

Testcenter Serial: 6001_Zora

Job ID: Scanoffice_001_23022021

Address: TUAS / Joukahaisenkatu 7

Country / City: FI 20520 Turku

Number of Modules: 3

Comments:

The study was performed by the TUAS MOBILE SOLAR Lab, calibrated on 28.2.2020 by MBJ Services GmbH. The references used for characterization was the TURU002 / 1K00008597 Mono reference Module, calibrated at 27.3.2020 by Fraunhofer ISE – CalLab PV Modules, accredited by Deutsche Akkreditierungsstelle GmbH.

The expanded measurement uncertainty for the measured module types is 2.5% with a probability of 95%. The study included three (3) modules of the type Trinasolar TSM-DD06M.05(II), rated at 330 Wp.

With a nominal power of 330 Wp the 2.5% measurement uncertainty means a range from 322...338 Wp. The average power of the measured modules was 328.4 Wp, which is below the rated nominal power, but still within the uncertainty range.

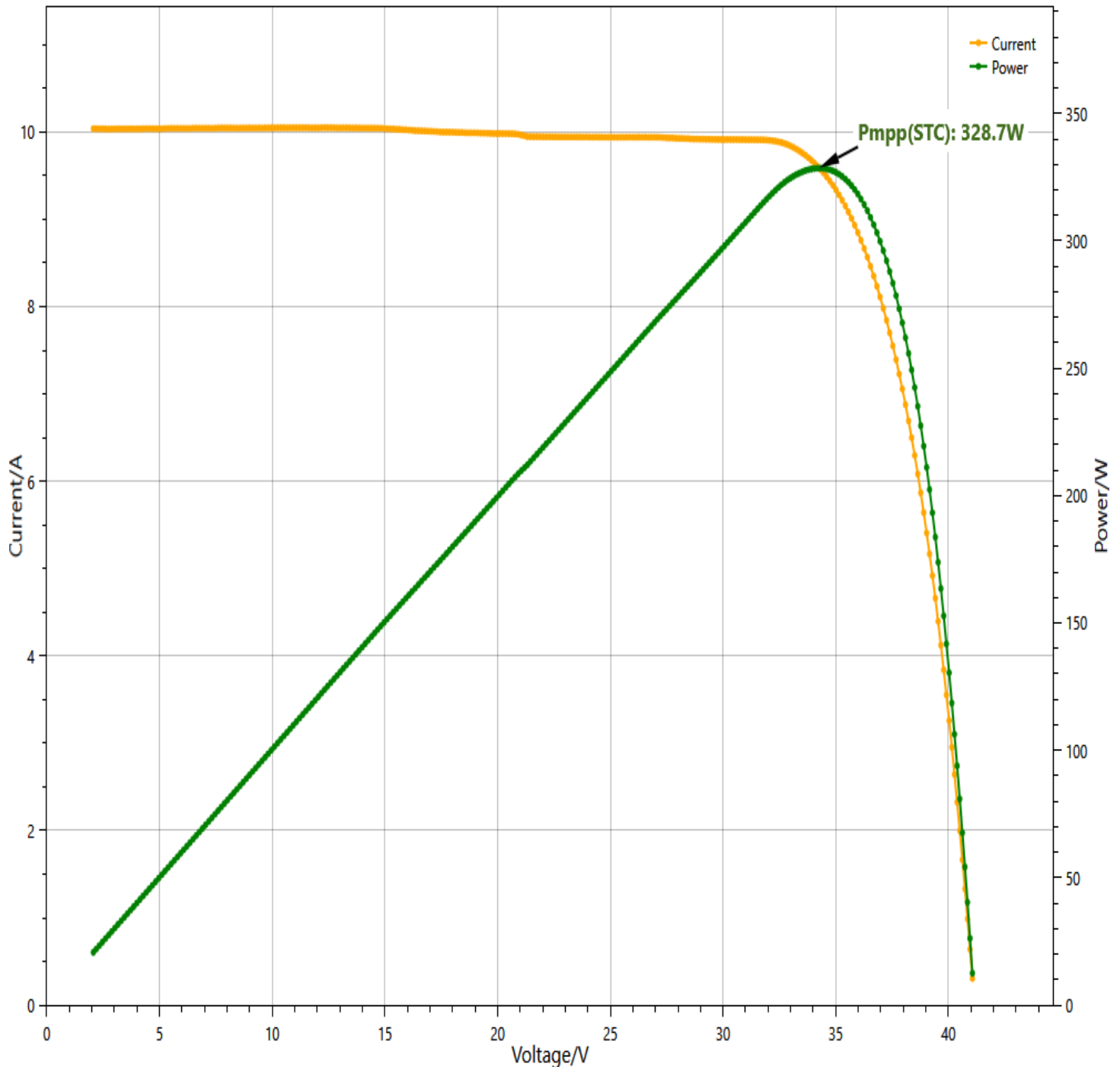
In the electroluminescence images no mismatching between cells was visible. However, the edges of all cells were visibly darker the middle of the cells.

