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FR Family FR80
32-BIT MICROCONTROLLER
MB91625/635/640/660/665series

Setup Guide

MB2198-700-E

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Revision History

| Revision | Date | Descriptions |
|----------|------------------|--|
| 1.0 | December 4, 2007 | Initial release |
| 2.0 | March 21, 2008 | Revised conforming to MB91660 series |
| 3.0 | May 24, 2010 | Revised conforming to MB91625/665 series |
| | | |

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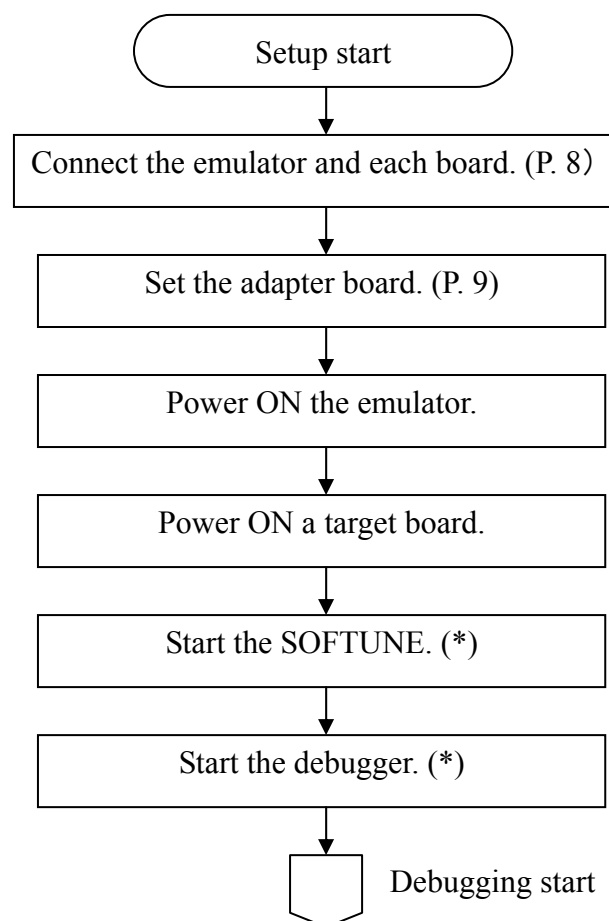
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1 Introduction

This guide describes the configuration of debugging environment and the setup procedures of Fujitsu 32-bit Microcontroller MB91625 / 635 / 640 / 660 / 665 series. In addition, it provides cautions to use the debugging environment of MB91625 / 635 / 640 / 660 / 665 series.

2 Setup Procedures

Figure 2-1 shows the flow of setup procedures for debugging environment of MB91625 / 635 / 640 / 660 / 665 series. The following sections describe the connection of emulator and each board, and setting procedures and operation of the adaptor board. For start procedures of SOFTUNE and the debugger, see SOFTUNE Setup Guide.

