

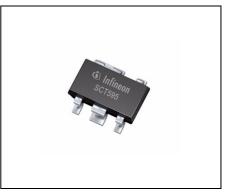
## 5-V Voltage Regulator

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 k $\Omega$  which is connected to the output Q.

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

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



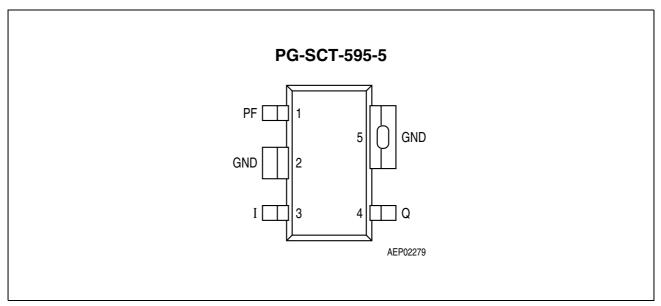


Figure 1 Pin Configuration (top view)

Table I Pill Deminitions 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	Ground; internally connected to pin 5				
3	1	Input voltage				
4	Q	<b>Output voltage;</b> must be blocked by a capacitor $C_Q \ge 1 \ \mu\text{F}$ , ESR $\le 10 \ \Omega$ to GND				
5	GND	Ground; internally connected to pin 2				

#### Table 1 Pin Definitions and Functions



## **Functional Block Diagram**

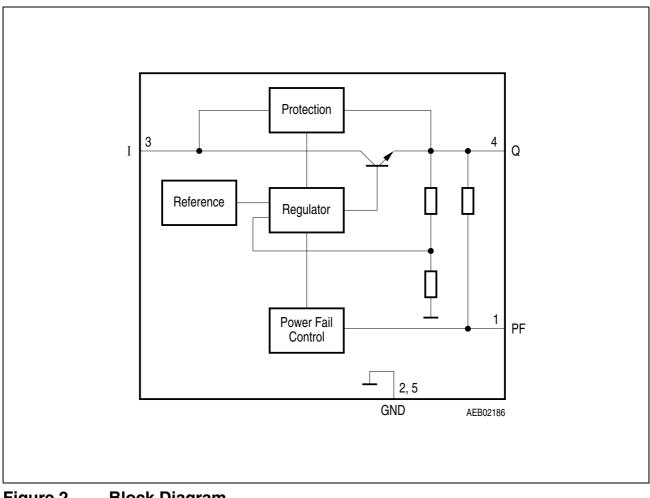


Figure 2 **Block Diagram** 



#### Table 2Absolute Maximum Ratings

-40 °C < *T*<sub>j</sub> < 150 °C

Parameter	Symbol	Limit Values		Unit	Remarks	
		Min.	Max.	-		
Input			-			
Voltage	$V_{\rm I}$	-0.3	45	V	-	
Current	I	-20	*	mA	* internally limited	
Output	·				•	
Voltage	V <sub>Q</sub>	-0.3	16	V	-	
Current	IQ	-20	*	mA	* internally limited	
Power Fail	·				•	
Voltage	$V_{PF}$	-0.3	45	V	-	
Current	I <sub>PF</sub>	-500	*	μA	* internally limited	
Temperatures	·					
Junction temperature	Tj	-40	150	°C	-	
Storage temperature	T <sub>stg</sub>	-50	150	°C	-	
Thermal Resistances						
Junction pin	$R_{ m thj-pin}$	-	30	K/W	measured to pin 5	
Junction ambient	R <sub>thj-a</sub>	-	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 3Operating Range

Parameter	Symbol	Limit Values		Unit	Remarks	
		Min.	Max.			
Input voltage	$V_{\rm I}$	6	42	V	-	
Output current	IQ	15	-	mA	-	
Junction temperature	T <sub>j</sub>	-40	150	°C	-	



