PCA4738SF-64
PCA4738FF-64
PCA4738HF-64
PCA4738GF-80
PCA4738HF-80

Flash Memory Programming Adapters for 38000 Series

User's Manual

Rev. 1.00
July 1, 2003
REJ10J0177-0100Z

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To use the product properly

Precautions for Safety

- In both this user's manual and on the product itself, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.
- The icons' graphic images and meanings are given in "Chapter 1. Precautions for Safety". Be sure to read this chapter before using the product.

1. Precautions for Safety

In this instruction manual, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.

This chapter describes precautions which should be taken in order to use this product safely and properly. Be sure to read this chapter before using this product.

1.1 Safety Symbols and Meanings

⚠ **WARNING**	If the requirements shown in the "WARNING" sentences are ignored, the equipment may cause serious personal injury or death.
⚠ **CAUTION**	If the requirements shown in the "CAUTION" sentences are ignored, the equipment may malfunction.
IMPORTANT	It means important information on using this product.

In addition to the three above, the following are also used as appropriate.

△ means WARNING or CAUTION.

Example: ⚠ **CAUTION AGAINST AN ELECTRIC SHOCK**

⃠ means PROHIBITION.

Example: **DISASSEMBLY PROHIBITED**

● means A FORCIBLE ACTION.

Example: **UNPLUG THE POWER CABLE FROM THE RECEPTACLE.**

The following pages describes the symbols "WARNING", "CAUTION", and "IMPORTANT".

⚠ WARNING

Warning for Use Environment:

- This equipment is to be used in an environment with a maximum ambient temperature of 35˚C. Care should be taken that this temperature is not exceeded.
- Select the proper programming mode of the PROM programmer.

⚠ CAUTION

Cautions to Be Taken for This Product:

- Do not disassemble or modify this product. Personal injury due to electric shock may occur if this product is disassembled or modified.
- Use caution when handling this product. Be careful not to apply a mechanical shock such as falling.
- Do not directly touch the connector pins of this product.
- Be careful with the static electricity when handling this product and the MCU.

When Not Using This Product for a Long Time:

- Attach the connector pins of this product to the conductive sponge.
- Put it into a conductive polyvinyl, and keep it in the package case shipped from the factory.
- Store it in the place where humidity and temperature are low and direct sunshine does not strike.

IMPORTANT

When Using The Product:

- Attach this product to the IC socket on the PROM programmer properly.
- Insert the MCU to the IC socket of this product properly.
- When opening and closing the IC socket of this product, be sure to keep it horizontal.
- Be sure to set the programming area as described in this instruction manual.
- Do not use the PROM programmer's device identification code readout function.

2. Introduction

This product is a flash memory programming adapter for 38000 Series of 8-bit microcomputers. The adapter is a tool that can be used to write programs into internal flash memory of microcomputers using a commercially available PROM programmer.

This manual describes the specifications and the operation.

Figures 2.1 and 2.2 show the external views and constituent parts of the adapters.

