

# TEST REPORT

**Reference No.**..... : WTN25D04087717W002  
**FCC ID** ..... : 2BO39-TXIRMT01  
**Applicant**..... : L&S Deutschland GmbH  
**Address**..... : Daimlerring 34 32289 Roedinghausen, Germany  
**Manufacturer** ..... : Ningbo Technic Lighting Co., Ltd  
**Address** ..... : No.8, CaiYuan Road, Lizhou Street, Yuyao City, Zhejiang Province, China  
**Product**..... : Refer to Section 4.3  
**Model(s)** ..... : Refer to Section 4.3  
**Standards** ..... : FCC CFR47 Part 15 Section 15.249  
**Date of Receipt sample** .... : 2025-04-11  
**Date of Test** ..... : 2025-04-14 to 2025-05-06  
**Date of Issue**..... : 2025-05-06  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

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### 3 Revision History

| Test Report No.    | Date of Receipt Sample | Date of Test                   | Date of Issue | Purpose  | Comment | Approved |
|--------------------|------------------------|--------------------------------|---------------|----------|---------|----------|
| WTN25D04087717W002 | 2025-04-11             | 2025-04-14<br>to<br>2025-05-06 | 2025-05-06    | Original | -       | Valid    |

## 4 General Information

### 4.1 General Description of E.U.T

Product: Refer to Section 4.3  
Model(s): Refer to Section 4.3  
Model Description: Refer to Section 4.3  
Remark: Refer to Section 4.3  
Test Sample No.: 1-1/1  
Hardware Version: A2  
Software Version: V1.0.0

### 4.2 Details of E.U.T.

Frequency Range: 2440MHz  
Type of Modulation: GFSK  
Antenna installation: PCB Antenna  
Antenna Gain: 2.76dBi

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTEK lab has not verified the authenticity of its information.

Ratings: DC 3V

### 4.3 Model List

| Product                                                                                                                                                                                          | Model(s)                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Mec Driver IR Sensor on/off dimmer                                                                                                                                                               | Mec Driver IR Sensor on/off dimmer |
| Mec Driver Door Contact Sensor                                                                                                                                                                   | Mec Driver Door Contact Sensor     |
| Remark:<br>1. The hardware is exactly the same, but the color of the shell and the functions of the keys are different.<br>2. Model Mec Driver IR Sensor on/off dimmer was tested in the report. |                                    |

### 4.4 Channel List

| Channel No. | Frequency (MHz) |
|-------------|-----------------|
| 1           | 2440            |

#### 4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

| Test mode    | Channel No. |
|--------------|-------------|
| Transmitting | 2440MHz     |

## 5 Equipment Used during Test

### 5.1 Equipments List

| 3m Semi-anechoic Chamber for Radiation Emissions |                                  |                      |               |            |                          |                          |
|--------------------------------------------------|----------------------------------|----------------------|---------------|------------|--------------------------|--------------------------|
| Item                                             | Equipment                        | Manufacturer         | Model No.     | Serial No. | Last Calibration Date    | Calibration Due Date     |
| 1                                                | Spectrum Analyzer                | R&S                  | FSP30         | 100091     | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 2                                                | Broad-band Horn Antenna(1-18GHz) | SCHWARZBECK          | BBHA 9120 D   | 667        | 2025-01-17               | 2026-01-16               |
| 3                                                | Broadband Preamplifier           | COMPLIANCE DIRECTION | PAP-1G18      | 2004       | 2024-07-18               | 2025-07-17               |
| 4                                                | Coaxial Cable (above 1GHz)       | Top                  | 1GHz-18GHz    | N/A        | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 3m Semi-anechoic Chamber for Radiation Emissions |                                  |                      |               |            |                          |                          |
| Item                                             | Equipment                        | Manufacturer         | Model No.     | Serial No  | Last Calibration Date    | Calibration Due Date     |
| 1                                                | Test Receiver                    | R&S                  | ESCI          | 101296     | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 2                                                | Trilog Broadband Antenna         | SCHWARZBECK          | VULB9160      | 9160-3325  | 2024-11-04               | 2025-11-03               |
| 3                                                | Active Loop Antenna              | Com-Power Corp.      | AL-130R       | 10160007   | 2024-04-22<br>2025-04-21 | 2025-04-21<br>2026-04-20 |
| 4                                                | Amplifier                        | ANRITSU              | MH648A        | M43381     | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 5                                                | Cable                            | HUBER+SUHNER         | CBL2          | 525178     | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| RF Conducted Testing                             |                                  |                      |               |            |                          |                          |
| Item                                             | Equipment                        | Manufacturer         | Model No.     | Serial No. | Last Calibration Date    | Calibration Due Date     |
| 1.                                               | Spectrum Analyzer                | R&S                  | FSL6          | 100959     | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 2                                                | Coaxial Cable                    | Top                  | 10Hz-30GHz    | -          | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 3                                                | Antenna Connector*               | Realacc              | 45RSm         | -          | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |
| 4                                                | DC Block                         | Gwave                | GDCB-3G-N-SMA | 140307001  | 2024-04-22<br>2025-04-19 | 2025-04-19<br>2026-04-18 |

