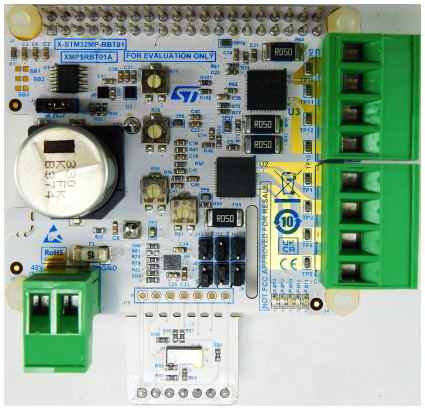
X-STM32MP-RBT01

Data brief

X-STM32MP expansion board for robotics applications



Features

- STSPIN948 motor driver IC
- Able to drive four DC motors simultaneously
- ISM330DHCXTR, on board iNEMO inertial module for accelerometer and gyroscope
- LPS22HH, pressure sensor for altitude measurement
- IIS2MDC, magnetometer for position accuracy
- VL53L5CX, ToF sensor
- LEDs for power and motors
- M24C32-RMN6TP, EEPROM for automatic GPIO setup and driver setup
- Compatible with both STM32MP157F-DK2, STM32MP257F-DK and Raspberry Pi's GPIO connector

Product summary	
X-STM32MP expansion board for robotics applications	X-STM32MP-RBT01
Software for X-STM32MP-RBT01	X-LINUX-RBT1
Discovery kit with STM32MP157F MPU	STM32MP157F-DK2
Discovery kit with STM32MP257F MPU	STM32MP257F-DK
Applications	Factory automation /Home and professional appliances/ Industrial robots

Description

The X-STM32MP-RBT01 is an MPU expansion board with STSPIN948 motor driver IC for brushed DC motors. Using two STSPIN948 devices, the board can drive four DC motors simultaneously with up to 48 V power supply.

The power rating of the board is 480 Watts at 48 V dc voltage rating with each of the four DC motor consuming a maximum 2.5 A current.

The X-STM32MP-RBT01 interfaces with the STM32MP microprocessor via 40-pin GPIO connector pins using I^2C, UART, PWM, and GPIO connections for various components. It is compatible with both STM32MP157F-DK2, STM32MP257F-DK and Raspberry Pi's GPIO connector layout.

The STSPIN948 is a 4.5 A dual full-bridge driver for brushed DC motors. The power stage is designed with high dynamic performance, allowing to achieve high frequency PWM control with precise duty-cycle.

The iNEMO inertial module ISM330DHCX has a full-scale acceleration range of ±2/±4/±8/±16 g and a wide angular rate range of ±125/±250/±500/±1000/±2000/±4000 dps.

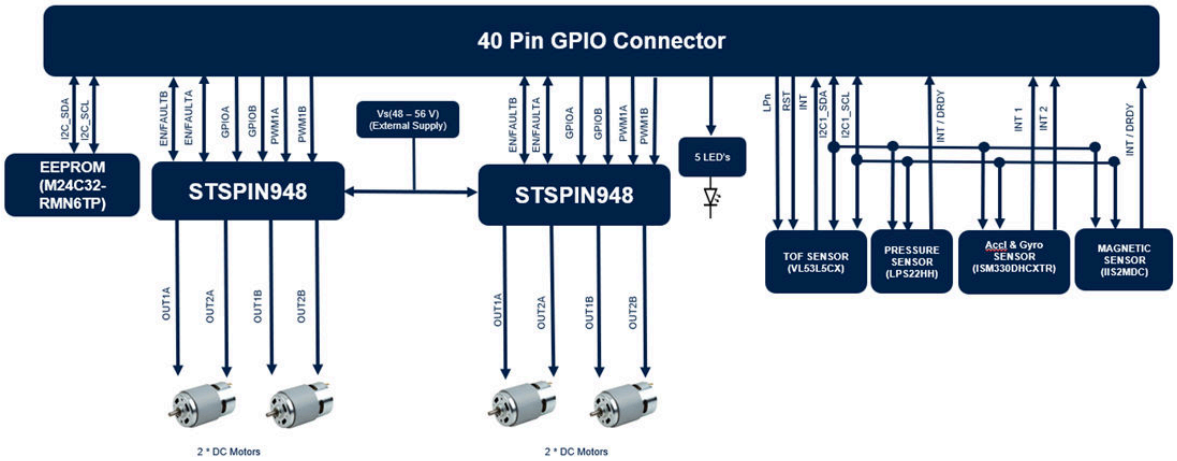
The LPS22HH is a high-performance MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer.

The IIS2MDC is a high-accuracy, ultra-low-power 3-axis digital magnetometer having a dynamic range up to ±50 gausses.

The VL53L5CX is a Time-of-Flight (ToF) 8x8 multizone ranging sensor with a wide field of view.

