SEAWARD ELECTRONICS

SE9450

28V, 1A, single cell, linear lithium battery charging IC

Product Description

SE9450 is a complete constant current/constant voltage High-voltage, high-current, single-cell lithium-ion battery linear charging IC. most High withstand voltage up to 28V, 6.5V automatic overvoltage protection, charging current can Up to 1A.

Due to the internal PMOSFET architecture and anti-reverse charging path, so no external isolation diode is required. Thermal feedback can affect charging power flow automatically adjusts for operation at high power or high ambient temperature conditions Limit the chip temperature under certain conditions. The full charge voltage is fixed at 4.2V, while the charge current can be externally set via a resistor. When the battery voltage reaches the full voltage, the charging current gradually decreases. When the charging current drops to 1/10 of the set value, the SE9450 will automatically terminate the charging process.

When the input voltage (AC adapter or USB power) is removed, the SE9450 automatically enters a low current state, reducing battery leakage current to less than 2uA (typ).

Other features of the SE9450 include battery temperature detection, undervoltage shutdown Lock, automatic recharge and two LEDs to indicate end of charge status pin.

Product Features

ÿ Input voltage up to 28V ÿ 6.5V input overvoltage protection (OVP) ÿ MPPT (Maximum Power Point Tracking) ÿ Charging current can be set by external resistor, up to 1A ÿ No need for anti-backcharge MOSFET, detection resistor or isolation diode ÿ Constant current/constant voltage operation with thermal regulation to maximize charge rates without risk of overheating

ÿ 4.2V preset full voltage with ±1% accuracy ÿ Automatic recharging ÿ Dual outputs for charge status, no battery and fault status display ÿ C/10 charge termination ÿ 2.9V trickle charging ÿ Soft start limits inrush current ÿ Battery reverse polarity protection ÿ Battery temperature monitoring function ÿ Using PSOP8, DFN2*2-8 package

Applications

ÿBackup power supply/mobile power supply

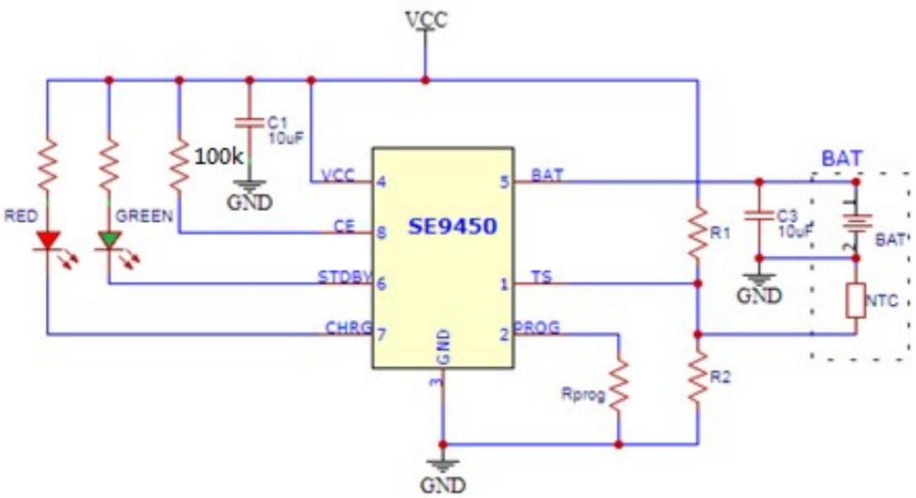
ÿ Mobile phones, PDAs, GPS

ÿ MP3, MP4 player

ÿDigital cameras, electronic dictionaries

ÿPortable devices, various chargers

Typical application circuit

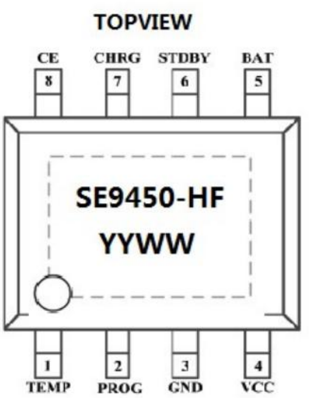


Ordering information

Product number	Seal information	Package form	Remark
SE9450-42-HF	S9450 AYYWW-HF	SOP8-EP	A: 4.2V; C: 4.35V YYWW represents the production batch HF stands for Halogen Free
SE9450-435-HF	S9450 CYYWW-HF		
SE9450—42-HF	S9450 AYYWW-HF	DFN2*2-8	
SE9450—435-HF	S9450 CYYWW-HF		

