

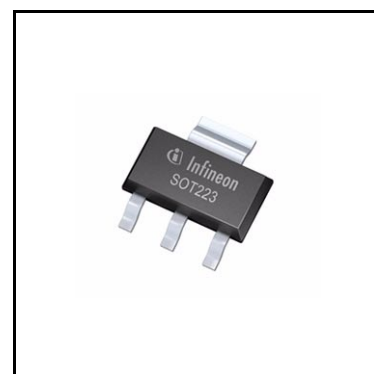
# OPTIREG™ Linear TLE4264

## 5-V low drop fixed voltage regulator



### Features

- Output voltage tolerance  $\leq \pm 2\%$
- Low-drop voltage
- Very low current consumption
- Overtemperature protection
- Short-circuit proof
- Suitable for use in automotive electronics
- Reverse polarity
- Green Product (RoHS compliant)



### Potential applications

General automotive applications.

### Product validation

Qualified for automotive applications. Product validation according to AEC-Q100/101.

### Description

The OPTIREG™ Linear TLE4264 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  $5.5 \text{ V} < V_I < 45 \text{ V}$  to  $V_{Q_{rated}} = 5.0 \text{ V}$ . 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.  $1 \Omega$  in series with  $C_i$ , the oscillating of input inductivity and input capacitance can be damped. The output capacitor  $C_o$  is necessary for the stability of the regulating circuit. Stability is guaranteed at values  $C_o \geq 10 \mu\text{F}$  and an  $\text{ESR} \leq 10 \Omega$  within the operating temperature range.

Type	Package	Marking
TLE4264G	PG-SOT223-4	4264 G

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Pin configuration

## 2 Pin configuration

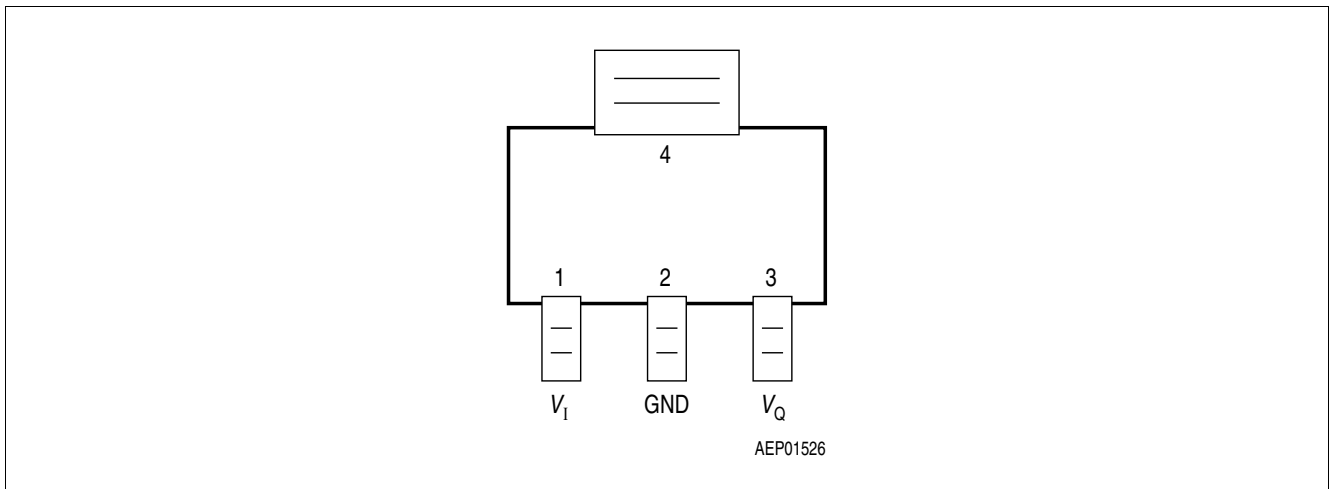


Figure 2 Pin configuration (top view)

Table 1 Pin definitions and functions

Pin	Symbol	Function
1	$V_I$	<b>Input voltage</b> Block to ground directly on IC with ceramic capacitor.
2, 4	GND	<b>Ground</b>
3	$V_O$	<b>5-V output voltage</b> Block to ground with $\geq 10 \mu\text{F}$ capacitor, $\text{ESR} \leq 10 \Omega$ .