1 Connector

Figure 1. **Connector**



2 Schematic diagrams

Figure 2. X-STM32MP-RBT01 circuit schematics (1 of 10)

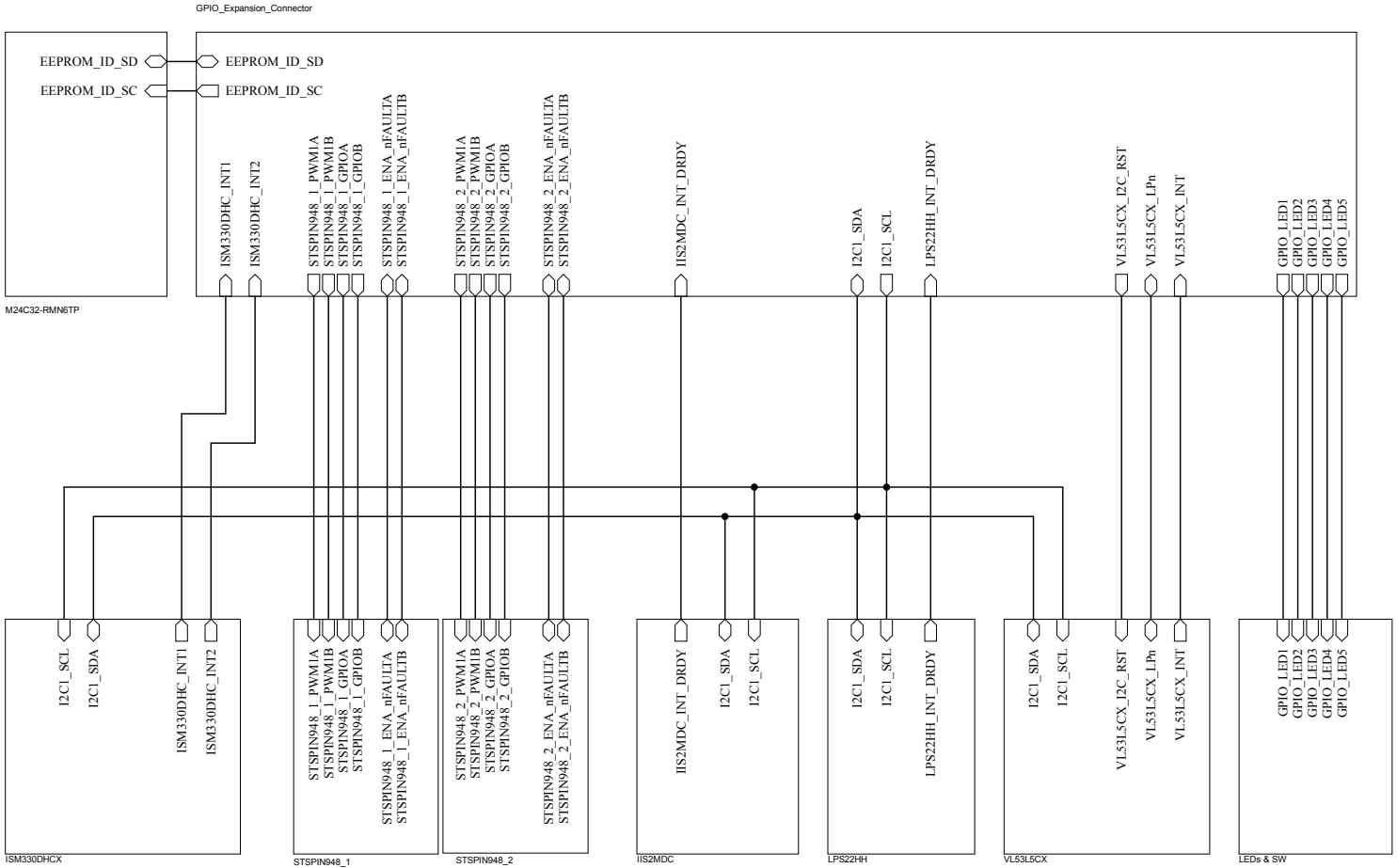
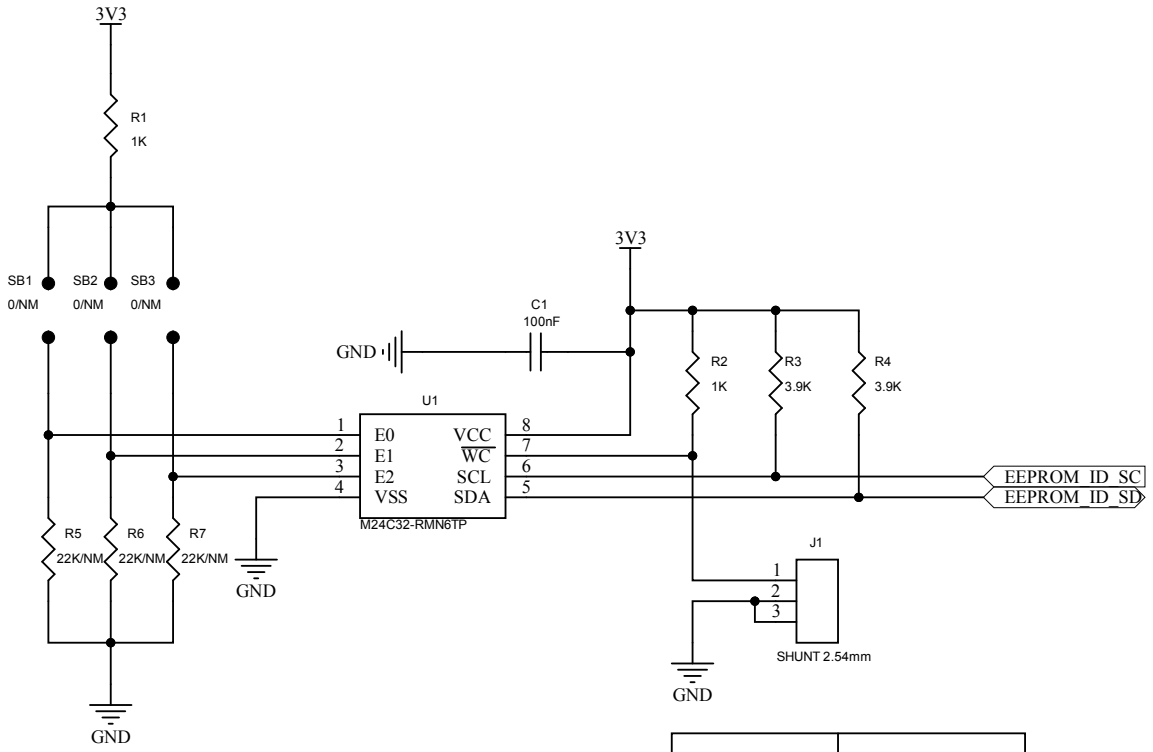
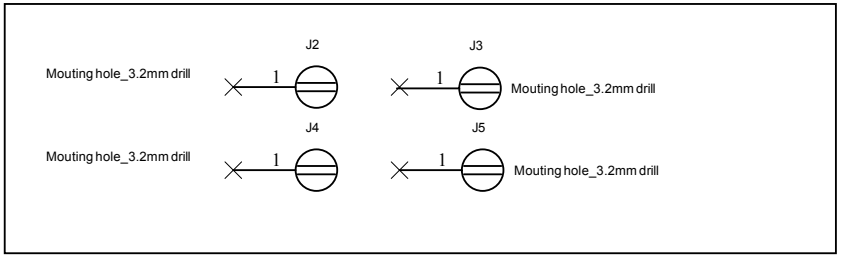


