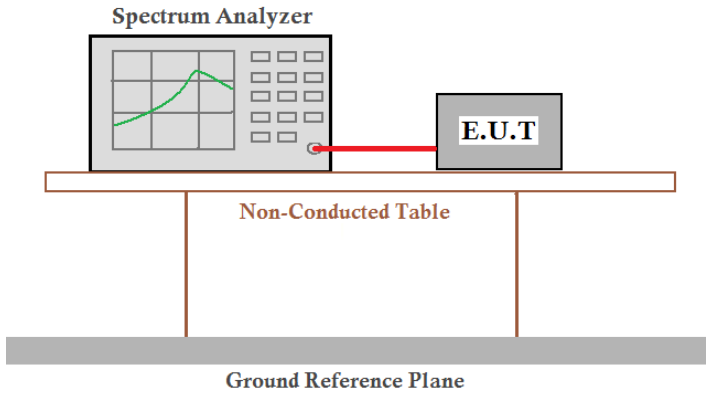


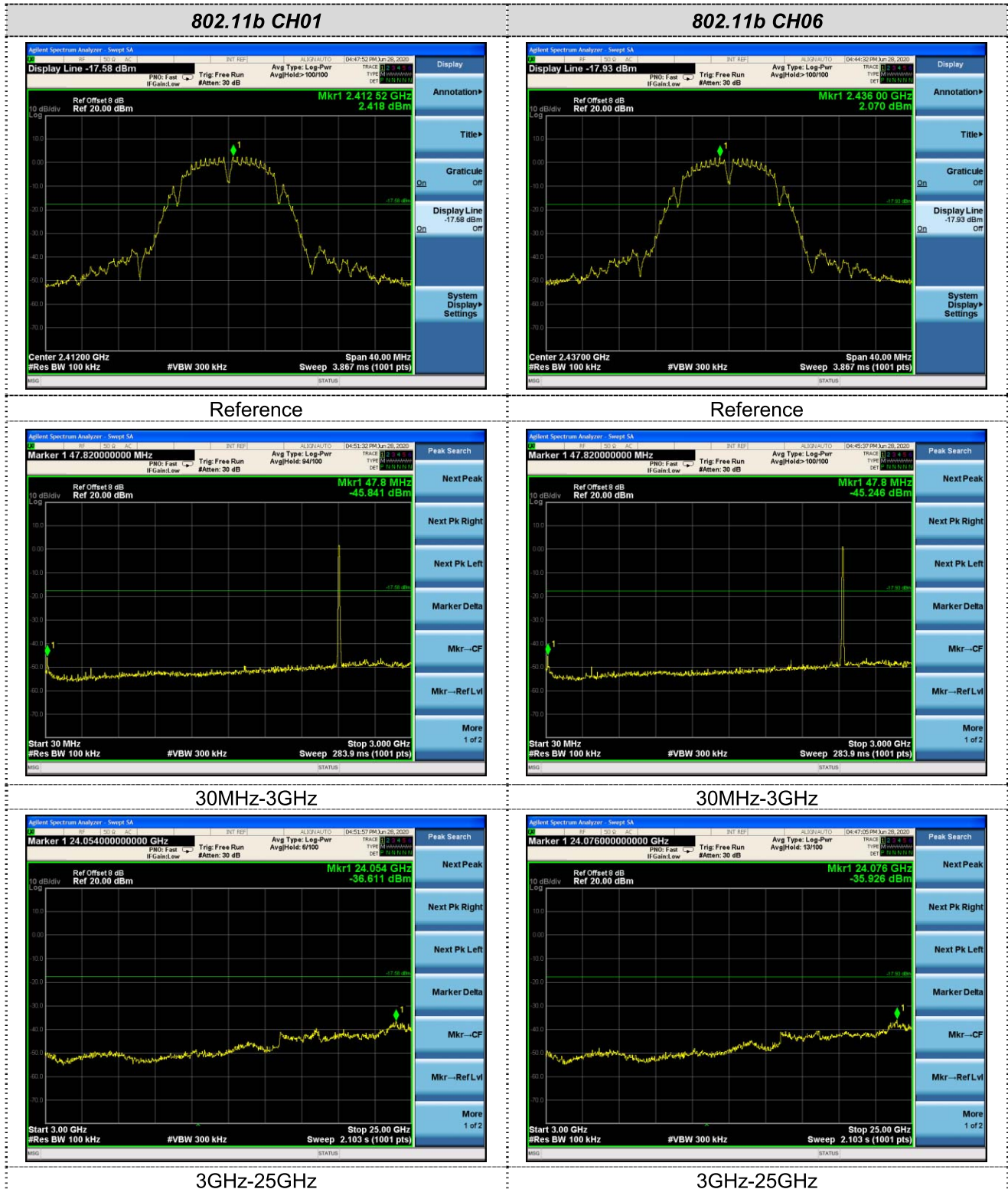
7.7 Spurious Emission

7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)					
Test Method:	KDB558074 D01 DTS Meas Guidance v05or02					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.					
Test setup:	 The diagram illustrates the test setup for conducted emission measurement. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

Test plot as follows:

For ANT1:



