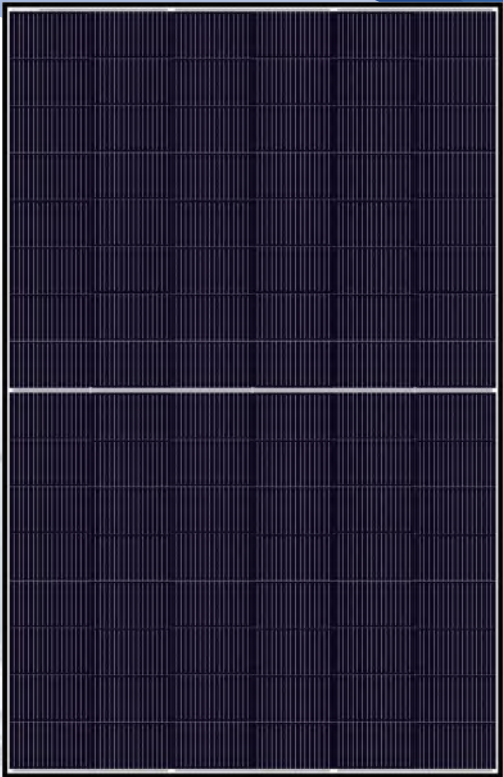


GEM G12R/96D 440-450W



Supreme Quality



High Efficiency

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



Excellent Energy Yield

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



Anti-degradation

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



Quality Guarantee

High module quality ensures long-term reliability



Module Characteristics

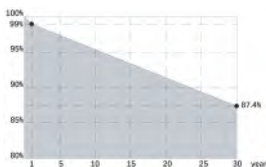
25-Year
Product Warranty

30-Year
Linear Power Warranty

1%
First Year Degradation

0.4%
Annual Power Degradation

*Subject to the terms and conditions contained in the applicable Gokin Solar Limited Warranty Statement.
Also this 25-year limited product warranty is available only for products installed and operating on rooftops in certain regions.



At least 87.4% of nominal power up to 30 years



IEC 61215(2021) / IEC 61730(2023)
ISO 9001: 2015: ISO Quality Management System
Made in China

450W

Maximum Power

22.5%

Highest Conversion Efficiency

1%

First Year Degradation

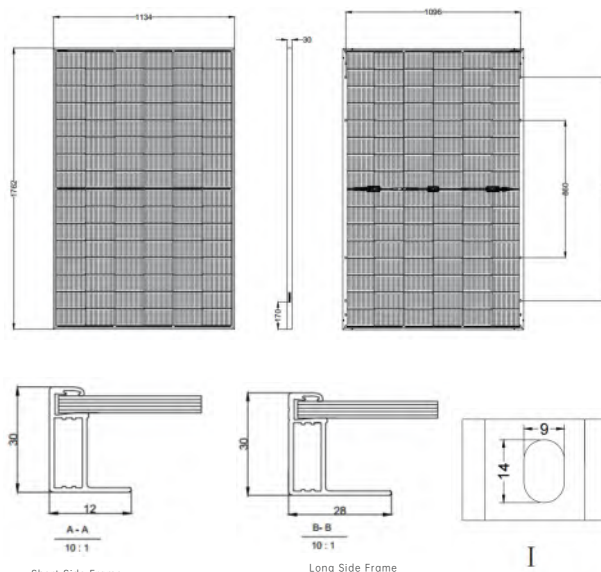
0.4%

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
	216 pcs per 20' HC, 936 pcs per 40' HC
Protection Class	Class II
Fire Rating	IEC Class C

Engineering Drawings



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

Electrical Characteristics (STC & NOCT & BNPI)

Module Type	GK-4-48HTBD-440M			GK-4-48HTBD-445M			GK-4-48HTBD-450M		
	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Testing Condition	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Maximum Power (Pmax/W)	440	331	480	445	335	485	450	338	490
Open-circuit Voltage (Voc/V)	34.89	32.91	34.92	35.06	33.08	35.09	35.23	33.25	35.26
Short-circuit Current (Isc/A)	15.94	12.90	17.58	16.01	12.94	17.65	16.08	12.98	17.72
Maximum Power Voltage (Vmp/V)	29.54	27.66	29.54	29.72	27.83	29.72	29.90	27.96	29.90
Maximum Power Current (Imp/A)	14.90	11.97	16.35	14.98	12.04	16.43	15.05	12.09	16.50
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 3. BNPI: Irradiance of front 1000W/M², rear 135W/M²
φPmax=80±5%, φIsc=80±5%, φVoc=100±5%

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 Sorting Tolerance	0~ +5W
Maximum System Voltage	1500V(IEC)
NOCT	45±2°C
Maximum Series Fuse Rating	35A
Pmax and Voc and Isc Tolerance	±3%
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



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

Cable type

Wuxi Xinhongye Wire&Cable Co., Ltd.
Ningbo Kibor Wire&Cable Co., Ltd.
Ningbo Minghe New Energy Technology Co., Ltd.
Xinya Electronic Co., Ltd.
QC Solar(Suzhou) Corporation
RUIXU INDUSTRY CO., Ltd.
SUZHOU YONGHAO CABLE CO., LTD.
Jiangxi Jinko PV Material Co., Ltd.
Suzhou Xtong Photovoltaic Technologies Co., Ltd.

Connector type

PV-MH5,Ningbo Minghe New Energy Technology Co., Ltd.
QC4.10-cds, QC Solar (Suzhou)Corporation
QC4.10-ab, QC Solar (Suzhou)Corporation
QC4, QC Solar (Suzhou)Corporation
T4-PPE-1;T4-PC-1, Changshu Tlian Co.,Ltd.
PV4-Syx&PV4-Slyx, Tyco Electronics Austria GmbH.
PV-KST4-EVO2/xy&PV-KBT4-EVO2/xy, Stäubli Electrical connectors AG
PV-KST4-EVO2A/xy&PV-KBT4-EVO2A/xy, Stäubli Electrical connectors AG
PV-JK03M/xy, Jiangxi Jinko PV Material Co., Ltd.
PV-JK03M1/xyz, Jiangxi Jinko PV Material Co., Ltd.
PV-JK03M2/xy, Jiangxi Jinko PV Material Co., Ltd.
PV-KST4-EVO2/xy_UR&PV-KBT4-EVO2/xy_UR, Stäubli Electrical connectors AG
PV-XT101.1;PV-XT101.2;XT2, Suzhou Xtong Photovoltaic Technologies Co.,Ltd
PV-GK01, Gokin Solar Co., Ltd.