TLS710/715B0 Demoboard

Product Manual

Z8F53922443

Application Note

Rev. 1.0, 2015-07-30

Automotive Power

1 Introduction

The TLS710/715B0 Demoboard is a demonstration of the Infineon low dropout linear voltage regulators TLS710/715B0 in PG-DSO-8 EP package.

This application note contains information for usage of the TLS710/715B0 Demoboard.

Table 1 provides an overview of the family members of TLS710/715B0 voltage regulators.

Table 1   Family Overview

Type	Output voltage	Output current	Enable	Reset	Package
TLS710B0EJV50	5.0 V	100 mA	Yes	No	PG-DSO-8 EP
TLS715B0EJV50	5.0 V	150 mA	Yes	No	PG-DSO-8 EP

1.1 General Description

The TLS710/715B0 is a low dropout linear voltage regulator for load current up to 100mA/150mA. An input voltage of up to 40 V is regulated to $V_{Q,nom}$ = 5 V with ±2 % precision.

The TLS710/715B0, with a typical quiescent current of 36 µA, is the ideal solution for systems requiring very low operating current, such as those permanently connected to the battery.

It features a very low dropout voltage of 200 mV at full load current. In addition, the dropout region begins at input voltages of 4.0 V (extended operating range). This makes the TLS710/715B0 Demoboard suitable to supply automotive systems with start-stop requirements.

The device can be switched on and off by the Enable feature.

In addition, the TLS710/715B0's new fast regulation concept requires only a single 1 µF output capacitor to maintain stable regulation.

The device is designed for the harsh environment of automotive applications. Therefore standard features like output current limitation and overtemperature shutdown are implemented and protect the device against failures like output short circuit to GND, over-current and over-temperature. The TLS710/715B0 can be also used in all other applications requiring a stabilized 5 V supply voltage.

1.2   TLS710/715B0 Feature List

- Wide Input Voltage Range from 4.0 V to 40 V
- Output Voltage 5 V
- Output Voltage Precision ±2 %
- Output Current up to 100 mA (TLS710B0) / 150 mA (TLS715B0)
- Low Current Consumption of 36 µA
- Very Low Dropout Voltage of typ. 200 mV at Full Output Current
- Stable with Small Output Capacitor of 1 µF
- Enable
- Overtemperature Shutdown
- Output Current Limitation
- Wide Temperature Range from -40 °C up to 150 °C
- Green Product (RoHS compliant)
- AEC Qualified

