

Can a solar energy harvesting system use an on-chip power source?

An on-chip power source is implemented with the optimized solar cells and the proposed energy harvesting system. Measurement results demonstrate that the proposed on-chip power source can deliver an output voltage of approximately 1 V, with a maximum power conversion efficiency of 10.20% from end to end.

Can on-chip integrated energy harvesting systems collect solar energy in microsensors?

The application of on-chip integrated energy harvesting systems to collect solar energy in microsensors has been successfully implemented in various studies [11,12]. The proposed on-chip power source comprises an energy harvesting system and solar cells.

What is an on-chip solar cell?

This on-chip solar cell is used for on-chip energy harvesting, achieving a maximum end-to-end conversion efficiency of 10.20%, referring to the overall efficiency from incident light power to load power output.

How are enhanced on-chip solar cells fabricated?

The enhanced on-chip solar cells and the corresponding energy harvesting system, forming the on-chip power source, were fabricated at a wafer foundry. Both the optimized on-chip solar cells and the on-chip power source were subsequently tested under illumination from a solar simulator.

How efficient is a conventional on-chip solar cell?

The conventional unsegmented on-chip solar cell has a maximum conversion efficiency of 21.95%. This means the proposed design shows a 17.49% improvement over the conventional design. The comparisons with other works in the literature are summarized in Table 3.

Can on-chip solar cells improve photoelectric conversion efficiency?

Enhancing the photoelectric conversion efficiency of on-chip solar cells is crucial for advancing solar energy harvesting in self-powered smart microsensors for Internet of Things applications. Here we show that adopting a center electrode (CE) layout instead of a ring electrode (RE) effectively reduces the shadowing effect of surface electrodes.

It integrates a variety of microscale energy collection/storage devices and energy management modules on a chip, realizing self-power supply and efficient energy management for ...

This self-powered microsensor on a single chip can be manufactured using only standard CMOS processes and simple packaging, without any special fabrication processes.

Enhancing the photoelectric conversion efficiency of on-chip solar cells is important for the realization of self-powered smart microsensors. The surface electrode models for the on-chip ...

This work presents a fully-integrated single-chip solar EH system, which employs on-chip solar cells and a capacitive EH interface for generating a stable V_{out} of 0.85V with a V_{in} of ...

The on-chip solar cells and energy harvesting systems form an on-chip power source that provides a stable, adapted working voltage to the application modules under certain lighting ...

An analysis of a micro-watt single-chip solar energy harvesting module with on-chip solar cell and charge pump is presented. By combining the charge pump and the solar cell in the same ...

A promising approach to overcome this limitation is the integration of energy conversion and storage devices, thereby enabling semi-permanent usage of portable ...

In this paper, an ultra-compact single-chip solar energy harvesting IC using on-chip photodiodes is introduced. The proposed system employs an on-chip charge pump to extract energy from ...

An ultra-compact single- chip solar energy harvesting IC using on-chip solar cell for biomedical implant applications is presented and efficiency improvement can be achieved when compared ...

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Abstract--In this paper, an ultra-compact single-chip solar energy harvesting IC using on-chip solar cell for biomedical implant applications is presented. By employing an on-chip charge ...

This highlights the need for new strategies that ensure both efficient energy conversion and optimal area use for on-chip solar energy harvesting systems. This work introduces a simple ...

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