# EMC TEST REPORT

| | |
|---|---|
| Equipment | LED Bulb |
| Trademark | [illegible] |
| Model No. | YR-QP01, YR-QP02, YR-QP03, YR-QP04, YR-QP05, YR-QP06 |
| Report No. | CTB200605016EX |
| Applicant | [illegible] |
| Manufacturer | [illegible] |
| Prepared by | Shenzhen CTB Testing Technology Co., Ltd.<br>Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China<br>Tel: 086-4008-258-12<br>Fax: 086-0755-23208027 |
| Date of Receipt | Jun. 03, 2020 |
| Date of Test(s) | Jun. 04, 2020 ~ Jun. 05, 2020 |
| Date of Issue | Jun. 06, 2020 |
| Test Standard(s) | EN 55015:2013+A1:2015, EN 61547:2009<br>EN 61000-3-2:2014, EN 61000-3-3:2013 |

In the configuration tested, the EUT complied with the standards specified above.

Producer : Lisa Deng , Date : Jun. 06, 2020

Lisa Deng/ Engineer

Signatory : Sherwin Xian , Date : Jun. 06, 2020

Sherwin Xian/ Director

**Note:** The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of CTB. This document may be altered or revised by CTB, personnel only, and shall be noted in the revision of the document.

## Revision History

| Rev. | Issue Date | Revisions | Effect Page | Revised By |
|---|---|---|---|---|
| 0 | Jun. 06, 2020 | Initial Issue | All Page | Sherwin Qian |
| | | | | |

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# 1. TEST SUMMARY

| EN 55015 | | |
|---|---|---|
| **Clause** | **Requirement – Test case** | **Results** |
| 4.2 | Insertion loss | N/A |
| 4.3.1 | Disturbance voltage at mains terminals "*" | Pass |
| 4.3.2 | Disturbance voltage at load terminals | N/A |
| 4.3.3 | Disturbance voltage at control terminals | N/A |
| 4.4.1 | Radiated electromagnetic disturbances (9 kHz to 30 MHz) "*" | Pass |
| 4.4.2 | Radiated electromagnetic disturbances (30 MHz to 300 MHz) "*" | Pass |
| Annex B | Independent method of measurement of radiated emission (CDNE) | N/A |
| EN 61000-3-2 | | |
| **Clause** | **Requirement – Test case** | **Results** |
| 6.1 | Control principle shall be allowed for the application according to the clause 6.1 | N/A |
| 6.2 | Harmonic current emissions "*" | N/A |
| EN 61000-3-3 | | |
| **Clause** | **Requirement – Test case** | **Results** |
| 4 | Voltage changes, voltage fluctuations and flicker "*" | N/A |
| EN 61547 | | |
| **Clause** | **Requirement – Test case** | **Results** |
| 5.2 | Electrostatic discharge | Pass |
| 5.3 | Radio-frequency electromagnetic fields | Pass |
| 5.4 | Power frequency magnetic fields | Pass |
| 5.5 | Fast transients | Pass |
| 5.6 | Injected currents (radio-frequency common mode) | Pass |
| 5.7 | Surges | Pass |
| 5.8 | Voltage dips and short interruptions | Pass |
| Supplementary information: -- | | |

Remark: N/A is abbreviation for Not Applicable.

"*" The test was carried out in all the test modes, only the worst data are list in report.

The test was carried out in all the test modes, only the worst data are list in report.

# 2. GENERAL INFORMATION

## 2.1. Description of EUT

| | |
|---|---|
| Equipment | LED Bulb |
| Trade Mark | Yarrae |
| Model Name | YR-QP01 |
| Serial No. | Not labeled |
| Model Difference | All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: YR-QP01. |
| Normal Voltage | AC 100-240V, 50/60Hz, 7.5W |
| Normal Testing Voltage | AC 230V/50Hz |
| Lamp technology used | ☐ Fluorescent lamp<br>☐ High pressure discharge lamp (HID)<br>☐ Light emitting diode (LED/OLED)<br>☐ Tungsten halogen lamp<br>☐ Incandescent lamp<br>☒ Others: LED Bulb |

Note: The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

Operating condition of EUT

| Test mode | Description |
|---|---|
| 1 | ON |
| 2 | |
| 3 | |
| 4 | |

## 2.2. Test conditions

Temperature: 15-25℃
Relative Humidity: 30-60 %
Atmospheric pressure: 800hPa-1060hPa

## 2.3. Block diagram of EUT configuration

# 3. FACILITIES

## 3.1. Test Facility

**CTB-LAB**

Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China

## 3.2. Test Instruments

Conducted Emission Measurement (Test software: EZ-EMC Ver. EMC-con3A1.1)

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | AMN | ROHDE&SCHWARZ | ESH3-Z5 | 831551852 | 20201030 |
| 2 | Pulse limiter | ROHDE&SCHWARZ | ESH3Z2 | 357881052 | 20201030 |
| 3 | EMI TEST RECEIVER | ROHDE&SCHWARZ | ESCI | 100428/003 | 20201102 |
| 4 | Coaxial cable | ZDECL | Z302S | 18091904 | 20201030 |
| 5 | AAN | Schwarzbeck | NTFM8158 | 183 | 20200506 |

Radiated Emission Measurement (Test software: EZ-EMC Ver. FA-03A2 RE)

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | 2m Triple-Loop Antenna | Daze | ZN30401 | 17014 | 20201102 |
| 2 | TRILOG Broadband Antenna | Schwarzbeck | VULB 9168 | 869 | 20201102 |
| 4 | Amplifier | HP | 8447E | 2945A02747 | 20201101 |
| 5 | EMI TEST RECEIVER | ROHDE&SCHWARZ | ESPI7 | 100362 | 20201101 |
| 6 | Coaxial cable | ETS | RFC-SNS-100 -NMS-80 NI | / | 20201101 |
| 7 | Coaxial cable | ETS | RFC-SNS-100 -NMS-20 NI | / | 20201101 |
| 8 | Coaxial cable | ETS | RFC-SNS-100 -SMS-20 NI | / | 20201101 |
| 9 | Coaxial cable | ETS | RFC-NNS-10 0-NMS-300 NI | / | 20201101 |

Harmonic Current & Voltage Fluctuation and Flicker (Test software: EZ-EMC Ver. FA-03A2 RE)

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Power Analyzer | Laplace Instruments | AC2000A | 311363 | 20201223 |
| 2 | AC Power source | HTEC Instruments | HPF5010 | 633088 | 20201223 |

Electrostatic Discharge Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | ESD Simulator | TESTQ | NSG437 | 329 | 20201030 |

Conducted RF Test

| Item | Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Signal Generator | Agilent | N5182A | MY47420195 | 2020.10.30 |
| 2 | Power Amplifier | AR | 75A 250A | 320289 | 2020.10.30 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Attenuator | EM-Test | ATT6/75 | 320835 | 2020.10.30 |
| 4 | CDN | EM-Test | CDN M2/M3 | 0208-01 | 2020.10.30 |
| 5 | EM-Clamp | EM-Test | EM101 | 35762 | 2020.10.30 |

RF electromagnetic field Test

| Item | Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Signal Generator | Agilent | N5182A | MY47420195 | 2020.10.30 |
| 2 | Log-Bicon Antenna | Schwarzbeck | VULB9161 | 9128ES-128 | 2020.10.30 |
| 3 | Power Amplifier | AR | 150W1000M1 | 342526 | 2020.10.30 |
| 4 | Microwave Horn Antenna | AR | AT4002A | 322279 | 2020.10.30 |
| 5 | Power Amplifier | AR | 25S1G4A | 321116 | 2020.10.30 |

Surge& Electrical Fast Transient/Burst Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Surge& Burst Generator | Lioncel | LSG-545CB | 180602 | 20201030 |
| 2 | Capacitive coupling clamp | Lioncel | EFTC | 18071801 | 20201030 |

Power frequency magnetic field

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Magnetic field generator | Lioncel | PMF-801C-C | 180701 | 20201101 |

Voltage dips and interruptions Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Voltage dip simulator | Lioncel | VDS-1102 | 180902 | 20201030 |

## 4. Measurement uncertainty

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4.

| Test | Parameters | Expanded Uncertainty ($U_{Lab}$) | Expanded Uncertainty ($U_{Cispr}$) |
|---|---|---|---|
| Conducted Emission | Level Accuracy: 150kHz to 30MHz | ±1.22 dB | ±3.6 dB |
| Radiated Emission | Level Accuracy: 30MHz to 1000 MHz | ±3.67 dB | ±5.2 dB |
| Radiated Emission | Level Accuracy: Above 1000MHz | ±4.79 dB | N/A |

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

# 5. Emission

## 5.1. Insertion loss

### 5.1.1. Limit

| Frequency range kHz | Minimum values dB |
|---|---|
| 150 to 160<br>160 to 1 400<br>1 400 to 1 605 | 28<br>28 to 20[a]<br>20 |
| [a] Decreasing linearly with the logarithm of frequency. | |

### 5.1.2. Test setup

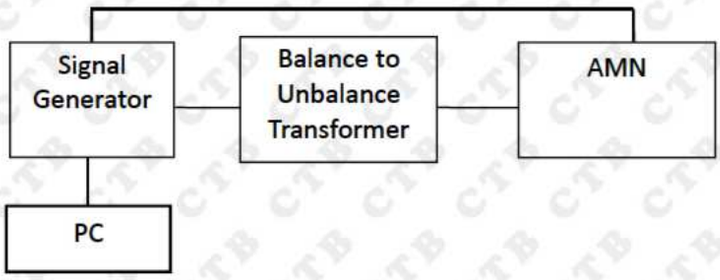



Figure 1

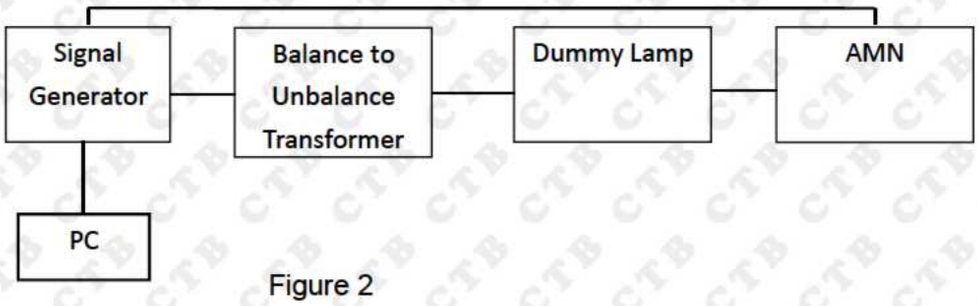



Figure 2

### 5.1.3. Test procedure

Set up and test as shown in Figure 1 and figure 2, and Test results are calculated using test software

**Attention:**

This test applies to fluorescent lamp products, halogen lamps are not applicable.

Both sides of AC line are checked to find out the maximum conducted emission according to the EN55015 regulations during Insertion Loss test.

The bandwidth of the test receiver (R&S ESCS30) is set at 10KHz in 150KHz~1605KHz and 200Hz bandwidth in 9KHz~150KHz.

The frequency range from 150KHz to 1605KHz is checked.

### 5.1.4. Test results

**N/A**

EUT not applicable to this test.

## 5.2. Disturbance voltage

### 5.2.1. Limit

Disturbance voltage limits at mains terminals

| Frequency range | Limits (dBμV) [a] | |
|---|---|---|
| | Quasi-peak | Average |
| 9KHz to 50KHz | 110 | -- |
| 50KHz to 150KHz | 90 ~ 80[b] | -- |
| 150KHz to 0.5MHz | 66 ~ 56[b] | 56 ~ 46[b] |
| 0.5MHz to 5MHz | 56 [c] | 46[c] |
| 5.0MHz to 30MHz | 60 | 50 |

[a] At the transition frequency, the lower limit applies.

