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RENESAS

32176 Group

Starter Kit User's Manual

M3A-2152

Precautions on Using The Product Described Herein

1. The product described herein should be used in combination with the parts included with the starter kit. If the product is operated in combination with any other item, its operation cannot be guaranteed. Nor will requests for help or suggestion be answered.

2. The product described herein was prepared for program development or evaluation purposes. The product cannot be used for the mass production.

3. Renesas Technology Corporation and Renesas Solutions Corporation will not assume any responsibility for the results of development no matter what systems may have been developed by customers by using the product described herein.

4. Guarantee for the product described herein shall conform to stipulations under which guarantee is provided for the starter kit.

5. The product described herein was prepared assuming it will be used in a laboratory or similar environment for program development or evaluation purposes. It is not covered in the electrical product safety laws, nor is it protected against electromagnetic hazards for use in Japan or elsewhere.

For Inquiries About Product Contents or This Manual

Please contact:
Renesas Technology Corporation
at csc@renesas.com

Preface

Thank you very much for purchasing the 32176 Group Starter Kit, the M3A-2152G52A and M3A-2152G52.

This manual describes how to set up the hardware and software products included with the 32176 Group Starter Kit and the precautions to be observed when using those products.

For details about the 32176 Group hardware and software products and development support tools, refer to the user's manuals and related documentation supplied with them.

Contents

32176 Group

Starter Kit User's Manual M3A-2152

1. Overview

1.1 Outline of the Starter Kit

The Starter Kit M3A-2152G52A and M3A-2152G52 are provided for the evaluation of the 32176 Group microcomputers.

The M3A-2152G52A Starter Kit consists of M3A-2152G02 (32176 Group Evaluation Board), M32100T-EZ-E (Emulator for M32R: model limited version), M3T-PD32RM (Emulator Debugger for M32100T-EZ-E), and M3T-CC32R (Cross Tool Kit for the M32R Family; trial version). This is an evaluation kit designed specifically for evaluating your computer at the early stage of system development as well as developing application software for the 32176 Group.

It is capable of reprogramming internal flash memory of the 32176 Group microcomputer as well as controlling. Included M32100T-EZ-E and M3T-PD32RM enable fast reprogramming MCU's internal flash memory.

The M3A-2152G52 Starter Kit consists of M3A-2152G02, M3A-2195 (SDI Interface Board with Housing), M3S-KD32R (Debugger for the Starter Kit), and M3T-CC32R. It has the same functions as the M3A-2152G52A Starter Kit.

Included M3A-2195 and M3S-KD32R enable fast reprogramming MCU's internal flash memory.

Note: From December 1,2004, the M3A-2152G52 was discontinued.

The following explains each item that constitutes the kits.

(1)   M3A-2152G02 (M3A-2152 Evaluation Board)

The M3A-2152G02 Evaluation Board contains one of the 32176 Group microcomputer of 32-bit and single-chip RISC with a socket.

You can evaluate a microcomputer using the M32R core, internal memory, and peripheral I/O functions with the M3A-2152 Evaluation Board.

(2)   M3T-CC32R (Cross Tool Kit)

The M3T-CC32R Cross Tool Kit, designed for use in developing application programs for the M32R Family microcomputers, has abundant functions suitable for developing embedded control systems using the M32R Family microcomputers. Included in the Starter Kit is a trial version of it whose useful period is limited.

(3)   M32100T-EZ-E (Emulator for M32R)

The M32100T-EZ-E Emulator connects the host PC's USB port and the M3A-2152 Evaluation Board's JTAG pin together, for controlling input/output between M3T-PD32RM and the M3A-2152 Evaluation Boards.

(Reference)

M32100T-EZ-E in M3A-2152G52A is an emulator designed exclusively for 32176 Group microcomputer, and cannot be used for M32R microcomputers except for 32176 Group.

In case that the M32100T-EZ-E is used for the product except for 32176 Group, the upgrade program to M32100T-EZ-E compliant with M32R microcomputers is available. For more details, refer to the attachment of M32R/ECU starter kit release notes.

(4)　M3T-PD32RM (Emulator Debugger)

M3T-PD32RM, the debugger software for the Starter Kit, enables debugging the application system from the host PC by controlling the microcomputer on the M3A-2152 Evaluation Board which is connected to the host PC via the M32100T-EZ-E emulator. You can analyze the operation of a program available in load module form by using the M3T-CC32R Cross Tool Kit described earlier. This debugger provides a man-machine interactive debugging environment based on mouse manipulation by using a multi-window, graphical user interface comprised of easy to use menus and multiple debugger windows and dialog boxes.

(5)　M3A-2195 (SDI Interface Board with Housing)

The M3A-2195 connects the host PC's LPT parallel port and the M3A-2152 Evaluation Board's JTAG pin together, for controlling input/output between M3S-KD32R and the M3A-2152 Evaluation Board.

(6)　M3S-KD32R (Emulator Debugger)

M3S-KD32R, the debugger software for the Starter Kit, enables debugging the application system from the host PC by controlling the microcomputer on the M3A-2152 Evaluation Board which is connected to the host PC via the M3A-2195 Interface Board. The function of M3S-KD32R is same as one of M3T-PD32RM.

1.2 System Configuration

Figure 1.1, Figure 1.2 and Figure 1.3 below show system configurations of M3A-2152G52A connected to an included emulator, system configurations of M3A-2152G52 connected to an included emulator and M3A-2152G02 by itself, respectively.
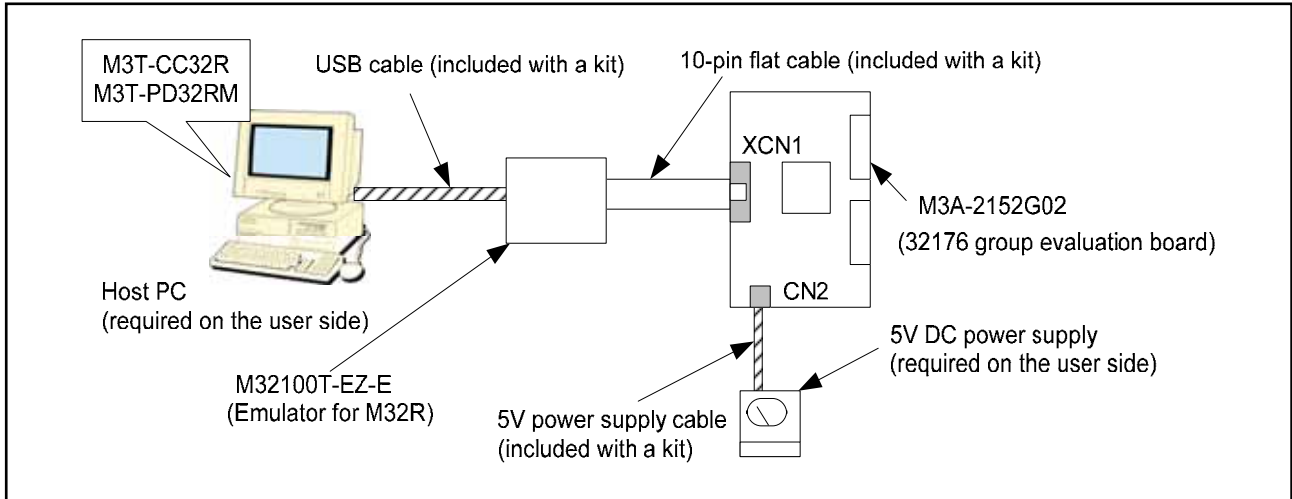
Figure 1.1   System Configuration of M3A-2152G52A Connected to an Included Emulator
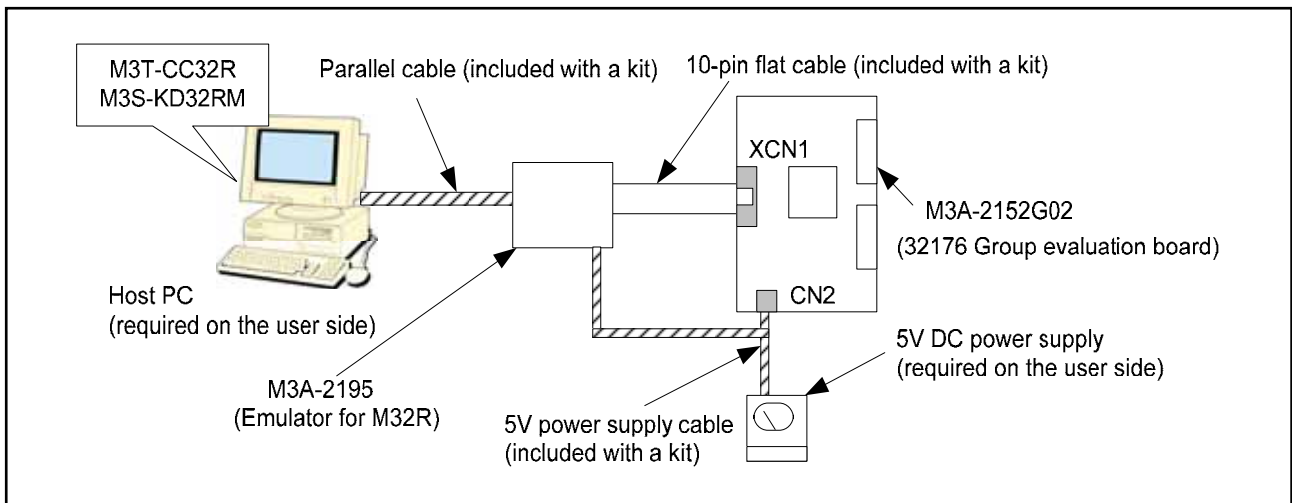
Figure 1.2   System Configuration of M3A-2152G52A Connected to an Included Emulator
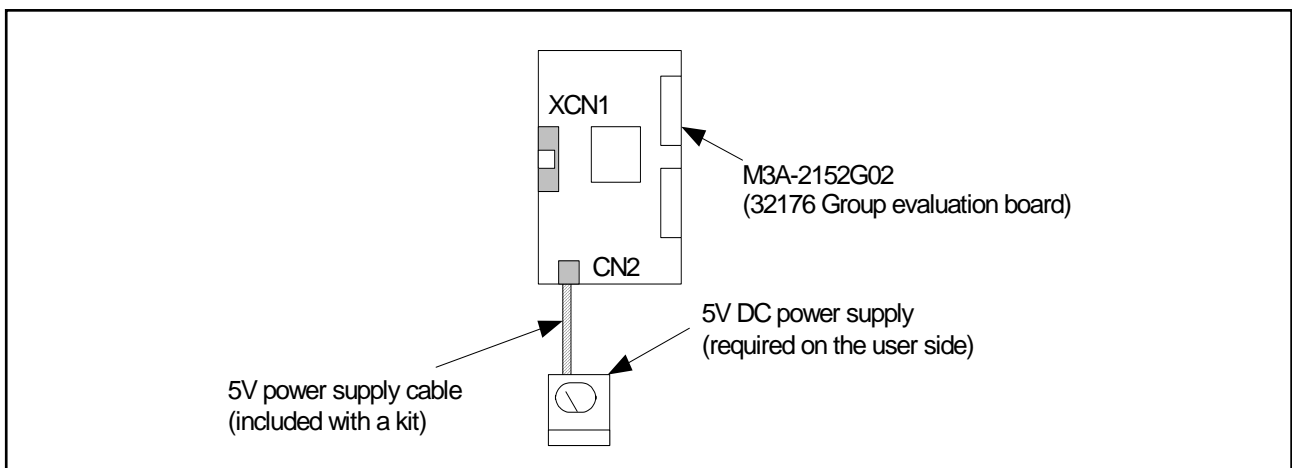
Figure 1.3   System Configuration of M3A-2154G02A by Itself

2. Contents of the Product Package

This chapter shows the contents of the Starter Kit product package. When unpacking, check to see that all items are included with your package.

2.1 Packaged Product Items

Table 2.1 shows the contents of the Starter Kit product package.

Table 2.1 Packaged Contents of 32176 Group Starter Kit

Packaged product name	Outline of product	Quantity	
		M3A-2152G52A	M3A-2152G52
M3A-2152G02	32176 Group Evaluation Board	1 pc	1 pc
M32100T-EZ-E	Emulator for M32R	1 pc	—
M3A-2195	Simple emulator probe	—	1 pc
5V power supply cable	Used for the M3A-2152 Evaluation Board	1 pc	1 pc
	Used for the M3A-2195	—	1 pc
12V power supply cable	Used for the M3A-2195	—	1 pc
10-pin Flat cable	Connected the M3A-2152 Evaluation Board and M32100T-EZ-E/M3A-2195	1 pc	1 pc
USB cable	Connected M32100T-EZ-E and host PC	1 pc	—
Parallel cable	Connected M3A-2195 and host PC	—	1 pc
CAN cable	CAN cable	2 pc	2 pc
CD-ROM	Contained documents and software	1 pc	1 pc
M32R/ECU Starter Kit release note	M3A-2152Gxx release notes	1 copy	1 copy
IMPORTANT-READ ME FIRST	Written contract	1 copy	1 copy

Note: When you unpack the Starter Kit, check to see that none of the above package contents is damaged or missing. If any item is damaged or not included, return the package to Renesas Technology Corporation through distributors. It will be replaced with a new one.

2.2 Contents of CD-ROM

The CD-ROM contains the software, manuals, various data sheets, and sample programs which are needed for you to use the Starter Kit.

When using the technical contents of the CD-ROM such as product data, diagrams, and tables or the programs and algorithms also included in the CD-ROM for your application, please be sure to evaluate those technical contents, programs, and algorithms as the whole system, and not individually as single items before you determine whether they are useful. Renesas Technology Corporation will not assume any responsibility regarding their suitability for your application.

The following shows directory configurations of data/manuals included in the CD-ROM.

For details, refer to **Appendix 1**.

```
Jpn/ Eng + Readme_j.txt/ Readme_e.txt : README file
            + AcrobatReader                 : Tool for read pdf file
            + Tool +                        : Software for the M32R Family
            |    + Cc32r                    : Cross Tool Kit for the M32R Family (Trial version)
            |    + Pd32rm                   : Debugger for the M32R Family
            |    + Kd32r                    : Debugger for the M32R Family
            |    + Ufla32r                  : Flash memory reprogramming kit for M32R/ECU by UART
            |    + Oldversion               : Old version of Tools
            |
            + Document +                    : Materials associated with boards
            |    + M3A-2114                 : Materials associated with the 32170/32174/32171/32172/32173
            |                                 Evaluation board (M3A-2114)
            |    + M3A-2142                 : Materials associated with the 32180/32182 Evaluation board
            |                                 (M3A-2142)
            |    + M3A-2152                 : Materials associated with the 32176 Evaluation board
            |                                 (M3A-2152)
            |    + M3A-2154                 : Materials associated with the 32185/32186/32192/32195/32196
            |                                 Evaluation board (M3A-2154)
            |    + M3A-2191                 : Connector Pitch Converter for M3A-2114 Evaluation board
            |                                 and M32100T-EZ-E
            |    + M32100T-EZ-E             : Materials associated with the Emulator for M32R
            |    + M3A-2145                 : Manual for Flash memory reprogramming kit (Ufla32r)
            |    + Discontinued_model       : Materials associated with the discontinued boards (M3A-2195)
            |
            + Manual                        : M32R/ECU manuals, data sheets, M32R Family
            |                                 software manuals
            + SampleProgram                 : Application notes and listed object/source files
```

2.3 Other Necessary Items

Before the Starter Kit can be used, the following items should separately be prepared by the user.

- Host PC (see Section **4.2 Host PC Condition**)
- Power supply (see Section **4.3 Conditions for the Power Supply Used**)

3. Usage Precautions

3.1 Guaranteed Scope of the Starter Kit

The Starter Kit was developed for users to trial the 32176 Group microcomputer specifications and development environment. Therefore, the results arising from the use of the Starter Kit are not guaranteed.
The M3A-2195 (SDI Interface Board with Housing) was developed for use with only the Starter Kit. If the M3A-2195 is used with any other system, its operation cannot be guaranteed.

When developing/debugging a system product using one of the M32R Family microcomputers, please be sure to use official development tools separately available as you debug.

The Starter Kit should be run on the designated type of host machine (IBM PC/AT compatibles). This designated type of host machine, however, is just an anticipated operating environment for the Starter Kit and does not mean that the Starter Kit operates properly on all relevant types of machines in all relevant environments (e.g., device drivers and peripheral units).

3.2 Regarding About System Power-on Sequence when Connected to the Emulator

3.2.1 M3A-2152G52A in Use

- When turning on power, turn on M32100T-EZ-E first and then the M3A-2152 Evaluation Board.
- When turning off power, turn off the M3A-2152 Evaluation Board first and then M32100T-EZ-E.
- When turning on power again after turning off power, wait for 10 seconds.
- Power to M32100T-EZ-E can be fed from USB cable.

Note: Unless the Starter Kit is powered on this sequence, the kit may operate erratically or break down.

3.2.2 M3A-2152G52 in Use

- When turning on power, turn on M3A-2195 first and then the M3A-2152 Evaluation Board, or simultaneously.
- When turning off power, turn off the M3A-2152 Evaluation Board first and then M3A-2195, or simultaneously.
- When turning on power again after turning off power, wait for 2 seconds.

Note: Unless the Starter Kit is powered on this sequence, the kit may operate erratically or break down.

3.3   About M32100T-EZ-E for M3A-2152G52A

M32100T-EZ-E in M3A-2152G52A is an emulator designed exclusively for 32176 Group microcomputer, and cannot be used for M32R microcomputers except for 32176 Group.

In case that the M32100T-EZ-E is used for the product except for 32176 Group, the upgrade program to M32100T-EZ-E compliant with M32R microcomputers is available. For more details, refer to the attachment of M32R/ECU starter kit release notes.

3.4   About M3T-CC32R

M3T-CC32R (M32R Family Cross Tool Kit) included with the Starter Kit is a trial version whose useful period is limited.

This version becomes unusable four months after it is installed. Past this period, it cannot be used even by reinstalling. If you wish to continue using M3T-CC32R, please purchase a production version of M3T-CC32R separately from distributors.

3.5   About M3T-PD32RM

The following describes precautions to be observed when using M3T-PD32RM.

3.5.1   Operating Manuals

To use M3T-PD32RM of M3A-2152G52A, see the manuals shown below.
- M3T-PD32RM release notes
- PD32RM Help

To use M3S-KD32R of M3A-2152G52, see the manuals shown below.
- M3S-KD32R release notes
- PD32R Help

3.5.2   About Break Operation

M3T-PD32RM (or M3S-KD32R) uses the M32R core's internal debug circuit (SDI) to realize break functions. For this reason, the break functions of M3T-PD32RM (or M3S-KD32R) behave differently from those in conventional emulators.

Furthermore, because M3T-PD32RM (or M3S-KD32R) does not have SDI trace pins as corresponding hardware resources, the trace pin corresponding break functions available with M3T-PD32R-compatible emulators are not supported.

The following explains the four types of breaks that can be executed with M3T-PD32RM (or M3S-KD32R).

(1) Software break

Up to 64 software breakpoints can be set and executed in RAM areas accessible by the target MCU. No software breakpoints can be set and executed in ROM areas such as the internal flash memory.

(2) Pre-execution PC break

The M32R core's internal debug circuit (SDI) allows setting breakpoints, at which to break the program immediately before executing an instruction (at the address indicated by the program counter).
For the M3A-2152G52A and M3A-2152G52 (32176 Group MCU), four such breakpoints can be set.

(3) Post-execution PC break

The M32R core's internal debug circuit (SDI) allows setting one breakpoint, at which to break the program immediately after executing an instruction (at the address indicated by the program counter).

(4) Chip break

The M32R core's internal debug circuit (SDI) allows setting breakpoints, at which to break the program when accessing memory for read/write.
For M3A-2152G52A and M3A-2152G52 (32176 Group MCU), two such breakpoints (level 2) can be set.

* The differences between levels 1 and 2 are outlined below.
    Level 1: Whether data which is maskable matches or not can be detected.
    Level 2: Data is maskable and an address range can be specified for the target data.

(5) About hardware break
Debug functions of M3T-PD32RM (or M3S-KD32R) are realized by using the M32R core's internal debug circuit (SDI), and not by using the emulator's hardware resources based on bus signals and debug information from the MCU as in conventional emulators. The pre-execution PC break, post-execution PC break, and chip break all uses this internal debug circuit (SDI).
Because the M3T-PD32RM (or M3S-KD32R) does not have trace pin information available as hardware resources, the hardware break functions cannot be used that use the trace pins implemented in the M3T-PD32R-compatible emulators.
Heed this point when referring to the PD32RM Help and PD32R Help.

3.5.3   About Security Code Check Function

If the target microcomputer has security code stored in it, the dialog box shown in Figure 3.1 appears at M3T-PD32RM (or M3S-KD32R) startup. When this dialog box is displayed, enter the appropriate security code. If the security code you've entered does not match the stored security code, M3T-PD32RM (or M3S-KD32R) will not start unless the contents of the internal flash memory are deleted.
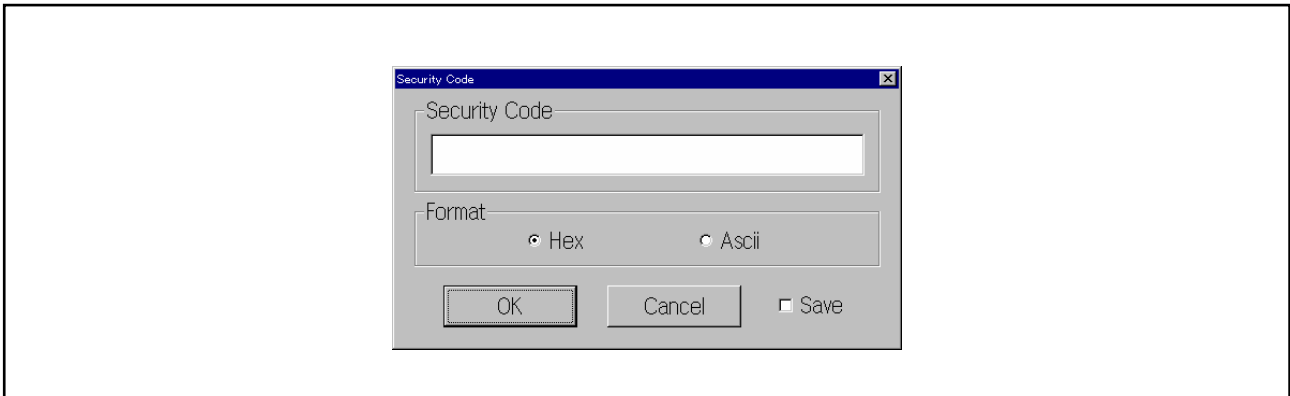
Figure 3.1   Security Code Input Dialog Box

Be sure to enter the security code that you set when writing to the flash memory.
Use the Format select button to choose the format of the security code you entered. Select the Save check box, and the security code you entered is saved. From next time on, the security code saved here is used to check matching with the stored security code when M3T- PD32RM (or M3S-KD32R) starts.

3.6 About Evaluation Board

When the evaluation board does not start operation after supplied power, check the following points.

3.6.1 Contact failure of IC Socket

Oscillation or thermal expansion may cause a poor connection between microcomputers and IC socket on the Evaluation Board. Follow the steps below.

- Screw down the top cover of IC socket with setscrews at four corners.
    The tightening torque shall be 0.054 N.m.
    Note that only one tight setscrew may cause a poor connection.

The IC socket included in the evaluation board uses NQPACK and HQPACK by TOKYO ELETECH CORPORATION.
For more details, visit their website at http://www.tetc.co.jp/e_index.htm.

The following illustrates configuration of M3A-2152G02 (32176 Group Evaluation Board).
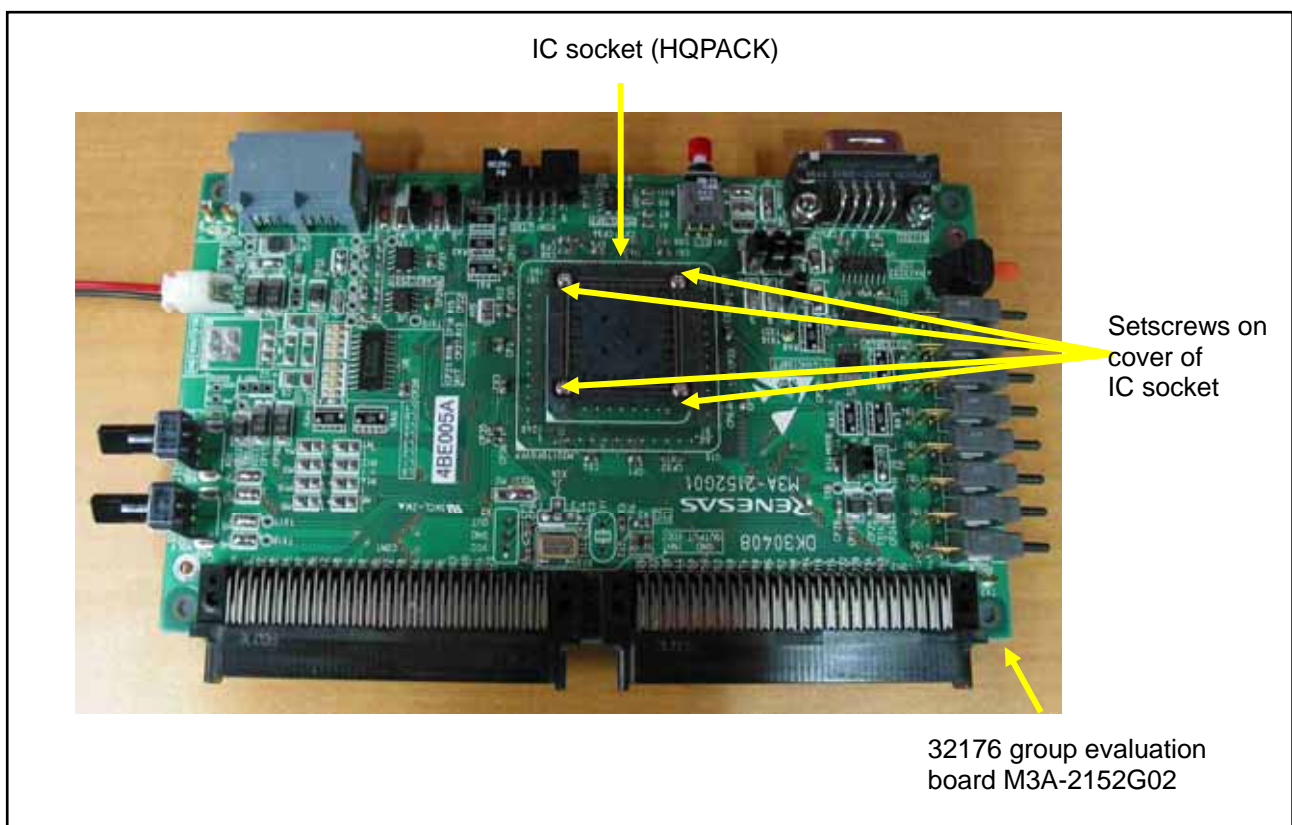
Figure 3.2   M3A-2154G02A

3.6.2 Cable Connection

- Make sure the cables are connected to the evaluation board firmly.

