

## 5-V Voltage Regulator

**TLE 4285 G**



### Features

- 15 mA current capability
- Low quiescent current consumption
- Power fail output
- Wide operation range: up to 45 V
- Wide temperature range: -40 °C to 150 °C
- Output protected against short circuit
- Overtemperature protection
- Very small SMD-Package PG-SCT-595-5
- Green product (RoHS compliant)
- AEC qualified



PG-SCT-595-5

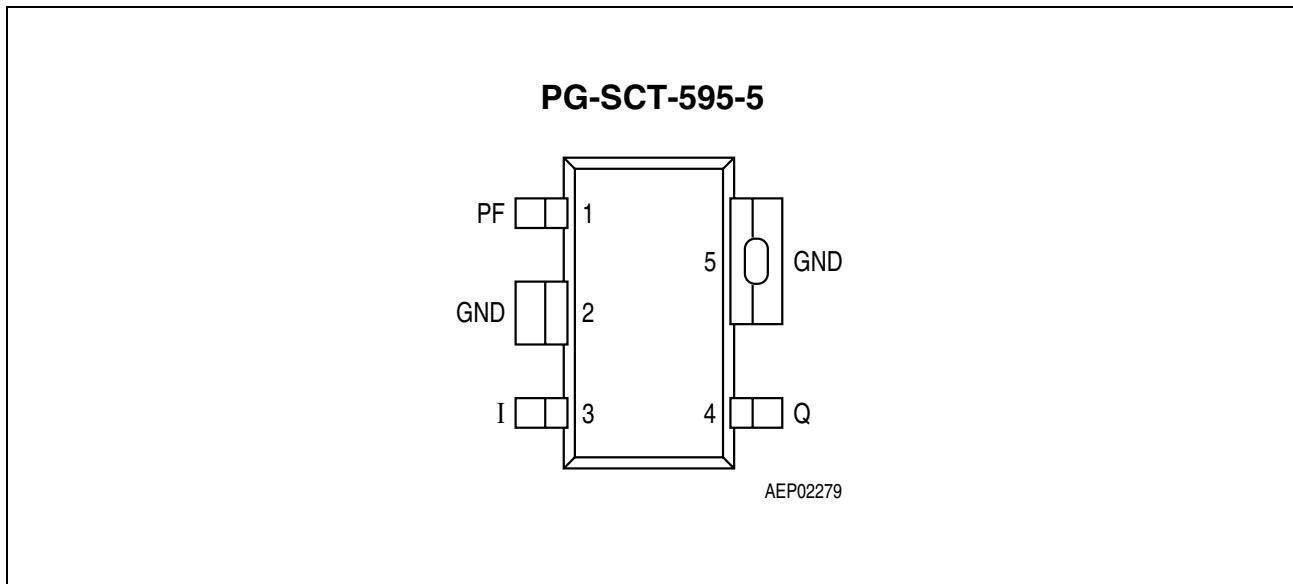
### Functional Description

The **TLE 4285 G** is a 5-V fixed voltage regulator in a very small SMD package PG-SCT-595-5. The maximum input voltage is 45 V. The output is able to drive an output current of more than 10 mA while it regulates the output voltage within a 4% accuracy.

The Power Fail Output (open collector) is switched to low in case of under-voltage at the output pin. To reduce external components the Power Fail Output has an internal pull-up resistor of 50 kΩ which is connected to the output Q.

The device incorporates a temperature protection that disables the circuit at overtemperature.

