F²MC-16 Family EMULATOR

QFP-100P PROBE HEADER

MB2147-583-E

OPERATION MANUAL

FUJITSU

PREFACE

Thank you for purchasing the QFP-100P[1] probe header (MB2147-583-E) for the F^2MC[2] -16 family emulator.

The QFP-100P probe header is used to connect the F^2MC-16L/16LX emulator (MB2147-01-E)[3] and the F^2MC-16L/16LX emulator PGA-299P adapter board (MB2147-20-E)[4] to the user system. That uses Fujitsu F^2MC-16LX microcontroller MB90940 series (QFP-100P).

This manual explains the handling of the QFP-100P probe header for the F^2MC-16 family emulator. Before using the MB2147-583-E, be sure to read this manual.

Please contact the sales or support representative for details on the mass production and evaluation MCU models that can be used with this product.

[1] : The lead pitch of PACKAGE (FPT-100P-M06) is 0.65mm and the body size is 14mm × 20mm. Using the product safely.

[2] : F^2MC is the abbreviation of FUJITSU Flexible Microcontroller.

[3] : referred to as "emulator"

[4] : referred to as "adapter board"

■ Handling and use

The handling and use of this product and notes regarding safety are included in the operation manual of the F^2MC-16 family emulator.

Follow the instructions in for the use of this product.
- F^2MC-16L/16LX EMULATOR MB2147-01-E OPERATION MANUAL
- F^2MC-16L/16LX EMULATOR PGA-299P ADAPTER BOARD
  MB2147-20-E OPERATION MANUAL

■ European RoHS compliance

Products with a -E suffix on the part number are European RoHS compliant products.

■ Notice on this document

All information included in this document is current as of the date it is issued. Such information is subject to change without any prior notice.
Please confirm the latest relevant information with the sales representatives.

■ Caution of the products described in this document

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

⚠ **CAUTION** | Indicates a feature that, if not used correctly, may result in minor or moderate injuries, and which may cause the customer system to malfunction.

Cuts	This product has parts with sharp points that are exposed. Do not touch edge of the product with your bare hands.
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.

1. Checking the Delivered Product

Before using the QFP-100P probe header, confirm that the following components are included in the box:

- QFP-100P Probe Header*[1]   : 1
- Screws for securing header board (M2 × 10mm, 0.4mm pitch)   : 4
- Washer   : 4
- NQPACK100RB179-A*[2]   : 1
- HQPACK100RB179*[3]   : 1
- Operation manual (Japanese version)   : 1
- Operation manual (English version, this manual)   : 1

*1 : Referred to as "header board". Header board is mounted on the YQPACK100RB-4W (Tokyo Eletech Corporation), referred to as "YQPACK".

*2 : IC socket manufactured by Tokyo Eletech Corporation, referred to as "NQPACK", and supplied with a special screwdriver and three guide pins. A socket offering higher reliability, NQPACK100RB179-SL-A (Tokyo Eletech Corporation, sold separately), can be used by making the IC socket mounting hole on the user system board. For more information, contact Tokyo Eletech Corporation.

*3 : IC Socket cover manufactured by Tokyo Eletech Corporation, referred to as "HQPACK", with four screws for securing HQPACK (M2 × 6mm, 0.4mm pitch).

This product is used as an emulator system by combining with an optional emulator and adapter board.
Please contact your sales or support representative for details on the adapter board and emulator that can be used with this product.

2. Handling Precautions

The header board is precision-manufactured to improve dimensional accuracy and to ensure reliable contact. The header is therefore sensitive to mechanical shock. To ensure correct use of the header in the proper environment, observe the following points regarding its insertion and removal:

- To avoid placing stress on the NQPACK mounted on the user system board during connecting the header board.