4. Starter Kit Usage Conditions

The following shows the conditions under which the Starter Kit can be used.

4.1 Ambient Conditions

Table 4.1 shows the ambient conditions under which the Starter Kit can be used.

Table 4.1   Operating Environment

Symbol	Parameter	Rated value	Remarks
Topr	Operating ambient temperature when connecting to emulator	5°C to 35°C	No dewdrops allowed. Corrosive gas environment not allowed.
	Operating ambient temperature when using evaluation board by itself	0°C to 70°C	
Tstr	Storage ambient temperature for emulator	-10°C to 60°C	
	Storage ambient temperature for evaluation board	0°C to 70°C	

4.2 Host PC Condition

It is recommended that each software included with the Starter Kit be run on the host PC under the OS listed in Table 4.2.

Table 4.2   Host PC Conditions

Starter Kit Type Name	M3A-2152G52A	M3A-2152G52
Host PC	IBM PC/AT compatibles	
CPU	Pentium III 500MHz or higher CPU is recommended	
Memory	192 Mbytes or more system memory is recommended	
OS	Windows 2000, XP	Windows 98, Me, NT4.0, 2000
USB Port	1 port (required)	—
LPT Port	—	1 port (required)

4.3 Conditions for the Power Supply Used

Table 4.3 shows power supply specifications required when using the Starter Kit.

Table 4.3   Power Supply Specifications

Symbol	Power supply voltage	Power supply current
VCC	4.75 V to 5.25 V	1A
GND	0V (reference voltage)	—

5. Hardware Setup

This chapter describes how to set up the hardware components necessary to use the Starter Kit.
Table 5.1 and Table 5.2 show how to set up the hardware components.

Table 5.1   Hardware Setup Procedure

Setup Procedure	When connected to the emulator		When using the evaluation board by itself
	M3A-2152G52A	M3A-2152G52	M3A-2152G52A/M3A-2152G52
Set the emulator	1st (Refer to **5.1.1**)	1st (Refer to **5.2.1**)	—
Connect the host PC and emulator	2nd (Refer to **5.1.1**)	2nd (Refer to **5.2.2**)	—
Set the evaluation board	3rd (Refer to **5.1.2**)	3rd (Refer to **5.2.3**)	1st (Refer to **5.3.1**)
Connect the evaluation board and emulator	4th (Refer to **5.1.3**)	4th (Refer to **5.2.4**)	—
Turn on the emulator	5th (Refer to **5.1.4**)	5th (Refer to **5.2.5**)	—
Turn on the evalution board	6th (Refer to **5.1.4**)	6th (Refer to **5.2.5**)	2nd (Refer to **5.3.2**)

Table 5.2   Hardware Power Off Procedure

Setup Procedure	When connected to the emulator	When using the evaluation board by itself
Turn off the evaluation board.	1st (Refer to **5.1.4**)	1st (Refer to **5.3.2**)
Turn off the emulator.	2nd (Refer to **5.1.4**)	—

5.1   Hardware Setup when M3A-2152G52A in Use

5.1.1   M32100T-EZ-E Power Supply and Settings

The following shows how to set M32100T-EZ-E.
For more details, refer to **M32100T-EZ-E User's Manual**.
M32100T-EZ-E is supplied power from the host PC via USB cable, and it turns ON by connecting included USB cable.
The Connecting M32100T-EZ-E and Host PC is shown in Figure 5.1
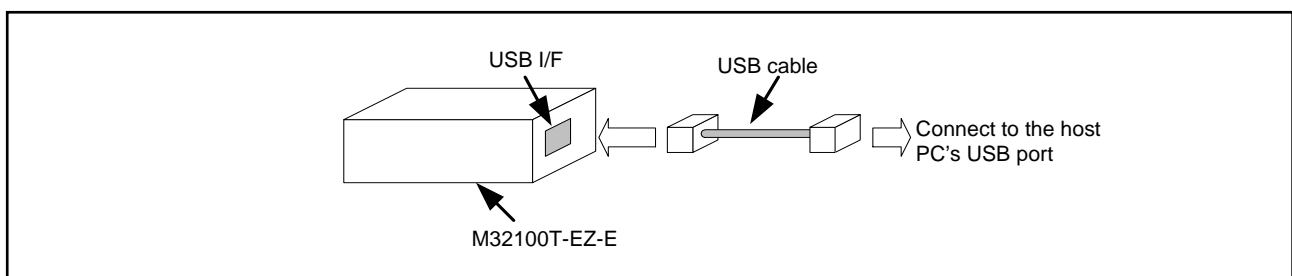
Figure 5.1   Connecting M32100T-EZ-E and Host PC

5.1.2 M3A-2152 Evaluation Board Power Supply and Settings

The following shows how to set the M3A-2152 Evaluation Board.

Use a 5V DC power supply to feed power to the M3A-2152 Evaluation Board.

Use included 5V power supply cable to connect the 5V DC power supply and CN2 connector included with the M3A-2152 Evaluation Board. The Connecting when Feeding Power to the M3A-2152 Evaluation Board is shown in Figure 5.2.
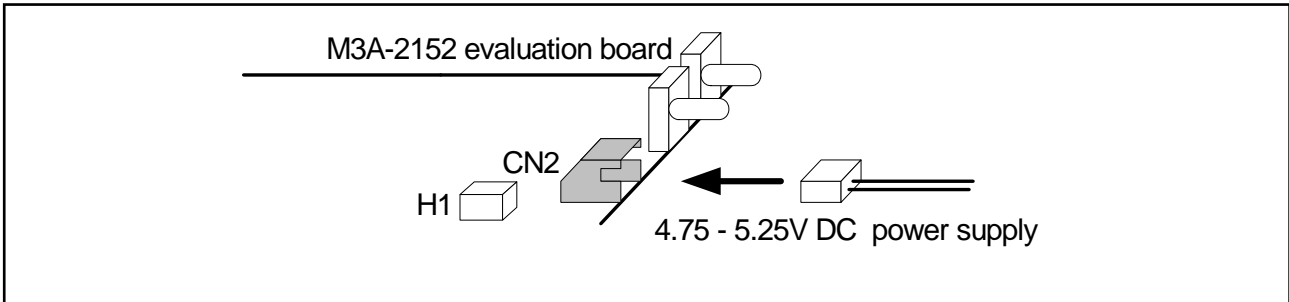
Figure 5.2   Connecting when Feeding Power to the M3A-2152 Evaluation Board

Table 5.3   Jumper Settings before Shipmen

Jumper Name	Jumper Settings	Remarks
H1	Shorted between 1-2	Uses power from CN2 connector to AVCC power supply

Note: For detail about the power supply settings, refer to **Appendix 3 M3A-2152G02 Product Standards**

5.1.3 Connecting M3A-2152 Evaluation Board and M32100T-EZ-E

Use included 10-pin flat cable to connect M32100T-EZ-E and XCN1 connector included with the M3A-2152 Evaluation Board.

The method for Connecting M3A-2152 Evaluation Board and M32100T-EZ-E is shown in Figure 5.3.
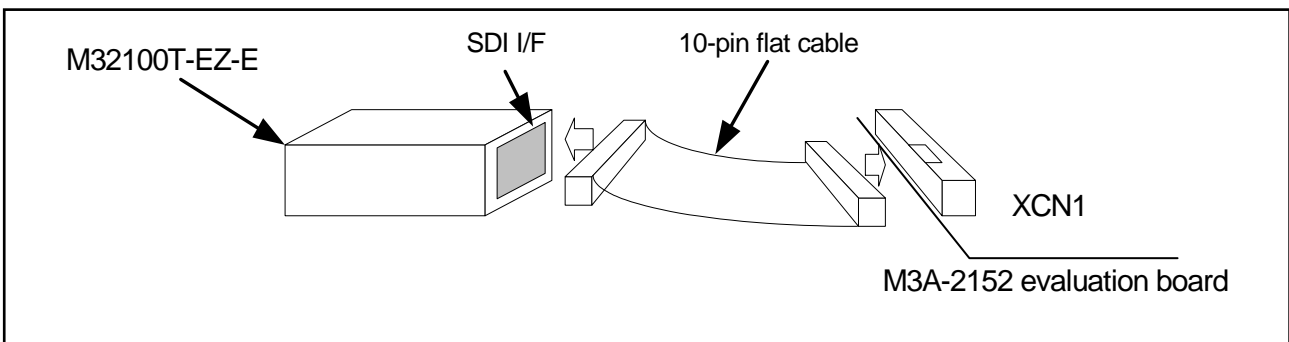
Figure 5.3   Connecting M3A-2152 Evaluation Board and M32100T-EZ-E

5.1.4 System Power-on Sequence when M3A-2152G52A in Use

- When turning on power, turn on M32100T-EZ-E first and then the M3A-2152 Evaluation Board.
- When turning off power, turn off the M3A-2152 Evaluation Board first and then M32100T-EZ-E.
- When turning on power again after turning off power, wait for 10 seconds.
- Power to M32100T-EZ-E can be fed from USB cable.

Note: Unless the Starter Kit is powered on this sequence, the kit may operate erratically or break down.

5.2 Hardware Setup when M3A-2152G52 in Use

5.2.1 M3A-2195 Power Supply Connection and Settings

The following shows how to set M3A-2195.

For more details, refer to M3A-2195 User's Manual.

Power to the M3A-2195 SDI Interface Board can be fed from either a 5V DC power supply (5V) or a 12 DC power supply (6-12V). Use the included 5V or 12V power supply cables to connect M3A-2195 and a corresponding DC power supply.

The Connecting when Feeding Power to the M3A-21 is shown in Figure 5.4
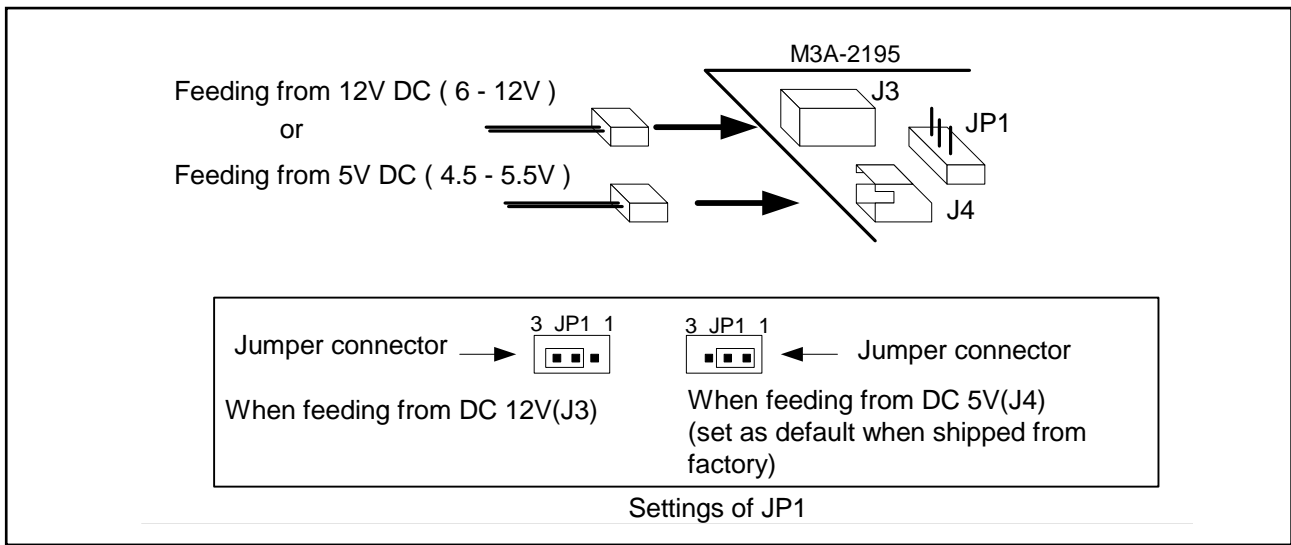
Figure 5.4   Connecting when Feeding Power to the M3A-2195

5.2.2 Connecting to Host PC

In order to control the M3A-2195 SDI Interface Board from M3S-KD32R installed in the host PC, the host PC's LPT parallel port and the M3A-2195's J1 connector should be connected with the parallel cable included in M3A-2195.

The Connecting the M3A-2195 and Host PC is shown in Figure 5.5
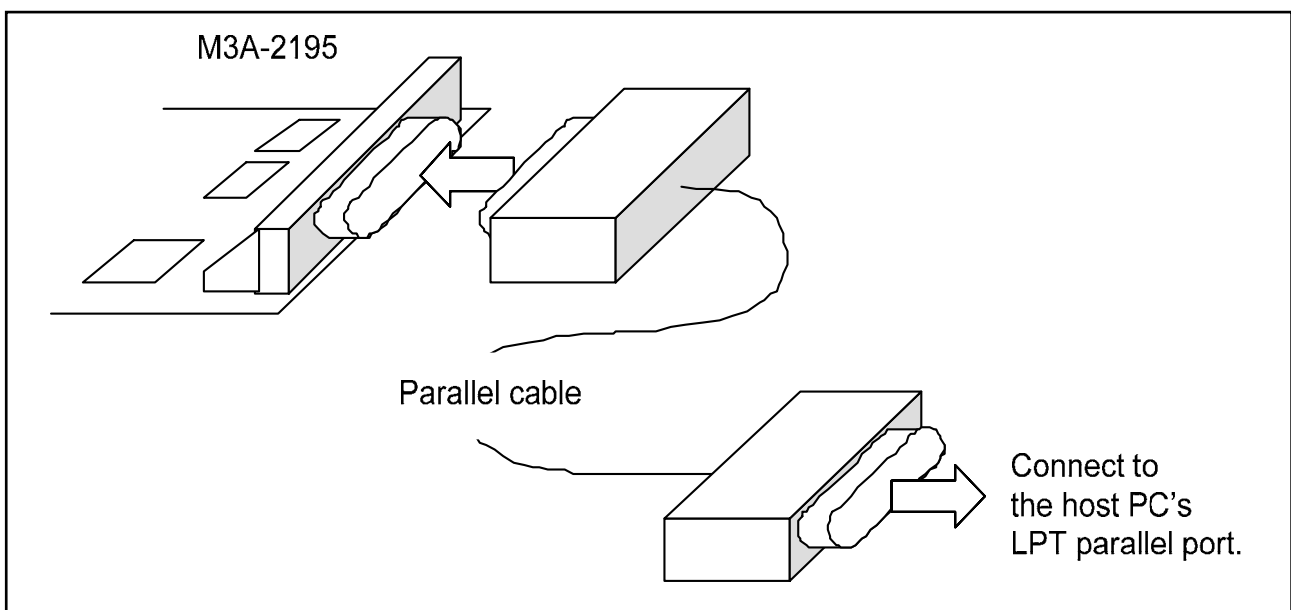
Figure 5.5   Connecting the M3A-2195 and Host PC

5.2.3 M3A-2152 Evaluation Board Power Supply and Settings

The following shows how to set the M3A-2152 Evaluation Board.
Use a 5V DC power supply to feed power to the M3A-2152 Evaluation Board.
Use included 5V power supply cable to connect the 5V DC power supply and CN2 connector included with the M3A-2152 Evaluation Board. The Connecting when Feeding Power to the M3A-2152 Evaluation Board is shown in Figure 5.6.
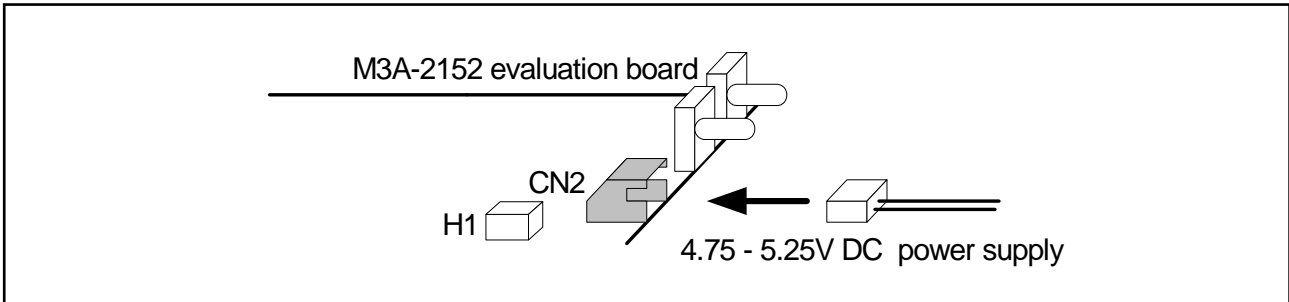
Figure 5.6　Connecting when Feeding Power to the M3A-2152 Evaluation Board

Table 5.4　Jumper Settings before Shipmen

Jumper Name	Jumper Settings	Remarks
H1	Shorted between 1-2	Uses power from CN2 connector to AVCC power supply

Note: For detail about the power supply settings, refer to **Appendix 3 M3A-2152G02 Product Standards**

5.2.4 Connecting M3A-2152 Evaluation Board and M3A-2195

Use included 10-pin Flat cable to connect M3A-2195 and XCN1 connector included with the M3A-2152 Evaluation Board.
The Connecting M3A-2152 Evaluation Board and M3 is shown in Figure 5.7.
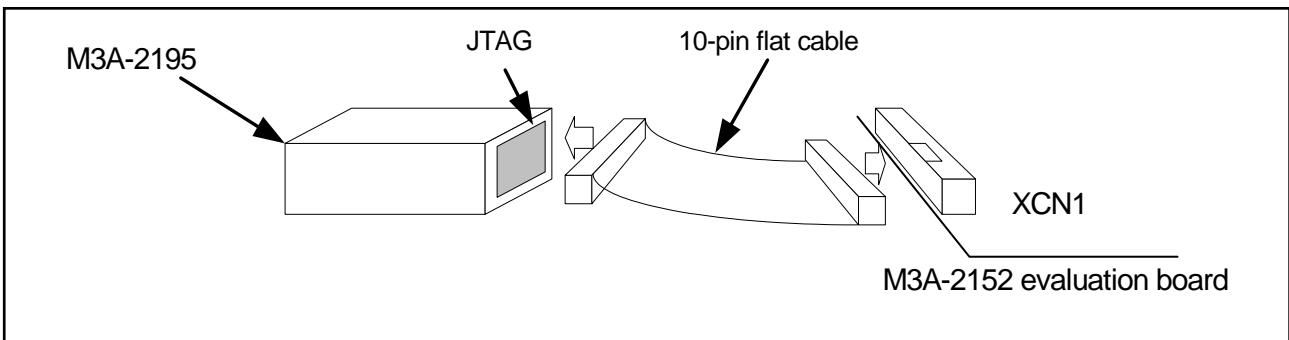
Figure 5.7　Connecting M3A-2152 Evaluation Board and M3A-2195

5.2.5 System Power-on Sequence when M3A-2152G52 in Use

- When turning on power, turn on M3A-2195 first and then the M3A-2152 Evaluation Board, or simultaneously.
- When turning off power, turn off the M3A-2152 Evaluation Board first and then M3A-2195, or simultaneously.
- When turning on power again after turning off power, wait for 2 seconds.

Note: Unless the Starter Kit is powered on this sequence, the kit may operate erratically or break down.

5.3 Hardware Setup when the Evaluation Board by Itself in Use

5.3.1 M3A-2152 Evaluation Board Power Supply and Settings

The following shows how to set the M3A-2152 Evaluation Board.

Use a 5V DC power supply to feed power to the M3A-2152 Evaluation Board.

Use an included 5V power supply cable to connect the 5V DC power supply and CN2 connector included with the M3A-2152 Evaluation Board.

The Connecting when Feeding Power to the M3A-2152 Evaluation Board is shown in Figure 5.8.
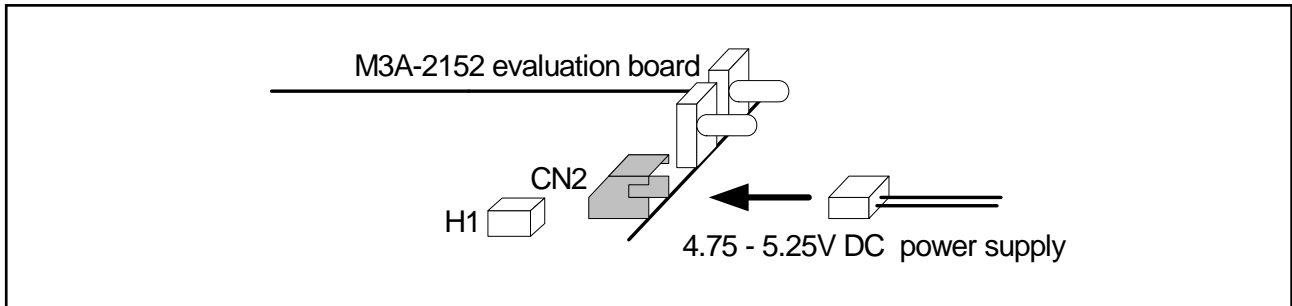
Figure 5.8   Connecting when Feeding Power to the M3A-2152 Evaluation Board

Before feeding power, make sure jumper switches are set as bellow.

Table 5.5   Jumper Settings before Shipmen

Jumper Name	Jumper Settings	Remarks
H1	Shorted between 1-2	Uses power from CN2 connector to AVCC power supply

Note: For detail about the power supply settings, refer to **Appendix 3 M3A-2152G02 Product Standards**

5.3.2 M3A-2152 Power Supply

Connecting the 5V power supply with the included cable turns the M3A-2152 Evaluation Board powered on.

By disconnecting it, the M3A-2152 Evaluation Board turns powered off.

6. Software Setup

6.1 M3T-PD32RM

M3T-PD32RM is the debugger software that controls M32100T-EZ-E from the host PC.

6.1.1 Installing M3T-PD32RM

[Notes]
Make sure that the installer is executed by one who is authorized as an Administrator when Windows 2000/XP is used as an operating system of the host machine.
No one but the user who has the authority of an Administrator can install M3T-PD32RM.

(1) Run pd32rmv301r00_e.exe that is included in the Eng \ Tool \ Pd32rm directory of the CD-ROM.
(2) Proceed to install M3T-PD32RM following messages on the installation screen..
(3) When you finished installing M3T-PD32RM, the dialog box shown in Figure 6.1 appears.

Figure 6.1   Dialog Box when Installation is Finished

6.1.2　Starting M3T-PD32RM

Before starting M3T-PD32RM, make sure the hardware components have been set up in accordance with the instructions in **5.1 Hardware Setup when M3A-2152G52A in Use**, and that the Starter Kit hardware system (M3A-2152 Evaluation Board and M32100T-EZ-E) have been powered on. Make sure that M3T-PD32RM cannot be started unless the power to the hardware system is turned on.

To start M3T-PD32RM, choose
　[Start] -> [Programs] -> [Renesas] -> [PD32RM V3.01 Release 00] -> [PD32RM]
from Start menu of Windows. When M3T-PD32RM starts, the initialize dialog box shown in Figure 6.2 appears. So initialize M3T-PD32RM from this dialog box.
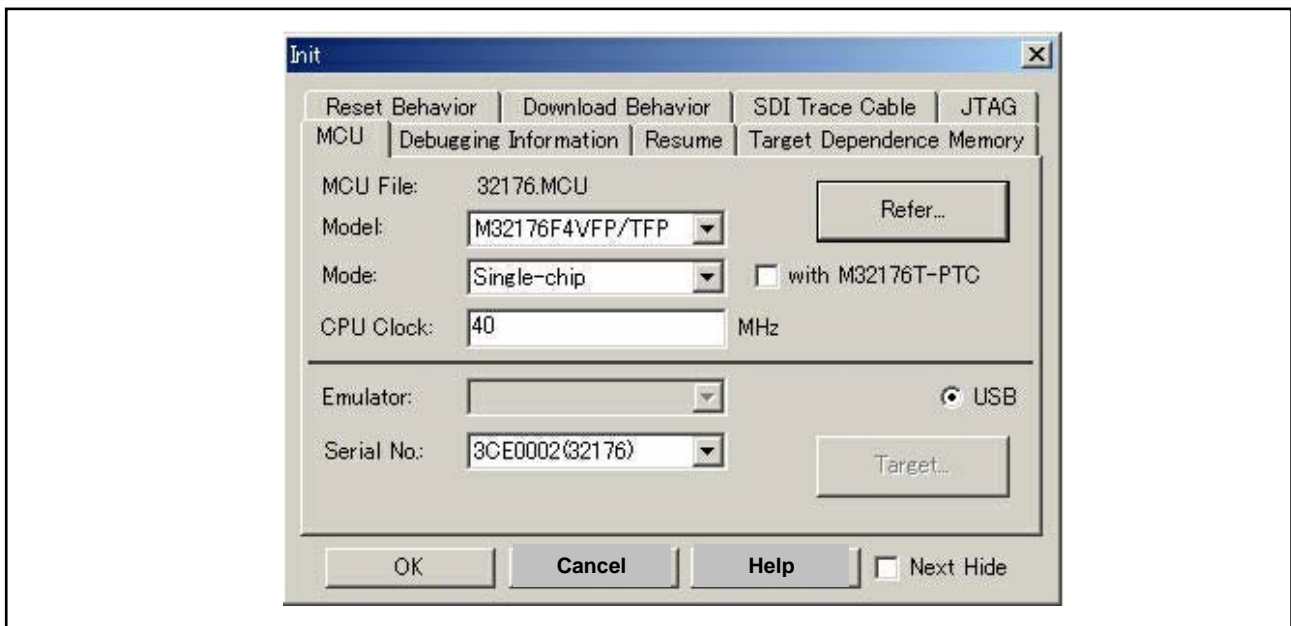
Figure 6.2　M3T-PD32RM Initialize Dialog Box

Setting MCU File
　To set 32176 Group, specify MCU file "32176.mcu".
　This MCU file is stored in directory: (installed location) \ PD32RM \ MCUFILES.
　Click the MCU tab in the initialize dialog box (see **Figure 6.2**) and then the "Refer" button. This brings up a dialog box for setting MCU files. In this dialog box, select the MCU file.

