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TEST REPORT

REPORT NO : 2019MA1568

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THIS TEST REPORT IS ISSUED IN SECURED PDF SOFTCOPY

Applicant : NANHUA ELECTRONICS Co., Ltd
Building #9, 1755 Wenbei road,
Jiading, Shanghai 201802
China
(Attn: Ms Larissa Liang)

Manufacturer : NANHUA ELECTRONICS Co., Ltd
Building #9, 1755 Wenbei road,
Jiading, Shanghai 201802
China

Product : SOLAR AVIATION OBSTRUCTION LIGHT

Reference Standard / Method of Test : ASD 404: Airport Standards Directive 404
Clause 4 : Performance Requirements
Clause 5 : Equipment Qualification Requirements

Description of sample / Description of Test Specimen : Brand: NANHUA
Model: LT864
Quantity: 2 units submitted for testing
Detail Info: Refer Page 11

Date Received of Complete Application : 29 March 2018

Job No. : J20181390205

Description of Test Results / Overall Test Result : The test results of the submitted test samples are described in Page 4 to Page 9 of this test report.

Issued Date : 31 October 2019

Approved Signatories;

(NOOR AZLIE BIN AHMAD)
Testing Executive



(MOHD FAIZAR BIN MUSTAFA)
Head
Mechanical & Automotive Section
Testing Services Department

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Summary of Results for Qualification Tests

Model: LT-864 – Solar LED Aviation Obstruction Light

The following is a summary of the results of tests of the Device Under Test (DUT) performed in accordance with the following ASD 404: Airport Standards Directive 404, First published July 2007 specifications issued by Civil Aviation Authority of Malaysia (CAAM).

Test Item	Requirements Clause (ASD 404 directive)	Remarks
Photometric	4.1.4	
- Luminous Intensity		Refer to Page 4/5
- Colour Measurement		Refer to Page 6
High temperature	5.1.7	Pass
Low temperature	5.1.8	Pass
Rain test – IPX5	5.1.9	Pass
- IP6X – dust ingress protection		Pass
Wind test	5.1.10	Pass
Humidity test	5.1.11	Pass
System Operational Test	5.1.12	Pass
Leakage Current test	5.1.13	+Not applicable
Lightning Surge Test	5.1.14	+Not applicable
Visual Examination	5.1.15	Pass

+Powered by Solar/battery storage



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Introduction : A request was received from NANHUA Electronics Co. Ltd. for performing Obstacle Light Qualification Tests, Medium Intensity, Type Code: DCA/M/B for Department of Civil Aviation Authority of Malaysia (CAAM) accordance to ASD 404: 2007- Airport Standards Directive 404 for Lighting of Obstacles.

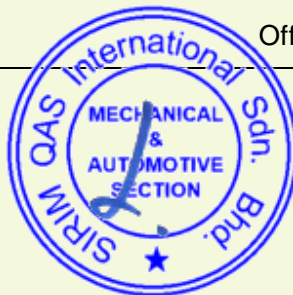
Objective : This test report contains the results of examination and tests of the Device under test (DUT) to demonstrate compliance with the applicable requirements of ASD 404: 2007 of Civil Aviation Authority of Malaysia (CAAM).

Test Result : Detail of test results are shown from Page 4 to 9 of this test report. .



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Clause	Test item	Judgement
4.1	Photometric	
4.1.4	Medium Intensity Type DCA/M/B light unit	
	At all redials throughout the omni directional 360°, there shall be a peak effective intensity of 2,000 ± 25% candela.	Maximum 3,006.4 cd at V/1°, H/60°
	Minimum effective intensity of 750 cd throughout a minimum vertical beam spread of 3°	Beam spread -1° to 1° Minimum: 1,090 cd at V/-1°, H/30°
	When the light unit is levelled, the intensity at 0° elevation angle (horizontal) shall be at least as great as the minimum specified beam peak intensity (1500 cd)	Minimum 2120 cd at H/30°
	Effective intensity at V=-1°, at least 50% the minimum allowable peak intensity (750 cd)	Minimum: 1,090.4 cd at H/30°
	Refer to Page 5 for the data measurements	
4.2	Flash rate shall be between 20 and 60 fpm (with 5% tolerance)	19 fpm
	Flash duration shall be between 100 and 250 ms	127.5 ms
		Period (s) 3029.8 ms
		On Time (s) 315.7 ms
		Off Time (s) 2714.1 ms
		Off time percent (%) 89.58 %



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Photometric test data:

