



钜地半导体
Tudi Semiconductor

Product Specification

TUDI-LM1084

5A Low Dropout Positive Voltage Regulator

网址 www.sztdbdt.com Q

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**semiconductor device
manufacturer**

- Design
- research and development
- production
- and sales



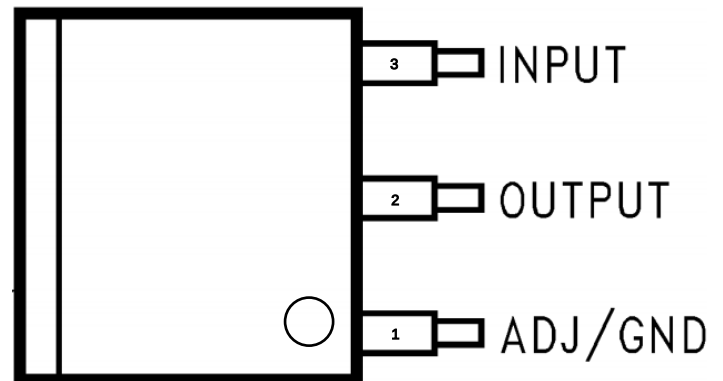
Features

- Supply 3.3V, 5.0V and adjustable version
- Current limit and thermal protection
- Output current: 5A
- Industrial temperature range: -40°C to 125°C
- Line regulation 0.015% (typical)
- Load regulation .1% (typical)

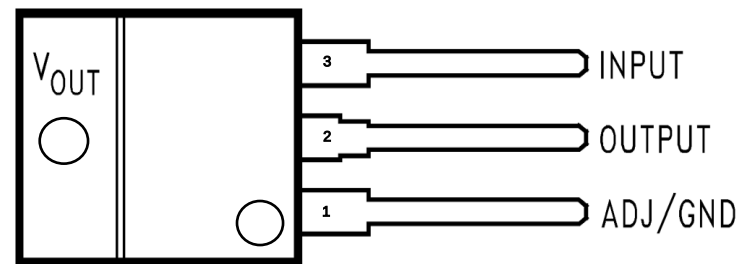
Explanation

The LM1084 is a voltage regulator with a maximum dropout voltage of 1.5V at a load current of 5A.

Two resistors are required to set the output voltage of the adjustable output voltage version of the LM1084. The fixed output voltage versions have the regulating resistor integrated. The LM1084 circuit contains a zener trimmed bandgap reference, current limiting and thermal shutdown functions.



TO263-3 Pin Diagram



TO220-3 Pin Diagram

Applications

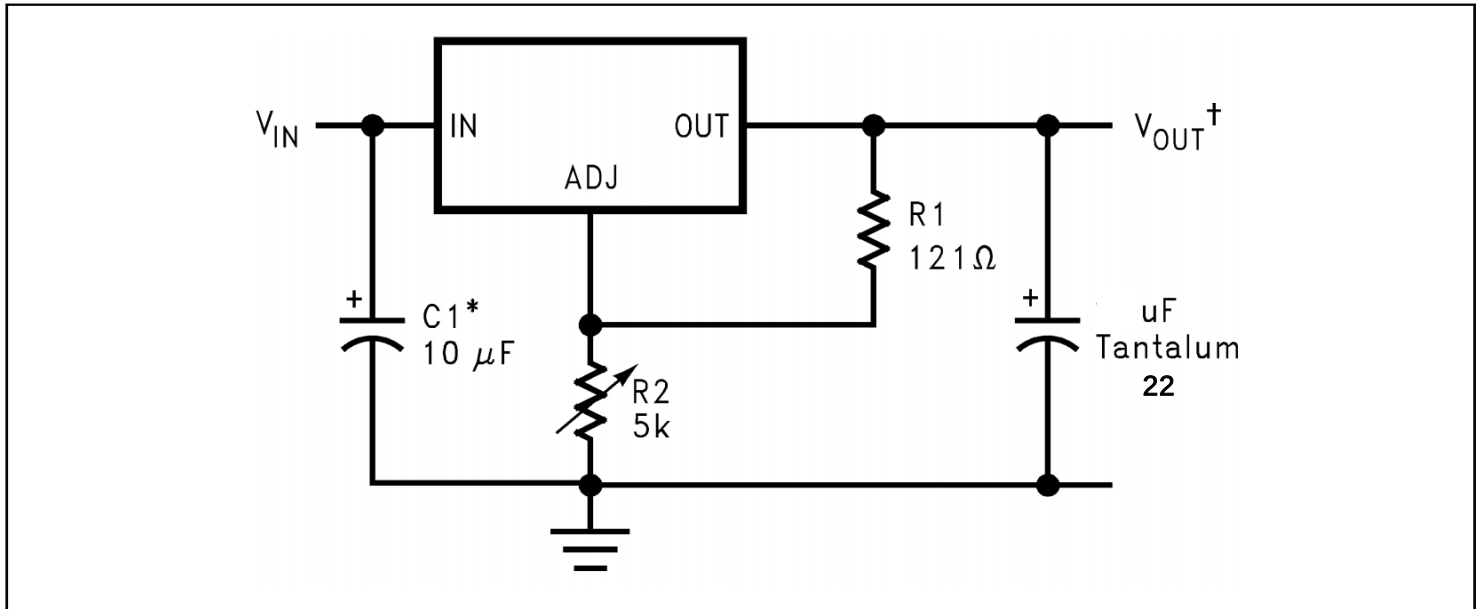
- Post-regulator for switch-mode DC/DC converters
- Efficient linear regulator
- Battery charger