3. Notes on Designing

■ Restrictions of PC board for the user system

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

The PC board of the user system must be designed with due consideration given to this restriction (Figure 1).
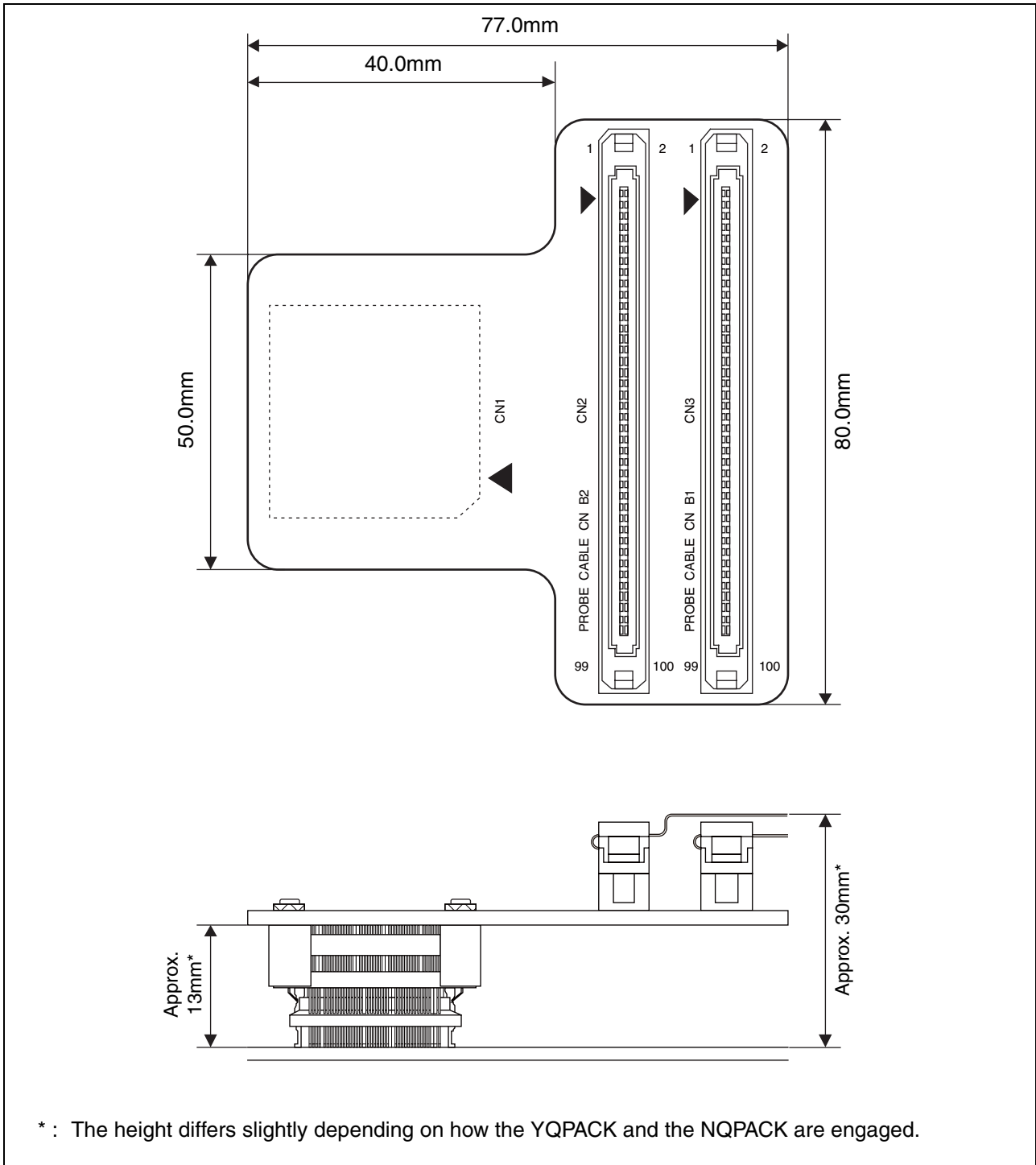
Figure 1 Header board dimensions

■ MCU footprint design notes

Figure 2 shows the recommended dimensions of the NQPACK footprint mounted on the PC board of the user system.

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

For more information, contact the Tokyo Eletech Corporation.

*1 : It is a position of hole (ϕ1.0) for the guide pin to fit position when NQPACK is mounted.
   When the guide pin is not used, it is not necessary to puncture it.

