



Project No.: BLTMT210719-01

## Test report

**LED High Bay**

**DR-HB100-EGXP**

**(X represent CCT, can be W=3000K, N=4000K, D=5000K, C1=5700K, C2=6000K, C3=6500K)**

**Tested under**

Luminaires - ANSI/UL 1598:2008 (Secs. 19.7, 19.10-16)  
ANSI/IES LM-80-15  
IES TM-21-11  
IES LM-84-14

**Applicant:**

**DUALRAYS LIGHTING Co.,LTD.**

3rd Floor, Building A3 | Tianrui Industrial Park| #35, Fuyuan 1st Road, Fuyong Town, Bao'an Dist |  
Shenzhen 518103, Guangdong Province, RPC

**Prepared By:**

**Shenzhen Belling Efficiency Testing Lab Co.,Ltd**  
1 Floor, No. 1 Building, Meibaoh Industrial Park, Dalang Street, Longhua District,  
Shenzhen, Guangdong Prov. 518101, China

*Jovan zhi*

*Jason zhou*

**Complied by: Jovan zhi**

**Review by: Jason zhou**

**Project Engineer**

**Technical Manager**

Note 1: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Belling Efficiency Testing Lab Co.,Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP, NIST, or any agency of the U.S. Government.

Note 2: IES TM-21-11: this test method are not in NVLAP accreditation scope.



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Test description: Only conduct temperature for LED according to UL1598.

Test Lab:	Shenzhen Belling Efficiency Testing Lab Co.,Ltd
Address:	1 Floor, No. 1 Building, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov. 518101, China.

Environment:	
Accommodations and Environmental conditions, including proper power source meet the requirements of the test standard or UL default criteria (ISO/IEC 17025 Clause 5.3.1, 5.3.2, 5.3.3, 5.3.4)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Personnel:	
Lab Management shall authorize personnel to operate particular types of equipment used in testing. (ISO/IEC 17025 5.2.5)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Equipment:	
Testing is being conducted within the test equipment calibration dates. (See Test Instrument Information Page and ISO/IEC 17025 5.5.1, 5.5.2, 5.5.4, 5.5.5, 5.5.8,)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Calibrations for testing equipment are traceable to SI Units. Refer to 00-OP-C0032 (Calibration Certificate Analysis). (ISO/IEC 17025 5.6.2.2)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Critical Consumables:	
Critical consumables are compliant with test standard requirements. (ISO/IEC 17025 Clause 4.6)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Sample Identification:	
Identification of items to be tested has been made (e.g. model no., Serial No., etc.) (See Test Sample Identification page and ISO/IEC 17025 Clause 5.8.2)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Summary:	
The test facility was deemed to have the environment and capabilities necessary to perform the tests included in this data package.	

Description:

Declaration: DUALRAYS LIGHTING Co.,LTD. declare that their product with model DR-HB100-EGXP are the same to the product in the report BLTMT210715-02 and is authorized by original applicant to use their test data.

Note: All the data in previous report BLTMT210715-02 is shared in report.



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### TEST EQUIPMENT INFORMATION

	BELL #	Equipment Description	Model No.	Manufacturer	Serial No.	Last Cal	Cal Due	Cal Freq
1	BL802	Power meter	PF9811	Everfine	G185824 CM13711 40	2021-04-26	2022-04-25	1 year
2	BL804	Hybrid Recorder	34970A	AGILEN T	MY41027 391	2021-04-20	2022-04-19	1 year
3	BL883	Environment Measurer	8813	Deli	N/A	2021-04-22	2022-04-21	1 year
4	BL861	Hybrid Recorder	34970A	KEYSIG HT	MY44095 108	2021-04-20	2022-04-19	1 year
5	BL834- 1	Thermocouple K	Type K	OMEGA	23736-1	2021-04-22	2022-04-21	1 year
6	BL826	Stop watch	K610	KISLO	N/A	2021-04-23	2022-04-22	1 year




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**TEST SAMPLE IDENTIFICATION:**

The table below is provided to provide correlation of sample numbers to specific product related information. Refer to this table when a test identifies a test sample by "Sample No." only.

