

# TEST REPORT

Report No.: SHATBL2509017W01

**Applicant** : Satellite Electronic(Zhong Shan)Ltd.

**Product Name** : Ceiling fan remote control switch

**Brand Name** : Coletto, Kichler, Progress Lighting

**Model Name** : TRD032K1M

**Series Model** : C2670

**FCC ID** : 2AQZU-18069

**Test Standard** : 47 CFR Part 15 Subpart C, Section 15.231

**Date of Sample Arrival** : Sep.08, 2025

**Date of Test** : Sep.09, 2025~Oct.22, 2025

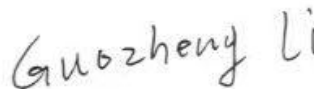
**Issue Date** : Oct.31, 2025

**Report Prepared by** :



(Emily)

**Report Approved by** :



(Guozheng Li)

**Authorized Signatory** :



(Terry Yang)



"Shanghai ATBL Technology Co., Ltd." hereby certifies that according to actual testing conditions. The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, ATBL shall not assume any responsibility. The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material. This report will be void without authorized signature or special seal for testing report. Do not copied without authorization.

## Table of Contents

|                                                                     |           |
|---------------------------------------------------------------------|-----------|
| <b>REVISION HISTORY .....</b>                                       | <b>3</b>  |
| <b>SUMMARY OF TEST RESULT .....</b>                                 | <b>4</b>  |
| <b>1. GENERAL DESCRIPTION .....</b>                                 | <b>5</b>  |
| 1.1. APPLICANT .....                                                | 5         |
| 1.2. MANUFACTURER .....                                             | 5         |
| 1.3. FACTORY .....                                                  | 5         |
| 1.4. GENERAL INFORMATION OF EUT .....                               | 6         |
| 1.5. ENVIRONMENTAL CONDITIONS .....                                 | 6         |
| 1.6. DESCRIPTION OF THE TEST MODES .....                            | 7         |
| 1.7. BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED ..... | 7         |
| 1.8. TEST SOFTWARE AND POWER LEVEL .....                            | 7         |
| 1.9. DESCRIPTION OF SUPPORT UNITS .....                             | 7         |
| 1.10. LABORATORY INFORMATION .....                                  | 8         |
| 1.11. MEASUREMENT UNCERTAINTY .....                                 | 8         |
| 1.12. EQUIPMENT LIST .....                                          | 9         |
| <b>2. TEST RESULT .....</b>                                         | <b>11</b> |
| 2.1. CONDUCTED EMISSION MEASUREMENT .....                           | 11        |
| 2.2. RADIATED EMISSION MEASUREMENT .....                            | 13        |
| 2.3. BANDWIDTH TEST .....                                           | 22        |
| 2.4. DUTY CYCLE .....                                               | 24        |
| 2.5. AUTOMATICALLY DEACTIVATE .....                                 | 26        |
| 2.6. ANTENNA REQUIREMENT .....                                      | 27        |
| <b>3. TEST SETUP PHOTOGRAPHS .....</b>                              | <b>27</b> |
| <b>4. EXTERNAL AND INTERNAL PHOTOS OF THE EUT .....</b>             | <b>27</b> |

## Revision History

| Rev. | Issue Date   | Report No.       | Effect Page | Contents        |
|------|--------------|------------------|-------------|-----------------|
| 00   | Oct.31, 2025 | SHATBL2509017W01 | ALL         | Initial Release |

## Summary of Test Result

| Standard Section      | Test Item                               | Result | Remark |
|-----------------------|-----------------------------------------|--------|--------|
| 15.207                | Conducted Emission                      | N/A    | --     |
| 15.209/<br>15.231.(b) | Radiated Spurious Emission              | PASS   | --     |
| 15.231.(b)            | Field Strength of Fundamental Emissions | PASS   | --     |
| 15.231(a)(1)          | Transmission requirement                | PASS   | --     |
| 15.231(C)             | 20dB&99% Bandwidth                      | PASS   | --     |
| 15.203                | Antenna Requirement                     | PASS   | --     |
| 15.35                 | Duty Cycle                              | PASS   | --     |

### NOTE:

- (1). 'N/A' denotes test is not applicable in this Test Report.
- (2). All tests are according to ANSI C63.10-2020.

## 1. General Description

### 1.1. Applicant

Name : Satellite Electronic(Zhong Shan)Ltd.

Address : No.8, Chuang Ye Road, Torch Development Zone, Zhongshan, Guangdong, China

### 1.2. Manufacturer

Name : Satellite Electronics (Zhong shan)Ltd.

Address : No.8, Chuang Ye Road, Torch Development Zone, Zhongshan, Guangdong, China

### 1.3. Factory

Name : CHUNGEAR INDUSTRIAL CO., LTD.

Address : No.12, Jingke 8th Rd., Nantun Dist., Taichung City 40852, Taiwan (R.O.C.)

#### 1.4. General Information of EUT

|                         |                                     |
|-------------------------|-------------------------------------|
| Product Name            | Ceiling fan remote control switch   |
| Trade Name              | Coletto, Kichler, Progress Lighting |
| Model Name              | TRD032K1M                           |
| Series Model            | C2670                               |
| Model Difference        | Only model name are different.      |
| Frequency band          | 304.25MHz                           |
| Power supply            | DC 3V From Battery                  |
| Modulation Type         | ASK                                 |
| Antenna type            | PCB Antenna                         |
| Antenna gain            | -6dBi                               |
| Hardware version number | TRD032K1M 250815                    |
| Software version number | TK50-01                             |

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.

#### 1.5. Environmental Conditions

|             |                     |        |
|-------------|---------------------|--------|
| Temperature | Normal Temperature: | 25°C   |
| Voltage     | Normal Voltage:     | DC 3V  |
| Other       | Relative Humidity:  | 54%    |
|             | Air Pressure:       | 100kPa |

## 1.6. Description of the test modes

### For Conducted test items and Radiated spurious emissions:

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

| Pretest Mode | Description |
|--------------|-------------|
| Mode 1       | TX Mode     |

Note:

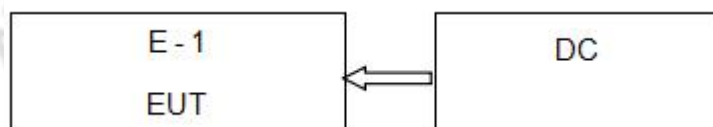
For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.

### For AC Power-Line Conducted Emission

| Pretest Mode | Description |
|--------------|-------------|
| N/A          | N/A         |

## 1.7. Block diagram showing the configuration of system tested

During test, Keep EUT is in continuous transmission mode, Both open button and closed button have been tested, The two keys were tested to assess and only record the worst case in the report (Open button).



## 1.8. Test Software and Power Level

| RF power setting value |                  |
|------------------------|------------------|
| Channel                | Power setting    |
| 304.25MHz              | Default- Level 2 |

Note:

1.For the test results, the EUT had been tested with all conditions, and the worst-case mode of data will record in the report.

2.By means of test software which provided by manufacture, the power levels during the tests were set according to the above table.

