

		5785	HV	NT	-8400.00	-1.462141	20	PASS
			NV	NT	-13500.00	-2.333621	20	PASS
			LV	NT	-10500.00	-1.815039	20	PASS
			HV	NT	-8400.00	-1.452031	20	PASS
		5825	NV	NT	-11400.00	-1.957082	20	PASS
			LV	NT	-10500.00	-1.802575	20	PASS
			HV	NT	-8700.00	-1.493562	20	PASS

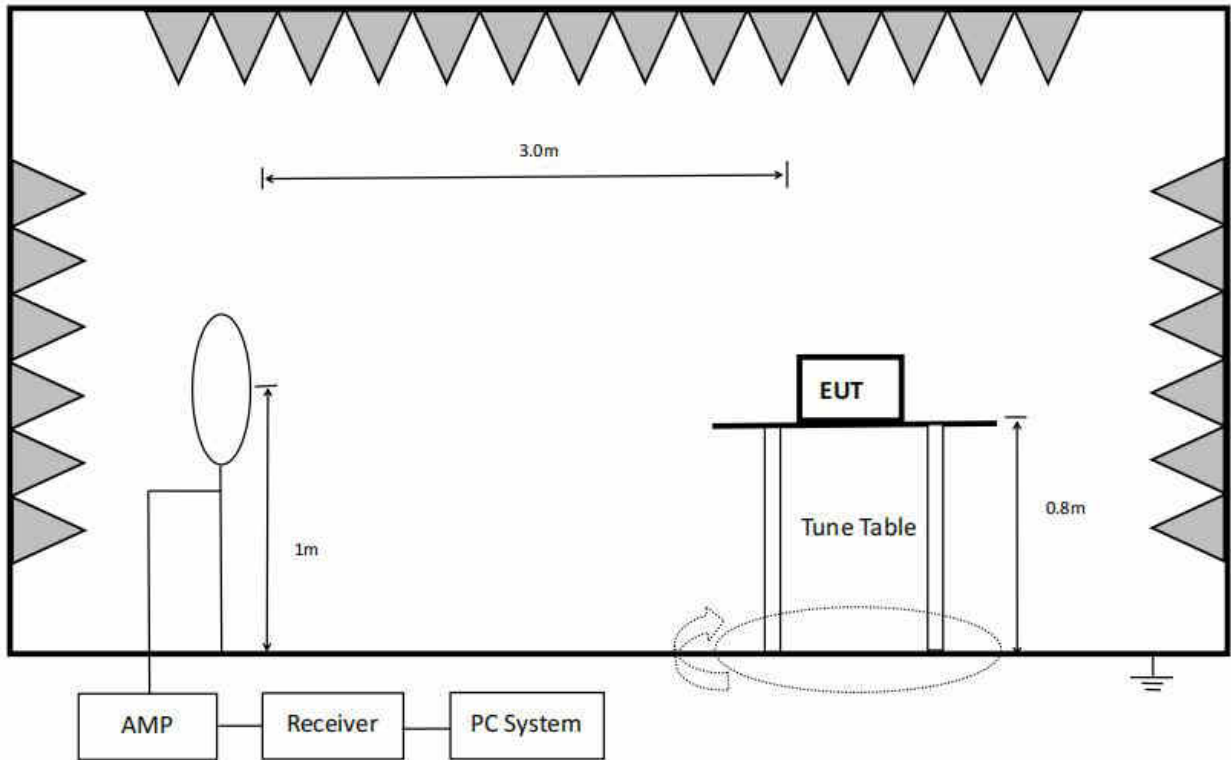
Test Mode	Antenna	Frequency (MHz)	Temperature					Verdict
			Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	
11A	Ant1	5180	NV	-30	-14100.00	-2.722008	20	PASS
			NV	-20	-12300.00	-2.374517	20	PASS
			NV	-10	-12300.00	-2.374517	20	PASS
			NV	0	-11100.00	-2.142857	20	PASS
			NV	10	-9900.00	-1.911197	20	PASS
			NV	20	-8100.00	-1.563707	20	PASS
			NV	30	-7800.00	-1.505792	20	PASS
			NV	40	-6900.00	-1.332046	20	PASS
			NV	50	-6900.00	-1.332046	20	PASS
		5200	NV	-30	-12000.00	-2.307692	20	PASS
			NV	-20	-11100.00	-2.134615	20	PASS
			NV	-10	-10200.00	-1.961538	20	PASS
			NV	0	-9900.00	-1.903846	20	PASS
			NV	10	-9300.00	-1.788462	20	PASS
			NV	20	-9000.00	-1.730769	20	PASS
			NV	30	-8700.00	-1.673077	20	PASS
			NV	40	-8400.00	-1.615385	20	PASS
			NV	50	-7800.00	-1.500000	20	PASS
		5240	NV	-30	-12600.00	-2.404580	20	PASS
			NV	-20	-10500.00	-2.003817	20	PASS
			NV	-10	-9600.00	-1.832061	20	PASS
			NV	0	-8700.00	-1.660305	20	PASS
			NV	10	-7800.00	-1.488550	20	PASS