Model No.	Test No.+	Sample No.	Ratings
DR-HB100-EGXP	S1-S25	S1	AC 100-277V, 50/60Hz, 100W

Applicant:	DUALRAYS LIGHTING Co.,LTD.
Applicant Address:	3rd Floor, Building A3   Tianrui Industrial Park  #35, Fuyuan 1st Road, Fuyong Town, Bao'an Dist   Shenzhen 518103, Guangdong Province, RPC
Brand Name:	 <i>Intelligent . Healthy . Efficient</i>
Manufacturer:	DUALRAYS LIGHTING Co.,LTD.
Manufacturer Address:	3rd Floor, Building A3   Tianrui Industrial Park  #35, Fuyuan 1st Road, Fuyong Town, Bao'an Dist   Shenzhen 518103, Guangdong Province, RPC
Product Description:	LED High Bay
Date Received:	2021-06-17
Date of Test:	2021-06-17 to 2021-06-28
Date of Issue:	2021-07-19



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NORMAL TEMPERATURE MEASUREMENT

UL 1598; Cl. 19

## METHOD

### GENERAL REQUIREMENTS PERTAINING TO SURFACE MOUNTED LUMINAIRES

Unless otherwise noted under METHOD, General requirements are applied.

The test was conducted in a draft-free room as specified in clause 19.10.3 or 19.11.3.

The rated wattage of any lamp used for the temperature test was the highest wattage rating marked on the luminaire.

### INSTALLATION AND SUPPORT (Clause 19.1)

The luminaire was installed or supported to simulate intended usage, in accordance with the manufacturer's instructions. Where more than one installation methods are specified the luminaire was installed to result in the maximum operating temperatures.

A luminaire part designed to be adjustable by the user was positioned or adjusted to cause maximum heating of the luminaire, mounting surface, or both.

A luminaire part that was marked in accordance with Table 20.1.1, Item 2.31, was positioned for the temperature test in accordance with the marking.

### TEMPERATURE TEST STABILIZATION (Clause 19.2)

Temperatures were measured after they stabilized, when:

The test was run for a minimum of 7.5 h. or the test was run for a minimum of 3 h, and then three successive readings taken at 15 min intervals were within 1°C of one another and not rising. (Temperature shall be measured **after** the test has been running for a minimum of 3 h)



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#### FREQUENCY (Clause 19.4)

Frequency-sensitive equipment was tested at rated frequency, and equipment marked with more than one frequency was tested at the frequency that produced the maximum temperature rise.

#### AMBIENT TEMPERATURE (Clause 19.5)

The tests were conducted in an ambient temperature of  $25 \pm 5^\circ\text{C}$ . Ambient temperature variations above or below  $25^\circ\text{C}$  were respectively subtracted from or added to temperatures recorded at points on the luminaire.

The ambient temperature was measured by means of a thermocouple or thermometer.

The thermocouple intended to measure ambient temperature was immersed in 0.5 oz (15 ml) of mineral oil in a glass container or attached to a metal mass of approximately 1 oz (30 g) that was within a cylindrical metal shield open at the top and bottom. The glass container or cylindrical metal shield was placed in the horizontal plane passing through the midpoint of the luminaire's vertical axis at a horizontal distance from the luminaire equal to at least 3 times the luminaire diameter.

[ ] Tests were conducted in an elevated ambient temperature with a source of heated air providing the elevated temperature for which the luminaire was marked. The maximum airflow past the luminaire was less than 9.1 m/min (30 ft/min). Maximum variations of  $5^\circ\text{C}$  from the intended ambient temperature was added to or subtracted from the observed temperature readings.

