

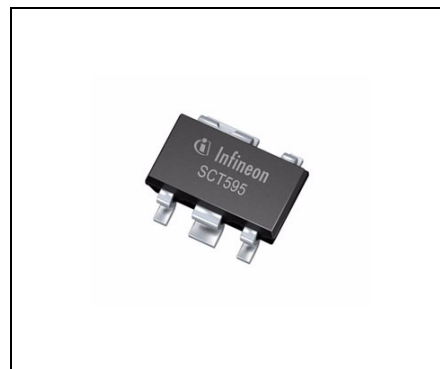
5-V Voltage Regulator

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

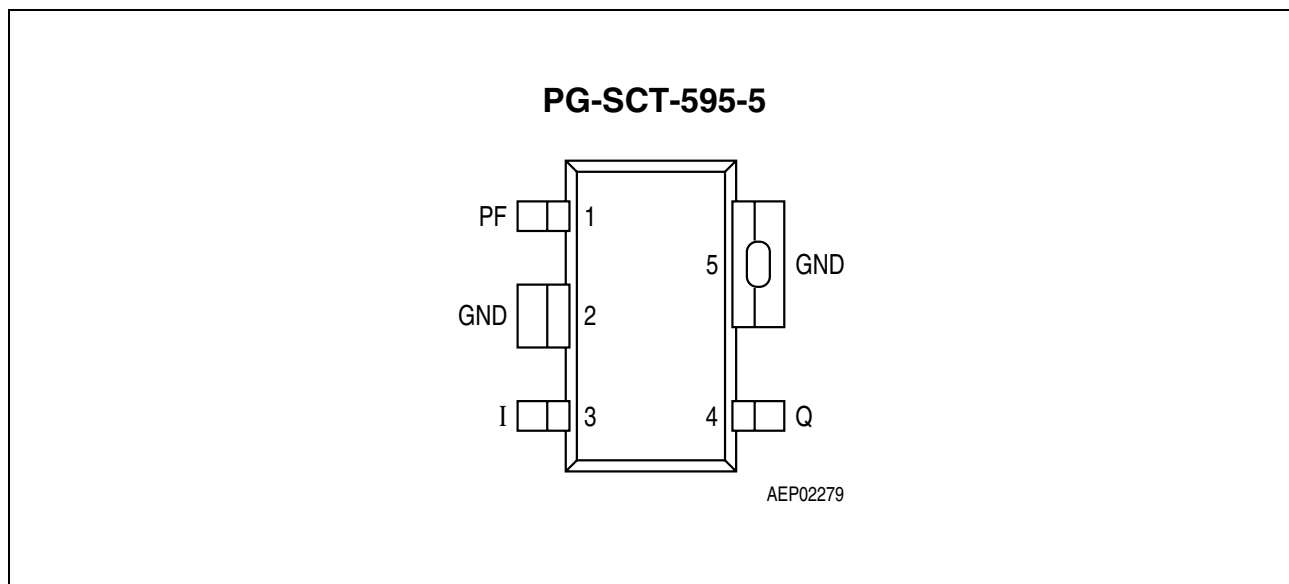


Figure 1 Pin Configuration (top view)

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 $C_Q \geq 1 \mu\text{F}$, $\text{ESR} \leq 10 \Omega$ to GND
5	GND	Ground ; internally connected to pin 2

