



TS1083

7.5 Amp Low Dropout Positive Voltage Regulator



TO-220

Low dropout voltage 1.3V max.

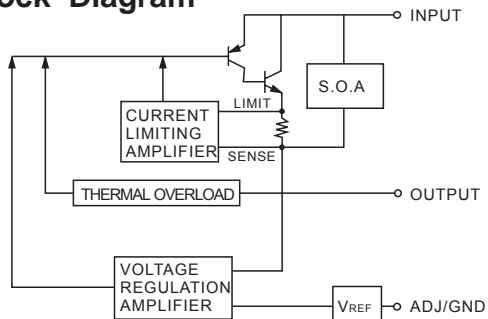
General Description

The TS1083 Series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current. Additionally, the TS1083 Series provide excellent regulation over variations due to changes in line, load and temperature. Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The TS1083 Series are three terminal regulators with fixed and adjustable voltage options available in popular packages.

Features

- ✧ Low dropout voltage 1.3V max.
- ✧ Full current rating over line and temperature
- ✧ Fast transient response
- ✧ Total output regulation $\pm 2\%$ over line, load and temperature
- ✧ Adjust pin current max 120 μA over temperature
- ✧ Line regulation typical 0.015%.
- ✧ Load regulation typical 0.05%.
- ✧ Fixed/adjustable output voltage
- ✧ TO-220 package

Block Diagram



Ordering Information

DEVICE	OPERATING TEMPERATURE (Ambient)	PACKAGE
TS1083CZ	-20 to +85°C	TO-220
TS1083CZ-2.5		
TS1083CZ-3.3		

Absolute Maximum Rating

PARAMETER	SYMBOL	MAXIMUM	UNITS
Input Voltage	V_{IN}	12	V
Power Dissipation	P_D	Internally Limited	W
Thermal Resistance Junction to Case	θ_{JC}	2	°C / W
Thermal Resistance Junction to Ambient	θ_{JA}	50	
Operating Junction Temperature Range	T_J	0 to +125	°C
Operating Ambient Temperature Range	T_A	-20 to +85	
Storage Temperature Range	T_{STG}	-25 to +150	
Lead Temperature (Soldering) 10 Sec	T_{LEAD}	260	

Electrical Characteristics

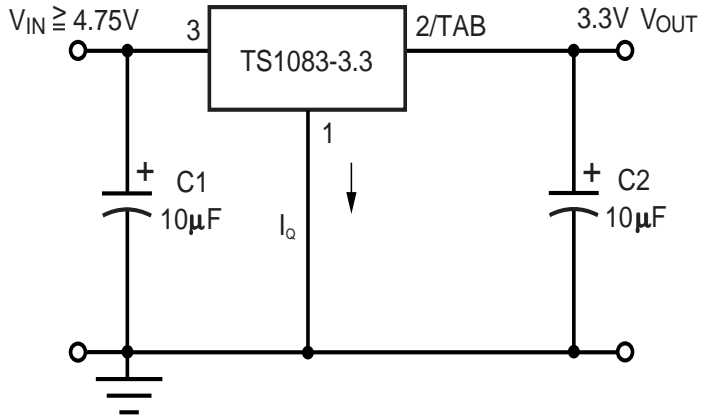
Unless otherwise specified,
 Adjust $V_{IN}=2.75V$ to 12V and Adjust $I_O=10mA$ to 7.5A
 Fixed $V_{IN}=4.75V$ to 12V and Fixed $I_O=10mA$ to 7.5A

PARAMETER	SYMBOL	TEST CONDITIONS			TEST LIMITS			UNITS
		$V_{IN} - V_{OUT}$	I_O	$T_J^{(4)}$	MIN	TYP	MAX	
Output Voltage ⁽¹⁾ Fixed Voltage	V_O	5V	10mA	25	0.99 V_O	V_O	1.01 V_O	V
				Over Temp.	0.98 V_O		1.02 V_O	
Reference Voltage ⁽¹⁾ Adj Voltage	V_{REF}	5V	10mA	25	1.238	1.250	1.262	
				Over Temp.	1.225		1.275	
Line Regulation ⁽¹⁾ ($V_{in}-V_{out}=3V$)	$REG_{(LINE)}$		10mA	25		0.015	0.2	%
				Over Temp.		0.035		
Load Regulation ⁽¹⁾ ($V_{in}-V_{out}=3V$)	$REG_{(LOAD)}$			25		0.05	0.3	
				Over Temp.		0.2		
Dropout Voltage $\Delta V_{REF}=1\%$	V_D			25		1	1.3	V
				Over Temp.		1.1		
Current Limit ($V_{in}-V_{out}=5V$)	I_{CL}			Over Temp.	8.5	9.5		A
Quiescent Current Fixed Model	I_Q	5V						12
Temperature Coefficient	T_C					0.005		% / °C
Adjust Pin Current	I_{ADJ}			25		55	120	μA
Adjust Pin Current Change	ΔI_{ADJ}			Over Temp.		0.2		
Temperature Stability	T_S	5V	500mA	Over Temp.		0.5		%
Minimum Load Current Adjust Model	I_O	5V				5	10	mA
RMS Output Noise ⁽²⁾	V_N			25		0.003		% V_O
Ripple Rejection Ratio ⁽³⁾	R_A	5V	7.5A	Over Temp.	60	72		dB

- (1) Low duty cycle pulse testing with Kelvin connections required.
 (2) Bandwidth of 10Hz to 10KHz.
 (3) 120Hz input ripple (C_{ADJ} for ADJ) = 25 μF .
 (4) Over Temp. - over specified operating junction temperature range.

