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.

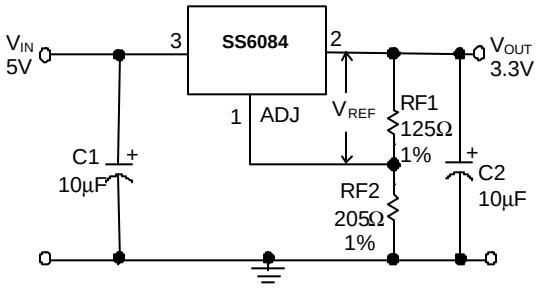
APPLICATIONS

- 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.

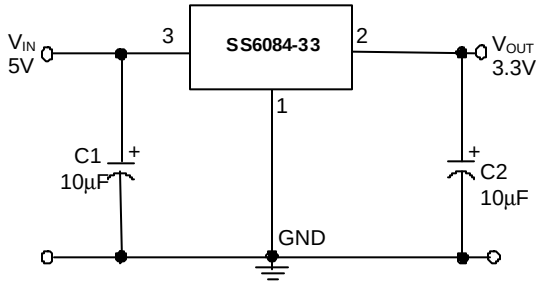
TYPICAL APPLICATION CIRCUIT



Adjustable Voltage Regulator

$V_{REF}=V_{OUT}$ $-V_{ADJ}=1.25V$ (typ.)
$V_{OUT}=V_{REF}$ x (1+RF2/RF1)+ I_{ADJ} x RF2
$I_{ADJ}=55\mu A$ (typ.)

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



Fixed Voltage Regulator

ORDERING INFORMATION

SS6084-XXCXXX

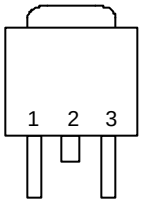
- Packing type
  - TB: tubes
  - TR: tape and reel
- Package type
  - E: TO-252
  - M: TO-263
  - T: TO-220
- Output voltage
  - Default: adjustable
  - 15: 1.5V
  - 18: 1.8V
  - 25: 2.5V
  - 33: 3.3V

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

PIN CONFIGURATION

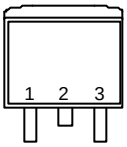
TO-252
TOP VIEW

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



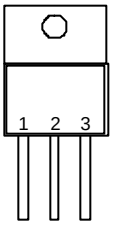
TO-263
TOP VIEW

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

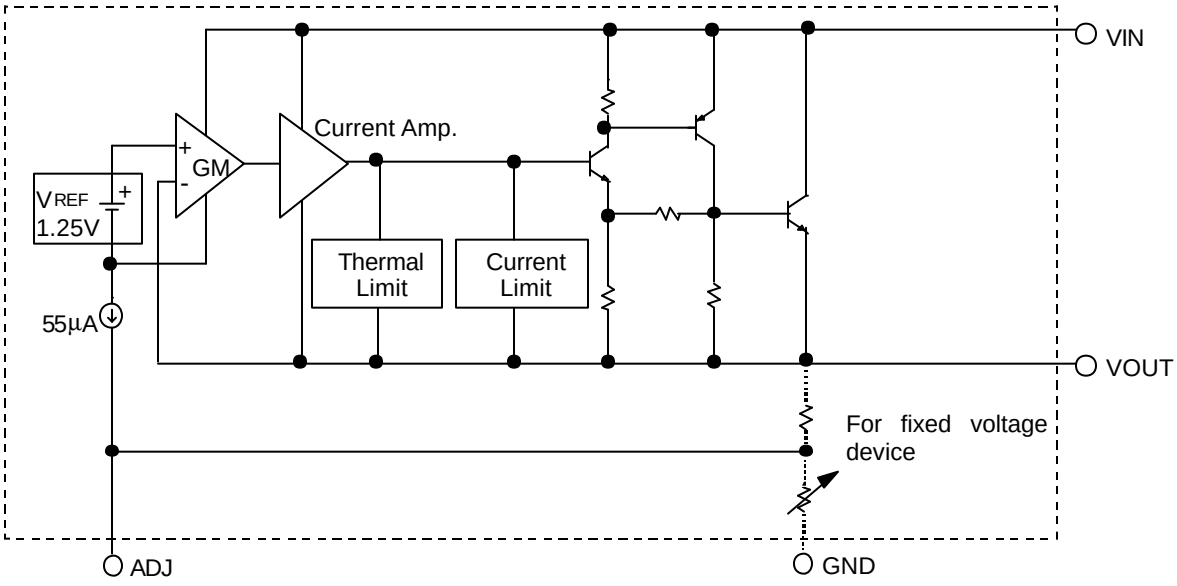
Refer to TYPICAL APPLICATION CIRCUIT.

