



سولار صنعت فیروزه

Solar Sanat Firoozeh

تولید کننده انواع پنل خورشیدی در ایران

Solar Sanat Firoozeh



www.ssf-solar.com



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شهرک صنعتی کمال الملک

مبنای طراحی پنل های خورشیدی کارایی و طول عمر و بازده بالا، ایمنی و زیبایی می باشد. پس از اتمام کار طراحی، جهت ساخت از دستگاه های پیشرفته اتومات، نیمه اتومات و به روز دنیا استفاده میشود. در مراحل ساخت ایمنی، دقت و استاندارد ملاک اصلی عمل است. ارائه محصولات جدید با بازده و توان بالا و مطابق با نیاز مصرف کنندگان از خصوصیات شرکت سولار صنعت فیروزه می باشد.

شرکت سولار صنعت فیروزه سعی نموده ضمن استفاده از مرغوبترین مواد اولیه و تجهیزات مدرن و پیشرفته دنیا در ساخت پنل های خورشیدی سود مورد نظر خود را در افزایش میزان فروش بیشتر جستجو نماید. از آنجا که شرکت سولار صنعت فیروزه مبنای کار خود را بر اساس بروز رسانی محصولات با علم روز دنیا و مشارکت علمی با فعالان در زمینه های انرژی های نو قرار داده است، برخورد لازم دانستیم که با شرکت در سمینارها و کنفرانس ها و نمایشگاه های مختلف در اقصی نقاط جهان گامی موثر در این زمینه برداریم.

شرکت سولار صنعت فیروزه با بهره گیری از پیشرفته ترین دستگاه های موجود و با استفاده از مواد اولیه درجه یک اقدام به تولید انواع پنل در دو گروه مونو کریستال و پلی کریستال در سایزهای مختلف، با ارائه گارانتی ۲۰ ساله عملکرد و خدمات پس از فروش نموده است.

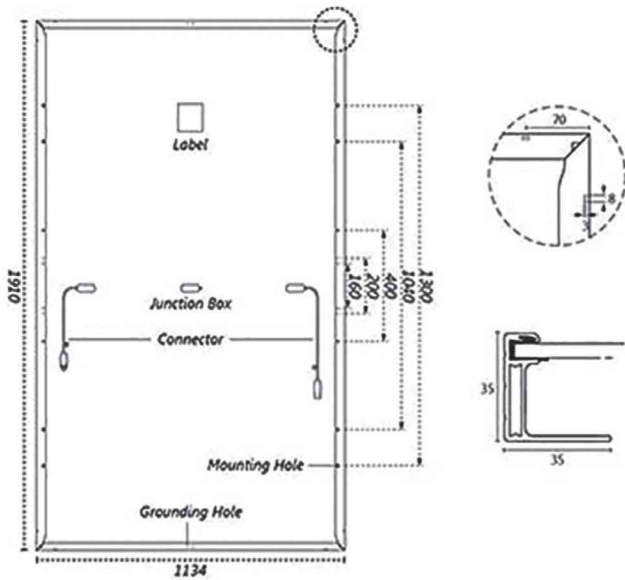
شرکت سولار صنعت فیروزه به عنوان یکی از زیر مجموعه های هلدینگ شرق صنعت در سال ۱۳۹۴ فعالیت خود را در زمینه طراحی و ساخت انواع پنل های خورشیدی آغاز و سپس با سرمایه گذاری مناسب اقدام به طراحی و ساخت نیروگاه های فتوولتائیک نمود. هلدینگ شرق صنعت با احداث این شرکت گامی بلند در زمینه توسعه انرژی های نو در ایران برداشته است.

احداث کارخانه سولار صنعت فیروزه با یکی از بالاترین ظرفیت های تولید پنل خورشیدی در ایران (در حال حاضر ۱۰۰ مگاوات)، در زمینی به وسعت بیش از ۴۰ هزار متر مربع در شهرک صنعتی کمال الملک شهر فیروزه آغاز به کار نمود و با بکارگیری نیروی انسانی متخصص و کارا در واحدهای مختلف فنی و مهندسی، طراحی، تولید و مونتاژ، کنترل کیفی، بازرگانی و... ضمن ارج نهادن به خلاقیت و نوآوری توانست هدفی بزرگ برای خانواده سولار صنعت رقم زند، که آن تبدیل شدن به یکی از قطب های انرژی خورشیدی در ایران می باشد.



