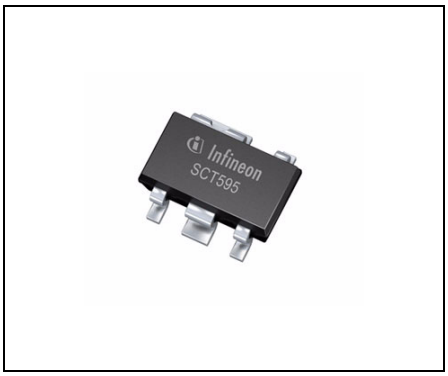
5-V Voltage Regulator

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

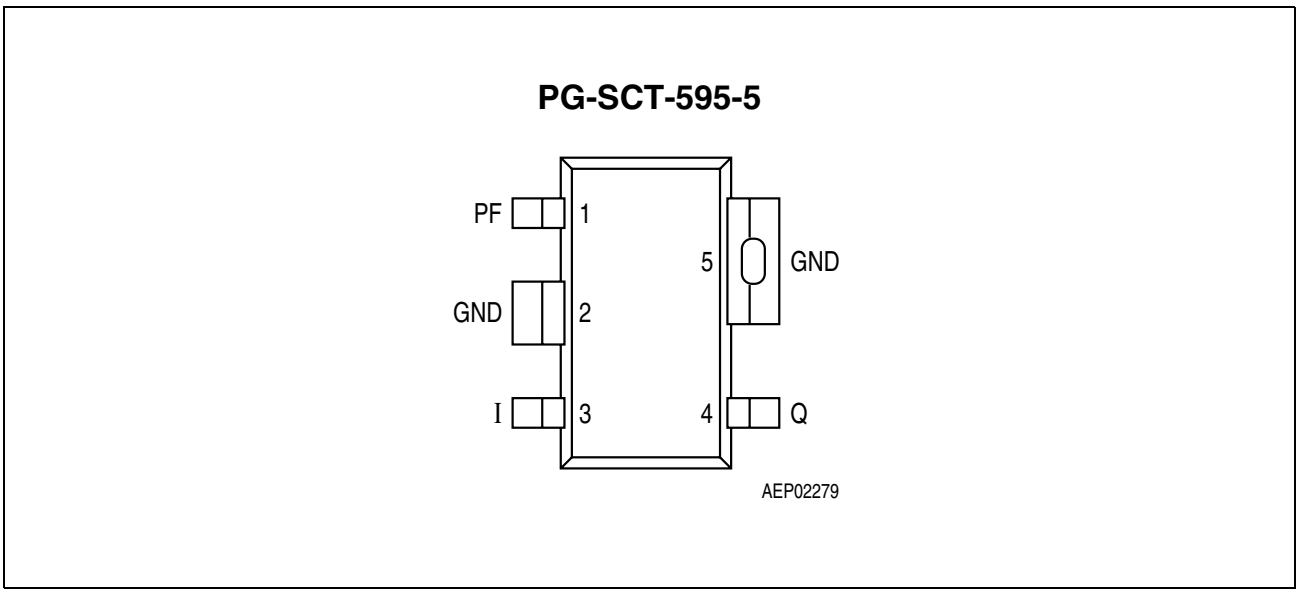


Figure 1 **Pin Configuration** (top view)

Table 1 **Pin Definitions and Functions**

Pin No.	Symbol	Function
1	PF	**Power Fail;** L for under-voltage; internally connected to Q via 50 kΩ pull-up resistor
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

