

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 SaloSolar 5BBSS305-M, rated at 305 Wp.

With a nominal power of 305 Wp the 2.5% measurement uncertainty means a range from 297...313 Wp. The average power of the measured modules was 307.1 Wp, which is above the rated nominal power, but still within the uncertainty range.

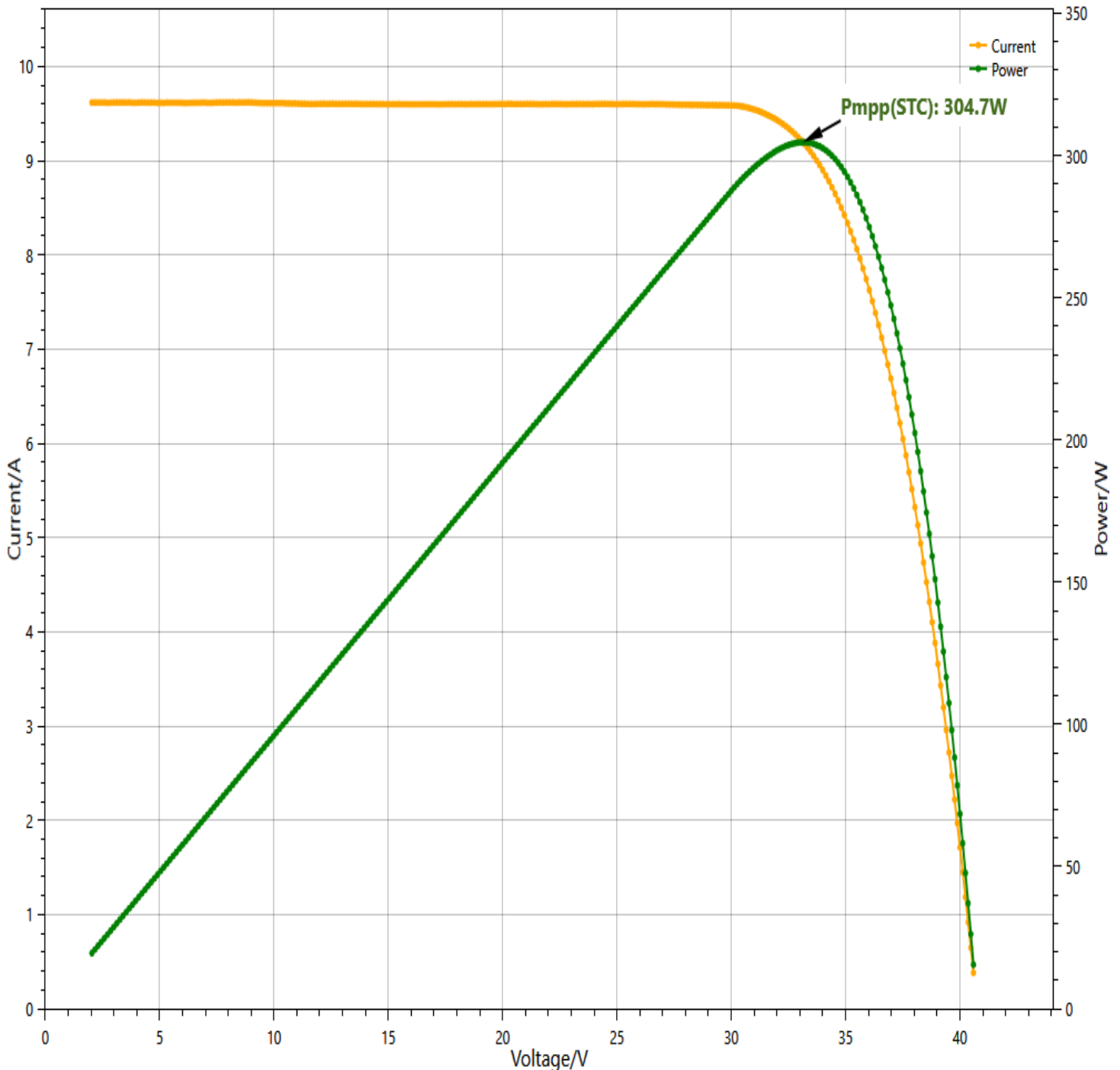
In the electroluminescence images some slight mismatching between cells was visible. No cracks were found on the panels.

