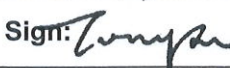




# ETSI EN300 328 RADIO TEST REPORT

|                      |                                                 |
|----------------------|-------------------------------------------------|
| <b>Product Name:</b> | Multifunctional LED controller for chain stores |
| <b>Model Number:</b> | BV-M3200                                        |
| <b>Applicant:</b>    | Blueview Elec-optic Tech Co., Ltd.              |

**KeySense Testing & Certification International Co., Ltd.**  
1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park,  
Huizhou, Guangdong, China

| Test Report Verification                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                      |                 |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Product name                              | Multifunctional LED controller for chain stores                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                      |                 |
| Model number                              | BV-M3200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                      |                 |
| Applicant                                 | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Blueview Elec-optic Tech Co., Ltd.                                                                                                                   |                 |
|                                           | Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China |                 |
| Manufacturer                              | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Blueview Elec-optic Tech Co., Ltd.                                                                                                                   |                 |
|                                           | Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China |                 |
| Factory                                   | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Blueview Elec-optic Tech Co., Ltd.                                                                                                                   |                 |
|                                           | Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China |                 |
| Trade Name                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                      |                 |
| Receipt date                              | Feb 24, 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Quantity                                                                                                                                             | 1               |
| Standard                                  | ETSI EN 300 328 V2.2.2 (2019-07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                      |                 |
| Test period                               | Feb 25, 2022- Mar 10, 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Issue Date                                                                                                                                           | Mar 23, 2022    |
| Test result                               | <p>The device described above is tested by KeySense Testing &amp; Certification International Co., Ltd. The measurement results were contained in this test report and KeySense Testing &amp; Certification International Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the ETSI EN 300 328 requirements.</p> <p>This report applies to above tested sample only and shall not be reproduced in part without written approval of KeySense Testing &amp; Certification International Co., Ltd.</p> |                                                                                                                                                      |                 |
| Tested by: Bing.He                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sign:                                                             | Date: 2022.3.23 |
| Reviewed by: Jack.Li                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sign:                                                             | Date: 2022.3.23 |
| Approved by: Tony.Xu<br>(General manager) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sign:                                                             | Date: 2022.3.23 |



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## 1. SUMMARY OF MEASUREMENTS AND RESULTS

### 1.1.Compliance with ETSI EN 300 328 V2.2.2 (2019-07)

| Harmonized Standard EN300 328                                                                                                                                    |                                                                    |                      |                                      |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------|--------------------------------------|---------|
| The following essential requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the RE Directive 2014/53/EU      |                                                                    |                      |                                      |         |
| No                                                                                                                                                               | Test Parameter                                                     | Clause No            | Condition                            | Results |
| Transmitter Parameters                                                                                                                                           |                                                                    |                      |                                      |         |
| 1                                                                                                                                                                | RF Output Power                                                    | 4.3.1.2 or 4.3.2.2   | Apply all equipment                  | PASS    |
| 2                                                                                                                                                                | Power Spectral Density                                             | 4.3.2.3              | Only for modulations other than FHSS | PASS    |
| 3                                                                                                                                                                | Duty Cycle ,Tx-Sequence, Tx-gap                                    | 4.3.1.3 or 4.3.2.4   | Only for non-adaptive equipment      | N/A     |
| 4                                                                                                                                                                | Accumulated Transmit Time, Frequency Occupation & Hopping Sequence | 4.3.1.4              | Only for FHSS                        | N/A     |
| 5                                                                                                                                                                | Hopping Frequency Separation                                       | 4.3.1.5              | Only for FHSS                        | N/A     |
| 6                                                                                                                                                                | Medium Utilization                                                 | 4.3.1.6 or 4.3.2.5   | Only for non-adaptive equipment      | N/A     |
| 7                                                                                                                                                                | Adaptivity                                                         | 4.3.1.7 or 4.3.2.6   | Only for adaptive equipment          | N/A     |
| 8                                                                                                                                                                | Occupied Channel Bandwidth                                         | 4.3.1.8 or 4.3.2.7   | Apply all equipment                  | PASS    |
| 9                                                                                                                                                                | Transmitter unwanted emissions in the OOB domain                   | 4.3.1.9 or 4.3.2.8   | Apply all equipment                  | PASS    |
| 10                                                                                                                                                               | Transmitter unwanted emissions in the spurious domain              | 4.3.1.10 or 4.3.2.9  | Apply all equipment                  | PASS    |
| 11                                                                                                                                                               | Receiver spurious emissions                                        | 4.3.1.11 or 4.3.2.10 | Apply all equipment                  | PASS    |
| 12                                                                                                                                                               | Receiver Blocking                                                  | 4.3.1.12 or 4.3.2.11 | Apply all equipment                  | PASS    |
| 13                                                                                                                                                               | Geo-location capability                                            | 4.3.1.13 or 4.3.2.12 | If implemented                       | N/A     |
| Note: N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device. |                                                                    |                      |                                      |         |

## 2. ENERAL INFORMATION

### 2.1.Description of Device (EUT)

|                     |   |                                |
|---------------------|---|--------------------------------|
| Product Name        | : | Remote Control                 |
| Model Number        | : | BV-M3200                       |
| Modulation          | : | O-QPSK(DSSS)                   |
| Operation Frequency | : | 2405MHz ~ 2480MHz              |
| Number of channel   | : | 16 Channels                    |
| Antenna and Gain    | : | External antenna , 3.4dBi Gain |
| Test Voltage        | : | AC 230V/50Hz                   |

## 2.2. Test Facilities

|                  |                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------|
| Site Description | 1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China |
| Name of Firm:    | KeySense Testing & Certification International Co., Ltd.                                                    |
| EMC Lab          | Certificated by CNAS, CHINA                                                                                 |
|                  | Registration No.: L9678                                                                                     |
|                  | Date of registration: Feb 07, 2017                                                                          |



### 2.3.Measurement uncertainty

|                                                               |                                         |
|---------------------------------------------------------------|-----------------------------------------|
| Uncertainty for Radiated Spurious Emission test in RF chamber | 1 dB<br>(Bilog antenna 30M~1000MHz)     |
|                                                               | 0.9 dB<br>(Horn antenna 1000M~25000MHz) |
| Uncertainty for Conduction Spurious emission test             | 2.10 dB                                 |
| Uncertainty for Output power test                             | 0.94 dB                                 |
| Uncertainty for Power density test                            | 2.10 dB                                 |
| Uncertainty for Temperature and humidity test                 | 2%                                      |
|                                                               | 1°C                                     |
| Uncertainty for Frequency range test                          | 1×10 <sup>-6</sup>                      |
| Uncertainty for Bandwidth test                                | 1×10 <sup>-6</sup>                      |
| Uncertainty for DC power test                                 | 0.042 %                                 |
| Uncertainty for test site temperature and humidity            | 0.6°C                                   |
|                                                               | 3%                                      |

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



## 2.4. Standard Description

**ETSI EN 300 328 V2.2.2 (2019-07):** Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.



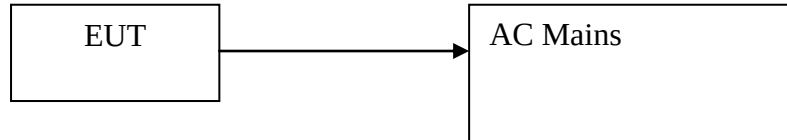
## 2.5.Assistant equipment used for test

### 2.5.1.Notebook

M / N : 13IML  
Manufacturer : Lenovo



## 2.6. Block Diagram of Test Setup



## 2.7. Test mode

The test software was used to control EUT work in Continuous TX or RX mode, and select test channel, wireless mode

| Test mode    | Lower channel | Center channel | Upper channel |
|--------------|---------------|----------------|---------------|
| Transmitting | 2405MHz       | 2440MHz        | 2480MHz       |
| Receiving    | 2405MHz       | 2440MHz        | 2480MHz       |

## 2.8. Channel List

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 11                                  | 2405MHz   | 15      | 2425MHz   | 19      | 2445MHz   | 23      | 2465MHz   |
| 12                                  | 2410MHz   | 16      | 2430MHz   | 20      | 2450MHz   | 24      | 2470MHz   |
| 13                                  | 2415MHz   | 17      | 2435MHz   | 21      | 2455MHz   | 25      | 2475MHz   |
| 14                                  | 2420MHz   | 18      | 2440MHz   | 22      | 2460MHz   | 26      | 2480MHz   |

### 3. MEASUREMENTS OF PARAMETERS (ETSI EN 300 328)

#### 3.1.RF Output Power

##### 3.1.1.Test Equipment

| Equipment                          | Manufacturer    | Model No.   | Serial No. | Last Cal.   | Cal. Interval |
|------------------------------------|-----------------|-------------|------------|-------------|---------------|
| Spectrum                           | Rohde & Schwarz | FSV         | 103559     | Dec 06,2021 | 1 Year        |
| Vector signal source               | Agilent         | N5182A      | MY47420382 | Dec 06,2021 | 1 Year        |
| Analog signal source               | Rohde & Schwarz | SMB 100A    | 179706     | Dec 06,2021 | 1 Year        |
| Comprehensive measuring instrument | Rohde & Schwarz | CMW 500     | 158242     | Dec 06,2021 | 1 Year        |
| control unit                       | MWRF            | MW100-RFC B | 10165      | Dec 06,2021 | 1 Year        |
| Testing software                   | SKET            | MTS-8310    | 10165      | Dec 06,2021 | 1 Year        |

N/A is an abbreviation for Not Applicable.

