OPTIREG™ linear voltage regulator TLS850A4TEV50 demoboard

Z8F80462613

 Simulation

 Family overview

 Support

About this document

Scope and purpose

This document describes the usage of the OPTIREG™ linear voltage regulator TLS850A4TEV50 demoboard for the TLS850A4TEV50 from Infineon Technologies AG. Please also refer to the corresponding datasheet for further information on the product.

Intended audience

This document is intended for engineers who develop applications.

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1 Introduction

The OPTIREG™ linear voltage regulator TLS850A4TEV50 demoboard allows for easy lab evaluation of the TLS850A4TEV50. The demoboard is populated with the TLS850A4TEV50 in a PG-TO252-3 (DPAK) package, as well as the standard external components and test points to allow for easy device evaluation.

1.1 General description

The OPTIREG™ linear TLS850A4TEV50 is an Infineon high performance regulator with low dropout voltage and ultra low quiescent current. With only 4.3 µA typical quiescent current at light load and an input voltage range of 3.7 V to 40 V the device is perfectly suitable for automotive supply systems or other supply systems that are permanently connected to the battery.

The loop concept combines fast regulation and very high stability while requiring only one small ceramic capacitor of 4.7 µF at the output. The operating range starts at an input voltage of 3.7 V (extended operating range). This makes the device suitable for automotive systems that need to operate in cranking condition.

Internal protection features, such as output current limitation and overtemperature shutdown, are designed to protect the device from immediate damage caused by failures such as

- output shorted to GND
- overcurrent condition
- overtemperature condition

The thermally conductive package enables sustained operation despite significant dissipation across the device.

1.2 TLS850A4TEV50 features

- Ultra low quiescent current, typically 4.3 µA at light loads
- Wide input voltage range from 3.7 V to 40 V
- Output voltage 5 V
- Output voltage accuracy ±2%
- Output current capability up to 500 mA
- Low dropout voltage, typically 190 mV, at output current below 100 mA
- Stable with ceramic output capacitor of 4.7 µF
- Overtemperature shutdown
- Output current limitation
- Wide temperature range
- Green Product (RoHS compliant)

