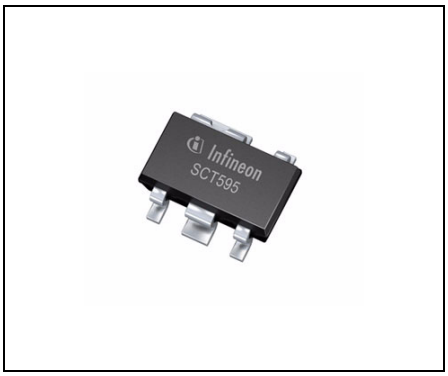
5-V Voltage Regulator

TLE 4286 G

Features

- 15 mA output current capability
- 1 µA current consumption in standby mode
- Low quiescent current consumption
  60 µA in ON mode
- Inhibit input
- Very small SMD-Package PG-SCT-595-5
- Wide operation range: 6.2 V to 42 V
- Wide temperature range: -40 °C to 150 °C
- Output protected against short circuit
- Overtemperature protection
- Green product (RoHS compliant)
- AEC qualified.



PG-SCT-595-5

Functional Description

The **TLE 4286 G** is a 5-V low-drop fixed voltage regulator in the very small SMD package PG-SCT-595-5. The maximum input voltage is 42 V. The output is able to drive a load of more than 10 mA while it regulates the output voltage within a 4% accuracy.

The device can be switched in stand-by mode via an inhibit input which causes the current consumption to drop below 1 µA.

A temperature protection disables the IC at over temperature.

Type	Package	Marking
TLE 4286 G	PG-SCT-595-5	A1

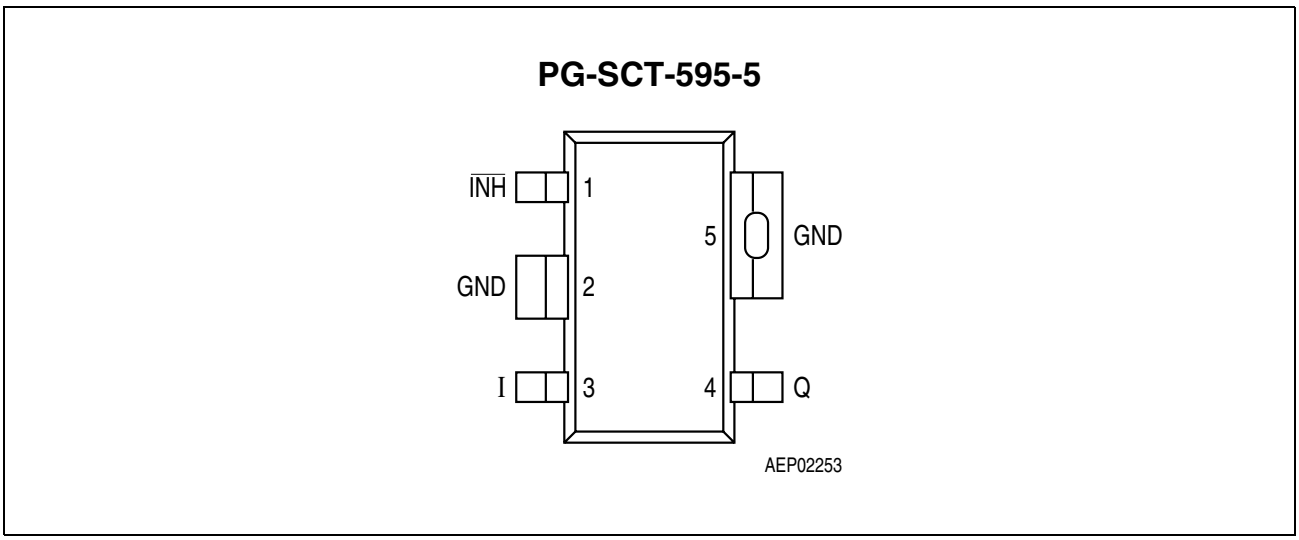


Figure 1 **Pin Configuration** (top view)

Table 1 **Pin Definitions and Functions**

Pin No.	Symbol	Function
1	INH	**Inhibit input;** H for active (V_Q = 5 V) and L for stand-by
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;** internally connected to pin 2

