DESCRIPTION

A1118 is a dual channel low-dropout regulator that delivers a maximum current of 1A for each individual output. Typical dropout voltage at 1A load current is 1.3V. Each individual output voltage can be set independently as fixed voltage (e.g 1.2V, 1.8V, 2.5V, 3.3V, 5V) or adjustable output which can provide an output voltage from 1.25 to 12V with two external resistors. The output accuracy of each channel is set within 2% by trimming.

A1118 offers thermal shut down and current limit functions to ensure reliability of device and power system.

Package input/output pin configuration can be customized on demand (i.e both output can share one input to save one input capacitor and corresponding PCB real estate).

The A1118 is available in PSOP8 Package.

FEATURES

- Dual channel output with each individual output can be either fixed output version or adjustable version.
- Maximum output current for each channel is 1A
- Range of operation input voltage: Max. 12V
- Standby current of each output: 2mA (typ.)
- Line regulation: 0.1%/V (typ.)
- Load regulation: 10mV (typ.)
- Environment Temperature: -20°C ~85°C
- Compatible with tantalum capacitor, electrolytic capacitor and MLCC.
- Available in PSOP8 Package

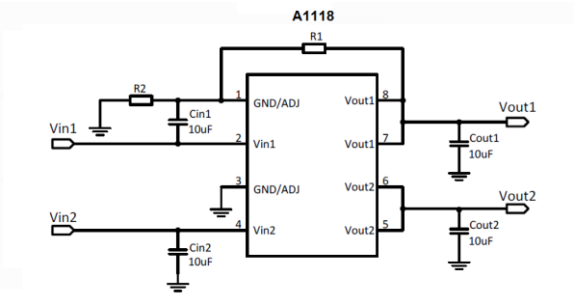
APPLICATION

- Power Management for Computer Mother Board, Graphic Card
- LCD Monitor and LCD TV
- DVD Decode Board
- ADSL Modem
- Post Regulators for Switching Supplies

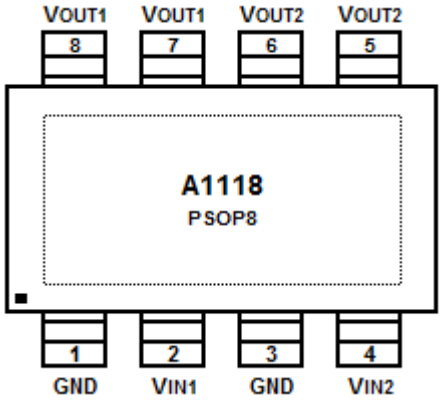
ORDERING INFORMATION

Package Type	Part Number	
PSOP8 SPQ: 2,500pcs/Reel	MP8	A1118MP8R-XXYY
		A1118MP8VR-XXYY
Note	XX: Output voltage Vout1 18=1.8V, AD=Adj YY: Output voltage Vout2 33=3.3V V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	GND	Ground
2	$V_{IN}1$	Channel 1 Input
3	GND	Ground
4	$V_{IN}2$	Channel 2 Input
5	$V_{OUT}2$	Channel 2 Output
6	$V_{OUT}2$	Channel 2 Output
7	$V_{OUT}1$	Channel 1 Output
8	$V_{OUT}1$	Channel 1 Output

ABSOLUTE MAXIMUM RATINGS

Max Input Voltage		12V
T_J, Operating Junction Temperature		125°C
T_A, Ambient Temperature		-20°C ~ 85°C
θ_{JC}, Package Thermal Resistance	PSOP8	10°C/W
T_S, Storage Temperature		-40°C ~ 150°C
Lead Temperature & Time		260°C, 10s

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED WORKING CONDITIONS

Input Voltage Range	Max. 12V
Ambient Temperature	-20°C ~ 85°C

ELECTRICAL CHARACTERISTICS

*For each individual channel output
Test Conditions: C_{IN}=0.1uF, C_{OUT}=10uF, T_A=25°C, unless otherwise specified.

