

Testcenter Serial: 6001_Zora

Job ID: Scan6_01092020

Address: TUAS / Joukahaisenkatu 7

Country / City: FI 20520 Turku

Number of Modules: 10

Module Type/Description: ZNshinesolar ZXM6-HLD120-305/M

PMPP NOM[W]: 305W

Comments:

The study was performed by TUAS MOBILE SOLAR Lab, calibrated 28.2.2020 by MBJ Services GmbH. The reference used for the characterization was 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 type is 2.5% with a probability of 95%. By the modules nominal Power of 305 Wp this means a range from 297...313 Wp.

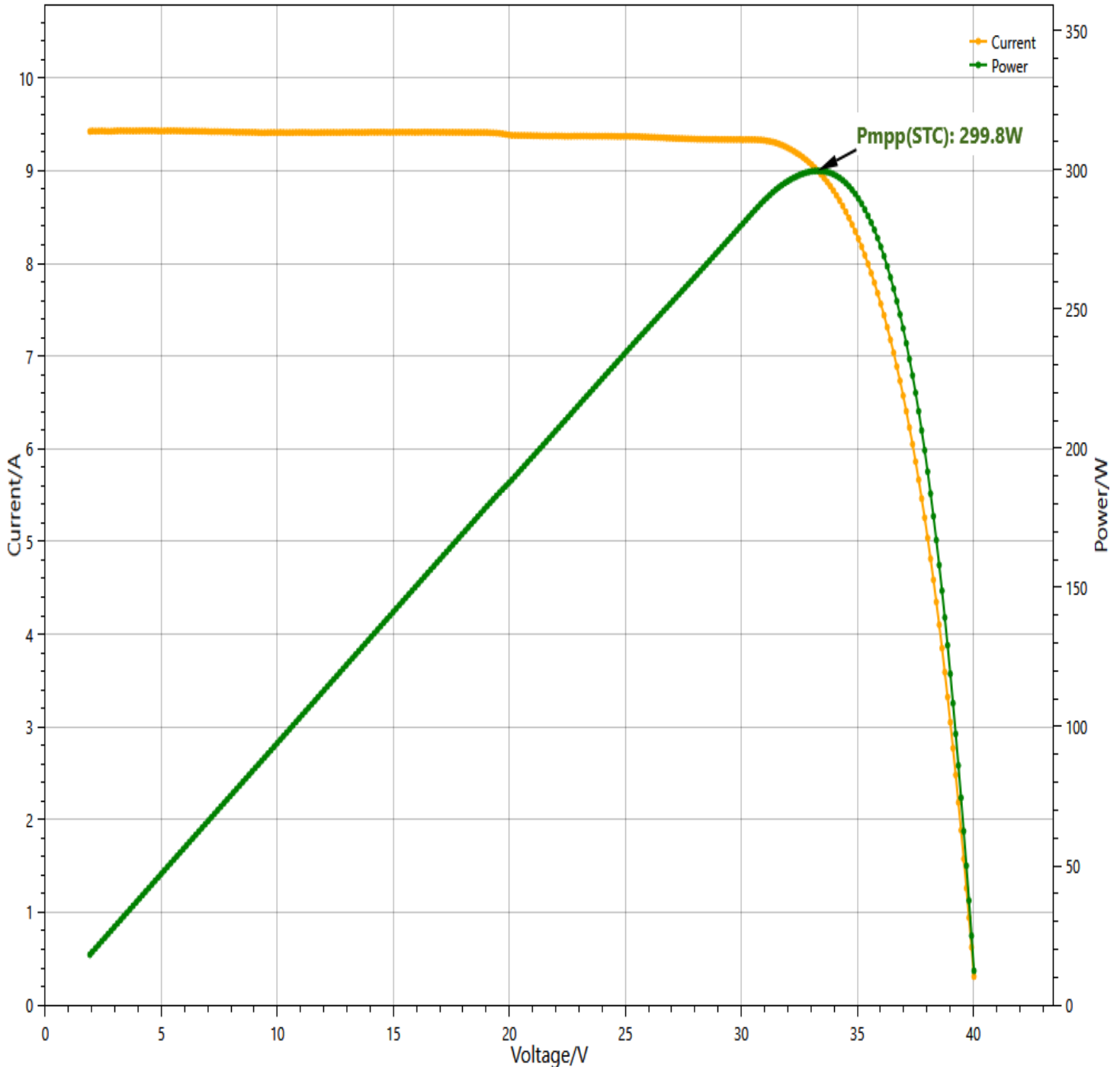
The average power of the measured modules was 300.61 Wp, with a maximum of 302,2 Wp and a minimum of 298.8 Wp. In the EL images of modules no signs of cracking or mismatch were found.

MBJ Unique ID: 600120200901105513

Module ID: ZX75243522300708

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



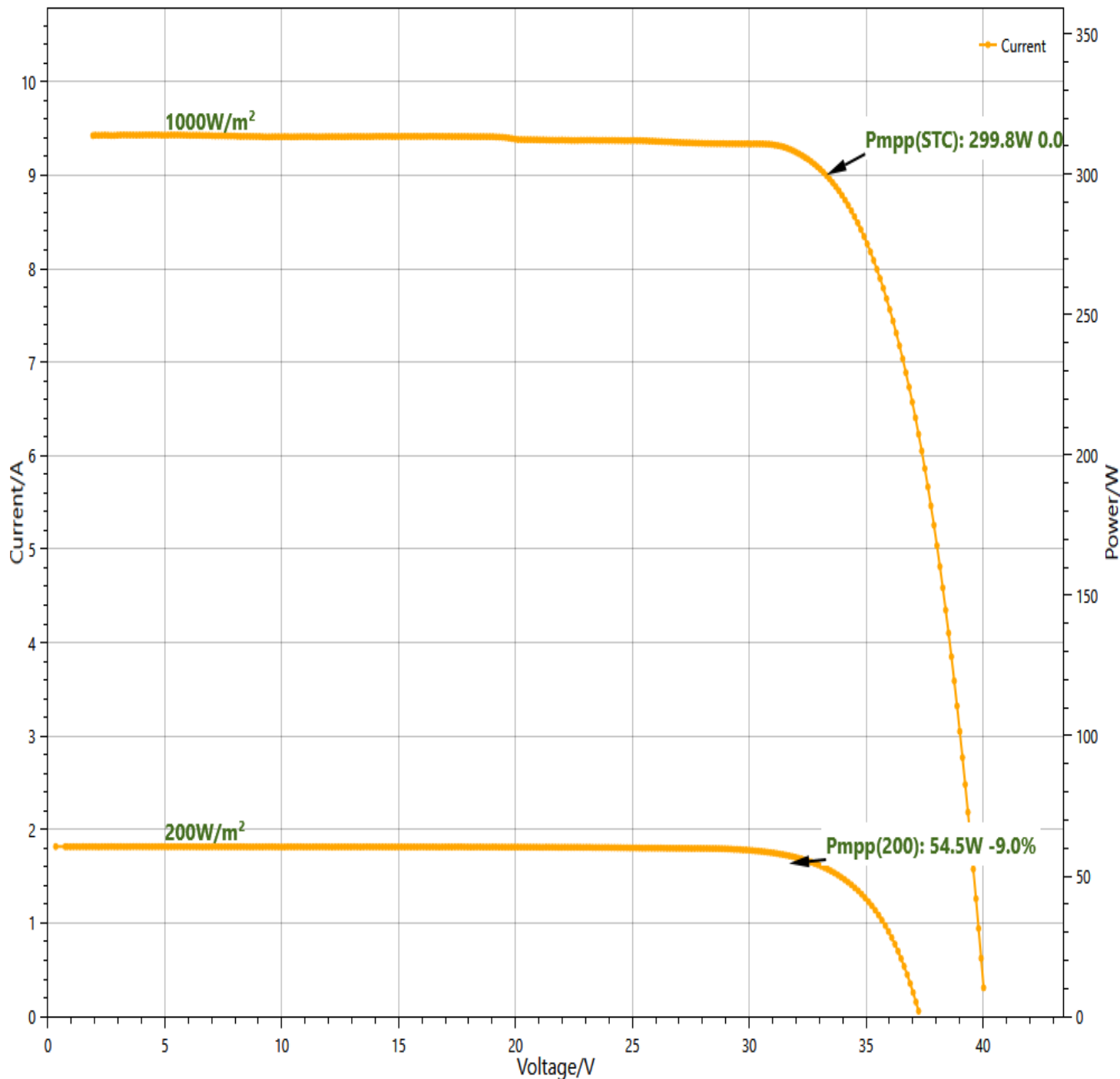
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	299.8	9.00	33.29	9.43	40.13	1000.0	79.2
Measured	302.6	9.01	33.58	9.49	40.12	1002.3	79.5
Tmod[°C]:25.1	Tref[°C]:25.8		Tfl[°C]:26.32		Tout[°C]:n/a		T[ms]:143.5
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901105513

Module ID: ZX75243522300708

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



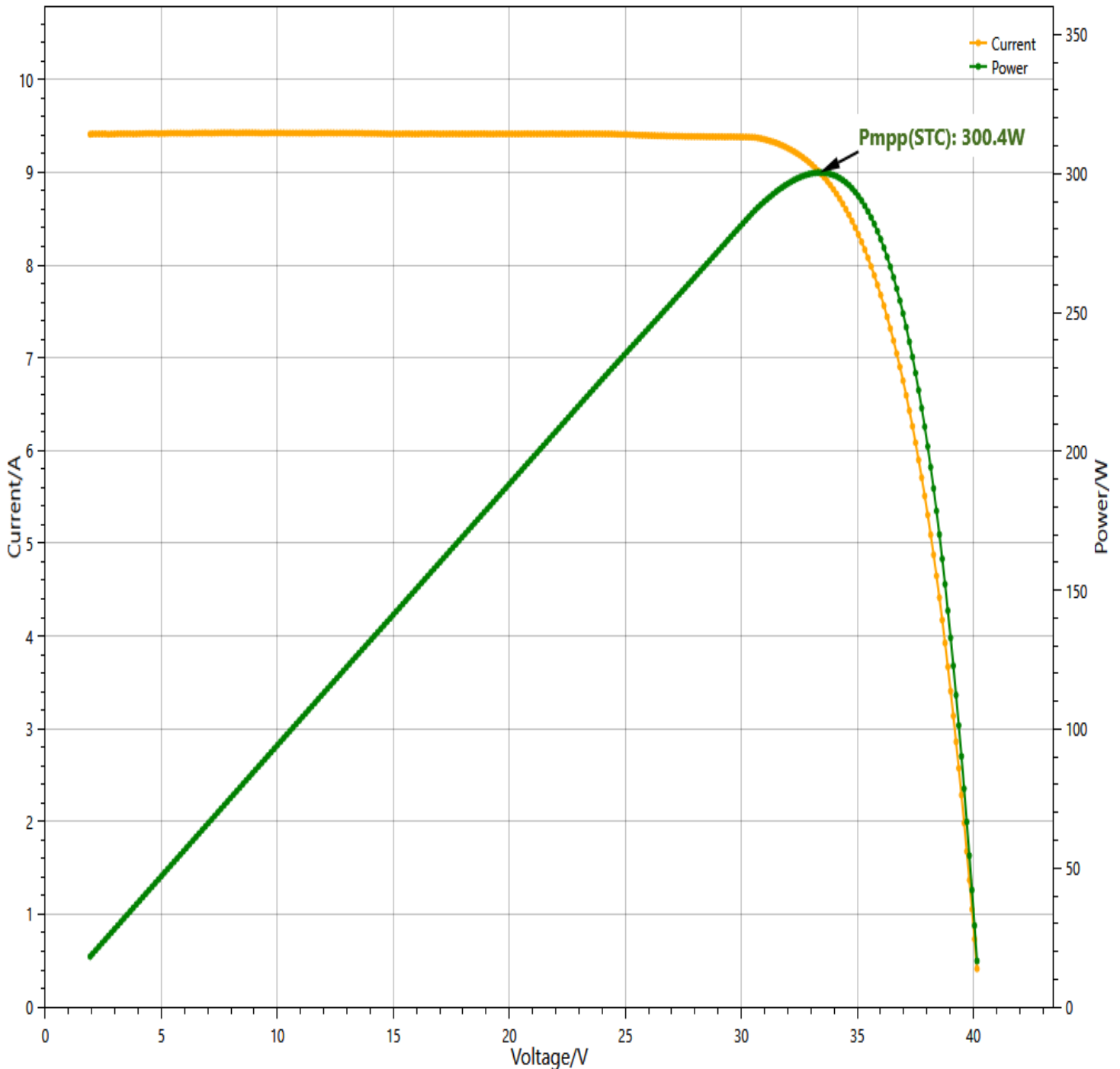
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.5	299.8
Module Eff [%]	16.4	18.0
Eff Delta [%]	-9.0	0.0
Measured [W/m2]	203.8	1002.3
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901114336

