

### Features

- $\pm 2\%$  Output Accuracy
- $12\mu\text{A}$  Quiescent Current
- Shutdown Current  $< 1\mu\text{A}$
- High Output Voltage: Up to 28V
- 30mA Output Current
- Tiny SOT-25 Package

### Applications

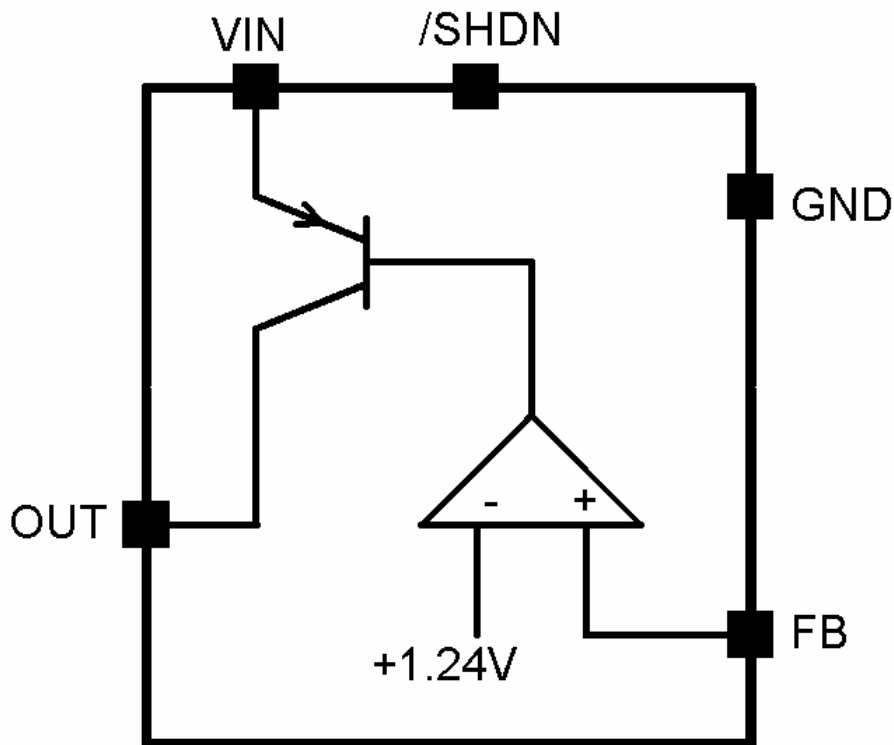
- Microcontroller Power
- Notebook Computers
- Battery Operating system

### General Description

The AT1202 is high voltage, micropower linear regulator. Key features include wide input voltage, low-noise, low-dropout and low-quiescent-current. The output voltage precision is within  $\pm 2\%$  and output currents of up to 30mA.

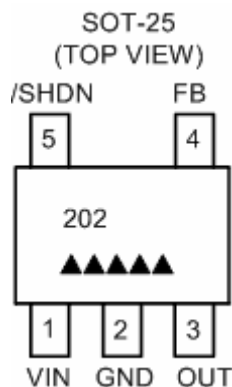
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### Block Diagram



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

### Pin Assignment



### Ordering Information

Part number	Package	Marking
AT1202X	SOT-25	▲▲▲▲▲ Date Code
AT1202X_GRE	SOT-25, Green	▲▲▲▲▲, Date Code with one bottom line

▲▲▲▲▲ : Date Code

\*For more marking information, contact our sales representative directly

### Pin Description

Pin No.	Symbol	I/O	Description
1	VIN	P	Power Supply
2	GND	P	Ground
3	OUT	O	Regulator Output
4	FB	I	Feedback Input
5	/SHDN	I	Shutdown input, active low.

### Absolute Maximum Ratings

Item	Symbol	Ratings	Units
Storage temperature	T <sub>STG</sub>	-55 ~ +150	°C
Operating temperature	T <sub>OPR</sub>	-30 ~ +85	°C
VIN		-0.3 ~ +30	V
/SHDN,FB		-0.3 ~ +(VIN+0.3)	V
OUT		-0.3V ~ +30	V
Power consumption	Pd*1	570	mW