Pin arrangement

SOP8-EP

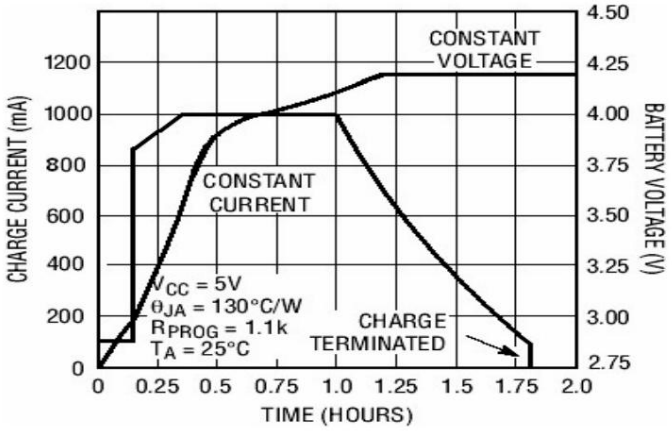


DFN2*2-8

Pin function description

pin	Pin function description	pin	Pin function description
TEMP	Battery temperature detection pin. External battery NTC sensor output, when TEMP<45%Vcc, TEMP>80%Vcc, charging is suspended; TEMP is grounded, This function is disabled, other functions are normal	THIS	Chip enable input. When inputting a high level, the chip is Normally working; when inputting low level, the chip stops working
PROG	constant current charging current setting and charging current monitoring terminal	STDBY	Charging completion indicator terminal. When charging is complete, this pin is The internal circuit pulls it to a low level; in other states, this pin is a high-
VCC	Input voltage positive input terminal	CHRG	impedance charging indication terminal. When charging is in progress, this pin is pulled to a low level by the internal circuit; in other states, this pin is in a high impedance state.
GND	power ground	BAT	battery connection terminal

Typical complete charge cycle curve



Maximum rated parameters

parameter	symbol	numerical value	unit
Input supply voltage	come	-0.3V~28V	IN
BAT voltage	Vbat	-0.3V~11V	IN
TEMP/CE/PROG voltage		11 -0.3V~6.0V	IN
CHRG / STDBY		-0.3V~28V	IN
BAT pin current	DIFFERENT	1500	mA
PROG pin current	PROG	2	mA
TEMP/CE pin current	ITEMP/ICE	5	mA
maximum junction temperature		150	°C
Storage temperature range		-40ÿ150	°C
Pin temperature (soldering time 10 seconds)		260±5	°C

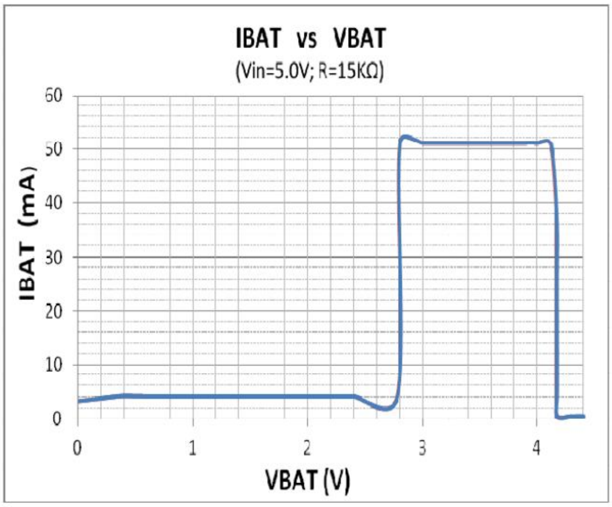
Recommended working conditions

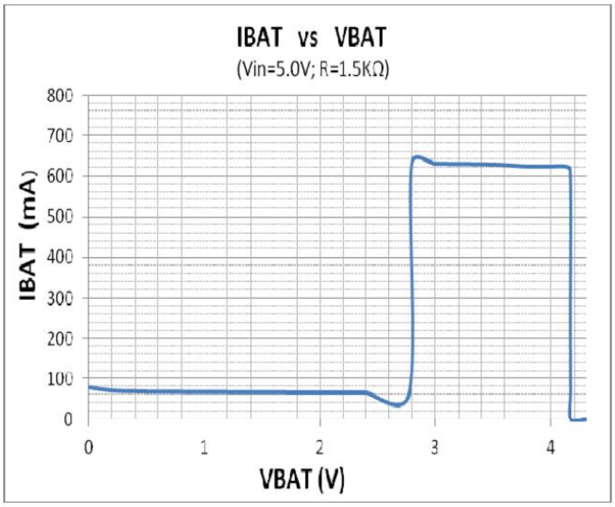
parameter	numerical value	unit
Input voltage	4.5 ÿ 25	IN
working environment temperature range	-20 ÿ 85	°C

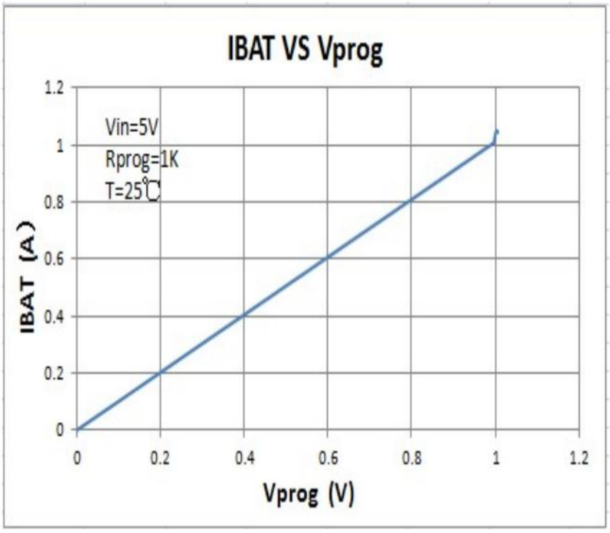
Electrical Parameters (Vcc=5V; Tj=25ÿ unless otherwise stated)