MBJ Unique ID: 600120210223141424

Module ID: 20200901053

Type ID: SaloSolar / 5BBSS305-M

I-V Curve



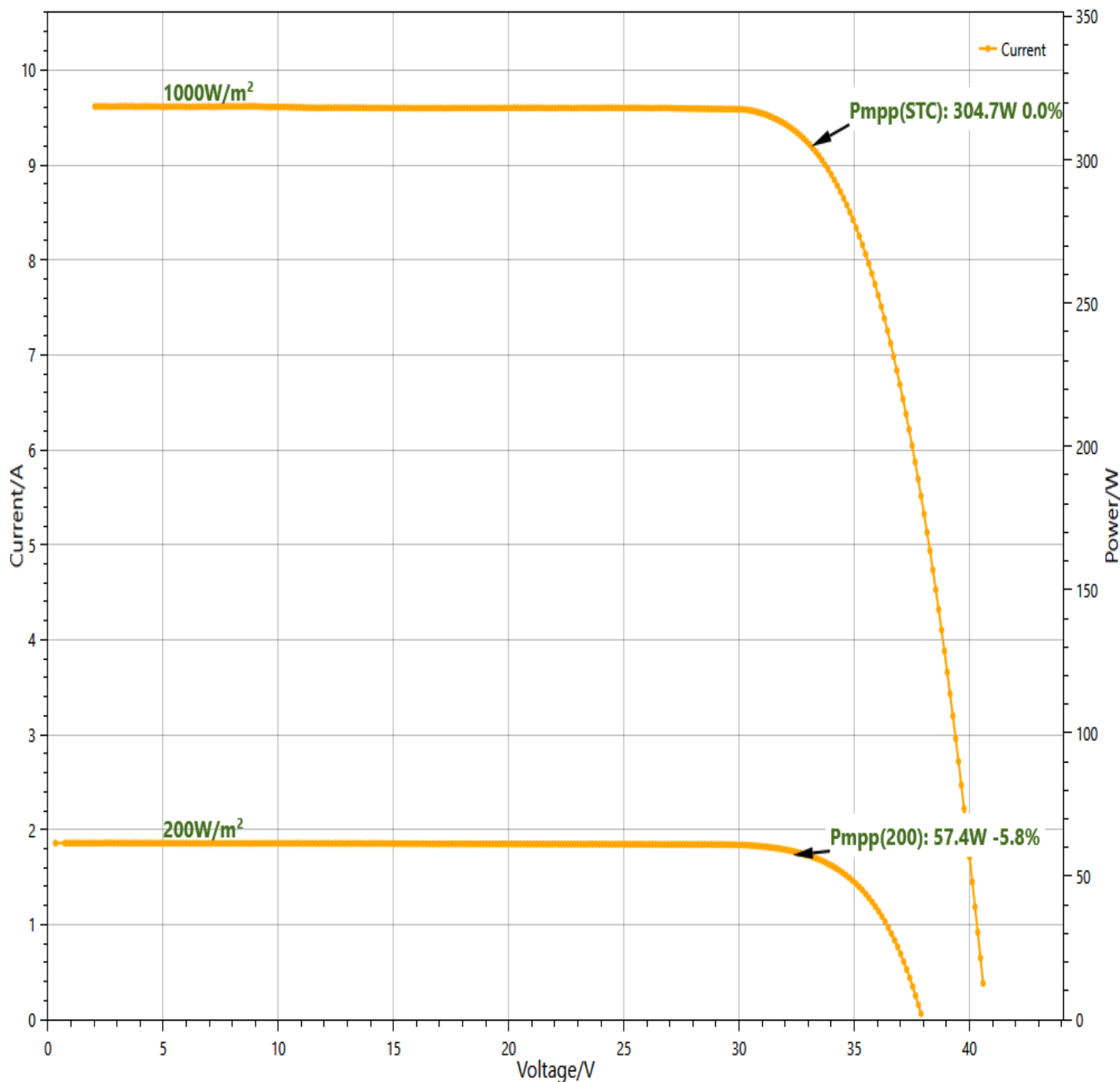
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	304.7	9.20	33.13	9.62	40.76	1000.0	77.7
Measured	306.4	9.19	33.35	9.66	40.78	1000.5	77.8
Tmod[°C]:24.7	Tref[°C]:26.2		Tfl[°C]:27.27		Tout[°C]:n/a		T[ms]:143.0
Type:Mono	alpha[%]:0.040		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_PERC_Reference				
			FFCorr: -0.572%				

MBJ Unique ID: 600120210223141424

Module ID: 20200901053

Type ID: SaloSolar / 5BBSS305-M

I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	57.4	304.7
Module Eff [%]	17.7	18.8
Eff Delta [%]	-5.8	0.0