Module ID: ZX75243522300796

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



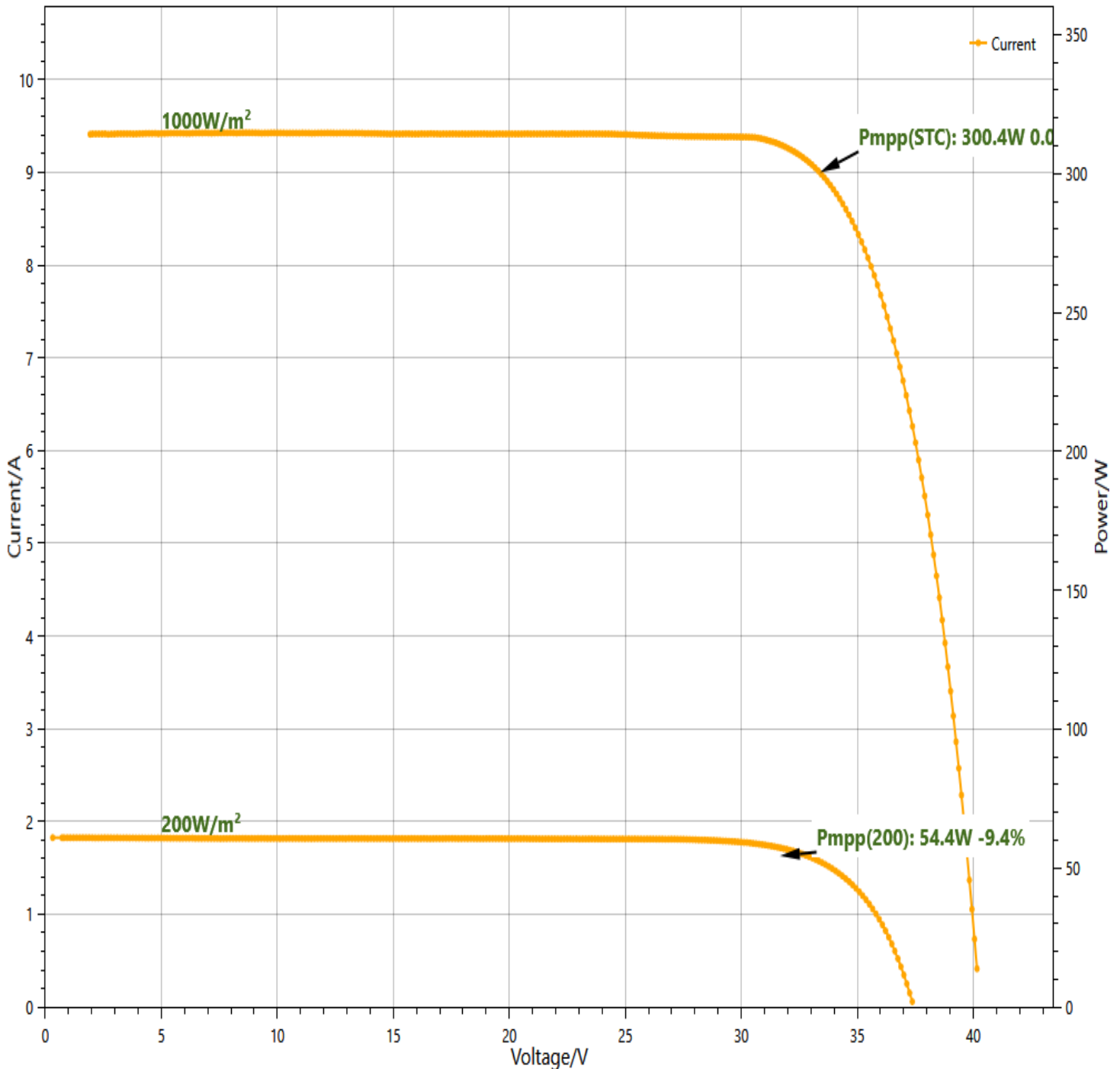
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	300.4	9.00	33.38	9.41	40.30	1000.0	79.2
Measured	303.4	9.01	33.69	9.47	40.31	1002.3	79.5
Tmod[°C]:24.9	Tref[°C]:26.1		Tfl[°C]:26.61		Tout[°C]:n/a		T[ms]:144.0
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901114336

Module ID: ZX75243522300796

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



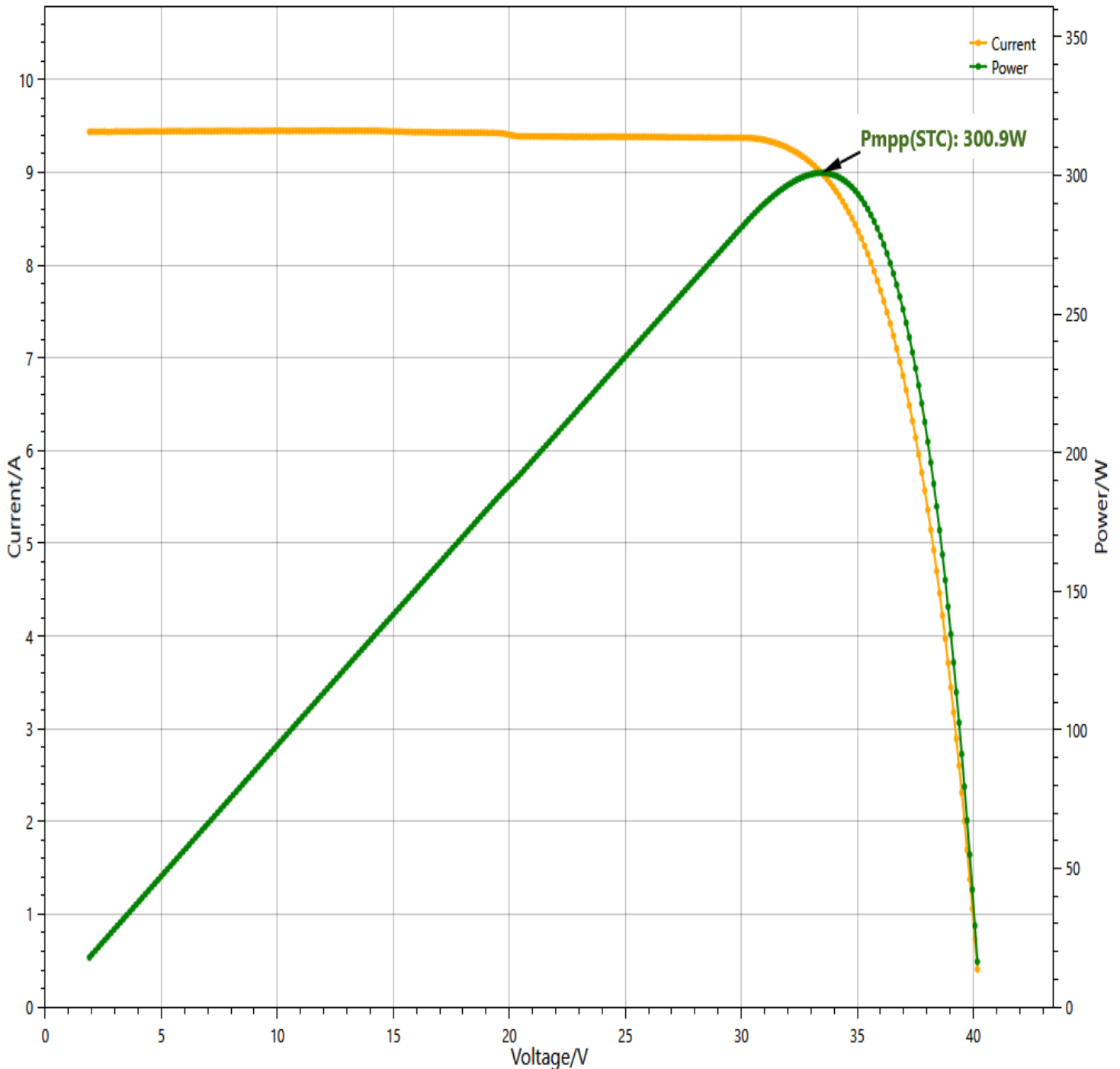
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.4	300.4
Module Eff [%]	16.4	18.1
Eff Delta [%]	-9.4	0.0
Measured [W/m2]	203.9	1002.3
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901115218

Module ID: ZX75243522300751

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



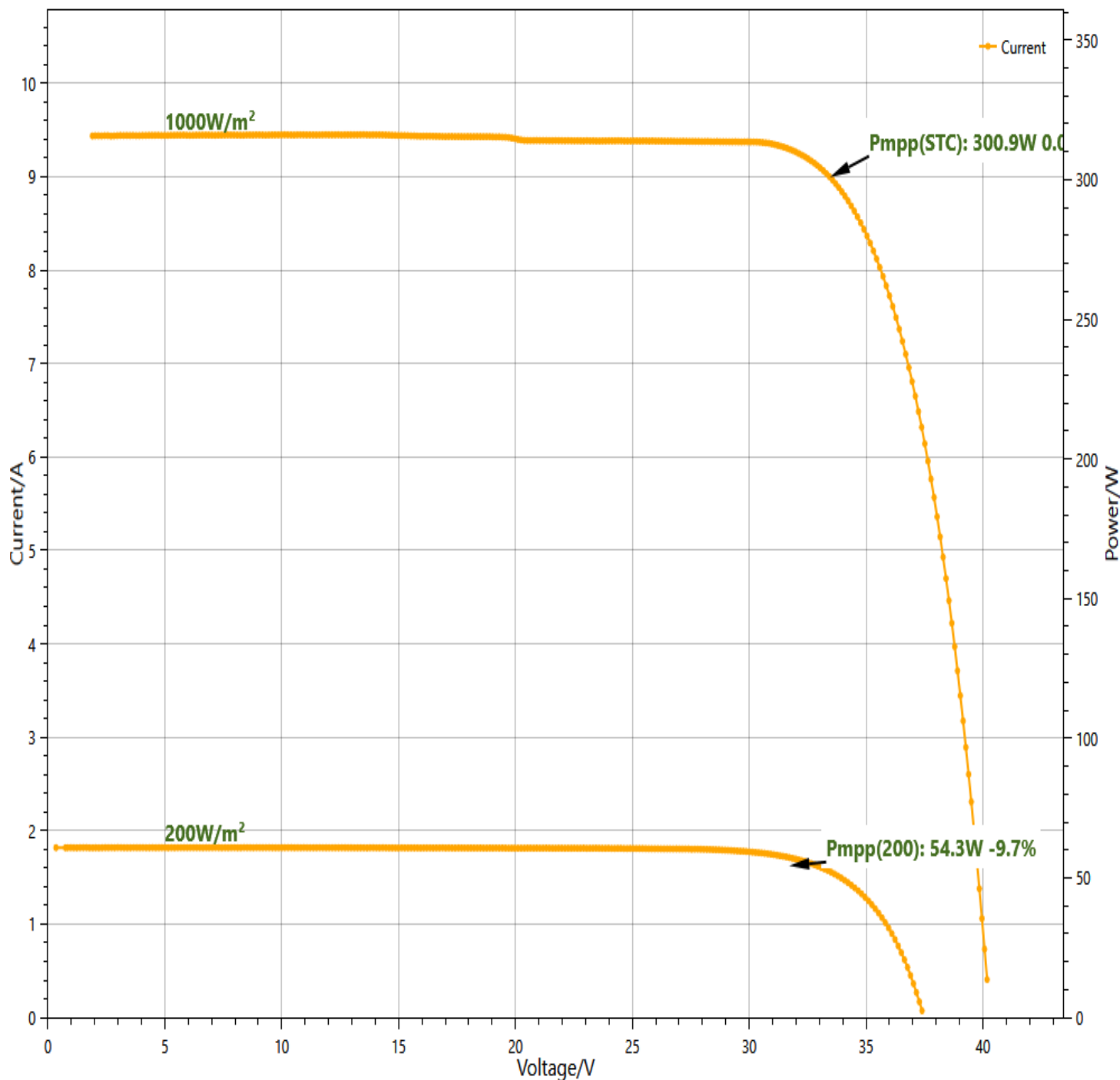
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	300.9	9.00	33.45	9.44	40.31	1000.0	79.1
Measured	303.7	9.00	33.73	9.49	40.30	1002.2	79.4
Tmod[°C]:25.1	Tref[°C]:26.0		Tfl[°C]:26.16		Tout[°C]:n/a		T[ms]:144.0
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901115218

Module ID: ZX75243522300751

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



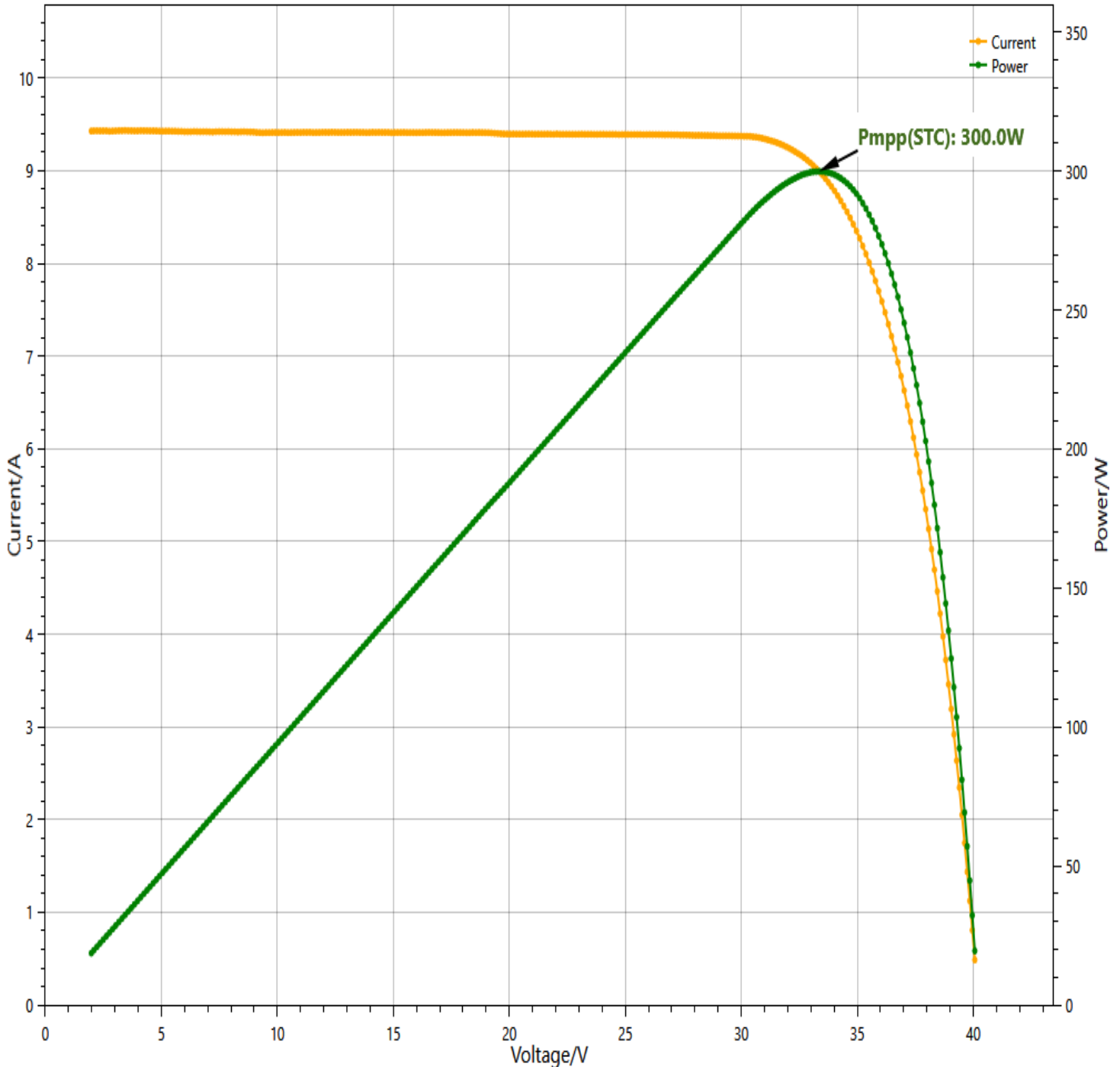
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.3	300.9
Module Eff [%]	16.4	18.1
Eff Delta [%]	-9.7	0.0
Measured [W/m2]	203.9	1002.2
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901120244

