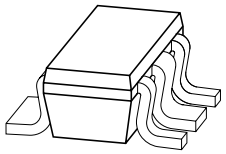
5-V Voltage Regulator

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 SCT-595
- Wide operation range: 6.2 V to 42 V
- Wide temperature range: – 40 °C to 150 °C
- Output protected against short circuit
- Over-temperature protection



SCT 595

Type	Ordering Code	Package
TLE 4286 G	Q67006-A9304	SCT-595 (SMD)

Functional Description

The **TLE 4286 G** is a 5-V low-drop fixed voltage regulator in the very small SMD package SCT-595. The maximum input voltage is 42 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 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.

SCT-595

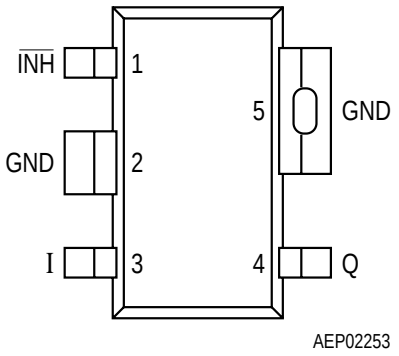


Figure 1 **Pin Configuration** (top view)

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

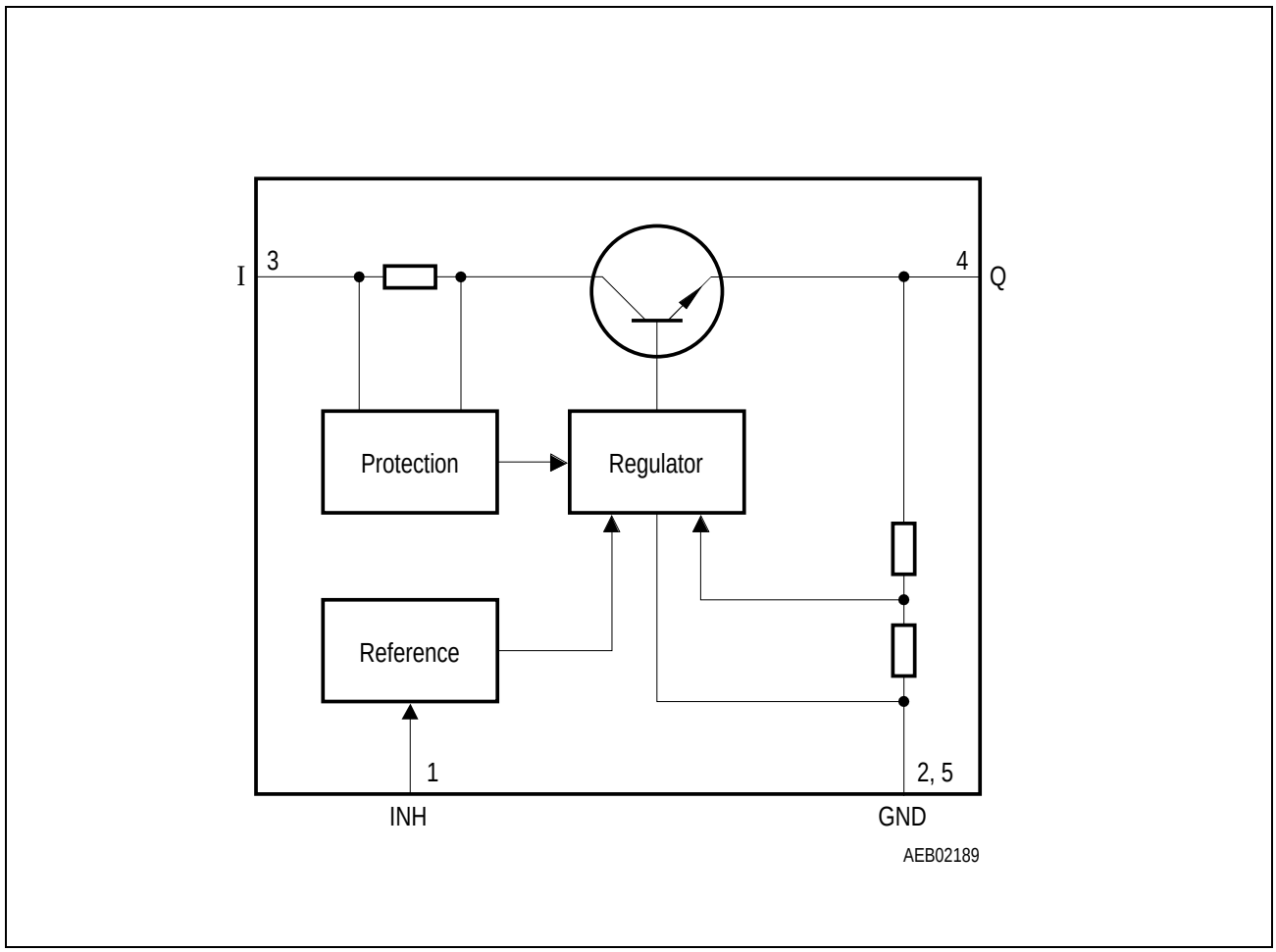


Figure 2 Block Diagram

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.

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	–

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 V_{SS}

Electrical Characteristics (cont'd)

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.		
Logic Inhibit Input						
Inhibit ON-threshold	$V_{INH, ON}$	–	–	3.5	V	$V_Q \geq 4.8$ V
Inhibit OFF-threshold	$V_{INH, OFF}$	0.3	–	–	V	$V_Q \leq 0.8$ 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

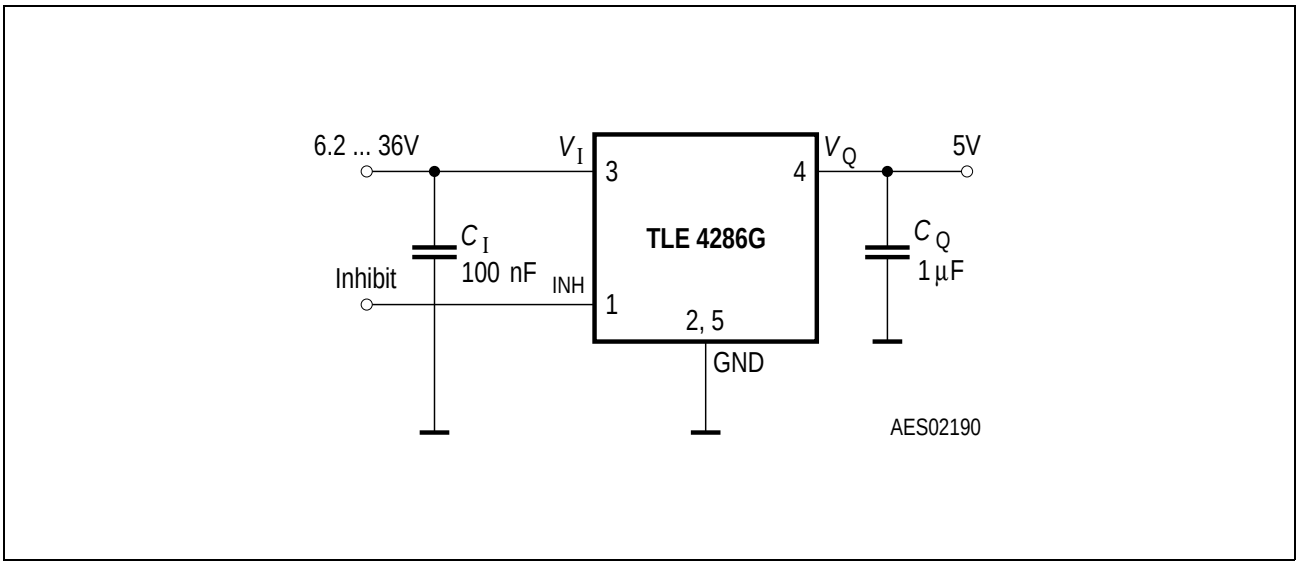
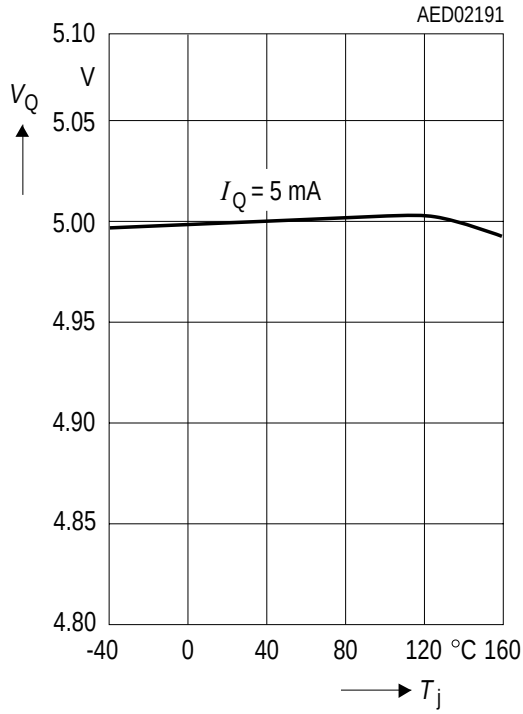