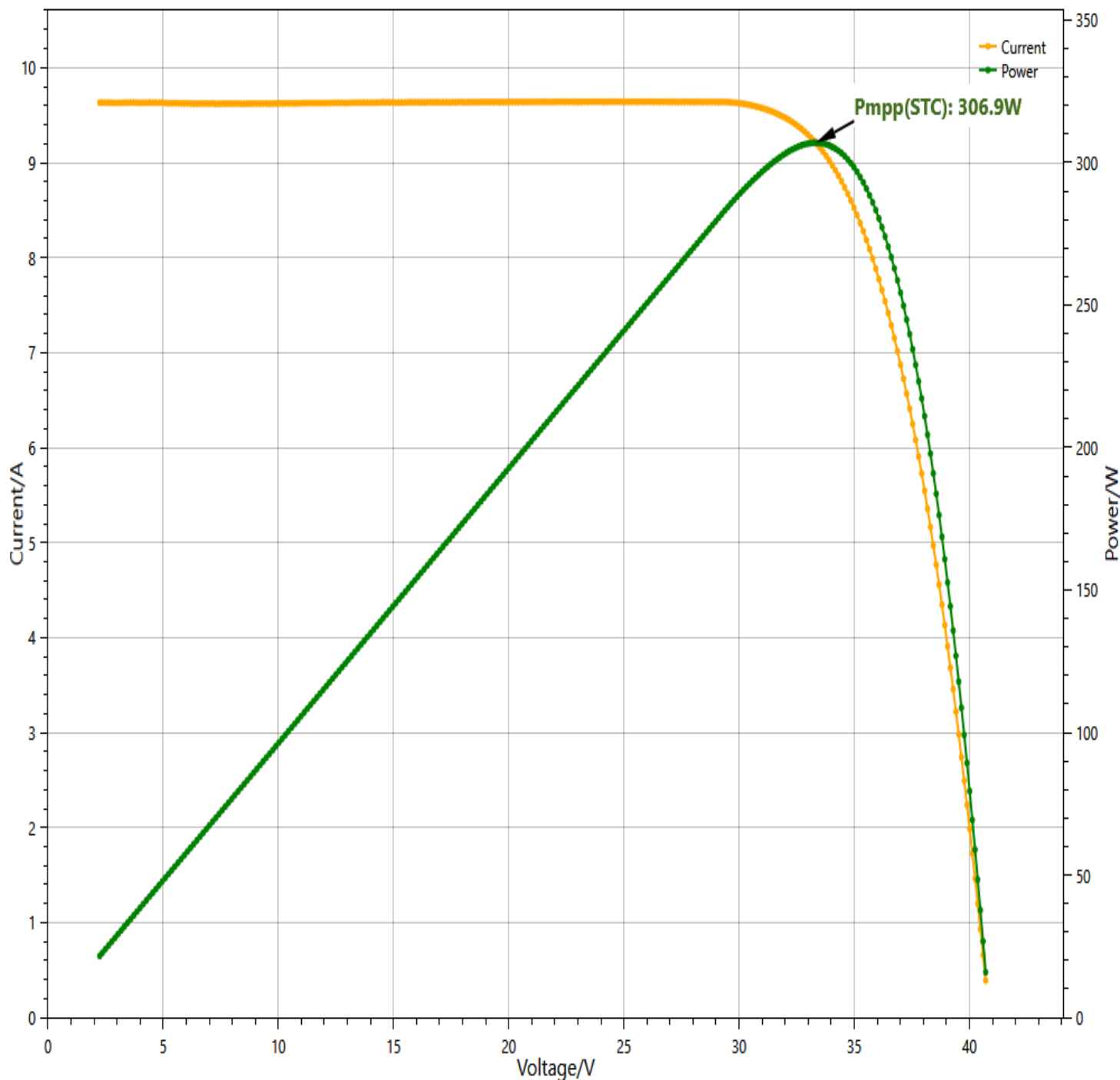
Measured [W/m2] 203.5 1000.5
Module Width/Height (Portrait) [mm]:992*1636