Figure 3. X-STM32MP-RBT01 circuit schematics (2 of 10)



Jumper	EEPROM (WC)
1-2	WRITE_ENABLE
2-3 (DEFAULT)	WRITE_DISABLE



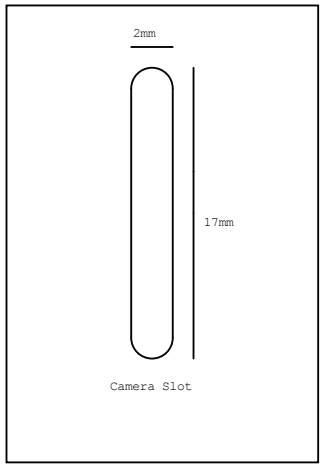


Figure 4. X-STM32MP-RBT01 circuit schematics (3 of 10)

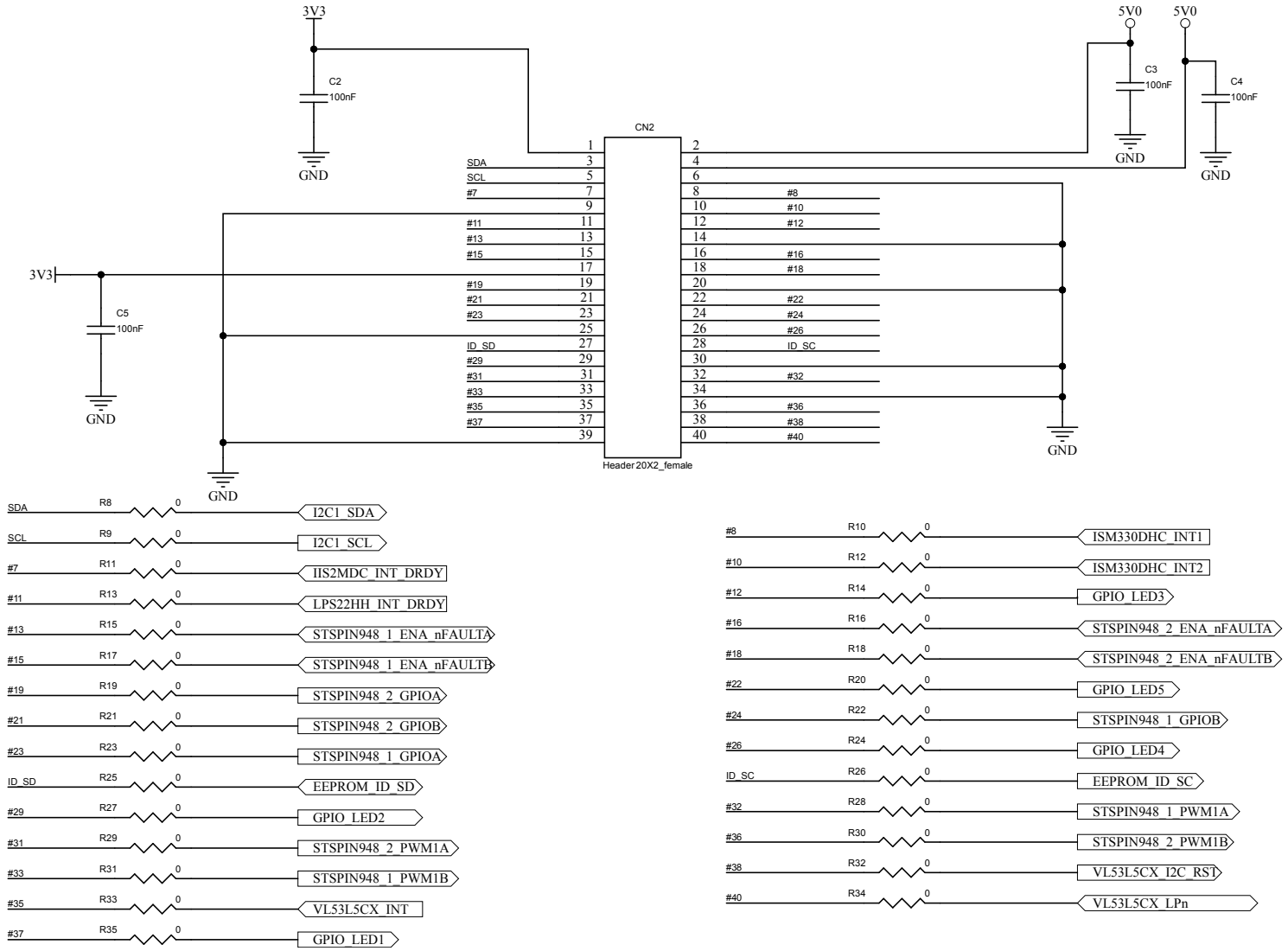


Figure 5. **X-STM32MP-RBT01 circuit schematics (4 of 10)**

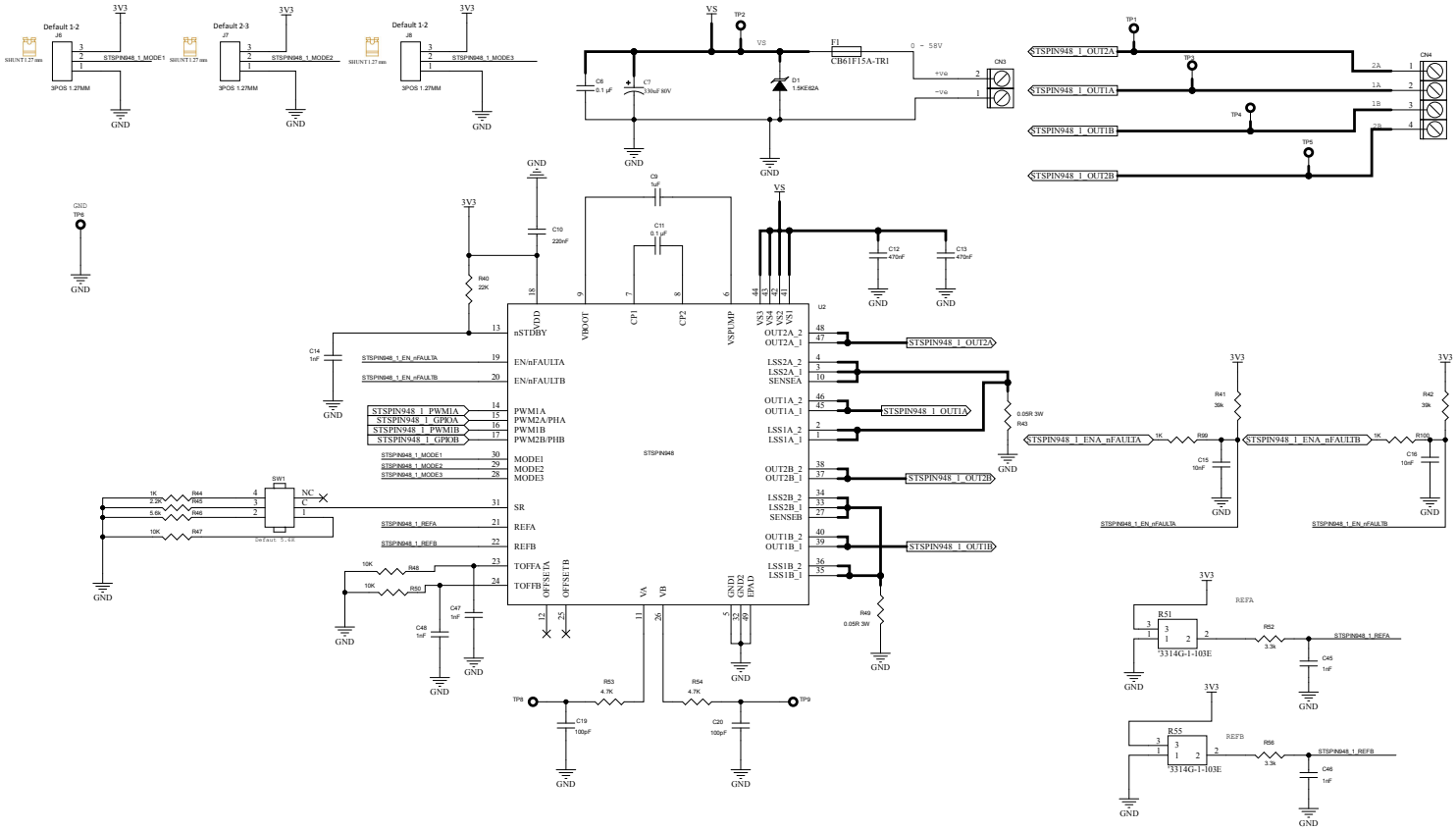


Figure 6. X-STM32MP-RBT01 circuit schematics (5 of 10)

