


## Constructional Data Form for Photovoltaic Modules

License Holder.....: (full address)	Sany Silicon Energy (Zhuzhou) Co., Ltd. No.333 Qingxia Road, Tongtangwan Street, Shifeng District, Zhuzhou City, 412005, Hunan Province, P.R. China				
Production factory (full address) 1	Sany Silicon Energy (Zhuzhou) Co., Ltd. No.333 Qingxia Road, Tongtangwan Street, Shifeng District, Zhuzhou City, 412005, Hunan Province, P.R. China				
Production factory (full address) 2	Sany Silicon Energy (Shuozhou) Co., Ltd. No.2-1, Weier Road, Pinglu Economic Development Zone, Shuozhou City, 036899, Shanxi Province, P.R. China				
Type of Product.....:	Photovoltaic (PV) Modules				
Trademark.....:					
Type name or model no.	SYM156TBDxxx xxx = 615-645 in steps of 5	SYM144TBDxxx xxx = 555-595 in steps of 5	SYM120TBDxxx xxx = 455-495 in steps of 5	SYM108TBDxxx xxx = 415-445 in steps of 5	SYM144R01TBDxxx xxx = 590-620 in steps of 5
Nominal maximum output power at STC [W]	615, 620, 625, 630, 635, 640, 645	555, 560, 565, 570, 575, 580, 585, 590, 595	455, 460, 465, 470, 475, 480, 485, 490, 495	415, 420, 425, 430, 435, 440, 445	590, 595, 600, 605, 610, 615, 620
Nominal short-circuit current at STC [A]	13.57, 13.63, 13.69, 13.75, 13.81, 13.87, 13.93	13.60, 13.66, 13.72, 13.78, 13.84, 13.90, 13.96, 14.02, 14.08	13.54, 13.60, 13.66, 13.72, 13.78, 13.84, 13.90, 13.96, 14.02	13.60, 13.66, 13.72, 13.78, 13.84, 13.90, 13.96	14.44, 14.50, 14.56, 14.62, 14.68, 14.74, 14.80
Nominal open-circuit voltage at STC [V]	56.31, 56.53, 56.75, 56.97, 57.14, 57.32, 57.51	50.98, 51.12, 51.26, 51.40, 51.54, 51.68, 51.82, 51.96, 52.10	42.27, 42.41, 42.55, 42.69, 42.83, 42.97, 43.11, 43.25, 43.39	37.94, 38.14, 38.34, 38.54, 38.74, 38.94, 39.14	51.20, 51.34, 51.48, 51.62, 51.76, 51.90, 52.04
Tolerance of rating at STC (Pmpp / Isc / Voc) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3
Nominal maximum output power at BNPI [W]	677, 682, 688, 693, 699, 704, 710	611, 616, 622, 627, 633, 638, 644, 649, 655	501, 506, 512, 517, 523, 528, 534, 539, 545	457, 462, 468, 473, 479, 484, 490	649, 655, 660, 666, 671, 677, 682
Nominal short-circuit current at BNPI [A]	14.93, 14.99, 15.06, 15.13, 15.19, 15.26, 15.32	14.96, 15.03, 15.09, 15.16, 15.22, 15.29, 15.36, 15.42, 15.49	14.89, 14.96, 15.03, 15.09, 15.16, 15.22, 15.29, 15.36, 15.42	14.96, 15.03, 15.09, 15.16, 15.22, 15.29, 15.36	15.88, 15.95, 16.02, 16.08, 16.15, 16.21, 16.28
Nominal open-circuit voltage at BNPI [V]	56.31, 56.53, 56.75, 56.97, 57.14, 57.32, 57.51	50.98, 51.12, 51.26, 51.40, 51.54, 51.68, 51.82, 51.96, 52.10	42.27, 42.41, 42.55, 42.69, 42.83, 42.97, 43.11, 43.25, 43.39	37.94, 38.14, 38.34, 38.54, 38.74, 38.94, 39.14	51.20, 51.34, 51.48, 51.62, 51.76, 51.90, 52.04
Tolerance of rating at BNPI (Pmpp / Isc / Voc) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3

