

uP-2
MCS-51/AVR/PIC MCU
Experimental Board

User's Manual

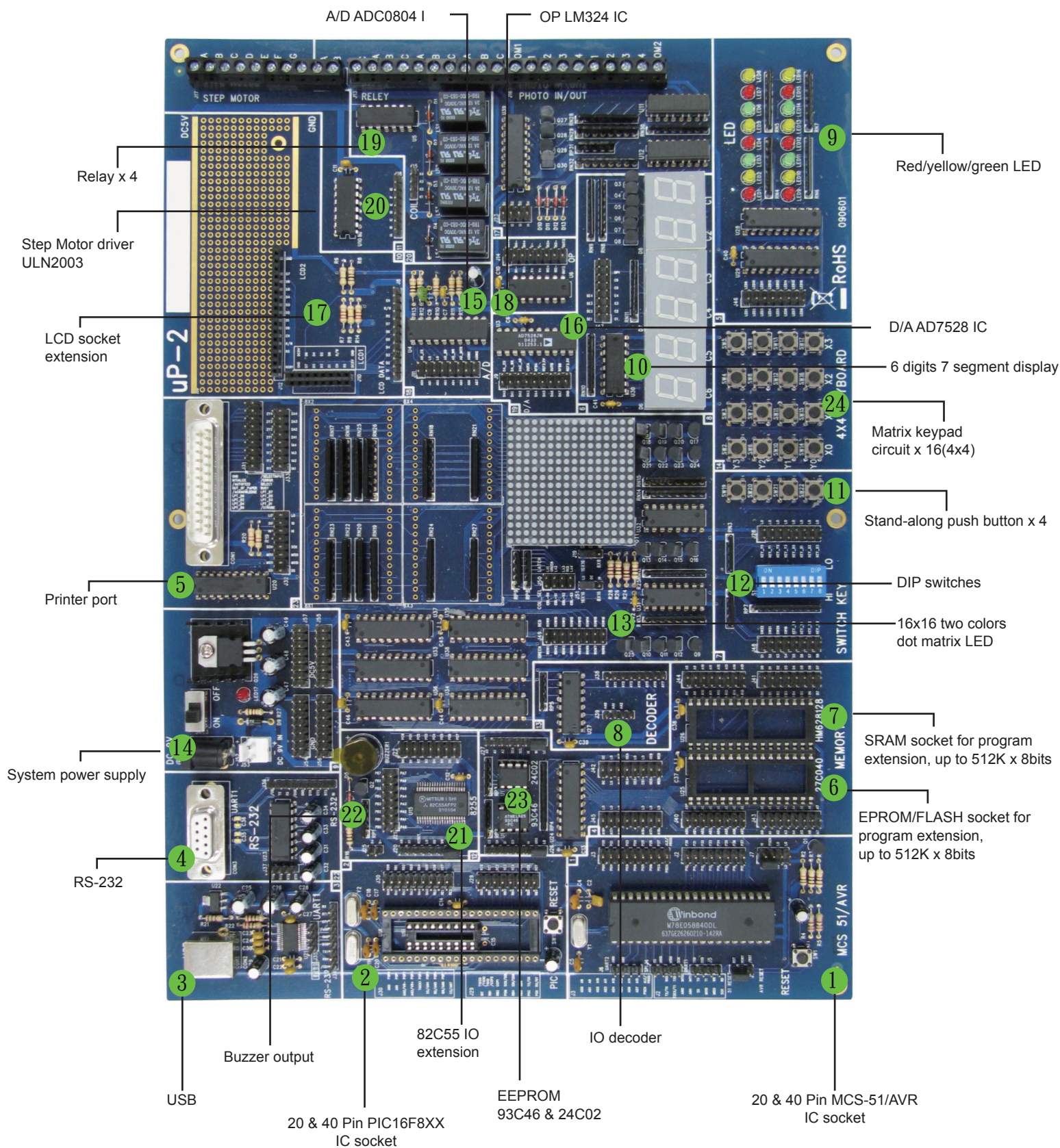


LEAP ELECTRONIC CO.,LTD.

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uP-2 MCS-51/AVR/PIC MCU Experimental Board User's Manual



1. Outline

In the process of learning MCU, people lacked of attention with practical training board, only focus on assembler and emulator. Moreover, users only can follow existed experiment, can not develop new electronic circuit if they use the boards on the market.

Another situation, users use bread board and follow the circuit to solder and insert component on it. It took a lot time on connection and debug. Many users will reduce their interesting because of no efficiency.

Because of above reason, we develop uP-2. The features are as below:

- (1) Applied subject are included MCS-5X/AVR/PIC 16F8XX.
- (2) Available 20 or 40 pin MUC.
- (3) Compatible with many brands emulator.
- (4) System be designed on stand-alone CPU, interface separately.
- (5) Provide 20 experimental units.
- (6) All of the circuits is able to combined with cable wires by user.
- (7) No need to Solder, saving time.
- (8) 385 holes on the board which provide user for extended application or subject experiments.
- (9) 1)The Power is provided two kinds of input, 9V adaptor or DC 9V.

However, if you have big current experiment, please provide by power supply.

2. uP-2 Circuit Unit

- (1) 20 & 40 Pin MCS-51/AVR IC socket
- (2) 20 & 40 Pin PIC16F8XX IC socket
- (3) USB
- (4) RS-232
- (5) Printer port
- (6) EPROM/FLASH socket for program extension, up to 512K x 8bits
- (7) SRAM socket for program extension, up to 512K x 8bits
- (8) IO decoder
- (9) Red/yellow/green LED
- (10) 6 digits 7 segment display
- (11) Stand-alone push button x 4
- (12) DIP switches
- (13) 16x16 two colors dot matrix LED
- (14) System power supply
- (15) A/D ADC0804 IC
- (16) D/A AD7528 IC
- (17) LCD socket extension.
- (18) OP LM324 IC
- (19) Relay x 4
- (20) Step Motor driver ULN2003
- (21) 82C55 IO extension
- (22) Buzzer output
- (23) EEPROM 93C46 & 24C02

(24) Matrix keypad circuit x 16(4x4)

(25) Photo

(26) 385 hole universal board

3.uP-2 Instruction

The uP-2 contain 17 circuit units. Users can easily accomplish either various circuits matched or utilizing the 385 hole universal board to join other electronics circuit for reach other requirement of experiment.

The uP-2 provides besides common use MCS-51 but also ISP function, which able for users to do on line programming. Moreover, it also involved currently popular AVR and PIC16F8XX.

For general experiment, it can normal work with 9V 500mA adaptor. The experiment contents involved besides DIP SW, LED output, relay output, Photo input/output, but also buzzer, RS-232.....

Further more, the extension for MCS-51/AVR and PIC, e.g., 82C55, AD7528, ADC0804, USB, ULN2003, 93C46, 24C02..... All of them are in uP-2 as well.

4.uP-2 PCB Introduction by Block

(1) MCS-51/AVR IC socket:

It's the place for 51 compatible 80, 87, 89 MPU and AVR90S.

Enclosed 51/AVR reset key. Stand-alone UART and SPI pin which is very convenience for users.

