

L9963E BMS IC evaluation board



Features

- Measures from 4 to 14 cells in series, with 0 μ s desynchronization delay between samples. Supports also busbar connection without altering cell results
- Coulomb counter supporting pack overcurrent detection in both ignition on and off states
- Fully synchronized current and voltage samples
- 16-bit voltage measurement
- 2.66 Mbps isolated serial communication with regenerative buffer, supporting dual access ring
- Transformer based isolation
- Up to 4 analog inputs for NTC sensing; plus PCB temperature sensing
- Onboard microcontroller SPC574S64E3 with 32-bit Power Architecture MCU for automotive chassis and safety applications
- Onboard L9001 regulator as microcontroller power supply
- Hot plug dedicated circuit

Description

The EVAL-L9963E-MCU is a hardware tool for evaluation of L9963E, automotive chip for battery management applications. It can be used for the development of a 48 V battery management system (BMS) or as lower stage of a distributed BMS (depending on total battery voltage. Additional stages can be added thanks to EVAL-L9963E-NDS).

EVAL-L9963E-MCU allows the user to connect up to 14 channels for cell voltage sensing, one channel for current sensing, and up to 4 analog input for temperature sensing (plus an additional on-board NTC to sense PCB temperature). The board provides an onboard microcontroller with preloaded GUI (graphical user interface) firmware intended to be used with STSW-L9963E PC GUI.

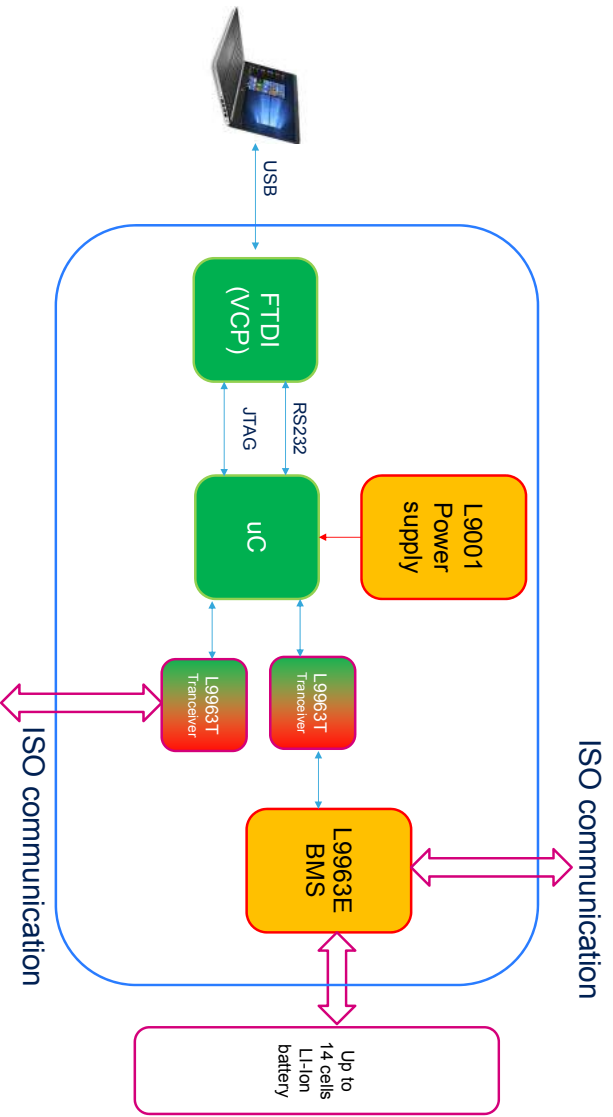
Product status link	
EVAL-L9963E-MCU	
Product summary	
Order code	EVAL-L9963E-MCU
Reference	EVAL-L9963E-MCU evaluation board

1 Hardware description

The EVAL-L9963E-MCU board provides maximum flexibility, giving access to all pins to simplify the evaluation and debug phase of the device.

1.1 Block diagram

Figure 1. EVAL-L9963E-MCU block diagram



1.2 Featured components

The EVAL-L9963E-MCU can be considered a reference design for a 48 V BMS or as a first layer of a distributed BMS system. In the following table there is a short description of all the ST featured components.

