



# Solar cells modules

## Turnkey Solutions

PV plants & PV factories



[www.gigasolar.cn](http://www.gigasolar.cn)

# ABOUT

As one of the world-leading PV companies with the biggest production capacity, GIGA SOLAR provides professional PV “Turnkey Solutions” and PV power plants. In 2010, the world’s top financial-audit institution Deloitte ranked GIGA SOLAR the fastest growing high tech company in China.

GIGA SOLAR has 8 production bases, 10 branch companies and a PV research institute around China, engaging in R&D and manufacturing of solar cells, modules as well as PV equipments. By the end of 2012, the estimated production capacity for solar cells and modules will reach 4GW and 2GW, respectively. Meanwhile, GIGA SOLAR has built a large 30MW grid-tied power station in Sheyang, Jiangsu Province, currently the largest single photovoltaic power station in China funded by private capital. By the end of 2011, the power station has connected to the state grid and generated electricity.

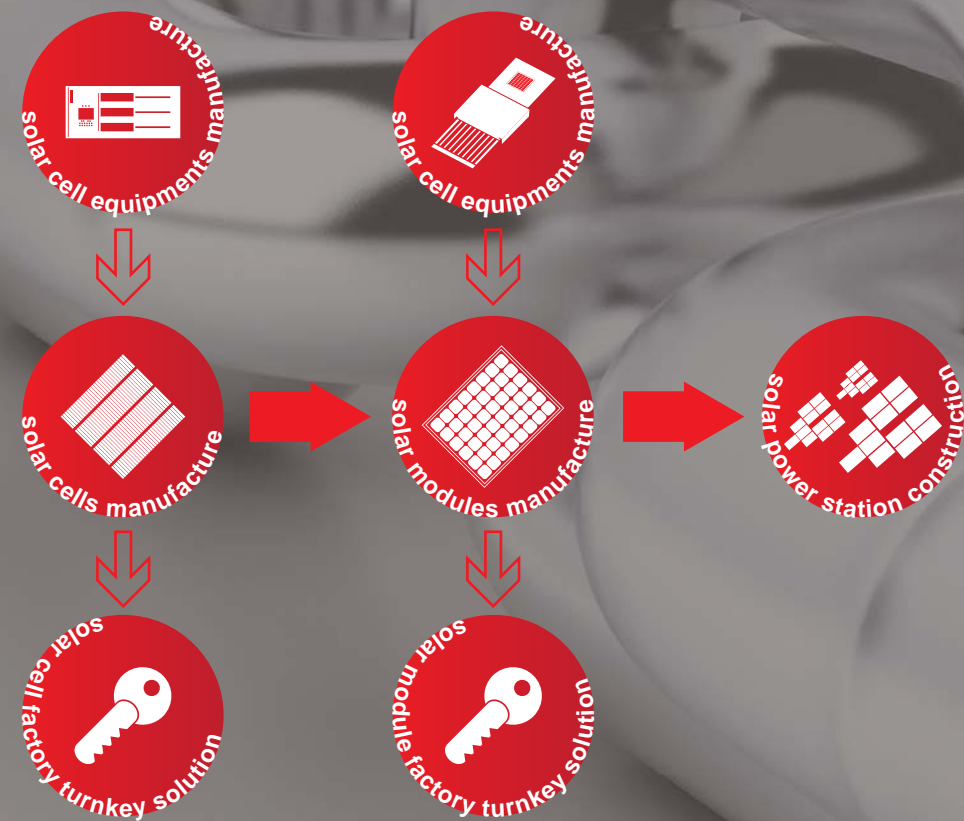
GIGA SOLAR is committed to realizing power price parity all around the world through self-owned technologies and complete industrial chain.

***GIGA SOLAR is committed to the technology which used to generate power by parity price, expecting to change human beings’ lifestyle by renewable energy.***

# Industrial Chain

GIGA SOLAR is the unique PV company in China to develop its full set self-owned technologies of assembly line of crystalline silicon solar cell (including the technology of whole assembly line and periphery off-set utilities etc.).

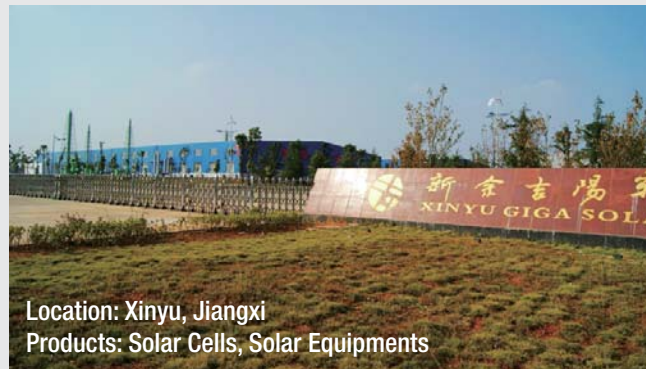
GIGA SOLAR has gone beyond the traditional definition of PV industrial chain through its self-owned technologies, reaching a level of researching the core equipments and providing turnkey solutions.



**GIGA SOLAR has 8 production bases in China, through large scale manufacture to decrease the costs.**



Location: Xiapu, Fujian  
Products: Solar Cells



Location: Xinyu, Jiangxi  
Products: Solar Cells, Solar Equipments



Location: Guilin, Guangxi  
Products: Solar Cells, Solar Modules, Solar Equipments



Location: Qingliu, Fujian  
Products: Solar Cells, Solar Modules

# 8 Bases in China

The 8 production bases form a solid foundation for Giga Solar's large-scale-low-cost strategy.

Under planned management of Beijing headquarter, the 8 production bases compete and complement with each other, aimed at continuous breakthrough in technique and decrease on costs, creating an instinctive advantage for Giga Solar in realizing power price parity.



Location: Haian, Jiangsu  
Products: Solar Cells, Solar Equipments



Location: Sheyang, Jiangsu  
Products: Solar Modules



Location: Qingdao, Shandong  
Products: Solar Cells



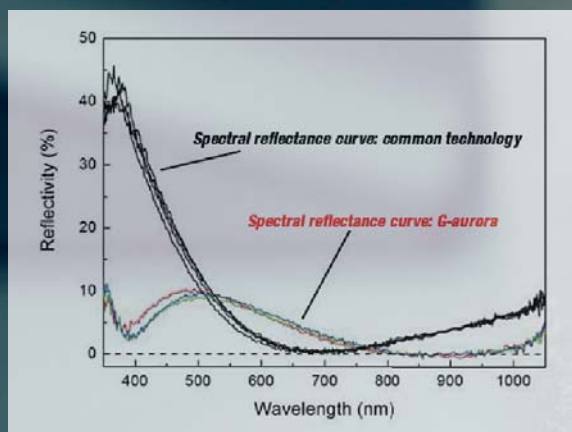
Location: Tianchang, Anhui  
Products: Solar Cells

# G-aurora

## High efficiency polycrystalline solar cell

**From 17% to 17.25%, the costs remain the same**

G-aurora is a new series of high efficiency polycrystalline solar cells developed by GIGA SOLAR. With Giga Solar's independent R&D specialized passivation technology, G-aurora didn't increase any additional costs compared with conventional technique, improving the conversion rate up to 17.25% (be tested according to Fraunhofer Standard).



Compared with conventional coating film technique, G-aurora solar cells' original creation of "three layers" coating film has substantially decreased the reflection rate of ultraviolet waveband and infrared waveband, the function is very obvious especially for reflection of ultraviolet waveband. The increase of incident rays increases the current flow, improving the efficiency of solar cells as well.

## 7 years as one day, persisting in its own technology

From the first polycrystalline groove-style texturing equipment R&D to the whole line of equipment of solar cell and solar module putting into production, Giga Solar accomplished the 1st generation self-owned technology development of solar cells within 7 years. With the leading cost advantage in the same industry, Giga realizes higher efficiency with 18.5% for monocrystalline solar cell and 17.25% for polycrystalline solar cell. At present, Giga is developing the next generation of photovoltaic battery technology revolutionary in order to promote parity power generation process.

### Technology Development Milestone

- In 2006 GIGA SOLAR completed innovation of Chinese first generation 10-groove Semi-automated wet processing equipment.
- In 2008 GIGA SOLAR invented the first Chinese polycrystalline groove-style texturing equipment breaking the foreign monopoly in this field.
- In 2009 GIGA SOLAR became the first whole silicon solar cell production line turnkey manufacturer with continuous innovation.
- In 2010 GIGA SOLAR successfully developed high efficiency solar cell technologies such as high resistance dense gate, SE selective emitter etc. as well as improved existing equipment.
- In 2011 GIGA SOLAR developed G3 diffusion furnace and PECVD, greatly raising the production capacity.
- In 2012 GIGA SOLAR developed G-aurora high efficiency polycrystalline solar cells on his own, improving the conversion rate up to 17.25%.

# PV Equipment

Giga Solar is the first company in China to possess the R&D technology on the production of silicon solar cell with a whole assembly line. Starting from the first multi-groove texturing equipment in 2007 and followed by the successful R&D of the third-generation PV equipment, Giga Solar is dedicated to optimizing the equipment performance to meet the improving techniques for solar cell's high efficiency, keeping an annual average 1%-1.5% growth of the conversion efficiency to ensure a consistently leading technology.

