To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

Send any inquiries to http://www.renesas.com/inquiry.

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: "Standard", "High Quality", and "Specific". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as "Specific" without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as "Specific" or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is "Standard" unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.

   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots.

   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; safety equipment; and medical equipment not specifically designed for life support.

   "Specific": Aircraft; aerospace equipment; submersible repeaters; nuclear reactor control systems; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

RENESAS

User's Manual

IE-703079-MC-EM1

In-circuit Emulator Option Board

Target device
V850/SF1™

Document No. U15447EJ1V0UM00 (1st edition)
Date Published September 2001 N CP(K)

© NEC Corporation 2001
Printed in Japan

Phase-out/Discontinued

[MEMO]

Phase-out/Discontinued

V850 Family and V850/SF1 are trademarks of NEC Corporation.

Windows is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

PC/AT is a trademark of International Business Machines Corporation.

Ethernet is a trademark of Xerox Corporation.

- **The information in this document is current as of May, 2001. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC's data sheets or data books, etc., for the most up-to-date specifications of NEC semiconductor products. Not all products and/or types are available in every country. Please check with an NEC sales representative for availability and additional information.**
- No part of this document may be copied or reproduced in any form or by any means without prior written consent of NEC. NEC assumes no responsibility for any errors that may appear in this document.
- NEC does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC semiconductor products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of customer's equipment shall be done under the full responsibility of customer. NEC assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC endeavours to enhance the quality, reliability and safety of NEC semiconductor products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC semiconductor products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment, and anti-failure features.
- NEC semiconductor products are classified into the following three quality grades:
  "Standard", "Special" and "Specific". The "Specific" quality grade applies only to semiconductor products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of a semiconductor product depend on its quality grade, as indicated below. Customers must check the quality grade of each semiconductor product before using it in a particular application.

  "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

  "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

  "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

  The quality grade of NEC semiconductor products is "Standard" unless otherwise expressly specified in NEC's data sheets or data books, etc. If customers wish to use NEC semiconductor products in applications not intended by NEC, they must contact an NEC sales representative in advance to determine NEC's willingness to support a given application.

  (Note)

  (1) "NEC" as used in this statement means NEC Corporation and also includes its majority-owned subsidiaries.

  (2) "NEC semiconductor products" means any semiconductor product developed or manufactured by or for NEC (as defined above).

M8E 00. 4

Phase-out/Discontinued

Regional Information

Some information contained in this document may vary from country to country. Before using any NEC product in your application, please contact the NEC office in your country to obtain a list of authorized representatives and distributors. They will verify:

- Device availability
- Ordering information
- Product release schedule
- Availability of related technical literature
- Development environment specifications (for example, specifications for third-party tools and components, host computers, power plugs, AC supply voltages, and so forth)
- Network requirements

In addition, trademarks, registered trademarks, export restrictions, and other legal issues may also vary from country to country.

NEC Electronics Inc. (U.S.)
Santa Clara, California
Tel: 408-588-6000
800-366-9782
Fax: 408-588-6130
800-729-9288

NEC Electronics (Germany) GmbH
Duesseldorf, Germany
Tel: 0211-65 03 02
Fax: 0211-65 03 490

NEC Electronics (UK) Ltd.
Milton Keynes, UK
Tel: 01908-691-133
Fax: 01908-670-290

NEC Electronics Italiana s.r.l.
Milano, Italy
Tel: 02-66 75 41
Fax: 02-66 75 42 99

NEC Electronics (Germany) GmbH
Benelux Office
Eindhoven, The Netherlands
Tel: 040-2445845
Fax: 040-2444580

NEC Electronics (France) S.A.
Velizy-Villacoublay, France
Tel: 01-3067-5800
Fax: 01-3067-5899

NEC Electronics (France) S.A.
Madrid Office
Madrid, Spain
Tel: 091-504-2787
Fax: 091-504-2860

NEC Electronics (Germany) GmbH
Scandinavia Office
Taeby, Sweden
Tel: 08-63 80 820
Fax: 08-63 80 388

NEC Electronics Hong Kong Ltd.
Hong Kong
Tel: 2886-9318
Fax: 2886-9022/9044

NEC Electronics Hong Kong Ltd.
Seoul Branch
Seoul, Korea
Tel: 02-528-0303
Fax: 02-528-4411

NEC Electronics Singapore Pte. Ltd.
Novena Square, Singapore
Tel: 253-8311
Fax: 250-3583

NEC Electronics Taiwan Ltd.
Taipei, Taiwan
Tel: 02-2719-2377
Fax: 02-2719-5951

NEC do Brasil S.A.
Electron Devices Division
Guarulhos-SP, Brasil
Tel: 11-6462-6810
Fax: 11-6462-6829

J01.2

Phase-out/Discontinued

INTRODUCTION

Target Readers

This manual is intended for users who design and develop application systems using the V850/SF1™.

Purpose

The purpose of this manual is to describe the proper operation of the IE-703079-MC-EM1 and its basic specifications.

Organization

This manual is divided into the following parts.

- Overview
- Names and functions of components
- Cautions

How to Read This Manual

It is assumed that the reader of this manual has general knowledge in the fields of electrical engineering, logic circuits, and microcontrollers.
The IE-703079-MC-EM1 is used connected to the IE-703002-MC in-circuit emulator. This manual explains the basic setup procedure and switch settings of the IE-703002-MC when it is connected to the IE-703079-MC-EM1. For the names and functions of parts, and the connection of elements, refer to the **IE-703002-MC User's Manual (U11595E)**.

To learn about the basic specifications and operation methods
→ Read this manual in the order of the **CONTENTS**.

To learn the operation methods and command functions, etc., of the IE-703002-MC and IE-703079-MC-EM1
→ Read the user's manual of the debugger (sold separately) that is used.

Conventions

Note: Footnote for item marked with **Note** in the text
Caution: Information requiring particular attention
Remark: Supplementary information
Numeral representation: Binary ··· xxxx or xxxxB
Decimal ··· xxxx
Hexadecimal ··· xxxxH
Prefix indicating the power of 2 (address space, memory capacity):
K (kilo): $2^{10} = 1024$
M (mega): $2^{20} = 1024^2$

Terminology

The meanings of terms used in this manual are listed below.

Target device	The device that is targeted for emulation.
Target system	The system (user-built system) that is targeted for debugging. This includes the target program and user-configured hardware.

Phase-out/Discontinued

Related Documents

When using this manual, refer to the following manuals.
The related documents indicated in this publication may include preliminary versions. However, preliminary versions are not marked as such.

○ **Documents related to development tools (user's manuals)**

Document Name		Document Number
IE-703002-MC In-circuit emulator		U11595E
IE-703079-MC-EM1 In-circuit emulator option board		U15447E
CA850 C Compiler package Ver. 2.40 or later	Operation	U15024E
	C Language	U15025E
	Project Manager	U15026E
	Assembly Language	U15027E
ID850 Integrated debugger Ver.2.40 Windows™ based	Operation	To be prepared
SM850 System simulator Ver.2.40 Windows based	Operation	To be prepared
SM850 System simulator Ver.2.00 or later	External Part User Open Interface Specifications	U14873E
RX850 Real-time OS Ver.3.13 or later	Basics	U13430E
	Installation	U13410E
	Technical	U13431E
RX850 Pro Real-time OS Ver.3.13	Basics	U13773E
	Installation	U13774E
	Technical	U13772E
RD850 Task debugger Ver.3.01		U13737E
RD850 Pro Task debugger Ver.3.01		U13916E
AZ850 System performance analyzer Ver.3.0		U14410E

Phase-out/Discontinued

CONTENTS

CHAPTER 1 OVERVIEW 10
1.1 Hardware Configuration 10
1.2 Features (When Connected to IE-703002-MC) 11
1.3 Function Specifications (When Connected to IE-703002-MC) 11
1.4 System Configuration 12
1.5 Contents in Carton 13
1.6 Connection Between IE-703002-MC and IE-703079-MC-EM1 15

CHAPTER 2 NAMES AND FUNCTIONS OF COMPONENTS 18
2.1 Component Names and Functions of IE-703079-MC-EM1 18
2.2 Clock Settings 20
2.2.1 Main system clock setting 20
2.2.2 Subsystem clock setting 21
2.3 Illegal Access Detection ROM Setting 22
2.4 CPU Operation Voltage Range Switching Setting 22

CHAPTER 3 FACTORY SETTINGS 23

CHAPTER 4 CAUTIONS 24
4.1 V_{DD0} and PORTV_{DD} of Target System 24
4.2 NMI Signal 25
4.3 V_{PP} Signal 25
4.4 NMI Signal Mask Function 25
4.5 Bus Interface Pin 26

CHAPTER 5 DIFFERENCES BETWEEN TARGET DEVICE AND TARGET INTERFACE CIRCUIT 28

APPENDIX PACKAGE DRAWINGS 34

Phase-out/Discontinued

LIST OF FIGURES

Figure No.	Title	Page
1-1	System Configuration	12
1-2	Contents in Carton	13
1-3	Accessories	14
1-4	Connection Between IE-703002-MC and IE-703079-MC-EM1	16
2-1	IE-703079-MC-EM1	18
4-1	Schematic Diagram of Power Supply Acquisition	24
4-2	NMI Signal Flow Path	25
5-1	Equivalent Circuit of Emulation Circuit	29

Phase-out/Discontinued

LIST OF TABLES

Table No.	Title	Page
2-1	Main System Clock Setting	20
2-2	Subsystem Clock Setting	21
2-3	JP1 Setting in IE-703002-MC	22
2-4	JP3 and JP4 Setting in IE-703002-MC	22
4-1	Bus Interface Pin Operation List	26

