

DSU-FR EMULATOR
LQFP-100P HEADER TYPE 7
MB2198-162
OPERATION MANUAL

PREFACE

Thank you for purchasing the LQFP-100P*1 header type 7 for the DSU-FR*2 emulator (model number : MB2198-162).

The MB2198-162 is used with the adapter unit for connecting to user systems that use the MB91 (F) 487 (LQFP-100P) series of Fujitsu FR microcontrollers, together with the DSU-FR emulator (model number : MB2198-01)*3 and DSU-FR cable (model number : MB2198-10)*4.

The manual explains how to handle the MB2198-162. Before using the MB2198-162, be sure to read this manual.

Consult a Fujitsu Limited sales representative or support representative for inquiries about mass production MCUs and evaluation MCUs.

*1 : Uses the FPT-100P-M20 package (lead pitch: 0.5mm, body size: 14mm × 14mm)

*2 : FR is an abbreviation of FUJITSU RISC CONTROLLER and is a product of Fujitsu Limited.

*3 : Referred to as the “emulator”.

*4 : Referred to as the “DSU cable”.

■ Handling and use

Please refer to the following manuals for information about how to handle and use this product and also for details on safety precautions.

- DSU-FR EMULATOR MB2198-01 HARDWARE MANUAL
- DSU-FR EMULATOR DSU-FR CABLE MB2198-10 OPERATION MANUAL
- DSU-FR EMULATOR BGA-224P ADAPTER MB2198-160 OPERATION MANUAL

■ Cautions regarding the products described in this document

The following precautions apply to the product described in this document.



The wrong use of a device will give an injury and may cause malfunction on customers system.

Cuts	This product has parts with sharp points that are exposed. Do not touch edge of the product with your bare hands. There is a possibility that it may be injured.
Damage	When connect the header board to the user system, correctly position the index mark (▲) on the NQPACK mounted on the user system with the index mark (▲) on the header board, otherwise the emulator system and user system might be damaged.
Damage	When mounting a mass production MCU, correctly position pin 1, otherwise the mass production MCU and user system might be damaged.

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1. Checking the Delivered Product

Before using the MB2198-162, confirm that the following components are included in the box:

- LQFP-100P Header type 7 *1 : 1
- Screws for securing the header board (M2 × 10mm, 0.4mm pitch) : 4
- Washers : 4
- NQPACK100SD-ND *2 : 1
- HQPACK100SD *3 : 1
- Operation manual (Japanese version) : 1
- Operation manual (English version, this manual) : 1

*1 : Referred to as the "header board".

A YQPACK100SD-4W (manufactured by Tokyo Eletech Corporation, referred to as the "YQPACK" in this manual) is mounted on the header board.

*2 : The IC socket (manufactured by Tokyo Eletech Corporation, referred to as the "NQPACK" in this manual).

The NQPACK includes a specialized screw driver and 3 guide pins.

A more reliable compatible socket, the NQPACK100SD-ND-SL (sold separately; manufactured by Tokyo Eletech Corporation), can be used by making a screw hole in the user system board for affixing the IC socket. For more information, contact Tokyo Eletech Corporation.

*3 : The IC socket cover (manufactured by Tokyo Eletech Corporation, referred to as the "HQPACK" in this manual). Includes 4 screws (M2 × 6mm, 0.4mm pitch) for attaching the HQPACK.

This product can function as an adapter unit when used in combination with an adapter board (sold separately). The product can also function as an emulator system when used in conjunction with an emulator.

For details about the emulators and adapter boards that support this product, contact our Sales Department or Support Department.

2. Handling Precautions

The adapter unit is precision-manufactured to improve dimensional accuracy and to ensure reliable contact, and is therefore mechanically weak.

Take the following precautions to ensure that the header board is always used correctly in an appropriate environment.

- Avoid placing any stress on the NQPACK that is mounted on the user system while the adapter unit is connected.

3. Notes on Designing

■ Notes on printed circuit board for the user system

If the header board is connected to a user system, the heights of parts mounted in the space around the header board are restricted.

When the printed circuit board of the user system is designed, consider the height of the parts so that components mounted on the user system and the header board do not interfere within range of the header board as shown in Figure 1.