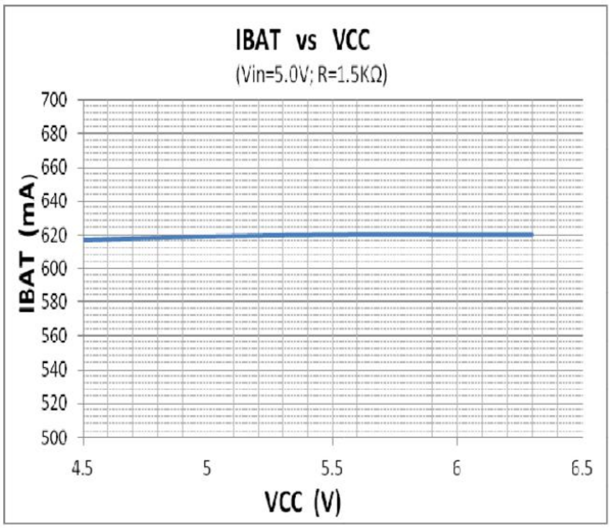
symbol		condition	Minimum value	Typical value	Maximum value	Unit
VCC	Parameters Input Supply Voltage		4.5	5	25	IN
ICC	Input supply current	Charging mode, RPROG=2K		1000		ÿA
		Standby mode (charging terminated)		170		
		Shutdown mode		3		
VFLOAT	stable output (floating charge) voltage	IBAT = 30mA, RPROG=10K	4.158	4.2	4.242	IN
			4.306	4.35	4.394	
DIFFERENT	BAT pin current:	Charging mode (RPROG=2K)		500		mA
		Charging mode (RPROG=1K)		1000		mA
		standby mode, VBAT=4.3V		2		uA
		shutdown mode		2		uA
ITRIKL	Trickle charging current	VBAT<VTRIKL, RPROG=2K		50		mA
VTRIKL	trickle charging threshold voltage	RPROG=2K, VBAT rises		2.9		IN
VTRHYS	trickle charge hysteresis voltage	RPROG=2K		100		mV
VUV	VCC undervoltage lockout threshold	from VCC low to high		3.7		IN
VUVHYS	VCC undervoltage lockout hysteresis			150		mV
VASD	VCC-VBAT latch threshold voltage	Vcc rise		150		mV
		Vcc drops		100		mV
ITERM	C/10 Termination current threshold	RPROG=2K		60		mA
		RPROG=1K		100		mA
VPROG	PROG pin voltage	RPROG=2K, current mode		1.0		IN
VCHRG	CHRG pin outputs low voltage	ICHRG = 5mA			0.4	IN
VSTDBY	STDBY pin outputs low level	ISTDBY =5mA			0.4	IN
VTEMP-H	TEMP pin high side flip voltage			80		%Vcc
VTEMP-L	TEMP pin low-side flip voltage			45		%Vcc
ÿVRECHRG	recharge battery threshold voltage	VFLOAT - VRECHRG		150		mV
TLIM	Junction temperature in limited temperature mode			120		°C
TRECHARGE	recharge comparator filter time	VBAT high to low		1		ms
TTERM	terminates the comparator filter time	IBAT and drops below ICHG/10		1		ms
PROG	PROG pin pull-up current			0.5		ÿA
OVP	Input overvoltage protection (rising)			6.5		IN
	Hysteresis			200		mV

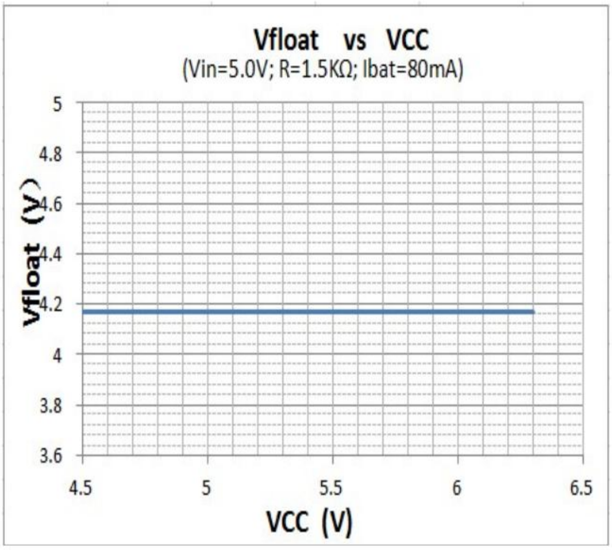
Typical performance characteristics

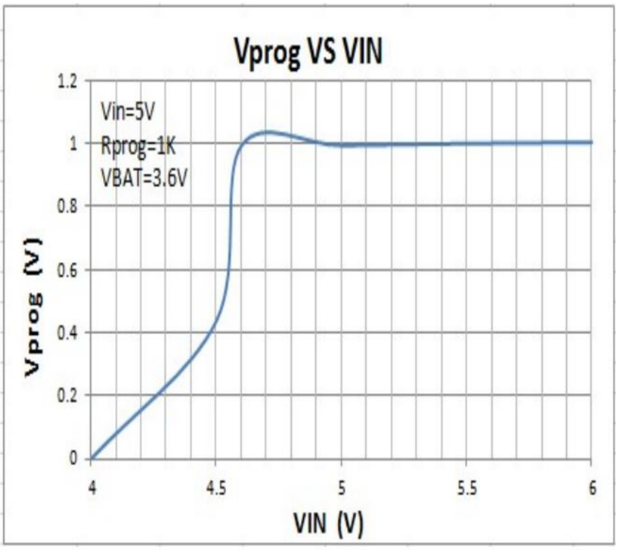












Application information

SE9450 is designed for one-cell Li-ion or Li-polymer batteries

The designed linear charger circuit uses the power crystal inside the chip.