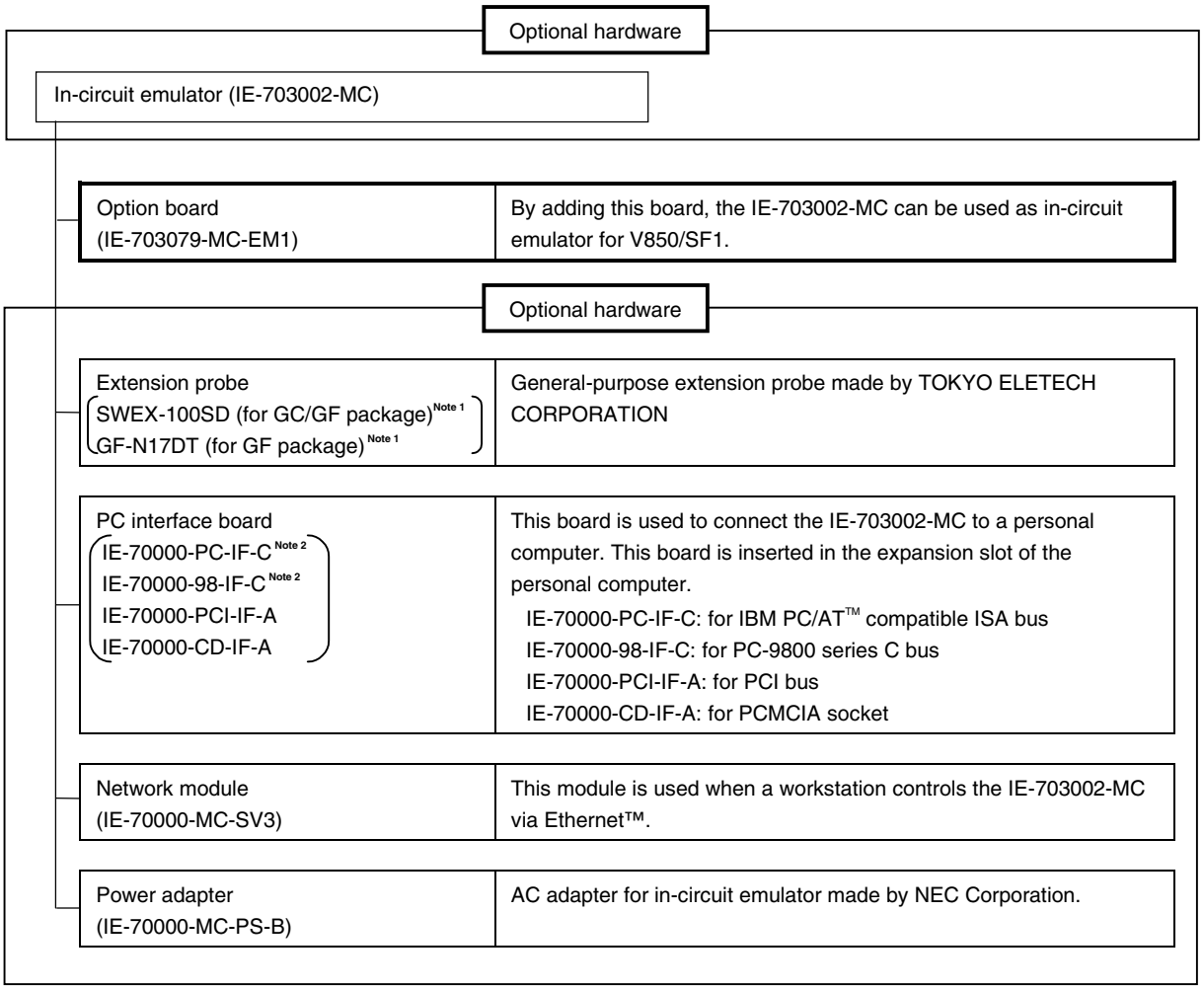
Phase-out/Discontinued

CHAPTER 1 OVERVIEW

The IE-703079-MC-EM1 is an option board for the IE-703002-MC in-circuit emulator. By connecting the IE-703079-MC-EM1 and IE-703002-MC, hardware and software can be debugged efficiently in system development using the V850/SF1.

In this manual, the basic setup procedure and switch settings of the IE-703002-MC when connecting the IE-703079-MC-EM1 are described. For the names and functions of the parts of the IE-703002-MC, and for the connection of elements, refer to the **IE-703002-MC User's Manual (U11595E)**.

1.1 Hardware Configuration



Notes 1. For further information, contact Daimaru Kogyo Co., Ltd.
Tokyo Electronics Department (TEL +81-3-3820-7112)
Osaka Electronics Department (TEL +81-6-6244-6672)

2. Cannot be used for PC98-NX series

Phase-out/Discontinued

1.2 Features (When Connected to IE-703002-MC)

- Maximum operating frequency: 16 MHz (at 5.0 V operation)
- Extremely lightweight and compact
- Higher equivalence with target device can be achieved by omitting buffer between signal cables.
- The following pins can be masked.
  $\overline{\text{RESET}}$, NMI, $\overline{\text{WAIT}}$, $\overline{\text{HLDRQ}}$
- Two methods of connection to target system:
  - Pod tip direct connection (For information on the pod, refer to the **IE-703002-MC User's Manual (U11595E)**)
  - Attach an extension probe (sold separately) to the pod tip for connection
- The dimensions of the IE-703079-MC-EM1 are as follows.

Parameter		Value
Power consumption (Max. value at 5.0 V supply voltage)		2.5 W (at 16 MHz operation frequency)[Note]
External dimensions (Refer to **APPENDIX PACKAGE DRAWINGS**)	Height	50 mm
	Length	130 mm
	Width	252 mm
Weight		300 g

Note 12.5 W when IE-703002-MC connected to IE-703079-MC-EM1

1.3 Function Specifications (When Connected to IE-703002-MC)

Parameter			Specification
Emulation memory capacity	Internal ROM		256 KB
	External memory	In ROMless mode	2 MB
		When using iROM	1 MB
Coverage memory capacity for execution/pass detection	Internal ROM		256 KB
	External memory	In ROMless mode	2 MB
		When using iROM	1 MB
Coverage memory capacity for memory access detection	External memory		1 MB
Coverage memory capacity for branching entry number counting	Internal ROM		256 KB
	External memory	In ROMless mode	2 MB
		When using iROM	1 MB

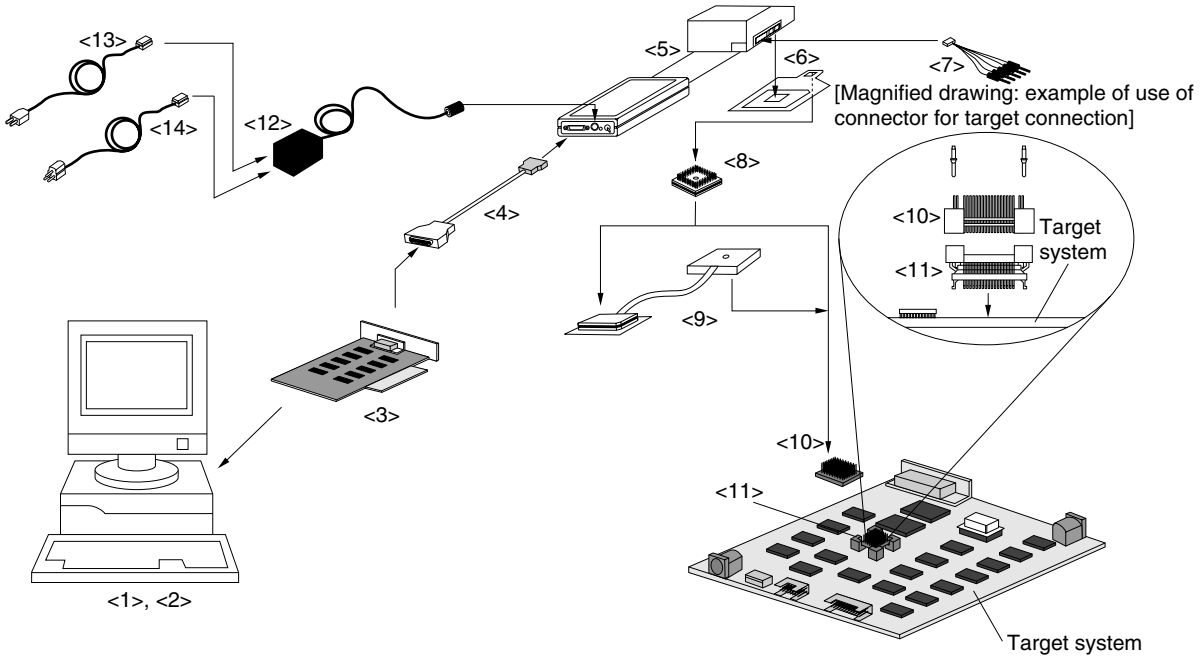
Caution Some of the functions may not be supported, depending on the debugger used.

Phase-out/Discontinued

1.4 System Configuration

The system configuration when connecting the IE-703002-MC to the IE-703079-MC-EM1 and a personal computer (PC-9800 series or PC/AT (or compatibles)) is shown below.

