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# APEX SOLAR ENTERPRISE BROCHURE

LET EVERYONE ENJOY  
THE WEALTH OF SUNSHINE



APEX SOLAR WECHAT PUBLIC ACCOUNT

GLOBAL OPERATION CENTER : ROOM 704, BLOCK A, JEWEL INTERNATIONAL CENTER, XISHAN DISTRICT, WUXI CITY  
PRODUCTION BASES: APEX SOLAR ENERGY TECHNOLOGY(YANGZHOU)CO.,LTD,NO. 1 XINJING ROAD, TIANSHAN INDUSTRIAL  
CONCENTRATION ZONE, SONGQIAO TOWN, GAOYOU CITY , JIANGSU PROVINCE ,CHINA  
WEBSITE: WWW.APEX-SOLARENERGY.COM

JIANGSU APEX SOLAR ENERGY GROUP CO., LTD.

APEX SOLAR  
**LET EVERYONE ENJOY  
THE WEALTH OF SUNSHINE**

Apex Solar Inc. operates with a 100% green production chain to help SMEs realize their carbon-reducing goals by providing:

Highest quality solar panels  
A full range of clean energy solutions  
Custom designs to meet your specific needs  
Excellent and responsive customer service.

We are committed to providing satisfied customers with the highest quality cutting-edge solar

Let us connect your solar plan to our 100% renewable supply chain and dedicated professional team so that we can work together to help you save on energy while protecting our natural environment.



## HRAP-120H 365-380M6

**20.86%**  
Maximum Module Efficiency

**380W**  
Maximum Power Output

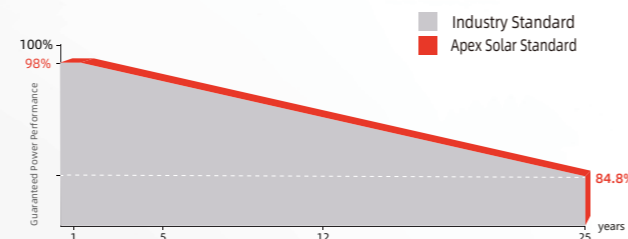
Power Shorting Tolerance:0-3W

**1755×1038×30mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safty class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



**Industry Leading Linear Power Warranty**  
12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty **25** Power Warranty

## High Efficiency Half-cells Solar Panel HRAP-120H 365-380M6

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	365	370	375	380
Maximum Power Voltage(Vmp) [V]	33.85	34.05	34.25	34.40
Maximum Power Current(Imp) [A]	10.79	10.87	10.95	11.04
Open Circuit Voltage(Voc) [V]	41.05	41.25	41.45	41.65
Short Circuit Current(Isc) [A]	11.27	11.35	11.43	11.51
Module Efficiency [%]	20.00	20.30	20.60	20.86

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	266.7	270.4	274.1	277.8
Maximum Power Voltage(Vmp) [V]	31.2	31.3	31.5	31.7
Maximum Power Current(Imp) [A]	8.56	8.63	8.7	8.76
Open Circuit Voltage(Voc) [V]	38.1	38.3	38.5	38.7
Short Circuit Current(Isc) [A]	9.06	9.12	9.19	9.25

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	166×166mm
Cell Arrangement	120(6×20)
Weight	19.5kg(±3%)
Module Dimensions	1755×1038×30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 (Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

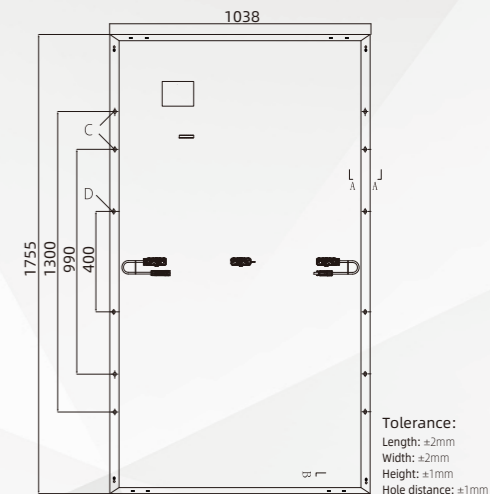
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000VDC/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C-+85°C
Maximum Series Fuse	20A

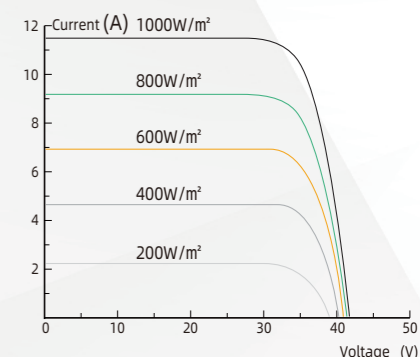
### PACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	845pcs/40HQ

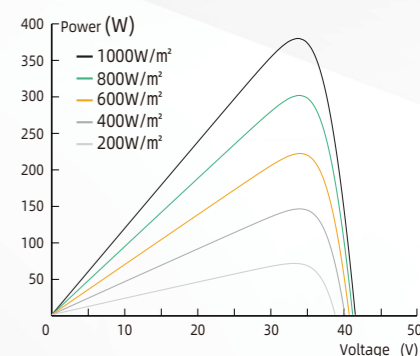
### Module Dimension(mm)



### Current-Voltage Curve (380W)



### Power-Voltage Curve (380W)



- 0-3W** Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value** Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control** Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology** The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance** Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance** The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment



## HRAP-144H 440-460M6

**21.16%**  
Maximum Module Efficiency

**460W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

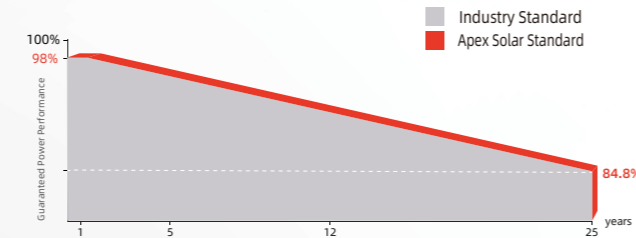
**2094×1038×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty **25** Power Warranty

- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-144H 440-460M6

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	440	445	450	455	460
Maximum Power Voltage(Vmp) [V]	41.2	41.44	41.67	41.9	42.13
Maximum Power Current(Imp) [A]	10.68	10.74	10.8	10.86	10.92
Open Circuit Voltage(Voc) [V]	49.3	49.55	49.8	50.05	50.3
Short Circuit Current(Isc) [A]	11.3	11.36	11.42	11.48	11.54
Module Efficiency [%]	20.24	20.47	20.7	20.93	21.16

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	334.76	338.61	342.39	346.19	349.57
Maximum Power Voltage(Vmp) [V]	39.29	39.52	39.74	39.96	40.18
Maximum Power Current(Imp) [A]	8.52	8.57	8.62	8.66	8.7
Open Circuit Voltage(Voc) [V]	46.76	46.99	47.23	47.47	47.71
Short Circuit Current(Isc) [A]	9.09	9.14	9.19	9.24	9.29

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	166×166mm
Cell Arrangement	144(6×24)
Weight	23kg(±3%)
Module Dimensions	2094×1038×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

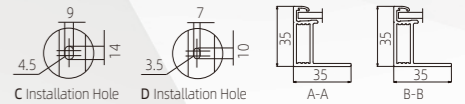
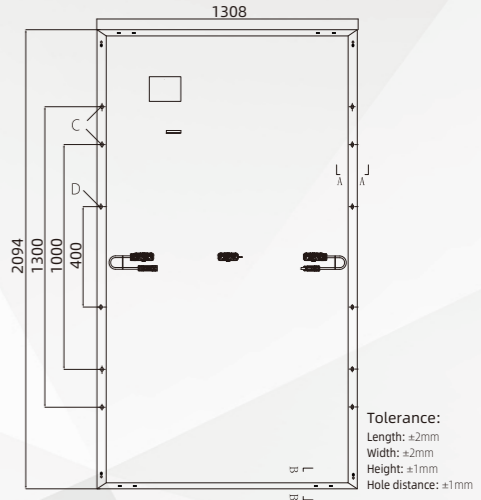
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05 %/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C-+85°C
Maximum Series Fuse	20A

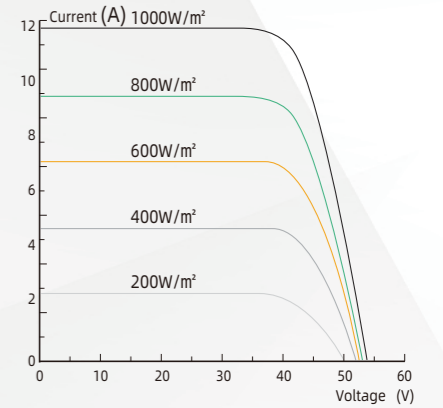
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	715pcs/40HQ

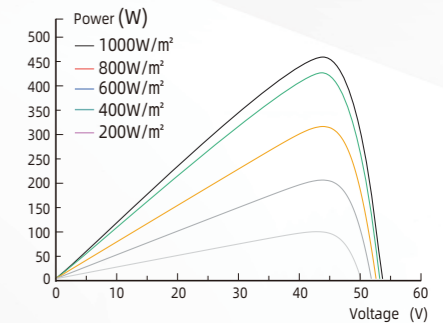
### Module Dimension(mm)

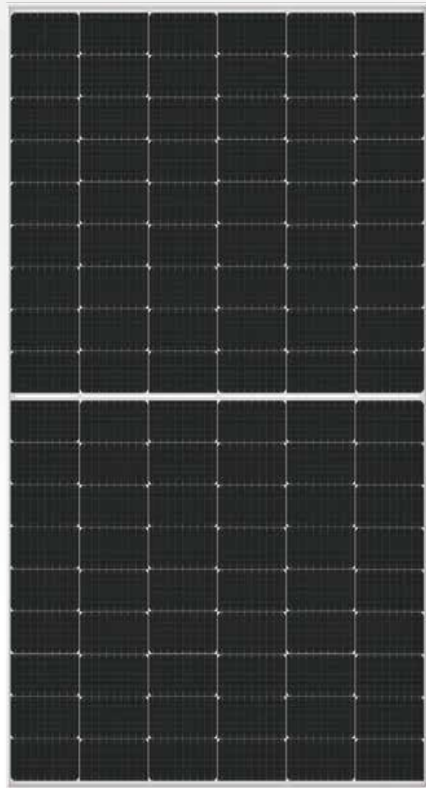


### Current-Voltage Curve (460W)



### Power-Voltage Curve (460W)





## HRAP-108H 400-420M10

**21.48%**  
Maximum Module Efficiency

**420W**  
Maximum Power Output

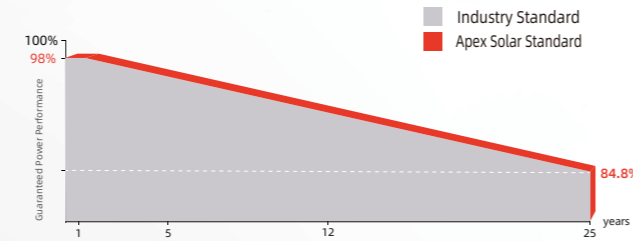
Power Shorting Tolerance:0-3W

**1724×1134×30mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



**Industry Leading Linear Power Warranty**  
12-year Warranty for Materials and Processing , 25-year Warranty for Extra Linear Power Output



**12** Process Warranty      **25** Power Warranty

- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-108H 400-420M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	400	405	410	415	420
Maximum Power Voltage(Vmp) [V]	30.75	31.00	31.25	31.49	31.73
Maximum Power Current(Imp) [A]	13.01	13.07	13.12	13.18	13.24
Open Circuit Voltage(Voc) [V]	36.75	37.00	37.25	37.50	37.75
Short Circuit Current(Isc) [A]	13.76	13.83	13.88	13.94	14.01
Module Efficiency [%]	20.46	20.72	20.97	21.23	21.48

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	299	302.7	306.5	310.2	313.9
Maximum Power Voltage(Vmp) [V]	28.56	28.80	29.03	29.25	29.47
Maximum Power Current(Imp) [A]	10.47	10.52	10.56	10.60	10.65
Open Circuit Voltage(Voc) [V]	34.55	34.79	35.08	35.26	35.49
Short Circuit Current(Isc) [A]	11.13	11.18	11.22	11.27	11.32

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	108(6×18)
Weight	21.5kg(±3%)
Module Dimensions	1724×1134×30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

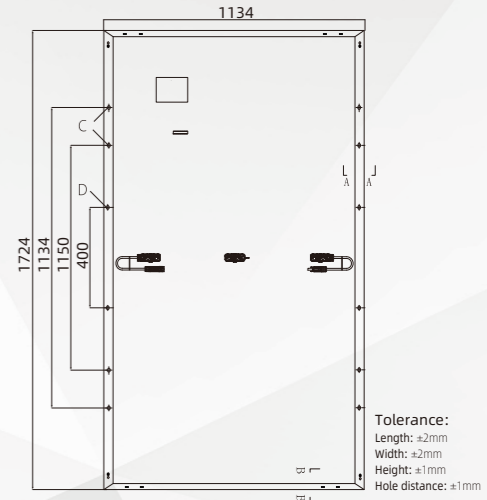
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C~+85°C
Maximum Series Fuse	25A

