Date of issue 2021-01-27
Version 1.0
Total pages 10

Test report of Horticultural Lighting

Applicant:

Shenzhen Phlizon Technology Co.,Ltd.

Address:

Bldg 2-4, TongFuYu Industrial Park, AiQun Road, Shiyan Town, Bao'an District, SHENZHEN Guangdong, China

For Product:

1000W FOLDABLE LED GROW LIGHT

Model No.:

PH-FD100-I

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

Jarvis zhang

Jason zhou

Complied by: Jarvis zhang **Review by: Jason zhou**

Project Engineer **Technical Manager**

Note: 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.

1 General

1.1 Product Information

Manufacturer	Shenzhen Phlizon Technology Co.,Ltd.
Manufacturer Address	Bldg 2-4, TongFuYu Industrial Park, AiQun Road, Shiyan Town, Bao'an District, SHENZHEN Guangdong, China
Brand Name	1000W FOLDABLE LED GROW LIGHT
Luminaire Type	PHLIZON
Model Number	PH-FD100-I
Rated Inputs	AC 120-277V 50/60Hz
Rated Power	1000 W
Dimming Capability	Yes
Date of Receipt Samples	2021-01-06
Date of test	2021-01-07 to 2021-01-18
Burning Time Before Test	0hour(For New Products)

1.2 Standards or methods

- ANSI C78.377-2017: Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-10:2014: Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment - Solid State
- CIE Publication No.13.3-1995: Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products

1.3 Equipment list

Device	Manufacture	Model No.	Serial No.	Calibration due date
Goniophotometric System	SENSING	GMS-3000	N.A	2021-04-02
AC Power Source	ALL POWER	APW-110N	992257	2021-04-02
Total Luminous Flux Standard Lamp	SENSING	110V/100W	S1510065	2021-04-08
Total Spectral Radiant Flux Standard Lamp	SENSING	12V/20W	LSD12201731	2021-04-08
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2021-04-02
Integral Sphere	SENSING	SPR-600M	N.A	2021-04-02
Digital Power Meter	YOKOGAWA	WT210	91L929742	2021-04-02
Optical Color and Electrical Measurement System	SENSING	SPR-3000	S1101108	2021-04-02
Environment Measurer	XUYAO	HS-1	N/A	2021-04-08
Environment Measurer	XUYAO	HS-1	N/A	2021-04-08
Stop watch	KISLO	K610	N/A	2021-04-26
Digital Anemometer	TECMAN	TD8901	026141	2021-09-09

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab Co.,Ltd attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).

2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25°C ±1°C, the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards. 4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

Integrating Sphere Uncertainty: The uncertainty of the light output (luminous flux) measurements is U=1.8% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=20K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=1.8(K=2), at the 95% confidence level. The uncertainty of power meter AC current U=0.18% of rdg, AC Voltage U=0.16% of rdg, Power U=0.20% (K=2), at the 95% confidence level.

2.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.

Goniophotometer Uncertainty :The uncertainty of the luminous intensity is U=1.6% (K=2), at the 95% confidence level.

3 Test Result Summary

3.1 Integrating Sphere System (Total operating time for integrating sphere test: 1.0 hour)

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
119.91	60	8.180	980.00	0.999

Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	CRI	R9
133476.00	136.2	4027	92.3	69

Duv	x	y	u'	v'
-0.00831	0.3738	0.3556	0.2294	0.4909

PPF (400-700nm) (μmol/s)	PPF Efficacy (μmol/J)	PPF (400-500nm) (μmol/s)	PPF (500-600nm) (μmol/s)	PPF (600-700nm) (μmol/s)	PF_{FR} (700-800nm) (μmol/s)
2682.79	2.74	507.73	1072.75	1102.31	84.49

Spectral Quantum Distribution (SQD)