Type	Package	Marking
TLE 4285 G	PG-SCT-595-5	B1

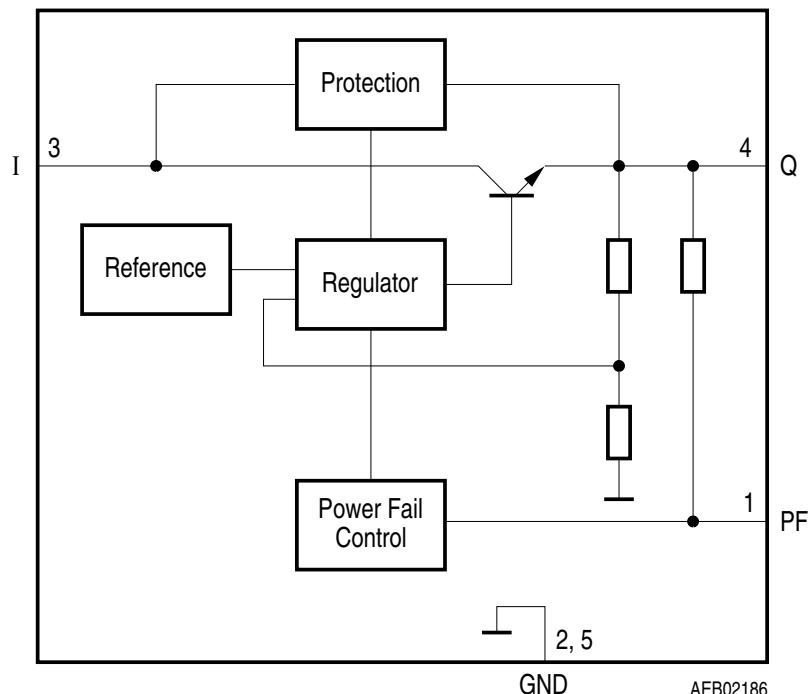


**Figure 1 Pin Configuration (top view)**

**Table 1 Pin Definitions and Functions**

Pin No.	Symbol	Function
1	PF	<b>Power Fail</b> ; L for under-voltage; internally connected to Q via 50 k $\Omega$ pull-up resistor
2	GND	<b>Ground</b> ; internally connected to pin 5
3	I	<b>Input voltage</b>
4	Q	<b>Output voltage</b> ; must be blocked by a capacitor $C_Q \geq 1 \mu\text{F}$ , ESR $\leq 10 \Omega$ to GND
5	GND	<b>Ground</b> ; internally connected to pin 2

## Functional Block Diagram



**Figure 2** Block Diagram

**Table 2      Absolute Maximum Ratings**
 $-40^{\circ}\text{C} < T_j < 150^{\circ}\text{C}$ 

Parameter	Symbol	Limit Values		Unit	Remarks
		Min.	Max.		
<b>Input</b>					
Voltage	$V_I$	-0.3	45	V	–
Current	$I_I$	-20	*	mA	* internally limited
<b>Output</b>					
Voltage	$V_Q$	-0.3	16	V	–
Current	$I_Q$	-20	*	mA	* internally limited
<b>Power Fail</b>					
Voltage	$V_{PF}$	-0.3	45	V	–
Current	$I_{PF}$	-500	*	μA	* internally limited
<b>Temperatures</b>					
Junction temperature	$T_j$	-40	150	°C	–
Storage temperature	$T_{stg}$	-50	150	°C	–
<b>Thermal Resistances</b>					
Junction pin	$R_{thj-pin}$	–	30	K/W	measured to pin 5
Junction ambient	$R_{thj-a}$	–	55	K/W	<sup>1)</sup>

1) Package mounted on PCB 40 × 40 × 1.5 mm<sup>3</sup>/6 cm<sup>2</sup> Cu.

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

**Table 3      Operating Range**

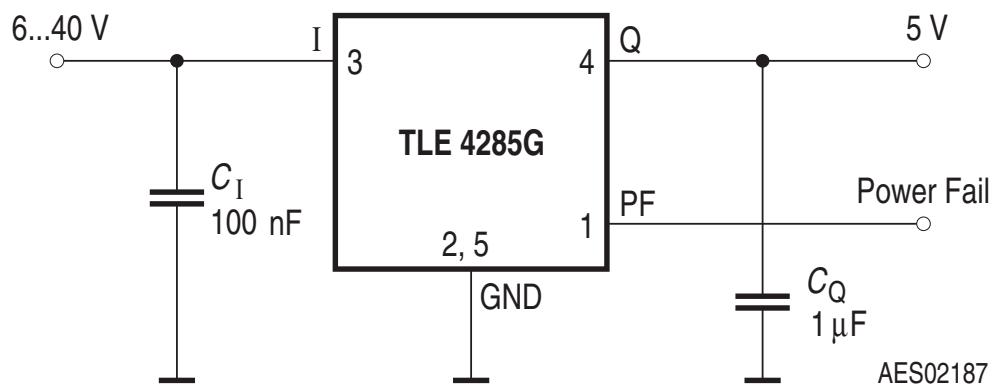
Parameter	Symbol	Limit Values		Unit	Remarks
		Min.	Max.		
Input voltage	$V_I$	6	42	V	–
Output current	$I_Q$	15	–	mA	–
Junction temperature	$T_j$	-40	150	°C	–