802.11b CH11



802.11g CH01



Reference



Reference



30MHz-10GHz



30MHz-10GHz



10GHz-26GHz

10GHz-26GHz

802.11g CH06



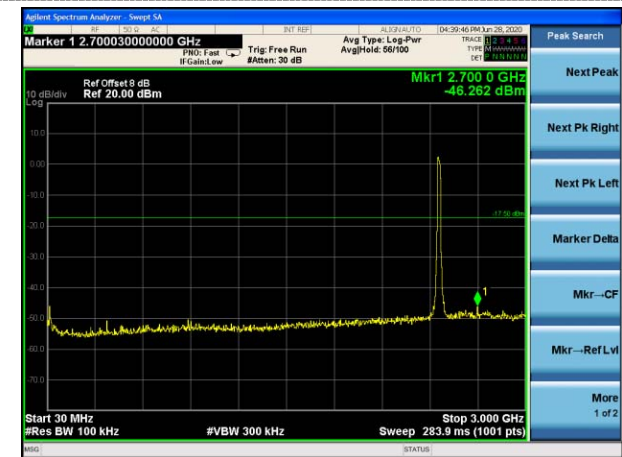
802.11g CH11



Reference



Reference



30MHz-10GHz



30MHz-10GHz



10GHz-26GHz

10GHz-26GHz

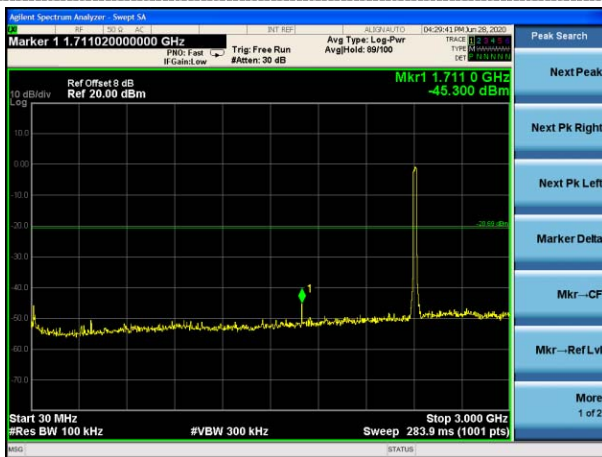
802.11n(HT20) CH01



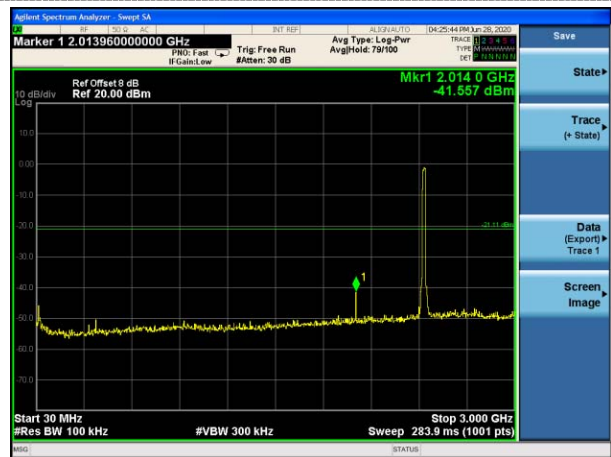
802.11n(HT20) CH06



