

# SHARP

## ND series

170 W | 162 W | 158 W

Polycrystalline silicon photovoltaic modules



## SAY YES TO SOLAR POWER!

Because it protects the climate.

### Innovation from the photovoltaic pioneer

Sharp, as a solar specialist with 50 years of experience in photovoltaics (PV), makes an essential contribution towards groundbreaking advancements in solar technology.

The ND Sharp series of photovoltaic modules is designed for applications with a high power requirement. These polycrystalline quality modules produce a sustained, reliable yield even under demanding deployment conditions.

All Sharp ND series modules offer optimal system integration – both technically and economically – and are suitable for installation in grid-coupled systems.



### Brief information for the installer

- 155.6 mm x 155.6 mm polycrystalline solar cells
- 48 cells in series
- 2,400 N/m<sup>2</sup> mechanical load-bearing capacity (245 kg/m<sup>2</sup>)
- 1,000V DC maximum system voltage
- CE tested for your safety

### Product features

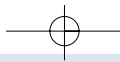
- High performance photovoltaic modules made of polycrystalline (155.6 mm)<sup>2</sup> silicon solar cells with module efficiency of up to 13.0 %.
- Bypass diodes to minimise power loss with shading.
- Textured cell surface for especially high current yields.
- BSF structure (Black Surface Field) for optimising cell efficiency.
- Use of annealed glass, EVA plastic and weather-protection foil, as well as an anodised aluminium frame with water drainage holes for prolonged use.
- Output: connection cable with water-protected plug connector.

### Quality from Sharp

Sharp Solar quality sets standards. Permanent monitoring guarantees consistent high quality. Each module is optically, mechanically and electrically tested. You recognise it from the original Sharp label, the serial number and the Sharp guarantee:

- 2 year product guarantee
- 10 year performance guarantee for a 90 % power output
- min. 20 year performance guarantee for a 80 % power output

The detailed guarantee conditions and further information are available at [www.sharp-world.com](http://www.sharp-world.com).



Mechanical data	
Cell	Polycrystalline (155.6 mm) <sup>2</sup> Sharp silicon solar cells
Number and connection of cells	48 in series
Dimensions	1,318 x 994 x 46 mm (1.31 m <sup>2</sup> )
Weight	16 kg
Connection type	Cable with plug connector (MC-3)

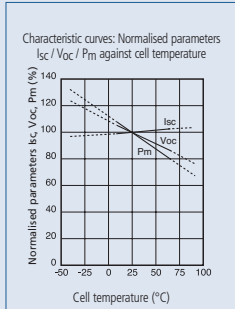
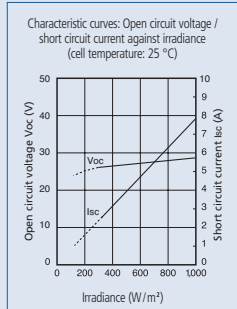
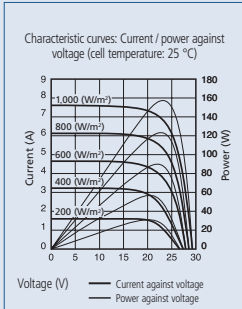
Limit values		
Storage humidity	up to 90	%
Operating temperature (cell)	-40 to +90	°C
Storage temperature	-40 to +90	°C
Maximum system voltage	1,000	V DC
Maximum mechanical load	2,400	N / m <sup>2</sup>
Reverse current rating	15	A

Electrical data	Module production in the EU	ND-170 (E1F)	ND-162 (E1F)*	ND-162 (E1) / ND-162 (E1D)	ND-158 (E1F)*	ND-158 (E1) / ND-158 (E1D)	
	Module production in Japan	ND-Q2 (E3EF)*		ND-Q2 (E3E) / ND-Q2 (E3ED)			
Rated power		170 W <sub>p</sub>	162 W <sub>p</sub>	162 W <sub>p</sub>	158 W <sub>p</sub>	158 W <sub>p</sub>	
Open circuit voltage	V <sub>OC</sub>	29.3	28.8	28.4	28.6	28.4	V
Short circuit current	I <sub>SC</sub>	8.04	7.95	7.92	7.92	7.85	A
Voltage at maximum power	V <sub>PM</sub>	23.2	22.7	22.8	22.5	22.5	V
Current at maximum power	I <sub>PM</sub>	7.33	7.14	7.11	7.03	7.04	A
Module efficiency	η <sub>m</sub>	13.0	12.4	12.4	12.1	12.1	%
Temperature coefficient – open circuit voltage	αV <sub>OC</sub>	-104	-104	-104	-104	-104	mV / °C
Temperature coefficient – short circuit current	αI <sub>SC</sub>	+0.053	+0.053	+0.053	+0.053	+0.053	% / °C
Temperature coefficient – power	αP <sub>m</sub>	-0.485	-0.485	-0.485	-0.485	-0.485	% / °C

The electrical data applies under standard testing conditions (STC): Radiation 1,000 W/m<sup>2</sup> with a spectrum of AM 1.5 and at a cell temperature of 25 °C. The power output is subject to a manufacturing tolerance of - 5 % and + 10 %. The modules manufactured in Europe and Japan are identical.

\*The modules E1F and E3EF have a novel cell connector.

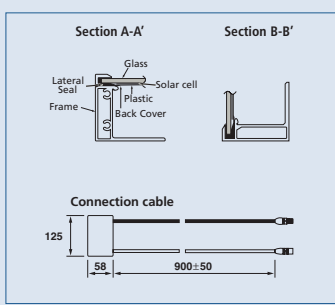
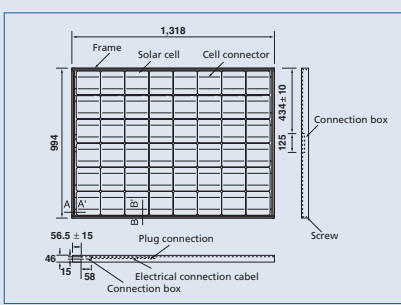
### Characteristic curves



### Applications

- On-grid PV systems
  - Off-grid systems
  - On-roof PV systems (roof parallel)
  - On-roof PV systems (on stilts)
  - Ground installations
- Please read our extensive installation guide carefully prior to installing the photovoltaic modules.

### External dimensions



### Note

Modifications to technical data are possible without prior notice. Please request the current data sheets from Sharp before using Sharp products. Sharp assumes no responsibility for damage caused to equipment fitted with Sharp products based on unverified information.

The specifications may deviate slightly and are not guaranteed. Installation and operating instructions are to be obtained from the relevant manuals or can be downloaded from [www.sharp-world.com](http://www.sharp-world.com).

This module should not be connected directly to a load.



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