PV magazine
Indoor Test Report

Supplier	AE Solar
Product	AE605CMER-132-BDS
Date	22 July 2025
Version	1.1

Overview of the Indoor Test

Description

The Indoor Test is a series of inspection and tests designed to characterize the performance of the PV module products before they are installed in the outdoor field.

The tests are conducted at CEA's parent company's Intertek state of the art laboratory in Zhejiang, China.

The results of the inspections are used to derive a grade number for each test and an average grade for all tests, except UVID, which is optional.

The detailed methodology can be found in the Appendix of this report.

Tests

Visual inspection	Modules are inspected for visual defects according to widely accepted industry criteria.
EL inspection	Modules are inspected for EL defects (electroluminescence) according to widely accepted industry criteria.
Low irradiance Performance	The performance loss of a module in low irradiance conditions is measured.
Pmax Temperature Coefficient	The Pmax temperature coefficient is measured, which determines the performance loss at high temperatures.
PID (Potential Induced Degradation)	The sensitivity of a module to degradation due to voltage stress is measured in a special chamber.
UVID (optional) (Ultraviolet Induced Degradation)	The sensitivity of a module to degradation due to UV light is measured in a special chamber.
Bifaciality Ratio	The bifaciality ratio of all samples is measured to compare against nameplate.

Product and Sample Details

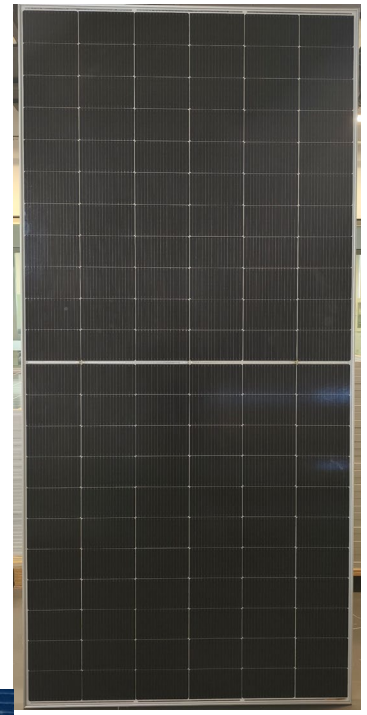
Test sample information

Sample #	Serial number
1	AECA6GCB250810730
2	AECA66CB250810727
3	AECA66CB250850003
4	AECA66CB250850006
5	AECA66CB250850004
6	AECA66CB250850002

Product information

Model	AE605CMER-132-BDS
Cell technology	n-type TOPCon
Cell number	132
Cell format	210x182 mm
Number of busbars	16
Junction box	IP68, 3 bypass diodes
Laminate construction	Glass
Bifaciality ratio	80±5%

Front side

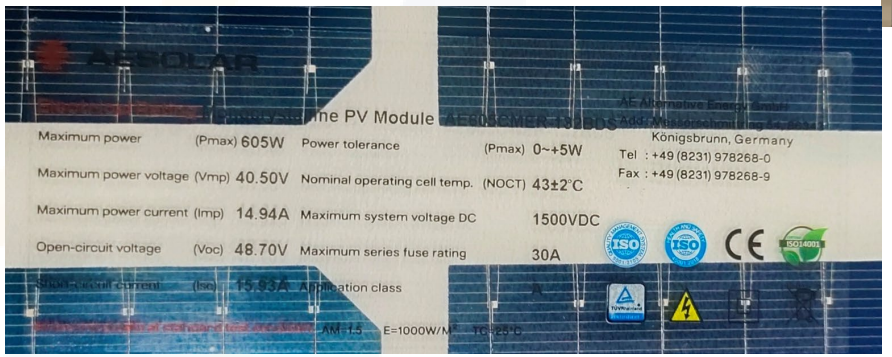


Rear side

Other information

Sample selection method	Sample provided by supplier, without random selection
Intertek lab report	Attached

Nameplate Label



Product Datasheet

TIER 1 BloombergNEF | Deutsche Qualität Garantiert

METEOR
N-TYPE TOPCON TECHNOLOGY

CMER-132BDS
610W-630W
More power, less degradation

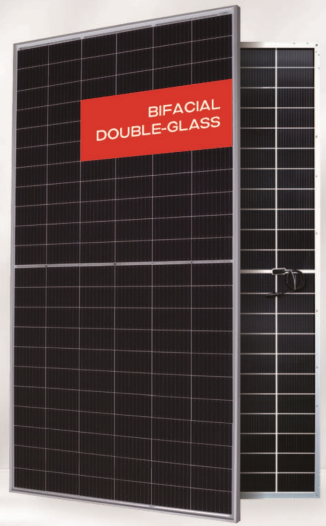
23.34%
MAXIMUM EFFICIENCY

132
HALF CELLS

30 YEARS Performance Warranty

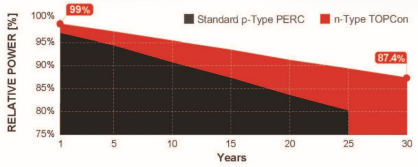
15 to 30 YEARS* Product Warranty

*The regular product warranty is 15 years, please refer to the latest version of AESOLAR Limited Warranty for the duration of the product warranty under special conditions. for extensions, please contact AESOLAR staff.



LID RESISTANT | PID RESISTANT | SALT CORROSION RESISTANT | SAND RESISTANT | AMMONIA RESISTANT | HIGHLY STABLE AND TOUGH

OUR PERFORMANCE WARRANTY



SYSTEM AND PRODUCT CERTIFICATIONS

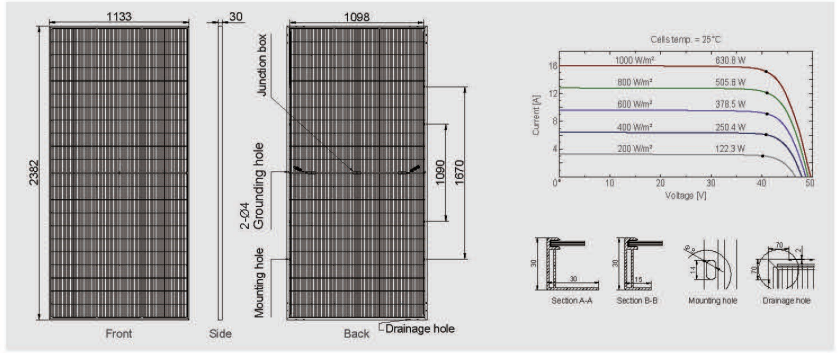
AESOLAR

www.ae-solar.com

AE CMER-132BDS 610W-630W

N-TYPE TOPCON TECHNOLOGY PV MODULE

BIFACIAL • DOUBLE-GLASS



Electrical specifications (STC*):

Nominal max. power	P_{max} (Wp)	610	615	620	625	630
Maximum operating voltage	V_{MPP} (V)	40.80	41.10	41.40	41.70	42.00
Maximum operating current	I_{MPP} (A)	14.95	14.96	14.98	14.99	15.00
Open-circuit voltage	V_{oc} (V)	49.00	49.30	49.60	49.90	50.20
Short-circuit current	I_{sc} (A)	15.96	15.99	16.03	16.06	16.09
Module efficiency	η (%)	22.60	22.79	22.97	23.16	23.34
Power tolerance	(W)			0~+5		
Maximum system voltage	(V)			1500		
Maximum series fuse rating	(A)			30		

*STC: Standard Test Conditions (irradiance 1000 W/m², cell temperature 25°C and air mass of AM1.5), measurement tolerance Pmax: ±3%

Electrical specifications (NMOT*):

Nominal max. power	P_{max} (Wp)	457	470	474	478	482
Maximum operating voltage	V_{MPP} (V)	38.20	38.40	38.60	38.80	39.00
Maximum operating current	I_{MPP} (A)	12.23	12.24	12.28	12.32	12.36
Open-circuit voltage	V_{oc} (V)	46.50	46.80	47.10	47.40	47.70
Short-circuit current	I_{sc} (A)	12.88	12.88	12.90	12.93	12.95

*NMOT: Normal Module Operating Temperature (irradiance 800 W/m², ambient temperature 20°C, air mass of AM1.5 and wind speed of 1 m/s)

Bifacial electrical specifications

Max.power front-side $P_{max\ front}$ (Wp)	610		615		620		625		630	
Backside Power Gain	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Total equivalent power $P_{max\ equ}$ (Wp)	641	671	646	677	651	682	656	686	662	693
Module efficiency η (%)	23.73	24.86	23.93	25.07	24.12	25.27	24.32	25.48	24.51	25.67

*Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on the mounting (structure, height, tilt angle, etc.) and albedo of the ground.

Mechanical and design specification

Cell type	n-Type TOPCon technology, half-cut cells
No. of cells	132
Bifaciality	80 ± 5%
Front cover	2.0 mm glass, high transmission, AR coated, tempered
Encapsulation	POE
Back cover	2.0 mm white glazed glass, tempered
Junction box	IP68 rated, 3 bypass diodes
Frame	30 mm anodized aluminium alloy
Cable (Including Connector)	1 x 4 mm², 350 mm length or customized
Connectors	MC 4 / MC 4 compatible
Dimension	2382 mm x 1133 mm x 30 mm
Weight	33.7 kg
Hail resistance	Max. Ø 25 mm at 23 m/s
Wind load	2400 Pa or 244 kg/m²
Snow load	5400 Pa or 550 kg/m²
Fire rating	Class A (according to UL 790)

Temperature ratings

Operating temperature	-40 to +85°C
Temp. coefficient of P_{max}	-0.29 %/°C
Temp. coefficient of V_{oc}	-0.24 %/°C
Temp. coefficient of I_{sc}	0.040 %/°C
Nom. operating cell temp. NOCT	43 ± 2°C

Packaging information

Packaging configuration	36 pcs / pallet
Loading capacity	720 pcs / 40 HQ
Size / Pallet	1160 mm x 1140 mm x 2500 mm (Upright)
Weight	1241 kg / pallet

The specifications and characteristics contained in this datasheet may deviate slightly from our actual products due to the product developments and uncertainty of measurement devices. The specifications included in the datasheet are subject to change without prior notice.

