


| <b>TEST REPORT</b><br><b>IEC 62722-2-1: 2014</b><br><b>LUMINAIRE PERFORMANCE – Part 2-1: Particular requirements for LED luminaires</b>  |  |
|--|--|
| <b>Report No.</b> .....  | OI-2016-B0170  |
| <b>Date of issue</b> .....   | Dec. 28, 2016  |
| <b>Testing Laboratory</b> .....  | SGS Taiwan Ltd., Optics Laboratory   |
| <b>Address</b> .....   | No. 33, Wu Chyuan Road, New Taipei Industrial Park, Wu Ku District, New Taipei City 24886, Taiwan (R.O.C.)                     |
| <b>Applicant's name</b> .....  | Top Win Optoelectronics Corp.  |
| <b>Address</b> .....   | 5F. -2, No. 120, Qiaohe Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)   |
| <b>Test specification:</b>   |  |
| <b>Standard</b> .....  | IEC 62722-2-1: 2014<br>LUMINAIRE PERFORMANCE – Part 2-1: Particular requirements for LED luminaires                            |
| <b>Test procedure</b> .....  | CE Marking Testing   |
| <b>Non-standard test method</b> .....  | N/A  |
| <b>Test item description</b> .....   | 90 W LED Street Light  |
| <b>Trade Mark</b> .....  | SLITE  |
| <b>Manufacturer</b> .....  | Top Win Optoelectronics Corp.  |
| <b>Model/Type reference</b> .....  | TW-PD0905011-D5  |
| <b>Ratings</b> .....   | AC 100 V to 240 V (50 / 60) Hz, 90 W   |
| <b>Conclusion:</b>   | In the opinion of SGS, the submitted <u>Device Under Test</u> (DUT) <u>complies</u> with the IEC 62722-2-1 test specification. |
| <div style="text-align: right;"> <b>Approved by: Benson DENG</b><br/> <b>Supervisor</b><br/> <b>Dec. 28, 2016</b> </div>   |  |
| <div style="text-align: right;"> <br/>           _____<br/> <b>Signature</b> </div>  |  |
| <p>Details and test results are given in subsequent pages of this report.<br/>           This report refers only to the unit(s) submitted for test.<br/>           "(see Enclosure #)" refers to additional information appended to the report.<br/>           "(see appended table)" refers to a table appended to the report. Throughout this report a point is used as the decimal separator.<br/>           This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms_and_conditions.htm">www.sgs.com/terms_and_conditions.htm</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms_e-document.htm">http://www.sgs.com/terms_e-document.htm</a><br/>           Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.<br/>           Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.</p> |  |

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| <input checked="" type="checkbox"/> <b>Testing Laboratory:</b>   |  | SGS Taiwan Ltd., Optics Laboratory  |                       |                      |
|--|--|---|-----------------------|----------------------|
| Testing Location / Address.....:   |  | <input checked="" type="checkbox"/> No. 33, Wu Chyuan Road, New Taipei Industrial Park, Wu Ku District, New Taipei City 24886, Taiwan (R.O.C.)<br><input type="checkbox"/> No. 61, Kai-Fa Road, Nanzih Export Processing Zone, Kaohsiung 81170, Taiwan (R.O.C.) |                       |                      |
| <b>Main Test Equipment:</b>  |  |   |                       |                      |
| Name   | Brand  | Model   | S/N                   | Calibration Due Date |
| Digital Power Meter / AC Source  | YOKOGAWA / apc                                   | WT-310 / AFC-500W   | C2PK22023V/F312120079 | 2017/8/18            |
| Goniophotometer  | SGS Define (CZIBULA & GRUNDMANN GMBH / everfine) | EVERFINE GO-R5000-PLUS  | 1001001               | 2017/2/1             |
| <b>Summary of testing:</b>   |  |   |                       |                      |
| This test report was issued for Energy Efficiency requirements of IEC 62722-2-1 LUMINAIRE PERFORMANCE – Part 2-1: Particular requirements for LED luminaires only.<br>The compliance with the requirements of other applicable standards may be needed in additional test reports. |  |   |                       |                      |
| <b>Copy of marking plate:</b>  |  |   |                       |                      |
| Please see IV Product Specification.<br>Note: The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.   |  |   |                       |                      |

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| TEST REPORT  |  |
|--|--|
| <b>Test item particulars:</b><br>Classification of installation and use .....: Type I Roadway Lighting<br>Supply Connection.....: MEAN WELL / HLG-120H-42A<br>Class of equipment.....: IP65<br>Mass of the equipment.....: 6.6 kg  |  |
| <b>Possible test case verdicts:</b><br>– test case does not apply to the test object.....: N (Not applicable)<br>– test object does meet the requirement .....: P (Pass)<br>– test object does not meet the requirement.....: F (Fail)   |  |
| <b>Testing:</b><br>Date of receipt of test item .....: Nov. 23, 2016<br>Date (s) of performance of tests .....: Nov. 23, 2016 ~ Dec. 23, 2016  |  |
| <b>General remarks:</b><br>The test results presented in this report relate only to the object tested.<br>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.<br>"(see Enclosure #)" refers to additional information appended to the report.<br>"(see appended table)" refers to a table appended to the report.<br>Clause numbers between brackets refer to clauses in IEC 62722-2-1<br>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator. |  |
| <b>General product information:</b><br>The model No. TW-PD0905011-D5 of 90 W LED Street Light were type I of IEC 60598-1 use for roadway lighting, the IEC 62717 report of LED module No. MD5T01 has been proven for the IEC 62722-2-1 testing.<br>The LED luminaire classification of IEC 62722-2-1 was type A.<br>Note: The test samples were LED module and controlgear combination, the real sample has long arm mounted type fixture kit, but does not affect the testing and requirements.   |  |

