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Spec No: 002-05451

Spec Title: AN205451 - F2MC-8FX Family MB95200H/260H series SOP8/SOP16/SOP20 Programmer Adaptor

Replaced by: None

AN205451

F²MC-8FX Family MB95200H/260H Series SOP8/SOP16/SOP20 Programmer Adaptor

This application note describes about the Programmer Adaptor which is developed mainly as an independent on-board programming and debugging tool for MB95200/260 series SOP8/SOP16/SOP20 package and also used with MB95200H/210H series EV-board V1.6.

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1 Introduction

MB95200/260 series SOP8/SOP16/SOP20 PGM adaptor V1.1 is developed mainly as an independent on-board programming and debugging tool for MB95200/260 series SOP8/SOP16/SOP20 package MCU. It can be also used with MB95200H/210H series EV-board V1.6.

The SOP8/SOP16/SOP20 PGM adaptor is shown as in Figure 1, Figure 2 and Figure 3 below. The socket is used to hold a MB95200/260 series SOP8/SOP16/SOP20 package MCU. The Part Number of each adaptor is shown in below list.

Adaptor Name	Part Number	Support Package
SOP8 PGM Adaptor	FMCDC-MB95200-PGMA-01008	SOP8
SOP16 PGM Adaptor	FMCDC-MB95200-PGMA-01016	SOP16
SOP20 PGM Adaptor	FMCDC-MB95200-PGMA-01020	SOP20

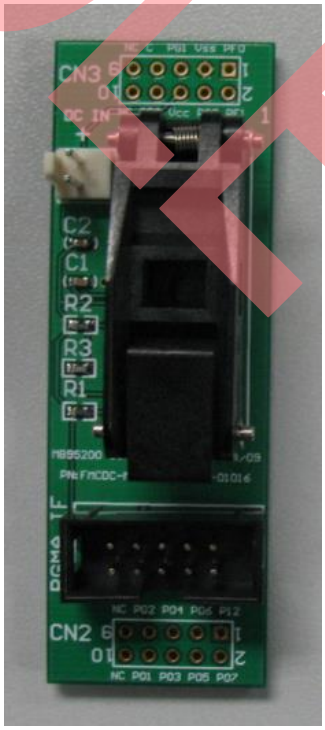
Note:

The shape of SOP8 PGM adaptor is as same as SOP16 PGM adaptor, but the left side pins of SOP16 socket are already removed away to avoid misplacing, and the right part is used to place SOP8 packet MCU, shown in the Figure 3.

Figure 1. MB95200H/260H SOP20 PGM adaptor



Figure 2. MB95200H/260H SOP16 PGM adaptor



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Figure 3. MB95200H/260H SOP8 PGM adaptor



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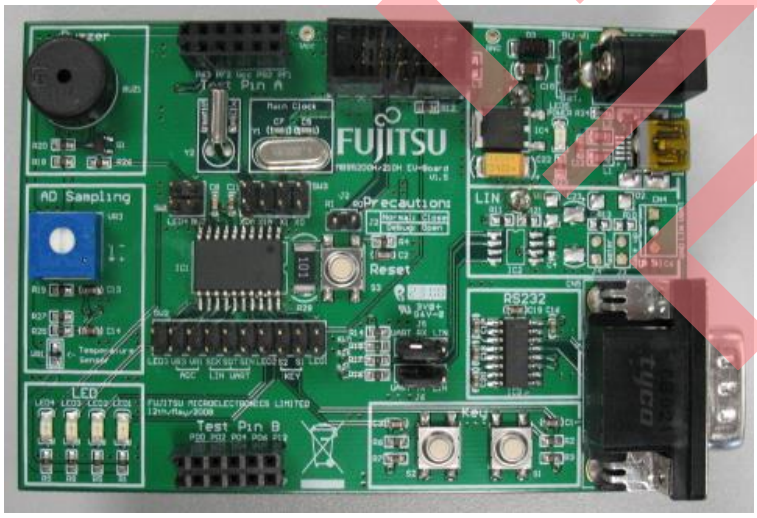
2 Application environment

This chapter introduces application environment of MB95200H/260H SOP8/SOP16/SOP20 PGM adaptor.

2.1 Mother board

The mother board of SOP8/SOP16/SOP20 PGM adaptor is MB95200H/210H series EV-board V1.6 as shown in the picture below. It is enclosed in the MB95200 series MCU Starter Kit package (part number: MB2146-410/420-01-E).

Figure 4. MB95200H/210H EV-board V1.6



2.2 Debug tool

The debugging tool is BGMA (BGM Adaptor) and the model number is MB2146-08-E as shown in the picture below. It is enclosed in the MB95200 series MCU Starter Kit package (Part Number: MB2146-410/420-01-E).

Figure 5. BGM Adaptor

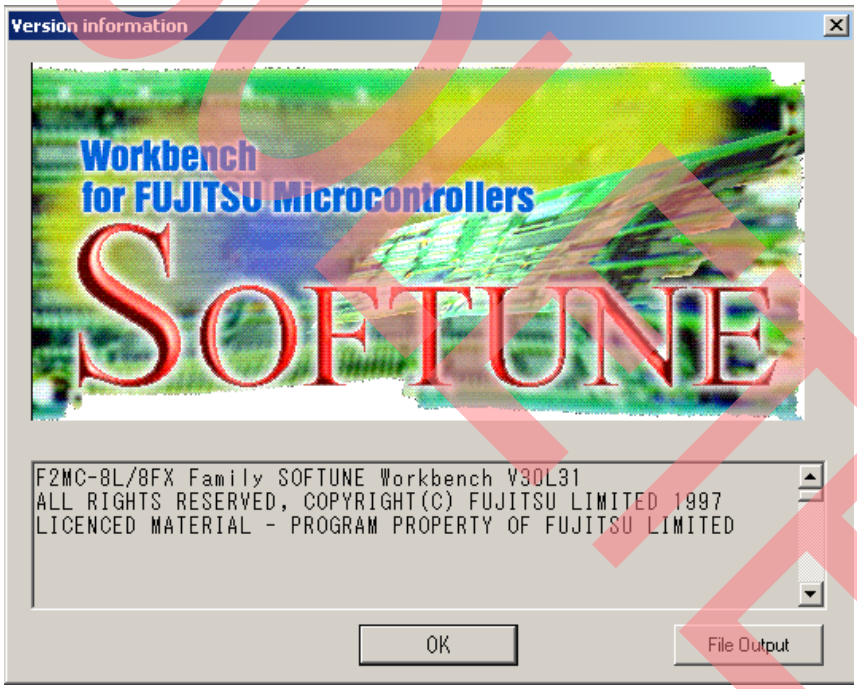


2.3 SOFTUNE

SOFTUNE is used as software development environment for programming and debugging. The current version is F2MC-8L/8FX SOFTUNE Workbench V30L31 as shown in the picture below. It is enclosed in the MB95200 series MCU Starter Kit package (part number: MB2146-410-01-E) or can be downloaded from the following website.