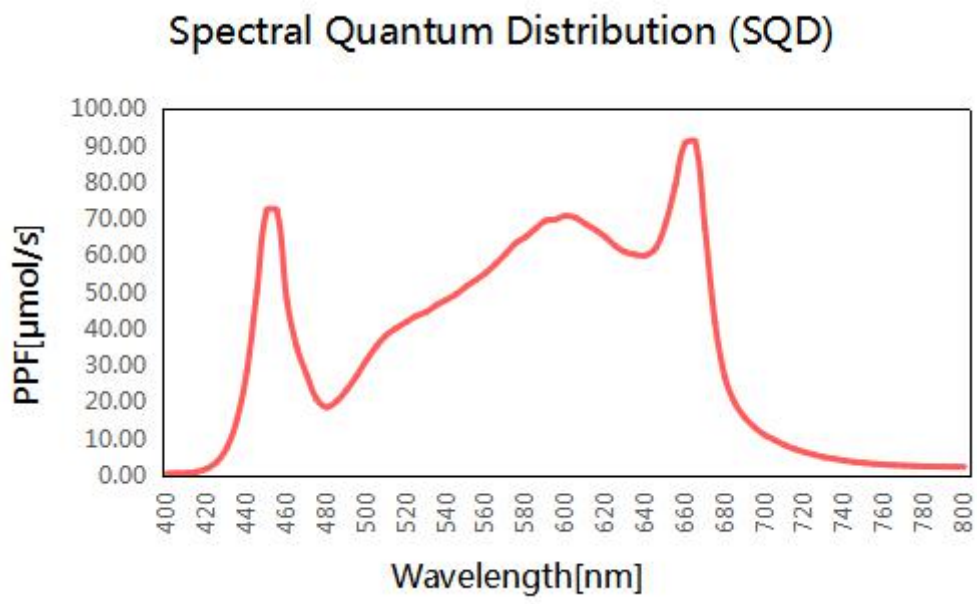


Photo Flux Summary vs Wavelength Bands

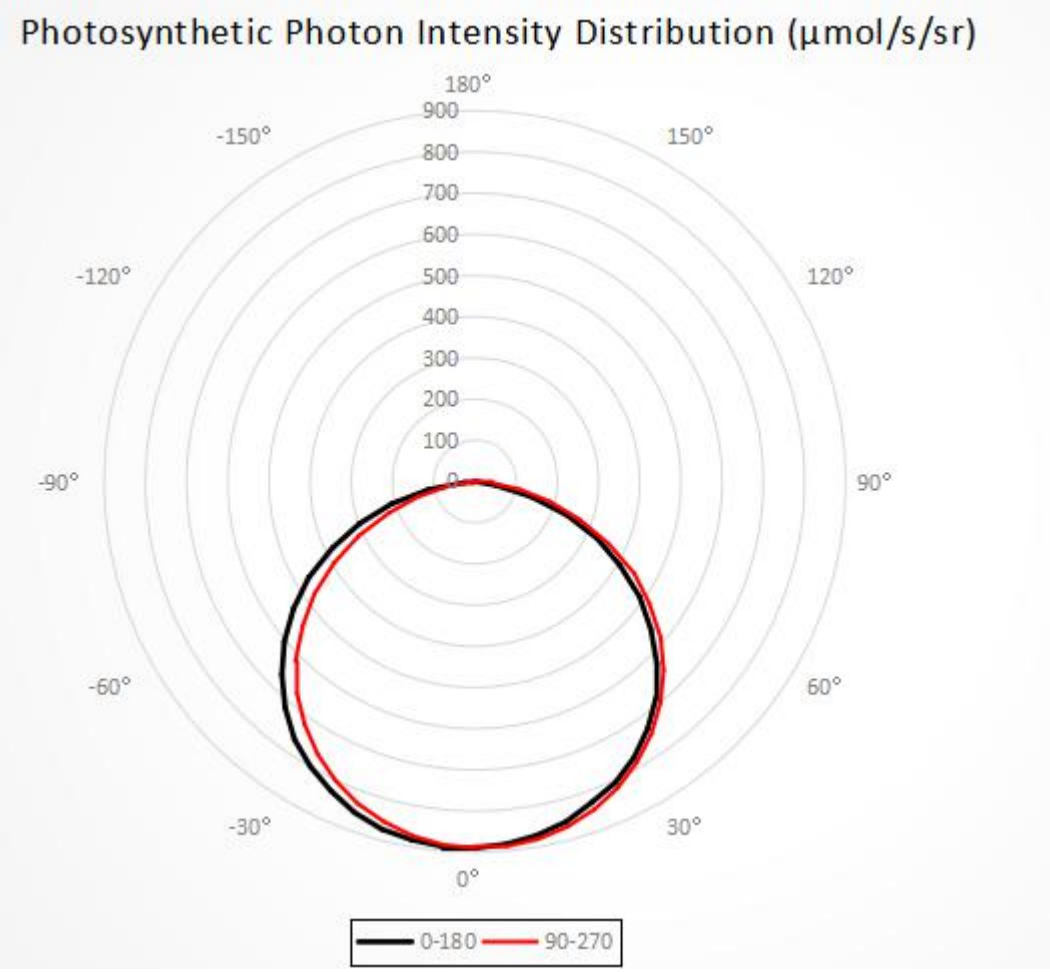
Wavelength [nm]	PPF [μmol/s]	Wavelength [nm]	PPF [μmol/s]	Wavelength [nm]	PPF [μmol/s]	Wavelength [nm]	PPF [μmol/s]
400	0.615562	500	31.445863	600	70.879195	700	11.053808
405	0.608043	505	35.268302	605	70.332637	705	9.685277
410	0.689599	510	38.304479	610	68.642745	710	8.314897
415	1.020107	515	40.250062	615	67.041833	715	7.241089
420	1.915515	520	41.879027	620	65.082799	720	6.390587
425	3.795194	525	43.555371	625	62.629199	725	5.652941
430	7.649514	530	44.601419	630	60.995378	730	4.987528
435	15.190389	535	46.445493	635	60.282037	735	4.533140
440	28.519322	540	47.927509	640	60.073714	740	4.079573
445	50.232836	545	49.441459	645	61.913642	745	3.695550
450	72.507978	550	51.555641	650	68.487945	750	3.426980
455	72.480724	555	53.385088	655	79.041365	755	3.173980
460	48.130887	560	55.349203	660	90.759997	760	2.988948
465	35.089342	565	57.828689	665	91.272742	765	2.835926
470	27.533832	570	60.556684	670	67.353460	770	2.717095
475	20.881780	575	63.443918	675	41.868312	775	2.609825
480	18.656703	580	65.154339	680	26.782438	780	2.497971
485	20.281987	585	67.448292	685	19.789266	785	2.464269
490	23.321893	590	69.570628	690	15.791903	790	2.416491
495	27.165959	595	69.903658	695	13.113916	795	2.377521
500	31.445863	600	70.879195	700	11.053808	800	2.400624

3.2 Goniophotometer System(Total operating time for luminous intensity distribution: 1.0 hour)

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
119.95	60	8.064	966.30	0.999

