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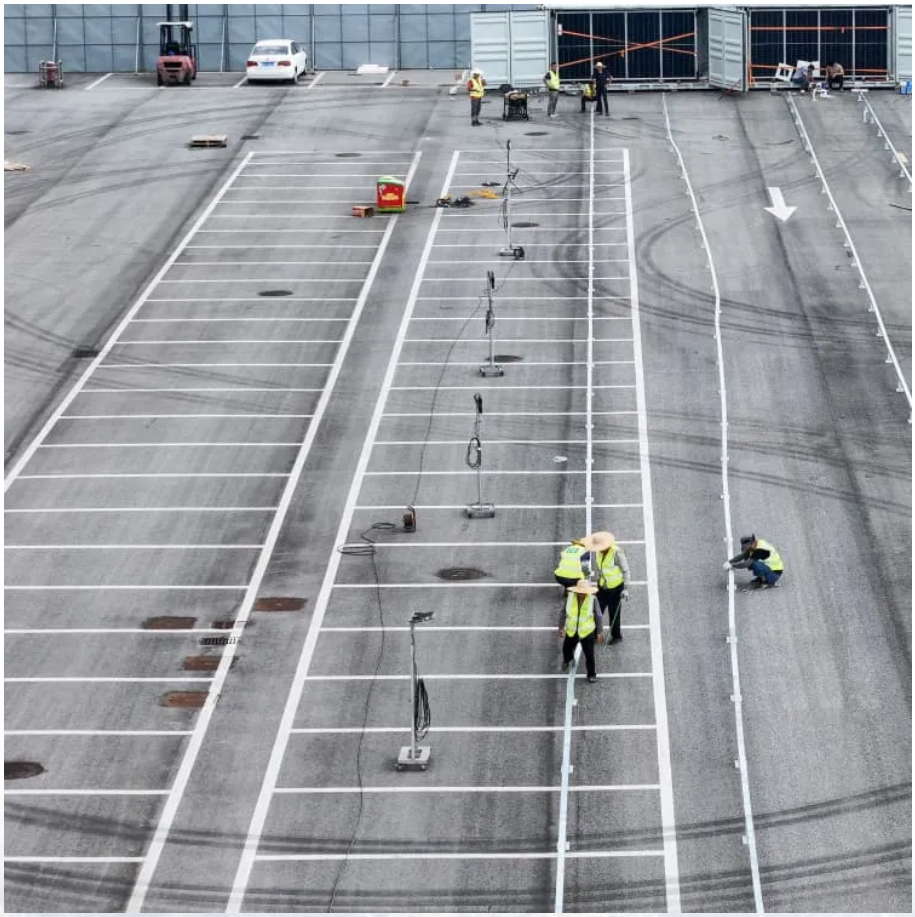
Hybrid Energy Design for Wireless solar container communication stations



Overview

What is a hybrid solar and RF energy harvester?

A hybrid solar and RF energy harvester is proposed for applications in self-powered wireless sensor nodes. A planar slot antenna array backed by substrate integrated waveguide (SIW) cavity is produced for RF energy harvesting. A designed rectifier connected to the antenna array converts the received RF energy into DC energy.

Can a hybrid solar and RF energy harvester be used in spwsns?

A hybrid solar and RF energy harvester for applications in SPWSNs has been proposed in this paper. A planar slot antenna element backed by substrate-integrated waveguide cavity was designed at first. Then, based on the antenna element, an 8×8 antenna array operating at 5.8 GHz was built to receiving the RF energy with a high gain.

How to integrate DC energy from solar and RF sources?

To integrate the DC energy harvested from both solar and RF sources, a power management circuit has been designed and fabricated, utilizing the BQ25504 chip. The circuit schematic is shown in Figure (a).

Can a wireless sensor node use a solar cell antenna?

Danesh M, Long J R. An autonomous wireless sensor node incorporating a solar cell antenna for energy harvesting. IEEE Trans Microw Theory Tech. 2011;59 (12):3546–3555. doi:10.1109/TMTT.2011.2171043 Roo-Ons M J, Shynu S V, Ammann M J, et al. Transparent patch antenna on a-Si thin-film glass solar module.

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