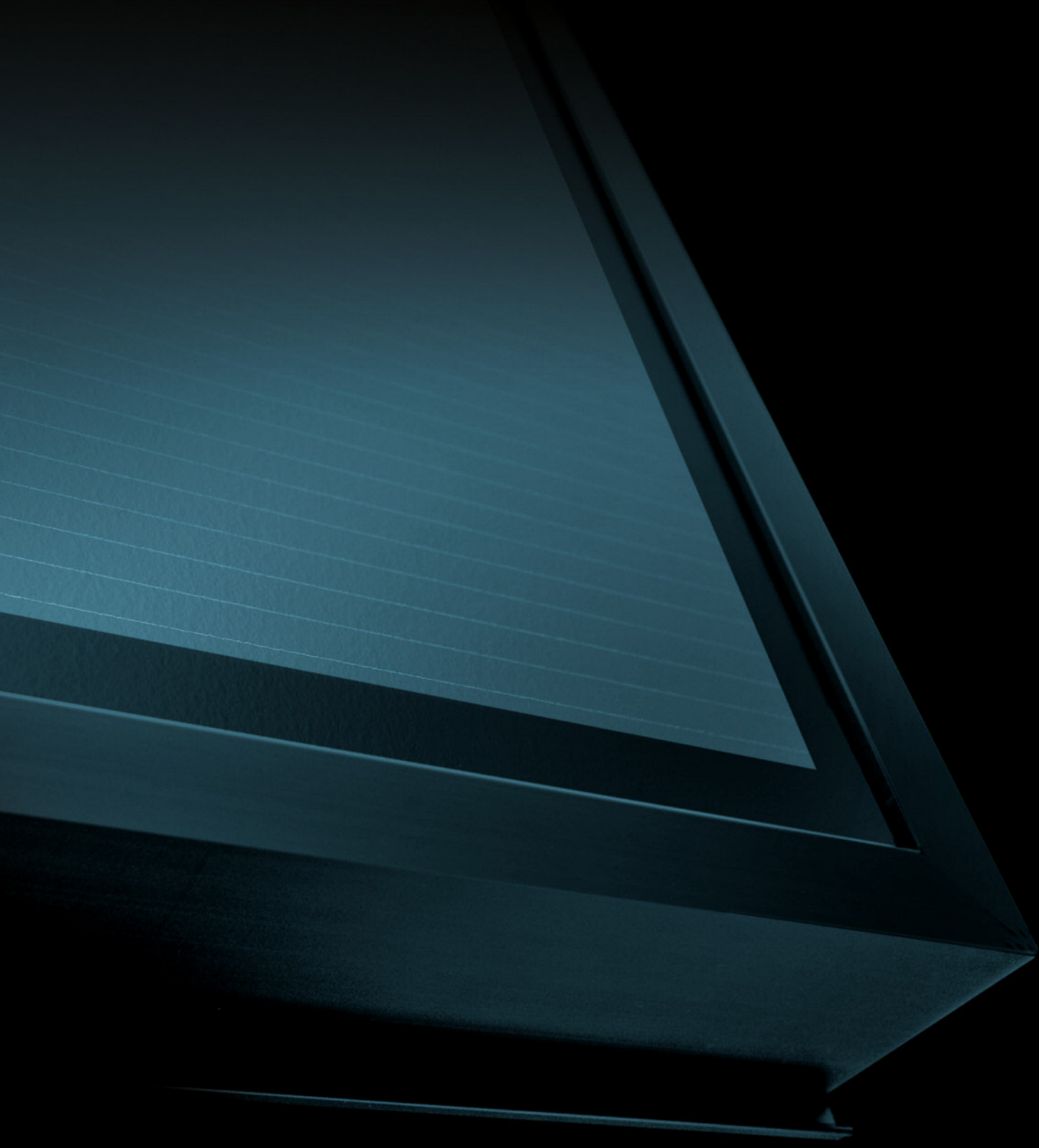


# *PowerMax*<sup>®</sup> **STRONG**

*The solid frame line.*



ENGLISH

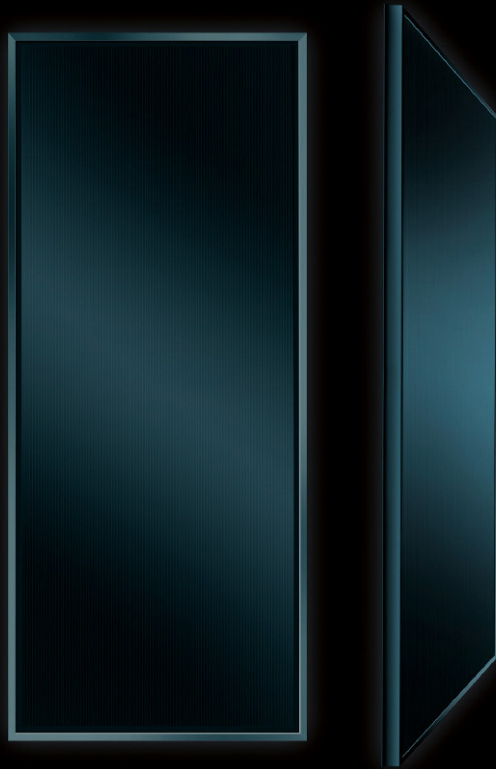
## AVANCIS – THE AVANT-GARDE OF PHOTOVOLTAICS.

Since the early 1980s we have been pioneering research into high-performance solar modules with our scientists. As pioneers of CIS technology we are extremely proud of what we have achieved so far, especially that our technology was the first to be successfully used for the mass-production of CIS modules. With our innovative history and our multiple world efficiency records, we are extremely proud of a track record that is clear for all to see. AVANCIS stands for advancement in technology, performance and aesthetics. Or simply put, AVANCIS = advanced solar power.

The successful AVANCIS brand is well known on the market under the name PowerMax®. Beneath this umbrella brand all of our product lines are brought together and have one very important thing in common: An extremely high energy yield (kWh per kWp) possible due to spectral sensitivity, excellent low light performance and a low temperature coefficient. All PowerMax® modules not only meet the highest technological and aesthetic requirements, they are also among the most economical on the market. The basis for this success is our fully integrated industrial production process.

# PowerMax® **STRONG**

## *The solid frame line.*



### SIMPLY STRONG: POWERMAX® FOR ROOFTOP APPLICATIONS.

PowerMax® STRONG modules have been designed as robust, framed solar modules which are especially good for use in rooftop systems and have proven equally effective when utilized in open space facilities or as façade solutions.

