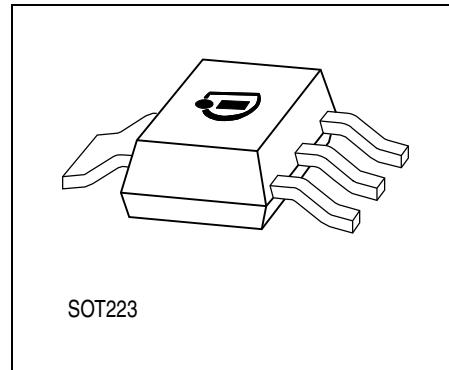


5 V/10 V Low Drop Voltage Regulator

TLE 4266

Features

- Output voltage 5 V or 10 V
- Output voltage tolerance $\leq \pm 2\%$
- 120 mA current capability
- Very low current consumption
- Low-drop voltage
- Overtemperature protection
- Reverse polarity proof
- Wide temperature range
- Suitable for use in automotive electronics
- Inhibit



Functional Description

TLE 4266 is a low-drop voltage regulator for 5 V or 10 V supply in a P-SOT223-4-2 SMD package. The IC regulates an input voltage V_I in the range of $5.5 \text{ V}/10.5 \text{ V} < V_I < 45 \text{ V}$ to $V_{Q,nom} = 5 \text{ V}/10 \text{ V}$. The maximum output current is more than 120 mA. The IC can be switched off via the inhibit input, which causes the current consumption to drop below 10 μA . The IC is shortcircuit-proof and incorporates a temperature protection which turns off the IC at overtemperature.

Choosing External Components

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

Type	Ordering Code	Package
TLE 4266 G	Q67006-A9152	P-SOT223-4-2
TLE 4266 GSV10	Q67006-A9355	P-SOT223-4-2

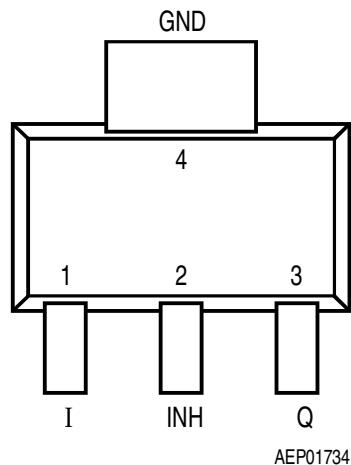


Figure 1 Pin Configuration (top view)

Table 1 Pin Definitions and Functions

Pin	Symbol	Function
1	I	Input voltage ; block to ground directly at the IC with a ceramic capacitor.
2	INH	Inhibit ; low-active input.
3	Q	Output voltage ; block to ground with a capacitor $C_Q \geq 10 \mu\text{F}$.
4	GND	Ground

Circuit Description

The device includes a precise reference voltage, which is very accurate due to resistor adjustment. A control amplifier compares the divided output voltage to this reference voltage and drives the base of the PNP series transistor through a buffer.

Saturation control as a function of the load current prevents any oversaturation of the power element. The IC also incorporates a number of protection circuitry for:

