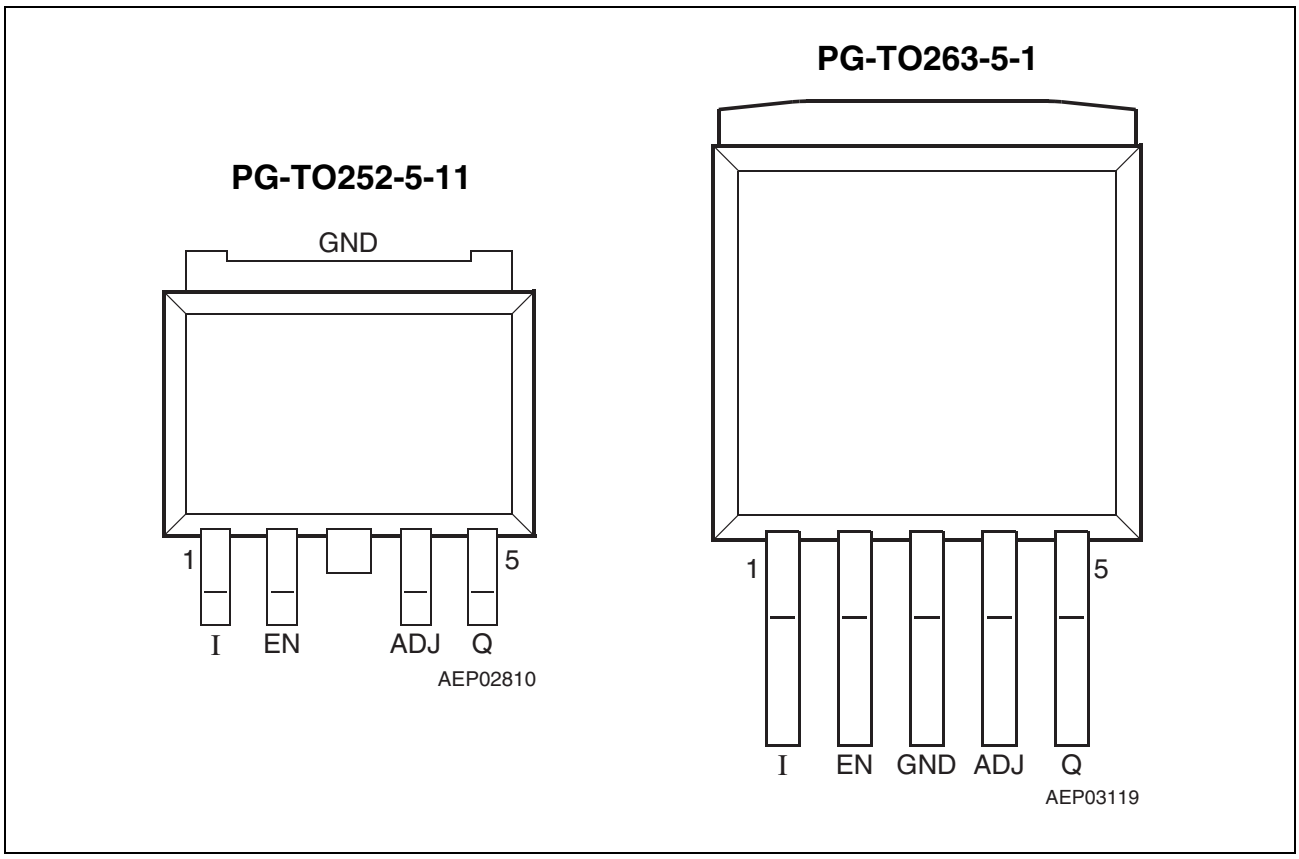


Figure 1 **Pin Configuration** (top view)

Table 1 **Pin Definitions and Functions**

Pin No.	Symbol	Function
1	I	**Input voltage**
2	EN	**Enable;** high-active input
3	GND	**Ground**
4	ADJ	**Adjust;** connect directly to the reference or with a voltage divider to the reference (for reference-proportional output voltages, VQ<Vref)…..
5	Q	**Output voltage;** must be blocked by a capacitor $C_Q \geq 22\ \mu F$, ESR $\leq 3\ \Omega$ to GND

