

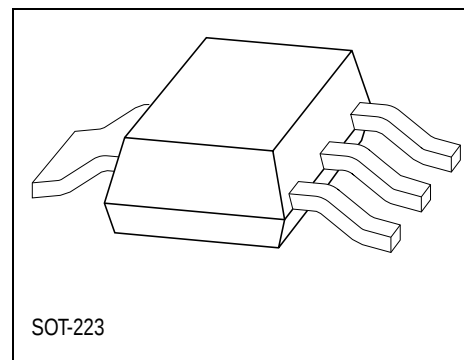
5 V/10 V Low-Drop Voltage Regulator

TLE 4266

Bipolar IC

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



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

- New type

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 $V_{Q, \text{nom}} = 5 \text{ V}/10 \text{ V}$. 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. 1 Ω in series with C_i , the oscillating of input line inductivity and input capacitance can be clamped. 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 whole operating temperature range.

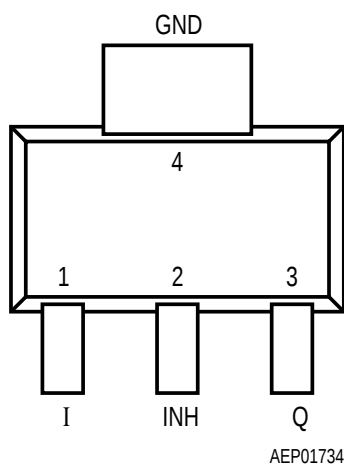


Figure 1 Pin Configuration (top view)

