

**DSU-FR EMULATOR**  
**LQFP-100P HEADER TYPE5**  
**MB2198-129**  
**OPERATION MANUAL**

## PREFACE

Thank you for purchasing the LQFP-100P header type5 (MB2198-129) for the DSU-FR emulator. The LQFP-100P header type5 is used to connect the DSU-FR emulator (MB2198-01\*<sup>3</sup>) and the DSU-FR emulator PGA-401P adapter type2 (MB2198-130\*<sup>4</sup>) to a user system. That uses Fujitsu FR\*<sup>1</sup> family micro controller MB91270 series (LQFP-100P\*<sup>2</sup>).

This manual explains the handling of the LQFP-100P header type5 for the DSU-FR emulator. Before using the MB2198-129, be sure to read this manual.

Consult the Sales Department or the Support Department of adapter Fujitsu Limited for mass-production MCUs and evaluation MCUs.

\*1 : FR is the abbreviation used for FUJITSU RISC CONTROLLER.

\*2 : The lead pitch of PACKAGE (FPT-100P-M05) is 0.5 mm and the body size is 14 mm × 14 mm.

\*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 hardware manual of the DSU-FR emulator.

Follow the instructions in for the use of this product.

- DSU-FR EMULATOR MB2198-01 HARDWARE MANUAL
- DSU-FR EMULATOR PGA-401P ADAPTER TYPE2 MB2198-130 OPERATION MANUAL

### ■ Caution of the products described in this document

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



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

<b>Cuts</b>	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.
<b>Damage</b>	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.
<b>Damage</b>	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 LQFP-100P header type5, confirm that the following components are included in the box:

- LQFP-100P header type5 \*1 : 1
- Screws for securing header board (M2 × 10 mm, 0.4 mm pitch) : 4
- Washer : 4
- NQPACK100SD-ND\*2 : 1
- HQPACK100SD\*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 YQPACK100SD (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 3 guide pins. A socket offering higher reliability, NQPACK100SD-ND-SL (Tokyo Eletech Corporation, sold separately), can be used by making an 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 4 screws for securing HQPACK (M2 × 6 mm, 0.4 mm pitch).

This product is used as an emulator system by combining with an optional emulator and adapter board.

Consult the Sales Department or the Support Department of Fujitsu Limited for the adapter or the emulator of 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:

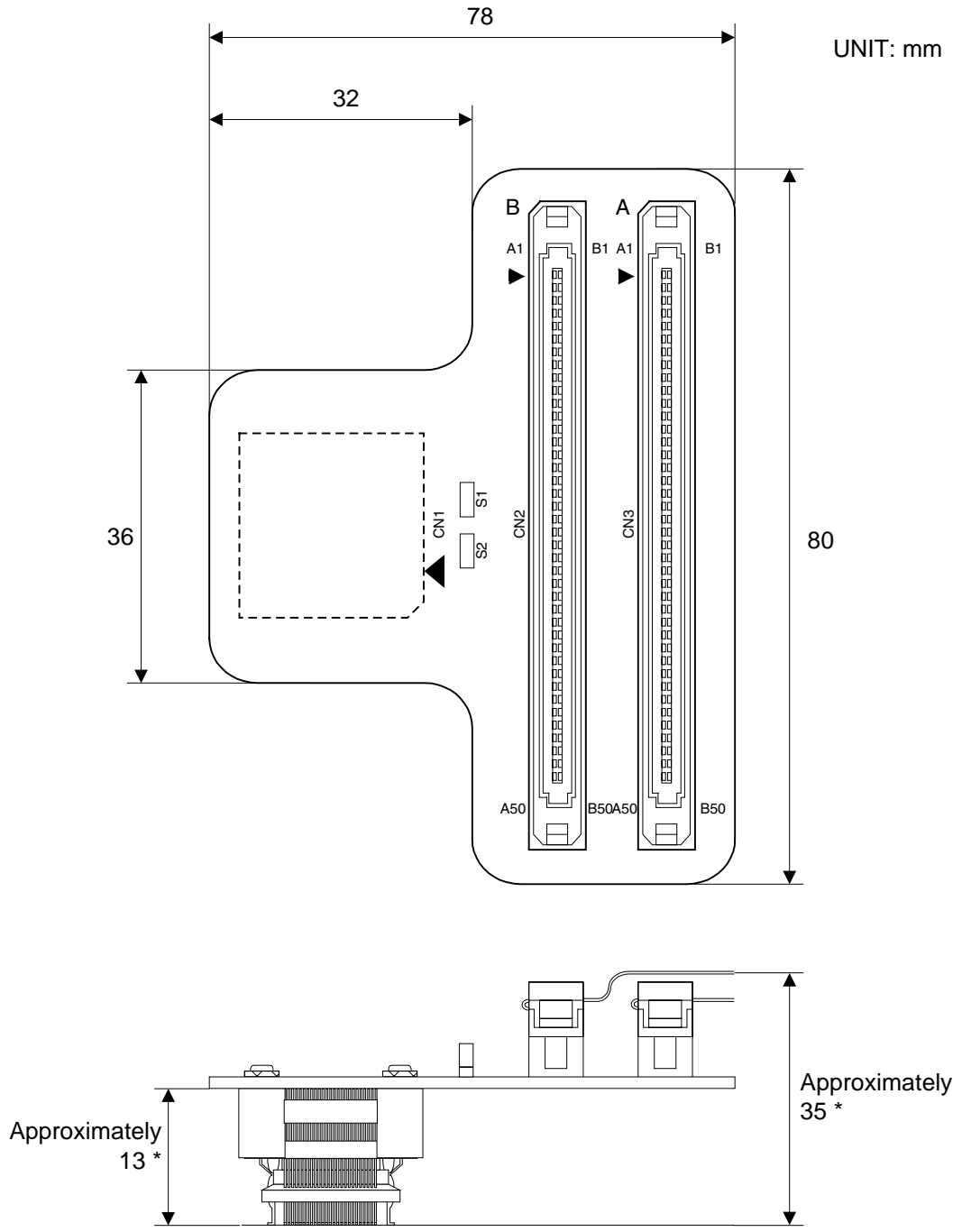
- To avoid placing stress on the NQPACK mounted on the user system board during connecting the header board.

### 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).



\* : The height differs slightly depending on how the YQPACK and the NQPACK are engaged.

Figure 1 Header board dimensions



## 4. Procedure for Connecting the User System

Before using the LQFP-100P header type5, mount the supplied NQPACK on the user system. The header board is used combining the emulator. Moreover, connection of a header board and an adapter board is two flat cables (a standard or Long) appended to the emulator main part. Please use it.

Refer to the hardware manuals of the emulator or 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 drilled 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. Please tighten a screw to a diagonal by equal power using a special screwdriver. Tightening the screws too tight might result in a defective contact.

