AP1119

0.5A Positive Low Dropout Fixed-Mode Regulator With EN Function

■ Features

- 1.3V maximum dropout at full load current
- Fast transient response
- Output current limiting
- Built-in thermal shutdown
- Packages: SOT89-5L
- Good noise rejection
- 5-Terminal device with fixed 1.5V, 1.8V, 2.5V, 3.3V, 5.0V, 9.0V, 12V output.

■ Applications

- PC peripheral
- Communication
- CDROM..

■ General Description

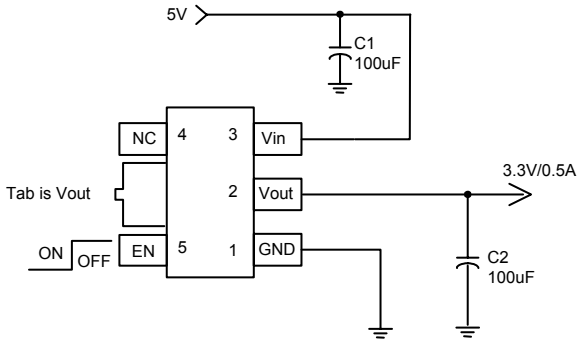
AP1119 is a low dropout positive adjustable or fixed-mode regulator with minimum of 0.5A output current capability. The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current 3.3V logic supply. AP1119 is also well suited for other applications such as VGA cards. AP1119 is guaranteed to have <1.3V dropout at full load current making it ideal to provide well regulated fixed outputs of 1.5 to 12V with up to 18V input supply. The AP1119 offers a TTL – Logic compatible enable pin.

■ Ordering Information

AP 1119 X XX X X

Low Dropout Regulator	Package	Vout	Lead Free	Packing
	Y : SOT89-5L	15 : 1.5V 18 : 1.8V 25 : 2.5V 33 : 3.3V 50 : 5.0V 90 : 9.0V 12 : 12V	Blank : Normal L : Lead Free Package	Blank : Tube A : Taping

■ Typical Circuit

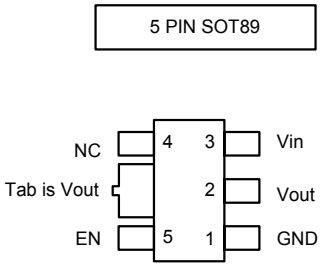


(5V/3.3V fixed output)

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■ Connection Diagram



■ Pin Descriptions

NAME	FUNCTION
GND	Ground
Vout	The output of the regulator. A minimum of 10uF capacitor must be connected from this pin to ground to insure stability.
Vin	The input pin of regulator. Typically a large storage capacitor is connected from this pin to ground to insure that the input voltage does not sag below the minimum dropout voltage during the load transient response. This pin must always be 1.3V higher than Vout in order for the device to regulate properly.
EN	The input pin of regulator. TTL/CMOS compatible input Logic high = disable output, Logic Low or open =Enable output. (internal Pull-down resistor ~ l00K).

■ Absolute Maximum Ratings

Characteristics	Symbol	Values	Unit
DC Supply Voltage	Vin	-0.3 to 18	V
Power Dissipation	P_D	Internally Limited	
Storage Temperature	T_{ST}	-65 to +150	^oC
Operating Junction Temperature Range	$T_{OP.}$	0 to +150	^oC

■ Electrical Characteristics (Under Operating Conditions)

