

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: 2023-04-20

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 - 138R2A1M2
Manufacturer:	see Annex 1
Test Report No.:	492012066.005
File No.:	PVP07123/22P



TÜV NORD CERT GmbH
Certification Body
Consumer Products



Essen, 2023-04-20

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.: 862010664.001

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

Remark:

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



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Description of product(s):

Module types:	Double Glass PV Modules with Half-cut 182mm Mono-crystalline Silicon Solar Cells: 144 cells: SS-BGxxx-72MDH (xxx=530-550, in steps of 5) 132 cells: SS-BGxxx-66MDH (xxx=485-505, in steps of 5) 120 cells: SS-BGxxx-60MDH (xxx=440-455, in steps of 5) 108 cells: SS-BGxxx-54MDH (xxx=400-410, in steps of 5) 108 cells: Alp 2 SS-BGxxx-54MDH (xxx=400-410, 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 Mono-crystalline Silicon Solar Cells: 132 cells: SS-BGxxx-66MDH-G12 (xxx=650-670, in steps of 5) 120 cells: SS-BGxxx-60MDH-G12 (xxx=590-610, in steps of 5) 108 cells: SS-BGxxx-54MDH-G12 (xxx=530-545, in steps of 5) 96 cells: SS-BGxxx-48MDH-G12 (xxx=475-490, in steps of 5) 84 cells: SS-BGxxx-42MDH-G12 (xxx=415-425, in steps of 5) Remark: xxx indicates output power from the front side only
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):	70% \pm 5%



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	Double Glass PV Modules with Half-cut 210mm TOPCon Monocrystalline Silicon Solar Cells: 132 cells: SS-BGxxx-66MDH-G12(T) (xxx=660-690, in steps of 5) 120 cells: SS-BGxxx-60MDH-G12(T) (xxx=600-625, in steps of 5) Remark: xxx indicates output power from the front side only
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):	70% \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) 144 cells: SS-BGxxx-72MDH(T) (xxx=535-590, in steps of 5) 132 cells: SS-BGxxx-66MDH(T) (xxx=490-540, in steps of 5) 120 cells: SS-BGxxx-60MDH(T) (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) 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%



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	SS-BG530-72MDH	SS-BG535-72MDH	SS-BG540-72MDH	SS-BG545-72MDH
Rated Pmpp at STC (Front side only):	530W	535W	540W	545W
Rated Pmpp power with albedo 13.5%:	580W	585W	590W	595W

Module types:	SS-BG550-72MDH	SS-BG485-66MDH	SS-BG490-66MDH	SS-BG495-66MDH
Rated Pmpp at STC (Front side only):	550W	485W	490W	495W
Rated Pmpp power with albedo 13.5%:	600W	530W	535W	540W

Module types:	SS-BG500-66MDH	SS-BG505-66MDH	SS-BG440-60MDH	SS-BG445-60MDH
Rated Pmpp at STC (Front side only):	500W	505W	440W	445W
Rated Pmpp power with albedo 13.5%:	545W	550W	480W	485W

Module types:	SS-BG450-60MDH	SS-BG455-60MDH	Alp 2 SS-BG400-54MDH / SS-BG400-54MDH /	Alp 2 SS-BG405-54MDH / SS-BG405-54MDH
Rated Pmpp at STC (Front side only):	450W	455W	400W	405W
Rated Pmpp power with albedo 13.5%:	490W	495W	435W	440W

Module types:	Alp 2 SS-BG410-54MDH / SS-BG410-54MDH	SS-BG650-66MDH-G12	SS-BG655-66MDH-G12	SS-BG660-66MDH-G12
Rated Pmpp at STC (Front side only):	410W	650W	655W	660W
Rated Pmpp power with albedo 13.5%:	445W	710W	715W	720W



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	SS-BG665-66MDH-G12	SS-BG670-66MDH-G12	SS-BG590-60MDH-G12	SS-BG595-60MDH-G12
Rated Pmpp at STC (Front side only):	665W	670W	590W	595W
Rated Pmpp power with albedo 13.5%:	725W	730W	645W	650W
Module types:	SS-BG600-60MDH-G12	SS-BG605-60MDH-G12	SS-BG610-60MDH-G12	SS-BG530-54MDH-G12
Rated Pmpp at STC (Front side only):	600W	605W	610W	530W
Rated Pmpp power with albedo 13.5%:	655W	660W	665W	580W
Module types:	SS-BG535-54MDH-G12	SS-BG540-54MDH-G12	SS-BG545-54MDH-G12	SS-BG475-48MDH-G12
Rated Pmpp at STC (Front side only):	535W	540W	545W	475W
Rated Pmpp power with albedo 13.5%:	585W	590W	595W	520W
Module types:	SS-BG480-48MDH-G12	SS-BG485-48MDH-G12	SS-BG490-48MDH-G12	SS-BG415-42MDH-G12
Rated Pmpp at STC (Front side only):	480W	485W	490W	415W
Rated Pmpp power with albedo 13.5%:	525W	530W	535W	455W
Module types:	SS-BG420-42MDH-G12	SS-BG425-42MDH-G12		
Rated Pmpp at STC (Front side only):	420W	425W		
Rated Pmpp power with albedo 13.5%:	460W	465W		