##### 3.1.2.Limit (ETSI EN 300 328 V2.2.2 (2019-07))

Refer to chapter 4.3.2.2 of EN 300 328 V2.2.2 .

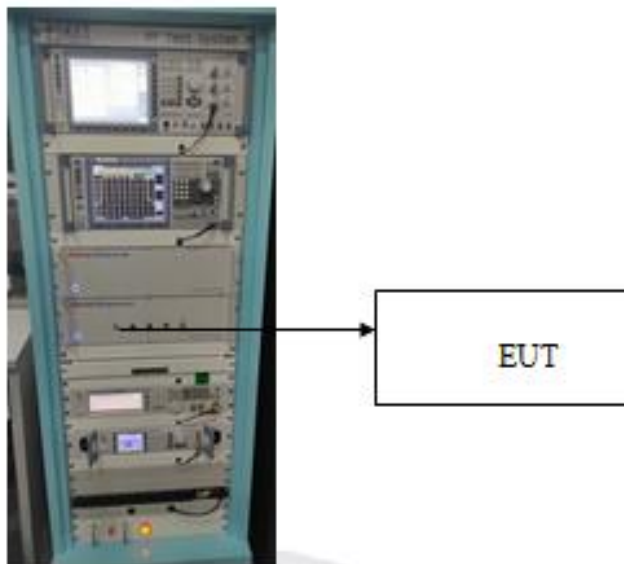
The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm.

The maximum RF output power for non-adaptive Frequency Hopping equipment shall be declared by the manufacturer. See clause 5.4.1 m). The maximum RF output power for this equipment shall be equal to or less than the value declared by the manufacturer. This declared value shall be equal to or less than 20 dBm.

This limit shall apply for any combination of power level and intended antenna assembly.

### 3.1.3. Test Method

(1) Connected the antenna port to the OSP of MTS-8310 system, read output power of the transmitter. (As below).



(2) Test conditions refer to chapter 5.4.2.1 of EN 300 328 V2.2.2 .

(3) Test method refer to chapter 5.4.2.2.1.2 of EN 300 328 V2.2.2 .

### 3.1.4. Test Information

|                                                      |                        |
|------------------------------------------------------|------------------------|
| EUT: Multifunctional LED controller for chain stores |                        |
| M/N: BV-M3200                                        |                        |
| Test Date: 2022.03.09                                | Tested by: Bing.He     |
| Ambient Temperature: 23°C                            | Relative Humidity: 54% |

### 3.1.5. Test Results

| Test mode: TX                    |                 |                | Test result: Pass |        |
|----------------------------------|-----------------|----------------|-------------------|--------|
| Test condition                   | Frequency (MHz) | Max EIRP (dBm) | Limit (dBm)       | Result |
| Normal<br>T: 23°C<br>V: AC 230V  | 2405            | 7.89           | 20                | Pass   |
|                                  | 2440            | 7.01           |                   | Pass   |
|                                  | 2480            | 7.66           |                   | Pass   |
| Extreme<br>T: 0°C<br>V: AC 230V  | 2405            | 7.81           |                   | Pass   |
|                                  | 2440            | 7.11           |                   | Pass   |
|                                  | 2480            | 7.61           |                   | Pass   |
| Extreme<br>T: 45°C<br>V: AC 230V | 2405            | 7.89           |                   | Pass   |
|                                  | 2440            | 7.01           |                   | Pass   |
|                                  | 2480            | 7.66           |                   | Pass   |

### 3.2. Power Spectral Density

#### 3.2.1. Test Equipment

| Equipment                          | Manufacturer    | Model No.   | Serial No. | Last Cal.   | Cal. Interval |
|------------------------------------|-----------------|-------------|------------|-------------|---------------|
| Spectrum                           | Rohde & Schwarz | FSV         | 103559     | Dec 06,2021 | 1 Year        |
| Vector signal source               | Agilent         | N5182A      | MY47420382 | Dec 06,2021 | 1 Year        |
| Analog signal source               | Rohde & Schwarz | SMB 100A    | 179706     | Dec 06,2021 | 1 Year        |
| Comprehensive measuring instrument | Rohde & Schwarz | CMW 500     | 158242     | Dec 06,2021 | 1 Year        |
| control unit                       | MWRF            | MW100-RFC B | 10165      | Dec 06,2021 | 1 Year        |
| Testing software                   | SKET            | MTS-8310    | 10165      | Dec 06,2021 | 1 Year        |

N/A is an abbreviation for Not Applicable.

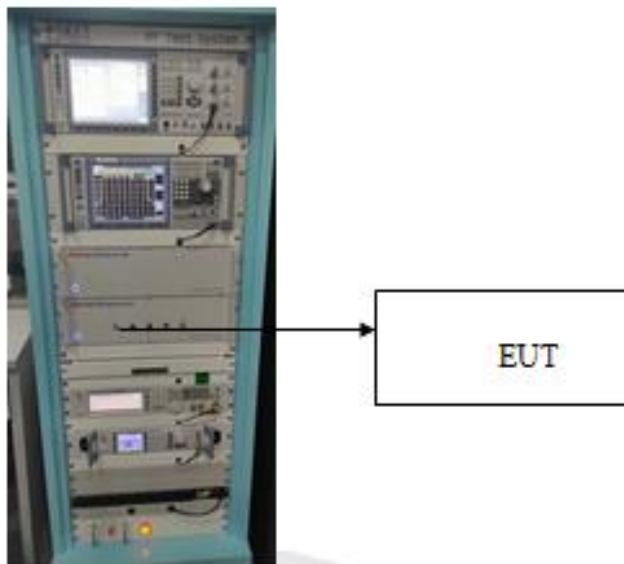
#### 3.2.2. Limit (ETSI EN 300 328 V2.2.2 (2019-07) )

Refer to chapter 4.3.2.3 of EN 300 328 V2.2.2 .

For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to 10 dBm per MHz.

### 3.2.3. Test Method

(1) Connected the antenna port to the OSP of MTS-8310 system, read output power of the transmitter. (As below).



- (2) Configure EUT work in TX operation mode.
- (3) Test conditions refer to chapter 5.4.3.1 of EN 300 328 V2.2.2 .
- (4) Test method refer to chapter 5.4.3.2.1 of EN 300 328 V2.2.2 .



## 3.2.4. Test Information

|                                                      |                        |
|------------------------------------------------------|------------------------|
| EUT: Multifunctional LED controller for chain stores |                        |
| M/N: BV-M3200                                        |                        |
| Test Date: 2022.03.09                                | Tested by: Bing.He     |
| Ambient Temperature: 23℃                             | Relative Humidity: 54% |

## 3.2.5. Test Results

| Test mode: TX     |                 |             |             |        |
|-------------------|-----------------|-------------|-------------|--------|
| Test result: Pass |                 |             |             |        |
| Test Mode         | Frequency (MHz) | Level (dBm) | Limit (dBm) | Result |
| TX                | 2405            | 5.69        | 10          | Pass   |
|                   | 2440            | 6.01        |             | Pass   |
|                   | 2480            | 5.87        |             | Pass   |

### 3.3.Duty Cycle ,Tx-Sequence, Tx-gap

N/A (Not Applicable)

These requirements apply to non-adaptive equipment or to adaptive equipment when operating in a non-adaptive mode. The equipment is using wide band modulations other than FHSS.

These requirements do not apply for equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.



### 3.4. Accumulated Transmit Time, Frequency Occupation and Hopping

#### Sequence

N/A (Not Applicable)  
Only for FHSS equipment.



### 3.5. Medium Utilization (MU) factor

N/A (Not Applicable)

This requirement does not apply to adaptive equipment unless operating in a non-adaptive mode.

In addition, this requirement does not apply for equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.