The body tube performs constant current and constant voltage charging of the battery. Charging current can be used

External resistor programming setting, the maximum continuous charging current can reach 1A, no

Additional blocking diodes and current sensing resistors are required. SE9450 contains

Two open-drain output status indication outputs, charge status indication

Indication terminal CHRG and battery fault status indication output terminal STDBY. chip

The internal power management circuit automatically shuts down when the junction temperature of the chip exceeds 125°C.

automatically reduce the charging current. This function allows users to maximize the

Utilizing the power processing capability of the chip, you don't have to worry about the chip being damaged due to overheating.

Bad chip or external component.

When the input voltage is greater than the power supply low voltage detection threshold and the chip enables

When the input terminal is connected to a high level, the SE9450 starts charging the battery,

and the CHRG pin outputs a low level, indicating that charging is in progress. If the battery voltage

is lower than 2.9V, the charger uses a small current to pre-charge the battery.

Charge. When the battery voltage exceeds 2.9V, the charger uses constant current mode

charge the battery, the charging current is between the PROG pin and GND

The resistor RPROG is determined. When the battery voltage is close to 4.2V,

The charging current gradually decreases and the SE9450 enters constant voltage charging mode. when

When the charging current decreases to the charging end threshold, the charging cycle ends.

The CHRG terminal outputs a high impedance state, and the STDBY terminal outputs a low potential.

The charge end threshold is 10% of the constant current charging current. when battery

When the voltage drops below the recharge threshold, a new charging cycle automatically starts.

The chip's internal high-precision voltage reference source, error amplifier and

The resistor voltage dividing network ensures that the accuracy of the battery terminal modulation voltage is within 1%.

Meets the requirements of lithium-ion batteries and lithium-polymer batteries.

When the input voltage loses power or the input voltage is lower than the battery voltage,

The charger enters a low-power sleep mode, and the current consumed by the battery is small.

less than 1uA, thus increasing the standby time. If the enable input terminal CE is connected to low

level, the charger stops charging.

Input overvoltage protection

The input voltage of SE9450 can reach 28V. When the internal input overvoltage detection

When the circuit detects an input voltage of 6.5V, it will immediately shut down the circuit.

Prevent high voltage damage; when the voltage is lower than 6.5V, the circuit will be opened again to continue

Charge.

Charging current setting

The charging current is determined by a connection between the PROG pin and ground.

resistor to set. To set the resistor and charge current use the following formula

Calculate with the formula: Determine the resistor resistance according to the required charging current,

$$RPROG \text{ ÿ } \frac{1000}{I_{ONE}}$$

In customer applications, the RPROG of appropriate size can be selected according to needs.

The relationship between RPROG and charging current can be determined by referring to the following table:

RPROG(k)	IBAT(mA)
28	40
18.6	60
9.3	120
4.6	240
3.73	300
2.8	400
1.86	600
1.55	720
1.25	800
1.11	900
1	1000

Charge

Termination The charge cycle is terminated when the charge current drops to 1/10

of the set value after reaching the final float voltage. The condition is created by using an inner

The external filter comparator monitors the PROG pin for detection. when

The PROG pin voltage drops below 100mV for more than Tterm

, charging is terminated. The charging current is turned off and SE9450 enters standby.

mode, the input current drops to 170uA.

When charging, a transient load on the BAT pin causes the PROG pin to

The voltage briefly drops to 1/10 of the set value when the DC charging current

Below 100mV. 1ms filter time on termination comparator (tTERM)

Ensure that load transients of this nature do not cause premature termination of the charge cycle.

Once the average charging current drops below 1/10 of the set value, the SE9450

This terminates the charge cycle and stops supplying any current through the BAT pin. exist

In this state, all loads on the BAT pin must be supplied by the battery.

electricity.

In standby mode, the SE9450 continuously changes the BAT pin voltage.

monitor. If the voltage on this pin drops to the recharge threshold of 4.05V

(VRECHRG) below, another charging cycle begins and charges the battery again supply current.

Figure 1 shows the state diagram of a typical charging cycle.

Charge status indicator

SE9450 has two open-drain status indication outputs,

CHRG and STDBY. When the charger is in charging state,

CHRG is pulled low. In other states, CHRG is high impedance.

state. When the battery temperature is outside the normal temperature range, both the

CHRG and STDBY pins output a high-impedance state.

When the typical connection method of TEMP terminal is used, when the battery is not connected to the charger

When the electrical appliance is turned on, it indicates a fault status: neither the red light nor the green light is on;

When the TEMP terminal is connected to GND, the battery temperature detection does not work.

