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Spec No: 002-04890

Spec Title: AN204890 - F2MC-8FX Family Easy Kit FMCDC-MB95260H-EK-01

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AN204890

F²MC-8FX Family Easy Kit FMCDC-MB95260H-EK-01

This application note describes about the Easy Kit for MB95200 series. It is composed of an Easy BGMA and an Easy EV-board. Combining the SOFTUNE Workbench on PC, the Easy Kit enables the quick start of development before the user system is ready.

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1 Product Overview

This product is an Easy Kit for MB95200 series. It is composed of an Easy BGMA and an Easy EV-board. Combining the SOFTUNE Workbench on PC, the Easy Kit enables the quick start of development before the user system is ready.

1.1 Objective and Deliverable

The Easy Kit provides users a simple development platform. Before using the Easy Kit, make sure that the following devices are ready:

- Easy Kit (FMCDC-MB95260H-EK-01) 1PCS
- Quick Start Guide 1PCS

User could download SOFTUNE and MB95200 Sample Code from the following address,

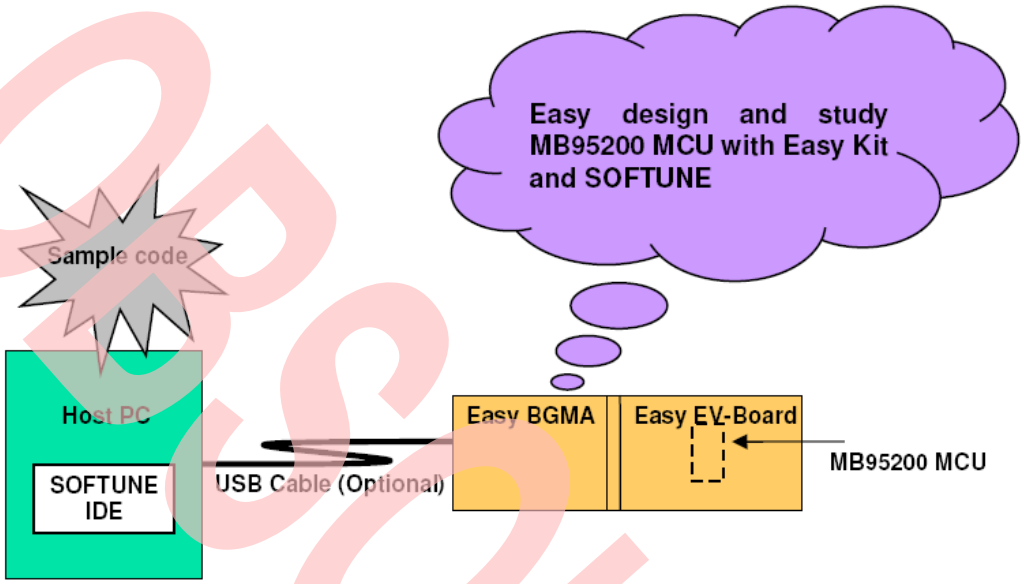
www.cypress.com/8fx-mb95200

An USB extension cable (A-plug to A-jack) is optional if direct USB connection to PC is inconvenient.

1.2 System Block

To setup a debugging system, connect PC and an Easy Kit together as shown below:

Figure 1. System Block



1.3 Handling Precautions

The Easy Kit can be used in connection with its bundled products. To ensure correct use of this product in a proper environment, observe the following guideline:

Follow the instructions described in each manual for the bundled product to use this product.

1.4 Feature

The MB95200 Series Easy Kit is the best for a performance and functional evaluation, and a check of operation before including MB95200 Series MCU in a user's system.

Below, the feature of the Easy Kit for MB95200 Series MCU is shown.

Microcomputer operation voltage. It corresponds to +2.7V to +5.5V.

(The maximum and minimum of microcomputer operation voltage and frequency of operation differs with each MCU. refer to the documents (a data sheet, hardware manual, etc.) of each device relation for the operation voltage and frequency of MCU of operation.)

Compact development environment, a light and small Easy Kit.

Since a monitor program is performed in exclusive memory space, it does not consume user memory space.

Continuation execution, step execution and break correspondence.

It connects with a host computer by the USB interface.

1.5 Hardware Setup

In the hardware setup procedure, you configure and connect the hardware products. This chapter includes the configuring and connecting procedure for each product in order. Check the contents and complete the hardware setup.

