5-V Voltage Regulator

TLE 4285 G

Features

- 15 mA current capability
- Low quiescent current consumption: 100 µA
- Power fail output
- Very small SMD-Package SCT-595
- Wide operation range: up to 45 V
- Wide temperature range: – 40 °C to 150 °C
- Output protected against short circuit
- Over-temperature protection

SCT 595

Type	Ordering Code	Package
TLE 4285 G	Q67006-A9328	SCT-595

Functional Description

The **TLE 4285 G** is a 5-V low-drop fixed voltage regulator in a very small SMD package SCT-595. The maximum input voltage is 45 V. The output is able to drive a load of more than 15 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 is internally pulled-up to the output Q by a 50 kΩ resistor.

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

Pin Configuration

(top view)

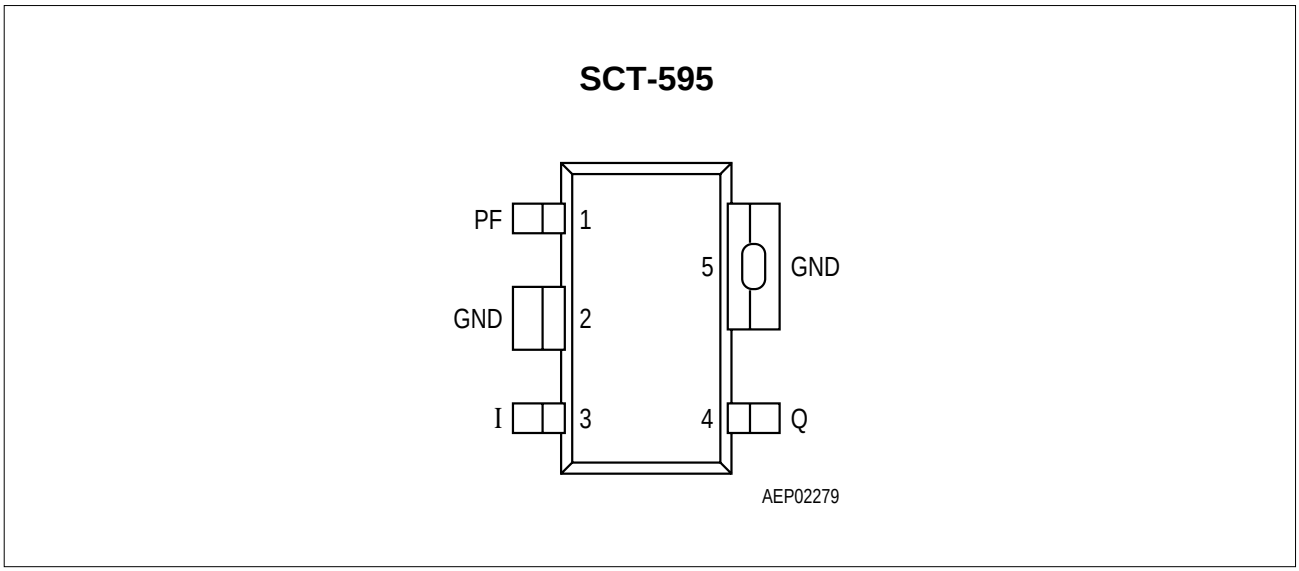