			NV	20	-6900.00	-1.316794	20	PASS
			NV	30	-6300.00	-1.202290	20	PASS
			NV	40	-6000.00	-1.145038	20	PASS
			NV	50	-5700.00	-1.087786	20	PASS
		5260	NV	-30	-9600.00	-1.825095	20	PASS
			NV	-20	-8700.00	-1.653992	20	PASS
			NV	-10	-6900.00	-1.311787	20	PASS
			NV	0	-6600.00	-1.254753	20	PASS
			NV	10	-5700.00	-1.083650	20	PASS
			NV	20	-5400.00	-1.026616	20	PASS
			NV	30	-5100.00	-0.969582	20	PASS
			NV	40	-5100.00	-0.969582	20	PASS
			NV	50	-5100.00	-0.969582	20	PASS
		5280	NV	-30	-9600.00	-1.818182	20	PASS
			NV	-20	-8100.00	-1.534091	20	PASS
			NV	-10	-7200.00	-1.363636	20	PASS
			NV	0	-6900.00	-1.306818	20	PASS
			NV	10	-5400.00	-1.022727	20	PASS
			NV	20	-5400.00	-1.022727	20	PASS
			NV	30	-4800.00	-0.909091	20	PASS
			NV	40	-4500.00	-0.852273	20	PASS
			NV	50	-3900.00	-0.738636	20	PASS
		5320	NV	-30	-11100.00	-2.086466	20	PASS
			NV	-20	-9900.00	-1.860902	20	PASS
			NV	-10	-7800.00	-1.466165	20	PASS
			NV	0	-6300.00	-1.184211	20	PASS
			NV	10	-5700.00	-1.071429	20	PASS
			NV	20	-4200.00	-0.789474	20	PASS
			NV	30	-3600.00	-0.676692	20	PASS
			NV	40	-2700.00	-0.507519	20	PASS
			NV	50	-2100.00	-0.394737	20	PASS
		5500	NV	-30	-5400.00	-0.981818	20	PASS
			NV	-20	-6000.00	-1.090909	20	PASS
			NV	-10	-5700.00	-1.036364	20	PASS

