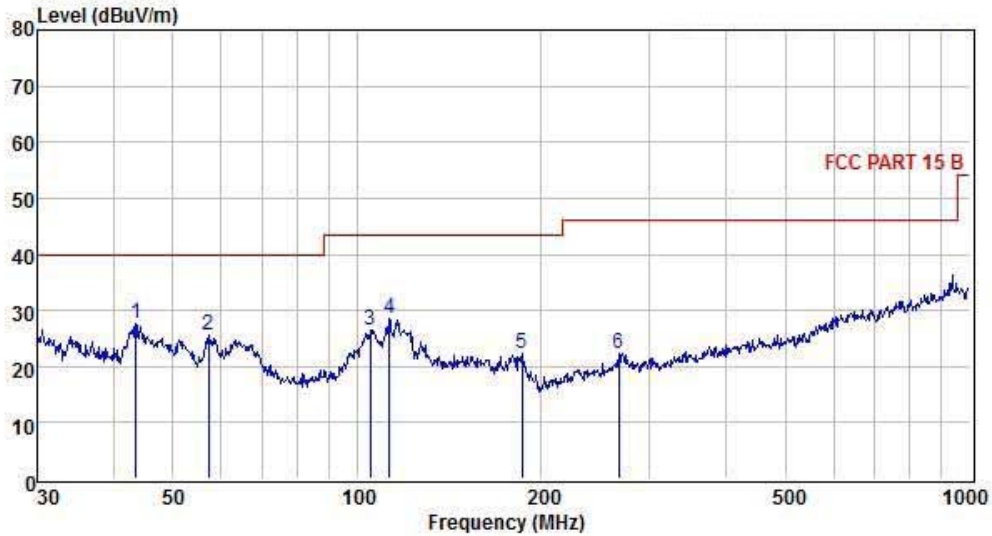
6.9.2. Test Data

Please refer to following diagram for individual
Below 1GHz



Condition		: FCC PART 15 B				POL: HORIZONTAL			
Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	42.01	38.61	13.93	30.40	0.19	22.33	40.00	-17.67	Peak
2	64.21	36.50	11.98	30.52	0.24	18.20	40.00	-21.80	Peak
3	143.83	36.06	13.77	29.39	0.38	20.82	43.50	-22.68	Peak
4	228.49	36.09	11.10	28.14	0.55	19.60	46.00	-26.40	Peak
5	452.72	35.02	16.01	27.52	1.15	24.66	46.00	-21.34	Peak
6	654.23	35.55	19.14	25.52	1.11	30.28	46.00	-15.72	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15 B POL: VERTICAL

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	43.51	44.12	13.79	30.40	0.09	27.60	40.00	-12.40	Peak
2	57.19	43.30	12.91	30.88	0.14	25.47	40.00	-14.53	Peak
3	104.90	45.33	10.74	30.04	0.36	26.39	43.50	-17.11	Peak
4	112.92	46.47	11.50	29.85	0.47	28.59	43.50	-14.91	Peak
5	185.79	39.74	10.95	28.98	0.57	22.28	43.50	-21.22	Peak
6	267.55	37.71	12.03	28.14	0.70	22.30	46.00	-23.70	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Remark: 1. Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

2. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

Above 1GHz

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

For MIMO antenna port 1 and part 2 above 1 GHz Test Results:

LOW CH 36 (802.11 a Mode with 5.2G)/5180

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3647	59.23	-4.59	54.64	74	-19.36	peak
3647	44.75	-4.59	40.16	54	-13.84	AVG
10360	52.38	3.74	56.12	74	-17.88	peak
10360	39.01	3.74	42.75	54	-11.25	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3647	60.23	-4.59	55.64	74	-18.36	peak
3647	46.45	-4.59	41.86	54	-12.14	AVG
10360	52.88	3.74	56.62	74	-17.38	peak
10360	38.59	3.74	42.33	54	-11.67	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH40 (802.11 a Mode with 5.2G)/5200
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3647	61.71	-4.59	57.12	74	-16.88	peak
3647	47.32	-4.59	42.73	54	-11.27	AVG
10400	50.50	3.74	54.24	74	-19.76	peak
10400	36.18	3.74	39.92	54	-14.08	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3647	59.94	-4.59	55.35	74	-18.65	peak
3647	45.79	-4.59	41.2	54	-12.8	AVG
10400	53.55	3.74	57.29	74	-16.71	peak
10400	38.67	3.74	42.41	54	-11.59	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH 48 (802.11a Mode with 5.2G)/5240
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3647	59.91	-4.59	55.32	74	-18.68	peak
3647	46.46	-4.59	41.87	54	-12.13	AVG
10480	53.48	3.75	57.23	74	-16.77	peak
10480	39.79	3.75	43.54	54	-10.46	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3647	58.96	-4.59	54.37	74	-19.63	peak
3647	45.30	-4.59	40.71	54	-13.29	AVG
10480	50.39	3.75	54.14	74	-19.86	peak
10480	37.36	3.75	41.11	54	-12.89	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 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) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (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.

