

SOT-23

Pin Definition:

1. Output
2. Input
3. Ground

General Description

TS3480 series is an integrated linear voltage regulator. It can be provided the operation from an input as high as 30V and a guaranteed maximum dropout of 1.2V at the full 100mA load. The 1.2V quasi low dropout of TS3480 series is able to makes them a nice fit in many applications where the 2 to 2.5V dropout of TS78LXX series devices precludes their use.

The TS3480 series features a 5V & 3.3V member. The SOT packaging and quasi low dropout features of the TS3480 series converge in this device to provide a very nice, very tiny 5V & 3.3V, 100mA bias supply that regulates directly off the system power supply.

Features

- 30V maximum input for operation
- 2V guaranteed maximum dropout over full load and temperature ranges
- 100mA guaranteed minimum load current
- $\pm 5\%$ guaranteed output voltage tolerance over full load and temperature ranges
- -40 to $+125^{\circ}\text{C}$ junction temperature range for operation

Application

- Tiny alternative to TS78LXX series and similar devices
- Tiny $5\text{V} \pm 5\%$ to 3.3V, 100mA converter
- Post regulator for switching DC/DC converter
- Bias supply for analog circuits

Ordering Information

Part No.	Package	Packing
TS3480CX $\underline{\text{xx}}$ RF	SOT-23	3Kpcs / 7" Reel

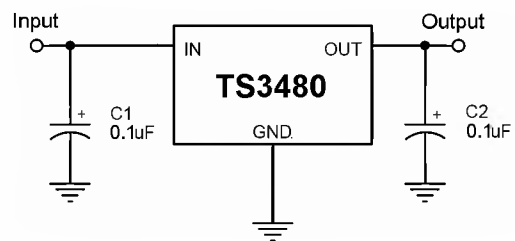
Note: Where $\underline{\text{xx}}$ denotes voltage option, available are

50 = 5.0V

33 = 3.3V

Contact to factory for addition voltage option

Block Diagram



Absolute Maximum Rating (Ta = 25°C unless otherwise noted) (Note 1)

Parameter	Symbol	Limit	Unit
Input Voltage	V_{IN}	35	V
Operating Input Voltage	V_{OPER}	30	V
Output Current Range	I_{OUT}	100	mA
Power Dissipation (Note 2)	P_d	350	mW
Junction Temperature	T_J	$+150$	$^{\circ}\text{C}$
Operating Temperature Range	T_{OPER}	$-40 \sim +125$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-65 \sim +150$	$^{\circ}\text{C}$
Lead Soldering Time (260°C) (Note 3)	T_{SOLDER}	4	Sec
ESD (note 4)		2	kV

Low Quiescent Current LDO Voltage Regulator

Electrical Specification (Ta = 25°C, unless otherwise specified.)

Parameter	Conditions	Min	Typ	Max	Unit
3.3V output					
Output Voltage	$V_{IN} = 4.8V, I_o = 1mA \sim 100mA$	3.17	3.3	3.43	V
Line Regulation	$4.8V \leq V_{IN} \leq 30V, I_o = 1mA$	--	10	25	mV
Load Regulation	$V_{IN} = 4.8V, I_o = 1mA \sim 100mA$	--	20	40	mV
Dropout Voltage	$I_o = 10mA$	--	0.75	0.9	V
	$I_o = 100mA$	--	0.95	1.1	V
Quiescent Current	$V_{IN} = 4.8V \leq V_{IN} \leq 30V, I_o = 0V$	--	3	5	mA
Output Current	$V_{IN} - V_{OUT} = 20V$	100	--	--	mA
Ripple Rejection	$F = 10Hz \sim 100kHz, I_o = 0mA, C_{OUT} = 0.1\mu F, V_{IN} = 10V$	--	100	--	uVrms
5.0V output					
Output Voltage	$V_{IN} = 6.5V, I_o = 1mA \sim 100mA$	4.80	5.0	5.20	V
Line Regulation	$6.5V \leq V_{IN} \leq 30V, I_o = 1mA$	--	10	25	mV
Load Regulation	$V_{IN} = 6.5V, I_o = 10mA \sim 100mA$	--	20	40	mV
Dropout Voltage	$I_o = 10mA$	--	0.75	0.9	V
	$I_o = 100mA$	--	0.95	1.1	V
Quiescent Current	$V_{IN} = 6.5V \leq V_{IN} \leq 30V, I_o = 0V$	--	3	5	mA
Output Current	$V_{IN} - V_{OUT} = 20V$	100	--	--	mA
Ripple Rejection	$F = 10Hz \sim 100kHz, I_o = 0mA, C_{OUT} = 0.1\mu F, V_{IN} = 10V$	--	150	--	uVrms