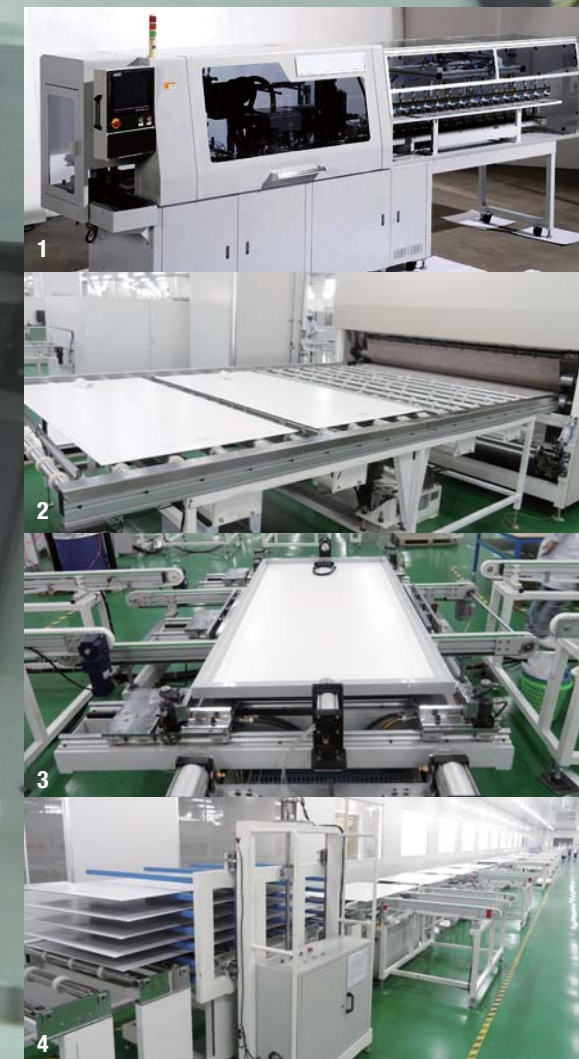
## Core Production Equipment Made by GIGA SOLAR: Solar Cell

1. Texturing machine
2. Diffusion furnace
3. Plasma etching machine
4. PECVD machine
5. Screen printer
6. Sintering furnace



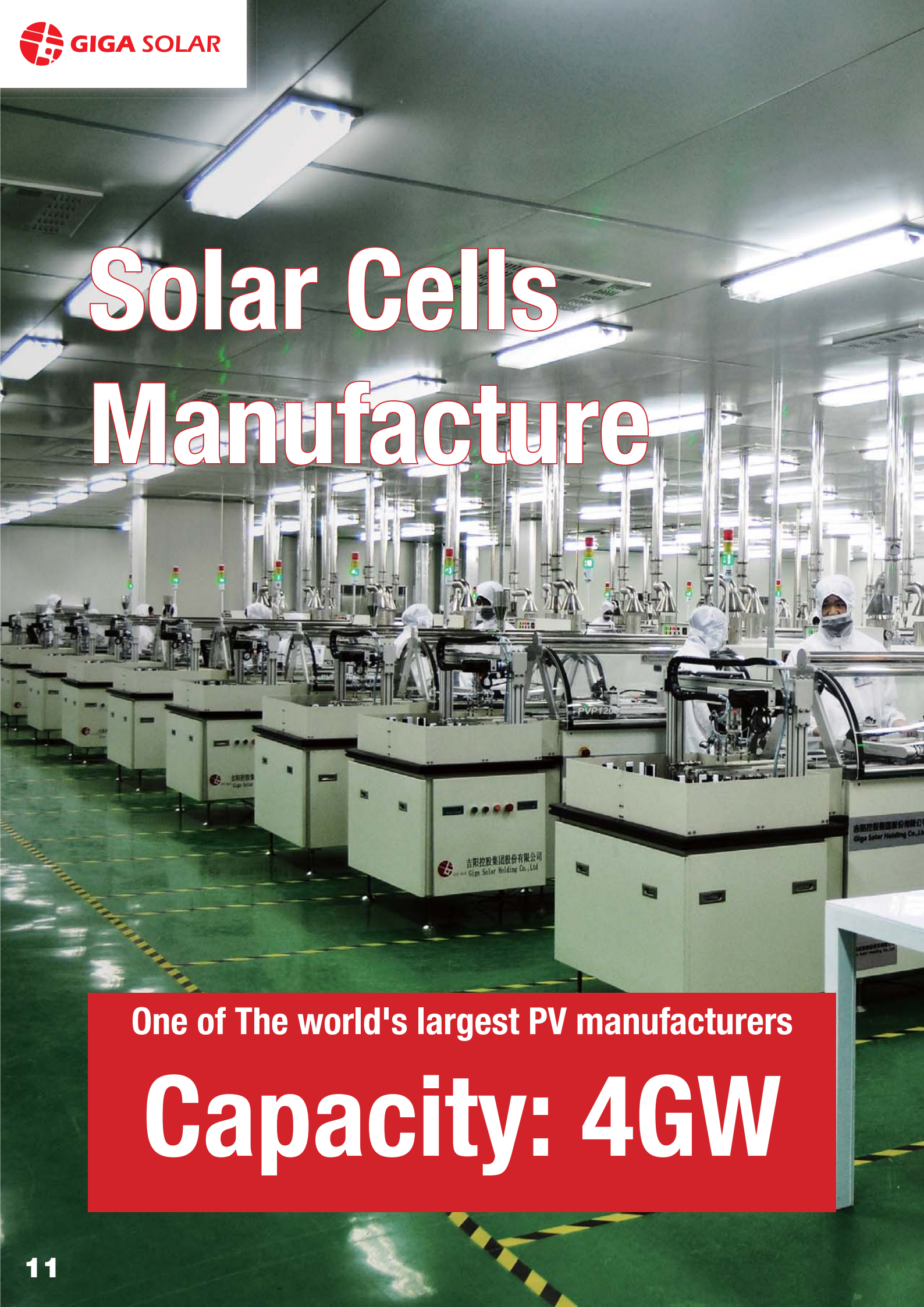
## Core Production Equipment Made by GIGA SOLAR: Solar Module

1. Welding machine
2. Laminating machine
3. Framing machine
4. Transfer line



*With rich experience on the semiconductor technology, the G3 PV equipment developed by GIGA SOLAR has reached the world-leading level.*

# Solar Cells Manufacture



One of The world's largest PV manufacturers  
**Capacity: 4GW**

# Solar Modules Manufacture



**10-Year Warranty** **+3% Tolerance** TÜV UL IEC CE ISO9001

# Turnkey Solution for PV Plant

*GIGA SOLAR provides EPC and "Turnkey Solutions" for both ground and rooftop power plants. In the field of PV plant construction, Giga Solar has possessed state power business license and a professional team with dozens of experts. Hence, Giga Solar is experienced and professional in designing, constructing and operating on-grid and off-grid power plants.*

## 30MW

### China's largest private Ongrid PV Power Plant

In 2011, Giga Solar invested and built a 30MW mudflat power plant in Sheyang, Jiangsu province which is the single largest PV station funded by private capital in China. It has an total site area of over 700mu. The power station has adopted 24.2MW modules of 285w polycrystalline, 1.5MW of 240w polycrystalline and 4.3MW of monocrystalline. This solar plant can generate a total power of 882935MWh within 25 years with an annual average of 35317.4MWh, 1160 operation hours.

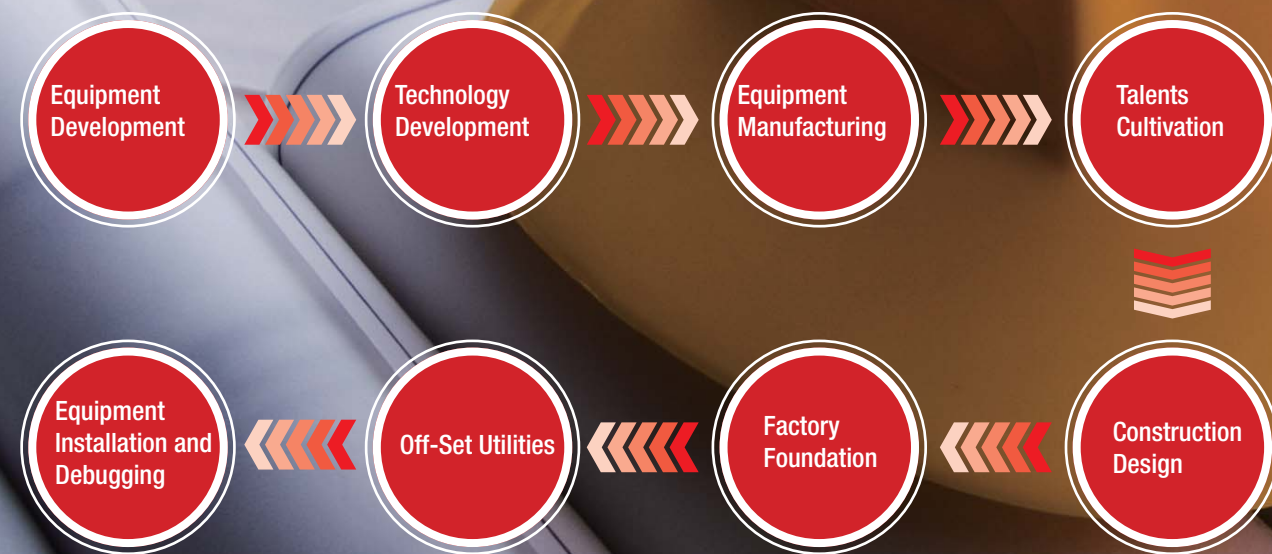


# Turnkey Solution for PV Factory

## Solar Cell Factory & Solar Module Factory

In 2007 GIGA Solar commenced the first solar cell manufacturing production line turnkey project and after 3 years GIGA Solar has become one of the world's most mature turnkey project integrators with experience in the construction of over 100 production lines.

### PROCESS OF PV FACTORY CONSTRUCTION



### Projects We Did

#### Solar Cell Factory

Projects List	Generation
• Sep. 2008 Jiangsu Bright Solar Phase 1: 40MW Mono	<b>G1</b>
• Sep. 2009 Giga Solar Xing'an base Phase 1: 60MW Mono	<b>G1</b>
• May. 2010 Zhongheng Tech Tangshan: 80MW Poly, 60MW Mono	<b>G1</b>
• Jun. 2010 Hengji Panshi Phase 1: 160MW Poly	<b>G1</b>
• Aug. 2010 Giga Solar Xinyu base Phase 1: 160MW Poly	<b>G1</b>
• Sep. 2010 Jiangsu Bright Solar Phase 2: 60MW Mono	<b>G1</b>
• Nov. 2010 Giga Solar Xing'an base Phase 2: 240MW Poly, 160MW Mono	<b>G2</b>
• Apr. 2011 Giga Solar Jimo base: 240MW Poly	<b>G2</b>
• Mar. 2011 Giga Solar Xiapu base: 240MW Poly	<b>G2</b>
• Aug. 2011 Giga Solar Tianchang base: 500MW Poly	<b>G3</b>
• Nov. 2011 Giga Solar Hai'an base: 500MW Poly	<b>G3</b>
• Nov. 2011 Giga Solar Xinyu base Phase 2: 500MW Poly	<b>G3</b>
• Dec. 2011 Giga Solar Xing'an base Phase 3: 500MW Poly	<b>G3</b>
• Dec. 2011 Giga Solar Qingliu base : 500MW Poly	<b>G3</b>

#### Solar Module Factory

Projects List	Generation
• Aug. 2010 Giga Solar Xing'an base Phase 1: 150MW	<b>G1</b>
• Dec. 2011 Giga Solar Sheyang base Phase 1: 500MW	<b>G1</b>

**Deloitte.**  
德勤

领先、创新、超越  
2010德勤高科技、高成长中国50强颁奖典礼  
暨德勤创业家论坛—科技与创新

# Rapid Development

Having achieved a 7,744% profit growth over the last three years, the world's top financial-audit institution – Deloitte - awarded GIGA Solar the following honours:  
**The first place in “China Technology Fast50”**  
**The third place in the “Asia Pacific Technology Fast500”**

Benefiting from different business models, Giga Solar has been keeping a high-speed growth over the past 7 years.