#### Test Software:

| Test Item             | Software name | Software version  |
|-----------------------|---------------|-------------------|
| Radiated Emission(3m) | EZ-EMC        | EZ-EMC(RA-03A1-1) |

## 5.2 Measurement Uncertainty

| Parameter                        | Uncertainty                                    |
|----------------------------------|------------------------------------------------|
| Radio Frequency                  | $\pm 1 \times 10^{-6}$                         |
| RF Power                         | $\pm 1.0$ dB                                   |
| RF Power Density                 | $\pm 2.2$ dB                                   |
| Radiated Spurious Emissions test | $\pm 5.03$ dB<br>(Bilog antenna 30M~1000MHz)   |
|                                  | $\pm 5.47$ dB<br>(Horn antenna 1000M~25000MHz) |

## 5.3 Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

## 5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

## 6 Test Summary

| Test Items              | Test Requirement                 | Result |
|-------------------------|----------------------------------|--------|
| Conducted Emissions     | 15.207                           | N/A    |
| Radiated Emission       | 15.249(a)<br>15.209<br>15.205(a) | PASS   |
| Periodic Operation      | 15.35(c)                         | PASS   |
| Outside Restricted band | 15.249<br>15.205<br>15.209       | PASS   |
| 20dB Bandwidth          | 15:215(c)                        | PASS   |
| Antenna Requirement     | 15.203                           | PASS   |

## 7 Radiation Emission Test

Test Requirement: FCC Part15 Paragraph 15.249&15.209&15.205

Test Method: ANSI C63.10-2020+A1-2024

Measurement Distance: 3m

Test Result: PASS

15.249(a)Limit:

| Fundamental frequency | Field strength of fundamental |        | Field strength of harmonics |        |
|-----------------------|-------------------------------|--------|-----------------------------|--------|
|                       | mV/m                          | dBuV/m | uV/m                        | dBuV/m |
| 902-928 MHz           | 50                            | 94     | 500                         | 54     |
| 2400-2483.5 MHz       | 50                            | 94     | 500                         | 54     |
| 5725-5875 MHz         | 50                            | 94     | 500                         | 54     |
| 24.0-24.25 GHz        | 250                           | 108    | 2500                        | 68     |

15.209 Limit:

| Frequency<br>(MHz) | Field Strength        |                 | Field Strength Limit at 3m Measurement Dist |                                       |
|--------------------|-----------------------|-----------------|---------------------------------------------|---------------------------------------|
|                    | uV/m                  | Distance<br>(m) | uV/m                                        | dBuV/m                                |
| 0.009 ~ 0.490      | $2400/F(\text{kHz})$  | 300             | $10000 * 2400/F(\text{kHz})$                | $20\log^{(2400/F(\text{kHz}))} + 80$  |
| 0.490 ~ 1.705      | $24000/F(\text{kHz})$ | 30              | $100 * 24000/F(\text{kHz})$                 | $20\log^{(24000/F(\text{kHz}))} + 40$ |
| 1.705 ~ 30         | 30                    | 30              | $100 * 30$                                  | $20\log^{(30)} + 40$                  |
| 30 ~ 88            | 100                   | 3               | 100                                         | $20\log^{(100)}$                      |
| 88 ~ 216           | 150                   | 3               | 150                                         | $20\log^{(150)}$                      |
| 216 ~ 960          | 200                   | 3               | 200                                         | $20\log^{(200)}$                      |
| Above 960          | 500                   | 3               | 500                                         | $20\log^{(500)}$                      |

**Note:** RF Voltage(dBuV)= $20 \log_{10}$  RF Voltage(uV)

### 7.1 EUT Operation

Operating Environment :

