

Ultra Low Quiescent Current 5V/150mA Fixed-Voltage Ultra Low LDO

DESCRIPTION

TS4264 is a 5V low-drop fixed-voltage regulator in an SOT-223 package. The IC regulates an input voltage in the range of $5.5V < V_{IN} < 45V$ to $V_{OUT} \text{ (rated)} = 5.0V$. The maximum output current is more than 150mA. This IC is designed with short circuit-proof and features temperature protection that disables the circuit at over-temperature.

FEATURES

- Fixed Output Voltage 5V
- Output Voltage Tolerance $\pm 2\%$
- 150mA Current Capability
- Ultra Low Dropout Voltage
- Over Temperature Protection
- Very Low Current Consumption 400uA (max.)
- Short-Circuit Proof
- Reverse Polarity Proof
- Wide Temperature Polarity Range
- Suitable for use in Automotive Electronics

APPLICATION

- Control module
- Body and Chassis
- Powertrain



SOT-223

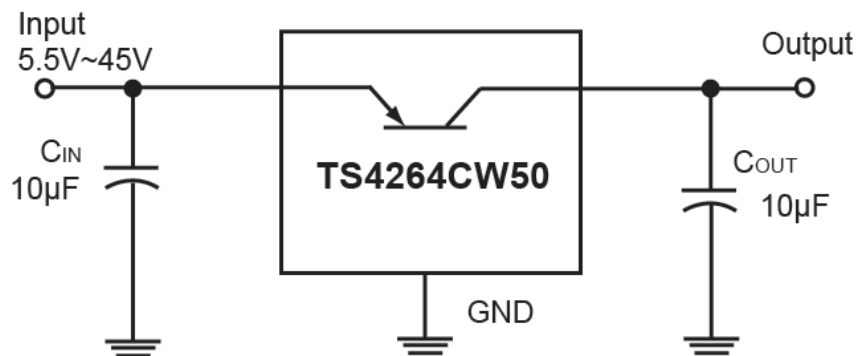


Pin Definition:

1. Input
2. Ground
3. Output

Notes: Moisture sensitivity level: level 3. Per J-STD-020

TYPICAL APPLICATION CIRCUIT



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|------------------|------------------|
| Input Voltage | V_{IN} | -42 ~ 45 | V |
| Input Voltage (Operating Range) | $V_{IN(OPR)}$ | 5.5 ~ 45 | V |
| Input Current | I_{IN} | Internal Limited | |
| Output Voltage | V_{OUT} | -0.3 ~ 32 | V |
| Output Current | I_{OUT} | Internal Limited | |
| Ground Current | $I_{GND(MIN)}$ | 50 | mA |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Junction Temperature (Operating Range) | $T_{J(OPR)}$ | -40 ~ +150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -50 ~ +150 | $^\circ\text{C}$ |

THERMAL PERFORMANCE (Note 1)

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|-----------------|-------|--------------------|
| Thermal Resistance from Junction to Pin | $R_{\theta JP}$ | 17 | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 80 | $^\circ\text{C/W}$ |

ELECTRICAL SPECIFICATIONS ($V_{IN}=13.5\text{V}$, $-40 \leq T_J \leq +150$, unless otherwise specified)

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------|---|------|------|------|---------------|
| Output Voltage | $6\text{V} \leq V_{IN} \leq 28\text{V}$, $5\text{mA} \leq I_O \leq 100\text{mA}$ | 4.85 | 5.00 | 5.10 | V |
| Output Current Limit | | 120 | 150 | -- | mA |
| Current Consumption | $I_O = 1\text{mA}$ | -- | -- | 400 | μA |
| | $I_O = 100\text{mA}$ | | 10 | 15 | mA |
| Dropout Voltage (Note 2) | $I_O = 100\text{mA}$ | -- | 0.22 | 0.5 | V |
| Load Regulation | $5\text{mA} \leq I_O \leq 100\text{mA}$, $V_{IN} = 13.5\text{V}$ | -- | 50 | 90 | mV |
| Line Regulation | $6\text{V} \leq V_{IN} \leq 28\text{V}$, $I_O = 5\text{mA}$ | -- | 15 | 30 | mV |
| Ripple Rejection | $F = 100\text{Hz}$, $V_R = 0.5V_{PP}$ | -- | 54 | -- | dB |

