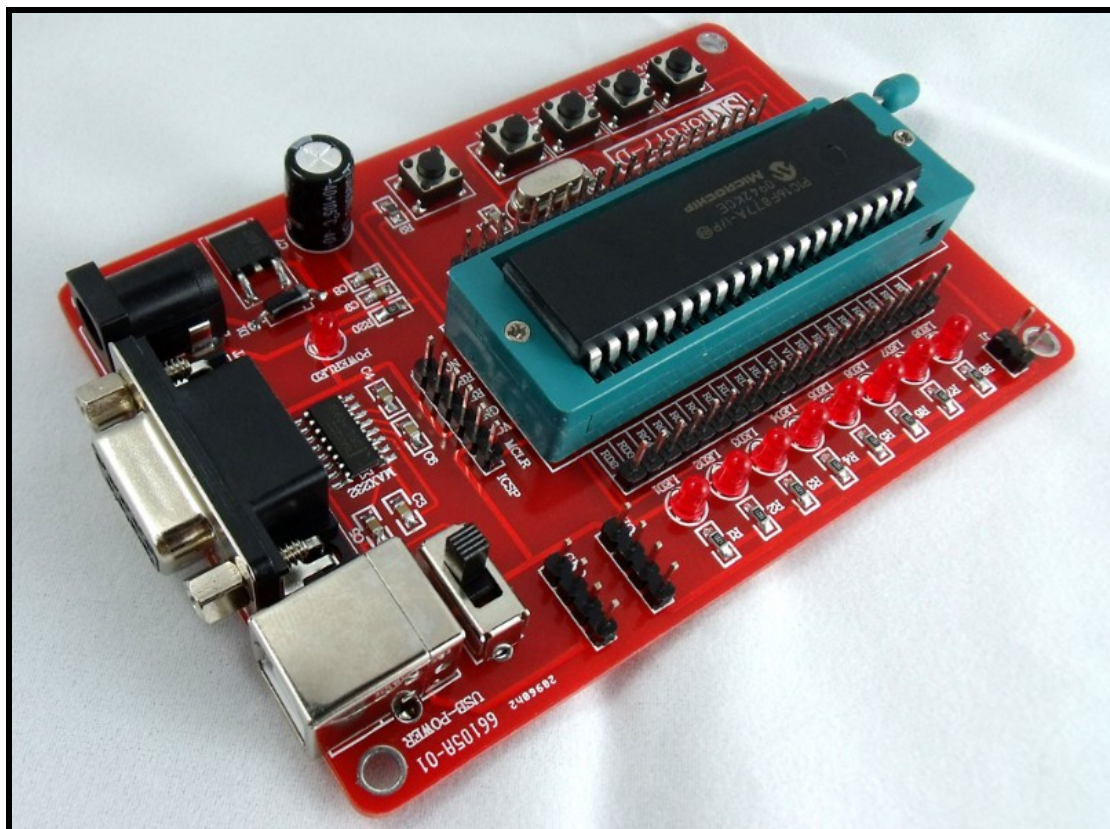


PIC16F877A Mini development board

Users Manual



Version 1.0

All boards produced by SINTECH STUDIO
Rev. A, July 2010

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- ◆J1, Leds enable jumper
- ◆J2, PIC16F877A's pin out
- ◆J3, PIC16F877A's pin out
- ◆VCC, Input/Output of power's VCC.
- ◆GND, Input/Output of power's GND.

Chapter 3. Troubleshooting

This chapter describes common problems when using the PIC16F877A Mini development board and their solutions.

3.1 The board does not power up.

Make sure that the POWER LED has turned on. If the LED is not on, check to see that the 6-12V power supply or the USB power is properly connected. It is necessary to note that the 6-12V power supply and the USB power can not be connected Simultaneously.

3.2 Microcontroller is not executing code.

First check to make sure that the microcontroller has been programmed with the firmware that is intended to run. If the part is programmed, ensure that the Related jumpers are properly placed.

3.3 The microcontroller will not program.

Check to make sure that the programmer/debugger is properly connected to the PC and powered. Make sure that the board is also powered with the 6-12V power or the USB power supply.

Chapter 3 MPLAB IDE Integrated Development

Environment

MPLAB IDE (hereinafter referred as MPLAB) is the powerful software integrated development environment provided by Microchip for its PIC microcontroller. It allows users to create, record, edit and comply programs of microcontrollers of PIC series on their own computer systems, and it even can achieves dynamic simulation and debugging and run like virtual exercises.

3.1 The installation of MPLAB

MPLAB is completely free software offered by Microchip. You can obtain the latest installation files through the following two ways.