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating ratings are conditions under which operation of the device is guaranteed. Operating ratings do not imply guaranteed performance limits. For guaranteed performance limits and associated test conditions, see the Electrical Characteristics

Note 2: The Absolute Maximum power dissipation depends on the ambient temperature and can be calculated using $P = (T_j - T_a) / R_{\theta ja}$ where T_j is the junction temperature, T_a is the ambient temperature, and $R_{\theta ja}$ is the junction-to-ambient thermal resistance. The 350mW rating results from substituting the absolute maximum junction temperature, 150°C for T_j , 50°C for T_a , and 300°C/W for $R_{\theta ja}$. More power can be safely dissipated at lower ambient temperatures, and less power can be safely dissipated at higher ambient temperatures. The absolute maximum power dissipation can be increased by 3.5mW for each °C below 50°C ambient. It must be derated by 3.5mW for each °C above 50°C ambient. A $R_{\theta ja}$ of 300°C/W represents the worst-case condition of no heat sinking of the 3-lead plastic SOT-23 package. Heat sinking enables the safe dissipation of more power. The TS3480 actively limits its junction temperature to about 150°C.

Note 3: Times shown are dwell times. Temperatures shown are dwell temperatures.

Note 4: For testing purposes, ESD was applied using the Human-Body Model, a 100pF capacitor discharged through a 1.5kΩ resistor.

Note 5: A typical is the center of characterization data taken with $T_a = T_j = 25^\circ C$. Typical are not guaranteed.

Note 6: All limits are guaranteed. All electrical characteristics having room-temperature limits are tested during production with $T_a = T_j = 25^\circ C$. All hot and cold limits are guaranteed by correlating the electrical characteristics to process and temperature variations and applying statistical process control.

Note 7: All voltages except dropout are with respect to the voltage at the GND pin.