### PACKING CONFIGURATION

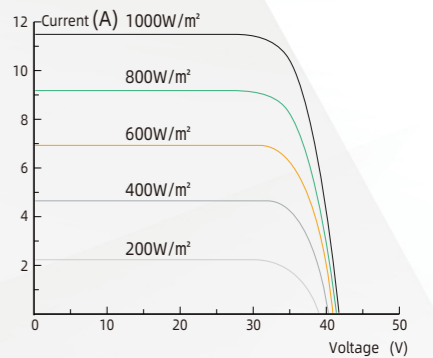
Quantity/Pallet	36pcs/pallet
Quantity/Container	962pcs/40HQ

### Module Dimension(mm)

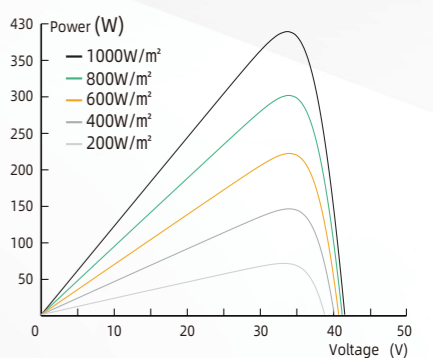


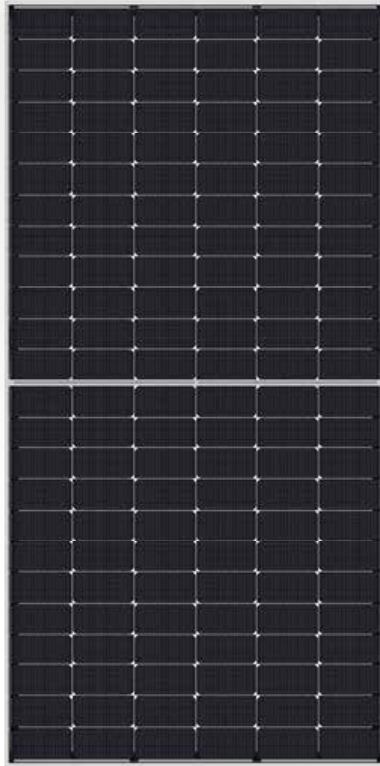
Tolerance:  
Length: ±2mm  
Width: ±2mm  
Height: ±1mm  
Hole distance: ±1mm

### Current-Voltage Curve (420W)



### Power-Voltage Curve (420W)





## HRAP-120H 440-455M10

**21.02%**  
Maximum Module Efficiency

**455W**  
Maximum Power Output

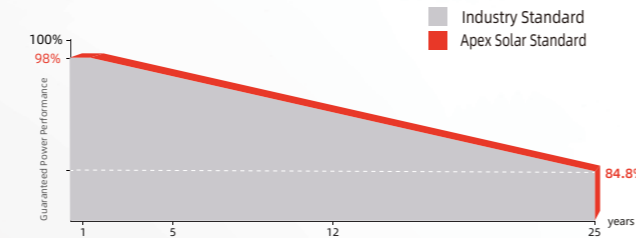
Power Shorting Tolerance:0-3W

**1909×1134×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safty class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



**Industry Leading Linear Power Warranty**  
12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty      **25** Power Warranty

- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-120H 440-455M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	440	445	450	455
Maximum Power Voltage(Vmp) [V]	33.91	34.06	34.21	34.36
Maximum Power Current(Imp) [A]	12.98	13.07	13.16	13.25
Open Circuit Voltage(Voc) [V]	40.95	41.1	41.25	41.4
Short Circuit Current(Isc) [A]	13.41	13.52	13.62	13.72
Module Efficiency [%]	20.33	20.56	20.79	21.02

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	330	334	338	342
Maximum Power Voltage(Vmp) [V]	31.34	31.49	31.64	31.79
Maximum Power Current(Imp) [A]	10.54	10.62	10.69	10.77
Open Circuit Voltage(Voc) [V]	37.76	37.91	38.06	38.21
Short Circuit Current(Isc) [A]	11.19	11.28	11.36	11.45

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	120(6×20)
Weight	23.5kg(±3%)
Module Dimensions	1909×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
junction Box	Protection class IP68
Connector	Mc4 Compatible
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

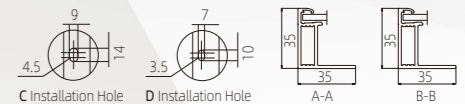
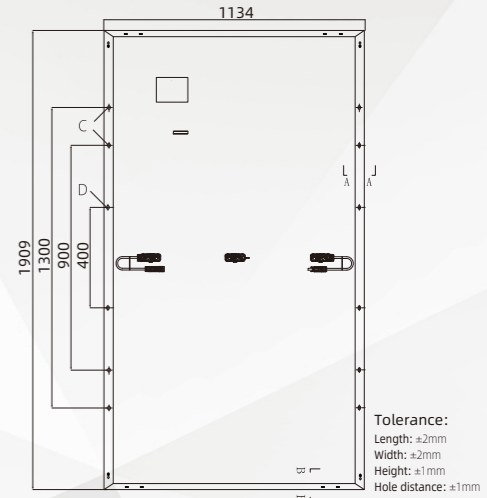
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05 %/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C-+85°C
Maximum Series Fuse	20A

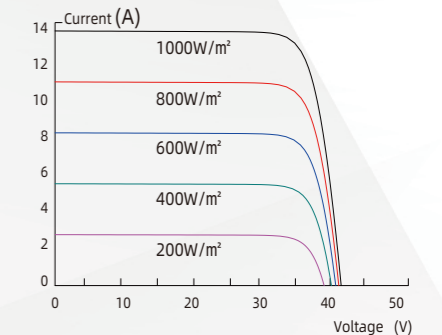
### PACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	864pcs/40HQ

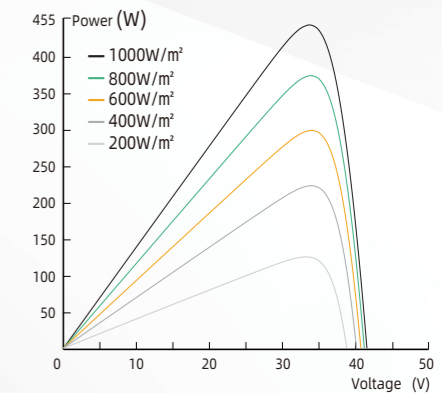
### Module Dimension(mm)



### Current-Voltage Curve (455W)



### Power-Voltage Curve (455W)





## HRAP-132H 485-505M10

**21.3%**  
Maximum Module Efficiency

**505W**  
Maximum Power Output

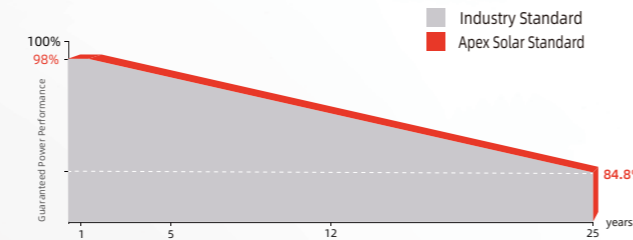
Power Shorting Tolerance:0-3W

**2094×1134×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



**Industry Leading Linear Power Warranty**  
12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty **25** Power Warranty

## High Efficiency Half-cells Solar Panel HRAP-132H 485-505M10

### ELECTRICAL PARAMETERS AT STC

	485	490	495	500	505
Rated Maximum Power(Pmax) [W]	485	490	495	500	505
Maximum Power Voltage(Vmp) [V]	37.81	37.99	38.17	38.35	38.53
Maximum Power Current(Impp) [A]	12.83	12.90	12.97	13.04	13.11
Open Circuit Voltage(Voc) [V]	45.20	45.33	45.46	45.59	45.72
Short Circuit Current(Isc) [A]	13.72	13.79	13.86	13.93	14.00
Module Efficiency [%]	20.4	20.6	20.8	21.1	21.3

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

	367	370	374	378	382
Rated Maximum Power(Pmax)[W]	367	370	374	378	382
Maximum Power Voltage(Vmp) [V]	35.67	35.76	35.84	35.93	36.02
Maximum Power Current(Impp) [A]	10.28	10.36	10.44	10.52	10.60
Open Circuit Voltage(Voc) [V]	42.30	42.43	42.58	42.72	42.86
Short Circuit Current(Isc) [A]	11.06	11.13	11.20	11.27	11.34

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	132(6×22)
Weight	26.3kg(±3%)
Module Dimensions	2094×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
junction Box	Protection class IP68
Connector	Mc4 Compatible
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

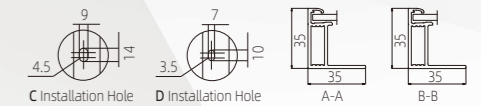
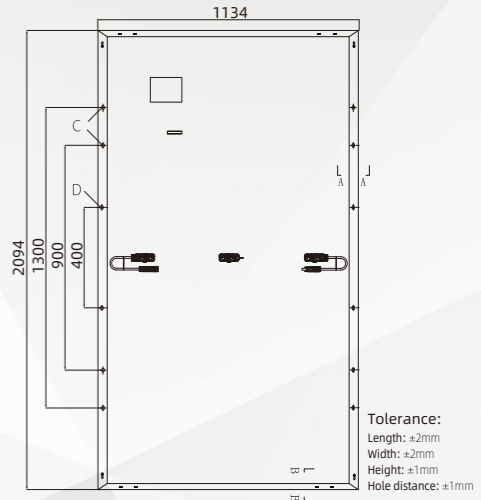
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A

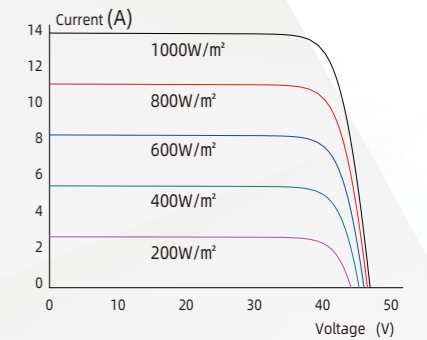
### PACKING CONFIGURATION

Quantity/Pallet	31 pcs/pallet
Quantity/Container	682pcs/40HQ

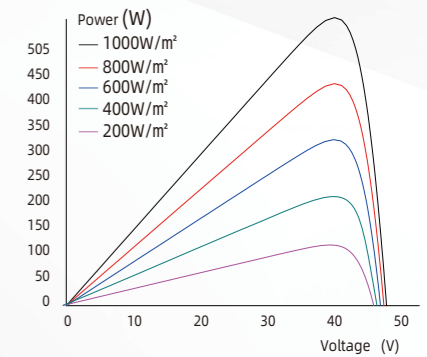
### Module Dimension(mm)



### Current-Voltage Curve (505W)



### Power-Voltage Curve (505W)



- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment



## HRAP-144H 525-550M10

**21.3%**  
Maximum Module Efficiency

**550W**  
Maximum Power Output

Power Shorting Tolerance: 0~+3W

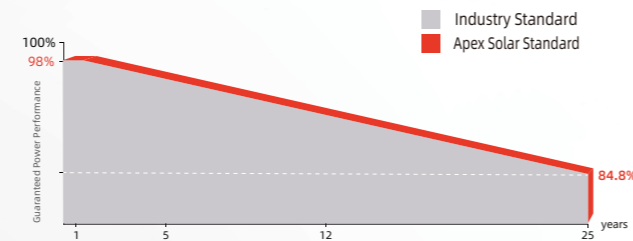
**2279×1134×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class: Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty      **25** Power Warranty

## High Efficiency Half-cells Solar Panel HRAP-144H 525-550M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	525	530	535	540	545	550
Maximum Power Voltage(Vmp) [V]	41.15	41.31	41.47	41.64	41.80	41.96
Maximum Power Current(Impp) [A]	12.76	12.83	12.90	12.97	13.04	13.11
Open Circuit Voltage(Voc) [V]	49.15	49.30	49.45	49.60	49.75	49.90
Short Circuit Current(Isc) [A]	13.65	13.72	13.79	13.86	13.93	14.00
Module Efficiency [%]	20.3	20.5	20.7	20.9	21.1	21.3

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	397	401	405	408	412	416
Maximum Power Voltage(Vmp) [V]	38.36	38.57	38.78	38.99	39.20	39.43
Maximum Power Current(Impp) [A]	10.35	10.39	10.43	10.47	10.51	10.55
Open Circuit Voltage(Voc) [V]	46.05	46.18	46.31	46.43	46.55	46.68
Short Circuit Current(Isc) [A]	10.97	11.01	11.05	11.09	11.13	11.17

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	144(6×24)
Weight	29.0kg(±3%)
Module Dimensions	2279×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