(2) PIC socket:

It's the place for 16F8XX MPU. Enclose reset Key.

(3) USB interface

It utilizes PL2303 to emulate RS-232 connection and IO function.

(4) EPROM, SRAM and SEEPROM circuit:

It's the place for MPU 8051 and extension for EPROM. The suitable devices are EPROMs are under 27C040, SRAMs are under 628128, SEEPROMs are 93C46 & 24C02.

(5) 8 LED output x 2

LED output display x 16

(6) 7 segment display

Using 7447 for output device, and the input display use GND short connection by selection C1 to C6. Or use program to display on the 7 segment.

(7) Press button and switch

Included two part, one is 8P DIP SW, another is press button x 4 which is for input testing.

(8) 16x16 two colors dot matrix LED

Dot matrix can be displayed by red & green and program. ROW1 to ROW8 are green output. ROW9 to ROW16 are red output. Besides, users can use jumper 16x16, 16x8 or 8x8 to select display mode.

(9) System power supply:

There are two way of power input:

- a. Use power adaptor DC 9V which was delivered with the uP-2 package.
- b. Use outside power. Users can use IC7805 to transfer input DC 9V to uP-2 +5V power supply. Beside, uP-2 provides extended connection point for +5V and GND.

(10) LCD

Provide two kinds of pin define. Users can select back-lighted or no back-lighted.

(11) Driver

This place provides +5V step motor 500mA ground current driver.

(12) 82C55+Buzzer

Provides IO extended circuit. Use transistor to be a driver through MPU/IO for input.

(13) Decoder

Use 74LS138 for providing multi-IO decoder.

(14) Keypad

It's 4x4 matrix keypad. User can use it for scanning input application.

(15) 421 hole universal board

This place is for soldering by user themselves.

(16) Photo

This circuit include input x 4, output x4. Both of them use PC817 as separate component. The input signal can reach DC30V. The output can use lower than 0.3A load.

(17) A/D

Uses ADC0804 circuit. The direct referring voltage is VCC divide 2. Inputs are ADIN1 and ADIN2. The range is 0V to +5V

(18) D/A

Uses A7528 two set of D/A. The direct referring voltage is VCC divide 2. The outputs are OUT-A and OUT-B.

(19) Relay

Regarding need to separate from the system power or signal can not drive output component, we can use relay circuit to drive AC110V. Moreover, it can provide N.C. Point.

(20) OP

Uses LM324. The power must be supplied from outside of V+ and V-.

(21) RS-232 interface

The 9pin connector provides complete signal. The 4pin connector provides UART1 signal.

(22) LPT interface

The 16pin connector provides complete signal. It uses 74LS244 for buffer and provide SPI connector.

5. uP-2 Experimental Contents

- (1) LED
- (2) push button
- (3) Single and dual Traffic light control
- (4) Neon lamp
- (5) Extended program memory
- (6) Extended data memory
- (7) Extended EEPROM recode data
- (8) 16x16 double color dot matrix display, Character/graph
- (9) 6 digits dynamic 7 segment display LCD circuit (LCD is option)
- (10) Step motor driver circuit (need connect to external motor)
- (11) Relay control 4x4 matrix keypad scan circuit
- (12) Press button circuit
- (13) Touch switch read and set
- (14) Timer
- (15) Password key
- (16) Electronic piano
- (17) Counter
- (18) A/D and D/A conversion
- (19) 8255 I/O extension
- (20) Multi I/O decode
- (21) Serial Peripheral Interface
- (22) Printer interface
- (23) USB interface
- (24) USB transfer to RS-232

