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LightLab International
Brisbane QLD 4019.

In-Situ Temperature Measurement Test

LL2132201-I

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Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.
Accreditation No. 2258.

Test Report Number LL2132201-I

Client	Interglo Lighting Pty. Ltd. 11E Plane Tree Avenue, Dingley Village. VIC. 3172.
Contact	Cameron Ely
Sample Description	A 36 W recessed LED downlight, Product ID: XE36. The sample comprises: white metal fascia and grey finned formed housing, one truncated cone combination reflector/diffuser, one white LED PCB, one remote electronic driver. Reflector has a stippled finish, diffuser is translucent with stippled finish on upper surface.
Reference Document Summary	LM-80 test report 160022W7 (Doc. No. 130484W9), on Osram Duris S 5 GW PSLPS1.EC LED, dated 15th August 2019. Report issued by Osram Opto Semiconductors GmbH, Reliability Engineering Test and Analysis Laboratory, Liebnizstraβe 4, 93055 Regensburg.
Nature of Tests	To determine the maximum value of T_s for a number of LEDs, where the LEDs are selected in accordance with IES LM-84-14 Annex A. The location of T_s is defined in the Reference Document. Measurement methods and conditions in accordance with the standards noted in the Observations and Determinations table: - the sample supply voltage and frequency were set to the input values noted in the Observations and Determinations table. - LED Ts was measured - driver Tc was measured
Sample Selection	This laboratory has not exercised control over the selection of samples to be tested. The significance of the report is limited to the extent that the sample is representative of the population.
Applicability	The results apply only to the sample that was tested.
Uncertainties	Uncertainties available on request.
Procedure Details	LightLab procedure Test-B3038. Testing was performed in a draught free, controlled environment. The sample was energised and operated until it reached thermal and electrical stability prior to measurements being performed. Observations and determinations relevant to the test are listed in the Observations and Determinations Table. Measurements are recorded in the Measurements Table.
Results of Tests	Compliance not relevant to the tests. Refer to the tables for test conditions, determinations and measurements.

Authorised Signatory

P. Lawrance

Date of Test 19th Nov 2021
Date of Report 2nd Dec 2021

B3007 ISTM Report & 60598-1 12.4 report, V4.9, 1st Dec 2021

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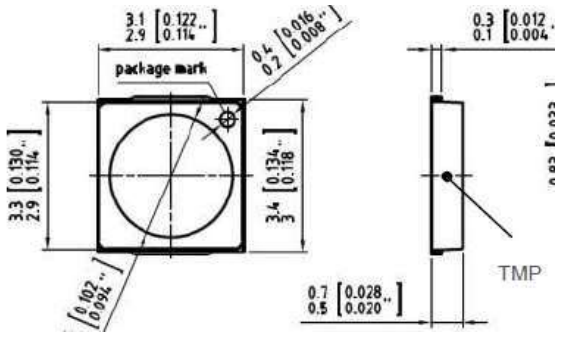
Observation	Determination
Standard(s) tested	VEU requirements: (a) ASNZS60598.1:2017 section 12.4.1 excepting: clause 12.4.1 (d) & applicable 60598-2-X document (b) IES LM-84-14 Annex A
Sample (manufacturer, model)	Interglo Lighting – XE36
LED (manufacturer, model)	Osram - Duris S GW PSLPS1.EC
Driver (manufacturer, model)	Lifud – LF-GIF040YA(H)0900H
Manufacturer's installation instructions	Not supplied
Reference document applicability	
	Appendix B: Additional Models Covered By Testing The 28 September 2017 ENERGY STAR® *Requirements for the Use of LM-80 Data* defines conditons for which a LM-80 report is applied to cover models that have not been directly tested. The following list of models may be covered by the test results in this report: • DURIS® S 5 GW PSLPS1.EC with CCT 2700 K – 6500 K • DURIS® S 5 GW PSLPS1.CC with CCT 2700 K – 4000 K • DURIS® S 5 GW PSLRS1.EC with CCT 2700 K – 6500 K
Luminaire type specific observations	Recessed luminaire
Sample mounting	Fitting and driver were recessed with fascia horizontal and beam downward.
Sample T_a rating	Not stated, deemed to be 25 °C for testing purposes
Sample electrical input rating	AC220-240V, 50-60Hz
Supply setpoint	230 V 50 Hz
Luminaire configuration	Mains power supplied to all parts of circuit
Selection of LED(s)	In accordance with IES LM-84-14 using thermal imaging camera
LED forward current determination method	Fanout of 12C6B printed on LED circuit board. Inspection yields 6 strings of 12 LEDs. Therefore fanout is 6:1.
Reference doc. LED dimensions	The dimensions of the LED from LM-80 report are 3.0 x 3.0 mm
Reference doc. LED T_s location	

