

Introduction

The AT32-Comm-EV evaluation board is designed to help users speed up the development of communication application solutions. It features CAN and RS-485 transceivers, I²C and SPI connectors. The board can be connected to Artery's AT-START board or other compatible control boards through standard Arduino[™] Uno R3 connectors.

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1 Hardware layout and configuration

The AT32-Comm-EV board is connected to the AT-START board through Arduino™ connectors. In this way, the EV board is able to access the CAN, USART, I²C and SPI on embedded AT32 MCU on AT-START board. This document uses AT-START-F403A board as an example to demonstrate various functions.

In addition to the embedded AT32 MCU, the AT-START board offers standard Arduino™ Uno R3 extension connectors to be connected to the AT32-Comm-EV board.

JP1 and JP2 are used to configure whether to turn on 120 Ω termination resistors of the CAN and RS-485 transceivers, respectively. They are ON by default. The users are allowed to adjust the resistors according to their needs.

Figure 1 and Figure 2 show these features on the AT32-Comm-EV board.

Figure 1. Top layer layout

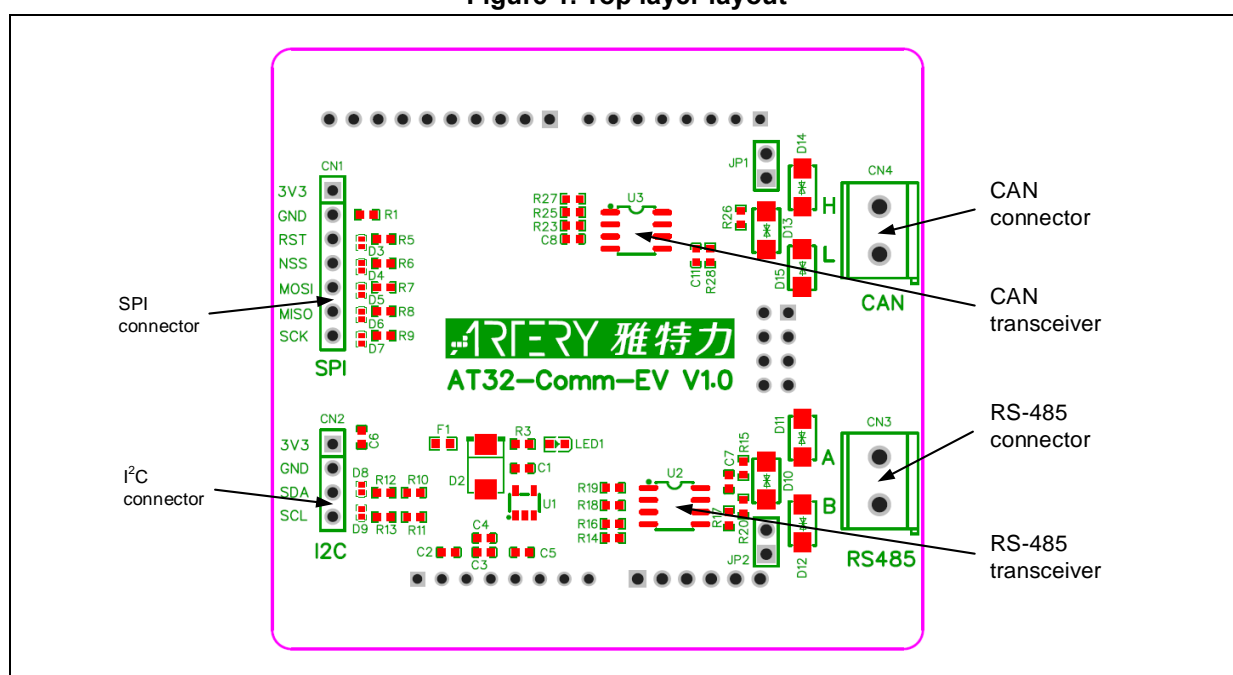
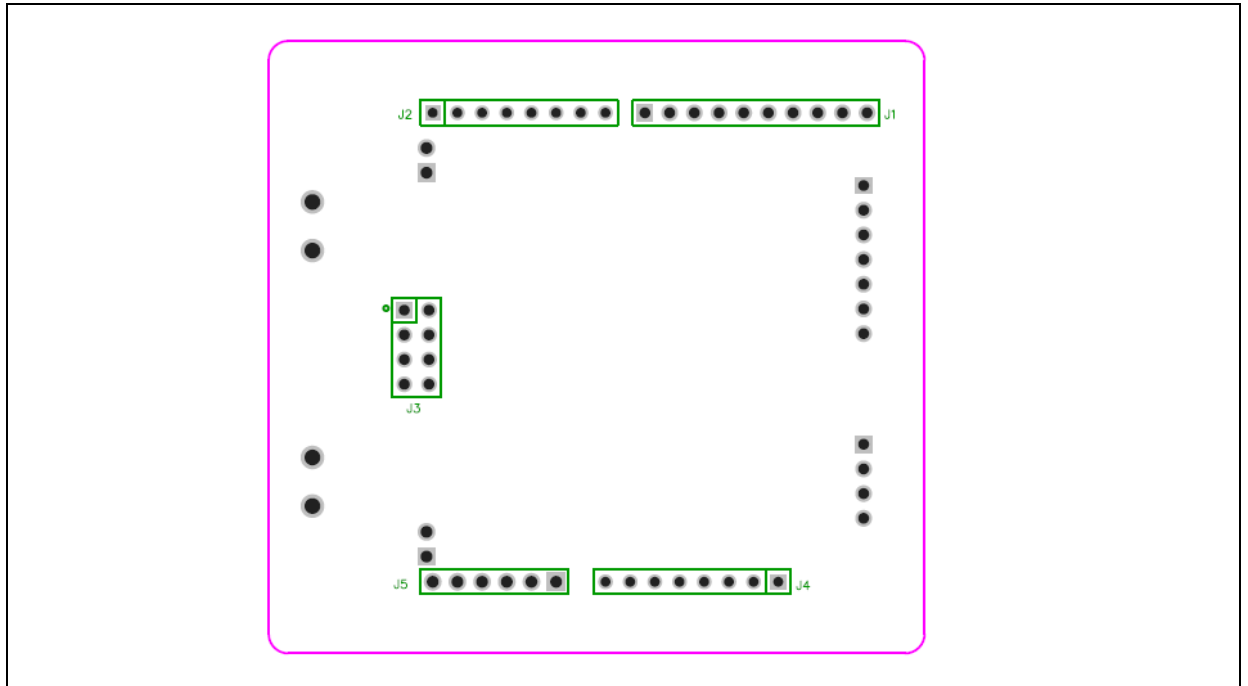