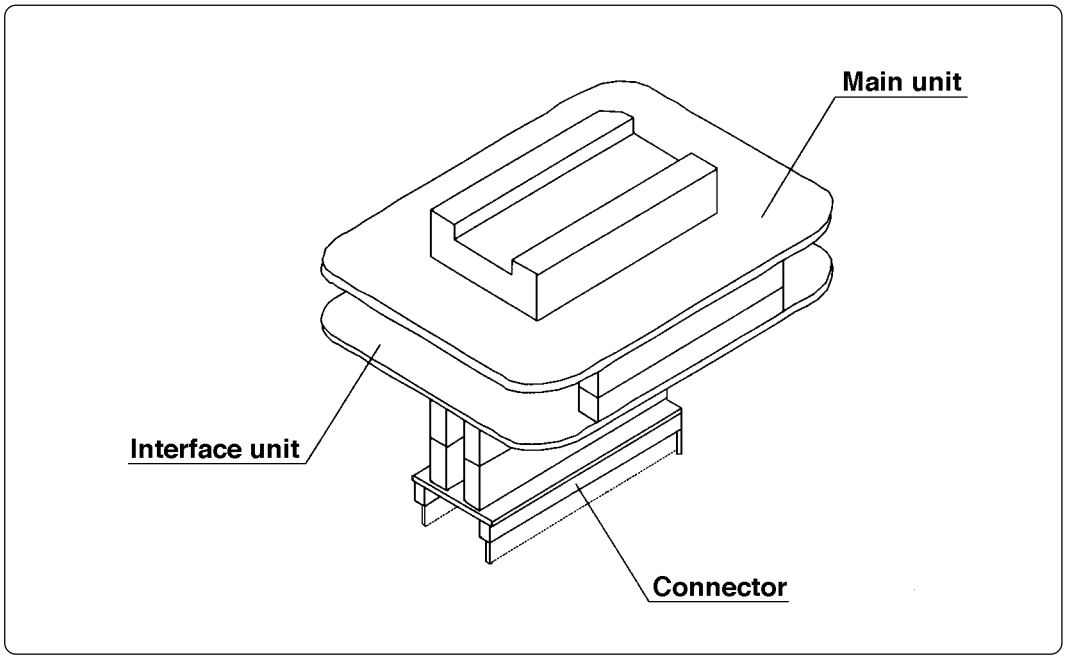

Figure 2.1 External view and constituent parts (IC socket: DIP type)

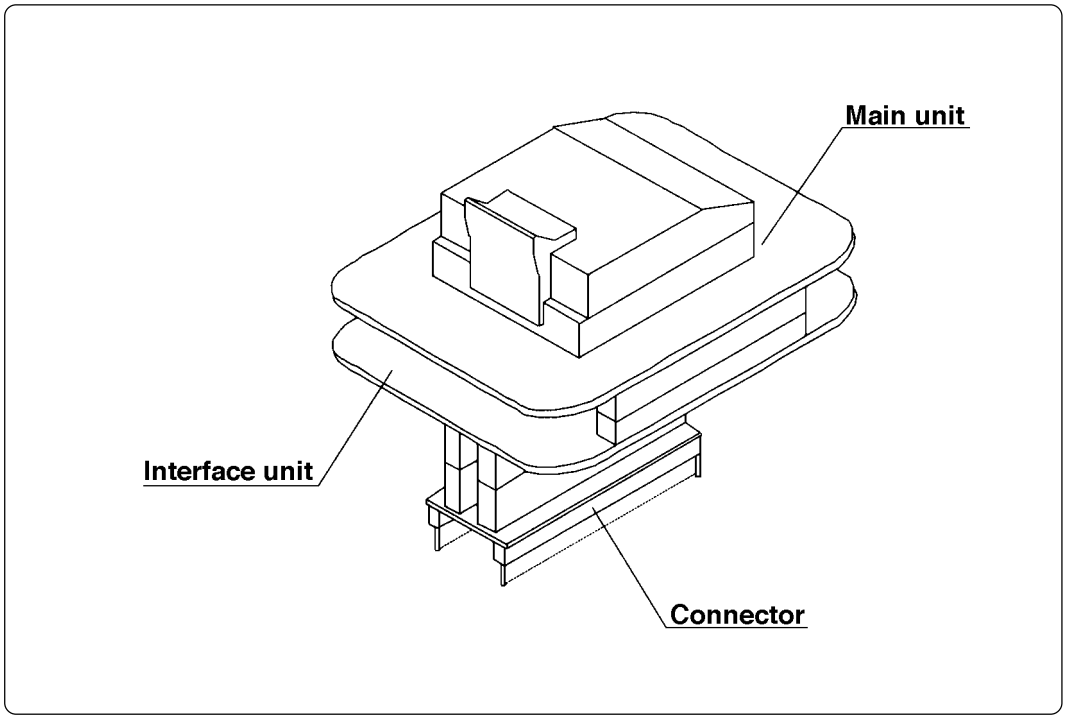

Figure 2.2 External view and constituent parts (IC socket: QFP type)

2.1 Things to Check When Unpacking

This product consists of the items listed in Table 2.1. Check to see that it contains all of the items.

Table 2.1 Contents

Main unit	PCA4738SF-64, PCA4738FF-64, PCA4738HF-64, PCA4738GF-80 or PCA4738HF-80
Interface unit	PCA7414B
Connector	PCA7402E (32 pins)
Instruction manual	This manual

If any part is missing or there is any doubt about your product package, contact your local distributor.

