Elektronische Bauelemente

SM1117A

1A Low Dropout Positive Adjustable or Fixed-Mode Regulator

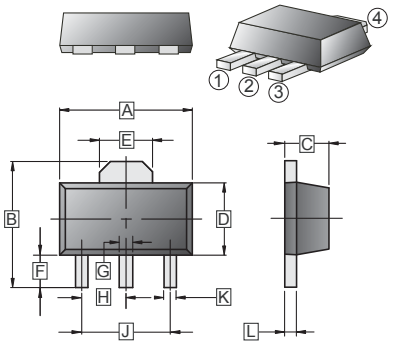
RoHS Compliant Product

A suffix of "-C" specifies halogen free

DESCRIPTION

The SM1117A is a low dropout at positive adjustable or fixed-mode regulator with minimum of 1A 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. SM1117A is also well suited for other applications such as VGA cards. SM1117A is guaranteed to have lower than 1.4V dropout at full load current making it ideal to provide well-regulated outputs of 1.25 to 5.0 with 6.4V to 12V input supply.

SOT-89



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.60	G	0.40	0.58
B	3.94	4.25	H	1.50 TYP	
C	1.40	1.60	J	3.00 TYP	
D	2.30	2.60	K	0.32	0.52
E	1.50	1.70	L	0.35	0.44
F	0.89	1.20			

FEATURES

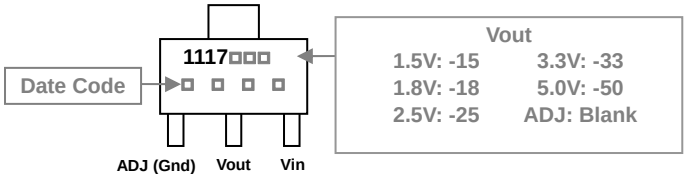
- 1.4Vmaximum dropout full load current
- Fast transient response
- Output current limiting
- Built-in thermal shutdown
- Good noise rejection
- 3-Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 3.3V, 5.0V

APPLICATIONS

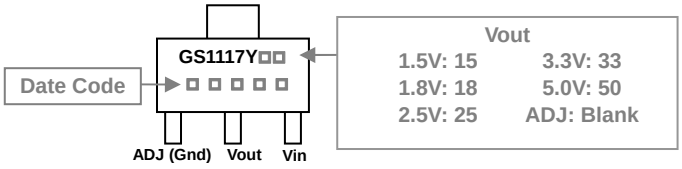
- PC peripheral
- Communication

MARKING

Production A Line



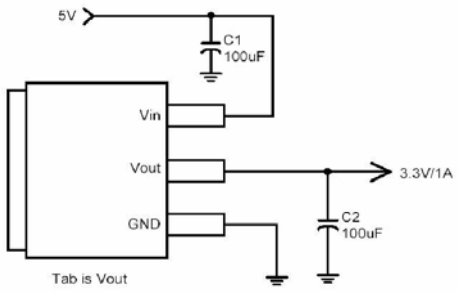
Production B Line



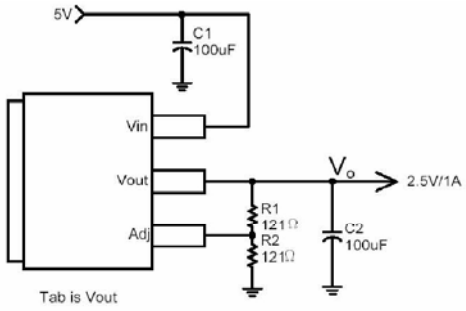
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-89	1K	7' inch