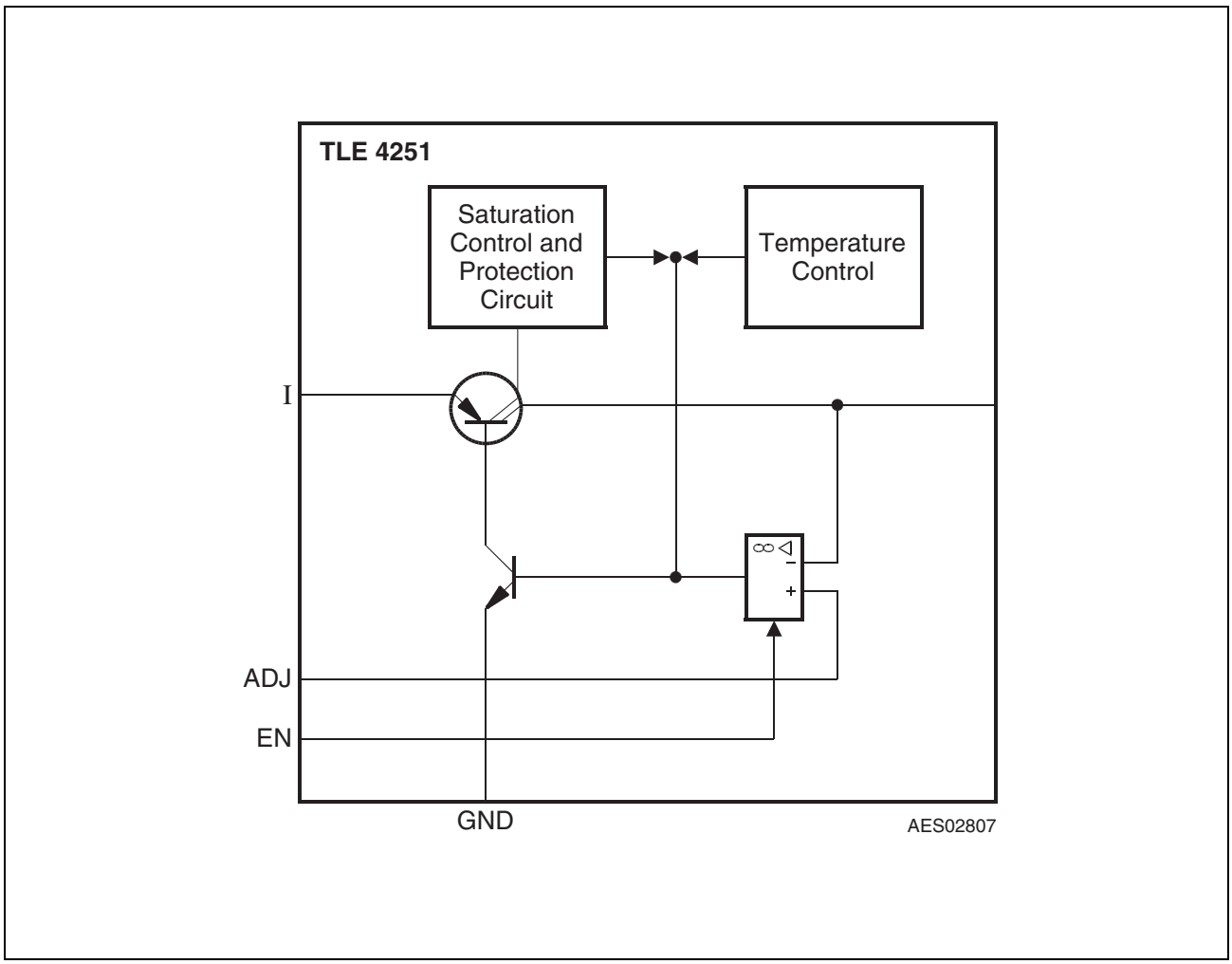


Figure 2 Block Diagram

Table 2 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	-2	45	V	–
Current	I_Q	–	–	mA	internally limited
Adjust					
Voltage	V_{ADJ}	-42	45	V	–
Current	I_{ADJ}	–	–	µA	internally limited
Enable					
Voltage	V_{EN}	-42	45	V	–
Current	I_{EN}	–	–	µA	internally limited
Temperatures					
Junction temperature	T_j	-40	150	°C	–
Storage temperature	T_{stg}	-50	150	°C	–
Thermal Resistances					
Junction case	R_{thjc}	–	4	K/W	TLE 4251 D
Junction ambient	R_{thja}	–	78	K/W	TLE 4251 D[1)]
Junction case	R_{thjc}	–	3	K/W	TLE 4251 G
Junction ambient	R_{thja}	–	52	K/W	TLE 4251 G[1)]

1) Worst case, regarding peak temperature; zero airflow; mounted an a PCB 80 × 80 × 1.5 mm^3, heat sink area 300 mm^2.