Table 1. Featured components

Name	Description
L9963E	Automotive chip for battery management applications
L9963T	Automotive SPI to isolated SPI transceiver
L9001	Automotive power supply IC with multiple voltage regulators
SPC574S64E3	32-bit Power Architecture MCU for automotive chassis and safety applications



2 Minimum system requirements

- PC with Windows 7.0 or higher
- Mini USB to USB type A cable
- Power supply:
 - At least 3 output 0 – 30 V (if possible 60V):
 - 1 output to power L9963E (0:60 V)
 - 1 output to simulate cells common mode voltage (0:60V)
 - 1 output to simulate cell voltage (0:5V)
 - 12 V power supply with 2.1 mm jack output, internal pin +

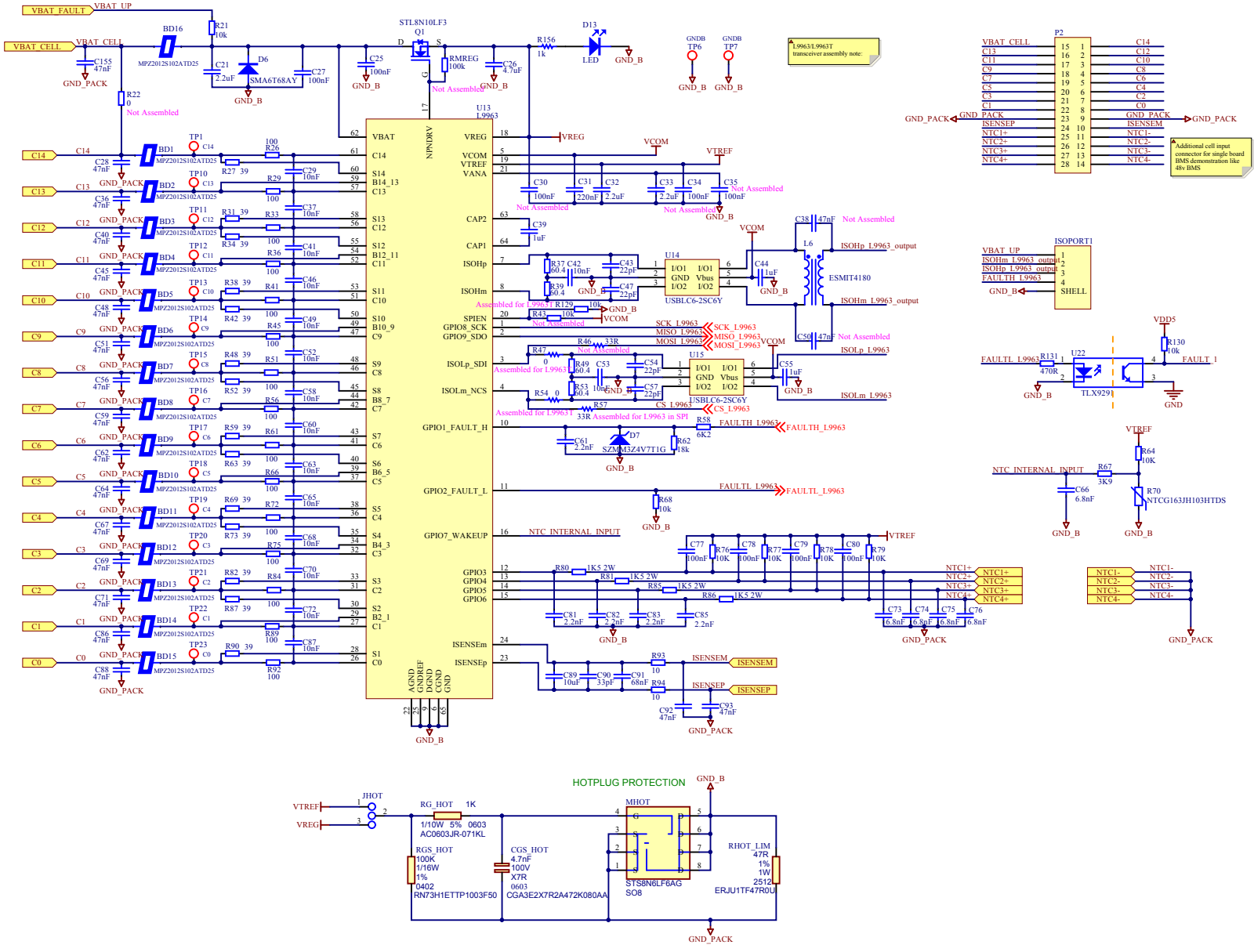


Figure 2. Board schematic (1/5)