3. Specifications

Table 3.1 lists common specifications of the programming adapters, and Table 3.2 lists individual specifications of each programming adapter.

Table 3.1 Common specifications

Item		Description
Operating clock frequency		1 MHz (Supplied by the ceramic oscillator mounted on the adapter)
Power supply		Supplied from Vcc of the PROM programmer
Board configuration	Main unit	Board to insert a programmable MCU (IC socket mounted on it)
	PCA7414B (Interface unit)	Interface board (Connected by two rows of standard-pitch 18-pin connectors and two rows of standard-pitch 16-pin connectors to the upper and lower boards)
	PCA7402E (Connector)	Board to connect to the PROM programmer (Standard-pitch 32-pin pin-header mounted)

Table 3.2 Individual specifications

Product name	Item	Description
PCA4738SF-64	MCU	M38039FFSP and M38049FFSP (64-pin 1.78-mm-pitch SDIP)
	IC socket	264-1300-00-0602J (Made by Sumitomo 3M Limited)
PCA4738FF-64	MCU	M38039FFFP and M38049FFFP (64-pin 0.8-mm-pitch QFP)
	IC socket	IC51-824.KS-8095 (Made by Yamaichi Electronics Co., Ltd.)
PCA4738HF-64	MCU	M38039FFHP and M38049FFHP (64-pin 0.5-mm-pitch LQFP)
	IC socket	IC51-0644-807 (Made by Yamaichi Electronics Co., Ltd.)
PCA4738GF-80	MCU	M38869FFAGP (80-pin 0.65-mm-pitch QFP)
	IC socket	IC51-0804-711 (Made by Yamaichi Electronics Co., Ltd.)
PCA4738HF-80	MCU	M38869FFAHP (80-pin 0.5-mm-pitch LQFP)
	IC socket	IC51-0804-808 (Made by Yamaichi Electronics Co., Ltd.)

4. How to Write the Program

This chapter describes how to write programs with a PROM programmer. For details on how to operate the PROM programmer, refer to the user's manual of the PROM programmer.

4.1 Programming Procedures

Follow procedures (1) to (7) to write programs into the MCU.

(1) Read the program into the PROM programmer.

▼

(2) Attach the adapter to the PROM programmer. (see section 4.2)

▼

(3) Insert the MCU into the adapter. (see section 4.3)

▼

(4) Specify the programming area of the MCU using the PROM programmer. (see section 4.6) *1

▼

(5) Using the PROM programmer's erase check function, check whether data can be written into the programming area of the MCU. *2

▼

(6) Write the program into the programming area of the MCU using the PROM programmer. *2

▼

(7) Verify the programming area of the MCU using the PROM programmer to check whether the program is written into the MCU correctly. *2

*1 Be sure to set the programming area. Otherwise the mode's shift to the programming mode may not be performed successfully. The erase check function etc. may not also be performed completely.

*2 Some PROM programmers perform the steps (5) through (7) automatically.

4.2 Attaching Adapter to PROM Programmer

As shown in Figure 4.1, attach the No. 1 pin of the PCA7402E connector (standard-pitch 32-pin pin-header mounted) to the No. 1 pin of the IC socket of the PROM programmer.

Be careful when attaching to the PROM programmer because incorrect insertion can cause fatal damage to the MCU.

