

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 TURU004 / 192M6H601312220 PERC Reference Module, calibrated at 1.4.2020 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 Jasolar JAM60S17 325, rated at 325 Wp.

With a nominal power of 325 Wp the 2.5% measurement uncertainty means a range from 317...333 Wp. The average power of the measured modules was 323.5 Wp, which is below the rated nominal power, but still within the uncertainty range.

In the electroluminescence images no mismatching between cells was visible.

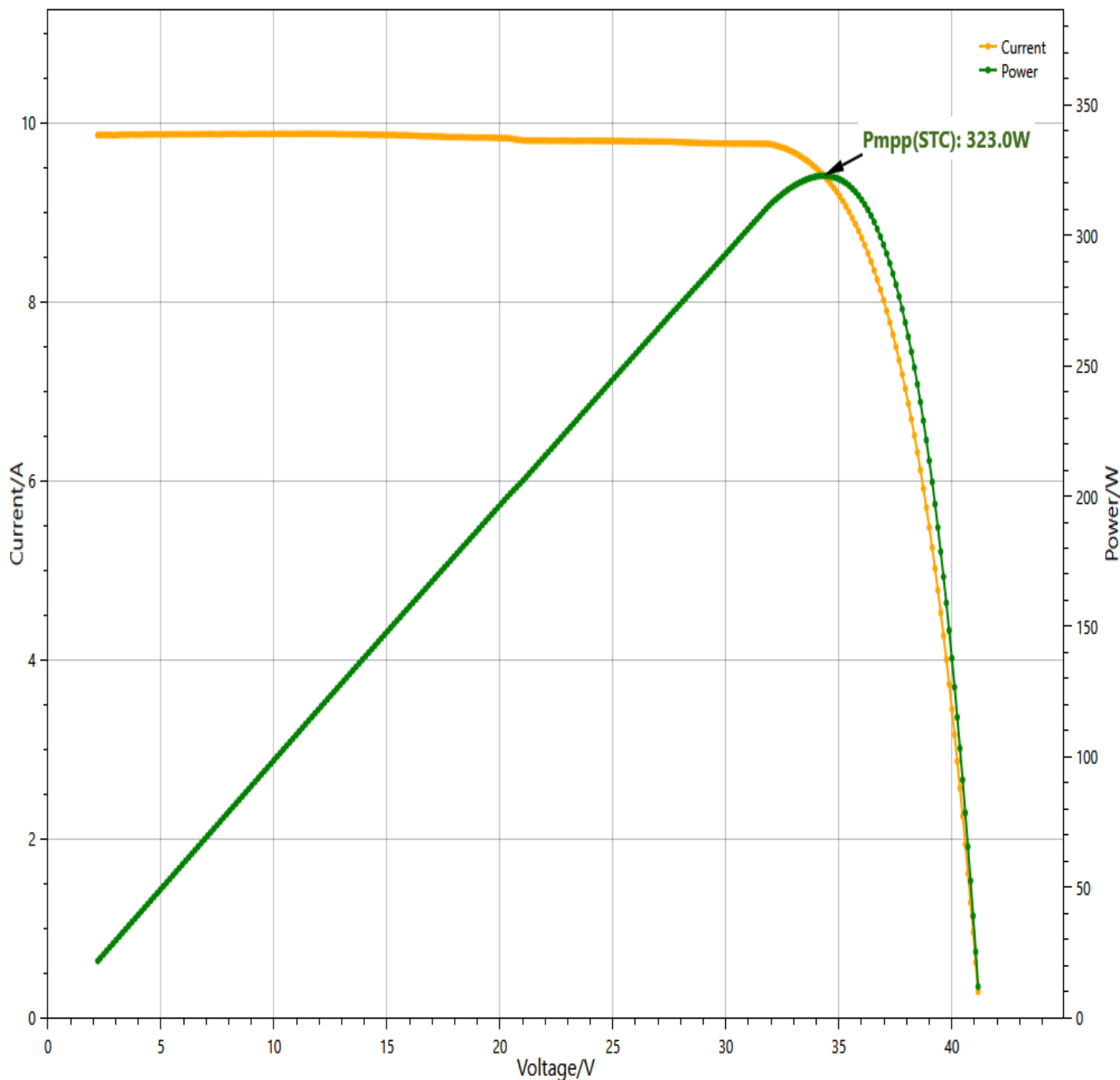
Some cracks were visible on two of the modules, but not enough to affect the power measurements in any significant way.

