



# Novaran Tose'e Tejarat Rasta (Rasta Export)







# INTRODUCTION

With two decades of experience in the field of exports, Niavaran Tose'e Tejarat Rasta (AKA Rasta Export) has established itself as one of the leaders in this industry in Iran. The company, with its diverse range of products, has secured a significant position in global markets.

Rasta Export has successfully built an extensive network of international clients, collaborating with over 50 countries including Oman, Saudi Arabia, China, various African nations, and more. As a trusted exporter, the company ensures that all its products comply with international standards and certifications, consistently remaining a top choice for foreign customers.

Our company excels in exporting a wide array of products, including petroleum products, solar power plants, electronic goods, and even household appliances. Clients can be assured of the quality and authenticity of our products, benefiting from our professional services and specialized consultancy in international trade. Rasta Export is committed to expanding and enhancing international collaborations, aiming to create added value for its clients and business partners.

Some of our prominent export activities include:

1. Exporting bitumen to Oman
2. Exporting solar panels to Saudi Arabia
3. Exporting televisions and refrigerators to Syria
4. Exporting household electrical appliances to Turkey
5. Exporting chemicals to India
6. Exporting medical equipment to Germany
7. Exporting carpets to the United Arab Emirates
8. Exporting agricultural products to Russia
9. Exporting building stones to Italy
10. Exporting air conditioning units to Iraq
11. Exporting cables and wires to Brazil
12. Exporting auto parts to South Africa
13. Exporting plastic products to South Korea
14. Exporting furniture to Spain
15. Exporting kitchen appliances to Japan

By adhering to quality and international standards, our company strives to meet the needs of its clients in the best possible manner and ensure their satisfaction.



## Rasta Export

**Address:** Unit 1, No. 27, Vanak Street, Vanak Square, Tehran, Iran

**Email:** [Info@Rastaexport.com](mailto:Info@Rastaexport.com)

**Website:** [RastaExport.com](http://RastaExport.com)

**WhatsApp:** +98 912 683 5639

**Phone:** +98 21 8877 0680



# MIC 750~3300 TL-X



- Maximum efficiency of 97.6%
- Compact design
- Touch key & OLED display
- Flexible monitoring options
- AFCI optional



Datasheet	MIC 750TL-X	MIC 1000TL-X	MIC 1500TL-X	MIC 2000TL-X	MIC 2500TL-X	MIC 3000TL-X	MIC 3300TL-X
<b>Input data (DC)</b>							
Max. recommended PV power (for module STC)	1050W	1400W	2100W	2800W	3500W	4200W	4290W
Max. DC voltage	500V	500V	500V	500V	550V	550V	550V
Start voltage	50V	50V	50V	50V	80V	80V	80V
Nominal voltage	120V	180V	250V	360V	360V	360V	360V
MPP voltage range	50V-500V	50V-500V	50V-500V	50V-500V	65V-550V	65V-550V	65V-550V
No. of MPP trackers	1						
No. of PV strings per MPP tracker	1						
Max. input current per MPP tracker	13A						
Max. short-circuit current per MPP tracker	16A						
<b>Output data (AC)</b>							
AC nominal power	750W	1000W	1500W	2000W	2500W	3000W	3300W
Max. AC apparent power	750VA	1000VA	1500VA	2000VA	2500VA	3000VA	3300VA
Nominal AC voltage(range*)	230V (180-280V)						
AC grid frequency(range*)	50/60 Hz (45-55Hz/55-65 Hz)						
Max. output current	3.6A	4.8A	7.1A	9.5A	11.9A	14.3A	14.3A
Adjustable power factor	0.8leading...0.8lagging						
THDi	<3%						
AC grid connection type	Single phase						
<b>Efficiency</b>							
Max. efficiency	97.4%	97.4%	97.4%	97.4%	97.6%	97.6%	97.6%
European efficiency	96.5%	96.5%	97.0%	97.0%	97.0%	97.1%	97.1%
MPPT efficiency	99.9%						
<b>Protection devices</b>							
DC reverse polarity protection	Yes						
DC switch	Yes						
AC/DC surge protection	Type III / Type III						
Insulation resistance monitoring	Yes						
AC short-circuit protection	Yes						
Ground fault monitoring	Yes						
Grid monitoring	Yes						
Anti-islanding protection	Yes						
Residual-current monitoring unit	Yes						
AFCI protection	Optional						
<b>General data</b>							
Dimensions (W / H / D)	274/254/138mm						
Weight	6kg	6kg	6kg	6kg	6.2kg	6.2kg	6.2kg
Operating temperature range	-25°C ... +60°C						
Nighttime power consumption	< 0.5W						
Topology	Transformerless						
Cooling	Natural convection						
Protection degree	IP65						
Relative humidity	0-100%						
Altitude	4000m						
DC connection	H4/MC4(Optional)						
AC connection	Connector						
Display	OLED+LED/WIFI+APP						
Interfaces: RS485 / USB/Wi-Fi/ GPRS/ RF/LAN	Yes/Yes/Optional/Optional/Optional /Optional						
Warranty: 5 years / 10 years	Yes /Optional						
CE,AS4777, AS/NZS 3100, CEI 0-21, VDE-AR-N 4105, VDE 0126-1-1, UTE C 15-712-1, EN50549, IEC 60068, IEC 61683, IEC 62116, IEC 61727, INMETRO, G98, C10/C11, UNE217001, UNE206007, PO12.2							

\* The AC voltage and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.



# MIN 2500~6000 TL-X



- Maximum efficiency 98.4%
- Dual MPP trackers
- Type II SPD on DC side
- Supports export control
- Touch key and OLED display
- Data storage up to 25 years





Datasheet	MIN 2500TL-X	MIN 3000TL-X	MIN 3600TL-X	MIN 4200TL-X	MIN 4600TL-X	MIN 5000TL-X	MIN 6000TL-X
<b>Input Data (DC)</b>							
Max. recommended PV power (for module STC)	3500W	4200W	5040W	5880W	6440W	7000W	8100W
Max. DC voltage	500V	500V	550V	550V	550V	550V	550V
Start voltage	100V						
Nominal voltage	360V						
MPP voltage range	80V-500V	80V-500V	80V-550V	80V-550V	80V-550V	80V-550V	80V-550V
No. of MPP trackers	2						
No. of PV strings per MPP tracker	1						
Max. input current per MPP tracker	13.5A*						
Max. short-circuit current per MPP tracker	16.9A						
<b>Output data (AC)</b>							
AC nominal power	2500W	3000W	3600W	4200W	4600W	5000W	6000W
Max. AC apparent power	2500VA	3000VA	3600VA	4200VA	4600VA	5000VA	6000VA
Nominal AC voltage (range*)	230V (180-280V)						
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)						
Max. output current	11.3A	13.6A	16A	19A	20.9A	22.7A	27.2A
Adjustable power factor	0.8leading...0.8lagging						
THDi	< 3%						
AC grid connection type	Single phase						
<b>Efficiency</b>							
Max. efficiency	98.2%	98.2%	98.2%	98.4%	98.4%	98.4%	98.4%
European efficiency	97.1%	97.1%	97.2%	97.5%	97.5%	97.5%	97.5%
MPPT efficiency	99.9%						
<b>Protection Devices</b>							
DC reverse polarity protection	yes						
DC switch	yes						
AC/DC surge protection	Type III / Type II						
Insulation resistance monitoring	yes						
AC short-circuit protection	yes						
Ground fault monitoring	yes						
Grid monitoring	yes						
Anti-islanding protection	yes						
Residual-current monitoring unit	yes						
AFCI protection	Optional						
<b>General Data</b>							
Dimensions (W / H / D)	375/350/160mm						
Weight	10.8kg						
Operating temperature range	-25°C ... +60°C						
Noise emission (typical)	≤35 dB(A)						
Nighttime power consumption	< 1W						
Topology	Transformerless						
Cooling	Natural convection						
Protection degree	IP65						
Relative humidity	0-100%						
Altitude	4000m						
DC connection	H4/MC4(Optional)						
AC connection	Connector						
Display	OLED+LED/WIFI+APP						
Interfaces: RS485 / USB/WI-FI / GPRS/ RF/LAN	Yes/Yes/Optional/Optional/Optional /Optional						
Warranty: 5 years / 10 years	Yes /Optional						
CE, IEC62109, VDE0126-1-1, AS4777, AS/NZS 3100, VDE-AR-N4105, CQC, IEC61683, IEC60068, IEC61727, IEC62116, INMETRO							

\* Only the latest version with max. input current 13.5A per MPP tracker, for details please contact Growatt.

\* The AC voltage and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.



# MIN 2500~6000 TL-XH



- Max. efficiency 98.4%
- Dual MPP trackers
- Type II SPD on DC side
- Battery ready, future proof
- 24h self-consumption monitoring



Datasheet	MIN 2500TL-XH	MIN 3000TL-XH	MIN 3600TL-XH	MIN 4200TL-XH	MIN 4600TL-XH	MIN 5000TL-XH	MIN 6000TL-XH
<b>Input data (DC)</b>							
Max. recommended PV power (for module STC)	5000W	6000W	7200W	8400W	9200W	10000W	10000W
Max. DC voltage	500V	500V	550V	550V	550V	550V	550V
Start voltage	100V						
Nominal voltage	360V						
MPP voltage range	70V-500V	70V-500V	70V-550V	70V-550V	70V-550V	70V-550V	70V-550V
No. of MPP trackers/strings per MPP tracker	2/1						
Max. input current per MPP tracker	13.5A						
Max. short-circuit current per MPP trackers	16.9A						
<b>Input data (DC battery)</b>							
Compatible battery	ARK XH Battery System (5.12kWh~17.9kWh)						
Operating voltage range	360-500V	360-500V	360-550V	360-550V	360-550V	360-550V	360-550V
Max.operating current	17A						
Max.charge power	6000W						
Max.discharge power	2500W	3000W	3600W	4200W	4600W	5000W	6000W
<b>Output data (AC)</b>							
AC nominal power	2500W	3000W	3600W	4200W	4600W	5000W	6000W
Max. AC apparent power	2500VA	3000VA	3600VA	4200VA	4600VA	5000VA	6000VA
Nominal AC voltage(range*)	230V (180-280V)						
AC grid frequency(range*)	50/60 Hz (45-55Hz/55-65 Hz)						
Max. output current	11.3A	13.6A	16A	19A	20.9A	22.7A	27.2A
Adjustable power factor	0.8leading...0.8lagging						
THDI	<3%						
AC grid connection type	Single phase						
<b>Output data (Backup*)</b>							
Max. apparent power	2500VA	3000VA	3600VA	4200VA	4600VA	5000VA	6000VA
Nominal AC voltage	230V						
AC grid frequency	50/60Hz						
<b>Efficiency</b>							
Max. efficiency	98.2%	98.2%	98.2%	98.4%	98.4%	98.4%	98.4%
European efficiency	97.1%	97.1%	97.2%	97.2%	97.5%	97.5%	97.5%
MPPT efficiency	99.9%						
<b>Protection devices</b>							
DC reverse polarity protection	Yes						
DC switch	Yes						
DC/AC surge protection	Type II/Type III						
Insulation resistance monitoring	Yes						
AC short-circuit protection	Yes						
Ground fault monitoring	Yes						
Grid monitoring	Yes						
Anti-islanding protection	Yes						
Residual-current monitoring unit	Yes						
AFCI protection	Optional						
<b>General data</b>							
Dimensions (W / H / D)	375/350/160mm						
Weight	10.8kg						
Operating temperature range	-25°C ... +60°C						
Altitude	4000m						
Self-Consumption night	<3W						
Topology	Transformerless						
Cooling	Natural convection						
Protection degree	IP65						
Relative humidity	0%~100%						
DC connection	H4/MC4(Optional)						
AC connection	Connector						
Display	OLED+LED/WIFI+APP						
Interfaces: RS485 / USB/WI-FI/ GPRS/ RF/LAN	Yes/Yes/Optional/Optional/Optional /Optional						
Warranty: 5 years / 10 years	Yes /Optional						

CE, IEC62109, AS/NZS 4777.2, CEI 0-21, VDE-AR-N 4105, VDE 0126-1-1, UTE C 15-712-1, EN 50549, IEC 62116, IEC 61727, G98/G99

\* The AC voltage and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.

\* Backup power function need a Backup Box accessory.





# MOD 3000~9000 TL3-X



- Max. efficiency 98.6%
- OLED and Touch button
- Type II SPD on DC and AC side
- String Monitoring
- AFCI optional



Datasheet	MOD 3000TL3-X	MOD 4000TL3-X	MOD 5000TL3-X	MOD 6000TL3-X	MOD 7000TL3-X	MOD 8000TL3-X	MOD 9000TL3-X
<b>Input data (DC)</b>							
Max. recommended PV power (for module STC)	4500W	6000W	7500W	9000W	10500W	12000W	13500W
Max. DC voltage	1100V						
Start voltage	160V						
Nominal voltage	580V						
MPPT voltage range	140V-1000V						
No. of MPP trackers	2						
No. of PV strings per MPP tracker	1						
Max. input current per MPP tracker	13A						
Max. short-circuit current per MPP tracker	16A						
<b>Output data (AC)</b>							
AC nominal power	3000W	4000W	5000W	6000W	7000W	8000W	9000W
Max. AC apparent power	3300VA	4400VA	5500VA	6600VA	7700VA	8800VA	9900VA
Nominal AC voltage (range*)	220V/380V, 230V/400V (340-440V)						
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)						
Max. output current	5.0A	6.7A	8.3A	10.0A	11.7A	13.3A	15.0A
Adjustable power factor	0.8leading...0.8lagging						
THDI	<3%						
AC grid connection type	3W+N+PE						
<b>Efficiency</b>							
MAX. efficiency	98.3%	98.3%	98.3%	98.3%	98.6%	98.6%	98.6%
European efficiency	97.5%	97.5%	97.5%	97.5%	98.1%	98.1%	98.1%
MPPT efficiency	99.9%						
<b>Protection devices</b>							
DC reverse polarity protection	Yes						
DC Switch	Yes						
AC/DC surge protection	Type II / Type II						
Insulation resistance monitoring	Yes						
AC short-circuit protection	Yes						
Ground fault monitoring	Yes						
Grid monitoring	Yes						
Anti-islanding protection	Yes						
Residual-current monitoring unit	Yes						
String fault monitoring	Yes						
AFCl protection	Optional						
<b>General data</b>							
Dimensions (W / H / D)	425/387/147mm	425/387/147mm	425/387/147mm	425/387/147mm	425/387/178mm	425/387/178mm	425/387/178mm
Weight	12.5kg	12.5kg	12.5kg	12.5kg	14kg	14kg	14kg
Operating temperature range	- 25°C ... +60°C						
Nighttime power consumption	< 1W						
Topology	Transformerless						
Cooling	Natural convection						
Protection degree	IP66						
Relative humidity	0-100%						
Altitude	4000m						
DC connection	H4/MC4(Optional)						
AC connection	Connector						
Display	OLED+LED/WIFI+APP						
Interfaces: USB/RS485/WIFI /GPRS/LAN/RF	yes/yes/Optional/Optional/Optional/Optional						
Warranty: 5 / 10 years	Yes/Optional						
CE, VDE0126, Greece, EN50549, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, N4105, TOR Erzeuger G98/G99, G100, AS4777, UNE217001, UNE206007, PO12.2							

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.



# MOD 10~15K TL3-X



- Max. efficiency 98.6%
- OLED and Touch button
- Type II SPD on DC and AC side
- String Monitoring
- AFCI optional

Datasheet	MOD 10KTL3-X	MOD 11KTL3-X	MOD 12KTL3-X	MOD 13KTL3-X	MOD 15KTL3-X
<b>Input data (DC)</b>					
Max. recommended PV power (for module STC)	15000W	16500W	18000W	19500W	22500W
Max. DC voltage	1100V				
Start voltage	160V				
Nominal voltage	580V				
MPPT voltage range	140V-1000V				
No. of MPP trackers	2				
No. of PV strings per MPP tracker	1	1	1/2	1/2	1/2
Max. input current per MPP tracker	13A	13A	13/26A	13/26A	13/26A
Max. short-circuit current per MPP tracker	16A	16A	16/32A	16/32A	16/32A
<b>Output data (AC)</b>					
AC nominal power	10000W	11000W	12000W	13000W	15000W
Max. AC apparent power	11000VA*	12100VA	13200VA	14300VA	16500VA
Nominal AC voltage (range*)	220V/380V, 230V/400V (340-440V)				
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)				
Max. output current	16.7A	18.3A	20A	21.7A	25A
Adjustable power factor	0.8leading...0.8lagging				
THDI	<3%				
AC grid connection type	3W+N+PE				
<b>Efficiency</b>					
MAX. efficiency	98.6%				
European efficiency	98.1%	98.1%	98.2%	98.2%	98.2%
MPPT efficiency	99.9%				
<b>Protection devices</b>					
DC reverse polarity protection	Yes				
DC Switch	Yes				
AC/DC surge protection	Type II / Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
String fault monitoring	Yes				
AFCl protection	Optional				
<b>General data</b>					
Dimensions (W / H / D)	425/387/178mm				
Weight	14kg	14kg	16kg	16kg	16kg
Operating temperature range	- 25°C ... +60°C				
Nighttime power consumption	< 1W				
Topology	Transformerless				
Cooling	Natural convection				
Protection degree	IP66				
Relative humidity	0~100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Connector				
Display	OLED+LED/WIFI+APP				
Interfaces: USB/RS485/WIFI /GPRS/LAN/RF	yes/yes/Optional/Optional/Optional/Optional				
Warranty:5 years / 10 years	Yes/Optional				
CE, VDE0126, Greece, EN50549, C10/C11, VFR 2019, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, N4105, TOR Erzeuger G98/G99, G100, AS4777, UNE217001, UNE206007, PO12.2					

\* For Belgium C10/C11, MOD 10KTL3-X max. output power is limit to 10000VA.

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.





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# MID 15~25K TL3-X



- 
- Max. efficiency 98.75%
  - Dual MPPT trackers
  - Supports export control
  - Touch key and OLED display
  - Type II SPD on AC and DC side

Datasheet	MID 15KTL3-X	MID 17KTL3-X	MID 20KTL3-X	MID 22KTL3-X	MID 25KTL3-X
<b>Input data (DC)</b>					
Max. recommended PV power (for module STC)	22500W	25500W	30000W	33000W	37500W
Max. DC voltage	1100V				
Start Voltage	250V				
Nominal voltage	580V				
MPPT voltage range	160V-1000V				
No. of MPP trackers	2				
No. of PV strings per MPP tracker	2	2	2	2	2/3
Max. input current per MPPT tracker*	27A	27A	27A	27A	27A/40.5A
Max. short circuit current per MPPT	33.8A	33.8A	33.8A	33.8A	33.8A/50.7A
<b>Output data (AC)</b>					
Rated AC output power	15000W	17000W	20000W	22000W	25000W
Max. AC apparent power	16600VA	18800VA	22000VA	24400VA	27700VA
Nominal AC voltage(range*)	220V/380V, 230V/400V (340-440V)				
AC grid frequency;(range*)	50/60 Hz (45-55Hz/55-65 Hz)				
Max. output current	24.2A	27.4A	31.9A	35.5A	40.2A
Adjustable power factor	0.8leading...0.8lagging				
THDi	< 3%				
AC grid connection type	3W + N + PE				
<b>Efficiency</b>					
Max. efficiency	98.75%				
European efficiency	98.6%				
MPPT efficiency	99.9%				
<b>Protection devices</b>					
DC reverse polarity protection	Yes				
DC Switch	Yes				
AC/DC surge protection	TypeII/Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
String monitoring	Yes				
AFCI protection	Optional				
<b>General data</b>					
Dimensions (W / H / D)	525/395/222mm				
Weight	23kg				
Operating temperature range	-25 °C ... +60 °C				
Self-Consumption (night)	< 1W				
Topology	Transformerless				
Cooling	Smart air cooling				
Protection degree	IP65				
Relative Humidity	0~100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Cable gland + OT terminal				
Display	OLED+LED/WIFI+APP				
Interfaces: RS485 / USB / WiFi/ GPRS / RF/ LAN	Yes/Yes /Optional/Optional/Optional/Optional				
Warranty: 5 years / 10 years	Yes /Optional				
CE, VDE0126, Greece, EN50549, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, N4105, TOR Erzeuger, G98/G99, G100, UNE217001, UNE206007, PO12.2, KSC8565					

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.

\* Only the latest version with max. input current 13.5A per string. for details please contact Growatt.





# MID 25~40K TL3-X



- The maximum efficiency is up to 98.8%
- AFCI function optional
- Self-consumption monitoring
- Touch key and OLED display
- Type II SPD on DC and AC side

Datasheet	MID 25KTL3-X1	MID 30KTL3-X	MID 33KTL3-X	MID 36KTL3-X	MID 40KTL3-X
<b>Input data (DC)</b>					
Max. recommended PV power (for module STC)	37500W	45000W	49500W	54000W	60000W
Max. DC voltage	1100V				
Start Voltage	250V				
Normal Voltage	600V				
MPPT voltage range	200-1000V				
No. of MPP trackers	3	3	3	4	4
No. of PV strings per MPP tracker	2				
Max.input current per MPP tracker	26A				
Max. short-circuit current per MPP tracker	32A				
<b>Output data (AC)</b>					
AC nominal power	25000W	30000W	33000W	36000W	40000W
Max. AC apparent power	27700VA	33300VA	36600VA	39600VA	44000VA
Nominal AC voltage (range*)	220V/380V, 230V/400V (340-440V)				
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)				
Max. output current	40A	50.5A	55.5A	60.0A	66.6A
Adjustable power factor	0.8leading...0.8lagging				
THDi	< 3%				
AC grid connection type	3W + N + PE				
<b>Efficiency</b>					
Max. efficiency	98.8%				
European efficiency	98.5%				
MPPT efficiency	99.9%				
<b>Protection devices</b>					
DC reverse polarity protection	Yes				
DC Switch	Yes				
AC/DC surge protection	Type II / Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
String monitoring	Yes				
AFCI protection	Optional				
<b>General data</b>					
Dimensions (W / H / D)	580/435/230mm				
Weight	29.5kg	29.5kg	29.5kg	30.5kg	30.5kg
Operating temperature range	- 25°C ... +60°C				
Nighttime power consumption	< 1W				
Topology	Transformerless				
Cooling	Smart air cooling				
Protection degree	IP66				
Relative humidity	0-100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Cable gland+OT terminal				
Display	OLED+LED/WIFI+APP				
Interfaces: RS485 / USB / WIFI/ GPRS / RF/ LAN	Yes/Yes/Optional/Optional/Optional/Optional				
Warranty: 5 years / 10 years	Yes/Optional				
CE, VDE0126, Greece, EN50549, C10/C11, UTE C 15-712, IEC62116,IEC61727, IEC 60068, IEC 61683, CEI0-21, CEI0-16, N4105, TOR Erzeuger, G98/G99, G100, AS/NZS 3100, AS4777, UNE217001, UNE206007, PO12.2, KSC8565					

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.





# MAX 50~80K TL3 LV



- 
- 6/7MPPTs
  - Smart diagnosis
  - High efficiency up to 99%
  - Local WIFI configuration
  - String monitoring
  - AC&DC type II SPD
  - AFCI protection
  - Data storage up to 25 years
  - DC side 2 in 1 connection enabled

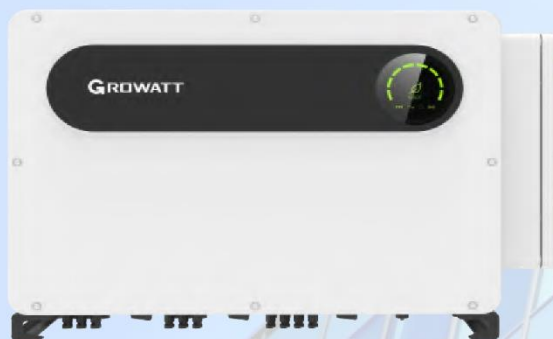


Datasheet	MAX 50KTL3 LV	MAX 60KTL3 LV	MAX 70KTL3 LV	MAX 80KTL3 LV
<b>Input data (DC)</b>				
Max. recommended PV power (for module STC)	75000W	90000W	105000W	120000W
Max.DC voltage	1100V			
Start voltage	250V			
Nominal voltage	585V	585V	600V	600V
MPPT voltage range	200V-1000V			
No. of MPP trackers	6	6	7	7
No. of PV strings per MPP tracker	2			
Max. input current per MPP tracker	26A			
Max. short-circuit current per MPP tracker	32A			
<b>Output data (AC)</b>				
AC nominal power	50000W	60000W	70000W	80000W
Max. AC apparent power	55500VA	66600VA	77700VA	88800VA
Nominal AC voltage(range*)	220V/380V, 230V/400V (340-440V)			
AC grid frequency(range*)	50/60 Hz (45-55Hz/55-65 Hz)			
Max. output current	80.5A	96.6A	112.7A	128.8A
Adjustable power factor	0.8leading ...0.8lagging			
THDi	<3%			
AC grid connection type	3W+N+PE			
<b>Efficiency</b>				
Max. efficiency	98.8%	98.8%	99%	99%
European efficiency	98.4%	98.4%	98.5%	98.5%
MPPT efficiency	99.9%			
<b>Protection devices</b>				
DC reverse polarity protection	Yes			
DC switch	Yes			
DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Anti-islanding protection	Yes			
Residual-current monitoring unit	Yes			
String monitoring	Yes			
AFCl protection	Yes			
<b>General data</b>				
Dimensions (W / H / D)	860/600/300mm			
Weight	82kg	82kg	86kg	86kg
Operating temperature range	-25°C ... +60°C			
Self-consumption	< 1W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP65			
Relative humidity	0-100%			
Altitude	4000m			
DC connection	H4/MC4(Optional)			
AC connection	Cable gland+OT terminal			
Display	LED/WIFI+APP			
Interfaces: RS485 / USB /WIFI/ RF/GPRS	Yes/Yes /Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			
CE , VDE0126, Greece, EN50438, EN50549, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, CEI 0-16, N4105, BDEW, DRRG, TOR Erzeuger G98/G99, G100, AS/NZS3100, AS4777, UNE217001, UNE206007, PO12.2, NRS 097-2-1, MEA , PEA , KSC8565				

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.



# MAX 100~125K TL3-X LV



- 10 MPPTs fusefree design
- Smart I/V scan and diagnosis
- Intelligent string monitoring
- AC&DC type II SPD
- IP66 and C5 protection

Datasheet	MAX 100KTL3-X LV	MAX 110KTL3-X LV	MAX 120KTL3-X LV	MAX 125KTL3-X LV
<b>Input data (DC)</b>				
Max. DC voltage	1100V			
Start voltage	195V			
Nominal voltage	600V			
MPP voltage range	180V-1000V			
No. of MPP trackers	10			
No. of PV strings per MPP tracker	2			
Max. input current per MPP tracker	32A			
Max. short-circuit current per MPP tracker	40A			
<b>Output data (AC)</b>				
AC nominal power	100000W	110000W	120000W	125000W
Max. AC apparent power	110000VA	121000VA	132000VA	137500VA
Nominal AC voltage(range*)	400V/380V(340-440VAC)			
AC grid frequency (range*)	50/60 Hz(45-55Hz/55-65 Hz)			
Max. output current	158.8A@400V 167.1A@380V	174.6A@400V 183.8A@380V	190.5A@400V 200.5A@380V	198.5A@400V 208.9A@380V
Adjustable power factor	0.8leading ...0.8lagging			
THDi	<3%			
AC grid connection type	3W/N/PE			
<b>Efficiency</b>				
Max. efficiency	98.8%			
European efficiency	98.4%	98.5%	98.5%	98.5%
MPPT efficiency	99.9%			
<b>Protection devices</b>				
DC reverse polarity protection	Yes			
DC switch	Yes			
AC/DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
String detection	Yes			
Anti PID function	Opt			
Arc fault detection (AFCI)	Opt			
<b>General data</b>				
Dimensions (W / H / D)	970/640/345mm			
Weight	84kg			
Operating temperature range	-30°C ... +60°C			
Nighttime power consumption	< 1W			
Topology	Transformerless			
Cooling	Smart Cooling			
Protection degree	IP66			
Relative humidity	0-100%			
Altitude	4000m			
DC connection	H4/MC4 (Max.6mm <sup>2</sup> )			
AC connection	OT Terminal (Max. 240mm <sup>2</sup> )			
Display	LED/WIFI+APP			
Interfaces: RS485 / USB /PLC/GPRS/4G/WIFI	Yes/Yes/Optional/Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			
CE,IEC62116, IEC61727, CQC, VDE0126, VFR2019, EN50549-1/2, C10/C11, UNE206007, G99 CEI 0-21/0-16, N4105&N4110, UNE206006,MEA, PEA, KSC8565				

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.





# MAX 185~253K TL3-X HV



- Up to 15 MPPTs, fuse free design
- MAX efficiency 99%, high yield
- Smart IV scan and diagnosis
- Intelligent string monitoring
- DC side 2 in 1 connection enabled
- Optional Anti-PID/Night SVG/AFCI function
- Data storage up to 25 years

Datasheet	MAX 185KTL3-X HV	MAX 216KTL3-X HV	MAX 250KTL3-X HV	MAX 253KTL3-X HV
<b>Input data (DC)</b>				
Max. DC voltage	1500V			
Start voltage	500V			
Nominal voltage	1080V			
MPP voltage range	500V-1500V			
No. of MPP trackers	9	9	12	15
No. of PV strings per MPP tracker	2			
Max. input current per MPP tracker	30A			
Max. short-circuit current per MPP tracker	50A			
<b>Output data (AC)</b>				
AC nominal power	185kW	216kW	250kW	253kW
Max. AC apparent power	185kVA@30°C 175kVA@40°C 160kVA@50°C	216kVA@30°C 200kVA@40°C 192kVA@50°C	250kVA@30°C 230kVA@45°C 220kVA@50°C	253kVA@30°C 230kVA@45°C 220kVA@50°C
Nominal AC voltage (range*)	800V (640-920V)			
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)			
Max. output current	133.5A	155.9A	180.4A	182.6A
Adjustable power factor	0.8leading ...0.8lagging			
THDI	<3%			
AC grid connection type	3W+PE			
<b>Efficiency</b>				
Max. efficiency	99.0%			
European efficiency	98.7%	98.7%	98.7%	98.5%
MPPT efficiency	99.9%			
<b>Protection devices</b>				
DC reverse polarity protection	Yes			
DC switch	Yes			
AC/DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Anti-islanding protection	Yes			
Residual-current monitoring unit	Yes			
String monitoring	Yes			
AFCI protection	Optional			
Anti-PID function	Optional			
LVRT	Yes			
HVRT	Yes			
Night SVG	Optional			
<b>General data</b>				
Dimensions (W / H / D)	1070/675/340mm			
Weight	95kg	95kg	99kg	109kg
Operating temperature range	-30°C ... +60°C			
Nighttime power consumption	< 1W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP66			
Relative humidity	0-100%			
Altitude	4000m			
DC connection	Staubli MC4/Amphenol UTX			
AC connection	OT Terminal connectors (Max. 300mm <sup>2</sup> )			
Display	LED/WIFI+APP			
Interfaces: RS485/USB / PLC/4G/GPRS	Yes/Yes/Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			
CE, IEC62116/61727, IEC60068/61683, IEC60529, PEA, MEA, VDE0126, Greece, NRS097-2-1:2017, CEA2019				

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.