Functional Block Diagram

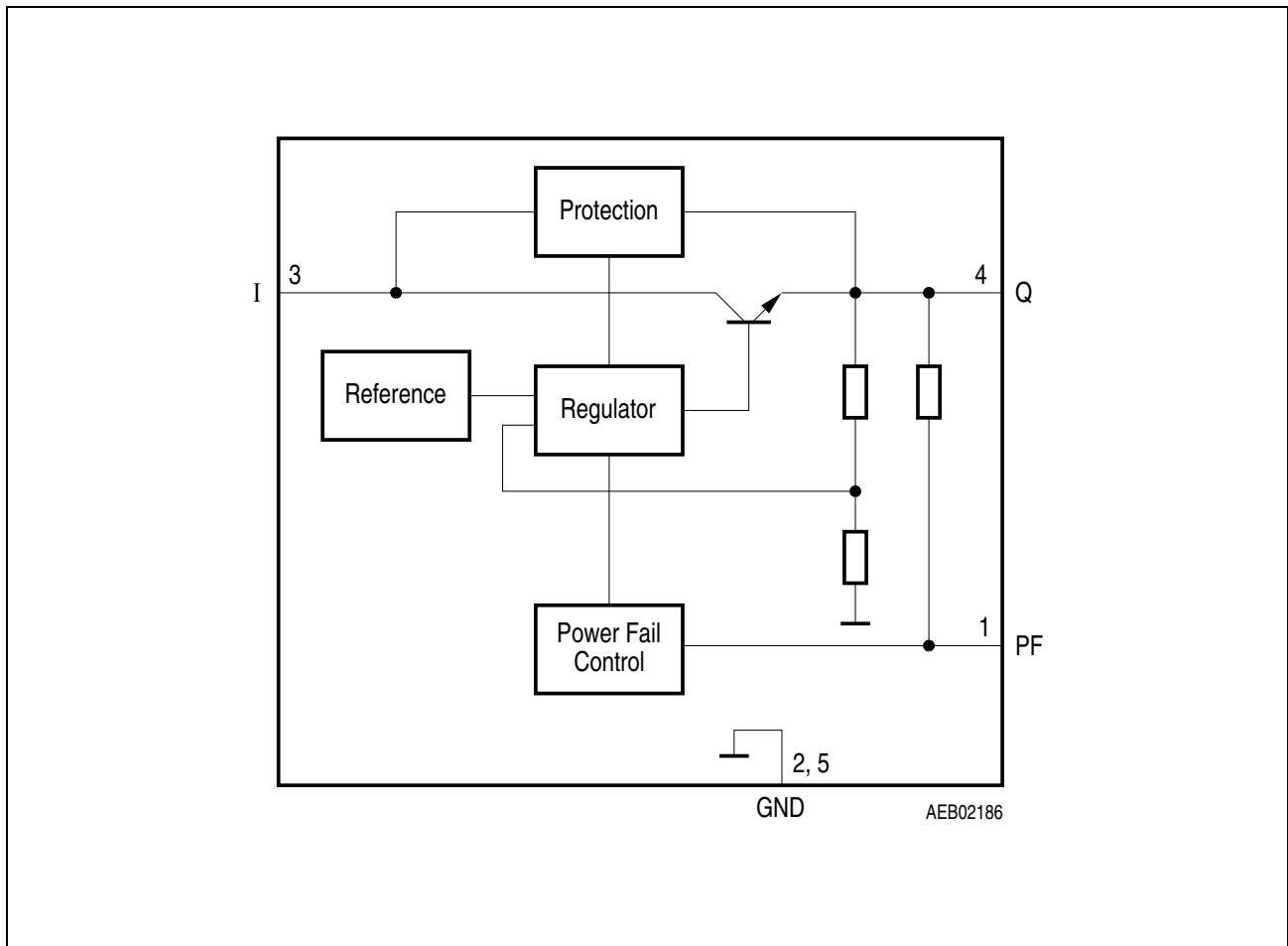


Figure 2 **Block Diagram**

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

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	$R_{thj-pin}$	—	30	K/W	measured to pin 5
Junction ambient	R_{thj-a}	—	55	K/W	1)

¹⁾ Package mounted on PCB $40 \times 40 \times 1.5\text{ mm}^3/6\text{ cm}^2\text{ Cu}$.

