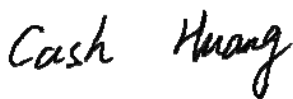






TEST REPORT

| | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Report No.: | SF201300656 | Page 1 of 17 |
| Client: | Shenzhen Aurora Technology Limited | |
| Address: | 6F, 1Building, Liantang Industrial Park, KangZheng Road, Buji, Shen Zhen, China | |
| Sample Description: | OFF ROAD LED LIGHT BAR | |
| Model: | ALO Series | |
| Test Location: | GUANGZHOU GRG METROLOGY&TEST CO., LTD. GRGT'S SAFETY LAB | |
| Test Specification: | EN60529:1991+A1:2000 Degrees of protection provided by enclosures (IP Code) DIN40050-9:1993 Road vehicles: degrees of protection (IP-code), protection against foreign objects, water and access, electrical equipment | |
| Test Date: | 2013-08-12 to 2013-08-15 | |
| Test Result: | <i>Passed</i> | |
| Tested By: | Reviewed By: | |
| Cash Huang | Connie Yang | |
|  |  |  |
| Date: 2013-08-29 | Date: 2013-08-29 | |
| Other Aspects: N/A | | |
| Abbreviations: <i>ok / P = passed; fail / F = failed; n.a. / N = not applicable</i> | | |
| The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT. | | |

| | |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Test item description : | |
| Manufacturer | Shenzhen Aurora Technology Limited |
| Address | 6F, 1 Building, Liantang Industrial Park, Kangzheng Road, Buji, Shenzhen, China |
| Factory | / |
| address | / |
| Name of Product..... | OFF ROAD LED LIGHT BAR |
| Model/Type reference..... | ALO Series |
| Trade Mark | AURORA |
| Ratings..... | 12V DC, 4.2A, 60W |
| Product Quantity | 1 PC |
| Received sample date | 2013-08-11 |
| Tested date | 2013-08-12 to 2013-08-15 |
| General remarks: | |
| The test results presented in this report relate only to the object tested. | |

| EN 60529 | | | |
|----------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---|
| 5 | DEGREES OF PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS AND AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL | | — |
| 5 | The designation with a first characteristic numeral implies that conditions stated in both 5.1 and 5.2 are met. | IP6X | P |
| | The first characteristic numeral indicates that: | | — |
| | the enclosure provides protection of persons against access to hazardous parts by preventing or limiting the ingress of a part of the human body or an object held by a person; | | P |
| | and simultaneously the enclosure provides protection of equipment against the ingress of solid foreign objects. | | P |
| | An enclosure shall only be designated with a stated degree of protection indicated by the first characteristic numeral if it also complies with all lower degrees of protection. | | P |
| | However, the tests establishing compliance with any one of the lower degrees of protection need not necessarily be carried out provided that these tests would obviously be met if applied | | P |
| 5.1 | Protection against access to hazardous parts | | — |
| | Tab. I gives brief descriptions and definitions for the degrees of protection against access to hazardous parts. | | P |
| | Degrees of protection listed in table I shall be specified only by the first characteristic numeral and not by reference to the brief description or definition. | | P |
| | To comply with the conditions of the first characteristic numeral, adequate clearance shall be kept between the access probe and hazardous parts | | P |
| | The tests are specified in Clause 12. | | P |
| | Tab. I-1 Degrees of protection against access to hazardous parts indicated by the first characteristic numeral | | — |
| | <i>First characteristic numeral</i> | <i>Test conditions (Clause)</i> | — |
| | 0 | -- | N |

| EN 60529 | | | |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 1 | 12.2 | N |
| | 2 | 12.2 | N |
| | 3 | 12.2 | N |
| | 4 | 12.2 | N |
| | 5 | 12.2 | N |
| | 6 | 12.2 | P |
| | <i>In the case of the first characteristic numerals 3, 4, 5 and 6, protection against access to hazardous parts is satisfied if adequate clearance is kept. The adequate clearance should be specified by the relevant product committee in accordance with 12.3.</i> | (EN 60529/A1) | P |
| | <i>Due to the simultaneous requirement specified in Table II, the definition "shall not penetrate" is given in Table I.</i> | (EN 60529/A1) | |
| 5.2 | Protection against solid foreign objects | | — |
| | Tab. II gives brief descriptions and the definitions for the degrees of protection against the penetration of solid foreign objects including dust. | | P |
| | Degrees of protection listed in Tab II shall only be specified by the first characteristic numeral and not by reference to the brief description or definition. | | P |
| | The protection against the ingress of solid foreign objects implies that the object probes up to numeral 2 in Tab. II shall not fully penetrate the enclosure. This means that the full diameter of the sphere shall not pass through an opening in the enclosure. | | P |
| | Object probes for numerals 3 and 4 shall not penetrate the enclosure at all. | | P |
| | Dust-protected enclosures to numeral 5 allow a limited quantity of dust to penetrate under certain conditions. | | P |
| | Dust-tight enclosures to numeral 6 do not allow any dust to penetrate. | | P |
| | Note <i>Enclosures assigned a first characteristic numeral of 1 to 4 generally exclude both regularly and irregularly shaped solid foreign objects provided that three mutually perpendicular dimensions of the object exceed the appropriate figure in column 3 of Tab. II.</i> | | P |
| | The tests are specified in Clause 13. | | P |