MBJ Unique ID: 600120210223132914

Module ID: 208M6M6022121819

Type ID: Jasolar / JAM60S17_325

I-V Curve



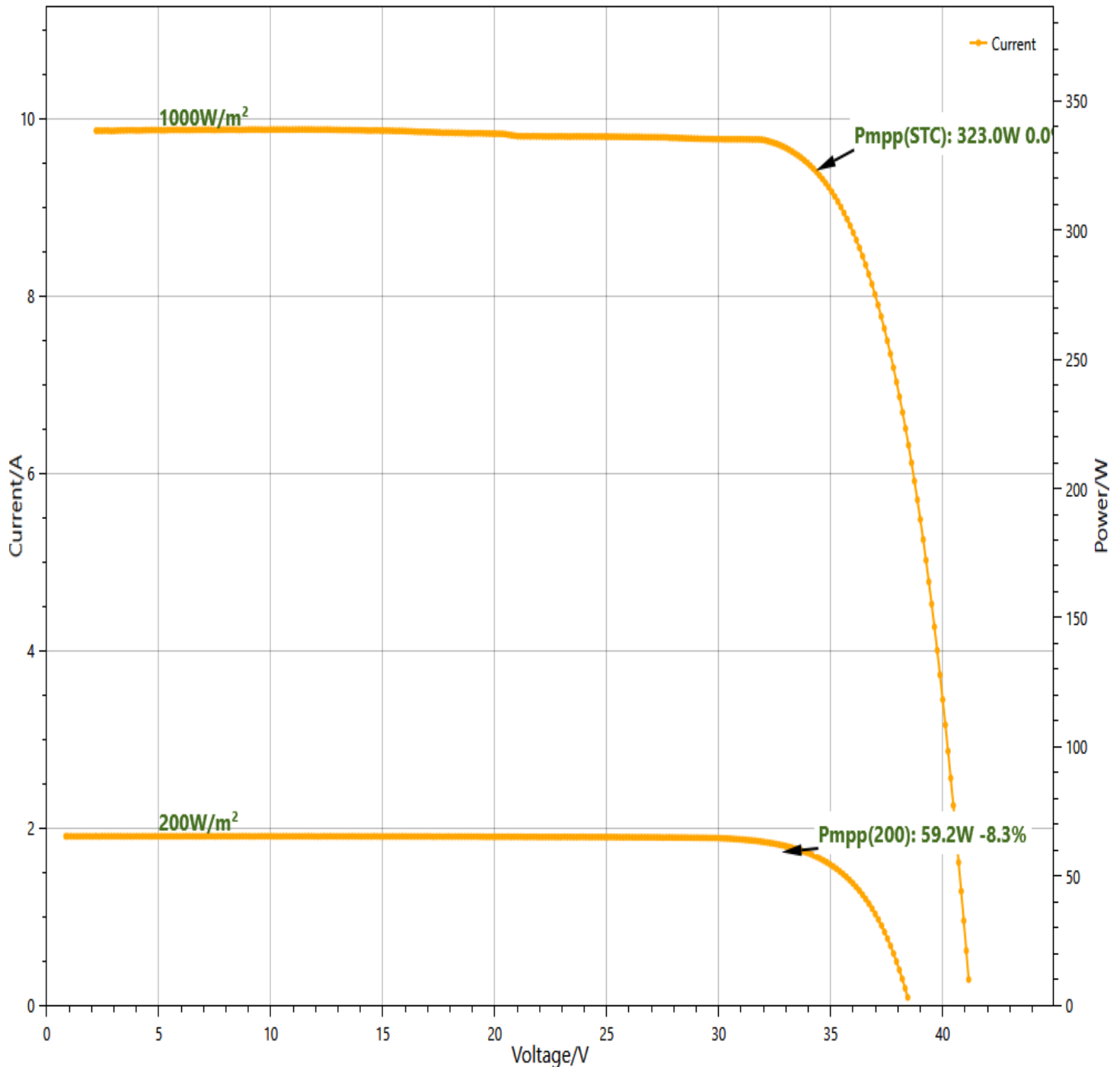
	Pmpp[W]	Imp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	323.0	9.41	34.33	9.86	41.26	1000.0	79.4
Measured	323.3	9.38	34.47	9.87	41.21	998.1	79.4
Tmod[°C]:25.3	Tref[°C]:26.2		Tfl[°C]:27.77		Tout[°C]:n/a		T[ms]:142.0
Type:Mono	alpha[%]:0.044		beta[%]:-0.272				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_PERC_Reference				
			FFCorr: -0.572%				

MBJ Unique ID: 600120210223132914

Module ID: 208M6M6022121819

Type ID: Jasolar / JAM60S17_325

I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	59.2	323.0
Module Eff [%]	17.6	19.2
Eff Delta [%]	-8.3	0.0

