ACE71218RT

18V, 1.2MHz Boost Regulator

Description

The ACE71218RT is a highly integrated boost converter designed for applications requiring high voltage and high efficiency solution. The ACE71218RT integrates a 20V power switch, it can output up to 18V from input of a Li+ battery or two cell alkaline batteries in series. The ACE71218RT operates with a switching frequency at 1.2MHz. This allows the use of small external components. ACE71218RT has typical 3A switch current limit. It has 1.5mS built-in soft start time to minimize the inrush current. The ACE71218RT also implements output short circuit protection, output over-voltage protection and thermal shutdown. The ACE71218RT is available in a small SOT-23-6 package.

Features

- 2.3V to 5.5V Input Voltage
- Output Adjustable from 0.6V
- Up to 18V Output Voltage
- 1.2MHz Fixed Switching Frequency
- Internal 3A Switch Current Limit
- Integrated 60mΩ Power MOSFET
- -40°C to 85°C Temperature Range
- Internal 1.5mS Soft Start Time
- Up to 85% Efficiency@3.6V Input 12V Output
- Power Save Operation Mode at Light Load
- Output Short Circuit Protection
- Output Over-Voltage Protection
- Thermal Shutdown Protection
- Available in SOT-23-6 Package

Application

- Battery-Powered Equipment
- Sensor Power Supply
- Wearable Devices
- Portable Medical Equipment

Absolute Maximum Ratings Note(1)(2)

Item	Min	Max	Unit
VIN EN Voltage	-0.3	6	V
SW Voltage	-0.3	19	V
SW Voltage (10ns transient)	-5	20	V
All Other Pins	-0.3	6	V
Power Dissipation Note(3)	Internally Limited		
Operating Junction Temperature, T_J	-40	150	°C
Storage Temperature, T_{stg}	-65	150	°C
Lead Temperature (Soldering, 10sec.)		260	°C

Note:

(1). Exceeding these ratings may damage the device.

(2). The device is not guaranteed to function outside of its operating conditions.

(3). The maximum allowable power dissipation is a function of the maximum junction temperature, $T_{J(MAX)}$, the junction-to-ambient thermal resistance, $R_{\theta JA}$, and the ambient temperature, T_A. The maximum allowable power dissipation at any ambient temperature is calculated using: $P_{D(MAX)} = (T_{J(MAX)}-T_A) / R_{\theta JA}$. Exceeding the maximum allowable power dissipation causes excessive die temperature, and the regulator goes into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage. Thermal shutdown engages at T_J=160°C (typical) and disengages at T_J=130°C (typical).

Recommended Operating

Item	Min	Max	Unit
Operating Junction Temperature Note(1)	-40	125	°C
Operating Temperature Range	-40	85	°C
Input Voltage, V_{IN}	2.3	5.5	V
Output Voltage, V_{OUT}		18	V
Typical Output Current, I_{OUT}	0	1	A

Note:

(1). All limits specified at room temperature (T_A=25°C) unless otherwise specified. All room temperature limits are 100% production tested. All limits at temperature extremes are ensured through correlation using standard Statistical Quality Control (SQC) methods. All limits are used to calculate Average Outgoing Quality Level (AOQL).

ESD Ratings

Item	Description	Value	Unit
$V_{(ESD-HBM)}$	Human Body Model (HBM) ANSI/ ESDA/JEDEC JS-001-2014 Classification, Class: 2	±2000	V
$V_{(ESD-CDM)}$	Charged Device Mode (CDM) ANSI/ESDA/JEDEC JS-002-2014 Classification, Class: C0b	±200	V
$I_{LATCH-UP}$	JEDEC STANDARD NO.78E APRIL 2016 Temperature Classification, Class: I	±150	mA

Thermal Information

Item	Description	Value	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance Note(1)(2)	105	°C/W
$R_{\theta JC(TOP)}$	Junction-to-Case (TOP) Thermal Resistance	55	°C/W
$R_{\theta JB}$	Junction-to-Board Thermal Resistance	17.5	°C/W
Ψ_{JT}	Junction-to-Top Characterization Parameter	3.5	°C/W
Ψ_{JB}	Junction-to-Board Characterization Parameter	17.5	°C/W

Note:

(1). The package thermal impedance is calculated in accordance to JESD 51-7.