(25) OPTO input & output

6.uP-2 accessories

(1) Main Board x 1

(2) USB Cable x 1

(3) 8pin Cable x 4

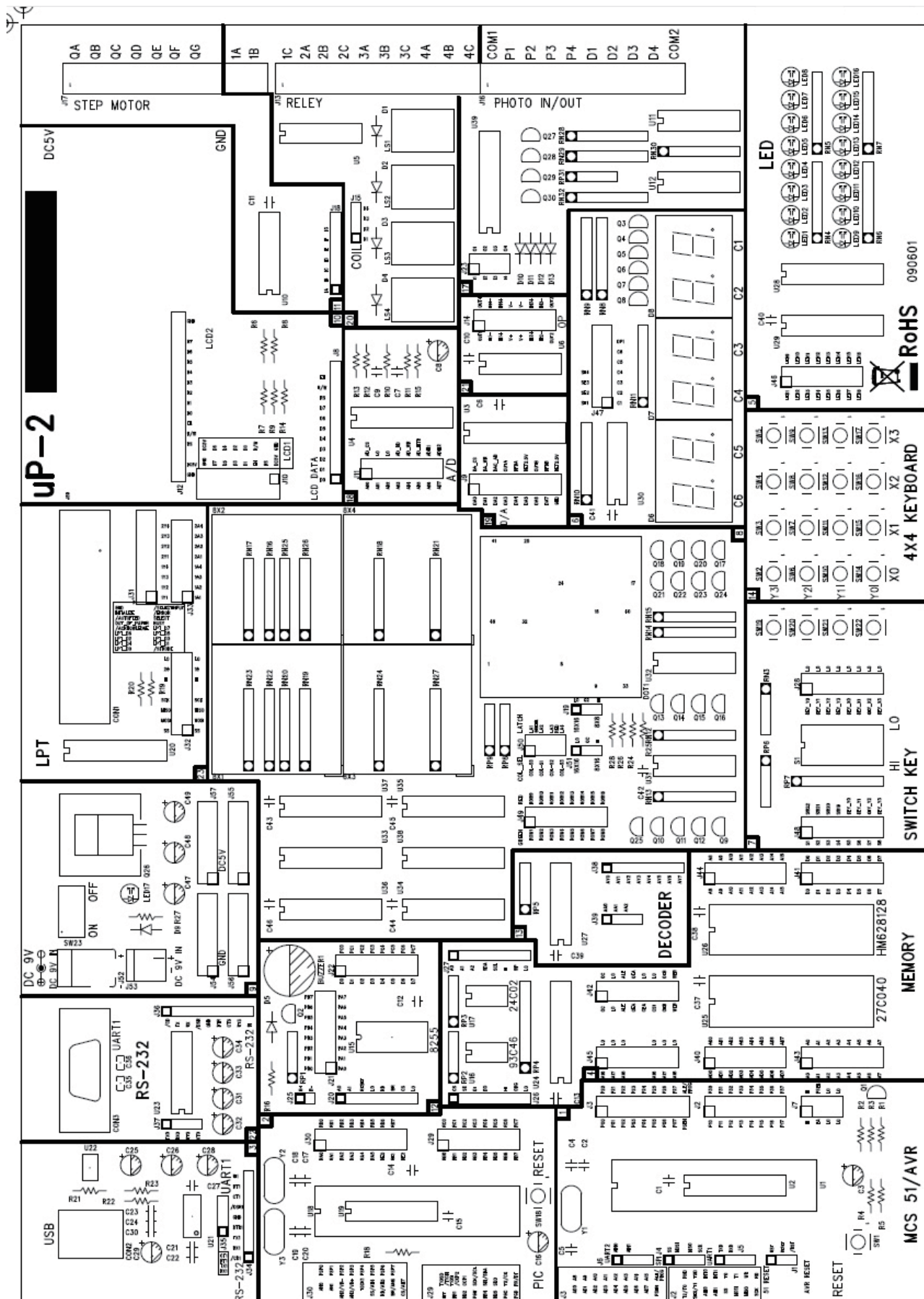
(4) 4pin Cable x 4

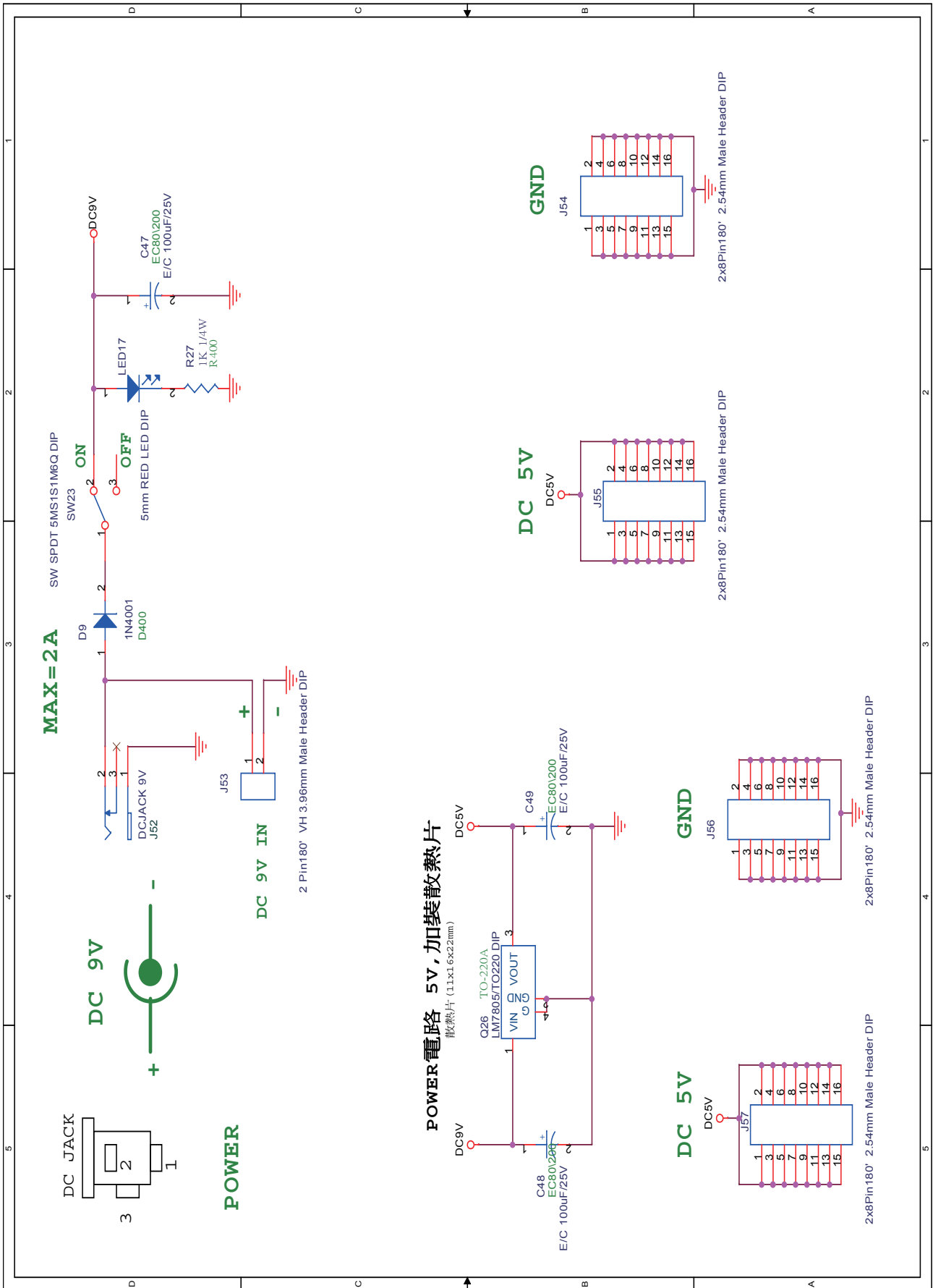
(5) 2pin cable x 8

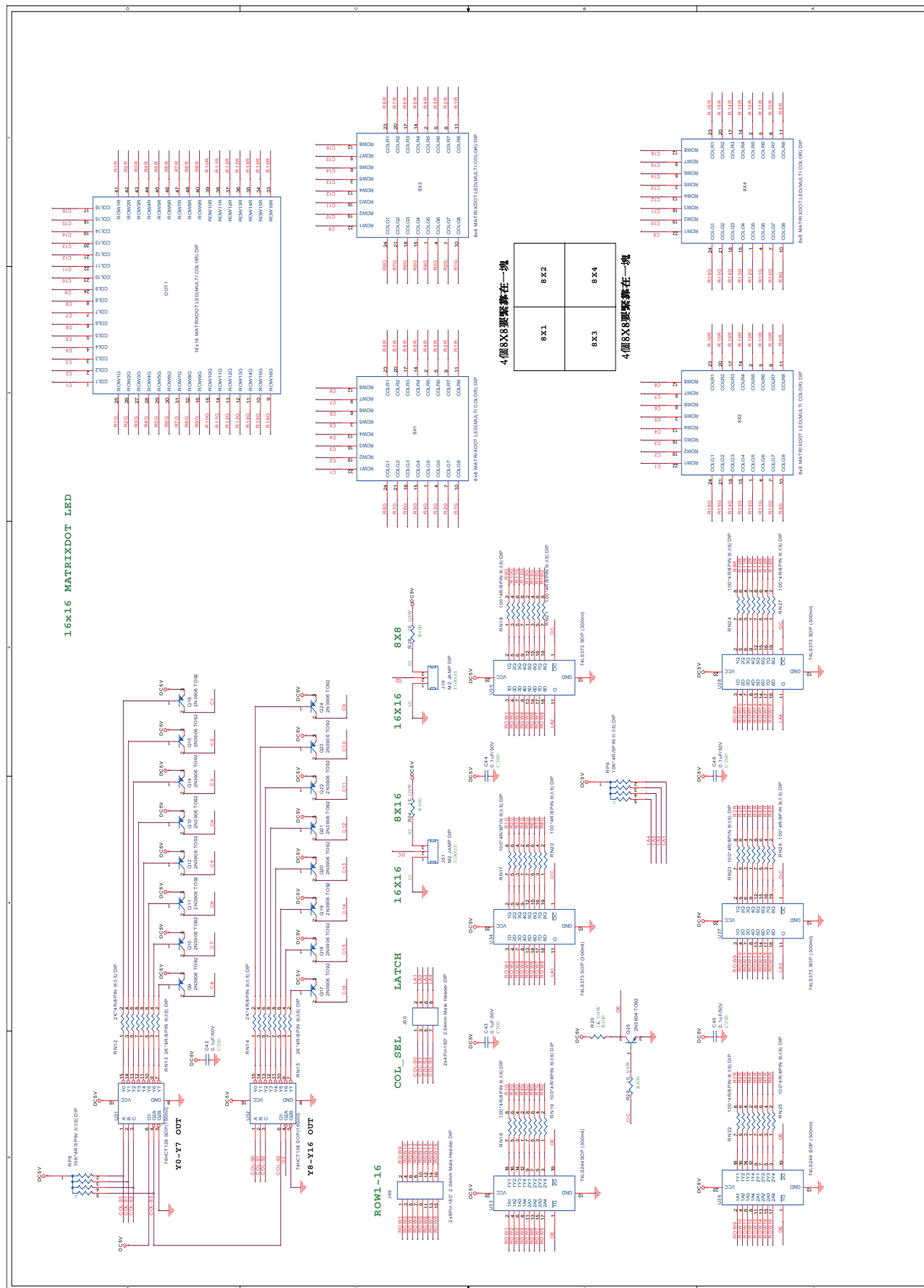
(6) CD, included user's manual, boot codes, softwares x 1