# Private Seaports

*Giga Solar will provide clients with timely and efficient delivery of goods via its own 3 seaports in China.*

## Global Business

NORTH ATLANTIC OCEAN

NORTH ATLANTIC OCEAN

Europe

Solar Module Manufacture  
PV Plants & System Turn-key Solution  
Solar Module Factory Turn-key Solution

China

Solar Cell & Module Manufacture  
PV Equipments Manufacture  
PV Plants & System Turn-key Solution  
Solar Cell Factory Turn-key Solution  
Solar Module Factory Turn-key Solution

NORTH ATLANTIC OCEAN

Middle East

Solar Module Manufacture  
PV Plants & System Turn-key Solution  
Solar Module Factory Turn-key Solution

South Asia

PV Plants & System Turn-key Solution

INDIAN OCEAN

SOUTH ATLANTIC OCEAN

SOUTH ATLANTIC OCEAN

SOUTH ATLANTIC OCEAN

Solar Cells  
Solar  
Modules

# CATALOGUE

## Cell

- GS-M5
- GS-M5L
- GS-M6
- GS-P6X
- GS-P6
- GS-Q6

## Module

- GS156-M60
- GS156-M72
- GS125-M72
- GS156-P60
- GS156-P72

# MON0125(R150)M5

## 125mm Monocrystalline silicon solar cells

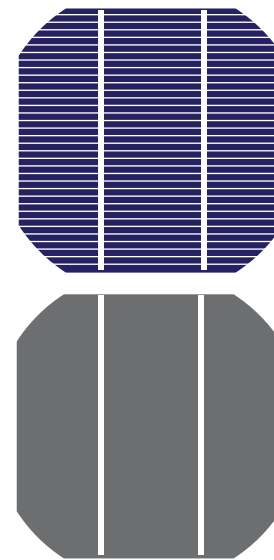
### MECHANICAL DATE AND DESIGN

Format	125 mm × 125 mm ± 0.5 mm
Thickness	190 μm ± 20 μm
Front (-)	1.8 mm bus bars (silver)
Back (+)	3 mm wide soldering pads (silver)

### TEMPERATURE COEFFICIENTS

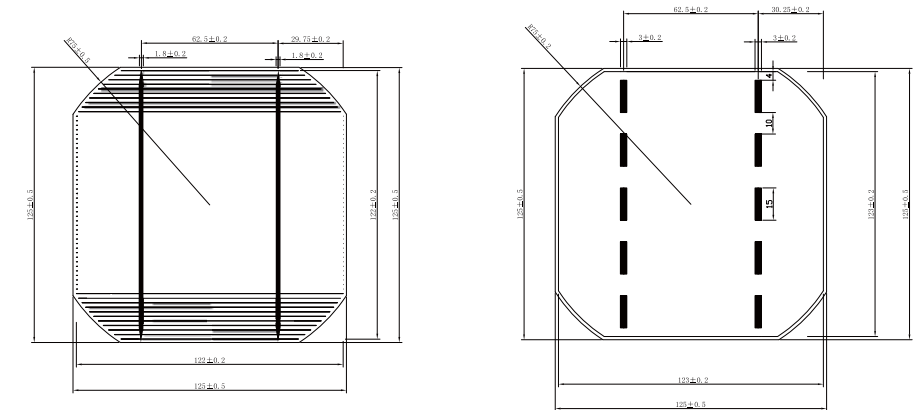
Voc.Temp.coef./K	-0.356%/K
Isc.Temp.coef./K	+0.024%/K
Pm.Temp. coef./K	-0.46%/K

### ELECTRICAL CHARACTERISTICS



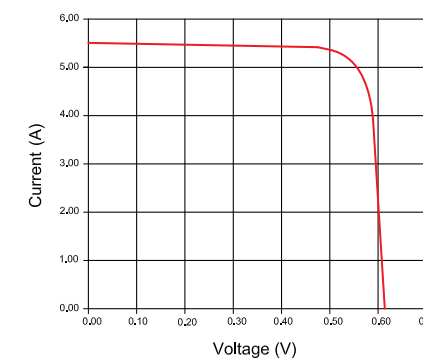
Efficiency (%)	Pmpp (W)	Umpp (V)	Impp (A)	Uoc (V)	Isc (A)	FF (%)
18.4-18.6	2.73	0.536	5.093	0.633	5.432	79.84
18.2-18.4	2.70	0.534	5.056	0.632	5.411	79.69
18.0-18.2	2.67	0.533	5.009	0.631	5.373	79.53
17.8-18.0	2.64	0.528	5.000	0.630	5.354	79.12
17.6-17.8	2.61	0.527	4.953	0.629	5.337	78.77
17.4-17.6	2.59	0.527	4.896	0.629	5.330	77.92
17.2-17.4	2.56	0.527	4.839	0.630	5.316	77.11
17.0-17.2	2.53	0.523	4.818	0.627	5.312	76.57
16.5-17.0	2.45	0.520	4.734	0.620	5.300	75.00
16.0-16.5	2.38	0.517	4.855	0.614	5.513	74.00

### DIAGRAM

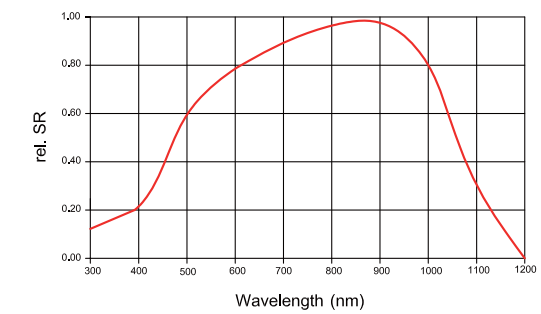


### SPECTRAL RESPONSE

#### IV CURVE



#### SPECTRAL RESPONSE



Calibrated under AM1.5 global SRC in Fraunhofer ISE.

#### INTENSITY DEPENDENCE

Intensity [ W/m <sup>2</sup> ]	Isc× [ mA ]	Voc× [ mV ]
1000	1.00	1.000
900	0.90	0.989
500	0.50	0.963
300	0.30	0.939
200	0.20	0.920

Ratio of Voc ( Isc ) at reduced intensity to Voc ( Isc ) at 1000 W/m<sup>2</sup>

# MON0125(R165)M5L

## 125mm Monocrystalline silicon solar cells

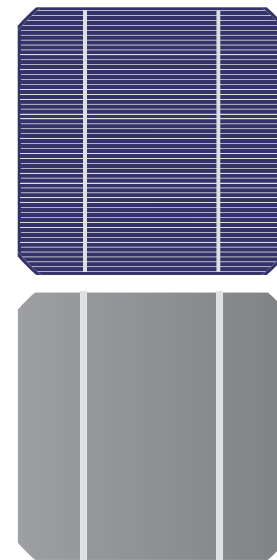
### MECHANICAL DATA AND DESIGN

Format	125 mm × 125 mm ± 0.5 mm
Thickness	190 μm ± 20 μm
Front (-)	1.8mm bus bars (silver)
Back (+)	3 mm wide soldering pads (silver)

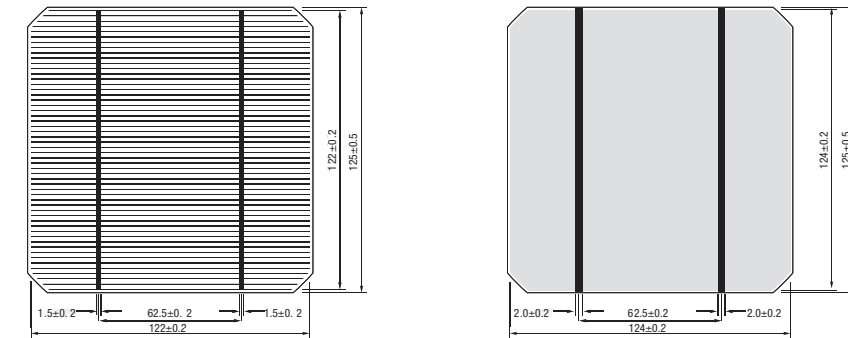
### TEMPERATURE COEFFICIENTS

Voc. Temp.coef. %/K	-0.348%/K
Isc. Temp.coef. %/K	+0.031%/K
Pm. Temp. coef. %/K	-0.46%/K

### ELECTRICAL CHARACTERISTICS

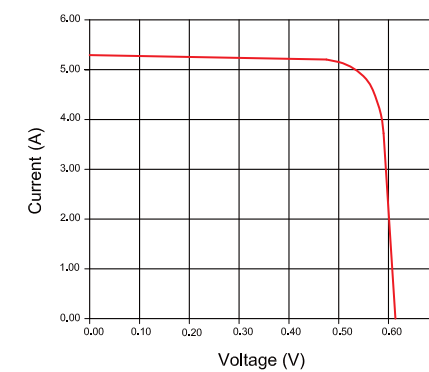


### DIAGRAM

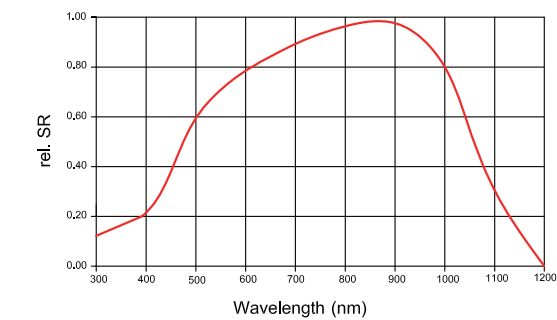


### SPECTRAL RESPONSE

#### IV CURVE



#### SPECTRAL RESPONSE



Calibrated under AM1.5 global SRC in Fraunhofer ISE.