Reference



Reference



30MHz-10GHz



30MHz-10GHz



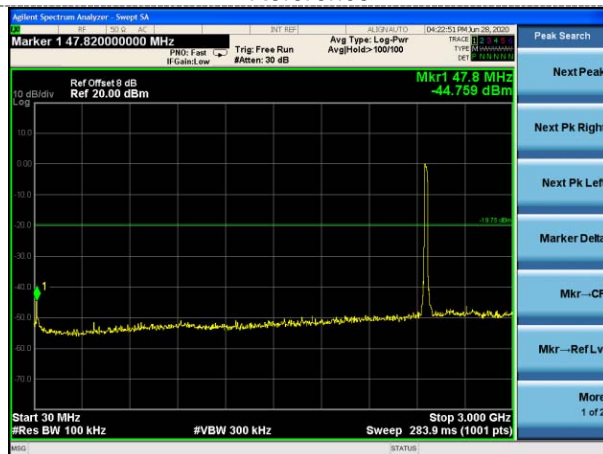
10GHz-26GHz

10GHz-26GHz

802.11n(HT20) CH11



Reference

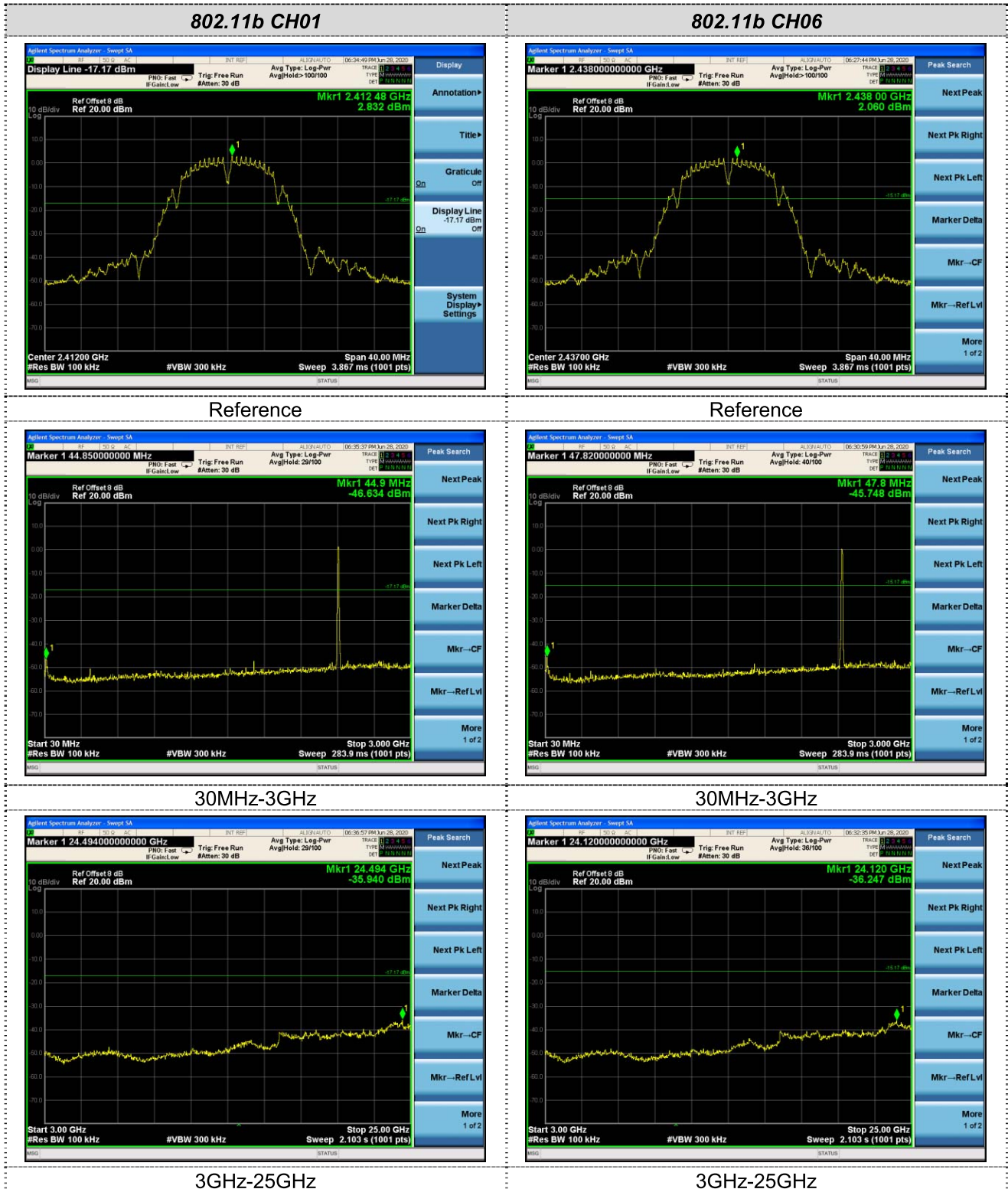


30MHz-10GHz



10GHz-26GHz

For ANT2:



802.11b CH11



802.11g CH01



Reference



Reference



30MHz-10GHz



30MHz-10GHz



10GHz-26GHz

10GHz-26GHz

802.11g CH06



802.11g CH11



Reference



Reference