Temperature: 26.3 °C

Humidity: 56.8 % RH

Atmospheric Pressure: 101.2kPa

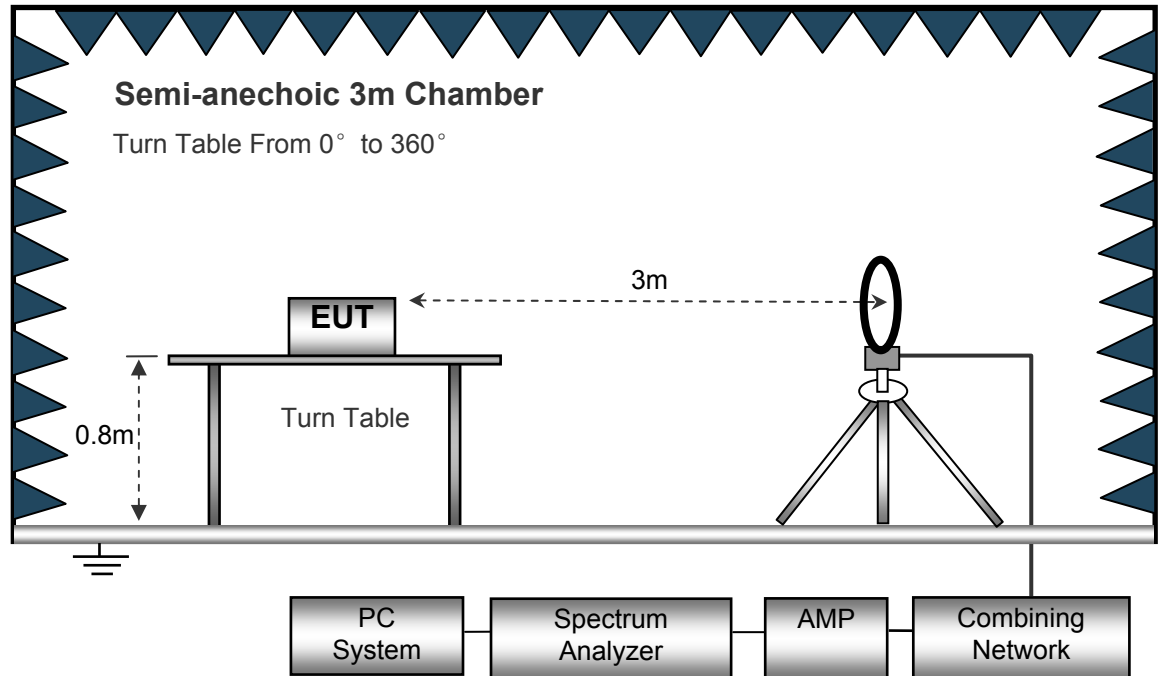
EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

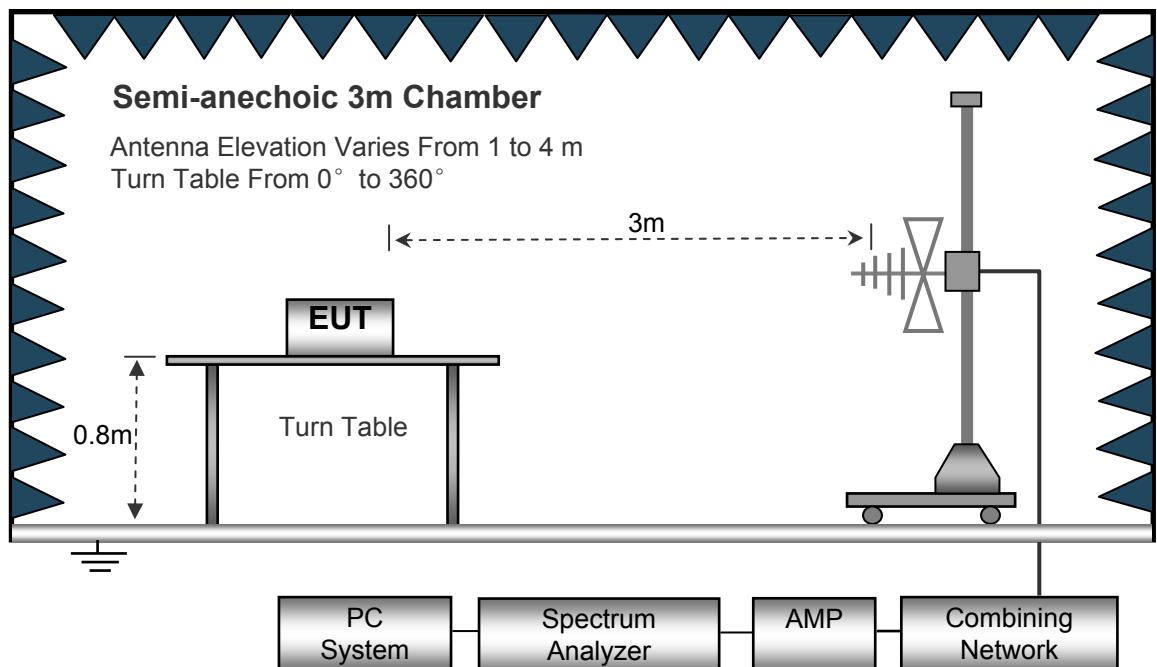
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

