




ST UM2921 EVAL-L99H02XP Evaluation Board User Manual

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UM2921 User manual EVAL-L99H02XP Evaluation board

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Introduction

The EVAL-L99H02XP is an evaluation board designed to control 4 external N-channel MOS transistors in bridge configuration for DC-motor driving in automotive applications.

EVAL-L99H02XP board

The EVAL-L99H02XP is composed of a motherboard and a daughterboard on which is pre-assembled the EVAL-L99H02XP (see **Figure1**). The system features an enhanced power management power supply functionality including various standby modes.

The motherboard, based on the STM8 microcontroller, provides the logic section for monitoring and driving the EVAL-L99H02XP assembled in the daughterboard.

With the aim to make the board usage and setting simpler, STM provides a dedicated Graphic User Interface (GUI). This enables the user to set EVAL-L99H02XP parameters and at the same time, it shows real-time device information.

Figure 1. EVAL-L99H02XP



Hardware description and setup

This section provides a description of the main components of this evaluation kit, giving instructions for a quick setup of the system.

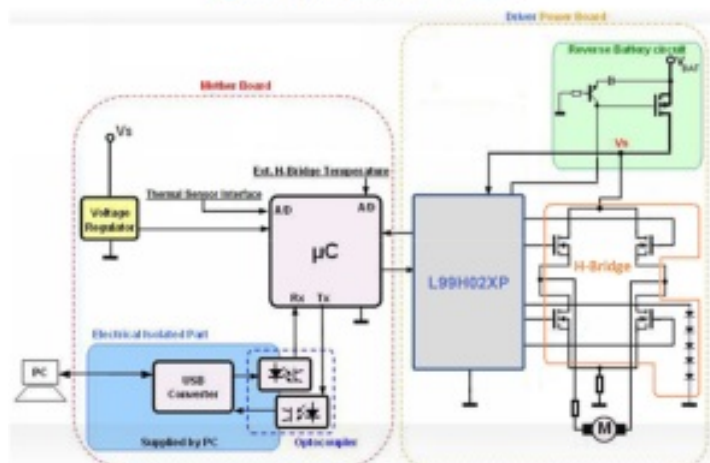
2.1 Components description

The evaluation kit consists of two main components:

- 1 Motherboard based on STM8A microcontroller, interfacing host PC with daughterboard. The communication with the PC is established through isolated USB.
- 1 Daughterboard assembling EVAL-L99H02XP.

The daughterboard with EVAL-L99H02XP and the motherboard is already properly plugged provided.

Figure 2. EVAL-L99H02XP block diagram



2.2 Motherboard schematic

A universal motherboard is used to control and drive the daughterboard containing the EVAL-L99H02XP. The motherboard has the following functions:

- USB-to-UART conversion: an FT232RL USB to serial UART interface is used to convert the data from the GUI, in the PC, in commands that are processed by the microcontroller.

- STM8AF51xAT microcontroller: it is used to convert the commands from the GUI in control signals for the L99H02XP in the daughterboard. Also, it processes the data received from the L99H02XP and returns the results to the GUI by the USB.
- L4995R LDO: this LDO is used to convert the +12 V used to supply the motherboard to a +5 V voltage used to supply the microcontroller and the L99H02XP in the daughterboard.
- Socket and connectors to plug the daughterboard.

The motherboard schematic is shown in the following figures. Schematic and BOM of the motherboard can be found on the ST website.