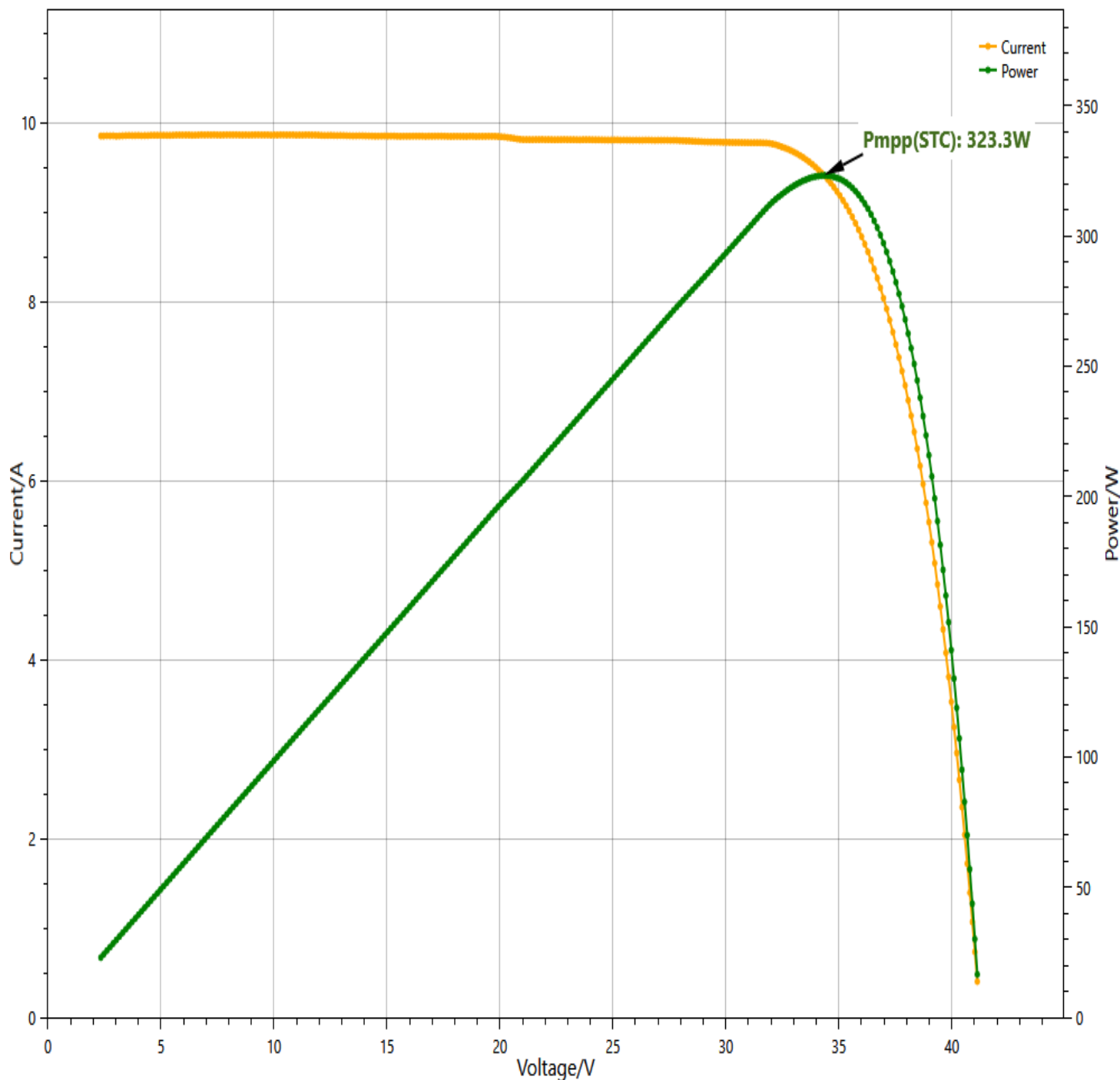
Measured [W/m2] 203.0 998.1
Module Width/Height (Portrait) [mm]:996*1689

