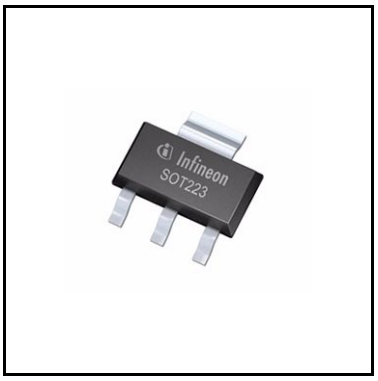
OPTIREG™ Linear TLE4264

5-V low drop fixed voltage regulator

AEC Qualified

RoHS



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)

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 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 ≥ 10 µF and an ESR ≤ 10 Ω within the operating temperature range.

Type	Package	Marking
TLE4264G	PG-SOT223-4	4264 G

Table of contents

1 Block diagram

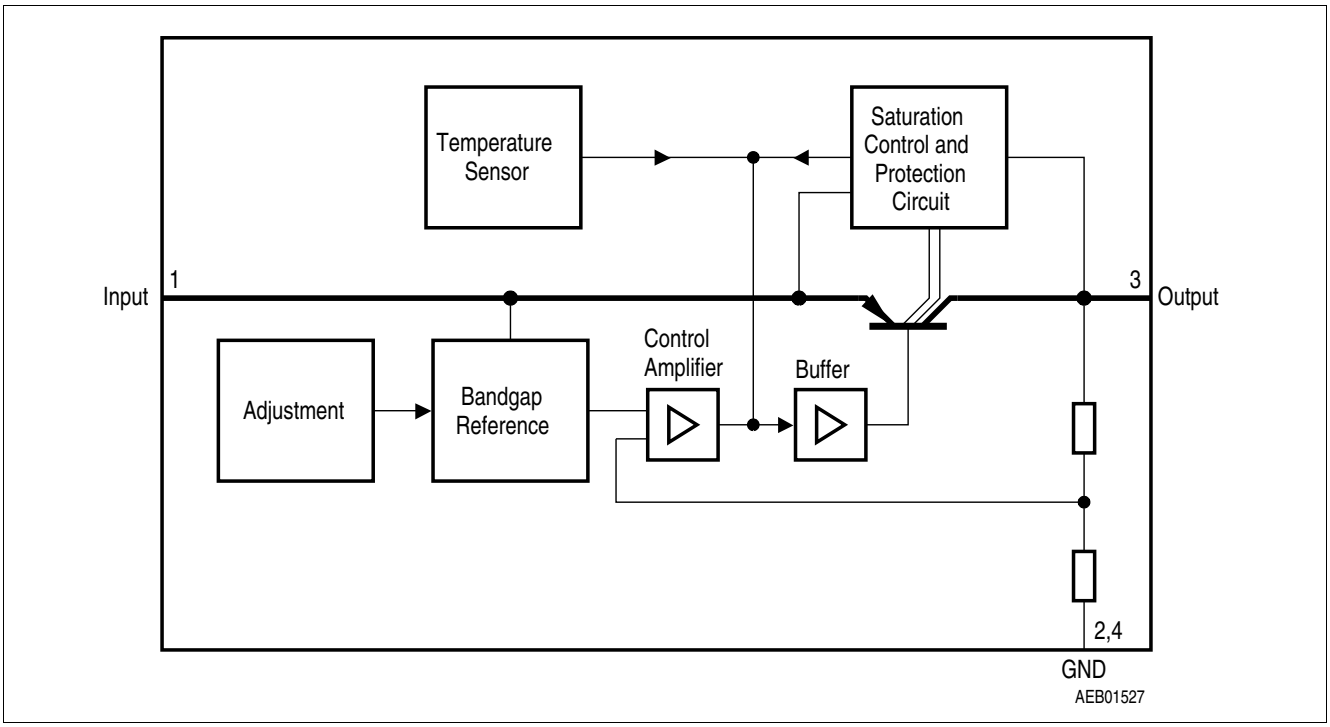


Figure 1 Block diagram

2 Pin configuration

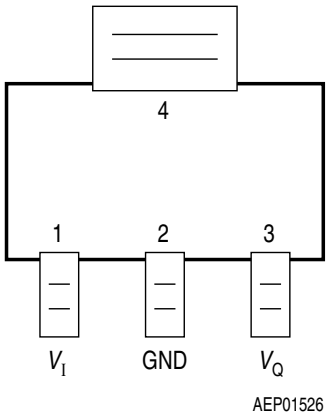


Figure 2 Pin configuration (top view)

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 ≥ 10 µF capacitor, ESR ≤ 10 Ω.

