AT1301

Preliminary Product Information

Micropower Step-Up DC/DC Converter

Features

- Guaranteed Start-Up from below 0.9V
- Low Input Current
- High Output Voltage Accuracy ±2.5%
- Small Number of External Components needed
- Fixed Output Voltage: 3.3V, 5V
- Space Saving SOT-89 package

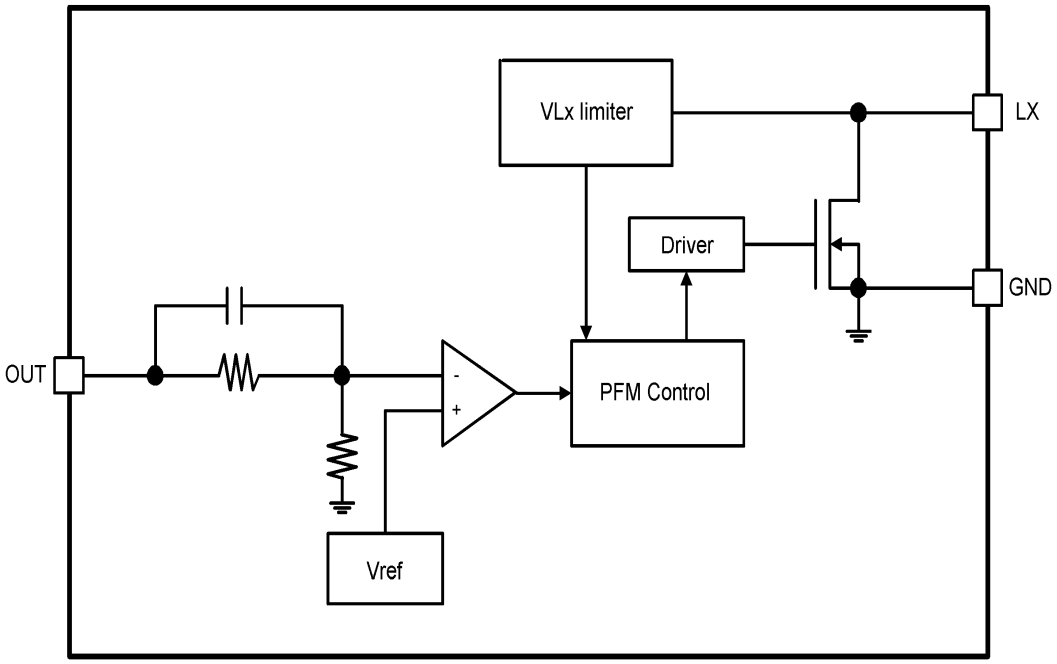
Applications

- Power source for battery-powered equipment
- Power source for cameras, camcorders, VCRs, PDAs, electronic data banks, and hand-held Communication equipment

General Description

The AT1301 is a high efficiency step-up DC/DC converter for applications using 1 to 2 cells battery. Only three external components are required to deliver a fixed output voltage of 3.3V, 5V. The small SOT-89 packages make the AT1301 an ideal choice of DC/DC Converter for space conscious applications.

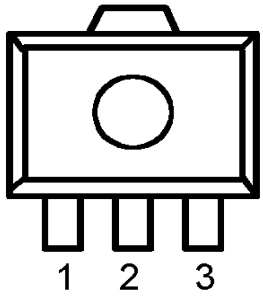
Block Diagram



Aimtron reserves the right without notice to change this circuitry and specifications.

