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.

USER'S MANUAL

RENESAS

Phase-out/Discontinued

EP-753017GC-R,
EP-753017GK-R

EMULATION PROBE

Document No. EEU-1494
(O. D. No. EEU-967)
Date Published August 1994 P
Printed in Japan

M7A 93.9

PREFACE

Intended Recipients

This manual is intended for use by users of μPD753017 subseries debugging using the IE-75001-R +IE-75300-R-EM and EP-753017GC-R or EP-753017GK-R.

Remarks The IE-75001-R is a product equivalent to the IE-75000-R (maintenance product) with the IE-75000-R-EM removed. The IE-75000-R can be substituted for the IE-75001-R. In this case, replace the IE-7500-R-EM incorporated in the IE-7500-R with the IE-75300-R-EM.

Purpose

This manual provides an understanding of the method for connecting the EP-753017GC-R or EP-753017GK-R to the IE-75001-R+ IE-75300-R-EM and methods for setting mask options.

Organization

The contents of this manual can be roughly divided under the following general headings.

General description
Methods for connecting this product
Methods for setting mask options

Using This Manual:

Before reading this manual, be sure to read the manual for the IE-75001-R or IE-75300-R-EM and get a thorough understanding of the configuration and functions of the debugging system.

Unless there are any pariticular differences, the EP-753017GC-R is described in this manual as a representative product. When using this as the EP-753017GK-R manual, "EP-753017GC-R" should be read as EP-753018GK-R".

When using the IE-75000-R as an in-circuit emulator, "IE-75001-R" should be read as "EP-75000-R".

Unless specified otherwise, "IE-75001-R" means "IE-75001-R + 75300-R-EM".

- When desiring to understand general EP-753017GC-R or EP-753017GK-R functions and connection methods:

→ Read in accordance with the table of contents.

- When desiring to understand the operating environment, configuration and object devices:

→ Read **1. GENERAL DESCRIPTION.**

- When desiring to understand in detail how to understand the connection method:

→ Read **2. CONNECTIONS.**

- When desiring to understand the mask option setting method:

→ Read **3. SETTING MASK OPTION.**

Legend

***** : Explains important points in the text.
Note : Contains important information that is of special importance.
Remarks : Provides a supplementary explanation for the text.

Related Documents

- IE-75000-R/IE-75001-R User's Manual (Document No.: EEU-1455)
- IE-75300-R-EM User's Manual (Document No.: EEU-1493)

Confirmation

The following items are included in the EP-753017GC-R or EP-753017GK-R packing box. Check the items carefully. If any item is missing or damaged, be sure to contact this company's sales representative or authorized dealer.

• Emulation Probe	1
• Adaptor Board	1
• User's Manual (This Manual)	1
• Spacer (with 2 screws)***1**	1
• Installation Screws***2**	2
• Conversion socket (provided with EP-753017GC-R: EV-9200GC-80)***3**	1
• Conversion adaptor (provided with EP-753017GK-R: EV-9500GK-80)***3**	1

***** **1.** Used to connect the adaptor board and the IE-75300-R-EM.
2. Used to connect the emulation probe and the IE-75001-R.
3. Used to connect the emulation probe and the target system.

CONTENTS

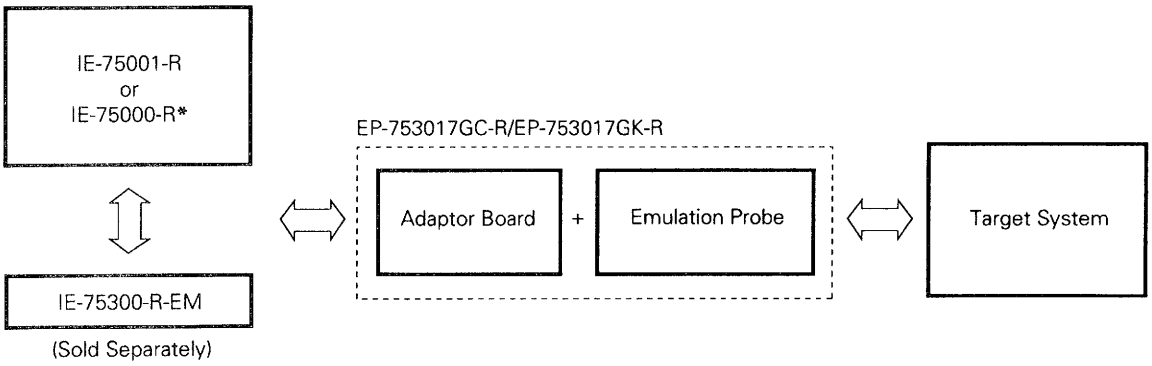
CHAPTER 1 GENERAL DESCRIPTION

This chapter gives an outline of the EP-753017GC-R.

1.1 OPERATING ENVIRONMENT

The EP-753017GC-R is a probe set designed for connection with the IE-75001-R and target system. By using the EP-753017GC-R in such connections, a debugging environment for the μPD753017GC subseries is created making comprehensive debugging of target system hardware and software possible. See **2. CONNECTIONS**, concerning concrete connection methods.

Fig. 1-1 Connection to the IE-75001-R and Target System



* Replace the IE-75000-R-EM incorporated in the IE-75000-R with the IE-75300-R-EM.

1.2 CONFIGURATION

The EP-753017GC-R is a set consisting of a emulation probe and an adaptor board.

(1) Emulation Probe

The emulation probe is configured from the following 3 components.

- **80-pin GC probe or 80-pin GK probe**
  This connects the IE-75001-R and target system.

- **Ground clip**
  This connects to the target system's GND. This makes the GND potential of the IE-75001-R and the target system the same, and protects the system against static electricity and noise.