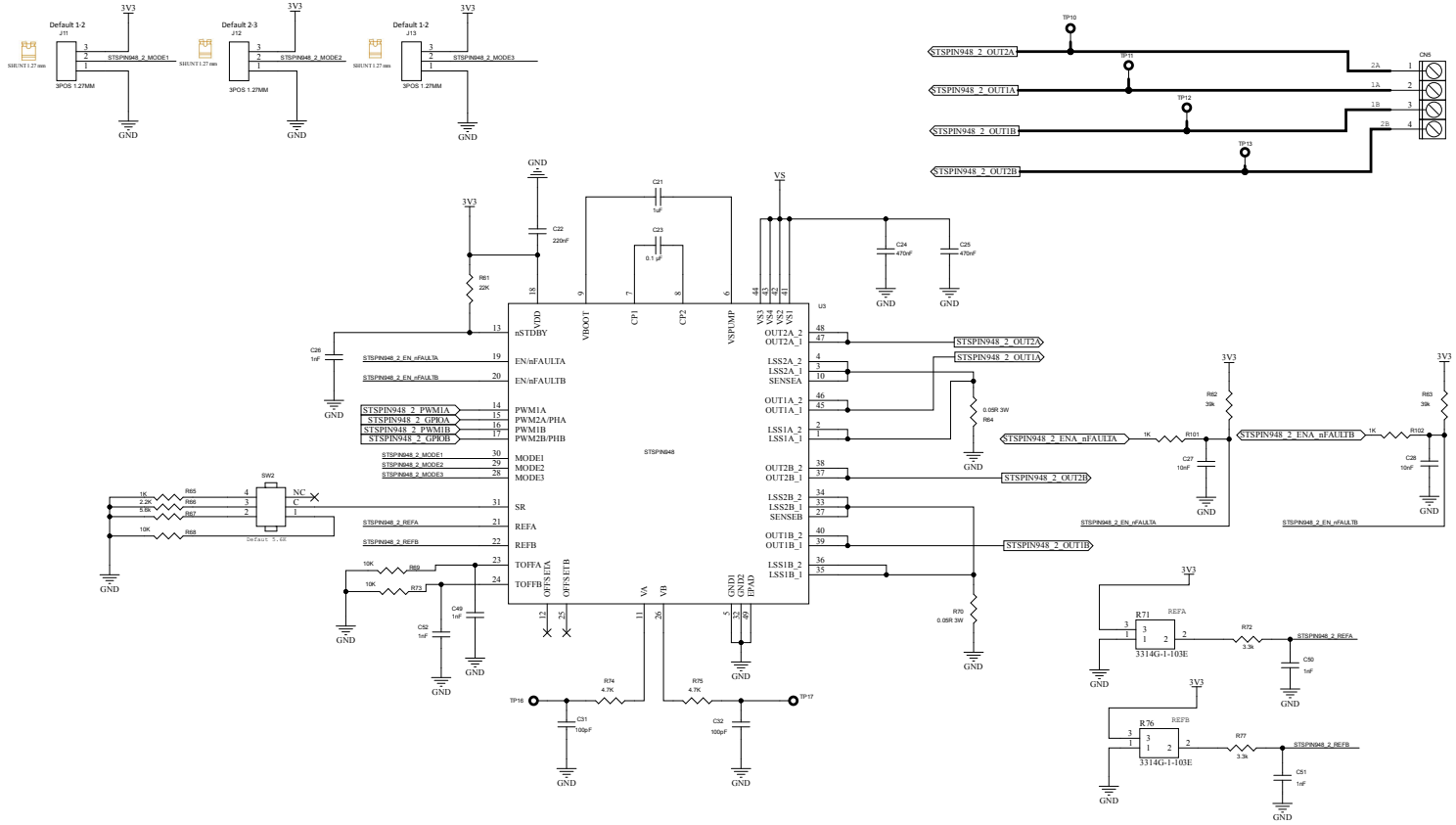
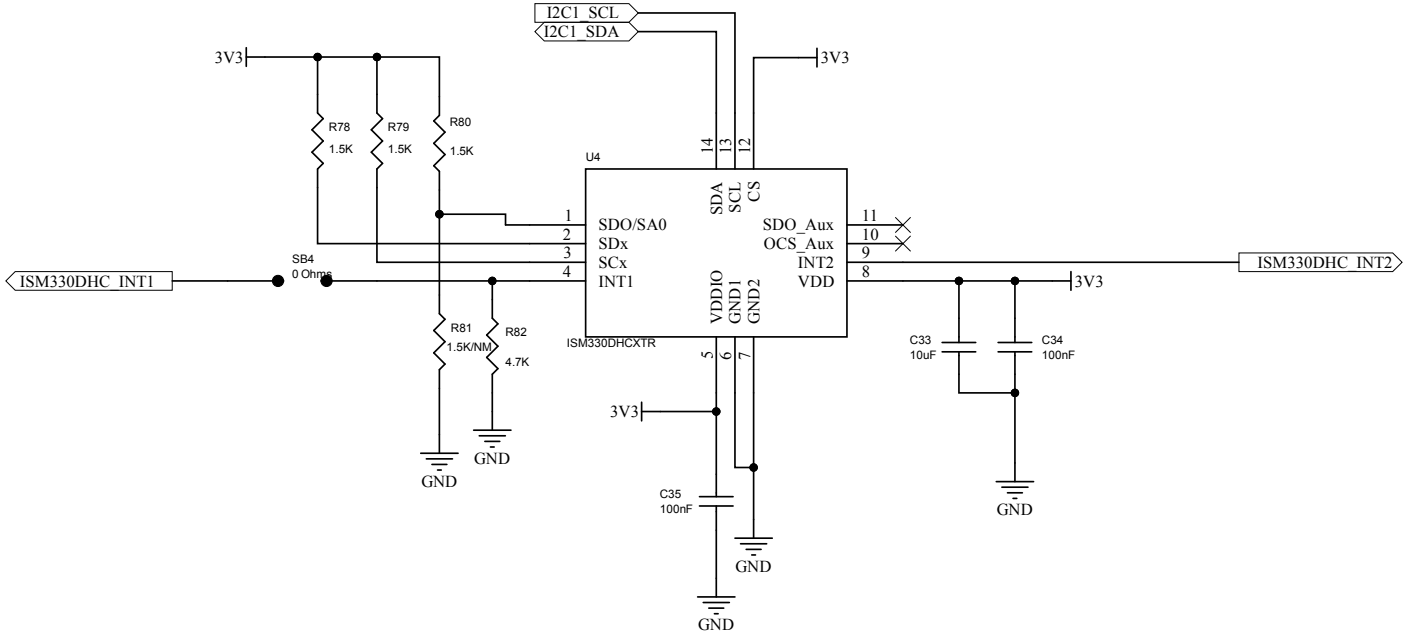