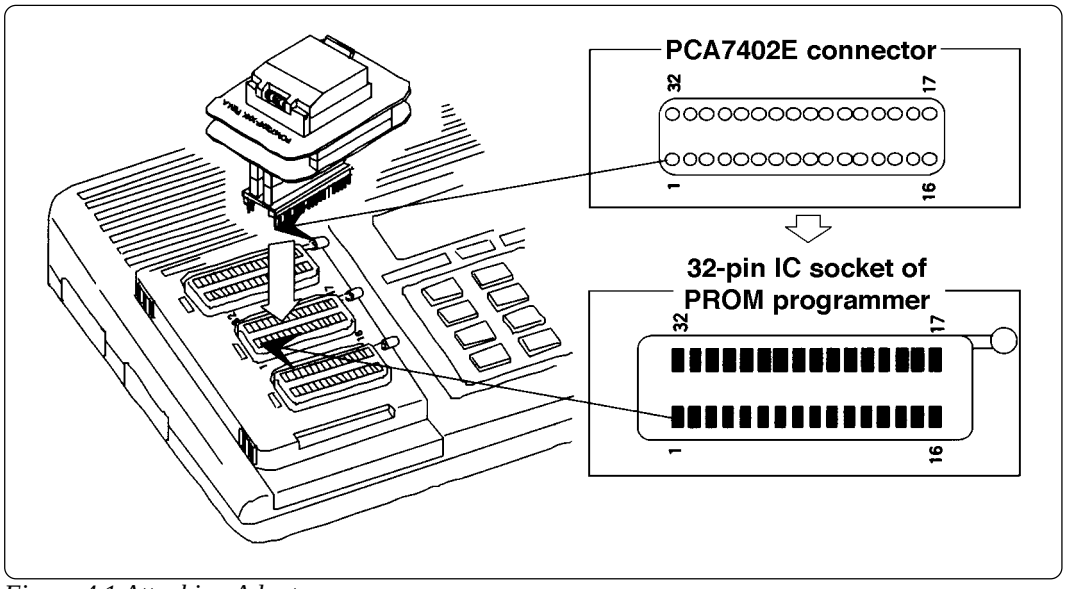

Figure 4.1 Attaching Adapter

4.3 Inserting MCU into Programming Adapter

As shown in Figures 4.2 and 4.3, insert the No. 1 pin of the MCU into the No. 1 pin of the IC socket on the main unit.

Be careful when inserting the MCU because incorrect insertion can cause fatal damage to the MCU.

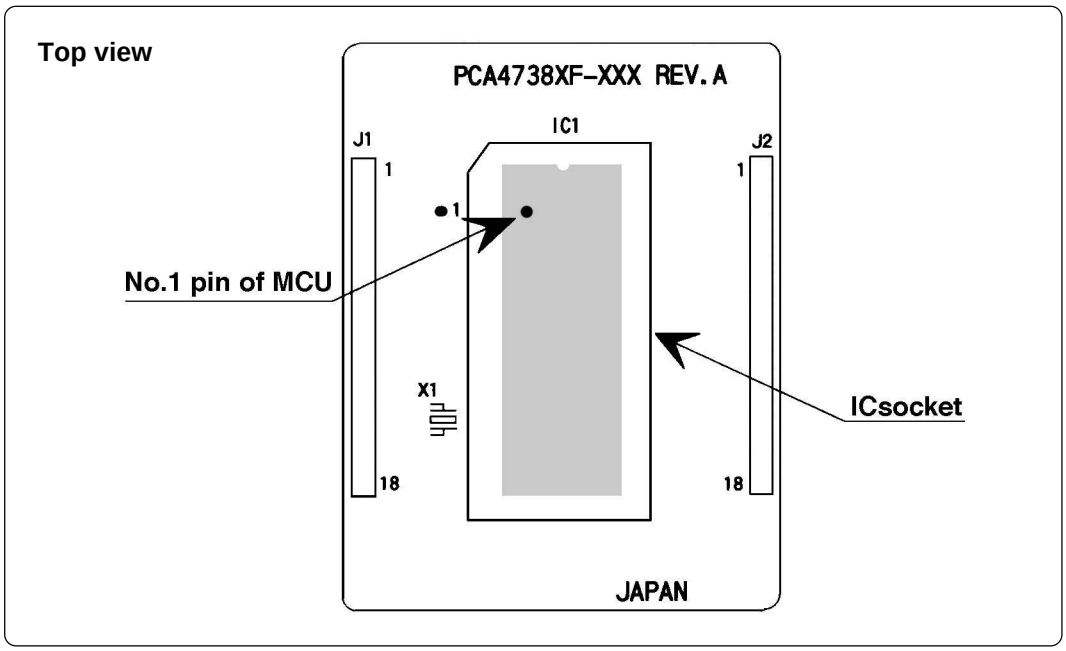

Figure 4.2 Inserting MCU (IC socket: DIP type)