## 1.9. Description of Support Units

| NO. | Unit | Brand | Model | Description |
|-----|------|-------|-------|-------------|
| 1   | N/A  | N/A   | N/A   | N/A         |
| 2   | N/A  | N/A   | N/A   | N/A         |

### 1.10. Laboratory Information

|                     |   |                                                                                                                                                                     |
|---------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Company Name        | : | Shanghai ATBL Technology Co., Ltd.                                                                                                                                  |
| Address             | : | 5-6/F., Unit 1, No 8, Free Trade One Life Science and Sci-Tech Industrial Park No. 160, Basheng Road, Pudong New District Shanghai City, People's Republic of China |
| Telephone           | : | +86(0)21-51298625                                                                                                                                                   |
| FCC-Registration No | : | 485917                                                                                                                                                              |
| Designation Number  | : | CN1306                                                                                                                                                              |
| A2LA-Lab Cert. No.  | : | 6184.01                                                                                                                                                             |

### 1.11. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                              | Uncertainty          |
|-----|-----------------------------------|----------------------|
| 1   | RF output power, conducted        | $\pm 0.68\text{dB}$  |
| 2   | Unwanted Emissions, conducted     | $\pm 2.988\text{dB}$ |
| 3   | All emissions, radiated 9K-30MHz  | $\pm 2.84\text{dB}$  |
| 4   | All emissions, radiated 30M- 1GHz | $\pm 4.39\text{dB}$  |
| 5   | All emissions, radiated 1G-6GHz   | $\pm 5.10\text{dB}$  |
| 6   | All emissions, radiated > 6G      | $\pm 5.48\text{dB}$  |
| 7   | Conducted Emission (9kHz- 150kHz) | $\pm 2.79\text{dB}$  |
| 8   | Conducted Emission (150kHz-30MHz) | $\pm 2.80\text{dB}$  |

## 1.12. Equipment List

### 1.12.1. For AC Power-Line Conducted Emission

| Kind of Equipment      | Manufacturer | Type No.                  | Serial No. | equipment number | Calibrated until | Calibrated due until | Cal. Interval |
|------------------------|--------------|---------------------------|------------|------------------|------------------|----------------------|---------------|
| EMI Test Receiver      | R&S          | ESPI                      | 100679     | SHATBL-E012      | 2025.03.17       | 2026.03.16           | 1 year        |
| LISN                   | R&S          | ENV216                    | 101300     | SHATBL-E013      | 2025.03.17       | 2026.03.16           | 1 year        |
| LISN                   | R&S          | ENV216                    | 100333     | SHATBL-E041      | 2025.03.17       | 2026.03.16           | 1 year        |
| CE Cable               | Chuangcexing | 2M                        | EMI0014    | SHATBL-E014      | N/A              | N/A                  | N/A           |
| Temperature & Humidity | Deli         | Deli                      | EMI0015    | SHATBL-E015      | 2025.08.01       | 2026.07.31           | 1 year        |
| Testing Software       | FALA         | EZ-EMC(Ver.EMC-CON 3A1.1) | EMI0044    | SHATBL-E044      | N/A              | N/A                  | N/A           |

### 1.12.2. For Radiated Spurious Emission

| Kind of Equipment                   | Manufacturer | Type No.        | Serial No.       | equipment number | Calibrated until | Calibrated due until | Cal. Interval |
|-------------------------------------|--------------|-----------------|------------------|------------------|------------------|----------------------|---------------|
| Signal analyzer                     | Agilent      | N9020A          | MY50200811       | SHATBL-E017      | 2025.03.17       | 2026.03.16           | 1 year        |
| Amplifier                           | JPT          | JPA0118-55-303A | 1910001800055000 | SHATBL-E006      | 2025.03.24       | 2026.03.23           | 1 year        |
| Amplifier                           | JPT          | JPA-10M1G32     | 21010100035001   | SHATBL-E005      | 2025.03.17       | 2026.03.16           | 1 year        |
| Antenna/Turn table Controller       | Brilliant    | N/A             | N/A              | SHATBL-E007      | N/A              | N/A                  | N/A           |
| Loop Antenna(9kHz-30MHz)            | Daze         | ZN30900C        | 20077            | SHATBL-E042      | 2025.05.13       | 2026.05.12           | 1 year        |
| Bilog Antenna                       | SCHWARZBECK  | VULB 9168       | 01174            | SHATBL-E008      | 2025.05.20       | 2026.05.19           | 1 year        |
| Broad-band Horn Antenna             | SCHWARZBECK  | BBHA 9120D      | 02334            | SHATBL-E009      | 2025.05.20       | 2026.05.19           | 1 year        |
| Horn Antenna                        | COM-POWER    | AH-1840         | 10100008         | SHATBL-E043      | 2025.07.27       | 2026.07.26           | 1 year        |
| Thermometer                         | DeLi         | N/A             | N/A              | SHATBL-E015      | 2025.08.01       | 2026.07.31           | 1 year        |
| Test Software                       | FALA         | EMC-RI(Ver.4A2) | N/A              | N/A              | N/A              | N/A                  | N/A           |
| Wideband radio communication tester | R&S          | CMW500          | 101331           | SHATBL-W044      | 2025.07.28       | 2026.07.27           | 1 year        |
| Spectrum analyzer                   | R&S          | FSV40-N         | 101761           | SHATBL-W036      | 2025.07.28       | 2026.07.27           | 1 year        |

### 1.12.3. For Conducted Test

| Kind of Equipment                   | Manufacturer | Type No.    | Serial No.    | equipment number | Calibrated until | Calibrated due until | Cal. Interval |
|-------------------------------------|--------------|-------------|---------------|------------------|------------------|----------------------|---------------|
| Power sensor                        | DARE         | RPR3006W    | 16I00054SN016 | SHATBL-W008      | 2025.07.28       | 2026.07.27           | 1 year        |
| Adjustable Attenuator               | Agilent      | 8494B       | MY42144015    | SHATBL-W009      | 2025.07.28       | 2026.07.27           | 1 year        |
| Adjustable Attenuator               | Agilent      | 8496B       | MY42143776    | SHATBL-W010      | 2025.07.28       | 2026.07.27           | 1 year        |
| Environmental Test Chamber          | KSON         | THS-B6C-150 | 9159K         | SHATBL-W019      | 2025.03.17       | 2026.03.16           | 1 year        |
| Signal analyzer                     | Keysight     | N9020A      | MY50510136    | SHATBL-W003      | 2025.07.18       | 2026.07.17           | 1 year        |
| Vector signal generator             | Agilent      | N5182A      | MY48180764    | SHATBL-W043      | 2025.07.18       | 2026.07.17           | 1 year        |
| Analog signal generator             | Keysight     | N5182B      | MY57300196    | SHATBL-W005      | 2025.07.18       | 2026.07.17           | 1 year        |
| Wideband radio communication tester | R&S          | CMW500      | 101331        | SHATBL-W007      | 2025.07.28       | 2026.07.27           | 1 year        |
| Switch Box                          | Cesheng      | smu 1003    | WCS20221215   | SHATBL-W046      | 2025.03.19       | 2026.03.18           | 1 year        |
| Thermometer                         | DeLi         | N/A         | N/A           | SHATBL-W011      | 2025.08.01       | 2026.07.31           | 1 year        |
| Test Software                       | Cesheng      | WCS-WC N    | N/A           | SHATBL-W021      | N/A              | N/A                  | N/A           |

Remark:

Calibration duration for above equipment is 1 year.