#### Table 4 Electrical Characteristics

6.2 V <  $V_{\rm I}$  < 36 V; -40 °C <  $T_{\rm j}$  < 150 °C; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Test Condition
		Min.	Тур.	Max.		
Output		•				
Output voltage	V <sub>Q</sub>	4.85	5.0	5.15	V	$T_{\rm j}$ = 25 °C; 1 mA < $I_{\rm Q}$ < 10 mA
Output voltage	V <sub>Q</sub>	4.8	5.0	5.20	V	1 mA < I <sub>Q</sub> < 10 mA
Drop voltage	$V_{dr}$	0.6	0.8	1.1	V	$I_{\rm Q} = 10 \ {\rm mA}^{1)}$
Output capacitor	C <sub>Q</sub>	1	-	-	μF	ESR ≤ 10 Ω at 10 kHz
Output current	IQ	15	-	70	mA	-
<b>Current Consumption</b>	I		·			
Quiescent current	I <sub>q</sub>	-	100	150	μA	$I_{\rm Q}$ < 10 mA; $V_{\rm I}$ = 13.5 V
Regulator Performance	ce	·				
Load regulation	$\Delta V_{Q}$	-	5	10	mV	0 mA < $I_Q$ <10 mA; $V_I$ = 6 V; $T_i \le 85 \text{ °C}$
Line regulation	$\Delta V_{Q}$	-	5	10	mV	$I_{\rm Q} = 5 \text{ mA};$ $T_{\rm j} \le 85 \text{ °C}$
Power supply ripple rejection	PSRR	-	60	-	dB	$f_{\rm r} = 100 \; {\rm Hz};$ $V_{\rm r} = 0.5 \; {\rm Vpp}$
Power Fail Output	·		·			
Power fail switching threshold	$\Delta V_{Q}$	-	V <sub>Q,nom</sub> - 50	-	mV	V <sub>PF</sub> < 1 V
Power fail low voltage	$V_{\rm PF,\ low}$	-	0.15	0.3	V	$I_{\rm PF}$ = 0.1 mA; $V_{\rm Q}$ = 4.5 V
Power fail leakage current	I <sub>PFLK</sub>	-	-	10	μA	$R_{\rm ext} = 47 \ {\rm k}\Omega$
Power fail pull-up	R <sub>PF</sub>	30	50	70	kΩ	internally connected to $V_{\rm Q}$

1) Measured when the output voltage  $V_{\rm Q}$  has dropped 100 mV from the nominal value.



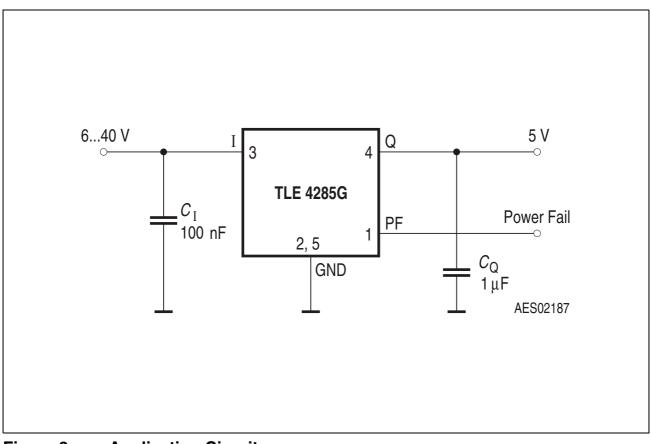
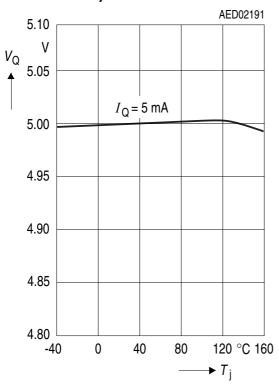