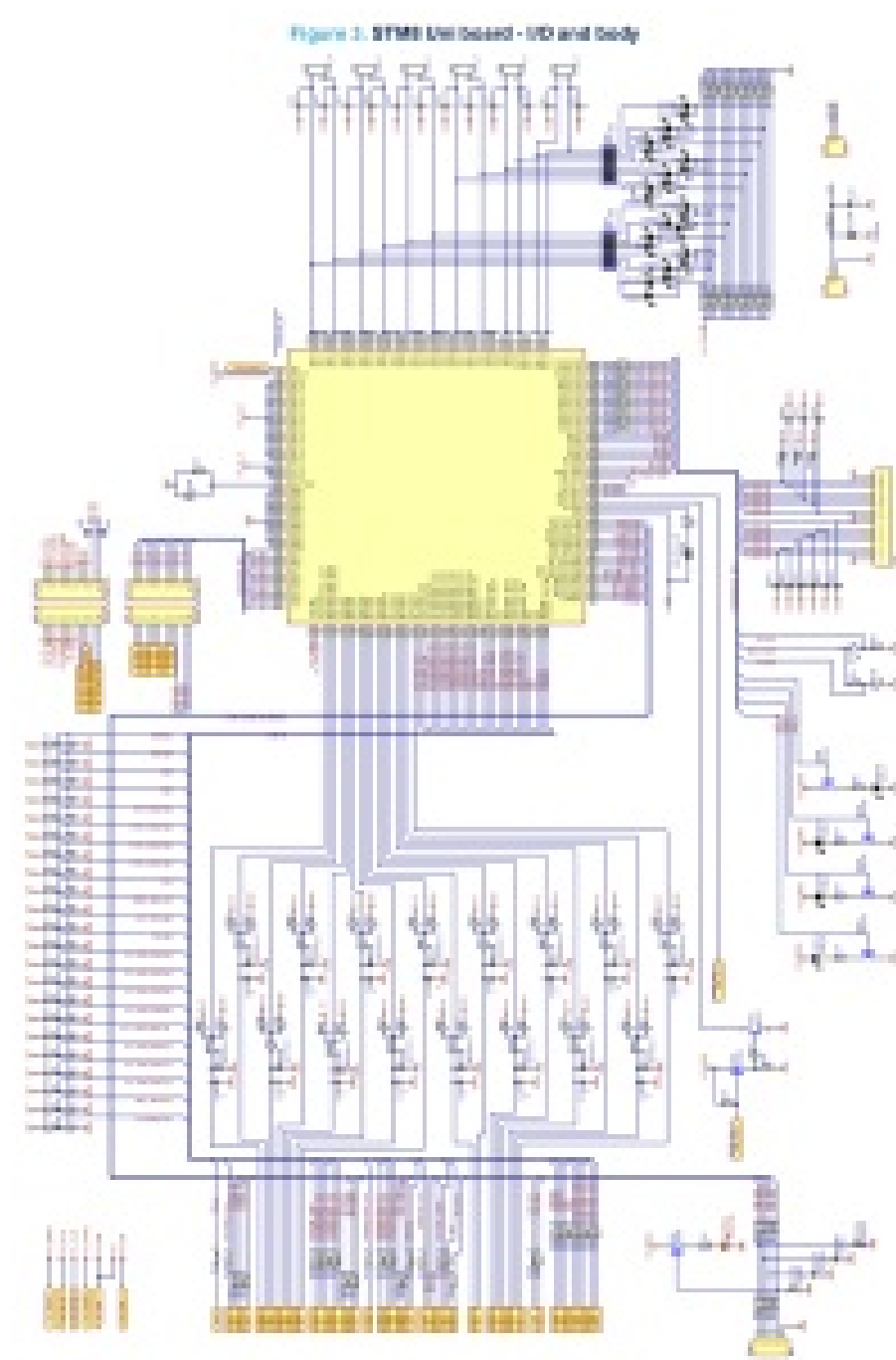
