

The true value of premium solar

SunPower® customer guide



SUNPOWER®

MORE ENERGY. FOR LIFE.™



Not all solar is the same

For over 25 years, SunPower has been delivering high-efficiency premium solar solutions for homes. When you select SunPower® panels you can be assured that you are getting the most powerful solar energy panels on the market¹, panels that can dramatically reduce your electricity bill and can help you save money from day one of installation.

The expression ‘you get what you pay for’ rings very true in the solar industry, and with SunPower you are getting the very best solar panels money can buy: the added benefits and value delivered by SunPower

greatly outweighs the initial cost.

Compared to an investment in Conventional Panels, an investment in SunPower can deliver a much greater return for you and your family, as SunPower delivers more energy, higher savings, greater reliability and a stronger warranty.²

At SunPower we like to let the facts speak for themselves, as you will see here as we outline the actual benefits and added value a SunPower premium panels deliver over their lifetime.

Reliability

SunPower® Maxeon™ cells are designed and tested to the highest possible standards to ensure reliability over the lifetime of the product.

What makes SunPower Maxeon cells more reliable?

The design of SunPower Maxeon solar cells is unique because each cell is built on a solid copper foundation — providing the strength and durability needed to survive all weather conditions year after year. Conversely, Conventional Cells use a low-cost metal paste on the front and back-sides to conduct the power generated by the cell, and are thus vulnerable to failing when exposed to the elements.

86% of Conventional Cells degrade through corrosion or cracking due to temperature fluctuations. This causes them to steadily lose power over time or completely fail.³ SunPower’s unique Maxeon cells are virtually impervious to these issues

Only **27**

out of a million SunPower panels have been returned under warranty⁴

1. SunPower has the highest efficiency panels, out of all 2600 panels listed in Photon International, Feb 2012.

2. Definitions used throughout presentation: “Conventional Panel” is a 240W panel, 15% efficient, approx. 1.6 m², made with Conventional Cells.

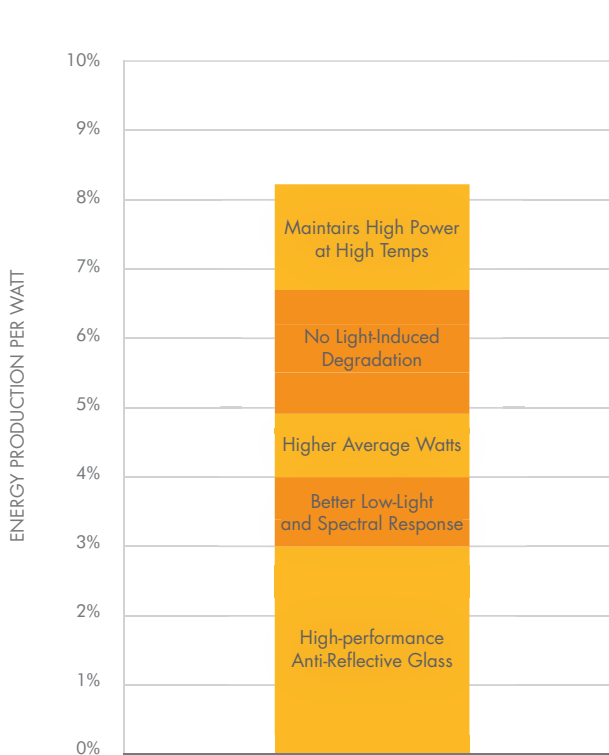
“Conventional Cells” are silicon cells that have many thin metal lines on the front and 2 or 3 interconnect ribbons soldered along the front and back.

3. Wohlgemuth, J. “Reliability of PV Systems.” Proceedings of SPIE, Aug, 2008.

4. Out of 6.5 million panels built with Maxeon Gen 2 cells installed world-wide, Jan 2006 through June 2012

More energy = more savings

SunPower panels have five major performance advantages over Conventional Panels:



8.2% more energy¹

SunPower panels maintain high power at real-world high temperatures

SunPower panels stay cooler and maintain their efficiency better at high temperatures when compared to Conventional Panels.

