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TOP 10 HIGHLIGHTS SNEC 2017 PV POWER EXPO Dialogue & Conference & Exhibition AWARD

AE SOLAR

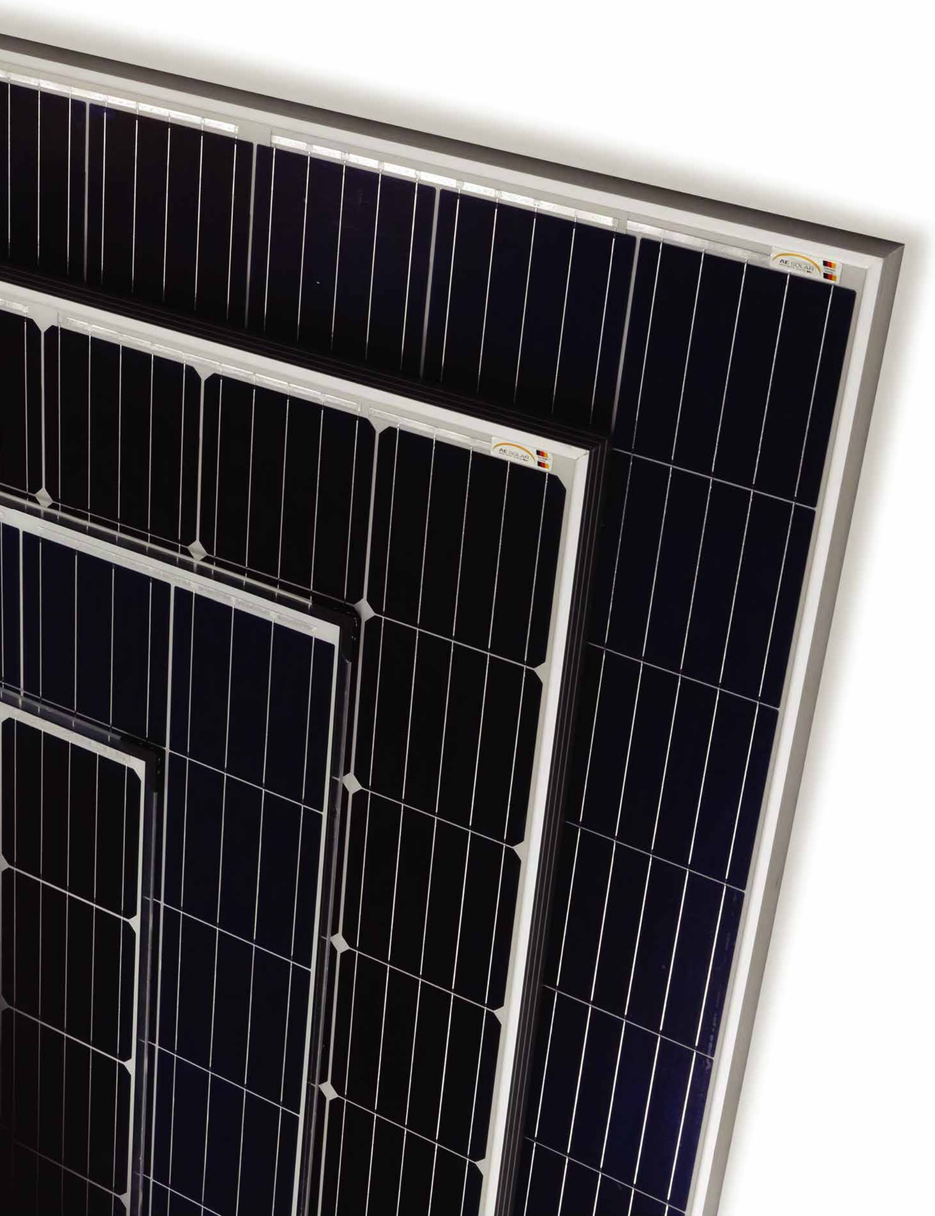
alternative energy

AE SMART HOT-SPOT FREE

Shading Resistant Technology

Tested by Fraunhofer CSP

Driven by Innovation



Our engineering teams are always focused on new innovations and emerging technologies in photovoltaic. Their continuous effort and research allows AE Solar to deliver its products with high quality.

Understanding this has been the driving factor behind continuously expanding our research team and allocating a generous budget for R&D each year.

As a result of this tireless research, AE Solar successfully developed the world's first Smart Hotspot Free module for mass production with TÜV certification in 2016.