MBJ Unique ID: 600120210223114233

Module ID: A09200801300278

Type ID: Trinasolar / TSM-DD06M.05(II)

I-V Curve



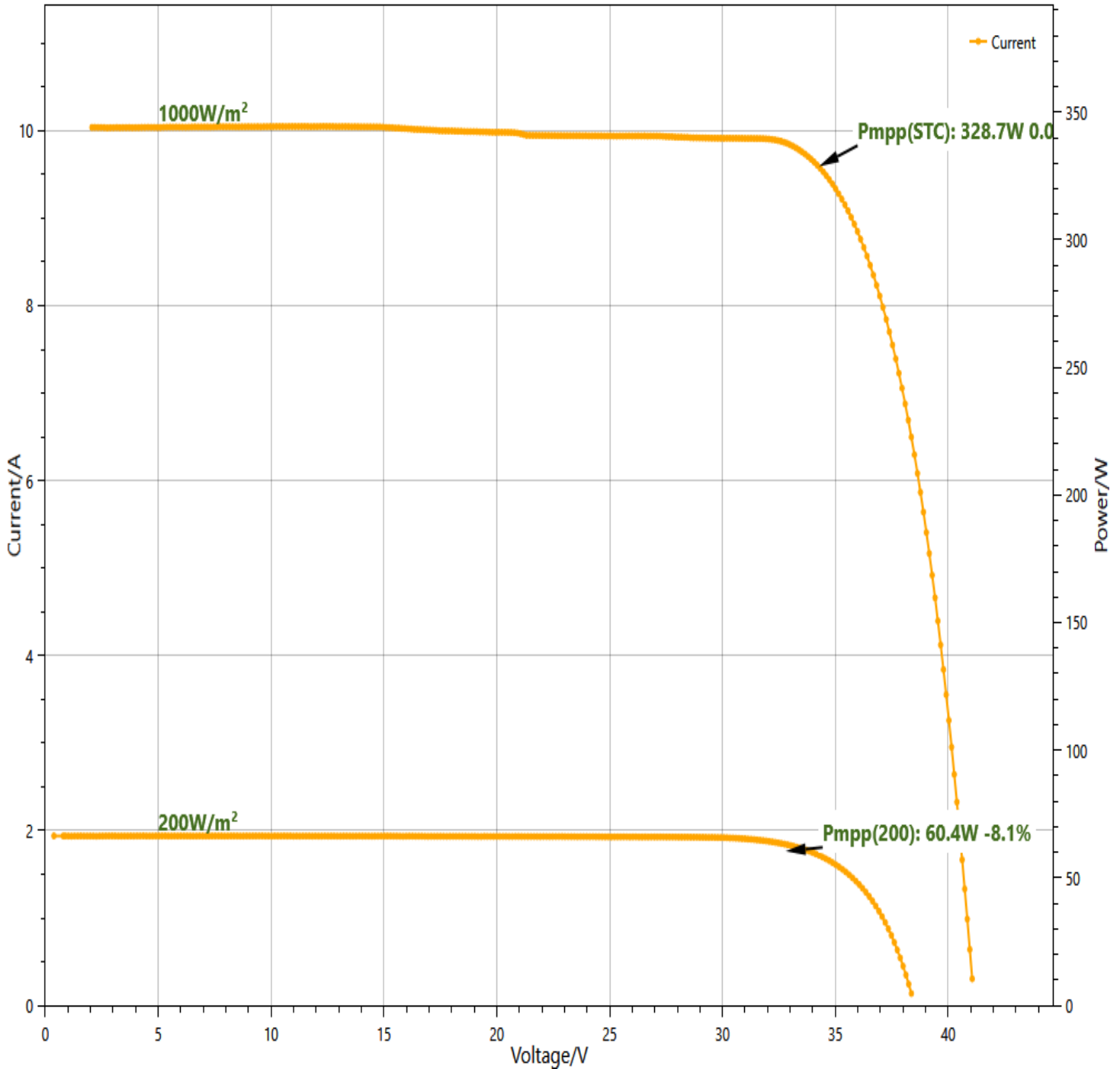
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	328.7	9.59	34.27	10.03	41.16	1000.0	79.6
Measured	332.2	9.59	34.63	10.08	41.23	1001.5	79.9
Tmod[°C]:24.4	Tref[°C]:25.4		Tfl[°C]:27.23		Tout[°C]:n/a		T[ms]:143.0
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01						
Software:748p	Reference: ISE_Mono_Reference						
	FFCorr: -0.899%						

MBJ Unique ID: 600120210223114233

Module ID: A09200801300278

Type ID: Trinasolar / TSM-DD06M.05(II)

