

HL7130

Dual Phase 40W Charge Pump Charger

Overview

The HL7130 is the low voltage fast charger for 1 cell Li-ion and Li-polymer batteries. The device integrates a dual phase switched capacitor converter and reverse blocking MOSFET (QRB FET). The HL7130 has 96.5% efficiency at 4V output and 6A current from 8V input.

The switched capacitor converter architecture and the integrated FETs in device are optimized to enable 50% duty cycle operation under charge pump (CP) mode. The 2:1 CP mode allows output voltage (VOUT) to be around half of the input voltage (VIN) and output current to double the input current, reducing input power cable loss and limiting temperature rise in application. The dual-phase architecture reduces input capacitance requirements and input voltage ripple. Besides the CP mode, the device has bypass (BP) mode. The BP mode allows VIN forwardly passing through the internal power FETs to VOUT directly.

The HL7130 provides CC (Constant Current) and CV (Constant Voltage) regulations through controlling an external NFET for a safe charging purpose. The CC regulation is controlled through a closed loop of battery current sensing. The CV regulation is controlled through a closed loop of the battery voltage sensing.

The HL7130 has all the necessary protections to ensure the safe operation. The device includes OTP, VBUS UVP/OVP, VIN UVP/OVP, IIN OCP/UCP, VOUT UVP/OVP, VBAT OVP, IBAT OCP, PMID to VOUT OV/UV, CFLY SCP, VIN SCP, VOUT SCP and watchdog timer.

Besides all protections above, the HL7130 also features 10bit ADC who can offer VBUS, VIN, IIN, VOUT, VBAT, IBAT, VTSBUS, VTSBAT and TDIE information to system for optimizing charging control.

The HL7130 is available in a 56-bump WLCSP package with 3.1mm x 3.23mm size.

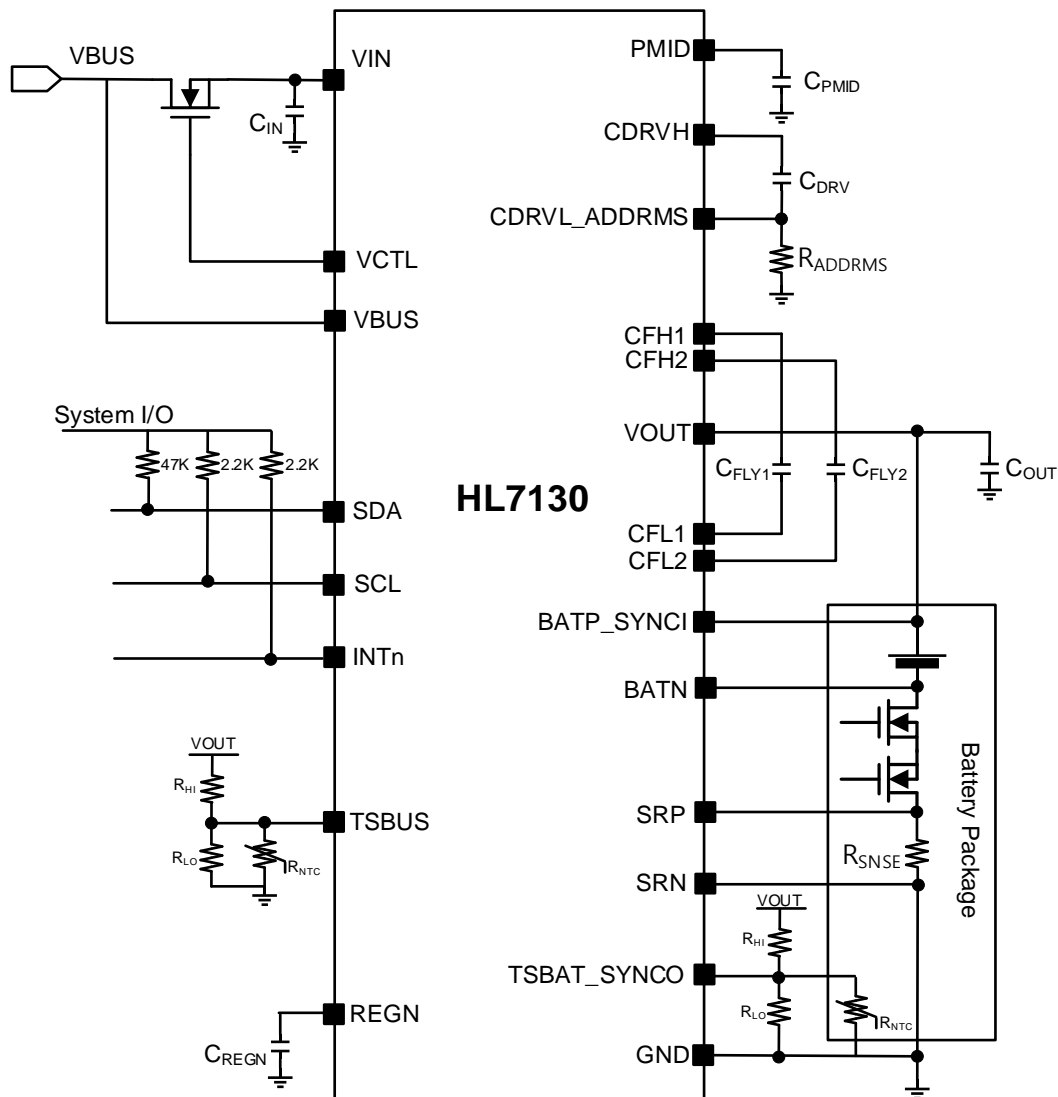
Features

- 20V Tolerance input voltage
- 3V to 12V Operational input voltage
- 5.0V Max operational output voltage
- Dual phase switched capacitor architecture
 - Optimized for 50% duty
- Charge pump mode (CP mode)
 - Continuous 8A output
- Bypass mode (BP mode)
 - Continuous 4.5A output
- Regulation loop for charging operation through external NFET control
 - Battery voltage regulation
 - Battery current regulation
- 96.5% Efficiency for 4V/6A output at CP mode
- Selectable switching frequency from 187.5kHz to 750kHz
- Integrated 10 bits ADC
 - VBUS voltage
 - VIN voltage
 - Output voltage
 - Battery voltage
 - Input current
 - Battery current
 - TSBUS input voltage
 - TSBAT input voltage
 - Die temperature
- Protections
 - Over temperature protection
 - VBUS/VIN over/under voltage protection
 - Voltage tracking protection under CP/BP mode
 - Input over/under current protection
 - VOUT over/under voltage protection
 - VBAT over voltage protection
 - IBAT over current protection
 - VOUT short circuit protection
 - VIN short circuit protection
 - CFLY short circuit protection
- 3.1mm x 3.23mm 56-bump WLCSP

Applications

- Smartphones
- Tablet PCs
- Mobile IoT Devices

Simplified Application Diagram



Ordering Information

Part Number	Max Input Work Voltage	Max Output Current rms	Package	Packing Method
HL7130WL01	12V	8A	WLCSP-36	Tape & Reel

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