SSF- H120 430~460W

Design



Mechanical Specification

Cells Type	Mono 182×91mm	Dimension (L×W×T)	1910×1134×35mm
Weight	24kg	Packing	31pcs/Pallet, 744pcs/40HQ
Output Cable (Including connector)		4.0mm ² , 300/400mm in length, length can be customized	
No. of Cells		120(6×10)	
Glass		3.2mm High Transmission, Antireflection Coating	
Junction box		IP68, 3 Bypass Diodes	
Connector		MC4 Compatible	

Operating Parameters

Maximum system voltage	1500V DC
Operating Temperature	-40~+85°C
Maximum series fuse rating	25A
Snow load, frontside	5400Pa
Wind load, backside	2400Pa
Nominal operating cell temperature	45°C±2°C
Application level	Class A

STC-Electrical Characteristics

Module Type

SSF-H120

Maximum Power (Pmax)	430W	435W	440W	445W	450W	455W	460W
Open.circuit Voltage (Voc)	40.8V	41.0V	41.2V	41.4V	41.6V	41.8V	42.0V
Maximum Power Voltage (Vmp)	34.4V	34.6V	34.8V	35.0V	35.2V	35.4V	35.6V
Short.circuit Current (Isc)	13.42A	13.48A	13.54A	13.60A	13.66A	13.72A	13.78A
Maximum Power Current (Imp)	12.50A	12.57A	12.64A	12.71A	12.78A	12.85A	12.92A
Module Efficiency (%)	19.85%	20.08%	20.31%	20.55%	20.78%	21.01%	21.24%
Temperature Coefficient of Isc	0.05%/°C						
Temperature Coefficient of Voc	-0.31%/°C						
Temperature Coefficient of Pmax	-0.35%/°C						

Standard Test Environment : Irradiance 1000W/m², Cell temperature 25°C, Spectrum AM1.5

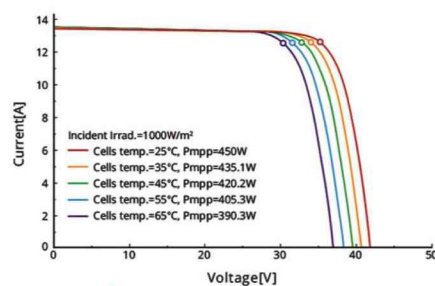
NOCT-Electrical Characteristics

Maximum Power (Pmax)	320W	324W	327W	331W	335W	339W	342W
Open.circuit Voltage (Voc)	38.3V	38.5V	38.6V	38.8V	39.0V	39.2V	39.4V
Maximum Power Voltage (Vmp)	32.6V	32.7V	32.9V	33.1V	33.3V	33.5V	39.7V
Short.circuit Current (Isc)	10.83A	10.88A	10.93A	10.97A	11.02A	11.07A	11.12A
Maximum Power Current (Imp)	9.83A	9.88A	9.94A	10.00A	10.05A	10.10A	10.16A

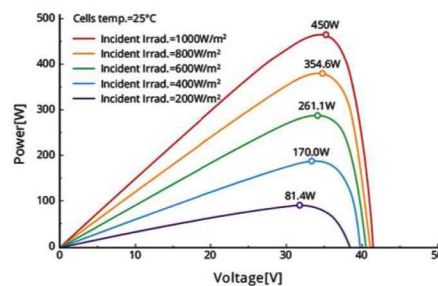
Standard Test Environment : Irradiance 800W/m², Ambient temperature 20°C, Spectrum AM1.5, Wind speed 1m/s

I-V Curve (SSF-H120-450W)