Luminous Flux (lm)	Efficacy (lm/W)
132445.52	137.06

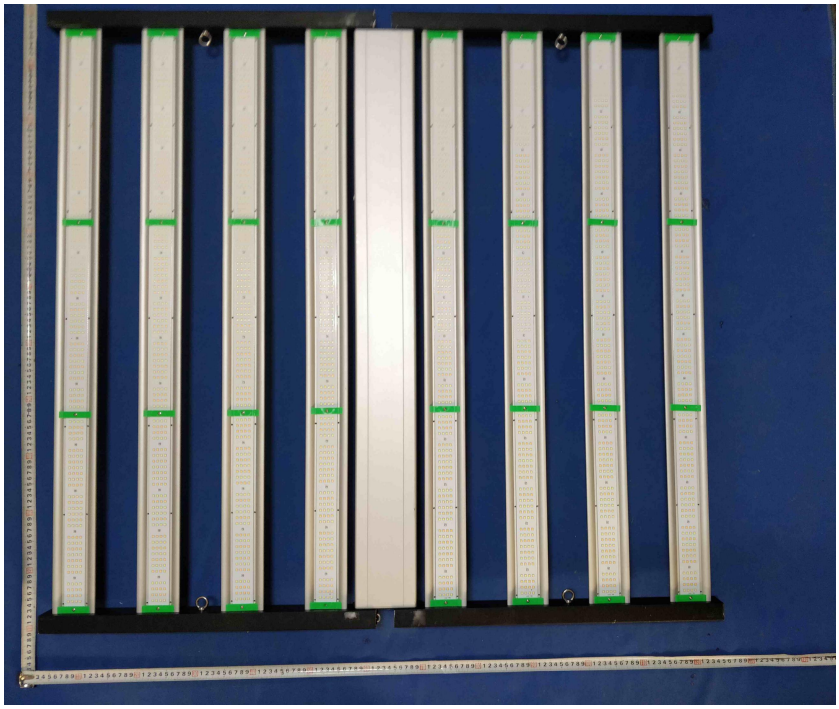
Photosynthetic Photon Intensity Distribution (PPID)



3.3 Additional Test

Model Number	Test Item	Test Voltage (V)	Frequency(Hz)	Test Result
PH-FD100-I	Power Factor	120	60	0.999
	THD	120	60	5.8%
	Power Factor	277	60	0.957
	THD	277	60	10.5%

Photo Document



****End of test report****

ISTMT Test report

1000W FOLDABLE LED GROW LIGHT

PH-FD100-I

Tested under

Luminaires - ANSI/UL 1598:2008 (Secs. 19.7, 19.10-16)

Applicant:

Shenzhen Phlizon Technology Co.,Ltd.

Bldg 2-4, TongFuYu Industrial Park, AiQun Road, Shiyan Town, Bao'an District, SHENZHEN Guangdong, China

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

Jovan zhi

Jason zhou

Complied by: Jovan zhi — **Project Engineer**

Review by: Jason zhou — **Technical Manager**

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)	[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 perform the tests included in this data package.	

TEST EQUIPMENT INFORMATION

	BELL #	Equipment Description	Model No.	Manufacturer	Serial No.	Last Cal	Cal Due	Cal Freq
1	BL802	Power meter	PF9811	Everfine	G185824 CM1371140	2020-04-30	2021-04-29	1 year
2	BL804	Hybrid Recorder	34970A	AGILENT	MY41027391	2020-04-27	2021-04-26	1 year
3	BL819	Environment Measurer	TA218B	KTJ	N/A	2020-05-06	2021-05-05	1 year
4	BL861	Hybrid Recorder	34970A	KEYSIGHT	MY44095108	2020-04-27	2021-04-26	1 year
5	BL834-1	Thermocouple K	Type K	OMEGA	23736-1	2020-05-06	2021-05-05	1 year
6	BL826	Stop watch	K610	KISLO	N/A	2020-04-28	2021-04-27	1 year

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
PH-FD100-I	1	S1	AC 120-277V, 50/60Hz, 1000W

Manufacturer:	Shenzhen Phlizon Technology Co.,Ltd.
Manufacturer Address:	Bldg 2-4, TongFuYu Industrial Park, AiQun Road, Shiyan Town, Bao'an District, SHENZHEN Guangdong, China
Brand Name:	PHLIZON
Product Description:	1000W FOLDABLE LED GROW LIGHT
Date Received:	2021-01-06
Date of Test:	2021-01-19
Date of Issue:	2021-01-27

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)

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 ± 5°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.