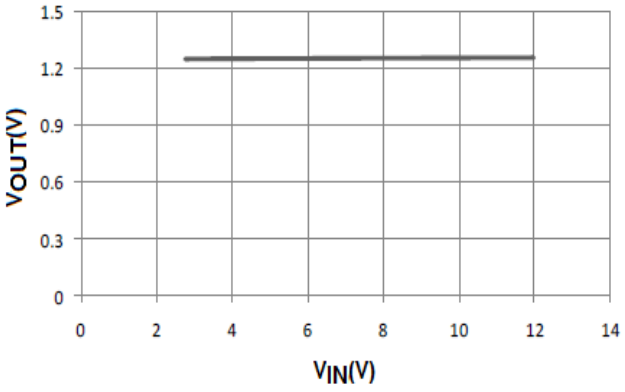
Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Reference Voltage	V_{REF}	10mA≤I_{OUT}≤1A , V_{IN}=3.25V	ADJ	1.225	1.25	1.275	V
Output Voltage	V_{OUT}	0≤I_{OUT}≤1A , V_{IN}=3.2V	1.2V	1.176	1.2	1.224	V
		0≤I_{OUT}≤1A , V_{IN}=3.8V	1.8V	1.764	1.8	1.836	
		0≤I_{OUT}≤1A , V_{IN}=4.5V	2.5V	2.45	2.5	2.55	
		0≤I_{OUT}≤1A , V_{IN}=5.3V	3.3V	3.234	3.3	3.366	
		0≤I_{OUT}≤1A , V_{IN}=7.0V	5.0V	4.9	5	5.1	
Line Regulation	ΔV_{OUT}	I_{OUT}=10mA, 2.75V≤V_{IN}≤12V	ADJ	-	0.1	0.2	%/V
		I_{OUT}=10mA, 2.7V≤V_{IN}≤10V	1.2V				
		I_{OUT}=10mA, 3.3V≤V_{IN}≤12V	1.8V				
		I_{OUT}=10mA, 4.0V≤V_{IN}≤12V	2.5V				
		I_{OUT}=10mA, 4.8V≤V_{IN}≤12V	3.3V				
		I_{OUT}=10mA, 6.5V≤V_{IN}≤12V	5.0V				
Load Regulation	ΔV_{OUT}	V_{IN} =2.75V, 10mA≤I_{OUT}≤1A	ADJ	-	10	30	mV
		V_{IN} =2.7V, 10mA≤I_{OUT}≤1A	1.2V				
		V_{IN}=3.3V, 10mA≤I_{OUT}≤1A	1.8V				
		V_{IN}=4.0V, 10mA≤I_{OUT}≤1A	2.5V				
		V_{IN}=4.8V, 10mA≤I_{OUT}≤1A	3.3V				
		V_{IN}=6.5V, 10mA≤I_{OUT}≤1A	5.0V				
Dropout Voltage	V_{DROP}	I_{OUT}=100mA		-	1.23	1.3	V
		I_{OUT}=1A		-	1.3	1.5	
Current Limit	Ilimit	V_{IN}-V_{OUT}=2V, T_J=25°C		1			A
Minimum Load Current	Imin		ADJ	-	2	10	mA
Quiescent Current	I_Q	V_{IN} =10V	1.2V	-	2	5	mA
		V_{IN} =12V	1.8V				
		V_{IN} =12V	2.5V				
		V_{IN} =12V	3.3V				
		V_{IN} =12V	5.0V				
Adjust Pin Current	I_{ADJ}	V_{IN} =5V, 10mA≤I_{OUT}≤1A	ADJ	-	55	120	μA
Iadj change	I_{CHANGE}	V_{IN} =5V, 10mA≤I_{OUT}≤1A	ADJ	-	0.2	10	μA
Temperature Coefficient	ΔV/ΔT			-	±100	-	ppm
Junction-Ambient Thermal Resistance	θ_{JA}	PSOP8		-	63	-	°C/W

NOTE1: All test are conducted under ambient temperature 25°C and within a short period of time 20ms
NOTE2: Load current smaller than minimum load current of A1118-ADJ will lead to unstable or oscillation output.