			NV	0	-4500.00	-0.818182	20	PASS
			NV	10	-3900.00	-0.709091	20	PASS
			NV	20	-2700.00	-0.490909	20	PASS
			NV	30	-3000.00	-0.545455	20	PASS
			NV	40	-2100.00	-0.381818	20	PASS
			NV	50	-1500.00	-0.272727	20	PASS
		5580	NV	-30	-13500.00	-2.419355	20	PASS
			NV	-20	-11400.00	-2.043011	20	PASS
			NV	-10	-10200.00	-1.827957	20	PASS
			NV	0	-8400.00	-1.505376	20	PASS
			NV	10	-6300.00	-1.129032	20	PASS
			NV	20	-6300.00	-1.129032	20	PASS
			NV	30	-4800.00	-0.860215	20	PASS
			NV	40	-4500.00	-0.806452	20	PASS
			NV	50	-3900.00	-0.698925	20	PASS
		5700	NV	-30	-7500.00	-1.315789	20	PASS
			NV	-20	-6600.00	-1.157895	20	PASS
			NV	-10	-5700.00	-1.000000	20	PASS
			NV	0	-5700.00	-1.000000	20	PASS
			NV	10	-4800.00	-0.842105	20	PASS
			NV	20	-4200.00	-0.736842	20	PASS
			NV	30	-3900.00	-0.684211	20	PASS
			NV	40	-3900.00	-0.684211	20	PASS
			NV	50	-3900.00	-0.684211	20	PASS
		5720	NV	-30	-8400.00	-1.468531	20	PASS
			NV	-20	-7200.00	-1.258741	20	PASS
			NV	-10	-6600.00	-1.153846	20	PASS
			NV	0	-5100.00	-0.891608	20	PASS
			NV	10	-4800.00	-0.839161	20	PASS
			NV	20	-3900.00	-0.681818	20	PASS
			NV	30	-3900.00	-0.681818	20	PASS
			NV	40	-3600.00	-0.629371	20	PASS
			NV	50	-3900.00	-0.681818	20	PASS
		5745	NV	-30	-6600.00	-1.148825	20	PASS
			NV	-20	-5100.00	-0.887728	20	PASS
			NV	-10	-4800.00	-0.835509	20	PASS
			NV	0	-4200.00	-0.731070	20	PASS
			NV	10	-3600.00	-0.626632	20	PASS
			NV	20	-3300.00	-0.574413	20	PASS
			NV	30	-3000.00	-0.522193	20	PASS
			NV	40	-2700.00	-0.469974	20	PASS
			NV	50	-2700.00	-0.469974	20	PASS
		5785	NV	-30	-6300.00	-1.089023	20	PASS
			NV	-20	-5700.00	-0.985307	20	PASS
			NV	-10	-4500.00	-0.777874	20	PASS
			NV	0	-3300.00	-0.570441	20	PASS
			NV	10	-3300.00	-0.570441	20	PASS
			NV	20	-3000.00	-0.518583	20	PASS
			NV	30	-2700.00	-0.466724	20	PASS
			NV	40	-2100.00	-0.363008	20	PASS
			NV	50	-1500.00	-0.259291	20	PASS
		5825	NV	-30	-8100.00	-1.390558	20	PASS
			NV	-20	-6600.00	-1.133047	20	PASS
			NV	-10	-6300.00	-1.081545	20	PASS
			NV	0	-5100.00	-0.875536	20	PASS
			NV	10	-4500.00	-0.772532	20	PASS
			NV	20	-3900.00	-0.669528	20	PASS
			NV	30	-3300.00	-0.566524	20	PASS
			NV	40	-3600.00	-0.618026	20	PASS
			NV	50	-3300.00	-0.566524	20	PASS