When the battery is not connected to the charger, CHRG outputs a pulse signal indicating that there is no

Install the battery. When the external capacitor of the battery connection terminal BAT pin is

At 10uF, the CHRG flashing frequency is about 1-4 seconds. When the status indication is not used

When using the function, connect the unused status indication output terminal to the ground.

Charging	Red light, green	light, on
status Charging status	and off	
Battery full status		
Under voltage, battery temperature is too high or too low Waiting for fault status, or no battery connected (TEMP use)	annihilate	
BAT terminal is connected to 10u capacitor, no battery (TEMP=GND)	Green light is on, red light is flashing T=1-4 S	

thermal limit

If the chip temperature rises above the preset value of approximately 120°C, a

An internal thermal feedback loop will reduce the programmed charge current. This function can

To prevent SE9450 from overheating and entering thermal protection. If the environment is restricted, heat dissipation

Defective, the charging chip will cycle repeatedly between normal charging and overheating protection.

the chip and reduce the equivalent charging current.

time. This function of SE9450 will effectively prevent core

solved: The chip enters thermal protection to ensure uninterrupted charging. This allows the SE9450

Charging can be done as normally as possible in a closed environment to reduce charging

time. Battery temperature monitoring

In order to prevent damage to the battery caused by too high or too low temperature,

SE9450 integrates a battery temperature monitoring circuit. battery temperature monitor

The measurement is achieved by measuring the voltage of the TEMP pin. The TEMP tube

The voltage at the pin is divided by the NTC thermistor inside the battery and a resistor.

voltage network, as shown in the typical application circuit.

SE9450 connects the voltage of the TEMP pin to the two internal

The thresholds VLOW and VHIGH are compared to confirm that the battery temperature is

is outside the normal range. Inside the SE9450, VLOW is fixed

At 45% × Vcc (K1), VHIGH is fixed at 80% × Vcc

(K2). If the voltage of TEMP pin VTEMP<VLOW or

VTEMP>VHIGH means the battery temperature is too high or too low.

The charging process will be suspended; if the voltage of TEMP pin VTEMP

Between VLOW and VHIGH, the charging cycle continues.

If the TEMP pin is connected to ground, the battery temperature monitoring function will be disabled

end.

Determine the values of R1 and R2

The values of R1 and R2 depend on the battery's temperature monitoring range and thermal

The resistance value of the sensitive resistor is determined by the following example: Assume that

The battery temperature range is TL ~ TH, (where TL < TH); battery

A negative temperature coefficient thermistor (NTC) is used, RTL

is its resistance at temperature TL, RTH is its resistance at temperature TH

resistance value, then RTL>RTH, then, at the temperature TL, the first tube

The voltage at pin TEMP is:

$$V_{TEMPL} = \frac{R2 \| R_{TL}}{R1 + R2 \| R_{TL}} \times VIN$$

At the temperature TH , the voltage at the TEMP terminal of the first pin is:

$$V_{TEMPH} = \frac{R2 \| R_{TH}}{R1 + R2 \| R_{TH}} \times VIN$$

Then, VTEMPL=VHIGH=k2×Vcc (k2=0.8) loop. This will affect the life of

VTEMPHÿVLOWÿk1×Vcc (k1=0.45) Extend the charging

Then it can be

$$R1 = \frac{R_{TL}R_{TH}(K_2 - K_1)}{(R_{TL} - R_{TH})K_1K_2}$$

$$R2 = \frac{R_{TL}R_{TH}(K_2 - K_1)}{R_{TL}(K_1 - K_1K_2) - R_{TH}(K_2 - K_1K_2)}$$

In the same way, if the battery has a positive temperature coefficient (PTC) Thermistor, then RTL<RTH, we can calculate:

$$R1=\frac{R_{TL}R_{TH}(K_2-K_1)}{(R_{TH}-R_{TL})K_1K_2}$$

$$R2=\frac{R_{TL}R_{TH}(K_2-K_1)}{R_{TH}(K_1-K_1K_2)-R_{TL}(K_2-K_1K_2)}$$

It can be seen from the above derivation that the temperature range to be set is related to supply voltage Vcc, and is only related to R1, R2, RTH, and RTL . off; among them, RTH and RTL can be determined by consulting the relevant battery manual or Obtained through experimental testing. In practical applications, if we only focus on one end temperature characteristics, such as overheating protection, then R2 does not need to be used, but only R1 is enough. The derivation of R1 also becomes simple and will not be repeated here.

SE9450 TS电阻计算举例

TempL=-7C, TempH=50C

已知（确定值）

TS1(K1)	0.45	内部设置
TS2(K2)	0.80	内部设置

输入NTC电阻值 （查表 muRata NCP15XH103F03RC）

RTL	37,073.00	负7C
RTH	4,161.00	正50度
R25C	10,000.00	

输出结算结果

R1	4,556.87
R2	35,857.20

There is a Zener inside the TS pin to ensure that when high voltage occurs on the input, TS voltage does not exceed 6V. Zener Sinking current capacity is maximum 5mA. For this reason, it is recommended that the value of R1 should not be less than 4.4K.