1.3   Block Diagram

Figure 1 shows the block diagram of TLS710/715B0.
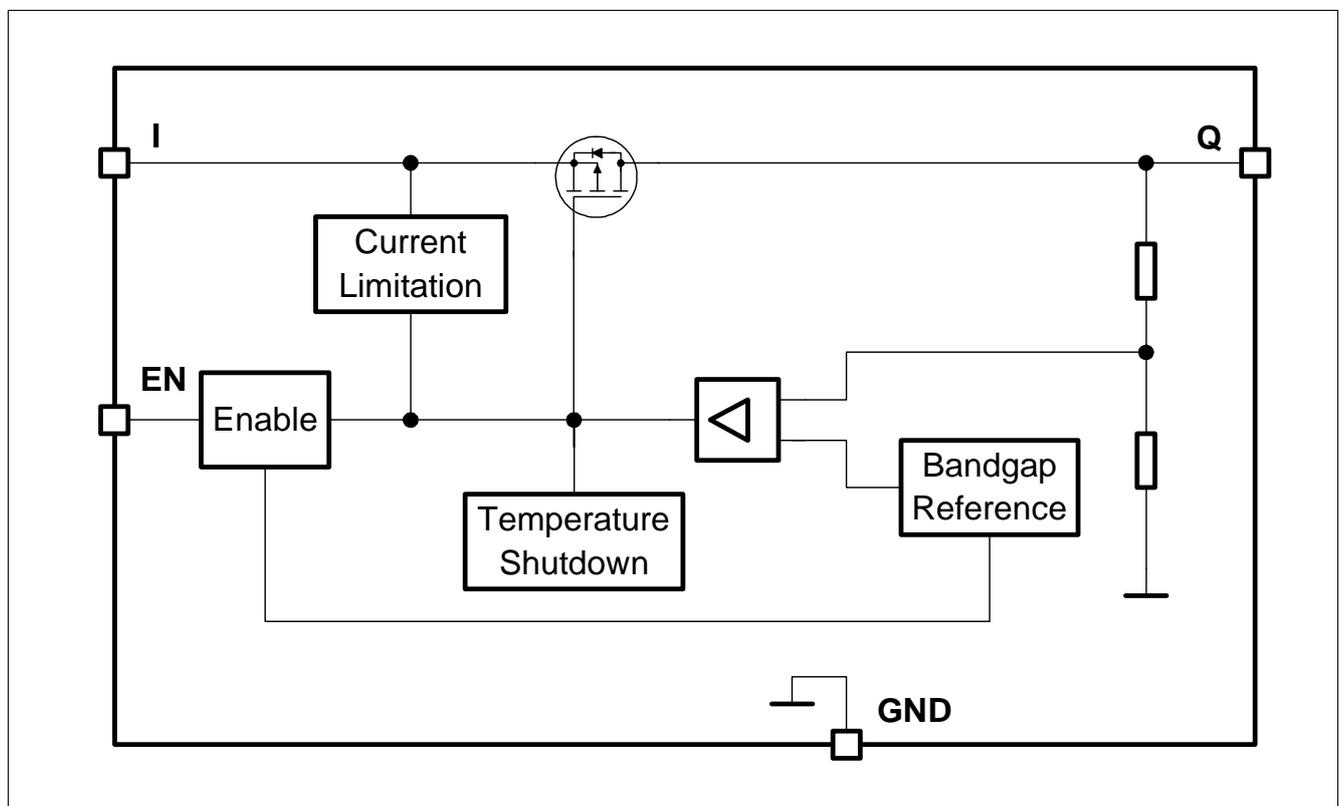
Figure 1   Block Diagram of TLS710/715B0

2 Demoboard

Figure 2 shows a TLS710/715B0 Demoboard equipped with TLS710B0EJV50.

Figure 2   TLS710/715B0 Demo Board

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[1]

Parameter	Symbol	Limit Values		Unit	Note
		Min.	Max.		
Board Supply[2]	VIN	0	45	V	Power supply
Regulator Output	VOUT	0	7	V	Regulated output voltage
Enable Signal	EN	0	45[3]	V	Enable signal to switch on the regulator
Ground	GND	0	0	V	System GND

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

2)   Functional input voltage range starts from 4 V to 40 V.

3)   Absolute max rating.

2.2   Board Configuration

The TLS710/715B0 Demoboard can be easily configured via jumpers on the board. The board provides the following configuration options:

• Bypassing the reverse protection diode D2 via solder option SJ1

• Connecting enable signal with the supply voltage VIN (CON1)

• Placeholder for additional input capacitor (C2)

• Placeholder for additional output capacitor (C5)

2.2.1   Enable Function

The jumper CON1 can be used to connect the EN signal to the supply voltage VIN.

Table 3   Jumper CON1 setting for enable function

CON1	Enable Function
set	EN is connected to the supply voltage VIN; the regulator is enabled while it is supplied
open	EN is supplied from external via connector EN (Banana jack)[1]

1)   Without suppling a signal to EN, the regulator is disabled because of an internal pull down resistor.

2.2.2   Signal Adaption

For easy signal adaption e.g. connecting probes for an oscilloscope, connectors CON_VIN, CON_EN, CON_VOUT and CON_GND can be used.

