TEST REPORT

According to ANSI/IES LM-80-15
For

Hongli Zhihui Group Co.,Ltd. Guangzhou Branch

Room 316, Building 2, No.1, Xianke Yi Road, Huadong Town, Huadu District, Guangzhou, China

Model: HL-AS-2835D68W-3-S1-08L-PCT-HR3-ZW-P6

Report Type: 10000 Hours Test Report	**Product Type:** LED Package
Reviewed By:	Pote Wang
Report Number:	SZ2201225-61531E-10-10000
Test Date:	2020-12-27 to 2022-02-26
Report Date:	2022-03-01
Approved by:	Bill Xiong / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588

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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

60 PCS test samples were in good condition and received on 2020-12-25. The samples were numbered from 1 to 30 and 31 to 60.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-AS-2835D68W-3-S1-08L-PCT-HR3-ZW-P6
Part Type:	LED Package
#Drive Level:	DC 300mA
#Wavelength:	605nm
#Power:	1.08W
#Average Current Density per LED die:	381.445mA/mm^2
#Average Power Density per LED die:	1.373W/mm^2
#CRI:	80
#Die Spacing:	0.15mm

Sampling Method:

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days.
These manufacturing lots are picked to represent a wide parametric distribution.

Family products covered by this report:

According to *ENERGY STAR® Requirements for the Use of LM-80 Data*, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of *ENERGY STAR® Requirements for the Use of LM-80 Data* (September 28, 2017)

This report covers the following models:

Model name	CRI (typ.)	CCT(typ.)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies	Current (mA)
HL-AS-2835D68W-3-S1-08L-PCT-HR3-ZW-P6	80	2700K	1	3	0.1102	381.445	100	0.15	300
HL-**-2835D***W-3-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	3	0.1102	381.445	100	0.15	300
HL-**-2835D***W-3-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	3	0.0551	190.723	50	0.15	150
HL-**-2835D***W-3-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	3	0.022	76.289	20	0.15	60
HL-**-2835D***W-3-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	3	0.1102	381.445	100	0.15	300
HL-**-2835D***W-3-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	3	0.0551	190.723	50	0.15	150
HL-**-2835D***W-3-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	3	0.022	76.289	20	0.15	60
HL-**-2835D***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.0735	381.445	100	0.15	200
HL-**-2835D***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.0551	286.084	75	0.15	150
HL-**-2835D***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.0239	123.97	32.5	0.15	65
HL-**-2835D***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.022	114.434	30	0.15	60
HL-**-2835D***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.011	57.217	15	0.15	30

Model name	CRI (typ.)	CCT(typ.)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies	Current (mA)
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.0735	381.445	100	0.15	200
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.0551	286.084	75	0.15	150
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.0239	123.97	32.5	0.15	65
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.022	114.434	30	0.15	60
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.011	57.217	15	0.15	30
HL-**-2835D***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.0367	381.445	100	/	100
HL-**-2835D***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.0239	247.939	65	/	65
HL-**-2835D***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.022	228.867	60	/	60
HL-**-2835D***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.011	114.434	30	/	30
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.0367	381.445	100	/	100
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.0239	247.939	65	/	65
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.022	228.867	60	/	60
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.011	114.434	30	/	30
HL-**-2835D***W-3C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	3	1	0.1061	381.445	100	0.15	100
HL-**-2835D***W-3C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	3	1	0.0637	228.867	60	0.15	60
HL-**-2835D***W-3C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	3	1	0.0318	114.434	30	0.15	30
HL-**-2835D***W-3C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	3	1	0.1061	381.445	100	0.15	100
HL-**-2835D***W-3C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	3	1	0.0637	228.867	60	0.15	60
HL-**-2835D***W-3C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	3	1	0.0318	114.434	30	0.15	30
HL-**-2835D***W-2C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	2	1	0.0714	381.445	100	0.15	100
HL-**-2835D***W-2C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	2	1	0.0429	228.867	60	0.15	60
HL-**-2835D***W-2C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	2	1	0.0714	381.445	100	0.15	100
HL-**-2835D***W-2C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	2	1	0.0429	228.867	60	0.15	60
HL-**-2835H***W-3-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	3	0.0735	377.13	66.7	0.15	200
HL-**-2835H***W-3-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	3	0.0551	287.038	50	0.15	150
HL-**-2835H***W-3-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	3	0.022	114.815	20	0.15	60
HL-**-2835H***W-3-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	3	0.0735	377.13	66.7	0.15	200
HL-**-2835H***W-3-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	3	0.0551	287.038	50	0.15	150
HL-**-2835H***W-3-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	3	0.022	114.815	20	0.15	60
HL-**-2835H***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.0511	377.436	75	0.15	150

