



4.2. Radiated Emission

4.2.1. Requirement

According to FCC section 15.109(a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency range (MHz) | Field Strength Limitation at 3m Measurement Dist | |
|-----------------------|--|----------------|
| | (μ V/m) | (dB μ V/m) |
| 30.0 - 88.0 | 100 | 20log 100 |
| 88.0 - 216.0 | 150 | 20log 150 |
| 216.0 - 960.0 | 200 | 20log 200 |
| Above 960.0 | 500 | 20log 500 |

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dB μ V/m is calculated by 20log Emission Level(μ V/m).
- 3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^2$.

Example:

F.S Limit at 30m distance is 30 μ V/m, then F.S Limitation at 3m distance is adjusted as

$$Ld1 = L1 = 30\mu V/m * (10)^2 = 100 * 30\mu V/m$$

4.2.2. Test Description

See section 3.2.2 of this report.



4.2.3. Frequency range of measurement

According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz) |
|--|--|
| Below 1.705 | 30. |
| 1.705–108 | 1000. |
| 108–500 | 2000. |
| 500–1000 | 5000. |
| Above 1000 | 5th harmonic of the highest frequency or 40 GHz, whichever is lower. |

4.2.4. Test Result

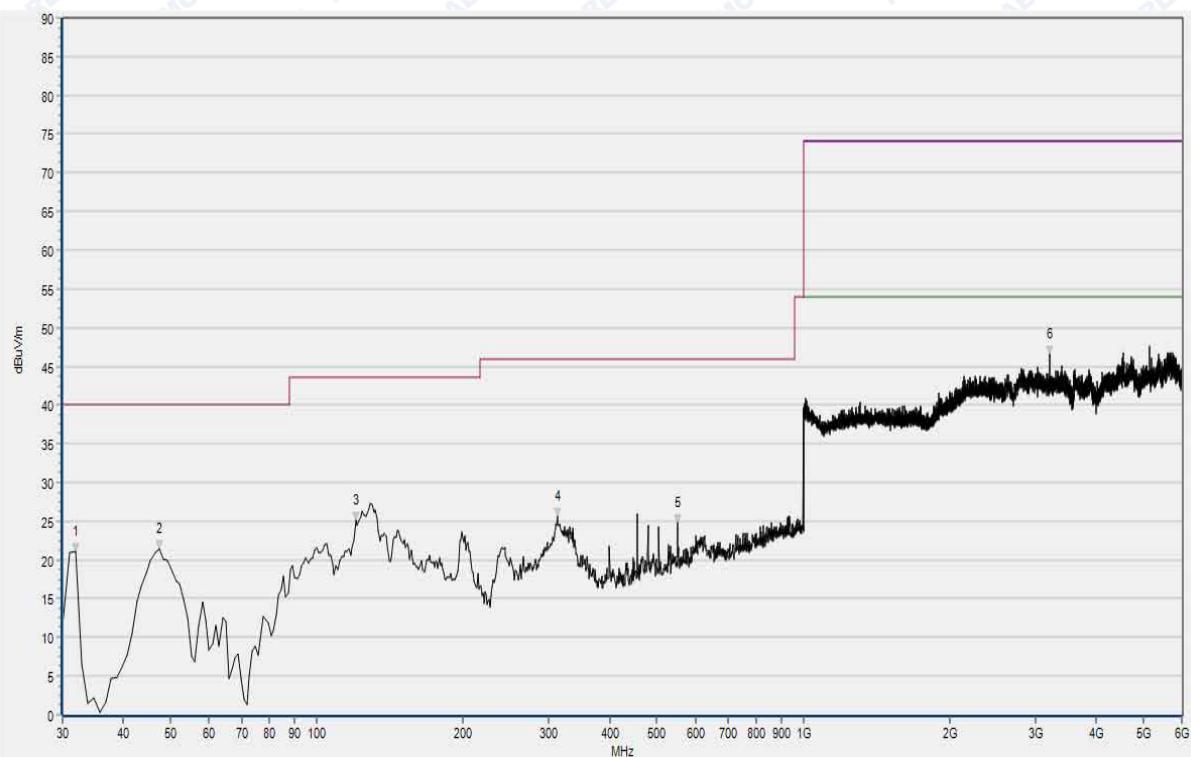
The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.