MBJ Unique ID: 600120210223135419

Module ID: 20200901084

Type ID: SaloSolar / 5BBSS305-M

I-V Curve



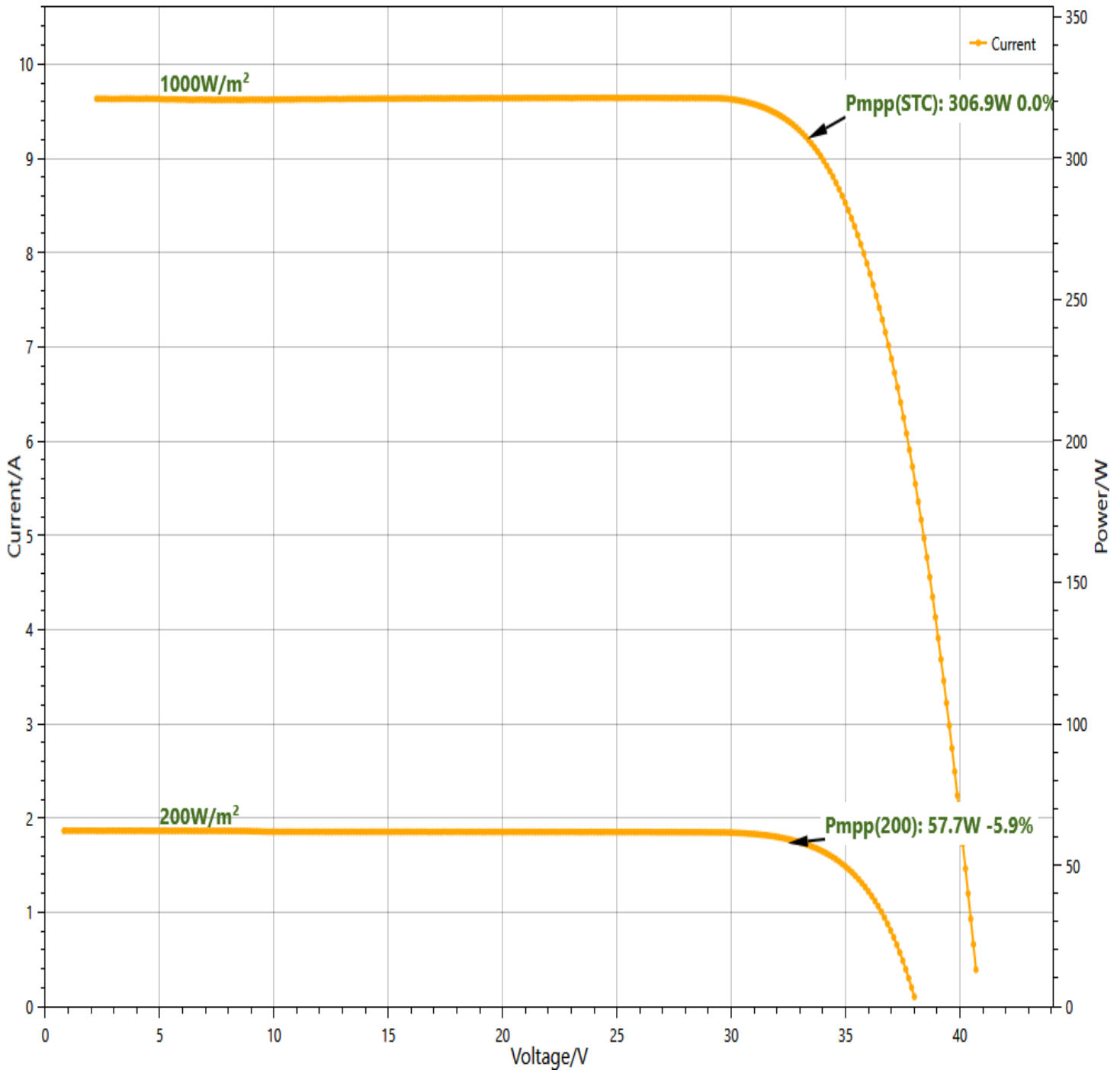
	Pmpp[W]	Imp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	306.9	9.21	33.33	9.64	40.87	1000.0	77.9
Measured	307.5	9.20	33.43	9.68	40.79	1000.2	77.9
Tmod[°C]:25.6	Tref[°C]:26.3		Tfl[°C]:27.31		Tout[°C]:n/a		T[ms]:143.0
Type:Mono	alpha[%]:0.040		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_PERC_Reference				
			FFCorr: -0.572%				