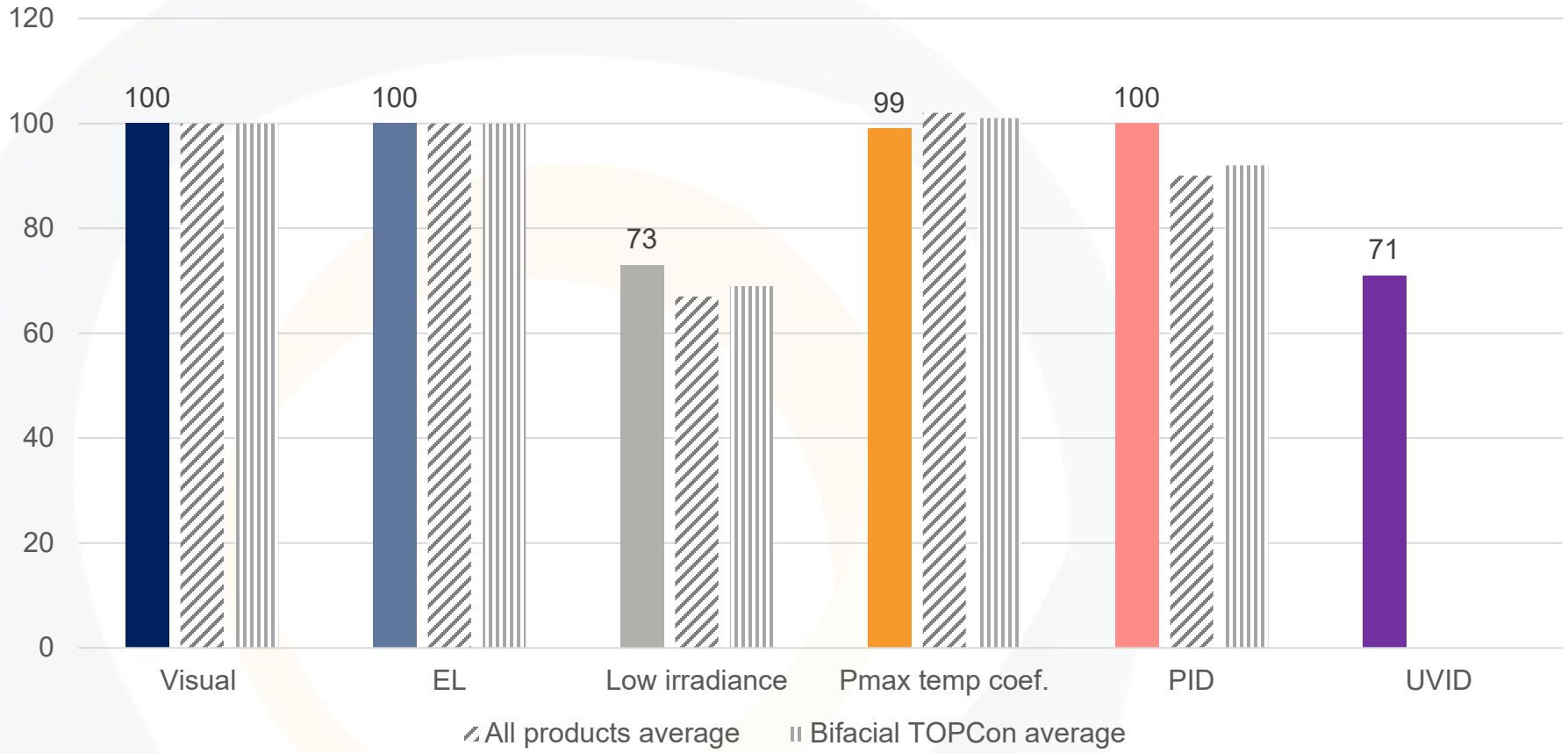
AESOLAR

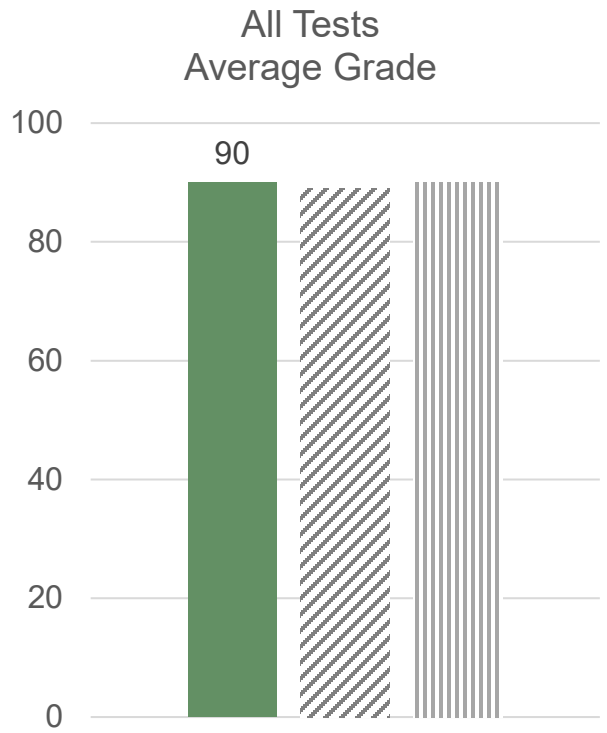
+49 8231 978268 0
sales@ae-solar.com
www.ae-solar.com

AESOLAR
Messerschmittring 54
86343 Königsbrunn, Germany

Ver. 24.12.1

Test Grading Overview

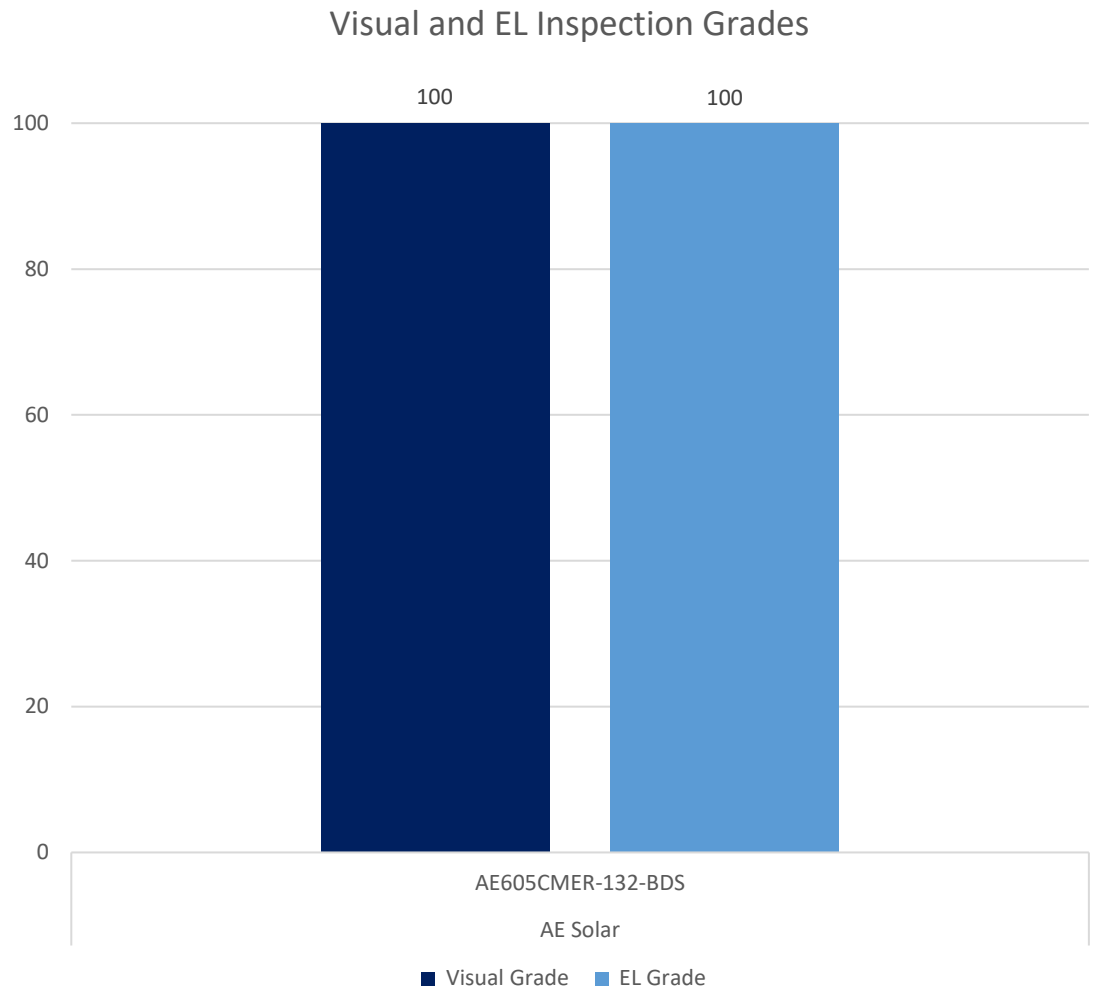




Individual test grades are compared to the average grades for products installed since 2022.
All products average: the average grade of all products.
Bifacial TOPCon average: the average grade of all Bifacial TOPCon products.
The All Tests Average Grade does **not** include the UVID test, as it is optional and not performed for all products.