4.1.4	Table of Luminous Intensity (cd) DCA/M/A											
V \ H	0	30	60	90	120	150	180	210	240	270	300	330
5	62.921	94.18	63.03	85.716	58.133	74.261	59.096	76.604	57.873	91.617	63.233	105.01
4	100.6	216.39	216.39	138.85	66.996	100.82	62.057	117.54	70.434	160.59	71.032	223.16
3	1246.8	1363.8	842.47	672.12	79.907	397.17	71.258	270.05	202.94	706.38	760.4	1231.6
2	2309.3	1766.4	2150.7	1512.6	995.52	767.17	544.82	892.07	1347.6	1519.2	2181.9	1645.3
1	2890.4	2448.9	3006.4	1964.2	2489.9	1630.3	2216	1753.5	2533.2	2199	2857.1	2282.3
0	2142.1	2120.1	2681.1	2475.7	2893.1	2171.1	2790	2308.1	2911.5	2426.8	2395	2180
-1	1256	1090.4	1448.5	2003	2119.7	2180.1	2407.3	2245.7	1952.5	1715.7	1462.9	1231.5
-2	714.11	672.21	865.32	981.77	1328.7	1352.2	1550.3	1244.2	1257.6	902.44	909.19	700.23
-3	323.4	233.72	344.11	407.93	699.06	899.12	1012.2	792.51	622.87	468.93	449.63	400.54
-4	103.31	158.89	119.15	241.46	251.26	466.35	396.09	420.46	340.28	172.97	104.15	139.24
-5	42.743	59.06	24.339	55.22	26.069	138.4	54.317	173.23	18.9	23.877	18.538	76.311



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Colour Measurement:

Test Result:

Colour region

RED

Direction		Coordinate	
H	V	x	y
0	0	0.6717	0.3267



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Clause	Test item	Judgement
5.0	Equipment Qualification Requirements	
5.1	Qualification tests	
5.1.7	High temperature test	
	The DUT of type code DCA/M/B was placed in preheated chamber at 50°C ± 2°C and allowed to temperature stabilized. The DUT was operated at rated input condition for 4 hours.	There was no deterioration in material and the DUT operated properly.
	The DUT was examined visually for any deterioration in materials and proper condition.	Pass
5.1.8	Low Temperature Test	
	The DUT was placed in cold chamber at 0°C for 24 hours. The DUT was turned on for a one hour time period.	There was no deterioration in material and the DUT operated properly.
	The DUT was examined visually for any deterioration in materials and proper condition.	Pass
5.1.9	Rain test	
	The DUT was placed at a rate 5.2 inches per hour (130 mm/hour). The DUT was operated throughout an exposure of 30 minutes cycle for each side.	During exposure to the rain test, the DUT operated properly. There was no excessive accumulation of
	Failure of the equipment to operate as specified or any deterioration in material shall constitute failure of test.	water in DUT Pass



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Clause	Test item	Judgement
	<p>IP 6X – Dust test</p> <p>The DUT was placed in Dust chamber and been tested in accordance to IEC 60529.</p> <p>The DUT was examined visually for any deposit of dust penetrate into enclosure at the end of the test.</p>	<p>Upon completion the test, no ingress of dust penetrated into the enclosure. The DUT operated properly.</p> <p>Pass</p>
5.1.10	<p>Wind test</p> <p>An equivalent mechanical force was calculated and to demonstrate the DUT meet wind speeds up to 150 km/h wind. The mechanical force was applied to the DUT perpendicular to its axis. The force was calculated with the following formula: $F_d = \frac{1}{2} \cdot C_d \cdot \rho \cdot A \cdot V^2$</p> <p>The DUT was examined visually for any damage or permanent deformation.</p>	<p>The DUT withstood the applied mechanical force of 21 kgf without any damage or permanent deformation.</p> <p>Pass</p>
5.1.11	<p>Humidity test</p> <p>The DUT was subjected to three complete daily cycles with a maximum of 72 hours at temperature 55°C and 95 % RH.</p> <p>Failure of the equipment to operate as specified or any deterioration in material shall constitute failure of test.</p>	<p>There was no deterioration in material and the DUT operated properly.</p> <p>Pass</p>



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Clause	Test item	Judgement
5.1.12	<p>System Operational Test</p> <p>The DUT system was energized and operated for 1000 continuous hours with normal 12 hours day/night cycling.</p> <p>Failure of the equipment to operate as specified or any deterioration in material shall constitute failure of test.</p>	<p>The DUT operated normally during and after test without any malfunction or any abnormalities.</p> <p>Pass</p>
5.1.13	<p>Leakage Current test</p> <p>Leakage current shall be measured between primary power connection points to the DUT chassis. The primary power connection points may be connected together during the test, but all other internal wiring must be connected as in normal operation. Devices for surge and lightning protection connected directly to input power wiring may be disconnected during the test.</p> <p>The leakage current of DUT did not exceed 10 microamperes when the voltage applied.</p>	<p>Not Applicable</p>
5.1.14	<p>Lightning Surge Test</p> <p>Subject to 2 pulse at 15 sec intervals to a combination wave 1.2msec/50msec and 8msec/20msec (6kV, 3kAmp) test pulse, under Category C1 of IEEEC62.41</p>	<p>Not Applicable</p>
5.1.15	<p>Visual Examination</p> <p>The DUT was examined for compliance with the requirements on material, finish and quality of workmanship.</p>	<p>Pass. The DUT met the requirement on materials, finishing and quality of workmanship.</p>