Module ID: ZX75243522300713

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



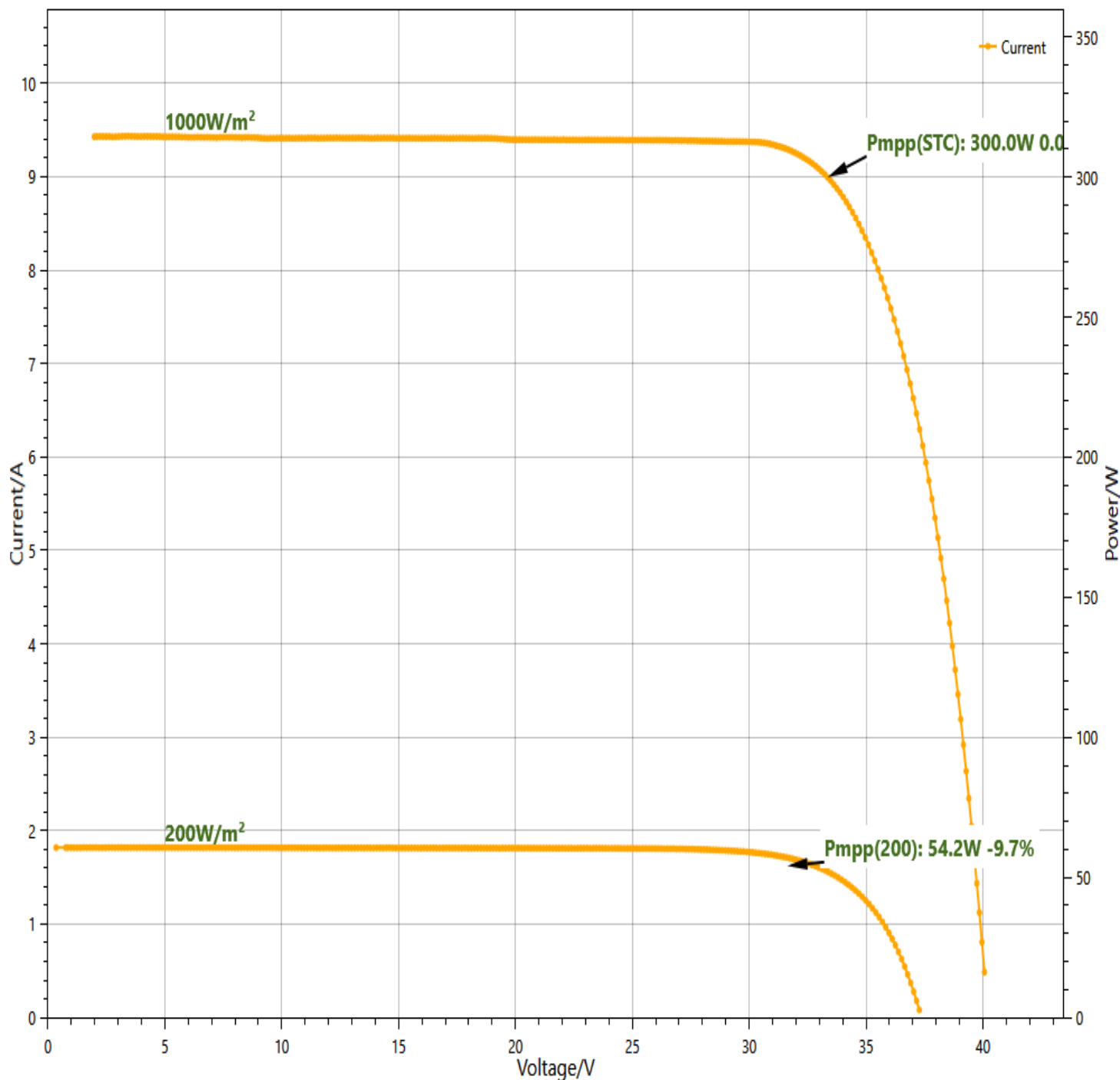
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	300.0	8.99	33.35	9.44	40.23	1000.0	79.0
Measured	302.6	9.00	33.62	9.49	40.21	1002.0	79.3
Tmod[°C]:25.2	Tref[°C]:26.0		Tfl[°C]:26.00		Tout[°C]:n/a		T[ms]:143.5
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901120244

Module ID: ZX75243522300713

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



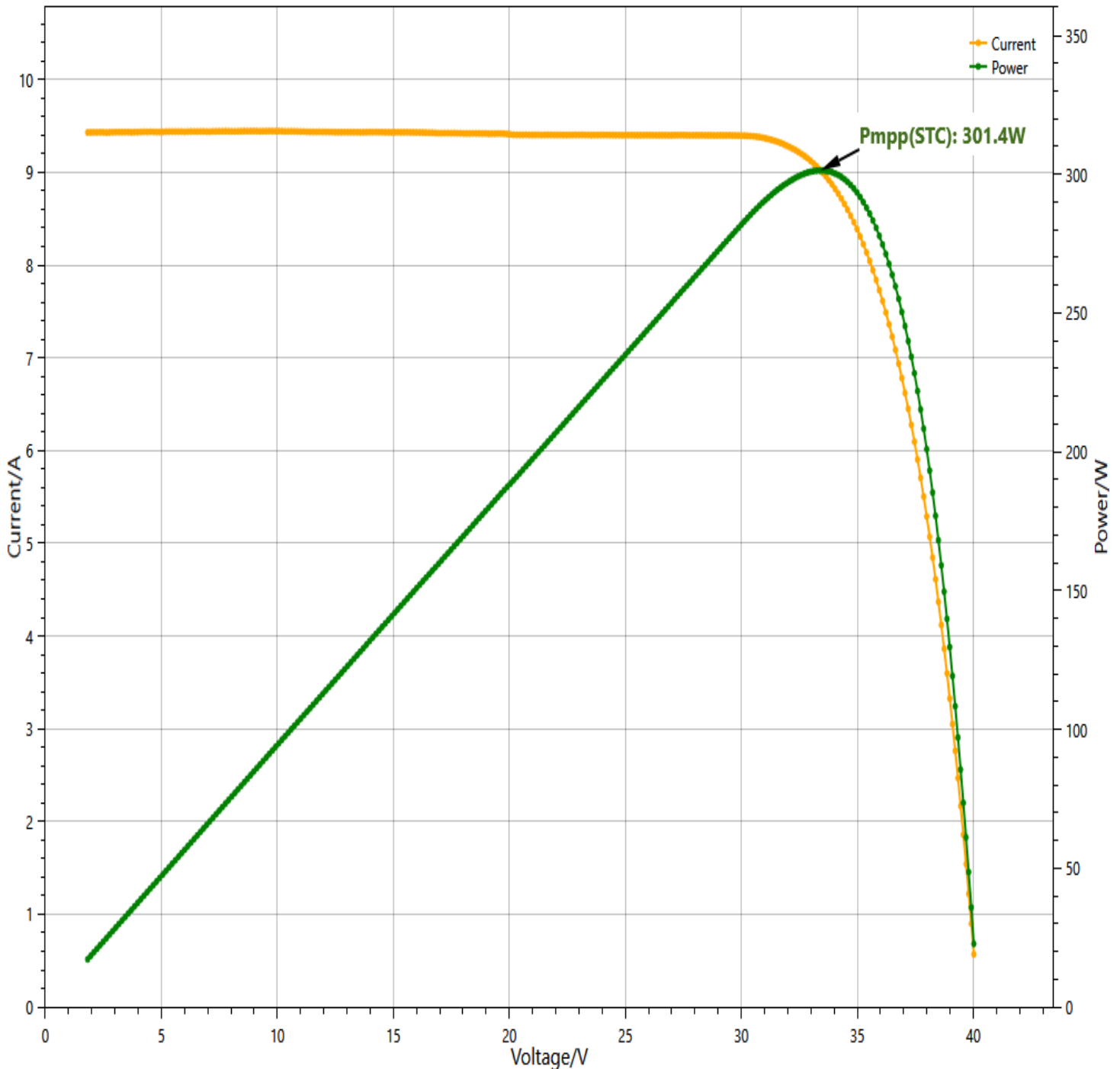
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.2	300.0
Module Eff [%]	16.3	18.1
Eff Delta [%]	-9.7	0.0
Measured [W/m2]	203.8	1002.0
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901121153

Module ID: ZX75243522300714

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



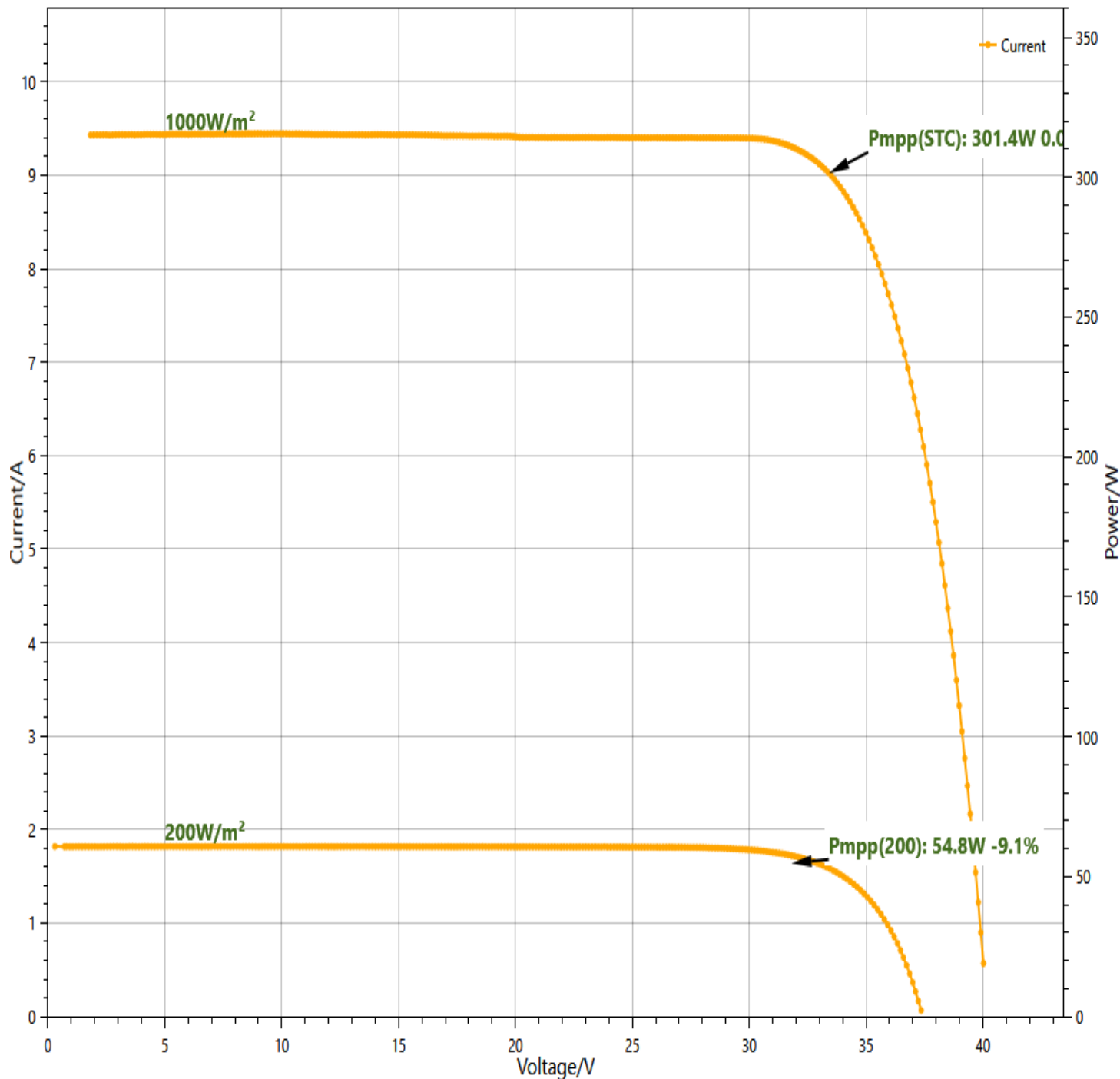
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	301.4	9.02	33.41	9.43	40.21	1000.0	79.5
Measured	304.5	9.03	33.73	9.48	40.23	1002.0	79.8
Tmod[°C]:24.8	Tref[°C]:26.0		Tfl[°C]:25.97		Tout[°C]:n/a		T[ms]:143.5
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901121153

Module ID: ZX75243522300714

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



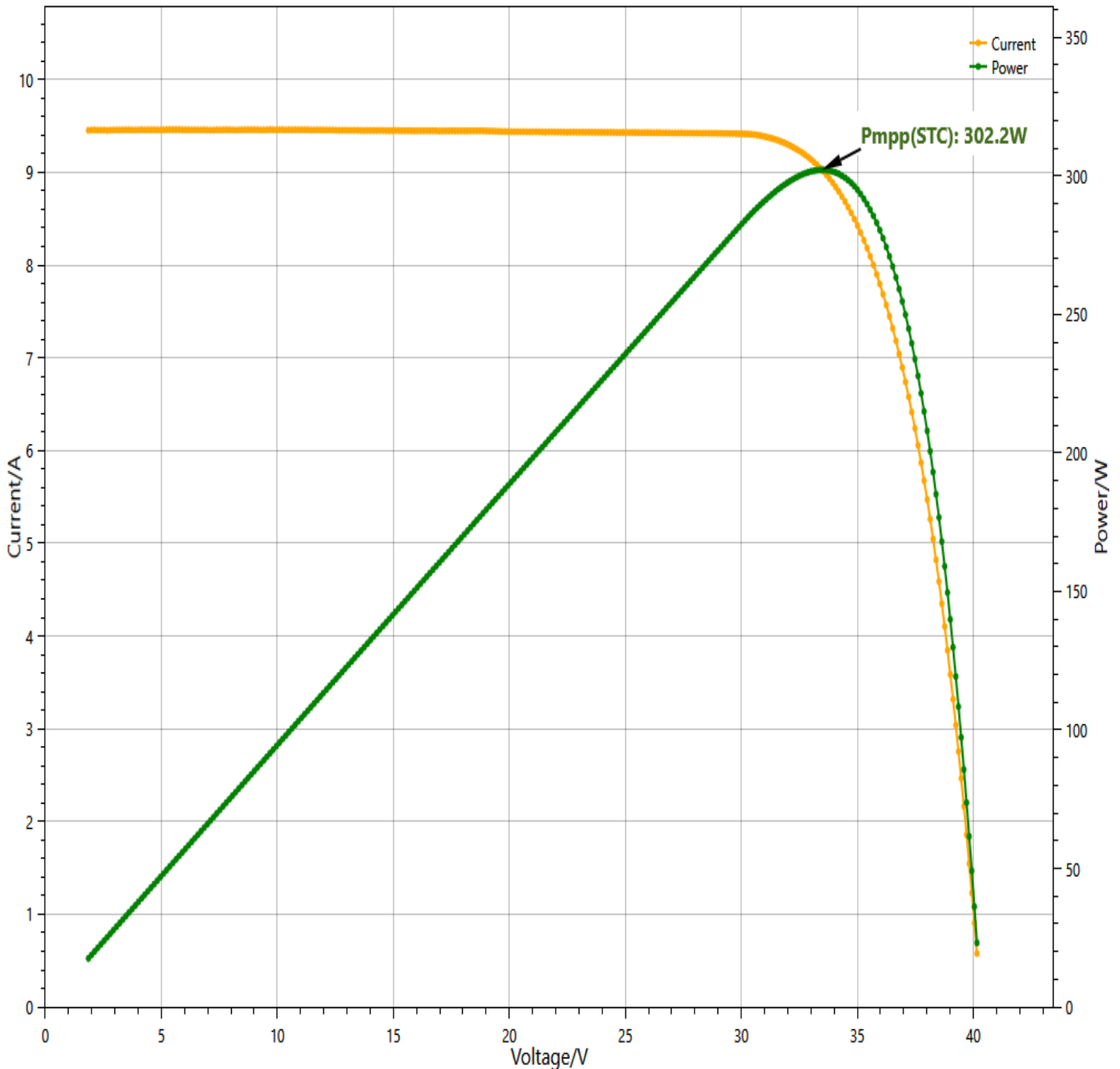
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.8	301.4
Module Eff [%]	16.5	18.1
Eff Delta [%]	-9.1	0.0
Measured [W/m2]	203.8	1002.0
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901122125

