

Sharp is a pioneer in photovoltaics /This is Why Sharp solar modules have set standards for over 50 years.



### Innovations from a photovoltaic pioneer

As a solar specialist with more than 50 years' experience in photovoltaics (PV), Sharp makes significant contributions to groundbreaking progress in solar technology. The NAE series of thin-film photovoltaic modules consists of an amorphous and a microcrystalline silicon layer. This microamorphous tandem structure not only absorbs visible light but also the invisible portion of the solar spectrum. This makes especially efficient use of solar energy. All module types of the Sharp NA Series offer optimum system integration, in terms of both technology and economy, and are suitable for installations in grid-connected PV systems.

### Product features

- Tandem structure with an amorphous and a microcrystalline silicon layer offering a stabilised module efficiency of up to 10%
- Two glass layers laminated with a high-performance vapour barrier encapsulant
- Attractive design allowing wide range of applications
- Low temperature coefficients enabling higher energy yields per watt at high temperatures
- Less dirt accumulation due to frameless design
- Installation in landscape or portrait mode
- One bypass diode integrated in the junction box
- No Cadmium – RoHS compliant
- Made in Italy

### Product warranty and performance guarantee

Each product has been carefully manufactured and subjected to operating tests during final inspection. Each product is backed up with a:

- 5-year product guarantee
- 10-year performance guarantee on 90% of the minimum power output
- Up to 25-year performance guarantee on 80% of the minimum power output

For more detailed information, please refer to the terms and condition of the guarantee. End users are required to register their modules in order for the product and power output guarantee to be valid.

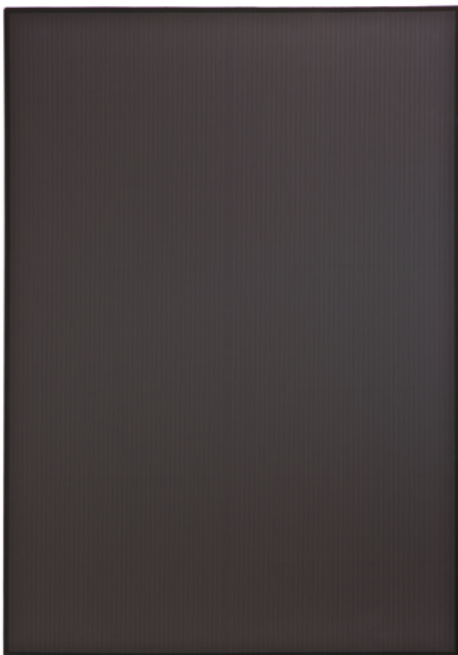
### Certificates and approvals

All modules are tested and certified according to

- IEC/EN 61646 and IEC/EN 61730, Application class A
- Safety class II / CE, Class E in accordance with EN13501-1
- IEC61701 ed2.0 severity 6 salt mist corrosion testing

The manufacturing facility is certified based on

- ISO 9001:2008, ISO 14001:2004 and OHSAS18001:2007



## ELECTRICAL DATA (AT STC)

		Nominal values				Initial values				
		NA-E140L5	NA-E135L5	NA-E130L5	NA-E125L5	NA-E140L5	NA-E135L5	NA-E130L5	NA-E125L5	
Maximum power	$P_{max}$	140	135	130	125	160.9	155.2	149.5	143.7	$W_p$
Open-circuit voltage	$V_{OC}$	61.8	61.3	60.4	59.7	62.5	61.8	61.1	60.4	V
Short-circuit current	$I_{SC}$	3.45	3.41	3.41	3.37	3.53	3.51	3.47	3.43	A
Voltage at point of maximum power	$V_{mpp}$	48.5	47.0	46.1	45.5	50.8	49.3	48.7	48.3	V
Current at point of maximum power	$I_{mpp}$	2.89	2.88	2.82	2.75	3.17	3.15	3.07	2.98	A
Module efficiency	$\eta_m$	10.0	9.6	9.3	8.9					%

STC = Standard Test Conditions: irradiance 1,000 W/m<sup>2</sup>, AM 1.5, cell temperature 25 °C. Rated electrical characteristics of  $I_{SC}$  and  $V_{OC}$  are within  $\pm 10\%$  of the indicated values and  $+7/-2\%$  of  $P_{max}$ . The initial values are approx. 15% higher than the nominal (stabilised) values and will decline within the first weeks of operation. Afterwards the power output will stabilize around the nominal value according to the seasonal changes.

