

**DSU-FR EMULATOR**  
**LQFP-120P HEADER TYPE 3**  
**MB2198-112-E**  
**OPERATION MANUAL**

# PREFACE

Thank you for purchasing the LQFP-120P header type 3 (MB2198-112-E) for the DSU-FR\*<sup>1</sup> emulator.

This optional product for the DSU-FR emulator BGA-420P adapter (MB2198-110-E)\*<sup>2</sup> is used to connect the DSU-FR emulator (MB2198-01-E) to a user system that uses MB91352, MB91353 or other FR series MCUs of the LQFP-120 package (package code: FPT-120P-M21). Consult the Sales Department for applicable MCUs and MCUs for evaluating applicability.

This manual explains how to operate the DSU-FR emulator LQFP-120P header type 3 (MB2198-112-E). Be sure to read this manual before using the product.

\*1 : FR, the abbreviation of FUJITSU RISC controller, is a line of products of FUJITSU MICRO-ELECTRONICS LIMITED.

\*2 : Referred to as the “adapter”

## ■ European RoHS compliance

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

## ■ Notice on this document

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Please confirm the latest relevant information with the sales representatives.

## ■ Caution of the product described in this document

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



Indicates a potentially hazardous situation which could result in death or serious injury and/or a fault in the user's system if the product is not used correctly.

<b>Cuts</b>	This product has parts with sharp points that are exposed. Do not touch edge of the product with your bare hands.
<b>Damage</b>	When connect the header board to the user system, correctly position the index mark (diagonally chipped corner) 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 and Accessories

The composition of this product is shown in the following. Before using this product, confirm that all the parts listed below were received.

- Header board :1
- NQPACK120SD (manufactured by Tokyo Eletech Corporation) :1
- HQPACK120SD (manufactured by Tokyo Eletech Corporation) :1
- Header board mounting screws :4
- Operation manual (Japanese version) :1
- Operation manual (English version, this manual) :1

## 2. Handling Precautions

The environmental specification of this product is shown in Table 1.

Table 1 Environmental specification

Item	Temperature	Relative humidity
Operation	5 °C to 35 °C	20% to 80% (without condensation)
Storage	0 °C to 70 °C	20% to 80% (without condensation)

The LQFP-120P header type 3 (MB2198-112-E) for the DSU-FR emulator is carefully designed to provide reliable contact between the parts by using a sophisticated structure and precise dimensions. Because of this, the adapter unit is less sturdy than conventional products of this kind. Always use the adapter unit correctly in the prescribed environment. For details about connection of header board, see "3. Using the Product".

### 3. Using the Product

Before using this product, install the accessory NQPACK120SD in the user system as an IC socket for MCU, to connect the header board to a user system.

#### ■ Connecting the user system

Connect the header board to the user system as follows:

1. Mount the header of the header board on the NQPACK120SD in the correct orientation by aligning the index mark (▼) on the header board with the index mark (diagonally chipped corner) of the NQPACK120SD.
2. Secure the header board to the NQPACK120SD with the header board mounting screws (Accessories).
3. Connect the header board to the adapter board with the header interface cable. For details about this connection, refer to the operation manual of the DSU-FR emulator BGA-420P adapter (MB2198-110-E).

Figure 1 is a diagram of the connection of the header board to the user system.

