



|  |                           |
|--|---------------------------|
|  |                           |
| Report reference No .  | : RSZ1                    |
| Compiled by (+ signature)  | : Test E                  |
| Approved by (+ signature)  | : Team                    |
| Date of issue  | : 2018-                   |
| Testing laboratory   | : Bay A                   |
| Address  | : No.69<br>Guan           |
| Testing location   | : Same                    |
| Applicant  | : Hong                    |
| Address  | : No.1,<br>China          |
| Standard   | : EN 62                   |
| Test sample(s)received.....  | : 2018-0                  |
| Test in period.....  | : 2018-0                  |
| Procedure deviation  | : N.A.                    |
| Non-standard test method   | : N.A.                    |
| <p>The test data was only valid for the test<br/>         above and for the specific product described<br/>         written consent from Bay Area Compliance L</p> |                           |
| Type of test object  | : LED p                   |
| Trademark  | : N.A.                    |
| Model/type reference   | : HL-AM                   |
| Manufacturer   | : Hongl<br>No.1,<br>China |
| Rating   | : Input:                  |
| Copy of marking plate:<br>None   |                           |

|  |                              |
|--|------------------------------|
| Tested lamp .....                              | : LED package                |
| Tested lamp system .....                       | : N.A.                       |
| Lamp cap .....                                 | : N.A.                       |
| Bulb.....                                      | : N.A.                       |
| Rated of the lamp .....                        | : N.A.                       |
| Furthermore marking on the lamp.....           | : N.A.                       |
| Seasoning of lamps according EN standard ..... | : No seasoning               |
| Used measurement instrument.....               | : See appendix B for details |
| Temperature by measurement.....                | : 25.0°C                     |
| Information for safety use.....                | : N.A                        |

|   |         |
|---|---------|
| :   |         |
| -test case does not apply to the test object..... | :N(.A.) |
| -test object does meet the requirement.....       | :P(ass) |
| -test object does not meet the requirement.....   | :F(ail) |

The test results presented in this report relates only to the object tested.  
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.  
 "(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 point is used as the decimal separator.  
 List of test equipment must be kept on file and available for review.

This report consists of 15 pages and following appendixes:  
 Appendix A EUT photos  
 Appendix B Test equipment list

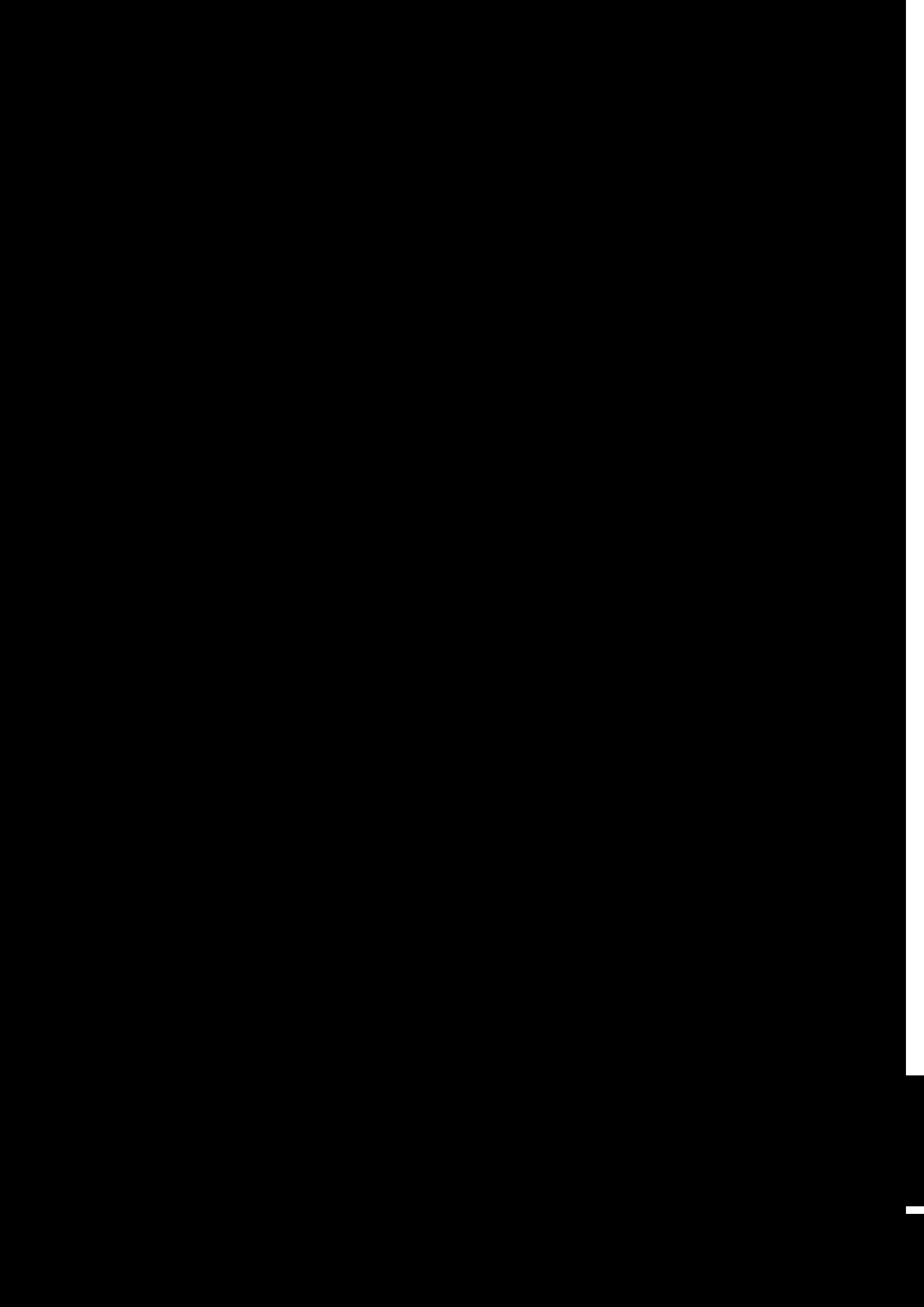
This product is LED package, test model is HL-AM-2835HW-S1-08-HR3 . Rated input is 2.8-3.4Vdc, 60mA.