[b] The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.

[c] For electrodeless lamps and luminaires, the limit in the frequency range of 2,51 MHz to 3,0 MHz is 73 dB(μV)

Disturbance voltage limits at control terminals

| Frequency range MHz | Limits (dBμV) [a] | |
|---|---|---|
| | Quasi-peak | Average |
| 0,15 to 0,5 | 80 | 70 |
| 0,5 to 30 | 74 | 64 |

[a] At the transition frequency, the lower limit applies.

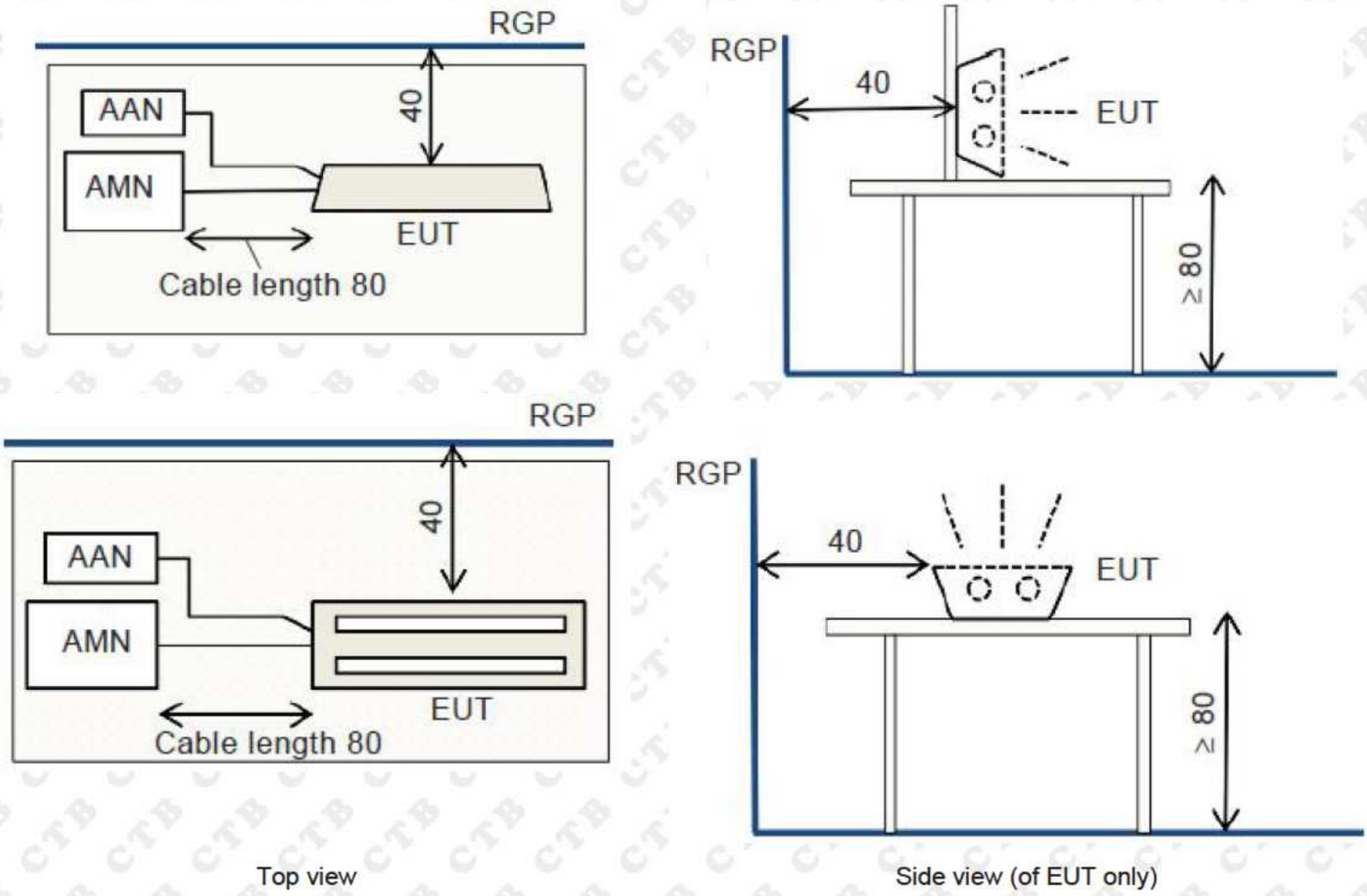
Disturbance voltage limits at control terminals

| Frequency range MHz | Limits (dBμV) [a] | |
|---|---|---|
| | Quasi-peak | Average |
| 0,15 to 0,5 | 80 to 74 | 74 to 64 |
| 0,5 to 30 | 74 | 64 |

NOTE 1 The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.

NOTE 2 The voltage disturbance limits are derived for use with an Asymmetric Artificial Network (AAN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the control terminal.

5.2.2. Block diagram of test setup




Top view

Side view (of EUT only)

5.2.3. Test procedure

Measurement was performed in shielded room, and instruments used were followed CISPR 16-2-1 clause7.

Detailed test procedure was following clause 7 of CISPR 16-2-1.

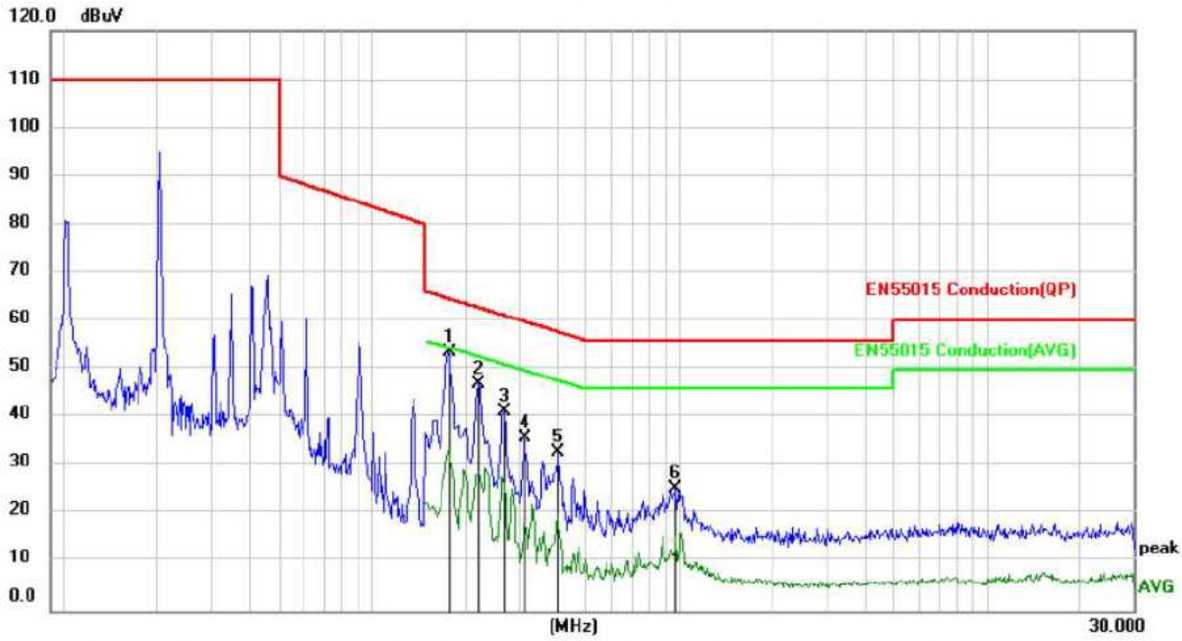
Frequency range 9kHz to 30MHz was checked and EMI receiver measurement bandwidth was set to 200Hz (9 to 150kHz), 9kHz (150kHz to 30MHz).

5.2.4. Test results

**PASS**

Please refer to the following page.

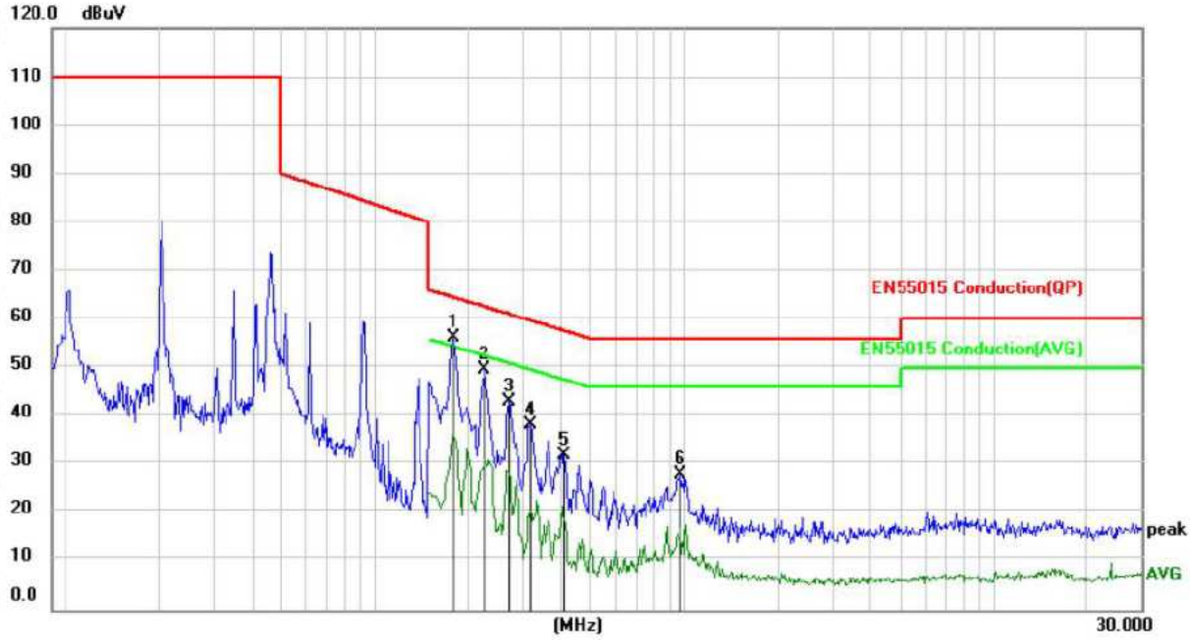
Phase: L




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.1781 | 43.41 | 10.21 | 53.62 | 64.57 | -10.95 | peak |
| 2 | | 0.2221 | 36.67 | 10.21 | 46.88 | 62.74 | -15.86 | peak |
| 3 | | 0.2701 | 31.03 | 10.17 | 41.20 | 61.11 | -19.91 | peak |
| 4 | | 0.3141 | 25.72 | 10.15 | 35.87 | 59.86 | -23.99 | peak |
| 5 | | 0.4061 | 22.66 | 10.10 | 32.76 | 57.73 | -24.97 | peak |
| 6 | | 0.9741 | 15.20 | 10.22 | 25.42 | 56.00 | -30.58 | peak |

Note: Result=Reading + Factor
Over Limit=Result - Limit

Phase: N




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.1781 | 46.13 | 10.21 | 56.34 | 64.57 | -8.23 | peak |
| 2 | | 0.2261 | 39.54 | 10.20 | 49.74 | 62.59 | -12.85 | peak |
| 3 | | 0.2701 | 32.79 | 10.17 | 42.96 | 61.11 | -18.15 | peak |
| 4 | | 0.3181 | 28.01 | 10.15 | 38.16 | 59.76 | -21.60 | peak |
| 5 | | 0.4101 | 21.90 | 10.10 | 32.00 | 57.65 | -25.65 | peak |
| 6 | | 0.9741 | 17.90 | 10.22 | 28.12 | 56.00 | -27.88 | peak |

