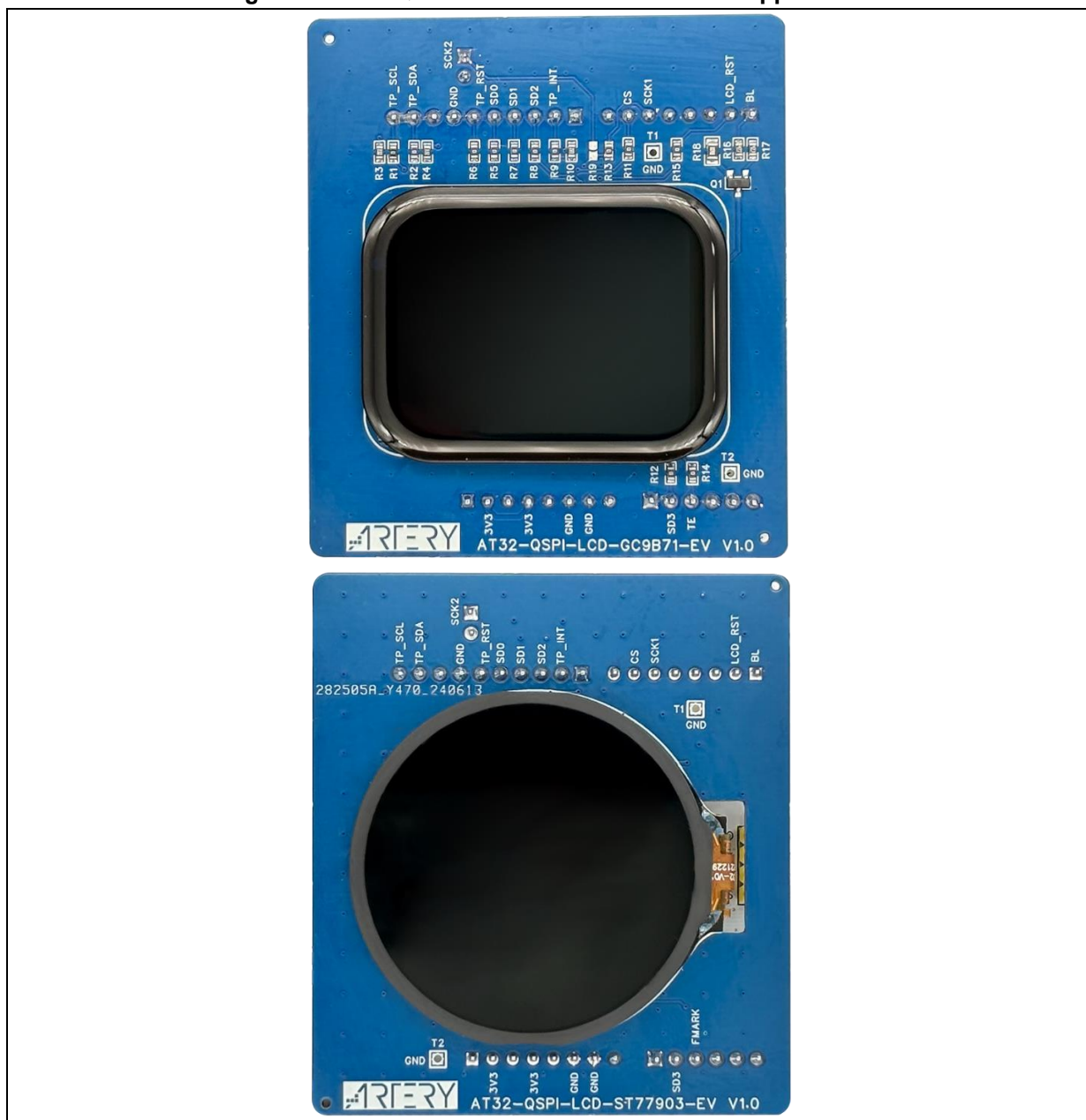


# Introduction

QSPI display panel has low pin count and easy-to-use feature. The AT32-QSPI-LCD-EV evaluation board is designed to help you accelerate your QSPI display panel solution development. This evaluation board features a small TFT LCD touch panel driven by QSPI interface. It comes with standard Arduino™ Uno R3 connectors that are intended to connect with ARTERY's AT-START evaluation board with QSPI feature and other compatible boards. The AT32-QSPI-LCD-EV evaluation board can be used for human-computer interaction application development.

