

TLS850B0TxVxx evaluation board

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Preface

Scope and purpose

This application note provides information about the usage of the TLS850B0TxVxx evaluation board. The TLS850B0TxVxx evaluation board is used to demonstrate the ultra low quiescent current linear voltage regulator family TLS850B0 from Infineon Technologies AG. Please also refer to the corresponding data sheet - [DS](#).

Intended audience

This document is intended for engineers who develop applications.

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Introduction

1 Introduction

This document describes the evaluation board for the TLS850B0 and its functionality. It includes a brief summary of the used passive components, as well as a short explanation for the correct usage of the board. The description of the TLS850B0 is not subject of this application note. Specifications and parameters for the device shall be taken from the corresponding data sheet.

1.1 General description

The TLS850B0 is a linear voltage regulator which can be connected directly to the battery board net of a car. It is optimized for low drop and current consumption in off mode and thus also suitable for standby operation. Additionally it is capable to withstand high voltage transients such as a load dump scenario in a vehicle.

Introduction

1.2 TLS850B0: Feature set

To meet the automotive standards, the TLS850B0 comes with a feature set, that includes:

- Output voltage accuracy at +/-2%
- Enable: reduces the current consumption to a minimum while the application is not used
- Protection functions:
 - Output current limitation
 - Overtemperature shutdown
- Robust against high input transients up to 45 V

1.3 Block diagram

Following the block diagram of TLS850B0 is illustrated. It shows the device's basic feature set. The parameters for each block shall be taken from the corresponding data sheet.

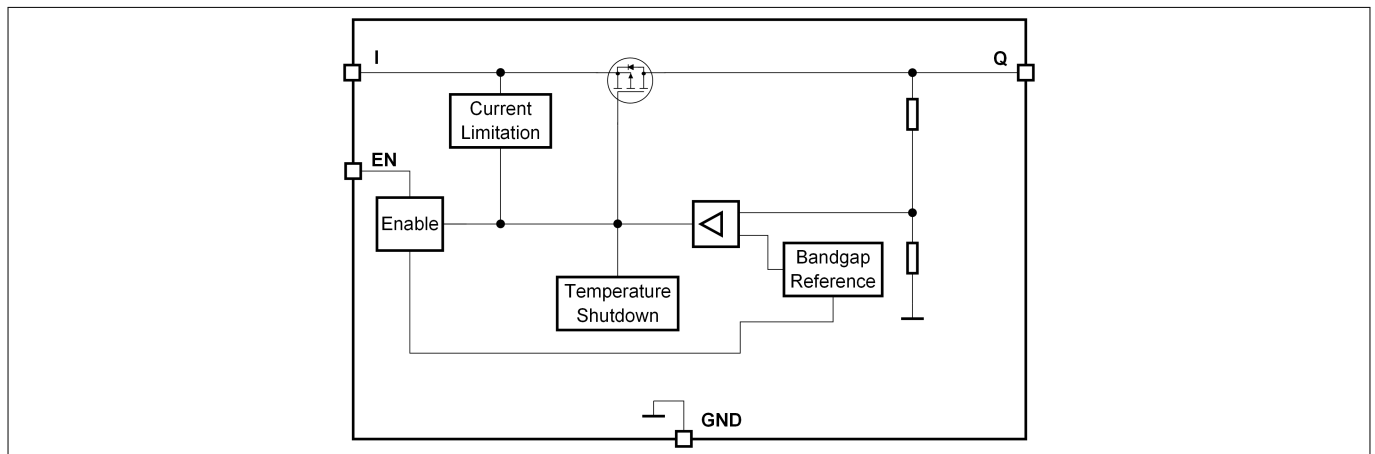


Figure 1 TLS850B0 block diagram

Demoboard

2 Demoboard

The TLS850B0TxVxx evaluation board is available for the PG-TO263-5 and PG-TO252-5 package. Basic functions of the device can be evaluated with it, as well as identifying the proper configuration. Apart from that it may serve as help to assess the device's behavior outside of the application and under isolated conditions of stress. Figure [Figure 2](#) and [Figure 3](#) show the respective evaluation boards.



Figure 2 TLS850B0TEVxx evaluation board



Figure 3 TLS850B0TBVxx evaluation board

Demoboard

2.1 Operating conditions

To avoid electrical damage of the evaluation board, the operating range defined in [Table 1](#) must be followed.