# WIT 50-100K TL3-H-MV



- 
- Scalable system configuration, extend to 300kW
  - Support EPS function and black start
  - 100% unbalanced load when backup
  - 110% continuous AC overloading capacity
  - Support remote control of DG
  - Multiple MPPTs input
  - Grid-support functions

Datasheet	WIT 50KTL3-H WIT 50KTL3-H-EP	WIT 63KTL3-H WIT 63KTL3-H-EP	WIT 75KTL3-H WIT 75KTL3-H-EP	WIT 100KTL3-H WIT 100KTL3-H-EP
<b>Input data (PV)</b>				
Max. recommended PV power(for module STC)	109200W	124800W	156000W	156000W
Start voltage			195V	
Nominal voltage			550V	
Max. input Voltage			1000V	
MPP voltage range			180V-800V	
Max. input current per MPP tracker			32A	
Max. short-circuit current per MPP tracker			40A	
No. of PV strings per MPP tracker			2	
No. of MPP trackers	7	8	10	10
<b>Output data (AC)</b>				
AC nominal power	50000W	63000W	75000W	100000W
Max. AC apparent power	55KVA	69.3KVA	82.5KVA	110KVA
Nominal AC voltage			380/400/415V	
AC voltage range			-15%~+10%	
AC grid frequency			50/60 Hz	
AC grid frequency/range			45-55Hz/55-65Hz	
Max. output current	83.3A@380V 79.7A@400V	105A@380V 100.4A@400V	125A@380V 119.5A@400V	166.7@380V 159.4A@400V
Adjustable power factor			-1...+1	
THDi			<3%	
AC grid connection type			3P3W+PE/3P4W+PE	
<b>Battery data (DC)</b>				
Continuous charging and discharging power	56.7KW	71.4KW	85.1KW	113.5KW
Battery voltage range		600-1000V (for 3P3W) / 680-1000V (for 3P4W)		
Recommended battery voltage			768V	
Max charging and discharging current	83.3A	105A	125A	167A
BMS communication			RS485/CAN	
<b>Backup power (AC)</b>				
Rated AC output power	50KW	63KW	75KW	100KW
Max. AC apparent power	60KVA	75.6KVA	90KVA	120KVA
Rated AC output voltage			220V/230V/240V/380V/400V/415V	
Nominal AC output frequency			50/60 Hz	
Load connection			3W+N+PE	
Max. output current	90.9A	114.5A	136.7A	181.8A
THDv			<3% (Linear load)	
Load unbalance			100% three-phase unbalanced	
Overload			≤110%: Continuous 110%~120%: <10min >120%: 200ms	
<b>Efficiency</b>				
Max. efficiency			98.0%	
MAX. Battery charge/discharge efficiency			98.0%	
<b>Protection devices</b>				
DC reverse polarity protection			Yes	
Battery reverse protection			Yes	
AC/DC surge protection			Class II	
Insulation resistance monitoring			Yes	
Ground fault monitoring			Yes	
Grid monitoring			Yes	
Residual-current monitoring unit			Yes	
AC short-circuit protection			Yes	
Strings Monitoring			Yes	
Anti-islanding protection			Yes	
PID Protection			Yes	
AFCI Function			Opt	
<b>General</b>				
Dimensions (W / H / D)			820/1350/510mm	
Weight	143kg	143kg	150kg	150kg
Operating temperature range	-20°C~+60°C (ENERGY CO.,LTD All rights reserved. Subject to change without notice.		30 °C~60 °C (> 50°C, derating)	
Relative humidity			0~100%	
Altitude			4000m	
Topology			Transformerless	
Cooling			Smart air cooling	
IP degree			IP65	
Display			OLED+LED/WIFI+APP	
Interfaces: RS485/CAN/USB			Yes	
Interfaces: WIFI/4G/LAN-X			Opt	
Warranty (5/10 years)			Yes/Opt	

GBT 34120-2017, IEC/EN61000-6-1, IEC/EN61000-6-3, IEC/EN62477-1, IEC/EN62109-1, IEC/EN62109-2, EC62116, EC61727, G99/2020, EN50549-1, VDE 4105, VDE 0124, UL1741, IEEE1547

\* The parameter of backup power is only available for WIT 50-100KTL3-H-EP model.

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# SPH 3000~6000TL BL-UP



- 
- Smart load management via dry contact
  - UPS function, 10ms transition
  - Scalable system configuration
  - VPP interface ready
  - Remote smart O&M
  - 2 DC/AC Ratio





Datasheet	SPH3000TL BL-UP	SPH3600TL BL-UP	SPH4000TL BL-UP	SPH4600TL BL-UP	SPH5000TL BL-UP	SPH6000TL BL-UP
<b>Input data(PV)</b>						
Max. recommended PV power (for module STC)	6000W	7200W	8000W	9200W	10500W	11200W
Max. DC voltage	550V					
Start voltage	120V					
MPP voltage range	120-550V/360V					
No. of MPP trackers	2					
No. of PV strings per MPP tracker	1					
Max. input current per MPP tracker	13.5A					
Max. short-circuit current per MPP tracker	16.5A					
<b>Battery data (DC)</b>						
AC nominal power	3000W	3680W	4000W	4600W	5000W	6000W
Max. AC apparent power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
Nominal AC voltage (range)	230V/(180Vac-270Vac)					
AC grid frequency (range)	50Hz/60Hz (45Hz-55Hz/55Hz-65Hz)					
Max. output current	16A	16A	22A	22A	27A	27A
Adjustable power factor	0.8leading...0.8lagging					
THDI	<3%					
AC grid connection type	Single phase					
<b>Backup power(AC)</b>						
Battery voltage range	42--59V					
Max charging and discharging current	66A	75A	85A	85A	85A	85A
Continuous charging and discharging power	3000W	3680W	4000W	4000W	4000W	4000W
Type of battery	Lithium /Lead-acid					
<b>Efficiency</b>						
MAX. efficiency	97.20%	97.20%	97.30%	97.40%	97.50%	97.60%
European efficiency	97%	97%	97.10%	97.10%	97.20%	97.20%
MPP efficiency	≥99.5%					
<b>Protection devices</b>						
DC switch	Yes					
DC reverse polarity protection	Yes					
AC/DC surge protection	Yes					
Battery reverse protection	Yes					
AC short-circuit protection	Yes					
Ground fault monitoring	Yes					
Grid monitoring	Yes					
Anti-islanding protection	Yes					
Residual-current monitoring unit	Yes					
Insulation resistance monitoring	Yes					
<b>General data</b>						
Dimensions (W / H / D)	458/565/188mm					
Weight	31kg					
Operating temperature range	-25°C ... +60°C					
Nighttime power consumption	< 10 W					
Topology	Transformerless					
Cooling	Natural					
Protection degree	IP65					
Relative humidity	0--100%					
Altitude	2000m					
PV DC Connection	H4/MC4(Optional)					
Battery DC Connection	OT Terminal					
AC connection	Connector					
Display	LCD+LED					
Interfaces:RS485/CAN/USB	Yes					
Monitor : RF/WIFI/GPRS	Optional					
Warranty: 5 years / 10 years	Yes/Optional					
CE, IEC62109, G98/G99, VDE0126-1-1, AS4777, CEI 0-21, VDE-AR-N4105, UTE C 15-712 EN50549, IEC 61727, IEC 62116, IEC 62040, C10/11, NRS 097-2-1						

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.



# SPH 10000TL-X



- Max. 6 units in parallel in both on/off-grid modes
- UPS function, 10ms transition
- 1.5 DC/AC Ratio with 3 Mppts
- Up to 200A charging/discharging current
- Support DC-coupled, AC-coupled, AC-retrofit applications
- Type II Surge protection for DC and AC sides
- Support charge from diesel generator
- Support both single phase and split phase application

Datasheet	SPH3000TL BL-UP	SPH3600TL BL-UP	SPH4000TL BL-UP	SPH4600TL BL-UP	SPH5000TL BL-UP	SPH6000TL BL-UP
<b>Input data(PV)</b>						
Max. recommended PV power (for module STC)	6000W	7200W	8000W	9200W	10500W	11200W
Max. DC voltage	550V					
Start voltage	120V					
MPP voltage range	120-550V/360V					
No. of MPP trackers	2					
No. of PV strings per MPP tracker	1					
Max. input current per MPP tracker	13.5A					
Max. short-circuit current per MPP tracker	16.5A					
<b>AC output data</b>						
AC nominal power	3000W	3680W	4000W	4600W	5000W	6000W
Max. AC apparent power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
Nominal AC voltage [range]	230V/ (180Vac-270Vac)					
AC grid frequency [range]	50Hz/60Hz (45Hz-55Hz/55Hz-65Hz)					
Max. output current	16A	16A	22A	22A	27A	27A
Adjustable power factor	0.8leading...0.8lagging					
THDI	<3%					
AC grid connection type	Single phase					
<b>Battery data (DC)</b>						
Battery voltage range	42~59V					
Max charging and discharging current	66A	75A	85A	85A	85A	85A
Continuous charging and discharging power	3000W	3680W	4000W	4000W	4000W	4000W
Type of battery	Lithium /Lead-acid					
<b>Backup power(AC)</b>						
Max. AC output power	3000W	3680W	4000W	4000W	4000W	4000W
Max. output current	17.4A					
Nominal AC output voltage	230Vac					
Nominal AC output frequency	50/60HZ					
THDv	<3%					
Switch time	<10ms					
<b>Efficiency</b>						
MAX. efficiency	97.20%	97.20%	97.30%	97.40%	97.50%	97.60%
European efficiency	97%	97%	97.10%	97.10%	97.20%	97.20%
MPPT efficiency	≥99.5%					
<b>Protection devices</b>						
DC switch	Yes					
DC reverse polarity protection	Yes					
AC/DC surge protection	Yes					
Battery reverse protection	Yes					
AC short-circuit protection	Yes					
Ground fault monitoring	Yes					
Grid monitoring	Yes					
Anti-islanding protection	Yes					
Residual-current monitoring unit	Yes					
Insulation resistance monitoring	Yes					
<b>General data</b>						
Dimensions (W / H / D)	458/565/188mm					
Weight	31kg					
Operating temperature range	-25°C ... +60°C					
Nighttime power consumption	< 10 W					
Topology	Transformerless					
Cooling	Natural					
Protection degree	IP65					
Relative humidity	0~100%					
Altitude	2000m					
PV DC Connection	H4/MC4(Optional)					
Battery DC Connection	OT Terminal					
AC connection	Connector					
Display	LCD+LED					
Interfaces:RS485/CAN/USB	Yes					
Monitor : RF/WIFI/GPRS	Optional					
Warranty: 5 years / 10 years	Yes/Optional					
CE, IEC62109, G98/G99, VDE0126-1-1, AS4777, CEI 0-21, VDE-AR-N4105, ITC C 15-712 EN50549, IEC 61727, IEC 62116, IEC 62040, C10/11, NRS 097-2-1						

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.





# SPH

## 4000~10000

### TL3 BH-UP



- 100% three-phase imbalance output
- Smart phase-level power export limitation
- Wide battery voltage 100-550V
- UPS function, 10ms transition
- Scalable system configuration
- VPP interface ready
- DC/AC type II SPD
- 1.5 DC/AC Ratio



Datasheet	SPH 4000TL3 BH-UP	SPH 5000TL3 BH-UP	SPH 6000TL3 BH-UP	SPH 7000TL3 BH-UP	SPH 8000TL3 BH-UP	SPH 10000TL3 BH-UP
<b>Input data(PV)</b>						
Max. recommended PV power (for module STC)	6000W	7500W	9000W	10500W	12000W	15000W
Max. DC voltage	1000					
Start voltage	120V					
MPP voltage range	120V-1000V/600V					
No. of MPP trackers	2					
No. of PV strings per MPP tracker	1					
Max. input current per MPP tracker	13.5A					
Max. short-circuit current per MPP tracker	16.9A					
<b>Output data(AC)</b>						
AC nominal power	4000W	5000W	6000W	7000W	8000W	10000W
Max. AC apparent power	4000VA	5000VA	6000VA	7000VA	8000VA	10000VA
Nominal AC voltage (range*)	230V/400V (310–476V)					
AC grid frequency (range)	50Hz/60Hz (45Hz-55Hz/55Hz-65Hz)					
Max. output current	6.1A	7.6A	9.1A	10.6A	12.1A	15.2A
Adjustable power factor	0.8leading...0.8lagging					
THDi	<3%					
AC grid connection type	3W   N   PE					
<b>Battery data (DC)</b>						
Battery voltage range	100–550V					
Max charging and discharging current	25A					
Continuous charging and discharging power	4000W	5000W	6000W	7000W	8000W	10000W
Type of battery	Lithium battery					
<b>Backup power(AC)</b>						
Max. AC output power	4000W	5000W	6000W	7000W	8000W	10000W
Max. AC apparent power	4000VA	5000VA	6000VA	7000VA	8000VA	10000VA
Max. output current	6.1A	7.6A	9.1A	10.6A	12.1A	15.2A
Nominal AC output voltage	230V/400V					
Nominal AC output frequency	50/60HZ					
THDv	<3%					
Switch time	<10ms					
<b>Efficiency</b>						
MAX. efficiency	97.6%	97.8%	98.0%	98.2%	98.2%	98.2%
European efficiency	97.0%	97.2%	97.3%	97.4%	97.4%	97.5%
<b>Protection devices</b>						
DC switch	Yes					
DC reverse polarity protection	Yes					
AC/DC surge protection	Type II					
Battery reverse protection	Yes					
AC short-circuit protection	Yes					
Ground fault monitoring	Yes					
Grid monitoring	Yes					
Anti-islanding protection	Yes					
Residual-current monitoring unit	Yes					
Insulation resistance monitoring	Yes					
<b>General data</b>						
Dimensions (W / H / D)	505/453/198mm					
Weight	30kg					
Operating temperature range	-25 °C ... + 60 °C					
Nighttime power consumption	<13W					
Topology	Transformerless					
Cooling	Natural					
Protection degree	IP65					
Relative humidity	0–100%					
Altitude	3000m					
DC connection	H4 / MC4 (Optional)					
AC connection	Connector					
Display	LCD   LED					
Interfaces: RS485/CAN/USB	Yes					
Monitor : RF/WIFI/GPRS	Optional					
Warranty: 5 years / 10 years	Yes / Optional					
CE, IEC62109, IEC 62040, VDE-AR-N 4105, VDE 0126, UTE C 15-712, C10/C11 • EN50549, CEI 0-21, CEI 0-16, IEC62116, IEC61727, AS/NZS 4777 , G98, TOR Erzeuger						

\* The AC Voltage Range may vary depending on specific country grid standard.




# ARK LV Battery System



- Flexible capacity options, 2.56kWh to 25.6kWh
- Excellent safety of cobalt free LiFePO4 battery
- Easy installation with modular and stacked design
- Remote firmware upgrade



GROWATT · PRODUCT

Datasheet	ARK 2.5L	ARK 5.1L	ARK 7.6L	ARK 10.2L	ARK 12.8L	ARK 15.3L	ARK 17.9L	ARK 20.4L	ARK 23.0L	ARK 25.6L
System Demo										
Battery Module	ARK 2.5L-A1 (2.56kWh, 51.2V, 28kg)									
Number of Modules	1	2	3	4	5	6	7	8	9	10
Energy Capacity	2.56kWh	5.12kWh	7.68kWh	10.24kWh	12.8kWh	15.35kWh	17.92kWh	20.48kWh	23.04kWh	25.64kWh
Usable Capacity	2.30kWh	4.6kWh	6.9kWh	9.21kWh	11.52kWh	13.81kWh	16.12kWh	18.43kWh	20.73kWh	23.04kWh
Dimension (W/D/H)	650/260/185mm	650/260/365mm	650/260/545mm	650/260/725mm	650/260/905mm	650/260/1085mm	650/260/1265mm	650/260/1445mm	650/260/1625mm	650/260/1805mm
Weight	28kg	56kg	84kg	112kg	140kg	168kg	196kg	224kg	252kg	280kg
Standard Charge/Discharge Current	25A	50A	75A	100A	100A	100A	100A	100A	100A	100A
<b>General</b>										
Battery Type	Cobalt Free Lithium Iron Phosphate (LFP)									
Nominal Voltage	51.2V									
Operating voltage Range	47.2 - 56.8V									
IP Protection	IP65									
Installation	Wall-mounted or Floor installation* <sup>1</sup>									
Operation Temperature	-10~50°C* <sup>2</sup>									
<b>Features</b>										
BMS Monitoring Parameters	SOC, System voltage, current, cell voltage, cell temperature, PCBA temperature measurement									
Communication Port	CAN									
Warranty: 5 years /10 years	Yes/optional									
<b>Certification</b> IEC62619 (Cell&Pack), CE, CEC, RCM, UN38.3										

\*1 Floor installation requires extra base (W/D/H=650/260/80 mm)

\*2 Battery discharge: -10°C ~ 50°C, battery charge: 0°C ~ 50°C

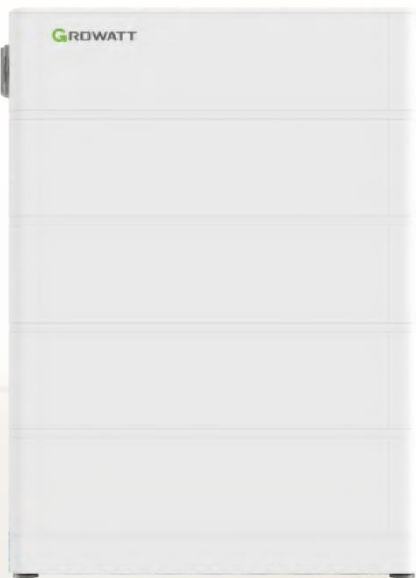
\*ARK series battery has an EU model and a General model, the storage inverters sold in European countries only work with EU model ARK battery.

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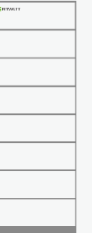



# ARK HV Battery System



- Flexible capacity options, 7.68kWh to 25.6kWh
- Excellent safety of cobalt free LiFePO4 battery
- Easy installation with modular and stacked design
- Remote firmware upgrade





Datasheet	ARK 7.6H	ARK 10.2H	ARK 12.8H	ARK 15.3H	ARK 17.9H	ARK 20.4H	ARK 23.0H	ARK 25.6H
System Demo								
Battery Module	ARK 2.5H-A1 (2.56kWh, 51.2V, 28kg)							
Number of Modules	3	4	5	6	7	8	9	10
Energy Capacity	7.68kWh	10.24kWh	12.8kWh	15.36kWh	17.92kWh	20.48kWh	23.04kWh	25.6kWh
Usable Capacity	6.9kWh	9.21kWh	11.52kWh	13.81kWh	16.12kWh	18.43kWh	20.73kWh	23.04kWh
Nominal Voltage	153.6V	204.8V	256V	307.2V	358.4V	409.6V	460.8V	512V
Operating Voltage Range	141.6~170.4V	188.8~227.2V	236-284V	283.2~340.8V	330.4~397.6V	377.6~454.4V	424.8~511.2V	472~568V
Dimension (W/D/H)*1	650/260/725mm	650/260/905mm	650/260/1085mm	650/260/1265mm	650/260/1445mm	650/260/1625mm	650/260/1805mm	650/260/1985mm
Weight	91kg	118kg	145kg	172kg	199kg	226kg	253kg	280kg

**General**

Battery Type	Cobalt Free Lithium Iron Phosphate (LFP)
Standard Charge/Discharge Current	25A/0.5C
IP Protection	IP65
Installation	Wall-mounted or Floor Installation*2
Operation Temperature	-10~50°C*3
Warranty	10 Years

**BMS Controller** HVC 60050-A1

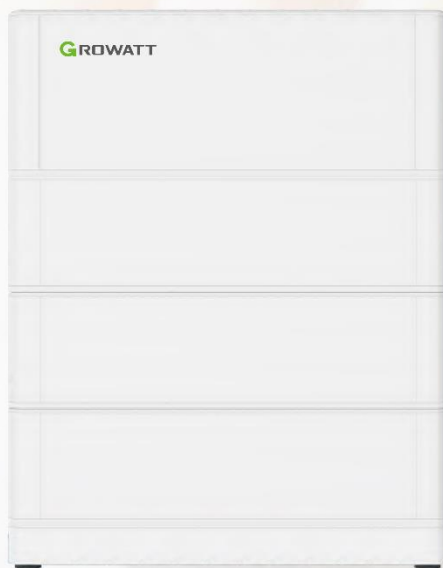
Weight	8kg
Communication Port	CAN
Dimension(W/D/H)	650/260/185 mm
BMS Monitoring Parameters	SOC, System voltage, current, cell voltage, cell temperature, PCBA temperature measurement

**Certification & Licensing** IEC62619(Cell&Pack), CE, CEC, RCM, UN38.3

\*1 Include BMS controller  
 \*2 Floor installation requires extra base (W/D/H=650/260/80 mm)  
 \*3 Battery discharge: -10°C ~ 50°C, battery charge: 0°C ~ 50°C  
 \*ARK series battery has an EU model and a General model, the storage inverters sold in European countries only work with EU model ARK battery.  
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# ARK XH Battery System



- Compatible with MIN-XH series inverter
- Flexible capacity options, 5.12kWh to 17.92kWh
- Excellent safety of cobalt free LiFePO4 battery
- Easy installation with modular and stacked design
- Remote firmware upgrade



Datasheet	ARK 5.1XH	ARK 7.6XH	ARK 10.2XH	ARK 12.8XH	ARK 15.3XH	ARK 17.9XH
System Demo						
Power module	BDC 95045-A1					
Number of power modules	1					
Battery Module	ARK 2.5H-A1 (2.56kWh, 51.2V, 26kg)					
Number of Modules in Series	2	3	4	5	6	7
Energy Capacity	5.12kWh	7.68kWh	10.24kWh	12.8kWh	15.36kWh	17.92kWh
Usable Capacity	4.6kWh	6.9kWh	9.21kWh	11.52kWh	13.81kWh	16.12kWh
Max. output power <sup>*1</sup>	2.5kW	3.75kW	5kW	6.25kW	7.5kW	8.75kW
Peak output power	5kW, 10s	7.5kW, 10s	10kW, 10s	12.5kW, 10s	15kW, 10s	17.5kW, 10s
Dimension (W/D/H) <sup>*2</sup>	650/260/630mm	650/260/815mm	650/260/1000mm	650/260/1185mm	650/260/1370mm	650/260/1555mm
Weight	71kg	99kg	127kg	155kg	183kg	211kg
Nominal voltage (single phase system)	360V	360V	360V	360V	380V	440V
Operating voltage range (single phase system) <sup>*3</sup>	360V-550V	360V-550V	360V-550V	360V-550V	380V-550V	440V-550V
Battery Type	Cobalt Free Lithium Iron Phosphate (LFP)					
IP Protection	IP65					
Installation	Wall-mounted or Floor installation <sup>*4</sup>					
Operation Temperature	-10°C ... ~50°C <sup>*5</sup>					
Relative humidity	5%~95%					
Cooling	Natural					
<b>Power Module</b>	<b>BDC 95045-A1</b>					
Dimension(W/D/H)	650/260/260mm					
Weight	15kg					
Communication Port	CAN/RS485					
BAT voltage range	90V-400V					
Power module output voltage	360V-550V					
Maximum BAT current	25A					
Peak BAT current	50A					
Monitoring Parameters	SOC, System voltage, current, cell voltage, cell temperature, PCBA temperature					
<b>Certification &amp; Licensing</b>	IEC62619(Cell&Pack)/CE/CEC/RCM/UN38.3					

\*1 Depend on the max. battery charge/discharge power of the inverter.

\*2 Include power module (BDC 95045-A1)

\*3 Single phase energy storage system supports 2~7pcs battery modules in series

\*4 Floor installation requires extra base (W/D/H=650/260/80 mm)

\*5 Battery discharge: -10°C ~ 50°C, battery charge: 0°C ~ 50°C

\*ARK series battery has an EU model and a General model, the storage inverters sold in European countries only work with EU model ARK battery.

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# AXE

## 5.0L Modular Battery



- Flexible capacity options, 5kWh to 400kWh
- Excellent safety of cobalt free LiFePO4 battery
- Stacked installation without cable connection
- Remote firmware upgrade





Datasheet	AXE 5.0L	AXE 10.0L	AXE 15.0L	AXE 20.0L	AXE 25.0L	AXE 30.0L	AXE 35.0L	AXE 40.0L	AXE 45.0L	AXE 50.0L
System Demo										
Battery Module	AXE 5.0L - C1 (5.0kWh, 51.2V, 45kg)									
Number of Modules	1	2	3	4	5	6	7	8	9	10
Energy Capacity	5.0kWh	10.0kWh	15.0kWh	20.0kWh	25.0kWh	30.0kWh	35.0kWh	40.0kWh	45.0kWh	50.0kWh
Dimension (W/D/H)*1	650/350/165mm	650/350/305mm	650/350/445mm	650/350/585mm	650/350/725mm	650/350/865mm	650/350/1005mm	650/350/1145mm	650/350/1285mm	650/350/1425mm
Weight	47kg	92kg	137kg	182kg	227kg	272kg	317kg	362kg	407kg	452kg
Max Charge	60A	120A	150A	150A	150A	150A	150A	150A	150A	150A
Max Discharge	60A	120A	150A	150A	150A	150A	150A	150A	150A	150A

### General

Battery Type	Cobalt Free Lithium Iron Phosphate (LFP)
Nominal Voltage	51.2V
Operating voltage Range	48 - 57.6V
IP Protection	IP20
Installation	Floor installations*2
Operation Temperature	0~50°C

### Features

DoD	92%
Multi-cluster AXE battery system in parallel	Max. 8 clusters ( Max. 400kWh )
BMS Monitoring Parameters	SOC, System voltage, Current, Cell voltage, Cell temperature, PCBA temperature measurement
Communication Port	CAN/RS485
Warranty(5/10 years)	Yes/Opt

### Certification

CE, ROHS, UL1973+FCC, UN38.3+PI965

\*1 The system dimension is included with the battery base

\*2 Floor installation requires extra base (W/D/H=654/353/25mm)

\*3 AXE series battery has an EU model and a General model, the storage inverters sold in European countries only work with EU model AXE battery.



# Hope 4.8L-C1 Lithium Battery



- Compact size and easy installation
- High energy density and efficiency
- Excellent safety of LiFePO4 battery
- DoD up to 93%



Datasheet	Hope 4.8L-C1
<b>Battery Data</b>	
Nominal Voltage	48V
Normal Capacity	4.8kWh
Usable Capacity	4.46kWh
Operating Voltage	42 ~ 54V
Rated Charging Current	50A
Rated Discharging Current	100A
Max. Discharging Power	4.5kW
Peak Discharging Power	6.1kW/6s
Max Charging Power	4.5kW
<b>General Data</b>	
Dimension (W/D/H)	442/130/480mm
Weight	40Kg
IP Protection	IP20
Working Temperature	-10°C~+55°C
Storage Temperature	-20°C~+45°C
<b>Features</b>	
DOD	93%
Parallel Connection	Max.16packs
Communication Port	CAN/RS485
Warranty	5 Years
CE , UN38.3	





# SPF 2000~5000TL HVM



- 
- Integrated MPPT charge controller
  - Configurable grid or solar input priority
  - Optional WIFI/ GPRS remote monitoring
  - Parallel for scalability



GROWATT - PRODUCT

Datasheet	SPF 2000TL HVM-24	SPF 3000TL HVM-24	SPF 2000TL HVM-48	SPF 3000TL HVM-48	SPF 5000TL HVM/HVM-P
Battery Voltage	24VDC		48VDC		
Battery Type	Lithium/Lead-acid				
<b>INVERTER OUTPUT</b>					
Rated Power	2000VA/ 2000W	3000VA/ 3000W	2000VA/ 2000W	3000VA/ 3000W	5000VA/ 5000W
Parallel Capability	No			No/ Yes, 6 units maximum	
AC Voltage Regulation (Battery Mode)	230VAC ± 5% @ 50/60Hz				
Surge Power	4000VA	6000VA	4000VA	6000VA	10000VA
Efficiency (Peak)	93%				
Waveform	Pure sine wave				
Transfer Time	10ms typical, 20ms Max				
<b>SOLAR CHARGER</b>					
Maximum PV Array Power	1500W		1800W		4500W
MPPT Range @ Operating Voltage	30VDC ~ 80VDC		60VDC ~ 115VDC		
Maximum PV Array Open Circuit Voltage	102VDC		145VDC		
Number of Independent MPP Trackers/ Strings Per MPP Tracker	1/1				
Maximum Solar Charge Current	50A		30A		80A
Maximum Efficiency	98%				
<b>AC CHARGER</b>					
Charge Current	30A		15A		60A
AC Input Voltage	230 VAC				
Selectable Voltage Range	170-280 VAC (For Personal Computers) ; 90-280 VAC (For Home Appliances)				
Frequency Range	50Hz/60Hz (Auto sensing)				
<b>PHYSICAL</b>					
Protection Degree	IP20				
Dimension (W/H/D)	315/400/130mm				350/455/130mm
Net Weight (kgs)	8	8.5	8	8.5	11.5
<b>OPERATING ENVIRONMENT</b>					
Humidity	5% to 95% Relative Humidity(Non-condensing)				
Altitude	<2000m				
Operating Temperature	0°C - 55°C				
Storage Temperature	-15°C - 60°C				





# SPF 6000 ES Plus



- Plug-and-Play terminal for PV port
- Dual MPP trackers
- Maximum PV input voltage up to 500VDC
- Configurable grid or solar input priority
- Parallel for scalability
- Dust-proof filter for harsh environment
- Two AC input terminals with integrated transfer switch





Datasheet	SPF 6000 ES Plus
Battery Voltage	48VDC
Battery Type	Lithium/Lead-acid
<b>Inverter Output</b>	
Rated Power	6000VA/6000W
Parallel Capability	Yes, 6 units maximum
AC Voltage Regulation (Battery Mode)	230VAC ± 5% @ 50/60Hz
Surge Power	12000VA
Efficiency (Peak)	93%
Waveform	Pure sine wave
Transfer Time	10ms typical, 20ms Max
<b>Solar Charger</b>	
Maximum PV Array Power	8000W
MPPT Range @ Operating Voltage	120VDC ~ 450VDC
Number of Independent MPP Trackers/ Strings Per MPP Tracker	2/1
Max. input current per MPP tracker	16A
Maximum PV Array Open Circuit Voltage	500VDC
Maximum Solar Charge Current	100A
<b>AC Charger</b>	
Charge Current	80A
AC Input Voltage	230VAC
Selectable Voltage Range	170-280 VAC (For Personal Computers) ; 90-280 VAC (For Home Appliances)
Frequency Range	50Hz/60Hz (Auto sensing)
<b>Protection</b>	
Protection Degree	IP20
Dimension (W/H/D)	460/395/132mm
Net Weight	13.5kg
<b>Operating Environment</b>	
Humidity	5% to 95% Relative Humidity(Non-condensing)
Altitude	<2000m
Operating Temperature	0°C - 55°C
Storage Temperature	-15°C - 60°C

# SPF

## 3500~5000ES



- Integrated MPPT charge controller.
- Equalization charging function.
- Work with or without battery
- PV input voltage up to 450VDC.
- Configurable grid or solar input priority.
- Optional WIFI/GPRS remote monitoring
- Support parallel operation for capacity expansion up to 30kW.
- PV and grid power the load jointly if PV energy is insufficient.
- Flexibly schedule the Inverter charging and discharging time.



