

11.0 – Appendix A – Electrical Breadth

Description	GP3S			Description	
	208 120	Ckt #			100A
REC RM 364, AREA 303		1	2		REC RM 354A,B,C
REC RM 364		3	4		REC RM 354A,B,C
REC RM 373		5	6		REC RM 354A,B,C
REC RM 373		7	8		REC RM 354, 354D
REC CORR 300F,H		9	10		REC RM 354, 354D
SPARE		11	12		REC RM 354, 354D
SPARE		13	14		REC RM 354
SPARE		15	16		REC RM 401V & ROOF
UH-1A/1B, RM 402		17	18		REC RM 373
CUH-6, RM 401V		19	20		REC ROOF
SPARE		21	22		LTG & REC EF-2A/2B ROOF
ROOF REC		23	24		SPARE
SPARE		25	26		SPARE
SPARE		27	28		SPARE
SPARE		29	30		SPARE
SPARE		31	32		SPARE
SPARE		33	34		SPARE
SPARE		35	36		SPARE
SPARE		37	38		SPARE
PV ARRAY # 2		39	40		PV ARRAY # 3
		41	42		

Description	EQ3S-1			Description	
	208 120	Ckt #			225A
ATC RM 382		1	2		REC RM 363A
SPARE		3	4		REC RM 363
ATC RM 308		5	6		REC RM 363
ATC RM 308		7	8		REC RM 363
FAN F-9		9	10		REC RM 363
REC RM 347A		11	12		REC RM 374
REC RM 347A		13	14		REC RM 374
REC RM 347, 347A		15	16		REC RM 374, 374A
REC RM 347, 345		17	18		REC RM 374
REC RM 344, 345A		19	20		SPARE
REC RM 344		21	22		REC RM 376
REC RM 344		23	24		REC RM 376
REC RM 341A		25	26		REC RM 310, 310A
REC RM 341A		27	28		REC RM 312
PV ARRAY # 5		29	30		REC RM 312A
		31	32		REC RM 315
COLD UNIT RM 342A		33	34		REC RM 315
COLD UNIT RM 342A		35	36		REC RM 315A
COLD UNIT RM 342A		37	38		REC RM 315A
REC RM 342		39	40		REC RM 315A
REC RM 342		41	42		REC RM 315A

Description	EQ3S-2			Description
	208 120	Ckt #		
REC RM 342		43	44	REC RM 315A
REC RM 341		45	46	REC RM 315A
REC RM 340A		47	48	REC RM 317
REC RM 340		49	50	REC RM 309
REC RM 338		51	52	REC RM 309
REC RM 338A		53	54	REC RM 309
REC RM 338A		55	56	REC RM 308,309
REC RM 383		57	58	ATC RM 308
REC RM 383		59	60	SPARE
REC RM 383		61	62	REC RM 402,403
REC RM 382,383		63	64	REC RM 355
PV ARRAY # 1		65	66	REC RM 355
		67	68	REC RM 362A
PV ARRAY # 4		69	70	SPARE
		71	72	SPARE
GROW CHAMBER RM 355		73	74	GROW CHAMBER RM 355
GROW CHAMBER RM 355		75	76	GROW CHAMBER RM 355
GROW CHAMBER RM 355		77	78	GROW CHAMBER RM 355
GROW CHAMBER RM 355		79	80	GROW CHAMBER RM 355
GROW CHAMBER RM 355		81	82	GROW CHAMBER RM 355
GROW CHAMBER RM 355		83	84	GROW CHAMBER RM 355

Array Size (kW)	34.71	Inverter Eff.	0.955	kWh / period												lbm CO2/kWh	1.445
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Sum				
	31	28	31	30	31	30	31	31	30	31	30	31	30	31	2973.8	55795.6	
Avg	45	3546.1	3918.5	4915.4	5177.9	5497.1	5494.9	5678.0	5531.4	5036.0	4661.1	3365.3	2973.8	55795.6	45442.3		
Min	45	2866.2	2624.1	4235.5	4169.8	4455.4	4799.1	4959.1	4920.1	4169.8	3766.0	2290.9	2186.3	45442.3	66790.3		
Max	45	4406.9	5018.5	5883.8	6290.1	6431.2	5982.3	6289.4	6499.8	5973.2	6059.9	4335.7	3619.4	66790.3			
	\$/ period																
Avg	45	\$311.56	\$344.28	\$431.86	\$454.93	\$482.98	\$482.78	\$498.87	\$485.99	\$442.46	\$409.53	\$295.68	\$261.28	\$4,902.20			
Min	45	\$251.82	\$230.55	\$372.13	\$366.36	\$391.45	\$421.65	\$435.71	\$432.28	\$366.36	\$330.88	\$201.27	\$192.09	\$3,992.56			
Max	45	\$387.19	\$440.93	\$516.95	\$552.65	\$565.05	\$525.61	\$552.58	\$571.07	\$524.80	\$532.43	\$380.93	\$318.00	\$5,868.20			
	tons CO2 offset / period																
Avg	45	2.4	2.7	3.4	3.6	3.8	3.8	3.9	3.8	3.5	3.2	2.3	2.1	38.5			
Min	45	2.0	1.8	2.9	2.9	3.1	3.3	3.4	3.4	2.9	2.6	1.6	1.5	31.4			
Max	45	3.0	3.5	4.1	4.3	4.4	4.1	4.3	4.5	4.1	4.2	3.0	2.5	46.1			