1.3 Block diagram

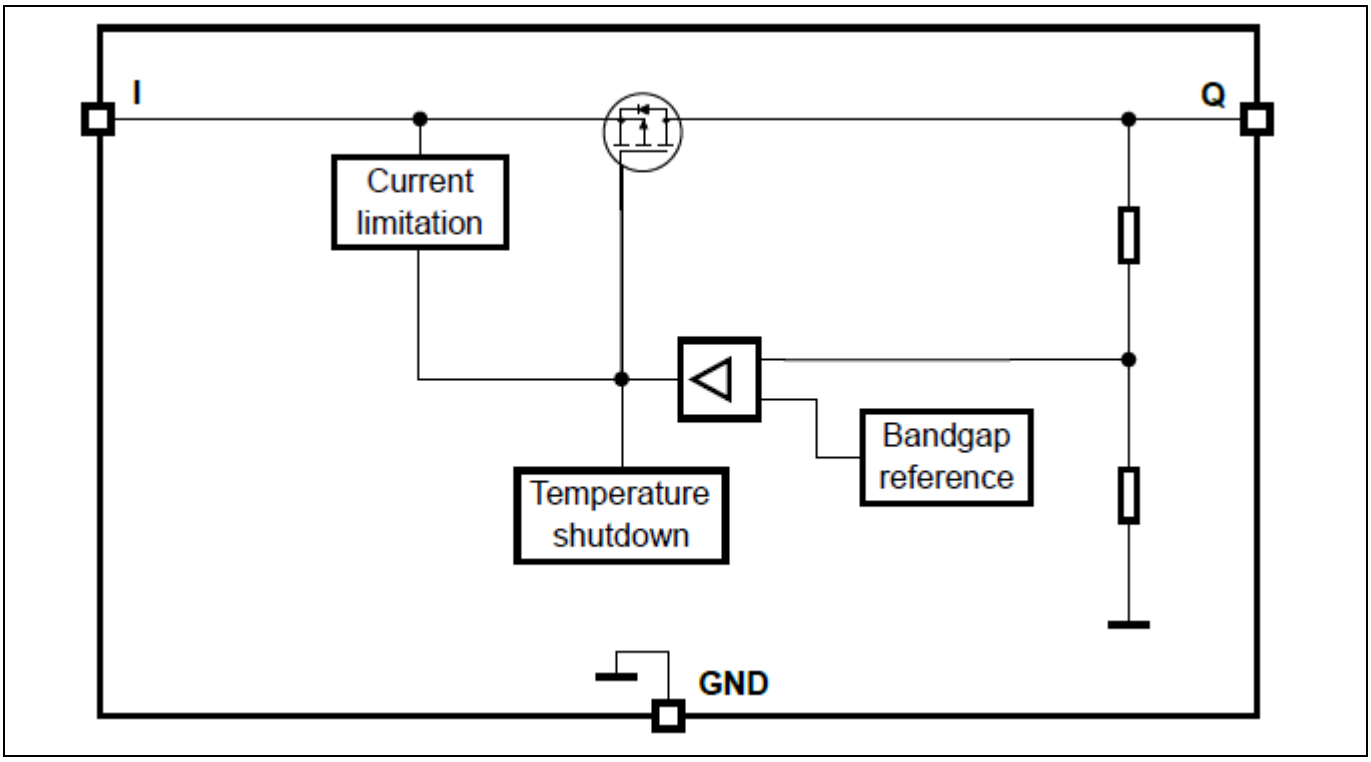

Figure 1 Block diagram of TLS850A4TEV50

2 Demoboard

2.1 Assembly

The TLS850A4TEV50 demoboard is equipped with the TLS850A4TEV50 in PG-TO252-3 and all the necessary components. Placeholders for an optional filtering capacitor on the output and an optional overvoltage suppressor diode on the input are available.

Figure 2 TLS850A4TEV50 demoboard

2.2 Operating conditions

To avoid electrical damage of the demoboard, the values in Table 1 must be maintained.

Table 1 Limit values for operation[1]

Parameter	Symbol	Values		Unit	Note or condition
		min	max		
Board supply voltage[2]	V_I	0	45	V	Power supply
Regulator output	V_Q	0	7	V	Regulated output voltage
Ground	GND	0	0	V	System GND

[1] The demoboard operates at an ambient temperature of 25°C

[2] Functional input voltage range: 3.7 V to 40 V

2.3 Configuration

The TLS850A4TEV50 demoboard is easy to use and provides a fixed output voltage of 5.0 V. No extra configuration is required.

2.3.1 Quick start procedure

1. With the power off, connect the input power supply to I and GND.
2. Connect the load between Q and GND.
3. Turn on the power supply. Ensure that the input voltage does not exceed 45 V. Schematic and layout

2.3.2 Optional additional components

The demoboard contains additional solder pads with are not populated by default, but can be populated by the user, if so required.

- C4: optional filtering capacitor can be used to improve the transient response.
- D1: optional overvoltage suppressor diode for protection against overvoltage at the input. The breakdown of the suppressor diode need to be chosen to ensure the input voltage to the TLS850A4TEV50 does not exceed the maximum ratings.