Functional Block Diagram

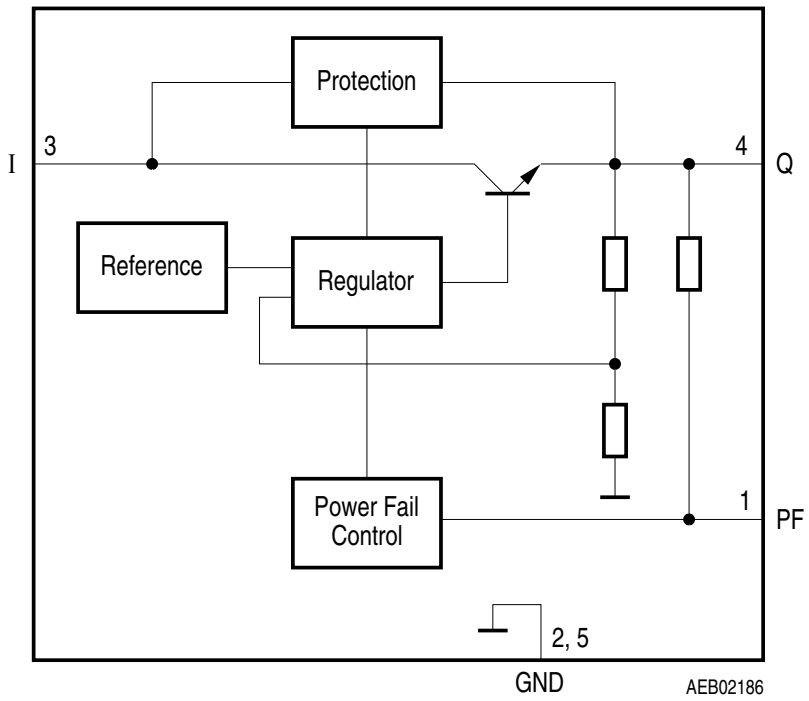


Figure 2 Block Diagram

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
Power Fail					
Voltage	V_{PF}	-0.3	45	V	–
Current	I_{PF}	-500	*	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	$R_{thj\text{-}a}$	–	55	K/W	1)

1) Package mounted on PCB 40 × 40 × 1.5 mm³/6 cm² 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.		
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[1)]
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	–	100	150	µA	I_Q < 10 mA; V_I = 13.5 V
Regulator Performance						
Load regulation	ΔV_Q	–	5	10	mV	0 mA < I_Q <10 mA; V_I = 6 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
Power Fail Output						
Power fail switching threshold	ΔV_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.

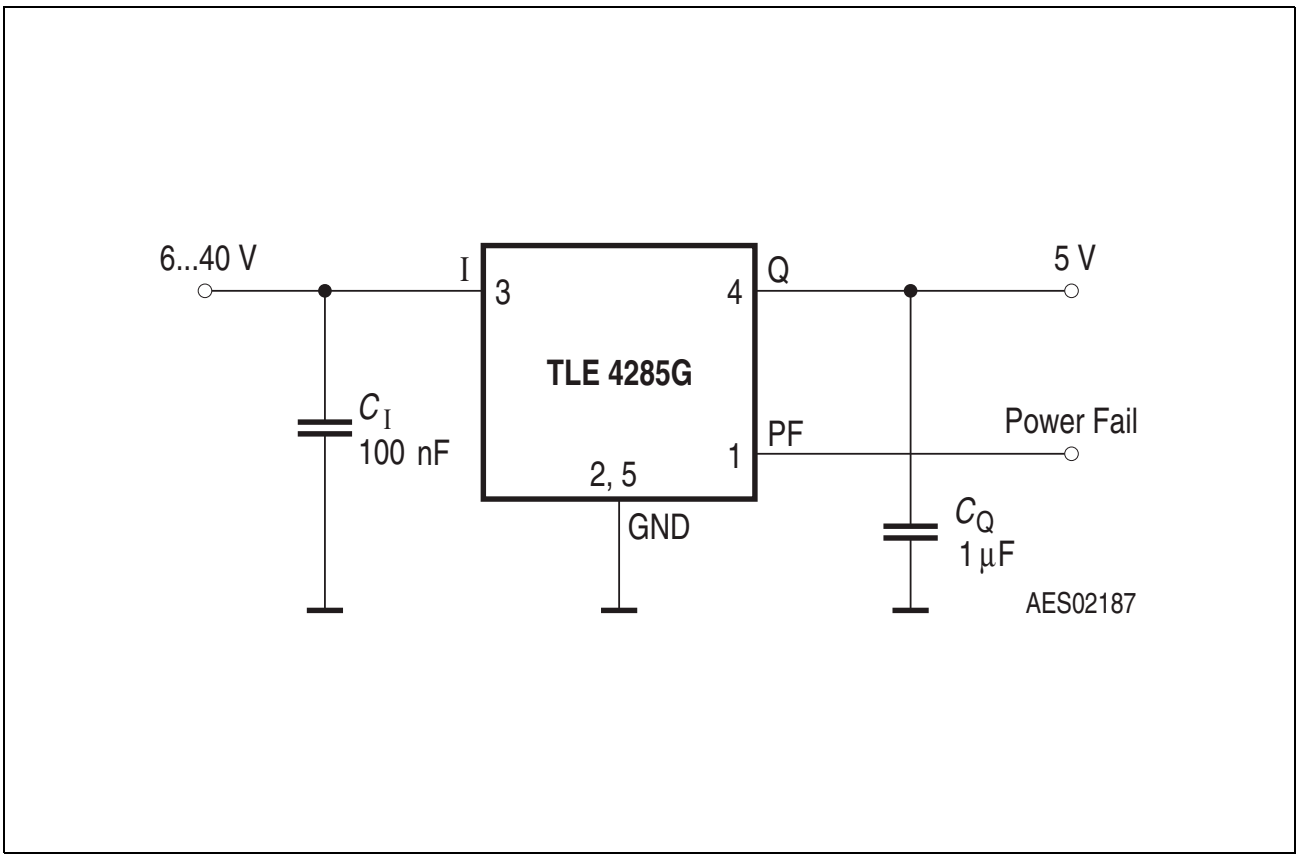
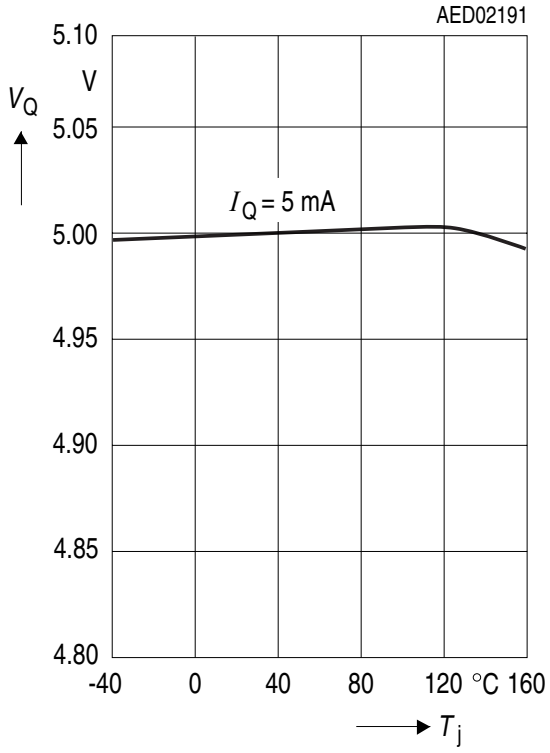


