

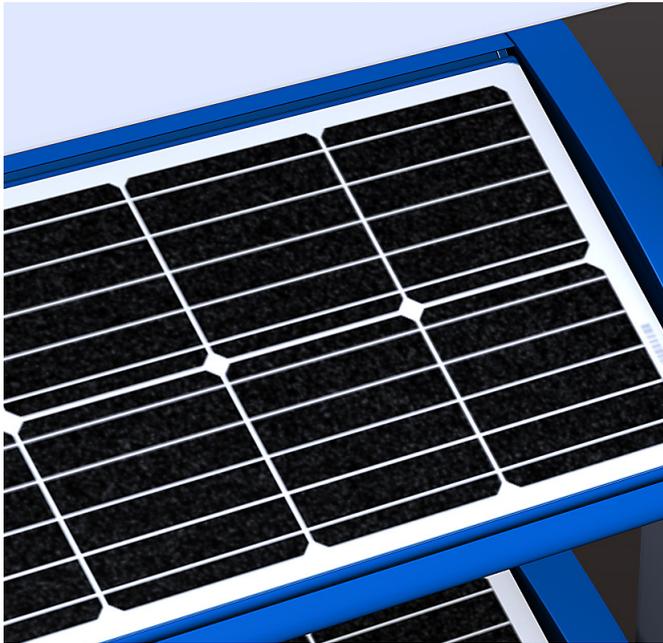
SUNMAN have partnered with Innovative Technologies Pty Ltd (Australia) to integrate its flexible 20 cell Monocrystalline PV Solar Modules with the Patented Solar Shutters® Modules.

The SUNMAN flexible 20 cell Monocrystalline PV Solar Modules are installed into each Solar Shutter blade which comprise the Solar Shutters® multiblade vertical or horizontal modules.

The Solar Shutters® modules are specifically designed to generate renewable solar energy for both vertical window and horizontal roof installation into high rise buildings, business offices, commercial and industrial buildings, warehouses and outdoor courtyards.

The vertical modules can be installed both inside and outside of windows and large glass frontages and as pergola roof structures that open and close to let in air and sunlight and close to create weatherproof shade.

Solar Shutters® modules open and close via electronic controls as required.



The Solar Shutters® modules are engineered to be extremely durable and weather resistant, approximately 20 times stronger than the glass used on conventional solar roof panels, and therefore able to withstand strong winds, rain and hail, and suitable for outdoor and balcony installation in high rise buildings and apartments.

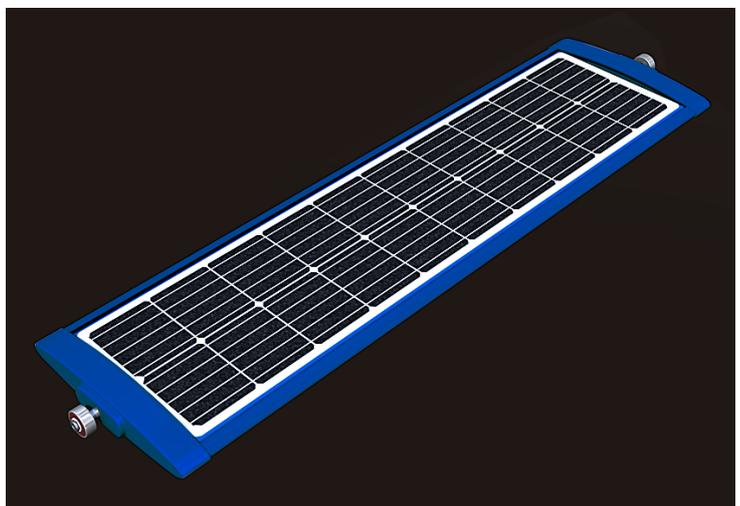
The Solar Shutters® modules offer a very effective method of generating renewable solar energy via existing window space and any outdoor roof surface area, with the benefits of opening or closing the shutters to let in sunshine, light and fresh air, or to create a shaded and weather proof roof surface area.