## 2. Test Result

### 2.1. Conducted emission measurement

#### 2.1.1. power line conducted emission limits

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

| FREQUENCY (MHz) | Class B (dBuV) |           | Standard    |
|-----------------|----------------|-----------|-------------|
|                 | Quasi- peak    | Average   |             |
| 0.15 -0.5       | 66 - 56 *      | 56 - 46 * | Part 15.207 |
| 0.50 -5.0       | 56.00          | 46.00     | Part 15.207 |
| 5.0 -30.0       | 60.00          | 50.00     | Part 15.207 |

Note:

(1) .The tighter limit applies at the band edges.

(2) .The limit of “ \* ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

#### 2.1.2. Test Procedure

a.The EUT is 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 (LISN). All other support equipment are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

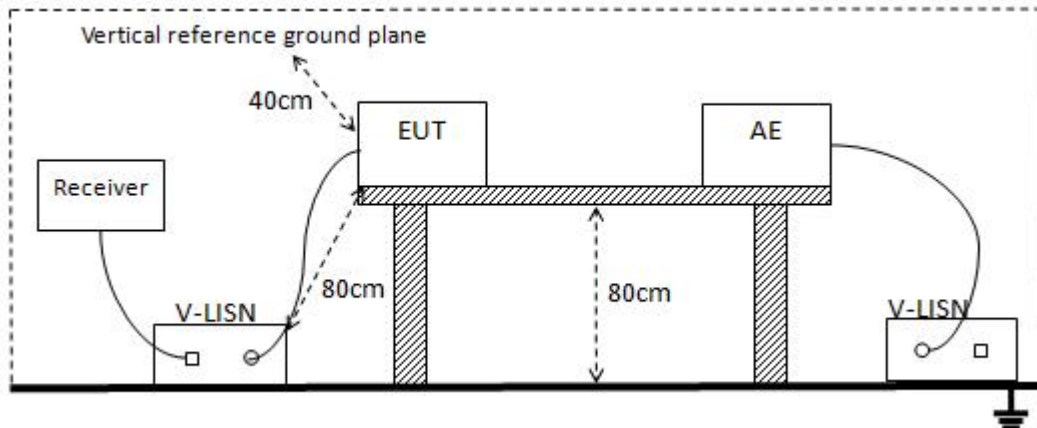
b.Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c.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. The overall length shall not exceed 1 m.

d.LISN is at least 80 cm from the nearest part of EUT chassis.

e.For the actual test configuration, please refer to the related Item – EUT Test Photos.

## 2.1.3.Test Setup



## 2.1.4.EUT operating conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 2.1.5. Test Results

Note: EUT is only power by battery, So it is not applicable for this test.

## 2.2. Radiated emission measurement

### 2.2.1. Radiated Emission Limits

In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a) and Part 15.231(b) limit in the table below has to be followed.

| FREQUENCIES (MHz) | 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 ~ 30.0      | 30                                | 30                            |
| 30 ~ 88           | 100                               | 3                             |
| 88 ~ 216          | 150                               | 3                             |
| 216 ~ 960         | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

According to § 15.231(b), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with 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                     | <sup>1</sup> 1,250 to 3,750                      | <sup>1</sup> 125 to 375                                 |
| 174-260                     | 3,750                                            | 375                                                     |
| 260-470                     | <sup>1</sup> 3,750 to 12,500                     | <sup>1</sup> 375 to 1,250                               |
| Above 470                   | 12,500                                           | 1,250                                                   |

Note:

- 1.Linear interpolations.
- 2.The lower limit shall apply at the transition frequencies.
- 3.Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 4.As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of restricted frequency bands:

| FREQUENCY (MHz)   | FREQUENCY (MHz)     | FREQUENCY (MHz) | FREQUENCY (GHz) |
|-------------------|---------------------|-----------------|-----------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410       | 4.5-5.15        |
| 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       |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5     | 9.0-9.2         |
| 4.20725-4.20775   | 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       | Above 38.6      |
| 13.36-13.41       |                     |                 |                 |

| Spectrum Parameter                    | Setting               |
|---------------------------------------|-----------------------|
| Detector                              | Peak                  |
| Attenuation                           | Auto                  |
| Start Frequency                       | 1000 MHz              |
| Stop Frequency                        | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1MHz / 3MHz           |

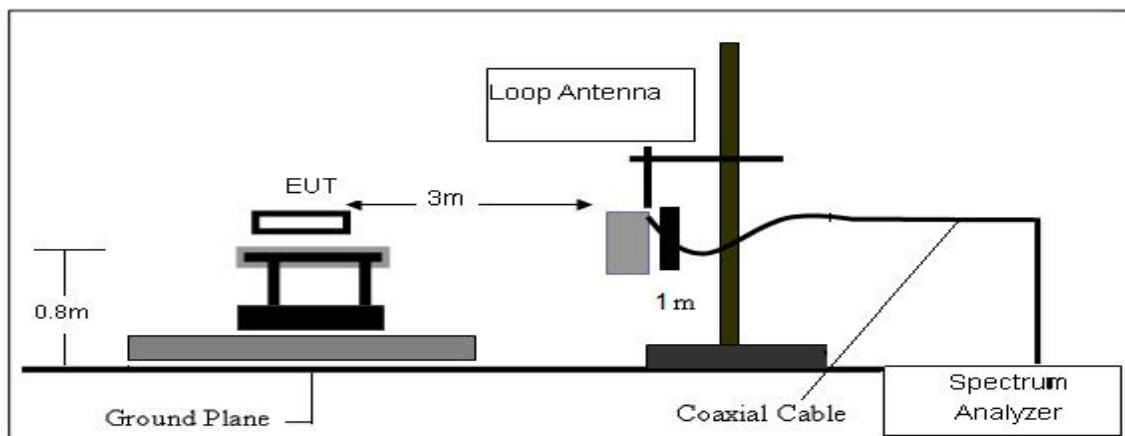
| Receiver Parameter     | Setting                              |
|------------------------|--------------------------------------|
| Attenuation            | Auto                                 |
| Start ~ Stop Frequency | 9kHz~90kHz / RB 200Hz for PK & AV    |
| Start ~ Stop Frequency | 90kHz~110kHz / RB 200Hz for QP       |
| Start ~ Stop Frequency | 110kHz~490kHz / RB 200Hz for PK & AV |
| Start ~ Stop Frequency | 490kHz~30MHz / RB 9kHz for QP        |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP     |

## 2.2.2. Test Procedure

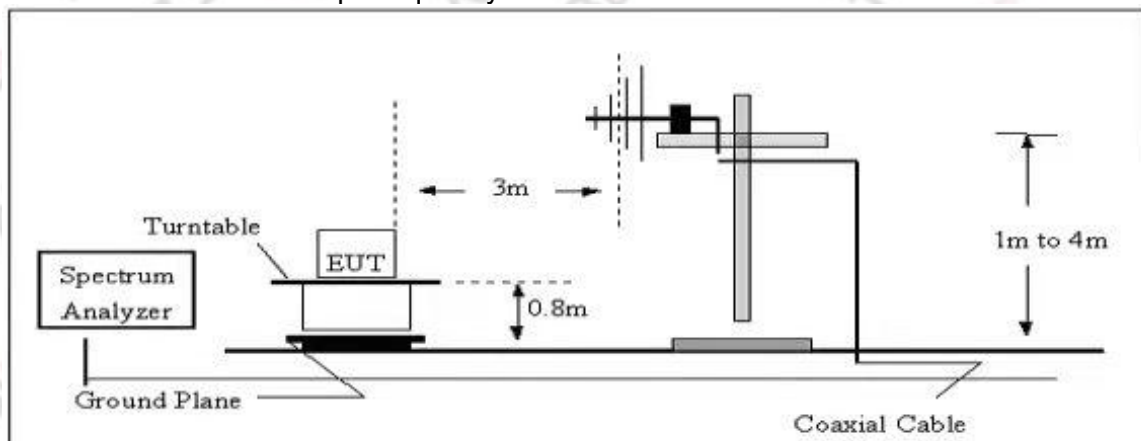
- The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- 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 Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item - EUT Test Photos:
- Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