Note: Result=Reading + Factor
Over Limit=Result – Limit

## 5.3. Radiated electromagnetic disturbances (9KHz to 30MHz)

### 5.3.1. Limit

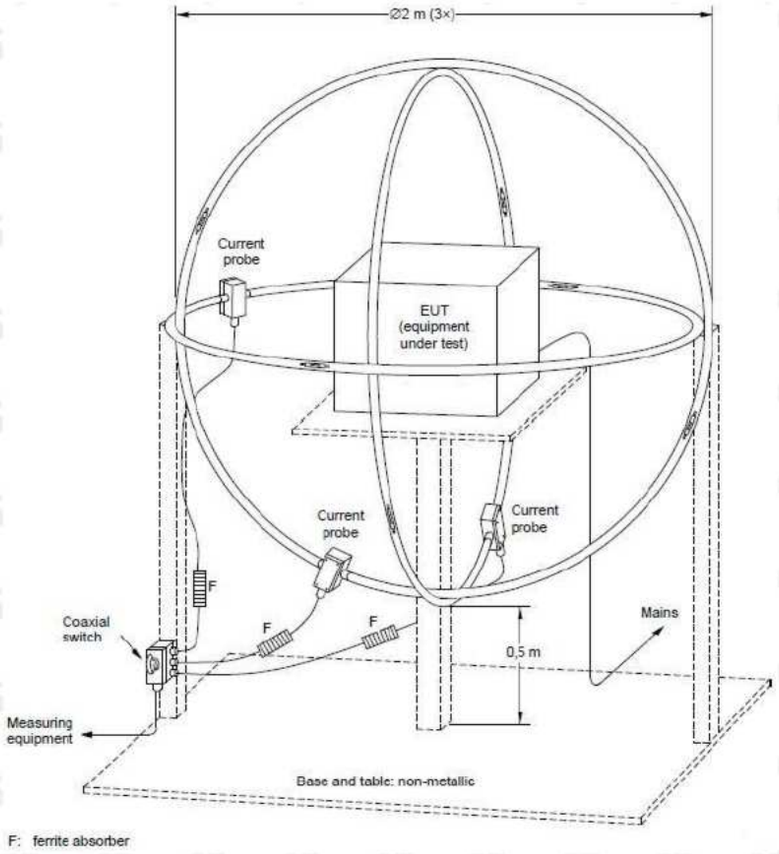
Radiated disturbance limits in the frequency range 9 kHz to 30 MHz

| Frequency range MHz | Limits for loop diameter (dBμA)[a] |
|---|---|
| | 2m |
| 9KHz to 70KHz | 88 |
| 70KHz to 150KHz | 88 ~ 58[b] |
| 150KHz to 3.0MHz | 58 ~ 22[b] |
| 3.0MHz to 30MHz | 22 |

[a] At the transition frequency, the lower limit applies.

[b] Decreasing linearly with the logarithm of the frequency. For electrodeless lamps and luminaires, the limit in the frequency range of 2,2MHz to 3,0MHz is 58dB(dBμA) for 2m.

### 5.3.2. Block diagram of test setup




F: ferrite absorber

### 5.3.3. Test procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three axes of X Y Z are tested by coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S test receiver ESCI) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

### 5.3.4. Test results

**PASS**

The peak value is too low against the limit, so the Test data is not record.

## 5.4. Radiated electromagnetic disturbances (30MHz to 300MHz)

### 5.4.1. Limit

| Frequency range MHz | Quai-peak limits (dBμV/m)[a] |
|---|---|
| | 3m [b, c] |
| 30 to 230 | 40 |
| 230 to 300 | 47 |

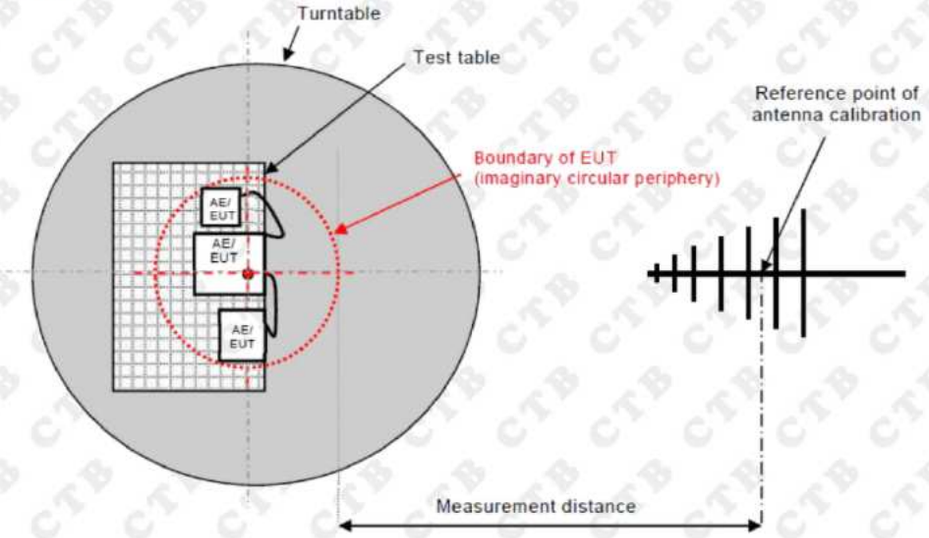
[a] At the transition frequency, the lower limit applies.

[b] Either of the two measurement distances and the associated limits can be applied to demonstrate compliance.

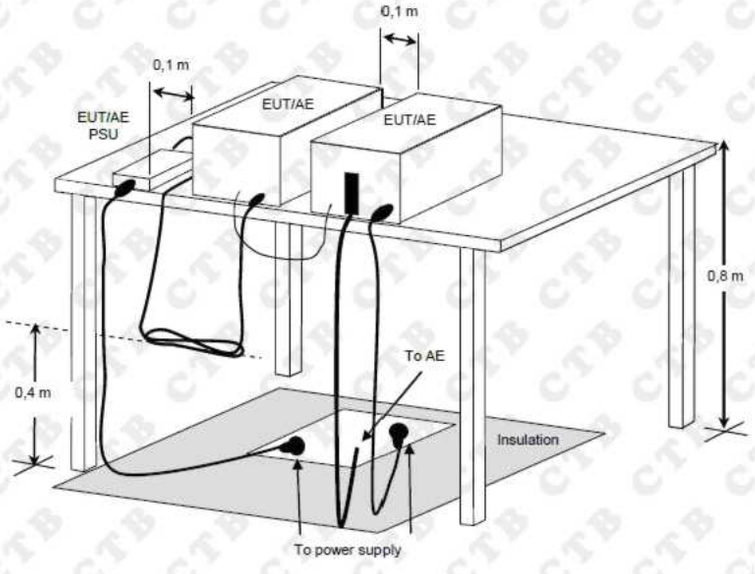
[c] Care should be taken when measuring a large EUT at 3 m and at frequencies near 30 MHz due to near field effects

### 5.4.2. Block diagram of test setup

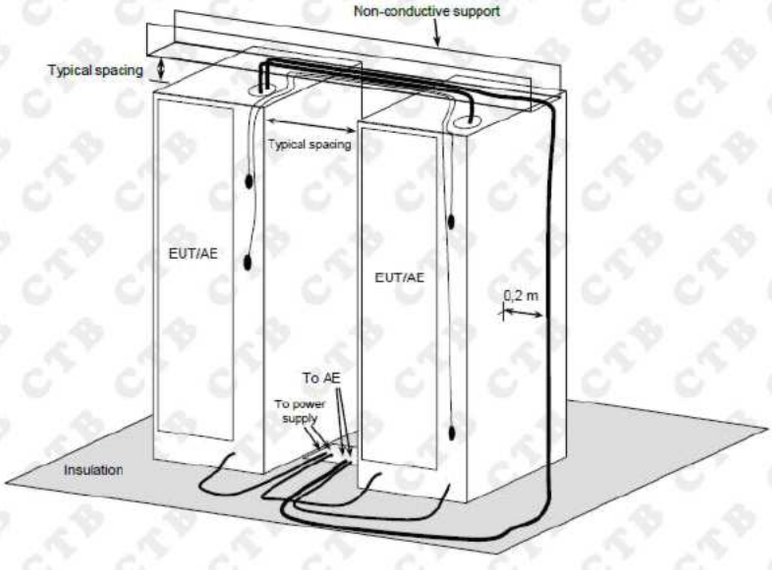
Measurement distance




For table-top equipment




For floor standing equipment



### 5.4.3. Test procedure

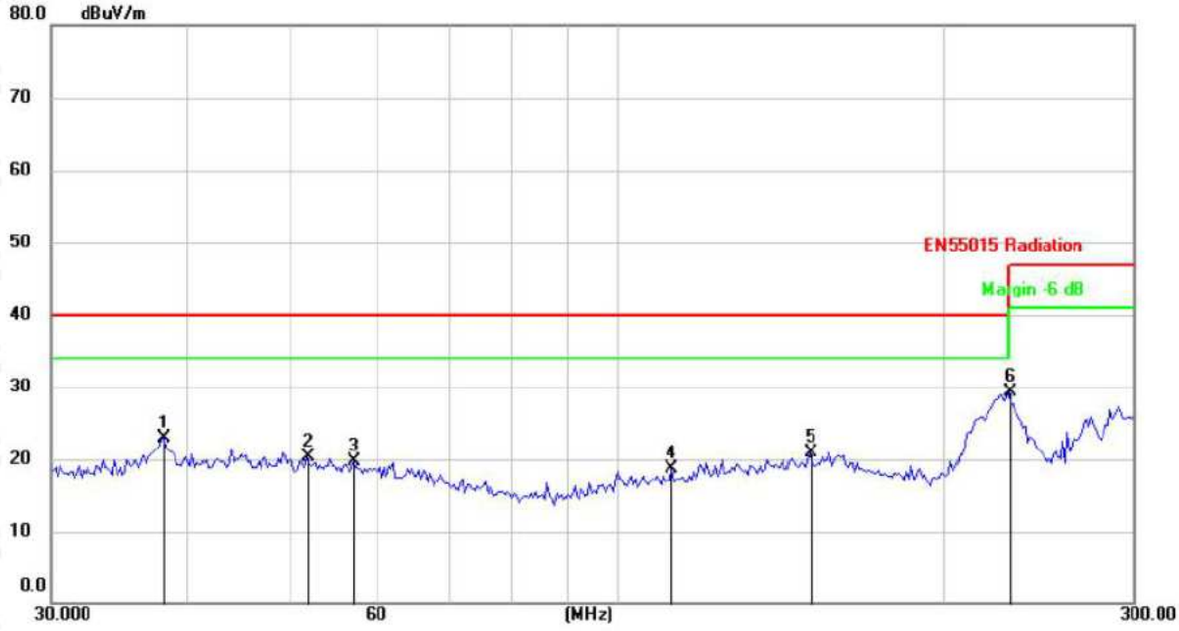
The measurement was performed in a semi-anechoic chamber.
The distance from EUT to receiving antenna is 3 meters.
Measurement was performed according to clause 7.3 of CISPR 16-2-3.

### 5.4.4. Test results

**PASS**

Please refer to the following page.

