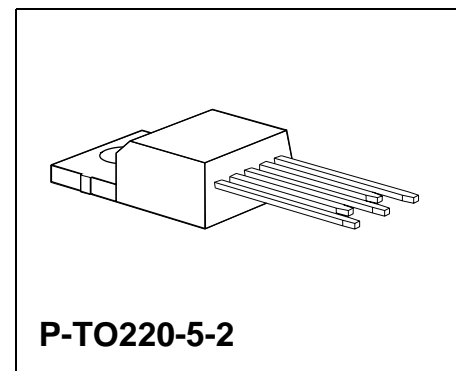
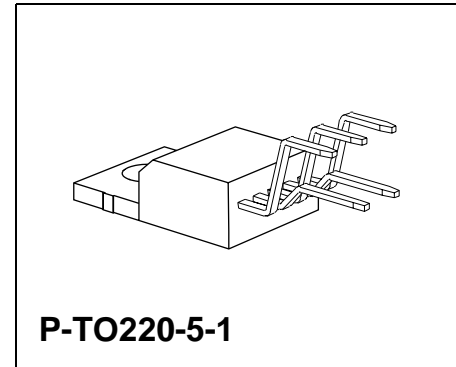


### Features

- Low-drop voltage
- Very low quiescent current
- Low starting current consumption
- Integrated temperature protection
- Protection against reverse polarity
- Input voltage up to 42 V
- Overvoltage protection up to 65 V ( $\leq 400$  ms)
- Short-circuit proof
- Suited for automotive electronics
- Wide temperature range
- EMC proofed (100 V/m)



Type	Ordering Code	Package
▼ TLE 4260	Q67000-A8187	P-TO220-5-1
▼ TLE 4260 S	Q67000-A9044	P-TO220-5-2

▼ Please also refer to the new pin compatible device TLE 4270

### Functional Description

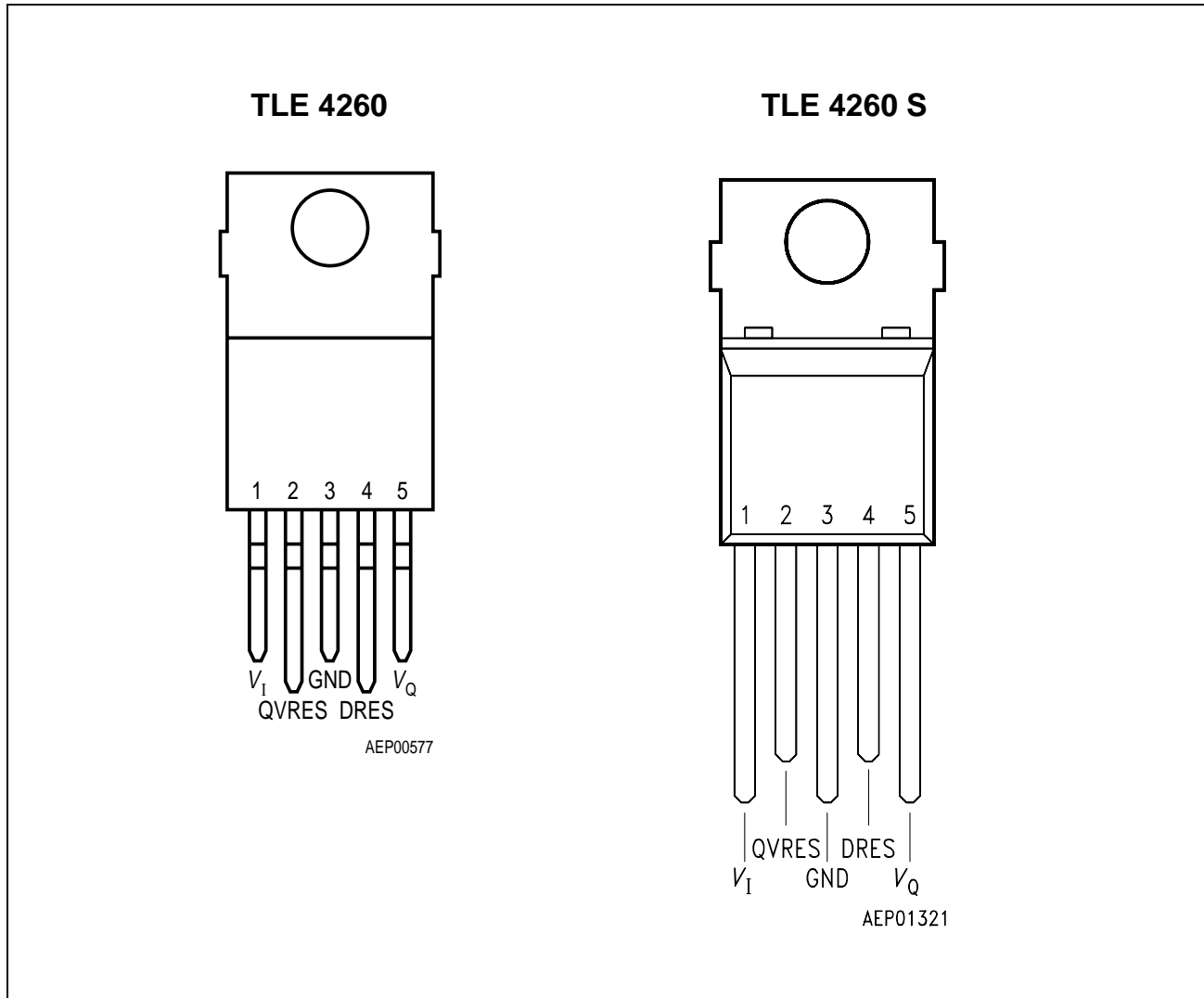
TLE 4260; S is a 5-V low-drop fixed-voltage regulator in a P-TO220-5-H/S package. The maximum input voltage is 42 V (65 V/ $\leq 400$  ms). The device can produce an output current of more than 500 mA. It is shortcircuit-proof and incorporates temperature protection that disables the circuit at unpermissibly high temperatures.