General product characteristics

### 3 General product characteristics

#### 3.1 Absolute maximum ratings

**Table 2 Absolute maximum ratings**

$T_j = -40^\circ\text{C}$  to  $150^\circ\text{C}$

Parameter	Symbol	Values			Unit	Note or Test Condition
		Min.	Typ.	Max.		
<b>Input</b>						
Input voltage	$V_I$	-42	-	45	V	-
Input current	$I_I$	-	-	-	-	Limited internally
<b>Output</b>						
Output voltage	$V_Q$	-1	-	32	V	-
Output current	$I_Q$	-	-	-	-	Limited internally
<b>Ground</b>						
Current	$I_{\text{GND}}$	50	-	-	mA	-
<b>Temperatures</b>						
Junction temperature	$T_j$	-	-	150	$^\circ\text{C}$	-
Storage temperature	$T_{\text{stg}}$	-50	-	150	$^\circ\text{C}$	-
<b>Operating range</b>						
Input voltage	$V_I$	5.5	-	45	V	-
Junction temperature	$T_j$	-40	-	150	$^\circ\text{C}$	-
<b>Thermal resistances</b>						
Junction-ambient	$R_{\text{thj-a}}$	-	-	85	K/W	<sup>1)</sup>
Junction-pin4	$R_{\text{thj-pin4}}$	-	-	20	K/W	-

1) Worst case, regarding peak temperature; zero airflow; mounted on a PCB  $80 \times 80 \times 1.5 \text{ mm}^3$ , heat sink area  $300 \text{ mm}^2$ .

#### 3.2 Electrical characteristics

**Table 3 Electrical characteristics**

$V_I = 13.5 \text{ V}$ ;  $T_j = -40^\circ\text{C}$  to  $125^\circ\text{C}$ , unless specified otherwise

Parameter	Symbol	Values			Unit	Note or Test Condition
		Min.	Typ.	Max.		
Output voltage	$V_Q$	4.9	5.0	5.1	V	$I_Q = 5 \text{ mA}$ to $100 \text{ mA}$ $V_I = 6 \text{ V}$ to $28 \text{ V}$
Output-current limiting	$I_Q$	120	160	-	mA	-
Current consumption $I_q = I_I - I_Q$	$I_q$	-	-	400	$\mu\text{A}$	$I_Q = 1 \text{ mA}$
Current consumption $I_q = I_I - I_Q$	$I_q$	-	9	15	mA	$I_Q = 100 \text{ mA}$

**General product characteristics**

**Table 3 Electrical characteristics (cont'd)**

$V_I = 13.5\text{ V}$ ;  $T_j = -40^\circ\text{C}$  to  $125^\circ\text{C}$ , unless specified otherwise

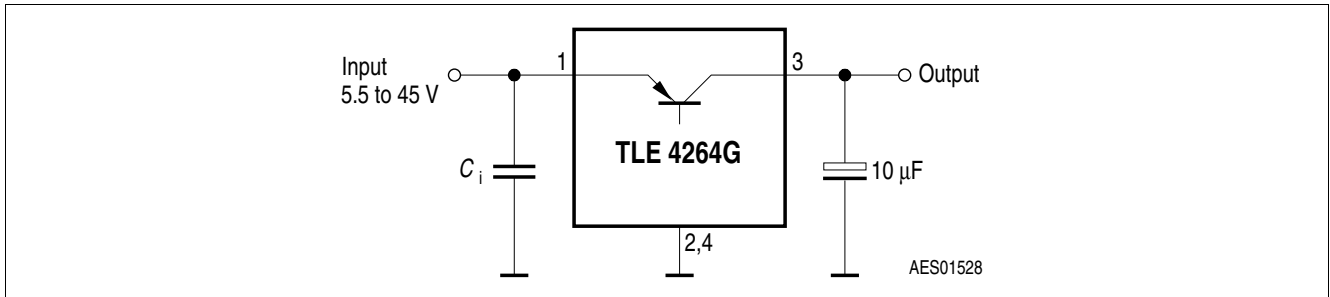
Parameter	Symbol	Values			Unit	Note or Test Condition
		Min.	Typ.	Max.		
Drop voltage	$V_{dr}$	–	0.25	0.5	V	$I_Q = 100\text{ mA}$ <sup>1)</sup>
Load regulation	$\Delta V_Q$	–	–	40	mV	$I_Q = 5$ to $100\text{ mA}$ $V_I = 6\text{ V}$
Supply-voltage regulation	$\Delta V_Q$	–	15	30	mV	$V_I = 6$ to $28\text{ V}$ $I_Q = 6\text{ mA}$
Power supply ripple rejection	$PSRR$	–	54	–	dB	$f_r = 100\text{ Hz}$ $V_r = 0.5\text{ Vpp}$