**Table 4 Electrical Characteristics**

6.2 V <  $V_I$  < 36 V; -40 °C <  $T_j$  < 150 °C; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Test Condition
		Min.	Typ.	Max.		
<b>Output</b>						
Output voltage	$V_Q$	4.85	5.0	5.15	V	$T_j = 25$ °C; 1 mA < $I_Q$ < 10 mA
Output voltage	$V_Q$	4.8	5.0	5.20	V	1 mA < $I_Q$ < 10 mA
Drop voltage	$V_{dr}$	0.6	0.8	1.1	V	$I_Q = 10$ mA <sup>1)</sup>
Output capacitor	$C_Q$	1	—	—	μF	ESR ≤ 10 Ω at 10 kHz
Output current	$I_Q$	15	—	70	mA	—
<b>Current Consumption</b>						
Quiescent current	$I_q$	—	100	150	μA	$I_Q < 10$ mA; $V_I = 13.5$ V
<b>Regulator Performance</b>						
Load regulation	$\Delta V_Q$	—	5	10	mV	0 mA < $I_Q$ < 10 mA; $V_I = 6$ V; $T_j \leq 85$ °C
Line regulation	$\Delta V_Q$	—	5	10	mV	$I_Q = 5$ mA; $T_j \leq 85$ °C
Power supply ripple rejection	$PSRR$	—	60	—	dB	$f_r = 100$ Hz; $V_r = 0.5$ Vpp
<b>Power Fail Output</b>						
Power fail switching threshold	$\Delta V_Q$	—	$V_{Q,nom}$ - 50	—	mV	$V_{PF} < 1$ V
Power fail low voltage	$V_{PF, low}$	—	0.15	0.3	V	$I_{PF} = 0.1$ mA; $V_Q = 4.5$ V
Power fail leakage current	$I_{PFLK}$	—	—	10	μA	$R_{ext} = 47$ kΩ
Power fail pull-up	$R_{PF}$	30	50	70	kΩ	internally connected to $V_Q$

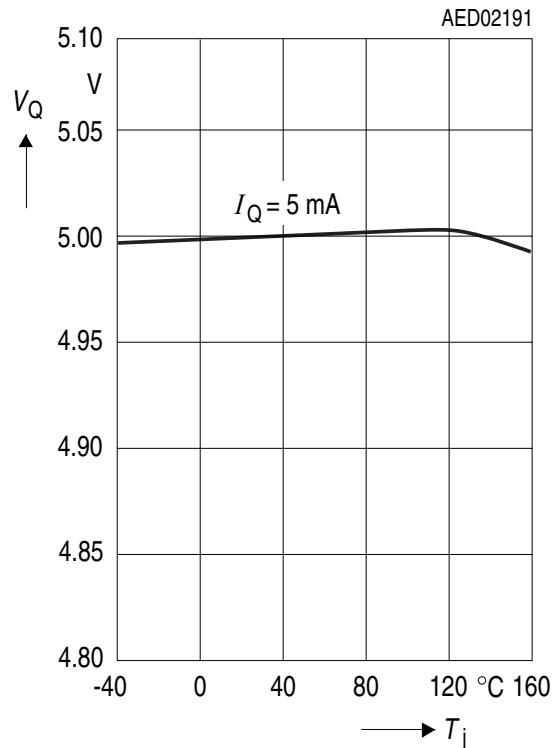
1) Measured when the output voltage  $V_Q$  has dropped 100 mV from the nominal value.



