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**Phase-out/Discontinued**

**EP-78240**  
**EMULATION PROBE**

**EP-78240CW-R**  
**EP-78240GC-R**  
**EP-78240GJ-R**  
**EP-78240GQ-R**  
**EP-78240LP-R**

**Phase-out/Discontinued**

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**Major Revisions in this Edition**

Page	Description
p.8	Table 2-1 Connection Board List The following subseries were added to the series supporting the EP-78240CW-R and EP-78240GC-R: <ul style="list-style-type: none"><li>• <math>\mu</math>PD78002Y Subseries</li><li>• <math>\mu</math>PD78014Y Subseries</li><li>• <math>\mu</math>PD78018F Subseries</li><li>• <math>\mu</math>PD78018FY Subseries</li></ul>
p.29	Appendix C Revision History was added

The mark \* shows the revised point.

## INTRODUCTION

### Target readers

This manual is intended for persons who will use an in-circuit emulator and the EP-78240 to debug microcontrollers.

**See the device-related documents or the selection guide for development tools related to combinations of various emulation probes with target devices.**

### Objective

The objective of this manual is to describe methods for connecting the EP-78240 to an in-circuit emulator.

### Configuration

This manual is broadly divided into the following parts.

OVERVIEW  
CONNECTIONS

### How to use this manual

Before reading this manual, read the manual for the target in-circuit emulator to become acquainted with the debugging system's configuration and functions.

- To learn about the EP-78240's functions and connection methods in general  
→ Read this manual in the order shown in the table of contents
- To learn about the operating environment and configuration  
→ Read "Chapter 1 OVERVIEW"
- To learn about specific connection methods  
→ Read "Chapter 2 CONNECTIONS"

**This manual describes the EP-78240 unless otherwise note. Therefore, when using this manual for any of the following products, replace the product name EP-78240 with the respective product name.**

- EP-78240CW-R • EP-78240GC-R • EP-78240GJ-R • EP-78240GO-R
- EP-78240LP-R

### Legend

Note : Describes items noted in text.

Caution : Describes points that warrant particular attention.

Remark : Provides supplementary remarks to descriptions in text.

**Component check**

The following components are contained in the EP-78240 package. Check that all components have been provided. If any of the components are missing or damaged, contact your local sales representative or authorized dealer of NEC.

- Emulation probe 1
- Connector board 1
- User's manual (this manual) 1
- Fastening screws 2
  - These screws are used to connect the emulation probe and in-circuit emulator.
- Conversion socket 1
  - This socket is used to connect the emulation probe and the target system. This component is provided only with the EP-78240GC-R and EP-78240GJ-R (See the next table).

(Correspondence table for connector boards and conversion sockets)

Emulation probe	Connector board	Conversion socket
EP-78240GC-R	64GC connector	EV-9200GC-64
EP-78240GJ-R	74GJ connector	EV-9200G-74
EP-78240CW-R	64CW connector	Not contained in package
EP-78240GQ-R	64GQ connector	
EP-78240LP-R	68LP connector	



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## CHAPTER 1 OVERVIEW

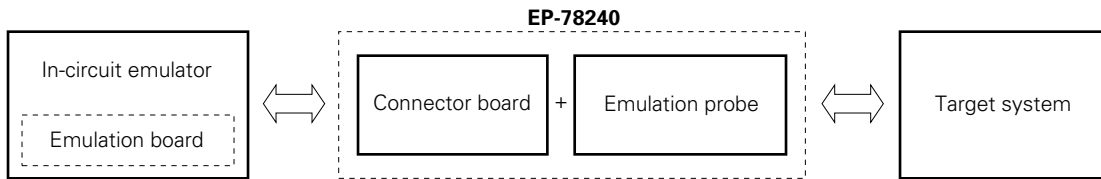
This chapter provides an overview description of the EP-78240.

### 1.1 Operating Environment

The EP-78240 is a probe set for connecting in-circuit emulators to target systems. The EP-78240 can be used to help set up a microcontroller debugging environment and to enable overall debugging of the target system's hardware and software. See "**CHAPTER 2 CONNECTIONS**" for detailed description of the connection methods.

**Figure 1-1. Operating Environment**

- **Connection of in-circuit emulator and target system**



## 1.2 Configuration

The EP-78240 set consists of an emulation probe and a connector board.

### (1) Emulation probe

The emulation probe contains the following three components.

**Probe**

The probe connects the in-circuit emulator with the target system.

- EP-78240CW-R: 64-pin CW probe
- EP-78240GC-R : 64-pin GC probe
- EP-78240GJ-R : 74-pin GJ probe
- EP-78240GQ-R : 64-pin GQ probe
- EP-78240LP-R : 68-pin LP probe

**Ground clip**

Should be connected to the target system's ground. Sets an equal GND potential between the emulation probe and the target system to boost resistance against static electricity and noise.

**External sense clips**

Eight sense clips are contained. Used to check the voltage level of the IC pins mounted on the target system.

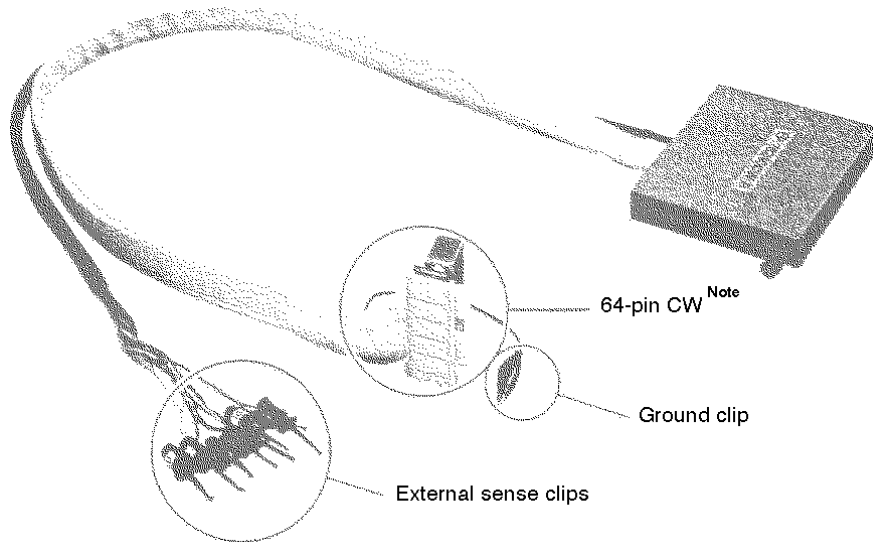
### (2) Connector board

The connector board is used to connect the in-circuit emulator and the emulation probe on the emulation board. It is attached to the connector<sup>Note</sup> of the emulation board or adapter board.

**Note** The attachment position differs according to the connected board. See the in-circuit emulator or emulation board User's Manuals listed in Table 2-1.