**Figure 1. AT32-QSPI-LCD-EV evaluation board appearance**



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## 1 Hardware layout and configuration

The AT32-QSPI-LCD-EV evaluation board is connected with the AT-START board with QSPI feature, via its Arduino™ connectors on board. The AT-START board embeds a microcontroller that is capable of setting TFT LCD display and transmitting images via QSPI bus, while obtaining touch coordinated data via I<sup>2</sup>C bus.

Because of different kinds of driving chips for QSPI panel exist with different appearances and structures, currently, ARTERY has launched its first two AT32-QSPI-LCD-EV evaluation boards: GC9B71 and ST77903. In the future, ARTERY will also continue its efforts to develop diverse evaluation boards to meet the evolving meeting demand.

The AT-START board features an embedded ARTERY MCU, and standard Arduino™ Uno R3 expansion connectors to be connected with the AT32-QSPI-LCD-EV evaluation board.

[Figure 2](#) presents the hardware configuration of the AT32-QSPI-LCD-EV evaluation board.

[Figure 3](#) and [Figure 4](#) show their respective locations on the AT32-QSPI-LCD-EV evaluation board, taking the AT32-QSPI-LCD-GC9B71-EV as an example.

**Figure 2. Hardware block diagram**

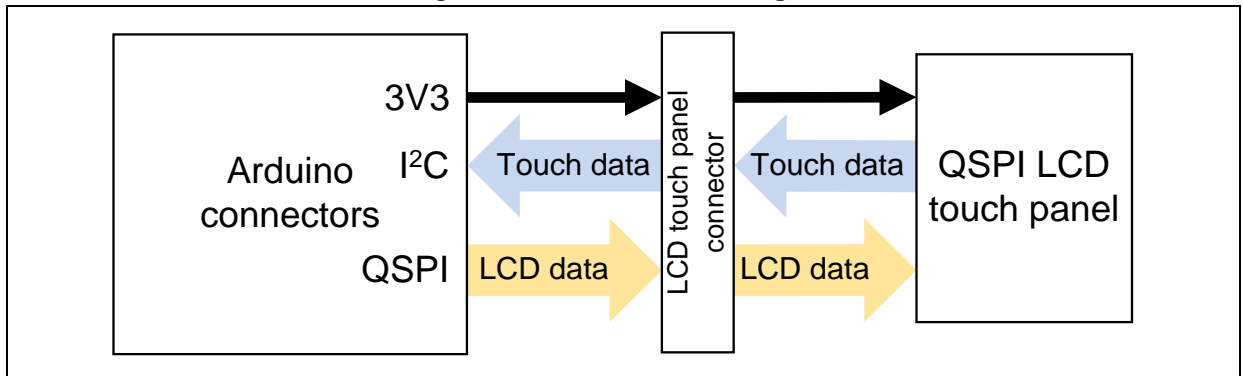


Figure 3. Top layer layout

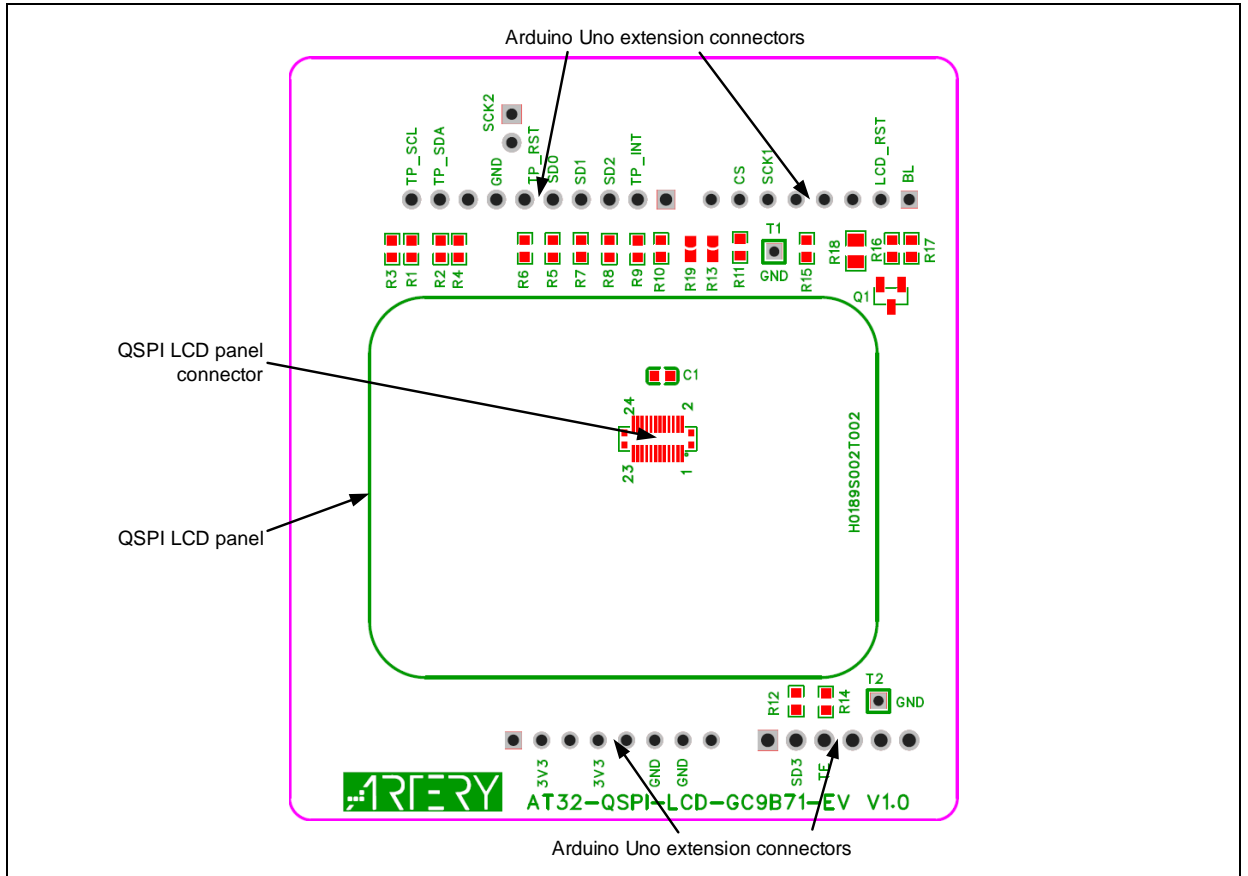
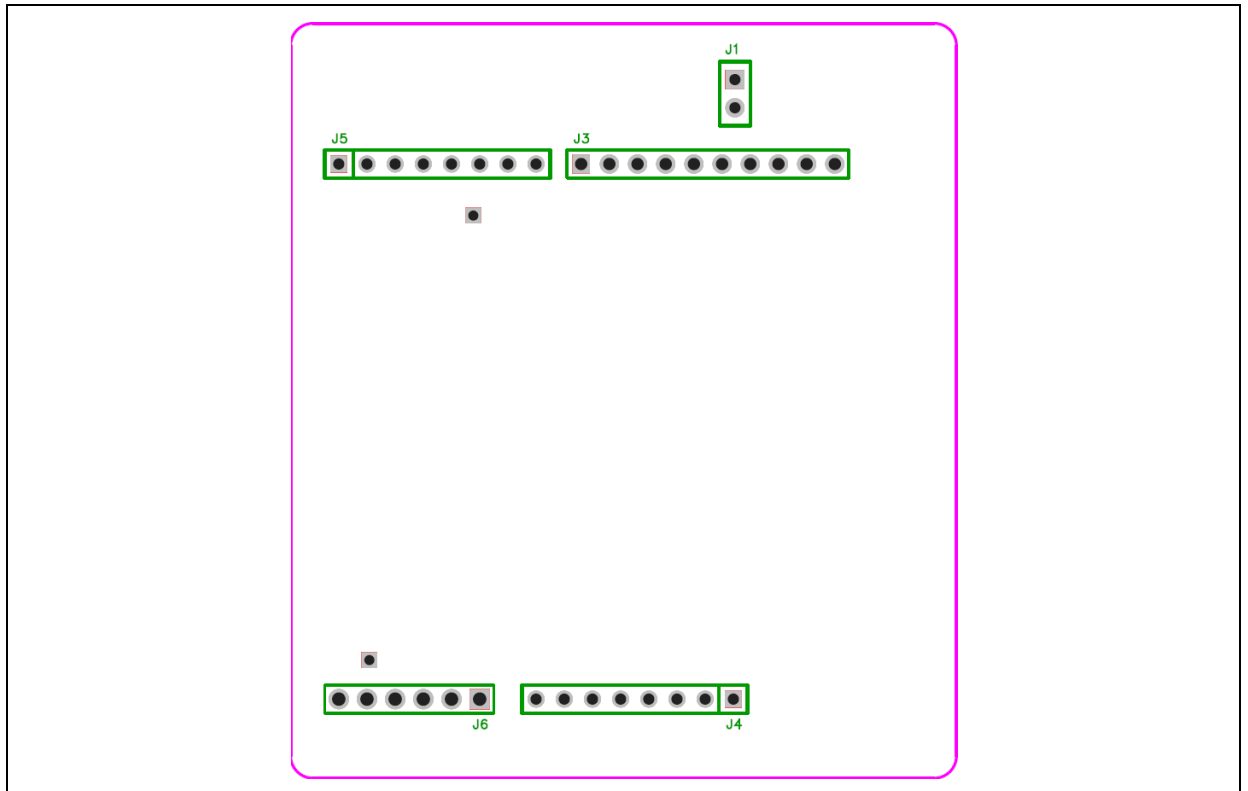