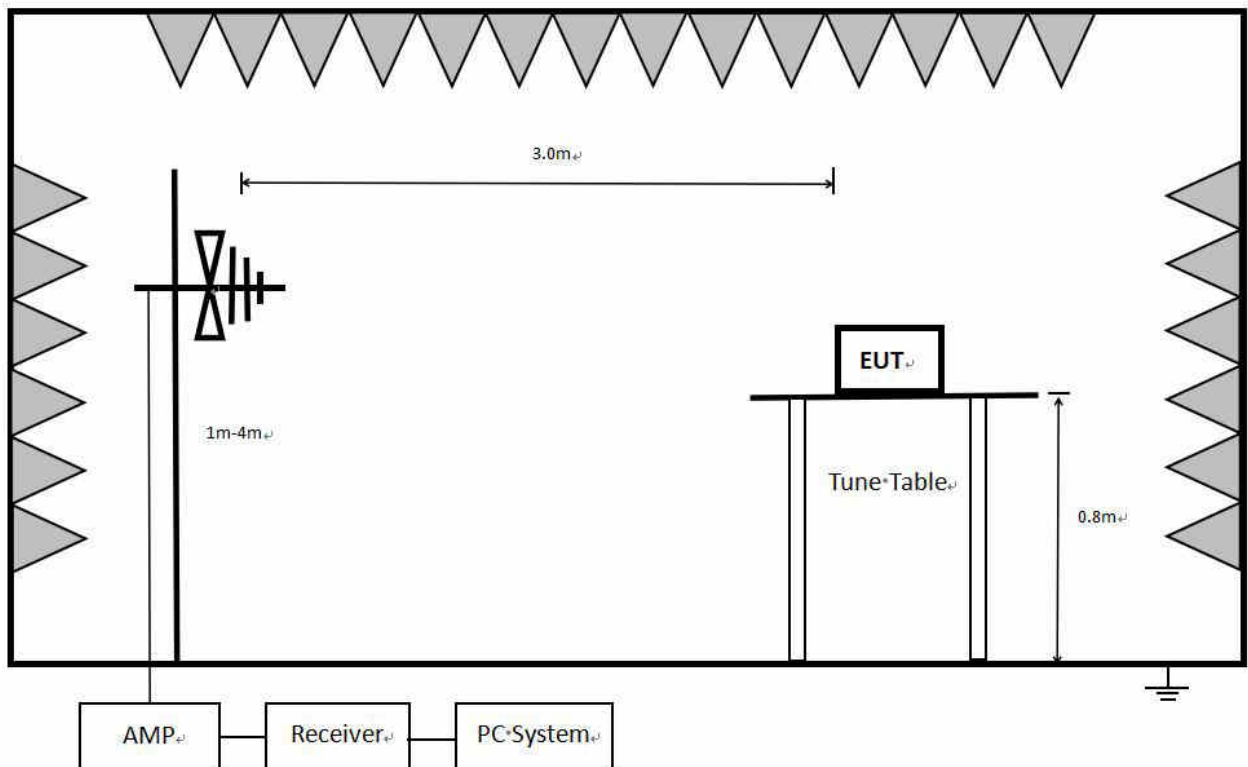
### 13. Radiated Emission

#### 13.1. Block Diagram of Test Setup

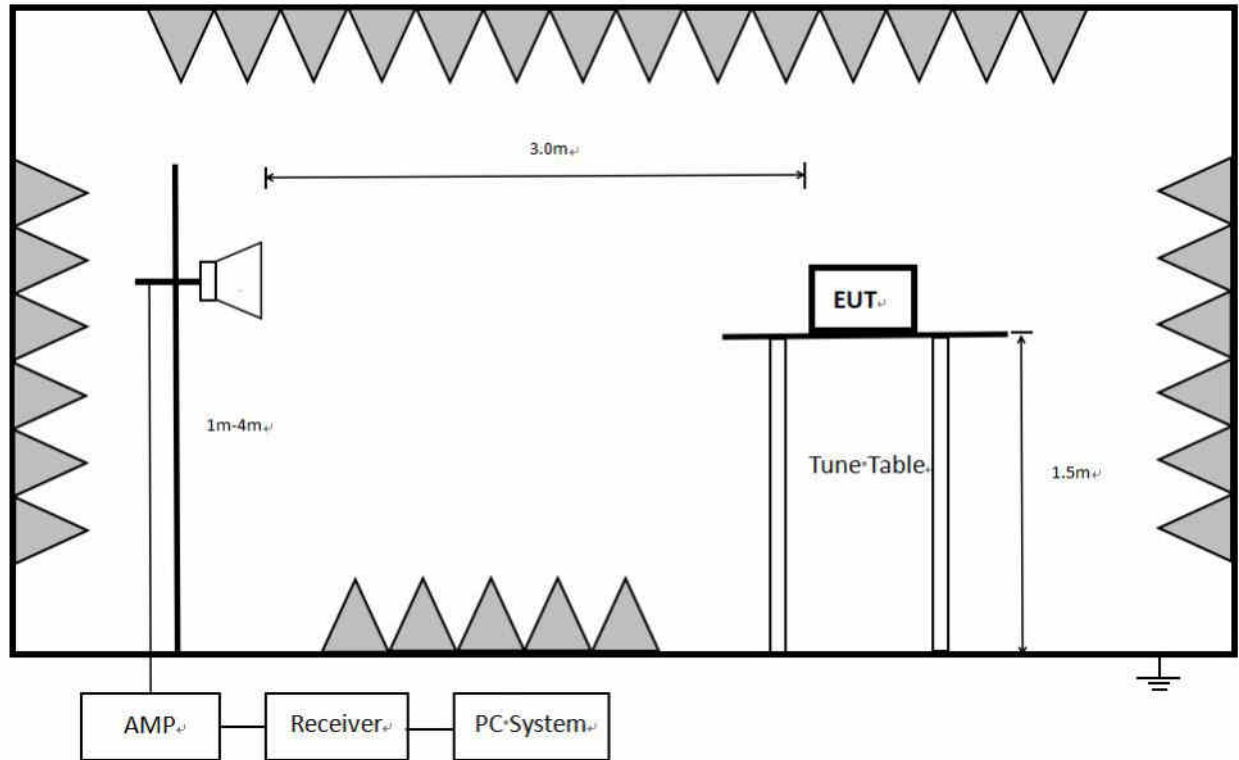
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

### 13.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6

## (2) FCC 15.209 Limit.

Frequency MHz	Distance Meters	Field strengths limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/\text{F}(\text{kHz})$	$67.6-20\log(\text{F})$
0.490 ~ 1.705	30	$24000/\text{F}(\text{kHz})$	$87.6-20\log(\text{F})$
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

(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  $-27 \text{ dBm} / \text{MHz}$ .