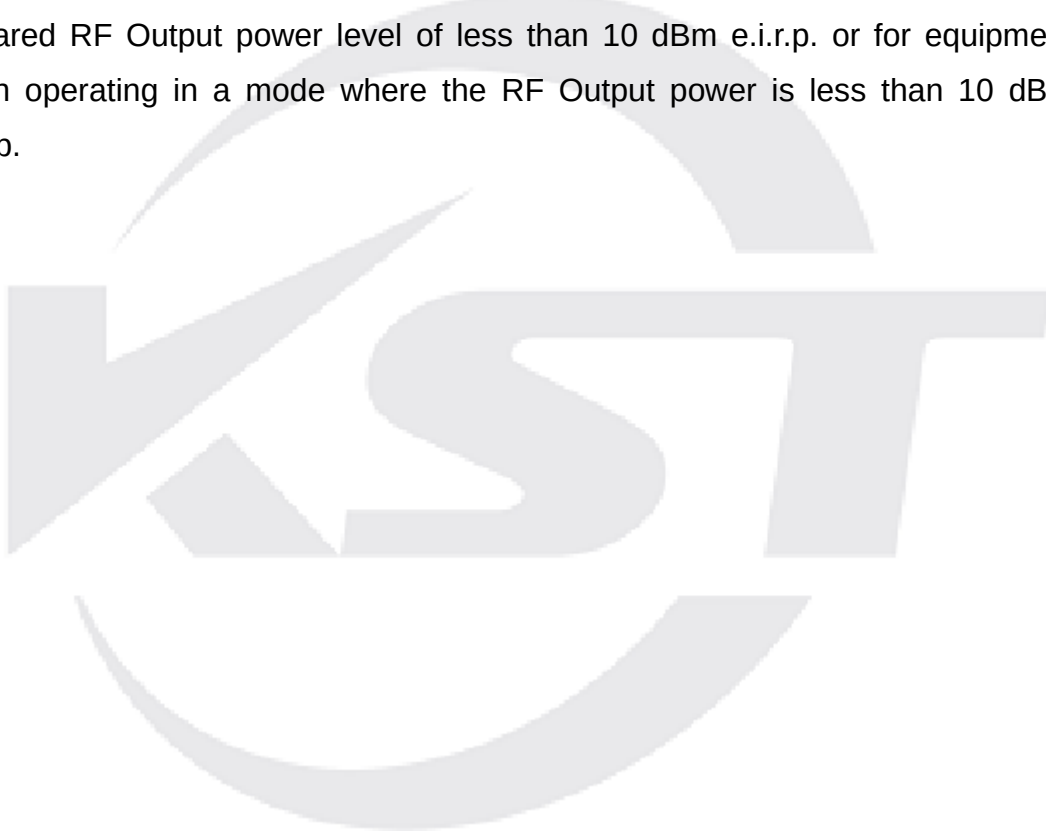


### 3.6.Adaptivity

N/A (Not Applicable)

This requirement does not apply to non-adaptive equipment or adaptive equipment operating in a non-adaptive mode providing the equipment complies with the requirements and/or restrictions applicable to non-adaptive equipment.

In addition, this requirement does not apply for equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.



### 3.7.Occupied Channel Bandwidth

#### 3.7.1.Test Equipment

| Equipment                                  | Manufacturer    | Model No.   | Serial No. | Last Cal.   | Cal. Interval |
|--------------------------------------------|-----------------|-------------|------------|-------------|---------------|
| Spectrum                                   | Rohde & Schwarz | FSV         | 103559     | Dec 06,2021 | 1 Year        |
| Vector signal source                       | Agilent         | N5182A      | MY47420382 | Dec 06,2021 | 1 Year        |
| Analog signal source                       | Rohde & Schwarz | SMB 100A    | 179706     | Dec 06,2021 | 1 Year        |
| Comprehensive measuring instrument         | Rohde & Schwarz | CMW 500     | 158242     | Dec 06,2021 | 1 Year        |
| control unit                               | MWRF            | MW100-RFC B | 10165      | Dec 06,2021 | 1 Year        |
| Testing software                           | SKET            | MTS-8310    | 10165      | Dec 06,2021 | 1 Year        |
| N/A is an abbreviation for Not Applicable. |                 |             |            |             |               |

#### 3.7.2.Limit (ETSI EN 300 328 V2.2.2 (2019-07))

Refer to chapter 4.3.2.7 of EN 300 328 V2.2.2 .

This requirement applies to all types of equipment using wide band modulations other than FHSS.

The Occupied Channel Bandwidth is the bandwidth that contains 99 % of the power of the signal.

The Occupied Channel Bandwidth shall fall completely within the band given in table 1.

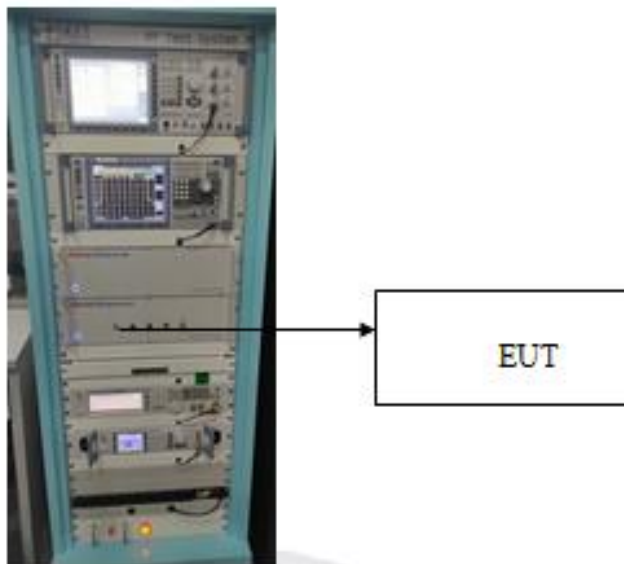
In addition, for non-adaptive equipment using wide band modulations other than FHSS and with e.i.r.p. greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

**Table 1: Service frequency bands**

|          | Service frequency bands  |
|----------|--------------------------|
| Transmit | 2 400 MHz to 2 483,5 MHz |
| Receive  | 2 400 MHz to 2 483,5 MHz |

### 3.7.3. Test method

- (1) Connected the antenna port to the OSP of MTS-8310 system, read output power of the transmitter. (As below).



- (2) Configure EUT work in lowest and highest TX frequency.
- (3) Test conditions refer to chapter 5.4.7.1 of EN 300 328 V2.2.2 .
- (4) Test method refer to chapter 5.4.7.2.1 of EN 300 328 V2.2.2 .

## 3.7.4. Test Information

|                                                      |                        |
|------------------------------------------------------|------------------------|
| EUT: Multifunctional LED controller for chain stores |                        |
| M/N: BV-M3200                                        |                        |
| Test Date: 2022.03.07                                | Tested by: Bing.He     |
| Ambient Temperature: 23°C                            | Relative Humidity: 54% |

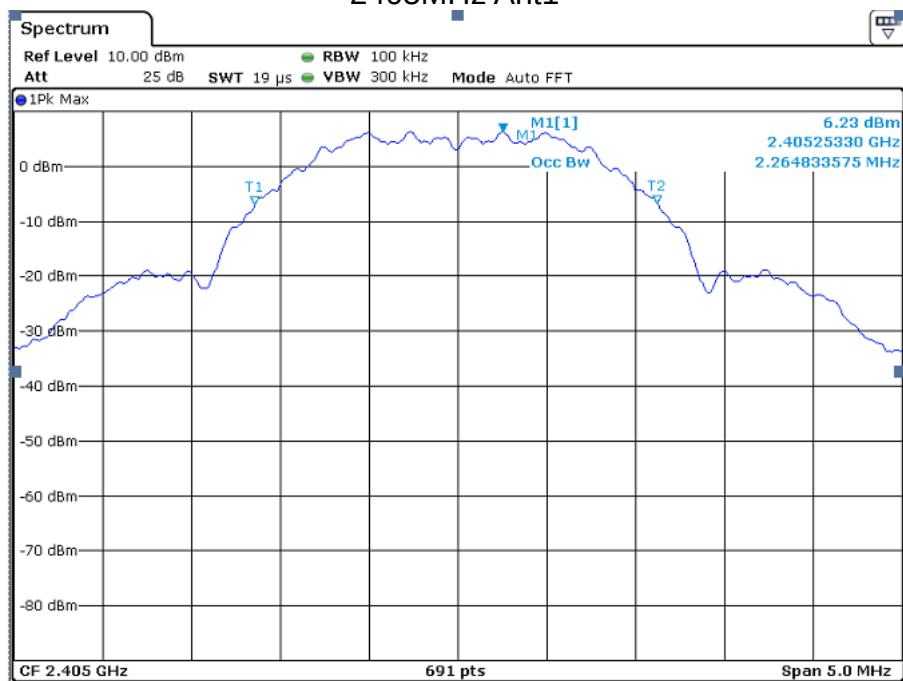
## 3.7.5. Test Results

| Frequency (MHz) | Antenna | Center Frequency (MHz) | OBW (MHz) | Limit OBW (MHz)  | Verdict |
|-----------------|---------|------------------------|-----------|------------------|---------|
| 2405            | Ant1    | 2405.253               | 2.265     | 2400 - 2483.5MHz | Pass    |
| 2440            | Ant1    | 2439.732               | 2.258     | 2400 - 2483.5MHz | Pass    |
| 2480            | Ant1    | 2479.739               | 2.265     | 2400 - 2483.5MHz | Pass    |