Figure 4. Bottom layer layout



## 2 Arduino connectors

Table 1. Arduino™ Uno R3 connectors definition

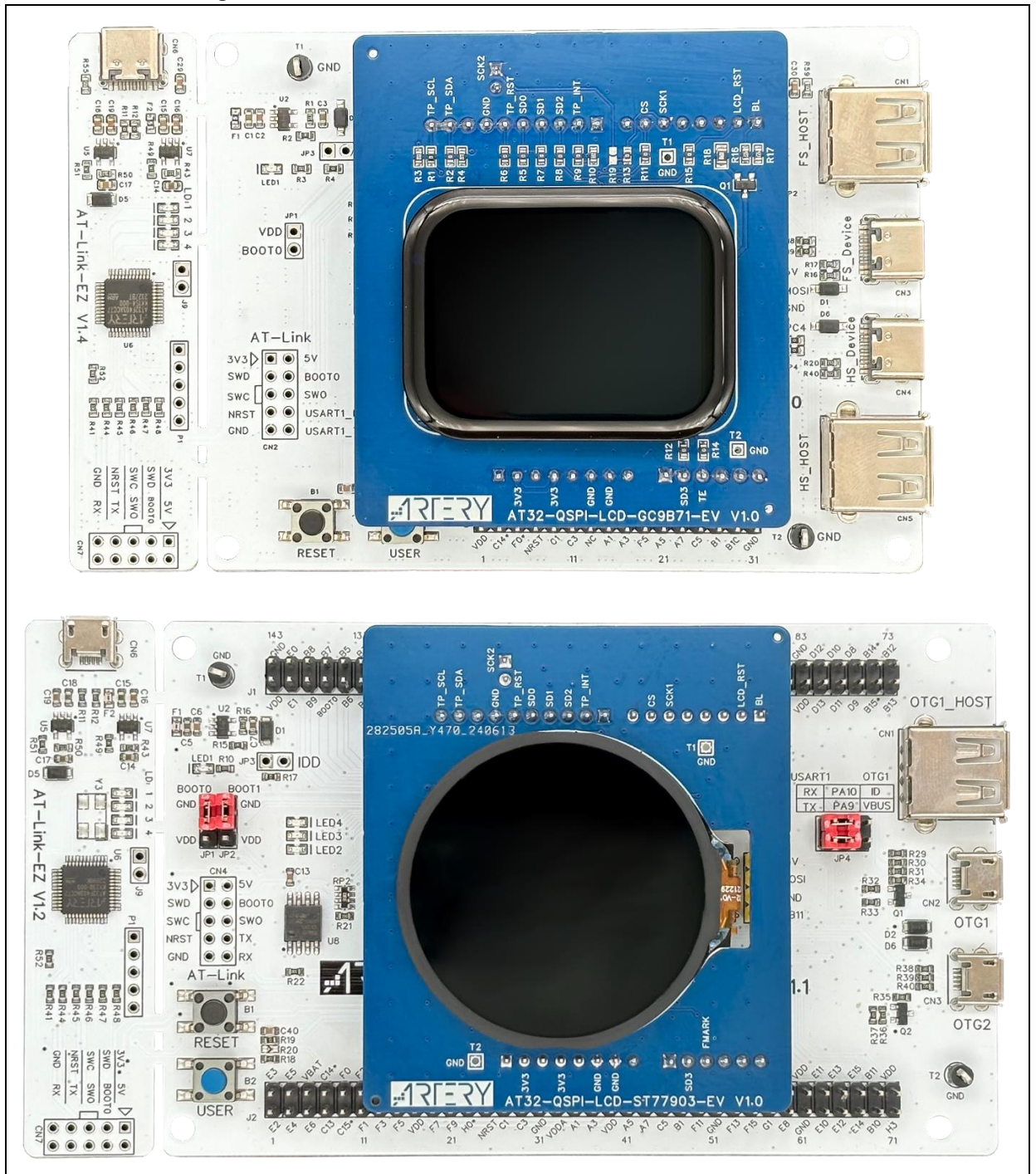
Connector	Pin No.	Arduino pin name	Function
J4 (power supply)	1	NC	-
	2	IOREF	-
	3	RESET	-
	4	3.3V	QSPI LCD panel power supply
	5	5V	-
	6	GND	Ground
	7	GND	Ground
	8	VIN	-
J6 (analog input)	1	AN0	-
	2	AN1	QSPI_IO3 connected to the SD3 of QSPI LCD panel
	3	AN2	GPIO connected to the tearing effect output of QSPI LCD panel
	4	AN3	-
	5	AN4	-
	6	AN5	-
J5 (logic input/output low byte)	1	D0	GPIO connected to the backlight control of QSPI LCD panel
	2	D1	GPIO connected to the reset pin of QSPI LCD panel, active low
	3	D2	-
	4	D3	-
	5	D4	-
	6	D5	QSPI_SCK connected to the CLK <sup>(1)</sup> pin of QSPI LCD panel
	7	D6	QSPI_CS connected to the CS pin of QSPI LCD panel
	8	D7	-
J3 (logic input/output high byte)	1	D8	-
	2	D9	Interrupt pin connected to touch INT
	3	D10	QSPI_IO2 connected to the SD2 pin of QSPI LCD panel
	4	D11	QSPI_IO1 connected to the SD1 pin of QSPI LCD panel
	5	D12	QSPI_IO0 connected to the SD0 pin of QSPI LCD panel
	6	D13	GPIO connected to touch reset pin, active low
	7	GND	Ground
	8	AREF	-
	9	SDA	I2C_SDA is connected to touch SDA
	10	SCL	I2C_SCL is connected to touch SCL

(1) For AT-START-F435/F437 board, its PB4 (corresponding to D5) has no QSPI\_SCK function, the user needs to set R13 OFF and R19 ON. In this case, the QSPI\_SCK comes from the PD3 corresponding to J1 pin 1.

## 3 How to use AT32-QSPI-LCD-EV

Plug the AT32-QSPI-LCD-EV evaluation board onto the AT-START board through Arduino connectors and supply 5 V or 3.3 V to the AT-START board (refer to the section [Power supply](#) sources of the AT-START user manual for details). Then it is now ready to use the AT32-QSPI-LCD-EV evaluation board. While connecting the AT32-QSPI-LCD-EV evaluation board to the AT-START board, it is necessary to make sure that the pins used in the AT32-QSPI-LCD-EV disconnect from those circuits on the AT-START board (such as USB and Ethernet PHY) to avoid mutual disturbance. This can be done by de-soldering corresponding resistors on the AT-START board.

Figure 5. AT32-QSPI-LCD-EV combined with AT-START board





## 4 Revision history

Table 2. Document revision history

Date	Revision	Changes
2024.8.20	1.00	Initial release

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