

5A Low-dropout Positive Linear Regulator

FEATURES

- Dropout voltage 1.3V at 5A output current.
- Fast transient response.
- Extremely tight line and load regulation.
- Current limiting and thermal protection.
- Adjustable output voltage or fixed at 1.5V, 1.8V, 2.5V, 3.3V.
- Standard 3-pin power packages.

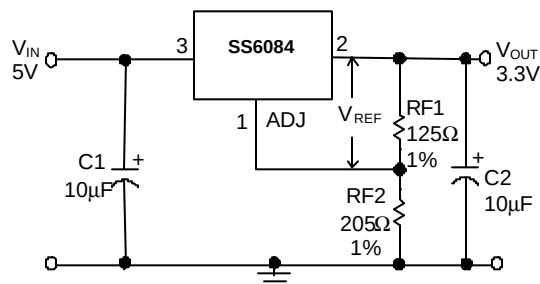
APPLICATIONS

- Motherboard I/O Power Supplies.
- Microprocessor Power Supplies.
- High-Current Regulators.
- Post-regulator for Switching Supplies.

DESCRIPTION

The SS6084 is a low-dropout three-terminal linear regulator with 5A output current capability. The output voltage is adjustable with a resistor divider or fixed at 1.5V, 1.8V, 2.5V or 3.3V. Dropout voltage is guaranteed to be a maximum of 1.4V at the maximum output current. This low dropout voltage and fast transient response make the SS6084 ideal for low-voltage microprocessor applications. Current and thermal limiting provide protection against overload conditions that would create excessive junction temperatures.

TYPICAL APPLICATION CIRCUIT



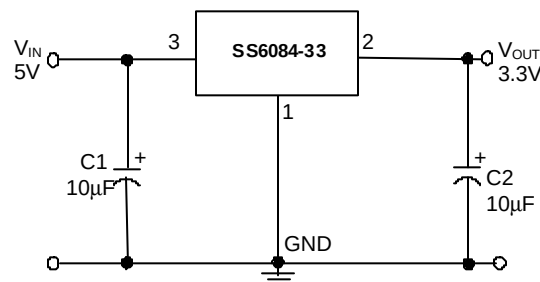
$$V_{REF} = V_{OUT} - V_{ADJ} = 1.25V \text{ (typ.)}$$

$$V_{OUT} = V_{REF} \times (1 + R_{F2}/R_{F1}) + I_{ADJ} \times R_{F2}$$

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

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

Adjustable Voltage Regulator



Fixed Voltage Regulator

ORDERING INFORMATION

SS6084-XXCXXX

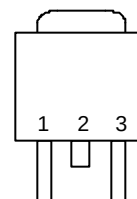
- └ Packing type
TB: tubes
TR: tape and reel
- └ Package type
E: TO-252
M: TO-263
T: TO-220
- └ Output voltage
Default: adjustable
15: 1.5V
18: 1.8V
25: 2.5V
33: 3.3V

Example: SS6084-15CETR
→ 1.5V fixed output in TO-252
shipped in tape and reel

PIN CONFIGURATION

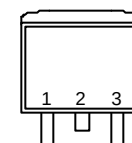
TO-252
TOP VIEW

1: ADJ (GND)
2: VOUT (TAB)
3: VIN



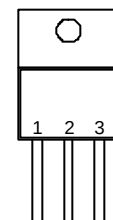
TO-263
TOP VIEW

1: ADJ (GND)
2: VOUT (TAB)
3: VIN



TO-220
FRONT VIEW

1: ADJ (GND)
2: VOUT (TAB)
3: VIN



ABSOLUTE MAXIMUM RATINGS

VIN pin to ADJ/GND pin	7V
Operating Junction Temperature Range	0°C~ 125°C
Storage Temperature Range	- 65°C ~ 150°C
Thermal Resistance Junction to Case TO-252	12.5°C/W
TO-263, TO-220	3°C /W
Thermal Resistance Junction to Ambient TO-252	100°C/W
(Assume no ambient airflow, no heatsink) TO-263	60°C /W
TO-220	50°C /W
Lead Temperature (Soldering) 10 sec.....	260°C

