

## Brief Description

The ZSPM4523 is a DC/DC synchronous switching super capacitor charger with fully integrated power switches, internal compensation, and full fault protection. It uses a temperature-independent photo-voltaic maximum power point tracking (MPPT) calculator to optimize power output from the source during Full-Charge Mode. Its 1MHz switching frequency allows using small filter components, which results in smaller board space and reduced bill-of-material costs.

In Full-Charge Mode, the duty cycle is controlled by the MPPT function. Once the termination voltage is reached, the regulator operates in Constant Voltage Mode. When the regulator is disabled (the EN pin is low), the device draws 10 $\mu$ A (typical) quiescent current from V<sub>OUT</sub>.

The ZSPM4523 integrates a wide range of protection circuitry, including input supply under-voltage lockout, output over-voltage protection, current limiting, and thermal shutdown.

The ZSPM4523 includes supervisory reporting via the NFLT (Inverted Fault) open-drain output to interface other components in the system. Device programming is achieved by the I<sup>2</sup>C™\* interface through the SCL and SDA pins.

## Benefits

- Up to 1.5A continuous output current
- High efficiency – up to 92% at typical load

## Features

- Temperature-independent MPPT regulation
- V<sub>OUT</sub> reverse-current blocking
- Programmable temperature-compensated termination voltage: 2.48 to 2.74 V  $\pm$  1%
- User programmable maximum charge current: 50mA to 1500mA
- Input supply under-voltage lockout
- Full protection for V<sub>OUT</sub> over-voltage
- I<sup>2</sup>C™ program interface with EEPROM registers
- Charge status indication

## Related IDT Smart Power Products

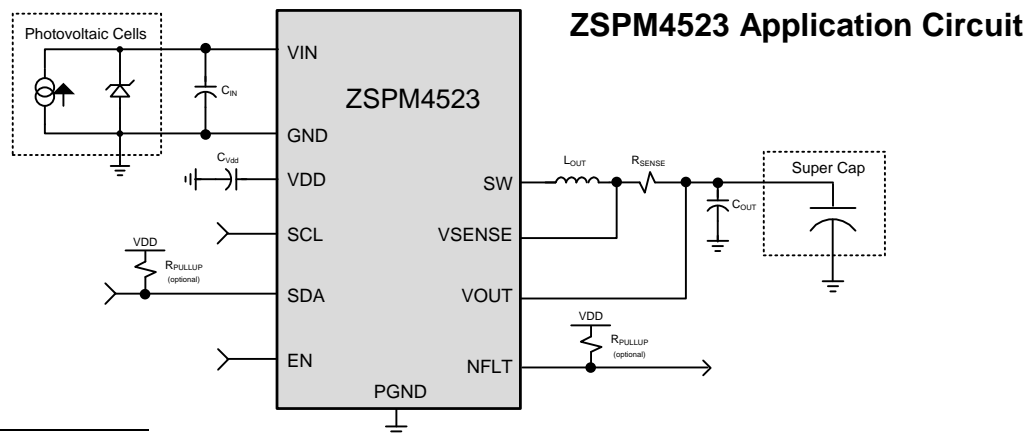
- ZSPM4521 High-Efficiency Charger for Li-Ion Batteries with MPPT Regulator
- ZSPM4551 High-Efficiency Charger for Li-Ion Batteries
- ZSPM4121 Ultra-low Power Under-Voltage Switch
- ZSPM4141 Ultra-Low-Power Linear Regulator

## Available Support

- Evaluation Kit
- Support Documentation

## Physical Characteristics

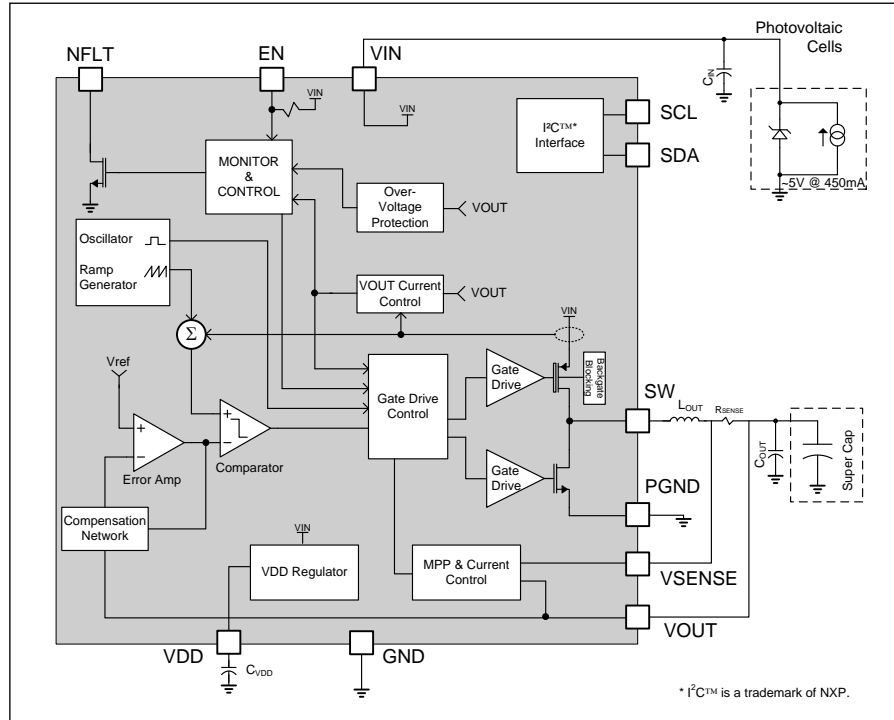
- Wide input voltage range: 3.2V to 7.2V
- Junction operating temperature -40°C to 125°C
- Packaged in a 16-pin PQFN (4mm x 4mm)



\* I<sup>2</sup>C™ is a trademark of NXP.

### ZSPM4523 Block Diagram

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



### Ordering Information

| Ordering Code | Description  | Package                             |
|---------------|--|-------------------------------------|
| ZSPM4523AA1W  | ZSPM4523 High-Efficiency Regulator for Super Cap Systems | 16-pin PQFN / 7" Reel (1000 parts)  |
| ZSPM4523AA1R  | ZSPM4523 High-Efficiency Regulator for Super Cap Systems | 16-pin PQFN / 13" Reel (3300 parts) |
| ZSPM4523KIT   | ZSPM4523 Evaluation Kit                                  |                                     |



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