Module ID: ZX75243522300621

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



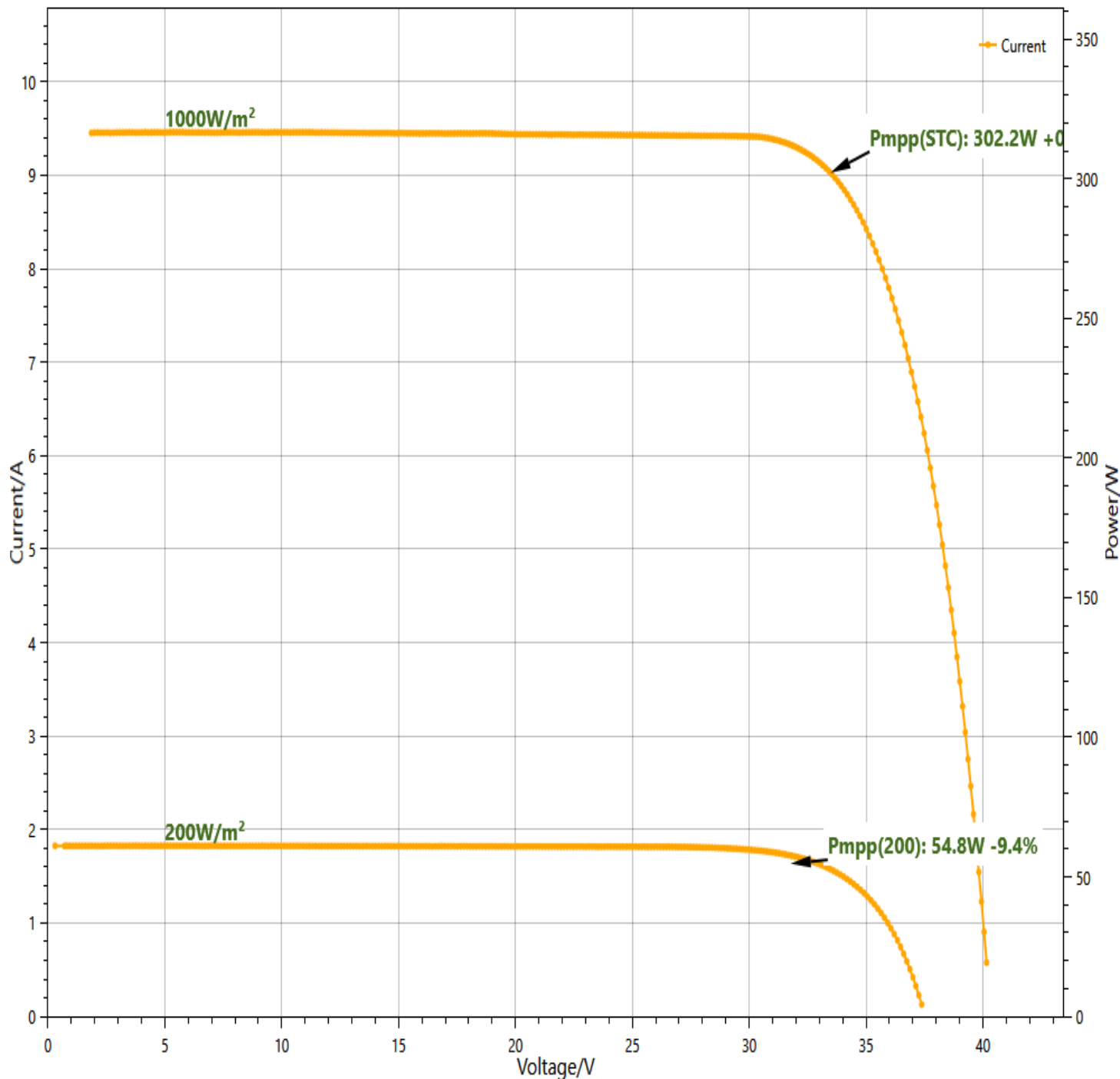
	Pmpp[W]	Imp[A]	Ump[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	302.2	9.03	33.47	9.45	40.35	1000.0	79.2
Measured	305.3	9.03	33.80	9.51	40.37	1002.1	79.5
Tmod[°C]:24.8	Tref[°C]:26.0		Tfl[°C]:25.89		Tout[°C]:n/a		T[ms]:144.0
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901122125

Module ID: ZX75243522300621

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



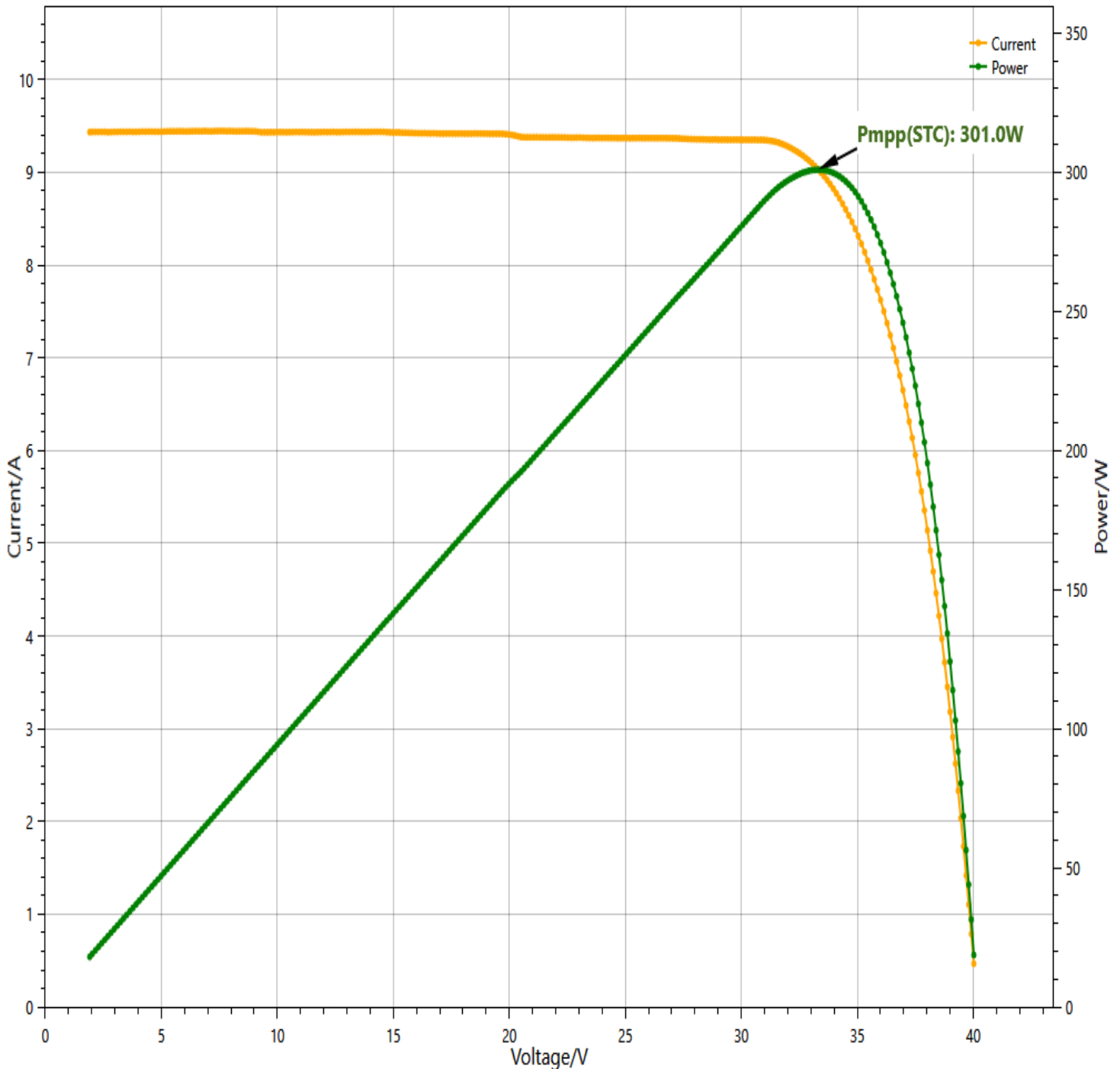
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.8	302.2
Module Eff [%]	16.5	18.2
Eff Delta [%]	-9.4	0.0
Measured [W/m2]	203.8	1002.1
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901123153

Module ID: ZX75243522300827

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



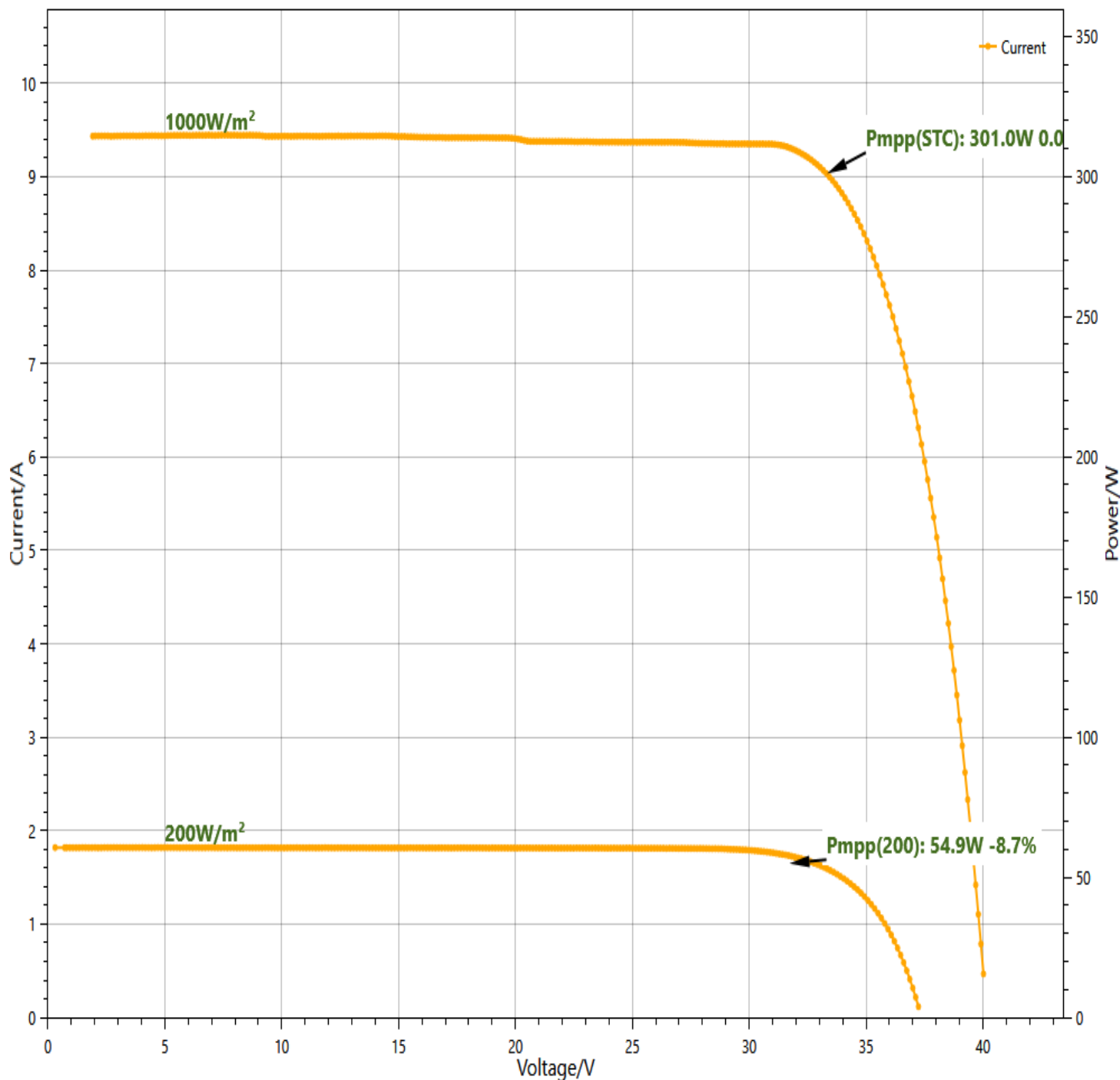
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	301.0	9.03	33.32	9.43	40.18	1000.0	79.4
Measured	304.1	9.04	33.64	9.49	40.20	1002.3	79.7
Tmod[°C]:24.8	Tref[°C]:26.0		Tfl[°C]:25.80		Tout[°C]:n/a		T[ms]:143.5
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901123153