Pin description

Pin number	Pin name	I/O	Function
1	ADJ/GND	G/O	The earth /ADJ
2	OUTPUT	O	Output voltage
3	INPUT	I	Input operating voltage



Typical application circuit diagram



*NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS

$$^+V_{OUT} = 1.25V \left(1 + \frac{R2}{R1}\right)$$

Limit Parameter

Parameter		Symbol	Scope	Unit
Input operating voltage		VIN	20	V
Pin temperature (welded 10 seconds)	TO-263/TO-220	TLEAD	245	
			260	
Working temperature range		TJ	150	
Storage temperature		TS	-65 ~ +150	V
Power dissipation		PD	Internal restrictions (Note 2)	mW
ESD capability(minimum)		ESD	2000	V

Note 1: Any attempt to apply anything above the absolute maximum rated value may cause permanent damage to the product. The absolute maximum rated value does not mean that the product will work properly under conditions other than the calibrated electrical characteristics.

2、 The maximum allowable power dissipation is a function of the maximum operating junction temperature TJ(max), junction-to-air thermal resistance θ_{JA} , and ambient temperature Tamb. Under given ambient conditions, the maximum allowable power dissipation is calculated as: PD (max) = (TJ(max) - Tamb)/ θ_{JA} . Exceeding this threshold will cause excessive chip temperature, triggering the regulator to enter an overheat shutdown state. The junction-to-air thermal resistance θ_{JA} varies across different packaging types, as it is determined by the specific packaging technology



Electrical Characteristics

(Unless Otherwise Specified, $T_{amb}=25^{\circ}\text{C}$, Normal Operating Junction Temperature Range 0°C to 125°C)