Figure 1

Pin Definitions and Functions

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

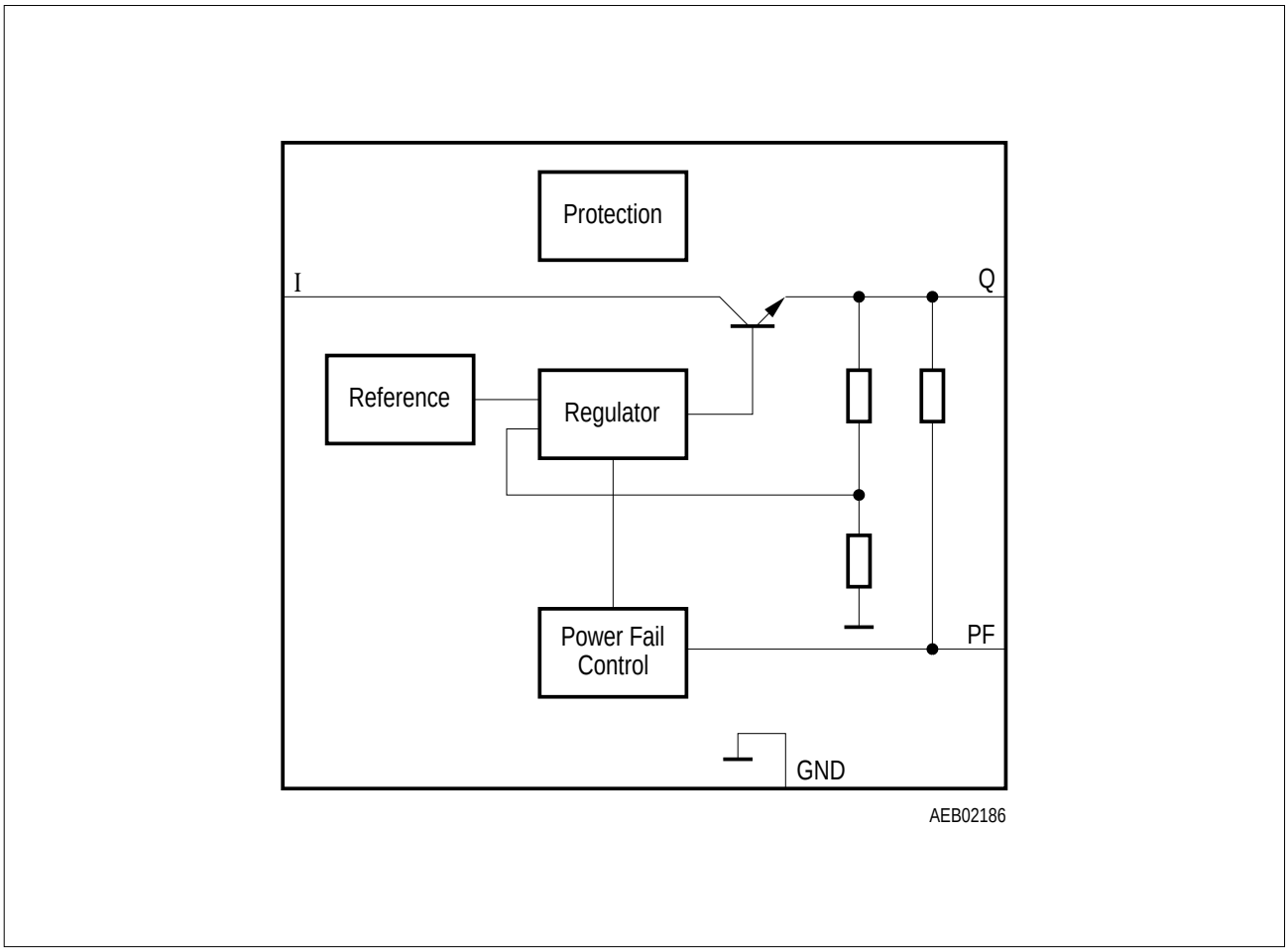


Figure 2
Block Diagram

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_{thja}	–	50	K/W	1)

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

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	–

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	$V_{Q,nom}$	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	–	100	145	µA	I_Q < 10 mA; I_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 V_{SS}

Electrical Characteristics (cont'd)

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.		
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
Power fail leakage current	I_{PFLK}	–	–	10	µA	–
Power fail pull up	R_{PF}	30	50	70	kΩ	internal connected to V_Q

