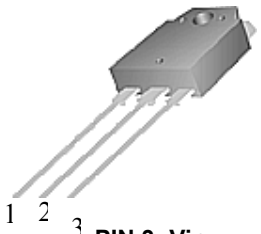
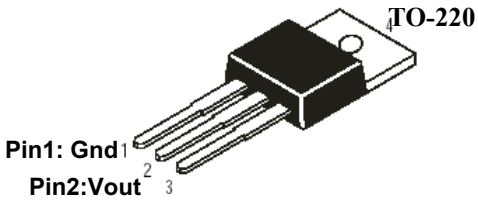
LT1085 3.0A LOW DROPOUT POSITIVE REGULATOR



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:

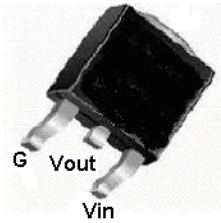
Post Regulator for Switching DC/DC Converter
High Efficiency Liner Regulators
Battery Charger

Operating Ratings:

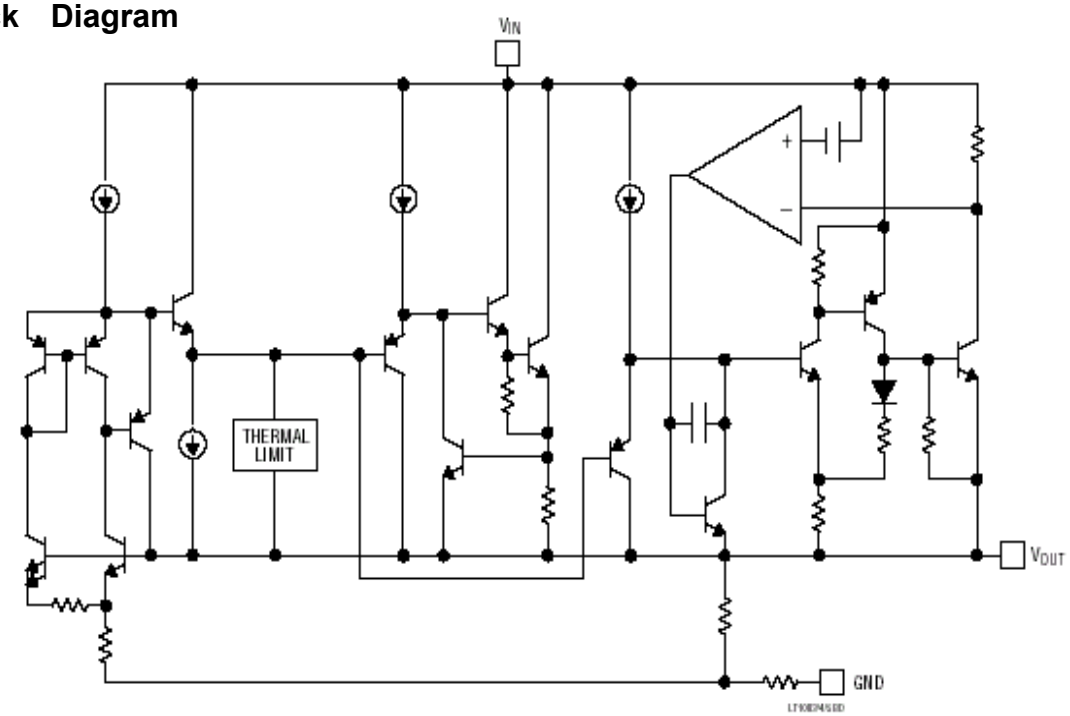
Junction Temperature Range: -10°C to 125°C

Ordering Information:

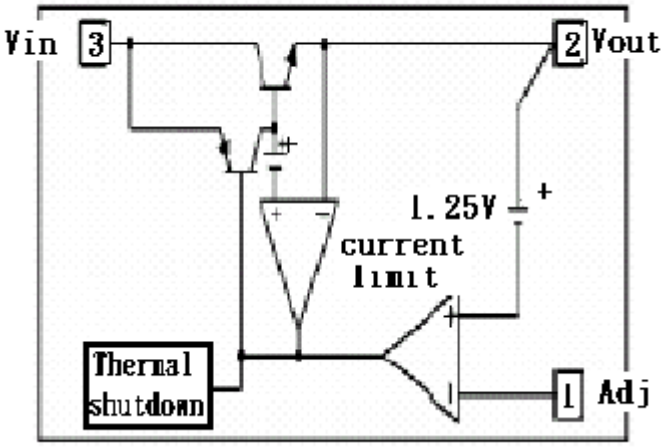
Parameter Number	Package
LT1085	TO-3P
LT1085T	TO-220
LT1085D	TO-252

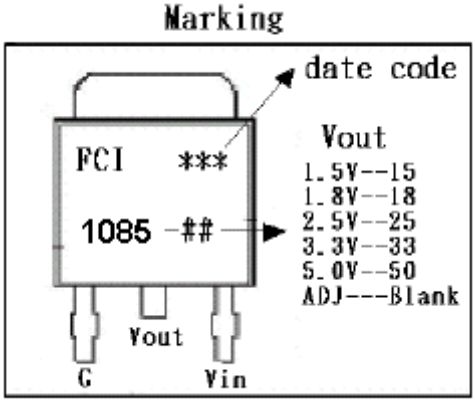


Block Diagram



Block Diagram





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 10uF 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.

Absolute Maximum Ratings

Symbol	Parameter	Ratings	Unit
V_{in}	DC Supply Voltage	-0.3 to 12	V
P_D	Power Dissipation	Internally Limited	
T_{ST}	Storage Temperature	-65 ~ +150	℃
T_{OP}	Operating Junction Temperature Range	0 ~ +150	℃

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Electrical Characteristics:

Typicals and limits appearing in normal type apply for Tj=25℃.

Limits appearing in Boldface type apply over the entire junction temperature range for operation

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vref	**Reference Voltage**	**Io=10mA, Tj=25C, (Vin-Vout)=1.5V**	**1.225**	**1.250**	**1.275**	**V**
Ripple rejection	F=120Hz, Cout=25uF,	Tantalum, Io=3A, Vin=Vout+3A		60	70	dB
Line Regu	LT1085-xxx	I_O =10mA,Vout+1.5V<Vin<12V,Tj=25C	-	-	0.2	%
Load Regu	LT1085-Adj	Vin=3.3, 0mA<Io<3A. Tj=25C Note 1, 2	-	-	1.0	
Output Regu	LT1085-1.5	I_O=10mA,Tj=25C, 3V<Vin<12V	1.470	1.500	1.530	V
Load Regu		Vin=3.0V, 0mA<Io<3A. Tj=25C Note 1, 2		12	15	mV
Output Regu	LT1085-1.8	I_O=10mA,Tj=25C,3.3V<Vin<12V	1.764	1.800	1.836	V
Load Regu		Vin=3.3V, 0mA<Io<3A. Tj=25C Note 1, 2		15	18	mV
Output Regu	LT1085-2.5	I_O=10mA,Tj=25C, 4V<Vin<12V	2.450	2.500	2.55	V
Load Regu		Vin=4.0V, 0mA<Io<3A. Tj=25C Note 1, 2		20	25	mV
Output Regu	LT1085-3.3	I_O=10mA,Tj=25C, 4.8V<Vin<12V	3.235	3.3	3.365	V
Load Regu		Vin=5.0V, 0mA<Io<3A. Tj=25C Note 1, 2		26	33	mV
Output Regu	LT1085-5.0	I_O=10mA,Tj=25C, 6.5V<Vin<12V	4.9	5.0	5.10	V
Load Regu		Vin=8.0V, 0mA<Io<3A. Tj=25C Note 1, 2		40	50	mV
	Dropout Voltage	Io=3.0A(△Vout=1% Vout)	-	1.3	1.4	V
△V	Current Limite	Vin-Vout=5V	3.1	-	-	A
	Mini Load Current	0C<Tj<125C		5.0	10.0	mA
	Temperature Stability	Io=10mA	-	0.5	-	%
	Thermal Regulation	Ta=25C, 30ms pulse	-	0.008	0.04	%/W
ThjA	Thermal Resisity Junction-Amient		-	98	-	C/W
ThjC	Thermal Resisity Junction-Case		-	15	-	