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of  $-27 \text{ dBm} / \text{MHz}$ .

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of  $-27 \text{ dBm} / \text{MHz}$ .

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of  $-17 \text{ dBm}/\text{MHz}$ ; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of  $-27 \text{ dBm} / \text{MHz}$ .

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(6) The provisions of §15.205 apply to intentional radiators operating under this section.

$$-27 \text{ dBm}/\text{MHz Limit} = 95.2 + \text{EIRP (dBm)} = 95.2 - 27 = 68.2 \text{ dB}\mu\text{V}/\text{m}$$

Note:

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V}/\text{m}) + 40\log(30\text{m}/3\text{m})$$

(3) Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 limits.

### 13.3. Test Procedure

Below 30 MHz:

The setting of the spectrum Analyzer

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then 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. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of 1 meter height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. 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.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KdB 414788.

Below 1 GHz and above 30 MHz:

The setting of the spectrum Analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. 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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. 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.

Above 1 GHz:

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. 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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for AVG measurements. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.
7. Restriction band: Investigated frequency range from 5.15-5.25 GHz, 5250-5350 GHz, 5470-5725 GHz, 5.725-5.85 GHz.

All restriction band should comply with 15.209, other emission should be at least 20 dB below the fundamental.

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT does not support simultaneous transmission.

Note 3: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.



### 13.4. Test Result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9kHz to 40GHz were comply with 15.209 limit.

Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 11AC80 5610 mode.

Note3: For below test data, when the limit tabular marked “/” means this frequency point is the fundamental emission and no need comply with this limit.

Note 4: As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit

Note 5: For emissions Above 1 GHz, all mode have been tested, 11AC80 mode of ANT1+ANT2 is worse case and recorded in report.

### 13.5. Original Test Data

Below 1 GHz and above 30 MHz test data Refer to appendix A

Above 1 GHz test data Refer to appendix B



















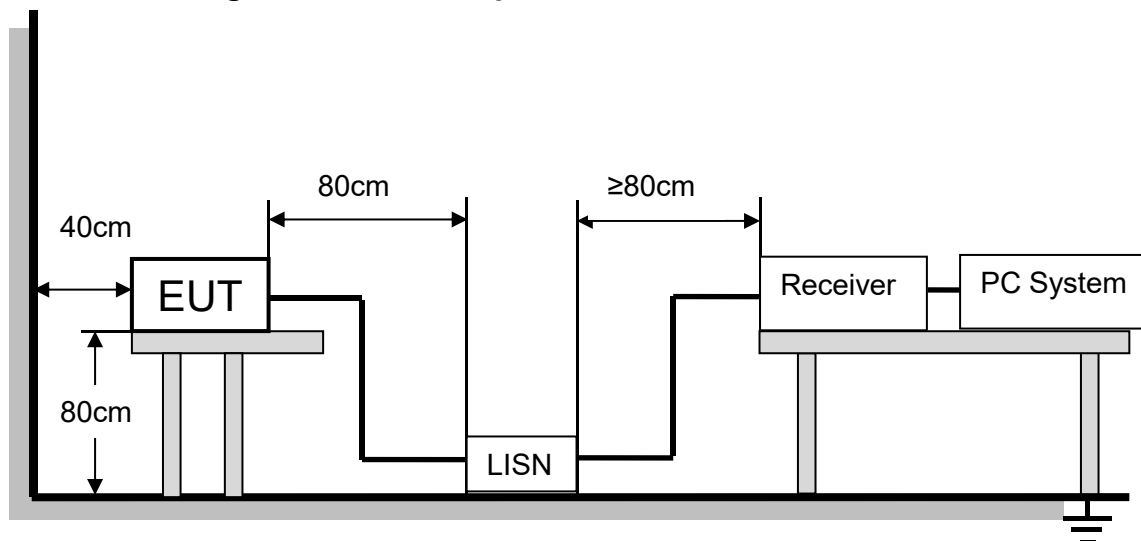






## 14. AC Power Line Conducted Emissions

### 14.1. Block Diagram of Test Setup



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

### 14.2. Limits

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8.

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note 1: \* Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

### 14.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

#### **14.4. Test Result**

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worse case.

#### **14.5. Original Test Data**

According to 15.207, power Line Conducted Emission is not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.