NEC

Preliminary User's Manual

IE-703178-MC-EM1

In-Circuit Emulator Option Board

Target Device
V850E/CG3,CG4™ CarGate+/CarGate-3G

Document No. U17556EE1V0UM00
Date Published April 2005

Printed in Germany

CE

The IE-703178-MC-EM1 complies with the EMC protection requirements

WARNING

This is a ‘Class A’ (EN 55022: 1998) equipment. This equipment can cause radio frequency noise when used in the residential area. In such cases, the user/operator of the equipment may be required to take appropriate countermeasures under his responsibility.

EEDT-ST-001-11

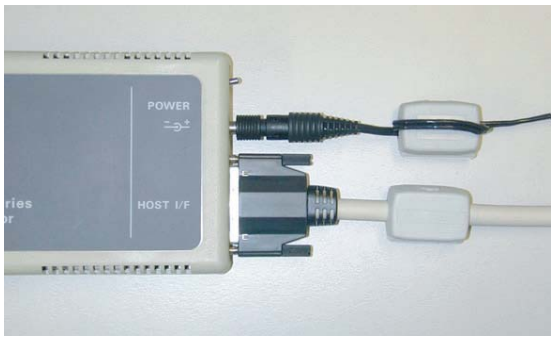
CAUTION

This equipment should be handled like a CMOS semiconductor device. The user must take all precautions to avoid build-up of static electricity while working with this equipment. All test and measurement tool including the workbench must be grounded. The user/operator must be grounded using the wrist strap. The connectors and/or device pins should not be touched with bare hands.

EEDT-ST-004-10

CAUTION

To operate this equipment with your target hardware the attached ferrites must be applied with the DC-power line and the PC interface line as shown in the photo. Make sure that both ferrites are located next to the emulator.



NOTES FOR CMOS DEVICES

① PRECAUTION AGAINST ESD FOR SEMICONDUCTORS

Note:

Strong electric field, when exposed to a MOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it once, when it has occurred. Environmental control must be adequate. When it is dry, humidifier should be used. It is recommended to avoid using insulators that easily build static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work bench and floor should be grounded. The operator should be grounded using wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions need to be taken for PW boards with semiconductor devices on it.

② HANDLING OF UNUSED INPUT PINS FOR CMOS

Note:

No connection for CMOS device inputs can be cause of malfunction. If no connection is provided to the input pins, it is possible that an internal input level may be generated due to noise, etc., hence causing malfunction. CMOS devices behave differently than Bipolar or NMOS devices. Input levels of CMOS devices must be fixed high or low by using a pull-up or pull-down circuitry. Each unused pin should be connected to V_{DD} or GND with a resistor, if it is considered to have a possibility of being an output pin. All handling related to the unused pins must be judged device by device and related specifications governing the devices.

③ STATUS BEFORE INITIALIZATION OF MOS DEVICES

Note:

Power-on does not necessarily define initial status of MOS device. Production process of MOS does not define the initial operation status of the device. Immediately after the power source is turned ON, the devices with reset function have not yet been initialized. Hence, power-on does not guarantee out-pin levels, I/O settings or contents of registers. Device is not initialized until the reset signal is received. Reset operation must be executed immediately after power-on for devices having reset function.

- **The information in this document is current as of April, 2005. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics 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 the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may appear in this document.
- NEC 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 NEC Electronics 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 Electronics 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 a customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics 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 Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".

  The "Specific" quality grade applies only to NEC Electronics products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics 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 Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

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

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

M8E 02. 11-1

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 America Inc.
Santa Clara, California
Tel: 408-588-6000
800-366-9782
Fax: 408-588-6130
800-729-9288

NEC Electronics (Europe) GmbH
Duesseldorf, Germany
Tel: 0211-65 03 1101
Fax: 0211-65 03 1327

Sucursal en España
Madrid, Spain
Tel: 091- 504 27 87
Fax: 091- 504 28 60

Succursale Française
Vélizy-Villacoublay, France
Tel: 01-30-67 58 00
Fax: 01-30-67 58 99

Filiale Italiana
Milano, Italy
Tel: 02-66 75 41
Fax: 02-66 75 42 99

Branch The Netherlands
Eindhoven, The Netherlands
Tel: 040-244 58 45
Fax: 040-244 45 80

Branch Sweden
Taeby, Sweden
Tel: 08-63 80 820
Fax: 08-63 80 388

United Kingdom Branch
Milton Keynes, UK
Tel: 01908-691-133
Fax: 01908-670-290

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.
Singapore
Tel: 65-6253-8311
Fax: 65-6250-3583

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

[MEMO]

Introduction

Readers

This manual is intended for users who design and develop application systems using the V850E/CG3,CG4^{TM} CarGate+/CarGate-3G.

Purpose

The purpose of this manual is to describe the proper operation of the IE-703178-MC-EM1, and its basic specifications.

Organization

This manual is broadly divided into the following parts.

- Overview
- Name and function of components
- Factory settings
- Cautions
- Debugger operation
- Limitations

How to Read This Manual

It is assumed that the reader of this manual has general knowledge of electrical engineering, logic circuits, and microcontrollers.
The IE-703178-MC-EM1 are used connected to the IE-V850E-MC in-circuit emulator. This manual explains the basic setup procedure and switch settings of the IE-703178-MC-EM1. For the names and functions, and the connection of parts, refer to the **IE-V850E-MC User's Manual**, which is a separate volume.

To understand the basic specifications and operation methods broadly
→ Read this manual in the order listed in **CONTENTS**.

To know the operation methods and command functions of the IE-V850E-MC, IE-703178-MC-EM1.
→ Read the user's manual of the debugger (separate volume) that is used.

Conventions

Note	:	Explanation of (Note) in the text
Caution	:	Item deserving extra attention
Remark	:	Supplementary explanation to the text
Numeric notation	:	Binary . . . xxxx or xxxB Decimal . . . xxxx Hexadecimal . . . xxxxH or 0x xxxx

Prefixes representing powers of 2 (address space, memory capacity)
K (kilo): $2^{10} = 1024$
M (mega): $2^{20} = 1024^2 = 1,048,576$
G (giga): $2^{30} = 1024^3 = 1,073,741,824$

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

Emulator	Combination of IE-V850E-MC and IE-703178-MC-EM1
Target device	Device that is emulated.
Target system	The system (user-built system) to be debugged. This includes the target program and user-configured hardware.
I/O Chip	Device in emulation mode mounted on IE-703178-MC-EM1.

Related Documents The related documents indicated in this publication may include preliminary versions. However, preliminary versions are not marked as such.

- **Documents related to V850E/CG3,CG4 CarGate+/CarGate-3G**

Document Name	Document Number
V850E1 User's Manual-Architecture	U14559EJ
µPD70F3178,µPD70F3433 User's manual	Under preparation

- **Documents related to development tools (User's Manual)**

Product Name	Document Number
IE-V850E-MC (In-circuit emulator)	U14487EJ
IE-703178-MC-EM1 (In-circuit emulator optional board)	This manual

Table of Contents

Introduction. 7

Chapter 1 Overview 15
1.1 Hardware Configuration 15
1.2 Features (When Connected to IE-V850E-MC) 16
1.3 Function Specifications (When Connected to IE-V850E-MC) 17
1.4 System Configuration 18
1.5 Contents in Carton. 19
1.6 Connection between IE-V850E-MC and IE-703178-MC-EM1 20

Chapter 2 Name and Function of Components. 23
2.1 Component Name and Function of IE-703178-MC-EM1 23
2.2 Clock Setting 27
2.3 Operation Mode 27

Chapter 3 Factory Settings 29

Chapter 4 Differences Between Emulator and Device 31
4.1 Pin Functions 31
4.1.1 MODE0 and MODE1 pins. 31
4.1.2 $\overline{\text{RESET}}$ input 31
4.1.3 Clock signals. 31
4.1.4 Alphabet ports, driver strengths 31
4.1.5 Supply pins 31
4.1.6 Standby behaviour of bus interface 31
4.1.7 AV_{REF}, AV_{SS} pins 31
4.2 Special Function Registers (SFRs) 32
4.2.1 Alphabet port mode register values 32
4.2.2 Port direction setting for peripheral function 32
4.3 Standby Release 32
4.4 Peripheral Break 32

Chapter 5 Debugger Operation. 33
5.1 Operation of FCAN Interface. 33

Chapter 6 Operating Precautions 35
6.1 Operating Precautions 35
6.1.1 UART malfunction during break 35
6.1.2 CSI malfunction during break 35
6.1.3 AFCAN malfunction during break 35
6.1.4 Capture value of Timer P might be corrupted if early capture event 35

Appendix A Package Drawings 37

Appendix B Connectors for Target Connection. 43

Appendix C Example of Use of Connector for Target Connection. 47

Appendix D Mounting of Plastic Spacer 49

List of Figures

Figure 1-1: Hardware Configuration 15
Figure 1-2: System Configuration 18
Figure 1-3: Contents in Carton 19
Figure 1-4: Connection between IE-V850E-MC and IE-703178-MC-EM1 (1/2) 20
Figure 2-1: IE-703178-MC-EM1 23
Figure A-1: IE-V850E-MC + IE-703178-MC-EM1 (Unit: mm) 37
Figure A-2: SWEX-100-SD-1 (Unit: mm) 38
Figure A-3: NQPACK100SD (Unit: mm) 39
Figure A-4: YQPACK10SD (Unit: mm) 40
Figure A-5: HQPACK100SD (Unit: mm) 41
Figure A-6: YQSOCKET100DN (Unit: mm) 42
Figure C-1: Mounting of NQPACK100SD 43
Figure C-1: Mounting Device 44
Figure C-2: NQPACK100SD and Device Pin 44
Figure C-1: When Directly Connecting Device to Target System (Connector for Target Connection is not used) 47
Figure C-2: When Equipping Device by using Connector for Target Connection 47
Figure C-3: Connection between Emulator and Target System 48
Figure D-1: Mounting Method of Plastic Spacer 49