Figure 2. Bottom layer layout



2 Arduino connectors

Table 1. Arduino™ Uno R3 connectors definition

Connector	Pin No.	Arduino pin name	AT32F403A pin name	Function	Description
J4 (power supply)	1	NC	-	-	-
	2	IOREF	-	3.3 V reference voltage	3.3 V reference voltage
	3	RESET	NRST	External reset	-
	4	3.3V	-	3.3 V input/output	3.3 V power supply
	5	5V	-	5 V input/output	5 V power supply
	6	GND	-	Ground	Ground
	7	GND	-	Ground	Ground
	8	VIN	-	7~12 V input/output	-
J5 (analog input)	1	A0	PA0	ADC123_IN0	-
	2	A1	PA1	ADC123_IN1	USART2_RTS_DE or GPIO
	3	A2	PA4	ADC12_IN4	-
	4	A3	PB0	ADC12_IN8	-
	5	A4	PC1 or PB9	ADC123_IN11 or I2C1_SDA	-
	6	A5	PC0 or PB8	ADC123_IN10 or I2C1_SCL	-
J2 (logic input/output low bytes)	1	D0	PA3	USART2_RX	USART2_RX
	2	D1	PA2	USART2_TX	USART2_TX
	3	D2	PA10	-	-
	4	D3	PB3	TMR2_CH2	-
	5	D4	PB5	-	-
	6	D5	PB4	TMR3_CH1	-
	7	D6	PB10	TMR2_CH3	I2C2_SCL
	8	D7	PA8	-	-
J1 (logic input/output high bytes)	1	D8	PA9	-	-
	2	D9	PC7	TMR3_CH2	-
	3	D10	PA15 or PB6	SPI1_NSS or TMR4_CH1	-
	4	D11	PA7	TMR3_CH2 or SPI1_MOSI	-
	5	D12	PA6	SPI1_MISO	-
	6	D13	PA5	SPI1_SCK	-
	7	GND	-	Ground	Ground
	8	AREF	-	VREF+ input/output	-
	9	SDA	PB9	I2C1_SDA	CAN1_TX
	10	SCL	PB8	I2C1_SCL	CAN1_RX