3 Schematic and layout

3.1 Schematic

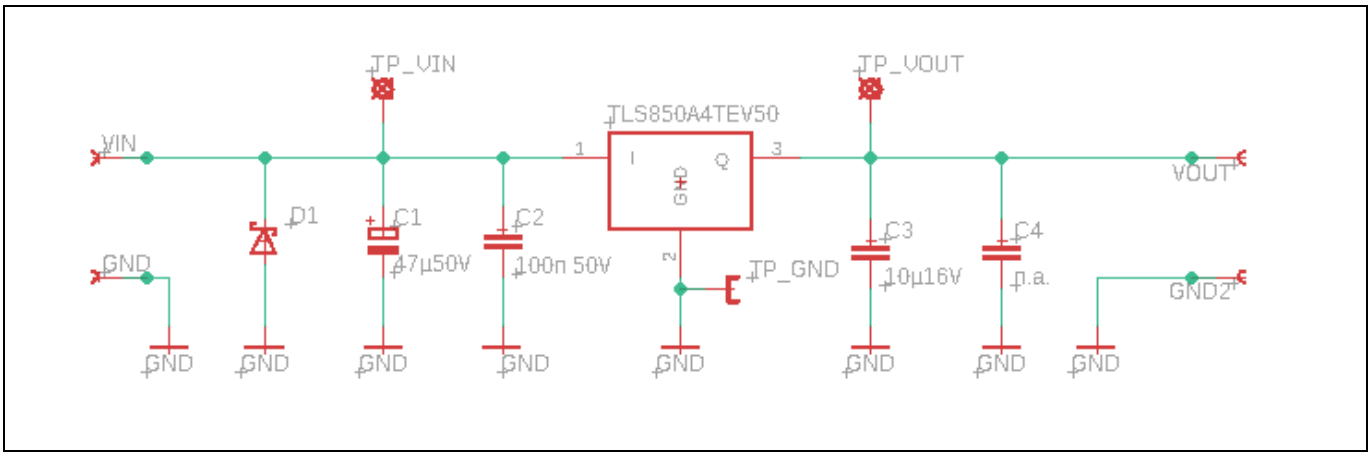

Figure 3 TLS850A4TEV50 demoboard schematic

3.2 Layout

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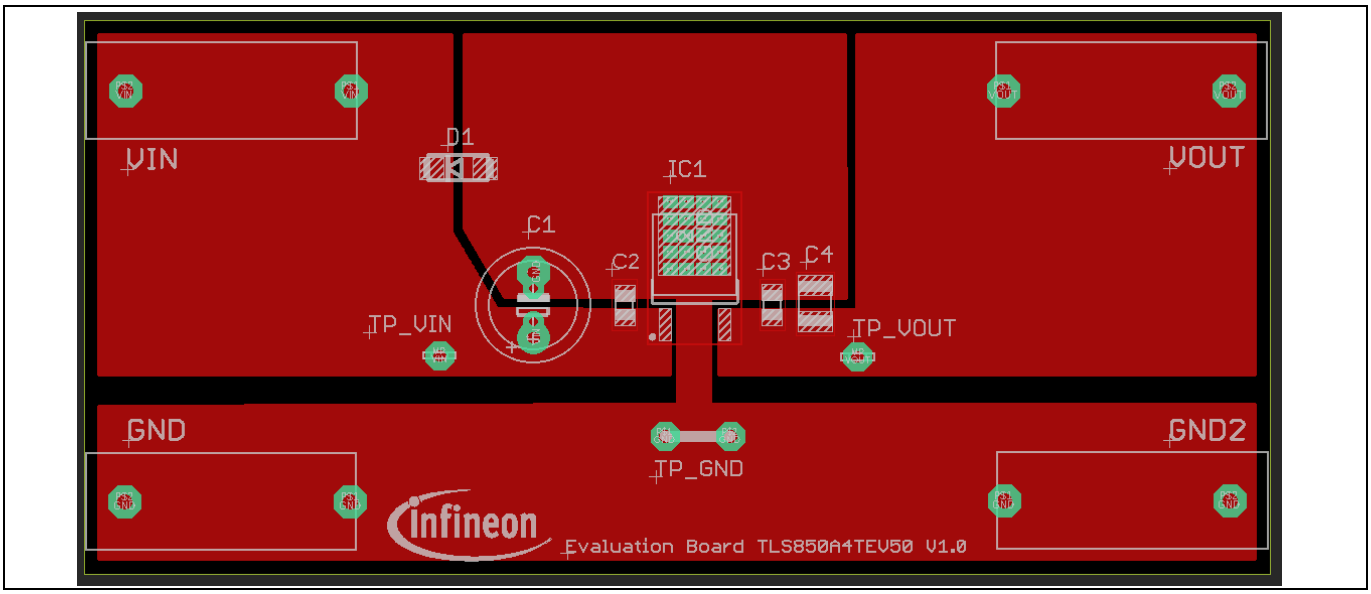