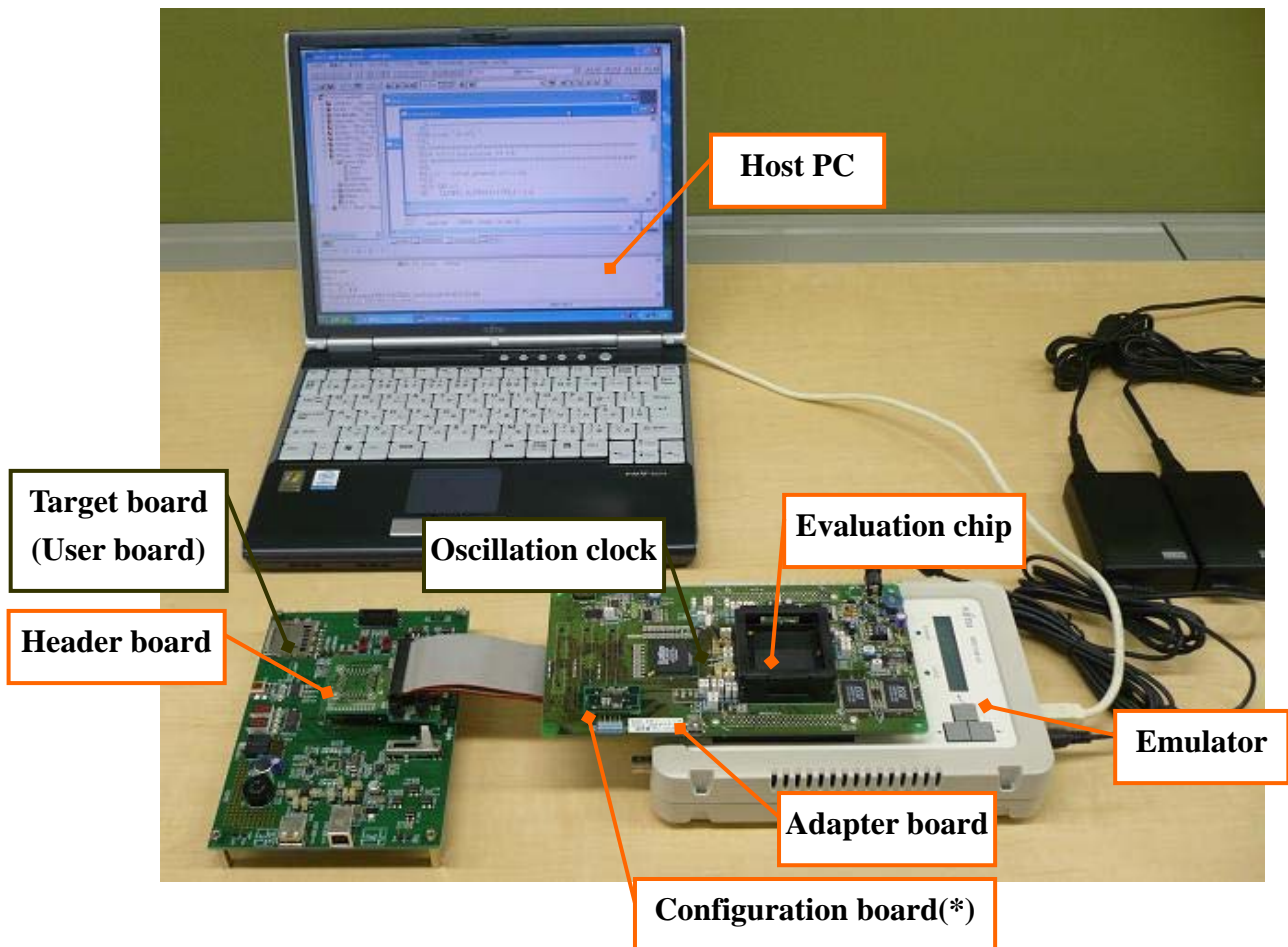


* See SOFTUNE Setup Guide

Figure 2-1 Flow of Setup Procedures

3 Hardware Configuration

Figure 3-1 shows the configuration for debugging environment of MB91625 / 635 / 640 / 660 / 665 series. It consists of the host PC, the emulator (MB2198-01-E), the evaluation chip (MB91V650), the adapter board (MB2198-700-E), the configuration board *¹ (MB2198-790-01-E), the header board, and the target board (user board). It is necessary to set up the integrated development environment SOFTUNE for the host PC. (For its setup procedures, see SOFTUNE First Step Guide.) Prepare the appropriate type of the header board that supports a chip and a package to be used. Table 3-1 shows types of header boards to support each of chip and package. In addition, it is necessary to implement the socket (NQPACK) on the target board (user board) to connect the header board.



*1: The configuration board (MB2198-790-01-E) is included in the adapter board (MB2198-700-E).

Figure 3-1 Configuration of Debugging Environment

Table 3-1 Configuration of Debugging Environment for Each Product

| Product to be evaluated | Evaluation chip | Emulator | Adapter board + Configuration board | Header board | Remarks |
|-------------------------|-----------------|-------------|-------------------------------------|--------------|-------------------|
| MB91625 series | MB91V650 | MB2198-01-E | MB2198-700-E + MB2198-790-01-E | MB2198-704-E | Package: LQFP-100 |
| MB91635 series | | | | MB2198-702-E | Package: LQFP-144 |
| MB91640 series | | | | MB2198-703-E | Package: LQFP-176 |
| MB91660 series | | | | MB2198-701-E | Package: LQFP-120 |
| MB91665 series | | | | MB2198-705-E | Package: LQFP-48 |
| | | | | MB2198-706-E | Package: LQFP-64 |

* In addition to the above, it is necessary to prepare the target board (user board) and the oscillation clock (crystal oscillator) separately.