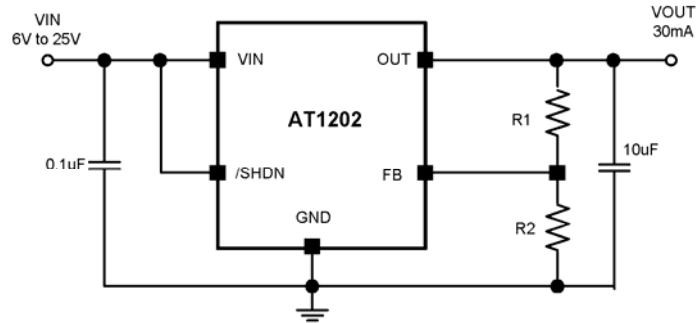
\*1. Continuous Power Dissipation derate 7.1mW/°C above +70°C

### Electrical Characteristics

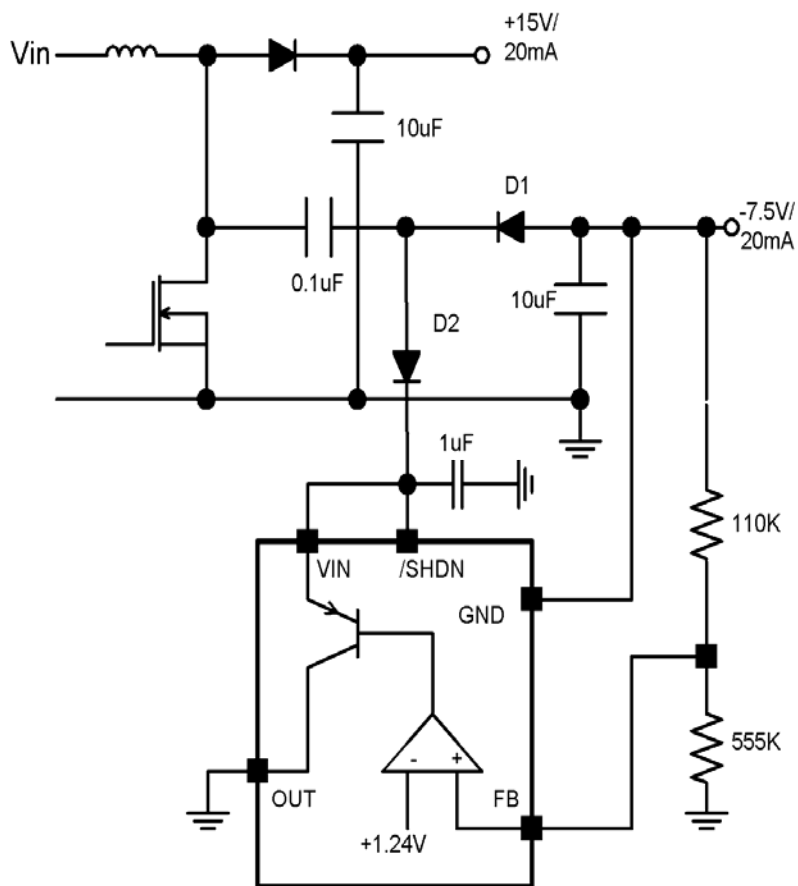
( $V_{IN}=15V$ ,  $I_{SHDN} = V_{IN}$ ,  $I_{LOAD}=5\mu A$ ,  $T_a=T_{MIN}$  to  $T_{MAX}$ , unless otherwise note. Typical  $T_a =25^{\circ}C$ )

Parameter	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Input Voltage	$V_{IN}$		4	-	28	V
Supply Current	$I_{IN}$	/SHDN= $V_{IN}$ , $T_a =25^{\circ}C$	-	12	15	$\mu A$
		/SHDN= $V_{IN}$ , $V_{IN}=6\sim 28V$ , $T_a=T_{MIN}$ to $T_{MAX}$	-	-	20	$\mu A$
Shutdown Supply Current	$I_{IN1}$	/SHDN=GND, $T_a =25^{\circ}C$	-	-	3	$\mu A$
		/SHDN=GND, $T_a=T_{MIN}$ to $T_{MAX}$	-	-	5	$\mu A$
Feedback Reference	$V_{FB}$	FB=OUT, $T_a =25^{\circ}C$ $V_{IN}=6V$ to $28V$ , $I_{LOAD}=1mA$	1.215	1.240	1.265	V
		FB=OUT, $V_{IN}=6V$ to $28V$ , $T_a=T_{MIN}$ to $T_{MAX}$ $I_{LOAD}=5\mu A$ to $30mA$	1.18	-	1.28	V
Feedback Input Current	$I_{FB}$	$V_{FB} =1.3V$	-10	12	30	nA
Dropout Voltage	$\Delta V_{DO}$	$I_{LOAD}=30mA$	-	-	350	mV
Output Current Limit		$V_{IN}=6$	-	100	-	mA
OUT Reverse Leakage Current		$V_{IN}=\text{unconnected}$ , OUT set to 5V	-	80	-	$\mu A$
Capacitive Load Requirement			0.33	-	-	$\mu F/mA$
Start-Up Time Response		$R_L =500\Omega$ , OUT set to 5V $C_{OUT} =10\mu F$	-	-	2	ms
Start-Up overshoot		$R_L =500\Omega$ , $C_{OUT} =10\mu F$ OUT set to 5V with 90% output	-	0.5	-	%OUT
/SHDN Input Current	$I_{SHDN}$	/SHDN=0 or 15V	-1	-	1	$\mu A$
/SHDN Input Level	$V_{IH}$ $V_{IL}$		1.4	-	-	V
			-	-	0.25	V