List of Tables

Table 1-1: Dimensions of the IE-703178-MC-EM1 16
Table 1-2: Function Specifications 17
Table 2-1: Jumpers 24
Table 2-2: Connector List 25
Table 2-3: LEDs 26
Table 3-1: Factory Settings 29

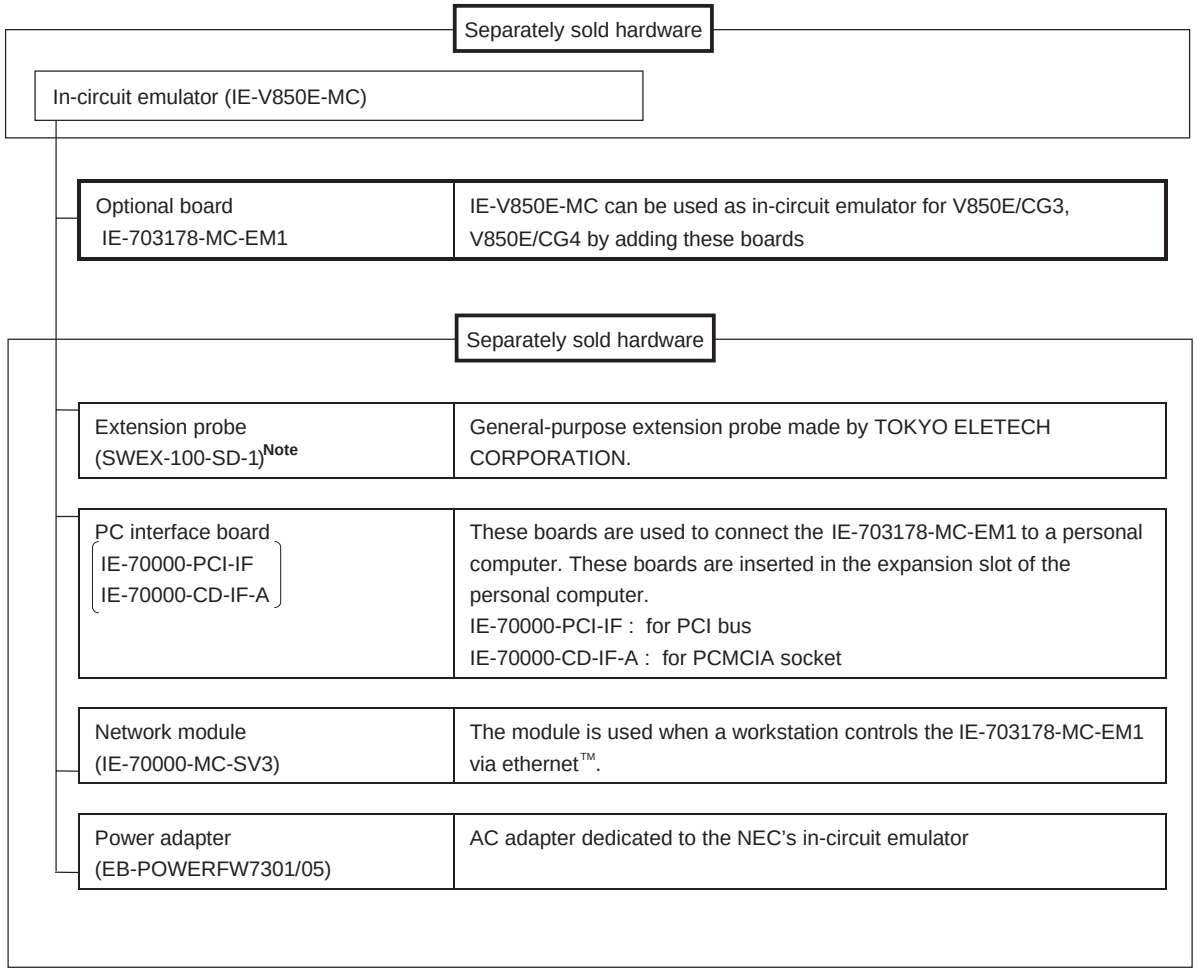
Chapter 1 Overview

The IE-703178-MC-EM1 is an optional board for the in-circuit emulator IE-V850E-MC. By connecting the IE-703178-MC-EM1 to IE-V850E-MC, hardware and software can be debugged efficiently in system development using the V850E/CG3,CG4 CarGate+/CarGate-3G.

In this manual, the basic setup sequences and switch settings of the IE-703178-MC-EM1 when connecting it to the IE-V850E-MC are described. For the names and functions of the parts of the IE-V850E-MC, and for the connection of elements, refer to the **IE-V850E-MC User's Manual** which is a separate volume.

1.1 Hardware Configuration

Figure 1-1: Hardware Configuration



Note: For further information concerning the extension probe, contact **http://www.tetc.co.jp**

1.2 Features (When Connected to IE-V850E-MC)

- Maximum operation frequency: 32 MHz
- Maximum operating frequency of the crystal: 8 MHz
- Extremely lightweight and compact
- Higher equivalence with target device can be achieved by omitting buffer between signal cables.
- Following pins can be masked: $\overline{\text{RESET}}$, NMI
- Two methods of connection to target system:
  - Direct connection of the IE-703178-MC-EM1
  - Attach an extension probe (sold separately) to the connection tab of the IE-703178-MC-EM1.
- Dimensions of the IE-703178-MC-EM1 are as follows.

Table 1-1: Dimensions of the IE-703178-MC-EM1

Parameter		Value
Power dissipation		0.6 W (at 32-MHz operation frequency)[Note]
External dimensions (Refer to **APPENDIX A DIMENSIONS**)	Height	41 mm
	Length	170 mm
	Width	85 mm
Weight		151.4 g

Note: The power dissipation is 11.6 W when IE-V850E-MC + IE-703178-MC-EM1 are connected.

1.3 Function Specifications (When Connected to IE-V850E-MC)

Table 1-2: Function Specifications

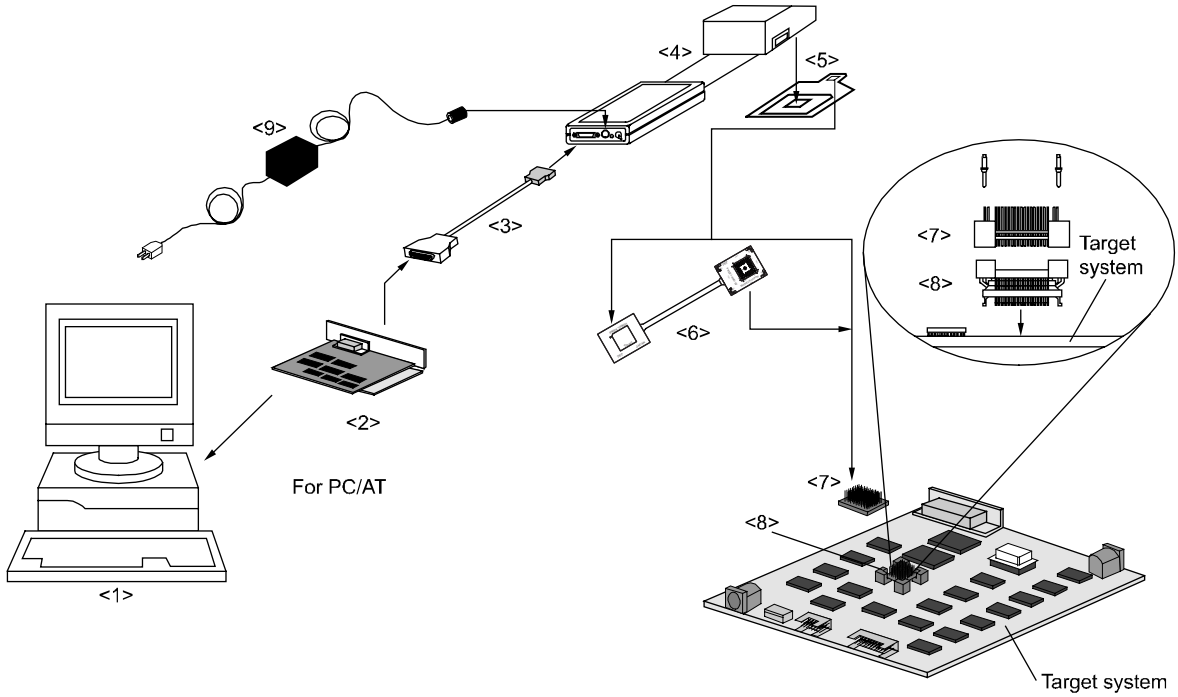
Parameter		Specification
Emulation memory capacity	Internal ROM	256 Kbytes (CarGate+), 384kB (CarGate-3G)
	External memory	None
Execution/pass detection Coverage memory capacity	Internal ROM	1 Mbyte
	External memory	1 Mbyte
Memory access detection Coverage memory capacity	External memory	1 Mbyte
Trace memory capacity		168 bits × 32 Kframes
Time measurement function		Can be measured with time tag and timers (3 lines)
External logic probe		8-bit external trace is possible
		Event setting for trace/break is possible
Break function		Event break
		Step execution break
		Forced break
		Fail safe break • Illegal access to peripheral I/O • Access to guard space • Write to the ROM space

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

1.4 System Configuration

The system configuration when connecting the IE-703178-MC-EM1 to the IE-V850E-MC, which is then connected to a personal computer (PC/AT compatible) is shown below.