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## I. Product Specification

| LED Luminaire Specification  |   |   |
|--|---|---|
| Scope Type   | : | Type A                                    |
| Model Name   | : | 90W LED Street Light                      |
| Rated Luminous Flux (lm)   | : | 11250 lm                                  |
| Photometric Code   | : | 750/7 <sup>+</sup> 7 <sup>+</sup> 9       |
| Rated Life Time (h) and Rated median useful life and the associated rated lumen maintenance factor (x) | : | 30000 h / L <sub>70</sub> F <sub>10</sub> |
| Rated Abrupt Failure Value AFV (%)   | : | 10 %                                      |
| Lumen Maintenance Code   | : | 9   |
| Categories of rated chromaticity coordinate values both initial and maintained                         | : | F5000 (7 <sup>+</sup> , 7 <sup>+</sup> )  |
| Correlated Colour Temperature (K)  | : | 5000 K                                    |
| Rated Colour Rendering Index   | : | 70  |
| <i>t<sub>q rated</sub></i> of LED Luminaire (°C)   | : | 48.5 °C                                   |
| Ageing time  | : | --  |
| Ambient temperature range (°C)   | : | -30 °C to 50 °C                           |
| Rated Input Voltage (V)  | : | 100 to 240 V                              |
| Rated Input Current (A)  | : | 0.38 to 0.90 A                            |
| Rated Input Frequency (Hz)   | : | (50 / 60) Hz                              |
| Rated Input Power (W)  | : | 90 W                                      |
| Rated Efficacy (lm/W)  | : | 125 lm/W                                  |
| Dimension (mm)   | : | W 150 x L 420 x H 130                     |
| LED Light Source Specification   |   |   |
| LED Model  | : | XPG2                                      |
| Manufacture / Brand  | : | CREE                                      |
| Rated Input Voltage (V)  | : | 3.05 V                                    |
| Rated Input Current (A)  | : | 750 mA                                    |
| Rated Input Frequency (Hz)   | : | DC  |
| LED Quantity per Module  | : | 24 pcs                                    |
| Dimension (mm)   | : | W 3.45 x L 3.45 x H 2.26                  |
| Controlgear Specification  |   |   |
| Model  | : | HLG-120H-42A                              |
| Manufacture / Brand  | : | MEAN WELL                                 |
| Rated Input Voltage (V)  | : | AC 100 V to 240 V                         |
| Rated Input Current (A)  | : | 1.4 A                                     |
| Rated Input Frequency (Hz)   | : | (50 / 60) Hz                              |
| Used Quantity per Luminaire  | : | 1 pce                                     |

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| IEC 62722-2-1 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

|          |  |                                     |   |
|----------|--|-------------------------------------|---|
| <b>1</b> | <b>Scope</b>   |                                     |   |
|          | Type A — Luminaires using LED modules where compliance with IEC 62717 has been proven.                             | IEC 62717 Report No.: OI-2016-70067 | P |
|          | Type B — Luminaires using LED modules where compliance with IEC 62717 has not been proven.                         |                                     | N |
|          | Type C — Luminaires using a LED lamp and covered in IEC 62722-1.<br>The standard does not cover Type C luminaires. |                                     | N |

|          |  |                              |   |
|----------|--|------------------------------|---|
| <b>4</b> | <b>Product information</b>   |                              |   |
|          | Information as below shall be provided by the manufacturer or responsible vendor on the product datasheets, leaflets or website.<br>Compliance is checked by inspection. | See IV Product Specification | P |
|          | a) Rated input power (in W)  | See IV Product Specification | P |
|          | b) Photometric code  | See IV Product Specification | P |
|          | c) Rated luminous flux (in lm)   | See IV Product Specification | P |
|          | d) Rated median useful life (h) and the associated rated lumen maintenance factor (x)  | See IV Product Specification | P |
|          | e) Rated abrupt failure value (%)  | See IV Product Specification | P |
|          | f) Lumen maintenance code  | See IV Product Specification | P |
|          | g) Rated chromaticity co-ordinate values both initial and maintained   | See IV Product Specification | P |
|          | h) Rated correlated colour temperature (CCT in K)  | See IV Product Specification | P |
|          | i) Rated colour rendering index (CRI)  | See IV Product Specification | P |
|          | j) Rated ambient temperature ( $t_a$ ) related to performance for a luminaire (°C)   | See IV Product Specification | P |
|          | k) Rated LED luminaire luminous efficacy (in lm/W)   | See IV Product Specification | P |
|          | l) Ageing time, if different from 0 h  | --                           | N |

|          |   |   |    |
|----------|---|---|----|
| <b>6</b> | <b>Test conditions</b>  |   |    |
| 6.1      | General test conditions   |   | -- |
|          | All tests are measured on "n" LED luminaires of the same type. The number "n" shall be a minimum of products as given in Table 3.   | LED modules where compliance with IEC 62717 has been proven | P  |
|          | LED luminaires used in the endurance tests shall not be used in other tests.  |   | P  |
|          | Each sample luminaire shall comply with all the relevant tests except for the tests of 10.3 where one sample is required for each of the three separate tests mentioned in Table 2 and Table 3. In order to reduce the time of testing, the manufacturer or responsible vendor may submit additional luminaires or parts of luminaires provided that these are of the |   | P  |