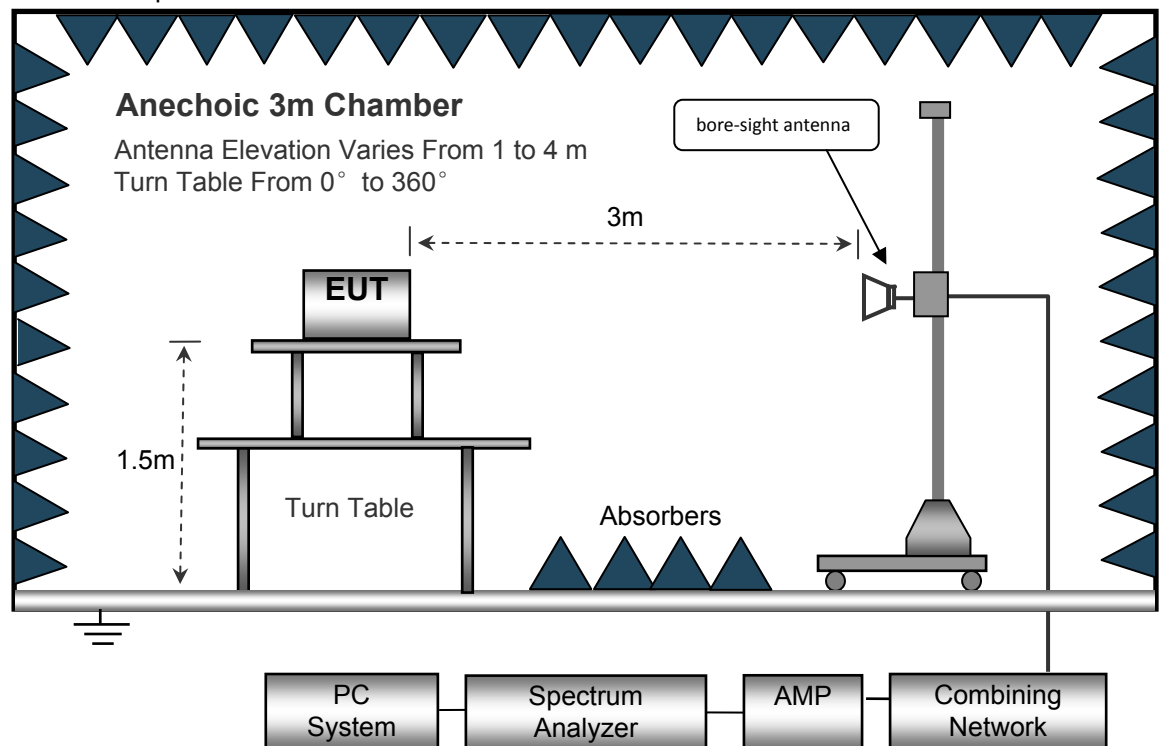
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1 GHz.



### 7.3 Spectrum Analyzer Setup

#### Below 30MHz

Sweep Speed .....Auto  
 IF Bandwidth.....10kHz  
 Video Bandwidth .....10kHz  
 Resolution Bandwidth .....10kHz

#### 30MHz ~ 1GHz

Sweep Speed .....Auto  
 Detector .....PK  
 Resolution Bandwidth.....100kHz  
 Video Bandwidth .....300kHz

#### Above 1GHz

Sweep Speed .....Auto  
 Detector .....PK  
 Resolution Bandwidth.....1MHz  
 Video Bandwidth .....3MHz  
 Detector .....Ave.  
 Resolution Bandwidth.....1MHz  
 Video Bandwidth .....10Hz