Due to the wide temperature range of  $-40$  to  $150$  °C, the TLE 4260; S is also suitable for use in automotive applications.

The IC regulates an input voltage  $V_I$  in the range  $6 < V_I < 35$  V to  $V_{Qnominal} = 5.0$  V. A reset signal is generated for an output voltage of  $V_Q < 4.75$  V. The reset delay can be set externally with a capacitor. If the output current is reduced below 10 mA, the regulator switches internally to standby and the reset generator is turned off. The standby current drops to max. 700  $\mu$ A.

## Pin Configuration

(top view)



## Pin Definitions and Functions (TLE 4260 and TLE 4260 S)

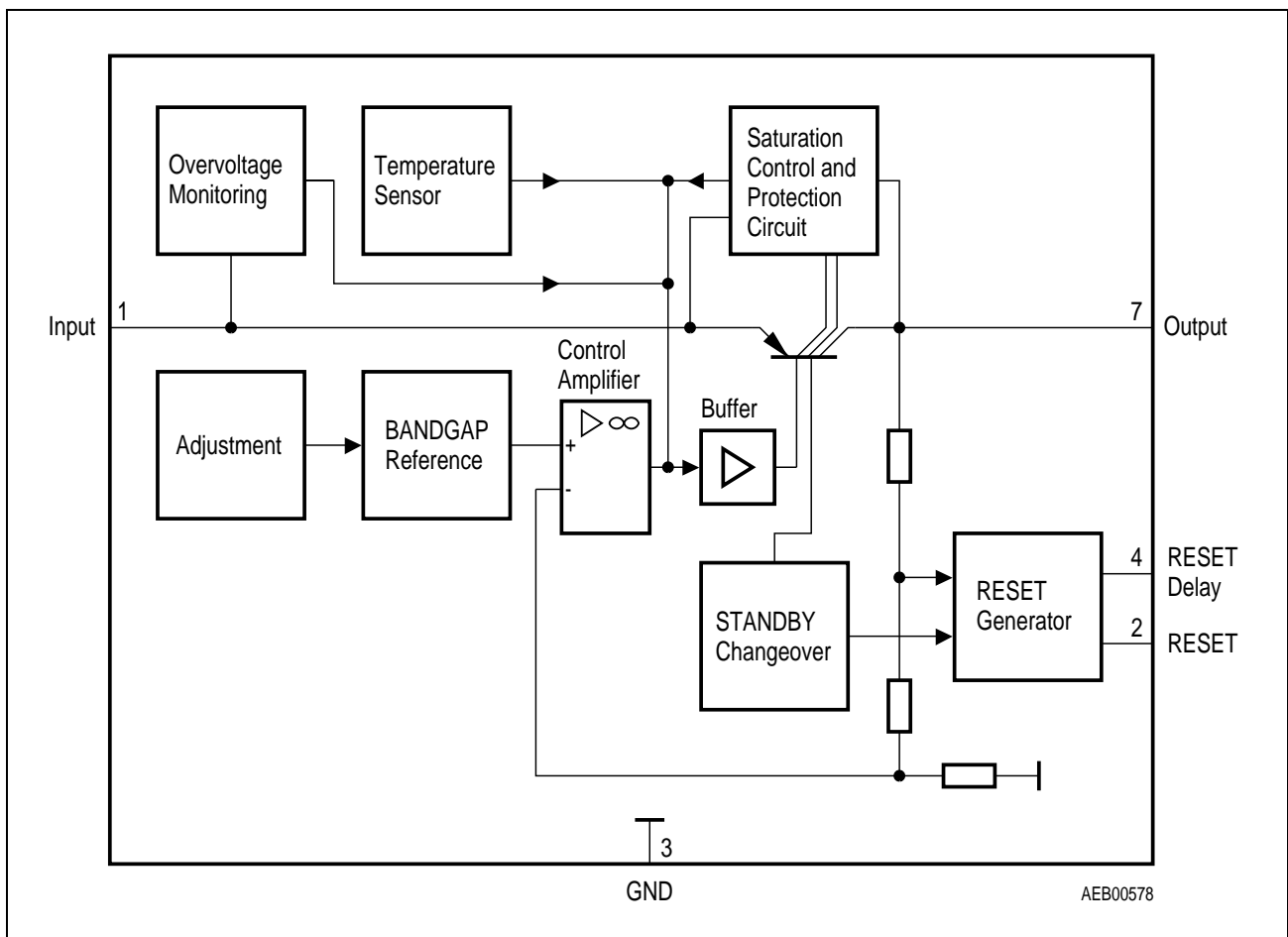
Pin No.	Symbol	Function
1	$V_I$	<b>Input</b> ; block directly to ground at the IC by a 470-nF capacitor
2	QVRES	<b>Reset output</b> ; open collector output controlled by the reset delay
3	GND	<b>Ground</b>
4	DRES	<b>Reset delay</b> ; wired to ground with a capacitor
5	$V_Q$	<b>5-V output voltage</b> ; block to ground with a 22- $\mu$ F capacitor

## Circuit Description

The control amplifier compares a reference voltage, which is kept highly accurate 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 as a function of the load current prevents any over-saturation of the power element. If the output voltage goes below 96% of its typical value, an external capacitor is discharged on pin 4 by the reset generator. If the voltage on the capacitor reaches the lower threshold  $V_{ST}$ , a reset signal is issued on pin 2 and not cancelled again until the upper threshold  $V_{DT}$  is exceeded. For an output current of less than  $I_{QN\ Off} = 10\text{ mA}$  the standby changeover turns off the reset generator. The latter is turned on again when the output current increases, the output voltage drops below 4.2 V or the delay capacitor is discharged by external measures.