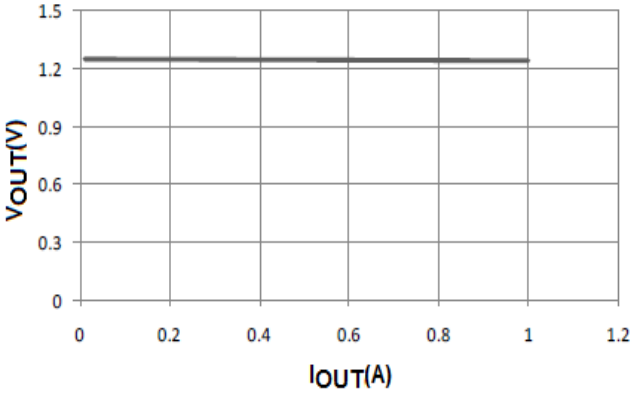
TYPICAL PERFORMANCE CHARACTERISTICS

T=25°C unless specified.

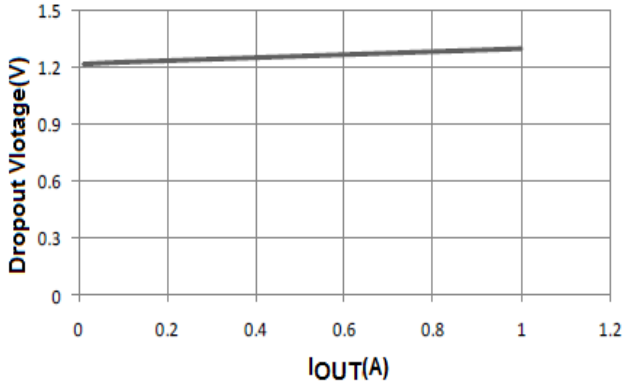
1. Line Regulation
   A1118-ADJ V_{OUT} Vs. V_{IN}



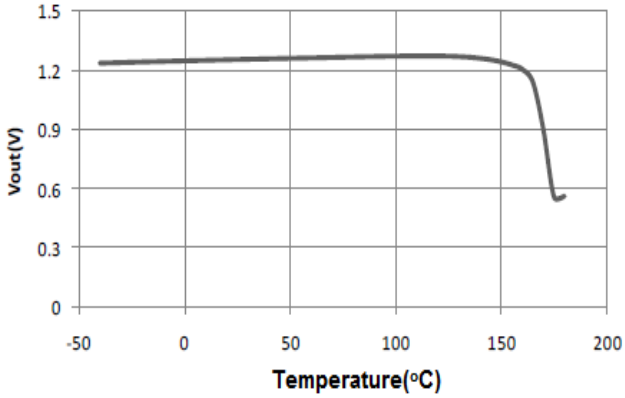
2. Load Regulation
   A1118-ADJ V_{OUT} Vs. I_{OUT}



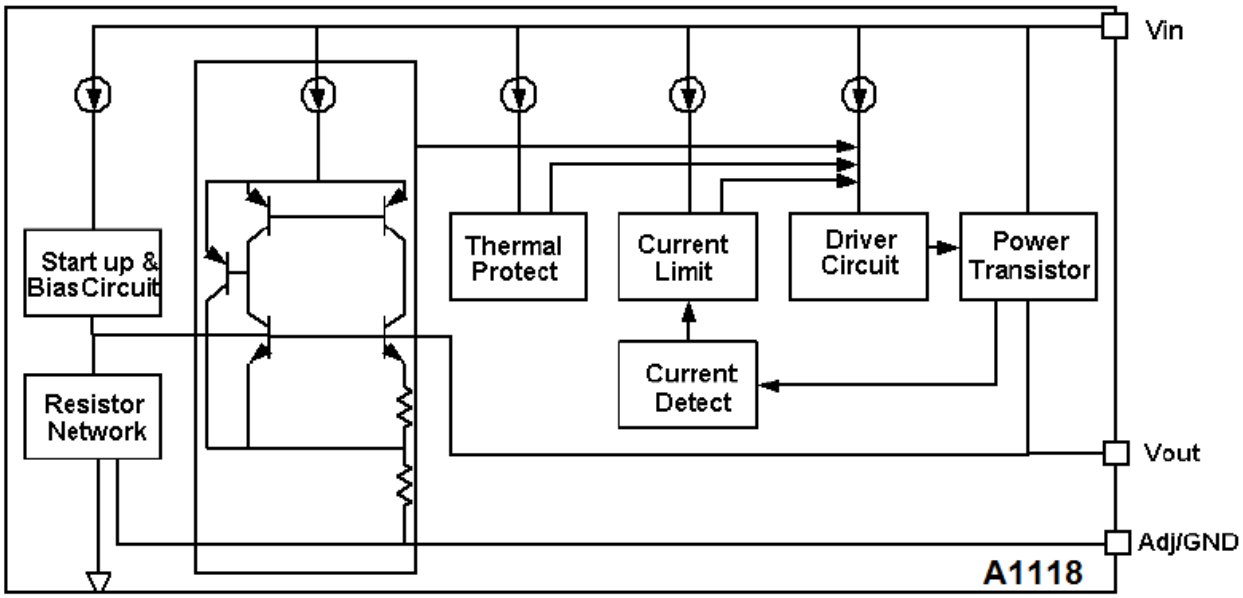
3. Dropout Voltage
   A1118-ADJ Dropout Vs. I_{OUT}