### INTENSITY DEPENDENCE

Intensity [ W/m <sup>2</sup> ]	Isc× [mA]	Voc× [mV]
1000	1.00	1.000
900	0.90	0.989
500	0.50	0.963
300	0.30	0.939
200	0.20	0.920

Ratio of Voc ( Isc ) at reduced intensity to Voc ( Isc ) at 1000 W/m<sup>2</sup>

# MON0156(R200)M6

## 156mm Monocrystalline silicon solar cells

### MECHANICAL DATA AND DESIGN

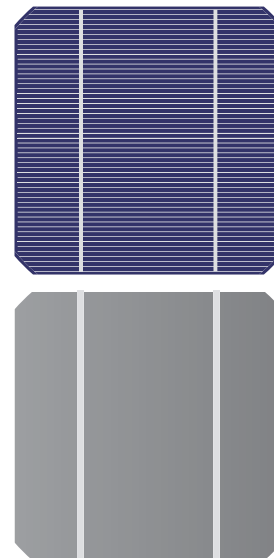
Format	156 mm × 156 mm ± 0.5 mm
Thickness	190 μm ± 20 μm
Front (-)	1.9 mm bus bars (silver)
Back (+)	3 mm wide soldering pads (silver)

### TEMPERATURE COEFFICIENTS

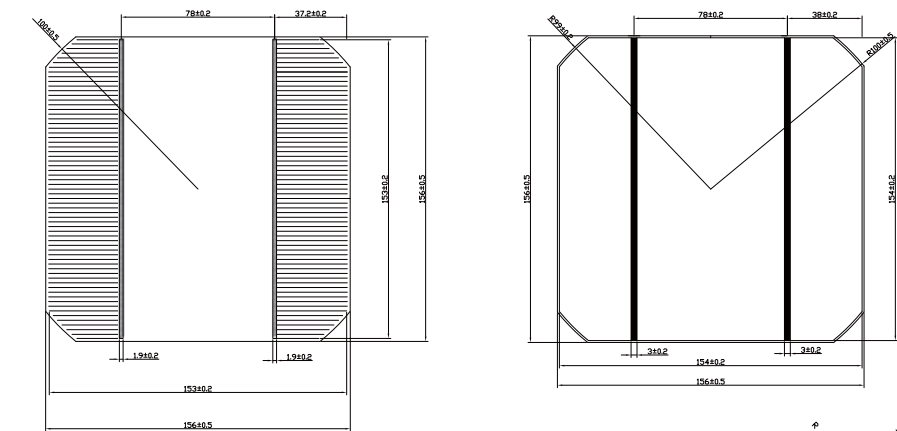
Voc. Temp.coef. %/K	-0.346%/K
Isc. Temp.coef. %/K	+0.036%/K
Pm. Temp. coef. %/K	-0.47%/K

### ELECTRICAL CHARACTERISTICS

Efficiency (%)	Pmpp (W)	Umpv (V)	Impp (A)	Uoc (V)	Isc (A)	FF (%)
18.00 - 18.20	4.30	0.531	8.109	0.631	8.628	79.09
17.80 - 18.00	4.25	0.529	8.057	0.630	8.594	78.72
17.60 - 17.80	4.21	0.527	7.997	0.629	8.571	78.17
17.40 - 17.60	4.16	0.526	7.941	0.629	8.555	77.62
17.20 - 17.40	4.11	0.525	7.845	0.628	8.532	76.87
17.00 - 17.20	4.06	0.524	7.807	0.628	8.514	76.51
16.80 - 17.00	4.01	0.522	7.717	0.627	8.504	75.43
16.60 - 16.80	3.97	0.519	7.679	0.627	8.489	74.87
16.40 - 16.60	3.92	0.517	7.608	0.626	8.449	74.25
16.20 - 16.40	3.87	0.515	7.540	0.625	8.424	73.63
16.00 - 16.20	3.82	0.511	7.483	0.624	8.398	72.85

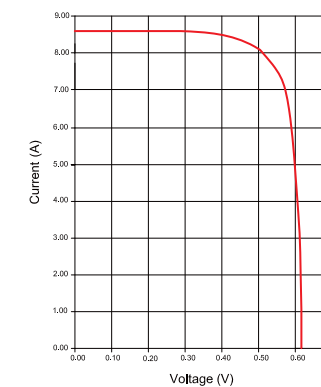


### DIAGRAM

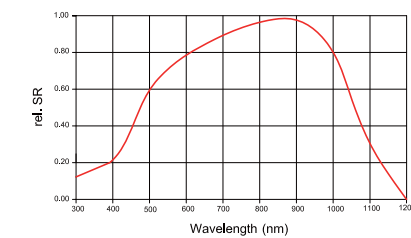


### SPECTRAL RESPONSE

#### IV CURVE



#### SPECTRAL RESPONSE



Calibrated under AM1.5 global SRC in Fraunhofer ISE.

### INTENSITY DEPENDENCE

Intensity [ W/m <sup>2</sup> ]	Isc× [mA]	Voc× [mV]
1000	1.00	1.000
900	0.90	0.989
500	0.50	0.963
300	0.30	0.939
200	0.20	0.920

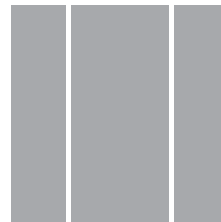
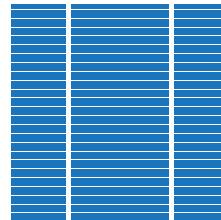
Ratio of Voc ( Isc ) at reduced intensity to Voc ( Isc ) at 1000 W/m<sup>2</sup>

# POLY156P6

## 156mm Polycrystalline silicon solar cells

### MECHANICAL DATA AND DESIGN

Format	156 mm × 156 mm ± 0.5 mm
Thickness	200 μm ± 20 μm
Front (-)	2 mm bus bars (silver)
Back (+)	3.5 mm wide soldering pads(silver) back



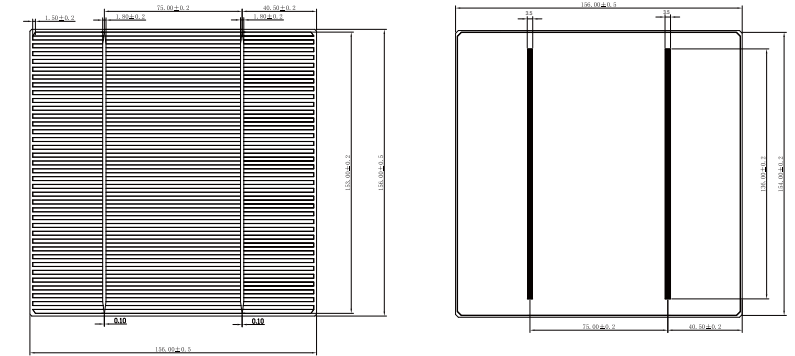
### TEMPERATURE COEFFICIENTS

Voc. Temp.coef. %/K	-0.346%/K
Isc. Temp.coef. %/K	+0.036%/K
Pm. Temp. coef. %/K	-0.47%/K

### ELECTRICAL CHARACTERISTICS

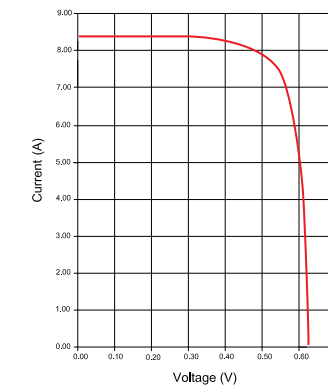
Efficiency (%)	Pmpp (W)	Umpp (V)	Impp (A)	Uoc (V)	Isc (A)	FF (%)
17.00 - 17.20	4.14	0.525	7.891	0.629	8.421	78.21
16.80 - 17.00	4.09	0.521	7.853	0.627	8.386	77.81
16.60 - 16.80	4.04	0.518	7.807	0.624	8.340	77.71
16.40 - 16.60	3.99	0.515	7.757	0.621	8.294	77.56
16.20 - 16.40	3.94	0.510	7.716	0.619	8.251	77.05
16.00 - 16.20	3.89	0.506	7.680	0.616	8.214	76.80
15.80 - 16.00	3.85	0.505	7.627	0.614	8.160	76.88
15.60 - 15.80	3.80	0.503	7.559	0.614	8.156	75.93
15.40 - 15.60	3.75	0.500	7.501	0.613	8.139	75.17
15.20 - 15.40	3.70	0.498	7.430	0.612	8.084	74.79
15.00 - 15.20	3.65	0.496	7.350	0.611	8.068	74.00

### DIAGRAM

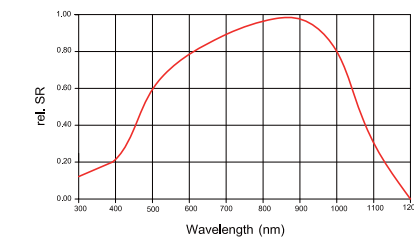


### SPECTRAL RESPONSE

#### IV CURVE



#### SPECTRAL RESPONSE



Calibrated under AM1.5 global SRC in Fraunhofer ISE.