MBJ Unique ID: 600120210223135419

Module ID: 20200901084

Type ID: SaloSolar / 5BBSS305-M

I-V Curve



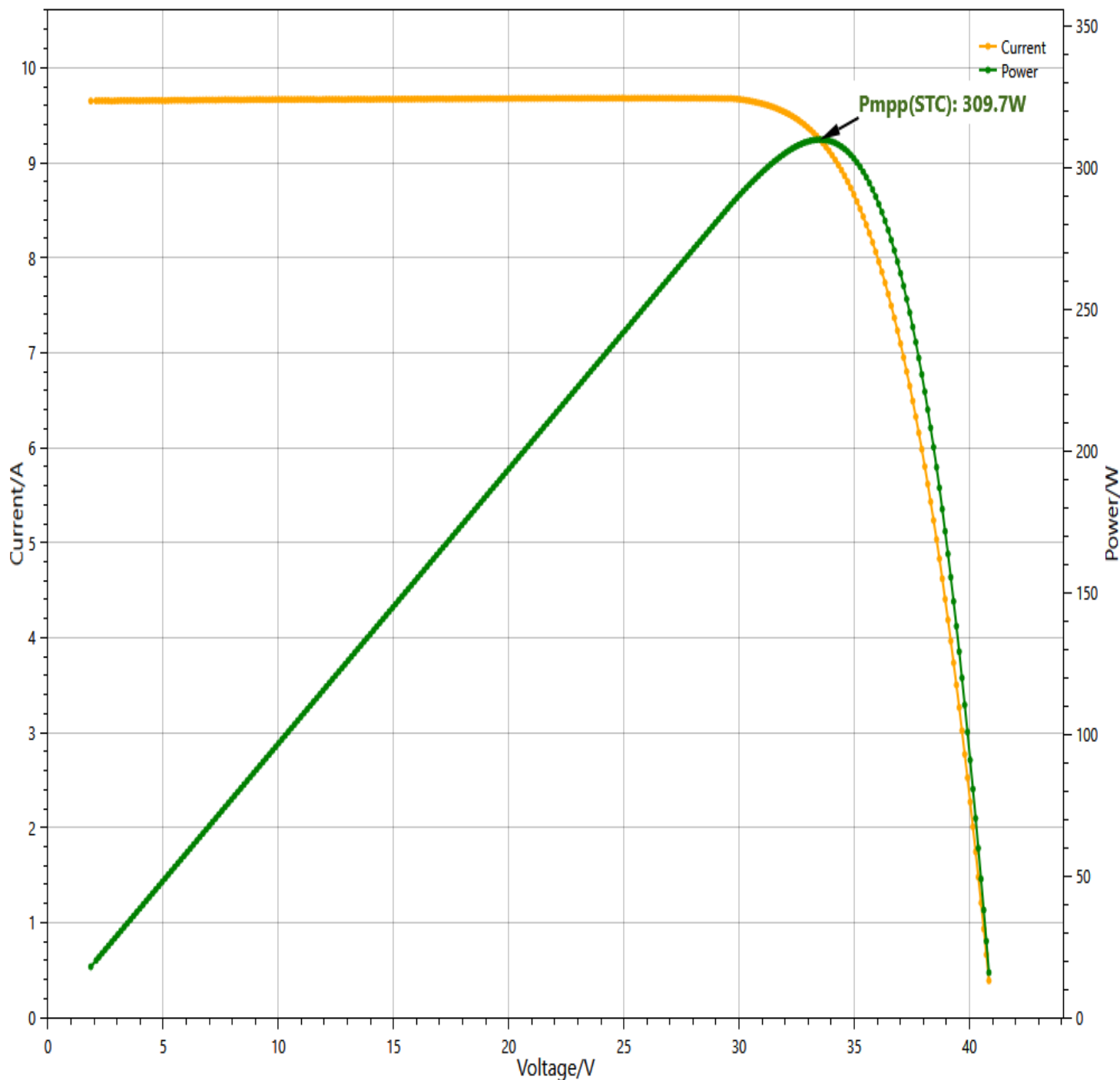
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	57.7	306.9
Module Eff [%]	17.8	18.9
Eff Delta [%]	-5.9	0.0
Measured [W/m2]	203.4	1000.2
Module Width/Height (Portrait) [mm]:	992*1636	