Table 1 Operating range¹⁾

Parameter	Symbol	Limit values		Unit	Note
		Min.	Max.		
Board supply ²⁾	V _{IN}	0	45	V	Power supply
Regulator output	V _{OUT}	0	7	V	Regulated output voltage
Enable input signal	EN	0	45 ³⁾	V	Enable signal to switch on the regulator

2.2 Demoboard configuration

The TLS850B0TxVxx evaluation board enables the operator to use and test the basic function set of the TLS850B0. This includes the following features:

- Connecting the enable input signal to the supply voltage V_{IN} via jumper JP1
- Delay the enable by adding an additional capacitor at EN (C5)
- Placeholder for additional output capacitor (C1)
- Several test points to conveniently attach probes to the respective signals

2.2.1 Enable function

The jumper JP1 can be used to connect the EN signal to the supply voltage V_{IN} or pull it to GND. Furthermore an external enable signal can be applied by using the banana jack EN.

Table 2 Jumper JP1 setting for enable function

JP1	Enable function
Pin 3 to pin 2	EN is connected to the supply voltage V _{IN} ; the regulator is enabled while it is supplied
Pin 2 to pin 1	EN is pulled to GND
Open	EN is floating; An external enable signal can be applied via the banana jack EN

¹ The Demoboard operates at an ambient temperature of 25°C

² Functional input voltage range: 3 V to 40 V

³ Absolute maximum rating

Schematic and layout

3 Schematic and layout

In the following the schematic and the layout of the board are illustrated. These figures can be used for a better understanding and tracing of the connections. In case of further questions, address to the AutomotivePowerSupplyIC_Support@infineon.com.

