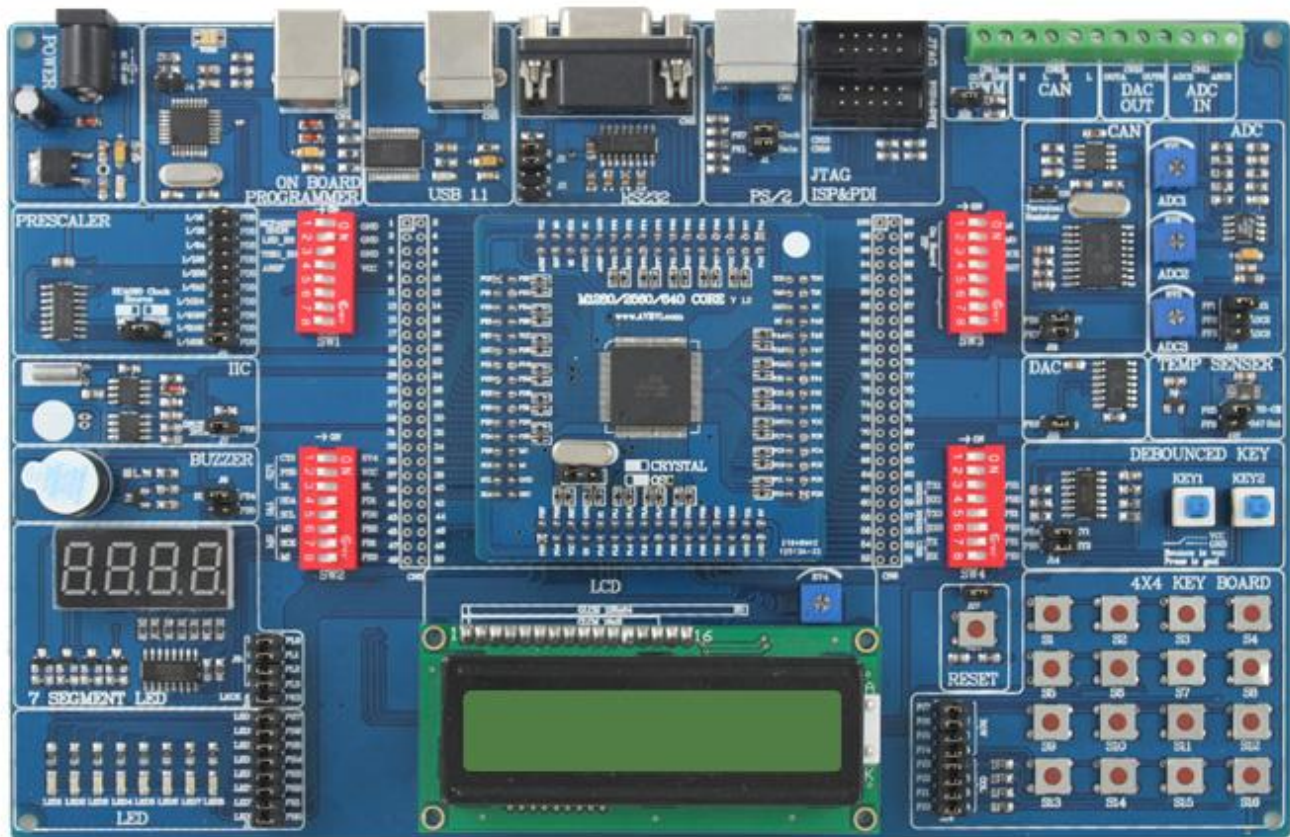Microcontroller embedded systemexpert   Professional virtual instrument solutions

Embedded Systems Career
From EasyAVR start!

EasyAVR
M1280 user's Manual

Hardware version：V1.2

Manual version：V1.0

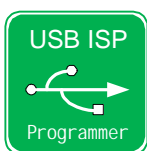**AVRVI professionally provide AVR MCU learning and development tools, AVR development board, AVR emulator, AVR programmer,AVR experiment box, DAQ card, video superposition module, etc. Also we can provide customized service.**

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二合一

USB ISP
Programmer

ATMEL
AVR
Atmega1280
Core board

With useful implemented peripherals, plentiful pratical code examples and a board set of additional add-on **boards (USB1.1,RS-232, PS/2 keyboard,LED,4X4 Keyboard,ADC,DAC,CAN,etc.),Development board integrates AVRISP MKII programmer, you do not have to purchase additional programmer.**

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Contents

1. Product introduction

1.1 Introduction

EasyAVR M1280 SK is AVR learning and development tools designed by AVRVI. To Atmega1280 as the core, it intergrated AVRISP MKII programmer, and only an extra computer is needed for user to begin the study.

1.2 Significant features

Intergrated common resource: LED, KEY, 7-segment LED display,LCD,RS232,CAN,DAC,PS/2 interface.

Intergrated AVRISP MKII programmer.

Intergrated signal conditioning circuit, input 0~10V, rail-to-rail signal conditioning.

The development board will be separate from the base board and core board. Core board can be easily replaced by other chip core board, such as ATMEGA2560, ATMEGA640, ATXMEGA128A1.

1.3 On-board resource list

1. 5V power supply interface, input 7~9V with inside positive

2. On-board AVRISP MKII USB interface

3. On-board external ISP, JTAG Programming interface

4. Atmega1280 chip, rich on-chip resource

5. USB1.1 communication interface

6. RS232 serial communication interface

7. 74HC4060 Variable Frequence

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8. 4X4 Keyboard

9. 4in1 7-segment LED display drived by HC595

10. 8 separate LED

11. 1 active buzzer, also can be accessed by passive buzzer

12. Calendar clock DS1337

13. 1 IIC bus EEPROM AT24C01

14. Analog Temperature Sensors TC1047A

15. SPI bus digital Temperature Sensor TC72

16. Hardware debounce circuitry

17. CAN bus circuit

18. Digital-analog conversion circuit constituted by the MCP4922

19. PS / 2 (Keyboard)connector

20. Crystal oscillator and reset circuit

21. Optional active crystal oscillator circuit

22. AD voltage adjustment potentiometer

23. Potentiometer voltage reference and voltage under test adjust

24. 4 8-bit DIP switch

25. 100Pin MCU pins marking all the external terminal

26. 12864 LCD Interface

27. 1602 LCD Interface

28. Standard nylon terminal block KF396

29. Transparent non-slip silicone pad

1.4 System requirements

To conduct system development, the minimum requirments on your computer

1. At least 80M of space for the installation of AVR studio and ICCAVR

2. Windows 98/2000/ME/XP or higher

3. Baud rate to 115200 of the RS232 communication interface (serial port), if not, you can use the USB-serial cable

4. USB interface used for communication, or 7~ 9 V DC power supply, 500mA, with positive inside

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2. System self-test

2.1 Check up list of articles

Check the packing materials, the list is as follows

1. EasyAVR development board (on-board AVRISP MKII programmer)

2. 9V DC power supply

3. USB communication cable

4. Development board manual

5. CD-ROM with schematic, development software, example program inside

2.2 Quick Start

EasyAVR M1280 SK board is rich in resources, and the core board chip is Atmega1280-16AU or ATmega1280-8AU. All jumpers are in their factory default position, and self-test program has been load in.

To Start the self-test, you only need to connect the serial cable and power cable, complete default jumper connection and hardware resources will be described in later chapters.

After installing the drivers, you can also use USB cable to complete this function . At this time, you need to connect CN3 with usb cable,and turn DIP switch SW4 7,8 on, the other off, and default is3,4 on .

2.3 System self-test process

1. 1. Insert CD into drive, open the serial debugging assistant in Software directory . You will see the following picture.

Note: You will need to select correct serial port number to connect to development board.

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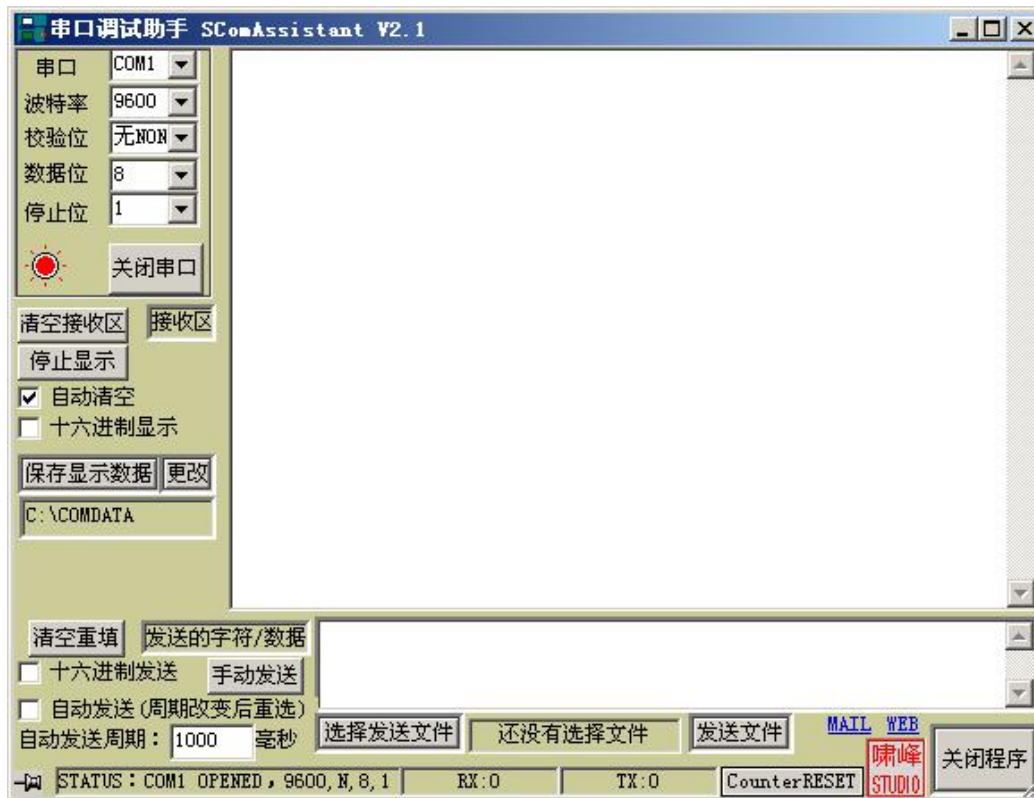
2. Maintain jumpers in default position, use a serial cable to connect PC and development board COM port.

3. Use board matched 9V power (positive inside) to supply the core board . Diagram as follow.

4. You can also use USB to complete the self-test . Use USB cable connect to the computer, and pay attention to turn SW4 78 on, the other off.

Once the power supply successful, you can see the power indicator lighted and self-test output from serial debugging assistant, and, of course, at the same time, you can see part of the operation status from on-board LED and LED display.

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3. Configuration DIP switches and jumpers

SWITCHES: SW1、SW2、SW3、SW4

Switches 1 and 2 are ON,
and other switches are OFF

Switch is ON

Switch is OFF
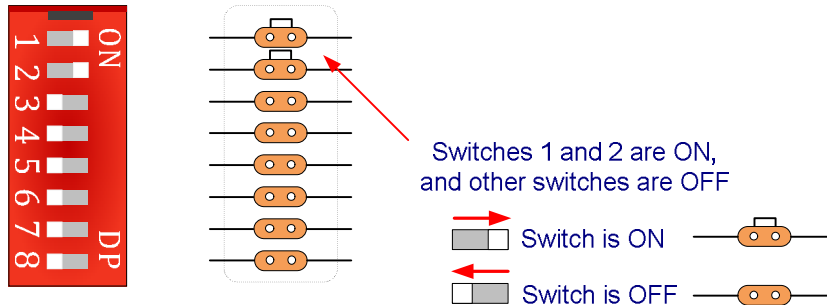
**JUMPERS:** J1、J2、…… J22

Jumpers,like switches,can break or establish a connection between two points. Beneath the plastic cover of the jumper is a metal contact,which makes a   connection when the jumper is placed between two disconnected pins.

For example,the jumpers J6 and J8

J6: Jumpers are used as a selector between two possible connections using a three pin connector. the middle connector can be connected to the left or right pin,depending on the jumper's position.

All lines are
disconnected

Left line is
selected

Right line is
selected
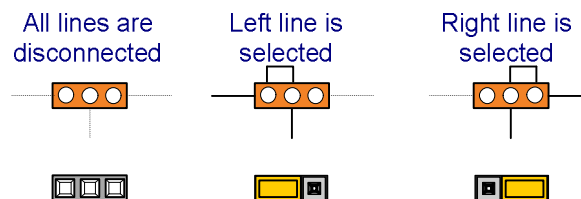
J8: The jumpers j6 is used to connect or disconnect BUZZER to the PB4 and PB5 pins. A connection is made when the jumper is placed between contacts.

Line is
disconnected

Line is selected
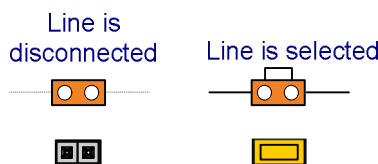
This development board has been carefully designed . Then the all onboard resources are   using ordinary pin jumper, so that this pin will not generate conflict when the core board is replaced by other core board.The board has four 8-bit DIP switches, each has a detailed annota- tion, DIP switch appropriated for the right to open, detail use of each road will be descript below.

Ø SW1(1) : MCP4922 SHDN Digital-analog converter chip MCP4922 sleep mode control

   n   MCP4922 using the sleep mode, this position is On

   n   MCP4922 MCP4922 sleep mode when not in use，this position is Off

Ø SW1(2) : LED_en, LED enable, On when use, Off when not

Ø SW1(3) : 7SEG_en,LED display enable, On when use, Off when not

Ø SW1(4) : AREF, connect AREF to AVCC, On when use AVCC as reference voltage, Off when not

Ø SW2(1~3) : 1602 LCD and 12864 LCD control

 n All off when not in use

 n When using the 1602,1~3 is On; On when use, Off when not

 n When using the LCD12864,1 is On,2,3 is Off; On when use, Off when not

Ø SW2(4、5) : SCL and SDA of TWI, On when use AT24C01 and DS1337, On when use, Off when not

Ø SW2(6~8) :MISO,MOSI,SCK of SPI, On when use 7segment LED, MCP4922,CAN,TC72, Off when not

Ø SW3(1~4) : programming using the onboard AVRISP MKII programmer, On when use, Off when not

Ø SW4(3、4) : RS232－**1**, On when use, Off when not

Ø SW4(5、6) : RS232－**2**, On when use, Off when not

Ø SW4(7、8) : Use USB1.1 communication, On when use, Off when not

Ø two-way ADC and PWM ports, two-way DAC, two-way CAN ports.

Ø All the PORT pins lead out on the board

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4. Driver Install

The development board requires two driver installation. One for USB1.1 communication interface (this USB interface is the CN3) driver; Another is the on-board programmer AVRISP MkII driver installation (this USB interface is the CN4).
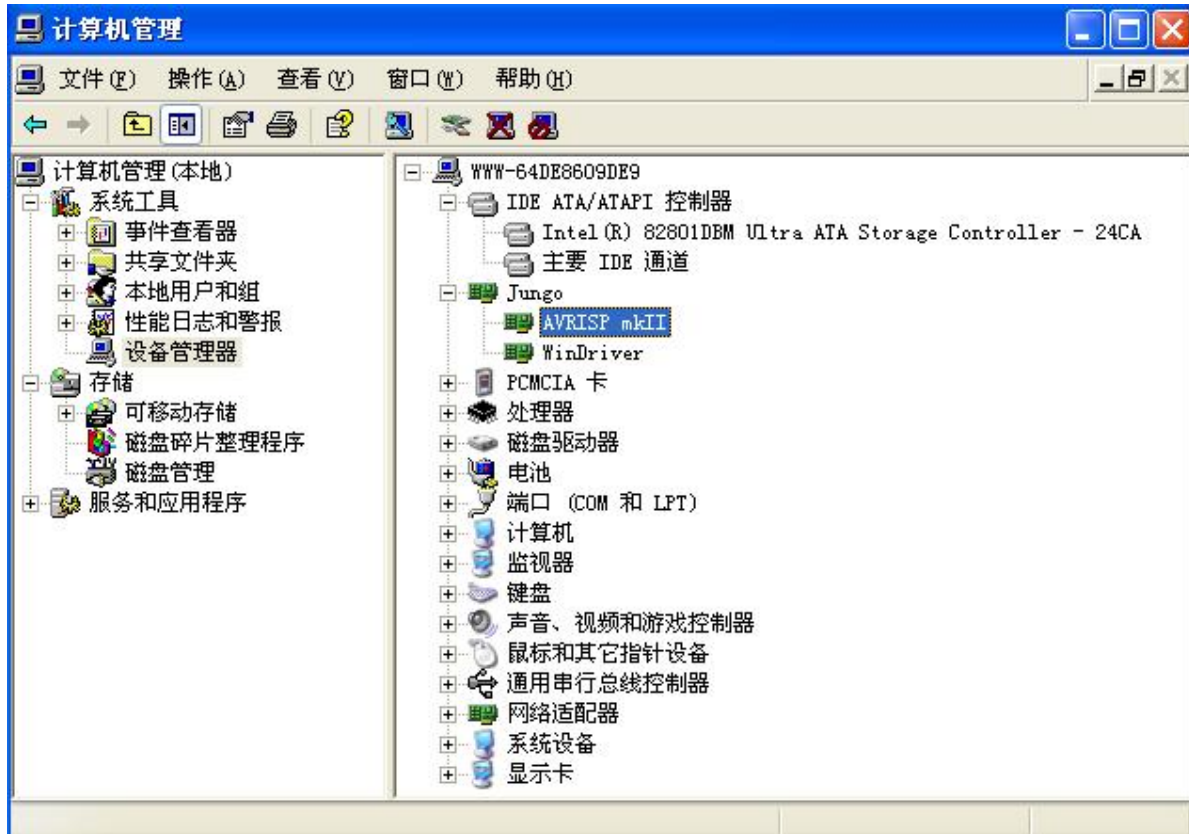
As illustrated:

USB 1 1

AVRISP MKII

4.1 Onboard AVRISP mKII programmer driver installation

This product integrates AVRISP programmer, please install AVRstudio software before installing this driver . The programming port CN4 connected to the computer using a USB cable, then will be prompted to install a new hard drive, you can choose to automatically install the software.