- 1), See our CD rom
- 2), Visit Microchip's website: www.microchip.com

After downloading the files, you only need to use compression/decompression software tools such as WINZIP to depress and release the files in your computer, and then run SETUP.EXE (or Install.exe) program, and follow a step-by-step installation guide (You may also do not need changes any of the settings, just click "Next") until finishing the installation.

3.2 MPLAB Simple Application

3.2.1 Create a Simple Project

Edit source codes

Click the MPLAB icon at your WINDOWS desktop, or choose Start→All application → Microchip→MPLAB IDE V.x.x→MPLAB (Vx.x for MPLAB version) to start running MPLAB integrated environment. Shown as Figure 3-1.

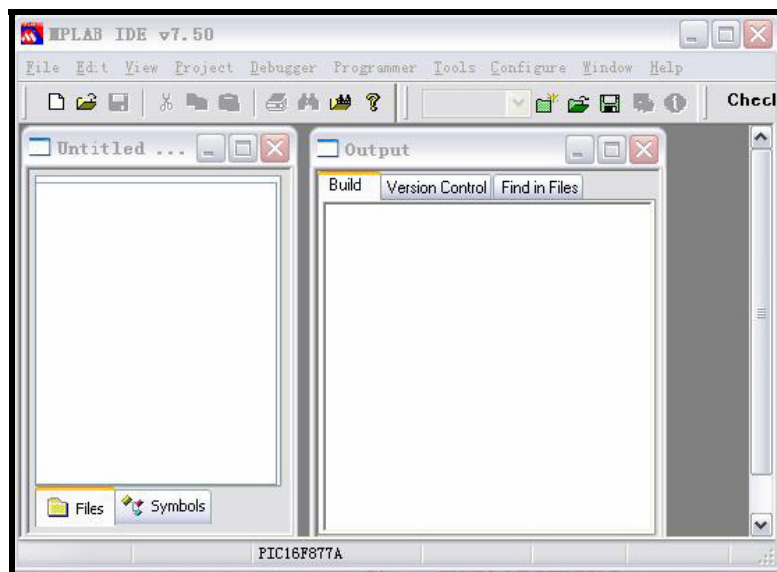


Figure 3-1 MPLAB main window

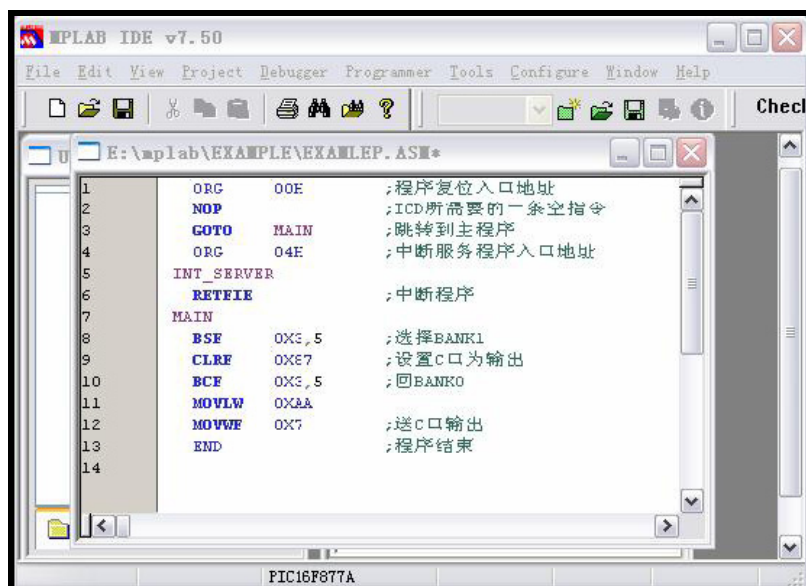


Figure 3-2 text editor window

Choose menu command File→new, MPLAB will automatically call MPLAB Editor (source editor), and the work area will have a text editor window, and you can complete input of source code. As shown in Figure 3-2.

Edit the source codes in "Text editor window", then select the menu command File→Save to save to the source file to the specified directory, as shown in Figure 3-3.

