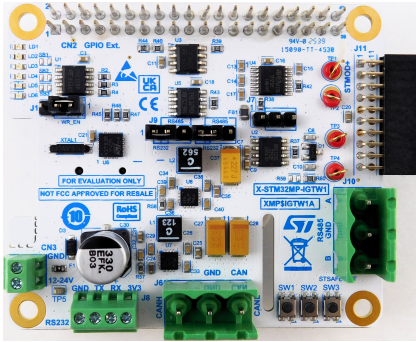


STM32MP expansion board for industrial IoT gateway



Features

The STM32MP2 based expansion board targets industrial IoT gateway applications and supports key factory automation serial communication protocols, including CAN bus and ModBus RTU. It incorporates the following features:

- ST4E1240 high-speed RS-485 transceiver IC
- ST3232 RS-232 transceiver IC
- M41T83 on board real-time clock (RTC) with built-in battery backup
- STSAFE-A110 for authentication, state-of-the-art security for peripherals and IoT devices
- High-speed CAN transceiver
- M24C32-R, EEPROM for automatic GPIO setup and driver setup
- L6983: DC-DC converter used to step down an input voltage (V_{in}) from 12-24 to 5 V
- L6983: DC-DC converter used to further step down the 5V output from the L6983N50QTR to 3.3 V
- Signaling LEDs and switches for user interface
- Compatible with STM32MP257F-DK's GPIO connector

Description

The **X-STM32MP-IGTW1** is an MPU expansion board designed for industrial IoT gateway applications, featuring a range of wired communication interfaces.

The **X-STM32MP-IGTW1** operates with a power supply between 12 to 24 V and interfaces with the STM32MP microprocessor via a 40-pin GPIO connector using I²C, UART, FDCAN, and GPIO connections. The board is compatible with the **STM32MP257F-DK** connector layout.

The **ST4E1240** is a high-speed RS-485 transceiver supporting data rates up to 20 Mbps, operating from 3.0 to 5.5 V. It features low-power consumption (1.5 mA active, <1 μ A shutdown), integrated ESD protection, and fail-safe mechanisms for reliable communication in industrial applications.

The **ST3232C** is a dual RS-232 transceiver operating from 3.0 to 5.5 V, supporting data rates up to 400 kbps. It features integrated charge pump capacitors and has low-power consumption (1 μ A in shutdown).

A further serial communication capability is given by a high-speed CAN transceiver designed for reliable communication in automotive and industrial applications, providing robust data transmission with data rate up to 1 Mbps and reception with low-power consumption, ± 36 VBUS fault tolerance, excellent noise immunity and includes autobaud loopback.

The **M41T83** is a real-time clock (RTC) with a built-in battery backup, providing accurate timekeeping for embedded systems. It operates from 1.8 to 5.5 V, features a low-power consumption of 1 μ A in battery mode, and includes programmable alarms, a watchdog timer, and a 32.768 kHz output for precise timing applications.

The **STSAFE-A110** is a secure element on the board that provides hardware-based authentication and cryptographic services, ensuring data integrity and confidentiality for IoT devices and peripherals.

The **M24C32-R** is a 32-kbit EEPROM with I²C interface, providing nonvolatile memory for data storage, ideal for industrial applications requiring reliable data retention and easy integration.

Product summary	
STM32MP expansion board for industrial IoT gateway	X-STM32MP-IGTW1
Software for X-STM32MP-IGTW1	X-LINUX-IGTW
High-speed 3.3 V / 5 V RS485 transceiver with ± 12 kV IEC 61000-4-2 contact ESD protection	ST4E1240DT
Authentication, state-of-the-art security for peripherals and IoT devices	STSAFE-A110SPL02
Serial I ² C bus real-time clock (RTC) with battery switchover	M41T83RQA6F
Discovery kit with STM32MP257F MPU	STM32MP257F-DK
Applications	Factory Automation Remote Monitoring and Control