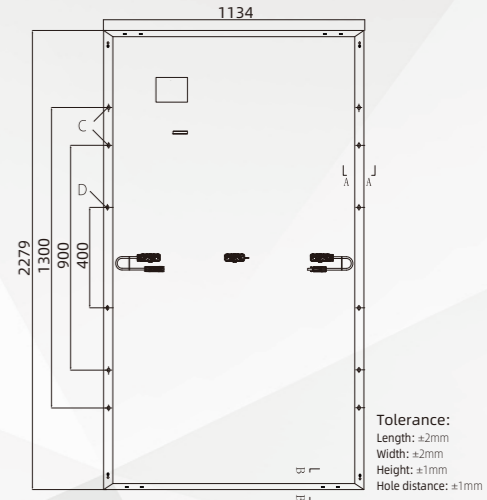
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A

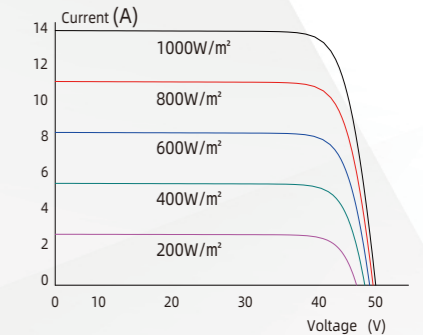
### PACKING CONFIGURATION

Quantity/Pallet	31 pcs/pallet
Quantity/Container	620pcs/40HQ

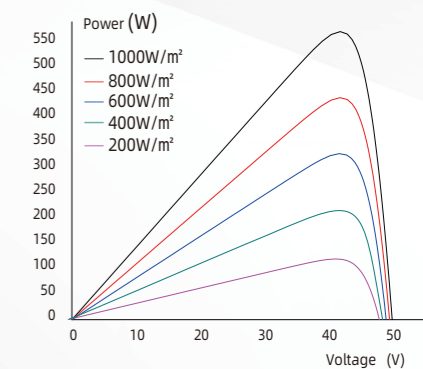
### Module Dimension(mm)



### Current-Voltage Curve (550W)

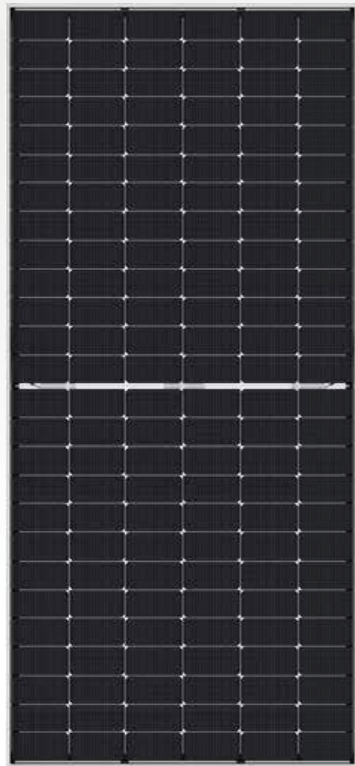


### Power-Voltage Curve (550W)



- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment





## HRAP-156H 570-595M10

**21.05%**  
Maximum Module Efficiency

**595W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

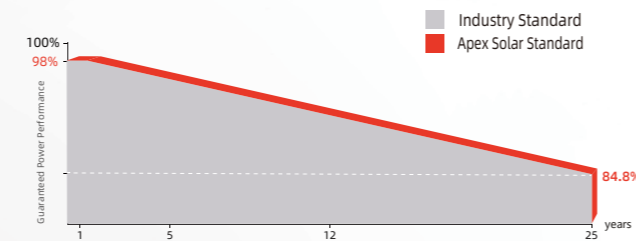
**2465×1134×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty      **25** Power Warranty

- 0-3W** Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value** Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control** Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology** The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance** Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance** The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-156H 570-595M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	570	575	580	585	590	595
Maximum Power Voltage(Vmp) [V]	44.02	44.17	44.32	44.47	44.62	44.78
Maximum Power Current(Imp) [A]	12.96	13.03	13.10	13.17	13.23	13.29
Open Circuit Voltage(Voc) [V]	53.22	53.37	53.52	53.67	53.82	53.97
Short Circuit Current(Isc) [A]	13.4	13.48	13.56	13.64	13.72	13.80
Module Efficiency [%]	20.34	20.51	20.69	20.92	21.10	21.28

STC: Irradiance 1000 W/m2 module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	426	430	434	438	442	446
Maximum Power Voltage(Vmp) [V]	40.5	40.65	40.8	40.95	41.1	41.25
Maximum Power Current(Imp) [A]	10.53	10.59	10.65	10.71	10.77	10.81
Open Circuit Voltage(Voc) [V]	48.91	49.06	49.21	49.36	49.51	49.66
Short Circuit Current(Isc) [A]	11.17	11.24	11.31	11.38	11.44	11.50

NMOT: Irradiance 800 W/m2 ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	156(6×26)
Weight	31.0kg(±3%)
Module Dimensions	2465×1134×35mm
Cable	4.0 mm² positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
junction Box	Protection class IP68
Connector	Mc4 Compatible
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

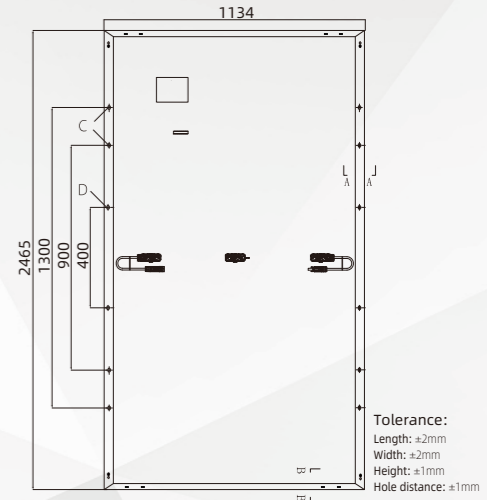
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C-+85°C
Maximum Series Fuse	20A

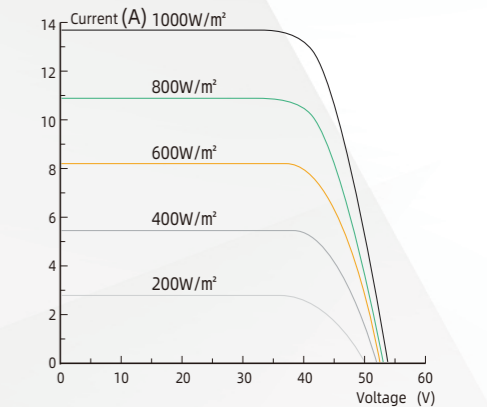
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	558pcs/40HQ

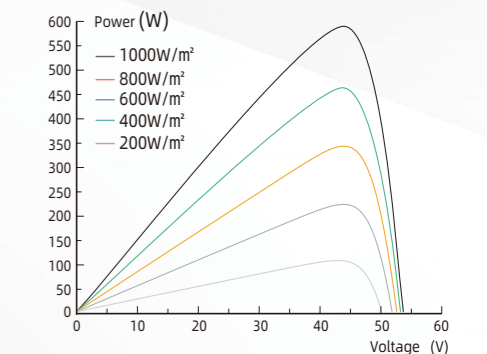
### Module Dimension(mm)



### Current-Voltage Curve (595W)



### Power-Voltage Curve (595W)





## HRAP-110H 540-560M12

**21.4%**  
Maximum Module Efficiency

**560W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

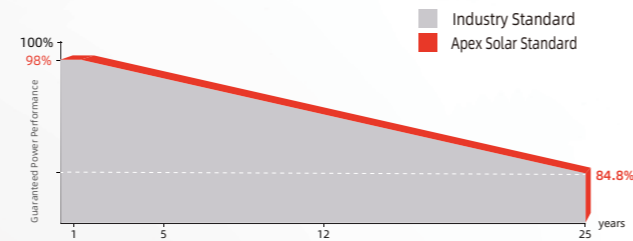
**2384×1096×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12 YEARS** Process Warranty      **25 YEARS** Power Warranty

## High Efficiency Half-cells Solar Panel HRAP-110H 540-560M12

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	540	545	550	555	560
Maximum Power Voltage(Vmp) [V]	31.2	31.4	31.6	31.8	32
Maximum Power Current(Imp) [A]	17.33	17.37	17.4	17.45	17.5
Open Circuit Voltage(Voc) [V]	37.5	37.7	37.9	38.1	38.3
Short Circuit Current(Isc) [A]	18.41	18.47	18.52	18.56	18.6
Module Efficiency [%]	20.7	20.9	21	21.2	21.4

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	409	413	417	420	424
Maximum Power Voltage(Vmp) [V]	29	29.2	29.3	29.5	29.7
Maximum Power Current(Imp) [A]	14.1	14.15	14.19	14.23	14.27
Open Circuit Voltage(Voc) [V]	35.3	35.5	35.7	35.9	36.1
Short Circuit Current(Isc) [A]	14.84	14.88	14.92	14.96	15

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	210×210mm
Cell Arrangement	110(5×22)
Weight	28.60kg(±3%)
Module Dimensions	2384×1096×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

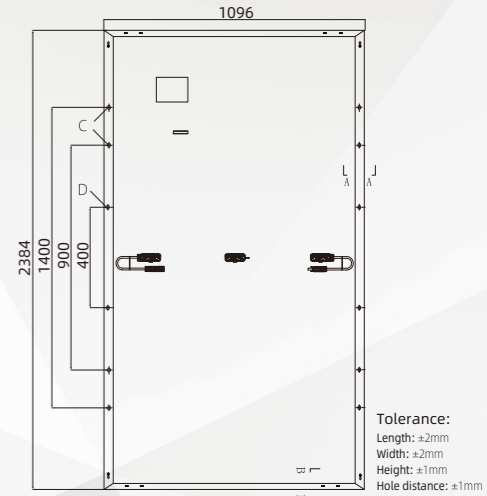
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C +85°C
Maximum Series Fuse	30A

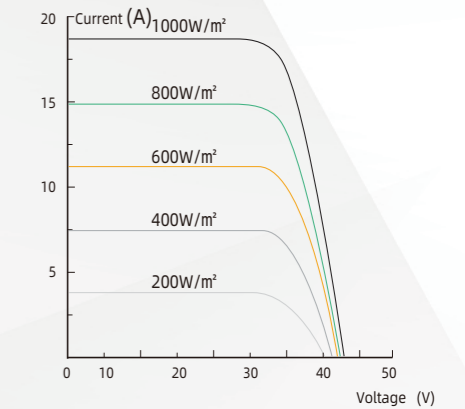
### PPACKING CONFIGURATION

Quantity/Pallet	31 pcs/pallet
Quantity/Container	616 pcs/40HQ

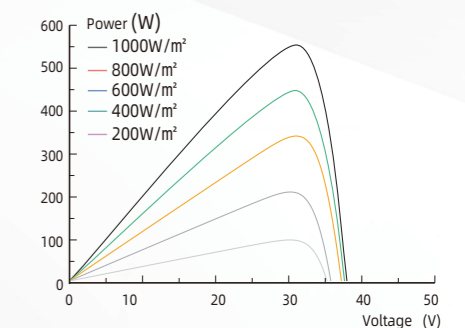
### Module Dimension(mm)



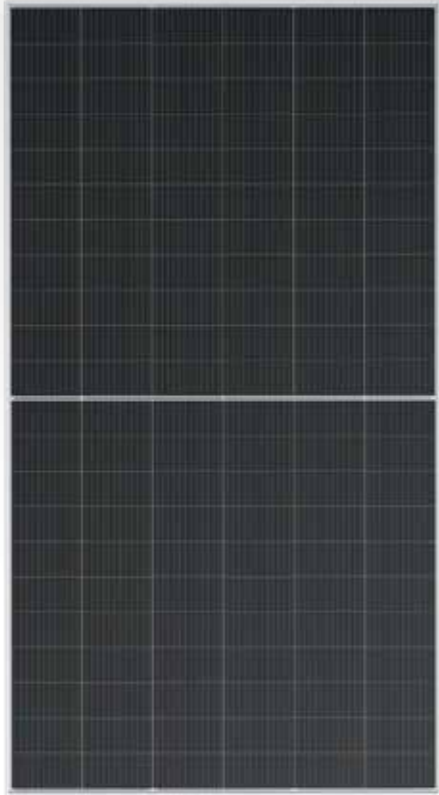
### Current-Voltage Curve (560W)



### Power-Voltage Curve (560W)



- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment



## HRAP-120H 590-610M12

**21.57%**  
Maximum Module Efficiency

**610W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

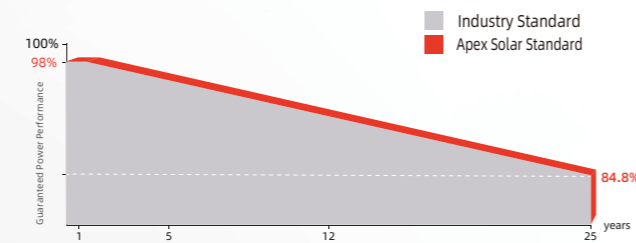
**2172×1303×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safty class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12 YEARS** Process Warranty      **25 YEARS** Power Warranty

- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-120H 590-610M12

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	590	595	600	605	610
Maximum Power Voltage(Vmp) [V]	34	34.2	34.4	34.6	34.8
Maximum Power Current(Imp) [A]	17.35	17.4	17.44	17.49	17.54
Open Circuit Voltage(Voc) [V]	41.1	41.3	41.5	41.7	41.9
Short Circuit Current(Isc) [A]	18.42	18.47	18.52	18.57	18.64
Module Efficiency [%]	20.8	21	21.2	21.4	21.57

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	447	451	454	458	462
Maximum Power Voltage(Vmp) [V]	31.7	31.9	32	32.2	32.4
Maximum Power Current(Imp) [A]	14.09	14.13	14.18	14.22	14.26
Open Circuit Voltage(Voc) [V]	38.7	38.9	39.1	39.3	38.5
Short Circuit Current(Isc) [A]	14.85	14.88	14.92	14.96	15

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	210×210mm
Cell Arrangement	120(6×20)
Weight	30.9kg(±3%)
Module Dimensions	2172×1303×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

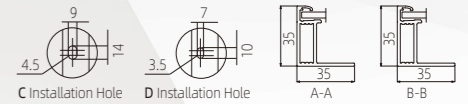
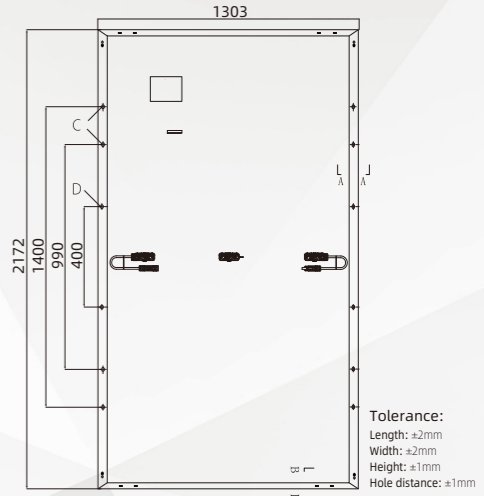
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C-+85°C
Maximum Series Fuse	30A

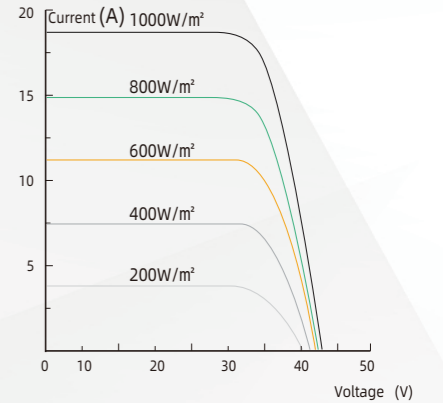
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	558pcs/40HQ

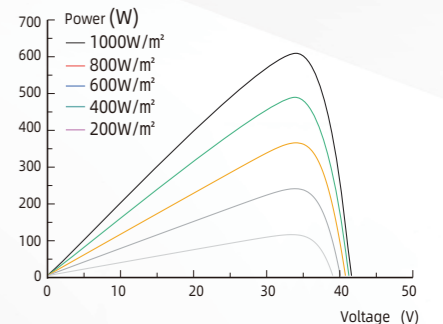
### Module Dimension(mm)

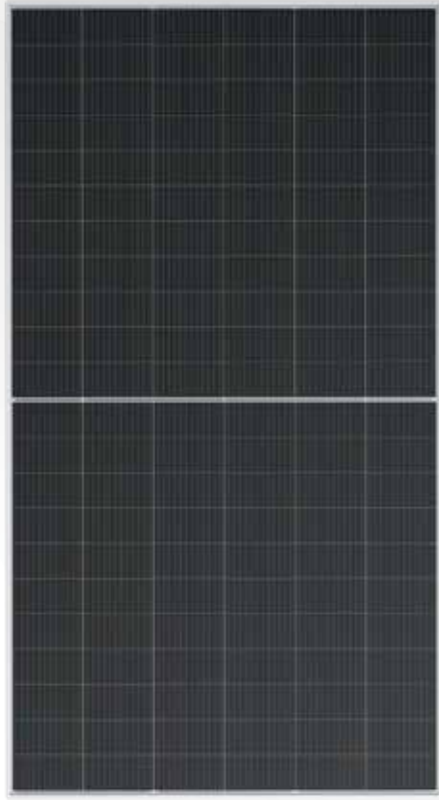


### Current-Voltage Curve (610W)



### Power-Voltage Curve (610W)





## HRAP-132H 655-675M12

**21.73%**  
Maximum Module Efficiency

**675W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

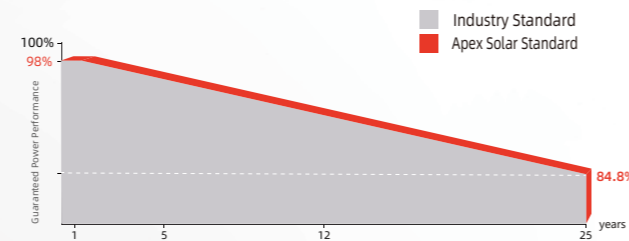
**2384×1303×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12 YEARS** Process Warranty      **25 YEARS** Power Warranty

- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-132H 655-675M12

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	655	660	665	670	675
Maximum Power Voltage(Vmp) [V]	37.59	37.79	37.99	38.19	38.39
Maximum Power Current(Imp) [A]	17.43	17.47	17.51	17.55	17.59
Open Circuit Voltage(Voc) [V]	45.49	45.69	45.89	46.09	46.29
Short Circuit Current(Isc) [A]	18.49	18.52	18.55	18.61	18.64
Module Efficiency [%]	21.09	21.25	21.41	21.57	21.73

STC: Irradiance 1000 W/m2 module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	496	500	504	508	512
Maximum Power Voltage(Vmp) [V]	35.09	35.29	35.49	35.69	35.89
Maximum Power Current(Imp) [A]	14.14	14.17	14.20	14.23	14.26
Open Circuit Voltage(Voc) [V]	42.79	42.99	43.19	43.39	43.59
Short Circuit Current(Isc) [A]	14.88	14.93	14.98	15.03	15.08

NMOT: Irradiance 800 W/m2 ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	210×210mm
Cell Arrangement	132(6×22)
Weight	34.0kg(±3%)
Module Dimensions	2384×1303×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd )
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

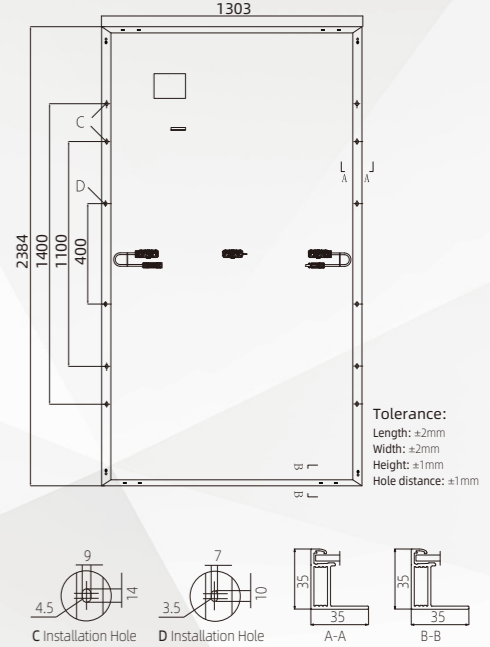
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C-+85°C
Maximum Series Fuse	30A

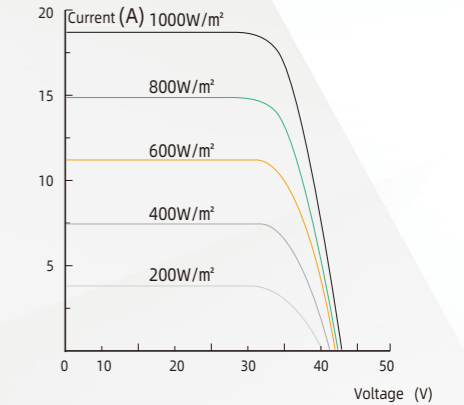
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	558pcs/40HQ

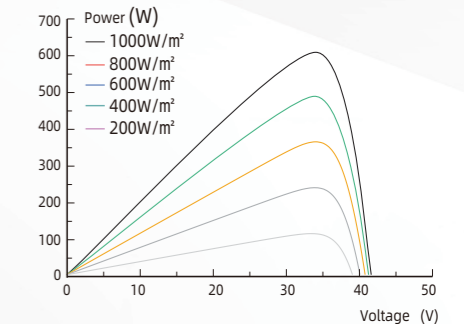
### Module Dimension(mm)



### Current-Voltage Curve (675W)



### Power-Voltage Curve (675W)





# HRAP-120H 365-380M6

**20.86%**  
Maximum Module Efficiency

**380W**  
Maximum Power Output

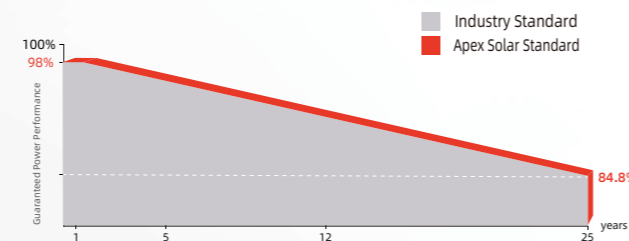
Power Shorting Tolerance:0-3W

**1755×1038×30mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



**Industry Leading Linear Power Warranty**  
12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12** Process Warranty **25** Power Warranty

- 0-3w** **0-3w**  
Guaranteed 0-3w positive tolerance ensures the power output reliability
- \$** **High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- ✓** **Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- ☀** **Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- PID** **Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- ☁** **Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-120H 365-380M6

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	365	370	375	380
Maximum Power Voltage(Vmp) [V]	33.85	34.05	34.25	34.40
Maximum Power Current(Impp) [A]	10.79	10.87	10.95	11.04
Open Circuit Voltage(Voc) [V]	41.05	41.25	41.45	41.65
Short Circuit Current(Isc) [A]	11.27	11.35	11.43	11.51
Module Efficiency [%]	20.00	20.30	20.60	20.86

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	266.7	270.4	274.1	277.8
Maximum Power Voltage(Vmp) [V]	31.2	31.3	31.5	31.7
Maximum Power Current(Impp) [A]	8.56	8.63	8.7	8.76
Open Circuit Voltage(Voc) [V]	38.1	38.3	38.5	38.7
Short Circuit Current(Isc) [A]	9.06	9.12	9.19	9.25

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	166×166mm
Cell Arrangement	120(6×20)
Weight	19.5kg(±3%)
Module Dimensions	1755×1038×30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 (Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

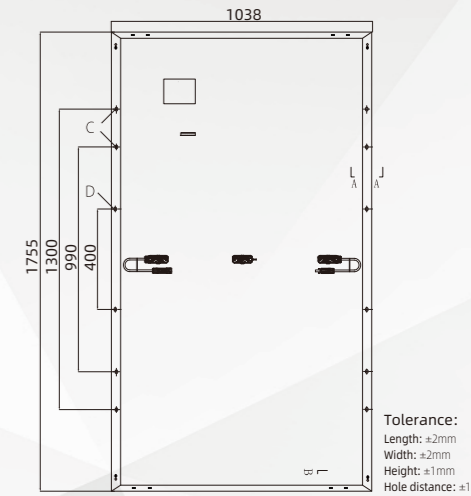
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C-+85°C
Maximum Series Fuse	20A

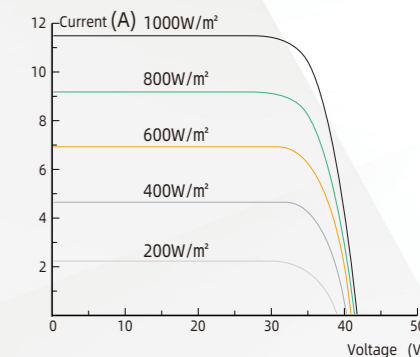
### PACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	845pcs/40HQ

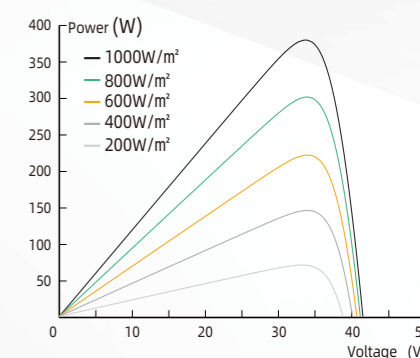
### Module Dimension(mm)



