BP8155 Standalone Linear Li-Ion Battery Charger with Thermal Regulation in SOT（ Reverse battery protection）

DESCRIPTION

The BP8155 is a complete constant-current/constant-voltage linear charger for single cell lithium-ion batteries, Reverse battery protection. Its SOT package and low external component count make the BP8155 ideally suited for portable applications. Furthermore, the BP8155 can work within USB and wall adapter.

No external sense resistor is needed, and no blocking diode is required due to the internal PMOSFET architecture and have prevent to negative Charge Current Circuit. 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 BP8155 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 BP8155 automatically enters a low current state, dropping the battery drain current to less than 2uA. The BP8155 can be put into shut down mode, reducing the supply current to 40uA. Other features include current monitor, under voltage lockout, automatic recharge and one status pin to indicate charge termination and the presence of an input voltage.

FEATURES

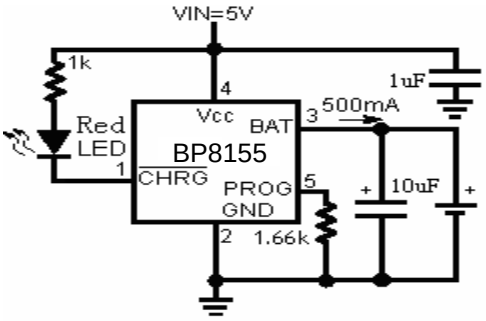
- lithium-ion batteries Reverse battery protection
- Programmable Charge Current Up to 500mA
- No MOSFET, Sense Resistor or Blocking Diode Required
- Complete Linear Charger in SOT23-6 Package for Single Cell Lithium-Ion Batteries
- Constant-Current/Constant-Voltage Operation with Thermal Regulation to Maximize Charge Rate Without Risk of Overheating
- Charges Single Cell Li-Ion Batteries Directly from USB Port
- Preset 4.2V Charge Voltage with 1% Accuracy
- Charge Current Monitor Output for Gas Gauging
- Automatic Recharge
- Charge Status Output Pin
- C/10 Charge Termination
- 40uA Supply Current in Shutdown
- 2.9V Trickle Charge Threshold (BP8155)
- Soft-Start Limits Inrush Current
- Available in 6-Lead SOT-23 Package

APPLICATIONS

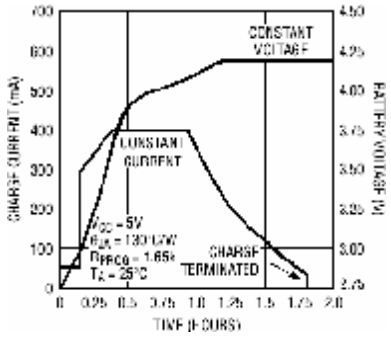
- Cellular Telephones, PDAs, MP3 Players
- Charging Docks and Cradles
- Blue tooth Applications

TYPICAL APPLICATION

500mA Single Cell Li-Ion Charger



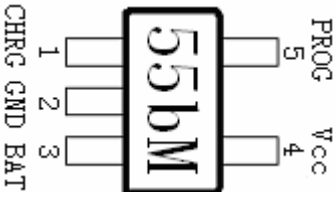
Complete Charge Cycle (600mAh Battery)



ABSOLUTE MAXIMUM RATINGS

- Input Supply Voltage(V_{CC})：-0.3V～9V
- PROG：-0.3V～V_{CC}+0.3V
- BAT：-4.2V～7V
- $\overline{CHRG}$：-0.3V～9V
- BAT Short-Circuit Duration：Continuous
- BAT Pin Current：500mA
- PROG Pin Current：800uA
- Maximum Junction Temperature：145℃
- Operating Ambient Temperature Range：-40℃～85℃
- Storage Temperature Range：-65℃～125℃
- Lead Temperature(Soldering, 10sec)：260℃

PACKAGE DESCRIPTION



PACKAGE
5-LEAD PLASTIC
SOT-23-5

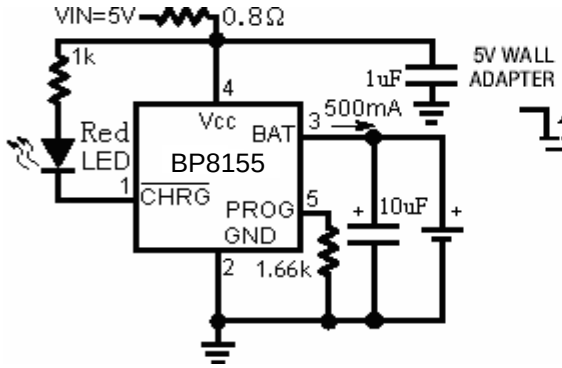
ORDER PART NUMBER
BP8155-42-SOT 25-R
PART MARKING
55bm