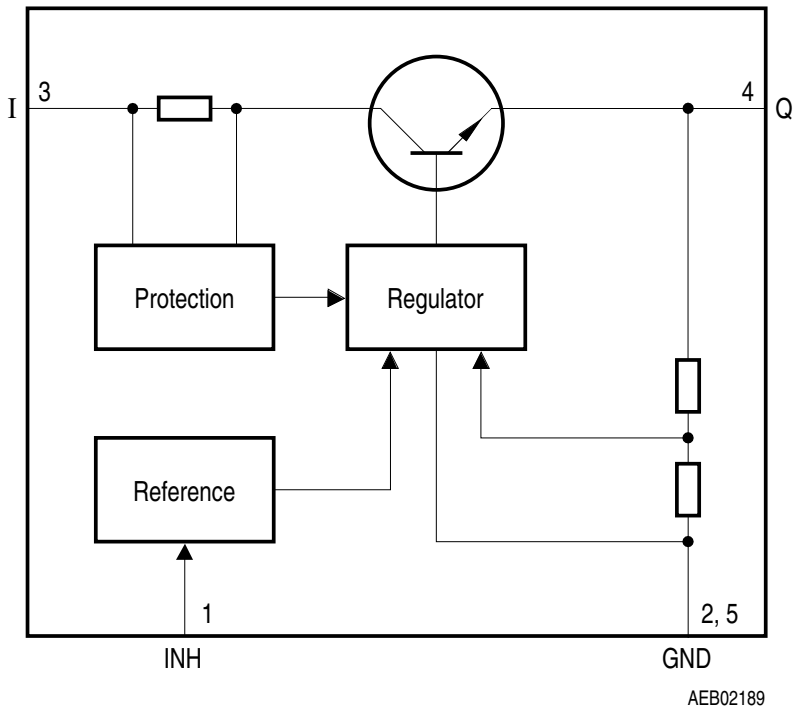


Figure 2 Block Diagram

Table 2 Absolute Maximum Ratings

-40 °C < T_j < 150 °C

Parameter	Symbol	Limit Values		Unit	Remarks
		Min.	Max.		
Input					
Voltage	V_I	-0.3	45	V	–
Current	I_I	-20	*	mA	* internally limited
Output					
Voltage	V_Q	-0.3	16	V	–
Current	I_Q	-20	*	mA	* internally limited
Inhibit					
Voltage	V_{INH}	-40	45	V	–
Current	I_{INH}	-500	*	µA	* internally limited
Current	I_{INH}	-5	5	mA	-0.3 V < V_I < 45 V; t < 1 ms
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}	–	179	K/W	zero airflow zero heat sink area

1) Worst case regarding peak temperature.

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	6.0	42	V	–
Inhibit input voltage	V_{INH}	-0.3	40	V	–
Junction temperature	T_j	-40	150	°C	–

Table 4 Electrical Characteristics

6.2 V < V_I < 36 V; V_{INH} > $V_{INH, ON}$; -40 °C < T_j < 150 °C; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Test Condition
		Min.	Typ.	Max.		
Output						
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
Output capacitor	C_Q	1	–	–	µF	ESR ≤ 10 Ω at 10 kHz
Output current	I_Q	15	–	70	mA	–
Current Consumption						
Quiescent current	I_q	–	60	100	µA	I_Q < 10 mA; V_I = 13.5 V
Quiescent current (stand-by)	I_q	–	–	1	µA	V_{INH} < $V_{INH, OFF}$; T_j < 85 °C
Quiescent current (stand-by)	I_q	–	–	5	µA	V_{INH} < $V_{INH, OFF}$
Regulator Performance						
Load regulation	ΔV_Q	–	5	10	mV	0 mA < I_Q <10 mA; V_I = 6.2 V; T_j ≤ 85 °C
Line regulation	ΔV_Q	–	5	10	mV	I_Q = 5 mA; T_j ≤ 85 °C
Power supply ripple rejection	$PSRR$	–	60	–	dB	f_r = 100 Hz; V_r = 0.5 Vpp
Logic Inhibit Input						
Inhibit ON-threshold	$V_{INH, ON}$	–	–	3.5	V	V_Q ≥ 4.8 V
Inhibit OFF-threshold	$V_{INH, OFF}$	0.3	–	–	V	V_Q ≤ 0.8 V
Inhibit input current H-state	$I_{INH, ON}$	–	10	15	µA	V_{INH} = 5 V
Inhibit input current L-state	$I_{INH, OFF}$	-2	0	2	µA	V_{INH} = 0 V

