# RF TEST REPORT

## FCC ID: 2AOVX-GM2

| | |
|---|---|
| Test Report No……..: | RF241112008-01-001 |
| Product(s) Name……..: | keyless transmitter |
| Model(s)……..: | PRX-OHT |
| Trade Mark……....: | N/A |
| Applicant……..…: | Green Start Industries LLC |
| Address……..…...: | 3305 Fairmount Ave Ocean NJ USA |
| Receipt Date……..: | 2024.11.14 |
| Test Date……....: | 2024.11.15~2024.11.18 |
| Issued Date……..…: | 2024.11.18 |
| Standards……..: | 47 CFR FCC Part 15, Subpart C(Section 15.231) |
| | ANSI C63.10:2013 |
| Testing Laboratory……: | Shenzhen Haiyun Standard Technical Co., Ltd. |

| Prepared By: | Checked By: | Approved By: | |
|---|---|---|---|
| Black Ding | Tim Zhang | Misue Su | |
| Black Ding | Tim.zhang | Misue Su | |

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# History of the test report

Original Report Issue Date: 2024.11.18

● No additional attachment

○ Additional attachments were issued following record

| Attachment No. | Issue Date | Description |
|---|---|---|
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# 1. General information

## 1.1. Basic information of EUT

| | |
|---|---|
| **Test sample No.** | POC241112008-S001 |
| **Product Name** | keyless transmitter |
| **Product Model** | PRX-OHT |
| **Trade Mark** | N/A |
| **Power supply** | DC 3V from battery |
| **Operation Frequency** | 314.9 MHz |
| **Modulation** | ASK |
| **Antenna Designation** | PCB antenna |
| **Antenna gain** | -11.25dBi |
| **Field Strength** | 65.66dBuV/m@3m |
| **Applicant** | Green Start Industries LLC<br>3305 Fairmount Ave Ocean NJ USA |
| **Manufacturer** | Green Start Industries LLC<br>3305 Fairmount Ave Ocean NJ USA |

**Note**:

1. For more detailed features description, please refer to the User manual.

# 2. Measured equipment list

## 2.1. Test facility

| | |
|---|---|
| Company: | Shenzhen Haiyun Standard Technical CO., Ltd. |
| Address: | No. 110, 111, 112, 113, 115, 116, Block B, Jinyuan business Building, No. 302, Xixiang Avenue, Laodong Community, Xixiang Street, Bao'an District, Shenzhen P.R.C. |
| CNAS Registration Number: | CNAS L18252 |
| CAB identifier: | CN0145 |
| Company Number | 30427 |
| A2LA Certificate Number: | 6823.01 |
| Telephone: | 0755-26024411 |

## 2.2. Test instruments list

| Radiated Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Equipment | Manufacturer | Type No. | Serial No. | Inventory No. | Cal. date (yyyy/mm/dd) | Cal. Due date (yyyy/mm/dd) |
| 1 | Test receiver | Rohde&Schwarz | ESU | 100184 | JLE011 | 2024/4/24 | 2025/4/23 |
| 2 | Log periodic antenna | Schwarzbeck | VULB 9168 | 1151 | JLE012 | 2024/4/20 | 2025/4/19 |
| 3 | Low frequency amplifier | / | LNA 0920N | 2014 | JLE023 | 2024/4/24 | 2025/4/23 |
| 4 | High frequency amplifier | Schwarzbeck | BBV 9718 | 284 | JLE024 | 2024/4/24 | 2025/4/23 |
| 5 | Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1273 | JLE028 | 2024/4/20 | 2025/4/19 |
| 6 | Temp&Humidity Recorder | Meideshi | JR900 | / | JLE021 | 2024/4/24 | 2025/4/23 |
| 7 | Horn Antenna | SCHWARZBECK | BBHA 9170 | 9170#685 | JLE029 | 2024/7/15 | 2025/7/14 |
| 8 | Loop Antenna | SCHWARZBECK | FMZB1519B | 00029 | JLE030 | 2024/7/15 | 2025/7/14 |
| 9 | Broadband preamplifier | Schwarzbeck | BBV9721 | 9721-019 | JLE025 | 2024/4/24 | 2025/4/23 |
| 10 | MXA Signal Analyzer | Keysight | N9010A | MY51440158 | JLE076 | 2024/4/20 | 2025/4/19 |
| 11 | Test software | Farad Technology Co., Ltd | EZ-EMC Ver.TW-03A2 | | | | |
| **RF Conducted Emission** | | | | | | | |
| 1 | MXA Signal Analyzer | Keysight | N9021B | MY60080169 | JLE050 | 2024/4/20 | 2025/4/19 |

## 2.3. Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Uncertainty | |
|---|---|
| Parameter | Uncertainty |
| Occupied Channel Bandwidth | ±102kHz |
| Power Spectral Density | ±0.377dB |
| Conducted Spurious Emission | ±0.743dB |
| RF power conducted | ±1.328dB |
| Conducted emission(9kHz~30MHz) AC main | ±2.68dB |
| Radiated emission(9kHz~30MHz) | ±2.74dB |
| Radiated emission (30MHz~1GHz) | ±4.22dB |
| Radiated emission (1GHz~18GHz) | ±5.06dB |
| Radiated emission (18GHz~40GHz) | ±4.98dB |
| Time | ±0.19% |

# 3. Test system information

## 3.1. Test result summary

| 47 CFR FCC Part 15, Subpart C(Section 15.231) | | | |
|---|---|---|---|
| Test item | Standard(s) Section | Results | Remarks |
| AC Power Conducted Emission | 15.207(a) | N/A | --- |
| Radiated Emissions | 15.205; 15.209; 15.231(b) | Pass | Meet the requirement of the limit |
| Bandwidth | 15.231(c) | Pass | Meet the requirement of the limit |
| Timing Testing | 15.231(a) | Pass | Meet the requirement of the limit |
| Antenna requirement | 15.203 | Compliance | Note2 |
| Note:<br>1. "N/A" denotes test is not applicable in this test report.<br>2. According to the manufacturer declared, the EUT has one PCB antenna arrangement which was permanently attached. | | | |

