

G12R-48P N-type Bifacial Double Glass Module

HSM-ND48-GR435~460

460W

Maximum Power Output

23.0%

Maximum Efficiency



Aesthetic Experience

- For RES scenarios, delivering aesthetic experience



Reliable and convenient to install

- Rigorous material selection
- High-strength frame and heat strengthened glass
- Easier handling and installation



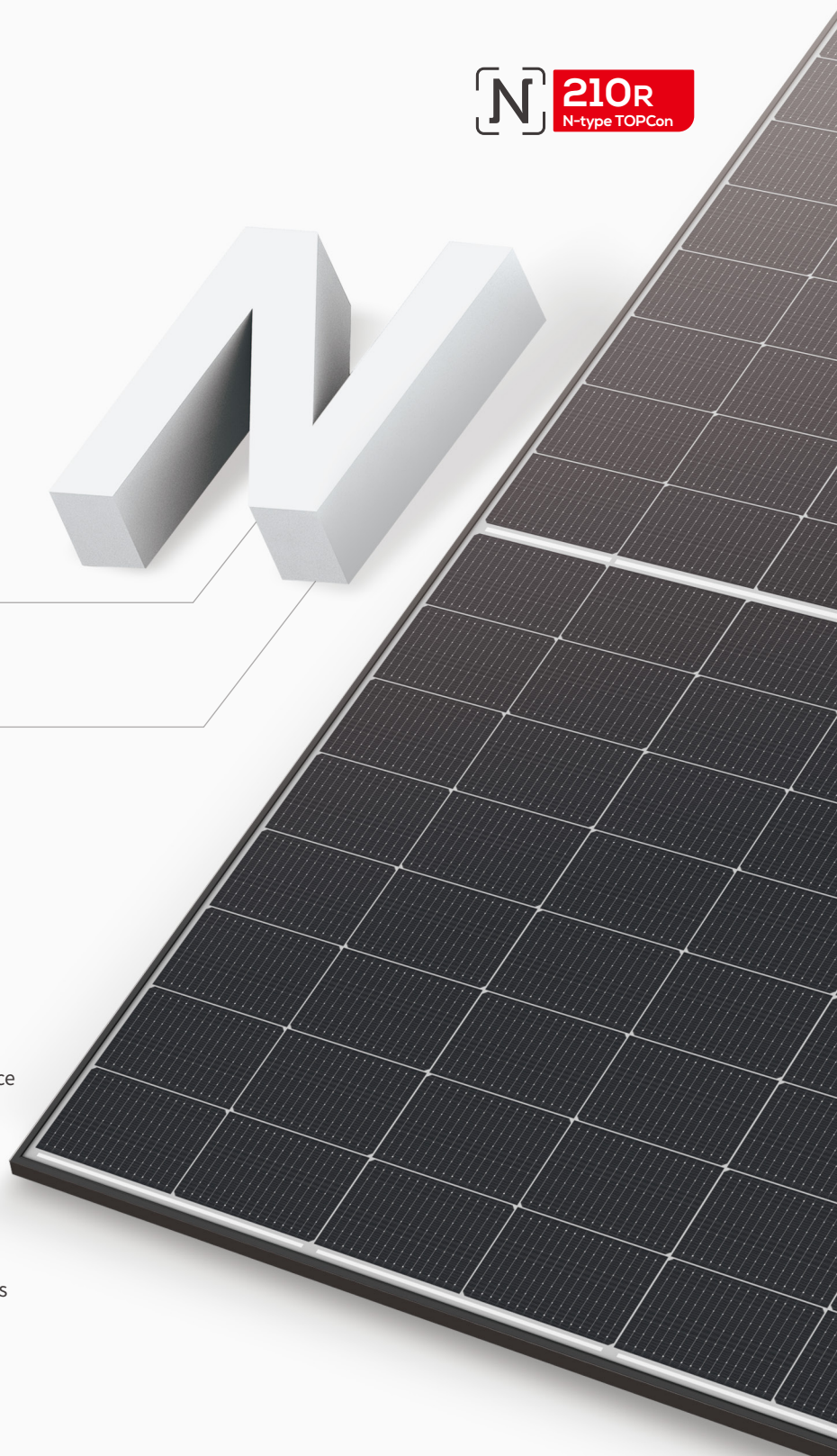
High Energy Yield

- Excellent thermal resistance and temperature coefficient
- Outstanding power generation performance

Comprehensive Products and System Certificates



IEC 61215 / IEC 61730 ISO 9001:2015 ISO 45001:2018 ISO 14001:2015



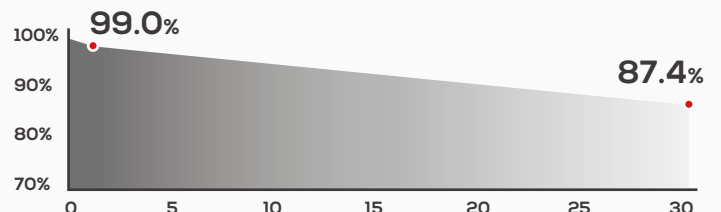
Linear Performance Warranty



15 Years Product Warranty



30 Years Linear Performance Warranty



Electrical Parameters (STC* & BNPI*)

* STC: Irradiance 1000W/m², Cell Temperature 25°C, AM1.5, Measuring Tolerance: ±2%
 * BNPI: Back Irradiance 135W/m², Cell Temperature 25°C, Atmospheric quality AM 1.5G, Wind speed 1m/s