3.1 Schematic

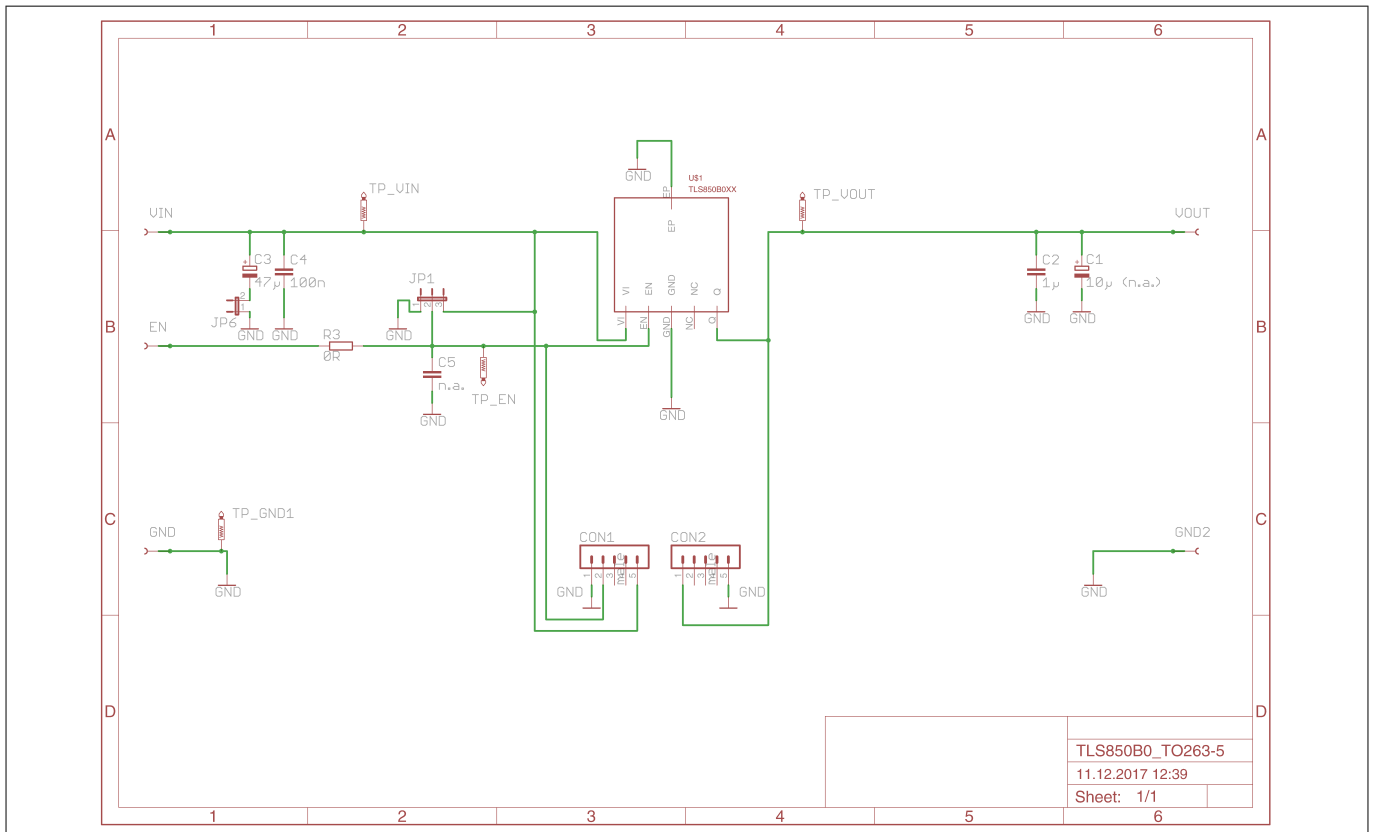


Figure 4 Schematic of TLS850B0TxVxx evaluation board

3.2 Layout

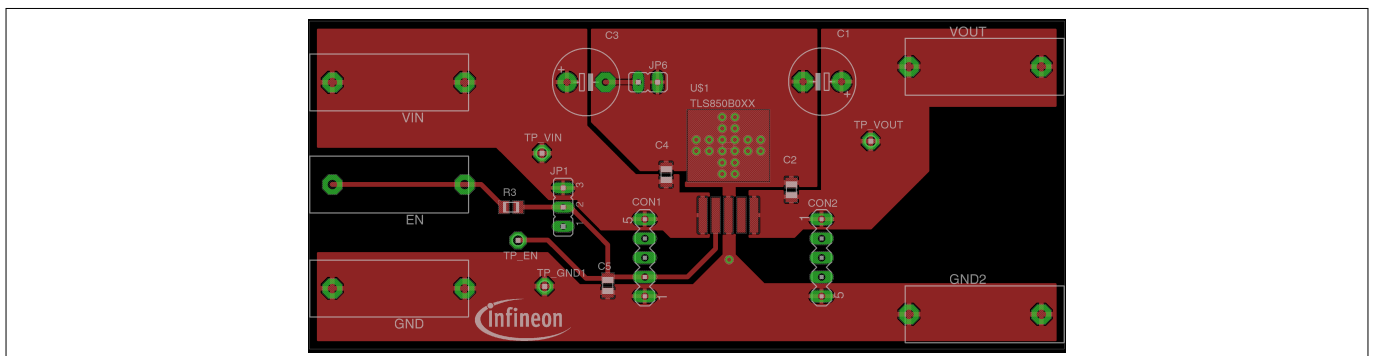


Figure 5 Top layer of TLS850B0TxVxx evaluation board

Schematic and layout

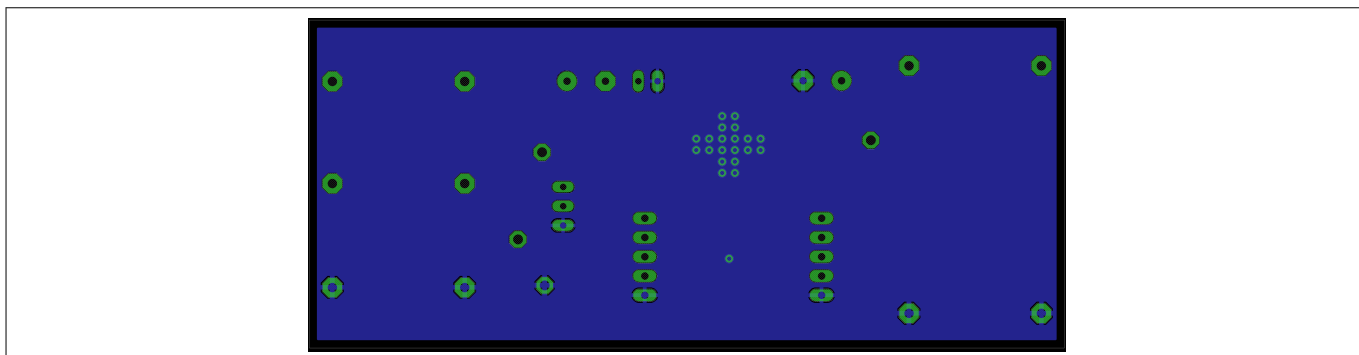


Figure 6 Bottom layer of TLS850B0TBVxx evaluation board

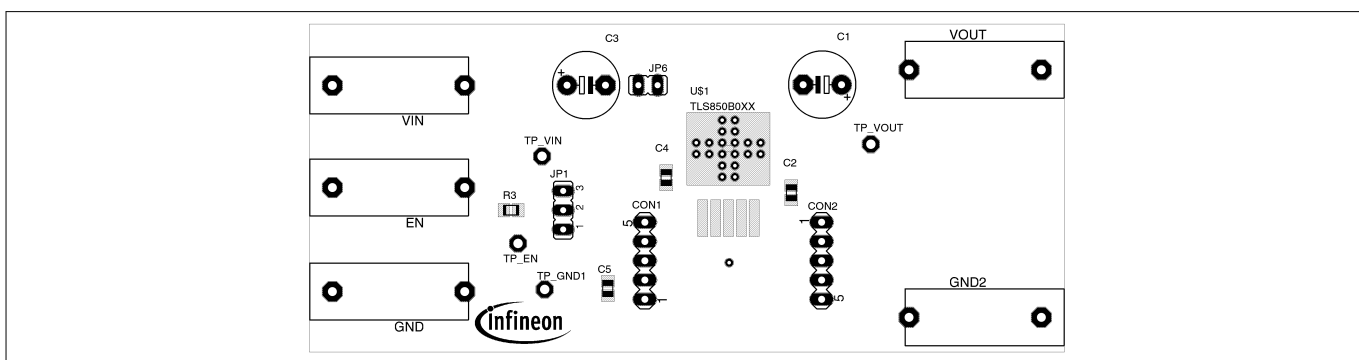


Figure 7 Top layer components of TLS850B0TBVxx evaluation board

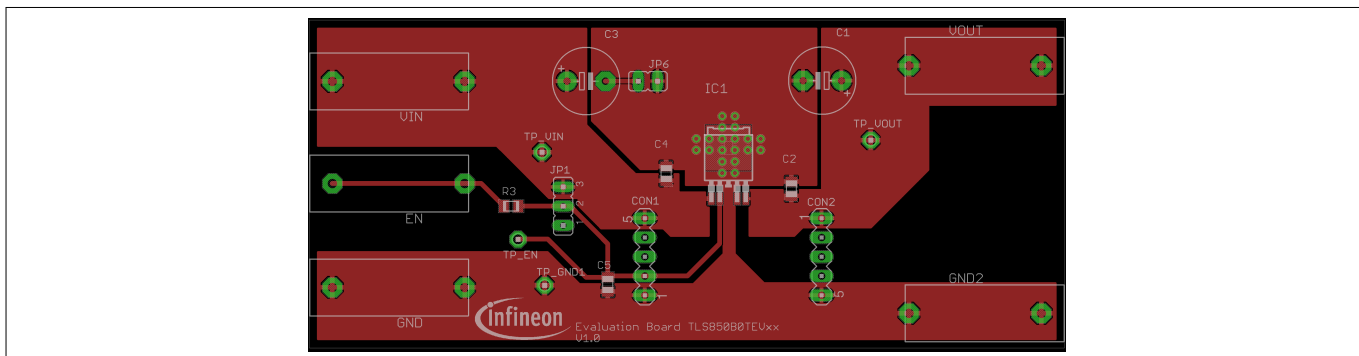


Figure 8 Top layer of TLS850B0TEVxx evaluation board

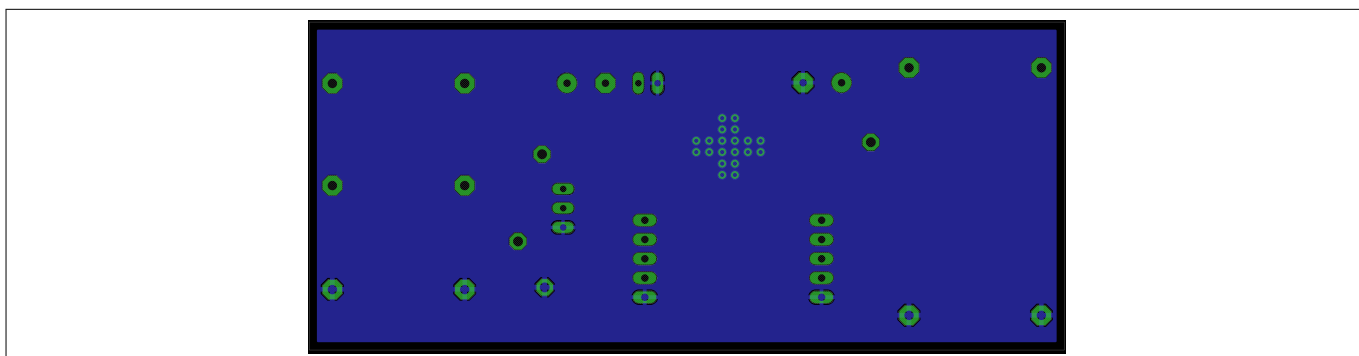


Figure 9 Bottom layer of TLS850B0TEVxx evaluation board

Schematic and layout

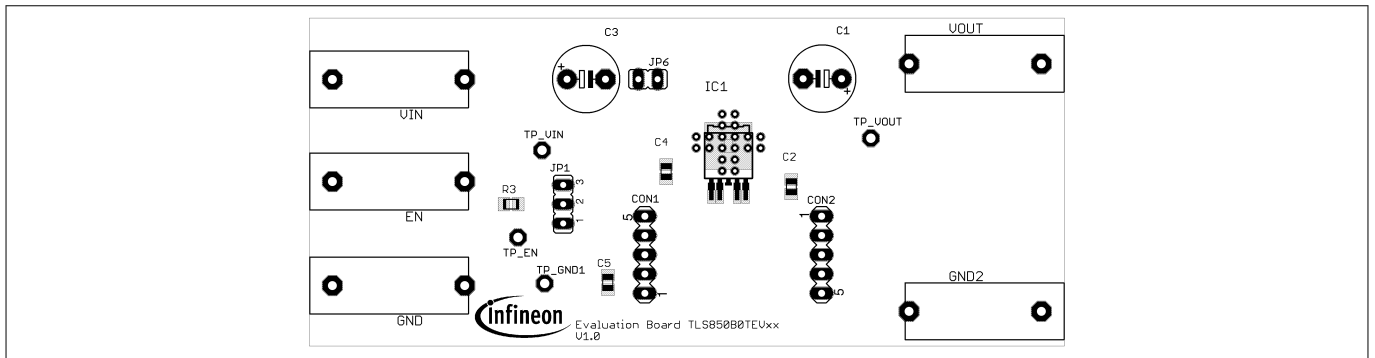


Figure 10 Top layer components of TLS850B0TEVxx evaluation board

Bill of material

4 Bill of material

Table 3 Table: Bill of materials

Part	Value	Device	Package	Description
