

## P-Type Bifacial Mono Double Glass Modules

**60 CELLS 5BB**  
MONO-CRYSTAL MODULES

**290-310W**  
POWER OUTPUT

**18.8%**  
MAXIMUM EFFICIENCY

**30 YEARS**  
linear performance  
warranty

**10 YEARS**  
product warranty

Qingdao RaySolar New Energy Co.,Ltd.( RaySolar), funded in February,2012 and located in Jimo Solar Industrial Park Qingdao city with an area of 400 mu, is a high and new technology enterprise integrating R&D, production and sales. RaySolar is mainly engaged in production and sales of double-glass solar modules, as well as development and construction of distributed power stations.

RaySolar focuses on production and sales of double-glass solar modules and is equipped with automatic production lines with a total annual capacity of 500MW. In addition, its products have obtained the Double-Glass Top-Runner Certification, TÜV, UL, China Compulsory Certification (CCC) of the construction industry, etc.

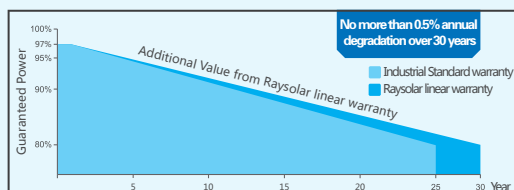
RaySolar adheres to the development concept of "Product-Centric and Service-Oriented", and it is in alliance with upstream suppliers, terminal construction contractors, and back-end service (operation and maintenance) providers to create an outstanding "ecosystem" that can demonstrate the advantages of double glass. Meanwhile, Raysolar will provide the financing platform for the customers, aiming at achieving the closed-loop promotion of the PV industry chain through the financial supply chain.

Solar makes life better!

### Certification



### Linear Performance Warranty



#### Higher Power Output

- Backside power gain up to 25% depending on reflection.
- Excellent low-light performance.



#### Excellent durability reliability performance

- Excellent PID resistant.
- No micro-cracks, free of snail trails.



#### Excellent withstand challenging environmental conditions and safety performance

- Resistant to high temperature and humidity, sand, acid and alkali.
- 5400 Pa snow load, 2400 Pa wind load.
- Passed hail test with 35mm hail stones at 97 km/h.
- Class A fireproofing rating.



#### High return on investment

- 1500 V system voltage reduces BOS costs.
- 0.5% annual degradation, 30 year linear warranty, more power output.
- Frameless design, less dust or snow pilling up, reduces O&M cost.



10% transmittance modules



Opaque modules

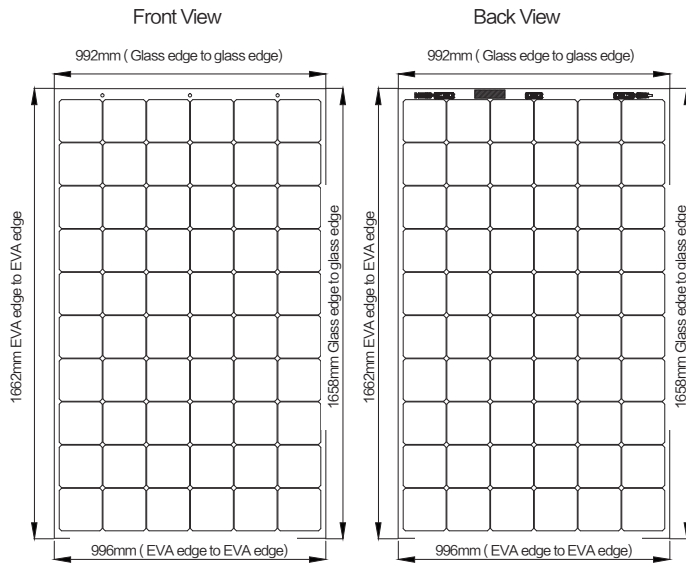


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## Engineering drawing



## Mechanical Specifications

Cell Type	Bifacial Mono crystalline (156.75mm*156.75mm)
Solar Cells	60(6*10)
Module Dimension [mm]	1658*992*6 (1662*996*6 with edge banding)
Weight [Kg]	23.0
Front Glass [mm]	2.5 (Heat Strength coated glass)
Interlayer	EVA/POE/PVB
Back Glass [mm]	2.5 (Heat Strength glass)
Junction Box	IP67 Rated, 3 by-pass diodes
Connector	Multi-Contact MC4(or equivalent)
Frame	No frame
Maximum Load Capacity [Pa]	2400(wind load)/ 5400(snow load)

## Electrical Characteristics

		BPDM60-290		BPDM60-295		BPDM60-300		BPDM60-305		BPDM60-310	
		STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power at STC [Pmax]	[W]	290	215	295	218	300	222	305	226	310	229
Open Circuit Voltage [Voc]	[V]	38.89	35.96	39.10	36.15	39.35	36.39	39.62	36.64	39.89	36.88
Short Circuit Current [Isc]	[A]	9.57	7.72	9.65	7.78	9.72	7.84	9.80	7.90	9.88	7.97
Voltage at Maximum Power point[Vm]	[V]	31.76	28.86	32.03	29.11	32.37	29.42	32.66	29.68	32.95	29.95
Current at Maximum Power point[Im]	[A]	9.13	7.44	9.21	7.50	9.27	7.55	9.34	7.61	9.41	7.66
Power Tolerance	[%]	0~+3%									
Module Efficiency	[%]	17.6		17.9		18.2		18.5		18.8	

STC: Air Mass AM1.5, Ir-radiance 1000W/m<sup>2</sup> Cell temperature 25°C.  
NOCT: Air Mass AM1.5, Ir-radiance 800W/m<sup>2</sup> Ambient temperature 20°C, wind speed 1m/s.

10% transmittance modules:290-305W;Opaque modules:295-310W

## Double sides Power Output (Back gain)

	5%					10%					15%				
	305	309	315	320	325	319	325	330	335	341	334	339	345	351	356
Maximum Power [Pmax]	305	309	315	320	325	319	325	330	335	341	334	339	345	351	356
Module Efficiency	18.5	18.8	19.1	19.4	19.7	19.4	19.7	20.0	20.4	20.7	20.2	20.6	20.9	21.3	21.6

## Scope of Work

Maximum System Voltage	[V]	1000 DC(IEC)or1500 DC(IEC)
Operating Temperature	[°C]	-40~+85
Nominal Operating Cell Temperature	[°C]	45±3
Maximum rated current	[A]	15

## Temperature Coefficients

Temperature Coefficient of Pmax	[%/°C]	-0.42
Temperature Coefficient of Voc	[%/°C]	-0.33
Temperature Coefficient of Isc	[%/°C]	0.04

## Package Configuration

per box 36 pieces	40" HQ 936 pieces
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## Electrical curves