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

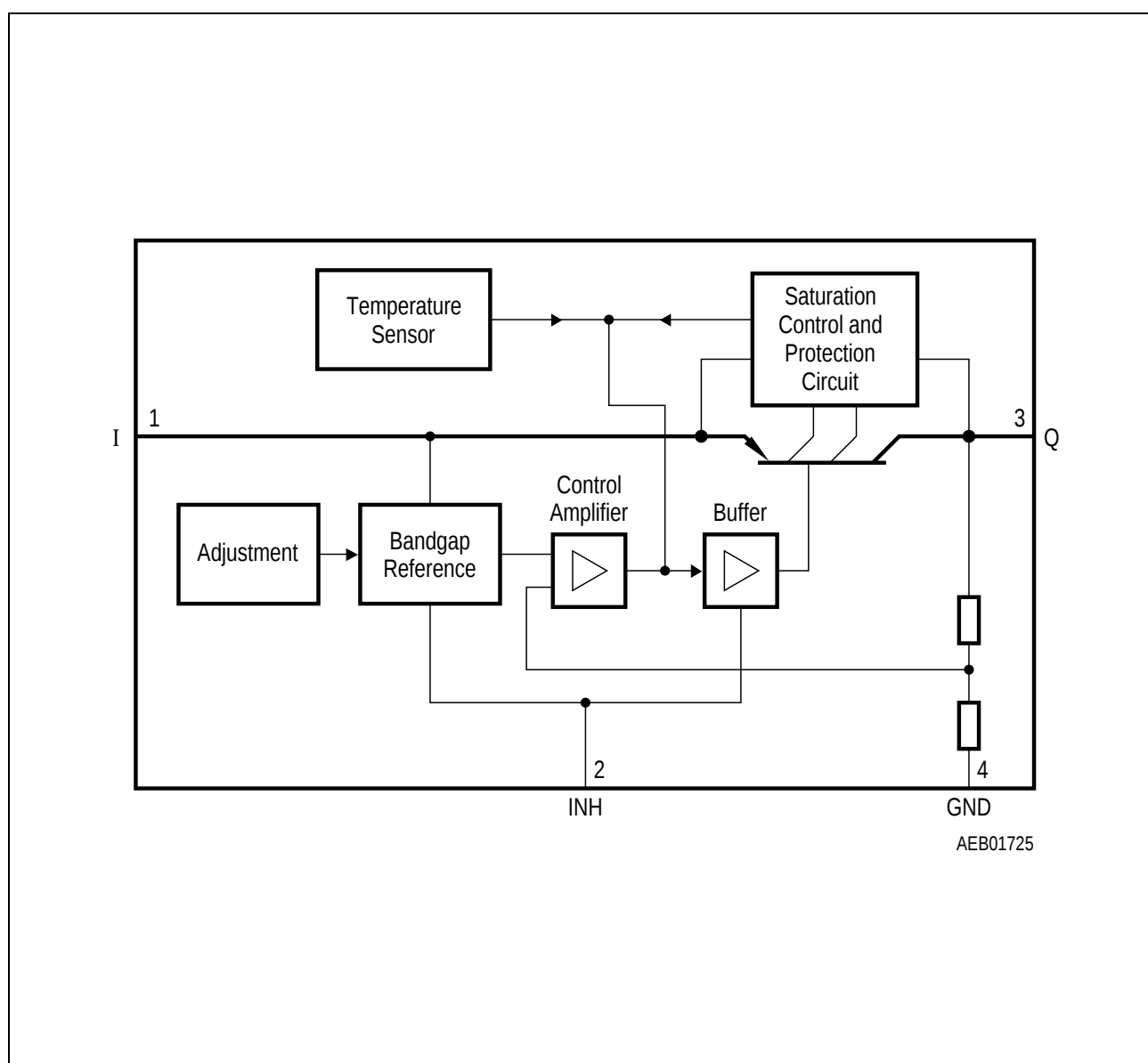


Figure 2 **Block Diagram**

Absolute Maximum Ratings (TLE 4266 G, TLE 4266 GSV10)
 $T_j = -40$ 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	–
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Output

Voltage	V_Q	- 1	32	V	–
Current	I_Q	–	–	–	internally limited

GND

Current	I_{GND}	50	–	mA	–
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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 $80 \times 80 \times 1.5\text{ mm}^3$; $35\mu\text{ Cu}$; $5\mu\text{ Sn}$; Footprint only; zero airflow.

Characteristics (TLE 4266 G)

 $V_i = 13.5 \text{ V}; -40 \text{ }^{\circ}\text{C} \leq T_j \leq 125 \text{ }^{\circ}\text{C}$

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	$V_{\text{INH}} = 0 \text{ V}; T_j \leq 100 \text{ }^{\circ}\text{C}$
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	$\Delta V_{Q,\text{lo}}$	–	–	40	mV	$I_Q = 5 \text{ to } 100 \text{ mA}$ $V_i = 6 \text{ V}$
Line regulation	$\Delta V_{Q,\text{li}}$	–	15	30	mV	$V_i = 6 \text{ V to } 28 \text{ V}$ $I_Q = 5 \text{ mA}$
Power supply ripple rejection	$PSRR$	–	54	–	dB	$f_r = 100 \text{ Hz}, V_r = 0.5 V_{\text{SS}}$

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	15	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 obtained at $V_i = 13.5 \text{ V}$).

Characteristics (TLE 4266 GSV10)

 $V_I = 13.5 \text{ V}; -40 \text{ }^{\circ}\text{C} \leq T_j \leq 125 \text{ }^{\circ}\text{C}$

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	$V_{\text{INH}} = 0 \text{ V}; T_j \leq 100 \text{ }^{\circ}\text{C}$
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	$f_r = 100 \text{ Hz}, V_r = 0.5 V_{\text{SS}}$

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.

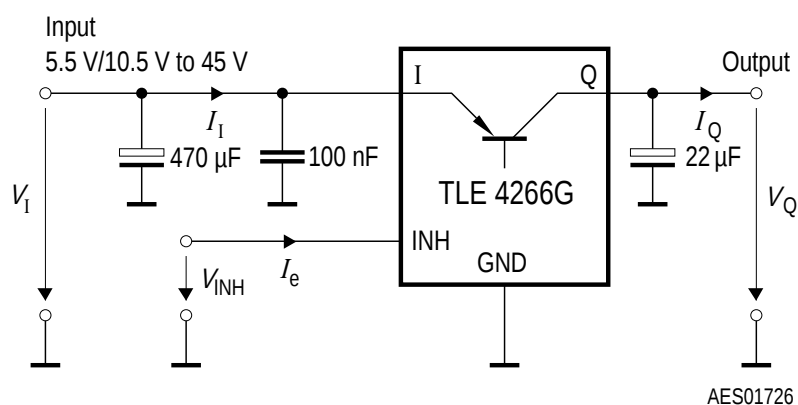


Figure 3 Measuring Circuit (TLE 4266 G, TLE 4266 GSV10)