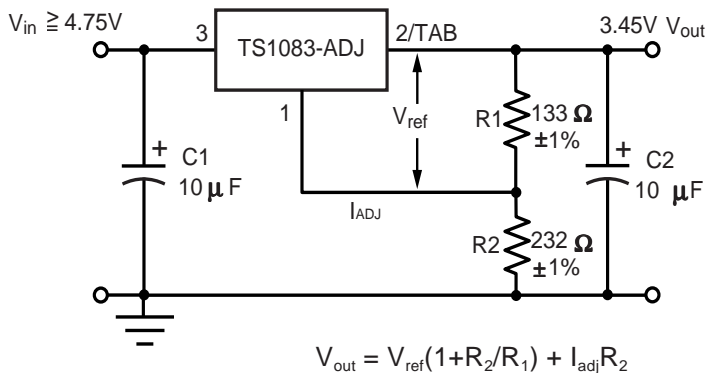


Fixed Voltage Regulator(1)(2)



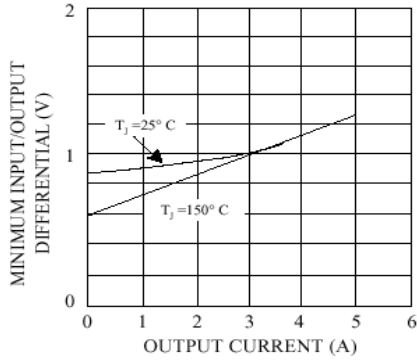
- (1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS
- (2) C2 REQUIRED FOR STABILITY

Adjustable Voltage Regulator(1)(2)

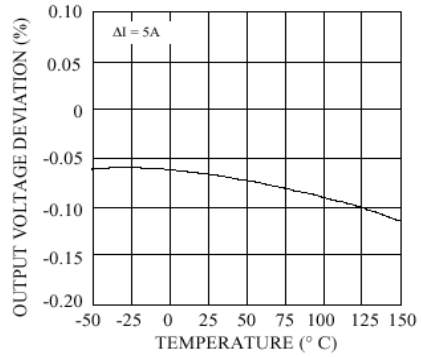


- (1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS
- (2) C2 REQUIRED FOR STABILITY