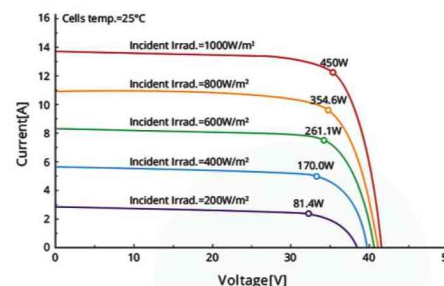
Current-Voltage Curve



Power-Voltage Curve

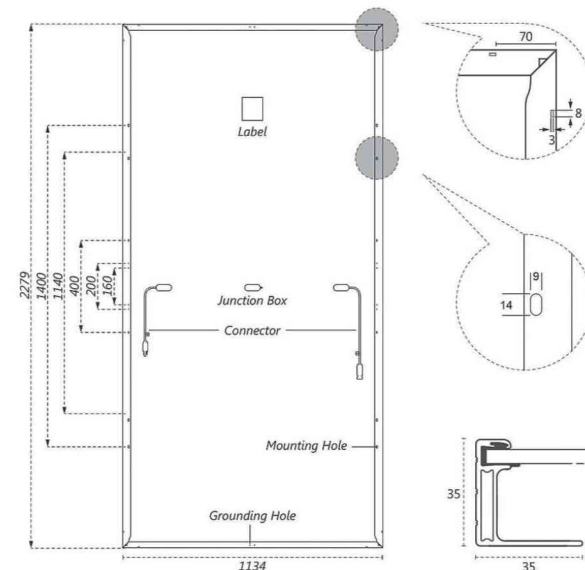


Current-Voltage Curve



SSF- H144 540~560W

Design



Mechanical Specification

Cells Type	Mono 182×91mm	Dimension (L×W×T)	2279×1134×35mm
Weight	29kg	Packing	31pcs/Pallet, 620pcs/40HQ
Output Cable (Including connector)		4.0mm ² , 300/400mm in length, length can be customized	
No. of Cells		144(6×24)	
Glass		3.2mm High Transmission, Antireflection Coating	
Junction box		IP68, 3 Bypass Diodes	
Connector		MC4 Compatible	

Operating Parameters

Maximum system voltage	1500V DC
Operating Temperature	-40~+85°C
Maximum series fuse rating	25A
Snow load, frontside	5400Pa
Wind load, backside	2400Pa
Nominal operating cell temperature	45°C±2°C
Application level	Class A

STC-Electrical Characteristics

Module Type

SSF-H144

Maximum Power (Pmax/W)	540	545	550	555	560
Open.circuit Voltage (Voc/V)	49.8	50.0	50.2	50.4	50.6
Maximum Power Voltage (Vmp/V)	42.0	42.2	42.4	42.6	42.8
Short.circuit Current (Isc/A)	13.66	13.72	13.78	13.84	13.90
Maximum Power Current (Imp/A)	12.86	12.91	12.97	13.03	13.08
Module Efficiency (%)	20.9	21.1	21.3	21.5	21.7
Temperature Coefficient of Isc	0.05%/°C				
Temperature Coefficient of Voc	-0.31%/°C				
Temperature Coefficient of Pmax	-0.35%/°C				

Standard Test Environment : Irradiance 1000W/m², Cell temperature 25°C, Spectrum AM1.5

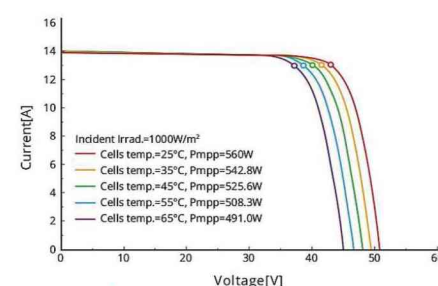
NOCT-Electrical Characteristics

Maximum Power (Pmax/W)	402	405	409	413	417
Open.circuit Voltage (Voc/V)	46.7	46.9	47.1	47.3	47.5
Maximum Power Voltage (Vmp/V)	39.4	39.6	39.8	40.0	40.1
Short.circuit Current (Isc/A)	11.04	11.09	11.13	11.18	11.23
Maximum Power Current (Imp/A)	10.20	10.24	10.29	10.33	10.38