MBJ Unique ID: 600120210223130731

Module ID: 208M6M6022121837

Type ID: Jasolar / JAM60S17_325

I-V Curve



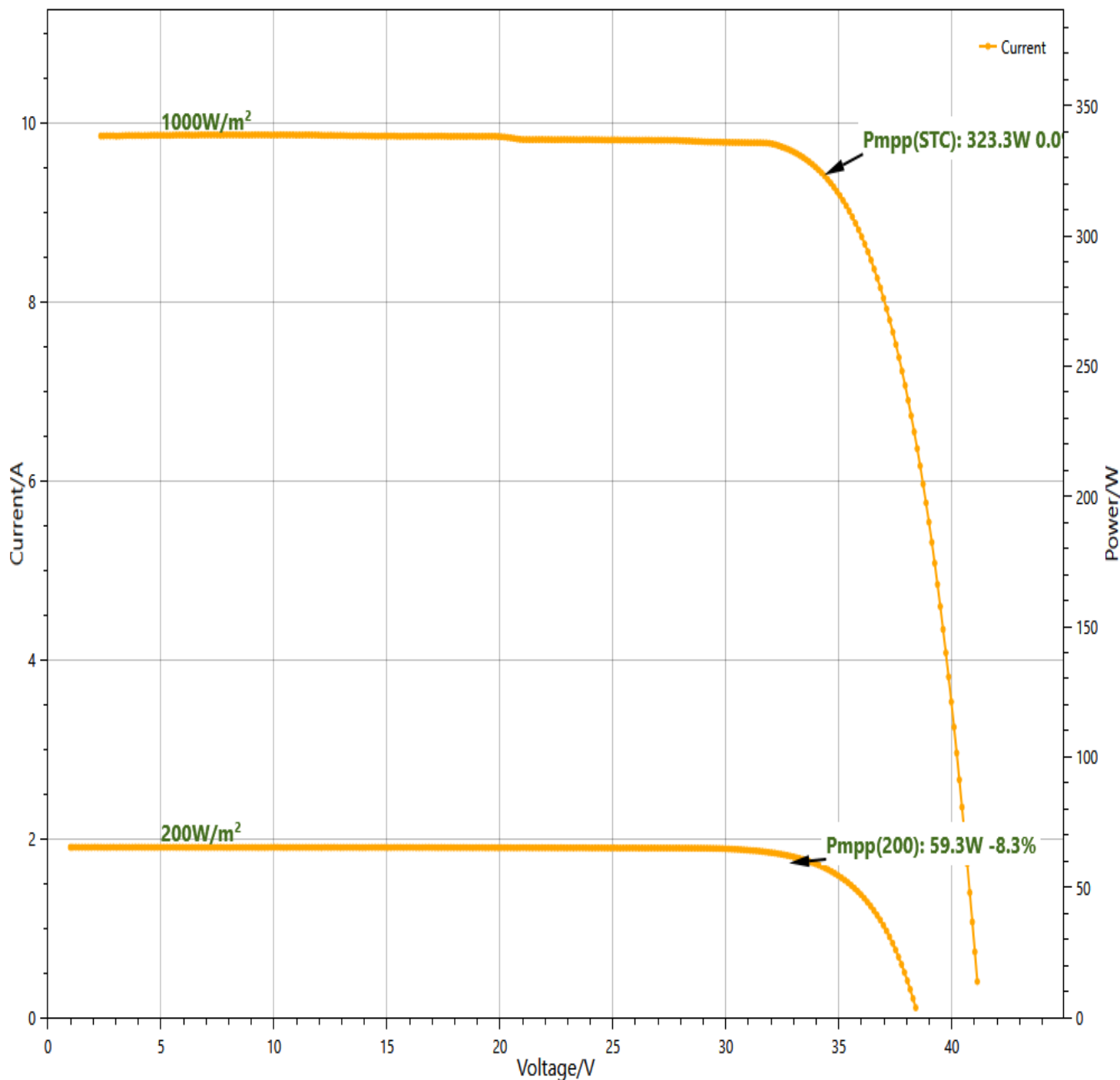
	Pmpp[W]	Imp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]	
IEC60891 STC	323.3	9.41	34.35	9.84	41.26	1000.0	79.6	
Measured	322.6	9.38	34.38	9.87	41.13	998.1	79.5	
Tmod[°C]:26.1	Tref[°C]:26.2		Tfl[°C]:26.23		Tout[°C]:n/a		T[ms]:141.5	
Type:Mono	alpha[%]:0.044		beta[%]:-0.272					
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00					
Software:748p	Reference: ISE_PERC_Reference							
	FFCorr: -0.572%							

MBJ Unique ID: 600120210223130731

Module ID: 208M6M6022121837

Type ID: Jasolar / JAM60S17_325

I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	59.3	323.3
Module Eff [%]	17.6	19.2
Eff Delta [%]	-8.3	0.0