- Overload
- Overtemperature
- Reverse polarity

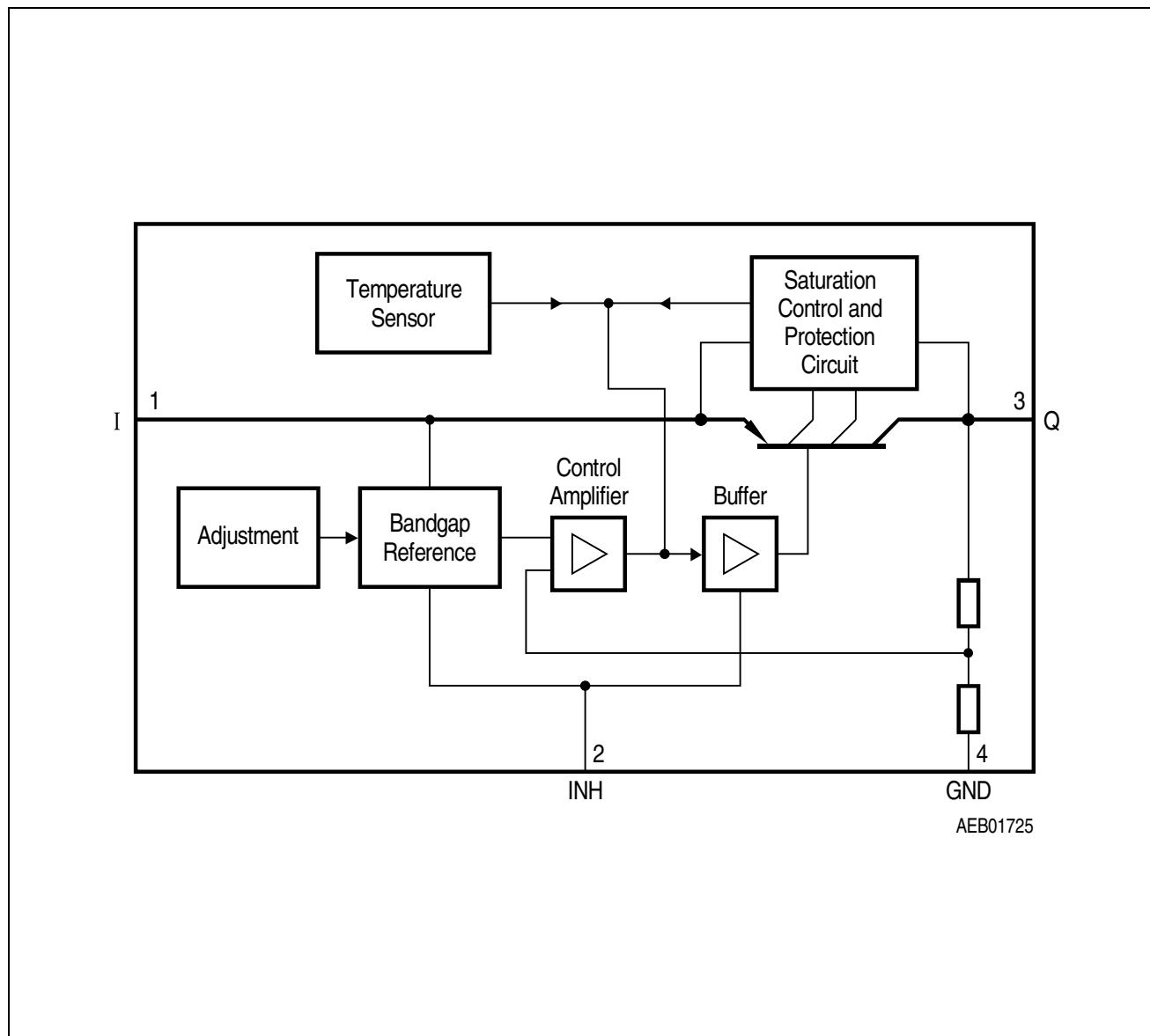


Figure 2 Block Diagram

Table 2 Absolute Maximum Ratings (TLE 4266 G, TLE 4266 GSV10)
 $T_j = -40 \text{ to } 150 \text{ }^\circ\text{C}$

Parameter	Symbol	Limit Values		Unit	Notes
		Min.	Max.		
Input					
Voltage	V_I	-42	45	V	-
Current	I_I	-	-	-	internally limited
Inhibit					
Voltage	V_{INH}	-42	45	V	-
Output					
Voltage	V_Q	-1	32	V	-
Current	I_Q	-	-	-	internally limited
GND					
Current	I_{GND}	50	-	mA	-
Temperature					
Junction temperature	T_j	-	150	$^\circ\text{C}$	-
Storage temperature	T_S	-50	150	$^\circ\text{C}$	-
Operating Range (TLE 4266 G)					
Input voltage	V_I	5.5	45	V	-
Junction temperature	T_j	-40	150	$^\circ\text{C}$	-
Operating Range (TLE 4266 GSV10)					
Input voltage	V_I	10.5	45	V	-
Junction temperature	T_j	-40	150	$^\circ\text{C}$	-
Thermal Resistance					
Junction ambient	R_{thj-a}	-	165	K/W	¹⁾
Junction case	$R_{thj-pin}$	-	17	K/W	measured to pin 4

 1) Package mounted on PCB $80 \times 80 \times 1.5 \text{ mm}^3$; 35 μCu ; 5 μSn ; Footprint only; zero airflow.

Table 3 Characteristics (TLE 4266 G)
 $V_I = 13.5 \text{ V}$; $-40^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$

Parameter	Symbol	Limit Values			Unit	Test Condition
		Min.	Typ.	Max.		
Output voltage	V_Q	4.9	5	5.1	V	$5 \text{ mA} \leq I_Q \leq 100 \text{ mA}$ $6 \text{ V} \leq V_i \leq 28 \text{ V}$
Output-current limitation	I_Q	120	150	—	mA	—
Current consumption $I_q = I_i - I_Q$	I_q	—	—	10	μA	$V_{INH} = 0 \text{ V}$; $T_j \leq 100^\circ\text{C}$
Current consumption $I_q = I_i - I_Q$	I_q	—	—	400	μA	$I_Q = 1 \text{ mA}$ Inhibit ON
Current consumption $I_q = I_i - I_Q$	I_q	—	10	15	mA	$I_Q = 100 \text{ mA}$ Inhibit ON
Drop voltage	V_{DR}	—	0.25	0.5	V	$I_Q = 100 \text{ mA}^1)$
Load regulation	$\Delta V_{Q,lo}$	—	—	40	mV	$I_Q = 5 \text{ to } 100 \text{ mA}$ $V_i = 6 \text{ V}$
Line regulation	$\Delta V_{Q,li}$	—	15	30	mV	$V_I = 6 \text{ V to } 28 \text{ V}$ $I_Q = 5 \text{ mA}$
Power supply ripple rejection	$PSRR$	—	54	—	dB	$f_r = 100 \text{ Hz}$, $V_r = 0.5 \text{ Vpp}$