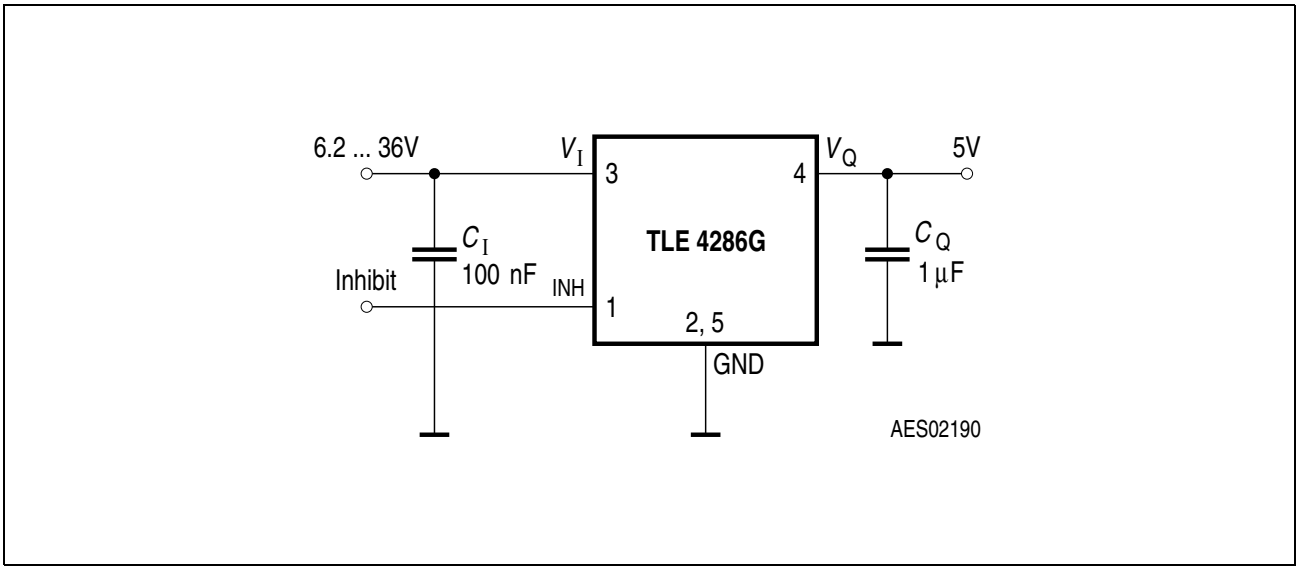
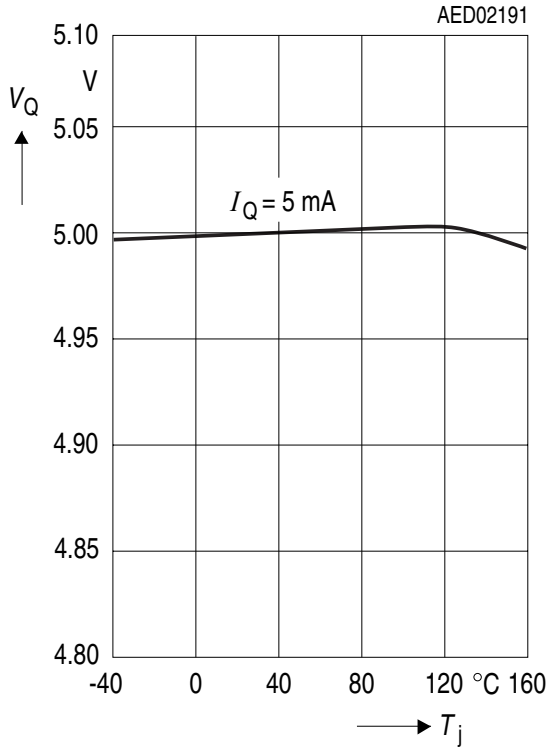