Figure 1-2: System Configuration



Remark:

<1> Personal computer

<2> PC interface board (IE-70000-PCI-IF, IE-70000-CD-IF-A: sold separately)

<3> PC interface cable (included with IE-V850E-MC)

<4> In-circuit emulator (IE-V850E-MC: sold separately)

<5> In-circuit emulator option board (IE-703178-MC-EM1)

<6> Extension probe (SWEX-100SD-1: not included)

<7> Connector for emulator connection (YQPACK100SD: included)

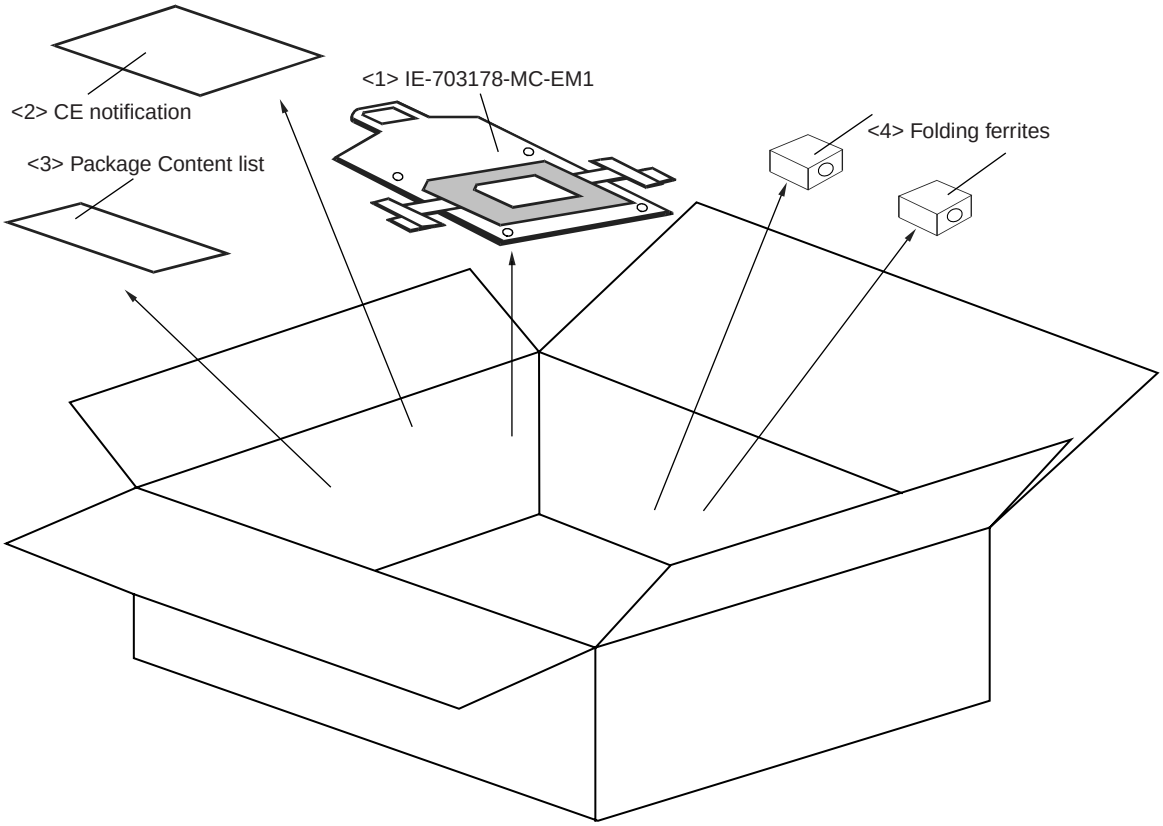
<8> Connector for target connection (NQPACK100SD: included)

<9> Power adapter (EB-POWERFW7301/05: included with IE-V850E-MC)

1.5 Contents in Carton

The carton of the IE-703178-MC-EM1 contains a main unit, CE notification, package content list and folding ferrites. In case of missing or damaged contents, contact an NEC sales representative or an NEC distributor.

Figure 1-3: Contents in Carton



<1> IE-703178-MC-EM1 × 1

<2> CE notification × 1

<3> Package content list × 1

<4> Folding ferrites × 2

1.6 Connection between IE-V850E-MC and IE-703178-MC-EM1

The procedure for connecting the IE-V850E-MC and IE-703178-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-V850E-MC.

<2> Set the PGA socket lever of the IE-703178-MC-EM1 to the OPEN position as shown in Figure 1-3 (b).

<3> Connect the IE-703178-MC-EM1 to the PGA socket at the back of the pod (refer to **Figure 1-3 (c)**). When connecting, position the IE-V850E-MC and IE-703178-MC-EM1 so that they are horizontal.
Spacers can be connected to fix the pod. (refer to **APPENDIX D MOUNTING OF PLASTIC SPACER**)

<4> Set the PGA socket lever of the IE-703178-MC-EM1 to the CLOSE position as shown in Figure 1-3 (b).

<5> Fix the IE-703178-MC-EM1 between the pod covers (upper and lower) with nylon rivets.

<6> Secure the pod cover (upper) end with nylon rivets.

Figure 1-4: Connection between IE-V850E-MC and IE-703178-MC-EM1 (1/2)

(a) Overview

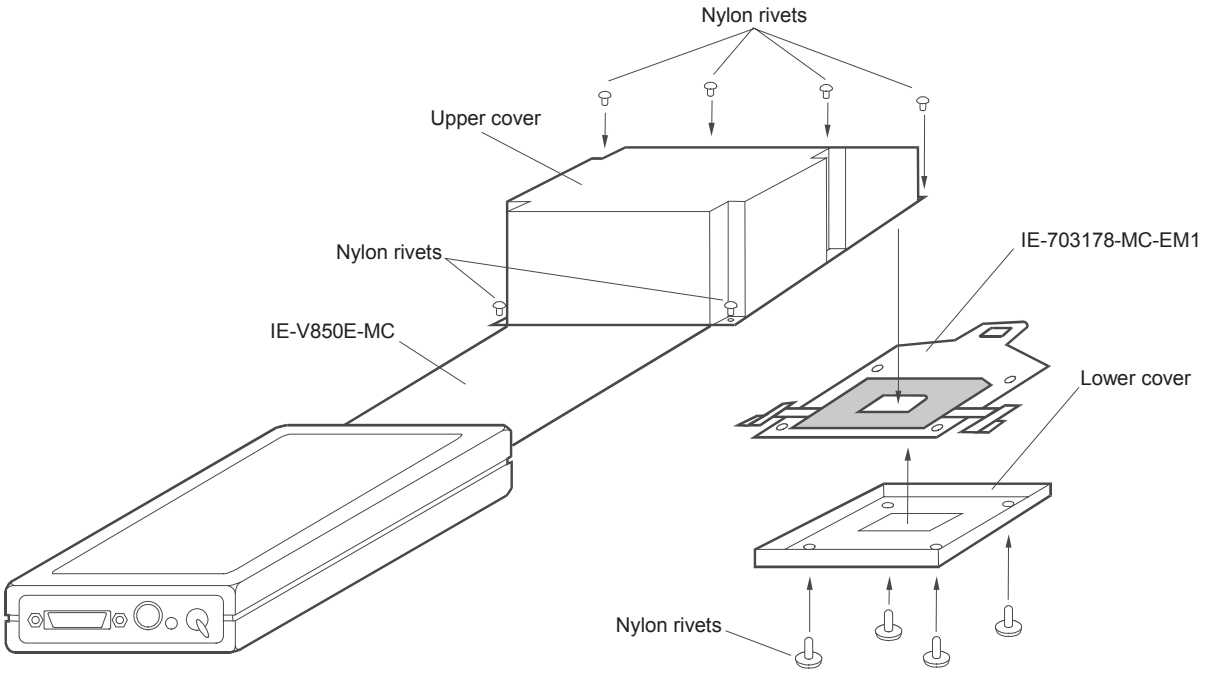
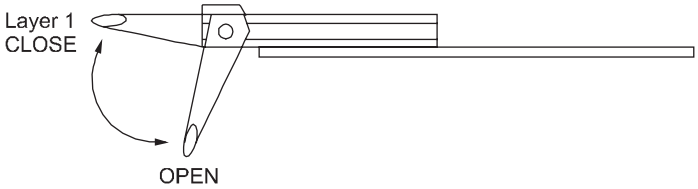
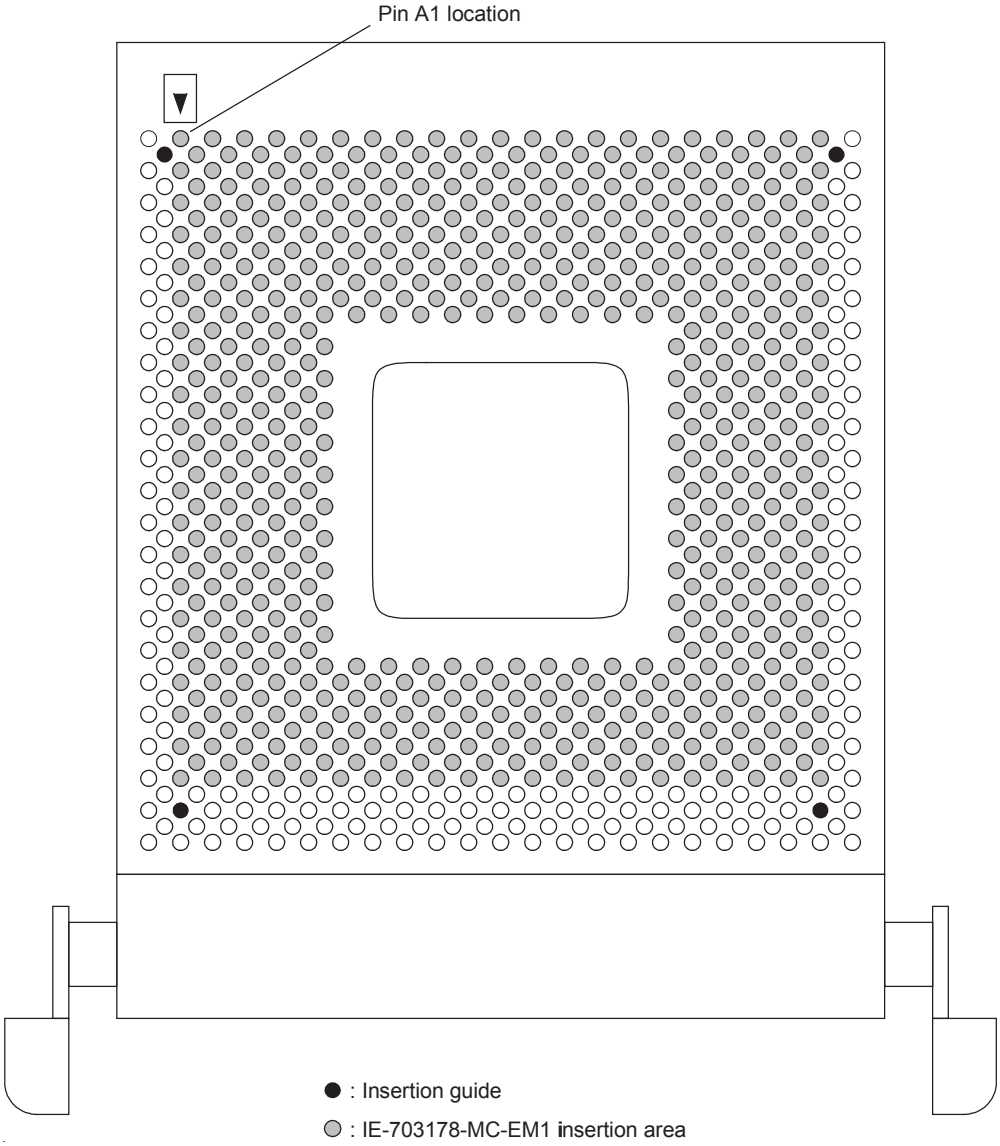