VT Slate Roof	\$1,100,000	Total SF Area	21100	\$/ SF	\$52.13
lbs / square	950	# squares	211	lbs slate	200450
SF PV Array	3250			lbs / SF	9.5
# PVs	178 PV kW	0.195 Array kW	34.71		
lbs/PV	40	Total Array lbs	7120		
PV \$ / kW	\$11,500	Total Array psf	2.2		
		Gross Array Cost	\$399,165		
		Gross Array \$/SF	\$122.82		
Fluid-Applied Roof Membrane \$/SF		\$3.20			
Fluid-Applied Roof Membrane Cost		\$10,400.00			
Fluid-Applied Roof Membrane PSF		0.25			

	per SF	Total
Saved \$	\$52.13	\$169,431.28
Saved weight	9.5	30,875
Additional \$	\$126.02	\$409,565.00
Additional weight	2.4	7,933
NET \$	\$73.89	\$240,133.72
NET weight	-7.1	-22,943

Simple Payback Period (years)			
	Average	Minimum	Maximum
Full System	83.5	102.6	69.8
Marginal Cost	49.0	60.1	40.9

High-efficiency photovoltaic module using silicon nitride multicrystalline silicon cells

Performance

Rated power (P_{max})	195W
Power tolerance	±9%
Nominal voltage	16V
Limited Warranty ¹	25 years

Configuration

- S** Silver frame with output cables and polarized Multicontact (MC) connectors
- B** Bronze frame with output cables and polarized Multicontact (MC) connectors

Electrical Characteristics²

	SX 3195	SX3190
Maximum power (P_{max}) ³	195W	190W
Voltage at P_{max} (V_{mp})	24.4	24.3V
Current at P_{max} (I_{mp})	7.96A	7.82A
Warranted minimum P_{max}	177.5W	172.9W
Short-circuit current (I_{sc})	8.6A	8.5A
Open-circuit voltage (V_{oc})	30.7V	30.6V
Temperature coefficient of I_{sc}	(0.065±0.015)%/°C	
Temperature coefficient of V_{oc}	-(111±10)mV/°C	
Temperature coefficient of power	-(0.5±0.05)%/°C	
NOCT (Air 20°C; Sun 0.8kW/m ² ; wind 1m/s)	47±2°C	
Maximum series fuse rating	15A	
Maximum system voltage	600V (U.S. NEC rating)	



Mechanical Characteristics

Dimensions	Length: 1680mm (66.14") Width: 837mm (32.95") Depth: 50mm (1.97")
Weight	15.4 kg (33.95 pounds)
Solar Cells	50 cells (156mm x 156mm) in a 5x10 matrix connected in series
Output Cables	RHW-2 AWG# 12 (4mm ²), cable with polarized weatherproof DC rated Multicontact connectors; asymmetrical lengths - 1250mm (-) and 800mm (+)
Diodes	IntegraBus™ technology includes Schottky by-pass diodes integrated into the printed circuit board bus
Construction	Front: High-transmission 3mm (1/8th in) tempered glass; Back: Tedlar; Encapsulant: EVA
Frame	S Anodized aluminium alloy type 6063T6 Universal frame; Color: silver B Anodized aluminium alloy type 6063T6 Universal frame; Color: bronze

1. Module warranty: 25-year limited warranty of 80% power output; 12-year limited warranty of 90% power output; 5-year limited warranty of materials and workmanship. See your local representative for full terms of these warranties.
 2. This data represents the performance of typical SX 3195 products, and is based on measurements made in accordance with ASTM E1036 corrected to SRC (STC.)
 3. During the stabilization process that occurs during the first few months of deployment, module power may decrease by up to 1% from typical P_{max} .