TEST CIRCUIT

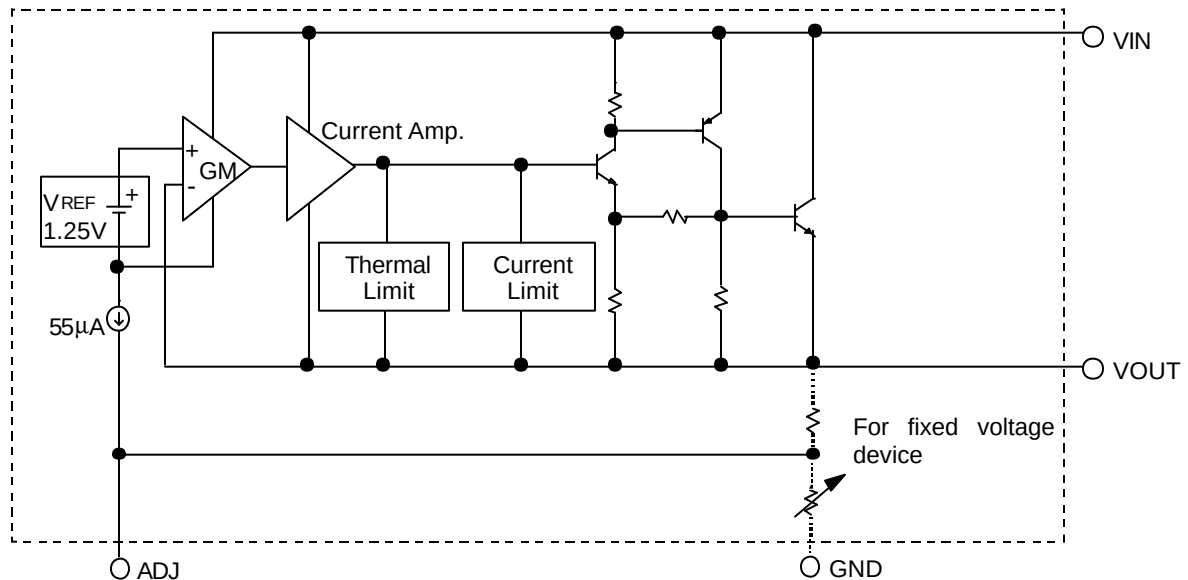
Refer to TYPICAL APPLICATION CIRCUIT.

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	SS6084 (ADJ) $T_J=25^{\circ}C$	1.238	1.25	1.262	V
Output Voltage	SS6084-15, $V_{IN}=5V$	1.48	1.50	1.52	V
	SS6084-18, $V_{IN}=5V$	1.78	1.80	1.82	
	SS6084-25, $V_{IN}=5V$	2.47	2.50	2.53	
	SS6084-33, $V_{IN}=5V$	3.26	3.30	3.34	
Line Regulation	ADJ : $2.65V \leq V_{IN} \leq 7V$ $V_{OUT}=1.25V$		0.015	0.2	%
	Fix : $V_{OUT}+1.4V \leq V_{IN} \leq 7V$ $T_J=25^{\circ}C$				
Load Regulation	$10mA < I_O < 5A$ $T_J=25^{\circ}C$			0.6	%
Dropout Voltage	$\Delta V_{OUT}, \Delta V_{REF}=1\%$ $10mA \leq I_O \leq 5A$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		1.3	1.4	V
Current Limit	$0^{\circ}C \leq T_J \leq 125^{\circ}C$	5	6		A
Adjusted Pin Current	$2.65V \leq V_{IN} \leq 7V$		55	120	μA
Adjusted Pin Current Change (ΔI_{ADJ})	$2.65V \leq V_{IN} \leq 7V$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		0.2	5	μA
Temperature Stability	$I_O=0.5A$ $0^{\circ}C \leq T_J \leq 125^{\circ}C$		0.5		%
Minimum Load Current	$0^{\circ}C \leq T_J \leq 125^{\circ}C$		5	10	mA
RMS Output Noise (% of V_{OUT})	$10Hz \leq f \leq 10KHz$		0.003		%
Ripple Rejection Ratio	120Hz input ripple $C_{OUT}=25\mu F$ $(V_{IN}-V_{OUT})=3V$	60	72		dB

BLOCK DIAGRAM



PIN DESCRIPTIONS

- ADJ PIN - 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 PIN - Adjustable output voltage.
- VIN PIN - Power Input.