Pin Configuration

AT1301A (SOT-89)



Pin Description

Pin No.	Symbol	I/O	Description
1	GND	P	Ground Pin
2	OUT	P/O	Step-Up Output and Power Supply Pin
3	LX	O	Switching Pin

Ordering Information

Part number.	Output voltage	Remarks
AT1301-33	3.3V	□□□**A**
AT1301-50	5.0V	□□□**B**

Absolute Maximum Ratings

(T_a=+25^{0}C)

Parameter	Symbol	Condition	Rated Value		Unit
			Min.	Max.	
Power supply voltage	V_{OUT}	—	—	6.0	V
LX pin voltage	V_{LX}	—	—	6.0	V
LX pin output current	I_{LX}	—	—	500	mA
Allowable dissipation	P_D	—	—	500	mW
Operating temperature	T_{OP}	—	-30	+85	^{0}C
Storage temperature	T_{stg}	—	-55	+125	^{0}C

WARNING: Semiconductor devices can be permanently damaged by application of stress (voltage, current, temperature, etc.) in excess of absolute maximum ratings. Do not exceed these ratings.

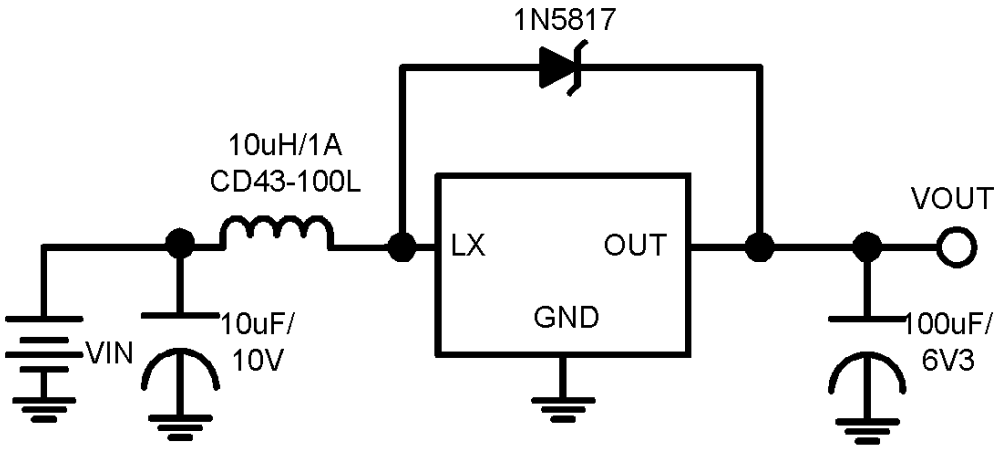
Electrical Characteristics

(Ta=+25^{0}C)

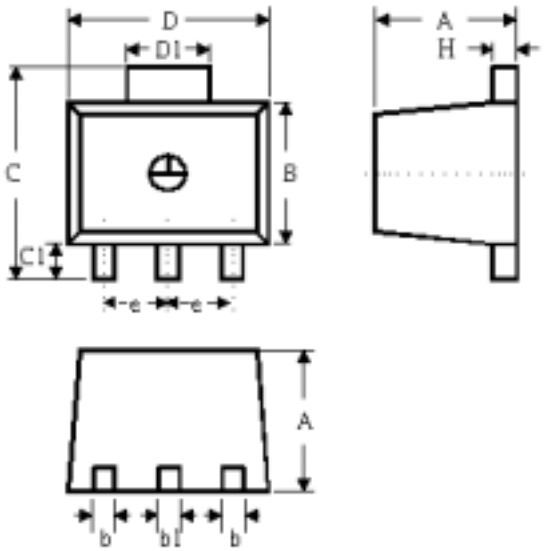
Parameter	Part number	Symbol	Condition	Values			Unit
				Min.	Typ.	Max.	
Output Voltage	AT1301-33	V_{OUT}		3.218	3.300	3.382	V
	AT1301-50	V_{OUT}		4.875	5.000	5.125	V
Input Voltage		V_{IN}		-	-	7	V
Start-Up Voltage		V_{Start}	I_{OUT}=0mA V_{IN} =0→2V	-	0.8	0.95	V
Hold-On Voltage		V_{Hold}	I_{OUT}=0mA V_{IN} =2→0V	0.6	-	-	V
No-Load Input Current	AT1301-33	I_{IN1}	I_{OUT}=0mA	-	30	-	μA
	AT1301-50						
Supply Current	AT1301-33	I_{IN2}	V_{IN} = V_{OUT} +0.5V Measurement of the IC input current in switch off	-	0.6	-	μA
	AT1301-50						
LX Switching Current	AT1301-33	I_{LX}	V_{LX} =0.4V	130	200	-	mA
	AT1301-50			130	215	-	mA
Off-State LX Leakage Current		I_{LXleak}	V_{LX} =6V	-	0.5	1.0	μA
Switch minimum Off Time		t_{Off}		-	1.0	-	μs
Switch On Time		t_{On}		-	4.0	-	μs
Oscillator Duty Cycle		DUTY	V_{LX} " L" side	-	80	-	%
V_{LX} Voltage Limit		$V_{LXlimit}$	LX Switch On	0.6	0.8	1.0	V