Observations & Determinations Table

: -

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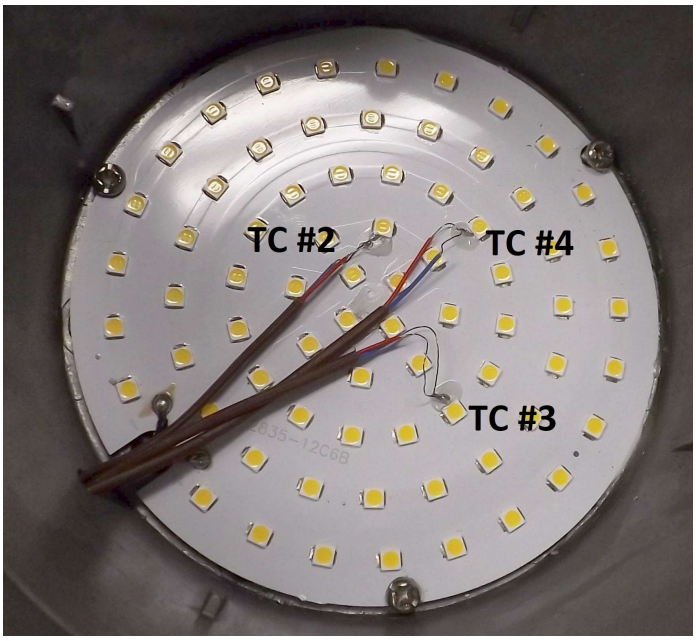
Electrical & environment		Temperatures [1]	
Supply Voltage (ac)	230 V	Driver Tc point (TC # 1)	61.4 ºC
Supply Power	33.6 W	LED Ts (TC # 2)	92.9 ºC
Supply Current (ac)	152 mA	LED Ts (TC # 3)	94.6 ºC
Supply Frequency *	50 Hz	LED Ts (TC # 4)	90.7 ºC
Power Factor	0.96		
Driver Output Current (dc)	884 mA		
Average LED Forward Current [2]	147 mA		
Measured Ambient Temperature	25.3 ºC		
Dimensions of LED *	3.0 x 3.0 mm		
LED count	72		
Stabilisation time *	22.5 hours		
Test duration *	0.25 hours		

Measurements Table

* NATA accreditation does not cover the performance of this service.
[1] All temperature measurements, apart from Measured Ambient, have been normalised to 25 °C.
[2] The Average LED Forward Current has been calculated by dividing the Driver Output Current by the LED Circuit Fanout.



Thermocouple attachment points

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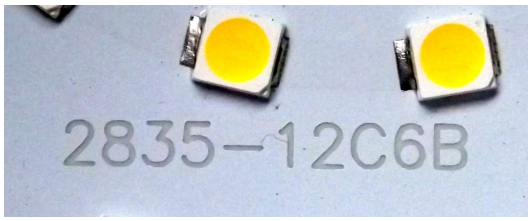
Photographs:



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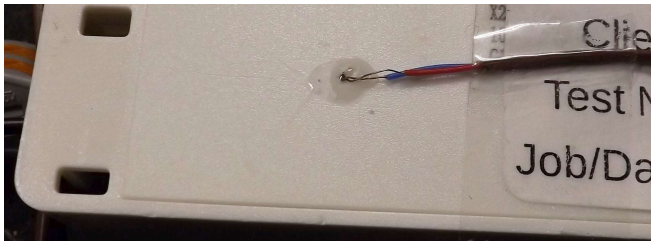
Thermocouple placement:

TC# 1



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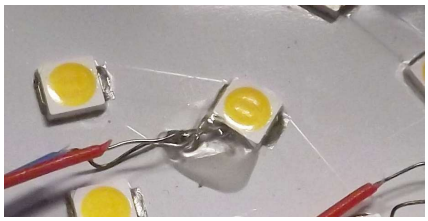

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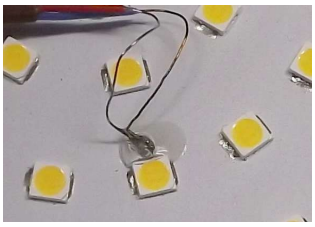
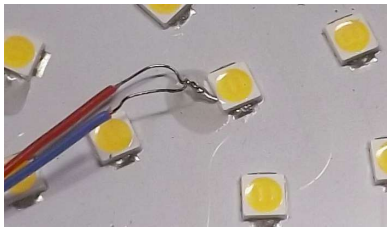


TC# 4

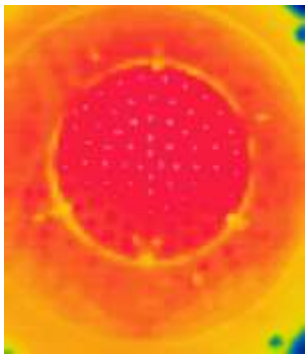


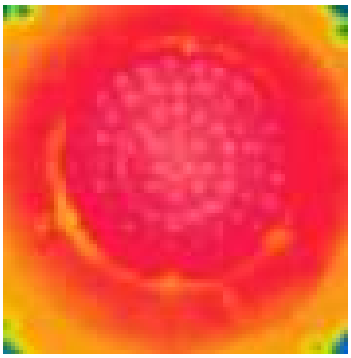
Relative temperature

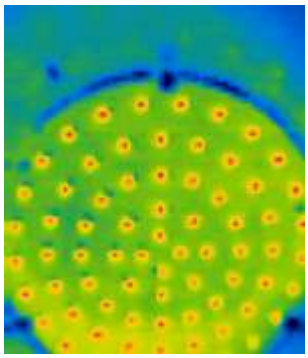
Hot

Cold

IR Thermography heat map







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Annex 1 – Determination of Lumen Maintenance Life of LEDs

Method — Determination of the L_{70} projected lumen maintenance of LEDs in accordance with IESNA TM-21-11 and its associated series of addenda. Calculations were performed using the TM-21 calculator spreadsheet published by Energy Star and located at www.energystar.gov.

Calculator revision — Revision 06-18-2018

Calculation results — The quantities in the tables below have been calculated for the LEDs based on the measurements, determinations and observations in this report. The table includes the Reported L_{70} projected lumen maintenance value. Refer to IESNA TM-21-11 for definitions of the quantities.

Quantity	Value	Units
$T_{s,1}$	85	ºC
$T_{s,1}$	358.15	K
α_1	4.878E-06	
B_1	1.0188	
$T_{s,2}$	105	ºC
$T_{s,2}$	378.15	K
α_2	4.1062E-06	
B_2	0.9802	
E_a/k_b	-1.17E+03	
A	0	
B_0	0.9993	
$T_{s,i}$ (ºC)	94.6	
$T_{s,i}$ (K)	367.75	
α_i	4.4804E-06	
Reported L70 (9K)	>54000	hour

L_{70} and interpolation data

Quantity	Test condition 1	Test condition 2	Test condition 3	Units
Sample size	25	25	25	
Number of failures	0	0	0	
DUT drive current used in the test	160	160	160	mA
Test duration	9000	9000	9000	hour
Test duration used for projection	4,000 - 9,000	4,000 - 9,000	4,000 - 9,000	(hour - hour)
Tested case temperature	55	85	105	ºC
α	6.420E-06	4.878E-06	4.106E-06	
B	1.027	1.019	0.980	
Reported L70 (9K)	>54000	>54000	>54000	hour

Test condition data used for interpolation

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