

# **OPTIREG™ Linear TLS850C2TEVxx Demoboard**

## **Low Dropout Linear Voltage Regulator**

### **About this document**

#### **Scope and purpose**

This document provides information about the usage of the TLS850C2TEVxx Demoboard for the OPTIREG™ Linear TLS850C2TEVxx voltage regulator family from Infineon Technologies AG.

The TLS850C2TEVxx demoboard can be used to easily evaluate the TLS850C2TEV50 (5V voltage variant) and TLS850C2TEV33 (3.3V voltage variant) in the PG-TO252-5 package.

Please also refer to the corresponding Data Sheets for device-specific information.

#### **Intended audience**

This document is as intended for engineers who develop applications.

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## Introduction

### 1 Introduction

The TLS850C2TEVxx Demoboard is a demonstration of the Infineon low dropout linear voltage regulator TLS850C2TEVxx family in PG-TO252-5 package.

This application note contains information for usage of the TLS850C2TEVxx Demoboard.

**Table 1** provides an overview of the family members of TLS850C2TEVxx voltage regulators.

**Table 1 Family Overview**

Type	Output voltage	Output current	Enable	Reset	Package
TLS850C2TEV50	5.0 V	500 mA	No	Yes	PG-TO252-5
TLS850C2TEV33	3.3 V	500 mA	No	Yes	PG-TO252-5

#### 1.1 General Description

The OPTIREG™ Linear TLS850C2TEVxx is a low dropout linear voltage regulator for load current up to 500 mA. An input voltage of up to 40 V is regulated to  $V_{Q,nom} = 5\text{ V}$  or  $V_{Q,nom} = 3.3\text{ V}$  with  $\pm 2\%$  precision.

With an input voltage range of 3 V to 40 V and very low quiescent current of only 20  $\mu\text{A}$ , this regulator is perfectly suitable for automotive or other supply systems permanently connected to the battery.

The new loop concept combines fast regulation and very high stability while requiring only one small ceramic capacitor of 1  $\mu\text{F}$  at the output. At output currents below 100 mA the device has a very low dropout voltage of only 100 mV. The operating range starts at an input voltage of only 3 V (extended operating range). This makes the TLS850C2TEVxx suitable for automotive systems that need to operate during cranking condition.

The output voltage is supervised by the reset feature, including undervoltage reset and delayed reset at power-on.

Internal protection features such as output current limitation and overtemperature shutdown, protect the device from immediate damage caused by failures such as output shorted to GND, overcurrent or overtemperature conditions.

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## Introduction

### 1.2 TLS850C2TEVxx Feature List

- Wide Input Voltage Range from 3.0 V to 40 V
- Output Voltage 5 V or 3.3 V
- Output Voltage Precision  $\pm 2\%$
- Output Current up to 500 mA
- Low Current Consumption of 20  $\mu\text{A}$
- Very Low Dropout Voltage of typ. 100 mV at 100 mA Current
- Stable with Small Output Capacitor of 1  $\mu\text{F}$
- Overtemperature Shutdown
- Output Current Limit Protection
- Reset
- Delayed reset at power-on.
- Wide Temperature Range from  $-40\text{ }^{\circ}\text{C}$  up to  $150\text{ }^{\circ}\text{C}$
- Available in PG-TO252-5 Package
- Green Product (RoHS compliant)
- AEC Qualified

These features make the TLS850C2TEVxx voltage regulators perfectly suitable as automotive supplies that are connected to the battery permanently and that need to operate in cranking condition.

Introduction

1.3 Block Diagram

Figure 1 shows the block diagram of TLS850C2TEVxx.

