

# OPTIREG™ Switcher TLE8386-2EL

## How to use the TLE8386-2EL demo board

### About this document

#### Scope and purpose

This document describes how to use the OPTIREG™ Switcher TLE8386-2EL demo board. Please refer to data sheet for more information.

## Table of Contents

	<b>About this document .....</b>	<b>1</b>
	<b>Table of Contents .....</b>	<b>2</b>
<b>1</b>	<b>Abstract .....</b>	<b>3</b>
<b>2</b>	<b>Description .....</b>	<b>4</b>
2.1	Quick Start .....	4
<b>3</b>	<b>Revision History .....</b>	<b>9</b>

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**Abstract**

## **1 Abstract**

The following application note shall enable the user to operate the TLE8386-2EL demo board. The TLE8386-2EL is a Step-Up controller with external power stage.

The demo board is equipped with a TLE8386-2EL, it is preset to  $\sim 27$  V output voltage.

*Note: The following information is given as a hint for the implementation of our devices only and shall not be regarded as a description or warranty of a certain functionality, condition or quality of the device.*

## Description

## 2 Description

### 2.1 Quick Start

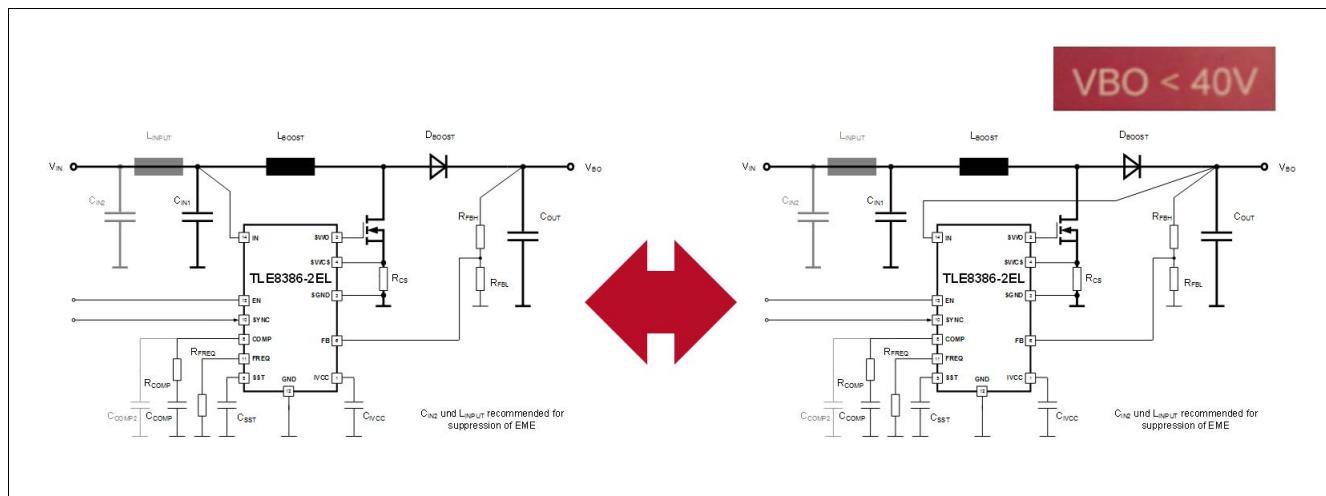
A cranking pulse at battery voltage is a potential risk for connected ECUs to suffer from supply voltage drop and reset pulses. A common practice is to install a step up or boost converter in front of the ECU (as an additional pre regulator) to maintain a minimum input voltage to ensure uninterrupted operation of the ECU. The TLE8386-2EL is a boost controller with an external power stage and is well fitting for such purpose.



Figure 1 Quick start

- Connect **GND** to ground
- Connect **V\_IN** to the voltage supply
- Connect **ENABLE** to **V\_IN** to start the board
- With **SYNC** you may synchronize the TLE8386-2EL to an external frequency source (please refer to data sheet for more information)
- The output voltage is present at **V\_OUT**
- **Source** offers you the possibility to run the TLE8386-2EL as a current source
- Pay attention if the demo board is marked with a red sticker “VBO < 40V”
- The sticker “VBO < 40V” indicates a demo board with modified schematic for cranking measure