Configuration of each product

- Configuring Easy Kit

Connection of each product

- Connecting Easy Kit to PC

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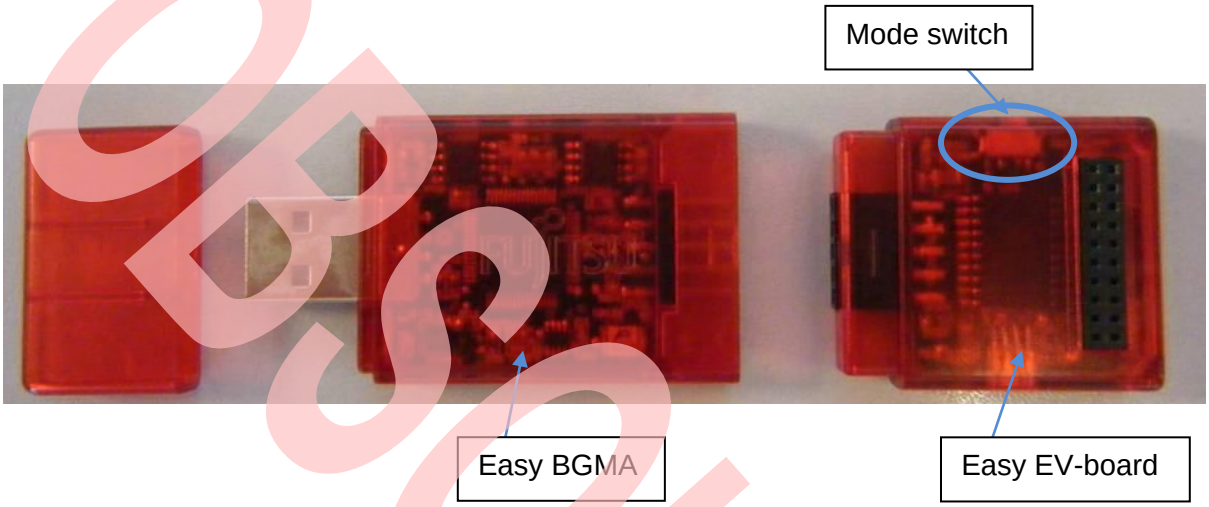
2 Easy Kit Manual

This chapter gives introduction how to setup Easy Kit.

2.1 Easy Kit Overview

Below is the close look of a MB95200 Series Easy Kit. The Part Number is FMCDCMB95260H-EK-01. It provides a debug platform for the MB95200 Series MCU in a small size (85mm (L) X30mm (W) X10mm (H)).



2.2 Function List

ID	Function description	Remarks
1	Support MB95200 Series MCU	MCU MAX machine clock: 16.25 MHz MCU power voltage: 2.4*1*2 V ~ 5.5*1 V
2	Break pointer	256 software breakpoints
3	USB interface to PC/SOFTUNE	Compatible to USB protocol version 1.1
4	1-Line UART interface to the MB95200 Series MCU	The Baud rate is 62,500 bps
5	Support the MCU flash programming for engineering development	Flash operation at MCU rated voltage. The program and read speed is about 800 B/S.

*1: The value varies depending on the operating frequency, the machine clock or the analog guaranteed range.

*2: The value is 2.88 V when the low-voltage detection reset is used.

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2.3 Easy Kit Interface Description

The Easy BGMA has five pins. Please check the table below for their definition. On board debug function will be easily realized by connecting the following 5 pins to target system.

Pin Number	Pin Name	Description
1	UVCC	Target MCU Vcc
2	DBG	Target MCU debug pin
3	GND	Target MCU Vss
4	RST	Target MCU reset input
5	5V	Power supply to Easy EV-Board

All the 20 pins of the MCU on Easy EV-Board are directly connected to the Easy EV-Board interface. Please check the table below.

Pin Number	Pin Name	Pin Number	Pin Name
1	X0/PF0	20	12/EC0/DBG
2	X1/PF1	19	P07/INT07
3	Vss	18	P06/INT06/TO01
4	X1A/PG2	17	P05/INT05/AN05/TO00/HCLK2
5	X0A/PG1	16	P04/INT04/AN04/SIN/HCLK1/EC0
6	Vcc	15	P03/INT03/AN03/SOT
7	C	14	P02/INT02/AN02/SCK
8	RST/PF2	13	P01/AN01
9	TO10/P62	12	P00/AN00
10	TO11/P63	11	P64/EC1

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2.4 Easy Kit USB Configuration