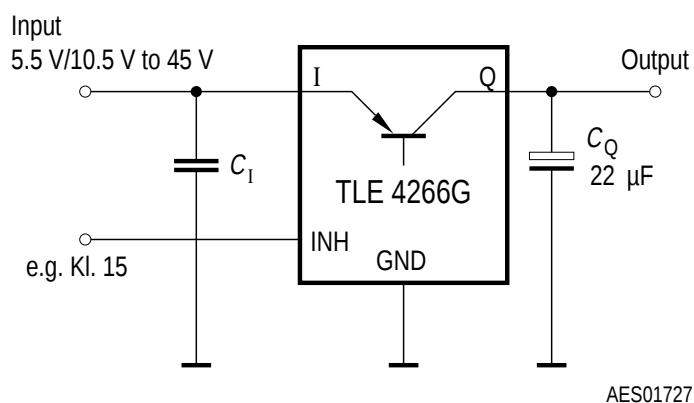
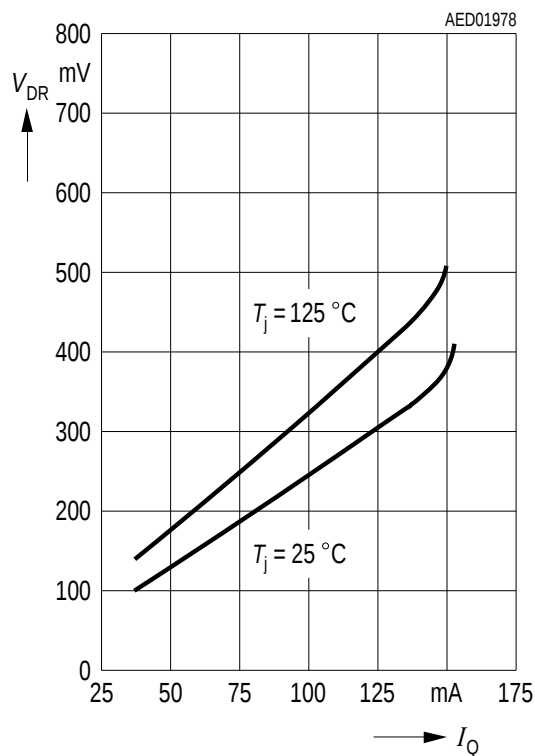
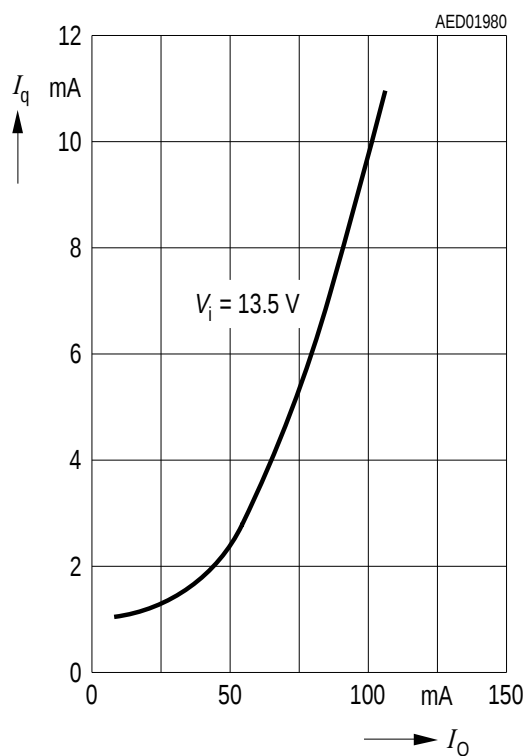


Figure 4 Application Circuit (TLE 4266 G, TLE 4266 GSV10)

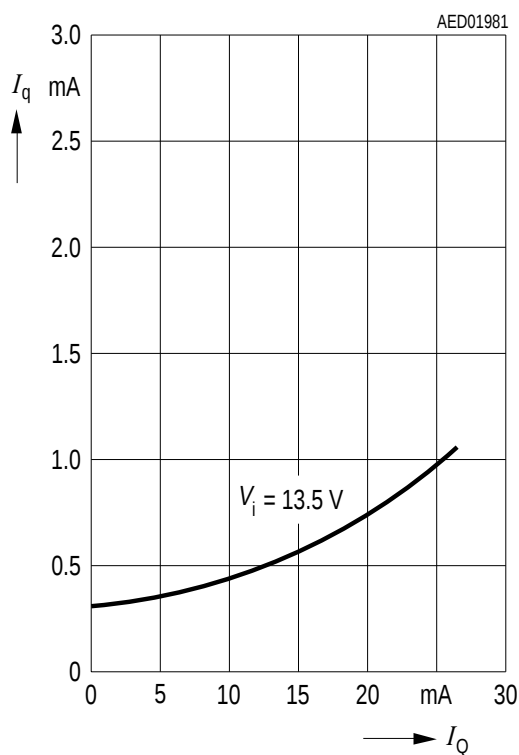
Drop Voltage V_{DR} versus Output Current I_Q (5 V, 10 V)



