5-V Low Drop Fixed Voltage Regulator

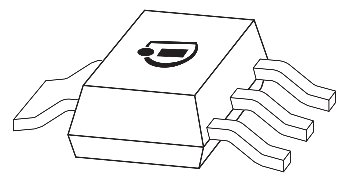
TLE 4264

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

Type	Package
TLE 4264 G	PG-SOT223-4

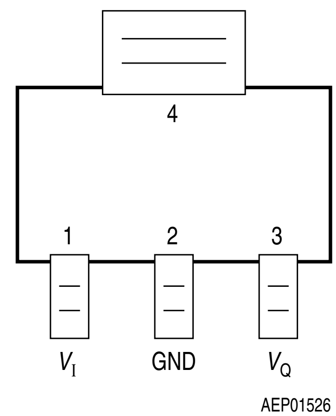


Figure 1 **Pin Configuration** (top view)

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 ≥ 10 µF capacitor, ESR ≤ 10 Ω

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.

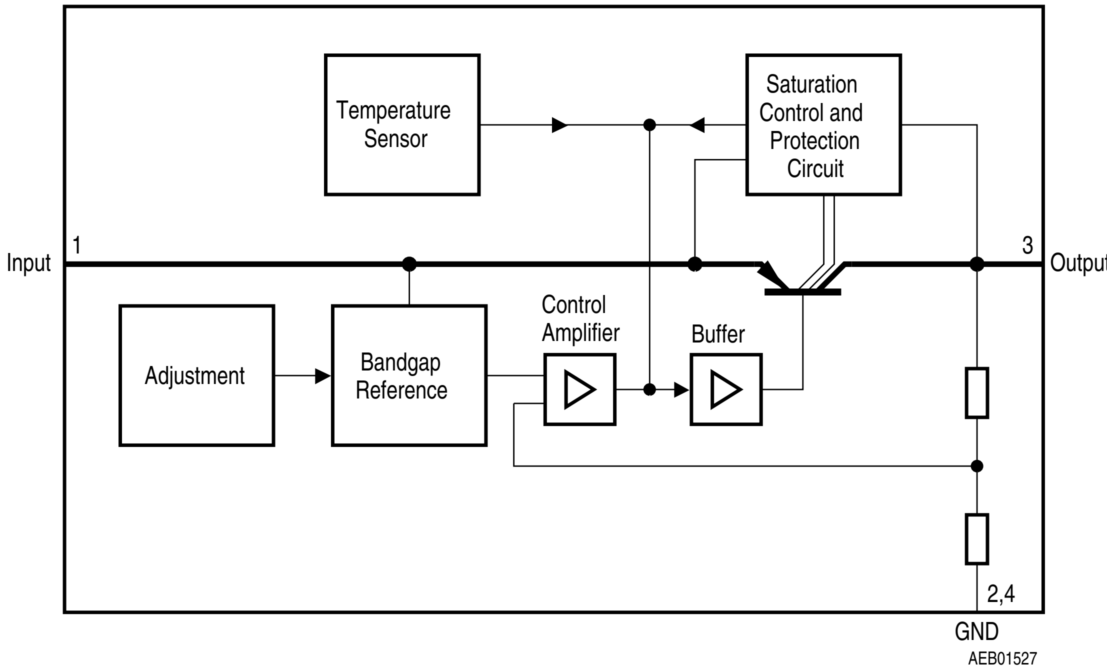


Figure 2 Block Diagram

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 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	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).