| EN 60529 | | | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------|---------|
| Clause | Requirement + Test | | Result - Remark | Verdict |
| | Tab. II-2 Degrees of protection against solid foreign objects indicated by the first characteristic numeral | | | — |
| | <i>First characteristic numeral</i> | <i>Test conditions (Clause)</i> | | — |
| | 0 | -- | | N |
| | 1 | 13.2 | | N |
| | 2 | 13.2 | | N |
| | 3 | 13.2 | | N |
| | 4 | 13.2 | | N |
| | 5 | 13.4 13.5 | | N |
| | 6 | 13.4 13.6 | (EN 60529/A1) | P |
| 9 | EXAMPLES OF DESIGNATIONS WITH THE IP CODE | | | — |
| 11 | GENERAL REQUIREMENTS FOR TESTS | | | — |
| 11.1 | Atmospheric conditions for water or dust tests | | | — |
| | Unless otherwise specified in the relevant product standard, the tests should be carried out under the standard atmospheric conditions described in IEC 68-1. | | | P |
| | The recommended atmospheric conditions during the tests are as follows | | | — |
| | Temperature range: 15 to 35 °C Relative humidity: 25 to 75% Air pressure: 86 to 106 kPa (860 to 1060 mbar) | | 27 °C ,71% ,101kPa | P |
| 11.4 | Combination of test conditions for the first characteristic numeral | | | — |
| | Designation with a first characteristic numeral implies that all test conditions are met for this numeral: | | | P |
| | Tab. V-5 Test conditions for degrees of protection indicated by the first characteristic numeral | | | — |
| | First characteristic numeral | Test for protection against | | P |
| | | access to hazardous parts | solid foreign objects | |
| | 0 | No test required | No test required | N |
| | 1 | The sphere of 50 mm Ø shall not fully penetrate and adequate clearance shall be kept | | N |

| EN 60529 | | | | | |
|----------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------|---------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| | 2 | <i>The jointed test finger may penetrate up to its 80 mm length, but adequate clearance shall be kept</i> | <i>The sphere of 12,5 mm Ø shall not fully penetrate</i> | | N |
| | 3 | <i>The test rod of 2,5 mm Ø shall not penetrate and adequate clearance shall be kept</i> | | | N |
| | 4 | <i>The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept</i> | | | N |
| | 5 | <i>The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept</i> | <i>Dust-protected as specified in Tab. II</i> | | N |
| | 6 | <i>The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept</i> | <i>Dust-tight as specified in Tab. II</i> | | P |
| 13 | TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL | | | | — |
| 13.1 | Test means | | | | — |
| | Test means and the main test conditions are given in Tab. VII. | | | | P |
| | Tab. VII-7 Test means for the tests for protection against solid foreign objects | | | | — |
| | First characteristic numeral | Test means | Test force | Test conditions | — |
| | 0 | <i>No test required</i> | — | — | N |
| | 1 | <i>Rigid sphere without handle or guard 50 mm diameter</i> | 50 N ± 10% | 13.2 | N |
| | 2 | <i>Rigid sphere without handle or guard 12,5 mm diameter</i> | 30 N ± 10% | 13.2 | N |
| | 3 | <i>Rigid steel rod 2,5 mm diameter with edges free from burrs</i> | 3 N ± 10% | 13.2 | N |
| | 4 | <i>Rigid steel wire 1 mm diameter with edges free from burrs</i> | 1 N ± 10% | 13.2 | N |
| | 5 | <i>Dust chamber Fig. 2, with or without underpressure</i> | — | 13.4 and 13.5 | N |
| | 6 | <i>Dust chamber Fig. 2, with underpressure</i> | — | 13.4 and 13.6 | P |
| 13.2 | Test conditions for first characteristic numerals 1, 2, 3, 4 | | | | — |
| | The object probe is pushed against any openings of the enclosure with the force specified in Tab. VII. | | | | N |
| 13.3 | Acceptance conditions for first characteristic numerals 1, 2, 3, 4 | | | | — |