ELECTRICAL CHARACTERISTICS

(V_{IN}=5V, T_J=25°C, I_O=10mA, unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	SS6084 (ADJ) T_J=25°C	1.238	1.25	1.262	V
Output Voltage	SS6084-15, V_{IN}=5V SS6084-18, V_{IN}=5V SS6084-25, V_{IN}=5V SS6084-33, V_{IN}=5V	1.48 1.78 2.47 3.26	1.50 1.80 2.50 3.30	1.52 1.82 2.53 3.34	V
Line Regulation	ADJ : 2.65V≤ V_{IN} ≤7V V_{OUT}=1.25V Fix : V_{OUT}+1.4V≤ V_{IN} ≤7V T_J=25°C		0.015	0.2	%
Load Regulation	10mA < I_O < 5A T_J=25°C			0.6	%
Dropout Voltage	ΔV_{OUT}, ΔV_{REF}=1% 10mA ≤ I_O ≤ 5A 0°C ≤T_J ≤125°C		1.3	1.4	V
Current Limit	0°C ≤ T_J ≤125°C	5	6		A
Adjusted Pin Current	2.65V ≤ V_{IN} ≤ 7V		55	120	µA
Adjusted Pin Current Change (ΔI_{ADJ})	2.65V ≤ V_{IN} ≤ 7V 0°C ≤T_J≤125°C		0.2	5	µA
Temperature Stability	I_O=0.5A 0°C ≤T_J≤125°C		0.5		%
Minimum Load Current	0°C ≤T_J ≤125°C		5	10	mA
RMS Output Noise (% of V_{OUT})	10Hz ≤ f ≤ 10KHz		0.003		%
Ripple Rejection Ratio	120Hz input ripple C_{OUT}=25µF (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}=55µA (typ.)

GND PIN- Power ground.

VOUT PIN - Adjustable output voltage.

VIN PIN - Power Input.

