High Accuracy Linear Li-Lon Battery Charger

Features

- Preset 8.4V Charge Voltage with 1% Accuracy
- Pre-Charging, the Charge Current is adjustable
- Ideal for Dual-Cell（8.4V）Li-Ion Batteries
- Constant -Current Charging, the Charge Current is adjustable
- Constant-Voltage Charging
- Constant-Current/Constant-Voltage Charging with Temperature Monitoring
- Automatic Recharge
- Double LEDs Charge Status Indication
- Available in SOP-8L Package

Applications

- Charger for Li-Ion Coin Cell Batteries
- Portable MP3 Players, Wireless Headsets
- Bluetooth Applications
- Multifunction Wristwatches

Description

The GS7001 is a complete constant-current/ constant voltage linear charger for cell lithium-ion batteries. Its package and low external component count make the GS7001 ideally suited for portable applications. The charge current can be programmed externally with a single resistor. GS7001 determines the charge mode by detecting the battery voltage: Pre-charge, constant current charging, constant voltage charging. The charge current of pre-charging and constant –current charging is adjustable. The GS7001 is monitored by temperature monitor during the constant-current and constant-voltage charging. There are two LEDs indicate the charge mode.

The GS7001 charger converters are available in the SOP-8L packages (or upon request).

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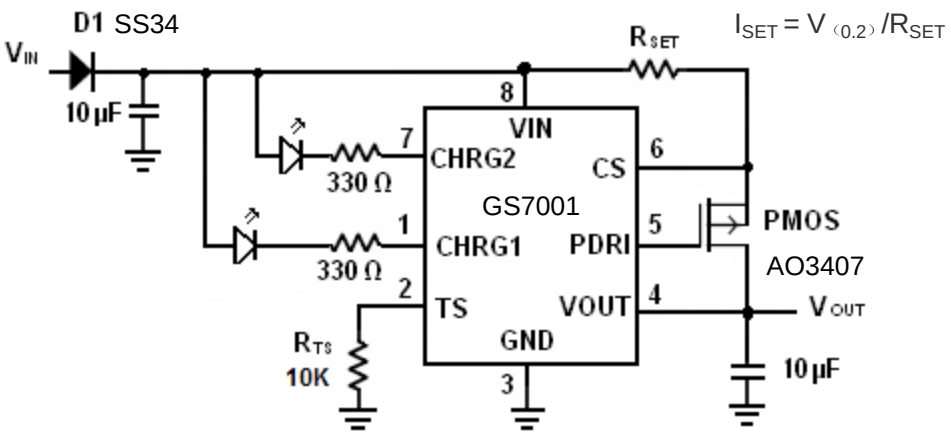
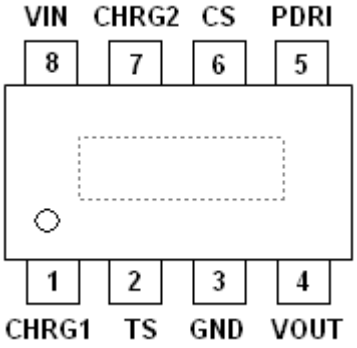
Typical Application



Pin Assignment



SOP-8L

PIN NUMBER SOP-8L	PIN NAME	DESCRIPTION
1	CHRG1	Open-Drain Charge Status Output
2	TS	Temperature Sense
3	GND	Ground
4	VOUT	Charge Current Output
5	PDRI	Charge Current Monitor and Shutdown Pin
6	CS	Charge Current Program
7	CHRG2	Open-Drain Charge Status Output
8	VIN	Positive Input Supply Voltage.