LOW CH 36 (802.11 n20 Mode with 5.2G)/5180
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	60.10	-4.79	55.31	74	-18.69	peak
3054	45.21	-4.79	40.42	54	-13.58	AVG
10360	51.32	3.74	55.06	74	-18.94	peak
10360	38.05	3.74	41.79	54	-12.21	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	59.21	-4.79	54.42	74	-19.58	peak
3054	44.35	-4.79	39.56	54	-14.44	AVG
10360	52.52	3.74	56.26	74	-17.74	peak
10360	38.70	3.74	42.44	54	-11.56	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

MID CH40 (802.11 n20 Mode with 5.2G)/5200
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3054	62.61	-4.79	57.82	74	-16.18	peak
3054	49.60	-4.79	44.81	54	-9.19	AVG
10400	53.79	3.74	57.53	74	-16.47	peak
10400	39.42	3.74	43.16	54	-10.84	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3054	59.11	-4.79	54.32	74	-19.68	peak
3054	44.45	-4.79	39.66	54	-14.34	AVG
10400	51.08	3.74	54.82	74	-19.18	peak
10400	37.81	3.74	41.55	54	-12.45	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH 48 (802.11 n20 Mode with 5.2G)/5240
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	61.34	-4.79	56.55	74	-17.45	peak
3054	48.07	-4.79	43.28	54	-10.72	AVG
10480	51.90	3.75	55.65	74	-18.35	peak
10480	38.08	3.75	41.83	54	-12.17	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	60.47	-4.79	55.68	74	-18.32	peak
3054	46.89	-4.79	42.1	54	-11.9	AVG
10480	53.87	3.75	57.62	74	-16.38	peak
10480	39.79	3.75	43.54	54	-10.46	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 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) Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (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 73.16dB μ V/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dB μ V/m(PK Value) <54 dB μ V/m(AV Limit), the Average Detected not need to completed.

LOW CH38 (802.11n40 Mode with 5.2G)/5190
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3432	62.42	-5.21	57.21	74	-16.79	peak
3432	47.80	-5.21	42.59	54	-11.41	AVG
10380	51.42	3.74	55.16	74	-18.84	peak
10380	37.03	3.74	40.77	54	-13.23	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3432	61.00	-5.21	55.79	74	-18.21	peak
3432	47.16	-5.21	41.95	54	-12.05	AVG
10380	52.14	3.74	55.88	74	-18.12	peak
10380	37.36	3.74	41.1	54	-12.9	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH46 (802.11n40 Mode with 5.2G)/5230
Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3432	61.40	-5.21	56.19	74	-17.81	peak
3432	48.39	-5.21	43.18	54	-10.82	AVG
10460	54.06	3.75	57.81	74	-16.19	peak
10460	40.00	3.75	43.75	54	-10.25	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3432	59.43	-5.21	54.22	74	-19.78	peak
3432	45.26	-5.21	40.05	54	-13.95	AVG
10460	53.83	3.75	57.58	74	-16.42	peak
10460	39.46	3.75	43.21	54	-10.79	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 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) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (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.