Web: www.cypress.com/supporttools/8fx

Figure 6. SOFTUNE Version



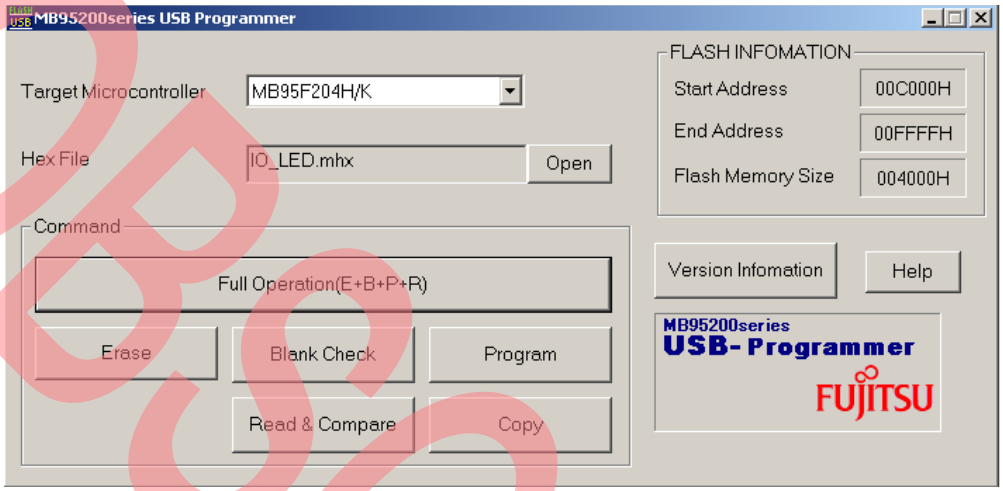
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2.4 USB programmer

The MB95200 series USB programmer is shown as below. It is enclosed in the MB95200 Series MCU Starter Kit package (part number: MB2146-410-01-E), or can be downloaded from the following website.

Web: www.cypress.com/supporttools/8fx

Figure 7. MB95200 series USB programmer



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3 Hardware Connection

This chapter introduces hardware connection when it is used independently or with mother board.

MB95200/260 series SOP8/SOP16/SOP20 PGM adaptor can be used to program and debug independently or after being installed to the mother board. Hardware preparations for each case are described in Section 3.1and Section 3.2 respectively.

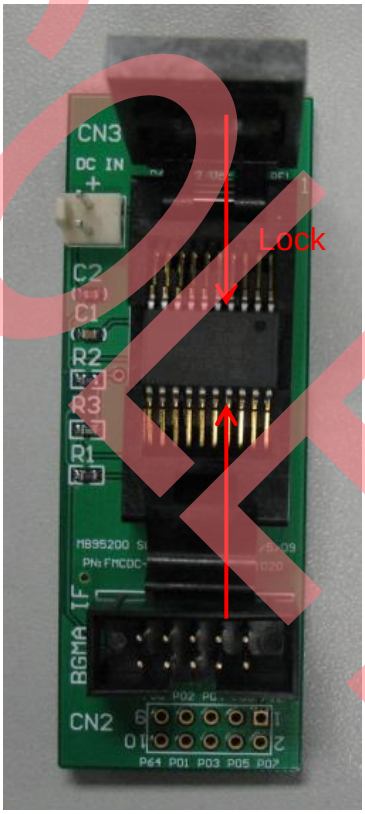
3.1 Independent Usage

When using MB95200/260 series SOP8/SOP16/SOP20 PGM adaptor independently for programming, we should fix MCU on the socket first (if MB95F20X is programmed, install it on SOP20 PGM adaptor; if MB95F21X is programmed, install it on SOP8 PGM adaptor; if MB95F22X is programmed, install it on SOP16 PGM adaptor). Then following steps should be implemented.

Note:

For MB95F260/MB95F270/MB95F280 series MCU, R3 should be removed.

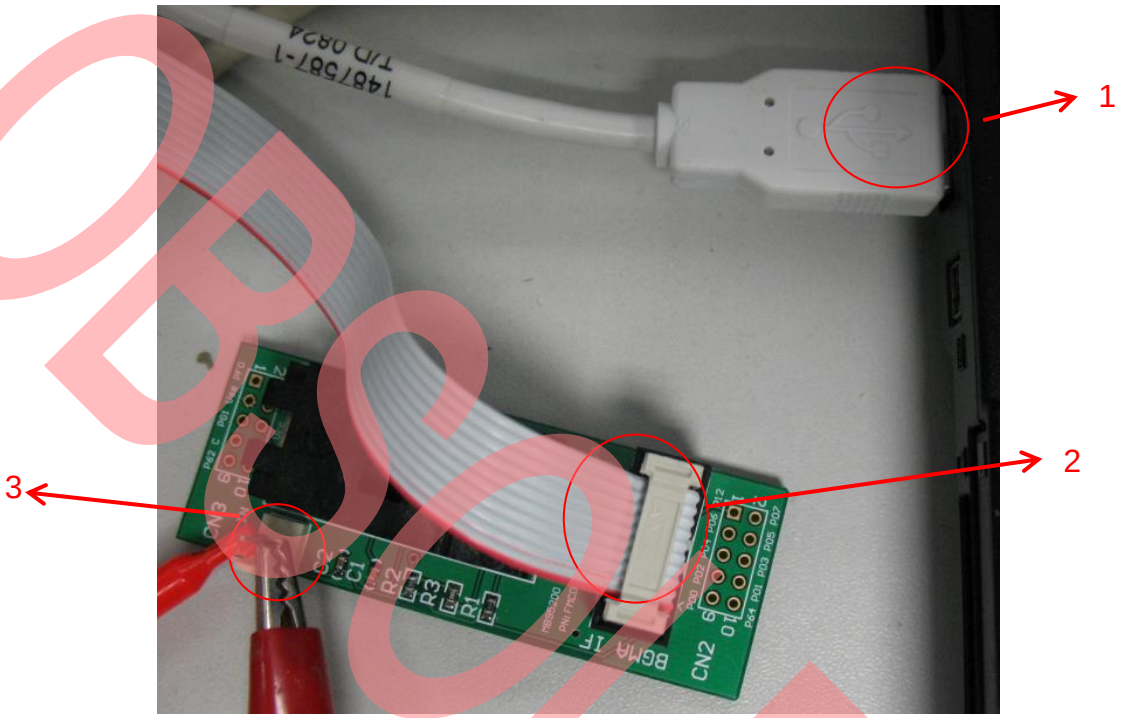
Figure 8. Independent Usage Preparation



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1. Connect BGMA to PC
2. Connect PGM adaptor board to BGMA
3. Power on the PGM adaptor board, the typical input voltage is 3.3V or 5V.