#### THERMOCOUPLES:

Reference Section 19.7 of UL 1598.

#### THERMOCOUPLES CONTACT:

Thermocouples were in contact with the TMP LED location described in LM-80 test report. In order to gain the maximum temperature, if appropriate, more than one thermocouple were contact in these locations. For details information, please refer to clause 3.3 for the photo of thermocouple contact.



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TEST RESULTS

Test Model No.:	DR-HB100-EGXP
LED Driver Model No.:	SS-100CP-54B
LED Package/Module No.:	NF2L757DR
Rating of LED Package/Module:	100mA
Manufacturer of LED Package/ Module:	Nichia Corporation

Input Voltage (V):	120
Input Power (W):	103.6
LED Board Input Current (mA):	1834
Single LED Input Current (mA):	96.53

Sample No.:	S1	S2	S3	S4	S5
LED Ts/°C (Temperature at soldering board):	49.24	50.92	51.09	51.34	47.86
Sample No.:	S6	S7	S8	S9	S10
LED Ts/°C (Temperature at soldering board):	51.05	47.85	46.82	50.05	46.28
Sample No.:	S11	S12	S13	S14	S15
LED Ts/°C (Temperature at soldering board):	48.11	51.63	46.42	46.77	51.60
Sample No.:	S16	S17	S18	S19	S20
LED Ts/°C (Temperature at soldering board):	50.43	46.90	50.64	49.13	47.20
Sample No.:	S21	S22	S23	S24	S25
LED Ts/°C (Temperature at soldering board):	47.46	50.11	47.40	47.95	49.21
LED Driver/°C (Temperature at Tc):	43.84				
Total operated period(hours):	4				
Ambient °C :	25.00				
Test Ambient:	25.36				

Lumen Maintenance Projection(IESNA TM-21-11 Method)

50000hrs at which to estimate lumen maintenance:	95.01%
Forward current on each LED light source:	96.53mA
Reported L <sub>70</sub> lumen maintenance life:	>60000hours
Reported L <sub>90</sub> lumen maintenance life:	>60000hours

Note: Please refer to appendix B and C for details of TM-21 inputs and report.



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Temperature Interpolation

Test data from LM-80 report issued by Nichia Corporation was referenced to calculate the lumen maintenance life according to IES TM-21-11.

Sample No.	50000hrs at which to estimate lumen maintenance	Reported L <sub>70</sub> lumen maintenance life	Reported L <sub>80</sub> lumen maintenance life	Reported L <sub>90</sub> lumen maintenance life
S1	95.01%	>60000	>60000	>60000
S2	95.01%	>60000	>60000	>60000
S3	95.01%	>60000	>60000	>60000
S4	95.01%	>60000	>60000	>60000
S5	95.01%	>60000	>60000	>60000
S6	95.01%	>60000	>60000	>60000
S7	95.01%	>60000	>60000	>60000
S8	95.01%	>60000	>60000	>60000
S9	95.01%	>60000	>60000	>60000
S10	95.01%	>60000	>60000	>60000
S11	95.01%	>60000	>60000	>60000
S12	95.01%	>60000	>60000	>60000
S13	95.01%	>60000	>60000	>60000
S14	95.01%	>60000	>60000	>60000
S15	95.01%	>60000	>60000	>60000
S16	95.01%	>60000	>60000	>60000
S17	95.01%	>60000	>60000	>60000
S18	95.01%	>60000	>60000	>60000
S19	95.01%	>60000	>60000	>60000
S20	95.01%	>60000	>60000	>60000
S21	95.01%	>60000	>60000	>60000
S22	95.01%	>60000	>60000	>60000
S23	95.01%	>60000	>60000	>60000
S24	95.01%	>60000	>60000	>60000
S25	95.01%	>60000	>60000	>60000

Projected from Reported:

