

## High Input Voltage Linear Charger

### GENERAL DESCRIPTION

The BC91801 is a complete constant-current/constant-voltage linear charger for single cell lithium battery. Its compact package with minimum external components requirement makes the BC91801 ideal for portable application. No external sense resistor or blocking diode is necessary for it. Build-in thermal feedback mechanism regulates the charge current to control the die temperature during high power operation or at elevated ambient temperature. The BC91801 has a pre-charge function for trickle charging deeply discharged batteries. The fast charge current can be programmed by an external resistor. CV regulation mode is automatically enable once the batter's charge curve reaches the constant voltage portion. The output current then decays and is finally terminated once the charge current drops to 1/10<sup>th</sup> of the programmed value. The BC91801 keeps monitoring the battery voltage and enable a new charge cycle once the voltage drops by 250mV Below the CV value.

### FEATURE

- Input voltage range 4.5V~6.5V, Maximum Voltage

- for the Power Input 25V
- Charging battery voltage 4.2V/4.35V/4.4V ( 4.35V, 4.4V Charging voltage can be customized )
- Accuracy of charging voltage ±1%
- Trickle/constant current/constant voltage charging
- Maximum constant current charging current 1A; External resistance adjustable
- Constant current charging accuracy ±10%
- VIN OVP 6.5V;
- When the chip is overheated, the temperature loop automatically reduces the charging current
- Battery anti-irrigation protection : Static power consumption 0uA
- Support single color light/dual color light display mode
- Package : DFN2\*2
- ESD 4KV

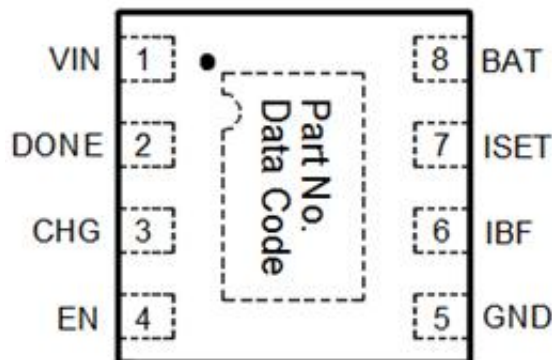
### APPLICATION

- IOT Gadgets; Wearable Devices; Credential Keys
- Wireless Remote; Electric toothbrush; Electric shaver; Electronic cigarette
- Other applications