4 Hardware Setup

The following describes the setup procedures of debugging environment for MB91625 / 635 / 640 / 660 / 665 series.

4.1 Setup of emulator and each board

Figure 4-1 shows connection between the emulator and each board. Connection should be made for each board, as shown in Figure 4-1. It is necessary to supply power to the emulator and the adapter board through the AC adapter attached. In addition, the evaluation chip (MB91V650) should be mounted on the adapter board.

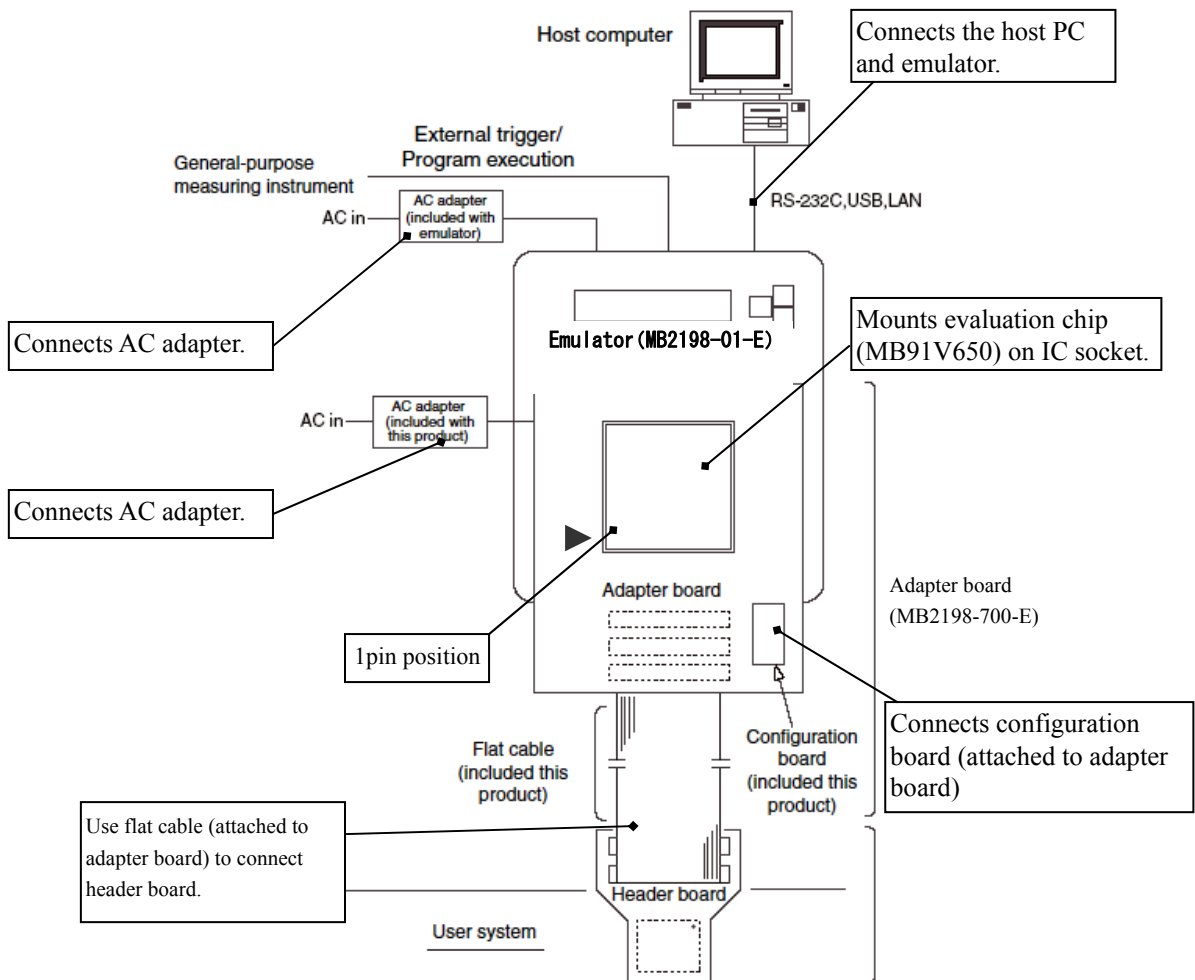


Figure 4-1 Connection between Emulator and Each Board

4.2 Jumper setting of adapter board

The adapter board has jumper pins and they need to be set in accordance with your usage. Figure 4-2 shows positions of jumper pins to be set on the adapter board. Tables 4-1 to 4-8 describe jumper settings of the adapter board. Meshed values (■) in Tables are recommended values for jumper pin settings. Set the jumper pins on the adapter board following Tables.

