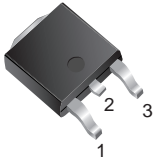


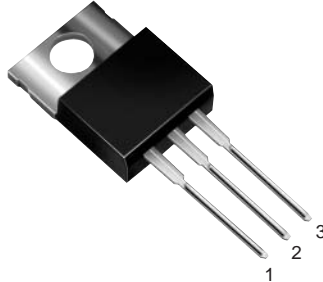
# 5A Low Dropout Positive Adjustable Regulator

TO-252  
(DPak)



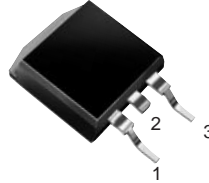
GS1084CE

TO-220AB



GS1084CT

TO-263AB  
(D<sup>2</sup>Pak)



GS1084CM

### Pin Definition

1. Adjust/Gnd.
2.  $V_{out}$  (tab)
3.  $V_{in}$

### Features

- Dropout Voltage 1.3V at 5A Output Current
- Fast Transient Response
- Line Regulation typically at 0.015%
- Load Regulation typically at 0.1%
- Internal thermal and current limiting
- Adjustable Output Voltage or Fixed 1.8V, 2.5V, 3.3V
- Standard 3-Pin Power Packages

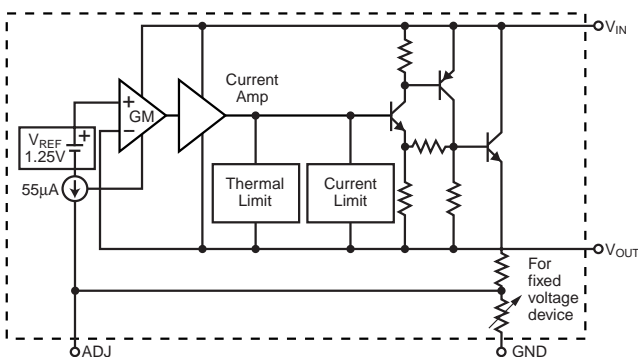
### Description

The GS1084 is a low dropout three terminal regulator with 5A output current capability. The output voltage is adjustable with the use of a resistor divider. For fixed output voltage versions, the output voltage is internally set at 1.8V, 2.5V, or 3.3V. Dropout is guaranteed at a maximum of 1.4V at maximum output current. Its low dropout voltage and fast transient response make it ideal for low voltage microprocessor applications. Internal current and thermal limiting provides protection against any overload condition that would create excessive junction temperatures.

### Applications

- Post Regulator for Switching Supply
- Microprocessor Power Supplies
- Constant-Current Regulators
- Motherboard I/O Power Supplies

### Functional Block Diagram



### Mechanical Data

Case: TO-220AB, TO-263AB (D<sup>2</sup>PAK), TO-252 (DPAK)

High temperature soldering guaranteed:  
260°C/10 seconds at terminals

Case outlines are on the back page



**Maximum Ratings and Thermal Characteristics** (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Vin Pin to ADJ/GND Pin	V <sub>in</sub>	7	V
Thermal Resistance – Junction to Case	R <sub>θJC</sub>	3.0 8.0 3.0	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	0 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-65 to 150	°C

**Electrical Characteristics** <sup>(1)</sup> T<sub>J</sub> = 25°C <sup>(2)</sup> V<sub>IN</sub> = 5V, I<sub>o</sub> = 10mA unless otherwise noted.