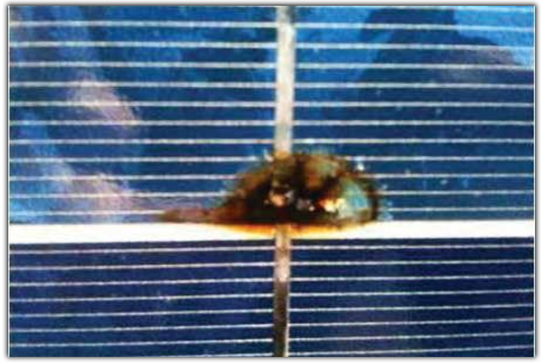
Tested by Fraunhofer CSP

What is a Hot-Spot?

The term “Hot-Spot” refers to the excessive heating in an area of a solar panel. This raise in temperature may result from a drop in the output of electric current in one or more cells of a string. The drop in output occurs from shading, dirt, dust, snow, and manufacturing defects.

Hot-Spots Damage cells and panels

Dirt, dust and shading lead to Hot-Spots



Hot-Spots cause heat accumulation. Cell temperatures rise up to 160*C, resulting in loss of efficiency, damage to the panel, and in some cases, causing fires. In fact, over 30% of fires at solar installations are caused by Hot-Spots.

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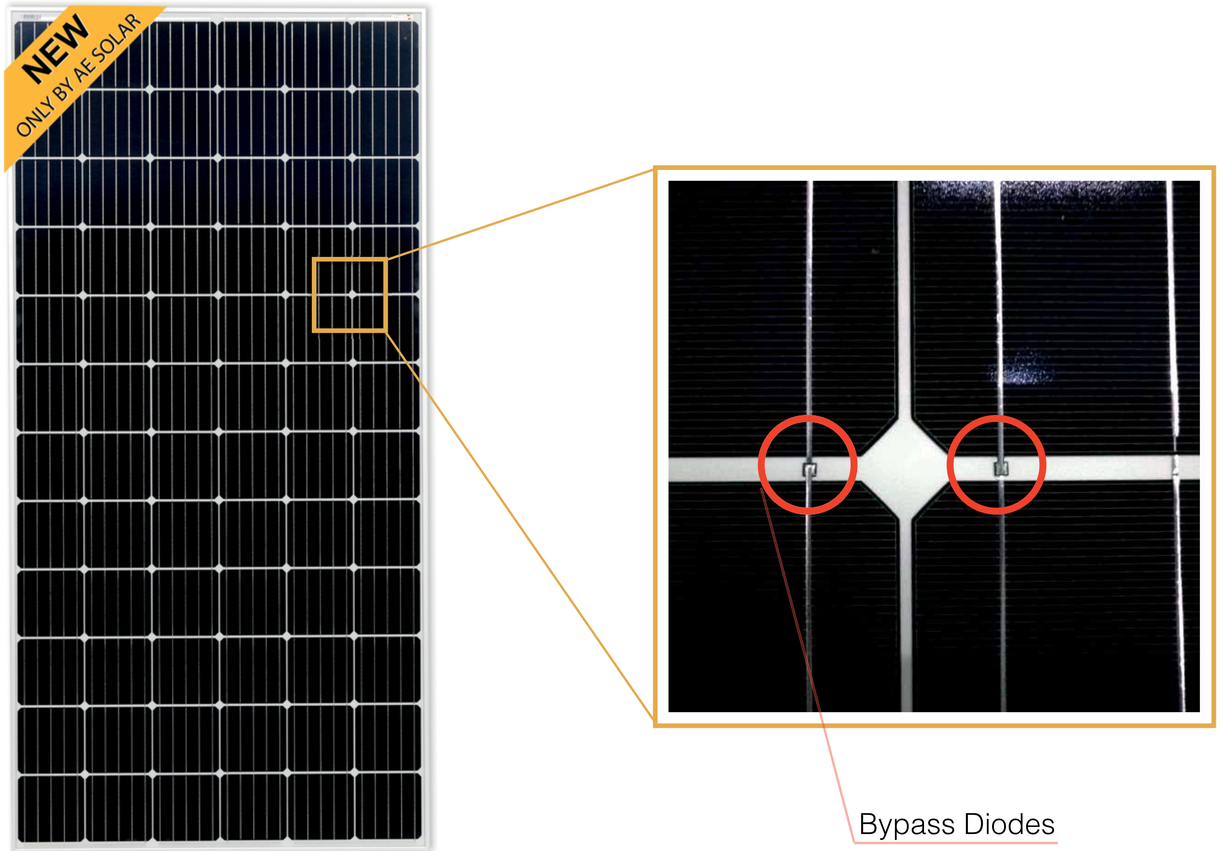
AE Smart Hot-Spot Free Module



The Hot-Spot Free Modules developed by AE Solar use bypass diodes to eliminate the development of hot-spots and thus the damages and risks associated.