1 Block diagram

Figure 1. Block diagram

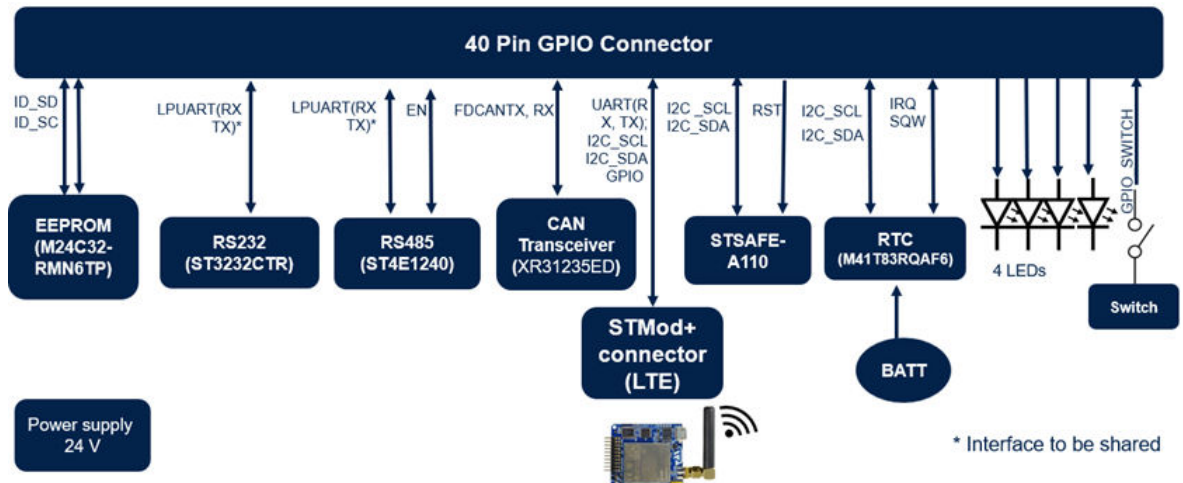
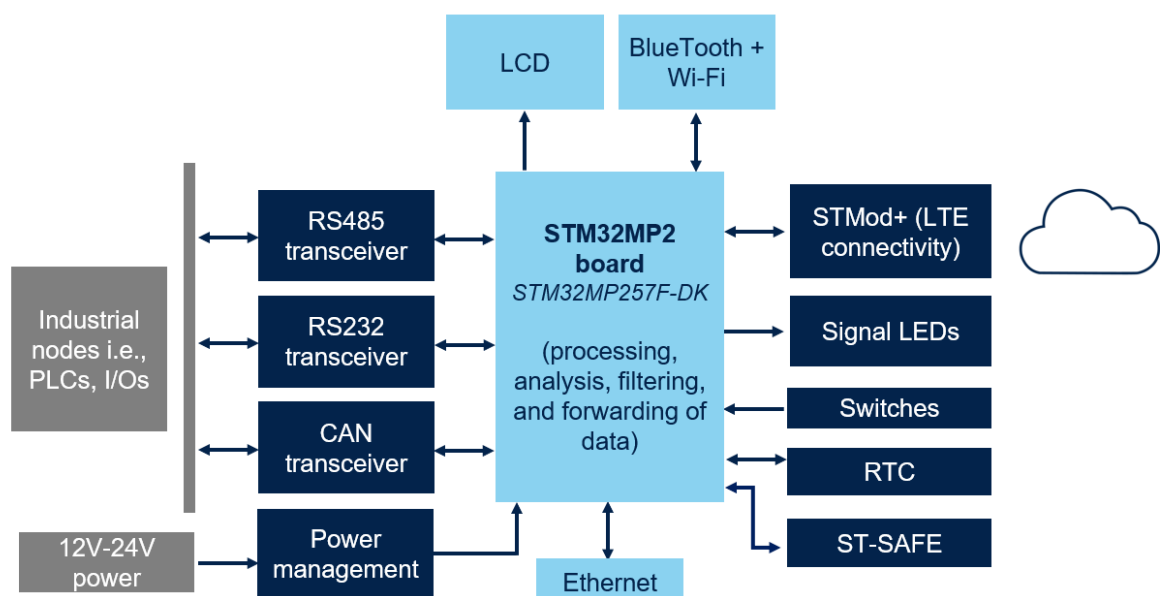


Figure 2. System block diagram



2 Schematic diagrams

Figure 3. X-STM32MP-IGTW1 circuit schematic (1 of 10)