Model name	CRI (typ.)	CCT(typ.)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies	Current (mA)
HL-**-2835H***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.0239	186.574	32.5	0.15	65
HL-**-2835H***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.022	172.223	30	0.15	60
HL-**-2835H***W-2-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	2	0.011	86.111	15	0.15	30
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.0511	377.436	75	0.15	150
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.0239	186.574	32.5	0.15	65
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.022	172.223	30	0.15	60
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	2	0.011	86.111	15	0.15	30
HL-**-2835H***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.0312	373.149	65	/	65
HL-**-2835H***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.022	344.445	60	/	60
HL-**-2835H***W-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	1	1	0.011	172.223	30	/	30
HL-**-2835H***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.0312	373.149	65	/	65
HL-**-2835H***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.022	344.445	60	/	60
HL-**-2835H***W-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	1	1	0.011	172.223	30	/	30
HL-**-2835H***W-3C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	3	1	0.069	373.149	65	0.15	65
HL-**-2835H***W-3C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	3	1	0.0637	344.445	60	0.15	60
HL-**-2835H***W-3C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	3	1	0.0318	373.149	65	0.15	30
HL-**-2835H***W-3C-S1-08*-PCT-HR(R9)-ZW-P6-***	80	2200-6500K	3	1	0.069	373.149	65	0.15	65
HL-**-2835H***W-3C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	3	1	0.0637	344.445	60	0.15	60
HL-**-2835H***W-3C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	3	1	0.0318	172.223	30	0.15	30
HL-**-2835H***W-2C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	2	1	0.0464	373.149	65	0.15	65
HL-**-2835H***W-2C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	2	1	0.0429	344.445	60	0.15	60
HL-**-2835H***W-2C-S1-08*-PCT-HR3-ZW-P6-***	80	2200-6500K	2	1	0.0214	172.223	30	0.15	30
HL-**-2835H***W-2C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	2	1	0.0464	373.149	65	0.15	65
HL-**-2835H***W-2C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	2	1	0.0429	344.445	60	0.15	60
HL-**-2835H***W-2C-S1-08*-PCT-HR3(R9)-ZW-P6-***	80	2200-6500K	2	1	0.0214	172.223	30	0.15	30
HL-**-2835D***W-3-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	3	0.1102	381.445	100	0.15	300
HL-**-2835D***W-3-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	3	0.1102	381.445	100	0.15	300
HL-**-2835D***W-3C-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	3	1	0.1061	381.445	100	0.15	100
HL-**-2835D***W-3C-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	3	1	0.1061	381.445	100	0.15	100
HL-**-2835D***W-2-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	2	0.0735	381.445	100	0.15	200

Model name	CRI (typ.)	CCT(typ.)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies	Current (mA)
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	2	0.0735	381.445	100	0.15	200
HL-**-2835D***W-2-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	2	0.0239	123.97	32.5	0.15	65
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	2	0.0239	123.97	32.5	0.15	65
HL-**-2835D***W-2-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	2	0.022	114.434	30	0.15	60
HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	2	0.022	114.434	30	0.15	60
HL-**-2835D***W-2C-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	2	1	0.0714	381.445	100	0.15	100
HL-**-2835D***W-2C-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	2	1	0.0714	381.445	100	0.15	100
HL-**-2835D***W-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	1	0.0367	381.445	100	/	100
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	1	0.0367	381.445	100	/	100
HL-**-2835D***W-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	1	0.0239	247.939	65	/	65
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	1	0.0239	247.939	65	/	65
HL-**-2835D***W-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	1	0.022	228.867	60	/	60
HL-**-2835D***W-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	1	0.022	228.867	60	/	60
HL-**-2835H***W-3-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	3	0.0735	378.7	66.7	0.15	200
HL-**-2835H***W-3-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	3	0.0735	378.7	66.7	0.15	200
HL-**-2835H***W-2-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	2	0.0551	377.436	75	0.15	150
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	2	0.0551	377.436	75	0.15	150
HL-**-2835H***W-2-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	2	0.0239	186.574	32.5	0.15	65
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	2	0.0239	186.574	32.5	0.15	65
HL-**-2835H***W-2-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	2	0.022	172.223	30	0.15	60
HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	2	0.022	172.223	30	0.15	60
HL-**-2835H***W-2C-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	2	1	0.0464	373.149	65	0.15	65
HL-**-2835H***W-2C-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	2	1	0.0464	373.149	65	0.15	65
HL-**-2835H***W-2C-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	2	1	0.0429	344.445	60	0.15	60
HL-**-2835H***W-2C-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	2	1	0.0429	344.445	60	0.15	60
HL-**-2835H***W-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	1	0.0312	373.149	65	/	65
HL-**-2835H***W-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	1	0.0312	373.149	65	/	65
HL-**-2835H***W-S1-08*-PCT-HR3-T6-ZW-P6-***	80	2200-6500K	1	1	0.022	344.445	60	/	60
HL-**-2835H***W-S1-08*-PCT-HR3(R9)-T6-ZW-P6-***	80	2200-6500K	1	1	0.022	344.445	60	/	60

Note: The model name begins with "HL", such as "HL-**-2835D***W-3-S1-08*-PCT-HR3-ZW-P6-***","*" is described in detail as follows :

1. The first "**" is a letter A or AS which stands for the Market demand .
2. The second "***" is a number from 1 to 999 which stands for the brightness level.
3. The third "*" is a letter L or None which stands for the bonding wire style.
4. The fourth "***" is the letter or None, which stands for the customer code.

1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs
- ANSI/ASABE S640 JUL2017 Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms) (This standard was not accredited by IAS)
- ANSI/ASABE S642 SEP2018: Recommended Methods for Measurement and Testing of LED Products for Plant Growth and Development (This standard was not accredited by IAS)

1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
High Accuracy Array Spectroradiometer	EVERFINE	HAAS 2000	P600674CM5391140	2021-09-27	2022-09-26
0.5M Integrating Sphere	EVERFINE	0.5m	NA	2021-09-27	2022-09-26
LED Test Source	EVERFINE	LTS-300	P185616CJ1391143	2022-01-05	2023-01-04
Standard Light Source	EVERFINE	D062	1011093	2021-10-15	2022-10-14
Multilayer aging machine	BACL	B2-270	20022	2021-02-24	2022-02-23
Program-controlled D.C. Stabilized Voltage Supply	Hanshenpuyuan	HSPY-200-01	N/A	2021-06-30	2022-06-29

1.4 Drive Level

Samples are driven with a constant direct current (DC) during maintenance test, photometric and electrical measurement. The current value was regulated to within ±3% of the specified value of the manufacturer during maintenance test, and was within ±0.5% during photometric and electrical measurement test.