Connector	Pin No.	Arduino pin name	AT32F403A pin name	Function	Description
J3 (others)	2	MISO	PB14	SPI2_MISO	SPI2_MISO
	1	5V	-	5 V input/output	5 V power supply
	4	SCK	PB13	SPI2_SCK	SPI2_SCK
	3	MOSI	PB15	SPI2_MOSI	SPI2_MOSI
	6	RESET	NRST	External reset	-
	5	GND	-	Ground	-
	8	CS	PB12	SPI2_CS	SPI2_CS
	7	PB11	PB11	-	I2C2_SDA

3 How to use AT32-Comm-EV

Insert the AT32-Comm-EV board into the Arduino connectors on AT-START board so that two parts are connected together. After successful connection, supply 5 V and 3.3 V for the combined board according to the descriptions of [Power supply section](#) of the AT-START user manual. Then it is ready to use the AT32-Comm-EV board, in which the CN1 is used to connect to SPI device, the CN2 to I²C device, CN3 to RS-485, and CN4 to CAN.

Example codes regarding AT32-Comm-EV board can be found in BSP, including:

CAN example code:

AT32xxx_Firmware_Library_V2.x.x\project\at_start_xxx\examples\can\communication_mode;

RS-485 example code:

AT32xxx_Firmware_Library_V2.x.x\project\at_start_xxx\examples\usart\rs485;

I²C example code:

AT32xxx_Firmware_Library_V2.x.x\project\at_start_xxx\examples\i2c\eeeprom;

SPI example code:

AT32xxx_Firmware_Library_V2.x.x\project\at_start_xxx\examples\spi\w25q_flash。

4 Schematics

Figure 3. Schematic diagram (power supply, I²C and SPI)