Figure 9. Hardware Connection for Independent Usage

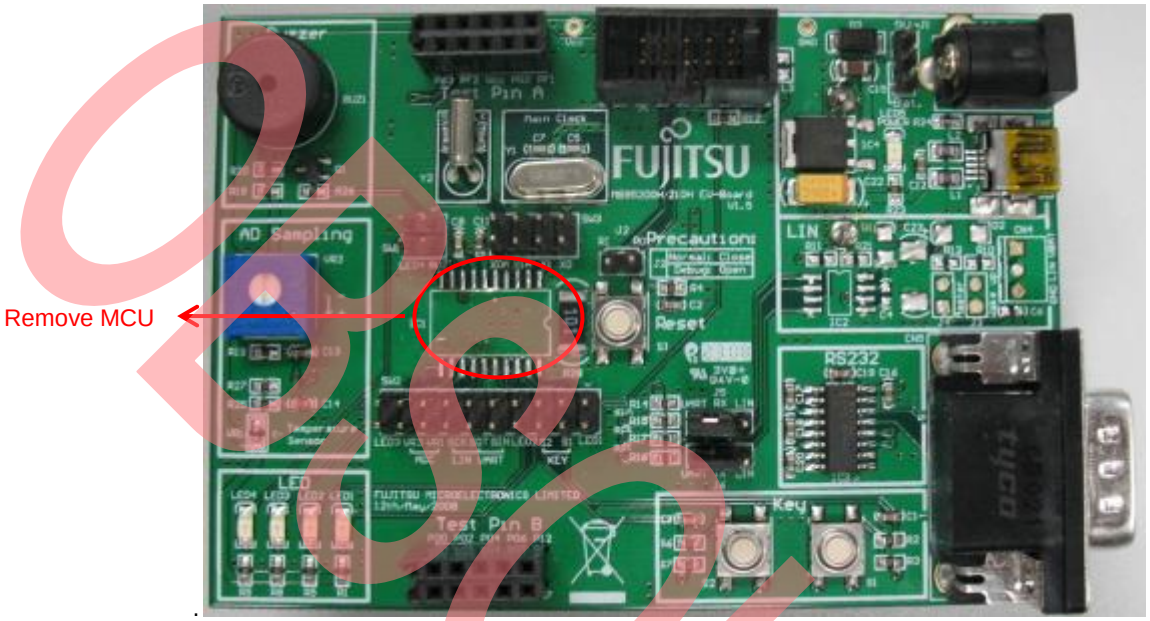


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3.2 Used with Mother Board

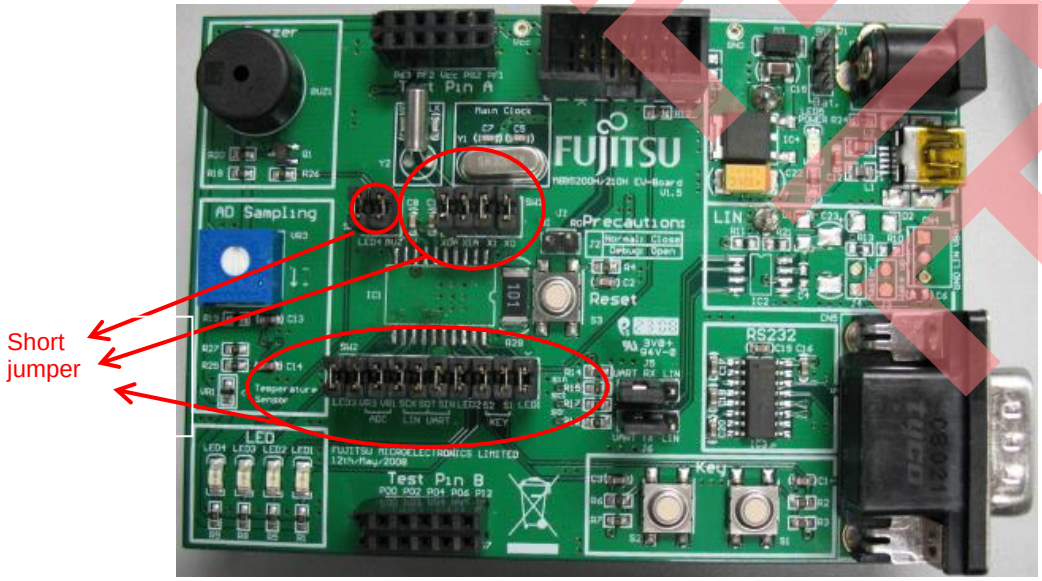
1. MB95200H/210H series EV-board V1.6 is the mother board of SOP8/SOP16/SOP20 PGM adaptor board. First remove the MB95F204K chip mounted on the mother board.

Figure 10. Remove MCU from Mother Board



2. MB95200H/210H series EV-board has many general MCU peripheral modules, including LED, key, UART, buzzer, AD sample and so on. Many jumpers on the mother board are used to connect or disconnect MCU to/from peripheral modules. For general applications, these jumpers should be set short. For special applications, user needs to open these jumpers and test I/O ports of the 10-pin connector on the adaptor board. For more information on MB95200H/210H series EV-board, please refer to the Starter Kit MB2146-410/420-01-E User Manual.

Figure 11. Short Jumpers on Mother Board



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3. Install the MB95F204K chip onto the SOP20 socket (if MB95F20X is programmed, install it on SOP20 PGM adaptor; if MB95F21X is programmed, install it on SOP8 PGM adaptor; if MB95F22X is programmed, install it on SOP16 PGM adaptor).

Note:

For MB95F260/MB95F270/MB95F280 series MCU, R3 should be removed.