### ORDING INFORMATION

Part Number	Package Type	Package Quality	Op Temp(°C)
BC91801	DFN2*2	3000	-40~85

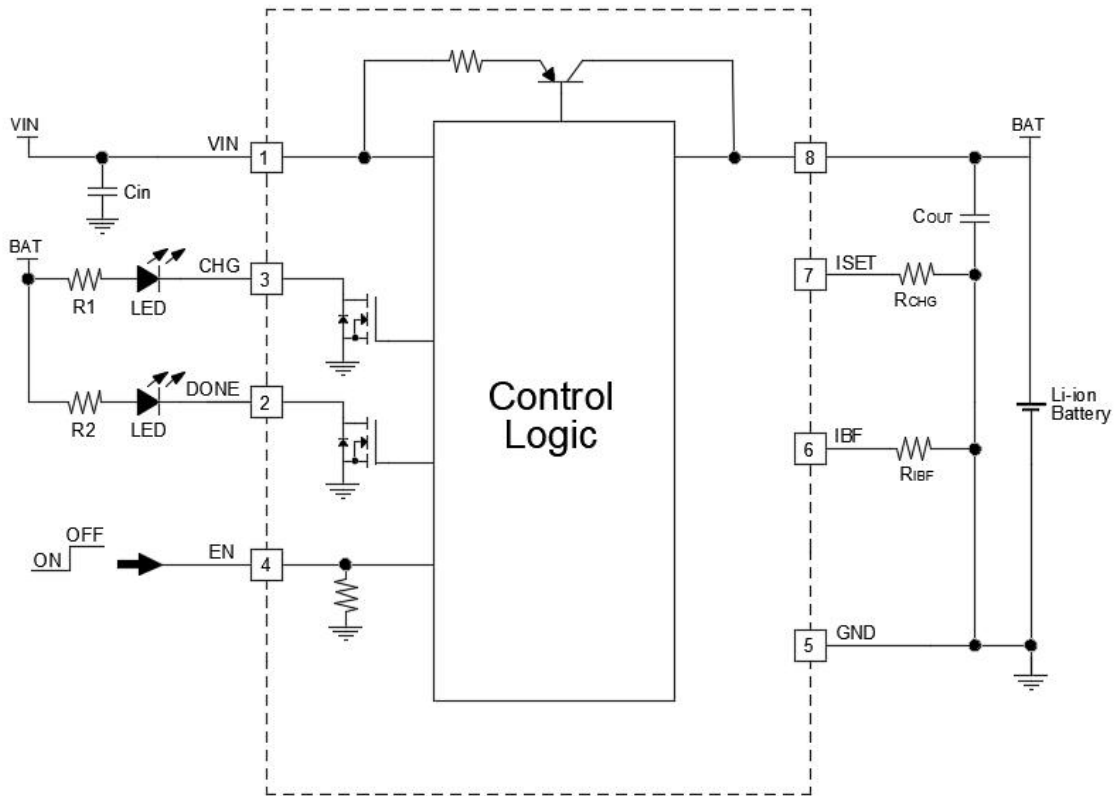
### MARK INFORMATION



\* DFN2\*2 兼容 SGM40561, SY8602

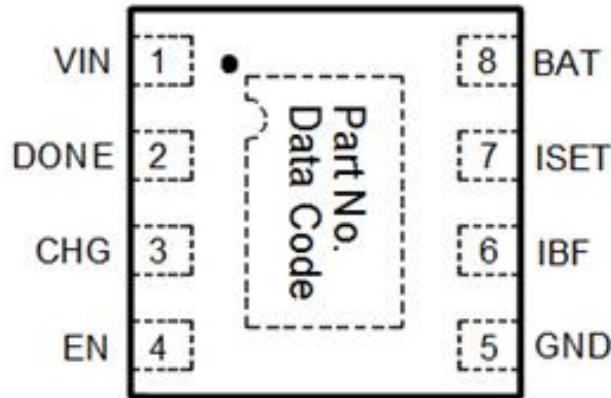
**High Input Voltage Linear Charger**

**CONFIGURATION**



**PIN FUNCTIONS**

Pin Name	PIN Number	Description
CHG	3	Open drain charge status output
GND	5	Ground
BAT	8	Charge current output.
VIN	1	Power supply input, Vin can range from 4.5V to 6.5V
DONE	2	Open drain charge status output for full
ISET	7	Charge current program/monitor and shutdown pin $IBAT=1V*1000/RISET$
EN	4	Charge Enable Input (active low).
IBF	6	Charge Status Threshold Program. Connect this pin to an external resistor to program the battery full current.

**High Input Voltage Linear Charger**
**PACKAGE**


DFN2\*2

**THERMAL CHARACTERISTICS**

over operating free-air temperature range (unless otherwise noted)

THERMAL METRIC			UNIT	
DFN2*2	$\theta_{JA}$	Package thermal impedance <sup>(1)</sup>	80	°C/W

The package thermal impedance is calculated in accordance with JESD 51-7.

**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

Over recommended operating free-air temperature range (unless otherwise noted)

Parameter	Symbol	Min	Type	Max	Unit
Input voltage range	$V_{IN}$	-0.3		25	V
Battery voltage range	BAT	-0.3		12	V
Junction temperature range			125		°C
Storage temperature range		-40		150	°C
HBM(Human Body Model)	ESD		4K		V

**RECOMMENDED OPERATING CONDITIONS**

parameter	Symbol	Min	Type	Max	Unit
Input voltage range	$V_{IN}$	4.5	5	25	V

\* Beyond these working conditions, the operating characteristics of the device can't be guaranteed °

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### ELECTRICAL CHARACTERISTICS

Chip working condition is 25°C except special specification

parameter	Symbol	Test conditions	Min	Type	Max	Unit
Input voltage range	$V_{IN}$		4.5	5	6.5	V
Input under voltage	$V_{IN\_UVLO}$			3.64		V
	slow-moving			0.36		V
Input overvoltage	$V_{IN\_OVP}$	$V_{IN\_OVP}=21.5V$ Customizable		6.5		V
	slow-moving			0.5		V
$V_{IN}-V_{BAT}$	VSD	$V_{IN}-V_{BAT}$ up and charge	160	200	240	mV
		$V_{IN}-V_{BAT}$ down, Turn off charge	60	90	120	mV
Input static current	$I_Q$	$V_{IN}=5V, V_{BAT}=10\mu F$		0.34		mA
BAT pin sink Current	$I_{standby}$	Charger disabled or the input is floating			50	nA
Trickle charge current	$I_{trick}$			$0.1 \cdot I_{CC}$		A
Trickle charging to constant current charging threshold				2.65		V
Constant current charging to trickle charging threshold				2.44		V
$I_{BF}$	Battery full programming range		10		50	% $I_{BAT}$
Constant current charging current	$I_{CC}$	RISET=1000		1		A
Accuracy of constant current charging current				$\pm 5$		%
Full voltage	BAT	4.35V/4.4V Customizable		4.2		V
Accuracy of full voltage				$\pm 1$		%
Battery overvoltage				$102\% \cdot V_{BAT}$		V
Charging cut-off current	$I_{term}$			$0.1 \cdot I_{CC}$		A
Charging cut-off time	$T_{term}$			2		s
Recharge threshold	$V_{BAT\_rechg}$	Full voltage=4.2V		3.95		V
Temperature loop threshold				140		°C