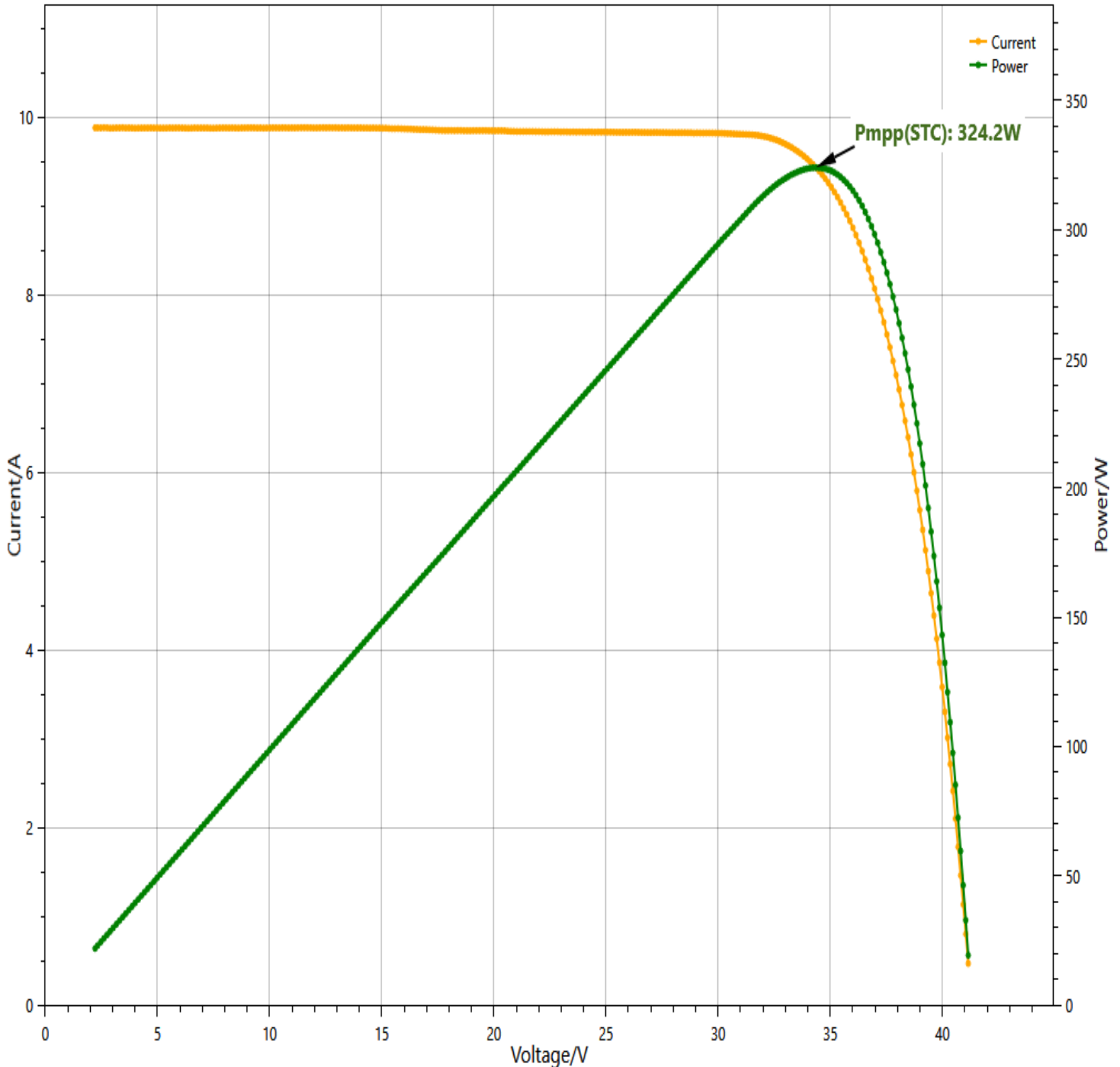
Measured [W/m2] 202.9 998.1
Module Width/Height (Portrait) [mm]:996*1689