1.4%
more energy

Superior performance in real world conditions:

No light-induced degradation

SunPower cells do not degrade when first exposed to light, unlike Conventional Cells which can degrade by up to 3% within the first few days of installation.²

2%
more energy

Higher average panel watts

SunPower panels provide an additional 3-4 watts above a Conventional Panels actual wattage.

0.8%
more energy

Excellent performance in low light conditions

SunPower cells generate more electricity early in the morning and late in the day compared to Conventional Cells.

1%
more energy

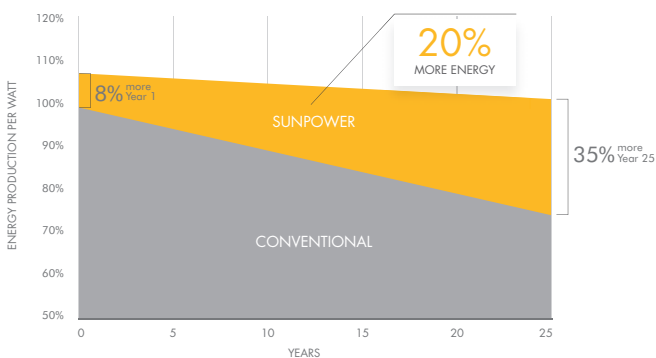
SunPower uses the best performing anti-reflective glass available

An anti-reflective coating reduces the amount of light reflected off the panel and further increases energy production.

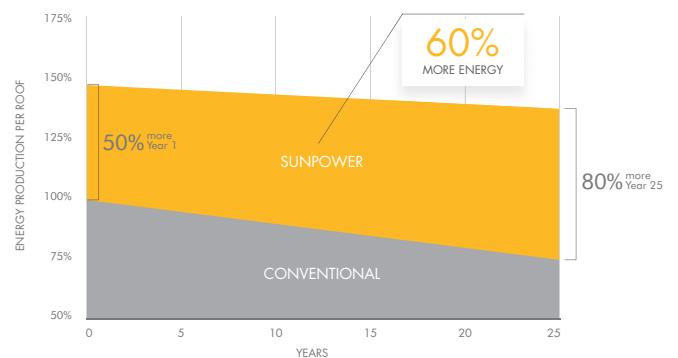
3%
more energy

25-Year Energy Production

Same Rated Watts³



Same Physical Size⁴



When comparing SunPower and a conventional system of the same physical size, the much higher efficiency of the SunPower panels creates a huge difference in the energy

produced in year one. That energy production advantage grows over a 25-year period to 80% more energy.

1. Typically 7-9% more energy per rated Watt compared to a Conventional Panel (240W, 15% efficient, approx. 1.6 m²). BEW/DNV Engineering "SunPower Yield Report," Jan 2013. See also Photon International, Nov 2012.
 2. Pingel, S., et al., "Initial Degradation of Industrial Silicon Solar Cells in Solar Panels," EU PVSEC, Valencia 2010.
 3. 0.75%/yr slower degradation based on: Black & Veatch Engineering, "Review of SunPower Fleet-Wide System Degradation," Nov 2012; Jordan, Dirk "SunPower Test Report," National Renewable Energy Laboratory, Oct 2012; Fraunhofer PV Module Durability Initiative, Feb 2013; Atlas 25+ Durability test report, Feb 2013; Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, Feb 2013.
 4. 327W SunPower vs. 240W Conventional Panel.