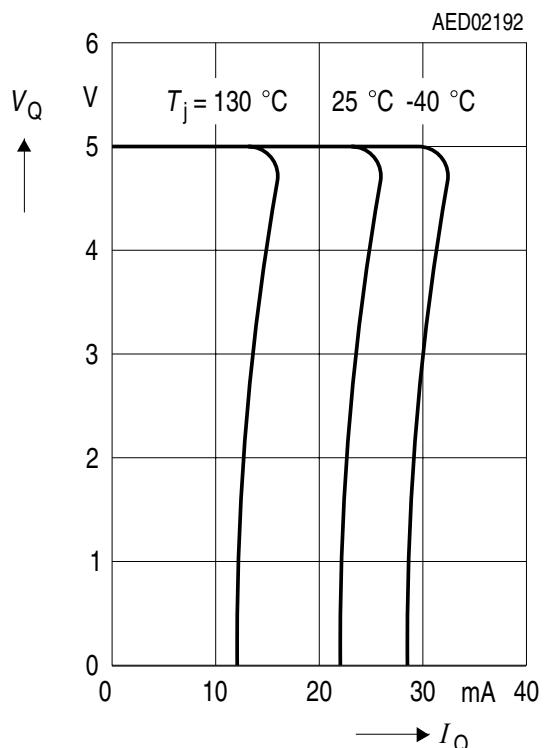
**Figure 3 Application Circuit**

## Typical Performance Characteristics

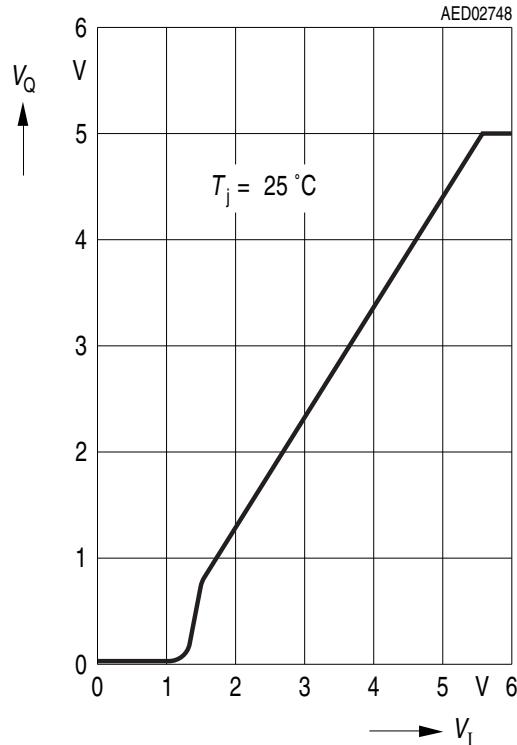
### Output Voltage $V_Q$ versus Temperature $T_j$



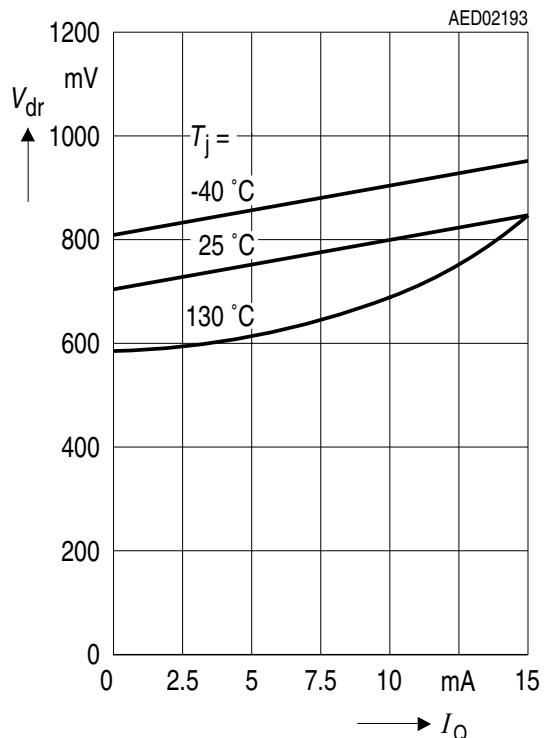
### Output Voltage $V_Q$ versus Output Current $I_Q$



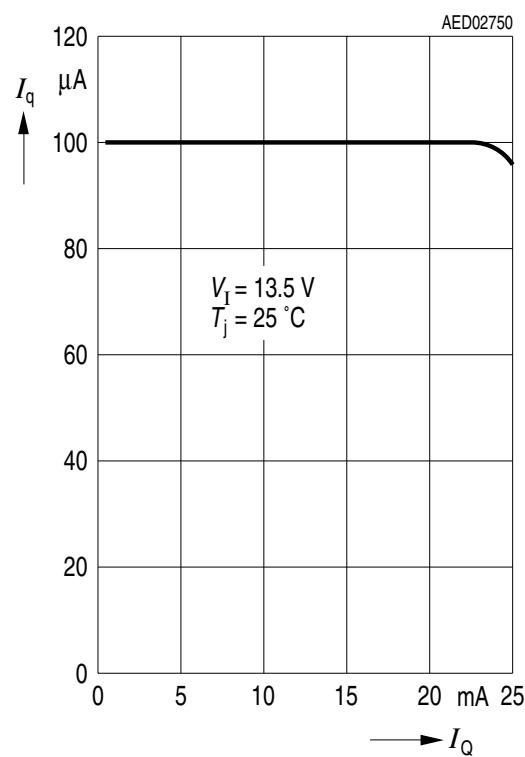
**Output Voltage  $V_Q$  versus  
Input Voltage  $V_I$**

