



# Technical Information Service Report

**TIS Report:** 80218376-1

**Date:** December 6, 2024

**CLIENT:** PT LESSO NEW ENERGY.  
Kawasan Industri JIPS blok D, Jalan Raya Semarang - Demak KM 14.7  
Desa/Keturah, Batu, Kec.Karangtengah,kab.Demak  
Demak Regency, Jawa Tengah 59561, Indonesia

Attention: Qin wu, R&D Manager

Issued by: Sara Guo

**SUBJECT:** California Energy Commission Listing Testing for PV modules;  
FLORIDA SOLAR ENERGY CENTER Listing Testing for PV modules

## APPLICABLE REQUIREMENTS:

IEC 61215 2nd, Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval, 2005

10.2 Maximum power determination

10.3 Insulation test

10.4 Measurement of temperature coefficients

10.5 Measurement of nominal operating cell temperature (NOCT)

10.6 Performance at STC and NOCT

10.7 Performance at low irradiance

## ASSESSMENT:

Please supply a copy of this information when filing an application for CSA Certification related to the SUBJECT, as it may aid the investigation.

**THIS REPORT DOES NOT AUTHORIZE THE USE OF THE CSA MARK ON THE SUBJECT PRODUCTS.**

*The completion of this form does not imply certification or approval of the "SUBJECT" product nor any features or components thereof.*

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**General product information provided by client.**

<b>Model Type</b>	580C(HBD)72(182)
<b>Max system voltage (V)</b>	1500
<b>Max open circuit voltage: Voc (V)</b>	52.42 ± 3%
<b>Short circuit current: Isc (A)</b>	14.33 ± 3%
<b>Vmp (V)</b>	42.75
<b>Imp (A)</b>	13.57
<b>Pmp (W)</b>	580 ± 3%
<b>Nominal power (W)</b>	580 ± 3%
<b>Total number cells</b>	144
<b>Number of cells in Series strings</b>	72
<b>Number of parallel strings</b>	2
<b>Number of cells per bypass diode</b>	48
<b>Number of bypass diode</b>	3
<b>Module dimension(mm)</b>	2278*1134*35
<b>Cell Technology</b>	N type Mono-Si

**1. TEST SAMPLE IDENTIFICATION:**

No.	Customer Series No.	Sample Card No.	Model Type
1#	BHH061LAC231107010046	HA2024L-1852-002X	580C(HBD)72(182)

**2. SAMPLE ALLOCATION**

Section	Tested Model	Test name as in IEC61215
10.5	580C(HBD)72(182)1#	NOCT Determination
10.4		Temperature Coefficient (including $\beta$ Voc, $\beta$ Vpmax, $\alpha$ Isc, $\gamma$ Pmax)
10.2 /10.6		Performance at STC Maximum power determination
10.6		Performance at NOCT.
10.7		Performance at low irradiance

**3. EQUIPMENT LIST**

Equipment Name	Equipment ID	Test item	Calibration Due Date
Flash Simulator	HYJC-YS-021	10.5, 10.4, 10.2, 10.6,10.7	2025-01-23
Temperature Controller	HYJC-YS-123	10.4, 10.6	2024-08-07
NMOT test system	HYJC-YS-067	10.5	2024-08-07
Anemometer	HYJC-LJ-091	10.5	2025-01-25
Anemoscope	HYJC-LJ-091	10.5	2025-01-25
Pyranometer	HYJC-YS-366	10.5	2024-08-29
Angle Gauge	HYJC-LJ-006	10.5	2025-06-19

4. TEST RESULTS

Maximum Power Determination

Sample No	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	Pmp (W)	FF (%)
580C(HBD)72(182)1#	52.256	44.391	13.463	12.873	571.444	81.22

Measurement of Temperature Coefficients

Radiant Source	<input checked="" type="checkbox"/> Solar Simulator	<input type="checkbox"/> Natural Sunlight
Irradiance(W/m <sup>2</sup> )	1000	
Range of module temperature (high/low) (°C)	25 to 55	
Parameter	Sample #	Calculated Value
Current: αIsc (%/°C)	580C(HBD)72(182)1#	0.0475
Voltage: βVoc (%/°C)		-0.2358
Current: αImpmax(%/°C)		0.0101
Voltage: βVpmax((%/°C)		-0.2989
Peak Power: γPmax (%/C)		-0.2898

Measurement of NOCT

Parameter	2024-07-24	2024-07-25	2024-07-29
Tamb Min (°C)	30.42	30.51	30.91
Tamb Max (°C)	34.59	33.88	34.94
Tamb Avg (°C)	32.59	31.87	32.80
Wind Velocity Min (m/s)	0.52	0.29	0.25
Wind Velocity Max (m/s)	1.09	1.15	0.86
Wind Velocity Avg (m/s)	0.81	0.72	0.54
Irradiance Min (W/m <sup>2</sup> )	782.68	712.91	743.02
Irradiance Max (W/m <sup>2</sup> )	979.42	926.77	952.12
Module Temp Min (°C)	55.69	55.84	56.15
Module Temp Max (°C)	60.87	60.16	60.97
NOCT Correction Factor	1	1	1
Calculated NOCT (°C)	46.34	46.80	46.44
Average NOCT (°C)	46.53		

Performance at STC: (1000 W/m2, 25°C, AM 1.5)

Sample No	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	Pmp (W)	FF (%)
580C(HBD)72(182)1#	52.256	44.391	13.463	12.873	571.444	81.22

Performance at NOCT: (800 W/m2, NOCT)

Sample No	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	Pmp (W)	FF (%)
580C(HBD)72(182)1#	47.964	40.449	11.258	10.694	432.558	80.11

Performance at Low Irradiance: (200 W/m2, 25°C, AM 1.5)

Sample No	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	Pmp (W)	FF (%)
580C(HBD)72(182)1#	49.726	43.358	2.707	2.583	111.986	83.19

Appendix 1: Photos of Modules

580C(HBD)72(182)

*Fig.1, Front view of module type*



*Fig. 2, Rear view of module type*



**Appendix II: Component list of Modules**

580C(HBD)72(182)

Item	Manufacturer	Model	Type
Superstrate	XINYI SOLAR (MALAYSIA) SDN.BHD.	Semi-tempered Front Panel Glass	2.0 mm
Encapsulation	FIRST MATERIAL SCIENCE (THAILAND) CO., LTD. or VIETNAM ADVANCE FILMMATERIAL COMPANY LIMITED	EPE EVA	EP304 F406PS
Substrate	XINYI SOLAR (MALAYSIA) SDN.BHD.	Semi-tempered Back Panel Patterned Glass	2.0 mm
Cell	SolarSpace Technology Co., Ltd	M18316BTP50	(182.2±0.25)mm*(183.75±0.25)mm 130µm±13µm thickness
Junction box	QC SOLAR (VIET NAM) ELECTRONIC COMPANY LIMITED	3Qxy	1500V DC, 30A
Module size (mm)	2278*1134*35		
Number of cells	144		
Number of strings	3		

---End of Report---