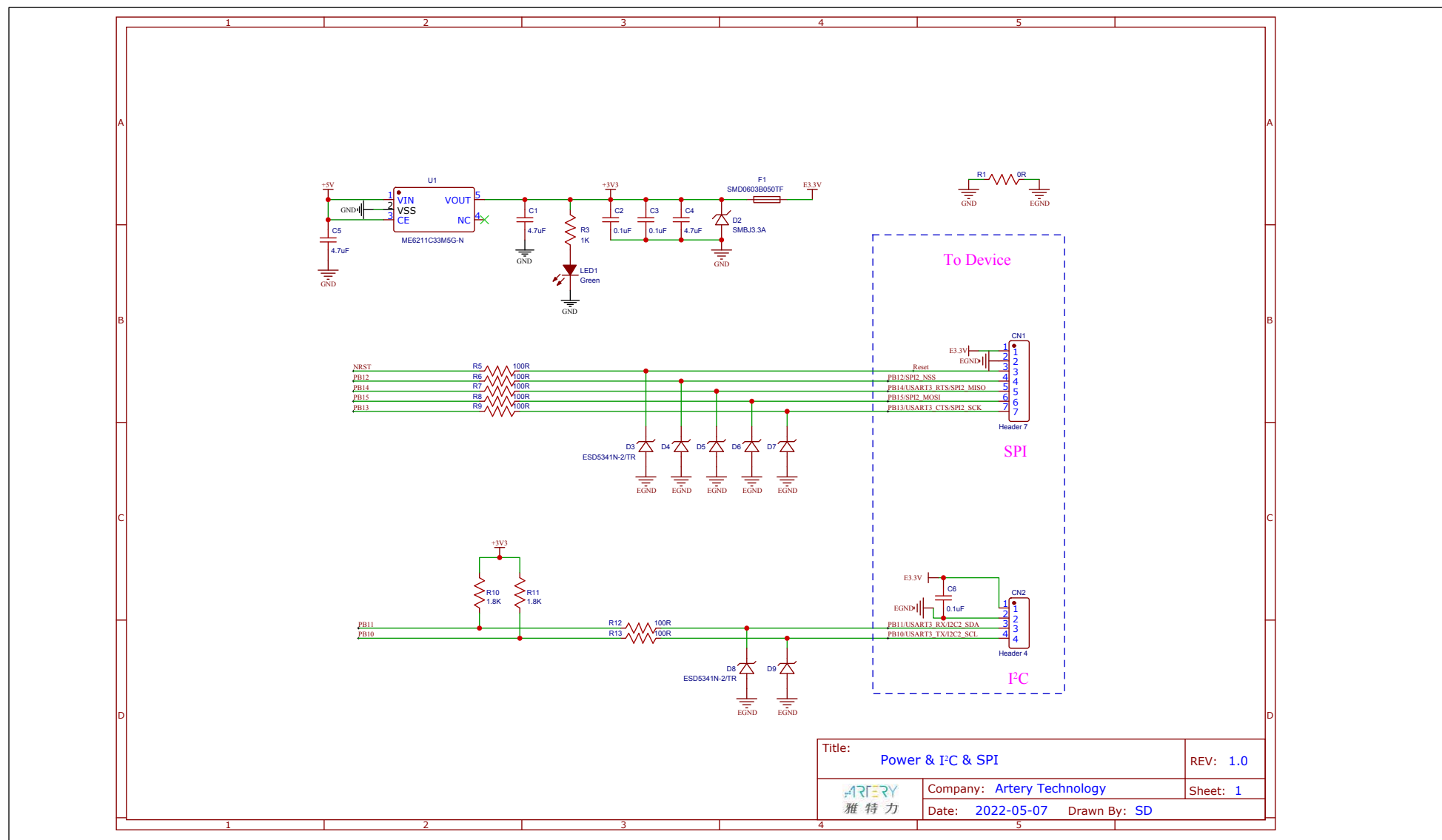


Figure 4. Schematic diagram (RS-485 and CAN)