## GROWATT · PRODUCT

Datasheet	SPF 3500 ES	SPF 5000 ES
Battery Voltage	48VDC	
Battery Type	Lithium/Lead-acid	
<b>INVERTER OUTPUT</b>		
Rated Power	3500VA/ 3500W	5000VA/ 5000W
Parallel Capability	Yes, 6 units maximum	
AC Voltage Regulation (Battery Mode)	230VAC ± 5% @ 50/60Hz	
Surge Power	7000VA	10000VA
Efficiency (Peak)	93%	
Waveform	Pure sine wave	
Transfer Time	10ms typical, 20ms Max	
<b>SOLAR CHARGER</b>		
Maximum PV Array Power	4500W	6000W
MPPT Range @ Operating Voltage	120VDC --- 430VDC	
Number of Independent MPP Trackers/ Strings Per MPP Tracker	1/1	
Maximum PV Array Open Circuit Voltage	450VDC	
Maximum Solar Charge Current	80A	100A
<b>AC CHARGER</b>		
Charge Current	60A	80A
AC Input Voltage	230 VAC	
Selectable Voltage Range	170-280 VAC (For Personal Computers) ; 90-280 VAC (For Home Appliances)	
Frequency Range	50Hz/60Hz (Auto sensing)	
<b>PHYSICAL</b>		
Protection Degree	IP20	
Dimension (W/H/D)	330/485/135mm	330/485/135mm
Net Weight	11.5kg	12kg
<b>OPERATING ENVIRONMENT</b>		
Humidity	5% to 95% Relative Humidity(Non-condensing)	
Altitude	<2000m	
Operating Temperature	0°C - 55°C	
Storage Temperature	-15°C - 60°C	





# SPF 3000T HVM-G2



- Industry-leading efficiency up to 95%
- Extended surge rating suitable for motor loads
- Wide PV input voltage range up to 250Vdc
- Parallel for high scalability
- Load segment control to maximize battery runtime for critical devices
- Warranty extend to 5 years



Datasheet	SPF 3000T HVM-G2
Battery Voltage	48VDC
Battery Type	Lithium/Lead-acid
<b>INVERTER OUTPUT</b>	
Rated Power	3000VA/ 3000W
Parallel Capability	Yes, 6 units maximum
AC Voltage Regulation (Battery Mode)	230VAC $\pm$ 5% @ 50/60Hz
Surge Power	9000VA
Efficiency (Peak)	95%
Waveform	Pure sine wave
Transfer Time	10ms
<b>SOLAR CHARGER</b>	
Maximum PV Array Power	4500W
MPPT Range @ Operating Voltage	60VDC ~ 200VDC
Number of Independent MPP Trackers/ Strings Per MPP Tracker	1/1
Maximum PV Array Open Circuit Voltage	250VDC
Maximum Solar Charge Current	80A
Maximum Efficiency	97%
<b>AC CHARGER</b>	
Charge Current	40A
AC Input Voltage	230 VAC
Selectable Voltage Range	184-272 VAC (For Personal Computers) ; 154-272 VAC (For Home Appliances)
Frequency Range	50Hz/60Hz (Auto sensing)
<b>PHYSICAL</b>	
Protection Degree	IP20
Dimension (D/W/H)	225/300/550mm
Net Weight (kgs)	27
<b>OPERATING ENVIRONMENT</b>	
Humidity	5% to 95% Relative Humidity(Non-condensing)
Operating Temperature	-20°C - 50°C
Storage Temperature	-40°C - 60°C



# Growatt Smart EV Charger

THOR 03AS-S, THOR 07AS-S/P  
(Single Phase)



- Compatible with all branded EV
- Integration in existing & new-installed PV system
- Charge EV with 100% renewable energy by surplus solar power
- APP smart control & smart scheduling
- IP65 design for indoor or outdoor use





GROWATT · PRODUCT

Datasheet*	THOR 03AS-S (WIFI/4G)	THOR 07AS-P (WIFI/4G)	THOR 07AS-S (WIFI/4G)
<b>Input &amp; Output</b>			
Input voltage	230V AC		
Input frequency	50Hz		
Output voltage	230V AC		
Max. output power	3.6KW	7KW	7KW
Max. output current	16A	32A	32A
Charging interface type	IEC 62196-2, Type 2		
Connection	Socket	Plug	Socket
Cable Length	/	5m	/
<b>Protection</b>			
Over voltage protection	Yes		
Under voltage protection	Yes		
Over load protection	Yes		
Short circuit protection	Yes		
Earth leakage protection	Yes		
Over-temp protection	Yes		
Lightning protection	Yes		
<b>Function and Accessory</b>			
Ethernet	Yes		
LCD	No		
RCD	Type A + 6mA DC fault current protection (Equivalent to Type B)		
Charge activation	APP	APP/RFID(opt)	APP/RFID(opt)
LED Indicator light	Yes		
Emergency stop button	Yes		
Multiple workmodes	Fast/ PV Linkage/ Off-peak/ Load balancing		
<b>General</b>			
Protection degree	IP65		
Environment temperature	-20°C ~ +65°C		
Relative humidity	5-95% non-condensing		
Maximum altitude	<2000m		
Cooling	Natural cooling		
Standby power consumption	<8W		
Dimension (W/H/D)	240/380/164mm		
Weight	7kg	9.5kg	7kg
Wall-mounting bracket/ Ground-mounting pole	Yes/Opt		
CE (LVD&EMC, EN 61851-1, EN61851-22, EN61000-6-3, EN61000-6-1), IEC62196			

\* Each model has 4G or WIFI version for flexible communication.

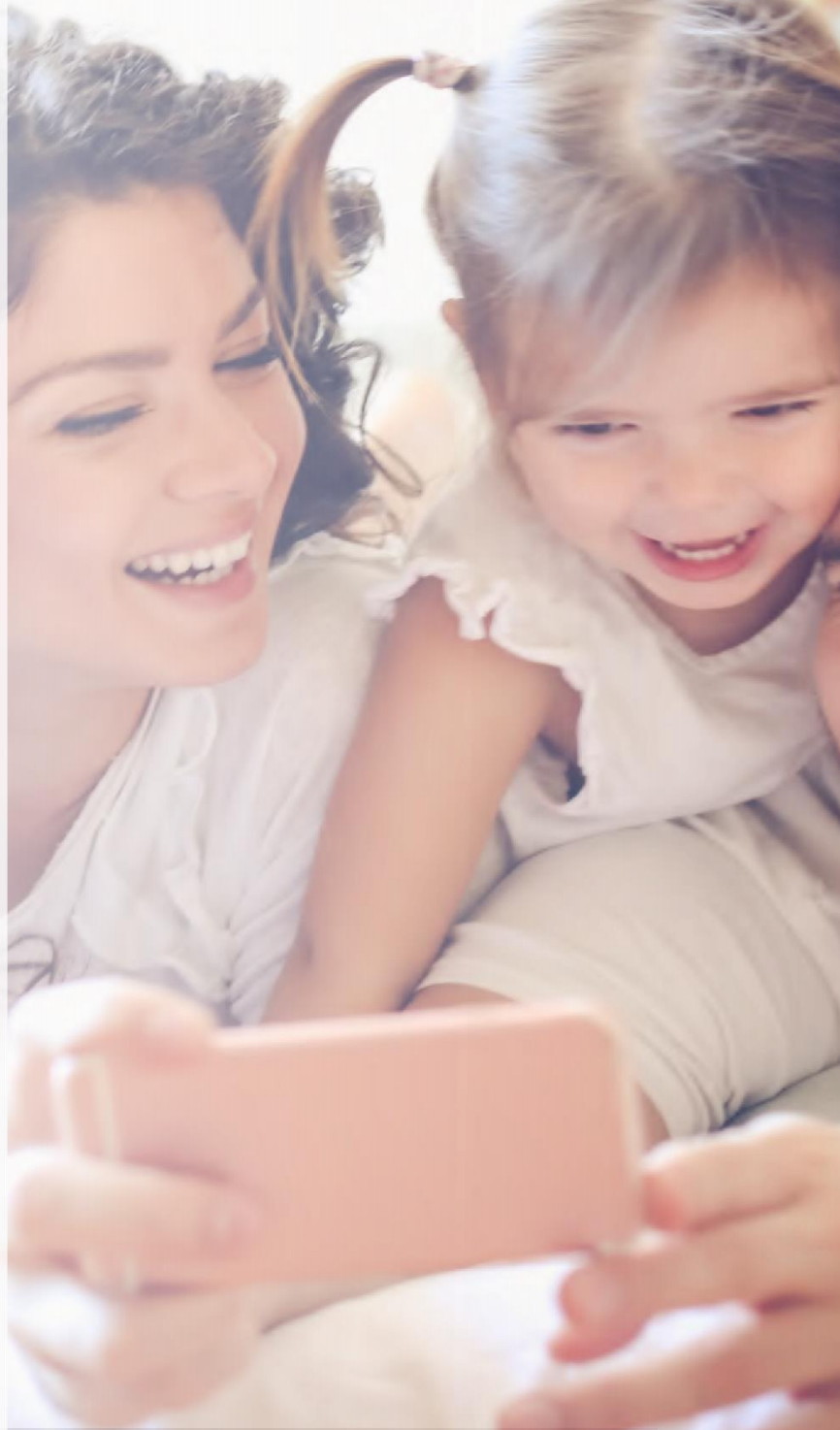


# Growatt Smart EV Charger

THOR 11AS-S/P, THOR 22AS-S/P  
(Three Phase)



- Compatible with all branded EV
- Integration in existing & new-installed PV system
- Charge EV with 100% renewable energy by surplus solar power
- APP smart control & smart scheduling
- Ip65 design for indoor or outdoor use



GROWATT · PRODUCT

Datasheet*	THOR 11AS-P (WIFI/4G)	THOR 11AS-S (WIFI/4G)	THOR 22AS-P (WIFI/4G)	THOR 22AS-S (WIFI/4G)
<b>Input &amp; Output</b>				
Input voltage	400V AC			
Input frequency	50Hz			
Output voltage	400V AC			
Max. output power	11KW		22KW	
Max. output current	16A		32A	
Charging interface type	IEC 62196-2, Type 2			
Connection	Plug	Socket	Plug	Socket
Cable Length	5m	/	5m	/
<b>Protection</b>				
Over voltage protection	Yes			
Under voltage protection	Yes			
Over load protection	Yes			
Short circuit protection	Yes			
Earth leakage protection	Yes			
Over-temp protection	Yes			
Lightning protection	Yes			
<b>Function and Accessory</b>				
Ethernet	Yes			
LCD	Yes			
RCD	Type A   6mA DC fault current protection (Equivalent to Type B)			
Charge activation	APP/RFID			
LED Indicator light	Yes			
Emergency stop button	Yes			
Multiple workmodes	Fast/ PV Linkage/ Off-peak/ Load balancing			
<b>General</b>				
Protection degree	IP65			
Environment temperature	-20°C ~ +65°C			
Relative humidity	5-95% non-condensing			
Maximum altitude	<2000m			
Cooling	Natural cooling			
Standby power consumption	<8W			
Dimension (W/H/D)	295/466/189mm			
Weight	12.5kg	10kg	12.5kg	10kg
Wall-mounting bracket/ Ground-mounting pole	Yes/Opt			
CE (LVD&EMC, EN 61851-1, EN61851-22, EN61000-6-3, EN61000-6-1), IEC62196				

\*Each model has 4G or WIFI version for flexible communication.





# SPI 3000~22000 Series



- Automatically running convenience for customer operate
- MPPT efficiency up to 99%
- IP65 protection level suitable for outdoor harsh environment
- Wide PV input voltage up to 900V to reduce the BOS cost
- With full / empty water level and dry running protection
- Remote monitor and smart control system (optional)



GROWATT · PRODUCT

Datasheet	SPI 3000	SPI 4000	SPI 5500	SPI 7500	SPI 9200	SPI 11000	SPI 13000	SPI 15000	SPI 18500	SPI 22000	
<b>INVERTER OUTPUT</b>											
Rated Output Power (W)	3000W	4000W	5500W	7500W	9200W	11000W	13000W	15000W	18500W	22000W	
Max. Output Current (A)	5A	9.5A	13A	18.5A	21A	24A	28A	32A	38A	45A	
Output Frequency (Hz)	0-50/60Hz										
Output Voltage (Vac)	3PH 380V										
<b>SOLAR INPUT</b>											
Max. Recommended PV Power	3600W	4800W	6600W	9000W	11000W	13200W	15600W	18000W	22200W	26500W	
Recommend Pump Capacity	2.2KW(3HP)	3KW(4HP)	3.7KW(5HP)	5.5KW(7.5HP)	7.5KW(10HP)	9.2KW(12.5HP)	11KW(15HP)	13KW(17.5HP)	15KW(20HP)	18.5KW(25HP)	
Max. DC Input Voltage (Vdc)	900V										
Qty. of PV Input Ports	2			3			5				
Recommended MPP Voltage (Vdc)	500-680V										
<b>MECHANICAL SPECIFICATIONS</b>											
Protection Degree	IP65										
Weight	13.79kg			18.32kg			23.85kg				
Demension (W/H/D)	480/340 /157mm			530/370/171mm			570/410/178mm				
<b>OPERATING ENVIRONMENT</b>											
Altitude	<2000m										
Operation Temperature Range	-25°C to 60°C										





# SPI 750~4000 TL2-HV



- Automatically running convenience for customer operate
- MPPT efficiency up to 99%
- IP65 protection level suitable for outdoor harsh environment
- Wide PV input voltage up to 450V to reduce the BOS cost
- Built-in booster module, flexible solar panel configuration
- Support PV and AC double input
- With full / empty water level and dry running protection
- Natural Cooling, maintenance-free design
- Remote monitor and smart control system (optional)



## GROWATT · PRODUCT

Datasheet	SPI 750TL2-HV	SPI 1500TL2-HV	SPI 2200TL2-HV	SPI 4000TL2-HV
<b>INPUT DATA (DC)</b>				
Max. PV Power	1000W	2100W	3100W	5500W
Max. DC Voltage	450V			
Start Voltage	80V			
MPP Voltage Range	100-400V			
No. of MPP Trackers	1			
No. of Pv Strings Per Mpp Tracker	1	1	1	2
Max. Input Current Per Mpp Tracker	9A	12A	12A	20A
<b>INPUT DATA (AC)</b>				
Nominal AC Voltage	220-240V(-15%~+10%)			
Rated Input Current	9.5A	16A	24A	38A
AC Grid Frequency	47-63Hz			
AC Connection	L,N,PE			
<b>OUTPUT DATA (AC)</b>				
AC Nominal Power	750W	1500W	2200W	4000W
Rated Output Current	5.1A(1PH)/4.2A(3PH)	10.2A(1PH)/7.5A(3PH)	14A(1PH)/10A(3PH)	25A(1PH)/16A(3PH)
Nominal AC Voltage Range	0-220Vac			
AC Frequency	0-50/60 Hz			
AC Connection	1P2L(1PH)/3P3L(3PH)			
<b>PERFORMANCE</b>				
Control Mode	V/F			
Type of Motor	Asynchronous machine			
Pump capacity	550W	750W	1600W	3000W
<b>GENERAL DATA</b>				
Dimensions (W / H / D)	335/370/135mm	335/370/135mm	335/370/135mm	365/450/150mm
Weight	9.5kg	9.5kg	9.5kg	16.5kg
Operating Temperature Range	-25°C ...   60°C			
Cooling	Natural convection			
Protection Degree	IP65			
Relative Humidity	0-100%			
Altitude	2000m without derating			
DC Connection	H4/MC(Optional)			
AC Connection	Connector			
Display	LCD			
Interfaces: Wi-Fi/ GPRS	Optional			





# Growatt ShineWiFi-F



- Cable free, easy for installation
- Communication distance up to 50m
- Built-in memory for up to one month of data
- Online monitoring and maintenance



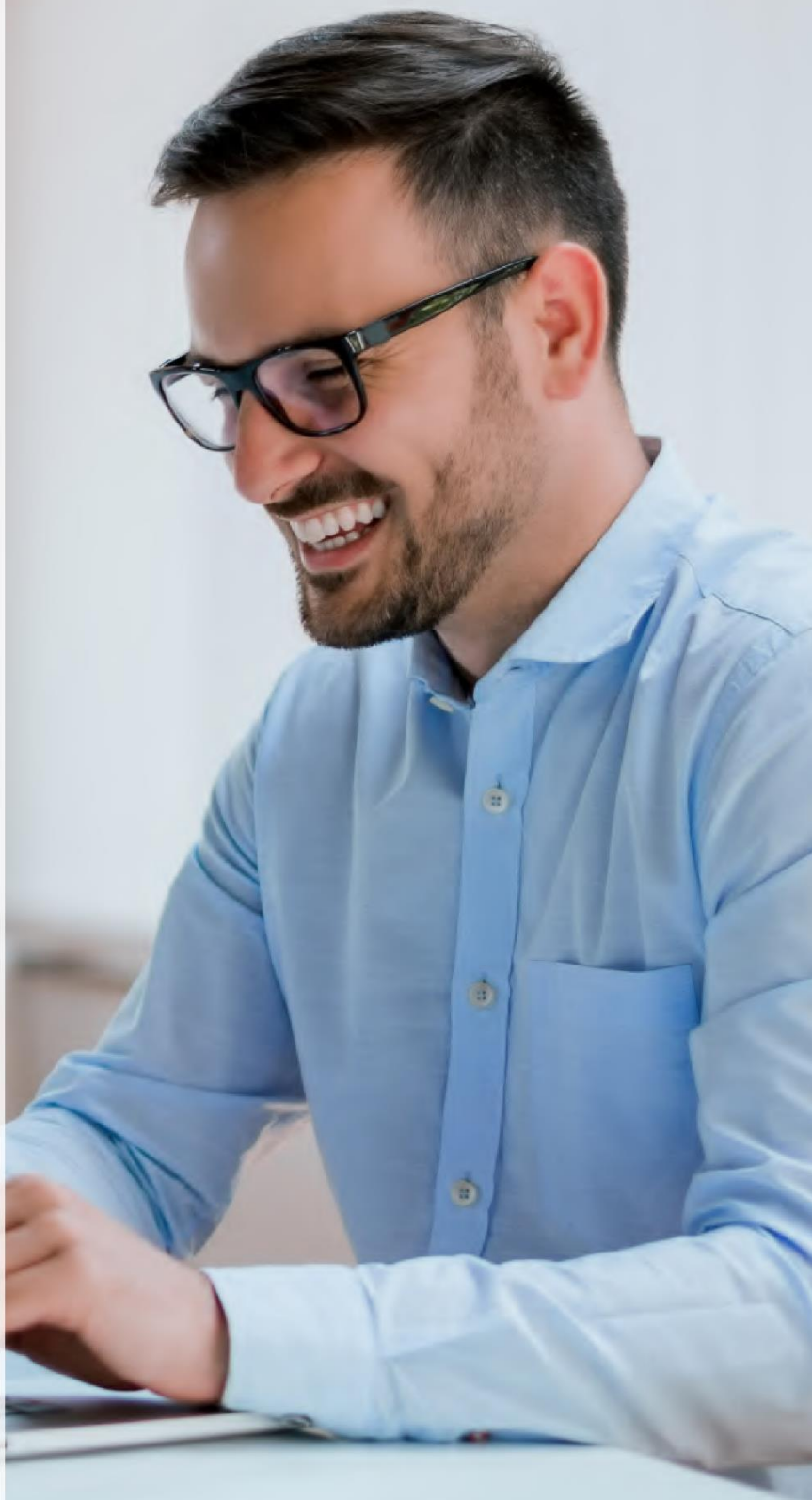
Datasheet		ShineWiFi-F
<b>General Data</b>		
Dimensions(L/W/H)	135/79/29mm	
Weight	63g	
Manual language	English, Chinese	
<b>Wireless Parameters</b>		
Wireless type	WiFi	
Wireless standard	802.11 b/g/n	
Transmit power	802.11b: +20dBm(Max.); 802.11g: +18dBm(Max.); 802.11n: +15dBm(Max.)	
Receiver sensitivity	802.11b: -89dBm(Max.); 802.11g: -81dBm(Max.); 802.11n: -71dBm(Max.)	
<b>Hardware Parameters</b>		
Data interface	UART: 9600bps; Ethernet: 100Mbps	
Operating voltage	5V (+/-15%)	
Operating current	1A	
Operating temperature	-20°C~+65°C	
Storage temperature	-40°C~+70°C	
Network type	AP (Access Point); station mode (with soft AP)	
Security mechanisms	WEP / WPA-PSK / WPA2-PSK	
Encryption	WEP64 / WEP128 / TKIP / AES	
<b>Application on Parameters</b>		
Supported servers	ShineServer	
Inverter communication	USB A-type	
Sever Communication	WiFi via router (Modbus TCP protocol)	
Supported Routers	Wireless router (Include 3G router)	
User Configuration Interface	Wireless web server (Internet Browser)	
Max. Communication Range	100m	
Data transmission interval	5 minutes	
Default Server URL	server.growatt.com	



# Growatt ShineWiFi-X



- 
- Cable free, easy installation
  - USB communication port
  - Built-in memory for up to one month of data
  - Online monitoring and maintenance





Datasheet		ShineWiFi-F
<b>General Data</b>		
Dimensions(L/W/H)	135/79/29mm	
Weight	63g	
Manual language	English, Chinese	
<b>Wireless Parameters</b>		
Wireless type	WiFi	
Wireless standard	802.11 b/g/n	
Transmit power	802.11b: +20dBm(Max.); 802.11g: +18dBm(Max.); 802.11n: +15dBm(Max.)	
Receiver sensitivity	802.11b: -89dBm(Max.); 802.11g: -81dBm(Max.); 802.11n: -71dBm(Max.)	
<b>Hardware Parameters</b>		
Data interface	UART: 9600bps; Ethernet: 100Mbps	
Operating voltage	5V (+/-15%)	
Operating current	1A	
Operating temperature	-20°C~+65°C	
Storage temperature	-40°C~+70°C	
Network type	AP (Access Point); station mode (with soft AP)	
Security mechanisms	WEP / WPA-PSK / WPA2-PSK	
Encryption	WEP64 / WEP128 / TKIP / AES	
<b>Application on Parameters</b>		
Supported servers	ShineServer	
Inverter communication	USB A-type	
Sever Communication	WiFi via router (Modbus TCP protocol)	
Supported Routers	Wireless router (Include 3G router)	
User Configuration Interface	Wireless web server (Internet Browser)	
Max. Communication Range	100m	
Data transmission interval	5 minutes	
Default Server URL	server.growatt.com	



# Smart Energy Manager



- 
- System self-consumption monitoring
  - Export limitation for commercial projects
  - Support online monitoring and online service
  - Flexible CTs for different project size
  - RS485 and Ethernet connection

GROWATT · PRODUCT

Datasheet	Smart Energy Manager				
System Size	100KW	300KW	600KW	1MW	2MW
<b>Meter data</b>					
Normal voltage	230/400Vac				
Voltage range(L-L)	180-540Vac				
Grid connection	3W+N+PE				
Normal frequency	50/60 Hz				
Frequency range	45~55Hz/55-65 Hz				
<b>CT data</b>					
Max. input current (CT second side)	5A				
Max.current ( CT detection)	250A	600A	1200A	2000A	4000A
Accuracy ( @ rated CT current)	0.5	0.5	0.5	0.5	0.2
<b>Communication</b>					
RS485	Yes				
Ethernet	Yes				
Max.inverter number	32				
Communication distance	Rs485: 500m Internet cable: 100m				
<b>General Data</b>					
Dimensions (W/H/D)	350/330/107mm				
Weight	6kg				
Operation temperature range	-25°C ... - 60°C				
Cooling concept	Natural Cooling				
Environmental Protection Rating	IP65				
Relative humidity	0~100%				
Altitude	2000m				
CE					





# Smart Energy Manager (SEM-E)



- Manage multiple solar and storage Inverters
- Online monitoring and export limitation for the whole system
- Flexible CTs for different project size
- RS485 and Ethernet connection





# Growatt ShineMaster



- Local webserver for easy configuration
- Supports RS485, Ethernet, 4G communication
- Up to 64 inverters connection
- Multi-function and high performance







# Growatt ShineLink-X



- 
- Cable free, easy installation
  - Dynamic IP, plug and play
  - Communication distance up to 120m
  - Support up to 8 devices
  - Built-in memory for up to one month of data
  - Online monitoring and maintenance

Datasheet	ShineLink-X
<b>Communication Interface</b>	
RF433	Yes
RF433(No barrier wall)	Up to 120 m
RF433(two walls blocking)	20 m
<b>Power Supply</b>	
Power consumption	<2W standby, <5W peak
Voltage range	196V~250V
Frequency	50/60Hz
<b>General Specifications</b>	
Dimensions(L/W/H)	105/85/26mm
Weight	< 1kg
Mounting options	Tabletop/wall-mount
Protection degree	IP30
Display	LED
Ambient temperature range	-20 to 65 °C
Humidity	0-95% (non condensing)
<b>Features</b>	
Remote firmware upgrade	Yes
Max. number of devices to monitor	8(RF433)
Warranty	1 years
CE	



# Growatt Shine LAN-X



- 
- Ethernet direct connection
  - Plug and Play
  - Online monitoring and maintenance
  - Built-in memory for up to one month of data



Datasheet	ShineLAN-X
<b>Hardware parameters</b>	
Data interface	USB
Nominal voltage	5V(±5%)
Nominal current	400mA
Nominal power	2W(MAX:3W)
Display	LED
<b>Application parameters</b>	
Supported Server	ShineServer
Inverter communication	USB(Modbus RTU protocol)
Server communication	TCP(Modbus TCP protocol)
Ethernet interface speed	10Mbps
Max. communication range	100m(Direct connection)
Configuration type	APP configuration
Data transmission interval	5 Minutes
Default server URL	server.growatt.com
<b>General data</b>	
Dimensions(L/W/H)	152/47/28mm
Weight	84g
Operating temperature range	-30°C ... +60°C
Environmental protection rating	IP65
CE, RoHS	

# TIGER Neo

## 54HL4R-BDB

425-450 Watt

ALL BLACK BIFACIAL MODULE WITH DUAL GLASS

N-type



### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



### Dual-Sided Power Generation

Dual-sided power generation gain increases with backside exposure to light, significantly reducing LCOE.



### Mechanical Load Enhanced

Certified to withstand:  
6000 Pa front side max static test load  
4000 Pa rear side max static test load



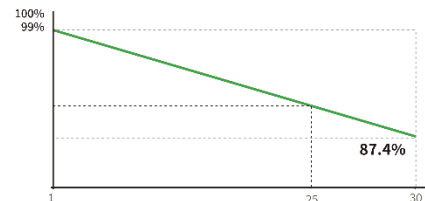
### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Anti-PID Guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**25 Year** Product Warranty | **30 Year** Linear Power Warranty | **1%** First-year Degradation | **0.40%** Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



**JKM425-450N-54HL4R-BDB-F3-EN**





# 54HL4R-BDB 425-450 Watt

## Mechanical Characteristics

Cell Type	N- type Mono-crystalline
No. of cells	108 (54×2)
Dimensions	1762×1134×30 mm
Weight	24.5 kg
Front Glass	2.0 mm, Anti-reflection Coating
Back Glass	2.0 mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	1792×1140×1249 mm
Packing Detail (Two pallets = One stack)	37 pcs/pallets, 74 pcs/stack, 962 pcs/ 40' HQ Container

## Specifications (STC)

Maximum Power - Pmax [Wp]	425	430	435	440	445	450
Maximum Power Voltage - Vmp [V]	32.90	33.08	33.26	33.44	33.61	33.79
Maximum Power Current - Imp [A]	12.92	13.00	13.08	13.16	13.24	13.32
Open-circuit Voltage - Voc [V]	39.23	39.43	39.63	39.83	40.03	40.23
Short-circuit Current - Isc [A]	13.77	13.84	13.91	13.98	14.05	14.12
Module Efficiency STC [%]	21.27	21.52	21.77	22.02	22.27	22.52
Power Tolerance	0 ~ + 3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Specifications (BNPI)

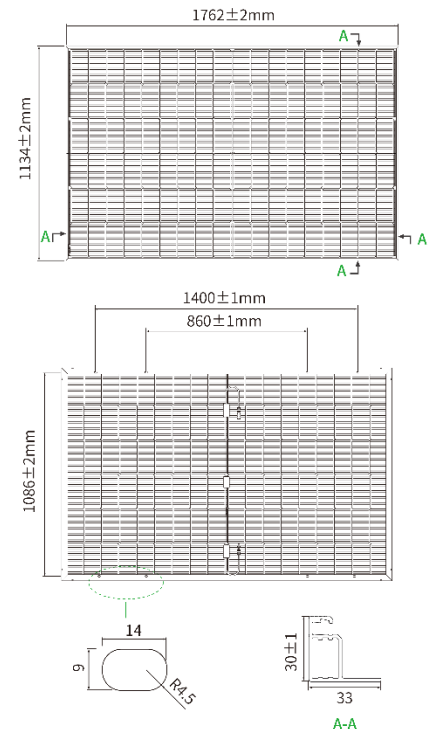
Maximum Power - Pmax [Wp]	469	474	480	485	491	496
Maximum Power Voltage - Vmp [V]	32.91	33.06	33.26	33.41	33.61	33.76
Maximum Power Current - Imp [A]	14.25	14.34	14.43	14.52	14.60	14.69
Open-circuit Voltage - Voc [V]	39.23	39.43	39.63	39.83	40.03	40.23
Short-circuit Current - Isc [A]	15.16	15.24	15.32	15.40	15.48	15.56

BNPI: Irradiance: front 1000W/m<sup>2</sup>, rear 135W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

Operating Temperature	-40 °C ~ +70 °C
Maximum System Voltage	1500 VDC (IEC)
Maximum Series Fuse Rating	30 A
Bifaciality Coefficient	φVoc: 98±5 %, φIsc: 80±5 %, φPmax: 80±5 %

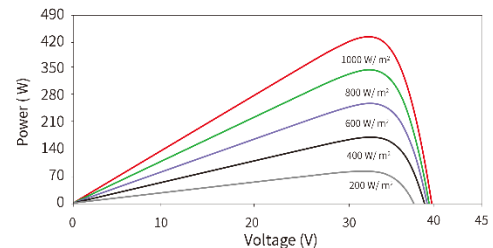
## Engineering Drawings



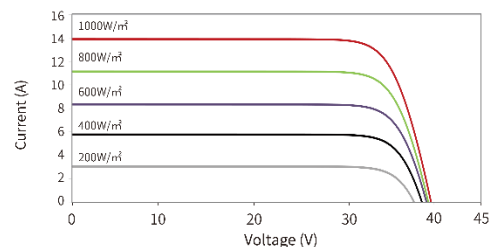
\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance

Power-Voltage Curves (54HL4R-BDB 440W)



Current-Voltage Curves (54HL4R-BDB 440W)



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**Note:** Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

**JKM425-450N-54HL4R-BDB-F3-EN**

www.jinkosolar.com



# TIGER Neo

## 54HL4R-B

430-455 Watt  
ALL BLACK MONO-FACIAL MODULE



### N-type



#### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPCon) technology offer lower LID/LeTID degradation and better low light performance.



#### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



#### Durability Against Extreme Environment

High salt mist and ammonia resistance.



#### Mechanical Load Enhanced

Certified to withstand:  
6000 Pa front side max static test load  
4000 Pa rear side max static test load



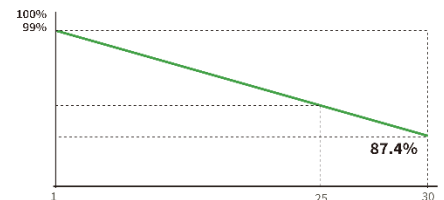
#### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



#### Anti-PID guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**25 Year** Product Warranty | **30 Year** Linear Power Warranty | **1%** First year Degradation | **0.40%** Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



**JKM430-455N-54HL4R-B-F8-EN**



# 54HL4R-B 430-455 Watt

## Mechanical Characteristics

Cell Type	N-type Mono-crystalline
No. of cells	108 (54×2)
Dimensions	1762×1134×30 mm
Weight	21.0 kg
Front Glass	3.2mm, Anti-reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	1792×1140×1249 mm
Packing detail (Two pallets=One stack)	37 pcs/pallets, 74 pcs/stack, 962 pcs/ 40'HQ Container

## Specifications (STC)

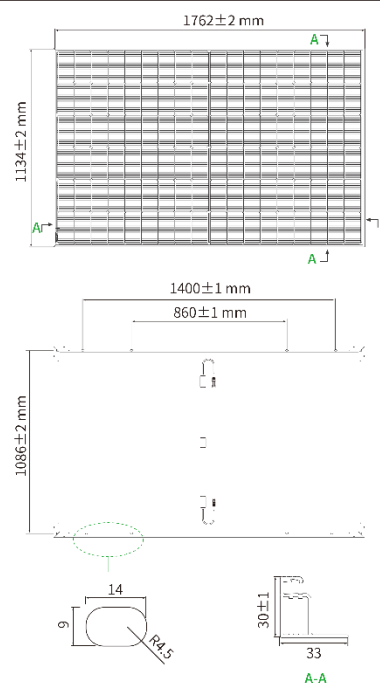
Maximum Power – Pmax [Wp]	430	435	440	445	450	455
Maximum Power Voltage – Vmp [V]	32.58	32.78	32.99	33.19	33.39	33.58
Maximum Power Current – Imp [A]	13.20	13.27	13.34	13.41	13.48	13.55
Open-circuit Voltage – Voc [V]	39.16	39.36	39.57	39.77	39.97	40.17
Short-circuit Current – Isc [A]	13.65	13.72	13.80	13.87	13.94	14.01
Module Efficiency STC [%]	21.52	21.77	22.02	22.27	22.52	22.77
Power Tolerance	0 ~ +3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

Operating Temperature	-40 °C ~ +70°C
Maximum System Voltage	1000 VDC (IEC)
Maximum Series Fuse Rating	25 A

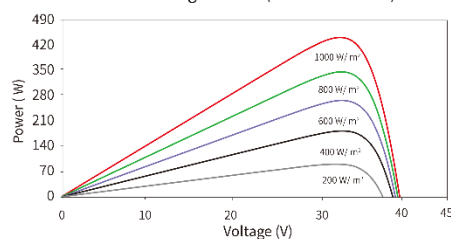
## Engineering Drawings



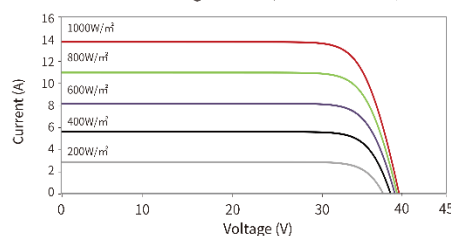
\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance

Power-Voltage Curves (54HL4R-B 445W)



Current-Voltage Curves (54HL4R-B 445W)



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**Note:** Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

**JKM430-455N-54HL4R-B-F8-EN**  
www.jinkosolar.com





# TIGER Neo

## 54HL4R-(V)

435-460 Watt  
MONO-FACIAL MODULE

N-type



### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



### Durability Against Extreme Environment

High salt mist and ammonia resistance.



