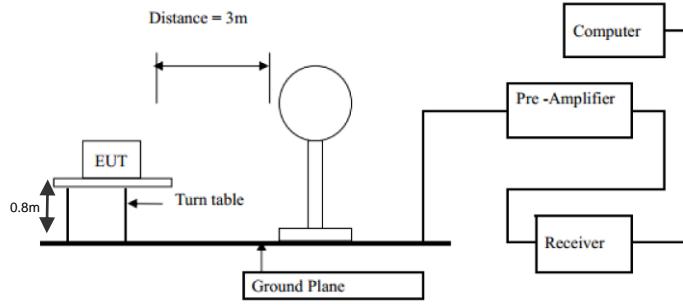
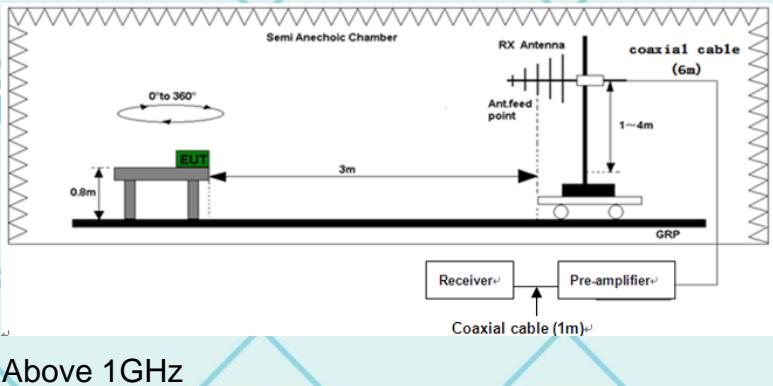
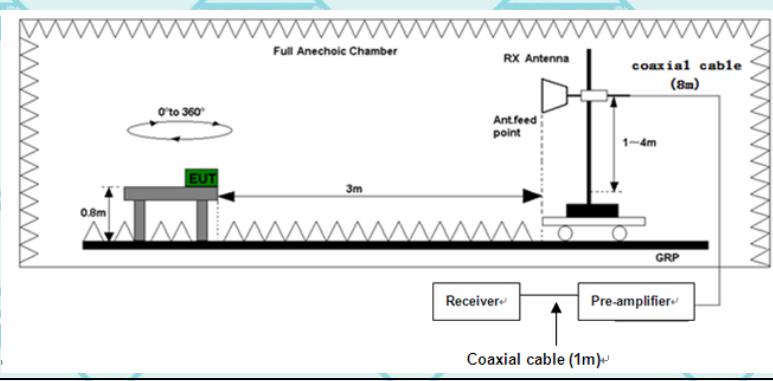


6.7. Radiated Spurious Emission Measurement

6.7.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209						
Test Method:	ANSI C63.10: 2013						
Frequency Range:	9 kHz to 25 GHz						
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:	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	Field Strength (microvolts/meter)		Measurement Distance (meters)	Detector		
	Above 1GHz	500		3	Average		
		5000		3	Peak		
Test setup:	For radiated emissions below 30MHz						
							
	30MHz to 1GHz						

<p>Test Procedure:</p>	 <p>Above 1GHz</p> 
	<p>1. For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.</p> <p>For the radiated emission test above 1GHz: Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p>

	<p>3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p> <p>4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</p> <p>5. Use the following spectrum analyzer settings:</p> <ol style="list-style-type: none"> (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p>
Test results:	PASS

Note 1: The symbol of “--” in the table which means not application.

Note 2: For the test data above 1 GHz, According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note 3: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note 4: The EUT is working in the Normal link mode below 1 GHz. All modes have been tested and normal link mode is worst.