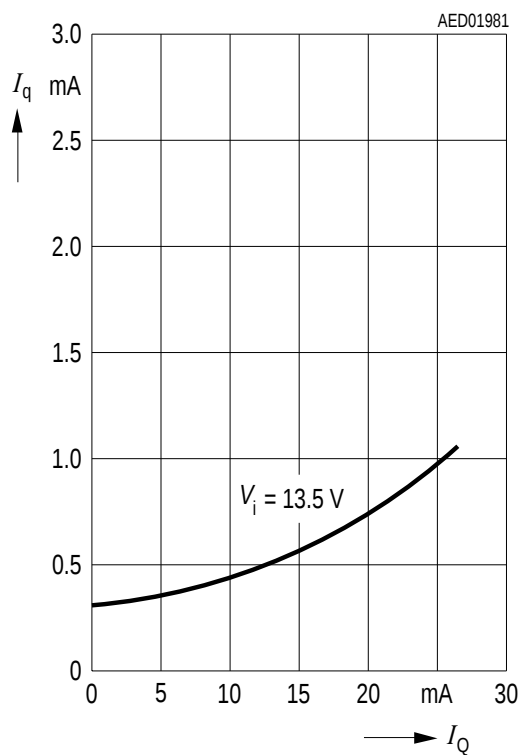
Current Consumption I_q versus Output Current I_Q (5 V)



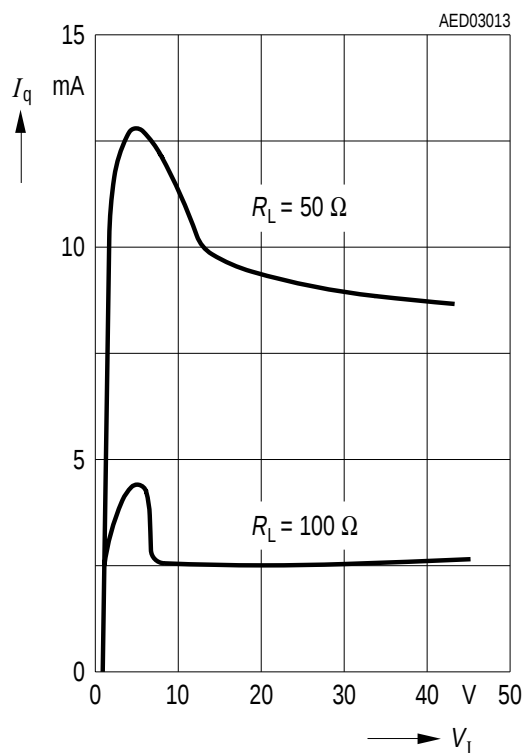
Current Consumption I_q versus Output Current I_Q (5 V version)



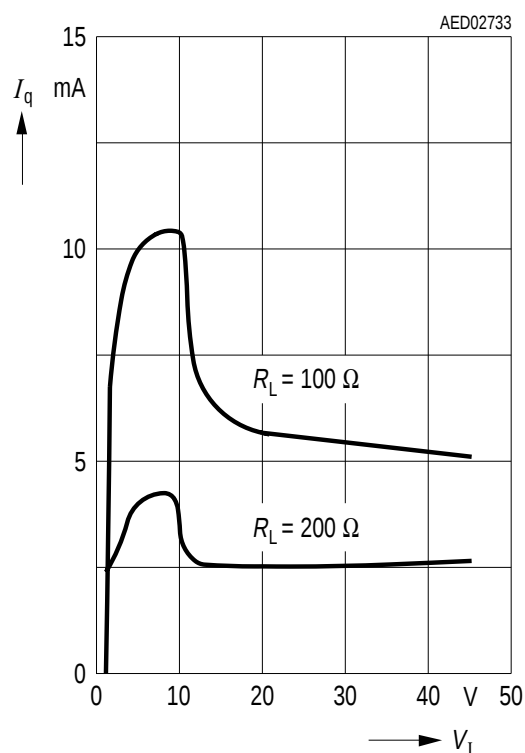
Current Consumption I_q versus Output Current I_Q (10 V version)