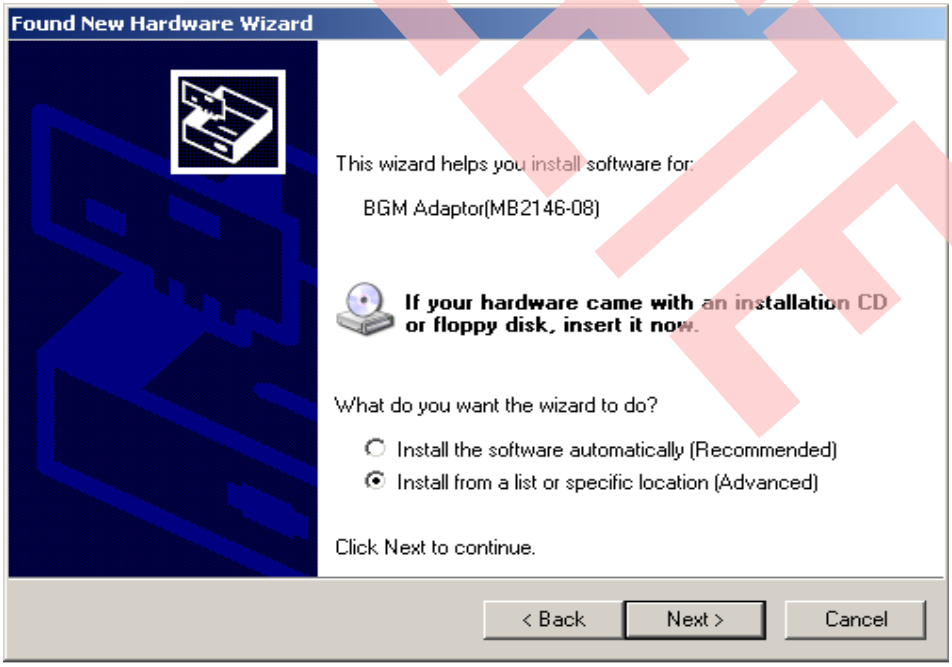
Connect the Easy Kit to a PC USB interface. If the connection is right, the following window will pop up. Follow the instructions displayed, and then click **Next**.

Figure 2. Install Easy Kit in Windows (1)



Select Install from a list or specific location (Advanced), then click Next.

Figure 3. Install Easy Kit in Windows (2)



