

CERTIFICATE

TÜV NORD CERT GmbH

herewith declares that

Sunova Solar Technology Co., Ltd.

Building H, Phase II, Standard Workshop, Runzhou Road, Huishan Industrial Transformation and Agglomeration Area 214115 Wuxi, Jiangsu Province, P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

Description of product (details see Annex 2):

Crystalline Silicon Terrestrial Photovoltaic (PV) Modules



Valid from: 2023-11-16

Valid until: 2027-07-03

Certification program:	P12-VA-01 Rev. 17 09.20
Certification fundamental(s):	IEC / EN 61215-1:2016; IEC / EN 61215-1-1:2016; IEC 61215-2:2016 / EN 61215-2:2017 + AC:2017 + AC:2018; IEC 61730-1:2016 / EN IEC 61730-1:2018 + AC:2018; IEC 61730-2:2016 / EN IEC 61730-2:2018 + AC:2018.
Registered No.:	44 780 22 406749 - 138R6A3M7
Manufacturer:	see Annex 1
Test Report No.:	492012066.010
File No.:	PVP07096/23P-02



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Essen, 2023-11-16

Please also pay attention to the information stated overleaf.

Manufacturer:

- Manufacturer 1: **Sunova Solar Technology Co., Ltd.**
Building H, Phase II, Standard Workshop, Runzhou Road, Huishan
Industrial Transformation and Agglomeration Area 214115 Wuxi,
Jiangsu Province, P.R. China
- Factory inspection report no.: 862010664.002
- Manufacturer 2: **Jiangsu Green Energy Power Technology Co., Ltd.**
No.1 Taiyang Road, Youfang Town,
Yangzhong City, Jiangsu Province
- Factory inspection report no.: 862010732.001
- Manufacturer 3: **THORNOVA SOLAR VIET NAM COMPANY LIMITED**
Factory No. 1 and No. 2 Lot (VI) VI-1.2, Road N1 intersects with Road D2,
Que Vo II Industrial Park, Ngoc Xa Commune, Que Vo Town, Bac Ninh
Province, Vietnam
- Factory inspection report no.: 862010779.001
- Manufacturer 4: **Anji Technology Co., Ltd.**
No. 19, Keji 5th Road Annan District 70955 Tainan City
- Factory inspection report no.: 862010855.001

Remark:

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



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Description of product(s):

Module types:	Double Glass PV Modules with Half-cut 210mm Mono-crystalline Silicon Solar Cells: 132 cells: SS-BGxxx-66MDH-G12 (xxx=650-670, in steps of 5) 132 cells: TS-BG66(xxx)-G12 (xxx=650-670, in steps of 5) 120 cells: SS-BGxxx-60MDH-G12 (xxx=590-610, in steps of 5) 120 cells: TS-BG60(xxx)-G12 (xxx=590-610, in steps of 5) 108 cells: SS-BGxxx-54MDH-G12 (xxx=530-545, in steps of 5) 108 cells: TS-BG54(xxx)-G12 (xxx=530-545, in steps of 5) 96 cells: SS-BGxxx-48MDH-G12 (xxx=475-490, in steps of 5) 96 cells: TS-BG48(xxx)-G12 (xxx=475-490, in steps of 5) 84 cells: SS-BGxxx-42MDH-G12 (xxx=415-425, in steps of 5) 84 cells: TS-BG42(xxx)-G12 (xxx=415-425, in steps of 5) 60 cells: SS-BGxxx-30MDH-G12 (xxx=285-310, in steps of 5) 60 cells: TS-BG30(xxx)-G12 (xxx=285-310, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Fuse rating:	35A or 15A, refer CDF for details
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient (φ):	70% \pm 5%