Module ID: ZX75243522300827

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



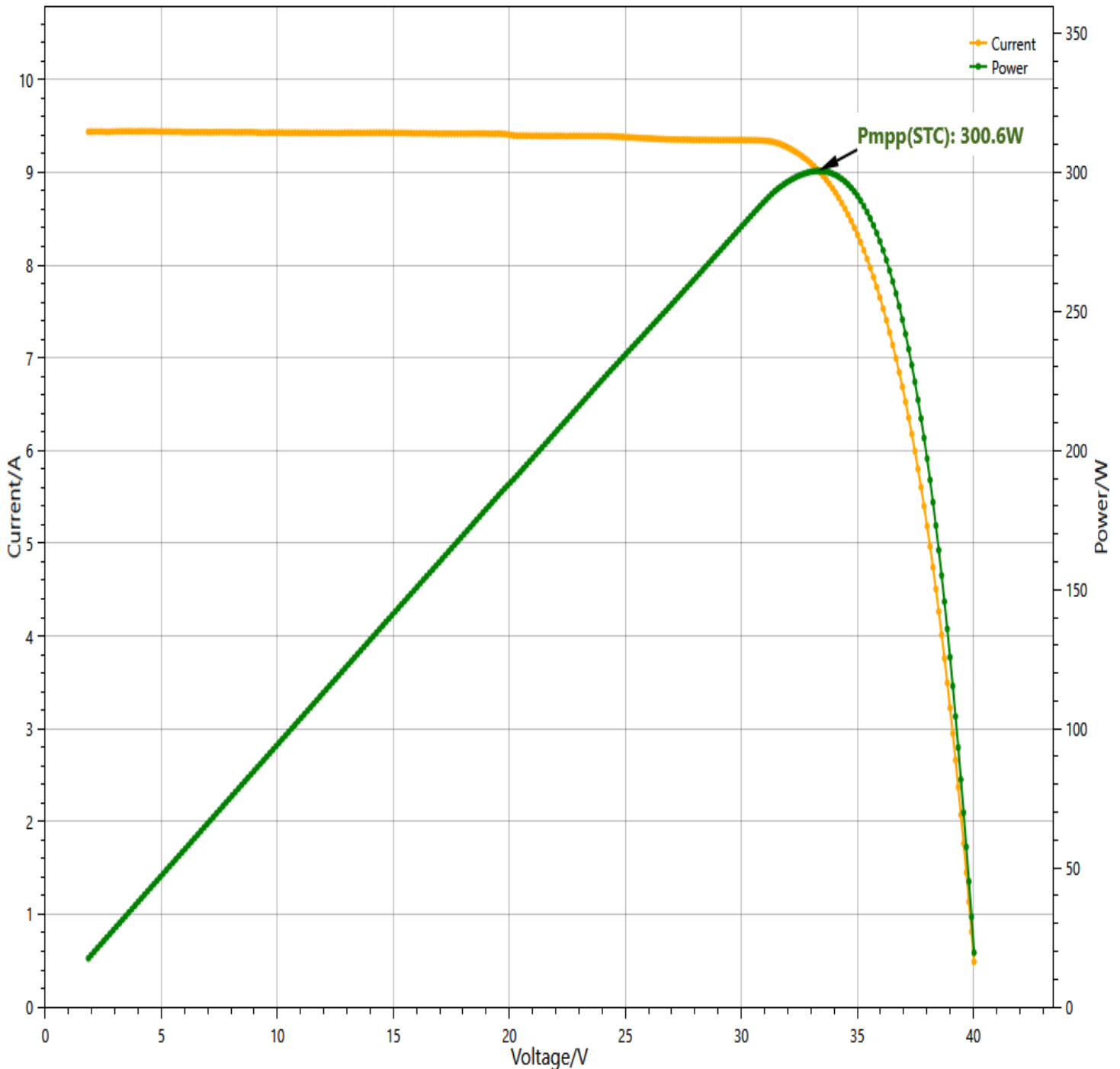
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.9	301.0
Module Eff [%]	16.5	18.1
Eff Delta [%]	-8.7	0.0
Measured [W/m2]	203.9	1002.3
Module Width/Height (Portrait) [mm]:	992*1675	

MBJ Unique ID: 600120200901124225

Module ID: ZX75243522300858

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



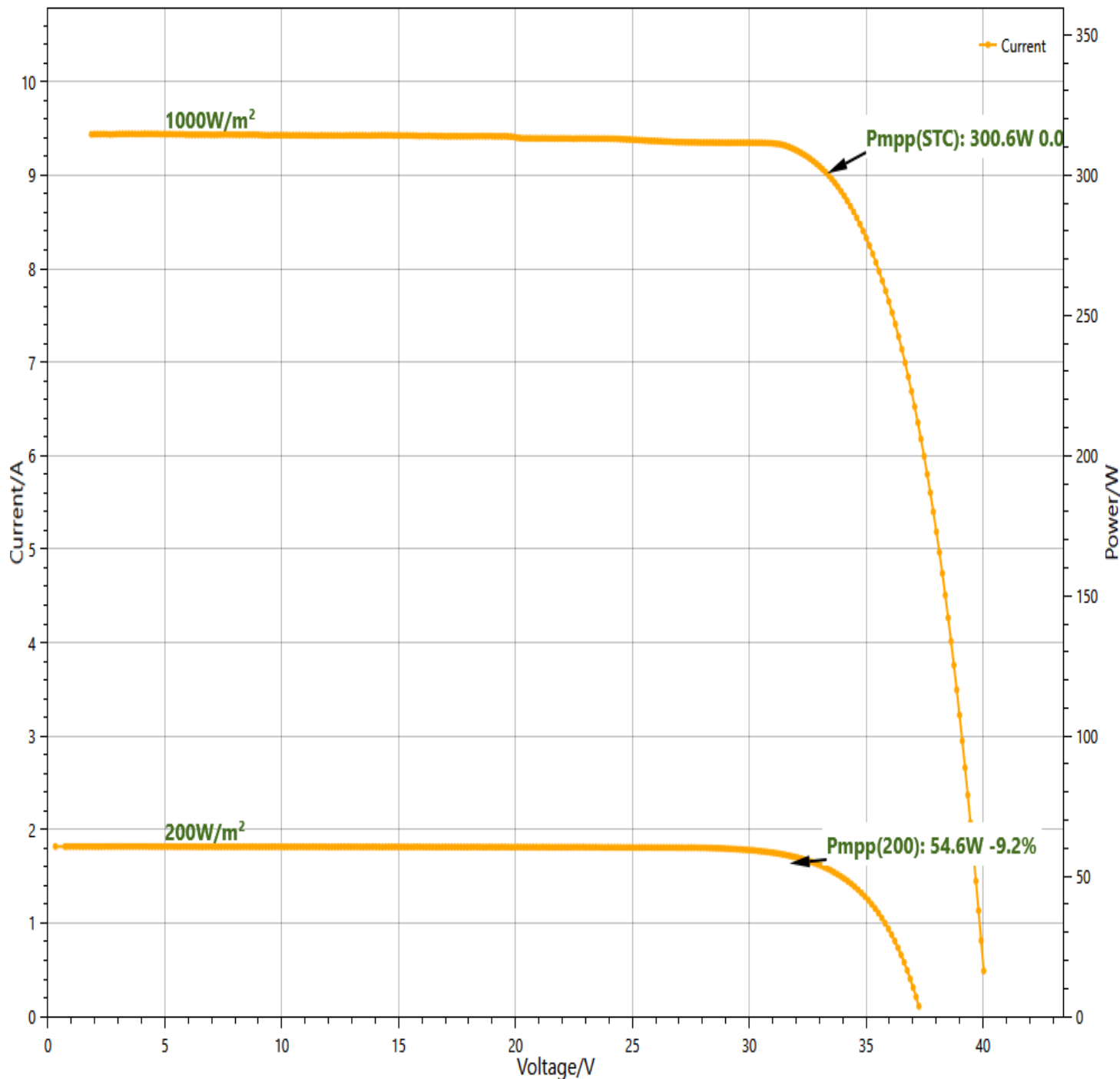
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	300.6	9.02	33.33	9.44	40.20	1000.0	79.2
Measured	303.7	9.03	33.63	9.50	40.21	1002.5	79.5
Tmod[°C]:24.9	Tref[°C]:25.9		Tfl[°C]:25.76		Tout[°C]:n/a		T[ms]:143.5
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901124225

Module ID: ZX75243522300858

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



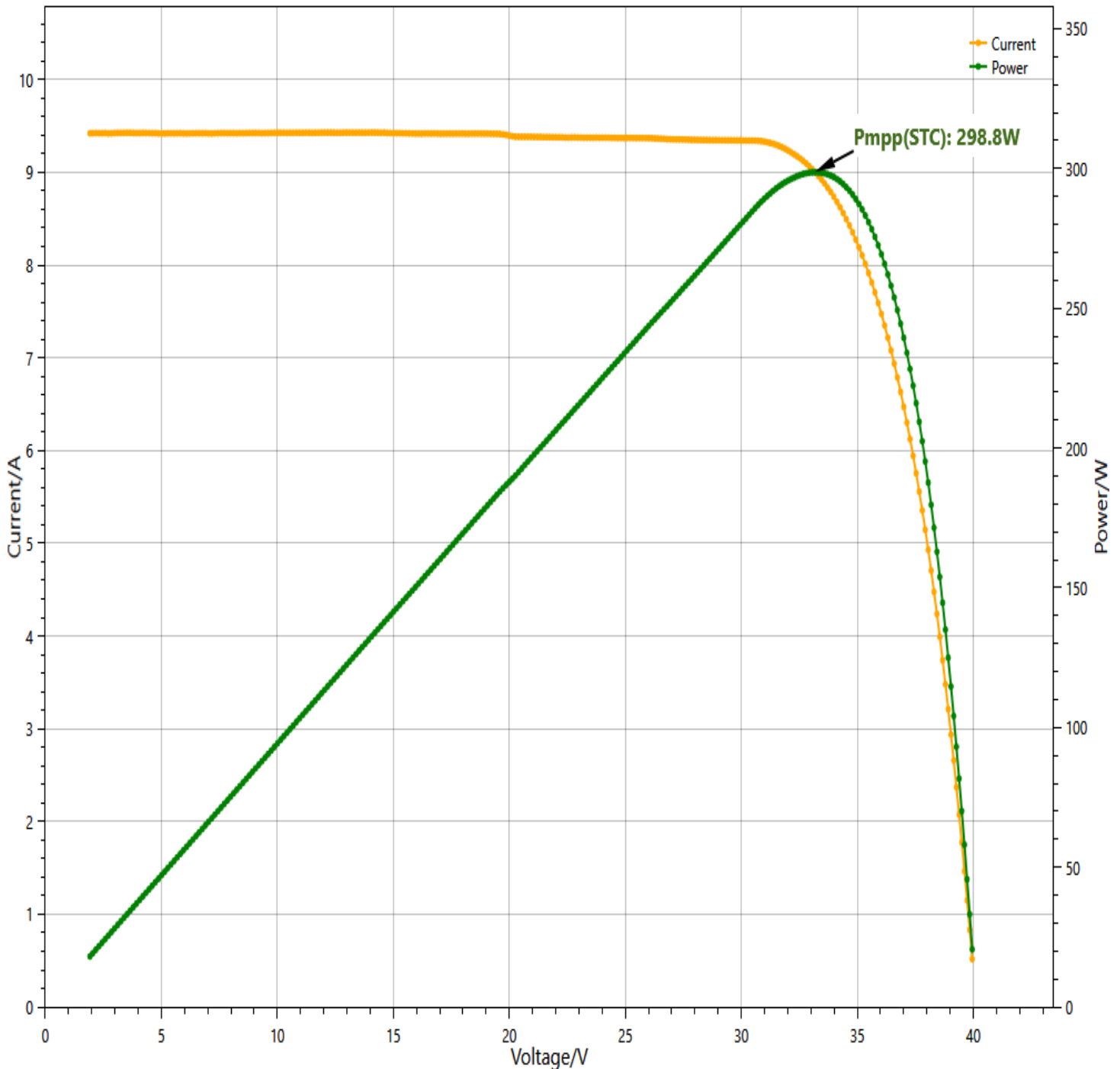
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.6	300.6
Module Eff [%]	16.4	18.1
Eff Delta [%]	-9.2	0.0
Measured [W/m2]	203.9	1002.5
Module Width/Height (Portrait) [mm]:	992*1675	

MBJ Unique ID: 600120200901132258

Module ID: ZX75243522300954

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



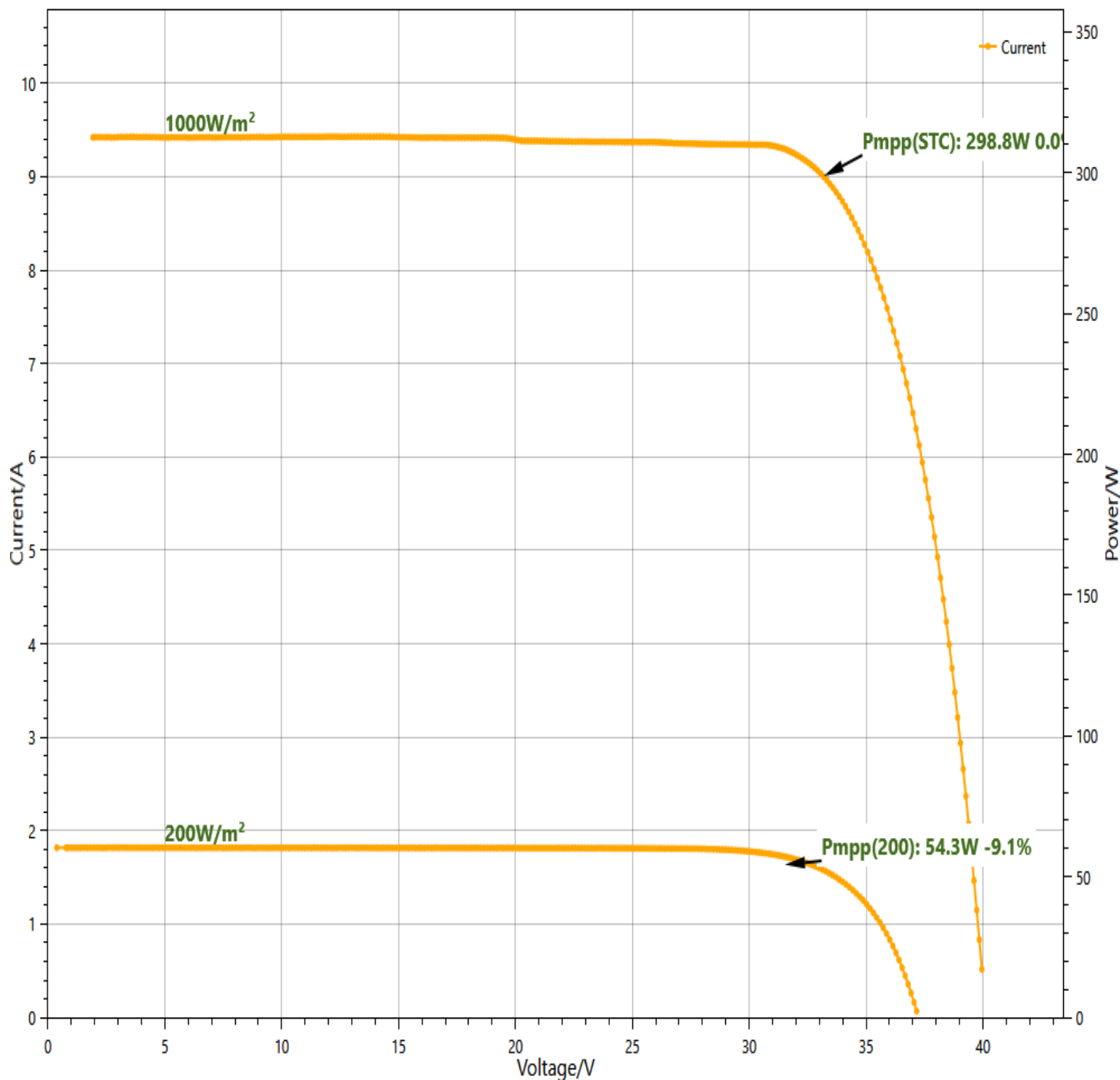
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	298.8	9.01	33.18	9.43	40.13	1000.0	79.0
Measured	301.2	9.01	33.41	9.48	40.08	1002.3	79.2
Tmod[°C]:25.4	Tref[°C]:26.2		Tfl[°C]:26.17		Tout[°C]:n/a		T[ms]:143.0
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p			Reference: ISE_Mono_Reference				
			FFCorr: -0.899%				