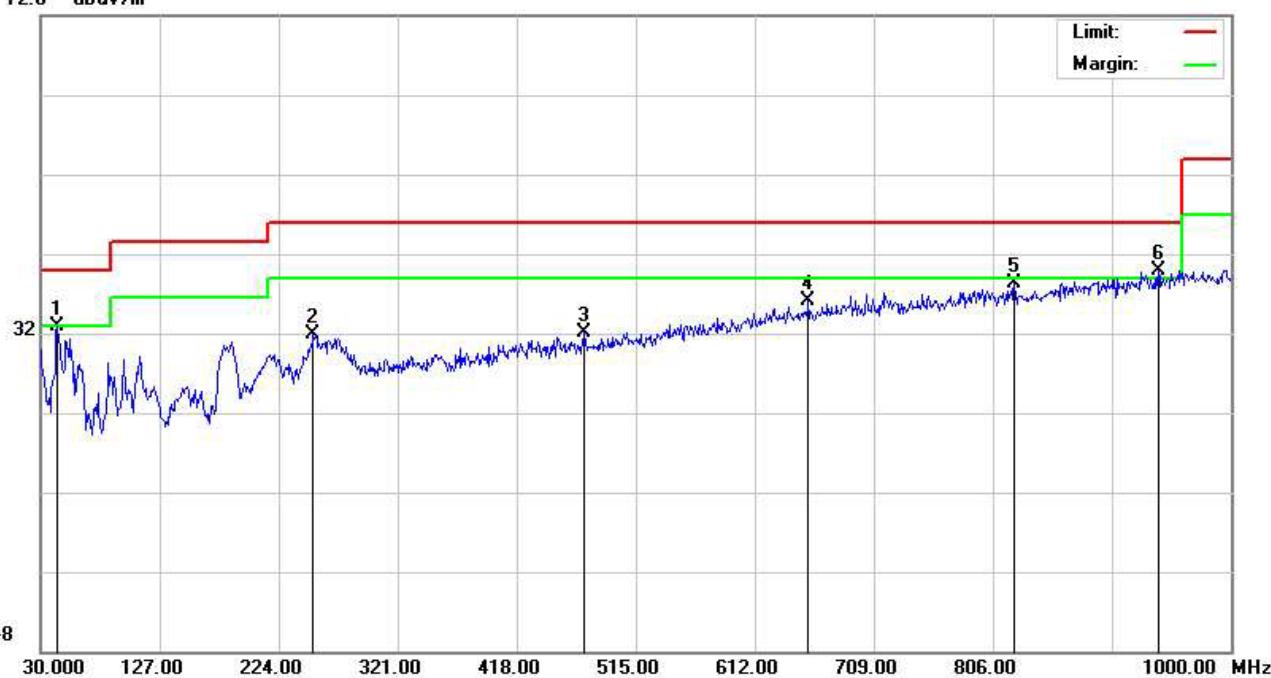


6.7.2. Test Data(worst)

Please refer to following diagram for individual
Below 1GHz

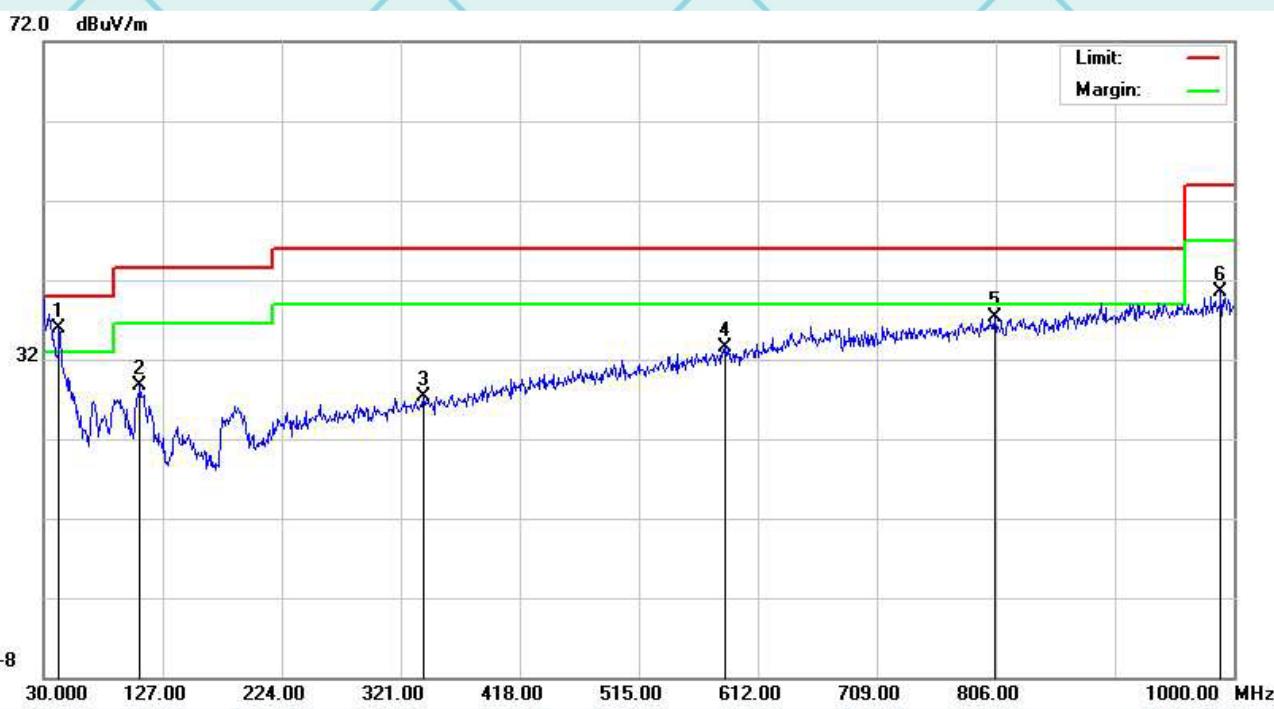
Horizontal:

72.0 dBuV/m



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
		MHz	dBuV	dB	dBuV/m	dB	Detector
1		43.5800	39.87	-6.88	32.99	40.00	-7.01 QP
2		252.1300	33.62	-1.62	32.00	46.00	-14.00 QP
3		473.2900	27.43	4.71	32.14	46.00	-13.86 QP
4		655.6500	27.09	9.07	36.16	46.00	-9.84 QP
5		823.4600	26.72	11.50	38.22	46.00	-7.78 QP
6	*	940.8300	26.16	13.72	39.88	46.00	-6.12 QP

Vertical:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
		MHz	dB μ V	dB	dBuV/m	dB	Detector
1	*	42.6100	56.33	-20.51	35.82	40.00	-4.18 QP
2		108.5700	48.92	-20.16	28.76	43.50	-14.74 QP
3		339.4300	46.45	-19.07	27.38	46.00	-18.62 QP
4		584.8400	51.41	-17.81	33.60	46.00	-12.40 QP
5		805.0300	53.92	-16.63	37.29	46.00	-8.71 QP
6		989.3300	55.89	-15.34	40.55	54.00	-13.45 QP

Note1:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss - Amplifier factor.

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)Limit (dB μ V) = Limit stated in standardMargin (dB) = Measurement (dB μ V) – Limits (dB μ V)

Above 1GHz

Note 1: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note 2: The spurious above 18G is noise only, do not show on the report.

Note 3: Report and only recorded the worst-case scenario 802.11b.
1 GHz to 18 GHz, ANT H 802.11b Low Channel

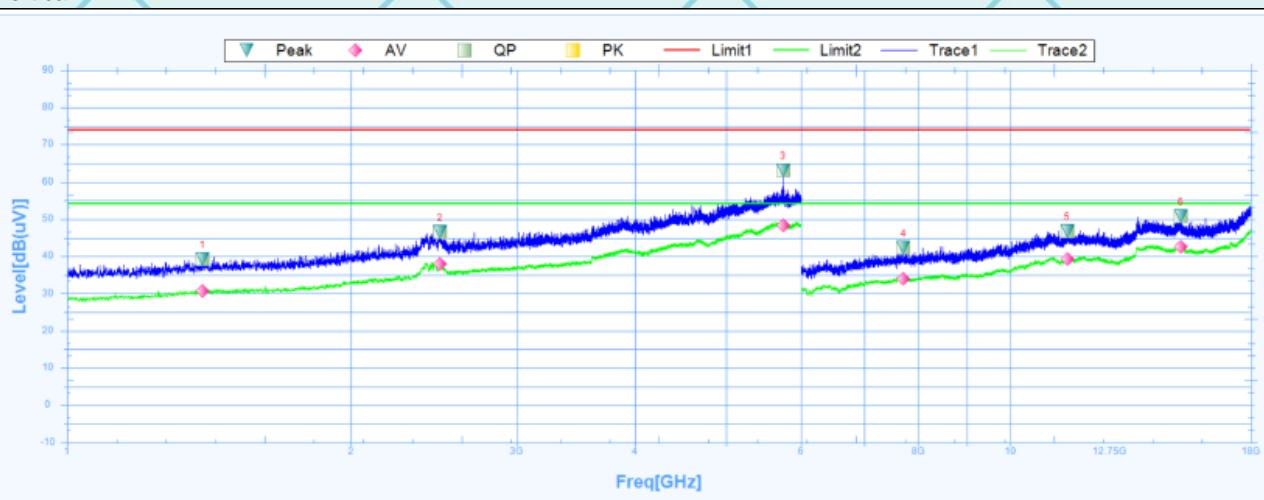
Horizontal:

**Suspected Data List**

NO.	Freq. [MHz]	Level [dB(uV)]	Factor [dB]	Reading [dB(uV)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1442.5000	40.28	25.06	15.22	74	-33.72	65.4	Horizontal	PK	Pass
1	1442.5000	30.49	25.06	5.43	54	-23.51	65.4	Horizontal	AV	Pass
2	2390.6250	46.61	27.23	19.38	74	-27.39	355.8	Horizontal	PK	Pass
2	2390.6250	36.84	27.23	9.61	54	-17.16	355.8	Horizontal	AV	Pass
3	5095.0000	55.14	31.68	23.46	74	-18.86	-0.1	Horizontal	PK	Pass
3	5095.0000	45.47	31.68	13.79	54	-8.53	-0.1	Horizontal	AV	Pass
4	7665.0000	37.22	7.96	29.26	74	-36.78	37.6	Horizontal	PK	Pass
4	7665.0000	29.61	7.96	21.65	54	-24.39	37.6	Horizontal	AV	Pass
5	10831.5000	45.59	14.82	30.77	74	-28.41	39.9	Horizontal	PK	Pass
5	10831.5000	36.31	14.82	21.49	54	-17.69	39.9	Horizontal	AV	Pass
6	14056.5000	49.53	19.07	30.46	74	-24.47	92.6	Horizontal	PK	Pass
6	14056.5000	42	19.07	22.93	54	-12	92.6	Horizontal	AV	Pass



Vertical :