Figure 1-4: Connection between IE-V850E-MC and IE-703178-MC-EM1 (2/2)

(b) PGA Socket Lever of IE-703178-MC-EM1



(c) Connecting part (IE-703178-MC-EM1)



[MEMO]

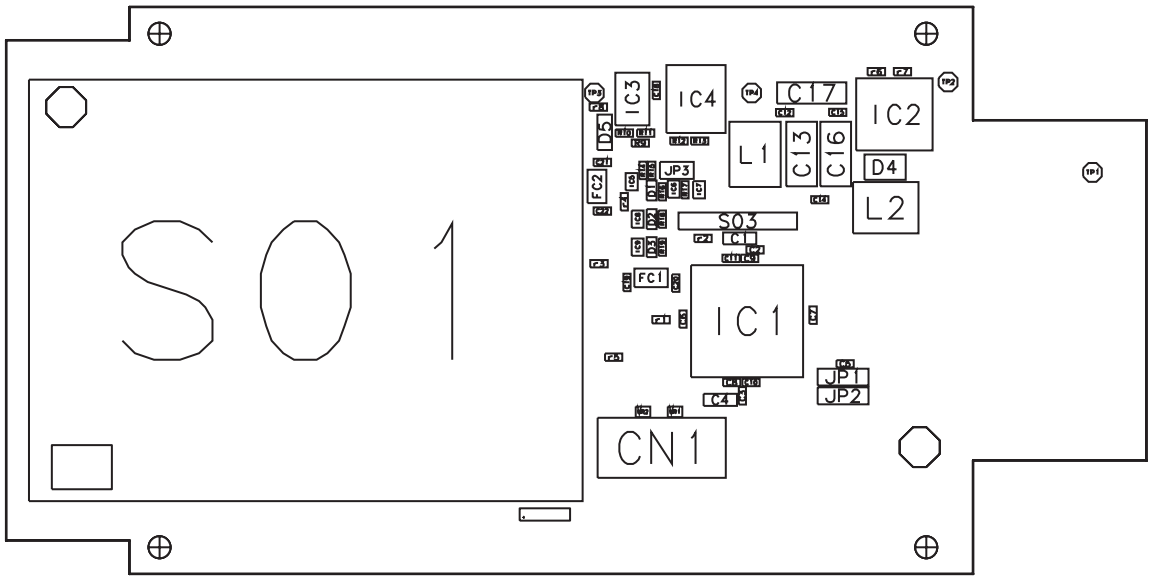
Chapter 2 Name and Function of Components

This chapter describes the names, functions, and switch settings of components comprising the IE-703178-MC-EM1. For the details of the pod, jumper, and switch positions, etc., refer to the **IE-V850E-MC User's Manual**.

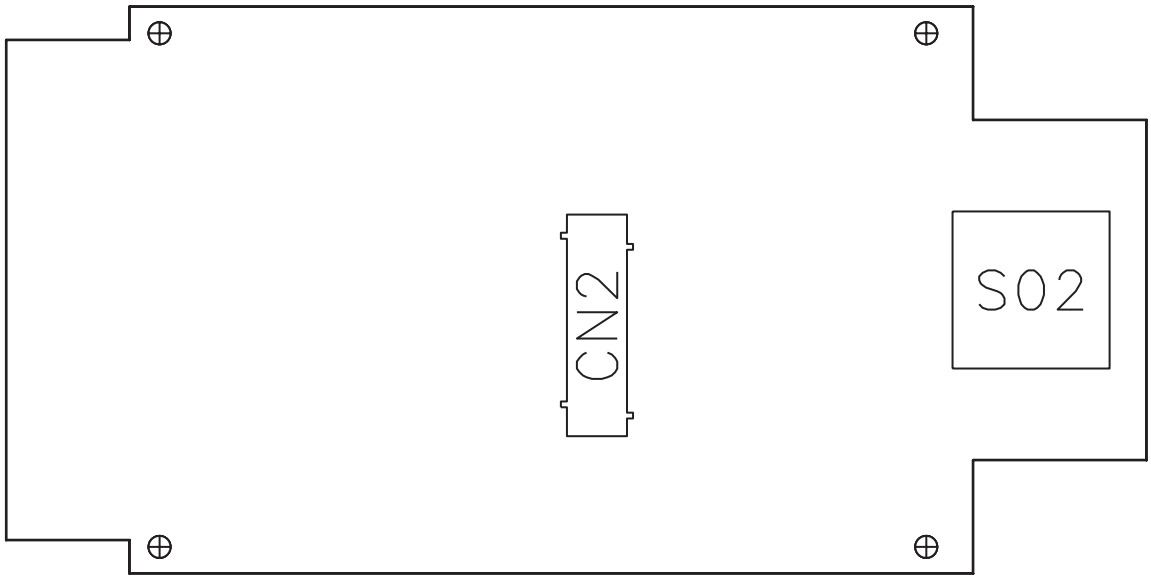
2.1 Component Name and Function of IE-703178-MC-EM1

Figure 2-1: IE-703178-MC-EM1

(a) Top View



(b) Bottom View



(1) Jumpers

Table 2-1: Jumpers

Test Pins	Function
JP1	AV_{REF} selection
JP2	AV_{SS} selection
JP3	Power sense- stand-alone selection

(a) JP1 - AV_{REF} selection

Position	Source
1-2	AV_{REF} is connected to target (T_AV_{REF})
2-3	AV_{REF} is connected to buffered 5.0 V

(b) JP2 - AV_{SS} selection

Position	Source
1-2	AV_{SS} is connected to target (T_AV_{SS})
2-3	AV_{SS} is connected to GND

(c) JP3 - Power sense / stand-alone selection

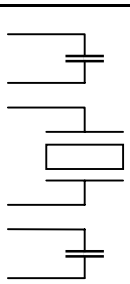
Position	Source
Closed	Normal operation: target power is detected and buffered or held at a default value of 5.0 V if no power supply is applied externally
Open	Stand-alone operation: (if no target power is connected) the 5.0V are generated independently

(2) Sockets and connectors List

Table 2-2: Connector List

Connector	Function
SO1	Connects to IE-V850E-MC
SO2	Connects to target application via TET-socket
SO3	Socket for main-clock crystal incl. capacitors / resonator
CN1	External probe connector

(a) Socket SO3 - Main clock source

Pin	Signal	Intended usage
1	GND	
2	Xtal (X1)	
3	Xtal (X1)	
4	GND	
5	Xtal (X2)	
6	Xtal (X2)	
7	GND	

(b) Connector CN1 - External probe clips

Signal	Pin	Pin	Signal
EXTPROBE(0)	1	2	EXTPROBE(1)
EXTPROBE(2)	3	4	EXTPROBE(3)
EXTPROBE(4)	5	6	EXTPROBE(5)
EXTPROBE(6)	7	8	EXTPROBE(7)
GND	9	10	GND

(3) LEDs

Table 2-3: LEDs

LED	Colour	Function
D1	Green	Valid target power detected (5.0 V and GND)
D2	Yellow	Reset
D3	Red	User Application running

2.2 Clock Setting

The clock supply of IE-703178-MC-EM1 can be provided by an on-board crystal/ceramic resonator only.

For this a crystal/ceramic resonator and capacitors can be mounted on connector SO3. The valid frequency range is from 6.000 MHz to 8.000 MHz.

2.3 Operation Mode

The IE-703178-MC-EM1 supports only the single chip mode (Mode 0), similar to the V850E/CG3,CG4 CarGate+/CarGate-3G. Be sure to set or select “Mode 0” in the debugger configuration. This configuration corresponds to single chip mode.