3 General product characteristics

3.1 Absolute maximum ratings

Table 2 Absolute maximum ratings

T_j = -40°C to 150°C

Parameter	Symbol	Values			Unit	Note or Test Condition
		Min.	Typ.	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	$R_{thj\text{-}a}$	–	–	85	K/W	1)
Junction-pin4	$R_{thj\text{-}pin4}$	–	–	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.

3.2 Electrical characteristics

Table 3 Electrical characteristics

V_I = 13.5 V; T_j = -40°C to 125°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 mA to 100 mA V_I = 6 V to 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

Table 3 Electrical characteristics (cont'd)

V_I = 13.5 V; T_j = -40°C to 125°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 mA[1)]
Load regulation	ΔV_Q	–	–	40	mV	I_Q = 5 to 100 mA V_I = 6 V
Supply-voltage regulation	ΔV_Q	–	15	30	mV	V_I = 6 to 28 V I_Q = 5 mA
Power supply ripple rejection	*PSRR*	–	54	–	dB	f_r = 100 Hz 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).

4 Functional description

4.1 Application circuit

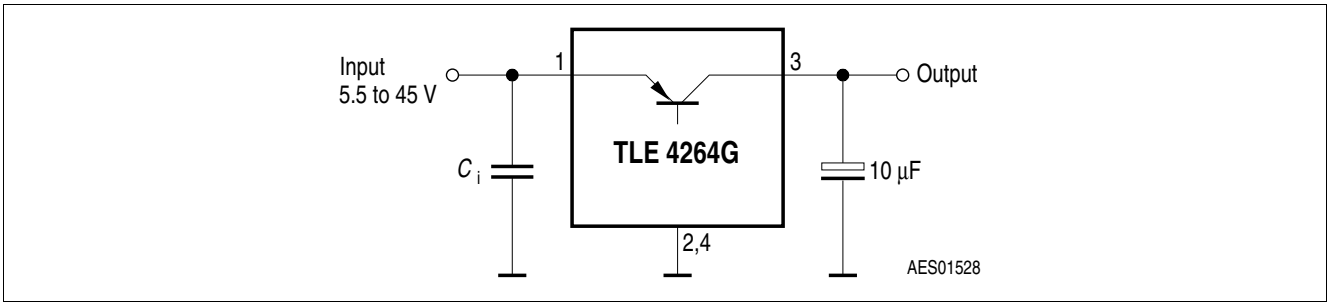
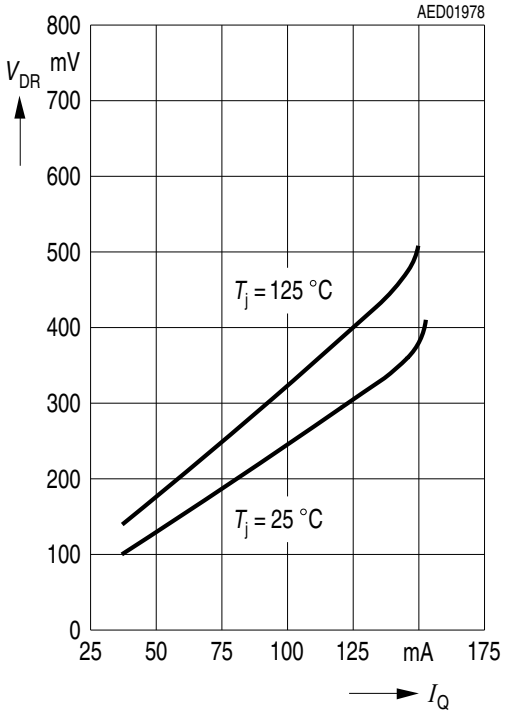


Figure 3 Application circuit

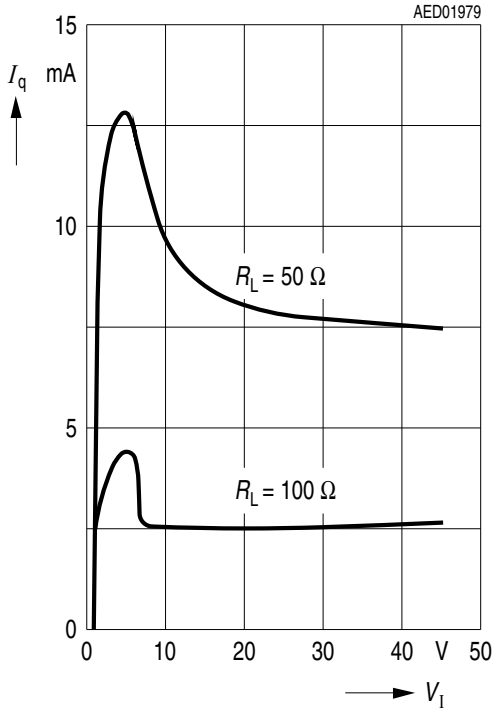
The control amplifier compares a reference voltage, which is kept highly precise by resistance adjustment, to a voltage that is proportional to the output voltage and drives the base of the series transistor via a buffer. Saturation control, working as a function of load current, prevents any over-saturation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