### 7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

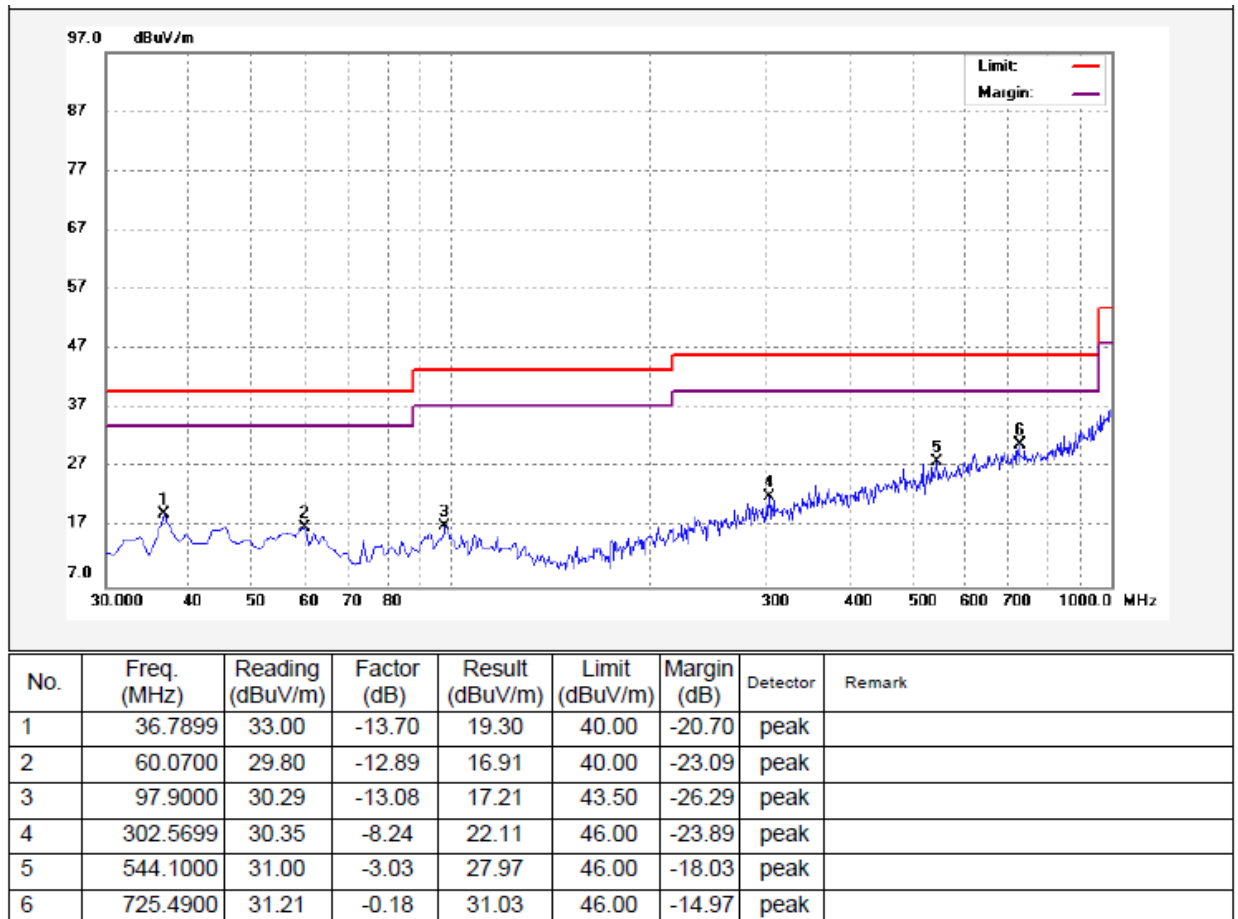
## 7.5 Test Result

### Test Frequency : 9kHz~ 30MHz

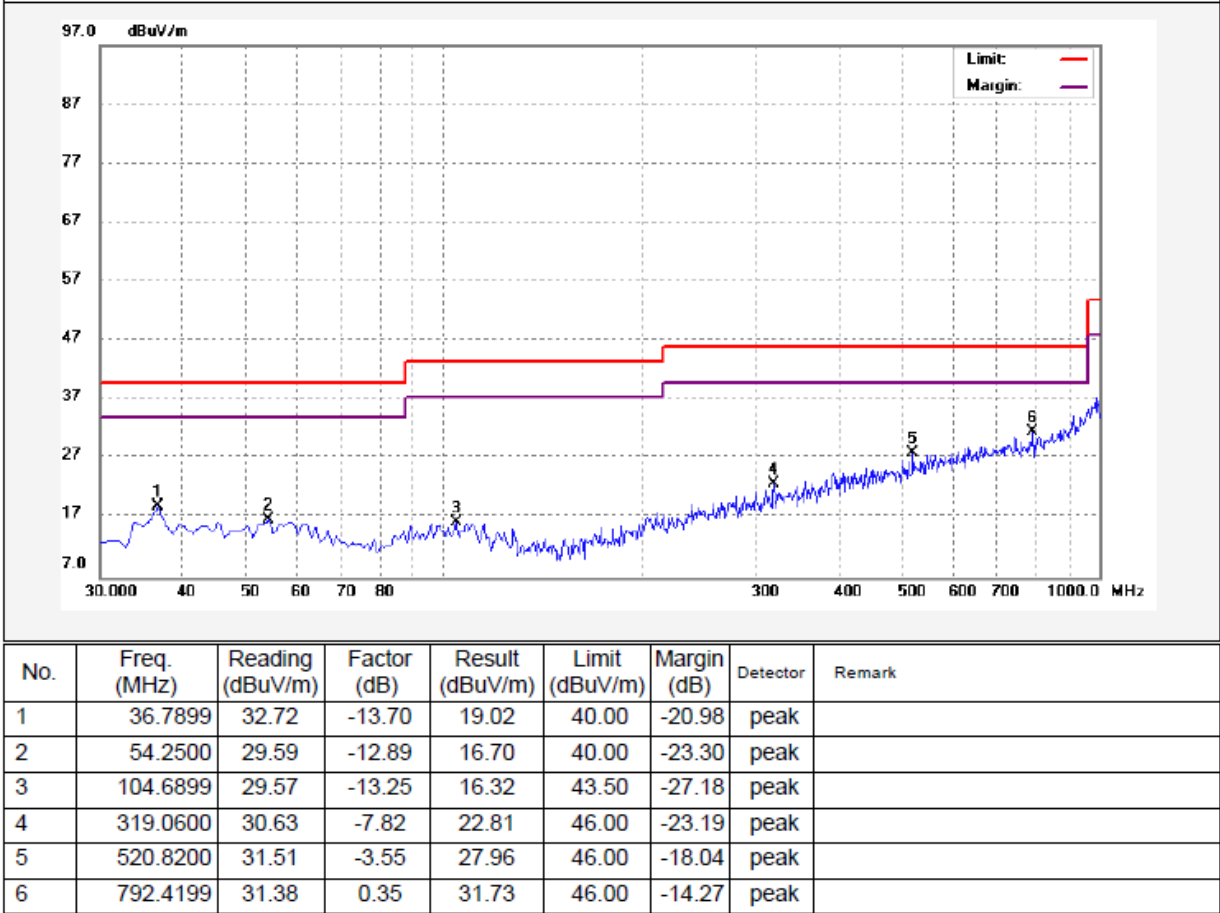
The measurements were more than 20 dB below the limit and not reported.