[MEMO]

Chapter 3 Factory Settings

Table 3-1: Factory Settings

Item	Setting	Remark
JP1		Use buffered 5 V for AV_{REF} by default.
JP2		AV_{SS} is connected to GND by default.
JP3		Emulator operation is stand-alone by default.
SO3	8.000-MHz crystal oscillator is mounted.	The clock frequency can be changed by changing the crystal oscillator (6.000 MHz to 8.000 MHz)

[MEMO]

Chapter 4 Differences Between Emulator and Device

4.1 Pin Functions

4.1.1 MODE0 and MODE1 pins

When the emulator operates as a stand-alone unit, the operation mode of the emulator is single chip mode. MODE0 and MODE1 pin inputs are not connected to the I/O chip itself, but with pull-up resistors to +5 V. Therefore, the input characteristic differs. The pins themselves have no functionality.

4.1.2 $\overline{\text{RESET}}$ input

The $\overline{\text{RESET}}$ input pin is connected to V_{DD} via a resistor (4,7 KΩ pull-up to +5 V). Therefore, the input characteristic differs from the target device.

4.1.3 Clock signals

The X1/X2 clock input pins are not connected to the target. As a crystal or resonator must be used, it must be assembled on the EM1 board.

4.1.4 Alphabet ports, driver strengths

Ports are driven directly by the CPU Eva-chip. Driving capabilities are different compared to CarGate+/ CarGate-3G alphabet ports. (6 mA Eva-Chip, 4 mA real-chip)

4.1.5 Supply pins

The emulation device is supplied by its own power supply. Therefore, the load on the power supply pins is very low.
The pins REGC0/REGC1 are not connected to the target.

4.1.6 Standby behaviour of bus interface

The ports PAH and PAL have different standby behaviour on the ICE compared to the real chip. The standby behaviour of all other alphabet port pins is the same in real chip and ICE.

Port	Real Chip	ICE	Comment
PAL / PAH	Hold	Hi-Z	memory interface function
PAL / PAH	Hold	Hold	port mode

4.1.7 AV_{REF}, AV_{SS} pins

Power supply of to these pins can be connected to the buffered 5V power supply by jumpers JP1 and JP2 (factory setting). In that case resulting A/D converter values and load on AV_{REF} and AV_{SS} pins may differ.

4.2 Special Function Registers (SFRs)

4.2.1 Alphabet port mode register values

Unused bits in the port registers PMCCS, PMCCT, PMCAH are reset to ‘1’ in the ICE, but reset to ‘0’ in the real-chip. They are R/W in the ICE, but read-only in the real-chip.

4.2.2 Port direction setting for peripheral function

If using peripheral functions the direction setting for the respective port bit is not forced automatically in the real chip. Port bit direction has to be programmed according to the peripheral function requirement by setting port mode register. On the ICE, port mode setting is not necessary if peripheral function is enabled.
Therefore, the alphabet ports behave different in ICE and real-chip.

4.3 Standby Release

In emulation mode the main oscillator is always running. Therefore, no oscillation stabilization time is required when stop mode is released. As a consequence the ICE will wake up immediately from stop mode while the real-chip device always assures the oscillation stabilization time for the main oscillator.

4.4 Peripheral Break

The CarGate+/CarGate-3G emulation board supports the peripheral break function for TMP2...0 and ADC. Counting of TMP2...0 and ADC conversion can be stopped while the ICE is in break mode. The peripheral break function is controlled by the register PEMU0.

Remark: This register is only effective for the tool.

PEMU0 is an 8-bit register to control the peripheral break function.
Register PEMU0 can be read/written in 8- or 1-bit units.

Symbol	Address	7	6	5	4	3	2	1	0
PEMU0	FFFFF9F8H	0	0	0	0	0	0	0	SVSTOPN
After Reset		0	0	0	0	0	0	0	0
R/W		R	R	R	R	R	R	R	R/W

SVSTPON	Enables the peripheral break function of TMP2...0
0	TMP2...0 continues counting during break
1	TMP2...0 stops counting during break

Chapter 5 Debugger Operation

5.1 Operation of FCAN Interface

The FCAN address space is mapped in the external target memory area and therefore must be configured in the .rc-file, when using Green Hills Multi 2000, or the Hardware Setup dialog box, when using V850 IAR Embedded Workbench.

[MEMO]

Chapter 6 Operating Precautions

6.1 Operating Precautions

Following items have to be considered when using the tool.

6.1.1 UART malfunction during break

Details:
<1> An overrun error occurs during the next reception operation following a break execution and an UAnRX register read to display UAnRX register in the I/O window of the debugger.
<2> An overrun error occurs during the next reception operation in case a s/w break occurs just after UAnRX register read regardless display UAnRX register in the I/O window of the debugger.

Workaround: None

6.1.2 CSI malfunction during break

Details:
The next reception operation doesn't start in case a s/w break is generated just after CBnRX read operation.

Workaround: None

6.1.3 AFCAN malfunction during break

Details:
<1> In case a s/w break is generated just after CORGPT register read operation, the read pointer register (RGPT) will not be incremented. Same data will be read as in previous read operation.
<2> In case a s/w break is generated right after CORGPT register read operation, the pointer register (TGTP) will not be incremented. Same data will be sent as in previous transmit operation.
<3> In case a break is generated just after the GOM bit was cleared, the AFCAN will not be switched off.
<4> In case the GOM bit will be cleared in single step mode, the AFCAN will not be switched off.

Workaround: None

6.1.4 Capture value of Timer P might be corrupted if early capture event

Details:
If a timer capture interrupt occurs after setting TMxCE = 1, before the internal count clock starts, the timer capture value will be 0xFFFF instead of 0x0000.

Workaround: If no sufficient delay between setting of TMxCE = 1 and occurrence of the first interrupt can be assured, ignore the first capture value.

[MEMO]

Appendix A Package Drawings

Figure A-1: IE-V850E-MC + IE-703178-MC-EM1 (Unit: mm)

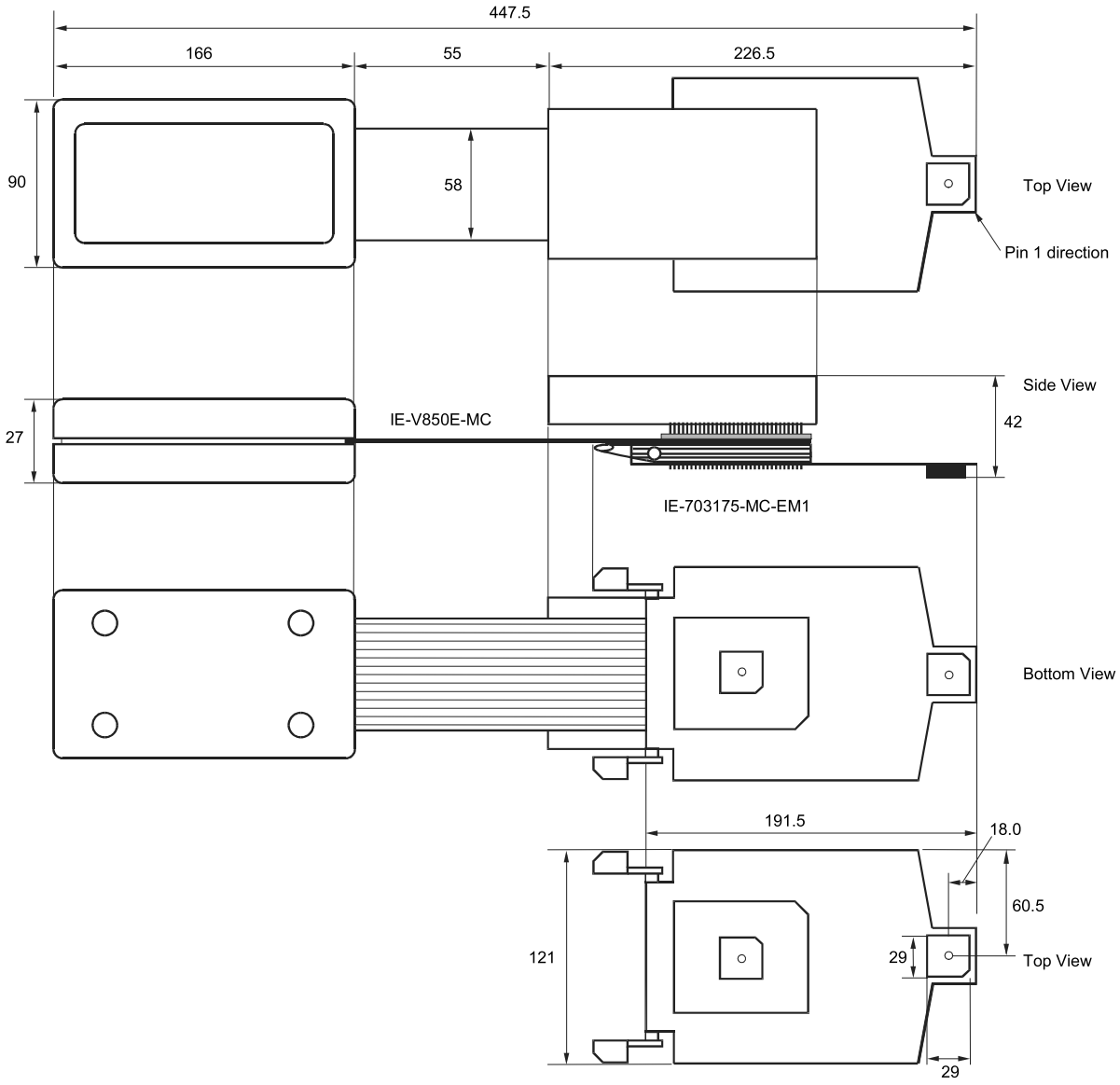


Figure A-2: SWEX-100-SD-1 (Unit: mm)