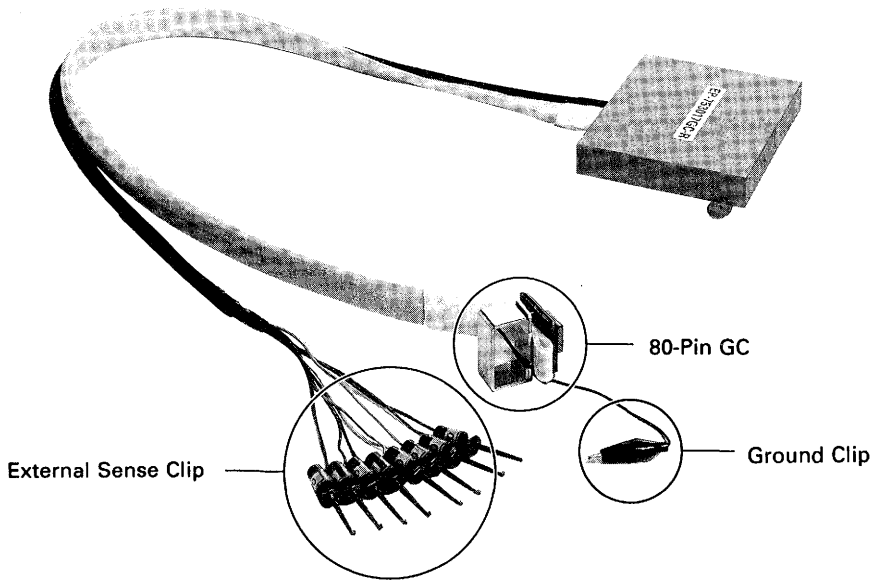
- **External sense clips**
  This consists of 8 sense clips. These clips are used to monitor the IC pin voltage level of the target system.

(2) Adaptor Board

The adaptor board is used to connect the emulation probe to the emulation board (IE-75300-R-EM). The adaptor board also includes functions to set mask options. For details, see **3. SETTING MASK OPTIONS**.

Fig. 1-2 Emulation Probe

(a) EP-753017GC-R



(b) EP-753017GK-R

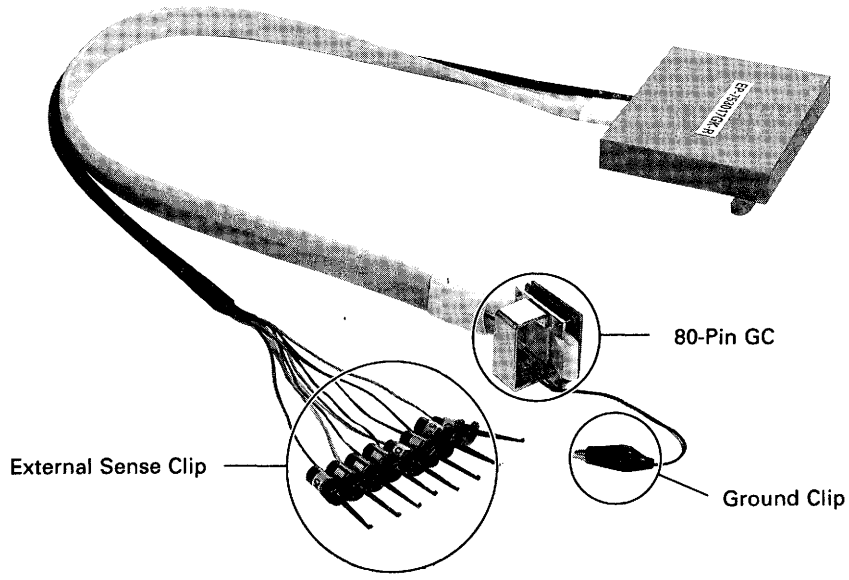
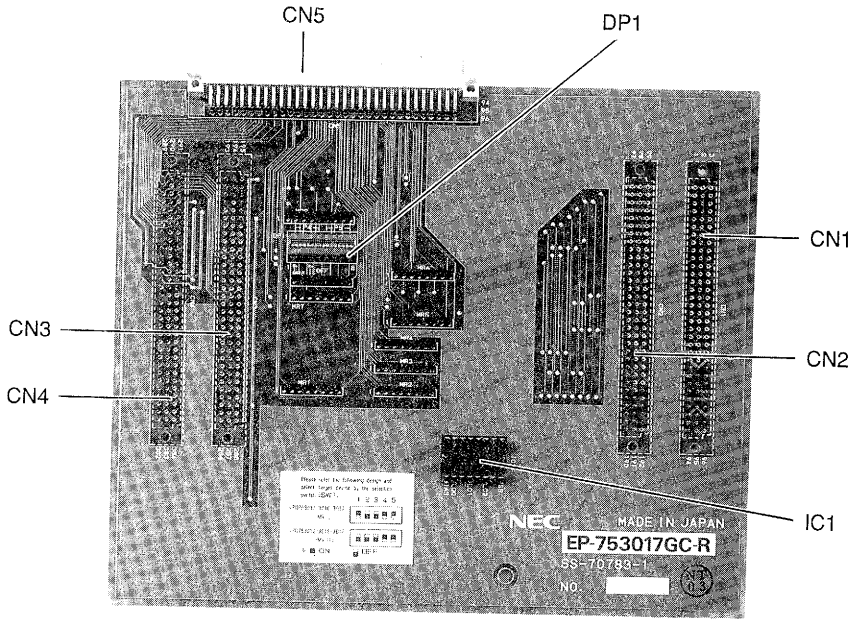
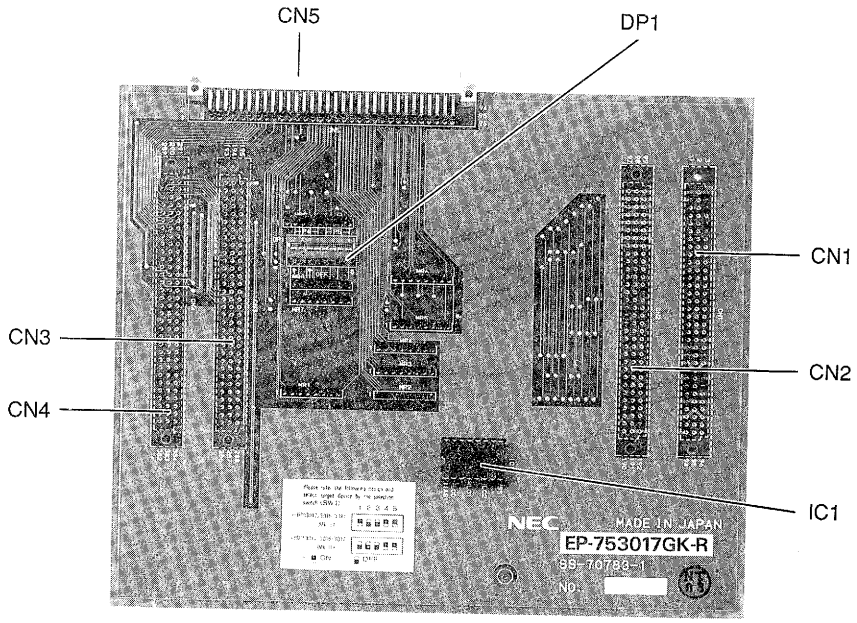


Fig. 1-3 Adaptor Board

(a) EP-753017GC-R



(b) EP-753017GK-R



1.3 TARGET DEVICES

The EP-753017GC-R is used in emulation of the following target devices (as of April 1994).