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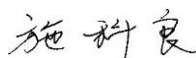
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<b>Bifaciality coefficient</b>	80%±5%	80%±5%	80%±5%	80%±5%	80%±5%
<b>Dimensions (L x W x H) [mm]</b>	2465x1134x30	2278x1134x30	1903*1134*30	1722*1134*30	2382x1134x30
<b>Module area [m²]</b>	2.80	2.58	2.16	1.95	2.70
<b>Class (IEC 61730-1:2016)</b>	II	II	II	II	II
<b>Maximum system voltage [V<sub>DC</sub>]</b>	1500	1500	1500	1500	1500
<b>Pollution degree</b>	I	I	I	I	I
<b>Qualified as cemented joint design</b>	No	No	No	No	No
<b>Over-current protection rating [A]</b>	30	30	30	30	30
<b>Defined min. creepage distance [mm]</b>	12.3±1	12.3±1	12.3±1	12.3±1	12.3±1
<b>Defined min. clearance distance [mm]</b>	12.3±1	12.3±1	12.3±1	12.3±1	12.3±1
<b>Max. operational altitude [masl]</b>	2000	2000	2000	2000	2000
<b>Design load – downwards [Pa]</b>	3600	3600	3600	3600	3600
<b>Design load – upwards [Pa]</b>	1600	1600	1600	1600	1600
<b>Safety factor for mechanical load</b>	1.5	1.5	1.5	1.5	1.5
<b>Number of solar cells</b>	156	144	120	108	144
<b>Connection of cells (S, SP, PS)</b>	SPS	SPS	SPS	SPS	SPS
<b>Number of diodes</b>	3	3	3	3	3

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Cells per diode	52	48	40	36	48
Type name or model no.	SYMN120R01TBDx xx xxx = 490-520 in steps of 5	SYMN108R01TBDxxx xxx = 440-470 in steps of 5	SYMN108TBDBxxx xxx = 415-445 in steps of 5	SYMN108TBDFBxxx x xxx = 415-445 in steps of 5	SYMN156R02TBD xxx xxx = 650-675 in steps of 5
Nominal maximum output power at STC [W]	490, 495, 500, 505, 510, 515, 520	440, 445, 450, 455, 460, 465, 470	415, 420, 425, 430, 435, 440, 445	415, 420, 425, 430, 435, 440, 445	650, 655, 660, 665, 670, 675
Nominal short-circuit current at STC [A]	14.44, 14.50, 14.56, 14.62, 14.68, 14.74, 14.80	14.44, 14.50, 14.56, 14.62, 14.68, 14.74, 14.80	13.37, 13.43, 13.49, 13.55, 13.61, 13.67, 13.73	13.60, 13.66, 13.72, 13.78, 13.84, 13.90, 13.96	14.21, 14.27, 14.33, 14.39, 14.45, 14.51
Nominal open-circuit voltage at STC [V]	42.62, 42.76, 42.90, 43.04, 43.18, 43.32, 43.46	38.33, 38.47, 38.61, 38.75, 38.89, 39.03, 39.17	38.74, 38.94, 39.14, 39.34, 39.54, 39.74, 39.94	37.94, 38.14, 38.34, 38.54, 38.74, 38.94, 39.14	56.77, 56.91, 57.05, 57.19, 57.33, 57.47
Tolerance of rating at STC (P <sub>mpp</sub> / I <sub>sc</sub> / V <sub>oc</sub> ) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3
Nominal maximum output power at BNPI [W]	539, 545, 550, 556, 561, 567, 572	484, 490, 495, 501, 506, 512, 517	457, 462, 468, 473, 479, 484, 490	457, 462, 468, 473, 479, 484, 490	715, 721, 726, 732, 737, 743
Nominal short-circuit current at BNPI [A]	15.88, 15.95, 16.02, 16.08, 16.15, 16.21, 16.28	15.88, 15.95, 16.02, 16.08, 16.15, 16.21, 16.28	14.71, 14.77, 14.84, 14.91, 14.97, 15.04, 15.10	14.96, 15.03, 15.09, 15.16, 15.22, 15.29, 15.36	15.63, 15.70, 15.76, 15.83, 15.90, 15.96
Nominal open-circuit voltage at BNPI [V]	42.62, 42.76, 42.90, 43.04, 43.18, 43.32, 43.46	38.33, 38.47, 38.61, 38.75, 38.89, 39.03, 39.17	38.74, 38.94, 39.14, 39.34, 39.54, 39.74, 39.94	37.94, 38.14, 38.34, 38.54, 38.74, 38.94, 39.14	56.77, 56.91, 57.05, 57.19, 57.33, 57.47
Tolerance of rating at BNPI (P <sub>mpp</sub> / I <sub>sc</sub> / V <sub>oc</sub> ) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3
Bifaciality coefficient	80%±5%	80%±5%	80%±5%	80%±5%	80%±5%
Dimensions (L x W x H) [mm]	1994x1134x30	1800x1134x30	1722*1134*30	1722*1134*30	2465x1192x33/30
Module area [m²]	2.20	2.04	1.95	1.95	2.94