I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	60.4	328.7
Module Eff [%]	17.7	19.3
Eff Delta [%]	-8.1	0.0

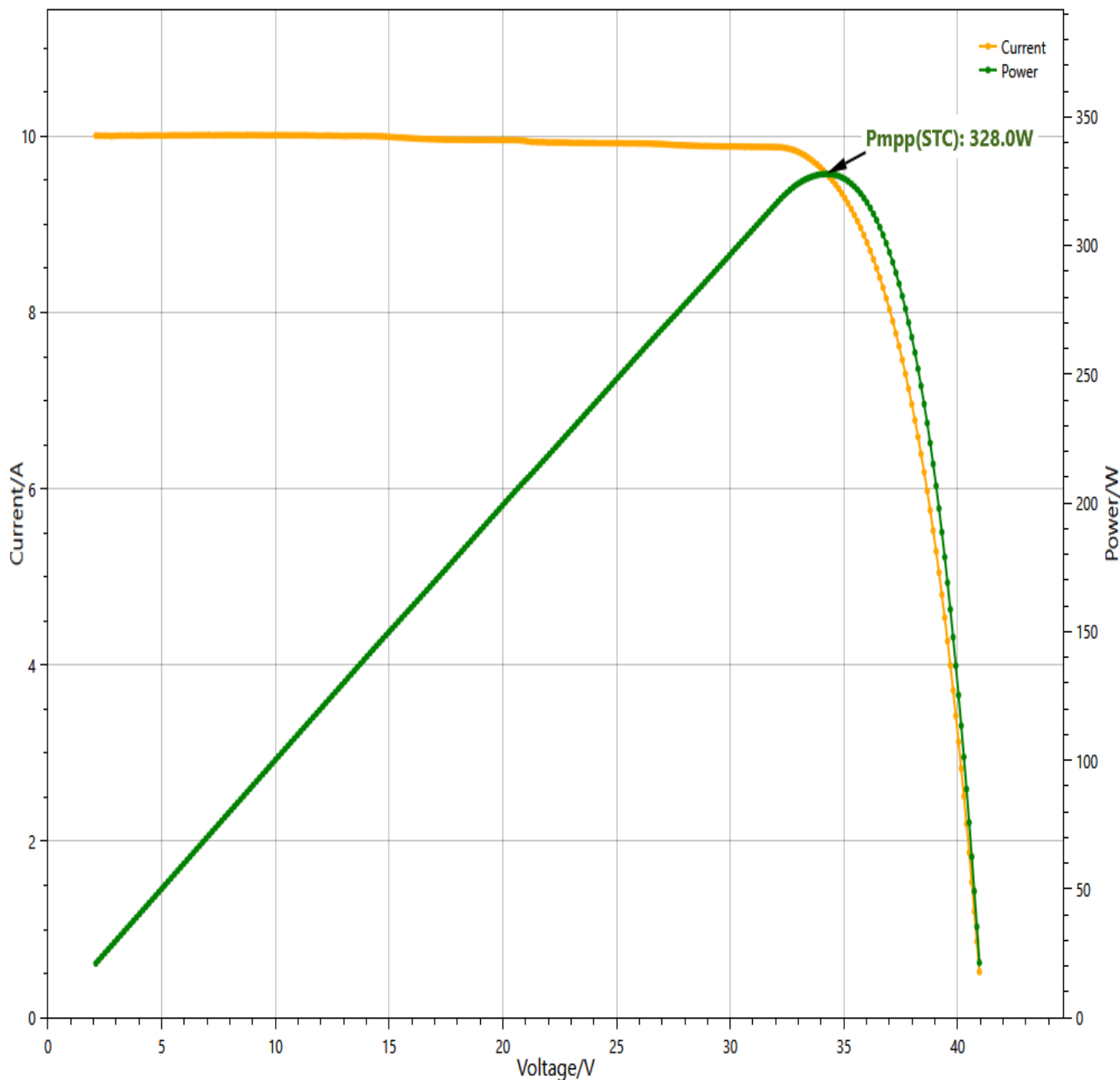
Measured [W/m2] 203.7 1001.5
Module Width/Height (Portrait) [mm]:1004*1698

MBJ Unique ID: 600120210223111610

Module ID: A09200801301919

Type ID: Trinasolar / TSM-DD06M.05(II)

I-V Curve



	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	328.0	9.58	34.24	10.00	41.13	1000.0	79.7
Measured	331.8	9.59	34.60	10.06	41.19	1002.1	80.1

Tmod[°C]:24.5	Tref[°C]:25.1	Tfl[°C]:26.30	Tout[°C]:n/a	T[ms]:142.5
Type:Mono	alpha[%]:0.050	beta[%]:-0.290		
IEC aICF:0.060	IEC Rs[Ohm]:0.01			
Software:748p				