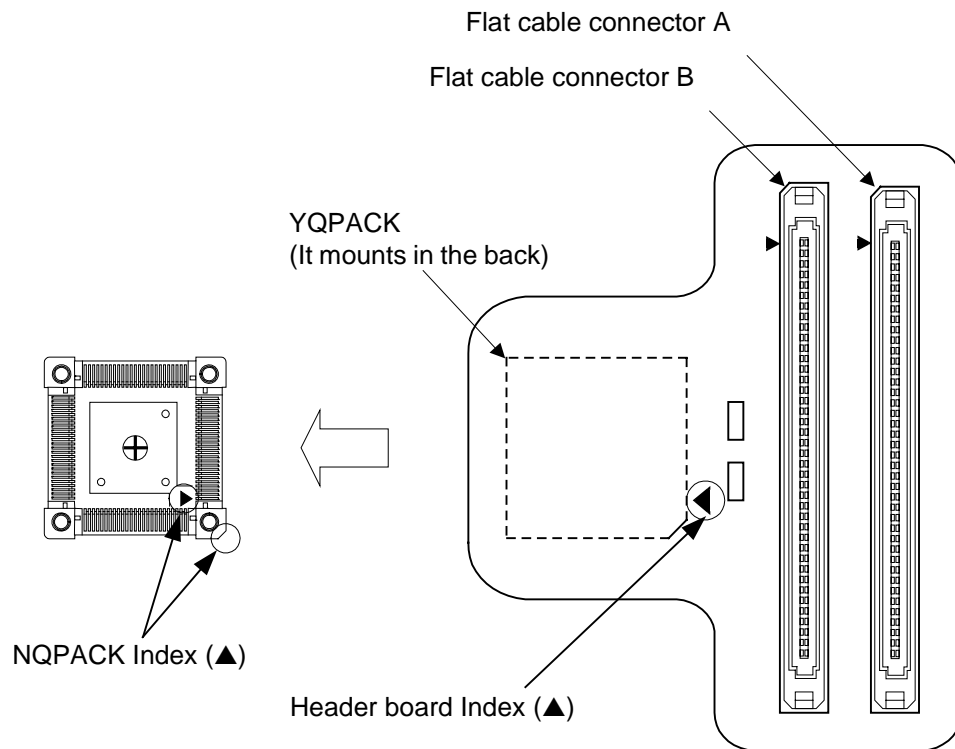


Figure 3 Index Position

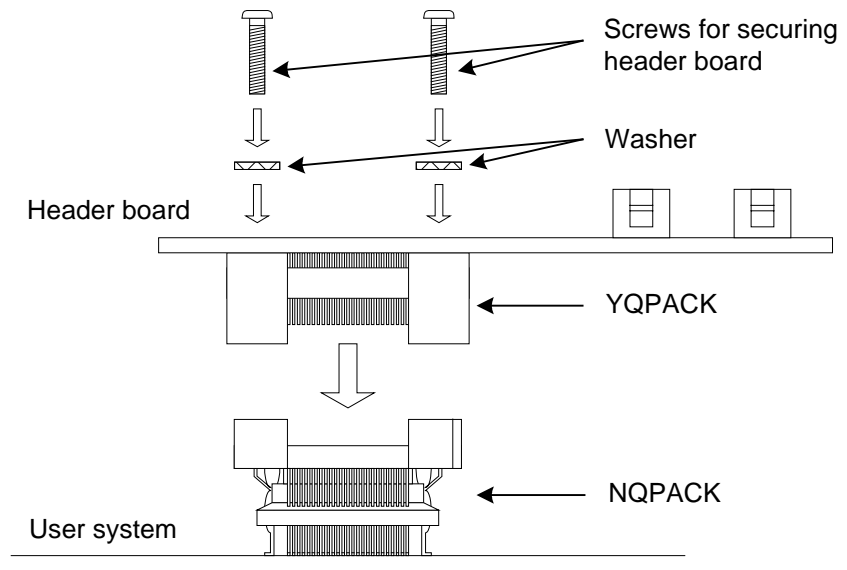


Figure 4 Header board connection

■ **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 (See Figure 5).

### ■ 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. Next, insert the HQPACK into a NQPACK.  
The pin of HQPACK is thin and easy to bent. Insert NQPACK after confirm that the pin of HQPACK is not bent.
3. Insert each screw for securing HQPACK in each of the four drilled 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. Please tighten a screw to a diagonal by equal power using a special-screwdriver. Tightening the screws too tight might result in a defective contact.