## 3.2. Description of test mode

| Operating mode | |
|---|---|
| Test mode 1 | 314.9MHz Transmitting |

## 3.3. Power setting and test software

| Power setting | Default power |
|---|---|
| Test software | Button control |

## 3.4. Description of support units

| No. | Equipment | Model | Manufacturer | Length | Provide By |
|---|---|---|---|---|---|
| / | / | / | / | / | / |

# 4. Summary of Test Projects

## 4.1. Conducted emission test

### 4.1.1. Limit

| FREQUENCY (MHz) | Limits (dB μV)) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 - 0.5 | 66 - 56 | 59 - 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

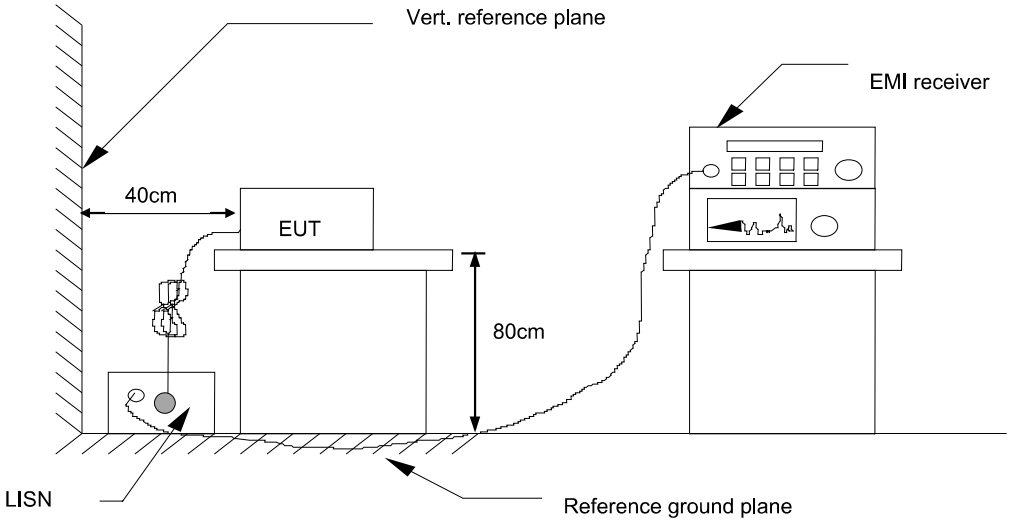
**Note:**

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 4.1.2. Test procedures

1. Test limits and test methods reference ANSI C63.10:2013.
2. The EUT was placed 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (AMN). All other support equipment powered from additional AMN. The AMN provide 50 Ohm/ 50 uH of coupling impedance for the measuring instrument.
3. Interconnecting cables that hang closer than 0.4 m to the ground plane shall be folded back and forth in the center forming a bundle 0.3 m to 0.4 m long.
4. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance.
5. The frequency range from 150 kHz to 30 MHz was searched.
6. Actual test configuration, please refer to the related Item – EUT Test Photos.
7. AAN, CP or CVP at least 0.8 m from nearest part of EUT chassis.
8. The thickness of the insulation shall not be more than 150 mm.

## 4.1.3. Test set-up




For the actual test configuration, please refer to the related item – Photographs of the test configuration

## 4.1.4. Test results

The EUT is powered by battery, so this test is not applicable.

## 4.2. Radiated emission test

### 4.2.1. Limit

In addition to the provisions of § 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

| Fundamental frequency (MHz) | Field strength of fundamental (microvolts/meter) | Field strength of spurious emissions (microvolts/meter) |
|---|---|---|
| 40.66-40.70 | 2,250 | 225 |
| 70-130 | 1,250 | 125 |
| 130-174 | [1] 1,250 to 3,750 | [1] 125 to 375 |
| 174-260 | 3,750 | 375 |
| 260-470 | [1] 3,750 to 12,500 | [1] 375 to 1,250 |
| Above 470 | 12,500 | 1,250 |

[1] *Linear interpolations.*

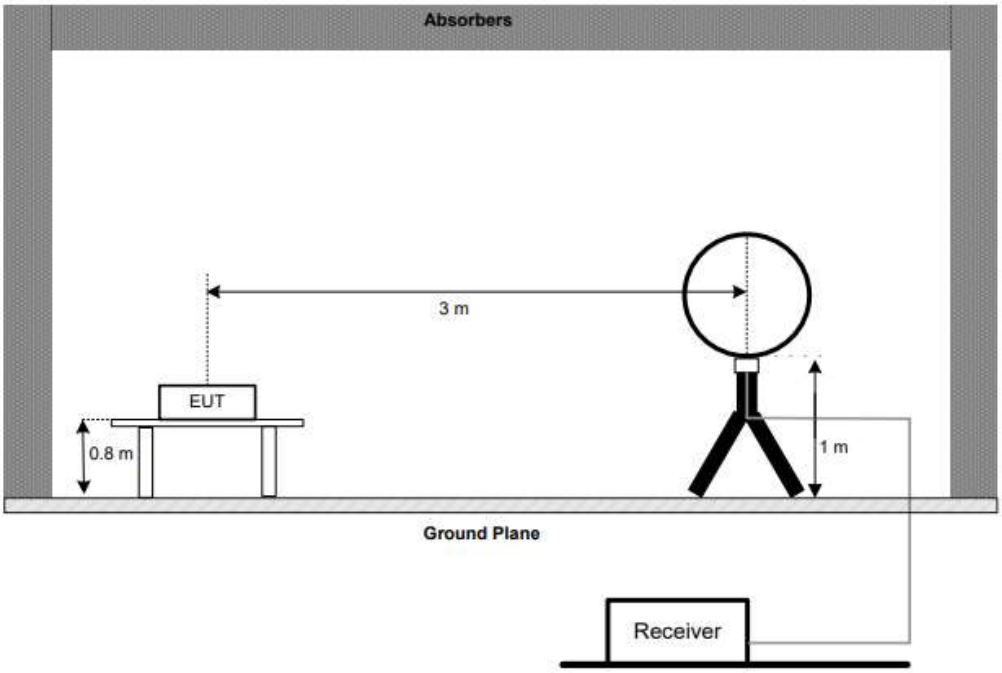
Note: (1) Emission level dBμV = 20 log Emission level μV/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges

## 4.2.2. Test procedures

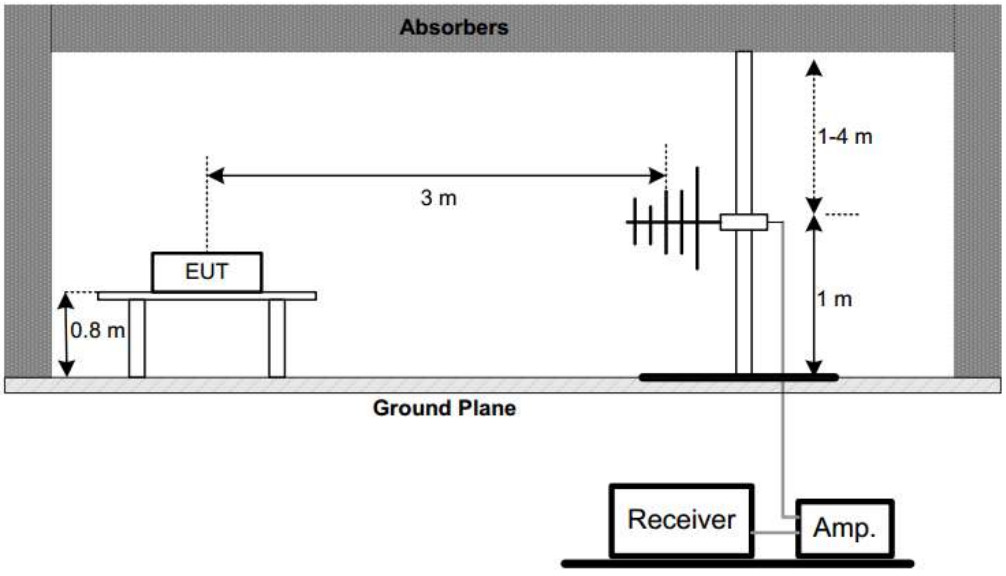
1. Test limits and test methods reference ANSI C63.10:2013.
2. Below 1GHz, the measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 m above the ground at a 3 m semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
3. Above 1GHz, the measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 m semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
5. The initial step in collecting radiated emission data is a receiver peak detector mode.
6. Pre - scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
7. For above 1GHz, If the emission level of the EUT In “Peak Detection” mode is 20 dB lower than the “Average” limit (means that the emission level in “Peak Detection” mode also complies with the limit in “Average Mode”), testing will be stopped and “Peak” values of the EUT will be reported, otherwise, the emissions of the EUT will be measured in “Average Mode” again and then reported.
8. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1GHz).
9. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform.(above 1GHz)

## 4.2.3. Test set-up

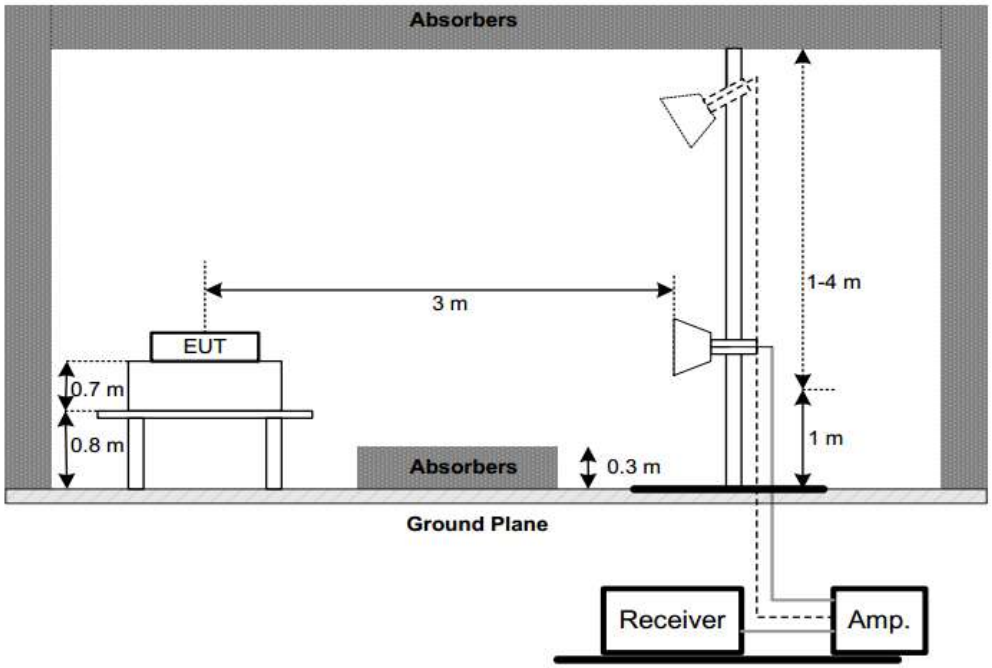
1）Radiated Emission Test Set-Up Frequency 9 kHz-30 MHz




