

# **DSU-FR EMULATOR**

## **LQFP-144P HEADER TYPE 4**

### **MB2198-123**

## **OPERATION MANUAL**

## PREFACE

Thank you for purchasing the LQFP-144P header type 4 (MB2198-123) for the DSU-FR emulator. The LQFP-144P header is used by the adapter unit to connect the DSU-FR emulator (MB2198-01) to a user system.

That uses Fujitsu FR\*<sup>1</sup> family micro controller MB91240 series (LQFP-144P\*<sup>2</sup>).

This manual explains the handling of the LQFP-144P header type 4 for the DSU-FR emulator.

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

\*1: FR is the abbreviation used for FUJITSU RISC CONTROLLER, which is a Fujitsu product.

\*2: The lead pitch of PACKAGE (FPT-144P-M08) is 0.5 mm and the body size is 20 mm x 20 mm.

### 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 the manual " DSU-FR EMULATOR MB2198-01 HARDWARE MANUAL " for the use of this product.

### Caution of the products described in this document

Cautions in the following correspond to the products 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.
Damage	Mind using correctly. 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 adapter unit and user system are damaged.
Damage	Mind using correctly. When mounting a mass production MCU, correctly position pin 1, otherwise the mass production MCU and user system are damaged.

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## 1. Checking the Delivered Product

Before using the LQFP-144P header type 4, confirm that the following components are included in the box:

- LQFP-144P Header board\*<sup>1</sup> : 1
- Screws for securing header board (M2 x 10 mm, 0.4 mm pitch) : 4
- Washer : 4
- NQPACK144SD-ND\*<sup>2</sup> : 1
- HQPACK144SD\*<sup>3</sup> : 1
- Operation manual (Japanese version) : 1
- Operation manual (English version, this manual) : 1

\*1: Referred to as "header board". Header board is mounted on YQPACK144SD (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, NQPACK144SD-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 x 6 mm, 0.4 mm pitch).

To use this product, follow the instructions shown in the adapter unit with "DSU-FR EMULATOR PGA-401P ADAPTOR TYPE 2 (MB2198-130)" (sold separately).

Consult the Sales Department or the Support Department of Fujitsu Limited for the adaptor of this product.

## 2. Handling Precautions

The adapter unit 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:

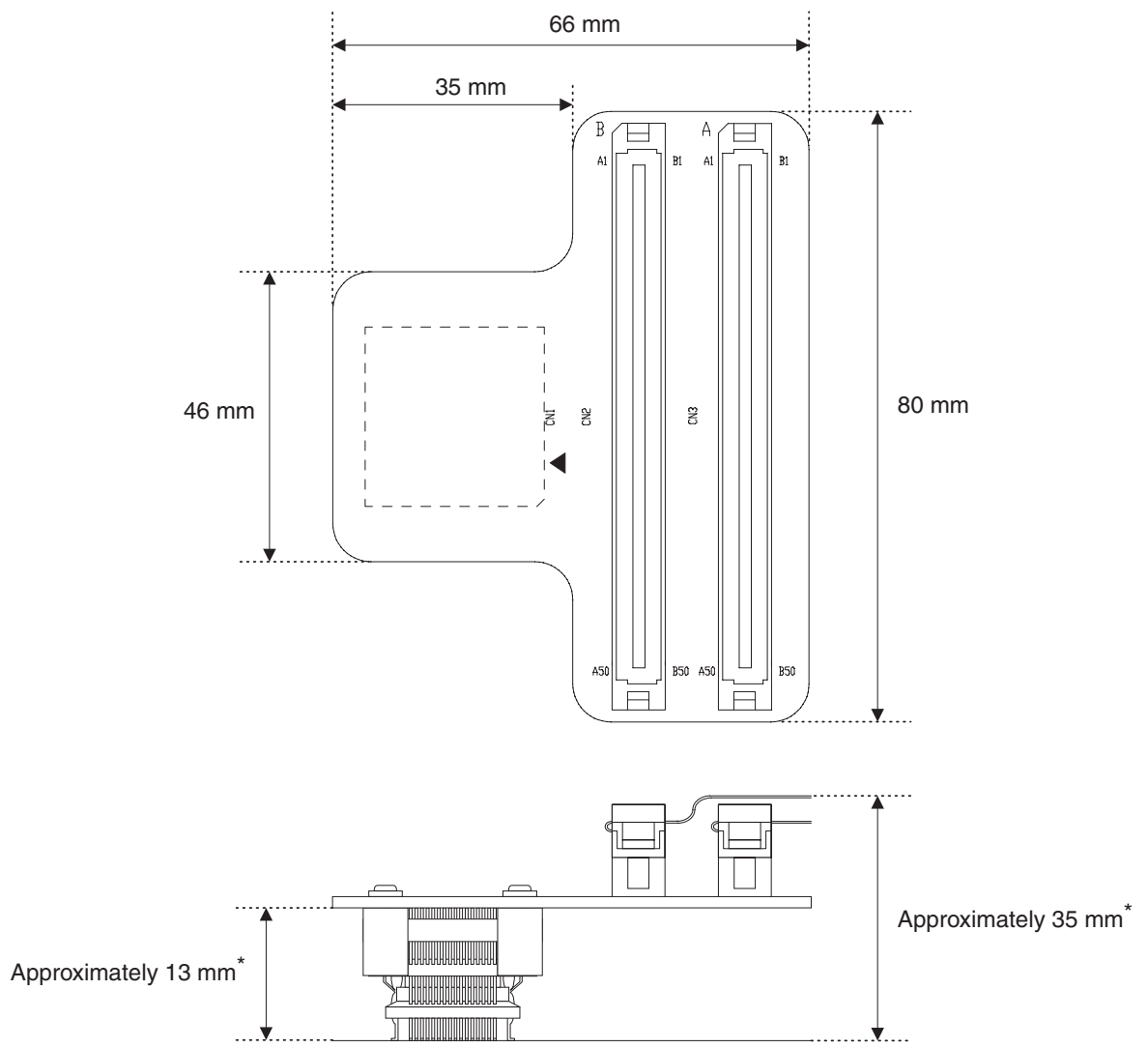
- To avoid placing stress on the NQPACK mounted on the user system board during connecting the adapter unit.

### 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 sockets are engaged.

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.

