

Will hot spots on photovoltaic panels spontaneously combust

What is a hot spot in a PV module?

In a photovoltaic (PV) module, a hot spot describes an over proportional heating of a single solar cell or a cell part compared to the surrounding cells. It is a typical degradation mode in PV modules. Hot spots can origin, if one solar cell, or just a part of it, produces less carrier compared to the other cells connected in series.

What happens if a solar cell has a hot spot?

Hot spots occur when the PV module is partially blocked, and part of the solar cell string becomes a reverse bias and dissipates energy in the form of heat. If the solar cell consumes more power than the maximum power of the PV cell, which maintain the maximum power under hot spot conditions, the PV cell will be completely damaged and open-circuit.

Do hot spots affect solar panels?

Hot spots were divided into eight different groups using the percentage of power loss. The conducted research showed that over 92% of solar modules were affected by hot spots in the northern part of the country, where the impact of low temperatures, heavy snowfall and frost is more significant.

What are hot spots in PV panels?

Dhimish et al. describe the phenomenon of hot spots in PV panels - heating up the cells to high temperature, causes the loss of their efficiency and leads to permanent damage of the panel. The authors proposed various hot spot limiting techniques, and used a thermographic camera to investigate these hot spots.

Why do PV modules have a hot-spot effect?

Due to the influence of turbulent kinetic energy (TKE) among the modules, the soiling on the surface of the module must be uneven, resulting in the hot-spot effect and PV module fire accidents.

How to prevent hot spots on solar panels?

Therefore, some preventive maintenance actions such as conducting a periodical cleaning can be very effective in slowing the aging process of PV components and mitigating the hot spot effect. There are currently two styles of solar panel installation: ground mounted and roof-top mounted.

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