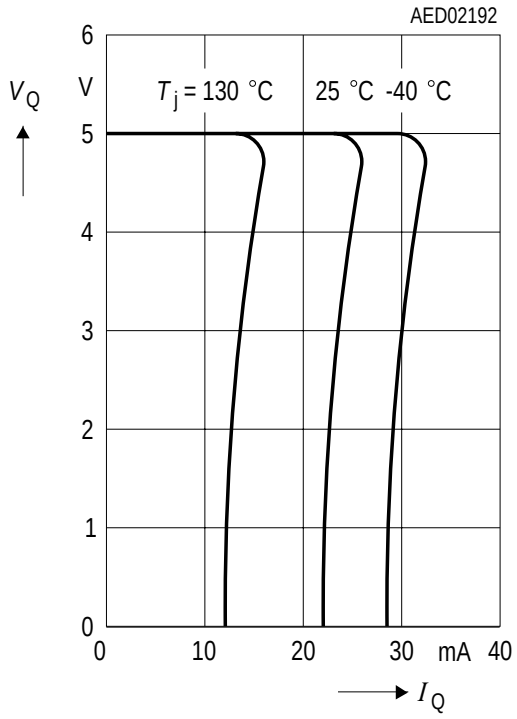
Figure 3 Application Circuit

Typical Performance Characteristics

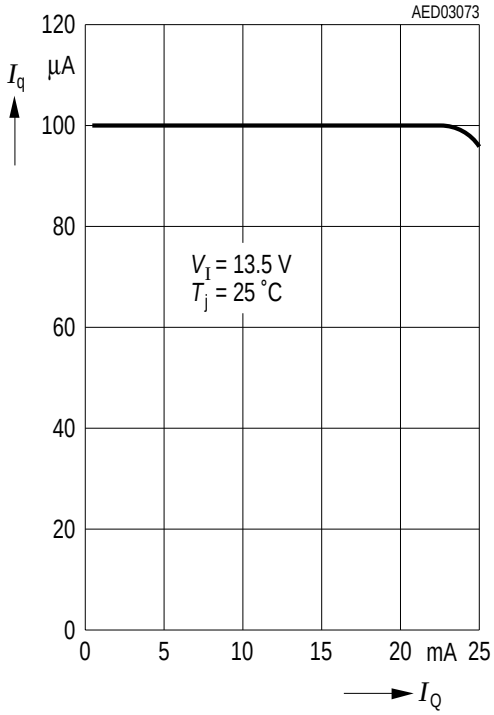
Output Voltage V_Q versus Temperature T_j