Note1: See Thermal Regulation specifications for changes in output vol. due to heating effects. line and load regulation are measured at a constant junction Temp. by low duty cycle pulse testing. Load regulation ismeasured at the output lead=1/8" from the package

Note2: Line and load Regulation are guaranteed up to the max power dissipation of 15W power dissipation is determined by the difference between input and output and the current. Guaranteed max power dissipation will not be available over the full input/output range

Note3: Quiescent current is defined as the mini output current required in maintaining regulation. At 12V input /output differential the device is quaranteed to regulate if the output current is greater than 10mA

LT1085 3.0A LOW DROPOUT POSITIVE REGULATOR

3A Low Dropout Positive Adjustable or Fixed-Mode Regulator

Description

The LT1085 is a low dropout positive adjustable or fixed-mode regulator with minimum of 3A output current capability .The product is specifically designed to provide well-regulated supply for low voltage IC applications such as high-speed bus termination and low current 3.3V logic supply. LT1085is also well suited for other applications such as VGA cards.LT1085 is guaranteed to have <1.4V dropout at full load current making it ideal to provide well-regulated outputs of 1.25 to 5.0V with 4.7 to 12V input supply by different output voltage.

Features

- 3-Terminal Adjustable or fixed 1.5V,1.8V,2.5V,3.3V,5.0V
- 1.4V Maximum Dropout at Full Load current
- Fast Transient response
- Built-in Thermal Shutdown

Functional Description

Introduction

The LT1085 adjustable or fixed-mode Low Dropout (LDO) regulator is a 3 terminal device which can easily be programmed by internal mask change to any voltage within the range of 1.25 to Vin-1.4V. The LT1085 only needs 1.4V differential between Vin and Vout to maintain output regulation, in addition, the output voltage tolerances are also extremely tight and they include the transient response as port of the specification. For example, Intel VRE specification calls for a total of +/-100mV including initial tolerance, load regulation and 0 to 3A load step. The LT1085 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.

Load Regulation

Since the LT1085 is only a 3 terminal device, it is not possible to provide true remote sensing of the output voltage at the load. But it can supply good load regulation by internal feedback bypass the external loss such as adjustable mode.

Stability

The LT1085 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.

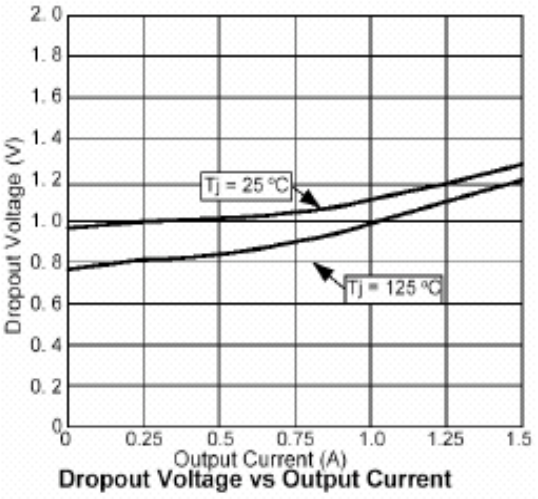
Thermal Design

The LT1085 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℃, 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.

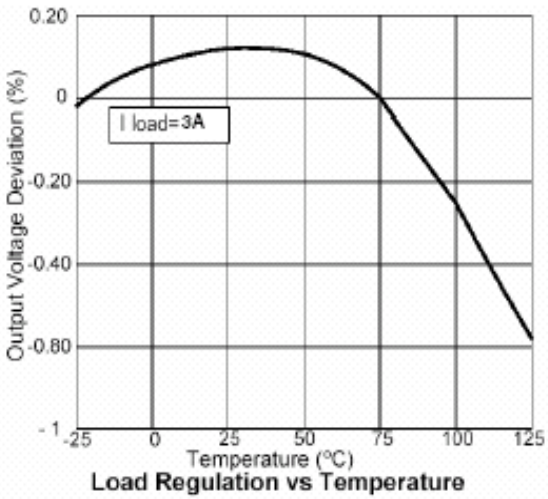
Layout Consideration

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.