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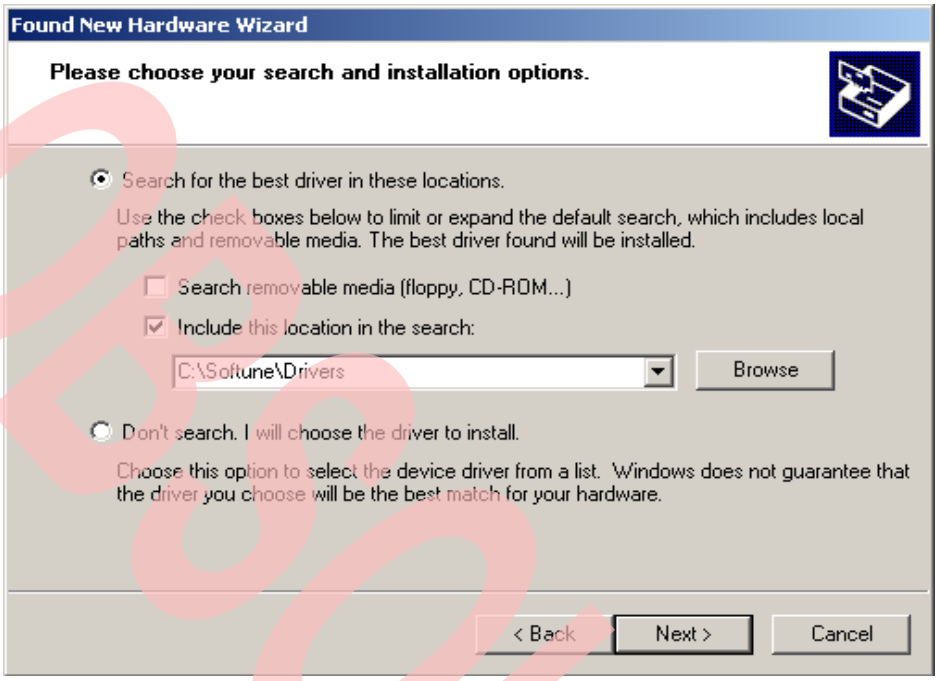
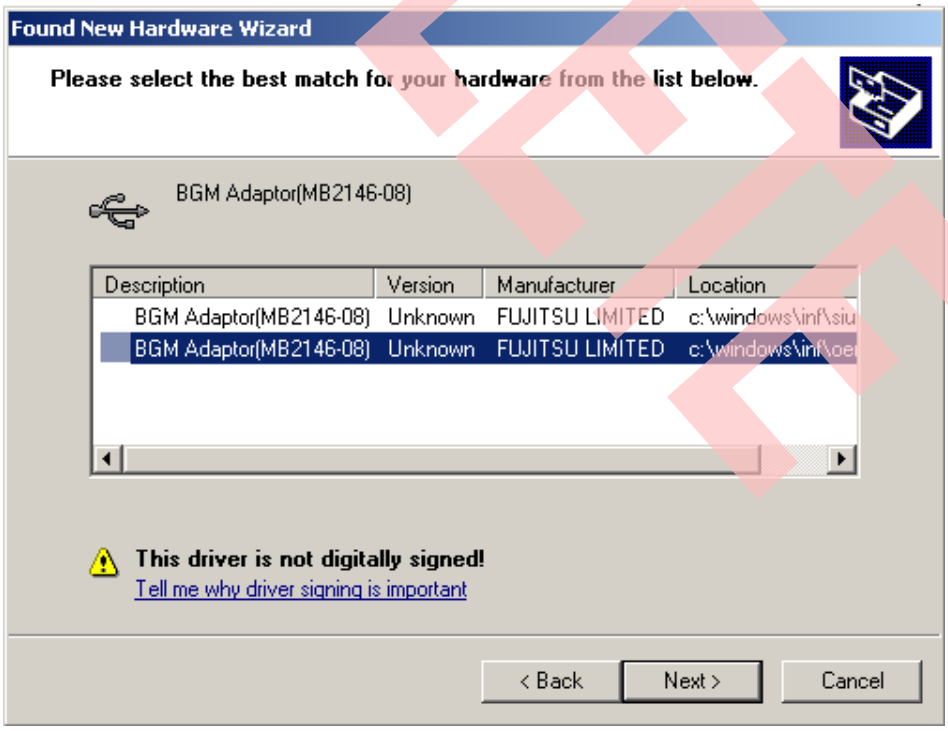
Select **…\Drivers** from the folder where SOFTUNE is installed, click **Next**.

Figure 4. Install Easy Kit in Windows (3)



Select BGMA (MB2146-08) as displayed below, and then click **Next**.

Figure 5. install Easy Kit in Windows (4)



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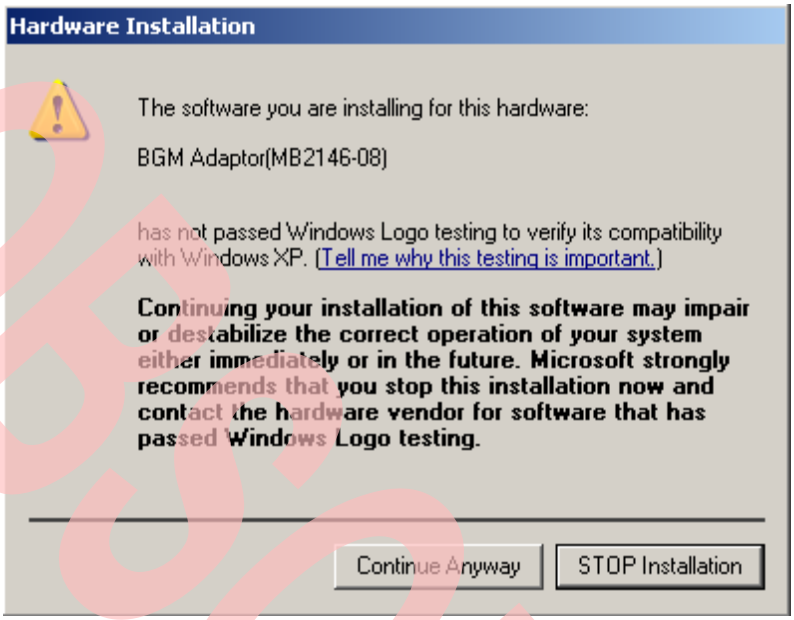
If the following window pops up during installation, click **Continue Anyway** to complete the installation.

Figure 6. Install Easy Kit in Windows (5)



Windows will install the driver automatically. Click **Finish** after the driver has completed the installation normally. Then users can find the Easy Kit is recognized as “BGM Adaptor (MB2146-08)” in Windows system.