Note:

1. Measured to pin 2 (tab)
2. Dropout voltage = $V_{IN} - V_{OUT}$
(Measured where V_{OUT} has dropped 100mV from the nominal value obtained at $V_{IN} = 13.5\text{V}$)

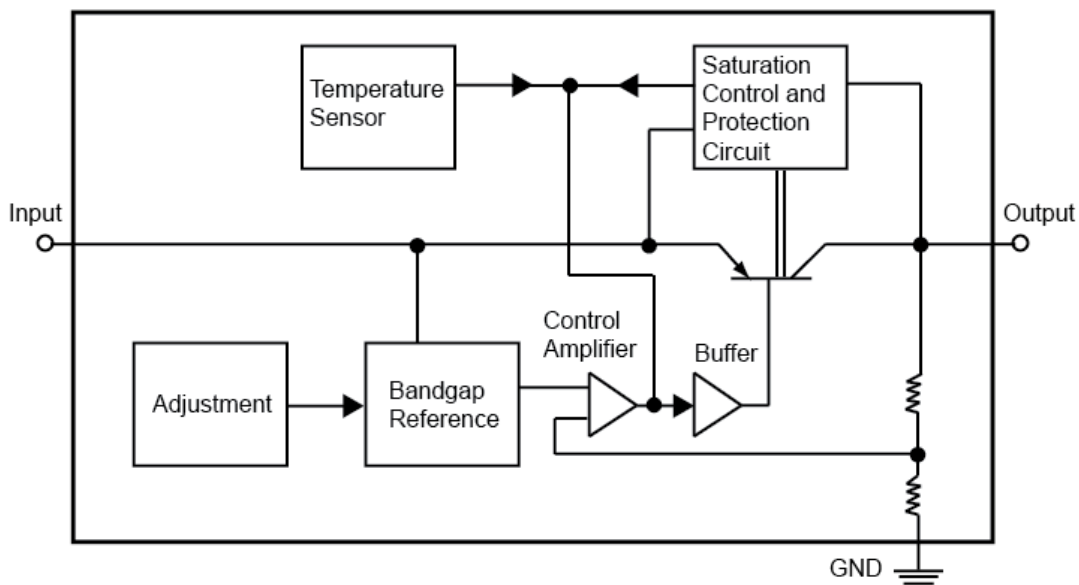
ORDERING INFORMATION

| PART NO. | PACKAGE | PACKING |
|----------------|---------|---------------------|
| TS4264CW50 RPG | SOT-223 | 2,500pcs / 13" Reel |

Note:

1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC.
2. Halogen-free according to IEC 61249-2-21 definition.

BLOCK DIAGRAM



PIN DESCRIPTION

| PIN NO. | NAME | FUNCTION |
|---------|--------|--|
| 1 | Input | Block to ground directly on IC with ceramic capacitor |
| 2 | Ground | Ground |
| 3 | Output | Block to ground with 10 μ F capacitor, ESR < 10 Ω |

APPLICATION INFORMATION

Dimensioning Information on External Components

The input capacitor C_{IN} is necessary for compensating line influences. Using a resistor of approx. 1 Ω in series with C_{IN} , the oscillating of input inductivity and input capacitance can be clamped. The output capacitor C_{OUT} is necessary for the stability of the regulating circuit. Stability is guaranteed at values $C_{OUT} \geq 10\mu\text{F}$ and an $\text{ESR} \leq 10\Omega$ within the operating temperature range.

