

# 1A Low-Dropout Positive Regulator

## FEATURES

- Dropout voltage 1.3V at 1A output current.
- Fast transient response.
- Line regulation typically at 0.015%.
- Load regulation typically at 0.1%.
- Current-limiting and thermal protection.
- Adjustable output voltage or fixed at 1.8V, 2.5V, 2.85V, 3.3V, 5V.

 **Pb-free; RoHS-compliant packages**

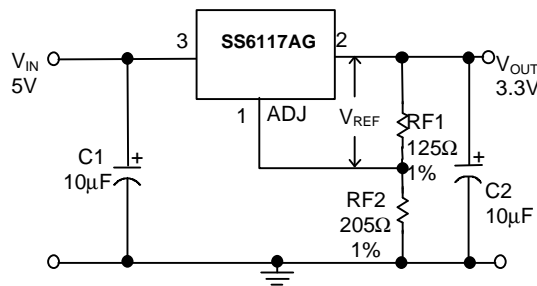
## APPLICATIONS

- Active SCSI termination.
- Battery chargers.
- Constant-current regulators.
- Post regulator for switching supplies.

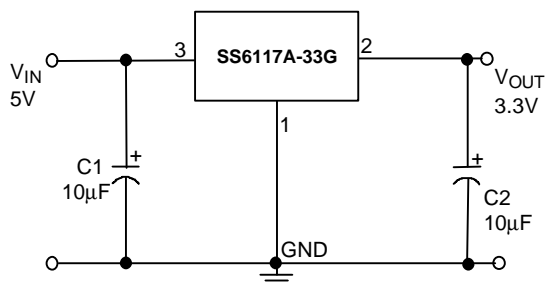
## DESCRIPTION

The SS6117AG is a low-dropout three-terminal regulator with 1A output current capability. The output voltage is adjustable with the use of a resistor divider or fixed at 1.8V, 2.5V, 2.85V, 3.3V, or 5V. Dropout voltage is guaranteed to be a maximum of 1.5V at the maximum output current. The low dropout voltage and fast transient response make this device ideal for low voltage microprocessor applications. The current-limiting and thermal protection reduce the risk that an overload condition might create excessive junction temperatures.

## TYPICAL APPLICATION CIRCUIT



**Adjustable Voltage Regulator**



**Fixed Voltage Regulator**

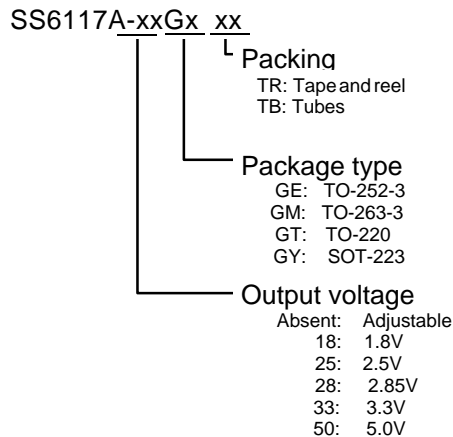
$$V_{REF} = V_{OUT} - V_{ADJ} = 1.25V \text{ (typ.)}$$

$$V_{OUT} = V_{REF} \times (1 + RF2/RF1) + I_{ADJ} \times RF2$$

$$I_{ADJ} = 55\mu A \text{ (typ.)}$$

- (1) C1 is needed if the device is mounted far from the filter capacitors.
- (2) C2 is required for stability.