1.5 Ambient Conditions for Maintenance Test

For lumen maintenance test, samples within one data set, were installed on cooling boards in thermal chambers with minimal ambient airflow. The case temperature and ambient temperature was monitored by thermocouples which one was soldered to the coldest DUTs' case (TMP_{LED}) location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing, TMP_{LED} of the coldest LEDs were maintained at a temperature that was greater than or equal to 2°C below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to 5°C below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with ASTM E230 Table 1 "Special Limits".

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within ±3% of the specified value of the manufacturer.

The relative humidity within chamber was kept less than 65% during test.

For photometry measurement, the ambient temperature during test was set to 25°C ± 2°C, RH <65%.

1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure spectral power distribution and photon flux. 2π measurement was used and sample was drived by DC power supply. The forward current was regulated to within ±0.5% of the nominal value. The test

system was calibrated by halogen reference lamp. The ambient temperature during test was set to 25°C ± 2°C, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

1.7 Statement of Traceability

Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.8 Sample Set

Data Set 1: 55°C, 300mA

Part Number:	HL-AS-2835D68W-3-S1-08L-PCT-HR3-ZW-P6
Number of Units:	30
Case Temperature:	>53°C
Ambient Temperature:	>50°C
Life Test Drive Current:	300mA
Measurement Current:	300mA

Data Set 2: 105°C, 300mA

Part Number:	HL-AS-2835D68W-3-S1-08L-PCT-HR3-ZW-P6
Number of Units:	30
Case Temperature:	>103°C
Ambient Temperature:	>100°C
Life Test Drive Current:	300mA
Measurement Current:	300mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 Q_{70} Lifetime	Reported TM-21 Q_{90} Lifetime
1	30	0	1000hrs	10000hrs	2.025E-06	1.003	>60000 hours	53000 hours
2	30	0	1000hrs	10000hrs	2.486E-06	1.003	>60000 hours	44000 hours

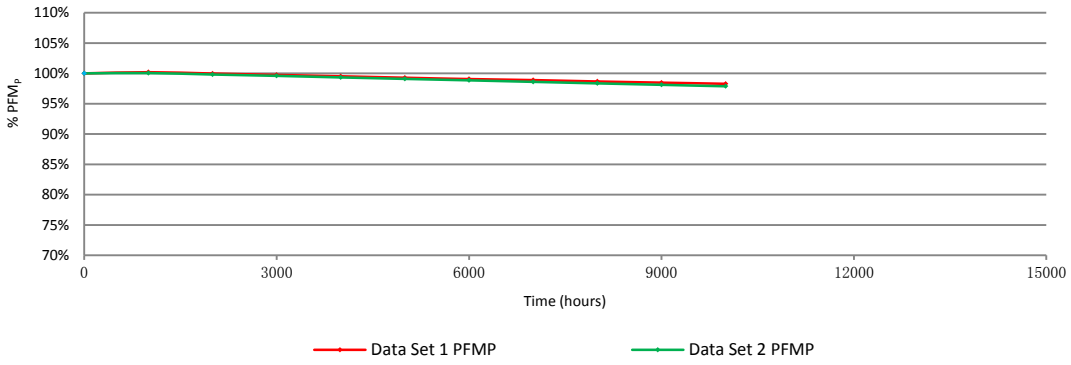
Average Photon Flux Maintenance, Photosynthetic 400-700nm (PFM_P) (Percentage of Initial)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	100.19%	99.97%	99.74%	99.52%	99.28%	99.06%	98.89%	98.66%	98.47%	98.28%
2	100.05%	99.81%	99.59%	99.33%	99.09%	98.85%	98.60%	98.35%	98.11%	97.87%

Average Wavelength

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	601.7	601.5	601.6	601.7	601.6	601.8	601.7	601.6	601.6	601.8
2	601.5	601.5	601.4	601.4	601.7	601.6	601.5	601.7	601.6	601.6

Average Photon Flux Maintenance, Photosynthetic 400-700nm (PFM_P)



