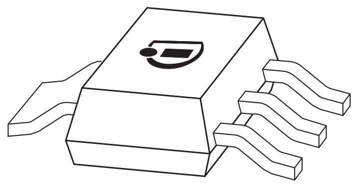
## 5-V Low Drop Fixed Voltage Regulator TLE 4264

### Features

- Output voltage tolerance ≤ ±2%
- Low-drop voltage
- Very low current consumption
- Overtemperature protection
- Short-circuit proof
- Suitable for use in automotive electronics
- Reverse polarity
- Green Product (RoHS compliant)
- AEC Qualified



SOT223

### Functional Description

TLE 4264 is a 5-V low-drop fixed-voltage regulator in an PG-SOT223-4 package. The IC regulates an input voltage $V_I$ in the range 5.5 V < $V_I$ < 45 V to $V_{Qrated}$ = 5.0 V. The maximum output current is more than 120 mA. This IC is shortcircuit-proof and features temperature protection that disables the circuit at overtemperature.

### Dimensioning Information on External Components

The input capacitor $C_i$ is necessary for compensating line influences. Using a resistor of approx. 1 Ω in series with $C_i$, the oscillating of input inductivity and input capacitance can be damped. The output capacitor $C_Q$ is necessary for the stability of the regulating circuit. Stability is guaranteed at values $C_Q \geq 10\ \mu F$ and an ESR ≤ 10 Ω within the operating temperature range.

| Type | Package |
|---|---|
| TLE 4264 G | PG-SOT223-4 |

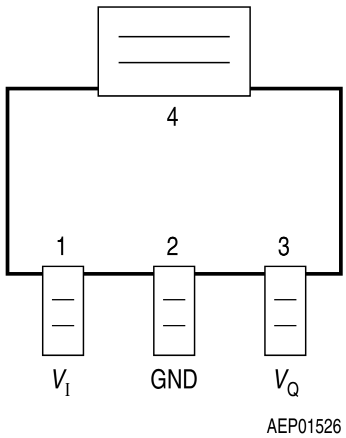



**Figure 1** **Pin Configuration** (top view)

**Table 1** **Pin Definitions and Functions**

| Pin | Symbol | Function |
|---|---|---|
| 1 | $V_I$ | **Input voltage;** block to ground directly on IC with ceramic capacitor |
| 2, 4 | GND | **Ground** |
| 3 | $V_Q$ | **5-V output voltage;** block to ground with $\geq$ 10 $\mu$F capacitor, ESR $\leq$ 10 $\Omega$ |

## 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 protected against overload, overtemperature and reverse polarity.