Electrical Characteristics Curve

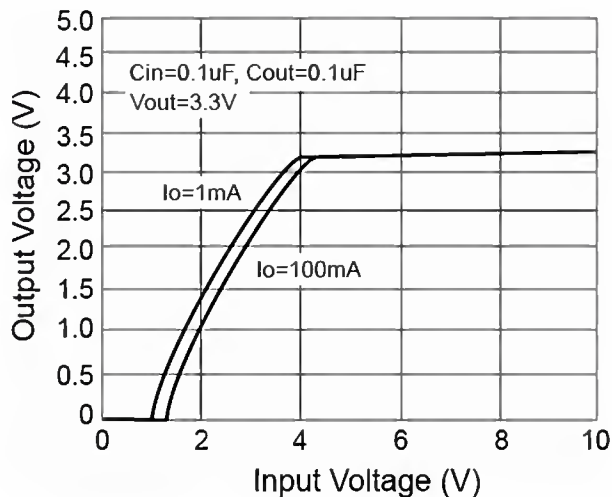


Figure 1. Output Voltage vs. Input Voltage

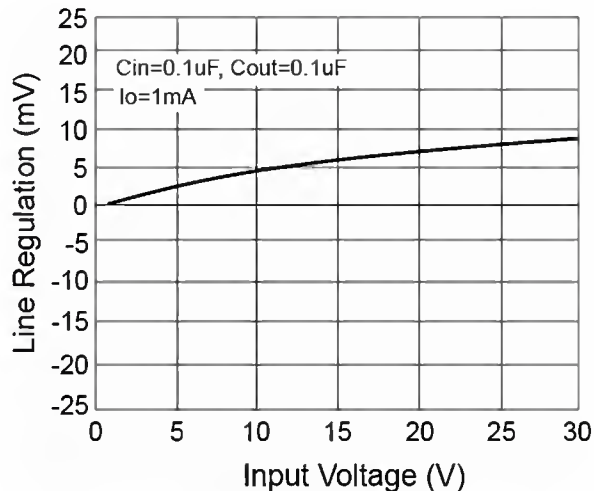


Figure 2. Line Regulation

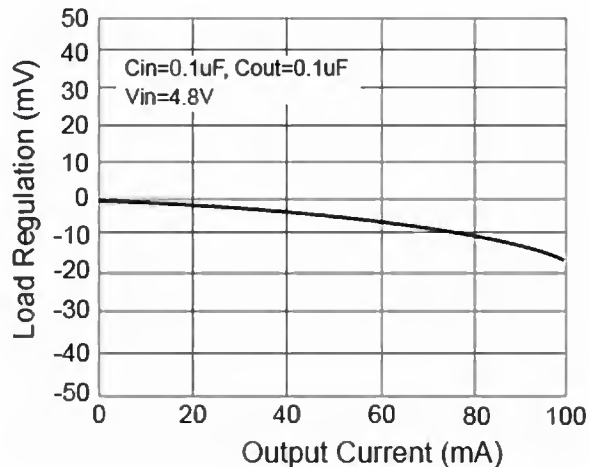


Figure 3. Load Regulation

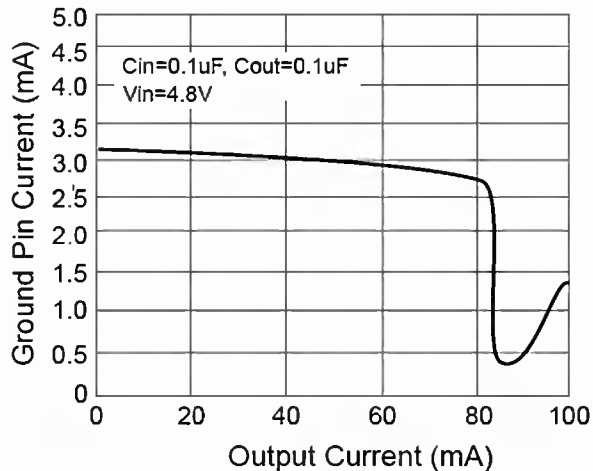


Figure 4. Ground Pin Current vs. Output Current

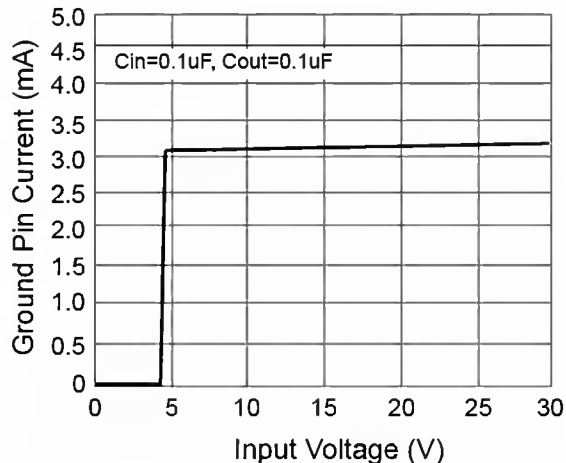


Figure 5. Ground Pin Current vs. Input Voltage

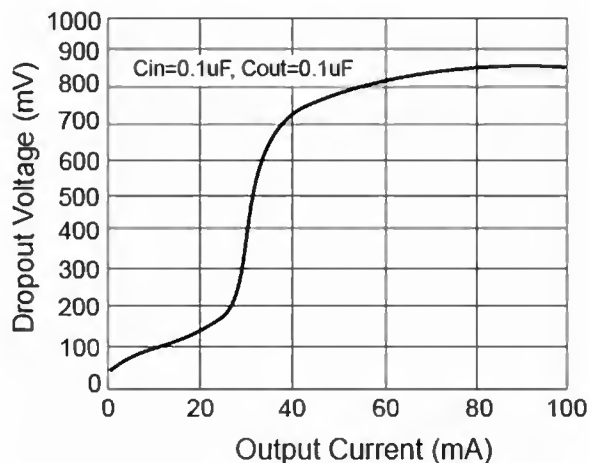
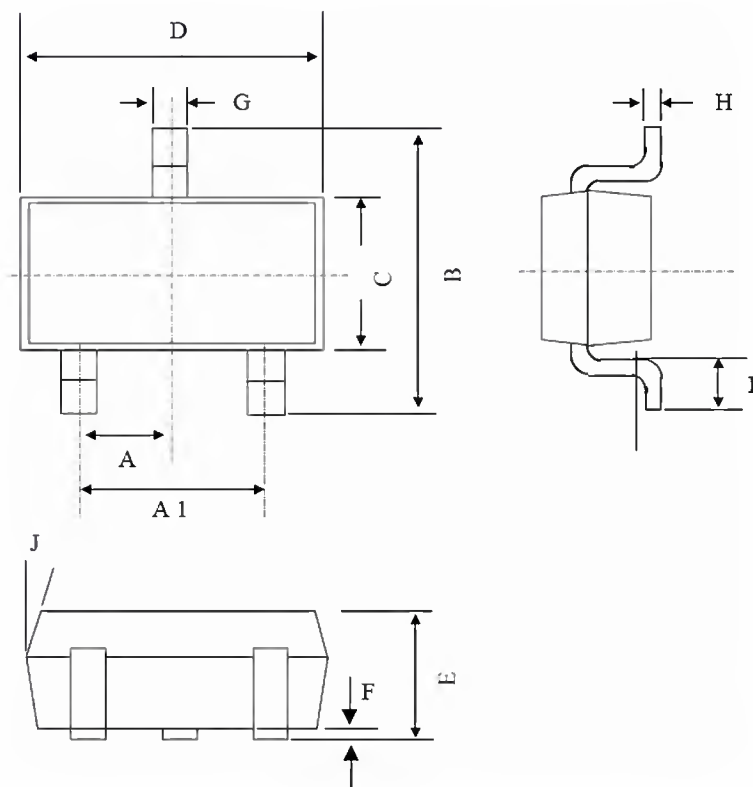


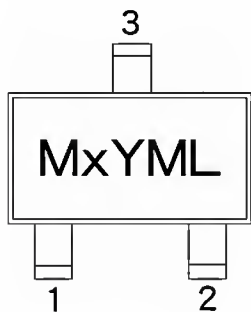
Figure 6. Dropout Voltage vs. Load Current

SOT-23 Mechanical Drawing



SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A	0.95 BSC		0.037 BSC	
A1	1.9 BSC		0.074 BSC	
B	2.60	3.00	0.102	0.118
C	1.40	1.70	0.055	0.067
D	2.80	3.10	0.110	0.122
E	1.00	1.30	0.039	0.051
F	0.00	0.10	0.000	0.004
G	0.35	0.50	0.014	0.020
H	0.10	0.20	0.004	0.008
I	0.30	0.60	0.012	0.024
J	5°	10°	5°	10°

Marking Diagram



- M** = Device Code
- x** = Voltage Code (5=5V, S=3.3V)
- Y** = Year Code
- M** = Month Code
(A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code

TS3480

Low Quiescent Current LDO Voltage Regulator

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.