

# **The internal structure of a 10-watt solar cell**





## Overview

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A solar cell (also known as a photovoltaic cell or PV cell) is defined as an electrical device that converts light energy into electrical energy.

A solar cell functions similarly to a junction diode, but its construction differs slightly from typical p-n junction diodes. A very thin layer of p-type semiconductor is grown on a relatively thicker n-type semiconductor. We then apply a few finer electrodes on the top.

When light photons reach the p-n junction through the thin p-type layer, they supply enough energy to create multiple electron-hole pairs, initiating the conversion process.

The cell's unique structure, consisting of two distinct semiconductor layers – one positively charged (p-type) and one negatively charged (n-type) – creates an electric field at their junction. This field drives the freed electrons to flow in a specific direction, generating an electric current.



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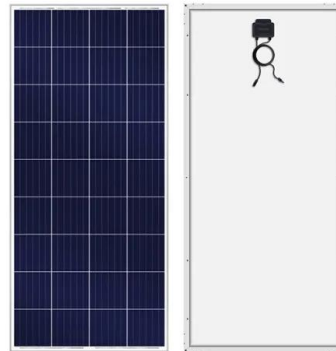
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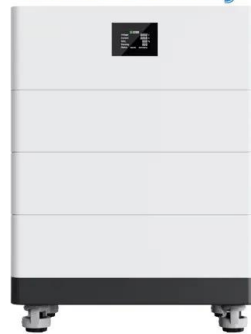
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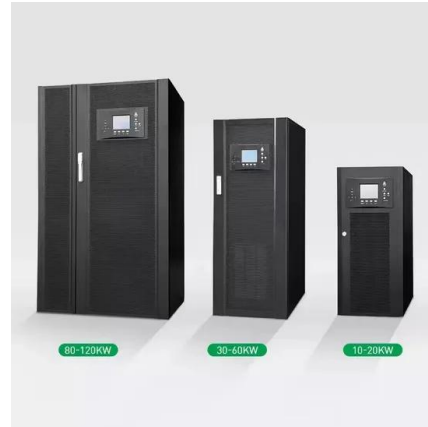




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tage:  $V_{oc}$  |  $I_m$  |  $I_{sc}$  | total  $P_m$  The open-circuit voltage,  $V_{oc}$ , is the maximum voltage available from a solar cell. occurs at zero current.  $V \times V_{oc}$  The open-circuit voltage corresponds to the ...

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Typically, c-Si solar PV modules have 60-72 PV cells in series [13], as shown in Fig. 1 (a). Each cell behaves as an individual DC power source.

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