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| EN 62471:2008 |  |                           |         |
|---------------|--|---------------------------|---------|
| Clause        | Requirement + Test   | Result - Remark           | Verdict |
| 4.3.3         | Retinal blue light hazard exposure limit   |                           | P       |
|               | To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$ , i.e., the blue-light weighted radiance, $L_B$ , shall not exceed the levels defined by: |                           | P       |
|               | $L_B \cdot t = \int L(\lambda, t) \cdot B(\lambda) \cdot d\lambda \leq 10^6 \text{ J} \cdot \text{m}^{-2} \cdot \text{sr}$   |                           | N       |
|               | $L_B = \int L(\lambda) \cdot B(\lambda) \cdot d\lambda \leq 100 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$  | See the Table 6.1         | P       |
| 4.3.4         | Retinal blue light hazard exposure limit - small source  | $\leq 0.0030 \text{ rad}$ | P       |
|               | Thus the spectral irradiance at the eye $E_\lambda$ , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by: see table 4.2   |                           | P       |
|               | $E \cdot t = \int E(\lambda, t) \cdot B(\lambda) \cdot d\lambda \leq 100 \text{ J} \cdot \text{m}^{-2}$  |                           | P       |
|               | $E_B = \int E(\lambda) \cdot B(\lambda) \cdot d\lambda \leq 1 \text{ W} \cdot \text{m}^{-2}$   | See the Table 6.1         | P       |
| 4.3.5         | Retinal thermal hazard exposure limit  |                           | P       |
|               | To protect against retinal thermal injury, the integrated spectral radiance of the light source, $L_\lambda$ , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:   |                           | P       |
|               | $L_R = \int_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50000}{\alpha \cdot t} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$  | See the Table 6.1         | P       |
| 4.3.6         | Retinal thermal hazard exposure limit – weak visual stimulus   |                           | P       |
|               | For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, $L_{IR}$ , as viewed by the eye for exposure times greater than 10 s shall be limited to:                  |                           | P       |
|               | $L_{IR} = \int_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6000}{\alpha} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$  | See the Table 6.1         | P       |