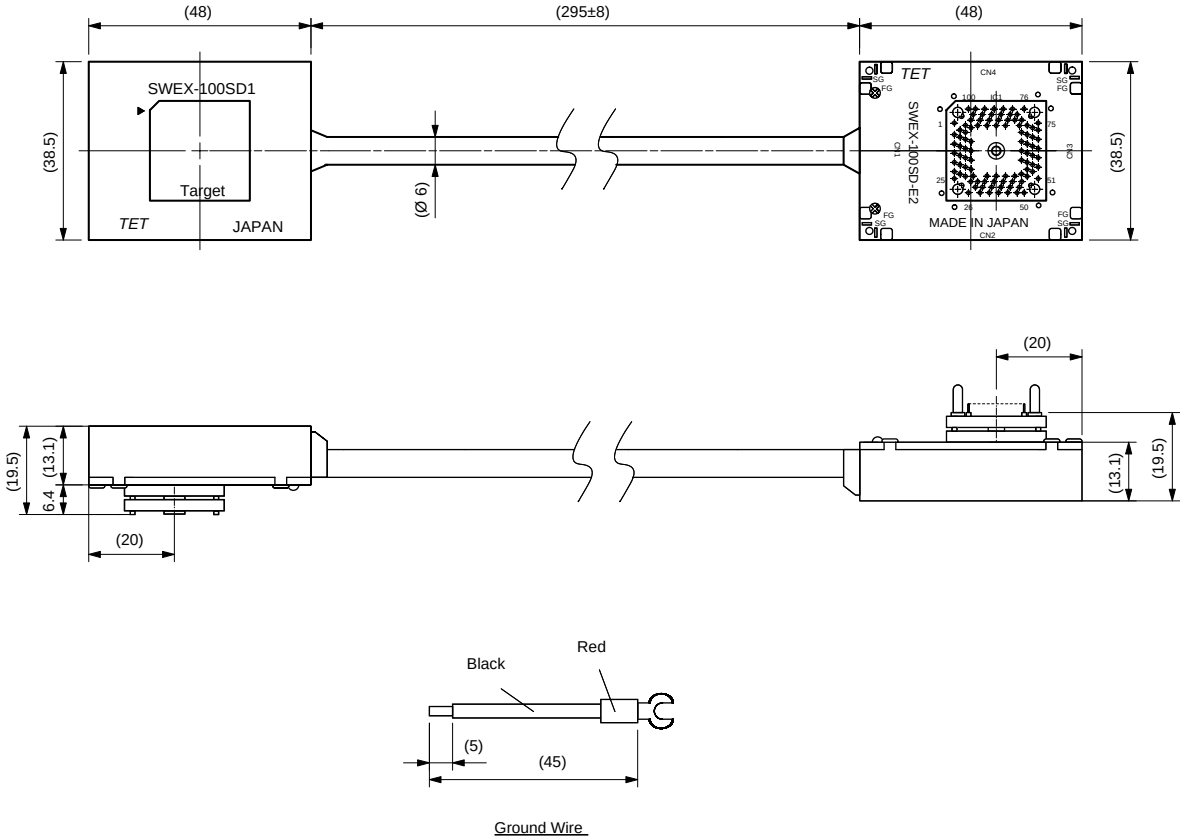


Figure A-3: NQPACK100SD (Unit: mm)

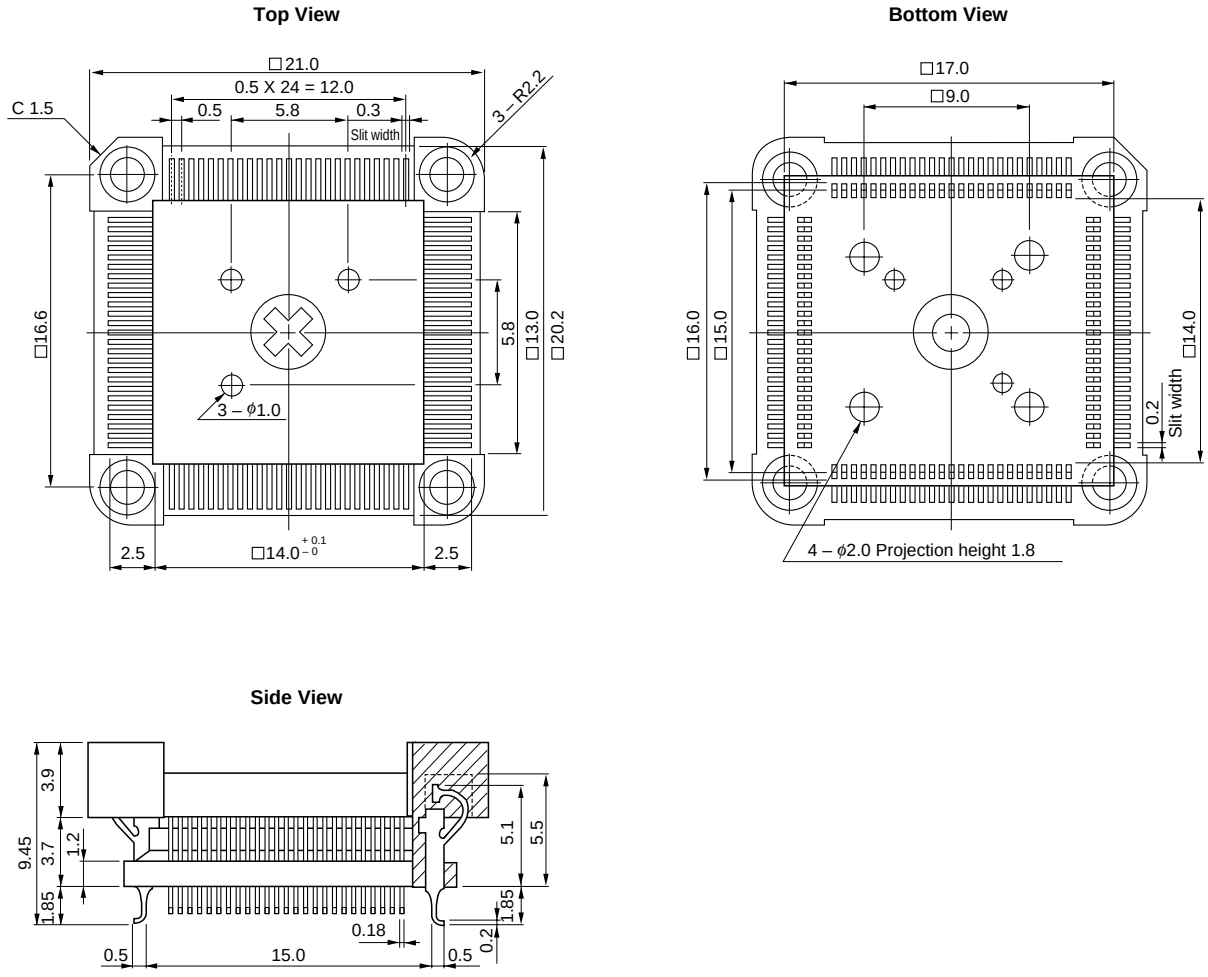


Figure A-4: YQPACK10SD (Unit: mm)

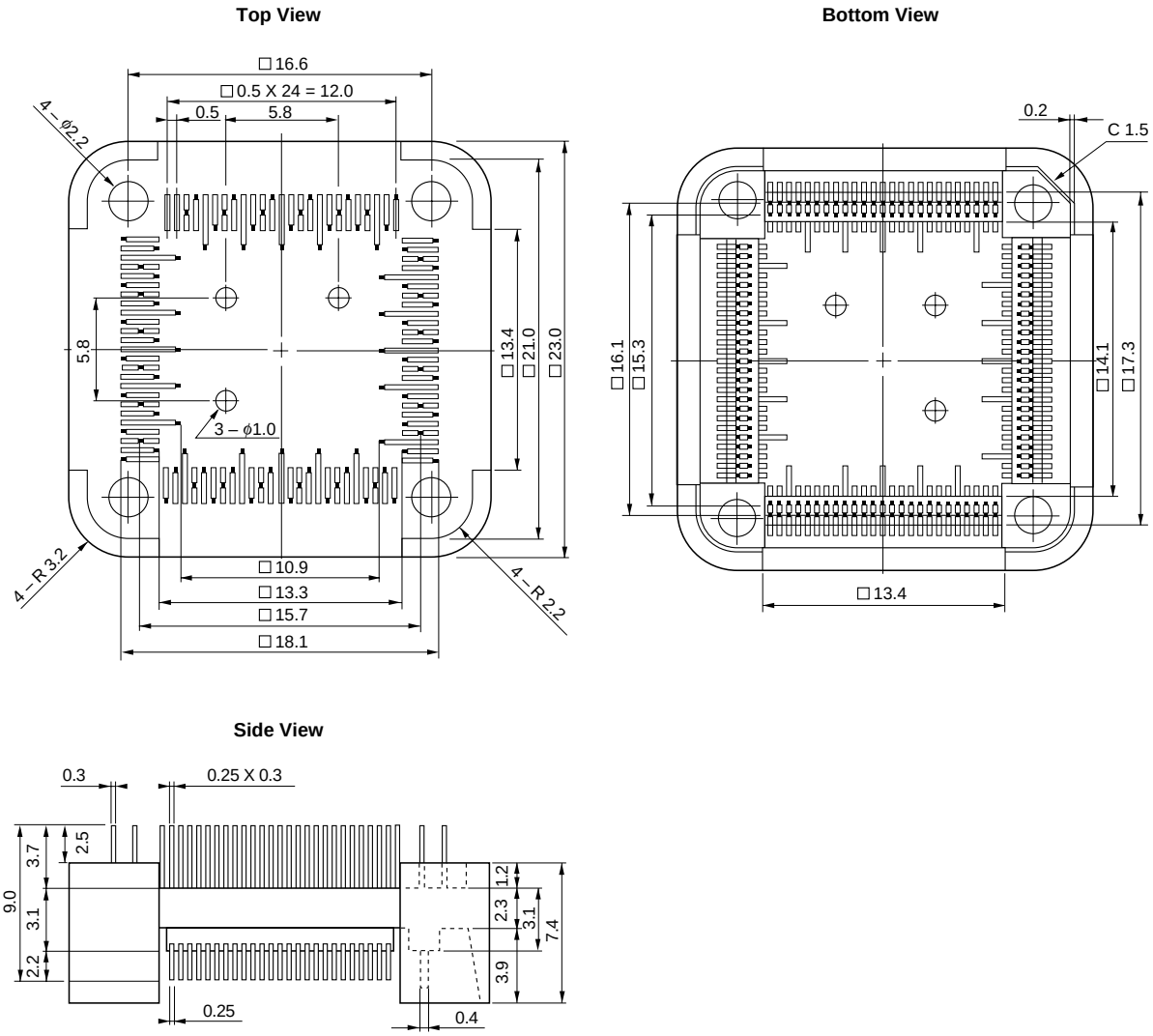


Figure A-5: HQPACK100SD (Unit: mm)