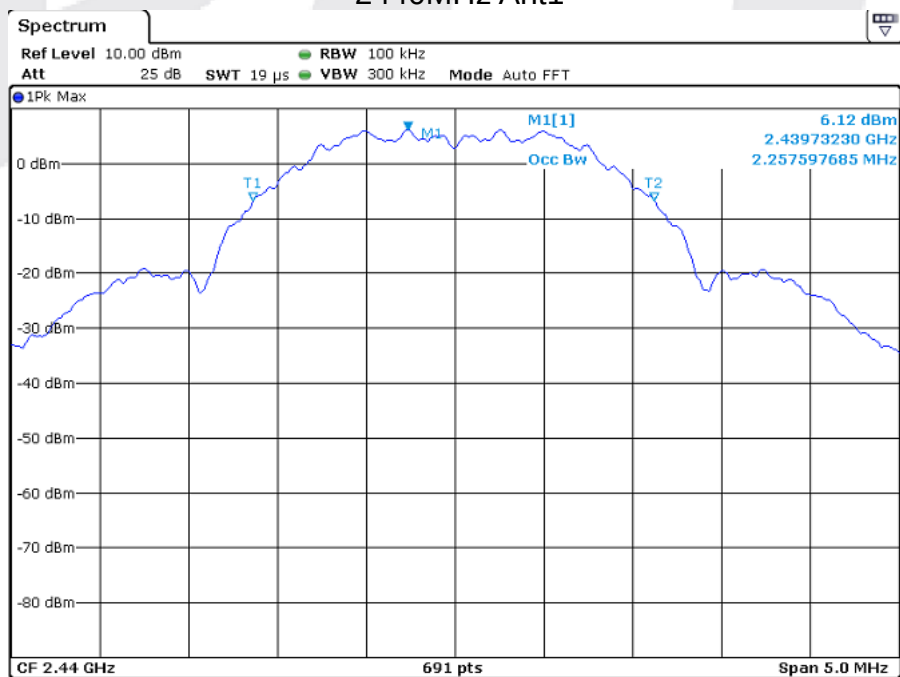


### 3.7.6.Original test data

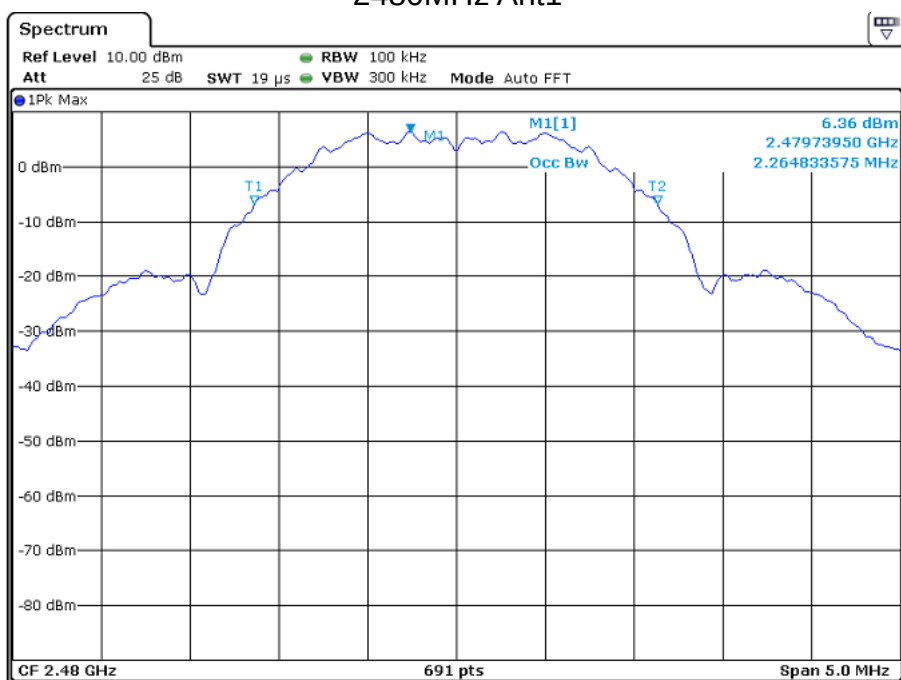
2405MHz Ant1



2440MHz Ant1



## 2480MHz Ant1



### 3.8. Transmitter unwanted emissions in the out-of-band domain

#### 3.8.1. Test Equipment

| Equipment                          | Manufacturer    | Model No.   | Serial No. | Last Cal.   | Cal. Interval |
|------------------------------------|-----------------|-------------|------------|-------------|---------------|
| Spectrum                           | Rohde & Schwarz | FSV         | 103559     | Dec 06,2021 | 1 Year        |
| Vector signal source               | Agilent         | N5182A      | MY47420382 | Dec 06,2021 | 1 Year        |
| Analog signal source               | Rohde & Schwarz | SMB 100A    | 179706     | Dec 06,2021 | 1 Year        |
| Comprehensive measuring instrument | Rohde & Schwarz | CMW 500     | 158242     | Dec 06,2021 | 1 Year        |
| control unit                       | MWRF            | MW100-RFC B | 10165      | Dec 06,2021 | 1 Year        |
| Testing software                   | SKET            | MTS-8310    | 10165      | Dec 06,2021 | 1 Year        |

N/A is an abbreviation for Not Applicable.

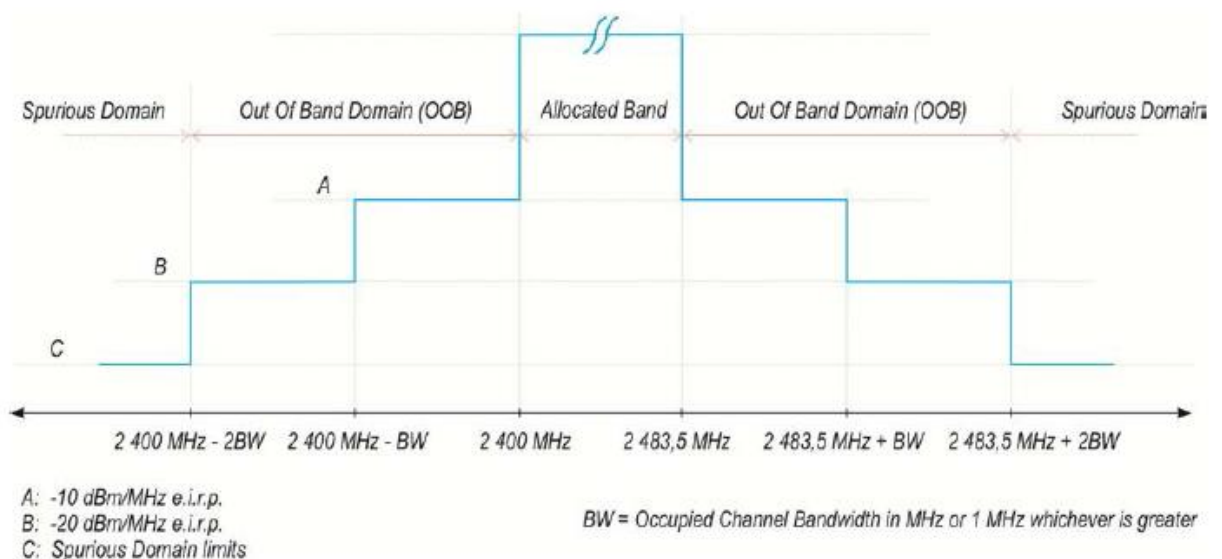
#### 3.8.2. Limit ((ETSI EN 300 328 V2.2.2 (2019-07))

Refer to chapter 4.3.2.8 of EN 300 328 V2.2.2 .

This requirement applies to all types of equipment using wide band modulations other than FHSS.

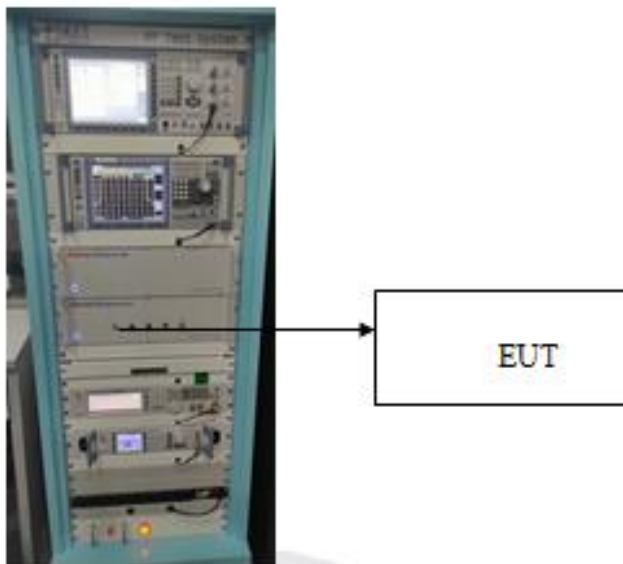
Transmitter unwanted emissions in the out-of-band domain are emissions when the equipment is in Transmit mode, on frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask as follow:



### 3.8.3. Test method

- (1) Connected the antenna port to the OSP of MTS-8310 system, read output power of the transmitter. (As below)



- (2) Configure EUT work in TX mode.
- (3) Test conditions refer to chapter 5.4.8.1 of EN 300 328 V2.2.2 .
- (4) Test method refer to chapter 5.4.8.2.1 of EN 300 328 V2.2.2 .