Visual inspection and EL inspection

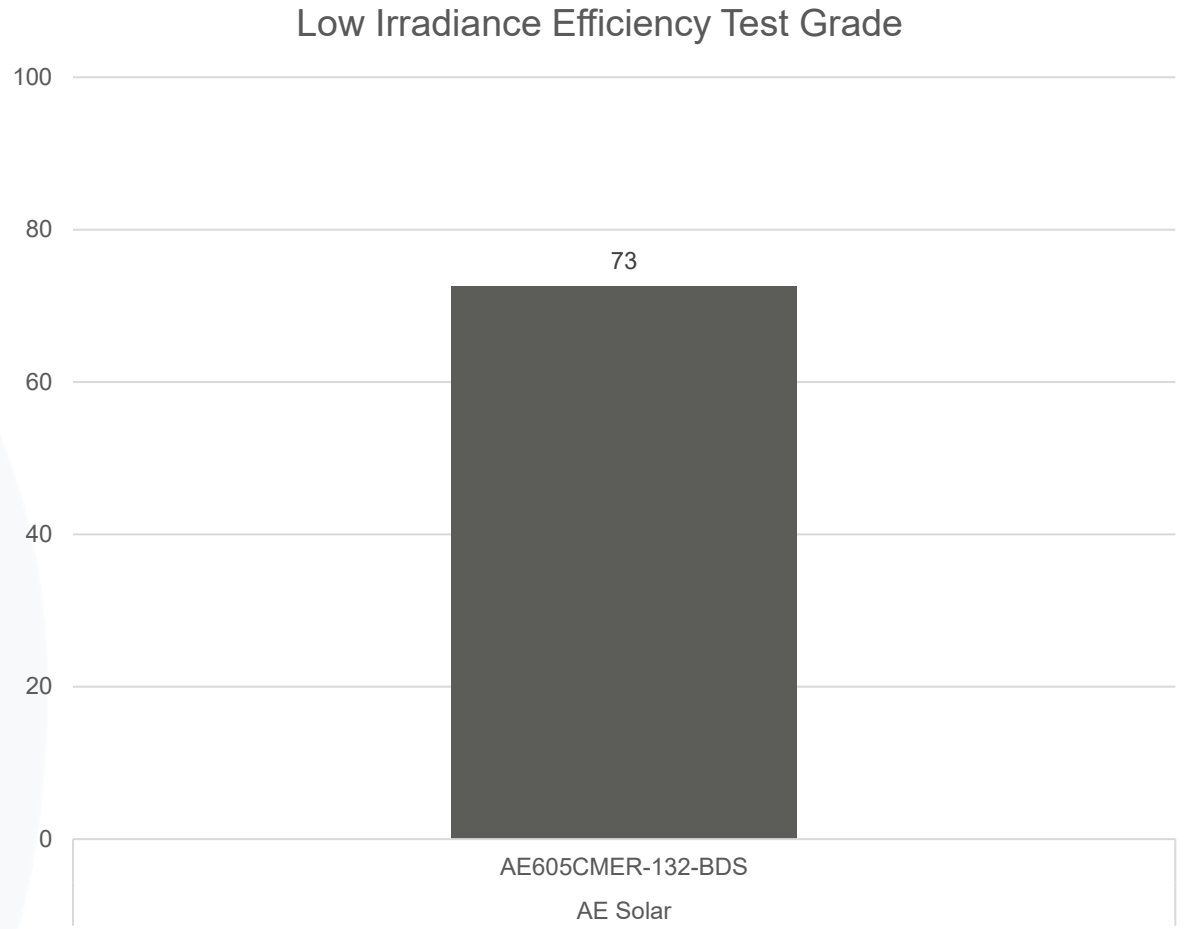
AE605CMER-132-BDS	Visual inspection	EL inspection
Sample 1	None	None
Sample 2	None	None
Sample 3	None	None
Sample 4	None	None
Sample 5	None	None
Sample 6	None	None
Score	0	0
Grade	**100**	**100**



All 6 modules of each product sample lot have undergone visual inspection, according to CEA's quality criteria for visual inspection.

Low irradiance efficiency loss test

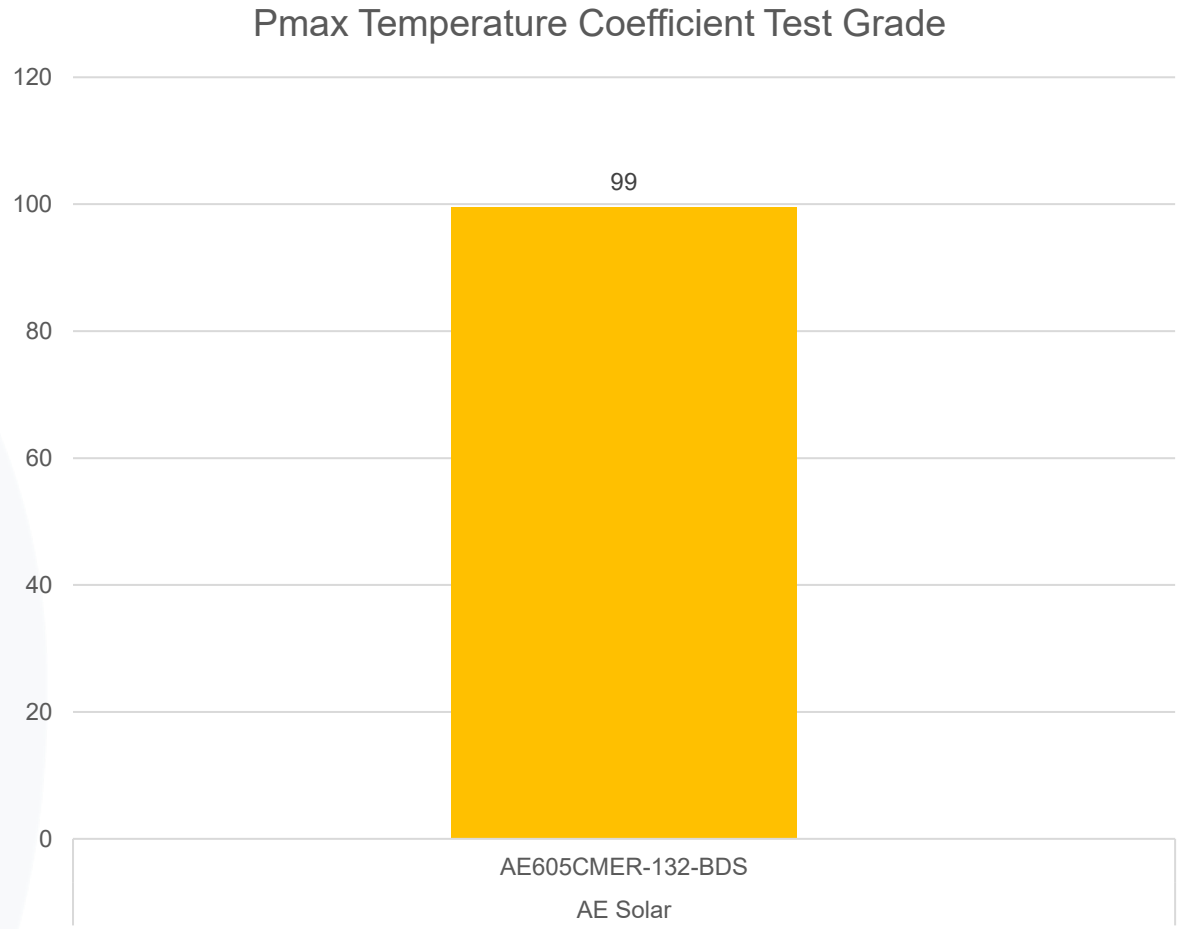
AE605CMER-132-BDS	Front side low irradiance efficiency loss (%)
Sample 1	
Sample 2	
Sample 3	3.01
Sample 4	
Sample 5	
Sample 6	
Grade	**73**



The efficiency loss is calculated by the following formula:
Efficiency loss = 1- [(Pmax at low irradiance conditions / Pmax at STC) * (1,000/200)]

Pmax temperature coefficient test

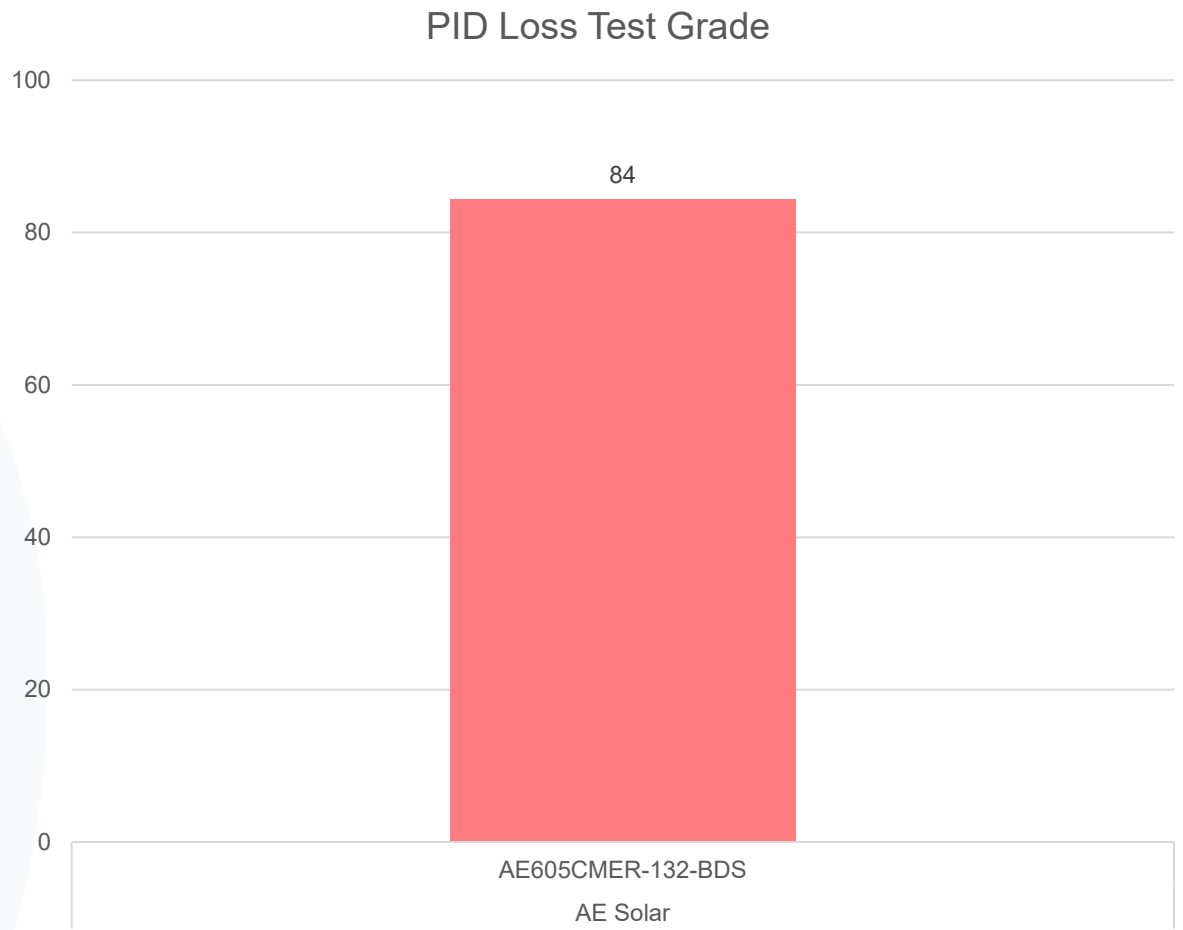
AE605CMER-132-BDS	Pmax Temperature coefficient (%/°C)
Sample1	
Sample2	
Sample3	-0.302
Sample4	
Sample5	
Sample6	
Grade	**99**



The Pmax Temperature Coefficient is measured according to IEC standards.