## Description



**Figure 2 Deviations between normal demo board and counter cranking demo board**

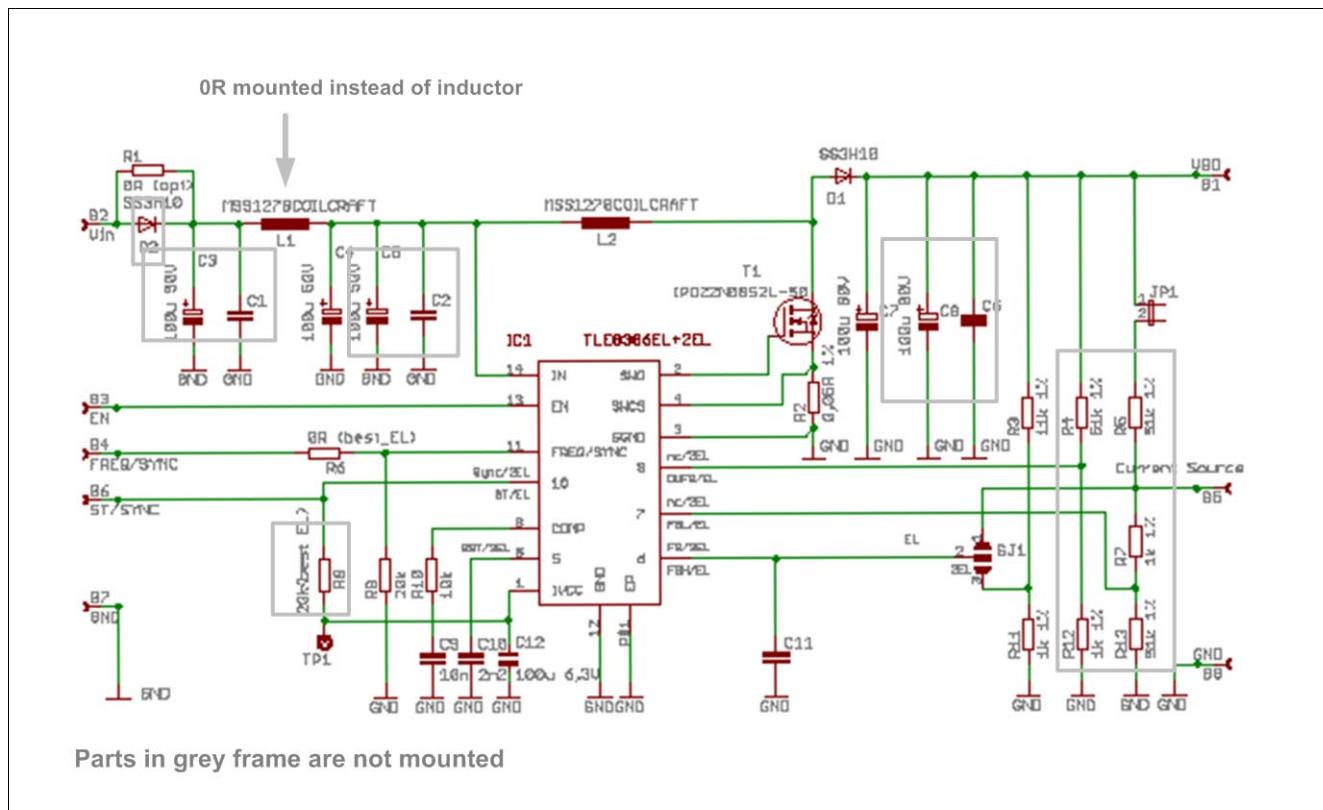
- **Normal demo board (left):** The IN pin of the TLE8386-2EL is connected to input voltage V\_IN, therefore the output voltage VBO is not limited.
- **Counter cranking demo board (right):** The IN pin of the TLE8386-2EL is connected to output voltage VBO, therefore the output voltage VBO must be limited to max 40 V not to overstress the maximum ratings of pin IN of TLE8386-2EL.

Please refer to data sheet for details.

Demo boards for both applications look similar, on normal demo boards the sticker “VBO < 40V” is missing, a red sticker “VBO < 40V” indicates, that the demo board layout is the cranking counter measure application.

The maximum output voltage of TLE8386-2EL is limited by maximum current rating of pin IN.