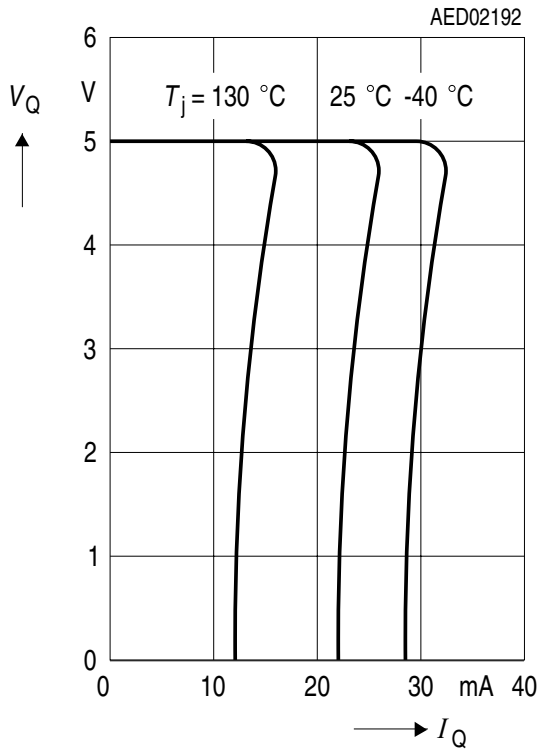
Figure 3 Application Circuit

Typical Performance Characteristics

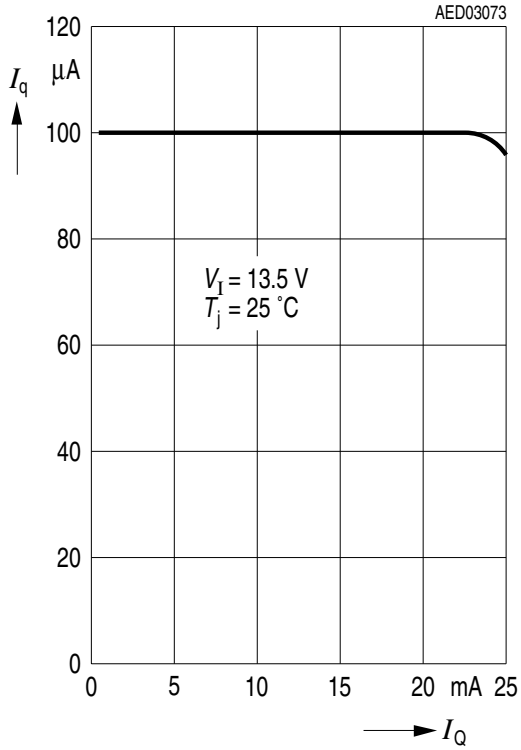
Output Voltage V_Q versus Temperature T_j



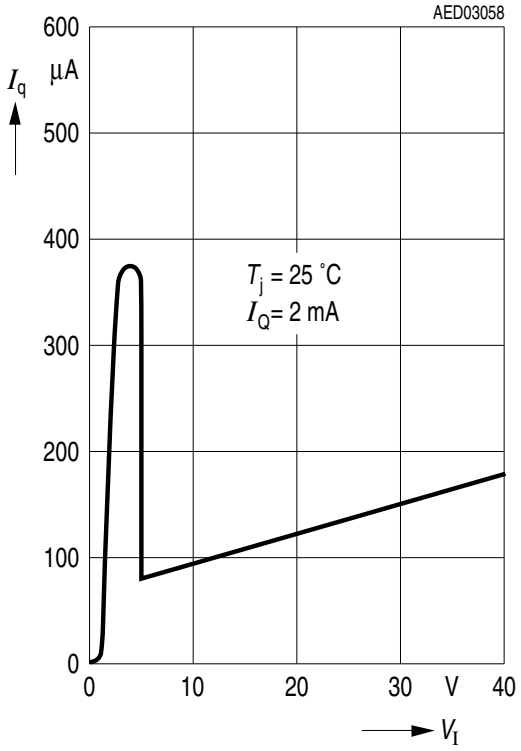
Output Voltage V_Q versus Output Current I_Q