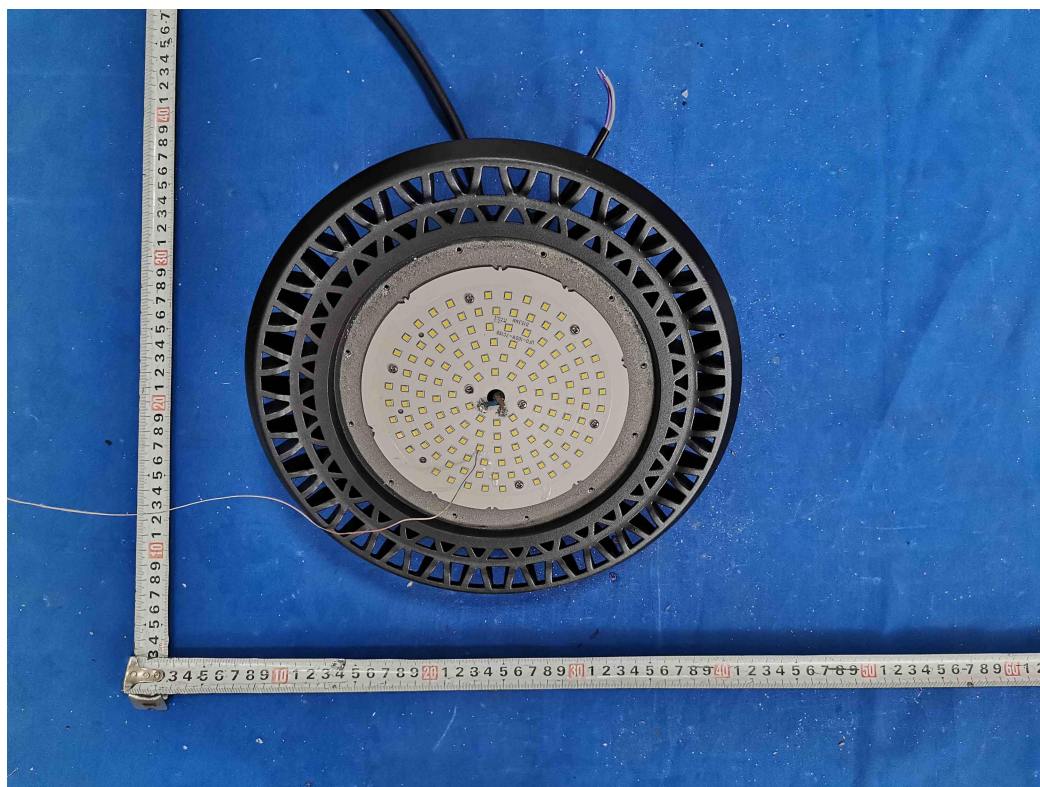
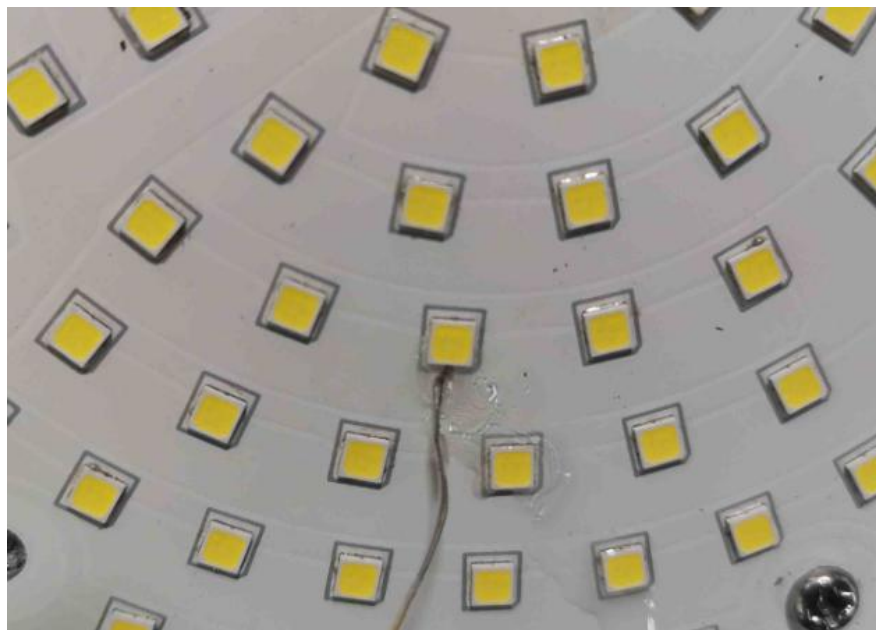
L<sub>90</sub>B<sub>50</sub>: ≥60000hrs