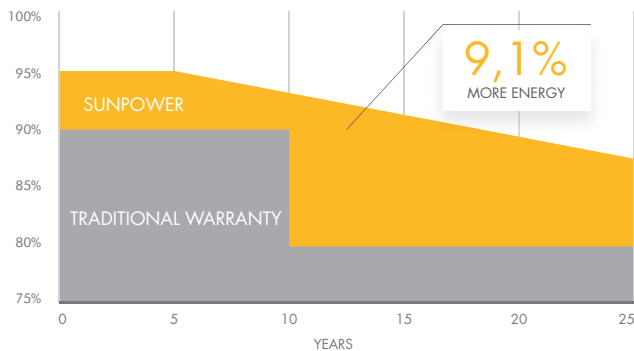
25-year warranty: a difference that matters

SunPower delivers an industry-leading 25-year combined product and performance warranty¹, guaranteeing 9.1% more energy over 25 years. This means 25 years of complete peace-of-mind for you and your family.

Why is SunPower's warranty better?

SunPower's warranty guarantees both the product and its power output for 25 years. In the unlikely event that you have an under-performing panel, SunPower will work with our Partners to repair or replace and install it.

Performance warranty



What is the value of a warranty?

When investing in solar it is important to understand what your product and performance warranties cover and for how long.

Product warranty

Typically, a solar panel manufacturer's warranty is for 10 years. After that period you are not covered should a problem arise. The cost of replacing a single panel can be well over \$1,500 when accounting for product, labour, testing and shipping costs.

SunPower products are backed by a 25-year product warranty, which covers panel removal, shipping and replacement, giving you complete peace-of-mind.

Performance warranty

Many manufactures offer a 25-year "stepped" performance warranty, typically guaranteeing 90% performance output for the first 10 years then only 80% for the remaining 15 years.

SunPower offers a 25-year linear performance warranty that guarantees over 95% performance output for the first 5 years, then a 0.4% degradation rate each year for the next 20 years. After 25 years SunPower panels will be still be producing over 87% of their original power.

Warranty cover guarantee

	SunPower Premium Panels	Conventional Panels
Covers removal of bad panel?	Yes	No
Covers shipping?	Yes	Yes
Covers new panel installation?	Yes	No
Product warranty term	25 years	10 years
Linear Power or Step Power	Linear	Linear
(% above floor)	+9.1%	+5.2%

1. Of the top 20 manufacturers. SunPower Warranty Review, Feb 2013

Understanding the true value of your solar investment

Retail ticket prices can often be confused with value, when the true value of a solar investment should always be calculated over its entire lifetime (25 years plus).

Value can be calculated directly from different variables that make up a solar system, these include both inputs and outputs.

INPUTS

- ✓ System size
- ✓ Number of panels
- ✓ Roof area required
- ✓ Panel efficiency
- ✓ System cost



OUTPUTS

- ✓ Energy generated by the system
- ✓ The value of that energy

Outlined below is a comparison between SunPower panels and some Conventional Panels. The associated variables are listed and the total value of the energy generated is clearly highlighted.

It is clear from the example that SunPower's product is different, as it requires less panels and roof space to generate more energy and value over its lifetime.

An investment in solar is a long term economic investment (25 years plus), it pays not to take shortcuts. It is important to ask questions before investing in a 25-year plus asset, such as:

- how efficient are the panels?
- how is the product and performance warranty structured?
- will the product manufacturer still be around in 10 or 25 years?

The below example is based on current peak (\$0.29/kWh) and reported future energy prices in NSW¹.

System Variables (All figures based over 25 years)	SunPower Premium Panels	Conventional Panels
System size (kWp)	3.27	3.12
Number of panels	10	13
Total roof area required (m ²)	16.3	20.8
Panel efficiency	20.1%	15.0%
kWh generated ²	137,002	114,932
Value of energy generated ¹	\$73,948	\$61,644
SunPower energy advantage		20.0%
Warranty Variable		
Replacement cost of an under performing panel after 10 years	\$0	>\$1,500

1. Based on price projections obtained from "Economic Outlook Information Paper - National Electricity Forecasting", Australian Energy Market Operator, December 2012. Available at www.aemo.com.au.

2. Includes a conservative SunPower yield benefit of 4.5% - Typically 7-9% more energy per rated Watt compared to a Conventional Panel (240W, 15% efficient, approx. 1.6 m²). BEW/DNV Engineering "SunPower Yield Report," Jan 2013. See also Photon International, Nov 2012.