The IC also incorporates a number of internal circuits for protection against:

- Overload
- Overvoltage
- Overtemperature
- Reverse polarity



**Block Diagram**

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit	Remarks
		min.	max.		

### Input (Pin 1)

Input voltage	$V_I$	- 42	42	V	-
	$V_I$	-	65	V	$t \leq 400$ ms
Input current	$I_I$	-	1.6	A	-

### Reset Output (Pin 2)

Voltage	$V_R$	- 0.3	42	V	-
Current	$I_R$	-	-	-	internally limited

### Ground (Pin 3)

Current	$I_{GND}$	- 0.5	-	A	-
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### Reset Delay (Pin 4)

Voltage	$V_D$	- 0.3	42	V	-
Current	$I_D$	-	-	-	internally limited

### Output (Pin 5)

Differential voltage	$V_I - V_Q$	- 5.25	$V_I$	V	-
Current	$I_Q$	-	1.4	A	-

### Temperature

Junction temperature	$T_j$	-	32	°C	-
Storage temperature	$T_{stg}$	- 50	150	°C	-

## Operating Range

Parameter	Symbol	Limit Values		Unit	Remarks
		min.	max.		
Input voltage	$V_I$	–	32	V	1)
Junction temperature	$T_j$	– 40	165	°C	–

## Thermal Resistances

Junction ambient	$R_{thja}$	–	65	K/W	–
Junction case	$R_{thjc}$	–	3	K/W	–

1) See diagram “Output Current versus Input Voltage”

## Characteristics

$V_I = 13.5 \text{ V}$ ;  $T_j = 25 \text{ }^\circ\text{C}$ ; (unless otherwise specified)

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		

## Normal Operation

Output voltage	$V_Q$	4.75	5.0	5.25	V	$25 \text{ mA} \leq I_Q \leq 500 \text{ mA}$ $6 \text{ V} \leq V_I \leq 28 \text{ V}$ $-40 \text{ }^\circ\text{C} \leq T_j \leq 125 \text{ }^\circ\text{C}$
Short -circuit current	$I_{SC}$	500	1000	–	mA	$V_I = 17 \text{ V to } 28 \text{ V}$ ; $V_Q = 0 \text{ V}$
Current consumption $I_q = I_I - I_Q$	$I_q$	–	8.5	10	mA <sup>1)</sup>	$6 \text{ V} \leq V_I \leq 28 \text{ V}$ $I_Q = 150 \text{ mA}$
Current consumption $I_q = I_I - I_Q$	$I_q$	–	50	65	mA <sup>1)</sup>	$6 \text{ V} \leq V_I \leq 28 \text{ V}$ $I_Q = 500 \text{ mA}$
Current consumption $I_q = I_I - I_Q$	$I_q$	–	–	80	mA <sup>1)</sup>	$V_I \leq 6 \text{ V}$ $I_Q = 500 \text{ mA}$
Drop voltage	$V_{DR}$	–	0.35	0.5	V	$V_I = 4.5 \text{ V}$ ; $I_Q = 0.5 \text{ A}$
Drop voltage	$V_{DR}$	–	0.2	0.3	V	$V_I = 4.5 \text{ V}$ ; $I_Q = 0.15 \text{ A}$
Load regulation	$\Delta V_Q$	–	15	35	mV	$25 \text{ mA} \leq I_Q \leq 500 \text{ mA}$
Supply-voltage regulation	$\Delta V_Q$	–	15	50	mV	$V_I \leq 6 \text{ V to } 28 \text{ V}$ ; $I_Q = 100 \text{ mA}$
Supply-voltage regulation	$\Delta V_Q$	–	5	25	mV	$V_I \leq 6 \text{ V to } 16 \text{ V}$ ; $I_Q = 100 \text{ mA}$
Ripple rejection	$SVR$	–	54	–	dB	$f = 100 \text{ Hz}$ ; $V_r = 0.5 V_{pp}$
Temperature drift of output voltage <sup>1)</sup>	$\alpha_{VQ}$	–	$2 \times 10^{-4}$	–	1/ $^\circ\text{C}$	–

## Standby Operation

Quiscent current; $I_q = I_I - I_Q$	$I_q$	–	500	700	$\mu\text{A}$	$10 \text{ V} \leq V_I \leq 16 \text{ V}$ ; $I_Q = 0 \text{ mA}$
Quiscent current; $I_q = I_I - I_Q$	$I_q$	–	750	850	$\mu\text{A}$	$10 \text{ V} \leq V_I \leq 16 \text{ V}$ ; $I_Q = 5 \text{ mA}$

## Characteristics (cont'd)

$V_I = 13.5 \text{ V}$ ;  $T_j = 25 \text{ }^\circ\text{C}$ ; (unless otherwise specified)

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		

### Standby Off/Normal On

Current consumption	$I_{qSOFF}$	–	1.0	1.2	mA	see test diagram
Current consumption	$I_{qNON}$	–	1.7	2.2	mA	see test diagram