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	$^{\circ}\text{C}$	–

Table 4 Electrical Characteristics
 $6.2\text{ V} < V_I < 36\text{ V}$; $-40\text{ °C} < T_j < 150\text{ °C}$; 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	$T_j = 25\text{ }^{\circ}\text{C}$; $1\text{ mA} < I_Q < 10\text{ mA}$
Output voltage	V_Q	4.8	5.0	5.20	V	$1\text{ mA} < I_Q < 10\text{ mA}$
Drop voltage	V_{dr}	0.6	0.8	1.1	V	$I_Q = 10\text{ mA}^{1)}$
Output capacitor	C_Q	1	–	–	μF	$\text{ESR} \leq 10\text{ }\Omega$ at 10 kHz
Output current	I_Q	15	–	70	mA	–
Current Consumption						
Quiescent current	I_q	–	100	150	μA	$I_Q < 10\text{ mA}$; $V_I = 13.5\text{ V}$
Regulator Performance						
Load regulation	ΔV_Q	–	5	10	mV	$0\text{ mA} < I_Q < 10\text{ mA}$; $V_I = 6\text{ V}$; $T_j \leq 85\text{ }^{\circ}\text{C}$
Line regulation	ΔV_Q	–	5	10	mV	$I_Q = 5\text{ mA}$; $T_j \leq 85\text{ }^{\circ}\text{C}$
Power supply ripple rejection	$PSRR$	–	60	–	dB	$f_r = 100\text{ Hz}$; $V_r = 0.5\text{ V}_{\text{pp}}$
Power Fail Output						
Power fail switching threshold	ΔV_Q	–	$V_{Q,\text{nom}}$ - 50	–	mV	$V_{\text{PF}} < 1\text{ V}$
Power fail low voltage	$V_{\text{PF},\text{ low}}$	–	0.15	0.3	V	$I_{\text{PF}} = 0.1\text{ mA}$; $V_Q = 4.5\text{ V}$
Power fail leakage current	I_{PFLK}	–	–	10	μA	$R_{\text{ext}} = 47\text{ k}\Omega$
Power fail pull-up	R_{PF}	30	50	70	$\text{k}\Omega$	internally connected to V_Q

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

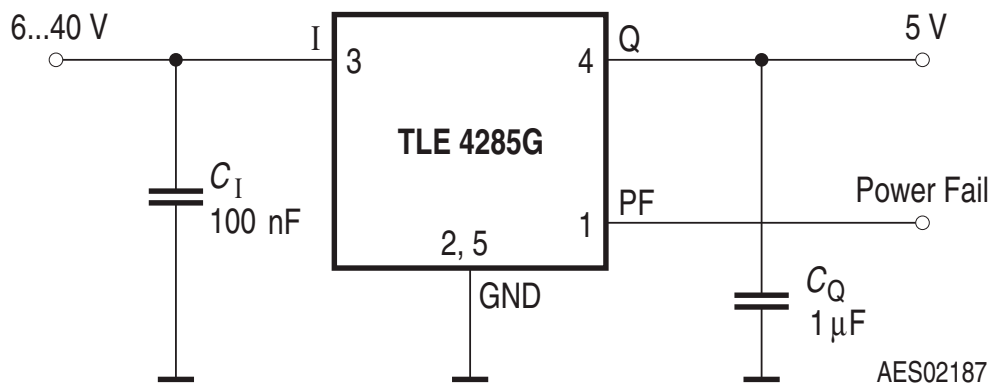
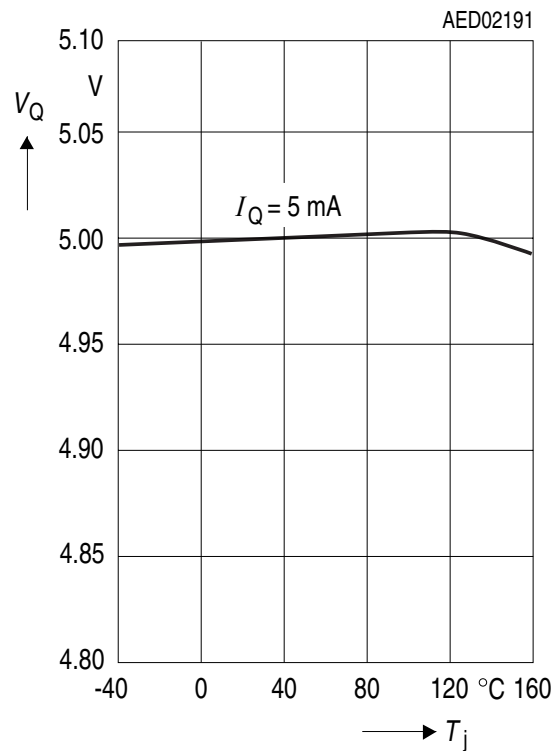