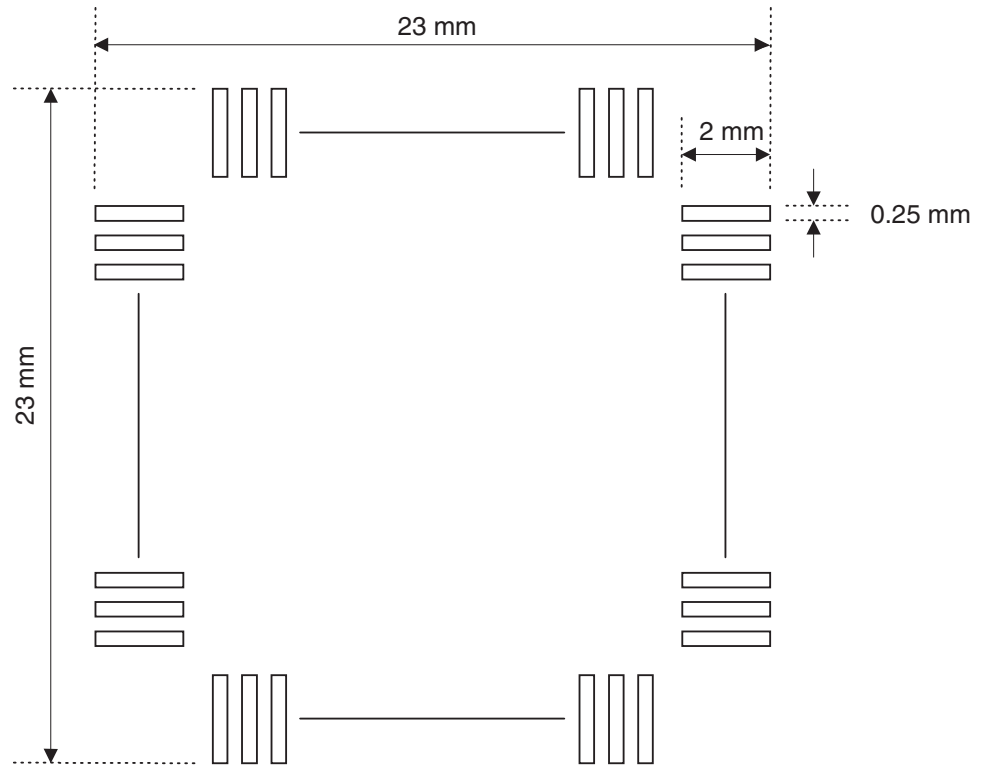


Figure 2 Recommended dimensions of the footprint for mounting the NQPACK

## 4. Procedure for Connecting the User System

### Connection

Before using the LQFP-144P header, mount the supplied NQPACK on the user system. To connect the header board to the adapter unit, use the flat cable (2 lines) supplied by the adapter unit sold separately.

Refer to the hardware manuals of each adapter unit about the way to connect.

1. To connect the header board to the user system, match the index mark (▲) (the corner is cut lineally) on the NQPACK mounted on the user system with the index mark (▼) on the header board, and then insert it. Next, secure the header board with four screws (see Figure 3).

The pin of YQPACK is thin and easy to bend. Insert NQPACK after confirm that the pin of YQPACK is not bent.

2. Insert each header board mounting screw for header board in each of the four tapped holes on the header board through a washer, and then first tighten the screws in opposing corners followed by the two remaining screws (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.