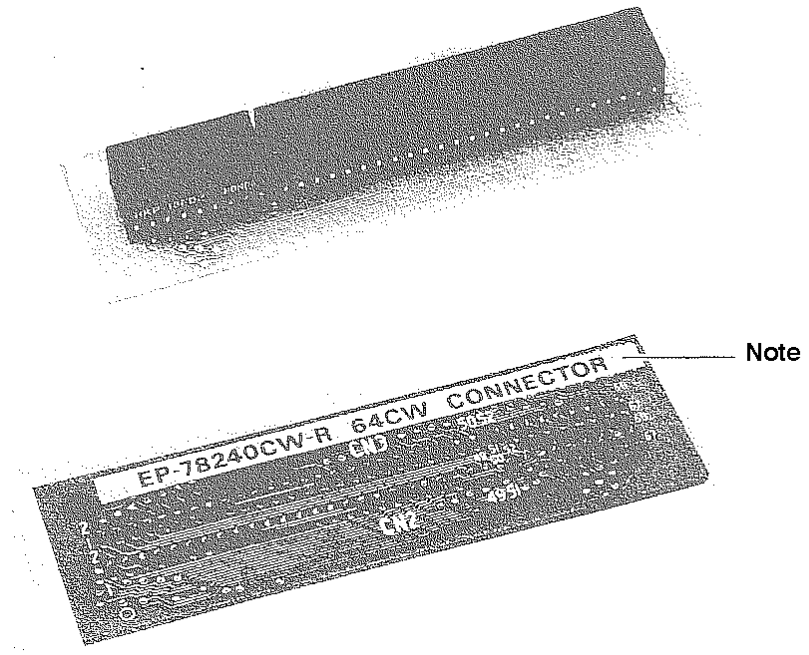
**Figure 1-2. Emulation Probe and Connector Board (example is EP-78240CW-R)**

**Emulation probe**



**Note** The size and nomenclature differs for each emulation probe.

**Connector board (64CW connector)**



**Note** The name of the supported probe is indicated. Check that the correct probe is being used.

**Phase-out/Discontinued**

[MEMO]

## CHAPTER 2 CONNECTIONS

This chapter describes the EP-78240's connection methods, sequence of power ON/OFF, and methods for disconnecting the emulation probe from the target system.

## 2.1 Connection of In-Circuit Emulator and Target System

The general connection procedure is described below.

- (1) Connection of emulation board and connector board  
Note that the board to be connected differs according to the in-circuit emulator being used.
- (2) Connection of in-circuit emulator and emulation probe
- (3) Connection of emulation probe and target system
- (4) Connection of external sense clips (if using external sense clips)
- (5) Power ON

The detailed connection procedures for the above items are described below.



**(1) Emulation board and connector board connection**

The connector board connection differs depending upon the type of target device.

Before making this connection, first check the type of board to be connected and the board's CN number, as listed in Table 2-1.

The following is a connection example when the  $\mu$ PD78244 Subseries device is used as the target device.

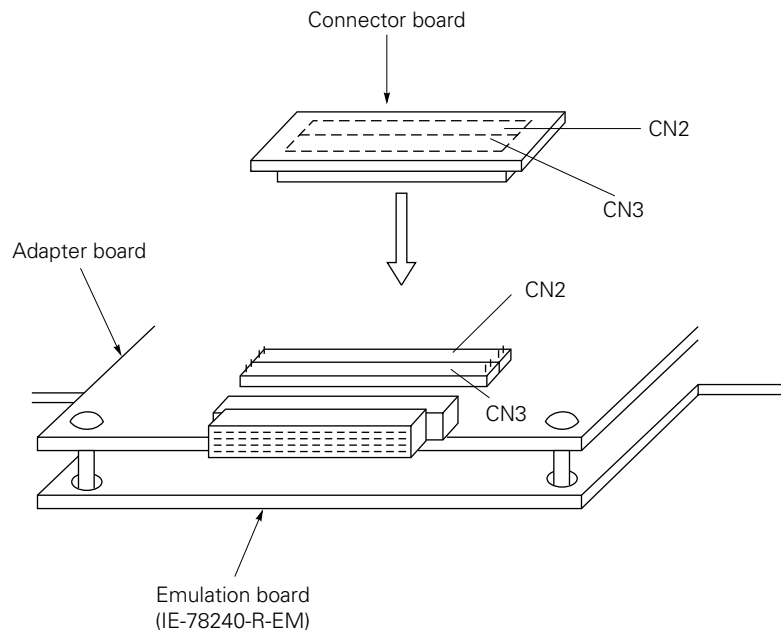
**Caution** Making connections at incorrect locations may damage the in-circuit emulator.

- **Connector board connection example**

Connect the connector board to the adapter board fixed to the emulation board IE-78240-R-EM.

Mount the connector board pins CN2 and CN3 to fully cover the adapter board's CN2 and CN3 pins respectively (see **Figure 2-1**).

**Figure 2-1. Connector Board Connection**



**Remark** The shape of the emulation board differs according to the target device, but the connector board's connection method is always the same as shown in Figure 2-1.

For details of methods for attaching the board to the in-circuit emulator's main unit, see the User's Manual for the each target in-circuit emulator.

\*

**Table 2-1. Connection Board List 1/2**

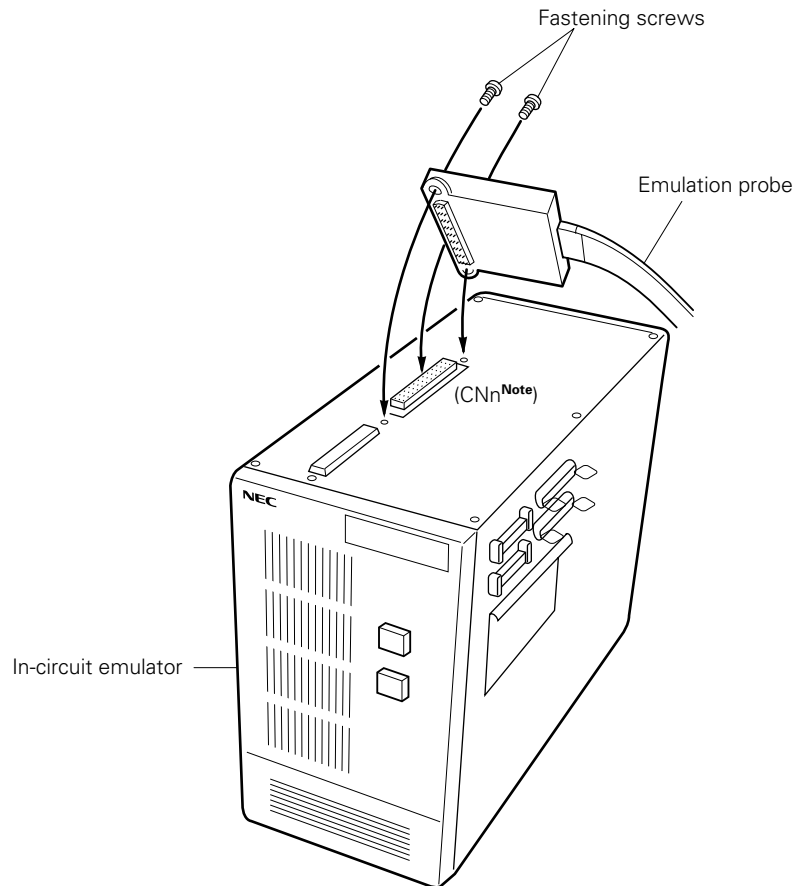
Emulation probe (connector board name)	Series	Package table	Adapter board	Emulation board	Connector No.	
					Target board	Connector board
EP-78240CW-R (64CW connector)	$\mu$ PD78002 Subseries	64 pin SDIP (750mil)	None	IE78014-R-EM or, IE-78014-R-EM-A	CN3 $\leftrightarrow$ CN2 CN4 $\leftrightarrow$ CN3	
	$\mu$ PD78002Y Subseries					
	$\mu$ PD78014 Subseries					
	$\mu$ PD78014Y Subseries					
	$\mu$ PD78018F Subseries					
	$\mu$ PD78018FY Subseries					
	$\mu$ PD78214 Subseries			Provided Fixed to emulation board	IE-78240-R-EM	CN2 $\leftrightarrow$ CN2 CN3 $\leftrightarrow$ CN3
	$\mu$ PD78218A Subseries					
	$\mu$ PD78244 Subseries					
EP-78240GC-R (64GC connector)	$\mu$ PD78002 Subseries	64-pin QFP (14 x 14 mm)	None	IE-78014-R-EM or, IE-78014-R-EM-A	CN3 $\leftrightarrow$ CN2 CN4 $\leftrightarrow$ CN3	
	$\mu$ PD78002Y Subseries					
	$\mu$ PD78014 Subseries					
	$\mu$ PD78014Y Subseries					
	$\mu$ PD78018F Subseries					
	$\mu$ PD78018FY Subseries					
					IE-78014-R-EM-A	