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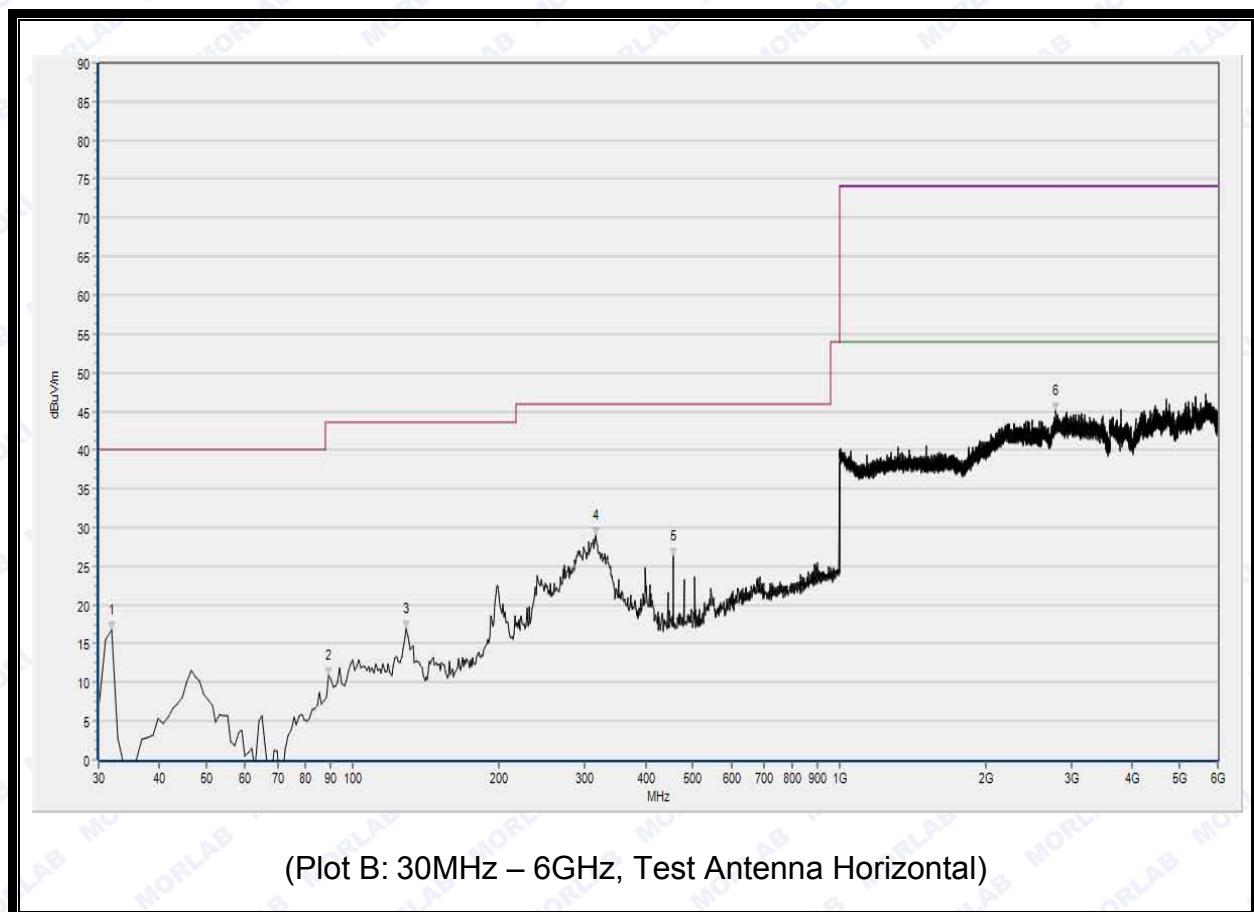


(Plot A: 30MHz –6GHz, Test Antenna Vertical)

| No. | Fre. MHz | Pk dB μ V/m | QP dB μ V/m | AV dB μ V/m | Limit-PK dB μ V/m | Limit-QP dB μ V/m | Limit-AV dB μ V/m | ANT | Verdict |
|-----|-------------|--------------------|--------------------|--------------------|--------------------------|--------------------------|--------------------------|-----|---------|
| 1 | 31.940 | N.A. | 21.12 | N.A. | N.A. | 40.00 | N.A. | V | PASS |
| 2 | 47.460 | N.A. | 21.47 | N.A. | N.A. | 40.00 | N.A. | V | PASS |
| 3 | 120.210 | N.A. | 25.10 | N.A. | N.A. | 43.50 | N.A. | V | PASS |
| 4 | 312.270 | N.A. | 25.70 | N.A. | N.A. | 46.00 | N.A. | V | PASS |
| 5 | 551.860 | N.A. | 24.82 | N.A. | N.A. | 46.00 | N.A. | V | PASS |
| 6 | 3209.280 | 46.66 | N.A. | 40.23 | 74.00 | N.A. | 54.00 | V | PASS |