Note: Before installing the driver programmer, you must first install AVRstudio software because AVRstudio contains AVRISP mKII drive.

After installation, you can right-click "My Computer" - "Management" - "Device Manager", find the devices.

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4.2 USB1.1 driver Installation

The development board using most stability and most expensive USB-serial chip FT232, driver install in two ways:

1. Use the driver ftdi_ft232_drive.exe, double-click the installation, and then insert the device, take note development board need additional power supply from USB cable or core board, then automatically complete the installation.

2. Plug-in equipment, according to the wizard, select the .INF file, search for the installation, need to install twice. Drivers can be downloaded from the company's Web site, and also be obtained from the CD-ROM.

After installation is complete, you can find the device in the Device Manager, as shown in the COM4 in the following picture, if you installed other drivers, it may appear different, it will be OK as long as the COM port can be displayed normally. Note if the port number is not COM4 or less, please change to COM4 within.

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5. Software Install

Software program files is in CD-ROM corresponding directory, double-click the icon below, according to the prompts to complete the installation.

5.1 Install ICCAVR

Directly run iccv7avrV7.22Setup.exe file, the installation interface is as follows:

Note: In order to develop convenient and avoid unnecessary path trouble, please set **icc7avr** installation path to **D:\icc7avr** install the interface as shown below.
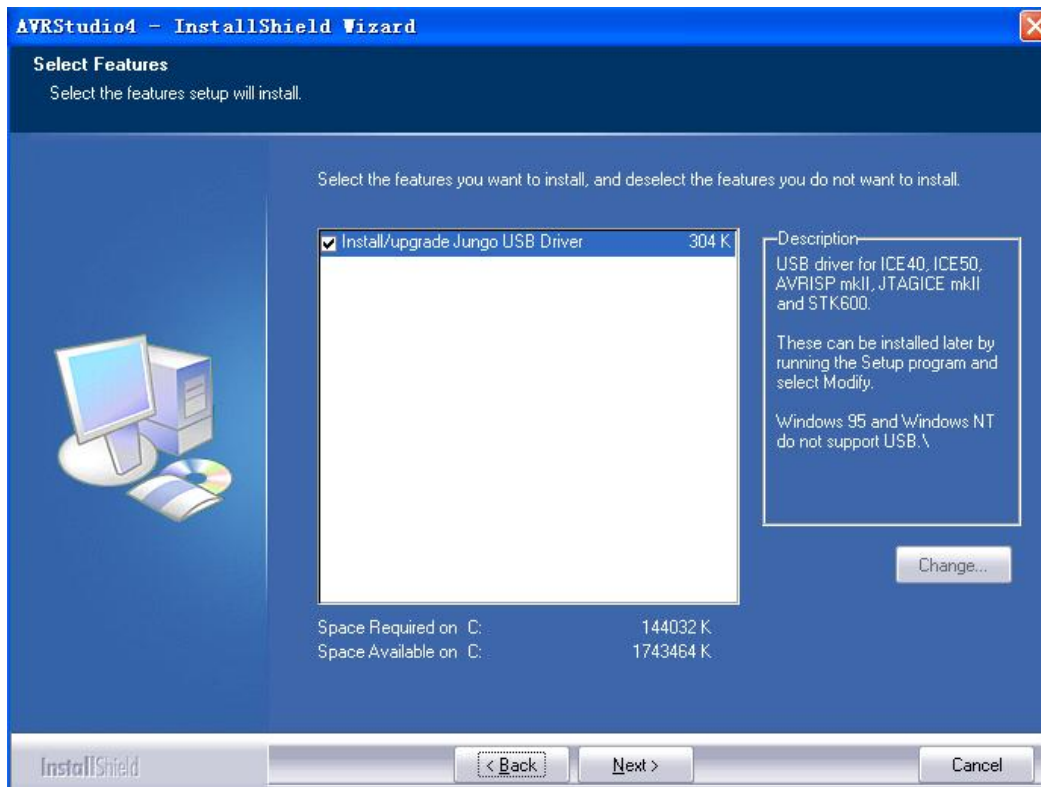

5.2 Install AVRstudio

Installation AVRstudio, double-click to run aStudio4.14b589.exe, in accordance with the default installation.

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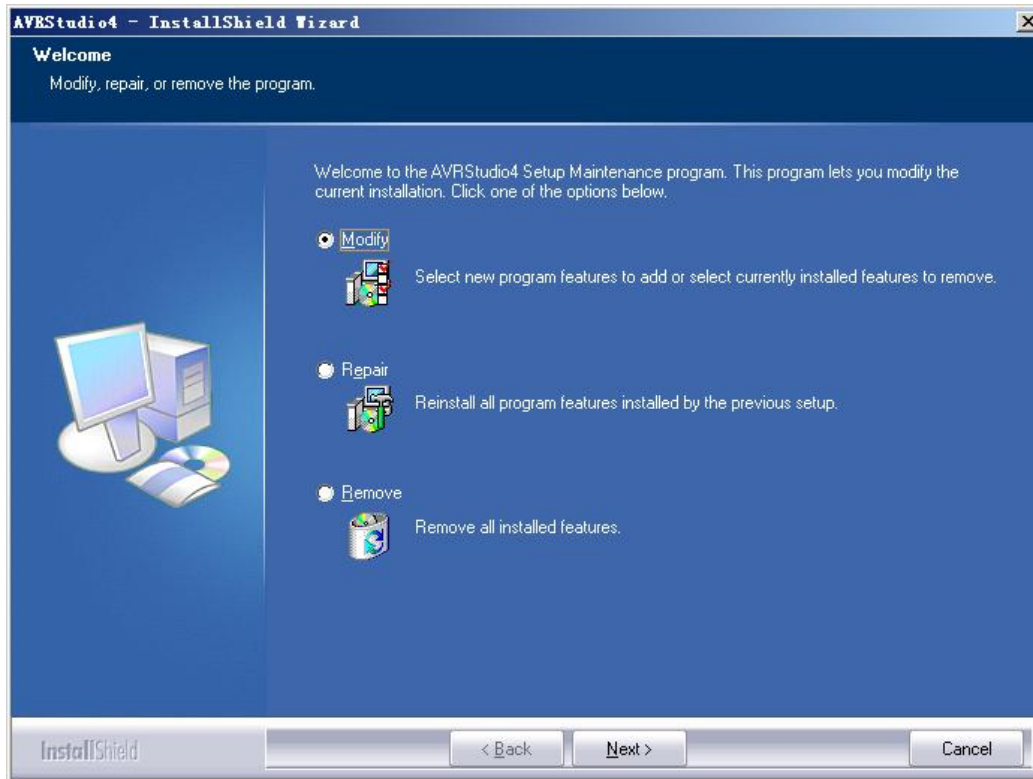
Note: In this interface, select the "Instal / upgraade Jungo USB Driver" (to install USB drivers), as shown bellow:

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6. Use on-board AVRISP MKII for program

Note that the following steps in the basis of the drives installed already, driver installation, please see Part IV.
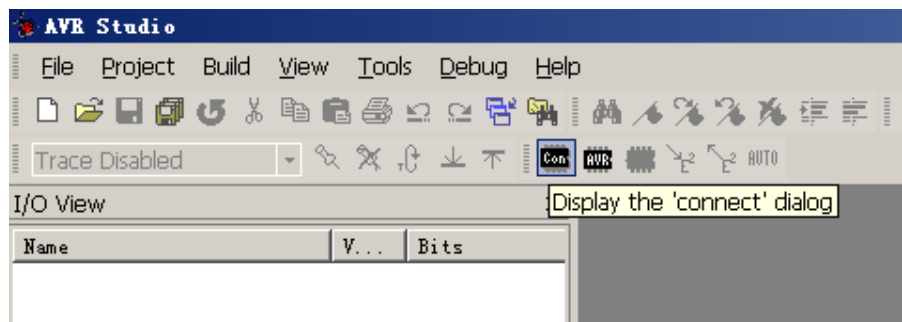
6.1 Connect hardware

Use USB cable connect EasyAVR to computer, use power to supply the board, as shown.
Note that keep the DIP SW3 1~4 Off, and 34 Off, After power, SW3 1~4 On.
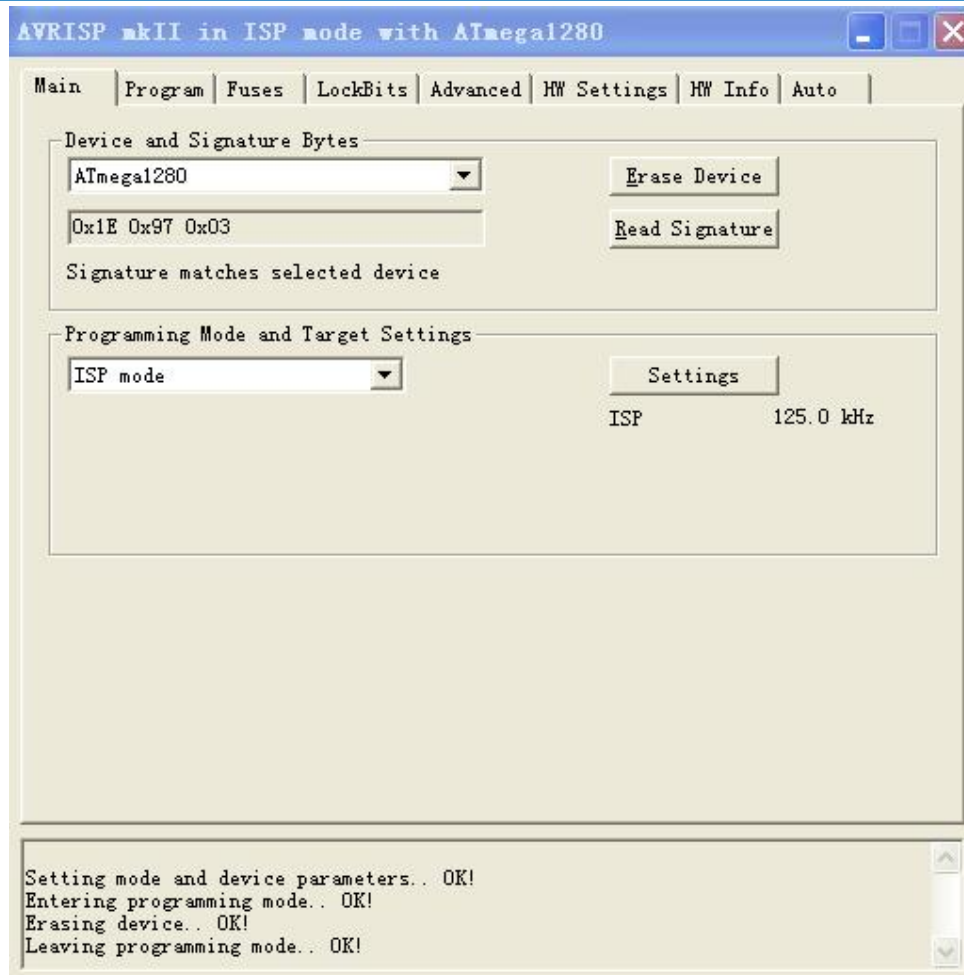
6.2 Use AVRstudio ISP download

Open AVR studio interface, click on the following map icon, or point the menu Tools-> Program AVR-> Connect

Select AVRISP MKII, COM port you are connected to (the port shown above after install the driver) or Auto, and then click Connect.
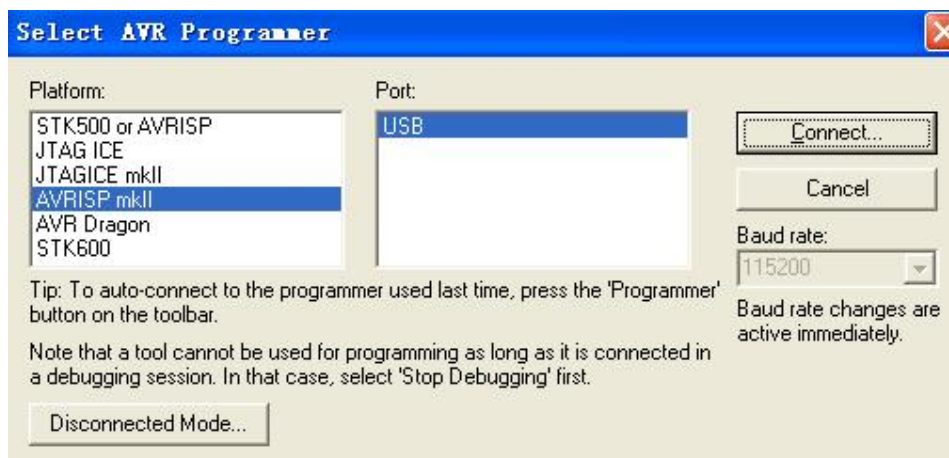
In the pop-up interface for programming verification, modify fuse, lock bits and other operations, please refer to AVRstudio software instructions.

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We wrote a detailed description of each experiments and have generated a good HEX file in the OUTPUT directory, you only need is to modulate DIP swithes according to the readme.txt, download pre-compiled HEX file can view effect of each of the examples.