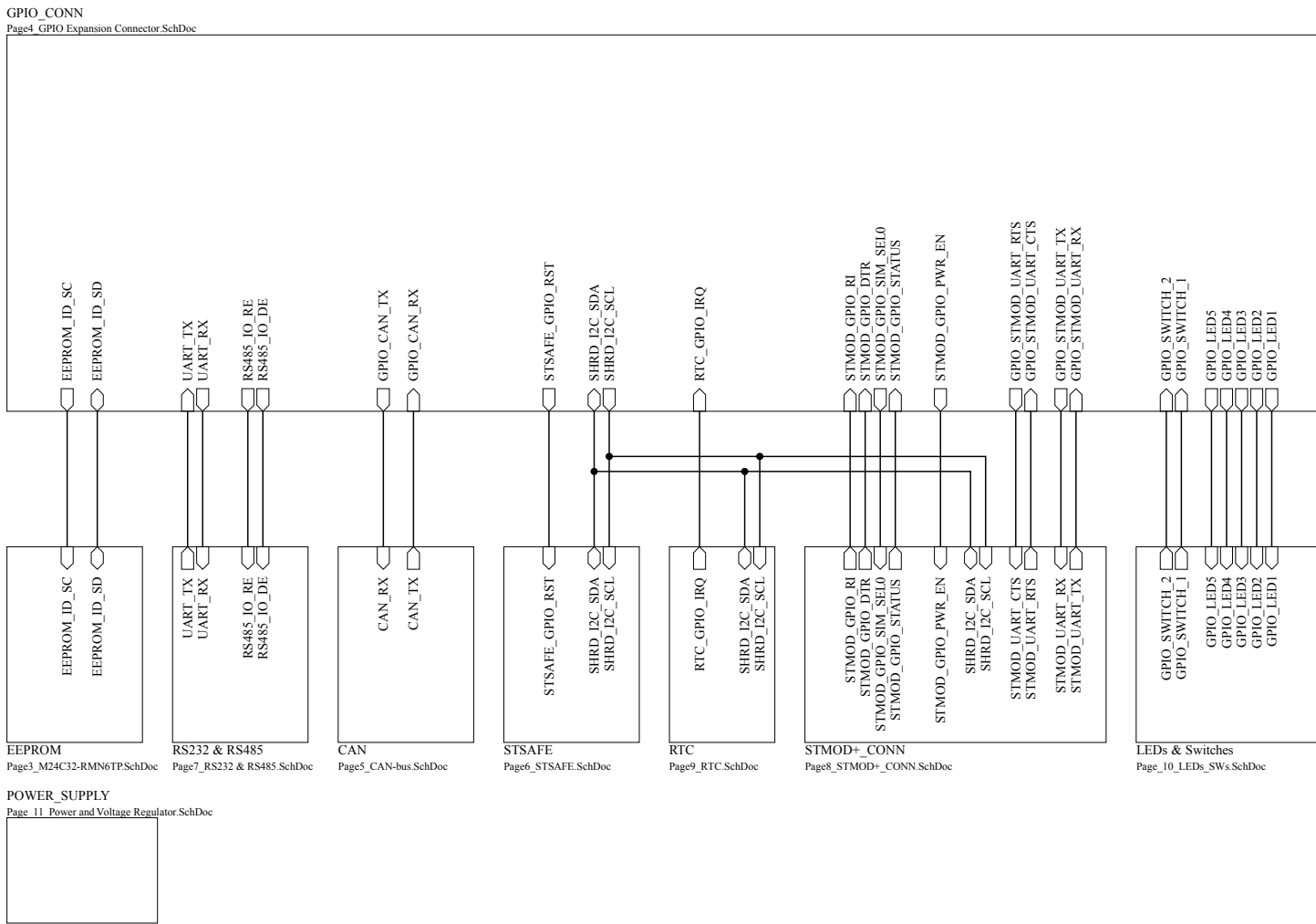


Figure 4. X-STM32MP-IGTW1 circuit schematic (2 of 10)

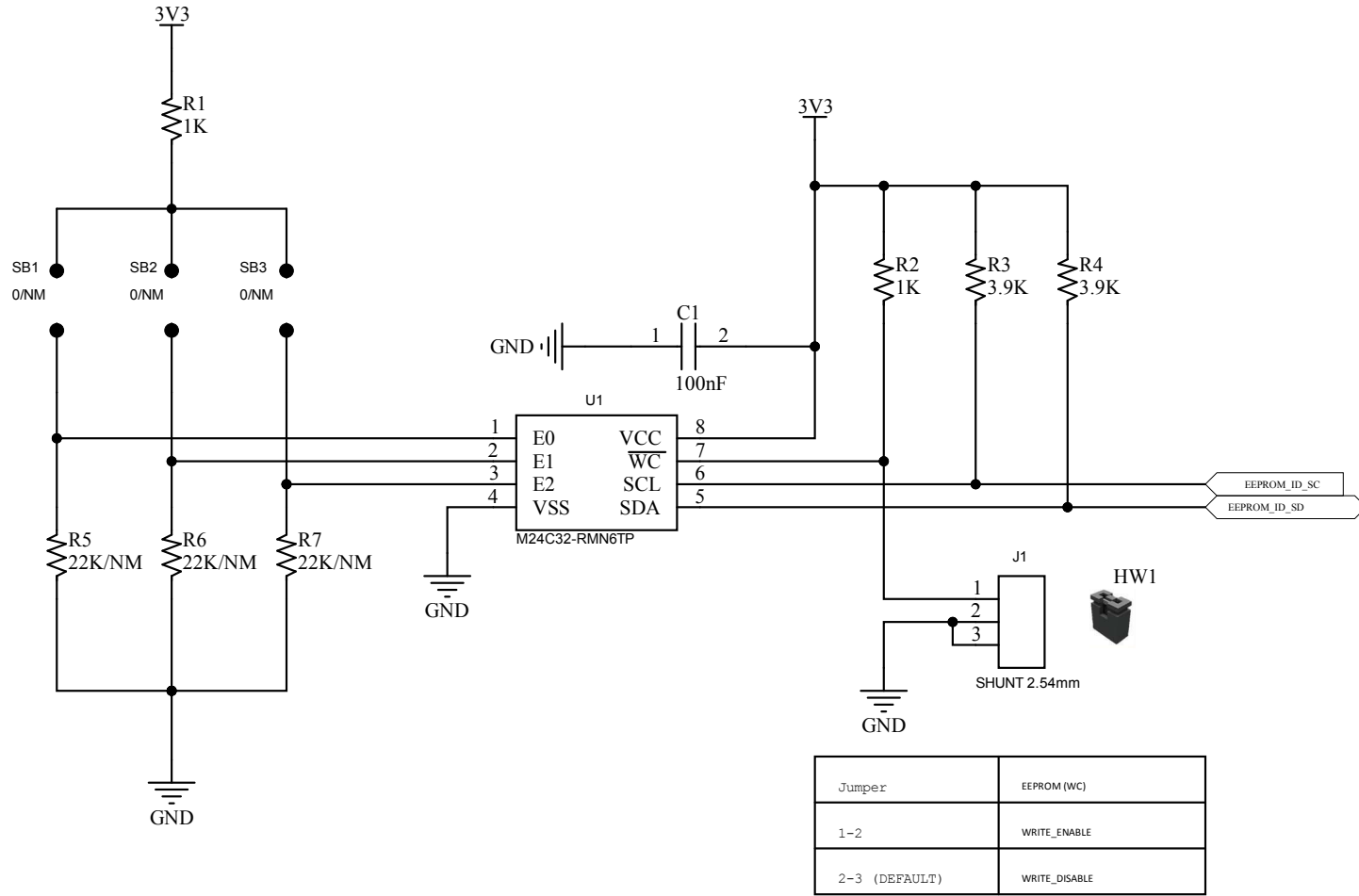


Figure 5. X-STM32MP-IGTW1 circuit schematic (3 of 10)