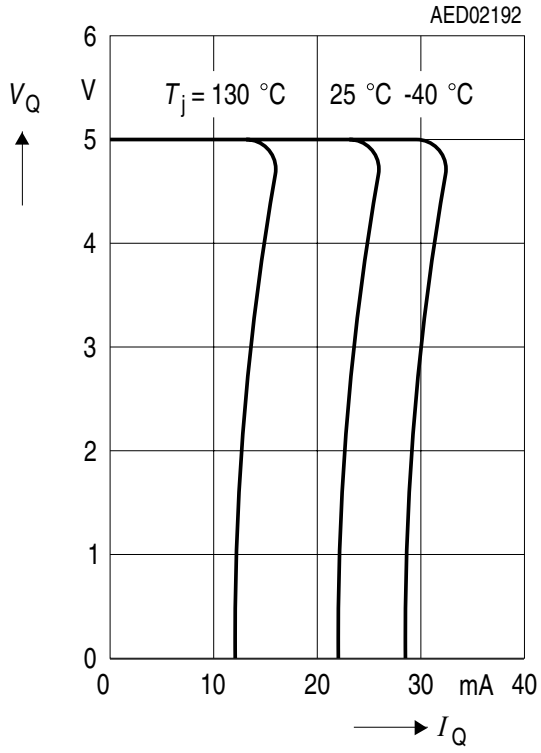
Figure 3 Application Circuit

Typical Performance Characteristics

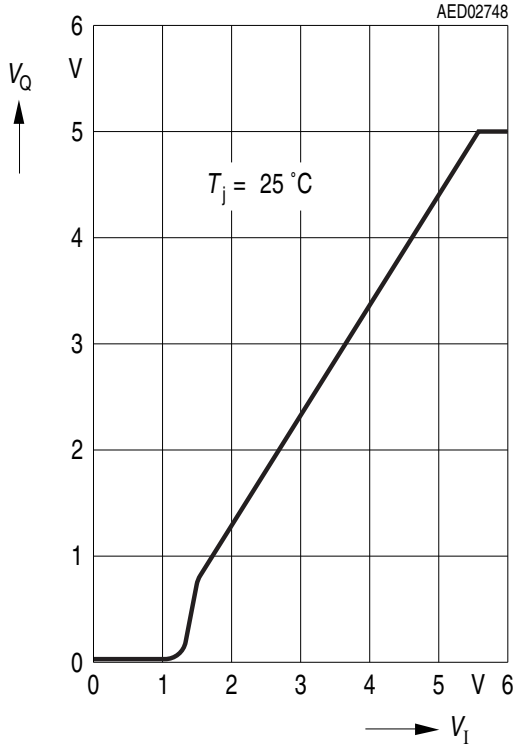
Output Voltage V_Q versus Temperature T_j