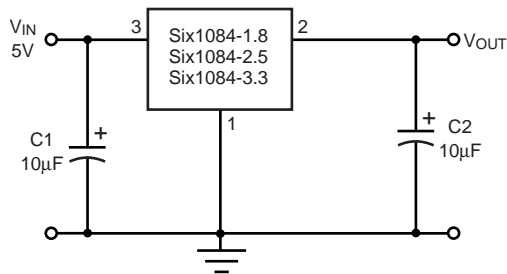
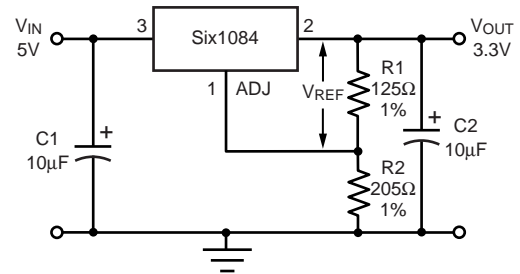
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Voltage	V <sub>REF</sub>	T <sub>J</sub> = 25°C 0°C ≤ T <sub>J</sub> ≤ 125°C 2.65V ≤ V <sub>IN</sub> ≤ 7V 10mA ≤ I <sub>o</sub> ≤ 5A	1.238 1.225	1.250 1.250	1.262 1.275	V
Output Voltage	V <sub>OUT</sub>	GS1084-1.8 V <sub>IN</sub> = 5V GS1084-2.5 V <sub>IN</sub> = 5V GS1084-3.3 V <sub>IN</sub> = 7V GS1084 0°C ≤ T <sub>J</sub> ≤ 125°C 2.65V ≤ V <sub>IN</sub> ≤ 7V 10mA ≤ I <sub>o</sub> ≤ 5A	1.78 2.47 3.26 0.98V <sub>N</sub>	1.8 2.5 3.3 V <sub>N</sub>	1.82 2.53 3.33 1.02V <sub>N</sub>	V
Line Regulation	REG <sub>line</sub>	2.65V ≤ V <sub>IN</sub> ≤ 7V T <sub>J</sub> = 25°C 0°C ≤ T <sub>J</sub> ≤ 125°C		0.015 0.035	0.2 0.2	% V <sub>O</sub>
Load Regulation	REG <sub>load</sub>	10mA ≤ I <sub>o</sub> ≤ 5A T <sub>J</sub> = 25°C 0°C ≤ T <sub>J</sub> ≤ 125°C		0.1 0.2	0.3 0.4	% V <sub>O</sub>
Dropout Voltage	V <sub>DROP</sub>	0°C ≤ T <sub>J</sub> ≤ 125°C I <sub>o</sub> = 5A I <sub>o</sub> = 3A I <sub>o</sub> = 1A		1.3 1.23 1.15	1.4 1.32 1.25	V
Output Current	I <sub>o</sub>	0°C ≤ T <sub>J</sub> ≤ 125°C	5.0	6.0	–	A
Adjust Pin Current	I <sub>adj</sub>	2.65 ≤ V <sub>in</sub> ≤ 7V 10mA ≤ I <sub>o</sub> ≤ 5A 0°C ≤ T <sub>J</sub> ≤ 125°C	–	55	120	μA
Adjust Pin Current Change	ΔI <sub>adj</sub>	2.65 ≤ V <sub>in</sub> ≤ 7V 10mA ≤ I <sub>o</sub> ≤ 5A 0°C ≤ T <sub>J</sub> ≤ 125°C	–	0.2	5	μA
Temperature Stability	T <sub>S</sub>	I <sub>o</sub> = 0.5A, 0°C ≤ T <sub>J</sub> ≤ 125°C	–	0.8	–	%V <sub>O</sub>
Min. Load Current Adjustable Version	IL <sub>MIN</sub>	0°C ≤ T <sub>J</sub> ≤ 125°C	–	3	10	mA

**Electrical Characteristics (con't.)**<sup>(1)</sup>  $T_J = 25^\circ\text{C}$ <sup>(2)</sup>,  $V_{IN} = 5\text{V}$ ,  $I_O = 10\text{mA}$  unless otherwise noted.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Current Fixed Voltage Version	$I_Q$	$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$	–	10	14	mA
RMS Output Noise	N	$10\text{Hz} \leq f \leq 10\text{kHz}$	–	0.003	–	% $V_O$
Ripple Rejection Ratio	RR	$f = 120\text{Hz}$ , $C_O = 25\mu\text{F}$ $C_{\text{adj}} = 25\mu\text{F}$	60	68	–	dB
Thermal Regulation	$R_{TH}$	$T_A = 25^\circ\text{C}$ , 30ms Pulse	–	0.02	0.05	%/W
Long Term Stability		$T_A = 125^\circ\text{C}$ , 1000 Hrs	–	0.3	–	% $V_O$

**Notes:**

- (1) All parameters, except nominal output voltage are specified for the variable voltage version, allowing a wider  $V_{IN}$  Range. The specified limits also apply for the fixed voltage versions over the allowable input voltage range: GS1084-1.8 (3.2V - 7.0V), GS1084-2.5 (3.9V - 7.0V), GS1084-3.3 (4.75V - 7.0V).
- (2) To maintain the specified junction temperatures, low duty cycle pulse testing is required for most parameters.

