



Project No.: BLTMT210719-04

Test report

LED High Bay

DR-HB240-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, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov. 518101, China

Complied by: Jovan zhi

Project Engineer

son chou

Review by: Jason zhou

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 descrip	tion: 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)	[X]Yes []No []N/A
Personnel:	
Lab Management shall authorize personnel to operate particular types of equipment used in testing. (ISO/IEC 17025 5.2.5)	[X]Yes []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,)	[X]Yes []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)	[X]Yes []No
Critical Consumables:	
Critical consumables are compliant with test standard requirements. (ISO/IEC 17025 Clause 4.6)	[X]Yes []No []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)	[X]Yes []No
Summary:	
The test facility was deemed to have the environment and capabilities necessary to data package.	perform the tests included in this

Description:

Declaration: DUALRAYS LIGHTING Co.,LTD. declare that their product with model DR-HB240-EGXP are the same to the product in the report BLTMT210715-05 and is authorized by original applicant to use their test data.

Note:All the data in previous report BLTMT210715-05 is shared in report.





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TEST EQUIPMENT INFORMATION

	BELL #	Equipment Description	Model No.	Manufac turer	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	Туре К	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-HB240-EGXP	S1-S25	S 1	AC 100-277V, 50/60Hz, 240W

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:	DUALRAYS Intelligent . Healthy . Efficient
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 $25 \pm 5^{\circ}$ C. Ambient temperature variations above or below 25° 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°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-HB240-EGXP
LED Driver Model No.:	SS-240CP-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):	246.5
LED Board Input Current (mA):	3796
Single LED Input Current (mA):	99.89

Sample No.:	S 1	S2	S 3	S 4	S5
LED Ts/°C (Temperature at soldering board):	72.44	69.91	71.09	71.10	76.64
Sample No.:	S 6	S7	S 8	S9	S10
LED Ts/°C (Temperature at soldering board):	76.30	75.10	70.15	70.53	72.93
Sample No.:	S 11	S12	S13	S14	S15
LED Ts/°C (Temperature at soldering board):	74.81	74.14	76.60	74.89	69.29
Sample No.:	S16	S17	S18	S 19	S20
LED Ts/°C (Temperature at soldering board):	76.44	71.68	74.17	71.22	74.11
Sample No.:	S21	S22	S23	S24	S25
LED Ts/°C (Temperature at soldering board):	70.40	74.39	74.90	76.98	71.87
LED Driver/°C (Temperature at Tc):	55.04				
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:	92.42%
Forward current on each LED light source:	99.89mA
Reported L ₇₀ lumen maintenance life:	>60000hours
Reported L ₉₀ 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 accoding to IES TM-21-11.

VIAPLAB CODE 60010

Sample No.	50000hrs at which to estimate lumen maintenance	Reported L ₇₀ lumen maintenance life	Reported L ₈₀ lumen maintenance life	Reported L ₉₀ lumen maintenance life
S1	92.42%	>60000	>60000	>60000
S2	92.78%	>60000	>60000	>60000
S3	92.65%	>60000	>60000	>60000
S4	92.62%	>60000	>60000	>60000
S5	91.78%	>60000	>60000	>60000
S6	91.83%	>60000	>60000	>60000
S7	92.02%	>60000	>60000	>60000
S8	92.75%	>60000	>60000	>60000
S9	92.70%	>60000	>60000	>60000
S10	92.35%	>60000	>60000	>60000
S11	92.06%	>60000	>60000	>60000
S12	92.17%	>60000	>60000	>60000
S13	91.78%	>60000	>60000	>60000
S14	92.05%	>60000	>60000	>60000
S15	92.87%	>60000	>60000	>60000
S16	91.81%	>60000	>60000	>60000
S17	92.53%	>60000	>60000	>60000
S18	92.16%	>60000	>60000	>60000
S19	92.60%	>60000	>60000	>60000
S20	92.17%	>60000	>60000	>60000
S21	92.72%	>60000	>60000	>60000
S22	92.13%	>60000	>60000	>60000
S23	92.05%	>60000	>60000	>60000
S24	91.72%	>60000	>60000	>60000
S25	92.50%	>60000	>60000	>60000