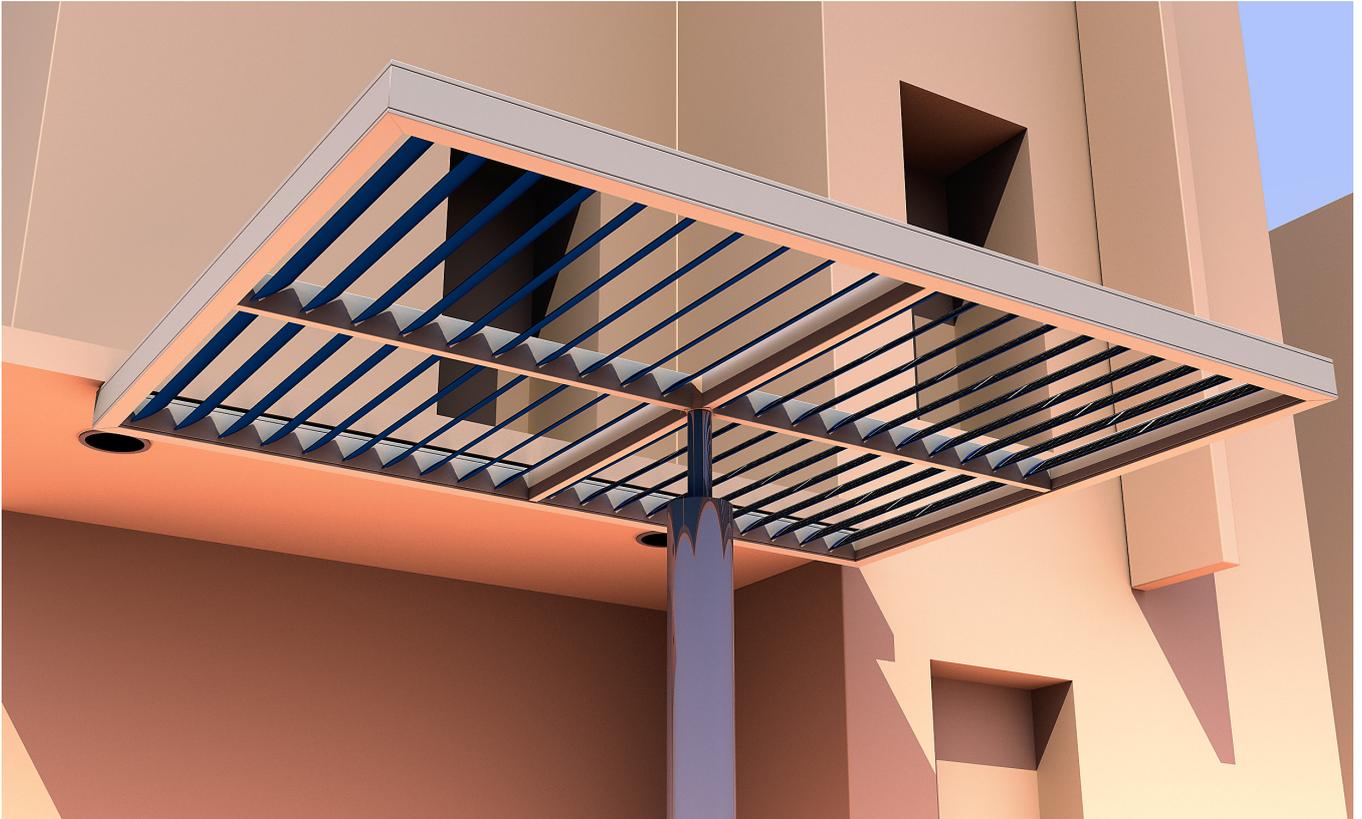
Many high-rise buildings and office towers have significant vertical window space which can now be effectively utilised to generate a significant amount

of renewable solar energy to cumulatively lower the carbon footprint of the building and to convert the solar energy to functional renewable electricity and power for lights and air-conditioning within the building.

## Solar Shutters® Patented Product Features:

1. Patented engineering, design and functionality.
2. Integrated micro-electronics in the supporting frames: specifically; electronic controls and wiring, solar blade opening and closing controls, shade and light controls, AC/DC Inverters, Lithium-Ion Batteries, Wifi device, LED Lights.
3. Vertical window and wall installation/attachment: Enables the effective attachment onto any vertical wall surface area due to the lightweight construction materials, thin profile, and custom designed 'Solar Shutters Connector Channel' installation system which not only physically interconnects the any number of Solar Shutters® modules, but also electronically inter-connects the modules, enabling compounded renewable solar energy generation and capture.
4. Colour Design Options: The Solar Shutters® supporting PV Blades and side Frames can be made in any custom colour or brand design.
5. LED Night Light Option: LED lights can be integrated into the Solar Shutters® PV Blades which can illuminate during the night in any color LED light, which can be powered directly from the PV cells on the same Solar Shutter blades. The net result is that the entire building surface area can be illuminated during the night from daytime renewable solar power capture and energy generation.