TYPICAL PERFORMANCE CHARACTERISTICS

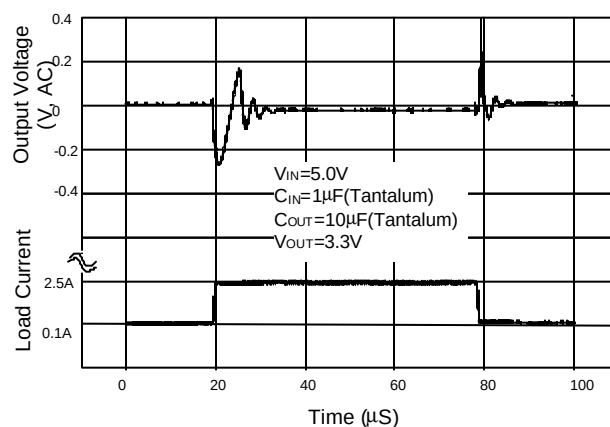


Fig. 1 Load Transient Response

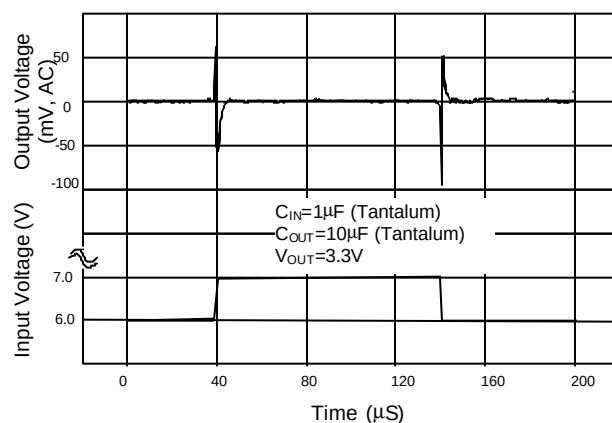


Fig. 2 Line Transient Response

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

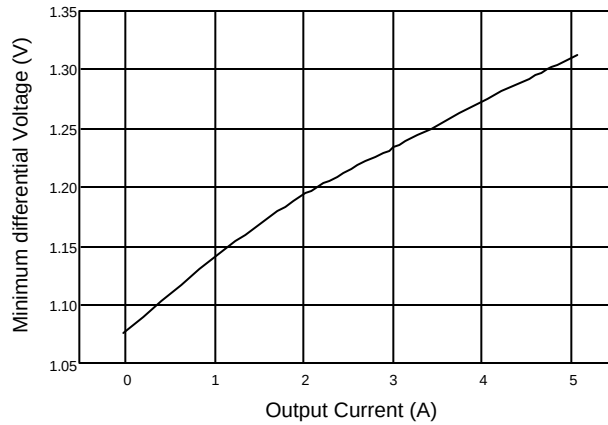


Fig. 3 Dropout Voltage ($V_{OUT}=3.3V$)

