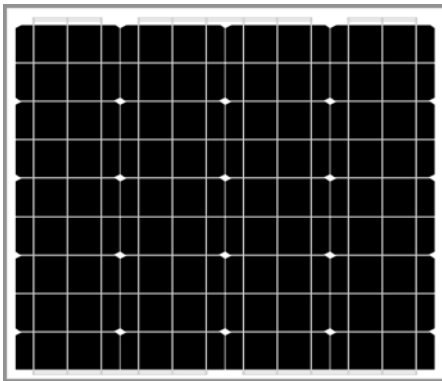
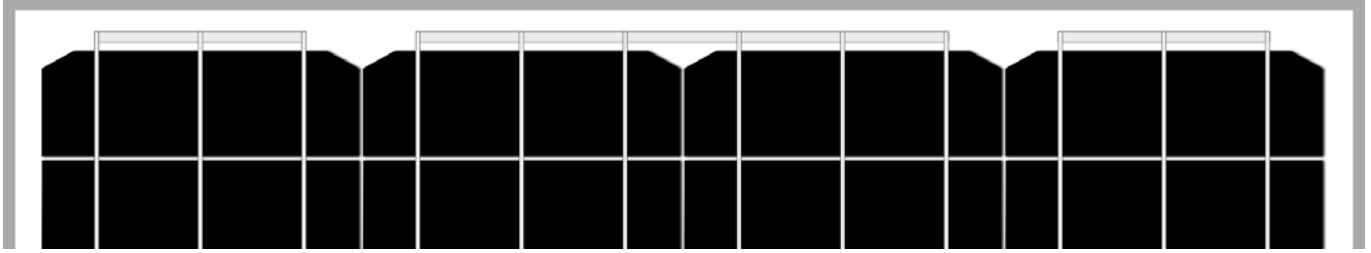




## PHOTOVOLTAIC SOLAR ENERGY

### MONOCRYSTALLINE MODULES - SI-ESF-M-NE-M-45W



#### ABOUT SOLAR INNOVA

Solar Innova uses the latest materials to manufacture photovoltaic modules. This ensures that we can control our quality strictly in raw materials and production processes, offering our customers a durable and sustainable performance products backed by our 25 year limited power warranty.

#### PERFORMANCE

These photovoltaic 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.

#### RESISTANCE

The compact, anodized aluminum frame provides an optimal relationship-weight moment of inertia, to obtain greater rigidity and resistance to twisting and bending. It has several holes to attach the module to the support structure and ground if necessary.

#### QUALITY

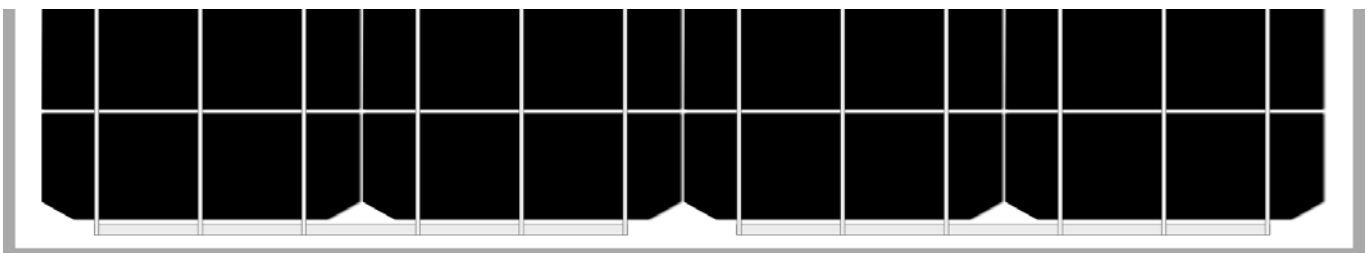
The photovoltaic modules from Solar Innova have passed several international certification requirements and continue to even improve on an already superior quality and performance of products of proven technologies. Quality is one of our core principles and the pursuit of quality is the engine of the company's future, in our desire to continually offer better products.

#### CERTIFICATES

Our manufacturing plants have been prepared in accordance with:

- ✓ ISO 9001:2008, in terms of Quality Systems and Business.
- ✓ ISO 14001:2004, in terms of Environmental Management Systems.
- ✓ OHSAS 18001:2007, in terms of Management Systems Health and Safety.

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.





## PHOTOVOLTAIC SOLAR ENERGY MONOCRYSTALLINE MODULES - SI-ESF-M-NE-M-45W

### ELECTRICAL CHARACTERISTICS (STC)

Maximum power (Pmpp)	[Wp]	45
Tolerance	[Wp]	0 ~ + 1.35
Voltage at maximum power (Vmpp)	[V]	17.30
Current at maximum power (Impp)	[A]	2.60
Open circuit voltage (Voc)	[V]	22.50
Short circuit current (Isc)	[A]	2.79
Maximum system Voltage (Vsyst)	[V]	715 (IEC)
Maximum series fuse	[A]	10
Form Factor	[%]	≥ 73

### MECHANICAL CHARACTERISTICS

Height	mm	529
Width	mm	676
Thickness	mm	25
Weight	kg	4.3
Frame	Material	Anodized aluminum AL6063-T5
Front	Material	High transmissivity toughened glass
Front-Thickness	mm	3.2 ± 0.2
Cells	Type	Monocrystalline
Cells	Quantity	4 x 9
Cells-Size	mm	156 x 51
Cells-Serial connection	Quantity	36
Cells-Parallel connection	Quantity	1
Encapsulation	Materials	Glass/EVA/Cells/EVA/TPT
Junction box	Type	IP65
Junction box	Isolation	Versus humidity and inclement weather
Cables	Type	Polarized and symmetric in length
Cables-Length	mm	600
Cables-Section of copper	mm <sup>2</sup>	4
Cables	Features	Low contact resistance Minimal losses for voltage drop
Connectors	Type	MC4

### THERMAL CHARACTERISTICS

Temperature coefficient of short circuit current α (Icc)	%/°C	+ 0.0814
Temperature coefficient of open circuit voltage β (Voc)	%/°C	- 0.3910
Temperature coefficient of maximum power γ (Pmpp)	%/°C	- 0.5141
Temperature coefficient of current at maximum power (Impp)	%/°C	+ 0.10
Temperature coefficient of voltage at maximum power (Vmpp)	%/°C	- 0.38
NOCT (Nominal Operating Cell Temperature)	°C	+ 47 ± 2

### WARRANTIES

Manufacturing defects	Years	12
Performance	Minimal Rated Power	90 % at 10 years,
	%/Years	80 % at 25 years.

