TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TS3480

Low Quiescent Current LDO Voltage Regulator

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
- ±5% guaranteed output voltage tolerance over full load and temperature ranges
- −40 to +125˚C junction temperature range for operation

Application

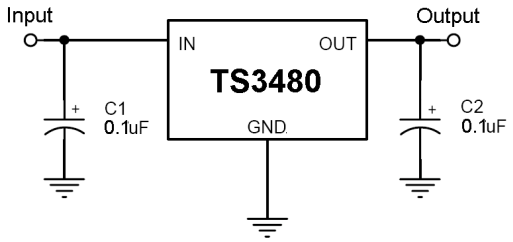
- Tiny alternative to TS78LXX series and similar devices
- Tiny 5V±5% to 3.3V, 100mA converter
- Post regulator for switching DC/DC converter
- Bias supply for analog circuits

Ordering Information

Part No.	Package	Packing
TS3480CX**xx** RF	SOT-23	3Kpcs / 7” Reel

Note: Where **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)	Pd	350	W
Junction Temperature	T_J	+150	°C
Operating Temperature Range	T_{OPER}	-40 ~ +125	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C
Lead Soldering Time (260°C) (Note 3)	T_{SOLDER}	4	Sec
ESD (note 4)		2	kV

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

Parameter	Conditions	Min	Typ	Max	Unit
3.3V output					
Output Voltage	V_{IN} = 3.8V, Io= 1mA ~ 100mA	3.17	3.3	3.43	V
Line Regulation	3.8V ≤ V_{IN} ≤ 30V, Io= 1mA	--	10	25	mV
Load Regulation	V_{IN} = 3.8V, Io= 1mA~100mA	--	20	40	mV
Dropout Voltage	Io=10mA	--	0.75	0.9	V
	Io=100mA	--	0.95	1.1	V
Quiescent Current	V_{IN} = 3.8V ≤ V_{IN} ≤ 30V, Io=0V	--	3	5	mA
Output Current	V_{IN} - V_{OUT} = 20V	100	--	--	mA
Ripple Rejection	F= 10Hz ~ 100kHz, Io= 0mA, C_{OUT} = 0.1uF, V_{IN} = 10V	--	100	--	uVrms
5.0V output					
Output Voltage	V_{IN} = 6.5V, Io= 1mA ~ 100mA	4.80	5.0	5.20	V
Line Regulation	6.5V ≤ V_{IN} ≤ 30V, Io= 1mA	--	10	25	mV
Load Regulation	V_{IN} = 6.5V, Io= 10mA~100mA	--	20	40	mV
Dropout Voltage	Io=10mA	--	0.75	0.9	V
	Io=100mA	--	0.95	1.1	V
Quiescent Current	V_{IN} = 6.5V ≤ V_{IN} ≤ 30V, Io=0V	--	3	5	mA
Output Current	V_{IN} - V_{OUT} = 20V	100	--	--	mA
Ripple Rejection	F= 10Hz ~ 100kHz, Io= 0mA, C_{OUT} = 0.1uF, 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 = (Tj -Ta) / Rθja where Tj is the junction temperature, Ta is the ambient temperature, and Rθja is the junction-to-ambient thermal resistance. The 350mW rating results from substituting the absolute maximum junction temperature, 150°C for Tj, 50°C for Ta, and 300°C/W for Rθja. 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 Rθja 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 Ta =Tj = 25 °C. Typical are not guaranteed.