3 Board schematics



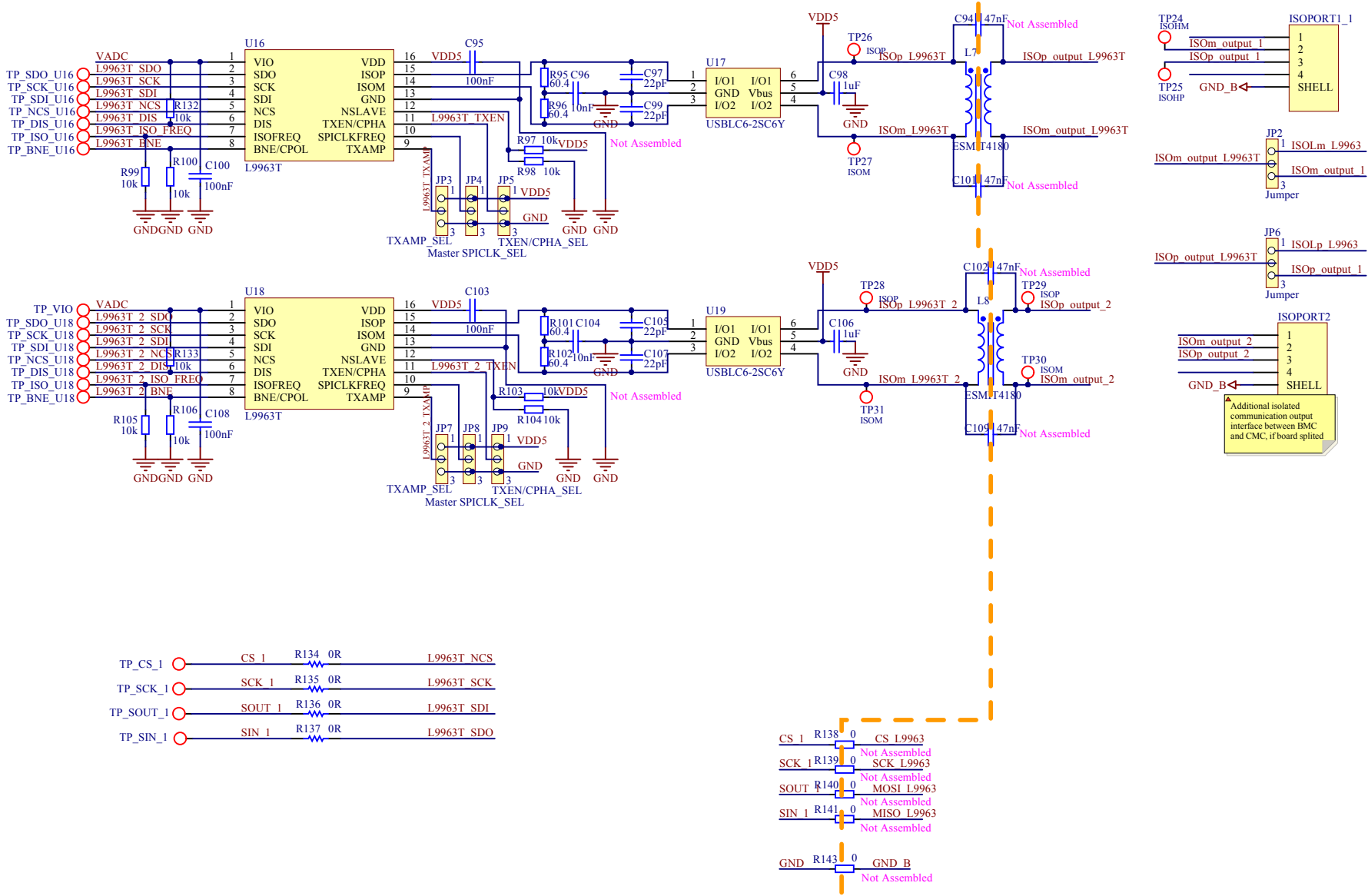


Figure 3. Board schematic (2/5)