Figure 12. Place MCU on Adaptor Board



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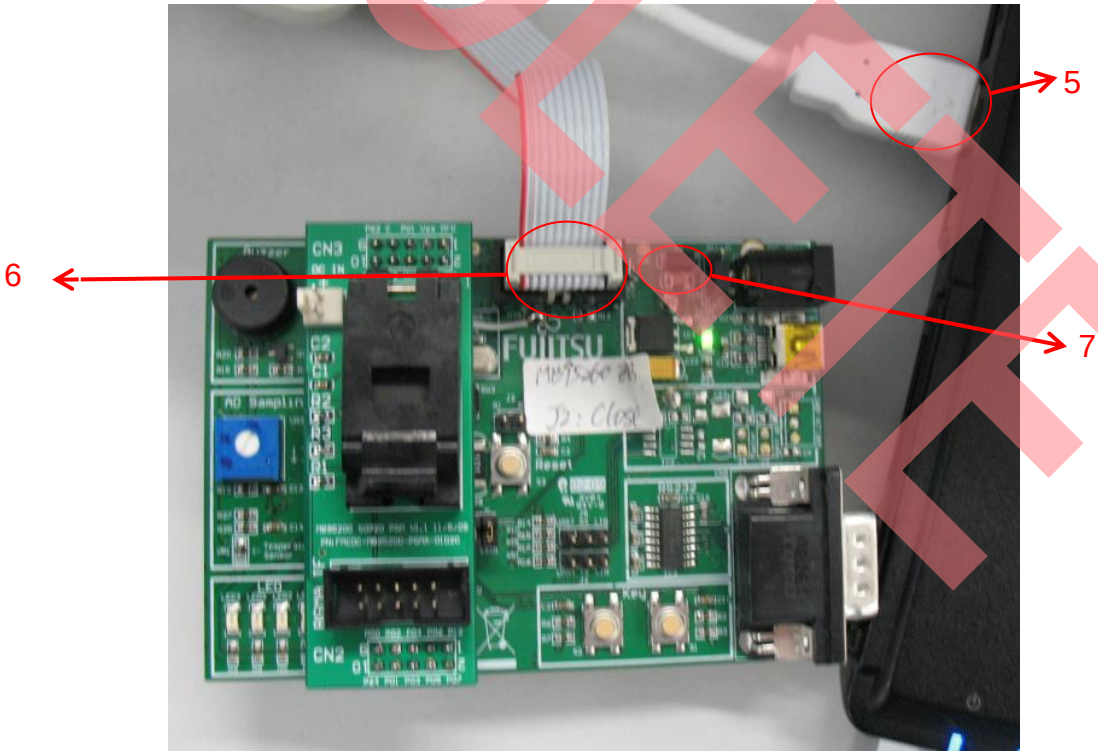
4. Last, fix the adaptor board to the mother board.

Figure 13. Fix Adaptor Board on the Mother Board



5. Connect BGMA to PC
6. Connect PGM adaptor board to BGMA
7. Power on the EV-board

Figure 14. Process 5-7



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4 Program Function

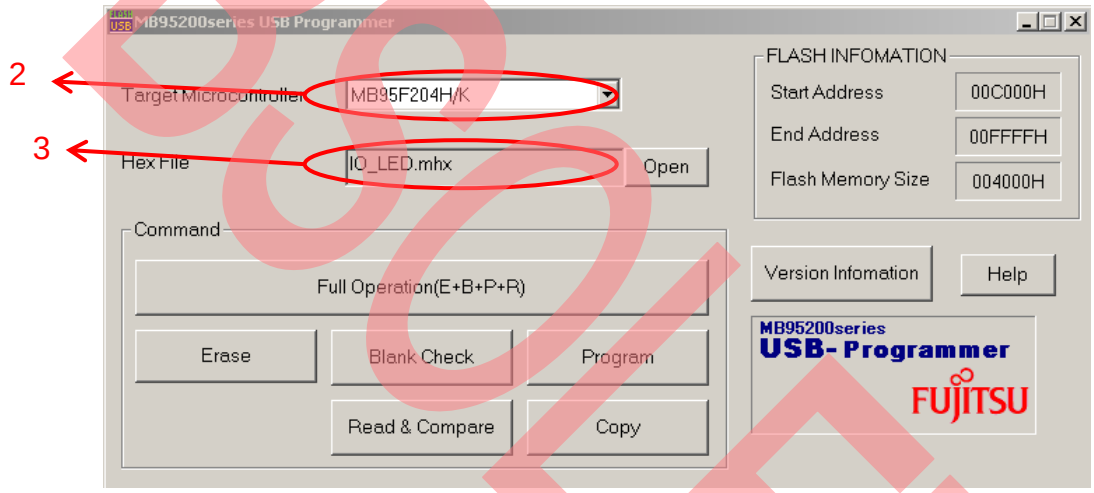
This chapter introduces programming steps using either MB95200 series USB programmer or F²MC-8L/8FX SOFTUNE Workbench V30L31.

MB95200 series MCU can be programmed through MB95200 series USB programmer or F²MC-8L/8FX SOFTUNE Workbench V30L31. Section 4.1 and section 4.2 introduce programming steps with MB95200 series USB programmer and F²MC-8L/8FX SOFTUNE Workbench V30L31 respectively.

4.1 Use MB95200 Series USB Programmer to Program

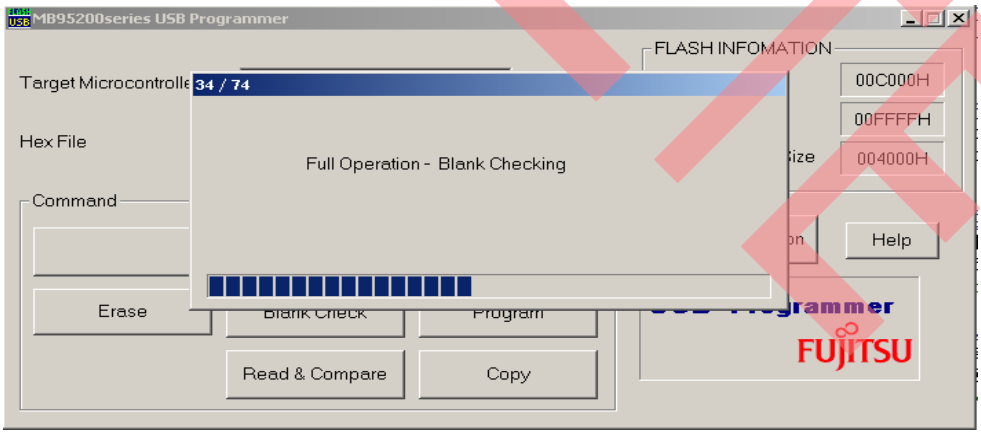
1. Open MB95200 series USB programmer
2. Select MCU type (MB95F204H/K for MB95F204K, MB95F223H/K for MB95F223K, MB95F213H/K for MB95F213K)
3. Select Hex file by the path: Current project DIR\Debug\ABS

Figure 15. Select MCU Type and Hex File



4. Click Full Operation to start programming.

Figure 16. Click Full Operation



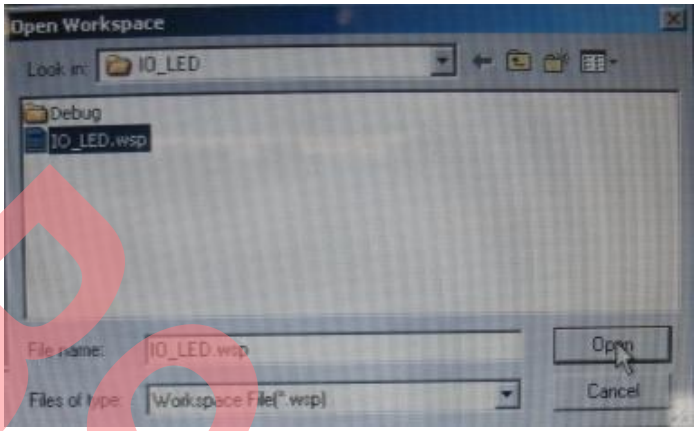
5. The USB programmer also provides single operation, including Erase, Blank Check, Program, Read & Compare and Copy.