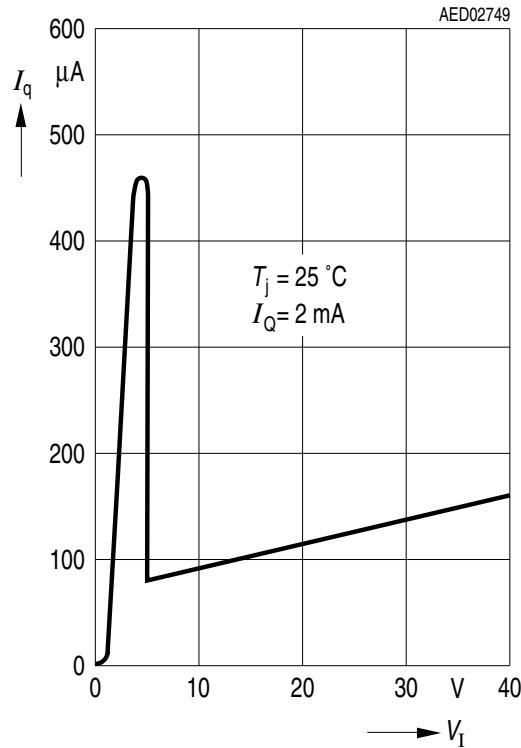
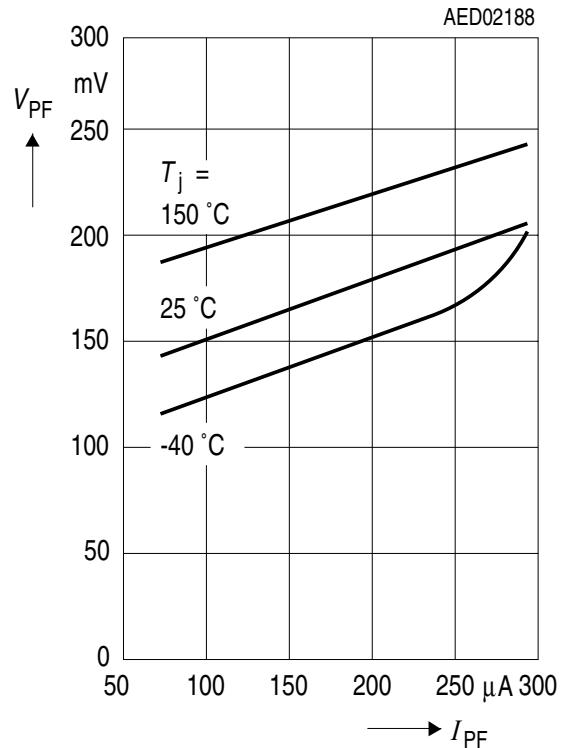