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	SS-BG660-66MDH-G12(T)	SS-BG665-66MDH-G12(T)	SS-BG670-66MDH-G12(T)	SS-BG675-66MDH-G12(T)
Rated Pmpp at STC (Front side only):	660W	665W	670W	675W
Rated Pmpp power with albedo 13.5%:	735W	740W	745W	750W
Module types:	SS-BG680-66MDH-G12(T)	SS-BG685-66MDH-G12(T)	SS-BG690-66MDH-G12(T)	SS-BG600-60MDH-G12(T)
Rated Pmpp at STC (Front side only):	680W	685W	690W	600W
Rated Pmpp power with albedo 13.5%:	755W	760W	765W	670W
Module types:	SS-BG605-60MDH-G12(T)	SS-BG610-60MDH-G12(T)	SS-BG615-60MDH-G12(T)	SS-BG620-60MDH-G12(T)
Rated Pmpp at STC (Front side only):	605W	610W	615W	620W
Rated Pmpp power with albedo 13.5%:	675W	680W	685W	690W
Module types:	SS-BG625-60MDH-G12(T)	SS-BG580-78MDH(T)	SS-BG585-78MDH(T)	SS-BG590-78MDH(T)
Rated Pmpp at STC (Front side only):	625W	580	585	590
Rated Pmpp power with albedo 13.5%:	695W	645	650	655
Module types:	SS-BG595-78MDH(T)	SS-BG600-78MDH(T)	SS-BG605-78MDH(T)	SS-BG610-78MDH(T)
Rated Pmpp at STC (Front side only):	595	600	605	610
Rated Pmpp power with albedo 13.5%:	660	665	670	675



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	SS-BG615-78MDH(T)	SS-BG535-72MDH(T)	SS-BG540-72MDH(T)	SS-BG545-72MDH(T)
Rated Pmpp at STC (Front side only):	615	535	540	545
Rated Pmpp power with albedo 13.5%:	680	595	600	605
Module types:	SS-BG550-72MDH(T)	SS-BG555-72MDH(T)	SS-BG560-72MDH(T)	SS-BG565-72MDH(T)
Rated Pmpp at STC (Front side only):	550	555	560	565
Rated Pmpp power with albedo 13.5%:	610	615	620	625
Module types:	SS-BG570-72MDH(T)	SS-BG575-72MDH(T)	SS-BG580-72MDH(T)	SS-BG585-72MDH(T)
Rated Pmpp at STC (Front side only):	570	575	580	585
Rated Pmpp power with albedo 13.5%:	630	635	640	645
Module types:	SS-BG590-72MDH(T)	SS-BG490-66MDH(T)	SS-BG495-66MDH(T)	SS-BG500-66MDH(T)
Rated Pmpp at STC (Front side only):	590	490	495	500
Rated Pmpp power with albedo 13.5%:	650	545	550	555
Module types:	SS-BG505-66MDH(T)	SS-BG510-66MDH(T)	SS-BG515-66MDH(T)	SS-BG520-66MDH(T)
Rated Pmpp at STC (Front side only):	505	510	515	520
Rated Pmpp power with albedo 13.5%:	560	565	570	575



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	SS-BG525-66MDH(T)	SS-BG530-66MDH(T)	SS-BG535-66MDH(T)	SS-BG540-66MDH(T)
Rated Pmpp at STC (Front side only):	525	530	535	540
Rated Pmpp power with albedo 13.5%:	580	585	590	595

Module types:	SS-BG445-60MDH(T)	SS-BG450-60MDH(T)	SS-BG455-60MDH(T)	SS-BG460-60MDH(T)
Rated Pmpp at STC (Front side only):	445	450	455	460
Rated Pmpp power with albedo 13.5%:	495	500	505	510

Module types:	SS-BG465-60MDH(T)	SS-BG470-60MDH(T)	SS-BG475-60MDH(T)	SS-BG480-60MDH(T)
Rated Pmpp at STC (Front side only):	465	470	475	480
Rated Pmpp power with albedo 13.5%:	515	520	525	530

Module types:	SS-BG485-60MDH(T)	SS-BG490-60MDH(T)	Alp 3 SS-BG400-54MDH(T) / SS-BG400-54MDH(T)	Alp 3 SS-BG405-54MDH(T) / SS-BG405-54MDH(T)
Rated Pmpp at STC (Front side only):	485	490	400	405
Rated Pmpp power with albedo 13.5%:	535	540	445	450

Module types:	Alp 3 SS-BG410-54MDH(T) / SS-BG410-54MDH(T)	Alp 3 SS-BG415-54MDH(T) / SS-BG415-54MDH(T)	Alp 3 SS-BG420-54MDH(T) / SS-BG420-54MDH(T)	Alp 3 SS-BG425-54MDH(T) / SS-BG425-54MDH(T)
Rated Pmpp at STC (Front side only):	410	415	420	425
Rated Pmpp power with albedo 13.5%:	455	460	465	470



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	Alp 3 SS-BG430-54MDH(T) / SS-BG430-54MDH(T)	Alp 3 SS-BG435-54MDH(T) / SS-BG435-54MDH(T)	Alp 3 SS-BG440-54MDH(T) / SS-BG440-54MDH(T)
Rated Pmpp at STC (Front side only):	430	435	440
Rated Pmpp power with albedo 13.5%:	475	480	485

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 Pmpp power with albedo: comprehensive power of both sides, taken φ and albedo into consideration.

The albedo is claimed by client.



TÜV NORD CERT GmbH
Certification Body
Consumer Products