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4.2 Use F²MC-8L/8FX SOFTUNE to Program

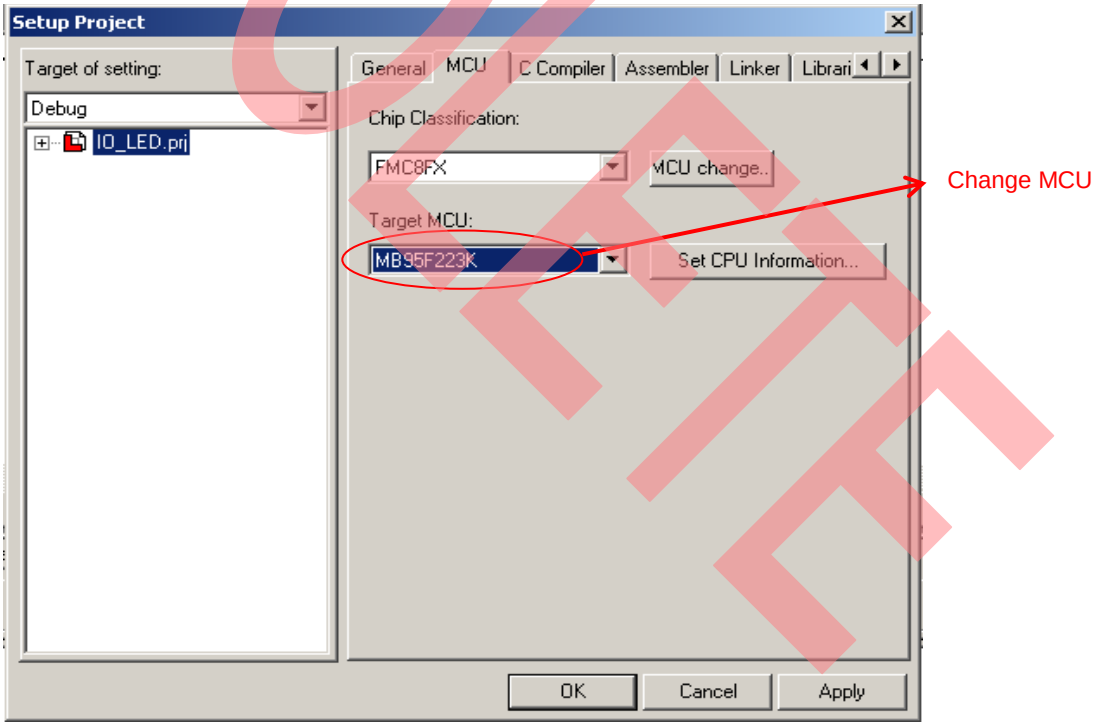
1. Open a project (E.g. IO_LED) using SOFTUNE

Figure 17. Open Demo Project



2. As the original IO_LED demo is intended for MB95F204K MCU, **when MB95F223K is used on the SOP16 PGM adaptor or MB95F213K is used on the SOP8 PGM adaptor**, please change the MCU type to MB95F223K/MB95F213K in "Project/Setup Project…/MCU". **If MB95F204K is programmed on SOP20 PGM adaptor, the step (2) and (3) should be skipped.**

Figure 18. Set MCU Type



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3. Reset all sections as their settings are cleared after MCU is changed. In “Project/Setup Project…/Linker”, set “Disposition/Connection” in Category, then select _INROM01 and click “Set Section…” After that, a dialog window will pop up as shown in Figure 19 below. Set Const (named @INIT) and Dirconst (named @DIRINIT) as shown in Figure 20 and Figure 21.

Figure 19. Disposition Display Window

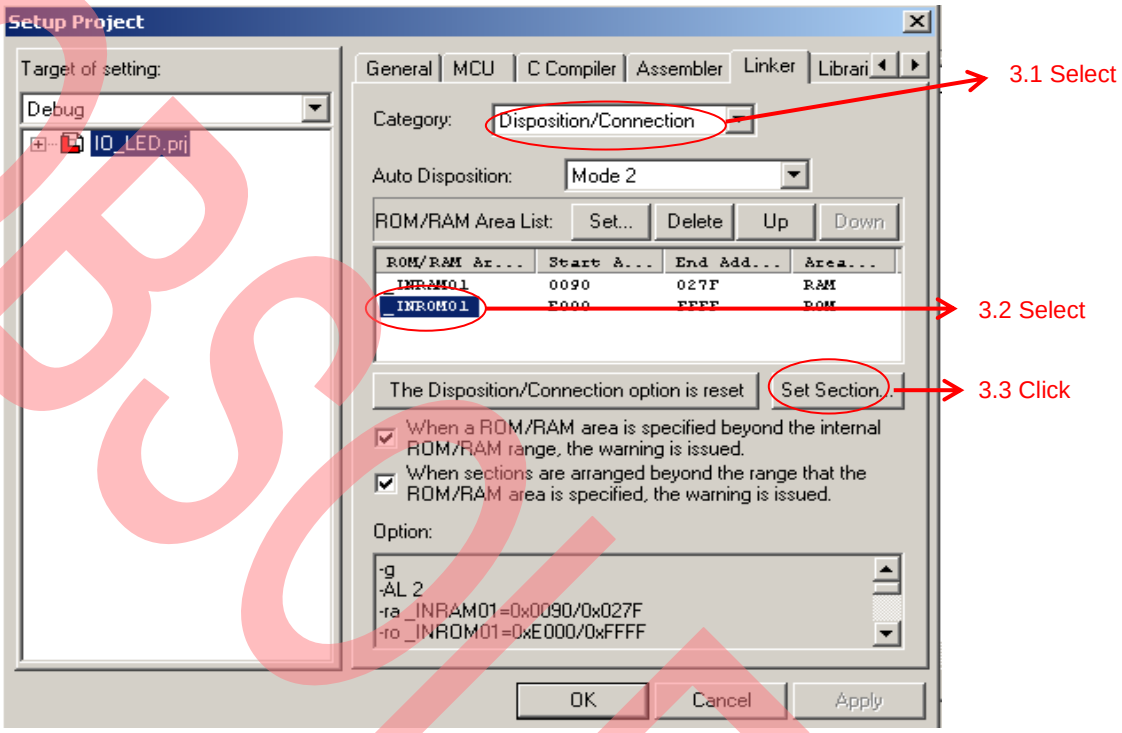
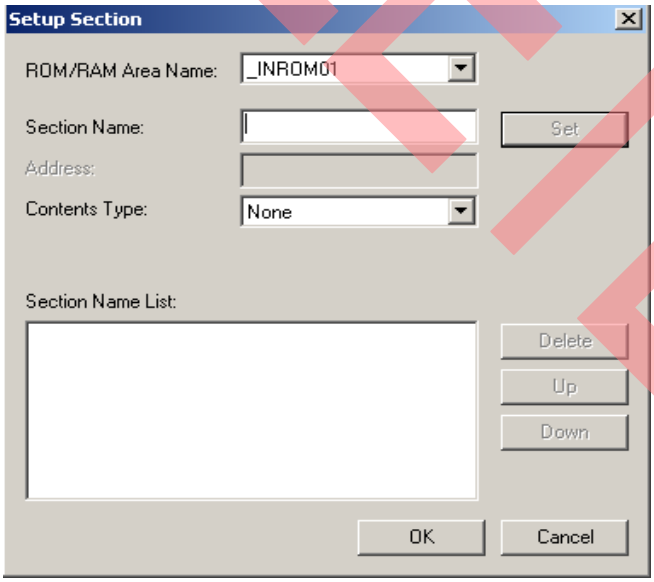