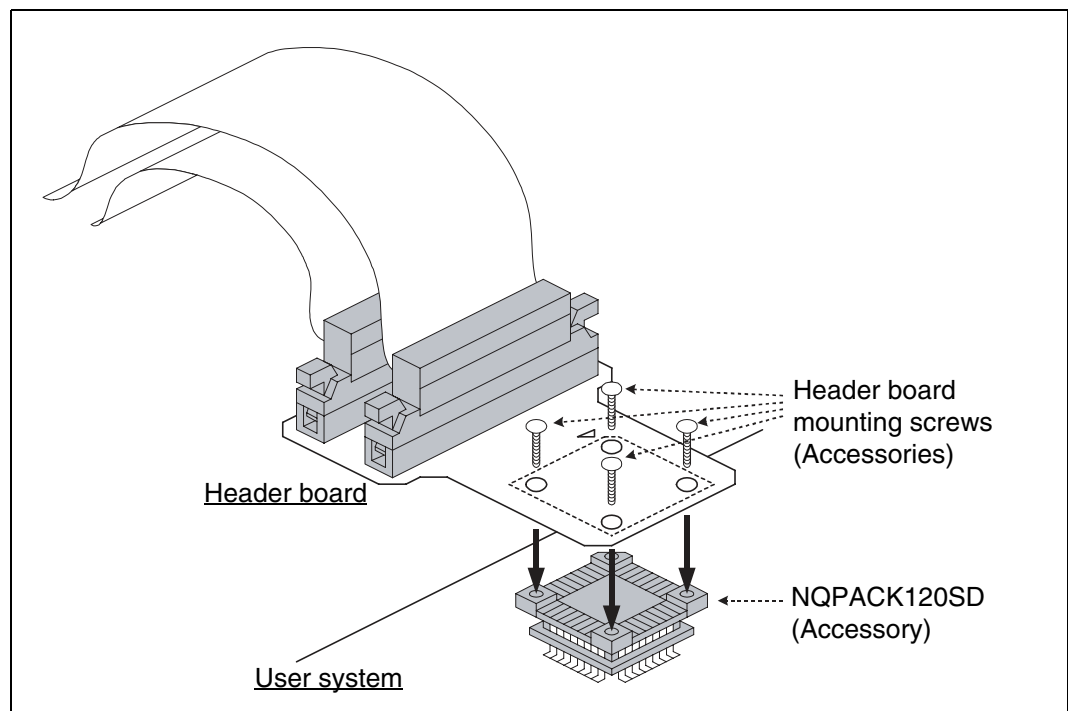


Figure 1 Header board connection to the user system

Note : The engagement between the board section and the header section of the header board is very fragile. Be sure to insert or extract the header from the board vertically. Be sure the header board connection is not forced.

## ■ Connecting a mass production MCU

A mass production MCU can be connected to the NQPACK120SD using the accessory HQPACK120SD. Connect the NQPACK120SD as follows:

1. Mount the mass production MCU on the NQPACK120SD in the correct orientation by aligning the index mark (● indent) on the MCU with the index mark (diagonally chipped corner) of the NQPACK120SD.
2. Mount the accessory HQPACK120SD on the NQPACK120SD in the correct orientation by aligning the index mark (diagonally chipped corner).
3. Secure the HQPACK120SD on the NQPACK120SD with the HQPACK120SD mounting screws.

Figure 2 is a diagram of connecting the mass production MCU to the user system.