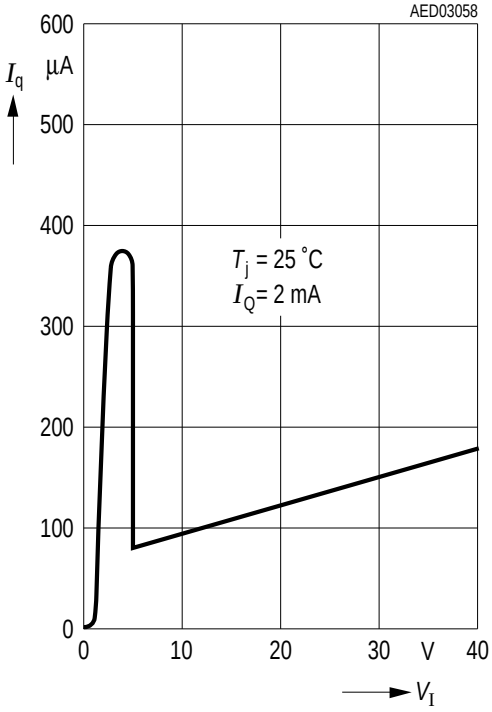
Output Voltage V_Q versus Output Current I_Q



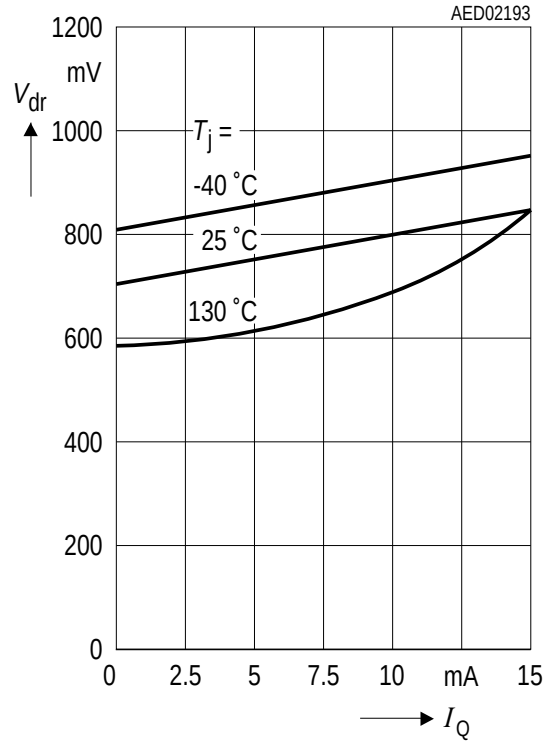
Current Consumption I_q versus Output Current I_Q



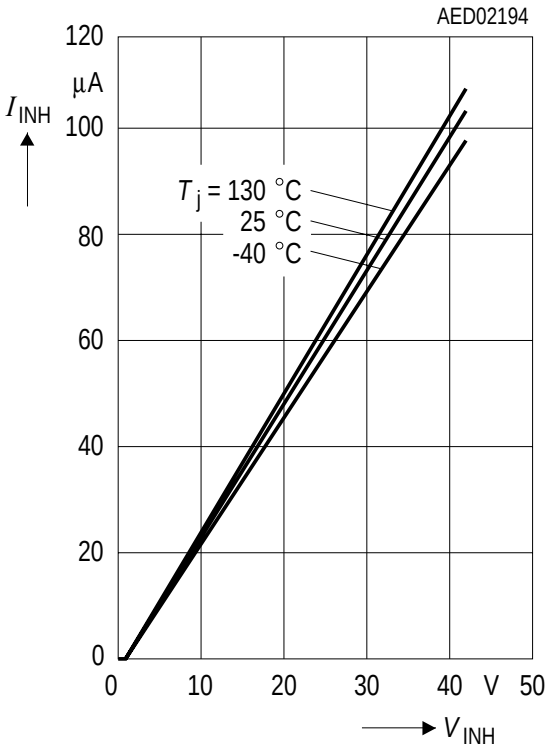
Current Consumption I_q versus Input Voltage V_I