Figure 20. Section Setting Window



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Figure 21. Set Const Section

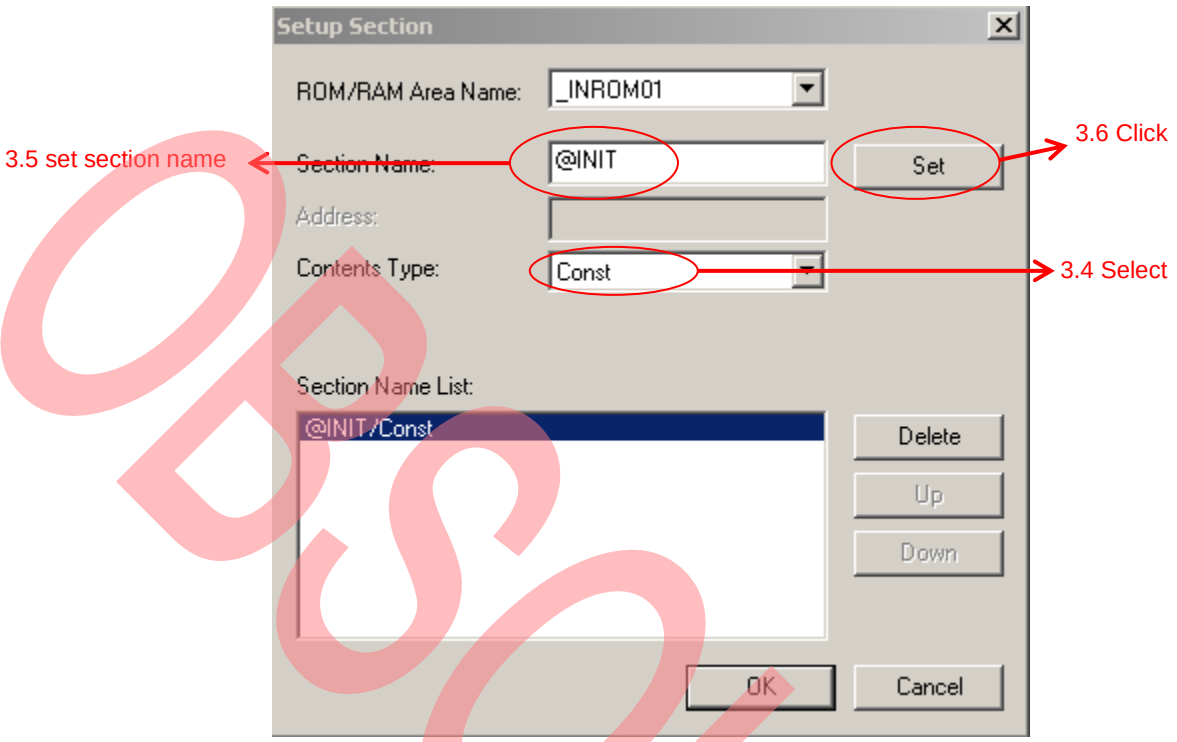
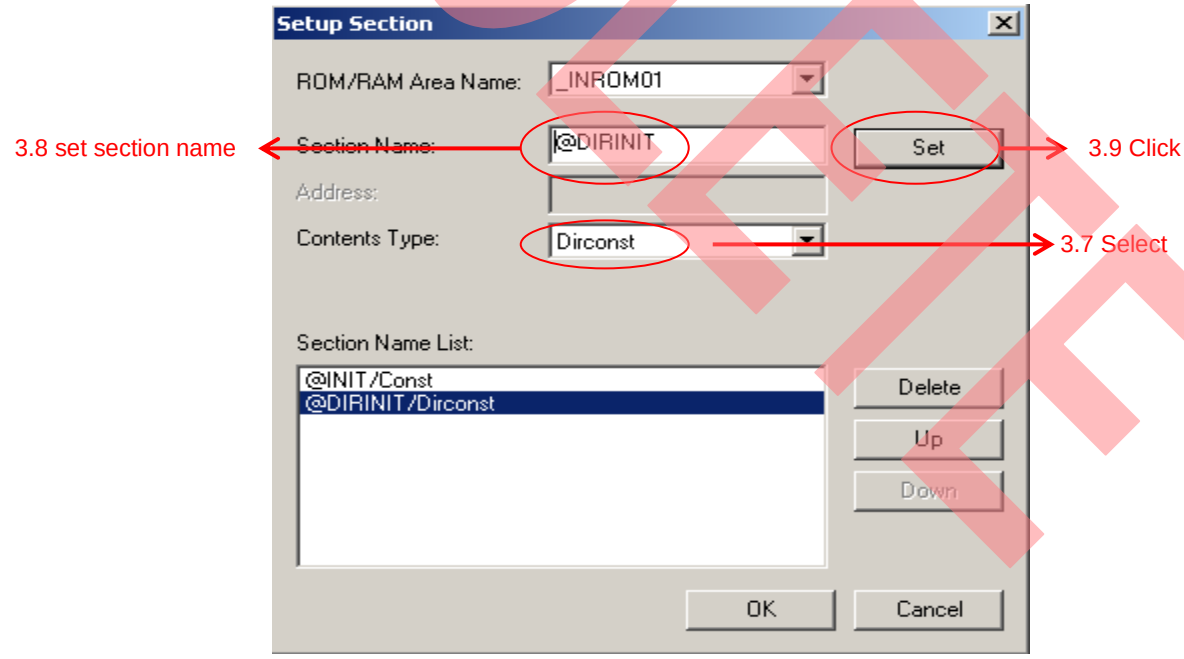