Projected from Reported:

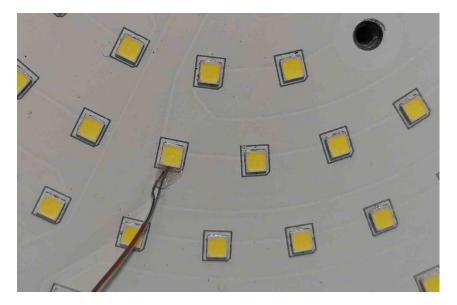
 $L_{90}B_{50}$: $\geq 60000 hrs$





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Test Photos for LEDs:









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Test Photos for LED Drivers:

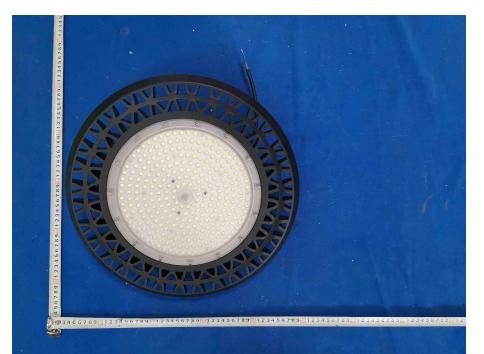




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NVLA LA CODE 600102-0

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℃	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 B: TM-21 Input

Instructions Cleacription of LED Light Source Tested (manufacturer, model, catalog number) Yellow fields are completed by the based on user anota set is to be used (no interpolation), complete only Tested Details". Test duration must be at least 6,000 hours, if only one case temperature data set is to be used (no interpolation), complete only Tested Case temperature 1*. For only two case temperature atta sets to be used (no interpolation), complete only Tested case temperature 1*. For only two case temperature 1*. For only two case temperature atta sets. The set data along with the time (in hours) at which each measurement was taxen. Data along with the time (in hours) at which each measurement was taxen. Data along with the time (in hours) at which each measurement was taxen. Data along with the time (in hours) at which each measure data (per TM-27 tested case temperature 3 (T _p • C): Mach uther 25 Tested case temperature 3 (T _p • C): Tested case temperature 3 (T _p • C): 55 Tested case temperature 3 (T _p • C): 55 Tested case temperature 3 (T _p • C): Tested case temperature 3 (T _p • C): 55 Tested case temperature 3 (T _p • C): 55 Tested case temperature 3 (T _p • C): Results can be talored to estimate tumen maintenance at a specific time yentering a value (fit in the yellow test. Acomptete TM-21 report will appear on the next tab labeled Tesport: Mich to estimate lumen maintenance Time (fit at which to estimate lumen maintenance Time (fit at which to estimate lum	1933.4	Dala for 5 Tempers	st Inputs 55° C Case (alure) an Maintenance (%) 98. 90% 98. 90% 98. 90% 98. 40% 98. 40% 98. 40% 98. 30% 98.	Test D Time (Nour) 541 1007 1697 2379 3141 3829 4544 5210 6043 5809 10100 10100	Data for 651 C C2 Temperature Lumen Maintee 98, 50% 98, 60% 97, 60% 97, 60% 97, 00% 97, 00% 97, 00% 96, 97% 96, 60% 96, 60% 96, 60% 96, 60% 96, 40%		Data for 105* C Case Temperature Lumen Maintenan 97 30% 97 30% 96 60% 95 10% 94 20% 94 20% 94 20% 93 70% 93 20% 93 30% 93 30% 93 30%
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The state of the second set is, complete and 2 and 2. and 2.	7601 8435 9269		98.20% 98.00% 97.80%	7601 8437 9269	95.60% 95.40% 95.10%	7601 8436 9269	93.00% 92.50% 92.20%
The set of the regist is the set of the set	8436 9269		98.00% 97.80%	8437 9269	96.40% 96.10%	8436 9269	92.50% 92.20%
and, turker to the right, in the image anding box(as) for each believed to the test data ong with the time (in hours) at which is the escience with the test data ong with the time (in hours) at which is the escience with the test data ong with the time (in hours) at which is characteristic data (per TM-21 cons 5.2.1 and 5.2.2.1). If case imperatures have different test rations, enter data up to the lowest the set durations for all of the case imperatures, and the percentage initial luments to project to in the idits labeled 'm-Stiv Imputs''. In -Situ Inputs 105 Drive current, In-Stiv imparature data on the percentage initial luments to project to in the idits labeled 'm-Stiv Imputs''. Drive current for each LED package/array/module (mA): Percentage ariany/module (mA): In-Situ case temperature (T_{u}, * C): 70 99.89 72.44 70 Drive current for each LED package/array/module (mA): each case temperature (T_{u}, * C): 70 72.44 70 Percentage of initial lumens to project to (eig, for Log. enter 70): 8 70 Time (1) at which to estimate lumen maintenance enter 70	9269		97.80%	9269	96.10%	9269	92.20%
Immesonaling box(es) for each tested and with the time (in hours) at which ch measurement was taken. Data tesd muse use data with the time erraged measured data (per TN-21) coins 5.2 1 and 5.2.2). If case mperatures have different test the test durations that of the case mperature data and the percentage initial luments to project to in the dis tabeled 'I'n-Situ Inputs'. Busults can be takened to estimate men maintenance at a specific time entening a value (i) in the yeak to A compiler TN-21 report with the yeak leport'. Drive current for each LED package/array/module (mA): Percentage of Initial/lumens to project to (e.g. for L _{To} , enter 70): 99.89 72.44 Time (1) at which to estimate men maintenance at a specific time entening a value (1) in the yeak leport'. Time (1) at which to estimate lumen maintenance 99.89				and the second se	And a second		and the second se
extra data must be normalized then cm was taken. Data level must be normalized then radions, enter data up to the lowest the test durations for all of the case mparature fails and the percentage initial lument to project to in the dis labeled monality a value (f) in the yellow it. A complete at a specific time enter and up estimate men maintenance at a specific time enter and up estimate men maintenance parture fails and the percentage initial luments to project to (e.g. for			30, 10, 10				22.00.78
Percentage of initialiumens to project to (e.g. tor 70) th. A complete Th-21 report the yealow th. A complete Th-21 report the yealow percentage or initialiumens to project to (e.g. tor 70) L _{To} , enter 70): Results Time (1) at which to estimate lumen maintenance 600							
Results							
Time (1) at which to estimate lumen maintenance					-		
		-				North Contractor	
	00				-		
Lumen maintenance at time (1) (%): 92.42%							
Reported L70 (hours): >60000							
	_						
		-					