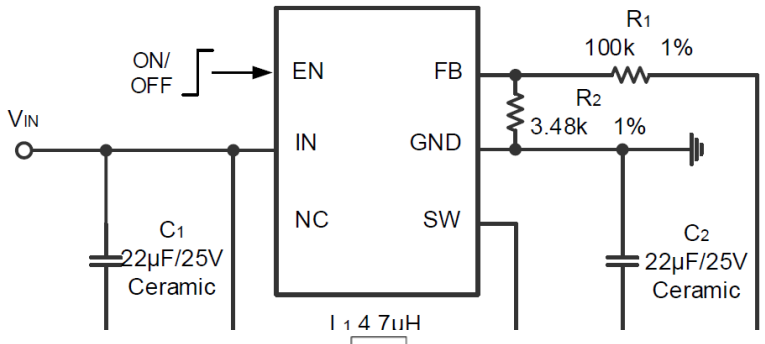
(2). Thermal Resistances were simulated on a 4-layer, JEDEC board.

Ordering Information

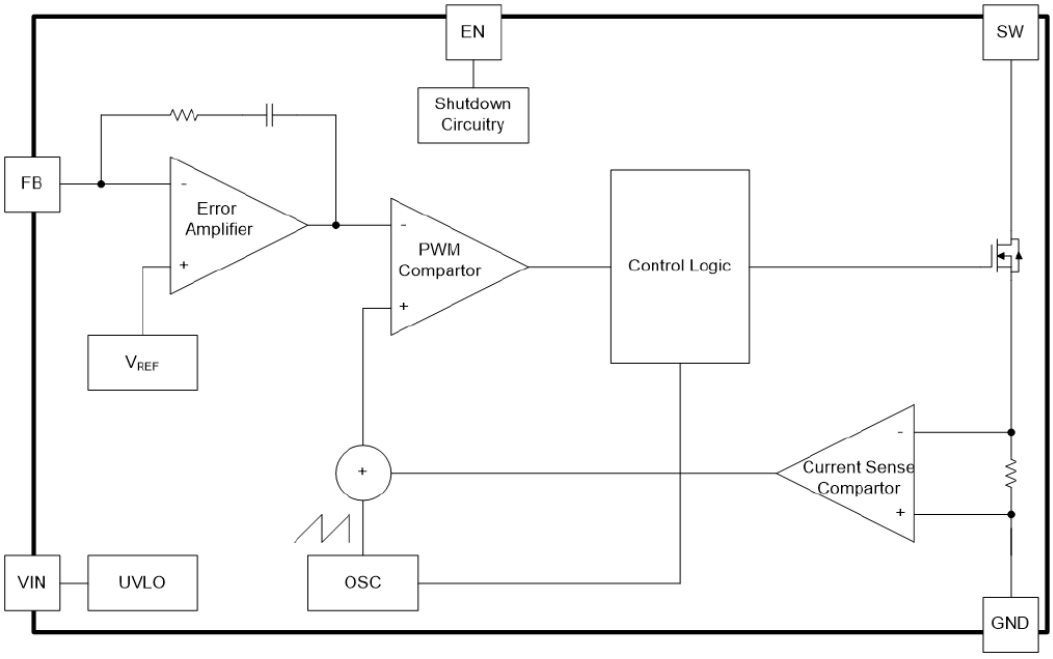
ACE71218RT XX + H

- Halogen - free
- Pb - free
- GM: SOT-23-6

Typical Application



Block Diagram



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.