

Simple Lithium-Ion Battery Charger

General Description

The RT9161B is a single-cell lithium-ion battery charger. It includes an on-chip pass transistor for high precision charging. Featuring with ultrahigh precision ($\pm 1\%$), the RT9161B provides a very effective and low cost solution for charging lithium-ion battery.

Other features of the RT9161B are current limit and thermal shutdown protection. The output voltage of RT9161B is internally set and ranges from 4.10V to 4.35V, in 0.05V steps. The RT9161B comes in the SOT-89 and SOT-223 packages.

Ordering Information

RT9161B-□□□□	
□□	Package type X : SOT-89 G : SOT-223
□	Operating temperature range C: Commercial standard
□	Output voltage 41 : 4.10V 4A : 4.15V 42 : 4.20V 4B : 4.25V 43 : 4.30V 4C : 4.35V

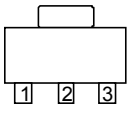
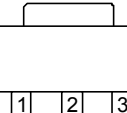
Features

- **High Accuracy Charge Voltage:** $\pm 1\%$
- **6 Available Output Voltages**
- **Low 450mV Dropout at 300mA**
- **Wide Input Voltage Range**
- **Thermal Shutdown and Current Limit Protection**
- **SOT-89 and SOT-223**
- **Low Ground Current 110 μ A**

Applications

- Li-Ion Battery Charger
- Cellular Phones
- Palmtop Computers
- PDAs
- Self Charging Battery Packs

Pin Configurations

Part Number	Pin Configurations
RT9161B-□□CX (Plastic SOT-89)	 <p>TOP VIEW</p> <ol style="list-style-type: none"> 1. GND 2. VIN (TAB) 3. VOUT
RT9161B-□□CG (Plastic SOT-223)	 <p>TOP VIEW</p> <ol style="list-style-type: none"> 1. GND 2. VIN (TAB) 3. VOUT

Absolute Maximum Ratings

- Input Voltage -0.3 ~ 14V
- Power Dissipation, P_D @ $T_A = 25^\circ\text{C}$
 SOT-89 0.5W
- Package Thermal Resistance
 SOT-89, θ_{JC} 100°C/W
 SOT-89, θ_{JA} 300°C/W
 SOT-223, θ_{JC} 15°C/W
 SOT-223, θ_{JA} 60°C/W
- Operating Junction Temperature Range $-40^\circ\text{C} \sim 125^\circ\text{C}$
- Storage Temperature Range $-65^\circ\text{C} \sim 150^\circ\text{C}$

Electrical Characteristics

($T_A = 25^\circ\text{C}$, $C_{IN} = 1\mu\text{F}$, $C_{OUT} = 10\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Input Voltage Range ⁽¹⁾	V_{IN}		4.5	--	14	V
Output Voltage Accuracy	ΔV_{OUT}	$I_L = 1\text{mA}$, $V_{IN} = 5\text{V}$	-1	--	+1	%
Output Voltage Temperature Coefficient ⁽¹⁾			--	50	150	PPM/ $^\circ\text{C}$
Line Regulation	ΔV_{LINE}	$I_L = 1\text{mA}$, $V_{IN} = 4.5 \sim 12\text{V}$	--	2	3	% V_{OUT}
Load Regulation ⁽²⁾	ΔV_{LOAD}	$I_L = 1\text{mA} \sim 300/500\text{mA}$, $V_{IN} = 5\text{V}$	--	1	30/50	mV
Current Limit ⁽³⁾	I_{LIMIT}	$V_{IN} = 5\text{V}$, $V_{OUT} = 0\text{V}$	300	--	600	mA
Dropout Voltage ⁽⁴⁾	V_{DROP}	$I_L = 300/500\text{mA}$	--	450/750	--	mV
Standby Current	$I_{STANDBY}$	$I_L = 0$, $V_{IN} = 12\text{V}$	--	110	180	μA

Note:

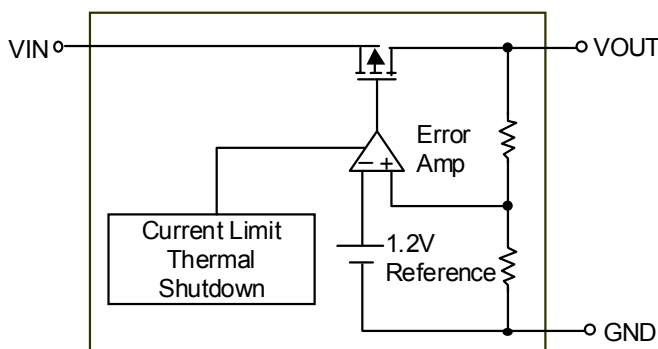
(1) Guaranteed by design.

(2) Regulation is measured at constant junction temperature, using pulsed ON time.

(3) Current Limit is measured at constant junction temperature, using pulsed ON time.

(4) Dropout is measured at constant junction temperature, using pulsed ON time.

