



LT1805 3.0A LOW DROPOUT POSITIVE REGULATOR

Features:

- Output Current - 3A
- Maximum Input Voltage – 12V
- Adjustable Output Voltage or Fixed
- 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5V
- Current Limiting and Thermal Protection
- Standard 3-Pin Power Packages

Applications:

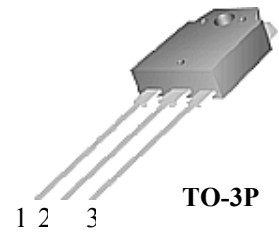
- Post Regulator for Switching DC/DC Converter
- High Efficiency Linear Regulators
- Battery Charger

Operating Ratings:

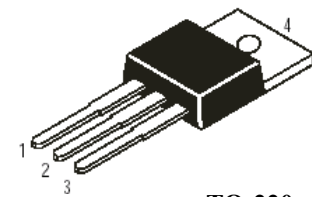
Junction Temperature Range: -10°C to 125°C

Ordering Information:

Parameter Number	Package
LT1084	TO-3P
LT1084T	TO-220
LT1084D	TO-252

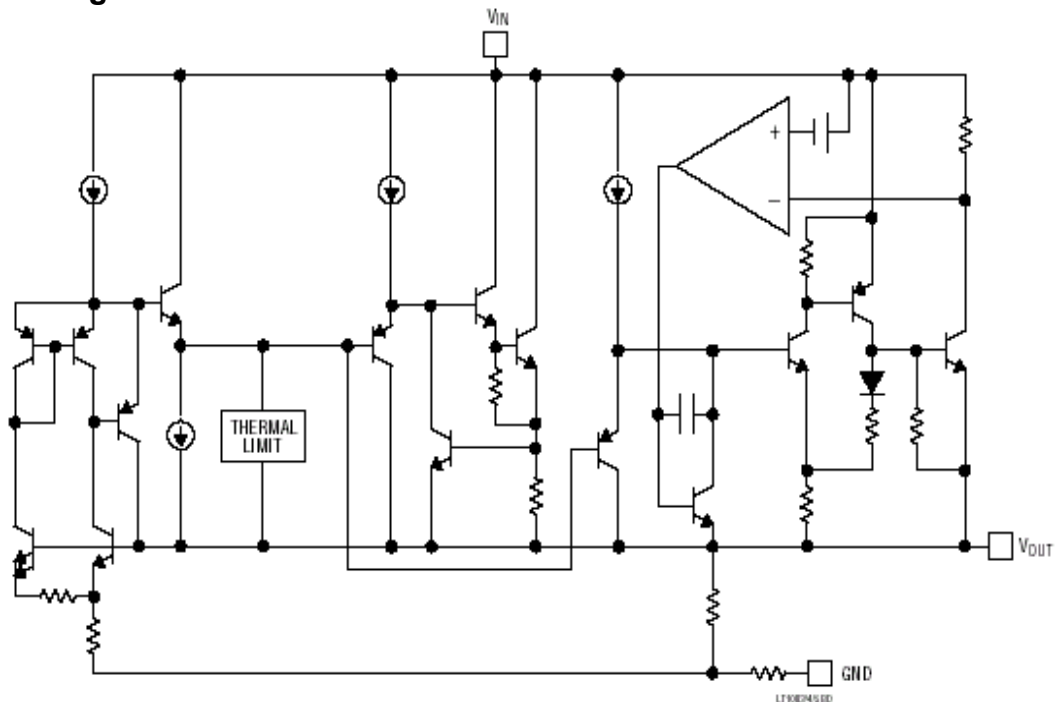


PIN 1: GND
PIN 2: Vout
PIN 3: Vin



Pin1: Gnd
Pin2:Vout
Pin3: Vin

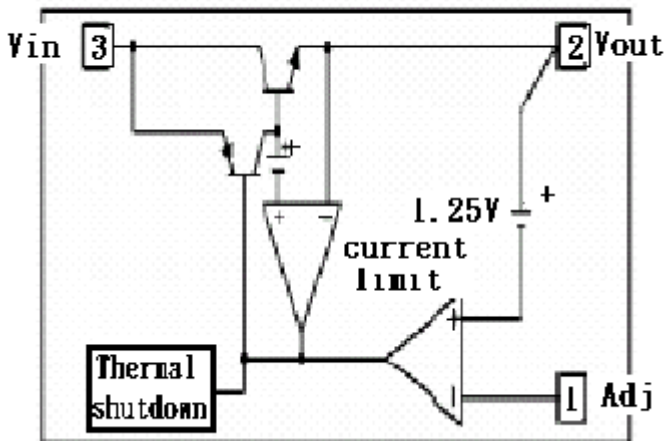
Block Diagram



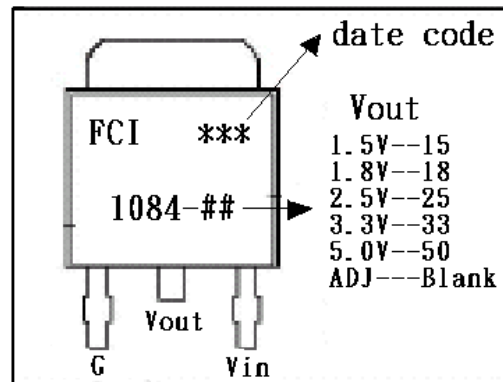


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Block Diagram



Marking



Pin Descriptions

Name	I/O	PIN#	FUNCTION
Adj (GND)		1	Adjustable (Ground only for fixed mode)
Vout	O	2	The output of the regulator. A minimum of 10 uF capacitor must be connected from this pin to ground to insure stability.
Vin	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 minimum dropout voltage during the load transient response. This pin must always be 1.4V higher than Vout in order for the device to regulate properly.

Functional Description

Introduction

The **LT1084** adjustable Low Dropout (LDO) regulator is a 3 terminal device that can easily be programmed with the addition of two external resistors to any voltages within the range of 1.25V to 2.5V. The **LT1084** only needs 1.4V differential between Vin and Vout to maintain output regulation, the output voltage tolerances are also extremely tight and they include the transient response as part of the specification. For example, Intel VRE specification calls for a total of +/-100mV including initial tolerance, load regulation and 0 to 5.0A load step. The **LT1084** is specifically designed to meet the fast current transient needs as well as providing an accurate initial voltage, reducing the overall system cost with the need for fewer output capacitors.

Output Voltage Setting

The **LT1084** can be programmed to ANY VOLTAGES IN THE RANGE OF 1.25V TO 5V with the addition of R1 and R2 external resistors According to the following formula:

The **LT1084** keeps a constant 1.25V between the output pin and the adjust pin. By placing a resistor R1 across these two pins a constant current flows through R1, adding to the Iadj current requirement of the **LT1084** IS 10mA, R1 is typically selected to be 121Ω resistor so that it automatically satisfies the minimum current requirement. Notice that since Iadj is typically in the range of 55uA it only adds a small error to the output voltage and should only be considered when a very precise output voltage setting is required. For example, in a typical 3.3V application where R1=121Ω and R2=200Ω the error due to Iadj is only 0.3% of the nominal set point.

Load Regulation

Since the **LT1084** is only a 3 terminal device, it is not possible to provide true remote sensing of the output voltage at the load.

The best load Regulation is achieved when the bottom side of R2 is connected to the load and the top-side of R1 resistor is connected directly to the case or the Vout pin of the regulator and not to the load. It is important to note that for high current applications, this can re-present a significant percentage of the overall load regulation and one must keep the path from the regulator to the load as short as possible to minimize this effect.

Stability

The **LT1084** requires the use of an output capacitor as part of the frequency compensation in order to make the regulator stable. For most applications a minimum of 10uF aluminum electrolytic capacitor insures both stability and good transient response.

Thermal Design

The **LT1084** incorporates an internal shutdown that protects the device when the junction temperature exceeds the maximum allowable junction temperatures. Although this device can operate with junction temperatures in the range of 150°C, it is recommended that the selected heat sink be chosen such that during maximum continuous load operation the junction temperature is kept below the temperature.

Layout Consideration

The output capacitors must be located as close to the Vout terminal of the device as possible. It is recommended to use a section of a layer of the PC board as a plane to connect the Vout pin to the output capacitors to prevent any high frequency oscillation that may result due to excessive trace inductance.



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Performance Characteristics