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HIGH PERFORMANCE & EXCELLENT DURABILITY

- **20.4% efficiency**

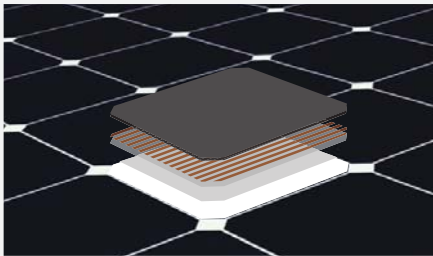
Ideal for roofs where space is at a premium or where future expansion might be needed.

- **High performance**

Delivers excellent performance in real world conditions, such as high temperatures, clouds and low light.^{1,2,3}

- **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.^{4,5}

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.^{4,5}

#1 Ranked in Fraunhofer durability test.¹⁰

100% power maintained in Atlas 25+ comprehensive PVDI Durability test.¹¹



E20 - 327 PANEL



HIGH EFFICIENCY⁶

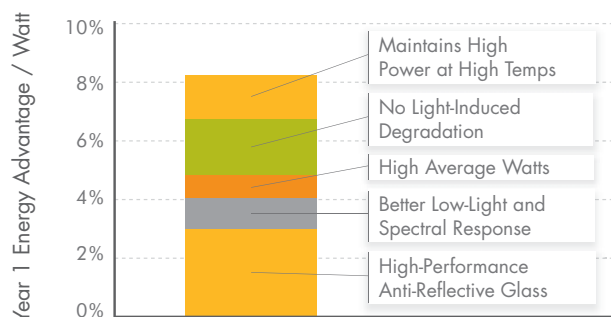
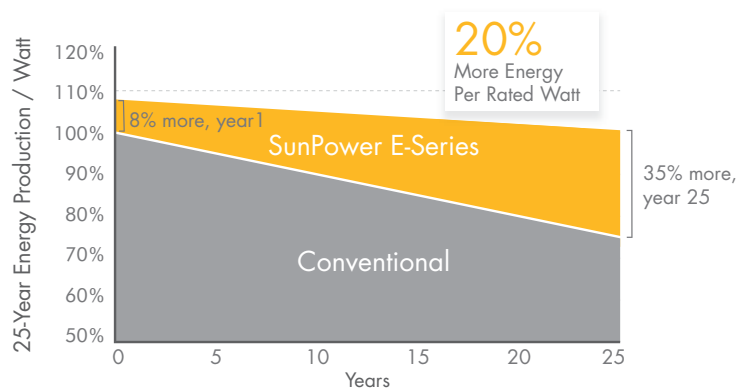
Generate more energy per square meter

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

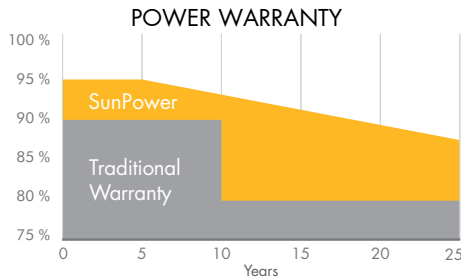
HIGH ENERGY PRODUCTION⁷

Produce more energy per rated watt

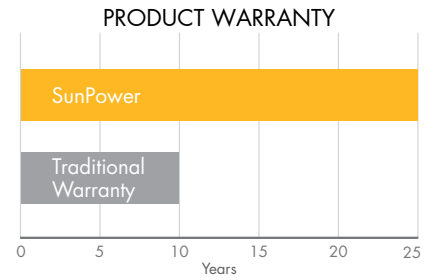
High year one performance delivers 7-9% more energy per rated watt.³ This advantage increases over time, producing 20% more energy over the first 25 years to meet your needs.⁴



SUNPOWER OFFERS THE BEST COMBINED POWER AND PRODUCT WARRANTY



More guaranteed power: 95% for first 5 years, -0.4%/yr. to year 25.⁸



Combined Power and Product defect 25 year coverage that includes panel replacement costs.⁹