### INTENSITY DEPENDENCE

Intensity [ W/m <sup>2</sup> ]	Isc× [mA]	Voc× [mV]
1000	1.00	1.000
900	0.90	0.989
500	0.50	0.963
300	0.30	0.939
200	0.20	0.920

Ratio of Voc ( Isc ) at reduced intensity to Voc ( Isc ) at 1000 W/m<sup>2</sup>

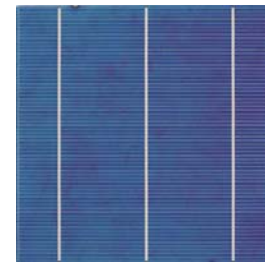


# POLY156P6X

## 156mm Polycrystalline silicon solar cells

### MECHANICAL DATA AND DESIGN

Format	156 mm × 156 mm ± 0.5 mm
Thickness	200 μm ± 20 μm
Front (-)	1.6mm bus bars (silver)
Back (+)	3mm wide soldering pads (silver)



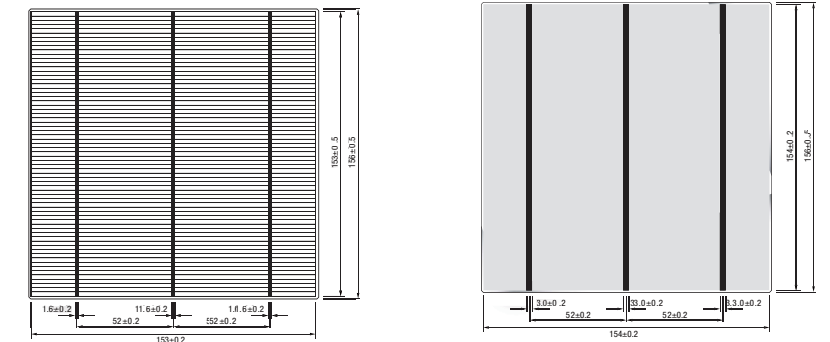
### TEMPERATURE COEFFICIENTS

Voc. Temp.coef.%/K	-0.32%/K
Isc. Temp.coef.%/K	+0.05%/K
Pm. Temp. coef.%/K	-0.39%/K

### ELECTRICAL CHARACTERISTICS

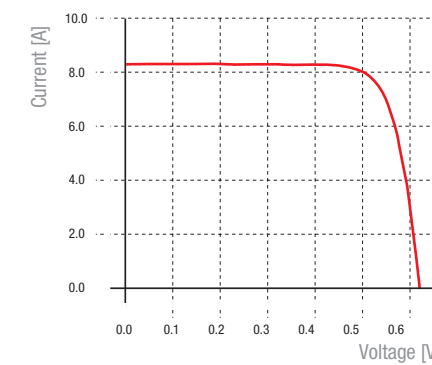
No.	Efficiency (%)	Pmpp(W)	Umpp(V)	Impp(A)	Uoc(V)	Isc(A)	FF(%)
09	17.25-	4.198	0.524	8.0361	0.626	8.58	78.4
08	17.05-17.25	4.149	0.521	8.0122	0.625	8.53	78.3
07	16.85-17.05	4.101	0.518	7.9687	0.624	8.47	78.1
06	16.65-16.85	4.052	0.515	7.9220	0.622	8.42	77.9
05	16.45-16.65	4.003	0.512	7.8666	0.620	8.35	77.8
04	16.25-16.45	3.955	0.509	7.8194	0.618	8.31	77.5
03	16.05-16.25	3.906	0.506	7.7704	0.615	8.26	77.4
02	15.85-16.05	3.857	0.504	7.7144	0.612	8.24	77.1
01	15.75-15.85	3.833	0.503	7.6478	0.611	8.23	76.5

### DIAGRAM

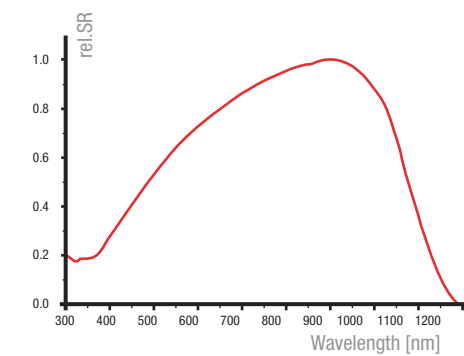


### SPECTRAL RESPONSE

#### IV CURVE



#### SPECTRAL RESPONSE



\*calibrated against fraunhofer ISE freiburg

### INTENSITY DEPENDENCE

Intensity [ W/m <sup>2</sup> ]	Isc× [ mA ]	Voc× [ mV ]
1000	1.00	1.000
900	0.90	0.996
500	0.50	0.969
300	0.30	0.947
200	0.20	0.928

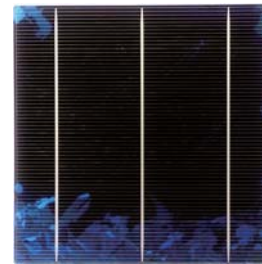
Ratio of Voc ( Isc ) at reduced intensity to Voc ( Isc ) at 1000 W/m<sup>2</sup>

# MONO-LIKE156Q6

## 156mm Mono-like solar cells

### MECHANICAL DATA AND DESIGN

Format	156 mm × 156 mm ± 0.5 mm
Thickness	200 μm ± 20 μm
Front (-)	1.5mm bus bars (silver)
Back (+)	2.5mm wide soldering pads (silver)



### TEMPERATURE COEFFICIENTS

Voc. Temp.coef.%/K	-0.368%/K
Isc. Temp.coef.%/K	+0.053%/K
Pm. Temp. coef.%/K	-0.531%/K



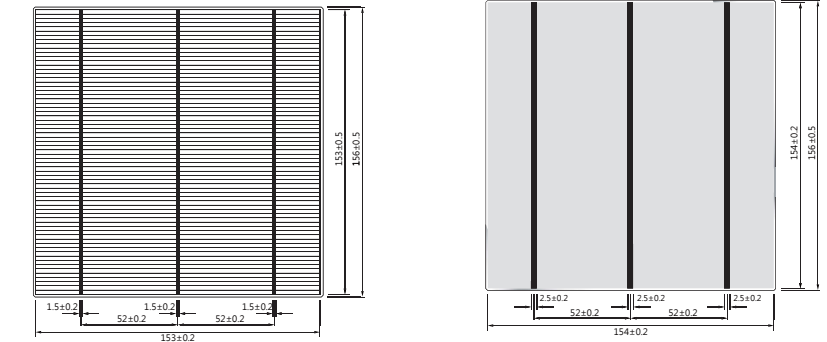
### ELECTRICAL CHARACTERISTICS

No.	Efficiency (%)	Pmpp(W)	Umpp(V)	Impp(A)	Uoc(V)	Isc(A)	FF(%)
09	18.30-	4.450	0.525	8.472	0.628	9.047	78.29
08	18.20-18.30	4.430	0.525	8.437	0.627	9.016	78.30
07	18.10-18.20	4.400	0.524	8.408	0.627	8.994	78.14
06	18.00-18.10	4.380	0.522	8.385	0.626	8.978	77.99
05	17.90-18.00	4.360	0.521	8.362	0.625	8.961	77.77
04	17.80-17.90	4.330	0.520	8.336	0.624	8.943	77.59
03	17.70-17.80	4.310	0.518	8.313	0.623	8.920	77.50
02	17.60-17.70	4.280	0.517	8.290	0.622	8.899	77.36
01	17.50-17.60	4.260	0.515	8.267	0.621	8.881	77.20

\*The above data are presently measured average,(Tolerance:Efficiency±0.2%abs.,Pmpp±1.5%rel.)

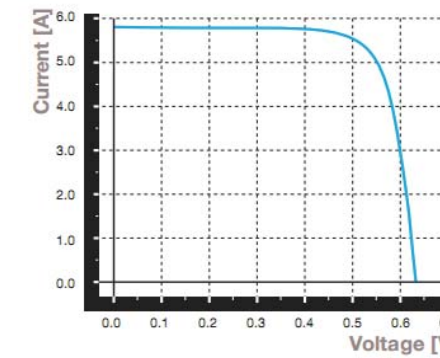
\* Data under testing condition (STC):1000±50W/m<sup>2</sup>,25±2°C

### DIAGRAM



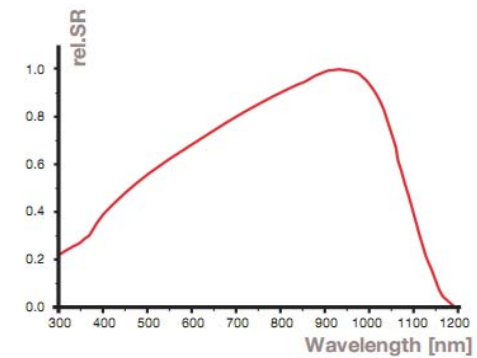
### SPECTRAL RESPONSE

#### IV CURVE



\*calibrated against fraunhofer ISE freiburg

#### SPECTRAL RESPONSE



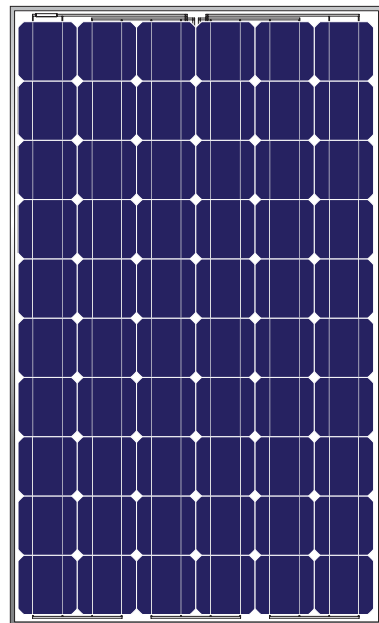
### INTENSITY DEPENDENCE

Intensity [ W/m <sup>2</sup> ]	Isc× [mA]	Voc× [mV]
1000	1.00	1.000
900	0.90	0.994
500	0.50	0.969
300	0.30	0.946
200	0.20	0.929

Ratio of Voc ( Isc ) at reduced intensity to Voc ( Isc ) at 1000 W/m<sup>2</sup>

# GS156-M60

235-255W



## Product Overview

Giga Solar modules are composed of welded monocrystalline or polycrystalline cells arranged in a parallel cells array, laminated with TPT, EVA glue and iron-tempered glass and integrated with anodized aluminum frame.

The 'Made by Giga Solar' brand is a full range of mono/poly modules which can be adapted to different situations in residential, commercial and utility applications. Power ranges from 30W to 300W.

## Module Characteristics

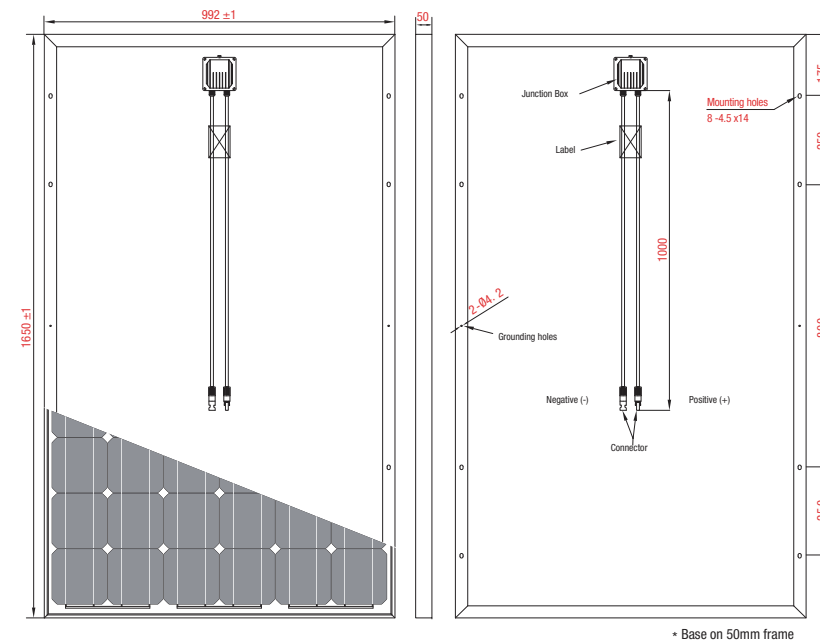
- Assembled with high quality GIGA Solar cells.
- Each module is made using the same grade power and color cells, ensuring output efficiency and perfect visual effect.
- With TUV and UL certification and having passed IEC61215 and IEC61730 performance test ensuring the panels will function normally under harsh conditions;
- Passed IEC 5400Pa mechanical strength test, demonstrating modules ability to withstand all weather environments and strong snow-loading capacity;
- 25-year power output assurance; 10-year quality warranty.