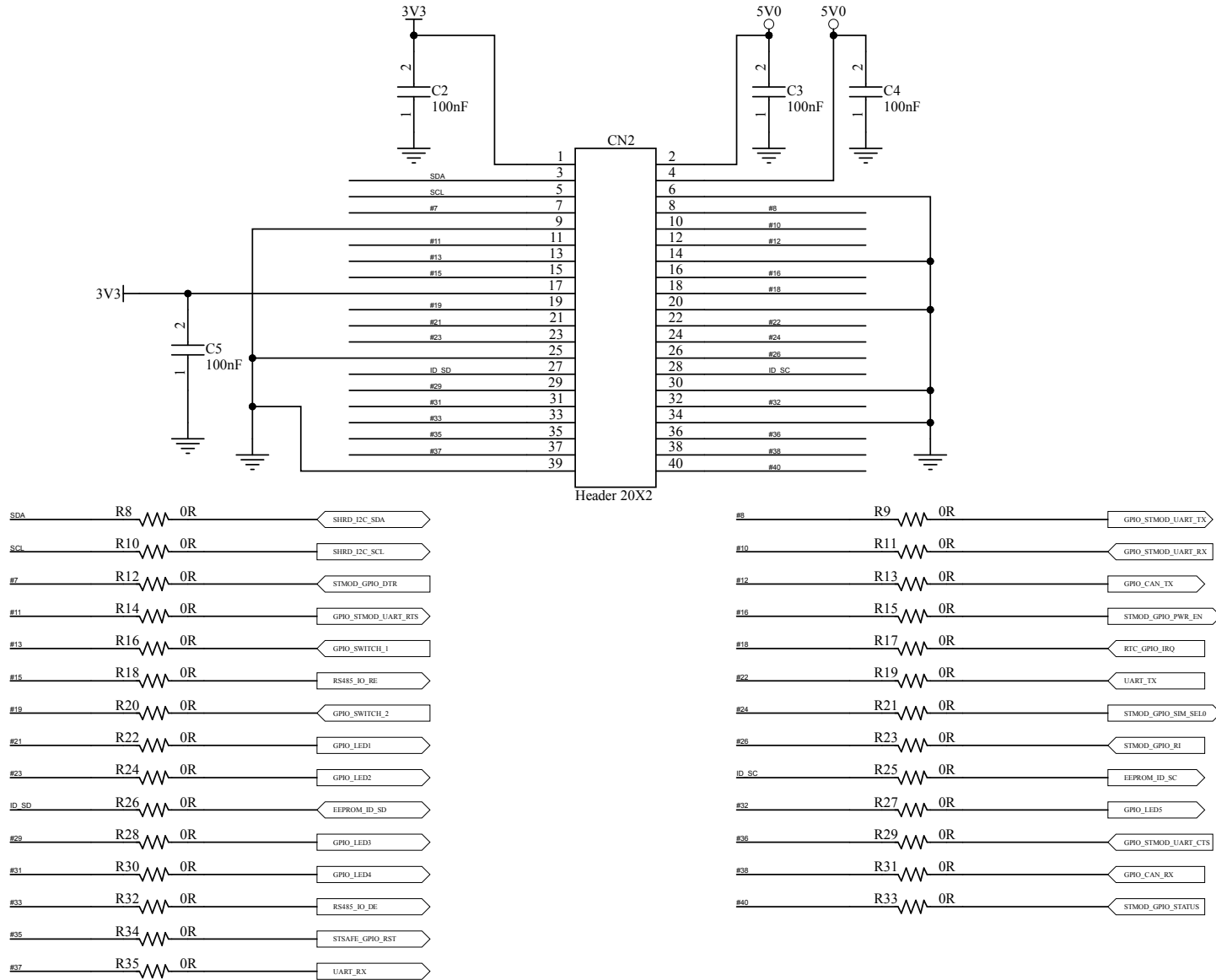


Figure 6. X-STM32MP-IGTW1 circuit schematic (4 of 10)