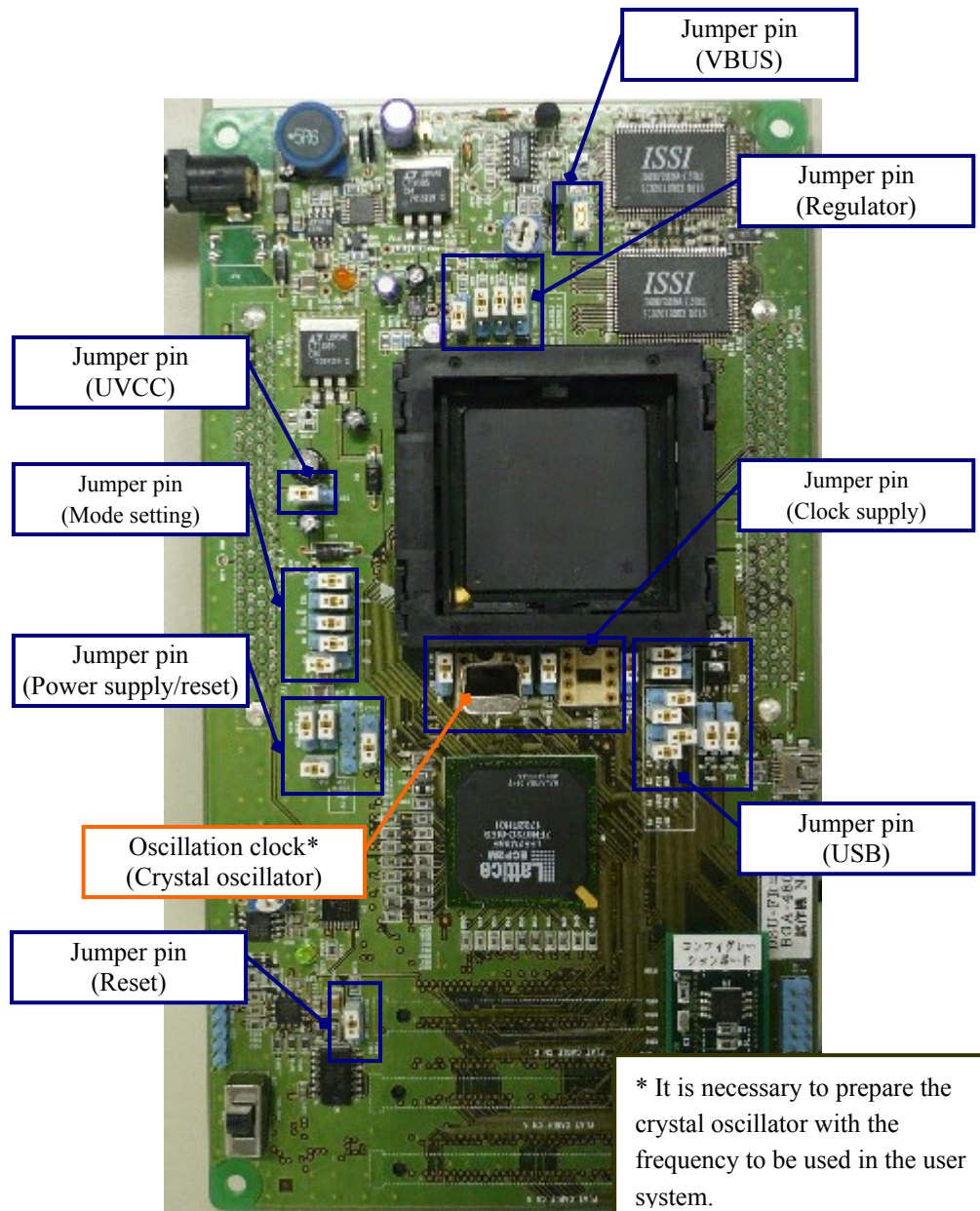


Figure 4-2 Jumper Pin Positions on Adapter Board

Table 4-1 Jumper Setting on Adapter Board (VBUS)

| Jumper | Setting | Description |
|---------------|---------------------|---|
| S22 (VBUS) | +5V (initial value) | Connects +5V to VBUS pin of USB connector on the adapter board. |
| | PORT | Connects PH3 pin of Evaluation MCU to VBUS pin of USB connector on the adapter board. |

Table 4-2 Jumper Setting on Adapter Board (Regulator)

| Jumper | Setting | Description |
|------------------|-------------------|--|
| S12 (EHBUSEN) | 0 (initial value) | Fixes EHBUSEN pin of Evaluation MCU (MB91V650) to “Low”. |
| | 1 | Fixes EHBUSEN pin of Evaluation MCU (MB91V650) to “Hi”. |
| S15 (REGSEL0) | 0 | Fixes REGSEL0 pin of Evaluation MCU (MB91V650) to “Low”. |
| | 1 (initial value) | Fixes REGSEL0 pin of Evaluation MCU (MB91V650) to “Hi”. |
| S16 (REGSEL1) | 0 | Fixes REGSEL1 pin of Evaluation MCU (MB91V650) to “Low”. |
| | 1 (initial value) | Fixes REGSEL1 pin of Evaluation MCU (MB91V650) to “Hi”. |
| S17 (REGSEL2) | 0 | Fixes REGSEL2 pin of Evaluation MCU (MB91V650) to “Low”. |
| | 1 (initial value) | Fixes REGSEL2 pin of Evaluation MCU (MB91V650) to “Hi”. |

Table 4-3 Jumper Setting on Adapter Board (UVCC)

| Jumper | Setting | Description |