### Test Frequency: 30MHz ~ 1GHz

Antenna Polarization: Vertical



Antenna Polarization: Horizontal



**Test Frequency: 1GHz ~ 18GHz**

| Frequency | Receiver Reading | Detector    | Turn table Angle | RX Antenna |       | Corrected Factor | Corrected Amplitude | FCC Part 15.249/209/205 |        |
|-----------|------------------|-------------|------------------|------------|-------|------------------|---------------------|-------------------------|--------|
|           |                  |             |                  | Height     | Polar |                  |                     | Limit                   | Margin |
| (MHz)     | (dBμV)           | (PK/QP/Ave) | Degree           | (m)        | (H/V) | (dB/m)           | (dBμV/m)            | (dBμV/m)                | (dB)   |
| 2440.00   | 85.36            | PK          | 324              | 1.8        | H     | -8.34            | 77.02               | 114.00                  | -36.98 |
| 2440.00   | 100.45           | PK          | 15               | 1.4        | V     | -8.34            | 92.11               | 114.00                  | -21.89 |
| 4880.00   | 55.63            | PK          | 53               | 1.9        | H     | -5.39            | 50.24               | 74.00                   | -23.76 |
| 4880.00   | 61.52            | PK          | 323              | 1.3        | V     | -5.39            | 56.13               | 74.00                   | -17.87 |
| 7320.00   | 47.69            | PK          | 115              | 1.8        | H     | 1.75             | 49.44               | 74.00                   | -24.56 |
| 7320.00   | 52.33            | PK          | 137              | 1.1        | V     | 1.75             | 54.08               | 74.00                   | -19.92 |
| 9760.00   | 44.63            | PK          | 342              | 1.8        | H     | 3.59             | 48.22               | 74.00                   | -25.78 |
| 9760.00   | 48.96            | PK          | 60               | 1.6        | V     | 3.59             | 52.55               | 74.00                   | -21.45 |
| 12200.00  | 45.16            | PK          | 70               | 1.7        | H     | 9.44             | 54.60               | 74.00                   | -19.40 |
| 12200.00  | 44.58            | PK          | 171              | 1.9        | V     | 9.44             | 54.02               | 74.00                   | -19.98 |

**AV = Peak +20Log10(duty cycle) =PK+(-17.99) [refer to section 8 for more detail]**

| Frequency | PK       | Turn<br>table<br>Angle | RX Antenna |       | Duty<br>cycle<br>Factor | AV       | FCC Part<br>15.249/209/205 |        |
|-----------|----------|------------------------|------------|-------|-------------------------|----------|----------------------------|--------|
|           |          |                        | Height     | Polar |                         |          | Limit                      | Margin |
| (MHz)     | (dBμV/m) | Degree                 | (m)        | (H/V) | (dB)                    | (dBμV/m) | (dBμV/m)                   | (dB)   |
| 2440.00   | 77.02    | 159                    | 1.2        | H     | -17.99                  | 59.03    | 94.00                      | -34.97 |
| 2440.00   | 92.11    | 147                    | 1.8        | V     | -17.99                  | 74.12    | 94.00                      | -19.88 |
| 4880.00   | 50.24    | 71                     | 1.7        | H     | -17.99                  | 32.25    | 54.00                      | -21.75 |
| 4880.00   | 56.13    | 76                     | 1.6        | V     | -17.99                  | 38.14    | 54.00                      | -15.86 |
| 7320.00   | 49.44    | 79                     | 1.2        | H     | -17.99                  | 31.45    | 54.00                      | -22.55 |
| 7320.00   | 54.08    | 316                    | 1.4        | V     | -17.99                  | 36.09    | 54.00                      | -17.91 |
| 9760.00   | 48.22    | 325                    | 1.4        | H     | -17.99                  | 30.23    | 54.00                      | -23.77 |
| 9760.00   | 52.55    | 159                    | 1.7        | V     | -17.99                  | 34.56    | 54.00                      | -19.44 |
| 12200.00  | 54.60    | 325                    | 2.0        | H     | -17.99                  | 36.61    | 54.00                      | -17.39 |
| 12200.00  | 54.02    | 159                    | 1.9        | V     | -17.99                  | 36.03    | 54.00                      | -17.97 |

**Test Frequency: 18GHz ~ 25GHz**

The measurements were more than 20 dB below the limit and not reported.