### Normal Off/Standby On

Current consumption	$I_{qNOFF}$	–	1.55	2.00	mA	see test diagram
Current consumption	$I_{qSON}$	–	850	1050	$\mu\text{A}$	see test diagram
Switching threshold	$I_{QNOFF}$	7.5	10	12.5	mA	see test diagram
Switching hysteresis	$\Delta I_Q$	2.25	3	4	mA	see test diagram

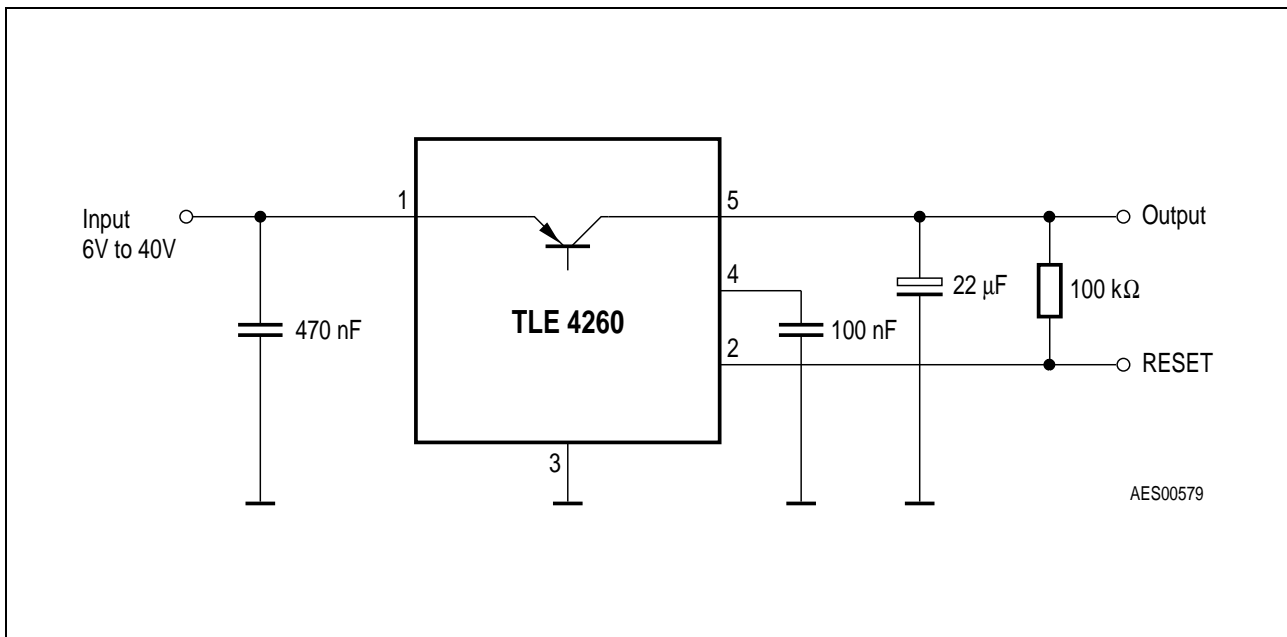
### Reset Generator

Switching threshold	$V_{RT}$	94	96	97	%	in % of $V_Q$ ; $I_Q > 500 \text{ mA}$ ; $V_I = 6 \text{ V}$
Saturation voltage	$V_R$	–	0.25	0.40	V	$I_R = 3 \text{ mA}$ ; $V_I = 4.5 \text{ V}$
Reverse current	$I_R$	–	–	1	$\mu\text{A}$	$V_R = 5 \text{ V}$
Charge current	$I_D$	7	10	13	$\mu\text{A}$	–
Switching threshold	$V_{ST}$	0.9	1.1	1.3	V	–
Delay switching threshold	$V_{DT}$	2.15	2.50	2.75	V	–
Delay time	$t_D$	–	25	–	ms	$C_D = 100 \text{ nF}$
Delay time	$t_t$	–	5	–	$\mu\text{s}$	$C_D = 100 \text{ nF}$