### Current-Voltage Curve (380W)



### Power-Voltage Curve (380W)





## HRAP-108H 400-420M10

**21.48%**  
Maximum Module Efficiency

**420W**  
Maximum Power Output

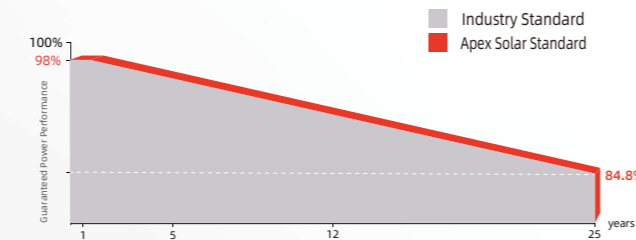
Power Shorting Tolerance:0-3W

**1724×1134×30mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safty class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



**Industry Leading Linear Power Warranty**  
12-year Warranty for Materials and Processing . 25-year Warranty for Extra Linear Power Output



**12 YEARS** Process Warranty      **25 YEARS** Power Warranty

- 0-3w** **0-3w**  
Guaranteed 0-3w positive tolerance ensures the power output reliability
- \$** **High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- 🛡️** **Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- 🔧** **Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- 🚫** **Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- ☁️** **Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## High Efficiency Half-cells Solar Panel HRAP-108H 400-420M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	400	405	410	415	420
Maximum Power Voltage(Vmp) [V]	30.75	31.00	31.25	31.49	31.73
Maximum Power Current(Imp) [A]	13.01	13.07	13.12	13.18	13.24
Open Circuit Voltage(Voc) [V]	36.75	37.00	37.25	37.50	37.75
Short Circuit Current(Isc) [A]	13.76	13.83	13.88	13.94	14.01
Module Efficiency [%]	20.46	20.72	20.97	21.23	21.48

STC: Irradiance 1000 W/m2 module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	299	302.7	306.5	310.2	313.9
Maximum Power Voltage(Vmp) [V]	28.56	28.80	29.03	29.25	29.47
Maximum Power Current(Imp) [A]	10.47	10.52	10.56	10.60	10.65
Open Circuit Voltage(Voc) [V]	34.55	34.79	35.08	35.26	35.49
Short Circuit Current(Isc) [A]	11.13	11.18	11.22	11.27	11.32

NMOT: Irradiance 800 W/m2 ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	108(6×18)
Weight	21.5kg(±3%)
Module Dimensions	1724×1134×30mm
Cable	4.0 mm² positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

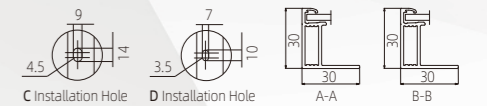
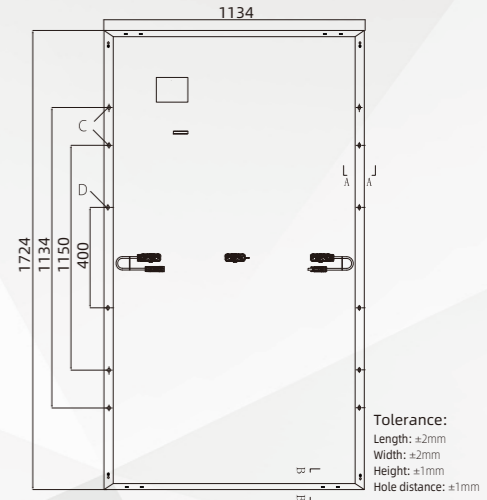
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.34%/°C
Voc Temperature Coefficient	-0.28%/°C
ISC Temperature Coefficient	+0.05%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	- 40°C~+85°C
Maximum Series Fuse	25A

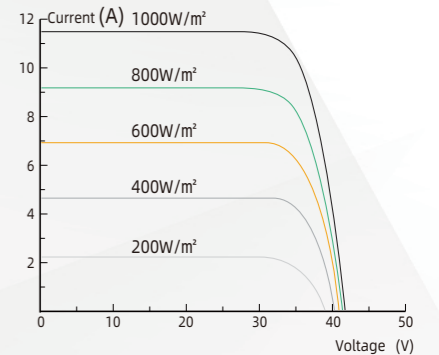
### PACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	962pcs/40HQ

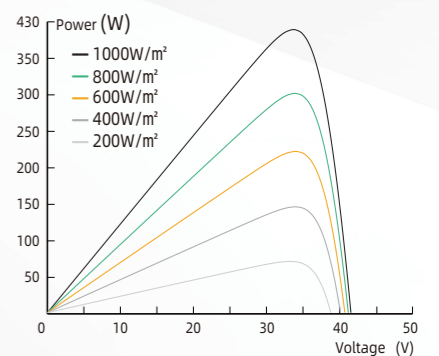
### Module Dimension(mm)



### Current-Voltage Curve (420W)



### Power-Voltage Curve (420W)





# HRAP-108H-N410-N430M10

## N-TOPCon Technology

### 22.02%

Maximum Module Efficiency

### 430W

Maximum Power Output

Power Shorting Tolerance:0-3W

### 1722x1134x30mm

Module Dimensions

IEC 61215 / IEC 61730

Fire safty class:Class C according to UL790

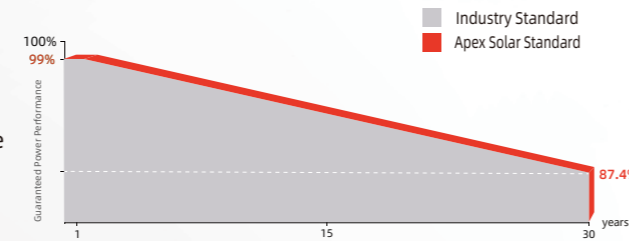
ISO 9001 :Quality Management System

ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing ,30-year Warranty for Extra Linear Power Output



12 Year Process Warranty

30 Year Power Warranty

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	410	415	420	425	430
Maximum Power Voltage(Vmp) [V]	31.13	31.32	31.51	31.70	31.88
Maximum Power Current(Imp) [A]	13.17	13.25	13.33	13.41	13.49
Open Circuit Voltage(Voc) [V]	37.73	37.92	38.11	38.30	38.49
Short Circuit Current(Isc) [A]	13.91	13.99	14.07	14.15	14.23
Module Efficiency [%]	21.00	21.25	21.51	21.76	22.02

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	308	312	316	320	323
Maximum Power Voltage(Vmp) [V]	29.06	29.21	29.34	29.50	29.63
Maximum Power Current(Imp) [A]	10.61	10.68	10.76	10.83	10.91
Open Circuit Voltage(Voc) [V]	35.84	36.02	36.20	36.38	36.56
Short Circuit Current(Isc) [A]	11.23	11.29	11.36	11.42	11.49

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182x182mm
Cell Arrangement	108(2x54)
Weight	22kg(±3%)
Module Dimensions	1722x1134x30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltaage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

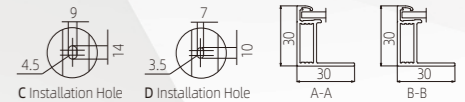
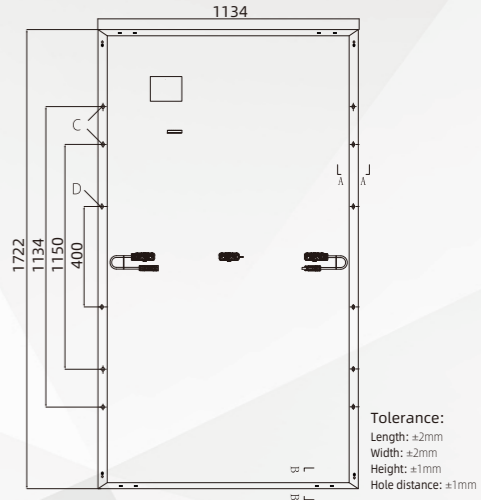
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

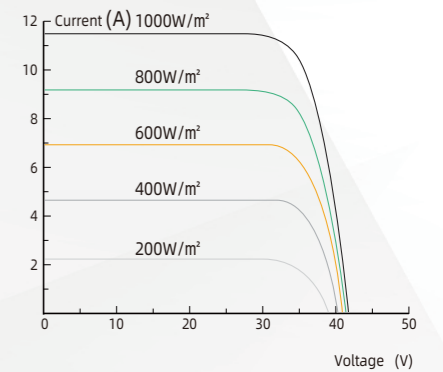
### PPACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	962pcs/40HQ

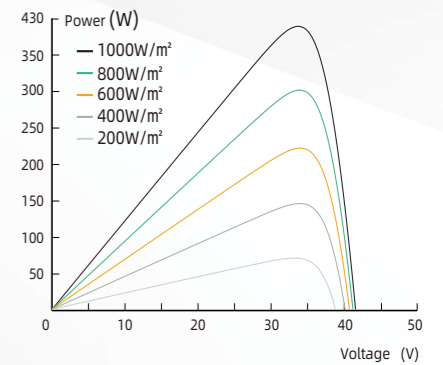
### Module Dimension(mm)



### Current-Voltage Curve (430W)



### Power-Voltage Curve (430W)



**0-3W**  
Guaranteed 0-3w positive tolerance ensures the power output reliability

**High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations

**Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements

**Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability

**Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process

**Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment



## HRAP-120H-N460-N490M10

### N-TOPCon Technology

# 22.63%

Maximum Module Efficiency

# 490W

Maximum Power Output

Power Shorting Tolerance:0-3W

# 1909×1134×30mm

Module Dimensions

IEC 61215 / IEC 61730

Fire safty class:Class C according to UL790

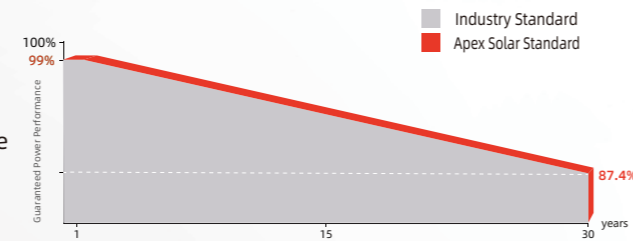
ISO 9001 :Quality Management System

ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing .30-year Warranty for Extra Linear Power Output



12 Process Warranty

30 Power Warranty

## HRAP-120H-N460-N490M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	460	465	470	475	480	485	490
Maximum Power Voltage(Vmp) [V]	34.72	34.89	35.05	35.21	35.38	35.54	35.64
Maximum Power Current(Imp) [A]	13.25	13.33	13.41	13.49	13.57	13.65	13.75
Open Circuit Voltage(Voc) [V]	42.05	42.22	42.38	42.54	42.71	42.88	43.12
Short Circuit Current(Isc) [A]	13.99	14.07	14.15	14.23	14.31	14.39	14.51
Module Efficiency [%]	21.32	21.55	21.78	22.01	22.20	22.40	22.63

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	346	350	353	357	361	365	369
Maximum Power Voltage(Vmp) [V]	32.60	32.77	32.94	33.10	33.27	33.84	34.00
Maximum Power Current(Imp) [A]	10.61	10.67	10.73	10.79	10.85	10.80	10.86
Open Circuit Voltage(Voc) [V]	39.94	40.10	40.25	40.41	40.57	41.57	41.71
Short Circuit Current(Isc) [A]	11.29	11.36	11.42	11.49	11.55	11.24	11.31

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	120(2×60)
Weight	24.2kg(±3%)
Module Dimensions	1909×1134×30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

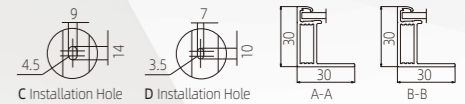
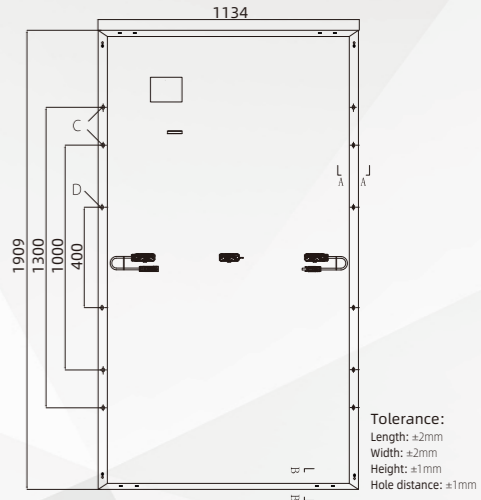
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

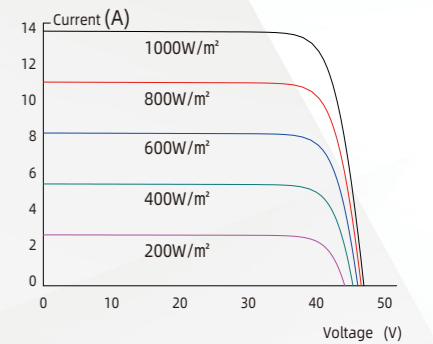
### PPACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	864pcs/40HQ

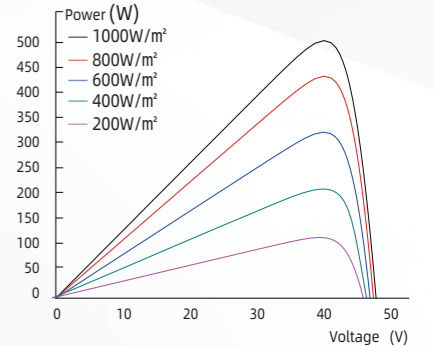
### Module Dimension(mm)



