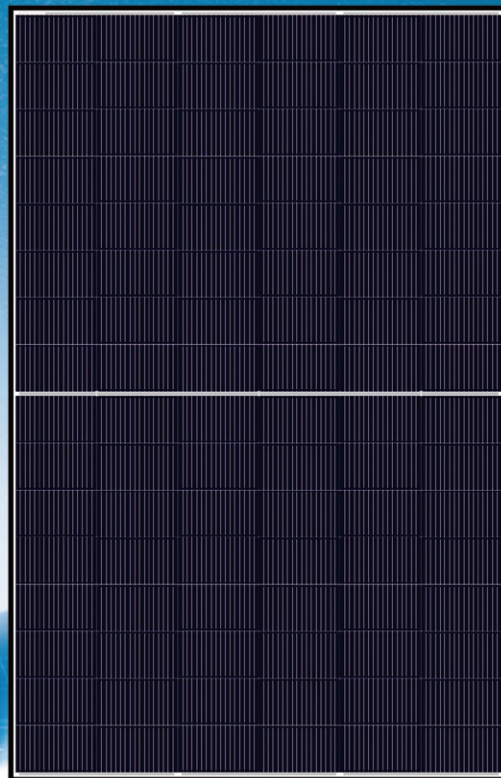


Gokin

GEM G12R/96D

440-450W



Supreme Quality



High Efficiency

Module efficiency up to 22.5% based on N-Type wafer and TOPCon technology



Anti-degradation

Unsusceptible to LID, LeTID and less annual degradation due to special characteristics of N-Type



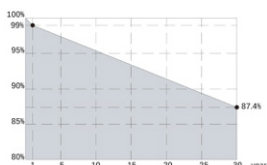
Excellent Energy Yield

More power output in field operation due to better thermal behaviors, weak-light performance and bifaciality



Quality Guarantee

High module quality ensures long-term reliability



At least 87.4% of nominal power up to 30 years

Module Characteristics



30 Years Product Warranty



30 Years Linear Power Warranty



1% First Year Degradation



0.4% Annual Power Degradation

Comprehensive Certification

IEC 61215(2021) / IEC 61730(2023)

ISO 9001: 2015: ISO Quality Management System

Anti-PID / Ammonia / Salt-mist / Dust and sand

Made in China



450W

Maximum Power

22.5%

Highest Conversion Efficiency

1%

First Year Degradation

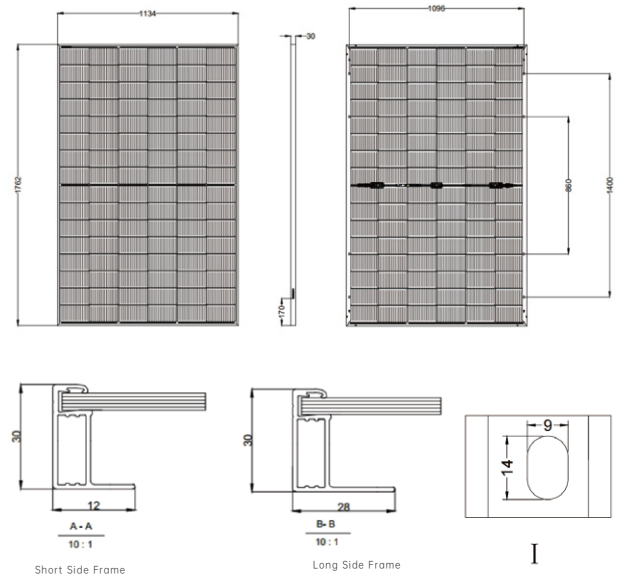
0.4%

2-30 Years Annual Power Attenuation

Mechanical Parameters

Cell Type	N-Type TOPCon
No. of cells	96 (2×48)
Output Cables	TüV 1×4mm ² (+)300mm,(-)200mm in length or customized length
Glass	Front: 1.6mm, AR-coating, semi-tempered Rear: 1.6mm, semi-tempered
Frame	Anodized aluminum alloy frame
Weight	20.1 kg (44.31 lbs)
Dimension	1762×1134×30mm
Packaging	36 pcs per pallet Package size(mm): 1785×1120×1259 216 pcs per 20' HC, 936 pcs per 40' HC
Protection Class	Class II