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**LED DISPLAY MODE**

	Charge	Full voltage	VIN_OVP
Default	CHG Lights on/DONE Lights out	CHG , Lights out/ DONE, Lights on	CHG, DONE, Lights out
Customizable	CHG 1HZ, twinkle	CHG, Lights on	CHG , Lights out

**CHARGER CURRENT SET**

Formula for setting charging current :  $I=1000/R_{ISET}$

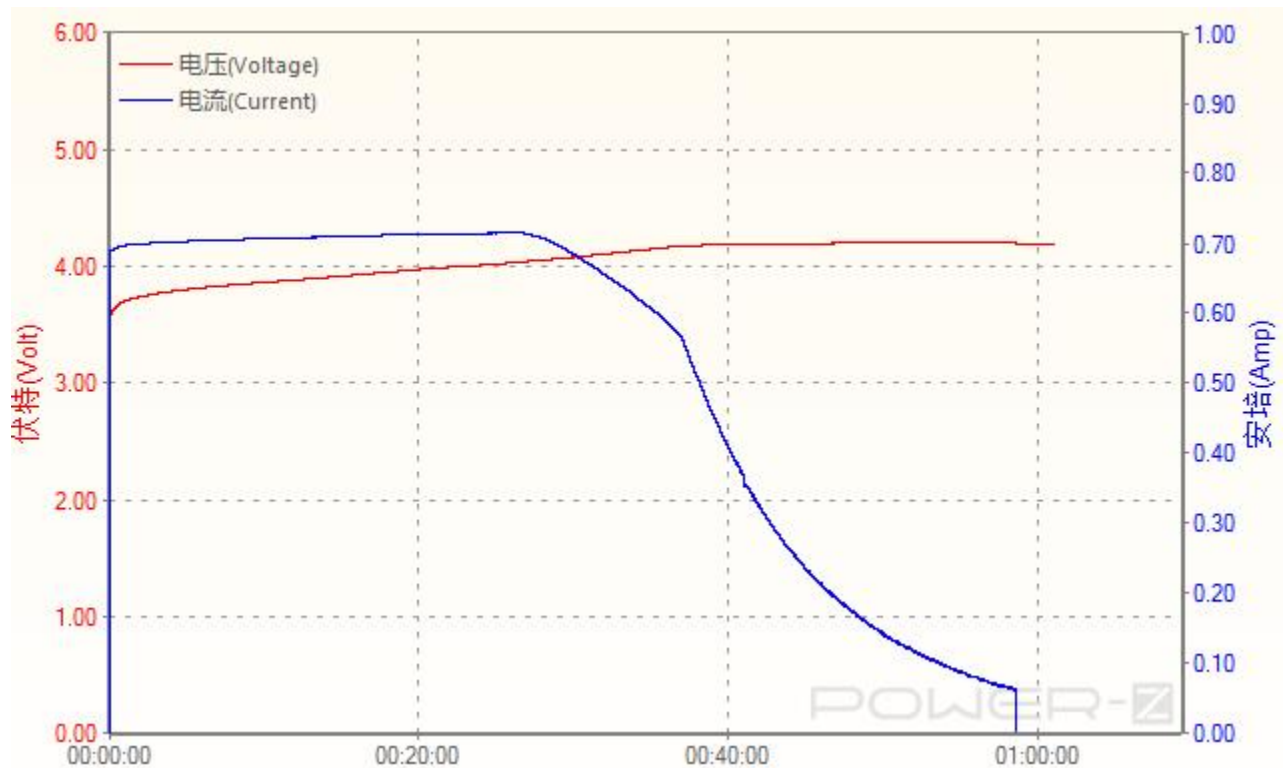
Such as:  $R_{ISET}=2k$ ; Charging current  $I=1000/2k=500mA$