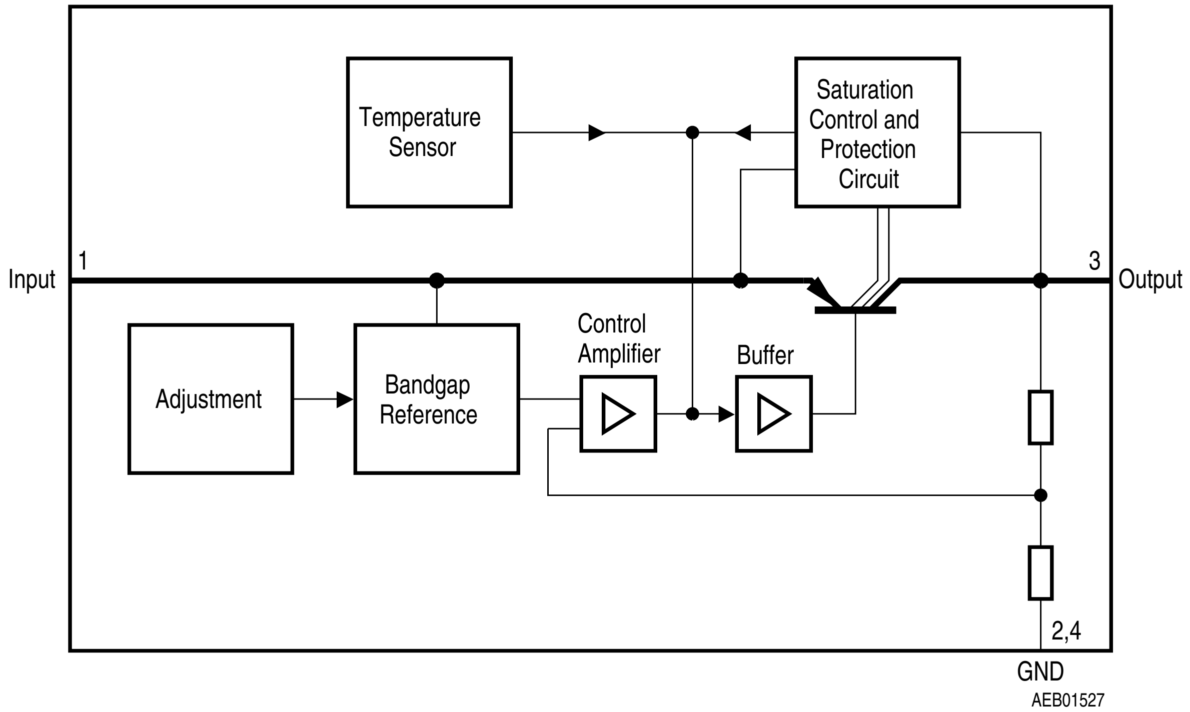



**Figure 2 Block Diagram**

**Table 2 Absolute Maximum Ratings**

$T_j$ = -40 to 150 °C

| Parameter | Symbol | Limit Values | | Unit | Notes |
|---|---|---|---|---|---|
| | | Min. | Max. | | |
| **Input** | | | | | |
| Input voltage | $V_I$ | -42 | 45 | V | – |
| Input current | $I_I$ | – | – | – | limited internally |
| **Output** | | | | | |
| Output voltage | $V_Q$ | -1 | 32 | V | – |
| Output current | $I_Q$ | – | – | – | limited internally |
| **Ground** | | | | | |
| Current | $I_{GND}$ | 50 | – | mA | – |
| **Temperatures** | | | | | |
| Junction temperature | $T_j$ | – | 150 | °C | – |
| Storage temperature | $T_{stg}$ | -50 | 150 | °C | – |
| **Operating Range** | | | | | |
| Input voltage | $V_I$ | 5.5 | 45 | V | – |
| Junction temperature | $T_j$ | -40 | 150 | °C | – |
| **Thermal Resistances** | | | | | |
| Junction-ambient | $R_{thj-a}$ | – | 85 | K/W | 1) |
| Junction-pin4 | $R_{thj-pin4}$ | – | 20 | K/W | – |

1) Worst case, regarding peak temperature; zero airflow; mounted an a PCB 80 × 80 × 1.5 $mm^3$, heat sink area 300 $mm^2$.

**Table 3 Characteristics**

$V_I$ = 13.5 V; -40 °C ≤ $T_j$ ≤ 125 °C, unless specified otherwise

| Parameter | Symbol | Limit Values | | | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Output voltage | $V_Q$ | 4.9 | 5.0 | 5.1 | V | 5 mA ≤ $I_Q$ ≤ 100 mA<br>6 V ≤ $V_I$ ≤ 28 V |
| Output-current limiting | $I_Q$ | 120 | 160 | – | mA | – |
| Current consumption $I_q = I_I - I_Q$ | $I_q$ | – | – | 400 | µA | $I_Q$ = 1 mA |
| Current consumption $I_q = I_I - I_Q$ | $I_q$ | – | 9 | 15 | mA | $I_Q$ = 100 mA |
| Drop voltage | $V_{dr}$ | – | 0.25 | 0.5 | V | $I_Q$ = 100 mA[1)] |
| Load regulation | $\Delta V_Q$ | – | – | 40 | mV | $I_Q$ = 5 to 100 mA<br>$V_I$ = 6 V |
| Supply-voltage regulation | $\Delta V_Q$ | – | 15 | 30 | mV | $V_I$ = 6 to 28 V<br>$I_Q$ = 5 mA |
| Power Supply ripple rejection | $PSRR$ | – | 54 | – | dB | $f_r$ = 100 Hz<br>$V_r$ = 0.5 Vpp |

1) Drop voltage = $V_I$ - $V_Q$ (measured where $V_Q$ has dropped 100 mV from the nominal value obtained at $V_I$ = 13.5 V).