### Mechanical Load Enhanced

Certified to withstand:  
6000 Pa front side max static test load  
4000 Pa rear side max static test load



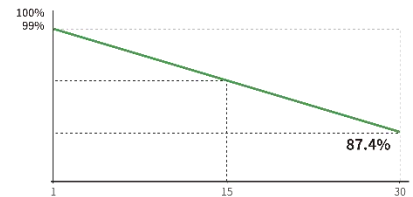
### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Anti-PID Guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**15 Year** Product Warranty | **30 Year** Linear Power Warranty | **1%** First-year Degradation | **0.40%** Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



**JKM435-460N-54HL4R-(V)-F8-EN**



# 54HL4R-(V) 435-460 Watt

## Mechanical Characteristics

Cell Type	N -type Mono-crystalline
No. of cells	108 (54×2)
Dimensions	1762×1134×30 mm
Weight	21.0 kg
Front Glass	3.2mm, Anti-reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	1792×1140×1249 mm
Packing detail (Two pallets=One stack)	37 pcs/pallets, 74 pcs/stack, 962 pcs/ 40'HQ Container

## Specifications (STC)

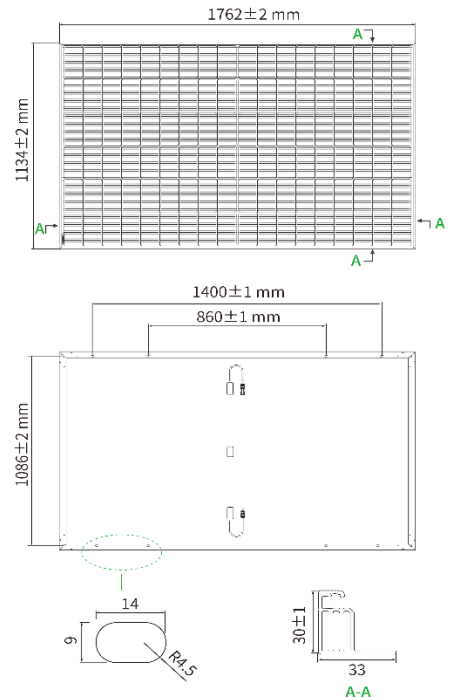
Maximum Power – Pmax [Wp]	435	440	445	450	455	460
Maximum Power Voltage – Vmp [V]	32.59	32.81	33.02	33.21	33.41	33.60
Maximum Power Current – Imp [A]	13.35	13.41	13.48	13.55	13.62	13.69
Open-circuit Voltage – Voc [V]	39.16	39.38	39.59	39.78	39.98	40.17
Short-circuit Current – Isc [A]	13.80	13.86	13.93	14.00	14.07	14.14
Module Efficiency STC [%]	21.77	22.02	22.27	22.52	22.77	23.02
Power Tolerance	0 ~ + 3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

Operating Temperature	-40 °C ~ +70°C
Maximum System Voltage	1000/1500 VDC (IEC)
Maximum Series Fuse Rating	25 A

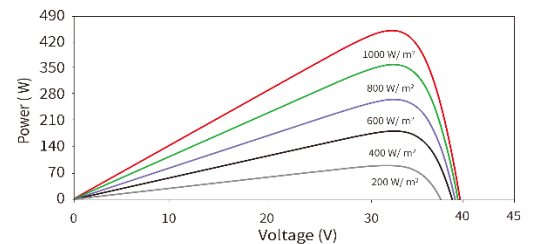
## Engineering Drawings



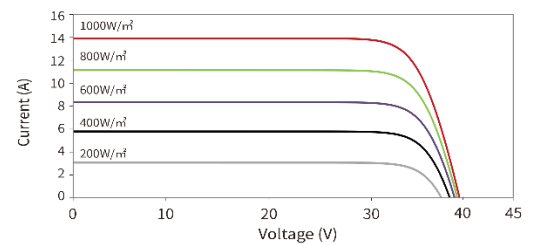
\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance

Power-Voltage Curves (54HL4R-(V) 450W)



Current-Voltage Curves (54HL4R-(V) 450W)



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**Note:** Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

**JKM435-460N-54HL4R-(V)-F8-EN**  
www.jinkosolar.com



# TIGER Neo

## 60HL4-(V)

475-500 Watt  
MONO-FACIAL MODULE

N-type



### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### Durability Against Extreme Environment

High salt mist and ammonia resistance.



### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



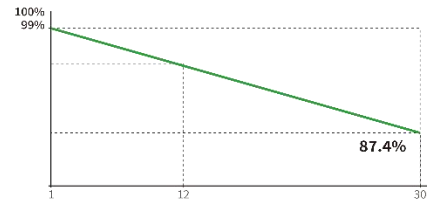
### Mechanical Load Enhanced

Certified to withstand:  
5400 Pa front side max static test load  
2400 Pa rear side max static test load



### Anti-PID Guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**12** Year Product Warranty | **30** Year Linear Power Warranty | **1%** First-year Degradation | **0.40%** Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



**JKM475-500N-60HL4-(V)-F8-EN**



# 60HL4-(V) 475-500 Watt

## Mechanical Characteristics

Cell Type	N -type Mono-crystalline
No. of cells	120 (60×2)
Dimensions	1906×1134×30 mm
Weight	22.5 kg
Front Glass	3.2mm, Anti-reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	1936×1140×1249 mm
Packing detail (Two pallets=One stack)	37 pcs/pallets, 74 pcs/stack, 888 pcs/ 40'HQ Container

## Specifications (STC)

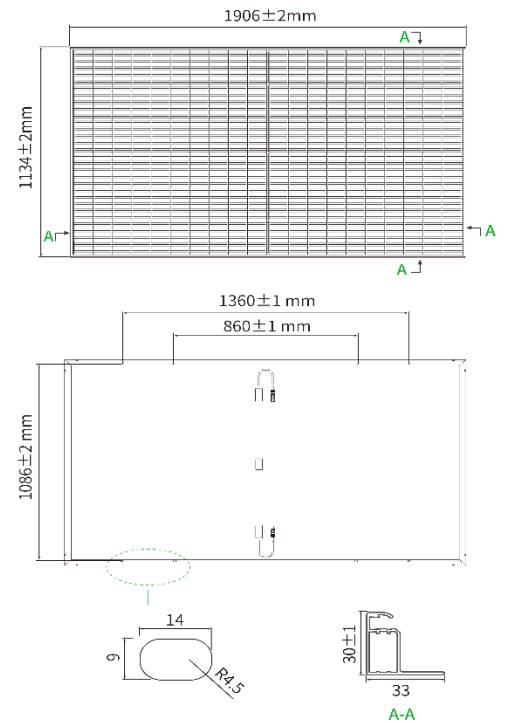
Maximum Power – Pmax [Wp]	475	480	485	490	495	500
Maximum Power Voltage – Vmp [V]	35.88	36.06	36.25	36.43	36.62	36.79
Maximum Power Current – Imp [A]	13.24	13.31	13.38	13.45	13.52	13.59
Open-circuit Voltage – Voc [V]	43.45	43.60	43.76	43.91	44.07	44.21
Short-circuit Current – Isc [A]	13.77	13.85	13.93	14.01	14.09	14.17
Module Efficiency STC [%]	21.98	22.21	22.44	22.67	22.90	23.17
Power Tolerance	0 ~ + 3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

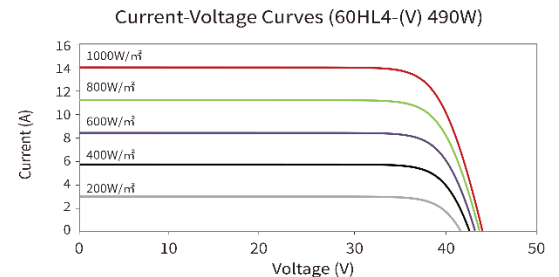
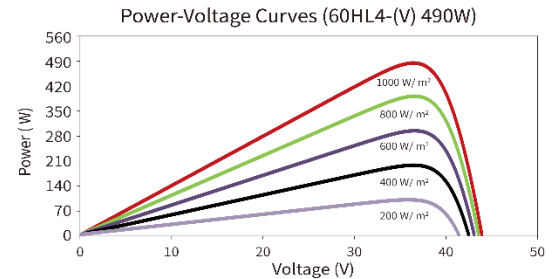
Operating Temperature	-40 °C ~ +70°C
Maximum System Voltage	1000/1500 VDC (IEC)
Maximum Series fuse Rating	25 A

## Engineering Drawings



\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance



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**Note:** Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

**JKM475-500N-60HL4-(V)-F8-EN**

www.jinkosolar.com





# Tiger Pro 72HC-BDVP

## 535-555 Watt

BIFACIAL MODULE WITH DUAL GLASS

### P-Type

Positive power tolerance of 0~+3%

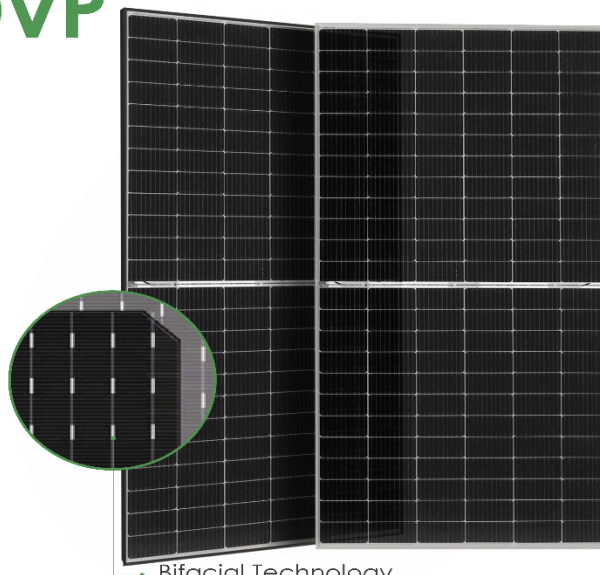
IEC61215(2016), IEC61730(2016)

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

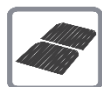
ISO45001:2018

Occupational health and safety management systems



Bifacial Technology

## Key Features



### Multi Busbar Technology

Better light trapping and current collection to improve module power output and reliability.



### PID Resistance

Excellent Anti-PID performance guarantee via optimized mass-production process and materials control.



### Higher Power Output

Module power increases 5-25% generally, bringing significantly lower LCOE and higher IRR.



### Longer Life-time Power Yield

0.45% annual power degradation and 30 year linear power warranty.



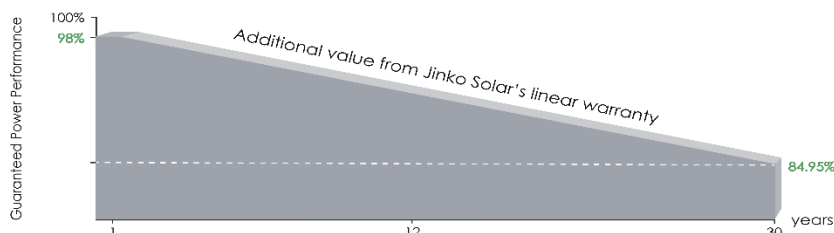
### Enhanced Mechanical Load

Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).



POSITIVE QUALITY™  
Continuous Quality Assurance

## LINEAR PERFORMANCE WARRANTY



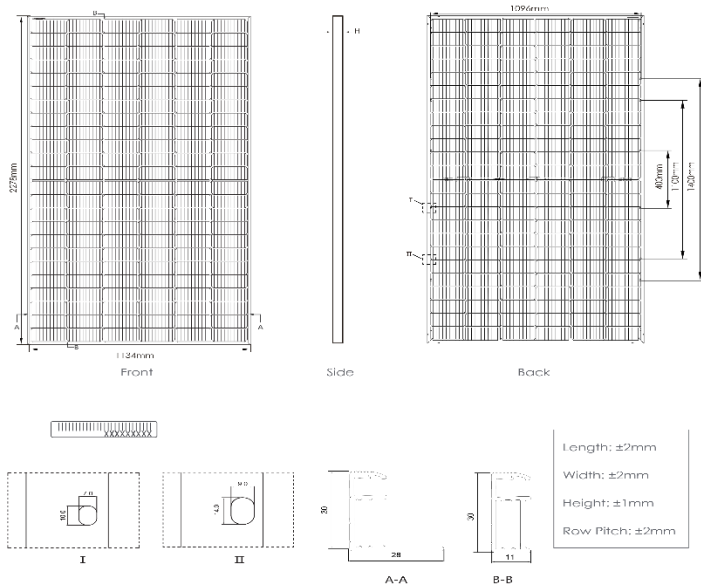
12 Year Product Warranty

30 Year Linear Power Warranty

0.45% Annual Degradation Over 30 years



## Engineering Drawings



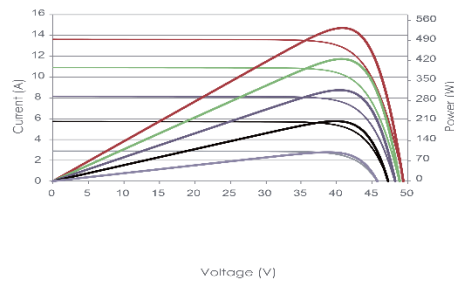
## Packaging Configuration

( Two pallets = One stack )

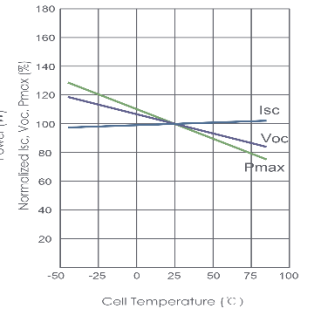
36pcs/pallets, 72pcs/stack, 720pcs/ 40'HQ Container

## Electrical Performance & Temperature Dependence

Current-Voltage & Power-Voltage Curves (540W)



Temperature Dependence of Isc, Voc, Pmax



## Mechanical Characteristics

Cell Type	P type Mono-crystalline
No. of cells	144 (6×24)
Dimensions	2278×1134×30mm (89.69×44.65×1.18 inch)
Weight	31 kg (68.34bs)
Front Glass	2.0mm, Anti-Reflection Coating
Back Glass	2.0mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Output Cables	TUV 1×4.0mm <sup>2</sup> (+): 400mm, (-): 200mm or Customized Length

## SPECIFICATIONS

Module Type	JKM535M-72HL4-BDVP		JKM540M-72HL4-BDVP		JKM545M-72HL4-BDVP		JKM550M-72HL4-BDVP		JKM555M-72HL4-BDVP	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	535Wp	398Wp	540Wp	402Wp	545Wp	405Wp	550Wp	409Wp	555Wp	413Wp
Maximum Power Voltage (Vmp)	40.94V	37.94V	41.13V	38.08V	41.32V	38.25V	41.51V	38.42V	41.70V	38.59V
Maximum Power Current (Imp)	13.07A	10.49A	13.13A	10.55A	13.19A	10.60A	13.25A	10.65A	13.31A	10.70A
Open-circuit Voltage (Voc)	49.54V	46.76V	49.73V	46.94V	49.92V	47.12V	50.11V	47.30V	50.30V	47.48V
Short-circuit Current (Isc)	13.83A	11.17A	13.89A	11.22A	13.95A	11.27A	14.01A	11.32A	14.07A	11.36A
Module Efficiency STC (%)	20.71%		20.90%		21.10%		21.29%		21.48%	
Operating Temperature(°C)	-40°C~+85°C									
Maximum system voltage	1500VDC (IEC)									
Maximum series fuse rating	30A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.35%/°C									
Temperature coefficients of Voc	-0.28%/°C									
Temperature coefficients of Isc	0.048%/°C									
Nominal operating cell temperature (NOCT)	45±2°C									
Refer. Bifacial Factor	70±5%									

## BIFACIAL OUTPUT-REAR SIDE POWER GAIN

		5%		15%		25%	
		Maximum Power (Pmax)	Module Efficiency STC (%)	Maximum Power (Pmax)	Module Efficiency STC (%)	Maximum Power (Pmax)	Module Efficiency STC (%)
5%	Maximum Power (Pmax)	562Wp	567Wp	572Wp	578Wp	583Wp	
	Module Efficiency STC (%)	21.76%	21.95%	22.15%	22.36%	22.56%	
15%	Maximum Power (Pmax)	615Wp	621Wp	627Wp	633Wp	638Wp	
	Module Efficiency STC (%)	23.81%	24.04%	24.26%	24.48%	24.71%	
25%	Maximum Power (Pmax)	669Wp	675Wp	681Wp	688Wp	694Wp	
	Module Efficiency STC (%)	25.90%	26.13%	26.37%	26.61%	26.86%	

\*STC: Irradiance 1000W/m<sup>2</sup>

Cell Temperature 25°C

AM=1.5

NOCT: Irradiance 800W/m<sup>2</sup>

Ambient Temperature 20°C

AM=1.5

Wind Speed 1m/s

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Specifications included in this datasheet are subject to change without notice.

JKM535-555M-72HL4-BDVP-F6-EN



# Tiger Pro 72HC

## 550-570 Watt

MONO-FACIAL MODULE

### P-Type

Positive power tolerance of 0~+3%

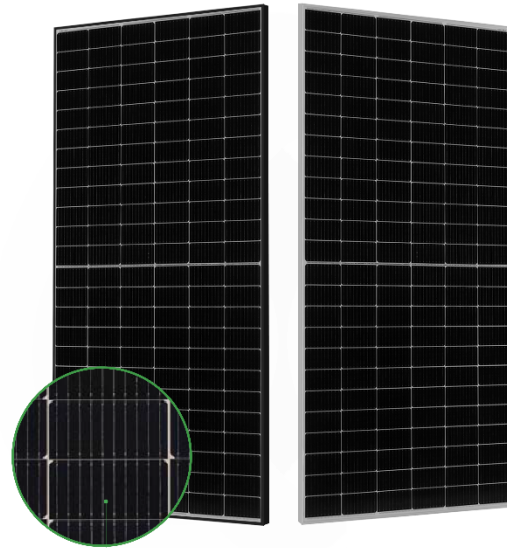
IEC61215(2016), IEC61730(2016)

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

ISO45001:2018

Occupational health and safety management systems



MBB HC Technology

## Key Features



### Multi Busbar Technology

Better light trapping and current collection to improve module power output and reliability.



### Durability Against Extreme Environmental Conditions

High salt mist and ammonia resistance.



### Reduced Hot Spot Loss

Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.



### Enhanced Mechanical Load

Certified to withstand:  
5400 Pa front side max static test load  
2400 Pa rear side max static test load



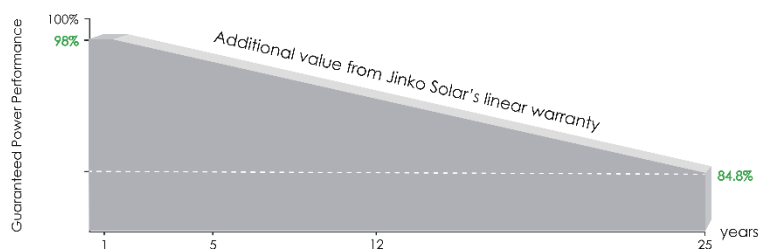
### Longer Life-time Power Yield

0.55% annual power degradation and 25 year linear power warranty.



POSITIVE QUALITY  
Continuous Quality Assurance

## LINEAR PERFORMANCE WARRANTY



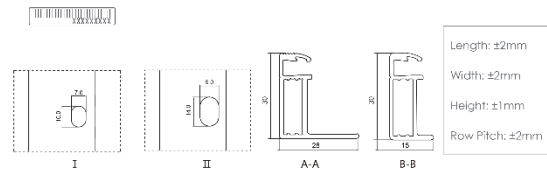
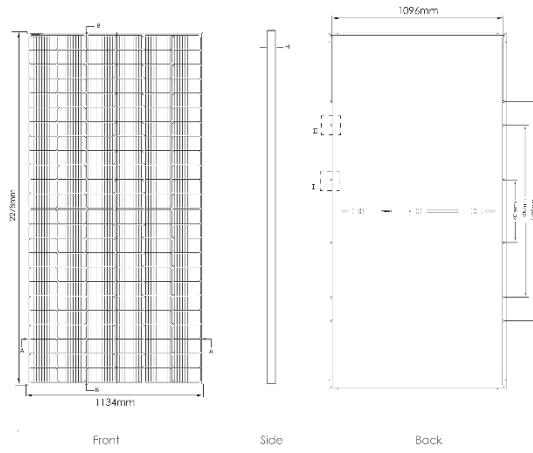
**12 Year Product Warranty**

**25 Year Linear Power Warranty**

**0.55% Annual Degradation Over 25 years**



## Engineering Drawings

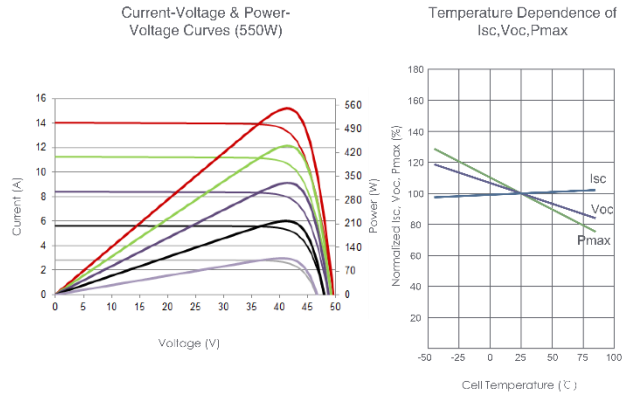


## Packaging Configuration

( Two pallets = One stack )

36pcs/pallets, 72pcs/stack, 720pcs/ 40'HQ Container

## Electrical Performance & Temperature Dependence



## Mechanical Characteristics

Cell Type	P type Mono-crystalline
No. of cells	144 (6×24)
Dimensions	2278×1134×30mm (89.69×44.65×1.18 inch)
Weight	27 kg (59.52 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Output Cables	TUV 1×4.0mm <sup>2</sup> (+): 400mm, (-): 200mm or Customized Length

## SPECIFICATIONS

Module Type	JKM550M-72HL4		JKM555M-72HL4		JKM560M-72HL4		JKM565M-72HL4		JKM570M-72HL4	
	JKM550M-72HL4-V	JKM555M-72HL4-V	JKM555M-72HL4-V	JKM555M-72HL4-V	JKM560M-72HL4-V	JKM560M-72HL4-V	JKM565M-72HL4-V	JKM565M-72HL4-V	JKM570M-72HL4-V	JKM570M-72HL4-V
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	550Wp	409Wp	555Wp	413Wp	560Wp	417Wp	565Wp	420Wp	570Wp	424Wp
Maximum Power Voltage (Vmp)	40.90V	38.42V	40.99V	38.59V	41.09V	38.69V	41.21V	38.74V	41.34V	38.84V
Maximum Power Current (Imp)	13.45A	10.65A	13.54A	10.70A	13.63A	10.77A	13.71A	10.85A	13.79A	10.92A
Open-circuit Voltage (Voc)	49.62V	46.84V	49.72V	46.93V	49.82V	47.02V	49.93V	47.13V	50.04V	47.23V
Short-circuit Current (Isc)	14.03A	11.33A	14.12A	11.40A	14.21A	11.48A	14.30A	11.55A	14.39A	11.62A
Module Efficiency STC (%)	21.29%		21.48%		21.68%		21.87%		22.07%	
Operating Temperature(°C)	-40°C~+85°C									
Maximum system voltage	1000/1500VDC (IEC)									
Maximum series fuse rating	25A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.35%/°C									
Temperature coefficients of Voc	-0.28%/°C									
Temperature coefficients of Isc	0.048%/°C									
Nominal operating cell temperature (NOCT)	45±2°C									

\*STC: Irradiance 1000W/m<sup>2</sup> Cell Temperature 25°C AM=1.5  
 NOCT: Irradiance 800W/m<sup>2</sup> Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

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 Specifications included in this datasheet are subject to change without notice.

JKM550-570M-72HL4-(V)-F5-EN





# TIGER Neo

## 72HL4-(V)

580-605 Watt  
MONO-FACIAL MODULE

N-type



### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



### Durability Against Extreme Environment

High salt mist and ammonia resistance.



### Mechanical Load Enhanced

Certified to withstand:  
5400 Pa front side max static test load  
2400 Pa rear side max static test load



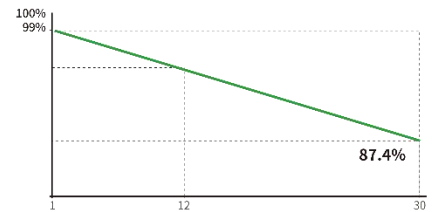
### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Anti-PID guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**12** Year Product Warranty | **30** Year Linear Power Warranty | **1** % First year Degradation | **0.40** % Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



**JKM580-605N-72HL4-(V)-F8-EN**



# 66HL4M-BDV 605-630 Watt

## Mechanical Characteristics

Cell Type	N-type Mono-crystalline
No. of cells	132 (66×2)
Dimensions	2382×1134×30 mm
Weight	32.4 kg
Front Glass	2.0 mm, Anti-reflection Coating
Back Glass	2.0 mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	2396×1110×1251 mm
Packing Detail	36 pcs/pallets, 72 pcs/stack, (Two pallets = One stack)
	720 pcs/ 40'HQ Container

## Specifications (STC)

Maximum Power - Pmax [Wp]	605	610	615	620	625	630
Maximum Power Voltage - Vmp [V]	40.31	40.46	40.60	40.74	40.88	41.02
Maximum Power Current - Imp [A]	15.01	15.08	15.15	15.22	15.29	15.36
Open-circuit Voltage - Voc [V]	48.48	48.68	48.88	49.08	49.28	49.48
Short-circuit Current - Isc [A]	15.90	15.96	16.02	16.08	16.14	16.20
Module Efficiency STC [%]	22.40	22.58	22.77	22.95	23.14	23.32
Power Tolerance	0 ~ + 3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Specifications (BNPI)

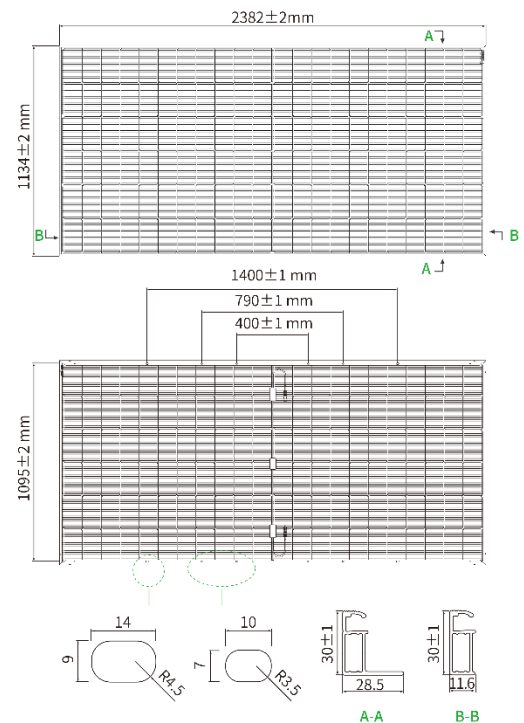
Maximum Power - Pmax [Wp]	668	674	679	685	690	696
Maximum Power Voltage - Vmp [V]	40.29	40.46	40.59	40.75	40.88	41.04
Maximum Power Current - Imp [A]	16.58	16.66	16.73	16.81	16.88	16.95
Open-circuit Voltage - Voc [V]	48.46	48.66	48.86	49.06	49.26	49.46
Short-circuit Current - Isc [A]	17.56	17.64	17.70	17.77	17.83	17.90

BNPI: Irradiance: front 1000W/m<sup>2</sup>, rear 135W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

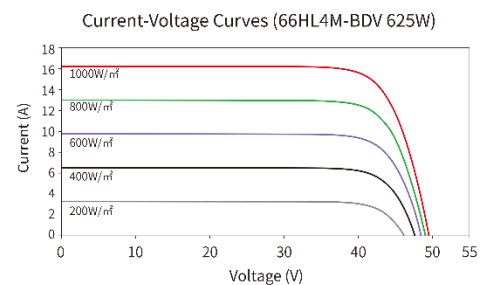
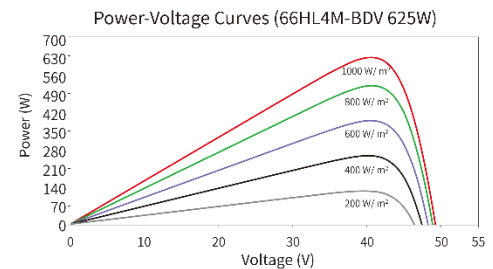
Operating Temperature	-40 °C ~ +70 °C
Maximum System Voltage	1500 VDC (IEC)
Maximum Series Fuse Rating	35 A
Bifaciality Coefficient	φVoc: 98±5 %, φIsc: 80±5 %, φPmax: 80±5 %

## Engineering Drawings



Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance



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Note: Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

JKM605-630N-66HL4M-BDV-F3-EN

[www.jinkosolar.com](http://www.jinkosolar.com)



# TIGER Neo

## 66HL4M-(V)

610-635 Watt  
MONO-FACIAL MODULE

N-type



### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



### Durability Against Extreme Environment

High salt mist and ammonia resistance.