Setting Model
　While the MCU tab is open, select the appropriate MCU type from Model selection.

Setting Mode
　While the MCU tab is open, select the appropriate MCU operation mode from Mode selection.

Setting CPU Clock
　While the MCU tab is open, select the "40" for the appropriate CPU Clock.

Checking Serial No.

While the MCU tab is open, make sure the Serial No. is in accordance with the following.

When M3A-2152G52A in use, M3T-PD32RM can be started only with Serial No. as follows.

- In case of M32100T-EZ-E's limited version included with M3A-2152G52A: 7-digit number (32176)
  Example : 3CE0002(32176)

- In case of the general purpose M32100T-EZ-E: 7-digit number
  Example : 3CE0002

Selecting a Cross Tool

While the Debugging Information tab is open, select "CC32R(M32R)" for Compiler.

For the Starter Kit, M3T-CC32R is the only cross tool which has had its operation guaranteed.
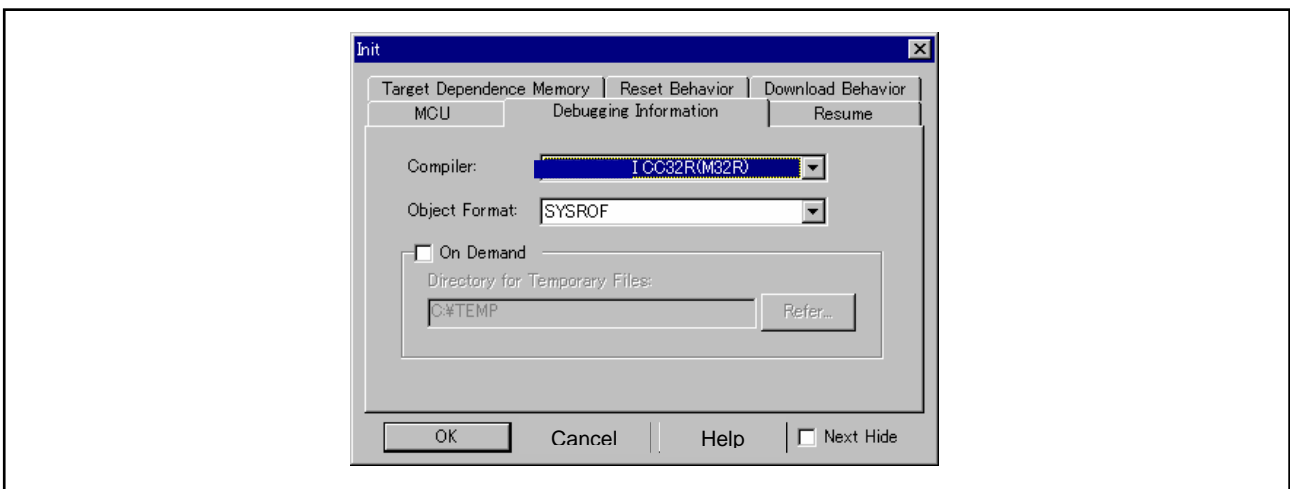
Figure 6.3   Selecting a Cross Tool

When you have finished the above initialization, click the "OK" button to start M3T-PD32RM.

If M3T-PD32RM communicates normally with the target system, it starts up and the M3T-PD32RM window shown in Figure 6.4 appears. For details on how to use it, refer to the **PD32RM Help**.
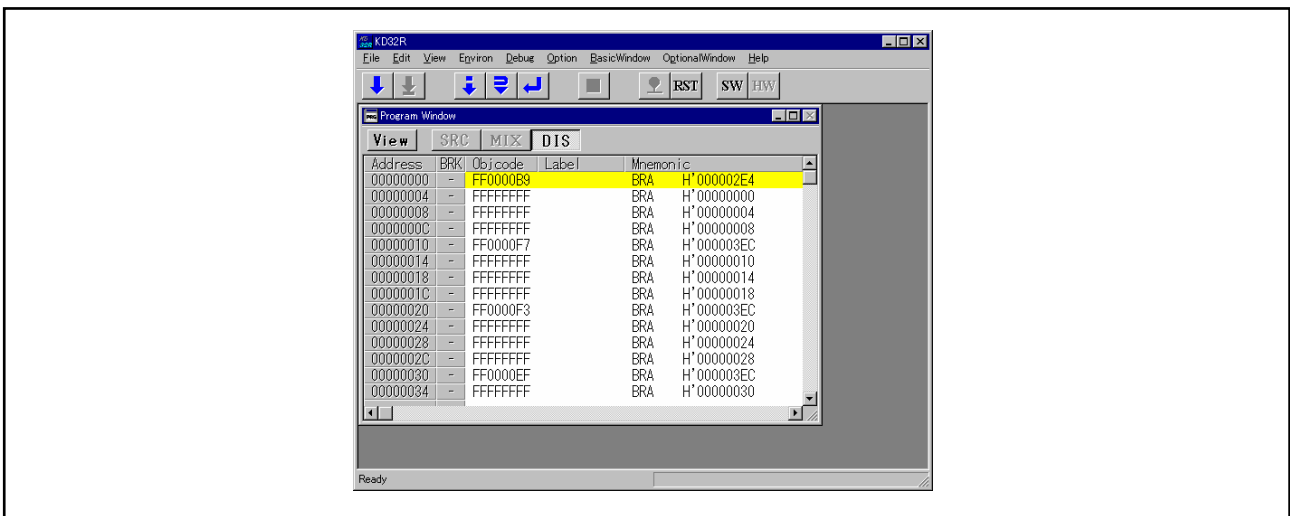
Figure 6.4   M3T-PD32RM Window at Normal Startup

6.1.3 Error Messages During M3T-PD32RM Startup

If M3T-PD32RM cannot communicate normally with the target system, it appears an error message in a pop-up box.

Causes of errors on the M3A-2152 Evaluation Board

If the error pop-up box shown in Figure 6.5 appears when starting M3T-PD32RM, check whether power is supplied to the M3A-2152 Evaluation Board and whether it is firmly connected to M32100T-EZ-E.
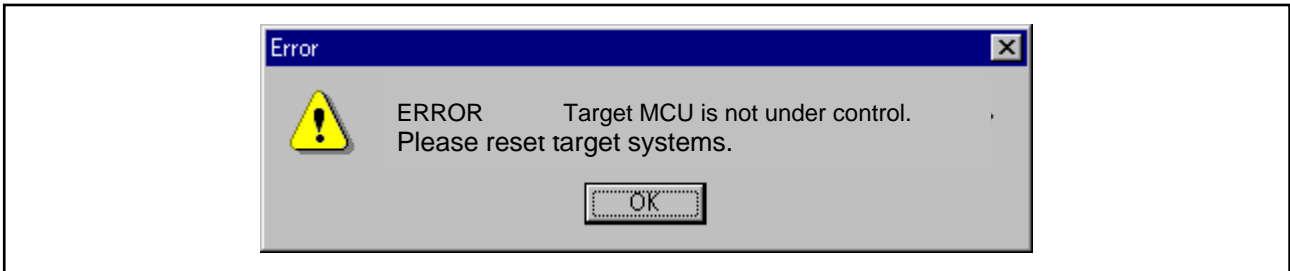
Figure 6.5   Error Message at Startup (Error on the M3A-2152 Evaluation Board Side)

If the error pop-up box is appeared when starting M3T-PD32RM, correct the cause of error and then click the "OK" button in that pop-up box. This brings up the initialize window, allowing you to retry the startup. In this case, you can retry only once.

6.1.4 Terminating M3T-PD32RM

To terminate M3T-PD32RM, choose [File] -> [Exit] from the pulldown menu. Then, a dialog box appears prompting you for your confirmation (see **Figure 6.6**). Click the "OK" button in that dialog box to quit M3T-PD32RM. Or click the "Cancel" button, in which case M3T-PD32RM does not terminate.
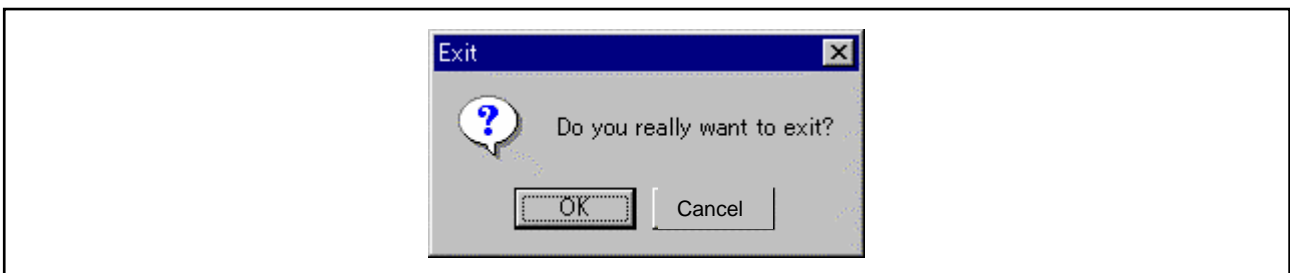
Figure 6.6   Dialog Box for Confirming Whether to Quit M3T-PD32RM

6.2 M3S-KD32R

M3S-KD32R is the debugger software that controls the M3A-2195 SDI Interface Board from the host PC.

6.2.1 Installing M3S-KD32R

[Notes for Windows 2000 / NT4.0]
Make sure that installer is executed by one who is authorized as an Administrator.
No one but the user who has the authority of an Administrator can install the M3S-KD32R.

(1) Run SETUP.EXE that is included in the Eng\Tool\Kd32r\W95E directory of the CD-ROM.
(2) Proceed to install M3S-KD32R following messages on the installation screen.
(3) When you finished installing M3S-KD32R, the dialog box shown in appears.

Figure 6.7   Dialog Box when Installation is Finished

(4) Case of using Windows 2000 / NT4.0, after M3S-KD32R is installed, reboot the PC.

6.2.2 Starting M3S-KD32R

Before starting M3S-KD32R, make sure the hardware components have been set up in accordance with the instructions in **5.2 Hardware Setup when M3A-2152G52 in Use**, and that the Starter Kit hardware system (M3A-2152 Evaluation Board and M3A-2195 SDI Interface Board) have been powered on. Make sure that M3S-KD32R cannot be started unless the power to the hardware system is turned on.

To start M3S-KD32R,
choose [Start] -> [Programs] -> [RENESAS-TOOL] -> [KD32R V4.00 Release 1] -> [KD32R] from Start menu of Windows. When M3S-KD32R starts, the initialize dialog box shown in Figure 6.2 appears. So initialize
M3S-KD32R from this dialog box.
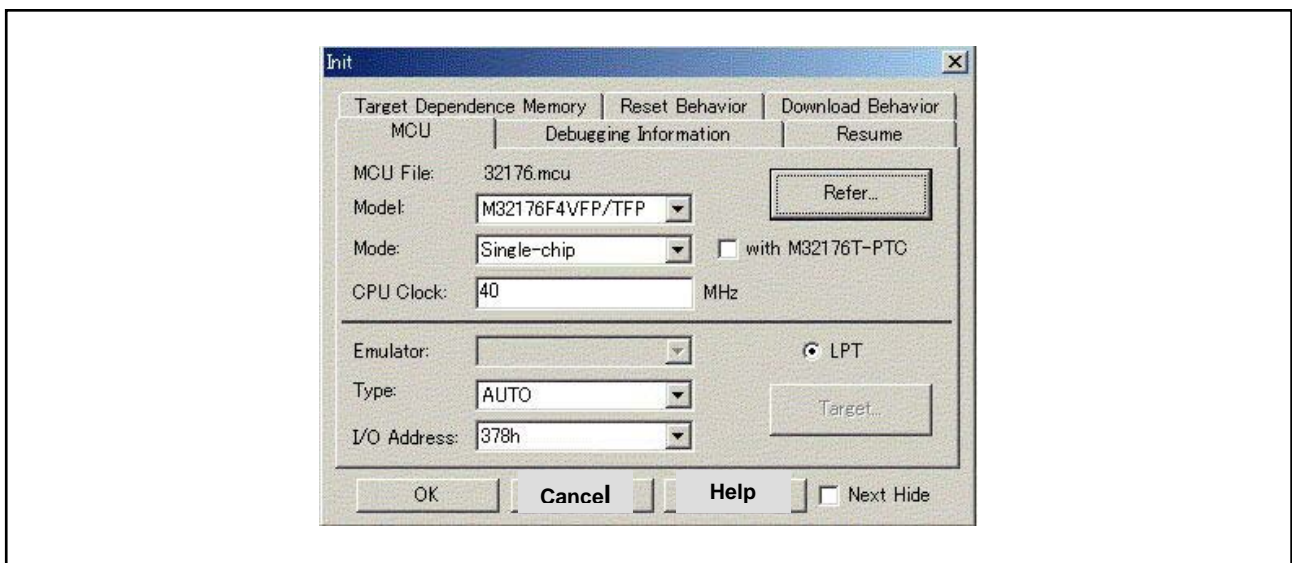
Figure 6.8   M3S-KD32R Initialize Dialog Box

Setting MCU File
To set 32176 Group, specify MCU file "32176.mcu".
This MCU file is stored in directory: (installed location) \ KD32R \ MCUFILES.
Click the MCU tab in the initialize dialog box (see **Figure 6.2**) and then the "Refer" button. This brings up a dialog box for setting MCU files. In this dialog box, select the MCU file.

Setting Model
While the MCU tab is open, select the appropriate MCU type from Model selection.

Setting Mode
While the MCU tab is open, select the appropriate MCU operation mode from Mode selection.

Setting CPU Clock
While the MCU tab is open, select the "40" for the appropriate CPU Clock.

Setting PC Communication Mode
While the MCU tab is open, select "AUTO" for Type, and "378h" or "278h" for I/O Address.

Selecting a Cross Tool

    While the Debugging Information tab is open, select "CC32R(M32R)" for Compiler.

    For the Starter Kit, M3T-CC32R is the only cross tool which has had its operation guaranteed.
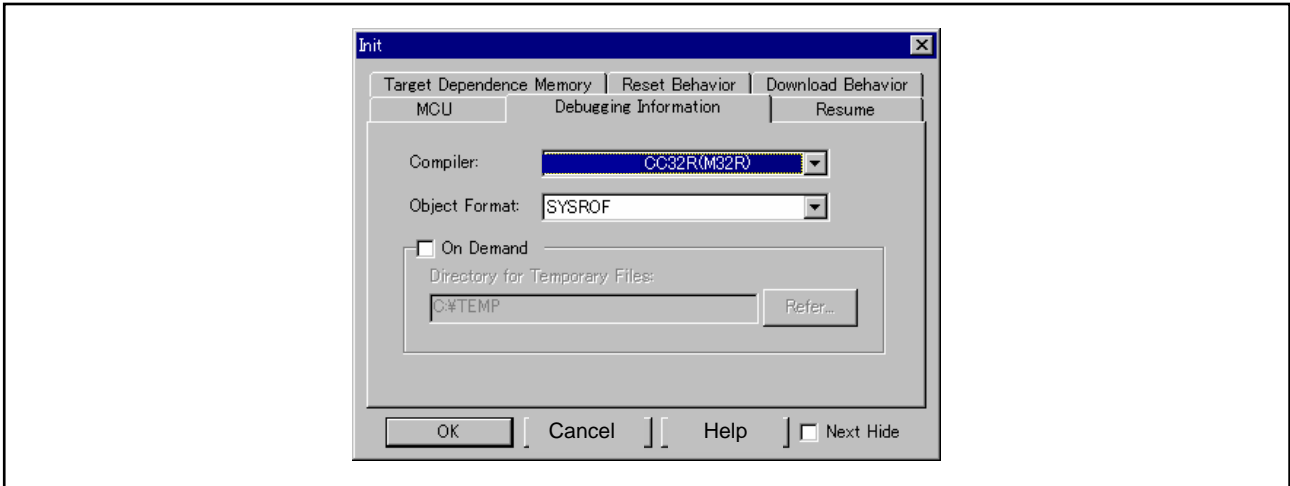
Figure 6.9   Selecting a Cross Tool

    When you have finished the above initialization, click the "OK" button to start M3S-KD32R.

If M3S-KD32R communicates normally with the target system, it starts up and the M3S-KD32R window shown in Figure 6.10 appears. For details on how to use it, refer to the M3S-KD32R Release Note and the PD32R Help.
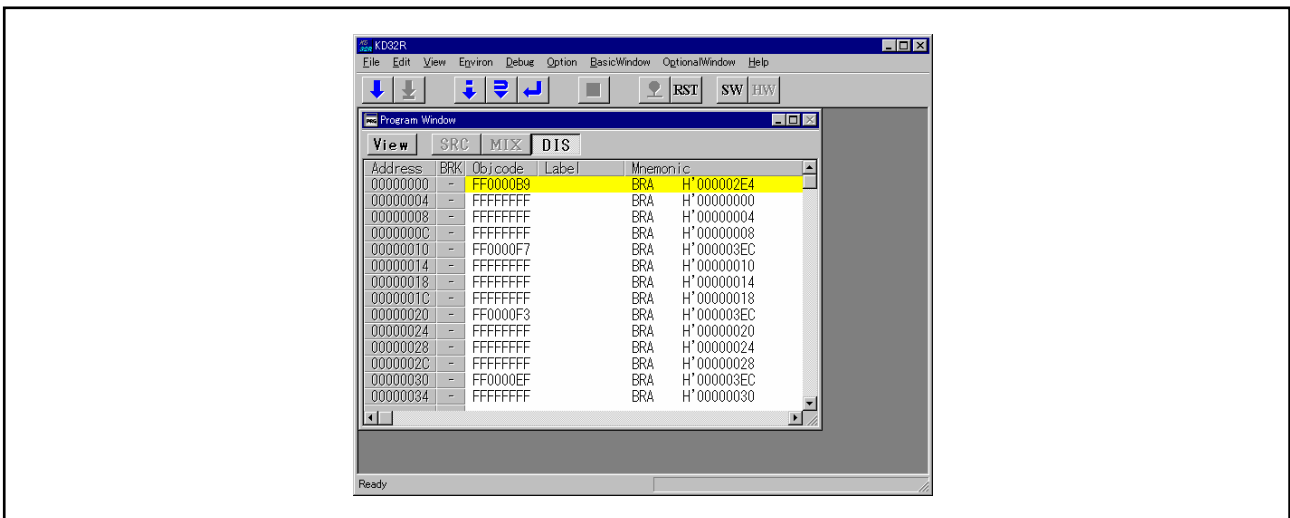
Figure 6.10   M3S-KD32R Window at Normal Startup

6.2.3 Error Messages during M3S-KD32R Startup

If M3S-KD32R cannot communicate normally with the target system, it appears an error message in a pop-up box.

Causes of Errors on the SDI Interface Board Side

If the error pop-up box shown in Figure 6.11 appears when starting M3S-KD32R, check whether power is supplied to the M3A-2195 SDI Interface Board and whether it is firmly connected to the host PC with a cable (LPT parallel cable).
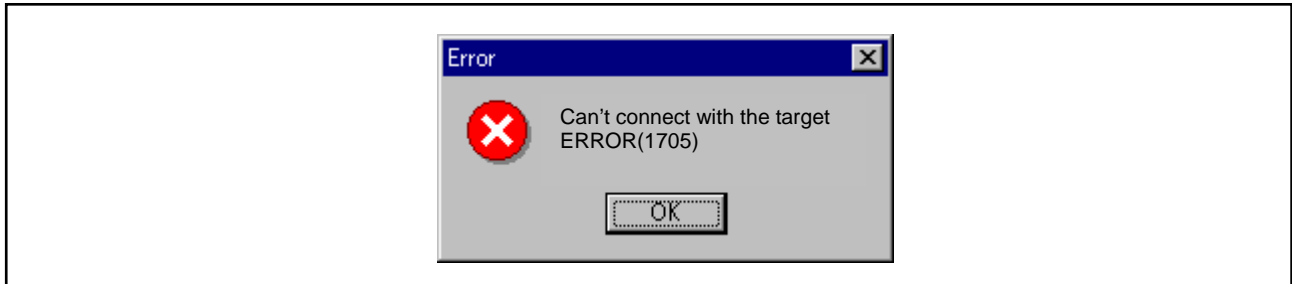
Figure 6.11   Error Message at Startup (Error on M3A-2195 Side)

Causes of Errors on the M3A-2152 Evaluation Board

If the error pop-up box shown in Figure 6.12 appears when starting M3S-KD32R, check whether power is supplied to the M3A-2152 Evaluation Board and whether it is firmly connected to M3A-2195 SDI Interface Board.
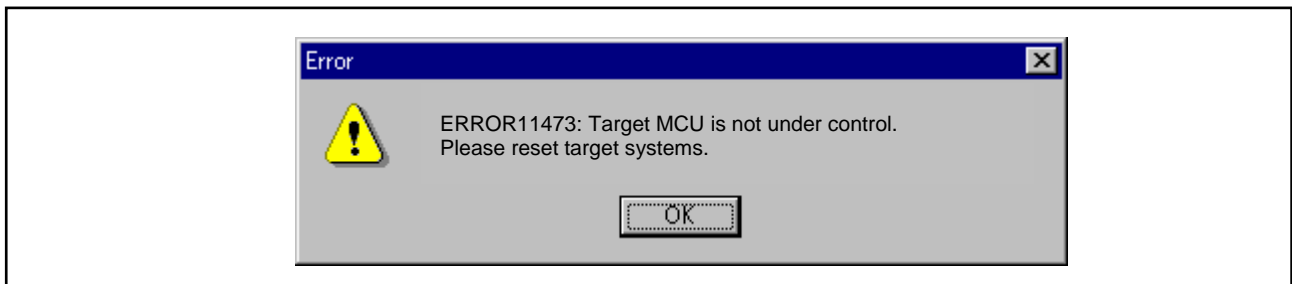
Figure 6.12   Error Message at Startup (Error on the M3A-2152 Evaluation Board Side)

If the error pop-up box is appeared when starting M3S-KD32R, correct the cause of error and then click the "OK" button in that pop-up box. This brings up the initialize window, allowing you to retry the startup. In this case, you can retry only once.

6.2.4 Terminating M3S-KD32R

To terminate M3S-KD32R, choose [File] -> [Exit] from the pulldown menu. Then, a dialog box appears prompting you for your confirmation (see **Figure 6.13**). Click the "OK" button in that dialog box to quit M3S-KD32R. Or click the "Cancel" button, in which case M3S-KD32R does not terminate.
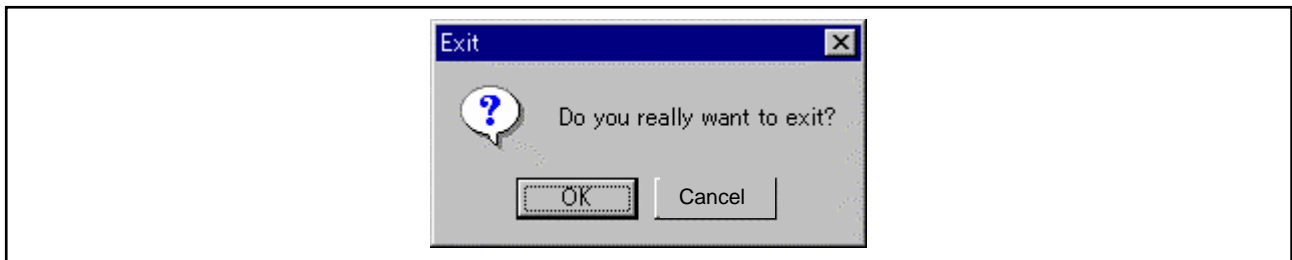
Figure 6.13   Dialog Box for Confirming Whether to Quit M3S-KD32R

6.3 M3T-CC32R

6.3.1 Installing M3T-CC32R

(1) Run cc32rv501r00_ar.exe that is included in the Eng \ Tool \ Cc32r directory of the CD-ROM.

(2) Proceed to install M3T-CC32R following messages on the installation screen.

(3) When you are asked to select the license type of M3T-CC32R, select "Trial License".

(4) While installing M3T-CC32R, you will be asked to confirm whether to change AUTOEXEC.BAT variables. If you chose "Not to Change", add the following contents to AUTOEXEC.BAT.

    (Setting example for M3T-CC32R environment variables)
```
        REM *********** Environment variables for CC32R ***************
        SET M32RBIN = (installed directory) ¥bin32R
        SET M32RLIB = (installed directory) ¥lib32R
        SET M32RINC = (installed directory) ¥inc32R
        SET M32RTMP = (installed directory) ¥TMP
        SET PATH=%M32RBIN%;%PATH%
```

(5) If you corrected AUTOEXEC.BAT, be sure to restart your computer after you finished installing M3T-CC32R.

6.3.2 Verifying Whether M3T-CC32R is Installed Normally

Execute the following operation from the DOS prompt. This helps to verify whether M3T-CC32R has been installed normally. For details about M3T-CC32R, refer to the CC32R User's Manual.

- Command
  C: \ >cc32r -V (V in uppercase)

- Result
  If M3T-CC32R has been installed normally, a command version of M3T-CC32R like the one shown below is displayed.

    CC32R Compiler for M32R Family V.X.XX Release X
    Copyright 1995-XXXX RENESAS TECHNOLOGY CORPORATION
    AND RENESAS SOLUTIONS CORPORATION
    ALL RIGHT RESERVED
    (X varies with the version of the Cross Tool Kit included in the package.)

Displayed below this is the version information of each tool included in the Cross Tool Kit.

- If M3T-CC32R does not start
  If M3T-CC32R does not start, check the following.
  1) See if the environmental variables (M32RBIN, M32LIB, M32RINC, M32RTMP command paths) are set correctly.
  2) See if cc32r.exe is correctly expanded in the directory specified in M32RBIN.

6.4 Browsing Electronic Manuals

The Starter Kit manuals each are provided as Portable Document Format (PDF) files.

To browse electronic manuals, you need to have Acrobat Reader. The CD-ROM supplied with the Starter Kit contains Acrobat Reader in its Acrobat directory, so install the desired version of Acrobat Reader from the CD-ROM. Acrobat Reader can also be downloaded from the Adobe Systems home page.