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*Anshen Ren*

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Class (IEC 61730-1:2016)	II	II	II	II	II
Maximum system voltage [V <sub>DC</sub> ]	1500	1500	1500	1500	1500
Pollution degree	I	I	I	I	I
Qualified as cemented joint design	No	No	No	No	No
Over-current protection rating [A]	30	30	30	30	30
Defined min. creepage distance [mm]	12.3±1	12.3±1	12.3±1	12.3±1	12.3±1
Defined min. clearance distance [mm]	12.3±1	12.3±1	12.3±1	12.3±1	12.3±1
Max. operational altitude [masl]	2000	2000	2000	2000	2000
Design load – downwards [Pa]	3600	3600	3600	3600	3600
Design load – upwards [Pa]	1600	1600	1600	1600	1600
Safety factor for mechanical load	1.5	1.5	1.5	1.5	1.5
Number of solar cells	120	108	108	108	156
Connection of cells (S, SP, PS)	SPS	SPS	SPS	SPS	SPS
Number of diodes	3	3	3	3	3
Cells per diode	40	36	36	36	52
Type name or model no.	SYM156TBDOxxx xxx = 615-645 in steps of 5	SYM156TBDLxxx xxx = 615-645 in steps of 5	/	/	/

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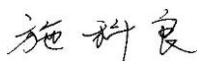

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Nominal maximum output power at STC [W]	615, 620, 625, 630, 635, 640, 645	615, 620, 625, 630, 635, 640, 645	/	/	/
Nominal short-circuit current at STC [A]	13.57, 13.63, 13.69, 13.75, 13.81, 13.87, 13.93	13.57, 13.63, 13.69, 13.75, 13.81, 13.87, 13.93	/	/	/
Nominal open-circuit voltage at STC [V]	56.31, 56.53, 56.75, 56.97, 57.14, 57.32, 57.51	56.31, 56.53, 56.75, 56.97, 57.14, 57.32, 57.51	/	/	/
Tolerance of rating at STC (P <sub>mpp</sub> / I <sub>sc</sub> / V <sub>oc</sub> ) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	/	/	/
Nominal maximum output power at BNPI [W]	677, 682, 688, 693, 699, 704, 710	677, 682, 688, 693, 699, 704, 710	/	/	/
Nominal short-circuit current at BNPI [A]	14.93, 14.99, 15.06, 15.13, 15.19, 15.26, 15.32	14.93, 14.99, 15.06, 15.13, 15.19, 15.26, 15.32	/	/	/
Nominal open-circuit voltage at BNPI [V]	56.31, 56.53, 56.75, 56.97, 57.14, 57.32, 57.51	56.31, 56.53, 56.75, 56.97, 57.14, 57.32, 57.51	/	/	/
Tolerance of rating at BNPI (P <sub>mpp</sub> / I <sub>sc</sub> / V <sub>oc</sub> ) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	/	/	/
Bifaciality coefficient	80%±5%	80%±5%	/	/	/
Dimensions (L x W x H) [mm]	2465x1134x30	2465x1134x30	/	/	/
Module area [m²]	2.80	2.80	/	/	/
Class (IEC 61730-1:2016)	II	II	/	/	/
Maximum system voltage [V <sub>DC</sub> ]	1500	1500	/	/	/
Pollution degree	I	I	/	/	/

