



2A Li-ion Battery Switching Charger with Integrated OTG Boost

Features

- ◆ Full Automatic and Efficient Charge Management for Large Capacity Lithium Battery
 - Automatic Conditioning, CC/ CV Charge Control, Termination and Recharge
 - Support 2A Charge Current Using 33mΩ Sensing Resistor
 - 3MHz Synchronous PWM, 1μH Low Profile Inductor
 - Input Current Regulation Accuracy: $\pm 5\%$ (100mA and 500mA)
 - Charge Voltage Regulation Accuracy: -0.25%~0.41%(25°C), $\pm 1\%$ (0°C to 85°C), $\pm 2\%$ (0°C to 125°C)
 - 20V Input Voltage Tolerance, 6.3V Max Operating Voltage
 - Input Voltage Based Dynamic Power Management (VIN DPM)
 - Optional 32s/30 Minutes Safety Timer with Reset Control
 - Power Up without Battery
- ◆ Automatic Adaptor Fault Detection
- ◆ High Impedance Mode with Low Power Consumption
- ◆ Comprehensive Protection
 - Reverse Battery Leakage Protection
 - Thermal Regulation and Shut-down
 - Input & Output Over-Voltage Protection
- ◆ Built-in Input Current and Input Voltage Limit
- ◆ Automatic Charge and USB Compliant Start Sequence
- ◆ Full Range Programmable Charge Parameter through I²C Compatible Interface
 - Input Current Limit Threshold
 - Input Voltage DPM Threshold
 - Charge Termination Current
 - Charge Termination Voltage
 - Charge Termination Enable
 - Support 3.4MHz I²C HS Mode
- ◆ USB OTG Boost
 - Input Voltage Range from Battery: 2.5V~4.5V
 - 5.0V/ 400mA ($V_{BAT} \geq 3.0V$)
- ◆ 3mmx3mm DFN Package

Applications

- Smart phone
- MP3 player
- Tablet PC



Order Information

Part Number	HL7022	
Default Charge Termination Voltage	4.20V	4.20V
OTG Mode Maximum Output Current	400mA	
I ² C Address	6AH	
Pre-charge Current	325mA	
CC Current (Default)	1050mA (Rsns=68mΩ)	325mA (Rsns=68mΩ)
30min Safety Timer and 32s Watch-Dog Timer	No	Yes
Package	DFN	
Packing Method	Tape and Reel	
Marking Information	HL7022FN01	HL7022FN02