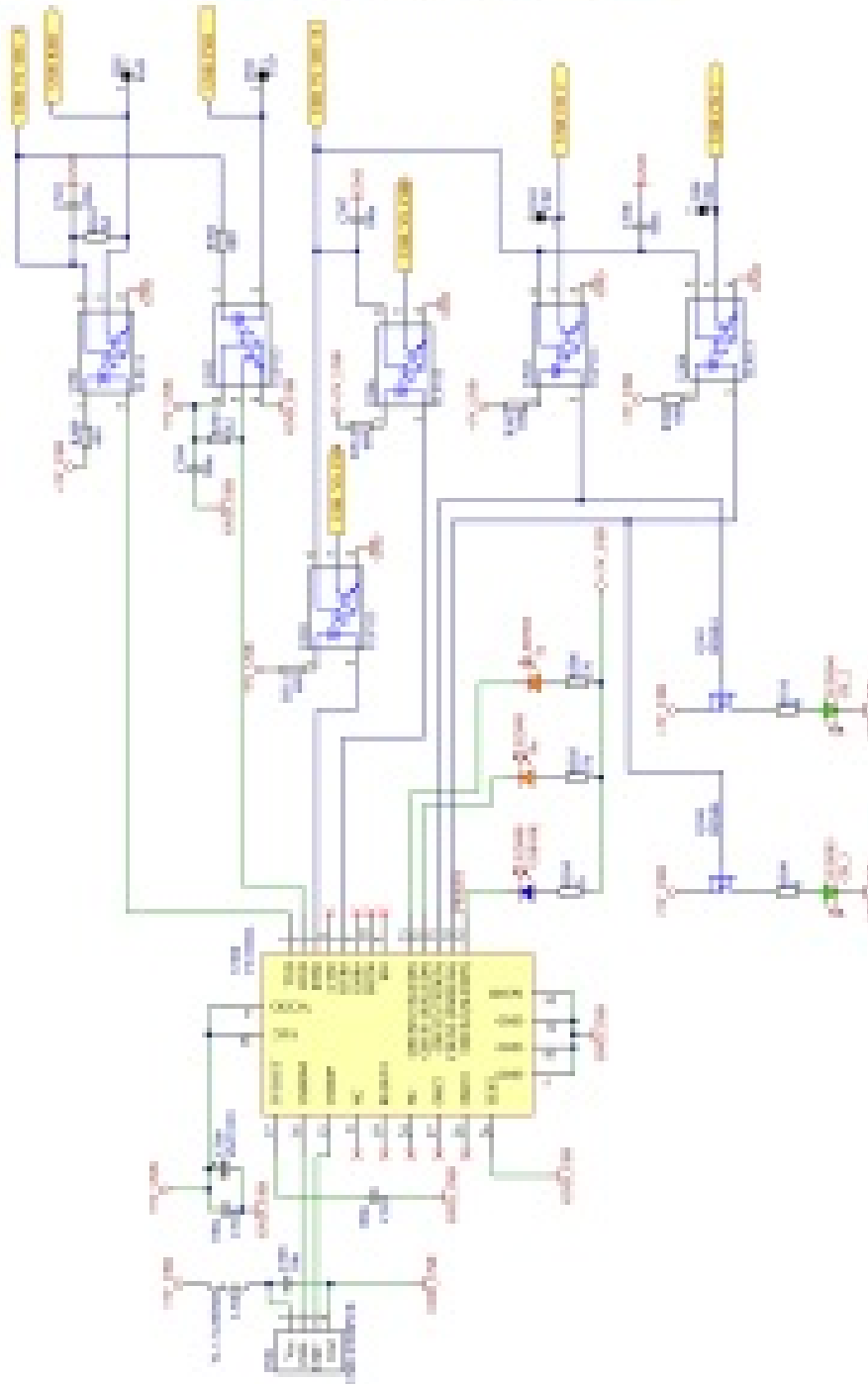