7. Hardware resource

7.1 Power Supply

The Atmega1280 AVR development board using the 9V power supply, using universal regulator chip 78M05 as voltage regulator, this circuit has very good universality and reference value.
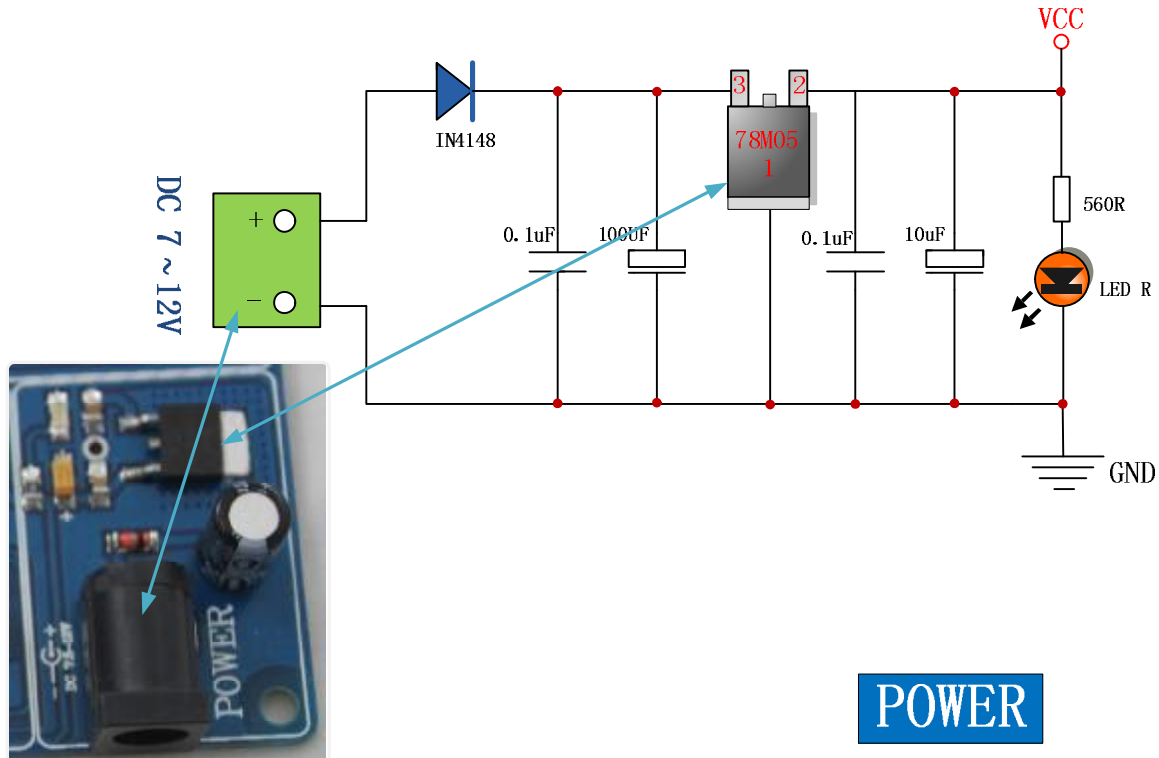
7.2 On-board AVRISP MKII programmer

Integrated USB AVRISP MKII is a unique feather of EasyAVR M1280 development board, you do not need to buy additional programming devices and emulators, just an extra computer, you can begin your learn and develop.

The microcontroller is connected to the onboard AVRISP MKII Programmer through the switches 1,2,3,and 4 on sw3;
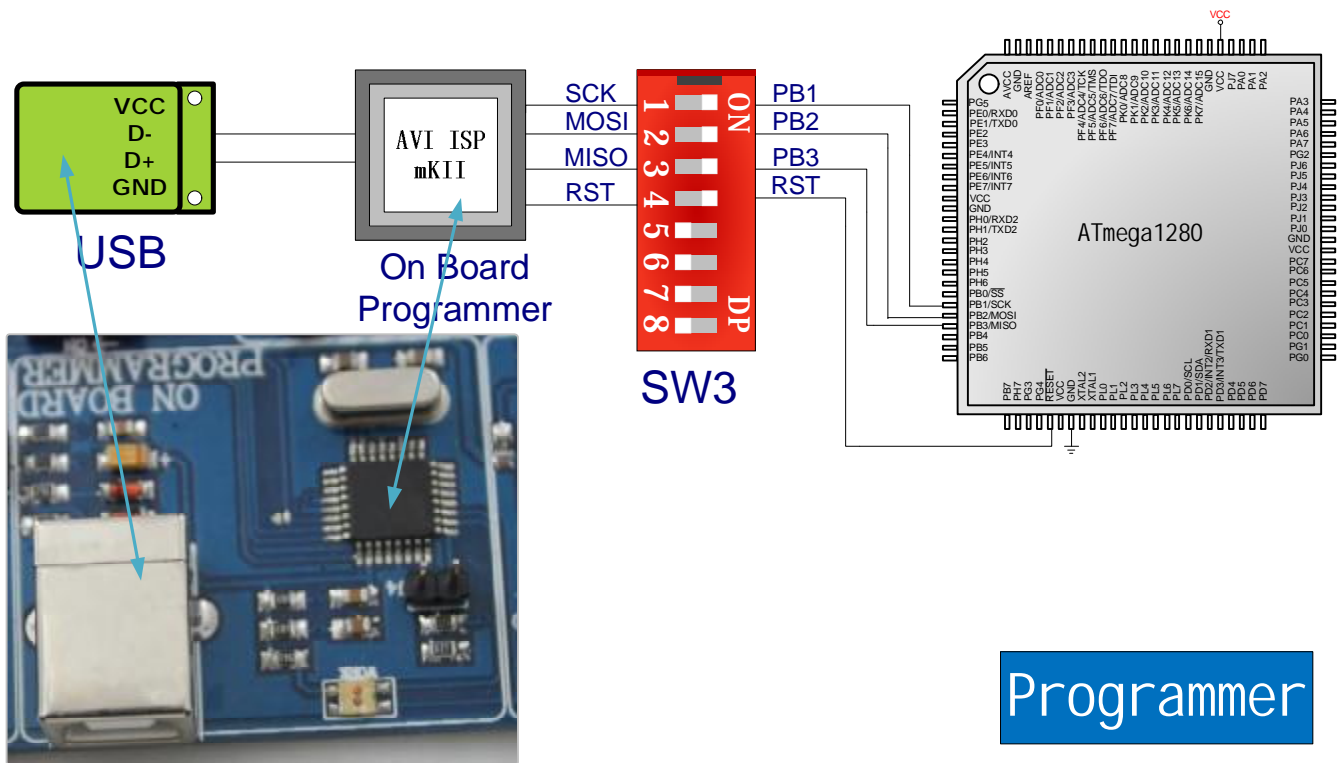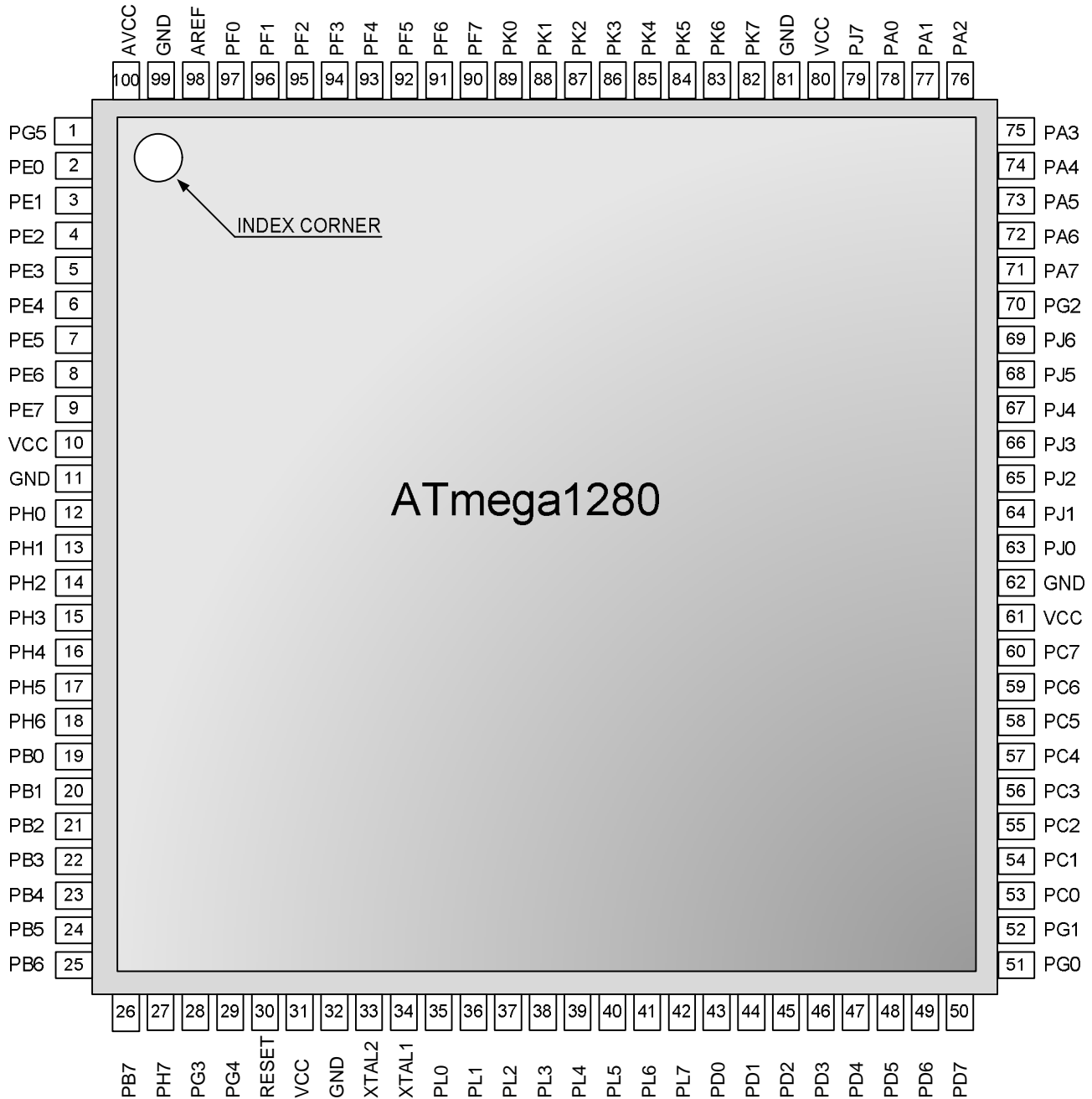
7.3 Atmega1280 core board

The core of the system Atmega1280 is a very classic 8-bit microcontrollers in ATMEL's AVR MCUs, which with a 128-Kbyte programmable Flash, 8-Kbyte SRAM, 4 Kbyte EEPROM, 16-channel 10-bit A / D converter, support JTAG on-line emulation, ISP download, flexible SPI, USART, TWI interface, built-in watchdog, the external circuit design is simple, just power can work, ideally suited for small and medium sized electronic product design.
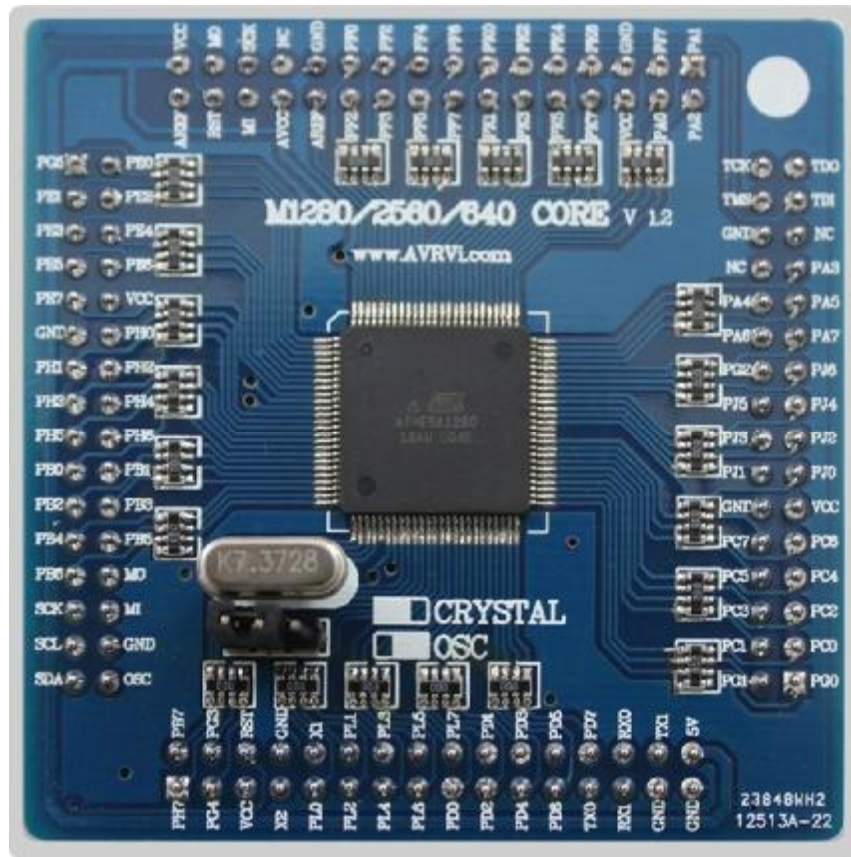
The development board will be separate from the base board and core board. Core board can be easily replaced by other chip core board, such as ATMEGA2560, ATMEGA640, ATXMEGA128A1.

Note: Please correct plug core board when used, to avoid burn out the core board.

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ATmega1280

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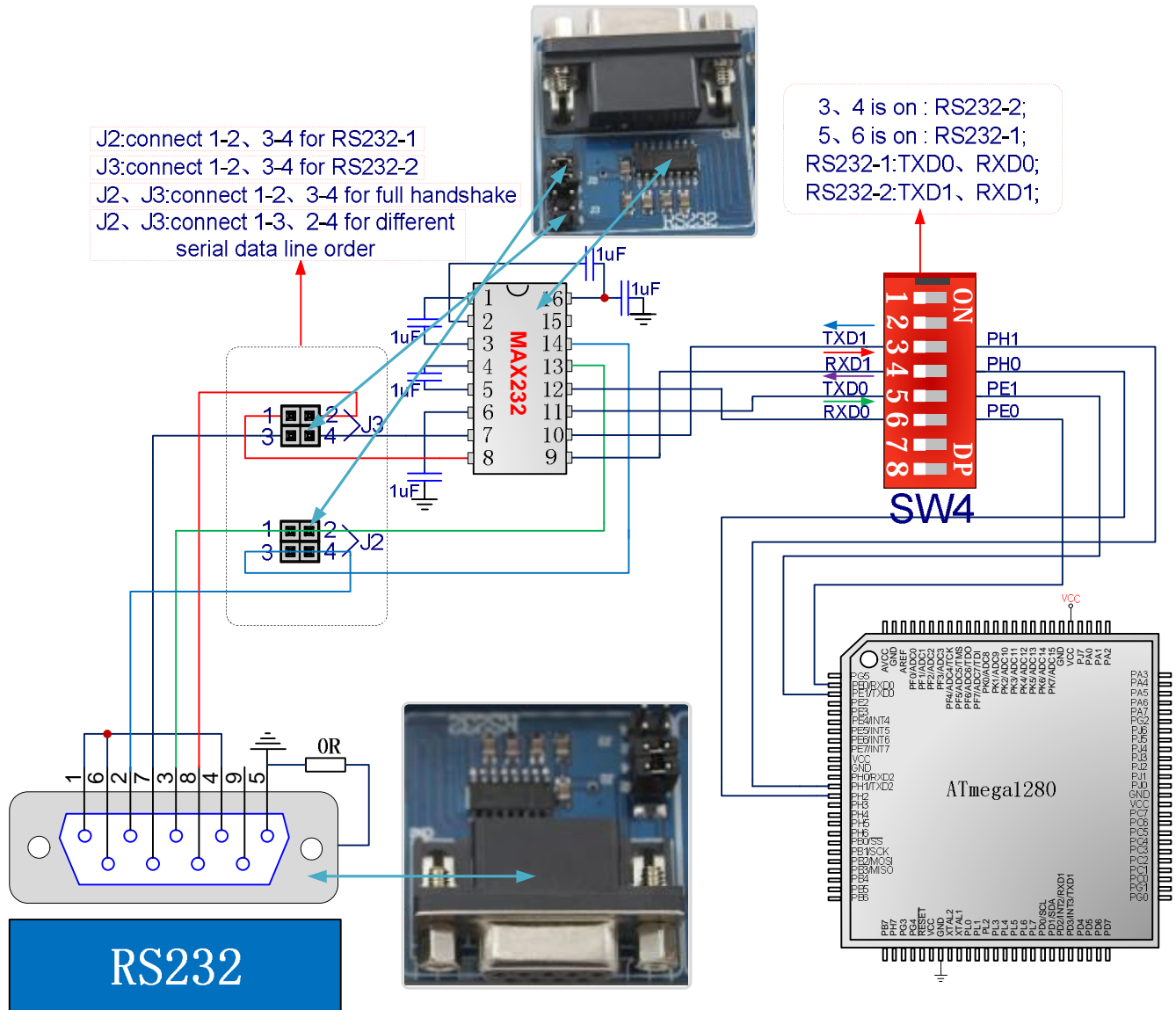
7.4 USB1.1 Communication Interface