TYPICAL PERFORMANCE CHARACTERISTICS

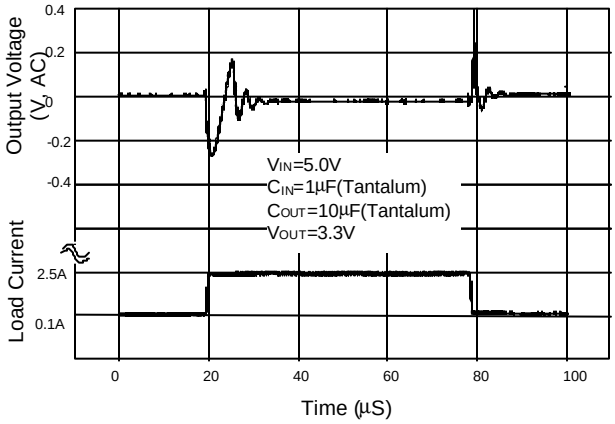


Fig. 1 Load Transient Response

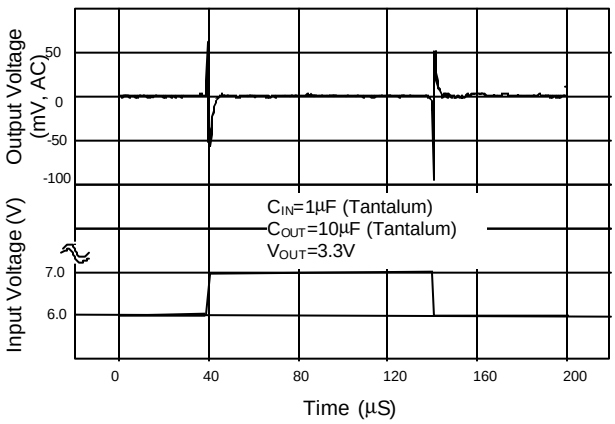


Fig. 2 Line Transient Response

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

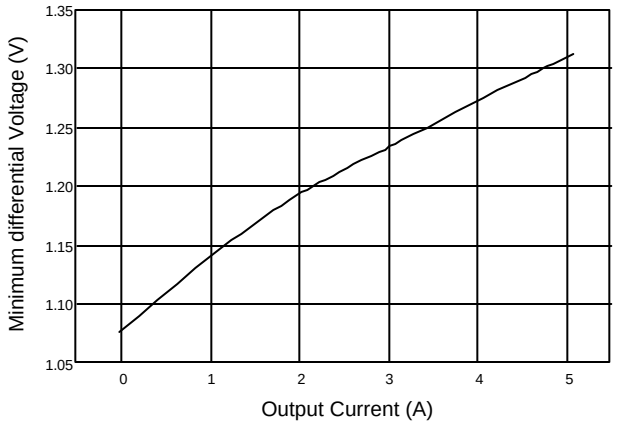


Fig. 3 Dropout Voltage (V_{OUT}=3.3V)

