

TLT807B0EPV Demoboard

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Preface

Scope and purpose

This application note provides information about the usage of the TLT807B0 Demoboard. The TLT807B0 Demoboard is used to demonstrate the ultra low quiescent current linear voltage regulator family TLT807B0 in a PG-TSDSO-14 package 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 TLT807B0 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 TLT807B0 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 TLT807B0 is a standby linear voltage regulator which is designed for 24 V systems and the demanding environment of truck applications. It is optimized for low drop and current consumption in off mode. Additionally it is capable to withstand high voltage transients.

Introduction

1.2 TLT807B0: Feature set

To meet the automotive standards the TLT807B0 comes with a feature set, that includes:

- Output voltage accuracy at $\pm 2\%$
- Enable: reduces the current consumption to a minimum while the application is not used
- Adjustable output voltage: 1.2 V to 20 V
- Protection functions:
 - Output current limitation
 - Reverse polarity protection
 - Overtemperature shutdown
- Protected against high input transients up to 58 V for less than 400 ms

1.3 Block diagram

Following the block diagram of TLT807B0 is illustrated. It shows the device's basic feature set and their interaction. The parameters for each block shall be taken from the corresponding data sheet.

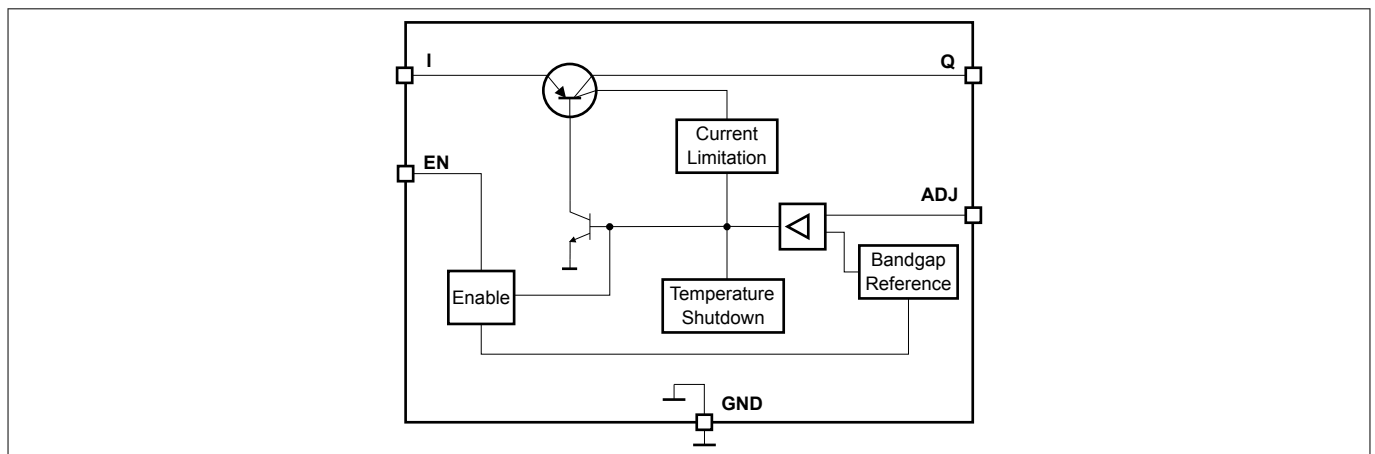


Figure 1 TLT807B0 block diagram

Demoboard

2 Demoboard

The TLT807B0 Demoboard is available for the PG-TSDSO-14 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 observe the device's behavior outside of the application and under isolated conditions of stress.

The figure [Figure 2](#) shows the TLT807B0 Demoboard.



Figure 2 TLT807B0 Demoboard

Demoboard

2.1 Operating conditions

To avoid electrical damage of the Demoboard, 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 | 36 | V | Regulated output voltage |
| Enable input signal | EN | 0 | 45 ³⁾ | V | Enable signal to switch on the regulator |

2.2 Demoboard configuration

The TLT807B0 Demoboard enables the operator to use and test the basic function set of the TLT807B0. This includes following features:

- Connecting the Enable input signal to the supply voltage VIN via jumper JP1
- Placeholder for additional input capacitor (C3)
- Placeholder for additional output capacitor (C1)
- Configure the output voltage via the resistor divider (R₁, R₂)
- Disable the resistor divider R₁, R₂ via jumper JP2 and JP3
- Connecting a external resistor divider via the banana jack ADJ

For further information regarding the configuration refer to the chapter [Schematic](#) and its component description.