TYPICAL CIRCUIT



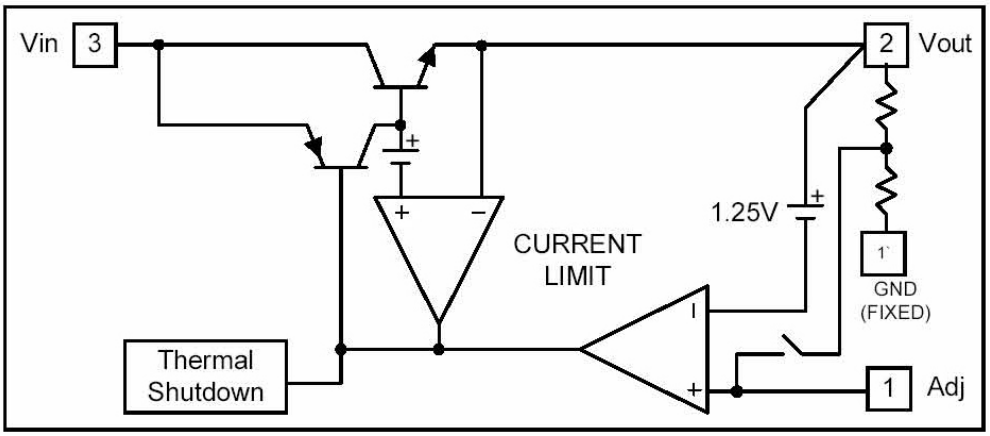
(5V/3.3V fixed output)



(5V/2.5V ADJ output)

Note: $V_o = V_{REF} * (1+\frac{R_2}{R_1})$

BLOCK DIAGRAM



PIN DESCRIPTIONS

Name	I/O	Pin#	Description
Adj (Gnd)	I	1	A resistor divider from this pin to the V_{OUT} pin and ground sets the output voltage (Ground only for fixed mode)
V_{OUT}	O	2	The output pin of regulator. A min. of 10μF capacitor must be connected from this pin to ground to insure stability.
V_{IN}	I	3	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 min. dropout voltage during the load transient response. This pin must always be 1.3V higher than V_{OUT} in order for the device to regulate properly.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
DC Supply Voltage	Vin	-0.3 to 12	V
Power Dissipation (T_A = 25°C)	P_D	Internally Limited	
Operating & Temperature Range	T_{STG}	0~150,-65~150	°C