## 8 Periodic Operation

Test Requirement: 15.35(c): when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

Test Mode: Transmitting

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 \* Log<sub>10</sub>(Duty Cycle)

|                                              |         |
|----------------------------------------------|---------|
| Test channel                                 | 2440MHz |
| Total transmission time(ms)                  | 100.00  |
| Length of a complete transmission period(ms) | 12.60   |
| Duty Cycle(%)                                | 12.60   |
| Duty Cycle Correction Factor(dB)             | -17.99  |

## 9 Restricted band

Test Requirement: FCC Part15 Paragraph 15.205

Test Method: ANSI C63.10-2020+A1-2024

Test Result: N/A

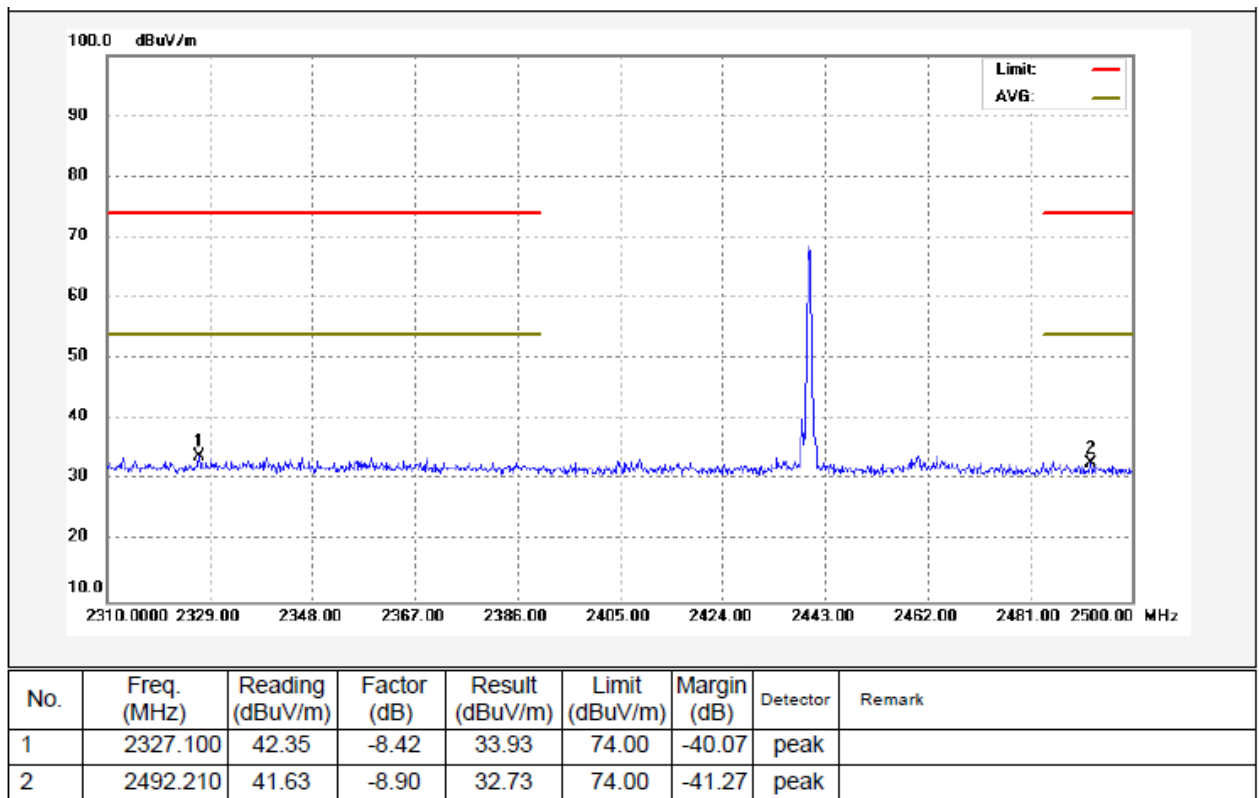
### 9.1 Requirments

emissions that fall in the restricted bands(15.205).Above 1000MHz, compliance with the emissions limits in section 15.209 shall be demonstrated based on the average value of the measured emissions,The provisions in section 15.35apply to these measurements.