Figure 1-1. System Configuration



Remark

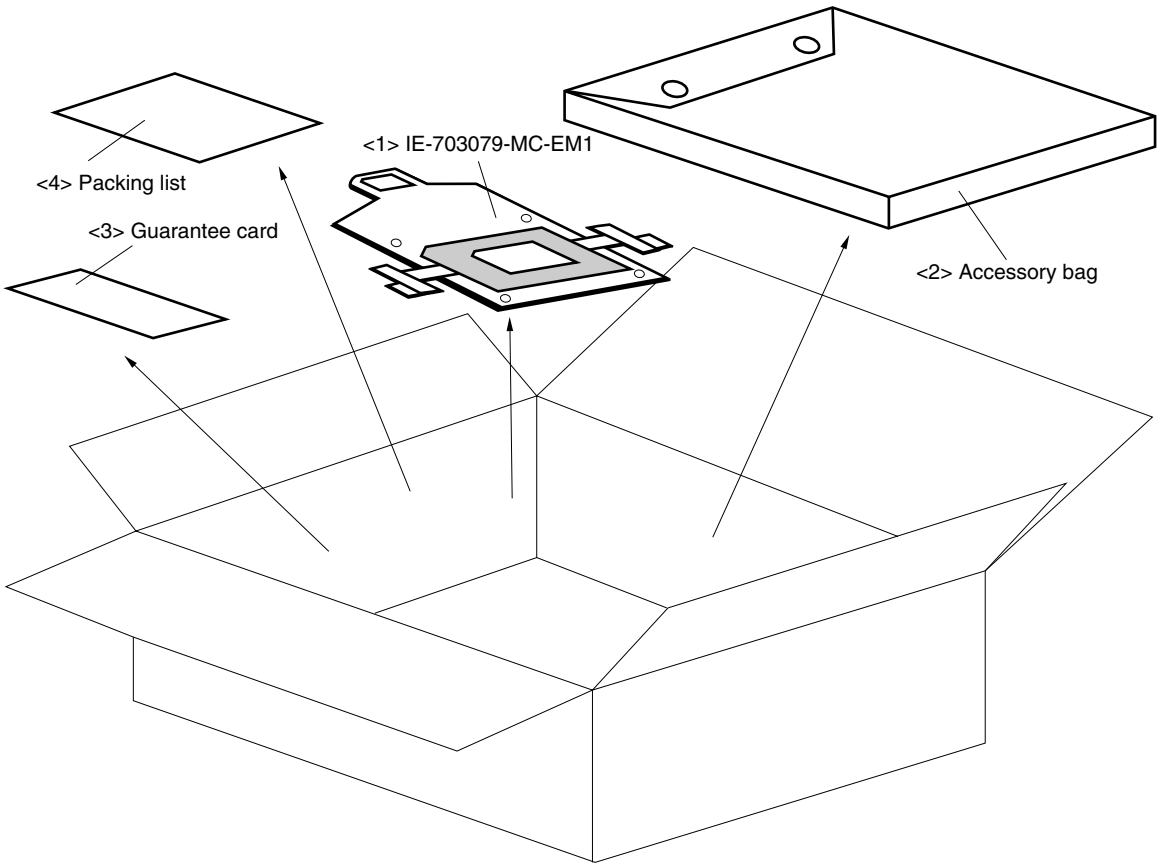
<1> Personal computer (PC-9800 series or PC/AT or compatibles)
<2> Debugger (ID850: sold separately)
<3> PC interface board
(IE-70000-98-IF-C/IE-70000-PC-IF-C, IE-70000-PCI-IF-A/IE-70000-CD-IF-A: sold separately)
<4> PC interface cable (included with IE-703002-MC)
<5> In-circuit emulator (IE-703002-MC: sold separately)
<6> In-circuit emulator option board (IE-703079-MC-EM1: this product)
<7> External logic probe (included with IE-703002-MC)
<8> Socket for target connection (YQSOCKET100SDN: sold separately)
<9> Extension probe (for GC package: SWEX-100SD, for GF package: SWEX-100SD/GF-N17DT)
<10> Connector for emulator connection (YQPACK100SD: included)
<11> Connector for target connection (NQPACK100SD: included)
<12> Power adapter (IE-70000-MC-PS-B: sold separately)
<13> AC100V power cable (sold separately: included with IE-70000-MC-PS-B)
<14> AC220V power cable (sold separately: included with IE-70000-MC-PS-B)

Phase-out/Discontinued

1.5 Contents in Carton

The carton of the IE-703079-MC-EM1 contains a main unit, guarantee card, packing list, and accessory bag. Make sure that the accessory bag contains this manual and the connector accessories. If there are missing or damaged items, please contact an NEC sales representative or an NEC distributor.

Figure 1-2. Contents in Carton



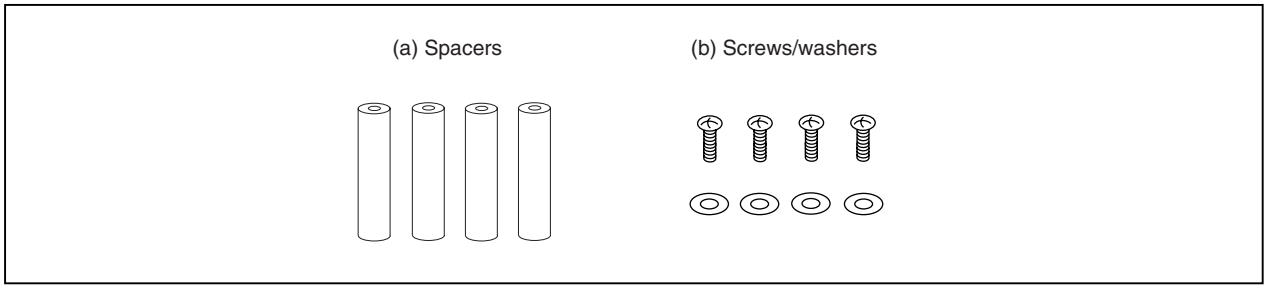
<1> IE-703079-MC-EM1 × 1
<2> Accessory bag × 1
<3> Guarantee card × 1
<4> Packing list × 1

Phase-out/Discontinued

Check that the accessory bag contains this manual, an accessory list (× 1), and the following accessories.

(a) Spacers × 4
(b) Screws/washers × 4 sets
(including screws and washer × 4)

Figure 1-3. Accessories



Phase-out/Discontinued

1.6 Connection Between IE-703002-MC and IE-703079-MC-EM1

The procedure for connecting the IE-703002-MC and IE-703079-MC-EM1 is described below.

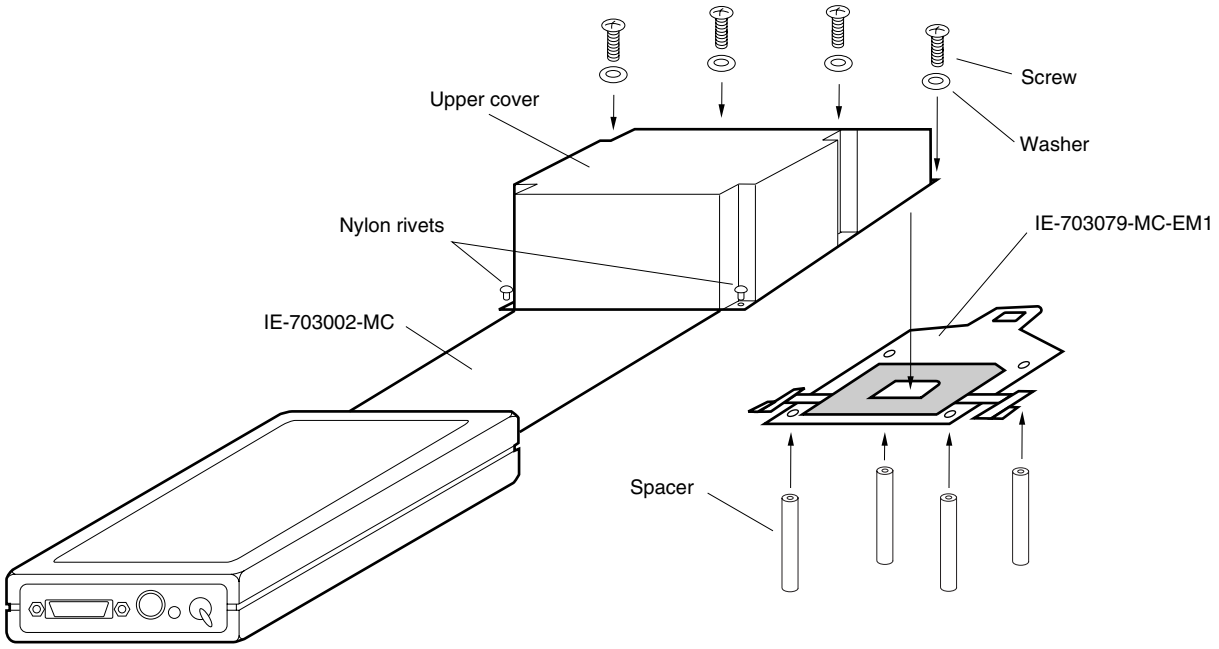
Caution Connect carefully so as not to break or bend connector pins.

<1> Remove the pod cover (upper and lower) of the IE-703002-MC.
<2> Set the PGA socket lever of the IE-703079-MC-EM1 to the OPEN position as shown in Figure 1-4 (b).
<3> Connect the IE-703079-MC-EM1 to the PGA socket at the back of the IE-703002-MC pod (refer to Figure 1-4 (c)). When connecting, position the IE-703002-MC and IE-703079-MC-EM1 so that they are horizontal.
<4> Set the PGA socket lever of the IE-703079-MC-EM1 to the CLOSE position as shown in Figure 1-4 (b).
<5> Set the IE-703002-MC pod jumpers (JP1 to JP3).
The factory settings of JP2 are pins 1 and 2 shorted.
<6> Place the supplied spacers in the four corner holes of the IE-703079-MC-EM1. Fix the spacers with the supplied screws.
<7> Fix the IE-703002-MC pod cover (upper) end with nylon rivets.