PID Test

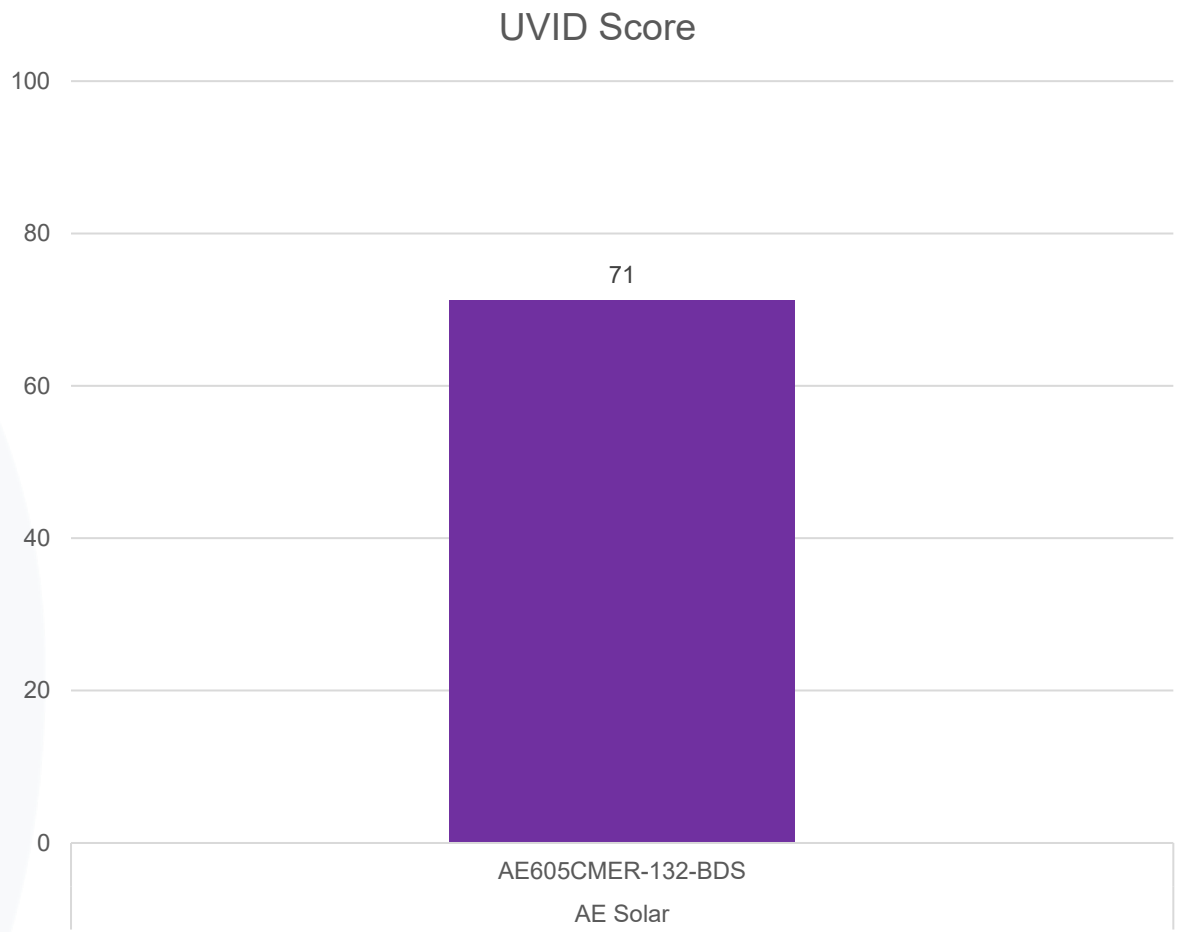
AE605CMER-132-BDS	Front side PID loss (%)
Sample 1	
Sample 2	
Sample 3	
Sample 4	
Sample 5	1.21
Sample 6	
Grade	**84**



The PID loss is the front side power degradation after testing at 1500 V for 96 hours. After PID stressing, the sample is light soaked for one day outdoors to recover any PID-p (polarization) effect. The remaining degradation is due to other causes, such as sodium ion migration.

UVID Test

AE605CMER-132-BDS	UVID loss(%/°C)
Sample1	
Sample2	
Sample3	
Sample4	
Sample5	
Sample6	1.73
Grade	**71**



The UVID loss is the front side power degradation after exposing the sample to 120 kWh/m2 of UV irradiance.

Bifaciality Ratio

AE605CMER-132-BDS	Bifaciality ratio (%)
Sample 1	78.24%
Sample 2	78.67%
Sample 3	78.80%
Sample 4	78.36%
Sample 5	78.56%
Sample 6	78.96%
Nameplate	80±5%
Average	**78.60%**

The bifaciality ratio test result is not graded. The results are listed for informational purposes.

The bifaciality ratio is calculated from the following formula:

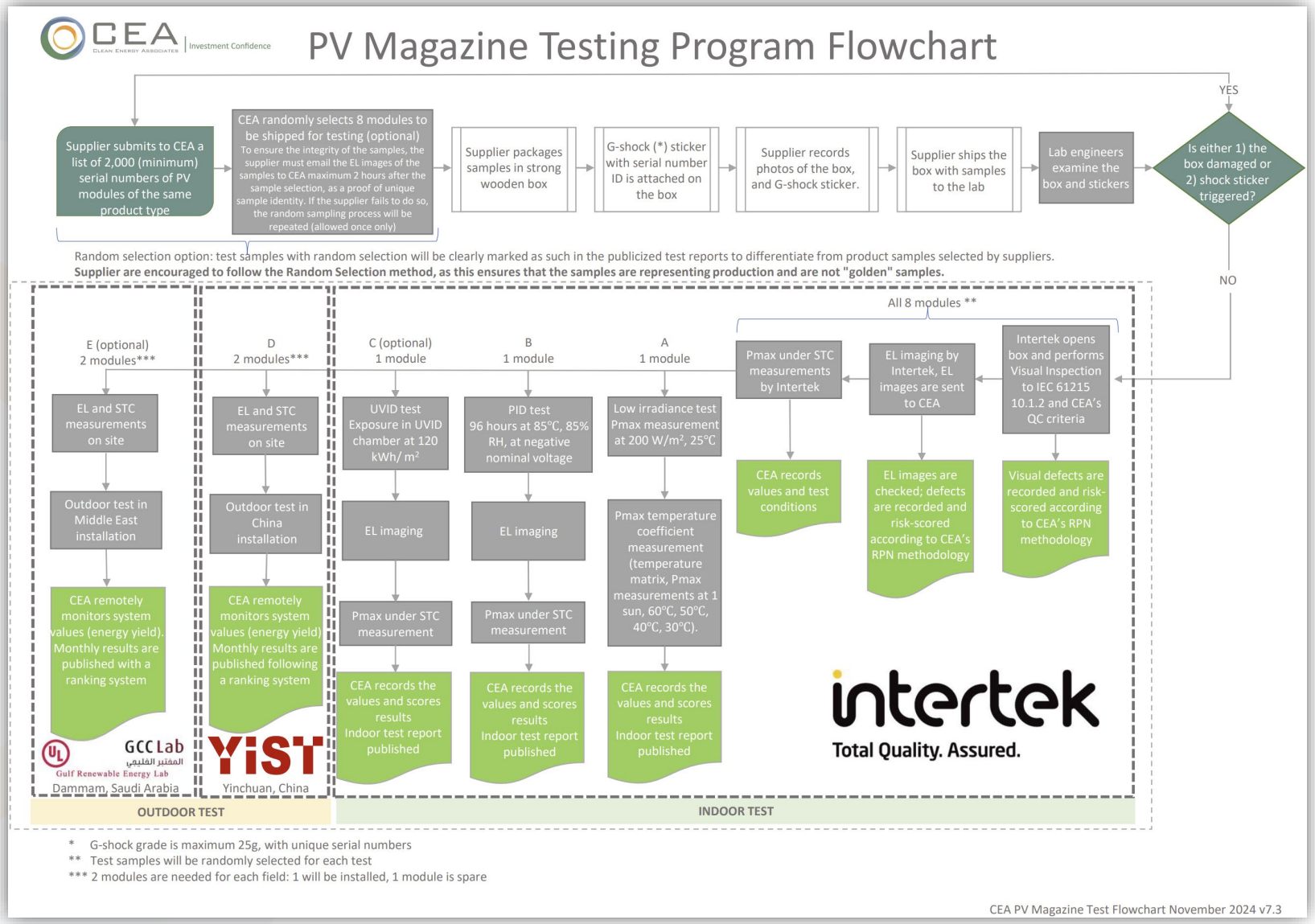
Bifaciality ratio = (Pmax rear surface / Pmax front surface) x 100%

Appendix
Methodology and Scoring System

Test Flowchart and Protocol

The flowchart is a high-level description of the testing procedure, describing the steps, and tests to be applied.

Detailed checklists and instructions created by CEA are delivered to all the testing partners.