4. Thermal performance with OTP
   A1118-ADJ V_{OUT} Vs. Temp



BLOCK DIAGRAM



DETAILED DESCRIPTION

A1118 is a series of dual channel low-dropout regulator that delivers a maximum current of 1A for each individual output. Typical dropout voltage at 1A load current is 1.3V. Each individual output voltage can be set independently as fixed voltage (i.e. 1.2V, 1.8V, 2.5V, 3.3V, 5V) or adjustable output which can provide an output voltage ranges from 1.25 to 12V with two external resistors. The output accuracy of each channel is set within 2% by trimming.

The device has build-in modules including start-up circuit, bias circuit, bandgap, thermal shutdown, current limit, power transistors and driver circuit. Thermal shut down and current limit functions ensure reliability of device and power system.

The bandgap module provides stable reference voltage whose temperature coefficient is compensated by careful design considerations. The temperature coefficient is under 100ppm/°C. The accuracy of output voltage is guaranteed by trimming technique.

Package input/output pin configuration can be customized on demand (i.e both output can share one input to save one input capacitor and corresponding PCB real estate).

TYPICAL APPLICATION

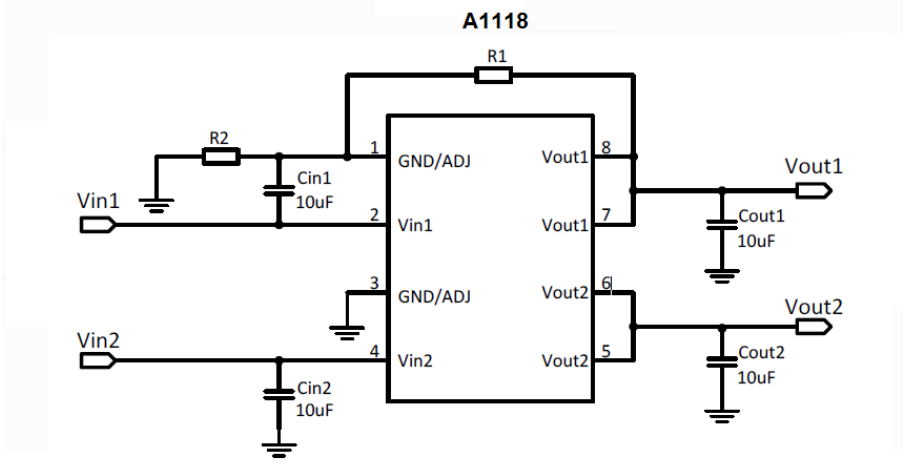


Figure 1 Typical Application Schematic of A1118

A1118 has both fixed voltage version (1.2V, 1.8V, 2.5V, 3.3V, 5V) and adjustable voltage version. The input and output capacitors of each channel can be either tantalum, electrolytic or ceramic capacitor.

Figure 1 shows both fixed voltage and adjustable voltage application schematic. Channel 1 (designated as pin 1\2\7\8) is the schematic of adjustable version application. Channel 2 (designated as pin 3\4\5\6) is a typical application of fixed voltage. The adjustable version provides a 1.25V reference voltage with regard to its ADJ pin (shown as PIN 7\8 as its output and PIN 1 as its adjustable pin in Fig.1). The output voltage of adjustable version follows the equation:

$V_{OUT}=1.25(1+R_2/R_1)+I_{ADJ}xR_2$.