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Module types:	Double Glass PV Modules with Half-cut 182mm Mono-crystalline Silicon Solar Cells: 144 cells: SS-BGxxx-72MDH (xxx=530-560, in steps of 5) 144 cells: TS-BG72(xxx) (xxx=530-560, in steps of 5) 132 cells: SS-BGxxx-66MDH (xxx=485-510, in steps of 5) 132 cells: TS-BG66(xxx) (xxx=485-510, in steps of 5) 120 cells: SS-BGxxx-60MDH (xxx=440-465, in steps of 5) 120 cells: TS-BG60(xxx) (xxx=440-465, in steps of 5) 108 cells: SS-BGxxx-54MDH (xxx=400-420, in steps of 5) 108 cells: Alp 2 SS-BGxxx-54MDH (xxx=400-420, in steps of 5) 108 cells: TS-BG54(xxx) (xxx=400-420, in steps of 5) 108 cells: Alp 2 TS-BG54(xxx) (xxx=400-420, in steps of 5) 96 cells: SS-BGxxx-48MDH (xxx=355-370, in steps of 5) 96 cells: TS-BG48(xxx) (xxx=355-370, in steps of 5) 72 cells: SS-BGxxx-36MDH (xxx=265-280, in steps of 5) 72 cells: TS-BG36(xxx) (xxx=265-280, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient (φ):	70% \pm 5%

Module types:	Double Glass PV Modules with Half-cut 210mm TOPCon Mono-crystalline Silicon Solar Cells: 132 cells: SS-BGxxx-66MDH-G12(T) (xxx=660-690, in steps of 5) 132 cells: TS-BGT66(xxx)-G12 (xxx=660-690, in steps of 5) 120 cells: SS-BGxxx-60MDH-G12(T) (xxx=600-625, in steps of 5) 120 cells: TS-BGT60(xxx)-G12 (xxx=600-625, in steps of 5) 60 cells: SS-BGxxx-30MDH-G12(T) (xxx=300-310, in steps of 5) 60 cells: TS-BGT30(xxx)-G12 (xxx=300-310, in steps of 5) Remark: xxx indicates output power from the front side only
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Maximum system voltage:	1500V
Fuse rating:	35A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient (φ):	75% \pm 5%

Module types:

Double Glass PV Modules with Half-cut 182mm TOPCon Monocrystalline Silicon Solar Cells:

156 cells: SS-BGxxx-78MDH(T) (xxx=580-615, in steps of 5)

156 cells: TS-BGT78(xxx) (xxx=580-615, in steps of 5)

144 cells: SS-BGxxx-72MDH(T) (xxx=535-590, in steps of 5)

144 cells: TS-BGT72(xxx) (xxx=535-590, in steps of 5)

132 cells: SS-BGxxx-66MDH(T) (xxx=490-540, in steps of 5)

132 cells: TS-BGT66(xxx) (xxx=490-540, in steps of 5)

120 cells: SS-BGxxx-60MDH(T) (xxx=445-490, in steps of 5)

120 cells: TS-BGT60(xxx) (xxx=445-490, in steps of 5)

108 cells: SS-BGxxx-54MDH(T) (xxx=400-440, in steps of 5)

108 cells: Alp 3 SS-BGxxx-54MDH(T) (xxx=400-440, in steps of 5)

108 cells: TS-BGT54(xxx) (xxx=400-440, in steps of 5)

108 cells: Alp 3 TS-BGT54(xxx) (xxx=400-440, in steps of 5)

Remark: xxx indicates output power from the front side only

Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient (φ):	75% \pm 5%



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Module types:	Double Glass PV Modules with Half-cut 182mm TOPCon Monocrystalline Silicon Solar Cells: 108 cells: SS-BGxxx-54MDH(T) (xxx=405-445, in steps of 5) 108 cells: TS-BGT54(xxx) (xxx=405-445, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient (φ):	80% \pm 5%

Remark:

For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.

Bifaciality coefficient (φ) = $(I_{SC_{rear}} / I_{SC_{front}})$ or $(P_{mpp_{rear}} / P_{mpp_{front}})$, whichever is smaller.

The tolerance of bifaciality coefficient (φ) is claimed by client.

Rated P_{mpp} power with albedo: comprehensive power of both sides, taken φ and albedo into consideration.

The albedo is claimed by client.



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