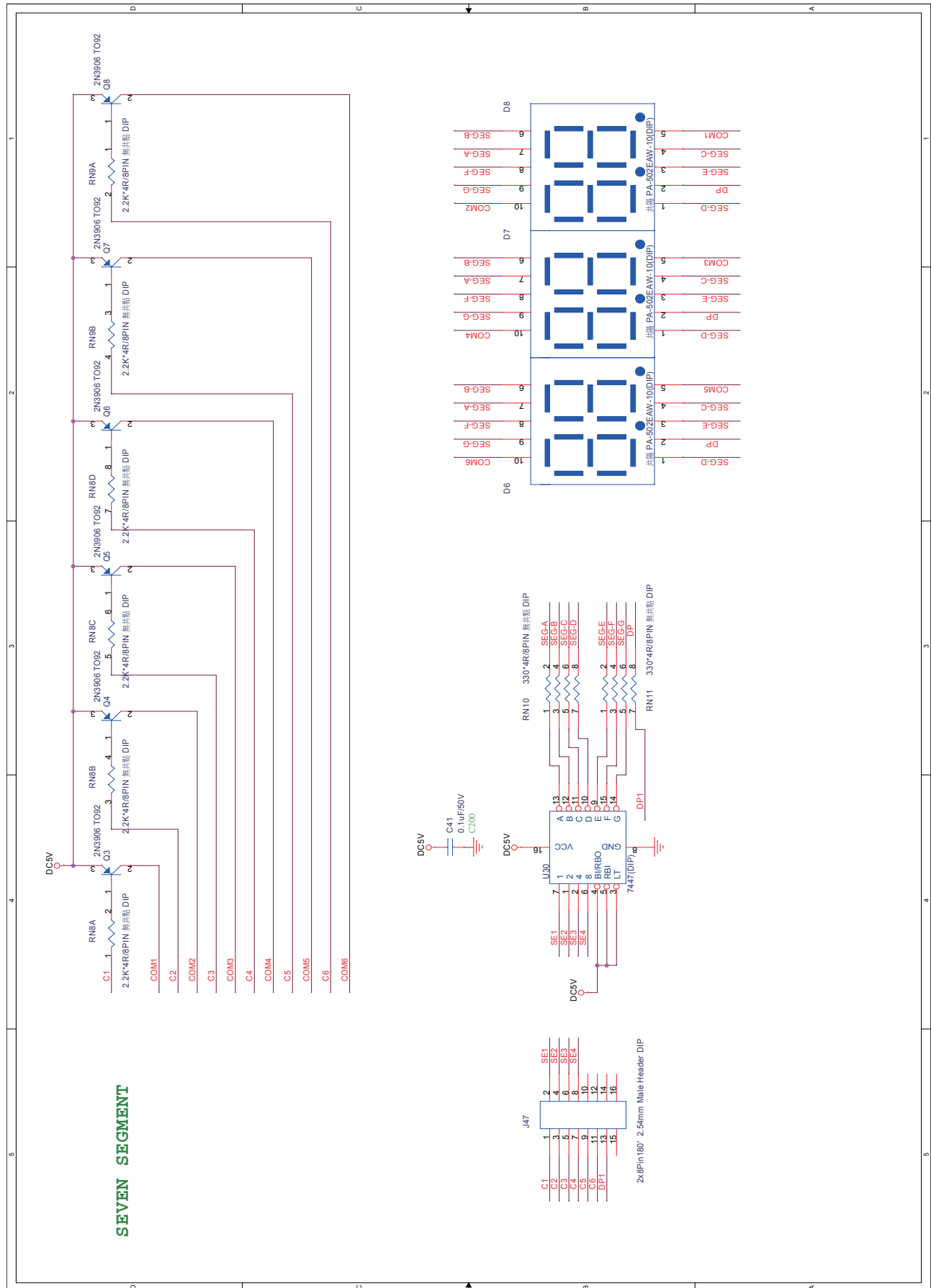
(7) AC110V/DC9V power adaptor x 1

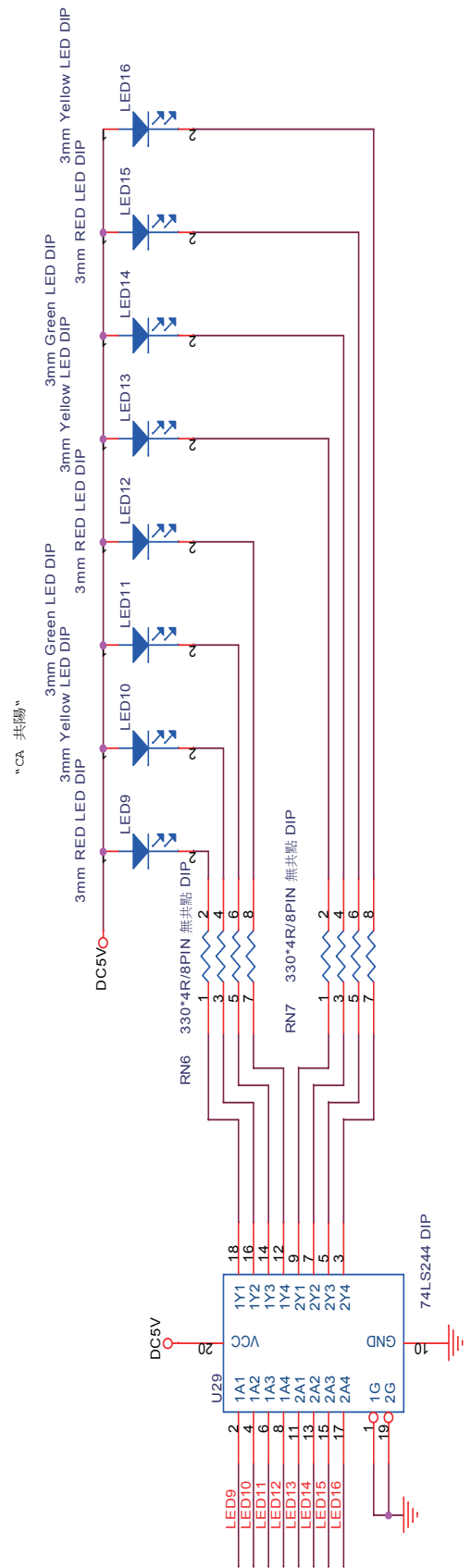
(8) MPU W78E052DDG IC x 1

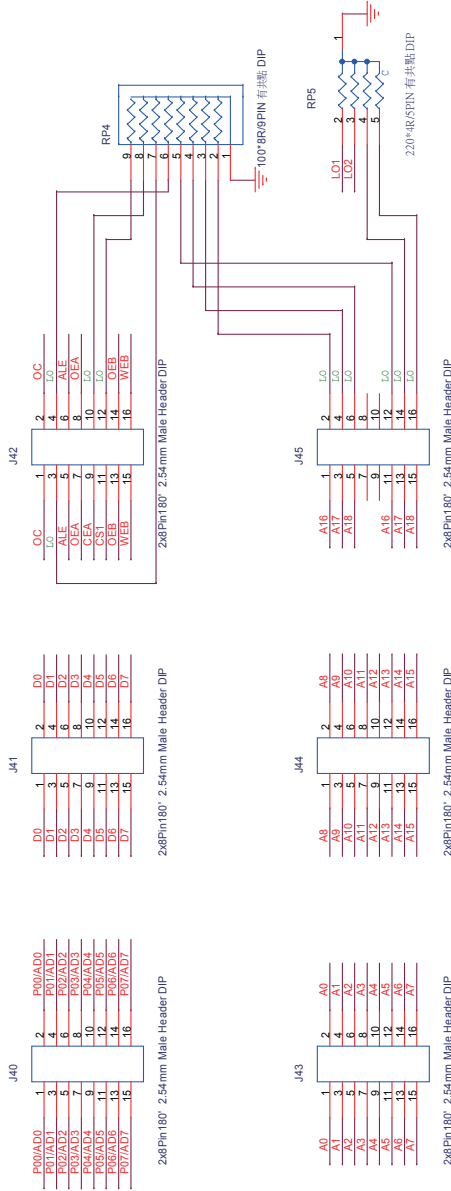