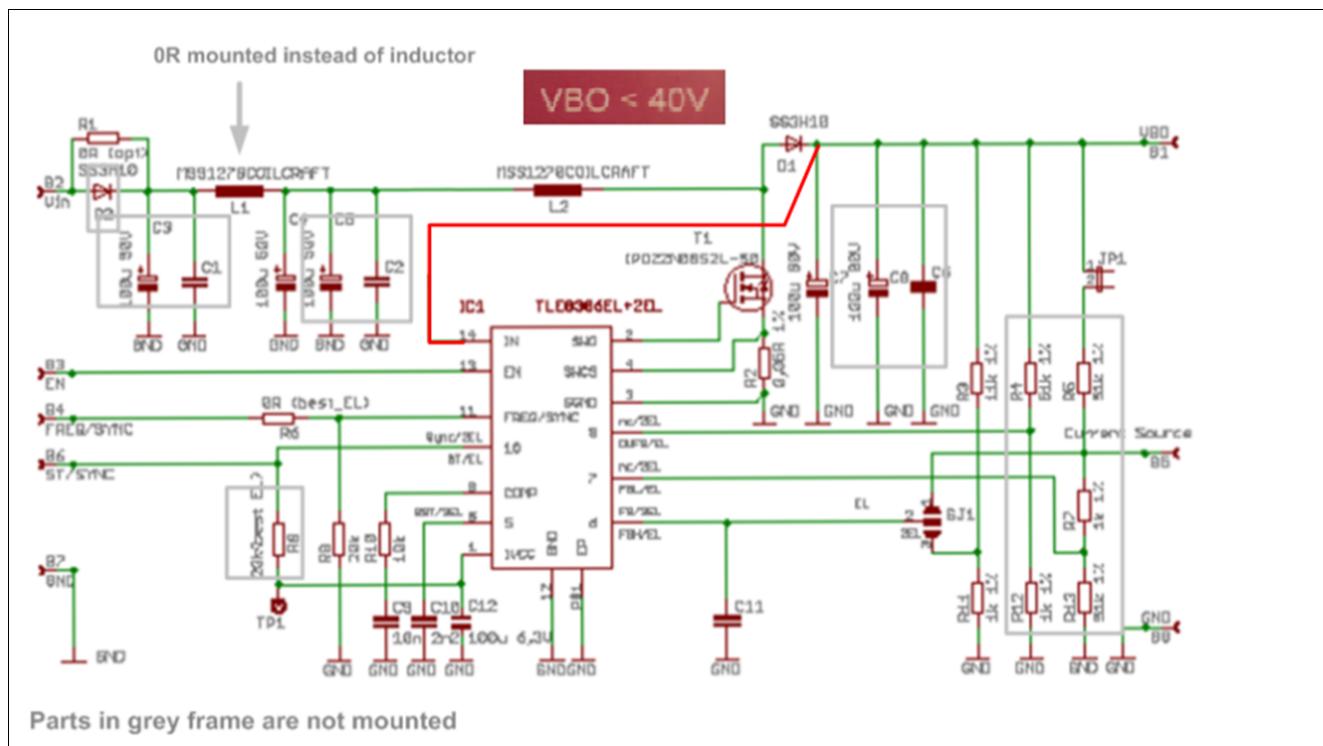
**Description**



**Figure 3 Original Boost Converter Application Circuit**

Figure 3 above shows the original boost converter application as given in the data sheet for boost applications. Pin IN is connected to the input voltage. If input voltage should drop below Input undervoltage shutdown threshold  $V_{IN,off}$ , the TLE8386-2EL will stop working.

Figure 4 below shows the modification, pin IN (14) is now connected to the output capacitor  $C_{OUT}$ .