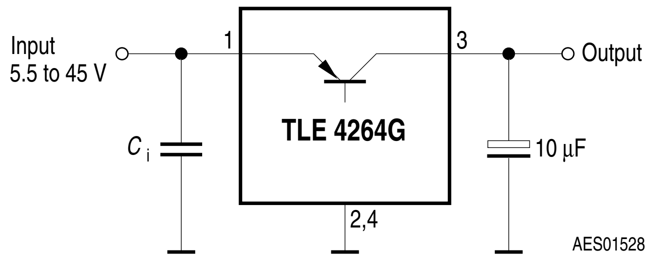
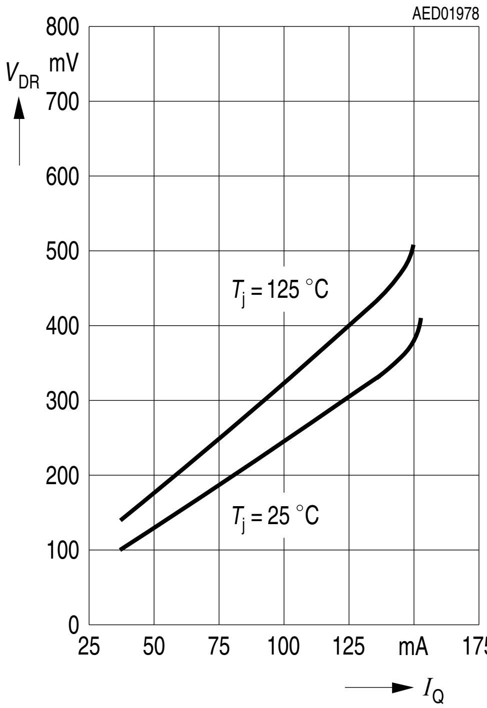
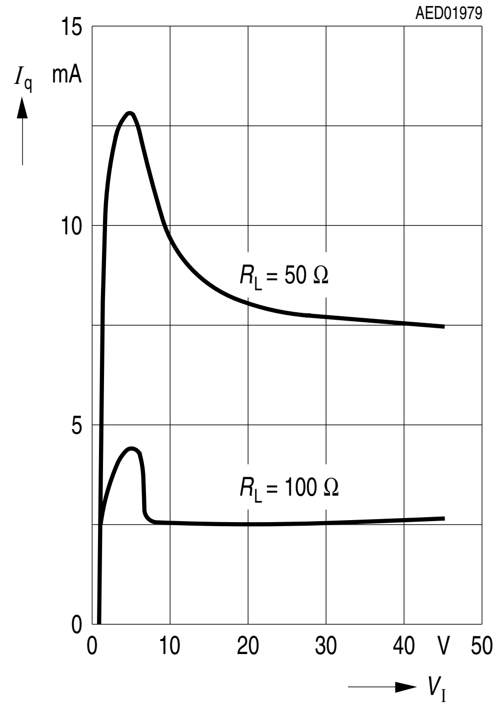


Figure 3 Application Circuit

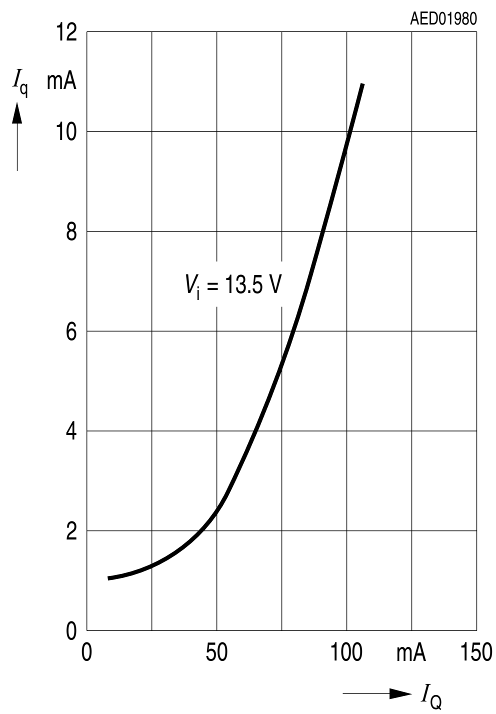
Drop Voltage V_{DR} versus Output Current I_Q



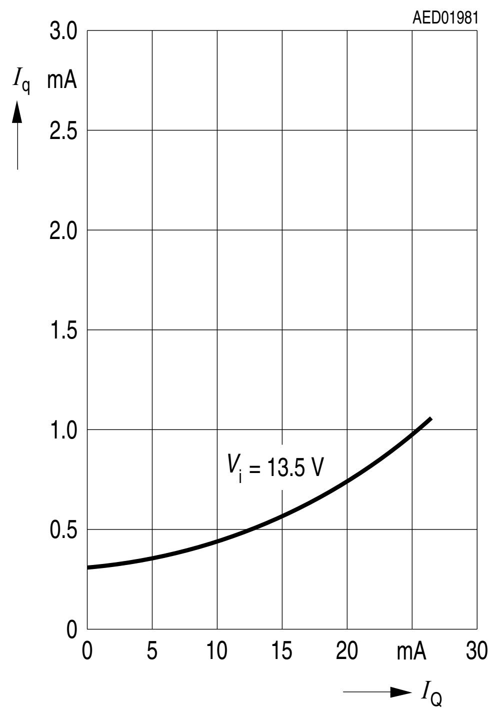
Current Consumption I_q versus Input Voltage V_i



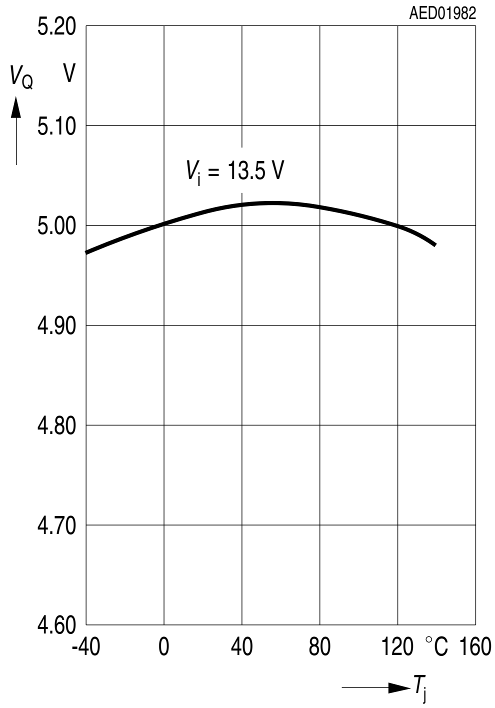
Current Consumption I_q versus Output Current I_Q



