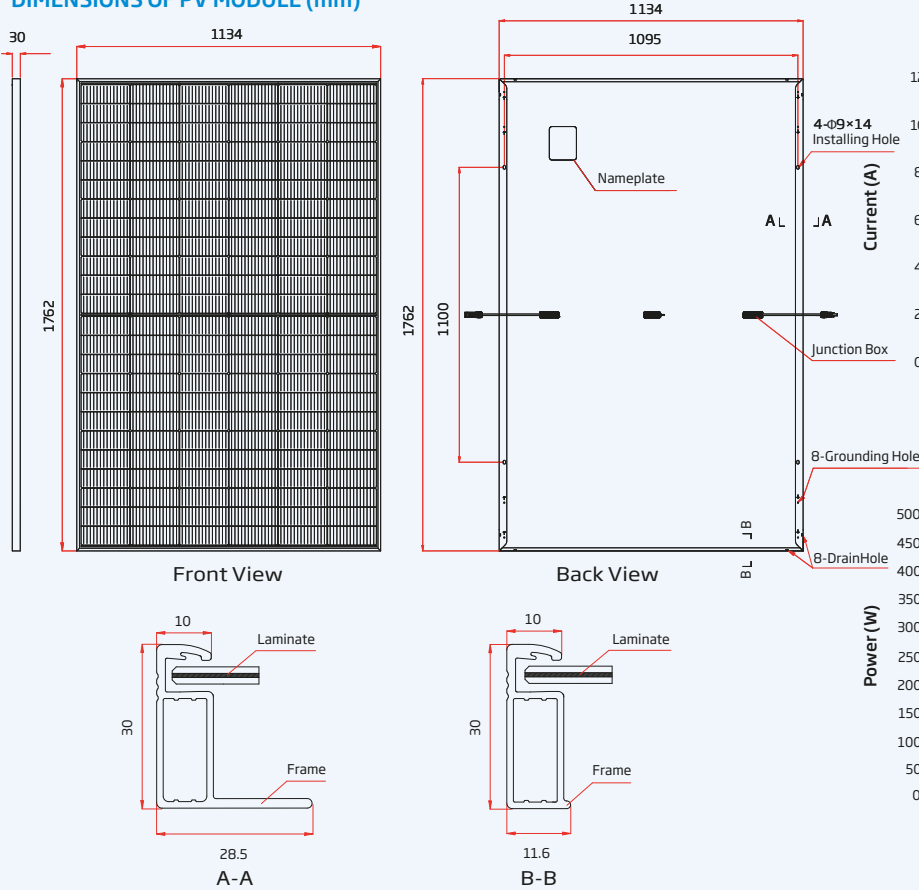
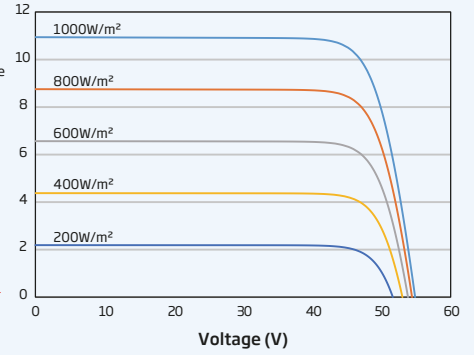
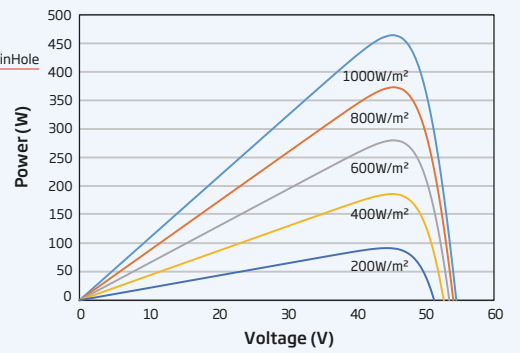


**DIMENSIONS OF PV MODULE (mm)**

**I-V CURVES OF PV MODULE (465 W)**

**P-V CURVES OF PV MODULE (465 W)**

**ELECTRICAL DATA (STC)**

	TSM-450 NEG9R.2B	TSM-455 NEG9R.2B	TSM-460 NEG9R.2B	TSM-465 NEG9R.2B	TSM-470 NEG9R.2B	TSM-475 NEG9R.2B
Peak Power Watts- $P_{MAX}$ (Wp)*	450	455	460	465	470	475
Power Selection (W)**	0/+5					
Maximum Power Voltage- $V_{MPP}$ (V)	44.6	45.0	45.4	45.8	46.1	46.4
Maximum Power Current- $I_{MPP}$ (A)	10.09	10.11	10.14	10.16	10.20	10.24
Open Circuit Voltage- $V_{oc}$ (V)	52.9	53.4	53.8	54.2	54.6	55.0
Short Circuit Current- $I_{sc}$ (A)	10.74	10.77	10.81	10.85	10.89	10.93
Module Efficiency $\eta_m$ (%)	22.5	22.8	23.0	23.3	23.5	23.8

STC: Irradiance 1000 W/m<sup>2</sup>, Cell Temperature 25 °C, Air Mass AM 1.5. \*Measuring tolerance: ±3%. \*\*Power Selection up to: +3%

**ELECTRICAL DATA (NOCT)**

	TSM-450 NEG9R.2B	TSM-455 NEG9R.2B	TSM-460 NEG9R.2B	TSM-465 NEG9R.2B	TSM-470 NEG9R.2B	TSM-475 NEG9R.2B
Maximum Power- $P_{MAX}$ (Wp)	344	348	352	355	358	362
Maximum Power Voltage- $V_{MPP}$ (V)	42.0	42.3	42.7	42.8	43.1	43.4
Maximum Power Current- $I_{MPP}$ (A)	8.19	8.22	8.25	8.28	8.31	8.35
Open Circuit Voltage- $V_{oc}$ (V)	50.2	50.6	51.0	51.4	51.8	52.1
Short Circuit Current- $I_{sc}$ (A)	8.66	8.68	8.71	8.74	8.76	8.79

NOCT: Irradiance at 800 W/m<sup>2</sup>, Ambient Temperature 20 °C, Wind Speed 1 m/s.

**MECHANICAL DATA**

Solar Cells	N-type i-TOPCon Monocrystalline
No. of cells	144 cells
Module Dimensions	1762×1134×30 mm
Weight	21.0 kg
Front Glass	1.6 mm, AR Coating Heat Strengthened Glass
Back Glass	1.6 mm, Heat Strengthened Glass
Frame	30 mm Anodized Aluminium Alloy, black
J-Box	IP 68 rated, 3 bypass diodes
Cables	Photovoltaic Technology Cable 4.0 mm <sup>2</sup> Landscape: 1100/1100 mm Portrait: 200/320 mm*
Connector	TS4 Plus / TS4 / MC4 EVO2*

\*Special order only

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43 °C (±2 °C)
Temperature Coefficient of $P_{MAX}$	-0.29 %/°C
Temperature Coefficient of $V_{oc}$	-0.24 %/°C
Temperature Coefficient of $I_{sc}$	0.04 %/°C

**MAXIMUM RATINGS**

Operational Temperature	-40 to +70 °C
Maximum System Voltage	1500 V DC (IEC)
Max Series Fuse Rating	25 A

PV module 98th percentile operating temperature: 70 °C

**WARRANTY**

25 year Product Workmanship Warranty  
30 year Power Warranty  
1% first year degradation  
0.4% Annual Power Attenuation

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

Modules per box:	36 pieces
Modules per 40' container:	936 pieces

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

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