ELECTRICAL CHARACTERISTICS

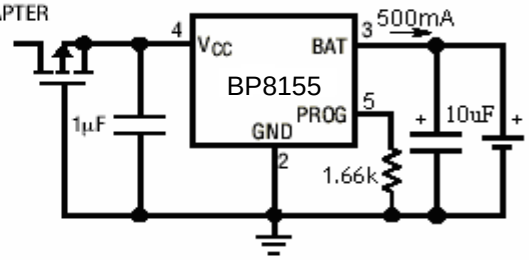
The ● denotes specifications which apply over the full operating temperature range, otherwise specifications are at T_A=25℃, V_{CC}=5V, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
V_{CC}	Input Supply Voltage		●	4.0	5	9.0	V
I_{CC}	Input Supply Current	Charge Mode, R_{PROG} = 10k StandbyMode(Charge Terminated) Shutdown Mode (R_{PROG} Not Connected, V_{CC} < V_{BAT}, or V_{CC} < V_{UV})	● ● ●		150 40 40 40	500 100 100 100	μA μA μA
V_{FLOAL}	Regulated Output (Float) Voltage	0℃≤T_A≤85℃, I_{BAT}=40mA		4.158	4.2	4.242	V
I_{BAT}	BAT Pin Current	R_{PROG} = 10k, Current Mode R_{PROG} = 1.66k, Current Mode Standby Mode, V_{BAT} = 4.2V Shutdown Mode (R_{PROG} Not Connected) Sleep Mode, V_{CC} = 0V	● ● ●	90 480 0	100 500 −2.5 ±1 −1	110 520 −6 ±2 −2	mA mA μA μA μA
I_{TRIKL}	Trickle Charge Current	V_{BAT}<V_{TRIKL}, R_{PROG}=10K	●	10	15	20	mA
V_{UV}	V_{CC} Undervoltage Lockout Threshold	From V_{CC} Low to High	●	3.4	3.6	3.8	V
I_{TERM}	C/10 Termination Current Threshold	R_{PROG}=10K R_{PROG}=1.66K	● ●	8 30	10 40	12 50	mA mA
V_{PROG}	PROG Pin Voltage	R_{PROG}=10K, Current Mode	●	0.9	1.0	1.1	V
$V_{\overline{CHRG}}$	$\overline{CHRG}$ Pin Output Low Voltage	$I_{\overline{CHRG}}$ =5mA			0.3	0.6	V
t_{ss}	Soft-Start Time	I_{BAT} = 0 to I_{BAT} =1000V/R_{PROG}			20		ms

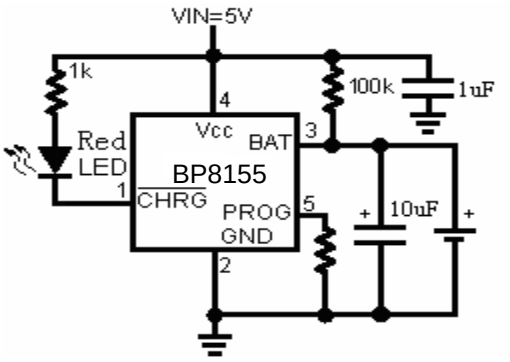
TYPICAL APPLICATIONS



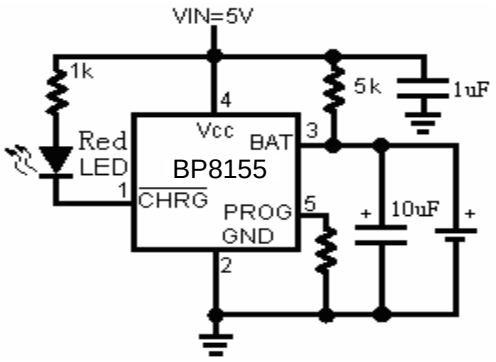
500mA Single Cell Li-Ion Charger



Low Loss Input Reverse Polarity Protection



No battery RED LED not flashing



Light body without battery