КБ142ЕН22А-4/КБ142ЕН22-4/КБ142ЕН22Б-4, КР142ЕН22А/КР142ЕН22/КР142ЕН22Б (LT1083/LT1084/LT1085)

Low Dropout Positive Adjustable Regulators

May 1995 -revised October 1999

Features

- Three Terminal Adjustable
- Output Current of 3A, 5A or 7.5A
- Operates Down to 1V dropout
- Guaranteed Dropout Voltage at Multiple Current Levels
- 0.015% Line Regulation
- 0.01% Load Regulation
- 100% Thermal Limit Burn-In

Applications

- High Efficiency Linear Regulators
- Post Regulators for Switching Supplies
- Constant Current Regulators
- Battery Chargers

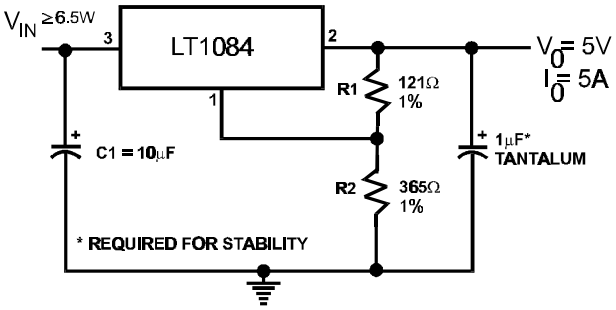
Description

The LT1083/LT1084/LT1085 series of positive adjustable regulators are designed to provide 7.5A, 5A and 3A with higher efficiency than currently available devices. All internal circuitry is designed to operate down to 1V input to output differential and the dropout voltage is fully specified as a function of load current. Dropout is guaranteed at a maximum of 1.5 V at maximum output current. On-chip trimming adjusts the reference voltage to 1%. Current limit is also trimmed, minimizing the stress on both the regulator and power source circuitry under overload conditions.

The LT1083/LT1084/LT1085 devices are pin compatible with older 3 terminal regulators. A 10µF output capacitor is required on these new devices; however, this is usually included in most regulator designs.

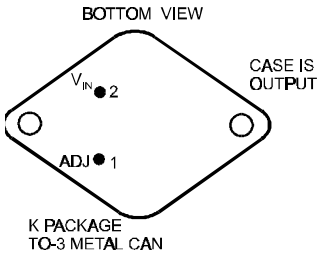
Typical application data

5V, 5A regulator

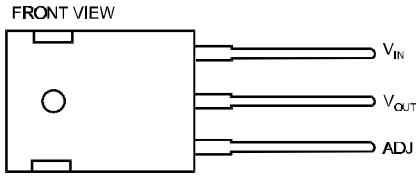


$$V_{out} = V_{REF}(1+\frac{R_2}{R_1})+I_{ADJ}R_2$$

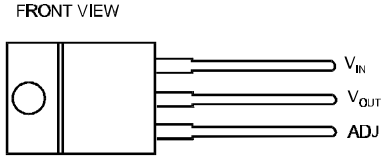
Package information



K PACKAGE
TO-3 METAL CAN



P PACKAGE
TO-3P PLASTIC



T PACKAGE
TO-220 PLASTIC

Absolute Maximum Ratings

Symbol	Parameter	Maximum	Units
P_D	Power Dissipation	Internally Limited	W
V_{IN}	Input to Output Voltage Differential «M» Grades «C» Grades	 35 30	V
T_J	Operating Junction Temperature Range «M» Grades Control Section Power Transistor «C» Grades Control Section Power Transistor	 -55 to 150 -55 to 200 0 to 125 0 to150	°C
T_{STG}	Storage Temperature	-65 to 150	°C
T_{LEAD}	Lead Temperature (Soldering, 10 sec)	300	°C

Device Selection Guide

Device	Output Current
LT1083	7.5A
LT1084	5.0A
LT1085	3.0A

Electrical Characteristics

(See Note 1)