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Qualified as cemented joint design	No	No	/	/	/
Over-current protection rating [A]	30	30	/	/	/
Defined min. creepage distance [mm]	12.3±1	12.3±1	/	/	/
Defined min. clearance distance [mm]	12.3±1	12.3±1	/	/	/
Max. operational altitude [masl]	2000	2000	/	/	/
Design load – downwards [Pa]	3600	3600	/	/	/
Design load – upwards [Pa]	1600	1600	/	/	/
Safety factor for mechanical load	1.5	1.5	/	/	/
Number of solar cells	156	156	/	/	/
Connection of cells (S, SP, PS)	SPS	SPS	/	/	/
Number of diodes	3	3	/	/	/
Cells per diode	52	52	/	/	/

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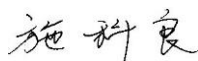
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Copy of marking plate:

   	<b>PV MODULE</b> Sany Silicon Energy (Zhuzhou) Co., LTD Sany Energy Equipment Industrial Park, No.320 Qingshui Road, Shifeng District, Zhuzhou City, Hunan Province 412005 China <a href="https://www.sanyglobal.com/product/">https://www.sanyglobal.com/product/</a>	<b>SYM156TBD 615</b> Test conditions Max. power (P <sub>max</sub> ) Max. power tolerance Voltage at max. power (V <sub>mpp</sub> ) Current at max. power (I <sub>mp</sub> ) Open-circuit voltage (V <sub>oc</sub> ) Short-circuit current (I <sub>sc</sub> ) The following coefficients measured at STC according to IEC TS 60904-1-2: Efficiency: qP <sub>max</sub> 30%±5%, qI <sub>sc</sub> 80%±5%, qV <sub>oc</sub> 99%±1%	Module(T88)(max(°C) Design Load (Pa) Series Fuse Rating Maximum system voltage operating temperature range protect. rage module wprotectheight module size STC BNPI Connector	70 +3600/1600 30A 1500VDC 40°C ~ +85°C II 34.3(kg) 2485×1134×30(mm) 1000W/m <sup>2</sup> , AM1.5, 25°C front 1000W/m <sup>2</sup> , rear 135W/m <sup>2</sup> Refer to manual <b>warning</b>  Only the professionals can install and maintain the components Be careful of the dangerous high DC voltage when connecting the components Never damage or scratch the back of the assembly Certified in accordance with IEC 61215:2021 and IEC 61730:2016 MADE IN CHINA
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List of Critical Components (add lines for multiple material sources)					
Object	Manufacturer / trademark	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
Front cover	Hunan Kibing Solar Technology Co., Ltd.	Semi-tempered AR coated glass	Thickness =2.0mm	—	—
Rear cover	Hunan Kibing Solar Technology Co., Ltd.	Semi-Tempered back glass	Thickness =2.0mm	—	—
Encapsulation material	HANGZHOU FIRST APPLIED MATERIAL CO., LTD	EP304 (near glass)	Thickness = 0.5mm gram weight: 400 g/m <sup>2</sup>	—	—
		F406PS (near back glass)	Thickness = 0.5mm gram weight:400 g/m <sup>2</sup>		
Solar cell 1	Sany Silicon Energy (Zhuzhou) Co., Ltd.	SYCN182T1634 (combined with Encapsulation material 1,2,3,4)	L x W x T [mm]: 182.2 x 91 (±0.25) x 0.13 (±0.015) 182.2 x 91.875 (±0.25) x 0.13 (±0.015) Topcon Mono-Si, 16BB	—	—
Solar cell 2	Sany Silicon Energy (Zhuzhou) Co., Ltd.	SYCN191T1638 (combined with Encapsulation material 1,2,3,4)	L x W x T [mm]: 182.2 x 95.8 (±0.25) x 0.13 (±0.015) 191.6 x 91.1 (±0.25) x 0.13 (±0.015) Topcon Mono-Si, 16BB	—	—
Cell connectors 1	Suzhou bonide Photovoltaic Technology Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm Ø= 0.23±0.023mm	—	—
Cell connectors 2	Jiangsu Xingdarui Optical Power Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm Ø= 0.23±0.023mm	—	—
Cell connectors 3	Changzhou Shengyue metal new material Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm Ø= 0.23±0.023mm	—	—
Cell connectors 4	Suzhou YourBest new-type materials Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm Ø= 0.23±0.023mm	—	—