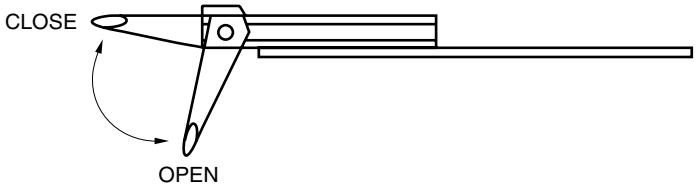
Phase-out/Discontinued

Figure 1-4. Connection Between IE-703002-MC and IE-703079-MC-EM1 (1/2)

(a) Overview

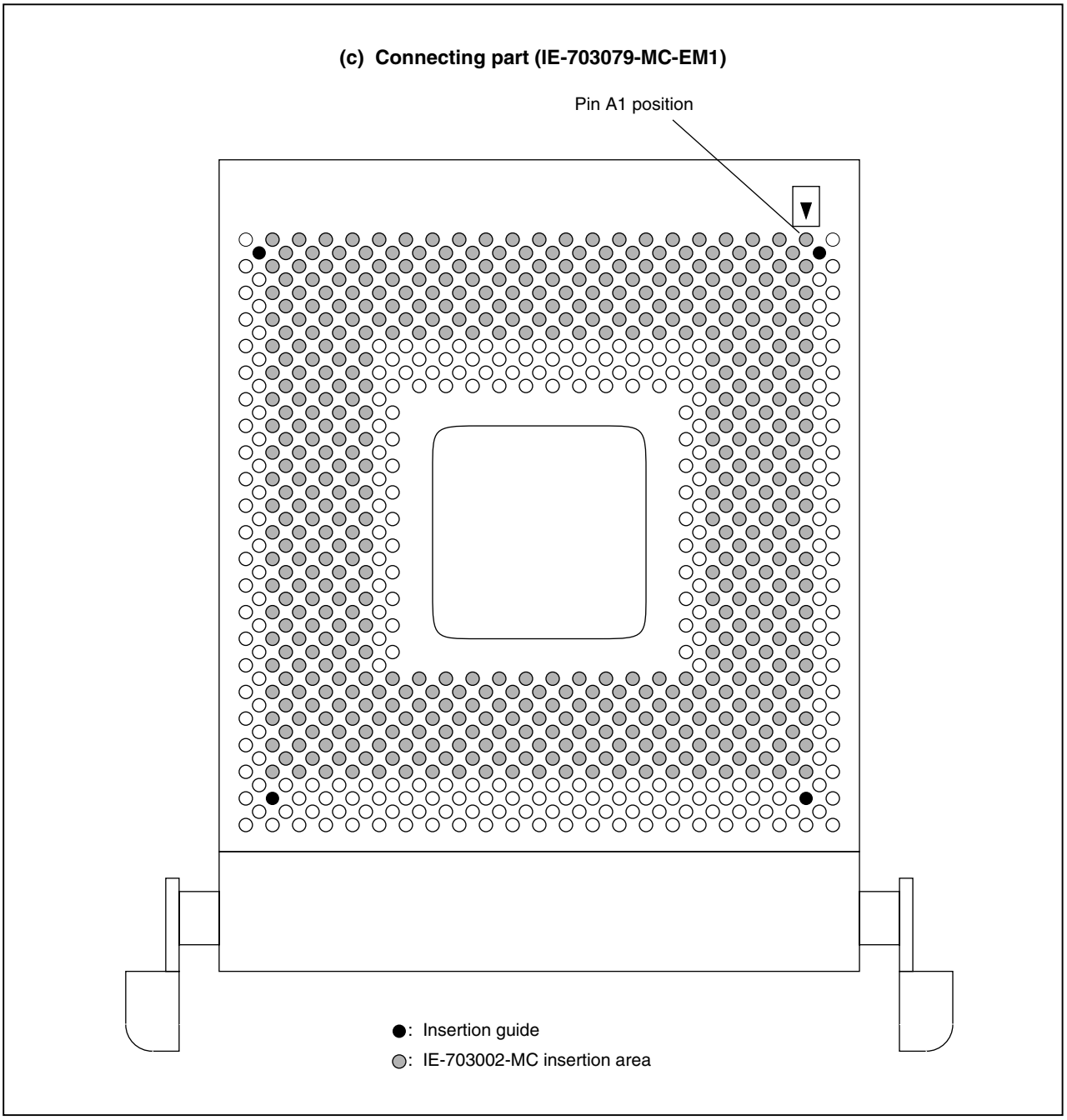


(b) PGA socket lever of IE-703079-MC-EM1



Phase-out/Discontinued

Figure 1-4. Connection Between IE-703002-MC and IE-703079-MC-EM1 (2/2)



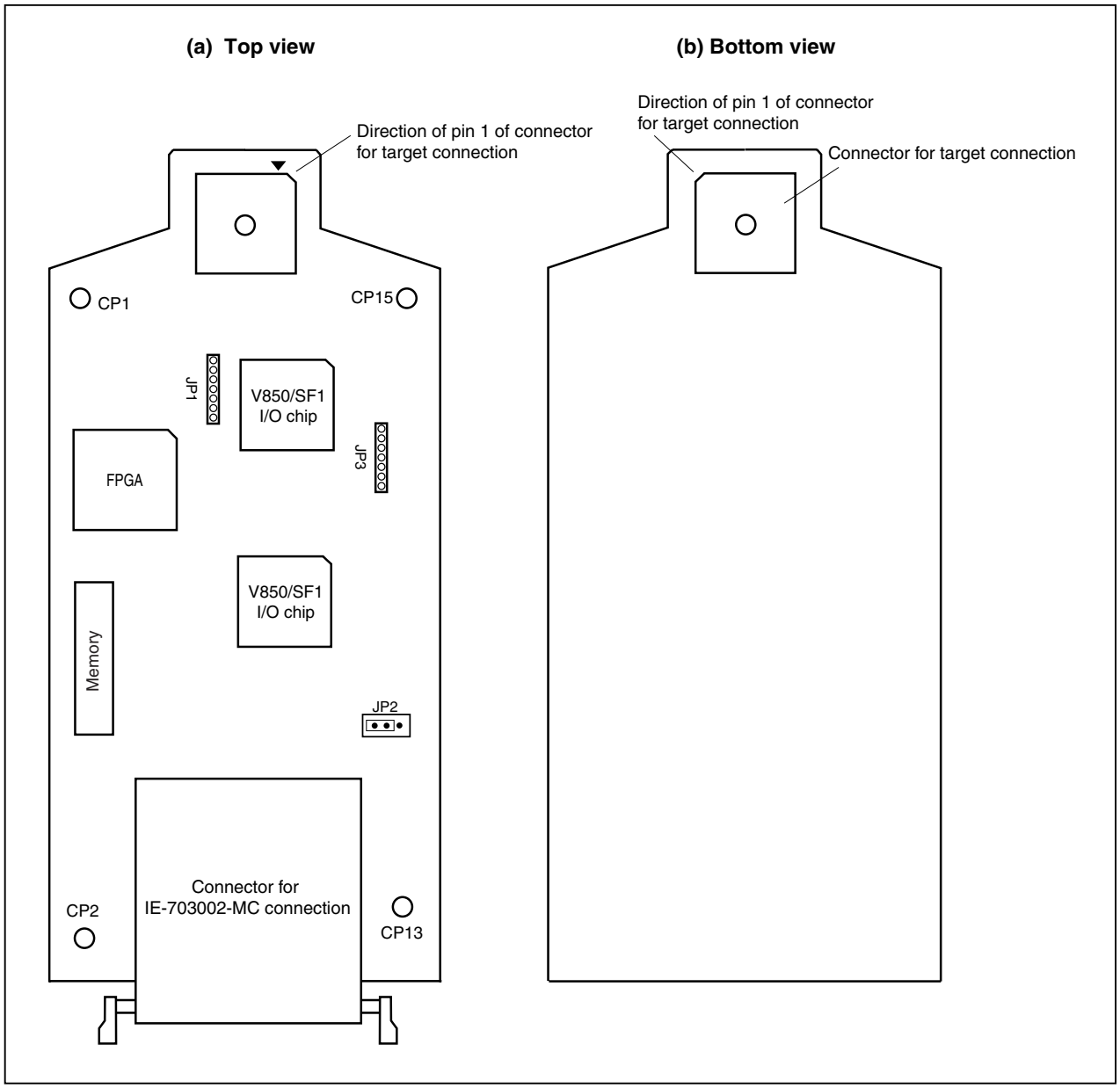
Phase-out/Discontinued

CHAPTER 2 NAMES AND FUNCTIONS OF COMPONENTS

This chapter describes the names, functions, and switch settings of components in the IE-703079-MC-EM1. For the details of the pod, jumper, and switch positions, etc., refer to the **IE-703002-MC User's Manual (U11595E)**.

2.1 Component Names and Functions of IE-703079-MC-EM1

Figure 2-1. IE-703079-MC-EM1



Phase-out/Discontinued

(1) TEST pins (CP1, CP2, CP13, CP15)

These are pins used for testing the analog signals of the standalone emulator.

- CP1: GND
- CP2: GND
- CP13: GND
- CP15: GND

(2) JP1

This is a pin board for supplying the main system clock.

(3) JP2

This is the switch jumper for the main system clock supply source. Use and retain the factory settings (pins 1 and 2 shorted).

(4) JP3

This is a pin board for supplying the subsystem clock (for details, refer to **2.2 Clock Settings**).

(5) Connector for IE-703002-MC connection

This is a connector for connecting with the IE-703002-MC.

(6) Connector for target connection

This is a connector for connecting with the target system or the extension probe.

Phase-out/Discontinued

2.2 Clock Settings

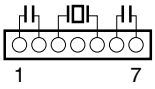
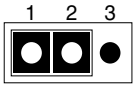
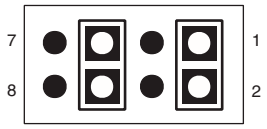
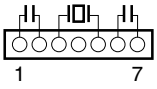
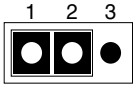
This section describes the clock settings.

For the position of the JP1 and JP2 in the IE-703079-MC-EM1, refer to Figure 2-1.

For the jumper switch position in the IE-703002-MC, refer to the **IE-703002-MC User's Manual (U11595E)**.

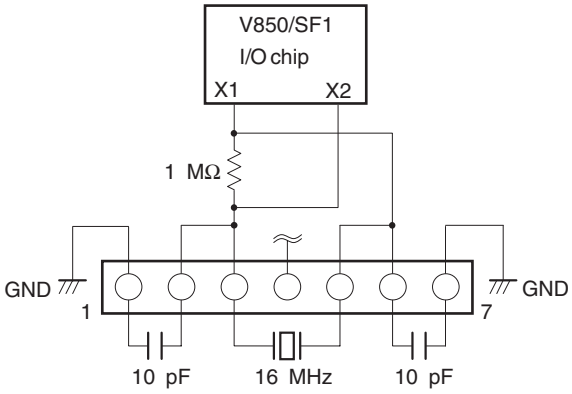
2.2.1 Main system clock setting

Table 2-1. Main System Clock Setting

Emulator Use Environment	Clock Supply Method	IE-703079-MC-EM1 Setting		IE-703002-MC Setting		
		JP1	JP2	SW1	SW2	JP2
When using emulator as standalone unit	Internal clock			ON	OFF	
When using emulator with target system	Internal clock					

Caution Emulation cannot be performed by inputting a clock from the target board.