Testing Condition		STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI
Maximum Power	P _{max} (W)	435	479	440	484	445	490	450	495	455	501	460	506
Open Circuit Voltage	V _{oc} (V)	34.96	35.05	35.16	35.23	35.36	35.46	35.56	35.64	35.76	35.86	35.96	36.05
Short Circuit Current	I _{sc} (A)	15.85	17.41	15.92	17.48	15.99	17.56	16.06	17.63	16.13	17.71	16.20	17.77
Maximum Power Voltage	V _{mp} (V)	29.54	29.43	29.74	29.61	29.93	29.83	30.13	30.00	30.32	30.20	30.52	30.40
Maximum Power Current	I _{mp} (A)	14.73	16.28	14.80	16.35	14.87	16.43	14.94	16.50	15.01	16.59	15.08	16.64
Module Efficiency	(%)	21.8		22.0		22.3		22.5		22.8		23.0	

Electrical Characteristics with Different Bifacial Gain*

* The additional gain from the back side depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

Bifacial Gain		5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Maximum Power	P _{max} (W)	457	479	462	484	467	490	473	495	478	501	483	506
Open Circuit Voltage	V _{oc} (V)	34.96	34.96	35.16	35.16	35.36	35.36	35.56	35.56	35.76	35.76	35.96	35.96
Short Circuit Current	I _{sc} (A)	16.64	17.44	16.72	17.51	16.79	17.59	16.86	17.67	16.94	17.74	17.01	17.82
Maximum Power Voltage	V _{mp} (V)	29.54	29.54	29.74	29.74	29.93	29.93	30.13	30.13	30.32	30.32	30.52	30.52
Maximum Power Current	I _{mp} (A)	15.47	16.20	15.54	16.28	15.61	16.36	15.69	16.43	15.76	16.51	15.83	16.59

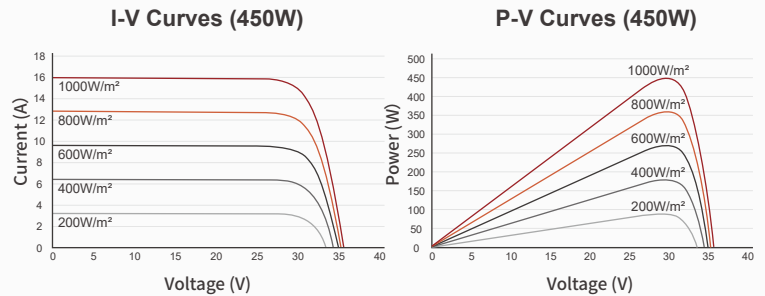
Temperature Coefficient

Nominal Module Operating Temperature*	43 ± 2°C
Temperature Coefficient of I _{sc}	+0.045%/°C
Temperature Coefficient of V _{oc}	-0.25%/°C
Temperature Coefficient of P _{max}	-0.29%/°C

Operating Parameters

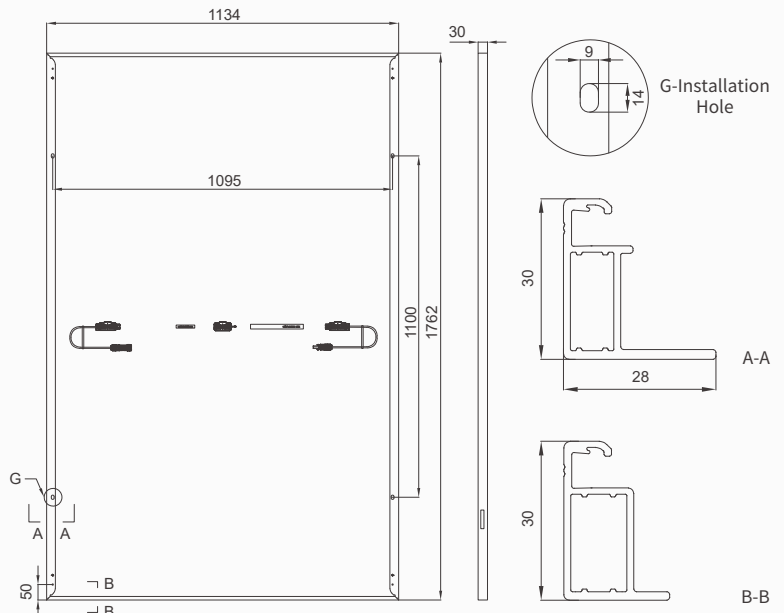
Operating Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	30A
Power Bifaciality	80 ± 5%

Curve Graph



Engineering Drawing

[Unit: mm]



Mechanical Data

* Please refer to installation manual for details

No. of Cells	96pcs (6 × 16)
Dimension	1762 × 1134 × 30 mm
Weight	24.5kg ± 3%
Front Glass	2.0mm, Heat Strengthened, AR coating Glass
Back Glass	2.0mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
J-Box	IP68, three diodes
Cables	4.0mm ² , +1200mm, -1200mm (can be customized)
Maximum Static Load	Front: 5400Pa/Back: 2400Pa*
Fire Rating	IEC Class C

Packaging Configuration

Modules per Pallet	36pcs
Modules per 40'HQ Container	936pcs
Pallets per 40'HQ Container	26pcs