3 - Test Data

3.1 Data Set 1, 55°C, 300mA (400-700nm Photon Flux Maintenance)

No.	Φ_p (μmol × s^{-1})	400-700nm Photon Flux Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2.0270	100.15	100.10	99.61	99.51	99.21	98.91	98.67	98.42	98.17	97.63
2	2.0150	100.20	99.90	99.65	99.40	99.21	98.96	98.81	98.51	98.41	98.21
3	2.0720	100.34	100.05	99.81	99.52	99.37	99.03	98.84	98.46	98.26	98.07
4	2.0660	100.19	99.95	99.71	99.42	99.18	99.08	98.98	98.69	98.50	98.26
5	2.0800	100.24	100.05	99.81	99.62	99.42	99.23	98.99	98.89	98.65	98.56
6	2.0500	100.05	99.90	99.61	99.37	99.12	98.83	98.68	98.59	98.54	98.44
7	2.1070	100.19	99.95	99.76	99.48	99.29	99.10	99.00	98.81	98.62	98.53
8	2.1060	100.19	99.67	99.76	99.57	99.29	99.05	98.86	98.67	98.62	98.34
9	2.0550	100.24	100.05	99.71	99.51	99.27	98.93	98.73	98.44	98.20	98.00
10	2.0260	100.25	100.05	99.80	99.56	99.31	99.11	98.86	98.62	98.42	98.12
11	2.0710	100.24	99.95	99.71	99.52	99.32	99.08	98.84	98.60	98.36	98.12
12	2.0500	100.20	99.95	99.61	99.37	99.02	98.83	98.59	98.24	98.05	98.54
13	2.0800	100.19	99.86	99.66	99.62	99.28	99.13	98.89	98.65	98.41	98.17
14	2.0680	100.24	100.05	99.71	99.47	99.18	98.89	98.60	98.31	98.11	97.92
15	2.1100	100.28	100.14	99.91	99.72	99.62	99.43	99.24	99.05	98.82	98.58
16	2.0540	100.10	99.90	99.71	99.46	99.32	99.07	99.03	98.69	98.59	98.30
17	2.0360	100.10	100.05	99.75	99.56	99.21	98.97	98.92	98.77	98.58	98.38
18	2.0270	100.25	100.05	99.80	99.61	99.31	99.06	98.87	98.72	98.47	98.22
19	2.0390	100.20	99.95	99.85	99.61	99.26	99.12	98.87	98.58	98.43	98.28
20	2.0660	100.24	99.95	99.81	99.71	99.47	99.23	98.94	98.74	98.55	98.45
21	2.0750	100.19	99.90	99.71	99.47	99.28	99.08	98.94	98.84	98.60	98.46
22	2.0990	100.14	99.95	99.67	99.43	99.24	99.09	98.86	98.62	98.43	98.28
23	2.0580	100.15	99.95	99.76	99.42	99.08	98.79	98.69	98.40	98.20	97.96
24	2.0650	100.15	99.95	99.76	99.47	99.18	98.93	98.79	98.50	98.31	98.11
25	2.0560	100.15	99.95	99.71	99.42	99.12	98.98	98.74	98.49	98.30	98.10
26	2.0410	100.24	100.10	99.90	99.71	99.56	99.31	99.27	99.12	98.92	98.68
27	2.0930	100.14	99.86	99.71	99.52	99.33	99.19	99.14	98.90	98.71	98.57
28	2.0400	100.20	100.05	99.75	99.51	99.36	99.12	98.97	98.73	98.63	98.48
29	2.0820	100.19	100.10	99.86	99.71	99.47	99.33	99.28	98.99	98.80	98.56
30	2.0980	100.10	99.90	99.67	99.43	99.09	98.90	98.76	98.62	98.38	98.14
Avg.	2.0637	100.19	99.97	99.74	99.52	99.28	99.06	98.89	98.66	98.47	98.28
Med.	2.0655	100.19	99.95	99.73	99.51	99.28	99.08	98.87	98.64	98.45	98.28
st dev	0.0261	0.06	0.10	0.08	0.10	0.14	0.15	0.18	0.21	0.21	0.24
Min.	2.0150	100.05	99.67	99.61	99.37	99.02	98.79	98.59	98.24	98.05	97.63
Max.	2.1100	100.34	100.14	99.91	99.72	99.62	99.43	99.28	99.12	98.92	98.68

3.2 Data Set 1, 55°C, 300mA (Forward Voltage)

No.	Forward Voltage (V)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	3.140	3.160	3.158	3.152	3.121	3.135	3.121	3.157	3.152	3.157	3.154
2	3.147	3.145	3.128	3.141	3.134	3.123	3.148	3.158	3.123	3.142	3.146
3	3.129	3.124	3.127	3.123	3.149	3.126	3.148	3.111	3.159	3.132	3.124
4	3.131	3.151	3.122	3.125	3.120	3.129	3.160	3.159	3.158	3.147	3.129
5	3.153	3.116	3.145	3.130	3.159	3.164	3.122	3.159	3.138	3.144	3.148
6	3.160	3.128	3.153	3.125	3.131	3.126	3.116	3.111	3.151	3.126	3.117
7	3.140	3.148	3.111	3.141	3.140	3.157	3.148	3.152	3.131	3.152	3.122
8	3.162	3.154	3.122	3.124	3.126	3.127	3.168	3.161	3.112	3.144	3.122
9	3.161	3.119	3.120	3.123	3.143	3.121	3.120	3.159	3.112	3.119	3.127
10	3.157	3.132	3.124	3.127	3.137	3.163	3.124	3.133	3.128	3.142	3.122
11	3.153	3.154	3.124	3.152	3.132	3.131	3.139	3.157	3.125	3.132	3.158
12	3.164	3.157	3.122	3.126	3.159	3.156	3.161	3.157	3.131	3.155	3.120
13	3.137	3.129	3.159	3.128	3.131	3.121	3.128	3.123	3.121	3.156	3.115
14	3.153	3.159	3.126	3.127	3.158	3.164	3.151	3.146	3.127	3.159	3.147
15	3.168	3.160	3.159	3.161	3.167	3.125	3.161	3.122	3.129	3.159	3.122
16	3.160	3.134	3.157	3.159	3.141	3.124	3.141	3.122	3.145	3.136	3.110
17	3.162	3.166	3.131	3.127	3.121	3.164	3.162	3.126	3.156	3.150	3.147
18	3.173	3.172	3.169	3.171	3.158	3.149	3.144	3.121	3.158	3.158	3.158
19	3.168	3.164	3.129	3.161	3.121	3.128	3.168	3.150	3.121	3.149	3.125
20	3.170	3.158	3.159	3.170	3.115	3.130	3.161	3.121	3.138	3.116	3.158
21	3.145	3.130	3.134	3.137	3.141	3.164	3.141	3.130	3.122	3.138	3.154
22	3.153	3.160	3.159	3.152	3.159	3.159	3.134	3.130	3.155	3.141	3.116
23	3.176	3.159	3.140	3.170	3.170	3.126	3.162	3.167	3.152	3.142	3.123
24	3.164	3.159	3.168	3.158	3.168	3.132	3.161	3.110	3.111	3.113	3.124
25	3.161	3.160	3.157	3.122	3.167	3.168	3.161	3.128	3.121	3.122	3.136
26	3.145	3.146	3.123	3.157	3.138	3.130	3.141	3.140	3.147	3.113	3.113
27	3.175	3.129	3.159	3.158	3.132	3.132	3.171	3.146	3.157	3.158	3.121
28	3.168	3.131	3.125	3.161	3.128	3.115	3.118	3.118	3.141	3.158	3.119
29	3.161	3.130	3.162	3.140	3.159	3.151	3.157	3.128	3.130	3.157	3.124
30	3.155	3.159	3.122	3.151	3.133	3.114	3.120	3.126	3.121	3.128	3.140
Avg.	3.1564	3.1463	3.1398	3.1433	3.1419	3.1385	3.1452	3.138	3.136	3.142	3.131
Med.	3.1600	3.1525	3.1325	3.1410	3.1390	3.1305	3.1480	3.132	3.131	3.143	3.124
st dev	0.0126	0.0159	0.0179	0.0168	0.0167	0.0175	0.0175	0.018	0.016	0.015	0.015
Min.	3.1290	3.1160	3.1110	3.1220	3.1150	3.1140	3.1160	3.110	3.111	3.113	3.110
Max.	3.1760	3.1720	3.1690	3.1710	3.1700	3.1680	3.1710	3.167	3.159	3.159	3.158