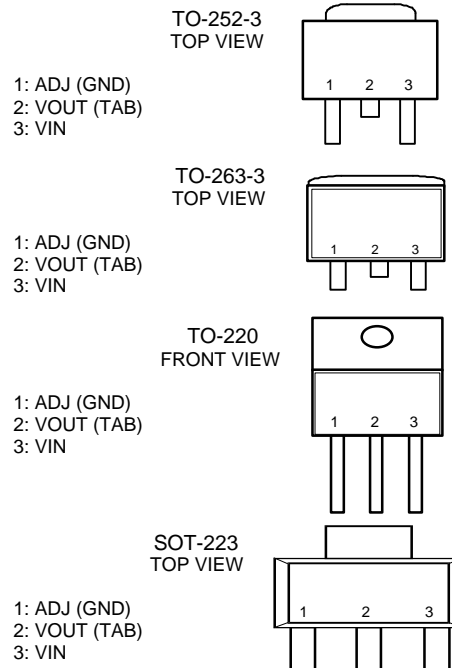
## ORDERING INFORMATION



Example: SS6117A-25GE TR  
 2.5V version in TO-252-3 package  
 shipped on tape and reel

SS6117AGM TR  
 Adjustable version in TO-263-3 package  
 shipped on tape and reel

## PIN CONFIGURATION



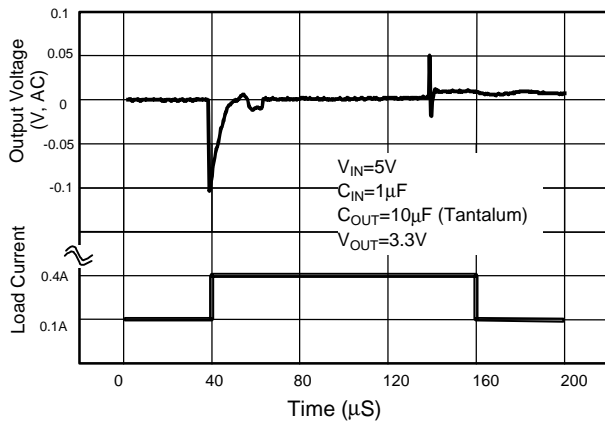
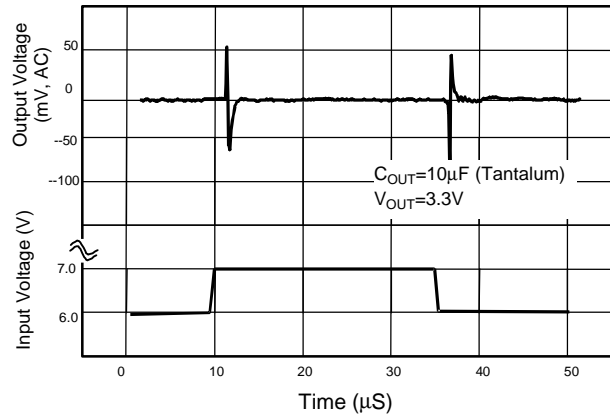
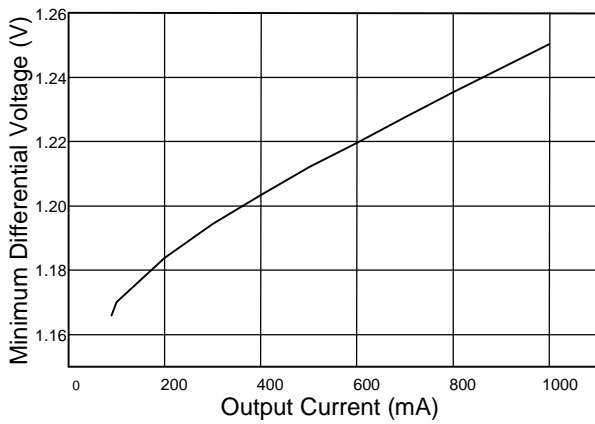
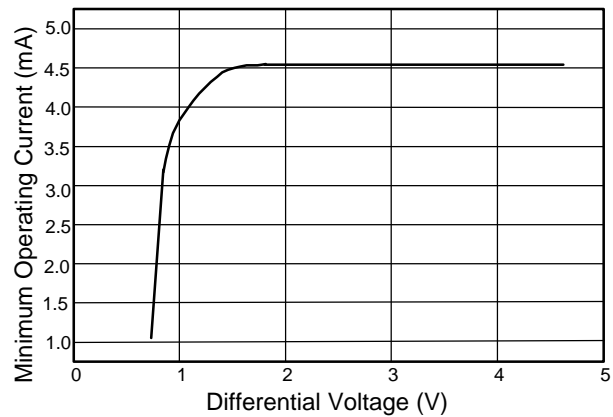
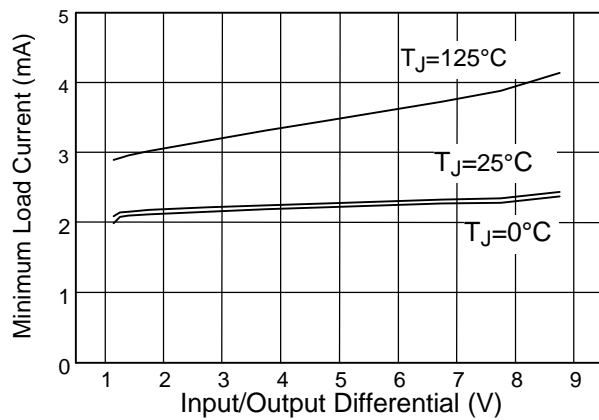
## ABSOLUTE MAXIMUM RATINGS