Note 6: All limits are guaranteed. All electrical characteristics having room-temperature limits are tested during production with Ta =Tj = 25°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

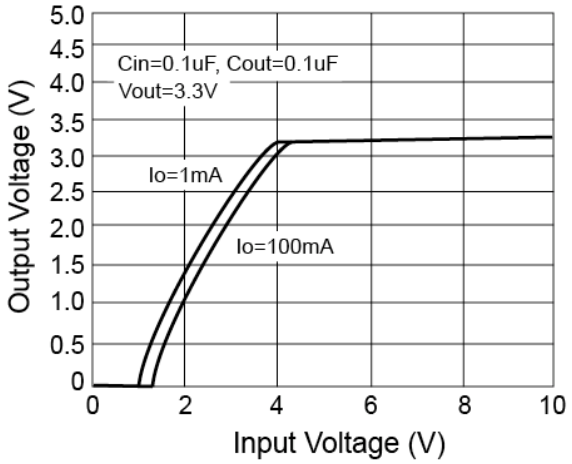


Figure 1. Output Voltage vs. Input Voltage

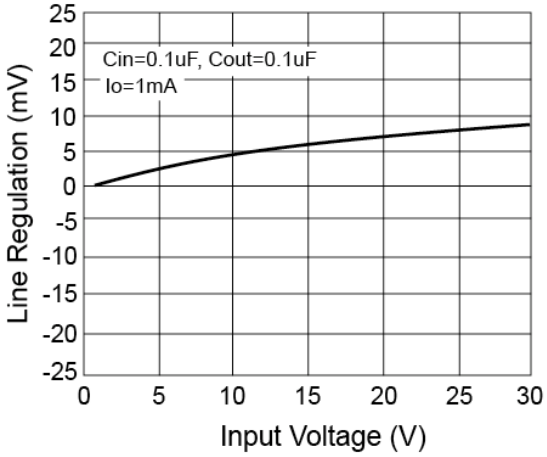


Figure 2. Line Regulation

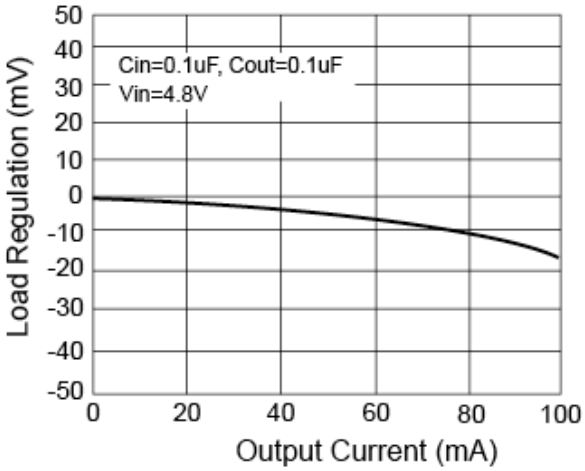


Figure 3. Load Regulation