Grading Methodology - 1

For every product, all samples are shipped to the Intertek laboratory and then 2 samples are shipped from the lab to each outdoor test field to conduct the tests and inspections according to the above flowchart.

The table describes the inspections and tests applied on all products.

Test/inspection grading system overview

	Test/inspection	# of samples	Method	Values	Average grade weight	Grades
1	Visual inspection	5-8	Inspection	RPN Scores	10%	1-100
2	EL image inspection	5-8	Inspection	RPN Scores	10%	1-100
3	Low irradiance efficiency loss	1	Test	%	25%	1-100
4	Pmax Temperature coefficient	1	Test	%/°C	25%	1-120
5	PID loss	1	Test	%	30%	1-100
6	UVID120 (optional)	1	Test	%	NA	1-100
7	Outdoor installation and yield measurement	2-4	Energy Yield Monitoring	Monthly kWh/kWp	NA	NA

The RPN (risk priority number) scoring method has been developed by CEA and is used to evaluate and create risk scores of Visual and EL defects.

The weights are used to calculate the average grade for tests 1-5.

Grading Methodology - 2

A number within the 1-100/120 range will be used to grade the results, so that the overall ranking of the products will reflect general industry practices and requirements:

Grading System

	Grade range:	120	100	90	80	70	60	50	40	30	20	10	0
1	Visual inspection (RPN scores)	NA	0	0.74	2.20	4.39	7.30	10.94	15.30	20.39	26.20	32.74	≥ 40
2	EL image (RPN scores)	NA	0.00	2.03	4.62	7.75	11.43	15.65	20.43	25.75	31.62	38.03	≥ 45.00
3	Low irradiance loss	NA	≤ -2.00%	-0.02%	1.78%	3.41%	4.87%	6.16%	7.27%	8.21%	8.98%	9.58%	≥ 10.00%
4	Pmax Temp. coefficient	≥ -0.200%	-0.300%	-0.343%	-0.382%	-0.417%	-0.448%	-0.475%	-0.498%	-0.517%	-0.532%	-0.543%	≤ -0.550%
5	PID loss	NA	≤ 0.0%	0.7%	1.6%	2.7%	4.0%	5.5%	7.2%	9.1%	11.2%	13.5%	≥ 16.0%
6	UVID120 (optional)	NA	≤ 0.00%	0.60%	1.20%	1.80%	2.40%	3.00%	3.60%	4.20%	4.80%	5.40%	≥ 6.00%

The Visual and EL Inspection RPN scores are divided by the number of samples, to normalize the score, as the total number of samples may vary.

The correspondence of the scores/test results to the grades follows a binomial or linear relationship, anchored to certain key values that are generally accepted in the PV industry. For example, a PID loss of 5%, which is the pass/fail threshold of the related IEC standard, will give a grade close to 50. Grades below 50 indicate a product performance that is below a generally acceptable threshold.

Test Report

Applicant 1	: Clean Energy Associates (China) Limited Room 1206, 300 Yan'an West Road, Jing'an District, Shanghai, China
Applicant 2	: Pv magazine group GmbH & Co. KG Kurfürstendamm 64 | 10707 Berlin, Germany
Product	: Crystalline Silicon Terrestrial Photovoltaic Module
Manufacturer	: AE Solar
Model No. of Manufacturer	: AE605CMER-132BDS
No. of Sample	: See the attached sheets
Date of receipt of test item	: 05/16/2025
Date (s) of performance of test	: 05/19/2025~07/15/2025
Date of issue	: 07/15/2025
Testing Laboratory	: Intertek Testing Services Zhejiang Ltd.
Location	: Building 2, Juanhu Science and Technology Innovation Park, No. 500 Shuiyueting East Road, Haining, Zhejiang, China
Service Requested	: Testing
Method	: See **General remarks** in next page
Result	: See the attached sheets
Conclusion	: The testing of submitted sample is **complied with** the above standards/requirements. See general remarks in page 2 for details.

********** End of page **********

Prepared and checked by:	Reviewed by
Intertek Testing Services Zhejiang	Intertek Testing Services Zhejiang
Andrew He Engineer PV Division	Ken Gu Reviewer PV Division

Test Report

GENERAL INFORMATION	
Test item particulars:	
Accessories and detachable parts included in the evaluation .....:	-
Options included .....:	-
Possible test case verdicts:	-
Abbreviations used in the report:	
Imp – Maximum power current	Voc – Open circuit voltage
Isc - Short circuit current	FF – Fill Factor
Pmp – Maximum power	α – Current temperature coefficient
Vmp – Maximum power voltage	β – Voltage temperature coefficient
STC – Standard Test Conditions	δ – power temperature coefficient
Possible test case verdicts: - test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	Pass (P)
- test object does not meet the requirement.....:	Fail (F)

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

Test method:

IEC 61215-2:2021 Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures

- Power determination at STC
- Wet Leakage Test
- Insulation Test
- Electroluminescence (EL) Test
- Low Irradiance measurement at 200 W/m2
- Module Temperature Coefficient Test
- UV Test 120KW/M^2

IEC TS 62804-1 Photovoltaic (PV) modules – Test methods for the detection of potential-induced degradation

- Potential induced degradation test (PID)

.

Test Report

General Product information:			
Sample assignment:			
Sample No.	SN	Model No.	Remarks
0250516-01-001	AECA6GCB250810730	AE605CMER-132BDS	Flash+EL
0250516-01-002	AECA66CB250810727	AE605CMER-132BDS	Flash+EL
0250516-01-003	AECA66CB250850006	AE605CMER-132BDS	Control
0250516-01-004	AECA66CR250850002	AE605CMER-132BDS	UVID
0250516-01-005	AECA66CR250850003	AE605CMER-132BDS	LOW、Temperature Coefficient
0250516-01-006	AECA66CR250850004	AE605CMER-132BDS	PID

Test Report

TABLE Potential induced degradation test (PID)						P
IEC 61215-2 MQT01 - Visual inspection (Initial)						P
Test Date [YYYY-MM-DD]:	2025-05-19					—
Sample#	Nature and position of initial findings – comments or attach photos					—
0250516-01-006	No major visual defect.					P
Supplementary information: N/A						
IEC 61215-2 MQT 02 – Maximum power determination (initial)						—
Test Date [YYYY-MM-DD]:	2025-05-19					—
Module temperature [°C]:	Corrected to 25					—
Irradiance [W/m²] :	1000					—
Sample#	Voc [V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-003front	48.452	15.554	605.877	40.909	14.810	80.40
0250516-01-003rear	48.131	13.357	474.782	41.633	11.404	73.85
0250516-01-006front	48.476	15.524	604.615	40.987	14.752	80.34
0250516-01-006rear	48.157	13.385	474.971	41.715	11.386	73.69
Supplementary information: N/A						
IEC 61215-2 MQT 03 – Insulation test (initial)						P
Test Date [YYYY-MM-DD]..... :	2025-05-19					—
Test Voltage applied [V] ..... :	8000/1500					—

Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
0250516-01-006	>1000	14.8	-	No	P

Supplementary information: Size of module[m²]: 2.70			
IEC 61215-2 MQT 15 – Wet leakage current test (initial)			P
Test Date [YYYY-MM-DD]..... :	2025-05-19		—
Maximum system voltage (V)	1500		—
Test voltage applied Vtest (V d.c.)	1500		—
Solution resistivity (Ω·cm)	< 3500 Ω cm at 22 ± 2°C		P
Solution temperature (°C)	22 ± 2°C		P
Sample##	Measured[MΩ]	Required[MΩ]	—
0250516-01-006	>1000	14.8	P
Supplementary information: Size of module [m²]: 2.70			

IEC 61730-2 MST 13 – Ground continuity test (initial)		P
Test Date [YYYY-MM-DD]..... :	2025-05-19	—

Test Report

Maximum over-current protection rating (A) .....:	30	—
Current applied (A) .....:	75	—
Location of designated grounding point .....:	Frame	—
Location of second contacting point .....:	Frame	—
Sample# #	Resistance (mΩ)	—
0250516-01-006	19	P
EL Test (Initial)		—
Test Date [YYYY-MM-DD].....	2025-05-19	—
Please check attached photos for details.		
Supplementary information: N/A		

PID test		—
Test Date [MM/DD/YYYY] / start - end ... :	2025-05-19~2025-05-23	—
Total time .....:	96 hours	—
Voltage appled between current carry parts and grounding .....:	-1500	—
Temperature .....:	85℃±2℃	—
Humidity .....:	85%±3%	—
Supplementary information: N/A		

IEC 61215-2 MQT01 - Visual inspection (after PID test)		P
Test Date [YYYY-MM-DD]:	2025-05-23	—
Sample#	Nature and position of initial findings – comments or attach photos	—
0250516-01-006	No major visual defect.	P
Supplementary information: N/A		

IEC 61215-2 MQT 02 – Maximum power determination (after PID test)		—
Test Date [YYYY-MM-DD]:	2025-05-23	—
Module temperature [°C]:	Nature and position of initial findings – comments or attach photos	—
Irradiance [W/m^2]:	1000	—

Sample#	Pmp change rate after this test [%]	Voc [V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-003front	-	48.451	15.558	605.866	40.924	14.805	80.38
0250516-01-003rear	-	48.136	13.461	474.457	41.612	11.402	73.23
0250516-01-006front	-1.21	48.529	15.349	597.299	41.065	14.545	80.19
0250516-01-006rear	-0.67	48.218	13.395	471.794	41.699	11.314	73.05
Supplementary information: N/A							

IEC 61215-2 MQT 03 – Insulation test (after PID test)		P
Test Date [YYYY-MM-DD]..... :	2025-05-23	—

Test Report

Test Voltage applied [V] ..... :	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
0250516-01-006	>1000	14.8	-	No	P
Supplementary information: Size of module[m²]: 2.70					
IEC 61215-2 MQT 15 – Wet leakage current test (after PID test)					P
Test Date [YYYY-MM-DD]..... :	2025-05-23				—
Maximum system voltage (V)	1500				—
Test voltage applied Vtest (V d.c.)	1500				—
Solution resistivity (Ω·cm)	< 3500 Ω cm at 22 ± 2°C				P
Solution temperature (°C)	22 ± 2°C				P
Sample##	Measured[MΩ]	Required[MΩ]			—
0250516-01-006	>1000	14.8			P
Supplementary information: Size of module [m²]: 2.70					
EL Test (after PID test)					—
Test Date [YYYY-MM-DD].....	2025-05-23				—
Please check attached photos for details.					
Supplementary information: N/A					