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| No. | Fre. MHz | Pk dB μ V/m | QP dB μ V/m | AV dB μ V/m | Limit-PK dB μ V/m | Limit-QP dB μ V/m | Limit-AV dB μ V/m | ANT | Verdict |
|-----|-------------|--------------------|--------------------|--------------------|--------------------------|--------------------------|--------------------------|-----|---------|
| 1 | 31.940 | N.A. | 16.77 | N.A. | N.A. | 40.00 | N.A. | H | PASS |
| 2 | 89.170 | N.A. | 10.91 | N.A. | N.A. | 43.50 | N.A. | H | PASS |
| 3 | 128.940 | N.A. | 16.97 | N.A. | N.A. | 43.50 | N.A. | H | PASS |
| 4 | 315.180 | N.A. | 28.98 | N.A. | N.A. | 46.00 | N.A. | H | PASS |
| 5 | 455.830 | N.A. | 26.29 | N.A. | N.A. | 46.00 | N.A. | H | PASS |
| 6 | 2788.160 | 45.01 | N.A. | 39.61 | 74.00 | N.A. | 54.00 | H | PASS |

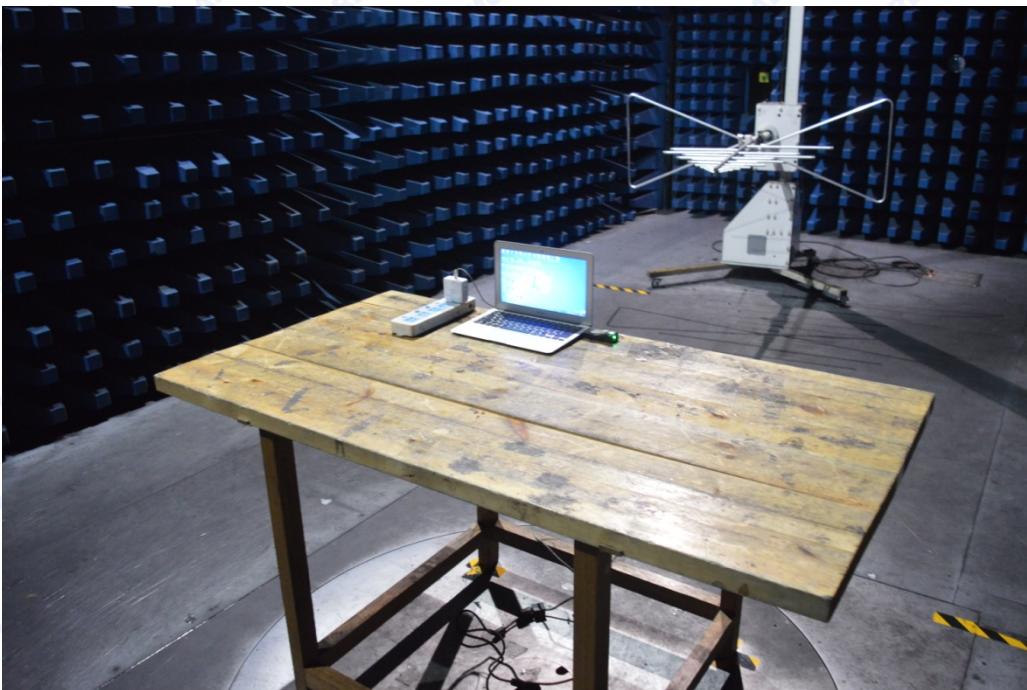
Test Result: PASS

Annex A Photographs of Test Setup

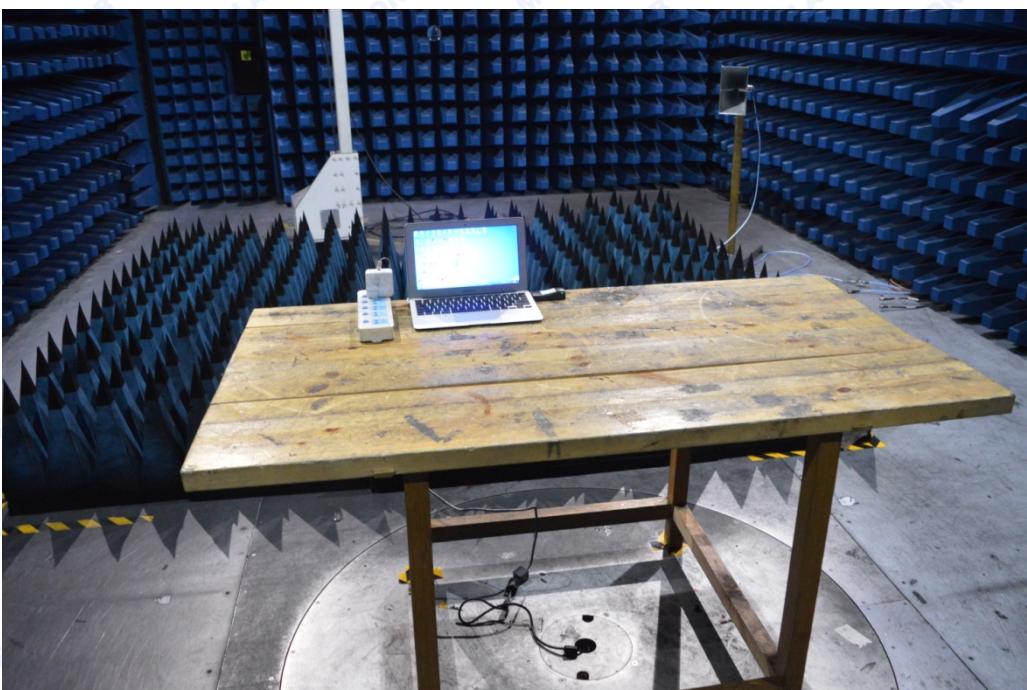
1. Mains Terminal Disturbance Voltage Measurement