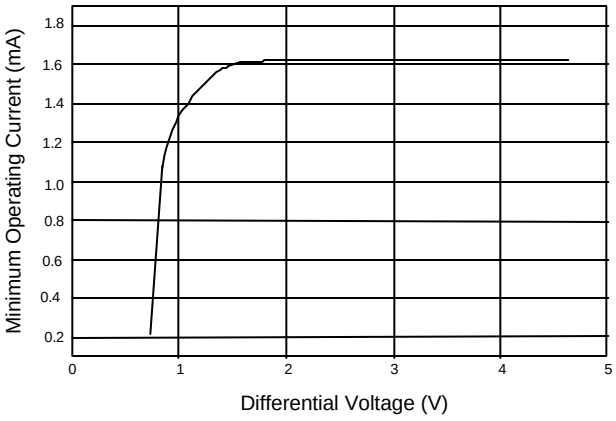


Fig. 4 Minimum Operating Current

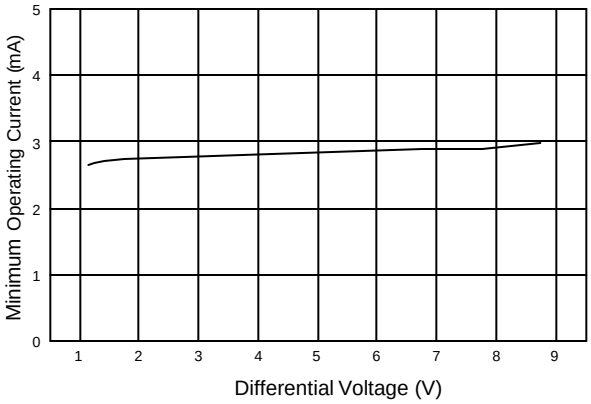


Fig. 5 Minimum Operating Current

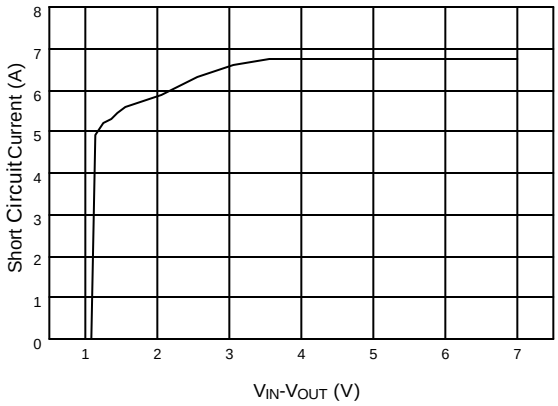


Fig. 6 SS6084 (ADJ.) Short Circuit Current

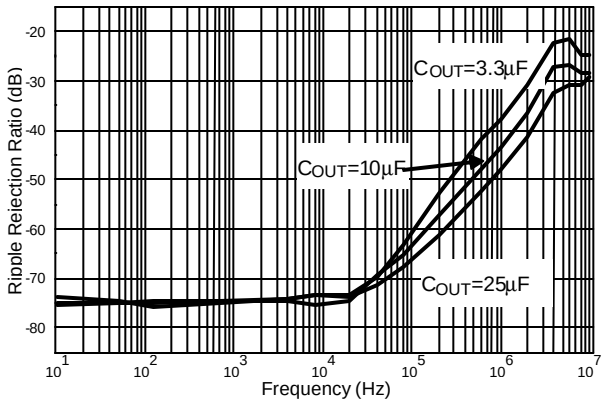
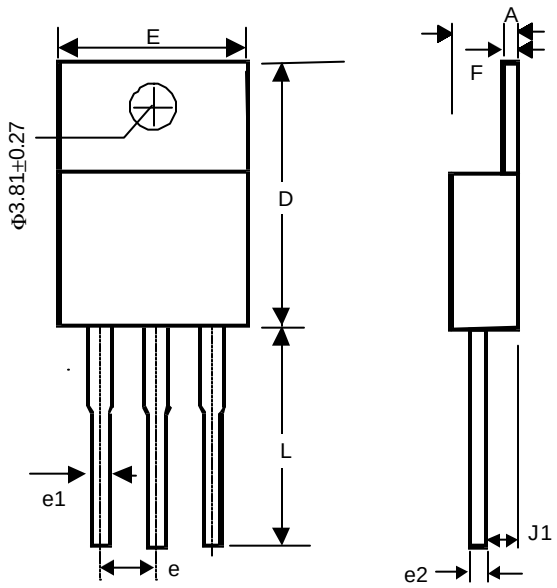


Fig. 7 SS6084 (ADJ.) Ripple Rejection

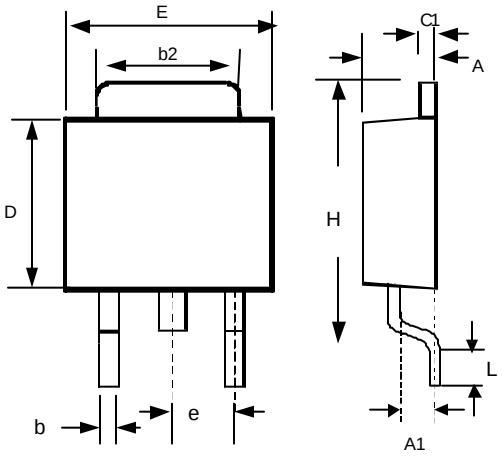
PHYSICAL DIMENSIONS

- **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

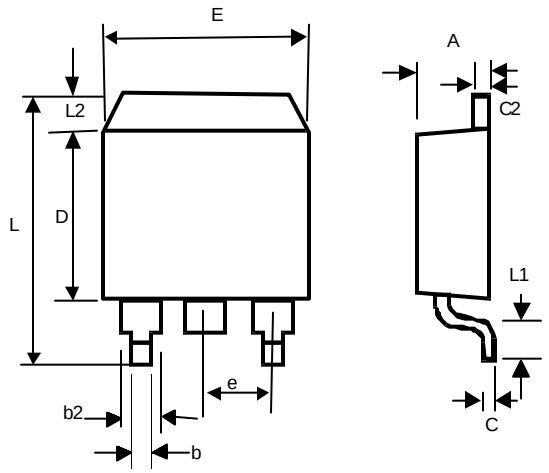
- **TO-252 (unit: mm)**



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