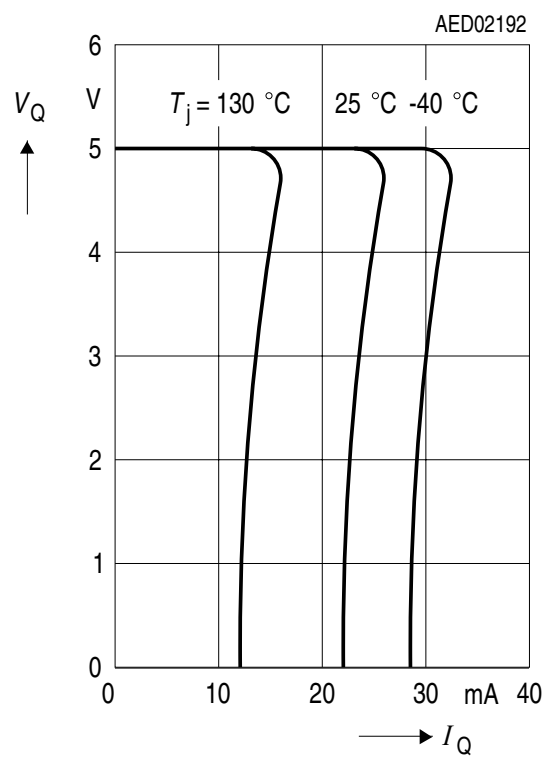
Figure 3 Application Circuit

Typical Performance Characteristics

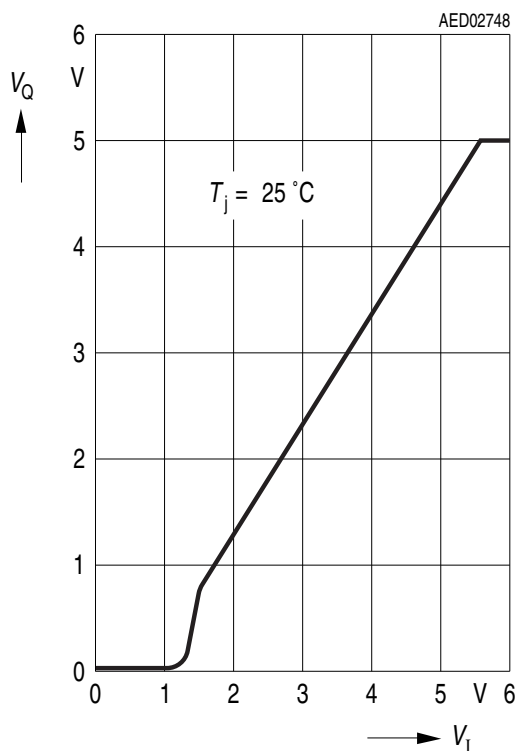
Output Voltage V_Q versus Temperature T_j



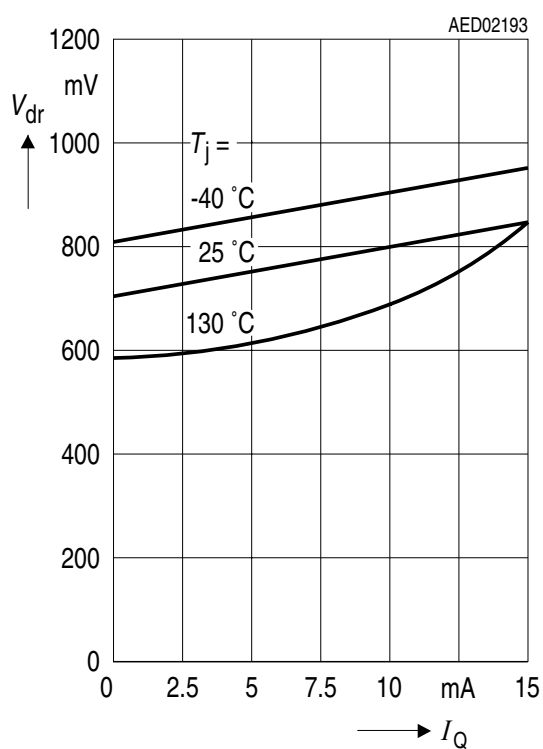
Output Voltage V_Q versus Output Current I_Q