Reference: ISE_Mono_Reference

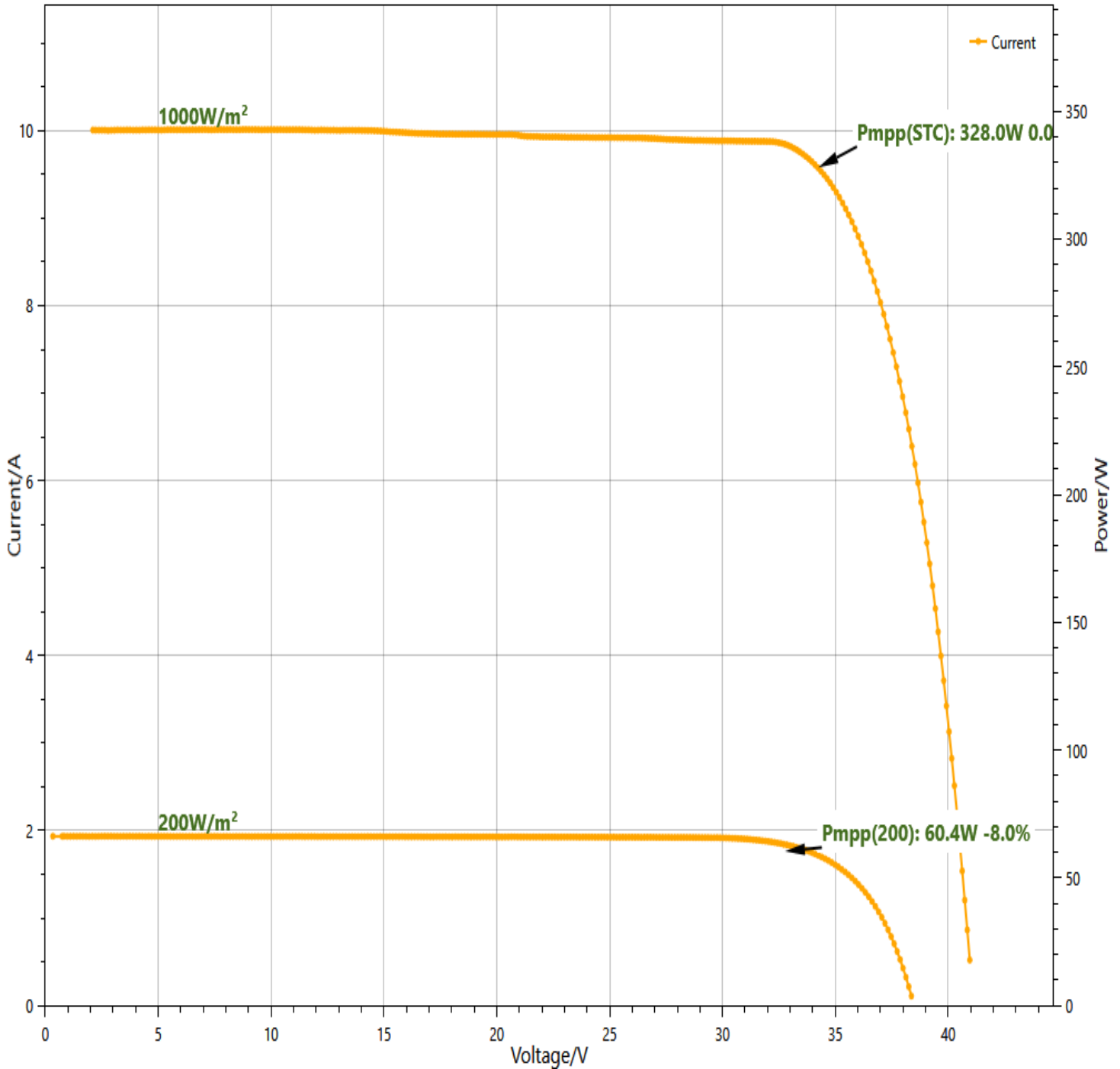
FFCorr: -0.899%

MBJ Unique ID: 600120210223111610

Module ID: A09200801301919

Type ID: Trinasolar / TSM-DD06M.05(II)

I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	60.4	328.0
Module Eff [%]	17.7	19.2
Eff Delta [%]	-8.0	0.0