MBJ Unique ID: 600120200901132258

Module ID: ZX75243522300954

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



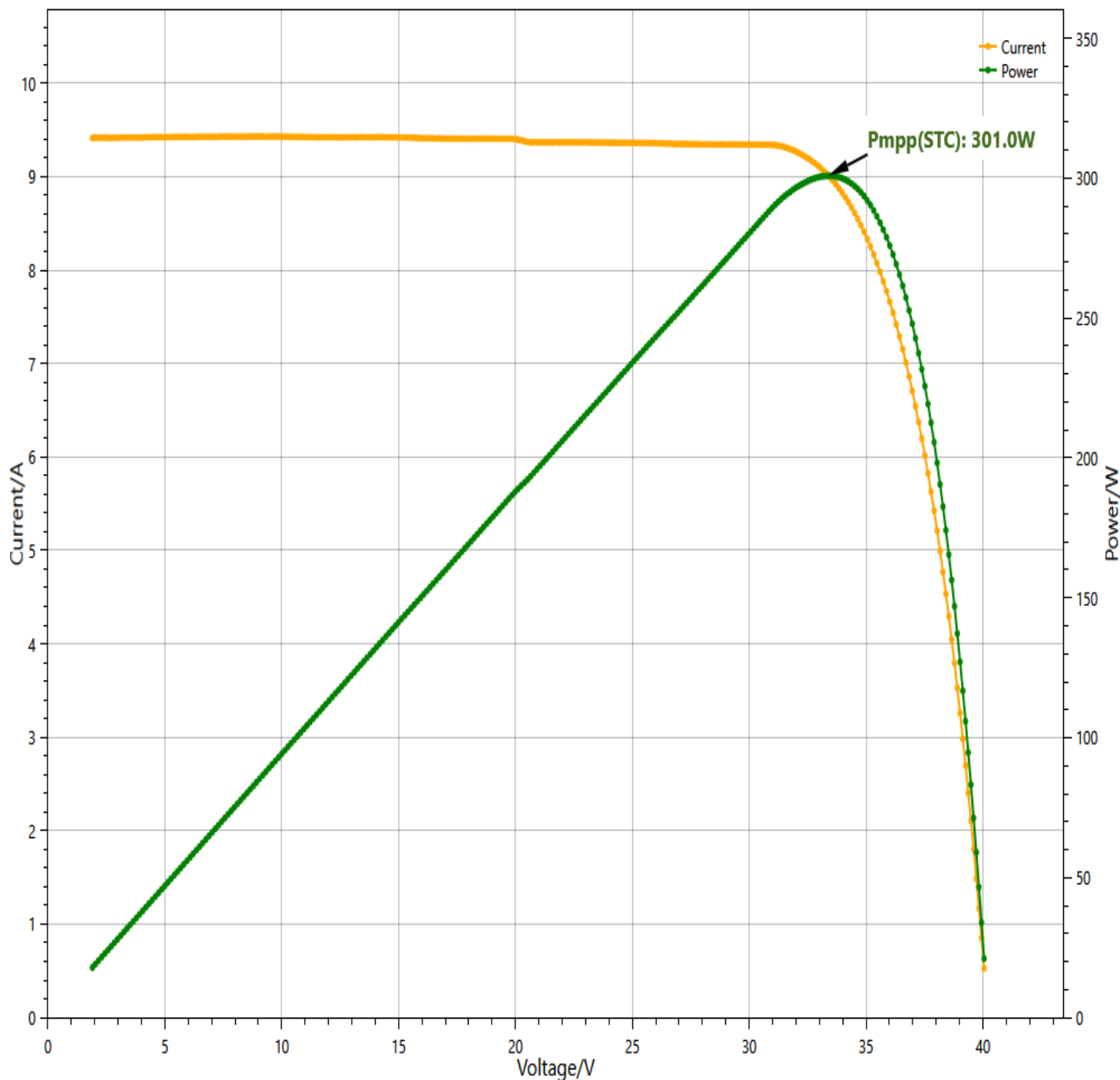
IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.3	298.8
Module Eff [%]	16.3	18.0
Eff Delta [%]	-9.1	0.0
Measured [W/m2]	203.9	1002.3
Module Width/Height (Portrait) [mm]:992*1675		

MBJ Unique ID: 600120200901133524

Module ID: ZX75243522300842

Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



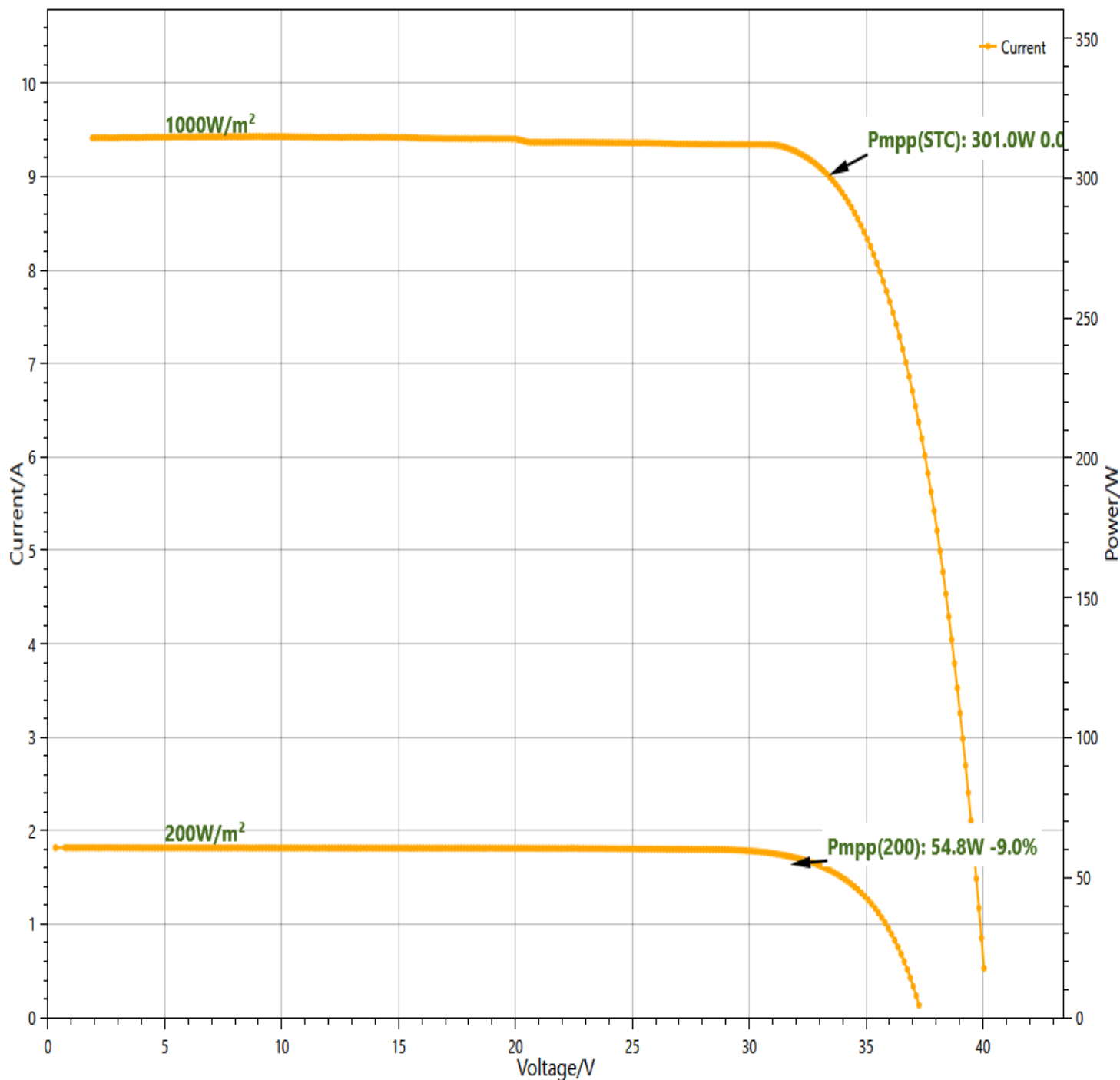
	Pmpp[W]	Impp[A]	Umpp[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
IEC60891 STC	301.0	9.01	33.39	9.41	40.22	1000.0	79.5
Measured	303.8	9.02	33.68	9.47	40.22	1002.1	79.8
Tmod[°C]:25.0	Tref[°C]:26.2		Tfl[°C]:26.12		Tout[°C]:n/a		T[ms]:143.5
Type:Mono	alpha[%]:0.050		beta[%]:-0.290				
IEC aICF:0.060	IEC Rs[Ohm]:0.01		kappa[mOhm/K]:3.00				
Software:748p	Reference: ISE_Mono_Reference						
	FFCorr: -0.899%						

MBJ Unique ID: 600120200901133524

Module ID: ZX75243522300842

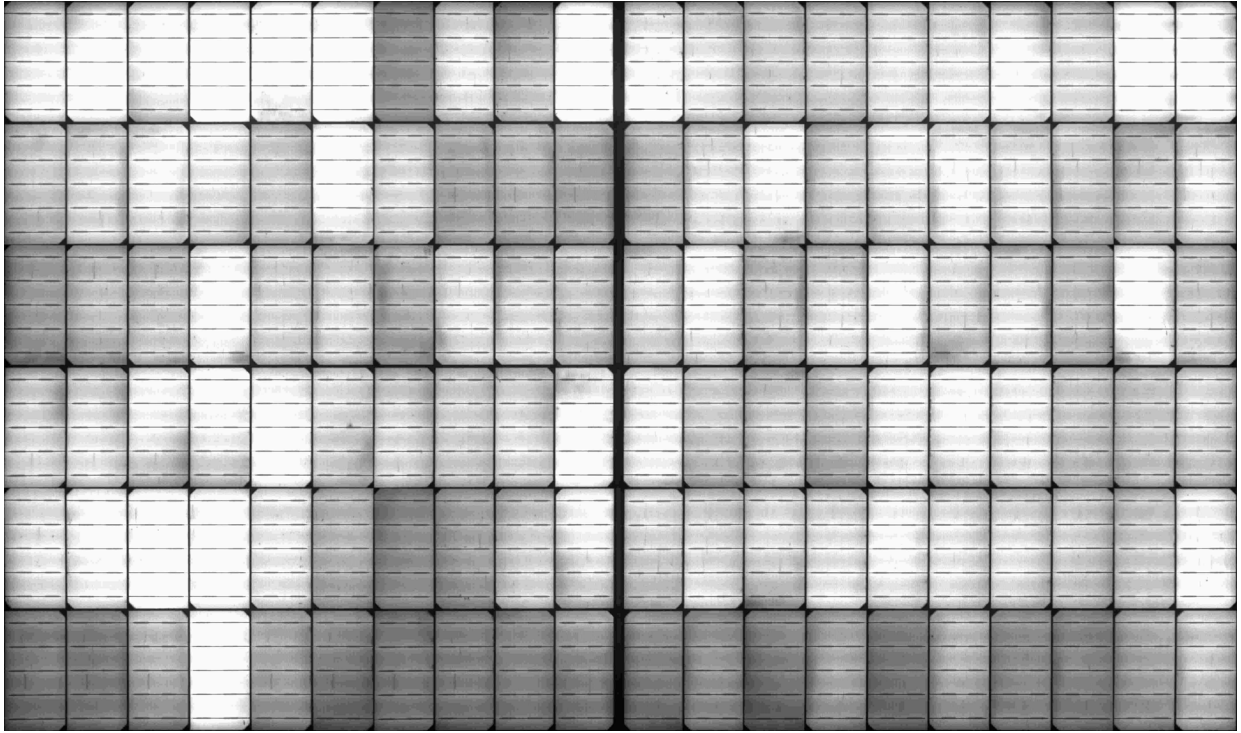
Type ID: ZNshinesolar / ZXM6-HLD120-305/M

I-V Curve



IEC60891 Irr [W/m2]	200	1000
IEC60891 Pmpp [W]	54.8	301.0
Module Eff [%]	16.5	18.1
Eff Delta [%]	-9.0	0.0
Measured [W/m2]	203.9	1002.1
Module Width/Height (Portrait) [mm]:992*1675		