## 3.8.4. Test Information

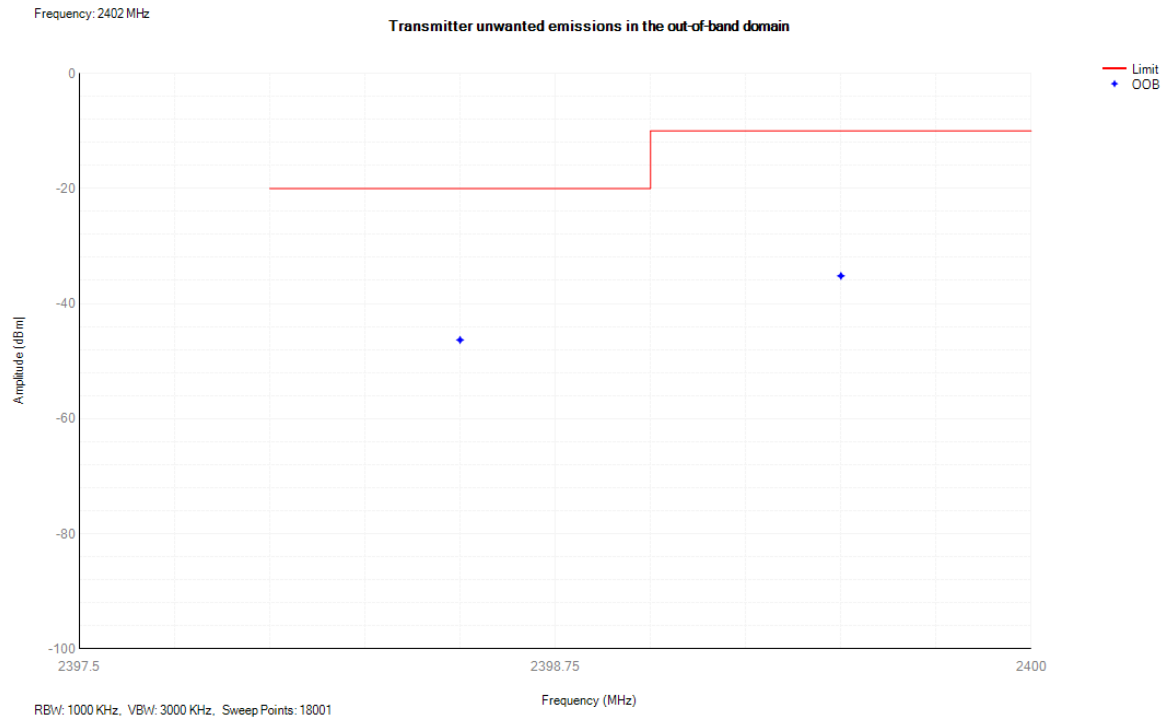
|                                                      |                        |
|------------------------------------------------------|------------------------|
| EUT: Multifunctional LED controller for chain stores |                        |
| M/N: BV-M3200                                        |                        |
| Test Date: 2022.03.07                                | Tested by: Bing.He     |
| Ambient Temperature: 23°C                            | Relative Humidity: 54% |

## 3.8.5. Test Results

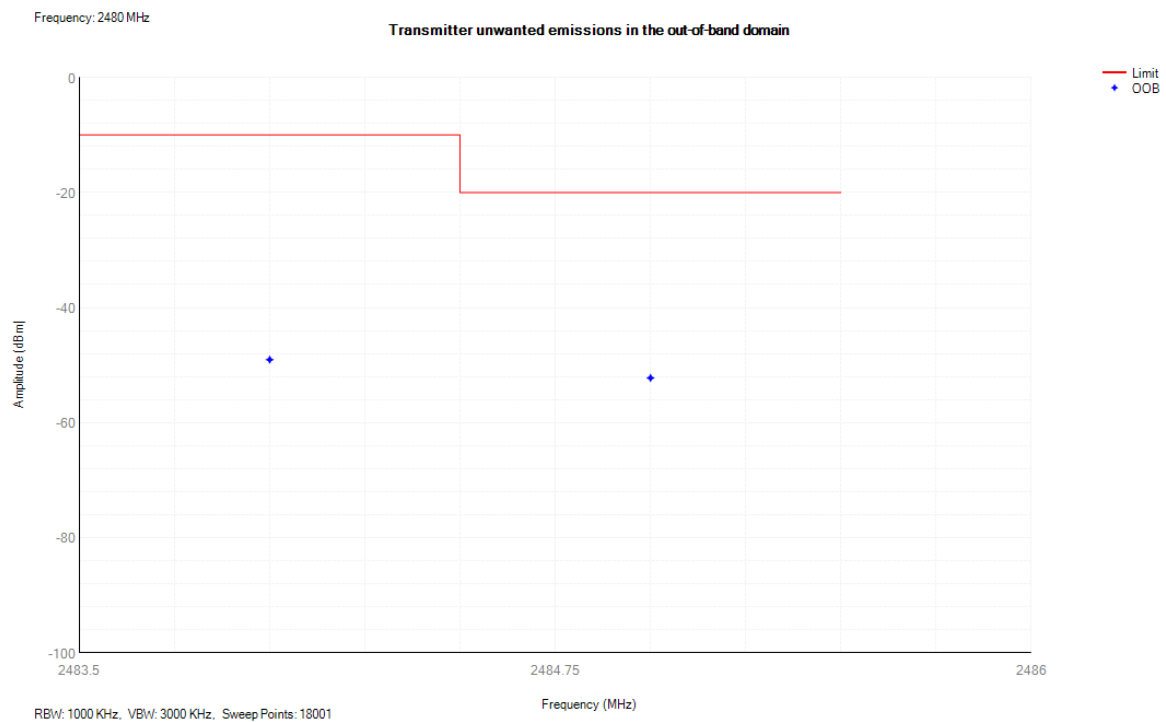
| Condition | Mode | Frequency (MHz) | Antenna | OOB Frequency (MHz) | Level (dBm/MHz) | Limit (dBm/MHz) | Verdict |
|-----------|------|-----------------|---------|---------------------|-----------------|-----------------|---------|
| NVNT      | TX   | 2405            | Ant1    | 2399.5              | -35.22          | -10             | Pass    |
| NVNT      | TX   | 2405            | Ant1    | 2398.5              | -46.35          | -20             | Pass    |
| NVNT      | TX   | 2480            | Ant1    | 2484                | -49.04          | -10             | Pass    |
| NVNT      | TX   | 2480            | Ant1    | 2485                | -52.19          | -20             | Pass    |

### 3.8.6.Original test data

#### Tx. Emissions OOB NVNT BLE 1M 2405MHz Ant1



#### Tx. Emissions OOB NVNT BLE 1M 2480MHz Ant1



### 3.9. Transmitter unwanted emissions in the spurious domain

#### 3.9.1. Test Equipment

| Equipment                 | Manufacturer | Model No.          | Serial No. | Cal. Date   | Cal. Interval |
|---------------------------|--------------|--------------------|------------|-------------|---------------|
| Spectrum analyzer         | R&S          | FSV30              | 103559     | Dec 06,2021 | 1 year        |
| Trilog-boardband antenna  | Schwarzbeck  | VULB 9163D         | 9163-971   | Dec 06,2021 | 3 years       |
| Horn antenna              | Schwarzbeck  | BBHA 9120D         | 9120D-1590 | Dec 06,2021 | 3 years       |
| Horn antenna              | ETS          | 3160-09            | 00208373   | Dec 06,2021 | 3 years       |
| Pre-amplifier (Low Freq)  | Claviio      | BDLNA-000 1-272007 | 1600015    | Dec 06,2021 | 3 years       |
| Pre-amplifier (High Freq) | Claviio      | BDLNA-011 8-352810 | 1600019    | Dec 06,2021 | 3 years       |
| Pre-amplifier (High Freq) | Claviio      | BDLNA-182 6-483105 | 1600013    | Dec 06,2021 | 3 years       |

#### 3.9.2. Limit (ETSI EN 300 328 V2.2.2 (2019-07))

Refer to chapter 4.3.2.9 of EN 300 328 V2.2.2 .

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 12.