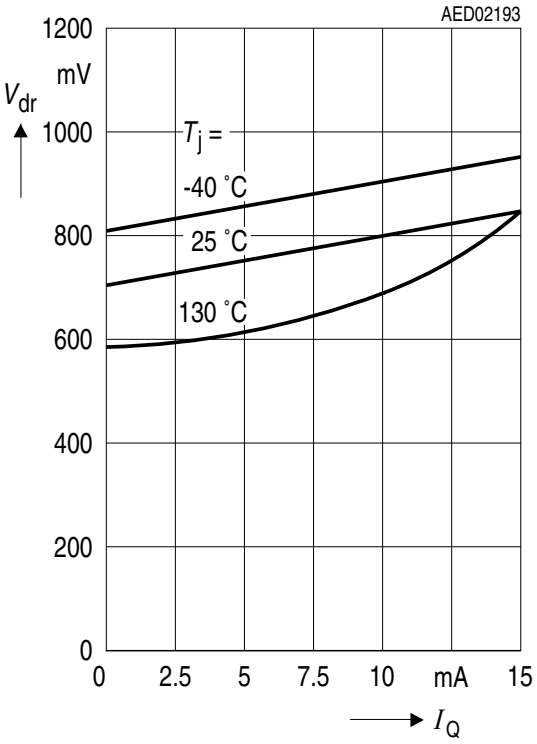
Current Consumption I_q versus Output Current I_Q



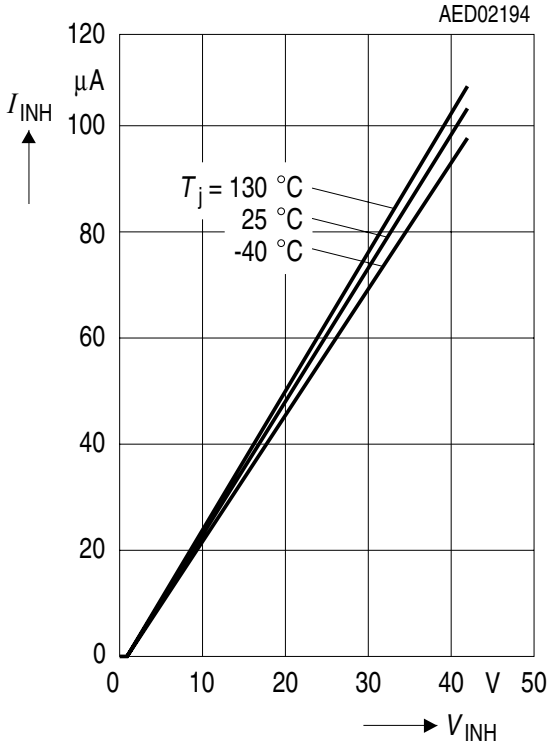
Current Consumption I_q versus Input Voltage V_I



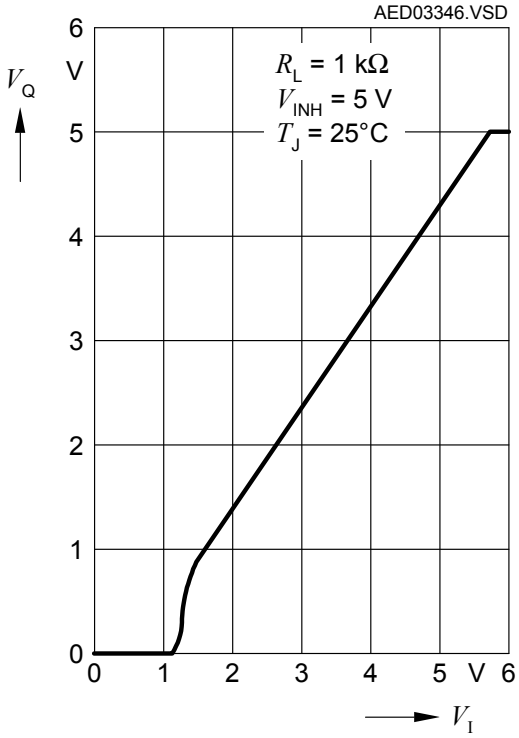
Drop Voltage V_{dr} versus Output Current I_Q