Polarization: H




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 38.1172 | 29.05 | -6.12 | 22.93 | 40.00 | -17.07 | peak |
| 2 | | 51.6561 | 26.56 | -6.22 | 20.34 | 40.00 | -19.66 | peak |
| 3 | | 57.1638 | 26.23 | -6.57 | 19.66 | 40.00 | -20.34 | peak |
| 4 | | 112.4919 | 26.92 | -8.26 | 18.66 | 40.00 | -21.34 | peak |
| 5 | | 150.3562 | 27.27 | -6.32 | 20.95 | 40.00 | -19.05 | peak |
| 6 | * | 229.6790 | 36.71 | -7.38 | 29.33 | 40.00 | -10.67 | peak |

Note: Result=Reading+Factor
Over Limit=Result-Limit

Polarization: V


| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | * | 38.1172 | 39.73 | -6.12 | 33.61 | 40.00 | -6.39 | peak |
| 2 | | 45.1982 | 32.36 | -5.80 | 26.56 | 40.00 | -13.44 | peak |
| 3 | | 58.4953 | 28.78 | -6.66 | 22.12 | 40.00 | -17.88 | peak |
| 4 | | 95.7461 | 29.33 | -9.76 | 19.57 | 40.00 | -20.43 | peak |
| 5 | | 204.7016 | 35.97 | -9.08 | 26.89 | 40.00 | -13.11 | peak |
| 6 | | 231.8042 | 35.84 | -7.23 | 28.61 | 47.00 | -18.39 | peak |

Note: Result=Reading+Factor
Over Limit=Result-Limit

## 5.5. Harmonic current emissions

### 5.5.1. Test Setup


### 5.5.2. Test specifications

| | | |
|---|---|---|
| Basic Standard(s) | : | EN 61000-3-2:2014 |
| Measurement Equipment requirement | : | IEC 61000-4-7 |
| Measured Harmonics | : | 1 - 40 |
| Equipment Class | : | ☐ A ☒ C |
| Limits | : | ☒ Clause 7.1 Table 1 |
| | | ☐ Clause 7.3 Table 2 |

### 5.5.3. Test Procedure

Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyzer which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

☐ Active input power > 25 W

☒ Active input power ⩽ 25 W

### 5.5.4. Test Result

**N/A.**

There is no limit described in EN 61000-3-2:2014 for class C equipment below 25W other than discharge lighting equipment, so this test is not applicable.

## 5.6. Voltage changes, voltage fluctuations and flicker

### 5.6.1. Test Setup


### 5.6.2. Test Procedure

| | | |
|---|---|---|
| Basic Standard(s) | : | EN 61000-3-3:2013 |
| Measurement Equipment requirement | : | IEC 61000-4-15 |
| Limits | : | Clause 5 |

5.4.2.1 Definition

Flicker: impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.

$P_{st}$: Short-term flicker indicator the flicker severity evaluated over a short period (in minutes); $P_{st}$=1 is the conventional threshold of irritability

$P_{lt}$: long-term flicker indicator; the flicker severity evaluated over a long period (a few hours) using successive $P_{st}$ values.

dc: the relative steady-state voltage change

$d_{max}$: the maximum relative voltage change

d(t): the value during a voltage change

5.4.2.2 Test Precedure

The following limits apply

-- "$P_{lt}$" shall not exceed 0.65.

-- "$P_{st}$" shall not exceed 1.0.

-- "dc" shall not exceed 3.3%.

-- "d(t)" shall not exceed 3.3% for more than 500ms.

-- "$d_{max}$" shall not exceed:

☐ 4% without additional conditions,

☐ 6% switched manually or automatically more than twice per day,

☐ 7% attended whilst in use or switched automatically for no more than twice per day or attended while in use.

☐ For manual switch, dmax is measured in accordance with Annex B of standard, average dmax is calculated from 24 times measurement.

☒ The EUT is unlikely to produce significant voltage fluctuations or flicker by technical analysis and evaluation. So it is deemed to fulfil the requirements without testing.

### 5.6.3. Test Result

**N/A**

According to EN 61000-3-3:2013, clause A.2* the voltage fluctuation and flicker on AC Mains were not measured.

EN 61000-3-3:2013, clause A.2: $P_{st}$ and $P_{lt}$ evaluations are required only for lighting equipment which is likely to produce flicker; for example: disco lighting and automatically regulated equipment.

Incandescent lamp luminaires with ratings less than or equal to 1 000 W and discharge lamp luminaires with ratings less than or equal to 600 W and LED luminaires with ratings less than or equal to 200W, are deemed to comply with the $d_{max}$ limits in this standard and are not required to be tested.

## 6. Immunity

**Performance criteria**

Performance criterion **A**

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion **B**

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion **C**

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## 6.1. Electrostatic discharge

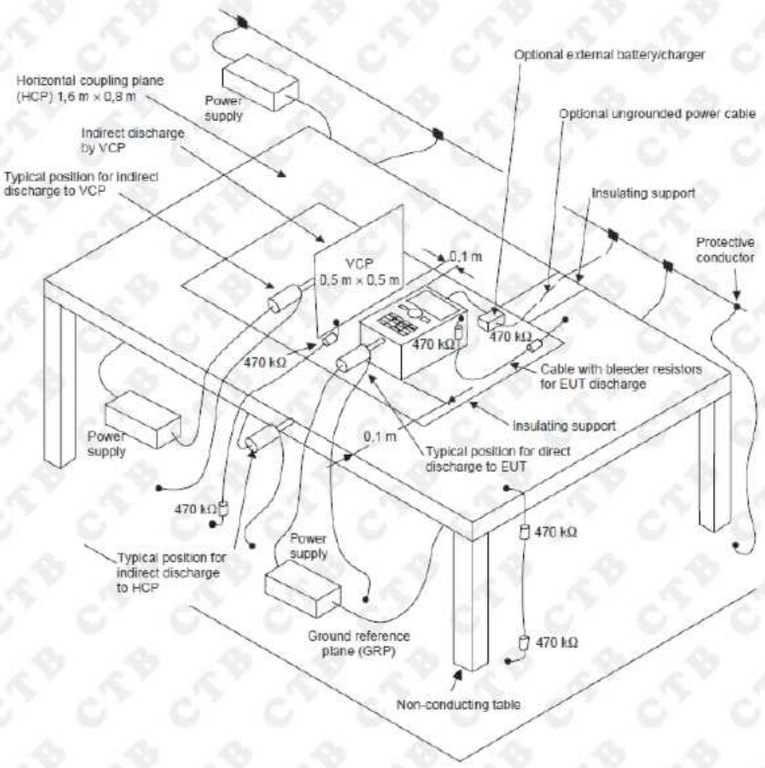
### 6.1.1. Test Levels and Performance Criterion

| Characteristics | Test levels |
|---|---|
| Air discharge | ±8 kV |
| Contact discharge | ±4 kV |

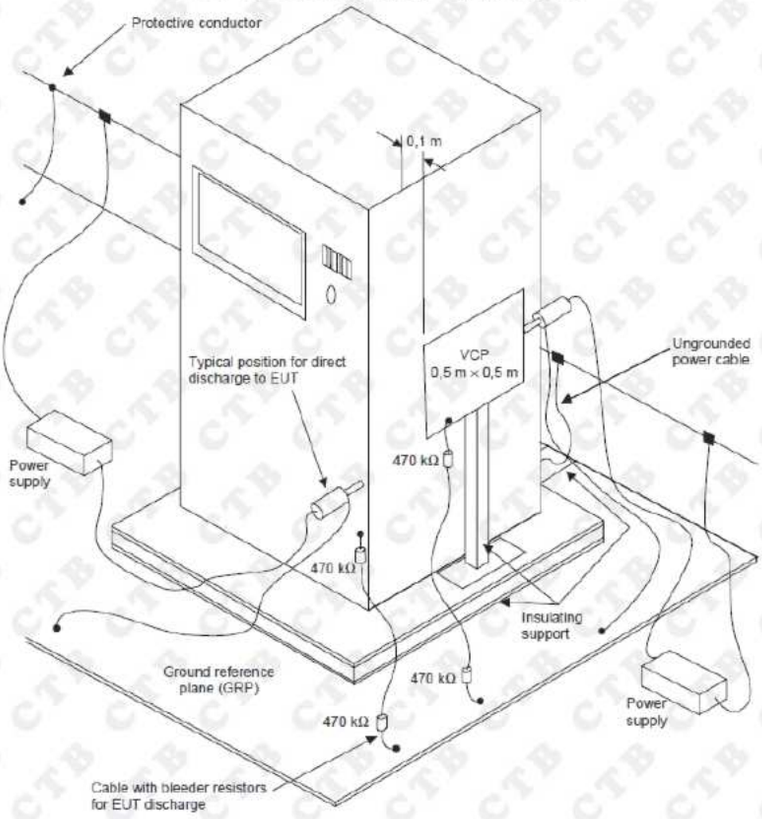
Performance criterion: **B**

### 6.1.2. Test setup

For table-top equipment




For floor standing equipment




### 6.1.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-2 clause 8.
The test method and equipment were specified by EN 61000-4-2.

### 6.1.4. Test Result

**PASS**
Please refer to the following page.

| No. | Location of discharge | Polarity | Discharge | Number of discharges | Test level kV | Result |
|---|---|---|---|---|---|---|
| 1 | HCP top side | P&N | C | 25 | 4 | PASS |
| 3 | HCP bottom side | P&N | C | 25 | 4 | PASS |
| 5 | VCP right side | P&N | C | 25 | 4 | PASS |
| 7 | VCP left side | P&N | C | 25 | 4 | PASS |
| 9 | Points on conductive surface | P&N | C | 25 | 4 | PASS |
| 10 | Points on non-conductive surface | P&N | A | 10 | 8 | PASS |

HCP = Horizontal coupling plate VCP = Vertical coupling plate N = Negative P = Positive

A = Air discharge C = Contact discharge

## 6.2. Radio-frequency electromagnetic field

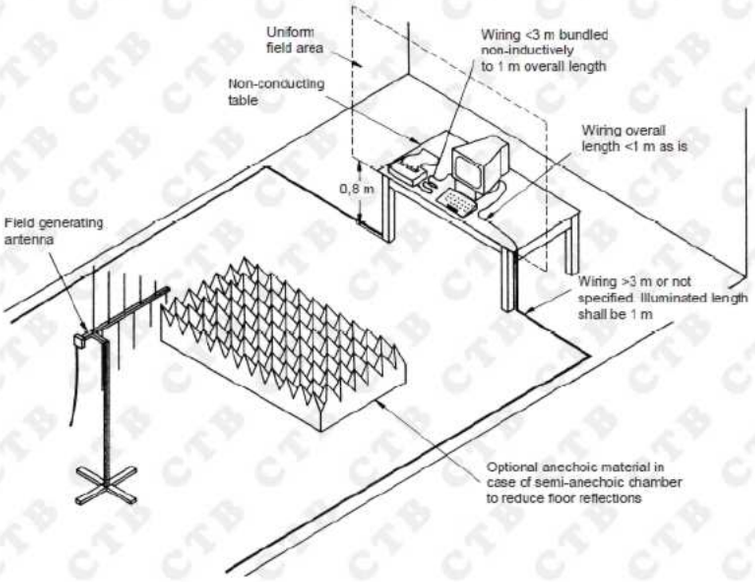
### 6.2.1. Test Levels and Performance Criterion

| Characteristics | Test levels |
|---|---|
| Frequency range | 80 MHz to 1 000 MHz |
| Test level | 3 V/m (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |

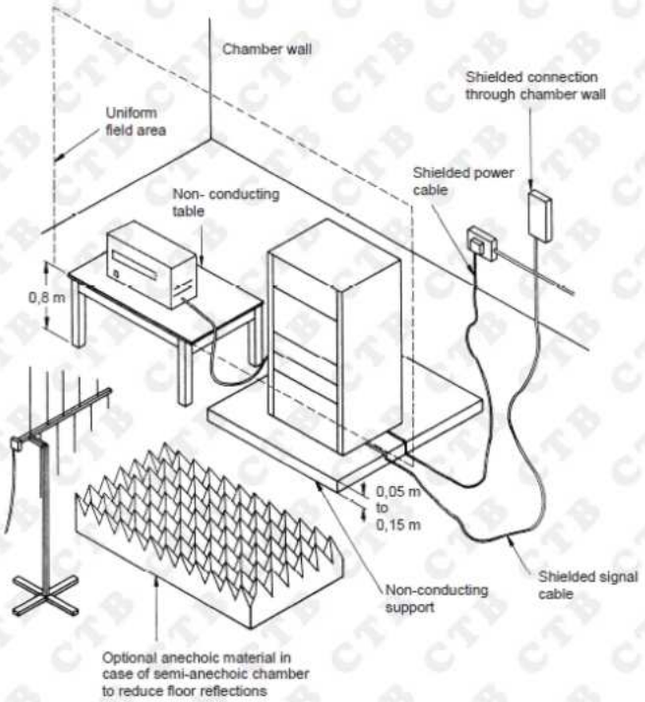
Performance criterion: **A**

### 6.2.2. Test setup

For table-top equipment




For floor standing equipment




### 6.2.3. Test Procedure

Measurement was performed in full-anechoic chamber.
Measurement procedure was applied according to EN 61000-4-3 clause 8.
The test method and equipment was specified by EN 61000-4-3.