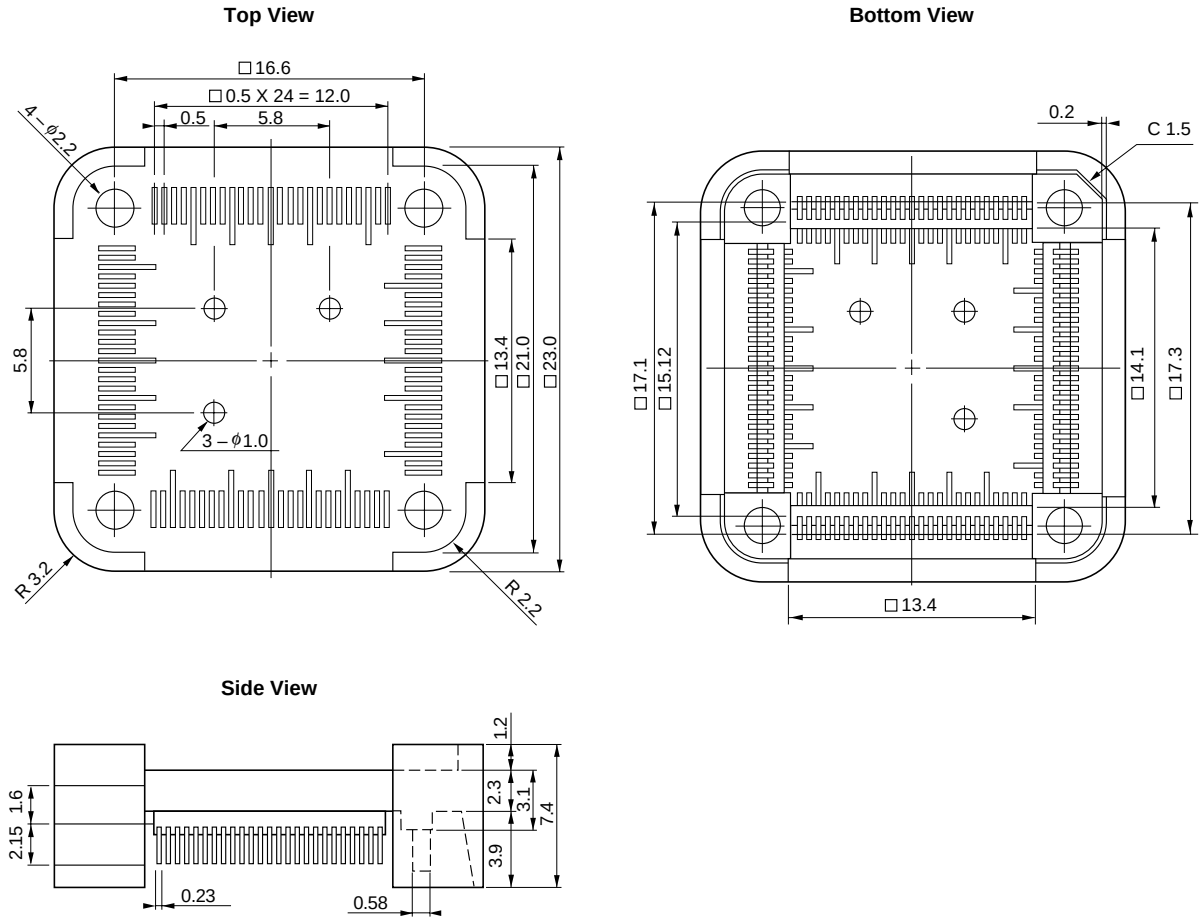
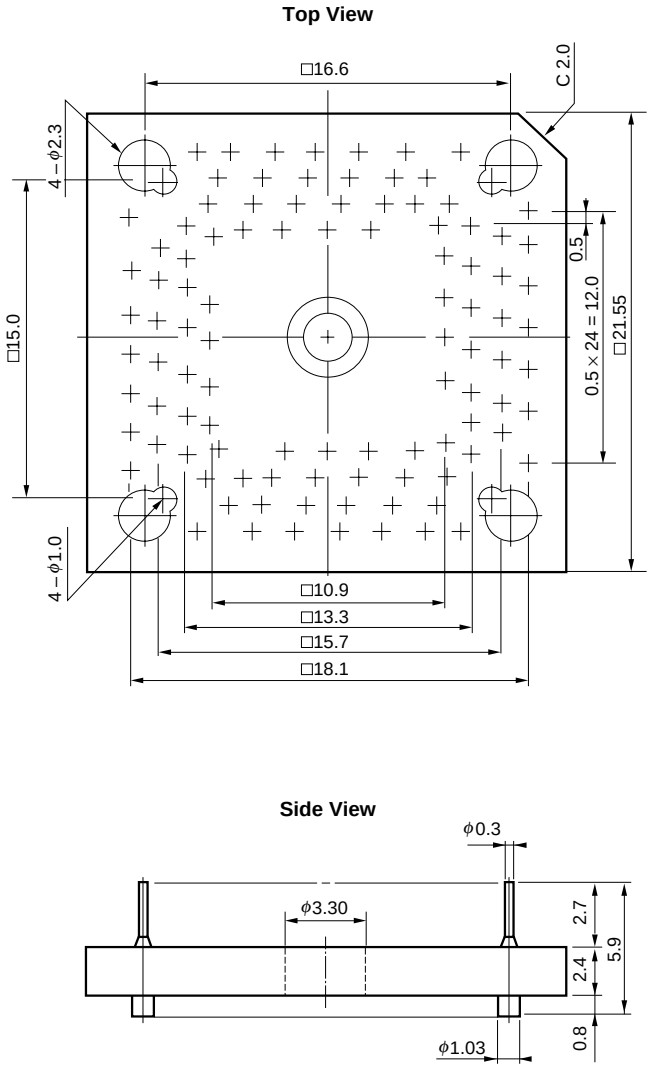


Figure A-6: YQSOCKET100DN (Unit: mm)



Appendix B Connectors for Target Connection

B.1 Use

(1) When mounting NQPACK100SD to target system

<1> Coat the tip of four projections (points) at the bottom of the NQPACK100SD with two-component type epoxy adhesive (cure time longer than 30 min.) and bond the NQPACK100SD to the target system. If not bonded properly, the pad of the printed circuit board may peel off when the emulator is removed from the target system. If the lead of the NQPACK100SD does not coincide with the pad of the target system easily, perform step <2> to adjust the position.

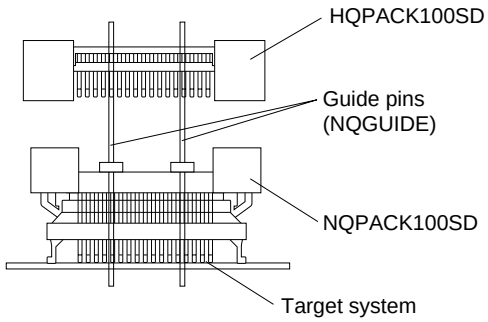
<2> To adjust the position, insert the guide pins for position-adjustment (NQGUIDE) provided with NQPACK100SD into the pin holes at the upper side of NQPACK100SD (refer to **Figure C-1**).
The diameter of a hole is ϕ = 1.0 mm. There are three non-through holes (refer to **APPENDIX A DIMENSIONS**).

<3> After setting the HQPACK100SD, solder NQPACK100SD to the target system. By following this sequence, adherence of flux or solder sputtering to contact pins of the NQPACK100SD can be avoided.

- Recommended soldering condition…Reflow : 240°C, 20 sec. max.
  Partial heating : 240°C, 10 sec. max. (per pin row)

<4> Remove the guide pins.

Figure C-1: Mounting of NQPACK100SD



Remark: NQPACK100SD: Connector for target connection
HQPACK100SD: Cover for device installation

(2) When setting device

Caution: Check for abnormal conditions such as resin burr or bent pins before setting a device to the NQPACK100SD. Moreover, check that the hold pins of the HQPACK100SD are not broken or bent before setting HQPACK100SD. If there are broken or bent pins, fix them with a thin, flat plate such as a blade.

<1> Make sure that the NQPACK100SD is clean and the device pins are parallel (flat) before setting a device to the NQPACK100SD. Then, after mounting the NQPACK100SD to the target board, set the device and HQPACK100SD (refer to **Figure C-2**).

<2> Using the screws provided with the HQPACK100SD (four locations: M2 × 6 mm), secure the HQPACK100SD, device, and NQPACK100SD.
Tighten the screws in a crisscross pattern with the provided screwdriver or driver with torque gauge (avoid tightening strongly only one screw). Tighten the screws with 0.55 kg·f·cm (0.054 N·m) max. torque. Excessive tightening may diminish conductivity.
At this time, each pin is fixed inside the plastic wall dividers by the contact pin of the NQPACK100SD and the hold pin of the HQPACK100SD (refer to **Figure C-3**). Thus, pins cannot cause a short with pins of neighboring devices.