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PHOTOGRAPH OF DEVICE UNDER TEST (DUT) OF LT-864




Figure 1: View of Device under Test



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Appendix 1**GENERAL PRODUCT INFORMATION**
(as Declared by the Applicant)

Product description	:	Medium Intensity LED type Obstacle Light
Brand	:	 NANHUA
Model	:	LT864
Manufacturer	:	NANHUA ELECTRONICS Co., Ltd
DCA Type Code	:	Medium Intensity – DCA/M/B
Control Gear/Driver	:	Solar/battery storage
Lamp used	:	Led module
Power requirements	:	SOLAR with capacity of DC 12V/12AH
Lamp current	:	3 Amp (DC)
Luminous Flux (lm)	:	Not stated
Flash rate (fpm)	:	Flashing: 40 fpm
Flash duration (ms)	:	660 ms
Overall Dimension	:	H: 285 mm, L: 468.1 mm (with solar), Ø 210 mm
Weight	:	11 kg
Material of body	:	Aluminum Alloy
Material of Diffuser/Cover	:	Reflector: ABS, Housing: PC



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1. A Test Report will be issued in respect of Testing Services conducted and shall relate only to the Sample actually tested. SIRIM QAS International makes no warranty whatsoever and the Applicant shall not represent in any manner that any duplication or mass production of the Product is same as the Sample actually tested or that SIRIM QAS International has tested any of the duplicated or mass produced Product.
2. The Test Report shall not be amended, changed, varied or modified in any manner whatsoever by the Applicant or otherwise.
3. If the Test Report is to be furnished to any third party or to the public, each such Test Report shall be furnished in full, legible and in its entirety.
4. The Test Report shall not be reproduced and shall not in any event be used for any advertising purposes or whatsoever without written approval from the Managing Director of SIRIM QAS International of No 1, Persiaran Dato' Menteri, Building 8, Section 2, P.O. Box 7035, 40700 Shah Alam, Selangor Darul Ehsan.
5. Customer (Applicant/Manufacture/Factory, etc.) is not permitted to use any SIRIM QAS International, SIRIM or other SIRIM's subsidiaries logo or words on packaging, sample's manual, technical specification, brochures/flyers or any other means without the prior written approval from the Managing Director of SIRIM QAS International.
6. If such approval is obtained from the Managing Director of SIRIM QAS International, the Applicant may only include the phrase, "A sample of this product has been tested by SIRIM QAS International ... (Test Report No) ... (dated) (for what test) ... (to which standard)" or such similar words which stress that only the Sample was actually tested. This phrase shall only be used for the purpose of product advertisement or product promotion (eg; brochures). For avoidance of doubt, the statement shall not be used on the sample and packaging of the sample.
7. In the event there is an investigation from a Government Regulatory Agency concerning the Applicant's Test Report, SIRIM QAS International may disclose the information pertaining to the Test Report for purposes of such investigation.
8. Further or in the alternative, it is strictly forbidden unless with prior written approval from the Managing Director of SIRIM QAS International, to represent in any manner whatsoever that SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries has endorsed, approved or validated the Product of the Applicant in any manner whatsoever.
9. In the event the Applicant is found in breach of this provision, SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries without prejudice to any other rights and remedies may take whatever action necessary including but not limited to:
 - a) Informing and placing a notice in the media;
 - b) Obtaining an injunction from Court (cost on a solicitor-client basis to be borne by the Applicant);
 - c) Refusing to accept any further Product for Testing Services from the Applicant or whosoever related to the Applicant, whether subsidiary or otherwise;
 - d) Instructing the Applicant to withdraw and recall the advertisement, statement or document in question and advertise a clarification and apology to SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries twice in a national publication of SIRIM QAS International's choice at the Applicant's sole cost; and
 - e) Informing or lodging a report pertaining the Applicant's Test Report with the relevant authorities.
10. Certified true copies of the Test Report may be issued upon request by the Applicant upon payment of the relevant fee.
11. Corrections to test report shall only be allowed within 6 months from issuance date of the test report and shall be limited to maximum 3 times, after either case whichever occurs earlier, a new test report shall be issued and replace the previous one (having error(s) or lack of information). Issuance of Supplementary Report to the original Test Report shall be for the followings;
 - a) Misprints and typo errors
 - b) Missing technical information
 - c) Test data not reported
 - d) Mistake in reporting of test data