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**Test Photos for LEDs:**





**Shenzhen Belling Efficiency Testing Lab Co., Ltd**  
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Street, Longhua District, Shenzhen, Guangdong Prov. 518101 China  
Tel: +86 755 2103 8430  
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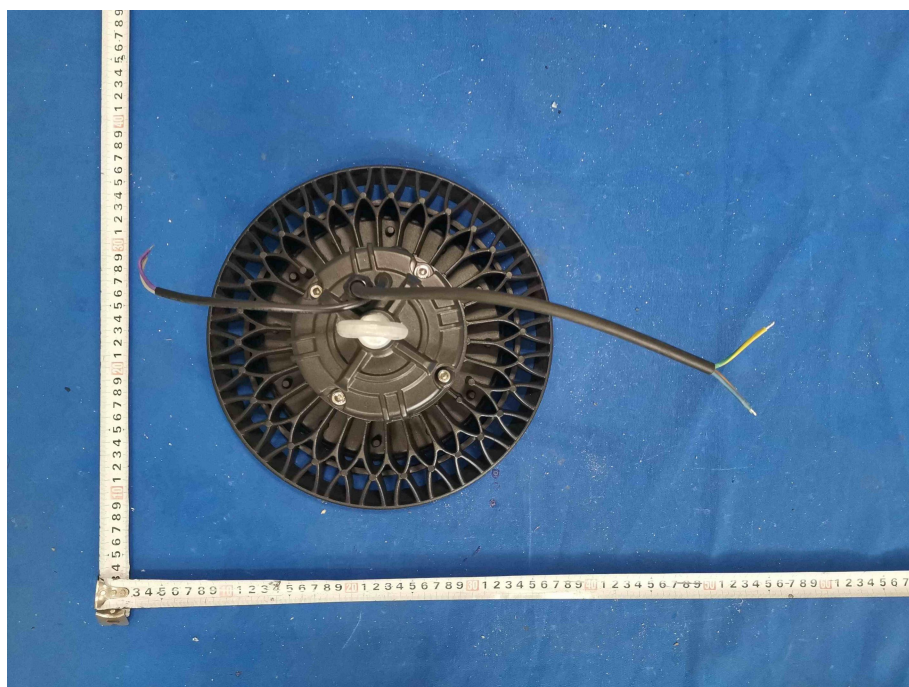
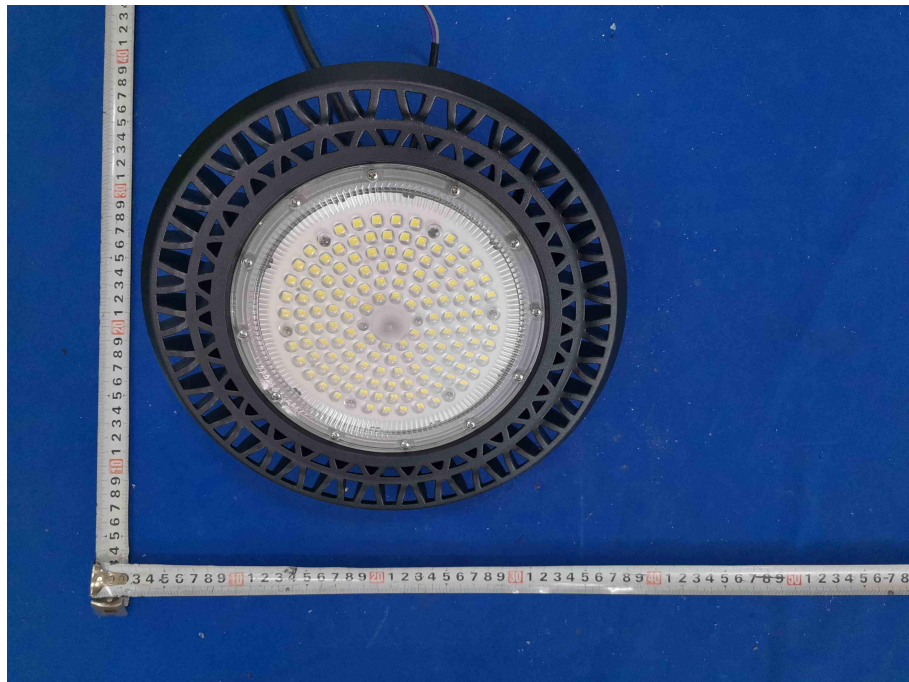
**Test Photos for LED Drivers:**