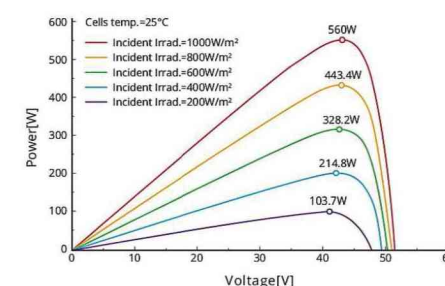
Standard Test Environment : Irradiance 800W/m², Ambient temperature 20°C, Spectrum AM1.5, Wind speed 1m/s

I-V Curve (SSF-H144-560W)

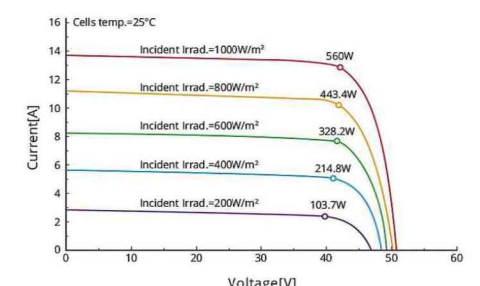
Current-Voltage Curve



Power-Voltage Curve



Current-Voltage Curve



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SSF Solar Module

SSF - M60



ELECTRICAL DATA (STC)

Peak Power Watts- $P_{MAX}(WP)^*$	295	300	305	310	315	320
Power Output Tolerance- P_{MAX} (W)	0~+5					
Maximum Power Voltage- $V_{MPP}(V)$	32.5	32.6	32.9	33.1	33.3	33.7
Maximum Power Current- $I_{MPP}(A)$	9.08	9.19	9.28	9.37	9.46	9.55
Open Circuit Voltage- $V_{OC}(V)$	39.6	39.8	40.0	40.2	40.5	40.9
Short Circuit Current- I_{SC} (A)	9.68	9.77	9.85	9.94	10.0	10.3
Module Efficiency η_m (%)	18.13	18.44	18.75	19.05	19.36	19.66

STC:Irradiance 1000W/m², Cell Temperature 25°C,Air Mass AM1.5

*Measuring tolerance: $\pm 3\%$

ELECTRICAL DATA (NOCT)

Maximum Power- $P_{MAX}(Wp)$	220	223	227	231	235	239
Maximum Power Voltage- V_{MPP} (V)	30.1	30.2	30.5	30.7	30.9	31.5
Maximum Power Current- $I_{MPP}(A)$	7.30	7.38	7.46	7.53	7.60	7.58
Open Circuit Voltage- $V_{OC}(V)$	36.8	37.0	37.2	37.4	37.6	37.9
Short Circuit Current- I_{SC} (A)	7.82	7.89	7.95	8.03	8.10	8.45

NOCT:Irradiance at 800W/m², Ambient Temperature 20°C,Wind Speed 1m/s.

COMPONENT MATERIALS

Solar Cells	Mono Crystalline 157 ×157 mm (6.18 inches)
Cell Orientation	60 cells(6 × 10)
Module Dimensions	1640 × 992 ×35 mm (64.57×39.05×1.37 inches)
Weight	17.8 kg (39.24 lb)
Glass	3.2 mm (0.125 inches), High Transmission, AR Coated Tempered Glass, Anti-Reflective, Low Iron
Backsheet	White
Frame	Silver Anodized Aluminium Alloy
J-Box	IP 67 rated - 4 Railes-3pce bypass diodes
Cables	Photovoltaic Technology Cable 4.0 mm ² (0.006inches ²),1000mm (30.37 inches)
Connector	MC4 Compatible

TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	44°C($\pm 2^\circ C$)
Temperature Coefficient of P_{MAX}	-0.39%/°C
Temperature Coefficient of V_{OC}	-0.29%/°C
Temperature Coefficient of I_{SC}	+0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1000V DC
Max Series Fuse Rating	15A