〈**75XL series**〉

- μPD753012GC
- μPD753012GK
- μPD753016GC
- μPD753016GK
- μPD753017GC
- μPD753017GK
- μPD75P3018GC
- μPD75P3018GK

CHAPTER 2 CONNECTIONS

EP-753017GC-R, the sequence for switching on the power and switching it off and the method used to disconnect the emulation probe from the emulation system.

2.1 CONNECTION TO THE IE-75001-R AND TARGET SYSTEM

The connection procedure is outlined as follows.

(1) Connection of the IE-75300-R-EM and adaptor board

- ① Switching off the IE-75001-R's power
- ② Connecting the IE-75300-R-EM and the adaptor board
- ③ Installing the IE-75300-R-EM (with adaptor board) on the IE-75001-R

(2) Connecting the IE-75001-R and the emulation probe

(3) Connecting the emulation probe and target system

- ① Switching off the target system's power
- ② Soldering the conversion socket or conversion adaptor into the target system
- ③ Inserting the target probe end into the conversion socket or conversion adaptor

(4) Connecting the external sense clip (if the external sense clip is used)

(5) Switching on the power

Next, details of each item in the connection procedure are explained.

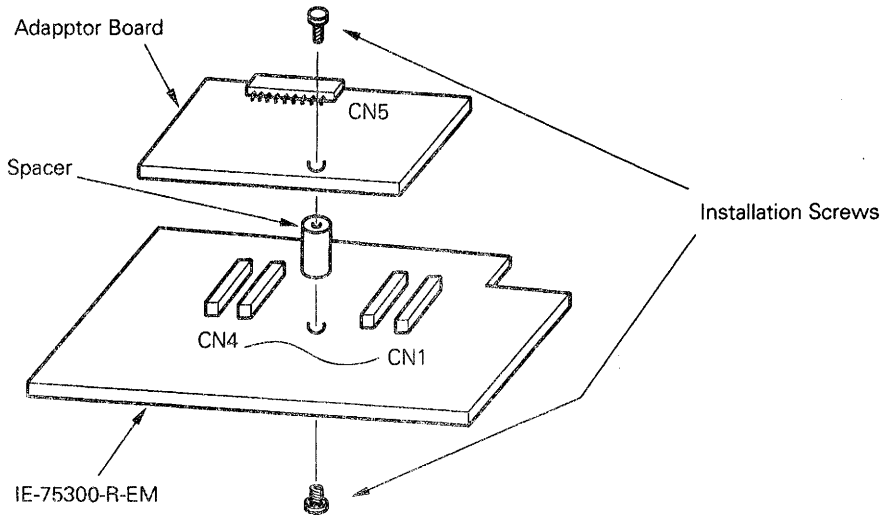
(1) Connecting the IE-75300-R-EM and Adaptor Board

Connect the adaptor board to the IE-75300-R-EM.

- ① While placing a spacer between the IE-75300-R-EM and the adaptor board, connect connectors CN1 to CN4 of the IE-75300-R-EM to connectors CN1 to CN4 of the adaptor board.
- ② Fasten the spacer between the IE-75300-R-EM and the adaptor board using the spacer installation screws.
- ③ First, switch off the IE-75001-R's power.
- ④ Take out the 6 screws in the top of the IE-75001-R unit, then open the unit's top cover.
- ⑤ Pull the card pullers on both ends of the board forward and pull out the IE-75000-R-BK*.
- ⑥ Screw the IE-75300-R-EM to the IE-75000-R-BK together.
- ⑦ Return the IE-75000-R-BK with the IE-75300-R-EM to the original position of the IE-75001-R.

* In the case of the IE-75000-R, the IE-75000-R-EM and IE-75000-R-BK are installed screw together. Therefore, pull out the IE-75000-R-BK from the main unit in above steps ③→④→⑤, screw off and remove the IE-75000-R-EM before following steps ①→②→⑥→⑦.

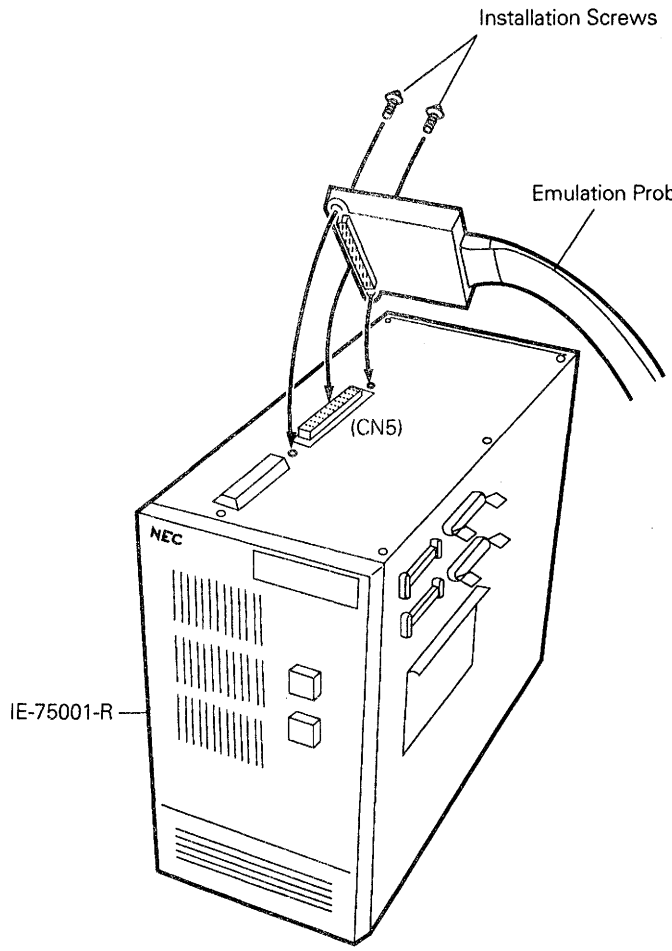
Fig. 2-1 Connecting the IE-75300-R-EM and the Adaptor Board



(2) Connecting the IE-75001-R and Emulation Probe

① Connect the emulation probe to the emulation probe DIN connector (CN5 of the adaptor board) on the top of the IE-75001-R.
② After connection, be sure to fasten the emulation probe to the IE-75001-R with the installation screws provided.