Inhibit

Inhibit on voltage	$V_{INH, on}$	3.5	—	—	V	—
Inhibit off voltage	$V_{INH, off}$	—	—	0.8	V	—
Inhibit current	I_{INH}	5	15	25	μA	$V_{INH} = 5 \text{ V}$

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

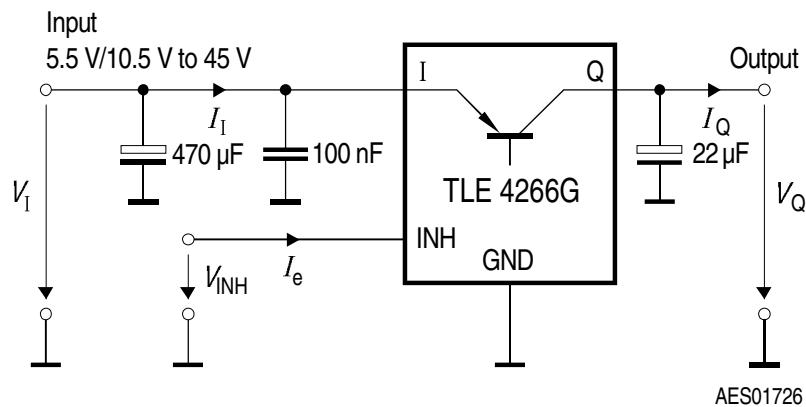
Table 4 Characteristics (TLE 4266 GSV10)
 $V_I = 13.5 \text{ V}$; $-40^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$

Parameter	Symbol	Limit Values			Unit	Test Condition
		Min.	Typ.	Max.		
Output voltage	V_Q	9.8	10	10.2	V	$5 \text{ mA} \leq I_Q \leq 100 \text{ mA}$ $11 \text{ V} \leq V_I \leq 21 \text{ V}$
Output voltage	V_Q	9.8	10	10.2	V	$1 \text{ mA} \leq I_Q \leq 50 \text{ mA}$ $11 \text{ V} \leq V_I \leq 28 \text{ V}$
Output-current limitation	I_Q	120	150	200	mA	–
Current consumption $I_q = I_I - I_Q$	$I_{q,\text{off}}$	–	–	10	μA	$V_{\text{INH}} = 0 \text{ V};$ $T_j \leq 100^\circ\text{C}$
Current consumption $I_q = I_I - I_Q$	I_q	–	350	500	μA	$I_Q < 1 \text{ mA}$ Inhibit ON
Current consumption $I_q = I_I - I_Q$	I_q	–	7	15	mA	$I_Q < 100 \text{ mA}$ Inhibit ON
Drop voltage	V_{DR}	–	0.28	0.5	V	$I_Q = 100 \text{ mA}^1)$
Load regulation	$\Delta V_{Q,\text{Lo}}$	-80	–	80	mV	$I_Q = 5 \text{ to } 100 \text{ mA}$ $V_I = 11 \text{ V}$
Line regulation	$\Delta V_{Q,\text{Li}}$	-30	5	30	mV	$V_I = 11 \text{ V to } 28 \text{ V}$ $I_Q = 5 \text{ mA}$
Power supply ripple rejection	$PSRR$	–	54	–	dB	$f_r = 100 \text{ Hz},$ $V_r = 0.5 \text{ Vpp}$

Inhibit

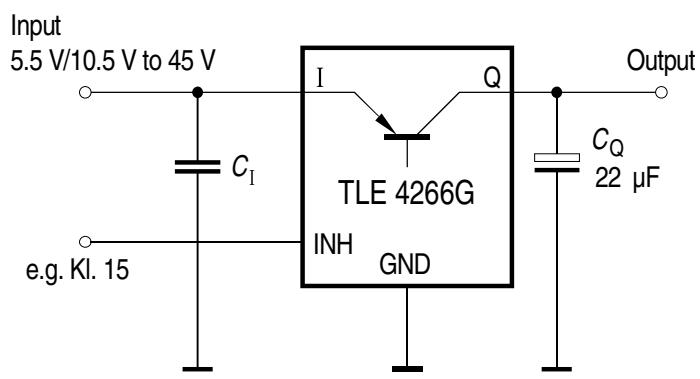
Inhibit on voltage	$V_{\text{INH, on}}$	3.5	–	–	V	–
Inhibit off voltage	$V_{\text{INH, off}}$	–	–	0.8	V	–
Inhibit current	I_{INH}	5	12	25	μA	$V_{\text{INH}} = 5 \text{ V}$

1) Drop voltage = $V_I - V_Q$ measured when the output voltage V_Q has dropped 100 mV from the nominal value.