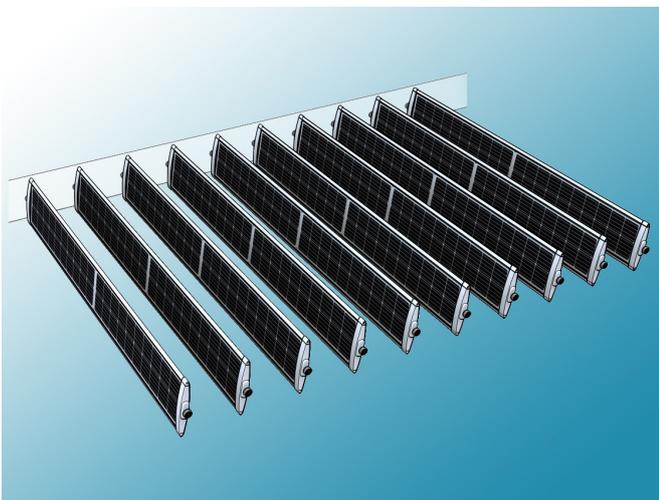




The Solar Shutters® modules can be effectively attached in a horizontal direction and physically and electronically inter-connected to create a Renewable Solar Roof structure which opens or closes as required to create a weatherproof roof for outside courtyards, outdoor entertainment, outdoor car parks, outdoor theatres, parks etc. sunlight and air can be let in as required during the day and can be closed during the night.

These large surface area structures would have the added benefit of generating significant amounts of renewable solar energy, which could be used for any associated business functionality.

### Open and Closed Roof Modes



### 100 Watt 20 Cell Monocrystalline Module



**Ultra-light:** Through replacement of the glass and optimization of the frame eArche weighs as 70% less than conventional PV panels.



**Flexible:** eArche combines a unique, patented material with other industry-leading technologies to produce superior flexible crystalline-silicon panel which can be installed on curved surface.



**Aesthetics:** Aesthetically pleasing design with patented materials and sophisticated manufacturing process results in a high-efficiency, attractive panel, with no light pollution, PID-free operation and high levels of safety.



**Easy Installation:** eArche can reduce installation cost by up to 50% through the use of re-engineered components, ease of handling and faster installation.



**Transportation:** eArche's innovative frame and low weight will very significantly reduce the cost of transportation.



**Deployment:** Ultra-light weight, flexibility and customizable size make eArche the best choice to change the way how solar is deployed in the market and bring added value to special applications.



**Durability:** eArche panels are certified to withstand maximum test load (2400 Pascal), while special materials and stringent quality control ensure panel longevity.

### LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty

25 Year Linear Power Warranty

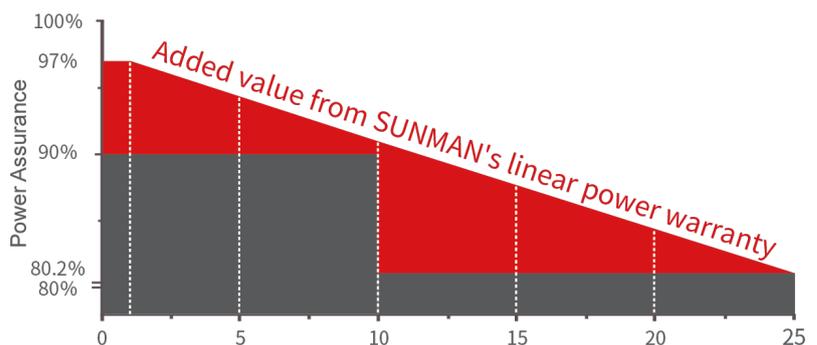


**95-100 W**

**POWER OUTPUT RANGE**

**0-5 W**

**POWER TOLERANCE**



[www.sunman-energy.com](http://www.sunman-energy.com)