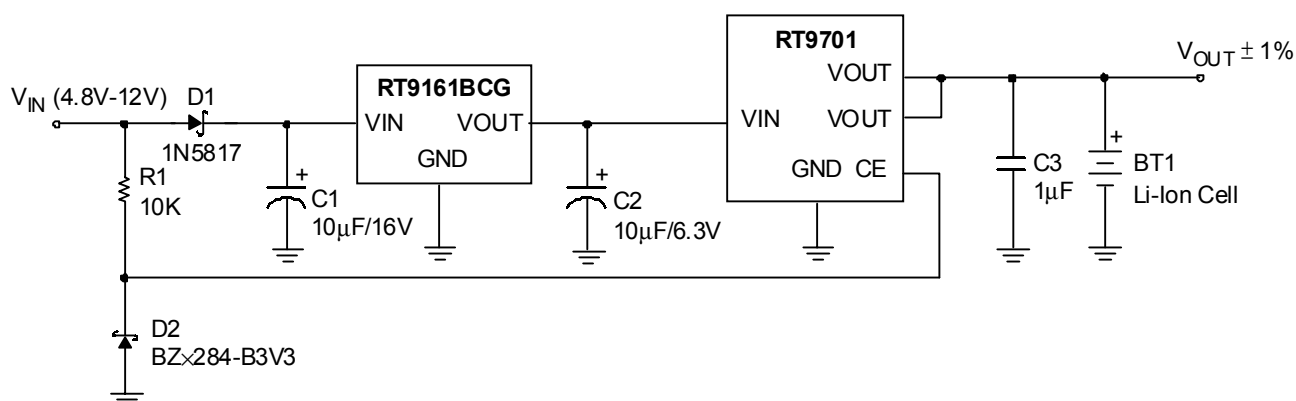
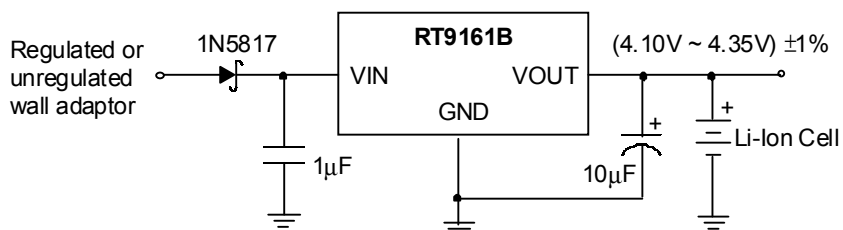
Function Block Diagram



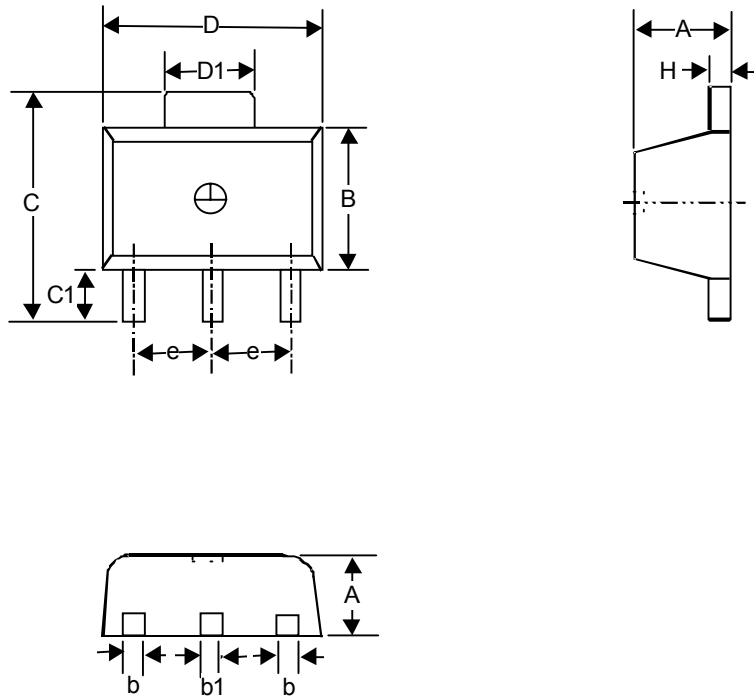
Pin Description

Pin Name	Pin Function
VOUT	Output Voltage
GND	Ground
VIN	Power Input

Typical Application Circuit

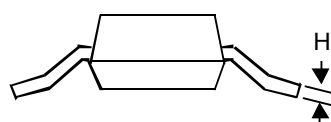
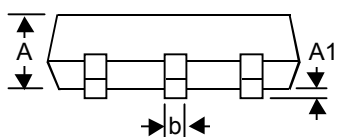
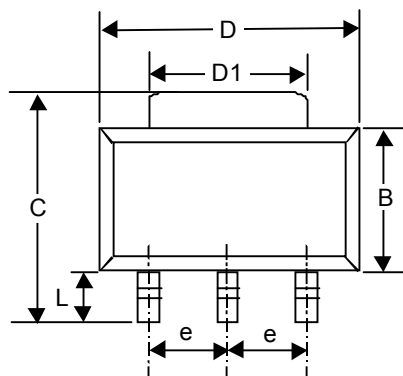


Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.397	1.600	0.055	0.063
b	0.356	0.483	0.014	0.019
B	2.388	2.591	0.094	0.102
b1	0.406	0.533	0.016	0.021
C	--	4.242	--	0.167
C1	0.787	1.194	0.031	0.047
D	4.394	4.597	0.173	0.181
D1	1.397	1.753	0.055	0.069
e	1.448	1.549	0.057	0.061
H	0.355	0.432	0.014	0.017

3-Lead SOT-89 Surface Mount



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	--	1.803	--	0.071
A1	0.020	0.100	0.0008	0.0047
b	0.610	0.787	0.024	0.031
B	3.302	3.708	0.130	0.146
C	6.706	7.290	0.264	0.287
D	6.299	6.706	0.248	0.264
D1	2.896	3.150	0.114	0.124
e	2.261	2.362	0.089	0.093
H	0.229	0.330	0.009	0.013
L	0.914	--	0.036	--

3-Lead SOT-223 Plastic Surface Mount

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