ACE4054R

24V Input Voltage Battery Linear Charger

Description

ACE4054R is a complete constant-current/constant voltage linear charger for single cell lithium-ion batteries. Furthermore, the ACE4054R is specifically designed to work within USB power specifications. No external sense resistor is needed and no blocking diode is required due to the internal PMOSFET architecture. Thermal feedback regulates the charge current to limit the die temperature during high power operation or high ambient temperature. The charge voltage is fixed at 4.2V, and the charge current can be programmed externally with a single resistor. The ACE4054R automatically terminates the charge cycle when the charge current drops to 1/10th the programmed value after the final float voltage is reached.

When the input supply (wall adapter or USB supply) is removed the ACE4054R automatically enters a low current state dropping the battery drain current to less than 2μA.The ACE4054R can be put into shutdown mode reducing the supply current to 100μA.

Other features include charge current monitor, undervoltage lockout, automatic recharge, and a status.

Features

- Maximum operating voltage 24V, improve system reliability
- Programmable charging current up to 600mA (SOT23-5、SOT23-6) 、800mA（DFN2*2-8L）、1A(ESOP8)
- Protection of battery cell reverse connection
- No MOSFET sense resistor or blocking diode required
- Complete Linear Charger in Thin SOT Package for Single Cell Lithium-Ion Batteries
- Constant-Current/Constant-Voltage operation with thermal regulation to maximize Rate Without risk of overheating.
- Preset 4.2V charge voltage with ±1% accuracy
- Automatic Recharge
- Charges Single Cell Li-Ion Batteries Directly from USB Port
- C/10 charge termination
- 100μA supply current in shutdown
- Over voltage protection：6.5V
- 2.9V trickle current charge threshold
- Soft-Start limits inrush current

Application

- Cellular Telephones, PDAs
- Charging Docks and Cradles
- Bluetooth Applications

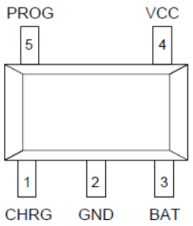
Absolute Maximum Ratings

Parameter		Rating	Unit
Input supply voltage: V_{CC}		-0.3～24	V
PROG、TEMP pin voltage		-0.3～6	V
BAT pin voltage		-0.3～16	V
CHRG、STDBY、CE pin voltage		-0.3～24	V
BAT pin current		1200	mA
PROG pin current		1200	μA
Junction temperature		-40～150	℃
Operating ambient temperature: T_{opa}		-40～85	℃
Storage temperature: T_{str}		-55～150	℃
Soldering temperature and time		260（Recommended 10S）	℃
Package thermal impedance: θ_{JA}	SOT23-5	210	℃/W
	SOT23-6	200	
	DFN2*2-6L	98	
	ESOP-8	63	
Maximum Power Dissipation: P_d	SOT23-5	0.6	W
	SOT23-6	0.63	
	DFN2*2-6L	1.28	
	ESOP-8	1.98	

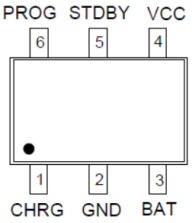
Caution: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

Packaging Type

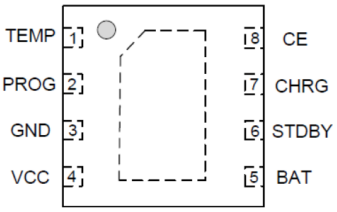
SOT-23-5



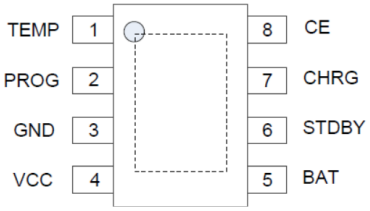
SOT-23-6



DFN2*2-8L



ESOP-8

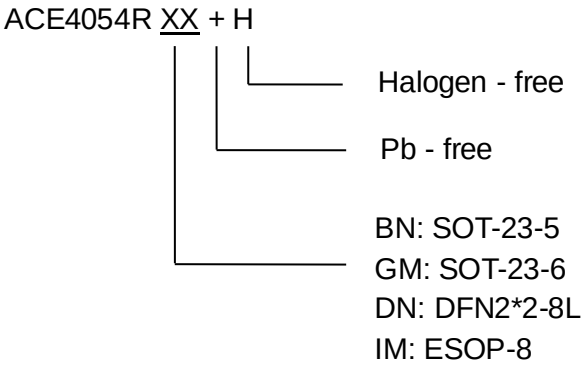


Pin Description

PIN No.				Pin Name	Function
SOT-23-5	SOT-23-6	DFN2*2-8L	ESOP-8		
1	1	7	7	CHRG	Open-Drain charge status output When the battery is being charged, the CHRG pin is pulled low by an internal switch, otherwise, CHRG pin is in high impedance state.
		1	1	TEMP	Temperature sense input Connecting TEMP pin to NTC thermistor's output in Lithium ion battery pack. If TEMP pin's voltage is below 45% or above 80% of supply voltage VCC, this means that battery's temperature is too low or too high, charging is suspended. The temperature sense function can be disabled by grounding the TEMP pin.
2	2	3	3	GND	Ground
3	3	5	5	BAT	Battery connection Pin Connect the positive terminal of the battery to this pin. BAT pin provides charge current to the battery and provides regulation voltage of 4.2V.

4	4	4	4	VCC	Positive input supply voltage Provides power to the internal circuit. When VCC drops to within 70mV of the BAT pin voltage, the ACE4054R enters low power sleep mode, dropping IBAT to less than 1μA.
5	6	2	2	PROG	Constant Charge Current Setting and Charge Current Monitor Pin The charge current is programmed by connecting a resistor RPROG from this pin to GND.
	5	6	6	STDBY	Charge terminated status output STDBY is pulled low by an internal switch to indicate a battery charge terminated; this means Charge termination. Otherwise STDBY pin is in high impedance state.
		8	8	CE	Chip enable input A high input will put the device in the normal operating mode. Pulling the CE pin to low levelwill put the ACE4054R into disable mode. The CE pin can be driven by TTL or CMOS logic level.

Ordering information



Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Technology Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.