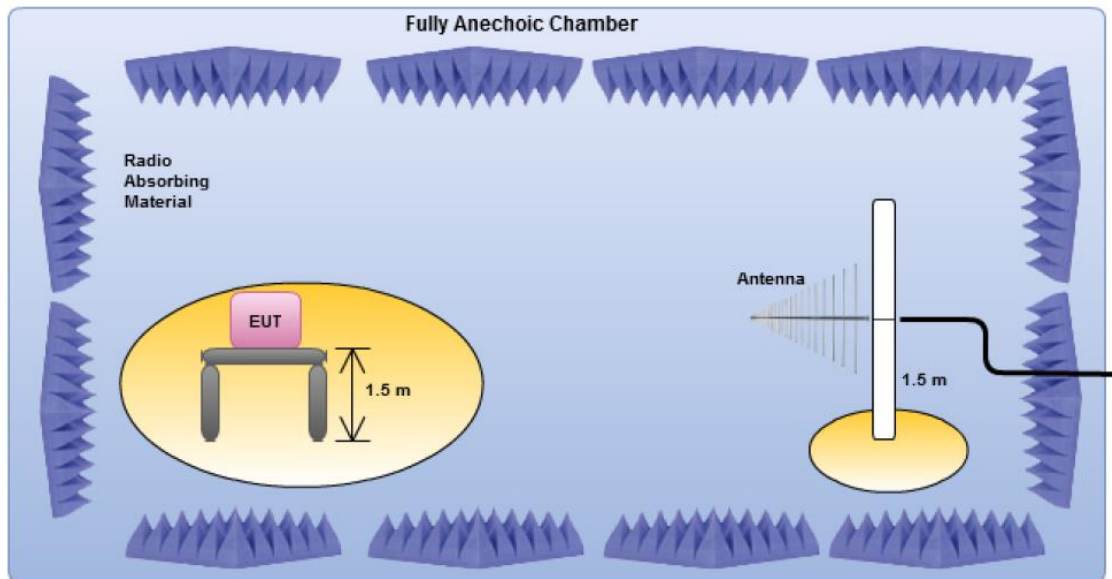
In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

**Table 12: Transmitter limits for spurious emissions**

| Frequency range     | Maximum power | Bandwidth |
|---------------------|---------------|-----------|
| 30 MHz to 47 MHz    | -36 dBm       | 100 kHz   |
| 47 MHz to 74 MHz    | -54 dBm       | 100 kHz   |
| 74 MHz to 87,5 MHz  | -36 dBm       | 100 kHz   |
| 87,5 MHz to 118 MHz | -54 dBm       | 100 kHz   |
| 118 MHz to 174 MHz  | -36 dBm       | 100 kHz   |
| 174 MHz to 230 MHz  | -54 dBm       | 100 kHz   |
| 230 MHz to 470 MHz  | -36 dBm       | 100 kHz   |
| 470 MHz to 862 MHz  | -54 dBm       | 100 kHz   |
| 862 MHz to 1 GHz    | -36 dBm       | 100 kHz   |
| 1 GHz to 12,75 GHz  | -30 dBm       | 1 MHz     |

### 3.9.3. Test Method

#### (1) Test Setup. (As Below)



(2) Test conditions refer to chapter 5.4.9.1 of EN 300 328 V2.2.2 .

(3) Test method refer to chapter 5.4.9.2.2 of EN 300 328 V2.2.2 .



### 3.9.4. Test Information

|                |                                                 |
|----------------|-------------------------------------------------|
| EUT:           | Multifunctional LED controller for chain stores |
| M/N:           | BV-M3200                                        |
| Test Date:     | 2022.02.28                                      |
| Test standard: | ETSI EN 300 328 V2.2.2 (2019-07)                |
| Test mode:     | BLE(GFSK)                                       |
| Test By:       | Bing.He                                         |

### 3.9.5. Test Results

| 30MHz to 1GHz                                                                                                        |                 |                                |             |            |                    |
|----------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------|-------------|------------|--------------------|
| EUT mode                                                                                                             | Frequency (MHz) | Spurious emissions level (dBm) | Limit (dBm) | Conclusion | Antenna Pole (H/V) |
| TX Mode                                                                                                              | 55.027          | -61.24                         | -54.00      | Pass       | H                  |
|                                                                                                                      | 141.91          | -66.01                         | -54.00      | Pass       | V                  |
| 1、"H" mean is horizontal direction, "V" mean is vertical direction.。<br>2、The worst case has recorded in the report. |                 |                                |             |            |                    |

| Above 1GHz                                                              |                 |                                |             |            |                    |
|-------------------------------------------------------------------------|-----------------|--------------------------------|-------------|------------|--------------------|
| EUT mode                                                                | Frequency (MHz) | Spurious emissions level (dBm) | Limit (dBm) | Conclusion | Antenna Pole (H/V) |
| 2405MHz                                                                 | 4810.00         | -45.67                         | -30.00      | Pass       | H                  |
|                                                                         | 7215.00         | -48.49                         | -30.00      | Pass       | H                  |
|                                                                         | 4810.00         | -45.82                         | -30.00      | Pass       | V                  |
|                                                                         | 7215.00         | -48.41                         | -30.00      | Pass       | V                  |
| 2480MHz                                                                 | 4960.00         | -45.53                         | -30.00      | Pass       | H                  |
|                                                                         | 7440.00         | -45.08                         | -30.00      | Pass       | H                  |
|                                                                         | 4960.00         | -45.68                         | -30.00      | Pass       | V                  |
|                                                                         | 7440.00         | -49.25                         | -30.00      | Pass       | V                  |
| Note: "H" mean is horizontal direction, "V" mean is vertical direction. |                 |                                |             |            |                    |

### 3.10.Receiver Spurious Emissions

#### 3.10.1.Test Equipment

| Equipment                                              | Manufacturer | Model No.         | Serial No. | Last Cal.   | Cal. Interval |
|--------------------------------------------------------|--------------|-------------------|------------|-------------|---------------|
| Spectrum analyzer                                      | R&S          | FSV30             | 103559     | Dec 06,2021 | 1 year        |
| Trilog-boardband antenna                               | Schwarzbeck  | VULB 9163D        | 9163-971   | Dec 06,2021 | 3 years       |
| Horn antenna                                           | Schwarzbeck  | BBHA 9120D        | 9120D-1590 | Dec 06,2021 | 3 years       |
| Horn antenna                                           | ETS          | 3160-09           | 00208373   | Dec 06,2021 | 3 years       |
| Pre-amplifier (Low Freq)                               | Claviio      | BDLNA-0001-272007 | 1600015    | Dec 06,2021 | 3 years       |
| Pre-amplifier (High Freq)                              | Claviio      | BDLNA-0118-352810 | 1600019    | Dec 06,2021 | 3 years       |
| Pre-amplifier (High Freq)                              | Claviio      | BDLNA-1826-483105 | 1600013    | Dec 06,2021 | 3 years       |
| Calibration Lab: CEPREI Calibration and Testing Center |              |                   |            |             |               |

#### 3.10.2.Limit (ETSI EN 300 328 V2.2.2 (2019-07))

Refer to chapter 4.3.2.10 of EN 300 328 V2.2.2 .

This requirement applies to all types of equipment using wide band modulations other than FHSS.

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

The spurious emissions of the receiver shall not exceed the values given in table 13.

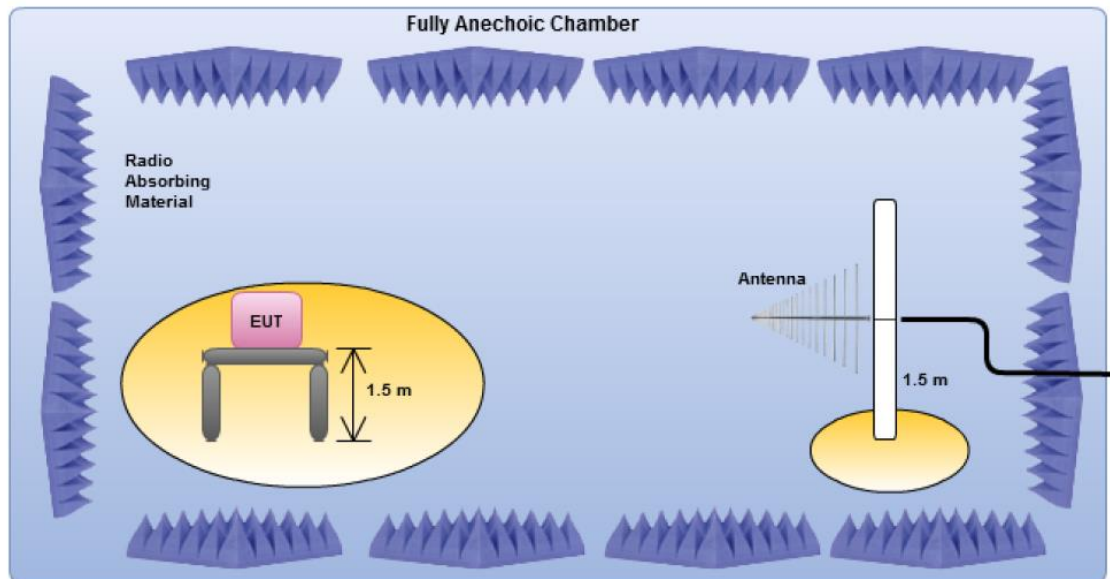
In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or for emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

**Table 13: Spurious emission limits for receivers**

| Frequency range    | Maximum power | Bandwidth |
|--------------------|---------------|-----------|
| 30 MHz to 1 GHz    | -57 dBm       | 100 kHz   |
| 1 GHz to 12,75 GHz | -47 dBm       | 1 MHz     |

### 3.10.3. Test Method

#### (1) Test Setup.(As Below)



(2) Test conditions refer to chapter 5.4.10.1 of EN 300 328 V2.2.2 .