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

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3647	59.65	-4.59	55.06	74	-18.94	peak
3647	45.97	-4.59	41.38	54	-12.62	AVG
11570	53.67	4.21	57.88	74	-16.12	peak
11570	40.25	4.21	44.46	54	-9.54	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3647	60.47	-4.59	55.88	74	-18.12	peak
3647	45.80	-4.59	41.21	54	-12.79	AVG
11570	52.21	4.21	56.42	74	-17.58	peak
11570	37.54	4.21	41.75	54	-12.25	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

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

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3647	59.97	-4.59	55.38	74	-18.62	peak
3647	45.39	-4.59	40.8	54	-13.2	AVG
11570	50.03	4.21	54.24	74	-19.76	peak
11570	36.88	4.21	41.09	54	-12.91	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3647	61.78	-4.59	57.19	74	-16.81	peak
3647	48.74	-4.59	44.15	54	-9.85	AVG
11570	50.55	4.21	54.76	74	-19.24	peak
11570	36.11	4.21	40.32	54	-13.68	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

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

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3647	60.18	-4.59	55.59	74	-18.41	peak
3647	46.61	-4.59	42.02	54	-11.98	AVG
11650	49.81	4.84	54.65	74	-19.35	peak
11650	36.02	4.84	40.86	54	-13.14	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3647	60.46	-4.59	55.87	74	-18.13	peak
3647	45.58	-4.59	40.99	54	-13.01	AVG
11650	51.74	4.84	56.58	74	-17.42	peak
11650	38.45	4.84	43.29	54	-10.71	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 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) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (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.

LOW CH 149 (802.11 n20 Mode with 5.8G)/5745
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	58.93	-4.79	54.14	74	-19.86	peak
3054	44.90	-4.79	40.11	54	-13.89	AVG
11570	50.80	4.21	55.01	74	-18.99	peak
11570	36.92	4.21	41.13	54	-12.87	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	62.51	-4.79	57.72	74	-16.28	peak
3054	48.99	-4.79	44.2	54	-9.8	AVG
11570	52.93	4.21	57.14	74	-16.86	peak
11570	38.67	4.21	42.88	54	-11.12	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH157 (802.11 n20 Mode with 5.8G)/5785
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	61.48	-4.79	56.69	74	-17.31	peak
3054	46.95	-4.79	42.16	54	-11.84	AVG
11570	50.57	4.21	54.78	74	-19.22	peak
11570	37.18	4.21	41.39	54	-12.61	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	59.21	-4.79	54.42	74	-19.58	peak
3054	45.45	-4.79	40.66	54	-13.34	AVG
11570	52.91	4.21	57.12	74	-16.88	peak
11570	38.05	4.21	42.26	54	-11.74	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH 165 (802.11 n20 Mode with 5.8G)/5825
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	60.47	-4.79	55.68	74	-18.32	peak
3054	46.70	-4.79	41.91	54	-12.09	AVG
11650	50.67	4.84	55.51	74	-18.49	peak
11650	35.90	4.84	40.74	54	-13.26	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3054	61.18	-4.79	56.39	74	-17.61	peak
3054	48.14	-4.79	43.35	54	-10.65	AVG
11650	49.54	4.84	54.38	74	-19.62	peak
11650	35.38	4.84	40.22	54	-13.78	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 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) Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (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.

LOW CH151 (802.11n40 Mode with 5.8G)/5755
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3432	60.89	-5.21	55.68	74	-18.32	peak
3432	46.58	-5.21	41.37	54	-12.63	AVG
11510	51.37	4.21	55.58	74	-18.42	peak
11510	36.60	4.21	40.81	54	-13.19	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3432	60.87	-5.21	55.66	74	-18.34	peak
3432	46.65	-5.21	41.44	54	-12.56	AVG
11510	50.14	4.21	54.35	74	-19.65	peak
11510	35.52	4.21	39.73	54	-14.27	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH159 (802.11n40 Mode with 5.8G)/5795
Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3432	61.07	-5.21	55.86	74	-18.14	peak
3432	46.75	-5.21	41.54	54	-12.46	AVG
11590	53.12	4.21	57.33	74	-16.67	peak
11590	38.40	4.21	42.61	54	-11.39	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
3432	60.73	-5.21	55.52	74	-18.48	peak
3432	46.06	-5.21	40.85	54	-13.15	AVG
11590	49.81	4.21	54.02	74	-19.98	peak
11590	35.27	4.21	39.48	54	-14.52	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 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) Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (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.

6.10. Frequency Stability Measurement

6.10.1. Test Specification

Test Requirement:	FCC Part15 Section 15.407(g) &Part2 J Section 2.1055
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:	Pre-scan was performed at Antenna 2 and Antenna 1.