**Drop Voltage  $V_{dr}$  versus  
Output Current  $I_Q$**

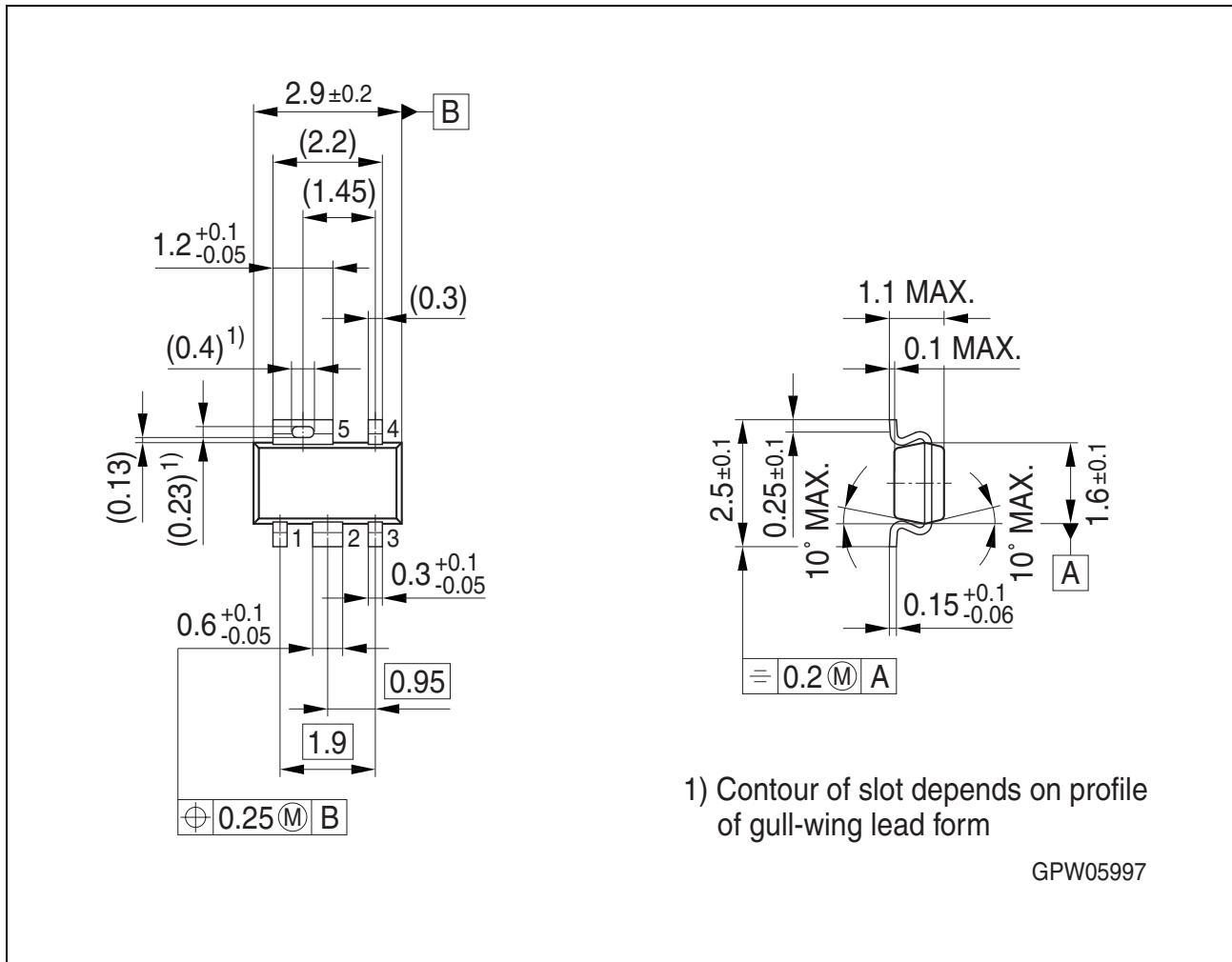


**Current Consumption  $I_q$  versus  
Output Current  $I_Q$**



**Current Consumption  $I_q$  versus  
Input Voltage  $V_I$** 

**Power Fail Low Voltage  $V_{PF}$  versus  
Power Fail Current  $I_{PF}$** 


## Package Outlines



**Figure 4      Outline PG-SCT-595-5**

### 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).

You can find all of our packages, sorts of packing and others in our Infineon Internet Page "Products": <http://www.infineon.com/packages>.

SMD = Surface Mounted Device

Dimensions in mm

## Revision History

Version	Date	Changes
Rev. 2.2	2008-04-21	<p>Initial version of RoHS-compliant derivate of TLE 4285 G</p> <p><b>Page 1:</b> AEC certified statement added.</p> <p><b>Page 1</b> and <b>Page 10:</b> RoHS compliance statement and Green product feature added.</p> <p><b>Page 1</b> and <b>Page 10:</b> Package changed to RoHS compliant version.</p> <p><b>Page 1:</b> Marking information added.</p> <p><b>Page 1:</b> Adapted description to values given on <b>Page 5</b>. Not a change of electrical characteristics.</p> <p>Legal Disclaimer updated.</p>
Rev. 2.1	2004-01-01	Final datasheet

**Edition 2008-04-21**

**Published by**

**Infineon Technologies AG  
81726 Munich, Germany**

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