| EN 62471:2008 |   |   |         |
|---------------|---|---|---------|
| Clause        | Requirement + Test  | Result - Remark   | Verdict |
| 4.3.7         | Infrared radiation hazard exposure limits for the eye   |   | P       |
|               | The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis),ocular exposure to infrared radiation, EIR,over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed: |   | N       |
|               | $E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18000 \cdot t^{-0,75} \quad W \cdot m^{-2}$  |   | N       |
|               | For times greater than 1000 s the limit becomes:  |   | P       |
|               | $E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$  | $E_{IR} = 0 W \cdot m^{-2}$   | P       |
| 4.3.8         | Thermal hazard exposure limit for the skin  |   | P       |
|               | Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:  |   | P       |
|               | $E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta t \cdot \Delta\lambda \leq 20000 \cdot t^{0,25} \quad J \cdot m^{-2}$  | $E_H \cdot t = 0.61 W \cdot m^{-2} \times 10s = 6.1 J \cdot m^{-2}$ | P       |
| 5             | MEASUREMENT OF LAMPS AND LAMP SYSTEMS   |   | P       |
| 5.1           | Measurement conditions  |   | P       |
|               | Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.   |   | P       |
| 5.1.1         | Lamp ageing (seasoning)   |   | N       |
|               | Seasoning of lamps shall be done as stated in the Appropriate EN lamp standard.   |   | N       |
| 5.1.2         | Test environment  | 25.0  | P       |
|               | For specific test conditions, see the appropriate EN lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.   |   | P       |
| 5.1.3         | Extraneous radiation  |   | P       |
|               | Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.   |   | P       |
| 5.1.4         | Lamp operation  |   | P       |
|               | Operation of the test lamp shall be provided in accordance with:  |   | P       |

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EN 62471:2008

| Clause | Requirement + Test   | Result - Remark | Verdict |
|--------|--|-----------------|---------|
|        | – an actinic ultraviolet hazard (ES) within 1000 s exposure, nor   |                 | N       |
|        | – a near ultraviolet hazard (EUVA) within 100 s, nor   |                 | N       |
|        | – a retinal blue-light hazard (LB) within 0,25 s (aversion response), nor  |                 | N       |
|        | – a retinal thermal hazard (LR) within 0,25 s (aversion response), nor   |                 | N       |
|        | – an infrared radiation hazard for the eye (EIR) within 10 s   |                 | N       |
|        | Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (LIR), within 10 s are in Risk Group 2.   |                 | N       |
| 6.1.4  | Risk Group 3 (High-Risk)   |                 | N       |
|        | Lamps which exceed the limits for Risk Group 2 are in Group 3.   |                 | N       |
| 6.2    | Pulsed lamps   |                 | N       |
|        | Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.  |                 | N       |
|        | A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.   |                 | N       |
|        | The risk group determination of the lamp being tested shall be made as follows:  |                 | N       |
|        | – a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)  |                 | N       |
|        | – for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group   |                 | N       |
|        | – for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission |                 | N       |



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EN 62471:2008

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

| Table 6.1                               | Emission limits for risk groups of continuous wave lamps base on Directive(2006/25/EC) |                                     |                  |                      |        |                      |                       |                      | P      |
|---|--|-------------------------------------|------------------|----------------------|--------|----------------------|-----------------------|----------------------|--------|
| Risk                                    | Action spectrum  | Units                               | Symbol           | Exempt               |        | Low risk             |                       | Mod risk             |        |
|   |  |                                     |                  | Limit                | Result | Limit                | Result                | Limit                | Result |
| Actinic UV                              | Suv( )   | W.m <sup>-2</sup>                   | E <sub>S</sub>   | 0.001                | --     | 0.003                | 5.4×10 <sup>-5</sup>  | 0.03                 | --     |
| Near UV                                 |  | W.m <sup>-2</sup>                   | E <sub>UVA</sub> | 0.33                 | --     | 33                   | 2.9×10 <sup>-5</sup>  | 100                  | --     |
| Blue light                              | B( )   | W.m <sup>-2</sup> .sr <sup>-1</sup> | L <sub>B</sub>   | 100                  | --     | 10000                | 1.89×10 <sup>3</sup>  | 4000000              | --     |
| Blue light,small source                 | B( )   | W.m <sup>-2</sup>                   | E <sub>B</sub>   | 0.01                 | --     | 1                    | 1.65×10 <sup>-1</sup> | 400                  | --     |
| Retinal thermal                         | R( )   | W.m <sup>-2</sup> .sr <sup>-1</sup> | L <sub>R</sub>   | 28000/<br>( =0.0030) | --     | 28000/<br>( =0.0030) | 2.3×10 <sup>4</sup>   | 71000/<br>( =0.0030) | --     |
| Retinal thermal, Weak visual stimulus** | R( )   | W.m <sup>-2</sup> .sr <sup>-1</sup> | L <sub>IR</sub>  | 6000/<br>( =0.0030)  | --     | 6000/<br>( =0.0030)  | 4.3×10 <sup>1</sup>   | 28000/<br>( =0.0030) | --     |
| IR radiation Eye                        |  | W.m <sup>-2</sup>                   | E <sub>IR</sub>  | 100                  | --     | 570                  | 0                     | 3200                 | --     |