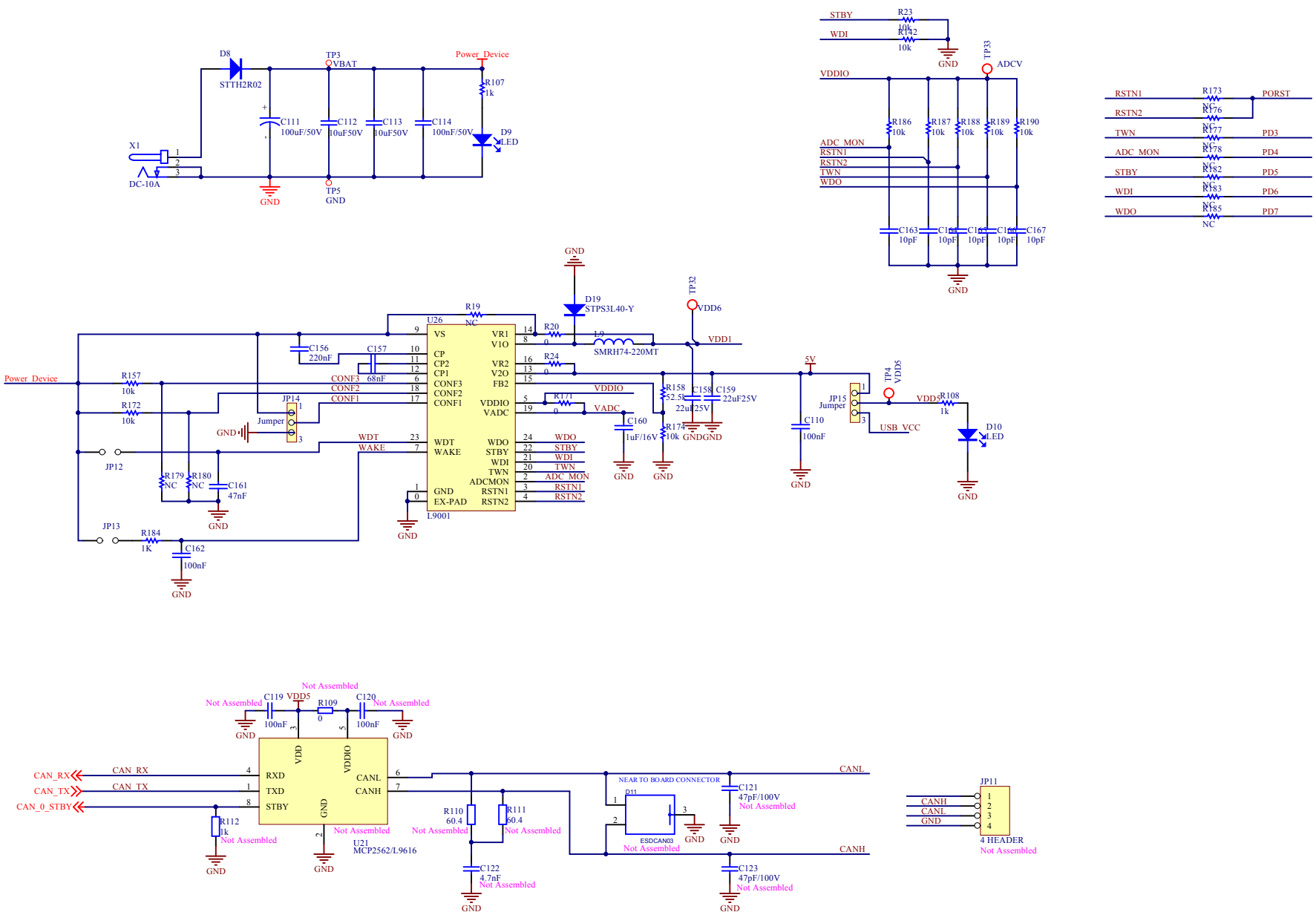


Figure 4. Board schematic (3/5)