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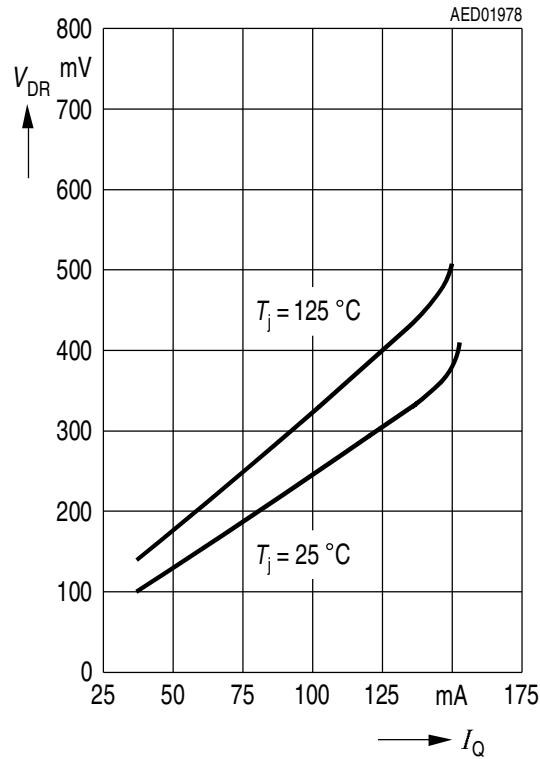
Figure 3 Measuring Circuit (TLE 4266 G, TLE 4266 GSV10)



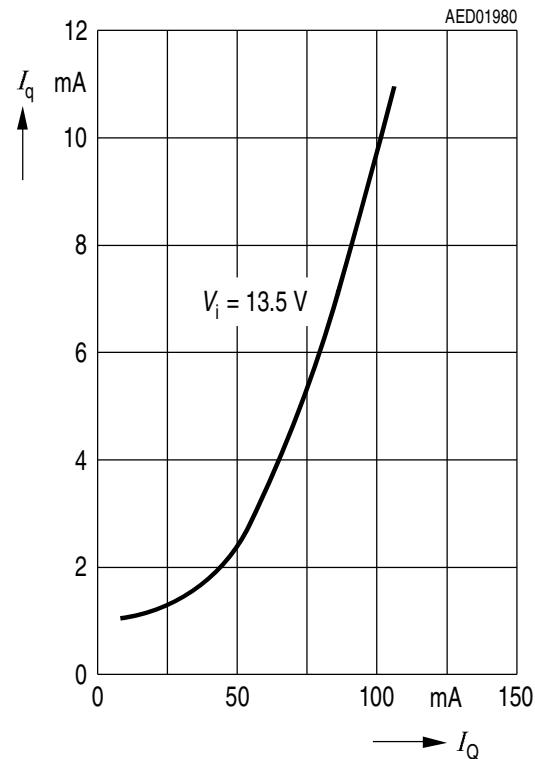
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Figure 4 Application Circuit (TLE 4266 G, TLE 4266 GSV10)

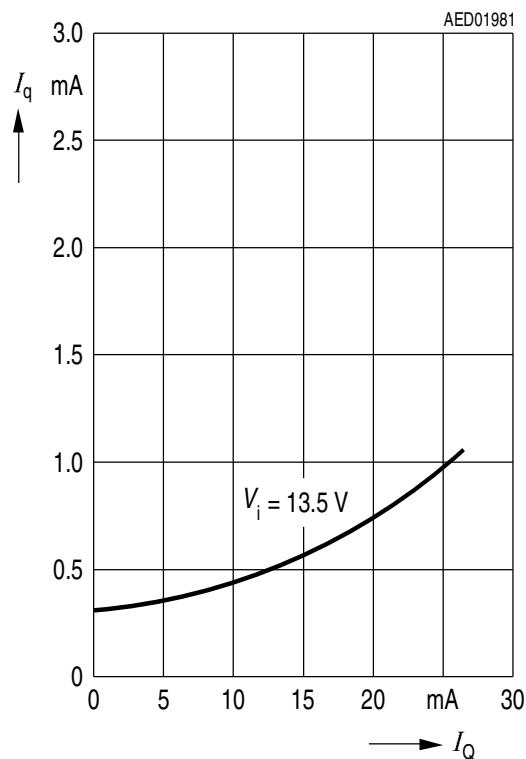
Drop Voltage V_{DR} versus Output Current I_Q (5 V, 10 V)