TEST RESULTS

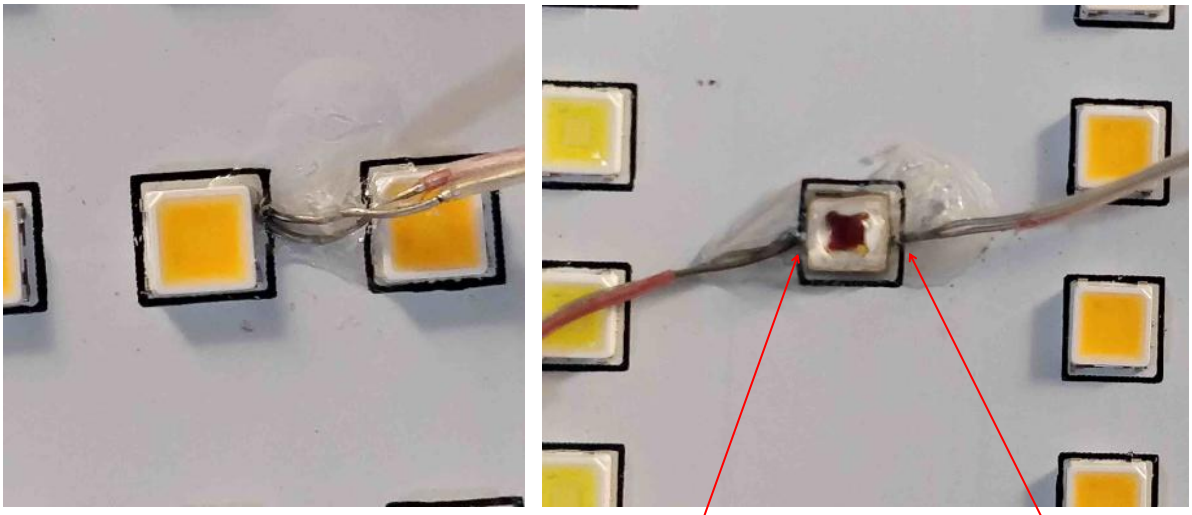
Input Voltage (V):	120
Input Power (W):	955.3
Temperature:	23.8
Total operated period(hours):	4

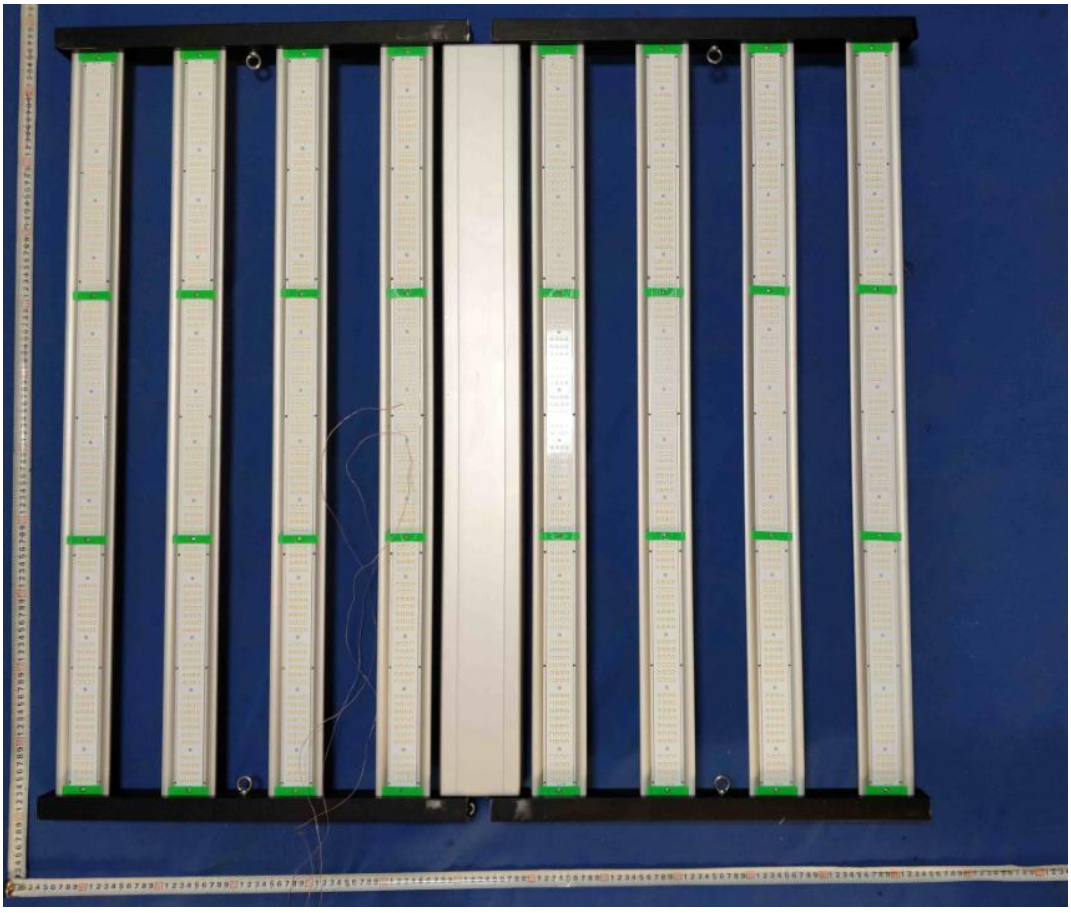
Red LED		
LED Package/Module No.:	GH CSSPM1.24-4T2U-1-1-L	
Rating of LED Package/Module:	800mA	
Manufacturer of LED Package/ Module:	OSRAM Opto Semiconductors (Malaysia) Sdn.Bhd.	
LED Location:	Location 1	Location 2
LED Ts/°C (Temperature at soldering board):	51.00	52.65
Corrected at 40°C:	67.20	68.85
Single LED Input Current (mA):	438	