**Typical Application Circuit**

**Fixed Voltage Regulator**

**Adjustable Voltage Regulator**
**Notes:**

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

$$V_{OUT} = V_{REF} \times (1 + R_2/R_1) + I_{ADJ} \times R_2$$

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

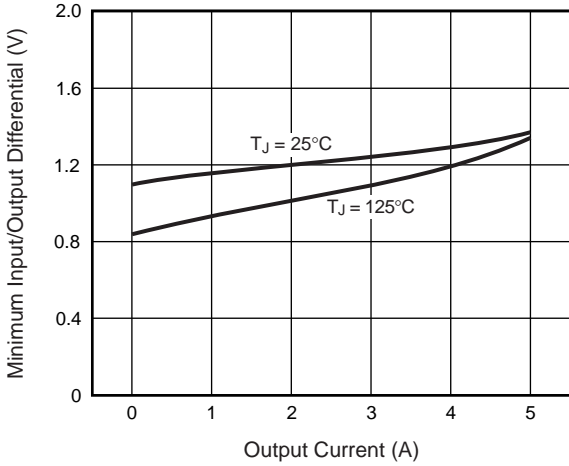
(1) C1 needed if device is far away from filter capacitors

(2) C2 required for stability

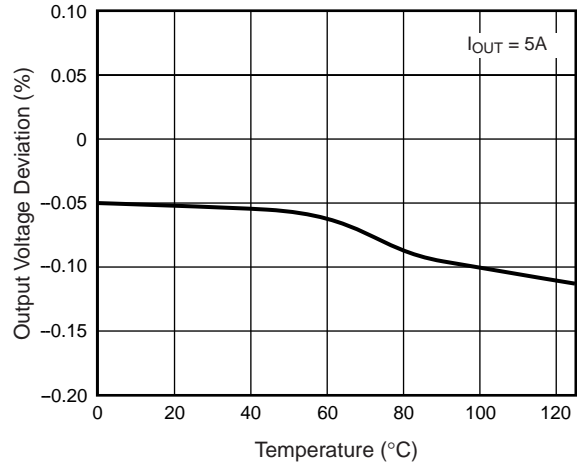
Vishay  
formerly General Semiconductor

**Ratings and Characteristic Curves** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

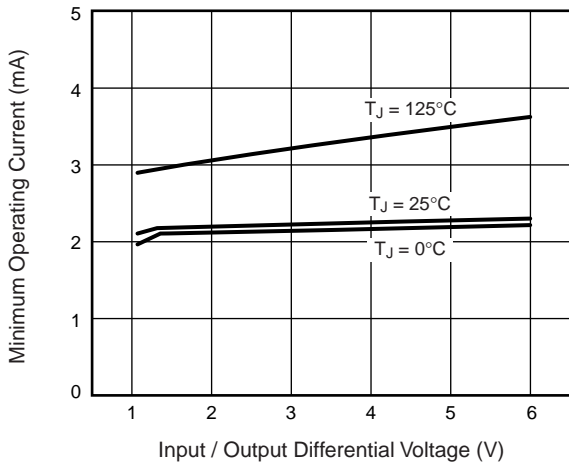
**Fig. 1 – Dropout Voltage vs. Output Current**



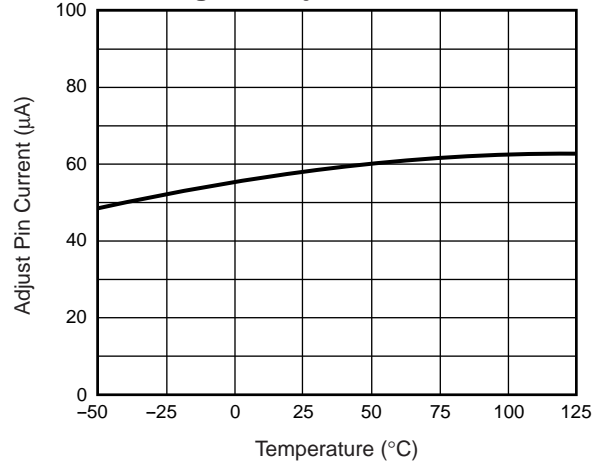
**Fig. 2 – Load Regulation vs. Temperature**