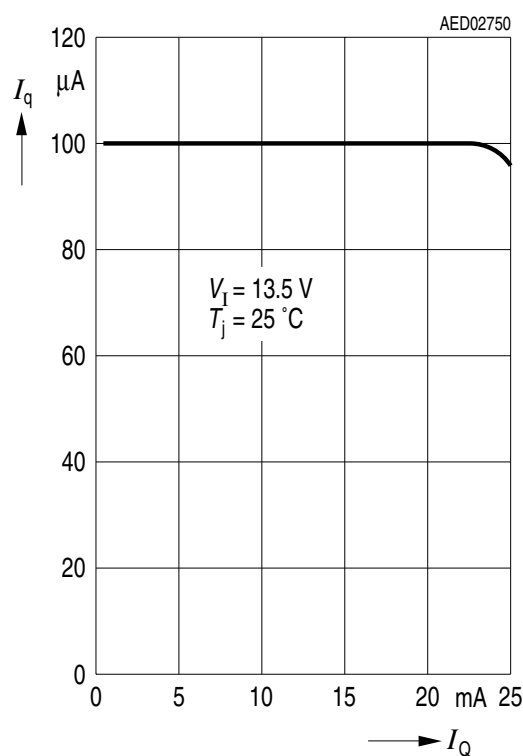
Output Voltage V_Q versus Input Voltage V_I



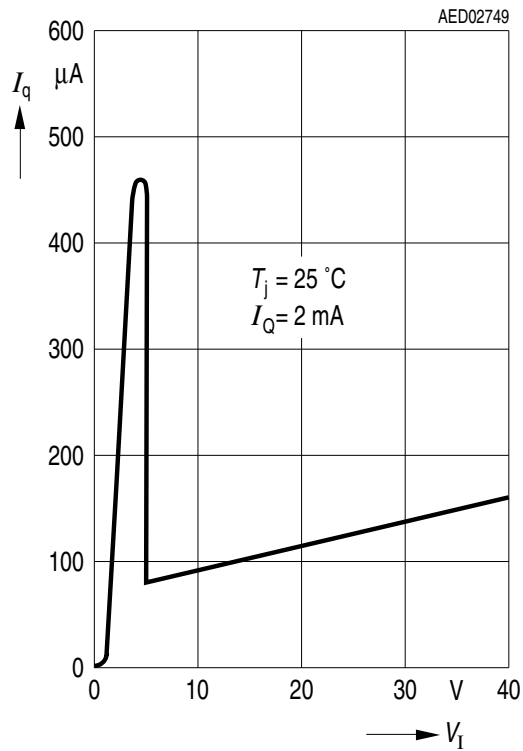
Drop Voltage V_{dr} versus Output Current I_Q



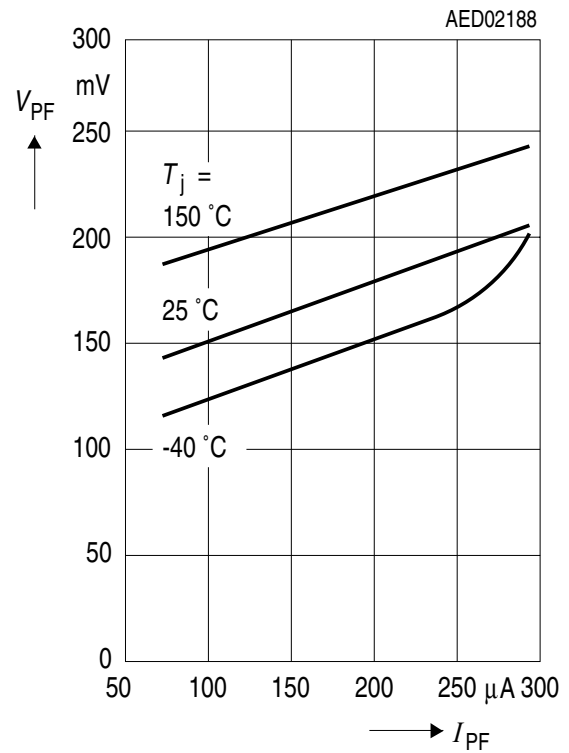
Current Consumption I_q versus Output Current I_Q