C1	10 μ (n.a.)	CPOL-EUE5-8.5	E5-8,5	POLARIZED CAPACITOR, European symbol
C2	1 μ	C-EUC0805	C0805	CAPACITOR, European symbol
C3	47 μ	CPOL-EUE5-8.5	E5-8,5	POLARIZED CAPACITOR, European symbol
C4	100n	C-EUC0805	C0805	CAPACITOR, European symbol
C5	n.a.	C-EUC0805	C0805	CAPACITOR, European symbol
CON1		MA05-1	MA05-1	PIN HEADER
CON2		MA05-1	MA05-1	PIN HEADER
EN		BABU4MM	BANANENBUCHSE4 MM	
GND		BABU4MM	BANANENBUCHSE4 MM	
GND2		BABU4MM	BANANENBUCHSE4 MM	
JP1		JP2E	JP2	JUMPER
JP6		JP1E	JP1	JUMPER
R3	OR	R-EU_M0805	M0805	RESISTOR, European symbol
TP_EN		PTR1PAD1-13	P1-13	TEST PIN
TP_GND1		PTR1PAD1-13	P1-13	TEST PIN
TP_VIN		PTR1PAD1-13	P1-13	TEST PIN
TP_VOUT		PTR1PAD1-13	P1-13	TEST PIN
U\$1	TLS850B0XX	TLS850B0XX	PG-TO263-5/PG-TO252-5	
VIN		BABU4MM	BANANENBUCHSE4 MM	
VOUT		BABU4MM	BANANENBUCHSE4 MM	

Restrictions

5 Restrictions

This evaluation board is offering limited features allowing you only to evaluate and test the Infineon products. The evaluation board is neither an end product, nor it is intended or authorized by Infineon to be used as a reference design. You are not authorized to use the evaluation board in any production.

For further information please refer to: www.infineon.com.

References

6 References

Table 4

Number	Bibliography
[1]	What The Designer Should Know – Introduction to Automotive Linear Voltage Regulators. Infineon Technologies AG
[2]	TLS850B0TEV50 Data Sheet, Infineon Technologies AG: TLS850B0TEV50
[3]	TLS850B0TEV33 Data Sheet, Infineon Technologies AG: TLS850B0TEV33
[4]	TLS850B0TBV50 Data Sheet, Infineon Technologies AG: TLS850B0TBV50
[5]	TLS850B0TBV33 Data Sheet, Infineon Technologies AG: TLS850B0TBV33

Revision history

7 Revision history

Revision	Date	Changes
1.0	2017-12-06	Initial version

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