We can ignore I_{ADJ} because I_{ADJ} (about 50uA) is much less than the current of R1 (in the order of several milliamps).

1. To meet the minimum load current (>10mA) requirement, R1 is recommended to be 125ohm or lower.
2. Using a bypass capacitor (C_{ADJ}) between the ADJ pin and ground can improve ripple rejection. This bypass capacitor prevents ripple from being amplified as the output voltage is increased. The impedance of C_{ADJ} should be less than R1 to prevent ripple from being amplified. As R1 is normally in the range of 100Ω~500Ω, the value of C_{ADJ} should satisfy this equation: $1/(2\pi Xf_{ripple}xC_{ADJ})<R1$.

THERMAL CONSIDERATIONS

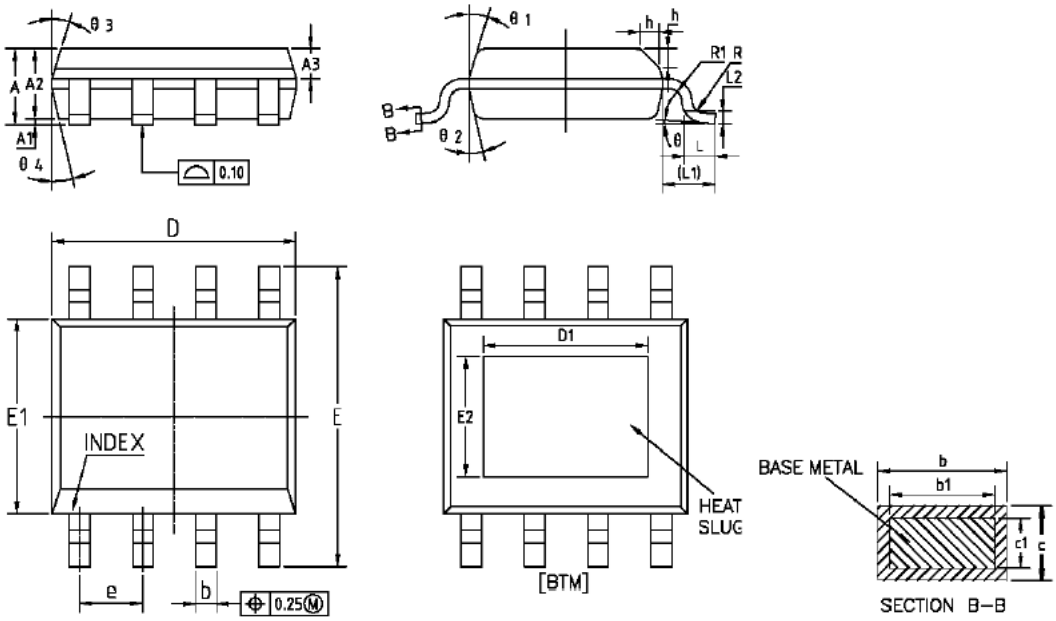
Thermal consideration has to be taken account into to ensure proper function of the device. Power dissipation of A1118 can be calculated as

$$\text{Power Dissipation} = (V_{IN}1-V_{OUT}1)\times I_{OUT}1+ (V_{IN}2-V_{OUT}2)\times I_{OUT}2$$

For proper function and safe operation of the device, power dissipation is recommended to be limited within 2W.

PACKAGE INFORMATION

Dimension in PSOP8 (Unit: mm)



Symbol	Min	Nom	Max
A	1.35	1.55	1.75
A1	0.00	0.10	0.15
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	-	0.51
b1	0.37	0.42	0.47
c	0.17	-	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
D1	3.10	3.30	3.50
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
E2	2.20	2.40	2.60
e		1.27BSC	
L	0.45	0.60	0.80
L1		1.04REF	
L2		0.25BSC	
R	0.07	-	-
R1	0.07	-	-
h	0.30	0.40	0.50
θ	0°	-	8°
θ1	15°	17°	19°
θ2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°

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