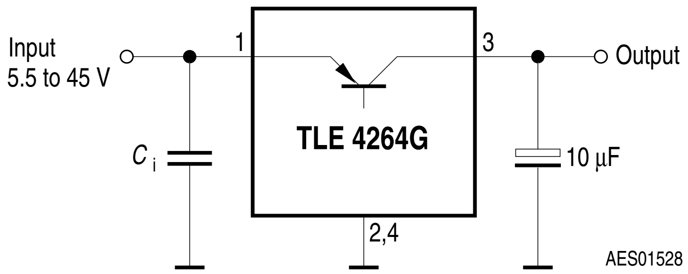
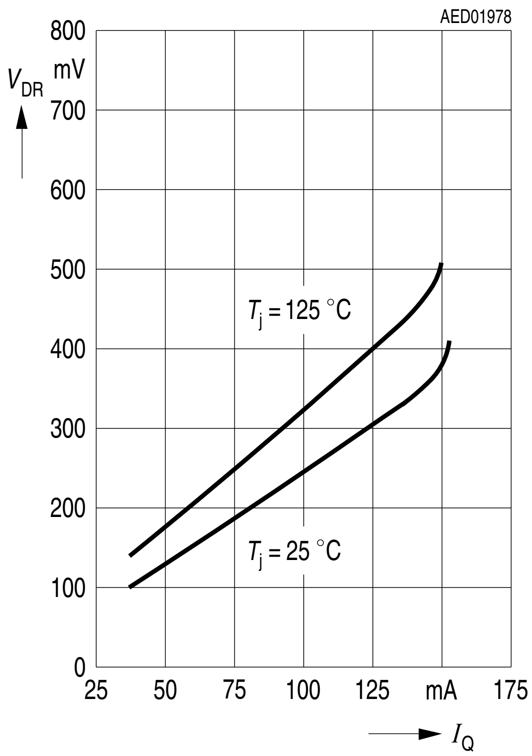
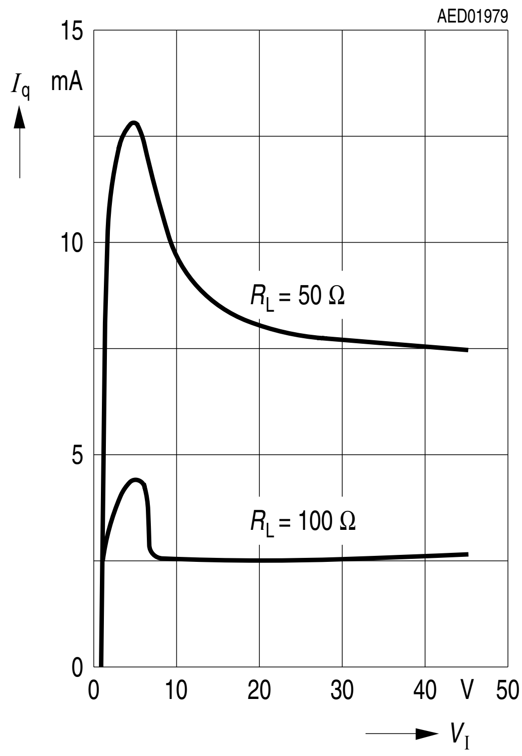



**Figure 3 Application Circuit**

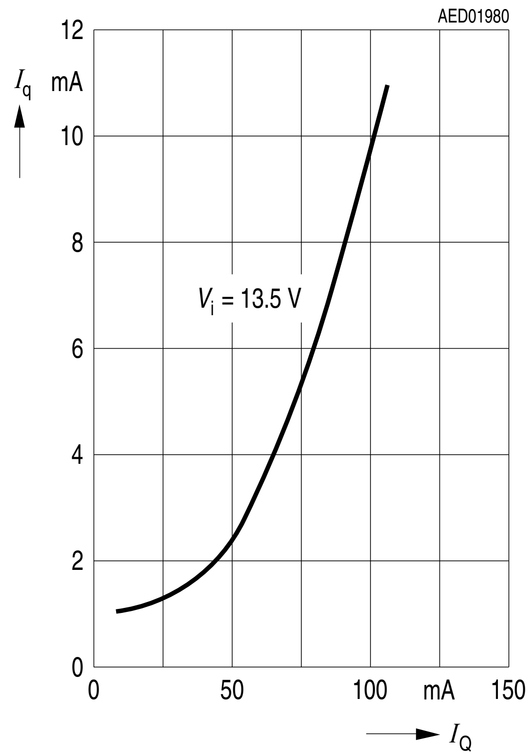
**Drop Voltage $V_{DR}$ versus Output Current $I_Q$**