MBJ Unique ID: 600120210223131559

Module ID: 208M6M6022121916

Type ID: Jasolar / JAM60S17_325

I-V Curve



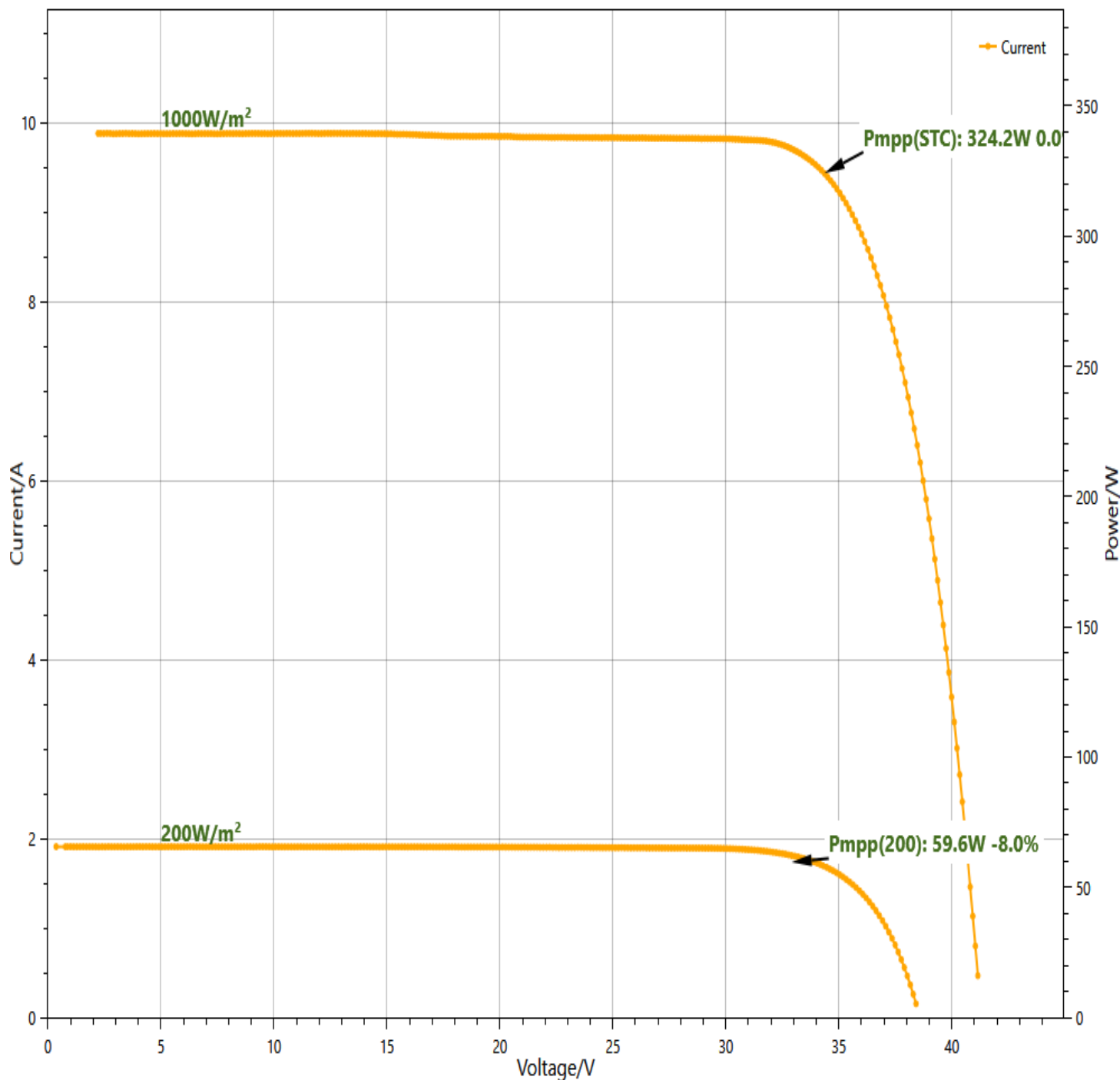
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	324.2	9.43	34.36	9.88	41.31	1000.0	79.4
Measured	324.5	9.40	34.53	9.89	41.29	997.5	79.5
Tmod[°C]:25.0	Tref[°C]:26.2		Tfl[°C]:27.67		Tout[°C]:n/a		T[ms]:142.0