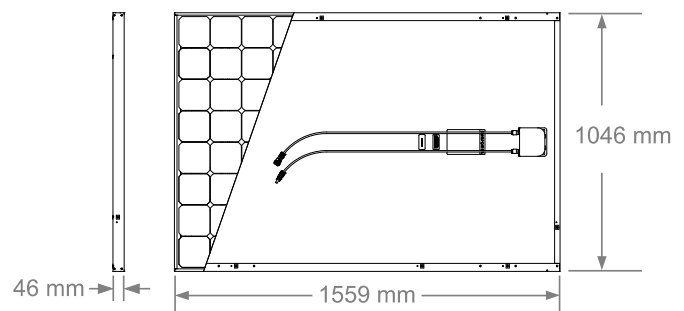
ELECTRICAL DATA		
	E20-327	E19-320
Nominal Power ¹² (P _{nom})	327 W	320 W
Power Tolerance	+5/-0%	+5/-0%
Avg. Panel Efficiency ¹³	20.4%	19.8%
Rated Voltage (V _{mpp})	54.7 V	54.7 V
Rated Current (I _{mpp})	5.98 A	5.86 A
Open-Circuit Voltage (V _{oc})	64.9 V	64.8 V
Short-Circuit Current (I _{sc})	6.46 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 ² front & back Snow: 5400 Pa, 550 kg/m ² 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 ¹⁰
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 m², 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/m² 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. Read safety and installation instructions before using this product.
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INTRODUCING THE SUNPOWER® E20 SERIES SOLAR PANEL



ACHIEVING 20% PANEL EFFICIENCY AND THE WORLD RECORD AGAIN.

20% EFFICIENCY

SunPower E20 panels are the highest efficiency panels available on the market today, providing more power in the same amount of space

TRANSFORMER-LESS INVERTER COMPATIBILITY

Comprehensive inverter compatibility ensures that customers can pair the highest efficiency panels with the highest efficiency inverters, maximising system output

POSITIVE POWER TOLERANCE

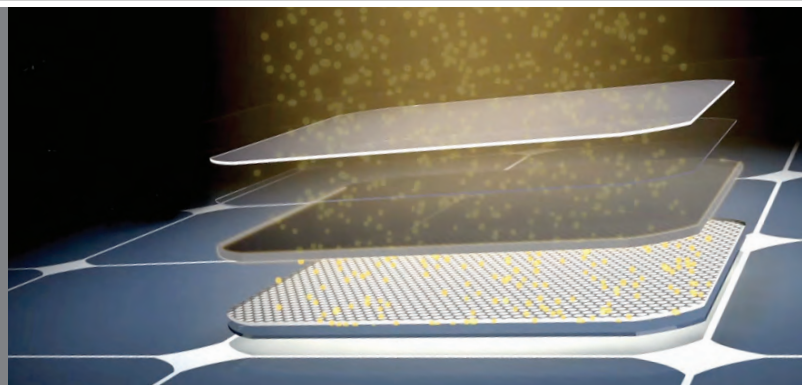
Positive tolerance ensures customers receive the rated power or higher for every panel

RELIABLE AND ROBUST DESIGN

SunPower's unique Maxeon™ cell technology and advanced module design ensure industry leading reliability

MAXEON™ CELL TECHNOLOGY

The solar industry's first and only
all-back contact solar cell.



SUNPOWER®

THE WORLD'S STANDARD FOR SOLAR™

THE SUNPOWER® E20 PANEL RECORD BREAKING TECHNOLOGY



SunPower™ E20 Solar Panels provide today's highest efficiency and performance. Powered by SunPower Maxeon™ cell technology, the E20 series provides panel conversion efficiencies of up to 20.4%. The E20's reduced voltage-temperature coefficient, anti-reflective glass and exceptional low-light performance attributes provide outstanding energy delivery per peak power watt.

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