Table 4   Signals on connector

| Connector	Accessible Signals
CON_VIN	- VIN (input voltage)
CON_EN	- EN (enable input signal)
CON_VOUT	- VOUT (output voltage)
CON_GND	- GND

3 Schematic and Layout

3.1 Schematic
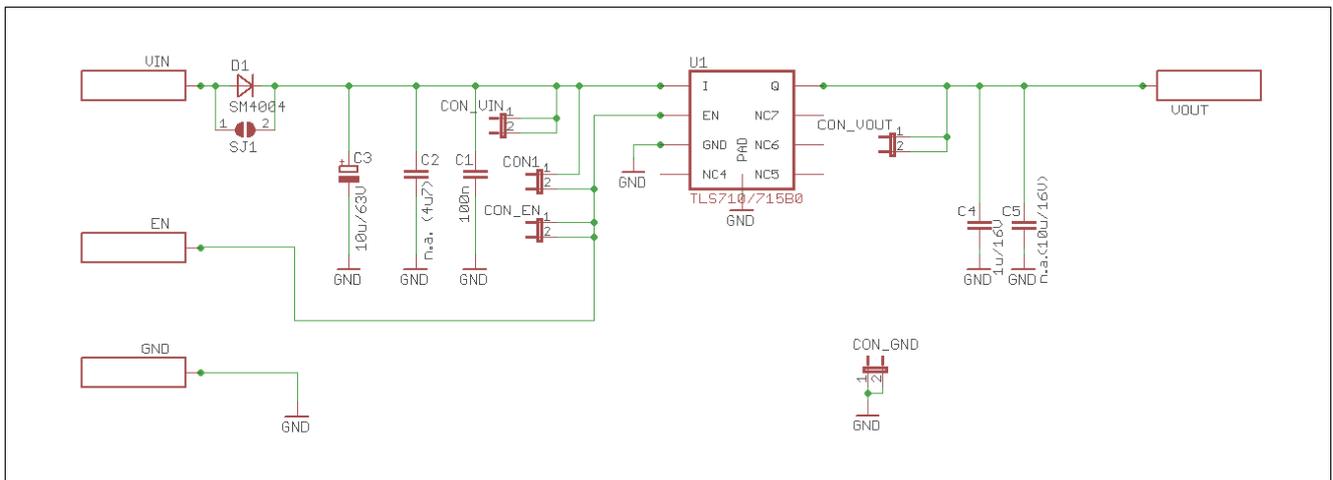
**Figure 3   Schematic of TLS710/715B0 Demoboard**

3.2 Layout
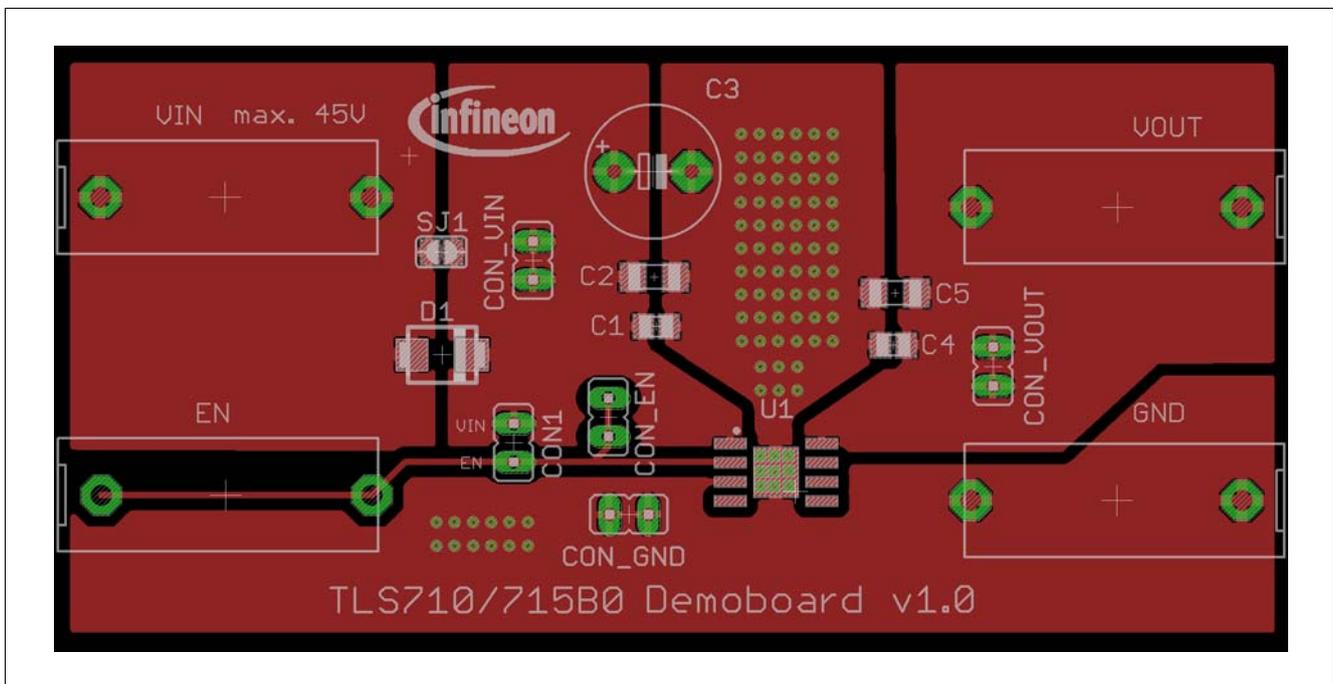

Figure 4   Top Layer of TLS710/715B0 Demoboard

![Infineon logo]
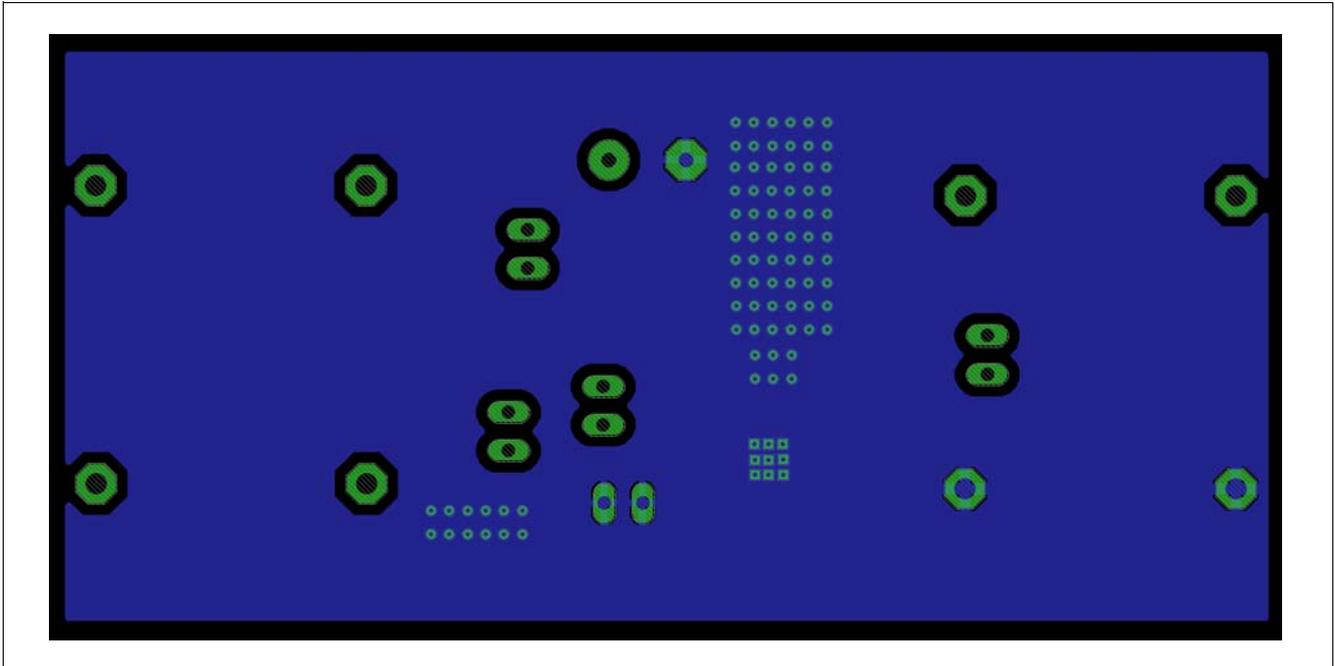
Figure 5   Bottom Layer of TLS710/715B0 Demoboard