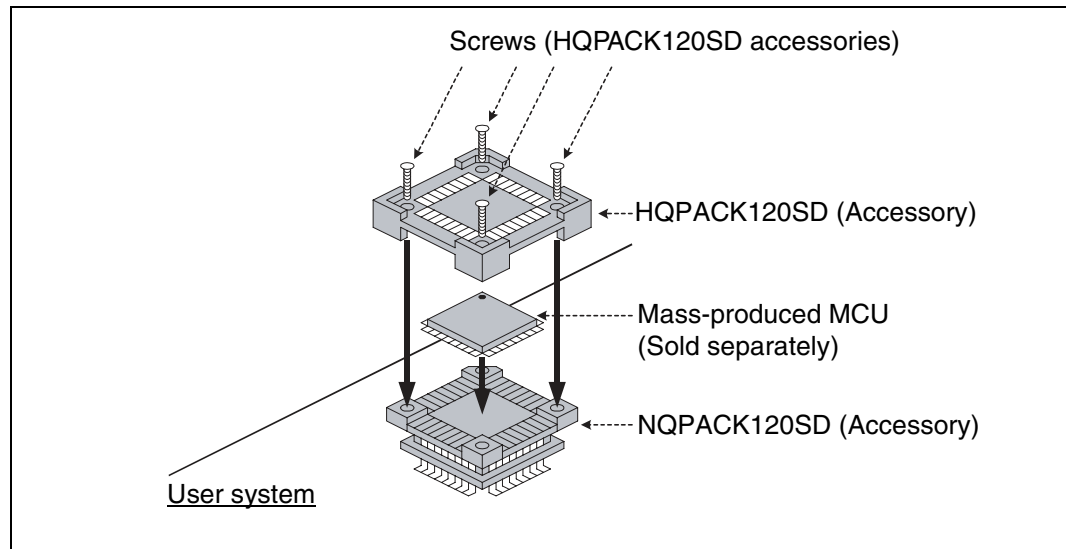


Figure 2 Mass production MCU connection to the user system

## 4. Restrictions

### ■ NQPACK120SD mounting restrictions

Once the header board is connected to the user system, the heights of parts mounted in the space around the NQPACK120SD are restricted.

The PC board of the user system must be designed with due consideration given to this restriction.