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

Table 3 Operating Range

Parameter	Symbol	Limit Values		Unit	Remarks
		Min.	Max.		
Input voltage	V_I	4[1)]	40	V	–
Adjust input voltage	V_{ADJ}	2.5	40	V	–
Adjust input voltage	V_{ADJ}	0	2.5	V	$V_Q \leq V_{ADJ} + \Delta V_Q$
Enable input voltage	V_{EN}	0	40	V	–
Junction temperature	T_j	-40	150	°C	–

1) $V_I > V_{ADJ} + V_{DR}$

Table 4 Electrical Characteristics

V_I = 13.5 V; 2.5 V ≤ V_{ADJ} ≤ V_I - 0.5 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 $\Delta V_Q = V_{ADJ} - V_Q$	ΔV_Q	-10	–	10	mV	V_I < 13.5 V; -40 °C < T_j < 125 °C; 1 mA < I_Q < 300 mA
Output voltage tracking accuracy	ΔV_Q	-10	–	10	mV	6 V < V_I < 40 V; 5 mA < I_Q < 200 mA
Output voltage tracking accuracy	ΔV_Q	-25	–	25	mV	6 V < V_I < 28 V; 1 mA < I_Q < 300 mA
Drop voltage	V_{dr}	–	280	520	mV	I_Q = 300 mA; V_{ADJ} > 4 V; Enable ON[1)]
Output current	I_Q	400	450	800	mA	T_j ≤ 125 °C[1)]
Output capacitor	C_Q	22	–	–	µF	ESR ≤ 3 Ω at 10 kHz
Current consumption $I_q = I_I - I_Q$	I_q	–	10	20	mA	I_Q = 300 mA
Current consumption $I_q = I_I - I_Q$	I_q	–	230	300	µA	I_Q < 1 mA; T_j < 85 °C; V_{EN} in ON state
Quiescent current (stand-by) $I_q = I_I - I_Q$	I_q	–	0	2	µA	V_{EN} = 0 V; T_j < 85 °C
Regulator Performance						
Load regulation	ΔV_Q	-35	±5	35	mV	5 mA < I_Q < 300 mA; V_I = 6 V; V_{ADJ} = 5 V
Line regulation	ΔV_Q	-25	±10	25	mV	12 V < V_I < 32 V; I_Q = 5 mA
Power Supply Ripple Rejection	$PSRR$	60	–	–	dB	f_r = 100 Hz; V_r = 0.5 Vpp; V_{ADJ} = 5 V; C_Q = 22 µF Tantalum
Adjust Input						
Input biasing current	I_{ADJ}	–	0.1	0.5	µA	V_{ADJ} = 5 V

Table 4 Electrical Characteristics (cont'd)

V_I = 13.5 V; 2.5 V ≤ V_{ADJ} ≤ V_I - 0.5 V; -40 °C < T_j < 150 °C; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Test Condition
		Min.	Typ.	Max.		
Enable						
Enable on voltage range	$V_{EN\ ON}$	2	–	–	V	V_Q ON
Enable off voltage range	$V_{EN\ OFF}$	–	–	0.5	V	V_Q ≤ 0.1 V
Input current	I_{EN}	5	40	70	µA	V_{EN} = 5 V