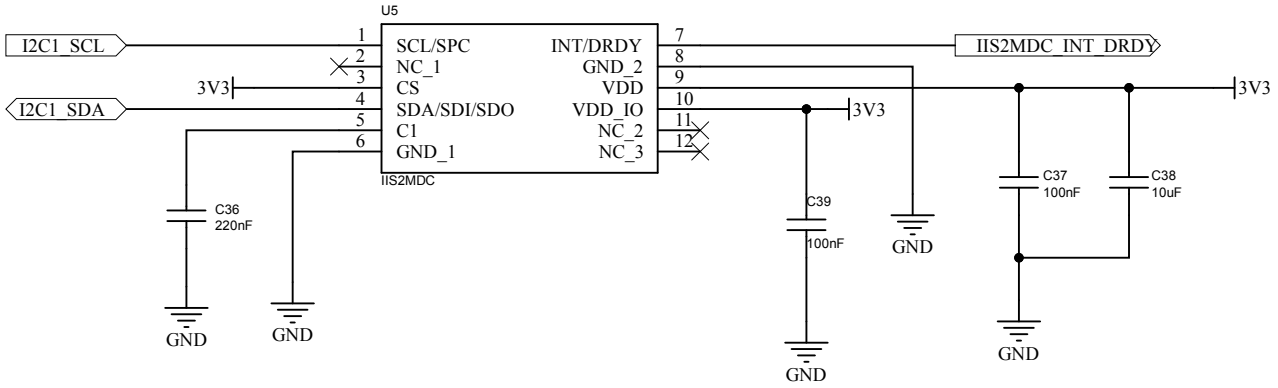