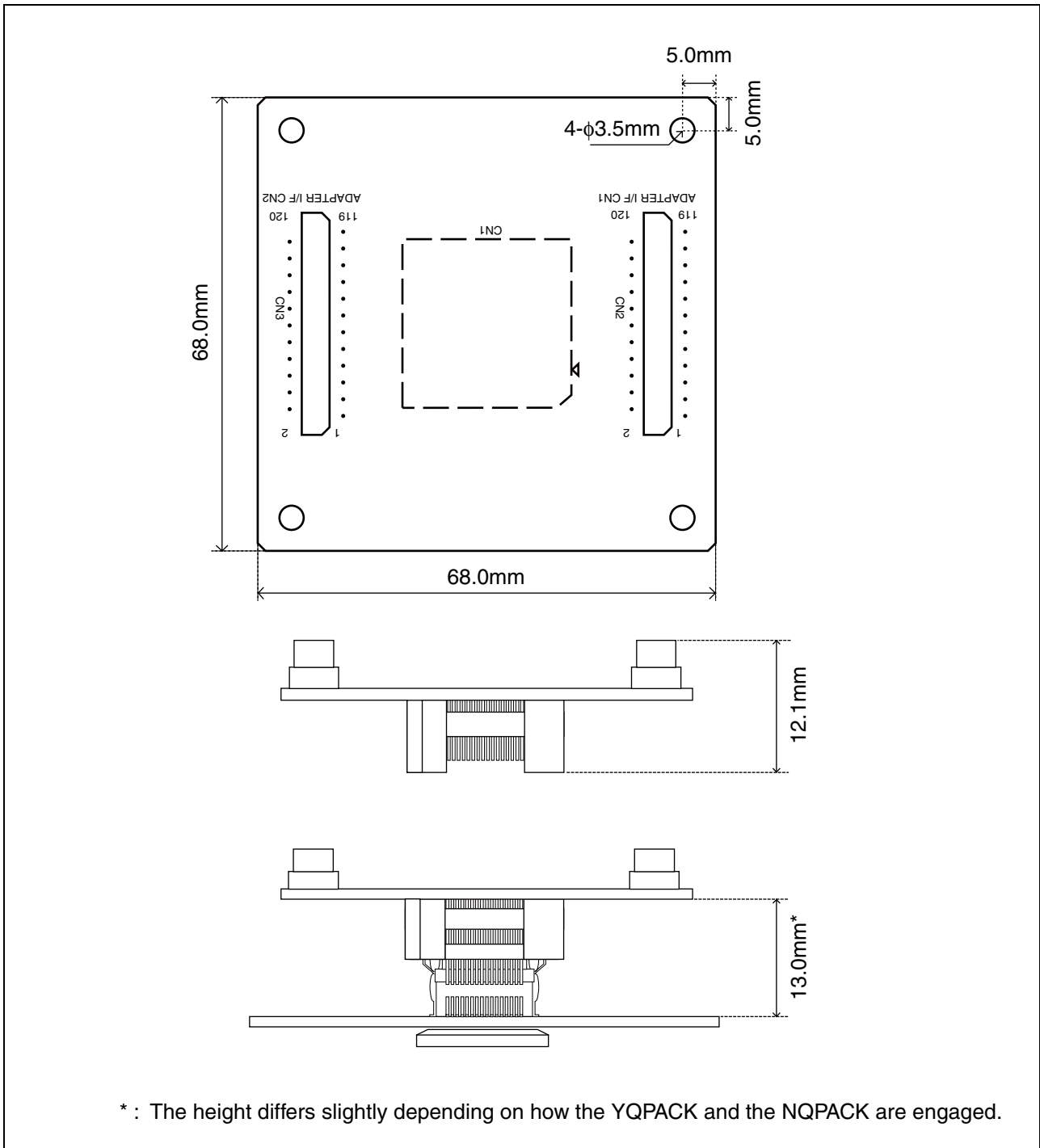


Figure 1 Header board dimensions

■ MCU footprint design notes

Figure 2 shows the recommended dimensions of the footprint for mounting the NQPACK on the printed circuit board of the user system.

The printed circuit board of the user system must be designed with due consideration given to this footprint as well as to the mass production MCU.