5 Typical performance characteristics

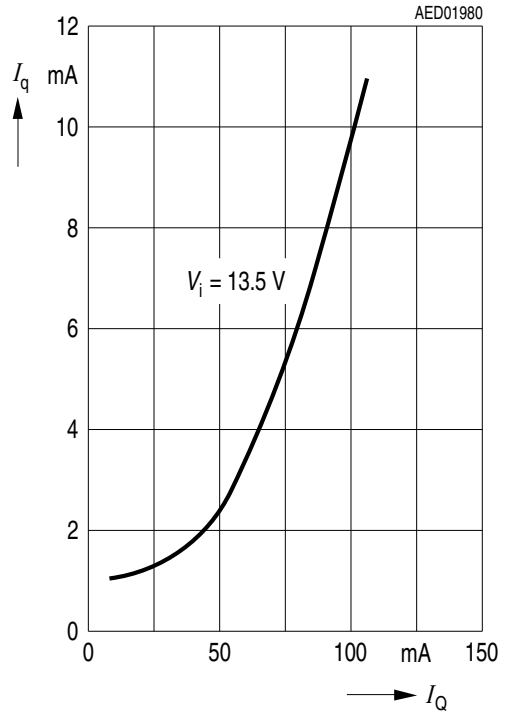
Drop voltage V_{DR} versus output current I_Q



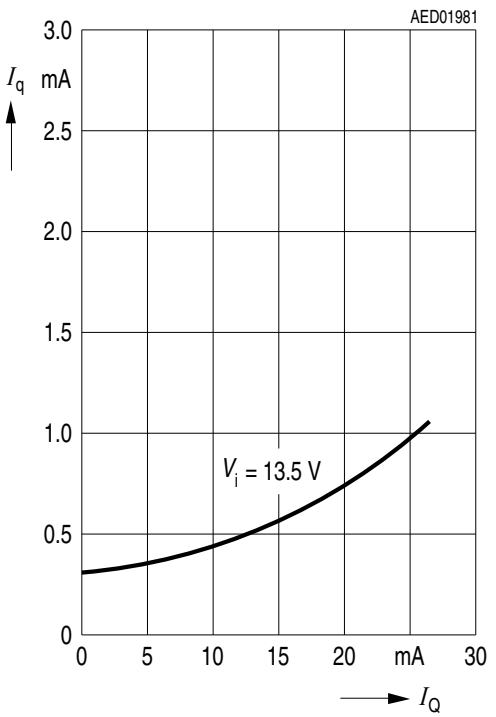
Current consumption I_q versus input voltage V_i