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| IEC 62722-2-1 |  |   |         |
|---------------|--|---|---------|
| Clause        | Requirement + Test   | Result - Remark                                 | Verdict |
|               | same materials and design as the original luminaire and that the results of the test are the same as if carried out on an identical luminaire.   |   |         |
|               | LED luminaires with dimming control shall be adjusted to maximum output for all tests.   |   | P       |
|               | LED luminaires with adjustable CCT shall be adjusted/set to one fixed value as indicated by the manufacturer or responsible vendor.  | Not an adjustable CCT luminaire                 | N       |
|               | LED luminaires of linear geometry and variable length shall be tested at a length at which the parameters are given (e.g. performance per x cm).   | Not linear geometry and variable length product | N       |
| 6.2           | Luminaires using LED modules where compliance with IEC 62717 has been proven (Type A)  |   | --      |
|               | Only the tests for measurement of initial performance are to be conducted, when the LED module is operated within its temperature limit $t_p$ .  |   | P       |
|               | The information for luminaire design given in IEC 62717, Clause B.1, requires LED modules to be operated within their $t_p$ temperature limit. The $t_p$ temperature shall be measured according to the thermal test procedure defined in 12.4 of IEC 60598-1, (normal operation). When the luminaire is operating at its own maximum rated ambient temperature for performance ( $t_q$ ), the $t_p$ limit (for the declared performance — Table 2, IEC 62717) of LED modules operating inside the luminaire shall not be exceeded. The test voltage for the luminaire shall be 1.00 times the rated voltage of the luminaire. In luminaires intended to be supplied with constant current, the test current shall be 1.00 times the rated current of the luminaire. |   | P       |
|               | For luminaires for road and street lighting and floodlights intended for outdoor use only, the reduction of the measured temperature according to 3.12.1 of IEC 60598-2-3, and 5.12.1 of IEC 60598-2-5, respectively shall not be applied for the $t_p$ temperature of the LED module.   |   | P       |
|               | The ambient performance temperature $t_q$ is measured in a draught-proof enclosure, as the air temperature, at a position near one of the perforated walls on a level with the centre of the luminaire, see item e), Clause K.1 of IEC 60598-1.  |   | P       |
| 6.3           | Luminaires using LED modules where compliance with IEC 62717 has not been proven (Type B)  |   | N       |
| 6.3.1         | General  |   |         |
|               | The manufacturer shall conduct testing for 25 % of rated life up to a maximum of 6 000 h.  |   | N       |

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| IEC 62722-2-1 |   |                     |         |
|---------------|---|---------------------|---------|
| Clause        | Requirement + Test  | Result - Remark     | Verdict |
| 6.3.2         | Creation of module families to reduce test effort   |                     | --      |
| 6.3.2.1       | General   |                     | N       |
|               | The provisions of 6.2.1 of IEC 62717 apply to the LED luminaire.  |                     |         |
| 6.3.2.2       | Variations within family  |                     | N       |
|               | The provisions of 6.2.2 of IEC 62717 apply to the LED luminaire.  |                     |         |
| 6.3.2.3       | Compliance testing of family members  |                     | N       |
|               | The provisions of 6.2.3 of IEC 62717 apply to the LED luminaire.  |                     |         |
| 6.4           | Performance requirements  |                     | P       |
|               | The performance criteria given in Table 2 applies for LED luminaires of Types A and B. All of the tested n LED luminaires shall have passed the performance requirements. | Luminaire of type A |         |

|          |   |                       |   |
|----------|---|-----------------------|---|
| <b>7</b> | <b>Input power</b>  |                       |   |
|          | Power shall be measured at the supply to the luminaire, see Figure 1. The provisions of Clause 7 of IEC 62717 apply to the LED luminaire. In case the power is not constant, the average of the power is measured over an appropriate time. | See II. TESTING VALUE | P |

|          |   |                       |    |
|----------|---|-----------------------|----|
| <b>8</b> | <b>Photometric performance</b>  |                       |    |
| 8.1      | Luminous flux   |                       | -- |
|          | Measured luminous flux (lm)   |                       | P  |
|          | The initial luminous flux of each individual LED luminaire in the measured sample shall not be less than the rated luminous flux by more than 10 %.   | See II. TESTING VALUE | P  |
| 8.2      | Luminous intensity distribution, peak intensity and beam angle.   |                       | -- |
| 8.2.1    | General   |                       |    |
|          | The requirements of 8.2.4 and 8.2.5 shall be applied to LED luminaire having a directional (spot) distribution.   | See II. TESTING VALUE | P  |
| 8.2.2    | Measurement   |                       |    |
|          | The intensity of light emitted from the LED luminaire in different directions is measured using a goniophotometer. All photometric data shall be declared for the LED module operating at its temperature $t_{p, rated}$ per Clause A.1. The allowed photometric variations detailed should take account of manufacturing tolerances. | See II. TESTING VALUE | P  |
| 8.2.3    | Luminous intensity distribution   |                       | -- |
|          | The distribution of luminous intensity shall be in accordance with that declared by the manufacturer.   | See II. TESTING VALUE | P  |

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| IEC 62722-2-1 |   |                       |         |
|---------------|---|-----------------------|---------|
| Clause        | Requirement + Test  | Result - Remark       | Verdict |
|               | The measurement is conducted according to A.3.3.  |                       |         |
|               | Compliance is under consideration.  | Under consideration   | N       |
| 8.2.4         | Peak intensity  | See II. TESTING VALUE | P       |
|               | The initial peak intensity of a LED luminaire shall not be less than 75 % of the rated intensity. |                       |         |
| 8.2.5         | Beam angle  | See II. TESTING VALUE | P       |
|               | The beam angle value of a LED luminaire shall not deviate by more than 25 % of the rated value.   |                       |         |
| 8.3           | Luminaire luminous efficacy   |                       | --      |
|               | Measured efficacy (lm/W)  | See II. TESTING VALUE | P       |
|               | The efficacy of LED luminaire shall not be less than 90% of the rated efficacy                    | See II. TESTING VALUE | P       |