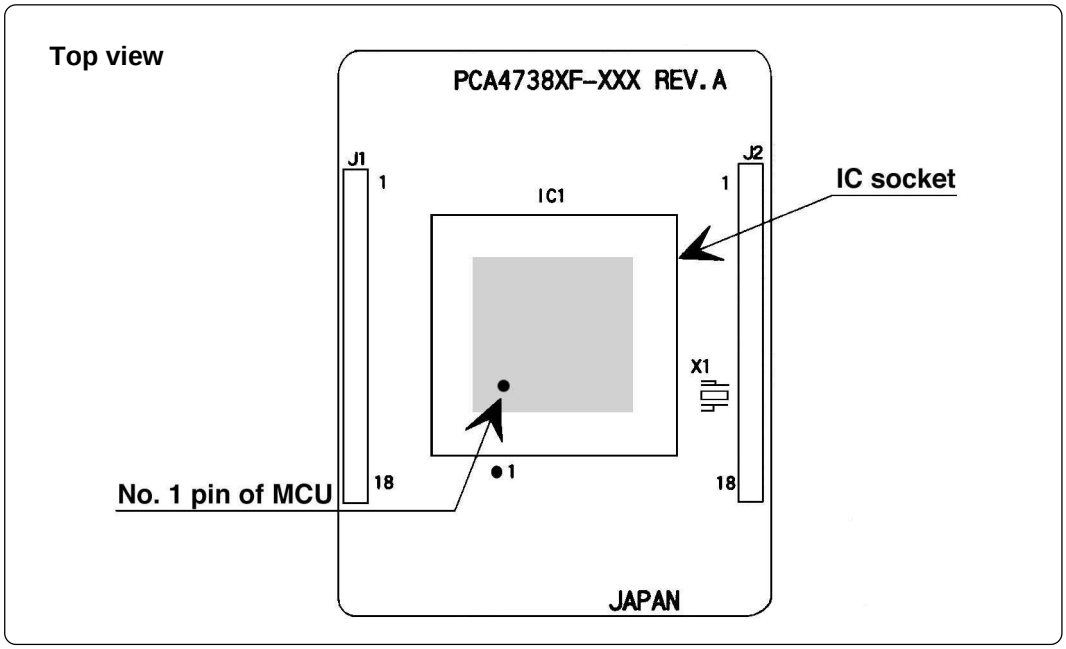

Figure 4.3 Inserting MCU (IC socket: QFP type)

4.4 Precautions When Opening and Closing IC Socket

When opening and closing the IC socket, hold the adapter horizontally as shown in Figure 4.4. Otherwise the inside of the IC socket may become damaged and cause an electrical insulation failure.

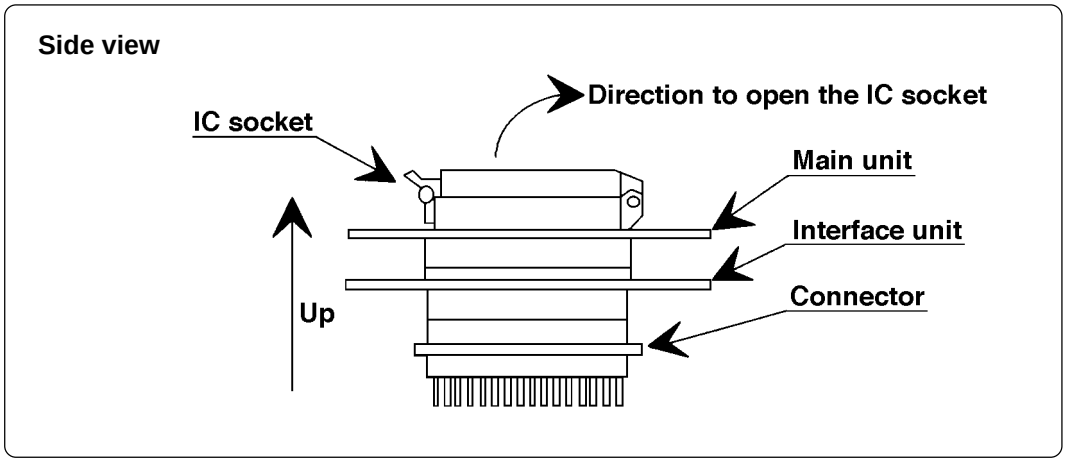

Figure 4.4 Holding the adapter in a horizontal position

4.5 Precautions When Handling Adapter

Do not directly touch the connector in the IC socket and the pins on the PROM programmer connector because dirt may cause an electrical insulation failure.