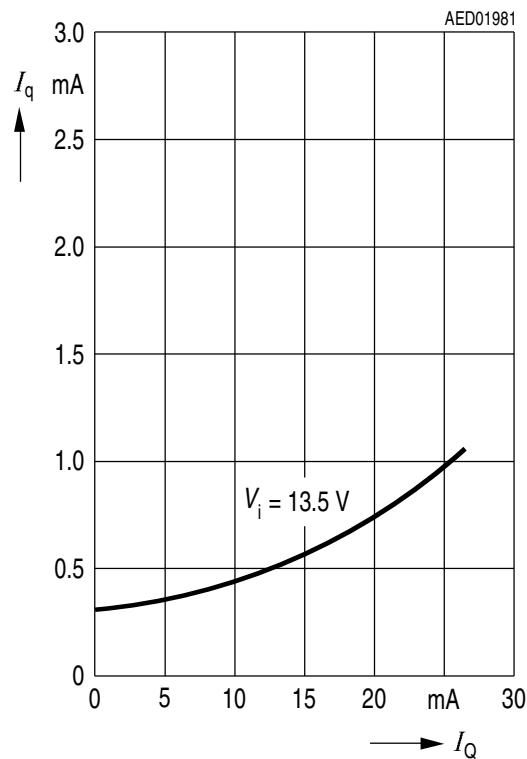
Current Consumption I_q versus Output Current I_Q (5 V)



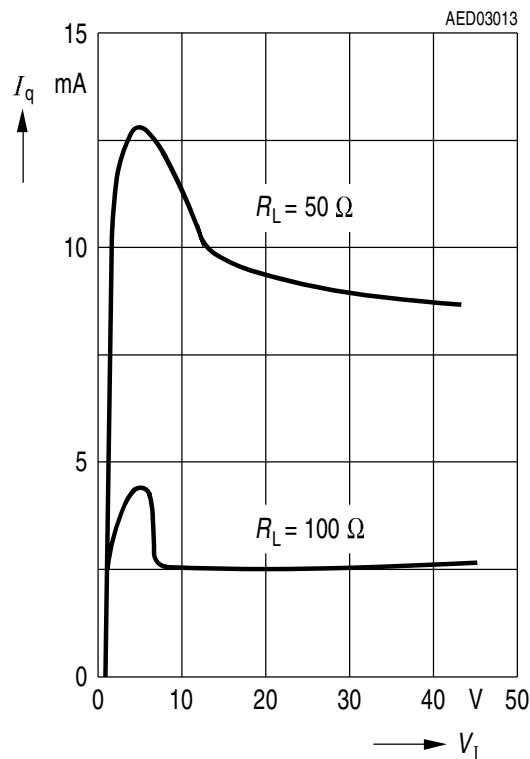
Current Consumption I_q versus Output Current I_Q (5 V version)



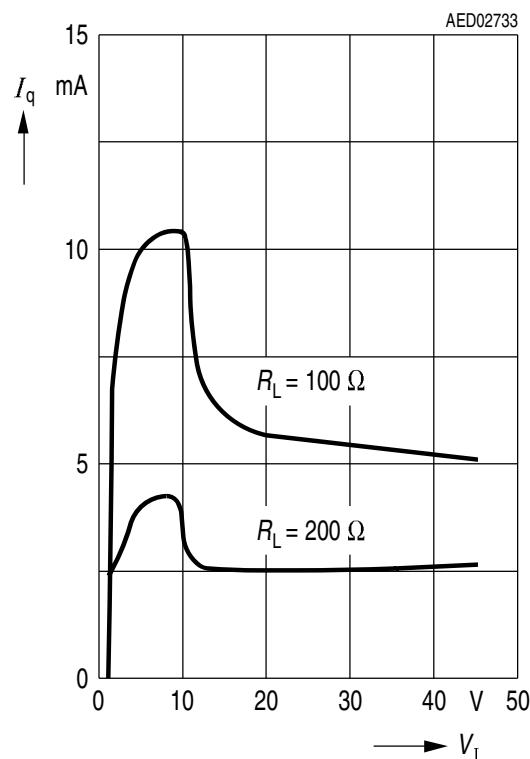
Current Consumption I_q versus Output Current I_Q (10 V version)



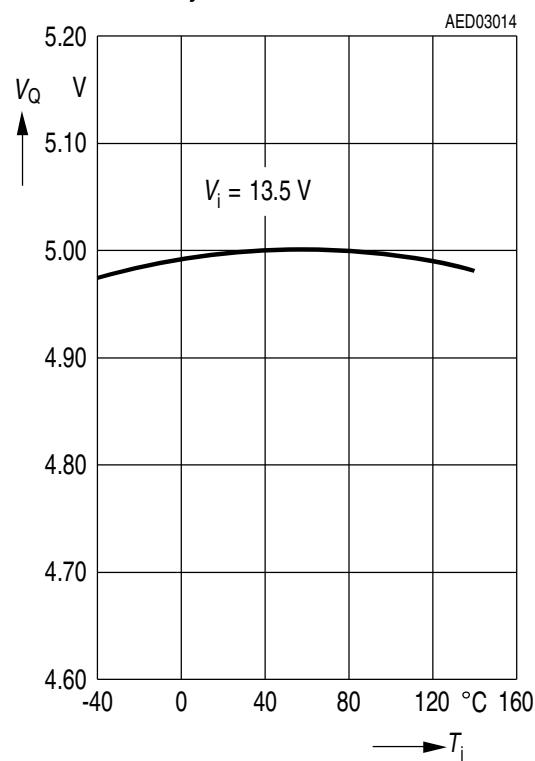
**Current Consumption I_q versus
Input Voltage V_i (5 V version)**