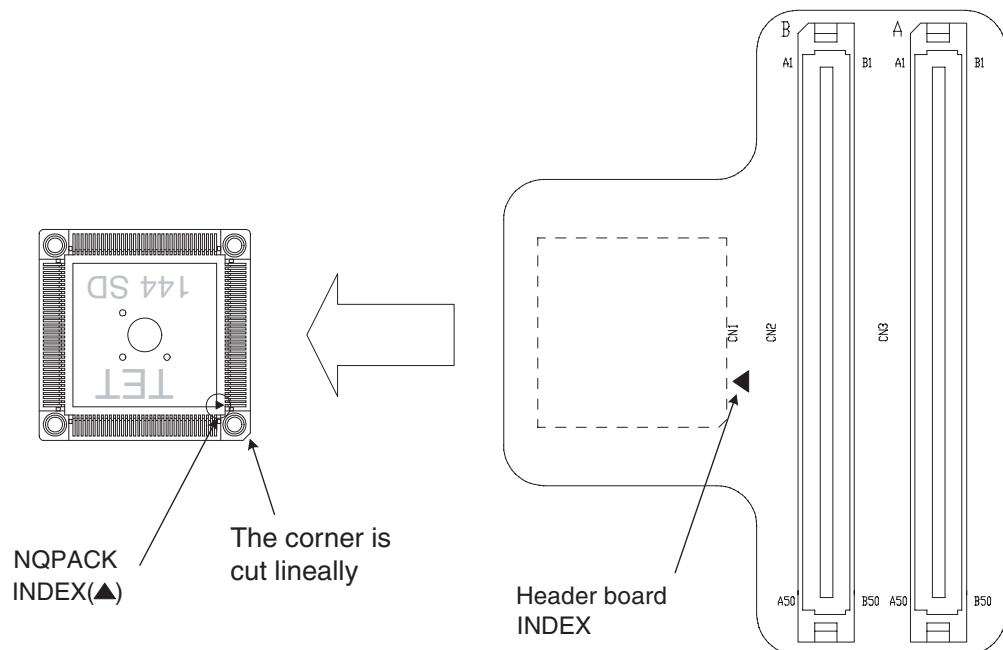


Figure 3 NQPAK index position

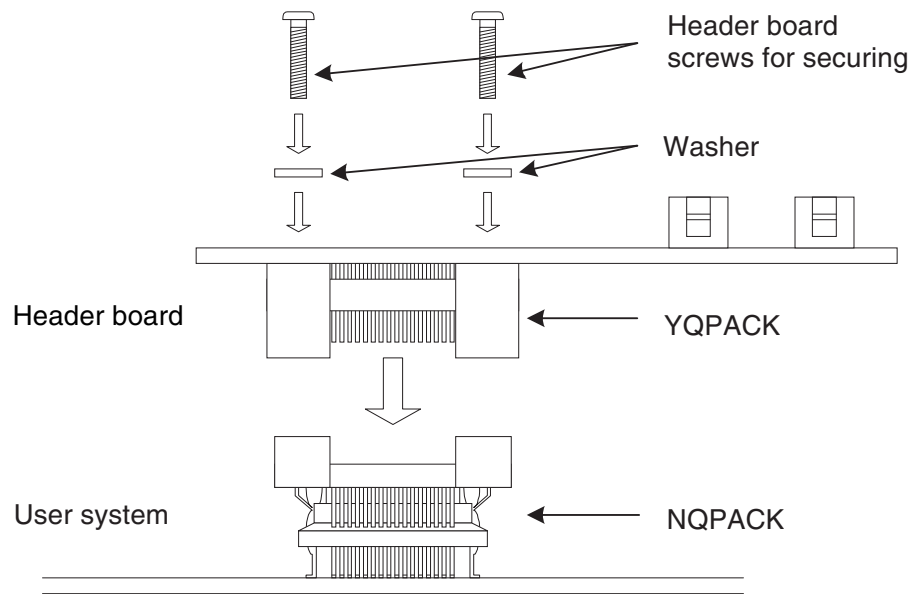


Figure 4 Header board connection

#### Disconnection

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



## 5. Mounting Mass Production MCUs

### Mounting

After mounting a mass production MCU on the user system, use the supplied IC socket cover.

1. To mount a mass production MCU on the user system, match the index mark (▲) (the corner is cut lineally) 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 (see Figure 5).  
The pin of HQPACK is thin and easy to bend. Insert NQPACK after confirm that the pin of HQPACK is not bent.
3. Insert each HQPACK screw for securing in each of four tapped holes on the socket cover, and then first tighten the screws in opposing corners followed by the two remaining screws.  
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.

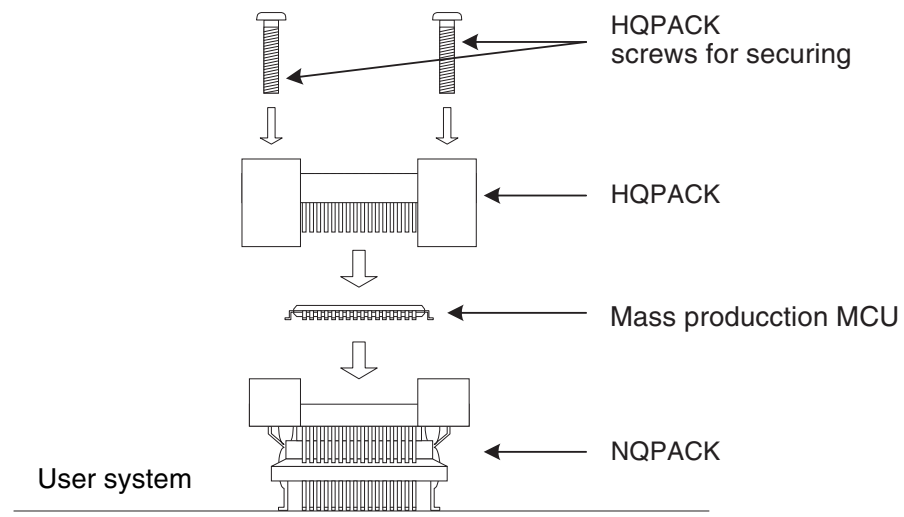


Figure 5 Mounting a mass production MCU

### Disconnection

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

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