For details on the footprint, contact Tokyo Eletech Corporation.

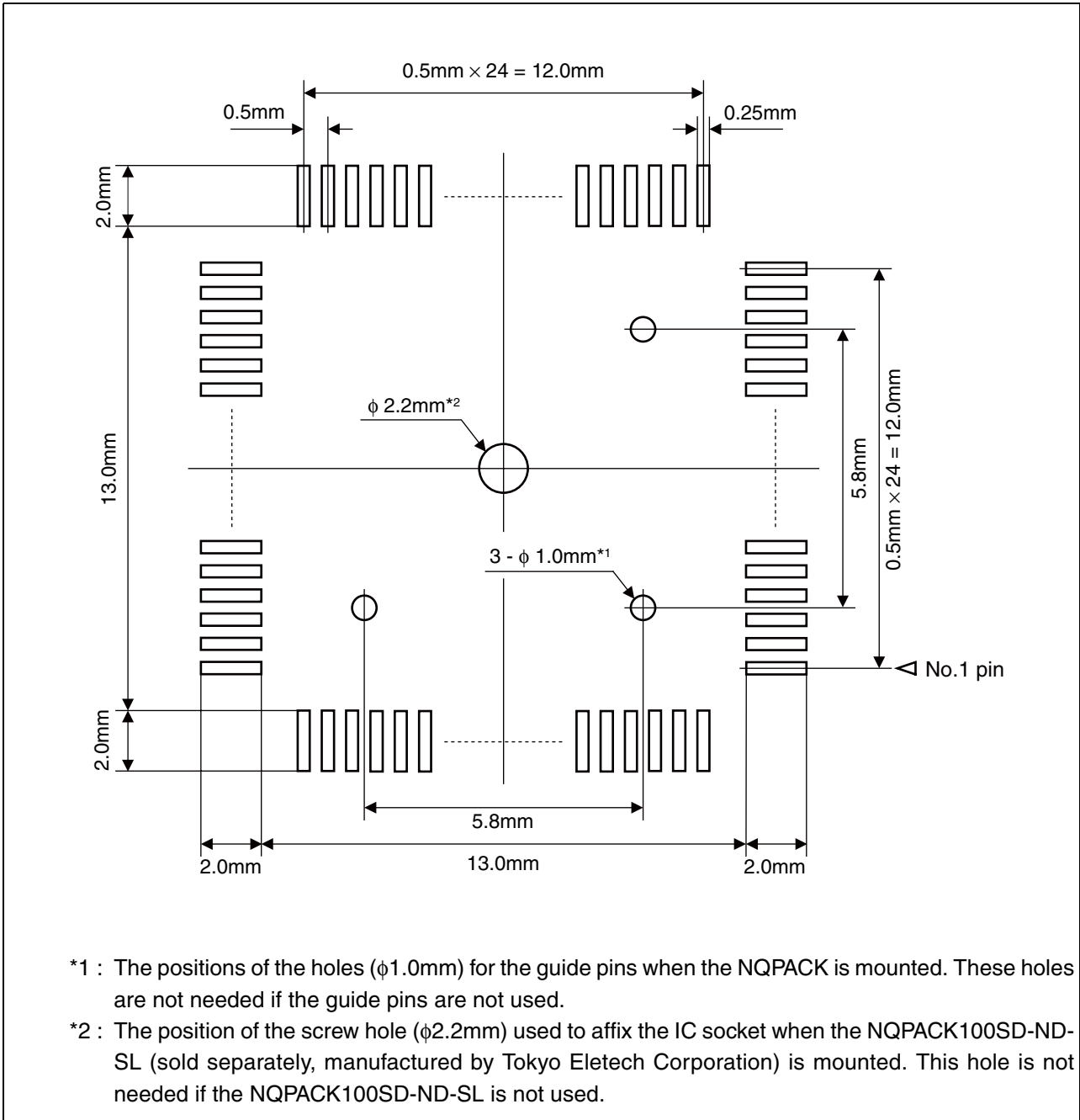


Figure 2 Recommended dimensions of the footprint for mounting the NQPACK

4. Connecting to the User System

Mount the attached NQPACK on the user system before using this product.
The header board and adapter board are connected in a stack structure.