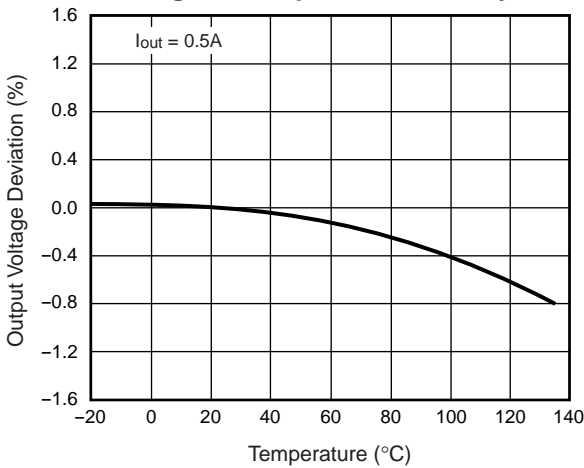
**Fig. 3 – Minimum Load Current (Adjustable Version)**



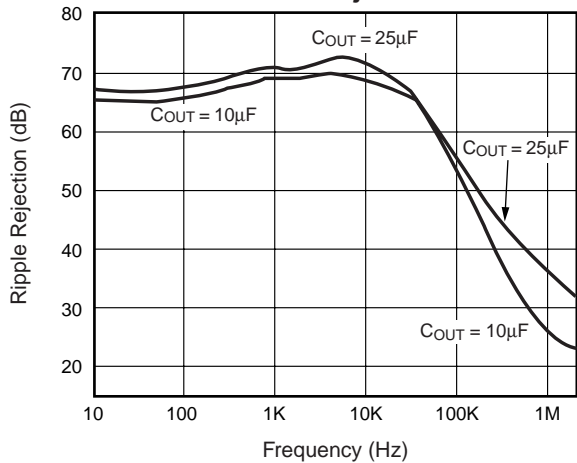
**Fig. 4 – Adjust Pin Current**



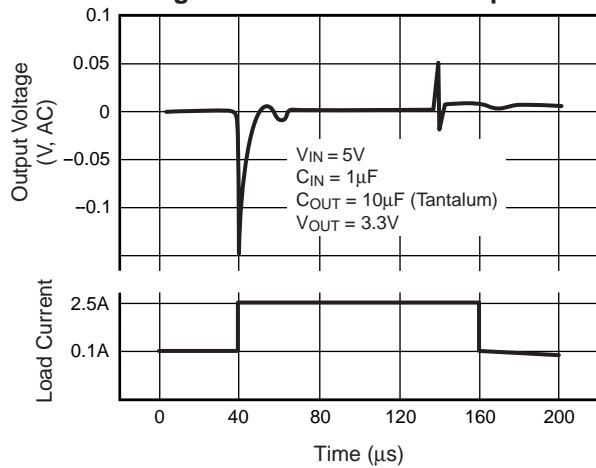
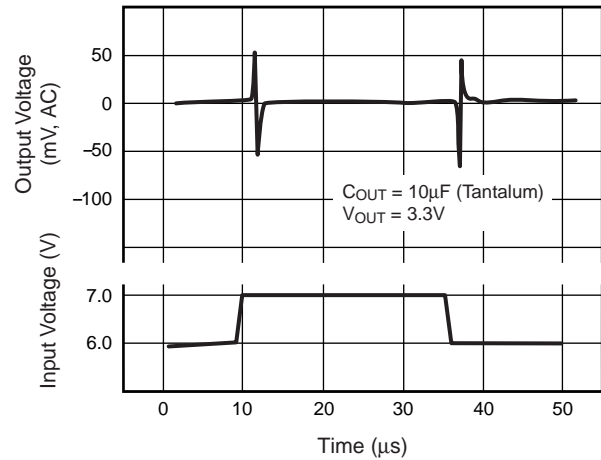
**Fig. 5 – Temperature Stability**