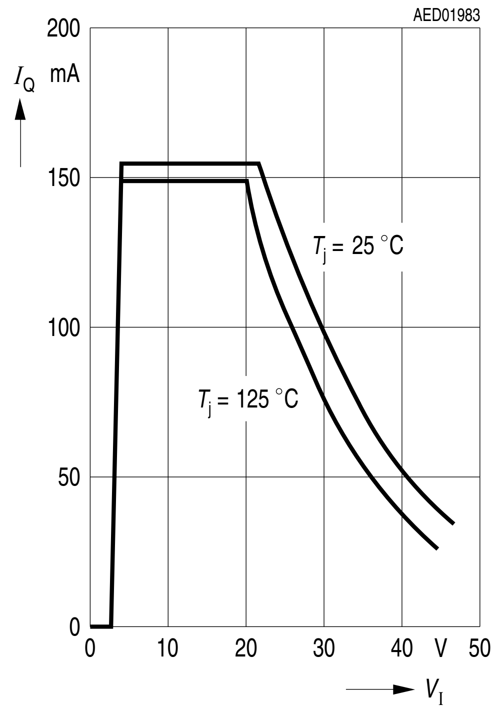
Current Consumption I_q versus Output Current I_Q



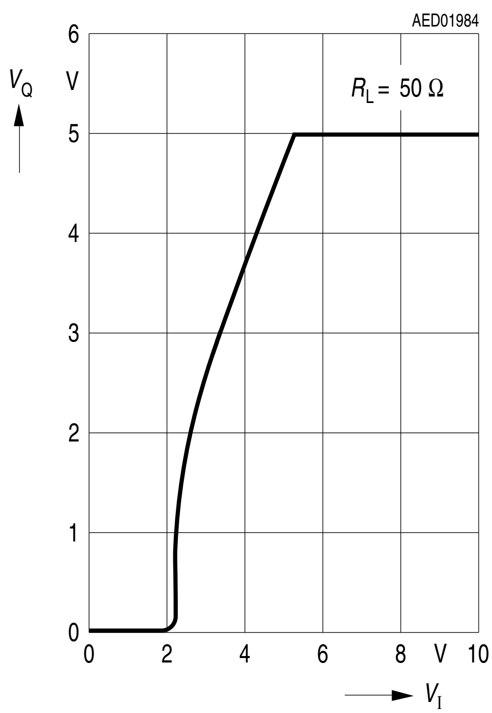
Output Voltage V_Q versus Temperature T_j



Output Current I_Q versus Input Voltage V_i



Output Voltage V_Q versus Input Voltage V_i



Package Outlines

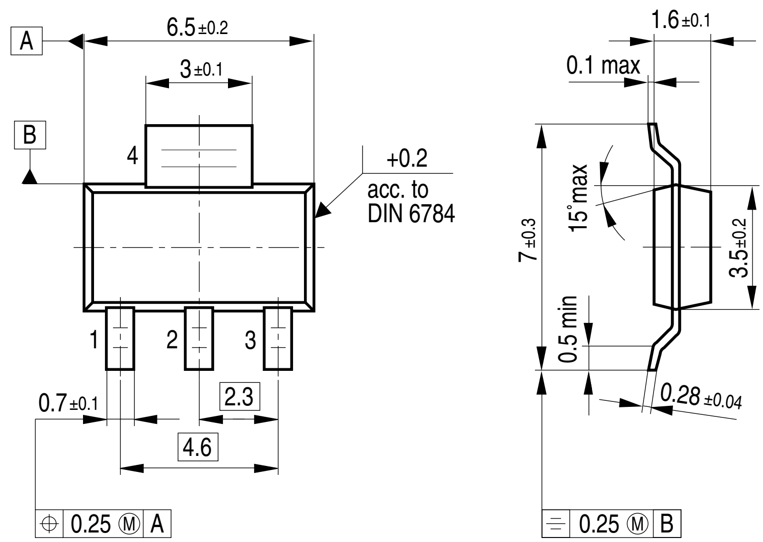


Figure 4 **PG-SOT223-4** (Plastic Small Outline Transistor)

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).

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SMD = Surface Mounted Device

Dimensions in mm

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

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