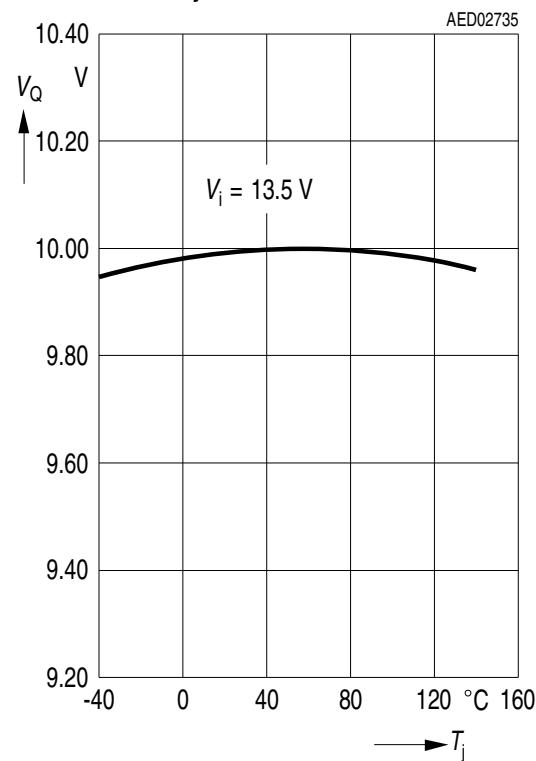
**Current Consumption I_q versus
Input Voltage V_i (10 V version)**



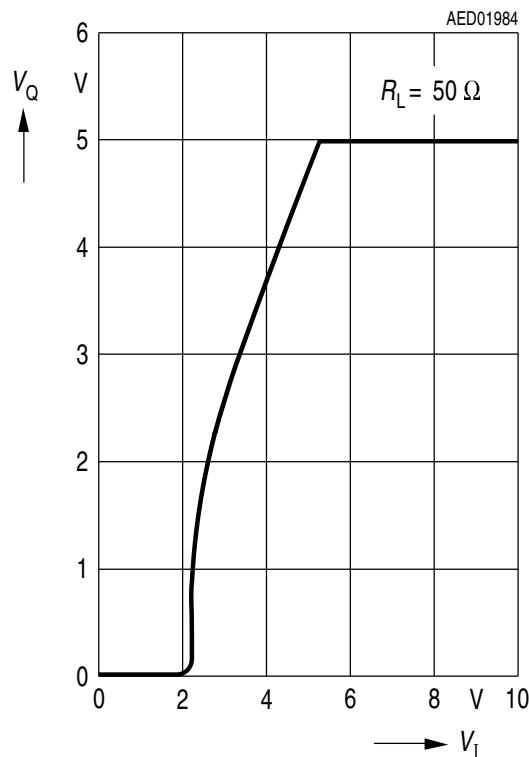
**Output Voltage V_Q versus
Temperature T_j (5 V version)**



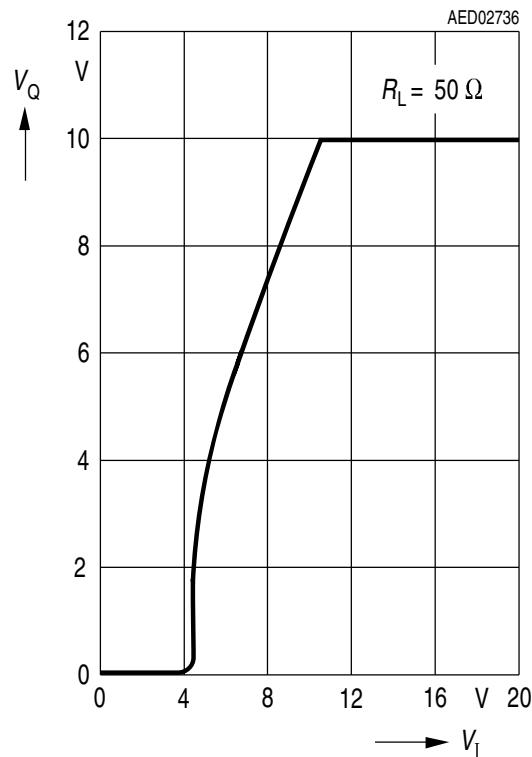
**Output Voltage V_Q versus
Temperature T_j (10 V version)**