*2 : It is a fixation of screw hole (ϕ3.2) for IC socket made when NQPACK100RB179-SL-A (Tokyo Eletech Corporation, sold separately) is mounted.
   When the NQPACK100RB179-SL-A is not used, it is not necessary.
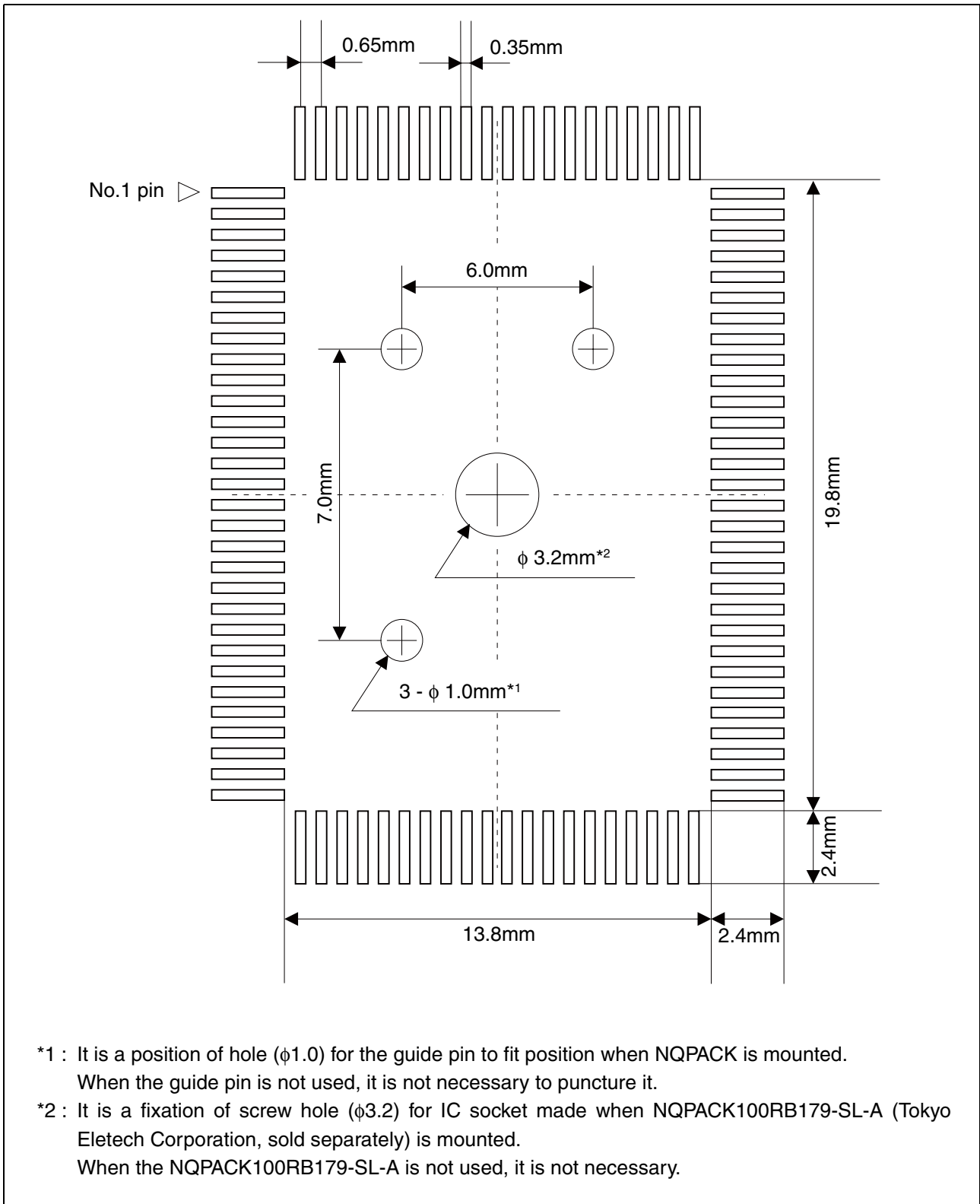
Figure 2 Recommended dimensions of the footprint for mounting the NQPACK

4. Procedure for Connecting the User System

Before using the QFP-100P probe header, mount the supplied NQPACK on the user system.
The header board is used combining the adapter board. To connect the header board to the adapter board, use the flat cable (2 lines) supplied by the emulator sold separately. Refer to the operation manuals of the adapter board about the way to connect.

■ **Connecting**

1. To connect the header board to the user system, match 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 pin of YQPACK is thin and easy to bent. Insert NQPACK after confirm that the pin of YQPACK is not bent.

2. Insert each screw for securing header board in each of the four screw holes on the header board (See Figure 4).
   To tighten the screws, use the special screwdriver supplied with the NQPACK to finally tighten the four screws in sequence. Tightening the screws too tight might result in a defective contact.