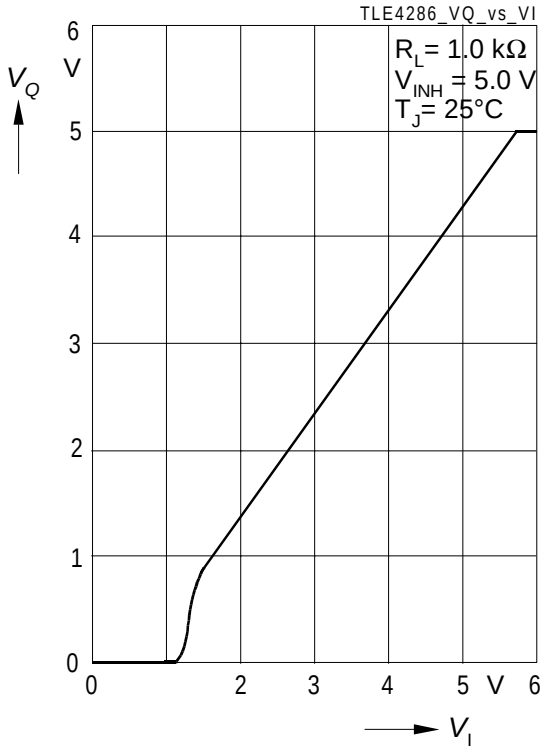
Drop Voltage V_{dr} versus Output Current I_Q



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

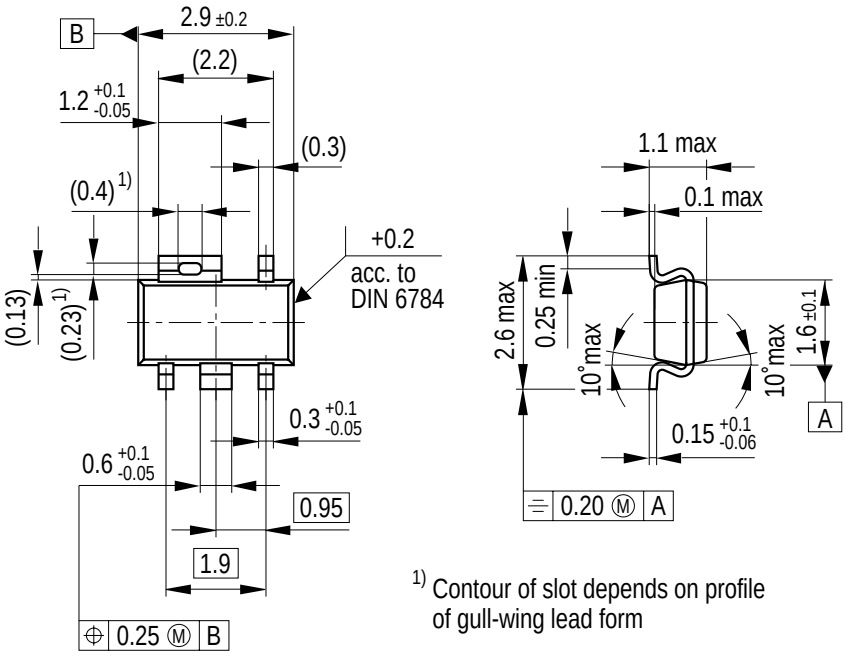


Output Voltage V_Q versus Input Voltage V_I



Package Outlines

SCT-595
(Special Package)



1) Contour of slot depends on profile of gull-wing lead form

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 2001-11-30

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