MBJ Unique ID: 600120210223140425

Module ID: 20200901085

Type ID: SaloSolar / 5BBSS305-M

I-V Curve



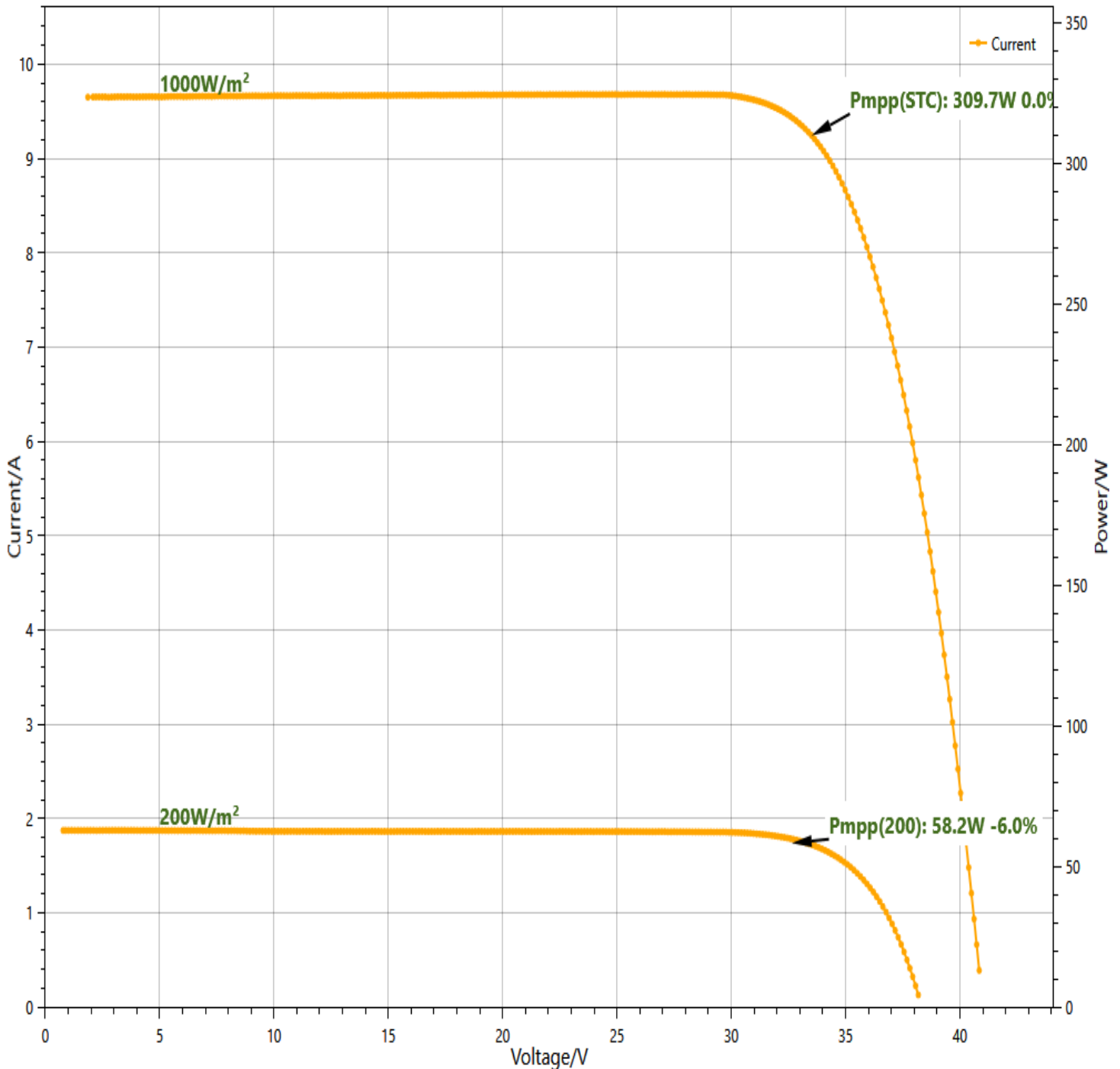
	Pmpp[W]	Imp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	309.7	9.24	33.51	9.65	41.01	1000.0	78.3
Measured	311.6	9.23	33.75	9.68	41.05	1000.2	78.4
Tmod[°C]:24.5	Tref[°C]:26.2		Tfl[°C]:26.49		Tout[°C]:n/a		T[ms]:144.5
Type:Mono	alpha[%]:0.040		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_PERC_Reference				
			FFCorr: -0.572%				