|          |   |   |    |
|----------|---|---|----|
| <b>9</b> | <b>Chromaticity co-ordinates, correlated colour temperature (CCT) and colour rendering</b>  |   |    |
| 9.1      | Chromaticity co-ordinates   |   | -- |
|          | Measured initial / maintained chromaticity co-ordinates   | See II.F to I of IEC 62717 report : OI-2016-70067 | P  |
|          | The measured chromaticity co-ordinate values of a LED module (the initial value and maintained value) shall not move beyond the chromaticity co-ordinate tolerance category | See II.G of IEC 62717 report : OI-2016-70067      | P  |
| 9.2      | Correlated colour temperature (CCT)   |   | -- |
|          | Measured initial / maintained CCT.  | See II.F to I of IEC 62717 report : OI-2016-70067 | P  |
|          | The measured correlated colour temperature shall not move beyond the value as declared.   | Rated value: 5000 K                               | P  |
| 9.3      | Colour rendering index (CRI)  |   | -- |
|          | Measured initial / maintained CRI.  | See II.F to I of IEC 62717 report : OI-2016-70067 | P  |
|          | For all tested item in the sample the measured CRI values shall not have decreased by more than:  | Rated value: 70                                   | -- |
|          | - 3 points from the rated CRI value (see Table 1) for initial CRI values;   | See II.F to I of IEC 62717 report : OI-2016-70067 | P  |
|          | - 4 points from the rated CRI value, when tested for 6 000 h maintained CRI values.   | See II.F to I of IEC 62717 report : OI-2016-70067 | P  |

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| IEC 62722-2-1 |                    |                 |         |
|---------------|--------------------|-----------------|---------|
| Clause        | Requirement + Test | Result - Remark | Verdict |

|                           |   |   |    |
|---------------------------|---|---|----|
| <b>10</b>                 | <b>LED luminaire life</b>   |   |    |
| 10.1                      | General   |   | N  |
| 10.2                      | Lumen maintenance   |   | N  |
|                           | Measured maintained luminous flux   |   | N  |
|                           | The measured luminous flux value shall not be less than the luminous flux value given by the rated lumen maintenance factor related to rated median useful life.  | Luminaire of type A (LED modules compliance with IEC 62717) | N  |
|                           | For all the tested items in a sample, the measured values shall be of the same maintenance code as the provided values. All the LED modules in a sample shall pass the test.  | Luminaire of type A (LED modules compliance with IEC 62717) | N  |
| 10.3                      | Endurance tests   | Luminaire of type A (LED modules compliance with IEC 62717) | N  |
| (10.3.1)<br>(IEC 62717)   | General   |   | N  |
| (10.3.2)<br>(IEC 62717)   | Temperature cycling test  |   | N  |
| (10.3.2.1)<br>(IEC 62717) | General   |   | N  |
| (10.3.2.2)<br>(IEC 62717) | Alternative test 1 with 10 K/min  |   | -- |
|                           | At the end of the test all the LED luminaire shall operate and have a luminous flux which stays within the claimed lumen maintenance code for a period of at least 15 mm and show no physical effects of temperature cycling such as cracks or delaminating of the label. | Luminaire of type A (LED modules compliance with IEC 62717) | N  |
| (10.3.2.3)<br>(IEC 62717) | Alternative test 2 with 1 K/min   |   | -- |
|                           | At the end of the test all the LED luminaire shall operate and have a luminous flux which stays within the claimed lumen maintenance code for a period of at least 15 mm and show no physical effects of temperature cycling such as cracks or delaminating of the label. | Luminaire of type A (LED modules compliance with IEC 62717) | N  |
| (10.3.3)<br>(IEC 62717)   | Supply switching test   |   | -- |
|                           | At test voltage, current or power, the LED luminaire shall be switched on and off for 30 s each. The cycling shall be repeated for a number equal to half the rated life in h.  | Luminaire of type A (LED modules compliance with IEC 62717) | N  |
|                           | At the end of the test all the LED luminaire shall operate and have a luminous flux which stays the claimed lumen maintenance code for a period of at least 15 mm.  | Luminaire of type A (LED modules compliance with IEC 62717) | N  |

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| IEC 62722-2-1           |  |   |         |
|-------------------------|--|---|---------|
| Clause                  | Requirement + Test   | Result - Remark   | Verdict |
| (10.3.4)<br>(IEC 62717) | Accelerated operation life test  |   | --      |
|                         | The LED luminaire shall be operated continuously without switching at test voltage and at a temperature corresponding to 10 K (see last paragraph) above the maximum recommended operating temperature $t_{p, rated}$ , over an operational time of 1 000 h. Any thermal protecting devices that would switch off the LED luminaire or reduces the light output at a threshold temperature $> t_{p, rated}$ shall be bypassed. | Luminaire of type A (LED modules compliance with IEC 62717) | N       |
|                         | At the end of this period, and after cooling down to room temperature and being stabilised, all the LED luminaire have an allowed decrease of light output at the end of the test of max. 20 % compared to the initial value, for at least 15 min.   | Luminaire of type A (LED modules compliance with IEC 62717) | N       |

|    |                          |                 |   |
|----|--------------------------|-----------------|---|
| 11 | <b>Verification</b>      |                 |   |
|    | Sample sizes and DUT S/N | See table below | P |

| Clause       | Test                                  | Type and S/N |
|--------------|---------------------------------------|--------------|
| 6.3          | LED module performance temperature    | A1           |
| 7            | Power                                 |              |
| 8.1          | Luminous flux                         |              |
| 8.2.3        | Luminous intensity distribution       |              |
| 8.2.4        | Intensity value                       |              |
| 8.2.5        | Beam angle value                      | --           |
| 8.3          | Luminaire luminous efficacy           |              |
| 9.1          | Initial chromaticity tolerance        |              |
| 9.1          | Maintained chromaticity tolerance     |              |
| 9.2          | Initial correlated colour temperature |              |
| 9.3          | CRI initial                           |              |
| 9.3          | CRI maintained                        |              |
| 10.2         | Lumen maintenance                     |              |
| 10.3(10.3.2) | Temperature cycling, energised        | --           |
| 10.3(10.3.3) | Supply voltage switching              | --           |
| 10.3(10.3.4) | Accelerated operation life test       | --           |

Note: The test samples were without erect poles.