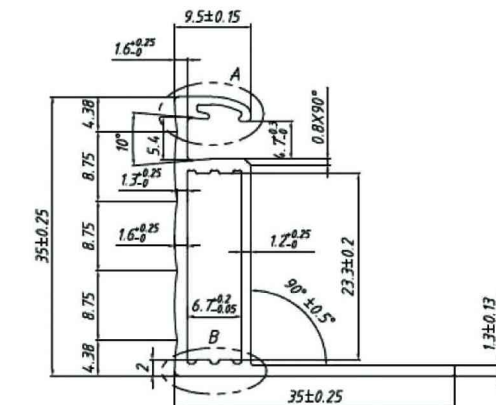
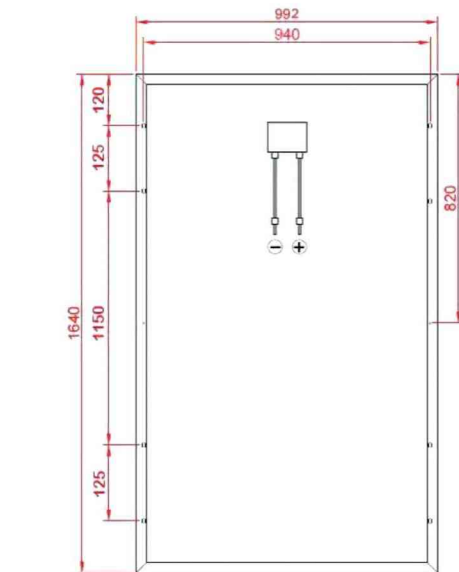
WARRANTY

- 10 year Product Workmanship Warranty
- 25 year linear Power Warranty

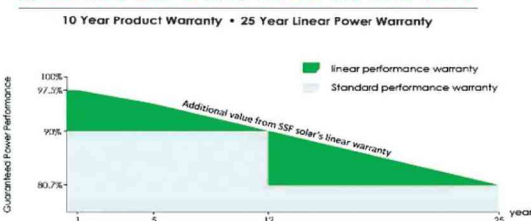
PACKAGING CONFIGURATION

- Modules per box:24 pieces
- Modules per 40' container:624 pieces

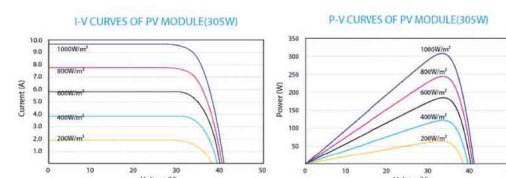
(Please refer to product warranty for details)



LINEAR PERFORMANCE WARRANTY



Electrical Performance & Temperature Dependence



SSF Solar Module

SSF - M72



ELECTRICAL DATA (STC)	SSF-350	SSF-355	SSF-360	SSF-365	SSF-370	SSF-375	SSF-380	SSF-385	SSF-390	SSF-395
Peak Power Watts- $P_{MAX}(WP)^*$	350	355	360	365	370	375	380	385	390	395
Power Output Tolerance- P_{MAX} (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage- $V_{MPP}(V)$	38.7	38.8	39.0	39.3	39.7	40.0	40.1	40.3	40.82	41.11
Maximum Power Current- $I_{MPP}(A)$	9.04	9.14	9.24	9.30	9.33	9.37	9.50	9.56	9.6	9.62
Open Circuit Voltage- $V_{OC}(V)$	47.0	47.4	47.7	48.0	48.3	48.5	48.7	48.9	48.95	49.1
Short Circuit Current- I_{SC} (A)	9.60	9.65	9.70	9.77	9.83	9.88	10.1	10.2	10.24	10.27
Module Efficiency η_m (%)	18.0	18.3	18.5	18.8	19.0	19.3	19.6	19.8	19.82	20.07

STC:Irradiance 1000W/m², Cell Temperature 25°C,Air Mass AM1.5

*Measuring tolerance: $\pm 3\%$

ELECTRICAL DATA (NOCT)	SSF-350	SSF-355	SSF-360	SSF-365	SSF-370	SSF-375	SSF-380	SSF-385	SSF-390	SSF-395
Maximum Power- $P_{MAX}(Wp)$	261	264	268	272	276	279	279	283	288	293
Maximum Power Voltage- V_{MPP} (V)	35.9	36.0	36.2	36.4	36.8	37.1	37.1	37.2	37.45	38.01
Maximum Power Current- $I_{MPP}(A)$	7.26	7.34	7.42	7.47	7.50	7.53	7.55	7.6	7.69	7.71
Open Circuit Voltage- $V_{OC}(V)$	43.7	44.1	44.3	44.6	44.9	45.1	45.20	45.38	45.59	45.73
Short Circuit Current- I_{SC} (A)	7.75	7.79	7.83	7.89	7.94	7.98	7.99	8.1	8.15	8.13

NOCT:Irradiance at 800W/m², Ambient Temperature 20°C,Wind Speed 1m/s.