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

Application Information

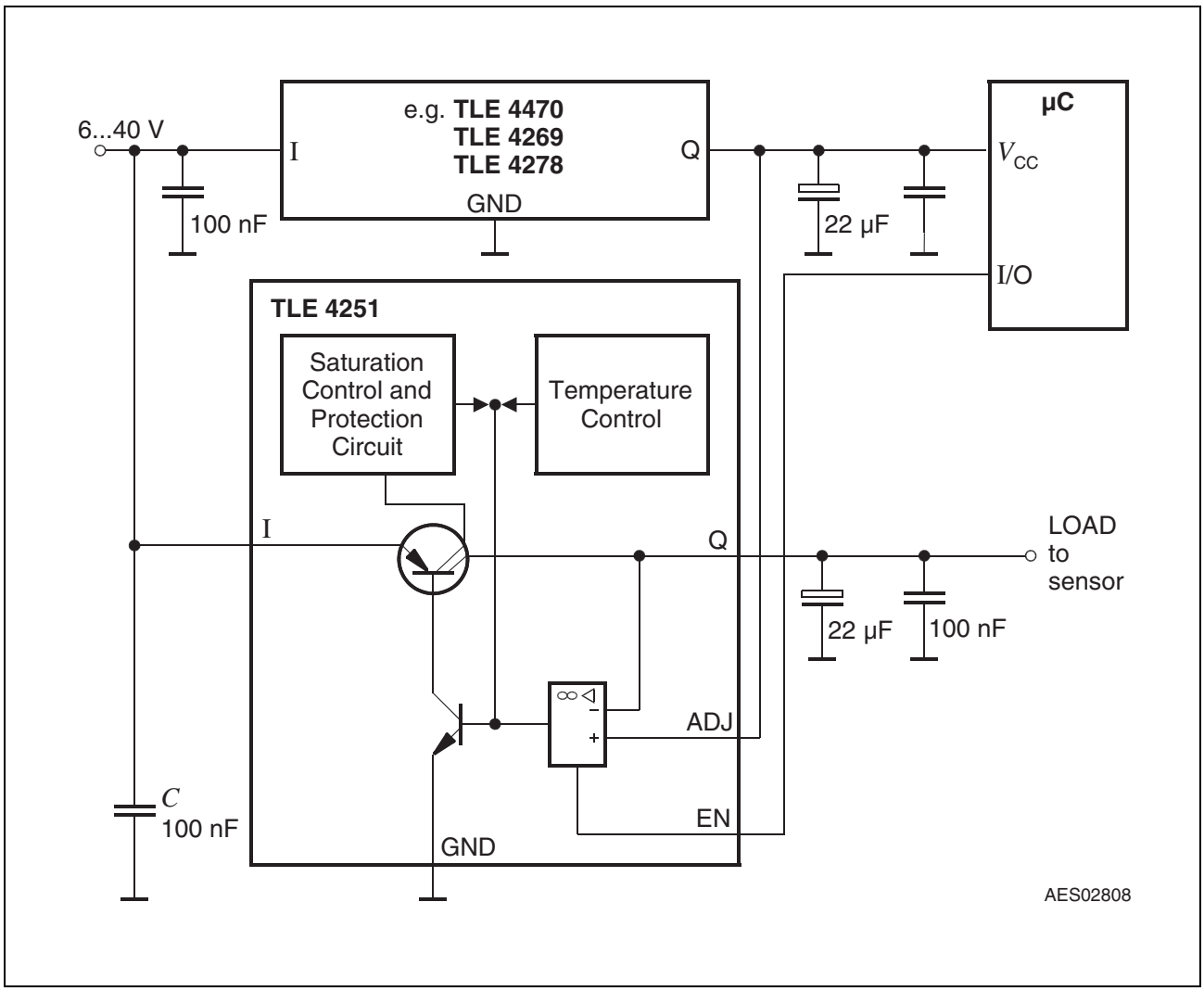
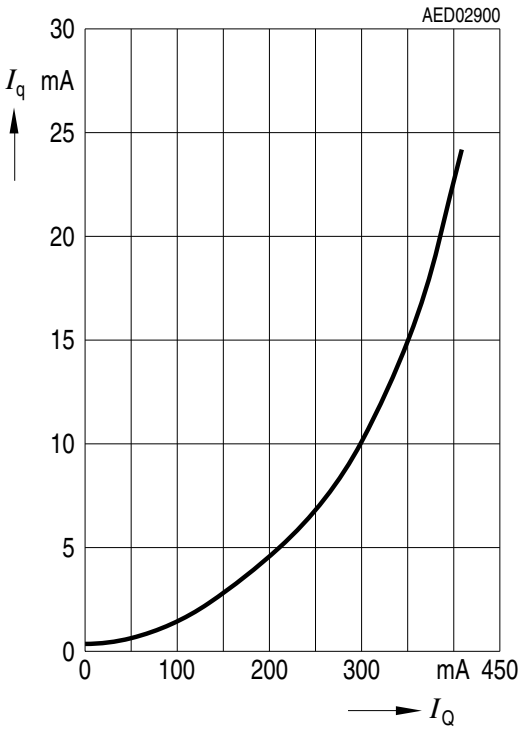
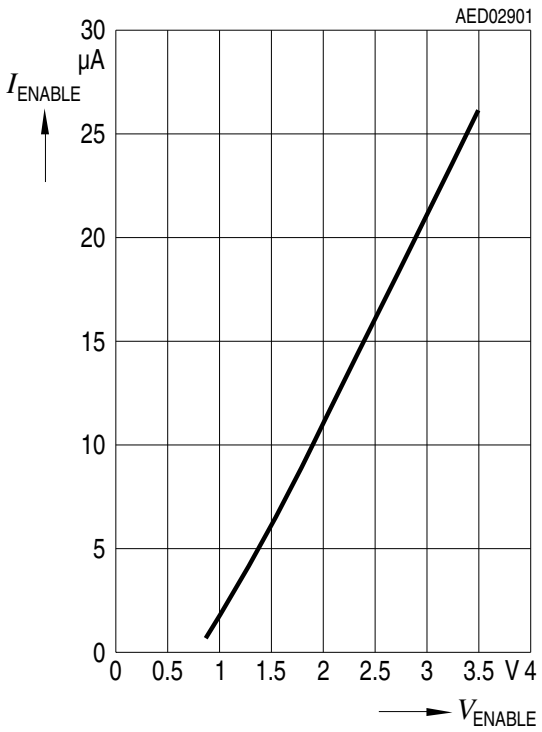