The specifications of JP1 are as follows.



Phase-out/Discontinued

2.2.2 Subsystem clock setting

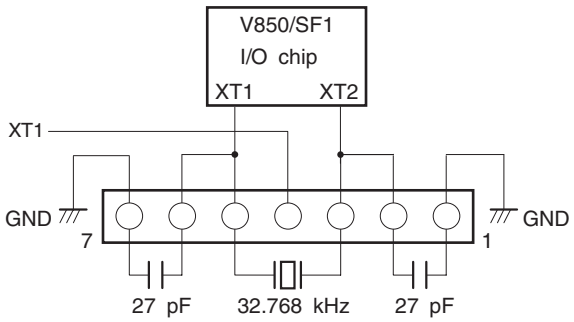
Table 2-2. Subsystem Clock Setting

Emulator Use Environment	Clock Supply Method	IE-703079-MC-EM1 Setting
		JP3
When using emulator as standalone unit	Internal clock[Note 1]	Oscillator mounted (a 32.768 kHz oscillator is mounted when shipped)[Note 2]
When using emulator with target system	Internal clock[Note 1]	Oscillator mounted (a 32.768 kHz oscillator is mounted when shipped)[Note 2]

Notes 1. The internal clock does not support the clock input by an oscillator.

2. To use a subsystem clock frequency other than 32.768 kHz, remove the resonator on JP3 and mount any oscillator.

The specifications of JP3 are as follows.



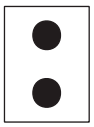
Caution Emulation cannot be performed by inputting a clock from the target board.

Phase-out/Discontinued

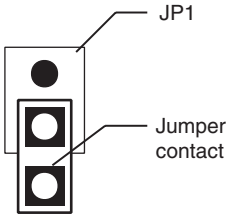
2.3 Illegal Access Detection ROM Setting

If using the IE-703002-MC for an in-circuit emulator for the V850/SF1 by connecting the IE-703079-MC-EM1, set JP1 of the IE-703002-MC as follows.

Table 2-3. JP1 Setting in IE-703002-MC

JP1		Description
Open[Note]		Illegal access detection ROM (mounted on IE-703079-MC-EM1) for V850/SF1 is used.

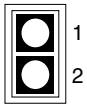
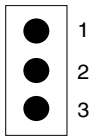
Note When JP1 is set open, keep the removed jumper contact attached to one pin as shown in the drawing on the right.



2.4 CPU Operation Voltage Range Switching Setting

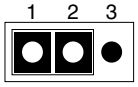
If using the IE-703002-MC for an in-circuit emulator for the V850/SF1 by connecting the IE-703079-MC-EM1, set JP3 and JP4 of the IE-703002-MC as follows.

Table 2-4. JP3 and JP4 Setting in IE-703002-MC

JP3, JP4		Description
JP3	 1 2 (Short)	The operation voltage range of the IE-703002-MC is 3.0 to 5.5 V.
JP4	 1 2 3 (Open)	The power supply for $PORTV_{DD}$ is generated on the IE-703079-MC-EM1.

Phase-out/Discontinued

CHAPTER 3 FACTORY SETTINGS

Item	Description	Remark
JP1	Oscillator mounted	16 MHz clock supplied for main system clock
JP2[Note]	1 2 3  (1-2 Shorted)	Internal clock used for main system clock
JP3	Oscillator mounted	32.768 kHz clock supplied for subsystem clock

Note Use JP2 with the factory settings.

Phase-out/Discontinued

CHAPTER 4 CAUTIONS

4.1 V_{DD0} and $PORTV_{DD}$ of Target System

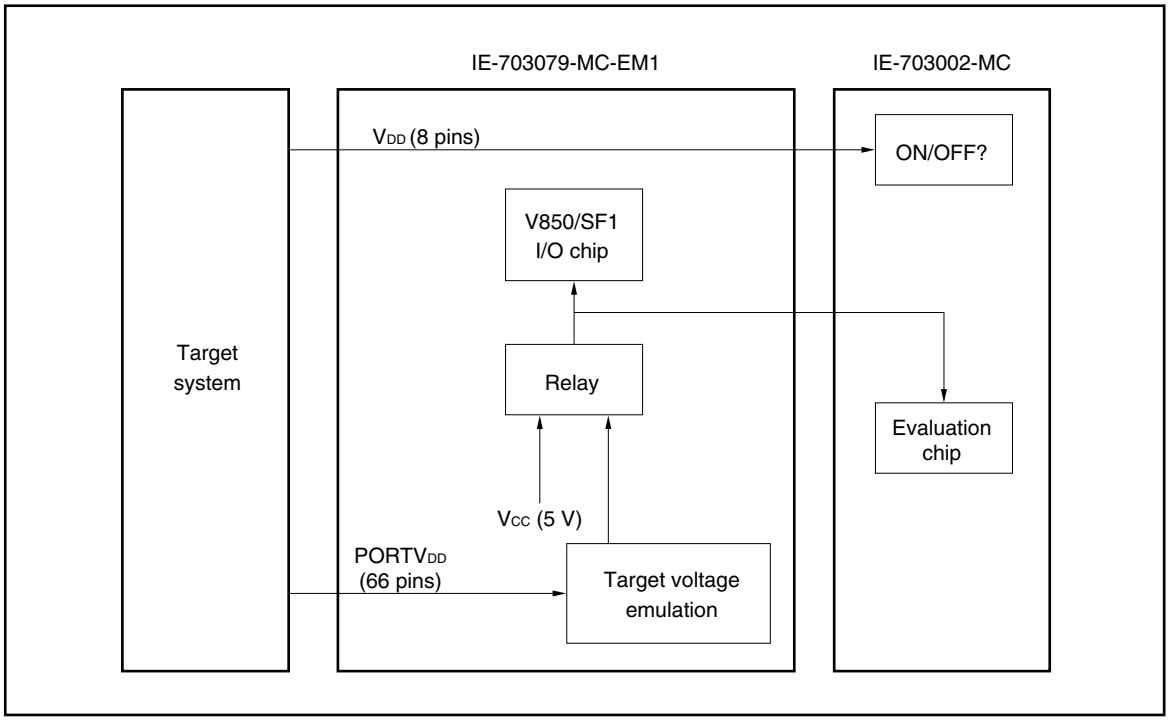
(1) V_{DD0} in the target system is used to sense the level for target system power supply ON/OFF.

- When V_{DD0} is lower than 1 V, it is judged that the target system is not connected, and mapping of the target memory cannot be performed with a debugger (FCAN cannot be used).
- When V_{DD0} is 1 V or higher, it is judged that the target system is connected, and mapping of the target memory can be performed with a debugger (FCAN can be used).

(2) $PORTV_{DD}$ in the target system is not supplied directly to the emulator chip; it is connected to the target voltage emulation circuit.

- When $PORTV_{DD}$ is lower than 3 V, V_{CC} (5 V) in the internal emulator is supplied to the emulator chip.
- When $PORTV_{DD}$ is 3 V or higher, a voltage of the same potential as $PORTV_{DD}$ in the target system is generated and supplied to the emulator chip.

Figure 4-1. Schematic Diagram of Power Supply Acquisition



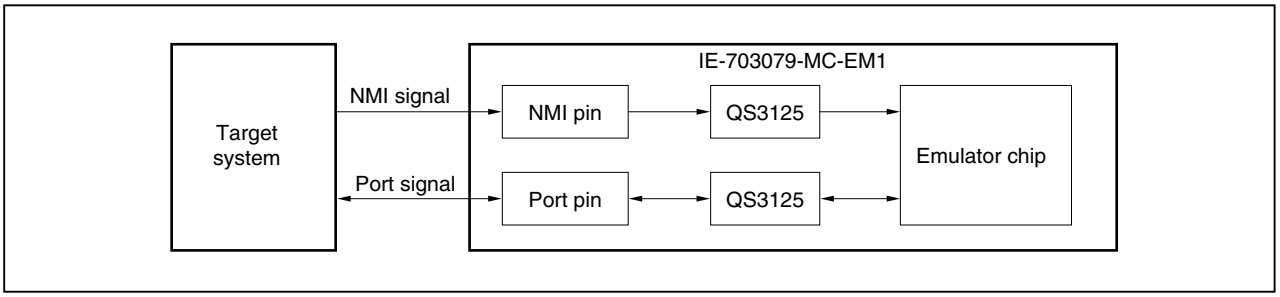
Phase-out/Discontinued

4.2 NMI Signal

The input signal (NMI signal) from the target system is delayed (t_{pD} = 0.25 ns (TYP.)) because it passes through QS3125 (Q switch), and I/O signals (ports 4, 5, 6, 9, 11) pass through QS3384 (Q switch) before it is input to the emulator chip.

In addition, the DC characteristics change. The input voltage becomes V_{IH} = 2.0 V (MIN.), V_{IL} = 0.8 V (MAX.), and the input current becomes I_{IN} = ±0.5 μA (MAX.).

Figure 4-2. NMI Signal Flow Path



4.3 V_{PP} Signal

The V_{PP} signal from the target system is left open in the emulator.

4.4 NMI Signal Mask Function

When using the P00/NMI pin in the port mode, do not mask the NMI signal.

Phase-out/Discontinued

4.5 Bus Interface Pin

The operation of the pin for the bus interface differs between the emulator and the target device as follows.

