SIEMENS

Low-Drop Voltage Tracker — TLE 4250 G

Target Data

Features

SCT-595

- Output tracking tolerance ≤ ± 0.5%
- Low drop voltage
- Wide operation range: up to 40 V
- Wide temperature range: – 40 °C ≤ T_j ≤ 150 °C
- Output protected against short circuit
- Overtemperature protection
- Reverse polarity proof
- Combined Tracking/Enable input
- Very small SMD-Package SCT 595
- Very low current consumption in stand-by (disable) mode
- Suitable for use in automotive electronics

Type	Ordering Code	Package
▼ TLE 4250 G	Q67006-A9351	SCT-595 (SMD)

▼ New type

Functional Description

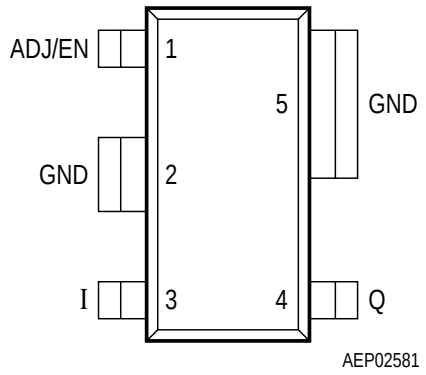
The **TLE 4250 G** is a monolithic integrated low-drop voltage tracker in the very small SMD package SCT 595. It is designed to supply e.g. sensors under the severe conditions of automotive applications. Therefore the device is equipped with additional protection functions against over load, short circuit and reverse polarity. At over temperature.

Supply voltages up to 40 V are tracked to a reference voltage at the adjust input. Therefore the Adjust/Enable pin has to be connected to the reference voltage via an external resistor controlled by an n-channel open drain or direct by a micro-controller port.

The output is able to drive a load up to 50 mA while it follows e.g. the 5 V output of a main voltage regulator within an accuracy of 0.5%.

The **TLE 4250 G** can be switched in stand-by mode via the adjust/enable input which causes the current consumption to drop to very low values. This feature makes the IC suitable for low power battery applications.

Pin Configuration
(top view)



Pin Definitions and Functions

Pin No.	Symbol	Function
1	ADJ/EN	**Adjust/Enable input**; connect to the reference voltage via ext. resistor or micro-controller port; high active input
2	GND	**Ground**; internally connected to pin 5
3	I	**Input voltage**
4	Q	**Output voltage**; must be blocked by a capacitor $C_Q \geq 1$ µF, ESR ≤ 10 Ω to GND
5	GND	**Ground**