**Table 2-1. Connection Board List 2/2**

Emulation probe (connector board name)	Series	Package table	Adapter board	Emulation board	Connector No.	
					Target board	Connector board
EP-78240GC-R (64GC connector)	$\mu$ PD78214 Subseries	64-pin QFP (14 x 14 mm)	Yes (fixed to emula- tion board)	IE-78240-R-EM	CN2 $\leftrightarrow$ CN2 CN3 $\leftrightarrow$ CN3	
	$\mu$ PD78218A Subseries					
	$\mu$ PD78244 Subseries					
	$\mu$ PD78350 Subseries		None	IE-78350-R-EM + IE-78350-R-EM1 (I/O expansion board)	CN2 $\leftrightarrow$ CN2 CN3 $\leftrightarrow$ CN3	
EP-78240GJ-R (74GJ connector)	$\mu$ PD78214 Subseries	74-pin QFP (20 x 20 mm)	Yes (fixed to emula- tion board)	IE-78240-R-EM	CN2 $\leftrightarrow$ CN2 CN3 $\leftrightarrow$ CN3	
EP-78240GQ-R (64GQ connector)	$\mu$ PD78214 Subseries	64-pin QUIP	Yes (fixed to emula- tion board)	IE-78240-R-EM	CN2 $\leftrightarrow$ CN2 CN3 $\leftrightarrow$ CN3	
EP-78240LP-R (68LP connector)	$\mu$ PD78214 Subseries	68-pin QFJ	Yes (fixed to emula- tion board)	IE-78240-R-EM	CN2 $\leftrightarrow$ CN2 CN3 $\leftrightarrow$ CN3	

**(2) Connection between in-circuit emulator and emulation probe**

- ① Connect the emulation probe to the emulation probe's DIN connector on top of the in-circuit emulator.
- ② After making this connection, use the fastening screws to stabilize the connection between the emulation probe and the in-circuit emulator.

**Figure 2-2. Example of Connection between In-circuit Emulator's Main Unit and Emulation Probe**

**Note** The connection location differs according to the target emulation board.  
See the User's Manual for the each target in-circuit emulator or the target emulation board.

**(3) Connection between emulation probe and target system**

Connect the emulation probe and target system in the order shown below.

- Cautions 1. Be sure to connect the ground clip before connecting the emulation probe to the target system. Failure to connect the ground clip may damage the in-circuit emulator due to static electricity or other factors.**
- 2. Be careful to avoid connecting the pins in incorrect positions. Incorrect pin connections may damage the in-circuit emulator.**

- ① Shut off the power to the target system.
- ② Solder the conversion socket (EV-9200G-74 and EV-9200GC-64 conversion sockets are contained) to the target system. If using a CW, GQ, or LP probe, use the (commercially available) socket that corresponds to the probe.
- ③ Connect the emulation probe's ground clip to the target system's ground (GND) terminal.
- ④ Connect the emulation probe by aligning and inserting the front end of the emulation probe onto pin 1 on the socket that was soldered onto the target system at step ② above.