Figure 3 Application Circuit

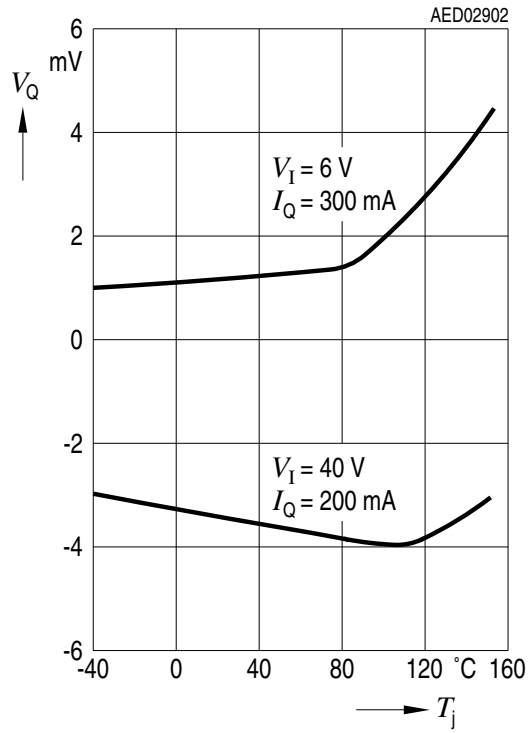
Quiescent Current I_q versus Output Current I_Q



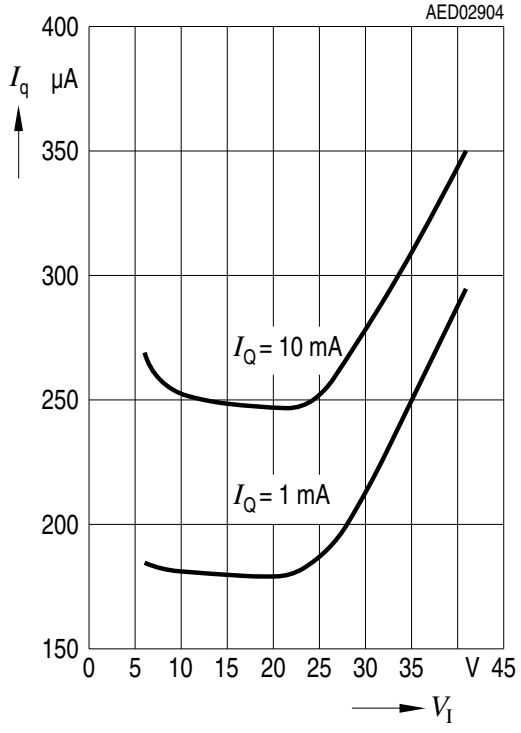
Enable Current I_{EN} versus Enable Voltage V_{EN}