2）Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



3) Radiated Emission Test Set-Up Frequency Above 1 GHz



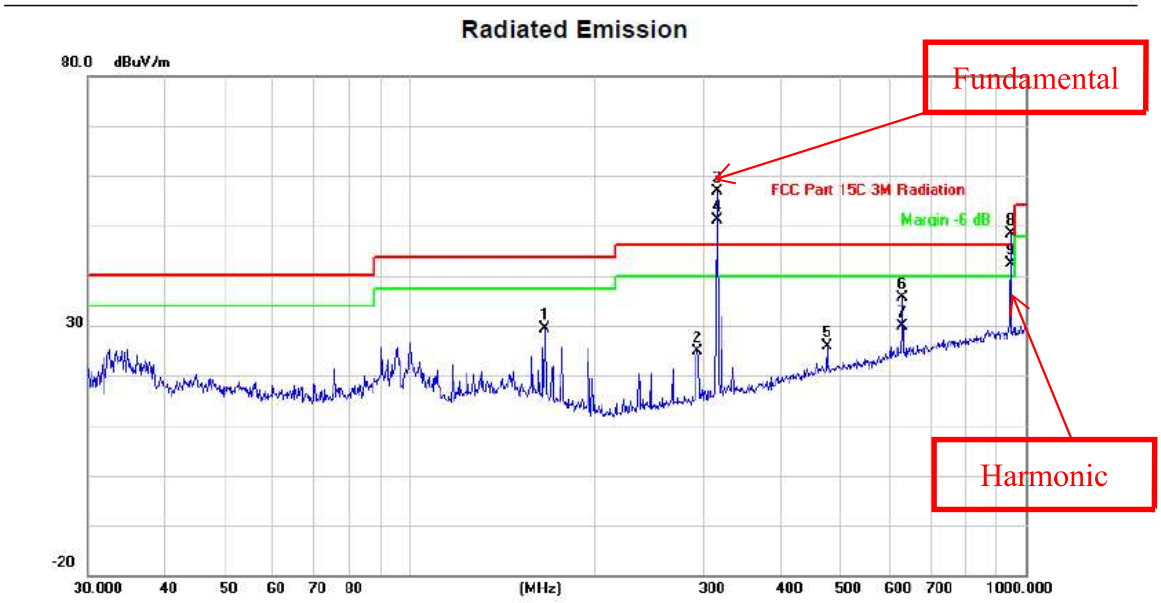

## 4.2.4. Test results

### 1) Radiated emission: 9kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

## 2) Radiated emission: 30MHz-1G

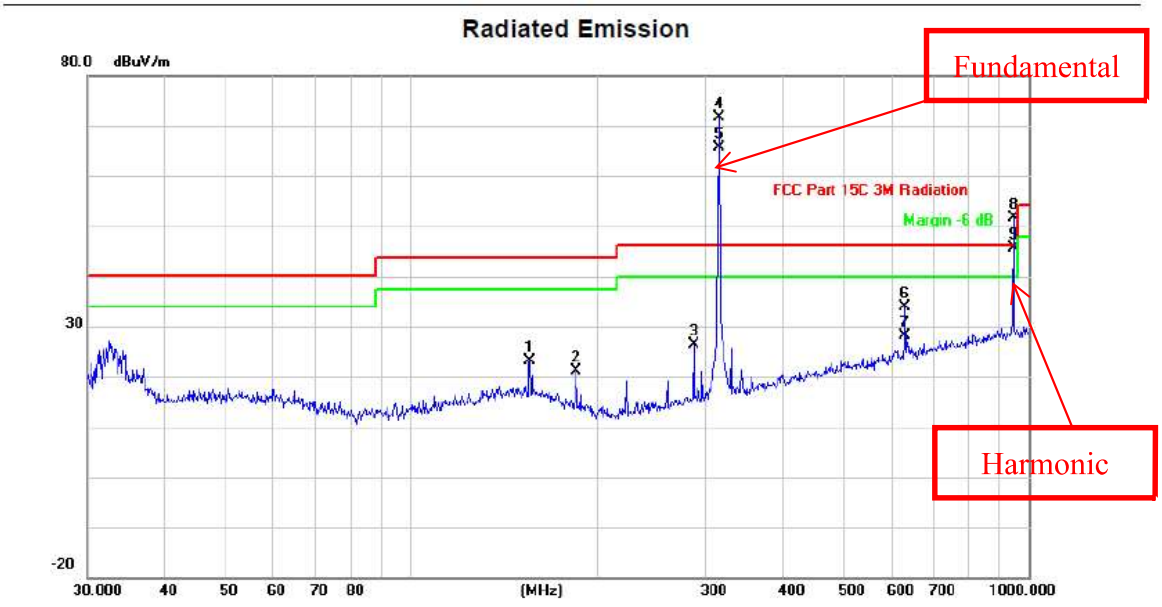
| EUT Model | PRX-OHT | Location | 3m chamber |
|---|---|---|---|
| Environmental Conditions | 24℃, 50% RH | Test Mode | 314.9MHz TX |
| Antenna Pole | Vertical | RBW | 120 kHz |
| Tested by | Albert Fan | Test Results | PASS |
| Test Date | 2024-11-15 | | |
| Note: DC 3V | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 165.4866 | 38.52 | -9.25 | 29.27 | 43.50 | -14.23 | peak |
| 2 | | 293.0842 | 35.31 | -10.37 | 24.94 | 46.00 | -21.06 | peak |
| 3 | * | 314.9000 | 66.57 | -9.58 | 56.99 | 95.62 | -38.63 | peak |
| 4 | X | 314.9000 | | | 51.14 | 75.62 | -24.48 | AVG |
| 5 | | 475.4990 | 31.51 | -5.51 | 26.00 | 46.00 | -20.00 | peak |
| 6 | | 629.8000 | 38.42 | -2.73 | 35.69 | 75.62 | -39.93 | peak |
| 7 | | 629.8000 | | | 29.84 | 55.62 | -25.78 | AVG |
| 8 | X | 944.7000 | 47.27 | 1.07 | 48.34 | 75.62 | -27.28 | peak |
| 9 | | 944.7000 | | | 42.49 | 55.62 | -13.13 | AVG |

**Note:** 1.QP= Quasi-peak Reading.
2.The other emission levels were very low against the limit.
3. Measurement = Reading Level+Correct Factor, Over = Measurement- Limit

| EUT Model | PRX-OHT | Location | 3m chamber |
|---|---|---|---|
| Environmental Conditions | 24℃, 50% RH | Test Mode | 314.9MHz TX |
| Antenna Pole | Horizontal | RBW | 120 kHz |
| Tested by | Albert Fan | Test Results | PASS |
| Test Date | 2024-11-15 | | |
| Note: DC 3V | | | |