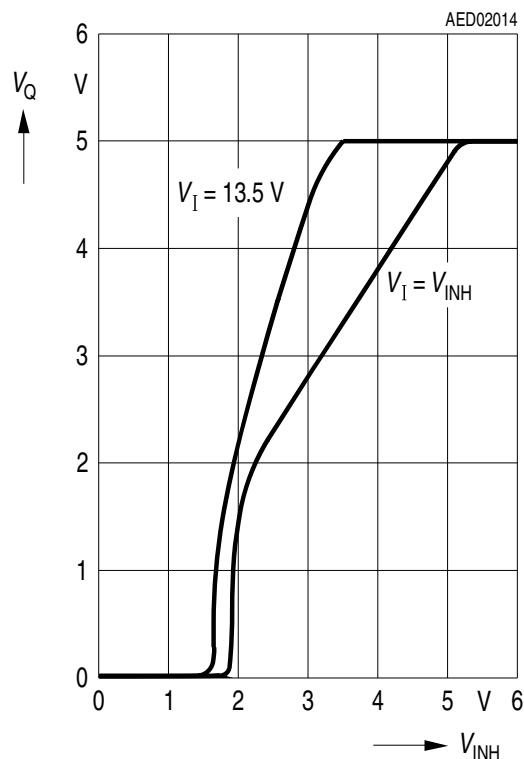
**Output Voltage V_Q versus
Input Voltage V_I (5 V version)**



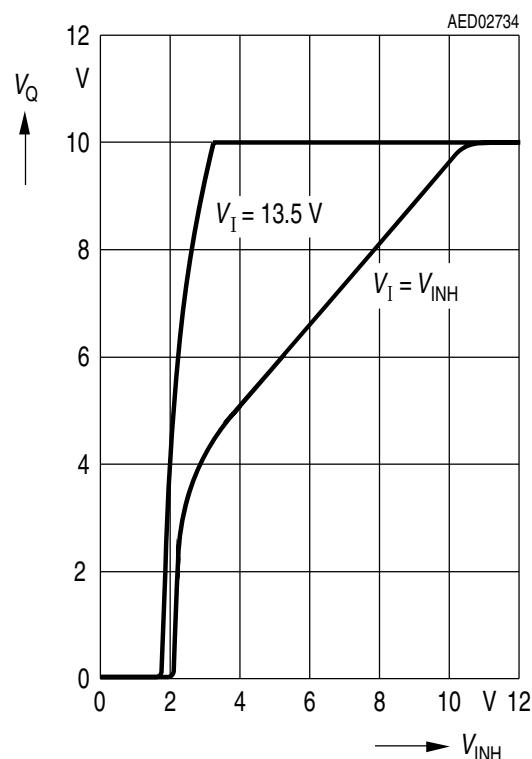
**Output Voltage V_Q versus
Input Voltage V_I (10 V version)**

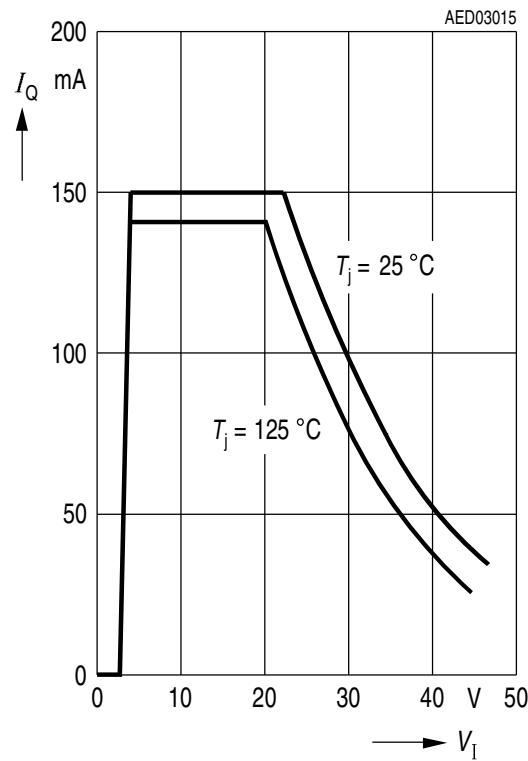
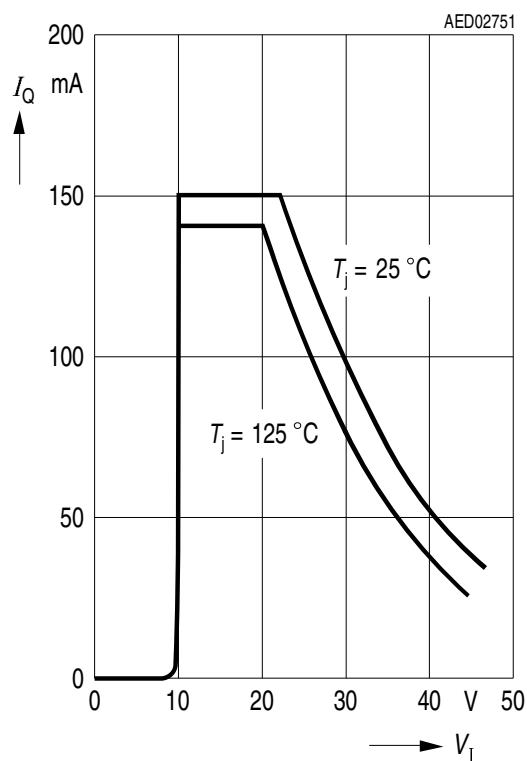


