

MANUFACTURER



SOLAR INNOVA GREEN TECHNOLOGY, S.L.

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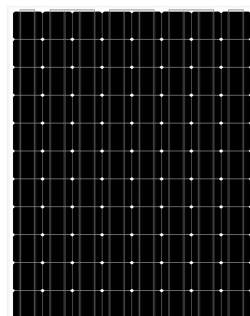
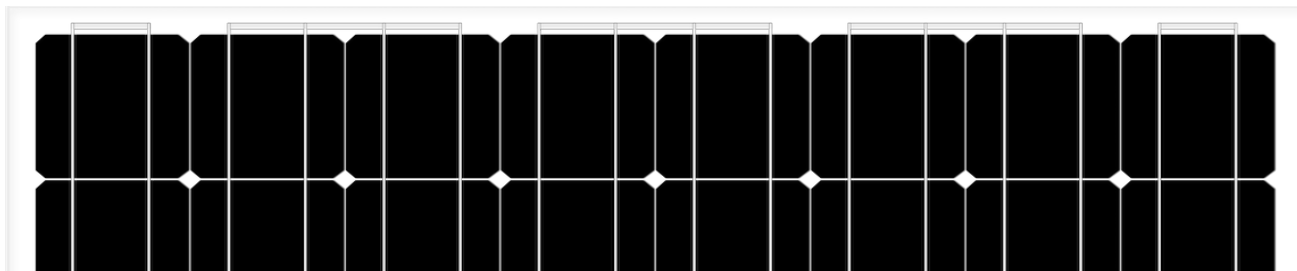
W: www.solarinnova.net



PHOTOVOLTAIC MODULES

Series	GLASS/GLASS	Reference	SI-ESF-M-BIPV-GG-M125-88	Type	MONOCRYSTALLINE
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INTRODUCTION



MATERIALS

Solar Innova uses the latest materials to manufacture photovoltaic modules.

USE

Our modules are ideal for any application that uses the photoelectric effect as a clean energy source because of its minimal chemical pollution and no noise pollution.

FRONT

The front of the module contains a tempered solar glass with:

High transmissivity.

Low reflectivity.

Low iron content.

PV CELLS

These PV modules use high-efficiency monocrystalline silicon cells (the cells are made of a single crystal of high purity silicon) to transform the energy of sunlight into electric energy.

Each cell is electrically rated to optimize the behavior of the module.

Its performance is excellent over the entire range of light spectrum, with particularly high yields in low light situations or cloudiness to direct sunlight (diffuse radiation).

ENCAPSULANT

The cell circuit is laminated using as encapsulant:

EVA (Ethylene-Vinyl Acetate).

POE (Polyolefin).

PVB (Polivinil Butiral).

BACK

The rear of the module contains a tempered glass which provides complete protection and seals against environmental agents and electrical insulation.

JUNCTION BOX

The junction boxes with IP67, are made from high temperature resistant plastics and containing terminals, connection terminals and protection diodes (by-pass).

These modules are supplied with symmetric lengths of cable, with a diameter of copper section of 4 mm and an extremely low contact resistance, all designed to achieve the minimum voltage drop losses.

PERFORMANCE

Our modules comply with all safety requirements not only flexibility but also double insulation and high resistance to UV rays, all are suitable for use in outdoor applications. The design of these modules makes their integration in both industrial and residential buildings (one of the most emerging sectors in the photovoltaic market), and other infrastructure, simple and aesthetic.

QUALITY CONTROL

We have quality control divided into three elements:

Regular inspections allow us to guarantee the quality of the raw material.

Quality control in the process of our manufacturing procedures.

Quality control of finished products, we conduct through inspections and tests of reliability and performance.