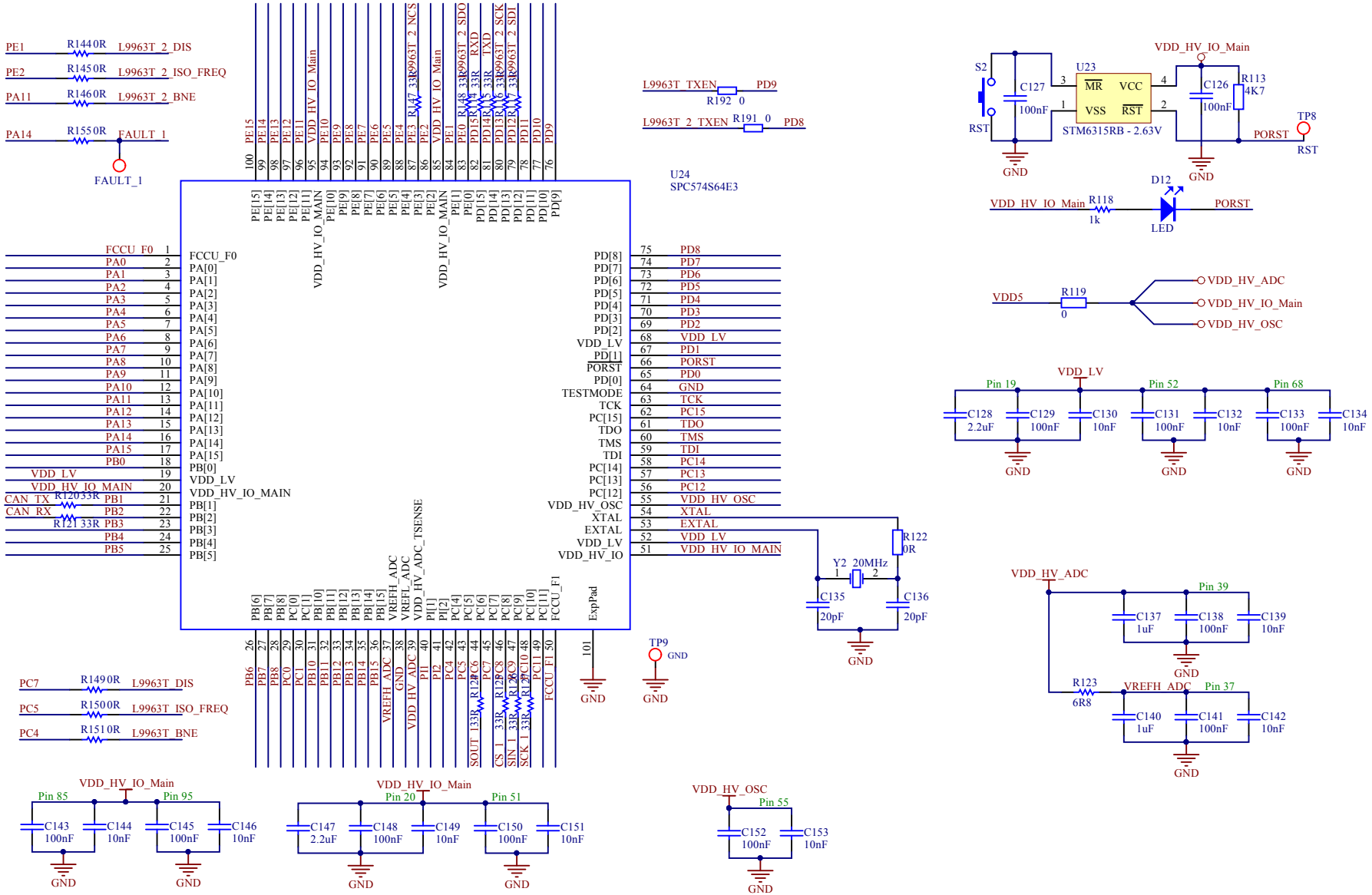


Figure 5. Board schematic (4/5)