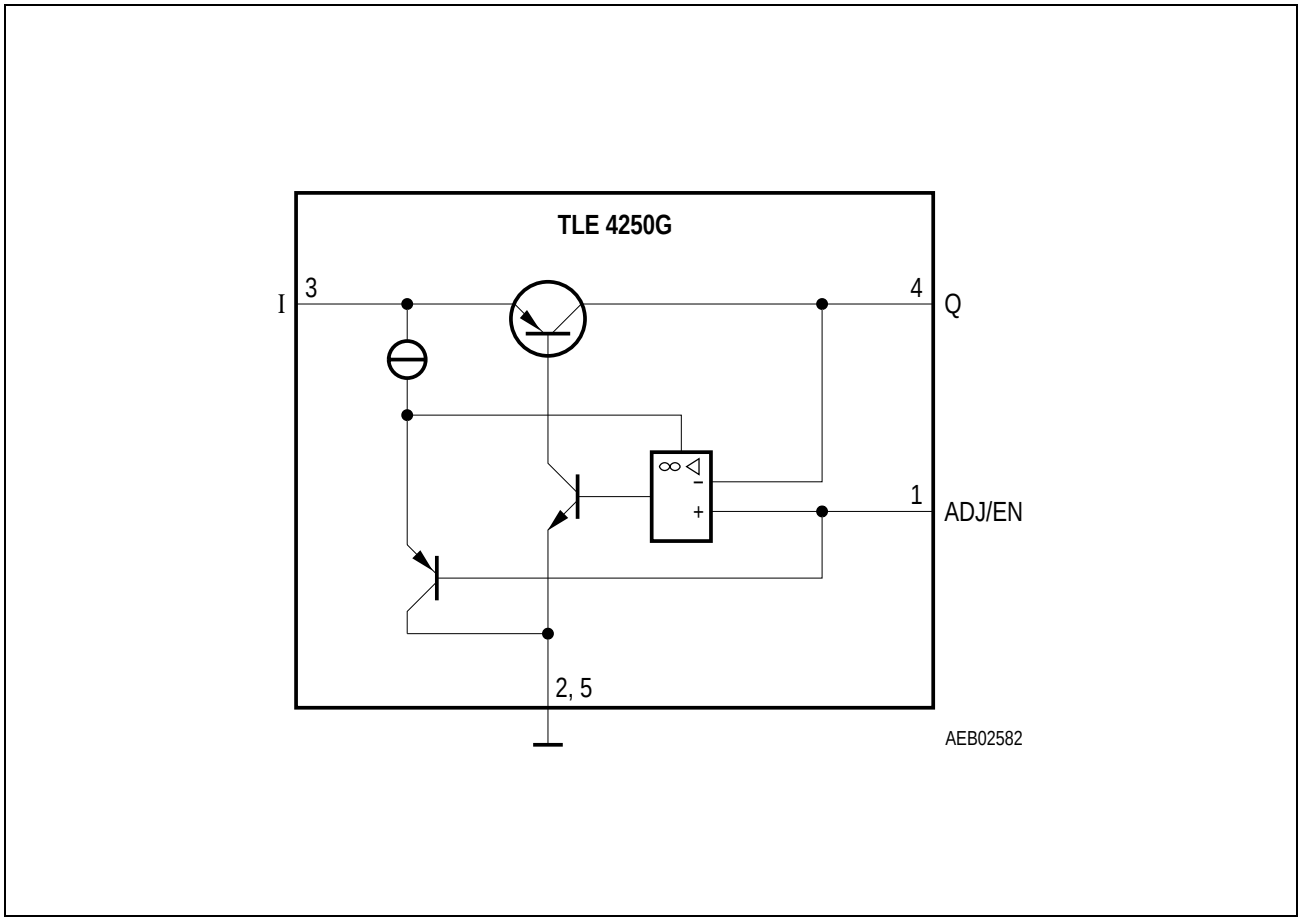


Figure 1
Block Diagram

Absolute Maximum Ratings

– 40 °C < T_j < 150 °C

Parameter	Symbol	Limit Values		Unit	Remarks
		min.	max.		
Input					
Voltage	V_I	– 42	45	V	–
Current	I_I	–	–	mA	internally limited
Output					
Voltage	V_Q	– 1	40	V	–
Current	I_Q	–	–	mA	internally limited
Adjust/Enable					
Voltage	$V_{ADJ/EN}$	– 0.3	40	V	–
Current	$I_{ADJ/EN}$	–	–	µA	internally limited
Temperatures					
Junction temperature	T_j	– 40	150	°C	–
Storage temperature	T_{stg}	– 50	150	°C	–
Thermal Resistances					
Junction pin	$R_{thj\text{-}pin}$	–	30	K/W	measured to pin 5
Junction ambient[1)]	R_{thja}	–	55	K/W	[1)]

[1)] Package mounted on PCB 40 mm × 40 mm × 1.5 mm/6 cm² Cu

Note: Maximum ratings are absolute ratings; exceeding any one of these values may cause irreversible damage to the integrated circuit.