## Electrical Characteristics

STC	SMF100M-2X10DW	SMF095M-2X10DW
Maximum Power ( $P_{max}$ )	100	95
Maximum Power Voltage ( $V_{mp}$ )	10.9	10.7
Maximum Power Current ( $I_{mp}$ )	9.18	8.88
Open-circuit Voltage ( $V_{oc}$ )	13.1	12.9
Short-circuit Current ( $I_{sc}$ )	9.70	9.39
Module Efficiency (%)	18.0	17.1
Operating Temperature ( $^{\circ}C$ )	-40 $^{\circ}C$ to 85 $^{\circ}C$	
Maximum System Voltage	1000 V DC (IEC)	
Maximum Series Fuse Rating	20 A	
Application Class	Class A	
Power Tolerance	0/+5 W	

STC: Irradiance 1000W/m<sup>2</sup>, Cell temperature 25 $^{\circ}C$ , AM=1.5.  
Tolerances of  $P_{max}$ ,  $V_{oc}$  and  $I_{sc}$  are within  $\pm 5\%$

NMOT	SMF100M-2X10DW	SMF095M-2X10DW
Maximum Power ( $P_{max}$ )	75	71
Maximum Power Voltage ( $V_{mp}$ )	9.9	9.7
Maximum Power Current ( $I_{mp}$ )	7.58	7.32
Open-circuit Voltage ( $V_{oc}$ )	12.1	11.9
Short-circuit Current ( $I_{sc}$ )	8.03	7.76

NMOT: Irradiance 800W/m<sup>2</sup>, Ambient temperature 20 $^{\circ}C$ , AM=1.5, Wind speed 1 m/s.

## Mechanical Characteristics

Solar Cell	Monocrystalline silicon (6 inches)
No. of Cells	20 (2 $\times$ 10)
Module Dimensions	1633 $\times$ 340 $\times$ 2 mm
Weight	1.5 kgs
Backsheet	White
Frame	Frameless
J-box	IP 68 rated
Output Cables	Photovoltaic technology cable 4.0 mm <sup>2</sup> , (+)150 / (-)450 mm
Connector	MC4 compatible

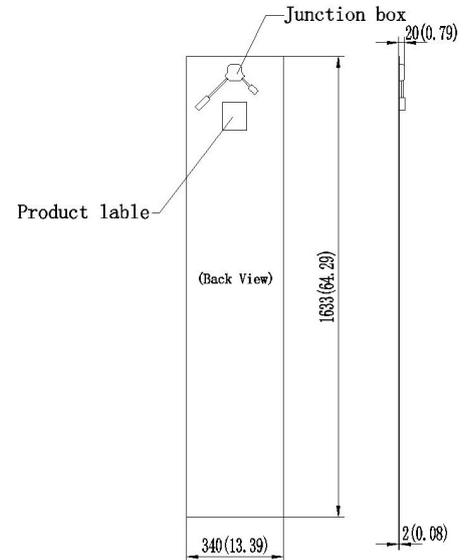
## Packaging Configuration

	20' GP	40' HC
Module per pallet	132	132
Pieces per container	1584	5544

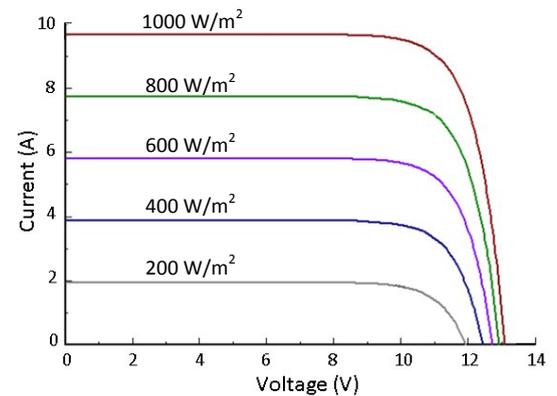
CAUTION: Read installation manual before using the product.

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## Dimensions



## I-V Curve (100)



## Temperature Characteristics

Nominal Module Operating Temperature(NMOT)	41 $\pm$ 2 $^{\circ}C$
Temperature Coefficient of $P_{max}$	-0.38 %/ $^{\circ}C$
Temperature Coefficient of $V_{oc}$	-0.28 %/ $^{\circ}C$
Temperature Coefficient of $I_{sc}$	0.020 %/ $^{\circ}C$

## Dealer Information



SMFDW\_IEC\_EN\_2019A