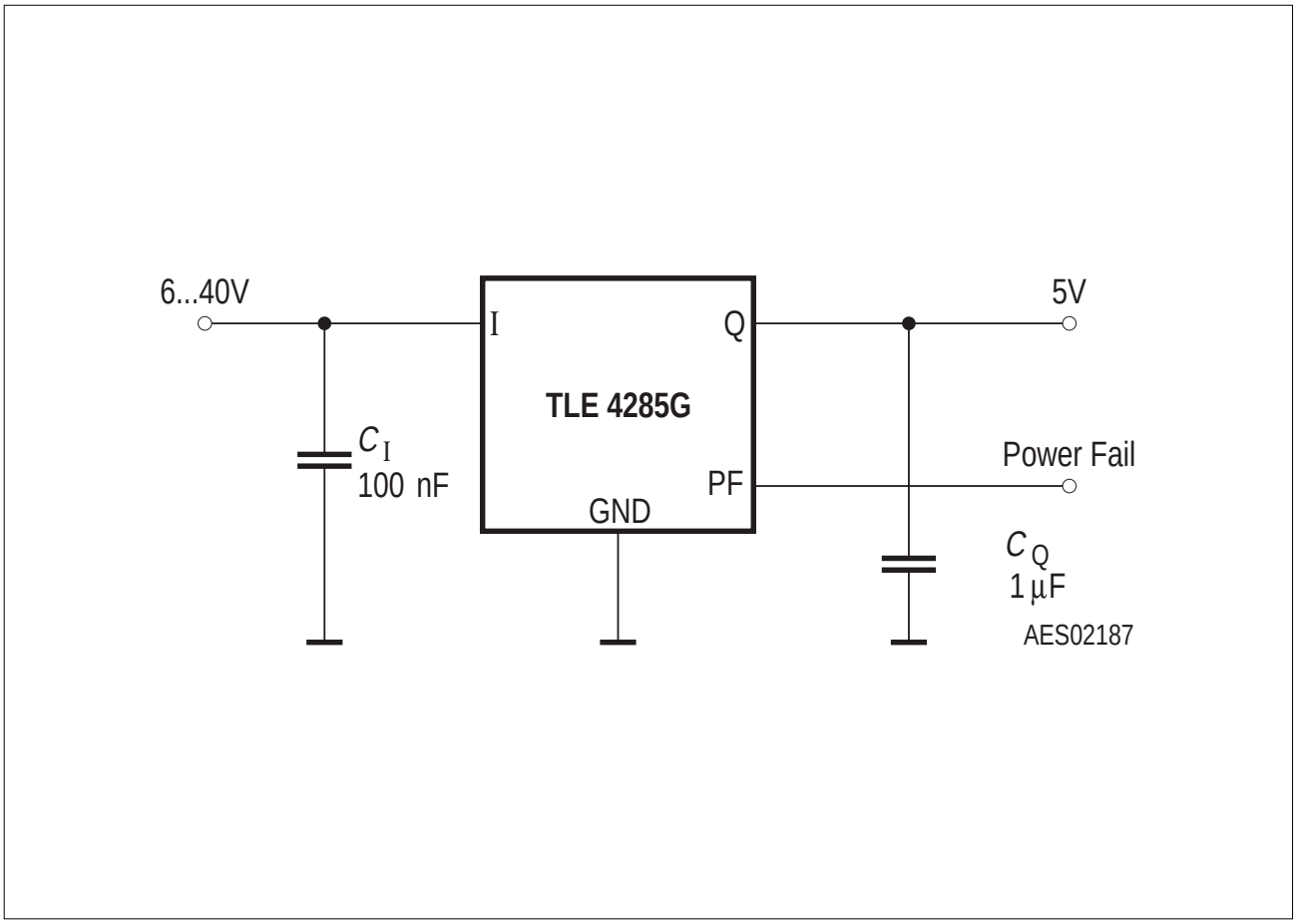
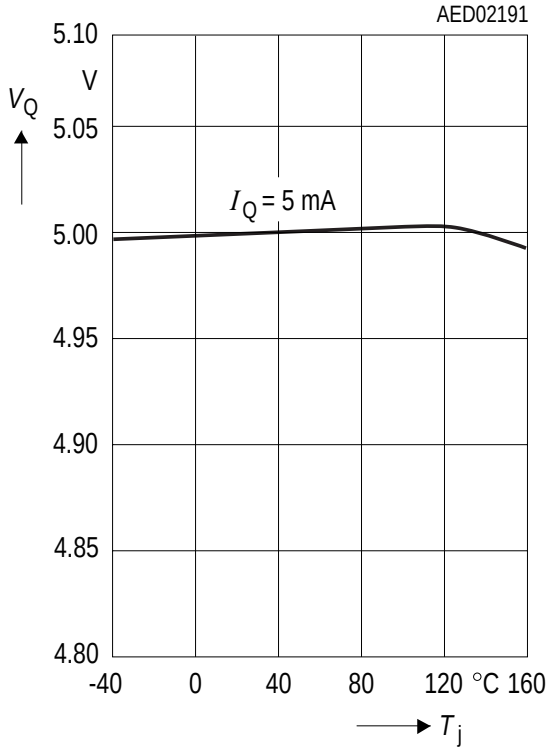