TABLE Performance at STC						P
IEC 61215-1 - Visual inspection						P
Test Date [YYYY-MM-DD]:	2025-05-19					—
Sample#	Nature and position of initial findings – comments or attach photos					—
0250516-01-001	No major visual defect.					P
0250516-01-002	No major visual defect.					P
0250516-01-003	No major visual defect.					P
Supplementary information: N/A						
IEC 61215-2 MQT 06 – Performance at STC						—
Test Date [YYYY-MM-DD]:	2025-05-19					—
Module temperature [°C]:	Corrected to 25					—
Irradiance [W/m²] :	1000					—
Sample#	Voc[V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-001front	48.463	15.508	603.895	40.906	14.763	80.35
0250516-01-001rear	48.153	13.454	472.492	41.680	11.336	72.93
0250516-01-002front	48.440	15.505	603.368	40.865	14.765	80.34
0250516-01-002rear	48.113	13.463	474.645	41.690	11.385	73.28

Test Report

0250516-01-003front	48.452	15.554	605.877	40.909	14.810	80.40
0250516-01-003rear	48.131	13.357	474.782	41.633	11.404	73.85
Supplementary information: NA						

IEC 61215-2 MQT 03 – Insulation test (initial)					P
Test Date [YYYY-MM-DD] .....:			2025-05-19		—
Test Voltage applied [V] .....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
0250516-01-001	>1000	14.8	-	No	P
0250516-01-002	>1000	14.8	-	No	P
0250516-01-003	>1000	14.8	-	No	P
Supplementary information: Size of module[m²]: 2.70					

IEC 61215-2 MQT 15 – Wet leakage current test (initial)			P
Test Date [YYYY-MM-DD] .....:	2025-05-19		—
Maximum system voltage (V)	1500		—
Test voltage applied Vtest (V d.c.)	1500		—
Solution resistivity (Ω·cm)	< 3500Ω cm at 22 ± 2°C		P
Solution temperature (°C)	22 ± 2°C		P
Sample#	Measured[MΩ]	Required[MΩ]	—
0250516-01-001	>1000	14.8	P
0250516-01-002	>1000	14.8	P
0250516-01-003	>1000	14.8	P
Supplementary information: Size of module [m²]: 2.70			

TABLE Performance at various irradiance								—
Test Date [YYYY-MM-DD]..... :			2025-05-21					—
Test method..... :			☒ Simulator ☐ Natural sunlight					—
Sample #	Irradiance [W/m²]	Loss of relative efficiency with respect to STC [%]	Voc [V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-005	1000(front)	-	48.445	15.470	602.475	40.928	14.720	80.39
	1000(rear)	-	48.147	13.366	474.767	41.686	11.389	73.78
	200(front)	-3.01	45.935	3.060	116.864	39.722	2.942	83.13
	200(rear)	-5.80	45.637	2.427	89.443	39.870	2.243	80.76

Test Report

TABLE Temperature Coefficient(Pmp)		—
Test Date [YYYY-MM-DD]	2025-05-21	—
Test method	☒ Simulator ☐ Natural sunlight	—
Sample #	Temperature coefficient[%]	
0250516-01-005	-0.3023	

TABLE UV preconditioning test						P
IEC 61215-2 MQT01 - Visual inspection (Initial)						P
Test Date [YYYY-MM-DD]:	2025-05-19					—
Sample#	Nature and position of initial findings – comments or attach photos					—
0250516-01-004	No major visual defect.					P
Supplementary information: N/A						
IEC 61215-2 MQT 02 – Maximum power determination (initial)						—
Test Date [YYYY-MM-DD]:	2025-05-19					—
Module temperature [°C]:	Corrected to 25					—
Irradiance [W/m²] :	1000					—
Sample#	Voc [V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-003front	48.452	15.554	605.877	40.909	14.810	80.40
0250516-01-003rear	48.131	13.357	474.782	41.633	11.404	73.85
0250516-01-004front	48.535	15.388	601.510	41.071	14.646	80.54
0250516-01-004rear	48.212	13.399	474.872	41.741	11.377	73.51
Supplementary information: N/A						
IEC 61215-2 MQT 03 – Insulation test (initial)						P
Test Date [YYYY-MM-DD] .....:	2025-05-19					—
Test Voltage applied [V] .....:	8000/1500					—

Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
0250516-01-004	>1000	14.8	-	No	P
Supplementary information: Size of module[m²]: 2.70					

IEC 61215-2 MQT 15 – Wet leakage current test (initial)		P
Test Date [YYYY-MM-DD] .....:	2025-05-19	—
Maximum system voltage (V)	1500	—
Test voltage applied Vtest (V d.c.)	1500	—
Solution resistivity (Ω·cm)	< 3500 Ω cm at 22 ± 2°C	P
Solution temperature (°C)	22 ± 2°C	P

Test Report

Sample##	Measured[MΩ]	Required[MΩ]	—
0250516-01-004	>1000	14.8	P
Supplementary information: Size of module [m²]: 2.70			

IEC 61215-2 MQT 10 UV preconditioning test		P
Sample#	0250516-01-004	
Test Date (YYYY-MM-DD) start/end.....	2025-06-11~2025-06-24	—
Module temperature [°C]	60±5	—
UV irradiance (280-400nm) [W/m²]	192	—
UV dose (280-400nm) [kWh/ m²]	60	—
Module operation condition	■ Short circuited ☐ Pmax	—
Supplementary information:		

IEC 61215-2 MQT01 - Visual inspection (after UV 60KWh/m²)		P
Test Date [YYYY-MM-DD]:	2025-06-24	—
Sample#	Nature and position of initial findings – comments or attach photos	—
0250516-01-004	No major visual defect.	P
Supplementary information: N/A		

IEC 61215-2 MQT 02 – Maximum power determination (after UV 60KWh/m2)		—
Test Date [YYYY-MM-DD]:	2025-06-24	—
Module temperature [°C]:	Corrected to 25	—
Irradiance [W/m²]:	1000	—

Sample#	Pmp change rate [%]	Voc [V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-003front	-0.05	48.444	15.551	605.575	40.858	14.821	80.39
0250516-01-003rear	-0.07	48.141	13.472	474.426	41.609	11.402	73.15
0250516-01-004front	-1.17	47.912	15.454	594.448	40.180	14.795	80.28
0250516-01-004rear	-1.88	47.529	13.887	465.928	41.099	11.337	70.59
Supplementary information: N/A							

IEC 61215-2 MQT 15 – Wet leakage current test (after UV 60KWh/m2)			P
Test Date [YYYY-MM-DD] .....:	2025-06-24		—
Maximum system voltage (V)	1500		—
Test voltage applied Vtest (V d.c.)	1500		—
Solution resistivity (Ω·cm)	< 3500 Ω cm at 22 ± 2°C		P
Solution temperature (°C)	22 ± 2°C		P
Sample##	Measured[MΩ]	Required[MΩ]	—
0250516-01-004	>1000	14.8	P

Test Report

Supplementary information: Size of module [m²]: 2.70		
EL Test (after UV 60KWh/m2)		—
Test Date [YYYY-MM-DD] :	2025-06-24	—
Please check attached photos for details.		
Supplementary information: N/A		

IEC 61215-2 MQT 10 UV preconditioning test		P
Sample#	0250516-01-004	
Test Date (YYYY-MM-DD) start/end.....:	2025-06-28~2025-07-11	—
Module temperature [°C] ..... :	60±5	—
UV irradiance (280-400nm) [W/m²] ..... :	192	—
UV dose (280-400nm) [kWh/ m²] ..... :	60	—
Module operation condition .....:	■ Short circuited ☐ Pmax	—
Supplementary information:		

IEC 61215-2 MQT01 - Visual inspection (after UV 120KWh/m²)		P
Test Date [YYYY-MM-DD]:	2025-07-11	—
Sample#	Nature and position of initial findings – comments or attach photos	—
0250516-01-004	No major visual defect.	P
Supplementary information: N/A		

IEC 61215-2 MQT 02 – Maximum power determination (after UV 120KWh/m2)	—
Test Date [YYYY-MM-DD]:	2025-07-15 —
Module temperature [°C]:	Corrected to 25 —
Irradiance [W/m²]:	1000 —

Sample#	Pmp change rate [%]	Total Pmp change rate [%]	Voc [V]	Isc [A]	Pmp [W]	Vmp [V]	Imp [A]	FF [%]
0250516-01-003front	0.02	-0.03	48.460	15.549	605.723	40.930	14.799	80.39
0250516-01-003rear	0.03	-0.05	48.121	13.392	474.559	41.728	11.373	73.64
0250516-01-004front	-0.56	-1.73	47.896	15.349	591.118	40.225	14.695	80.41
0250516-01-004rear	-0.77	-2.64	47.495	13.270	462.321	41.076	11.255	73.35
Supplementary information: N/A								

IEC 61215-2 MQT 15 – Wet leakage current test (after UV 120KWh/m2)		P
Test Date [YYYY-MM-DD] .....:	2025-07-11	—
Maximum system voltage (V)	1500	—
Test voltage applied Vtest (V d.c.)	1500	—

Test Report

Solution resistivity (Ω·cm)	< 3500 Ω cm at 22 ± 2°C		P
Solution temperature (°C)	22 ± 2°C		P
Sample##	Measured[MΩ]	Required[MΩ]	—
0250516-01-004	>1000	14.8	P
Supplementary information: Size of module [m²]: 2.70			
EL Test (after UV 120KWh/m2)			—
Test Date [YYYY-MM-DD] :	2025-07-15		—
Please check attached photos for details.			
Supplementary information: N/A			