Undervoltage lockout

An internal undervoltage lockout circuit monitors the input voltage and keeps the charger active until Vcc rises above the undervoltage lockout threshold. in shutdown mode. The UVLO circuit will keep the charger in shutdown mode. If the UVLO comparator trips, Vcc rises to The charger will not exit shutdown mode until the cell voltage is 100mV higher. Manual shutdown

At any time during the charge cycle, the CE pin can be set low. potential or remove RPROG (thereby floating the PROG pin) to SE9450 is placed in shutdown mode. This reduces battery leakage current to 1μA below, and the supply current drops below 30ÿA. Resetting the CE terminal to high potential or connecting the setting resistor can start a new charging cycle.

If the SE9450 is in undervoltage lockout mode, CHRG and STDBY The pin is in a high impedance state: either Vcc is less than 100mV above the BAT pin voltage, or the voltage applied to the Vcc pin is insufficient. automatic restart

Once the charge cycle is terminated, the SE9450 immediately adopts a specific The comparator with 1.8ms filter time (tRECHARGE) has nothing to do with the BAT power The voltage on the pin is continuously monitored. When the battery voltage drops to 4.05V (roughly corresponding to 80% to 90% of battery capacity), charge The electrical cycle begins again. This ensures that the battery is maintained at (or close to) a fully charged state and eliminates the need for periodic charging cycles The need to move. During the recharge cycle, the CHRG pin output enters Enter a strong pull-down state.

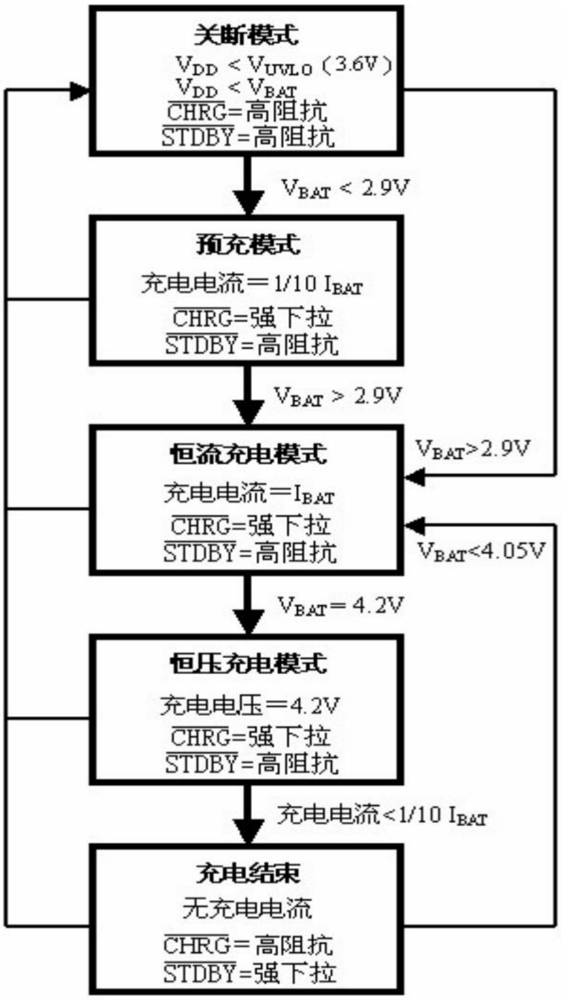


Figure 1: State diagram of a typical charging cycle

Power loss

SE9450 reduces charging current due to thermal feedback

The condition can be estimated from the power loss in the IC. This power loss

Almost all the power consumption is generated by the internal MOSFET. This can be determined by

The following equation can be approximated:

$$P_D = (V_{CC} - V_{BAT}) \bullet I_{BAT}$$

PD in the formula is the dissipated power, VCC is the input power supply voltage,

VBAT is the battery voltage, and IBAT is the charging current. When thermal feedback begins

When protecting the IC, the ambient temperature is approximately:

TA=120C-PD *ÿJA

TA=120C-(VCC – VBAT)*IBAT *ÿJA

Example: Programming a device to obtain operating power from a 5V power supply

to a discharged lithium-ion battery with a voltage of 3.6V

800mA full amplitude current.

Assuming ÿJA is 70°C/W (see board layout considerations), when the SE9450 starts

to reduce the charging current, the ambient temperature

Approximately:

TA=120C-(5V-3.6V)*800mA*70C/W TA=

120C-1.12W*70C/W

TA=120C-78.4C = 41.6C

SE9450 can be used under ambient temperature conditions above 41.6ÿ

used, but the charging current will be reduced to less than 800mA. for a given

At a certain ambient temperature, such as 35C, the charging current can be approximated by the following formula

Find:

IBAT=(120C-35C)/((5V-3.6V)*70C/W)

IBAT=867mA

As discussed in the How-To section, when thermal feedback causes

As the charging current decreases, the voltage on the PROG pin will also be proportional to

Decrease accordingly. Remember that you do not need to consider worst-case thermal conditions in your application design

conditions, this is important because the IC will reach the junction temperature

Automatically reduces power consumption when the temperature is around 120°C.

hot consideration

Due to the small size of the SOP8-EP package, it requires

Use a thermally well-designed PC board layout to maximize

It is very important to add the available charging current. for dissipative IC

The heat generated is dissipated via a thermal path from the chip to the lead frame and through

The bottom heat sink reaches the PC board copper surface. The copper surface of the PC

board is the heat sink. The copper area where the heat sink is connected should be as wide as

possible and extend outward into the larger copper area to dissipate heat to the surrounding

environment. Vias to internal or back copper circuit layers improve the overall thermal performance of the charger

It is also quite useful in terms of energy. When designing PC board layout,

Other heat sources on the circuit board not related to the charger must also be considered

, because they will have an impact on the overall temperature rise and maximum charging current.