## Mechanical Parameters

Cells	Mono 156mm*156 ( mm )
Connections	60 ( 10*6 )
Weight	19.5kg
Dimensions	1650*992*50 ( mm )
Panel	Tempered Glass
Frame	Anodized Aluminum
Packaging	25pcs/carton

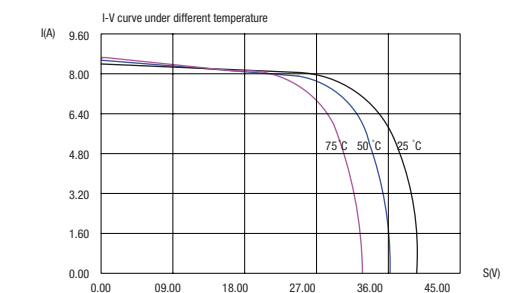
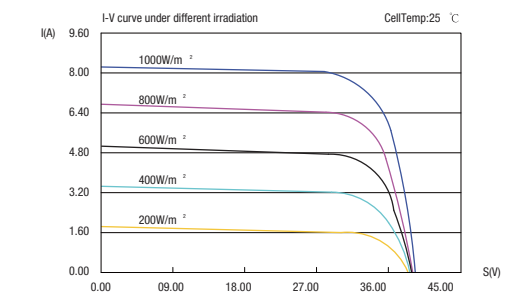
## Working Conditions

Operating Temp.	-40°C~+85°C
Maximum System Voltage	DC 1000V(TUV)/600V(UL)
Maximum Series Fuse	15A
Static Loading	5400Pa
NOCT	47±2°C
Insulation Resistance	≥100MΩ



## I-V CURVE

Output under different irradiation and the correlation between Isc/Voc/ Pmax and Temperature map

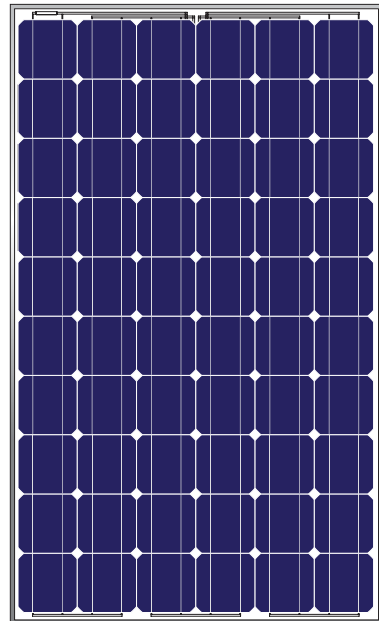


## ELECTRICAL PARAMETERS

	235	240	245	250	255				
Rated Maximum Power at STC (W)	235	240	245	250	255				
Open Circuit Voltage (Voc/V)	37.20	37.50	37.70	37.90	38.10				
Maximum Power Voltage (Vmp/V)	30.20	30.65	31.00	31.40	31.70				
Short Circuit Current (Isc/A)	8.40	8.45	8.53	8.62	8.72				
Maximum Power Current (Imp/A)	7.78	7.83	7.90	7.96	8.05				
Power Tolerance						+3%			
$\alpha_{Isc}$						0.036%/°C			
$\beta_{Voc}$						-0.310%/°C			
$\gamma_{Pmp}$						-0.450%/°C			

# GS156-M60

235-255W



## Product Overview

Giga Solar modules are composed of welded monocrystalline or polycrystalline cells arranged in a parallel cells array, laminated with TPT, EVA glue and iron-tempered glass and integrated with anodised aluminum frame.

The 'Made by Giga Solar' brand is a full range of mono/poly modules which can be adapted to different situations in residential, commercial and utility applications. Power ranges from 30W to 300W.

## Module Characteristics

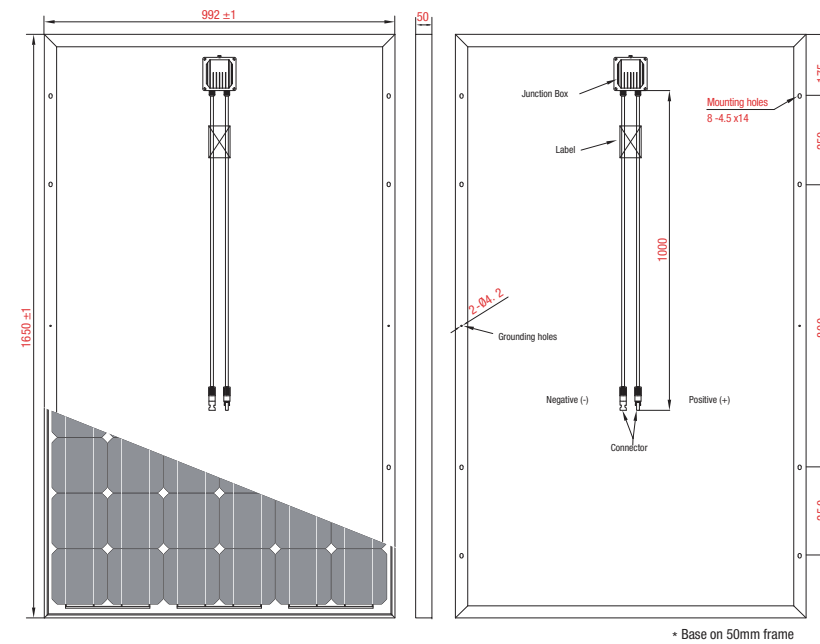
- Assembled with high quality GIGA Solar cells.
- Each module is made using the same grade power and color cells, ensuring output efficiency and perfect visual effect.
- With TUV and UL certification and having passed IEC61215 and IEC61730 performance test ensuring the panels will function normally under harsh conditions;
- Passed IEC 5400Pa mechanical strength test, demonstrating modules ability to withstand all weather environments and strong snow-loading capacity;
- 25-year power output assurance; 10-year quality warranty.

## Mechanical Parameters

Cells	Mono 156mm*156 ( mm )
Connections	60 ( 10*6 )
Weight	19.5kg
Dimensions	1650*992*50 ( mm )
Panel	Tempered Glass
Frame	Anodized Aluminum
Packaging	25pcs/carton

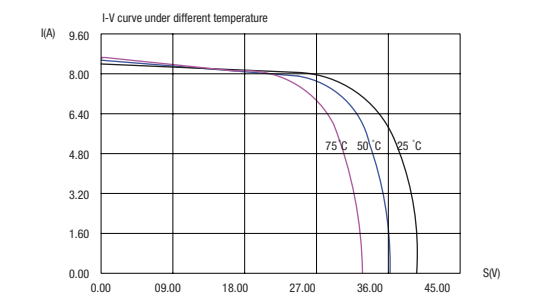
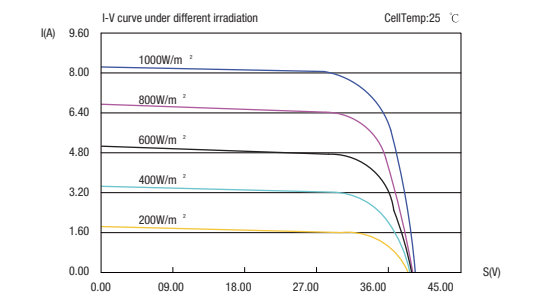
## Working Conditions

Operating Temp.	-40°C~+85°C
Maximum System Voltage	DC 1000V(TUV)/600V(UL)
Maximum Series Fuse	15A
Static Loading	5400Pa
NOCT	47±2°C
Insulation Resistance	≥100MΩ



## I-V CURVE

Output under different irradiation and the correlation between Isc/Voc/ Pmax and Temperature map

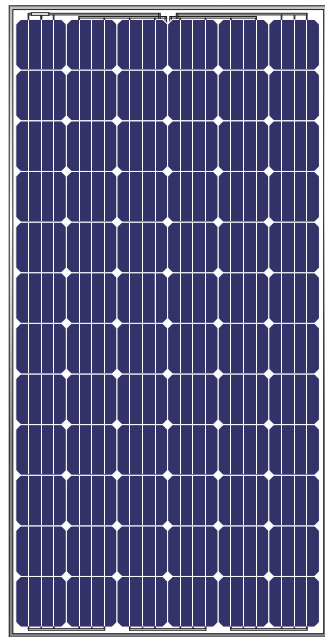


## ELECTRICAL PARAMETERS

	235	240	245	250	255				
Rated Maximum Power at STC (W)	235	240	245	250	255				
Open Circuit Voltage (Voc/V)	37.20	37.50	37.70	37.90	38.10				
Maximum Power Voltage (Vmp/V)	30.20	30.65	31.00	31.40	31.70				
Short Circuit Current (Isc/A)	8.40	8.45	8.53	8.62	8.72				
Maximum Power Current (Imp/A)	7.78	7.83	7.90	7.96	8.05				
Power Tolerance						+3%			
$\alpha_{Isc}$						0.036%/°C			
$\alpha_{Voc}$						-0.310%/°C			
$\alpha_{Pmp}$						-0.450%/°C			

GS156-M72

285-305W



### Product Overview

Giga Solar modules are composed of welded monocrystalline or polycrystalline cells arranged in a parallel cells array, laminated with TPT, EVA glue and iron-tempered glass and integrated with anodized aluminum frame.

The 'Made by Giga Solar' brand is a full range of mono/poly modules which can be adapted to different situations in residential, commercial and utility applications.

Power ranges from 30W to 300W.