30MHz-10GHz



30MHz-10GHz



10GHz-26GHz

10GHz-26GHz

802.11n(HT20) CH01



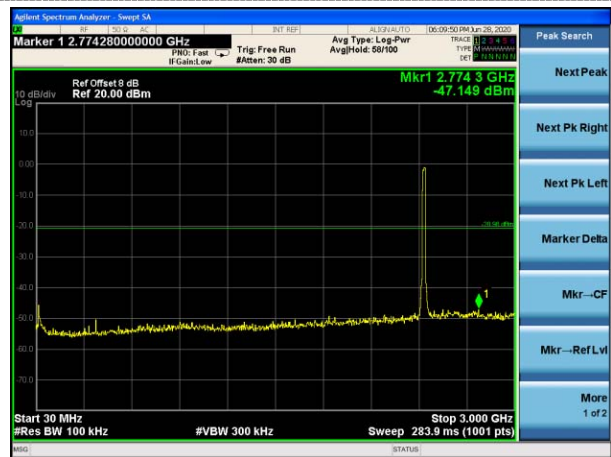
802.11n(HT20) CH06



Reference



Reference



30MHz-10GHz



30MHz-10GHz



10GHz-26GHz

10GHz-26GHz

802.11n(HT20) CH11



Reference

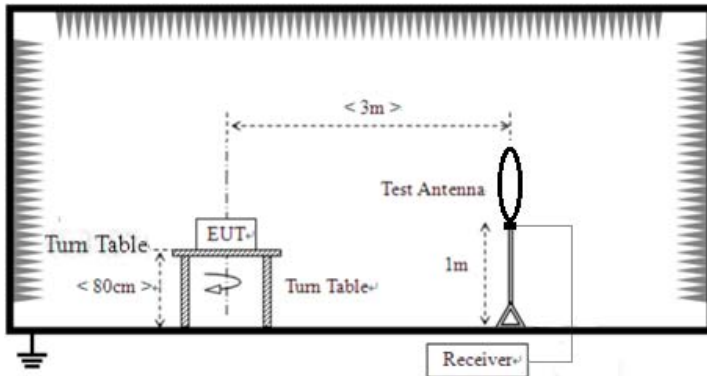


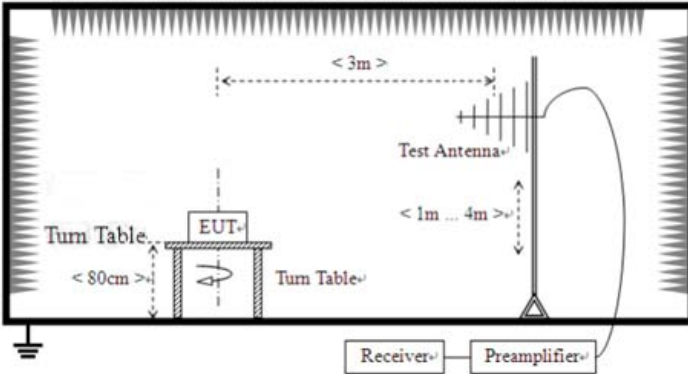
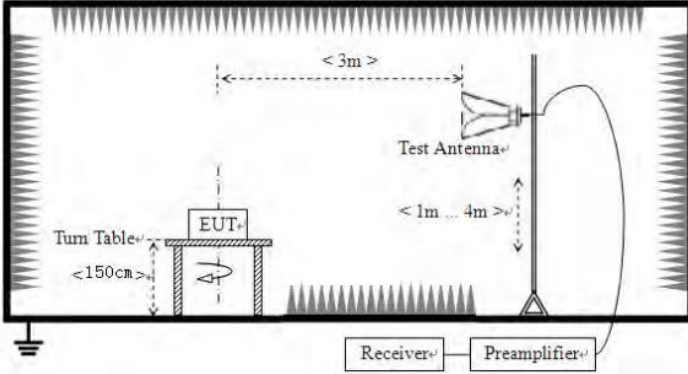
30MHz-10GHz