MBJ Unique ID: 600120210223140425

Module ID: 20200901085

Type ID: SaloSolar / 5BBSS305-M

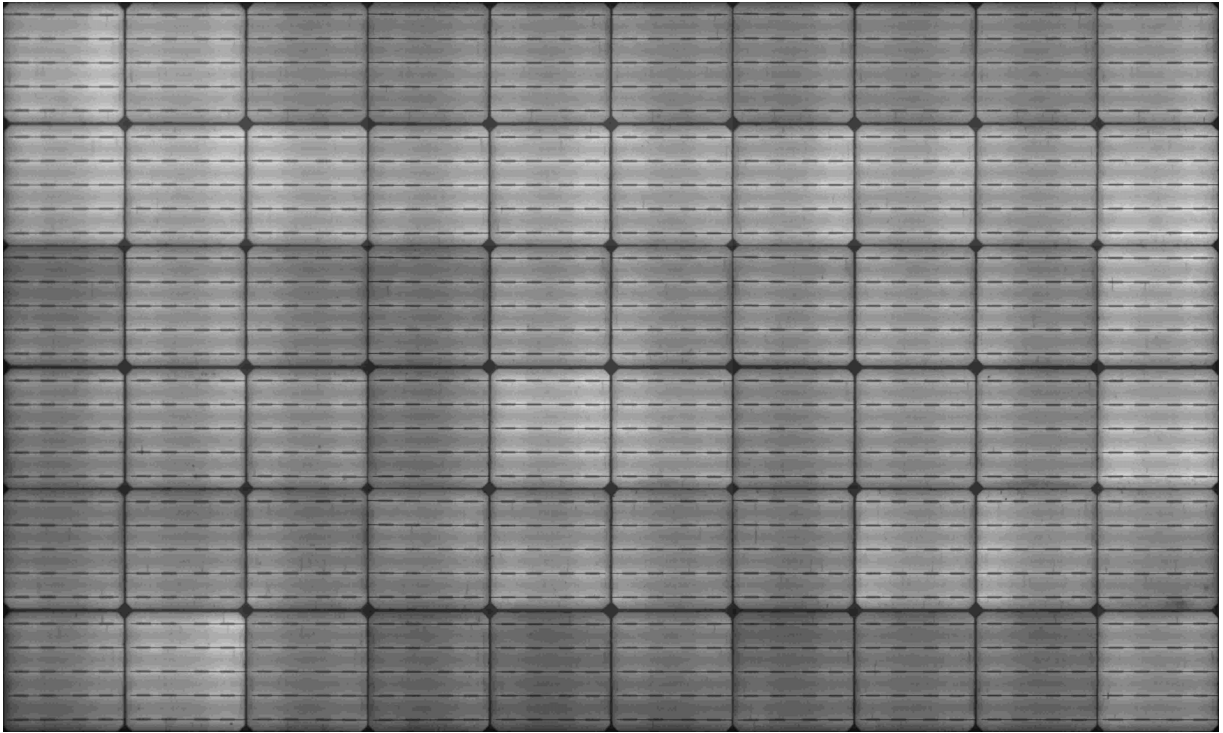
I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	58.2	309.7
Module Eff [%]	17.9	19.1
Eff Delta [%]	-6.0	0.0