■ Connection

1. To connect the header board to the user system, match pin 1 indicated by the index mark (▲) on the NQPACK mounted on the user system with the index mark (▲) on the header board and then insert it (see “Figure 3”). The YQPACK pins are thin and easily bent. When you are connecting the YQPACK to the NQPACK, ensure that the YQPACK pins are not bent before pushing it all the way into the NQPACK.
2. Insert the screws for securing the header board through the washers into the four holes on the header board, and then tighten the screws in the opposite corners evenly using the special screw driver that was included with the NQPACK (see “Figure 4”).
Be careful not to over-tighten the screws as this may result in bad connections.

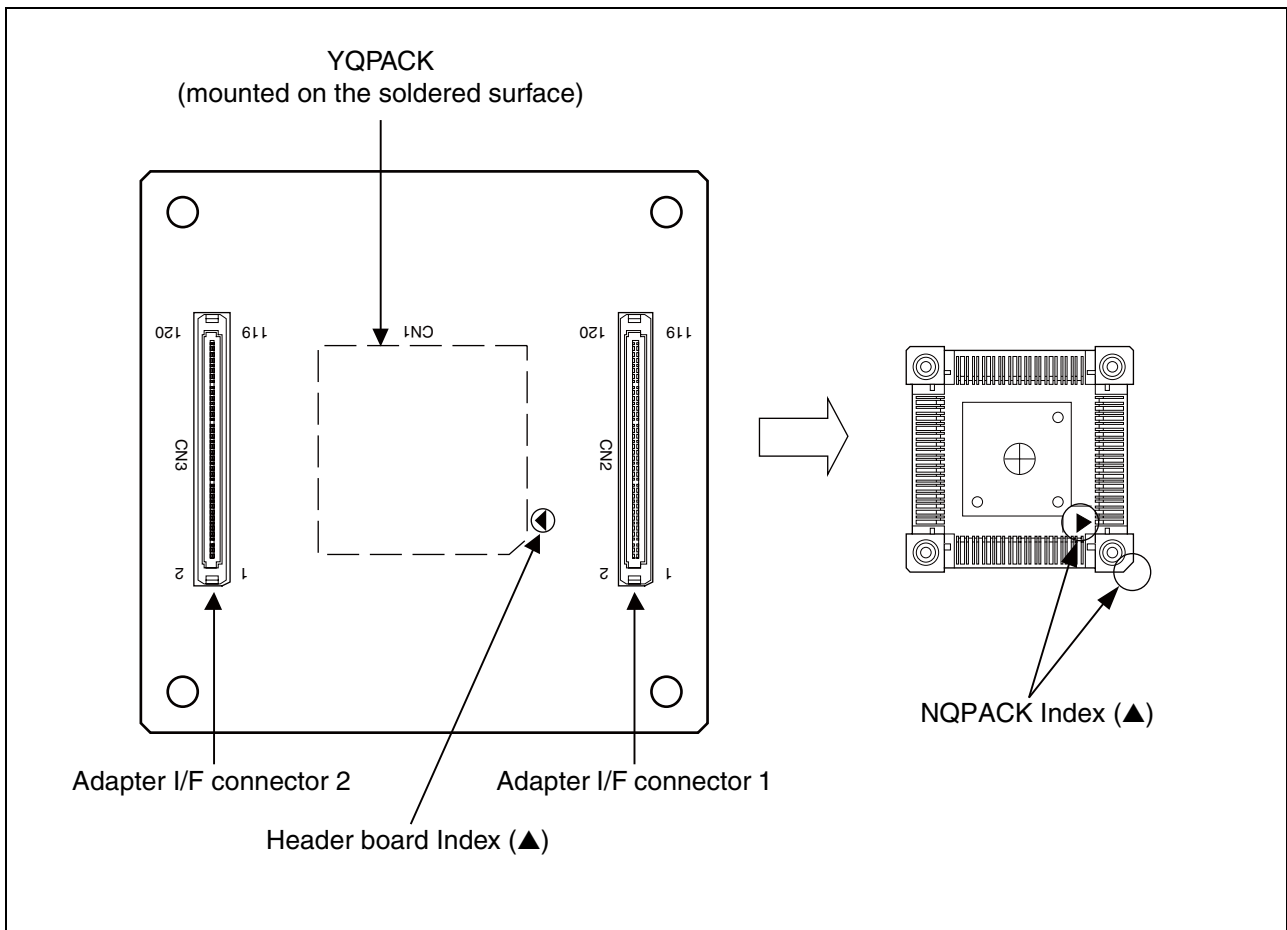


Figure 3 Index position

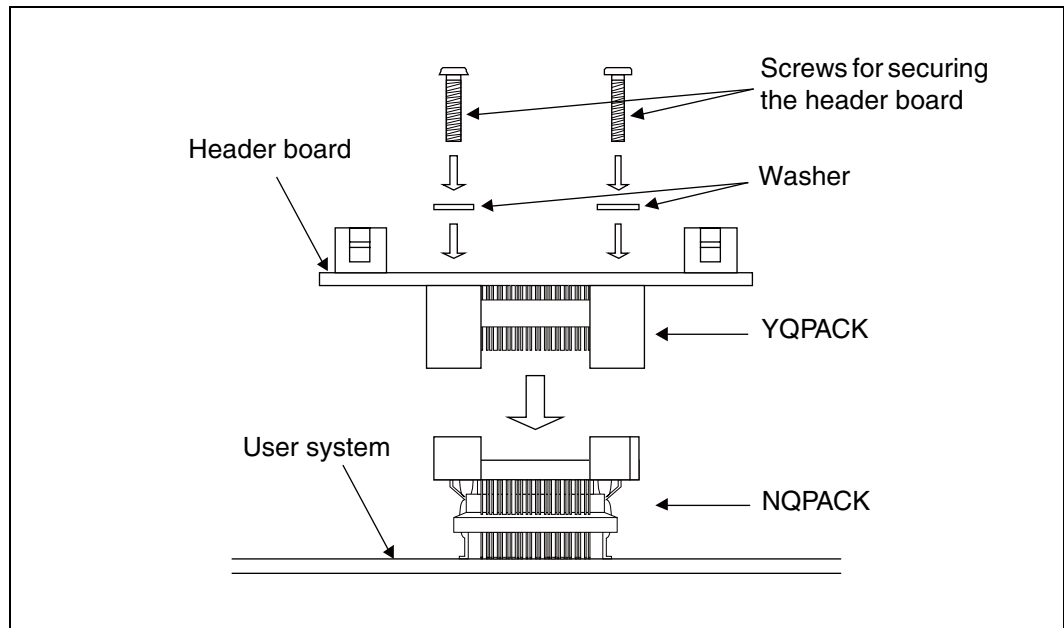


Figure 4 Header board connection

■ **Disconnection**

To disconnect the header board from the user system, remove all four screws, and then pull the header board straight out of the socket

5. Mounting Mass Production MCUs

To mount a mass production MCU on the user system, use the supplied HQPACK.

■ Mounting

1. To mount a mass production MCU on the user system, match the index mark (▲) on the NQPACK mounted on the user system with the index mark (●) on the mass production MCU.
2. Confirm that the mass production MCU is correctly mounted on the NQPACK, and then align the index of the HQPACK with the index of the NQPACK (the corner that has a straight-line notch cut out of it) and insert the HQPACK into the NQPACK (see “Figure 5”).
The HQPACK pins are thin and easily bent. When you are connecting the HQPACK to the NQPACK, ensure that the HQPACK pins are not bent before pushing it all the way into the NQPACK.
3. Insert the screws for securing the HQPACK into the four holes in the HQPACK, and then tighten the screws in the opposite corners evenly using the special screw driver that was included with the NQPACK. Be careful not to over-tighten the screws as this may result in bad connections.