2.2.1 Enable function

The jumper JP1 can be used to connect the EN signal to the supply voltage VIN 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 VIN; the regulator is enabled while it is supplied |
| Pin 2 to pin 1 | EN is pulled to GND |
| Open | EN is floating, external enable signal can be applied via the banana jack EN |

2.2.2 Adjustable output voltage

The TLT807B0 is an adjustable standby linear voltage regulator. Therefore the TLT807B0EPV Demoboard provides the option to configure the external voltage divider in two ways:

1. Changing the ratio of the voltage divider R₁ and R₂
2. Apply a feedback off board via the banana jack ADJ⁴⁾

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

² Functional input voltage range: 2.75 V to 42 V

³ Absolute maximum rating

⁴ Make sure that the voltage divider on board is disconnected by pulling jumper JP2 and JP3

Demoboard

When dimensioning the ratio of the voltage divider, equations

$$V_Q = \left(\frac{R_1}{R_2} + 1 \right) V_{\text{ref}}$$

Equation 1

$$R_1 + R_2 \leq 250 \text{ k}\Omega$$

Equation 2

Schematic and layout

3 Schematic and layout

Following the schematic and the layout of the board are illustrated. For a better understanding and tracing of the connections these figures can be used. In case of further questions please address to the IFAG ATV PSN AE support box.