**Fig. 6 – Ripple Rejection (with  $C_{adj} 25\mu\text{F}$ )**



**Ratings and Characteristic Curves** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

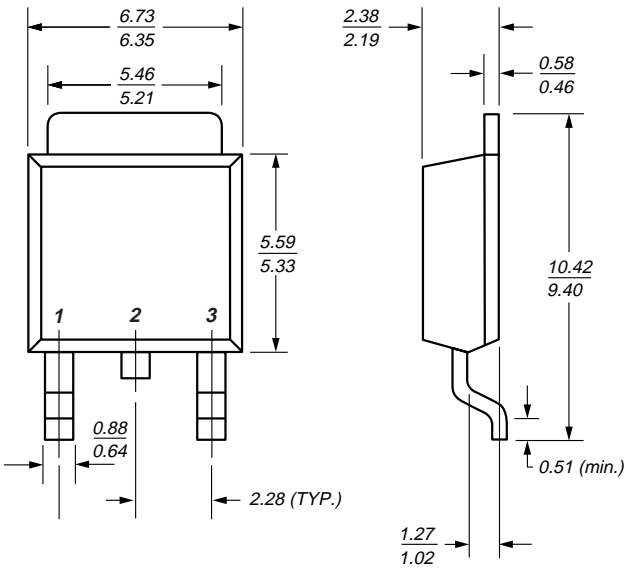
**Fig. 7 – Load Transient Response**

**Fig. 8 – Line Transient Response**

**Ordering Information**
**GS1084Cxx xxx**

 Output Voltage  
 Default: Adj.  
 1.8: 1.8V  
 2.5: 2.5V  
 3.3: 3.3V

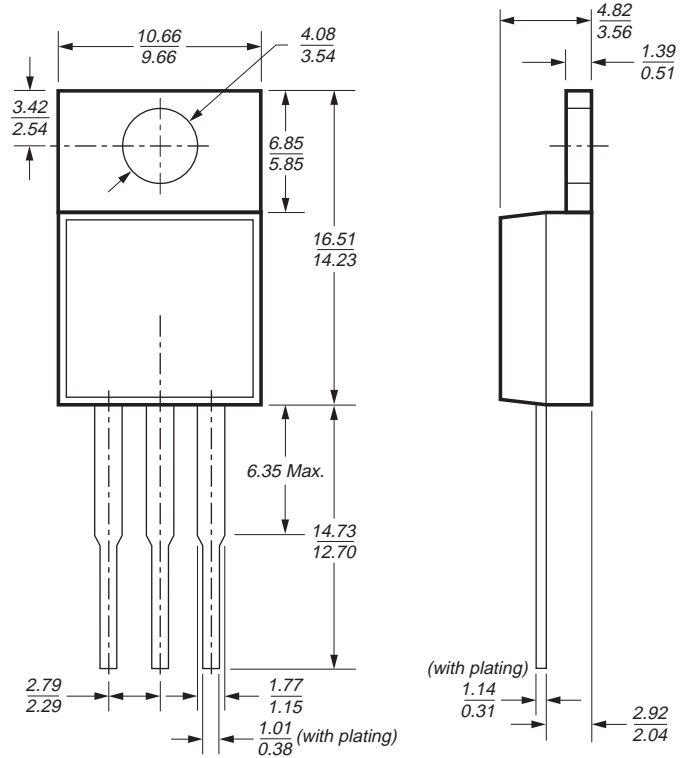
 Package Type  
 T: TO-220  
 M: TO-263  
 E: TO-252

**Case Outlines**

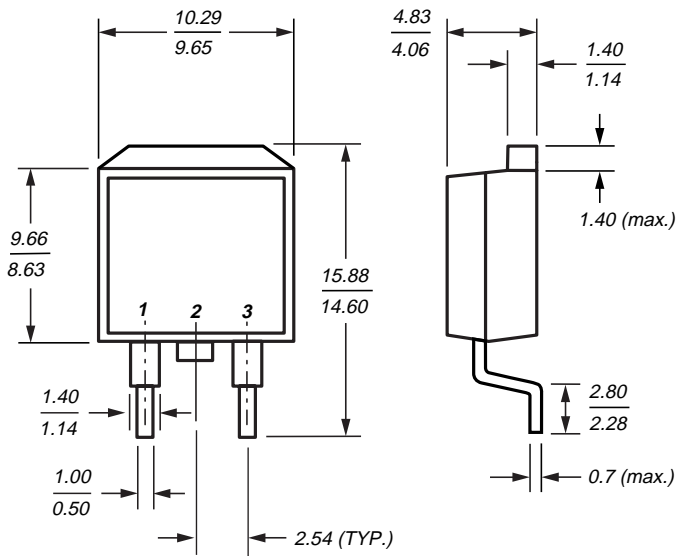
**TO-252 (DPAK)**



**TO-220 Case Outline**



**TO-263 Case Outline**



Dimensions in millimeters