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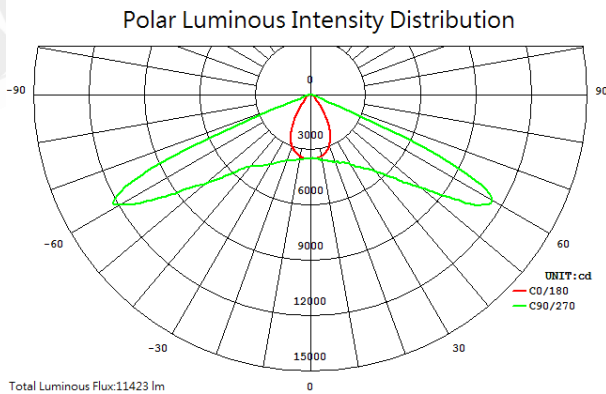
## II. TESTING VALUE

### A. LED Luminaire performance temperature

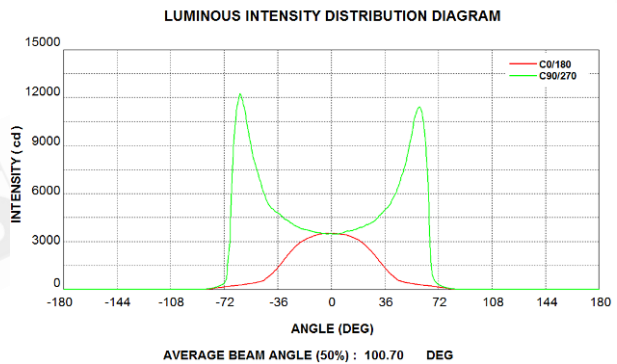
| S/N | Input Voltage | Input Current | Input Power | $t_g$ Temp.(°C) |
|-----|---------------|---------------|-------------|-----------------|
| A1  | 219.98        | 0.4241        | 89.94       | 42.7            |

### B. Luminous intensity distribution

S/N A1



Polar Luminous Intensity Distribution



Cartesian Coordinates Luminous Intensity Distribution

### C. Peak intensity & Beam angle

| S/N | Peak intensity (cd) | Beam angle (50%)(°) |
|-----|---------------------|---------------------|
| A1  | 12255.91 cd         | 100.7°              |

### D. Optical Properties & Electrical Characteristics

| Initial ( 0 h ) |               |               |             |               |      |         |      |                   |
|-----------------|---------------|---------------|-------------|---------------|------|---------|------|-------------------|
| S/N             | Input Voltage | Input Current | Input Power | Luminous Flux | CCT  | CRI(Ra) | SDCM | Luminous Efficacy |
| A1              | 219.95        | 0.4264        | 90.25       | 11423         | 4913 | 71.6    | 1.95 | 126.6             |

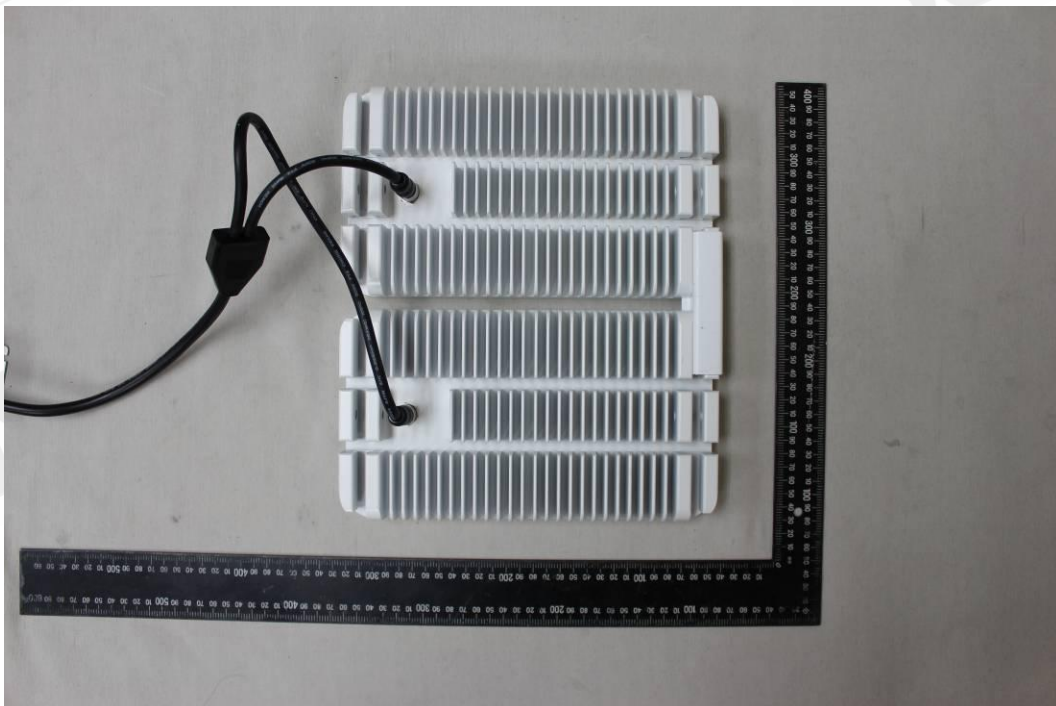
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### III. Attachment Photos