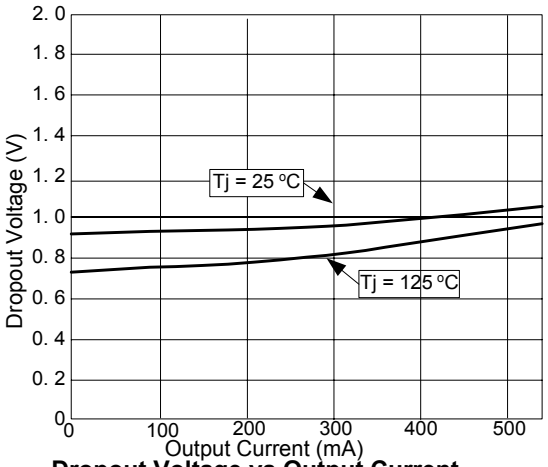
PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	AP1119-1.5	I_{OUT} = 10mA, T_J = 25°C, 3V≦V_{IN}≦12V	1.470	1.500	1.530	V
	AP1119-1.8	I_{OUT} = 10mA, T_J = 25°C, 3.3V≦V_{IN}≦12V	1.764	1.800	1.836	V
	AP1119-2.5	I_{OUT} = 10mA, T_J = 25°C, 4V≦V_{IN}≦12V	2.450	2.500	2.550	V
	AP1119-3.3	I_{OUT} = 10mA, T_J = 25°C, 4.8V≦V_{IN}≦12V	3.235	3.300	3.365	V
	AP1119-5.0	I_{OUT} = 10mA, T_J = 25°C, 6.5V≦V_{IN}≦12V	4.900	5.000	5.100	V
	AP1119-9.0	I_{OUT} = 10mA, T_J = 25°C, 10.5V≦V_{IN}≦18V	8.820	9.000	9.180	V
	AP1119-12.0	I_{OUT} = 10mA, T_J = 25°C, 13.5V≦V_{IN}≦18V	11.760	12.000	12.240	V
Line Regulation	AP1119-XXX	I_O=10mA,V_{OUT}+1.5V<V_{IN}<15V, T_J=25°C			0.2	%
Load Regulation	AP1119-1.5	V_{IN}=3V, 0mA<Io<0.5A, T_J=25°C (Note 1,2)		12	15	mV
	AP1119-1.8	V_{IN}=3.3V, 0mA<Io<0.5A, T_J=25°C (Note 1,2)		15	18	mV
	AP1119-2.5	V_{IN}=4V, 0mA<Io<0.5A, T_J=25°C (Note 1,2)		20	25	mV
	AP1119-3.3	V_{IN} = 5V, 0≦I_{OUT}≦0.5A, T_J=25°C (Note 1,2)		26	33	mV
	AP1119-5.0	V_{IN} = 8V, 0≦I_{OUT}≦0.5A, T_J=25°C (Note 1,2)		40	50	mV
	AP1119-9.0	V_{IN} =12V, 0≦I_{OUT}≦0.5A, T_J=25°C (Note 1,2)		70	90	mV
	AP1119-12.0	V_{IN} =15V, 0≦I_{OUT}≦0.5A, T_J=25°C (Note 1,2)		100	120	mV
Dropout Voltage (V_{IN}-V_{OUT})	AP1119 series	I_{OUT} = 0.5A , ΔV_{OUT}=0.1V_{OUT}		1.1	1.3	V
Current Limit	AP1119 series	(V_{IN}-V_{OUT}) = 5V	0.6			A
Minimum Load Current	AP1119-XXX	0°C≦Tj≦125°C		5	10	mA
V_{EN}	Enable Input Voltage	Logic Low (ON)			0.8	V
		Logic High (OFF)	2.0			
I_{EN}	Enable Input Current	V_{EN} = 0.8V			10	μA
		V_{EN} = 2.0V			30	
Thermal Regulation	T_A=25℃, 30ms pulse			0.008	0.04	%/W
Ripple Rejection	F=120Hz,C_{OUT}=25uF Tantalum, I_{OUT}=0.5A			60	70	dB
	AP1119-XXX	V_{IN}=V_{OUT}+3V				
Temperature Stability	I_O=10mA			0.5		%
θ_{JA}	SOT89-5L Thermal Resistance Junction-to-Ambient(No heat sink ;No air flow)			300		°C/W
θ_{JC}	SOT89-5L	: Control Circuitry/Power Transistor Thermal Resistance Junction-to-Case		100		°C/W

Note1: See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.