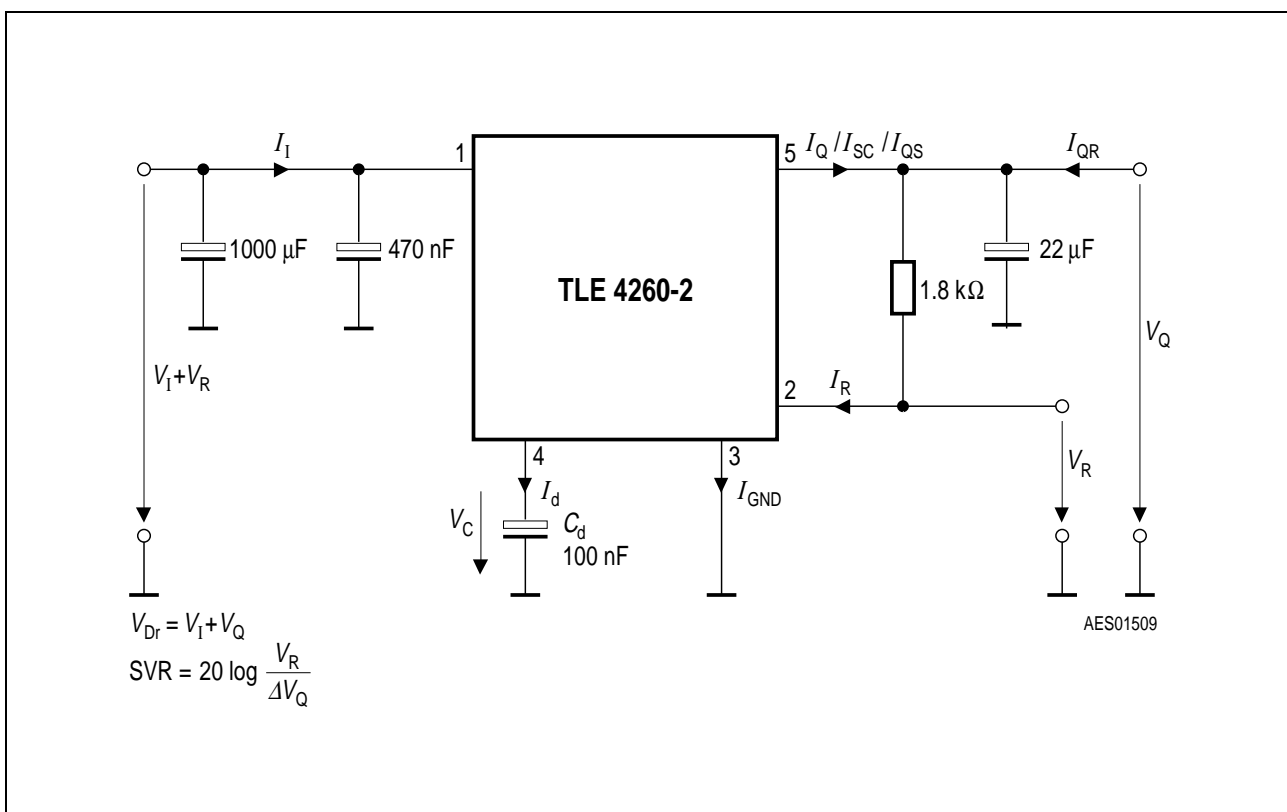
### General Data

Turn-Off voltage	$V_{IOFF}$	40	43	45	V	$I_Q < 1 \text{ mA}$
Turn-Off hysteresis	$\Delta V_I$	–	3.0	–	V	–
Leakage current	$I_{QS}$	–	500	–	$\mu\text{A}$	$V_Q = 0 \text{ V}$ ; $V_I = 45 \text{ V}$
Reverse output current	$I_{QR}$	–	–	1.5	mA	$V_Q = 5 \text{ V}$ ; $V_I = \text{open}$