### Mechanical Load Enhanced

Certified to withstand:  
5400 Pa front side max static test load  
2400 Pa rear side max static test load



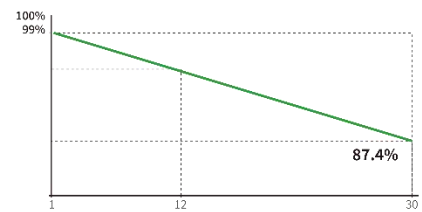
### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Anti-PID guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**12** Year Product Warranty | **30** Year Linear Power Warranty | **1%** First year Degradation | **0.40%** Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



**JKM610-635N-66HL4M-(V)-F2-EN**



# 66HL4M-(V) 610-635 Watt

## Mechanical Characteristics

Cell Type	N -type Mono-crystalline
No. of cells	132 (66×2)
Dimensions	2382×1134×35 mm
Weight	28.2 kg
Front Glass	3.2mm, Anti-reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	2396×1110×1251 mm
Packing detail (Two pallets=One stack)	31 pcs/pallets, 62 pcs/stack, 620 pcs/ 40'HQ Container

## Specifications (STC)

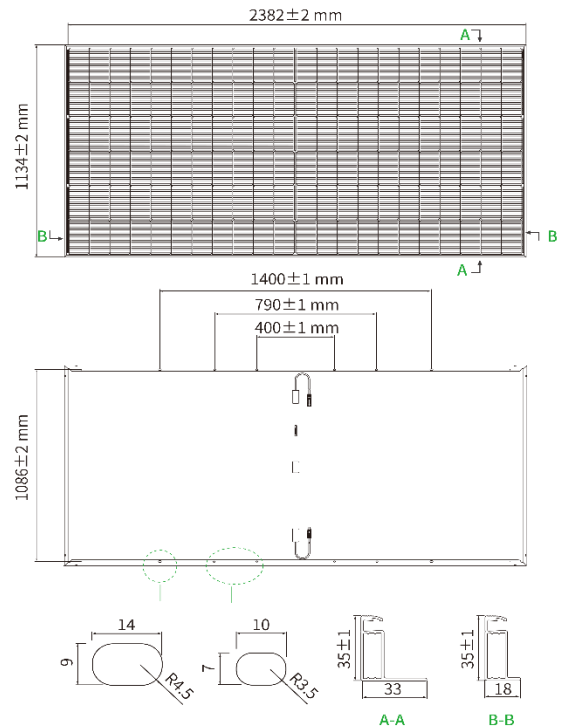
Maximum Power – Pmax [Wp]	610	615	620	625	630	635
Maximum Power Voltage – Vmp [V]	40.56	40.73	40.90	41.07	41.23	41.39
Maximum Power Current – Imp [A]	15.04	15.10	15.16	15.22	15.28	15.34
Open-circuit Voltage – Voc [V]	48.63	48.79	48.95	49.11	49.27	49.43
Short-circuit Current – Isc [A]	16.01	16.08	16.15	16.22	16.29	16.36
Module Efficiency STC [%]	22.58	22.77	22.95	23.14	23.32	23.51
Power Tolerance	0 ~ + 3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

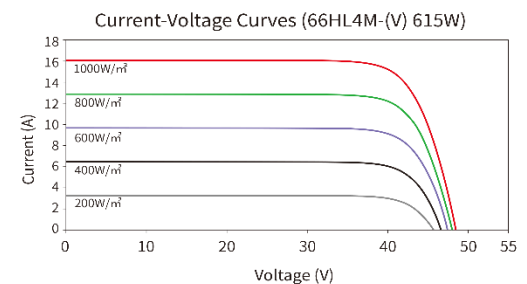
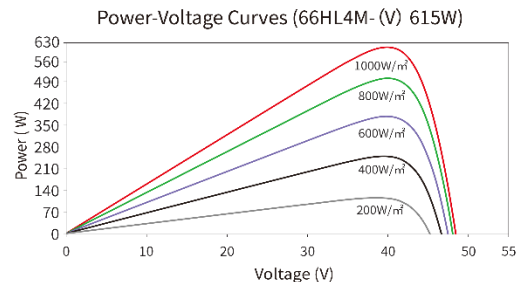
Operating Temperature	-40 °C ~ +70°C
Maximum System Voltage	1000/1500 VDC (IEC)
Maximum Series Fuse Rating	30 A

## Engineering Drawings



\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance



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**Note:** Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

JKM610-635N-66HL4M-(V)-F2-EN

www.jinkosolar.com





# TIGER Neo

## 78HL4-(V)

615-635 Watt  
MONO-FACIAL MODULE

N-type



### N-Type Technology

N-Type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### HOT 2.0 Technology

N-type modules with JinkoSolar's HOT 2.0 technology offer better reliability and efficiency.



### Durability Against Extreme Environment

High salt mist and ammonia resistance.



### Mechanical Load Enhanced

Certified to withstand:  
5400 Pa front side max static test load  
2400 Pa rear side max static test load



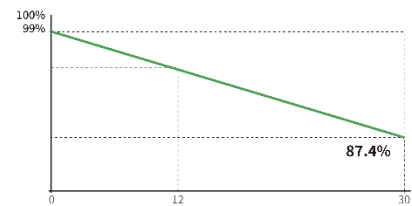
### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Anti-PID guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



**12 Year**  
Product Warranty

**30 Year**  
Linear Power  
Warranty

**1%**  
First-year  
Degradation

**0.4%**  
Annual Degradation  
Over 30 Years

- IEC61215 (2016) / IEC61730 (2016)
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



JKM615-635N-78HL4-(V)-F6-EN



# 78HL4-(V) 615-635 Watt

## Mechanical Characteristics

Cell Type	N-type Mono-crystalline
No. of cells	156 (2×78)
Dimensions	2465×1134×35 mm
Weight	29.5 kg
Front Glass	3.2 mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Output Cables	4.0mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimensions	2495×1120×1249 mm
Packing detail (Two pallets=One stack)	31 pcs/pallets, 62 pcs/stack, 496 pcs/ 40'HQ Container

## SPECIFICATIONS (STC)

Maximum Power – Pmax [Wp]	615	620	625	630	635
Maximum Power Voltage – Vmp [V]	46.81	46.97	47.14	47.30	47.46
Maximum Power Current – Imp [A]	13.14	13.20	13.26	13.32	13.38
Open-circuit Voltage – Voc [V]	56.25	56.40	56.55	56.70	56.85
Short-circuit Current – Isc [A]	13.80	13.86	13.92	13.98	14.04
Module Efficiency STC [%]	22.00	22.18	22.36	22.54	22.72
Power Tolerance	0 ~ +3 %				
Temperature Coefficients of Pmax	-0.29 %/°C				
Temperature Coefficients of Voc	-0.25 %/°C				
Temperature Coefficients of Isc	0.045 %/°C				

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## SPECIFICATIONS (NOCT)

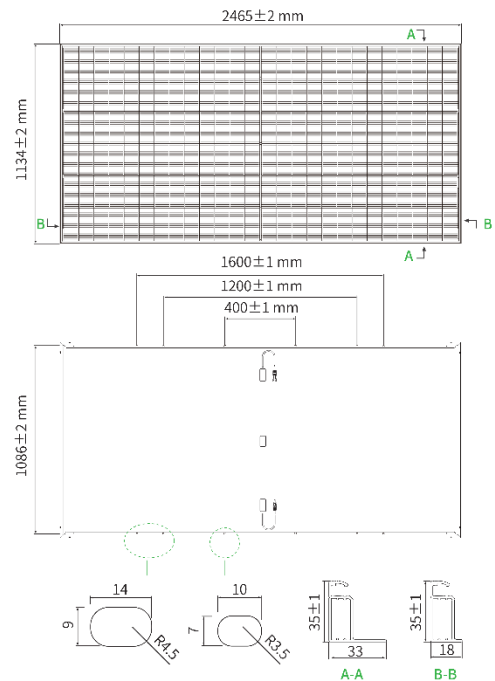
Maximum Power – Pmax [Wp]	463	467	471	475	479
Maximum Power Voltage – Vmp [V]	43.85	44.00	44.14	44.29	44.43
Maximum Power Current – Imp [A]	10.57	10.62	10.67	10.72	10.77
Open-circuit Voltage – Voc [V]	53.43	53.57	53.72	53.86	54.00
Short-circuit Current – Isc [A]	11.14	11.19	11.24	11.28	11.33

NOCT: Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

## Application Conditions

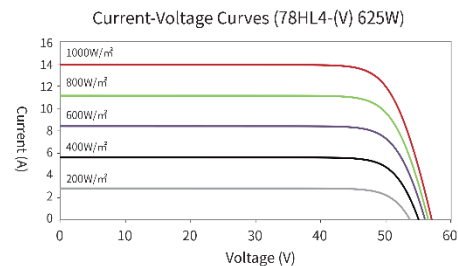
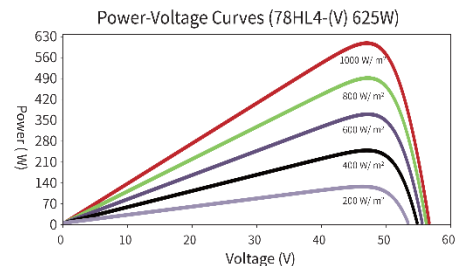
Operating Temperature	-40 °C ~ +85 °C
Maximum system voltage	1000/1500 VDC (IEC)
Maximum series fuse rating	25 A
Nominal operating cell temperature -NOCT	45±2 °C

## Engineering Drawings



\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance & Temperature Dependence



**JinKo Solar Global Market Center**

No.1, Lane 1466, Shen Chang Road, Minhang District, Shanghai, China  
 Tel: +86-21-51808777 Fax: +86-21-51808600 www.jinkosolar.com

**JKM615-635N-78HL4-(V)-F6-EN**

NOTE: Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.



# TIGER Neo

## 78HL4-BDV

625-650 Watt

BIFACIAL MODULE WITH DUAL GLASS

N-type



### N-type Technology

N-type modules with Tunnel Oxide Passivating Contacts (TOPcon) technology offer lower LID/LeTID degradation and better low light performance.



### HOT 3.0 Technology

N-type modules with JinkoSolar's HOT 3.0 technology offer better reliability and efficiency.



### Dual-Sided Power Generation

Dual-sided power generation gain increases with backside exposure to light, significantly reducing LCOE.



### Mechanical Load Enhanced

Certified to withstand:  
5400 Pa front side max static test load  
2400 Pa rear side max static test load



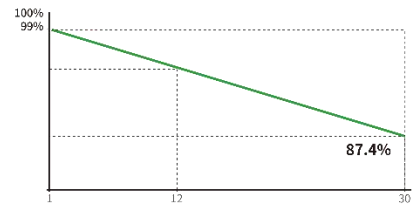
### SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Anti-PID Guarantee

Minimizes the chance of degradation caused by PID phenomena through optimization of cell production technology and material control.



12 Year  
Product Warranty

30 Year  
Linear Power  
Warranty

1%  
First-year  
Degradation

0.40%  
Annual Degradation  
Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems



JKM625-650N-78HL4-BDV-F9-EN



# 78HL4-BDV 625-650 Watt

## Mechanical Characteristics

Cell Type	N- type Mono-crystalline
No. of cells	156 (78×2)
Dimensions	2465×1134×30 mm
Weight	34.0 kg
Front Glass	2.0 mm, Anti-reflection Coating
Back Glass	2.0 mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M/MC4/Others
Output Cables	4.0 mm <sup>2</sup> (+): 400 mm , (-): 200 mm or Customized Length

## Packaging Configuration

Pallet Dimentions	2525×1140×1251 mm
Packing Detail (Two pallets = One stack)	36 pcs/pallets, 72 pcs/stack, 576 pcs/ 40'HQ Container

## Specifications (STC)

Maximum Power - Pmax [Wp]	625	630	635	640	645	650
Maximum Power Voltage - Vmp [V]	47.54	47.70	47.86	48.02	48.17	48.33
Maximum Power Current - Imp [A]	13.15	13.21	13.27	13.33	13.39	13.45
Open-circuit Voltage - Voc [V]	56.95	57.08	57.21	57.34	57.47	57.60
Short-circuit Current - Isc [A]	13.80	13.86	13.92	13.98	14.04	14.10
Module Efficiency STC [%]	22.36	22.54	22.72	22.90	23.07	23.25
Power Tolerance	0 ~ + 3 %					
Temperature Coefficients of Pmax	-0.29 %/°C					
Temperature Coefficients of Voc	-0.25 %/°C					
Temperature Coefficients of Isc	0.045 %/°C					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Specifications (BNPI)

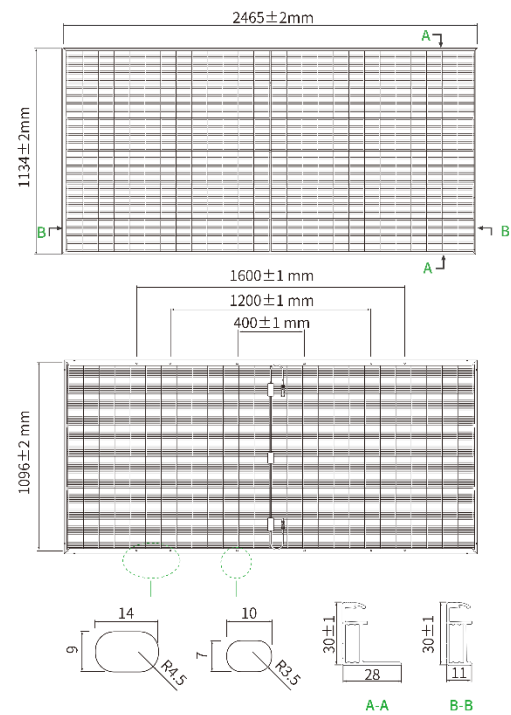
Maximum Power - Pmax [Wp]	688	693	699	704	710	716
Maximum Power Voltage - Vmp [V]	47.57	47.73	47.91	48.06	48.23	48.40
Maximum Power Current - Imp [A]	14.46	14.52	14.59	14.65	14.72	14.79
Open-circuit Voltage - Voc [V]	57.00	57.14	57.28	57.42	57.56	57.70
Short-circuit Current - Isc [A]	15.19	15.27	15.35	15.43	15.51	15.59

BNPI: Irradiance: front 1000W/m<sup>2</sup>, rear 135W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

## Application Conditions

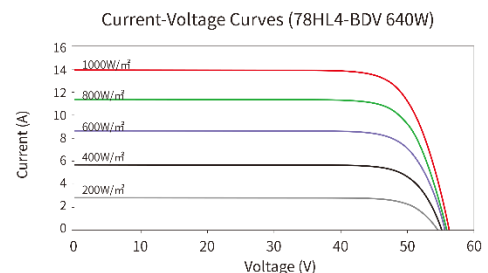
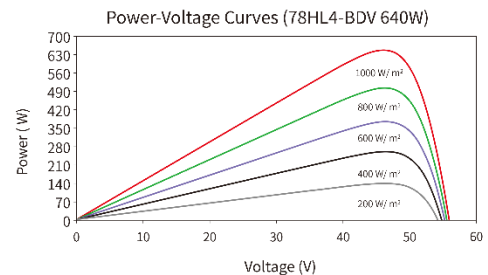
Operating Temperature	-40 °C ~ +70 °C
Maximum System Voltage	1500 VDC (IEC)
Maximum Series Fuse Rating	30 A
Bifaciality Coefficient	φVoc: 98±5 % , φIsc: 80±5 % , φPmax: 80±5 %

## Engineering Drawings



\*Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

## Electrical Performance & Temperature Dependence



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**Note:** Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

JKM625-650N-78HL4-BDV-F9-EN

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# Monocrystalline Bifacial Dual Glass Module

## STN120H

### 440-460W

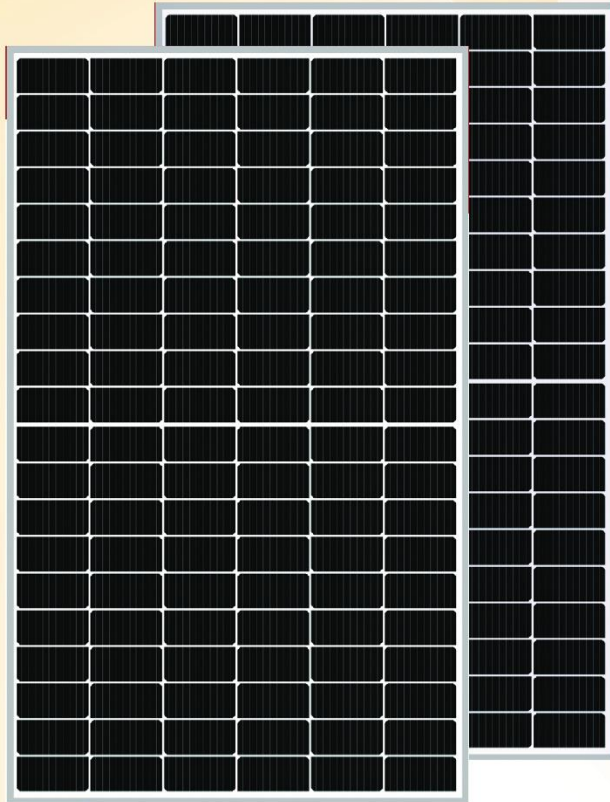
Power Output

### 20.46%-21.39%

Module Efficiency

### 1909×1131×35mm

Module Dimensions



**0-±5%**  
Guaranteed 0-±5% positive tolerance ensures the power output reliability

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

**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

**Bifacial technology**  
Enables additional energy harvesting from rear side (up to 30%)

**Dual stage EL Inpection**  
Warranting defect-free product

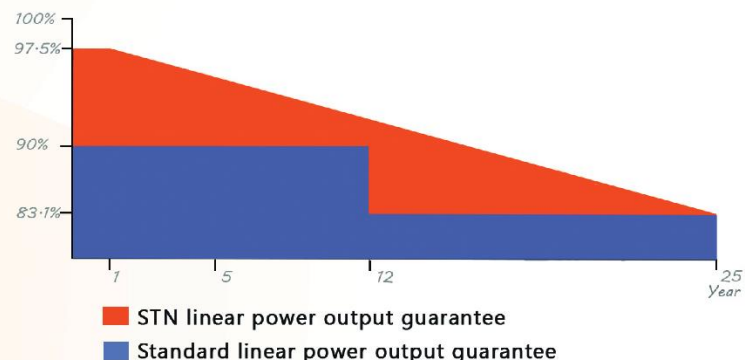
**Highly reliable due to stringent quality control**  
Strict EL testing beyond certification requirements

**ISO** ISO 9001:Quality Management System  
ISO14001:Environment Management

### Industry Leading Linear Power Warranty

**12 years**  
Warranty for materials and processing

**25 years**  
Warranty for extra linear power output



Specifications in this datasheet are subject to change without prior notice.



# High Efficiency Half-cells Module STN440-460W BDM10

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	440	445	450	455	460
Short Circuit Current(Isc)[A]	13.64	13.71	13.78	13.85	13.91
Maximum Power Current(Imp)[A]	12.91	12.98	13.05	13.12	13.19
Maximum Power Voltage(Vmp)[V]	34.10	34.28	34.49	34.68	34.88
Open Circuit Voltage (Voc)[V]	41.0	41.18	41.39	41.58	41.78
Module Efficiency [%]	20.46	20.69	20.93	21.16	21.39

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

## ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power (Pmax)[W]	328.4	332.5	336.7	340.1	344.2
Open Circuit Voltage (Voc)[V]	38.28	38.49	38.67	38.88	39.08
Short Circuit Current(Isc)[A]	11.02	11.07	11.13	11.18	11.23
Maximum Power Voltage (Vmpp)[V]	31.69	31.9	32.08	32.29	32.46
Maximum Power Current (Imp)[A]	10.37	10.43	10.48	10.54	10.59

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s AM=1.5

## REARSIDE POWER GAIN

5%	Total Equivalent Power-Pmax(Wp)	462	467	472	477	483
	Module Efficiency [%]	21.49	21.73	21.98	22.22	22.47
10%	Total Equivalent Power-Pmax(Wp)	484	489	495	500	506
	Module Efficiency [%]	22.51	22.77	23.02	23.28	23.53

## MECHANICAL SPECIFICATION

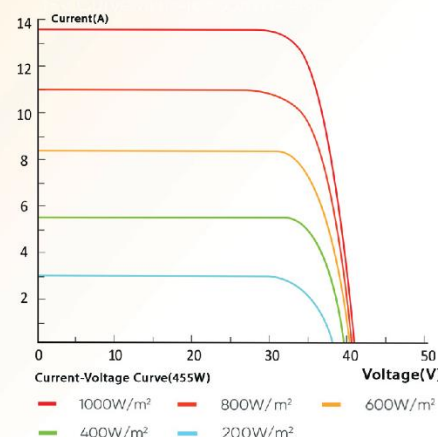
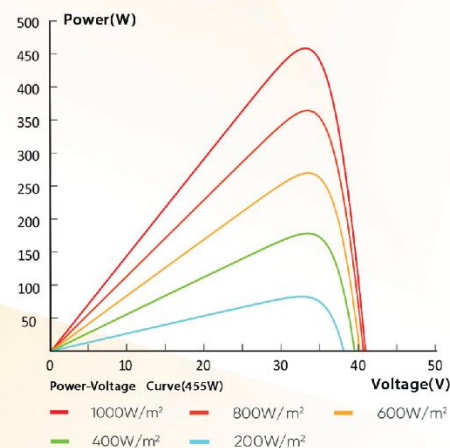
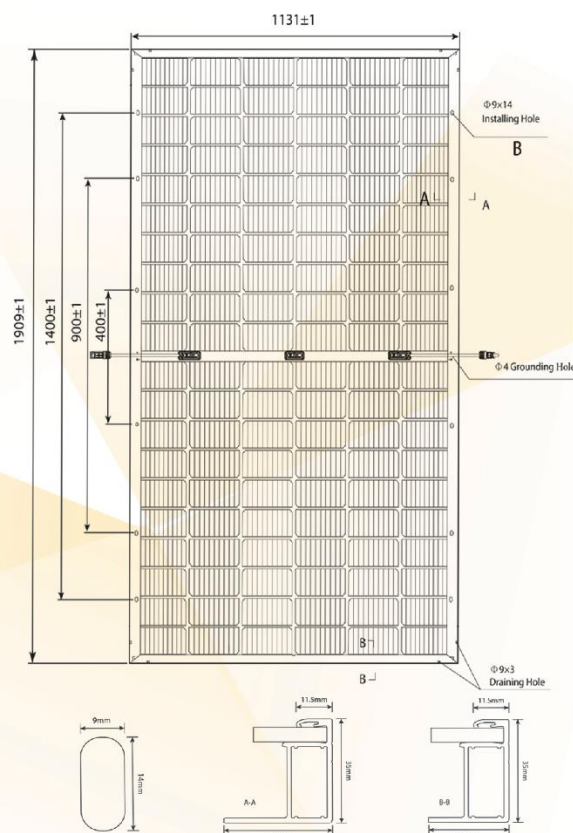
Cell Type	Monocrystalline , 182*182mm
Cell Arrangement	120(6*10 + 6*10)
Weight	28.2Kg(76.5lbs)(±3%)
Module Dimensions	1909*1131*35mm(75.1*44.5*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/ °C
Voc Temperature Coefficient	-0.275 %/ °C
Isc Temperature Coefficient	0.048 %/ °C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	620Pcs/40HQ





# Monocrystalline Module

## STN120H

### 440-460W

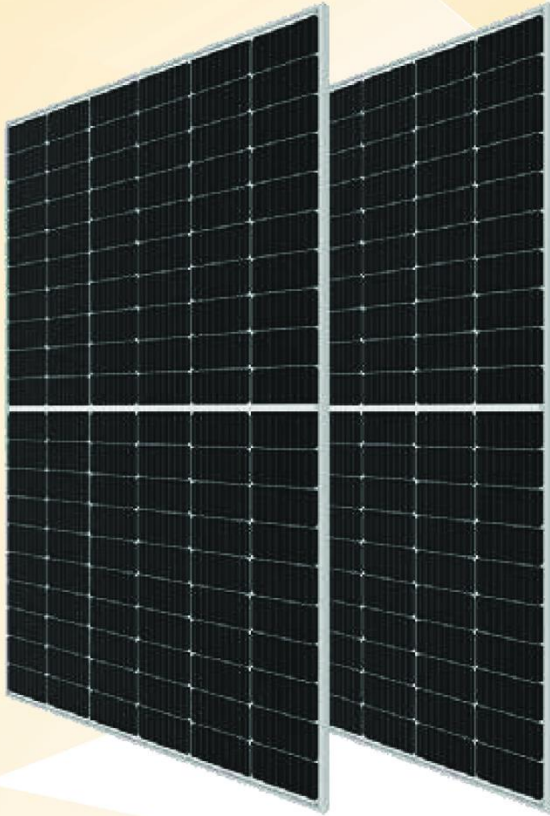
Power Output

### 20.46%-21.39%

Module Efficiency

### 1909×1131×35mm

Module Dimensions



**0-±5%**  
Guaranteed 0-±5% positive tolerance ensures the power output reliability

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

**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

**Dual stage EL Inpection**  
Warranting defect-free product

**Highly reliable due to stringent quality control**  
Strict EL testing beyond certification requirements

ISO 9001:Quality Management System  
ISO14001:Environment Management

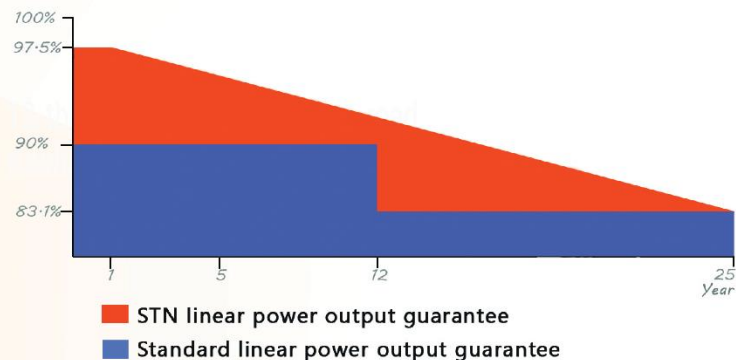
### Industry Leading Linear Power Warranty

**12 years**

Warranty for materials and processing

**25 years**

Warranty for extra linear power output



Specifications in this datasheet are subject to change without prior notice.



# High Efficiency Half-cells Module STN440-460W M10

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	440	445	450	455	460
Short Circuit Current(Isc)[A]	13.64	13.71	13.78	13.85	13.91
Maximum Power Current(Imp)[A]	12.91	12.98	13.05	13.12	13.19
Maximum Power Voltage(Vmp)[V]	34.10	34.28	34.49	34.68	34.88
Open Circuit Voltage (Voc)[V]	41.0	41.18	41.39	41.58	41.78
Module Efficiency [%]	20.46	20.69	20.93	21.16	21.39

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

## ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power (Pmax)[W]	328.4	332.5	336.7	340.1	344.2
Open Circuit Voltage (Voc)[V]	38.28	38.49	38.67	38.88	39.08
Short Circuit Current(Isc)[A]	11.02	11.07	11.13	11.18	11.23
Maximum Power Voltage (Vmpp)[V]	31.69	31.9	32.08	32.29	32.46
Maximum Power Current (Imp)[A]	10.37	10.43	10.48	10.54	10.59

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s AM=1.5

## MECHANICAL SPECIFICATION

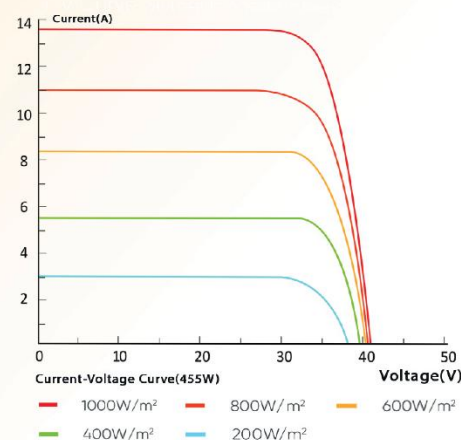
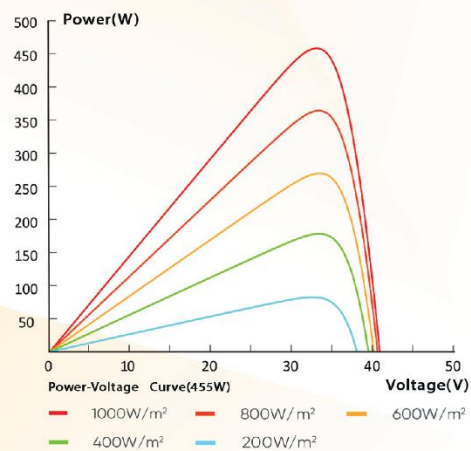
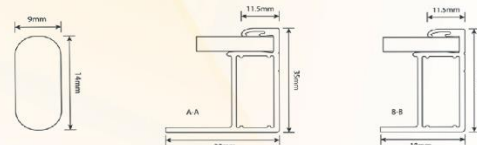
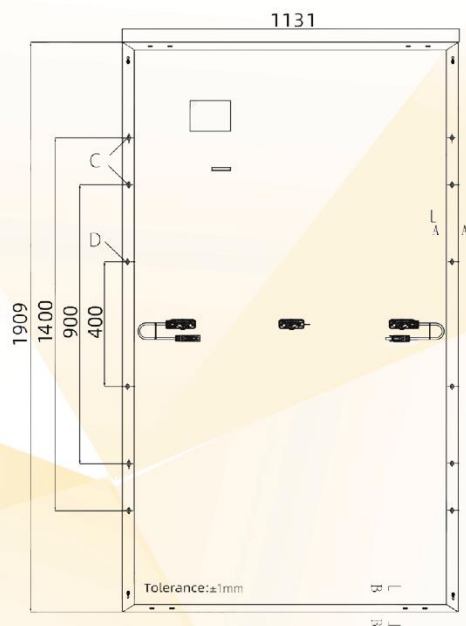
Cell Type	Monocrystalline , 182*182mm
Cell Arrangement	120(6*10 + 6*10)
Weight	28.2Kg(76.5lbs)(±3%)
Module Dimensions	1909*1131*35mm(75.1*44.5*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/ °C
Voc Temperature Coefficient	-0.275 %/ °C
Isc Temperature Coefficient	0.048 %/ °C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	620Pcs/40HQ





# Monocrystalline Module

## STN144H

### 535-555W

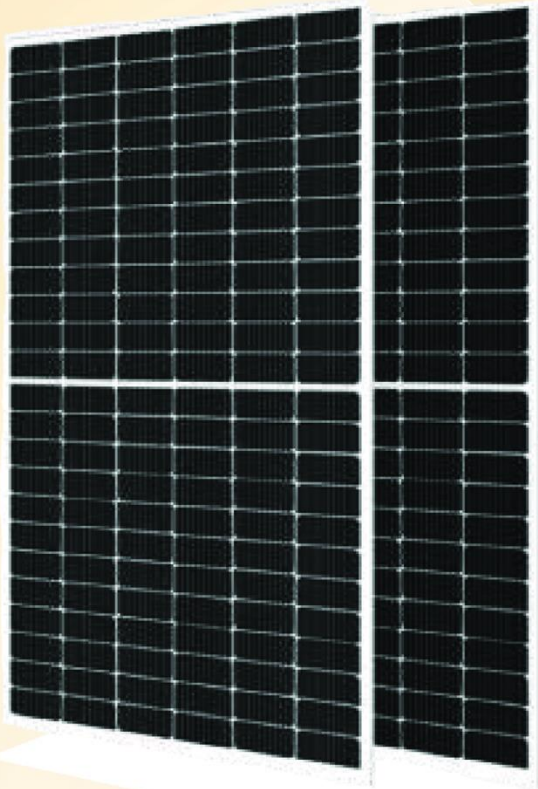
Power Output

### 20.81%-21.59%

Module Efficiency

### 2279×1131×35mm

Module Dimensions



**0-±5%**  
Guaranteed 0-±5% positive tolerance ensures the power output reliability

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

**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

**Dual stage EL Inpection**  
Warranting defect-free product

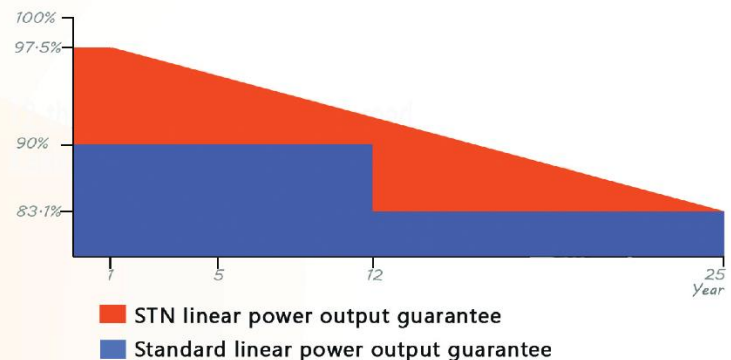
**Highly reliable due to stringent quality control**  
Strict EL testing beyond certification requirements

**ISO** ISO 9001:Quality Management System  
ISO14001:Environment Management

### Industry Leading Linear Power Warranty

**12 years**  
Warranty for materials and processing

**25 years**  
Warranty for extra linear power output



Specifications in this datasheet are subject to change without prior notice.