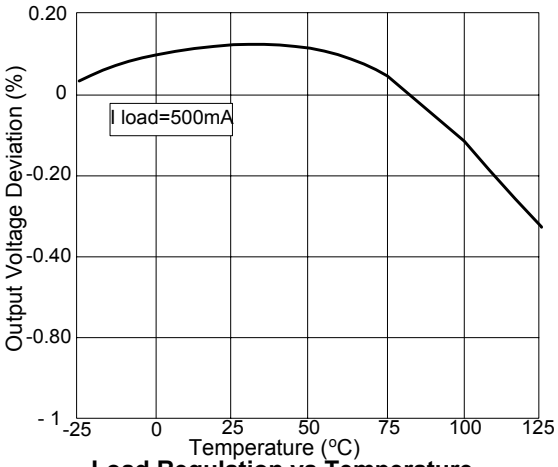
Note2: Line and load regulation are guaranteed up to the maximum power dissipation of 5W. Power dissipation is determined by the input/output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

Note3: Quiescent current is defined as the minimum output current required maintain regulation. At 12V input/output differential the device is guaranteed to regulate if the output current is greater than 10mA.

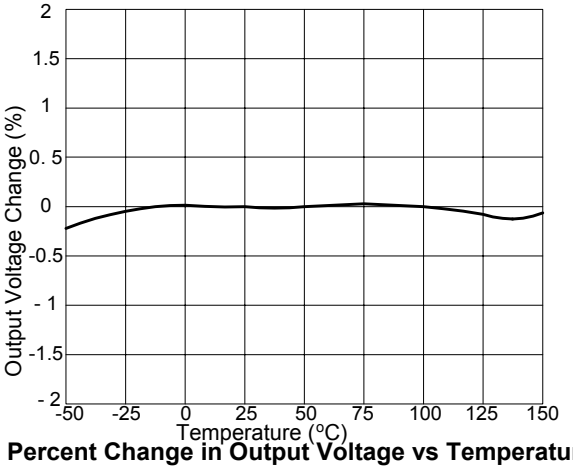
■ Typical Performance Characteristics



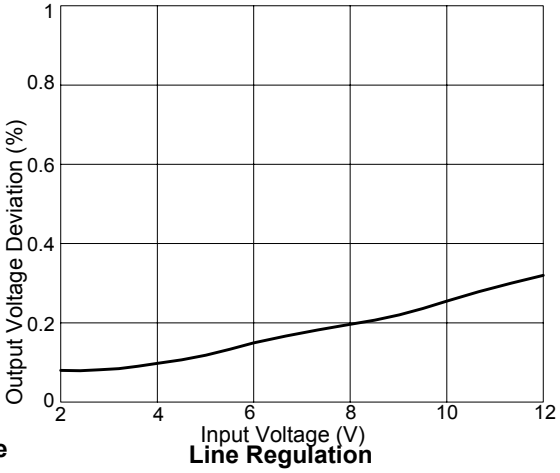
Dropout Voltage vs Output Current



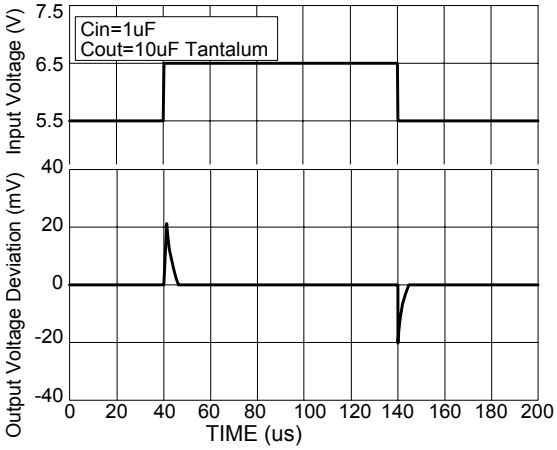
Load Regulation vs Temperature



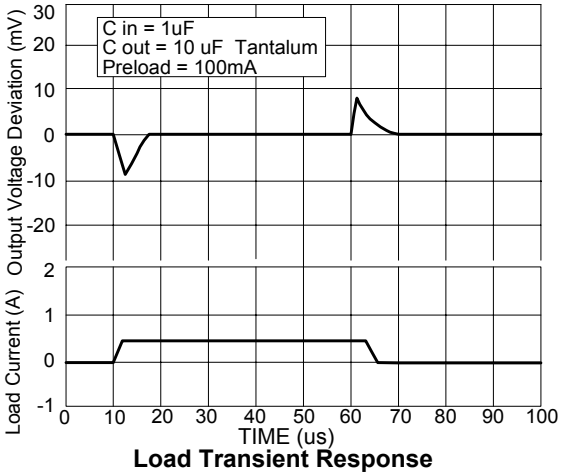
Percent Change in Output Voltage vs Temperature



Line Regulation



Line Transient Response

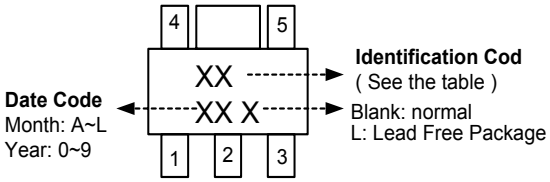