Test Report

Annex 1: List of measurement equipment

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Calibration due date
IEC 61215-2 MQT01	**Visual inspection**	Lamp	-	NA
		Digital Luxmeter EZ6330	-	2025-08-11
		Digital caliper, measuring tape EZ6286	-	2026-07-09
		Camera	-	NA
IEC 61215-2 MQT02	**Maximum power determination**	Solar Simulator EZ4446	-	2025-08-02
		Reference cell EZ4751	-	2026-01-22
IEC 61215-2 MQT04	**Temperature Coefficient**	Solar Simulator EZ4446	-	2025-08-02
		Temperature control chamber EZ4446-4	-	2025-10-16
		Reference cell EZ4751	-	2026-01-22
IEC 61215-2 MQT03	**Insulation test**	Comprehensive safety test instrument EZ1096	-	2026-07-04
IEC 61215-2 MQT15	**Wet leakage current test**	Comprehensive safety test instrument EZ1096	-	2026-07-04
		Conductivity meter EZ5723	-	2026-06-12
IEC TS 62804-1	**PID**	PID test system EZ6648	-	2025-09-02
		Climate chamber EZ6217	-	2025-12-15
IEC 61730-2 MST13	**Ground continuity test**	Comprehensive safety test instrument EZ1096	-	2026-07-04
IEC 61215-2 MQT 19	**UV test**	UV Chamber EZ6520	-	2025-07-19

Test Report

Annex 2: Statement of the estimated uncertainty of the test results

Statement of the estimated uncertainty of the I/V test, K=2. U(Isc)=2.2% U(Voc)=1.04% U(Pmax)=2.4%