Figure 3 Index position

4

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 NQPACK.

5. Mounting Mass Production MCUs

To mount a mass production MCU on the user system, use the supplied HQPACK (See Figure 5).

■ **Mounting**

1. To mount a mass production MCU on the user system, match the index mark (▲) on the NQ-PACK 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. Next, insert the HQPACK into the NQPACK.
   The pin of HQPACK is thin and easy to bent. Insert NQPACK after confirm that the pin of HQ-PACK is not bent.

3. Insert each screw for securing HQPACK in each of the four screw holes on the HQPACK (See Figure 5).
   To tighten the screws, use the special screwdriver supplied with the NQPACK to finally tighten the four screws in sequence. Tightening the screws too tight might result in a defective contact.
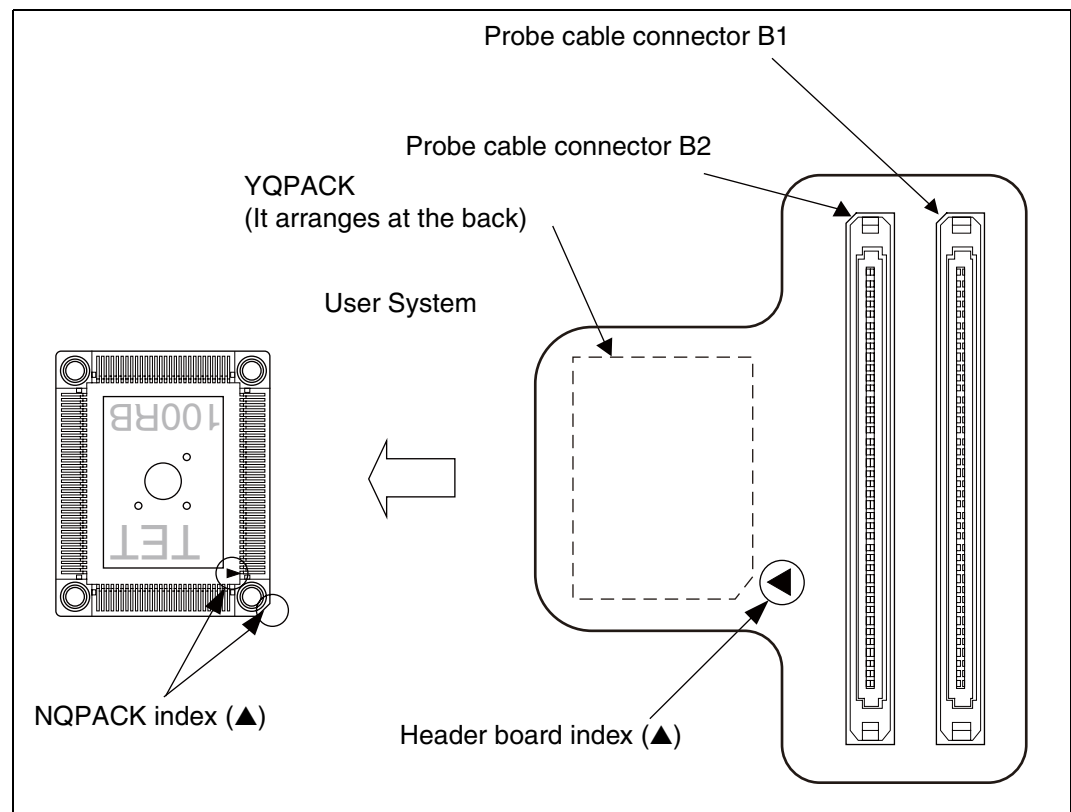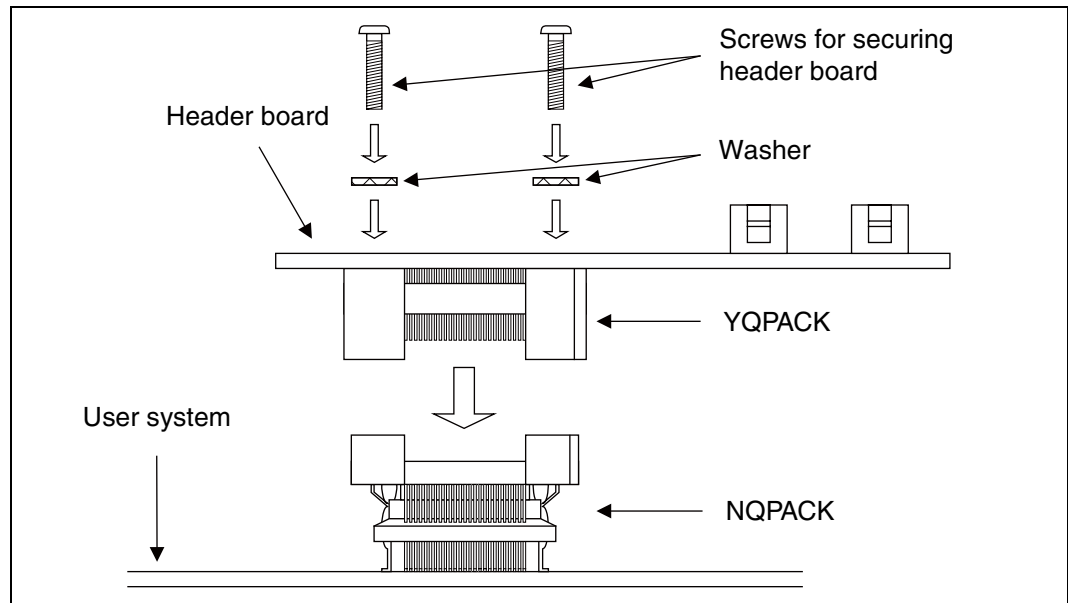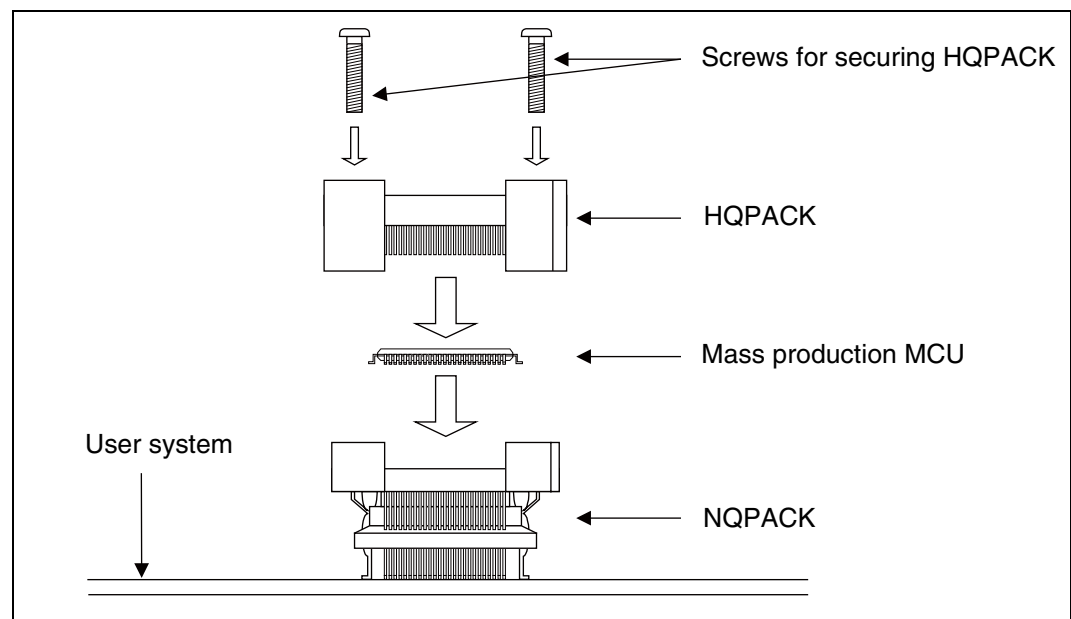