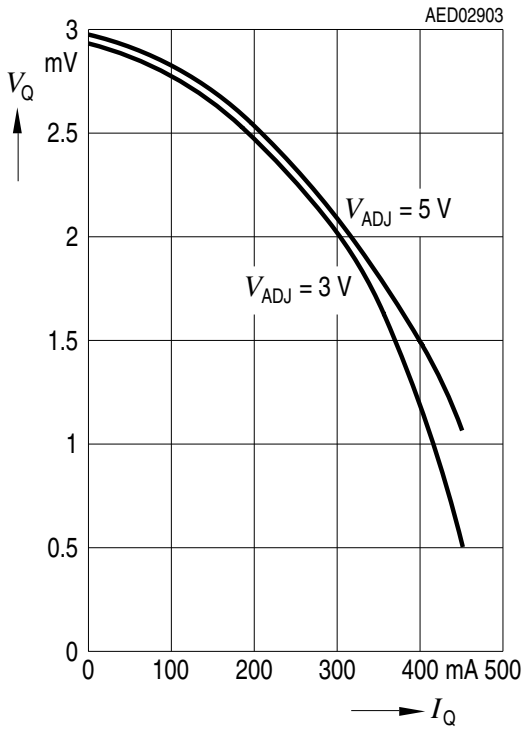
Tracking Accuracy ΔV_Q versus Temperature T_j, V_{ADJ} = 5 V



Current Consumption I_q versus Input Voltage V_I, V_{ADJ} = 5 V



Tracking Accuracy ΔV_Q versus Output Current I_Q



Package Outlines

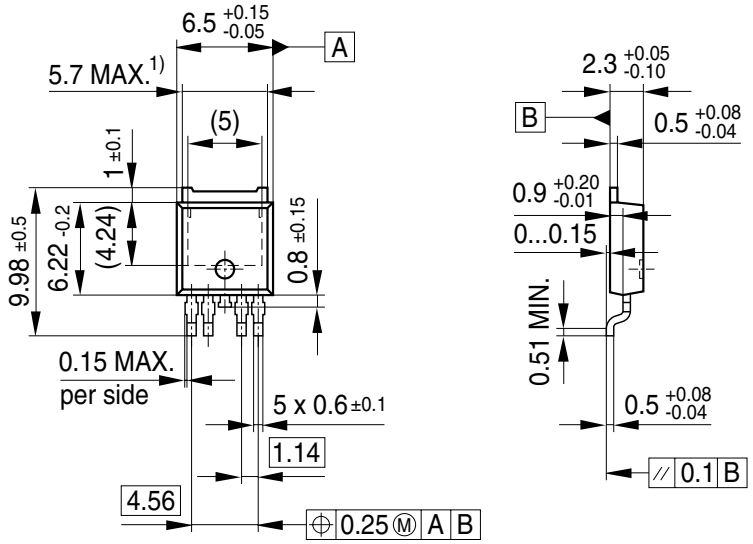


Figure 4 **PG-TO252-5-11** (Plastic Transistor Single Outline)

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

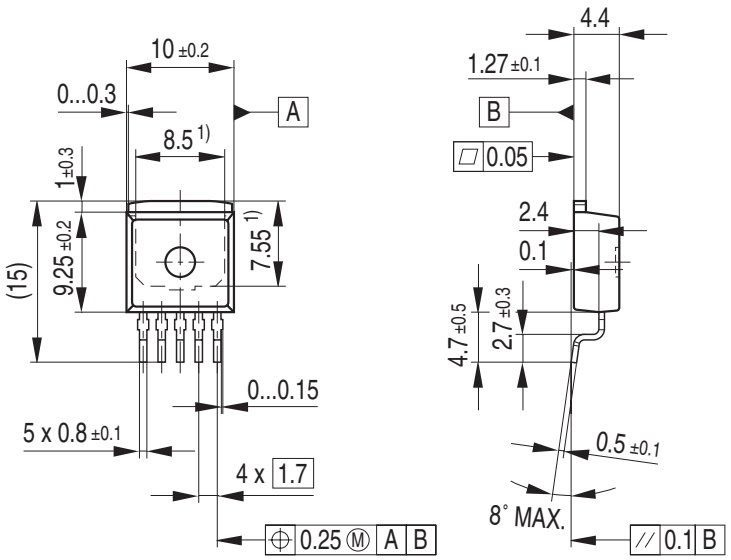

Figure 5 **PG-TO263-5-1** (Plastic Transistor Single Outline)

Green Product (RoHS compliant)

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SMD = Surface Mounted Device

Dimensions in mm

Revision History

Version	Date	Changes
Rev. 2.9	2007-03-20	Initial version of RoHS-compliant derivate of TLE 4251 **Page 1**: AEC certified statement added **Page 1** and **Page 10**: RoHS compliance statement and Green product feature added **Page 1** and **Page 10**: Package changed to RoHS compliant version Legal Disclaimer updated

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