Figure 5. STM32-Unit board - STM32 and supply



2.3 Daughterboard schematic

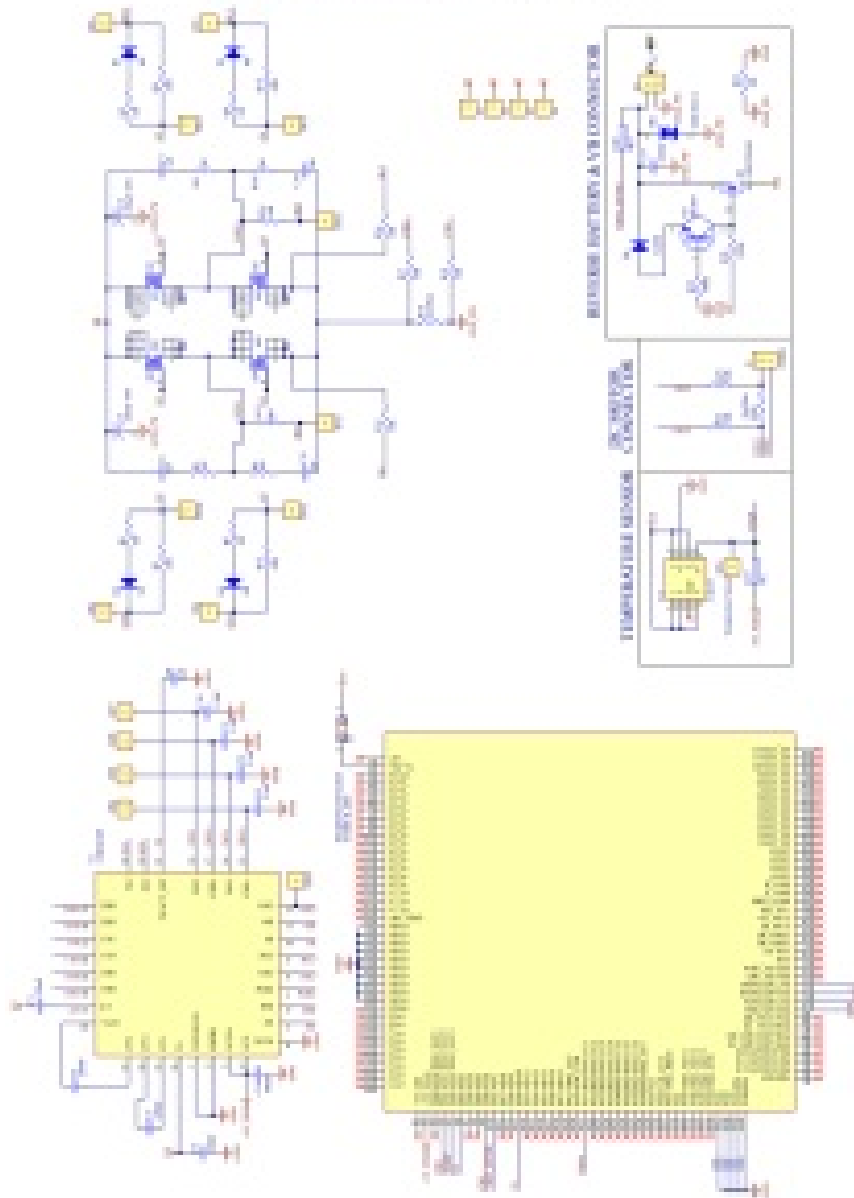
Figure 6 shows the schematic of the daughterboard.