Figure 7. Easy Kit is installed in Windows



2.5 Easy Kit Mode Setting

A mode switch on Easy EV-Board is used to select Easy Kit between debug mode and free run mode, as shown in the figures below.

Figure 8. Mode Switch from Top View

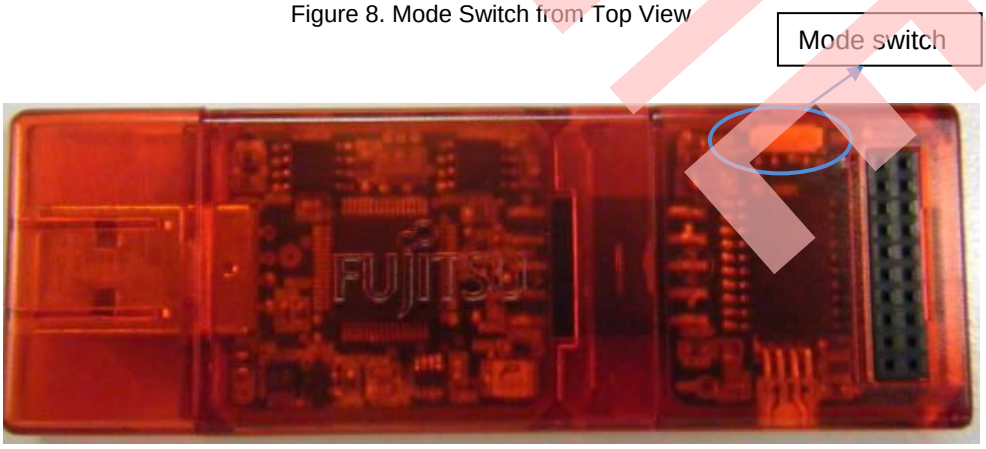


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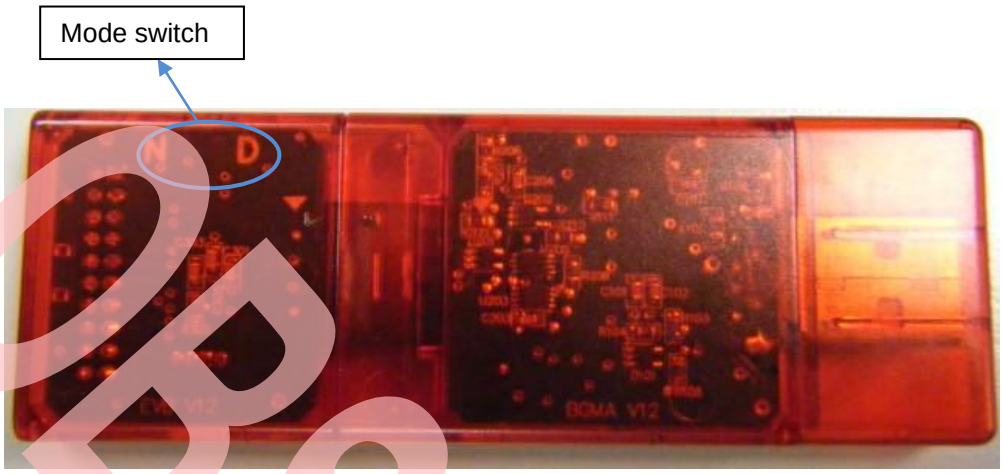
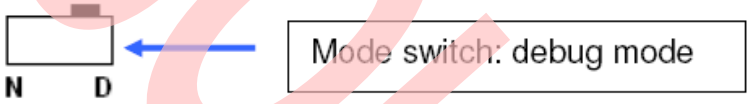
Figure 9. Mode Switch from Top View



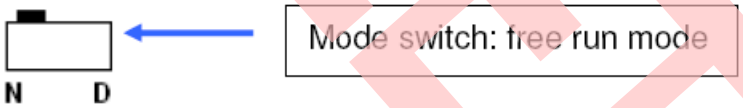
Set mode switch on Easy Kit to debug mode as Figure 2.9. In this mode, after connecting the Easy Kit to USB interface, user could start debug in the SOFTUNE on PC.

Figure 10. Easy Kit Debug Mode Setting



Set mode switch on Easy Kit to free run mode as Figure 2.10. In this mode, the target MCU is in free run mode after connecting Easy Kit to USB interface.