FT232 is the most stable of the USB-serial chip rate of USB1.1, adaptive USB2.0 interface, the largest communications baud rate up to 115200, the development of the module used for both board USB1.1 programmer simulator and user's program communication, through DIP SW4 7,8; to control.
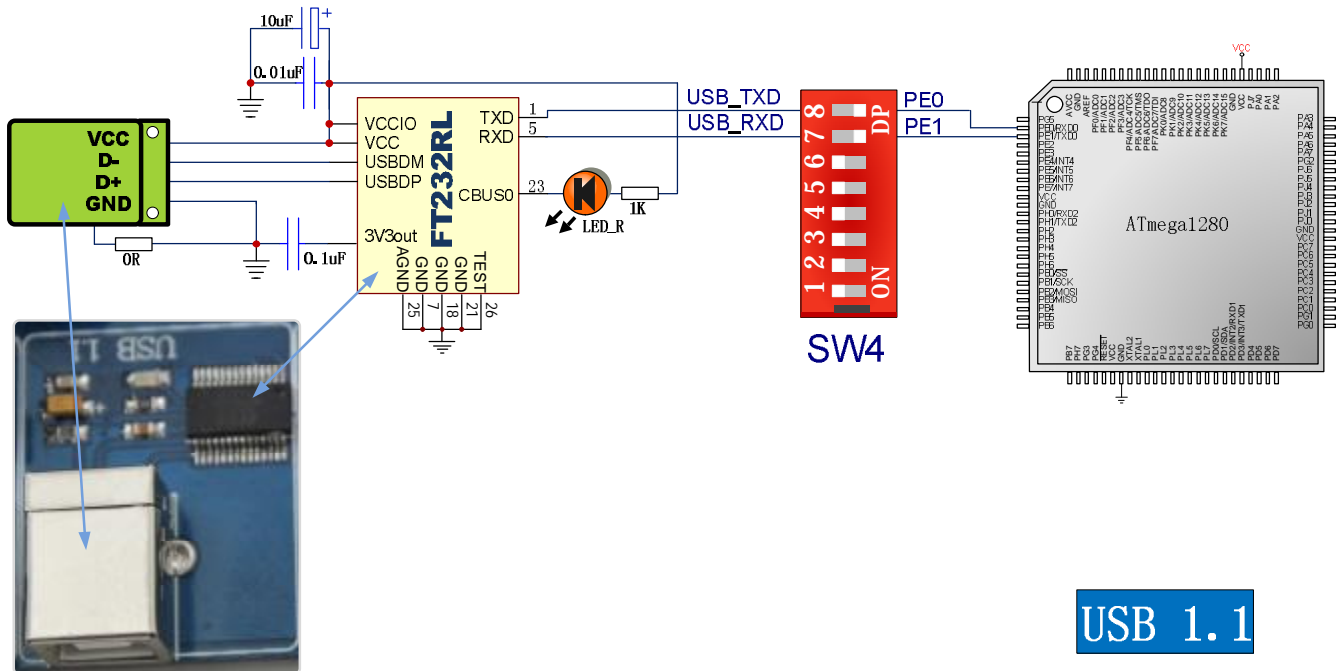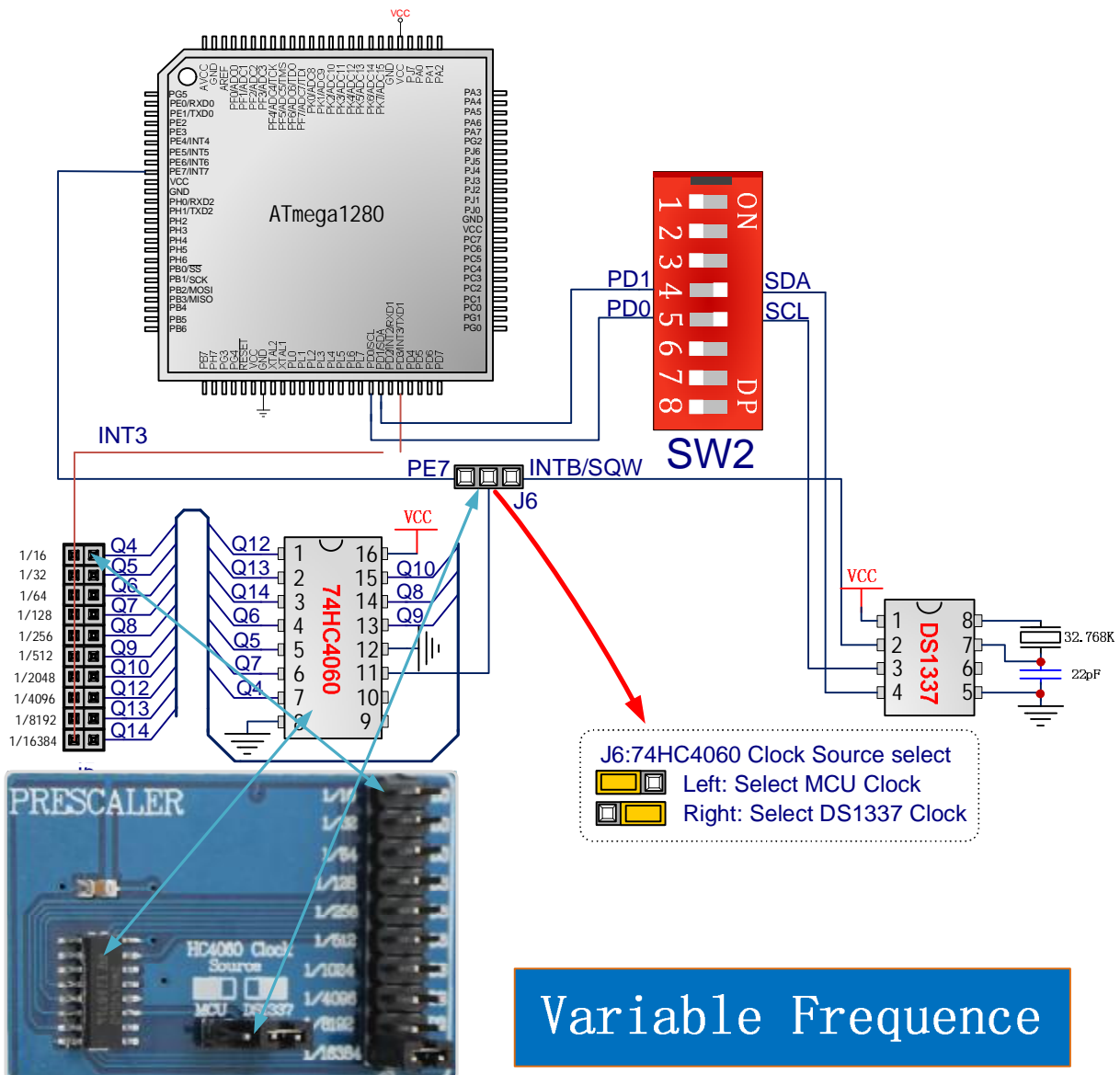
7.5 RS232 serial communication port

RS232 is a standard communication interface, if not RS232 communication, not to say MCU, the development board use the MAX232 as interface chip, use two way. It use jumpers J2 and J3 and SW4 to control.

J2:connect 1-2、3-4 for RS232-1
J3:connect 1-2、3-4 for RS232-2
J2、J3:connect 1-2、3-4 for full handshake
J2、J3:connect 1-3、2-4 for different serial data line order

3、4 is on : RS232-2;
5、6 is on : RS232-1;
RS232-1:TXD0、RXD0;
RS232-2:TXD1、RXD1;

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7.6 74HC4060 Variable Frequence

74HC4060 chip frequency clock can be provided on the ATMEGA1280 (ATMEGA1280 pin 9 output clock, through its fuse bit "CLKO" enable output) and the DS1337 output clock (DS1337 output clock frequency can be set) in frequency, J6 jumper cap on the left is choice the ATMEGA1280 output clock frequency; inserted on the right is the DS1337 output clock frequency; J5 is used to connect the sub-frequency clock signal and the INT3 (PD3) of MCU.

J6:74HC4060 Clock Source select
Left: Select MCU Clock
Right: Select DS1337 Clock

Variable Frequence

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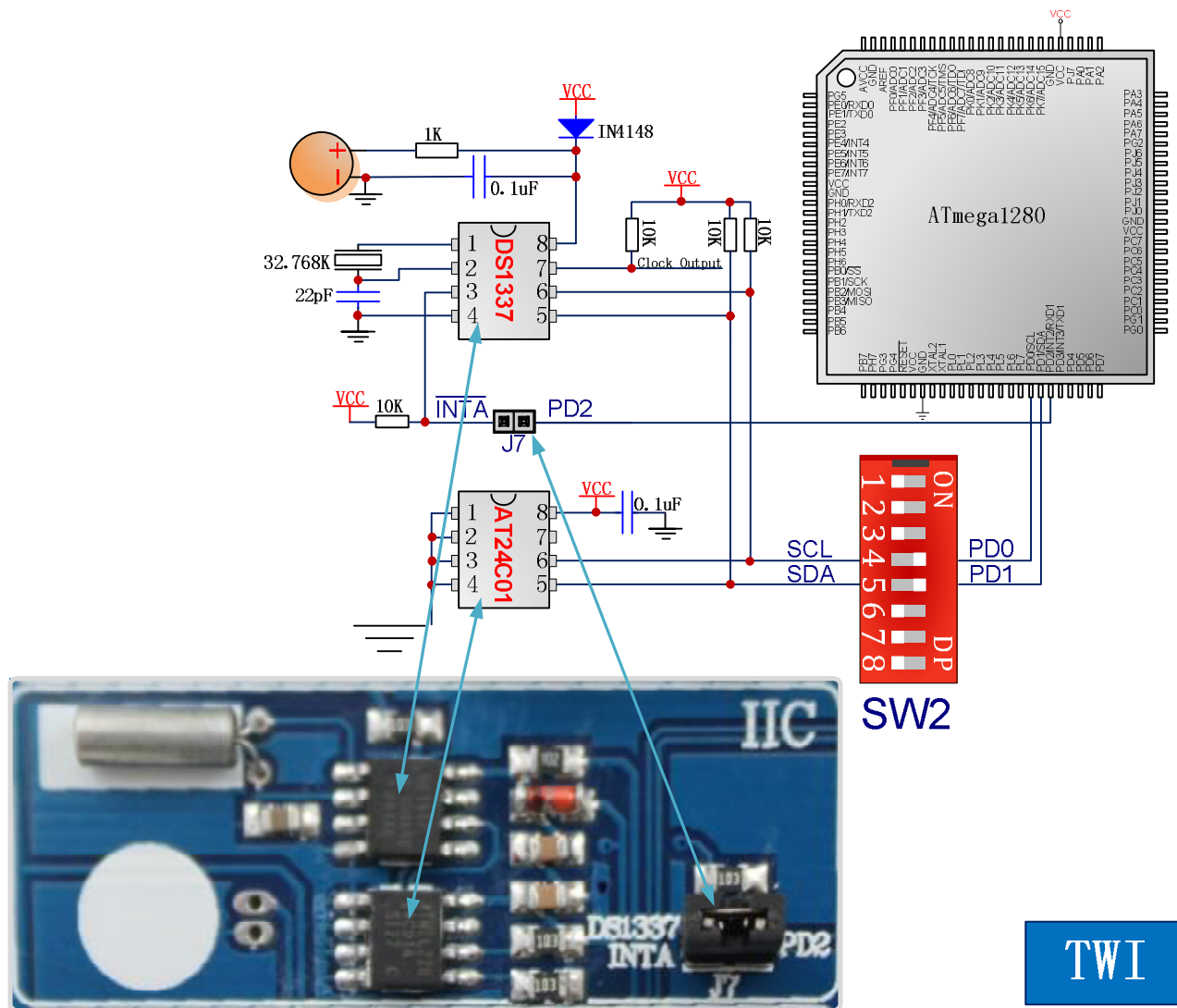0086-531-62327572   www.avrvi.com
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7.7 Calendar clock DS1337

DS1337 connected to SDA and SCL bus of ATmega1280 through the TWI bus, the bus has two pull-up resistor, SW2 45 to control on and off.

The crystal used for the DS1337 providing 32.768Khz clock, DS1337 can be used for accurate electronic clock designs.

Principles and connecting as following diagram.

DS1337's INTA connection PD2 by jumper J 7, please shorted J7 when you use the INTA. 。
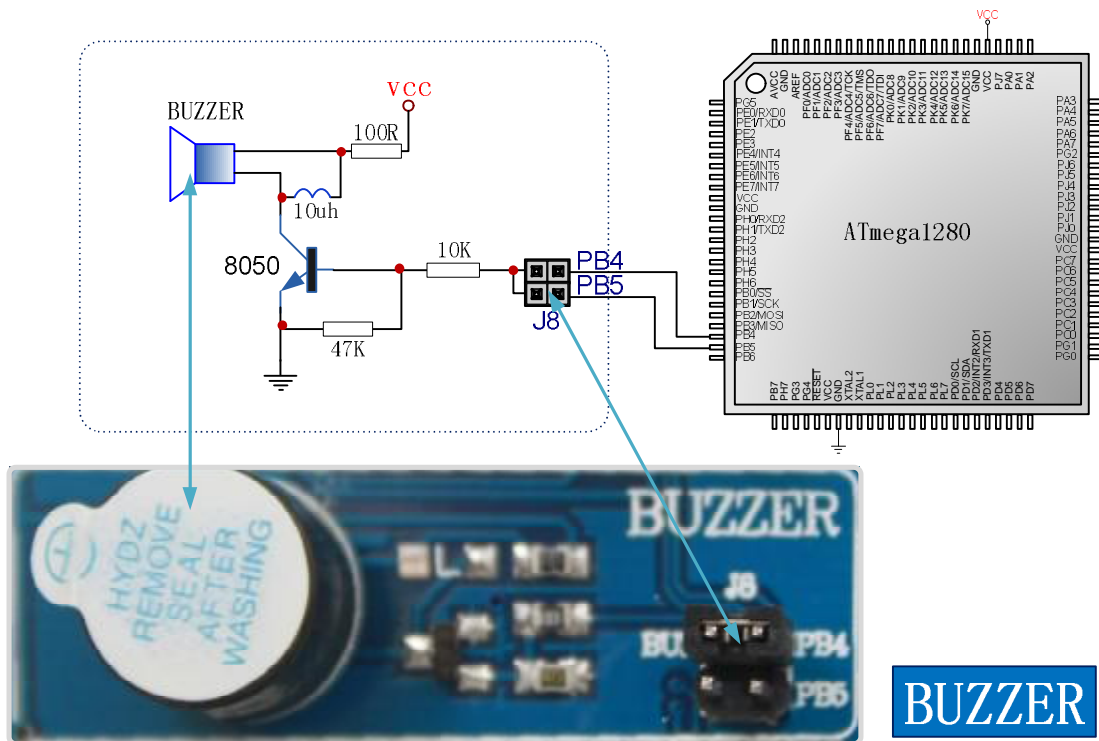

7.8 IIC bus EEPROM AT24c01

External EEPROM chip AT24C01 and DS1337 are all connected to SDA and SCL bus of ATmega1280 through the TWI bus, the bus has two pull-up resistor, SW2 45 to control on and off.

EEPROM used to store the data needs to be saved after power-down, such as some important parameters, the principle is as follows diagram.   Principle as shown above.

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7.9 One active passive buzzer

Buzzer used to generate sound signals, active buzzer through the DC voltage control, resulting in a single voice, passive buzzer through a certain frequency PWM control, can produce sounds of various frequencies and bands and even play music. EasyAVR circuit design can either use active and passive buzzer. Buzzer connected with the microcontroller through the jumper J8. The product uses two MCU pins control, so it can Produce Polyphonic sound. Please shorted J8 when used.