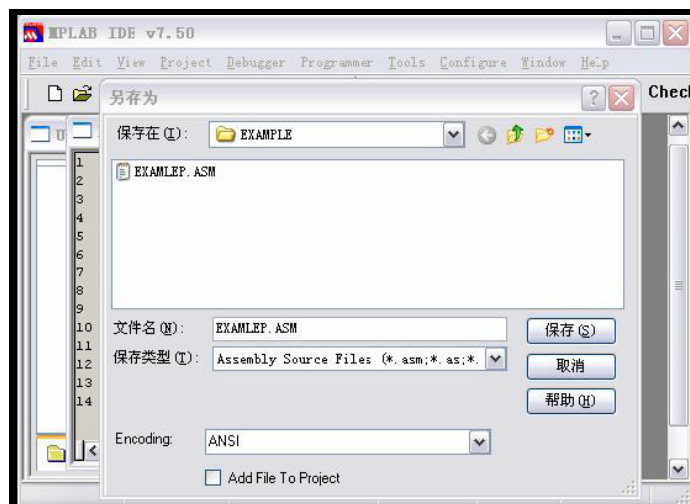


Figure 3-3 Save source codes

Use the wizard to create project files

step 1, Chose menu command **Project→Project Wizard** to come to the Welcome interface shown as Figure 3-4.

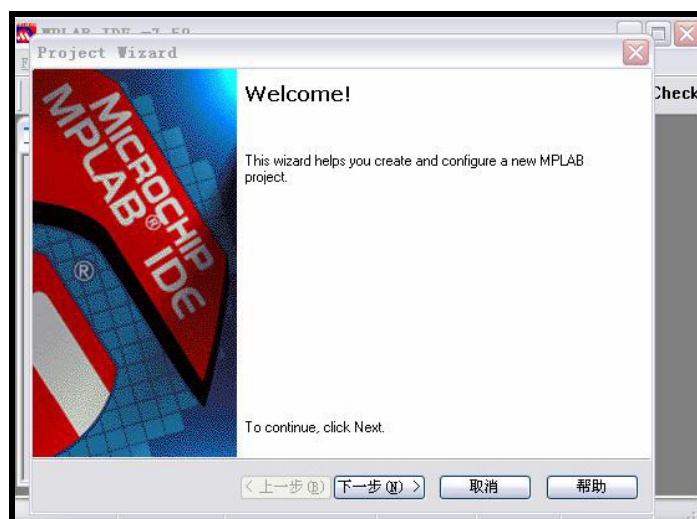


Figure 3-4 Project wizard welcome interface

Step 2, directly click "Next", and select chip model, as shown in Figure 3-5.

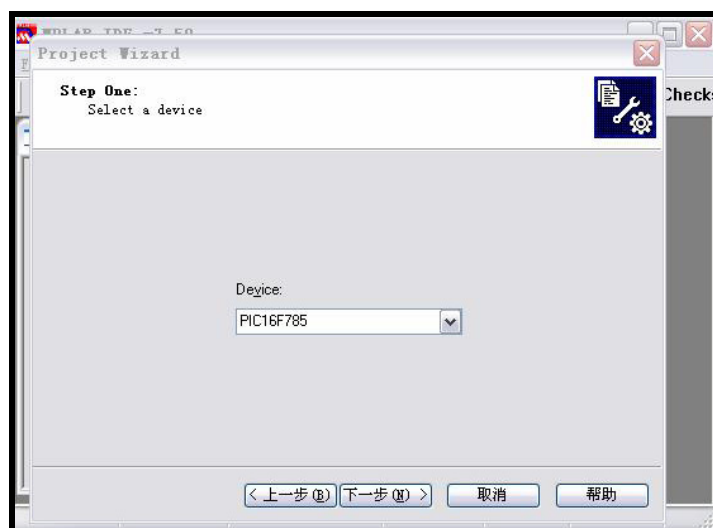


Figure 3-5 Choose chip model

Step 3, click "Next", select the appropriate compiler tools according to the source language and chip to be used, as shown in Figure 3-6.

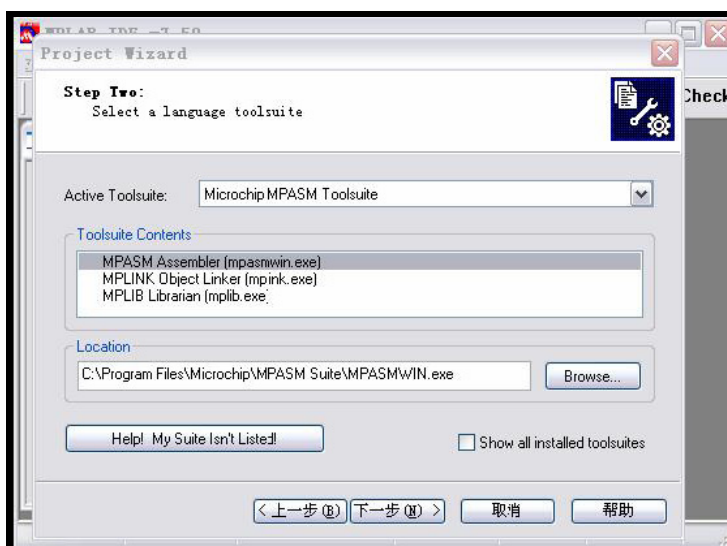


Figure 3-6 Choose compiler tools

Step 4, click "Next", choose the directory where the project is saved and complete the project name, as shown in Figure 3-7.

