Isolated photovoltaic inverter

What are isolated microinverters?

Recently developed isolated microinverters were mainly based on center-tapped single or interleaved flyback converters in single-stage topology and DC-DC converters cascaded with half or full-bridge inverters in multi-stage topology. These converters are proposed to either increase the lifetime and efficiency or decrease the cost of components.

What isolation options are available for solar power conversion applications?

In response to these needs, Texas Instruments offers several isolation offerings for solar power conversion applications. These include isolated IGBT gate drivers, digital isolators, isolated delta-sigma ADCs and amplifiers, and isolated communication links such as isolated RS-485 and isolated CAN.

Why is galvanic isolation important in grid-connected photovoltaic microinverters?

Galvanic isolation in grid-connected photovoltaic (PV) microinverters is a very important feature concerning power quality and safety issues. However,high-frequency transformers and high switching losses degrade the efficiency of the isolated types of microinverters.

What is a solar PV inverter?

Early solar PV inverters were simply modules that dumped power onto the utility grid. Newer designs emphasize safety, intelligent grid integration, and cost reduction. Designers are looking to new technology, not used in existing solar inverter modules, to improve performance and reduce cost.

Do solar power conversion circuits need a basic isolation?

In the solar power conversion system (Figure 1),the isolated gate drivers and isolated voltage and current-feedback circuits both need to support reinforced isolation. Basic isolation is suficient if another basic isolation is inserted through the isolated data links.

What is galvanic isolation in a microinverter?

Galvanic isolation exists between the grid and the PV modulesin isolated microinverter types. The presence of a high-frequency transformer in the microinverter topology usually provides this isolation. The PV voltage level's boost up and conversion into an AC voltage can be accomplished either by a single-stage or multi-stage conversion circuit.

This article will suggest how i Coupler ® isolation technology can reduce cost, increase smart grid integration, and improve safety of solar PV inverters by using Analog Devices isolated analog-to-digital converters (ADCs) and gate drivers.