### Module Characteristics

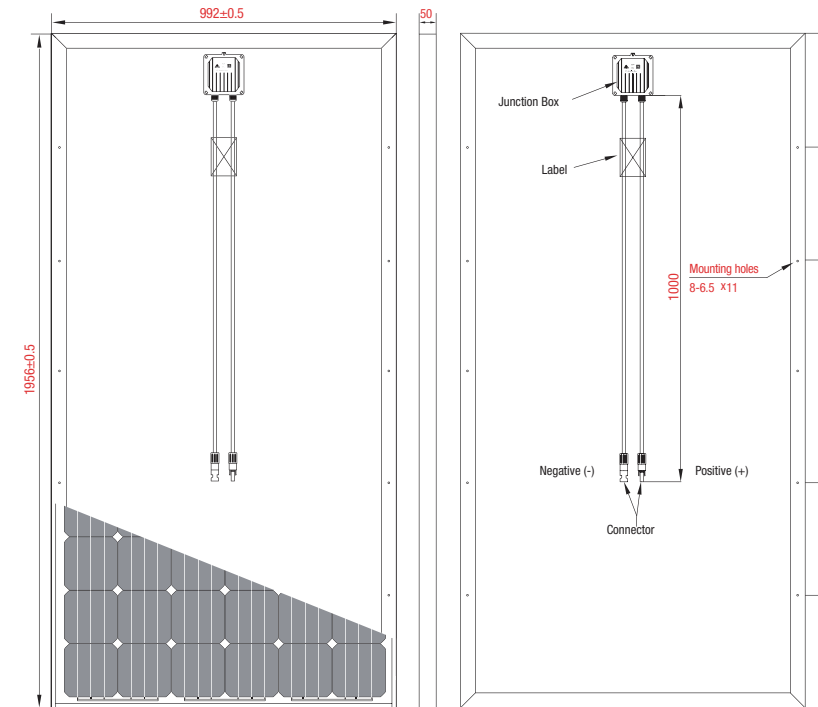
- Assembled with high quality GIGA Solar cells.
- Each module is made using the same grade power and color cells, ensuring output efficiency and perfect visual effect.
- With TUV and UL certification and having passed IEC61215 and IEC61730 performance test ensuring the panels will function normally under harsh conditions;
- Passed IEC 5400Pa mechanical strength test, demonstrating modules ability to withstand all weather environments and strong snow-loading capacity;
- 25-year power output assurance; 10-year quality warranty.

### Mechanical Parameters

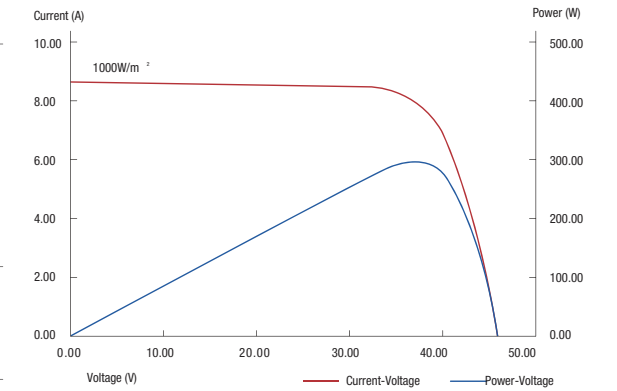
### Working Conditions

Cells	Mono 156mm*156 ( mm )
Connections	72 ( 12*6 )
Weight	22.5kg
Dimensions	1956*992*50 ( mm )
Panel	Tempered Glass
Frame	Anodized Aluminum
Packaging	20pcs/carton

Operating Temp.	-40°C~+85°C
Maximum System Voltage	DC 1000V(TUV)/600V(UL)
Maximum Series Fuse	15A
Static Loading	5400Pa
NOCT	47±2°C
Insulation Resistance	≥100MΩ



### I-V CURVE

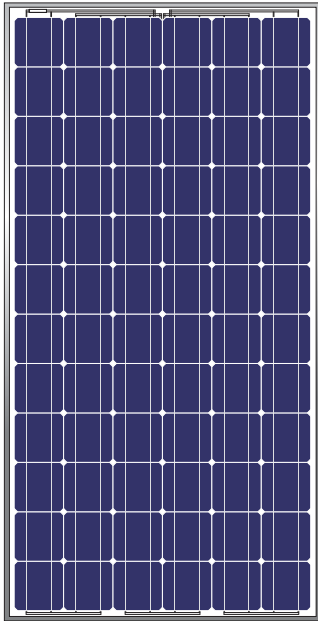


### ELECTRICAL PARAMETERS

Rated Maximum Power at STC (W)	285	290	295	300	305		
Open Circuit Voltage (Voc/V)	44.90	45.10	45.30	45.40	45.50		
Maximum Power Voltage (Vmp/V)	36.50	36.85	37.10	37.45	37.80		
Short Circuit Current (Isc/A)	8.42	8.49	8.55	8.68	8.75		
Maximum Power Current (Imp/A)	7.81	7.88	7.94	8.02	8.07		
Power Tolerance						+3%	
$\alpha_{Isc}$						+0.037%/°C	
$\beta_{Voc}$						-0.297%/°C	
$\gamma_{Pmp}$						-0.438%/°C	

## GS125-M72

180-200W



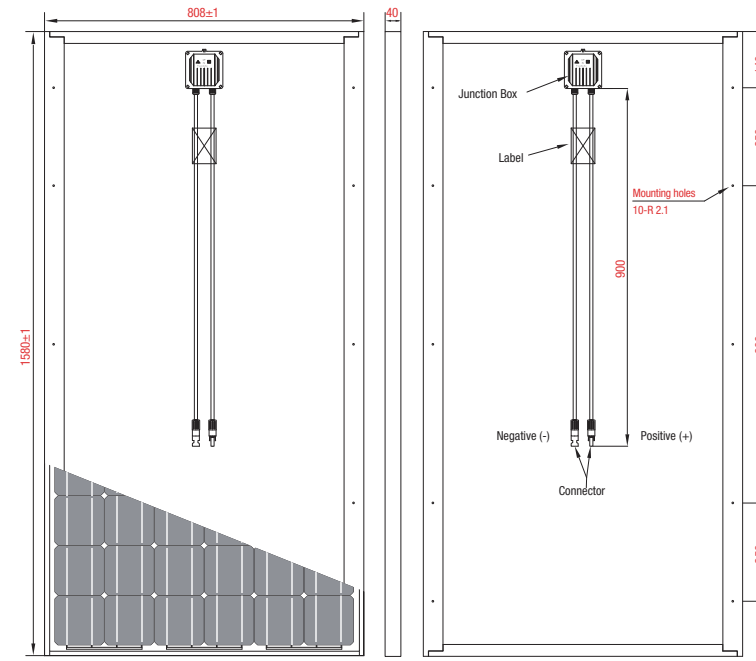
### Product Overview

Giga Solar modules are composed of welded monocrystalline or polycrystalline cells arranged in a parallel cells array, laminated with TPT, EVA glue and iron-tempered glass and integrated with anodized aluminum frame.

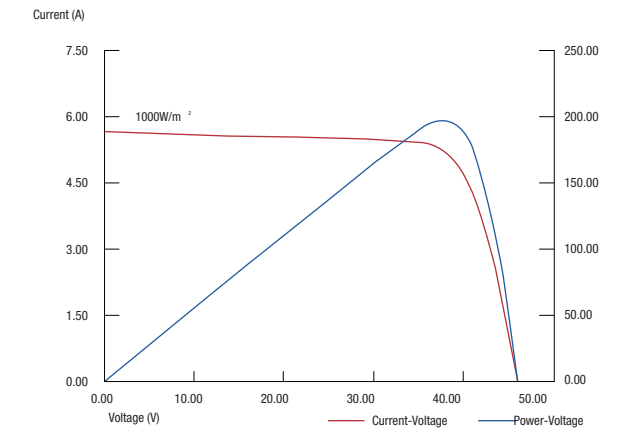
The 'Made by Giga Solar' brand is a full range of mono/poly modules which can be adapted to different situations in residential, commercial and utility applications. Power ranges from 30W to 300W.

### Module Characteristics

- Assembled with high quality GIGA Solar cells.
- Each module is made using the same grade power and color cells, ensuring output efficiency and perfect visual effect.
- With TUV and UL certification and having passed IEC61215 and IEC61730 performance test ensuring the panels will function normally under harsh conditions;
- Passed IEC 5400Pa mechanical strength test, demonstrating modules ability to withstand all weather environments and strong snow-loading capacity;
- 25-year power output assurance; 10-year quality warranty.



### I-V CURVE



### Mechanical Parameters

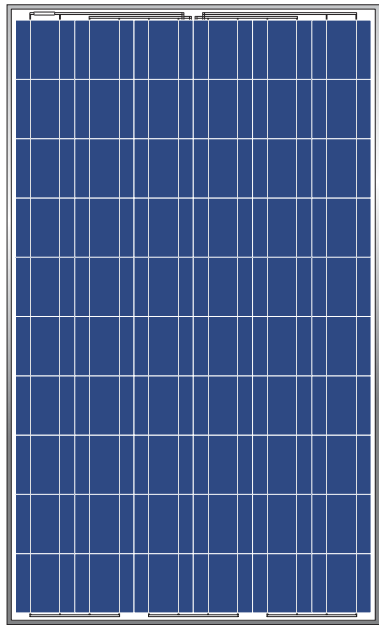
### Working Conditions

Cells	Mono 125mm*125 ( mm )	Operating Temp.	-40°C~+85°C
Connections	72 ( 12*6 )	Maximum System Voltage	DC 1000V(TUV)/600V(UL)
Weight	15.5kg	Maximum Series Fuse	10A
Dimensions	1580*808*40 ( mm )	Static Loading	5400Pa
Panel	Tempered Glass	NOCT	47±2°C
Frame	Anodized Aluminum	Insulation Resistance	≥100MΩ
Packaging	25pcs/carton		

### ELECTRICAL PARAMETERS

Rated Maximum Power at STC (W)	180	185	190	195	200
Open Circuit Voltage (Voc/V)	44.80	45.10	45.35	45.50	45.60
Maximum Power Voltage (Vmp/V)	36.30	36.75	37.10	37.40	37.80
Short Circuit Current (Isc/A)	5.35	5.43	5.52	5.62	5.72
Maximum Power Current (Imp/A)	4.96	5.03	5.12	5.21	5.29
Power Tolerance	+3%				
$\alpha_{Isc}$	0.037%/°C				
$\alpha_{Voc}$	-0.297%/°C				
$\alpha_{Pmp}$	-0.438%/°C				

## GS156-P60 225-245W



### Product Overview

Giga Solar modules are composed of welded monocrystalline or polycrystalline cells arranged in a parallel cells array, laminated with TPT, EVA glue and iron-tempered glass and integrated with anodised aluminum frame.