\* Small source defined as one with < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.

\*\* Involves evaluation of non-GLS source

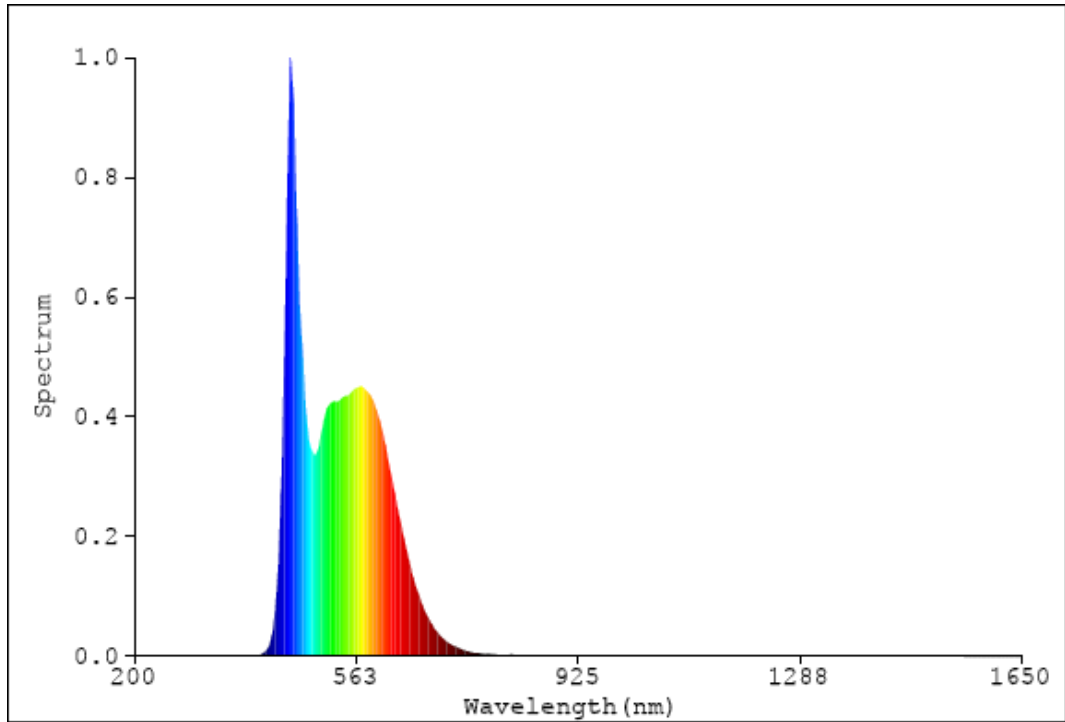
NOTE The action functions: see Table 4.1 and Table 4.2