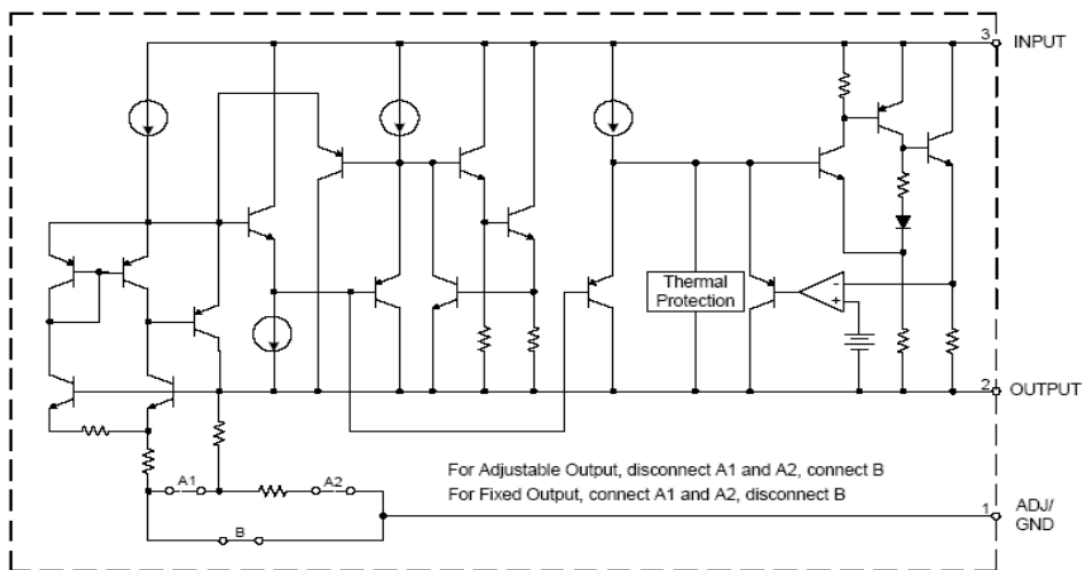
Parameter	Symbol	Test condition	Least value	Typical value	Crest value	Unit
Reference voltage	VREF	1084-ADJ, $I_{OUT}=10\text{mA}$, $V_{IN}-V_{OUT}=3\text{V}$, $10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $1.5\text{V}\leq V_{IN}-V_{OUT}\leq 5\text{V}$	1.231 1.225	1.250 1.250	1.269 1.275	V
Output voltage	VOUT	1084-3.3, $I_{OUT}=10\text{mA}$, $V_{IN}=6.3\text{V}$, $10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $4.8\text{V}\leq V_{IN}\leq 8\text{V}$	3.225 3.234	3.3 3.3	3.350 3.366	V
		1084-5.0, $I_{OUT}=10\text{mA}$, $V_{IN}=8\text{V}$, $10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $6.5\text{V}\leq V_{IN}\leq 10\text{V}$	4.925 4.9	5.5	5.075 5.1	V
Linearity control	ΔV_{OUT}	1084-ADJ, $I_{OUT}=10\text{mA}$, $2.85\text{V}\leq V_{IN}\leq 10\text{V}$		0.015 0.035	0.2 0.2	%
		1084-3.3, $I_{OUT}=10\text{mA}$, $4.8\text{V}\leq V_{IN}\leq 10\text{V}$		0.51	66	mV
		1084-5.0, $I_{OUT}=10\text{mA}$, $6.5\text{V}\leq V_{IN}\leq 10\text{V}$		0.51	1010	mV
Load regulation	ΔV_{OUT}	1084-ADJ, $0\text{mA}\leq I_{OUT}\leq 5\text{A}$, $V_{IN}-V_{OUT}=3\text{V}$		0.1 0.2	0.3 0.4	%
		1084-3.3, $0\text{mA}\leq I_{OUT}\leq 5\text{A}$, $V_{IN}-V_{OUT}=3\text{V}$		37	1520	mV
		1084-5.0, $0\text{mA}\leq I_{OUT}\leq 5\text{A}$, $V_{IN}-V_{OUT}=3\text{V}$		5 10	2035	mV
Differential pressure	VDROP	$I_{OUT}=5\text{A}$, ΔV_{REF} , $\Delta V_{OUT}=1\%$		1.45	1.5	V
Cut-off current	ILIMIT	$V_{IN}-V_{OUT}=3\text{V}$	5.5	6.5		A
Minimum load current	ILOAD(MIN)	$V_{IN}=10\text{V}$ (1084-ADJ)		3	10	mA
Quiescent current	IQ	$V_{IN}=10\text{V}$ (1084)		5	10	mA
Ripple rejection ratio	PSRR	fRIPPLE=120 Hz, $C_{OUT}=25\mu\text{F}$ tantalum, capacitor, $I_{OUT}=5\text{A}$, $V_{IN}-V_{OUT}=3\text{V}$	60	72		dB
Adjustable pin current	IADJ	$V_{IN}=4.25\text{V}$, $I_{OUT}=10\text{mA}$		55	120	μA
Adjustable pin current variation	ΔI_{ADJ}	$10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $1.5\text{V}\leq (V_{IN}-V_{OUT})\leq 4.5\text{V}$		0.2	5	μA
Temperature stability		$I_{OUT}=10\text{mA}$, $V_{IN}-V_{OUT}=1.5\text{V}$		0.5		%
Long term stability		$T_{amb}=125^{\circ}\text{C}$, 1000Hrs		0.5		%
RMS noise (%ofVOUT)		$10\text{Hz}\leq f\leq 10\text{kHz}$		0.003		%
Thermal resistance	θ_{JA}	TO-263-3		60		$^{\circ}\text{C/W}$
		TO-220-3		60		