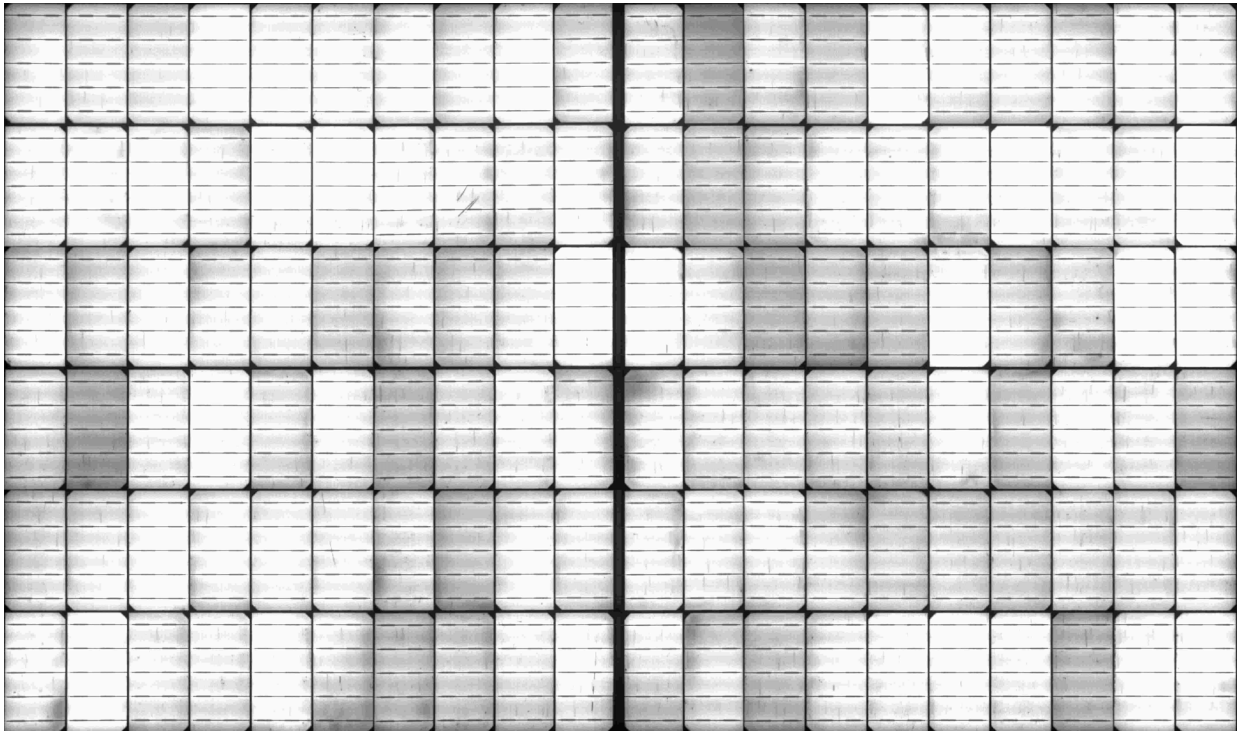
Electroluminescence for 600120200901105513



Current[A]: 12.020
Exposure Time [ms]: 1000

Voltage[V]: 44.390

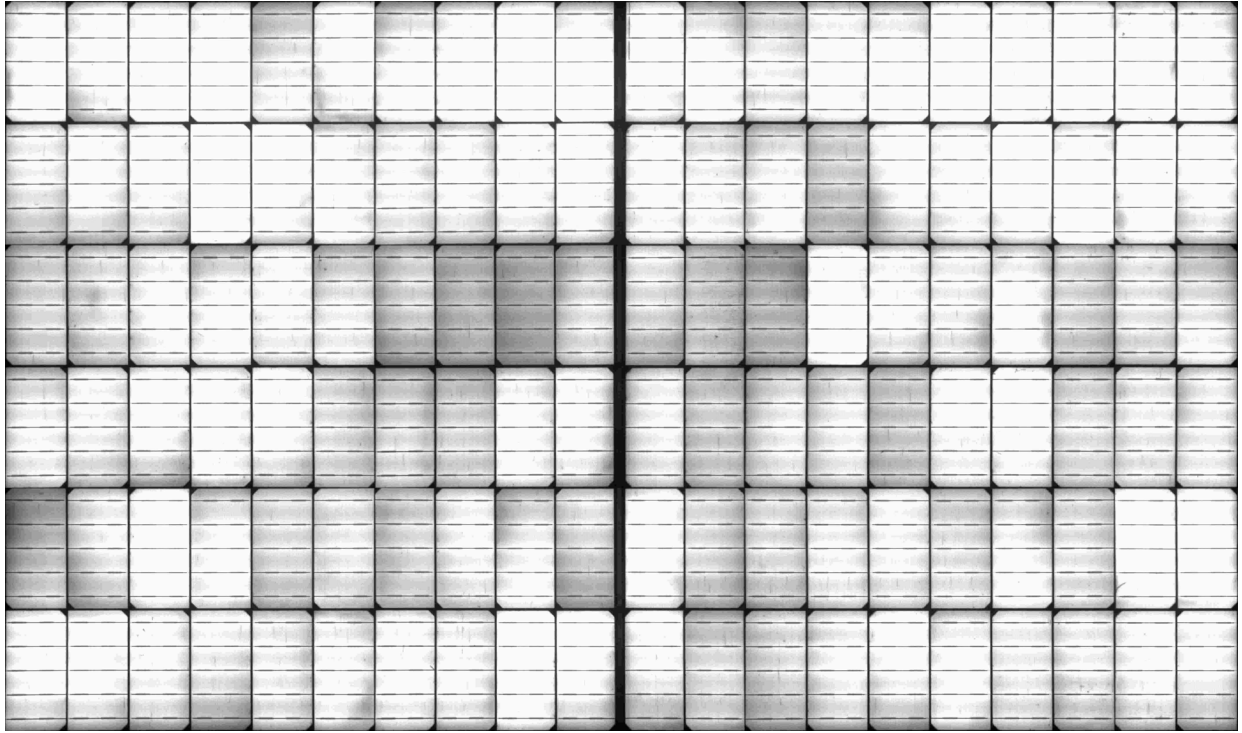
Electroluminescence for 600120200901114336



Current[A]: 12.020
Exposure Time [ms]: 1000

Voltage[V]: 44.390

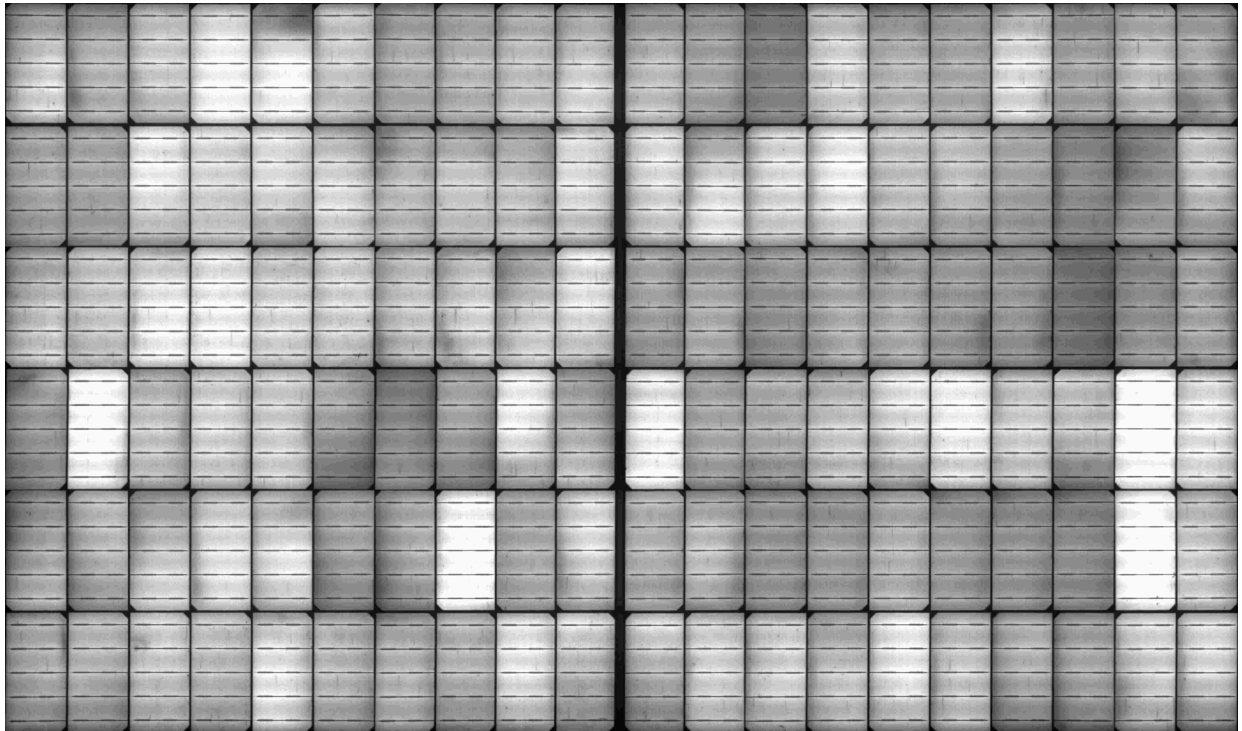
Electroluminescence for 600120200901115218



Current[A]: 12.020
Exposure Time [ms]: 1000

Voltage[V]: 44.390

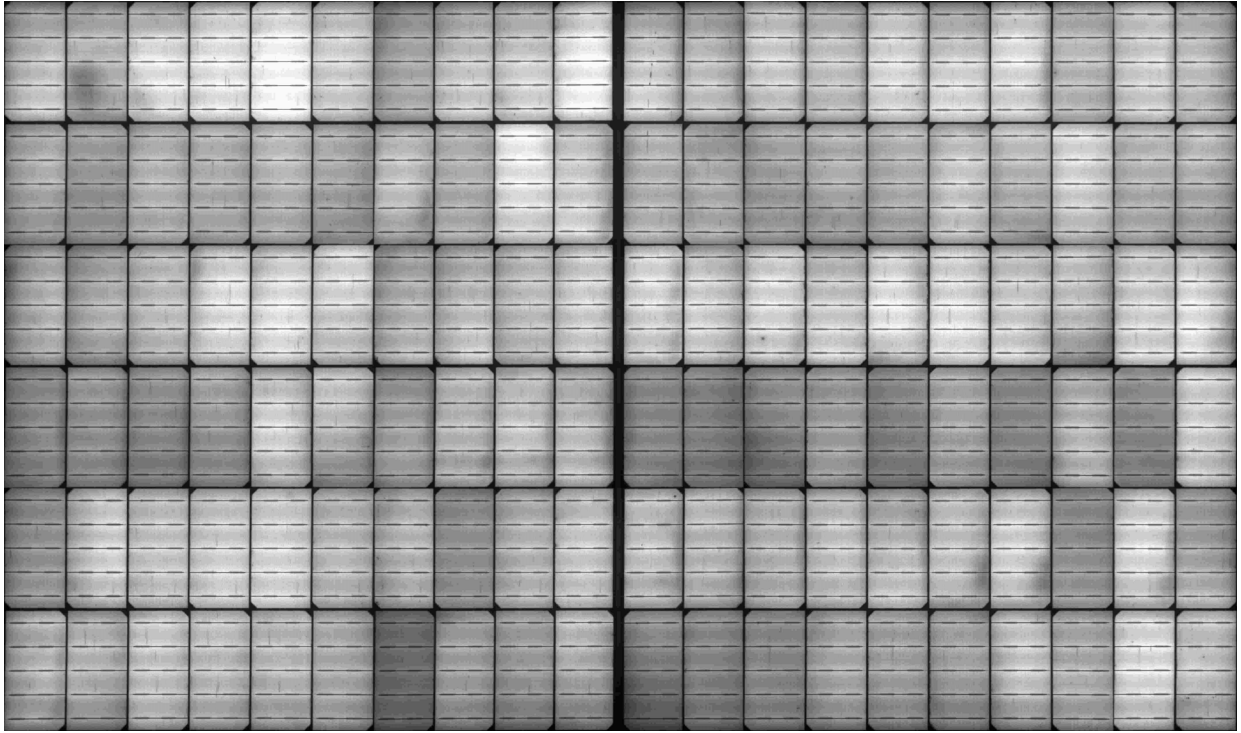
Electroluminescence for 600120200901120244



Current[A]: 12.020
Exposure Time [ms]: 850

Voltage[V]: 44.390

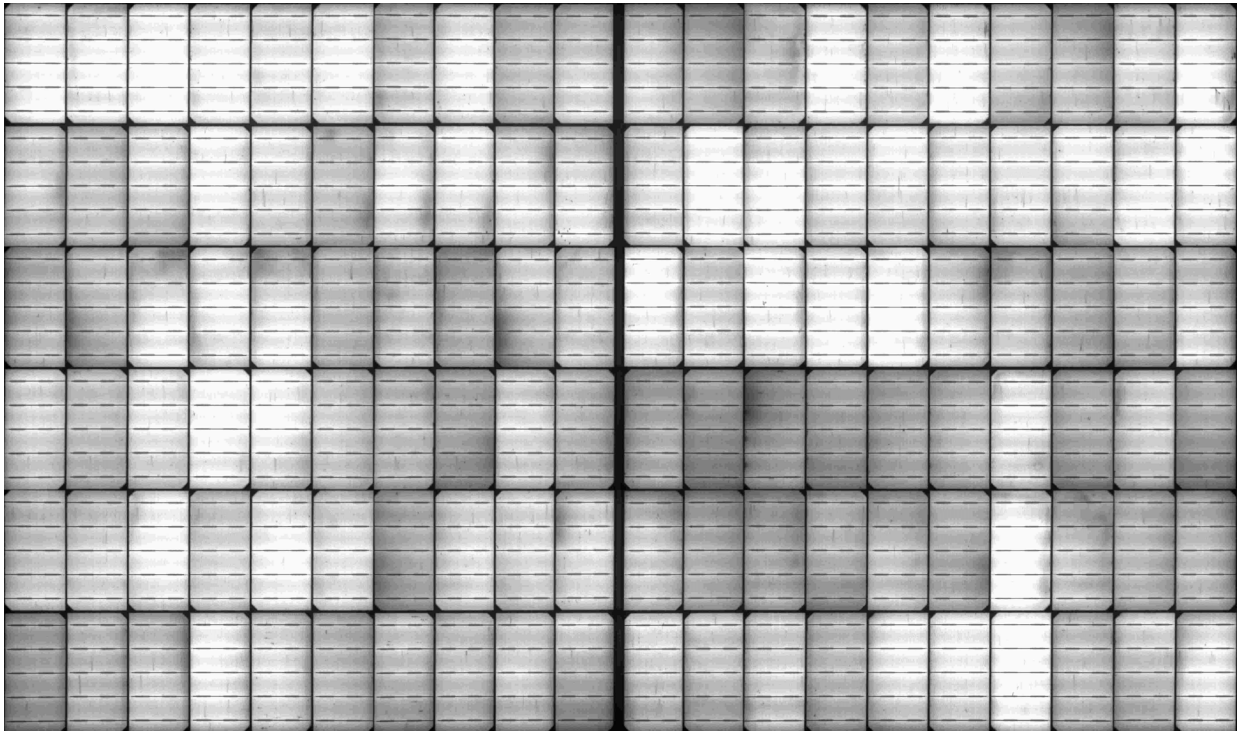
Electroluminescence for 600120200901121153