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7.10 7-segment LED display

7-segment LED display is commonly used in human-computer display device, commonly used in digital display in device, here through the SPI driver, in order to save IO port, bit selection connect to PL0123, code selection through the jumper J9 connect to SPI (PB123), SW1(3) enable. Data latch signal input LKCK through the jumper J10 connect to PK3.
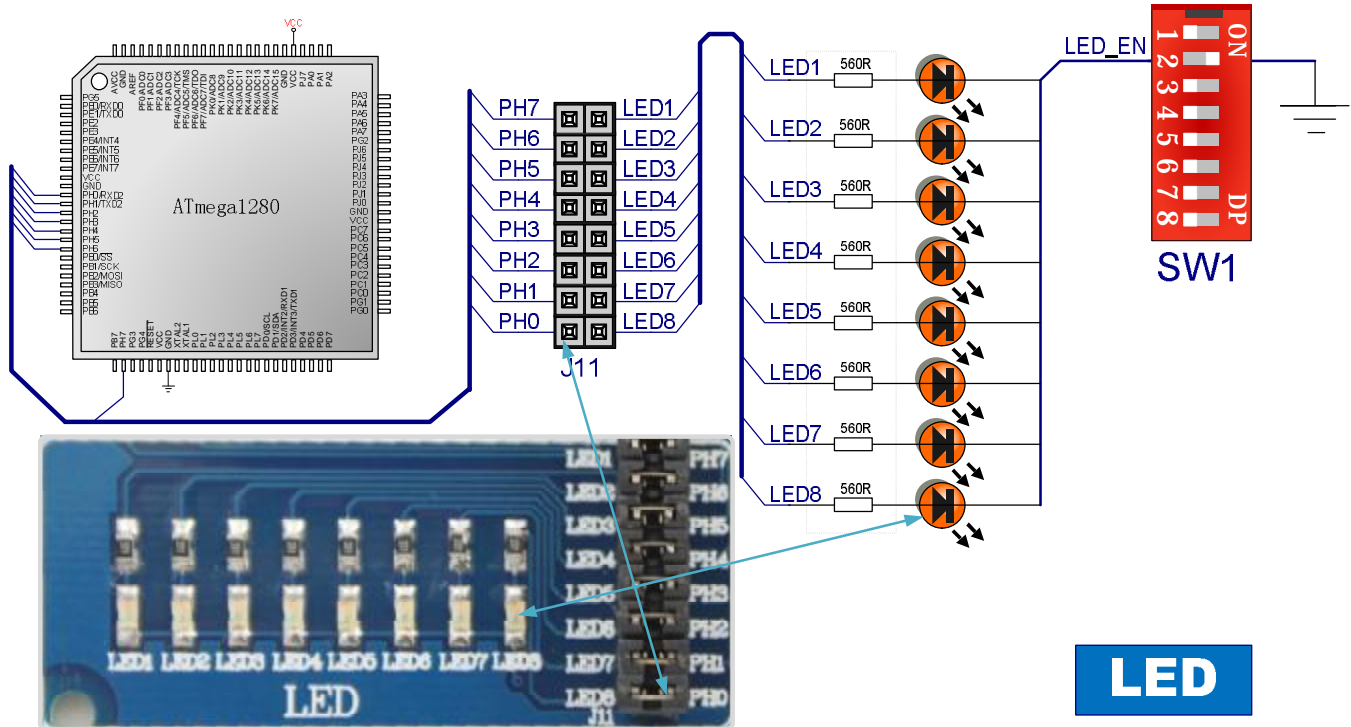
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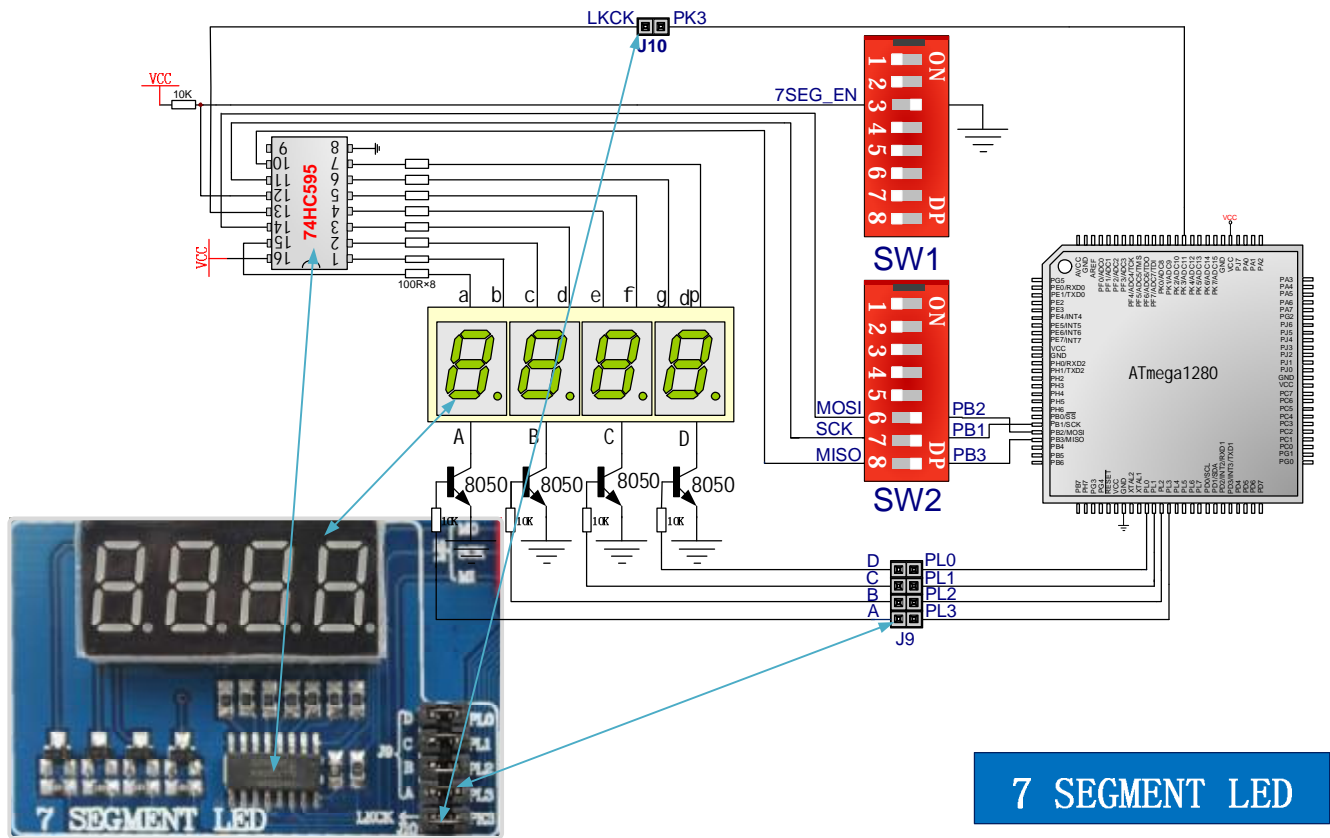
7.11 8 separate LED

LED is the most common human-machine display device used to indicate a variety of states, eight LED through the jumper J11 connect to Atmega1280 PH port and through current- limiting resistor connect to DIP switch LED_EN to control whether to connect to GND.

Need to use the LED, Shorted jumper J11 and On SW1 LED_EN .

7.12 1602 LCD interface

LCD is very commonly used in display device, contains graphic LCD and character LCD, common are 1602 character LCD and 12864 graphic LCD.

EasyAVR left standard LCD interface can be directly inserted 1602 or 12864 LCD, and is equipped with the appropriate examples. 1602 only 16 pins, Plug-in close to the pin 1 side. Shorted jumper J12 and J13 and the DIP switch SW2 123 to On when use 1602, at the same time RV4 adjusted to a minimum.

Potentiometer RV4 used to adjust the contrast, please read LCD data sheet carefully, part of the LCD can not adjust the contrast, can not shorted SW1 3 , otherwise it will burn LCD.

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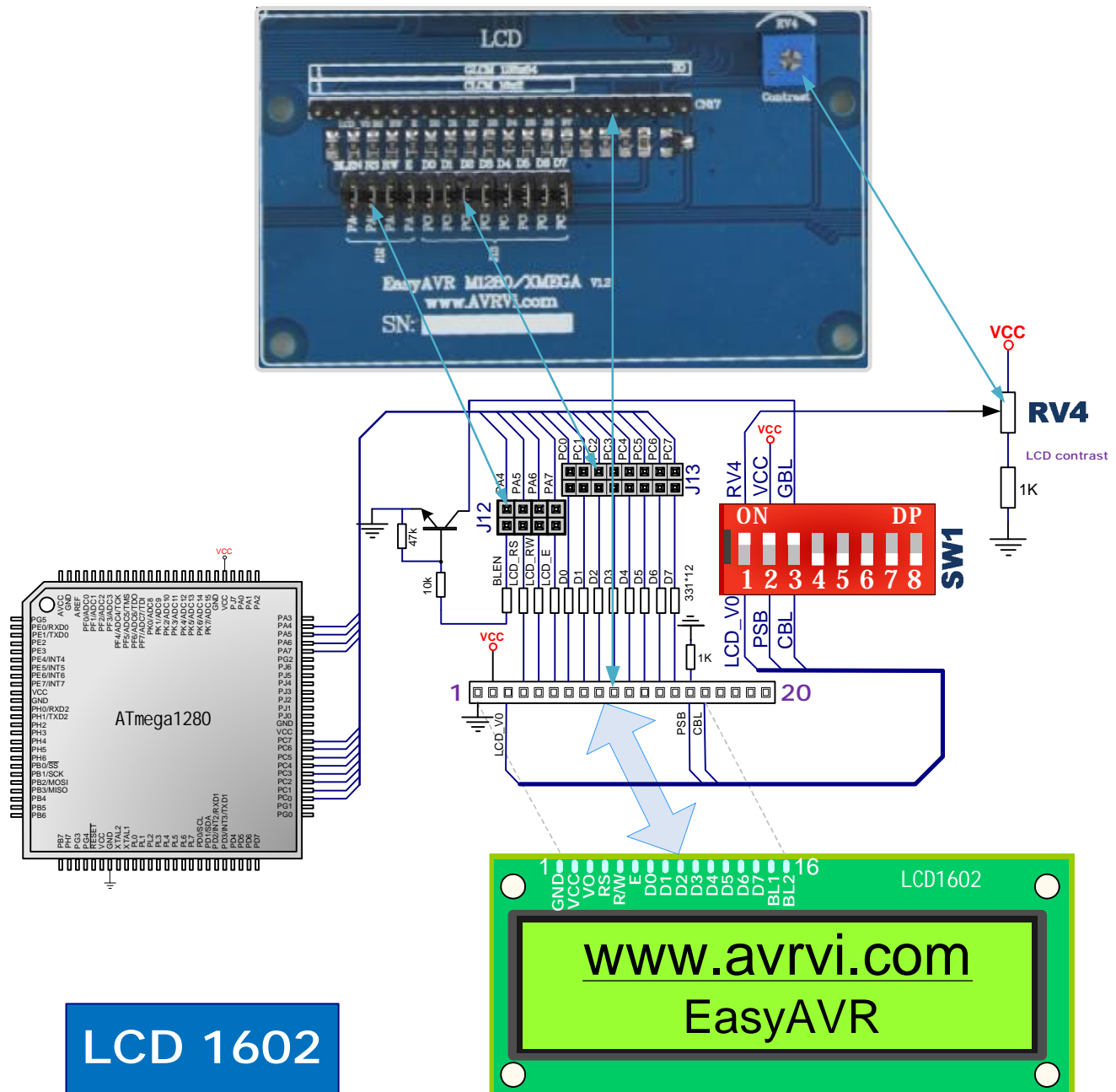
7.13 12864 LCD interface

EasyAVR left standard LCD interface can be directly inserted 1602 or 12864 LCD, and is equipped with the appropriate examples. Use 12864 exactly 20 feet, one on one connection.

Shorted jumper J12 and J13 and SW2 12 On when use 12864, at the same time RV4 adjusted to maxim- um.

The first leg is used to connect SW2 potentiometer RV4 to adjust contrast, please read LCD data sheet carefully, part of the LCD can not adjust the contrast, then can not shorten, otherwise it will burn LCD.
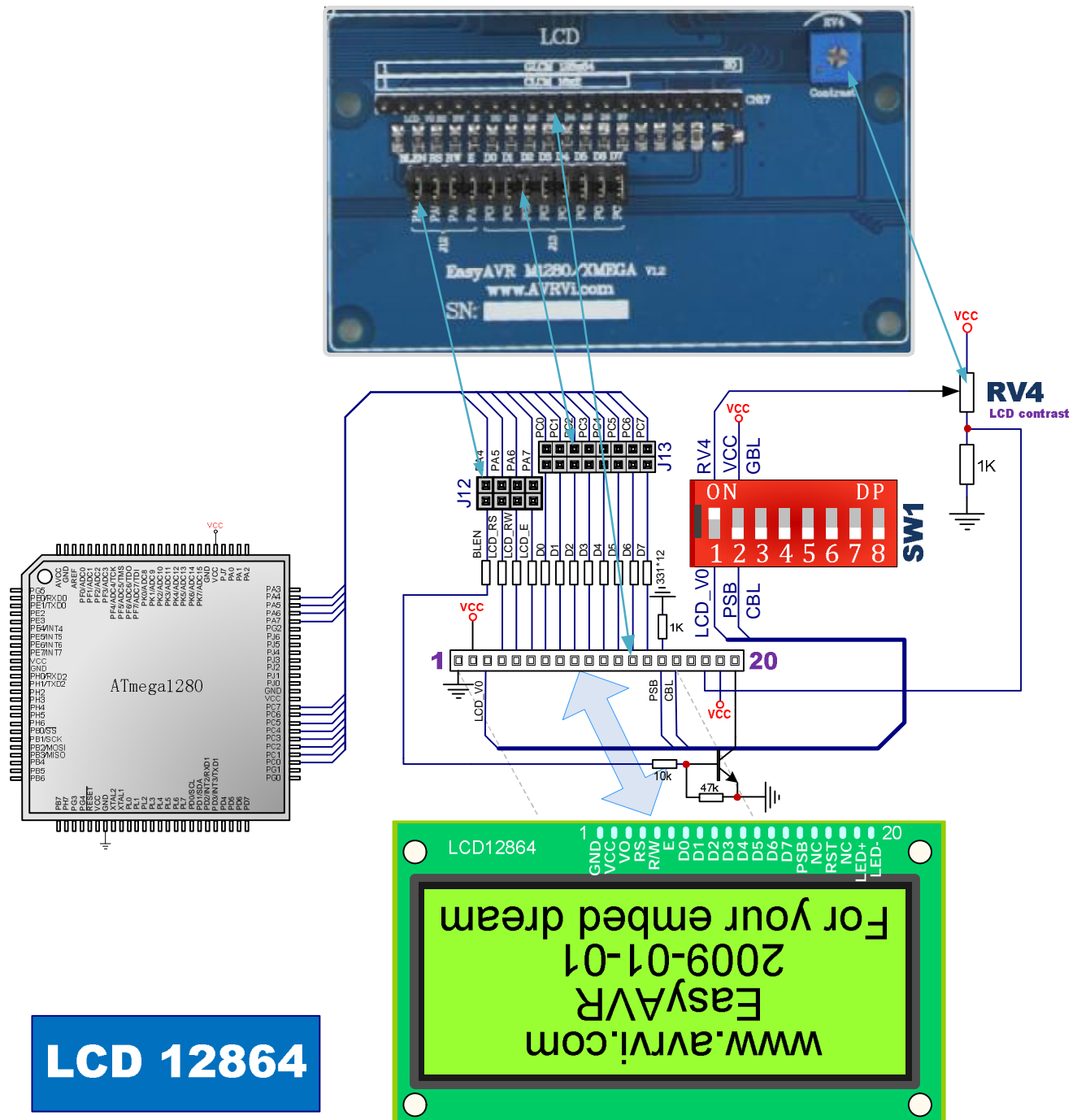
7.14 Crystal oscillator and reset

AVR Microcontroller own internal RC clock, but in order to assure communication's accuracy (such as RS232 communication), often using an external crystal oscillator, the development board designed with regular crystal interface and the active crystal interface, the default plug a 7.3728M crystal, if needed the customers can solder their own active crystal. Standard RC reset circuit reset, with buttons down reset pin voltage(When used to the reset circuit,please shorted the jumper J17).