Front View

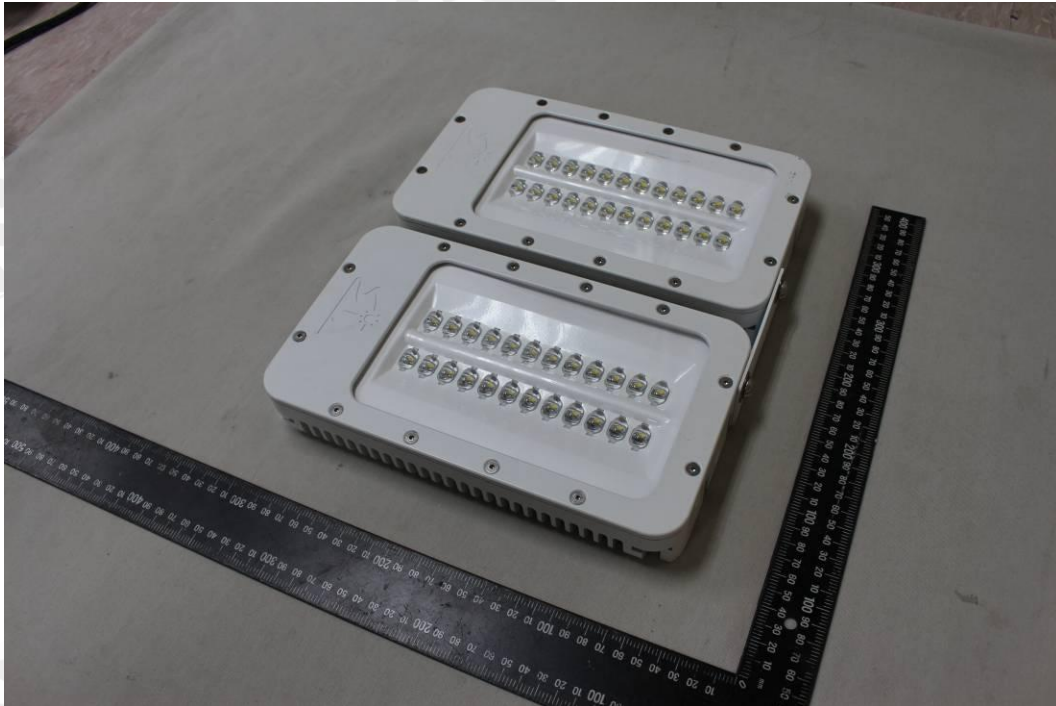


Back View

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DUT



Control Gear

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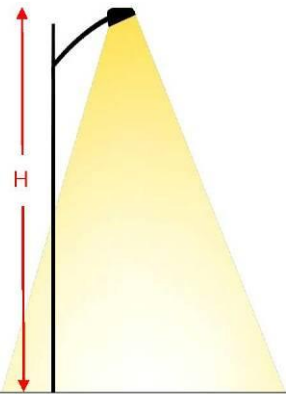



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## IV. Product Specification

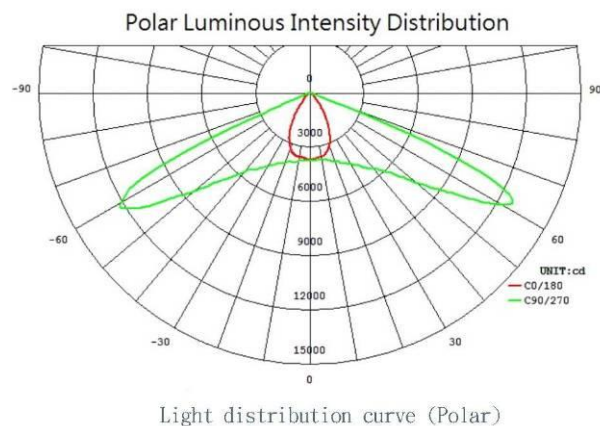
### 德威光電股份有限公司 Top Win Optoelectronics Corp.

|                             |                                       |              |
|-----------------------------|---------------------------------------|--------------|
| Street Light - SLITE Series | File Number :                         | Edition : A0 |
|                             | Formulate : Product Integration Dept. | Pages : 1/7  |

|  | Height of poles<br>(H) | Applicable luminaire   |
|--|------------------------|--|
|  | < 8M                   | 36W~55W<br>SLITE<br>  |
|  | 8~12M                  | 72W~110W<br>SLITE<br> |
|  | > 12M                  | 135W<br>SLITE<br>    |

Note: The Figure above is for reference only. To achieve the best result, it should simulate each road conditions.

## PHOTOMETRY



表單編號: QP-702-14 版次: A0

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## Street Light - SLITE Series

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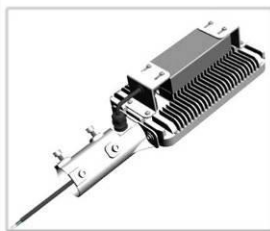
Edition : A0

Formulate : Product Integration Dept.

Pages : 2/7

## Specification

1 Module



36W~55W

2 Module



72W~110W

3 Module



135W

| Model number    | Luminaire Wattage (W) | Luminous Flux (lm) | Luminaire Efficacy (lm/W) | Weight (kg) | Dimensions (cm) | EPA (cm <sup>2</sup> ) |
|-----------------|-----------------------|--------------------|---------------------------|-------------|-----------------|------------------------|
| TW-PD0365011-D5 | 36                    | 4600               | 128                       | < 4.2       | 15*42*13        | 594                    |
| TW-PD0555011-D5 | 55                    | 6700               | 122                       | < 4.2       | 15*42*13        | 594                    |
| TW-PD0725011-D5 | 72                    | 9200               | 128                       | < 6.6       | 31*43*13        | 1150                   |
| TW-PD0855011-D5 | 85                    | 10700              | 126                       | < 6.6       | 31*43*13        | 1150                   |
| TW-PD0905011-D5 | 90                    | 11250              | 125                       | < 6.6       | 31*43*13        | 1150                   |
| TW-PD1105011-D5 | 110                   | 13400              | 122                       | < 6.6       | 31*43*13        | 1150                   |
| TW-PD1355011-D5 | 135                   | 16850              | 125                       | < 8.9       | 47*43*13        | 1687                   |

|  |                       |
|--|-----------------------|
| Input Voltage                                      | 100~240VAC            |
| Frequency  | 50/60Hz               |
| Operating Temperature                              | -30°C ~ 50°C          |
| Color Temperature                                  | 5000 K                |
| CRI  | Ra ≥ 70               |
| Photometric Code                                   | 750/7°7'9             |
| Categories of rated chromaticity coordinate values | F5000 (7°, 7')        |
| Lumen Maintenance Code                             | 9                     |
| Case Material                                      | AL 6063 T6            |
| Ingress Protection                                 | IP65                  |
| Certification                                      | CE                    |
| Life   | ≥ 30,000 hrs (L70F10) |