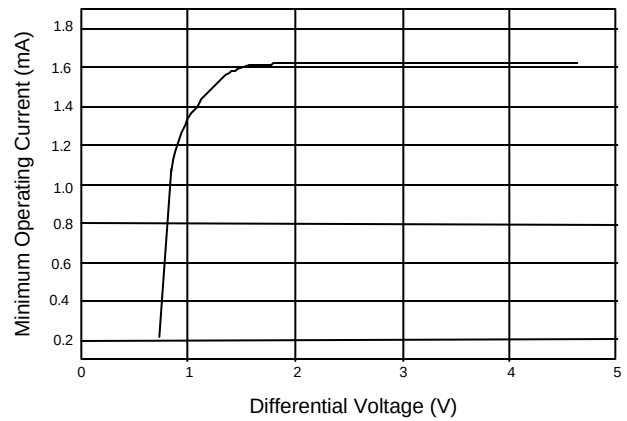


Fig. 4 Minimum Operating Current

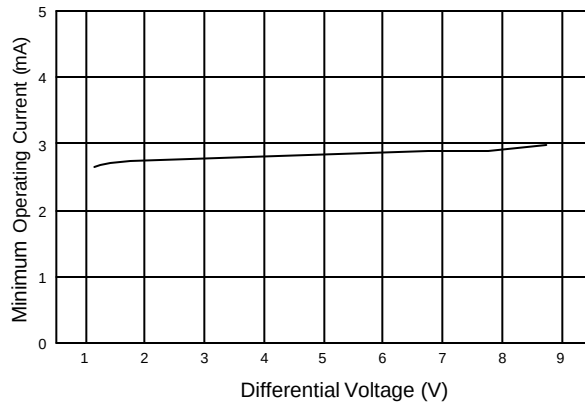


Fig. 5 Minimum Operating Current

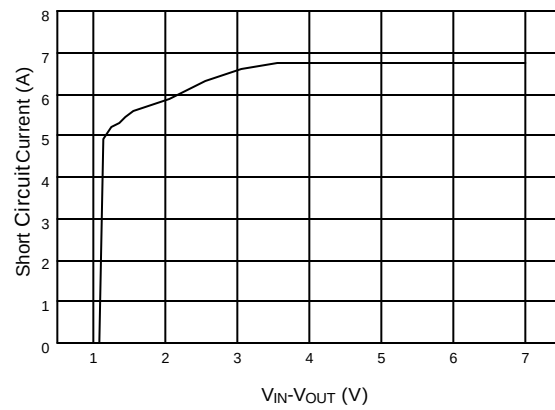


Fig. 6 SS6084 (ADJ.) Short Circuit Current

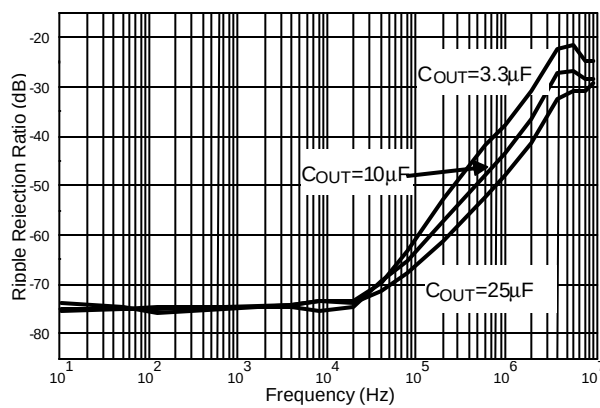
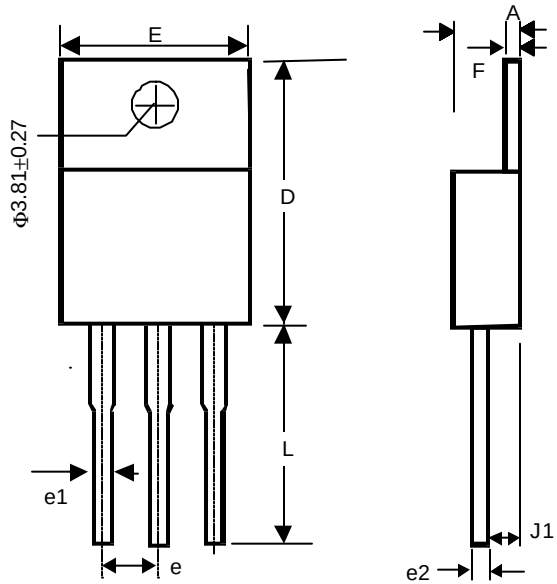


Fig. 7 SS6084 (ADJ.) Ripple Rejection

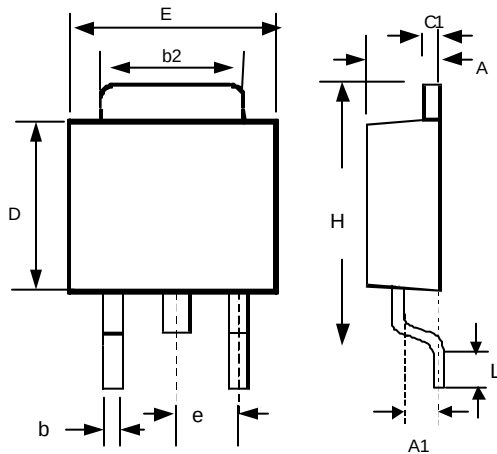
PHYSICAL DIMENSIONS

● TO-220 (unit: mm)



SYMBOL	MIN	MAX
A	3.56	4.82
D	14.23	16.51
E	9.66	10.66
e	2.29	2.79
e1	0.50	1.15
e2	-	1.10
F	0.51	1.39
J1	2.04	2.92
L	12.70	14.73

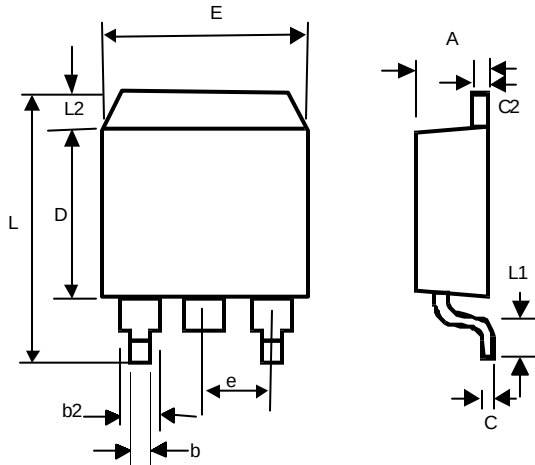
● TO-252 (unit: mm)



SYMBOL	MIN	MAX
A	2.19	2.38
A1	1.02	1.27
b	0.64	0.88
b2	5.21	5.46
C1	0.46	0.58
D	5.33	5.59
E	6.35	6.73
e	2.28 (TYP.)	
H	9.40	10.42
L	0.51	-

PHYSICAL DIMENSIONS (cont.)

- TO-263 (unit: mm)



SYMBOL	MIN	MAX
A	4.06	4.83
b	0.50	1.00
b2	1.14	1.40
C	-	0.7
c2	1.14	1.40
D	8.63	9.66
E	9.65	10.29
e	2.54 (TYP.)	
L	14.60	15.88
L1	2.28	2.80
L2	-	1.40

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