3.3 Data Set 1, 55°C, 300mA (Wavelength)

No.	Wavelength (nm)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	602.0	602.1	601.6	601.9	601.9	601.6	602.0	602.0	602.0	602.1	601.9
2	602.0	601.8	602.0	602.0	601.9	601.7	601.8	601.8	602.1	602.0	601.9
3	601.8	601.5	601.0	601.4	602.2	601.8	601.9	601.7	601.7	601.9	600.9
4	600.2	601.7	601.8	601.8	601.8	601.9	601.9	601.8	601.9	601.7	601.7
5	602.1	601.8	602.0	601.7	601.0	601.6	601.9	602.1	601.8	601.8	601.9
6	602.1	601.9	601.4	601.9	601.8	601.0	601.8	601.5	602.1	601.5	601.3
7	602.1	601.9	601.9	601.9	601.2	601.7	601.9	601.2	601.9	601.9	601.4
8	601.8	600.9	601.2	601.2	601.1	601.7	602.3	601.7	601.6	602.6	601.9
9	602.0	602.5	601.0	601.7	601.6	602.3	602.0	601.8	602.0	601.9	601.8
10	602.2	602.0	601.6	598.9	601.0	601.5	600.5	602.0	601.9	601.8	602.0
11	602.1	600.5	601.6	602.0	601.9	601.9	602.0	602.1	600.3	601.8	601.6
12	601.9	601.9	601.9	601.9	601.6	602.0	601.7	601.6	600.1	601.6	602.1
13	601.4	601.7	601.8	601.4	600.9	602.0	601.9	601.2	601.6	601.0	601.9
14	601.7	600.9	601.5	600.7	602.0	602.0	601.8	602.0	601.3	601.9	601.9
15	602.0	602.3	601.9	601.8	601.2	601.9	601.8	601.9	601.5	601.8	601.9
16	600.1	601.3	602.0	601.9	601.6	602.1	601.0	601.5	599.8	601.5	601.6
17	601.5	601.6	601.7	601.3	601.8	601.9	601.9	602.0	601.9	601.8	601.5
18	601.9	601.7	601.8	602.7	601.8	601.6	601.6	601.8	601.8	600.4	601.7
19	601.8	601.9	601.8	601.4	601.9	602.0	602.0	601.1	602.0	599.2	601.6
20	602.0	601.7	601.5	602.3	601.9	601.5	601.7	601.8	601.8	602.2	601.8
21	602.0	601.9	600.8	601.6	602.0	601.8	601.9	601.8	602.0	601.9	601.9
22	601.7	601.7	601.7	602.0	601.7	601.3	601.8	602.2	601.9	602.1	601.7
23	602.0	601.7	601.5	601.9	601.2	601.9	601.6	601.7	602.0	600.0	601.7
24	601.9	601.8	600.4	600.2	601.8	602.0	601.4	601.9	601.5	601.9	602.6
25	601.5	601.5	601.6	601.9	601.8	601.7	601.8	601.9	601.7	601.3	601.8
26	602.1	601.8	601.2	602.3	601.6	601.9	601.8	601.2	602.1	602.0	601.5
27	601.9	601.5	601.4	601.3	602.0	599.2	601.8	601.3	601.8	601.3	601.8
28	601.4	601.4	602.3	601.7	601.7	601.1	601.8	601.9	600.9	602.0	601.4
29	602.0	601.2	601.7	602.0	601.7	600.1	602.1	600.9	602.1	601.9	601.8
30	602.0	601.9	600.3	602.0	601.9	601.5	601.9	601.7	602.1	601.5	602.1
Avg.	601.8	601.7	601.5	601.6	601.7	601.6	601.8	601.7	601.6	601.6	601.8
Med.	602.0	601.7	601.6	601.9	601.8	601.8	601.8	601.8	601.9	601.8	601.8
st dev	0.4899	0.4088	0.4625	0.7006	0.3481	0.6142	0.3298	0.3296	0.5992	0.6825	0.2991
Min.	600.1	600.5	600.3	598.9	600.9	599.2	600.5	600.9	599.8	599.2	600.9
Max.	602.2	602.5	602.3	602.7	602.2	602.3	602.3	602.2	602.1	602.6	602.6