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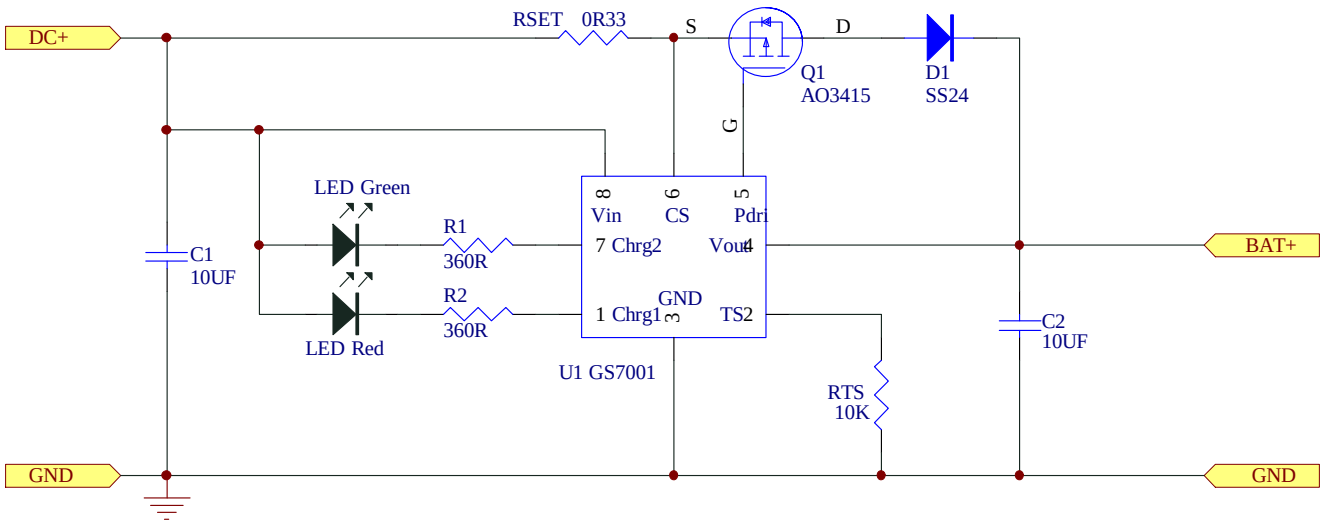

Absolute Maximum Ratings

- Input Supply Voltage (VIN) ..... 8.5V to 9.0V
- TS、CHRG1、CHRG2、PDRI、CS ..... – 0.3V to VIN + 0.3V
- Maximum Junction Temperature ..... 125℃
- Operating Ambient Temperature Range..... –40℃ to 85℃
- Storage Temperature Range ..... –65 ℃to 125℃
- Lead Temperature (Soldering, 10 sec)..... 300℃

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Electrical Characteristics

Operating Conditions: T_A=25℃.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
I_{VIN}	Input Supply Current		0.15	0.7	1.1	mA
I_{SLEEP}	VIN Sleep Current	VIN=7V VOUT=8V			7.8	μA
$I_{IV(VOUT)}$	Input bias current on VOUT pin	VOUT=8.4V	10		65	μA
Battery Voltage Regulation Constant-current Charge						
$V_{O(REG)}$	Output voltage		8.317	8.4	8.484	V
$V_{（CS）}$	Current regulation threshold	Voltage at pin CS , relative to VIN	180	200	220	mV
Precharge Comparator						
$V_{(min)}$	Precharge threshold		5.6	6	6.2	V
Precharge Current Regulation						
$I_{(PRECHG)}$	Precharge current regulation	Voltage at pin CS, relative to VIN, R_{SET} =1Ω.		18		mA
		Voltage at pin CS, relative to VIN, R_{SET} =1Ω.，VIN=9V	10		35	mA
V_{RCH} comparator（Battery Recharge Threshold）						
$V_{（RCH）}$	Recharge threshold			$V_{O(REG)}$ -400m V		V
STAT Pin						
$V_{OL(STAT)}$	Output（low）voltage	I_{OL} =10mA		1.5		V
$V_{OH(STAT)}$	Output（high）voltage	I_{OH} =5mA	VIN-2			V

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Application Information

PIN ASSIGNMENT

CHRG1 (Pin 1): Charge Status Indication. When the battery is charging, the CHRG1 pin is pulled low. When the charge cycle is completed or reverse battery lockout / No AC is detected, CHRG is forced high impedance. The battery is not working properly or when the temperature exceeds the set range, output 50% duty cycle of 2Hz pulse, the PIN is available through 330 ohm resistors and indicates that the light-emitting diode connected.