**CHARGE TERMINATION CURRENT**

$I_{term} \cdot R_{BF}/100=0.1$   $R_{BF}=10K$  · 则  $I_{term}=1Ma$

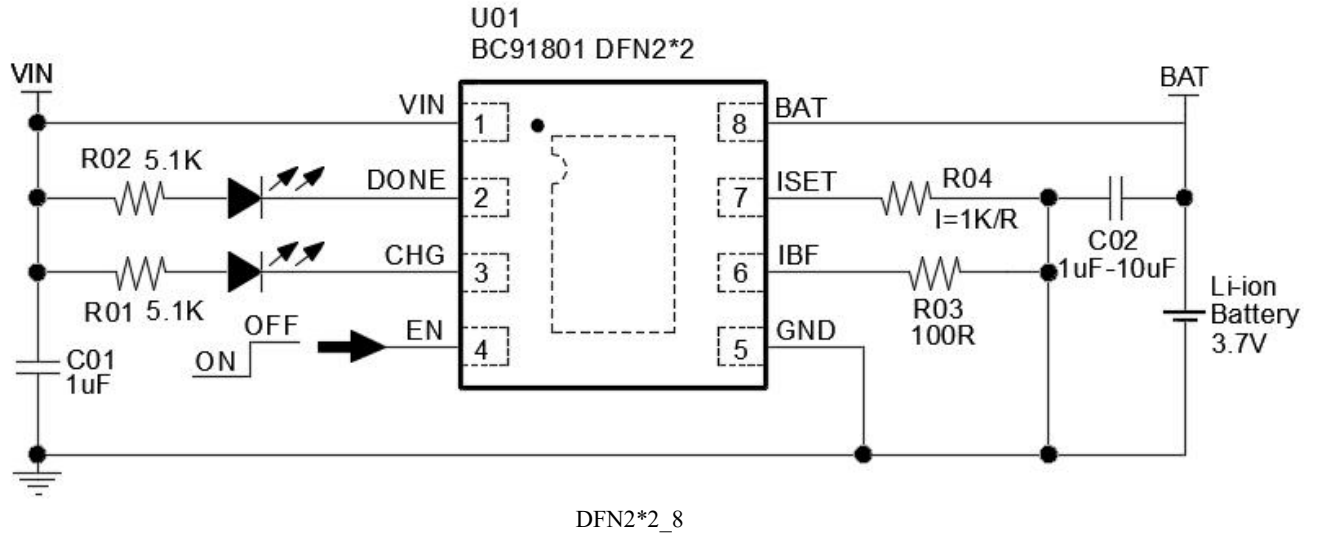
$I=7/R$  Such as:  $R=100R$   $I=7/100=0.07A=70mA$

**CHARGING CURVE**



**High Input Voltage Linear Charger**

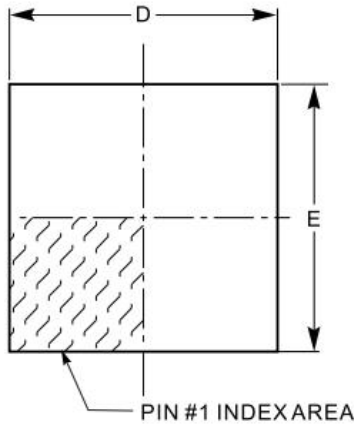
**Typical Application Circuit**



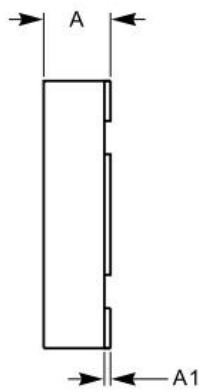
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**Package information**

DFN-2x2\_8

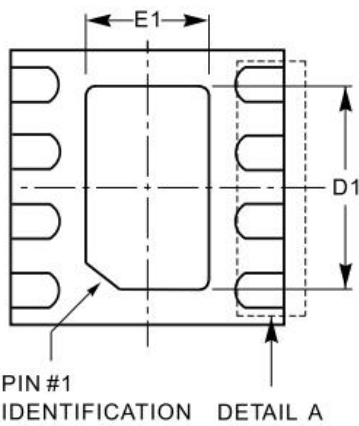


**TOP VIEW**

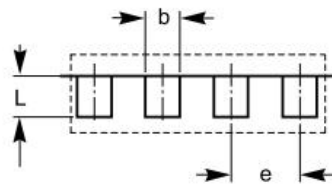


**SIDE VIEW**

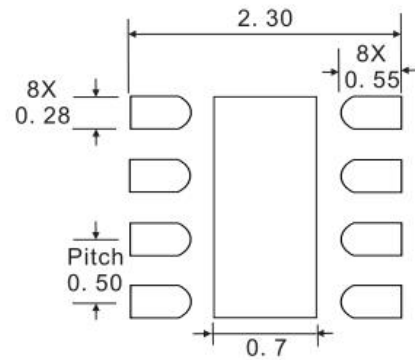
SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
D	2.00BSC		
D1	1.10	1.20	1.30
E	2.00BSC		
E1	0.50	0.60	0.70
e	0.50 BSC		
L	0.30	0.35	0.40



**BOTTOM VIEW**



**DETAIL A**



**UNIT:mm**

**Recommended Land Pattern**

**Notes:**

- (1) 所有尺寸都为毫米
- (2) 参考JEDEC MO-229标准