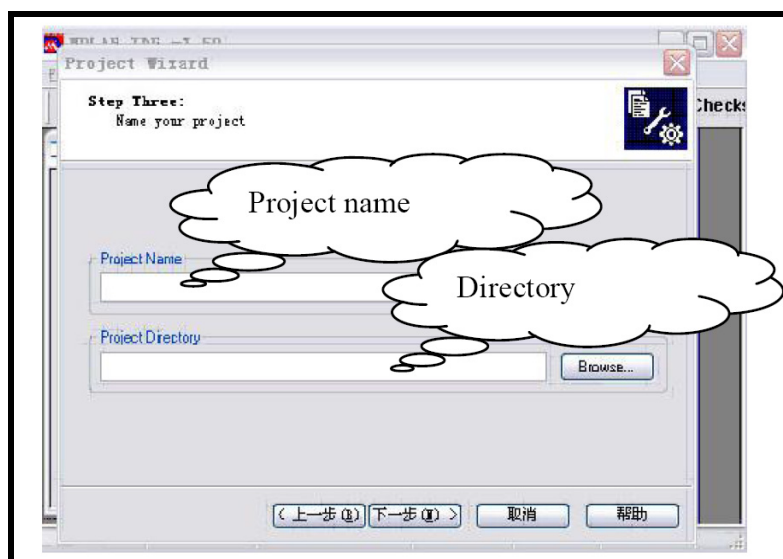


Figure 3-7 Choose directory to save project

Step 5 click "Next", the add source codes to the project, as shown in Figure 3-8.

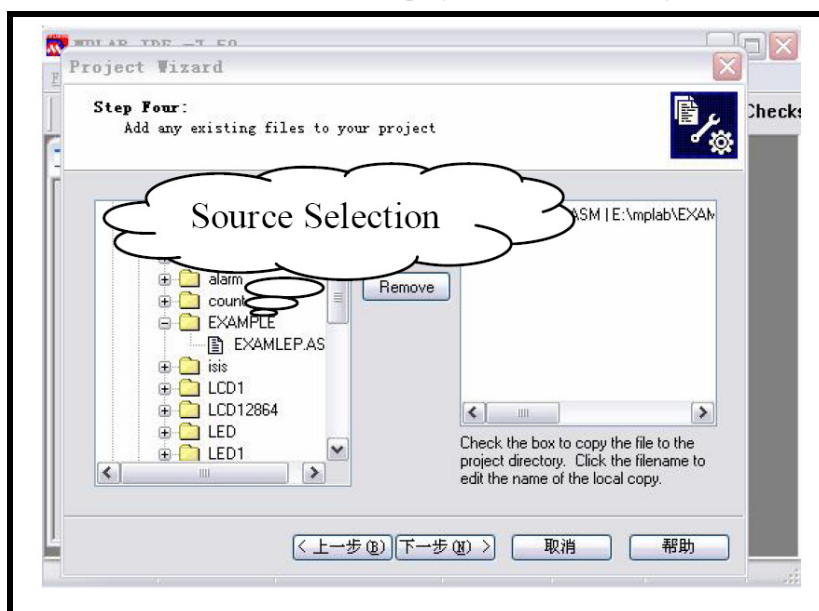


Figure 3-8 source selection

Step 6, click "Next", as shown in Figure 3-9 to come to tips interface.

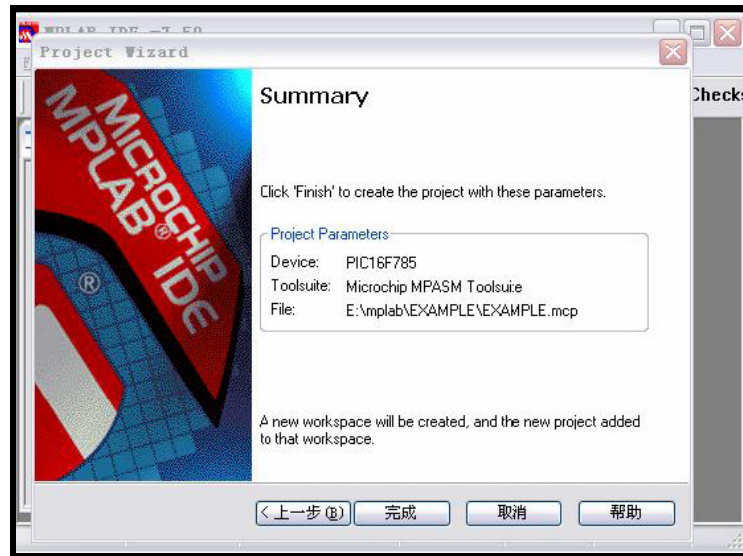


Figure 3-9 Tip interface

Step 7, directly click "Done", and exit the wizard.