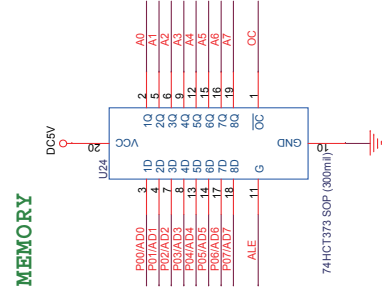
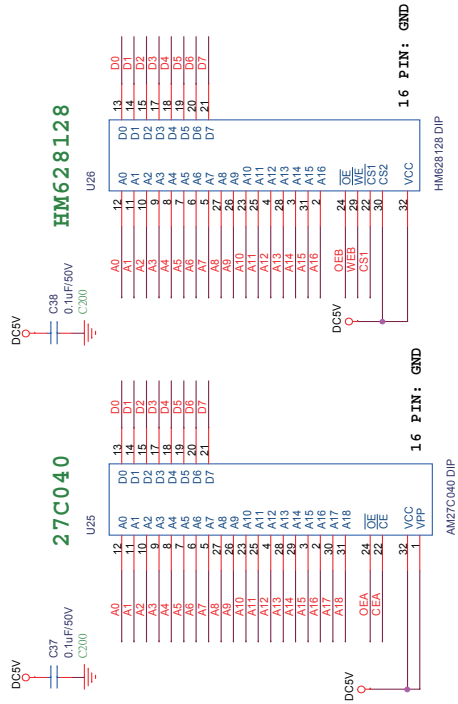
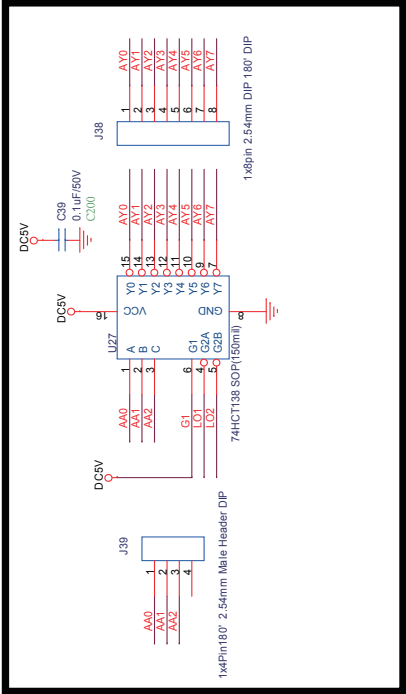


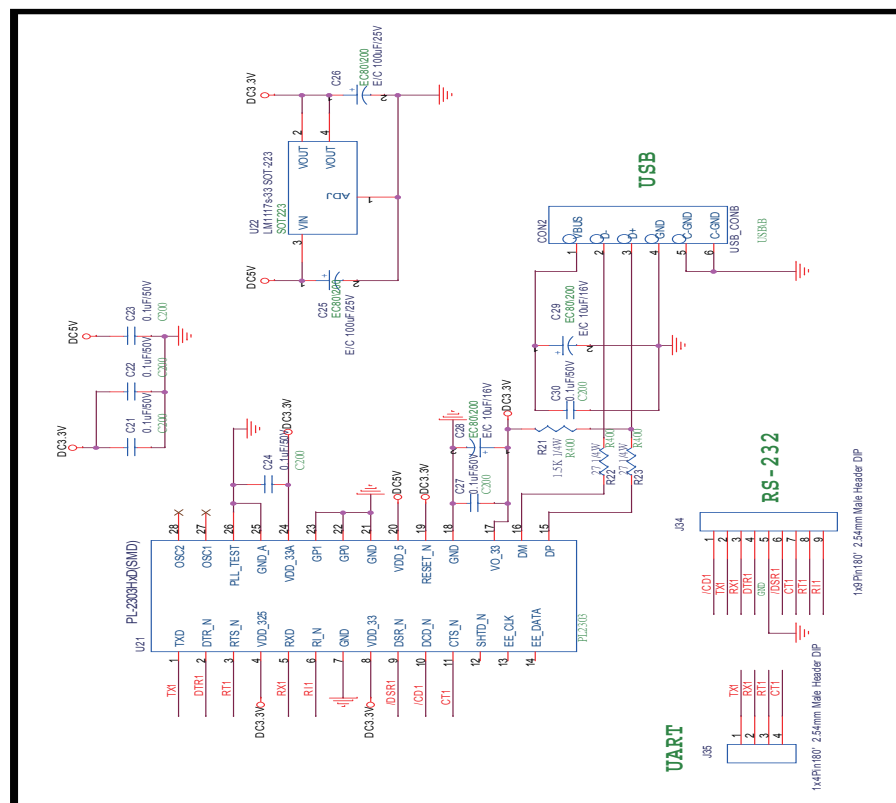
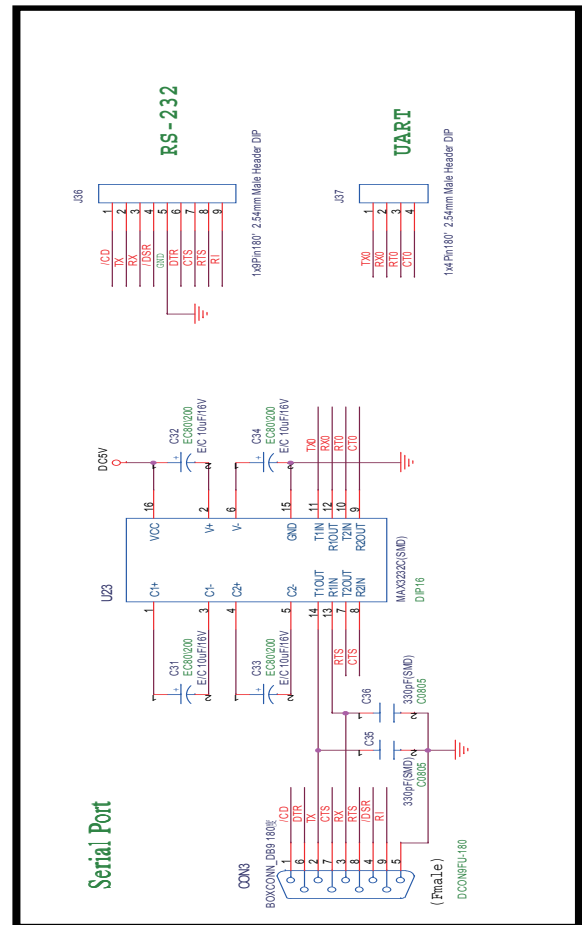