Appendix 1   Contents of CD-ROM

1.   Contents of CD-ROM

The CD-ROM contains the software, manuals, various data sheets, and sample programs which are needed for you to use the Starter Kit.

When using the technical contents of the CD-ROM such as product data, diagrams, and tables or the programs and algorithms also included in the CD-ROM for your application, please be sure to evaluate those technical contents, programs, and algorithms as the whole system, and not individually as single items before you determine whether they are useful. Renesas Technology Corporation will not assume any responsibility regarding their suitability for your application.

The following shows directory configurations and contents of the CD-ROM.

```
Jpn/ Eng + Readme_j.txt/ Readme_e.txt : README file
        + AcrobatReader              : Tool for read pdf file
        + Tool +                     : Software for the M32R Family
        |     + Cc32r                : Cross Tool Kit for the M32R Family (Trial version)
        |     + Pd32rm               : Debugger for the M32R Family
        |     + Kd32r                : Debugger for the M32R Family
        |     + Ufla32r              : Flash memory reprogramming kit for M32R/ECU by UART
        |     + Oldversion           : Old version of Tools
        |
        + Document +                 : Materials associated with boards
        |     + M3A-2114             : Materials associated with the 32170/32174/32171/32172/32173
        |                              Evaluation board (M3A-2114)
        |     + M3A-2142             : Materials associated with the 32180/32182 Evaluation board
        |                              (M3A-2142)
        |     + M3A-2152             : Materials associated with the 32176 Evaluation board
        |                              (M3A-2152)
        |     + M3A-2154             : Materials associated with the 32185/32186/32192/32195/32196
        |                              Evaluation board (M3A-2154)
        |     + M3A-2191             : Connector Pitch Converter for M3A-2114 Evaluation board
        |                              and M32100T-EZ-E
        |     + M32100T-EZ-E         : Materials associated with the Emulator for M32R
        |     + M3A-2145             : Manual for Flash memory reprogramming kit (Ufla32r)
        |     + Discontinued_model   : Materials associated with the discontinued boards (M3A-2195)
        |
        + Manual                     : M32R/ECU manuals, data sheets, M32R Family
        |                              software manuals
        + SampleProgram              : Application notes and listed object/source files
```

1.1 Acrobat

The CD-ROM contains files necessary to read manuals (PDF files). The documents included in the CD-ROM have been verified to be displayed and printed using the following versions of Acrobat. If you have trouble displaying or printing documents with other Acrobat versions, install the appropriate Acrobat version from the CD-ROM into your computer.

```
(English version)
    Eng + AcrobatReader   + V3  + (For Windows95)
                          |       + Ar32e301.EXE          : PDF reader installation software
                          |       + Readme.txt            : README file
                          + V4  + (For Version4)
                          |       + ArR0ENG.EXE           : PDF reader installation software
                          |       + Readme.txt            : README file
                          + Win16e + (For Windows3.1)
                                  + AR16E301.EXE          : PDF reader installation software
                                  + Readme.txt            : README file


    (Japanese version)
    Jpn + AcrobatReader   + AR40JPN.EXE                   : PDF reader installation software
                          + Readme.txt                    : README file
```

1.2 Tool

(1) M3T-CC32R

M3T-CC32R (Cross Tool Kit for the M32R Family, trial version whose useful period is limited) is included. Its directory structure is shown below.

(English version)
Eng+Tool+Cc32r+

+ cc32rv501r00_ar.exe   : Setup programs for M3T-CC32R
+ rej10j0931_as32r_u.pdf : M3T-CC32R user's manual (Assembler)
+ rej10j0930_cc32r_u.pdf : M3T-CC32R user's manual (C Compiler)
+ mapue.pdf   : MAP Viewer user's manual

(Japanese version)
Jpn+Tool+Cc32r+

+ cc32rv501r00_ar.exe   : Setup programs for M3T-CC32R
+ as32ruj.pdf   : M3T-CC32R user's manual (Assembler)
+ cc32ruj.pdf   : M3T-CC32R user's manual (C Compiler)
+ mapuj.pdf   : MAP Viewer user's manual

(2) M3T-PD32RM

M3T-PD32RM (Debugger for M32100T-EZ-E) is included. This debugger software (Windows-compliant version) is used to control the microcomputer on the evaluation board from the host PC by connecting M32100T-EZ-E and the host PC with USB cable.
Its directory structure is shown below.

(English version)
Eng+Tool+Pd32rm+

+ pd32rmv301r00_e.exe   : Setup programs for M3T-PD32RM
+ rej10j1494_pd32rm_n.pdf: M3T-PD32RM release note

(Japanese version)
Jpn+Tool+Pd32rm+

+ pd32rmv301r00_j.exe   : Setup programs for M3T-PD32RM
+ rjj10j1800_pd32rm_n.pdf : M3T-PD32RM release note

(3)   M3S-KD32R (Discontinued)

M3S-KD32R (Debugger for the Starter Kit) is included. This debugger software (Windows -compliant version) is used to control the microcomputer on the evaluation board from the host PC by connecting it and the host PC with LPT parallel cable through the M3A-2195 (SDI Interface Board). Its directory structure is shown below.

(English version)
Eng+Tool+Kd32r+

             + KD32RNE.pdf   : M3S-KD32R release note
             + W95E   : Setup programs for M3S-KD32R

(Japanese version)
Jpn+Tool+Kd32r+

             + KD32RNJ.pdf   : M3S-KD32R release note
             + W95J   : Setup programs for M3S-KD32R

(4)   M3S-UFLA32R

M3S-UFLA32R is included. M3S-UFLA32R is the software to program into internal flash memory on M32R/ECU series 3217x, 3218x Group microcomputers from Windows version personal computer(PC/AT), by using UART communication. Its directory structure is shown below.

(English version)
Eng+Tool+Ufla32r+

             + rej10b0239_ufla32rum.pdf: M3S-UFLA32R user's manual
             + W95E   : Setup programs for M3S-UFLA32R

(Japanese version)
Jpn+Tool+Ufla32r+

             + rjj10b0232_ufla32rum.pdf: M3S-UFLA32R user's manual
             + W95J   : Setup programs for M3S-UFLA32R

(5) Oldversion

Old versions of tools are included.

Its directory structure is shown below.

(English version)

Eng+Tool+Oldversion+

+ Cc32rv43	: Objects for M3T-CC32R Version 4.3
+ Cc32rv50	: Objects for M3T-CC32R Version 5.0
+ Pd32rmv3	: Objects for M3T-PD32RM Version 3
+ Kd32rv3	: Objects for M3S-KD32R Version 3
+ Ufla32rv13	: Objects for M3S-UFLA32R Version 1.3

(Japanese version)

Jpn+Tool+Oldversion+

+ Cc32rv43	: Objects for M3T-CC32R Version 4.3
+ Cc32rv50	: Objects for M3T-CC32R Version 5.0
+ Pd32rmv3	: Objects for M3T-PD32RM Version 3
+ Kd32rv3	: Objects for M3S-KD32R Version 3
+ Ufla32rv13	: Objects for M3S-UFLA32R Version 1.3

1.3 Manual

The M32R Family related manuals and data sheets are included in PDF file format.

(English version)
Eng + Manual +

+ Readme_e.txt	: README file
+ e32rsm.pdf	: M32R Family software manual
+ rej09b0112_32fpusm.pdf	: M32R-FPU software manual
+ e32170um.pdf	: 32170/32174 Group user's manual
+ e32172um.pdf	: 32172/32173 Group user's manual
+ rej06b0048_32180um.pdf	: 32180 Group user's manual
+ rej09b0014_32182um.pdf	: 32182 Group user's manual
+ rej09b0015_32171um.pdf	: 32171 Group user's manual
+ rej09b0067_32176hm.pdf	: 32176 Group hardware manual
+ rej09b0123_32192_195_196hm.pdf: 32192/32195/32196 Group hardware manual
+ rej09b0235_32185_186hm.pdf	: 32185/32186 Group hardware manual

(Japanese version)
Jpn + Manual +

+ Readme_j.txt	: README file
+ j32rsm.pdf	: M32R Family software manual
+ rjj09b0107_32fpusm.pdf	: M32R-FPU software manual
+ j32170um.pdf	: 32170/32174 Group user's manual
+ j32171um.pdf	: 32171 Group user's manual
+ j32172um.pdf	: 32172/32173 Group user's manual
+ j32180um.pdf	: 32180 Group user's manual
+ rjj09b0001_32176um.pdf	: 32176 Group user's manual
+ rjj09b0053_32182um.pdf	: 32182 Group user's manual
+ rjj09b0099_32192hm.pdf	: 32192/32195/32196 Group hardware manual
+ rjj09b0246_32185_186hm.pdf	: 32185/32186 Group hardware manual
+ 32470210j.pdf	: Errata table for 32182 Group user's manual
+ 32580401j.pdf	: Errata table for 32170/32174 Group user's manual
+ 32590401j.pdf	: Errata table for 32171 Group user's manual
+ 32630402j.pdf	: Errata table for 32180 Group user's manual
+ 32680404j.pdf	: Errata table for 32172/32173 Group user's manual

1.4 Board Related Manual (Document)

The product standards, part list, connection diagrams and user's manuals for the evaluation board in Starter Kit are included in PDF file format.

(1) M3A-2114 Evaluation Board related documents

The related documents for the 32170/32171/32172/32173/32174 Group Evaluation Board are included in PDF file format.

(English version)
Eng+Document+M3A-2114+

```
                    + Readme_e.txt     : README file
                    + 2114um_e.pdf     : M3A-2114 Starter Kit use's manual
                    + 2114g02sk_e.pdf : M3A-2114G02 product standards
                    + 2114g12sk_e.pdf : M3A-2114G12 product standards
                    + 2114g22sk_e.pdf : M3A-2114G22 product standards
                    + cdrom_e.pdf      : Content list of CD-ROM
```

(Japanese version)
Jpn+Document+M3A-2114+

```
                    + Readme_j.txt              : README file
                    + rjj10b0235_2114um.pdf     : M3A-2114 Starter Kit use's manual
                    + 2114g02sk_j.pdf           : M3A-2114G02 product standards
                    + 2114g12sk_j.pdf           : M3A-2114G12 product standards
                    + rjj10b0236_2114g22sk.pdf : M3A-2114G22 product standards
                    + cdrom_j.pdf               : Content list of CD-ROM
```

(2) M3A-2142 Evaluation Board related documents

The related documents for the function extension board and the 32180/32182 Group Evaluation Board are included in PDF file format.

(English version)
Eng+Document+M3A-2142+

```
                    + Readme_e.txt             : README file
                    + rej10b0233_2142um.pdf    : M3A-2142 Starter Kit use's manual
                    + rej10b0232_2142g01sk.pdf: M3A-2142G01 product standards
                    + rej10b0230_2142g03sk.pdf: M3A-2142G03 product standards
                    + cdrom_e.pdf              : Content list of CD-ROM
```

(Japanese version)
Jpn+Document+M3A-2142+

```
                    + Readme_j.txt             : README file
                    + rjj10b0243_2142um.pdf    : M3A-2142 Starter Kit use's manual
                    + rjj10b0242_2142g01sk.pdf : M3A-2142G01 product standards
                    + rjj10b0240_2142g03sk.pdf : M3A-2142G03 product standards
                    + cdrom_j.pdf              : Content list of CD-ROM
```

(3) M3A-2152 Evaluation Board related documents
   The related documents for the 32176 Group Evaluation Board are included in PDF file format.

   (English version)
      Eng+Document+M3A-2152+
                              + Readme_e.txt   : README file
                              + rej10b0224_2152um.pdf   : M3A-2152 Starter Kit use's manual

   (Japanese version)
      Jpn+Document+M3A-2152+
                              + Readme_j.txt   : README file
                              + rjj10b0233_2152um.pdf   : M3A-2152 Starter Kit use's manual

(4) M3A-2154 Evaluation Board related documents
   The related documents for the 32185/32186/32192/32195/32196 Group Evaluation Board are included in PDF file format.

   (English version)
      Eng+Document+M3A-2154+
                              + Readme_e.txt   : README file
                              + rej10b0223_2154um.pdf   : M3A-2154 Starter Kit use's manual

   (Japanese version)
      Jpn+Document+M3A-2154+
                              + Readme_j.txt   : README file
                              + rjj10b0231_2154um.pdf   : M3A-2154 Starter Kit use's manual

(5) M32100T-EZ-E related documents
   M32100T-EZ-E documents are included in PDF file format.

   (English version)
      Eng+Document+M32100T-EZ-E+
                          + Readme_e.txt   : README file
                          + rej10j0002_m32100teze_u.pdf : M32100T-EZ-E use's manual
                          + rej10j0013_m32100teze_s.pdf : M32100T-EZ-E release note

   (Japanese version)
      Jpn+Document+M32100T-EZ-E+
                          + Readme_j.txt   : README file
                          + rjj10j0002_m32100teze_u.pdf : M32100T-EZ-E use's manual
                          + rjj10j0014_m32100teze_s.pdf : M32100T-EZ-E release note

(6) M3A-2191 Pitch Converter related documents

The M3A-2114 Evaluation Board and M3A-2195 Interface Board connecting pitch converter related documents are included in PDF file format.

(English version)
Eng+Document+M3A-2191+

+ Readme_e.txt	: README file
+ rej10b0228_2191sk.pdf	: M3A-2191 product standards
+ cdrom_e.pdf	: Content list of CD-ROM

(Japanese version)
Jpn+Document+M3A-2191+

+ Readme_j.txt	: README file
+ rjj10b0237_2191sk.pdf	: M3A-2191 product standards
+ cdrom_j.pdf	: Content list of CD-ROM

(7) M3A-2145 Evaluation Board related documents

The related documents for the M3S-UFLA32R are included in PDF file format.

(English version)
Eng+Document+M3A-2145+

+ Readme_e.txt	: README file
+ 2145g50sk_e.pdf	: M3A-2145G50 product standards
+ 2145g02sk_e.pdf	: M3A-2145G02 product standards
+ 2145g50p_e.pdf	: M3A-2145G50 part list
+ 2145g02p_e.pdf	: M3A-2145G02 part list
+ cdrom_e.pdf	: Content list of CD-ROM

(Japanese version)
Jpn+Document+M3A-2145+

+ Readme_j.txt	: README file
+ 2145g50sk_j.pdf	: M3A-2145G50 product standards
+ 2145g02sk_j.pdf	: M3A-2145G02 product standards
+ 2145g50p_j.pdf	: M3A-2145G50 part list
+ 2145g02p_j.pdf	: M3A-2145G02 part list
+ cdrom_j.pdf	: Content list of CD-ROM

(8) M3A-2195 SDI Interface Board related documents (Discontinued)
The SDI Interface Board documents are included in PDF file format.

(English version)
Eng+Document+Discontinued_model+M3A-2195+
+ Readme_e.txt   : README file
+ 2195g50sk_e.pdf : M3A-2195G50 product standards
+ 2195c_e.pdf   : M3A-2195 Evaluation Board connection diagram
+ 2195p_e.pdf   : M3A-2195 part list
+ 2195g50p_e.pdf : M3A-2195G50 part list
+ 2195um_e.pdf   : M3A-2195 user's manual
+ cdrom_e.pdf   : Content list of CD-ROM

(Japanese version)
Jpn+Document+Discontinued_model+M3A-2195+
+ Readme_j.txt   : README file
+ 2195g50sk_j.pdf : M3A-2195G50 product standards
+ 2195c_j.pdf   : M3A-2195 Evaluation Board connection diagram
+ 2195p_j.pdf   : M3A-2195 part list
+ 2195g50p_j.pdf : M3A-2195G50 part list
+ 2195um_j.pdf   : M3A-2195 user's manual
+ cdrom_j.pdf   : Content list of CD-ROM

(9) M3A-2128 Evaluation Board related documents (Discontinued)
The related documents for the 32170 Group Evaluation Board are included in PDF file format.

(Japanese version)
Jpn+Document+Discontinued_model+M3A-2128+
+ Readme_j.txt   : README file
+ 2128im_j.pdf   : M3A-2128 installation manual
+ 2128um_j.pdf   : M3A-2128 Starter Kit user's manual
+ 2128sk_j.pdf   : M3A-2128 product standards
+ 2128g50p_j.pdf : M3A-2128G50 part list
+ cdrom_j.pdf   : Content list of CD-ROM

(10) M3A-2154 Evaluation Board related documents (Discontinued)
The related documents for the 32192 Group Evaluation Board are included in PDF file format.

(English version)
Eng+Document+Discontinued_model+M3A-2154G52A+
+ Readme_e.txt   : README file
+ 2154g52aum_e.pdf : M3A-2154 Starter Kit user's manual
+ 2154g02sk_e.pdf   : M3A-2154G02 product standards

(Japanese version)
Jpn+Document+Discontinued_model+M3A-2154G52A+
+ Readme_j.txt   : README file
+ 2154g52aum_j.pdf   : M3A-2154 Starter Kit user's manual
+ rjj10b0244_2154g02sk.pdf : M3A-2154G02 product standards

(11) M3A-2142G04 Board related documents (Discontinued)
The related documents for the MCU pin processing Board are included in PDF file format.

(English version)
Eng+Document+Discontinued_model+M3A-2142G04+

    + Readme_e.txt   : README file
    + rej10b0231_2142g04sk.pdf : M3A-2142G04 product standards
    + cdrom_e.pdf   : Content list of CD-ROM

(Japanese version)
Jpn+Document+Discontinued_model+M3A-2142G04+

    + Readme_j.txt   : README file
    + rjj10b0241_2142g04sk.pdf : M3A-2142G04 product standards
    + cdrom_j.pdf   : Content list of CD-ROM

1.5   Sample Program

The application notes, the object and source files of sample programs for the M32R/ECU's peripheral functions to be written into the M32R/ECU's internal flash memory that can be used on the Evaluation Board for Starter kit, are included in the CD-ROM

(English version)
    Eng+SampleProgram+
                + 32170_32171   : 32170/32171 Group application notes and sample programs
                + 32172_32173   : 32172/32173 Group application notes and sample programs
                + 32176   : 32176 Group application notes and sample programs
                + 32180_32182   : 32180/32182 Group application notes and sample programs
                + 32185_32186   : 32185/32186 Group application notes and sample programs
                + 32192_32195_32196 : 32192/32195/32196 Group application notes and
                                                  sample programs

(Japanese version)
    Jpn+SampleProgram+
                + Readme.html   : README file
                + 32170_32171   : 32170/32171 Group application notes and sample programs
                + 32172_32173   : 32172/32173 Group application notes and sample programs
                + 32176   : 32176 Group application notes and sample programs
                + 32180_32182   : 32180/32182 Group application notes and sample programs
                + 32185_32186   : 32185/32186 Group application notes and sample programs
                + 32192_32195_32196 : 32192/32195/32196 Group application notes and
                                                  sample programs

Appendix 2   Part List

A part list is provided in following pages for your reference.

Handling		Classification		No.		Title		Division in charge
		Part List		**PPL-M3A-2152G52A**		**M3A-2152G52A**		
Created				Revision				
Checked								

	Part Name			Part Specification			Supply Classification	Remarks
Item No.	Description	Part No.	Part Type Name (Drawing No.,Product Specification)	Manufacturer Name	Mounting Direction	Required Q'ty per Unit		
1	M32R/ECU#4NL Evaluation board	PLL-M3A-2152G02	M3A-2152G02			1		
2	Emulator for 32176 Group MCU		M32100T-EZ-E			1		
3	USB cable					1		
4	10-pin flat cable					1		
5	CD-ROM					1		
6	IMPORTANT-READ ME FIRST					1		
7	M32R/ECU Starter kit Release note					1		
*								

Special note:

Special note:
(1) Blank columns denote the same content as the upper row.
(2) If two or more part type names are written for one part, the upper row has priority.
(3) The asterisk (*) in the item No. column denotes that the rest is blank.

PLL-M3A-2152G52A　（1 / 1）

Handling		Classification **Part List**	No. **PPL-M3A-2152G52**		Title **M3A-2152G52**			Division in charge
Created			Revision					
Checked								

	Part Name		Part Specification			Required Q'ty per Unit	Supply Classification	Remarks
Item No.	Description	Part No.	Part Type Name (Drawing No.,Product Specification)	Manufacturer Name	Mounting Direction			
1	M32R/ECU#4NL Evaluation board	PLL-M3A-2152G02	M3A-2152G02			1		
2	Simple Emulator probe	PLL-M3A-2195	M3A-2195			1		
3	5V power supply cable					1		
4	12V power supply cable					1		
5	Parallel cable					1		
6	10-pin flat cable					1		
7	CD-ROM					1		
8	IMPORTANT-READ ME FIRST					1		
9	M32R/ECU Starter kit Release note					1		
*								

Special note:
(1) Blank columns denote the same content as the upper row.
(2) If two or more part type names are written for one part, the upper row has priority.
(3) The asterisk (*) in the item No. column denotes that the rest is blank.

Special note:

PLL-M3A-2152G52   (1 / 1)

Appendix 3   M3A-2152G02 Product Standards

This manual describes how to operate the M3A-2152G02 (32176 Group Evaluation Board)

1. Overview

1.1 Outline of the Product

Table 1.1 Mounted Microcomputer Type

Mounted microcomputer type name	M32176F4VFP
Evaluation board type name (socket mounted type)	M3A-2152G02

Table 1.2 Specification of Product

| Operation mode	Single-chip mode, Processor mode and External extension mode
Board extension	Can be extended using the board's extension connector
CAN I/F	Comes standard with a 2-channel CAN connector, CAN modular cord included
RS-232C I/F	Comes standard with an RS-232C connector
Serial port	One of four channels can be selected using a rotary switch
Analog port	Inputs on two channels can be controlled using variable resistor (VR) controls
Display I/O	Comes with a single-port LED
Input I/O	Comes with a single-port toggle switch
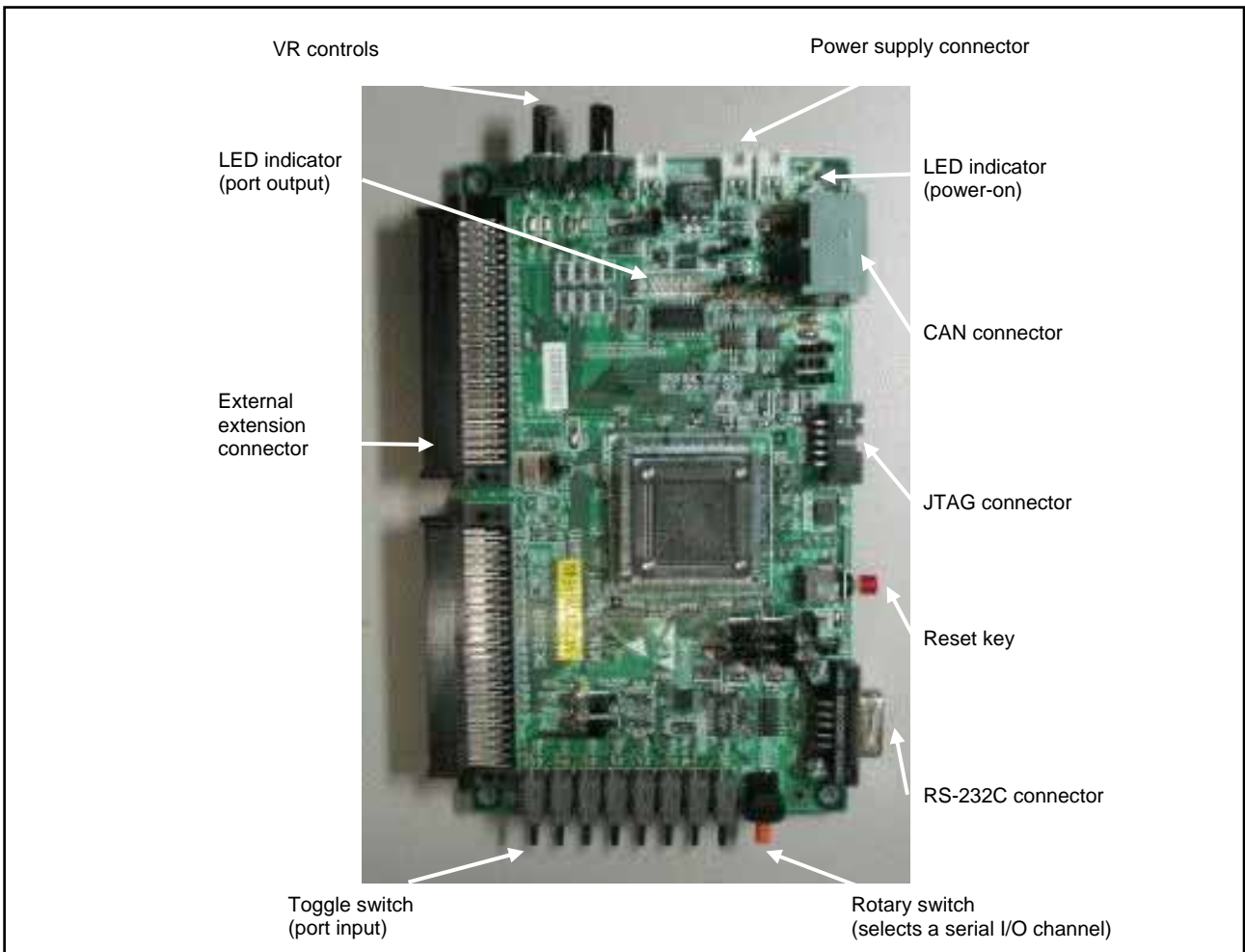
Figure 1.1 Photograph of the M3A-2152G02

1.2   External View

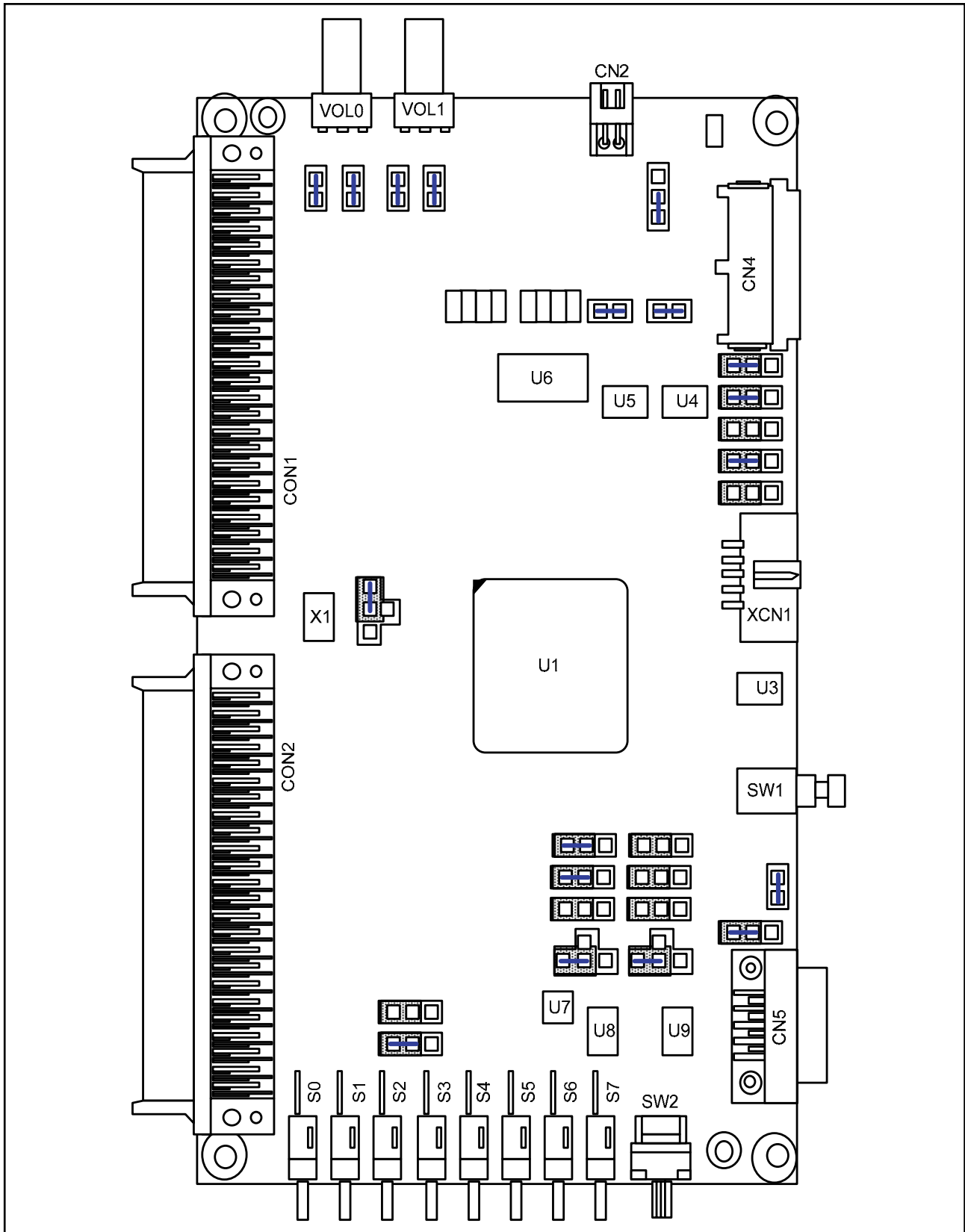An external view of the M3A-2152G02 is shown below.