TS (Pin 2): Temperature Sense.

GND (Pin 3): Ground.

VOUT (Pin 4): Charge Current Output. It should be bypassed with at least a 10uF capacitor. It provides charge current to the battery and regulates the final float voltage to 8.4V.

PDRI (Pin 5): Driving side. Connect to the grid of the PMOS.

CS (Pin 6): Charge Current Program, Charge Current Monitor and Shutdown Pin. The charge current is programmed by connecting a resistor, R_{SET}, $I_{SET} = V_{〈CS〉}/R_{SET}$.

CHRG2 (Pin 7): End-of-Charge Status Indication. When the battery is charging, the CHRG2 pin is forced high impedance. When the charge cycle is completed, CHRG2 is pulled GND.

VIN (Pin 8): Positive Input Supply Voltage. It Provides power to the charger VIN and should be bypassed with a 10uF capacitor.

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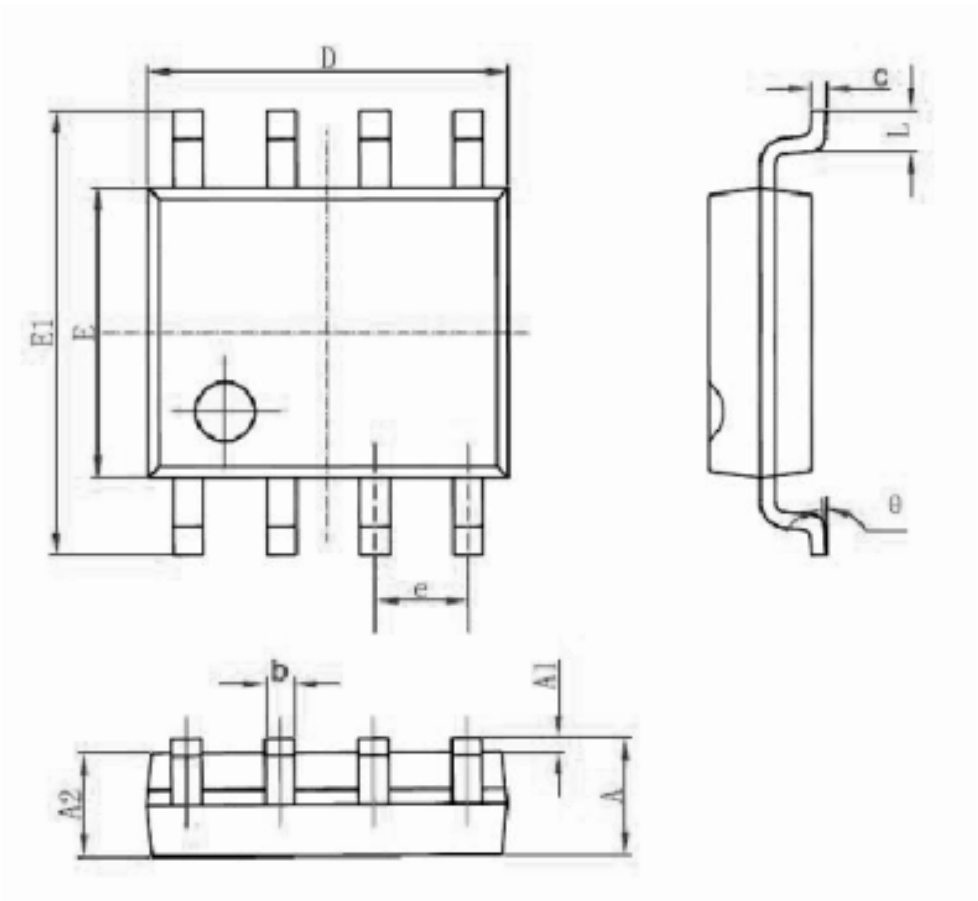
Packaging Information

SOP-8 Package Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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