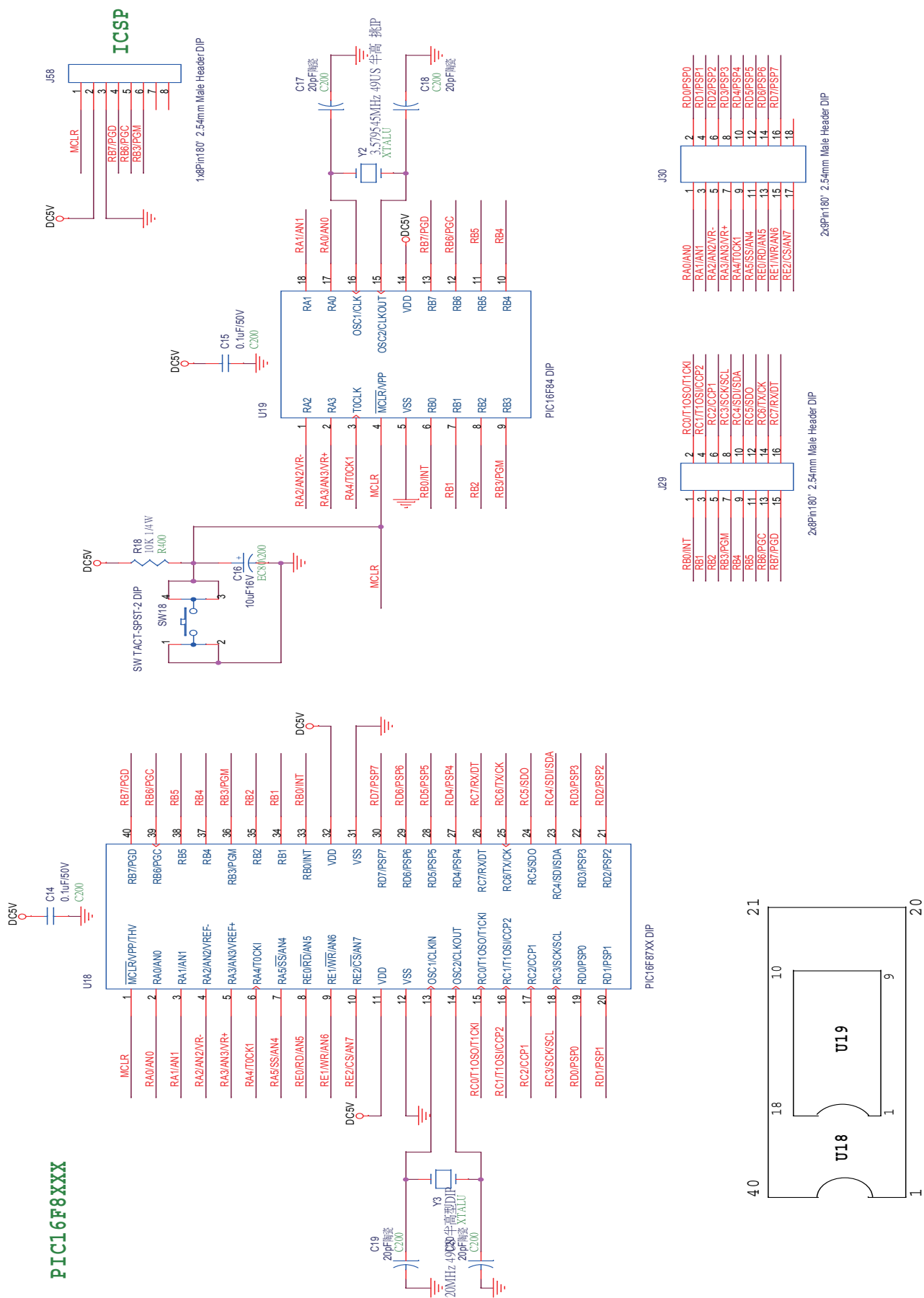


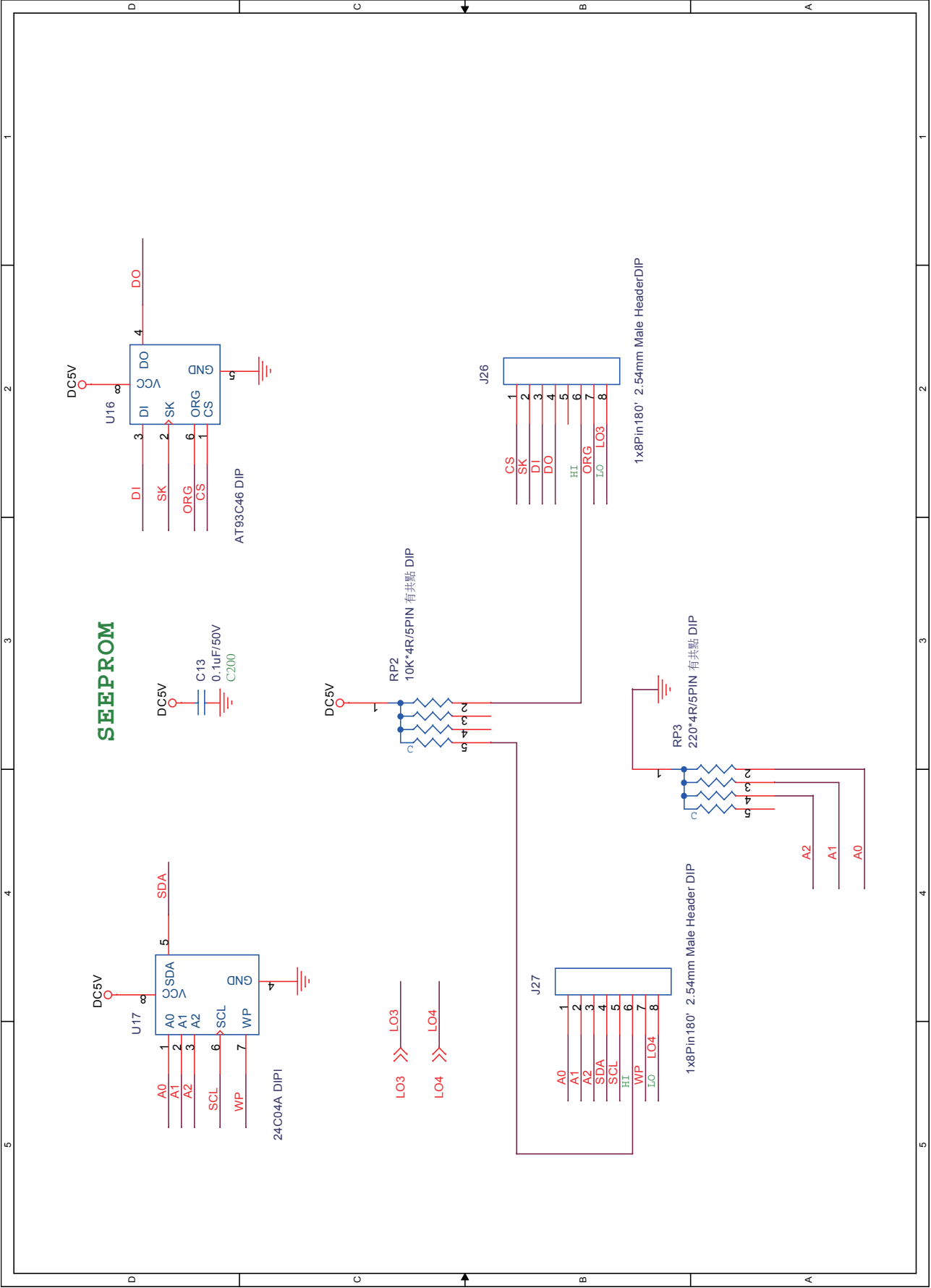