WARRANTIES

Our manufacturing plants have been prepared in accordance with:

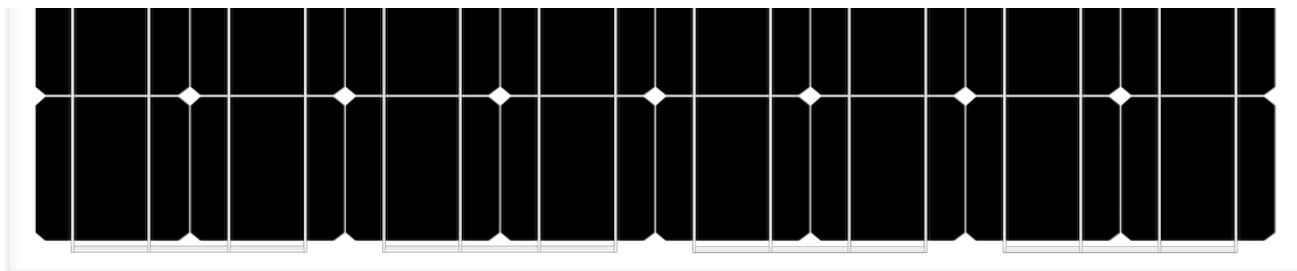
ISO 9001, in terms of Quality Systems and Business.

ISO 14001, in terms of Environmental Management Systems.

OHSAS 18001, in terms of Management Systems Health and Safety.

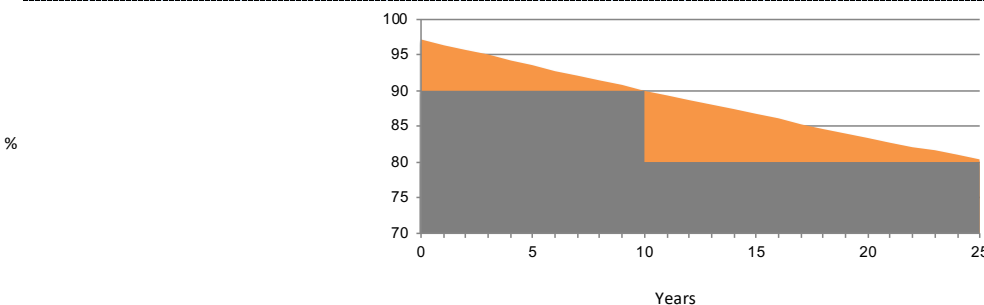
CERTIFICATES

Our PV modules are certified by internationally recognized laboratories and are proof of our strict adherence to international safety standards, long term performance and overall quality of products.