COMPONENT MATERIALS

Solar Cells	Mono Crystalline 157 ×157 mm (6.18 inches)
Cell Orientation	72 cells(6 × 12)
Module Dimensions	1956 × 992 ×35 mm (77.0×39.0×1.37 inches)
Weight	22.5kg (49.60 lb) (with 3.2 mm glass; 26.1 kg with 4.0 mm glass)
Glass	3.2 mm (0.125 inches), High Transmission, AR Coated Tempered Glass, Anti-Reflective, Low Iron, High Transmission
Backsheet	White
Frame	Silver Anodized Aluminium Alloy
J-Box	IP 68 rated - 4 Railes-3pcs bypass diodes
Cables	Photovoltaic Technology Cable 4.0 mm ² (0.006inches ²),1100 mm (43.3 inches)
Connector	MC4 Compatible

TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	44°C($\pm 2^\circ C$)
Temperature Coefficient of P_{MAX}	-0.39%/°C
Temperature Coefficient of V_{OC}	-0.29%/°C
Temperature Coefficient of I_{SC}	+0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1000V DC
Max Series Fuse Rating	15A

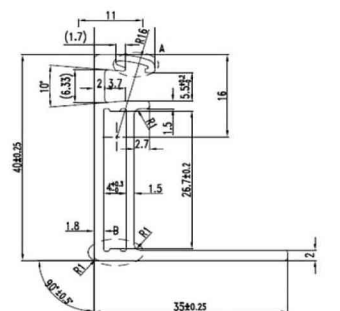
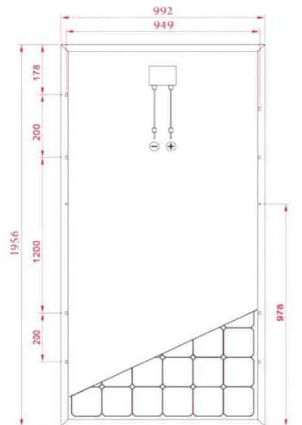
WARRANTY

- 10 year Product Workmanship Warranty
- 25 year linear Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

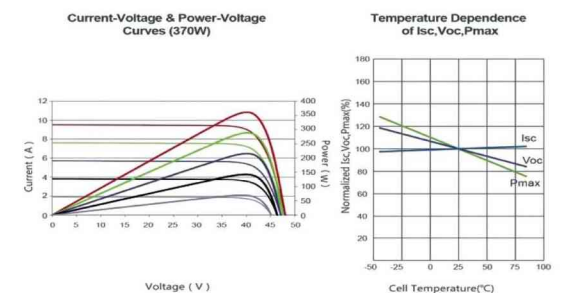
- Modules per box:24 pieces
- Modules per 40' container:528 pieces



LINEAR PERFORMANCE WARRANTY



Electrical Performance & Temperature Dependence



SSF Solar Module

SSF - P60



ELECTRICAL DATA (STC)

Peak Power Watts- $P_{MAX}(WP)^*$	265	270	275	280
Power Output Tolerance- P_{MAX} (W)	0~+5			
Maximum Power Voltage- $V_{MPP}(V)$	30.8	30.9	31.1	31.4
Maximum Power Current- $I_{MPP}(A)$	8.61	8.73	8.84	8.92
Open Circuit Voltage- $V_{OC}(V)$	38.3	38.4	38.5	38.7
Short Circuit Current- $I_{SC}(A)$	9.10	9.18	9.25	9.34
Module Efficiency η_m (%)	16.2	16.5	16.8	17.1