表單編號: QP-702-14 版次: A0

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## Street Light - SLITE Series

File Number :

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## Simulation for roadway lighting :

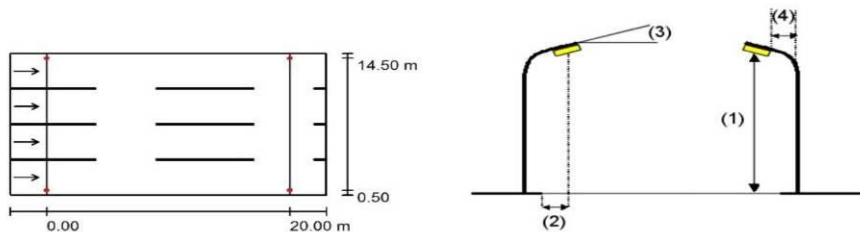
36~55W Street Light: (This is for reference, the simulation of actual roadway is principal.)

## Street Profile

Roadway 1 (Width: 15.000 m, Number of lanes: 4, tarmac: R3, q0: 0.070)

Light loss factor: 0.80

## Luminaire Arrangements



| Luminaire                | TW-PD0365011-D5      | TW-PD0555011-D5 |
|--------------------------|----------------------|-----------------|
| Luminous flux(Luminaire) | 4800 lm              | 6700 lm         |
| Luminaire Wattage        | 36 W                 | 55 W            |
| Arrangement              | Double row, opposing |                 |
| Pole Distance            | 20 M                 |                 |
| Mounting Height          | 7 M                  |                 |
| Height                   | 7 M                  |                 |
| Overhang                 | 0.5 M                |                 |
| Boom Angle               | 15°                  |                 |
| Boom Length              | 1 M                  |                 |
| $E_{av}$ [lx]            | 19                   | 27              |
| $E_{min}$ [lx]           | 12                   | 18              |
| $E_{max}$ [lx]           | 23                   | 34              |
| $u0$                     | 0.669                | 0.669           |
| $E_{min} / E_{max}$      | 0.534                | 0.534           |

表單編號: QP-702-14 版次: A0

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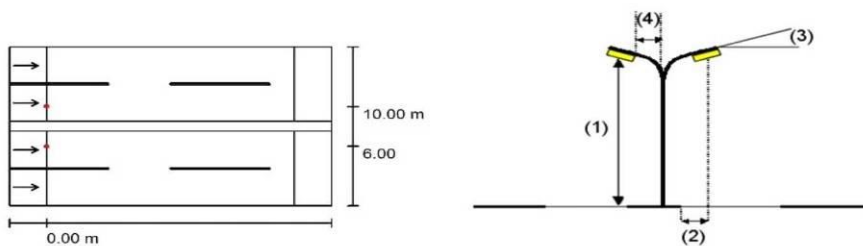
72~110W Street Light: (This is for reference, the simulation of actual roadway is principal.)

## Street Profile

Roadway 2 (Width: 7.500 m, Number of lanes: 2, tarmac: R3, q0: 0.070)  
Median 1 (Width: 1.000 m, Height: 0.000 m)  
Roadway 1 (Width: 7.500 m, Number of lanes: 2, tarmac: R3, q0: 0.070)

Light loss factor: 0.80

## Luminaire Arrangements



| Luminaire                                    | TW-PD0725011-D5 | TW-PD0855011-D5 | TW-PD0905011-D5 | TW-PD1105011-D5 |
|--|-----------------|-----------------|-----------------|-----------------|
| Luminous flux(Luminaire)                     | 9200 lm         | 10700 lm        | 11250 lm        | 13400 lm        |
| Luminaire Wattage                            | 72 W            | 85 W            | 90 W            | 110 W           |
| Arrangement                                  | on Median       |                 |                 |                 |
| Pole Distance                                | 35 M            |                 |                 |                 |
| Mounting Height                              | 12 M            |                 |                 |                 |
| Height                                       | 12 M            |                 |                 |                 |
| Overhang                                     | 1.5 M           |                 |                 |                 |
| Boom Angle                                   | 15°             |                 |                 |                 |
| Boom Length                                  | 2 M             |                 |                 |                 |
| Roadway1 E <sub>av</sub> [lx]                | 17              | 20              | 21              | 25              |
| Roadway1 E <sub>min</sub> [lx]               | 13              | 15              | 15              | 18              |
| Roadway1 E <sub>max</sub> [lx]               | 23              | 26              | 28              | 33              |
| Roadway1 u <sub>0</sub>                      | 0.747           |                 |                 |                 |
| Roadway1 E <sub>min</sub> / E <sub>max</sub> | 0.557           |                 |                 |                 |
| Roadway2 E <sub>av</sub> [lx]                | 17              | 20              | 21              | 25              |
| Roadway2 E <sub>min</sub> [lx]               | 13              | 15              | 15              | 18              |
| Roadway2 E <sub>max</sub> [lx]               | 23              | 26              | 28              | 33              |
| Roadway2 u <sub>0</sub>                      | 0.747           |                 |                 |                 |
| Roadway2 E <sub>min</sub> / E <sub>max</sub> | 0.557           |                 |                 |                 |

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Top Win Optoelectronics Corp.

## Street Light - SLITE Series

File Number :

Edition : A0

Formulate : Product Integration Dept.

Pages : 5/7

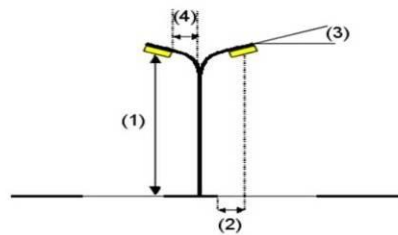
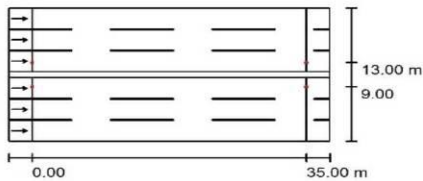
135W Street Light: (This is for reference, the simulation of actual roadway is principal.)