So far, we have completed establishing a project the source. For more details, please refer to MPLAB Operation Manual.

3.2.2 Debugging the program

Based on the source code edited and project created in above, this section will show you a brief introduction about complying and debugging a program.

Compile

Implement menu command Project→Build All and MPLAB will automatically call the tools mentioned in above Step 3 of establishment of project for you to compile this source code. When completing compile, the interface will be shown as Figure 3-10.

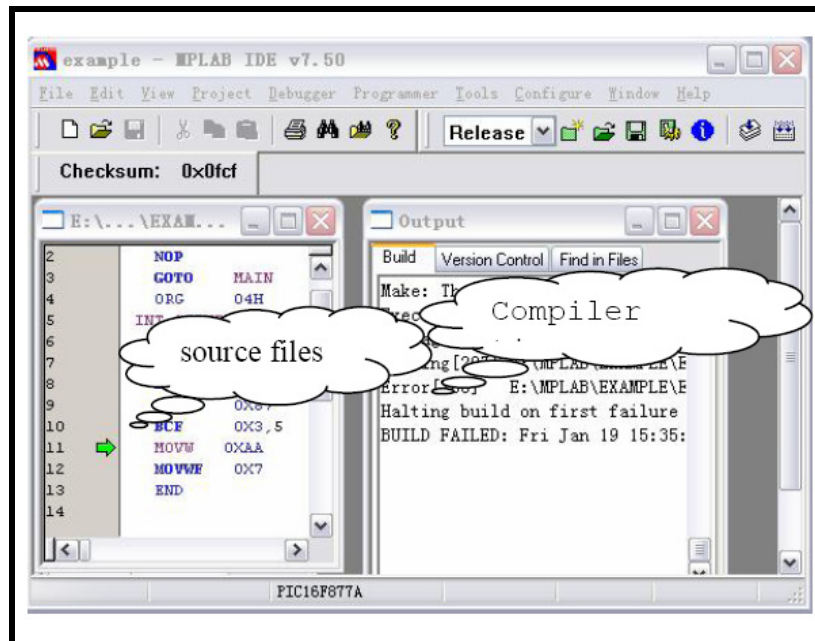


Figure 3-10 Source compiled results

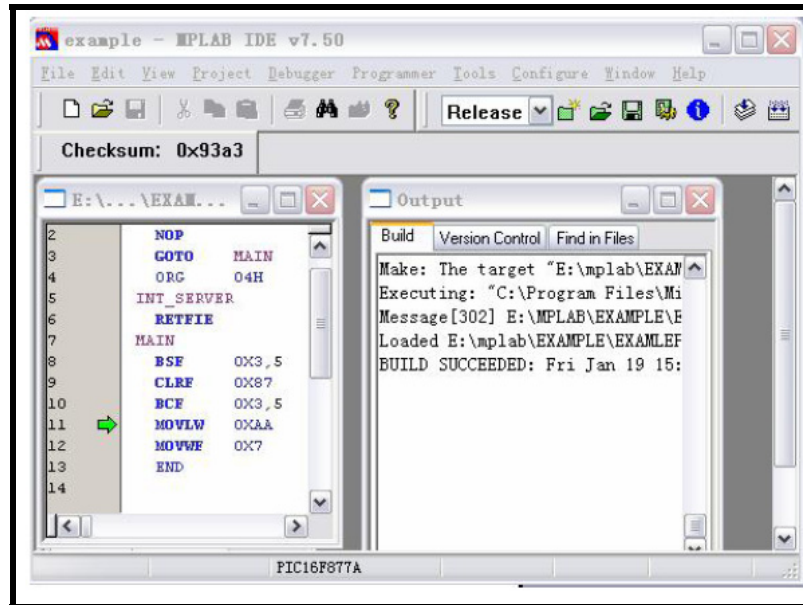


Figure 3-11 Compiling succeeds

From the output window of Figure 3-11, we can see the results that the program compiling failed because of a wrong source, double-click the message, and the cursor will automatically stay at the line where there's an error, and at the margin of most left of this line there's a "Green Arrow". It is obvious that the type of "MOVLW" has been wronged as "MOVW". Now correct the typo and compile it again, the results are shown in Figure 3-11.