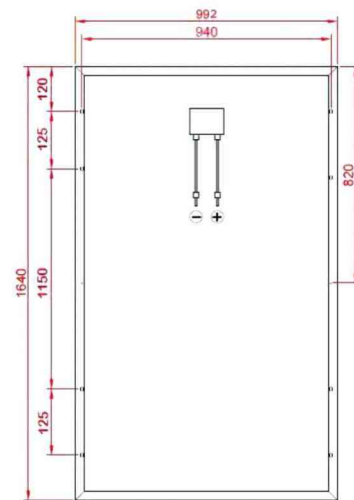
STC:Irradiance 1000W/m², Cell Temperature 25°C,Air Mass AM1.5

*Measuring tolerance: $\pm 3\%$

ELECTRICAL DATA (NOCT)

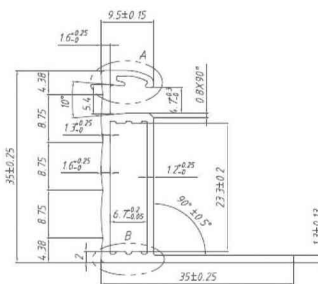
Maximum Power- $P_{MAX}(Wp)$	197	200	204	207
Maximum Power Voltage- V_{MPP} (V)	28.6	28.7	29.0	29.2
Maximum Power Current- $I_{MPP}(A)$	6.89	6.97	7.03	7.10
Open Circuit Voltage- $V_{OC}(V)$	35.5	35.5	35.6	35.8
Short Circuit Current- I_{SC} (A)	7.35	7.41	7.47	7.55

NOCT:Irradiance at 800W/m², Ambient Temperature 20°C,Wind Speed 1m/s.



COMPONENT MATERIALS

Solar Cells	Poly Crystalline 157 ×157 mm (6.18 inches)
Cell Orientation	60 cells(6 × 10)
Module Dimensions	1640 × 992 ×35 mm (64.57×39.05×1.37 inches)
Weight	17.8 kg (39.24 lb)
Glass	3.2 mm (0.125 inches). High Transmission, AR Coated Tempered Glass, Anti-Reflective, Low Iron
Backsheet	White
Frame	Silver Anodized Aluminium Alloy
J-Box	IP 67 rated - 4 Railes-3pcs bypass diodes
Cables	Photovoltaic Technology Cable 4.0 mm ² (0.006inches ²),1000mm (30.37 inches)
Connector	MC4 Compatible



TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	44 °C(±2 °C)
Temperature Coefficient of P_{MAX}	-0.41%/°C
Temperature Coefficient of V_{OC}	-0.32%/°C
Temperature Coefficient of I_{SC}	+0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85 °C
Maximum System Voltage	1000V DC
Max Series Fuse Rating	15A

WARRANTY

10 year Product Workmanship Warranty	Modules per box:24 pieces
25 year linear Power Warranty	Modules per 40' container:624 pieces

(Please refer to product warranty for details)

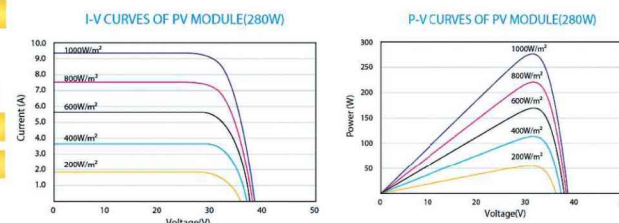
PACKAGING CONFIGURATION

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty



Electrical Performance & Temperature Dependence



SSF Solar Module

SSF - P72



ELECTRICAL DATA (STC)

Peak Power Watts- $P_{MAX}(WP)^*$	320	325	330	335
Power Output Tolerance- P_{MAX} (W)	0~+5			
Maximum Power Voltage- $V_{MPP}(V)$	37.1	37.2	37.3	37.6
Maximum Power Current- $I_{MPP}(A)$	8.63	8.76	8.87	8.91
Open Circuit Voltage- $V_{OC}(V)$	45.8	45.9	46.1	46.3
Short Circuit Current- I_{SC} (A)	9.10	9.25	9.38	9.39
Module Efficiency η_m (%)	16.5	16.8	17.0	17.3

