

ZSPM4521

High-Efficiency Charger for Li-Ion Batteries with Photovoltaic Sources

ZMDI
The Analog Mixed Signal Company



Brief Description

The ZSPM4521 is a DC/DC synchronous switching lithium-ion (Li-Ion) battery charger with fully integrated power switches, internal compensation, and full fault protection. It uses a temperature-independent photovoltaic maximum power point tracking (MPPT) function to optimize power output from the source during Full-Charge Constant-Current (CC) Mode. Its switching frequency of 1MHz enables the use of small filter components, resulting in smaller board space and reduced bill-of-material costs.

During Full-Charge Constant-Current Mode, the duty cycle is controlled by the MPPT regulator. Once the battery's termination voltage is reached, the regulator operates in Constant Voltage Mode. In this mode, the ZSPM4521 modulates the charging current until the battery reaches full charge. When the regulator is disabled (the EN pin is low), the device draws 10 μ A (typical) quiescent current (Disabled Mode).

The ZSPM4521 includes supervisory reporting through the NFLT (inverted fault) open-drain output to interface other components in the system. Device programming is achieved by an I²C™* interface through the SCL and SDA pins.

Benefits

- Up to 1.5A of continuous output current in Full-Charge Constant Current (CC) Mode
- High efficiency – up to 92% with typical loads

Available Support

- Evaluation Kit
- Documentation

Features

- Temperature-independent photovoltaic maximum power tracking (MPPT) regulator
- VBAT reverse-current blocking
- Programmable temperature-compensated termination voltage: 3.94V to 4.18V \pm 1%
- User programmable maximum charge current: 50mA to 1500mA
- Supervisor for V_{BAT} reported at the NFLT pin
- Input supply under-voltage lockout
- Full protection for VBAT over-current, over-temperature, VBAT over-voltage, and charging timeout
- Charge status indication
- I²C™ program interface with EEPROM registers

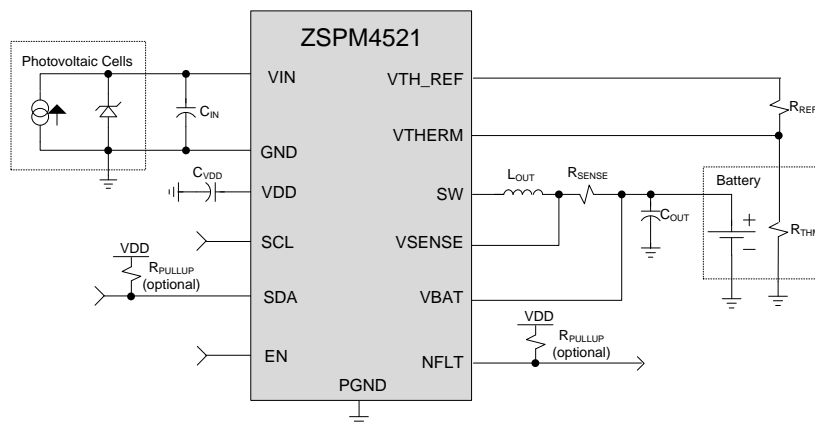
Related ZMDI Smart Power Products

- ZSPM4523 DC/DC Synchronous Switching Super Capacitor Charger With MPPT Regulator
- ZSPM4551 High-Efficiency Li-Ion Battery Charger
- ZSPM4121 Ultra-low Power Under-Voltage Switch
- ZSPM4141 Ultra-Low-Power Linear Regulator

Physical Characteristics

- Wide input voltage range: 4.0V to 7.2V
- Junction operating temperature: -40°C to 125°C
- Package: 16-pin PQFN (4mm x 4mm)

ZSPM4521 Application Circuit



* I²C™ is a trademark of NXP.

For more information, contact ZMDI via analog@zmdi.com.