### 6.2.4. Test Result

**PASS**

| Enclosure | Horizontal | Vertical |
|---|---|---|
| Front | PASS | PASS |
| Right Side | PASS | PASS |
| Left Side | PASS | PASS |
| Rear | PASS | PASS |

## 6.3. Power frequency magnetic fields

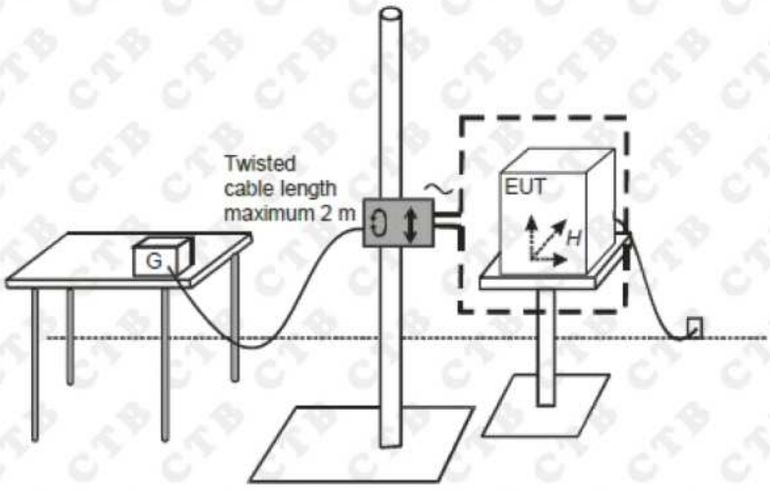
### 6.3.1. Test Levels and Performance Criterion

| Characteristics | Test levels |
|---|---|
| Field frequency | 50/60 Hz |
| Test level | 3 A/m |

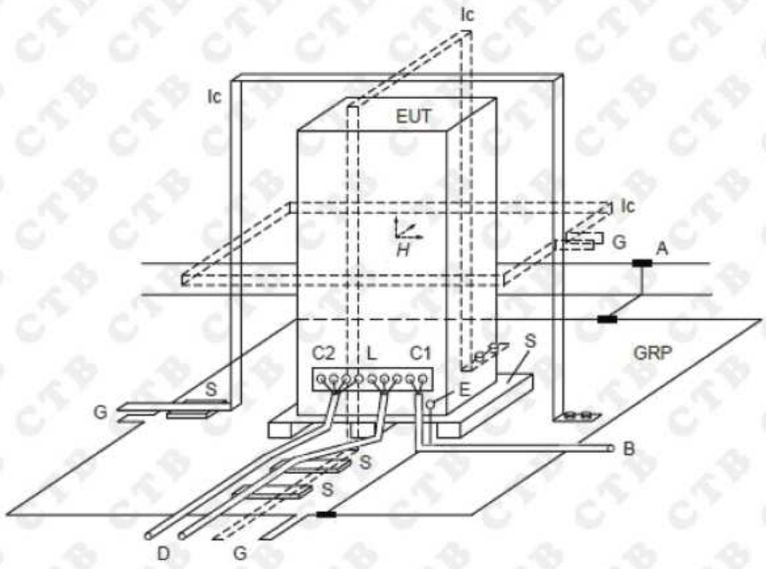
Performance criterion: **A**

### 6.3.2. Test setup

For table-top equipment




For floor standing equipment




### 6.3.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-8 clause 8.
The test method and equipment was specified by EN 61000-4-8.

### 6.3.4. Test Result

**PASS**

| Test frequency | Test Level (A/m) | Test time [s] | Axis | Result |
|---|---|---|---|---|
| ☒ 50Hz ☐ 60Hz | 3 | 300 | X | Pass |
| ☒ 50Hz ☐ 60Hz | 3 | 300 | Y | Pass |
| ☒ 50Hz ☐ 60Hz | 3 | 300 | Z | Pass |

## 6.4. Fast transients

### 6.4.1. Test Levels and Performance Criterion

Test levels at ports for signal and control lines

| Characteristics | Test levels |
|---|---|
| Test level | ±0.5 kV (peak) |
| Rise time/hold time | 5/50 ns |
| Repetition frequency | 5 kHz |
| NOTE 1 Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m.<br>NOTE 2 Change of state commands are not applied during the test. | |

Test levels at input and output d.c. power ports

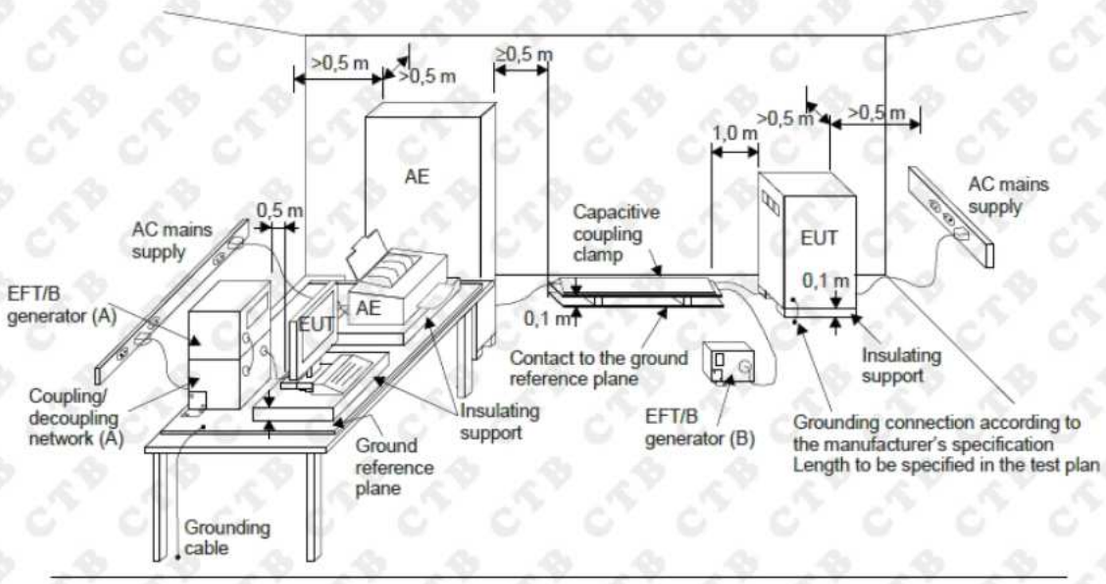
| Characteristics | Test levels |
|---|---|
| Test level | ±0.5 kV (peak) |
| Rise time/hold time | 5/50 ns |
| Repetition frequency | 5 kHz |
| NOTE Not applicable to equipment not connected to the mains while in use. | |

Test levels at input and output a.c. power ports

| Characteristics | Test levels |
|---|---|
| Test level | ±1 kV (peak) |
| Rise time/hold time | 5/50 ns |
| Repetition frequency | 5 kHz |

Performance criterion: **B**

### 6.4.2. Test setup



### 6.4.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-4 clause 8.
The test method and equipment was specified by EN 61000-4-4.

### 6.4.4. Test Result

**PASS**

| Location | Level (kV) | Polarity (P/N) | Result |
|---|---|---|---|
| AC power ports | 1 | P/N | Pass |
| DC power ports | 0,5 | P/N | N/A |
| Signal and control lines | 0,5 | P/N | N/A |

## 6.5. Injected currents (radio-frequency common mode)

### 6.5.1. Test Levels and Performance Criterion

Test levels at ports for signal and control lines

| Characteristics | Test levels |
|---|---|
| Frequency range | 0.15 MHz to 80 MHz |
| Test level | 3 V r.m.s. (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |
| Source impedance | 150 Ω |
| NOTE Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m. | |

Test levels at input and output d.c. power ports

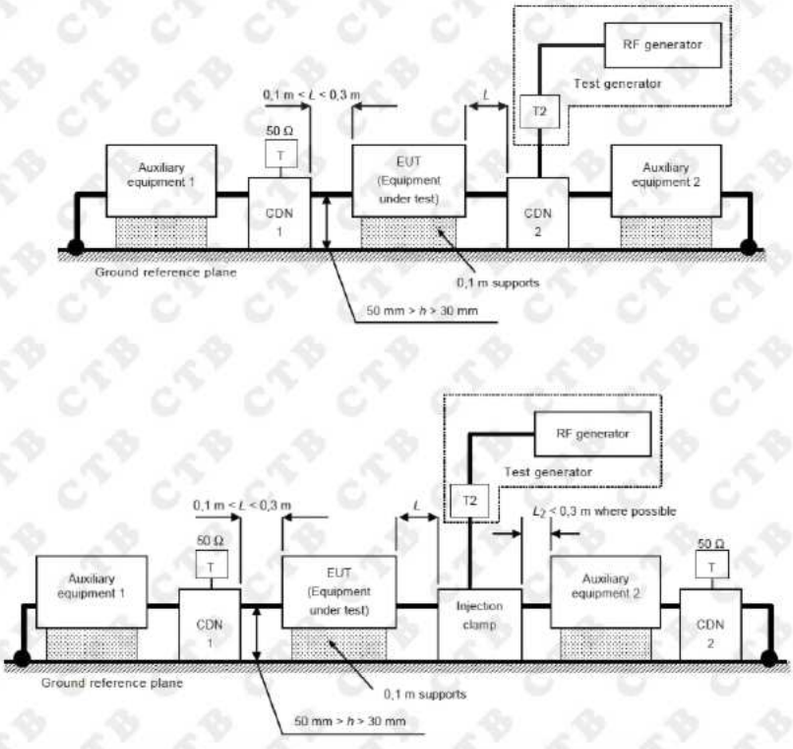
| Characteristics | Test levels |
|---|---|
| Frequency range | 0.15 MHz to 80 MHz |
| Test level | 3 V r.m.s. (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |
| Source impedance | 150 Ω |
| NOTE Only applicable to equipment that is connected to the mains while in use. | |

Test levels at input and output a.c. power ports

| Characteristics | Test levels |
|---|---|
| Frequency range | 0.15 MHz to 80 MHz |
| Test level | 3 V r.m.s. (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |
| Source impedance | 150 Ω |
| NOTE Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m. | |

Performance criterion: **A**

### 6.5.2. Test setup



### 6.5.3. Test Procedure

Measurement procedure was applied according to EN 61000-4-6 clause 8.
The test method and equipment was specified by EN 61000-4-6.