Fig. 2-2 Connecting the IE-75001-R and Emulation Probe



(3) Connecting the Emulation Probe and Target System

Connect the emulation probe to the target system by the following procedure.

Note 1. Before connecting the emulation probe to the target system, be sure to connect the ground clip. If the ground clip is not connected, the IE-75001-R could be damaged by static electricity, etc.
2. When making connections, be careful not to reverse the pins. If connections are incorrect, it could damage the IE-75001-R.

① Switch off the target system's power supply.
② Solder the conversion socket (EV-9200GC-80) or conversion adaptor (EV-9500GK-80) to the target system.
③ Connect the emulation probe's ground clip to the ground (GND) pin of the target system.
④ Align the No. 1 pin of the 80-pin GC or 80-pin GK at the end of the emulation probe with the No. 1 pin of the conversion socket or conversion adaptor soldered into the target system in ②, then insert the emu-lation probe.

Fig. 2-3 80-Pin GC Emulation Probe Connection Diagram

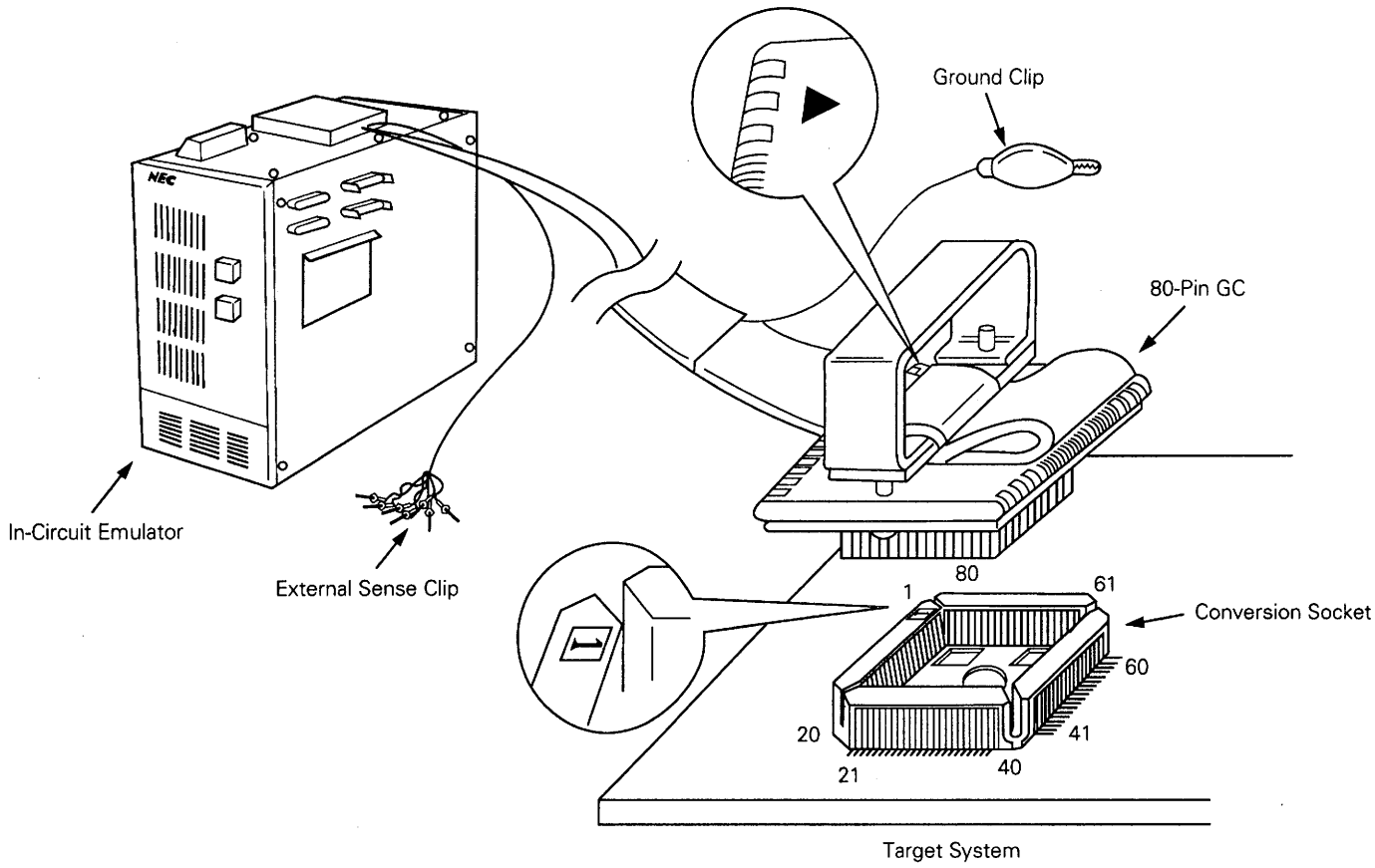
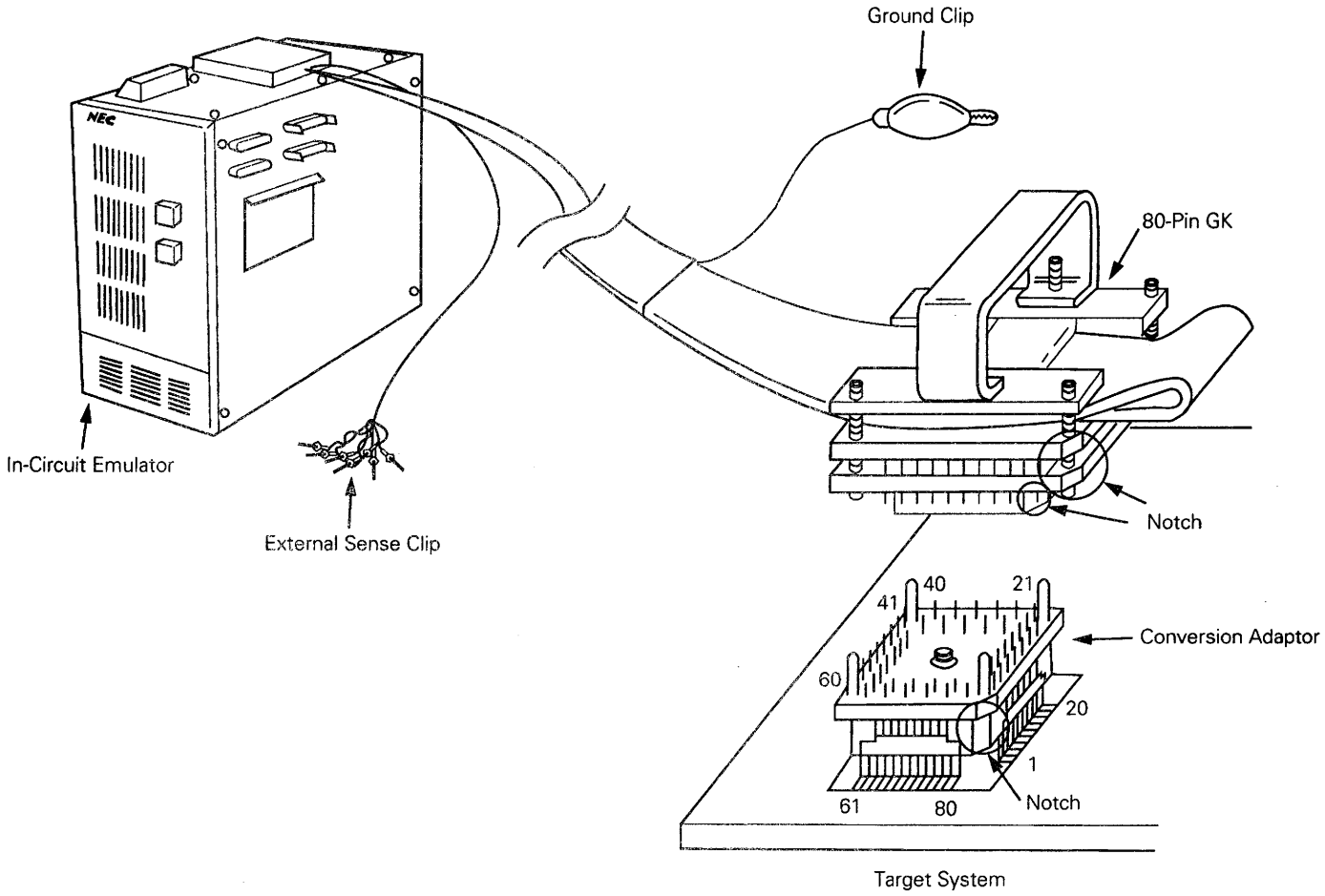