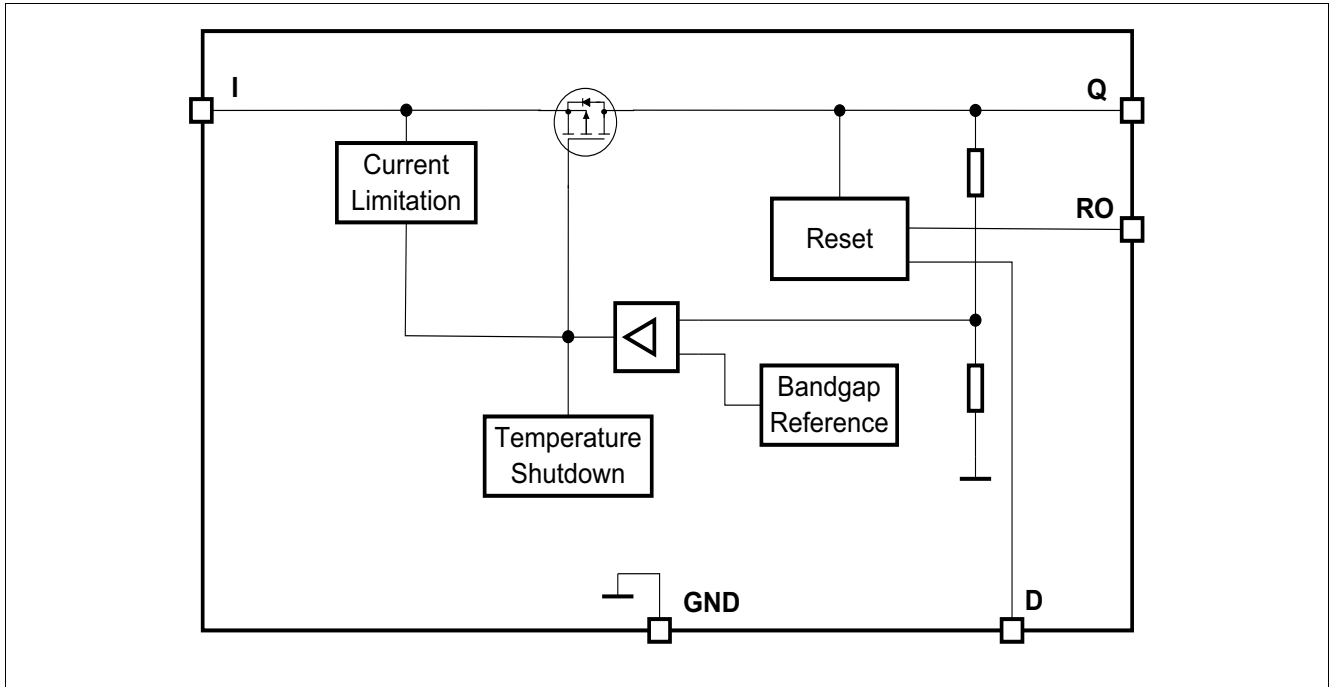


Figure 1 Block Diagram of TLS850C2TEVxx.

Demoboard

## 2 Demoboard

Figure 2 shows a TLS850C2TEVxx Demoboard equipped with TLS805D3MCV33.