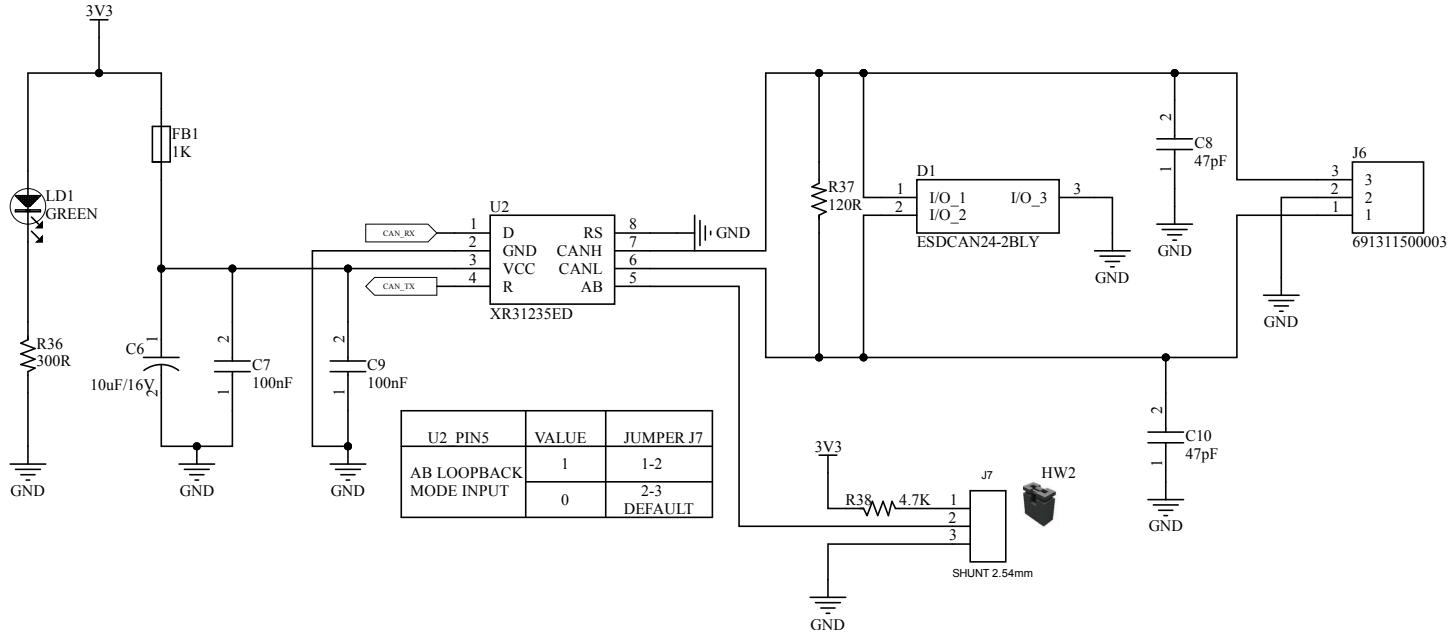
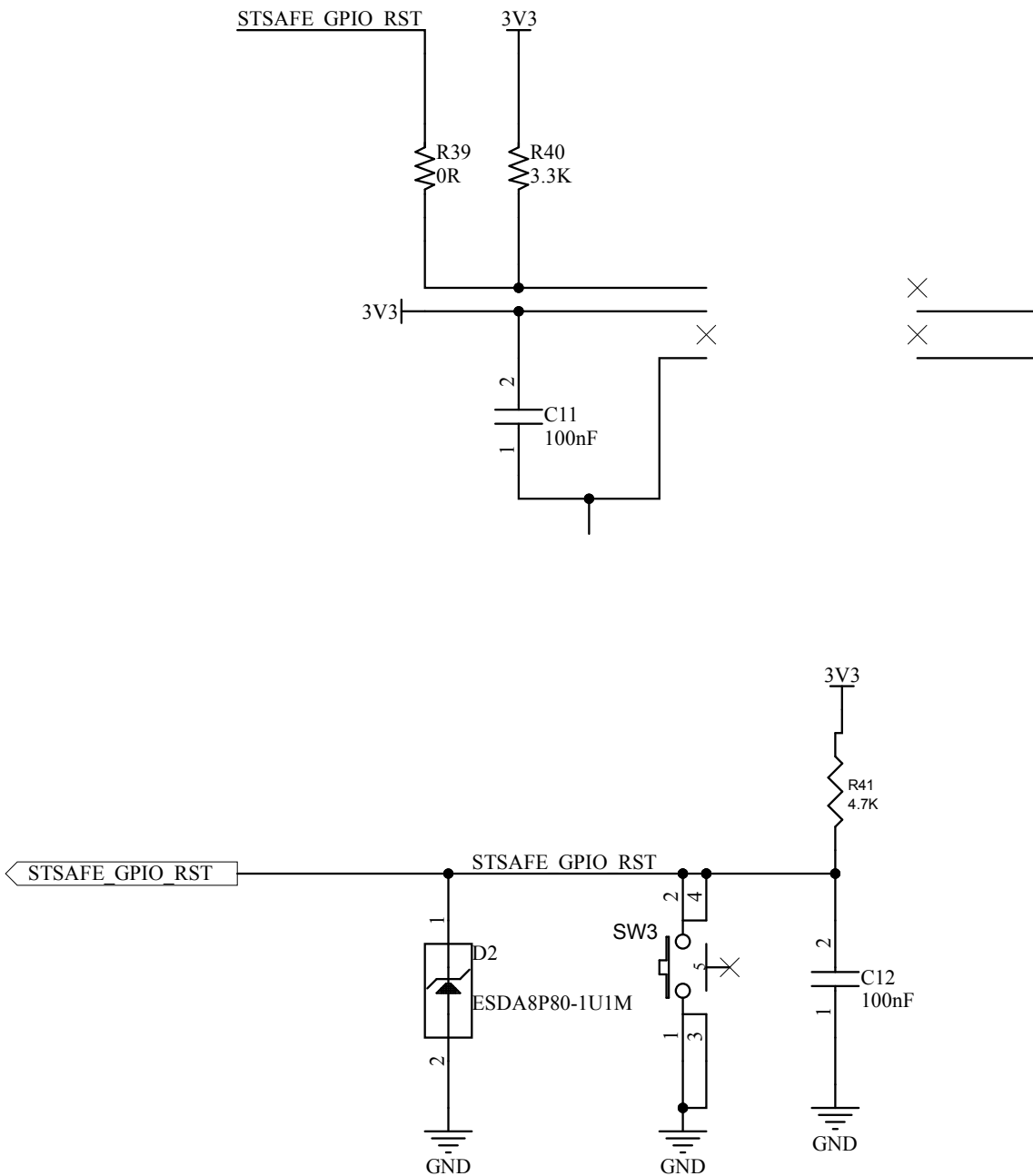


Figure 7. X-STM32MP-IGTW1 circuit schematic (5 of 10)