### Current-Voltage Curve (490W)

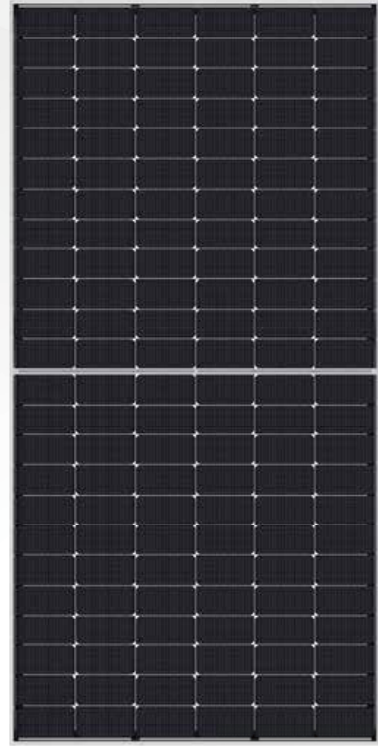


### Power-Voltage Curve (490W)



- 0-3w**  
Guaranteed 0-3w positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment





# HRAP-144H-N565-N585M10

## N-TOPCon Technology

### 22.65%

Maximum Module Efficiency

### 585W

Maximum Power Output

Power Shorting Tolerance:0-3W

### 2279×1134×35mm

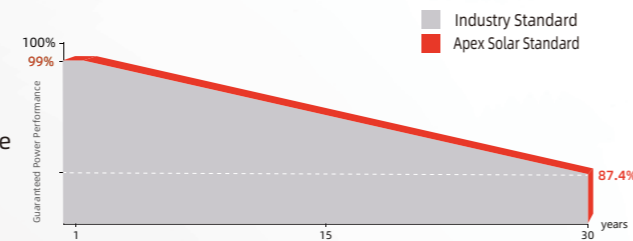
Module Dimensions

IEC 61215 / IEC 61730  
 Fire safty class:Class C according to UL790  
 ISO 9001 :Quality Management System  
 ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing ,30-year Warranty for Extra Linear Power Output



Process Warranty Power Warranty

- 0-3w** Guaranteed 0-3w positive tolerance ensures the power output reliability
- High customer value** Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control** Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology** The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance** Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance** The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	565	570	575	580	585
Maximum Power Voltage(Vmp) [V]	41.92	42.07	42.22	42.37	42.52
Maximum Power Current(Imp) [A]	13.48	13.55	13.62	13.69	13.76
Open Circuit Voltage(Voc) [V]	50.60	50.74	50.88	51.02	51.16
Short Circuit Current(Isc) [A]	14.23	14.31	14.39	14.47	14.55
Module Efficiency [%]	21.87	22.07	22.26	22.45	22.65

STC: Irradiance 1000 W/m2 module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	425	429	432	436	440
Maximum Power Voltage(Vmp) [V]	39.38	39.51	39.60	39.69	39.81
Maximum Power Current(Imp) [A]	10.79	10.85	10.92	10.99	11.05
Open Circuit Voltage(Voc) [V]	48.06	48.20	48.33	48.46	48.60
Short Circuit Current(Isc) [A]	11.49	11.55	11.62	11.68	11.75

NMOT: Irradiance 800 W/m2 ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	144(2×72)
Weight	28kg(±3%)
Module Dimensions	2279×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

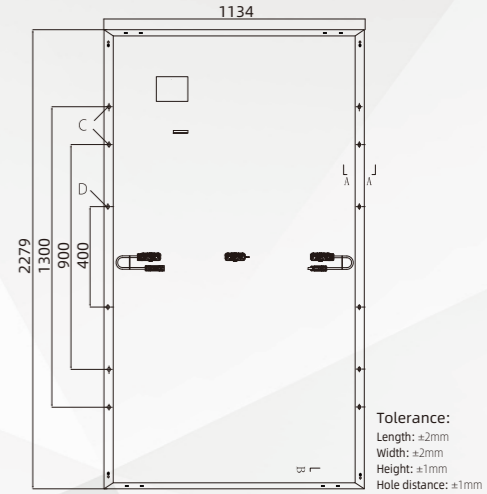
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

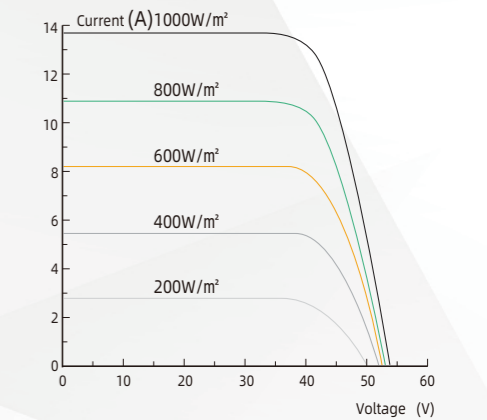
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	620pcs/40HQ

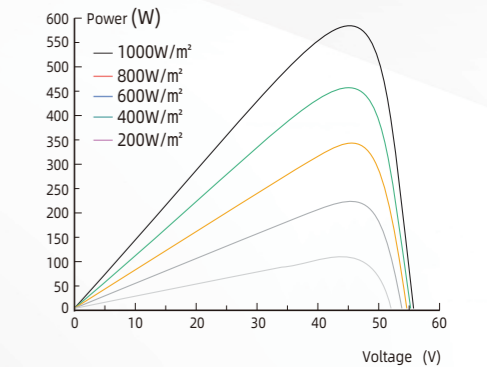
### Module Dimension(mm)



### Current-Voltage Curve (585W)



### Power-Voltage Curve (585W)





## HRAP-156H-N610-N640M10

### N-TOPCon Technology

**22.89%**

Maximum Module Efficiency

**640W**

Maximum Power Output

Power Shorting Tolerance:0-3W

**2465×1134×35mm**

Module Dimensions

IEC 61215 / IEC 61730

Fire safty class:Class C according to UL790

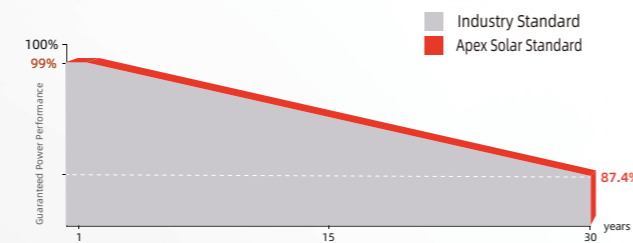
ISO 9001 :Quality Management System

ISO 14001 :Environment Management



#### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing .30-year Warranty for Extra Linear Power Output



**12** Process Warranty

**30** Power Warranty

## HRAP-156H-N610-N640M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	610	615	620	625	630	635	640
Maximum Power Voltage(Vmp) [V]	45.59	45.69	45.79	45.92	46.26	46.42	46.52
Maximum Power Current(Imp) [A]	13.38	13.46	13.54	13.61	13.62	13.68	13.76
Open Circuit Voltage(Voc) [V]	55.25	55.40	55.55	55.70	55.86	56.01	56.15
Short Circuit Current(Isc) [A]	14.11	14.18	14.25	14.32	14.35	14.48	14.54
Module Efficiency [%]	21.82	22.00	22.18	22.36	22.53	22.71	22.89

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	459	462	466	470	472	476	480
Maximum Power Voltage(Vmp) [V]	42.28	42.39	42.50	42.61	42.72	42.82	42.92
Maximum Power Current(Imp) [A]	10.85	10.91	10.97	11.03	11.09	11.11	11.18
Open Circuit Voltage(Voc) [V]	52.48	52.62	52.77	52.91	53.05	53.66	53.96
Short Circuit Current(Isc) [A]	11.39	11.45	11.50	11.56	11.62	11.68	11.72

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	156(2×78)
Weight	30.6kg(±3%)
Module Dimensions	2465×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

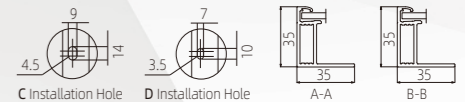
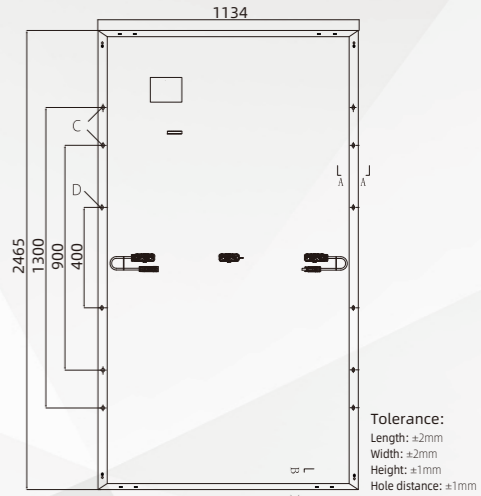
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

### PPACKING CONFIGURATION

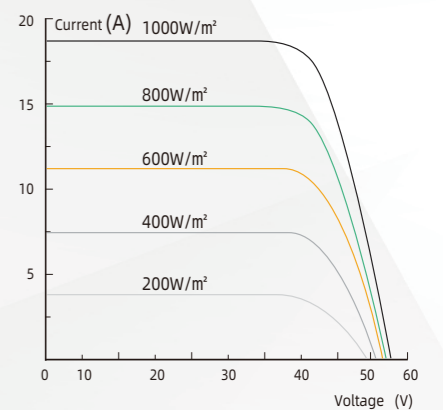
Quantity/Pallet	31 pcs/pallet
Quantity/Container	558pcs/40HQ

### Module Dimension(mm)

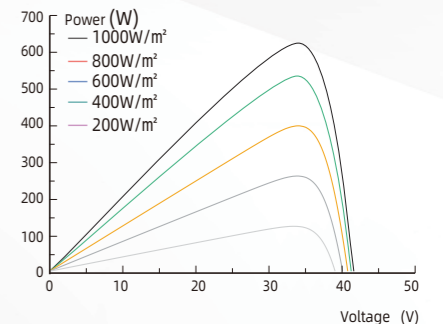


Tolerance:  
Length: ±2mm  
Width: ±2mm  
Height: ±1mm  
Hole distance: ±1mm

### Current-Voltage Curve (640W)



### Power-Voltage Curve (640W)



- 0-3w** Guaranteed 0-3w positive tolerance ensures the power output reliability
- High customer value** Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control** Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology** The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance** Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance** The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

# HRAP-108H-N410-N425M10

## N-TOPCon Technology

**21.76%**

Maximum Module Efficiency

**425W**

Maximum Power Output

Power Shorting Tolerance:0-3W

**1722x1134x30mm**

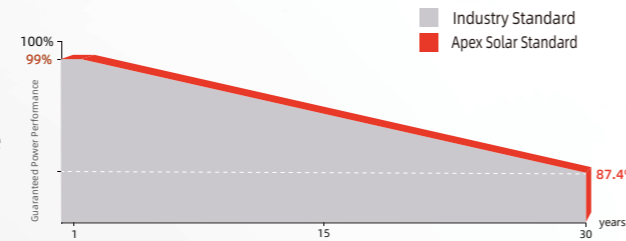
Module Dimensions

IEC 61215 / IEC 61730  
 Fire safty class:Class C according to UL790  
 ISO 9001 :Quality Management System  
 ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing ,30-year Warranty for Extra Linear Power Output



**12** Process Warranty **30** Power Warranty



- 0-3w** Guaranteed 0-3w positive tolerance ensures the power output reliability
- High customer value** Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control** Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology** The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance** Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance** The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## HRAP-108H-N410-N425M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	410	415	420	425
Maximum Power Voltage(Vmp) [V]	31.13	31.32	31.51	31.70
Maximum Power Current(Imp) [A]	13.17	13.25	13.33	13.41
Open Circuit Voltage(Voc) [V]	37.73	37.92	38.11	38.30
Short Circuit Current(Isc) [A]	13.91	13.99	14.07	14.15
Module Efficiency [%]	21.00	21.25	21.51	21.76

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	308	312	316	320
Maximum Power Voltage(Vmp) [V]	29.06	29.21	29.34	29.50
Maximum Power Current(Imp) [A]	10.61	10.68	10.76	10.83
Open Circuit Voltage(Voc) [V]	35.84	36.02	36.20	36.38
Short Circuit Current(Isc) [A]	11.23	11.29	11.36	11.42

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182x182mm
Cell Arrangement	108(2x54)
Weight	22kg(±3%)
Module Dimensions	1722x1134x30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltaic Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

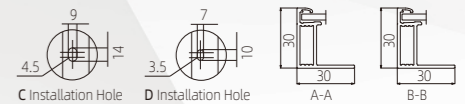
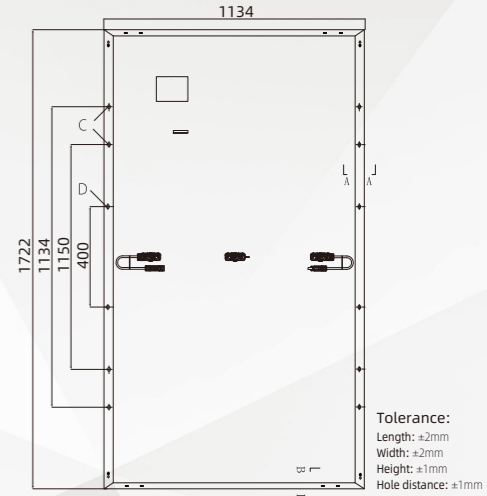
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