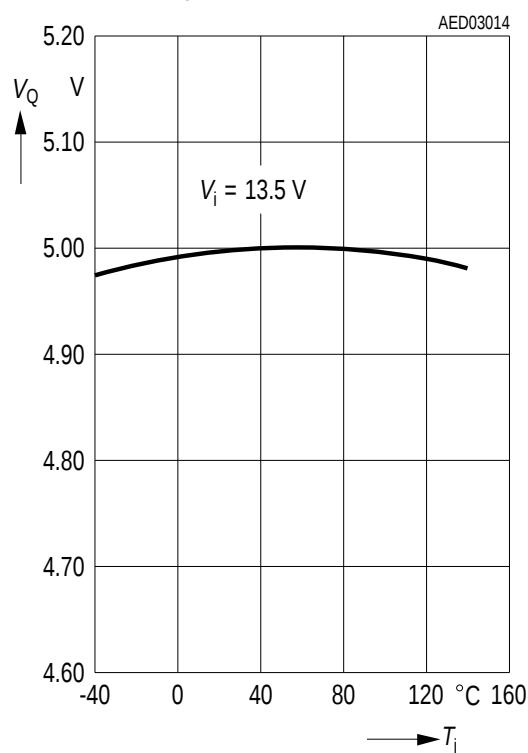
Current Consumption I_q versus Input Voltage V_i (5 V version)



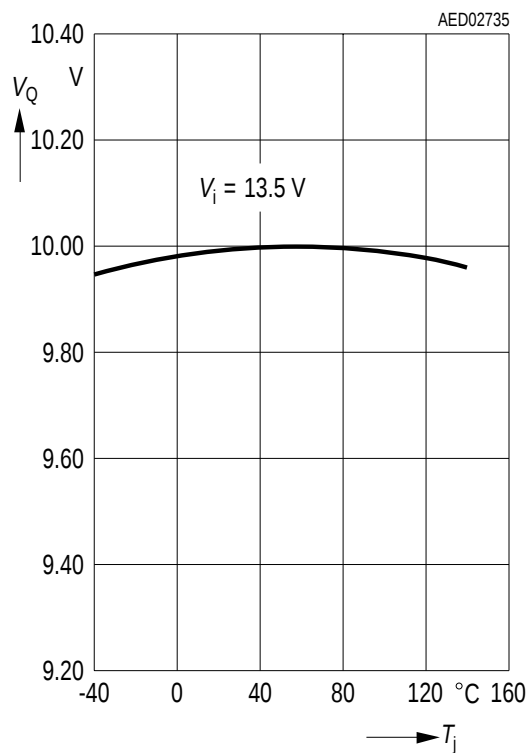
Current Consumption I_q versus Input Voltage V_i (10 V version)



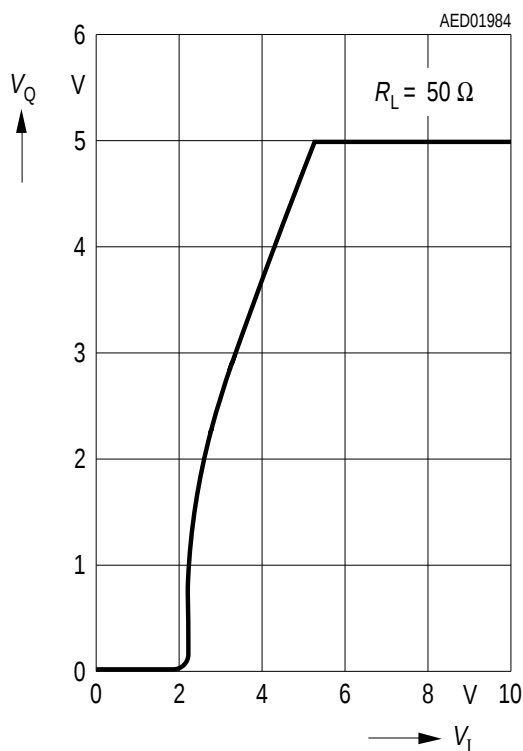
Output Voltage V_Q versus Temperature T_j (5 V version)