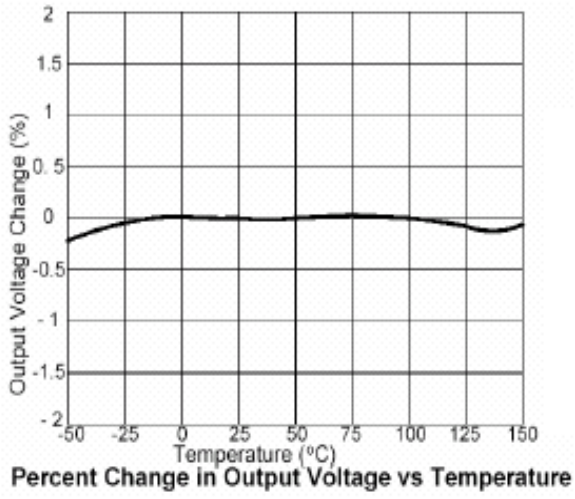
Typical Performance Characteristics



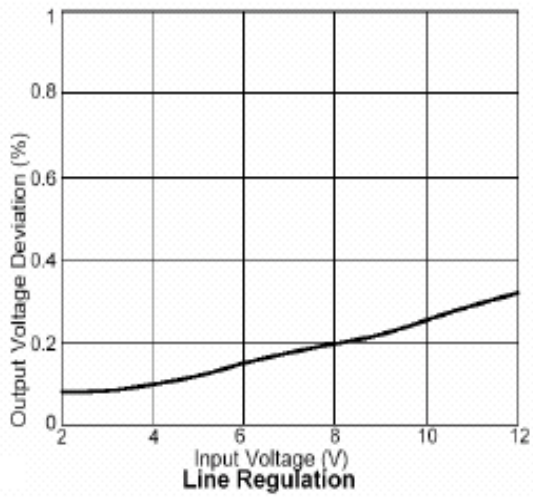
Dropout Voltage vs Output Current



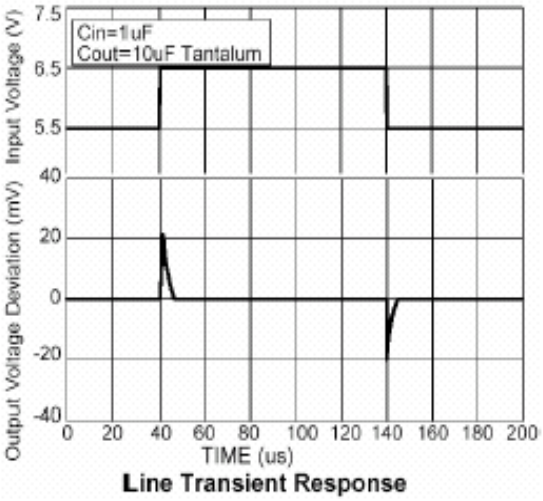
Load Regulation vs Temperature



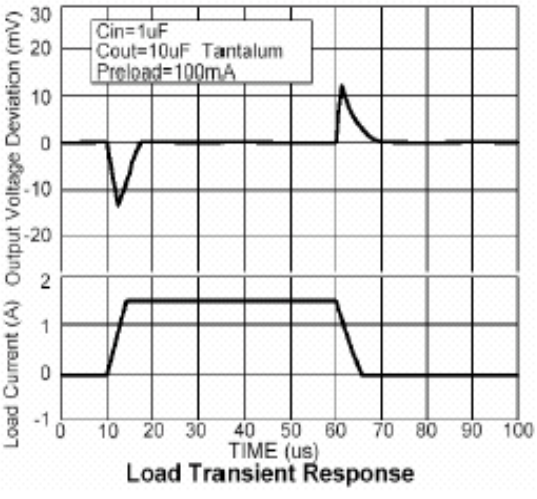
Percent Change in Output Voltage vs Temperature



Line Regulation



Line Transient Response



Load Transient Response