1) See diagram

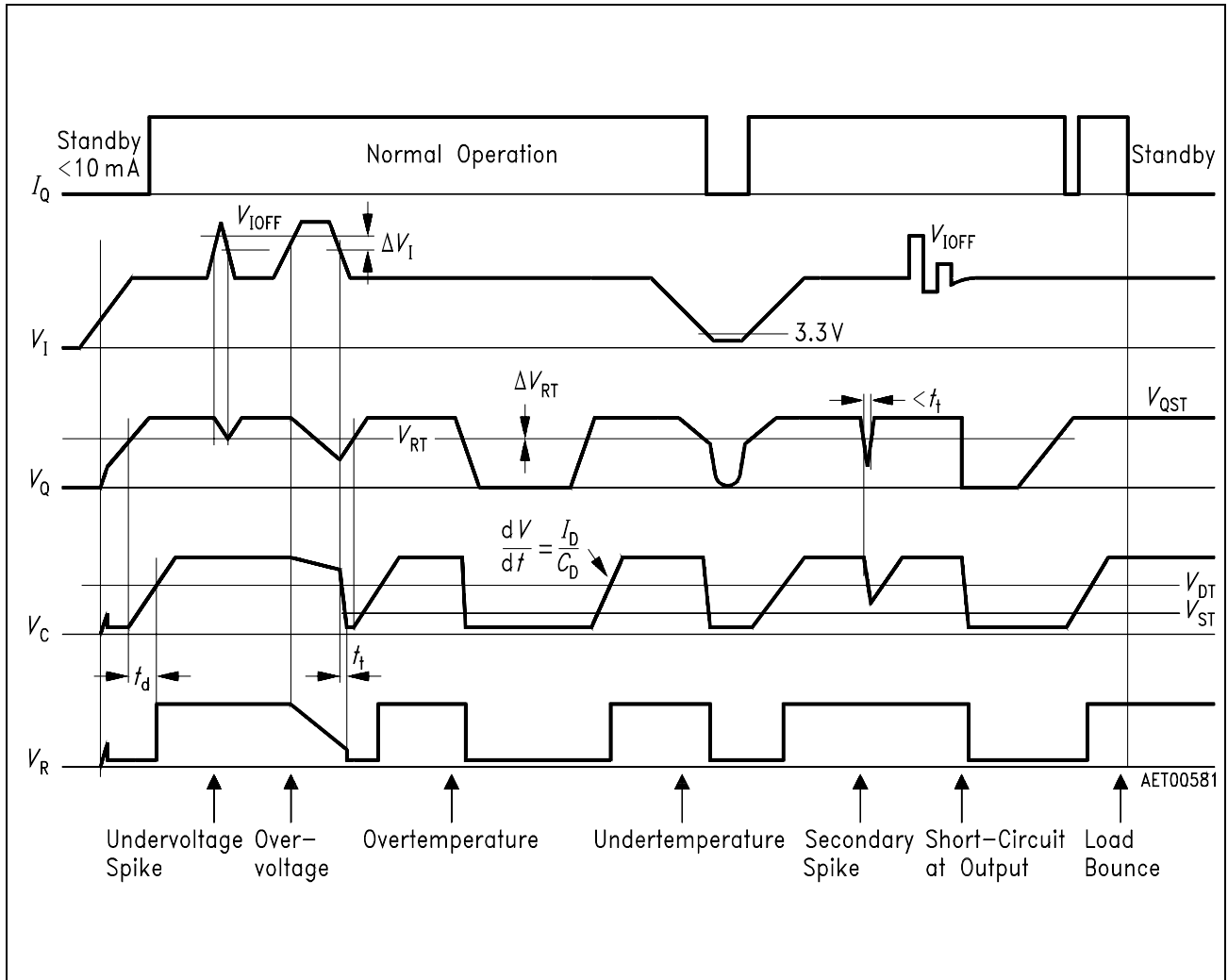


**Application Circuit**

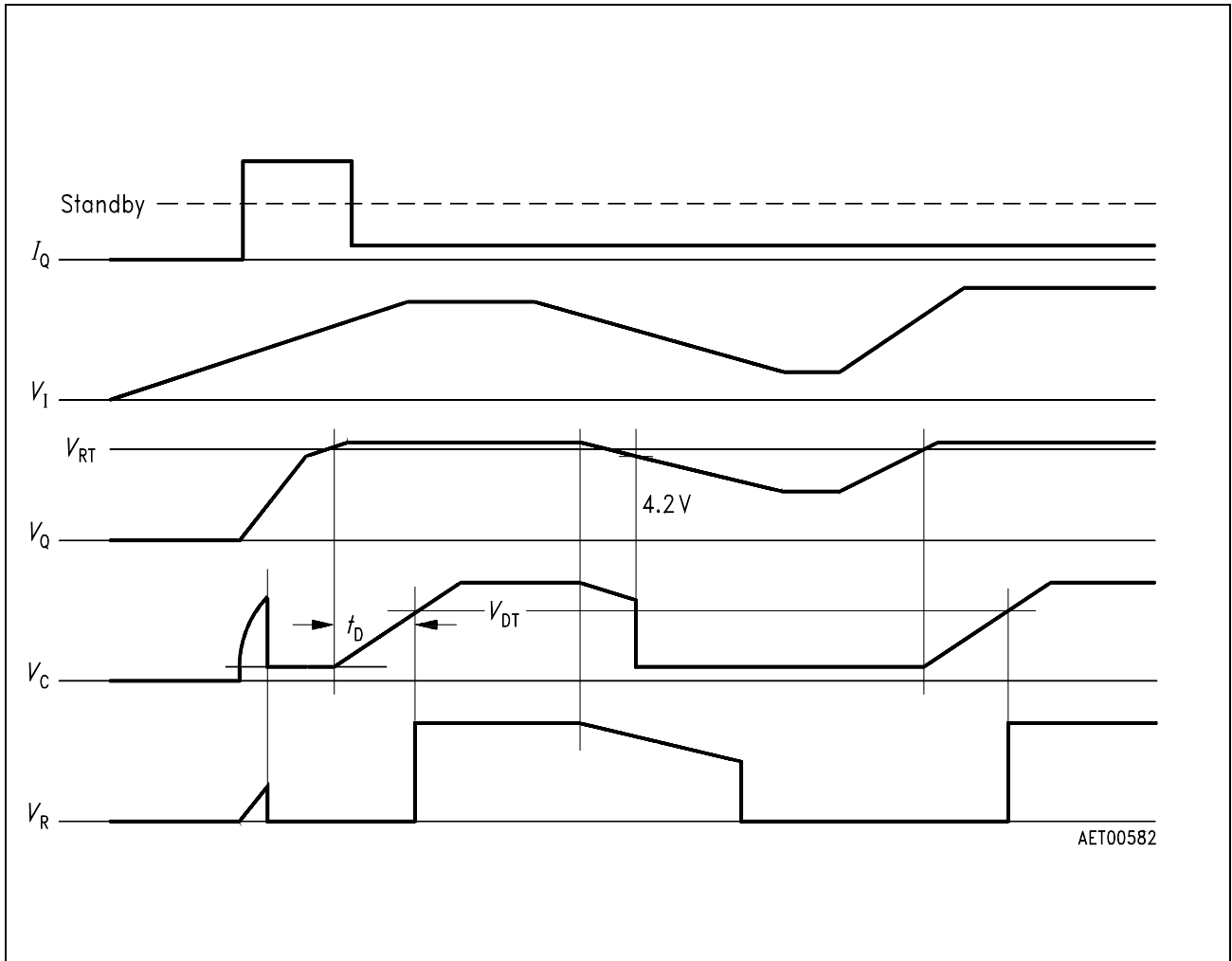


**Test Circuit**



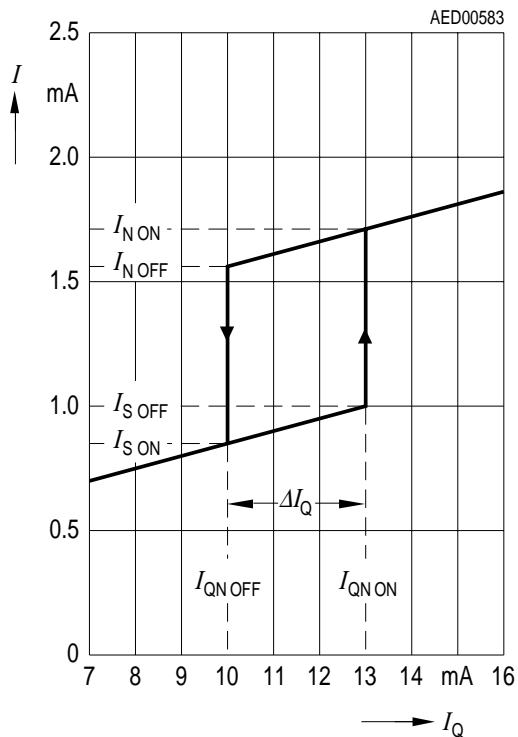


Time Response

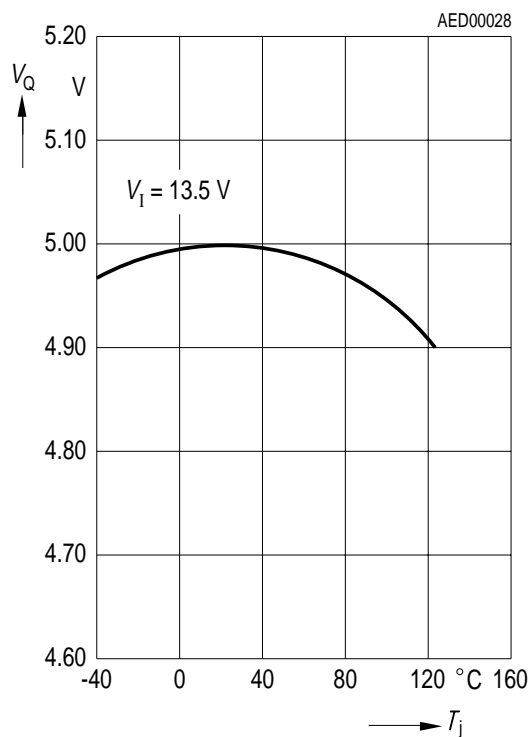


**Time Response in Standby Condition**

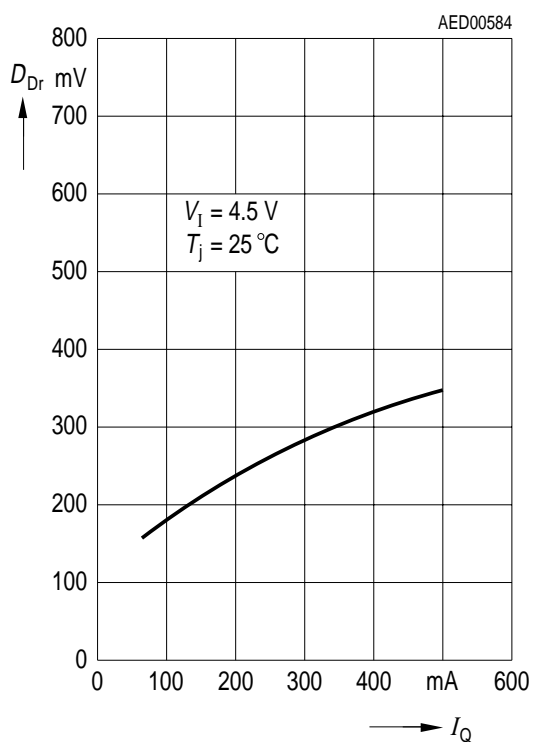
Standby/Normal Changeover



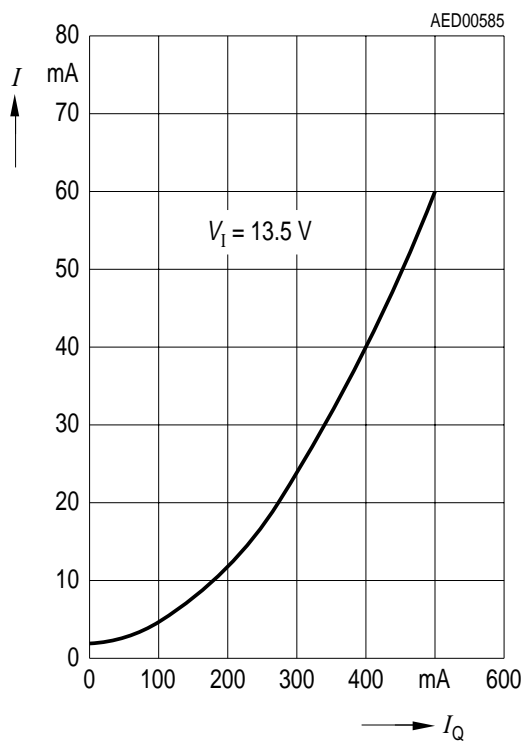
Output Voltage versus Temperature



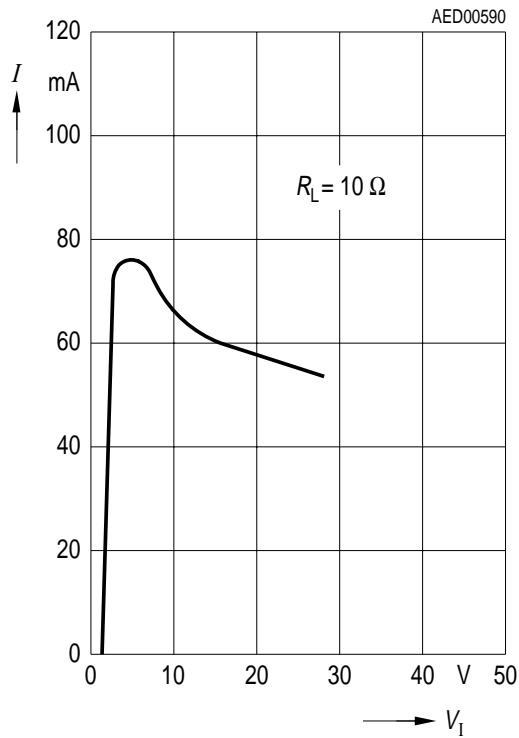
Drop Voltage versus Output Current