**Typical Application Circuit**

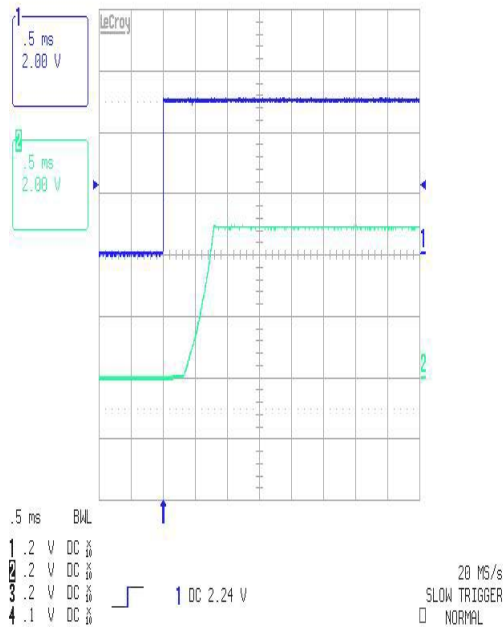


*Fig1. AT1202 Typical Application Circuit*



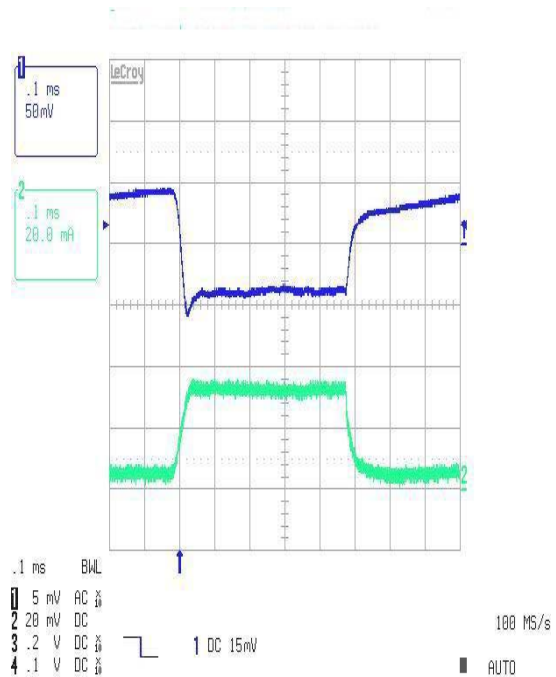
*Fig2. Negative Power supply*

**Typical Characteristics (C<sub>OUT</sub>=10μF)**



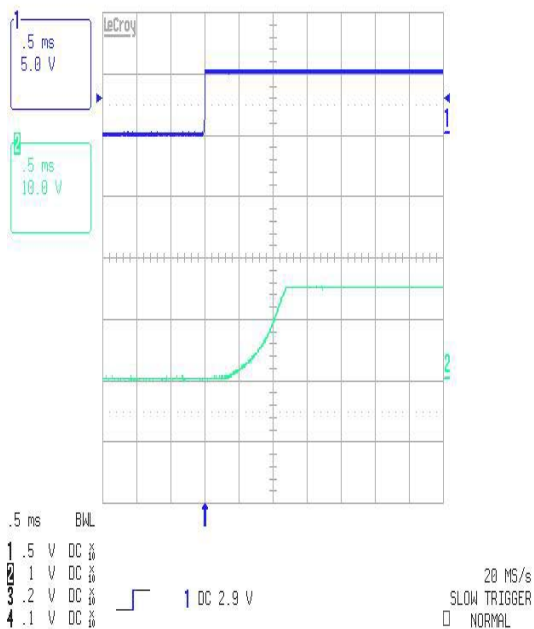
**Fig1a. V<sub>OUT</sub>=5V Start-Up Response**