Recommended Working Conditions

Parameter	Symbol	Scope	Unit
Input voltage	VIN	12	V
Working temperature range	TJ	-40 to 125	

Functional Block Diagram

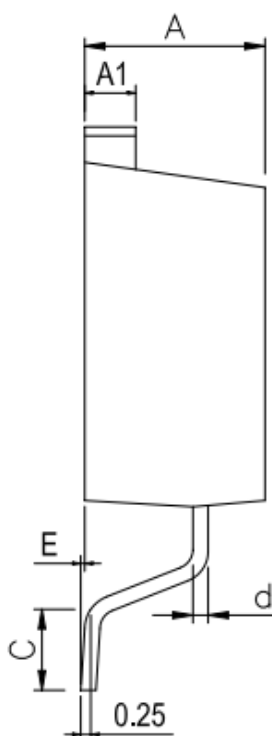
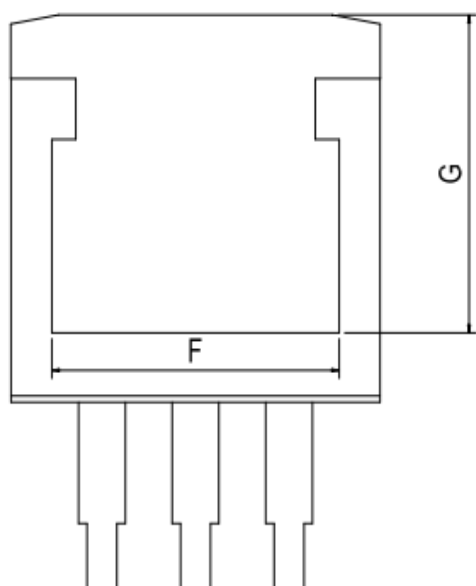
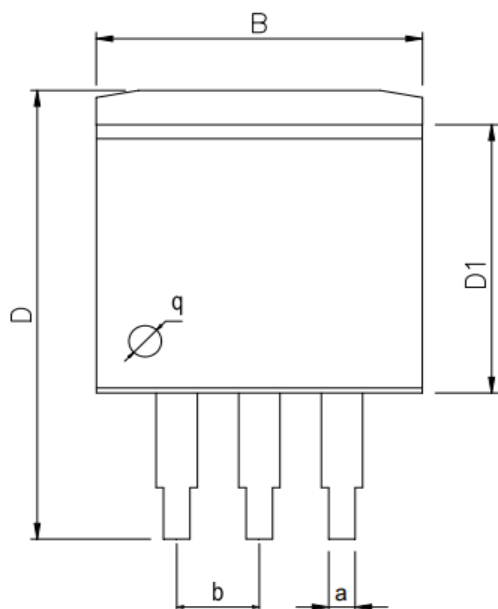


Order information

Order Number	Package	Package Quantity	Marking On The park	Temperature
LM1084S-3.3/TR-TUDI	TO263-3	Tape,Reel,500	LM1084S-3.3	- 40°C to 125°C
LM1084T-3.3-TUDI	TO220-3	Tube,50,A box of 2000	LM1084T-3.3	
LM1084S-5.0/TR-TUDI	TO263-3	Tape,Reel,500	LM1084S-5.0	
LM1084T-5.0-TUDI	TO220-3	Tube,50,A box of 2000	LM1084T-5.0	
LM1084S-ADJ/TR-TUDI	TO263-3	Tape,Reel,500	LM1084S-ADJ	
LM1084T-ADJ-TUDI	TO220-3	Tube,50,A box of 2000	LM1084T-ADJ	