Message [302] information tips draws your attention to BANK selection, even if BANK is set up correctly, the messages will still appear, but it does not affect the results of the implementation of program.

If there is an error in the program, it will not generate the target HEX file, to get HEX file you need to correct all errors in the source codes.

Debugging

Debugging program is to test whether the program you designed is operational, whether it produces correct result as wanted, whether there's any defects in your design, whether the algorithm design is reasonable, and whether it can accurately control the various hardware resources, and whether it can obtain desired results.

Choose debugging tools

Select menu command Debugger. Select Tool, to select the simulator connected to the PC as the debugging tool, or you may select the software debugger which comes with the MPLAB software as the debugger for the target program. After choice, it will open the corresponding toolbar.

Observe debugging results

The internal storage area of PIC microcontroller can be divided into several sections: program memory, hardware stack, file registers, special function registers and EEPROM data memory. In the course of the operation of program, it will repeatedly read, write or modify the contents in the storage area. Therefore, we can observe the changes of content in storage area corresponding to the operation of program so as to understand the operation of program, and achieve the purpose of debugging. To open storage area we can choose the View menu commands, as shown in Figure 3-12.

Apart from the use of these storage area to observe the debugging process, we can also add the

concerned specific modules to the observation window to monitor the results. Implementation the menu command **View→Watch** and the observation window will open, as shown in Figure 3-13.

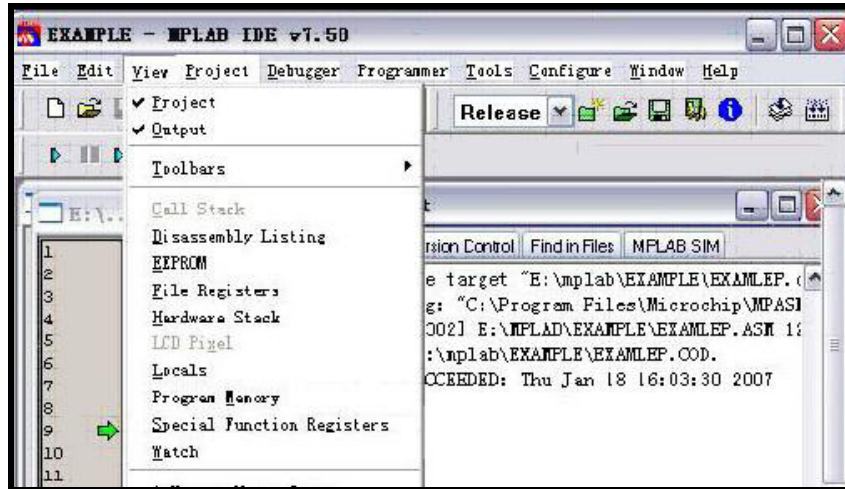


Figure 3-12 Menu command to open storage area

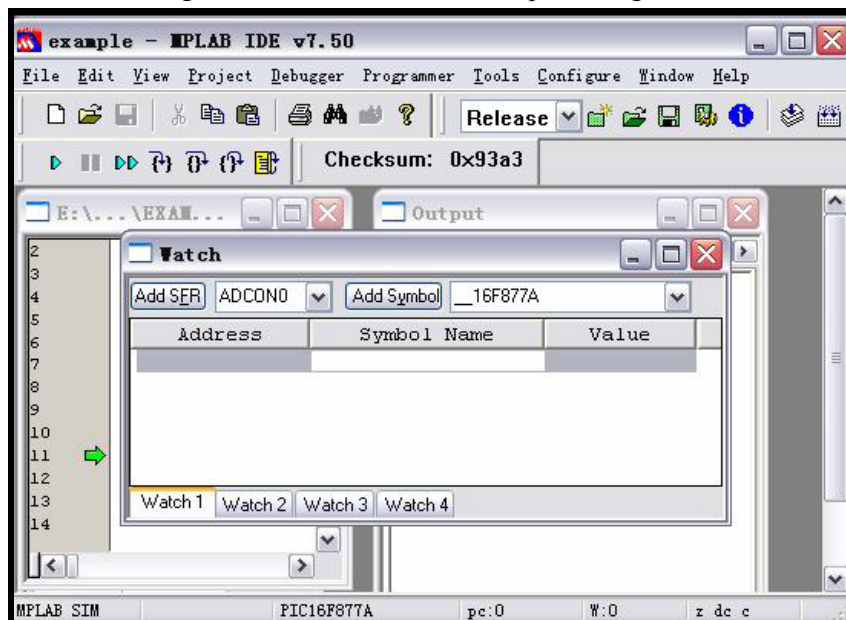


Figure 3-13 Observation window

Thus, we have introduced a simple use of MPLAB, and through the learning in this chapter, we should be able to complete the source code edit, compile and debug.