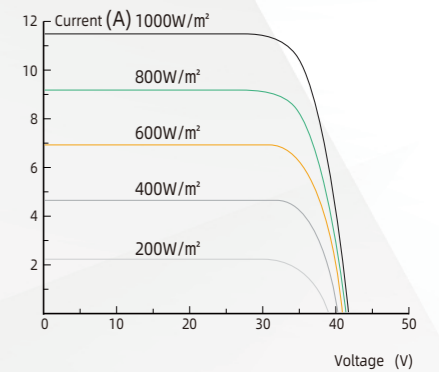
### PPACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	962pcs/40HQ

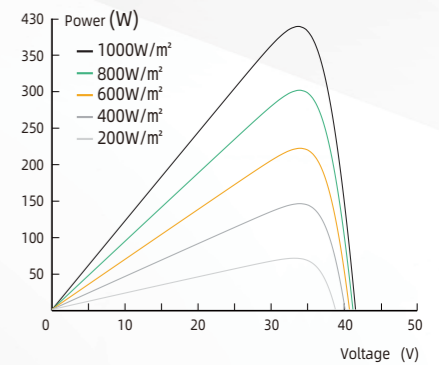
### Module Dimension(mm)



### Current-Voltage Curve (425W)



### Power-Voltage Curve (425W)



# HRAP-120H-N460-N475M10

## N-TOPCon Technology

**22.01%**  
Maximum Module Efficiency

**475W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

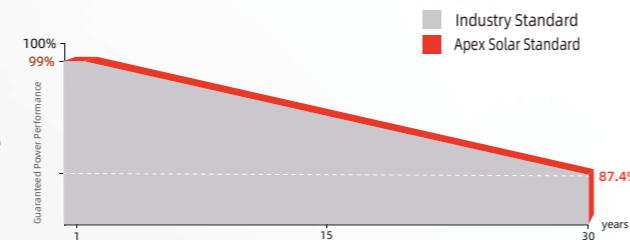
**1909×1134×30mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safty class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing ,30-year Warranty for Extra Linear Power Output



**12** Process Warranty

**30** Power Warranty



- 0-3w** Guaranteed 0-3w positive tolerance ensures the power output reliability
- High customer value** Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control** Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology** The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance** Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance** The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## HRAP-120H-N460-N475M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	460	465	470	475
Maximum Power Voltage(Vmp) [V]	34.72	34.89	35.05	35.21
Maximum Power Current(Imp) [A]	13.25	13.33	13.41	13.49
Open Circuit Voltage(Voc) [V]	42.05	42.22	42.38	42.54
Short Circuit Current(Isc) [A]	13.99	14.07	14.15	14.23
Module Efficiency [%]	21.32	21.55	21.78	22.01

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	346	350	353	357
Maximum Power Voltage(Vmp) [V]	32.60	32.77	32.94	33.10
Maximum Power Current(Imp) [A]	10.61	10.67	10.73	10.79
Open Circuit Voltage(Voc) [V]	39.94	40.10	40.25	40.41
Short Circuit Current(Isc) [A]	11.29	11.36	11.42	11.49

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	120(2×60)
Weight	24.2kg(±3%)
Module Dimensions	1909×1134×30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

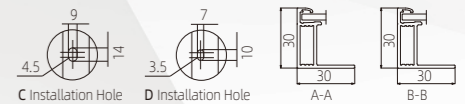
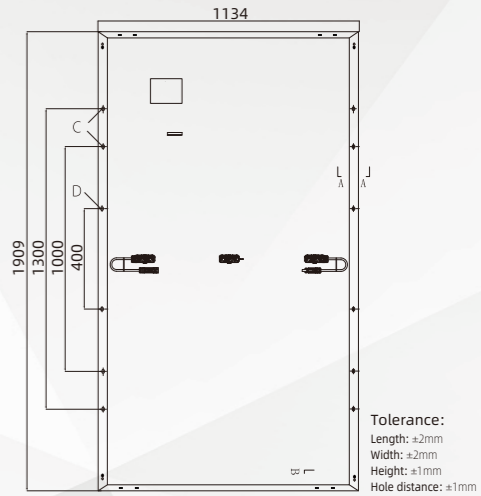
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

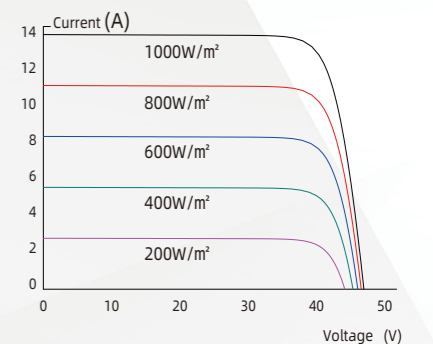
### PPACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	864pcs/40HQ

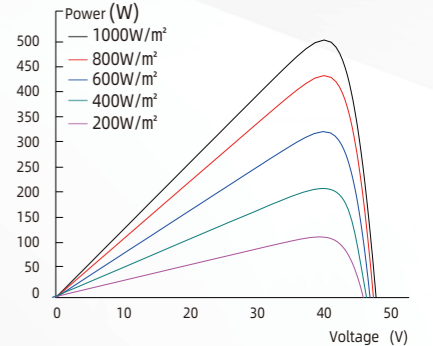
### Module Dimension(mm)



### Current-Voltage Curve (475W)



### Power-Voltage Curve (475W)





# HRAP-144H-N570-N590M10

## N-TOPCon Technology

**22.82%**  
Maximum Module Efficiency

**590W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

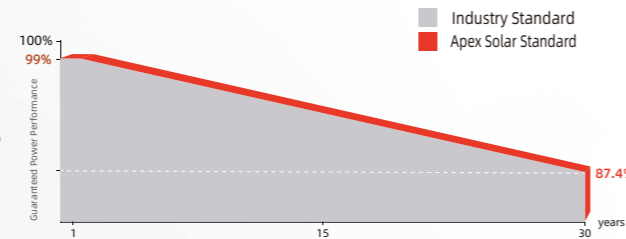
**2279×1134×35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safty class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing .30-year Warranty for Extra Linear Power Output



**12** Process Warranty **30** Power Warranty

## HRAP-144H-N570-N590M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	570	575	580	585	590
Maximum Power Voltage(Vmp) [V]	42.07	42.22	42.37	42.52	42.67
Maximum Power Current(Imp) [A]	13.55	13.62	13.69	13.76	13.83
Open Circuit Voltage(Voc) [V]	50.74	51.88	51.02	52.16	52.37
Short Circuit Current(Isc) [A]	14.31	14.39	14.47	14.89	14.94
Module Efficiency [%]	22.05	22.24	22.45	22.63	22.82

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	429	432	436	441	445
Maximum Power Voltage(Vmp) [V]	39.65	39.78	39.87	41.05	41.21
Maximum Power Current(Imp) [A]	10.81	10.87	10.94	10.74	10.79
Open Circuit Voltage(Voc) [V]	48.51	48.70	48.89	50.06	50.25
Short Circuit Current(Isc) [A]	11.50	11.55	11.60	11.30	11.36

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	144(2×72)
Weight	28kg(±3%)
Module Dimensions	2279×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

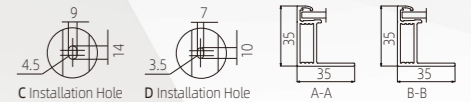
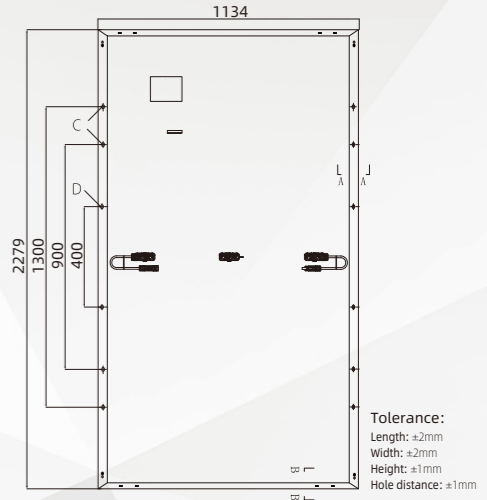
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

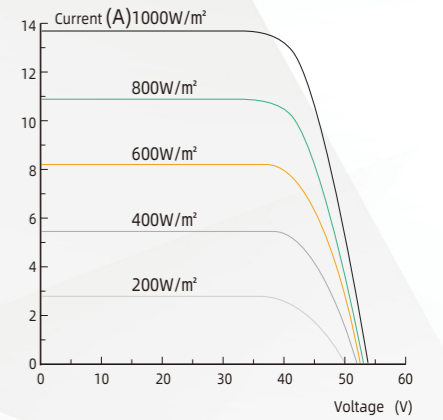
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	620pcs/40HQ

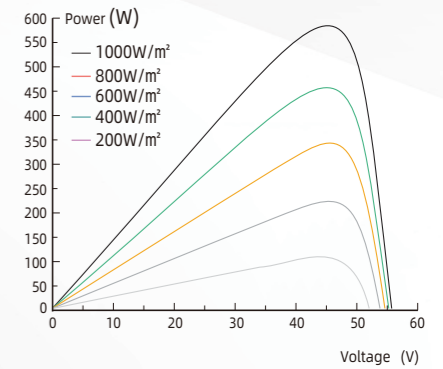
### Module Dimension(mm)



### Current-Voltage Curve (590W)



### Power-Voltage Curve (590W)



- 0-3w**  
Guaranteed 0-3w positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## HRAP-156H-N610-N640M10

### N-TOPCon Technology

# 22.89%

Maximum Module Efficiency

# 640W

Maximum Power Output

Power Shorting Tolerance:0-3W

# 2465×1134×35mm

Module Dimensions

IEC 61215 / IEC 61730

Fire safety class:Class C according to UL790

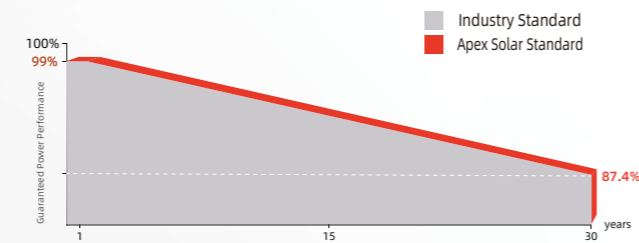
ISO 9001 :Quality Management System

ISO 14001 :Environment Management



### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing .30-year Warranty for Extra Linear Power Output



**12** Process Warranty

**30** Power Warranty



#### 0-3W

Guaranteed 0-3W positive tolerance ensures the power output reliability

#### High customer value

Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations

#### Highly reliable due to stringent quality control

Three times strict EL testing beyond certification requirements

#### Fusion of MBB and half-cut cells technology

The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability

#### Excellent Anti-PID performance

Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process

#### Outstanding low light performance

The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## HRAP-156H-N610-N640M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	610	615	620	625	630	635	640
Maximum Power Voltage(Vmp) [V]	45.59	45.69	45.79	45.92	46.26	46.42	46.52
Maximum Power Current(Imp) [A]	13.38	13.46	13.54	13.61	13.62	13.68	13.76
Open Circuit Voltage(Voc) [V]	55.25	55.40	55.55	55.70	55.86	56.01	56.15
Short Circuit Current(Isc) [A]	14.11	14.18	14.25	14.32	14.35	14.48	14.54
Module Efficiency [%]	21.82	22.00	22.18	22.36	22.53	22.71	22.89

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	459	462	466	470	472	476	480
Maximum Power Voltage(Vmp) [V]	42.28	42.39	42.50	42.61	42.72	42.82	42.92
Maximum Power Current(Imp) [A]	10.85	10.91	10.97	11.03	11.09	11.11	11.18
Open Circuit Voltage(Voc) [V]	52.48	52.62	52.77	52.91	53.05	53.66	53.96
Short Circuit Current(Isc) [A]	11.39	11.45	11.50	11.56	11.62	11.68	11.72

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1 m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	156(2×78)
Weight	30.6kg(±3%)
Module Dimensions	2465×1134×35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

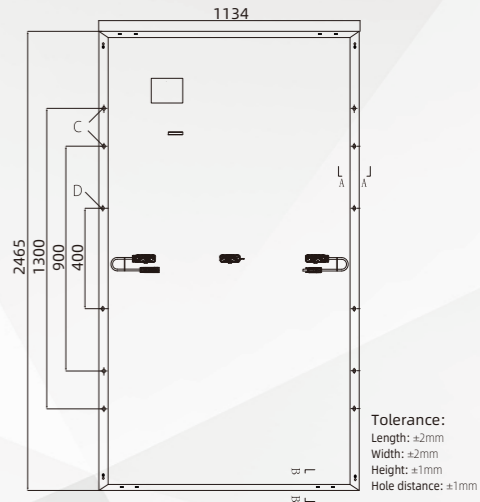
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