3.4 Data Set 2, 105°C, 300mA (400-700nm Photon Flux Maintenance)

No.	Φ_p (μmol × s^{-1})	400-700nm Photon Flux Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
31	2.0250	100.10	99.90	99.70	99.41	99.01	99.01	98.81	98.52	98.22	97.98
32	2.0190	99.90	99.60	99.46	99.26	99.06	98.91	98.81	98.56	98.46	98.27
33	2.0540	100.10	99.81	99.46	99.17	98.83	98.49	98.30	98.00	97.71	97.37
34	2.1060	99.95	99.67	99.53	99.38	99.38	99.15	98.81	98.48	98.20	97.82
35	2.0650	100.15	100.05	99.76	99.56	99.18	98.79	98.60	98.16	97.97	97.82
36	2.0170	100.05	99.70	99.60	99.45	99.16	99.01	98.71	98.61	98.51	98.41
37	2.0430	100.15	99.90	99.61	99.41	99.22	98.97	98.09	97.90	97.36	97.06
38	2.0570	100.24	99.85	99.51	99.17	98.83	98.49	98.40	98.20	97.96	97.72
39	2.0880	100.14	99.90	99.81	99.52	99.23	99.04	98.75	98.61	98.42	98.13
40	2.0090	100.05	99.80	99.50	99.30	99.10	98.90	98.66	98.61	98.26	98.16
41	2.1000	100.05	99.81	99.57	99.38	99.29	99.19	98.81	98.57	98.29	98.05
42	2.0980	100.05	99.95	99.76	99.62	99.33	99.19	98.95	98.62	98.43	98.14
43	2.0420	100.20	99.90	99.56	99.41	99.22	98.92	98.73	98.43	98.19	97.99
44	2.0170	100.05	99.80	99.75	99.36	99.11	98.91	98.71	98.41	98.22	98.12
45	2.0120	99.90	99.70	99.65	99.40	99.06	98.81	98.66	98.56	98.41	98.21
46	2.0380	100.10	99.85	99.75	99.41	99.26	99.12	98.87	98.82	98.58	98.38
47	2.0630	100.15	99.76	99.32	98.89	98.55	97.96	97.67	97.43	97.19	96.95
48	2.0110	100.15	99.90	99.75	99.40	99.20	99.01	98.66	98.26	97.96	97.71
49	2.0520	99.95	99.90	99.56	99.46	99.22	99.12	98.83	98.49	98.15	97.90
50	2.0810	100.14	99.95	99.66	99.28	98.99	98.75	98.46	98.13	97.79	97.45
51	2.0740	99.95	99.81	99.61	99.28	99.08	98.75	98.41	98.17	97.88	97.54
52	2.0110	100.05	99.90	99.75	99.45	99.40	99.10	98.96	98.56	98.41	98.06
53	2.0800	100.05	99.66	99.62	99.38	99.28	99.13	98.94	98.70	98.41	98.17
54	2.0490	99.95	99.71	99.51	99.12	98.93	98.58	98.49	98.44	98.15	97.95
55	2.0270	99.90	99.70	99.61	99.36	99.11	99.01	98.87	98.47	98.27	97.98
56	2.0810	99.95	99.71	99.38	99.09	98.89	98.61	98.41	98.13	97.89	97.69
57	2.0830	99.90	99.62	99.52	99.14	98.80	98.66	98.42	98.27	98.13	98.08
58	2.0210	100.15	99.85	99.55	99.46	99.16	98.86	98.76	98.47	98.37	98.17
59	2.0920	99.90	99.71	99.38	99.19	99.04	98.76	98.52	98.37	98.09	97.75
60	2.1040	100.05	99.81	99.43	99.10	98.67	98.24	98.00	97.67	97.39	97.01
Avg.	2.0540	100.05	99.81	99.59	99.33	99.09	98.85	98.60	98.35	98.11	97.87
Med.	2.0530	100.05	99.81	99.59	99.38	99.11	98.91	98.68	98.45	98.19	97.98
st dev	0.0322	0.10	0.11	0.13	0.16	0.21	0.29	0.30	0.31	0.35	0.39
Min.	2.0090	99.90	99.60	99.32	98.89	98.55	97.96	97.67	97.43	97.19	96.95
Max.	2.1060	100.24	100.05	99.81	99.62	99.40	99.19	98.96	98.82	98.58	98.41