(3) Test method refer to chapter 5.4.10.2.2 of EN 300 328 V2.2.2 .

## 3.10.4. Test Information

|                |                                                 |
|----------------|-------------------------------------------------|
| EUT:           | Multifunctional LED controller for chain stores |
| M/N:           | BV-M3200                                        |
| Test Date:     | 2022.02.28                                      |
| Test standard: | ETSI EN 300 328 V2.2.2 (2019-07)                |
| Test mode:     | BLE(GFSK)                                       |
| Test By:       | Bing.He                                         |

## 3.10.5. Test Results

| EUT mode                                                                                                             | Frequency (MHz) | Spurious emissions level (dBm) | Limit (dBm) | Conclusion | Antenna Pole (H/V) |
|----------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------|-------------|------------|--------------------|
| RX Mode                                                                                                              | 45.88           | -67.99                         | -57.00      | Pass       | H                  |
|                                                                                                                      | 1450.11         | -56.29                         | -47.00      | Pass       | H                  |
|                                                                                                                      | 99.18           | -64.78                         | -57.00      | Pass       | V                  |
|                                                                                                                      | 1901.66         | -59.00                         | -47.00      | Pass       | V                  |
| 1、“H” mean is horizontal direction, “V” mean is vertical direction.。<br>2、The worst case has recorded in the report. |                 |                                |             |            |                    |

### 3.11.Receiver Blocking

#### 3.11.1.Test Equipment

| Equipment                                  | Manufacturer    | Model No.   | Serial No. | Last Cal.   | Cal. Interval |
|--------------------------------------------|-----------------|-------------|------------|-------------|---------------|
| Spectrum                                   | Rohde & Schwarz | FSV         | 103559     | Dec 06,2021 | 1 Year        |
| Vector signal source                       | Agilent         | N5182A      | MY47420382 | Dec 06,2021 | 1 Year        |
| Analog signal source                       | Rohde & Schwarz | SMB 100A    | 179706     | Dec 06,2021 | 1 Year        |
| Comprehensive measuring instrument         | Rohde & Schwarz | CMW 500     | 158242     | Dec 06,2021 | 1 Year        |
| control unit                               | MWRF            | MW100-RFC B | 10165      | Dec 06,2021 | 1 Year        |
| Testing software                           | SKET            | MTS-8310    | 10165      | Dec 06,2021 | 1 Year        |
| N/A is an abbreviation for Not Applicable. |                 |             |            |             |               |

#### 3.11.2.Limit (ETSI EN 300 328 V2.2.2 (2019-07))

Refer to chapter 4.3.2.11 of EN 300 328 V2.2.2 .

While maintaining the minimum performance criteria as defined in clause 4.3.2.11.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for the applicable receiver category provided in table 14, table 15 or table 16.

This requirement applies to all receiver categories.

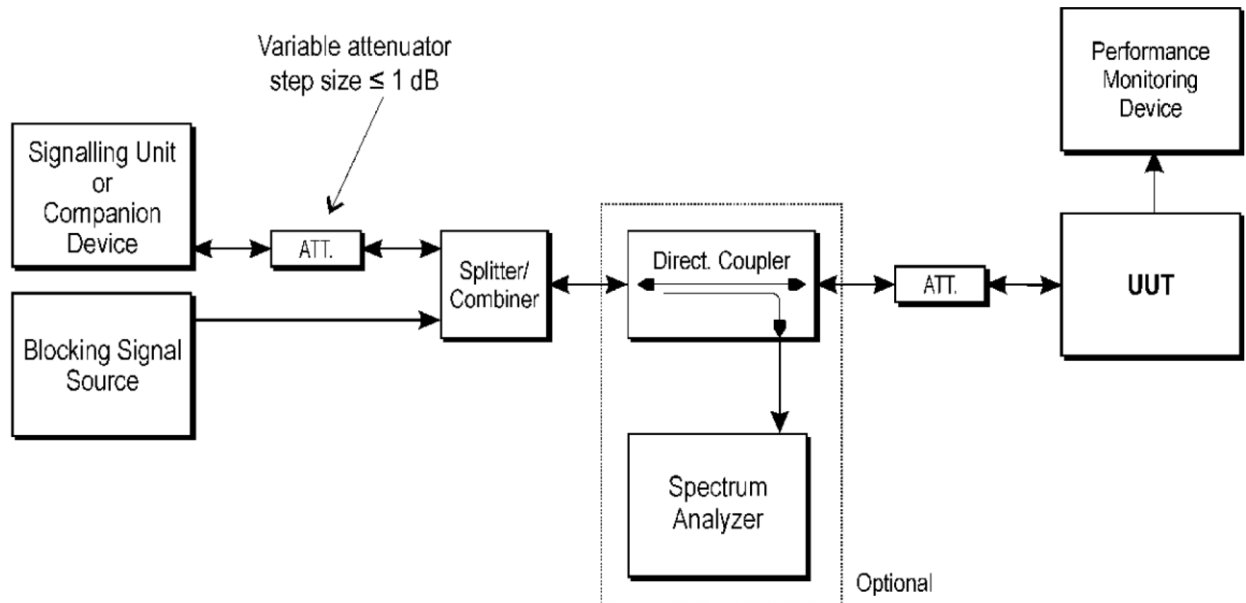
| Receiver Category                                                                                    |                                                                                                                           |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Category 1                                                       | <input type="checkbox"/> Category 2 <input type="checkbox"/> Category 3                                                   |
| Minimum performance criterion                                                                        | <input checked="" type="checkbox"/> PER $\leq$ 10%<br><input type="checkbox"/> Alternative performance criteria(See Note) |
| Note: The manufacturer was declared performance criteria is x% for the intended use of the equipment |                                                                                                                           |

**Table 14: Receiver Blocking parameters for Receiver Category 1 equipment**

| Wanted signal mean power from companion device (dBm)                                                                                                                                           | Blocking signal frequency (MHz)                                | Blocking signal power (dBm) (see note 2) | Type of blocking signal |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------|-------------------------|
| $P_{\min} + 6 \text{ dB}$                                                                                                                                                                      | 2 380<br>2 503,5                                               | -53                                      | CW                      |
| $P_{\min} + 6 \text{ dB}$                                                                                                                                                                      | 2 300<br>2 330<br>2 360                                        | -47                                      | CW                      |
| $P_{\min} + 6 \text{ dB}$                                                                                                                                                                      | 2 523,5<br>2 553,5<br>2 583,5<br>2 613,5<br>2 643,5<br>2 673,5 | -47                                      | CW                      |
| NOTE 1: $P_{\min}$ is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal. |                                                                |                                          |                         |
| NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels have to be corrected by the actual antenna assembly gain.                   |                                                                |                                          |                         |

### 3.11.3. Test Method

#### (1) Test Setup.(As Below)



(2) Test conditions refer to chapter 5.4.11.1 of EN 300 328 V2.2.2 .

(3) Test method refer to chapter 5.4.11.2.1 of EN 300 328 V2.2.2 .