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**EUT Photos:**





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**Appendix A: LM-80 report summary**

Report originated by:	Nichia Corporation		
Manufactured by:	Nichia Corporation		
LM-80 report No.:	SQETMN558101		
LED Model:	NF2L757DR		
Number of LED light source tested:	25 units		
Drive Current:	100mA		
Case temperature:	55°C	85°C	105°C
10100 hours lumen maintenance:	98.1%	96.4%	92.3%
10100 hours color maintenance( $\Delta u'v'$ ):	0.0014	0.0014	0.0019





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### Appendix C: TM-21 Report

Description of LED Light Source Tested (manufacturer, model, catalog number)		Table 1: Report at each LM-80 Test Condition						Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
NICHIA NF2L757DR		Test Condition 1 - 55° C Case Temp		Test Condition 2 - 85° C Case Temp		Test Condition 3 - 105° C Case Temp		$T_{s,1}$ (° C)	55.00
Sample size	25	Sample size	25	Sample size	25	Sample size	25	$T_{s,1}$ (K)	328.15
Number of failures	0	Number of failures	0	Number of failures	0	Number of failures	0	$\alpha_1$	7.592E-07
DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	$B_1$	0.987
Test duration (hours)	10,000	Test duration (hours)	10,000	Test duration (hours)	10,000	Test duration (hours)	10,000	$T_{s,2}$ (° C)	-
Test duration used for projection (hour to hour)	5,210 - 10,100	Test duration used for projection (hour to hour)	5,210 - 10,100	Test duration used for projection (hour to hour)	5,210 - 10,100	Test duration used for projection (hour to hour)	5,210 - 10,100	$T_{s,2}$ (K)	-
Tested case temperature (° C)	55	Tested case temperature (° C)	85	Tested case temperature (° C)	105	Tested case temperature (° C)	105	$\alpha_2$	-
$\alpha$	7.592E-07	$\alpha$	1.680E-06	$\alpha$	4.197E-06	$\alpha$	4.197E-06	$B_2$	-
$B$	0.987	$B$	0.978	$B$	0.960	$B$	0.960	$E_a/k_b$	-
Reported L70(10k) (hours)	>60000	Reported L70(10k) (hours)	>60000	Reported L70(10k) (hours)	>60000	Reported L70(10k) (hours)	>60000	A	-
								$B_0$	0.987
								$T_{s,1}$ (° C)	49.24
								$T_{s,1}$ (K)	322.39
								$\alpha_1$	7.592E-07
								Reported L70(10k) at 49.24° C (hours)	>60000

End of Report