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

**Functional description**

## **4 Functional description**

### **4.1 Application circuit**



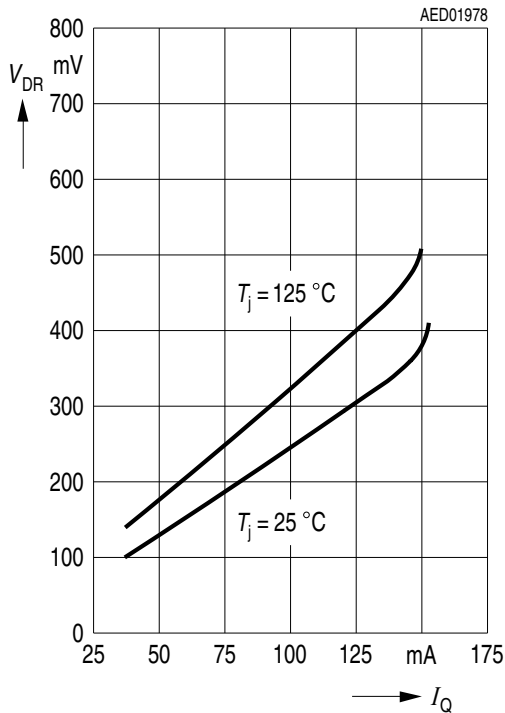
**Figure 3 Application circuit**

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.

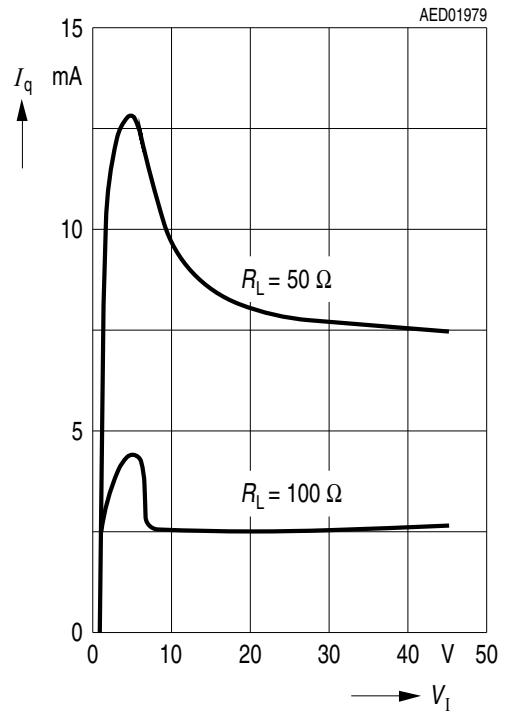
Typical performance characteristics

**5 Typical performance characteristics**

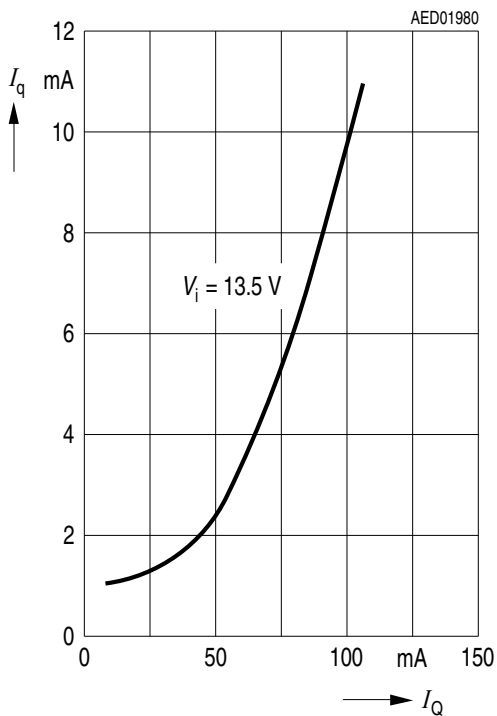
**Drop voltage  $V_{DR}$  versus output current  $I_Q$**