When not using this product, attach the connector pins of this product to the conductive sponge as it was shipped from the factory.

4.6 Setting Programming Area

When writing and erasing programs, be sure to set the programming area. And also, specify its device of the PROM programmer.

Table 4.1 Programming area

MCU type name	ROM size	PROM programmer		Internal flash memory area of MCU
		Device	Programming area	
M38039FFSP M38039FFFP M38039FFHP M38049FFSP M38049FFFP M38049FFHP M38869FFAGP M38869FFAHP	60 KB	M5M28F101	01000_{16}--$0FFFF_{16}$	1000_{16}--$FFFF_{16}$

5. Recommended PROM Programmers

The PROM programmers listed in Table 5.1 are recommended for this product. Using the actual products, we have verified that these PROM programmers can be used to write programs without problem. Nonconformity occurring by using any other PROM programmers can not be supported. For the latest type of PROM programmers, contact the manufacturer to confirm whether it can be used for your product.

Table 5.1 Recommended PROM programmers

Manufacturer	Type	Device	Programming voltage (Vpp)
Advantest	R4945	M5M28F101 mode	12.0 V
	R4945A		

6. Memory Maps

Figure 6.1 shows memory maps of the MCU and the PROM programmer.

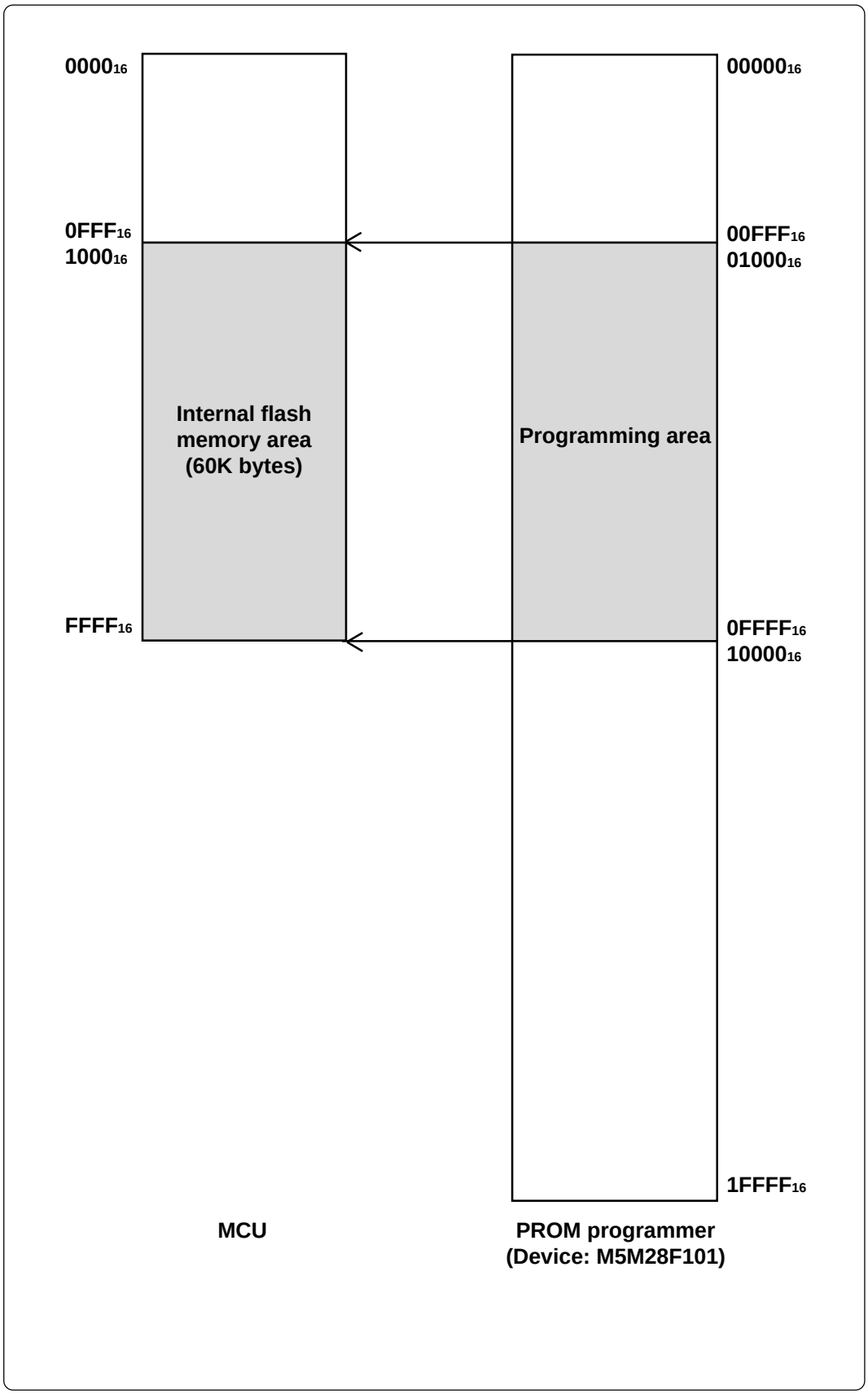

Figure 6.1 Memory maps

7. Troubleshooting

The table below summarizes errors we wish to be checked carefully before you determine them to be a fault.

7.1 Errors That Occur When Writing to ROM

7.1.1 When Newly Purchased

Cause	Content	See pages
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	10
	Is the MCU attached to the correct position?	11
PROM programmer	Is the area specification set correctly?	12
	Is the correct device selected?	13
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs to be replaced.	-

7.1.2 Previously Written Normally

Cause	Content	See pages
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	10
	Is the MCU attached to the correct position?	11
PROM programmer	Is the area specification set correctly?	12
	Is the correct device selected?	13
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs to be replaced.	-
	The PROM programmer connector at which the PROM programmer is contacted may be stained. Clean it with alcohol, etc.	-

7.2 The MCU Does Not Function Normally

The program operates normally on the emulator, but when the MCU that has normally been written is attached the same program does not function normally.