# High Efficiency Half-cells Module STN535-555W M10

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	535	540	545	550	555
Short Circuit Current(Isc)[A]	13.79	13.86	13.93	14	14.07
Maximum Power Current(Imp)[A]	12.9	12.97	13.06	13.13	13.24
Maximum Power Voltage(Vmp)[V]	41.37	41.65	41.7	41.96	42.17
Open Circuit Voltage (Voc)[V]	49.45	49.66	49.74	50.06	50.1
Module Efficiency [%]	20.81	21.01	21.2	21.4	21.59

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

## ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power (Pmax)[W]	405	407	411	415	418
Open Circuit Voltage (Voc)[V]	46.3	46.43	46.55	46.73	46.84
Short Circuit Current(Isc)[A]	11.07	11.1	11.16	11.19	11.23
Maximum Power Voltage (Vmpp)[V]	38.78	38.8	39.1	39.45	39.53
Maximum Power Current (Imp)[A]	10.45	10.47	10.52	10.56	10.6

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s AM=1.5

## MECHANICAL SPECIFICATION

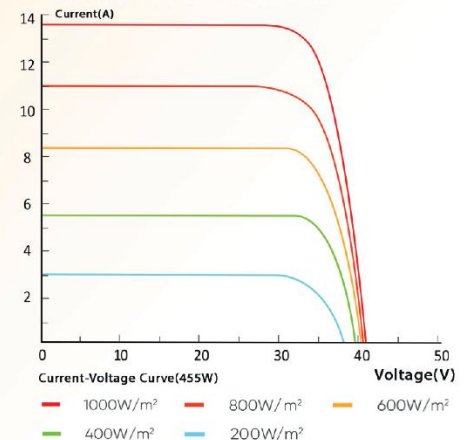
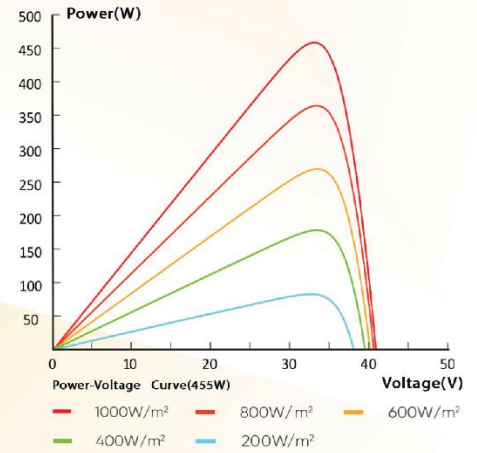
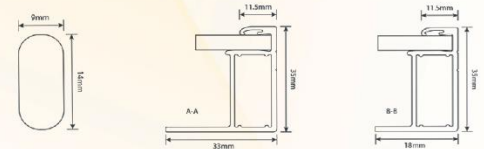
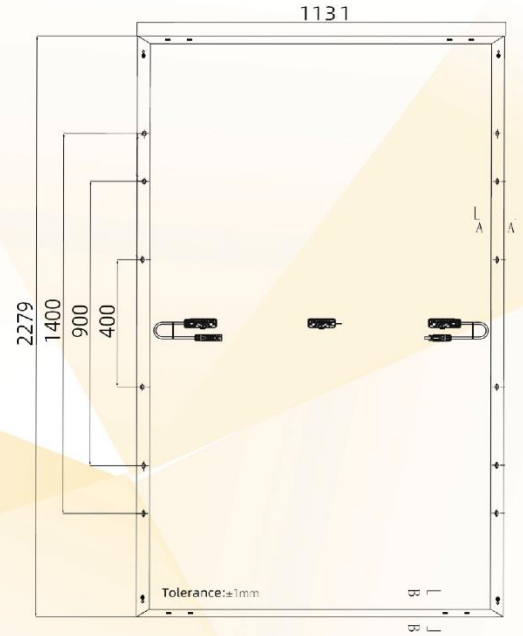
Cell Type	Monocrystalline , 182*182mm
Cell Arrangement	144(6*12 + 6*12)
Weight	34.5Kg(76.5lbs)(±3%)
Module Dimensions	2279*1131*35mm(89.7*44.5*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/°C
Voc Temperature Coefficient	-0.275 %/°C
Isc Temperature Coefficient	0.048 %/°C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	620Pcs/40HQ





# Monocrystalline Module

## STN144H

### 535-555W

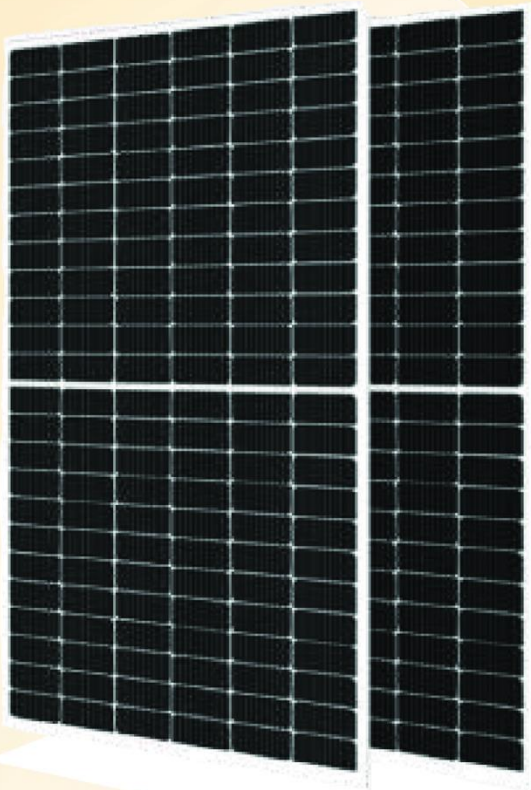
Power Output

### 20.81%-21.59%

Module Efficiency

### 2279×1131×35mm

Module Dimensions



**0-±5%**  
Guaranteed 0-±5% positive tolerance ensures the power output reliability

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

**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

**Dual stage EL Inpection**  
Warranting defect-free product

**Highly reliable due to stringent quality control**  
Strict EL testing beyond certification requirements

**ISO 9001:Quality Management System**  
**ISO14001:Environment Management**

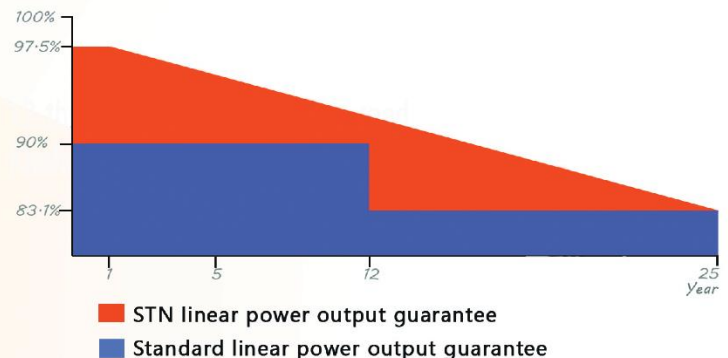
### Industry Leading Linear Power Warranty

**12 years**

Warranty for materials and processing

**25 years**

Warranty for extra linear power output



Specifications in this datasheet are subject to change without prior notice.



# High Efficiency Half-cells Module STN535-555W M10

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	535	540	545	550	555
Short Circuit Current(Isc)[A]	13.79	13.86	13.93	14	14.07
Maximum Power Current(Imp)[A]	12.9	12.97	13.06	13.13	13.24
Maximum Power Voltage(Vmp)[V]	41.37	41.65	41.7	41.96	42.17
Open Circuit Voltage (Voc)[V]	49.45	49.66	49.74	50.06	50.1
Module Efficiency [%]	20.81	21.01	21.2	21.4	21.59

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

## ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power (Pmax)[W]	405	407	411	415	418
Open Circuit Voltage (Voc)[V]	46.3	46.43	46.55	46.73	46.84
Short Circuit Current(Isc)[A]	11.07	11.1	11.16	11.19	11.23
Maximum Power Voltage (Vmpp)[V]	38.78	38.8	39.1	39.45	39.53
Maximum Power Current (Imp)[A]	10.45	10.47	10.52	10.56	10.6

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s AM=1.5

## MECHANICAL SPECIFICATION

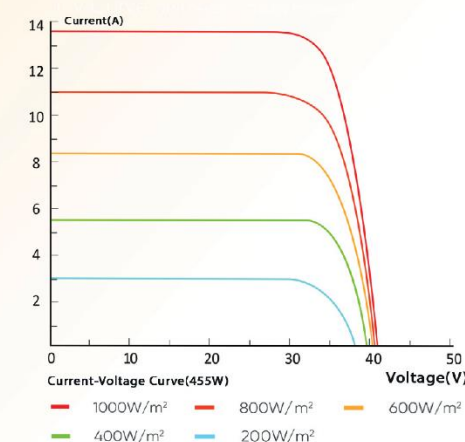
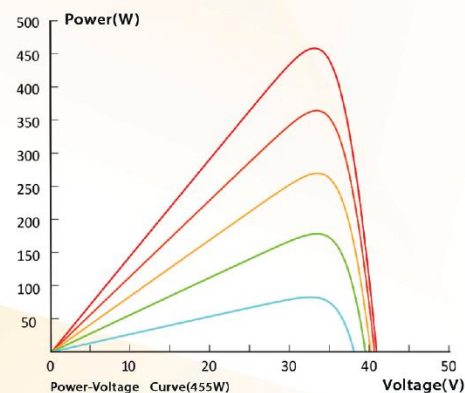
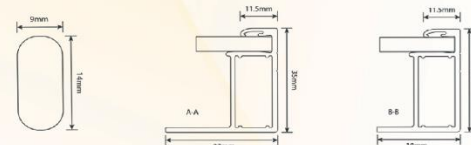
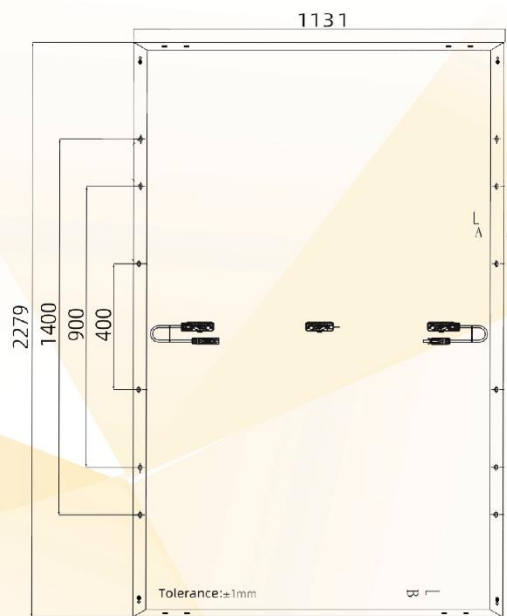
Cell Type	Monocrystalline , 182*182mm
Cell Arrangement	144(6*12 + 6*12)
Weight	34.5Kg(76.5lbs)(±3%)
Module Dimensions	2279*1131*35mm(89.7*44.5*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/ °C
Voc Temperature Coefficient	-0.275 %/ °C
Isc Temperature Coefficient	0.048 %/ °C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	620Pcs/40HQ





# Monocrystalline Bifacial Dual Glass Module

## STN120H

### 590-610W

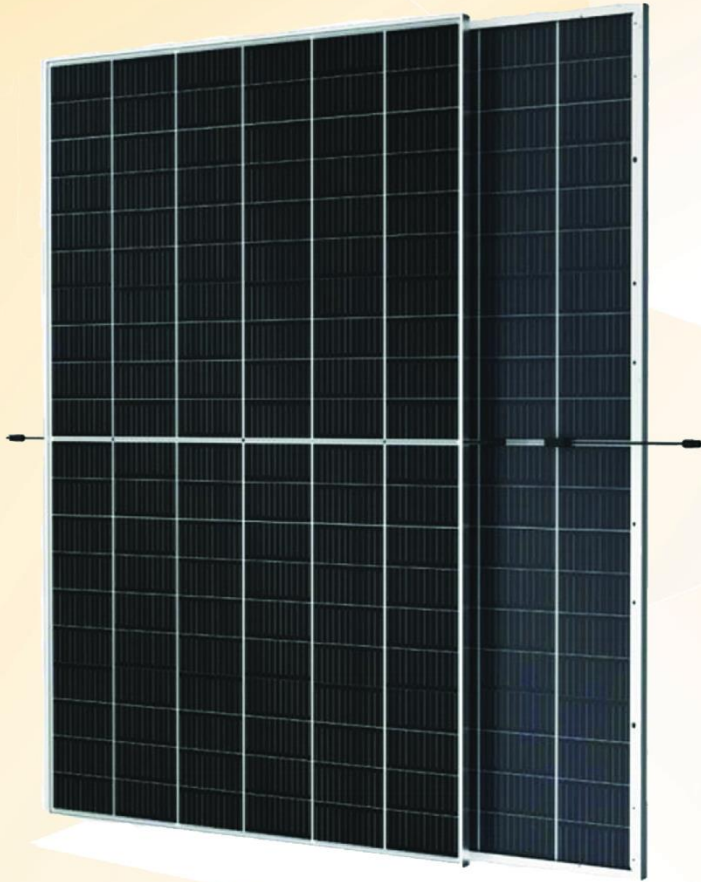
Power Output

### 20.85%-21.55%

Module Efficiency

### 2172×1303×35mm

Module Dimensions



**0-±5%**  
Guaranteed 0-±5% positive tolerance ensures the power output reliability

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

**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

**Bifacial technology**  
Enables additional energy harvesting from rear side(up to30%)

**Dual stage EL Inpection**  
Warranting defect-free product

**Highly reliable due to stringent quality control**  
Strict EL testing beyond certification requirements

ISO 9001:Quality Management System  
ISO14001:Environment Management

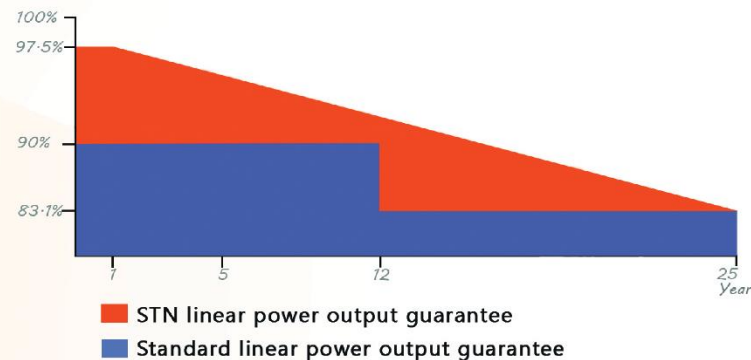
### Industry Leading Linear Power Warranty

**12 years**

Warranty for materials and processing

**25 years**

Warranty for extra linear power output



Specifications in this datasheet are subject to change without prior notice.



# High Efficiency Half-cells Module STN590-610W BDM12

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	590	595	600	605	610
Short Circuit Current(Isc)[A]	18.43	18.48	18.52	18.58	18.61
Maximum Power Current(Imp)[A]	17.34	17.39	17.43	17.48	17.53
Maximum Power Voltage(Vmp)[V]	34.02	34.18	34.39	34.61	34.78
Open Circuit Voltage (Voc)[V]	41.11	41.29	41.48	41.69	41.88
Module Efficiency [%]	20.85	21.02	21.20	21.38	21.55

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	463
Open Circuit Voltage (Voc)[V]	38.68	38.87	39.07	39.26	39.45
Short Circuit Current(Isc)[A]	14.83	14.87	14.92	14.95	14.98
Maximum Power Voltage (Vmp)[V]	31.73	31.91	32.04	32.19	32.36
Maximum Power Current (Imp)[A]	14.10	14.14	14.19	14.23	14.27

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1 m/s AM=1.5

## REARSIDE POWER GAIN

5%	Total Equivalent Power-Pmax(Wp)	619	624	630	635	640
	Module Efficiency [%]	21.89	22.08	22.26	22.45	22.63
10%	Total Equivalent Power-Pmax(Wp)	649	654	660	665	671
	Module Efficiency [%]	22.93	23.13	23.32	23.52	23.71

## MECHANICAL SPECIFICATION

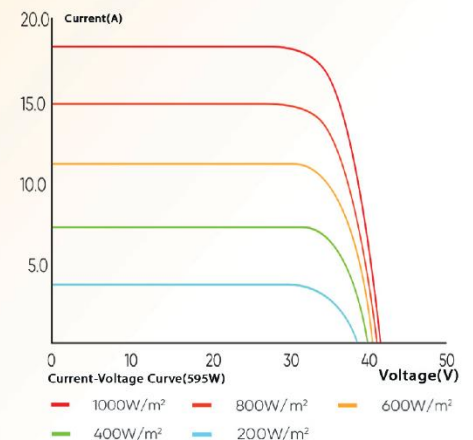
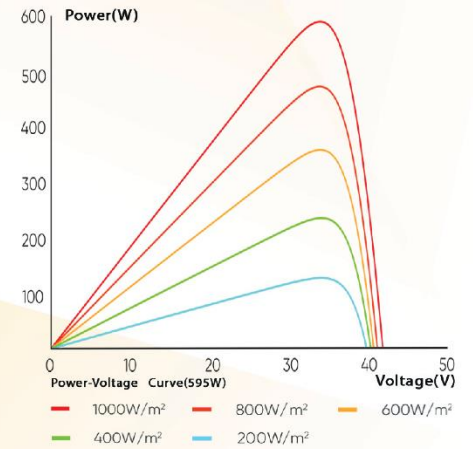
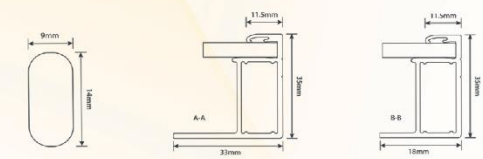
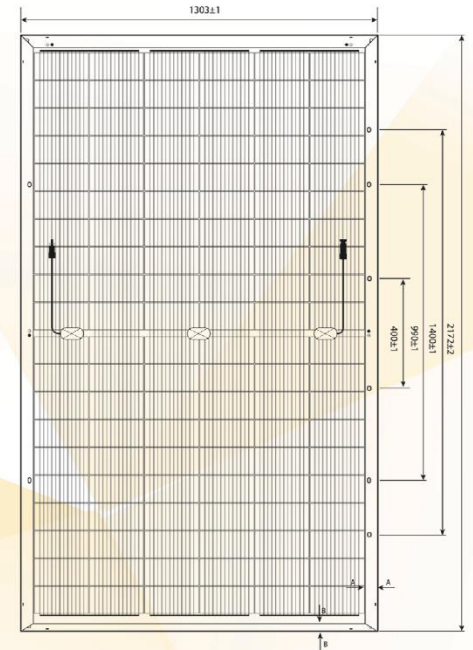
Cell Type	Monocrystalline , 210*210mm
Cell Arrangement	120(6*10 + 6*10)
Weight	38.6Kg(85.09lbs)(±3%)
Module Dimensions	2172*1303*35mm(85.5*51.2*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/ °C
Voc Temperature Coefficient	-0.275 %/ °C
Isc Temperature Coefficient	0.048 %/ °C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	527Pcs/40HQ





# Monocrystalline Module

## STN120H

### 590-610W

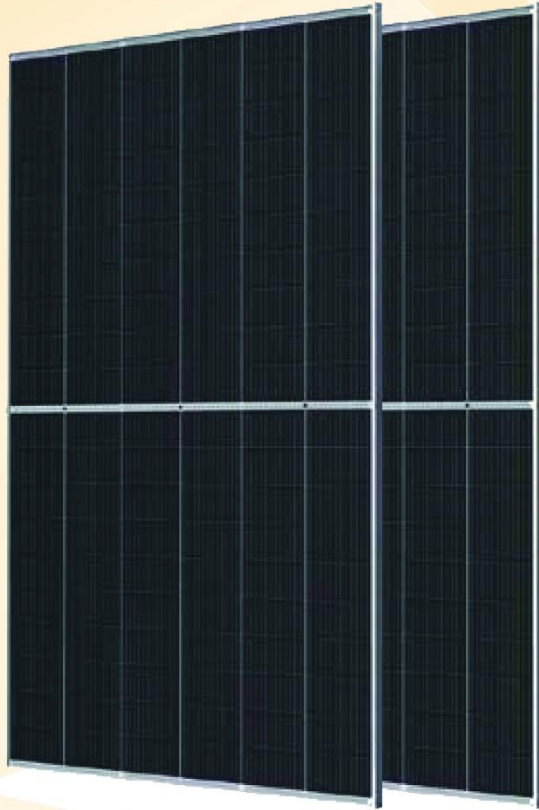
Power Output

### 20.85%-21.55%

Module Efficiency

### 2172×1303×35mm

Module Dimensions



0-±5%

Guaranteed 0-±5% positive tolerance ensures the power output reliability



ISO 9001:Quality Management System

ISO14001:Environment Management



#### High customer value

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



#### 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



#### Dual stage EL Inpection

Warranting defect-free product



#### Highly reliable due to stringent quality control

Strict EL testing beyond certification requirements

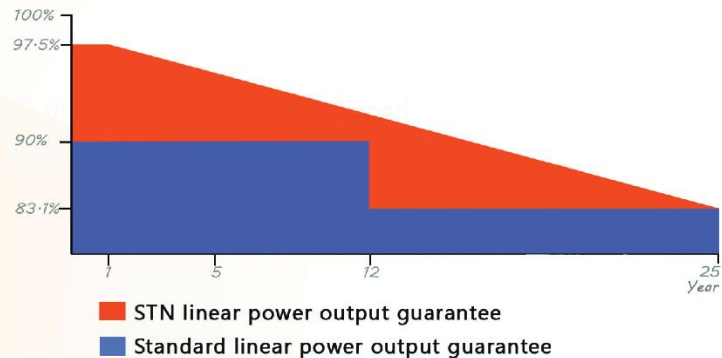
### Industry Leading Linear Power Warranty

12 years

Warranty for materials and processing

25 years

Warranty for extra linear power output



STN linear power output guarantee

Standard linear power output guarantee

Specifications in this datasheet are subject to change without prior notice.





# High Efficiency Half-cells Module STN590-610W M12

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	590	595	600	605	610
Short Circuit Current(Isc)[A]	18.43	18.48	18.52	18.58	18.61
Maximum Power Current(Imp)[A]	17.34	17.39	17.43	17.48	17.53
Maximum Power Voltage(Vmp)[V]	34.02	34.18	34.39	34.61	34.78
Open Circuit Voltage (Voc)[V]	41.11	41.29	41.48	41.69	41.88
Module Efficiency [%]	20.85	21.02	21.20	21.38	21.55

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	463
Open Circuit Voltage (Voc)[V]	38.68	38.87	39.07	39.26	39.45
Short Circuit Current(Isc)[A]	14.83	14.87	14.92	14.95	14.98
Maximum Power Voltage (Vmpp)[V]	31.73	31.91	32.04	32.19	32.36
Maximum Power Current (Imp)[A]	14.10	14.14	14.19	14.23	14.27

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s AM=1.5

## MECHANICAL SPECIFICATION

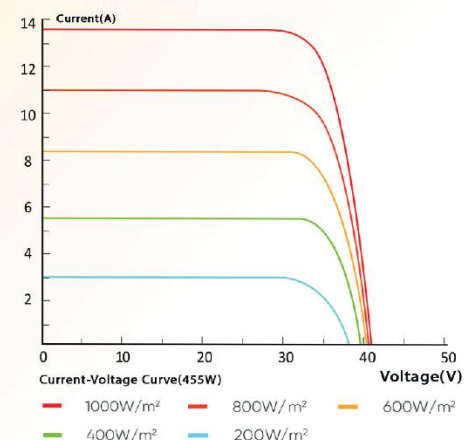
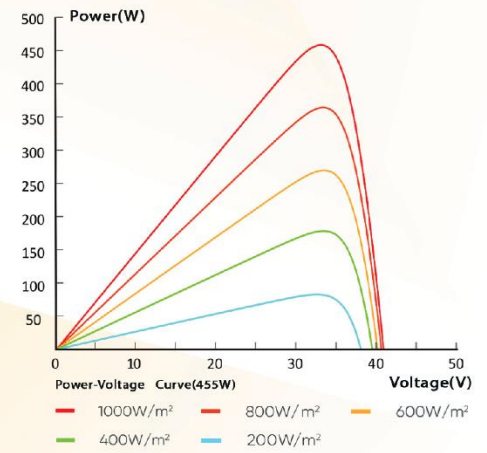
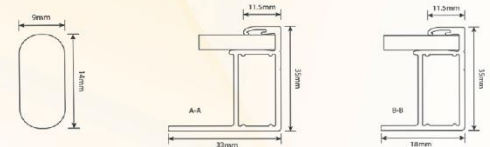
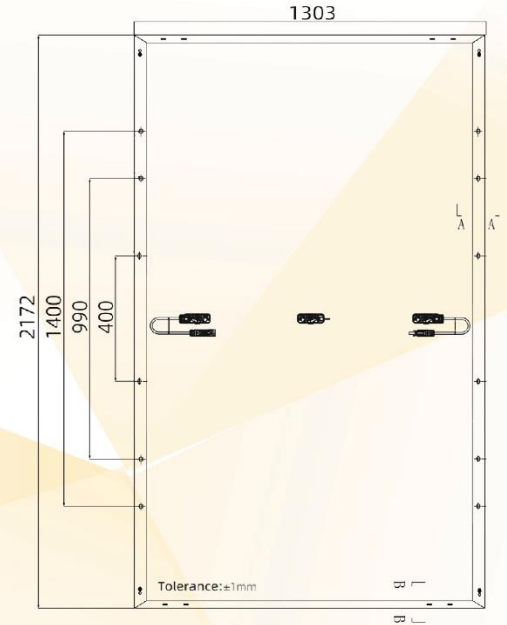
Cell Type	Monocrystalline , 210*210mm
Cell Arrangement	120(6*10 + 6*10)
Weight	38.6Kg(85.09lbs)(±3%)
Module Dimensions	2172*1303*35mm(85.5*51.2*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/ °C
Voc Temperature Coefficient	-0.275 %/ °C
Isc Temperature Coefficient	0.048 %/ °C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	527Pcs/40HQ



# Monocrystalline Bifacial Dual Glass Module

## STN132H

### 655-675W

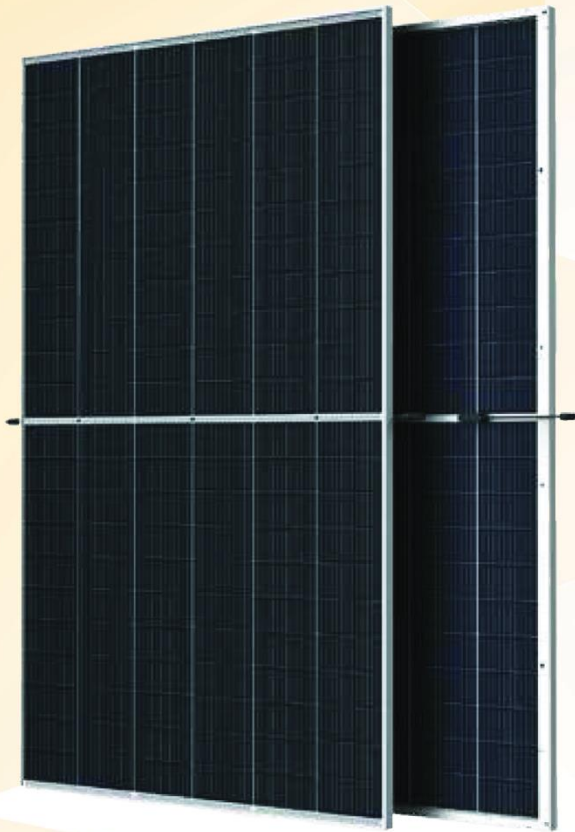
Power Output

### 21.13%-21.77%

Module Efficiency

### 2384×1303×35mm

Module Dimensions



**0-±5%**  
Guaranteed 0-±5% positive tolerance ensures the power output reliability

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

**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

**Bifacial technology**  
Enables additional energy harvesting from rear side(up to30%)

**Dual stage EL Inpection**  
Warranting defect-free product

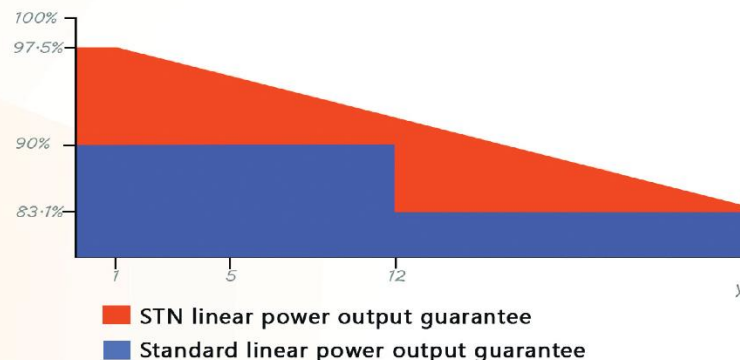
**Highly reliable due to stringent quality control**  
Strict EL testing beyond certification requirements

**ISO** ISO 9001:Quality Management System  
ISO14001:Environment Management

### Industry Leading Linear Power Warrant

**12 years**  
Warranty for materials and processing

**25 years**  
Warranty for extra linear power output



Specifications in this datasheet are subject to change without prior notice.