Engineering Drawings



* Length:±2mm Width:±2mm Height:±1mm Row Pitch:±2mm

Electrical Characteristics (STC Test) Test Uncertainty: ±3%

Module Type	GK-4-48HTBD-440M		GK-4-48HTBD-445M		GK-4-48HTBD-450M	
	STC	NOCT	STC	NOCT	STC	NOCT
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	440	331	445	335	450	338
Open-circuit Voltage (Voc/V)	34.89	32.91	35.06	33.08	35.23	33.25
Short-circuit Current (Isc/A)	15.94	12.90	16.01	12.94	16.08	12.98
Maximum Power Voltage (Vmp/V)	29.54	27.66	29.72	27.83	29.90	27.96
Maximum Power Current (Imp/A)	14.90	11.97	14.98	12.04	15.05	12.09
Module Efficiency (%)	22.0		22.3		22.5	

Note: 1. STC: Irradiance 1000W/M², Cell Temperature 25°C, AM=1.5 2. NOCT: Irradiance 800W/M², Ambient Temperature 20°C, AM=1.5, Wind Speed 1M/S

Different Rearside Power Gain (Reference to 440W)

Rearside Power Gain	5%	10%	20%
Maximum Power at STC (Pmax)	462.0	484.0	528.0
Open-circuit Voltage (Voc/V)	34.9	34.9	34.9
Short-circuit Current (Isc/A)	16.7	17.5	19.1
Maximum Power Voltage (Vmp/V)	29.5	29.5	29.5
Maximum Power Current (Imp/A)	15.6	16.4	17.9
Module Efficiency (%)	23.1	24.2	26.4

*The above data is for reference only. When signing a contract, the latest version of the product specification shall prevail.

Working Parameters

Operating Temperature	-40°C~ +85°C
Power Tolerance	0~ +5W
Maximum System Voltage	1500V(IEC)
NOCT	45±2°C
Maximum Series Fuse Rating	35A
Bifacial Factor	80±5%
Junction Box	IP68

Temperature Ratings (STC)

Temperature coefficient of Isc	+ 0.045%/°C
Temperature coefficient of Voc	- 0.25%/°C
Temperature coefficient of Pmax	- 0.29%/°C

Mechanical Loading

Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm hailstone at 23m/s

Gokin

Gokin Solar Co., Ltd.

<https://www.gokinsolar.com>
gk@gokinsolar.com

Office 1102, No. 58 Huajin Street, Hengqin Free Trade Zone, Zhuhai City, Guangdong Province, China.

Product data is updated as of May 2024. Gokin Solar Co., Ltd. reserves the right to change specifications.

Cable type

Zhejiang Zhonghuan Sunter PV Technology Co., Ltd.

DAS SOLAR CO., LTD.

Wuxi Xinhongye Wire & Cable Co., Ltd.

Ningbo Kibor Wire & Cable Co., Ltd.

Xinya Electronic Co., Ltd.

Jiangsu Tonglin Electric Co., Ltd.

QC Solar (Suzhou) Corporation

SUZHOU YONGHAO CABLE CO LTD

RUIXU INDUSTRY CO., LTD.

Jiangxi Jinko PV Material Co., Ltd.

Suzhou Xietong Photovoltaic Technology Co., Ltd.

Ningbo Minghe New Energy Technology Co., Ltd.

Connector type

PV-KST4-EVO2/xy_UR , PV-KBT4-EVO2/xy_UR, Stäubli Electrical Connectors AG

PV-KST4-EVO2A/xy, PV-KBT4-EVO2A/xy, Stäubli Electrical Connectors AG