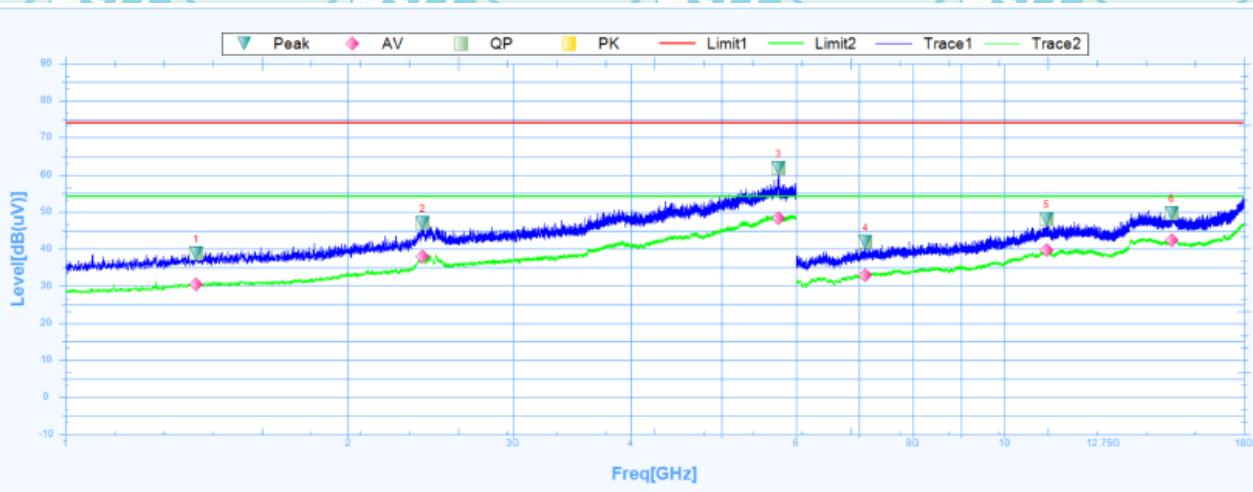
Suspected Data List

NO.	Freq. [MHz]	Level [dB(uV)]	Factor [dB]	Reading [dB(uV)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1391.8750	39.23	25.07	14.16	74	-34.77	51.1	Vertical	PK	Pass
1	1391.8750	30.58	25.07	5.51	54	-23.42	51.1	Vertical	AV	Pass
2	2486.2500	46.47	27.55	18.92	74	-27.53	240.1	Vertical	PK	Pass
2	2486.2500	38	27.55	10.45	54	-16	240.1	Vertical	AV	Pass
3	5743.7500	63.18	32.39	30.79	74	-10.82	164.7	Vertical	PK	Pass
3	5743.7500	48.24	32.39	15.85	54	-5.76	164.7	Vertical	AV	Pass
4	7708.5000	42.3	7.96	34.34	74	-31.7	360.1	Vertical	PK	Pass
4	7708.5000	33.94	7.96	25.98	54	-20.06	360.1	Vertical	AV	Pass
5	11493.0000	46.87	16.11	30.76	74	-27.13	152.3	Vertical	PK	Pass
5	11493.0000	39.23	16.11	23.12	54	-14.77	152.3	Vertical	AV	Pass
6	15174.0000	50.81	19.34	31.47	74	-23.19	185.8	Vertical	PK	Pass
6	15174.0000	42.63	19.34	23.29	54	-11.37	185.8	Vertical	AV	Pass



1 GHz to 18 GHz, ANT H 802.11b Middle Channel

Horizontal:



Suspected Data List

NO.	Freq. [MHz]	Level [dB(uV)]	Factor [dB]	Reading [dB(uV)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1376.8750	38.92	25.02	13.9	74	-35.08	352.9	Horizontal	PK	Pass
1	1376.8750	30.4	25.02	5.38	54	-23.6	352.9	Horizontal	AV	Pass
2	2402.5000	47.08	27.27	19.81	74	-26.92	63	Horizontal	PK	Pass
2	2402.5000	37.99	27.27	10.72	54	-16.01	63	Horizontal	AV	Pass
3	5750.6250	61.73	32.4	29.33	74	-12.27	359.3	Horizontal	PK	Pass
3	5750.6250	48.4	32.4	16	54	-5.6	359.3	Horizontal	AV	Pass
4	7114.5000	41.93	6.8	35.13	74	-32.07	219.2	Horizontal	PK	Pass
4	7114.5000	32.92	6.8	26.12	54	-21.08	219.2	Horizontal	AV	Pass
5	11091.0000	48.04	15.89	32.15	74	-25.96	136.7	Horizontal	PK	Pass
5	11091.0000	39.69	15.89	23.8	54	-14.31	136.7	Horizontal	AV	Pass
6	15076.5000	49.59	19.45	30.14	74	-24.41	105.7	Horizontal	PK	Pass
6	15076.5000	42.31	19.45	22.86	54	-11.69	105.7	Horizontal	AV	Pass



Vertical :