In the daughterboard the following sections are present:

- 1 EVAL-L99H02XP and the components necessary for its functionality.
- 1 connector to the motherboard.
- 1 temperature sensor LM135.
- 1 DC motor connector.
- 1 reverse battery network and VB connector.
- 1 H-bridge.

The schematic and BOM of the daughterboard can be found on the ST website.

Figure 6. EVAL-L99H02XP daughterboard schematic



2.4 Motherboard layout

The EVAL-L99H02XP motherboard was designed in a 2 layers board. Motherboard Top and Bottom layers are shown in the **Figure 7** and **Figure 8**. Gerber files of the motherboard can be found on the ST website

Figure 7. Assembly Top

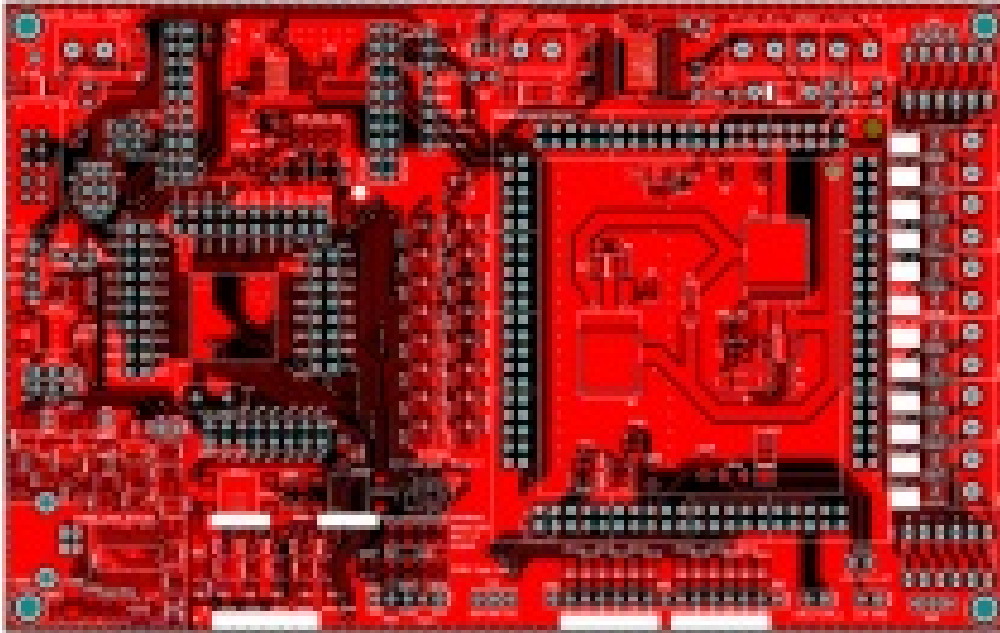
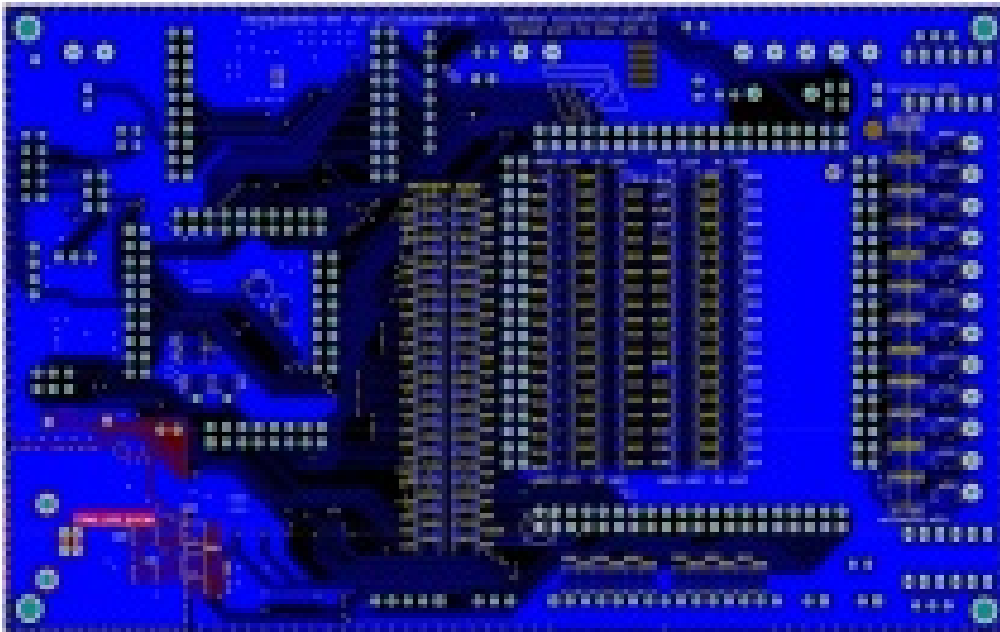