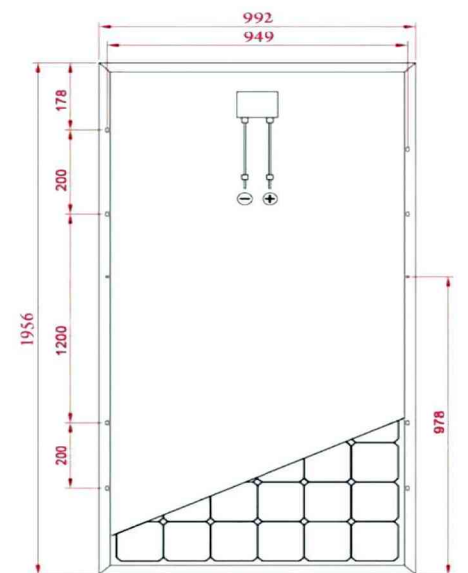
STC:Irradiance 1000W/m², Cell Temperature 25°C,Air Mass AM1.5

*Measuring tolerance: $\pm 3\%$

ELECTRICAL DATA (NOCT)

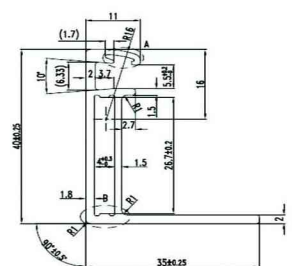
Maximum Power- $P_{MAX}(Wp)$	238	242	246	249
Maximum Power Voltage- V_{MPP} (V)	34.4	34.5	34.6	34.9
Maximum Power Current- $I_{MPP}(A)$	6.91	7.02	7.11	7.14
Open Circuit Voltage- $V_{OC}(V)$	42.5	42.6	42.7	42.9
Short Circuit Current- I_{SC} (A)	7.35	7.47	7.57	7.58

NOCT:Irradiance at 800W/m², Ambient Temperature 20°C,Wind Speed 1m/s.



COMPONENT MATERIALS

Solar Cells	Poly Crystalline 157 ×157 mm (6.18 inches)
Cell Orientation	72 cells(6 × 12)
Module Dimensions	1956 × 992 ×35 mm (77.0×39.0×1.37 inches)
Weight	22.5 kg (49.60 lb) (with 3.2 mm glass; 26.1 kg with 4.0 mm glass)
Glass	3.2 mm (0.125 inches). High Transmission, AR Coated Tempered Glass, Anti-Reflective, Low Iron, High Transmission
Backsheet	White
Frame	Silver Anodized Aluminium Alloy
J-Box	IP 68 rated - 4 Railes-3pcs bypass diodes
Cables	Photovoltaic Technology Cable 4.0 mm ² (0.006inches ²),1100mm (43.3 inches)
Connector	MC4 Compatible



TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	44 °C(±2 °C)
Temperature Coefficient of P_{MAX}	-0.41%/°C
Temperature Coefficient of V_{OC}	-0.32%/°C
Temperature Coefficient of I_{SC}	+0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85 °C
Maximum System Voltage	1000V DC
Max Series Fuse Rating	15A

WARRANTY

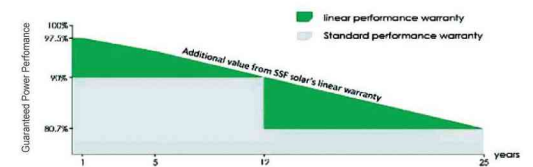
10 year Product Workmanship Warranty	Modules per box:24 pieces
25 year linear Power Warranty	Modules per 40' container:528 pieces

(Please refer to product warranty for details)

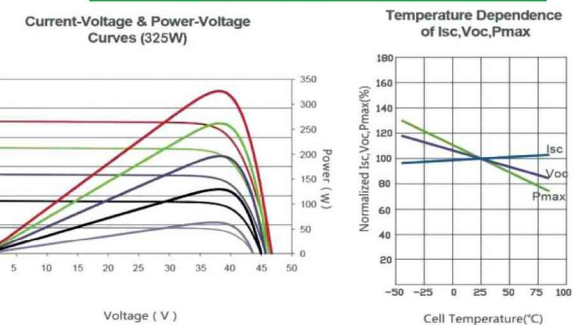
PACKAGING CONFIGURATION

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty



Electrical Performance & Temperature Dependence





SSF
Solar Sanat Firoozeh