Figure 1.2   External View of the M3A-2152G02

1.3 Block Diagram

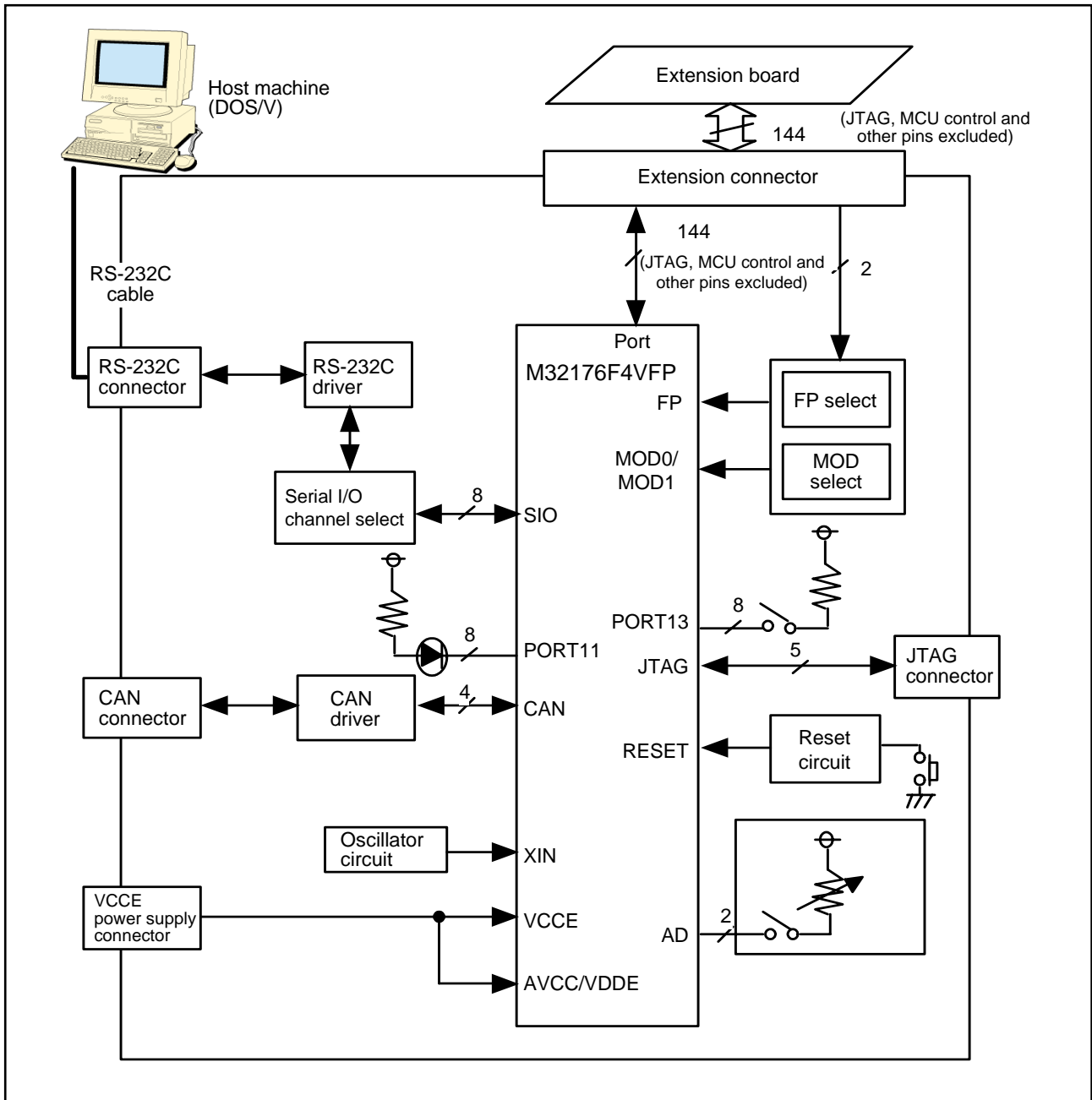A block diagram of the M3A-2152G02 is shown below.

Figure 1.3   Block Diagram of the M3A-2154G02A

1.4 Specifications of the Evaluation Board

1.4.1 Electrical Characteristics

Table 1.3   Electrical Characteristics

Symbol	Parameter	Rated Value
VCCE, AVCC	Power supply voltage	4.75 V to 5.25 V
Tstr	Storage ambient temperature	0°C to 70°C
Topr	Operating ambient temperature	0°C to 70°C

Note: Operating conditions require that no dewdrops and corrosive gas be present.

1.4.2 Functional Characteristics

Table 1.4   Functional Characteristic**s**

Item		M3A-2152G02
CPU		M32176F4VFP(U1)
		Clock input: 10 MHz; CPU clock: 40 MHz
Memory	Flash memory	512 KB
	SRAM	24 KB
RS-232C interface		Comes standard with a 9-pin Dsub connector (CN5) for serial communication with the host PC (DOS/V)
JTAG interface		Comes standard with an SDI connector (XCN1)
CAN interface		Comes standard with a 2-channel connector for CAN communication (CN4), a CAN-to-Dsub connector (9-pin) conversion cord included
Power supply	VCCE	Power supply, Connector (CN2)
	AVCC	Analog circuit power supply, Connector (CN1)
	LED	Illuminates in red when powered on (LED1)
General-purpose output		LED indicators (L0–L7), CPU ports (P110–P117)
General-purpose input		Toggle switches (S0–S7), CPU ports (P130–P137)
Reset		Reset switch (SW1), reset input (red pushbutton) ***Please be careful to configure a reset circuit according to your system.**
Serial I/O		Rotary switch (SW2), which selects one of four serial I/O channels
Analog input		VR controls (VOL0, VOL1) Connects these VR controls with AD0IN0 and AD0IN1 to use them to control inputs on ports
Extension		Extension connectors (CON1, CON2)

2. Functional Specifications

2.1 Configuration of the Power Supply

The power to the M32R/ECU can be supplied from two sources, AVCC and VCCE independently of each other. With default settings, the power to the M32R/ECU is fed through the VCCE power supply connector to all of its internal circuits.

Note: H1, TX1 and TX18 are not mounted but they only have patterns available.
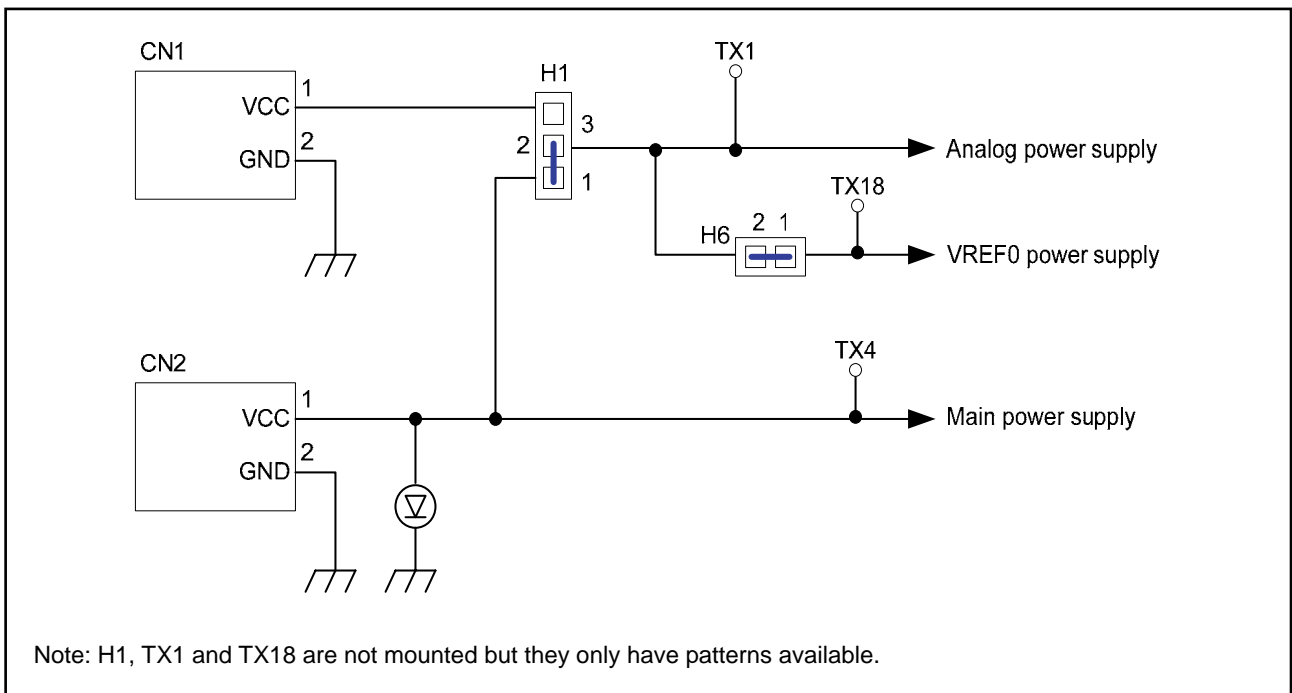
Figure 2.1   Power Supply Circuit

Table 2.1   Configuration of the Power Supply

Connector	Power Supply	Jumper			Description
		Name	Default	Condition	
CN1	AVCC	H1	○	Shorted between 1–2	Power supply from VCCE (CN2)
				Shorted between 2–3	Power supply from AVCC (CN1)
CN2	VCCE	—	—	—	VCCE power supply
—	VREF0	H6	○	Shorted between 1–2	Power supply from AVCC

Note: The H1 and H6 jumpers are shorted by soldering.

2.2 FP Select Circuit

The FP select circuit is used for reprogramming the internal flash memory of the M32R/ECU.
This circuit is configured in such a way that FP is switched from the EXTFP signal by using a jumper (J6).
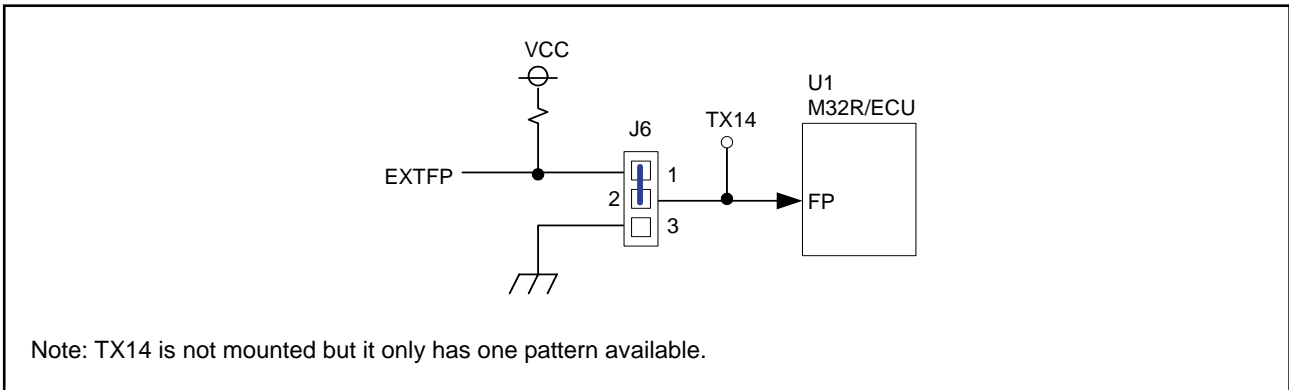
Figure 2.2   FP Select Circuit

Table 2.2   FP Select Circuit (Jumper)

Name	Default	Condition	Description
J6	○	Shorted between 1–2	Enables reprogramming the M32R/ECU's internal flash
		Shorted between 2–3	Disables reprogramming the M32R/ECU's internal flash
		Open	Unusable

Note: The J6 jumper is shorted by soldering.

2.3 MOD Select Circuit

This circuit is used to set operation modes of the M32R/ECU. The MOD0 power supply is configured in such a way that MOD0 is switched from the EXTMOD0 signal of extension connector (CON2) by using a jumper (J8).

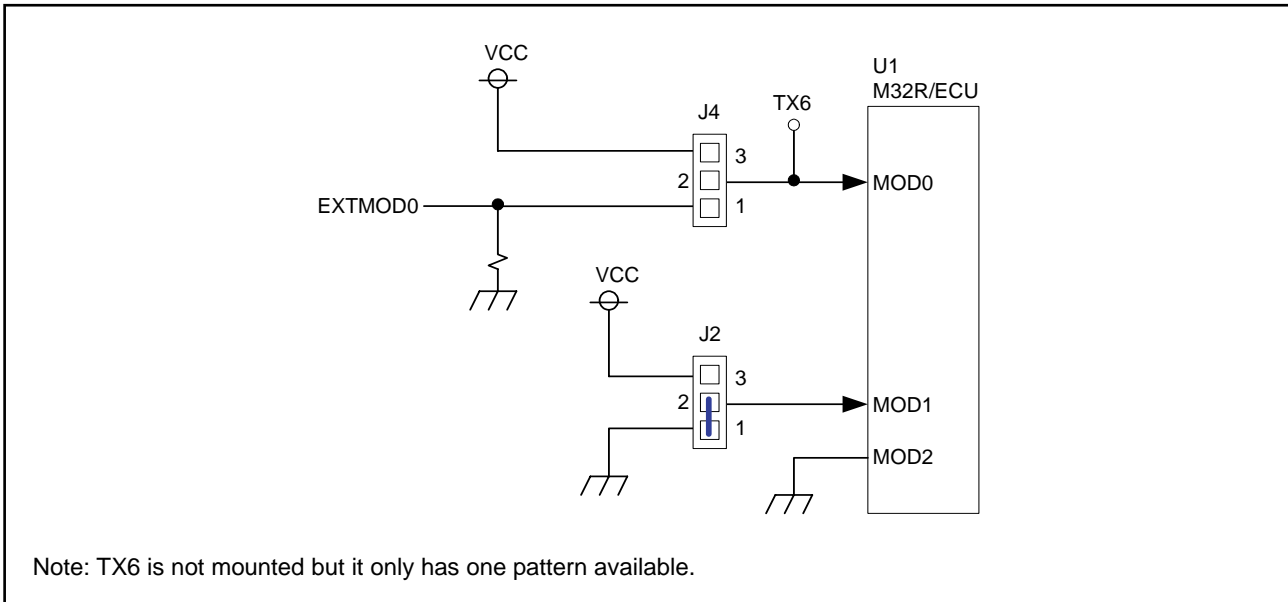The MOD1 power supply defaults to 0 V. The MOD2 power supply is fixed to 0 V.

Note: TX6 is not mounted but it only has one pattern available.

Figure 2.3   MOD Select Circuit

Table 2.3   Operation Mode Settings

MOD0	MOD1	MOD2	Function
0	0	0	• When flash reprogramming is disabled: Single-chip mode • When flash reprogramming is enabled: Flash rewrite + single-chip mode
1	0	0	• When flash reprogramming is disabled: Processor mode • When flash reprogramming is enabled: Boot model + flash E/W enable
0	1	0	External extension mode
1	1	0	Settings inhibited

Table 2.4   MOD Select Circuit (Jumper)

Name	Default	Condition	Description
J4	○	Shorted between 1–2	Controls MOD0 by EXTMOD0, unless control MOD0 by EXTMOD0 sets MOD0 to 0
		Shorted between 2–3	Sets MOD0 to 1
J2	○	Shorted between 1–2	Sets MOD1 to 0
		Shorted between 2–3	Sets MOD1 to 1

Note: The J2 jumper is shorted by soldering.

2.4 Serial I/O Interface

The evaluation board is interfaced to the host PC (DOS/V) through its RS-232C by using SIO of the M32R/ECU.
Of the RS-232C control signals, only TXD and RXD are used for connection to the host PC (DOS/V). The unused CTS and RTS are directly-coupled to configure a loop-back. The unused DSR and DTR also are configured in a similar manner. The serial I/O interface is configured in such a way that only one serial I/O channel can be used at a time.
Any of the four channels 0–3 can be selected using a rotary switch.
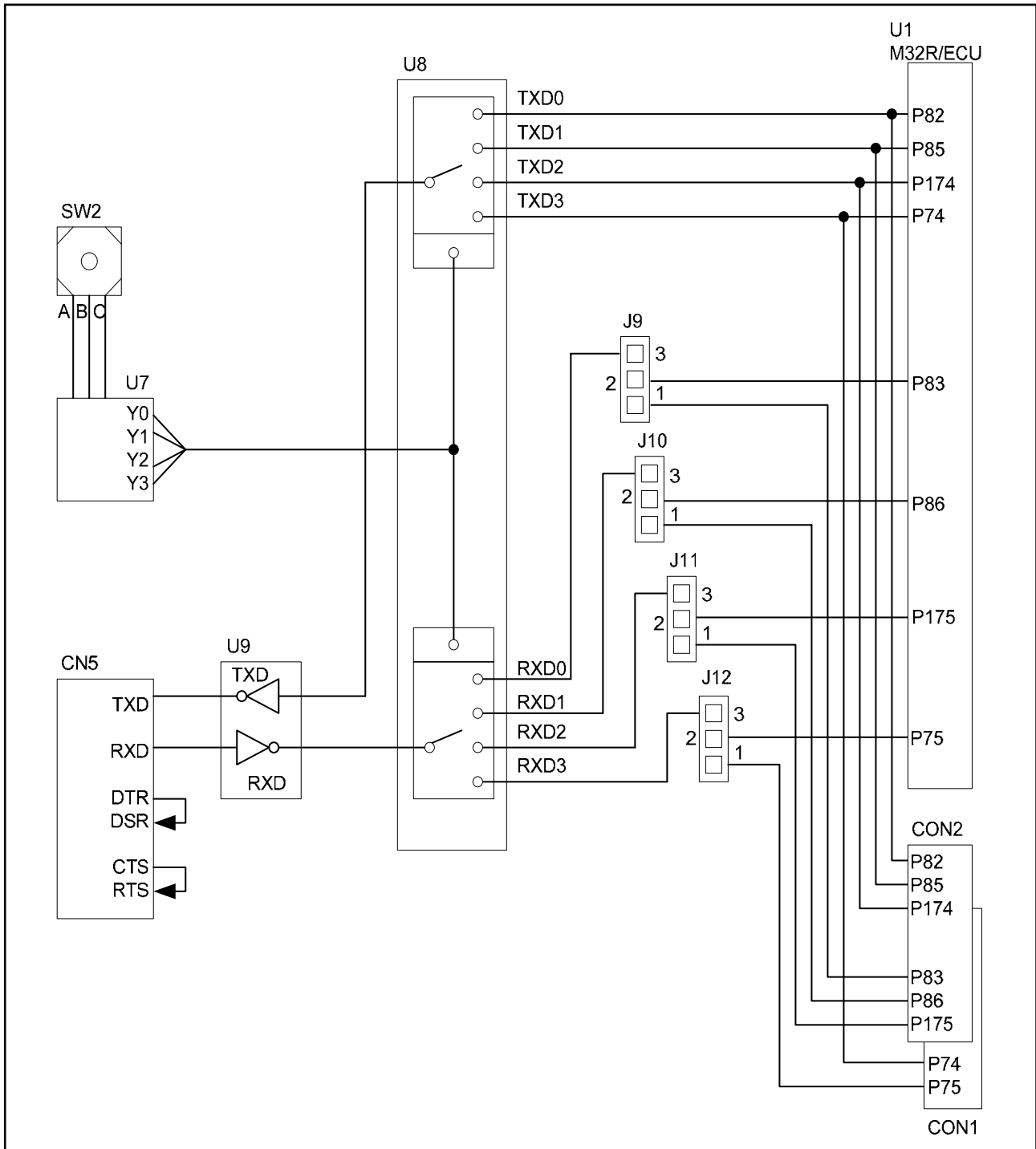

Figure 2.4　Serial I/O Interface

Table 2.5 Channel Selection by a Rotary Switch

Rotary switch position	SIO Selected channel
0	SIO0
1	SIO1
2	SIO2
3	SIO3

Table 2.6 Serial I/O Interface (Jumper)

Name	Default	Condition	Description
J9	○	Shorted between 1–2	Connects P83/RXD0 to the extension connector (CON2)
		Shorted between 2–3	Uses the RXD0 function in RS-232C
J10	○	Shorted between 1–2	Connects P86/RXD1 to the extension connector (CON2)
		Shorted between 2–3	Uses the RXD1 function in RS-232C
J11	○	Shorted between 1–2	Connects P175/RXD2 to the extension connector (CON2)
		Shorted between 2–3	Uses the RXD2 function in RS-232C
J12	○	Shorted between 1–2	Connects P75/RXD3 to the extension connector (CON1)
		Shorted between 2–3	Uses the RXD3 function in RS-232C

Table 2.7 RS-232C Connector Pin Assignments

Connector Name	Pin No	Signal Name	Description
CN5	1	DCD	Unused
	2	RXD	Received data
	3	TXD	Transmitted data
	4	DTR	Connects to the DSR pin
	5	SG	Ground
	6	DSR	Connects to the DTR pin
	7	RTS	Connects to the CTS pin
	8	CTS	Connects to the RTS pin
	9	RI	Unused

2.5 Oscillator Circuit

The oscillator circuit can be selected from three options by using the jumper J1: a surface mount-type 10 MHz crystal oscillator module, a DIP-type crystal oscillator module or a crystal resonator.

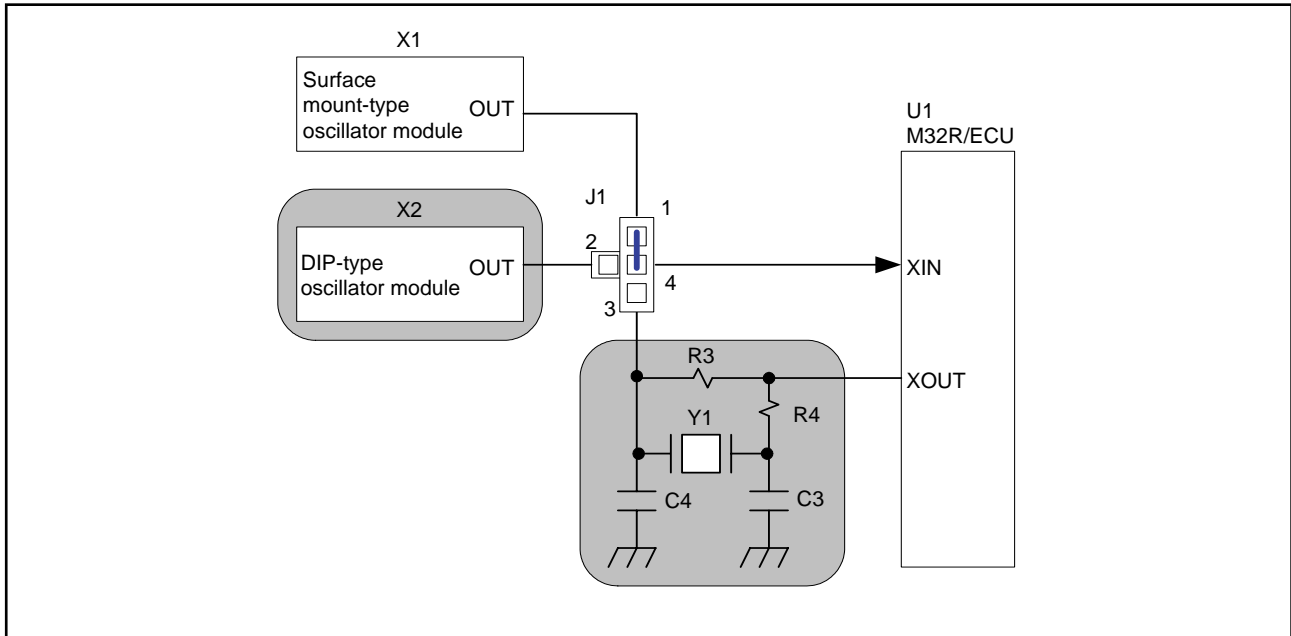By default, the surface mount-type 10 MHz crystal oscillator module is selected.