JUMPER (J9)	PIN
1-2	RS232_RX
4-5	RS232_TX
2-3 DEFAULT	RS485_RX
5-6 DEFAULT	RS485_TX

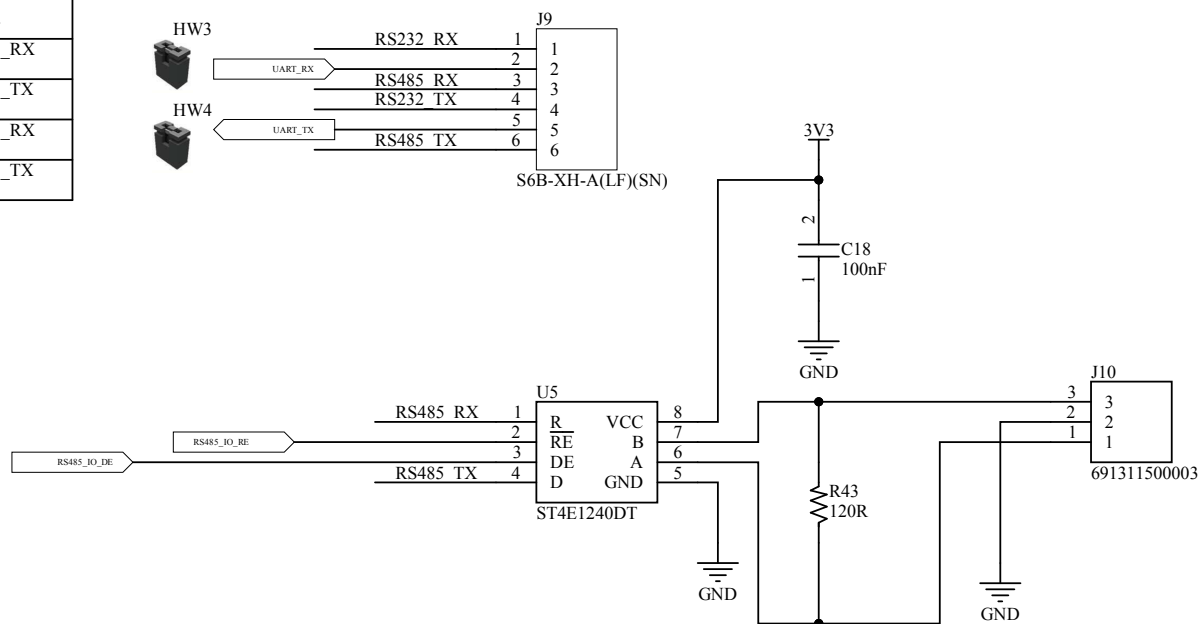


Figure 9. X-STM32MP-IGTW1 circuit schematic (7 of 10)

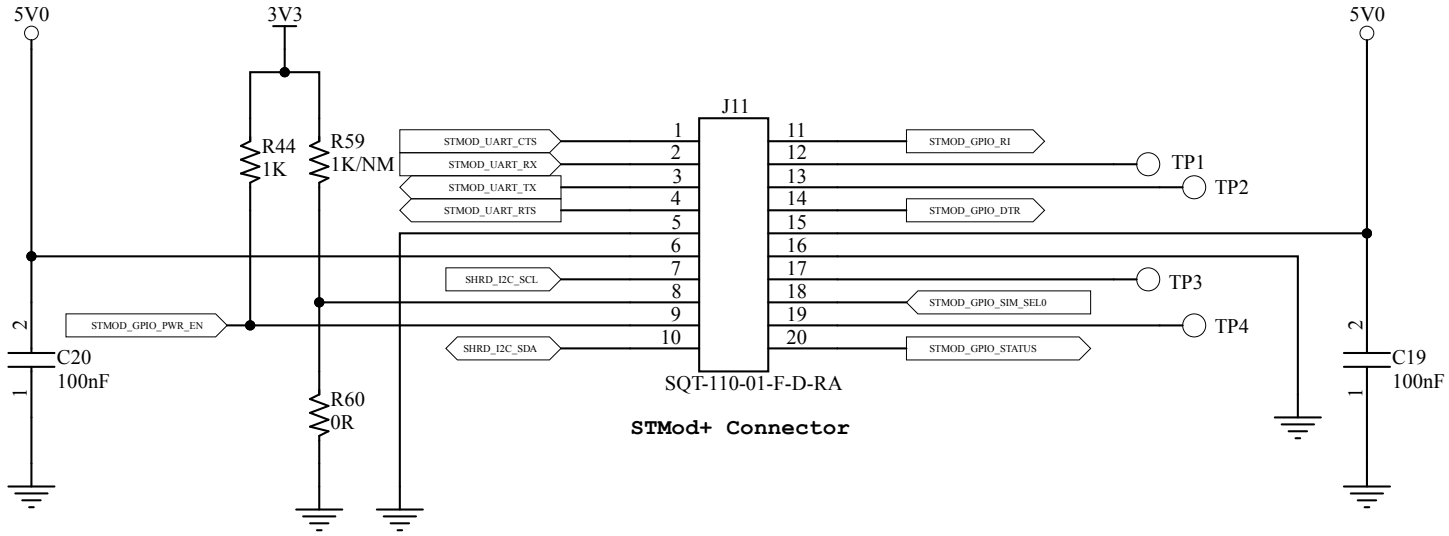


Figure 10. X-STM32MP-IGTW1 circuit schematic (8 of 10)