Current Consumption I_q versus Input Voltage V_I



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



Package Outlines

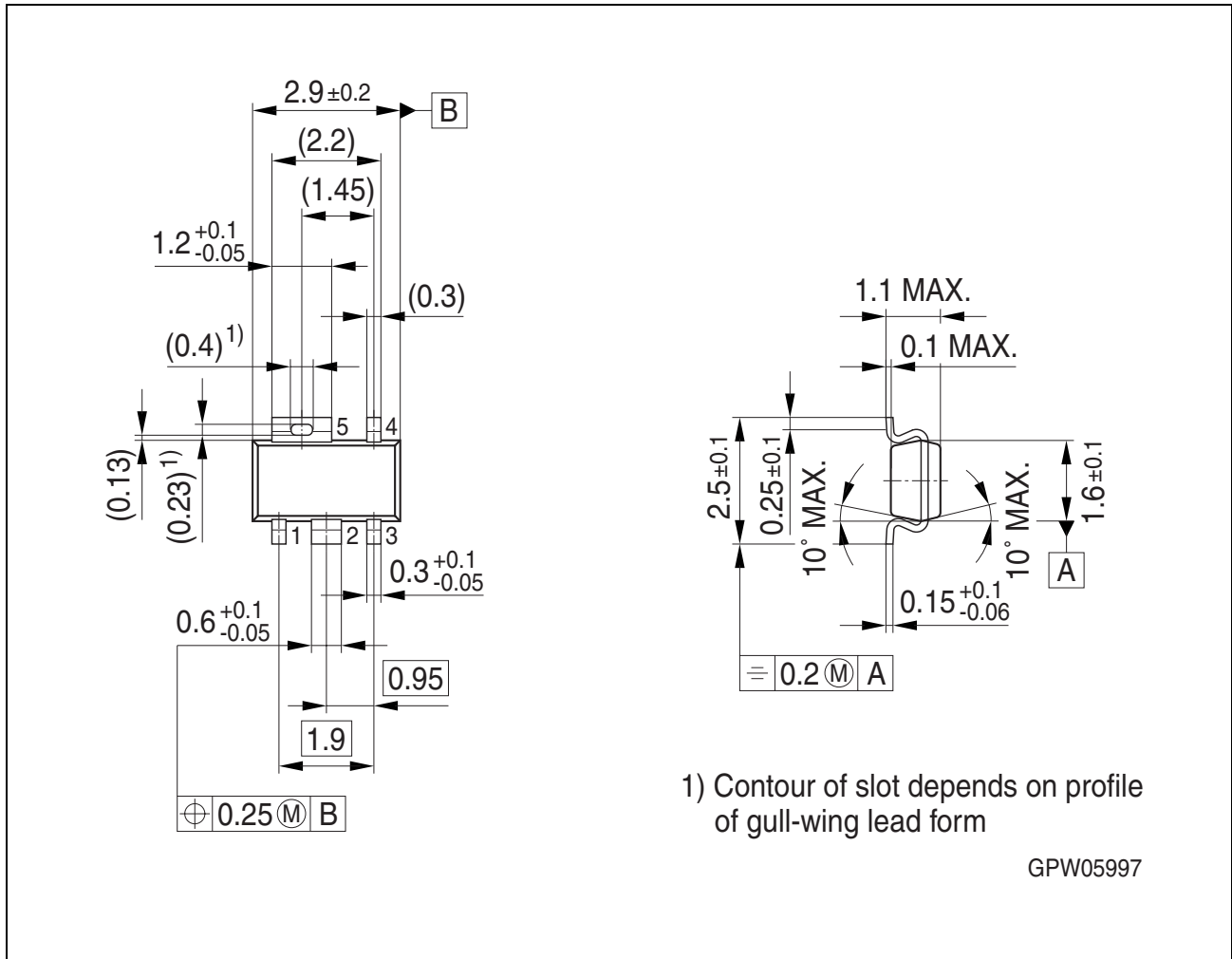


Figure 4 Outline PG-SCT-595-5

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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