Fig. 2-4 80-Pin GK Emulation Probe Connection Diagram



(4) Connecting the External Sense Clip

The emulation probe is provided with 8 external sense clips which can trace hardware signals on the target system in real time.

Since the external sense clips are directly connected to the input buffer HCT244 inside the in-circuit emulator unit, they are TTL level inputs.

The 8 external sense clips are normally input signal lines. However, by setting the in-circuit emulator OUT command, the signal line of external sense clip 1 can be used as an outgoing trigger output signal line in the case of an event (see the in-circuit emulator manual for details).

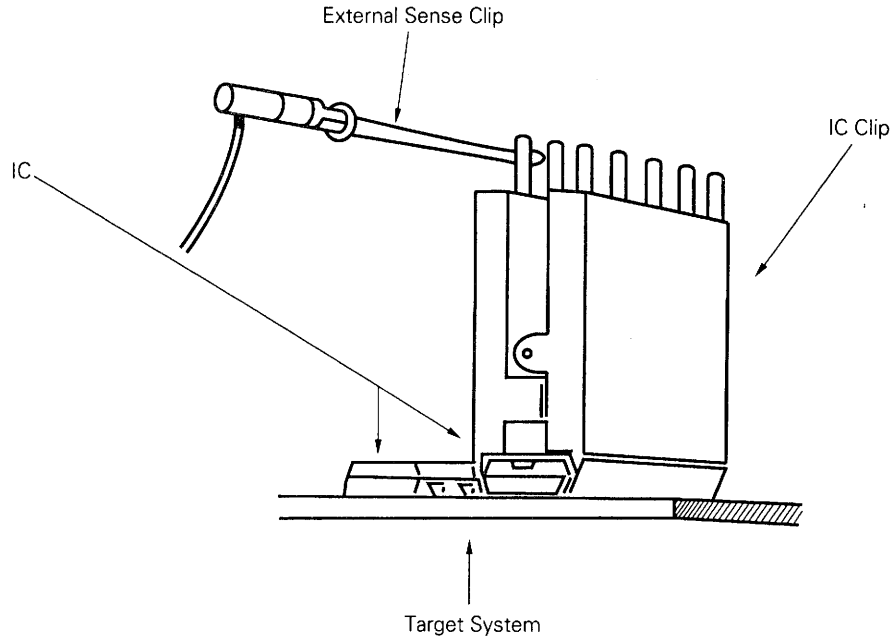
Note 1. Connect the external sense clip to a TTL level signal line only. If it is connected to a signal line other than a TTL level signal line, it will not detect the high level and low level accurately. Also, depending on the voltage level, the IE-75001-R's sensor could be damaged.

2. Before using external sense clip 1 as an external trigger output, ensure that external sense clip 1 is not connected to the signal output line. If it is connected, a fault may result.

Connect the external sense clip by the following procedure if it is used.

① Switch off the power to the target system, then the IE-75001-R.
② Install the IC clip (commercially available) on the IC in the target system which is to be traced.
③ Connect the external sense clip to the IC clip.
④ Switch on the power to the IE-75001-R, then the target system.

Fig. 2-5 Connecting the External Sense Clip



Remarks If an external sense clip is connected, be sure to use an IC clip if at all possible. Thishelps prevent faulty contact and improves operability.

2.2 POWER ON AND OFF SEQUENCE

After connection of the emulation probe to the target system has been completed, switch on the power. The sequence for switching on the power and switching it off is shown below.