### WHY POWERMAX® STRONG MODULES ARE SO STRONG.

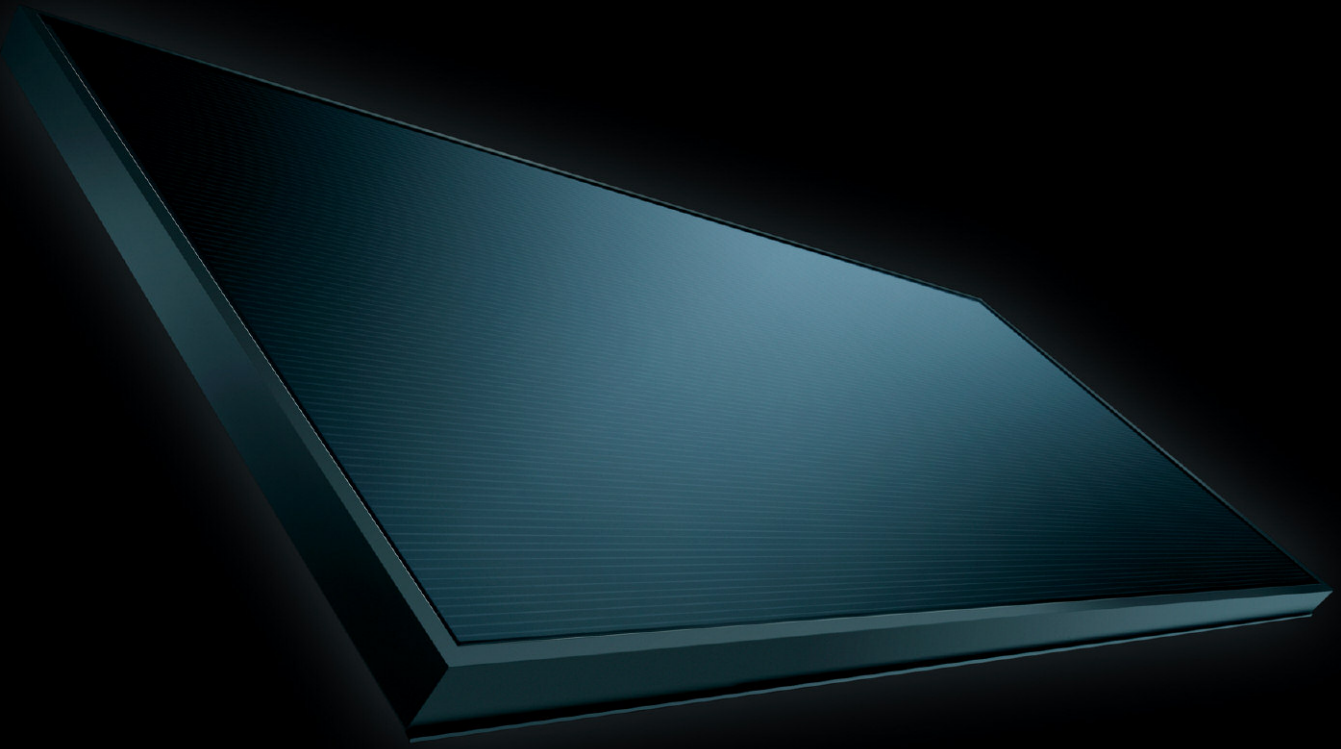
PowerMax® STRONG are robust, framed CIS solar modules that are safely and securely mounted using a black hollow chamber aluminum frame with a mounting lip. The mounting clamps fit perfectly into the shadow gap of the mounting lip removing them from sight. Mechanical force on the front glass is avoided via a clamp which distributes the mounting force to the frame – this will prevent glass breakage.

PowerMax® STRONG modules are extremely robust and solid. Due to the stable frame, the modules are suitable for high snow load areas and can carry up to 551 kg/m<sup>2</sup>. Additionally, they are resistant to ammonia and salt mist corrosion, making them suitable for use in both agricultural and coastal areas.

PowerMax® STRONG is one of the most powerful thin-film modules found on the photovoltaic market.

This we find STRONG.





## POWERMAX® STRONG – 4 TIMES STRONG.

### HIGHEST YIELD

- The broadest spectral sensitivity, the very good performance in low light conditions and the low temperature coefficient ensure a high energy yield (kWh/kWp).
- The plus sorting of the nominal power guarantees the paid for power, and more.

### EXTREMELY DURABLE

- The aluminum hollow chamber profile mounting frame is extremely torsionally rigid and corrosion-resistant.
- The module adheres to DIN 1055, maximum snow load zones and is able to withstand loads of up to 551 kg/m<sup>2</sup>.
- The glass is mounted with a highly elastic polymer glue: This means the glass is not exposed to any mechanical point loads.
- A butyl seal protects the cells against moisture.
- A permanent lamination between the glass layers utilizes a foil that has proven its worth in the automotive industry.
- Additional stability is provided by the tempered front glass.

### UNIQUE AESTHETICS

- Excellent design through cells in an elegant pinstripe look and a uniform black surface of the module creates a uniquely attractive look.
- The mounting clamps fit perfectly into the shadow gap of the mounting lip between the modules, ensuring an attractive appearance for the entire system.