Figure 2.5   Oscillator Circuit

Note: The shaded sections in the above diagram have only patterns available. When using the resonator Y1, please be sure to add capacitors (C3, C4) and a resistor (R4).

Table 2.8   Oscillator Circuit Connections (Jumper)

Name	Default	Condition	Description
J1	○	Shorted between 1–4	Outputs a clock from X1 (surface mount-type oscillator module)
		Shorted between 2–4	Outputs a clock from X2 (DIP-type oscillator module)
		Shorted between 3–4	Outputs a clock from Y1 (resonator)

Note: The J1 jumper is shorted by soldering.

2.6 General-purpose Output Port LED Indicators

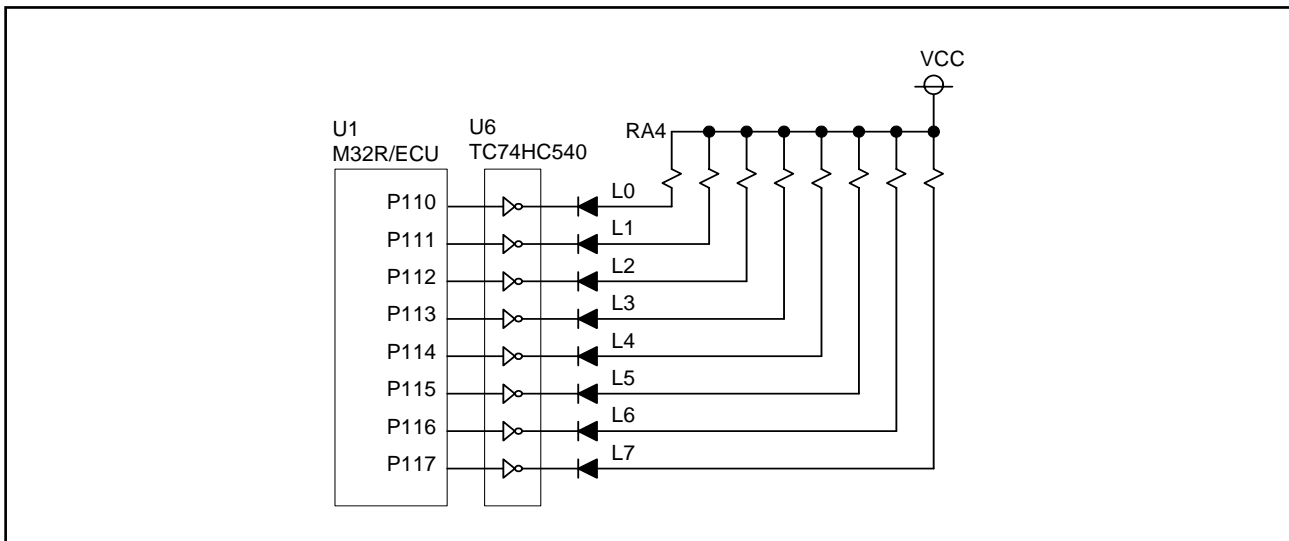The LED indicators (L0–L7) are used to indicate the status of the M32R/ECU ports P110–P117.

Figure 2.6   LED Indicator Block for the General-purpose Output Ports

Table 2.9   LED Indicators of General-purpose Output Ports

LED Name	Corresponding M32R/ECU Port	ON Condition	Color
L0	P110	High	Red
L1	P111	High	Red
L2	P112	High	Red
L3	P113	High	Red
L4	P114	High	Green
L5	P115	High	Green
L6	P116	High	Green
L7	P117	High	Green

2.7 General-purpose Input Port Control Circuit

The general-purpose input port control circuit is used to control the status of the M32R/ECU ports P130–P137 by using toggle switches (S0–S7).
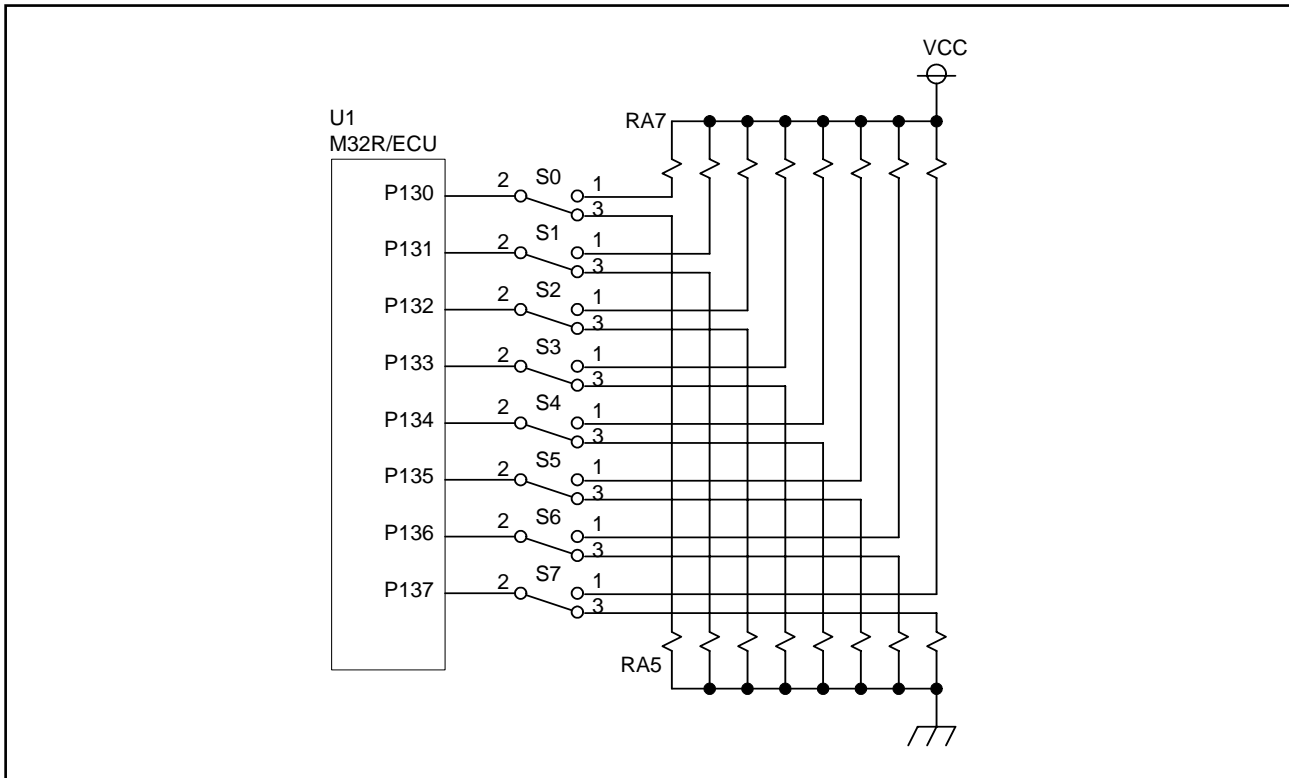

Figure 2.7   General-purpose Input Port Control Circuit

Table 2.10   Relationship Between Toggle Switches and Ports

Toggle Switch Name	Corresponding M32R/ECU Port
S0	P130
S1	P131
S2	P132
S3	P133
S4	P134
S5	P135
S6	P136
S7	P137

Table 2.11   Toggle Switch Positions

Lever Direction	Port Input Level
Up	High
Middle	Open
Down	Low

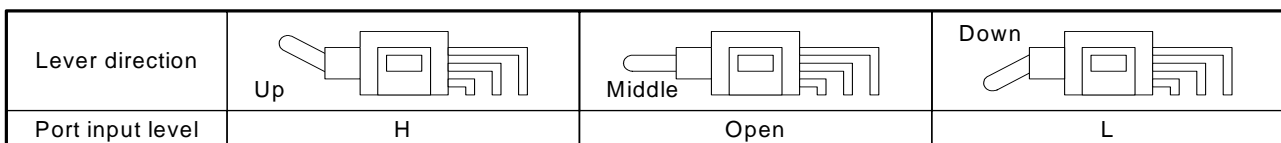| Lever direction	Up	Middle	Down
Port input level	H	Open	L

Figure 2.8   Toggle Switch Positions

2.8 Analog Port Input Control Circuit

The analog port input control circuit is used to control the status of the M32R/ECU ports AD0IN0 and AD0IN1 by using VR controls VOL0 and VOL1.
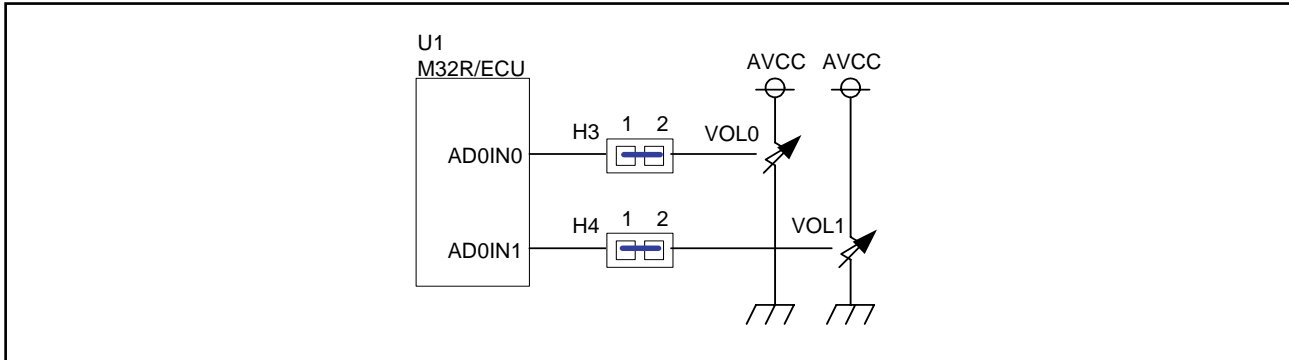

Figure 2.9   Analog Port Input Control Circuit

Table 2.12   Analog Port Input Control (Jumper)

Name	Default	Condition	Description
H3	○	Shorted between 1–2	Uses VR control (VOL0)
		Open between 1–2	Does not use VR control (VOL0)
H4	○	Shorted between 1–2	Uses VR control (VOL1)
		Open between 1–2	Does not use VR control (VOL1)

Note: The H3 and H4 jumpers are shorted by soldering.

2.9 CAN Interface

The evaluation board is interfaced to a CAN-mounted system by using the internal CAN functions of the M32R/ECU.
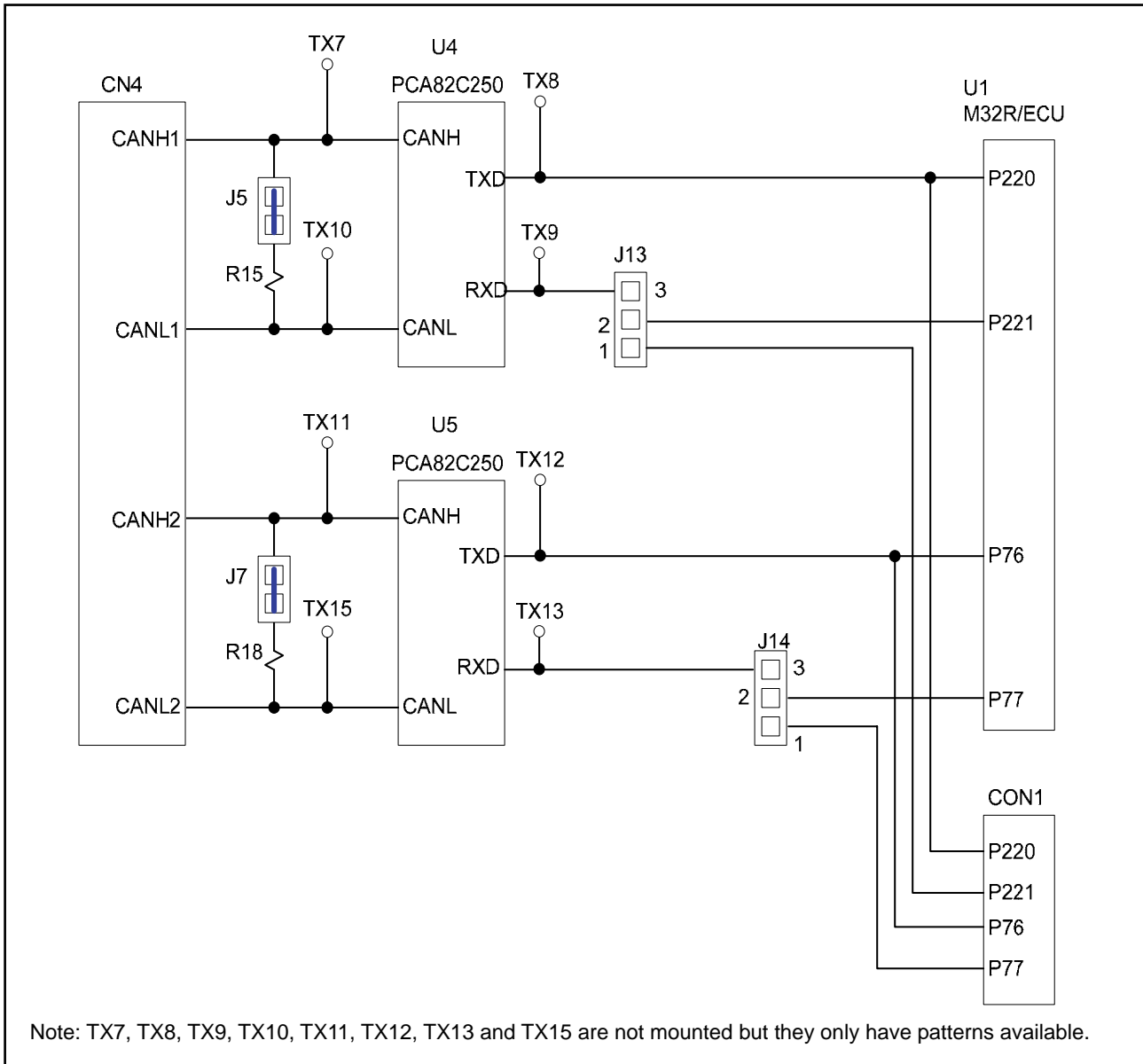

Note: TX7, TX8, TX9, TX10, TX11, TX12, TX13 and TX15 are not mounted but they only have patterns available.

Figure 2.10 Interface with a CAN-mounted System

Table 2.13   CAN Connector Pin Assignments

Connector Name	Pin No	Signal Name	Description
CN4	1	CANH1	High-level CAN0 input/output port
	2	CANL1	Low-level CAN0 input/output port
	3	CANH2	High-level CAN1 input/output port
	4	CANL2	Low-level CAN1 input/output port
	5	GND	Ground
	6	—	Free pin
	7	GND	Ground
	8	—	Free pin

(1)   How to connect the CAN connector

The jumpers J13 and J14 allow selecting the destinations to which the CAN communication pins (CTX, CRX) are connected.

Table 2.14   Jumper Usage Conditions (J13 and J14)

Name	Default	Condition	Description
J13	○	Shorted between 1–2	Connects P221 to the extension connector (CON1)
		Shorted between 2–3	Uses the CRX0 function
J14	○	Shorted between 1–2	Connects P77 to the extension connector (CON1)
		Shorted between 2–3	Uses the CRX1 function

(2)   How to select the terminating resistor connection

The jumpers J5 and J7 allow the terminating resistors to be used in the CAN transmission path

Table 2.15   Selecting the Terminating Resistor Connection (J5 and J7)

Name	Default	Condition	Description
J5	○	Shorted between 1–2	Uses the CAN0 terminating resistor mounted on-board
		Open between 1–2	Does not use the CAN0 terminating resistor mounted on-board
J7	○	Shorted between 1–2	Uses the CAN1 terminating resistor mounted on-board
		Open between 1–2	Does not use the CAN1 terminating resistor mounted on-board

Note: The jumpers J5 and J7 are shorted by soldering.

2.10 JTAG Peripheral Circuit

The evaluation board comes standard with a connector for Renesas SDI. This connector consists of the 2.54-mm contact pitch XG4C-1034 made by Omron Corporation.
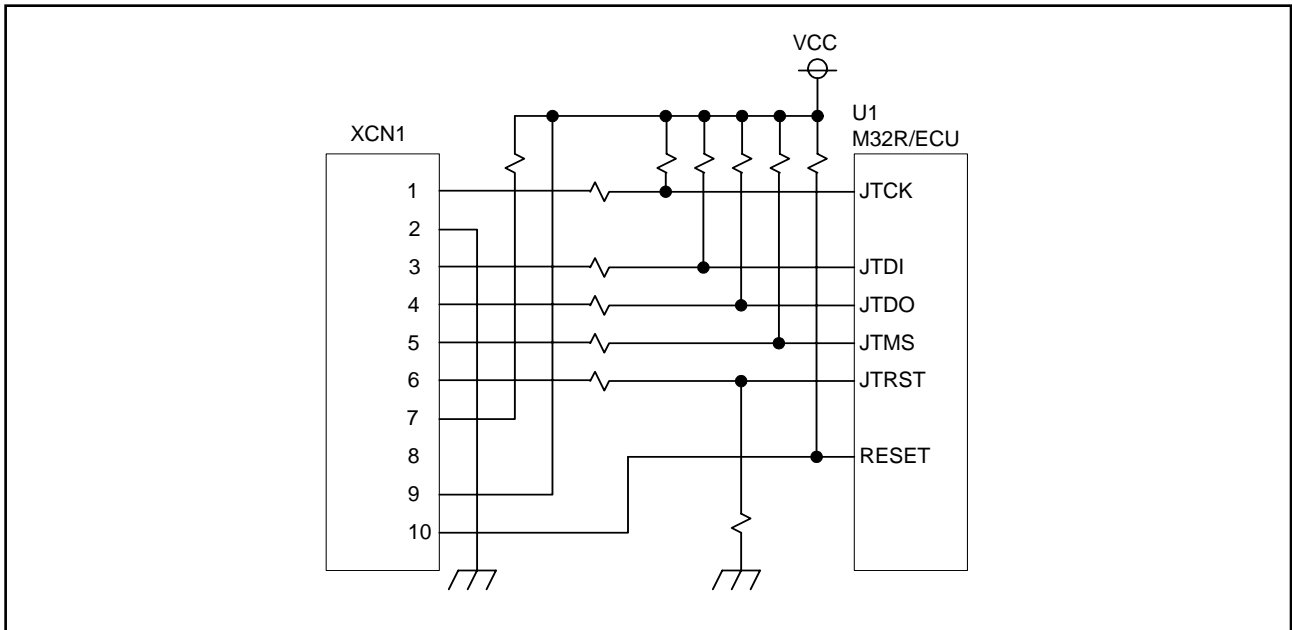

Figure 2.11 JTAG/NBD Interface

Table 2.16 JTAG Connector Pin Assignments

Connector Name	Pin No	Signal Name	Description
XCN1	1	JTCK	Test clock
	2	GND	Ground
	3	JTDI	Test data input
	4	JTDO	Test data output
	5	JTMS	Test mode select
	6	JTRST	Test reset
	7	JDBI	Break request
	8	VCC	Power supply
	9	JVCC	User system power supply monitor
	10	RESET	Reset

3. Reference Data

3.1 Jumper and Test Pin Lists

3.1.1 Jumpers

Table 3.1 Jumper List

Jumper No.	Default	Description
J1	Shorted between 1–4	Outputs a clock from X1 (surface mount-type oscillator module)
J2	Shorted between 1–2	Sets MOD1 to 0
J4	Shorted between 1–2	Controls MOD0 by EXTMOD0, unless control MOD0 by EXTMOD0 sets MOD0 to 0
J5	Shorted between 1–2	Uses the CAN0 terminating resistor mounted on-board
J6	Shorted between 1–2	Enables reprogramming the M32R/ECU's internal flash
J7	Shorted between 1–2	Uses the CAN1 terminating resistor mounted on-board
J9	Shorted between 1–2	Connects P83/RXD0 to the extension connector (CON2)
J10	Shorted between 1–2	Connects P86/RXD1 to the extension connector (CON2)
J11	Shorted between 1–2	Connects P175/RXD2 to the extension connector (CON2)
J12	Shorted between 1–2	Connects P75/RXD3 to the extension connector (CON1)
J13	Shorted between 1–2	Connects P221 to the extension connector (CON1)
J14	Shorted between 1–2	Connects P77 to the extension connector (CON1)
H1	Shorted between 1–2	Power supply from VCCE (CN2)
H3	Shorted between 1–2	Uses the VR control (VOL0)
H4	Shorted between 1–2	Uses the VR control (VOL1)
H6	Shorted between 1–2	Power supply from AVCC

3.1.2 Test Pins

Table 3.2 List of Test Pins

Test Pin No.	Signal Name	Test Pin No.	Signal Name
TX1	AVCC	TX10	CANL0
TX2	GND	TX11	CANH1
TX3	GND	TX12	CTX1
TX4	VCCE	TX13	CRX1
TX6	MOD0	TX14	FP
TX7	CANH0	TX15	CANL21
TX8	CTX0	TX16	TXD1
TX9	CRX0	TX18	VREF0

3.2 Extension Connectors CON1 and CON2

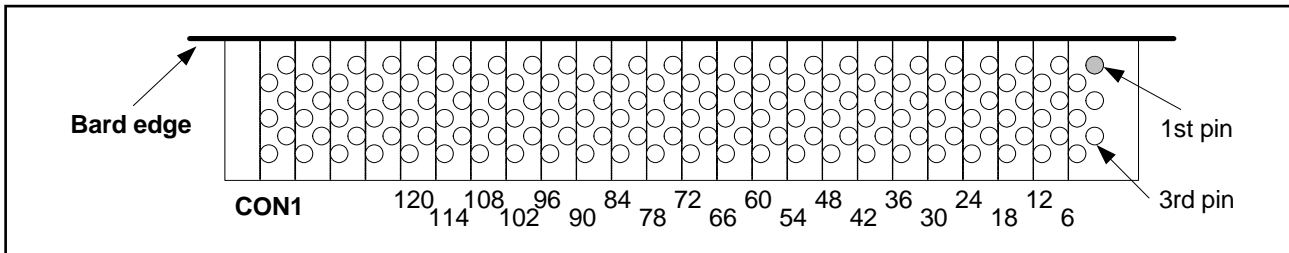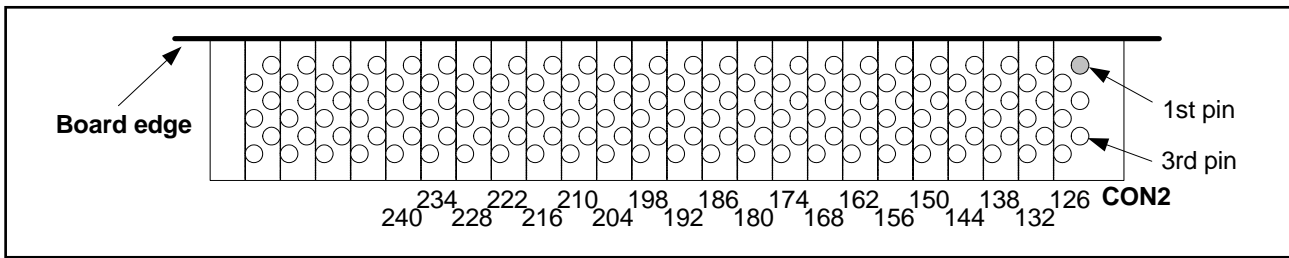### 3.2.1 Pin Assignments of the Extension Connector CON1

Figure 3.1 CON1 Connector Pin Assignments (View from Side of Mounted Items)

Table 3.3 CON1 Connector Pin Assignments

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1	AVCC	31	NC	61	VCCE	91	NC
2	GND	32	NC	62	GND	92	P124
3	VCCE	33	GND	63	AVCC0	93	P125
4	P150	34	NC	64	VREF0	94	P126
5	NC	35	RESET	65	AD0IN0	95	P127
6	NC	36	NC	66	AD0IN1	96	NC
7	P153	37	NC	67	AD0IN2	97	NC
8	NC	38	NC	68	AD0IN3	98	NC
9	NC	39	NC	69	AD0IN4	99	NC
10	NC	40	NC	70	AD0IN5	100	NC
11	NC	41	NC	71	AD0IN6	101	NC
12	NC	42	NC	72	AD0IN7	102	NC
13	NC	43	NC	73	GND	103	NC
14	NC	44	P74	74	AD0IN8	104	NC
15	NC	45	P75	75	AD0IN9	105	NC
16	P130	46	P76	76	AD0IN10	106	NC
17	P131	47	P77	77	AD0IN11	107	NC
18	P132	48	NC	78	AD0IN12	108	NC
19	P133	49	NC	79	AD0IN13	109	NC
20	P134	50	NC	80	AD0IN14	110	NC
21	P135	51	NC	81	AD0IN15	111	NC
22	P136	52	NC	82	P61	112	P110
23	P137	53	P100	83	P62	113	P111
24	P220	54	P101	84	P63	114	P112
25	P221	55	P102	85	SBI	115	P113
26	NC	56	P103	86	GND	116	P114
27	NC	57	P104	87	GND	117	P115
28	VCCE	58	P105	88	GND	118	P116
29	GND	59	P106	89	VCCE	119	P117
30	NC	60	P107	90	GND	120	P97

Note: NC denotes "Not Connected."