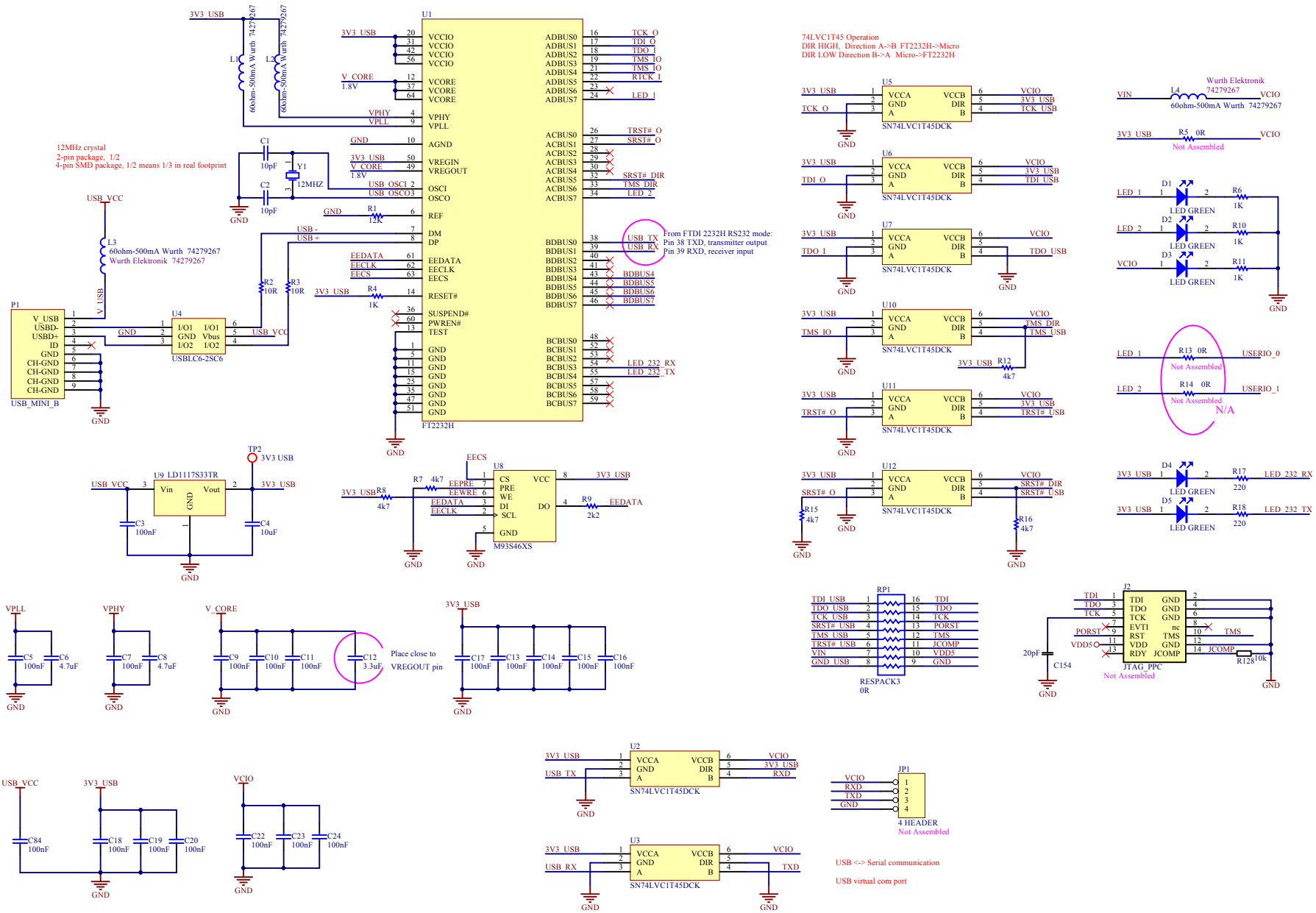


Figure 6. Board schematic (5/5)