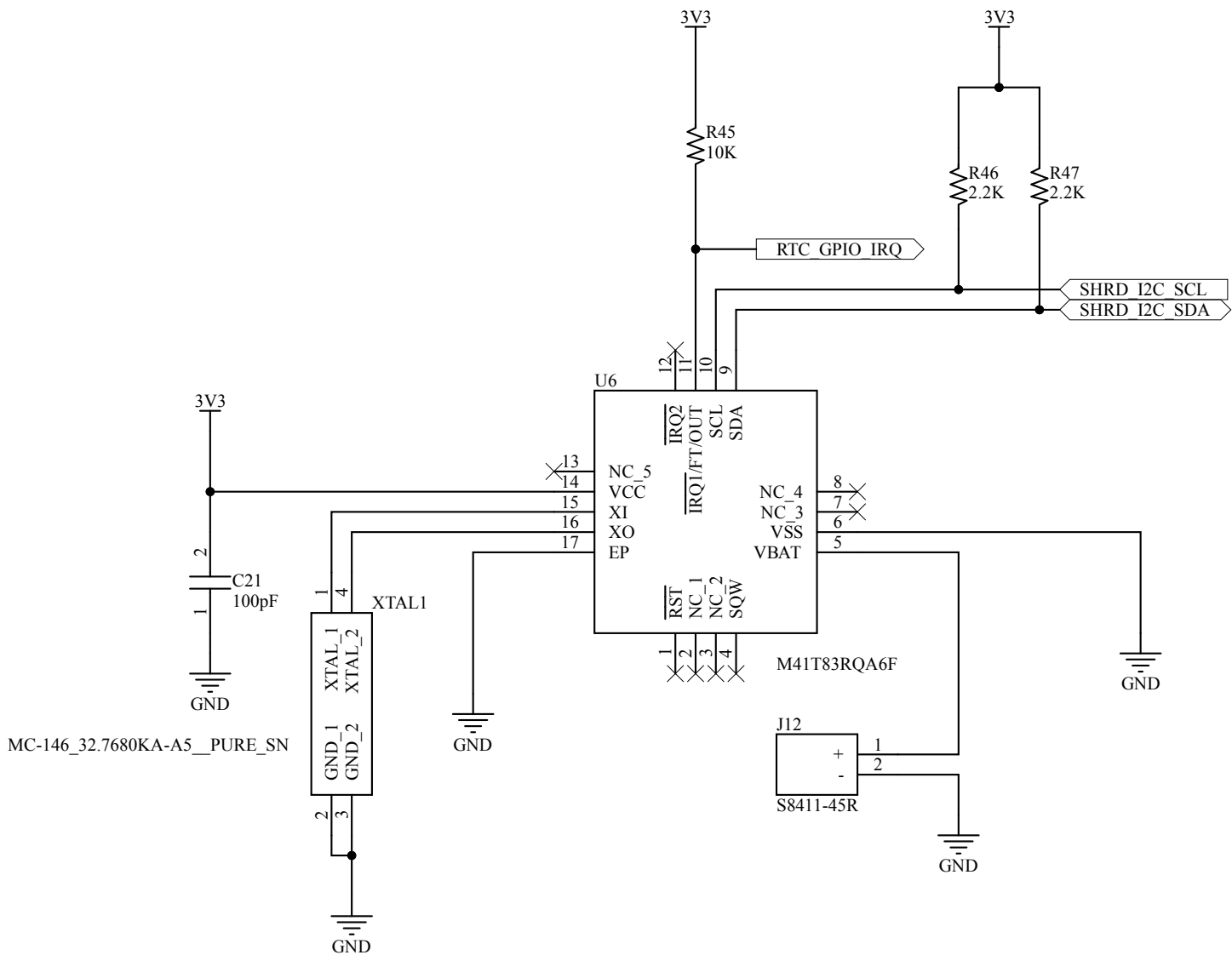


Figure 11. X-STM32MP-IGTW1 circuit schematic (9 of 10)