The appliance apertuer diameters: see 4.2.1

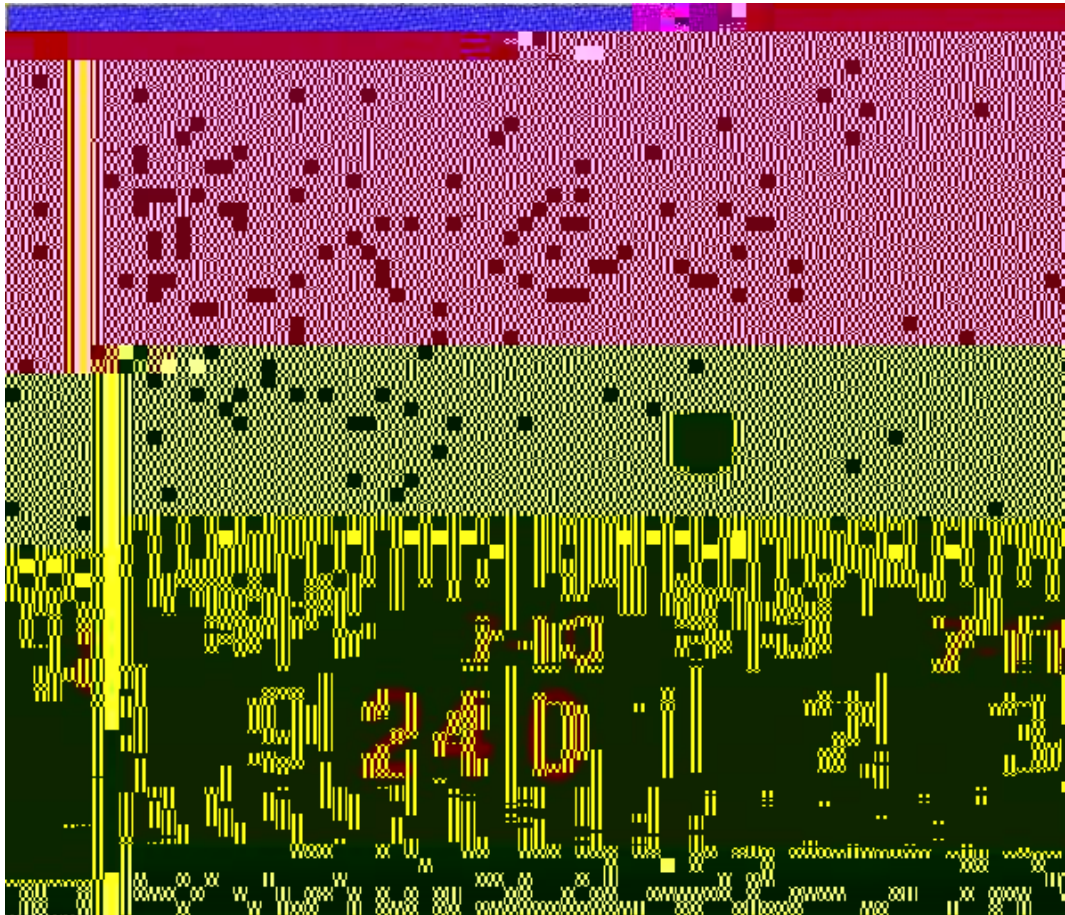
The limitations for the angular subtenses: see 4.2.2

The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5

Figure of Spectral distribution



Appendix A –EUT Photos



### Appendix B Test equipment list

|   |           |              |          |            |            |
|---|-----------|--------------|----------|------------|------------|
| UV-VIS-near IR Spectrophotocolorimeter        | PMS-2000  | T-08-SF213   | EVERFINE | 2017-08-08 | 2018-08-07 |
| Imaging luminance meter                       | CX-2K     | T-08-SF140-1 | EVERFINE | 2017-08-08 | 2018-08-07 |
| Radiation illuminance meter                   | RD-2000   | T-08-SF140-2 | EVERFINE | 2017-08-08 | 2018-08-07 |
| Radiation illuminance meter                   | RD-2000   | T-08-SF140-3 | EVERFINE | 2017-08-08 | 2018-08-07 |
| High Accuracy Array                           | HAAS-2000 | T-08-SF140-4 | EVERFINE | 2017-08-08 | 2018-08-07 |
| Hygrothermograph                              | PWS280    | T-08-QA026   | N/A      | 2017-03-21 | 2018-03-20 |
| Standard power spectral UV radiation-specific | UVS-8003  | T-08-EE048   | EVERFINE | 2017-03-21 | 2018-03-20 |
| 80mm sample integrating sphere                | SMS-300   | F-08-SF130   | EVERFINE | 2016-12-26 | 2018-12-25 |
| Steel tape                                    | HILOCK-19 | T-08-SF100   | TAJIMA   | 2013-04-18 | 2018-04-17 |
| Digital CC&CV DC Power Supply                 | WY305     | T-08-EE098   | EVERFINE | 2017-03-04 | 2018-03-04 |