

P型双面单晶组件

P-Type Bifacial PV Module

400W/410W
(12BB 210mm)

- **Multi busbar technology**

Superior optical utilization and current collection capability, effectively improving product power and reliability

高转换效率

更优越的光学利用率和电流收集能力，有效提升产品功率和可靠性

- **Extended wind and snow load tests**

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

优越的载荷能力

整体组件通过5400Pa的正面最大测试静态载荷及2400Pa的背面最大测试静态载荷认证。

- **Excellent weak light performance**

优异的弱光性能

- **Double-sided Power Generation**

The dual-glass module has a double-sided ratio of up to 80% and a power generation gain of 5%-25% on the back side.

双面发电

双玻组件的双面率高达80%，背面可带来5%-25%的收益。

- **Withstanding harsh environment**

High salt mist and ammonia resistance.

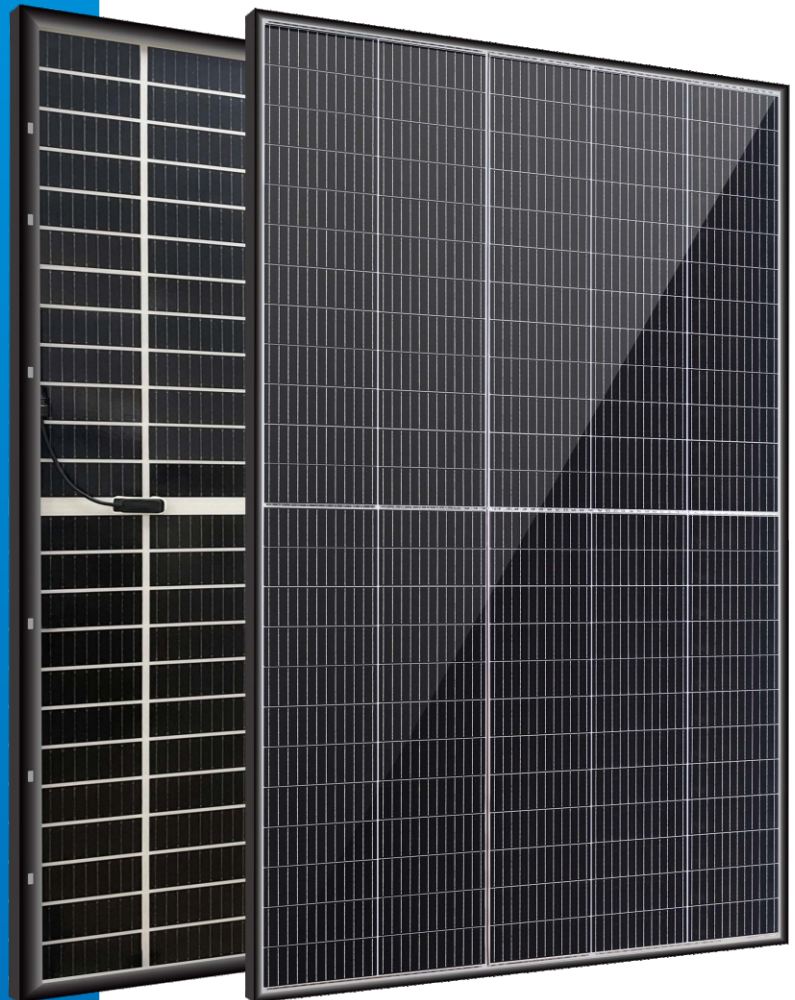
可承受更严酷的环境

通过盐雾及氨气腐蚀测试

WARRANTY

12 years product warranty

25 years performance warranty



中设无锡机械设备工程有限公司
China Machinery Engineering Wuxi Co.,Ltd.