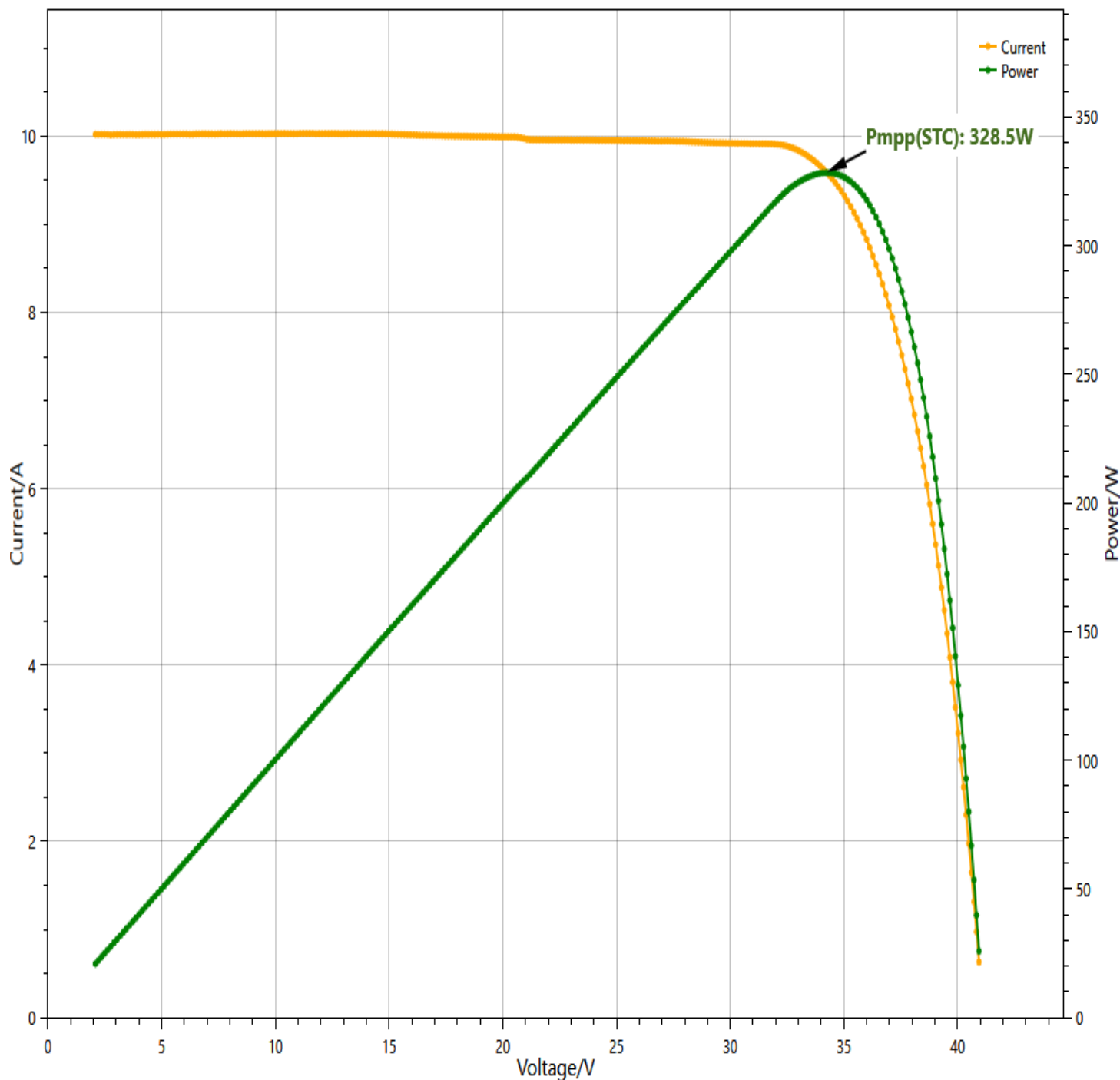
Measured [W/m2] 203.8 1002.1
Module Width/Height (Portrait) [mm]:1004*1698

MBJ Unique ID: 600120210223113025

Module ID: A09200801302020

Type ID: Trinasolar / TSM-DD06M.05(II)

I-V Curve



	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	328.5	9.59	34.25	10.02	41.14	1000.0	79.7
Measured	332.4	9.60	34.63	10.07	41.23	1001.8	80.0

Tmod[°C]:24.2	Tref[°C]:25.3	Tfl[°C]:26.36	Tout[°C]:n/a	T[ms]:142.5
Type:Mono	alpha[%]:0.050	beta[%]:-0.290		
IEC aICF:0.060	IEC Rs[Ohm]:0.01			
Software:748p				