### 6.5.4. Test Result

**PASS**

| Injected point | Frequency (MHz) | Level (e.m.f) | Modulation | Result |
|---|---|---|---|---|
| AC power ports | 0.15 to 80 | 3V | 80%, 1 kHz, AM | PASS |
| DC power ports | 0.15 to 80 | 3V | 80%, 1 kHz, AM | N/A |
| Signal and control lines | 0.15 to 80 | 3V | 80%, 1 kHz, AM | N/A |

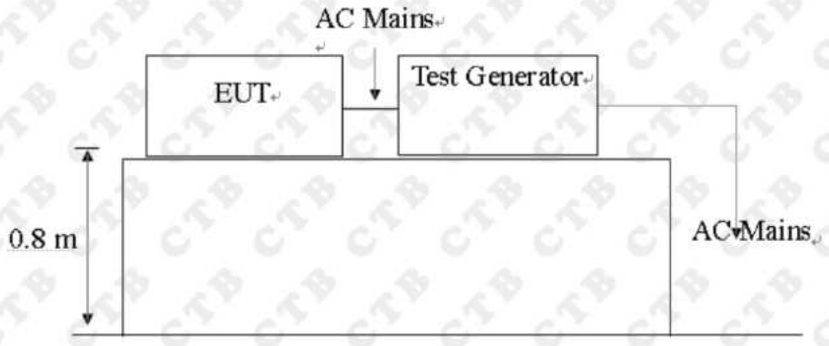
## 6.6. Surges

### 6.6.1. Test Levels and Performance Criterion

| Characteristics | | Test levels | | |
|---|---|---|---|---|
| | | Device | | |
| | | Self-ballasted lamps and semi-luminaires | Luminaires and independent auxiliaries | |
| | | | Input power | |
| | | | ≤25 W | >25 W |
| Wave-shape data | | 1.2/50 μs | 1.2/50 μs | 1.2/50 μs |
| Test levels | line to line | ±0.5 kV | ±0.5 kV | ±1.0 kV |
| | line to ground | ±1.0 kV | ±1.0 kV | ±2.0 kV |
| NOTE In addition to the specified test level, all lower test levels as detailed in IEC 61000-4-5 should also be satisfied. | | | | |

Performance criterion: **B**

### 6.6.2. Test setup




### 6.6.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-5 clause 8.
The test method and equipment was specified by EN 61000-4-5.

### 6.6.4. Test Result

**PASS**

| Location | Level(kV) | Polarity(P/N) | Result |
|---|---|---|---|
| Luminaires and independent auxiliaries >25 W (line to line) | 1 | P/N | N/A |
| Luminaires and independent auxiliaries >25 W (line to ground) | 2 | P/N | N/A |
| Luminaires and independent auxiliaries ≤25 W (line to line) | 0,5 | P/N | Pass |
| Luminaires and independent auxiliaries ≤25 W (line to ground) | 1.0 | P/N | N/A |
| Self-ballasted lamps and semi-luminaires (line to line) | 0,5 | P/N | N/A |
| Self-ballasted lamps and semi-luminaires (line to ground) | 1.0 | P/N | N/A |

## 6.7. Voltage dips and Short interruptions

### 6.7.1. Test Levels and Performance Criterion

Voltage dips – Test levels at input a.c. power ports

| Characteristics | Test levels |
|---|---|
| Test voltage level | 70 % |
| Number of periods | 10 |

Voltage short interruptions – Test levels at input a.c. power ports

| Characteristics | Test levels |
|---|---|
| Test voltage level | 0 % |
| Number of periods | 0.5 |

Performance criterion: C & B

### 6.7.2. Test setup


### 6.7.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-11 clause 8.
The test method and equipment was specified by EN 61000-4-11.

### 6.7.4. Test Result

**PASS**

| Test level $\%U_T$ | Voltage dips & short interruptions $\%U_T$ | Duration [Cycles] | Result |
|---|---|---|---|
| 70 | 30 | 10 | Pass |
| 0 | 100 | 0.5 | Pass |
| Remark: $U_T$ is the rated voltage for the equipment. | | | |

# Test Report



The following sample(s) was /were submitted and identified on behalf of the clients as :

| | | |
|---|---|---|
| **Sample Name** | : | LED Bulb |
| **Main Model** | : | YR-QP01 YR-QP02, YR-QP03, YR-QP04, YR-QP05, YR-QP06 |
| **Sample Received Date** | : | May.29,2020 |
| **Testing Period** | : | May.29,2020 To Jun.05,2020 |
| **Test Requested** | : | 1. As specified by client ,to screen Lead(Pb),Cadmium(Cd),Mercury(Hg), Chromium(Cr)and Bromine(Br)in the submitted sample(s)by XRF.<br>2. As specified by client ,when screening results exceed the XRF screening limit in IEC62321-4:2017 Edition 1.0,further use of wet chemical methods are required to test Lead(Pb),Cadmium(Cd),Mercury(Hg),Hexavalent Chromium(Cr(VI)),Polybrominated Biphenyls(PBBs),Polybrominated Diphenyl Ethers(PBDEs),Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutylphthalate (DBP) , and Diisobutyl phthalate (DIBP) in the submitted sample(s). |
| **Test Method** | : | Please refer to next page(s). |
| **Test Result** | : | Please refer to next page(s). |
| **Conclusion** | : | The test results comply with the limits of RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU. |

**Signed for and on behalf of**

TST TESTING TECHNOLOGY CO., LTD. APPROVED

**Andy Zheng**
**Technical Director**



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# Test Report



| No. | Sample Description | Test item | XRF Result | ChemicalTest (mg/kg) | Conclusion |
|---|---|---|---|---|---|
| 1 | PCB | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | X | N.D. | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 2 | IC | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 3 | Triode | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 4 | Resistance | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |

| No. | Sample Description | Test item | XRF Result | ChemicalTest (mg/kg) | Conclusion |
|---|---|---|---|---|---|
| 5 | Capacitance | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 6 | Inductance | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 7 | Solder | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 8 | Black electrolytic capacitor film | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |

| No. | Sample Description | Test item | XRF Result | ChemicalTest (mg/kg) | Conclusion |
|---|---|---|---|---|---|
| 9 | Black rubber | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 10 | Pin | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 11 | Aluminum shell | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 12 | Electrolytic paper | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |

| No. | Sample Description | Test item | XRF Result | ChemicalTest (mg/kg) | Conclusion |
|---|---|---|---|---|---|
| 13 | Inductor body | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 14 | Copper wire | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 15 | Adhesive tape | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 16 | LED | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |

| No. | Sample Description | Test item | XRF Result | ChemicalTest (mg/kg) | Conclusion |
|---|---|---|---|---|---|
| 17 | Silver metal case | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 18 | Wire core | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 19 | Silver metal sheet | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | -- | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | -- | |
| 20 | White plastic shell | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |

| No. | Sample Description | Test item | XRF Result | ChemicalTest (mg/kg) | Conclusion |
|---|---|---|---|---|---|
| 21 | White plastic | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 22 | Ink | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 23 | White paint | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |
| 24 | Glue | Pb | BL | -- | Pass |
| | | Cd | BL | -- | |
| | | Hg | BL | -- | |
| | | Cr(Cr(VI) | BL | -- | |
| | | Br(PBBs&PBDEs) | BL | -- | |
| | | Phthalate(DBP\BBP \DEHP\DIBP) | -- | N.D. | |

**1. It is the result on total Br while test item on restricted substances in PBBs/PBDEs.It is the result on total Cr while test item on restricted substances is Cr(VI).**

**2. Screening test by XRF spectroscopy**

**XRF screening limits in mg/kg for regulated elements according to IEC62321-4:2017 Ed.1 Sec.6 & AnnesD.**

| Element | Polymer Material | Metallic Material | Composite Material |
|---|---|---|---|
| Pb | BL≤700-3σ≤X＜1300+3σ≤OL | BL≤700-3σ≤X＜1300+3σ≤OL | BL≤500-3σ≤X＜1500+3σ≤OL |
| Cd | BL≤70-3σ≤X＜130+3σ≤OL | BL≤70-3σ≤X＜130+3σ≤OL | LOD＜X＜150+3σ≤OL |
| Hg | BL≤700-3σ≤X＜1300+3σ≤OL | BL≤700-3σ≤X＜1300+3σ≤OL | BL≤500-3σ≤X＜1500+3σ≤OL |
| Cr | BL≤700-3σ＜X | BL≤700-3σ＜X | BL≤500-3σ＜X |
| Br | BL≤300-3σ＜X | -- | BL≤250-3σ＜X |

**XRF detection limits in mg/kg for regulated elements in various material**

| Element | Polymer Material | Metallic Material | Composite Material |
|---|---|---|---|
| Pb | 10 | 50 | 50 |
| Cd | 10 | 50 | 50 |
| Hg | 10 | 50 | 50 |
| Cr | 10 | 50 | 50 |
| Br | 10 | 50 | 50 |

**Note:**

-BL = Under the XRF screening limit

-OL = Furture chemical test will be conducted while result is above the screening limit

-X =The symbol"X"marks the region where further investingation in necessary

-3σ=The reproducibility of analytical instruments

-LOD=Detection limit

**3. Wet chemical test**

| Test Item(s) | Test Method | Test Equipment | MDL |
|---|---|---|---|
| Pb | IEC62321-5:2013 | ICP-AES | 2 |
| Cd | IEC62321-5:2013 | ICP-AES | 2 |
| Hg | IEC62321-4:2017 | ICP-AES | 2 |
| Cr(VI) | IEC62321-7-1:2015<br>IEC62321-7-2:2017 | UV-Vis | 2 |
| PBB | IEC62321-6:2015 | GC-MS | 5 |
| PBDE | IEC62321-6:2015 | GC-MS | 5 |
| Dibutyl Phthalate(DBP) | IEC62321-8:2017 | GC-MS | 30 |
| Benzylbutyl Phthalate (BBP) | IEC62321-8:2017 | GC-MS | 30 |
| Di-(2-ethylhexyl) Phthalate(DEHP) | IEC62321-8:2017 | GC-MS | 30 |
| Diisobutyl phthalate (DIBP) | IEC62321-8:2017 | GC-MS | 30 |

**Note:**

- mg/kg= ppm=0.0001%

-ND=Not Detected(<MDL)