Figure 8. Assembly Bottom



2.5 Daughterboard layout

The different choices regarding the number of layers can be used. A two-layers or an N-layers (where N can be 3 or 4) application board can be used to develop the board for the L99H02XP application.

A 4 layers solution was chosen to design the EVAL-L99H02XP daughterboard to increase the ground area on which to disperse the heat.

The Top, Inner 1, Inner 2, and Bottom layers are shown in the following figures.

Gerber files of the daughterboard can be found on the ST website.

Figure 9. Assembly Top

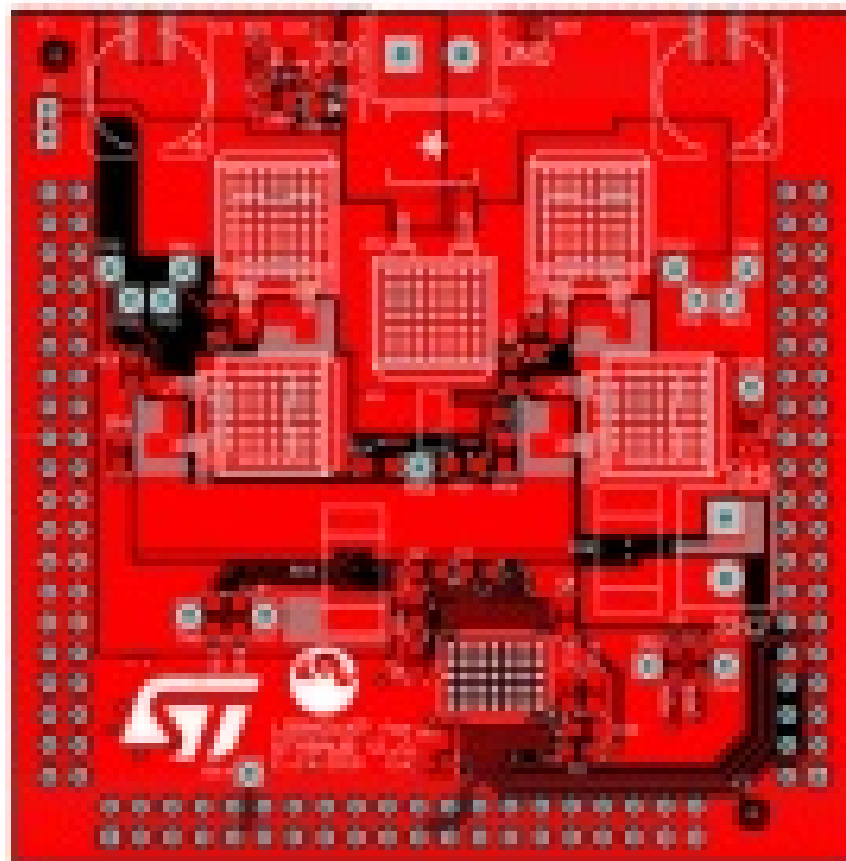


Figure 10. Inner 1

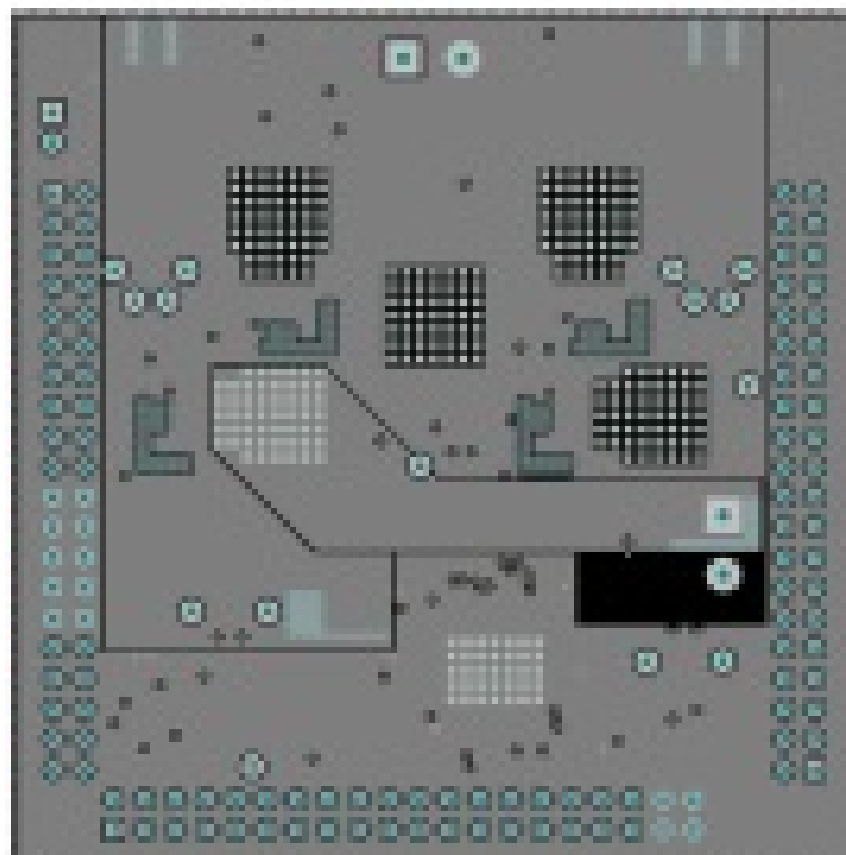


Figure 11. Inner 2

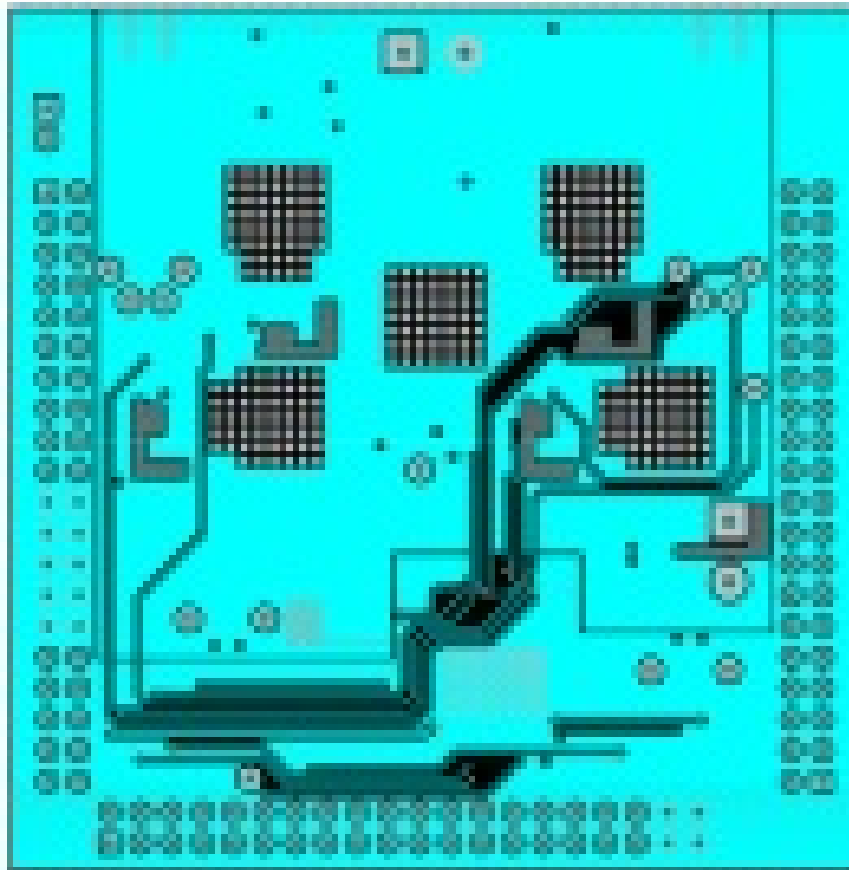
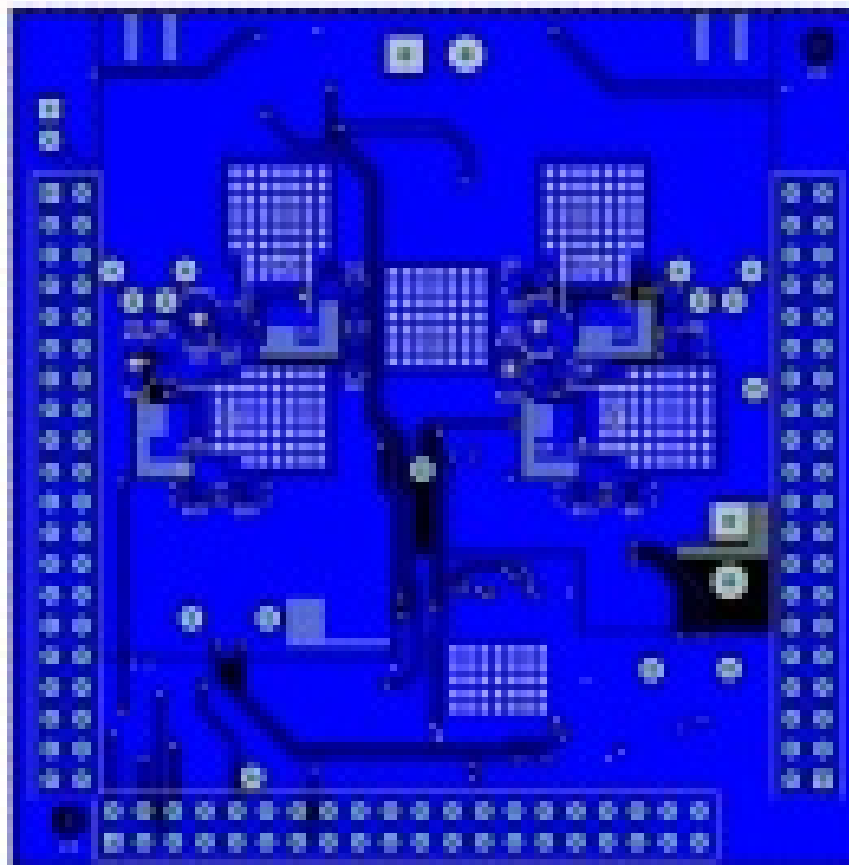