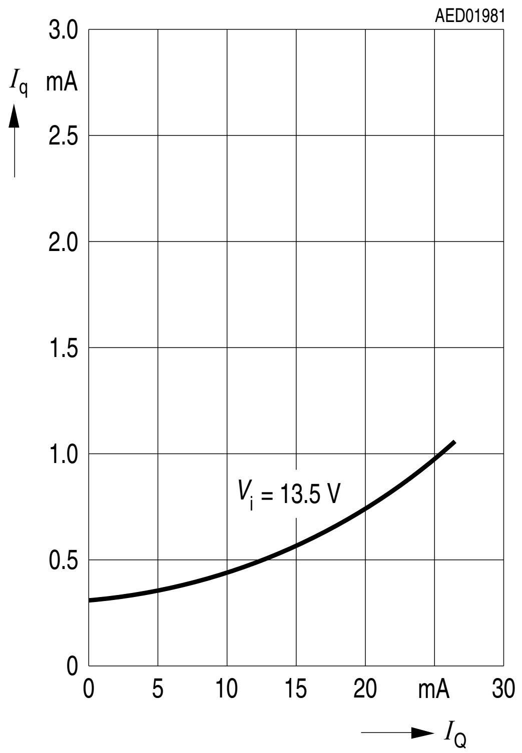

**Current Consumption $I_q$ versus Input Voltage $V_i$**



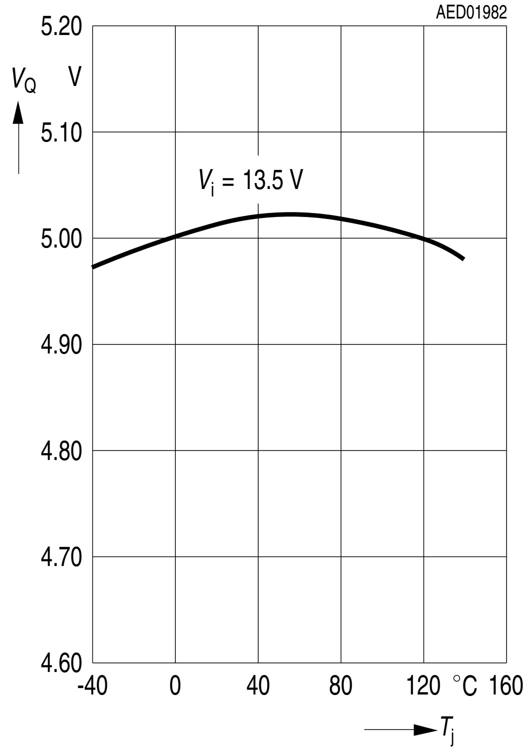

**Current Consumption $I_q$ versus Output Current $I_Q$**



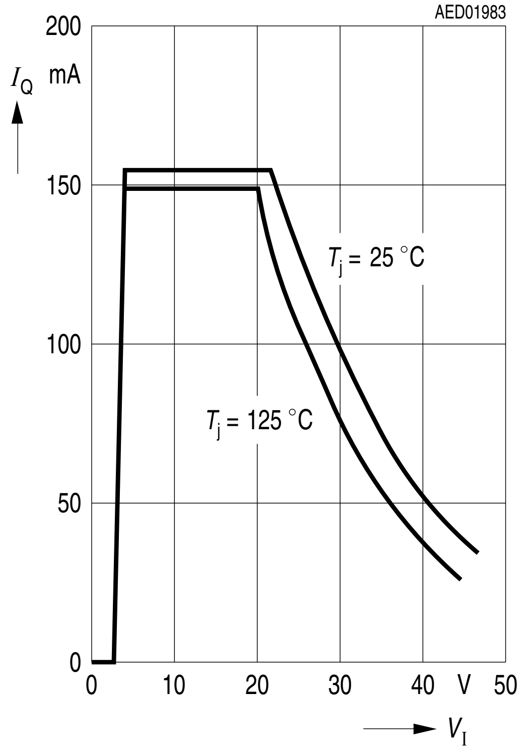

**Current Consumption $I_q$ versus Output Current $I_Q$**



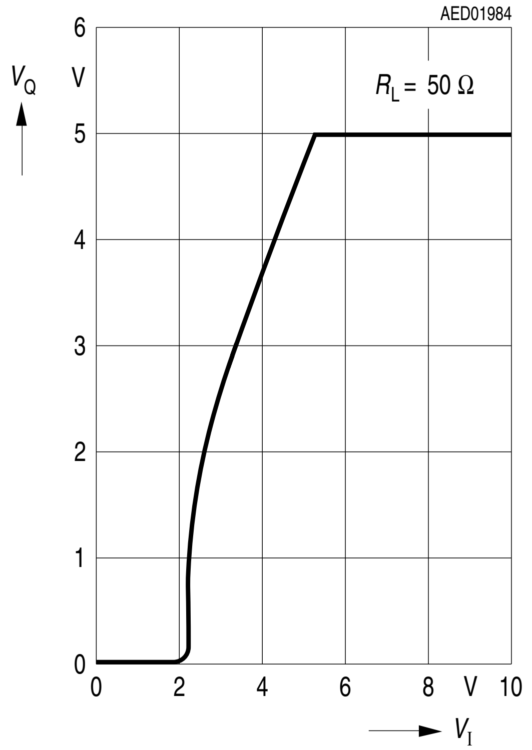
**Output Voltage $V_Q$ versus Temperature $T_j$**




**Output Current $I_Q$ versus Input Voltage $V_i$**




**Output Voltage $V_Q$ versus Input Voltage $V_i$**



## Package Outlines

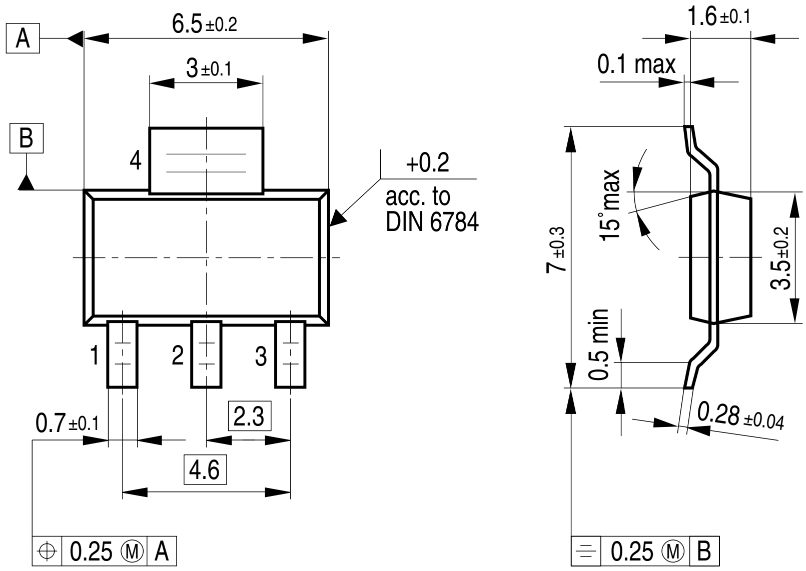



**Figure 4** **PG-SOT223-4** (Plastic Small Outline Transistor)

**Green Product** (RoHS compliant)

To meet the world-wide customer requirements for environmentally friendly products and to be compliant with government regulations the device is available as a green product. Green products are RoHS-Compliant (i.e Pb-free finish on leads and suitable for Pb-free soldering according to IPC/JEDEC J-STD-020).

You can find all of our packages, sorts of packing and others in our Infineon Internet Page "Products": **http://www.infineon.com/products**.

SMD = Surface Mounted Device

Dimensions in mm

| Version | Date | Changes |
|---|---|---|
| Rev. 2.3 | 2008-03-07 | Simplified package name to PG-SOT223-4.<br>No modification of released product. |
| Rev. 2.2 | 2007-03-20 | Initial version of RoHS-compliant derivate of TLE 4264<br>**Page 1**: AEC certified statement added<br>**Page 1** and **Page 9**: RoHS compliance statement and Green product feature added<br>**Page 1** and **Page 9**: Package changed to RoHS compliant version<br>Legal Disclaimer updated |

**Edition 2008-03-07**

**Published by**
**Infineon Technologies AG**
**81726 Munich, Germany**



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