Figure 7. X-STM32MP-RBT01 circuit schematics (6 of 10)



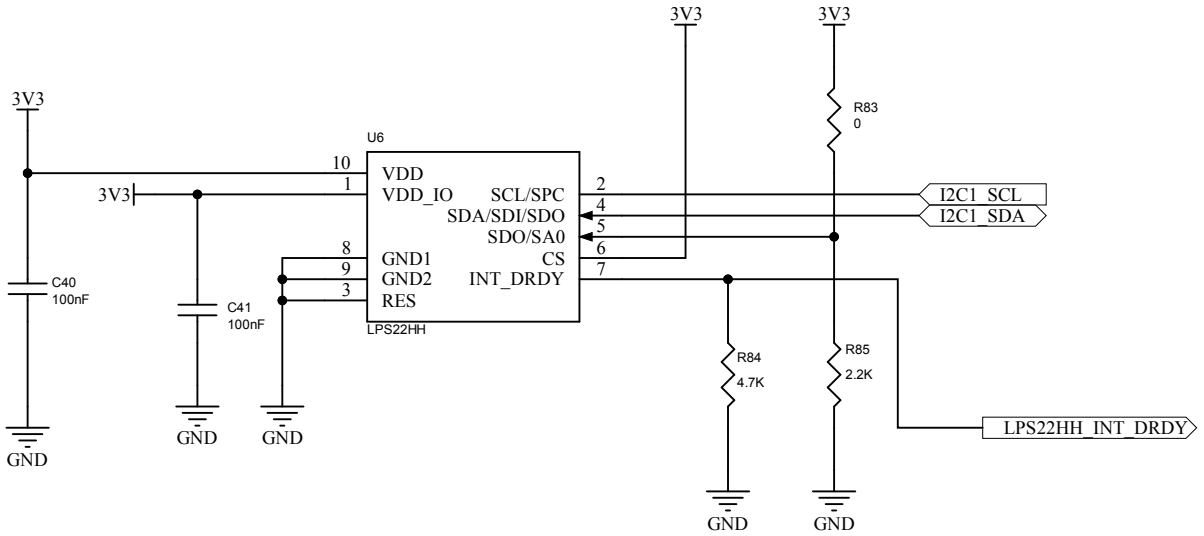
Accelerometer
and Gyroscope

Figure 8. X-STM32MP-RBT01 circuit schematics (7 of 10)