400/410W

ZS400/410SH11

120
cells

MONO
PV Module

0~+5W
Power Tolerance

电学性能 Electrical Characteristics

STC峰值功率 Maximum Power at STC (Pmax)	400W	410W
最佳工作电压 Optimum Operating Voltage (Vmp)	34.20V	34.60V
最佳工作电流 Optimum Operating Current (Imp)	11.70A	11.84A
开路电压 Open Circuit Voltage (Voc)	41.20V	41.60V
短路电流 Short Circuit Current (Isc)	12.28A	12.41A
组件转换效率 Module Efficiency	20.80%	21.20%
组件工作温度 Operating Module Temperature	-40°C to +85°C	
最大系统电压 Maximum System Voltage	1500V DC (IEC)	
最大串联保险丝电流等级 Maximum Series Fuse Rating	25A	
功率公差 Power Tolerance	0~+5W	

温度特性 Temperature Characteristics

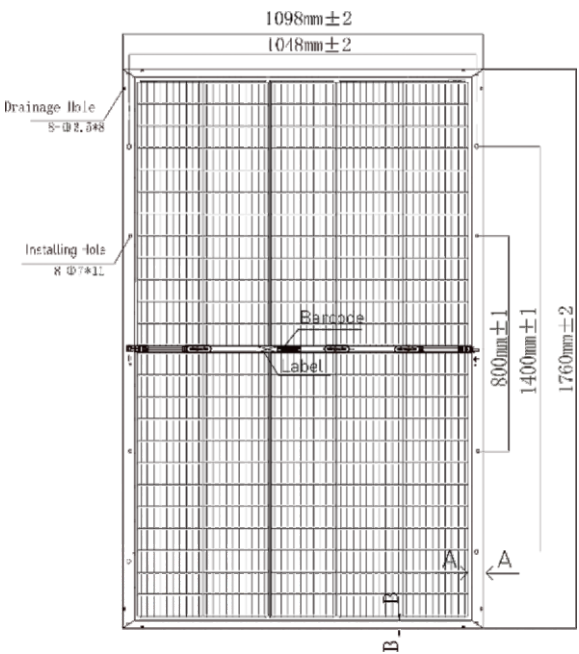
标称组件工作温度 Nominal Module Operating Temperature	42±2°C
峰值功率温度系数 Temperature Coefficient of Pmax	-0.39%/°C
开路电压温度系数 Temperature Coefficient of Voc	-0.30%/°C
短路电流温度系数 Temperature Coefficient of Isc	0.060%/°C

产品规格 Mechanical Characteristics

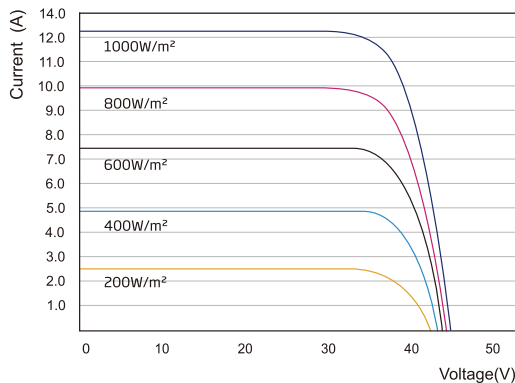
太阳能电池 Solar Cell	单晶硅电池片 Monocrystalline solar cell
电池数量 No. of Cells	120(5 × 24)
组件尺寸 Dimensions	1760 × 1098 × 28mm(69.29 × 43.22 × 1.10inches)
重量 Weight	19.5kgs(42.99 lbs.)
正面玻璃 Front Glass	1.6mm, Anti-Reflection Coating
背面玻璃 Back Glass	1.6mm, Heat Strengthened Glass
边框 Frame	氧化铝合金 Anodized aluminium alloy
接线盒 Junction Box	IP68标准 (3个旁路二极管) IP68 rated(3 bypass diodes)
输出电缆 Output Cables	4.0mm ² , 300cm in length
连接器 Connectors	MC4

包装信息 Packing Configuration

包装 Container	40'HQ
片/托盘 Pieces per pallet	39
托盘/集装箱 Pallets per container	26
片/集装箱 Pieces per container	1014
套箱尺寸 Dimensions	-
托盘重量 Weight	-



ZS410SH11 I-V Curves



其他说明 Other information



* STC: 光照强度 1000W/m² 电池温度: 25°C 大气质量=1.5
* STC: Irradiance 1000W/m², AM1.5 spectrum, module temperature 25°C
* 电性能参数是组件在标准测试条件下的平均理论数据
* NOCT: Nominal operating cell temperature (the data is only for reference)