Figure C-1: Mounting Device

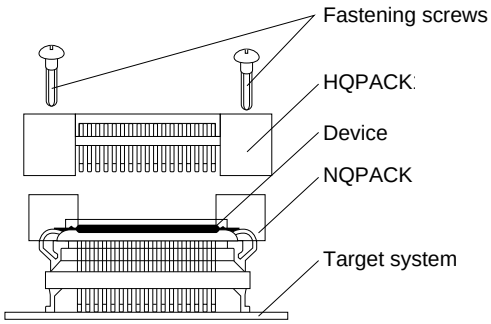
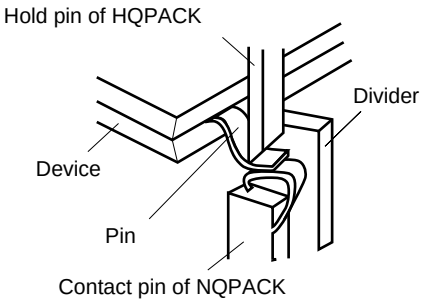


Figure C-2: NQPACK100SD and Device Pin



B.2 Cautions on Handling Connectors

(1) When taking connectors out of the case, remove the sponge while holding the main unit.

(2) When soldering the NQPACK100SD to the target system, cover the HQPACK100SD to protect it against splashing flux.

- Recommended soldering conditions Reflow : 240°C, 20 sec. max.
  Partial heating : 240°C, 10 sec. max. (per pin row)

(3) Check for abnormal conditions such as resin burr or bent pins before setting a device to the NQPACK100SD. Moreover, check that the hold pins of the HQPACK100SD are not broken or bent before setting HQPACK100SD. If there are broken or bent pins, fix them with a thin, flat plate such as a blade.

(4) When securing the YQPACK100SD (connector for emulator connection) or HQPACK100SD to the NQPACK100SD with screws, tighten the four screws temporarily with the provided screwdriver or driver with torque gauge, then tighten the screws in a crisscross pattern (with 0.054 N·m max. torque).
Excessive tightening of only one screw may diminish conductivity.
If the conductivity is diminished after screw-tightening, stop tightening, remove the screws and check whether the NQPACK100SD is stained and make sure the device pins are parallel.

(5) Device pins do not have high strength. Repeatedly connecting to the NQPACK100SD may cause pins to bend. When setting a device to the NQPACK100SD, check and adjust bent pins.

[MEMO]

Appendix C Example of Use of Connector for Target Connection

Figure C-1: When Directly Connecting Device to Target System (Connector for Target Connection is not used)

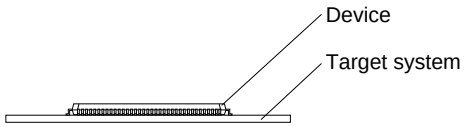


Figure C-2: When Equipping Device by using Connector for Target Connection

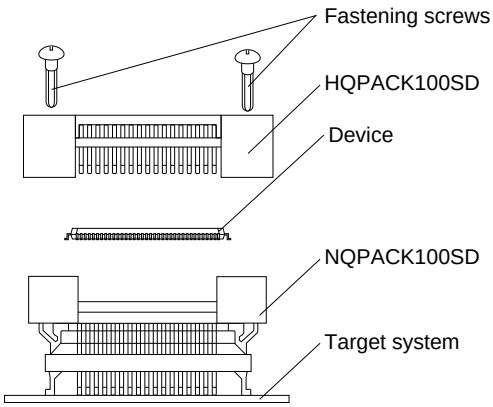
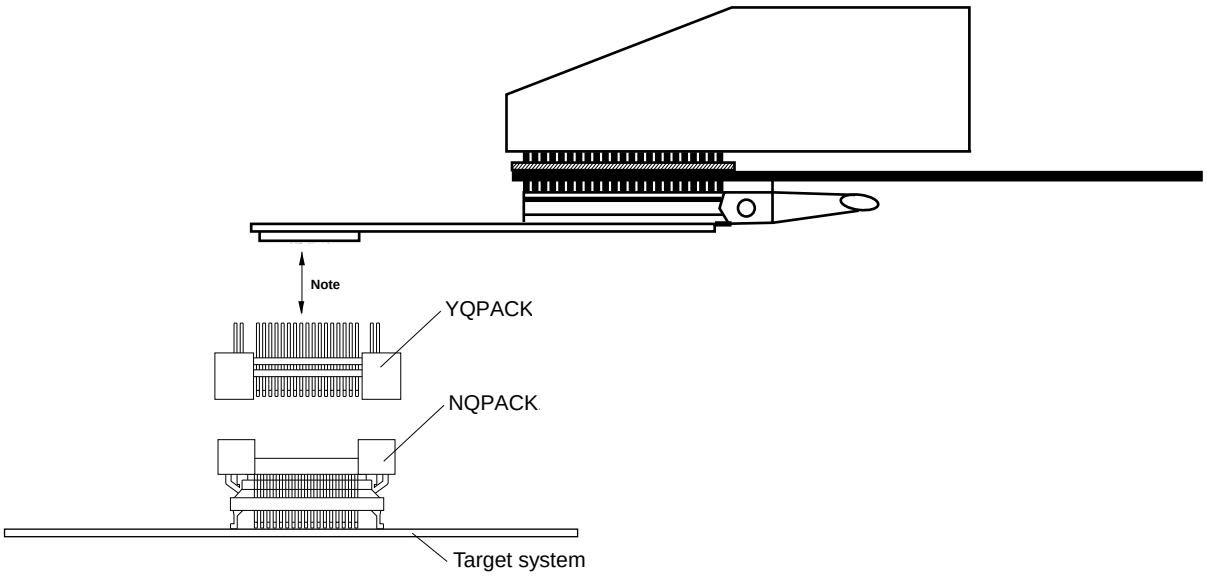


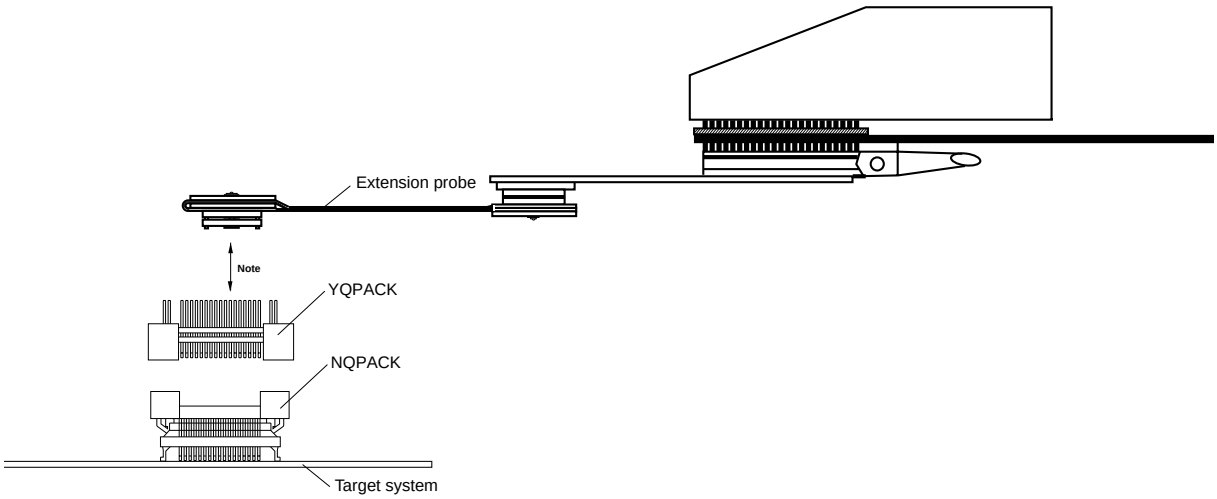
Figure C-3: Connection between Emulator and Target System

(a) When extension probe is not used



Note: Connector for emulator connection (YQSOCKET100SDN) can be inserted at this position for height adjustment.

(b) Example of use of extension probe



Note: Connector for emulator connection (YQSOCKET100SDN) can be inserted at this position for height adjustment.

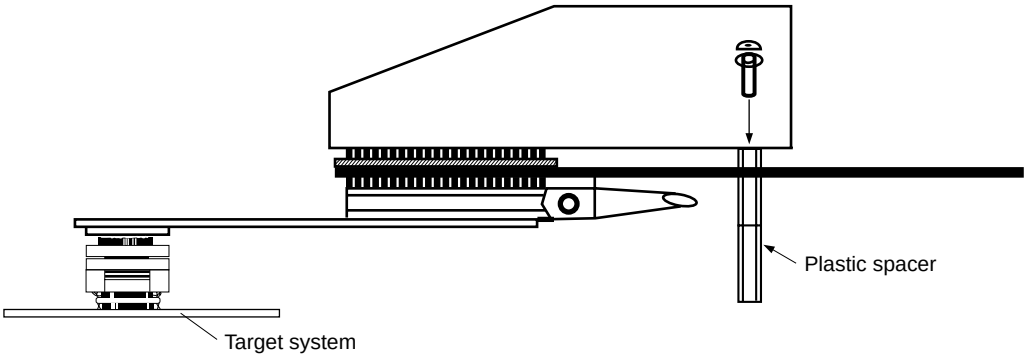
Appendix D Mounting of Plastic Spacer

This chapter describes the mounting method for the plastic spacer supplied with the IE-V850E-MC. When using the emulator connected to the target system, mount the plastic spacer as shown in Figure D-1 to fix the pod horizontally.

(1) Mounting IE-V850E-MC to plastic spacer

<1> Remove the nylon rivet from the rear part of the pod.
<2> Tighten the plastic spacer with the supplied plastic screw.
<3> To adjust the height, use a user spacer or stand.

Figure D-1: Mounting Method of Plastic Spacer



[MEMO]

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
Market Communication 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	☐	☐	☐	☐