## ELECTRICAL DATA (AT NOCT)

		NA-E140L5	NA-E135L5	NA-E130L5	NA-E125L5	
Maximum power	$P_{max}$	106.7	102.4	98.6	94.8	$W_p$
Open-circuit voltage	$V_{OC}$	57.2	56.8	55.9	55.3	V
Short-circuit current	$I_{SC}$	2.84	2.76	2.76	2.73	A
Voltage at point of maximum power	$V_{mpp}$	46.0	44.0	43.2	42.6	V
Current at point of maximum power	$I_{mpp}$	2.32	2.33	2.29	2.23	A
Nominal operating cell temperature	NOCT	46	46	46	46	°C

NOCT: Module operating temperature at 800 W/m<sup>2</sup> irradiance, air temperature of 20 °C, wind speed of 1 m/s.

## LIMIT VALUES

Maximum system voltage	1,000 V DC
Over-current protection	6 A
Temperature range	-40 to +90 °C
Maximum mechanical load	2,400 N/m <sup>2</sup>

## MECHANICAL DATA

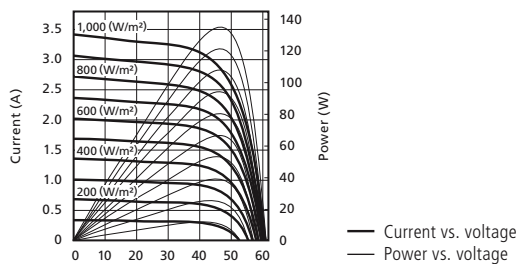
Length	1,402 mm
Width	1,001 mm
Depth (including junction box = 23.3 mm)	6.7 mm
Weight	24 kg

## TEMPERATURE COEFFICIENT

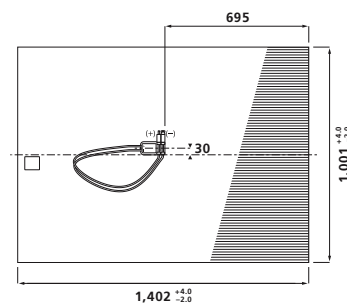
$P_{max}$	-0.24 % / °C
$V_{OC}$	-0.30 % / °C
$I_{SC}$	+0.07 % / °C

## CHARACTERISTIC CURVES NA-E135L5

Characteristic curves: current/power vs. voltage (cell temperature: 25 °C)



## REAR VIEW



## GENERAL DATA

Cells	Tandem cell of amorphous ( $\alpha$ -Si) and microcrystalline ( $\mu$ c-Si) silicon
Front glass   rear glass	low iron non tempered glass   tempered glass
Connection box	PPE/PPO resin, IP65 rating, 1 bypass diode included
Cable	2.5 mm <sup>2</sup> , length 950 mm
Connector	SMK (Type CCT9901-2352F/2452F), IP67 rating To extend the module connection leads, only use SMK connector under the same series or MultiContactAG MC4 connector (PV-KST/KBT4)
Modules per palette	40 pcs

## NOTE

The content of this document is a short product description and does not contain all important information for the user. Please refer to the full specification for each module, follow the instructions on using thin-film PV modules to avoid white spots and follow all instructions in the installation manual (e.g. minus pole grounding, protection with blocking diodes/fuses). Before installing the photovoltaic modules, please make sure you have received all documents.

Sharp Energy Solutions Europe · a division of Sharp Electronics (Europe) Ltd. · Sonninstrasse 3, 20097 Hamburg, Germany · Tel: +49(0)40/2376-0 · Fax: +49(0)40/2376-2193

[www.sharp.eu/solar](http://www.sharp.eu/solar)

**SHARP**

Local responsibility:

**Benelux** SolarInfo.seb@sharp.eu  
**France** SolarInfo.fr@sharp.eu  
**Germany** SolarInfo.de@sharp.eu  
**Spain & Portugal** SolarInfo.es@sharp.eu  
**United Kingdom** SolarInfo.uk@sharp.eu  
**Other countries** SolarInfo.Europe@sharp.eu

The reference image on the front page shows a 340 kWp system in Eastern Germany. **Note:** Technical data is subject to change without prior notice. Before using Sharp products, please request the latest data sheets from Sharp. Sharp accepts no responsibility for damage to devices which have been equipped with Sharp products on the basis of unverified information. The specifications may deviate slightly and are not guaranteed. This module should not be directly connected to a load.

SolarNAE\_L5\_E0514