**Figure 2-3. Connection of EP-78240CW-R and Target System**

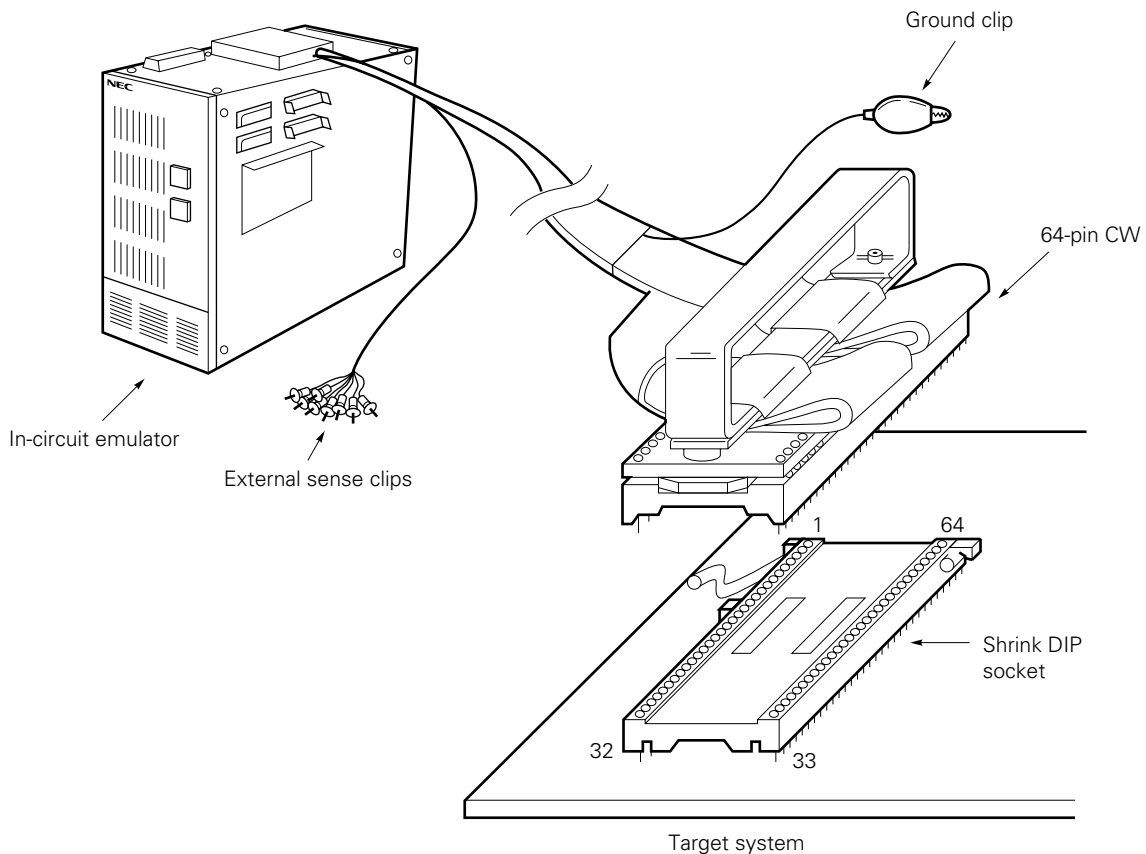
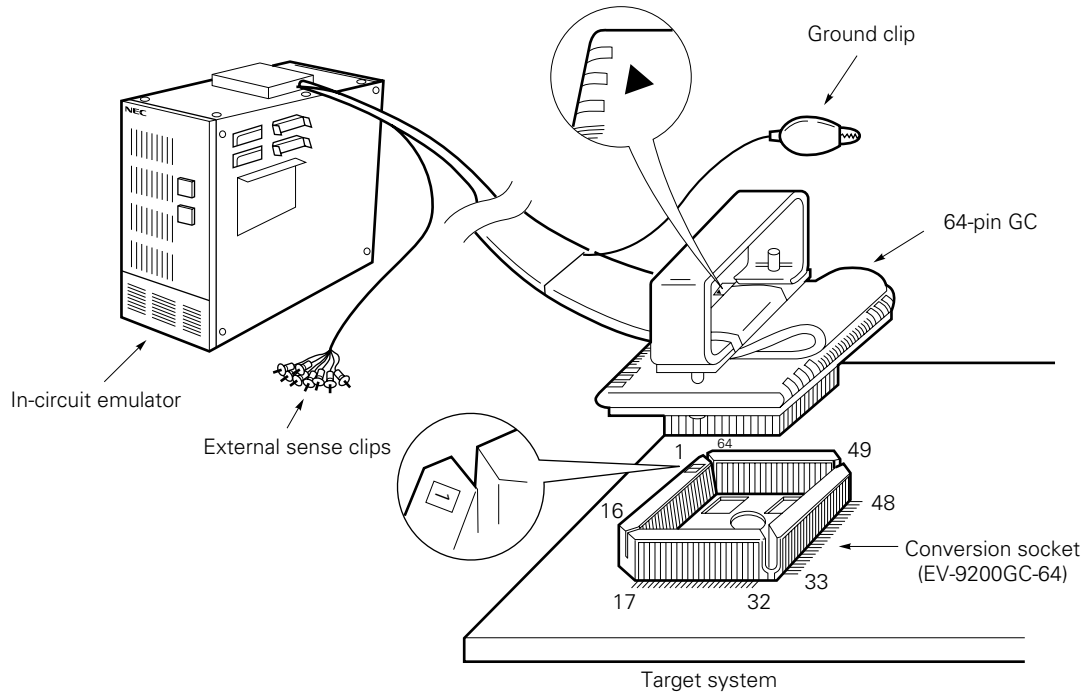
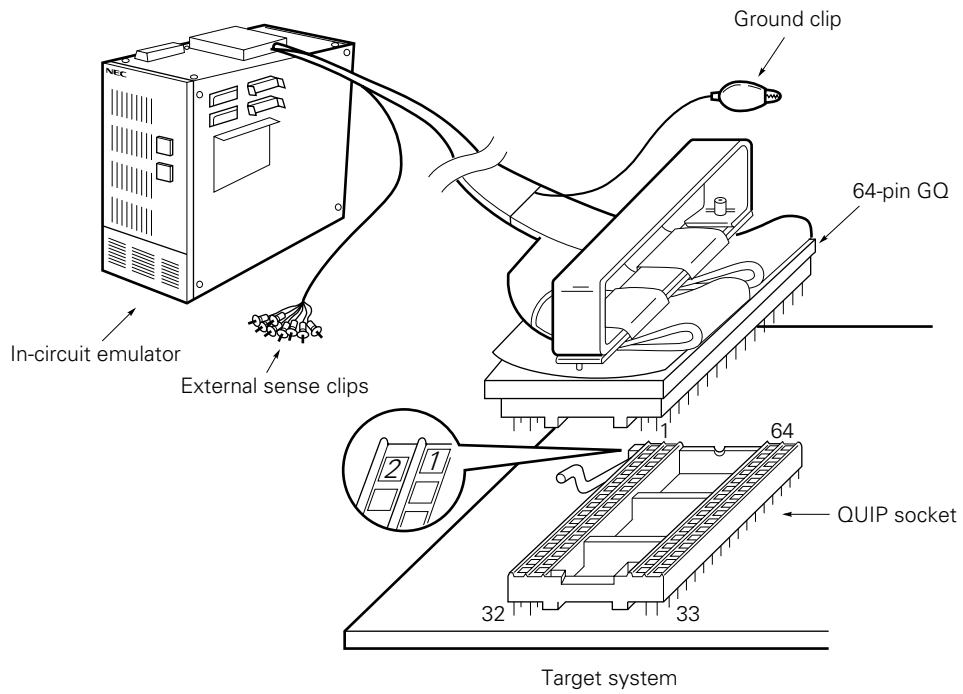


Figure 2-4. Connection of EP-78240GC-R and Target System

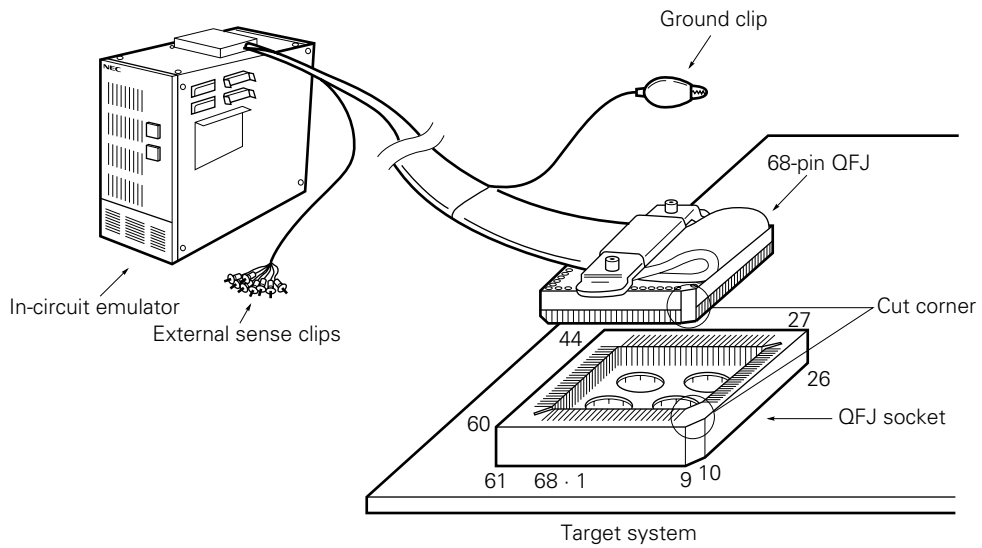


**Remark** The EP-78240GJ-R is the same as the EP-78240GC-R basically except for the size of the connector on the front end of the probe.