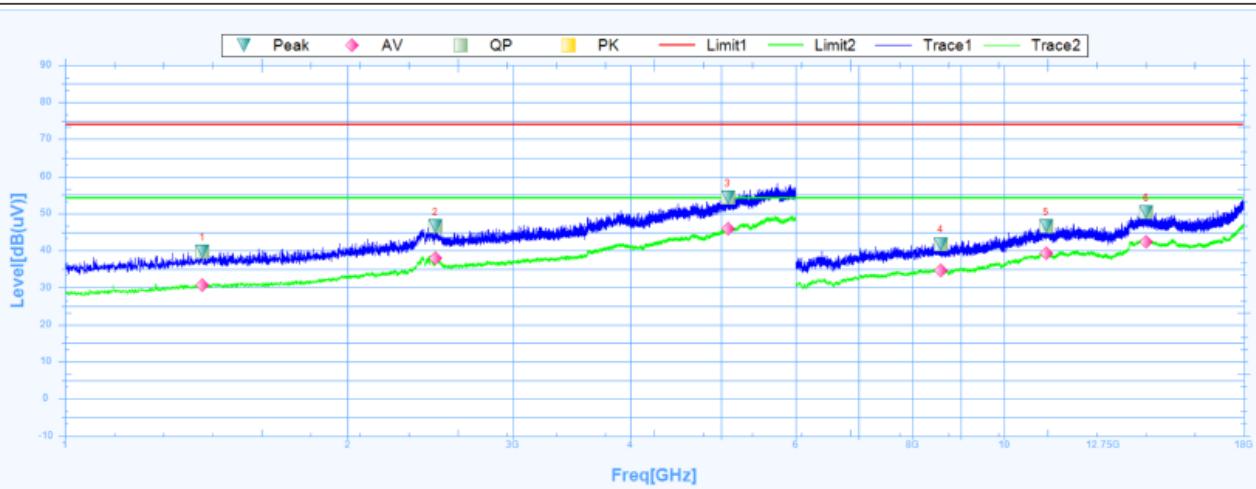
Suspected Data List

NO.	Freq. [MHz]	Level [dB(uV)]	Factor [dB]	Reading [dB(uV)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1571.2500	39.68	24.93	14.75	74	-34.32	273	Vertical	PK	Pass
1	1571.2500	30.81	24.93	5.88	54	-23.19	273	Vertical	AV	Pass
2	2399.3750	46.3	27.26	19.04	74	-27.7	329.2	Vertical	PK	Pass
2	2399.3750	38	27.26	10.74	54	-16	329.2	Vertical	AV	Pass
3	5748.1250	63.58	32.4	31.18	74	-10.42	178.6	Vertical	PK	Pass
3	5748.1250	48.45	32.4	16.05	54	-5.55	178.6	Vertical	AV	Pass
4	7506.0000	40.85	7.55	33.3	74	-33.15	297.4	Vertical	PK	Pass
4	7506.0000	33.53	7.55	25.98	54	-20.47	297.4	Vertical	AV	Pass
5	11112.0000	46.84	15.86	30.98	74	-27.16	337.8	Vertical	PK	Pass
5	11112.0000	38.98	15.86	23.12	54	-15.02	337.8	Vertical	AV	Pass
6	15624.0000	49.73	18.37	31.36	74	-24.27	6.2	Vertical	PK	Pass
6	15624.0000	41.36	18.37	22.99	54	-12.64	6.2	Vertical	AV	Pass



1 GHz to 18 GHz, ANT H 802.11b High Channel

Horizontal:

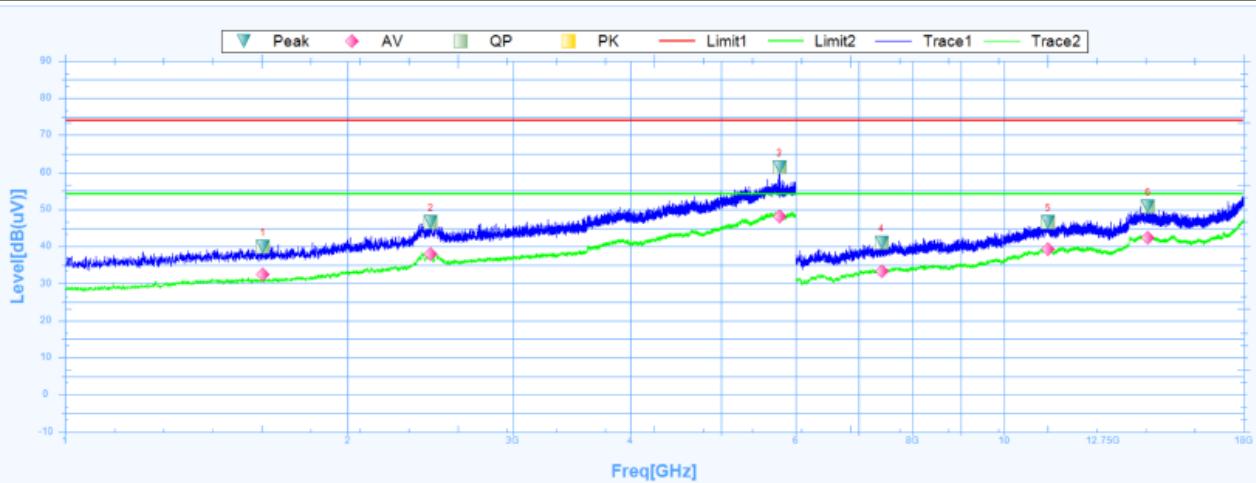


Suspected Data List

NO.	Freq. [MHz]	Level [dB(uV)]	Factor [dB]	Reading [dB(uV)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1400.0000	39.64	25.1	14.54	74	-34.36	221.7	Horizontal	PK	Pass
1	1400.0000	30.57	25.1	5.47	54	-23.43	221.7	Horizontal	AV	Pass
2	2480.0000	46.64	27.53	19.11	74	-27.36	280.2	Horizontal	PK	Pass
2	2480.0000	37.96	27.53	10.43	54	-16.04	280.2	Horizontal	AV	Pass
3	5080.0000	54.25	31.66	22.59	74	-19.75	86.6	Horizontal	PK	Pass
3	5080.0000	45.99	31.66	14.33	54	-8.01	86.6	Horizontal	AV	Pass
4	8559.0000	41.8	9.29	32.51	74	-32.2	211.3	Horizontal	PK	Pass
4	8559.0000	34.61	9.29	25.32	54	-19.39	211.3	Horizontal	AV	Pass
5	11088.0000	46.55	15.89	30.66	74	-27.45	-0.1	Horizontal	PK	Pass
5	11088.0000	39.27	15.89	23.38	54	-14.73	-0.1	Horizontal	AV	Pass
6	14175.0000	50.28	18.95	31.33	74	-23.72	358.5	Horizontal	PK	Pass
6	14175.0000	42.41	18.95	23.46	54	-11.59	358.5	Horizontal	AV	Pass



Vertical :



Suspected Data List

NO.	Freq. [MHz]	Level [dB(uV)]	Factor [dB]	Reading [dB(uV)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1625.0000	40.02	24.91	15.11	74	-33.98	293.4	Vertical	PK	Pass
1	1625.0000	32.33	24.91	7.42	54	-21.67	293.4	Vertical	AV	Pass
2	2452.5000	46.6	27.44	19.16	74	-27.4	324.5	Vertical	PK	Pass
2	2452.5000	37.88	27.44	10.44	54	-16.12	324.5	Vertical	AV	Pass
3	5765.0000	61.28	32.42	28.86	74	-12.72	238.4	Vertical	PK	Pass
3	5765.0000	48.11	32.42	15.69	54	-5.89	238.4	Vertical	AV	Pass
4	7407.0000	41.02	7.18	33.84	74	-32.98	126.4	Vertical	PK	Pass
4	7407.0000	33.28	7.18	26.1	54	-20.72	126.4	Vertical	AV	Pass
5	11146.5000	46.58	15.81	30.77	74	-27.42	277	Vertical	PK	Pass
5	11146.5000	39.26	15.81	23.45	54	-14.74	277	Vertical	AV	Pass
6	14241.0000	50.79	18.88	31.91	74	-23.21	-0.1	Vertical	PK	Pass
6	14241.0000	42.26	18.88	23.38	54	-11.74	-0.1	Vertical	AV	Pass

Note:

1. All emissions not reported were more than 20dB below the specified limit or in the noise floor.
2. Emission Level= Reading Level+ Probe Factor +Cable Loss.
3. 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.



6.7.3. Restricted Bands Requirements

Test result for 802.11b Mode (the worst case)

Frequency (MHz)	Reading (dB μ V/m)	Correct Factor dB/m	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Polar H/V	Detector
Low Channel							
2390	64.01	-8.76	55.25	74	18.75	H	PK
2390	54.46	-8.76	45.70	54	8.30	H	AV
2390	59.44	-8.73	50.71	74	23.29	V	PK
2390	54.04	-8.73	45.31	54	8.69	V	AV
High Channel							
2483.5	61.49	-8.17	53.32	74	20.68	H	PK
2483.5	53.21	-8.17	45.04	54	8.96	H	AV
2483.5	62.44	-8.17	54.27	74	19.73	V	PK
2483.5	53.11	-8.17	44.94	54	9.06	V	AV

Note: Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Attenuation factor + Cable loss

Level (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)

Limit (dB μ V) = Limit stated in standard

Margin (dB) = Level (dB μ V) – Limits (dB μ V)



7. Test Setup Photographs

Please refer to Annex "Set Up Photos-15C" for test setup photos

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