Figure 11. Easy Kit Free Run Mode Setting



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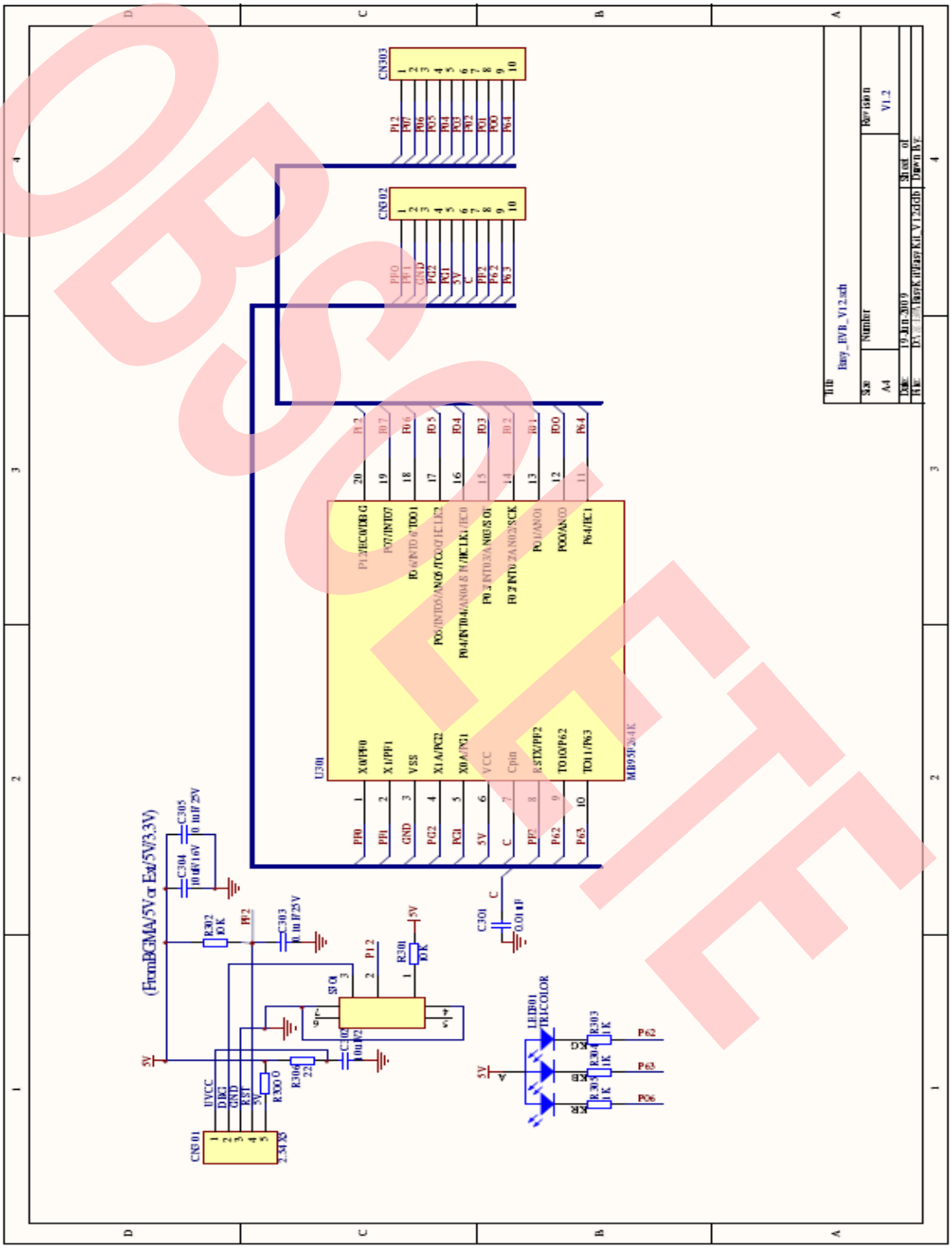
3 Easy Kit Schematic

The Easy EV-Board schematic is shown as below.

Figure 12. Easy EV-board Schematic



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4 Sample Code Manual

4.1 Topic List

User could access the following address to get the SOFTUNE IDE and sample code for MB95200 Series Easy Kit.