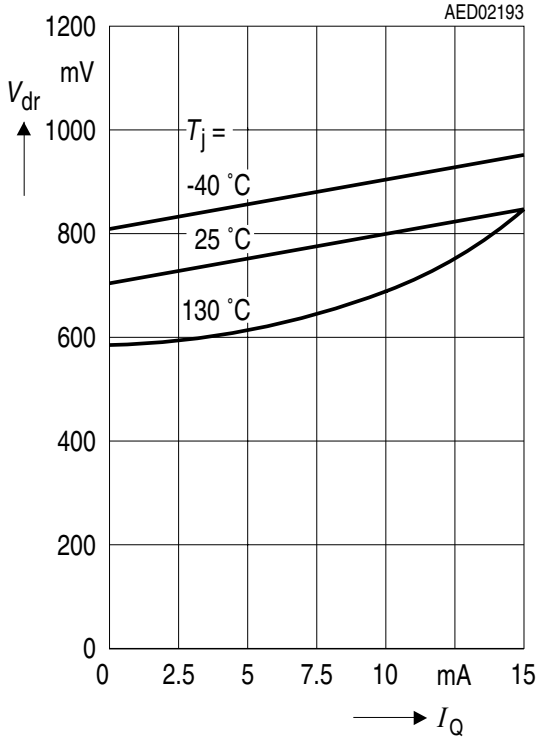
Output Voltage V_Q versus Output Current I_Q



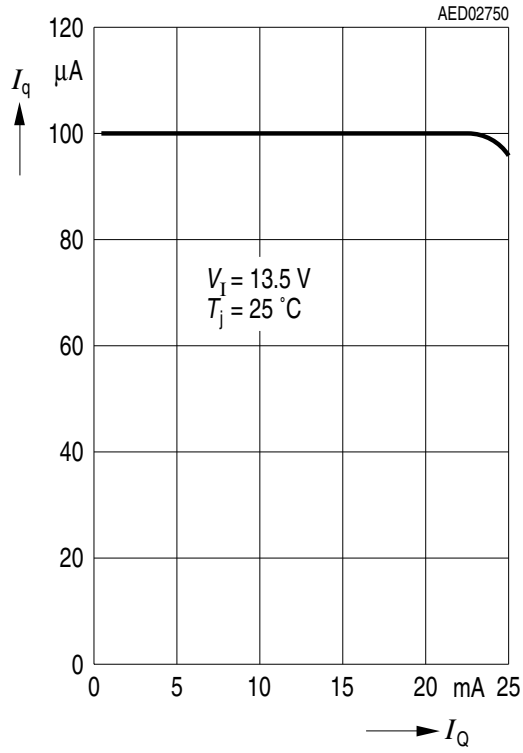
Output Voltage V_Q versus Input Voltage V_I



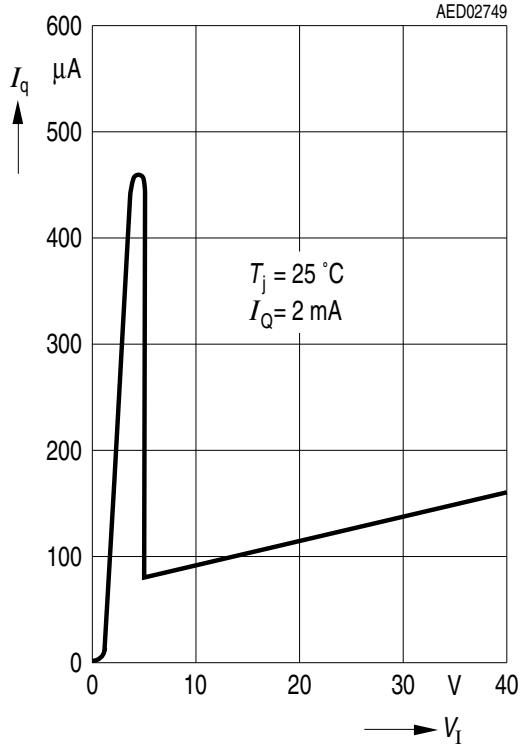
Drop Voltage V_{dr} versus Output Current I_Q