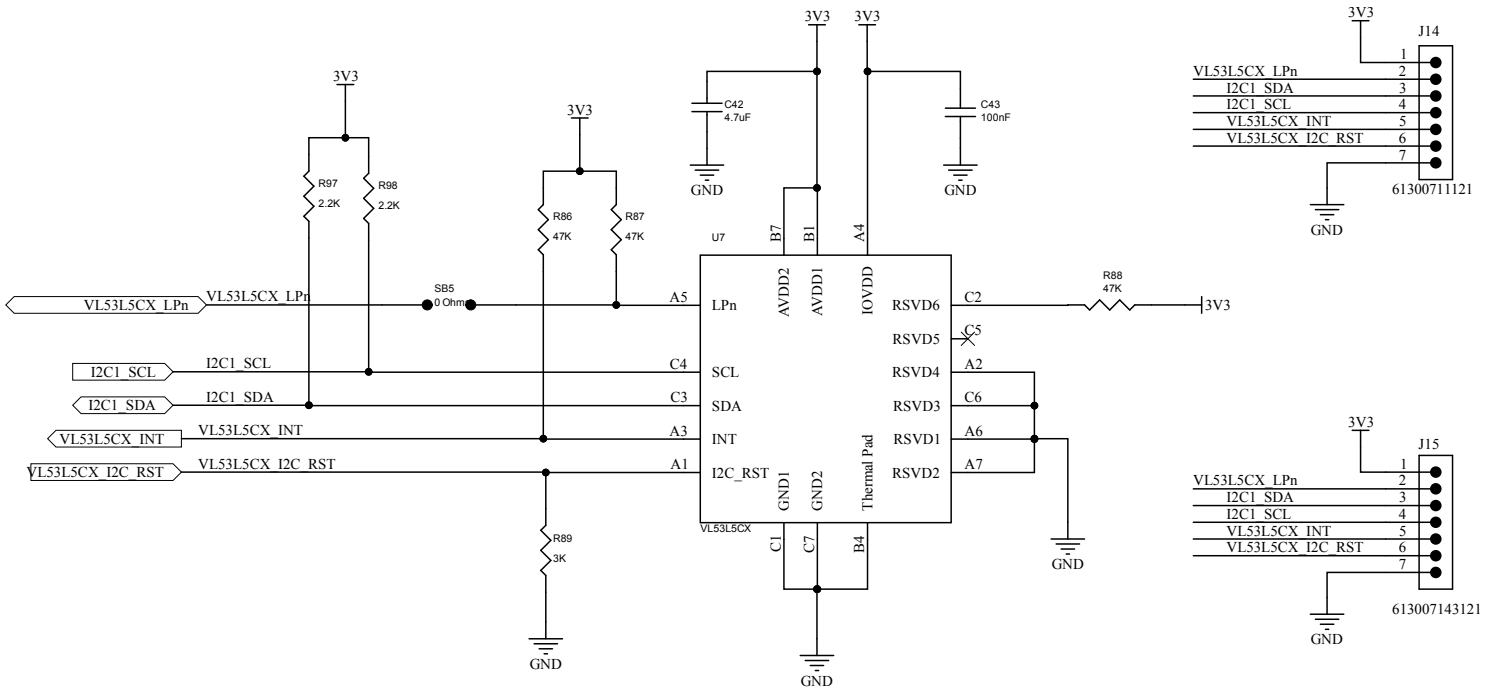
Magnetometer

Figure 9. X-STM32MP-RBT01 circuit schematics (8 of 10)



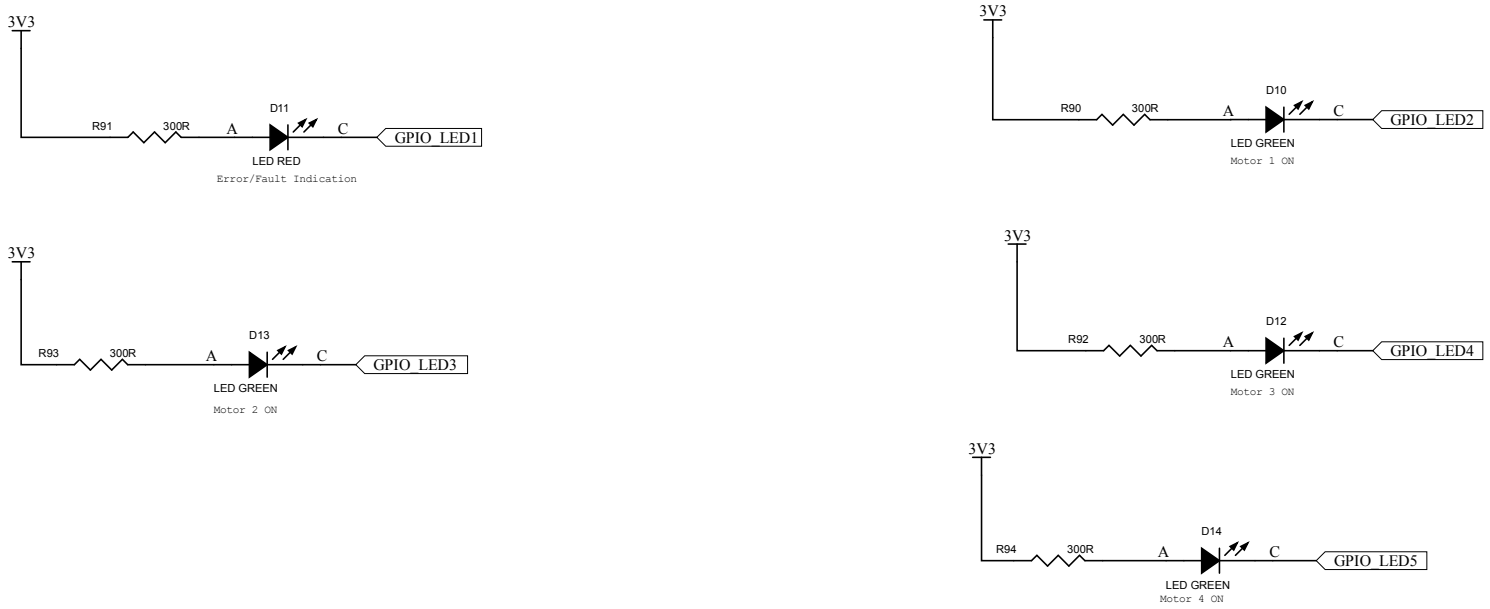
Pressure Sensor

Figure 10. X-STM32MP-RBT01 circuit schematics (9 of 10)



Time of Flight
Ranging Sensor

Figure 11. **X-STM32MP-RBT01 circuit schematics (10 of 10)**



Revision history

Table 1. **Document revision history**

Date	Revision	Changes
20-Feb-2025	1	Initial release.