4 Board layout

Figure 7. Assembly top

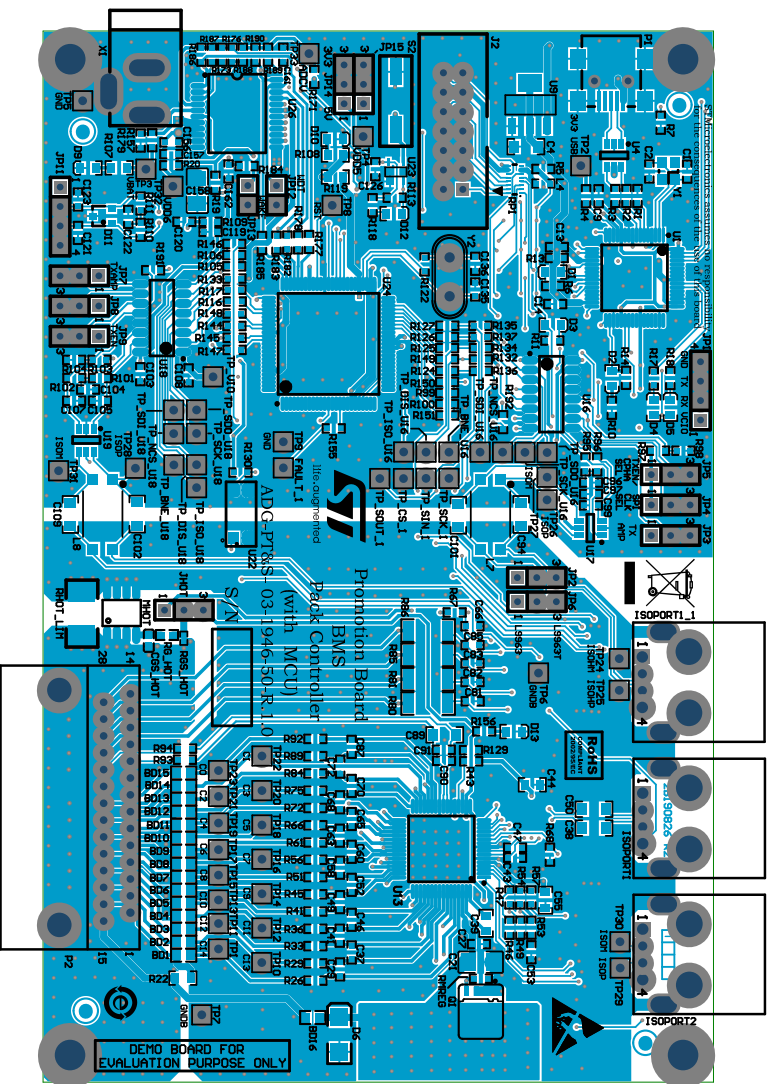
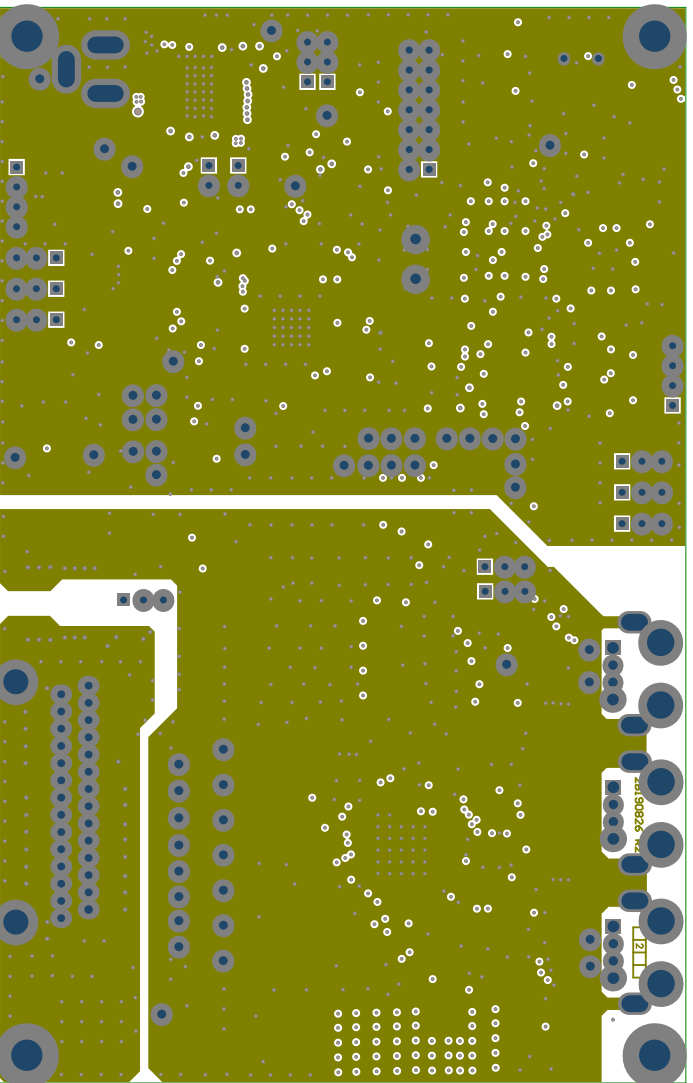