White LED	
LED Package/Module No.:	SPMWHD32AMD5XAV0S0
Rating of LED Package/Module:	200mA
Manufacturer of LED Package/ Module:	SAMSUNG ELECTRONICS LED BUSINESS
LED Ts/°C (Temperature at soldering board):	49.00
Corrected at 40°C:	65.20
Single LED Input Current (mA):	110

Driver	
LED Driver Model No.:	4 x FD-240E-054B
LED Driver/°C (Temperature at Tc):	55.1
Corrected at 40°C:	71.3

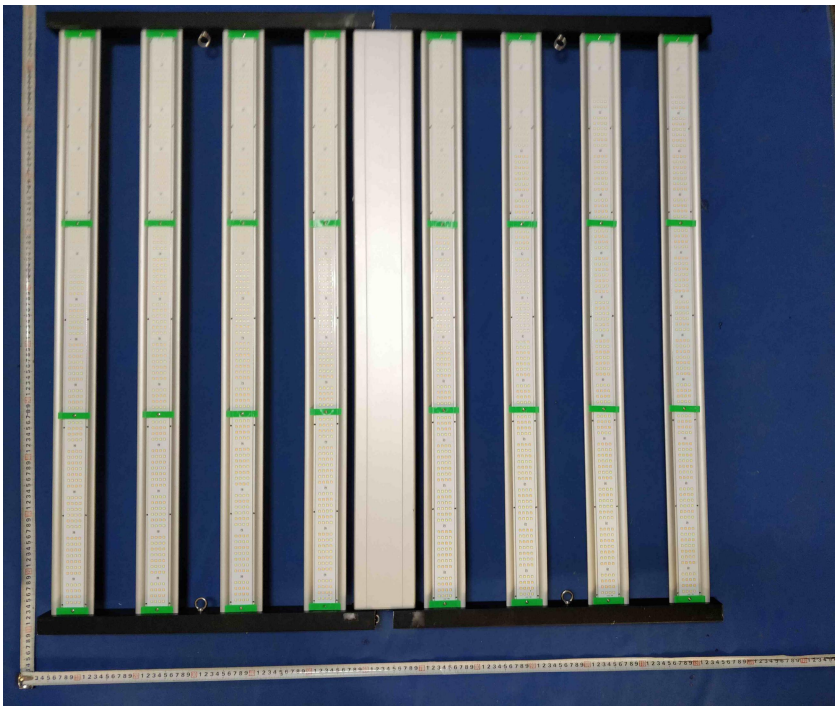
Test Photos for LEDs:





Test Photos for LED Drivers:

EUT Photos:



End of Report