Parameter	Test Conditions		Min	Typ	Max	Units
Reference Voltage	I_{OUT} = 10mA, T_j=25 °C (V_{IN} - V_{OUT}) = 3V (K Package Only) 10mA ≤ I_{OUT} ≤ $I_{FULL\ LOAD}$ 1.5V ≤ (V_{IN} - V_{OUT}) ≤ 25V (Note 3)	 *	1.238 1.225	1.250 1.250	1.262 1.270	V
Line Regulation	I_{LOAD}=10mA, 1.5 ≤ (V_{IN} - V_{OUT}) ≤ 15V, T_j = 25 °C M Grade 15V ≤ (V_{IN} - V_{OUT}) ≤ 35V C Grade 15V ≤ (V_{IN} - V_{OUT}) ≤ 30V (Notes 1,2)	 * * *		0.015 0.035 0.05 0.05	0.2 0.2 0.5 0.5	%
Load Regulation	(V_{IN} - V_{OUT}) = 3V 10mA ≤ I_{OUT} ≤ $I_{FULL\ LOAD}$ T_j = 25 °C (Notes 1,2,3,5)	 *		 0.1 0.2	 0.3 0.4	%
Dropout Voltage	ΔV_{REF} = 1%, I_{OUT} = $I_{FULL\ LOAD}$ (Notes 4,5)	*		1.3	1.5	V
Current Limit LT1083 LT1084 LT1085	 (V_{IN} - V_{OUT}) = 5V (V_{IN} - V_{OUT}) = 25V (V_{IN} - V_{OUT}) = 5V (V_{IN} - V_{OUT}) = 25V (V_{IN} - V_{OUT}) = 5V (V_{IN} - V_{OUT}) = 25V	 * * * * * *	 8.0 0.4 5.5 0.3 3.2 0.2	 9.5 1.0 6.5 0.6 4.0 0.5		A
Minimum Load Current	(V_{IN} - V_{OUT}) = 25V	*		5	10	mA
Termal Regulation LT1083 LT1083 LT1085	T_A = 25 °C, 30ms pulse			 0.002 0.003 0.004	 0.01 0.015 0.02	%/W
Ripple Rejection	f = 120Hz, C_{ADJ}=25µF, C_{OUT}=25µF Tantalum, I_{OUT} = $I_{FULL\ LOAD}$, (V_{IN} - V_{OUT}) = 3V (Note 5)	 *	 60	 75		dB
Adjust Pin Current	T_j = 25 °C	 *		55	 120	µA
Adjust Pin Current Change	10mA ≤ I_{OUT} ≤ $I_{FULL\ LOAD}$, 1.5V ≤ (V_{IN} - V_{OUT}) = 25V (Note 5)	 *		 0.2	 5	
Temperature Stability		*		0.5		
Long Term Stability	T_A = 125 °C, 1000Hrs			0.3	1	
RMS Output Noise (% of V_{OUT})	T_A = 25 °C, 10Hz ≤ f ≤ 10kHz			 0.003		%

The * denotes the specifications which apply over the full operating temperature range.

Note 1: See thermal regulation specifications for changes in output voltage due to heating effects. Load and line regulation are measured at a constant junction temperature by low duty cycle pulse testing.

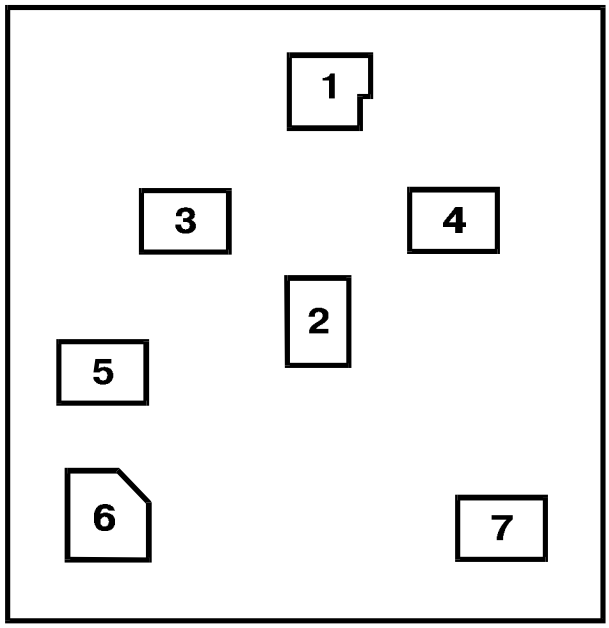
Note 2: Line and load regulation are guaranteed up to the maximum power dissipation (60W for the LT1083, 45W for the LT1084(K,P), 30W for the LT1084(T) and 30W for the LT1085). Power dissipation is determined by the input/output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output voltage range.

Note 3: $I_{FILL\ LOAD}$ is defined in the current limit curves. $I_{FILL\ LOAD}$ curve is defined as the minimum value of current limit as a function of input to output voltage.

Note 4: Dropout voltage is specified over the full output current range of the device.

Note 5: For LT1083 $I_{FILL\ LOAD}$ is 5A for -55 °C ≤ Tj ≤ -40 °C and 7.5A for Tj > -40 °C

Load Location LT1083/ LT1084/ LT1085



Chip size 3.1mm x 3.5mm

Pad Location Coordinates

N	Pad Name	X (μm)	X (μm)
1	INPUT	1370	2280
2	INPUT	1530	1190
3	OUTPUT	520	1720
4	OUTPUT	2245	1720
5	OUTPUT	100	760
6	ADJUST	100	100
7	NC	2660	100