Type:Mono	alpha[%]:0.044		beta[%]:-0.272				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_PERC_Reference				
			FFCorr: -0.572%				

MBJ Unique ID: 600120210223131559

Module ID: 208M6M6022121916

Type ID: Jasolar / JAM60S17_325

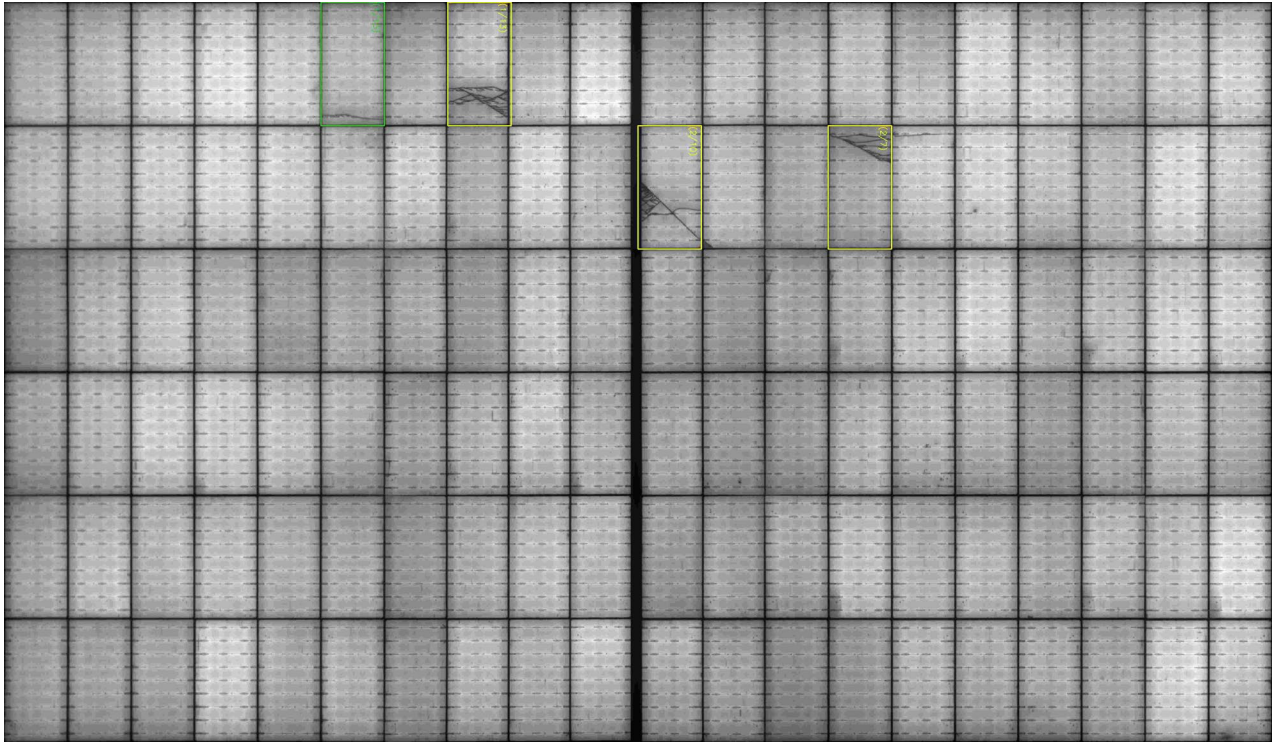
I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	59.6	324.2
Module Eff [%]	17.7	19.3
Eff Delta [%]	-8.0	0.0