External crystal selected

External oscillator selected

Oscillator & RTS
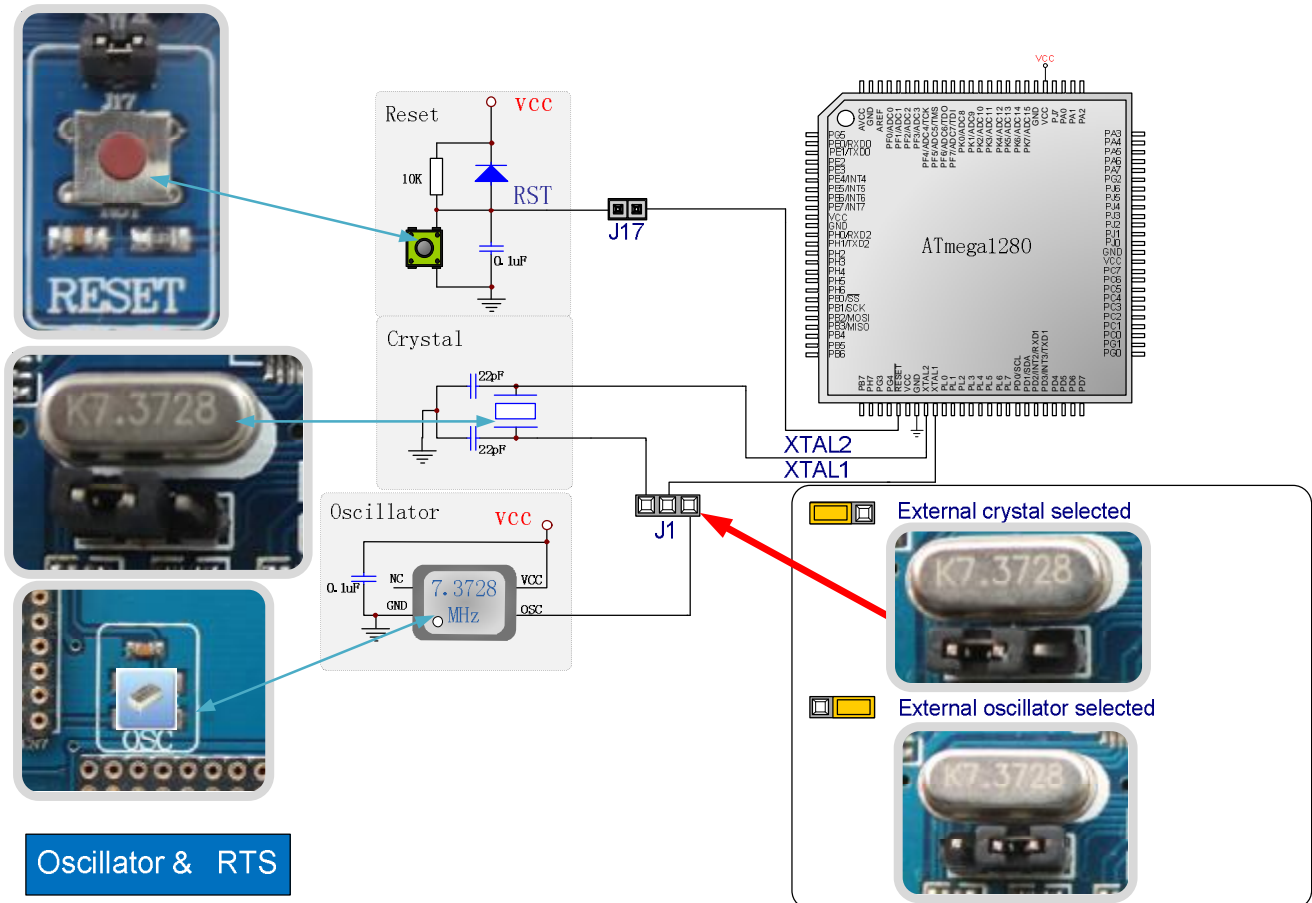
7.15 4X4 Keyboard

Key is the most basic human input interface, commonly used to switch funtion in equipment, EasyAVR M1280 is designed 4X4 Keyboard, connected to the PJ port by jumper J24.
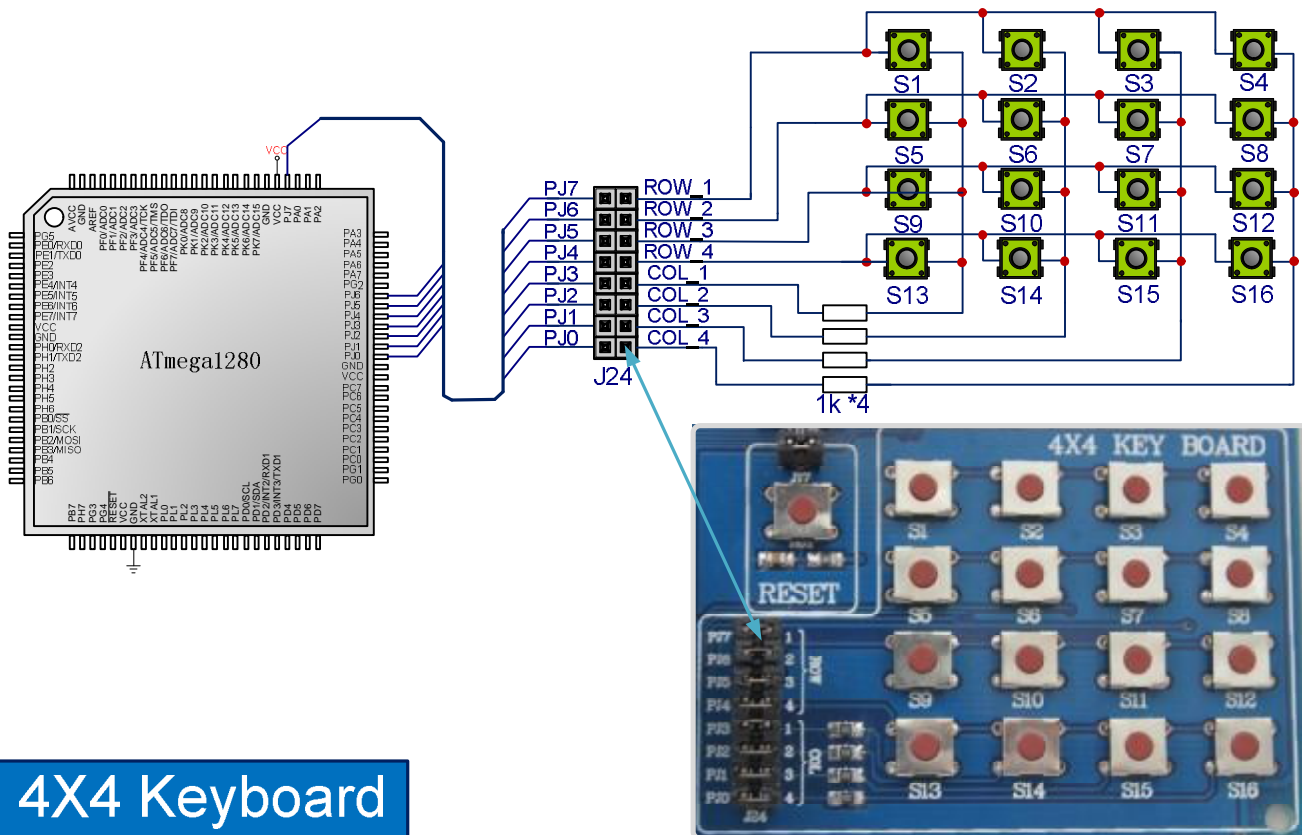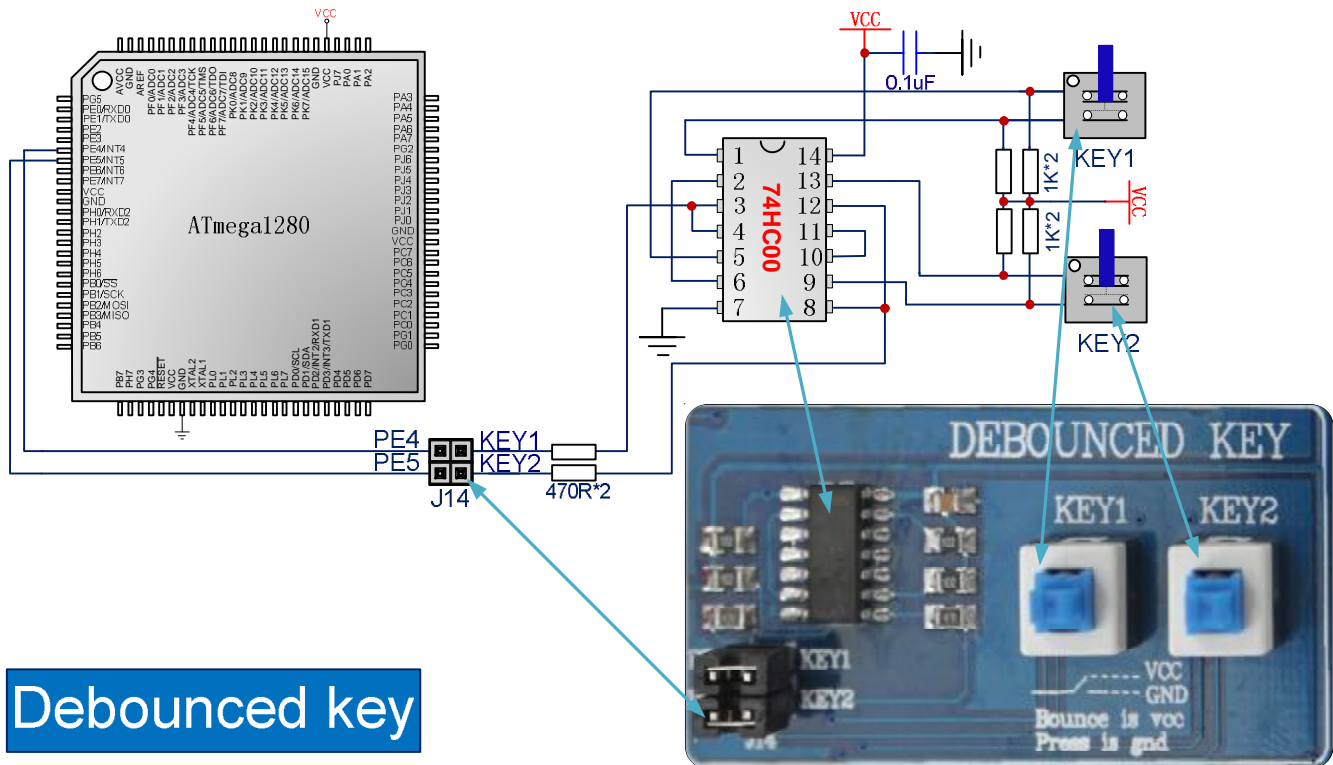

4X4 Keyboard

7 .16 74HC00 Hardware debounce circuitry

In the closed button and disconnect process, because of the mechanical characteristics of switches, resulting generation button jitter. If the button does not eliminate the mechanical jitter, key state possible will be read error. Debounced divided into hardware debounced and software debounced . This product   using 74HC00 way to remove jitter. KEY1 and KEY2 correspond to the PE4 (INT4) and PE5 (INT5). please shorted the jumper J14 to connect the PE4 and PE5 when you use it.

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7 .17 MCP4922   DA Circuit

MCP4922 is a device with two-way DA output, using the SPI control, MCP4922 chip select connected PK6 by jumper J15; MCP4922 voltage output by standard nylon terminal block KF396; please shorted jumper J15 when you use the MCP4922. MCP4922 sleep mode control by switch 1 on SW1.
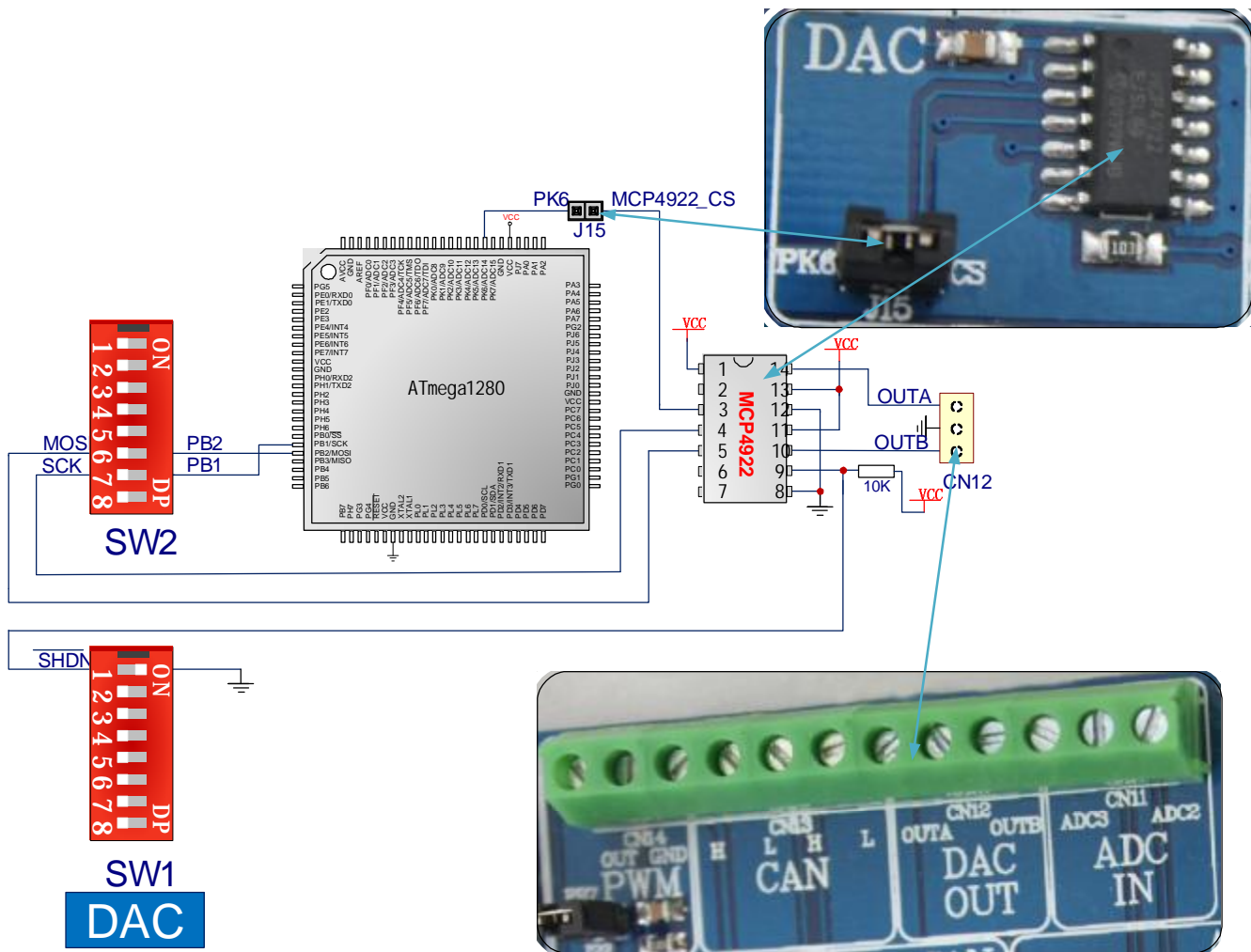
7 .18 Analog Temperature Sensors TC1047A