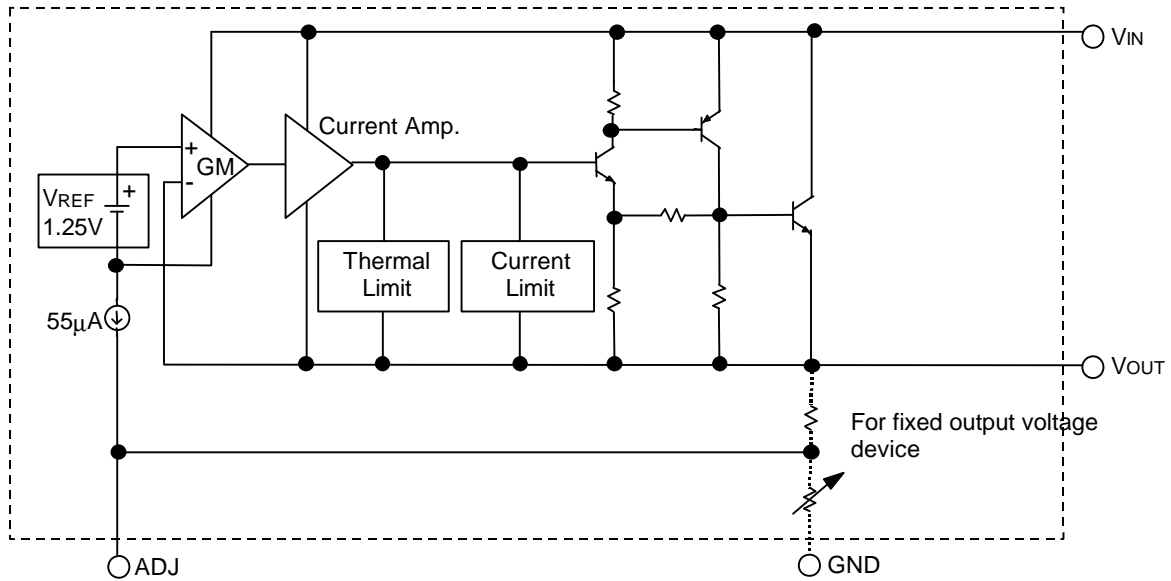
VIN pin to ADJ/GND pin	.....	7V
Operating junction temperature range	.....	0°C ~ 125°C
Power dissipation	.....	Internally Limited
Thermal resistance (junction to case)	TO-220 .....	3°C /W
	TO-263 .....	3°C /W
	SOT-223 .....	15°C /W
	TO-252 .....	12.5°C /W
Thermal resistance (junction to ambient)	TO-220 .....	50°C/W
(assuming no ambient airflow, no heatsink)	TO-263 .....	60°C/W
	SOT-223 .....	155°C/W
	TO-252 .....	100°C/W
Storage temperature range	.....	- 65°C ~ 150°C
Lead temperature (soldering) 10 sec.	.....	260°C