Operating Range

Parameter	Symbol	Limit Values		Unit	Remarks
		min.	max.		
Input voltage	V_I	4	40	V	–
Adjust/Enable input voltage	$V_{ADJ/EN}$	2.8	36	V	–
Junction temperature	T_j	– 40	150	°C	–

Electrical Characteristics

V_I = 13.5 V; $V_{ADJ/EN}$ > 2.8 V; – 40 °C < T_j < 150 °C; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Output						
Output voltage tracking accuracy $DV_Q = V_{ADJ/EN} - V_Q$	DV_Q	– 25	–	25	mV	R_{ext} = 500 kΩ 6 V < V_I < 28 V 1 mA < I_Q < 50 mA
Output voltage tracking accuracy	DV_Q	– 25	–	25	mV	R_{ext} = 500 kΩ 6 V < V_I < 40 V 1 mA < I_Q < 10 mA
Output voltage tracking accuracy	DV_Q	– 5	–	5	mV	R_{ext} = 500 kΩ 6 V < V_I < 16 V $1\ mA$ < I_Q < 10 mA
Drop voltage	V_{dr}	–	100	300	mV	I_Q = 10 mA; $V_{ADJ/EN}$ > 4 V; see note 2)
Output current	I_Q	50	70	–	mA	see note 2)
Output capacitor	C_Q	1	–	–	µF	ESR ≤ 10 Ω at 10 kHz
Current consumption $I_q = I_I - I_Q$	I_q	–	2.5	3.0	mA	I_Q < 30 mA
Current consumption $I_q = I_I - I_Q$	I_q	–	80	150	µA	I_Q < 1 mA
Quiescent current (stand-by) $I_q = I_I - I_Q$	I_q	–	10	20	µA	V_{DIS} < $V_{DIS, low}$; T_j < 85 °C

note 2) Measured when the output voltage V_Q has dropped 100 mV from the nominal value.

Regulator Performance

Load regulation	DV_Q	– 15	–	15	mV	1 mA < I_Q < 30 mA; T_j = 25 °C
Line regulation	DV_Q	– 10	–	10	mV	6 V < V_I < 40 V I_Q = 10mA; T_j = 25 °C

Electrical Characteristics (cont'd)

V_I = 13.5 V; $V_{ADJ/EN}$ > 2.8 V; – 40 °C < T_j < 150 °C; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Power-Supply-Ripple-Rejection	$PSRR$	–	60	–	dB	f_r = 100 Hz; V_r = 0.5 V_{SS}
Adjust/Disable Input						
Input biasing current	I_{ADJ}	–	0.1	0.5	µA	–
Adjust low threshold to disable	$V_{ADJ/EN}$	0.8	2.2	2.8	V	$V_{ADJ/EN} - V_Q$ > 25 mV