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PHOTOVOLTAIC MODULES															
Series	GLASS/GLASS			Reference	SI-ESF-M-BIPV-GG-M125-88			Type	MONOCRYSTALLINE						
PV CELLS															
ELECTRICAL CHARACTERISTICS															
Type	Monofacial			sc-Si											
MECHANICAL CHARACTERISTICS				TEMPERATURE COEFFICIENTS											
Size	mm 125 x 125 ±0,5			Tk Voltage	% / K			-0,36							
Thickness	µm 210 ±20			Tk Current	% / K			0,07							
Front	[-] Si3N4 anti-reflection coating			Tk Power	% / K			-0,38							
Back	[+] Aluminum back surface field (Al-BSF)														
PV MODULES															
ELECTRICAL CHARACTERISTICS															
STC CONDITIONS															
Maximum power	[Pmpp]	Wp	255	260	265	270	±3% (*)								
Power selection	[Pmpp]	Wp	0/+5												
Voltage at maximum power	[Vmpp]	V	46,11	46,29	46,46	46,64	IEC 60904-1								
Current at maximum power	[Impp]	A	5,52	5,61	5,70	5,79	IEC 60904-3								
Open circuit voltage	[Voc]	V	56,08	56,25	56,37	56,40	±3% (*)								
Short circuit current	[Isc]	A	5,78	5,92	6,03	6,13	±4% (*)								
Maximum system voltage	[Vsyst]	V	1500 / 1000				IEC / UL								
Maximum series fuse rating	[Icf]	A	15												
Efficiency	[ηm]	%	16,36	16,70	17,03	17,36									
Form Factor	[FF]	%	78,48	78,00	77,94	78,15									
STC (Standard Test Conditions):				Irradiance: 1000 W/m2 + Cell Temperature: 25º C + Air Mass: 1.5											
				* (Considering LID, the power range of the certification authority)											
NMOT CONDITIONS															
Maximum power	[Pmpp]	Wp	188	191	195	199	IEC 61215								
Voltage at maximum power	[Vmpp]	V	41,98	42,15	42,31	42,47									
Current at maximum power	[Impp]	A	4,48	4,56	4,63	4,70									
Open circuit voltage	[Voc]	V	51,25	51,41	51,52	51,55									
Short circuit current	[Isc]	A	4,69	4,80	4,89	4,97									
NMOT (Nominal Module Operating Temperature):				Irradiance: 800 W/m2 + Ambient Temperature: 20º C + Air Mass: 1.5 + Wind Speed: 1 m/s											
MECHANICAL CHARACTERISTICS															
PANEL	WIDTH (X)		HIGH (Y)	AREA											
Size	1069	x	1455	mm				1,56 m2							
CELLS															
Size	125	x	125	mm				210 mm 0,16 m2							
Quantity	8	x	11	= 88 units				1,38 m2							
COMPONENTS															
MATERIAL	QUANTITY	THICKNESS (Z)	DESCRIPTION	DENSITY	TOTAL WEIGHT										
Glass-1	1 units	3,2 mm	Tempered	8,10 kg/m2	12,60 kg										
Sheet Encapsulant	1 units	0,38 mm	EVA	0,40 kg/m2	0,63 kg										
Busbars	5 units	0,2 mm	CuSn6	0,10 kg/m2	0,14 kg										
PV Cells	88 units	0,21 mm	sc-Si	0,20 kg/m2	0,28 kg										
Sheet Encapsulant	1 units	0,38 mm	EVA	0,40 kg/m2	0,63 kg										
Glass-2	1 units	3,2 mm	Tempered	8,10 kg/m2	12,60 kg										
Junction Box	1 units	10 mm	Monopolar	0,10 kg/m2	0,10 kg										
Diodes (By-pass)	5 units			0,01 kg/m2	0,02 kg										
Cables (+/-)	2 units	4 mm2	900 mm	0,10 kg/m2	0,20 kg										
Connectors	2 units	MC4-T4 type	PVC-IP67	0,05 kg/m2	0,10 kg										
TOTAL		7,57 mm		19,84 kg/m2	27,29 kg										
THERMAL CHARACTERISTICS															
TEMPERATURE COEFFICIENTS				MONOCRYSTALLINE											
Temperature coefficient of short circuit current			α	[Isc]	0,0814			% / º C							
Temperature coefficient of open circuit voltage			β	[Voc]	-0,3910			% / º C							
Temperature coefficient of maximum power			γ	[Pmpp]	-0,5141			% / º C							
Temperature coefficient of current at maximum power				[Impp]	0,1000			% / º C							
Temperature coefficient of voltage at maximum power				[Vmpp]	-0,3800			% / º C							
Nominal Module Operating Temperature				[NMOT]	+ 47 ± 2			º C							
TOLERANCES															
Working temperature			- 40 / + 85 ºC		Glass dimension		< ± 2,5 mm		EN 12543-5						
Dielectric isolation voltage			3000 V		Glass symmetry tolerance		< ± 3 mm		EN 12543-5						
Relative humidity			0 / 100 %		Cell single string distolerance		< ± 1 mm		EN 12543-6						
Wind resistance			2400 Pa 245 kg/m2						IEC 61215						
Snow resistance			5400 Pa 551 kg/m2		Maximum hail resistance		Ø 35 97 m/s		IEC 61215						
Conductivity at ground			≤ 0.1 Ω		Resistance		≥ 100 Ω								
CLASSIFICATIONS															
Application class		A Class IEC 61730		Pollution		Degree 1		IEC 61730							
Electrical protection class		II Class IEC 61140 IEC 61730		Material		Group I		IEC 61730							
Fire safety class		A Class ANSI/UL 790 IEC 61730		Safety		Factors 1.5		IEC 61730							
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PHOTOVOLTAIC MODULES						
Series	GLASS/GLASS		Reference	SI-ESF-M-BIPV-GG-M125-88	Type	MONOCRYSTALLINE
DRAWING						
JUNCTION BOX						
Position	Front	-	Rear	-	Axis (X)	Axis (Y)
PANEL						
FRONT			REAR			
WIDTH (X)			1069 mm			
PERFORMANCE						
CELLS						
TEMPERATURE			IRRADIANCE			
Temperature depending on Isc, Voc and Pmax			Irradiance depending on Isc, Voc and Pmax (cell temperature: 25° C)			
Isc, Voc, Pmax normalized (%)						
	Cell temperature (° C)			Irradiance (W/m2)		
	--- Pmax --- Voc --- Isc			--- Voc --- Isc --- Pmax		
PANELS						
TEMPERATURE			IV-IRRADIANCE			
Electrical performance (cell temperature: 25° C)						
Current (A)						
	Voltage (V)			Voltage (V)		
	--- I-V 1000 W/m2 --- I-V 800 W/m2 --- I-V 600 W/m2 --- I-V 400 W/m2 --- I-V 200 W/m2			I-V (-25°C) I-V (0°C) I-V (+25°C) I-V (+50°C) I-V (+75°C)		
SOLAR SIMULATOR						
Class	AAA	IEC 60904-9	Power measurement uncertainty is		± 3 %	
ELECTRICAL MEASURES						
STC CONDITIONS			NMOT CONDITIONS			
Irradiance	1000 W/m2	IEC 60904-1	Irradiance	800 W/m2	IEC 61215	
Cell temperature	25 °C	IEC 60904-3	Ambient temperature	20 °C		
Air Mass	1,5	ASTM G173	Air Mass	1,5	ASTM G173-03	
		ASTM 1036	Wind speed	1 m/s		
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PHOTOVOLTAIC MODULES					
Series	GLASS/GLASS		Reference	SI-ESF-M-BIPV-GG-M125-88	Type MONOCRYSTALLINE
STANDARD GUARANTEES					
LINEAR PERFORMANCE WARRANTY					
					