3.2.2 Pin Assignments of the Extension Connector CON2

Figure 3.2   CON2 Connector Pin Assignments (View from Side of Mounted Items)

Table 3.4   CON2 Connector Pin Assignments

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1 (121)	P96	31 (151)	NC	61 (181)	P174	91 (211)	P1
2 (122)	P95	32 (152)	NC	62 (182)	P175	92 (212)	P0
3 (123)	P94	33 (153)	NC	63 (183)	NC	93 (213)	GND
4 (124)	P93	34 (154)	VCCE	64 (184)	NC	94 (214)	P73
5 (125)	VCCE	35 (155)	GND	65 (185)	NC	95 (215)	P72
6 (126)	GND	36 (156)	NC	66 (186)	NC	96 (216)	P71
7 (127)	NC	37 (157)	NC	67 (187)	FP	97 (217)	P70
8 (128)	P27	38 (158)	NC	68 (188)	MOD0	98 (218)	P43
9 (129)	P26	39 (159)	NC	69 (189)	NC	99 (219)	P42
10 (130)	P25	40 (160)	NC	70 (190)	NC	100 (220)	P41
11 (131)	P24	41 (161)	NC	71 (191)	GND	101 (221)	NC
12 (132)	P23	42 (162)	NC	72 (192)	NC	102 (222)	GND
13 (133)	P22	43 (163)	NC	73 (193)	NC	103 (223)	NC
14 (134)	P21	44 (164)	NC	74 (194)	GND	104 (224)	NC
15 (135)	P20	45 (165)	NC	75 (195)	VCCE	105 (225)	NC
16 (136)	GND	46 (166)	NC	76 (196)	NC	106 (226)	NC
17 (137)	P37	47 (167)	NC	77 (197)	P17	107 (227)	NC
18 (138)	P36	48 (168)	NC	78 (198)	P16	108 (228)	NC
19 (139)	P35	49 (169)	NC	79 (199)	P15	109 (229)	NC
20 (140)	P34	50 (170)	NC	80 (200)	P14	110 (230)	NC
21 (141)	P33	51 (171)	NC	81 (201)	P13	111 (231)	GND
22 (142)	P32	52 (172)	NC	82 (202)	P12	112 (232)	NC
23 (143)	P31	53 (173)	NC	83 (203)	P11	113 (233)	NC
24 (144)	P30	54 (174)	NC	84 (204)	P10	114 (234)	NC
25 (145)	P47	55 (175)	P87	85 (205)	P7	115 (235)	NC
26 (146)	P46	56 (176)	P86	86 (206)	P6	116 (236)	NC
27 (147)	P225	57 (177)	P85	87 (207)	P5	117 (237)	NC
28 (148)	NC	58 (178)	P84	88 (208)	P4	118 (238)	NC
29 (149)	P45	59 (179)	P83	89 (209)	P3	119 (239)	NC
30 (150)	P44	60 (180)	P82	90 (210)	P2	120 (240)	NC

Note: NC denotes "Not Connected."

3.3 Modular Cord for CAN

(1) External view
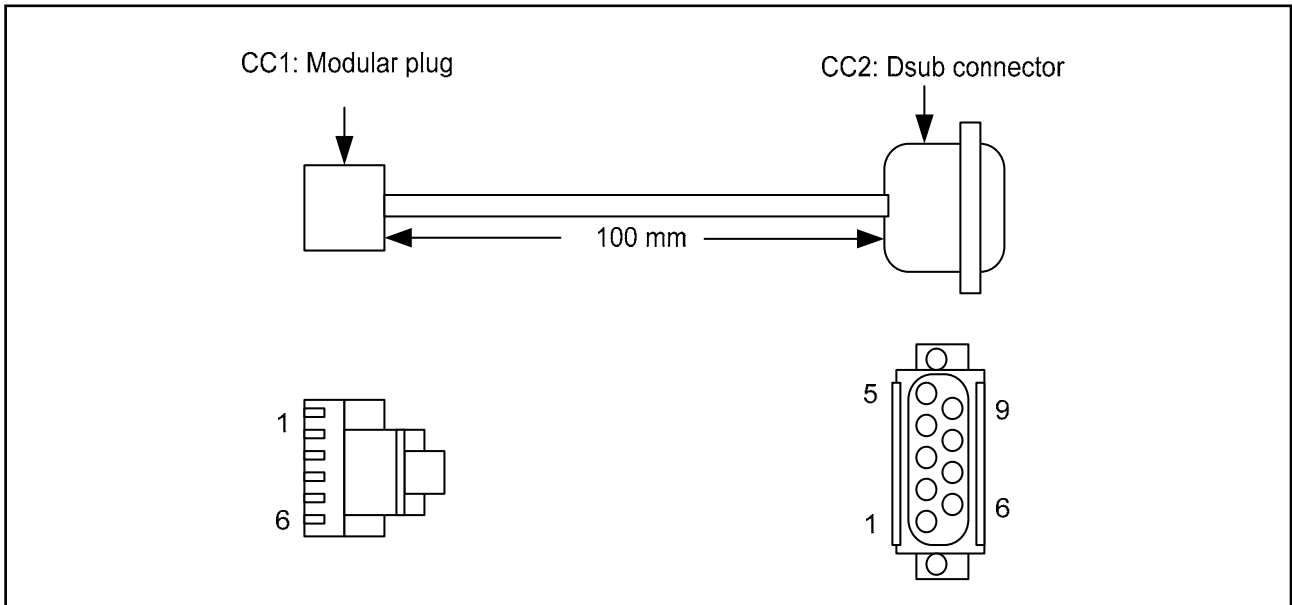
Figure 3.3   External View

(2) CC1 and CC2 connections
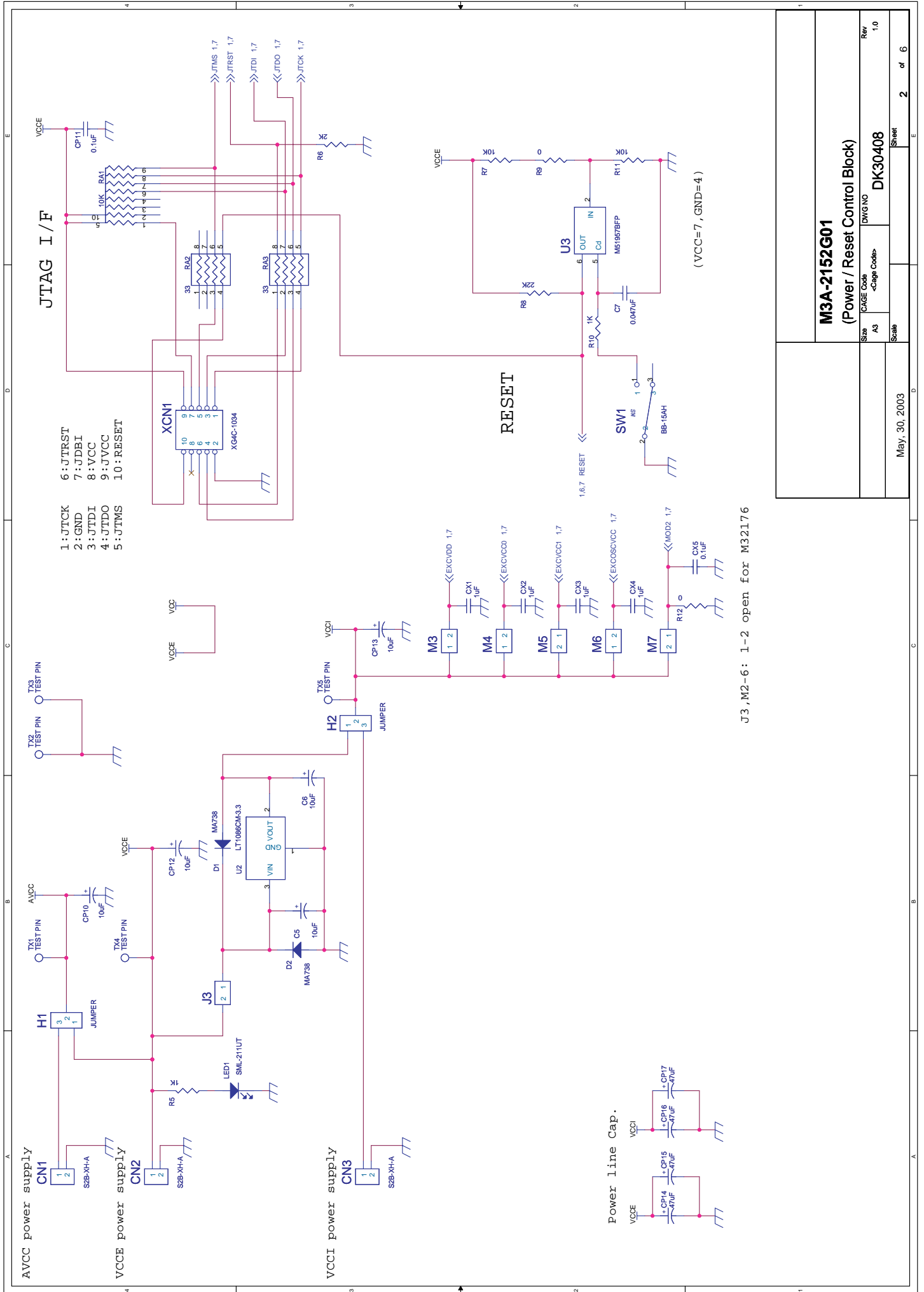
Table 3.5   Connection Table

CN1			CN2	
Pin No.	Pin Name		Pin Name	Pin No.
1	—		NC	1
2	CANL (blue)		CANL	2
3	—		GND	3
4	CANH (white)		NC	4
5	GND (black)		NC	5
6	—		NC	6
			CANH	7
			NC	8
			NC	9

3.4 Connection Diagram

A connection diagram is provided in following pages for your reference.

JTAG I/F

6:JTRST
7:JDBI
8:VCC
9:JVCC
10:RESET

1:JTCK
2:GND
3:JTDI
4:JTDO
5:JTMS

RESET

(VCC=7,GND=4)

J3,M2-6: 1-2 open for M32176

Power line Cap.

AVCC power supply
CN1

VCCE power supply
CN2

VCCI power supply
CN3

M32R/ECU MOD0 select S/W

TX6
TEST PIN

MOD0 1,7

J4
JUMPER
CP19 2.2uF
CP20 220pF
VCCE
R14 10K

6 EXTMOD0

M32R/ECU FP select S/W

TX14
TEST PIN

FP 1,7

J6
JUMPER
CP24 2.2uF
CP25 220pF
VCCE
R16 10K

6 EXTFP

TX9 TEST PIN
CTX0
CTX0 1,6,7
CRX0
CRX0 6
TX8 TEST PIN
VCCE
CP21 0.1uF

CAN I/F
U4
PCA82C250T
CANH TXD
CANL RXD
RS VCC
VREF GND

TX7 TEST PIN
R13 0
TX10 TEST PIN

J5
JUMPER
CP18 0.1uF(Open)
R15 120
CP22 0.1uF(Open)

TX13 TEST PIN
CTX1
CTX1 6
CRX1
CRX1 6
TX12 TEST PIN
VCCE
CP26 0.1uF

CAN I/F
U5
PCA82C250T
CANH TXD
CANL RXD
RS VCC
VREF GND

TX11 TEST PIN
R17 0
TX15 TEST PIN

J7
JUMPER
CP23 0.1uF(Open)
R18 120
CP27 0.1uF(Open)

CN4
1
2
3
4
5
6
7
8
TM2REA-1208

1:CANH1
2:CANL1
3:CANH2
4:CANL2
5:GND
6:
7:GND
8:

J4,J5,J6,J7:Default:1-2 Short

M3A-2152G01
(CAN IF / MOD0 / FP Select Block)
CAGE Code
<Cage Code>
Size A3
DWG NO DK30408
Rev 1.0
Sheet 3 of 6
Scale
May, 30, 2003

REJ10B0224-0310/Rev.3.10   Mar. 2008   Page 65 of 83
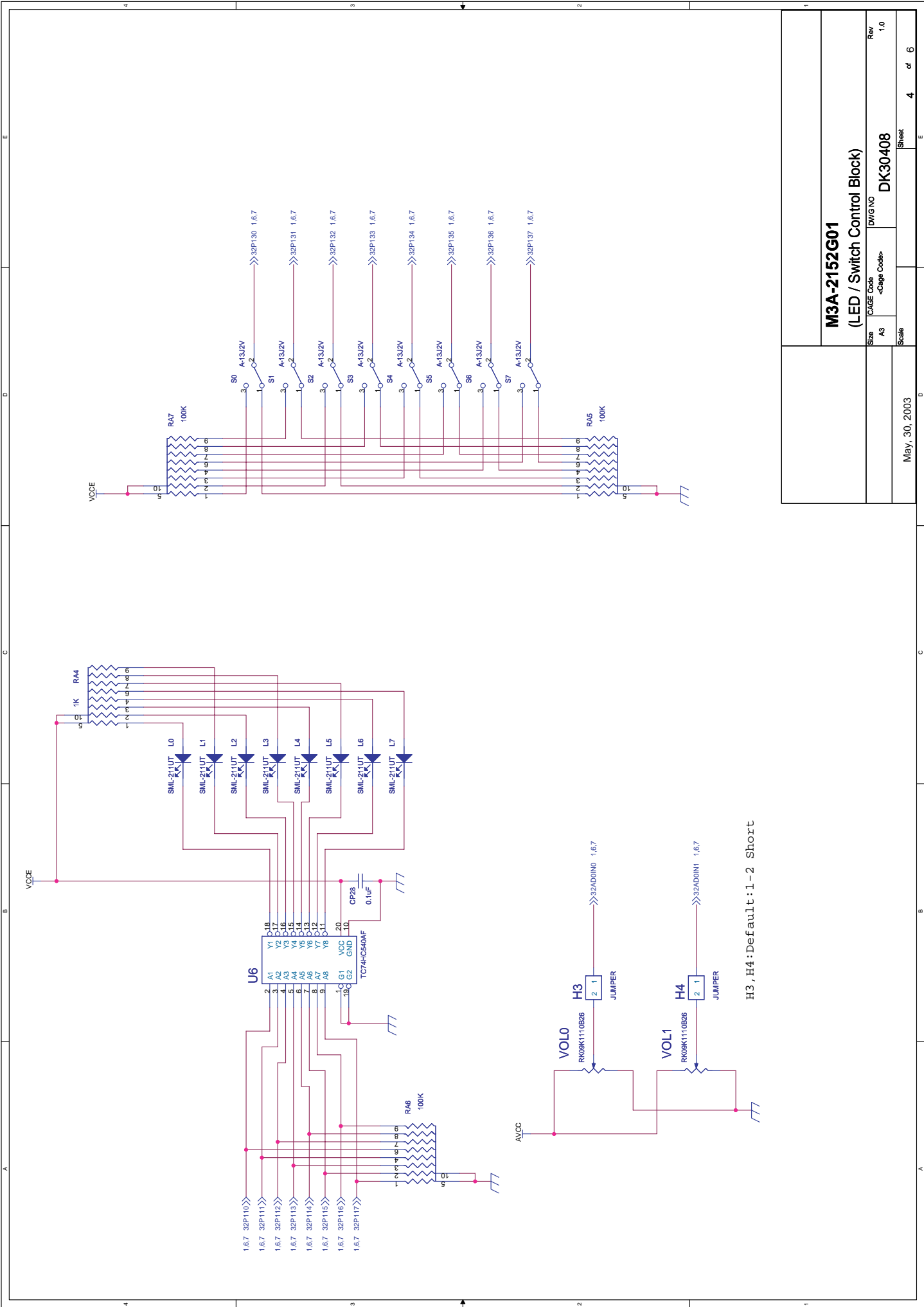
M3A-2152G01
(LED / Switch Control Block)

CAGE Code
<Cage Code>

DWG NO
DK30408

Rev
1.0

Size
A3

Scale

Sheet 4 of 6

May, 30, 2003

M3A-2152G01
(Serial IO IF Block)

Size A3
Scale
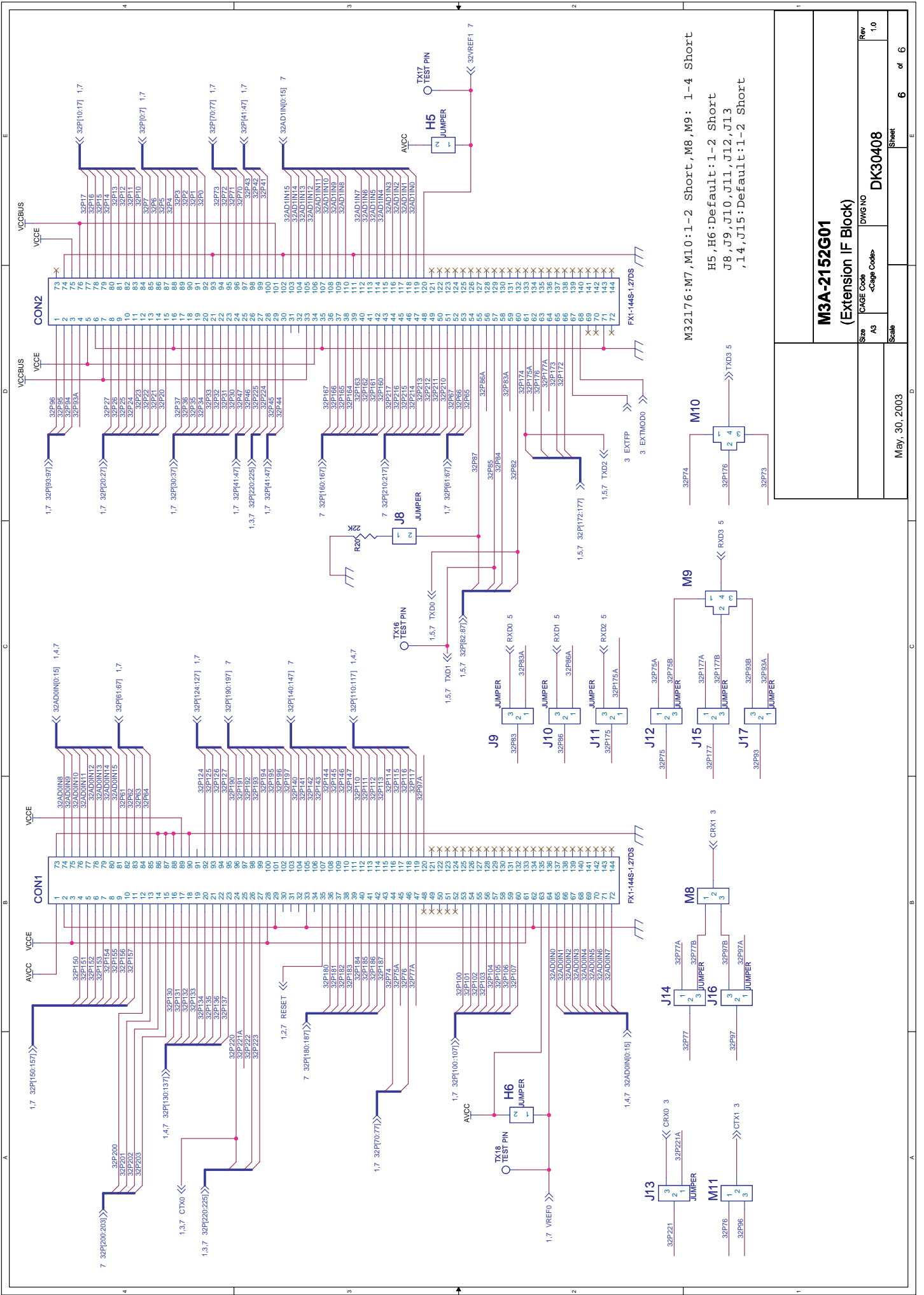
CAGE Code <Cage Code>
DWG NO DK30408

Rev 1.0

May, 30, 2003

RXD0 6
RXD1 6
RXD2 6
RXD3 6

U8
QS32X384Q1
(VCC=36,48,
GND=12,24)

VCC
CP30
0.1uF

RA8
100K

VCC

1,6,7 TXD0
1,6,7 TXD1
1,6,7 TXD2
6 TXD3

U7
TC74VHC138FT

VCC

VCC
CP29
0.1uF

RA9
100K

SW2
DR-KR10H

VCC

RS232C I/F

VCC
R19
10K

VCC
CP31
0.1uF

U9 (VCC=16, GND=15)
MAX3232CSE

C9 0.1uF
C11 0.1uF

C8 0.1uF
C10 0.1uF

CN5
XM2C-0912

1 : DCD
2 : RXD
3 : TXD
4 : DTR
5 : SG
6 : DSR
7 : RTS
8 : CTS
9 : RI

3.5　Part List

A part list is provided following pages for your reference.

Handling			Classification		No.	PPL-M3A-2152G02-B		Title		M3A-2152G02				Division in charge	
Created			**Part List**		Revision										
Checked															

	Part Name		Part Specification						
Item No.	Description	Part No.	Part Type Name (Drawing No.,Product Specification)	Manufacturer Name	Mounting Direction	Required Q'ty per Unit	Supply Classification	Remarks
1.	M32R/ECU#4NL	U1	M32176F4VFP	Renesas	Socket-mounted	1		
2.	Microcomputer socket		NQPACK144SD-ND	Tokyo eletec	Mounted directly	1		
3.			HQPACK144SD	Tokyo eletec	Mounted directly	1		
4.	Regulator	U2	LT1086CM-3.3	Linear	Not mounted	0		
5.	Reset IC	U3	M51957BFP	Renesas	Mounted directly	1		
6.	CAN driver IC	U4, 5	PCA82C250T	Philips	Mounted directly	2		
7.	LED driver IC	U6	TC74HC540AF	Toshiba	Mounted directly	1		
8.	Decoder IC	U7	TC74VHC138FT	Toshiba	Mounted directly	1		
9.	Bus switch IC	U8	QS32X384Q1G	IDT	Mounted directly	1		
10.	RS232C driver IC	U9	MAX3232CSE+	MAXIM	Mounted directly	1		
11.	Oscillator	X1	DS0751SB-10MHz	Daishinku	Mounted directly	1		
12.	Oscillator	X2	DOC-49S1(10MHz)	Daishinku	Not mounted	0		
13.	Resonator	Y1	CSA-10MTz(10MHz)	Murata	Not mounted	0		
14.	Switch (push type)	SW1	BB-15AH(right-angle type)	Nihon Kaiheiki	Mounted directly	1		
15.	Operating unit for SW1	For SW1	AT-475 (red color)	Nihon Kaiheiki	Mounted directly	1		

Special note:

Special note:
(1) Blank columns denote the same content as the upper row.
(2) If two or more part type names are written for one part, the upper row has priority.
(3) The asterisk (*) in the item No. column denotes that the rest is blank.
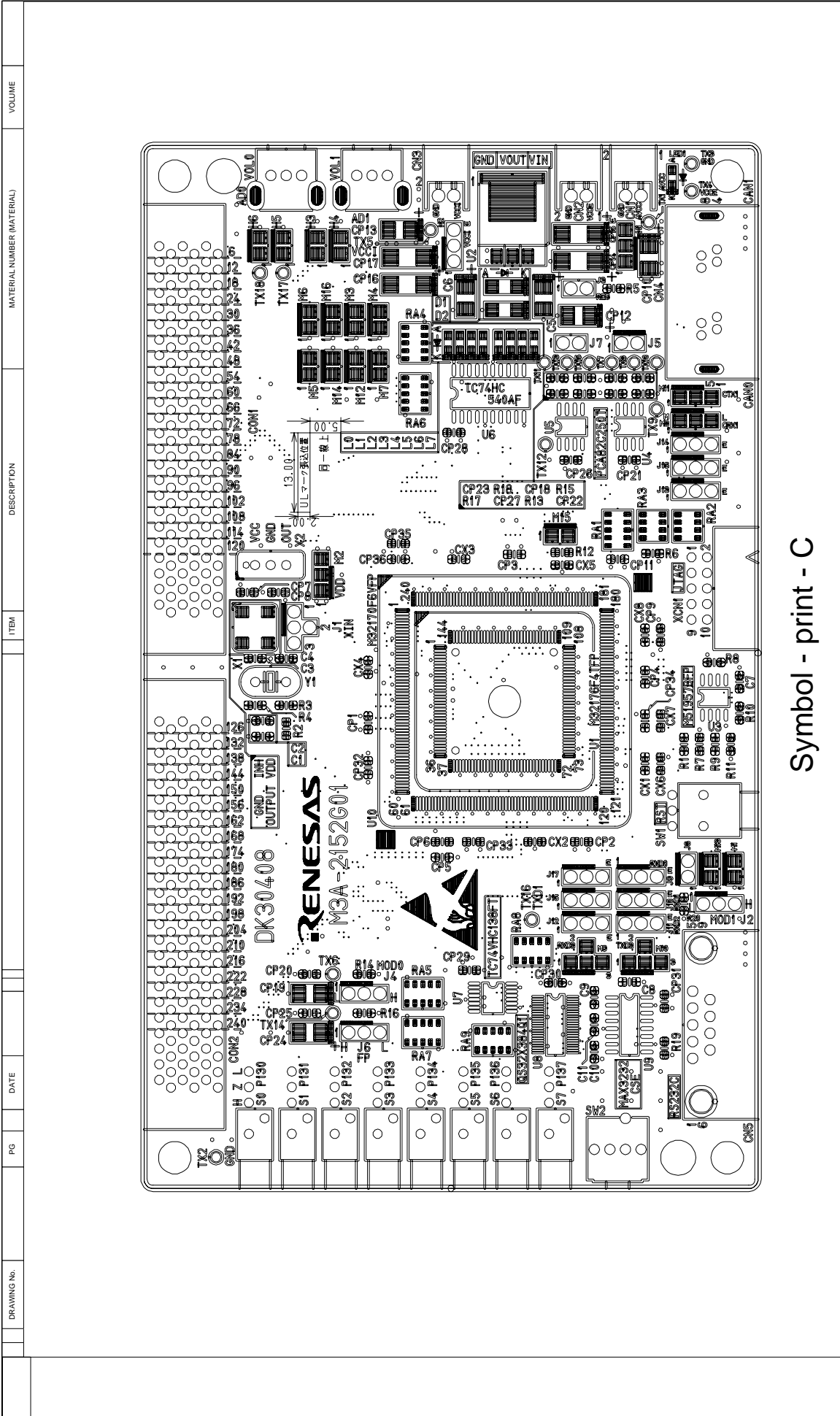
Item No.	Part Name			Part Specification				Remarks
	Description	Part No.	Part Type Name (Drawing No., Product Specification)	Manufacturer Name	Mounting Direction	Required Q'ty per Unit	Supply Classification	
16.	Switch	S0-7	A-13J2V(right-angle type)	Nihon Kaiheiki	Mounted directly	8		
17	Rotary switch	SW2	DR-KR10H (right-angle type)	Nihon Kaiheiki	Mounted directly	1		
18	Connector	CN2	S2B-XH-A	J.S.T. Mfg.	Mounted directly	1		
19	Connector	CN1,3	S2B-XH-A	J.S.T. Mfg.	Not mounted	0		
20	Connector	CN4	TM2REA-1208(50)	Hirose	Mounted directly	1		
21	Connector	CN5	XM2C-0912	Omron	Mounted directly	1		
22	Connector	CON1,2	FX1-144S-1.27DS(71)	Hirose	Mounted directly	2		
23	Connector	XCN1	XG4C-1034	Omron	Mounted directly	1		
24	Jumper pin (2 pins)	J5,7	FFC-2ASM1B	Honda Tsushin Kogyo	Mounted directly	2		
25	Jumper pin (2 pins)	J3,8	FFC-2ASM1B	Honda Tsushin Kogyo	Not mounted	0		
26	Jumper pin (3 pins)	J4,9,10,11,12,13,14	FFC-3ASM1B	Honda Tsushin Kogyo	Mounted directly	7		
27	Jumper pin (3 pins)	J2,6,15,16,17	FFC-3ASM1B	Honda Tsushin Kogyo	Jumper fixed	5		
28	Jumper pin (3 pins)	H2	FFC-3ASM1B	Honda Tsushin Kogyo	Not mounted	0		
29	Jumper pin (4 pins)	J1	FFC-4ASM1B	Honda Tsushin Kogyo	Jumper fixed	1		
30	LED	LED1, L0,1,2,3	SML-211UT	Rohm	Mounted directly	5		
31	LED	L4,5,6,7	SML-211YT	Rohm	Mounted directly	4		
32	Test pin	TX2,3,4,16	ST-1-1	Mac-Eight	Mounted directly	4		
33	Test pin	TX1,5,6,7,8,9,10,11,	ST-1-1	Mac-Eight	Not mounted	0		
34		12,13,14,15,17,18						

Special note:

Special note:
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(2) If two or more part type names are written for one part, the upper row has priority.
(3) The asterisk (*) in the item No. column denotes that the rest is blank.