3.5 Data Set 2, 105°C, 300mA (Forward Voltage)

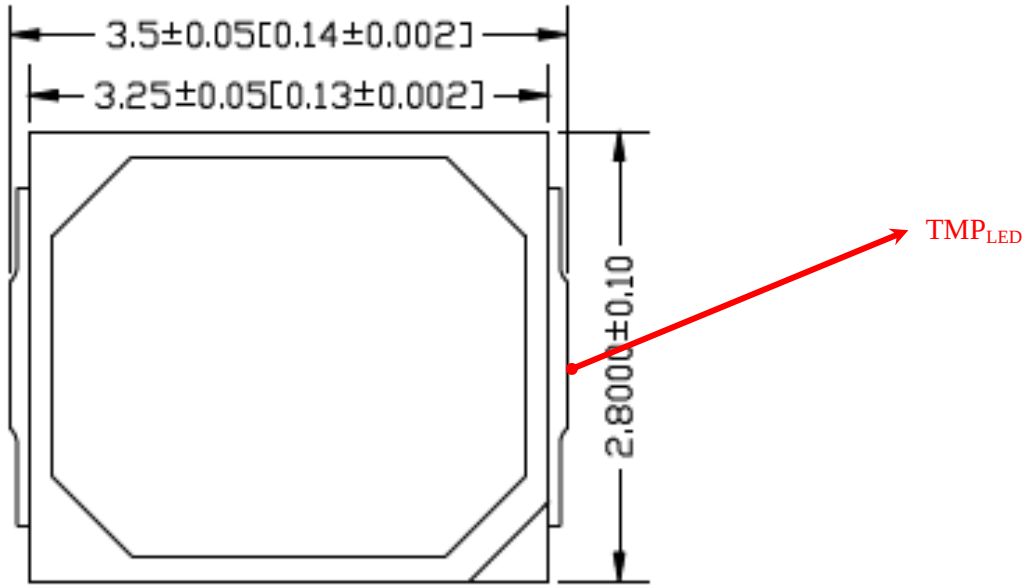
No.	Forward Voltage (V)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
31	3.158	3.183	3.158	3.140	3.140	3.167	3.158	3.154	3.157	3.152	3.157
32	3.157	3.152	3.141	3.147	3.150	3.151	3.152	3.161	3.159	3.155	3.158
33	3.160	3.162	3.169	3.155	3.168	3.166	3.166	3.157	3.160	3.157	3.153
34	3.180	3.185	3.182	3.181	3.164	3.158	3.169	3.155	3.154	3.158	3.163
35	3.151	3.154	3.152	3.165	3.162	3.154	3.163	3.155	3.159	3.155	3.150
36	3.147	3.143	3.141	3.167	3.144	3.148	3.141	3.150	3.166	3.152	3.156
37	3.150	3.152	3.164	3.162	3.169	3.157	3.158	3.154	3.162	3.157	3.166
38	3.170	3.172	3.171	3.179	3.170	3.157	3.151	3.158	3.158	3.157	3.161
39	3.157	3.153	3.151	3.152	3.158	3.153	3.157	3.155	3.157	3.154	3.150
40	3.157	3.152	3.152	3.159	3.152	3.157	3.154	3.156	3.156	3.159	3.160
41	3.149	3.170	3.151	3.141	3.171	3.141	3.153	3.162	3.148	3.152	3.153
42	3.160	3.156	3.161	3.154	3.161	3.166	3.152	3.154	3.158	3.161	3.150
43	3.166	3.163	3.160	3.143	3.167	3.157	3.151	3.160	3.156	3.155	3.159
44	3.167	3.164	3.159	3.155	3.143	3.165	3.140	3.156	3.156	3.169	3.156
45	3.170	3.175	3.171	3.162	3.141	3.168	3.151	3.149	3.151	3.157	3.158
46	3.151	3.151	3.164	3.153	3.149	3.154	3.156	3.159	3.142	3.143	3.169
47	3.179	3.172	3.171	3.142	3.170	3.169	3.150	3.153	3.162	3.156	3.157
48	3.153	3.151	3.152	3.158	3.150	3.147	3.165	3.157	3.162	3.156	3.156
49	3.158	3.152	3.151	3.153	3.149	3.157	3.151	3.156	3.158	3.150	3.144
50	3.166	3.177	3.161	3.164	3.154	3.161	3.152	3.157	3.163	3.165	3.159
51	3.165	3.161	3.143	3.140	3.161	3.161	3.160	3.151	3.151	3.156	3.157
52	3.172	3.175	3.149	3.141	3.154	3.156	3.153	3.156	3.153	3.151	3.166
53	3.151	3.154	3.151	3.168	3.162	3.151	3.152	3.163	3.155	3.158	3.152
54	3.150	3.173	3.166	3.150	3.163	3.167	3.152	3.157	3.157	3.158	3.155
55	3.160	3.160	3.161	3.161	3.161	3.144	3.156	3.154	3.167	3.159	3.160
56	3.175	3.173	3.171	3.179	3.170	3.160	3.150	3.152	3.156	3.156	3.153
57	3.174	3.171	3.171	3.152	3.159	3.152	3.155	3.152	3.158	3.159	3.169
58	3.168	3.163	3.161	3.169	3.141	3.141	3.151	3.167	3.150	3.156	3.156
59	3.154	3.154	3.142	3.158	3.159	3.163	3.153	3.159	3.162	3.166	3.159
60	3.171	3.175	3.140	3.170	3.161	3.169	3.163	3.163	3.158	3.155	3.164
Avg.	3.1615	3.1633	3.1579	3.1573	3.1574	3.1572	3.1545	3.1564	3.1570	3.1565	3.1575
Med.	3.1600	3.1625	3.1595	3.1565	3.1600	3.1570	3.1530	3.1560	3.1575	3.1560	3.1570
st dev	0.0095	0.0111	0.0110	0.0118	0.0097	0.0081	0.0064	0.0041	0.0052	0.0049	0.0058
Min.	3.1470	3.1430	3.1400	3.1400	3.1400	3.1410	3.1400	3.1490	3.1420	3.1430	3.1440
Max.	3.1800	3.1850	3.1820	3.1810	3.1710	3.1690	3.1690	3.1670	3.1670	3.1690	3.1690