**Figure 2-5. Connection of EP-78240GQ-R and Target System**



**Figure 2-6. Connection of EP-78240LP-R and Target System**



**(4) Connection of external sense clips (when using external sense clips)**

The emulation probe is equipped with eight external sense clips that can perform real-time tracing of signals from the hardware in the target system.

These external sense clips are connected directly to the input buffer HCT244 in the in-circuit emulator's main unit, and therefore use TTL-level input.

Although the eight external sense clips normally function as input signal lines, the in-circuit emulator's OUT command can be set to enable external sense clip No. 1's signal line to be used as an external trigger output signal line for event occurrences (for details, see the in-circuit emulator's manual).

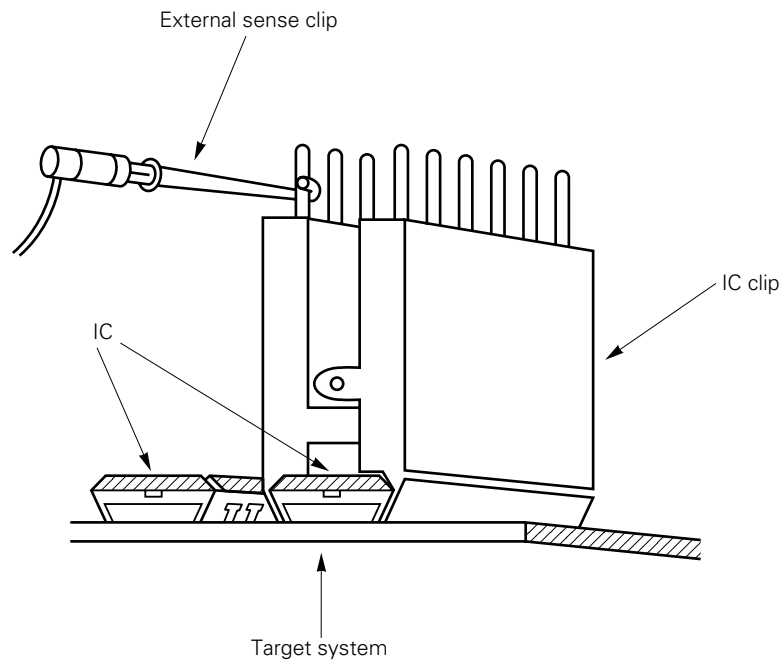
- |   |
|---|
| <p><b>Cautions</b></p> <ol style="list-style-type: none"><li><b>1. Connect the external sense clips only to TTL-level signal lines. If they are connected to another type of signal line, incorrect detection of high level and low level may result. In addition, the in-circuit emulator sensors may be damaged, depending upon the voltage level.</b></li><li><b>2. When using external sense clip No. 1 as an external trigger output signal line, make sure that clip No. 1 is not connected to the signal output line. Such a connection may result in a breakdown.</b></li></ol> |
|---|



Connect the external sense clips in the order shown below.

- ① Shut off the power to the target system, then to the in-circuit emulator.
- ② Attach a (commercially available) IC clip to any IC that will perform a trace on the target system.
- ③ Connect an external sense clip to the attached IC clip.
- ④ Turn on the power to the in-circuit emulator, then to the target system.

**Figure 2-7. Connection of External Sense Clip**



**Remark** When connecting the external sense clip, use an IC clip whenever possible to prevent connection errors and improve operability.

## 2.2 Sequence of Power ON/OFF

Once the connections between the emulation probe and the target system have been completed, switch on the power in the order shown below.

**Caution** Be sure to follow the prescribed sequence of power ON/OFF. Failure to do so may damage the in-circuit emulator.

### (1) Sequence of power ON

- ① Turn on the power to the in-circuit emulator.
- ② Turn on the power to the target system.

### (2) Sequence of power OFF

- ① Turn off the power to the target system.
- ② Turn off the power to the in-circuit emulator.

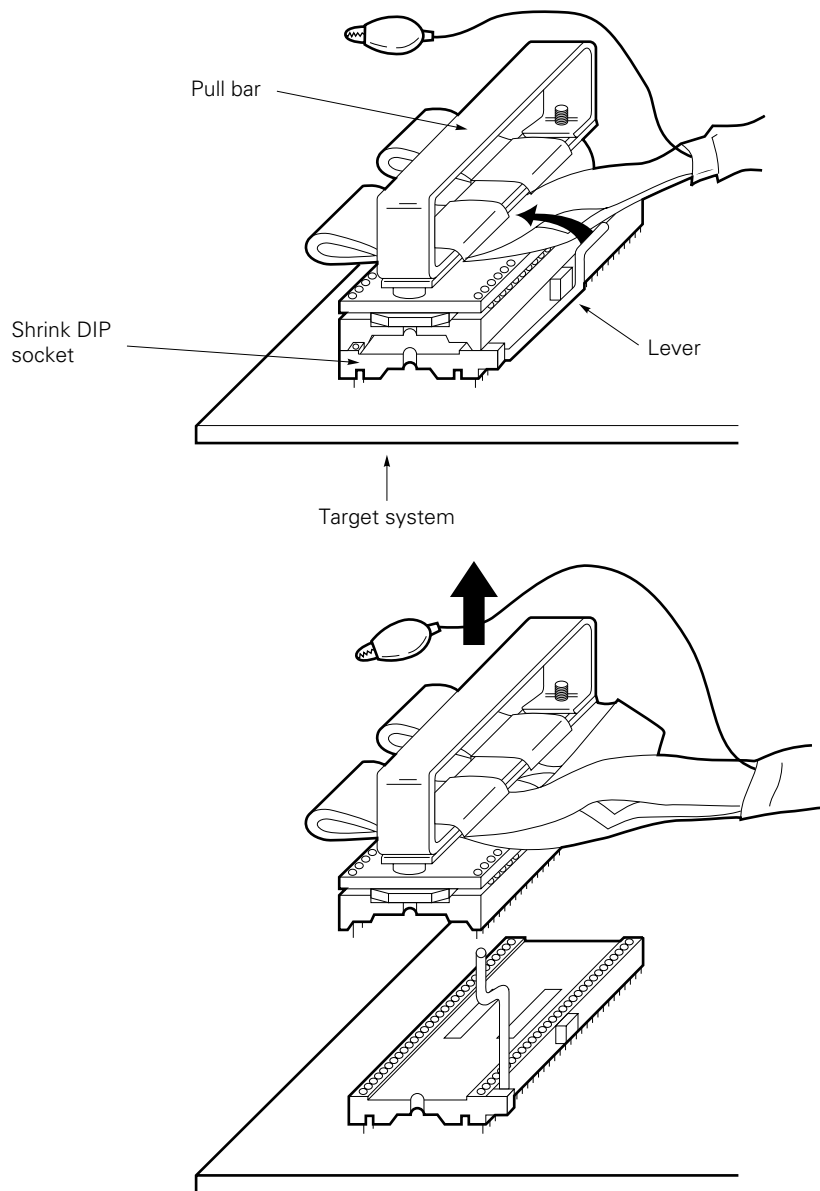
### 2.3 Disconnection of Emulation Probe from Target System

Disconnect the emulation probe from the target system in the order shown below.