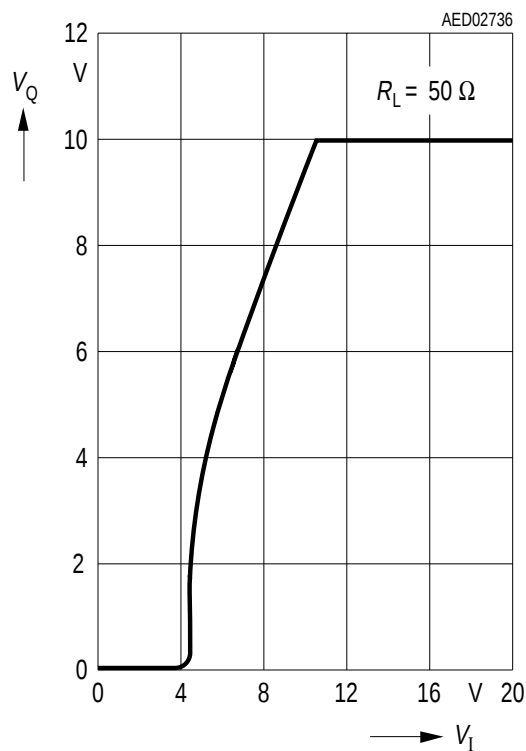
Output Voltage V_Q versus Temperature T_j (10 V version)



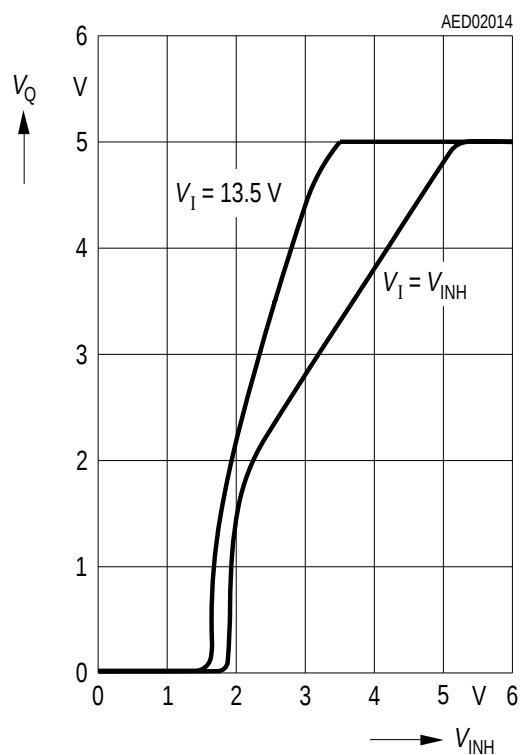
**Output Voltage V_Q versus
Input Voltage V_I (5 V version)**



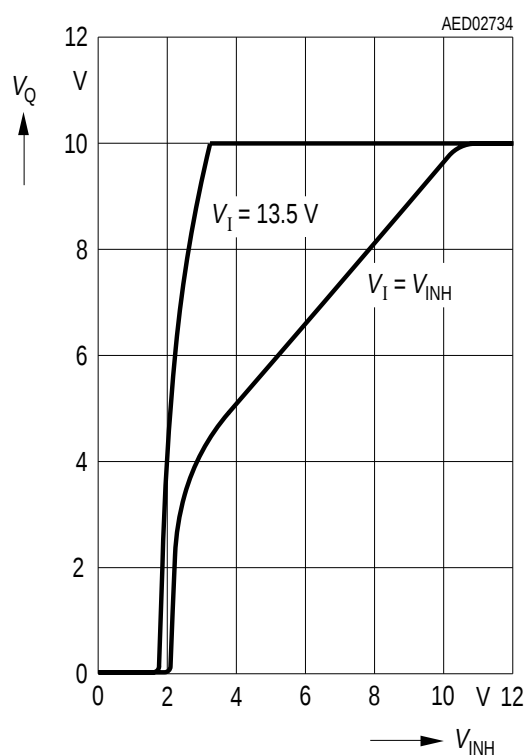
**Output Voltage V_Q versus
Input Voltage V_I (10 V version)**