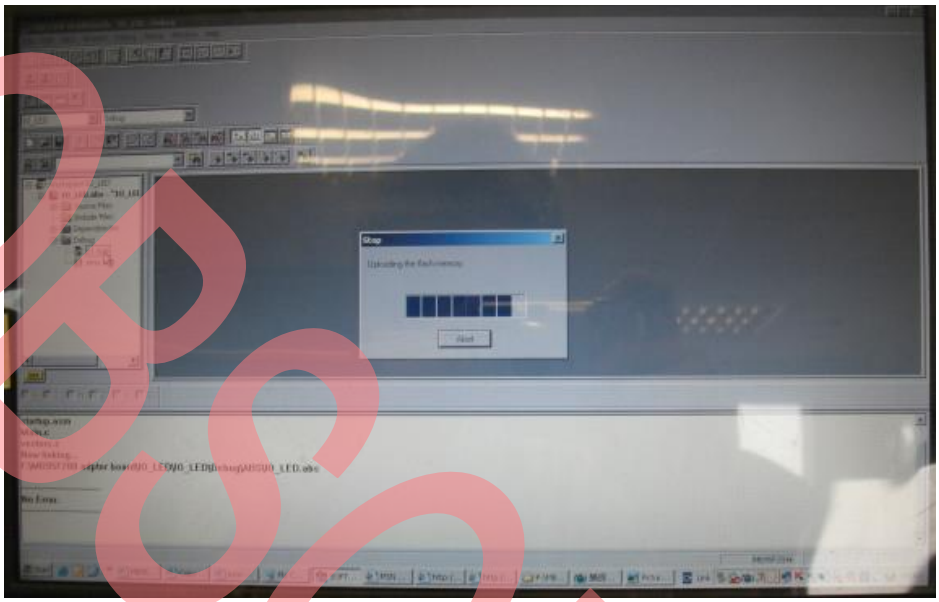
Figure 22. Set Dirconst Section



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4. Compile project
5. Start debugging

Figure 23. Start Debugging



6. Run (code update)
7. End debugging

Note:

SOFTUNE environment can also be used to debug, however if users only need to do programming, DO NOT set any breakpoint before step 6, or error code will be programmed.

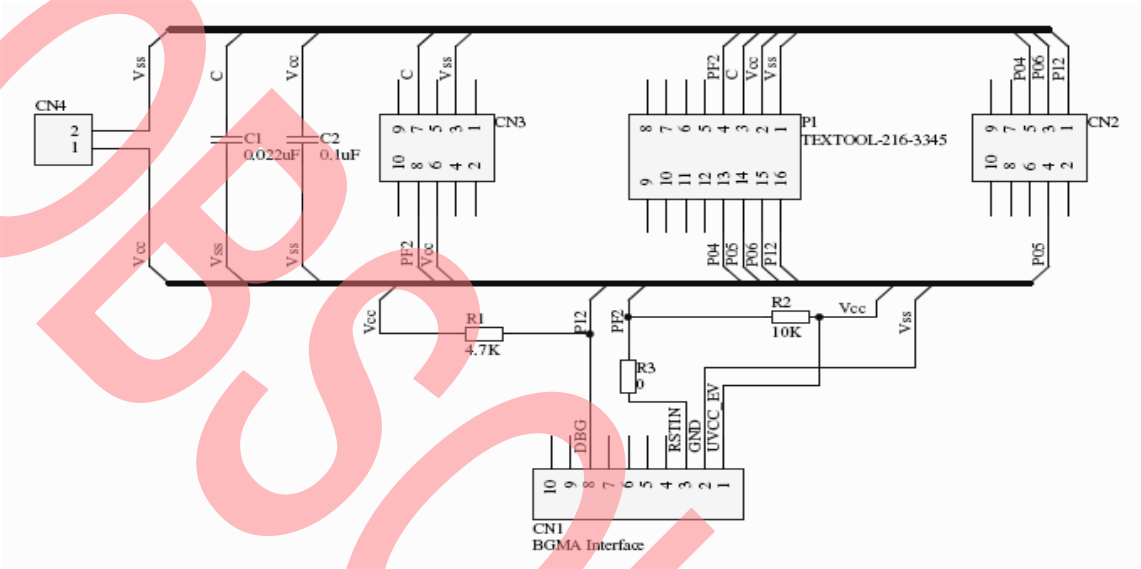
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5 Schematic

This chapter demonstrates schematic of each PGM adaptor.