Item No.	Part Name		Part Specification			Required Q'ty per Unit	Supply Classification	Remarks
	Description	Part No.	Part Type Name (Drawing No., Product Specification)	Manufacturer Name	Mounting Direction			
35	Laminated ceramic capacitor	C8,9,10,11,	GRM219F11H104ZA01(0.1uF)	Murata	Mounted directly	18		
36		CP1,2,3,4,5,6,9,11,						
37		21,26,28,29,30,31						
38	Laminated ceramic capacitor	C1, CP18,22,23,27,	GRM219F11H104ZA01(0.1uF)	Murata	Not mounted	0		
39		32,33,34,35,36,						
40		CX5,6,7,8						
41	Laminated ceramic capacitor	CX1,2,3,4	GRM219F11H105ZA01(1.0uF)	Murata	Mounted directly	4		
42	Laminated ceramic capacitor	CP20,25	GRM2192P1H221JZA01(220pF)	Murata	Mounted directly	2		
43		C2	GRM2192P1H221JZA01(220pF)	Murata	Not mounted	0		
44	Laminated ceramic capacitor	CP7,8	GRM219F11H103ZA01(0.01uF)	Murata	Mounted directly	2		
45	Laminated ceramic capacitor	C7	GRM21BB11H473ZA01(0.047uF)	Murata	Mounted directly	1		
46	Laminated ceramic capacitor	C3,4	GRM2192P1H300JZ01(30pF)	Murata	Not mounted	0		
47	Tantalum electrolytic capacitor	CP19,24	F931V225MBA(2.2uF)	Nichicon	Mounted directly	2		
48	Tantalum electrolytic capacitor	CP10,12,13	F931D106MBA(10uF)	Nichicon	Mounted directly	3		
49	Tantalum electrolytic capacitor	C5,6	F931D106MBA(10uF)	Nichicon	Not mounted	0		
50	Tantalum electrolytic capacitor	CP14,15,16,17	F931C476MCA(47uF)	Nichicon	Mounted directly	4		
51	Diode	D1,2	MA738	Matsushita	Not mounted	0		
52	5% resistor array (33 Ω)	RA2,3	CN2B4 TBK330J(33Ω)	KOA	Mounted directly	2		
53	5% resistor array (1 KΩ)	RA4	CND2B10 TBK102J(1KΩ)	KOA	Mounted directly	1		

Special note:
(1) Blank columns denote the same content as the upper row.
(2) If two or more part type names are written for one part, the upper row has priority.
(3) The asterisk (*) in the item No. column denotes that the rest is blank.

Special note:

PLL-M3A-2152G02-B （3 / 5 ）

Item No.	Part Name		Part Specification			Required Q'ty per Unit	Supply Classification	Remarks
	Description	Part No.	Part Type Name (Drawing No., Product Specification)	Manufacturer Name	Mounting Direction			
54	5% resistor array (10 KΩ)	RA1	CND2B10 TBK103J(10KΩ)	KOA	Mounted directly	1		
55	5% resistor array (100 KΩ)	RA5,6,7,8,9	CND2B10 TBK104J(100KΩ)	KOA	Mounted directly	5		
56	5% resistor (0 Ω)	R9,12,13,17	MCR10EZPJ000(0Ω)	Rohm	Mounted directly	4		
57	5% resistor (0 Ω)	R4	MCR10EZPJ000(0Ω)	Rohm	Not mounted	0		
58	5% resistor (120 Ω)	R15,18	MCR10EZPJ121(120Ω)	Rohm	Mounted directly	2		
59	5% resistor (1 KΩ)	R1,5,10	MCR10EZPJ102(1KΩ)	Rohm	Mounted directly	3		
60		R2	MCR10EZPJ202(2KΩ)	Rohm	Not mounted	0		
61	5% resistor (2 KΩ)	R6	MCR10EZPJ202(2KΩ)	Rohm	Mounted directly	1		
62	5% resistor (22 KΩ)	R8,20	MCR10EZPJ223(22KΩ)	Rohm	Mounted directly	2		
63	5% resistor (1MΩ)	R3	MCR10EZPJ105(1MΩ)	Rohm	Mounted directly	1		
64	1% resistor (10 KΩ)	R7,11,14,16,19	MCR10EZPF103(10KΩ)	Rohm	Mounted directly	5		
65	Variable resistor	VOL0,1	RK09K1110B26 (right-angle type)	ALPS	Mounted directly	2		
66	Jx compatible jumper socket		DIC208	Honda Tsushin Kogyo	Mounted directly	7		
67	Pattern only	M1-16, H1,3,4,5,6			Not mounted	0		
68	Rubber feet		TM-166-3 (black color)	3M	-	5		
69	Board		M3A-2154G01 (DK30408)	(SHT)	-	1		
70	Power cable		HTD-A4H0043		-	1		
71	CAN cable		HTD-A4H0044		-	2		
*				Special note:				

Special note:
(1) Blank columns denote the same content as the upper row.
(2) If two or more part type names are written for one part, the upper row has priority.
(3) The asterisk (*) in the item No. column denotes that the rest is blank.

Part List for M3A-2152G02

REVISION HISTORY

Rev.	Date	Description	
		Page	Summary
A	Sep 4, 2007	—	- Changed part type U8, U9, CN4, CON1, CON2 for RoHS X1 for discontinued-product
B	Feb 21, 2008	—	- Changed part type Microcomputer socket U1 for discontinued-product
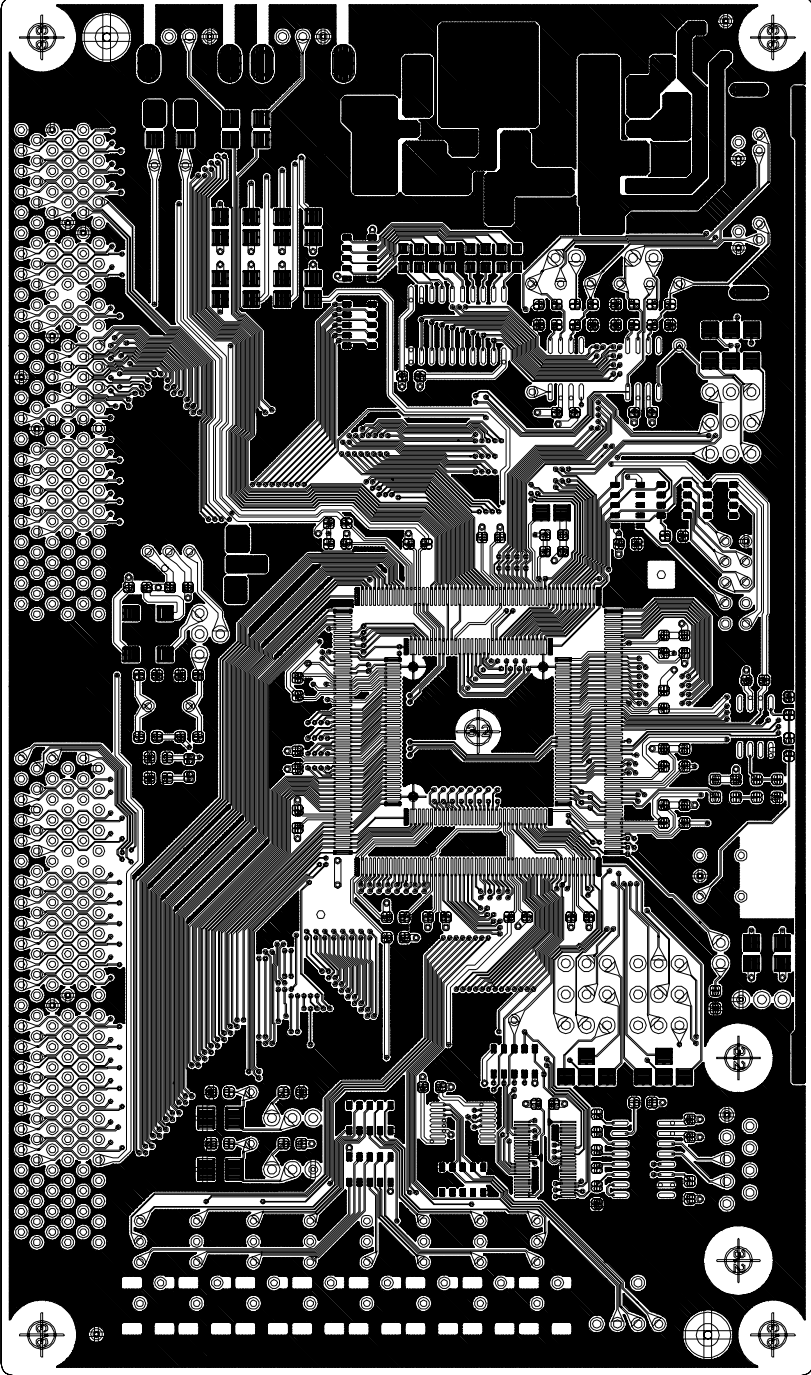
3.6 Pattern Diagram
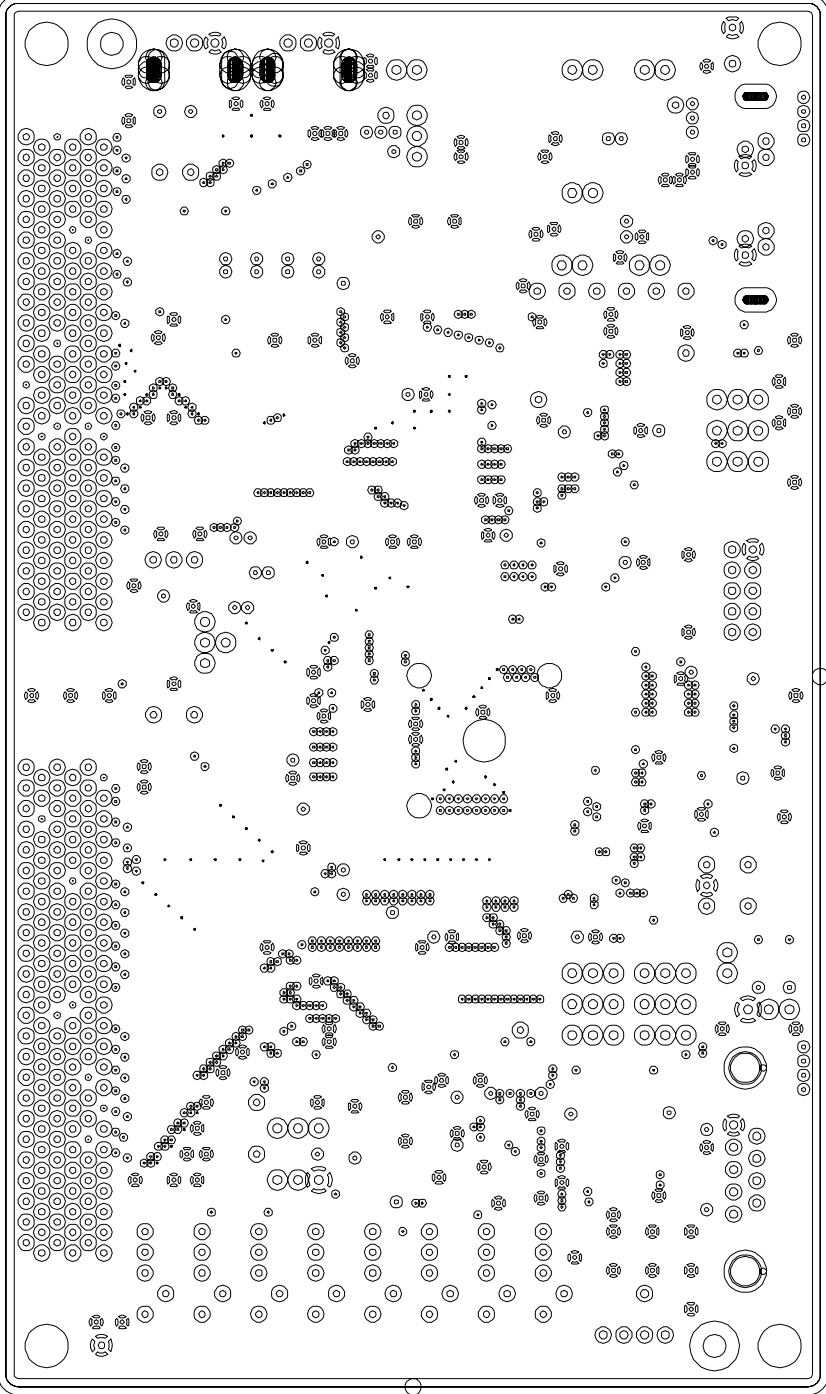
A pattern diagram for the board is provided in this and following pages for your reference.
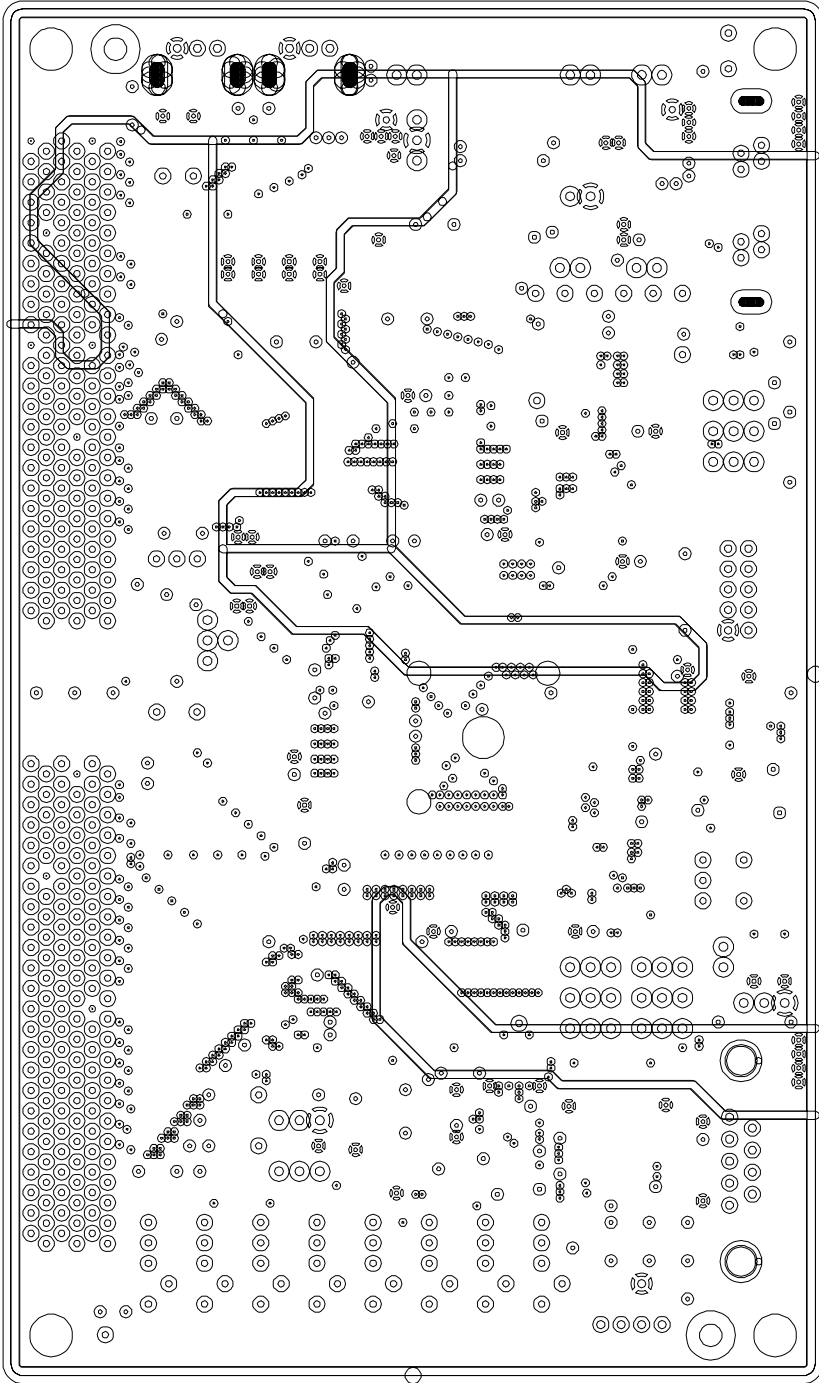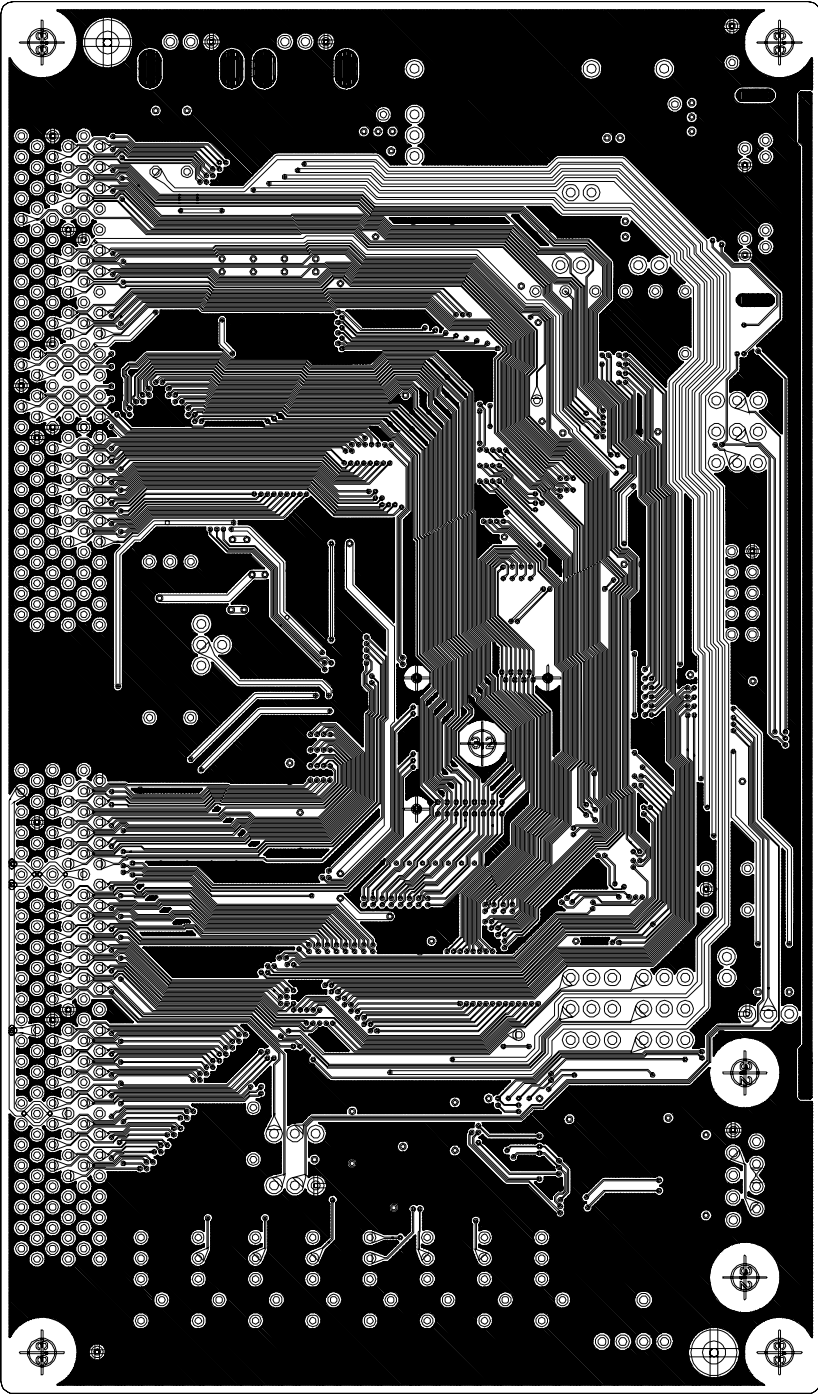
Symbol - print - C

Pattern 1/4

M3A-2152G01
Pattern diagram (2/5)

DK30435-A

3RD ANGLE PROJECTION		DIM IN mm	SCALE / (NTS)	DATE 03-3-5
	DRAWN	CHECKED	DESIGN	APPROVED

CHANGE

Pattern 2/4

M3A-2152G01
Pattern diagram (3/5)

DK30435-A

DATE
03-3-5

SCALE
/ (NTS)

APPROVED

DIM
IN
mm

DESIGN

3RD ANGLE
PROJECTION

CHECKED

DRAWN

CHANGE

Pattern 3/4

M3A-2152G01
Pattern diagram (4/5)

DK30435-A

Pattern 4/4

M3A-2152G01
Pattern diagram (5/5)

DK30435-A

3.7 Diagram of External Dimension

A diagram of external dimension for the board is provided in following pages for your reference.

DIMENSION:mm

Detail table of Through-Hole

Hole Symbol	Hole Diameter	Occupancy	Remarks	Hole Symbol	Hole Diameter	Occupancy	Remarks
○	φ0.25	○		⑳	φ2.0		
⊕	φ0.4			㉑	φ2.1		
○	φ0.5	○		㉒	φ2.2		
⊘	φ0.6			㉓	φ2.3		
⑦	φ0.7			㉔	φ2.4		
○	φ0.8	○		㉕	φ2.5		
⊘	φ0.9	○		㉖	φ2.6		
⊘	φ1.0	○		㉗	φ2.7		
⑪	φ1.1			㉘	φ2.8	○	
⑫	φ1.2			㉙	φ2.9		
◎	φ1.3			㉚	φ3.0		
⑭	φ1.4			㉛	φ3.1		
⑮	φ1.5			㉜	φ3.2		
⊗	φ1.6			㉝	φ3.3		
⑰	φ1.7			㉞	φ3.4		
⑱	φ1.8			㉟	φ3.5		
⑲	φ1.9			㊱	φ3.6		

Mounting hole details

⊕ shows the hole symbol of the mounting hole.

[Example]

㉜ is φ3.2 mounting hole.

✳ Hole Diameter shows the finished diameter of each hole.

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M3A-2152G01		
Diagram of external dimension (1/1)		
DK30436		

3RD ANGLE PROJECTION	DIM IN mm	SCALE / (NTS)	DATE 03-3-5
	DESIGN		APPROVED
	CHECKED		
	DRAWN		

CHANGE

3.8 Description of Board Silk

The color of board silk indicates solder specification when the items on board are mounted.

Table 3.6 Difference in the Color of Board Silk

Color of board silk	Solder specification when the items on board are mounted
White	Using nonlead-free soldering
Yellow	Using lead-free soldering

Rev.	Date	Description	
		Page	Summary
1.00	Jun 27, 2003	—	First edition
1.10	Oct 03, 2003	—	Added Windows XP as OS of Host available PC

2.00	Mar 11, 2004	—	- Incorporated Installation Manual
			- Added system configuration diagrams (1.2 System Configuration)
			- Added M3A-2152G52A (2.1 Packaged Product Items)
			- Added M3T-PD32RM and M32100T-EZ-E in CD-ROM
			  (2.2 CD-ROM, Appendix A Contents of CD-ROM)
			- Added usage precautions (3.6 About Evaluation Board)
			- Added M3A-2152G52A (4.2 Host PC Condition)
			- Added M32100T-EZ-E settings
			  (2100T-EZ-E Power Supply Connection and Settings)
			- Added M3T-PD32RM settings (6.1 M3T-PD32RM)
			- Added a component table (Appendix B Component Table)

2.01	Oct 21, 2004	—	- Changed contents of CD-ROM (2.2 CD-ROM, Appendix A) - Updated the operating environment for kit. (Table 4.1-1)
2.10	Oct 16, 2006	—	- Updated a setup method along with the tool update (Chapter 6) - Updated contents of CD-ROM (Appendix 1)
3.00	Dec 08, 2006	—	Added an evaluation board product standard of the M3A-2152G02 and updated its contents (Appendix 3) - Updated an external view and a block diagram (1. Overview) - Updated the configuration of the power supply, serial I/O interface and CAN interface (2. Function Specifications) - Added description of board silk (3.8 Description of Board Silk)
3.10	Mar 13, 2008	—	- Updated a Host PC condition in Starter Kit Usage Conditions (Chapter 4) - Updated a setup method along with the tool update (Chapter 6) - Updated contents of CD-ROM (Appendix 1) - Updated a part list of the evaluation board (Appendix 3.5)

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