Figure 12. Assembly Bottom



2.6 Board connection and setup

Figure 13 shows the placement of the components on the motherboard. Also, the placement of the connectors to

be used to supply the evaluation board and to connect with a host PC through a USB cable is shown.

Figure 13. Motherboard section

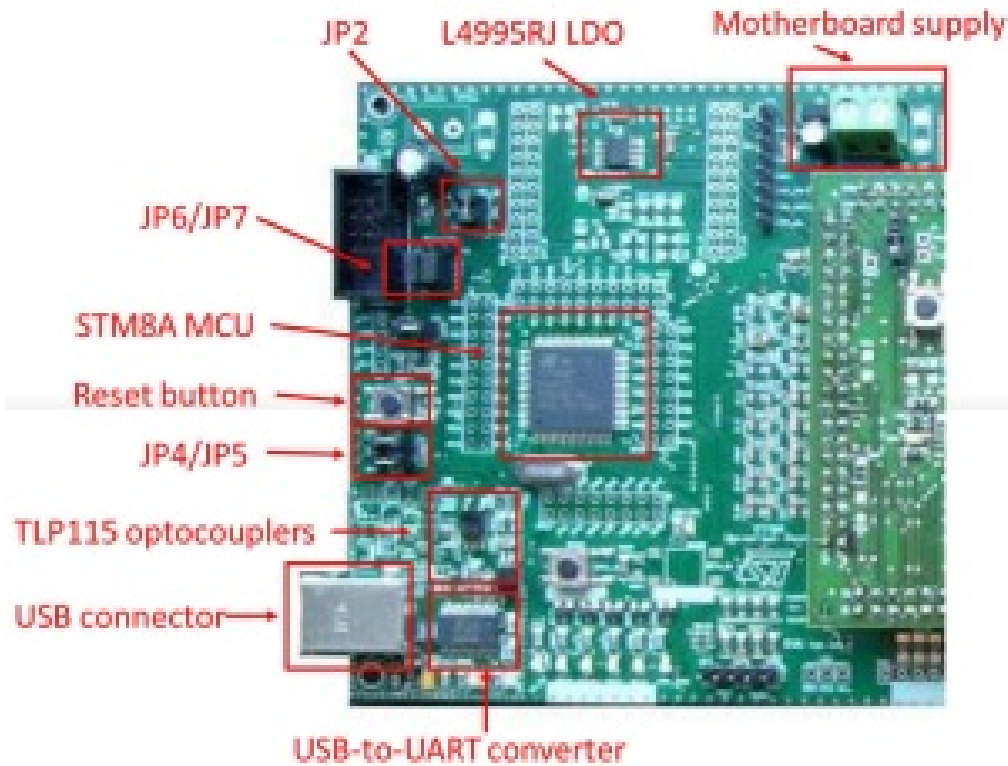
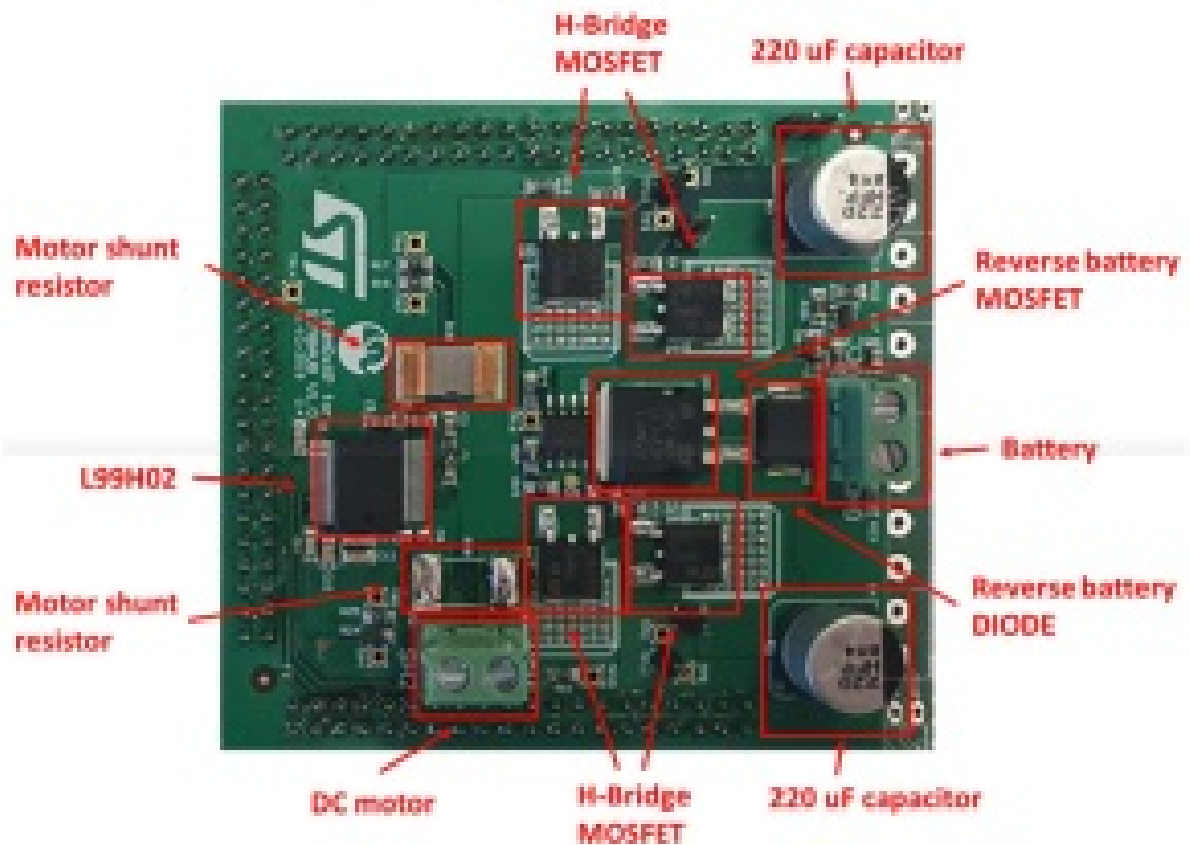


Figure 14 shows the placement of the components on the daughterboard.

Figure 14. Daughterboard section



Jumpers of the motherboard are already set in their default position.

Table 1. Motherboard jumper configuration

Jumper	Description
JP2	+5 V_DB
JP2	+5 V_STM8
JP4	RxD
JP5	TxD
JP6	Reset
JP7	Swim

Revision history

Table 2. Document revision history

Date	Version	
2-Nov-21	1	

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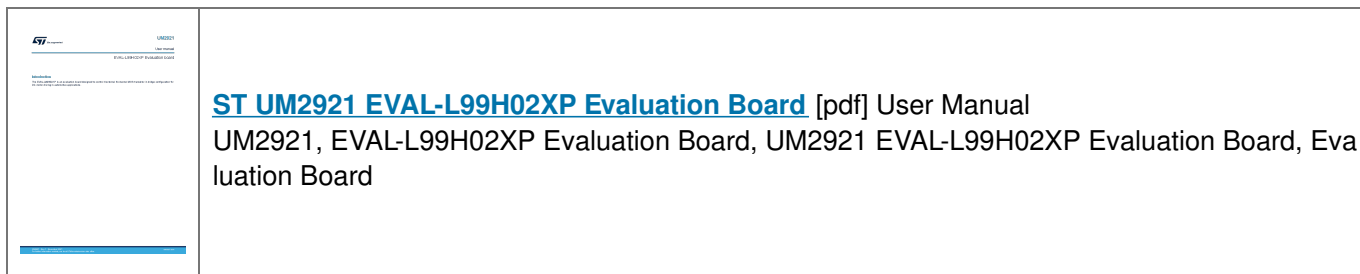
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