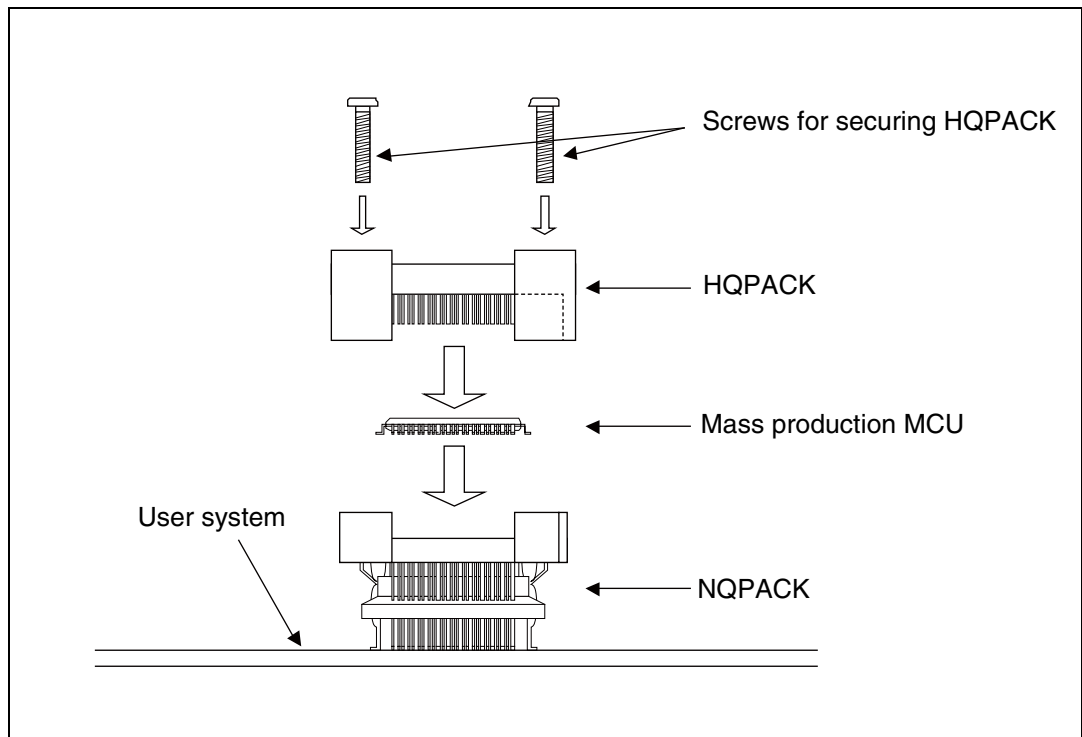


Figure 5 Mounting a mass production MCU

■ Disconnection


To remove the HQPACK, remove all four screws, and pull out the HQPACK vertically.

6. Connector Pin Assignment

Tables 1 and 2 list the pin connections for the mass production MCU, the adapter I/F connectors, and the evaluation MCU on the adapter board.

For detailed pin information for the mass production MCUs, refer to the data sheets or hardware manuals.

The following notes are related to the tables.

 : VDDE

The power supply (VDDE) pin numbers on the evaluation MCU are as follows.

VDDE = C3, E1, K1, T8, V14, V18, K17, A18, D12, D8, U2, U5, R6, V6, R1, R3

The power supply (VDDE) pin numbers on the mass production MCU are as follows.

VDDE = 1, 19, 32, 33, 51, 76

 : VSS

The ground (VSS) pin numbers on the evaluation MCU are as follows.

VSS = D1, K4, R8, T12, T16, K15, C16, B12, B8, D4, T3, V3, T6, V7, N2, V1

The ground (VSS) pin numbers on the mass production MCU are as follows.

VSS = 18, 34, 47, 50, 75, 100

- : Unconnected (open circuit) pins

*1 : Unconnected pin : Fixed to VDDE on the header board.

*2 : Unconnected pin : Fixed to VSS on the header board.