2024-2025
www.tcpowertec.com

N-TYPE TOPCON MODULE BLACK BIFACIAL DUAL GLASS N型TOPCON双面双玻组件

410W~430W
(16BB 182mm)

- **Multi busbar technology**

Superior optical utilization and current collection capability, effectively improving product power and reliability

高转换效率

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

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整体组件通过5400Pa的正面最大测试静态载荷及2400Pa的背面最大测试静态载荷认证。

- **Excellent weak light performance**

优异的弱光性能

- **Double-sided Power Generation**

The dual-glass module has a double-sided ratio of up to 80% and a power generation gain of 5%-25% on the back side.

双面发电

双玻组件的双面率高达80%，背面可带来5%-25%的收益。

- **Withstanding harsh environment**

High salt mist and ammonia resistance.

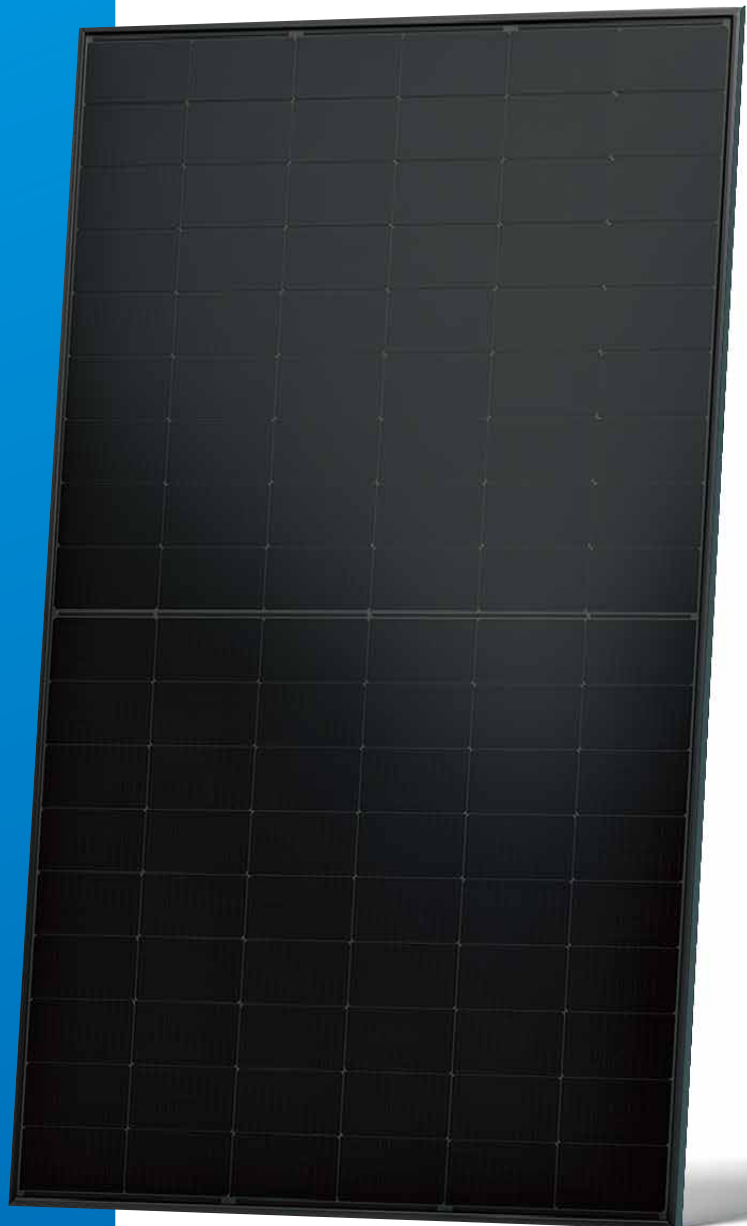
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WARRANTY

12 years product warranty

25 years performance warranty



中设无锡机械设备工程有限公司
China Machinery Engineering Wuxi Co.,Ltd.