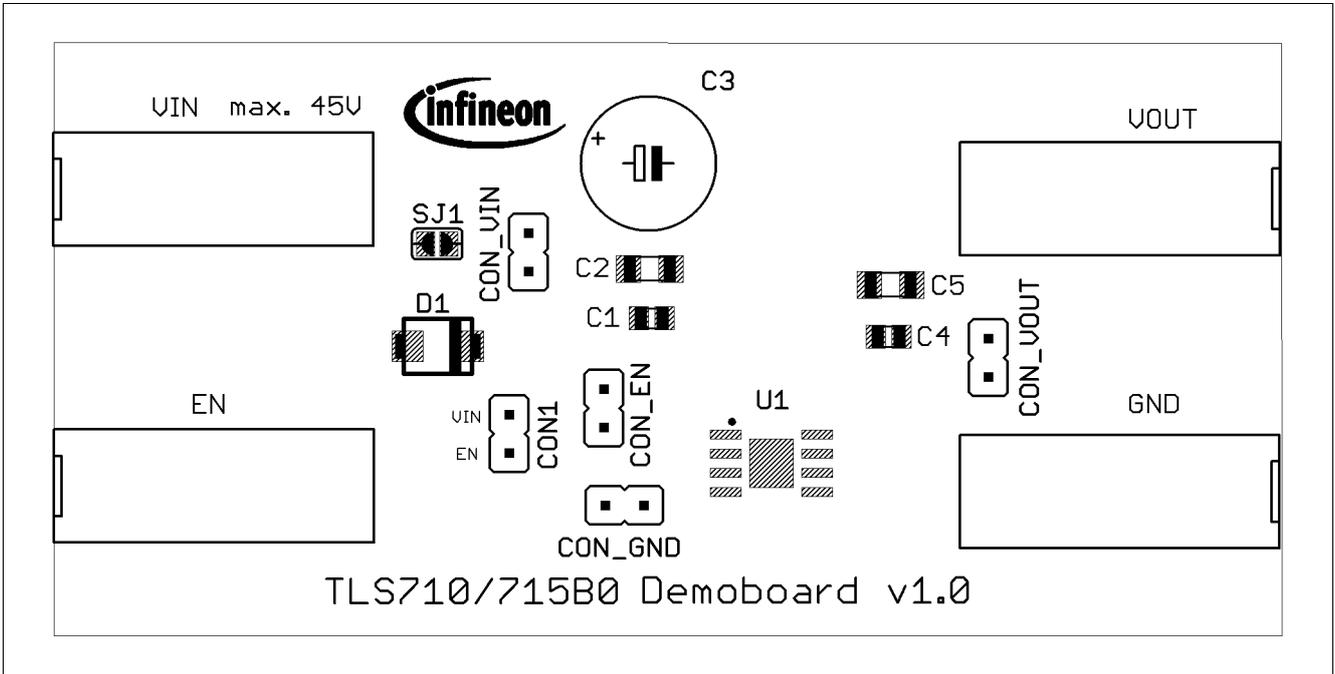
Figure 6   Top Layer components of TLS710/715B0 Demoboard

4   Bill of Material

Table 5   Bill of Material

Part	Value	Package
VIN	Banana jack	BABU4MM
VOUT	Banana jack	BABU4MM
EN	Banana jack	BABU4MM
C1	100n/50V	C0805
C2	n.a. (4u7/50V)	C1206
C3	100u/50V	E5-8,5
C4	1u/16V	C0805
C5	n.a. (10u/16V)	C1206
CON_VIN		2 pin connector
CON_EN		2 pin connector
CON_VOUT		2 pin connector
CON_GND		2 pin connector
CON1		jumper
SJ1		solder jumper
D1	SM4004	diode
U1	TLS710B0EJV50 / TLS715B0EJV50	PG-DSO-8 EP

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. You are not authorized to use the Demoboard in any production system.

5.2   Additional Information

- For further information you may contact **http://www.infineon.com/**

6 Revision History

Revision	Date	Changes
1.0	2015-07-30	Initial version

www.infineon.com

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (**www.infineon.com**).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office. Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.