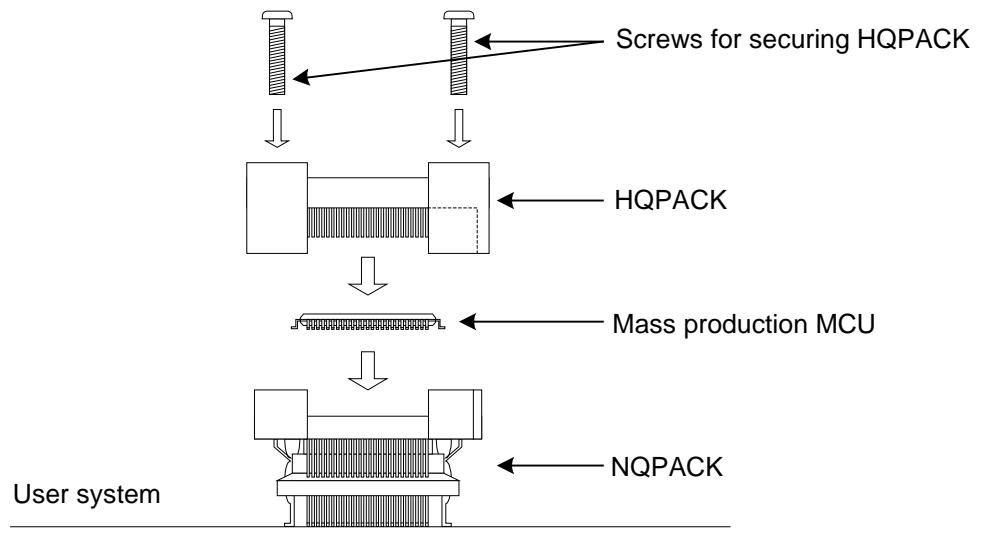


Figure 5 Mounting a mass production MCU

### ■ Disconnection

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

## 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 flat cable connector (A,B) on a header-board.

Connection of a header board and an adapter board is two flat cables (a standard or Long) appended to the emulator main part. Please use it.

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

For details on the production MCU's pin information, refer to the datasheet or hardware manual for the relevant MCU.

### ■ Pin Assignment

Tables 2 and 3 list the pin assignments among the probe connector, the evaluation MCU on the adapter board, and the mass production MCU.

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

Comments in the tables are given below.

\*1 : Connected to the mass production MCU pin:VSS (pins 14, 42, 64 and 89).

\*2 : Connected to the mass production MCU pin:C (pin15).

\*3 : Connected to the mass production MCU pin:VCC (pins 13, 63 and 83).

\*4 : Header board control pin (not connected to the mass production MCU).

\*5 : Connected to the Evaluation MCU pin (pins 38, 51, 87 and 209) :It connects with a terminal-block and connects with mass production MCU terminal (pins 11 and 12) with the jump-er plug, respectively.

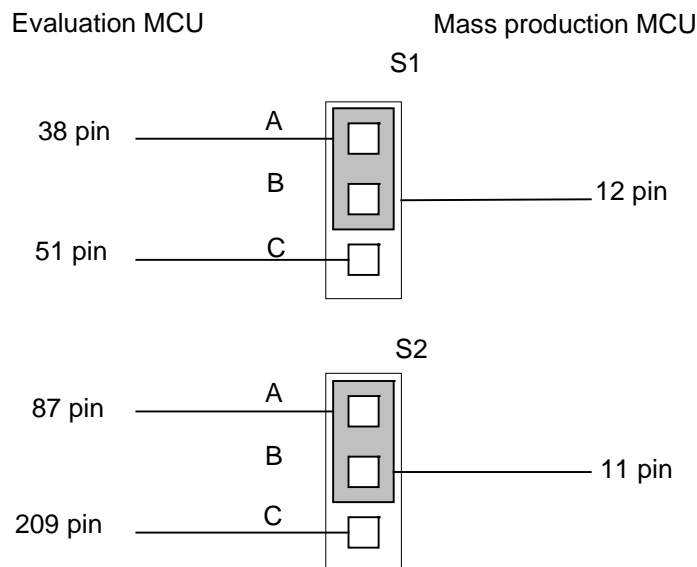


Figure 6 Pin Assignment

Table 1 Jumper Plug Setup

Jumper Plug Setup (S1,S2) Item	Mass production MCU
A-B	MB91F272
B-C	MB91F272R

\*6 : In Evaluation MCU, since it becomes a non-connected terminal, it connects with the pull-up (10K ohm)

\*7 : In Evaluation MCU, since it becomes a non-connected terminal, it connects with the pull-up (10K ohm)