Figure 3 Application Circuit

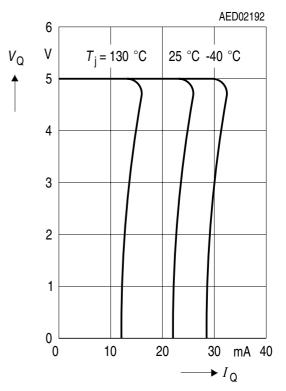


## **Typical Performance Characteristics**

### Output Voltage $V_{Q}$ versus Temperature $T_{i}$

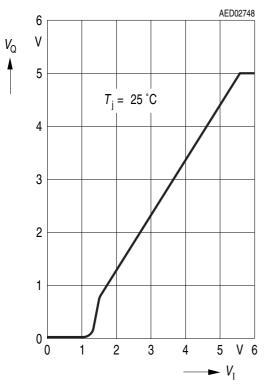


Output Voltage  $V_{Q}$  versus Output Current  $I_{Q}$ 

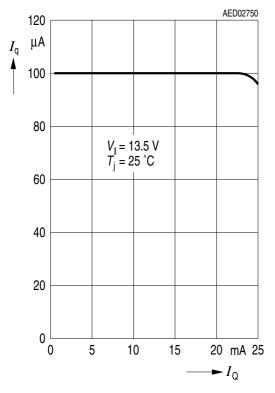




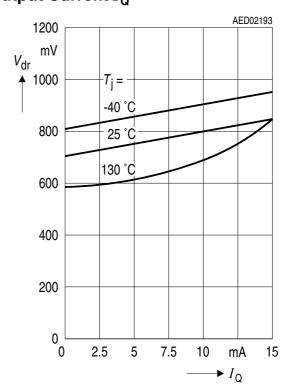
Output Voltage  $V_{\rm Q}$  versus Input Voltage  $V_{\rm I}$ 



Current Consumption  $I_q$  versus Output Current  $I_Q$ 

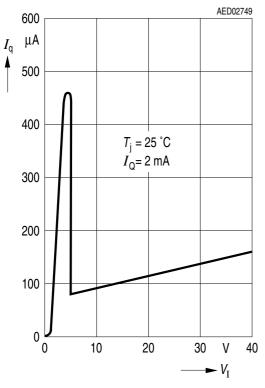


Drop Voltage  $V_{\rm dr}$  versus Output Current  $I_{\rm O}$ 

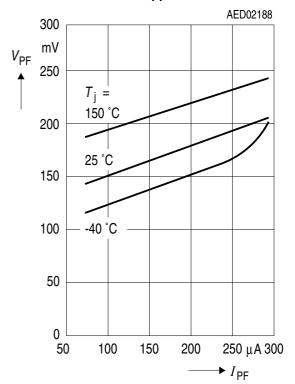




# Current Consumption $I_q$ versus Input Voltage $V_l$



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





#### **Package Outlines**

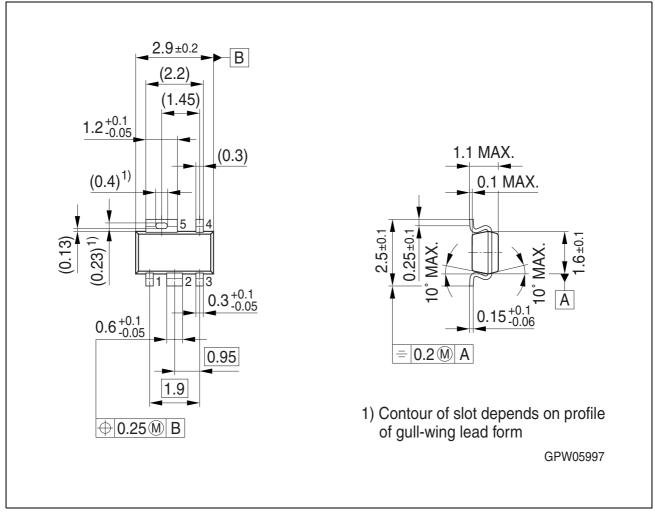


Figure 4 Outline PG-SCT-595-5

#### 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

Edition 2008-04-21 Published by Infineon Technologies AG 81726 Munich, Germany © 2008 Infineon Technologies AG All Rights Reserved.

#### Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

#### Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (www.infineon.com).

#### Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.