## 2.2.3. Test Setup

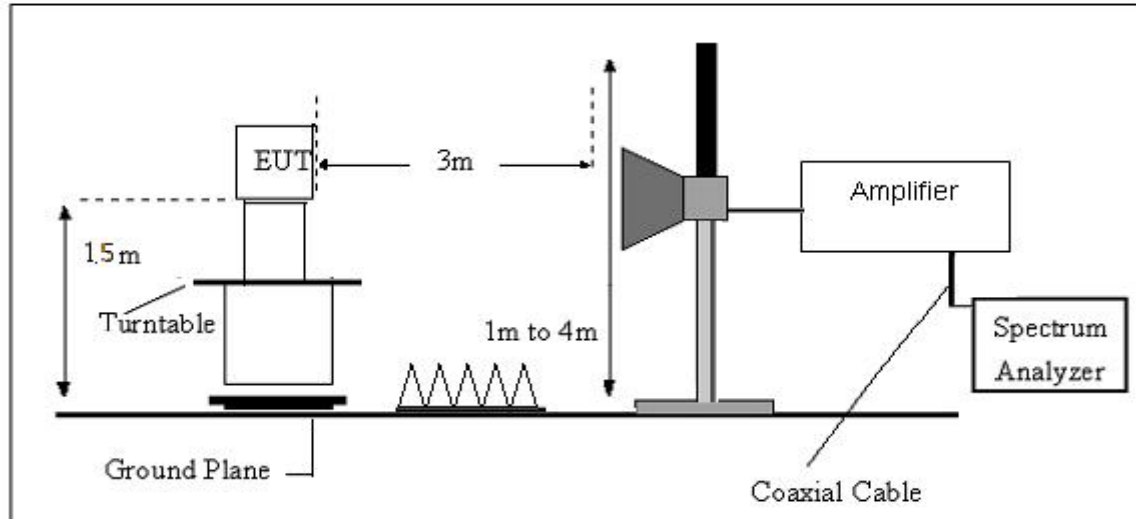
### (A) Radiated Emission Test-Up Frequency Below 30MHz



### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



2.2.4.EUT operating conditions

The EUT tested system was configured as the statements of 1.7 Unless otherwise a special operating condition is specified in the follows during the testing.

2.2.5.Field strength calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

$$\text{Factor} = AF + CL - AG$$

## 2.2.6. Test Results

| Field Strength of Fundamental Emissions and Field strength of spurious emissions Value |                         |          |                    |             |            |
|----------------------------------------------------------------------------------------|-------------------------|----------|--------------------|-------------|------------|
| Operating Frequency (MHz)                                                              | Field Strength (dBuV/m) | Detector | Limit @3m (dBuV/m) | Margin (dB) | Antenna    |
| 304.25                                                                                 | <b>62.91</b>            | Peak     | 94.98              | -32.07      | Horizontal |
|                                                                                        | 62.38                   | Peak     | 94.98              | -32.60      | Vertical   |
| 608.50                                                                                 | 31.82                   | Peak     | 74.98              | -43.16      | Horizontal |
|                                                                                        | 25.36                   | Peak     | 74.98              | -49.62      | Vertical   |
| 304.25                                                                                 | 55.98                   | Avg      | 74.98              | -19.00      | Horizontal |
|                                                                                        | 55.45                   | Avg      | 74.98              | -19.53      | Vertical   |
| 608.50                                                                                 | 24.89                   | Avg      | 54.98              | -30.09      | Horizontal |
|                                                                                        | 18.43                   | Avg      | 54.98              | -36.55      | Vertical   |

Note:

Fundamental AV value =PK Emission +20\*log(duty cycle)Where the duty factor is calculated from following formula:20 log (Duty cycle) =20Log(45%)=-6.93dB, Please see page 25.

(Radiated Emission<30MHz (9kHz-30MHz, H-field))

|               |                    |                   |       |
|---------------|--------------------|-------------------|-------|
| Temperature:  | 25°C               | Relative Humidity | 54%RH |
| Test Voltage: | DC 3V From Battery | Polarization:     | N/A   |
| Test Mode:    | TX Mode            |                   |       |

Note:

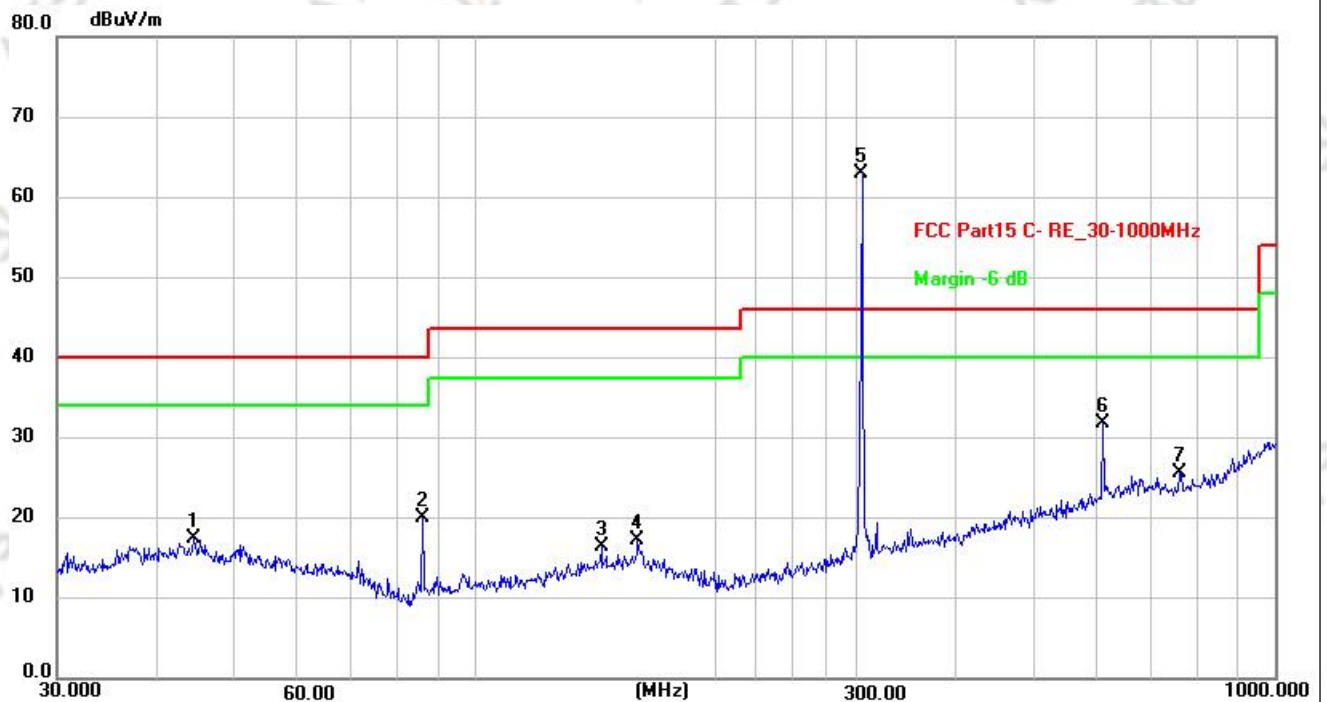
- 1.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 2.Distance extrapolation factor =40 log (specific distance/test distance)(dB);  
Limit line = specific limits(dBuV) + distance extrapolation factor.
3. The verdict please refer to the A.6 field strength of fundamental emissions and field strength of spurious emissions value.
- 4.Limit field strength of fundamental:  
 $20 \cdot \log(((12500-3750) \cdot ((fc-260)/(470-260))+3750) \text{dBuV/m} + 20 \text{dB} = 94.98 \text{dBuV/m} @ 3\text{m (PK)}.$
5. Limit field strength of harmonics:  $20 \cdot \log(((1250-375) \cdot ((fc-260)/(470-260))+375) \text{dBuV/m} + 20 \text{dB} = 74.98 \text{dBuV/m} @ 3\text{m (PK)}.$