2. Radiated Field Strength Measurement(30MHz-1GHz)



3. Radiated Field Strength Measurement (above 1GHz)



Annex B Photos of the EUT

1. Appearance of the EUT





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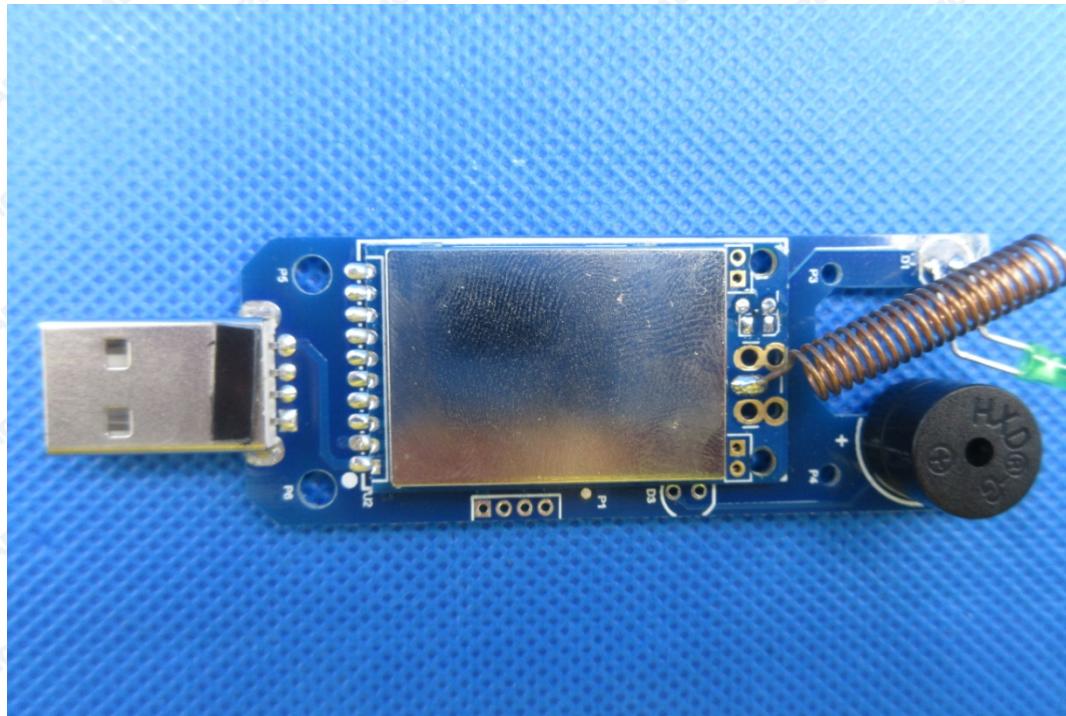
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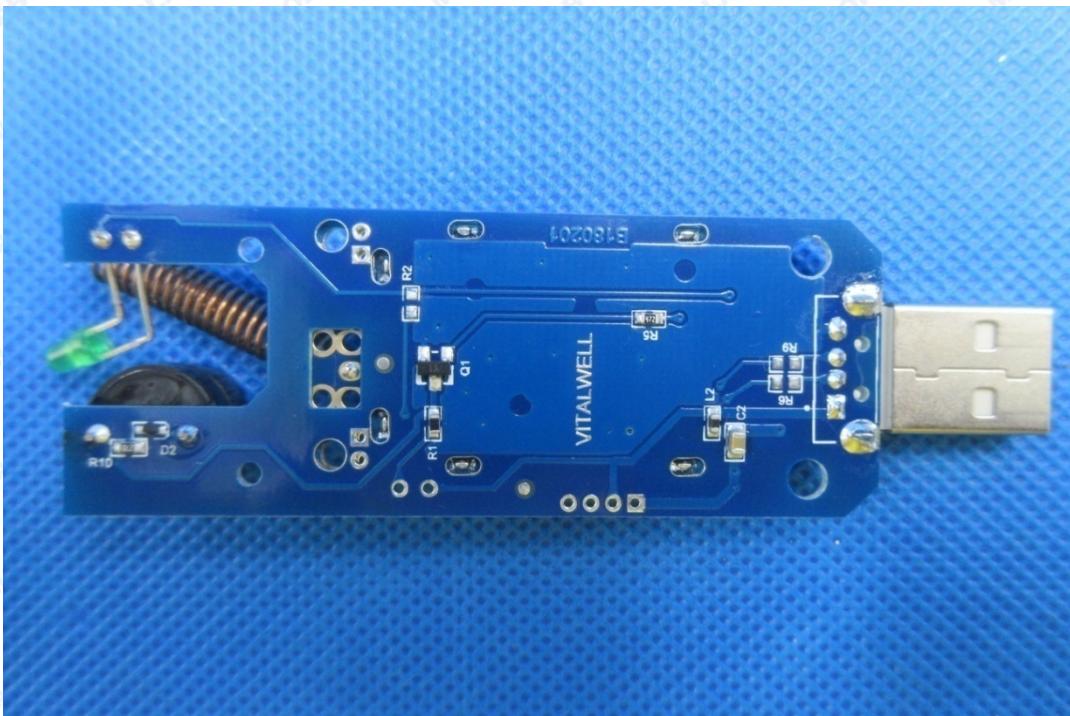
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2. Inside of the EUT





