SiRo T Efficient

GCL

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 outputunder low-light conditions

NT12R/48GDF

TOPCon 2.0 Tech

Maximum Power Output **465W**

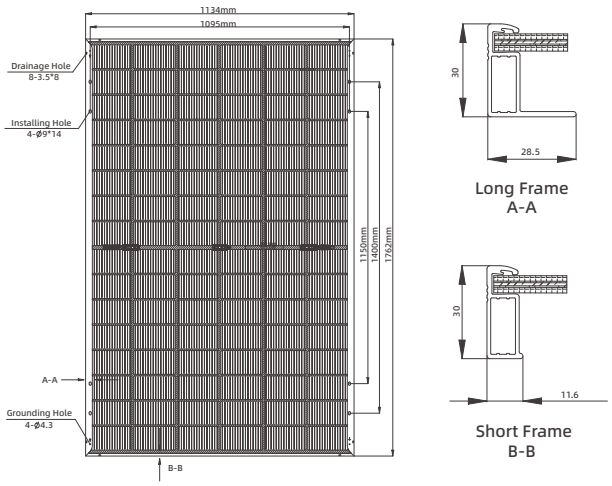
Maximum Module Efficiency **23.27%**

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	4.0mm², +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)

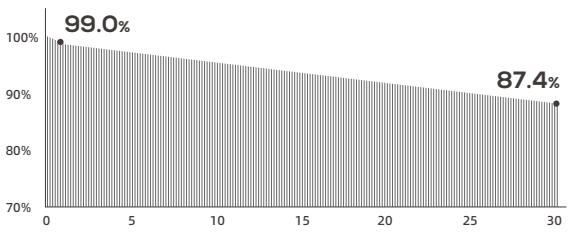
Maximum Power	Pmax (W)	475.2	480.8	486.1	491.6	496.8	502.3
Maximum Power Voltage	Vmp(V)	29.24	29.48	29.71	29.94	30.13	30.33
Maximum Power Current	Imp (A)	16.25	16.31	16.36	16.42	16.49	16.56
Open Circuit Voltage	Voc (V)	34.55	34.80	35.05	35.30	35.55	35.80
Short Circuit Current	Isc (A)	17.12	17.17	17.23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

30 year
Linear power warranty

1%
First year power attenuation

0.40%
Annual degradation over 30 years