- MDL = Method Detection Limit

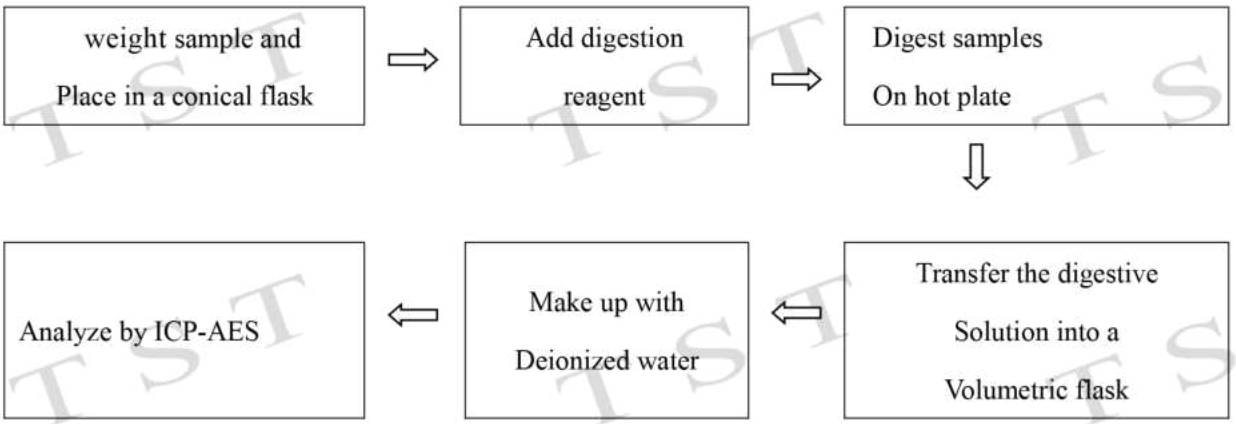
-- = No Testing

-Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm$^2$ sample surface

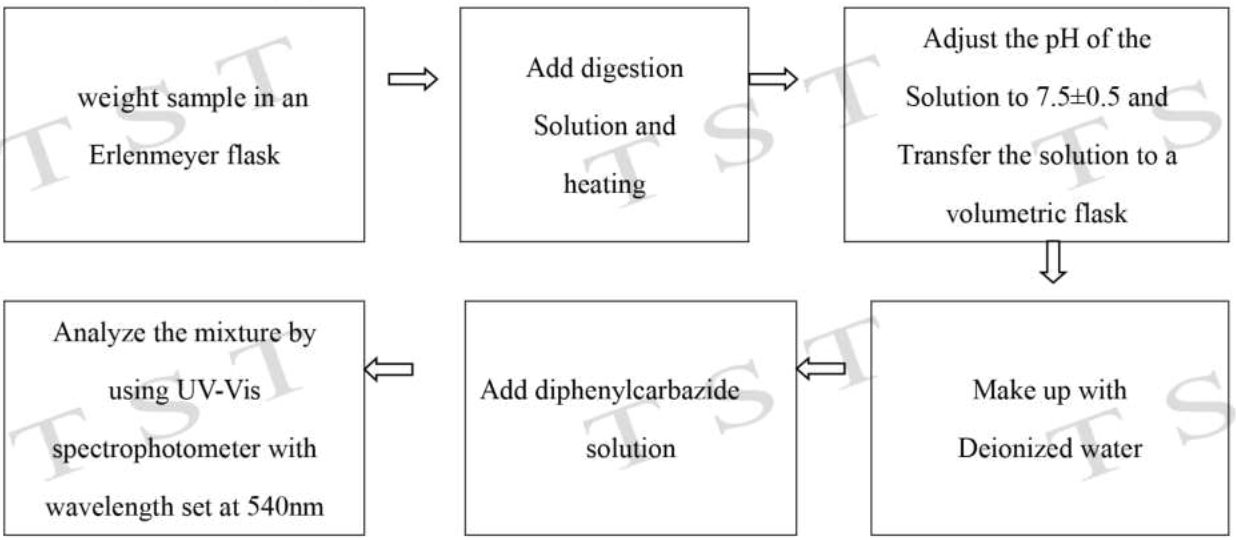
-*=According to 2011/65/EU Annex,point 6-Lead as an alloying element is steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight and as a copper alloy, containing up to 4% lead by weight can be exempted.

**Test Process:**

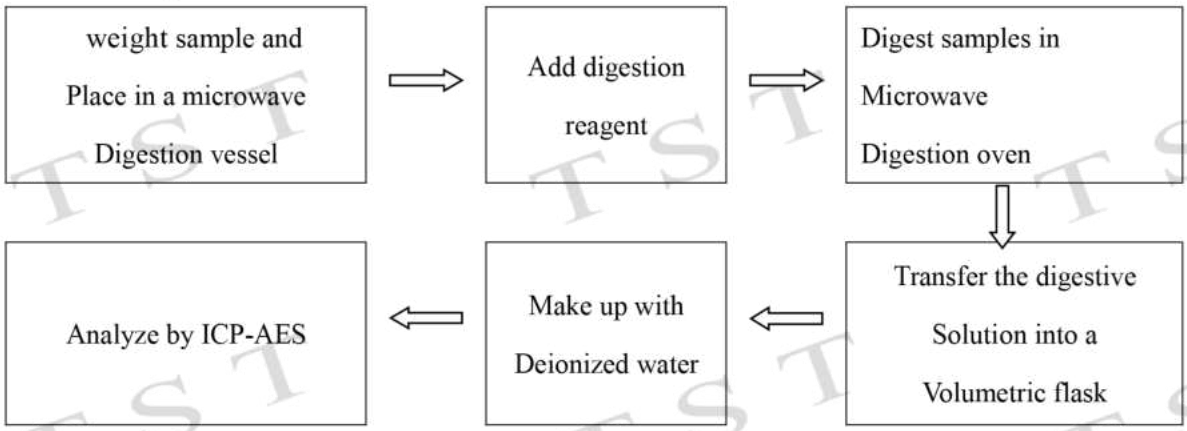
1. Test for Cd/Pb Content



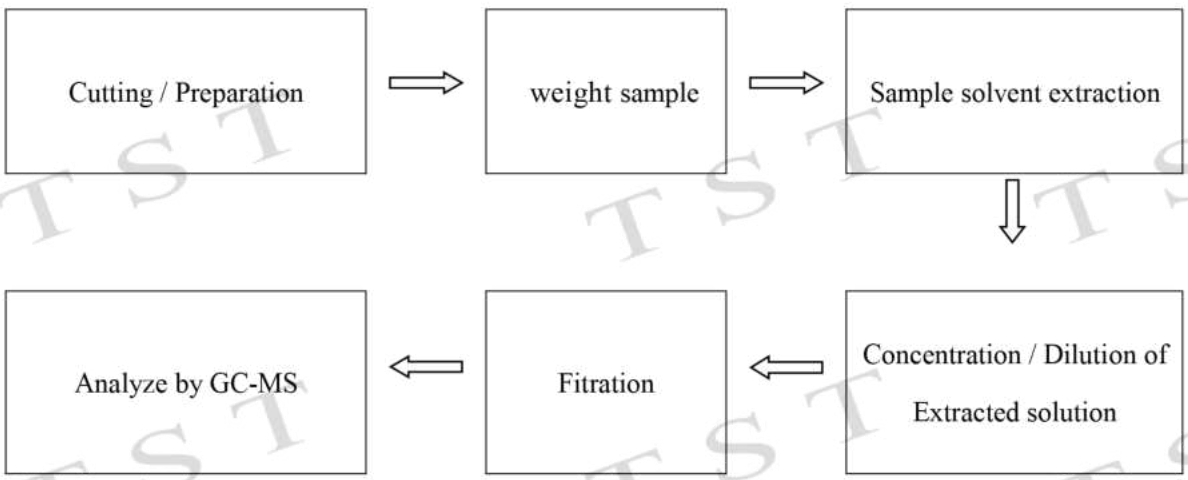

2. Test for Chromium(VI)Content



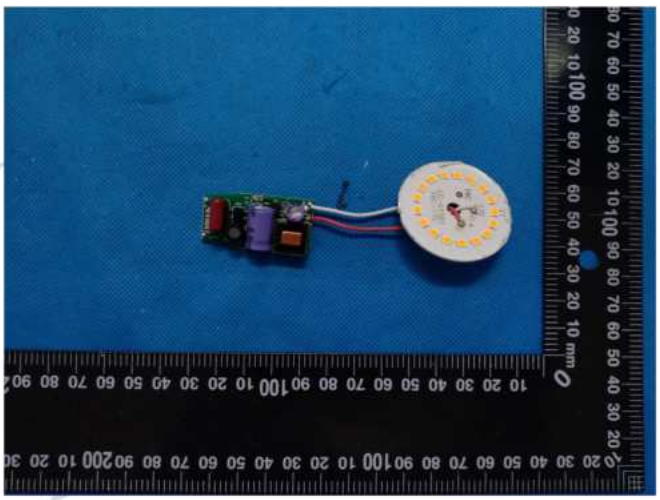
3. Test for Hg Contents

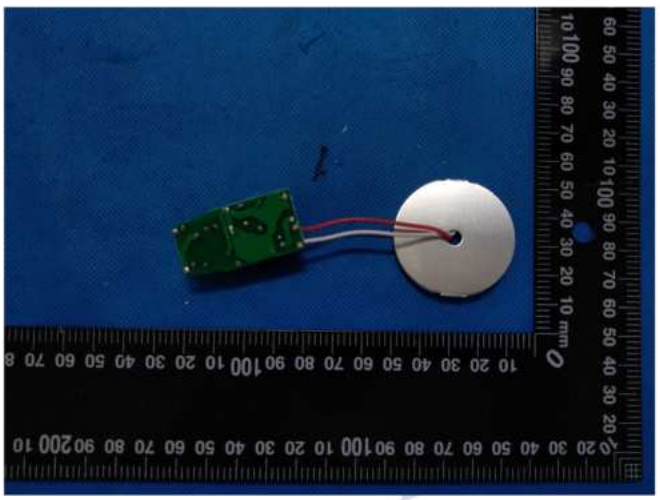



4. Test for PBBs/PBDES/DBP/BBP/DEHP/DIBP



**Sample photo:**





*** End of Report ***

# SAFETY TEST REPORT

MEASUREMENT AND TEST REPORT
For

[redacted]

**Models: YR-QP01 YR-QP02, YR-QP03, YR-QP04, YR-QP05, YR-QP06**

June 05, 2020

| **This Report Concerns:** | **Equipment Type:** |
|---|---|
| ☒ Original Report | LED Bulb |

| | |
|---|---|
| **Test Standard:** | EN 62560: 2012+A1:2015 |
| **Report Number:** | CTB200603011SX |
| **Test Date:** | June 03-04, 2020 |
| **Test category:** | Consignment test |
| **Prepared By:** | **Shenzhen CTB Testing Technology Co., Ltd.**<br>Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, China<br>Tel: 4008-258-120<br>E-mail: ctb@ctb-lab.com<br>Web: http://www.ctb-lab.com |

# TEST REPORT
## EN 62560
## Self-Ballasted LED-Lamp for general lighting services by voltage > 50V Safety specifications

| | | |
|---|---|---|
| Report reference No. ..... | : | CTB200603011SX |
| Date of issue..... | : | June 05, 2020 |

**Testing laboratory**

| | | |
|---|---|---|
| Name..... | : | Shenzhen CTB Testing Technology Co., Ltd. |
| Address..... | : | Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, China |

**Client**

| | | |
|---|---|---|
| Name | : | [redacted] |
| Address | : | [redacted] |

**Test specification**

| | | |
|---|---|---|
| Standard..... | : | EN 62560: 2012+A1:2015 |
| Test procedure..... | : | Safty report |
| Procedure deviation..... | : | N.A. |
| Non-standard test method.. | : | N.A. |

| | | |
|---|---|---|
| **Test Report Form No**.....: | | IEC62560B |
| TRF originator .....: | | DEKRA Certification B.V. |
| Master TRF .....: | | 2015-11-27 |



**Test item**

| | | |
|---|---|---|
| Description..... | : | LED Bulb |
| Model No. ..... | : | YR-QP01 YR-QP02, YR-QP03, YR-QP04, YR-QP05, YR-QP06 |
| Trade Mark..... | : | / |
| Manufacturer..... | : | [redacted] |
| Address..... | : | [redacted] |
| Rating(s)..... | : | 100-240V~ 50/60Hz, 7.5W |

**Particulars: test item vs. test requirements**

| | |
|---|---|
| Equipment mobility | Self-Ballasted Equipment |
| Class of equipment | Class II |
| Degree of protection | IPX0 |
| Supply construction | E27 lamp cap |

**Possible test case verdicts:**

| | |
|---|---|
| - test case does not apply to the test object | N/A |
| - test object does meet the requirement | P(Pass) |
| - test object does not meet the requirement | F(Fail) |

**Testing**

| | |
|---|---|
| Date of receipt of test item | June 03, 2020 |
| Date (s) of performance of tests | June 03-04, 2020 |
| Laboratory sample number | 200603005-1X |
| Sample appearance and function are in normal condition, yes or no | Yes |
| Ambient temperature | 24-26℃ |
| Ambient humidity | 60-65% |

**General remarks:**

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Laboratory CTB. The authenticity of this Test Report and its contents can be verified by contacting CTB, responsible for this Test Report.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

**General product information:**

- The apparatus is indoor used only.
- The max. operated temperature is considered as 25℃.
- Instructions and equipment marking related to safety is applied in the language that is acceptable in the country in which the equipment is to be sold.
- Self-ballasted Non-SELV LED lamps, integrated with E27 lamp cap, non-dimmable.
- Series models YR-QP01 YR-QP02, YR-QP03, YR-QP04, YR-QP05, YR-QP06.. are identical for construction, working principle and main components listed in below table ANNEX 1 The only difference is model name and outlook appearance for decoration. All tests were performed on model YR-QP01

**Copy of marking plate:**

**LED Bulb**

Model: YR-QP01

Rated: 100-240V~ 50/60Hz, 7.5W E27

PF:>0.95

Shenzhen Yarrae Technology Co., Ltd.