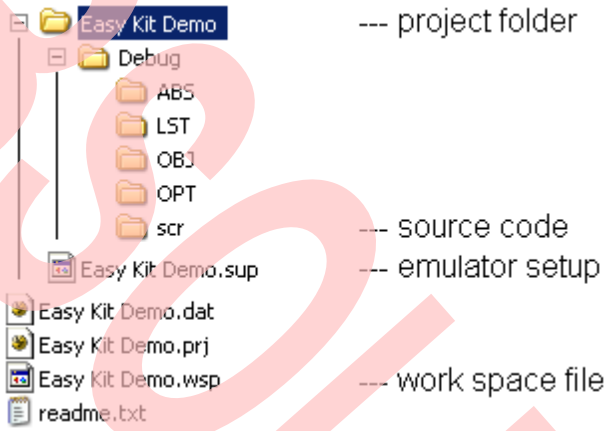
www.cypress.com/8fx-mb95200

4.2 Project Structure

Here take Easy Kit Demo project for example.

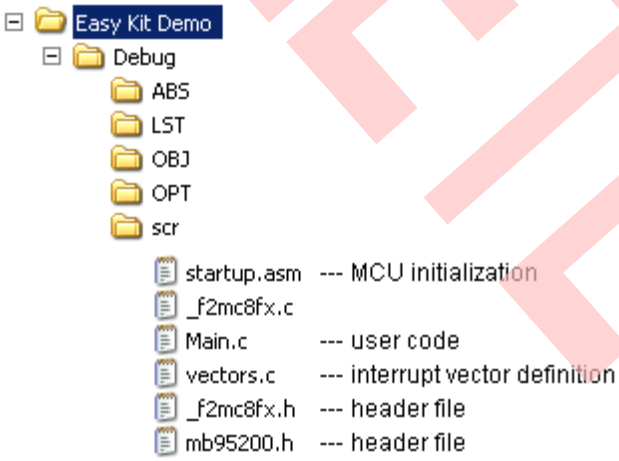
The sample code is organized as Figure 13 in Windows system.

Figure 13. Easy Kit Demo Project Structure



It's recommended that user saves all the source codes in one source code folder. In Easy Kit Demo project, folder "scr" is used. There are six files used in this project. They are shown as below.

Figure 14. Source Code Files



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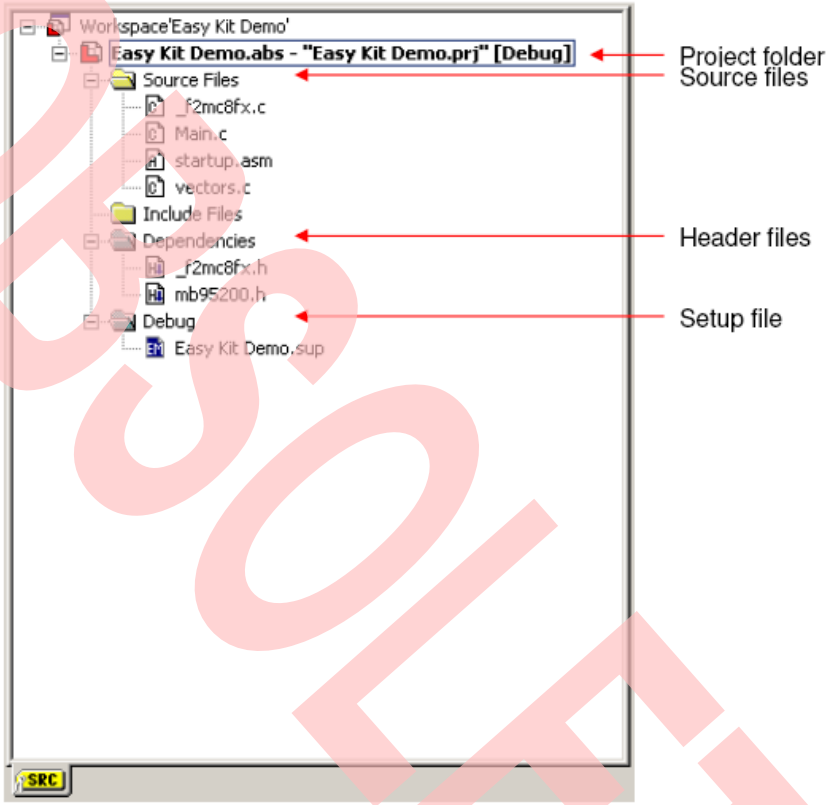
4.3 Source Code File Description

In SOFTUNE, the structure is shown as Figure 4-3. After compiling successfully in SOFTUNE, user could easily identify source code and header files in this window.

Figure 15. SOFTUNE Version



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4.3.1 Header Files

The MB95200.h and the _f2mc8fx.h are header files, including MB95200 Series MCU I/O registers definition.