For 30MHz -1000MHz:

Remark:

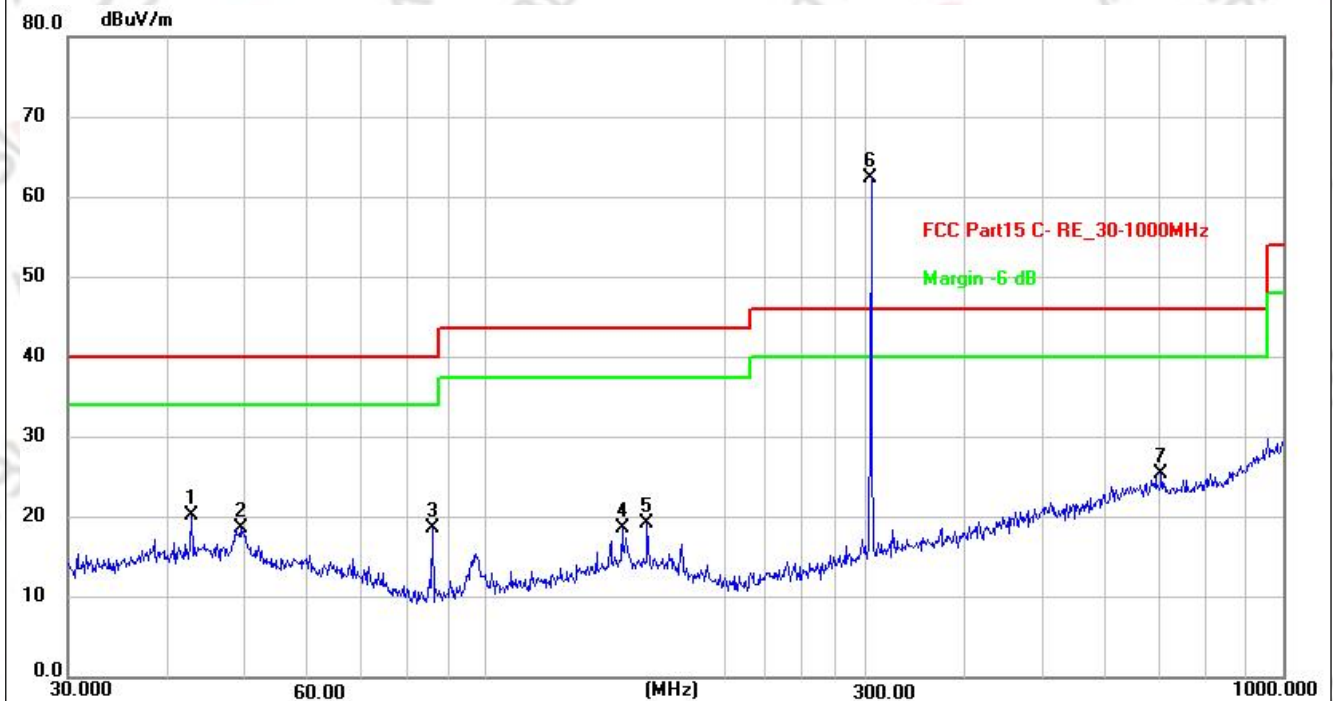
1. Margin = Result (Result =Reading + Factor )-Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
3. " \* ": Fundamental frequency.
4. " # ": Harmonic frequency.

|               |                    |                    |            |
|---------------|--------------------|--------------------|------------|
| Temperature:  | 25°C               | Relative Humidity: | 54%RH      |
| Test Voltage: | DC 3V From Battery | Phase:             | Horizontal |
| Test Mode:    | TX Mode            |                    |            |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 44.4307         | 40.53          | -22.98        | 17.55          | 40.00          | -22.45      | peak |
| 2   | 85.8983         | 49.01          | -28.93        | 20.08          | 40.00          | -19.92      | peak |
| 3   | 143.8295        | 41.11          | -24.71        | 16.40          | 43.50          | -27.10      | peak |
| 4   | 159.7844        | 40.81          | -23.64        | 17.17          | 43.50          | -26.33      | peak |
| 5 * | 304.25          | 85.46          | -22.55        | 62.91          | 94.98          | -32.07      | peak |
| 6 # | 608.5           | 46.94          | -15.12        | 31.82          | 74.98          | -43.16      | peak |
| 7   | 760.7035        | 38.70          | -13.03        | 25.67          | 46.00          | -20.33      | peak |

|               |                    |                    |          |
|---------------|--------------------|--------------------|----------|
| Temperature:  | 25°C               | Relative Humidity: | 54%RH    |
| Test Voltage: | DC 3V From Battery | Phase:             | Vertical |
| Test Mode:    | TX Mode            |                    |          |