## Street Profile

Roadway 2 (Width: 10.500 m, Number of lanes: 3, tarmac: R3, q0: 0.070)  
Median 1 (Width: 1.000 m, Height: 0.000 m)  
Roadway 1 (Width: 10.500 m, Number of lanes: 3, tarmac: R3, q0: 0.070)

Light loss factor: 0.80

## Luminaire Arrangements



| Luminaire                    | TW-PD1355011-D5 |
|------------------------------|-----------------|
| Luminous flux(Luminaire)     | 16850 lm        |
| Luminaire Wattage            | 135 W           |
| Arrangement                  | on Median       |
| Pole Distance                | 35 M            |
| Mounting Height              | 12 M            |
| Height                       | 12 M            |
| Overhang                     | 1.5 M           |
| Boom Angle                   | 15°             |
| Boom Length                  | 2 M             |
| Roadway1 $E_{av}$ [lx]       | 27              |
| Roadway1 $E_{min}$ [lx]      | 15              |
| Roadway1 $E_{max}$ [lx]      | 42              |
| Roadway1 $u0$                | 0.55            |
| Roadway1 $E_{min} / E_{max}$ | 0.363           |
| Roadway2 $E_{av}$ [lx]       | 27              |
| Roadway2 $E_{min}$ [lx]      | 15              |
| Roadway2 $E_{max}$ [lx]      | 42              |
| Roadway2 $u0$                | 0.55            |
| Roadway2 $E_{min} / E_{max}$ | 0.363           |

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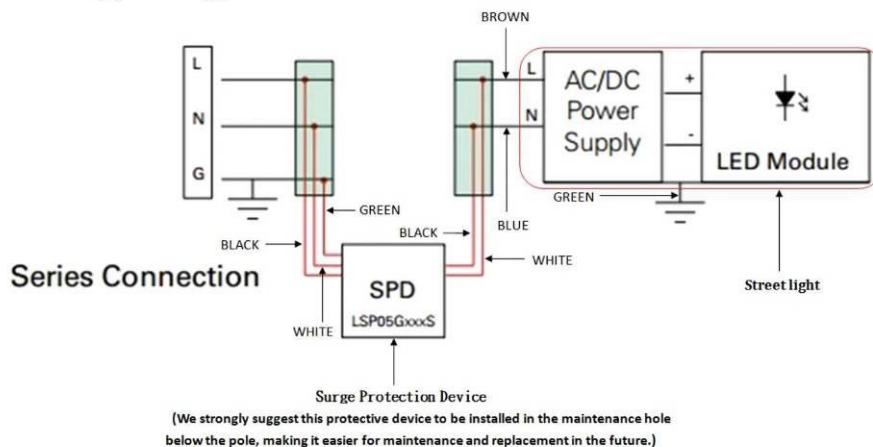
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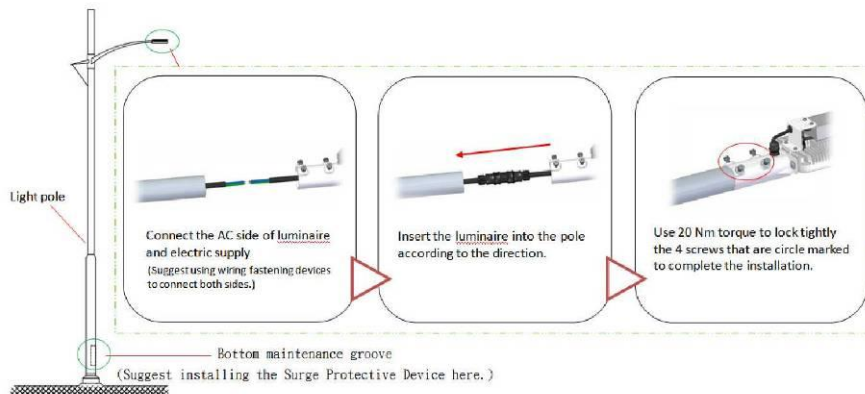
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### Wiring diagram:



### Procedure:



#### Remark:

1. Depend on the different requirement of installed site, this series of luminaire could be installed up to 12 meters.
2. The LED Street light is provided with certified supply cord for supply connections. A recommended cord anchorage, Wieland Electric GmbH, Type RST20i3B, was tested with appliance.

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**Warning:**

- Operation condition: 100~240 VAC, -30℃~60℃.
- For your safety, please cut off the power before installation.
- Please ensure the installation location can bear more than 10 times weight of the luminaire.
- Put down gently when moving the luminaire.
- Please do not try to disassemble, repair or modify the luminaire or the product is not within the company warranty.
- If there aren't green or green-yellow ground wires on the luminaire, please connect the AC ground wire onto the lamp housing or the pole.  
Cautions: For the safety of the lamp, please make sure the grounding must be completed. Any damages caused by without following the installation instruction, the product is not within the company warranty.
- Do not scratch the wires when connecting.
- Installing Surge Protective Device could effectively reduce the risk of damage of LED luminaire from lightning strike. The wiring replacement is according to page 2 if damage caused. (consumables)
- The luminaire should be positioned so that prolonged staring into the luminaire at a distance closer than 0.823m is not expected.
- The external flexible cable or cord of this luminaire cannot be replaced; if the cord is damaged, the luminaire shall be destroyed.
- The light source contained in this luminaire shall only be replaced by the manufacturer or his service agent or a similar qualified person.
-  Don't touch the luminaire after powering up to avoid the risk of electric shock.
- The product is not within the scope of the warranty if there's damage caused by natural disasters, floods or earthquake.

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**- End of Report -**

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