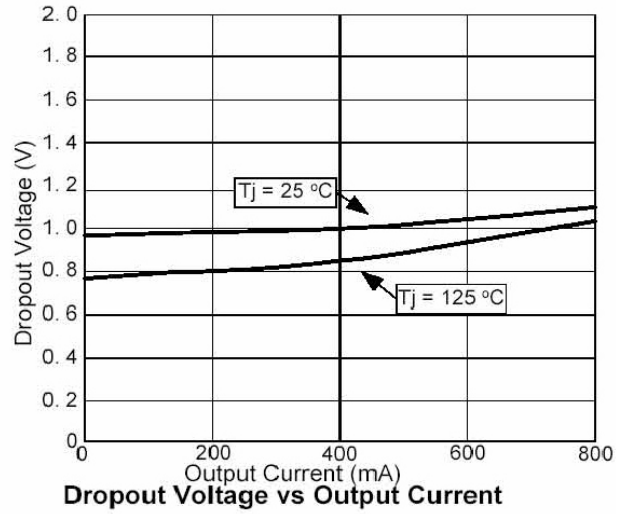
ELECTRICAL CHARACTERISTICS

Parameter	Test Conditions		Min.	Typ.	Max	Unit
Reference Voltage	SM1117A-ADJ	I_o=10mA, T_J=25°C, (V_{IN} - V_{OUT})=1.5V	1.225	1.25	1.275	V
Output Voltage	SM1117A-1.5	I_o=10mA, T_J=25°C, 3.0V≦V_{IN}≦12V	1.47	1.5	1.53	V
	SM117A-1.8	I_o=10mA, T_J=25°C, 3.3V≦V_{IN}≦12V	1.764	1.8	1.836	V
	SM117A-2.5	I_o=10mA, T_J=25°C, 4.0V≦V_{IN}≦12V	2.45	2.5	2.55	V
	SM117A-3.3	I_o=10mA, T_J=25°C, 4.8V≦V_{IN}≦12V	3.235	3.3	3.365	V
	SM117A-5.0	I_o=10mA, T_J=25°C, 6.5V≦V_{IN}≦12V	4.9	5	5.1	V
Line Regulation	SM117A-XXX	I_o=10mA, V_{OUT} +1.5V<V_{IN}<12V, T_J=25°C	-	-	0.2	%
Load Regulation	SM117A-ADJ [1,2]	V_{IN}=3.3V, Vadj=0, 10mA< I_o <1A, T_J=25°C	-	-	1	%
	SM117A-1.5 [1,2]	V_{IN}=3.0V, 0mA<I_o<1A, T_J=25°C	-	12	15	mV
	SM117A-1.8 [1,2]	V_{IN}=3.3V, 0mA<I_o<1A, T_J=25°C	-	15	18	mV
	SM117A-2.5 [1,2]	V_{IN}=4.0V, 0mA<I_o<1A, T_J=25°C	-	20	25	mV
	SM117A-3.3 [1,2]	V_{IN}=5.0V, 0mA<I_o<1A, T_J=25°C	-	26	33	mV
	SM117A-5.0 [1,2]	V_{IN}=8.0V, 0mA<I_o <1A, T_J=25°C	-	40	50	mV
Dropout Voltage (V_{IN}-V_{OUT})	SM117A-XXX	I_o=1A, (ΔV_{out}=0.1% V_{out})	-	1.3	1.4	V
Current Limit	SM117A-XXX	V_{IN} – V_{OUT} =5V	1.1	-	-	A
Minimum Load Current	Adjustable model	V_{IN}=5V	-	5	10	mA
Thermal Regulation	T_A=25°C, 30ms pulse		-	0.008	0.04	%W
Ripple Rejection	F=120Hz, C_{OUT}=25μF Tantalum, I_{OUT}=1A					
	SM117AXXX	V_{IN}=V_{OUT}+3V	-	60	70	dB
Temperature Stability	I_o=10mA		-	0.5	-	%
θ_{JA} Thermal Resistance Junction-to-Ambient (No heat sink ;No air flow)			-	300	-	°C/W
θ_{JC} Thermal Resistance Junction-to-Case	Control Circuitry/Power Transistor		-	100	-	°C/W

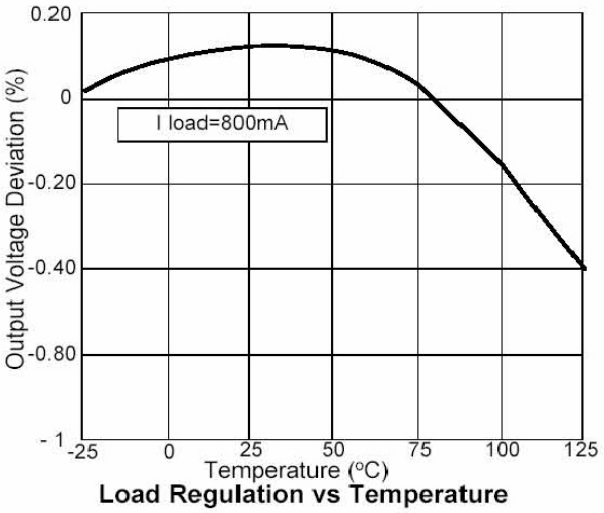
Note:

1. 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.
2. Line and load regulation are guaranteed up to the maximum power dissipation of 15W.Power dissipation is determined by the difference between input and output and the output current .Guaranteed maximum power dissipation will not be available over the full input/output range.
3. Quiescent current is defined as the minimum output current required in maintaining regulation .At 12V input/output differential the device is guaranteed to regulate if the output current is greater than 10mA.