Circuit Description

The control amplifier compares a reference voltage, which is kept highly precise by resistance adjustment, to a voltage that is proportional to the output voltage and drives the base of the series transistor via a buffer. Saturation control, working as a function of load current, prevents any over-saturation of the power element. The IC is additionally protected against overload, over temperature and reverse polarity

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

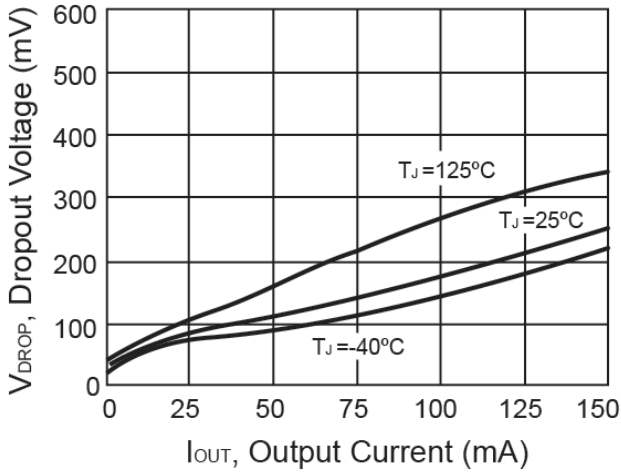


Figure 1. Output Voltage vs. Input Voltage

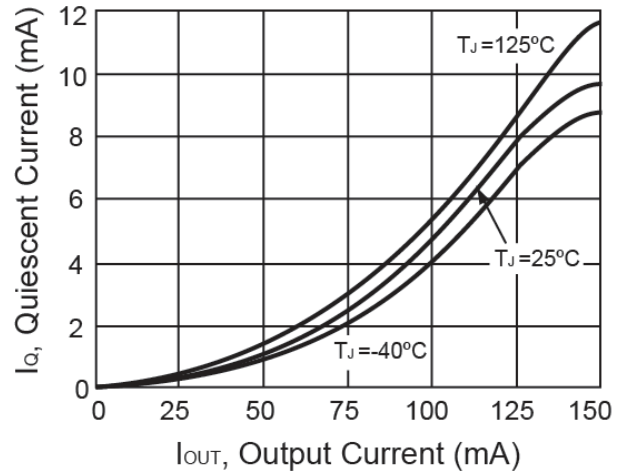


Figure 2. Quiescent Current vs. Output Current

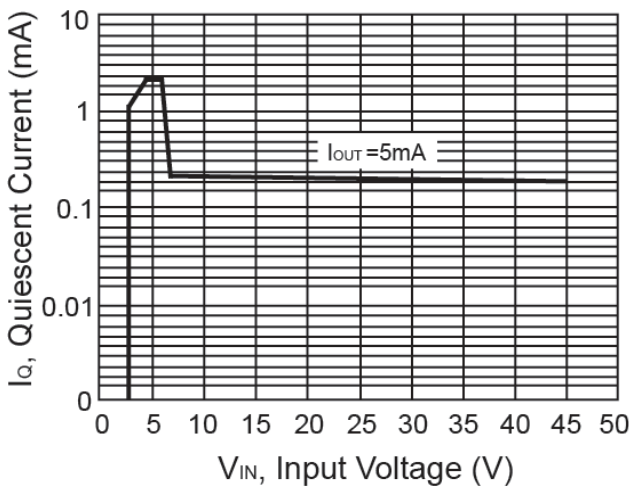


Figure 3. Quiescent Current vs. Input Voltage