The temperature of Hot-Spot cells within AE Smart Hot-Sport Free Modules does not exceed 85°C. This temperature management eliminates material hazard, the safety of the module and its surroundings.

Available from 260W to 385W range, the AE SmartHot-Spot Free Modules offer up to 30% more power output compared to standard PV Modules thanks to their improved efficiency.

This added efficiency translates into less modules needed and less space required for installation.

- Space Saving for PV plants by using Smart Modules compared to standard “non-smart” modules
- Temperature of cells does not exceed operating temperature of PV modules
- No reduction of PV module stability and no fire risk from hot-spots.

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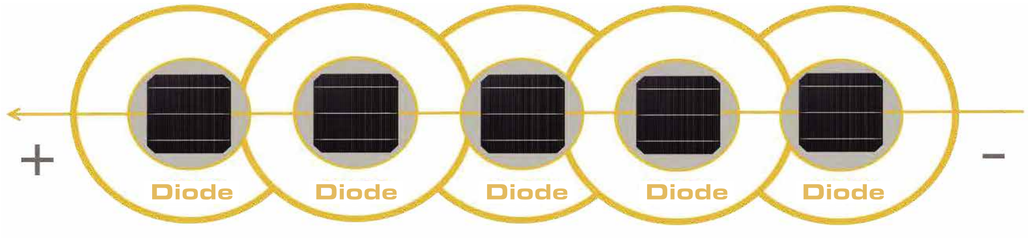
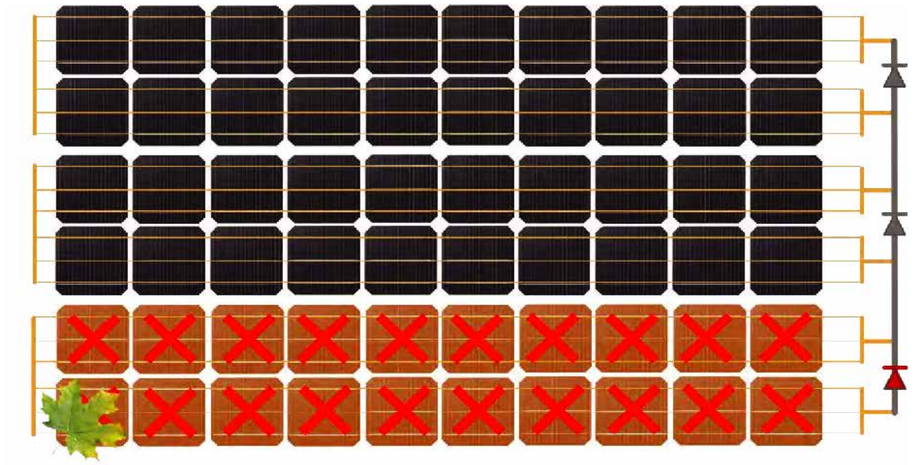
How it works?

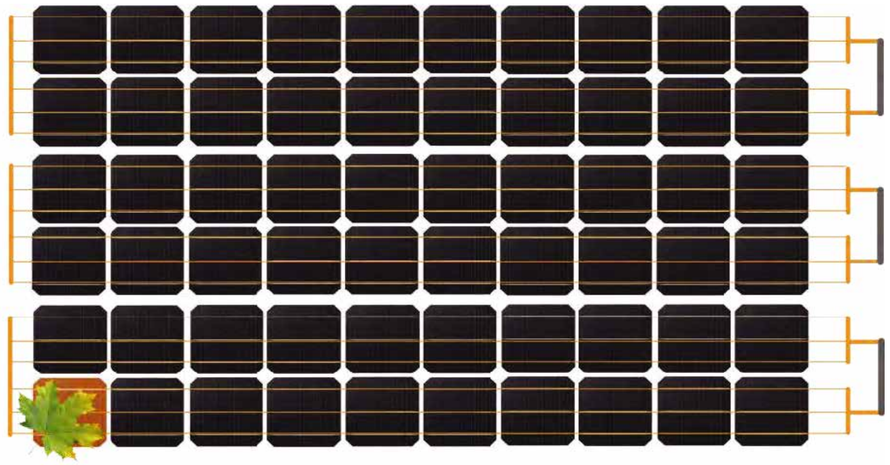
Standard Module

AE Smart Hot-Spot Free Module



HOT-SPOT FREE technology protects each cell by an individual bypass diode.





