

IC Enables Up to 98 Percent-Efficient Power Extraction in Solar PV Applications

NXP Semiconductors N.V. recently announced the availability of the MPT612 - a unique low-power IC dedicated to performing the Maximum Power Point Tracking (MPPT) function for applications using solar photovoltaic (PV) cells or fuel cells. Supported by a patent-pending MPPT algorithm, the MPT612 IC can deliver up to 98-percent efficient power extraction in applications such as solar battery charge controllers, distributed MPPT and micro-inverters.

The MPT612 from NXP can also be easily configured for a variety of DC solar charge controller applications using MPPT, such as battery chargers for portable devices and home appliances; railway and traffic signals; and street, garden and driveway lighting. The MPT612 is also ideal for non-storage-based electric motors for water pumps and fans.

“Compared to traditional PWM controllers, MPPT controllers can extract up to 30-percent more power from a solar PV panel,” said Jan Willem Vogel, senior director, industrial applications marketing, NXP Semiconductors. “Our expertise in High Performance Mixed Signal technologies has enabled us to develop a unique MPPT IC and algorithm that enables PV integrators to further improve efficiency across a wide range of solar cell and fuel cell applications, as validated through extensive testing over an extended period of time.” The highly flexible MPT612 solution from NXP is based on a low-power, 32-bit ARM7TDMI-S™ processor, which supports multiple serial interfaces including I2C, UART, SPI and SSP. The MPT612 features hardware functions needed in PV applications, including voltage and current measurement, as well as panel parameter configuration, and is able to send an output signal to control external switching.

To further simplify development and maximize system efficiency, the MPT612 is available with object files including NXP’s patent-pending MPPT algorithm, an application-specific software library, and easy-to-use application programming interfaces (APIs). The API for system configuration can set the topology for buck or buck-boost, enabling optimal battery charging even in tropical regions during the summer when PV MPP voltage can be lower than battery voltage. The MPT612 offers up to 15 KB of flash memory for application software, as well as three levels of flash Code Read Protection (CRP) to safeguard user-developed code.

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