**(a) For EP-78240CW-R and EP-78240GQ-R**

- ① Turn off the power to the target system.
- ② Turn off the power to the in-circuit emulator.
- ③ Lift the lever on the shrink DIP socket or QUIP socket.
- ④ Pull the pull bar attached to the front end of the emulation probe directly upward to remove the emulation probe from the shrink DIP socket or QUIP socket.

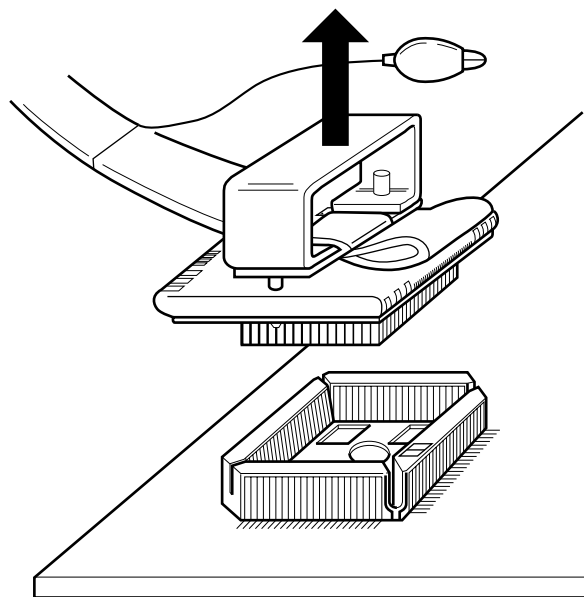
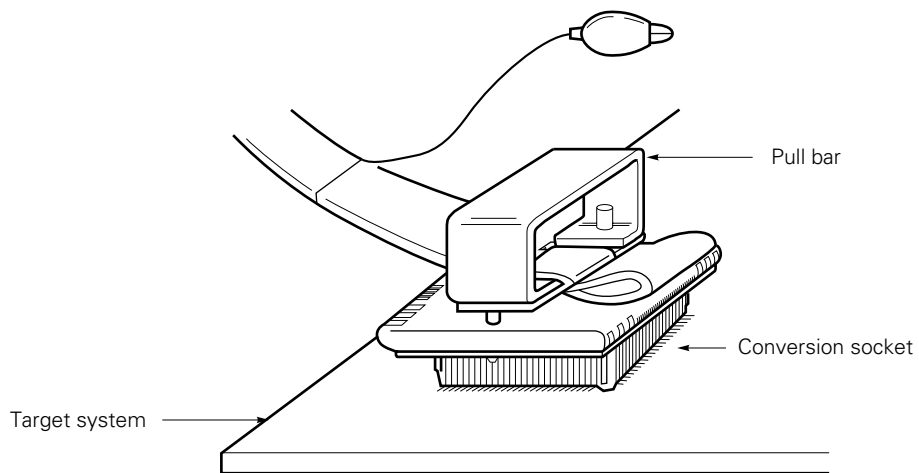
**Figure 2-8. Disconnection of EP-78240CW-R**



**Remark** Remove the EP-78240GQ-R in the same way as shown in Figure 2-8.

**(b) For EP-78240GC-R and EP-78240GJ-R**

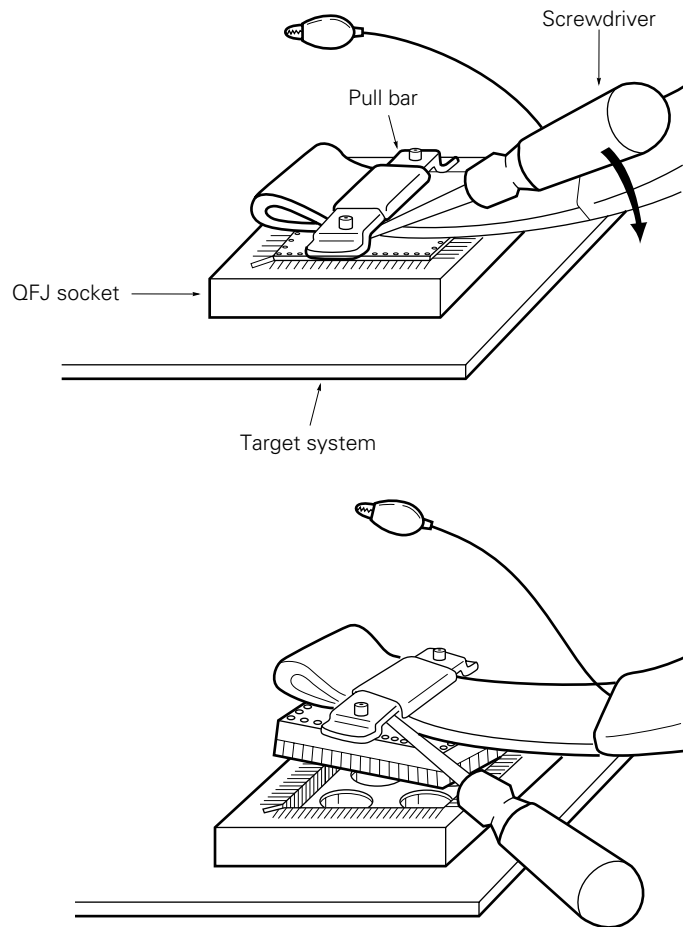
- ① Turn off the power to the target system.
- ② Turn off the power to the in-circuit emulator.
- ③ Pull the pull bar attached to the front end of the emulation probe directly upward to remove the emulation probe from the conversion socket.

**Figure 2-9. Disconnection of EP-78240GC-R**

**Remark** Remove the EP-78240GJ-R in the same way as shown in Figure 2-9.

**(c) For EP-78240LP-R**

- ① Turn off the power to the target system.
- ② Turn off the power to the in-circuit emulator.
- ③ Insert a flat object such as a screwdriver between the pull bar attached to the front end of the emulation probe and QFJ socket and lift the pull bar directly upward to remove the emulation probe from the QFJ socket.

**Figure 2-10. Disconnection of EP-78240LP-R**

**Phase-out/Discontinued**

[MEMO]

**APPENDIX A TABLE OF PIN CORRESPONDENCES AMONG VARIOUS EMULATION PROBES**

**A.1 64-Pin CW, 64-Pin GC, and 64-Pin GQ Emulation Probes**

CNn pin No.	Emulation probe	CNn pin No.	Emulation probe	CNn pin No.	Emulation probe	CNn pin No.	Emulation probe
1	GND	25	15	49	39	73	63
2		26	16	50	40	74	64
3	EXT0	27	17	51	41	75	NC
4	EXT1	28	18	52	42	76	
5	EXT2	29	19	53	43	77	
6	EXT3	30	20	54	44	78	
7	EXT4	31	21	55	45	79	
8	EXT5	32	22	56	46	80	
9	EXT6	33	23	57	47	81	
10	EXT7	34	24	58	48	82	
11	1	35	25	59	49	83	
12	2	36	26	60	50	84	
13	3	37	27	61	51	85	
14	4	38	28	62	52	86	
15	5	39	29	63	53	87	
16	6	40	30	64	54	88	
17	7	41	31	65	55	89	
18	8	42	32	66	56	90	
19	9	43	33	67	57	91	
20	10	44	34	68	58	92	
21	11	45	35	69	59	93	
22	12	46	36	70	60	94	
23	13	47	37	71	61	95	GND
24	14	48	38	72	62	96	

**Remarks 1.** CNn pin No.

CNn: The connector to be connected to the emulation probe

The “n” value of the connector (CN) differs according to the emulation board. See the User’s Manual for the each target emulation board or in-circuit emulator.