Note Be sure to follow the correct sequence for switching the power ON and OFF. If the sequence is mistaken, the IE-75001-R could be damaged.

(1) If the IE-75001-R is Connected to the Target System

- Power ON sequence
  ① Switch on the power to the IE-75001-R.
  ② Switch on the power to the target system.

- Power OFF sequence
  ① Switch off the power to the target system.
  ② Switch off the power to the IE-75001-R.

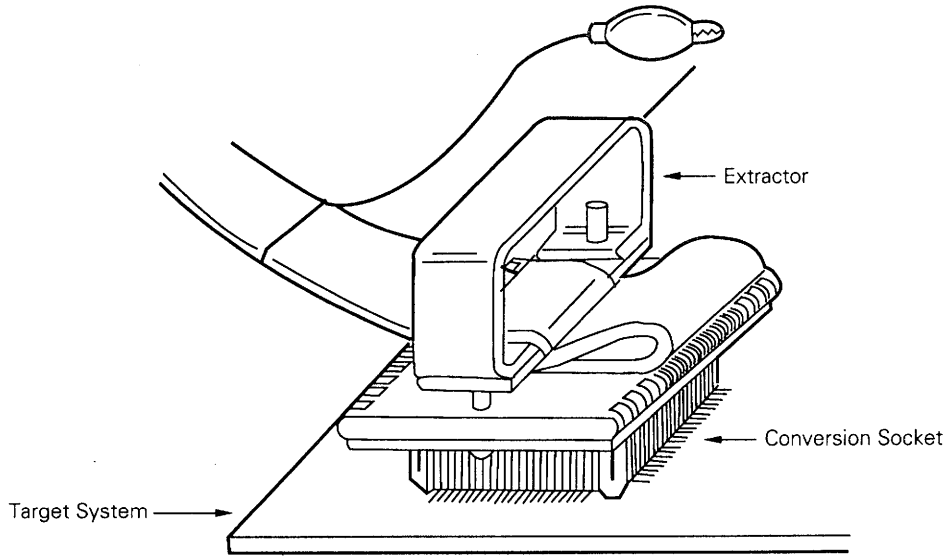
2.3 DISCONNECTING THE EMULATION PROBE FROM THE TARGET SYSTEM

Disconnect the emulation probe from the target system by the following procedure.

① Switch off the power to the target system.
② Switch off the power to the IE-75001-R.
③ Pull the extractor on the end of the emulation probe straight up to extract the emulation probe from the conversion socket.

Fig. 2-6 Disconnecting the Emulation Probe (1/2)

(a) EP-753017GC-R



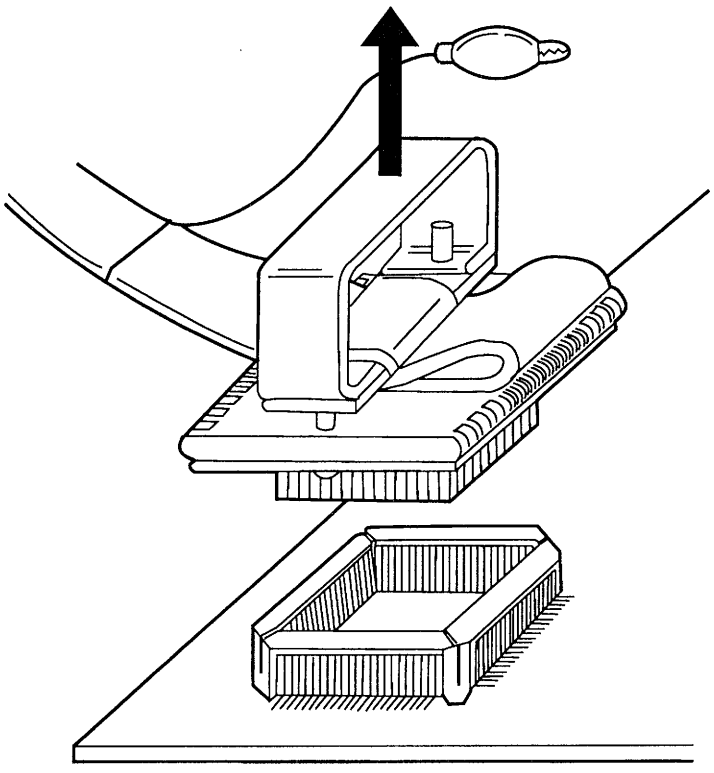
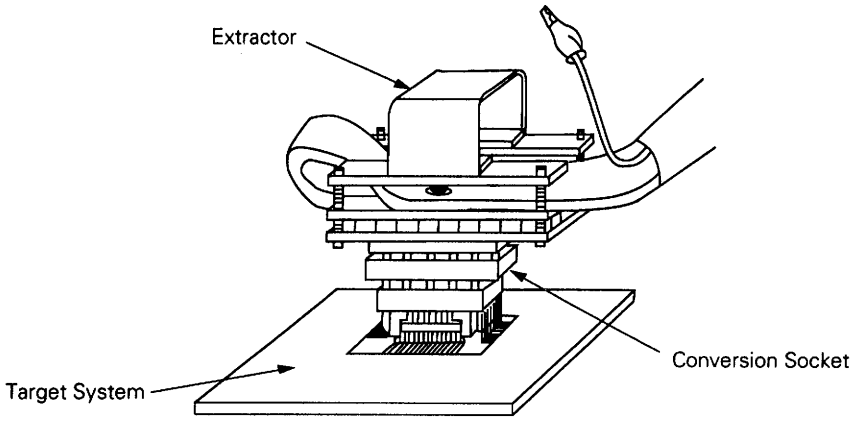
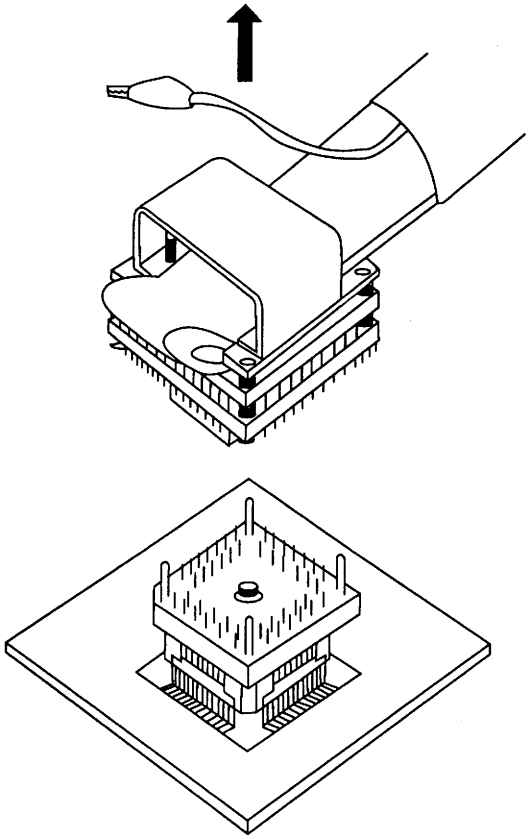