### SIMPLE INSTALLATION

- The mechanical and electrical construction of each module has been optimized for low system costs.
- Additionally to mounting via clamps, there are four M6 holes for rear side mounting (320 mm distance to the edge along the frame sides).
- The long frames are provided with grounding holes (distance to long frame part ends 100 mm) as well as a hole to connect the module cables (distance to lower module end 500 mm).
- To ensure ease of installation, the two junction boxes are equipped with cables and connectors.



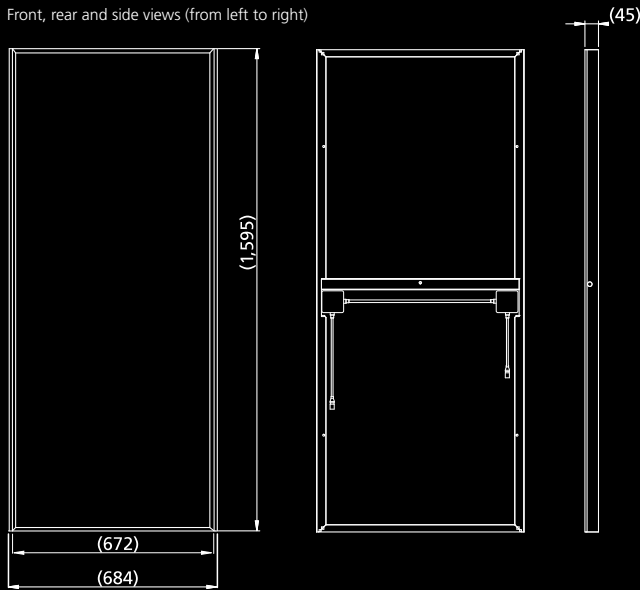
# PowerMax<sup>®</sup> STRONG

The solid frame line.

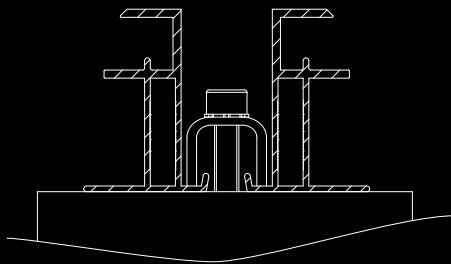


## DIMENSIONS

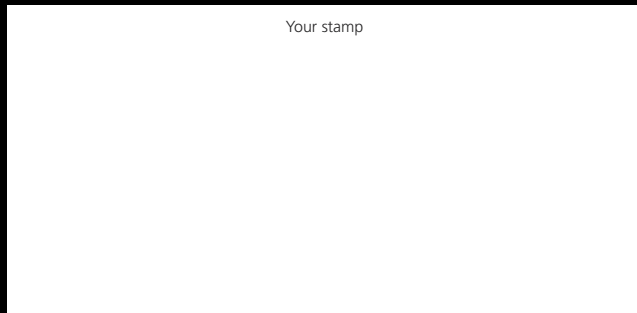
Front, rear and side views (from left to right)



Cross section through frames, mounting structure and clamp



Dimensions in mm



## MECHANICAL SPECIFICATIONS

PowerMax <sup>®</sup> STRONG	Value
External dimensions incl. mounting lip	1,595 x 684 mm <sup>2</sup>
External dimensions excl. mounting lip	1,595 x 672 mm <sup>2</sup>
Thickness	45 mm
Weight	19.6 kg
Junction box protection class	IP65
Dimensions of the junction boxes	70 x 70 x 23 mm <sup>3</sup>
Cable lengths (⊖ plug   ⊕ socket)	210   330 mm
Cable cross section	2.5 mm <sup>2</sup>
Connector type	TPCB-4

## ELECTRICAL SPECIFICATIONS

Data measured under standard test conditions (STC)\*:

PowerMax <sup>®</sup> STRONG	110	115	120	125	130	135
Nominal power $P_{nom}$	110 W	115 W	120 W	125 W	130 W	135 W
Tolerance of nominal power $\Delta P_{nom}$	-0/+5 %	-0/+5 %	-0/+5 %	-0/+4 %	-0/+4 %	-0/+4 %
Module efficiency $\eta^{**}$	10.3 %	10.7 %	11.2 %	11.7 %	12.1 %	12.6 %
Aperture efficiency $\eta$	11.6 %	12.2 %	12.7 %	13.2 %	13.7 %	14.2 %
Open-circuit voltage $V_{oc}$	56.9 V	57.7 V	58.5 V	59.3 V	60.2 V	61.1 V
Short-circuit current $I_{sc}$	3.19 A	3.20 A	3.21 A	3.22 A	3.23 A	3.24 A
Voltage at mpp $V_{mpp}$	40.4 V	41.6 V	42.8 V	44.0 V	45.3 V	46.6 V
Current at mpp $I_{mpp}$	2.72 A	2.76 A	2.80 A	2.84 A	2.87 A	2.90 A
Limiting reverse current $I_r$	5.0 A	5.0 A	5.0 A	5.0 A	5.0 A	5.0 A
Max. system voltage $V_{sys}$ (IEC)	1,000 V	1,000 V	1,000 V	1,000 V	1,000 V	1,000 V
Max. system voltage $V_{sys}$ (UL)	600 V	600 V	600 V	600 V	600 V	600 V

\* Insolation intensity 1,000 W/m<sup>2</sup> in the plane of the module, module temperature 25 °C and a spectral distribution of the sunlight according to the atmospheric mass (AM) 1.5.

\*\* excl. mounting lip.

Data measured at nominal operating cell temperature (NOCT)\* and AM 1.5:

PowerMax <sup>®</sup> STRONG	110	115	120	125	130	135
NOCT	40.0 °C	40.0 °C	40.0 °C	40.0 °C	40.0 °C	40.0 °C
Nominal power $P_{nom}$	82.0 W	85.8 W	89.5 W	93.2 W	96.9 W	100.7 W
Open-circuit voltage $V_{oc}$	53.3 V	54.0 V	54.8 V	55.6 V	56.5 V	57.4 V
Short-circuit current $I_{sc}$	2.51 A	2.51 A	2.51 A	2.51 A	2.51 A	2.51 A
Voltage at mpp $V_{mpp}$	37.5 V	38.7 V	39.9 V	41.1 V	42.3 V	43.6 V

\* Module operating temperature at 800 W/m<sup>2</sup> insolation intensity in the plane of the module, air temperature 20 °C, wind speed 1 m/s and open-circuit condition.

Temperature coefficients:

PowerMax <sup>®</sup> STRONG	Value
Temperature coefficient $P_{nom}$	-0.39 %/°C
Temperature coefficient $V_{oc}$	-170 mV/°C
Temperature coefficient $I_{sc}$	0.1 mA/°C
Temperature coefficient $V_{mpp}$	-140 mV/°C

Data measured at low light intensity:

The relative reduction in the module-efficiency at a light intensity of 200 W/m<sup>2</sup> relative to 1,000 W/m<sup>2</sup> at 25 °C module temperature and spectrum AM 1.5 is 10 %.  
At 500 W/m<sup>2</sup> the relative reduction in module-efficiency is 1 %.

For more information about handling, installation and operation of PowerMax<sup>®</sup> modules, refer to the installation, operating and safety manual for AVANCIS PowerMax<sup>®</sup> photovoltaic modules.

As a result of ongoing research and product improvements, the specifications in this product data sheet are subject to changes without prior publication. This data sheet is not allowed to be used for deriving any rights, and AVANCIS does not accept any liability with regard to and resulting from the use of information contained herein. Installation equipment is not supplied with the product.

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- Qualified, IEC 61646
- Safety tested, IEC 61730
- Periodic inspection
- Salt mist corrosion proofed



TUEVPAM-1110  
(Resistance to Ammonia Test)



Certification per Ammonia Test pending.