Reference: ISE_Mono_Reference

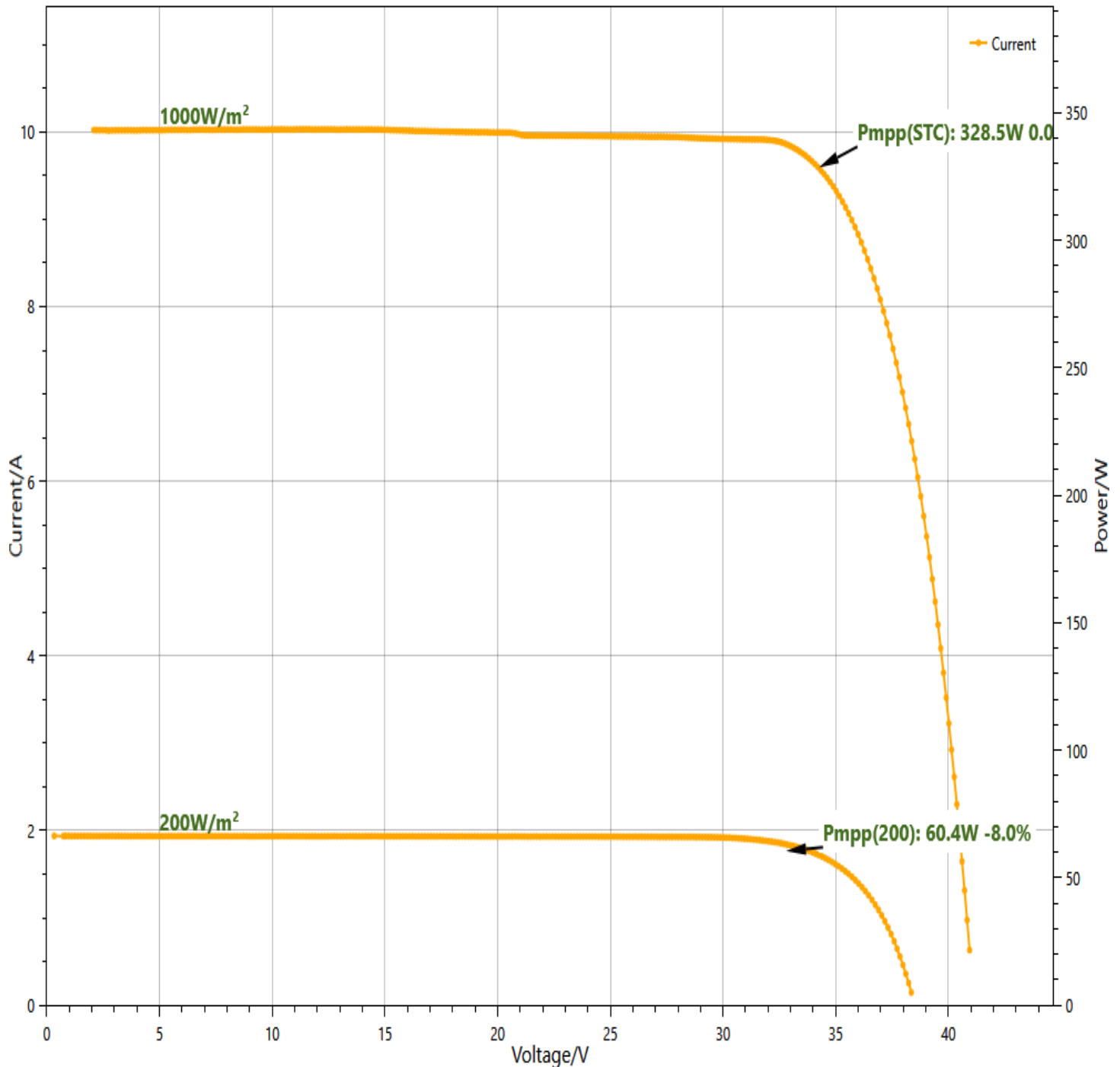
FFCorr: -0.899%

MBJ Unique ID: 600120210223113025

Module ID: A09200801302020

Type ID: Trinasolar / TSM-DD06M.05(II)