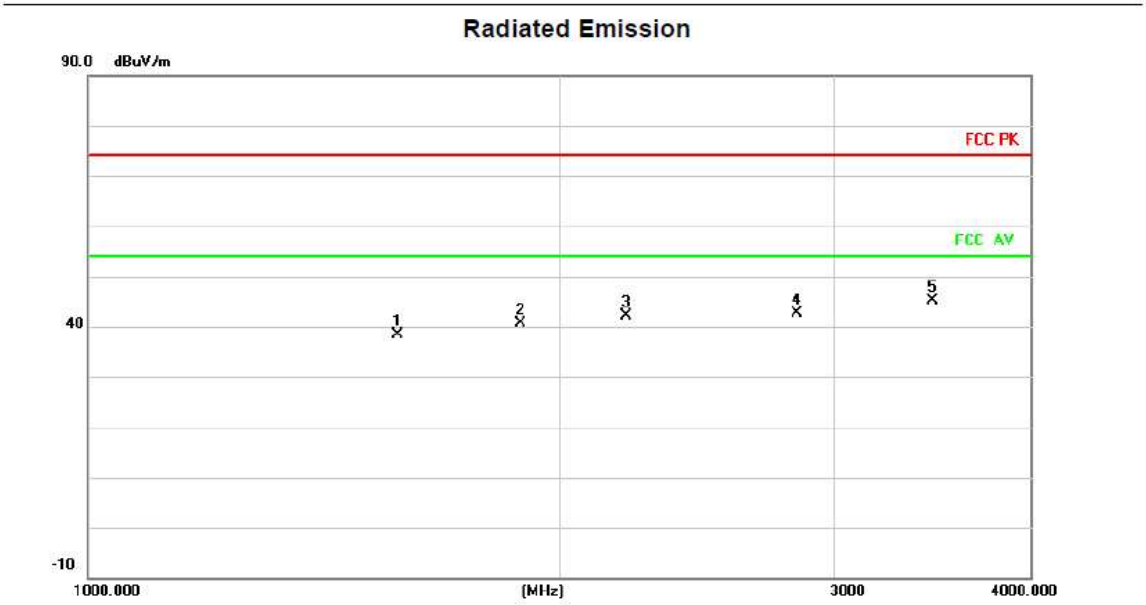



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 155.9100 | 31.84 | -8.69 | 23.15 | 43.50 | -20.35 | peak |
| 2 | | 185.1377 | 32.84 | -11.72 | 21.12 | 43.50 | -22.38 | peak |
| 3 | | 286.9823 | 37.10 | -10.63 | 26.47 | 46.00 | -19.53 | peak |
| 4 | * | 314.9000 | 81.09 | -9.58 | 71.51 | 95.62 | -24.11 | peak |
| 5 | X | 314.9000 | | | 65.66 | 75.62 | -9.96 | AVG |
| 6 | | 629.8000 | 36.68 | -2.73 | 33.95 | 75.62 | -41.67 | peak |
| 7 | | 629.8000 | | | 28.10 | 55.62 | -27.52 | AVG |
| 8 | X | 944.7000 | 50.49 | 1.07 | 51.56 | 75.62 | -24.06 | peak |
| 9 | | 944.7000 | | | 45.71 | 55.62 | -9.91 | AVG |

**Note:** 1.QP= Quasi-peak Reading.
2.The other emission levels were very low against the limit.
3. Measurement = Reading Level+ Correct Factor, Over = Measurement- Limit

## 3) Radiated emission: Above 1G

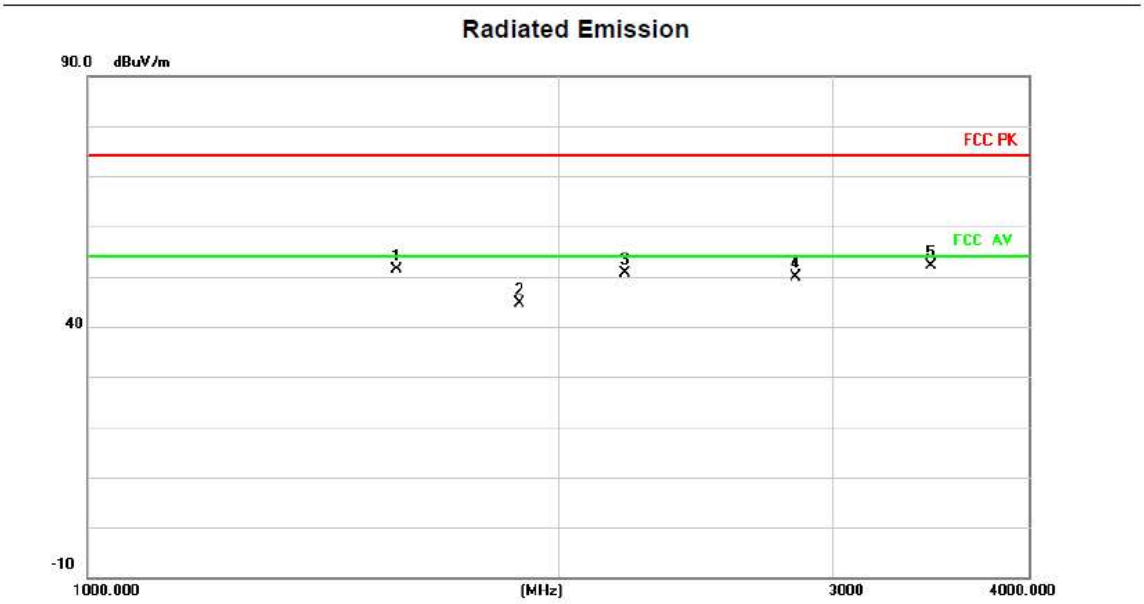
| EUT Model | PRX-OHT | Location | 3m chamber |
|---|---|---|---|
| Environmental Conditions | 24℃, 50% RH | Test Mode | 314.9MHz TX |
| Antenna Pole | Vertical | RBW | 120 kHz |
| Tested by | Albert Fan | Test Results | PASS |
| Test Date | 2024-11-15 | | |
| Note: DC 3V | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 1574.500 | 53.91 | -15.60 | 38.31 | 74.00 | -35.69 | peak |
| 2 | | 1889.400 | 54.87 | -14.34 | 40.53 | 74.00 | -33.47 | peak |
| 3 | | 2204.300 | 55.25 | -13.23 | 42.02 | 74.00 | -31.98 | peak |
| 4 | | 2834.100 | 52.69 | -9.94 | 42.75 | 74.00 | -31.25 | peak |
| 5 | * | 3463.900 | 53.44 | -8.20 | 45.24 | 74.00 | -28.76 | peak |