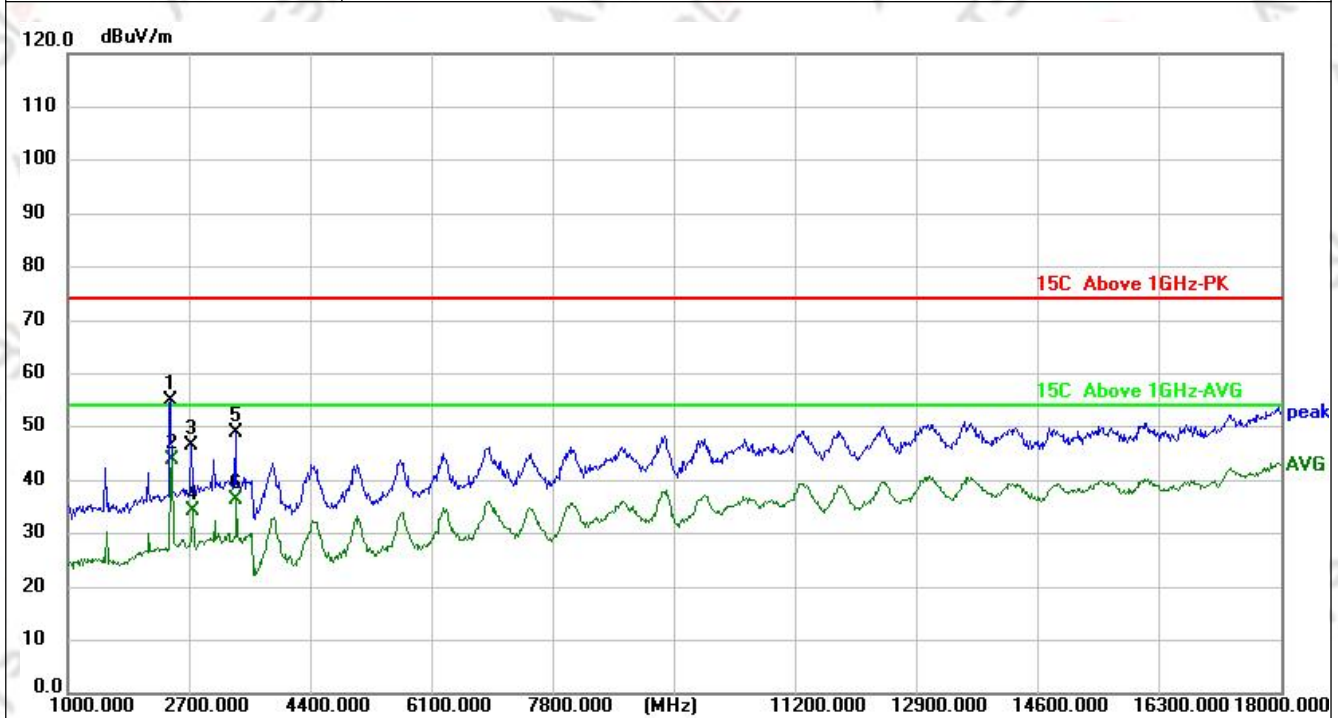
| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 42.8998         | 43.34          | -23.11        | 20.23          | 40.00          | -19.77      | peak |
| 2   | 49.3594         | 42.35          | -23.74        | 18.61          | 40.00          | -21.39      | peak |
| 3   | 85.8984         | 47.54          | -28.93        | 18.61          | 40.00          | -21.39      | peak |
| 4   | 148.4410        | 43.11          | -24.40        | 18.71          | 43.50          | -24.79      | peak |
| 5   | 159.7844        | 42.82          | -23.64        | 19.18          | 43.50          | -24.32      | peak |
| 6 * | 304.25          | 84.93          | -22.55        | 62.38          | 94.98          | -32.60      | peak |
| 7 # | 608.5           | 38.71          | -13.35        | 25.36          | 74.98          | -49.62      | peak |

For 1000MHz -5000MHz:

Remark:

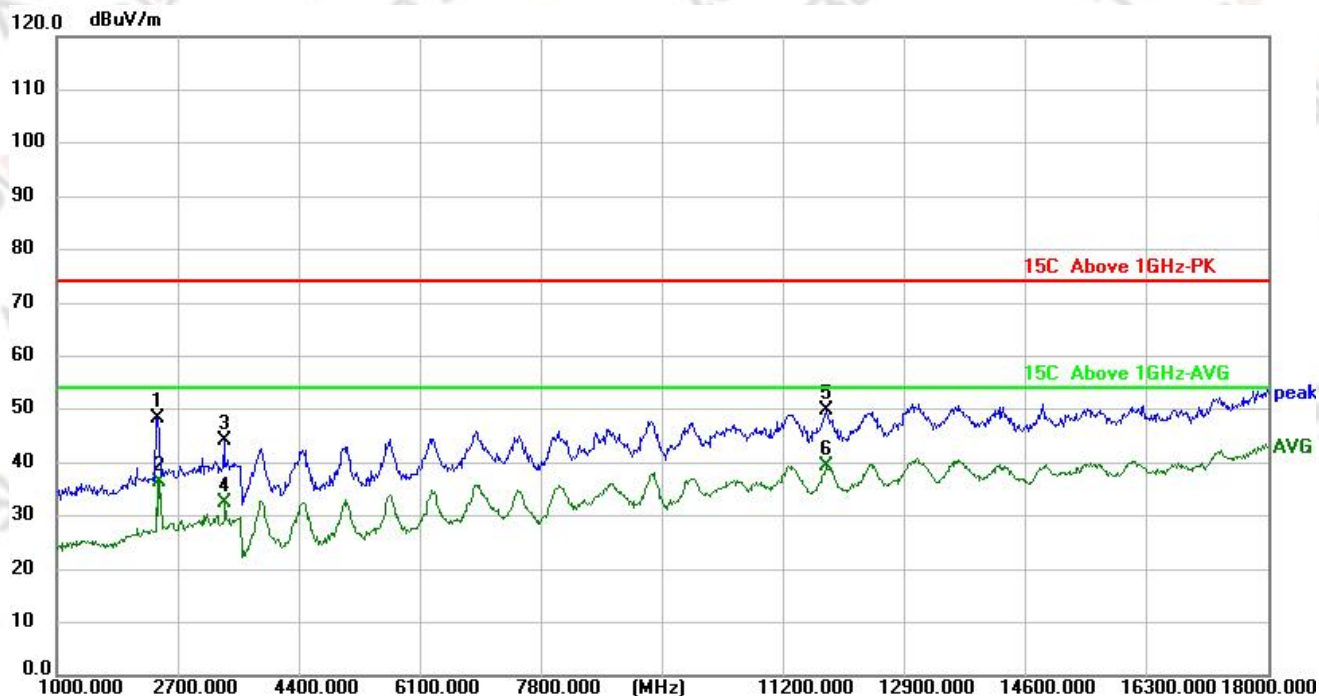
1. Margin = Result (Result =Reading + Factor )-Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

|               |                    |                    |            |
|---------------|--------------------|--------------------|------------|
| Temperature:  | 25°C               | Relative Humidity: | 54%RH      |
| Test Voltage: | DC 3V From Battery | Phase:             | Horizontal |
| Test Mode:    | TX Mode            |                    |            |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 2445.000        | 70.33          | -15.55        | 54.78          | 74.00          | -19.22      | peak |
| 2   | 2462.000        | 59.24          | -15.44        | 43.80          | 54.00          | -10.20      | AVG  |
| 3   | 2734.000        | 60.62          | -14.21        | 46.41          | 74.00          | -27.59      | peak |
| 4   | 2751.000        | 48.45          | -14.17        | 34.28          | 54.00          | -19.72      | AVG  |
| 5   | 3346.000        | 60.73          | -11.82        | 48.91          | 74.00          | -25.09      | peak |
| 6   | 3363.000        | 48.28          | -11.81        | 36.47          | 54.00          | -17.53      | AVG  |

|               |                    |                    |          |
|---------------|--------------------|--------------------|----------|
| Temperature:  | 25°C               | Relative Humidity: | 54%RH    |
| Test Voltage: | DC 3V From Battery | Phase:             | Vertical |
| Test Mode:    | TX Mode            |                    |          |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 2428.000        | 63.87          | -15.67        | 48.20          | 74.00          | -25.80      | peak |
| 2   | 2445.000        | 52.02          | -15.55        | 36.47          | 54.00          | -17.53      | AVG  |
| 3   | 3346.000        | 56.05          | -11.82        | 44.23          | 74.00          | -29.77      | peak |
| 4   | 3363.000        | 44.35          | -11.81        | 32.54          | 54.00          | -21.46      | AVG  |
| 5   | 11795.000       | 41.65          | 8.18          | 49.83          | 74.00          | -24.17      | AVG  |
| 6   | 11812.000       | 31.11          | 8.19          | 39.30          | 54.00          | -14.70      | peak |