(1) Is the offset address specified correctly when copying data into the PROM programmer?

(2) In the emulator, NOPs are often inserted in the area where the program has not been read, therefore the program happens to appear functioning normally even though it may have gone wild. Check your program again.

(3) The emulator and the actual MCU may differ in characteristics. Consult the user's manual of the emulation pod to check for differences in characteristics again.

7.3 Other Precautions

7.3.1 About The Recommended PROM Programmer

Not all PROM programmers available on the market can be checked to see if they function properly. There are several PROM programmers that we have verified to function properly. These products are listed as recommended PROM programmers in the instruction manual. Other PROM programmers may also be used providing that you verified them to function properly.

Note: No matter which type of PROM programmer you use, it is necessary to verify completion of programming by executing screening, etc. that are stipulated for each microcomputer used.

7.3.2 About Reading out of Device Identification Code *1

Please do not use the PROM programmer's device identification code readout function.

Using this function may break down the microcomputer. The device identification code is included in EPROM to indicate the manufacturer code and device code; it is not included in the microcomputer.

*1 Depending on PROM programmer manufacturers, this may be referred to by another name (e.g., ID code).

7.4 How to Request for Support

After checking this manual, fill in the following information and email to your local distributor.

For prompt response, please specify the following information:

(1) Contact address

- Company name
- Department
- Responsible person
- Phone number
- Fax number
- E-mail address

(2) Product information

- Name of the programming adapter
- Serial number
- Date of purchase
- Target MCU
- Symptoms (Fails blank check/Cannot write a program/Fails verification etc.)
- Detailed symptoms
- How often does the problem occur? (2 out of 10 etc.)
- When did the problem start to occur? (Since purchase/Used to work correctly)
- Type name of the PROM programmer (Advantest R4945A etc.)
- Specified device when writing to PROM (M27C101 etc.)
- Specified programming area when writing to PROM
- Switch settings of the adapter when writing to PROM

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