410~430W

ZS410~430SL1

108
cells

MONO
PV Module

0~+3%
Power Tolerance

电学性能 Electrical Characteristics

STC峰值功率 Maximum Power at STC (Pmax)	410W	420W	430W
最佳工作电压 Optimum Operating Voltage (Vmp)	31.13V	31.51V	31.88V
最佳工作电流 Optimum Operating Current (Imp)	13.19A	13.33A	13.49A
开路电压 Open Circuit Voltage (Voc)	37.73V	38.11V	38.49V
短路电流 Short Circuit Current (Isc)	13.91A	14.07A	14.23A
组件转换效率 Module Efficiency	21.01%	21.51%	22.02%
组件工作温度 Operating Module Temperature	-40°C to +85°C		
最大系统电压 Maximum System Voltage	1500V DC (IEC)		
最大串联保险丝电流等级 Maximum Series Fuse Rating	25A		
功率公差 Power Tolerance	0/+5W		

温度特性 Temperature Characteristics

标称组件工作温度 Nominal Module Operating Temperature	42±2°C
峰值功率温度系数 Temperature Coefficient of Pmax	-0.30%/°C
开路电压温度系数 Temperature Coefficient of Voc	-0.249%/°C
短路电流温度系数 Temperature Coefficient of Isc	0.045%/°C

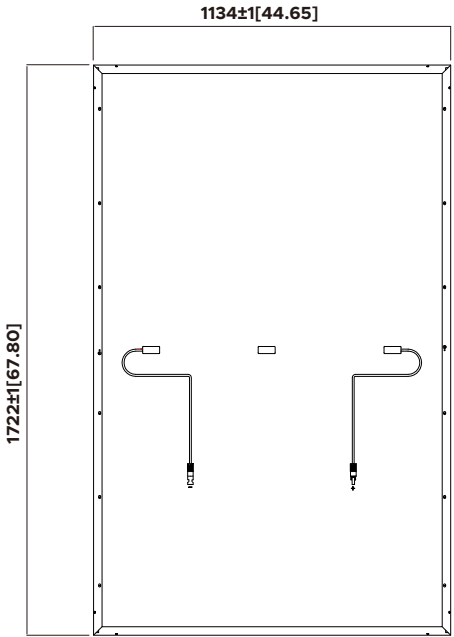
产品规格 Mechanical Characteristics

太阳能电池 Solar Cell	单晶硅182毫米 Monocrystalline silicon 182mm
电池数量 No. of Cells	108(6 × 18)
组件尺寸 Dimensions	1722 × 1134 × 30mm(67.80 × 44.65 × 1.18inches)
重量 Weight	21.4kgs(47.18 lbs.)
前玻璃 Front Side Glass	2.0mm钢化玻璃 tempered glass
后玻璃 Back Side Glass	2.0mm钢化玻璃 tempered glass
边框 Frame	氧化铝合金, 黑色 Anodized aluminium alloy, Black
接线盒 Junction Box	IP68标准 (3个旁路二极管) IP68 rated(3 bypass diodes)
输出电缆 Output Cables	4mm ² - Length:300 mm(+)/400 mm(-) or customized
连接器 Connectors	MC4

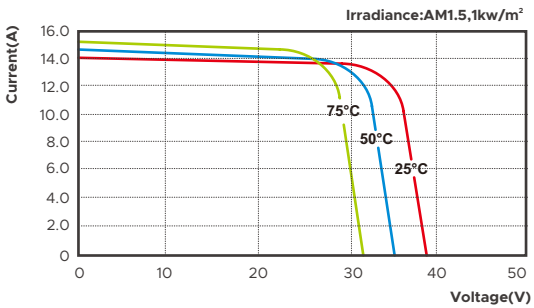
包装信息 Packing Configuration

包装 Container	40'HQ
片/托盘 Pieces per pallet	36
托盘/集装箱 Pallets per container	23
片/集装箱 Pieces per container	828
套箱尺寸 Dimensions	-
托盘重量 Weight	-

Unit: mm[in.]



