

MOTECH

POWER UP NOW



HALF CUT 144 CELL

MONOCRYSTALLINE MODULE

435-460W

POWER OUTPUT RANGE

21.1%

MAXIMUM EFFICIENCY

0~+5W

BINNING TOLERANCE

9BB

MULTI BUSBAR

PERC CELL TECHNOLOGY

PRODUCTS

Berlin Series

POWER RANGE

435-460W



High power Mono Perc

- **Up to 460W front power and 21.1% module efficiency with half cut tech**
- MBB (Multi Busbar) technology bringing more BOS savings
- **Lower resistance and good reflection effect of MBB ensure high power**



High reliability

- Ensured PID resistance through cell process and module material control
- Resistant to salt, acid and ammonia
- Proven to be reliable in high temperature and humidity areas
- **Certified to fire class A**
- Minimizes micro-crack and snail trails
- Mechanical performance: Up to 5400 Pa positive load and 2400 Pa negative



High energy generation

- Up to 25% additional power gain from back side depending on the design
- Excellent current and low light performance validated by 3rd party
- Perfect cell process and module material optimization
- **Lower temp coefficient (-0.35%) and NMOT bring more energy**
- Better anti-shading performance and lower operating temperature



Easy to install

- Frame design makes module compatible with all racking and installation methods
- **Easy to handle and install as normal framed module during transportation**

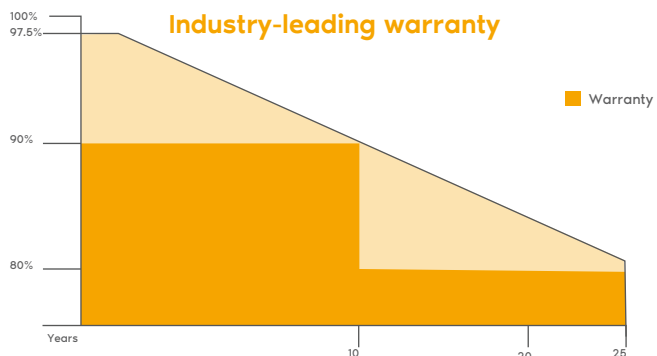
SYSTEM CERTIFICATES

IEC61215/IEC61730/IEC61701/IEC62716

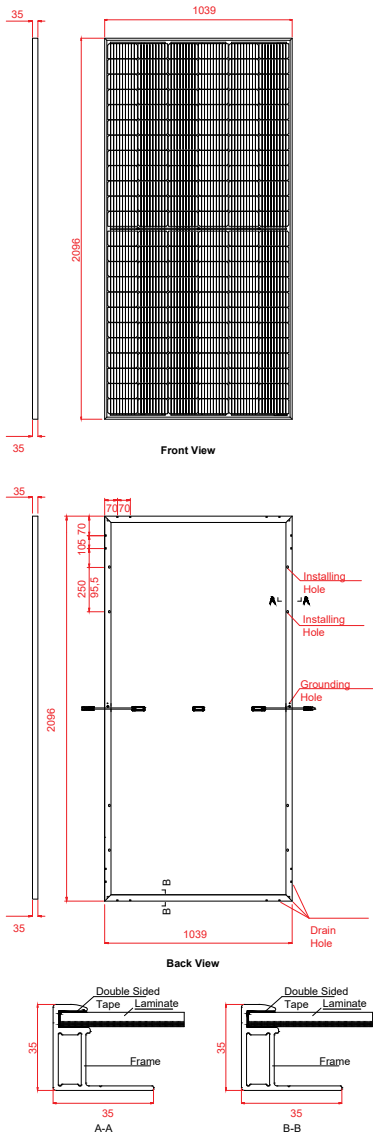
ISO 9001: Quality Management System

ISO 14001: Environmental Management

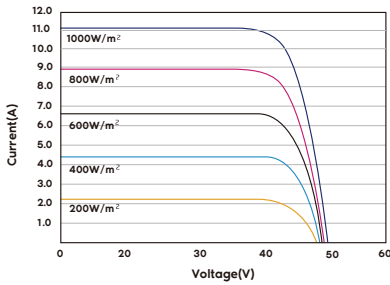
ISO45001: Occupational Health and Safety