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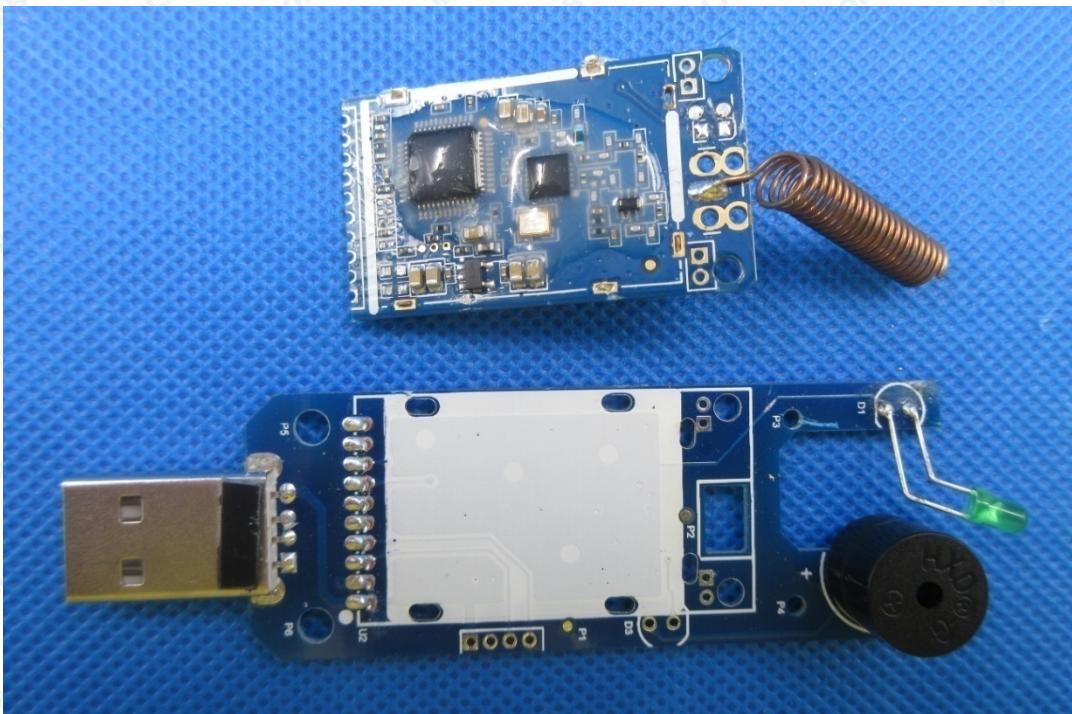
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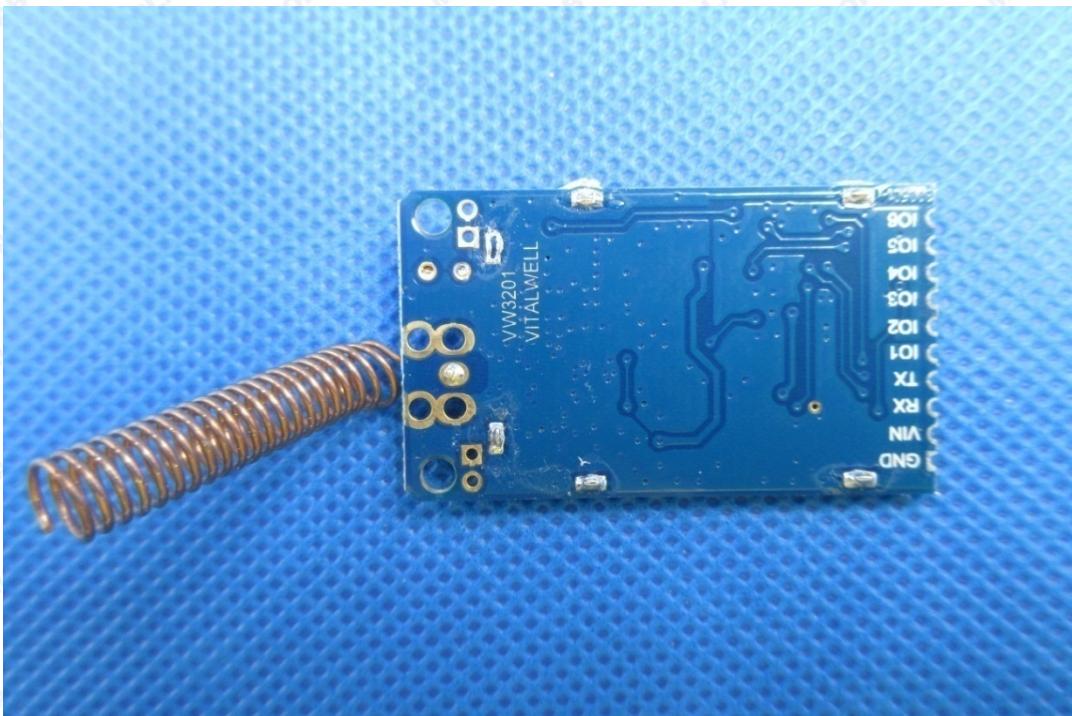
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Annex C Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

| | |
|------------------------------------|--------|
| Uncertainty of Conducted Emission: | ±1.8dB |
| Uncertainty of Radiated Emission: | ±3.1dB |



Annex D Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

| | |
|-------------------------------|--|
| Company Name: | Shenzhen Morlab Communications Technology Co., Ltd. |
| Department: | Morlab Laboratory |
| Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |
| Responsible Test Lab Manager: | Mr. Su Feng |
| Telephone: | +86 755 36698555 |
| Facsimile: | +86 755 36698525 |

2. Identification of the Responsible Testing Location

| | |
|----------|--|
| Name: | Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory |
| Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |

3. Accreditation Certificate

Accredited Testing Laboratory: The FCC registration number is 695796.
(Shenzhen Morlab Communications Technology Co., Ltd.)

4. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

| | |
|-----------------------------|----------|
| Temperature (°C): | 15 - 35 |
| Relative Humidity (%): | 30 - 60 |
| Atmospheric Pressure (kPa): | 86 - 106 |

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