**ELECTRICAL CHARACTERISTICS**

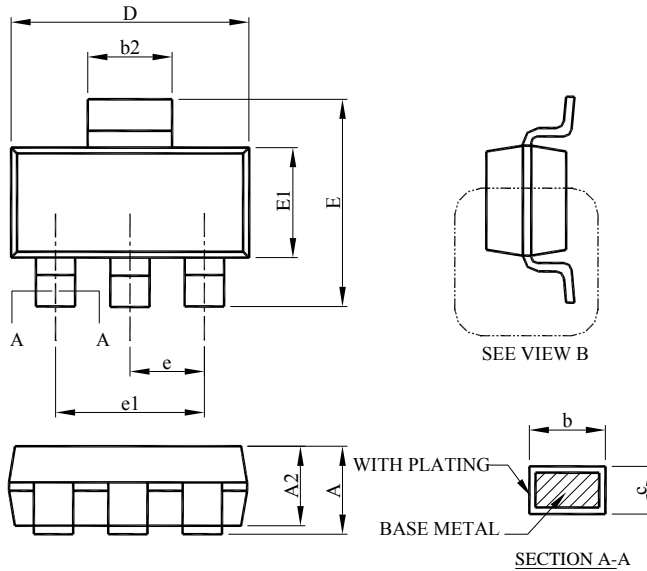
 ( $V_{IN}=5V$ ,  $T_J=25^{\circ}C$ ,  $I_O=10mA$ , unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference voltage	$T_J=25^{\circ}C$	1.238	1.25	1.262	V
	$0^{\circ}C \leq T_J \leq 125^{\circ}C$ $2.65V \leq V_{IN} \leq 7V$ $10mA \leq I_O \leq 1A$	1.225	1.25	1.275	
Output voltage	SS6117A-18G, $V_{IN}=3.3V$	1.78	1.80	1.82	V
	SS6117A-25G, $V_{IN}=5V$	2.47	2.50	2.53	
	SS6117A-28G, $V_{IN}=5V$	2.82	2.85	2.88	
	SS6117A-33G, $V_{IN}=5V$	3.26	3.30	3.33	
	SS6117A-50G, $V_{IN}=7V$	4.95	5.00	5.05	
	SS6117AG $0^{\circ}C \leq T_J \leq 125^{\circ}C$ $2.65V \leq V_{IN} \leq 7V$ $10mA \leq I_O \leq 1A$	$0.98V_{OUT}$	$V_{OUT}$	$1.02V_{OUT}$	
Line regulation	$2.65 \leq V_{IN} \leq 7V$ , $T_J=25^{\circ}C$		0.015	0.2	% $V_{OUT}$
	$0^{\circ}C \leq T_J \leq 125^{\circ}C$		0.035	0.2	
Load regulation	$T_J=25^{\circ}C$ , $I_O=10mA \sim 1A$		0.1	0.3	% $V_{OUT}$
	$0^{\circ}C \leq T_J \leq 125^{\circ}C$		0.2	0.4	
Dropout voltage	$\Delta V_{OUT}$ , $\Delta V_{REF}=1\%$ , $I_O=1A$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		1.3	1.5	V
Current limit	$0^{\circ}C \leq T_J \leq 125^{\circ}C$	1			A
Adjustable pin current ( $I_{ADJ}$ )	$2.65 \leq V_{IN} \leq 7V$ $10mA \leq I_O \leq 1A$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		55	120	$\mu A$
Adjustable pin current change ( $\Delta I_{ADJ}$ )	$2.65 \leq V_{IN} \leq 7V$ $10mA \leq I_O \leq 1A$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		0.2	5	$\mu A$
Temperature stability	$I_O=0.5A$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		0.5		% $V_{OUT}$
Minimum load current (Adj.)	$0^{\circ}C \leq T_J \leq 125^{\circ}C$		5	10	mA
Quiescent current (fixed outputs)	$0^{\circ}C \leq T_J \leq 125^{\circ}C$		10	14	mA
RMS output noise (% of $V_{OUT}$ )	$10Hz \leq f \leq 10KHz$		0.003		% $V_{OUT}$
Ripple rejection ratio	120Hz input ripple $C_{OUT}=25\mu F$	60	72		dB