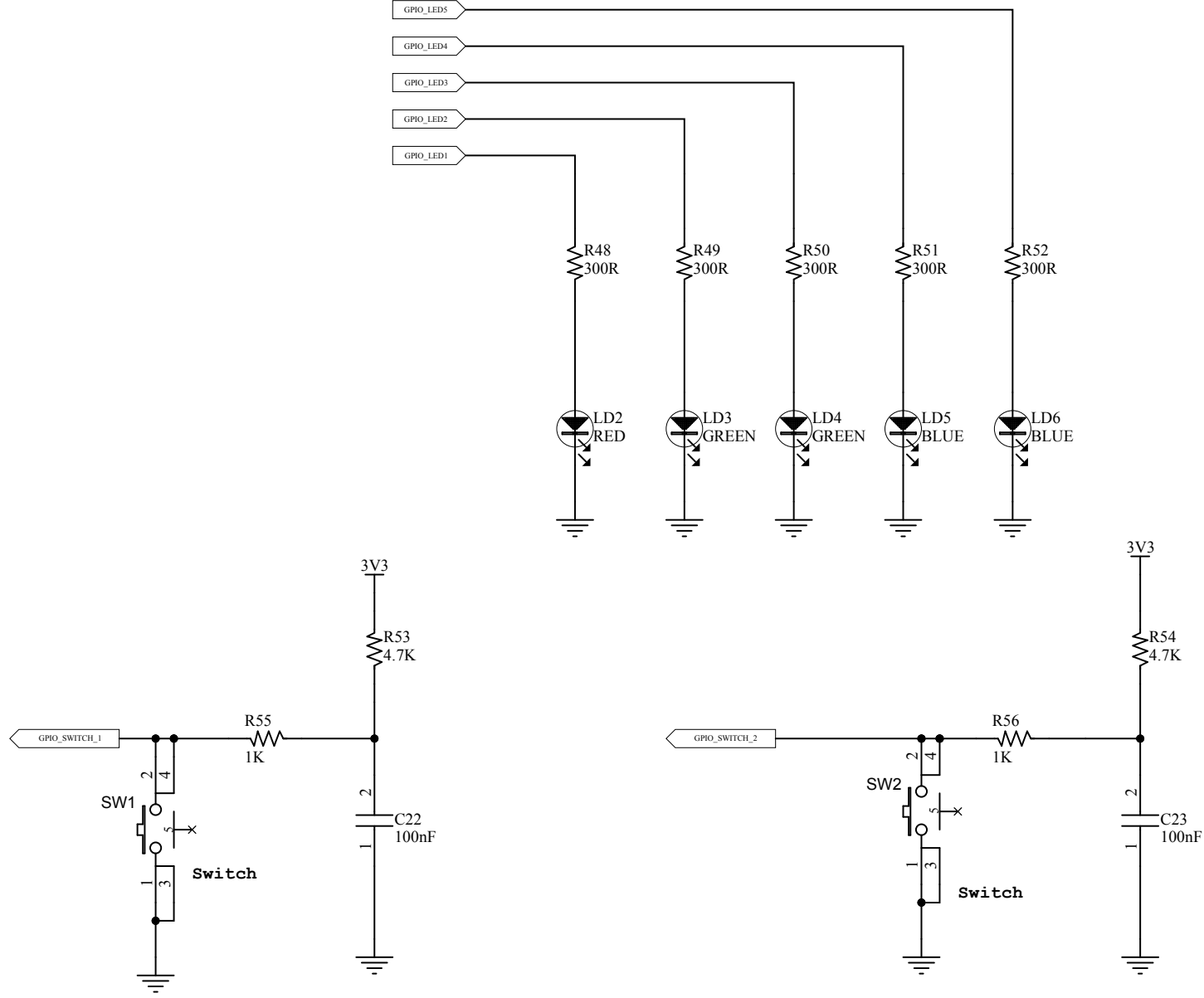
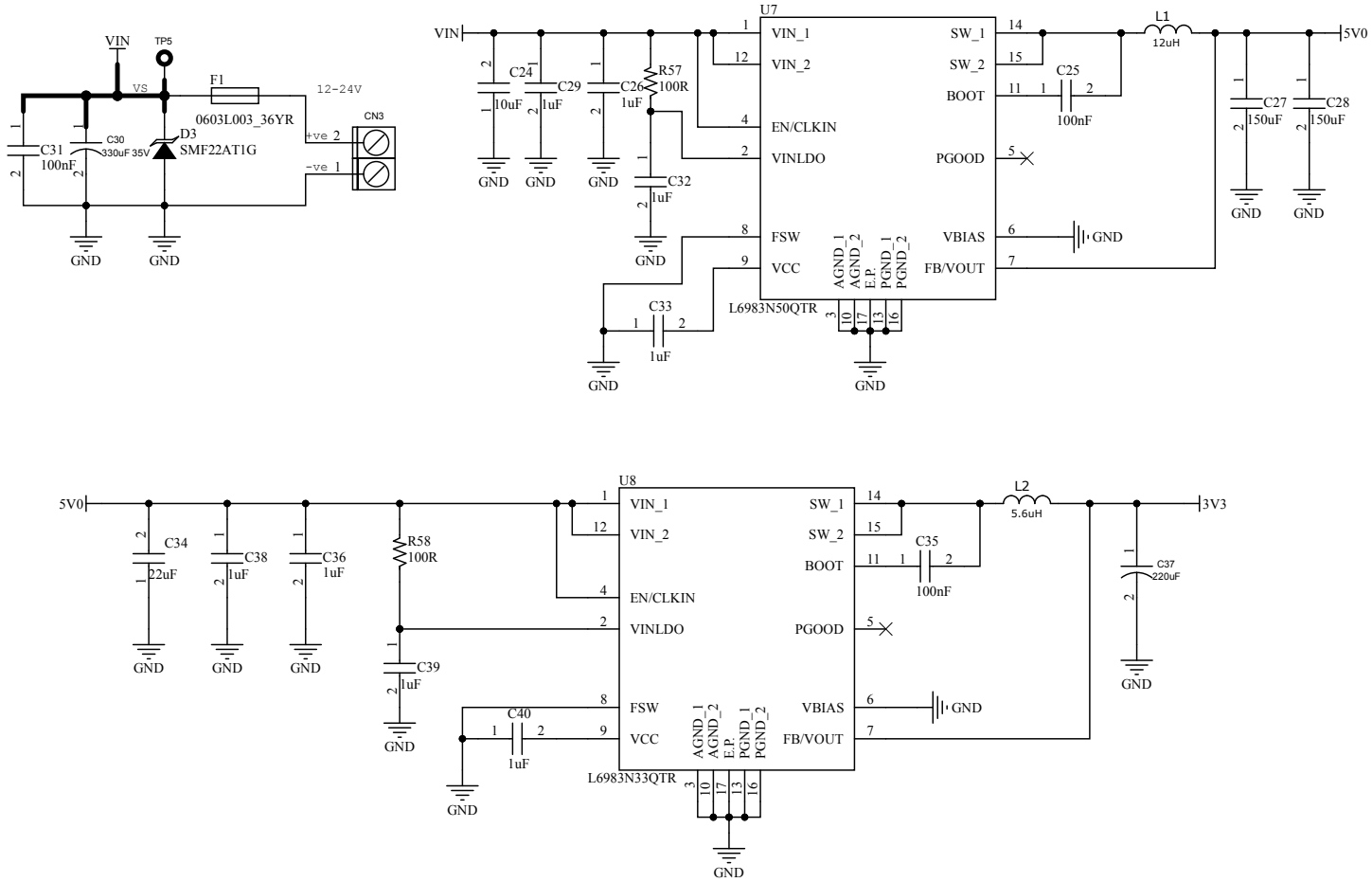


Figure 12. X-STM32MP-IGTW1 circuit schematic (10 of 10)



3 Board versions

Table 1. X-STM32MP-IGTW1 versions

PCB version	Schematic diagrams	Bill of materials
XMP\$IGTW1A ⁽¹⁾	XMP\$IGTW1A schematic diagrams	XMP\$IGTW1A bill of materials

1. This code identifies the X-STM32MP-IGTW1 evaluation board first version. It is printed on the board PCB.

Revision history

Table 2. Document revision history

Date	Revision	Changes
11-Nov-2025	1	Initial release.

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