### 3.11.4. Test information

|                |                                                 |
|----------------|-------------------------------------------------|
| EUT:           | Multifunctional LED controller for chain stores |
| M/N:           | BV-M3200                                        |
| Test Date:     | 2022.02.28                                      |
| Test standard: | ETSI EN 300 328 V2.2.2                          |
| Test mode:     | BLE(GFSK) Low Channel and High Channel (Worst)  |
| Test By:       | Bing.He                                         |

### 3.11.5. Test Results

| Test Mode | Frequency (MHz) | Wanted signal mean power from companion device (dBm) | Blocking signal frequency (MHz) | Blocking signal power (dBm) | PER (%) | Limit (%) | Result |
|-----------|-----------------|------------------------------------------------------|---------------------------------|-----------------------------|---------|-----------|--------|
| GFSK      | 2405            | -68                                                  | 2380                            | -34                         | 1.76    | 10.00     | Pass   |
|           |                 |                                                      | 2300                            |                             | 2.05    | 10.00     | Pass   |
|           |                 | -74                                                  | 2330                            |                             | 1.38    | 10.00     | Pass   |
|           |                 |                                                      | 2360                            |                             | 5.79    | 10.00     | Pass   |
|           | 2480            | -68                                                  | 2504                            |                             | 3.37    | 10.00     | Pass   |
|           |                 |                                                      | 2524                            |                             | 2.15    | 10.00     | Pass   |
|           |                 | -74                                                  | 2584                            |                             | 3.46    | 10.00     | Pass   |
|           |                 |                                                      | 2674                            |                             | 3.75    | 10.00     | Pass   |



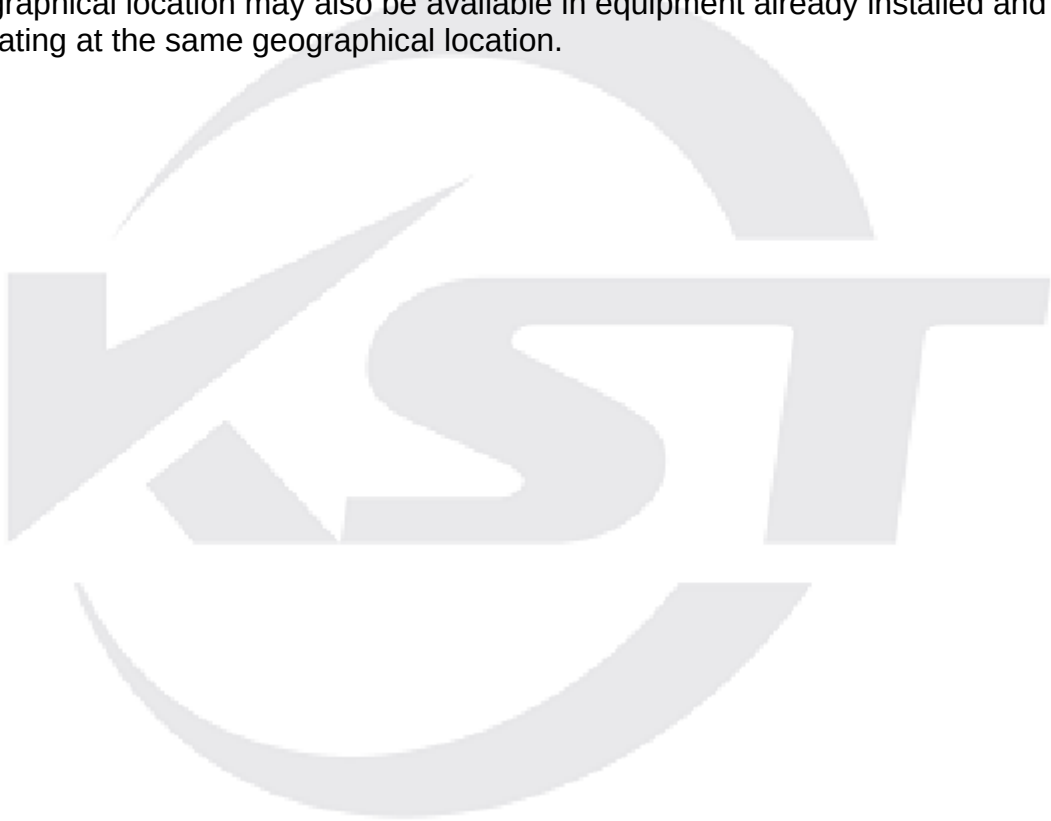
### 3.12.Geo-location capability

N/A (Not Applicable)

This requirement only applies to equipment with geo-location capability.

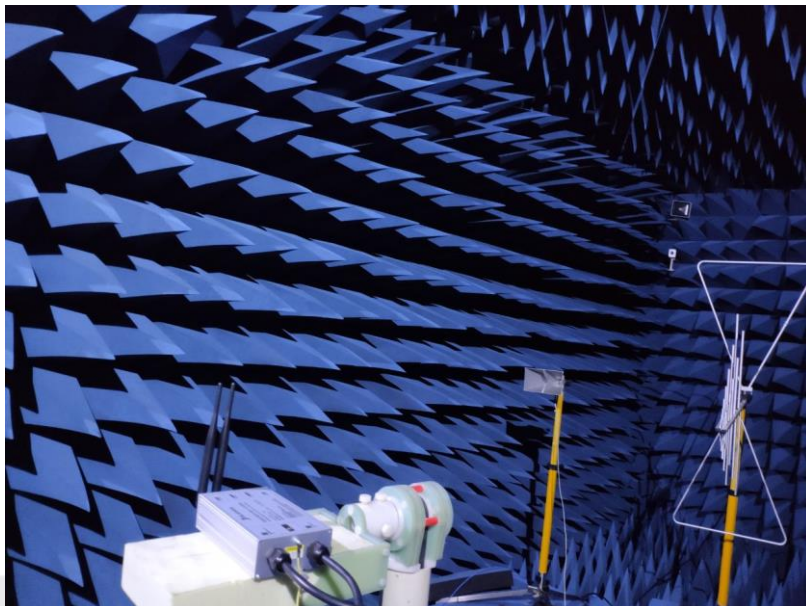
Geo-location capability is a feature of the equipment to determine its geographical location with the purpose to configure itself according to the regulatory requirements applicable at the geographical location where it operates.

The geo-location capability may be present in the equipment or in an external device (temporary) associated with the equipment operating at the same geographical location during the initial power up of the equipment. The geographical location may also be available in equipment already installed and operating at the same geographical location.



## 4. PHOTOGRAPHS OF TEST SETUP

### 4.1. Set-up for Transmitter & Receiver Spurious Emissions, Below 1GHz & Above 1GHz

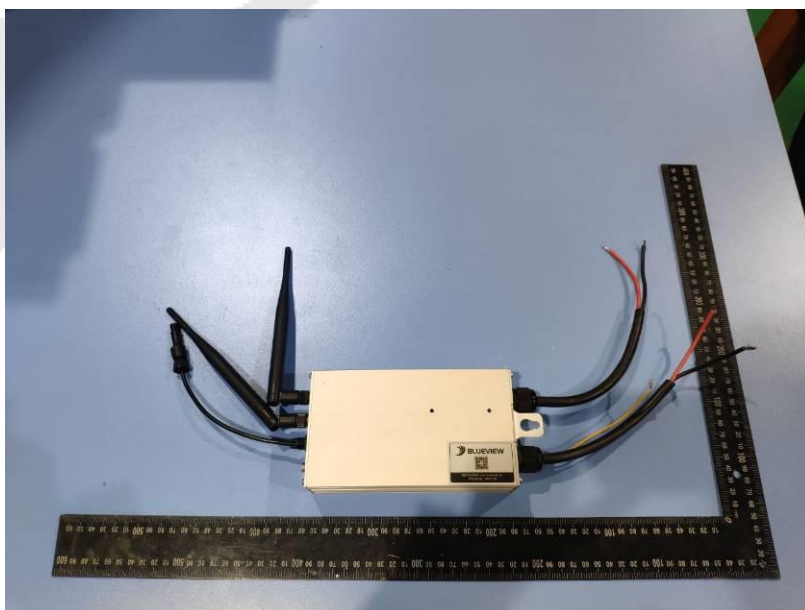
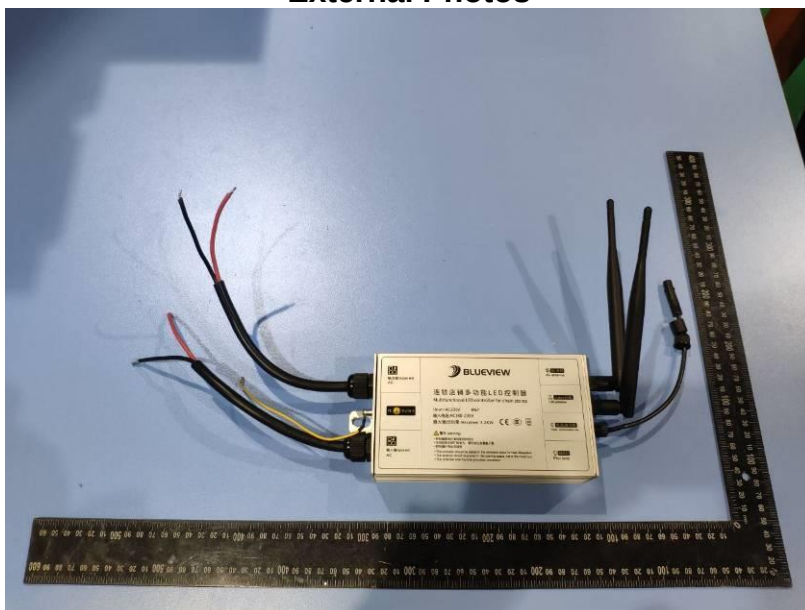


### 4.2. Set-up for Radio Spectrum Testing, Condition



## 5. PHOTOGRAPHS OF EUT

### External Photos



## Internal Photos



..... End of Report .....

# Statement

1. The calibration and measurement of test equipments used in our laboratory are traceable to National primary standard of measurement and BIPM.
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Postcode: 516006

Fax: 0752-3219929

Tel: 0752-3219929

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