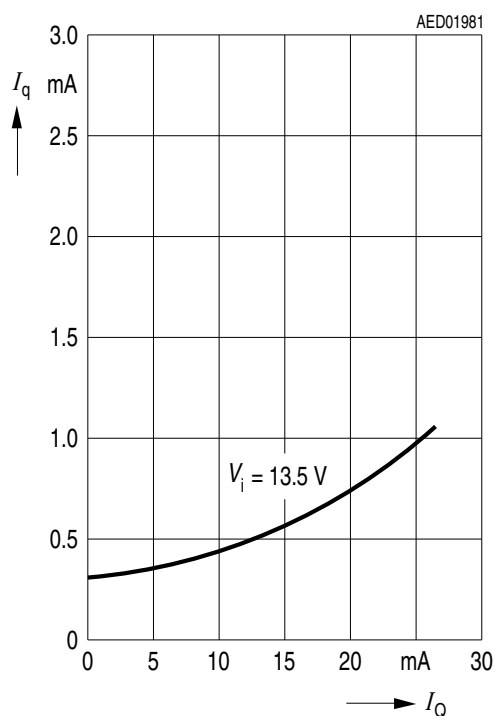
**Current consumption  $I_q$  versus input voltage  $V_i$**



**Current consumption  $I_q$  versus output current  $I_Q$**



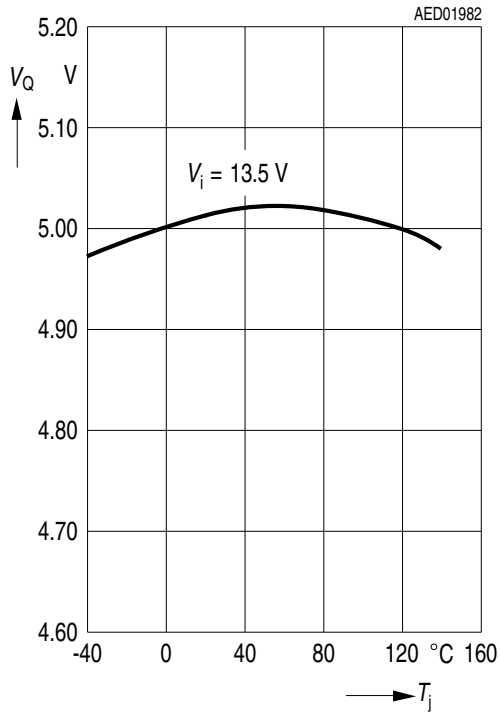
**Current consumption  $I_q$  versus output current  $I_Q$**



