

## 2018 International Codes (Adopted and Enforced)

### Solar Panel/Module Arrays Plans Submittal Checklist

#### **All Systems (Roof, Ground and Wall Mounted, Photovoltaic (PV), Solar Thermal)**

- Panel/Module product cut sheet showing manufacturer, listing agency and size of panels or modules being used. See sample cut sheet on pages 3-4.
- Product cut sheets on all associated hardware, electrical or other.
- Project Engineer's letters\* shall include the wind and snow load design criteria for the site on which the system(s) are being installed.
- Solar water-heating system construction notes shall include the requirement that they be installed in compliance with the adopted plumbing code.
- Photovoltaic system construction notes shall include the requirement that they be installed in compliance with the adopted electrical code.

#### **Roof Mounted Systems**

*In addition to the requirements for all systems, provide the following:*

- \*Colorado Registered Engineer's letter shall address the structure's roof system's ability to handle dead and uplift loads of the proposed system and specify alterations needed, if any. The engineer's letter shall specify anchoring connections needed and detail drawings of the proper connections.
- Roof layout plans delineating the location of the solar panel/module array and all related equipment on the roof system, including but not limited to dedicated PV system meter, PV array DC disconnect switch, PV system utility AC disconnect switch, inverter. (Liquid mix/water solar panel systems also need roof layout and associated equipment on roof shown).
- Mounting system plans for panels/modules, along with any specifications including details of actual required attachment to roof system framing.

### **Ground Mounted Systems:**

*In addition to the requirements for all systems, provide the following:*

- \*Colorado Registered Engineer's letter and detail sheets shall specify the foundation/piers system or ballast type anchoring system to be used for the proposed solar panels system(s).
- Site plan delineating the location of the solar panels/modules array, solar collectors, and the location and labeling of all other mounted solar equipment.

### **Wall Mounted Systems:**

*In addition to the requirements for all systems, provide the following:*

- \*Colorado Registered Engineer's letter shall analyse the structure's wall system's ability to handle dead and live loads of the proposed system and alterations needed, if any.
- Engineer's stamped detail sheets of the actual mounting requirements and required alterations to the structural framing for the installation.

### **See the following code sections for further information:**

- Section R324 and Chapter 23 - 2018 International Residential Code
- Sections 1505.8 & .9, 1510.7, 1512.1, 1607.13.5, 3111 - 2018 International Building Code
- Chapter 14 – 2018 International Mechanical Code
- Section 1204.2 - 2018 International Fire Code
- 2017 National Electrical Code

# Panel/Module Cut Sheet Example Only (Front)

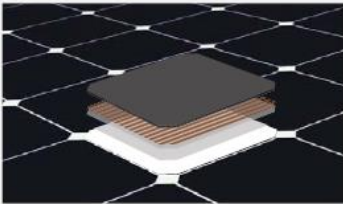
**SUNPOWER**

MORE ENERGY. FOR LIFE.™

E-SERIES SOLAR PANELS



- **20.4% efficiency**  
Ideal for roofs where space is at a premium or where future expansion might be needed.
- **High performance**  
Delivers excellent performance in real world conditions, such as high temperatures, clouds and low light.<sup>1,2,3</sup>
- **Proven value**  
Designed for residential rooftops, E-Series panels deliver the features, value and performance for any home.



**Maxeon™ Solar Cells: Fundamentally better.**  
Engineered for performance, designed for durability.

**Engineered for peace of mind**  
Designed to deliver consistent, trouble-free energy over a very long lifetime.<sup>4,5</sup>

**Designed for durability**  
The SunPower Maxeon Solar Cell is the only cell built on a solid copper foundation. Virtually impervious to the corrosion and cracking that degrade Conventional Panels.<sup>4,5</sup>

**#1 Ranked in Fraunhofer durability test.<sup>10</sup>**  
**100% power maintained in Atlas 25+ comprehensive PVDI Durability test.<sup>11</sup>**

## HIGH PERFORMANCE & EXCELLENT DURABILITY



E20 - 327 PANEL



## HIGH EFFICIENCY<sup>6</sup>

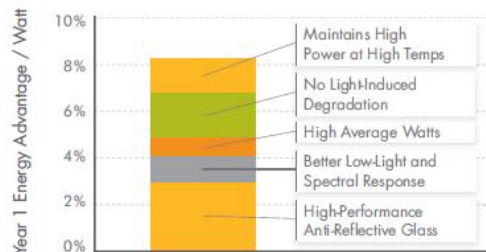
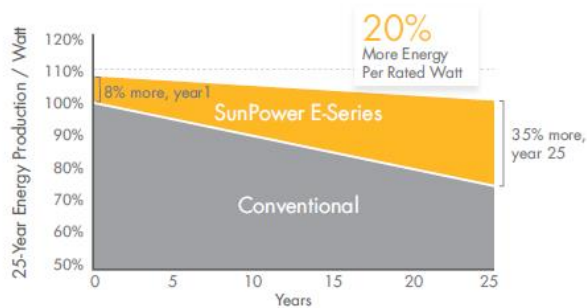
### Generate more energy per square meter

E-Series residential panels convert more sunlight to electricity producing 36% more power per panel,<sup>1</sup> and 60% more energy per square meter over 25 years.<sup>3,4</sup>