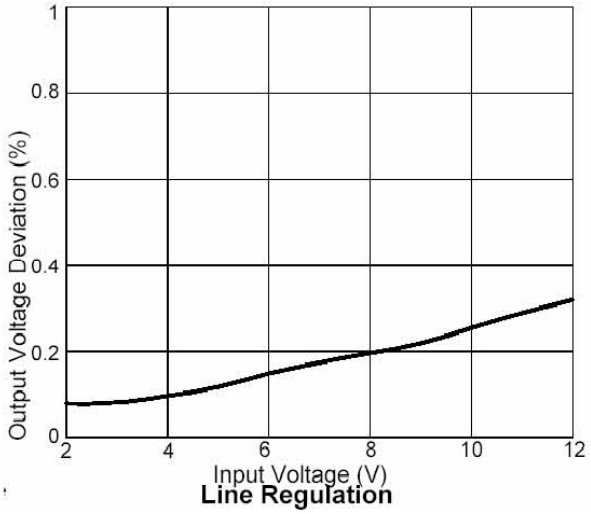
CHARACTERISTIC CURVES



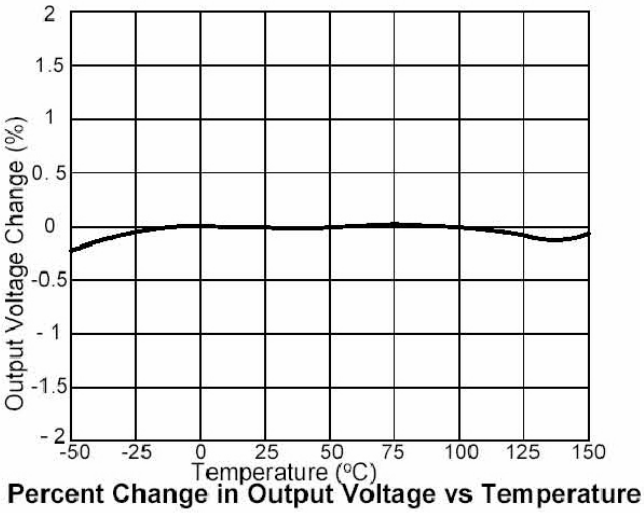
Dropout Voltage vs Output Current



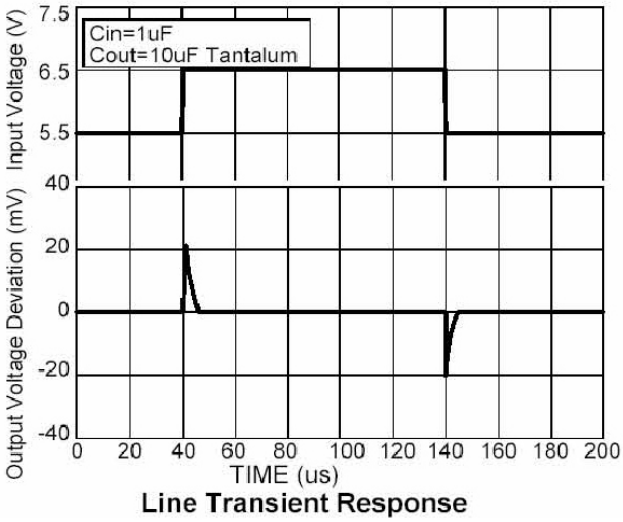
Load Regulation vs Temperature



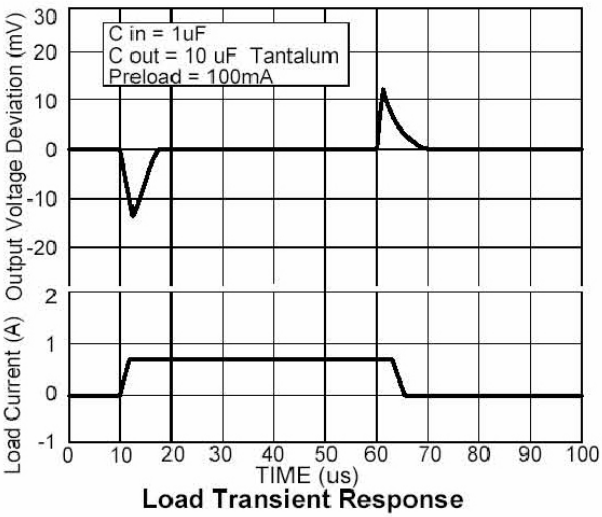
Line Regulation



Percent Change in Output Voltage vs Temperature



Line Transient Response



Load Transient Response