Figure 5 Mounting a mass production MCU

■ **Disconnection**

To remove the HQPACK, remove all four screws, and pull the HQPACK straight out of the NQ-PACK.

6. Connector Pin Assignment

The signal of Evaluation MCU with which it was carried on the adapter board is connected to YQ-PACK (the same assignments as production MCU) via the probe cable connector (B1, B2) on the header board.

An adapter board and a header board are connected to an emulator main part by the attached flat cable (It is used standard 2 or two long) connector.

Please check the operation manual of the emulator or the adapter board about reference of the connection method.

■ Pin Assignment

Tables 1 and 2 list the pin assignments among the flat cable connector, the evaluation MCU on the adapter board, and the production MCU.

For details on the names of signal conductors of the evaluation MCU, refer to the operation manual for the adapter board.

Comments in the tables are given below.

*1 : Connected to the main power supply of the evaluation MCU.

*2 : Connected to the main power supply (Vcc) of the production MCU. The connection pin numbers are 15 and 90.

*3 : Connected to the ground of the evaluation MCU.

*4 : Connected to the ground (Vss) of the production MCU. The connection pin numbers are 16, 44 and 91.

" - ": Unconnected pin (left open).

Table 1 Pin assignment of the probe cable connector B1

Probe cable connector pin numbers	Evaluation MCU pin numbers	Production MCU pin numbers	Probe cable connector pin numbers	Evaluation MCU pin numbers	Production MCU pin numbers
100	*3	*4	99	*3	*4
98	*3	*4	97	80	42
96	208	43	95	148	41
94	259	40	93	*3	*4
92	79	39	91	207	38
90	147	37	89	258	35
88	78	36	87	206	34
86	*3	*4	85	77	32
84	146	33	83	160	49
82	223	—	81	*3	*4
80	26	—	79	268	—
78	94	74	77	269	72
76	219	73	75	95	71
74	*3	*4	73	33	63
72	*1	*2	71	169	62
70	226	58	69	*3	*4
68	275	57	67	34	56
66	105	55	65	167	—
64	224	—	63	35	48
62	*3	*4	61	225	60
60	274	64	59	32	61
58	104	59	57	*3	*4
56	170	47	55	106	46
54	227	17	53	163	65
52	*3	*4	51	162	70
50	*3	*4	49	96	68
48	220	69	47	270	67
46	100	66	45	*3	*4
44	97	—	43	221	—
42	164	—	41	273	—
40	98	—	39	271	—
38	*3	*4	37	222	76
36	23	—	35	99	75
34	165	—	33	*3	*4
32	276	45	31	107	24
30	108	23	29	277	21
28	172	22	27	109	20
26	*3	*4	25	173	18
24	229	19	23	228	*2
22	130	12	21	*3	*4
20	292	11	19	193	10
18	131	9	17	194	7
16	247	8	15	132	6
14	*3	*4	13	*3	*4
12	293	5	11	61	4
10	248	3	9	*3	*4
8	133	2	7	195	1
6	62	100	5	63	98
4	134	99	3	294	97
2	*3	*4	1	*3	*4

Table 2 Pin assignment of the probe cable connector B2

Probe cable connector pin numbers	Evaluation MCU pin numbers	Production MCU pin numbers	Probe cable connector pin numbers	Evaluation MCU pin numbers	Production MCU pin numbers
100	*3	*4	99	*3	*4
98	—	—	97	159	50
96	*3	*4	95	217	14
94	267	13	93	*3	*4
92	149	25	91	81	26
90	260	27	89	82	29
88	209	28	87	83	—
86	*3	*4	85	87	—
84	218	—	83	212	—
82	263	—	81	*3	*4
80	153	—	79	86	—
78	8	—	77	150	30
76	*1	*2	75	84	—
74	*3	*4	73	272	—
72	5	31	71	168	—
70	103	—	69	*3	*4
68	166	—	67	7	—
66	*3	*4	65	210	—
64	151	—	63	261	—
62	*3	*4	61	158	—
60	6	—	59	216	—
58	92	—	57	*3	*4
56	266	—	55	157	—
54	91	—	53	156	—
52	215	—	51	155	—
50	*3	*4	49	88	—
48	16	—	47	15	—
46	264	—	45	*3	*4
44	213	—	43	154	—
42	14	—	41	255	—
40	203	—	39	143	—
38	*3	*4	37	202	—
36	299	—	35	142	—
34	201	—	33	*3	*4
32	141	—	31	101	—
30	110	51	29	230	53
28	278	52	27	262	54
26	*3	*4	25	140	93
24	*3	*4	23	200	92
22	*1	*2	21	*3	*4
20	252	77	19	199	78
18	71	79	17	70	81
16	138	80	15	251	82
14	*3	*4	13	198	84
12	296	83	11	137	85
10	136	86	9	*3	*4
8	197	87	7	295	88
6	250	89	5	64	95
4	135	94	3	196	96
2	*3	*4	1	*3	*4