(CH1:/SHDN CH2:V<sub>OUT</sub>/30mA VIN=10V)



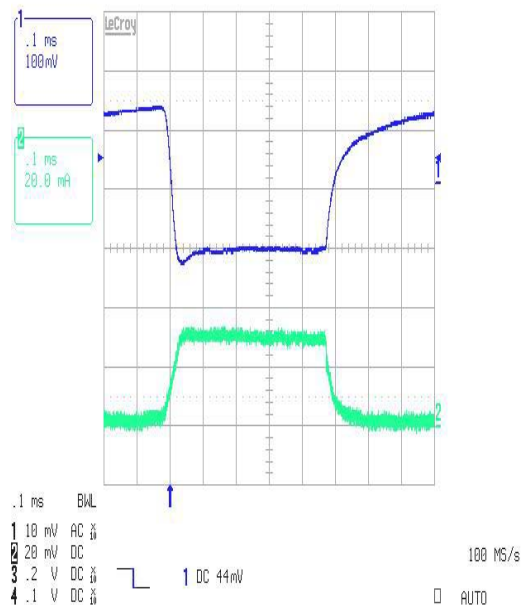
**Fig1b. V<sub>OUT</sub>=5V Transient**

(CH1:V<sub>OUT</sub> CH2:I<sub>OUT</sub>)



**Fig 2a. V<sub>OUT</sub>=15V Start-Up Response**

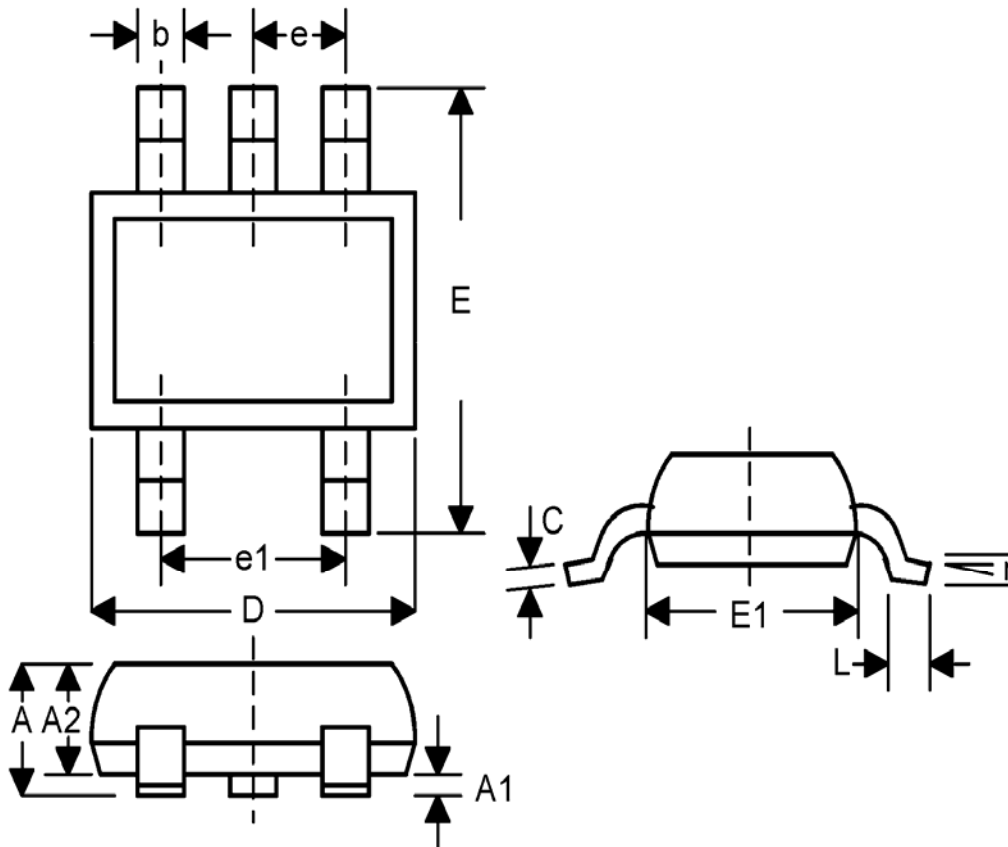
(CH1:/SHDN CH2:V<sub>OUT</sub>/30mA VIN=20V)