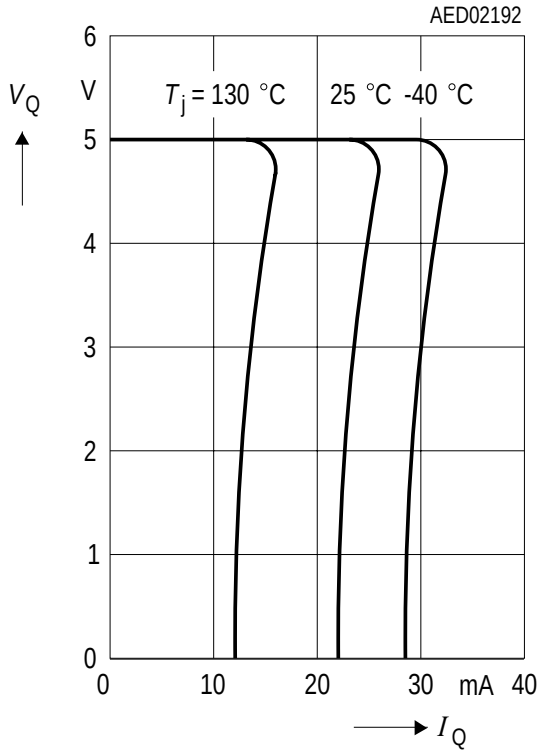
Figure 3
Application Circuit

Typical Performance Characteristics

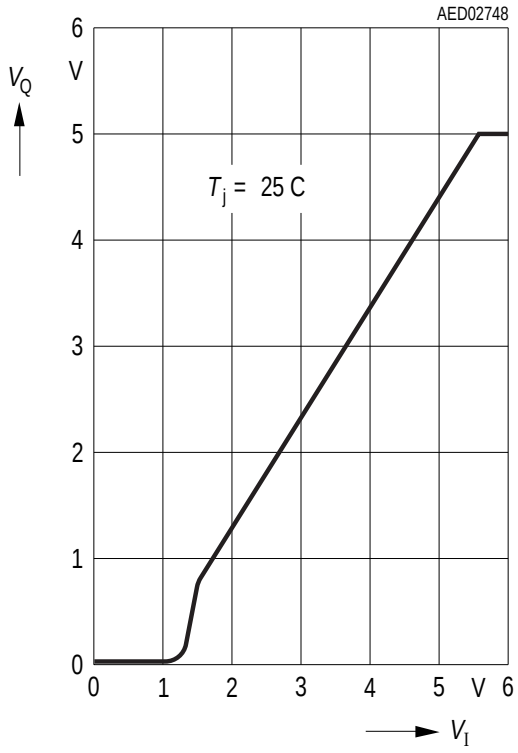
Output Voltage V_Q versus Temperature T_j