Quality and Safety

ESTI Module power measurements calibrated to World Radiometric Reference through ESTI (European Solar Test Installation at Ispra, Italy)

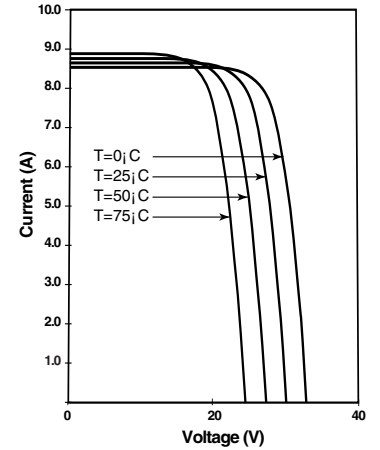


Listed by Underwriter's Laboratories for electrical and fire safety (Class C fire rating)

Qualification Test Parameters

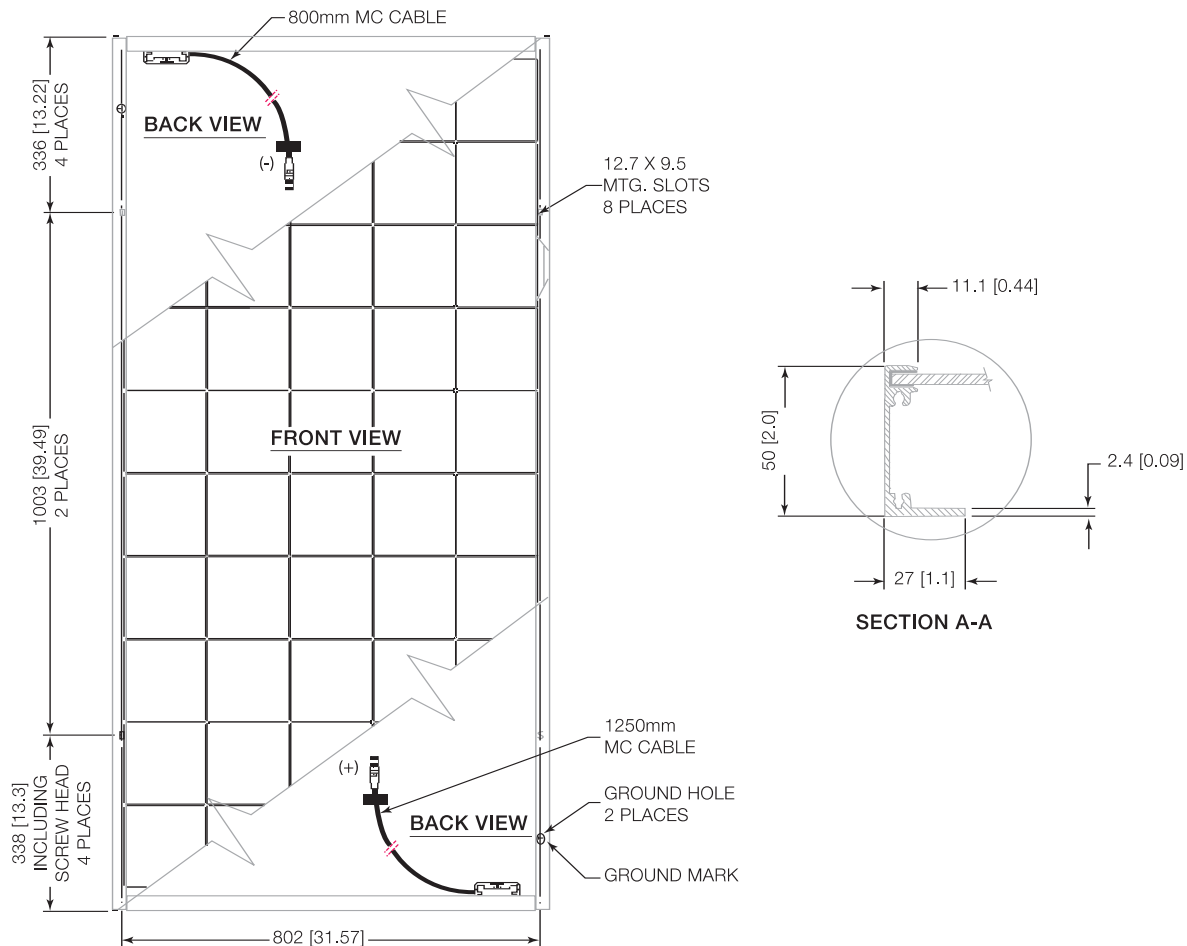
Temperature cycling range	-40°C to +85°C (-40°F to 185°F)
Humidity freeze, damp heat	85% RH
Static load front and back (e.g. wind)	2,400 pa (50psf)
Front loading (e.g. snow)	5,400 pa (113psf)
Hailstone impact	25mm Ø (1 inch) at 23 m/s (52mph)

SX 3195 I-V Curves



Module Diagram

Dimensions in brackets are in inches. Un-bracketed dimensions are in millimeters. Overall tolerances $\pm 3\text{mm}$ (1/8").



Included with each module: self-tapping grounding screw, instruction sheet and warranty documents.

Note: This publication summarizes product warranty and specifications, which are subject to change without notice. Additional information may be found on our web site: www.bpsolar.us