Current consumption I_q versus output current I_Q

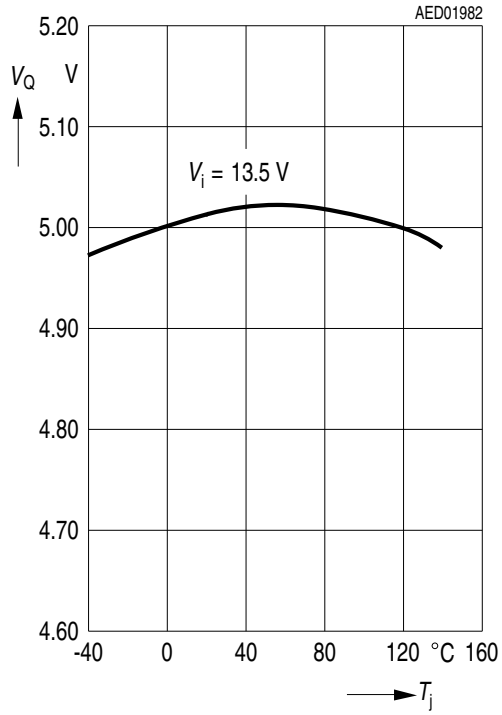


Current consumption I_q versus output current I_Q

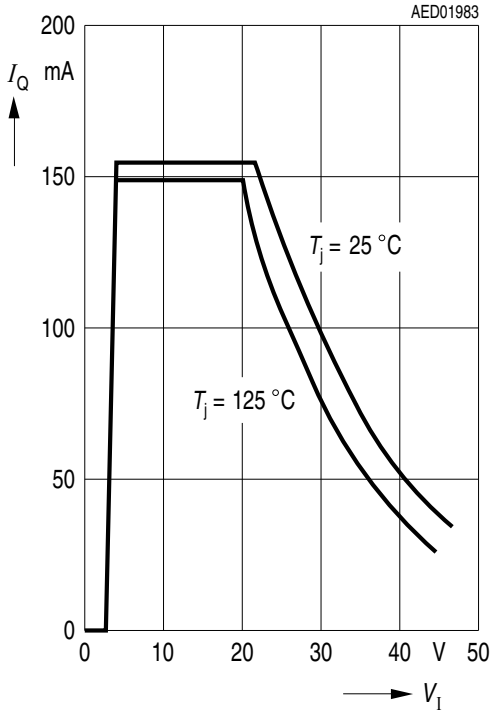


Typical performance characteristics

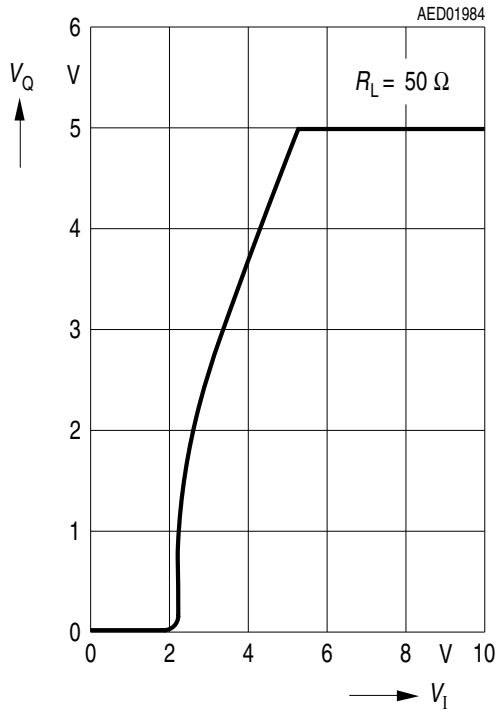
Output voltage V_Q versus junction temperature T_j



Output current I_Q versus input voltage V_i



Output voltage V_Q versus input voltage V_i



6 Package information

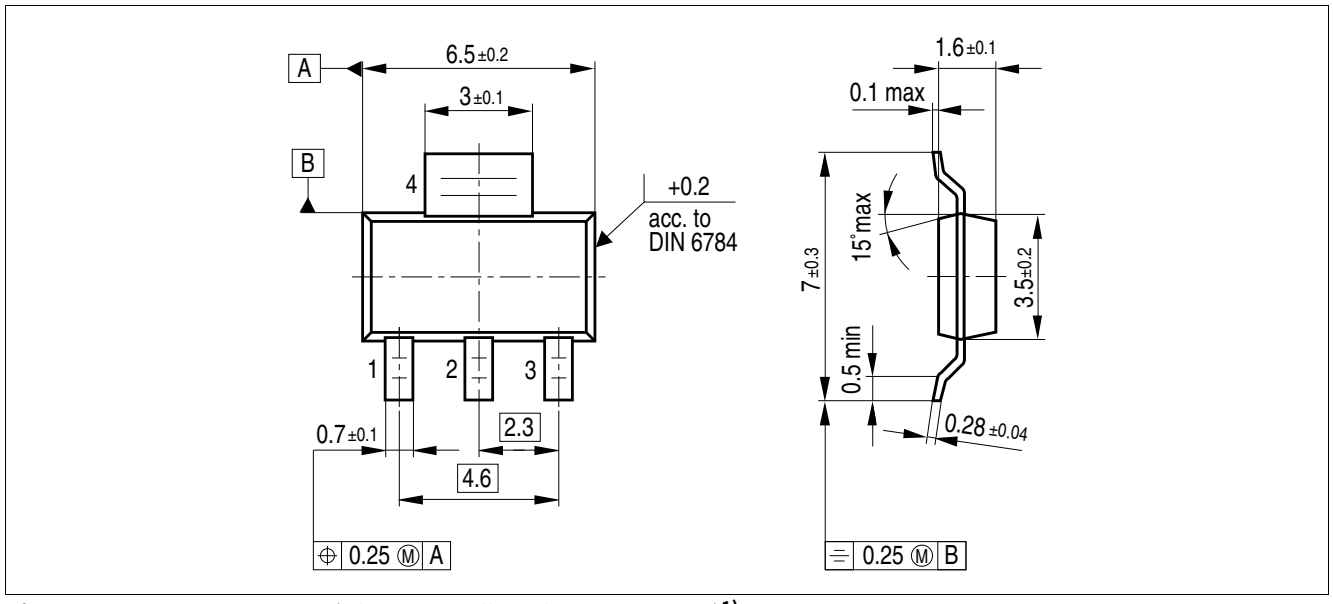


Figure 4 **PG-SOT223-4** (Plastic small outline transistor)[1)]

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

7 Revision history

Revision	Date	Changes
2.5	2021-07-12	Editorial change page 6: typo in column “Note or Test conditions” 6mA to 5mA
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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