## HIGH ENERGY PRODUCTION<sup>7</sup>

### Produce more energy per rated watt

High year one performance delivers 7-9% more energy per rated watt.<sup>3</sup> This advantage increases over time, producing 20% more energy over the first 25 years to meet your needs.<sup>4</sup>



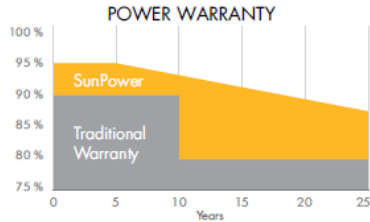
(Back)

SUNPOWER™

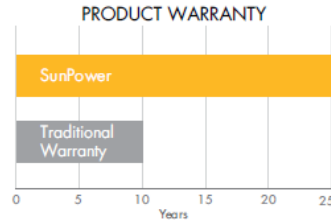
MORE ENERGY. FOR LIFE.™

E-SERIES SOLAR PANELS

SUNPOWER OFFERS THE BEST COMBINED POWER AND PRODUCT WARRANTY



More guaranteed power: 95% for first 5 years, -0.4%/yr. to year 25.<sup>8</sup>



Combined Power and Product defect 25 year coverage that includes panel replacement costs.<sup>9</sup>

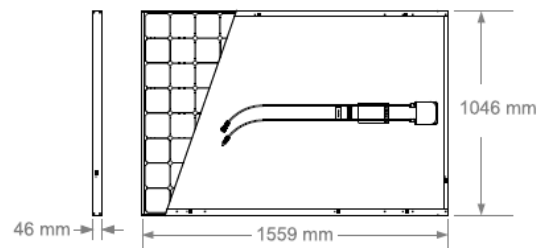
ELECTRICAL DATA		
	E20-327	E19-320
Nominal Power <sup>12</sup> (P <sub>nom</sub> )	327 W	320 W
Power Tolerance	+5/-0%	+5/-0%
Avg. Panel Efficiency <sup>13</sup>	20.4%	19.8%
Rated Voltage (V <sub>mpp</sub> )	54.7 V	54.7 V
Rated Current (I <sub>mpp</sub> )	5.98 A	5.86 A
Open-Circuit Voltage (V <sub>oc</sub> )	64.9 V	64.8 V
Short-Circuit Current (I <sub>sc</sub> )	6.46 A	6.24 A
Max. System Voltage	1000 V IEC & 600 V UL	
Maximum Series Fuse	20 A	
Power Temp Coef.	-0.38% / °C	
Voltage Temp Coef.	-176.6 mV / °C	
Current Temp Coef.	3.5 mA / °C	

OPERATING CONDITION AND MECHANICAL DATA	
Temperature	-40°C to +85°C
Max load	Wind: 2400 Pa, 245 kg/m <sup>2</sup> front & back Snow: 5400 Pa, 550 kg/m <sup>2</sup> front
Impact resistance	25mm diameter hail at 23 m/s
Appearance	Class A
Solar Cells	96 Monocrystalline Maxeon Gen II
Tempered Glass	High transmission tempered Anti-Reflective
Junction Box	IP-65 Rated
Connectors	MC4
Frame	Class 1 black anodized (highest AAMA rating)
Weight	18,6 kg

TESTS AND CERTIFICATIONS	
Standard tests	IEC 61215, IEC 61730, UL1703
Quality tests	ISO 9001:2008, ISO 14001:2004
EHS Compliance	RoHS, OHSAS 18001:2007, lead free, PV Cycle
Ammonia test	IEC 62716
Salt Spray test	IEC 61701 (passed maximum severity)
PID test	Potential-Induced Degradation free: 1000V <sup>10</sup>
Available listings	TUV, MCS, UL, JET, KEMCO, CSA, CEC, FSEC

REFERENCES:

- All comparisons are SPR-E20-327 vs. a representative conventional panel: 240W, approx. 1.6 m<sup>2</sup>, 15% efficiency.
- PVEvolution Labs "SunPower Shading Study," Feb 2013.
- Typically 7-9% more energy per watt, BEW/DNV Engineering "SunPower Yield Report," Jan 2013.
- SunPower 0.25%/yr degradation vs. 1.0%/yr conv. panel. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, Feb 2013; Jordan, Dirk "SunPower Test Report," NREL, Oct 2012.
- "SunPower Module 40-Year Useful Life" SunPower white paper, Feb 2013. Useful life is 99 out of 100 panels operating at more than 70% of rated power.
- Out of all 2600 panels listed in Photon International, Feb 2012.
- 8% more energy than the average of the top 10 panel companies tested in 2012 (151 panels, 102 companies), Photon International, March 2013.
- Compared with the top 15 manufacturers. SunPower Warranty Review, Feb 2013.
- Some exclusions apply. See warranty for details.
- 5 of top 8 panel manufacturers were tested by Fraunhofer ISE, "PV Module Durability Initiative Public Report," Feb 2013.
- Compared with the non-stress-tested control panel. Atlas 25+ Durability test report, Feb 2013.
- Standard Test Conditions (1000 W/m<sup>2</sup> irradiance, AM 1.5, 25° C).
- Based on average of measured power values during production



See <http://www.sunpowercorp.com/facts> for more reference information.

For more details, see extended datasheet: [www.sunpowercorp.com/datasheets](http://www.sunpowercorp.com/datasheets). Read safety and installation instructions before using this product.

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