In a standard module, the impact of shading on a single cell affects a whole string, while an AE SOLAR SMART MODULE with HOT-SPOT FREE technology loses the output of only one single cell during the shading

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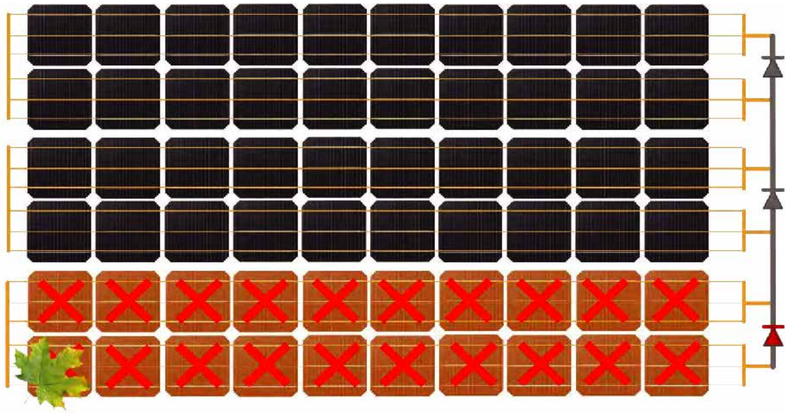
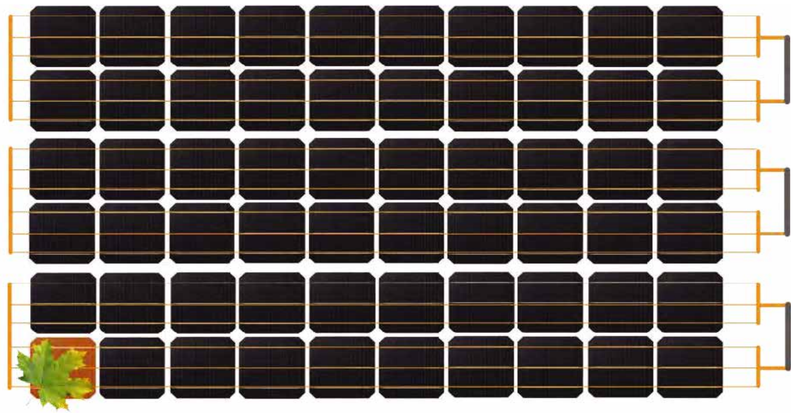
Higher efficiency added value

Standard Module



AE Smart Hot-Spot Free Module



Shading In % of a single cell	0 %	10 %	20 %	30 %	40 %	50 %	100 %
Output from AE Smart Hot-Spot Free Module	100 %	98 %	96 %	96 %	96 %	96 %	96 %
Output from Standard Module	100 %	98 %	91 %	83 %	73 %	65 %	65 %
Additional efficiency in Power Generation	**0**	**0**	**5 %**	**13 %**	**23 %**	**31 %**	**31 %**

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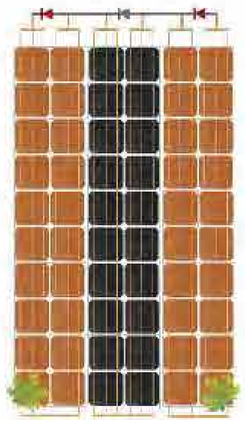
Higher efficiency added value

Shades	One Cell in One String		One Cell in Two Different Strings		Row of Cells Across Different Strings	
Illustration						
	Standard	Hot-Spot Free	Standard	Hot-Spot Free	Standard	Hot-Spot Free
Output from AE Smart Hot-Spot Free Module	95 %		93 %		83 %	
Output from Standard Module	64 %		38 %		1 %	
Additional efficiency in Power Generation	**31 %**		**55 %**		**82 %**	

AE SOLAR SMART MODULE with HOT-SPOT FREE technology has a lower operating temperature, which not only eliminates a potential cause for back sheet degradation, but also prevents damage to silicon-based cells.

Enhanced lifetime of AE SOLAR SMART MODULES with HOT-SPOT FREE technology is up to 25 years over standard warranty term.

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For more information, please visit www.ae-solar.com

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