**Note:** 1.QP= Quasi-peak Reading.
2.The other emission levels were very low against the limit.
3. Measurement = Reading Level+Correct Factor, Over = Measurement- Limit

| EUT Model | PRX-OHT | Location | 3m chamber |
|---|---|---|---|
| Environmental Conditions | 24℃, 50% RH | Test Mode | 314.9MHz TX |
| Antenna Pole | Horizontal | RBW | 1MHz |
| Tested by | Albert Fan | Test Results | PASS |
| Test Date | 2024-11-15 | | |
| Note: DC 3V | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 1574.500 | 67.06 | -15.60 | 51.46 | 74.00 | -22.54 | peak |
| 2 | | 1889.400 | 59.03 | -14.34 | 44.69 | 74.00 | -29.31 | peak |
| 3 | | 2204.300 | 63.97 | -13.23 | 50.74 | 74.00 | -23.26 | peak |
| 4 | | 2834.100 | 59.77 | -9.94 | 49.83 | 74.00 | -24.17 | peak |
| 5 | * | 3463.900 | 60.28 | -8.20 | 52.08 | 74.00 | -21.92 | peak |

**Note:** 1.QP= Quasi-peak Reading.
2.The other emission levels were very low against the limit.
3. Measurement = Reading Level+ Correct Factor, Over = Measurement- Limit

# 4.3. 20dB Bandwidth & 99% Bandwidth

## 4.3.1. Limit

The bandwidth of the emissions shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. So the emission bandwidth limits have been calcuated in below table

| Fundamental Frequency | Limits (MHz) |
|---|---|
| 314.9 MHz | 0.78725 |

## 4.3.2. Test Procedure

| Test Method | |
|---|---|
| ●Conducted Measurement | ○Radiated Measurement |
| Test Channels | |
| ●314.9MHz | ○ Lowest and Highest Channel |
| Environmental conditions | |
| ●Normal | ○Normal and Extreme |
| Note:●:Test ○:No Test | |

a) The EUT shall be connected to the spectrum analyser, and the spectrum analyser is set as follow:

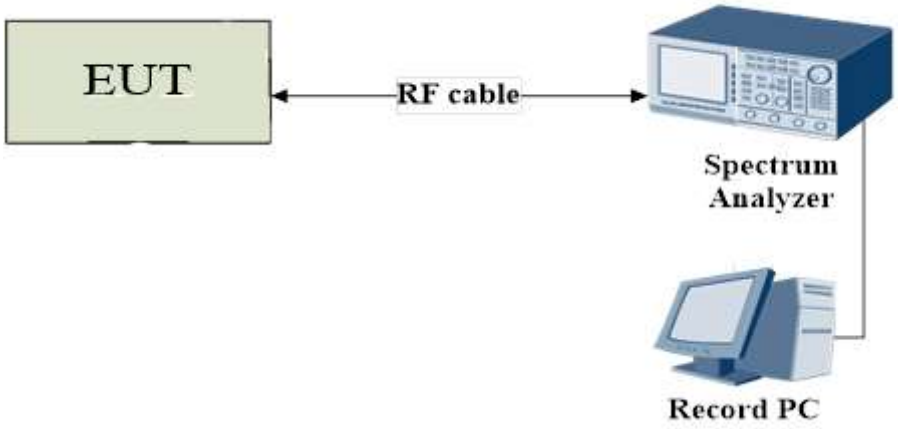
| | |
|---|---|
| Centre Frequency | The centre frequency of the channel under test |
| RBW | 1%-5% OCB |
| VBW | 3*RBW |
| Frequency span | 2x Nominal Channel Bandwidth |
| Detector Mode | Peak |
| Trace Mode | Max Hold |
| Sweep Time | Auto Couple |

b) The EUT was programmed to be in continuously transmitting mode, Wait for the trace to stabilize then find the peak value of the trace and place the analyser marker on this peak.

c) Use the -20dB bandwidth function of the spectrum analyser to measure the 20dB Bandwidth of the EUT. This value shall be recorded.

d) Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

## 4.3.3. Test set-up




## 4.3.4. Test Result

| Frequency(MHz) | 20dB Bandwidth(MHz) | 99% Occupied BW(MHz) | 20dB bandwidth Limits (MHz) |
|---|---|---|---|
| 314.9 | 0.01411 | 0.05405 | 0.78725 |

Test plot

# 4.4. TIMING TESTING

## 4.4.1. Limit

A manually operated transmitter shall be equipped with a push-to-operate switch and beunder manual control at all times during transmission. When released, the transmittershall cease transmission within no more than 5 seconds of being released.