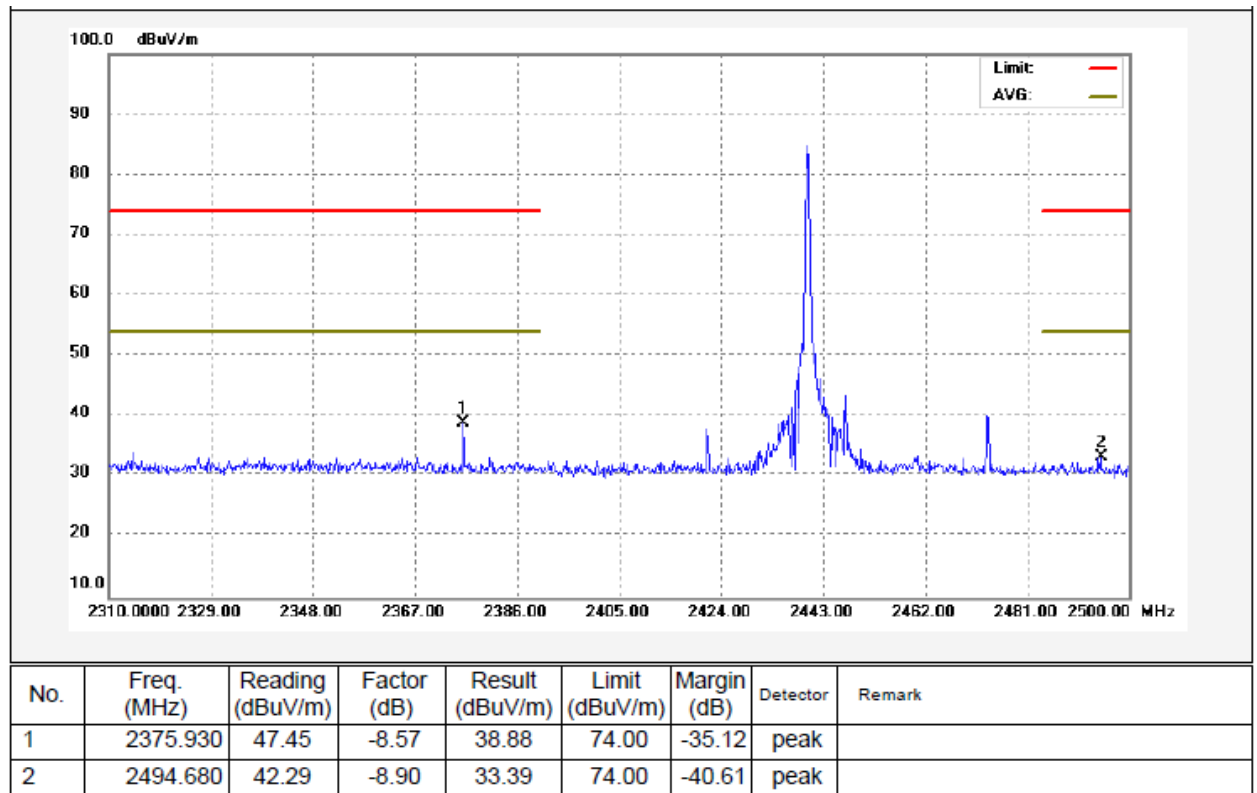
### 9.2 Test Result

Mode: Continuously Transmitting

Antenna Polarization: Vertical



Antenna Polarization: Horizontal



## 10 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215(c)  
 Test Method: ANSI C63.10-2020+A1-2024  
 Test Mode: Transmitting

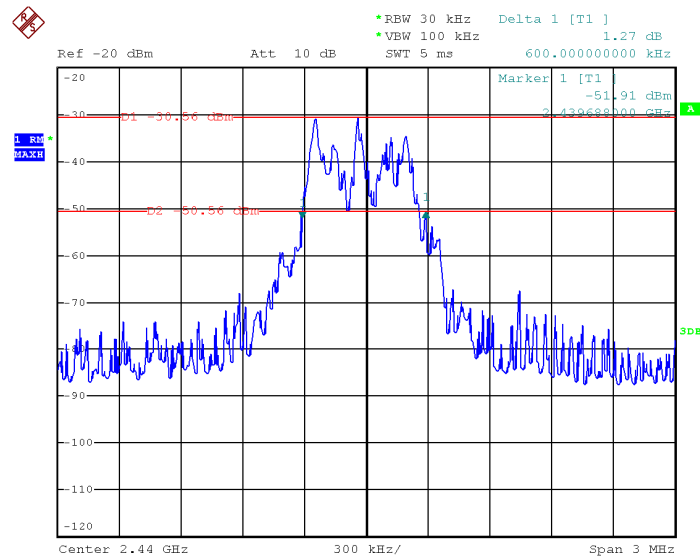
### 10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW = 3RBW

### 10.2 Test Result

| Frequency (MHz) | Bandwidth Emission (MHz) |
|-----------------|--------------------------|
| 2440            | 0.600                    |

Low channel Test plots



Date: 29.APR.2025 08:22:23

## **11 Antenna Requirement**

According to the 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. This product has a PCB Antenna , fulfil the requirement of this section.

## **12 RF Exposure**

Remark: Please refer to MPE test report: WTN25D04087717W003

## **13 Photographs - Constructional Details**

Note: Please refer to appendix: Appendix- Mec Driver IR Sensor on/off dimmer -Photos.

=====End of Report=====