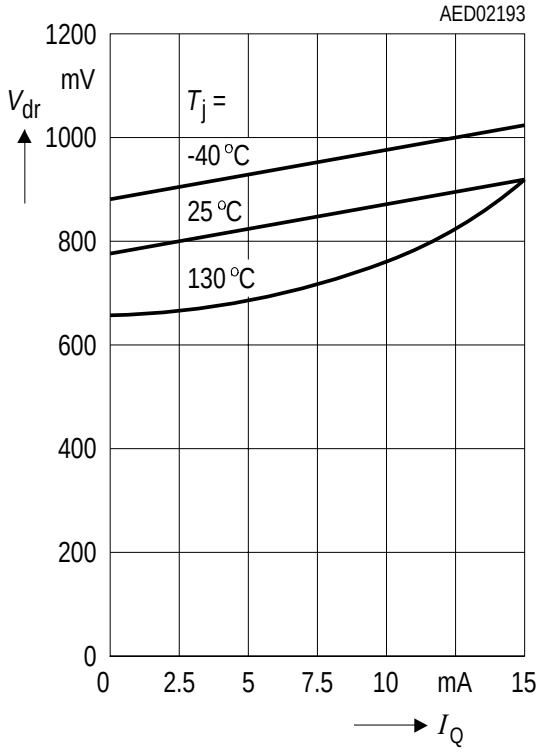
Output Voltage V_Q versus Output Current I_Q



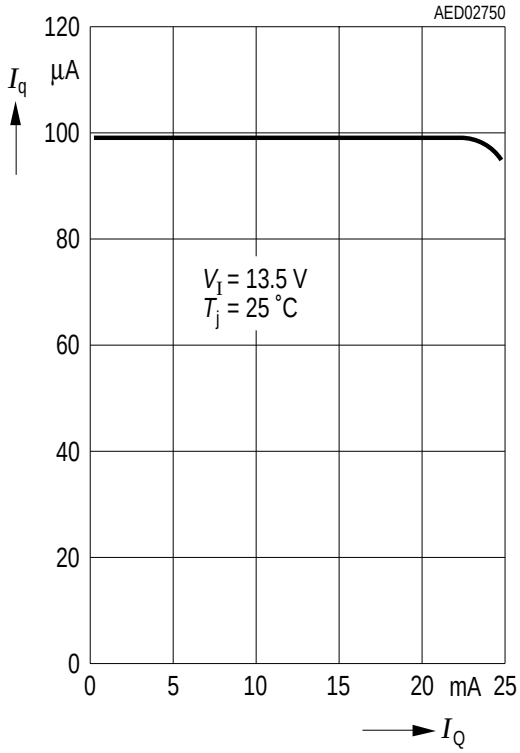
Output Voltage V_Q versus Input Voltage V_I



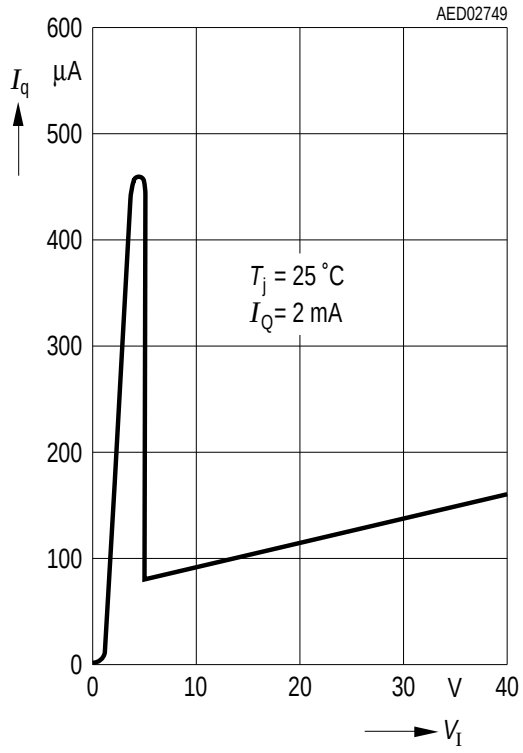
Drop Voltage V_{dr} versus Output Current I_Q