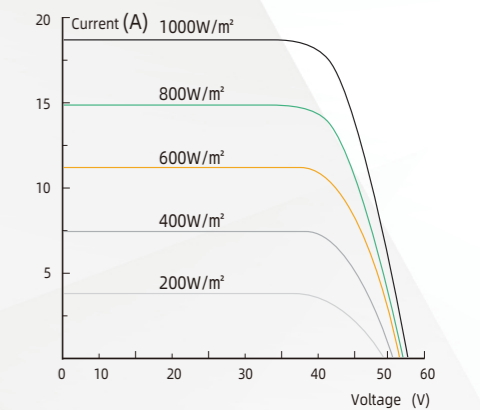
### PPACKING CONFIGURATION

Quantity/Pallet	31pcs/pallet
Quantity/Container	558pcs/40HQ

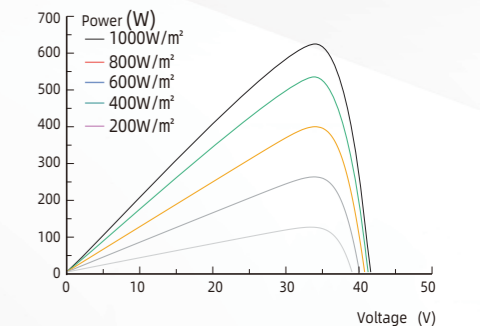
### Module Dimension(mm)



### Current-Voltage Curve (640W)



### Power-Voltage Curve (640W)



## HRAP-144H-N570-N590M10

### N-TOPCon Technology

**22.82%**  
Maximum Module Efficiency

**590W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

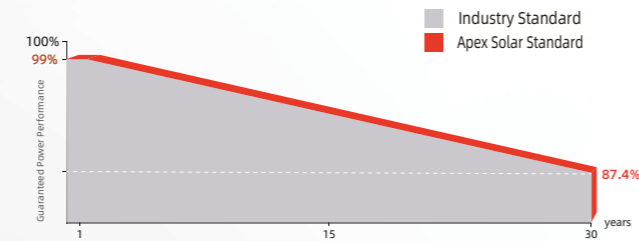
**2278x1134x35mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management

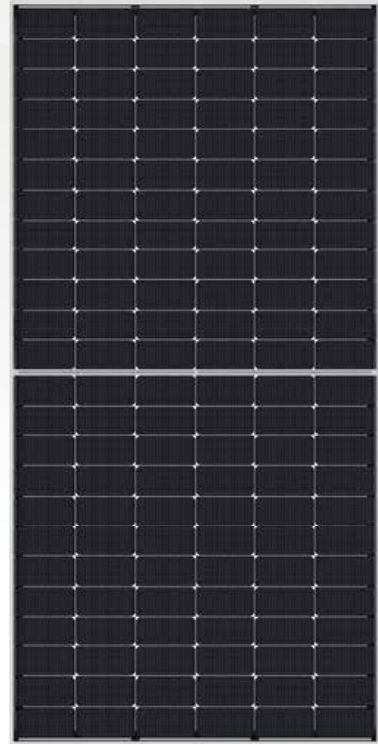


#### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing .30-year Warranty for Extra Linear Power Output



**12** Process Warranty      **30** Power Warranty



- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
The new circuit design, minimizes the impact of shadow on the power generation of solar module.Excellent light utilization and current collection capacity, effectively improve product power output and reliability
- Excellent Anti-PID performance**  
Ensure that the scale production passes the PID test, and greatly reduce the attenuation caused by PID by optimizing the wafer process
- Outstanding low light performance**  
The coated glass with high transmittance and the surface technology of the wafer are used to achieve excellent performance in low light environment

## HRAP-144H-N570-N590M10

### ELECTRICAL PARAMETERS AT STC

	570	575	580	585	590
Rated Maximum Power(Pmax) [W]	570	575	580	585	590
Maximum Power Voltage(Vmp) [V]	42.07	42.22	42.37	42.52	42.67
Maximum Power Current(Imp) [A]	13.55	13.62	13.69	13.76	13.83
Open Circuit Voltage(Voc) [V]	50.74	51.88	51.02	52.16	52.37
Short Circuit Current(Isc) [A]	14.31	14.39	14.47	14.89	14.94
Module Efficiency [%]	22.05	22.24	22.45	22.63	22.82

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

	429	432	436	441	445
Rated Maximum Power(Pmax)[W]	429	432	436	441	445
Maximum Power Voltage(Vmp) [V]	39.65	39.78	39.87	41.05	41.21
Maximum Power Current(Imp) [A]	10.81	10.87	10.94	10.74	10.79
Open Circuit Voltage(Voc) [V]	48.51	48.70	48.89	50.06	50.25
Short Circuit Current(Isc) [A]	11.50	11.55	11.60	11.30	11.36

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1 m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182x182mm
Cell Arrangement	144(2x72)
Weight	28kg(±3%)
Module Dimensions	2278x1134x35mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

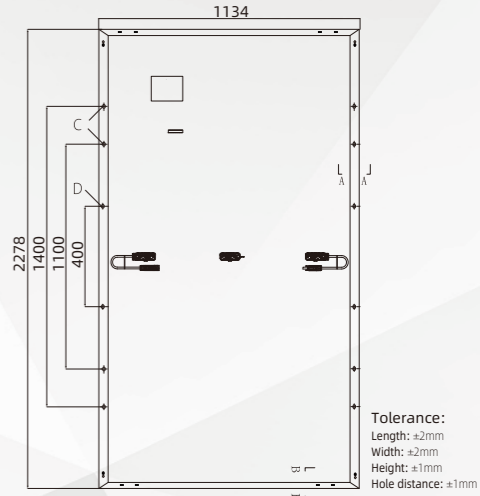
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

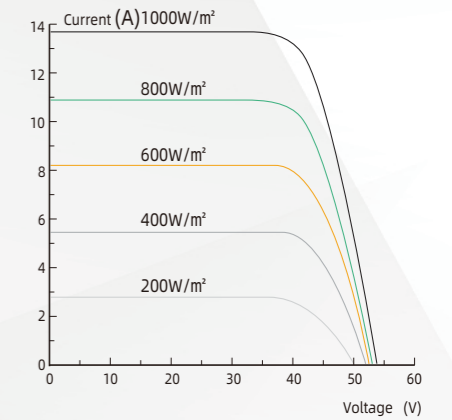
### PPACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	792pcs/40HQ

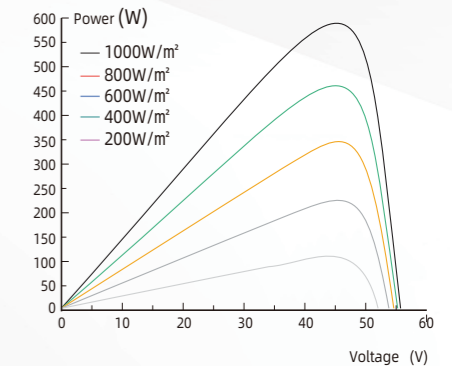
### Module Dimension(mm)



### Current-Voltage Curve (590W)



### Power-Voltage Curve (590W)



## HRAP-108H-N430-N450M10

### N-TOPCon Technology

**23.00%**  
Maximum Module Efficiency

**450W**  
Maximum Power Output

Power Shorting Tolerance:0-3W

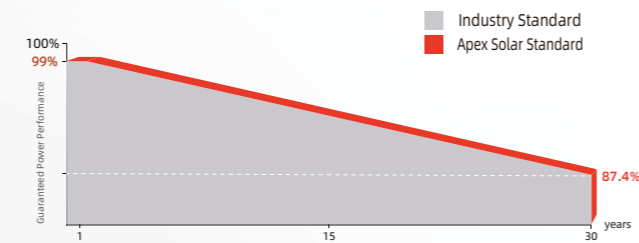
**1724×1134×30mm**  
Module Dimensions

IEC 61215 / IEC 61730  
Fire safety class:Class C according to UL790  
ISO 9001 :Quality Management System  
ISO 14001 :Environment Management



#### Industry Leading Linear Power Warranty

12-year Warranty for Materials and Processing .30-year Warranty for Extra Linear Power Output



**12** Process Warranty      **30** Power Warranty

## HRAP-108H-N430-N450M10

### ELECTRICAL PARAMETERS AT STC

Rated Maximum Power(Pmax) [W]	430	435	440	445	450
Maximum Power Voltage(Vmp) [V]	32.38	32.59	32.81	33.02	33.21
Maximum Power Current(Imp) [A]	13.28	13.35	13.41	13.48	13.55
Open Circuit Voltage(Voc) [V]	38.95	39.16	39.38	39.59	39.78
Short Circuit Current(Isc) [A]	13.73	13.80	13.86	13.93	14.00
Module Efficiency [%]	21.99	22.25	22.50	22.76	23.00

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5

### ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power(Pmax)[W]	323	327	331	335	338
Maximum Power Voltage(Vmp) [V]	30.10	30.33	30.56	30.76	30.90
Maximum Power Current(Imp) [A]	10.73	10.78	10.83	10.89	10.94
Open Circuit Voltage(Voc) [V]	37.00	37.20	37.41	37.61	37.79
Short Circuit Current(Isc) [A]	11.09	11.14	11.19	11.25	11.30

NMOT: Irradiance 800 W/m<sup>2</sup> ambient temperature 20°C wind speed: 1 m/s

### MECHANICAL SPECIFICATION

Cell Type	N-Type Monocrystalline
Cell Dimensions	182×182mm
Cell Arrangement	108(6×18)
Weight	21kg(±3%)
Module Dimensions	1724×1134×30mm
Cable	4.0 mm <sup>2</sup> positive/negative:300mm(11.8inches ),length Can be customized
Front Glass	3.2 mm high transmittance,AR coating tempered glass
Frame	Anodized aluminium alloy
Junction Box	Protection class IP68
Type of Connector	PV-XT101.1 ( Suzhou Xtong Photovoltage Technology Co., Ltd)
Mechanical Load	Front side 5400Pa/Rear side 2400Pa

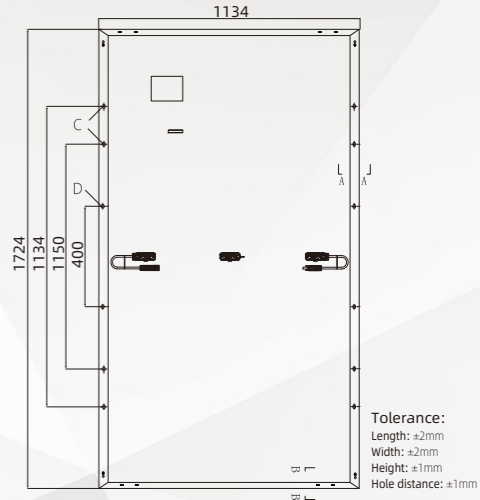
### OPERATING CONDITIONS

Maximum System Voltage (V)	1000/1500VDC (IEC)
Pmax Temperature Coefficient	-0.30%/°C
Voc Temperature Coefficient	-0.25%/°C
ISC Temperature Coefficient	0.046%/°C
Nominal Operating Cell Temperature	45±2°C
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A

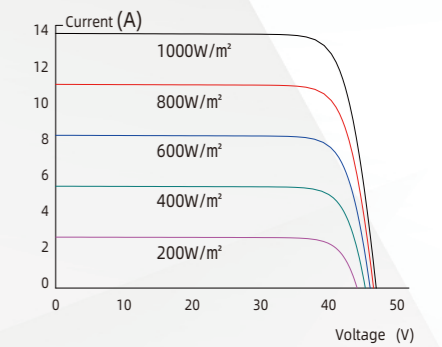
### PPACKING CONFIGURATION

Quantity/Pallet	36pcs/pallet
Quantity/Container	962pcs/40HQ

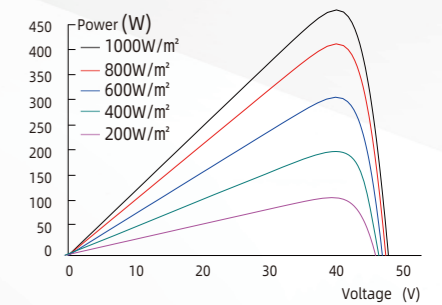
### Module Dimension(mm)



### Current-Voltage Curve (450W)



### Power-Voltage Curve (450W)



- 0-3W**  
Guaranteed 0-3W positive tolerance ensures the power output reliability
- High customer value**  
Lower cost per kilowatt hour.High quality silicon wafer guarantee, high power module output, excellent cost performance advantage, is an ideal choice for solar power stations
- Highly reliable due to stringent quality control**  
Three times strict EL testing beyond certification requirements
- Fusion of MBB and half-cut cells technology**  
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