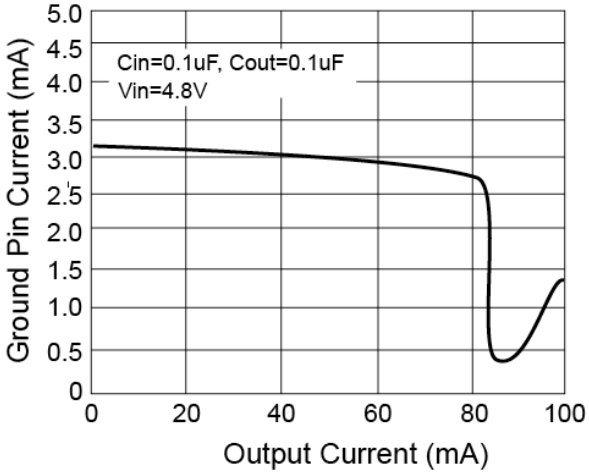


Figure 4. Ground Pin Current vs. Output Current

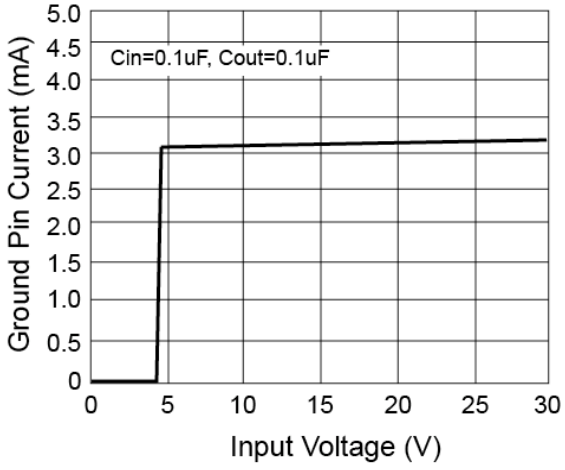


Figure 5. Ground Pin Current vs. Input Voltage

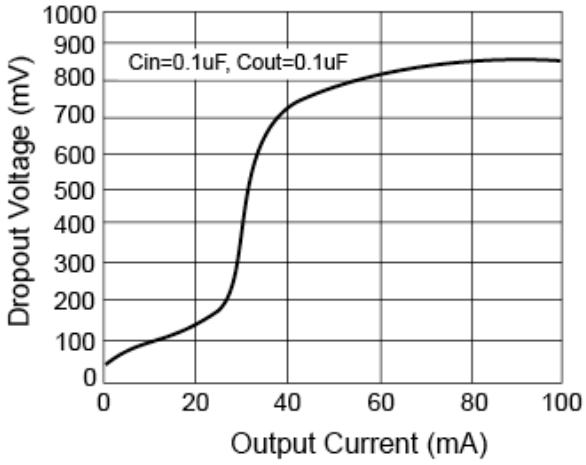
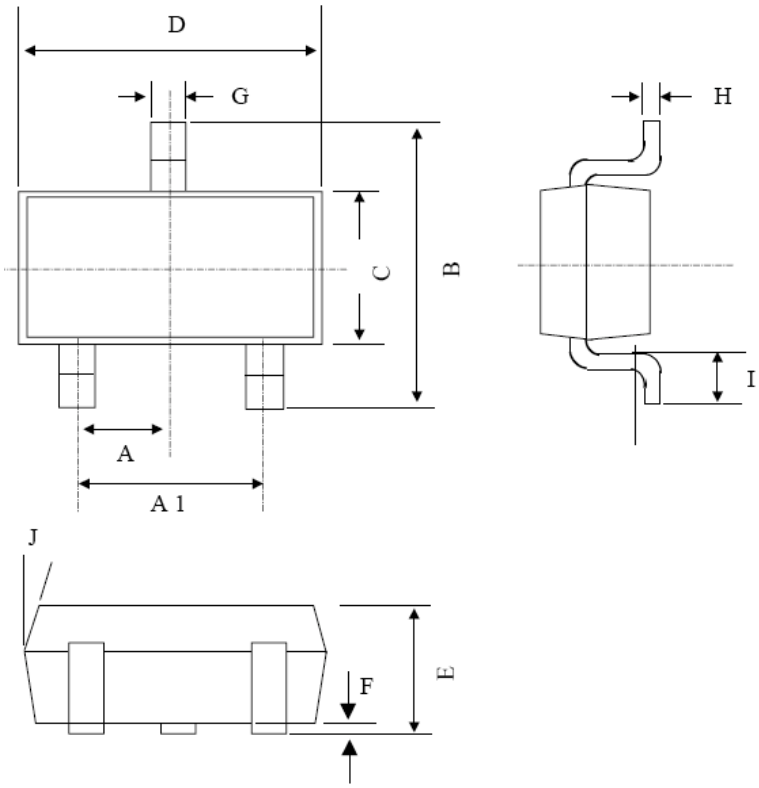


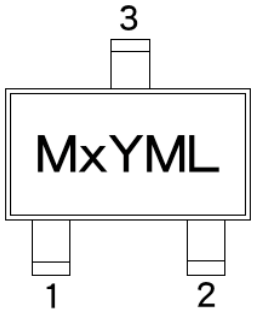
Figure 6. Efficiency vs. Load Current

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

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