Add thermal adjustment resistor

Reducing the voltage drop across the internal MOSFET can significantly reduce power

dissipation in the IC. This has the effect of increasing the amount of energy delivered to the battery during thermal conditio

The effect of electric current. One countermeasure is to pass an external component such as a

resistor or diode) dissipates some of the power. Example: pass

Overprogram a device that gets its operating power from a 5V AC adapter

The SE9450 is designed to power a discharged lithium-ion battery with a voltage of 3.6V.

Set to full charging current of 800mA. Assuming ÿJA is 70ÿ/W,

Then under the ambient temperature condition of 35ÿ, the charging current is approximately:

IBAT=(120C-35C)/(5V-3.6V)*70C/W=867mA

On-chip power dissipation can be reduced by placing a resistor in series with the 5V AC

adapter (shown in Figure 2), thereby increasing thermally regulated charge.

Current:

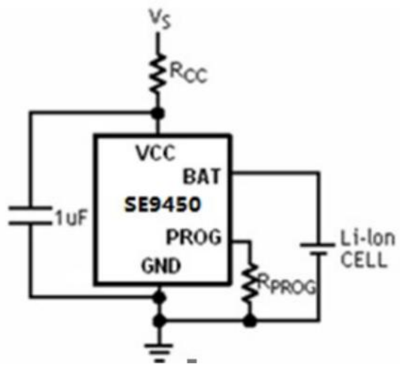


Figure 2: A circuit that maximizes the charging and saving current in thermal regulation mode

If we wish to increase the charging current to 1A:

VS -VRCC– VBAT = (120-TA)/(IBAT*ÿJA)

VS – VRCC-VBAT = (120-35)/(1A*70C/W)

VS – VRCC-VBAT = 1.21V

VRCC is the voltage drop of RCC . VBAT is the battery voltage. if VS=5V, we get:

VRCC = VCC - VBAT – 1.21V

VRCC = 5V - 3.6V – 1.21V = 0.19V

RCC = VRCC /IBAT = 0.19V/1A = 0.19ÿ

The results show that the structure can output at higher ambient temperatures. Out of 1000MA full charge. Although this application can be done in thermal In full mode, more energy is delivered to the battery and shortens charging time. But in voltage mode, if VCC becomes low enough that the low voltage drop condition, it may actually extend the charging time. Figure 3 shows how this circuit causes the voltage to drop as RCC becomes larger. Falling. When in order to keep component sizes small and avoid stress This technology works best when the RCC value is minimized by reducing the use. Remember to choose a resistor with adequate power handling capabilities device.

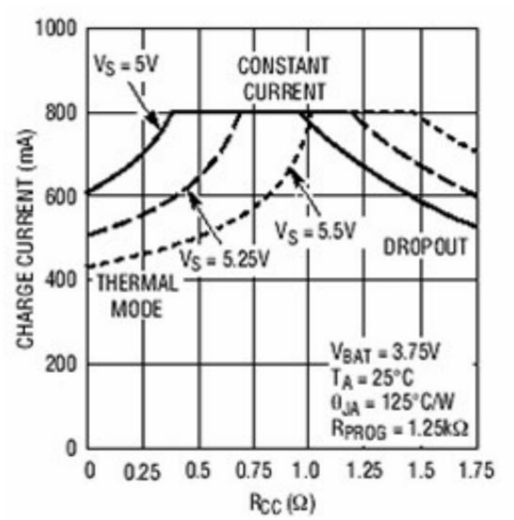


图3：充电电流与Rcc的关系曲线

VCC bypass capacitor

Several types of capacitors can be used for input bypass. However, caution must be used when using multilayer ceramic capacitors. Since some types of ceramic capacitors have self-resonance and high Q values, in certain under some starting conditions (such as connecting the charger input to a working battery source connected) may produce high voltage transients. add one A 1.5ÿ resistor in series with the X5R ceramic capacitor will maximize ground to reduce the startup voltage transient signal.

Charging current soft start

Includes one to minimize the Soft-start circuit for inrush current. When a charge cycle is initiated, The charging current will rise from 0 to full scale in about 20ÿs. scale value. During startup, this minimizes Effect of transient current loads on the power supply.

Reverse polarity input voltage protection

In some applications, a reverse polarity voltage on VCC is required. pressure protection. If the supply voltage is high enough, a series isolation away from the diode. In other situations where the voltage drop must be kept low, a P-channel MOSFET can be used (shown in Figure 4).