Inhibit Voltage V_{INH} versus Inhibit Current I_{INH}



Output Voltage V_Q versus Input Voltage V_I



Package Outlines

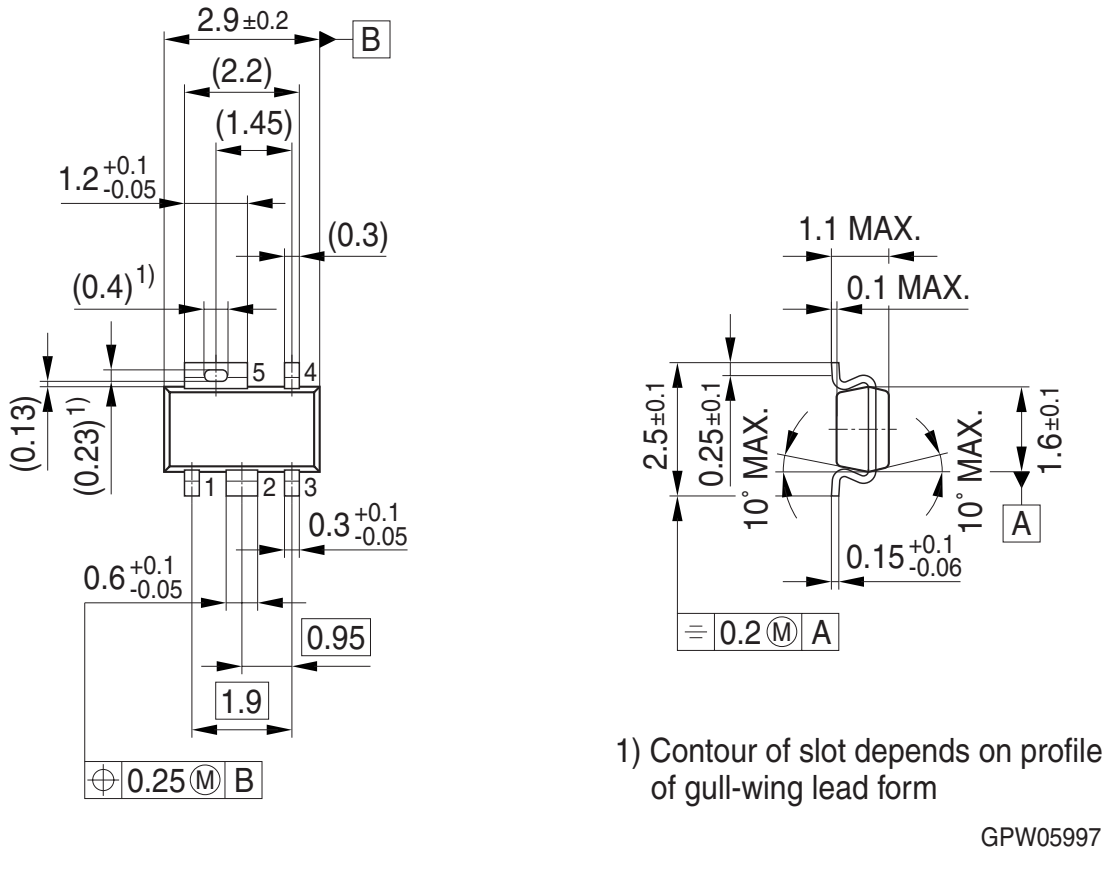


Figure 4 Outline PG-SCT-595-5

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. 2.3	2008-04-21	Initial version of RoHS-compliant derivate of TLE 4286 G. **Page 1**: AEC certified statement added. **Page 1** and **Page 9**: RoHS compliance statement and Green product feature added. **Page 1** and **Page 9**: Package changed to RoHS compliant version. **Page 1**: Marking information added. **Page 1**: Adapted description to values given on **Page 5**. Not a change of electrical characteristics. Legal Disclaimer updated
Rev. 2.2	2004-01-01	Final datasheet

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