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

<table>
<thead>
<tr>
<th>Type</th>
<th>Output voltage</th>
<th>Output current</th>
<th>Enable</th>
<th>Reset</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLS710B0EJV50</td>
<td>5.0 V</td>
<td>100 mA</td>
<td>Yes</td>
<td>No</td>
<td>PG-DSO-8 EP</td>
</tr>
<tr>
<td>TLS715B0EJV50</td>
<td>5.0 V</td>
<td>150 mA</td>
<td>Yes</td>
<td>No</td>
<td>PG-DSO-8 EP</td>
</tr>
</tbody>
</table>

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 \( V_{\text{Q,nom}} = 5 \text{ V} \) with \( \pm 2 \% \) 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 2 shows a TLS710/715B0 Demoboard equipped with TLS710B0EJV50.
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Max.</th>
<th>Unit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Supply</td>
<td>VIN</td>
<td>0</td>
<td>45</td>
<td>V</td>
<td>Power supply</td>
</tr>
<tr>
<td>Regulator Output</td>
<td>VOUT</td>
<td>0</td>
<td>7</td>
<td>V</td>
<td>Regulated output voltage</td>
</tr>
<tr>
<td>Enable Signal</td>
<td>EN</td>
<td>0</td>
<td>45</td>
<td>V</td>
<td>Enable signal to switch on the regulator</td>
</tr>
<tr>
<td>Ground</td>
<td>GND</td>
<td>0</td>
<td>0</td>
<td>V</td>
<td>System GND</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>CON1</th>
<th>Enable Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>set</td>
<td>EN is connected to the supply voltage VIN; the regulator is enabled while it is supplied</td>
</tr>
<tr>
<td>open</td>
<td>EN is supplied from external via connector EN (Banana jack)</td>
</tr>
</tbody>
</table>

1) Without supplying 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

<table>
<thead>
<tr>
<th>Connector</th>
<th>Accessible Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON_VIN</td>
<td>- VIN (input voltage)</td>
</tr>
<tr>
<td>CON_EN</td>
<td>- EN (enable input signal)</td>
</tr>
<tr>
<td>CON_VOUT</td>
<td>- VOUT (output voltage)</td>
</tr>
<tr>
<td>CON_GND</td>
<td>- GND</td>
</tr>
</tbody>
</table>
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]
Figure 5  Bottom Layer of TLS710/715B0 Demoboard

Figure 6  Top Layer components of TLS710/715B0 Demoboard
5.2 Additional Information

- For further information you may contact [http://www.infineon.com/](http://www.infineon.com/)
## Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2015-07-30</td>
<td>Initial version</td>
</tr>
</tbody>
</table>