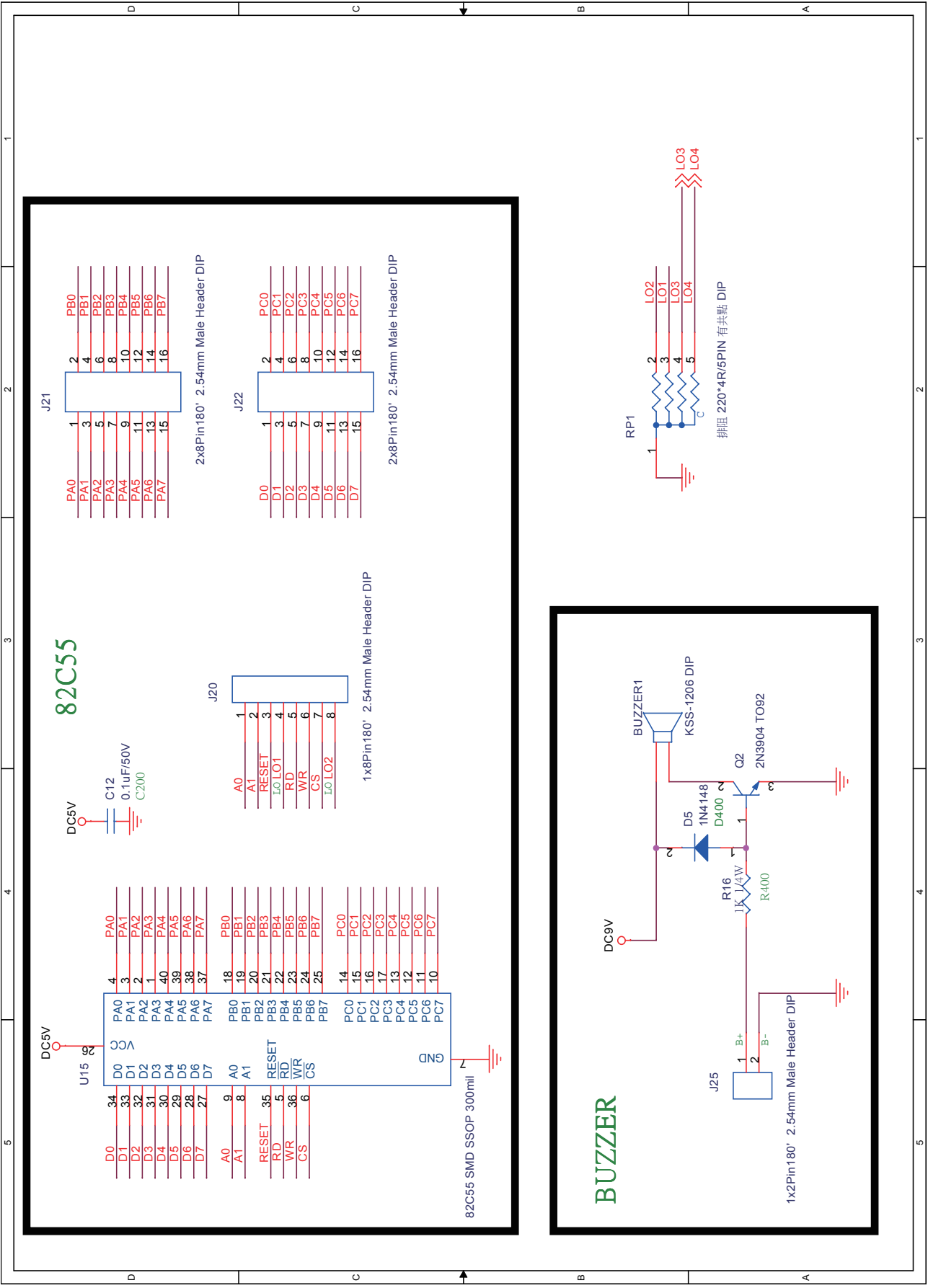


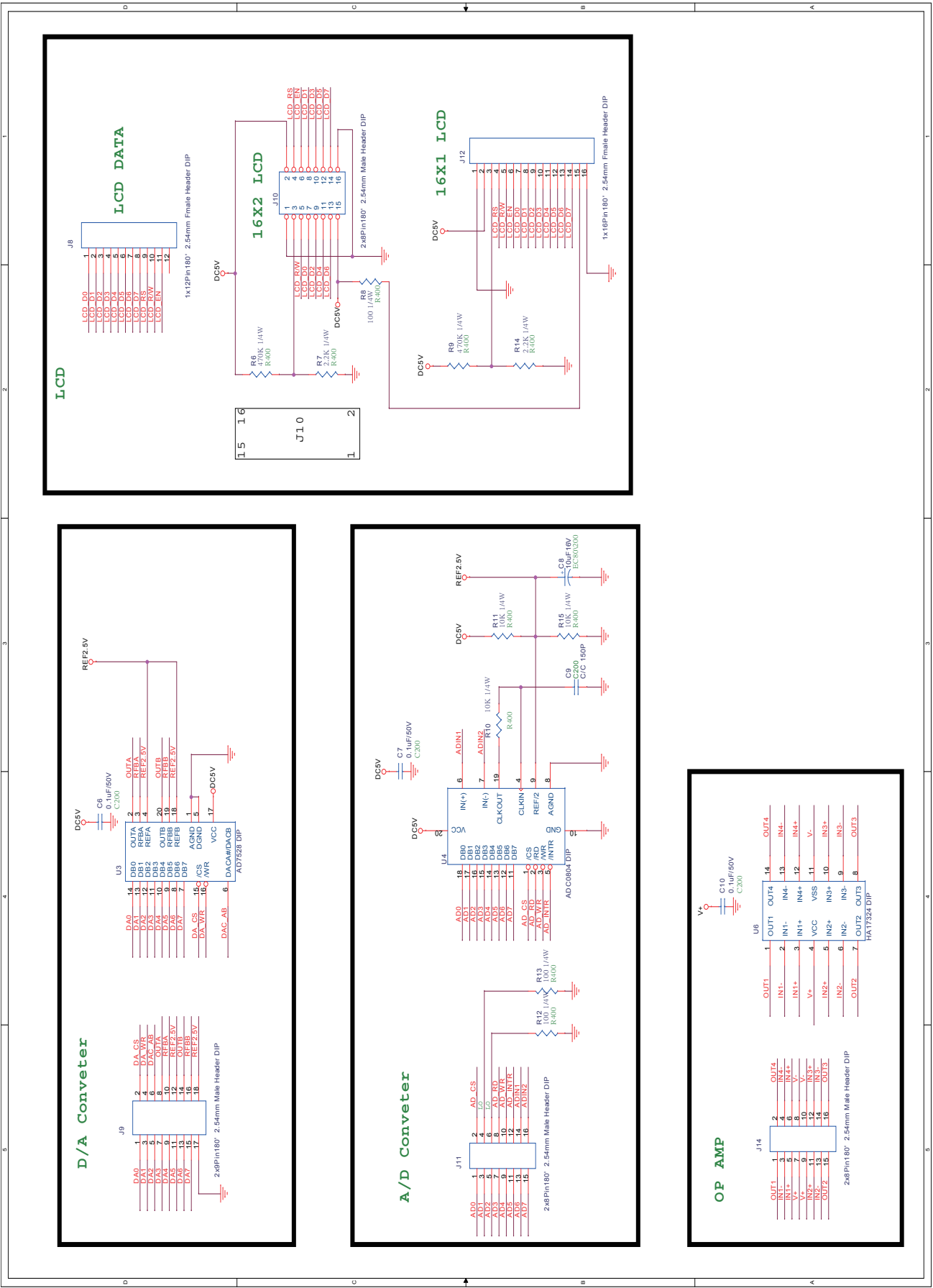