3.6 Data Set 2, 105°C, 300mA (Wavelength)

No.	Wavelength (nm)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
31	602.1	601.7	601.9	601.5	601.9	601.9	601.9	601.8	602.2	601.9	602.0
32	601.7	600.2	601.0	601.6	600.6	602.2	601.9	601.9	601.8	601.8	602.0
33	602.0	599.5	601.3	601.5	601.0	600.8	601.8	601.2	602.0	602.0	601.9
34	602.0	602.1	599.8	602.0	602.0	602.0	601.3	601.9	601.6	601.8	601.8
35	602.0	601.7	599.5	601.6	601.7	601.6	601.5	601.9	601.9	601.9	601.7
36	602.0	602.0	601.6	601.1	602.0	602.3	601.4	602.0	602.0	601.8	601.9
37	601.9	601.5	601.9	601.2	602.1	602.3	601.9	601.5	601.8	601.5	601.9
38	601.8	601.9	601.8	601.7	601.9	601.5	601.0	600.7	601.7	601.9	600.4
39	601.5	601.0	601.8	601.2	601.0	601.3	601.5	601.3	601.8	600.3	601.6
40	600.3	601.9	601.9	601.3	601.8	601.7	601.9	602.2	601.5	602.5	601.9
41	601.8	600.2	601.7	601.4	601.7	601.9	601.9	601.4	601.9	600.9	601.0
42	602.1	601.9	601.8	602.0	601.8	601.7	601.4	601.2	601.7	601.9	602.2
43	601.8	602.0	601.7	600.0	601.2	601.8	601.7	601.8	601.9	601.7	601.7
44	600.3	601.4	601.8	601.3	600.8	601.1	601.5	601.5	601.3	601.6	601.7
45	602.2	602.2	600.4	601.9	600.1	602.0	602.0	602.3	601.7	601.4	601.8
46	601.8	601.8	601.7	601.7	599.9	601.7	601.7	601.8	601.6	602.2	602.0
47	601.9	601.6	600.4	601.8	601.8	601.8	601.4	601.7	602.2	601.3	601.0
48	600.9	601.8	601.7	601.9	601.3	601.8	601.9	601.5	601.3	601.5	601.2
49	601.8	602.1	601.3	601.9	601.7	601.6	601.8	601.6	601.7	601.9	600.1
50	602.2	601.9	602.0	601.9	601.9	602.0	601.6	601.5	601.9	601.5	601.8
51	601.4	601.8	602.0	601.5	601.6	602.4	601.8	601.2	601.7	602.0	602.0
52	601.9	601.9	601.7	599.8	602.0	601.6	601.6	601.8	601.7	601.8	602.3
53	601.9	600.2	601.6	602.0	600.3	601.9	602.0	600.3	601.0	601.5	601.6
54	600.8	601.8	601.8	599.2	601.5	601.3	601.8	601.8	601.9	602.1	601.8
55	602.2	600.2	602.2	601.9	601.3	601.3	601.7	601.9	602.0	601.3	602.1
56	601.7	602.1	601.9	601.8	601.4	601.0	601.8	600.4	600.0	601.9	601.8
57	601.7	601.8	602.1	601.9	601.6	601.7	601.0	602.1	601.3	600.8	601.8
58	602.0	601.8	601.9	601.8	601.5	601.4	600.8	601.8	601.5	601.4	601.8
59	602.1	601.3	600.7	601.7	601.0	601.3	601.2	600.0	601.7	601.0	602.1
60	601.2	602.1	601.2	600.4	601.4	602.2	602.3	602.2	601.5	600.6	600.1
Avg.	601.7	601.5	601.5	601.4	601.4	601.7	601.6	601.5	601.7	601.6	601.6
Med.	601.9	601.8	601.7	601.7	601.6	601.7	601.7	601.8	601.7	601.8	601.8
st dev	0.5133	0.7171	0.6737	0.6944	0.5831	0.3978	0.3377	0.5654	0.4132	0.4887	0.5707
Min.	600.3	599.5	599.5	599.2	599.9	600.8	600.8	600.0	600.0	600.3	600.1
Max.	602.2	602.2	602.2	602.0	602.1	602.4	602.3	602.3	602.2	602.5	602.3

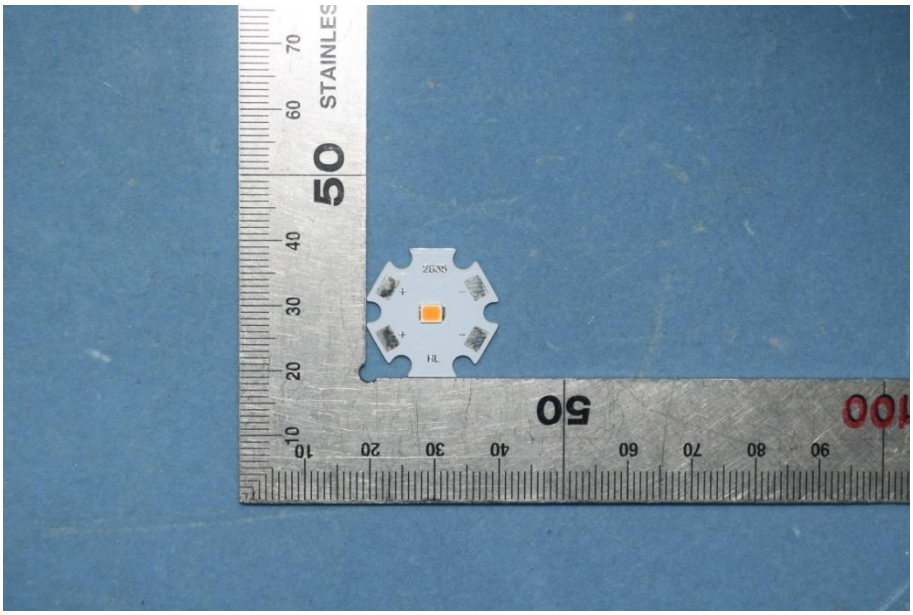
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



Directions

1. The information marked “superscript #” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K=2 with the 95% confidence interval.
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**********END OF REPORT**********