Manufacturing defects	12 years.				
Performance	90 %	of rated power after	12	years of operation,	
	80 %	of rated power after	25	years of operation.	
Lifespan	> 30 years.				
ENVIRONMENTAL INFORMATION					
Solar Hours Peak	6 day		kWh	Coal	Petrol/Gas Combined
Irradiation rate	1000 W/ m2			1	0,961 0,828 0,372 kg/CO2
Energy generated	1,53 kWh/ day	Avoid	day	1,47 1,26	0,57 kg/CO2
	46 kWh/ month	CO2	month	44,03 37,94	17,04 kg/CO2
	557 kWh/ year	emissions	year	535,70 461,56	207,37 kg/CO2
CERTIFICATES					
ISO 9001	Quality Management Systems.				
ISO 14001	Environmental Management Systems.				
OHSAS 18001	Occupational Health and Safety Management Systems.				
CE	Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.				
IEC/EN 61215	Crystalline silicon terrestrial photovoltaic (PV) modules. Design qualification and type approval.				
IEC/EN 61730-1	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction.				
IEC/EN 61730-2	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing.				
IEC/EN 61701	Salt mist corrosion testing of photovoltaic (PV) modules.				
IEC/EN 62716	Photovoltaic (PV) modules - Ammonia corrosion testing.				
UNE-EN IEC 62804-1	Photovoltaic (PV) Modules - Test Methods for the detection of potential-induced degradation. Part 1: Crystalline silicone.				
IEC/EN 62790	Junction boxes for photovoltaic modules - Safety requirements and tests.				
IEC/EN 62852	Connectors for DC-application in photovoltaic systems - Safety requirements and test.				
UL 1703	Standard for Flat-Plate Photovoltaic Modules and Panels.				
      					
PACKING					
CONTAINER 20'			CONTAINER 40'HQ		
PANELS X PALLET	PALLETS	TOTAL	PANELS X PALLET	PALLETS	TOTAL
-	-	-	26	22	572
IEC 62759-1 Photovoltaic (PV) modules - Transportation testing - Part 1: Transportation and shipping of module package units.					
EXPORT INFORMATION					
HS Code	85414020	TARIC code	8541409021		
COMMENTS					
NOTICE					
The specifications and technical data may be subject to possible modifications without notice.					
This data sheet are conform to the requirements of the Standard EN 50380:2018.					
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