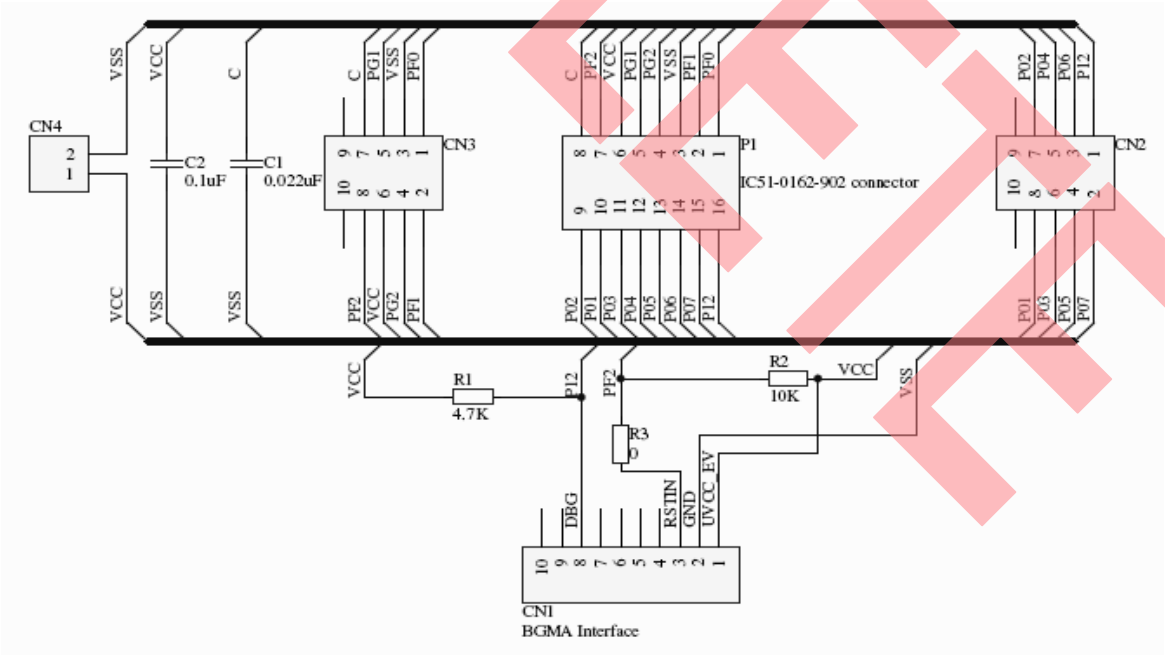
5.1 SOP8 PGM Adaptor

Figure 24. SOP8 PGM Adaptor Schematic



5.2 SOP16 PGM Adaptor

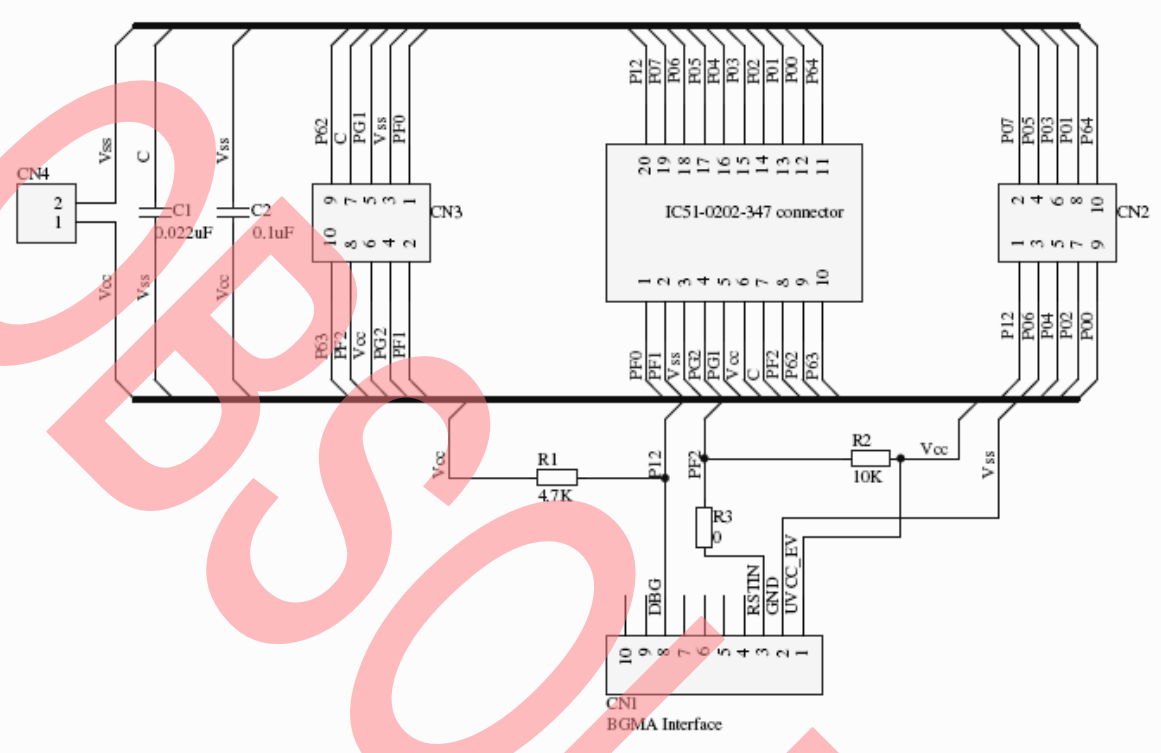
Figure 25. SOP16 PGM Adaptor Schematic



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5.3 SOP20 PGM Adaptor

Figure 26. SOP20 PGM Adaptor Schematic



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6 PN Definition Rule

The part number of PGM adaptor is FMCDC-MB95200-PGMA-0x0xx

0x: SOP→ 01, SSOP→ 02, DIP→ 03, SDIP→ 04, QFN→ 05, TSSOP-> 06

0xx: Pin count (e.g. 008 means 8pin MCU)

E.g. for SOP8/16/20 PGM adaptor, the PN is listed as below table.

Adaptor Name	Part Number
SOP8 PGM Adaptor	FMCDC-MB95200-PGMA-01008
SOP16 PGM Adaptor	FMCDC-MB95200-PGMA-01016
SOP20 PGM Adaptor	FMCDC-MB95200-PGMA-01020

7 PN List of Applicable MCUs

MCU Series	Part Number	Footprint
MB95220 series	MB95F222HPF-G-SNE1 MB95F222KPF-G-SNE1 MB95F223HPF-G-SNE1 MB95F223KPF-G-SNE1	SOP16
MB95210 series	MB95F214HPF-G-SNE2 MB95F214KPF-G-SNE2 MB95F213HPF-G-SNE2 MB95F213KPF-G-SNE2 MB95F212HPF-G-SNE2 MB95F212KPF-G-SNE2	SOP8
MB95200 series	MB95F204HPF-G-SNE2 MB95F204KPF-G-SNE2 MB95F203HPF-G-SNE2 MB95F203KPF-G-SNE2 MB95F202HPF-G-SNE2 MB95F202KPF-G-SNE2	SOP20
MB95260 series	MB95F262HPF-G-SNE2 MB95F262KPF-G-SNE2 MB95F263HPF-G-SNE2 MB95F263KPF-G-SNE2 MB95F264HPF-G-SNE2 MB95F264KPF-G-SNE2	SOP20
MB95270 series	MB95F272HPF-G-SNE2 MB95F272KPF-G-SNE2 MB95F273HPF-G-SNE2 MB95F273KPF-G-SNE2 MB95F274HPF-G-SNE2 MB95F274KPF-G-SNE2	SOP8
MB95280 series	MB95F282HPF-G-SNE1 MB95F282KPF-G-SNE1 MB95F283HPF-G-SNE1 MB95F283KPF-G-SNE1 MB95F284HPF-G-SNE1 MB95F284KPF-G-SNE1	SOP16

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8 More Information

For more information on Cypress MB95200 products, please visit following website:

www.cypress.com/documentation/application-notes/mb95200-mb95200-mcu-programmer-adaptor-usage

Document History

Document Title: AN205451 - F²MC-8FX Family MB95200H/260H series SOP8/SOP16/SOP20 Programmer Adaptor

Document Number: 002-05451

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	—	HUAL	01/14/2009	Initial release.
			02/27/2009	Add SOP16 PGM adaptor usage.
			03/04/2009	Modify.
			03/23/2009	Add PGM adaptor PN information.
			11/02/2009	Add SOP8 PGM adaptor usage.
			12/16/2009	Update for PGM adaptor V1.1.
*A	5264435	HUAL	06/28/2016	Migrated Spansion Application note from MCU-AN-500028-E-15 to Cypress format. Hardware no longer exist and this AN to be Obsolete.

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