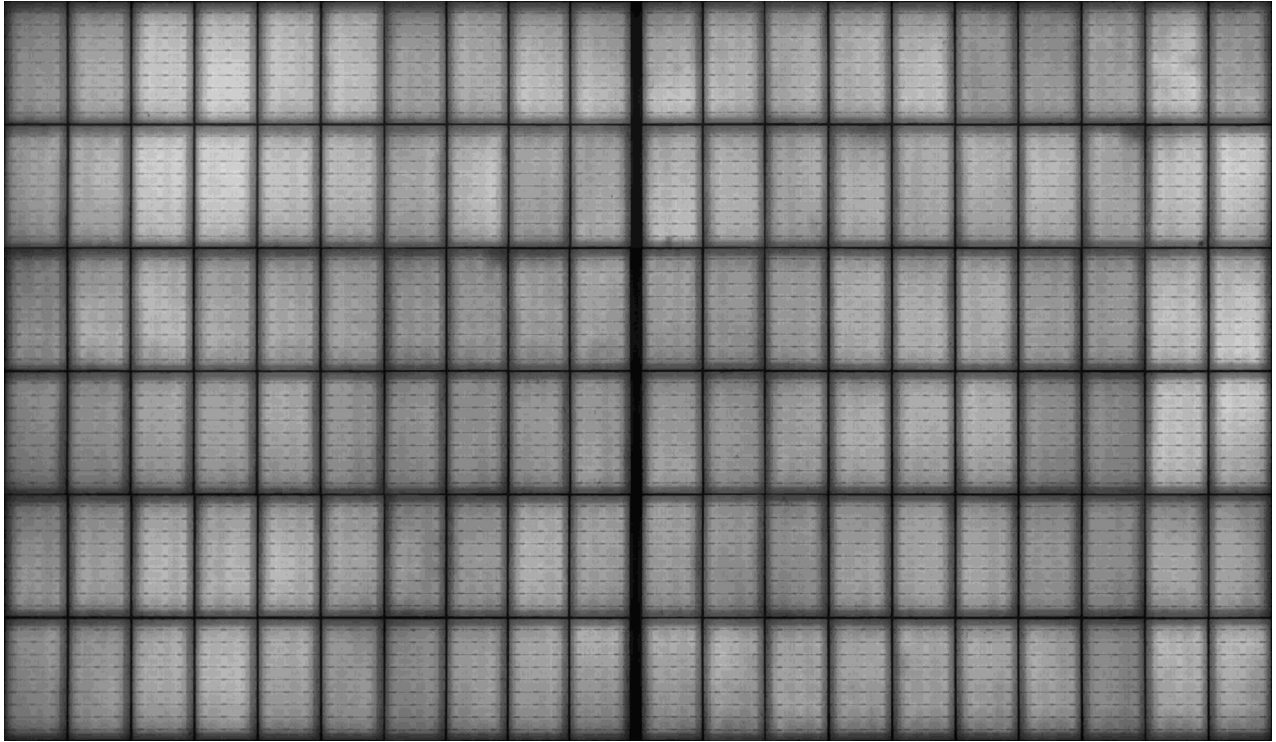
I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	60.4	328.5
Module Eff [%]	17.7	19.3
Eff Delta [%]	-8.0	0.0