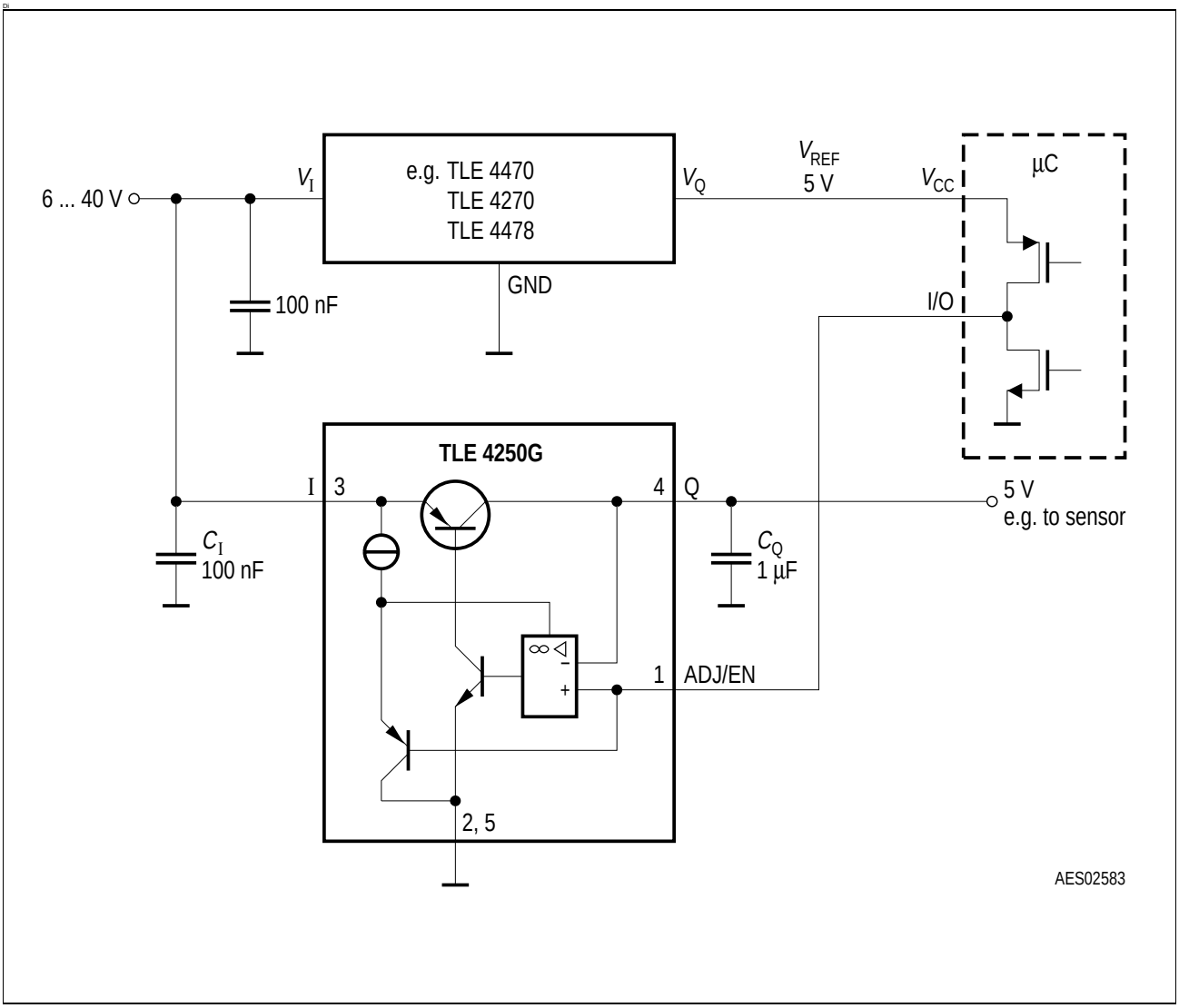
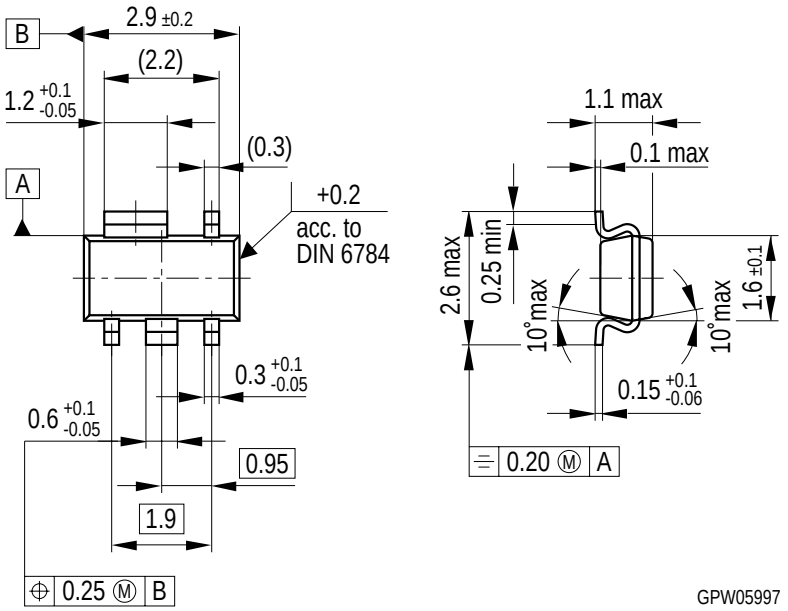


Figure 2
Application Circuit

Package Outlines

SCT-595
(Special Package)



Sorts of Packing
Package outlines for tubes, trays etc. are contained in our Data Book “Package Information”.

SMD = Surface Mounted Device

Dimensions in mm