ZSPM4521

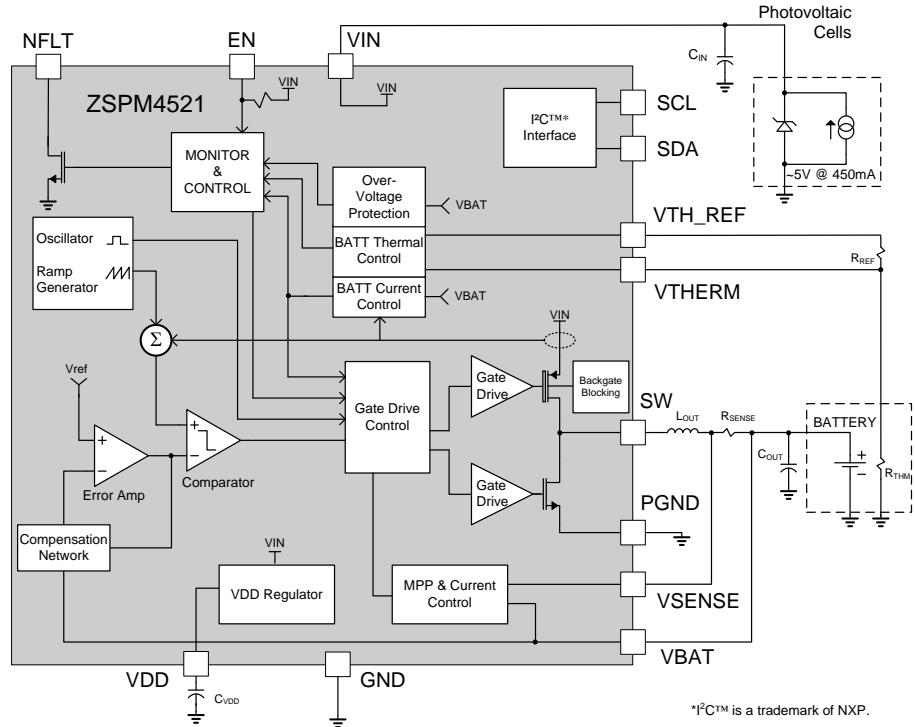
High-Efficiency Charger for Li-Ion Batteries with Photovoltaic Sources



The Analog Mixed Signal Company



ZSPM4521 Block Diagram



- Typical Applications**
- Portable solar chargers
 - Off-grid systems
 - Wireless sensor networks
 - HVAC controls

Ordering Information

Ordering Code	Description	Package
ZSPM4521AA1W	ZSPM4521 High Efficiency Li-Ion Battery Charger for Photovoltaic Sources	16-pin PQFN / 7" Reel (1000 parts)
ZSPM4521AA1R	ZSPM4521 High Efficiency Li-Ion Battery Charger for Photovoltaic Sources	16-pin PQFN / 13" Reel (3300 parts)
ZSPM4521KIT	ZSPM4521 Evaluation Kit	

Sales and Further Information		www.zmdi.com	Analog@zmdi.com
Zentrum Mikroelektronik Dresden AG Grenzstrasse 28 01109 Dresden Germany Phone +49.351.8822.7.776 Fax +49.351.8822.8.7776	ZMD America, Inc. 1525 McCarthy Blvd., #212 Milpitas, CA 95035-7453 USA Phone +855.275.9634 (USA) Phone +408.883.6310 Fax +408.883.6358	Zentrum Mikroelektronik Dresden AG, Japan Office 2nd Floor, Shinbashi Tokyu Bldg. 4-21-3, Shinbashi, Minato-ku Tokyo, 105-0004 Japan Phone +81.3.6895.7410 Fax +81.3.6895.7301	ZMD Far East, Ltd. 3F, No. 51, Sec. 2, Keelung Road 11052 Taipei Taiwan Phone +886.2.2377.8189 Fax +886.2.2377.8199
			Zentrum Mikroelektronik Dresden AG, Korea Office U-space 1 Building 11th Floor, Unit JA-1102 670 Sampyeong-dong Bundang-gu, Seongnam-si Gyeonggi-do, 463-400 Korea Phone +82.31.950.7679 Fax +82.504.841.3026

DISCLAIMER: This information applies to a product under development. Its characteristics and specifications are subject to change without notice. Zentrum Mikroelektronik Dresden AG (ZMD AG) assumes no obligation regarding future manufacture unless otherwise agreed to in writing. The information furnished hereby is believed to be true and accurate. However, under no circumstances shall ZMD AG be liable to any customer, licensee, or any other third party for any special, indirect, incidental, or consequential damages of any kind or nature whatsoever arising out of or in any way related to the furnishing, performance, or use of this technical data. ZMD AG hereby expressly disclaims any liability of ZMD AG to any customer, licensee or any other third party, and any such customer, licensee and any other third party hereby waives any liability of ZMD AG for any damages in connection with or arising out of the furnishing, performance or use of this technical data, whether based on contract, warranty, tort (including negligence), strict liability, or otherwise.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ZMDI:](#)

[ZSPM4521KIT](#)