**2.** The symbols and numbers that appear in the “Emulation probe” column have the following meanings.

GND : Ground clip (GND)

EXT0 to EXT7: External sense clip Nos. 1 to 8

1 to 64 : Pin Nos. on front end of emulation probe

NC : No connection

**A.2 74-Pin GJ Emulation Probe**

CN1 pin No.	Emulation probe	CN1 pin No.	Emulation probe	CN1 pin No.	Emulation probe	CN1 pin No.	Emulation probe
1	GND	25	73	49	26	73	55
2		26	74	50	27	74	56
3	EXT0	27	1	51	29	75	62
4	EXT1	28	2	52	30	76	67
5	EXT2	29	3	53	31	77	9
6	EXT3	30	4	54	32	78	13
7	EXT4	31	5	55	33	79	22
8	EXT5	32	6	56	34	80	28
9	EXT6	33	7	57	35	81	37
10	EXT7	34	8	58	36	82	40
11	57	35	10	59	38	83	47
12	58	36	11	60	39	84	52
13	59	37	12	61	41	85	NC
14	60	38	14	62	42	86	
15	61	39	15	63	43	87	
16	63	40	16	64	44	88	
17	64	41	17	65	45	89	
18	65	42	18	66	46	90	
19	66	43	19	67	48	91	
20	68	44	20	68	49	92	
21	69	45	21	69	50	93	
22	70	46	23	70	51	94	
23	71	47	24	71	53	95	
24	72	48	25	72	54	96	GND

- Remarks 1.** CN1: The connector to be connected to the emulation probe
- 2.** The symbols and numbers that appear in the “Emulation probe” column have the following meanings.
- GND : Ground clip (GND)
- EXT0 to EXT7: External sense clip Nos. 1 to 8
- 1 to 74 : Pin Nos. on front end of emulation probe
- NC : No connection



**A.3 68-Pin LP Emulation Probe**

CN1 pin No.	Emulation probe	CN1 pin No.	Emulation probe	CN1 pin No.	Emulation probe	CN1 pin No.	Emulation probe
1	GND	25	41	49	65	73	21
2		26	42	50	66	74	22
3	EXT0	27	43	51	67	75	23
4	EXT1	28	44	52	68	76	24
5	EXT2	29	45	53	1	77	25
6	EXT3	30	46	54	2	78	26
7	EXT4	31	47	55	3	79	NC
8	EXT5	32	48	56	4	80	
9	EXT6	33	49	57	5	81	
10	EXT7	34	50	58	6	82	
11	27	35	51	59	7	83	
12	28	36	52	60	8	84	
13	29	37	53	61	9	85	
14	30	38	54	62	10	86	
15	31	39	55	63	11	87	
16	32	40	56	64	12	88	
17	33	41	57	65	13	89	
18	34	42	58	66	14	90	
19	35	43	59	67	15	91	
20	36	44	60	68	16	92	
21	37	45	61	69	17	93	
22	38	46	62	70	18	94	
23	39	47	63	71	19	95	
24	40	48	64	72	20	96	

**Remarks 1.** CN1: The connector to be connected to the emulation probe

**2.** The symbols and numbers that appear in the "Emulation probe" column have the following meanings.

GND : Ground clip (GND)

EXT0 to EXT7: External sense clip Nos. 1 to 8

1 to 68 : Pin Nos. on front end of emulation probe

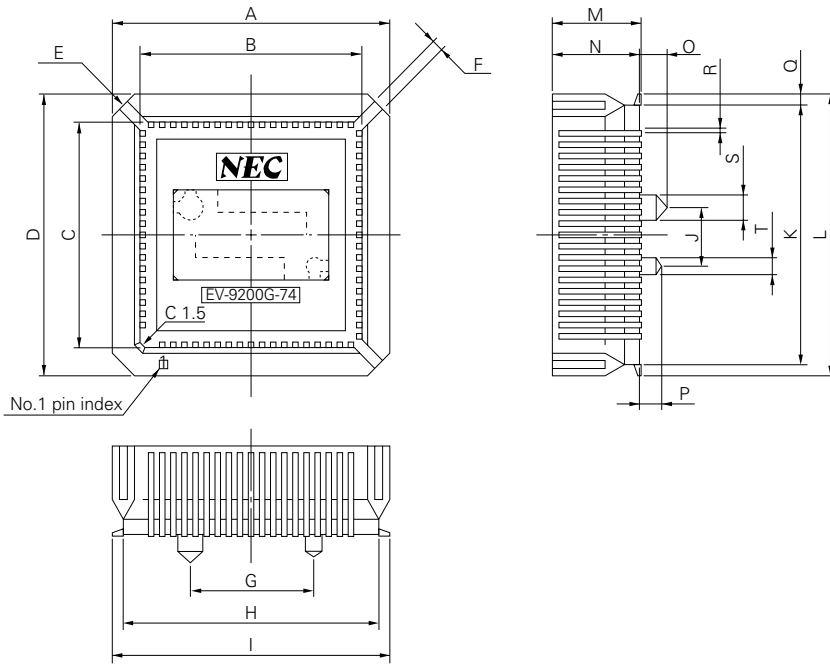
NC : No connection

[MEMO]

**APPENDIX B SOCKET DRAWINGS OF CONVERSION SOCKETS AND FOOTPRINTS**

**B.1 EV-9200G-74**

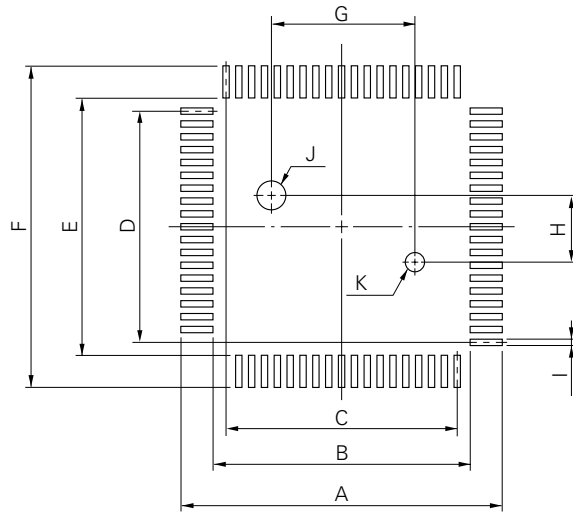
**Figure B-1. Socket Drawing of EV-9200G-74 (Reference)**