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Object	Manufacturer / trademark	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
String connectors 1	Suzhou bonide Photovoltaic Technology Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm	—	—
String connectors 2	Jiangsu Xingdarui Optical Power Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm	—	—
String connectors 3	Changzhou Shengyue metal new material Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm	—	—
String connectors 4	Suzhou YourBest new-type materials Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm	—	—
Frame parts	CHANGSHU DONGNENG SOLAR TECHNOLOGY CO., LTD	Anodized Aluminium Alloy 6005-T6 (Silver)	H(mm) x W(mm): 30x33mm (long frame) 30x18mm (short frame)	—	—
Adhesive (frame)	Shanghai Huitian New Material Co., Ltd.	HT906Z	Color: White	—	—
Fluxing agent 1	Zhuhai Changxian New Materials Technology Co., Ltd	CX700	—	—	—
Fluxing agent 2	ASAHI SOLDER TECHNOLOGY(WUXI) CO., LTD	SF180	—	—	—
Fluxing agent 3	Shenzhen Tongfang Electronic New-Material CO., LTD	AATF9800-MBB	—	—	—
Fixing tape 1	SuZhou Rongzhi Electronic Technology Co., Ltd	D60F6-2	Thickness= 100µm±40µm	—	—
Fixing tape 2	Guangdong Sunrui New Material Co., Ltd.	HZ UV-100	Thickness= 100µm±40µm	—	—

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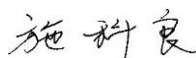
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Object	Manufacturer / trademark	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
Fixing tape 3	SuZhou Rongzhi Electronic Technology Co., Ltd	D60F6-6	Thickness= 100µm±40µm	—	—
Fixing tape 4	Guangdong Sunrui New Material Co., Ltd.	HZ UV-3	Thickness= 100µm±40µm	—	—
Insulation tape	—	—	—	—	—
(Optional) Accessories	—	—	—	—	—
Junction box	QC Solar (Suzhou) Corporation	3Qxy (x=1 or 2 or 3 or 4; y=1 or 2 or 3 or 4)	Rated voltage =1500VDC Rated current =20A (x=1; y=1 or 2 or 3 or 4) Rated current =22A (x=2; y=1 or 2 or 3) Rated current =25A (x=3; y=1 or 2 or 3 or 4) Rated current =30A (x=4; y=1 or 2 or 3 or 4) Reverse current=40A IP68	IEC 62790: 2020 EN IEC 62790: 2020	R 50510013
Cable	QC Solar (Suzhou) Corporation	62930 IEC 131 1 x 2,5mm <sup>2</sup> / 1 x 4,0mm <sup>2</sup> / 1 x 6,0mm <sup>2</sup> / 1 x 10,0mm <sup>2</sup> HALOGEN FREE LOW SMOKE	Max. Voltage = 1500VDC	IEC 62930	R 50447239
Connector	QC Solar (Suzhou) Corporation	QC4.10-cds	Max. Voltage = 1500VDC Max. Current = 41A	IEC 62852	R 50505605
Bypass diode	QC Solar (Suzhou) Corporation	QCM4045	Tj max =200 °C;	—	—
Adhesive	Shanghai Huitian New Material Co., Ltd.	HT906Z	Color: White	—	—
Potting (junction box)	Shanghai Huitian New Material Co., Ltd.	5299W-S	Color: White	—	—

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