Table 1 Pin assignment of adapter I/F connector 1

Connector pin number	Evaluation MCU pin number	Mass-produced MCU pin number	Connector pin number	Evaluation MCU pin number	Mass-produced MCU pin number
1	-	-	61	H4	94
2	C10	*2	62	H3	95
3	A10	*2	63	H2	96
4	A9	*2	64	H1	97
5	D9	*2	65	J2	98
6	C9	*2	66	J4	99
7	B9	*2	67	J3	2
8	A8	*2	68	J1	3
9	A7	*2	69	VCC	-
10	VSS	-	70	VSS	-
11	VCC	-	71	K3	4
12	C8	35	72	K2	5
13	VSS	-	73	L1	*2
14	A6	*2	74	M1	*2
15	B7	*2	75	L4	*2
16	D7	*2	76	L3	*2
17	C7	*2	77	L2	*2
18	A5	*2	78	N1	*2
19	B6	*2	79	VSS	-
20	A4	*2	80	M2	42
21	D6	*2	81	M4	43
22	VSS	-	82	M3	44
23	VCC	-	83	VSS	-
24	C6	*2	84	VSS	-
25	B5	*2	85	P1	48
26	A3	*2	86	VSS	-
27	B4	*2	87	VSS	-
28	D5	*2	88	VCC	-
29	C5	*2	89	VCC	-
30	A2	*2	90	VSS	-
31	B3	*2	91	VCC	-
32	VSS	-	92	VSS	-
33	VSS	-	93	T4	20
34	C4	46	94	U3	21
35	A1	45	95	V2	22
36	VSS	-	96	T5	23
37	VSS	-	97	R5	24
38	B2	77	98	U4	25
39	D3	78	99	VCC	-
40	C2	79	100	VSS	-
41	B1	80	101	VSS	-
42	E3	81	102	VCC	-
43	E4	82	103	U6	26
44	VCC	-	104	V4	27
45	VCC	-	105	V5	28
46	D2	83	106	T7	29
47	E2	84	107	R7	30
48	C1	85	108	U7	31
49	F3	*2	109	VCC	-
50	F4	*2	110	VSS	-
51	F2	*2	111	VSS	-
52	VSS	-	112	VCC	-
53	VCC	-	113	U8	12
54	G3	7	114	V8	13
55	G4	8	115	U9	14
56	G2	9	116	R9	15
57	F1	10	117	T9	16
58	VSS	-	118	V9	17
59	G1	6	119	VSS	-
60	VSS	-	120	-	-

Table 2 Pin assignment of adapter I/F connector 2

Connector pin number	Evaluation MCU pin number	Mass-produced MCU pin number	Connector pin number	Evaluation MCU pin number	Mass-produced MCU pin number
1	D10	*2	61	H18	*2
2	B10	*2	62	J17	*2
3	A11	*2	63	J16	*2
4	B11	*2	64	J15	*2
5	C11	*2	65	J18	*2
6	D11	*2	66	K18	*2
7	A12	*2	67	K16	63
8	A13	*2	68	VCC	-
9	VSS	-	69	VSS	-
10	VCC	-	70	L16	*2
11	C12	*2	71	L15	*2
12	VSS	-	72	M18	*2
13	VSS	-	73	N18	*2
14	B15	*2	74	R18	*2
15	C13	*2	75	N17	*2
16	VSS	-	76	N15	*2
17	VSS	-	77	N16	*2
18	A16	*2	78	VSS	-
19	B14	*2	79	M17	*1
20	VSS	-	80	M15	*1
21	VSS	-	81	M16	*2
22	D13	*2	82	P18	*1
23	B13	*2	83	R17	*2
24	VSS	-	84	P15	*2
25	VSS	-	85	P16	*2
26	A14	*2	86	U18	*2
27	A15	*2	87	T17	*2
28	B16	73	88	R16	*2
29	VSS	-	89	U17	*2
30	C15	74	90	T15	11
31	B17	49	91	VSS	-
32	L18	*2	92	VCC	-
33	L17	*2	93	R15	*2
34	VCC	-	94	U16	*2
35	VSS	-	95	V17	*2
36	D16	65	96	T14	*2
37	D15	66	97	VSS	-
38	C17	67	98	R14	93
39	B18	68	99	U15	92
40	E16	69	100	V16	91
41	E15	70	101	U14	90
42	D17	71	102	T13	89
43	C18	72	103	R13	88
44	VSS	-	104	V15	87
45	E17	62	105	U13	86
46	F16	*1	106	VCC	-
47	F15	64	107	VSS	-
48	D18	*1	108	R12	*2
49	VSS	-	109	U12	*2
50	F17	52	110	V13	*2
51	E18	53	111	U11	*2
52	G16	54	112	T11	*2
53	G15	55	113	R11	*2
54	G17	56	114	VSS	-
55	F18	57	115	V12	41
56	H17	58	116	V11	40
57	H16	59	117	U10	39
58	VSS	-	118	T10	38
59	H15	60	119	R10	37
60	G18	61	120	V10	36

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