## 4.4.2. Test procedures

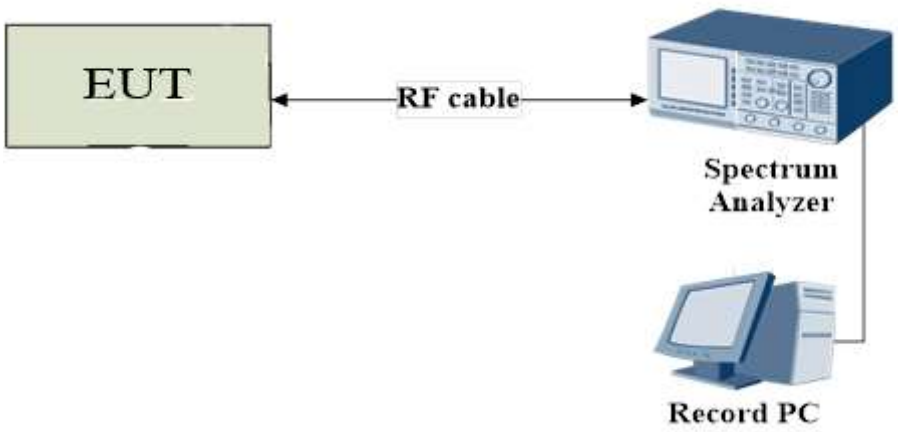
| Test Method | |
|---|---|
| ●Conducted Measurement | ○Radiated Measurement |
| Test Channels | |
| ●314.9MHz | ○ Lowest and Highest Channel |
| Environmental conditions | |
| ●Normal | ○Normal and Extreme |
| Note:●:Test ○:No Test | |

a) The EUT shall be connected to the spectrum analyser, and the spectrum analyser is set as follow:

| | |
|---|---|
| Centre Frequency | The centre frequency of the channel under test |
| RBW | 1MHz |
| VBW | 3MHz |
| Frequency span | Zero Span |
| Detector Mode | Peak |
| Trace Mode | Max Hold |
| Sweep Time | 10 seconds |

b) The EUT was programmed to be in normal mode.

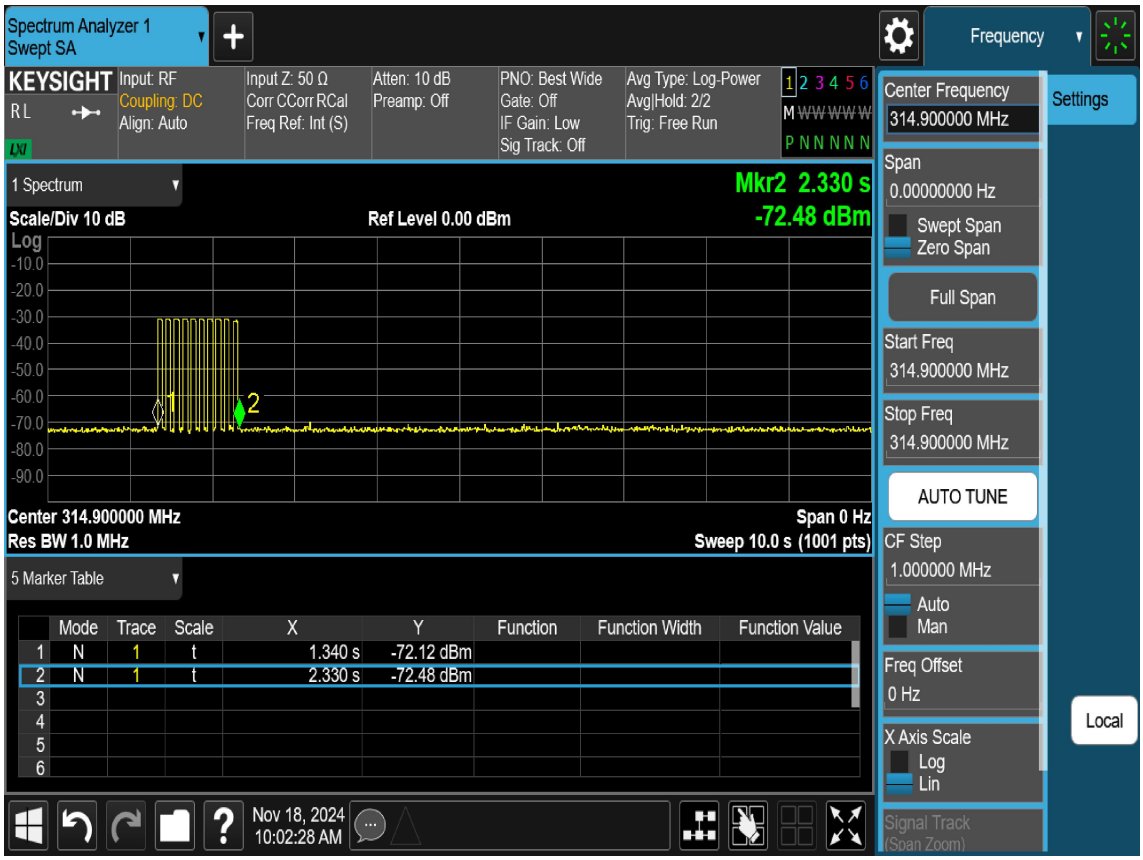
## 4.4.3. Test set-up



## 4.4.4. Test results

| Frequency(MHz) | On Time(Sec) | Limits (Sec) |
|---|---|---|
| 314.9 | 0.99 | <5 |

**Test plot**




Note: Long press the button, the product can automatically stop transmitting.