Measured [W/m2] 203.8 1001.8
Module Width/Height (Portrait) [mm]:1004*1698

Electroluminescence for 600120210223114233

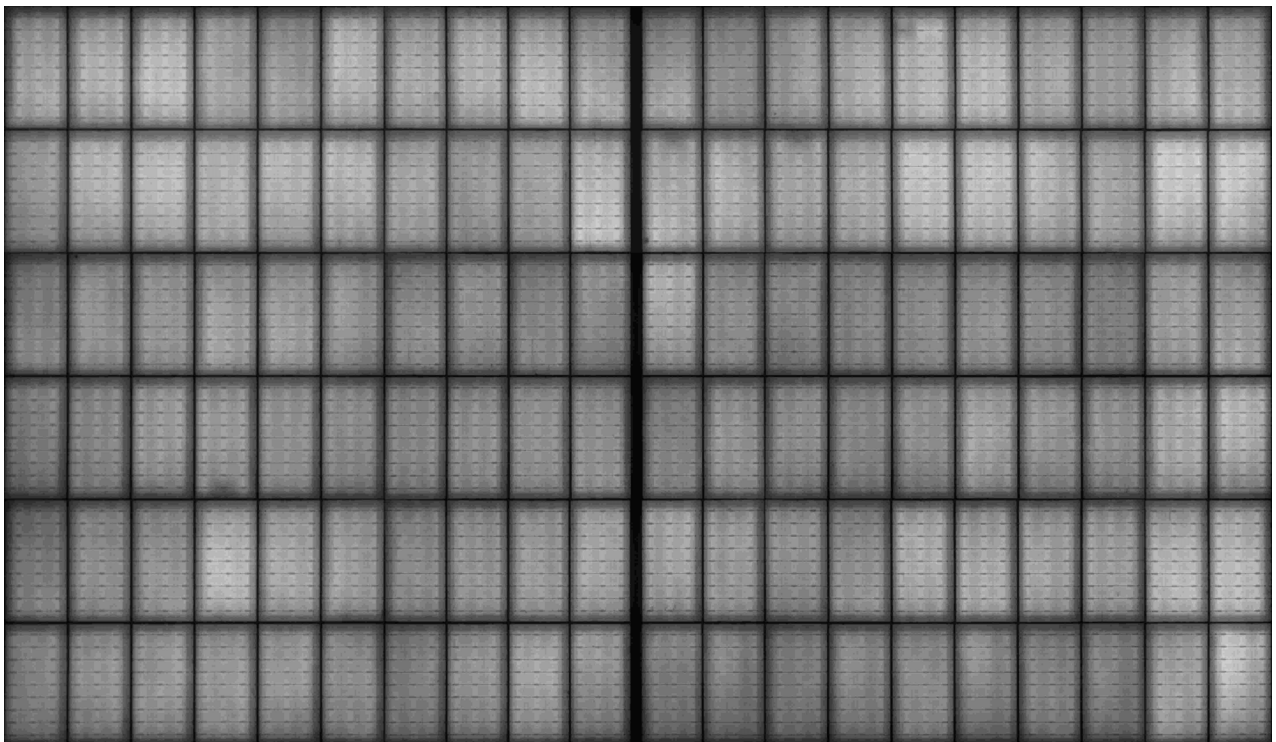


Current[A]: 12.010

Voltage[V]: 45.360

Exposure Time [ms]: 400

Electroluminescence for 600120210223111610

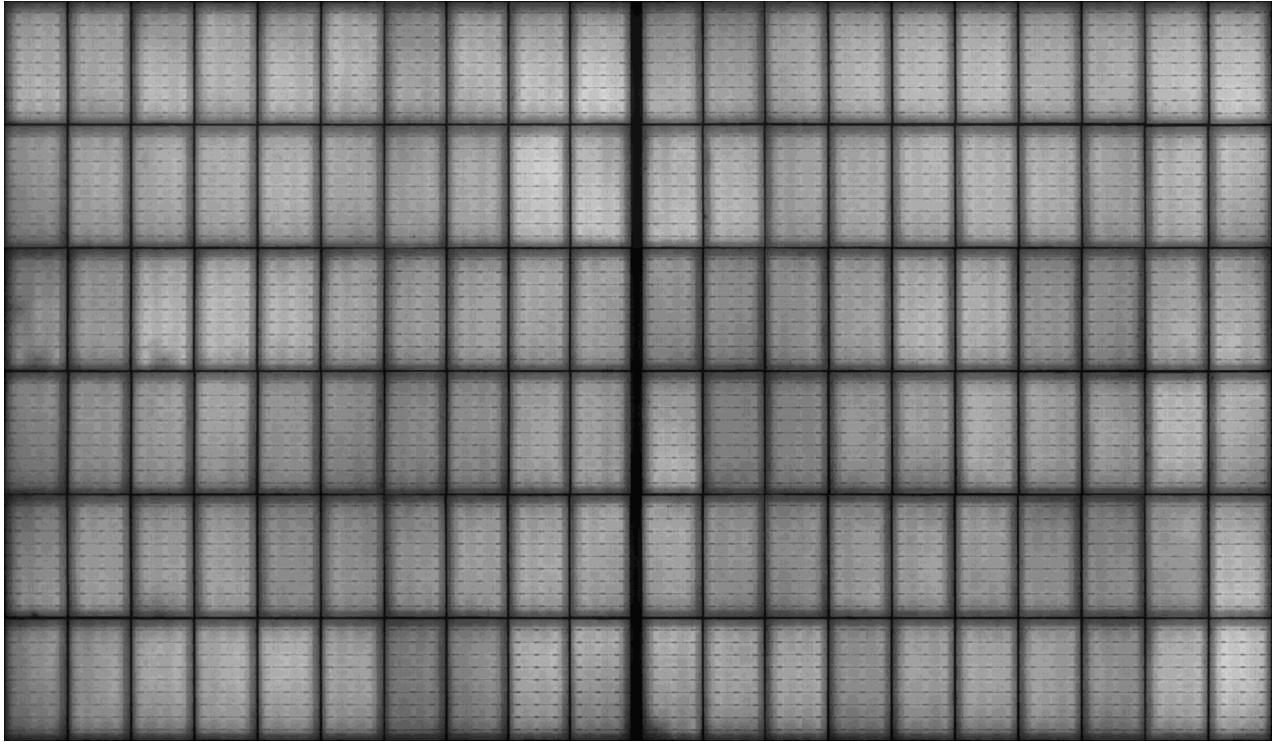


Current[A]: 12.010

Voltage[V]: 45.360

Exposure Time [ms]: 400

Electroluminescence for 600120210223113025



Current[A]: 12.010

Voltage[V]: 45.360

Exposure Time [ms]: 400

MBJ Unique ID	Module ID	Module Type/Description	Judgment
600120210223114233	A09200801300278	Trinasolar TSM-DD06M.05(II)	ClassC
600120210223111610	A09200801301919	Trinasolar TSM-DD06M.05(II)	ClassC
600120210223113025	A09200801302020	Trinasolar TSM-DD06M.05(II)	ClassC

MBJ Unique ID	Connection Check	Diode Test	HiPot Test	GND Bond Tests		
				Port 1	Port 2	Port 3
600120210223114233	Successfull	Successfull	n/a	n/a	n/a	n/a
600120210223111610	Successfull	Successfull	n/a	n/a	n/a	n/a
600120210223113025	Successfull	Successfull	n/a	n/a	n/a	n/a

MBJ Unique ID	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
600120210223114233	328.7	9.59	34.27	10.03	41.16	1000.0	79.6
600120210223111610	328.0	9.58	34.24	10.00	41.13	1000.0	79.7
600120210223113025	328.5	9.59	34.25	10.02	41.14	1000.0	79.7

MBJ Unique ID	Red	Yellow	Green	Blue	White
600120210223114233	0	0	0	0	120
600120210223111610	0	0	0	0	120
600120210223113025	0	0	0	0	120