Note: For more information on the MPLAB please visit the website of MICROCHIP and download "MPLAB User Manual".

Chapter 4. Board Schematics

This part contains the PIC16F877A Mini board schematics, broken down into 8 sheets, as follows:

4.1 Power Supply Circuit

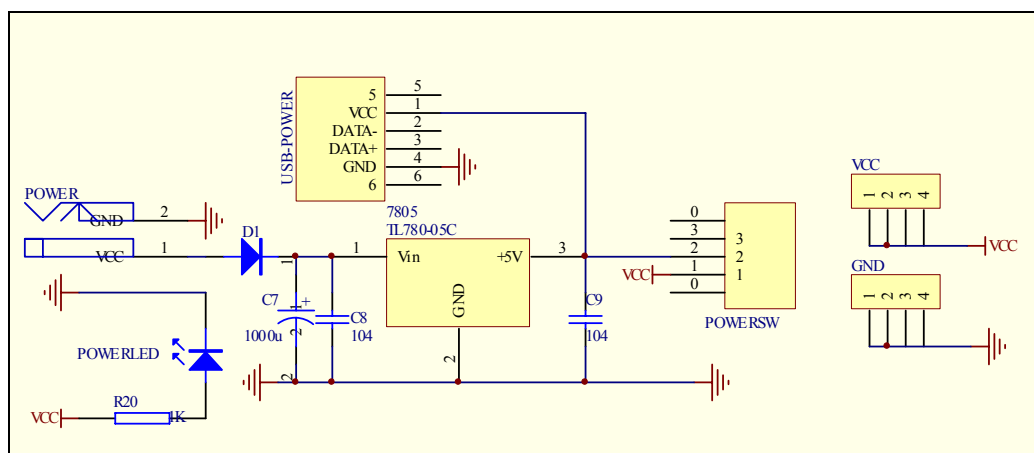


Figure 4-1

4.2 PIC16F877A pin out

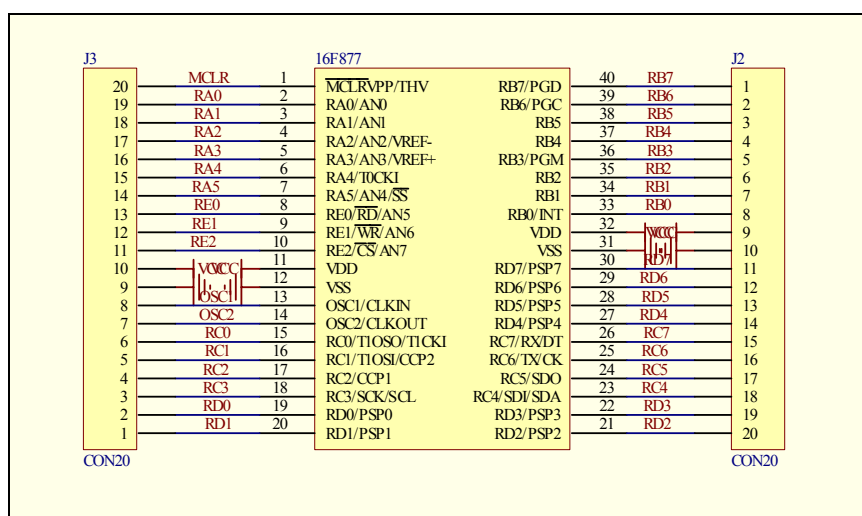


Figure 4-2

4.3 System clock

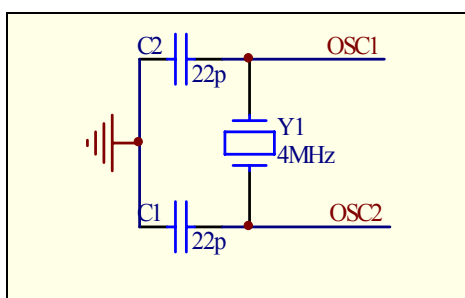


Figure 4-3

4.4 Reset

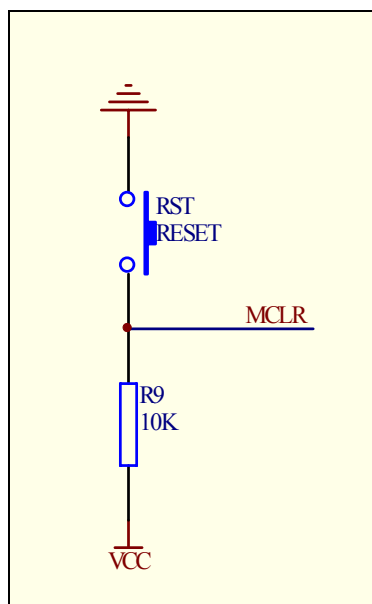


Figure 4-4

4.5 Users Keys

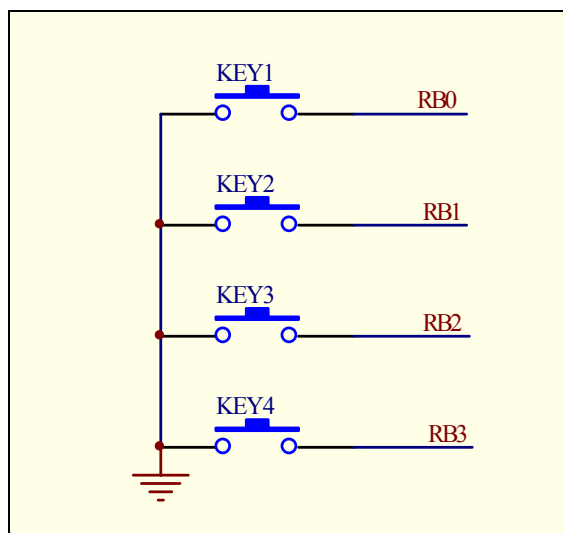


Figure 4-5