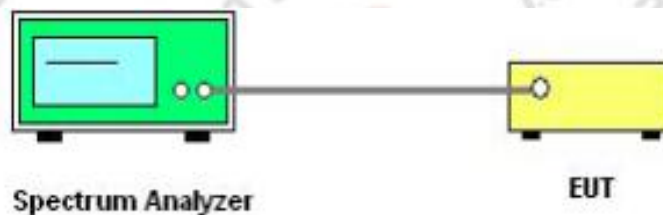
## 2.3. Bandwidth Test

### 2.3.1.Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

| Spectrum Parameter | Setting                 |
|--------------------|-------------------------|
| Attenuation        | Auto                    |
| Span Frequency     | > Measurement Bandwidth |
| RB                 | 10 kHz                  |
| VB                 | 30 kHz                  |
| Detector           | Peak                    |
| Trace              | Max Hold                |
| Sweep Time         | Auto                    |

### 2.3.2.Test Setup

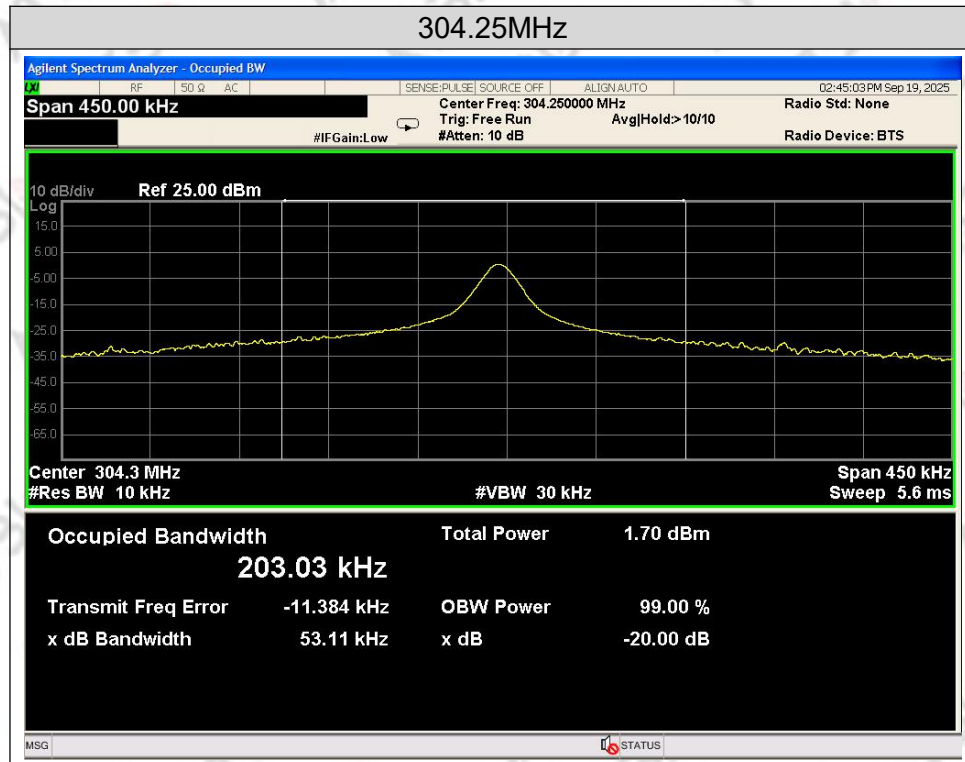


### 2.3.3.EUT operating conditions

The EUT tested system was configured as the statements of 1.7 Unless otherwise a special operating condition is specified in the follows during the testing.

## 2.3.4. Test Results

| Centre Frequency (MHz) | 20dB Bandwidth (kHz) | Limit(kHz) | Results |
|------------------------|----------------------|------------|---------|
| 304.25                 | 53.11                | 760.625    | PASS    |



## 2.4. Duty Cycle

### 2.4.1. Test Procedure

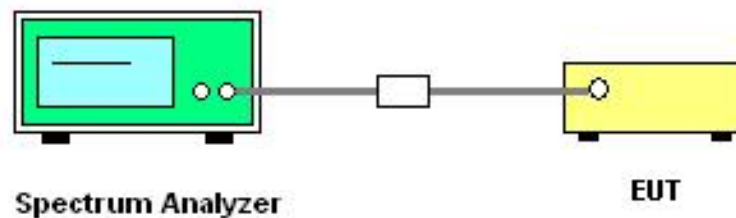
The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

The Duty Cycle Was Determined By The Following Equation: To Calculate The Actual Field Intensity, The Duty Cycle Correction Factor In Decibel Is Needed For Later Use And Can Be Obtained From Following Conversion.

Duty Cycle(%)=Total On Interval In A Complete Pulse Train/ Length Of A Complete Pulse Train \* %

Duty Cycle Correction Factor(Db)=20 \* Log10(Duty Cycle(%))