**Output Voltage V_Q versus
Inhibit Voltage V_{INH} (5 V version)**



**Output Voltage V_Q versus
Inhibit Voltage V_{INH} (10 V version)**



**Output Current I_Q versus
Input Voltage V_I (5 V-version)**

**Output Current I_Q versus
Input Voltage V_I (10 V version)**


Package Outlines

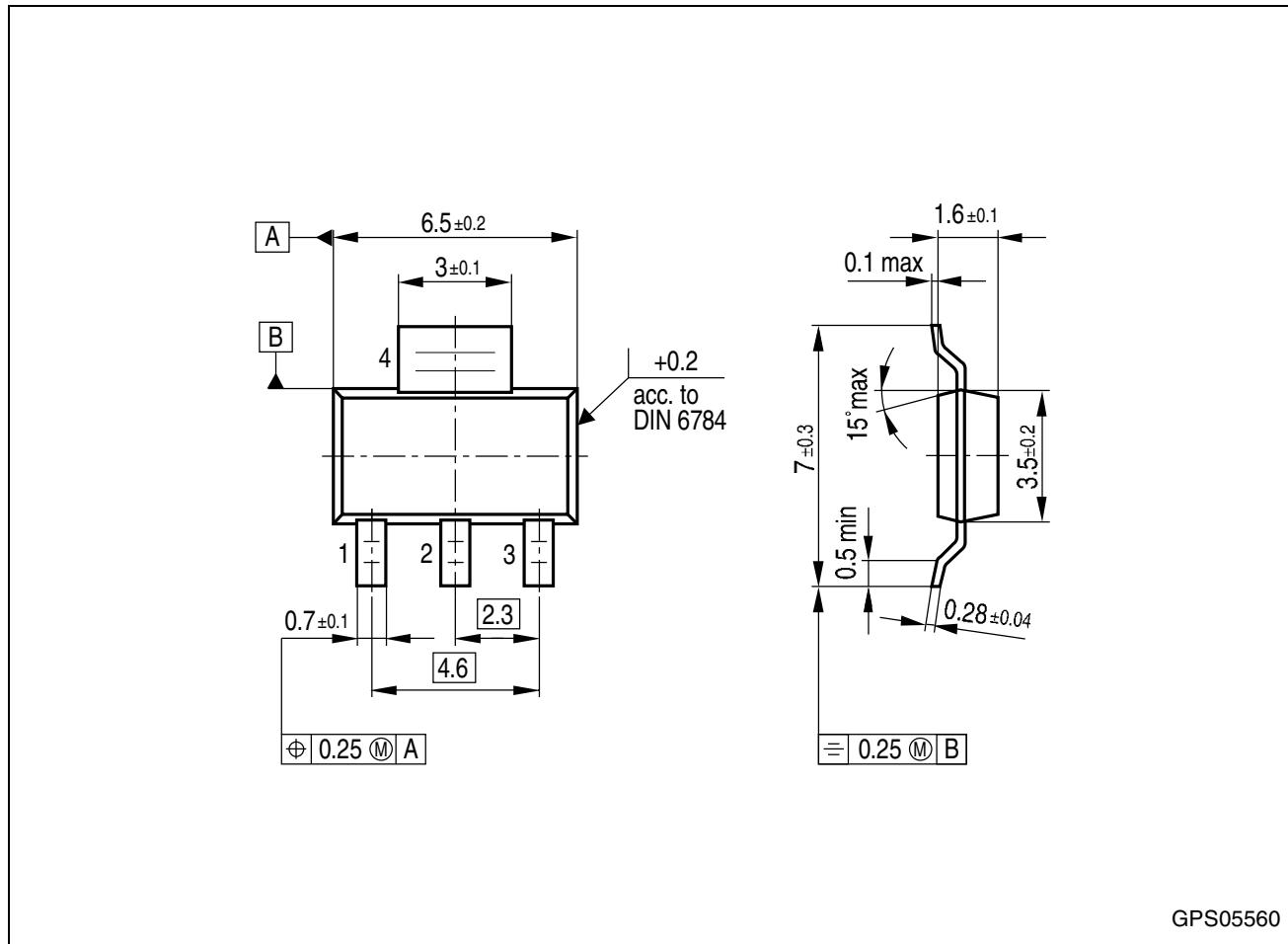


Figure 5 **P-SOT223-4-2 (Plastic Small Outline Transistor)**

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

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