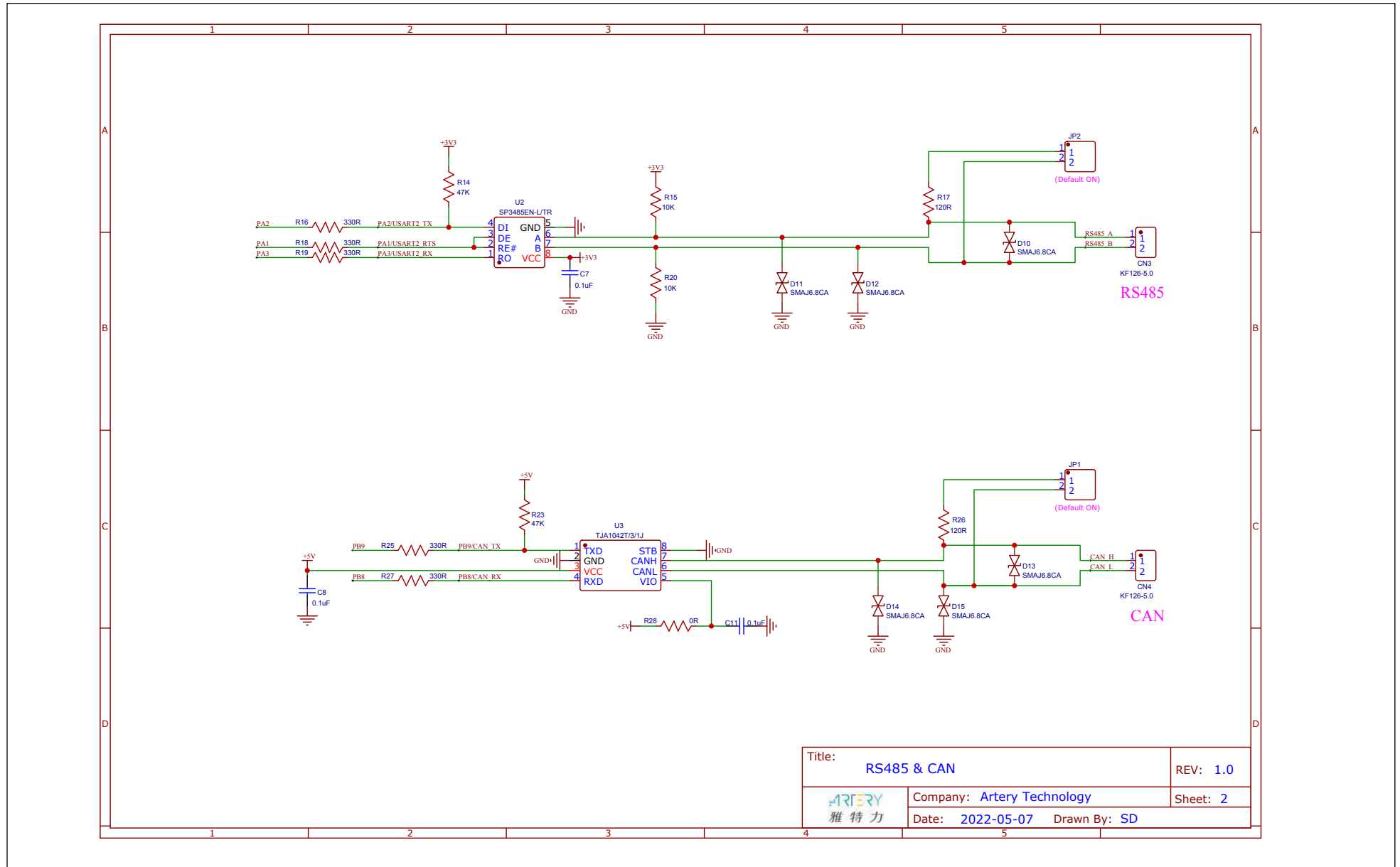
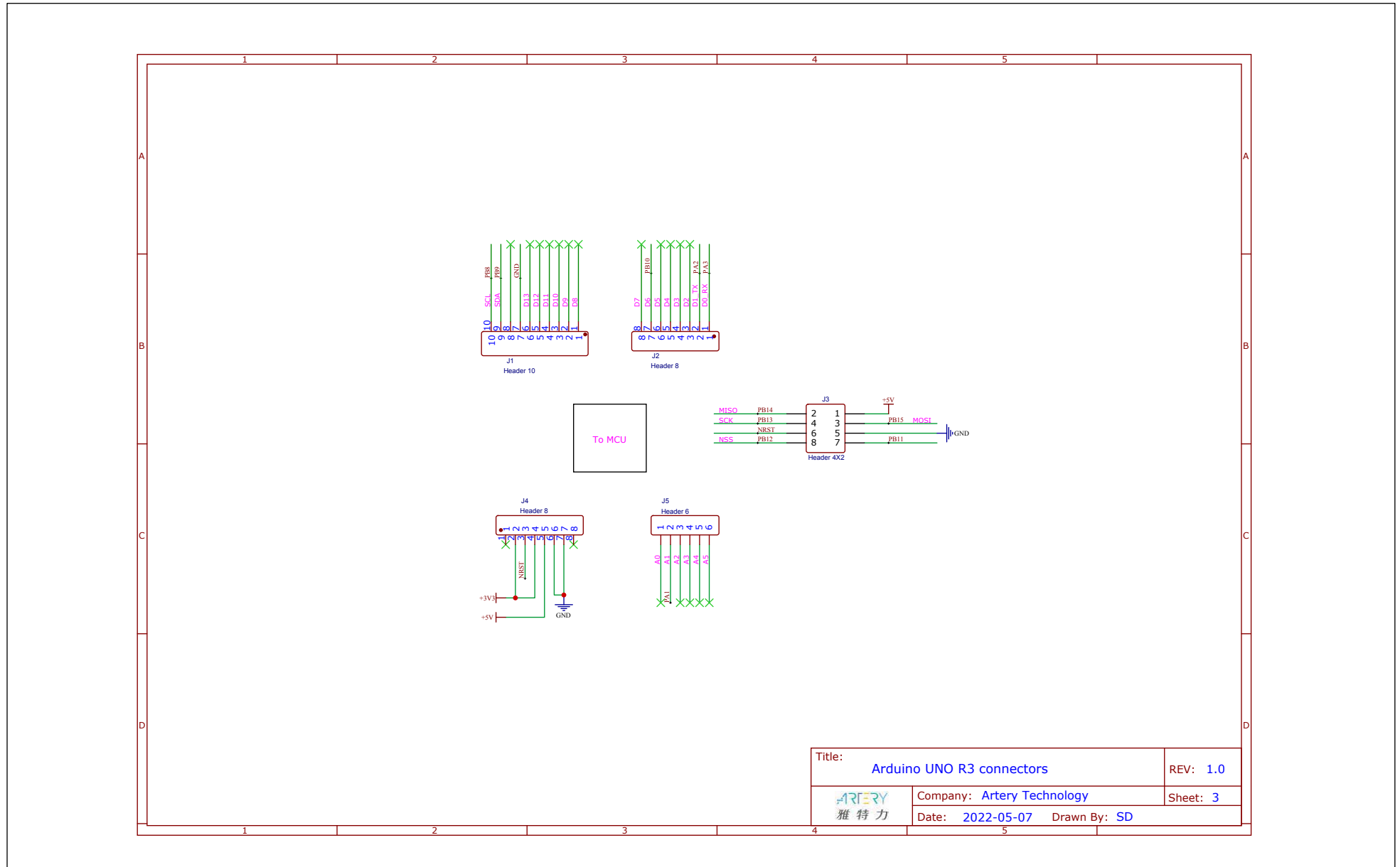


Figure 5. Schematic diagram (Arduino UNO R3 extension connectors)



5 Revision history

Table 2. Document revision history

Date	Revision	Changes
2022.5.7	1.00	Initial release

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