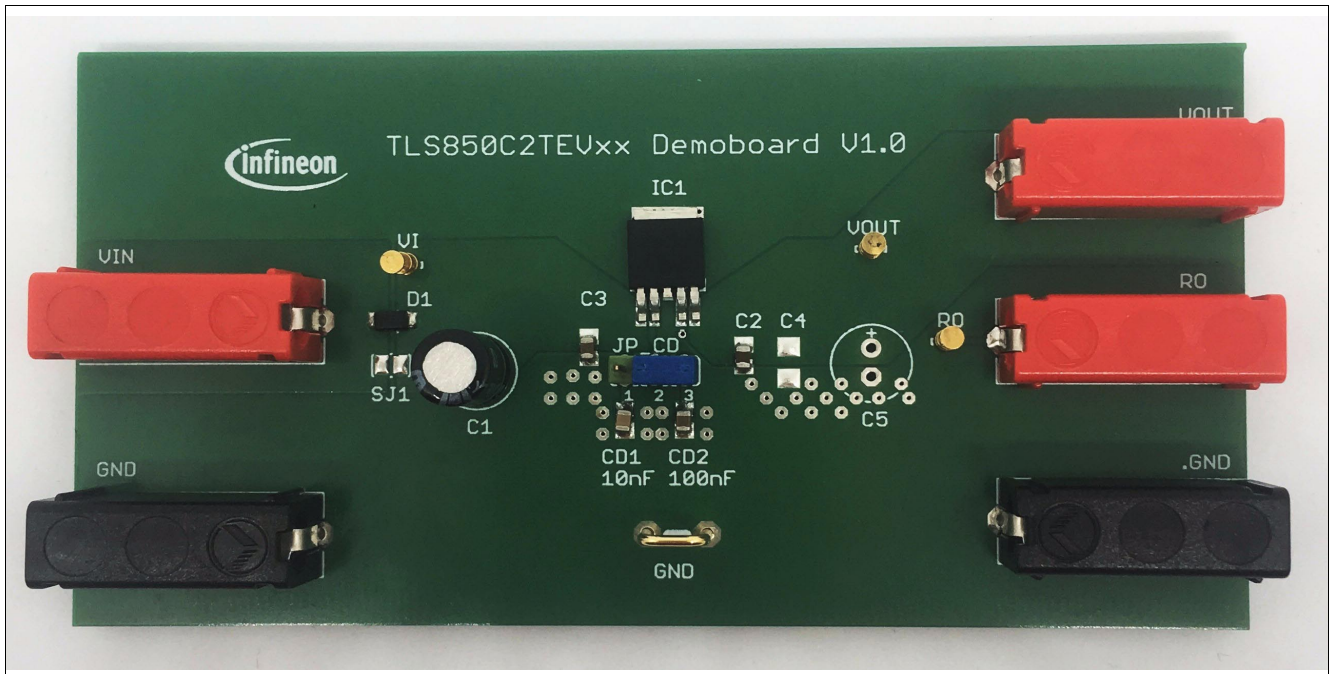


Figure 2 TLS850C2TEVxx Demoboard

## Demoboard

### 2.1 Operating Conditions

To avoid any electrical damage of the Demoboard, the maximum operating range defined in [Table 2](#) must be followed.

**Table 2** Operating Range<sup>1)</sup>

Parameter	Symbol	Limit Values		Unit	Note
		Min.	Max.		
Board Supply Voltage <sup>2)</sup>	VIN	0	40	V	Power supply
Regulator Output	VOUT	0	7	V	Regulated output voltage
Reset output Signal	RO	0	7	V	Indicates whether reset occurred
Ground	GND	0	0	V	System GND

1) The Demoboard operates at ambient temperature of 25°C.

2) Functional input voltage range starts from 3.0 V to 40 V.

### 2.2 Board Configuration

The TLS850C2TEVxx Demoboard can be easily configured via jumpers on the board. The board provides the following configuration options:

- Reset timing selection (JP\_CD)
- Placeholder for additional SMD output capacitors (C4)
- Placeholder for additional Through-Hole output capacitors (C5)

#### 2.2.1 Power-on reset timing selection

Power-on reset delay timing can be configured by JP\_CD; connecting pin D with the available delay capacitors:

**Table 3** Header options for reset delay timing<sup>1)</sup>

JP_CD	Function
set to 10nF	Power-on reset delay time is configured to typically 2.5 ms
set to 100nF	Power-on reset delay time is configured to typically 25 ms

1) Without a defined capacitor on pin D the reset function is disabled.

## Demoboard

### 2.2.2 Signal Adaption

For easy signal adaption e.g. connecting probes for an oscilloscope, test points VIN, VOUT, RO and GND can be used.

**Table 4** Signals on test point

Test point	Accessible Signal
VIN	Input voltage
VOUT	Output voltage
RO	Reset output signal
GND	GND