**Figure 4 Modified Boost Converter Application Circuit for Cranking Counter measure**

Description

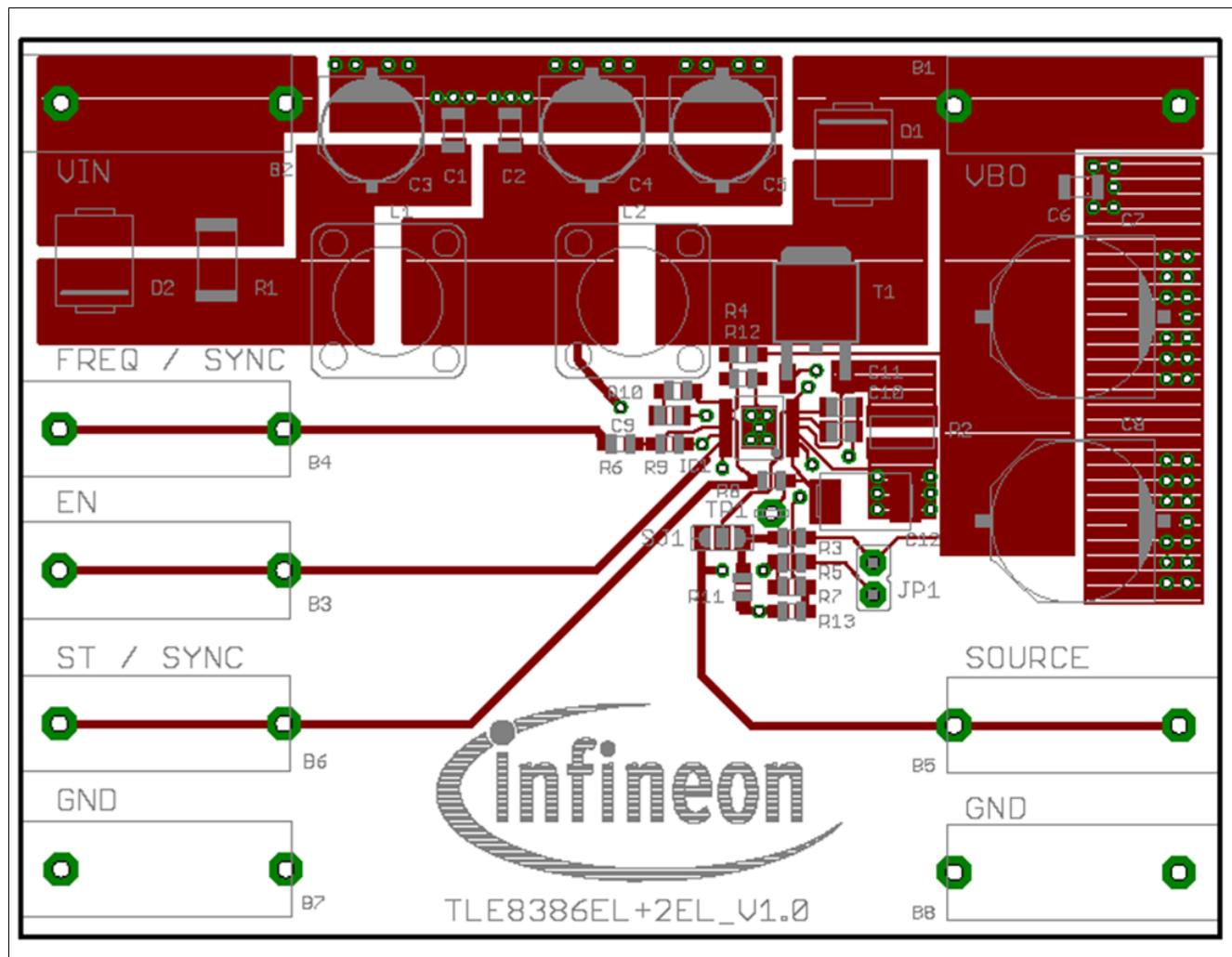


Figure 5 Demo board layout - normal boost configuration

**Description**

BoardNumber	PartNumber
IC1	TLE8386_2
T1	IPD22N08S2L-50
D1	SS3H10
D2	n.c.
R1	0 R
R2	0.05 R
R3	11 kR.
R4	n.c
R5	n.c
R6	n.c.
R7	n.c.
R8	n.c.
R9	20 kR
R10	10 kR
R11	1 kR
R12	n.c.
R13	n.c.
C1	n.c.
C2	n.c.
C3	n.c.
C4	100 $\mu$ F/ 50V
C5	n.c.
C6	n.c.
C7	100 $\mu$ F/ 80V
C8	n.c.
C9	10 nF
C10	2.2 nF
C11	n.c.
C12	1 $\mu$ F
L1	0 R mounted
L2	MSS1278COILCRAFT
B1	4 mm Banana Jack red
B2	4 mm Banana Jack red
B3	4 mm Banana Jack red
B4	4 mm Banana Jack red
B5	4 mm Banana Jack red
B6	4 mm Banana Jack red
B7	4 mm Banana Jack black
B8	4 mm Banana Jack black
JP1	Jumper
TP1	Testpoint

**Figure 6 Demo board bill of material**

**Revision History**

**3 Revision History**

<b>Revision</b>	<b>Date</b>	<b>Changes</b>
1.0	2018-08-01	Application Note created.

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