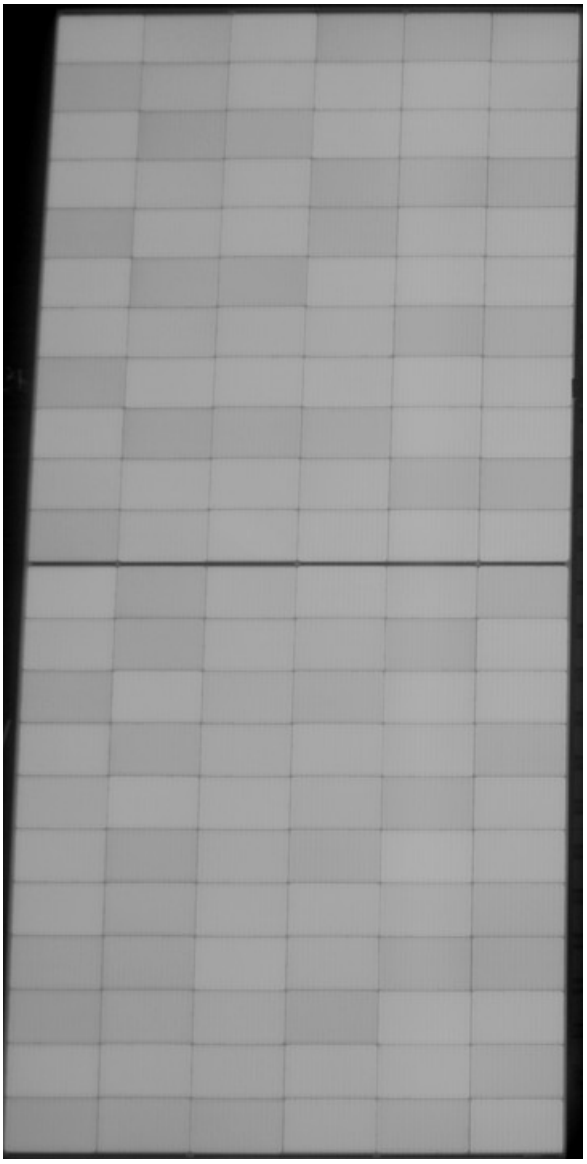
Test Report

Annex 3: Photos of module

Test Report

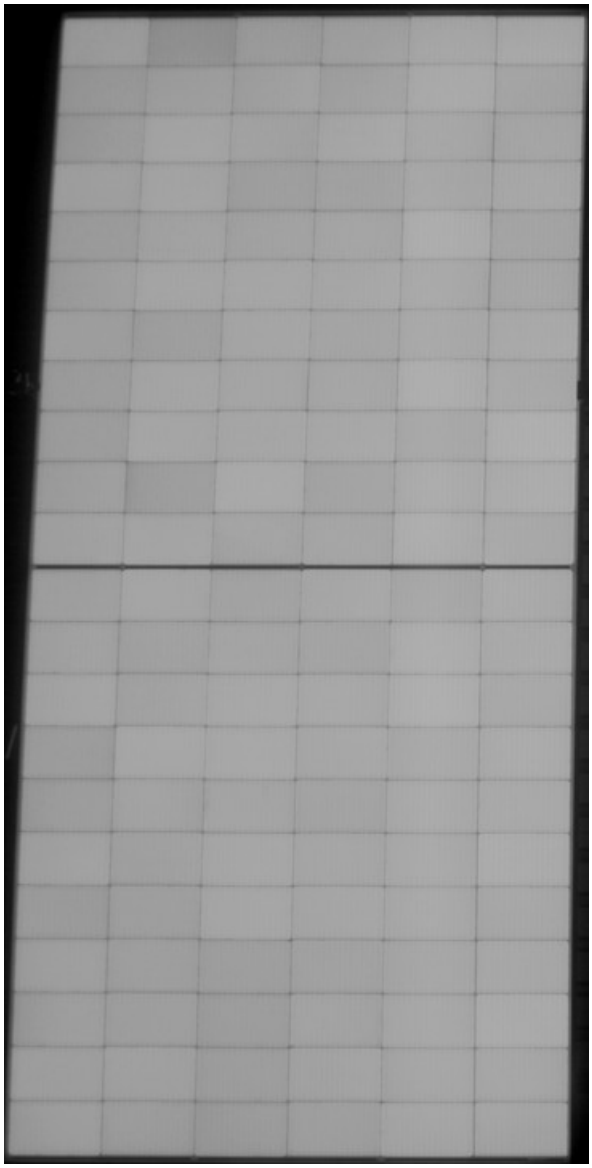
Annex 4: Photo of EL test

Sample# 0250516-01-001
As received



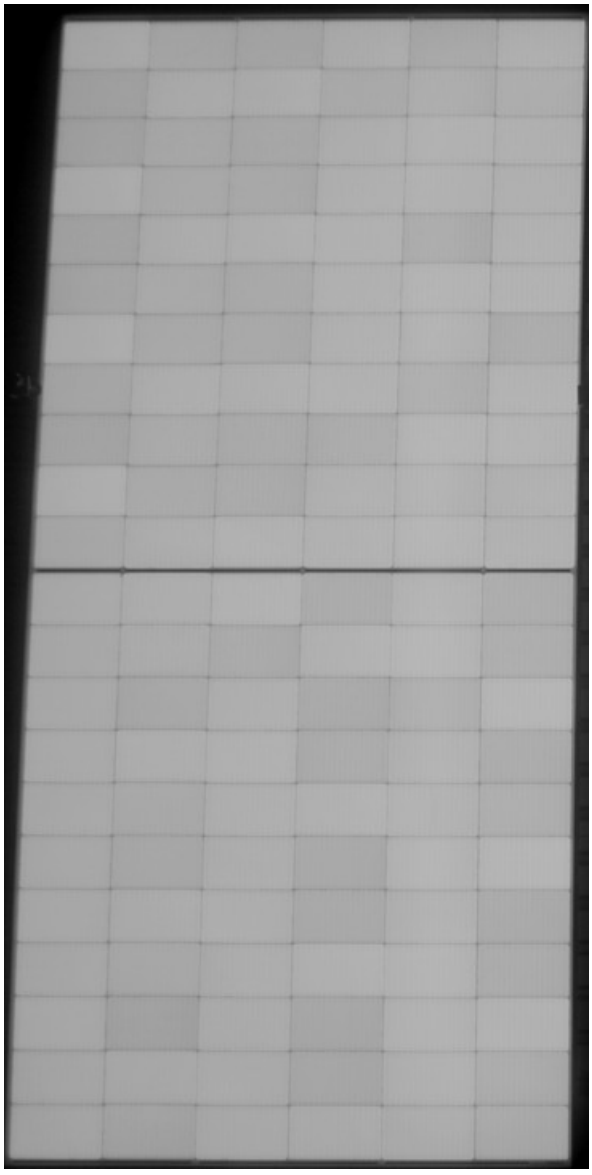
Test Report

Sample# 0250516-01-002
As received

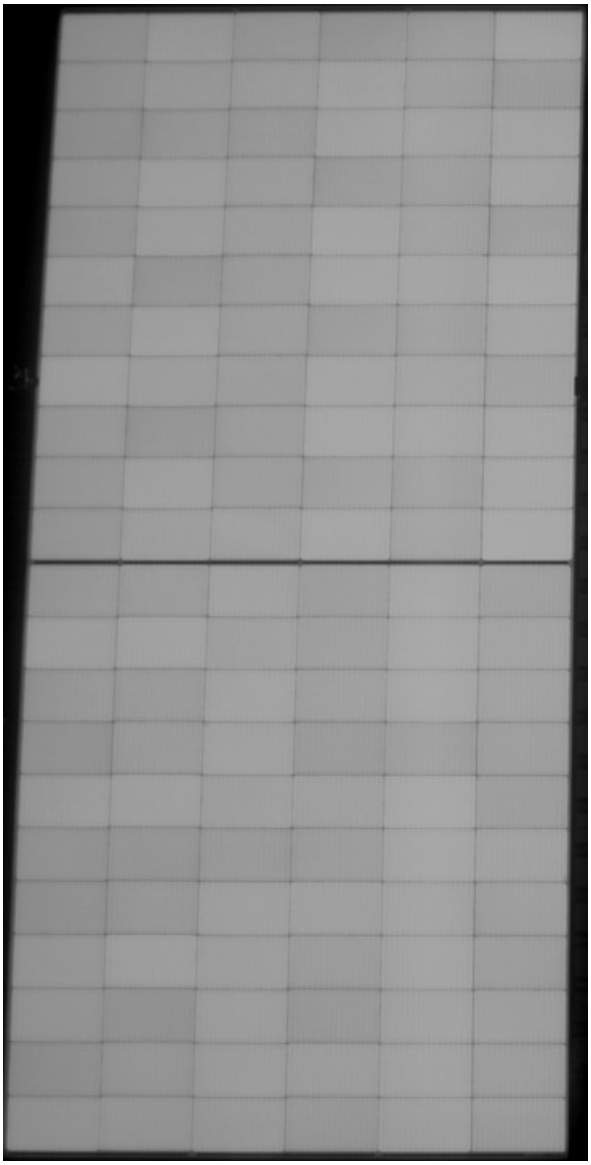
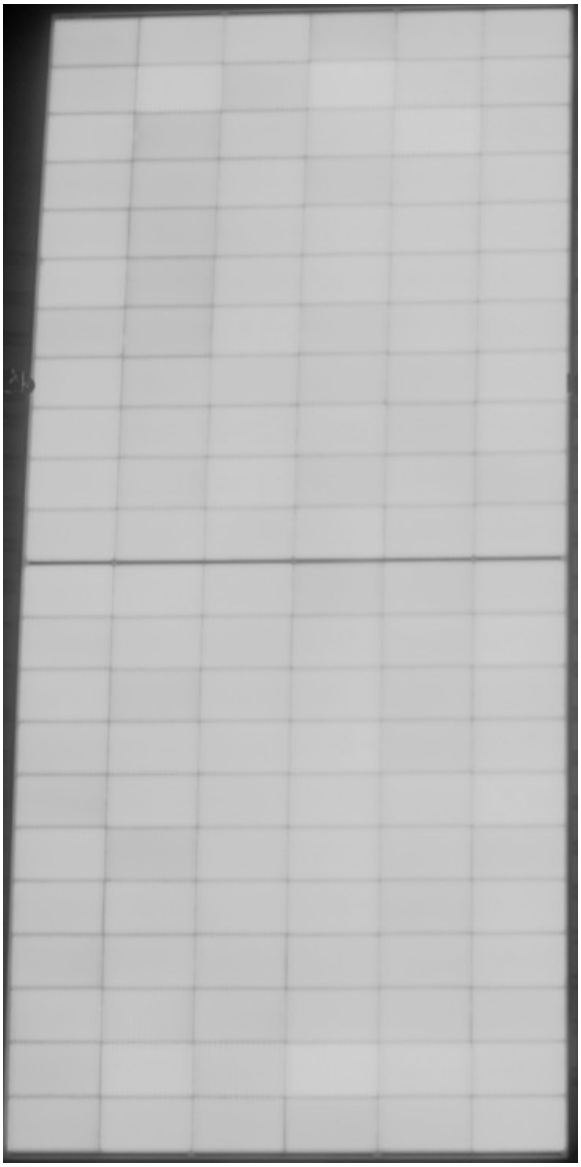


Test Report

Sample# 0250516-01-003
As received

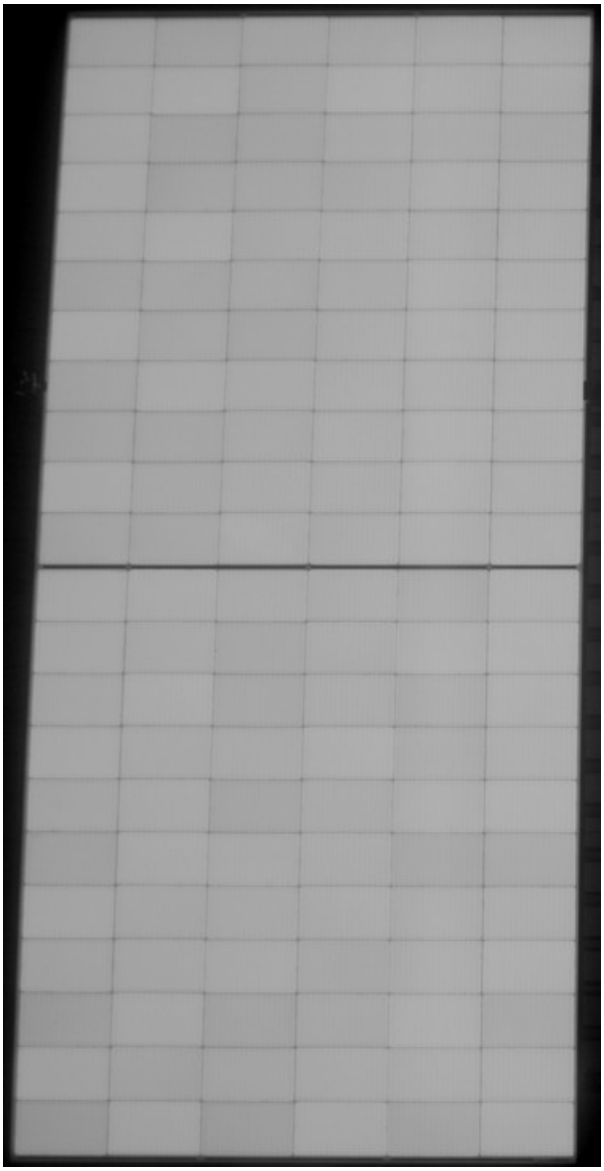


Test Report

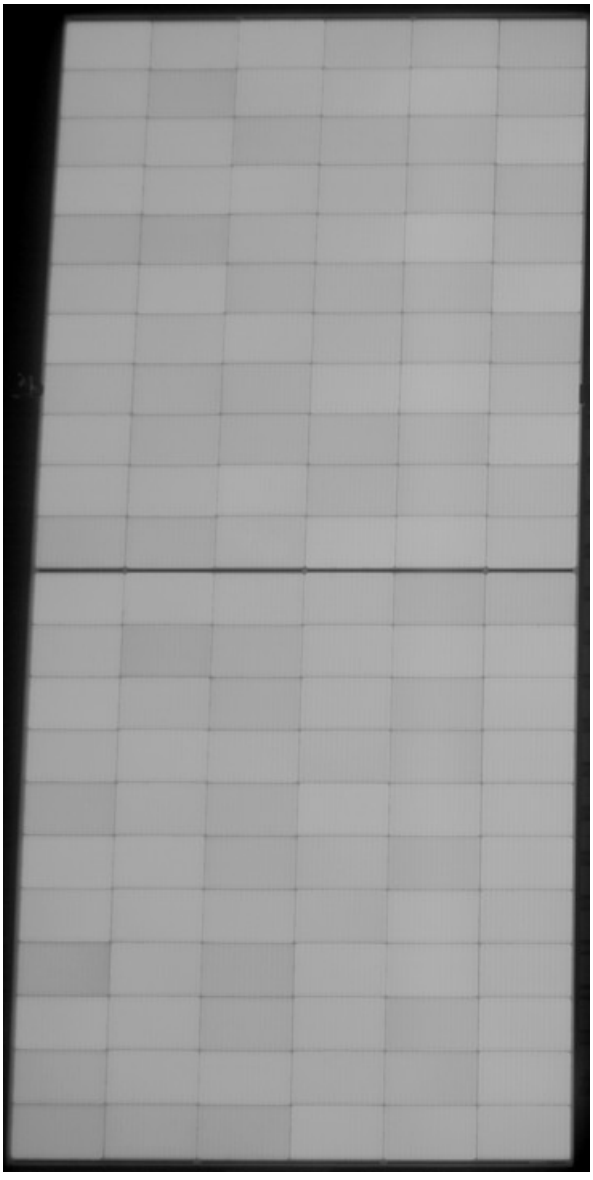
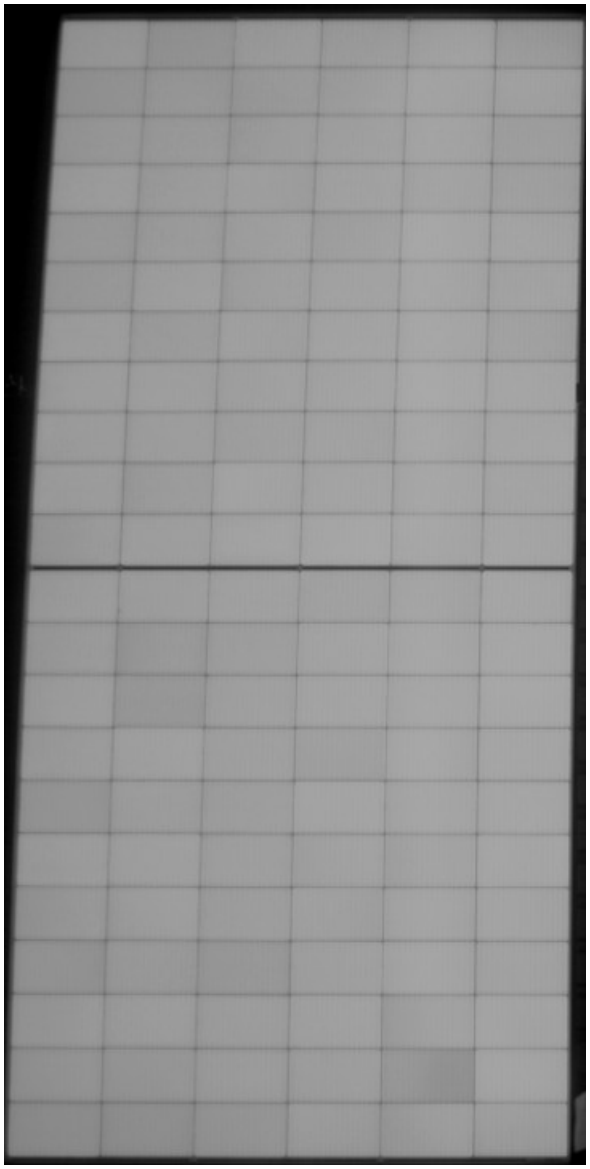
Sample# 0250516-01-004	
Before UVID	After UVID
	

Test Report

Sample# 0250516-01-005
As received



Test Report

Sample# 0250516-01-006	
Before PID	After PID
	

-- END OF REPORT --

Thank You

Company: Clean Energy Associates

Website: www.cea3.com

Email: info@cea3.com