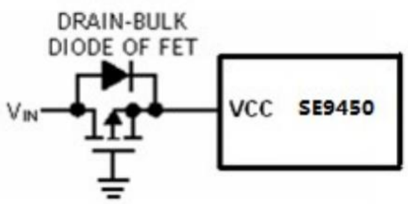


Figure 4: Low-loss input reverse polarity protection

USB and AC adapter power

The SE9450 allows connection from an AC adapter or a USB port port for charging. Figure 5 shows how to connect the AC adapter to the USB An example of combining power inputs. a P channel MOSFET (MP1) is used to prevent signals when the AC adapter is plugged in into the USB port, while a Schottky diode (D1) is used to prevent USB power from flowing through the 1K pull-down resistor produce losses.

Generally speaking, AC adapters are able to provide more current than USB ports have a much larger current limit of 500mA. therefore, When the AC adapter is plugged in, an N-channel MOSFET (MN1) and an additional 10K setting resistor to increase the charging current to 600mA.

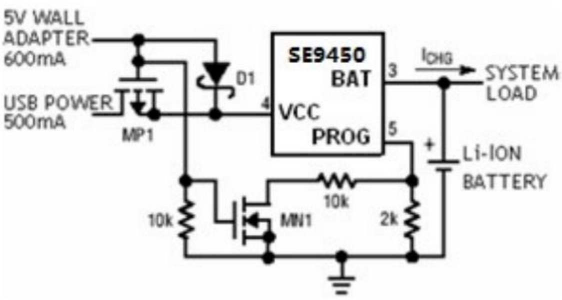
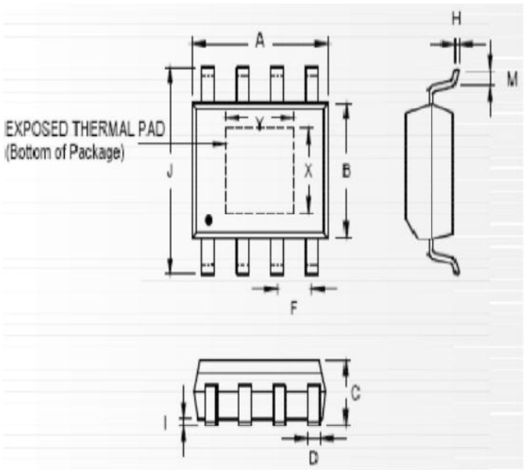


Figure 5: AC adapter and USB power supply combination

Maximum Power Tracking (MPPT)

When the input power decreases, such as when the solar panels are obscured by clouds Partially, the solar panel output power decreases. Charge with the same current will pull down the input voltage. When the voltage decreases, the SE9450 will automatically Reduce the charging current and keep the input voltage stable. When the input device function rate rebounds, for example, the clouds drift away and the output power of solar panels increases. As the input voltage increases, SE9450 will automatically increase the charging current to ensure Charge the battery at maximum power.

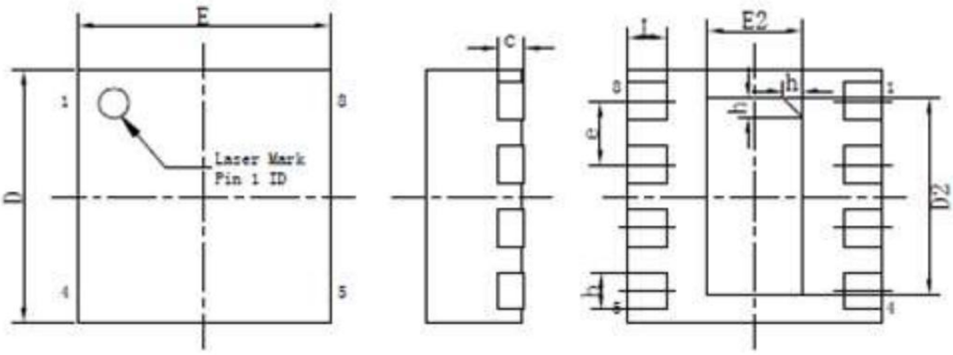
Package size: PSOP8



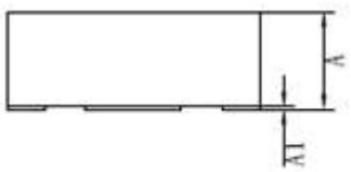
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.801	5.004	0.189	0.197
B	3.810	3.988	0.150	0.157
C	1.346	1.753	0.053	0.069
D	0.330	0.508	0.013	0.020
F	1.194	1.346	0.047	0.053
H	0.191	0.254	0.008	0.010
I	0.000	0.152	0.000	0.006
J	5.791	6.190	0.220	0.244
M	0.406	1.270	0.016	0.050
X	2.057	2.515	0.081	0.099
Y	2.057	3.404	0.081	0.134

Package size: DFN2*2-8

尺寸 / 标注	最小(mm)	标准(mm)	最大(mm)	尺寸 / 标注	最小(mm)	标准(mm)	最大(mm)
A	0.70	0.75	0.80	e		0.50BSC	
A1	0.00	0.02	0.05	E	1.95	2.00	2.05
b	0.18	0.29	0.30	E2	0.70	0.75	0.80
c		0.20REF		L	0.25	0.30	0.35
D	1.95	2.00	2.05	h	0.10	0.15	0.20
D2	1.50	1.55	1.60			L/F载体尺寸（mm）:1.00*1.80	



bottom view



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