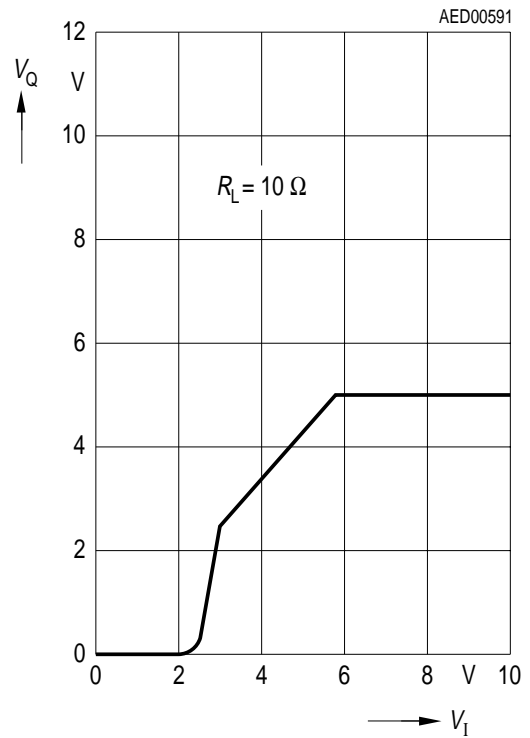
Current Consumption versus Output Current



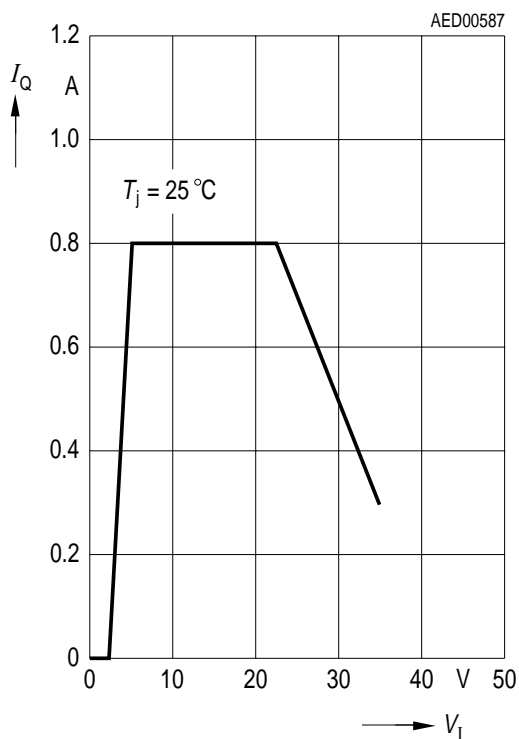
**Current Consumption versus Input Voltage**



**Output Voltage versus Input Voltage**



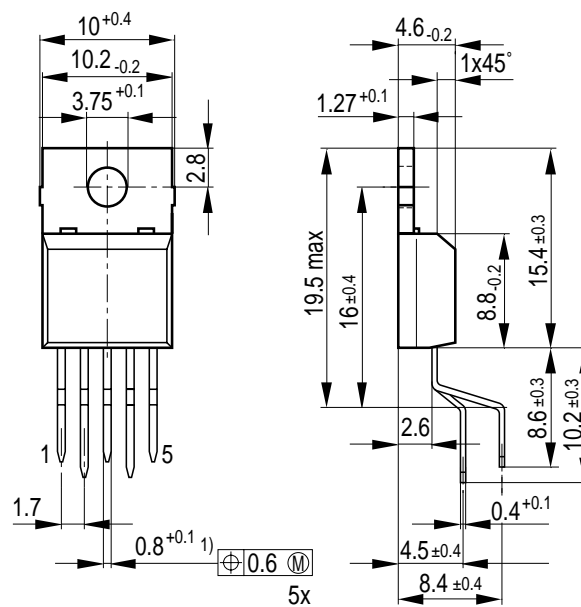
**Output Current versus Input Voltage**



## Package Outlines

### P-TO220-5-1

(Plastic Transistor Single Outline)



- 1)  $1_{-0.15}$  at dam bar (max 1.8 from body)
- 1)  $1_{-0.15}$  im Dichtstegbereich (max 1.8 vom Körper)

Weight approx. 2.1 g

GPT05107