**Fig2b. V<sub>OUT</sub>=15V Transient**

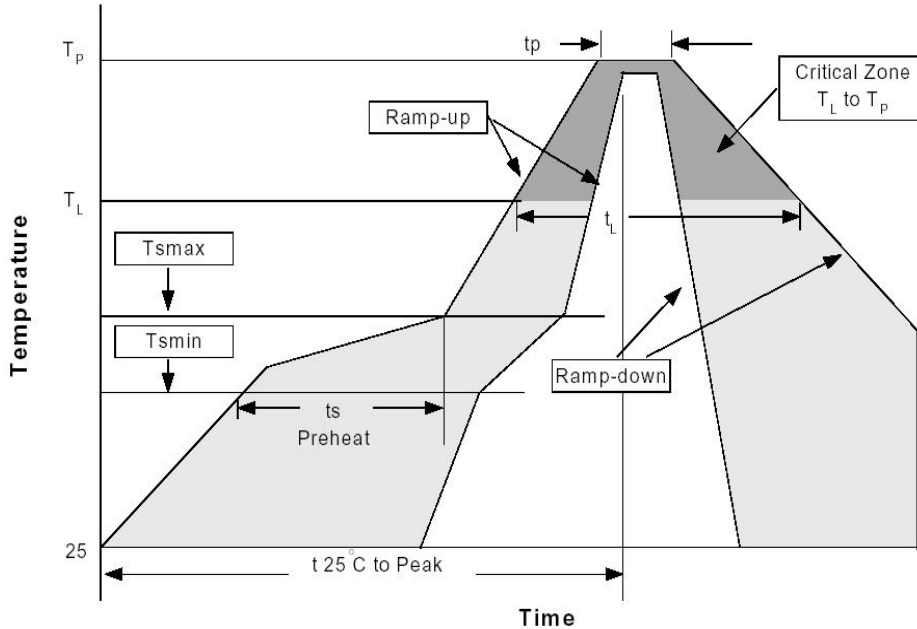
(CH1:V<sub>OUT</sub> CH2:I<sub>OUT</sub>)

**Small Outline SOT-25**



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.035	0.057	0.90	1.45	-
A1	0.000	0.006	0.00	0.15	-
A2	0.035	0.051	0.90	1.30	-
b	0.010	0.020	0.25	0.50	-
C	0.003	0.008	0.08	0.20	-
D	0.110	0.122	2.80	3.10	-
E	0.102	0.118	2.60	3.00	-
E1	0.059	0.069	1.50	1.75	-
L	0.014	0.022	0.35	0.55	-
e	0.037ref		0.95ref		-
e1	0.075ref		1.90ref		-
r	0 <sup>0</sup>	10 <sup>0</sup>	0 <sup>0</sup>	10 <sup>0</sup>	-

**Reflow Profiles**



Profile Feature	Sn-Pb Eutectic Assembly		Pb-Free Assembly	
	Large Body Pkg. thickness ≥2.5mm or Pkg. volume ≥350mm <sup>3</sup>	Small Body Pkg. thickness <2.5mm or Pkg. volume <350mm <sup>3</sup>	Large Body Pkg. thickness ≥2.5mm or Pkg. volume ≥350mm <sup>3</sup>	Small Body Pkg. thickness ≥2.5mm or Pkg. volume ≥350mm <sup>3</sup>
Average ramp-up rate (T <sub>L</sub> to T <sub>P</sub> )	3°C/second max.		3°C/second max.	
Preheat -Temperature Min(T <sub>smin</sub> ) -Temperature Max (T <sub>smax</sub> ) -Time (min to max)(t <sub>s</sub> )	100°C 150°C 60-120 seconds		150°C 200°C 60-180 seconds	
T <sub>smax</sub> to T <sub>L</sub> -Ramp-up Rate			3°C/second max.	
Time maintained above: -Temperature (T <sub>L</sub> ) -Time (t <sub>L</sub> )	183°C 60-150 seconds		217°C 60-150 seconds	
Peak Temperature(T <sub>P</sub> )	225+0/-5°C	240+0/-5°C	245+0/-5°C	250+0/-5°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	10-30 seconds	10-30 seconds	10-30 seconds	20-40 seconds
Ramp-down Rate	6°C/second max.		3°C/second max.	
Time 25°C to Peak Temperature	6 minutes max.		8 minutes max.	

\*All temperatures refer to topside of the package, measured on the package body surface.

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