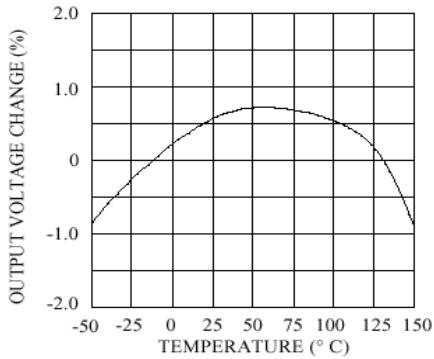
Dropout Voltage



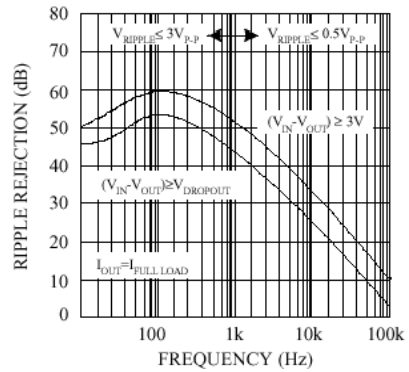
Load Regulation



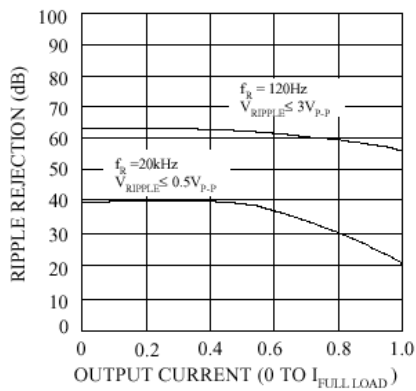
Temperature Stability



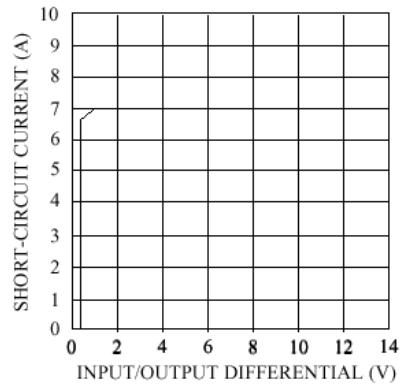
Ripple Rejection



Ripple Rejection vs. Current

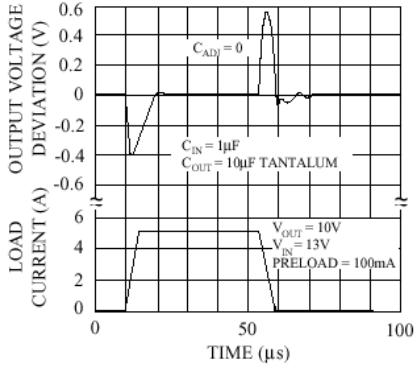


Short-Circuit Current

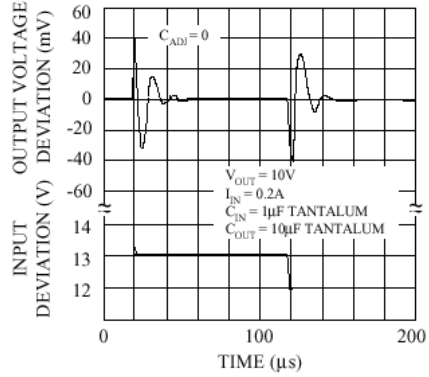




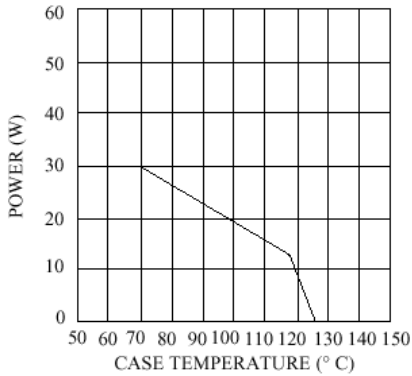
Load Transient Response



Line Transient Response

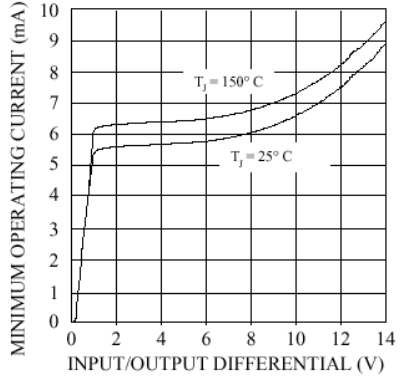


Maximum Power Dissipation*

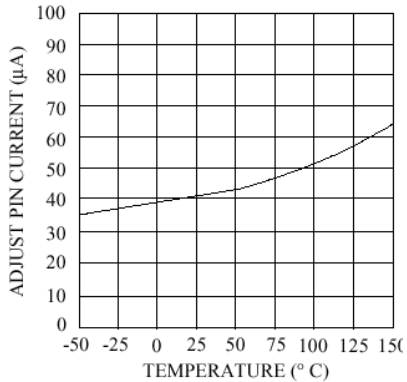


*AS LIMITED BY MAXIMUM JUNCTION TEMPERATURE

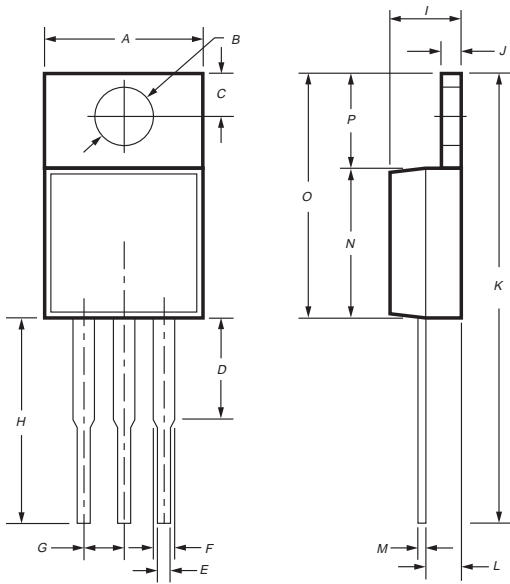
Minimum Operating Current (Adjustable only)



Adjust Pin Current (Adjustable only)



TO-220 Unit:mm



DIM	TO-220 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.00	10.50	0.394	0.413
B	3.24	4.44	0.128	0.175
C	2.44	2.94	0.096	0.116
D	3.565	4.315	0.140	0.170
E	0.68	0.92	0.027	0.036
F	1.115	1.485	0.044	0.058
G	2.345	2.715	0.092	0.107
H	13.49	14.31	0.531	0.563
I	4.475	5.225	0.176	0.206
J	1.15	1.39	0.045	0.055
K	27.78	29.62	1.094	1.166
L	2.175	2.925	0.086	0.115
M	0.297	0.477	0.012	0.019
N	8.28	8.80	0.326	0.346
O	14.29	15.31	0.563	0.603
P	6.01	6.51	0.273	0.256