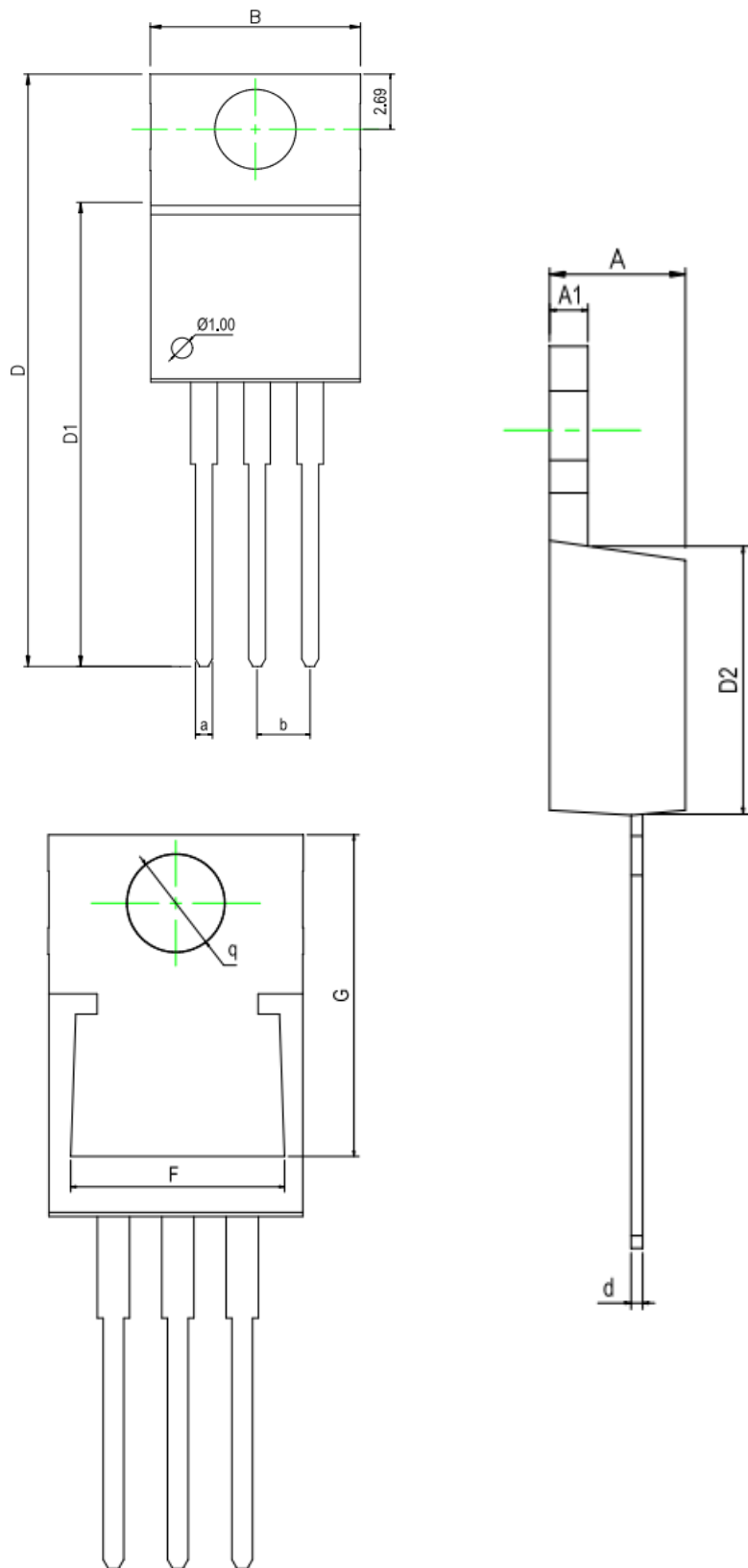
Package TO263-3



Symbol:	Min:	Max:
A	4.45	4.62
A1	1.22	1.32
B	10	10.4
C	1.89	2.19
D	13.7	14.6
D1	8.38	8.89
E	0	0.305
F	8.332	8.552
G	7.7	8.1
a	0.71	0.97
b	2.54BSC	



Package TO220-3



Symbol:	Min:	Max:
A	4.45	4.62
A1	1.22	1.32
B	10	10.4
D	28.2	28.9
D1	22.22	22.62
D2	8.5	9.1
F	8.3	8.55
G	12.55	12.75
a	0.71	0.97
d	0.33	0.42
b	2.54BSC	
q	3.8TYP	



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