Measured [W/m2] 203.4 1000.2
Module Width/Height (Portrait) [mm]:992*1636

Electroluminescence for 600120210223141424

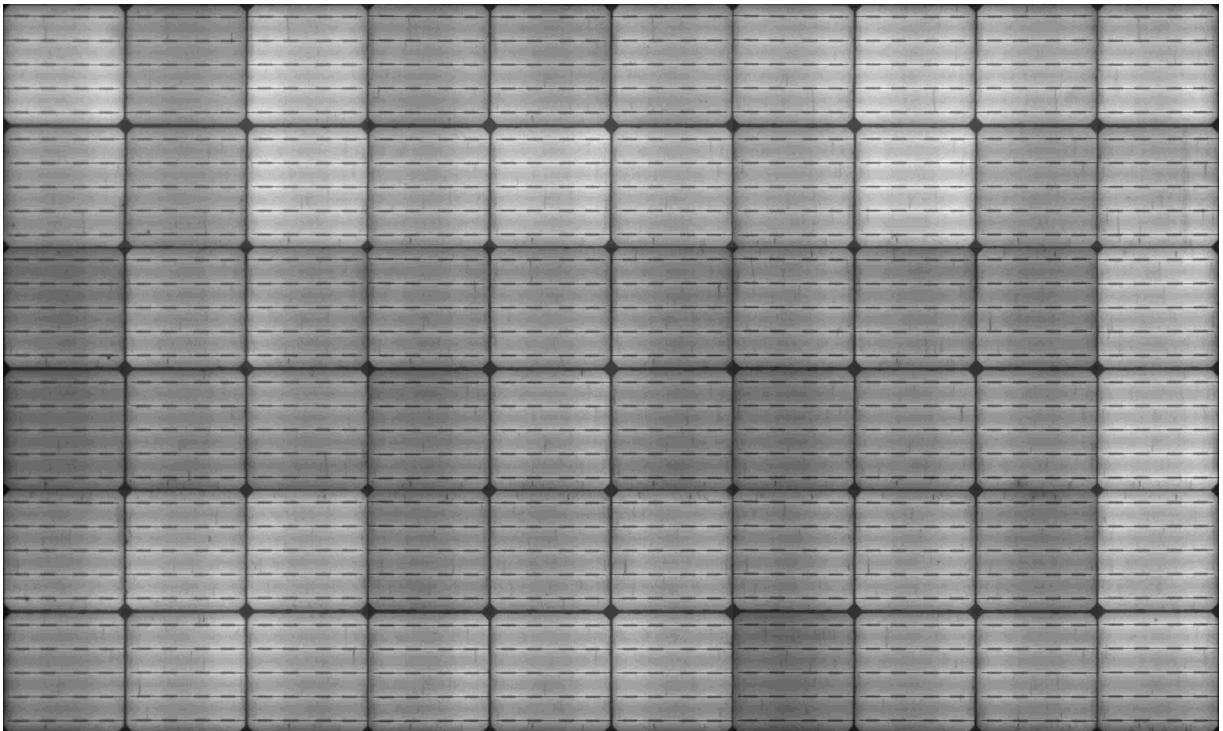


Current[A]: 12.020

Voltage[V]: 46.330

Exposure Time [ms]: 500

Electroluminescence for 600120210223135419

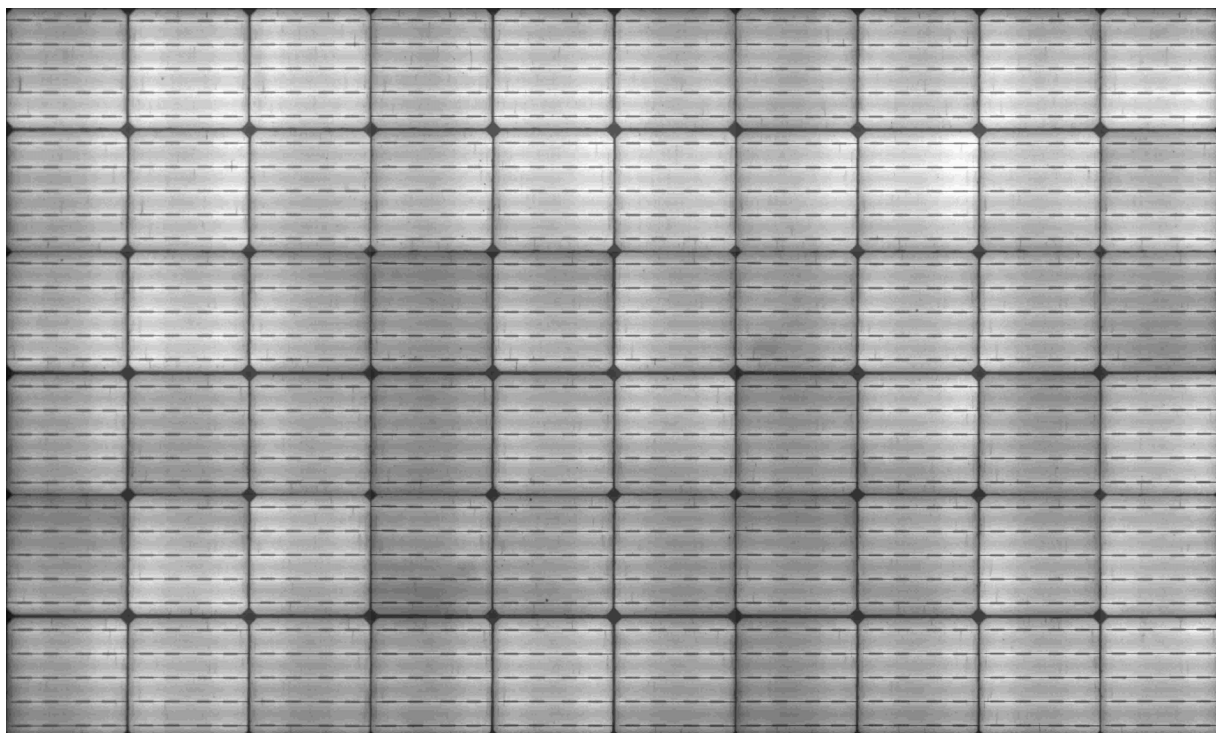


Current[A]: 12.020

Voltage[V]: 46.330

Exposure Time [ms]: 500

Electroluminescence for 600120210223140425



Current[A]: 12.020

Voltage[V]: 46.650

Exposure Time [ms]: 500

MBJ Unique ID	Module ID	Module Type/Description	Judgment
600120210223141424	20200901053	SaloSolar 5BBSS305-M	ClassC
600120210223135419	20200901084	SaloSolar 5BBSS305-M	ClassB
600120210223140425	20200901085	SaloSolar 5BBSS305-M	ClassB

MBJ Unique ID	Connection Check	Diode Test	HiPot Test	GND Bond Tests		
				Port 1	Port 2	Port 3
600120210223141424	Successfull	Successfull	n/a	n/a	n/a	n/a
600120210223135419	Successfull	Successfull	n/a	n/a	n/a	n/a
600120210223140425	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[%]
600120210223141424	304.7	9.20	33.13	9.62	40.76	1000.0	77.7
600120210223135419	306.9	9.21	33.33	9.64	40.87	1000.0	77.9
600120210223140425	309.7	9.24	33.51	9.65	41.01	1000.0	78.3

MBJ Unique ID	Red	Yellow	Green	Blue	White
600120210223141424	0	0	0	0	60
600120210223135419	0	0	0	0	60
600120210223140425	0	0	0	0	60