Table 4-1. Bus Interface Pin Operation List (1/2)

(a) During break

Pin Name	Internal Memory								External Memory			
	Memory Used by Emulator			Internal ROM	Internal RAM		Internal Peripheral I/O		Emulation RAM		Target System	
	F	R	W	R	R	W	R	W	R	W	R	W
A16 to A21	Hold the last accessed address								Active		Active	
AD0 to AD15	Hi-Z								Active		Active	
ASTB	H								Active		Active	
R/$\overline{W}$	H								Active		Active	
$\overline{DSTB}$	H								H		Active	
$\overline{LBEN}$	H								Active		Active	
$\overline{UBEN}$	H								Active		Active	
$\overline{WAIT}$	Invalid								Maskable		Maskable	
$\overline{HLDRQ}$	Maskable								Maskable		Maskable	
$\overline{HLDAK}$	H or L								H or L		H or L	
$\overline{WRL}$	H								H		H	**Note**
$\overline{WRH}$	H								H		H	**Note**
$\overline{RD}$	H								H		**Note**	H

Note Active

Caution When accessing an FCAN register with the external memory expanded, a bus cycle for FCAN access is generated in AD0 to AD15 and A16 to A21. However, R/$\overline{W}$, $\overline{DSTB}$, $\overline{LBEN}$, $\overline{UBEN}$, $\overline{WRL}$, $\overline{WRH}$, and $\overline{RD}$ are inactive.

Remarks 1. F: Fetch
R: Read
W: Write

2. H: High-level output
L: Low-level output
Hi-Z: High-impedance

Phase-out/Discontinued

Table 4-1. Bus Interface Pin Operation List (2/2)

(b) During run

Pin Name	Internal Memory							External Memory					
	Internal ROM		Internal RAM			Internal Peripheral I/O		Emulation RAM			Target System		
	F	R	F	R	W	R	W	F	R	W	F	R	W
A16 to A21	Hold the last accessed address							Active			Active		
AD0 to AD15	Hi-Z							Active			Active		
ASTB	H							Active			Active		
R/$\overline{W}$	H							Active			Active		
$\overline{DSTB}$	H							H			Active		
$\overline{LBEN}$	H							Active			Active		
$\overline{UBEN}$	H							Active			Active		
$\overline{WAIT}$	Invalid							Maskable			Maskable		
$\overline{HLDRQ}$	Maskable							Maskable			Maskable		
$\overline{HLDAK}$	H or L							H or L			H or L		
$\overline{WRL}$	H							H			H		**Note**
$\overline{WRH}$	H							H			H		**Note**
$\overline{RD}$	H							H			**Note**		H

Note Active

Caution When accessing an FCAN register with the external memory expanded, a bus cycle for FCAN access is generated in AD0 to AD15 and A16 to A21. However, R/$\overline{W}$, $\overline{DSTB}$, $\overline{LBEN}$, $\overline{UBEN}$, $\overline{WRL}$, $\overline{WRH}$, and $\overline{RD}$ are inactive.

Remarks 1. F: Fetch
R: Read
W: Write

2. H: High-level output
L: Low-level output
Hi-Z: High-impedance

Phase-out/Discontinued

CHAPTER 5 DIFFERENCES BETWEEN TARGET DEVICE AND TARGET INTERFACE CIRCUIT

Differences between the signal lines of the target device and the signal lines of the IE-703079-MC-EM1 target interface circuit are described in this chapter.

The target device is a CMOS circuit, whereas the target interface circuit of the IE-703079-MC-EM1 is configured with an emulation circuit such as a gate array TTL or CMOS-IC.

When debugging the IE system connected to the target system, the IE system emulates as if the real target device is operating on the target system.

Small differences occur however, because the IE system is emulating actual operation.

(1) Signals input/output to/from the emulation CPU μPD70F3079Y

(2) Other signals

The IE-703079-MC-EM1 circuit regarding the (1) and (2) signals described above is as follows.

(1) Signals input/output to/from the emulation CPU μPD70F3079Y

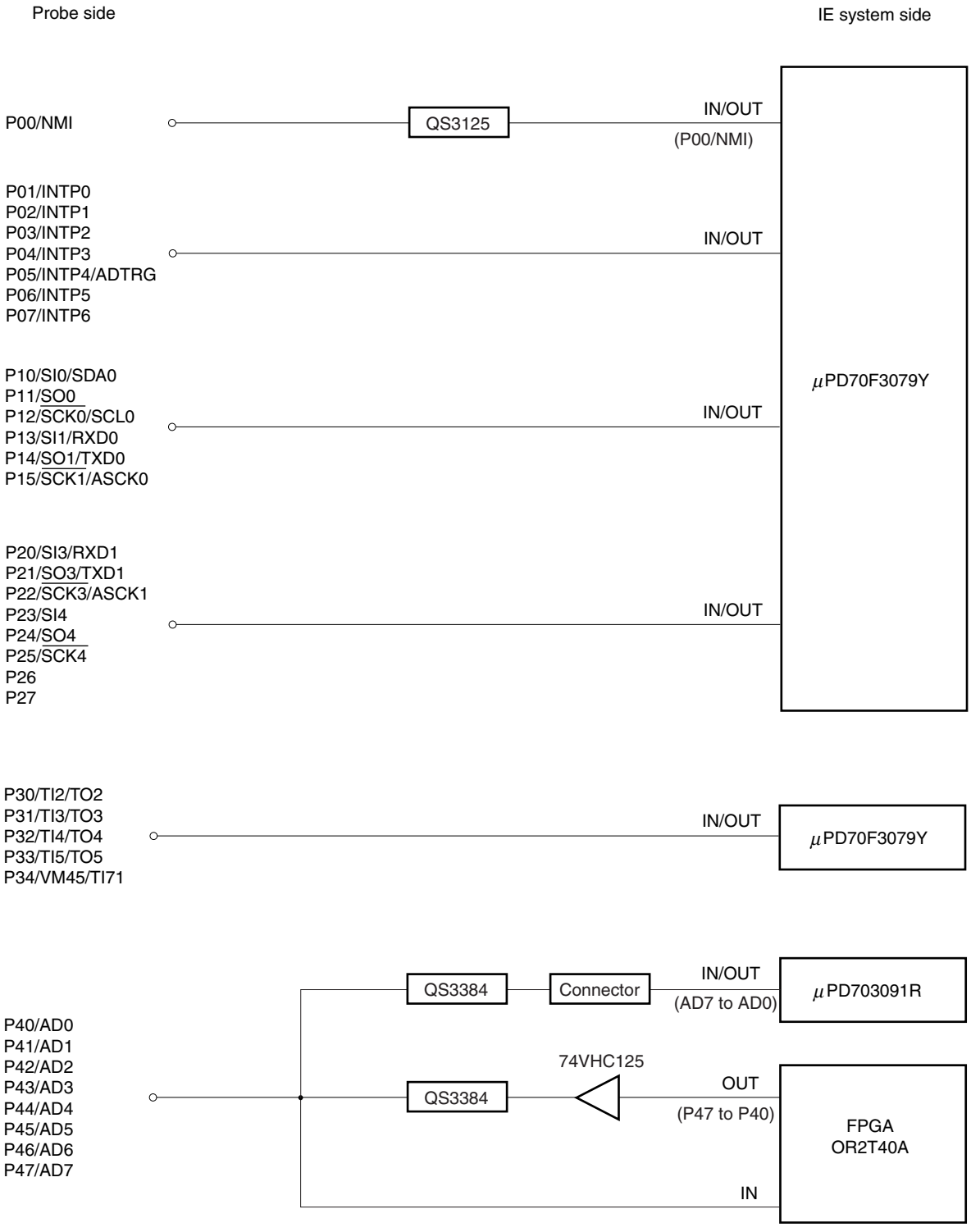
- P00
- P07/INTP6 to P01/INTP0
- P15/SCK1/ASCK0 to P10/SO0/SDA0
- P27 to P20/SI3/RXD1
- P34/VM45/TI71 to P30/TI2/TO2
- P77/ANI7 to P70/ANI0
- P83/ANI11 to P80/ANI8
- P107/KR7/TO1 to P100/KR0/TO7

(2) Other signals

- NMI
- P47/AD7 to P40/AD0
- P57/AD15 to P50/AD8
- P65/A21 to P60/A16
- P96/$\overline{\text{HLDRQ}}$ to P90/$\overline{\text{LBEN}}$
- P117/CANRX2 to P110/$\overline{\text{WAIT}}$
- X1, XT1
- $\overline{\text{RESET}}$
- CLKOUT
- PORTV_{DD}
- CPUREG
- V_{PP}/MODE
- X2, XT2
- GND0, GND1, GND2, PORTGND