Fig. 2-6 Disconnecting the Emulation Probe (2/2)

(b) EP-753017GK-R





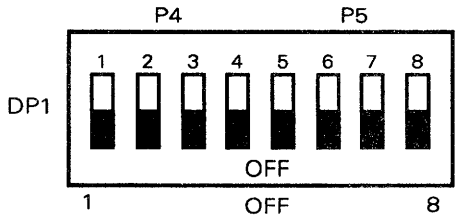
CHAPTER 3 SETTING MASK OPTIONS

3.1 SETTING THE PORT 5 MASK OPTION

The adapter board DP1 switch is the port 4 & 5 mask option setting switch. When these switches are switched ON, pull -up resistors (68 KΩ) are connected.

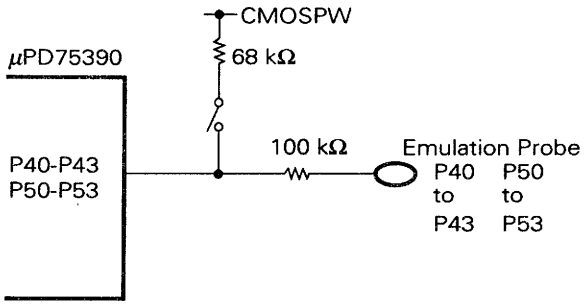
At shipping time, the DP1 switches are set in the OFF position.

Fig. 3-1 DP1 Switch Arrangement Diagram



SW Bit	Signal Name	SW Bit	Signal Name
DP1-1 →	S40	DP1-5 →	S50
-2 →	S41	-6 →	S51
-3 →	S42	-7 →	S52
-4 →	S43	-8 →	S53

Pin Processing

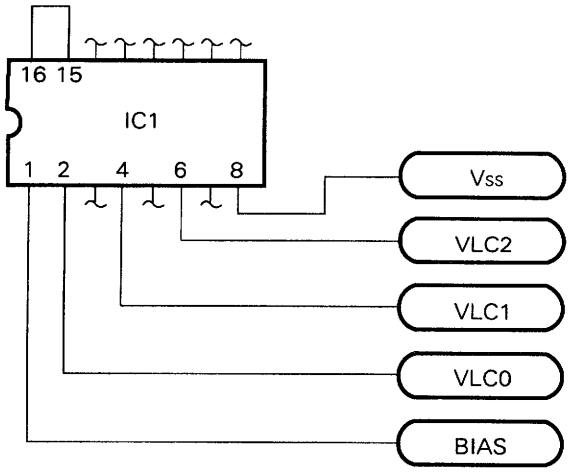


3.2 SETTING THE LCD DRIVE SPLIT RESISTOR

The adapter board IC socket (IC1) is used for setting of LCD drive split resistor which can be set by mask option.

When setting an LCD drive split resistor, the resistor is mounted on parts holder and the parts holder is inserted in the IC socket (see Fig. 3-2).

Fig. 3-2 IC1 Pin Connection



APPENDIX A EMULATION PROBE PIN ARRANGEMENT TABLE

Table A-1 Pin Correspondence of 80-Pin GC and 80-Pin GK Emulation Probe (1/2)

CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name
1	GND	GND	25	15	S26/BP2	49	34	P50
2	GND	GND	26	16	S27/BP3	50	33	GND
3	EXT0	EXT0	27	17	S28/BP4	51	32	P43
4	EXT1	EXT1	28	18	S29/BP5	52	31	P42
5	EXT2	EXT2	29	19	S30/BP6	53	41	P03/SI/SB1
6	EXT3	EXT3	30	20	S31/BP7	54	42	P10/INT0
7	EXT4	EXT4	31	21	COM0	55	43	P11/INT1
8	EXT5	EXT5	32	NC	NC	56	44	P12/INT2/TI1/TI2
9	EXT6	EXT6	33	NC	NC	57	45	P13/TI0
10	EXT7	EXT7	34	30	P41	58	46	P20/PTO0
11	1	S12	35	29	P40	59	47	P21/PTO1
12	2	S13	36	28	VLC2	60	48	P22/PCL/PTO2/REM
13	3	S14	37	27	VLC1	61	49	P23/BUZ
14	4	S15	38	26	VLC0	62	50	P30/LCDCL
15	5	S16	39	25	BIAS	63	51	P31/SYNC
16	6	S17	40	24	COM3	64	52	P32
17	7	S18	41	23	COM2	65	53	P33
18	8	S19	42	22	COM1	66	54	V_{DD}
19	9	S20	43	40	P02/SO/SB0	67	55	XT1
20	10	S21	44	39	P01/$\overline{SCK}$	68	56	XT2
21	11	S22	45	38	P00/INT4	69	57	IC
22	12	S23	46	37	P53	70	58	X1
23	13	S24/BP0	47	36	P52	71	59	X2
24	14	S25/BP1	48	35	P51	72	60	P60/KR0

Remarks 1. If the IE-75001-R is used, the emulation probe is connected to CN5 connector.