|--------------|---------------------|--|
| S26 (VCC) | USR (initial value) | Connects UVCC pin of Evaluation MCU (MB91V650) to the power supply of the user system. |
| | EML | Connects UVCC pin of Evaluation MCU (MB91V650) to the power supply of the emulator. |

Table 4-4 Jumper Setting on Adapter Board (Mode setting)

| Jumper | Setting | Description |
|--------------|---------------------|---|
| S27 | LOW (initial value) | Fixes MD1 pin of Evaluation MCU (MB91V650) to “Low “(*). |
| | HI | Fixes MD1 pin of Evaluation MCU (MB91V650) to “Hi” (*). |
| S29 (MD1) | USR (initial value) | Connects MD1 pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Handles MD1 pin of Evaluation MCU (MB91V650) on the adapter board. |
| S30 (MD0) | USR (initial value) | Connects MD0 pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Handles MD0 pin of Evaluation MCU (MB91V650) on the adapter board. |
| S28 | LOW (initial value) | Fixes MD0 pin of Evaluation MCU (MB91V650) to “Low “(*). |
| | HI | Fixes MD0 pin of Evaluation MCU (MB91V650) to “Hi “(*). |
| S14 (C) | USR | Connects C pin of Evaluation MCU (MB91V650) to the user system. |
| | EML (initial value) | Connects C pin of Evaluation MCU (MB91V650) to the capacitor (0.1μF and 10μF in parallel) on the adapter board. |

(*). If MD pin is handled on the adapter board.