Test plots as follows:

For antenna 1

Mode	Voltage (V)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	132 V	5179.983	17	5239.988	12
	120 V	5179.987	13	5239.982	18
	108 V	5179.985	15	5239.987	13

Mode	Temperature (°C)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.961	39	5239.954	46
	-20	5179.964	36	5239.963	37
	-10	5179.973	27	5239.978	22
	0	5179.977	23	5239.973	27
	10	5179.975	25	5239.979	21
	20	5179.983	17	5239.982	18
	30	5179.976	24	5239.979	21
	40	5179.978	22	5239.976	24
	50	5179.961	39	5239.967	33

Mode	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	132 V	5744.988	12	5824.985	15
	120 V	5744.987	13	5824.983	17
	108 V	5744.986	14	5824.989	11

Mode	Temperature (°C)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	-30	5744.952	48	5824.967	33
	-20	5744.955	45	5824.965	35
	-10	5744.976	24	5824.978	22
	0	5744.971	29	5824.976	24
	10	5744.974	26	5824.976	24
	20	5744.982	18	5824.987	13
	30	5744.972	28	5824.977	23
	40	5744.979	21	5824.972	28
	50	5744.961	39	5824.961	39

For antenna 2

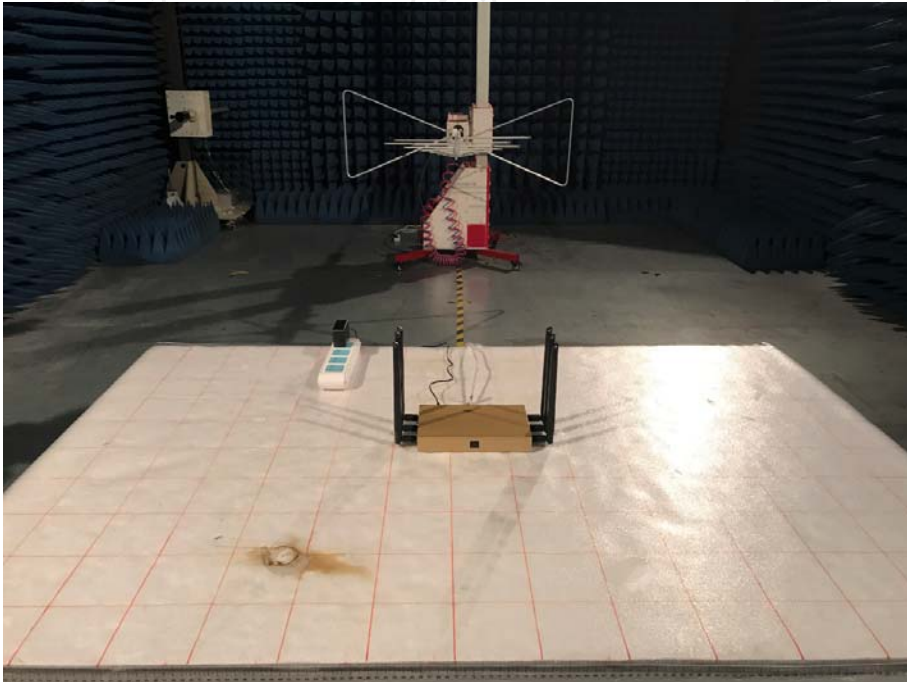
Mode	Voltage (V)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	132 V	5179.983	17	5239.983	17
	120 V	5179.983	17	5239.985	15
	108 V	5179.985	15	5239.989	11

Mode	Temperature (°C)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.961	39	5239.954	46
	-20	5179.964	36	5239.963	37
	-10	5179.973	27	5239.978	22
	0	5179.977	23	5239.973	27
	10	5179.975	25	5239.979	21
	20	5179.983	17	5239.982	18
	30	5179.976	24	5239.979	21
	40	5179.978	22	5239.976	24
	50	5179.961	39	5239.967	33

Mode	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	132 V	5744.988	12	5824.985	15
	120 V	5744.987	13	5824.983	17
	108 V	5744.986	14	5824.989	11

Mode	Temperature (°C)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	-30	5744.952	48	5824.967	33
	-20	5744.955	45	5824.965	35
	-10	5744.976	24	5824.978	22
	0	5744.971	29	5824.976	24
	10	5744.974	26	5824.976	24
	20	5744.982	18	5824.987	13
	30	5744.972	28	5824.977	23
	40	5744.979	21	5824.972	28
	50	5744.961	39	5824.961	39

Appendix A: Photographs of Test Setup
Radiated Emission



Conducted Emission



Appendix B: Photographs of EUT

Refer to the test report No.: TCT171204E011

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