

SiRo  **Efficient**



NT12R/48GDF

440-465W

N-type Bifacial Double Glass Module

TOPCon ^{2.0}
Tech

Designed with TOPCon 2.0 technology for
higher power output and long-term reliability



Sound quality management and
product certification system

IEC61215:2021 / IEC61730:2023

ISO9001:2015: quality management system

ISO14001:2015: environmental management system

ISO45001:2018: Occupational Health and Safety Management System



Low degradation ensures
reliable output over the
module's lifetime

High bifaciality for superior
rear-side power output

Excellent temperature coefficient
ensures power generation in high
temperature areas

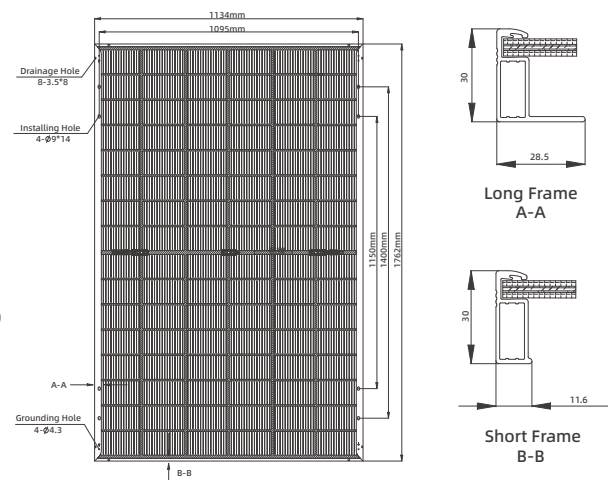
Enhanced low-light response
ensures stable output under
low-light conditions

Mechanical Data

Cell Type	N-Type Monocrystalline Solar Cell
Number of Cells	96 Cells (6×16)
Dimensions of Module	1762×1134×30mm (69.37×44.65×1.18 inches)
Weight	24.5kg
Front/Back Side Glass	2.0mm (0.08 inches), High transparency solar glass 2.0mm (0.08 inches), Black glazed mesh glass
Frame	Anodized aluminium alloy
J-Box	IP68 Rated, 3 diodes
Cable	4.0mm ² , +300/-200mm (length can be customized)
Connector	GCL-01/GCL-02/MC4-EVO2/others
Packaging Configuration	Module per box: 36 pieces Module per 40' HQ: 936 pieces

Module Dimension

Tolerance: Length:±2mm Width:±2mm



Electrical Specification (STC*)

* Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5

Maximum Power	Pmax (W)	440	445	450	455	460	465
Maximum Power Voltage	Vmp(V)	29.24	29.48	29.71	29.94	30.13	30.33
Maximum Power Current	Imp (A)	15.05	15.10	15.15	15.20	15.27	15.33
Open Circuit Voltage	Voc (V)	34.55	34.80	35.05	35.30	35.55	35.80
Short Circuit Current	Isc (A)	15.85	15.90	15.95	16.00	16.05	16.11
Module Efficiency	(%)	22.02	22.27	22.52	22.77	23.02	23.27
Power Output Guarantee	(%)	0~+3					
Temperature Coefficient of Isc	(Isc)	+0.045%/°C					
Temperature Coefficient of Voc	(Voc)	-0.25%/°C					
Temperature Coefficient of Pmax	(Pmax)	-0.29%/°C					

Electrical Characteristics with Different Power Bin (Reference to 10% Irradiance Ratio)

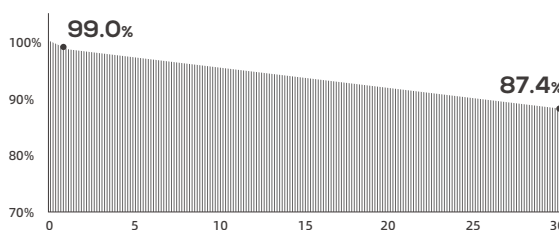
Maximum Power	Pmax (W)	475.2	480.8	486.1	491.6	496.8	502.3
Maximum Power Voltage	Vmp(V)	29.24	29.48	29.71	29.94	30.13	30.33
Maximum Power Current	Imp (A)	16.25	16.31	16.36	16.42	16.49	16.56
Open Circuit Voltage	Voc (V)	34.55	34.80	35.05	35.30	35.55	35.80
Short Circuit Current	Isc (A)	17.12	17.17	17.23	17.28	17.33	17.40

Application Conditions

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Max Series Fuse Rating	35A
Wind/ Snow Load	2400Pa/5400Pa*
Bifaciality	80±5%

*For more details please check the installation manual of GCLSI

Linear Performance Warranty

12 year
Product warranty30 year
Linear power warranty1%
First year power attenuation0.40%
Annual degradation over
30 years