EV-9200G-74-G0

ITEM	MILLIMETERS	INCHES
A	25.0	0.984
B	20.35	0.801
C	20.35	0.801
D	25.0	0.984
E	4-C 2.8	4-C 0.11
F	1.0	0.039
G	11.0	0.433
H	22.0	0.866
I	24.7	0.972
J	5.0	0.197
K	22.0	0.866
L	24.7	0.972
M	8.0	0.315
N	7.8	0.307
O	2.5	0.098
P	2.0	0.079
Q	1.35	0.053
R	0.35±0.1	0.014 <sup>+0.004</sup> <sub>-0.005</sub>
S	∅2.3	∅0.091
T	∅1.5	∅0.059

**Figure B-2. Footprint for EV-9200G-74 (Reference)**



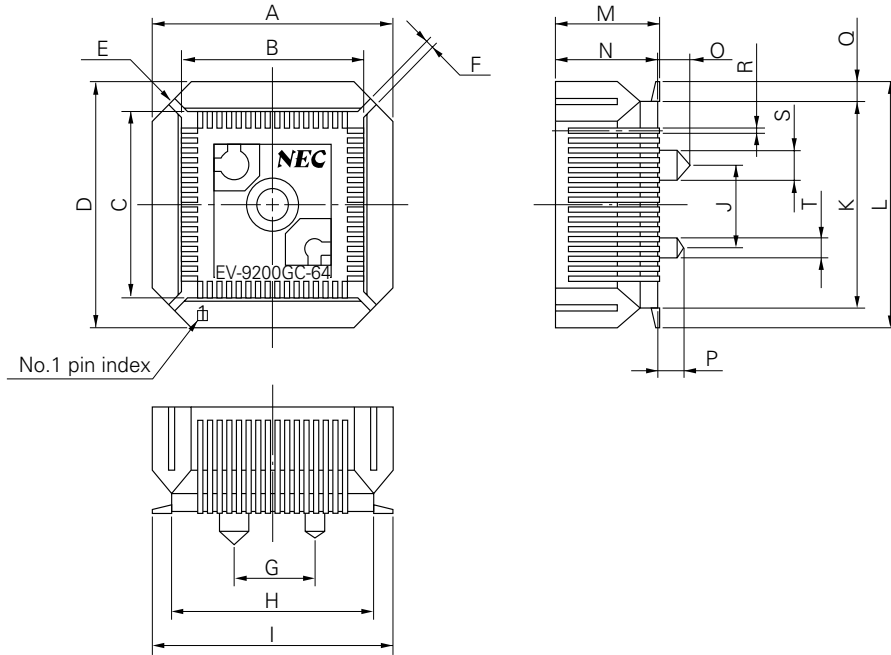
EV-9200G-74-P0

ITEM	MILLIMETERS	INCHES
A	25.7	1.012
B	21.0	0.827
C	$1.0 \pm 0.02 \times 18 = 18.0 \pm 0.05$	$0.039^{+0.002}_{-0.001} \times 0.709 = 0.709^{+0.002}_{-0.003}$
D	$1.0 \pm 0.02 \times 18 = 18.0 \pm 0.05$	$0.039^{+0.002}_{-0.001} \times 0.709 = 0.709^{+0.002}_{-0.003}$
E	21.0	0.827
F	25.7	1.012
G	$11.00 \pm 0.08$	$0.433^{+0.004}_{-0.003}$
H	$5.00 \pm 0.08$	$0.197^{+0.003}_{-0.004}$
I	$0.6 \pm 0.02$	$0.024^{+0.001}_{-0.002}$
J	$\phi 2.36 \pm 0.03$	$\phi 0.093^{+0.001}_{-0.002}$
K	$\phi 1.57 \pm 0.03$	$\phi 0.062^{+0.001}_{-0.002}$

**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).

**B.2 EV-9200GC-64**

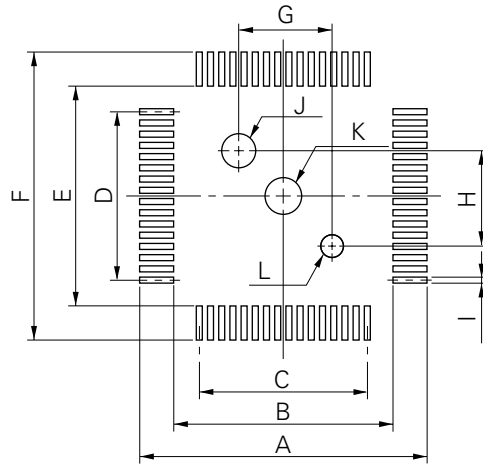
**Figure B-3. Socket Drawing of EV-9200GC-64 (Reference)**



EV-9200GC-64-G0

ITEM	MILLIMETERS	INCHES
A	18.8	0.74
B	14.1	0.555
C	14.1	0.555
D	18.8	0.74
E	4-C 3.0	4-C 0.118
F	0.8	0.031
G	6.0	0.236
H	15.8	0.622
I	18.5	0.728
J	6.0	0.236
K	15.8	0.622
L	18.5	0.728
M	8.0	0.315
N	7.8	0.307
O	2.5	0.098
P	2.0	0.079
Q	1.35	0.053
R	0.35±0.1	0.014 <sup>+0.004</sup> <sub>-0.005</sub>
S	∅2.3	∅0.091
T	∅1.5	∅0.059

Figure B-4. Footprint for EV-9200GC-64 (Reference)



EV-9200GC-64-P0

ITEM	MILLIMETERS	INCHES
A	19.5	0.768
B	14.8	0.583
C	$0.8 \pm 0.02 \times 15 = 12.0 \pm 0.05$	$0.031^{+0.002}_{-0.001} \times 0.591 = 0.472^{+0.003}_{-0.002}$
D	$0.8 \pm 0.02 \times 15 = 12.0 \pm 0.05$	$0.031^{+0.002}_{-0.001} \times 0.591 = 0.472^{+0.003}_{-0.002}$
E	14.8	0.583
F	19.5	0.768
G	$6.00 \pm 0.08$	$0.236^{+0.004}_{-0.003}$
H	$6.00 \pm 0.08$	$0.236^{+0.004}_{-0.003}$
I	$0.5 \pm 0.02$	$0.197^{+0.001}_{-0.002}$
J	$\phi 2.36 \pm 0.03$	$\phi 0.093^{+0.001}_{-0.002}$
K	$\phi 2.2 \pm 0.1$	$\phi 0.087^{+0.004}_{-0.005}$
L	$\phi 1.57 \pm 0.03$	$\phi 0.062^{+0.001}_{-0.002}$

**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).

**APPENDIX C REVISION HISTORY**

\*

Major revisions by edition and revised chapters are shown below.

Edition	Major revisions from previous version	Revised chapters
2nd	<p><b>Table 2-1 Connection Board List</b></p> <p>The following subseries were added to the series supporting the EP-78240CW-R and EP-78240GC-R</p> <ul style="list-style-type: none"><li>• <math>\mu</math>PD78002Y Subseries</li><li>• <math>\mu</math>PD78014Y Subseries</li><li>• <math>\mu</math>PD78018F Subseries</li><li>• <math>\mu</math>PD78018FY Subseries</li></ul>	Chapter 2 CONNECTIONS

**Phase-out/Discontinued**

[MEMO]