TC1047A analog temperature sensor output the temperature value to the ADC0 (PF0) by jumper J16. TC1047A can be enabled using J16's PF0—1047 Out.
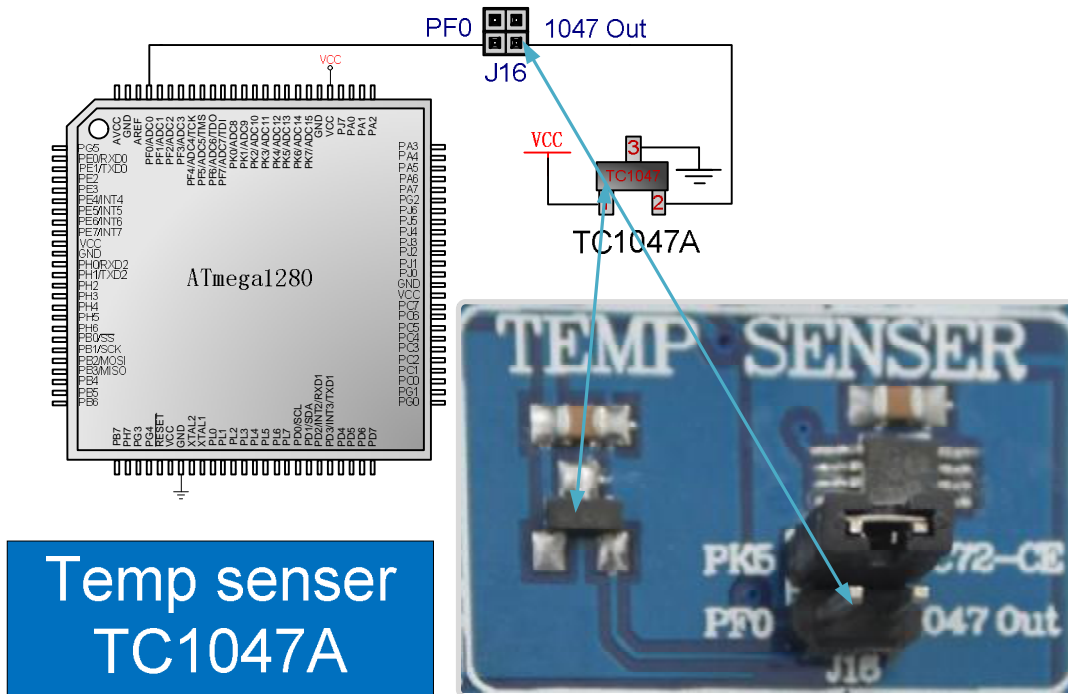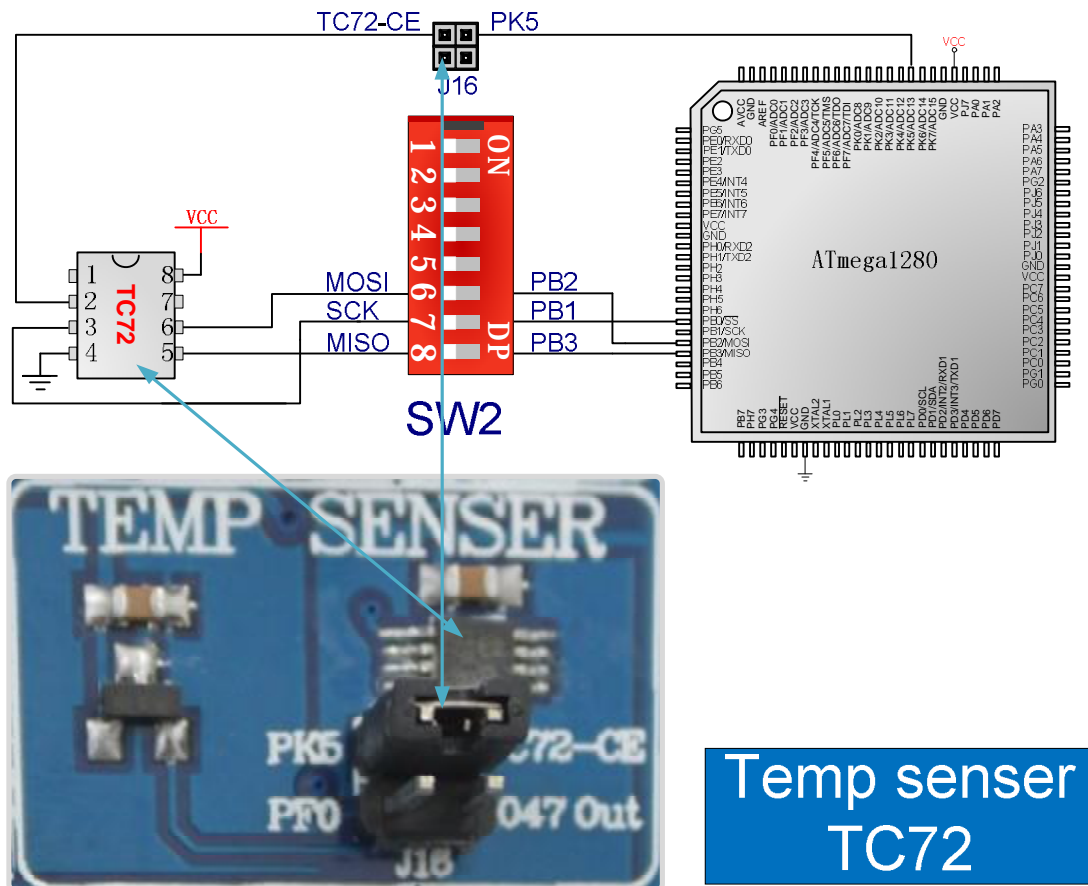

Temp senser TC1047A

7 .19 Digital Temperature Sensors TC72

TC72 digital temperature sensor is a SPI device, TC72 temperature value output to the microcontroller through the SPI,TC72 can be enabled using J16's PK5-TC72-CE.

# 7 .20   AD voltage adjustment potentiometer

Development board designed an adjustable potentiometer (RV1/ADC1) through the resistor divider to obtain changes in voltage, used for ADC conver- sion and experiment. AREF through SW1 4 connected to the AVCC, to use the AVCC as a reference voltage source.The jumpers group J19's PF1-ADC1 should be shorted when you use the ADC1.
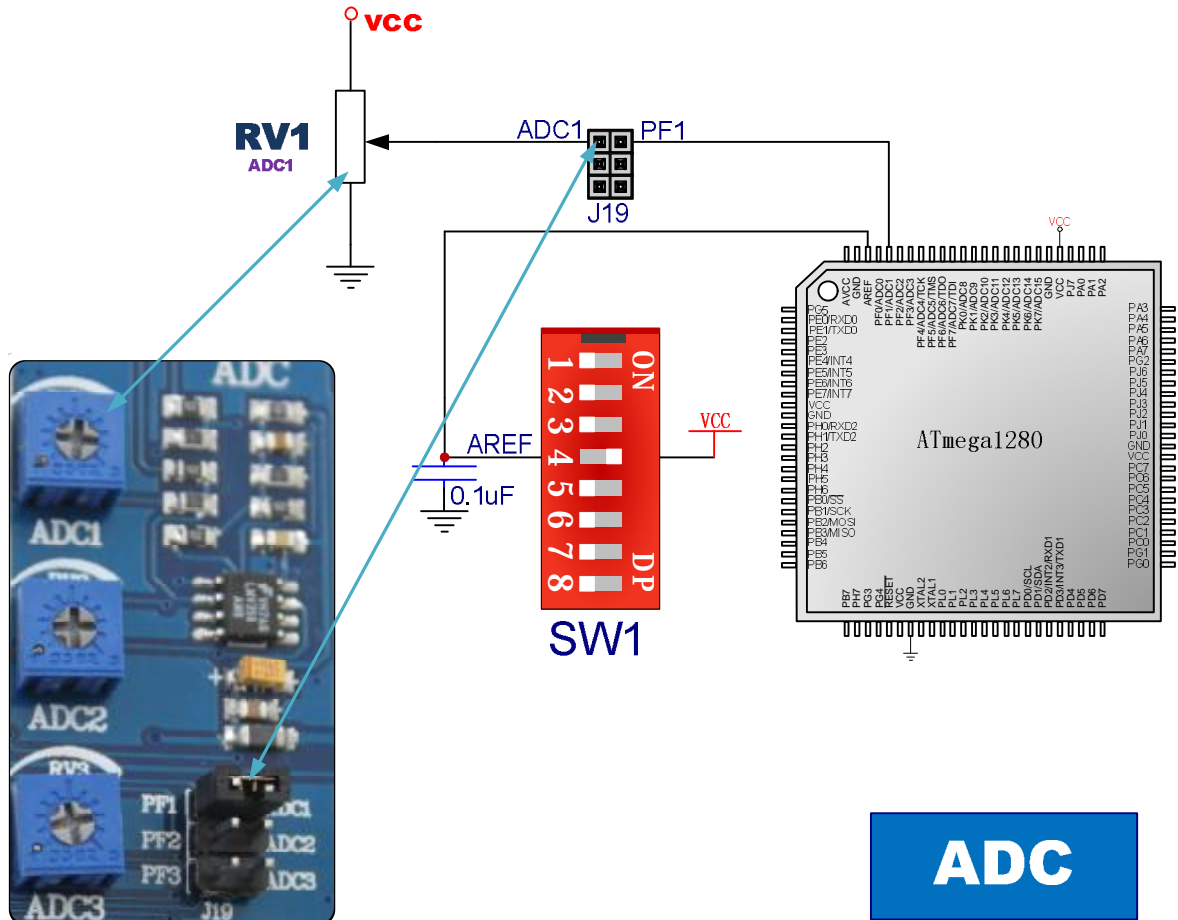
7.21 LM358 signal conditioning

EasyAVR M1280 use LMV358 to do rail-to-rail signal conditioning gain circuit, input range 0-10V, signal gain 0.1-1000, potentiometer ADC2 and ADC3 respec- tively adjust gain of ADC2 and ADC3; ADC2 and ADC3 use standard socket interface KF396 and more convenient to use; Please shorting the jumpers group J19's ADC2-PF2 and ADC3- PF3 when use, open the analog reference voltage AREF at the same time, that is On the SW1 AREF-VCC.

2 ADC input
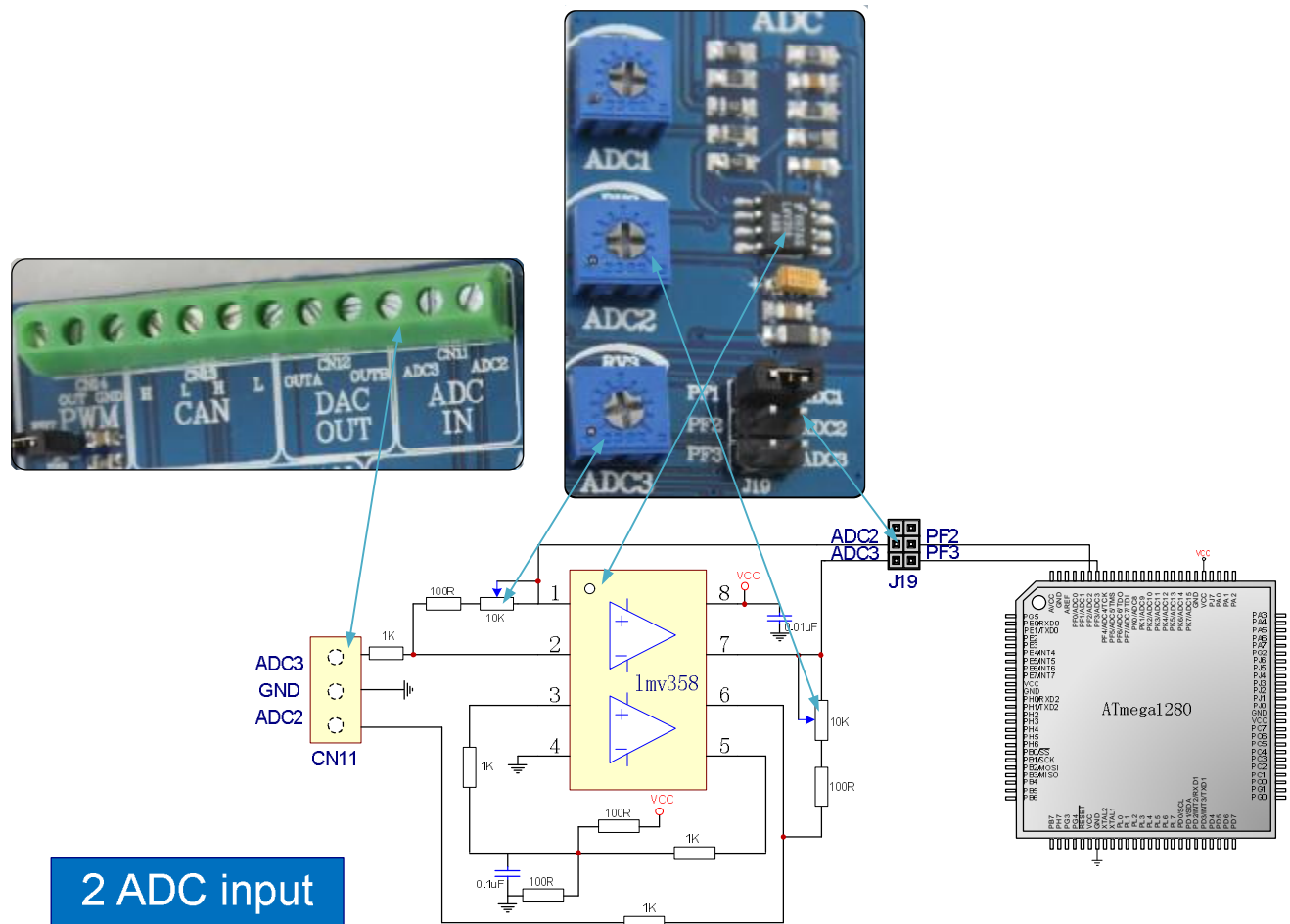
7.22 CAN Information Transmission

Controller–area network (CAN or CAN-bus) is a vehicle bus standard designed to allow microcontrollers and devices to communicate with each other within a vehicle without a host computer.

CAN is a message based protocol, designed specifically for automotive applications but now also used in other areas such as industrial automation and medical equipment.

Development of the CAN-bus started originally in 1983 at Robert Bosch GmbH.[1] The protocol was officially released in 1986 at the Society of Automotive Engineers (SAE) congress in Detroit, Michigan. The first CAN controller chips, produced by Intel and Philips, came on the market in 1987. Bosch published the CAN 2.0 specification in 1991.

CAN is one of five protocols used in the OBD-II vehicle diagnostics standard. The OBD standard is mandatory for all cars and light trucks sold in the United States since 1996, and the EOBD standard, mandatory for all petrol vehicles sold in the European Union since 2001 and all diesel vehicles since 2004.[2]

The jumper J20 used to connect or disconnect 120ohm resistance. The jumpers group J21 used to connect or disconnect MCP2515's CS and MCP2515's INT to the PK7 and PE6,respectively. The product designed have Two-way CAN output. CAN output use standard socket interface KF396 and more convenient to use. Please shorting the jumper J21 and On the SW2 6 7 8 when you use the CAN.
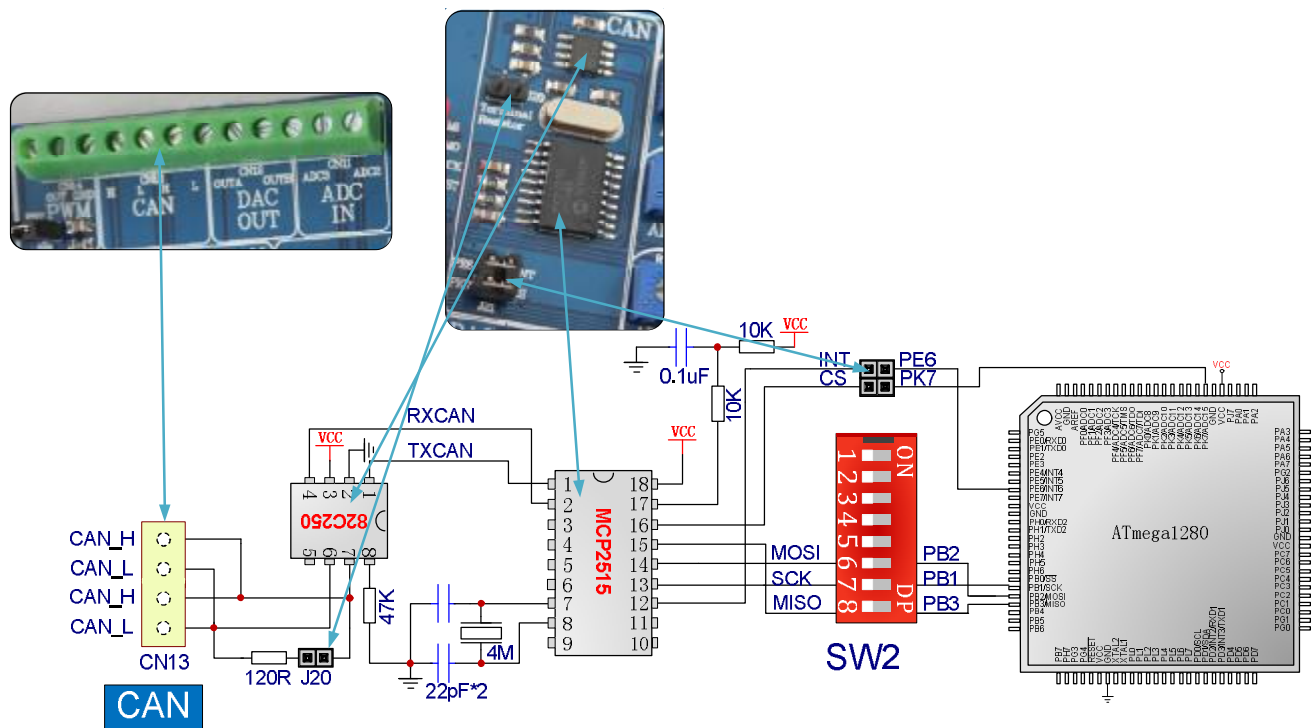
7.23 PWM output