### 2.4.2. Test Setup



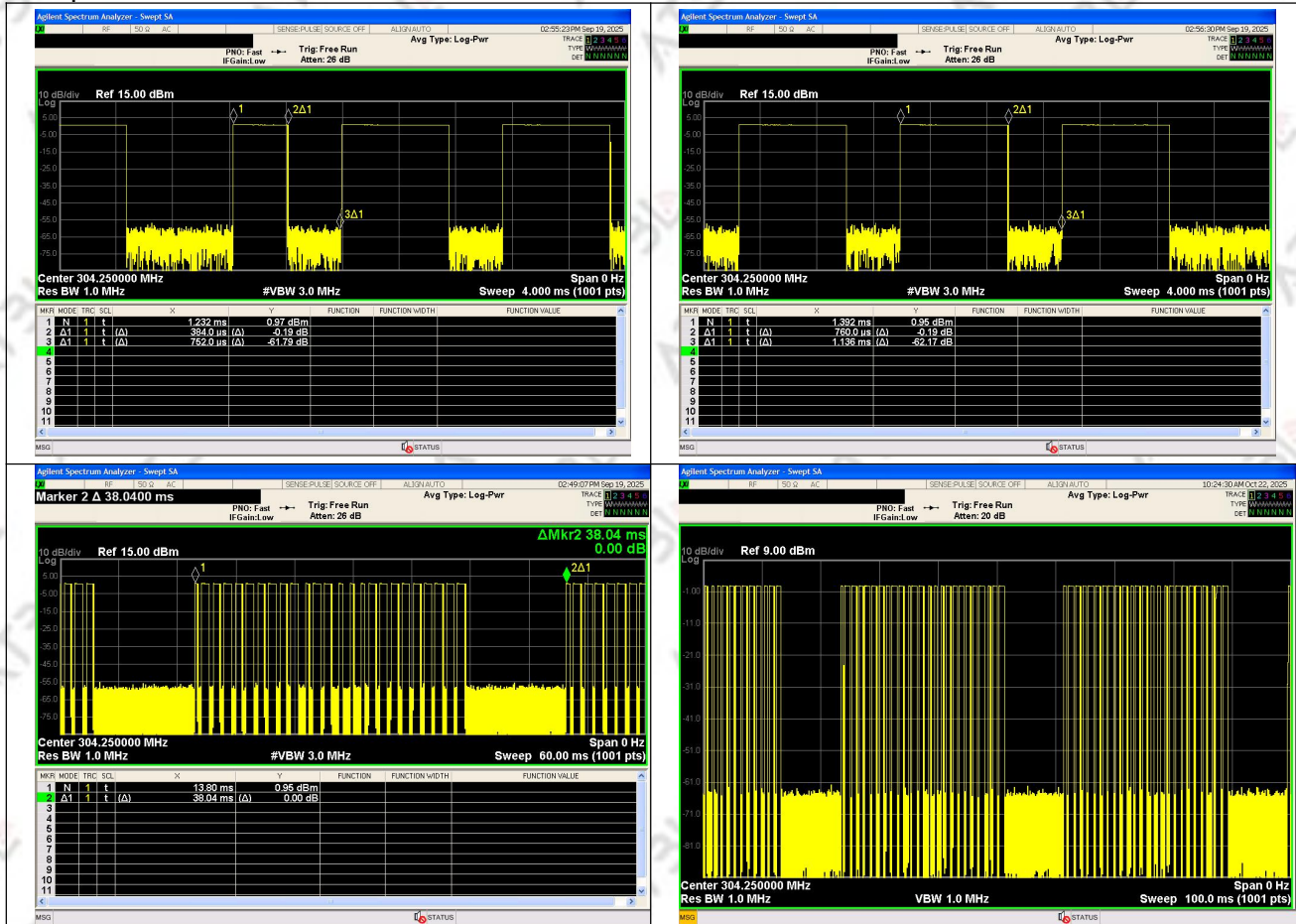
### 2.4.3. EUT operating conditions

TX mode.

## 2.4.4. Test Results

|                                  |                                            |
|----------------------------------|--------------------------------------------|
| Ton(ms)                          | $5 \times 0.384 + 20 \times 0.760 = 17.12$ |
| T period(ms)                     | 38.04                                      |
| Duty Cycle (%)                   | 45.00                                      |
| Duty Cycle Correction Factor(dB) | -6.93                                      |

Test photo:



## 2.5. Automatically Deactivate

### 2.5.1. Standard requirement

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

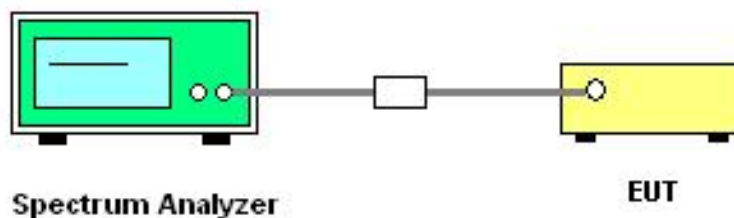
### 2.5.2. Test Procedure

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

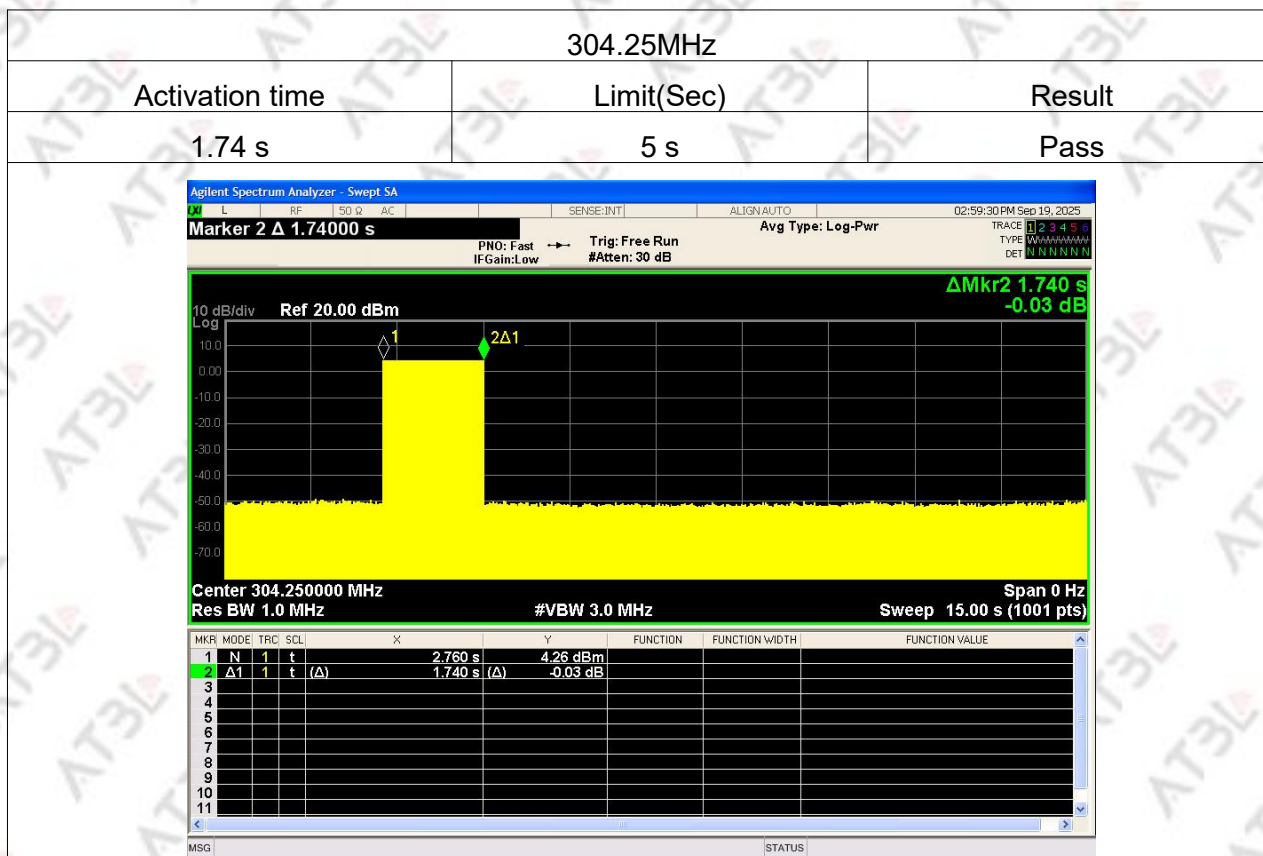
Spectrum Setting: RBW= 1MHz, VBW=3MHz, Sweep time = 15s.

Set the EUT to transmit by manually operated. Use the “View” function of SPA to find the transmission time of being released.

### 2.5.3. Test Setup



### 2.5.4. Test Results



## **2.6. Antenna Requirement**

### **2.6.1. Standard requirement**

FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### **2.6.2. EUT Antenna**

The EUT antenna is PCB Antenna. It conforms to the standard requirements.

## **3. Test Setup Photographs**

Please refer to the Appendix F.

## **4. External and Internal photos of the EUT**

Please refer to the Appendix G.

Please refer to the Appendix H.

\*\*\*\*\*END OF THE REPORT\*\*\*\*\*