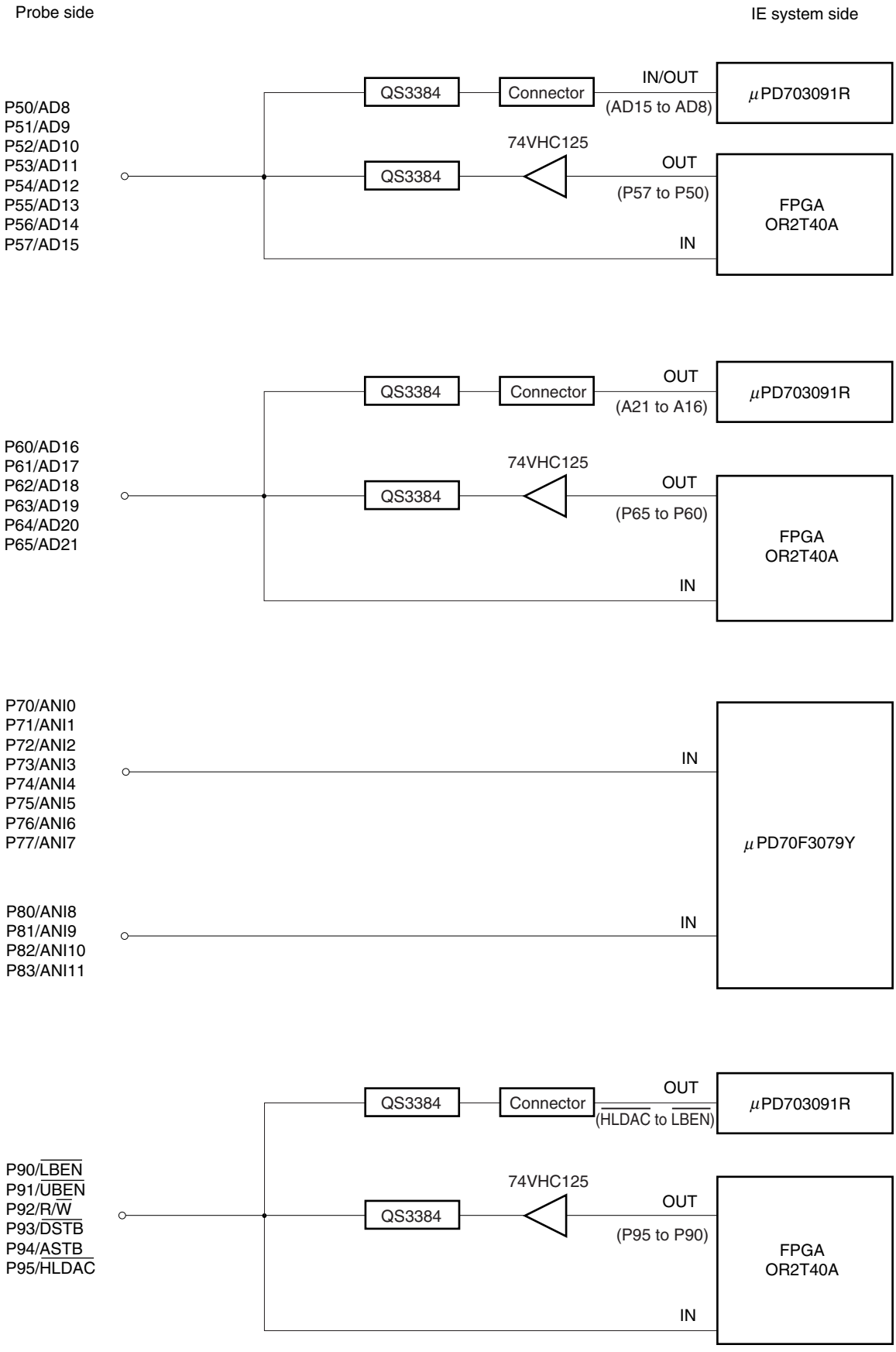
Phase-out/Discontinued

Figure 5-1. Equivalent Circuit of Emulation Circuit (1/5)



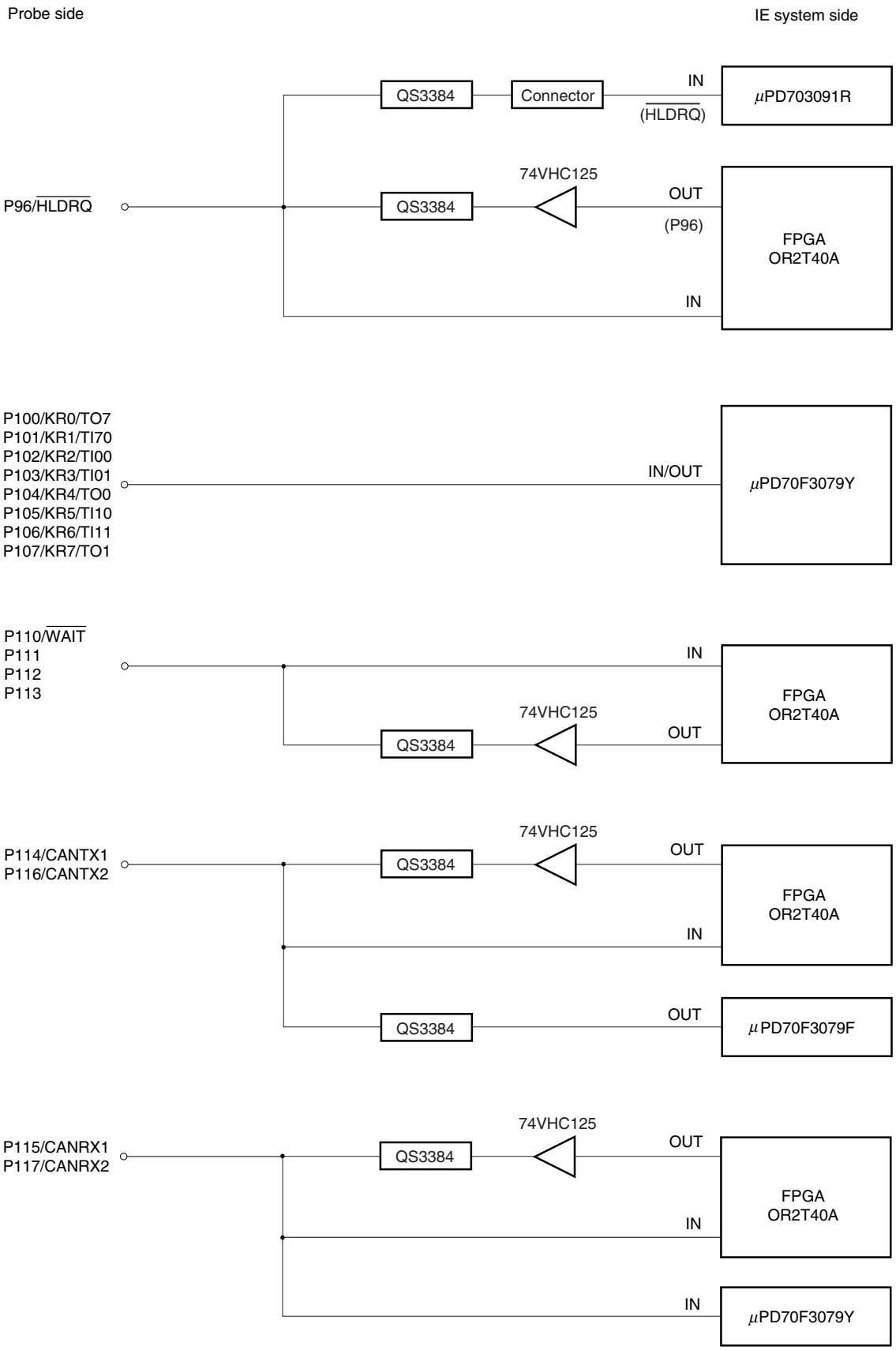
Phase-out/Discontinued

Figure 5-1. Equivalent Circuit of Emulation Circuit (2/5)



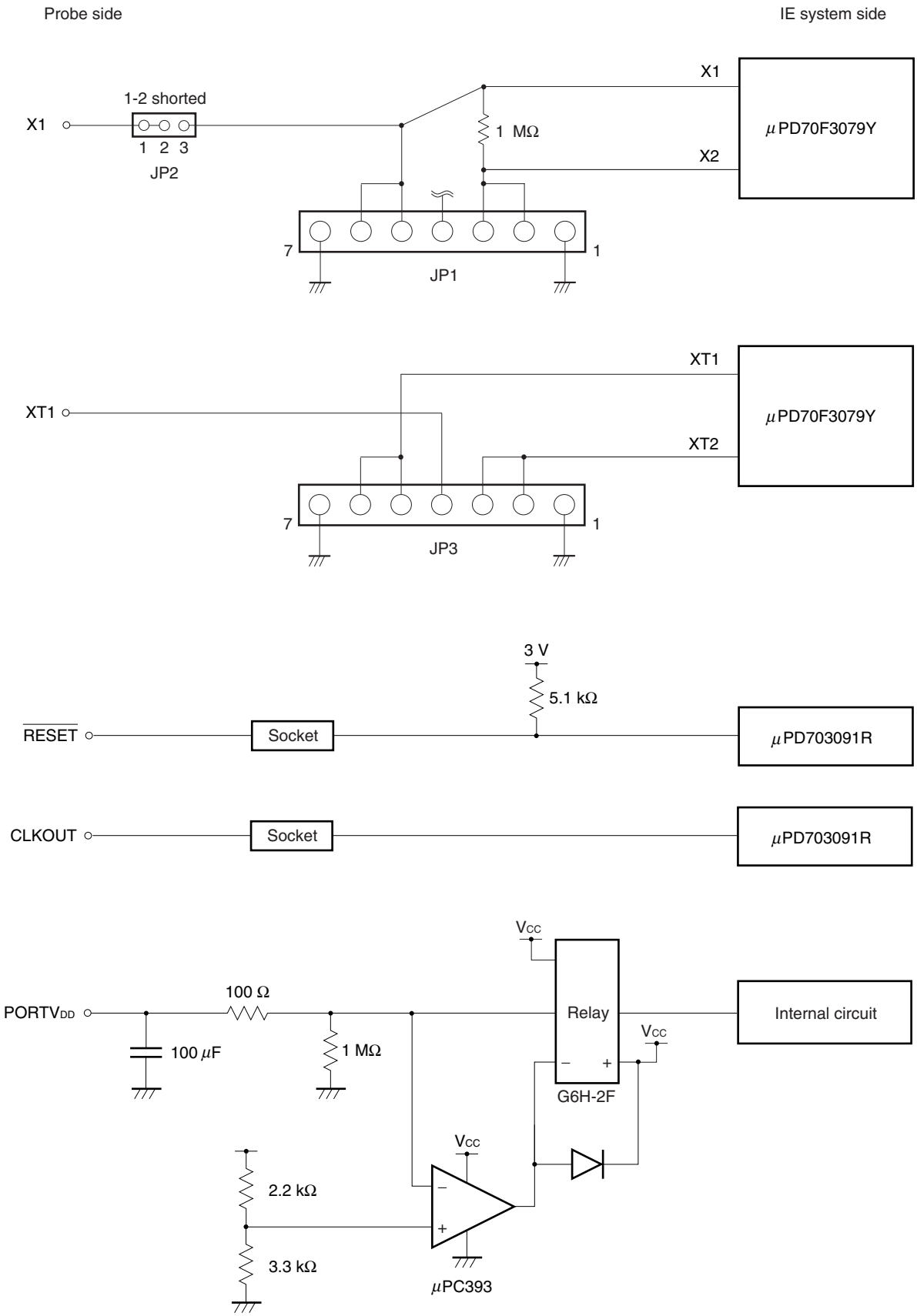
Phase-out/Discontinued

Figure 5-1. Equivalent Circuit of Emulation Circuit (3/5)