Load Transient Response

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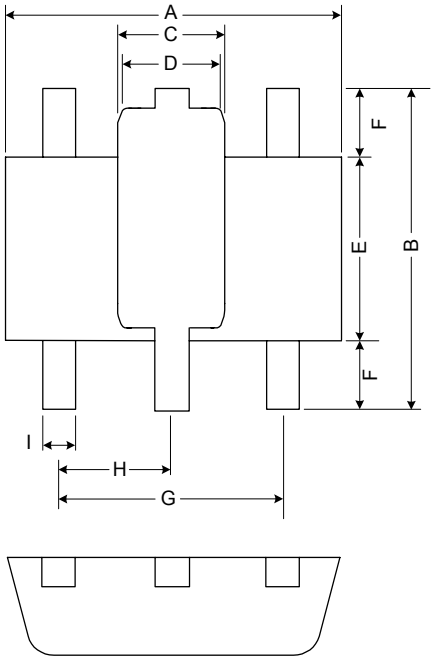
■ Marking Information

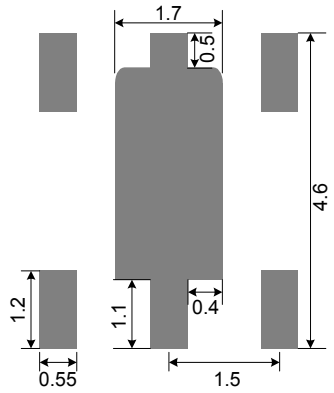
SOT89-5L



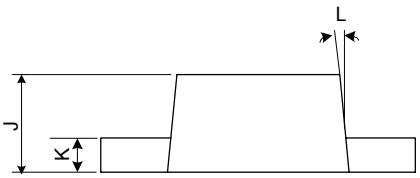
Identification code	Output version
JF	AP1119-1.5V
JG	AP1119-1.8V
JH	AP1119-2.5V
JI	AP1119-3.3V
JJ	AP1119-5.0V
JK	AP1119-9.0V
JL	AP1119-12V

■ Package Information





Land Pattern Recommendation (Unit: mm)



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	4.05	4.15	4.25	0.159	0.163	0.167
C	1.50	1.60	1.70	0.059	0.063	0.067
D	1.30	1.40	1.50	0.051	0.055	0.059
E	2.40	2.50	2.60	0.094	0.098	0.102
F	0.80	-	-	0.031	-	-
G	3.00 Ref.			0.118 Ref.		
H	1.50 Ref.			0.059 Ref.		
I	0.40	0.46	0.52	0.016	0.018	0.020
J	1.40	1.50	1.60	0.055	0.059	0.063
K	0.35	0.39	0.43	0.014	0.015	0.017
L	5^{o} Typ.			5^{o} Typ.		