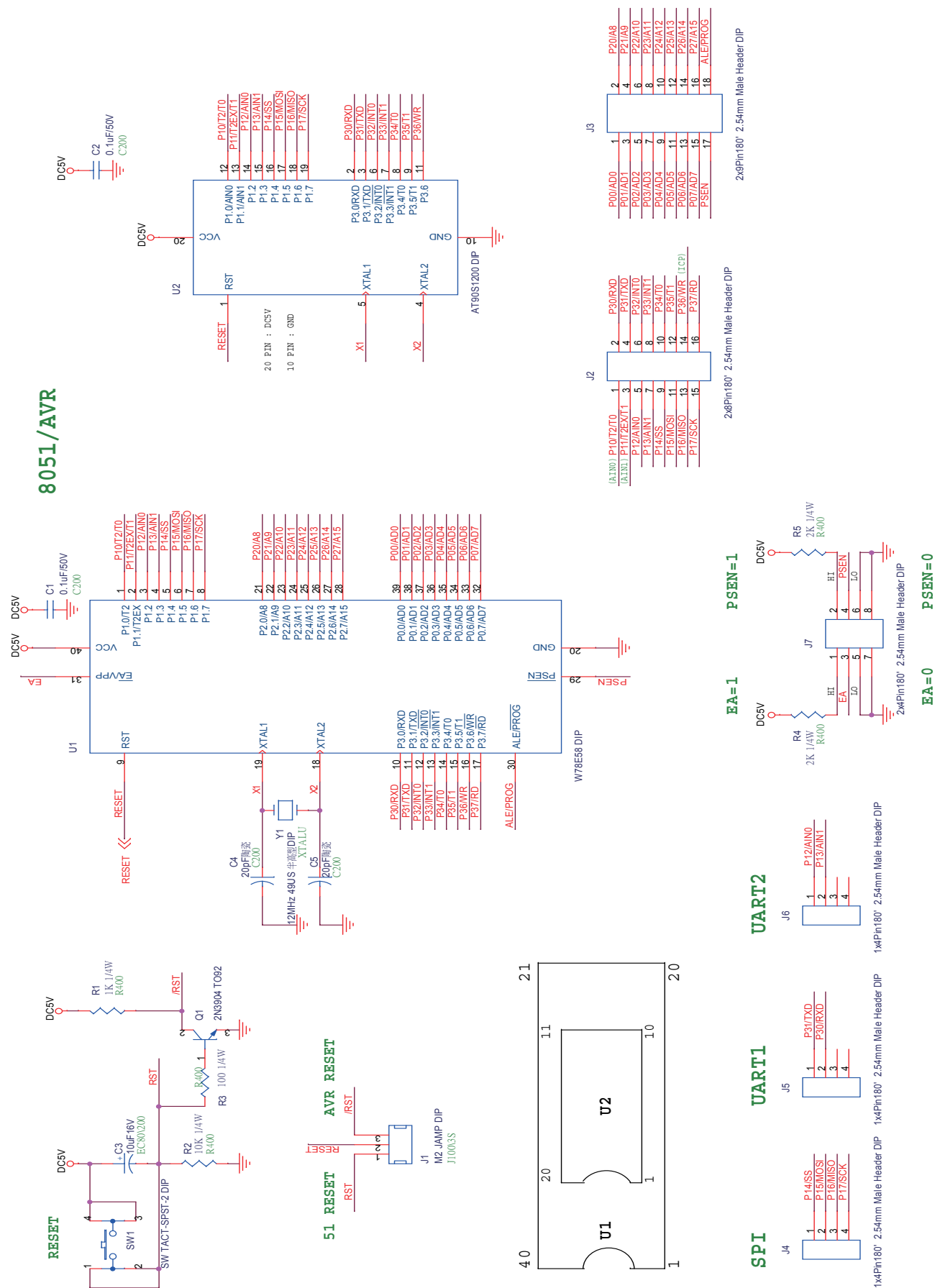












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