**MADE IN CHINA**

Remark for above marking:

1. The height of graphical symbols shall not be less than 5 mm;
2. The height of letters and numerals shall not be less than 2 mm;
3. The main rating label was attached in enclosure,

**Summary of testing:**

The submitted sample were tested and found to compliance with requirements of the standards EN 62560: 2012+A1:2015.

**Testing procedure and testing location**

| | | |
|---|---|---|
| Laboratory name..... | : | Shenzhen CTB Testing Technology Co., Ltd. |
| Testing locatioNddress: | : | Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, China |
| Testing procedure | : | TL ☒ RMT ☐ SMT ☐ WMT ☐ TMP ☐ |
| Tested By (Test Engineer) | : | Humberot Huang |
| Reviewed By (Supervisor) | : | Kubo Lee |
| Approved By (Chief Engineer) | : | Simon Lee |

| EN 62560 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4** | **GENERAL REQUIREMENTS** | | **P** |
| 4.1 | The lamp shall be so designed and constructed that in normal use cause no danger to the user. | | P |
| 4.2 | Self-ballasted LED-Lamp are non-repairable. | | P |
| **5** | **MARKING** | | **P** |
| 5.1 | Mandatory marking | | P |
| | - mark of origin | | P |
| | - rated supply voltage (V) .....: | 100-240V | P |
| | - rated wattage (W).....: | 7.5W | P |
| | - rated frequency (Hz).....: | 50/60Hz | P |
| 5.2 | Addition marking | | N/A |
| | - burning position | | N/A |
| | - rated current (A) .....: | | N/A |
| | - weight significantly higher | | N/A |
| | - special conditions or restrictions | | N/A |
| | - not use suitable for water | | N/A |
| 5.3 | Marking durable and legible | | P |
| | rubbing 15 s water, 15 s petroleum; marking legible | | P |
| **6** | **INTERCHANGEABILITY** | | **P** |
| 6.1 | Cap interchangeability in accordance with EN 60061-1 | | P |
| | Gauge in accordance with EN 60061-3 | All applicable dimensions comply with the standard sheet. | P |
| 6.2 | Bending moment | | P |
| | Bending moment imparted by the lamp at the lampholder | | P |
| | E27: 2.0Nm | | P |
| | an axial pull of 40N or a bending moment of 3Nm | | N/A |
| | GU10 Bending moment: 0.1Nm | | N/A |
| **7** | **PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS** | | P |
| | Internal, basic insulated or live metal parts not accessible | | P |
| | Tested with a test finger with a force of 10 N | | P |
| | Compliance checked with appropriate gauges | | P |
| **8** | **INSULATION RESISTANCE AND ELECTRIC STRENGTH** | | P |

| EN 62560 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.2 | After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ): | | P |
| | ≥ 4 MΩ for double or reinforced insulation.....: | >100 MΩ | P |
| | The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c. | | P |
| | For frequencies above 1 kHz, the value does not exceed the limit of 70 mA (peak) | | N/A |
| | The voltage bewteen the part concerned and any accessible part is not more than 34V (peak) | | P |
| 8.3 | Immediately after clause 8.2 electric strength test for 1 min | | P |
| | HV type cap | 4000V | P |
| | No flashover or breakdown | (see appended table) | P |
| **9** | **MECHANICAL STRENGTH** | | |
| | Torsion resistance of unused lamps | | P |
| 9.1 | Torque test | | P |
| | B 15 d Cap.....1,15 Nm | | N/A |
| | B 22 d Cap.....3,0 Nm | | N/A |
| | E 11 Cap.....0,8 Nm | | N/A |
| | E 12 Cap.....0,8 Nm | | N/A |
| | E 14 Cap.....1,15 Nm | | N/A |
| | E 17 Cap.....1,5 Nm | | N/A |
| | E 26 or E27 Cap.....3,0 Nm | | P |
| | GX 53 Cap.....3,0 Nm | | N/A |
| 9.2 | Torsion resistance of lamps after a defined time of usage | | N/A |
| | Torsion resistance of used lamp | Under consideration. | N/A |
| 9.3 | Repetition of clause 8 | | P |
| | Clause 8 shall comply after the mechanical strength test. | | P |
| **10** | **CAP TEMPERATURE RISE** | | **P** |
| | The cap temperature rise $\Delta t_s$ of the lamp shall not exceed 120 K. | (see appended table) | P |
| **11** | **RESISTANCE TO HEAT** | | **N/A** |
| | Parts of insulating material retaining live parts in position, ball-pressure test: | | N/A |
| | - part; test temperature (°C) .....: | See appended table | N/A |
| | - part; test temperature (°C) .....: | | N/A |
| | - part; test temperature (°C) .....: | | N/A |

| EN 62560 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **12** | **RESISTANCE TO FLAME AND IGNITION** | | P |
| | Parts of insulating material retaining live parts in position and external parts of insulating material preventing electric shock glow-wire test 650 °C | PCB; E27 cap plastic | P |
| | - flame extinguished within 30 s | | P |
| | - no flaming drops igniting tissue paper | | P |
| **13** | **FAULT CONDITIONS** | | **N/A** |
| 13.2 | Extreme electrical conditions (dimmable lamps) | | N/A |
| | Lamp withstands overpower condition >15 min. | | N/A |
| | Lamp fails safe after 15 min overpower condition | | N/A |
| | Lamp with automatic protective device or power limiter, test performed 15 min. At limit. | | N/A |
| 13.3 | Extreme electrical conditions (non-dimmable lamps) | | P |
| | Lamp withstands overpower condition >15 min. | | P |
| | Lamp fails safe after 15 min overpower condition | | P |
| | Lamp with automatic protective device or power limiter, test performed 15 min. At limit. | | P |
| 13.4 | Short-circuit across capacitors | (see appended table) | P |
| 13.5 | Fault conditions: where diagram indicates fault condition impairs safety, electronic components have been short-circuited or disconnected | (see appended table) | P |
| 13.6 | When operated under fault conditions the lamp | | P |
| | - does not emit flames or molten material | | P |
| | - does not produce flammable gases or smoke | | P |
| | - live parts not accessible | | P |
| | After the tests the insulation resistance with d.c. 1000 V complies with requirements of Cl. 8.1.....: | | P |
| **14 (16)** | **CREEPAGE DISTANCES AND CLEARANCES** | | P |
| | Creepage distances and clearances according to Table 3 and 4 of EN 61347-1, as appropriate | (see appended table) | P |
| | Printed boards see clause 14 of EN 61347-1 | | N/A |
| | Insulating lining of metallic enclosures | | N/A |
| **15** | **Abnormal operation** | | N/A |
| | Self-ballasted lamps shall not create hazard under abnormal operating conditions. | | N/A |

| EN 62560 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **16** | **Test conditions for dimmable lamps** | | **N/A** |
| | Test shall be carried out at maximum power setting for Clause 10 and Clause 17. | | N/A |
| **17** | **PHOTOBIOLOGICAL SAFETY** | | **N/A** |
| **17.1** | **UV radiation** | | N/A |
| | The LED lamp doesn't exceed 2mW/klm | | N/A |
| **17.2** | **Blue light hazard** | | N/A |
| | Assessed according to IEC TR 62778 | | N/A |
| | LED lamps shall be RG0 or RG1 | | N/A |
| **18** | **Ingress protection** | | **N/A** |
| 18.1 | Lamps shall be suitable for water contact unless marked with Figure 6. | | N/A |
| 18.2 | The lamp is subjected to an IPX4 test according to IEC 60598-1. | | N/A |

| EN 62560 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| ANNEX 1 | TABLE: Critical components information | | | | P |
|---|---|---|---|---|---|
| **Object / part No.** | **Manufacturer/ trademark** | **Type / model** | **Technical data** | **Standard** | **Mark(s) of conformity[1)]** |
| E27 Lamp cap | Various | Various | 2A, 500VAC | EN 60238 | Approved<br>Tested with appliance |
| Plastic of lamp cap | Various | Various | V-0, 130℃ | UL 94 | UL |
| LED driver | Various | Various | INPUT:<br>100-240V AC | IEC 61347-1 | Approved<br>Tested with appliance |
| LED Modual | Various | Various | CCT=3500K, | IEC 62031 | Tested with appliance |
| **Supplementary information:**<br>**[1)] Provided evidence ensures the agreed level of compliance.** | | | | | |

| 8.3 | Electric strength | | | P |
|---|---|---|---|---|
| Test points | | Test voltage | Results | |
| Between | To | | | |
| Live parts | enclosure | 4000V | No breakdown | |

| 10 | Temperature measurements, thermal tests of Section 10 | | P |
|---|---|---|---|
| | Type reference..... : | YR-QP01 | — |
| | Lamp used ..... : | LED Bulb | |
| | Lamp control gear used : | Integrated | — |
| | Mounting position of luminaire..... : | Normal use | — |
| | Supply wattage (W) ..... : | 7.25W | — |
| | Supply current (A)..... : | | — |
| | Table: measured temperatures corrected for ta = 25 °C: | | P |
| | - abnormal operating mode ..... : | No abnormal operation | — |
| | - test 1: rated voltage..... : | -- | — |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... : | 240V*1.06 | |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage..... : | -- | — |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... : | -- | — |
| | Through wiring or looping-in wiring loaded by a current of A during the test ..... : | -- | — |

| temperature (°C) of part | Clause 10 – normal | Clause 12.5 – abnormal |
|---|---|---|

| EN 62560 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | test 1 | test 2 | test 3 | limit | test 4 | Limit |
|---|---|---|---|---|---|---|
| E27cap | - | 48.7 | - | 120 | - | - |
| PCB | | 40.6 | | 130 | | |
| Plastic of lamp cap | | 42.6 | | 130 | | |
| Ambient | - | 25.0 | - | - | - | - |

| 11 | TABLE: Ball Pressure Test of Thermoplastics | | N/A |
|---|---|---|---|
| Allowed impression diameter (mm) .....: | | ≤ 2mm | — |
| Part | | Test temperature (°C) | Impression diameter (mm) |
| -- | | -- | -- |
| Supplementary information: — | | | |

| 13 | TABLE: tests of fault conditions | | N/A |
|---|---|---|---|
| Part | Simulated fault | Result | Hazard |
| -- | -- | -- | -- |

| 14(16) | TABLE: Clearance And Creep age Distance Measurements | | | | | P |
|---|---|---|---|---|---|---|
| clearance cl and creepage distance decry at/of: | Up (V) | U rms. (V) | Required cl (mm) | cl (mm) | Required cr (mm) | cr (mm) |
| Minimum distances between live parts of different polarity | <420 | <250 | 1.6 | >1.6 | 2.5 | >2.5 |
| Minimum distances between live parts and accessible parts | <420 | <250 | 3.0 | 3.5 | 5.0 | 5.5 |
| Supplementary information: — | | | | | | |

**Appendix**
**Photo documentation**

**Photo 1**

View:

[ ] front

[ ] rear

[ ] right side

[ ] left side

[ √ ] top

[ ] bottom

[ ] internal

**Photo 2**

View:

[ √ ] front

[ ] rear

[ ] right side

[ ] left side

[ ] top

[ ] bottom

[ ] internal

******End of this report******