3.1 Schematic

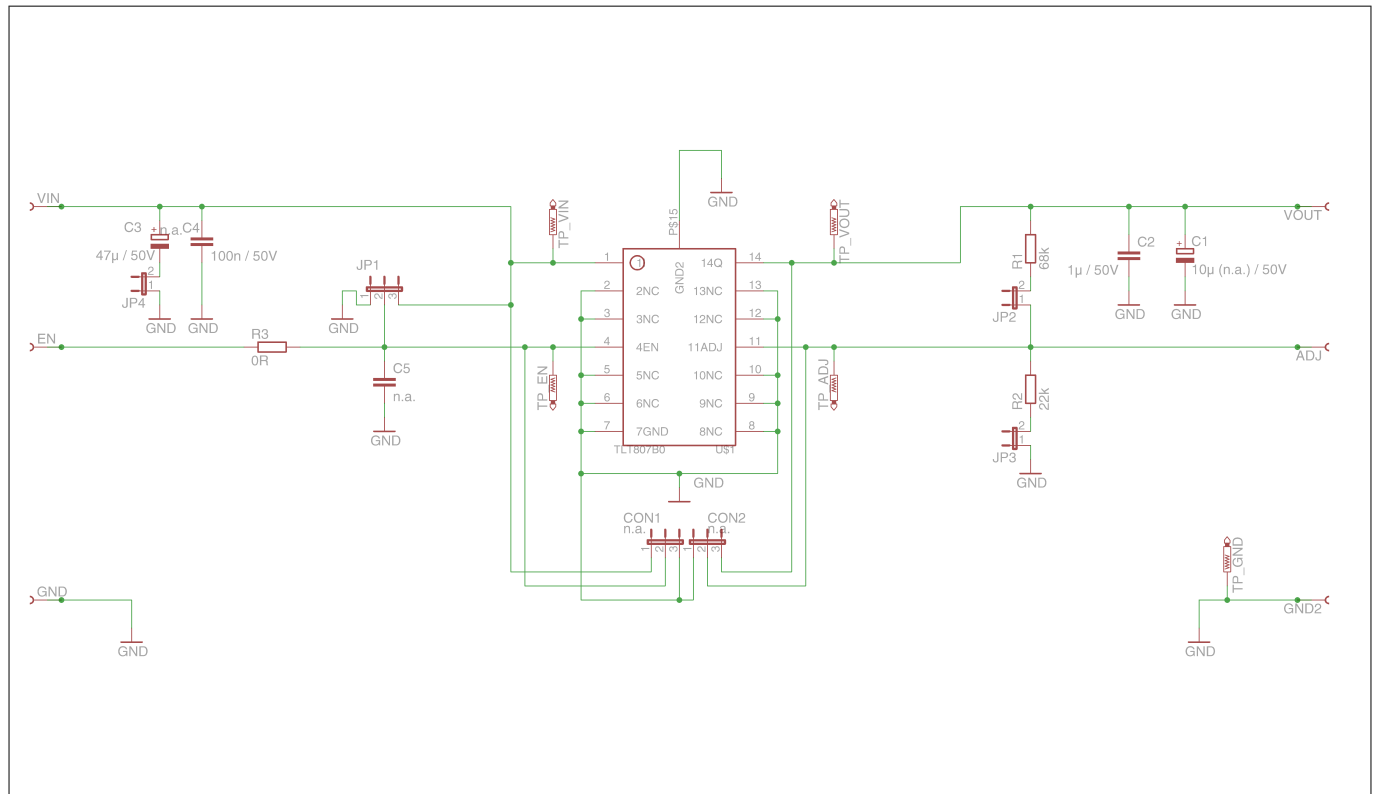


Figure 3 Schematic of TLT807B0 Demoboard

3.2 Layout

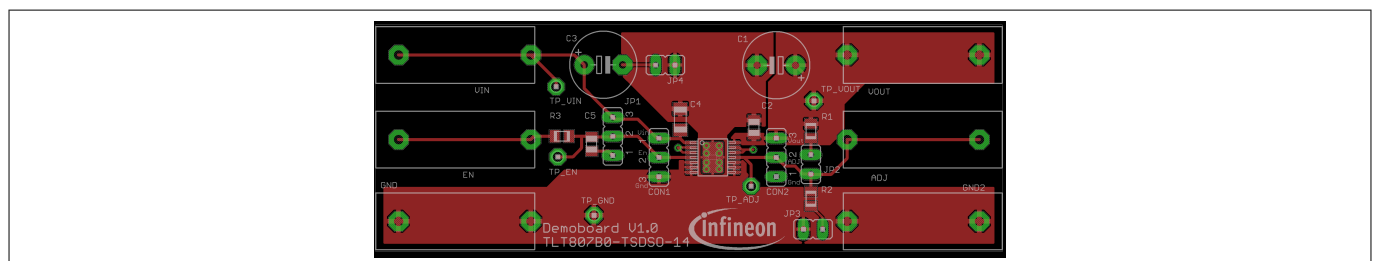


Figure 4 Top layer of TLT807B0 Demoboard

Schematic and layout

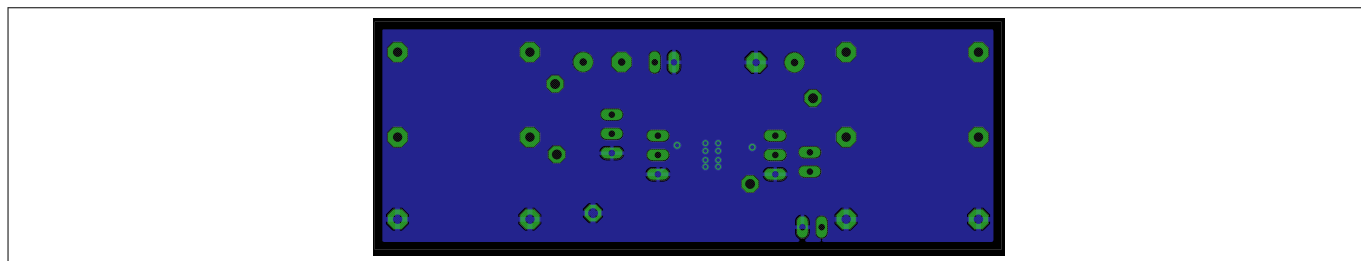


Figure 5 Bottom layer of TLT807B0 Demoboard

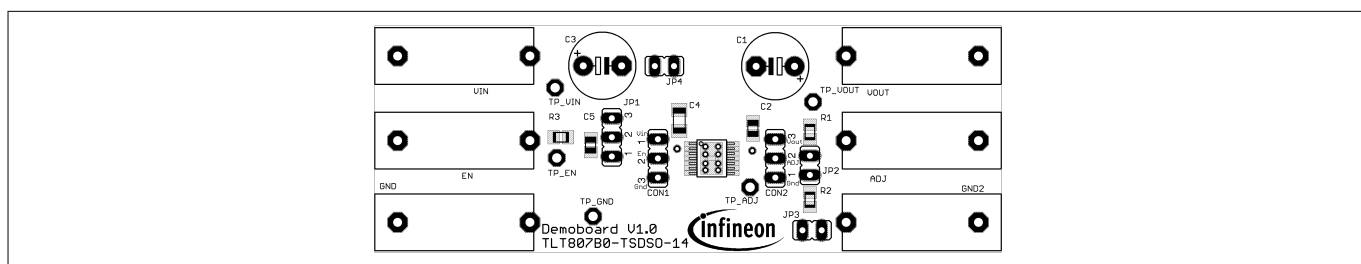


Figure 6 Top layer components of TLT807B0 Demoboard

Bill of material

4 Bill of material

Table 3 Bill of materials

| Part | Value | Device | Package | Description |
|---------|-----------------------|---------------|----------------------|--|
| ADJ | | BABU4MM | BANANENBUCHSE4 MM | |
| C1 | 10 μ (n.a.) / 50V | CPOL-EUE5-8.5 | E5-8,5 | POLARIZED CAPACITOR, European symbol |
| C2 | 1 μ / 50V | C-EUC0805 | C0805 | CAPACITOR, European symbol |
| C3 | 47 μ / 50V | CPOL-EUE5-8.5 | E5-8,5 | POLARIZED CAPACITOR, European symbol |
| C4 | 100n / 50V | C-EUC1206 | C1206 | CAPACITOR, European symbol |
| C5 | n.a. | C-EUC0805 | C0805 | CAPACITOR, European symbol |
| CON1 | n.a. | JP2E | JP2 | JUMPER |
| CON2 | n.a. | JP2E | JP2 | JUMPER |
| EN | | BABU4MM | BANANENBUCHSE4 MM | |
| GND | | BABU4MM | BANANENBUCHSE4 MM | |
| GND2 | | BABU4MM | BANANENBUCHSE4 MM | |
| JP1 | | JP2E | JP2 | JUMPER |
| JP2 | | JP1E | JP1 | JUMPER |
| JP3 | | JP1E | JP1 | JUMPER |
| JP4 | | JP1E | JP1 | JUMPER |