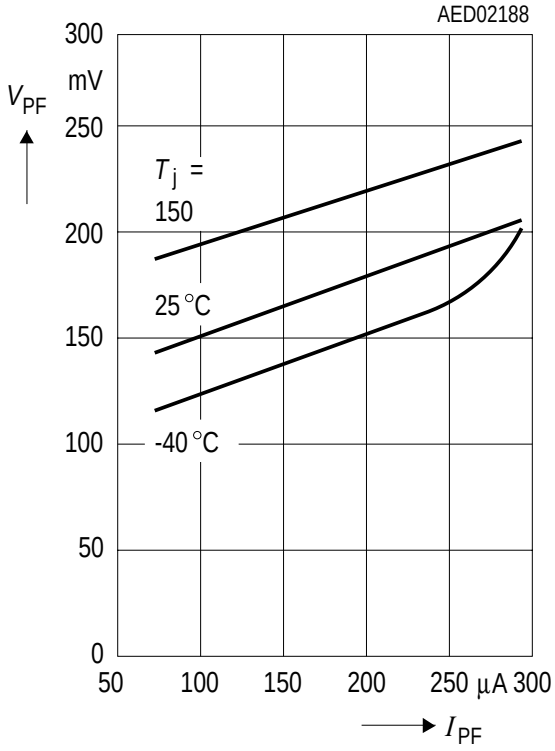
Current Consumption I_q versus Output Current I_Q



Current Consumption I_q versus Input Voltage V_I

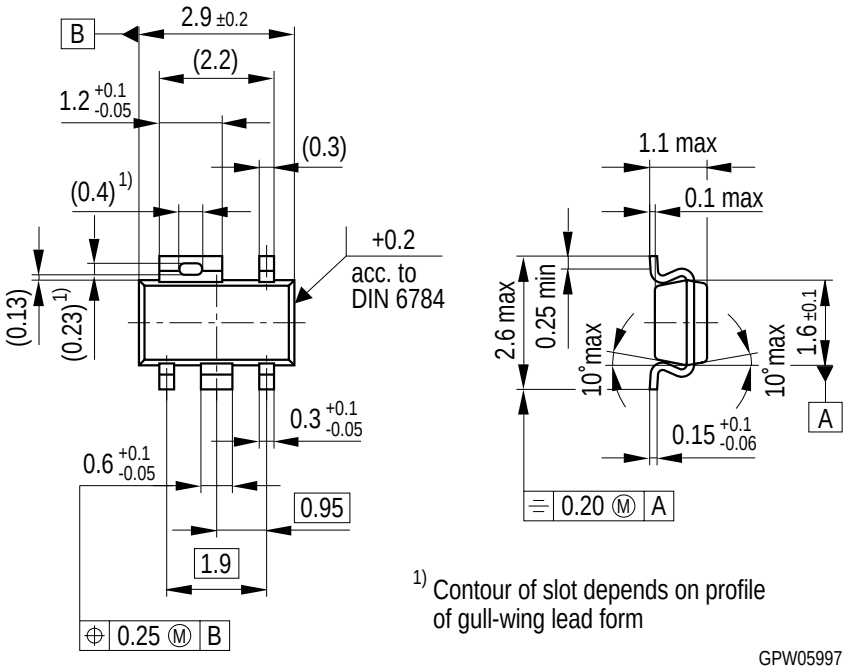


Power Fail Low Voltage V_{PF} versus Power Fail Current I_{PF}



Package Outlines

SCT-595
(Special Package)



Sorts of Packing
Package outlines for tubes, trays etc. are contained in our Data Book “Package Information”.

SMD = Surface Mounted Device

Dimensions in mm

Edition 1999-08-04

Published by
Infineon Technologies AG i. Gr.,
St.-Martin-Strasse 53
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