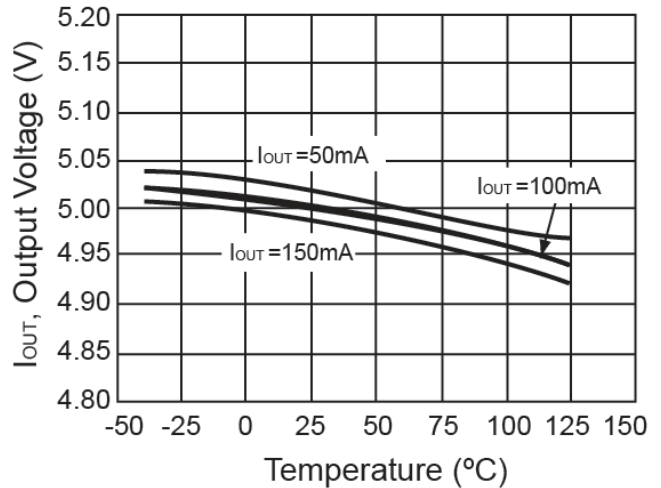


Figure 4. Output Current vs. Temperature

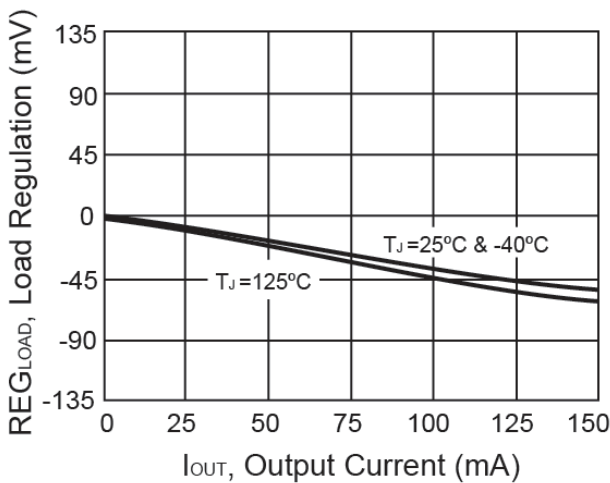


Figure 5. Load Regulation vs. Output Current

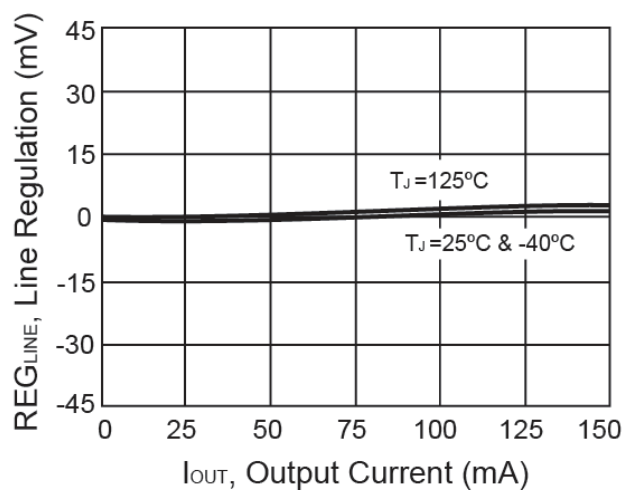
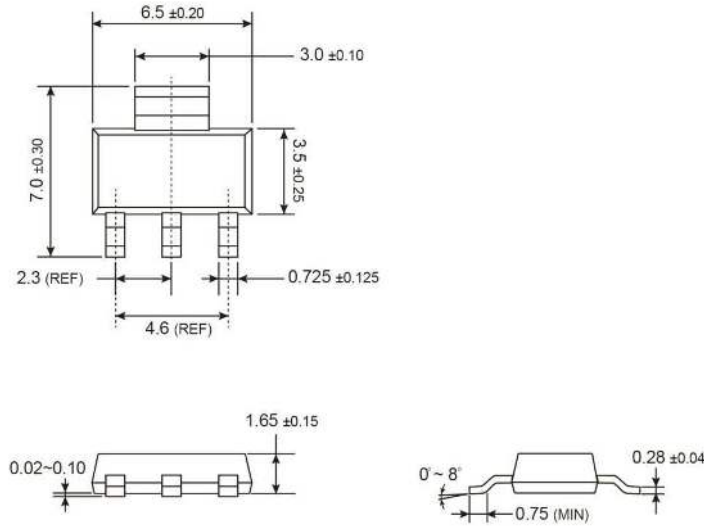


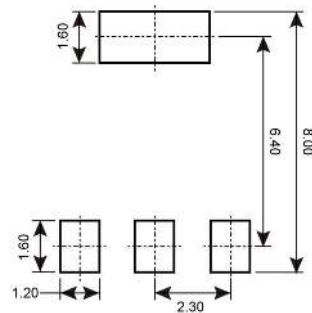
Figure 6. Line Regulation vs. Output Current

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

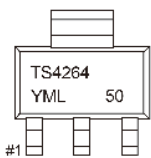
SOT-223



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



- Y** = Year Code
- M** = Month Code for Halogen Free Product
 - O** =Jan **P** =Feb **Q** =Mar **R** =Apr
 - S** =May **T** =Jun **U** =Jul **V** =Aug
 - W** =Sep **X** =Oct **Y** =Nov **Z** =Dec
- L** = Lot Code (1~9, A~Z)

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