Current[A]: 12.020
Exposure Time [ms]: 850

Voltage[V]: 44.390

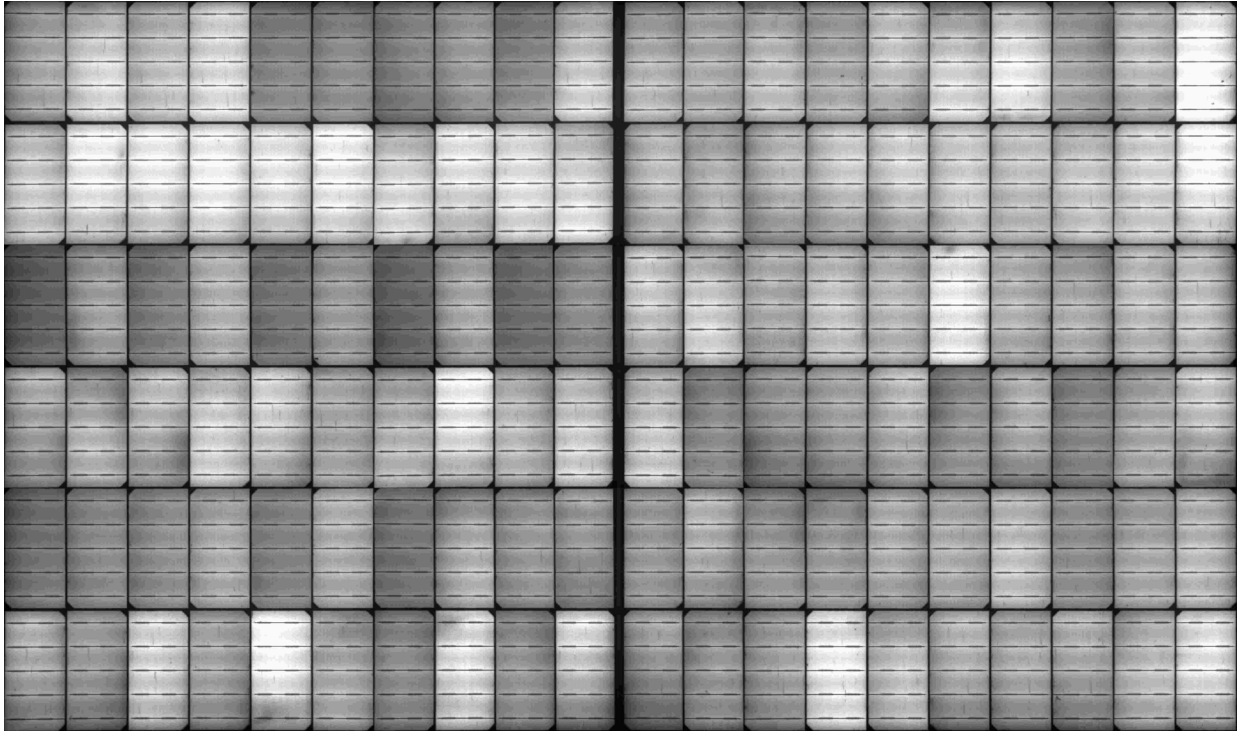
Electroluminescence for 600120200901122125



Current[A]: 12.020
Exposure Time [ms]: 850

Voltage[V]: 44.710

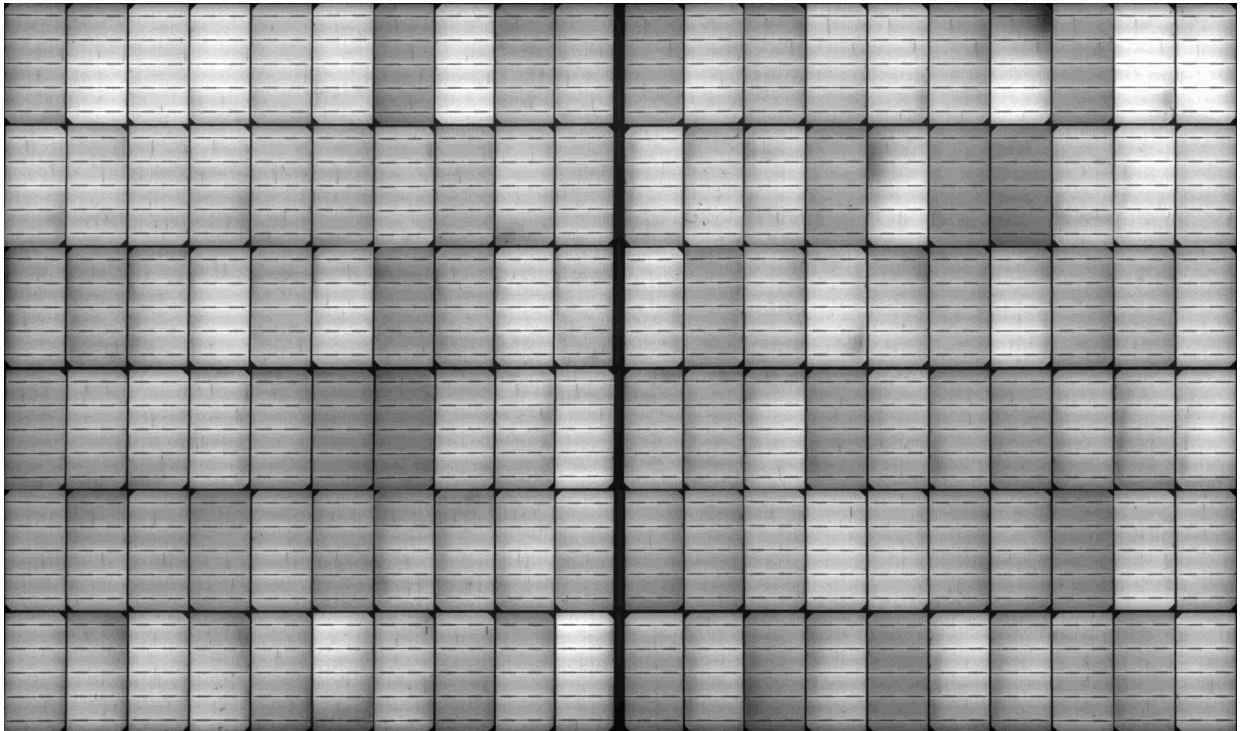
Electroluminescence for 600120200901123153



Current[A]: 12.020
Exposure Time [ms]: 850

Voltage[V]: 44.390

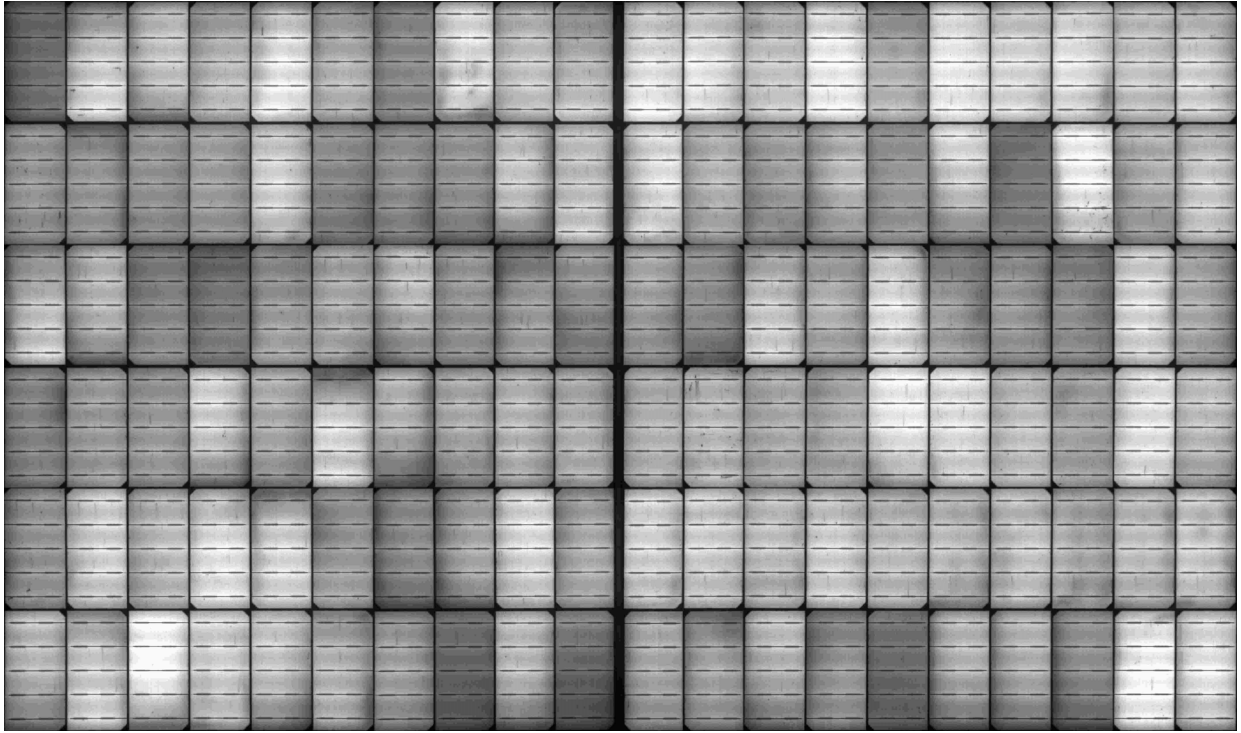
Electroluminescence for 600120200901124225



Current[A]: 12.020
Exposure Time [ms]: 850

Voltage[V]: 44.390

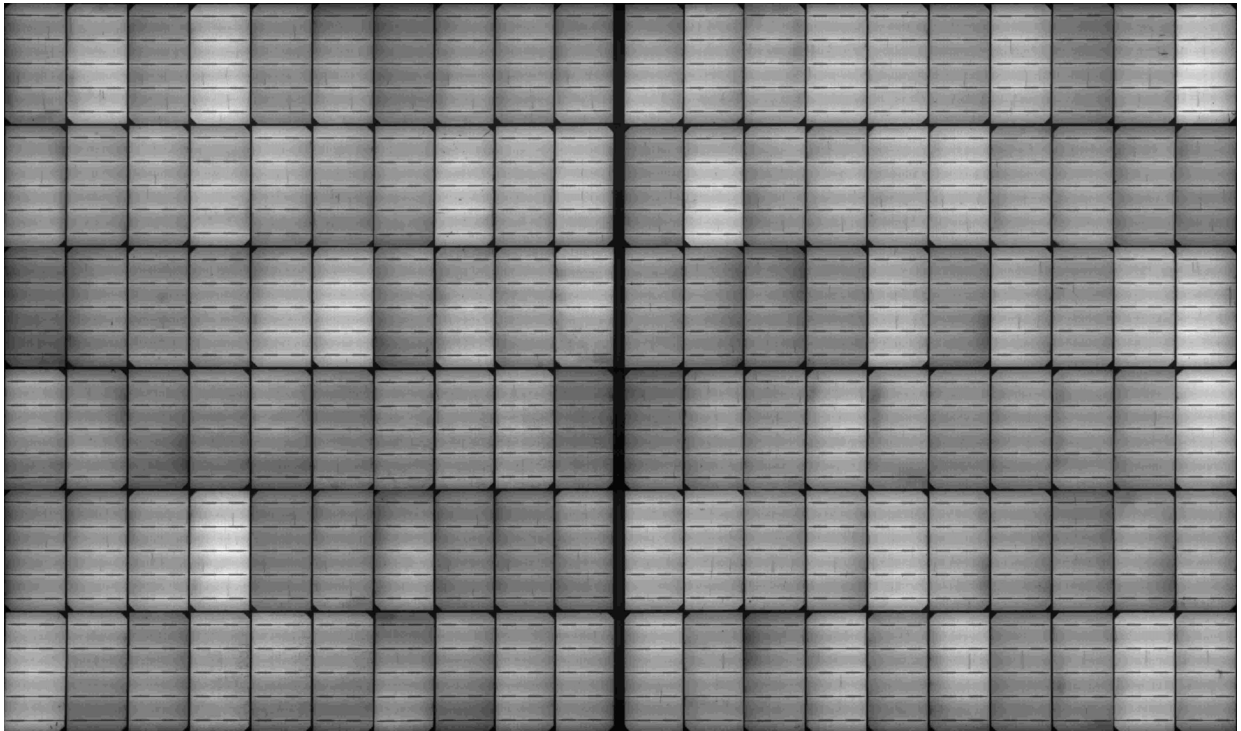
Electroluminescence for 600120200901132258



Current[A]: 12.020
Exposure Time [ms]: 850

Voltage[V]: 44.390

Electroluminescence for 600120200901133524



Current[A]: 12.020
Exposure Time [ms]: 750

Voltage[V]: 44.390

MBJ Unique ID	Module ID	Module Type/Description	Judgment
600120200901105513	ZX75243522300708	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901114336	ZX75243522300796	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901115218	ZX75243522300751	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901120244	ZX75243522300713	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901121153	ZX75243522300714	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901122125	ZX75243522300621	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901123153	ZX75243522300827	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901124225	ZX75243522300858	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901132258	ZX75243522300954	ZNshinesolar ZXM6-HLD120-305/M	ClassC
600120200901133524	ZX75243522300842	ZNshinesolar ZXM6-HLD120-305/M	ClassD

MBJ Unique ID	Judgment Comment	Module Comment
600120200901133524		Glass at the back side broken.

MBJ Unique ID	Connection Check	Diode Test	HiPot Test	GND Bond Tests		
				Port 1	Port 2	Port 3
600120200901105513	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901114336	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901115218	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901120244	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901121153	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901122125	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901123153	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901124225	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901132258	Successfull	Successfull	n/a	n/a	n/a	n/a
600120200901133524	Successfull	Successfull	n/a	n/a	n/a	n/a

MBJ Unique ID	Pmpp[W]	Impp[A]	Umpv[V]	Isc[A]	Uoc[V]	Irr[W/m2]	FF[%]
600120200901105513	299.8	9.00	33.29	9.43	40.13	1000.0	79.2
600120200901114336	300.4	9.00	33.38	9.41	40.30	1000.0	79.2
600120200901115218	300.9	9.00	33.45	9.44	40.31	1000.0	79.1
600120200901120244	300.0	8.99	33.35	9.44	40.23	1000.0	79.0
600120200901121153	301.4	9.02	33.41	9.43	40.21	1000.0	79.5
600120200901122125	302.2	9.03	33.47	9.45	40.35	1000.0	79.2
600120200901123153	301.0	9.03	33.32	9.43	40.18	1000.0	79.4
600120200901124225	300.6	9.02	33.33	9.44	40.20	1000.0	79.2
600120200901132258	298.8	9.01	33.18	9.43	40.13	1000.0	79.0
600120200901133524	301.0	9.01	33.39	9.41	40.22	1000.0	79.5

MBJ Unique ID	Red	Yellow	Green	Blue	White
600120200901105513	0	0	0	0	120
600120200901114336	0	0	0	0	120
600120200901115218	0	0	0	0	120
600120200901120244	0	0	0	0	120
600120200901121153	0	0	0	0	120
600120200901122125	0	0	0	0	120
600120200901123153	0	0	0	0	120
600120200901124225	0	0	0	0	120
600120200901132258	0	0	0	0	120
600120200901133524	0	0	0	0	120