2. Symbols and numbers in the emulation probe column mean as follows.

GND : Ground clip pin No.
EXT0 to EXT7 : External sense clips 1 to 8
1 to 64 : Pin No. of 80-pin GC or 80-pin GK on end of emulation probe
NC : No Connection

Table A-1 Pin Correspondence of 80-Pin GC and 80-Pin GK Emulation Probe (2/2)

CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name
73	61	P61/KR1	81	65	P71/KR5	89	76	S7
74	NC	NC	82	64	P70/KR4	90	75	S6
75	NC	NC	83	63	P63/KR3	91	74	S5
76	70	S1	84	62	P62/KR2	92	73	S4
77	69	S0	85	80	S11	93	72	S3
78	68	$\overline{\text{RESET}}$	86	79	S10	94	71	S2
79	67	P73/KR7	87	78	S9	95	GND	GND
80	66	P72/KR6	88	77	S8	96	GND	GND

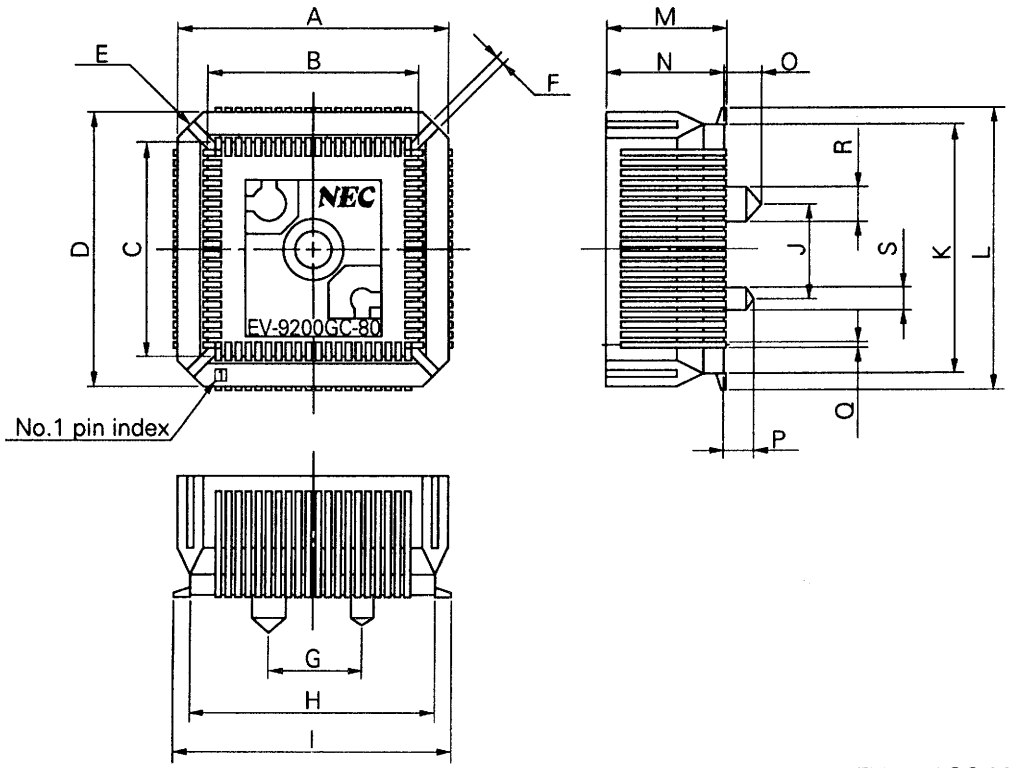
Remarks 1. If the IE-75001-R is used, the emulation probe is connected to CN5 connector.

2. Symbols and numbers in the emulation probe column mean as follows.

GND : Ground clip pin No.
EXT0 to EXT7 : External sense clips 1 to 8
1 to 64 : Pin No. of 80-pin GC or 80-pin GK on end of emulation probe
NC : No Connection

APPENDIX B EXTERNAL VIEW OF CONVERSION SOCKET (EV-9200GC-80) AND RECOMMENDED BOARD MOUNTING PATTERN

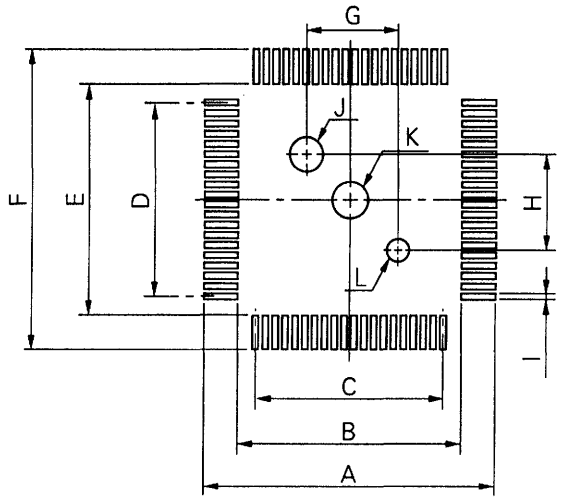
Fig. B-1 External View of EV-9200GC-80 (Reference)



EV-9200GC-80-G0

ITEM	MILLIMETERS	INCHES
A	18.0	0.709
B	14.4	0.567
C	14.4	0.567
D	18.0	0.709
E	4-C 2.0	4-C 0.079
F	0.8	0.031
G	6.0	0.236
H	16.0	0.63
I	18.7	0.736
J	6.0	0.236
K	16.0	0.63
L	18.7	0.736
M	8.2	0.323
O	8.0	0.315
N	2.5	0.098
P	2.0	0.079
Q	0.35	0.014
R	ϕ2.3	ϕ0.091
S	ϕ1.5	ϕ0.059

Fig. B-2 EV-9200GC-64 Recommended Board Mounting Pattern (Reference)



EV-9200GC-80-P0

ITEM	MILLIMETERS	INCHES
A	19.7	0.776
B	15.0	0.591
C	$0.65\pm0.02\times19=12.35\pm0.05$	$0.026^{+0.001}_{-0.002}\times0.748=0.486^{+0.003}_{-0.002}$
D	$0.65\pm0.02\times19=12.35\pm0.05$	$0.026^{+0.001}_{-0.002}\times0.748=0.486^{+0.003}_{-0.002}$
E	15.0	0.591
F	19.7	0.776
G	6.0 ± 0.05	$0.236^{+0.003}_{-0.002}$
H	6.0 ± 0.05	$0.236^{+0.003}_{-0.002}$
I	0.35 ± 0.02	$0.014^{+0.001}_{-0.001}$
J	$\phi2.36\pm0.03$	$\phi0.093^{+0.001}_{-0.002}$
K	$\phi2.3$	$\phi0.091$
L	$\phi1.57\pm0.03$	$\phi0.062^{+0.001}_{-0.002}$

Caution Dimensions of mount pad for EV-9200 and that for target device (QFP) may be different in some parts. For the recommended mount pad dimensions for QFP, refer to "SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL" (IEI-1207).

Phase-out/Discontinued