***Unless otherwise provided, V_{IN} =2.0V (when V_{OUT} =3.3V); V_{IN} =3.0V (when V_{OUT} =5.0V) , I_{OUT}=10mA, and use External Circuit of Typical Application (Fig 1).**

Typical Application Schematic



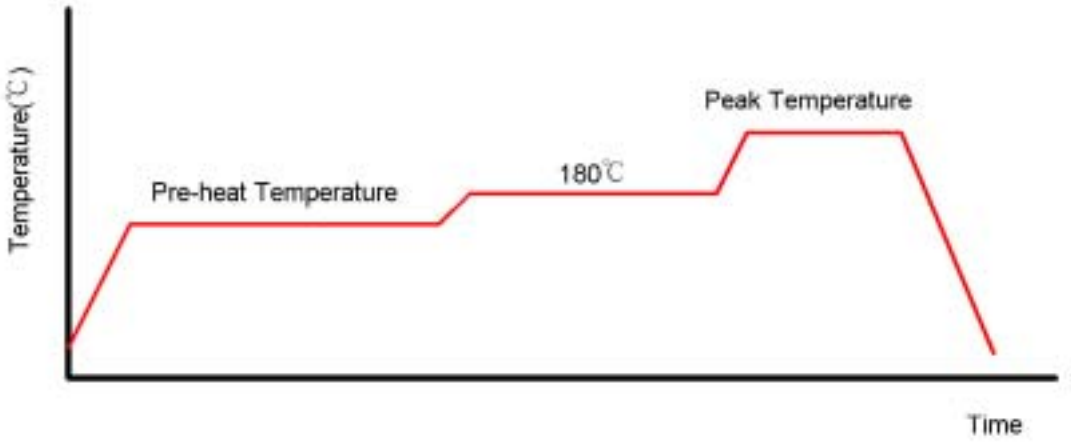
Package Information



Symbol	Dimension 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	0.381	0.432	0.015	0.017

Reflow Condition (IR/Convection or VPR Reflow)

Reference JEDEC Standard J-STD-020A



Classification Reflow Profiles

	Convection or IR/Convction	VPR
Average Heating Rate(180°C to peak)	5°C/second max.	10°C/second max.
Preheat Temperature(125±20°C)	120 seconds max.	
Temperature maintained above 180°C	10~150 seconds	
Time within 5°C of actual Peak Temperature	10~20 seconds	60 seconds
Peak Temperature Range(Note 1)	219~225°C or 235~240°C	219~225°C or 235~240°C
Cooling Rate	6°C /second max.	10°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	

***1 The maximum peak temperatures for IR and VP reflow are depending on package dimensions.**

Package Reflow Conditions

Pkg. Thickness ≥2.5mm and all bags	Pkg. Thickness <2.5mm and Pkg. Volume ≥350 mm^3	Pkg. Thickness <2.5mm and Pkg. Volume <350 mm^3
Convection 219~225°C		Convection 235~240°C
VPR 219~225°C		VPR 235~240°C
IR/Convection 219~225°C		IR/Convection 235~240°C