Figure 8. Inner 1



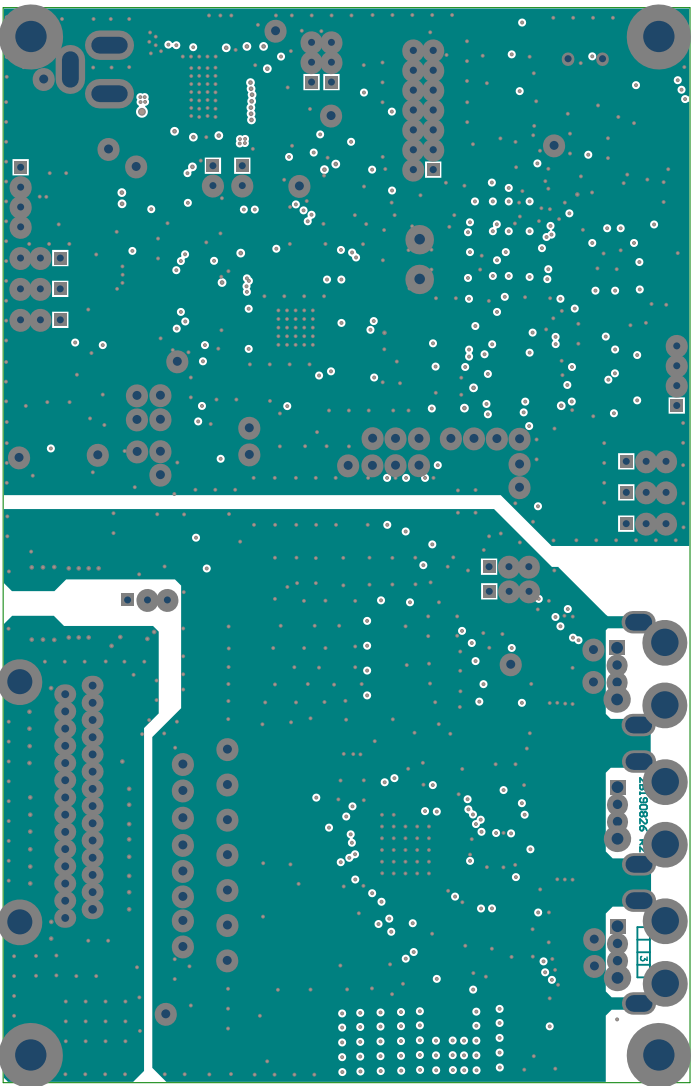
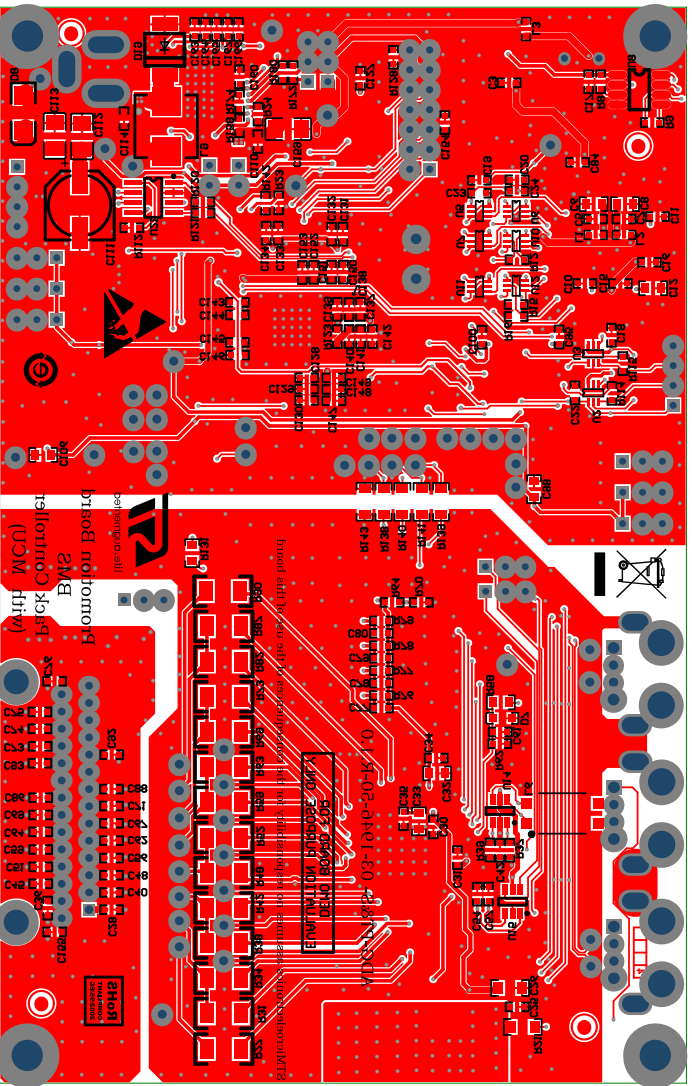


Figure 9. Inner 2

Figure 10. Assembly bottom





5 Demonstration software

STSW-L9963E software is available for demonstration purpose. For more information and download, please refer to ST web page ([STSW-L9963E](#)).



Revision history

Table 2. Document revision history

Date	Version	Changes
03-Mar-2020	1	Initial release.



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