Schematic and Layout TLS850C2TEVxx Demoboard

### 3 Schematic and Layout TLS850C2TEVxx Demoboard

#### 3.1 Schematic TLS850C2TEVxx Demoboard

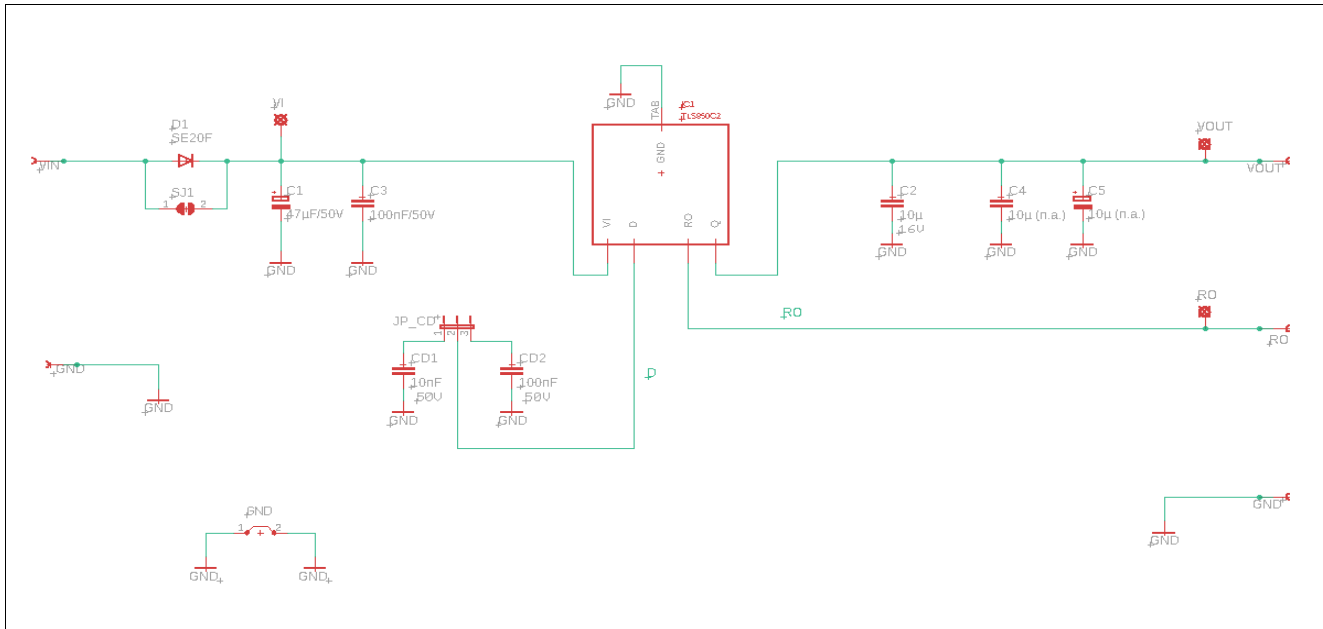


Figure 3 Schematic of TLS850C2TEVxx Demoboard

Schematic and Layout TLS850C2TEVxx Demoboard

3.2 Layout TLS850C2TEVxx Demoboard

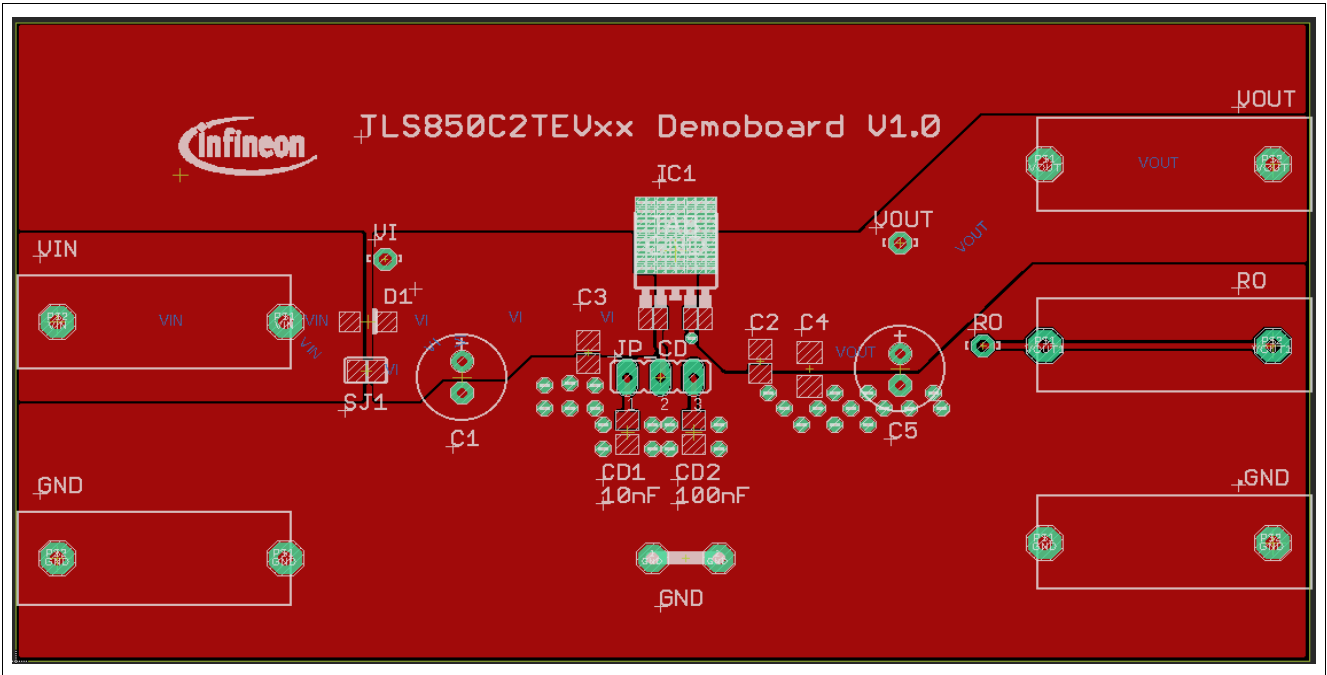


Figure 4 Top Layer of TLS850C2TEVxx Demoboard

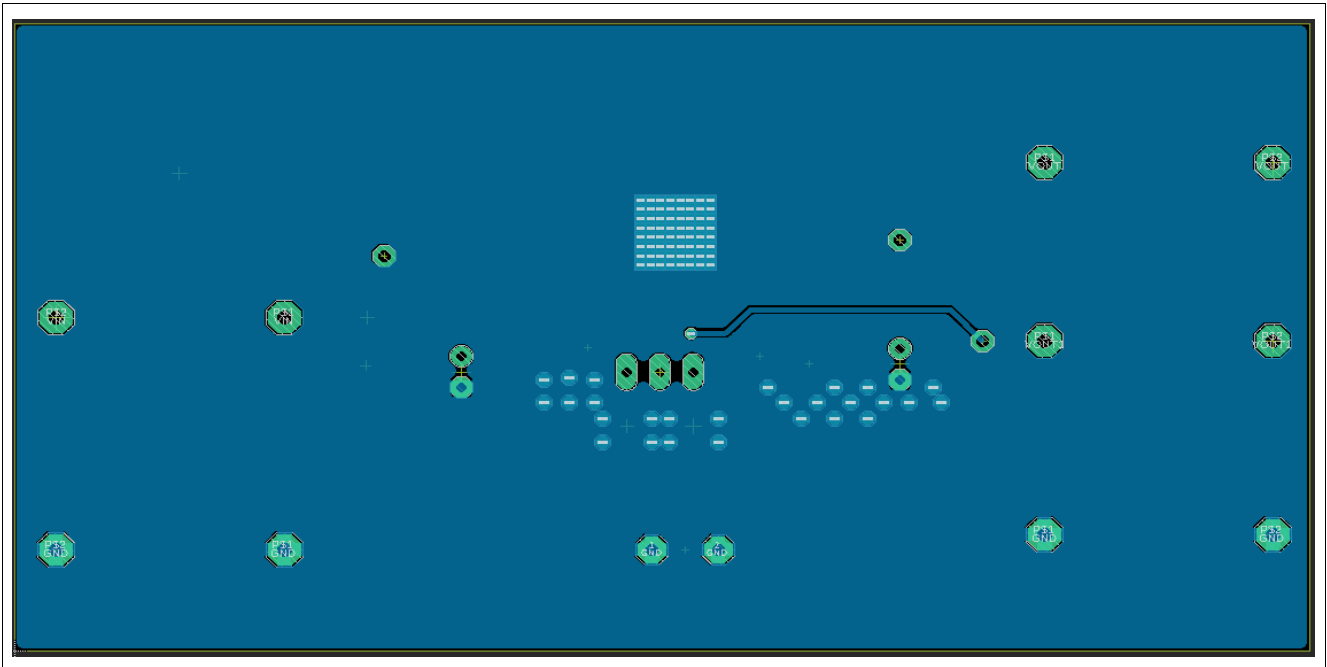


Figure 5 Bottom Layer of TLS850C2TEVxx Demoboard

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**Bill of Material**

## 4 Bill of Material

**Table 5 Bill of Material**

Part	Value	Package
IC1	TLS850C2TEV50 / TLS850C2TEV33	PG-TO252-5
VIN	Banana jack	BABU4MM
VOUT	Banana jack	BABU4MM
RO	Banana jack	BABU4MM
GND	Banana jack	BABU4MM
D1	Diode SE20F	SMF (DO-219AB)
SJ1		Solder jumper
C1	47 $\mu$ F/50V	E2,5-7
C2	10 $\mu$ F/16V	C0805
C3	100nF/50V	C0805
C4	n.a.	C1206
C5	n.a.	E2,5-7
JP_CD	3 pin connector	
CD1	10nF/50V	C0805
CD2	100nF/50V	C0805
GND	GND connector	

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## General Information

### 5 General Information

#### 5.1 Restrictions

This Demoboard is offering limited features allowing you only to evaluate and test the 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.

#### 5.2 Additional Information

For further information you may contact <http://www.infineon.com/>

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Revision History

## 6 Revision History

Revision	Date	Changes
1.01	2020-10-21	Editorial changes
1.0	2019-09-05	Initial version

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