ZS420SL1 I-V Curves



其他说明 Other information



* STC: 光照强度 1000W/m² 电池温度: 25°C 大气质量=1.5
* STC: Irradiance 1000W/m², AM1.5 spectrum, module temperature 25°C
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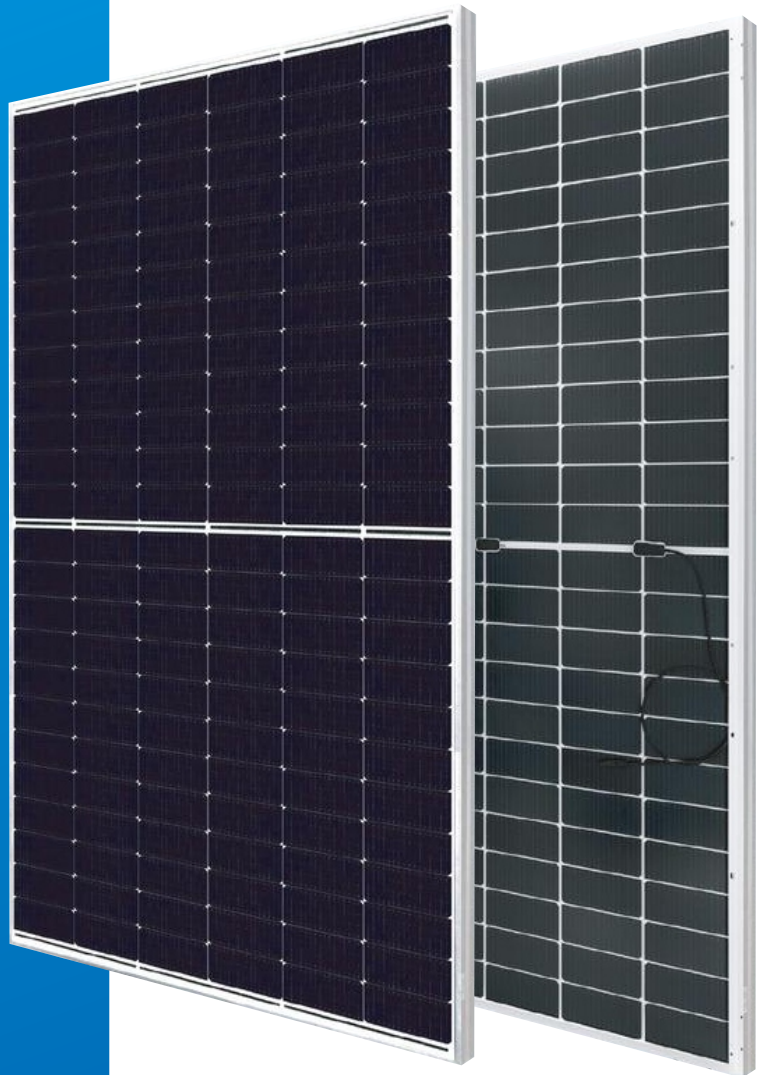
WARRANTY

12 years product warranty

25 years performance warranty

570W~585W

(16BB 182mm)



中设无锡机械设备工程有限公司
China Machinery Engineering Wuxi Co., Ltd.

570~585W

ZS570~585SL51

144
cells

MONO
PV Module

0~+3%
Power Tolerance

电学性能 Electrical Characteristics

STC峰值功率 Maximum Power at STC (Pmax)	570W	580W	585W
最佳工作电压 Optimum Operating Voltage (Vmp)	42.29V	42.59V	42.75V
最佳工作电流 Optimum Operating Current (Imp)	13.48A	13.62A	13.69A
开路电压 Open Circuit Voltage (Voc)	51.07V	51.47V	51.67V
短路电流 Short Circuit Current (Isc)	14.25A	14.37A	14.43A
组件转换效率 Module Efficiency	22.10%	22.50%	22.70%
组件工作温度 Operating Module Temperature	-40°C to +85°C		
最大系统电压 Maximum System Voltage	1500V DC (IEC)		
最大串联保险丝电流等级 Maximum Series Fuse Rating	25A		
功率公差 Power Tolerance	0~+3%		