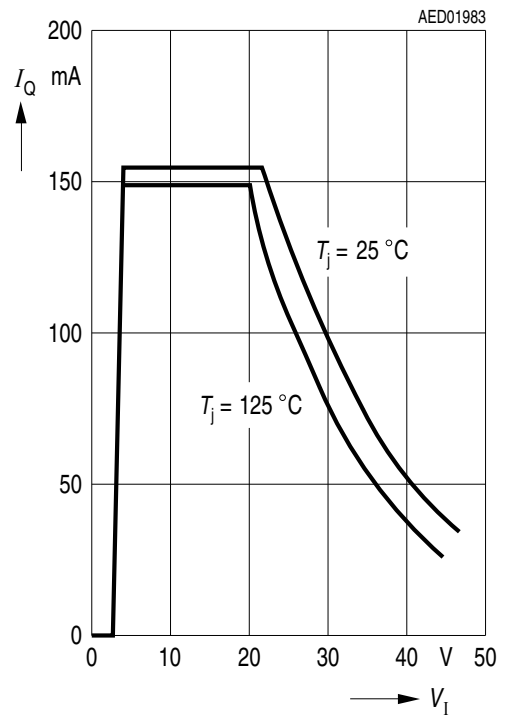


**Typical performance characteristics**

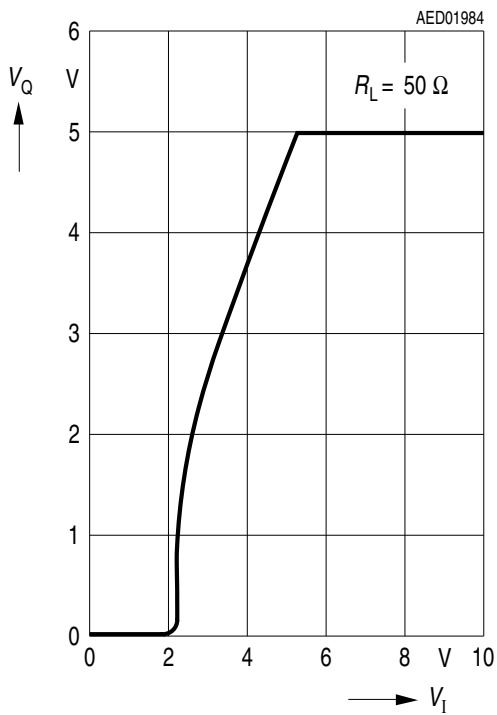
**Output voltage  $V_Q$  versus junction temperature  $T_j$**



**Output current  $I_Q$  versus input voltage  $V_i$**

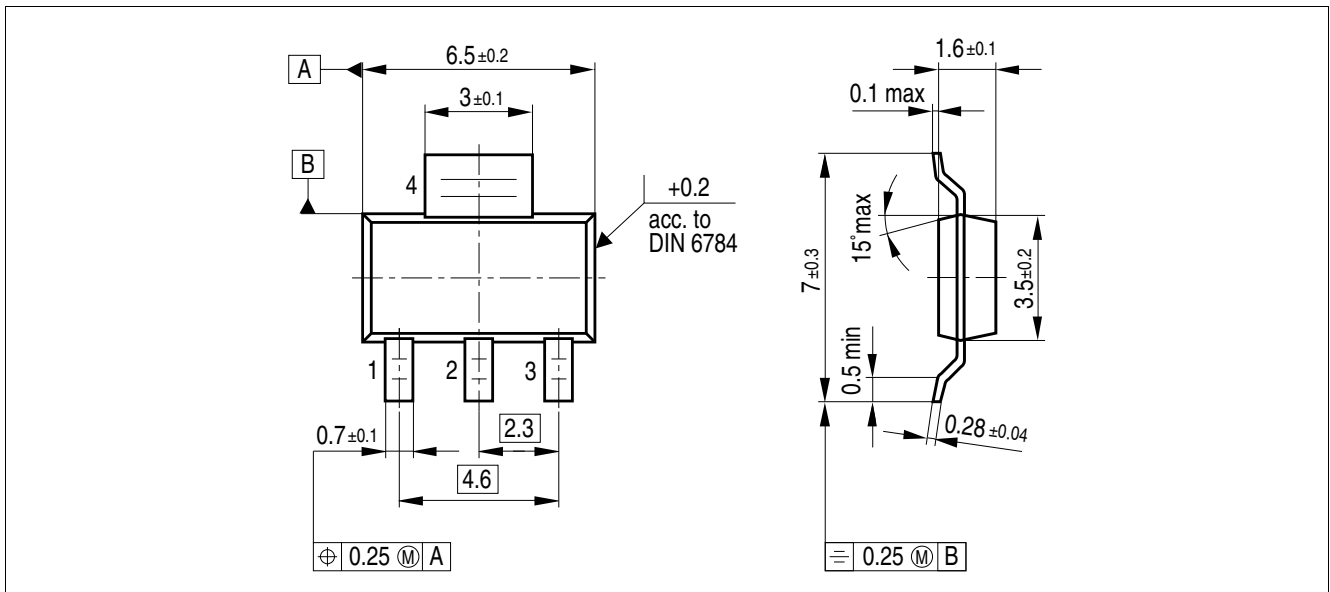


**Output voltage  $V_Q$  versus input voltage  $V_i$**



**Package information**

**6 Package information**



**Figure 4** PG-SOT223-4 (Plastic small outline transistor)<sup>1)</sup>

**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).

**Further information on packages**

<https://www.infineon.com/packages>

1) Dimensions in mm

**Revision history**

## **7 Revision history**

<b>Revision</b>	<b>Date</b>	<b>Changes</b>
2.4	2019-05-22	Updated layout and structure Updated packaged drawing “PG-SOT223” Editorial changes
2.3	2008-03-07	Simplified package name to PG-SOT223-4 No modification of released product
2.2	2007-03-20	Initial version of RoHS-compliant derivate of TLE4264 Page 1: AEC certified statement added Page 1 and Page 10: RoHS compliance statement and Green product feature added Page 1 and Page 10: Package changed to RoHS compliant version Legal Disclaimer updated

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**Document reference**

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