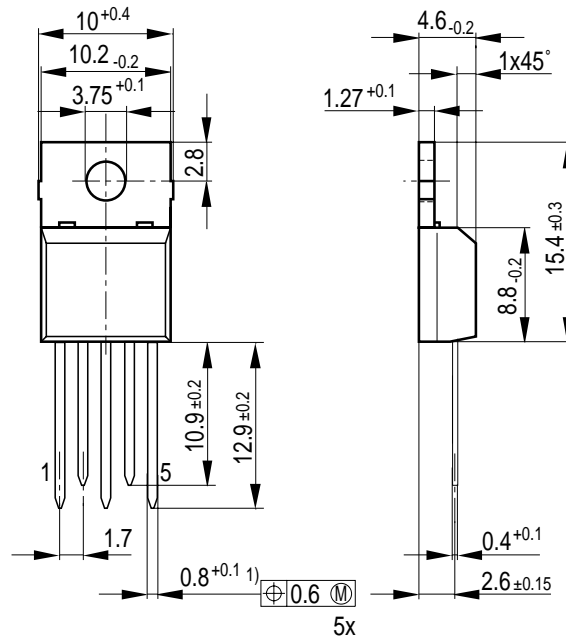
### Sorts of Packing

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

Dimensions in mm

**P-TO220-5-1**

(Plastic Transistor Single Outline)



- 1) 1<sub>-0.15</sub> at dam bar (max 1.8 from body)
- 1) 1<sub>-0.15</sub> im Dichtstegbereich (max 1.8 vom Körper)

Weight approx. 2.1 g

GPT05256

**Sorts of Packing**

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

Dimensions in mm

This datasheet has been download from:

[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.