10GHz-26GHz

7.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	300m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					
For radiated emissions from 30MHz to1GHz					

	 For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) 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, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 6.0 for details

Test mode:	Refer to section 5.2 for details					
Test voltage:	AC120V 60Hz					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. Only the worst case Main Antenna test data.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement data:

■ 9kHz~30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

■ Below 1GHz

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		52.7600	42.18	-18.54	23.64	40.00	-16.36	QP
2	*	79.2426	55.33	-20.74	34.59	40.00	-5.41	QP
3		105.6415	49.31	-20.34	28.97	43.50	-14.53	QP
4		212.2695	49.01	-19.70	29.31	43.50	-14.19	QP
5		300.3672	48.84	-18.28	30.56	46.00	-15.44	QP
6		480.5276	53.15	-15.67	37.48	46.00	-8.52	QP

Final Level =Receiver Read level + Correct Factor

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	52.7600	56.46	-18.54	37.92	40.00	-2.08	QP
2	!	78.9652	57.09	-20.72	36.37	40.00	-3.63	QP
3	!	105.6415	60.18	-20.34	39.84	43.50	-3.66	QP
4		157.0074	52.86	-16.90	35.96	43.50	-7.54	QP
5		244.2321	52.66	-19.51	33.15	46.00	-12.85	QP
6		480.5276	52.63	-15.67	36.96	46.00	-9.04	QP

Final Level =Receiver Read level + Correct Factor

■ Above 1GHz

Note: 802.11b/802.11g/802.11n (H20)/802.11n (H20) MIMO and all have been tested, only worse case 802.11n (H20) MIMO is reported

Horizontal: LOW CH1 (802.11n (H20) MIMO Mode)/2412

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824	65.58	-3.67	61.91	74	-12.09	peak
4824	46.03	-3.64	42.39	54	-11.61	AVG
7236	62.79	-0.9	61.89	74	-12.11	peak
7236	43.37	-0.9	42.47	54	-11.53	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical: LOW CH1 (802.11n (H20) MIMO Mode)/2412

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824	62.89	-3.67	59.22	74	-14.78	peak
4824	47.03	-3.64	43.39	54	-10.61	AVG
7236	57.38	-0.9	56.48	74	-17.52	peak
7236	45.25	-0.9	44.35	54	-9.65	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Horizontal: MID CH6 (802.11n (H20) MIMO Mode)/2437

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	62.38	-3.53	58.85	74	-15.15	peak
4874	45.56	-3.53	42.03	54	-11.97	AVG
7311	57.39	-0.85	56.54	74	-17.46	peak
7311	42.38	-0.85	41.53	54	-12.47	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical: MID CH6 (802.11n (H20) MIMO Mode)/2437

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	63.18	-3.53	59.65	74	-14.35	peak
4874	46.32	-3.53	42.79	54	-11.21	AVG
7311	59.77	-0.85	58.92	74	-15.08	peak
7311	44.75	-0.85	43.9	54	-10.1	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Horizontal: HIGH CH11 (802.11n (H20) MIMO Mode)/2462

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924	64.52	-3.49	61.03	74	-12.97	peak
4924	46.85	-3.49	43.36	54	-10.64	AVG
7386	60.49	-0.78	59.71	74	-14.29	peak
7386	44.07	-0.78	43.29	54	-10.71	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical: HIGH CH11 (802.11n (H20) MIMO Mode)/2462

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924	63.68	-3.49	60.19	74	-13.81	peak
4924	46.75	-3.49	43.26	54	-10.74	AVG
7386	61.52	-0.78	60.74	74	-13.26	peak
7386	43.36	-0.78	42.58	54	-11.42	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Remark:

- (1) 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.
- (2) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----