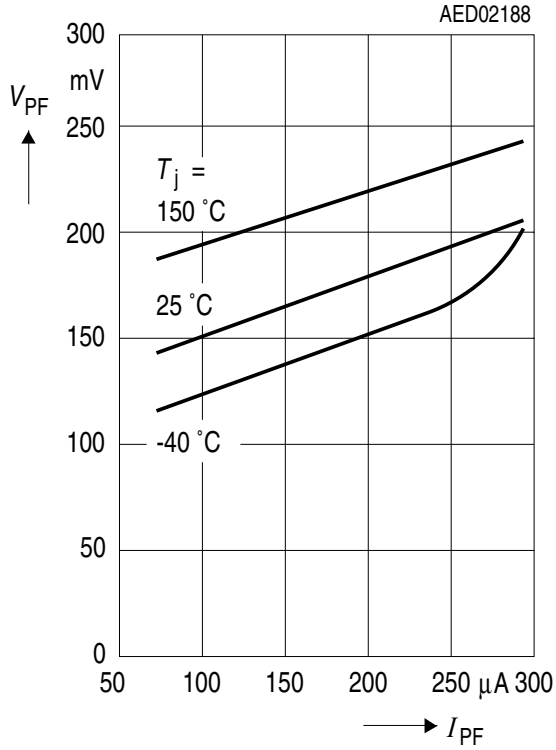
Current Consumption I_q versus Output Current I_Q



Current Consumption I_q versus Input Voltage V_I



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



Package Outlines

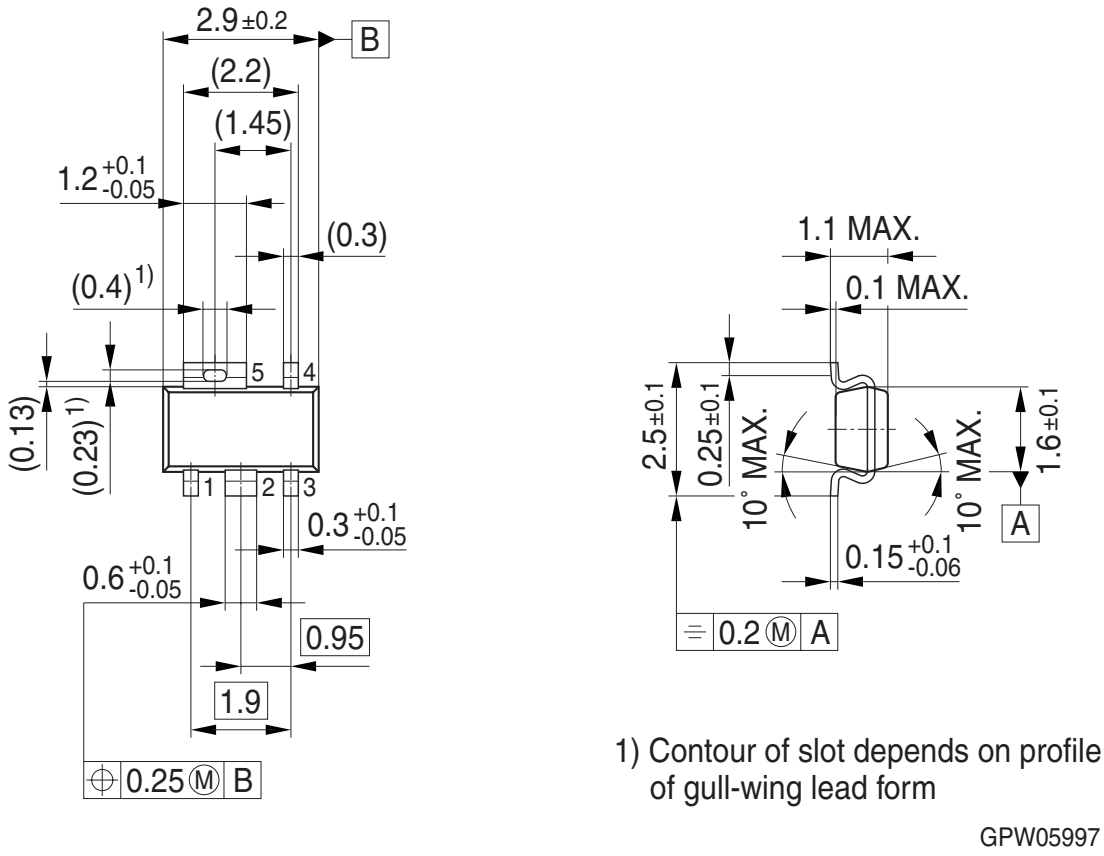


Figure 4 Outline PG-SCT-595-5

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	Initial version of RoHS-compliant derivate of TLE 4285 G **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. **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. 2.1	2004-01-01	Final datasheet

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