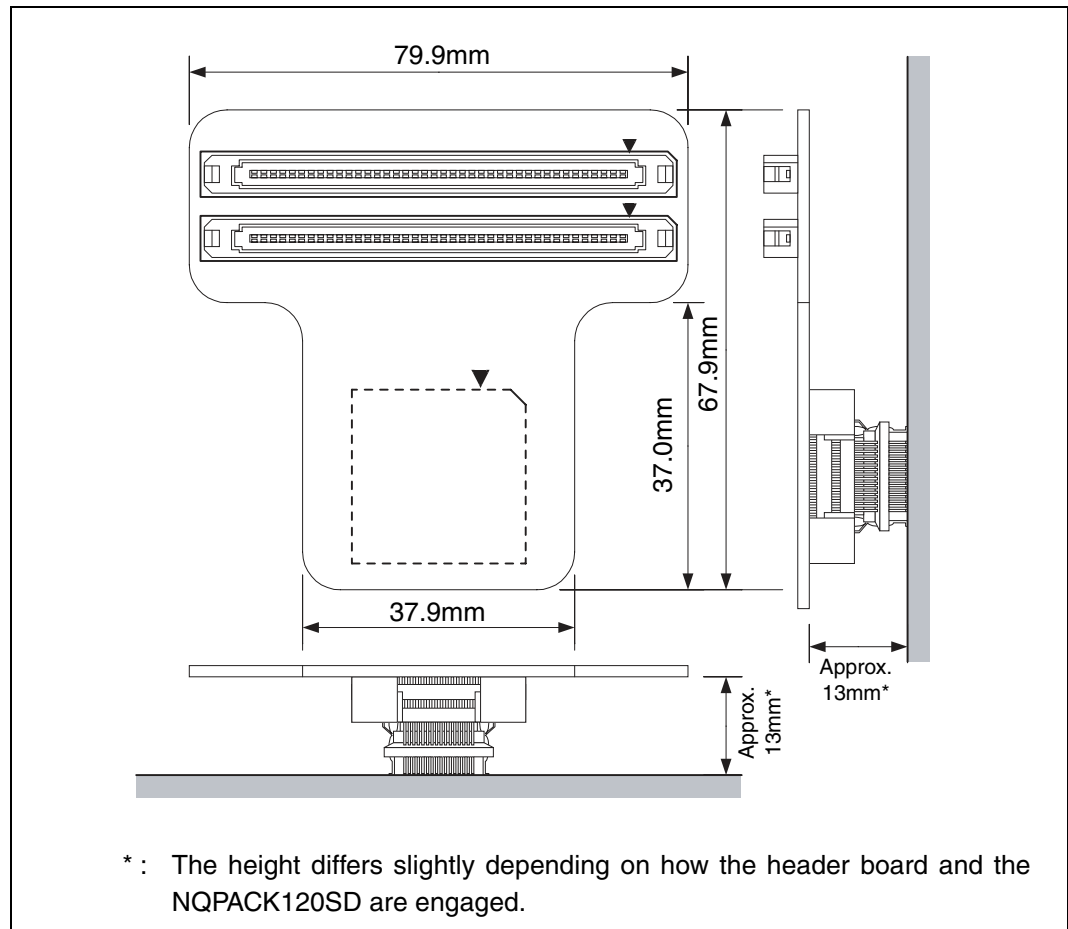


Figure 3 Header board dimensions

■ **MCU footprint design notes**

Figure 4 shows the recommended dimensions of the NQPACK120SD 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.

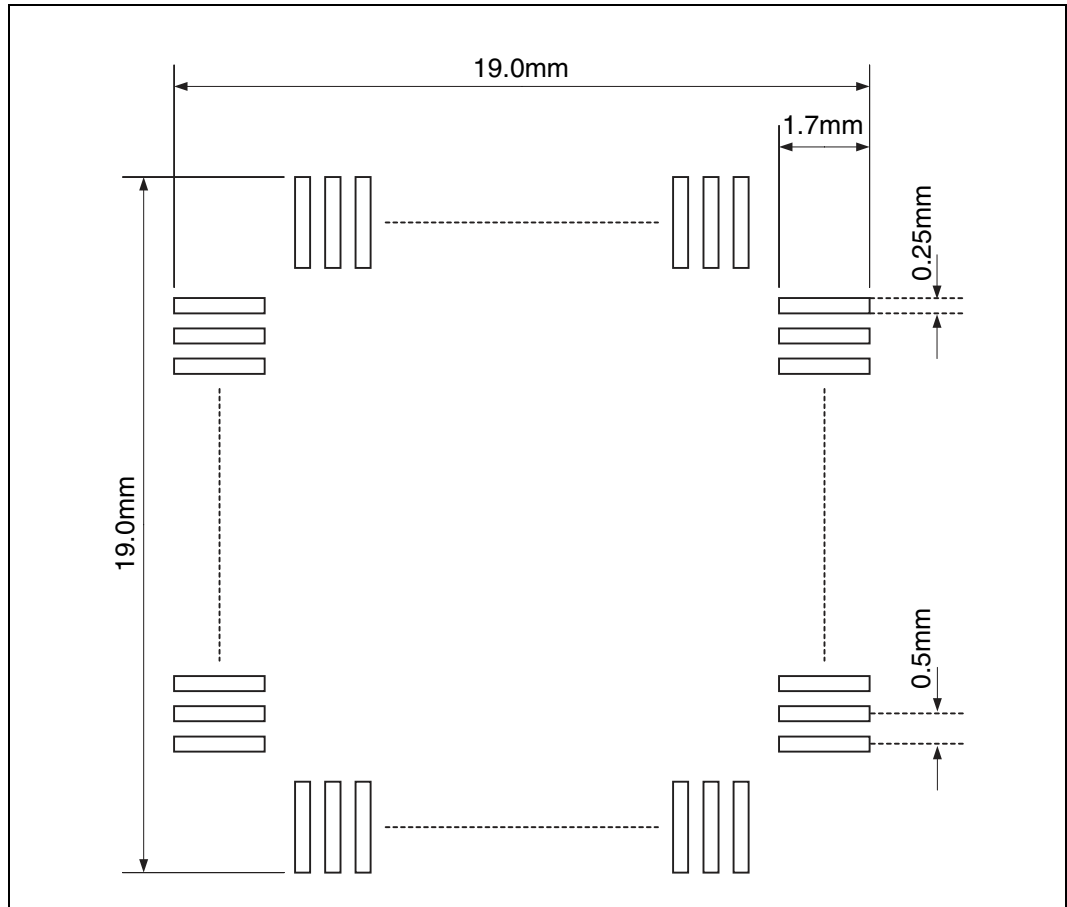


Figure 4 Recommended dimensions of the footprint for mounting the NQPACK120SD



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