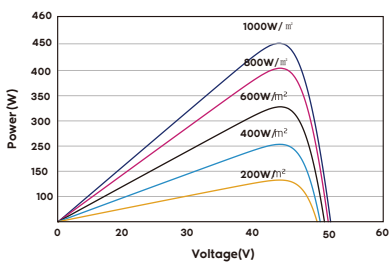
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(450W)



P-V CURVES OF PV MODULE(450W)



ELECTRICAL DATA (STC)

| Peak Power Watts-PMAX (Wp)* | 435 | 440 | 445 | 450 | 455 | 460 |
|--------------------------------|--------|-------|-------|-------|-------|-------|
| Power Tolerance Range-PMAX (W) | 0 - +5 | | | | | |
| Maximum Power Voltage-VMPP (V) | 40,7 | 40,7 | 40,8 | 41,0 | 41,0 | 41,2 |
| Maximum Power Current-IMPP (A) | 10,69 | 10,82 | 10,90 | 10,98 | 11,10 | 11,17 |
| Open Circuit Voltage-VOC (V) | 49,0 | 49,2 | 49,4 | 49,6 | 49,6 | 49,8 |
| Short Circuit Current-ISC (A) | 11,35 | 11,39 | 11,46 | 11,53 | 11,58 | 11,74 |
| Module Efficiency η_m (%) | 19,7 | 20,2 | 20,4 | 20,60 | 20,80 | 21,10 |

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
*Measuring tolerance: ±3%.

ELECTRICAL DATA (NMOT)

| | | | | | | |
|--------------------------------|------|------|-------|------|------|------|
| Maximum Power-PMAX (Wp) | 321 | 326 | 331 | 336 | 341 | 346 |
| Maximum Power Voltage-VMPP (V) | 38,2 | 38,4 | 38,5 | 38,7 | 38,9 | 39,1 |
| Maximum Power Current-IMPP (A) | 8,40 | 8,48 | 8,59 | 8,68 | 8,76 | 8,85 |
| Open Circuit Voltage-VOC (V) | 45,9 | 46,1 | 46,3 | 46,5 | 46,7 | 46,9 |
| Short Circuit Current-ISC (A) | 8,95 | 9,01 | 12,79 | 9,11 | 9,15 | 9,21 |

NMOT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

| | |
|----------------------|--|
| Solar Cells | Monocrystalline |
| Cell Orientation | 144 cells (6 × 24) |
| Module Dimensions | 2096×1039×35 mm |
| Weight | 24,KG |
| Front Glass | 3,2 mm, High Transmission, AR Coated Heat Strengthened Glass |
| Encapsulant Material | POE/EVA |
| Back Glass | KPF Type |
| Frame | 35mm Anodized Aluminium Alloy |
| J-Box | IP 68 rated and 30cm or 120cm cable |
| Cables | Photovoltaic Technology Cable 4.0mm2 |
| Connector | MC4 EVO2 / TS4 |

TEMPERATURE RATINGS

| | |
|--|-------------|
| NMOT(Nominal Module Operating Temperature) | 45°C (±2°C) |
| Temperature Coefficient of PMAX | _-0.360 °C% |
| Temperature Coefficient of VOC | _-0.304 °C% |
| Temperature Coefficient of ISC | _-0.050%/°C |

MAXIMUM RATINGS

| | |
|-------------------------|----------------|
| Operational Temperature | -40~+85 °C |
| Maximum System Voltage | 1500V DC (IEC) |
| Max Series Fuse Rating | 20A |

WARRANTY

| |
|--------------------------------------|
| 10 year Product Workmanship Warranty |
| 25 year Power Warranty |
| 2% first year degradation |
| 0.45% Annual Power Attenuation |

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

| | |
|---------------------------|---------|
| Modules per box | 32 pcs |
| Modules per 40' Container | 832 pcs |