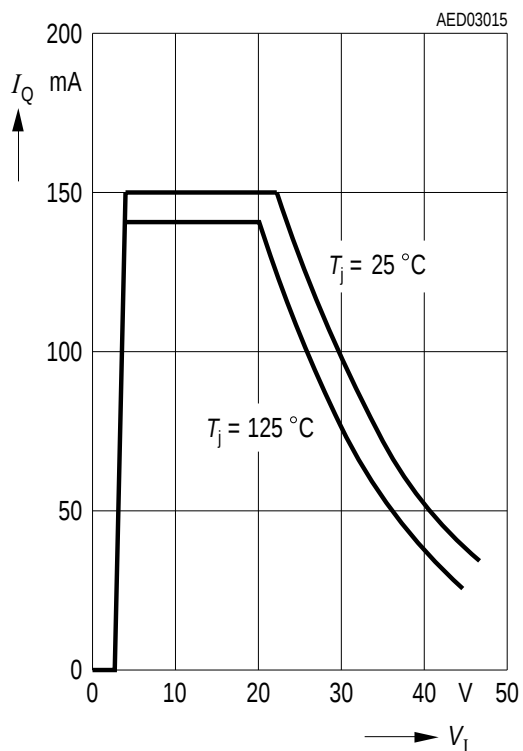
**Output Voltage V_Q versus
Inhibit Voltage V_{INH} (5 V version)**



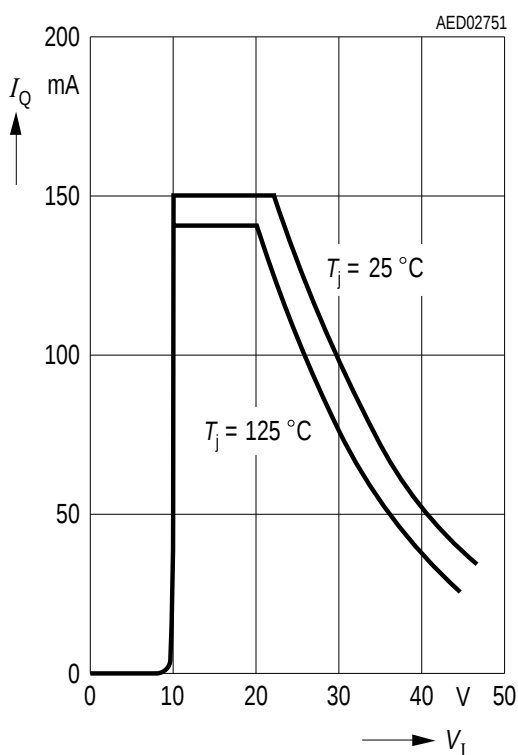
**Output Voltage V_Q versus
Inhibit Voltage V_{INH} (10 V version)**



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

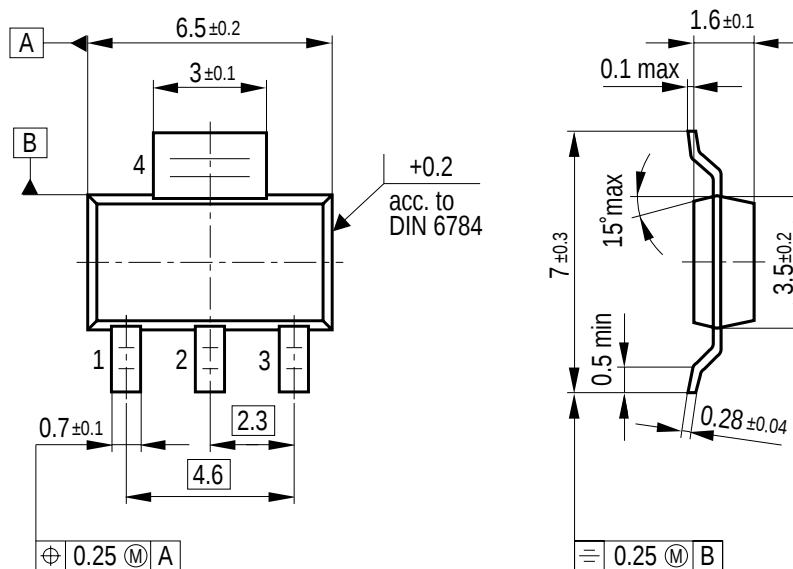


**Output Current I_Q versus
Input Voltage V_I (10 V version)**



Package Outlines

P-SOT223-4-2 (Plastic Small Outline Transistor)



Weight approx. 0.15 g

GPS05560

Sorts of Packing

Package outlines for tubes, trays etc. are contained in our Data Book "Package Information"

SMD = Surface Mounted Device

Dimensions in mm

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