| R1 | 68k | R-EU_M0805 | M0805 | RESISTOR, European symbol |
| R2 | 22k | R-EU_M0805 | M0805 | RESISTOR, European symbol |
| R3 | 0R | R-EU_M0805 | M0805 | RESISTOR, European symbol |
| TP_ADJ | | PTR1PAD1-13 | P1-13 | TEST PIN |
| TP_EN | | PTR1PAD1-13 | P1-13 | TEST PIN |
| TP_GND | | PTR1PAD1-13 | P1-13 | TEST PIN |
| TP_VIN | | PTR1PAD1-13 | P1-13 | TEST PIN |
| TP_VOUT | | PTR1PAD1-13 | P1-13 | TEST PIN |

Bill of material

Table 3 Bill of materials (continued)

| Part | Value | Device | Package | Description |
|-------------|--------------|---------------|----------------------|--------------------|
| U\$1 | TLT807B0 | TLT807B0 | PG-TSDSO-14 | TruckVreg |
| VIN | | BABU4MM | BANANENBUCHSE4 MM | |
| VOUT | | BABU4MM | BANANENBUCHSE4 MM | |

Restrictions

5 Restrictions

The demoboard for the TLT807B0 is only intended to be used for evaluation and test purposes. Basic safety features and functions can be tested with it. It must not be used for any field 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] | TLT807B0EPV Data Sheet, Infineon Technologies AG: https://www.infineon.com/dgdl/Infineon-TLT807B0EPV-DS-v01_00-EN.pdf?fileId=5546d4625bd71aa0015c10aadb33e93 |

Revision history

7 Revision history

| Revision | Date | Changes |
|-----------------|-------------|-----------------|
| 1.0 | 2017-06-28 | Initial version |

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