温度特性 Temperature Characteristics

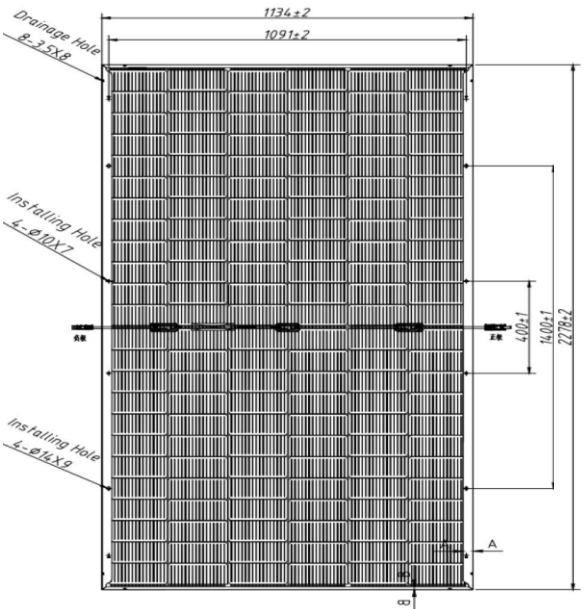
标称组件工作温度 Nominal Module Operating Temperature	42±2°C
峰值功率温度系数 Temperature Coefficient of Pmax	-0.39%/°C
开路电压温度系数 Temperature Coefficient of Voc	-0.30%/°C
短路电流温度系数 Temperature Coefficient of Isc	0.060%/°C

产品规格 Mechanical Characteristics

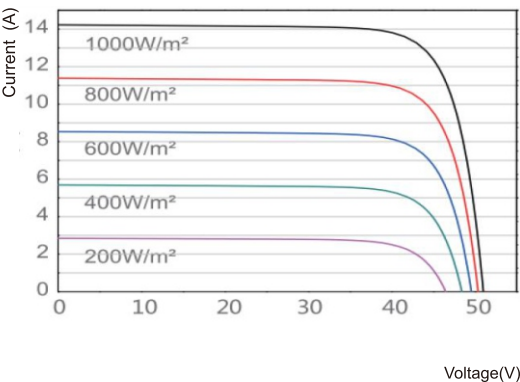
太阳能电池 Solar Cell	单晶硅电池片 Monocrystalline solar cell
电池数量 No. of Cells	144(6 × 24)
组件尺寸 Dimensions	2278 × 1134 × 30/35mm(89.69 × 44.65 × 1.18/1.38inches)
重量 Weight	32kgs(70.55 lbs.)/32.3kgs(71.21 lbs.)
正面玻璃 Front Glass	2.0mm, Anti-Reflection Coating
背面玻璃 Back Glass	2.0mm, Heat Strengthened Glass
边框 Frame	氧化铝合金 Anodized aluminium alloy
接线盒 Junction Box	IP68标准 (3个旁路二极管) IP68 rated(3 bypass diodes)
输出电缆 Output Cables	4.0mm ² , 300cm in length
连接器 Connectors	MC4

包装信息 Packing Configuration

包装 Container	40'HQ
片/托盘 Pieces per pallet	36/31
托盘/集装箱 Pallets per container	20/20
片/集装箱 Pieces per container	720/620
套箱尺寸 Dimensions	-
托盘重量 Weight	-



ZS580SL51 I-V Curves



其他说明 Other information



* STC: 光照强度 1000W/m² 电池温度: 25°C 大气质量=1.5
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2024-2025
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WARRANTY

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25 years performance warranty

690W~700W

(18BB 210mm)



中设无锡机械设备工程有限公司
China Machinery Engineering Wuxi Co., Ltd.