Figure 4 TLS850A4TEV50 demoboard top layer

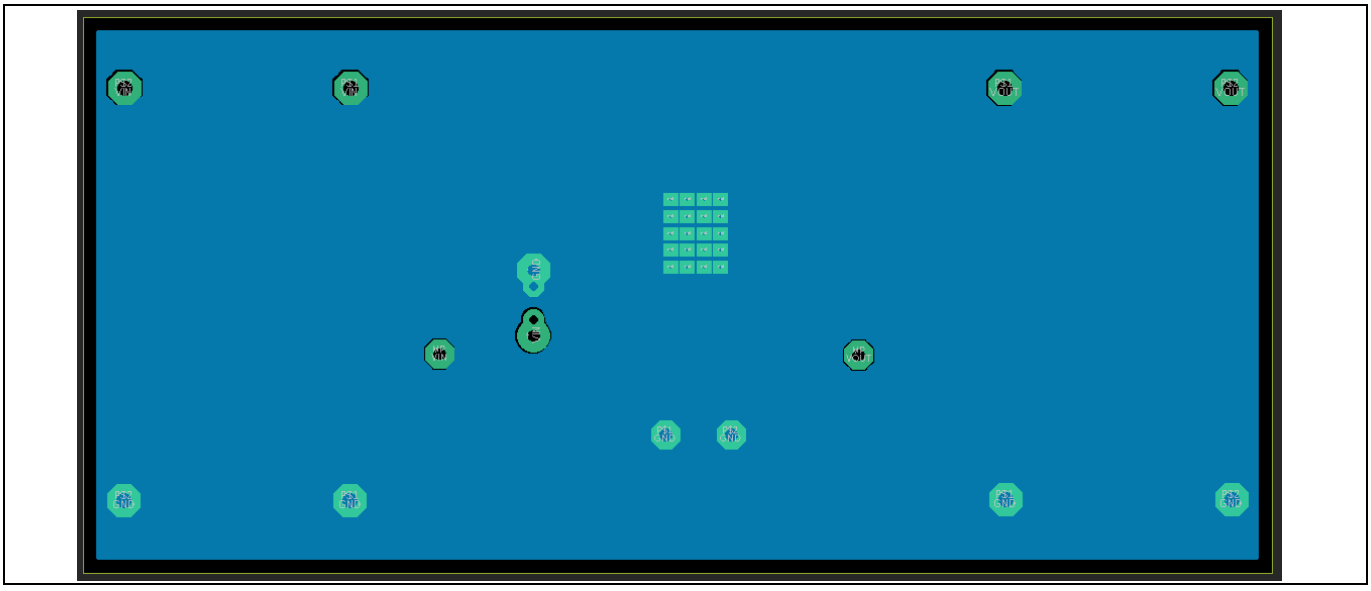

Figure 5 TLS850A4TEV50 demoboard bottom layer

4 Bill of materials

The bill of materials shows the components for both product specific assembly variants of the demoboard. For the mounting condition of each component see Schematic.

Table 2 Bill of material

Part	Value	Package
IC1	TLS850A4TEV50	PG-TO252-3
VIN, VOUT	Banana jack (red)	BABU4MM
GND, GND	Banana jack (black)	BABU4MM
TP_VIN, TP_VOUT	Test point	–
TP_GND	Test point	–
C1	10 µF / 50 V	E5-8,5
C2	100 nF / 50 V	C0805
C3	10 µF / 16 V	C0805
C4	Optional	C1210
D1	Optional	DO-214AC

5 Restrictions

This demoboard offers limited features only for evaluation and testing of Infineon products. The demoboard is not an end product or finished appliance, nor is it intended or authorized by Infineon to be integrated into end products. The demoboard may not be used in any production system. For further information please visit www.infineon.com.

Revision history

Document version	Date of release	Description of changes
1.00	25.05.2023	Initial release

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