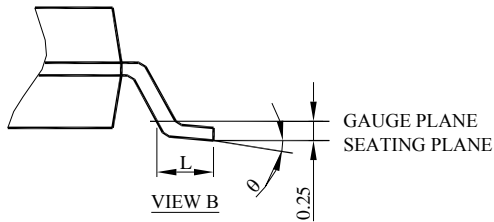
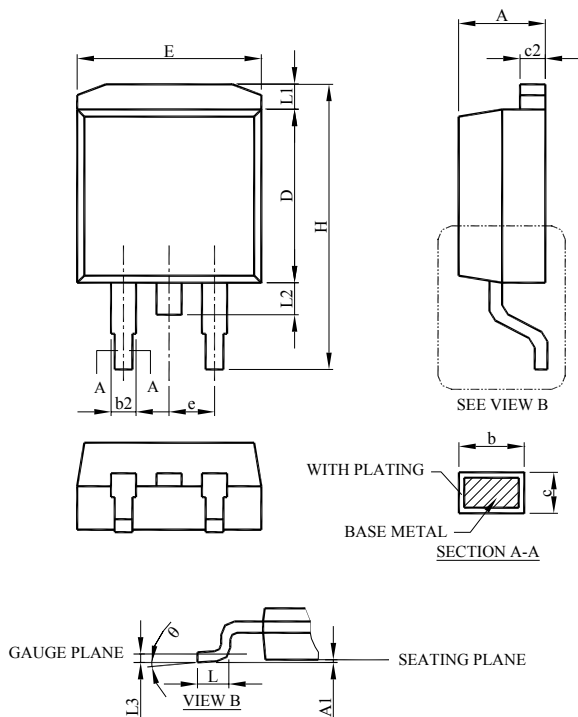
**TYPICAL PERFORMANCE CHARACTERISTICS**

**Fig. 1 Load Transient Response**

**Fig. 2 Line Transient Response**

**Fig. 3 Dropout Voltage ( $V_{OUT}=3.3V$ )**

**Fig. 4 Minimum Operating Current**

**Fig. 5 Minimum Load Current (Adjustable Version)**

**BLOCK DIAGRAM**

**PIN DESCRIPTIONS**

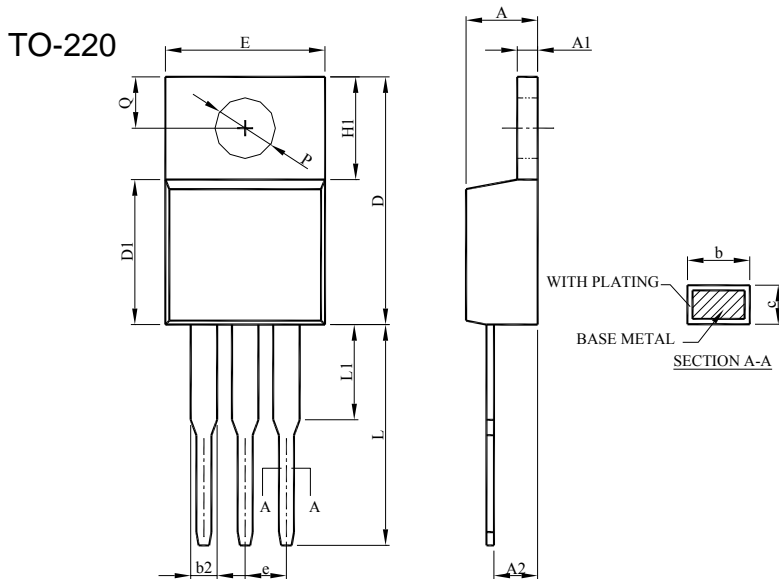
- ADJ - Providing  $V_{REF}=1.25V$  (typ.) for adjustable  $V_{OUT}$ .  $V_{REF}=V_{OUT}-V_{ADJ}$  and  $I_{ADJ}=55\mu A$  (typ.) (GND PIN- Power ground.)
- VOUT- Adjustable output voltage.
- VIN - Power input.