Table 4-5 Jumper Setting on Adapter Board (Power supply/reset)

| Jumper | Setting | Description |
|-------------------|-----------------------|--|
| S20 (INITX) | USR | Supplies INITX signal from the user system to INITX pin of Evaluation MCU (MB91V650). |
| | EML (initial value) | Supplies the reset signal from the emulator to INITX pin of Evaluation MCU (MB91V650). |
| S21 (TRSTX) | USR | Supplies INITX signal from the user system to TRSTX pin of Evaluation MCU (MB91V650). |
| | EML (initial value) | Supplies the reset signal from the emulator to TRSTX pin of Evaluation MCU (MB91V650). |
| S13 (SCVCC) | Short (initial value) | Connects SCVCC pin of Evaluation MCU (MB91V650) to the power supply pin. |
| | Open | Separates SCVCC pin of Evaluation MCU (MB91V650) from the power supply pin (allowing such measurement devices as voltmeter to be connected). |
| S19 (VCCIO6/7) | +3.3V (initial value) | Selects 3.3 V of the drive power supply when connecting FPGA pin to the user system. |
| | VCCA | Selects VCCA of the drive power supply when connecting FPGA pin to the user system. |

Table 4-6 Jumper Setting on Adapter Board (Power supply/reset)

| Jumper | Setting | Description |
|----------------|---------------------|--|
| S31 (UNITX) | USR (initial value) | Supplies INITX signal from the user system to UNITX pin of Evaluation MCU (MB91V650). |
| | EML | Supplies the reset signal from the emulator to UNITX pin of Evaluation MCU (MB91V650). |

Table 4-7 Jumper Setting on Adapter Board (USB)

| Jumper | Setting | Description |
|--------------|--------------------------|---|
| S1 | Short (initial value) | Connects P33 pin of Evaluation MCU (MB91V650) to the user system. |
| | Open | Not connects P33 pin of Evaluation MCU (MB91V650) to the user system. |
| S9 (PH3) | VBUS | Connects PH3 pin of Evaluation MCU (MB91V650) to USB connector (VBUS pin) on the adapter board. |
| | USR (initial value) | Connects PH3 pin of Evaluation MCU (MB91V650) to the user system. |
| S2 | Short (initial value) | Connects P32 pin of Evaluation MCU (MB91V650) to the user system. |
| | Open | Not connects P32 pin of Evaluation MCU (MB91V650) to the user system. |
| S7 (PH2) | PUC | Connects PH2 pin of Evaluation MCU (MB91V650) to USB connector (UDP pin) on the adapter board. |
| | USR (initial value) | Connects PH2 pin of Evaluation MCU (MB91V650) to the user system. |
| S5 (UDM) | USR (initial value) | Connects UDM pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Connects UDM pin of Evaluation MCU (MB91V650) to USB connector on the adapter board. |
| S4 (UDP) | USR (initial value) | Connects UDP pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Connects UDP pin of Evaluation MCU (MB91V650) to USB connector on the adapter board. |
| S23 (UDP) | PD_EN (initial value) | Connect 15KΩ pull-down resistance to UDM pin (2nd pin) of USB connector on the adapter board. |

| | | |
|--------------|--------------------------|--|
| | PD_DIS | Not connect 15K Ω pull-down resistance to UDM pin (2nd pin) of USB connector on the adapter board. |
| S24 (UDM) | PD_EN (initial value) | Connect 15K Ω pull-down resistance to UDP pin (2nd pin) of USB connector on the adapter board. |
| | PD_DIS | Not connect 15 K Ω pull-down resistance to UDP pin (2nd pin) of USB connector on the adapter board. |

Table 4-8 Jumper Setting on Adapter Board (Clock supply)

| Jumper | Setting | Description |
|--------------|---------------------|--|
| S6 (X0) | USR (initial value) | Connects X0 pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Connects X0 pin of Evaluation MCU (MB91V650) to the oscillation IC socket on the adapter board. |
| S8 (X1) | USR (initial value) | Connects X1 pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Connects X1 pin of Evaluation MCU (MB91V650) to the oscillation IC socket on the adapter board. |
| S10 (X1A) | USR (initial value) | Connects X0A pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Connects X0A pin of Evaluation MCU (MB91V650) to the oscillation IC socket on the adapter board. |
| S11 (X0A) | USR (initial value) | Connects X1A pin of Evaluation MCU (MB91V650) to the user system. |
| | EML | Connects X1A pin of Evaluation MCU (MB91V650) to the oscillation IC socket on the adapter board. |