The 'Made by Giga Solar' brand is a full range of mono/poly modules which can be adapted to different situations in residential, commercial and utility applications. Power ranges from 30W to 300W.

### Module Characteristics

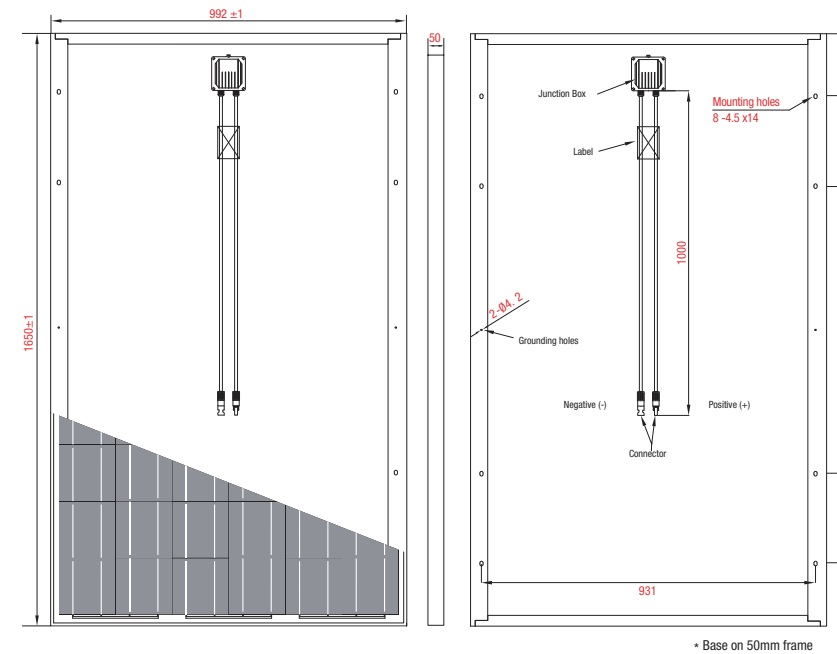
- Assembled with high quality GIGA Solar cells.
- Each module is made using the same grade power and color cells, ensuring output efficiency and perfect visual effect.
- With TUV and UL certification and having passed IEC61215 and IEC61730 performance test ensuring the panels will function normally under harsh conditions;
- Passed IEC 5400Pa mechanical strength test, demonstrating modules ability to withstand all weather environments and strong snow-loading capacity;
- 25-year power output assurance; 10-year quality warranty.

### Mechanical Parameters

### Working Conditions

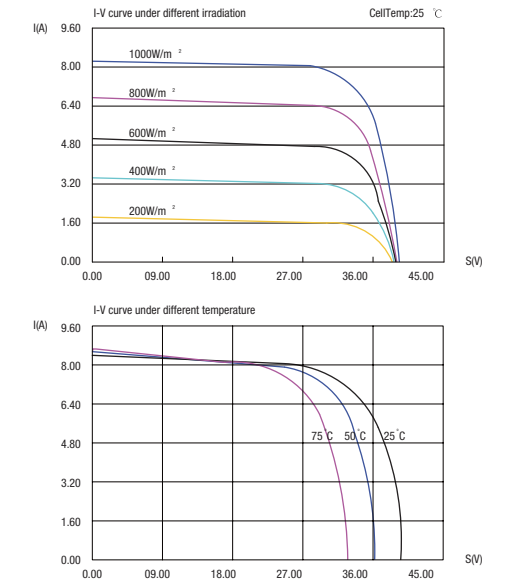
Cells	Poly 156mm*156 ( mm )
Connections	60 ( 10*6 )
Weight	19.5kg
Dimensions	1650*992*50 ( mm )
Panel	Tempered Glass
Frame	Anodized Aluminum
Packaging	25pcs/carton

Operating Temp.	-40°C~+85°C
Maximum System Voltage	DC 1000V(TUV)/600V(UL)
Maximum Series Fuse	15A
Static Loading	5400Pa
NOCT	47±2°C
Insulation Resistance	≥100MΩ



### I-V CURVE

Output under different irradiation and the correlation between Isc/Voc/ Pmax and Temperature map

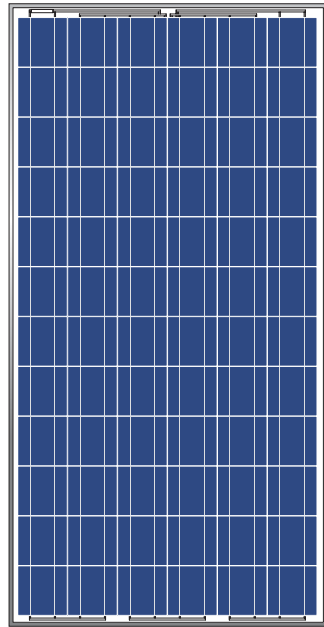


### ELECTRICAL PARAMETERS

	225	230	235	240	245
Rated Maximum Power at STC (W)	225	230	235	240	245
Open Circuit Voltage (Voc/V)	36.60	36.80	37.00	37.20	37.40
Maximum Power Voltage (Vmp/V)	29.10	29.60	30.00	30.40	30.70
Short Circuit Current (Isc/A)	8.35	8.41	8.48	8.54	8.59
Maximum Power Current (Imp/A)	7.73	7.78	7.84	7.90	7.98
Power Tolerance					+3%
$\alpha_{Isc}$					0.036%/°C
$\beta_{Voc}$					-0.310%/°C
$\gamma_{Pmp}$					-0.450%/°C

## GS156-P72

275-295W



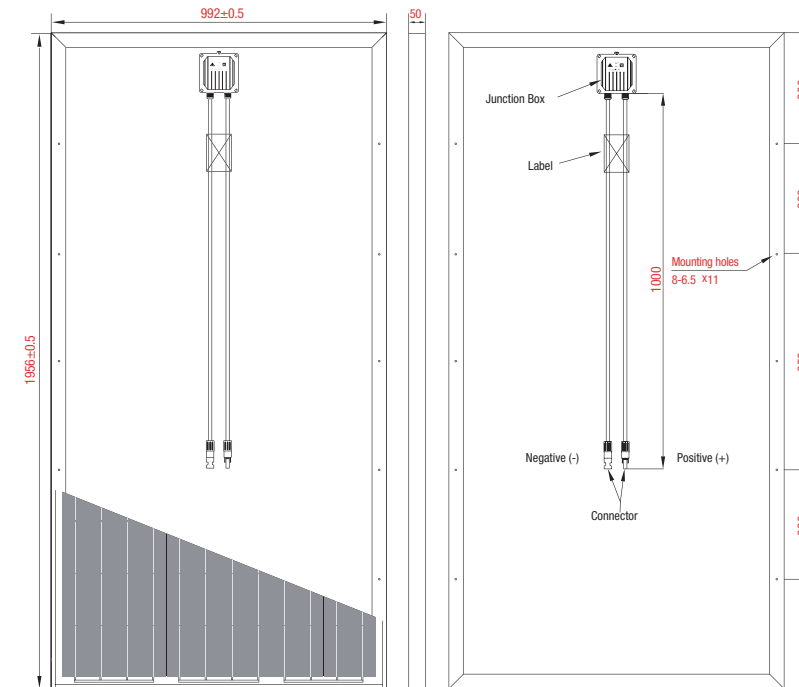
### Product Overview

Giga Solar modules are composed of welded monocrystalline or polycrystalline cells arranged in a parallel cells array, laminated with TPT, EVA glue and iron-tempered glass and integrated with anodised aluminum frame.

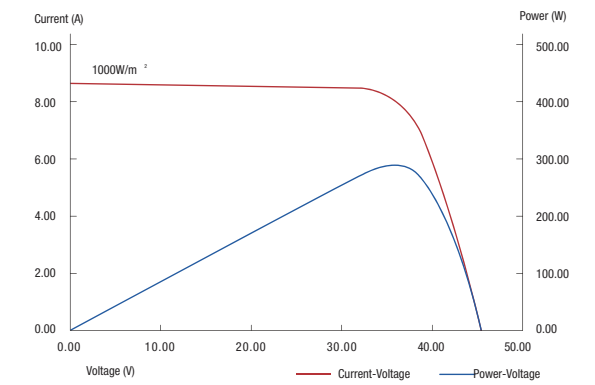
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### Module Characteristics

- Assembled with high quality GIGA Solar cells.
- Each module is made using the same grade power and color cells, ensuring output efficiency and perfect visual effect.
- With TUV and UL certification and having passed IEC61215 and IEC61730 performance test ensuring the panels will function normally under harsh conditions;
- Passed IEC 5400Pa mechanical strength test, demonstrating modules ability to withstand all weather environments and strong snow-loading capacity;
- 25-year power output assurance; 10-year quality warranty.



### I-V CURVE



### Mechanical Parameters

### Working Conditions

Cells	Poly 156mm*156 ( mm )	Operating Temp.	-40°C~+85°C
Connections	72 ( 12*6 )	Maximum System Voltage	DC 1000V(TUV)/600V(UL)
Weight	22.5kg	Maximum Series Fuse	15A
Dimensions	1956*992*50 ( mm )	Static Loading	5400Pa
Panel	Tempered Glass	NOCT	47±2°C
Frame	Anodized Aluminum	Insulation Resistance	≥100MΩ
Packaging	20pcs/carton		

### ELECTRICAL PARAMETERS

Rated Maximum Power at STC (W)	275	280	285	290	295
Open Circuit Voltage (Voc/V)	43.90	44.10	44.30	44.50	44.70
Maximum Power Voltage (Vmp/V)	35.40	35.80	36.25	36.75	37.20
Short Circuit Current (Isc/A)	8.40	8.46	8.51	8.55	8.61
Maximum Power Current (Imp/A)	7.77	7.82	7.86	7.90	7.94
Power Tolerance	+3 %				
$\alpha_{Isc}$	+0.036%/°C				
$\beta_{Voc}$	-0.310%/°C				
$\gamma_{Pmp}$	-0.450%/°C				





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