**PHYSICAL DIMENSIONS (unit: mm)**
**SOT-223**


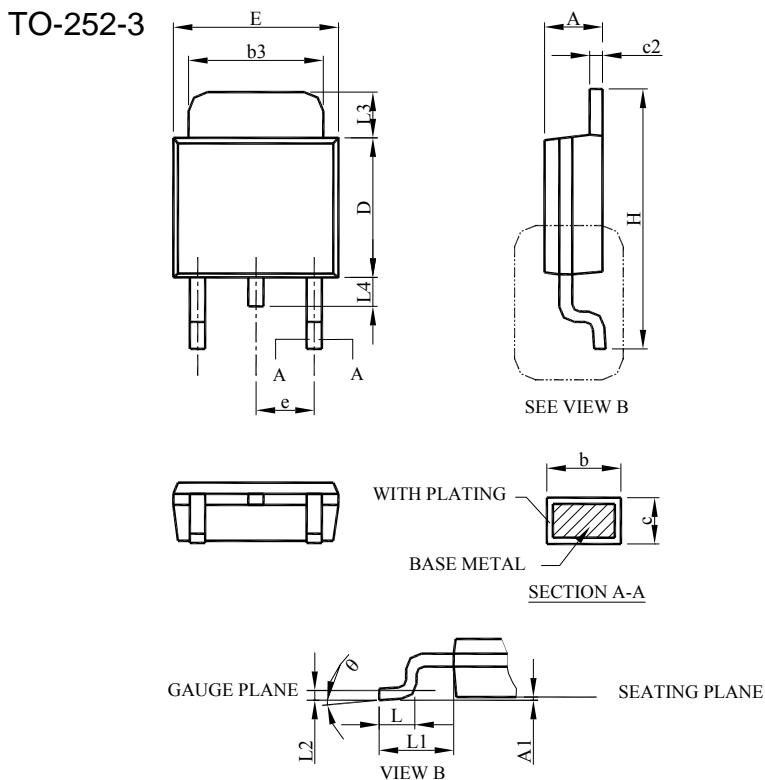
SYMBOL	SOT-223	
	MILLIMETERS	
	MIN.	MAX.
A		1.80
A1	0.02	0.10
A2	1.55	1.65
b	0.66	0.84
b2	2.90	3.10
c	0.23	0.33
D	6.30	6.70
E	6.70	7.30
E1	3.30	3.70
e	2.30 BSC	
e1	4.60 BSC	
L	0.90	
$\theta$	0°	8°


**TO-263-3**


SYMBOL	TO-263-3	
	MILLIMETERS	
	MIN.	MAX.
A	4.06	4.83
A1	0.00	0.25
b	0.51	0.99
b2	1.14	1.78
c	0.38	0.74
c2	1.14	1.65
D	8.38	9.65
E	9.65	10.67
e	2.54 BSC	
H	14.61	15.88
L	1.78	2.79
L1	--	1.68
L2	--	1.78
L3	0.25 BSC	
$\theta$	0°	8°

**PHYSICAL DIMENSIONS (unit: mm) (cont.)**


SYMBOL	TO-220	
	MILLIMETERS	
	MIN.	MAX.
A	3.56	4.82
A1	0.51	1.39
A2	2.04	2.92
b	0.38	1.01
b2	1.15	1.77
c	0.35	0.61
D	14.23	16.51
D1	8.38	9.02
E	9.66	10.66
e	2.54 BSC	
H1	5.85	6.85
L	12.70	14.73
L1	--	6.35
P	3.54	4.08
Q	2.54	3.42



SYMBOL	TO-252-3	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.64	0.89
b3	4.95	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
E	6.35	6.73
e	2.28 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
L4	--	1.02
θ	0°	8°

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