Here take PDR0 for example. In MB95200.h, PDR0 is defined as below.

```
"
#ifdef __IO_DEFINE
#pragma segment IO=IO_PDR0, locate=0x0
#endif
typedef union  {
        __BYTE          byte;
        struct {
                        __BYTE P00:1;
                        __BYTE P01:1;
                        __BYTE P02:1;
                        __BYTE P03:1;
                        __BYTE P04:1;
                        __BYTE P05:1;
                        __BYTE P06:1;
                        __BYTE P07:1;
        } bit;
        struct {
                        __BYTE P00:1;
                        __BYTE P01:1;
                        __BYTE P02:1;
                        __BYTE P03:1;
                        __BYTE P04:1;
                        __BYTE P05:1;
                        __BYTE P06:1;
                        __BYTE P07:1;
        } bitc;
} PDR0STR;
__IO_EXTERN PDR0STR IO_PDR0;
#define   _pdr0 (IO_PDR0)
#define   PDR0 (IO_PDR0.byte)
#define   PDR0_P00 (IO_PDR0.bit.P00)
#define   PDR0_P01 (IO_PDR0.bit.P01)
#define   PDR0_P02 (IO_PDR0.bit.P02)
#define   PDR0_P03 (IO_PDR0.bit.P03)
#define   PDR0_P04 (IO_PDR0.bit.P04)
#define   PDR0_P05 (IO_PDR0.bit.P05)
#define   PDR0_P06 (IO_PDR0.bit.P06)
#define   PDR0_P07 (IO_PDR0.bit.P07)
"
```

4.3.2 Startup.asm File

The Startup.asm is the MB95200 Series MCU initialization file including stack settings, register bank settings and watchdog settings etc.

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4.3.3 Vectors.c File

The Vectors.c contains the MB95200 Series MCU Interrupt vector definition.

User can pre-set all interrupt control registers in function InitIrqLevels(). It can be used to set all interrupt priorities in static applications. For example, to set the external interrupt ch.0 to level 0, change the following code:

```
ILR0 = 0xFF;          // IRQ0: external interrupt ch.0 | ch.4
                      // IRQ1: external interrupt ch.1 | ch.5
                      // IRQ2: external interrupt ch.2 | ch.6
                      // IRQ3: external interrupt ch.3 | ch.7
To
ILR0 = 0xFC;          // IRQ0: external interrupt ch.0 | ch.4
                      // IRQ1: external interrupt ch.1 | ch.5
                      // IRQ2: external interrupt ch.2 | ch.6
                      // IRQ3: external interrupt ch.3 | ch.7
```

And declare the interrupt function as in Vectors.c below,

```
……
__interrupt void external_int00 (void);
……
#pragma intvect external_int00 0 // IRQ0: external interrupt ch0 | ch4
```

Then user can write his own interrupt sub-routine in Main.C shown as below.

```
/*--------------------- INTERRUPT SERVICE ROUTINE ---------------------------*/
__interrupt void external_int00(void)
{
//User code
}
```

4.3.4 Main.c File

Main.c contains the user code.

5 Development Platform Quick Start

5.1 Tools Setup Sequence

Start the debugging system in the following sequence:

- Select mode switch on Easy EV-Board to debug mode;
- Connect Easy Kit to PC USB interface;
- The Easy Kit will be recognized as “BGM Adaptor (MB2146-08)” in Windows.

5.2 Open Project and Start Debug

Users can start debug from SOFTUNE in the following sequence. Here take IO_LED project for example.

Start the SOFTUNE by selecting **Program** > **SOFTUNE V3**> **FFMC-8L Family SOFTUNE Workbench** from **Start** Menu in Windows;

- Click **Open Workspace** from **File** Menu in SOFTUNE;
- Select IO_LED.wsp in Open Space window;
- Click **Start Debug** from **Debug** Menu.

If the entire procedure goes right, a debug will start normally.

5.3 Operation Precautions

- All pins of MB95200 Series MCU are directly connected to Easy EV-board 20 pin interface. If the user wants to connect these pins out, it’s recommended to add terminal resistors in series with the pins.

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6 Additional Information

For more Information on Cypress Semiconductor products, visit the following websites:

English version address:

www.cypress.com/cypress-microcontrollers

Chinese version address:

www.cypress.com/cypress-microcontrollers-cn

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Document History

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	—	HUAL	06/18/2009	Initial release.
			07/01/2009	Update.
			07/16/2009	Update.
*A	5235125	HUAL	06/28/2016	Migrated Spansion Application Note from MCU-AN-500059-E-12 to Cypress format. Link to Hardware and firmware doesn't exist and this AN to be Obsolete.

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