690~700W

ZS690~700SL51

132
cells

MONO
PV Module

0~+3%
Power Tolerance

电学性能 Electrical Characteristics

STC峰值功率 Maximum Power at STC (Pmax)	690W	695W	700W
最佳工作电压 Optimum Operating Voltage (Vmp)	39.60V	39.80V	40.00V
最佳工作电流 Optimum Operating Current (Imp)	17.43A	17.47A	17.51A
开路电压 Open Circuit Voltage (Voc)	47.50V	47.70V	47.90V
短路电流 Short Circuit Current (Isc)	18.39A	18.44A	18.49A
组件转换效率 Module Efficiency	22.20%	22.42%	22.50%
组件工作温度 Operating Module Temperature	-40°C to +85°C		
最大系统电压 Maximum System Voltage	1500V DC (IEC)		
最大串联保险丝电流等级 Maximum Series Fuse Rating	35A		
功率公差 Power Tolerance	0~+3%		

温度特性 Temperature Characteristics

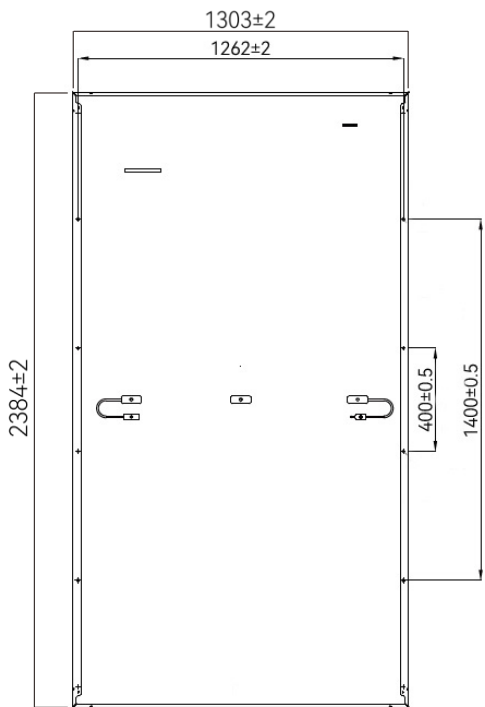
标称组件工作温度 Nominal Module Operating Temperature	42±2°C
峰值功率温度系数 Temperature Coefficient of Pmax	-0.39%/°C
开路电压温度系数 Temperature Coefficient of Voc	-0.30%/°C
短路电流温度系数 Temperature Coefficient of Isc	0.060%/°C

产品规格 Mechanical Characteristics

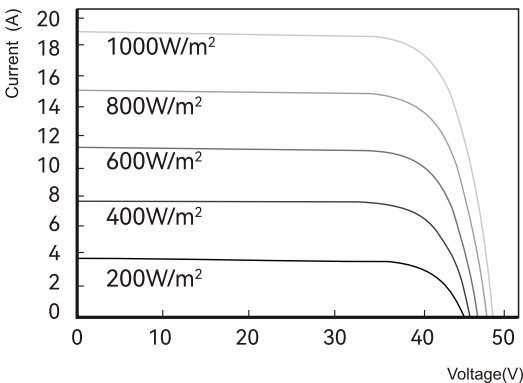
太阳能电池 Solar Cell	单晶硅电池片 Monocrystalline solar cell
电池数量 No. of Cells	132(6 × 22)
组件尺寸 Dimensions	2384 × 1303 × 33/35mm(93.86 × 51.30 × 1.30/1.38inches)
重量 Weight	38.3kgs(84.44 lbs.)/38.7kgs(85.32 lbs.)
正面玻璃 Front Glass	2.0mm, Anti-Reflection Coating
背面玻璃 Back Glass	2.0mm, Heat Strengthened Glass
边框 Frame	氧化铝合金 Anodized aluminium alloy
接线盒 Junction Box	IP68标准 (3个旁路二极管) IP68 rated(3 bypass diodes)
输出电缆 Output Cables	4.0mm ² , 300cm in length
连接器 Connectors	MC4

包装信息 Packing Configuration

包装 Container	40'HQ
片/托盘 Pieces per pallet	31
托盘/集装箱 Pallets per container	18
片/集装箱 Pieces per container	558
套箱尺寸 Dimensions	-
托盘重量 Weight	-



ZS690SL51 I-V Curves



其他说明 Other information



* STC: 光照强度 1000W/m² 电池温度: 25°C 大气质量=1.5
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