# High Efficiency Half-cells Module STN655-675W BDM12

## ELECTRICAL PARAMETERS AT STC

Rated Maximum Power (Pmax)[W]	655	660	665	670	675
Short Circuit Current(Isc)[A]	18.49	18.52	18.57	18.6	18.63
Maximum Power Current(Imp)[A]	17.42	17.46	17.51	17.55	17.59
Maximum Power Voltage(Vmp)[V]	37.58	37.78	37.97	38.16	38.37
Open Circuit Voltage (Voc)[V]	45.44	45.64	45.83	46.02	46.23
Module Efficiency [%]	21.13	21.29	21.45	21.61	21.77

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

## ELECTRICAL PARAMETERS AT NMOT

Rated Maximum Power (Pmax)[W]	495	499	505	509	513
Open Circuit Voltage (Voc)[V]	42.78	42.98	43.18	43.38	43.58
Short Circuit Current(Isc)[A]	14.86	14.91	14.96	15.01	15.05
Maximum Power Voltage (Vmpp)[V]	35.08	35.27	35.48	35.67	35.87
Maximum Power Current (Imp)[A]	14.13	14.16	14.19	14.23	14.26

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1m/s AM=1.5

## REARSIDE POWER GAIN

5%	Total Equivalent Power-Pmax(Wp)	687	693	698	703	708
	Module Efficiency [%]	22.19	22.35	22.52	22.69	22.86
10%	Total Equivalent Power-Pmax(Wp)	720	726	731	737	742
	Module Efficiency [%]	23.24	23.42	23.60	23.77	23.95

## MECHANICAL SPECIFICATION

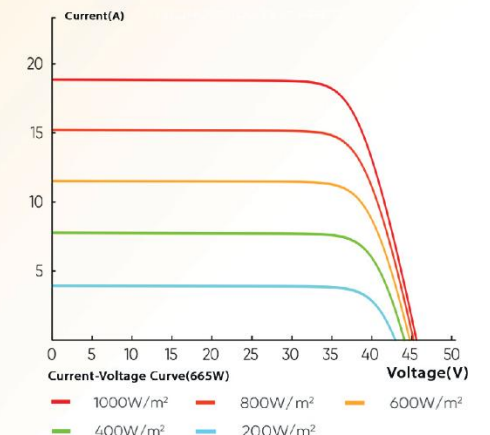
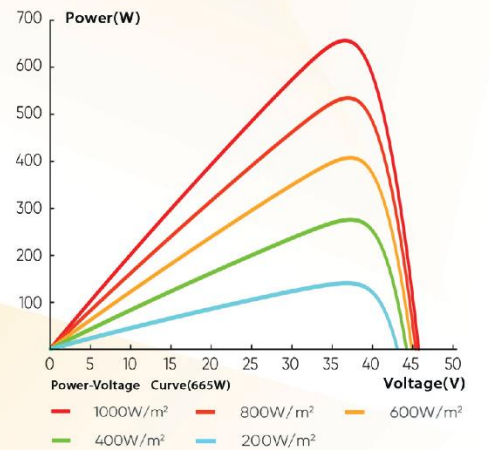
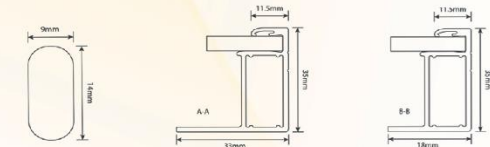
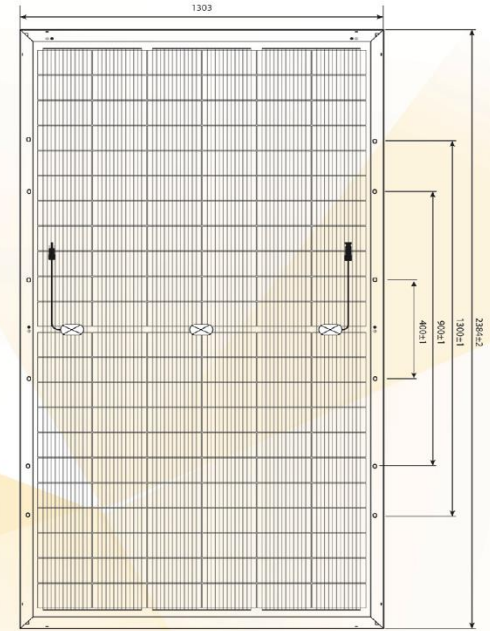
Cell Type	Monocrystalline , 210*210mm
Cell Arrangement	132(6*11 + 6*11)
Weight	41.1Kg(90.6lbs)(±3%)
Module Dimensions	2384*1303*35mm(93.8*51.2*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%

## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/°C
Voc Temperature Coefficient	-0.275 %/°C
Isc Temperature Coefficient	0.048 %/°C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A

## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	527Pcs/40HQ





# Monocrystalline Module

## STN132H

### 655-675W

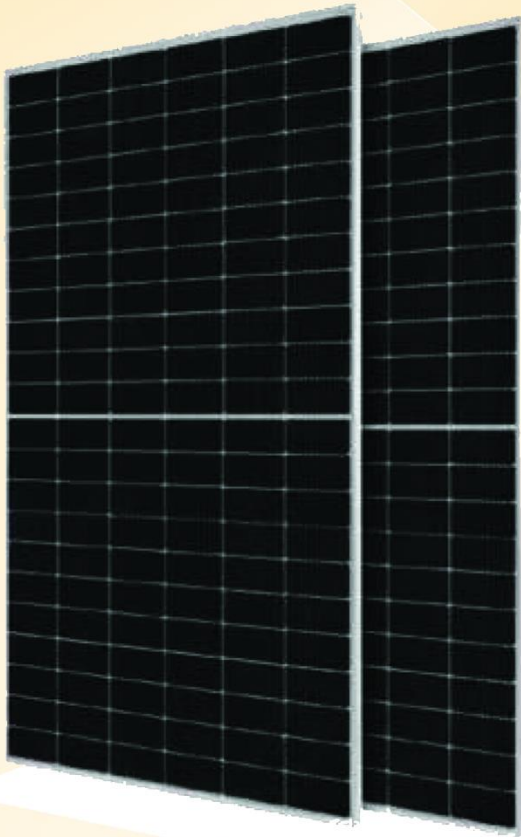
Power Output

### 21.13%-21.77%

Module Efficiency

### 21384×1303×35mm

Module Dimensions



0-±5%

Guaranteed 0-±5% positive tolerance ensures the power output reliability

#### High customer value

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

#### 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

#### Dual stage EL Inpection

Warranting defect-free product

#### Highly reliable due to stringent quality control

Strict EL testing beyond certification requirements



ISO 9001:Quality Management System

ISO14001:Environment Management

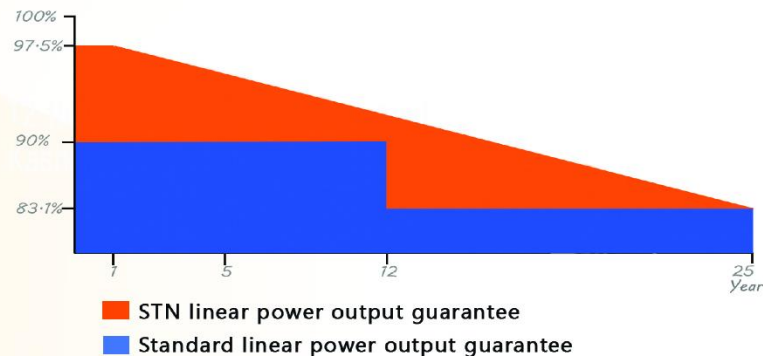
### Industry Leading Linear Power Warranty

12 years

Warranty for materials and processing

25 years

Warranty for extra linear power output



STN linear power output guarantee

Standard linear power output guarantee

Specifications in this datasheet are subject to change without prior notice.



# High Efficiency Half-cells Module STN655-675W M12

## ELECTRICAL PARAMETERS AT STC

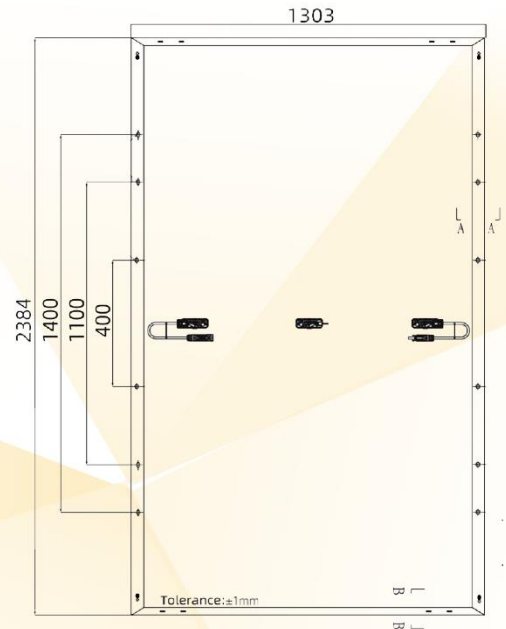
Rated Maximum Power (Pmax)[W]	655	660	665	670	675
Short Circuit Current(Isc)[A]	18.49	18.52	18.57	18.6	18.63
Maximum Power Current(Imp)[A]	17.42	17.46	17.51	17.55	17.59
Maximum Power Voltage(Vmp)[V]	37.58	37.78	37.97	38.16	38.37
Open Circuit Voltage (Voc)[V]	45.44	45.64	45.83	46.02	46.23
Module Efficiency [%]	21.13	21.29	21.45	21.61	21.77

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

## ELECTRICAL PARAMETERS AT NMOT

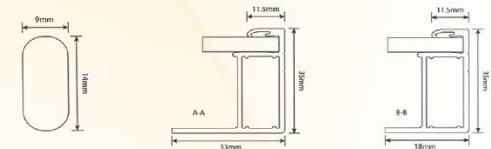
Rated Maximum Power (Pmax)[W]	495	499	505	509	513
Open Circuit Voltage (Voc)[V]	42.78	42.98	43.18	43.38	43.58
Short Circuit Current(Isc)[A]	14.86	14.91	14.96	15.01	15.05
Maximum Power Voltage (Vmpp)[V]	35.08	35.27	35.48	35.67	35.87
Maximum Power Current (Imp)[A]	14.13	14.16	14.19	14.23	14.26

NMOT: Irradiance 800W/m<sup>2</sup> ambient temperature 20°C wind speed:1 m/s AM=1.5



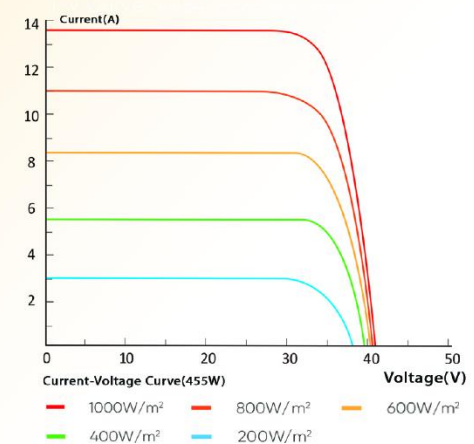
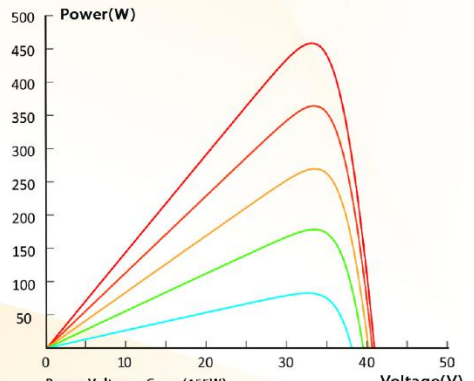
## MECHANICAL SPECIFICATION

Cell Type	Monocrystalline , 210*210mm
Cell Arrangement	132(6*11 + 6*11)
Weight	41.1Kg(90.6lbs)(±3%)
Module Dimensions	2384*1303*35mm(93.8*51.2*1.3 inch)
Cable	4.0mm Positive / Negative: 300mm
Front Glass	2.0mm AR coating Semi-Tempered Glass
Rear Glass	2.0mm Semi-Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	Protection Class IP68 , 3 Bypass Diodes
Connector	MC4 Compatible
Bifaciality Factor	(70±5)%



## OPERATING CONDITIONS

Maximum System Voltage (V)	1500VDC
Pmax Temperature Coefficient	-0.35 %/ °C
Voc Temperature Coefficient	-0.275 %/ °C
Isc Temperature Coefficient	0.048 %/ °C
Normal Operating Cell Temperature	45 ± 2 °C
Operating Temperature	-40 °C to +85°C
Maximum Series Fuse	25A



## PACKING CONFIGURATION

Quantity/Pallet	31Pcs/Pallet
Quantity/Container	527Pcs/40HQ



# Vertex N

**N-type i-TOPCon bifacial dual glass**  
Monocrystalline module

PRODUCT: TSM-NEG21C.20  
PRODUCT RANGE: 685-710W

## 710W

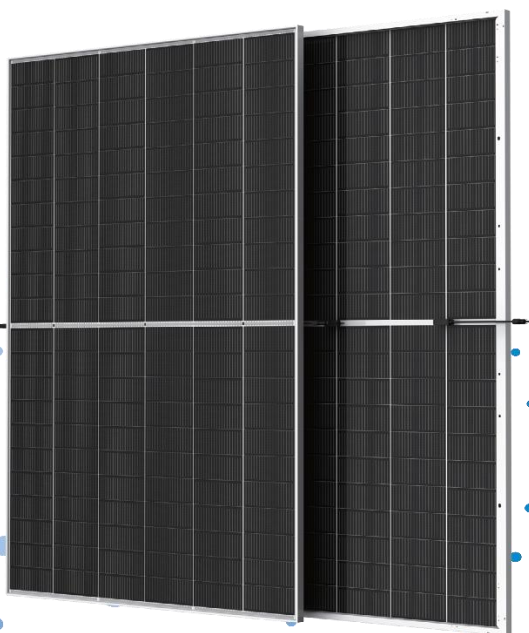
MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 22.9%

MAXIMUM EFFICIENCY



### High customer value

- The star of LCOE (Levelized Cost Of Energy) .Higher string power feature effectively reduces BOS (Balance of System)and LCOE
- More energy harvest with cutting-edge N-type i-TOPCon technology
- Designed for compatibility with existing mainstream system components



### High power up to 710W

- Up to 22.9% module efficiency with high density interconnect technology
- SMBB (Super multi-busbar) technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

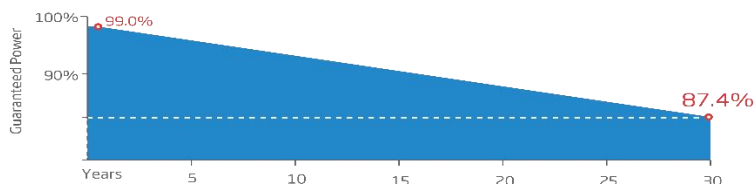
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



### High energy yield

- Excellent product bifaciality and low irradiation performance, validated by 3rd party
- Lower degradation: 1% first year, 0.4% annually thereafter
- Lower temperature coefficient (-0.29%/°C)
- Up to 30% additional power gain from back side depending on albedo

### Trina Solar's Vertex Bifacial Dual Glass Performance Warranty



### Comprehensive Products and System Certificates

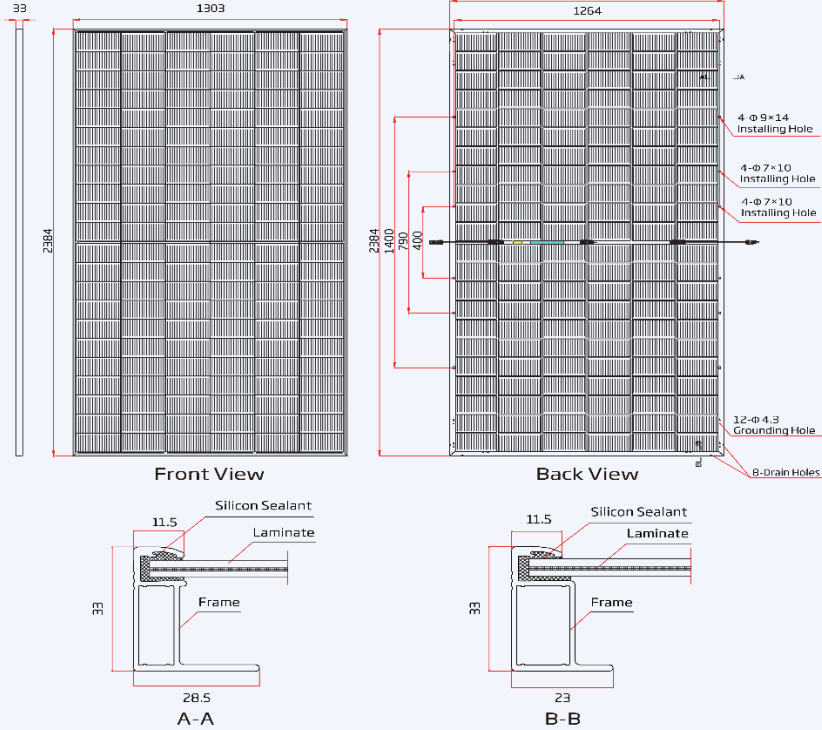


IEC61215/IEC61730/IEC61701/IEC62716  
ISO 9001: Quality Management System  
ISO 14001: Environmental Management System  
ISO14064: Greenhouse Gases Emissions Verification  
ISO45001: Occupational Health and Safety Management System

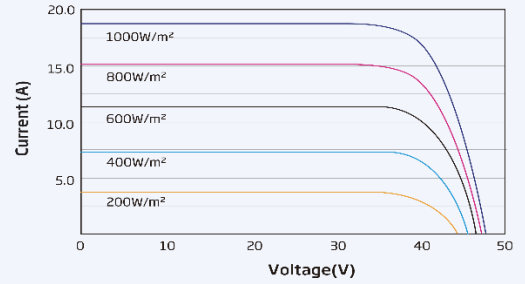




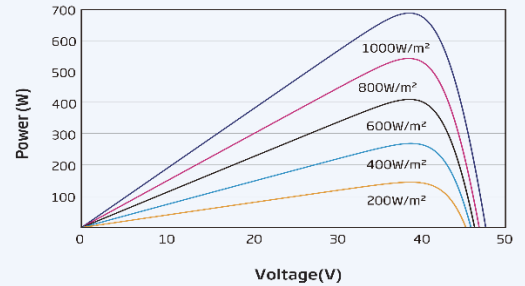
**DIMENSIONS OF PV MODULE(mm)**



**I-V CURVES OF PV MODULE(695W)**



**P-V CURVES OF PV MODULE(695 W)**



**MECHANICAL DATA**

Solar Cells	N-type Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (93.86×51.30×1.30 inches)
Weight	38.3 kg (84.4 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)

Frame	33mm(1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EVO2 / TS4 PLUS / TS4*

\*Please refer to regional datasheet for specified connector.

**ELECTRICAL DATA (STC & NOCT)**

Testing Condition	STC		NOCT		STC		NOCT		STC		NOCT		STC		NOCT	
Peak Power Watts-P <sub>MAX</sub> (Wp)*	685	522	690	526	695	531	700	534	705	540	710	543				
Power Tolerance-P <sub>MAX</sub> (W)	0 ~ +5															
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.8	37.4	40.1	37.7	40.3	37.9	40.5	38.0	40.7	38.3	40.9	38.5				
Maximum Power Current-I <sub>MPP</sub> (A)	17.19	13.93	17.23	13.95	17.25	14.00	17.29	14.04	17.33	14.08	17.36	14.12				
Open Circuit Voltage-V <sub>OC</sub> (V)	47.7	45.3	47.9	45.4	48.3	45.9	48.6	46.1	48.8	46.3	49.0	46.5				
Short Circuit Current-I <sub>SC</sub> (A)	18.21	14.67	18.25	14.71	18.28	14.72	18.32	14.76	18.36	14.80	18.40	14.83				
Module Efficiency η <sub>m</sub> (%)	22.1		22.2		22.4		22.5		22.7		22.9					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s. \*Measuring tolerance: ±3%.

**Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)**

Backside Power Gain	5%		10%		5%		10%		5%		10%		5%		10%	
Total Equivalent power -P <sub>MAX</sub> (Wp)	719	754	725	759	730	765	735	770	740	775	746	781				
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.8	39.8	40.1	40.1	40.3	40.3	40.5	40.5	40.7	40.7	40.9	40.9				
Maximum Power Current-I <sub>MPP</sub> (A)	18.05	18.91	18.09	18.95	18.11	18.98	18.15	19.02	18.20	19.06	18.23	19.10				
Open Circuit Voltage-V <sub>OC</sub> (V)	47.7	47.7	47.9	47.9	48.3	48.3	48.6	48.6	48.8	48.8	49.0	49.0				
Short Circuit Current-I <sub>SC</sub> (A)	19.12	20.03	19.16	20.08	19.19	20.11	19.24	20.15	19.28	20.20	19.32	20.24				

Power Bifaciality: 80±5%.

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P <sub>MAX</sub>	-0.29%/°C
Temperature Coefficient of V <sub>OC</sub>	-0.24%/°C
Temperature Coefficient of I <sub>SC</sub>	0.04%/°C

**MAXIMUM RATINGS**

Operational Temperature	-40 ~ +85° C
Maximum System Voltage	1500V DC (IEC) 1500V DC (UL)
Max Series Fuse Rating	35A

**WARRANTY**

- 12 year Product Workmanship Warranty
- 30 year Power Warranty
- 1% first year degradation
- 0.40% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

- Modules per box: 33 pieces
- Modules per 40' container: 594 pieces

# Vertex N

**N-type i-TOPCon bifacial dual glass**  
Monocrystalline module

PRODUCT: TSM-NEG19RC.20

POWER RANGE: 590-620W

## 620W

MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 23.0%

MAXIMUM EFFICIENCY



### High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- More energy harvest with cutting-edge N-type i-TOPCon technology
- Designed for compatibility with existing mainstream system components
- Higher container space utilization effectively reduces the freight cost



### High power up to 620 W

- Up to 23.0% module efficiency with high density interconnect technology
- SMBB (Super multi-busbar) technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

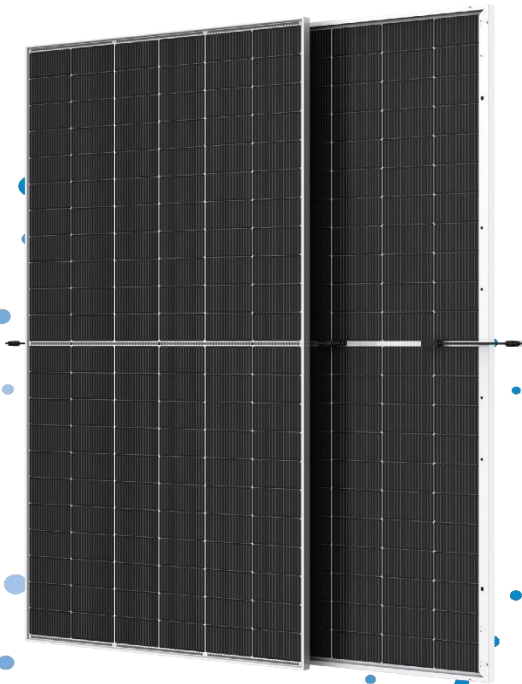
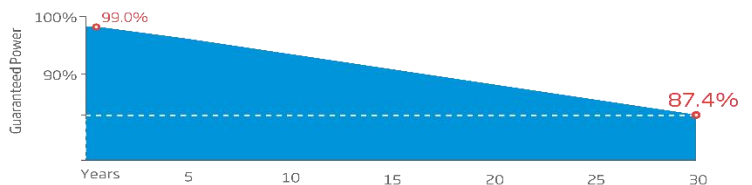
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



### High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- Lower degradation: 1% first year, 0.4% annually thereafter
- Lower temperature coefficient (-0.29%/°C)
- Up to 30% additional power gain from back side depending on albedo

### Trina Solar's Vertex Bifacial Dual Glass Performance Warranty



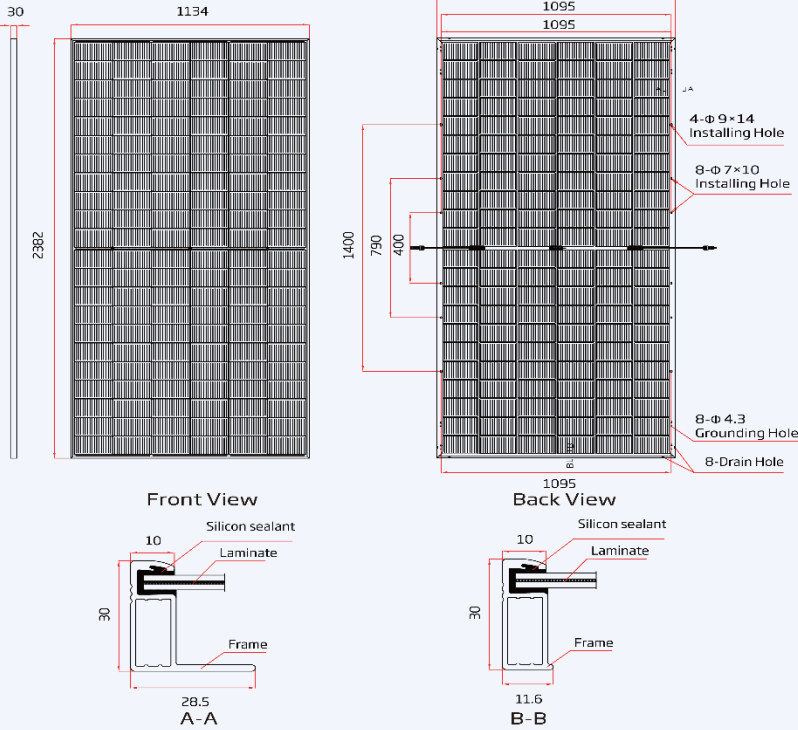
### Comprehensive Products and System Certificates



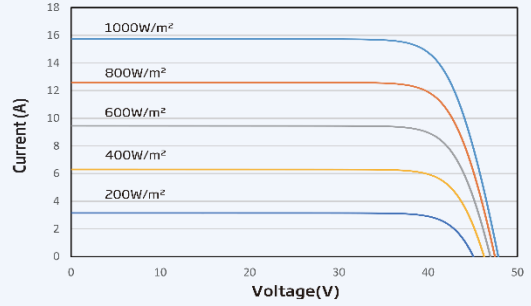
IEC61215/IEC61730/IEC61701/IEC62716/UL61730  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System



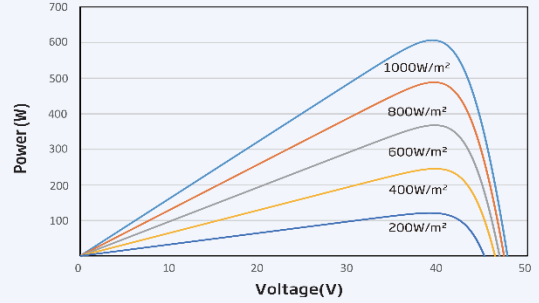
**DIMENSIONS OF PV MODULE(mm)**



**I-V CURVES OF PV MODULE ( 605 W)**



**P-V CURVES OF PV MODULE ( 605 W)**



**MECHANICAL DATA**

Solar Cells	N-type Monocrystalline
No. of cells	132 cells
Module Dimensions	2382×1134×30 mm (93.78×44.65×1.18 inches)
Weight	33.7kg (74.3 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)

Frame	30mm(1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EVQ2 / TS4 PLUS / TS4*

\*Please refer to regional datasheet for specified connector.

**ELECTRICAL DATA (STC & NOCT)**

Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak Power Watts-P <sub>MAX</sub> (Wp)*	590	450	595	454	600	459	605	462	610	466	615	470	620	474
Power Tolerance-P <sub>MAX</sub> (W)	0 ~ +5													
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.7	37.4	40.0	37.6	40.3	37.9	40.5	38.1	40.8	38.3	41.1	38.6	41.4	38.8
Maximum Power Current-I <sub>MPP</sub> (A)	14.86	12.05	14.89	12.07	14.91	12.11	14.94	12.13	14.96	12.16	14.98	12.19	14.99	12.20
Open Circuit Voltage-V <sub>OC</sub> (V)	47.8	45.4	48.1	45.7	48.4	46.0	48.7	46.2	49.0	46.5	49.3	46.8	49.6	47.1
Short Circuit Current-I <sub>SC</sub> (A)	15.72	12.67	15.76	12.69	15.80	12.73	15.83	12.75	15.86	12.78	15.89	12.80	15.91	12.82
Module Efficiency η <sub>m</sub> (%)	21.8		22.0		22.2		22.4		22.6		22.8		23.0	

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s. \*Measuring tolerance: ±3%.

**Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)**

Backside Power Gain	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Total Equivalent power -P <sub>MAX</sub> (Wp)	620	649	625	655	630	660	635	666	641	671	646	677	651	682
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.7	39.7	40.0	40.0	40.3	40.3	40.5	40.5	40.8	40.8	41.1	41.1	41.4	41.4
Maximum Power Current-I <sub>MPP</sub> (A)	15.60	16.35	15.63	16.38	15.66	16.40	15.69	16.43	15.71	16.46	15.73	16.48	15.74	16.49
Open Circuit Voltage-V <sub>OC</sub> (V)	47.8	47.8	48.1	48.1	48.4	48.4	48.7	48.7	49.0	49.0	49.3	49.3	49.6	49.6
Short Circuit Current-I <sub>SC</sub> (A)	16.51	17.29	16.55	17.34	16.59	17.38	16.62	17.41	16.65	17.45	16.68	17.48	16.71	17.50

Power Bifaciality: 80±5%.

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P <sub>MAX</sub>	-0.29%/°C
Temperature Coefficient of V <sub>OC</sub>	-0.24%/°C
Temperature Coefficient of I <sub>SC</sub>	0.04%/°C

**MAXIMUM RATINGS**

Operational Temperature	-40~+85° C
Maximum System Voltage	1500V DC (IEC) 1500V DC (UL)
Max Series Fuse Rating	35A

**WARRANTY**

12 year Product Workmanship Warranty  
 30 year Power Warranty  
 1% first year degradation  
 0.40% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

Modules per box: 36 pieces  
 Modules per 40' container: 720 pieces



# 585 W

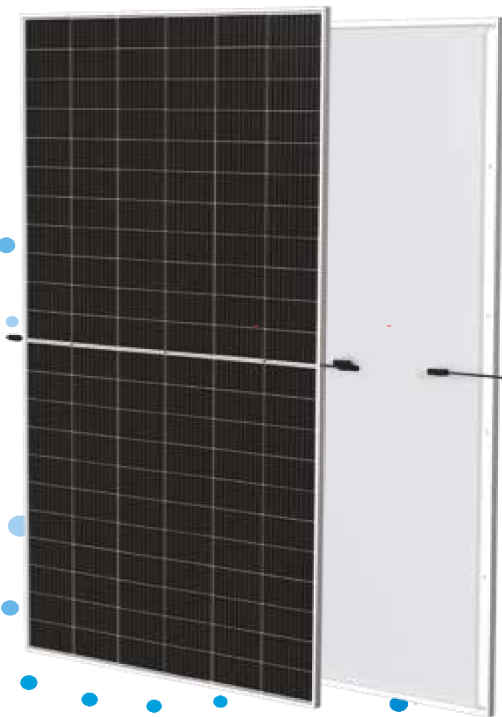
MAXIMUM POWER OUTPUT

# 0/+5 W

POSITIVE POWER TOLERANCE

# 21.7 %

MAXIMUM EFFICIENCY



### High power & efficiency

- Generates up to 585 W, 21.7 % module efficiency with high density interconnect technology
- Maximum energy harvest from rooftops



### Easy design & installation on C&I rooftops

- Designed for high compatibility with mainstream inverters
- Mainstream rooftop mounting methods approved



### Optimized system cost

- Lower cost of structure, cable and electrical equipment
- Reduced installation time and labor costs
- Shorter payback time



### High reliability

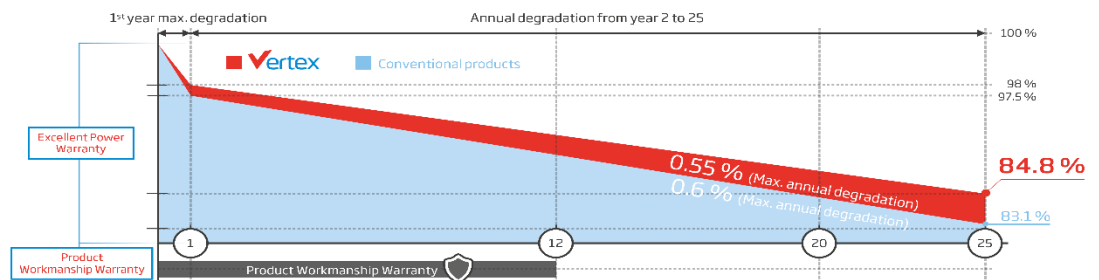
- Assembly in fully automated and state-of-the-art factories
- Beyond industry-standard hail test passed: 35 mm hail size
- Mechanical performance tested up to 5400 Pa positive load and 2400 Pa negative load

## Vertex Warranty

**2 %**  
1<sup>st</sup> year max. degradation

**0.55 %**  
Max. annual degradation from year 2 to 25

**12 Years**  
Product Workmanship Warranty



## Comprehensive Product and System Certificates

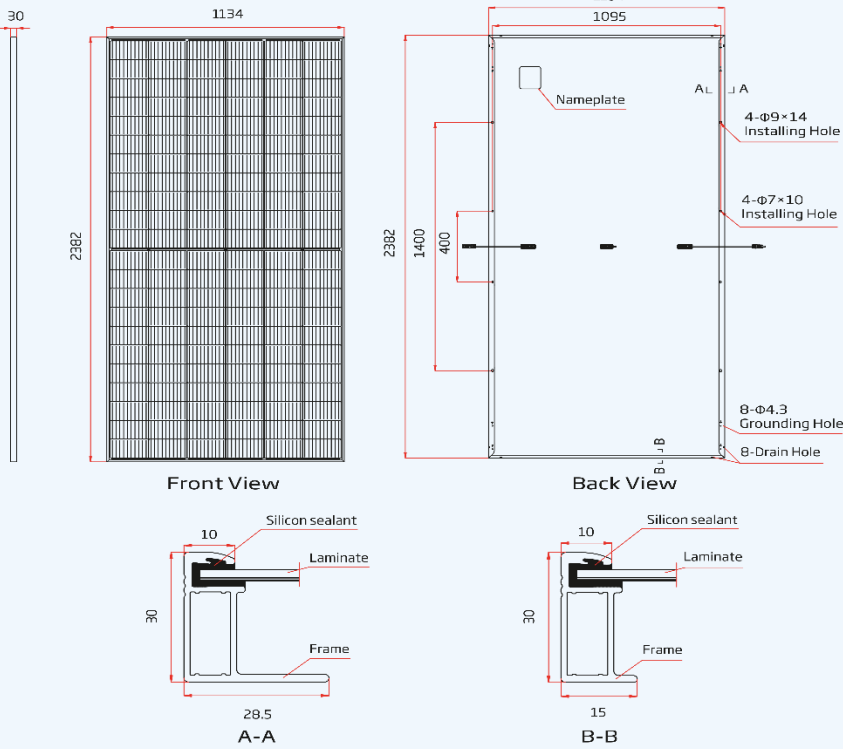


IEC61215/IEC61730/IEC61701/IEC62716  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System

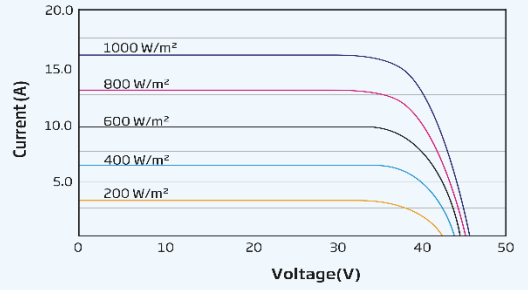
# TrinaSolar



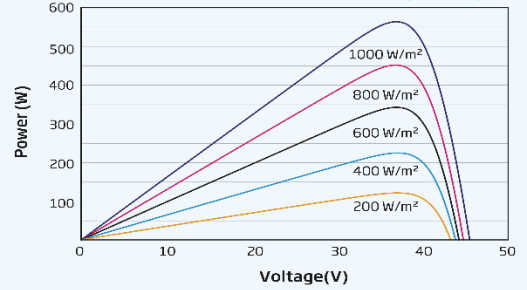
### DIMENSIONS OF PV MODULE (mm)



### I-V CURVES OF PV MODULE (575 W)



### P-V CURVES OF PV MODULE (575 W)



ELECTRICAL DATA (STC)	TSM-565 DE19R	TSM-570 DE19R	TSM-575 DE19R	TSM-580 DE19R	TSM-585 DE19R
Peak Power Watts-P <sub>MAX</sub> (Wp)*	565	570	575	580	585
Power Tolerance-P <sub>MAX</sub> (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage-V <sub>MPP</sub> (V)	38.3	38.5	38.8	39.0	39.3
Maximum Power Current-I <sub>MPP</sub> (A)	14.76	14.79	14.83	14.86	14.90
Open Circuit Voltage-V <sub>OC</sub> (V)	45.6	45.8	46.1	46.3	46.6
Short Circuit Current-I <sub>SC</sub> (A)	15.81	15.85	15.90	15.94	15.99
Module Efficiency η <sub>m</sub> (%)	20.9	21.1	21.3	21.5	21.7

STC: Irradiance 1000 W/m<sup>2</sup>, Cell Temperature 25 °C, Air Mass AM1.5. \*Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)	TSM-565 DE19R	TSM-570 DE19R	TSM-575 DE19R	TSM-580 DE19R	TSM-585 DE19R
Maximum Power-P <sub>MAX</sub> (Wp)	428	431	435	439	443
Maximum Power Voltage-V <sub>MPP</sub> (V)	35.3	35.5	35.8	35.9	36.2
Maximum Power Current-I <sub>MPP</sub> (A)	12.10	12.13	12.17	12.20	12.24
Open Circuit Voltage-V <sub>OC</sub> (V)	42.9	43.1	43.4	43.6	43.9
Short Circuit Current-I <sub>SC</sub> (A)	12.74	12.77	12.81	12.84	12.88

NOCT: Irradiance at 800 W/m<sup>2</sup>, Ambient Temperature 20 °C, Wind Speed 1 m/s.

### MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2382 x 1134 x 30 mm
Weight	28.5 kg
Glass	3.2 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Backsheet	White
Frame	30 mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm <sup>2</sup> , Landscape: 1400/1400 mm Portrait: 280/350 mm*
Connector	TS4 Plus / TS4 / MC4 EVO2 *

\*Special order only.

### TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43 °C (±2 K)
Temperature Coefficient of P <sub>MAX</sub>	-0.34%/K
Temperature Coefficient of Voc	-0.25%/K
Temperature Coefficient of Isc	0.04%/K

### MAXIMUM RATINGS

Operational Temperature	-40 to +85 °C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	30A

### WARRANTY

12 Year product workmanship warranty  
25 Year power warranty  
2% First year degradation  
0.55% Annual power degradation

(Please refer to the applicable limited warranty for details)

### PACKAGING CONFIGURATION

Modules per box: 36 pieces  
Modules per 40' container: 720 pieces



**BACKSHEET MONOCRYSTALLINE MODULE**

PRODUCT: TSM-DE21

POWER RANGE: 650 -670W

**670W**

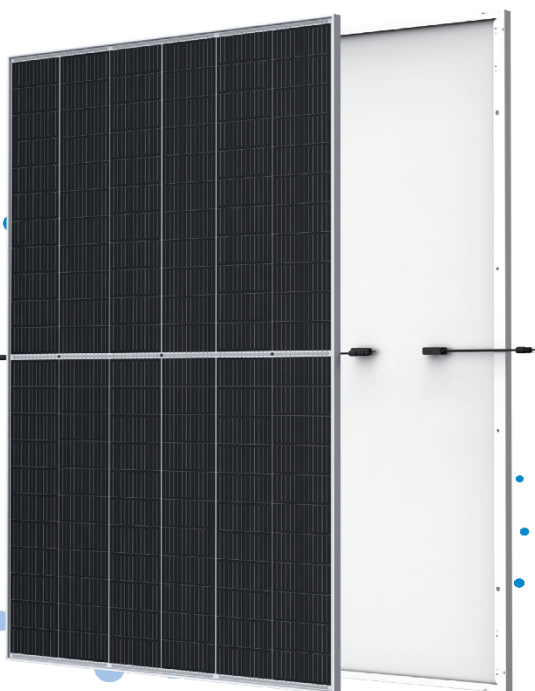
MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**21.6%**

MAXIMUM EFFICIENCY



**High customer value**

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components



**High power up to 670W**

- Up to 21.6% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



**High reliability**

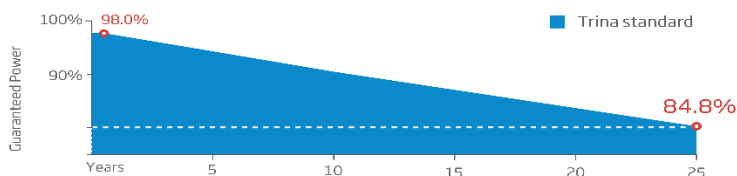
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



**High energy yield**

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature

**Trina Solar's Backsheet Performance Warranty**



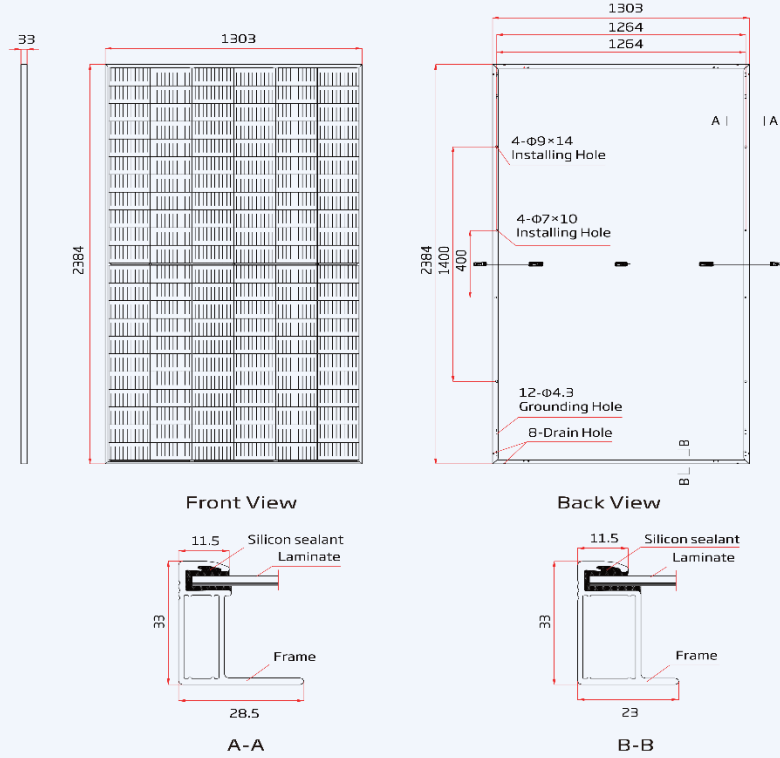
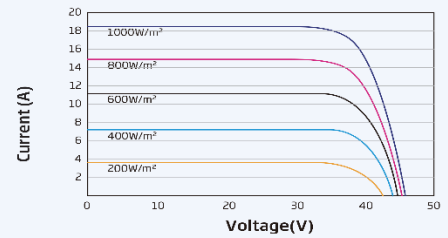
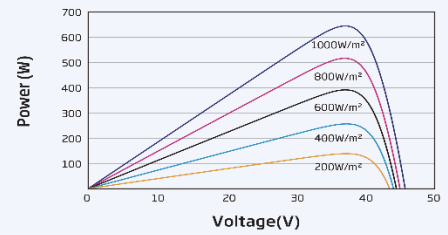
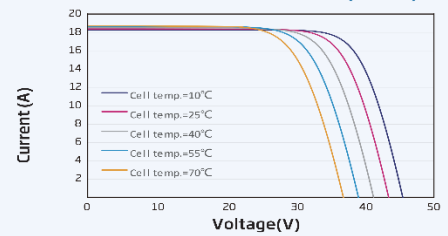
**Comprehensive Products and System Certificates**



IEC61215/IEC61730/IEC61701/IEC62716  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System





**DIMENSIONS OF PV MODULE(mm)**

**I-V CURVES OF PV MODULE(655 W)**

**P-V CURVES OF PV MODULE(655W)**

**I-V CURVES OF PV MODULE(655 W)**

**ELECTRICAL DATA (STC)**

Parameter	650	655	660	665	670
Peak Power Watts-P <sub>MAX</sub> (Wp)*	650	655	660	665	670
Power Tolerance-P <sub>MAX</sub> (W)	0 ~ +5				
Maximum Power Voltage-V <sub>MPP</sub> (V)	37.4	37.6	37.8	38.0	38.2
Maximum Power Current-I <sub>MPP</sub> (A)	17.39	17.43	17.47	17.51	17.55
Open Circuit Voltage-V <sub>OC</sub> (V)	45.3	45.5	45.7	45.9	46.1
Short Circuit Current-I <sub>SC</sub> (A)	18.44	18.48	18.53	18.57	18.62
Module Efficiency η <sub>m</sub> (%)	20.9	21.1	21.2	21.4	21.6

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. \*Measuring tolerance: ±3%.

**ELECTRICAL DATA (NOCT)**

Parameter	492	496	500	504	508
Maximum Power-P <sub>MAX</sub> (Wp)	492	496	500	504	508
Maximum Power Voltage-V <sub>MPP</sub> (V)	34.9	35.1	35.3	35.4	35.6
Maximum Power Current-I <sub>MPP</sub> (A)	14.09	14.13	14.17	14.22	14.26
Open Circuit Voltage-V <sub>OC</sub> (V)	42.7	42.9	43.0	43.2	43.4
Short Circuit Current-I <sub>SC</sub> (A)	14.86	14.89	14.93	14.96	15.01

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

**MECHANICAL DATA**

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (93.86×51.30×1.30 inches)
Weight	33.3 kg (73.4 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA
Backsheet	White
Frame	33mm(1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ), Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EVO2 / TS4*

\*Please refer to regional datasheet for specified connector.

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P <sub>MAX</sub>	-0.34%/°C
Temperature Coefficient of V <sub>OC</sub>	-0.25%/°C
Temperature Coefficient of I <sub>SC</sub>	0.04%/°C

**MAXIMUM RATINGS**

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	30A

**WARRANTY**

12 year Product Workmanship Warranty  
 25 year Power Warranty  
 2% first year degradation  
 0.55% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

Modules per box: 33 pieces  
 Modules per 40' container: 594 pieces



**BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE**

PRODUCT: TSM-DEG19RC.20  
 PRODUCT RANGE: 560-580W

**580W**

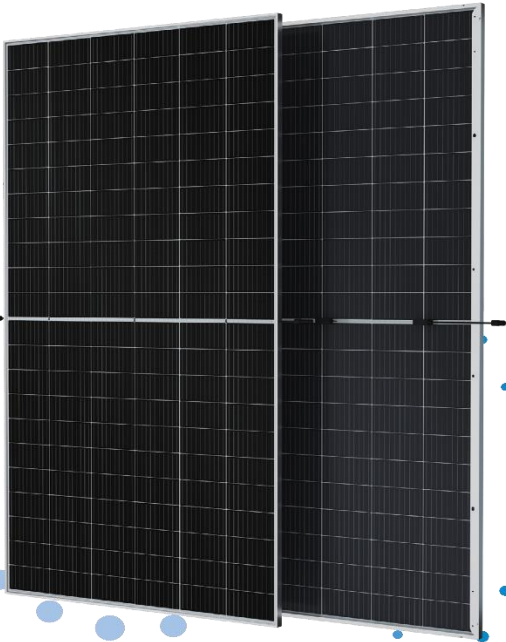
MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**21.5%**

MAXIMUM EFFICIENCY



**High customer value**

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lower first year and annual degradation
- Designed for compatibility with existing mainstream system components
- Higher return on Investment



**High power up to 580W**

- Up to 21.5% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



**High reliability**

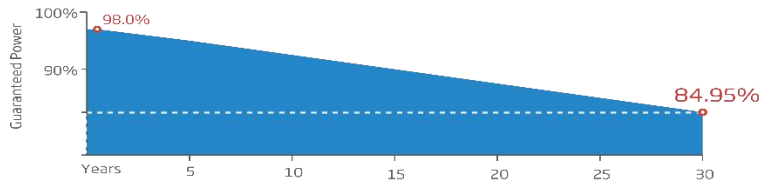
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



**High energy yield**

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature
- Up to 25% additional power gain from back side depending on albedo

**Trina Solar's Vertex Bifacial Dual Glass Performance Warranty**

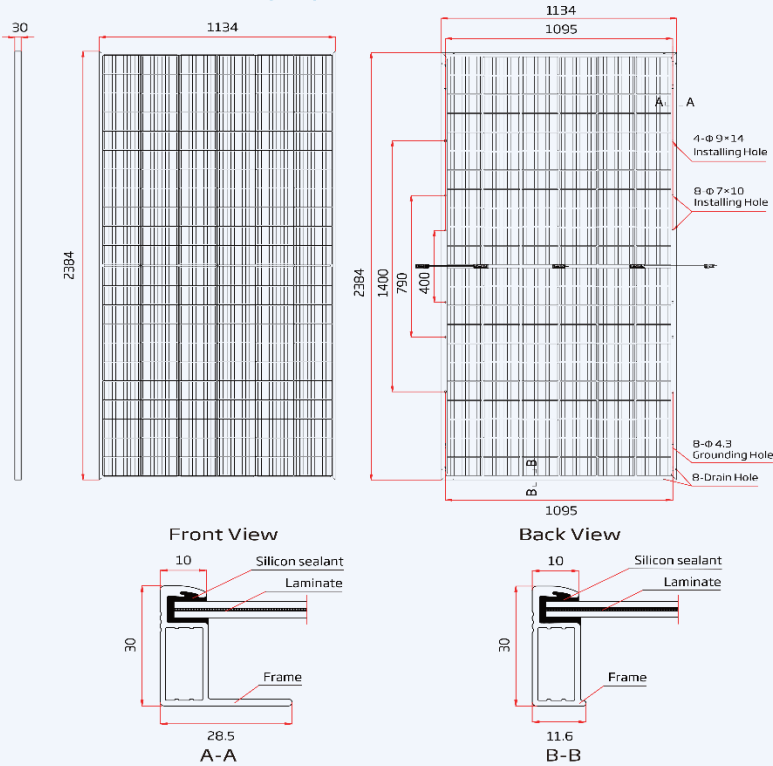
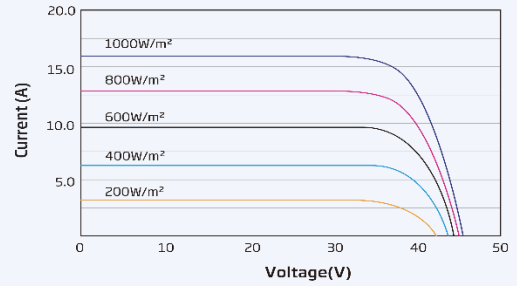
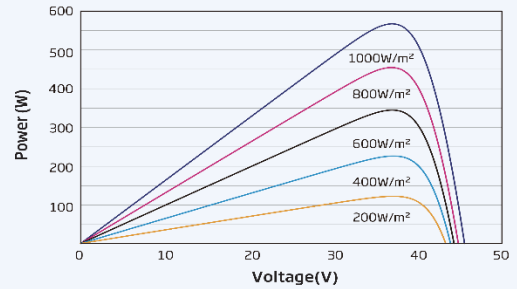


**Comprehensive Products and System Certificates**



IEC61215/IEC61730/IEC61701/IEC62716  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System



**DIMENSIONS OF PV MODULE(mm)**

**I-V CURVES OF PV MODULE(570 W)**

**P-V CURVES OF PV MODULE(570 W)**

**ELECTRICAL DATA (STC)**

Peak Power Watts-P <sub>MAX</sub> (Wp)*	560	565	570	575	580
Power Tolerance-P <sub>MAX</sub> (W)			0 ~ +5		
Maximum Power Voltage-V <sub>MPP</sub> (V)	37.9	38.2	38.4	38.7	38.9
Maximum Power Current-I <sub>MPP</sub> (A)	14.76	14.80	14.84	14.87	14.91
Open Circuit Voltage-V <sub>OC</sub> (V)	45.2	45.5	45.7	46.0	46.2
Short Circuit Current-I <sub>SC</sub> (A)	15.86	15.90	15.93	15.97	16.01
Module Efficiency η <sub>m</sub> (%)	20.7	20.9	21.1	21.3	21.5

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. \*Measuring tolerance: ±3%.

**Electrical characteristics with different power bin (reference to 10% Irradiance ratio)**

Total Equivalent power -P <sub>MAX</sub> (Wp)	599	605	610	615	620
Maximum Power Voltage-V <sub>MPP</sub> (V)	37.9	38.2	38.4	38.7	38.9
Maximum Power Current-I <sub>MPP</sub> (A)	15.81	15.83	15.88	15.90	15.94
Open Circuit Voltage-V <sub>OC</sub> (V)	45.2	45.5	45.7	46.0	46.2
Short Circuit Current-I <sub>SC</sub> (A)	16.97	17.01	17.05	17.09	17.13
Irradiance ratio (rear/front)			10%		

Power Bifaciality: 70 ± 5%.

**ELECTRICAL DATA (NOCT)**

Maximum Power-P <sub>MAX</sub> (Wp)	424	428	431	436	439
Maximum Power Voltage-V <sub>MPP</sub> (V)	34.9	35.2	35.4	35.7	35.8
Maximum Power Current-I <sub>MPP</sub> (A)	12.12	12.15	12.18	12.22	12.25
Open Circuit Voltage-V <sub>OC</sub> (V)	42.6	42.8	43.0	43.3	43.5
Short Circuit Current-I <sub>SC</sub> (A)	12.78	12.81	12.84	12.87	12.90

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

**MECHANICAL DATA**

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2384 × 1134 × 30 mm (93.86 × 44.65 × 1.18 inches)
Weight	33.7 kg (74.3 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	30mm(1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EV02 / TS4 Plus/ TS4*

\*Please refer to regional datasheet for specified connector.

**TEMPERATURE RATINGS**

NOCT(Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P <sub>MAX</sub>	- 0.34%/°C
Temperature Coefficient of V <sub>OC</sub>	- 0.25%/°C
Temperature Coefficient of I <sub>SC</sub>	0.04%/°C

**MAXIMUM RATINGS**

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	35A

**WARRANTY**

12 year Product Workmanship Warranty  
 30 year Power Warranty  
 2% first year degradation  
 0.45% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

Modules per box: 36 pieces  
 Modules per 40' container: 720 pieces





**BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE**

PRODUCT: TSM-DEG21C.20

POWER RANGE: 645-665W

**665W**

MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**21.4%**

MAXIMUM EFFICIENCY



**High customer value**

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components



**High power up to 665W**

- Up to 21.4% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



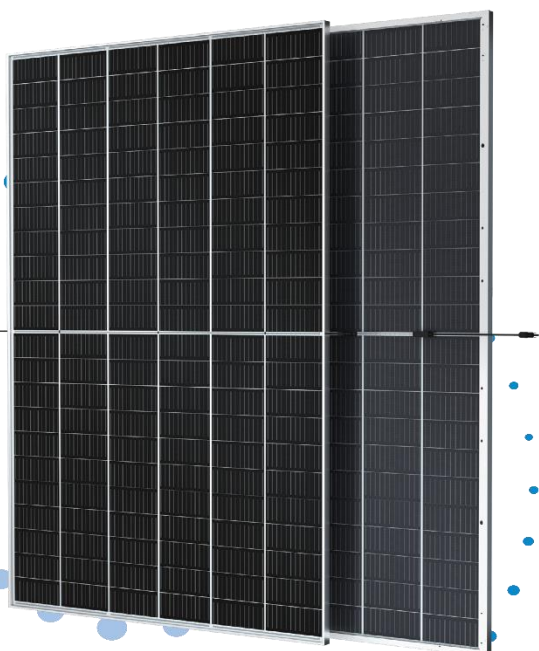
**High reliability**

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

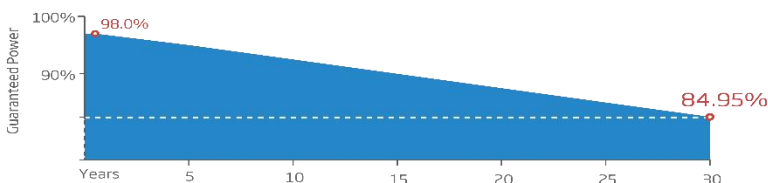


**High energy yield**

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature
- Up to 25% additional power gain from back side depending on albedo



**Trina Solar's Vertex Bifacial Dual Glass Performance Warranty**

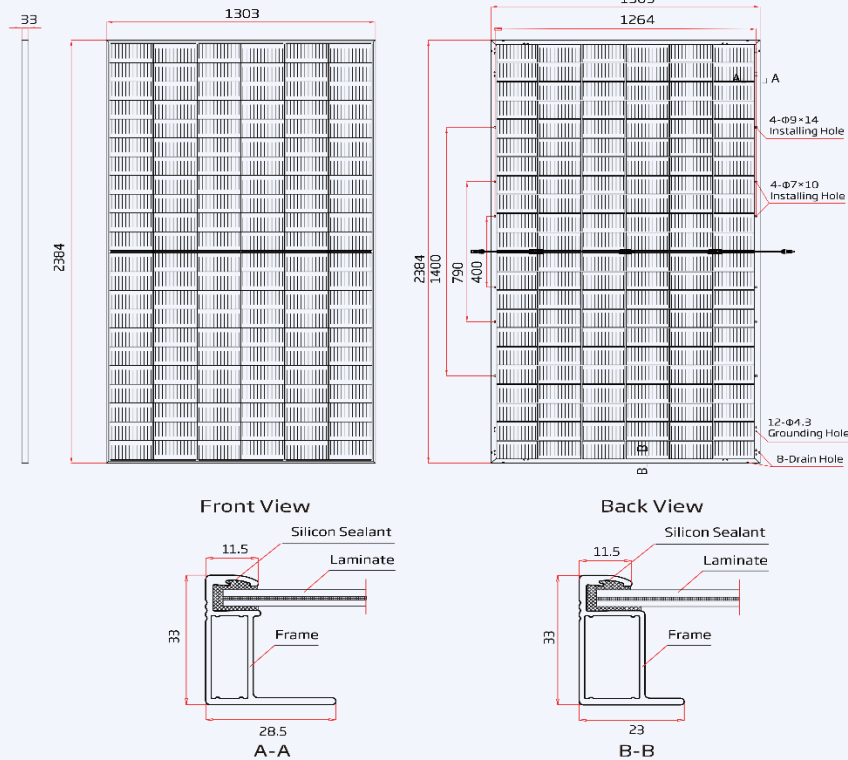
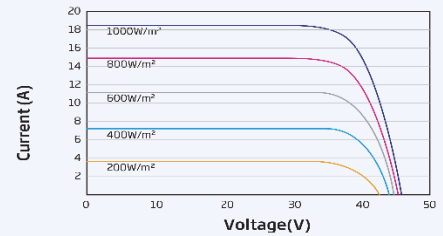
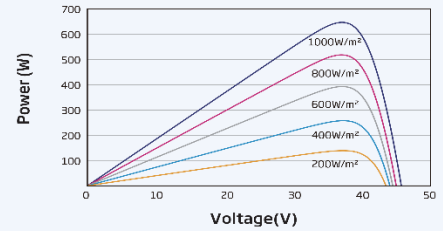
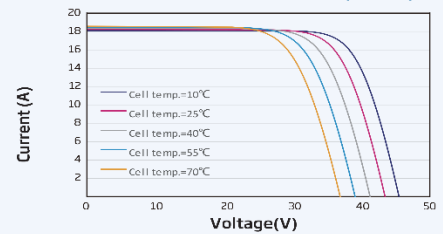


**Comprehensive Products and System Certificates**



IEC61215/IEC61730/IEC61701/IEC62716/UL61730  
 ISO 9001: Quality Management System  
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 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System



**DIMENSIONS OF PV MODULE(mm)**

**I-V CURVES OF PV MODULE(650 W)**

**P-V CURVES OF PV MODULE(650W)**

**I-V CURVES OF PV MODULE(650 W)**

**ELECTRICAL DATA (STC)**

Peak Power Watts- $P_{MAX}$ (Wp)*	645	650	655	660	665
Power Tolerance- $P_{MAX}$ (W)			0 ~ +5		
Maximum Power Voltage- $V_{MPP}$ (V)	37.5	37.7	37.9	38.1	38.3
Maximum Power Current- $I_{MPP}$ (A)	17.23	17.27	17.31	17.35	17.39
Open Circuit Voltage- $V_{OC}$ (V)	45.3	45.5	45.7	45.9	46.1
Short Circuit Current- $I_{SC}$ (A)	18.31	18.35	18.40	18.45	18.50
Module Efficiency $\eta_m$ (%)	20.8	20.9	21.1	21.2	21.4

STC: Irradiance: 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. \*Measuring tolerance:  $\pm$ 3%.

**Electrical characteristics with different power bin (reference to 10% Irradiance ratio)**

Total Equivalent power - $P_{MAX}$ (Wp)	690	696	701	706	712
Maximum Power Voltage- $V_{MPP}$ (V)	37.5	37.7	37.9	38.1	38.3
Maximum Power Current- $I_{MPP}$ (A)	18.44	18.48	18.52	18.56	18.60
Open Circuit Voltage- $V_{OC}$ (V)	45.3	45.5	45.7	45.9	46.1
Short Circuit Current- $I_{SC}$ (A)	19.59	19.63	19.69	19.74	19.79
Irradiance ratio (rear/front)			10%		

Power Bifaciality: 70 $\pm$ 5%.

**ELECTRICAL DATA (NOCT)**

Maximum Power- $P_{MAX}$ (Wp)	488	492	495	499	504
Maximum Power Voltage- $V_{MPP}$ (V)	34.9	35.1	35.2	35.4	35.6
Maximum Power Current- $I_{MPP}$ (A)	13.98	14.01	14.05	14.10	14.16
Open Circuit Voltage- $V_{OC}$ (V)	42.7	42.9	43.0	43.2	43.4
Short Circuit Current- $I_{SC}$ (A)	14.75	14.79	14.83	14.87	14.91

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

**MECHANICAL DATA**

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (93.86×51.30×1.30 inches)
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Frame	33mm(1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ), Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
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**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C ( $\pm$ 2°C)
Temperature Coefficient of $P_{MAX}$	-0.34%/°C
Temperature Coefficient of $V_{OC}$	-0.25%/°C
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**MAXIMUM RATINGS**

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	35A

**WARRANTY**

12 year Product Workmanship Warranty  
30 year Power Warranty  
2% first year degradation  
0.45% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

Modules per box: 33 pieces  
Modules per 40' container: 594 pieces

## **Rasta Export: A Leader in Solar Power Plant Construction and Development**

With two decades of experience in the fields of export and production, Rasta Export is a prominent company in the energy industry, particularly in the solar power plant sector in Iran. Leveraging advanced technologies and a team of specialists, the company has made significant strides in developing and implementing power plant projects.

### **EPC Services** (Engineering, Procurement, and Construction) for Solar Power Plants

Rasta Development and Trading Innovators provides comprehensive **EPC** services for solar power plants. These services include the following stages:

#### **1. Engineering:**

- Initial and conceptual design of the power plant
- Technical and economic analysis of the project
- Detailed design and execution drawings
- Environmental studies and impact assessments

#### **2. Procurement:**

- Procurement of high-quality solar panels
- Procurement of inverters and electronic equipment
- Procurement of structures and mounting systems
- Procurement of cables and auxiliary equipment

#### **3. Construction:**

- Execution of civil works and panel installation
- Installation and commissioning of electrical systems
- Implementation of control and monitoring systems
- Final testing and commissioning of the power plant

### **Power Plant Projects by Rasta Export in Iran**

Rasta Export has successfully executed several power plant projects in Iran, significantly contributing to the country's energy industry development. Some of the power plants constructed by the company include:

#### **1. Yazd Solar Power Plant:**

- Capacity: **20 MW**

#### **2. Kerman Solar Power Plant:**

- Capacity: **15 MW**

#### **3. Hamedan Solar Power Plant:**

- Capacity: **10 MW**

#### **4. Shiraz Solar Power Plant:**

- Capacity: **25 MW**

#### **5. Zanzan Solar Power Plant:**

- Capacity: **30 MW**





## Types of Solar Power Plant Structures

In solar power plants, different types of structures are used to support and position the solar panels for optimal energy generation. These structures include:

### 1. Fixed Tilt Structures:

- These structures are designed with a fixed tilt angle, optimized for the location's latitude to capture maximum solar radiation throughout the year.
- They are simple, cost-effective, and require minimal maintenance.

### 2. Adjustable Tilt Structures:

- These structures allow manual adjustment of the tilt angle at regular intervals (e.g., seasonally) to improve energy capture efficiency.
- They offer a balance between cost and increased energy production.

### 3. Single-Axis Trackers:

- These structures rotate around a single axis, typically aligned north-south, to follow the sun's path from east to west.
- They significantly increase energy production by maximizing exposure to sunlight.

### 4. Dual-Axis Trackers:

- These structures rotate around both the horizontal and vertical axes, allowing them to follow the sun's path more precisely throughout the day and year.
- They offer the highest energy yield but are more expensive and require more maintenance.

### 5. Ground-Mounted Structures:

- These are installed directly on the ground and can be used in a variety of terrains and soil conditions.
- They are versatile and can support different types of tilt and tracking systems.

## Types of Cables Used in Solar Power Plants

In solar power plants, specific types of cables are used to ensure efficient and safe transmission of electrical power. These include:

### 1. DC Cables:

- Solar DC Main Cable: Connects solar panels to the inverter.
- Solar DC Extension Cable: Extends the connection from the solar panel to the inverter when longer distances are required.
- PV Wire: Designed for direct current (DC) applications with high voltage and temperature resistance.

### 2. AC Cables:

- Solar AC Main Cable: Connects the inverter to the grid or the main distribution panel.
- Solar AC Extension Cable: Used to extend the connection from the inverter to the grid or main distribution panel.
- THHN/THWN-2 Wire: Commonly used for alternating current (AC) applications, known for its flexibility and resistance to heat and moisture.



## **Rasta Export: Manufacturer of Solar Power Plant Structures and Cables**

Our company, is a manufacturer of solar power plant structures and cables. We produce a wide range of products in various shapes, sizes, and configurations to meet the specific needs of solar power plants. Whether you require fixed tilt structures, advanced tracking systems, or specialized AC and DC cables, we have the expertise and capability to provide high-quality, reliable solutions.

We understand the importance of quality and performance in solar power systems, and our products are designed to meet the highest industry standards, ensuring optimal efficiency and durability.







## Rasta Export

**Address:** Unit 1, No. 27, Vanak Street, Vanak Square, Tehran, Iran

**Email:** [Info@Rastaexport.com](mailto:Info@Rastaexport.com)

**Website:** [RastaExport.com](http://RastaExport.com)

**WhatsApp:** +98 912 683 5639

**Phone:** +98 21 8877 0680