Project No.: BLTMT210719-04

Appendix C: TM-21 Report

Table 1: Report at each LM-80 Test Condition						Table 2: Interpolation Report	
Description of LED Light Source Tested (manufacturer, model, catalog number)		NICHA NF2L757DR				(projection based on <i>in-situ</i> temperature ent T _{s,1} (° C) 55.00	
						T _{s,1} (K)	328.15
Test Condition 1 - 55	C Case Temp	Test Condition 2 - 85° C Case Temp		Test Condition 3 - 105" C Case Temp		α1	7.592E-07
Sample size	25	Sample size	25	Sample size	25	B ₁	0.987
Number of failures	0	Number of failures	0	Number of failures	0	T _{s.2} (° C)	85.00
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)	<mark>1</mark> 00	T _{s,2} (K)	358.15
Test duration (hours)	10,000	Test duration (hours)	10,000	Test duration (hours)	10,000	α2	1.680E-06
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, <mark>210</mark> - 10,100	B ₂	0.978
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (° C)	105	E _a /k _b	3.11E+03
α	7.592E-07	α	1.680E-06	α	4.197E-06	A	9.931E-03
В	0.987	В	0.978	В	0.960	B ₀	0.983
Reported L70(10k) (hours)	>60000	Reported L70(10k) (hours)	>60000	Reported L70(10k) (hours)	>60000	T _{s,i} (°C)	72.44
						T _{s,i} (K)	345.59
						α _i	1.225E-06
						Reported L70(10k) at 72.44° C (hours)	>60000

End of Report