# 4.5. Duty Cycle of Test Signal

## 4.5.1. Test procedures

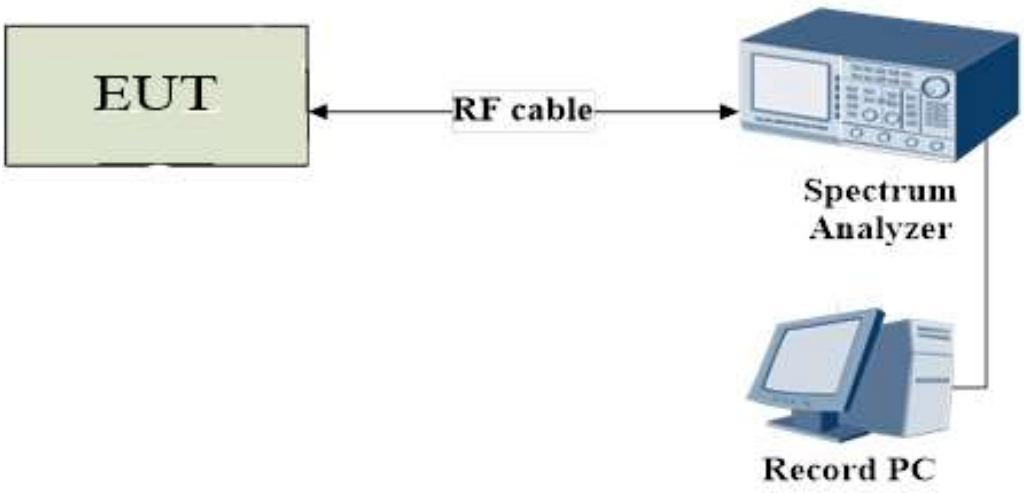
| Test Method | |
|---|---|
| ●Conducted Measurement | ○Radiated Measurement |
| Test Channels | |
| ●314.9MHz | ○ Lowest and Highest Channel |
| Environmental conditions | |
| ●Normal | ○Normal and Extreme |
| Note:●:Test ○:No Test | |

c) The EUT shall be connected to the spectrum analyser, and the spectrum analyser is set as follow:

| | |
|---|---|
| Centre Frequency | The centre frequency of the channel under test |
| RBW | 1MHz |
| VBW | 3MHz |
| Frequency span | Zero Span |
| Detector Mode | Peak |
| Trace Mode | Max Hold |
| Sweep Time | 0.1 seconds |

d) The EUT was programmed to be in normal mode.

## 4.5.2. Test set-up



## 4.5.3. Test results

All the duty factor of other test mode have been considered.

Dwell time of periodic operation measurement

Duty Cycle = (N1*L1+N2*L2+…+Nn-1*Ln-1+Nn*Ln)/100 or T

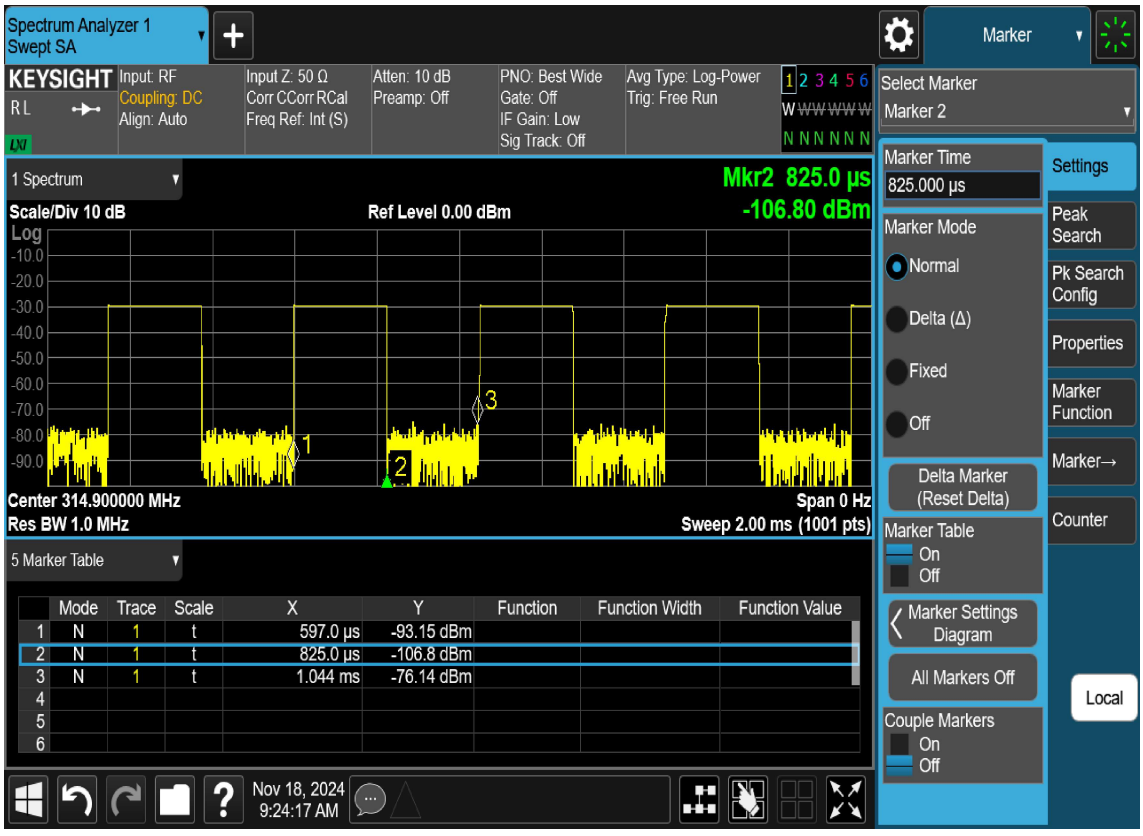
On time=0.228ms, T=0.447ms

Duty Cycle = 0.228/0.447=0.51

Average Reading = Peak Reading (dBuV/m) + 20log (Duty cycle)

Average Reading = Peak+20*log (Duty Cycle) = Peak–5.85

**Test plot**



# Statement

1. The report is invalid without the official seal or special seal of Shenzhen Haiyun Standard Technology Co., Ltd. (hereinafter referred to as the unit).
2. The report is invalid without the signature of the approver.
3. The report is invalid if altered arbitrarily.
4. The report shall not be partially copied without the written approval of the unit.
5. The reported test results are only valid for the tested samples.
6. If there is any objection to the test report, it shall be submitted to the test unit within 15 days from the date of receiving the report, and the overdue shall not be accepted.

## Shenzhen Haiyun Standard Technology Co., Ltd.

Address: Room 110, 111, 112, 113, 115, 116, Block B, Jinyuan Business Building, No. 302, Xixiang Avenue, Labor Community, Xixiang Street, Baoan District, Shenzhen, China

Tel: 0755-26024411

Email: service@hy-lab.cn

**（END OF REPORT）**