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|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The protection is satisfactory if the full diameter of the probe specified in Table VII does not pass through any opening. | (EN 60529/A1) | N |
| 13.4 | Dust test for first characteristic numerals 5 and 6 | | — |
| | The test is made using a dust chamber incorporating the basic principles shown in Fig. 2 whereby the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50 mm and the nominal width of a gap between wires 75 mm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests. | (EN 60529/A1) IP6X | P |
| | Enclosures are of necessity in one of two categories: | | — |
| | Category 1: Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below that of the surrounding air, e.g., due to thermal cycling effects. | | N |
| | Category 2: Enclosures where no pressure difference relative to the surrounding air is present | | P |
| | <i>Category 1 enclosures:</i> | | — |
| | The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump. | | P |
| | The suction connection shall be made to a hole specially provided for this test. | | P |
| | If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts. | | P |
| | If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole. | | P |
| | If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site. | | P |

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|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour. . | | P |
| | In no event shall the depression exceed 2 kPa (20 mbar) on the manometer shown in Fig. 2. | | P |
| | If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h. | | P |
| | If, with a maximum depression of 2 kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed. | | N |
| | or a period of 8 h has elapsed. | | N |
| | <i>Category 2 enclosures:</i> | | — |
| | The enclosure under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump. | | N |
| | Any drain-hole normally open shall be left open for the duration of the test. | | N |
| | The test shall be continued for a period of 8 | | N |
| | <i>Category 1 and category 2 enclosures:</i> | | — |
| | If it is impracticable to test the complete enclosure in the test chamber, one of the following procedures shall be applied: | | N |
| | testing of individually enclosed sections of the enclosure;. | | N |
| | testing of representative parts of the enclosure, comprising components such as doors, ventilation openings, joints, shaft seals, etc., in position during test; | | N |
| | testing of a smaller enclosure having the same full-scale design details. | | N |
| | In the last two cases, the volume of air to be drawn through the enclosure under test shall be the same as for the whole enclosure in full scale | | N |
| 13.6 | Special conditions for first characteristic numeral 6 | | P |
| 13.6.1 | Test conditions for first characteristic numeral 6 | | P |

| EN 60529 | | | |
|----------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The enclosure shall be deemed category 1, Whether reductions in pressure below the atmospheric pressure are present or not. | | P |
| 13.6.2 | Acceptance conditions for first characteristic numeral 6 | | — |
| | The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test. | See the photos of sample | P |

| DIN 40050-9 | | | |
|-------------|---------------------------------------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2 | Meaning of the IP code | | P |
| | Second characteristic numeral | | — |
| | IPX0-not protected | | N |
| | IPX1-vertical dripping | | N |
| | IPX2-dripping (inclined 15°) | | N |
| | IPX3-spraying | | N |
| | IPX4-splashing | | N |
| | IPX4K-same with increased pressure | | N |
| | IPX5-jetting | | N |
| | IPX6-powerful jetting | | N |
| | IPX6K-same at increased pressure | | N |
| | IPX7-temporary immersion | | N |
| | IPX8-continuous immersion | | N |
| | IPX9K- high-pressure/steam jet cleaning | | P |
| | — 14 to 16 L/min | 14 L/min | P |
| | — about 8000 to 10000 kPa | 9050 kPa | P |
| | — (80±5)°C different temperatures may be agreed | 80°C | P |
| | — 30 s per position | 30s | P |
| 7 | Requirements and tests | | P |
| 7.1 | Atmospheric conditions: | | P |
| | Temperature range:(23±5°C) | 27.3°C | P |
| | Relative humidity: 25% to 75% | 71% | P |
| | Air pressure: 86kPa to 106kPa | 101.2kPa | P |
| 8.2 | Allocation of degrees of protection against water | IPX9K | P |

List of test equipment used

| NO. | Name of equipment | Type of equipment | Apparatus NO. | Due date of calibration |
|------------|---------------------------------------------------|--------------------------|----------------------|--------------------------------|
| 1 | Hygro/thermograph | WS-1 | 2008-D001 | 2014.04.24 |
| 2 | tape measure | 3m*13mm | 2008-D255 | 2015.09.13 |
| 3 | Hot and cold water high pressure cleaning machine | HYNOX90 | HJ2013-G139 | 2014.04.09 |
| 4 | Combined rain test chamber | CH-2010-ATRS | GDA-2012-486 | 2013.12.11 |
| 5 | Sand and dust test chamber | SC-500 | 80612 | 2014.07.03 |
| 6 | Stopwatch | SW8019 | 2008-D250 | 2014.05.01 |

Photos of sample



Front view



Rear view



Before the test of IP6X



Testing of IP6X



After the test of IP6X



Result for the test of IP6X



Before the test of IPX9K



Testing of IPX9K (0 degrees)



Testing of IPX9K (30 degrees)



Testing of IPX9K (60 degrees)



Testing of IPX9K (90 degrees)



Result for the test of IPX9K

-- END --