Measured [W/m2] 202.8 997.5
Module Width/Height (Portrait) [mm]:996*1689

Electroluminescence for 600120210223132914

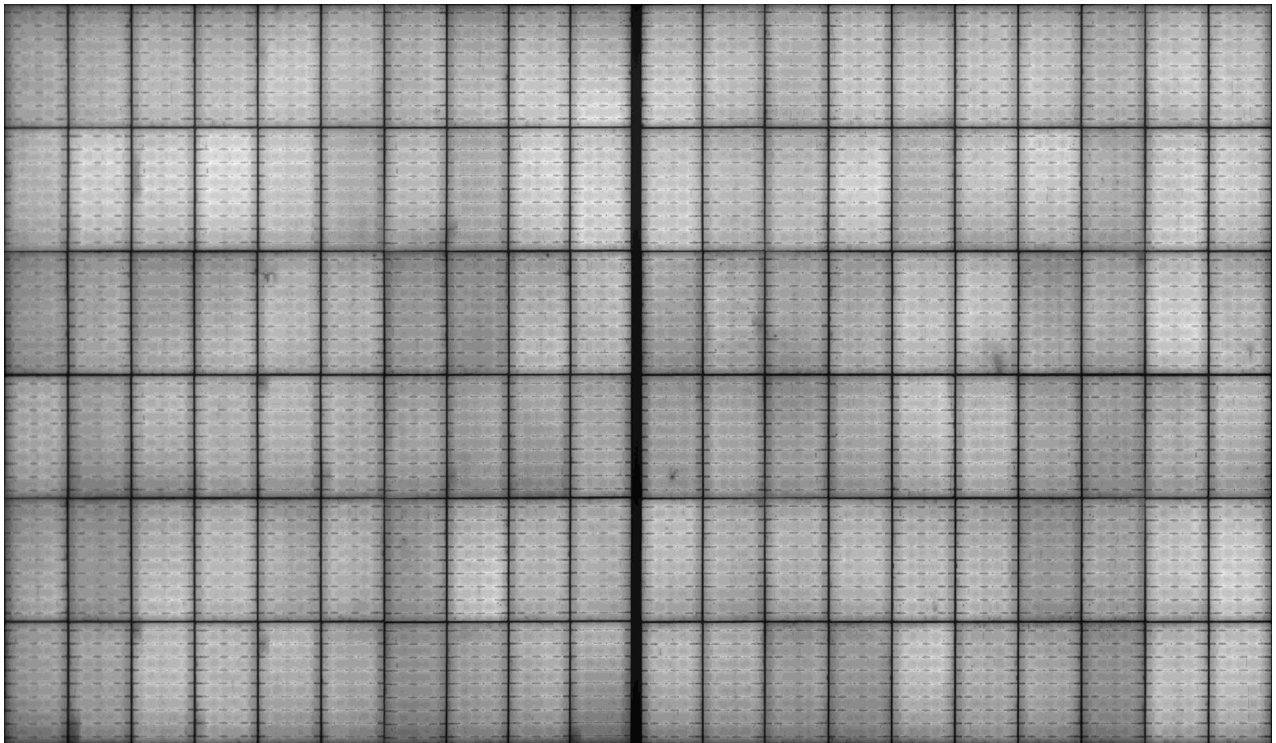


Current[A]: 12.020

Voltage[V]: 46.010

Exposure Time [ms]: 500

Electroluminescence for 600120210223130731

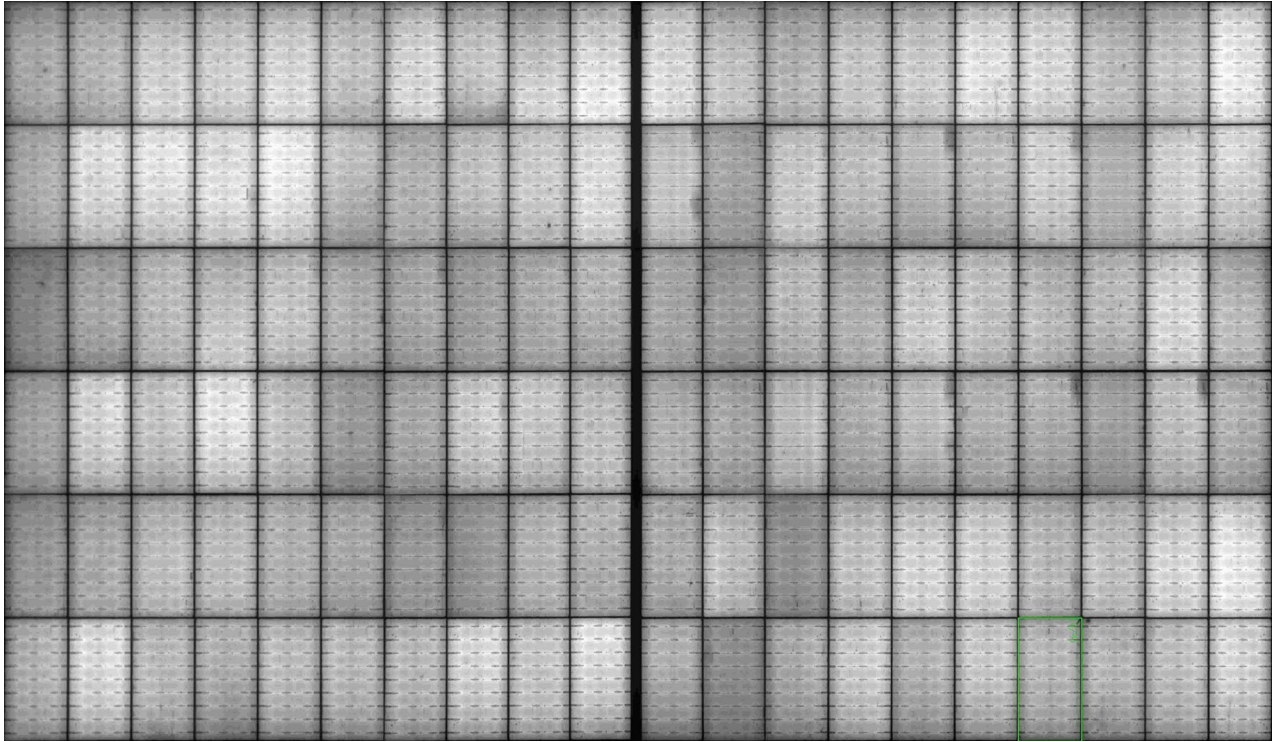


Current[A]: 12.020

Voltage[V]: 45.360

Exposure Time [ms]: 500

Electroluminescence for 600120210223131559



Current[A]: 12.020

Voltage[V]: 46.010

Exposure Time [ms]: 500

MBJ Unique ID	Module ID	Module Type/Description	Judgment
600120210223132914	208M6M6022121819	Jasolar JAM60S17_325	ClassC
600120210223130731	208M6M6022121837	Jasolar JAM60S17_325	ClassC
600120210223131559	208M6M6022121916	Jasolar JAM60S17_325	ClassC

MBJ Unique ID	Connection Check	Diode Test	HiPot Test	GND Bond Tests		
				Port 1	Port 2	Port 3
600120210223132914	Successfull	Successfull	n/a	n/a	n/a	n/a
600120210223130731	Successfull	Successfull	n/a	n/a	n/a	n/a
600120210223131559	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[%]
600120210223132914	323.0	9.41	34.33	9.86	41.26	1000.0	79.4
600120210223130731	323.3	9.41	34.35	9.84	41.26	1000.0	79.6
600120210223131559	324.2	9.43	34.36	9.88	41.31	1000.0	79.4

MBJ Unique ID	Red	Yellow	Green	Blue	White
600120210223132914	0	3	1	0	116
600120210223130731	0	0	0	0	120
600120210223131559	0	0	1	0	119