Typical Application Diagram

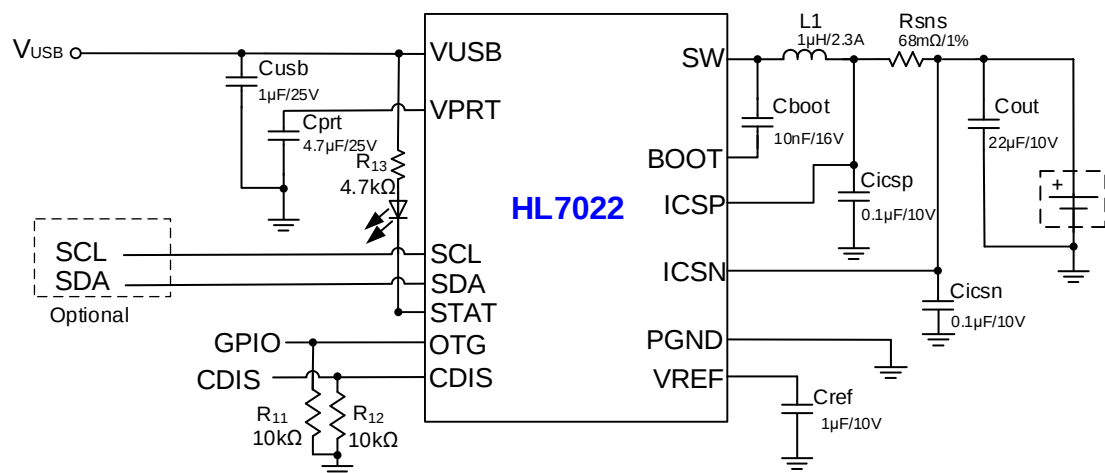


Figure 1. HL7022FN01 Typical Application Diagram

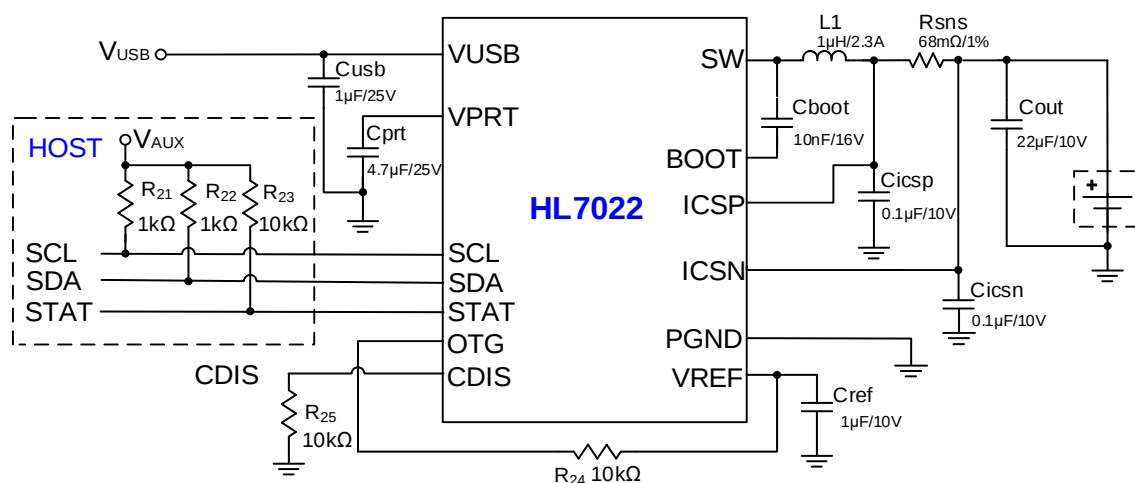


Figure 2. HL7022FN02 Typical Application Diagram



Component	Part Number	Value	Size	Vendor
L1	LQM2HPN1R0MGH	1 μ H/2.3A	2016	Murata
Cicsp, Cicsn	C1005X5R1A104K	0.1 μ F/10V	0402	TDK
Cboot	C2012X5R1E103K	10nF/16V	0805	TDK
Cusb	C2012X5R1E105K	1 μ F/25V	0805	TDK
Cprt	C2012X5R1E475K	4.7 μ F/25V	0805	TDK
Cref	GRM185R61A105K	1 μ F/10V	0603	Murata
Cout	GRM319R61A226ME15D	22 μ F/10V	1206	Murata
Rsns	ERJ8BWFR068V	68m Ω /1%	1206	PANASONIC
	RL0805FR-070R056L	56m Ω /1%	0805	Yageo
R ₂₁ ,R ₂₂	-	1k Ω	-	-
R ₁₁ ,R ₁₂ ,R ₂₃ ,R ₂₄ ,R ₂₅	-	10k Ω	-	-
R ₁₃		4.7k Ω		

Table 1. Recommended Component list



Description

HL7022 is a compact, flexible, high-efficiency, USB compliant switch-mode charge management device for single cell Li-ion and Li-polymer battery used in a wide range of portable applications. The charge parameters can be programmed through I²C interface. HL7022 integrates a synchronous PWM controller, power MOSFET, input current sensing, high-accuracy current and voltage regulation, and charge termination function into a tiny CSP package.

HL7022 provides a complete automatic three-phase battery charging control: trickle charge, constant-current charge (CC) and constant voltage charge (CV) until the battery reaches the charge termination voltage. The input current is automatically limited to the value set by the host. Charging is terminated based on the battery voltage and a

user selectable minimum current level. A safety timer with reset control provides a safety backup for I²C interface. During normal operation, the IC automatically restarts the charge cycle if the battery voltage falls below an internal threshold and automatically enters sleep mode or high impedance mode when the input supply is not correctly connected. The charge status can be reported to the host through the I²C interface.

During the charging process, the IC monitors its junction temperature (T_J) and reduces the charge current once T_J increases to about 120°C. To support USB OTG device, HL7022 can provide VBUS (5.0V) by boosting the battery voltage.

HL7022 is available in a 14-pin DFN package.



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