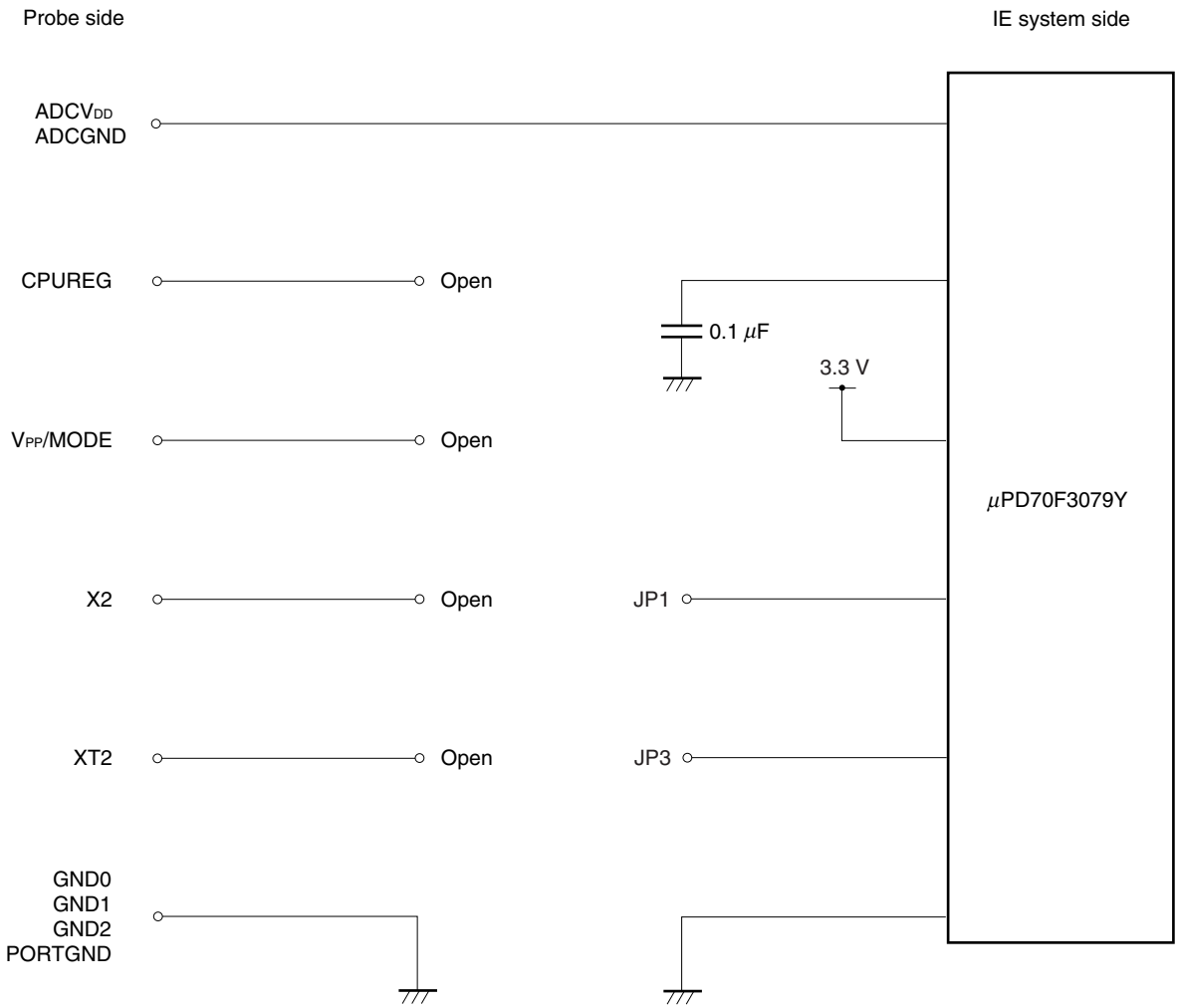
Phase-out/Discontinued

Figure 5-1. Equivalent Circuit of Emulation Circuit (4/5)



Phase-out/Discontinued

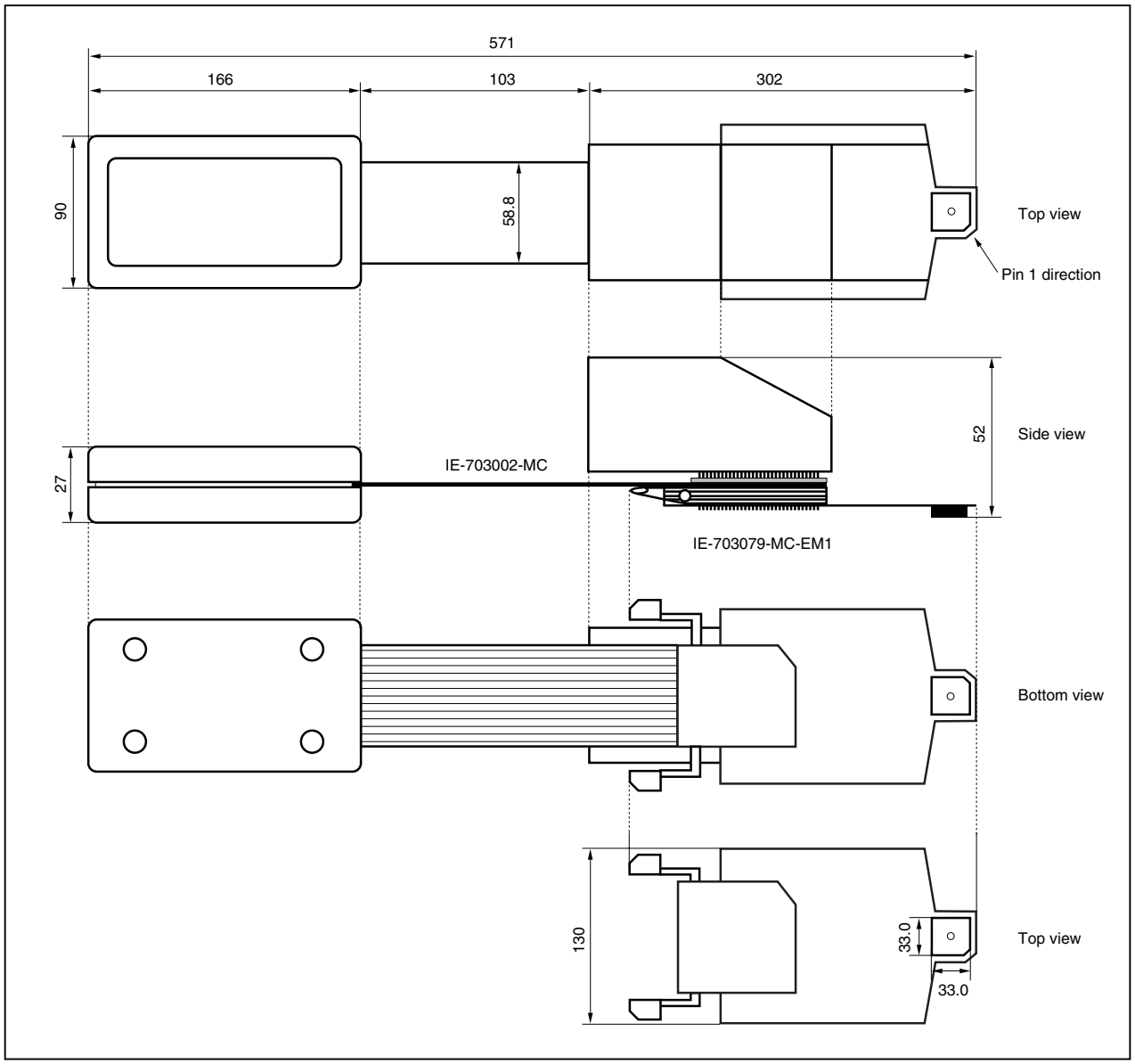
Figure 5-1. Equivalent Circuit of Emulation Circuit (5/5)



Phase-out/Discontinued

APPENDIX PACKAGE DRAWINGS

IE-703002-MC + IE-703079-MC-EM1 (Unit: mm)



Phase-out/Discontinued

NEC

Facsimile Message

From:

Name

Company

Tel. FAX

Address

Although NEC has taken all possible steps to ensure that the documentation supplied to our customers is complete, bug free and up-to-date, we readily accept that errors may occur. Despite all the care and precautions we've taken, you may encounter problems in the documentation. Please complete this form whenever you'd like to report errors or suggest improvements to us.

Thank you for your kind support.

North America
NEC Electronics Inc.
Corporate Communications Dept.
Fax: +1-800-729-9288
+1-408-588-6130

Europe
NEC Electronics (Europe) GmbH
Technical Documentation Dept.
Fax: +49-211-6503-274

South America
NEC do Brasil S.A.
Fax: +55-11-6462-6829

Hong Kong, Philippines, Oceania
NEC Electronics Hong Kong Ltd.
Fax: +852-2886-9022/9044

Korea
NEC Electronics Hong Kong Ltd.
Seoul Branch
Fax: +82-2-528-4411

Taiwan
NEC Electronics Taiwan Ltd.
Fax: +886-2-2719-5951

Asian Nations except Philippines
NEC Electronics Singapore Pte. Ltd.
Fax: +65-250-3583

Japan
NEC Semiconductor Technical Hotline
Fax: +81- 44-435-9608

I would like to report the following error/make the following suggestion:

Document title: _____

Document number: _____ Page number: _____

If possible, please fax the referenced page or drawing.

Document Rating	Excellent	Good	Acceptable	Poor
Clarity	❑	❑	❑	❑
Technical Accuracy	❑	❑	❑	❑
Organization	❑	❑	❑	❑