AVR chip has PWM function which is short for "Pulse Width Modulation". It is the use of digital output of the microprocessor to control analog circuits in a very effective technology, widely used in from the measurement, communications to power control and conversion and many areas.
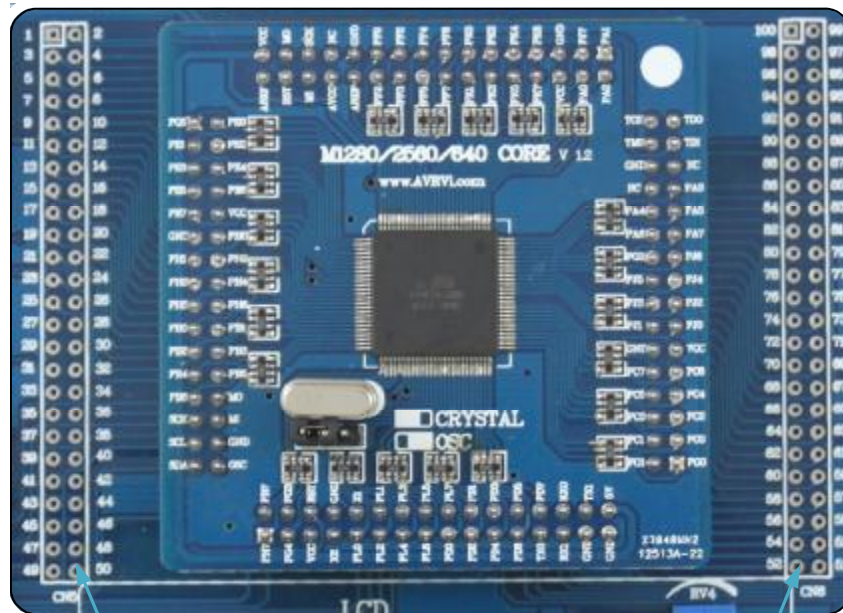
EasyAVR connect Atmega1280 PWM pins PB7 to the external connector pins through J22 to control external devices, very useful, as illustrated.
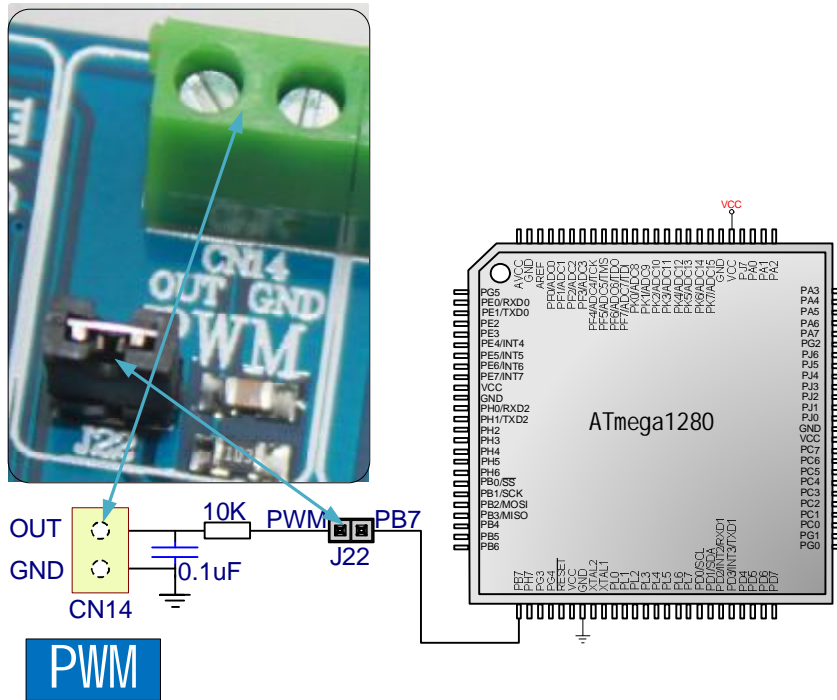
7.24 100Pin MCU DIRECT PORT ACCESS

All microcontroller input/output pins can be accessed via connectors placed along the right and left side of the core board. There have 2 groups,each group have 50 pins. To enable you can quickly view the pin number corresponding to the pin's name, please refer to the part of 7.3.

CN5

CN6

MCU PIN

EasyAVR
On board programmer

7.25 External programming interfaces

This product is equipped with a standard JTAG and ISP programming interface Block CN15 and CN16, when used, please connect PC and develement board use the programmer (To ensure the programmer quality, we recommend using our company's programmers) .

JTAG/ISP
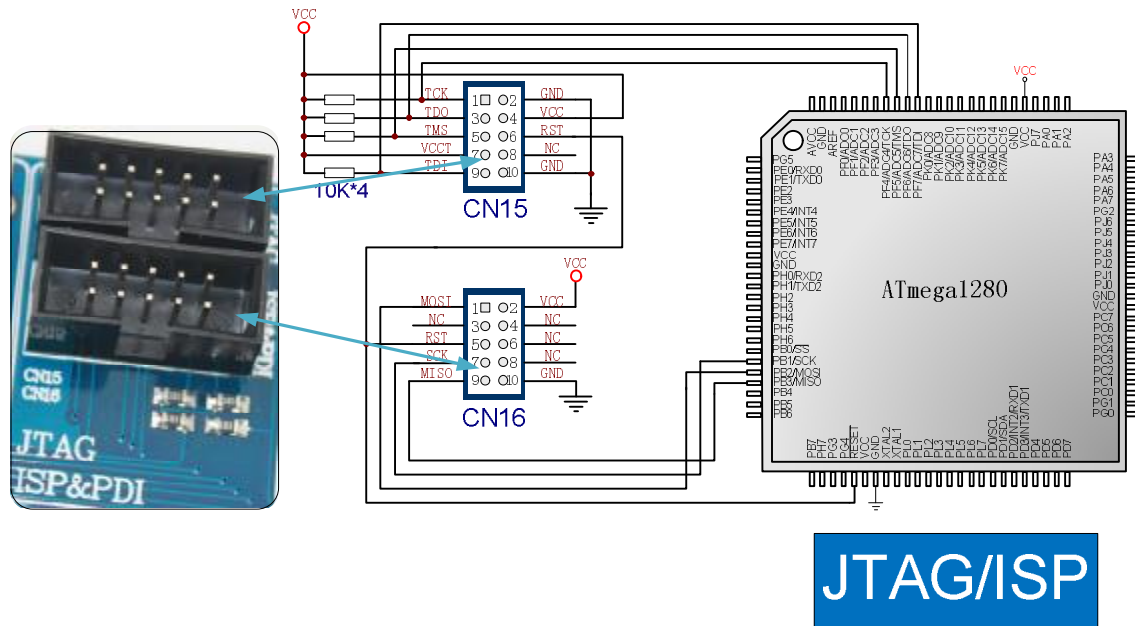
7.26 PS / 2 (Keyboard) connector

The PS/2 connector allows direct connection between EasyAVR and devices that use PS/2 communication, such as PC, keyboard or mouse.For example,the microcontroller can be connected to a keyboard to capture pressed kers or it can be connected to a PC to act as a keyboard.CLK and DATA lines are used for data tansfer. In this case,they are conneted to pins PE7 and PK1 respectively. Please shorting the jumper J1 when use PS/2.

PS/2 CONNECTOR

AVR AND Virtual Instruments
www.avrvi.com
EasyAVR M1280 SK user guide
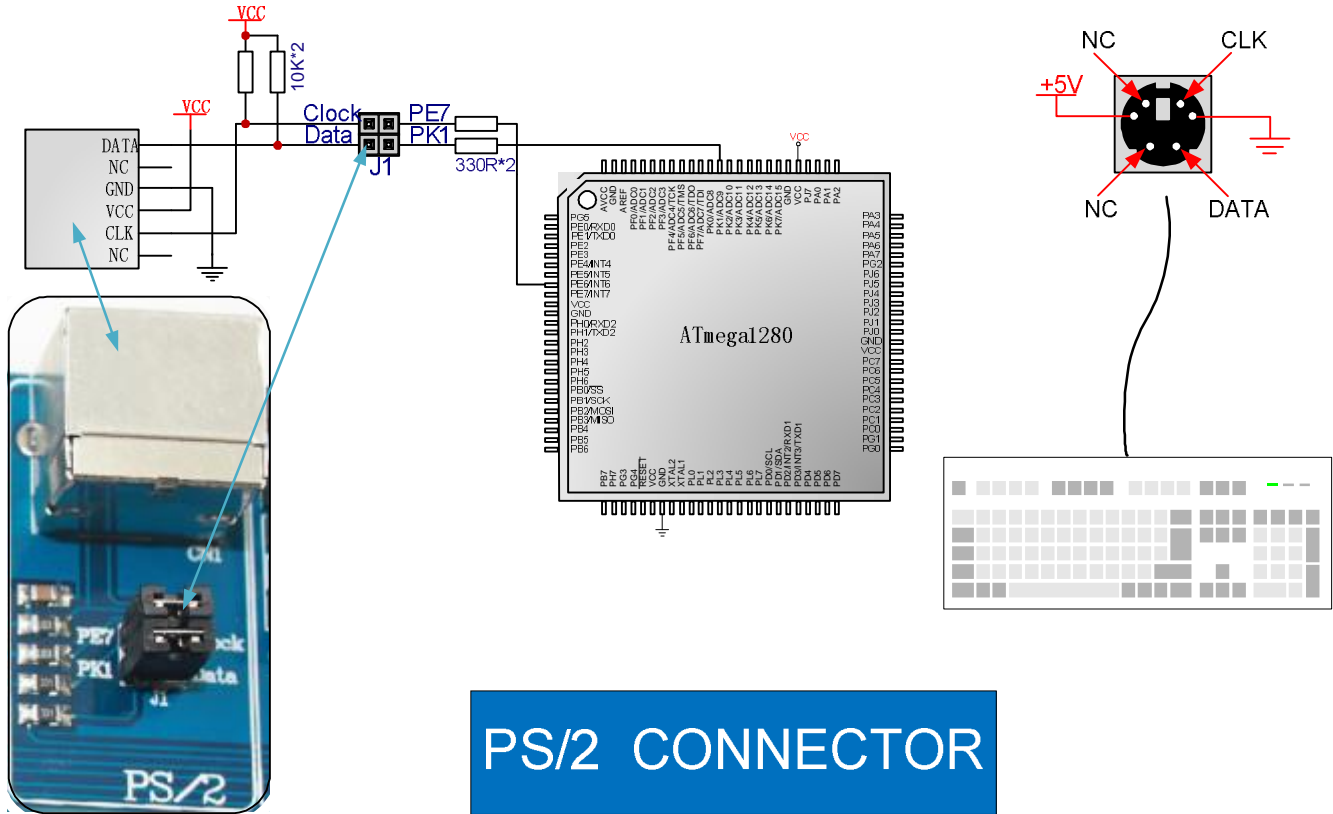
8．Material resources

8.1 CD content

File list Description:

1. CD-ROM description.txt

2.democode / readme.txt

   How to get start and the copyright statement

3.AVR books

   AVR MCU e-book

4.AVR teach

   Original AVR MCU Tutorial

5.Datasheet

   EasyAVR M1280 SK matched devices manual

6. Democode

Development board supporting routines and description

7.protel_libs

protel Package Library

8. Schematics

Development board schematics and jumper configuration pictures

9.Software

Development software, ICC GCC CVAVR AVRstudio, etc

8.2 Experimental contents

Analog-digital conversion (AD):

Single-channel AD acquisition, 7-segment LED display display the results

Dual-channel time-sharing the collection, 7-segment LED display display the results

TC1047A output the temperature value to the AD function module.,7-segment LED display display the results

74HC4060:

The DS1337 output the 32.768 KHZ clock signal frequency as the 74HC4060 clock source to trigger Interrupt, to achieve the flashing LED.

Buzzer:

Key detection, buzzer tweet

Keyboard:

Key detection, buzzer tweet

Key detection, 7-segment LED display display the results

LED:

Light water program

DS1337 Timing, LED blink once when the time is 10s.

The DS1337 output the 32.768 KHZ clock signal frequency as the 74HC4060 clock source to trigger Interrupt, to achieve the flashing LED.

74HC00 debounce circuit, press KEY1 or KEY2, the corresponding LED flashes once.

Timer:

Timer T1 to achieve 1 second timing, 7-segment LED display display the results

7-segment LED:

Timer T1 to achieve 1 second timing, 7-segment LED display display the results

TC1047A test temperature, 7-segment LED display display the results

TC72 test temperature, 7-segment LED display display the results

Single-channel AD acquisition, 7-segment LED display display the results

Dual-channel time-sharing the collection, 7-segment LED display display the results

Key detection, 7-segment LED display display the results

Calendar clock DS1337，7-segment LED display display the results

TC1047A:

TC1047A test temperature, 7-segment LED display display the results

TC72:

TC72 test temperature, 7-segment LED display display the results

SPI:

Using SPI drive SPI device 74HC595, to achieve display of 7-segment LED display

Using SPI drive SPI device TC72，Read temperature value and   by using 7-segment LED display

Using SPI drive SPI device MCP4922，To achieve digital-analog converter, and output continuous voltage.

TWI:

 Using TWI drive TWI device 24C01

 Using TWI drive TWI device DS1337

24C01:

24C01 read and write, look at the results of the use of JTAG

DS1337:

 Calendar clock DS1337, 7-segment LED display time display

DS1337 timing, LED blink once when the time is 10s

DS1337 output the 32.768 KHZ as the clock souce of 74HC4060

ST7920（LCD128*64）：

 ST7920 drived LCD128 * 64 serial mode display

4X4 keyboard:

Using numerical code tube display the value for the button is pressed.

74HC00 debounce circuitry:

 74HC00 debounce circuit, press KEY1 or KEY2, the corresponding LED flashes once.

MCP4922:

Using SPI drive SPI device MCP4922，To achieve digital-analog converter, and output continuous voltage.
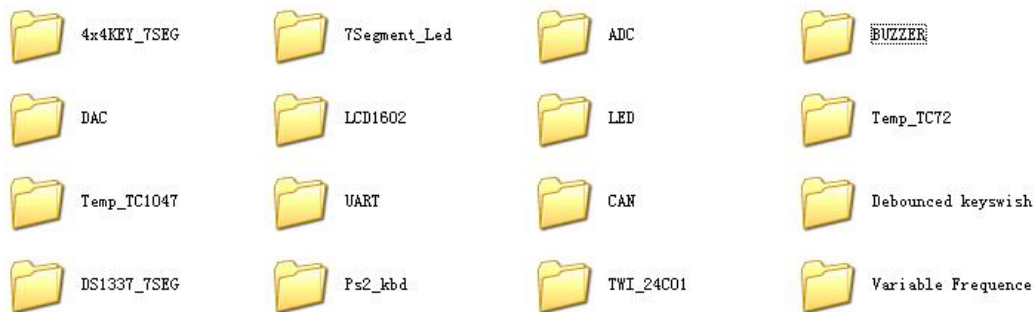
CAN:

Data exchange between the two CAN devices.

PS / 2 (Keyboard) connector:

Using the LCD1602 displar the corresponding ASCII code of PS / 2 keyboard button is pressed.

USART:

 Communication with the PC using the uart,and observe the received data using the serial port debugging software.

4x4KEY_7SEG	7Segment_Led	ADC	BUZZER
DAC	LCD1602	LED	Temp_TC72
Temp_TC1047	UART	CAN	Debounced keyswish
DS1337_7SEG	Ps2_kbd	TWI_24C01	Variable Frequence

Note: In order to better use of the development board supporting package, to avoid the path problem

Ø   Please put the package in :D:\avrvi\AVRVi_m1280_Starter_Kit and remove the read-only attribute

Ø   ICC installation directory:D:\icc7avr

8.3 Expand board available

Based on this board, you can also study in-depth through a variety of modules

1. LCD Module

2. ENC28J60 network module

3. CP2200 network module

4.Wireless communication module (nrf905 nrf2401 nrf1100 and many other models)

5. VS1003 mp3 development board

6. Intelligent Vehicle Development Platform

7. OSD video overlay Development Board

8. GSM GPRS Development Module

9. ... ...

EasyAVR
On board programmer

9. Service and support

Technical support:

AVRVi Website: http://www.avrvi.com

http://www.avrvi.net

AVRVi Forum: http://bbs.avrvi.com

AVRVi Shop: http://shop.avrvi.com

Technical Support E-mail: support@avrvi.com

Technical Support Online: MSN avrvi@homtail.com

Technical Support TEL:0086-531-62327572

Fax:0086-531-80879869

This product sevice whole of the country and can also contact the local office directly.

Access to technical support, please provide the following information:

1. Information of the purchaser.

2. A detailed version of the software You are using, you can see it in Help menu.

3. A detailed description of the problem or failure.

Warranty terms:

1. Time: a month exchange, one-year warranty.

2. Free Warranty: proper use of quality issues arising under the free warranty

3. Charge Warranty: Non-proper use of quality problems arise in the context, depending on the extent of damage to charge for the maintenance fee.

4. If it has generated between the freight, freight borne by the client side.

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