Table 2 Pin assignment of the adapterboard connector A

Connector Pin Numbers	Mass Production MCU Pin Numbers	Production MCU Pin Numbers	Connector Pin Numbers	Evaluation MCU Pin Numbers	Mass Production MCU Pin Numbers
A1	VSS	*1	B1	VSS	*1
A2	135	*6	B2	84	*6
A3	301	*6	B3	192	*6
A4	191	*6	B4	35	*6
A5	349	*6	B5	131	30
A6	296	31	B6	242	32
A7	186	33	B7	245	34
A8	188	35	B8	297	36
A9	244	37	B9	346	38
A10	187	39	B10	345	40
A11	243	41	B11	VSS	*1
A12	83	73	B12	300	74
A13	-	*2	B13	248	*6
A14	249	62	B14	193	*6
A15	VSS	*1	B15	85	61
A16	302	59	B16	36	60
A17	136	57	B17	303	58
A18	37	55	B18	86	56
A19	138	21	B19	VSS	*1
A20	250	19	B20	351	20
A21	195	17	B21	137	18
A22	38	*5	B22	194	16
A23	VSS	*1	B23	-	*2
A24	5	-	B24	87	*5
A25	209	*5	B25	51	*5
A26	252	71	B26	251	69
A27	39	70	B27	VSS	*1
A28	40	8	B28	304	*3
A29	139	2	B29	88	7
A30	41	9	B30	305	1
A31	VSS	*1	B31	89	6
A32	140	4	B32	196	5
A33	42	67	B33	253	68
A34	306	66	B34	-	*2
A35	197	65	B35	VSS	*1
A36	141	3	B36	90	10
A37	76	*3	B37	202	*6
A38	310	*6	B38	201	*6
A39	VSS	*1	B39	357	*6
A40	257	*6	B40	144	*6
A41	309	*6	B41	256	*6
A42	200	*6	B42	356	*6
A43	308	*6	B43	VSS	*1
A44	92	*6	B44	44	*6
A45	255	*6	B45	143	*6
A46	199	*6	B46	307	95
A47	91	96	B47	-	*2
A48	254	98	B48	142	97
A49	198	100	B49	43	99
A50	VSS	*1	B50	VSS	*1

Table 3 Pin assignment of the adapterboard connector B

Connector Pin Numbers	Evaluation MCU Pin Numbers	Mass Production MCU Pin Numbers	Connector Pin Numbers	Evaluation MCU Pin Numbers	Mass Production MCU Pin Numbers
A1	VSS	*1	B1	VSS	*1
A2	-	-	B2	50	*6
A3	4	*6	B3	315	*6
A4	208	*6	B4	98	*6
A5	153	*6	B5	182	-
A6	127	*6	B6	239	*6
A7	VSS	*1	B7	31	72
A8	293	*6	B8	183	*6
A9	78	*6	B9	128	*6
A10	184	*6	B10	32	*6
A11	240	*6	B11	VSS	*1
A12	129	*6	B12	79	54
A13	294	53	B13	185	48
A14	130	47	B14	241	46
A15	VSS	*1	B15	97	*1
A16	80	45	B16	295	44
A17	-	*3	B17	344	43
A18	298	29	B18	132	28
A19	189	27	B19	VSS	*1
A20	246	26	B20	348	25
A21	299	24	B21	133	23
A22	81	22	B22	33	*3
A23	VSS	*1	B23	247	*6
A24	190	*6	B24	34	*6
A25	134	*6	B25	82	*6
A26	-	*3	B26	29	91
A27	291	90	B27	VSS	*1
A28	258	94	B28	146	93
A29	203	92	B29	259	87
A30	93	86	B30	147	85
A31	VSS	*1	B31	204	84
A32	312	83	B32	260	82
A33	94	81	B33	45	80
A34	205	79	B34	148	78
A35	1	77	B35	VSS	*1
A36	-	*3	B36	95	76
A37	46	75	B37	126	52
A38	292	51	B38	30	50
A39	VSS	*1	B39	77	49
A40	206	*3	B40	261	*1
A41	47	*1	B41	313	*1
A42	2	*1	B42	149	-
A43	150	-	B43	VSS	*1
A44	262	*1	B44	48	*1
A45	96	*1	B45	151	-
A46	207	-	B46	49	-
A47	VSS	*1	B47	3	-
A48	263	*7	B48	-	*3
A49	264	*7	B49	-	-
A50	VSS	*1	B50	VSS	*1

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April 2005 the first edition

Published **FUJITSU LIMITED** Electronic Devices

Edited Business Promotion Dept.

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