4.6 Leds

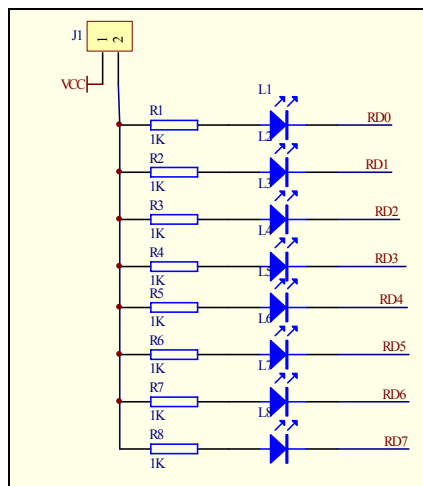


Figure 4-6

4.7 RS232

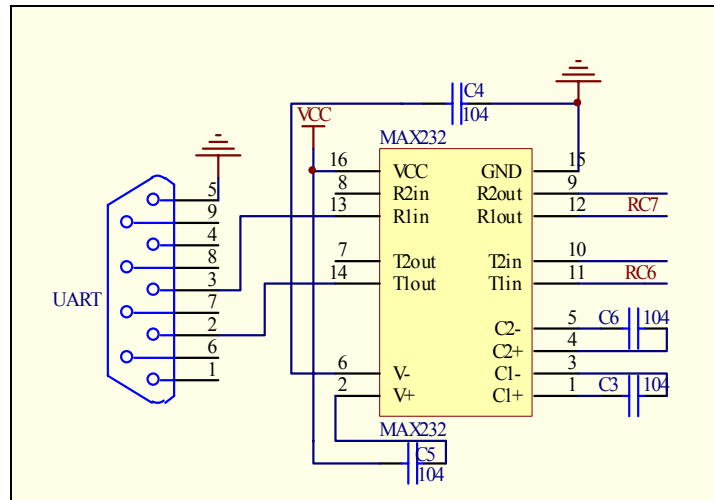


Figure 4-7

4.8 ICSP Programming and Debugging Port

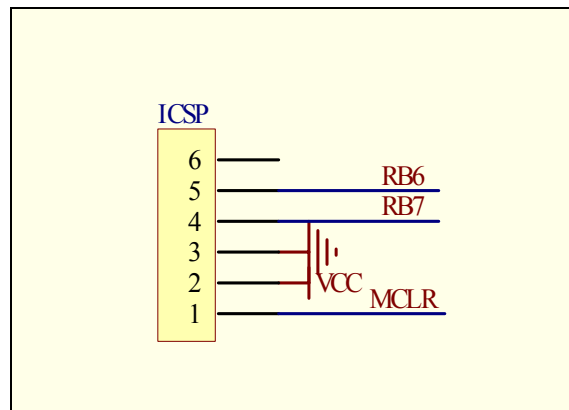


Figure 4-8

Appendix A. Packing List

When you receive the products, please check the box to see if all accessories are complete. This product should include the following components:

- PIC16F877A Mini development board, 1 pcs;
- USB power supply cable, 1 pcs;
- CD-ROM or DVD-ROM, 1 pcs;

Appendix B. Contact Us

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QQ: 634503119

www.mcufighter.com