RENESAS

M32186T2-PTC

Converter for In-circuit Connection (for M32186FxxFP)

User's Manual

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1. Outline

The M32186T2-PTC is a converter board for featuring the debugging function such as real-time tracing when using the SDI emulator, M32100T-SDI-E, M32170T-SDI, M32100T2-SDI-E, M32100T3-SDI-E or M32100T5-SDI-E with the M32186FxxFP.
Compared with the M32100T3-SDI-E or M32100T5-SDI-E, more loss of trace information occurs when using with the M32100T-SDI-E, M32170T-SDI or M32100T2-SDI-E.
For the M32186T2-PTC, using with the M32100T3-SDI-E or M32100T5-SDI-E is recommended.

2. Package Components

(1)   M32186T2-PTC converter board

(2)   YQPACK144SD (made by Tokyo Electech Corporation)

(3)   NQPACK144SD (made by Tokyo Electech Corporation)

(4)   YQ-GUIDE x 4 (made by Tokyo Electech Corporation)

(5)   Screwdriver (made by Tokyo Electech Corporation))

(6)   M32186T2-PTC User's Manual (This manual)

(7)   M32186T2-PTC User's Manual (Japanese)
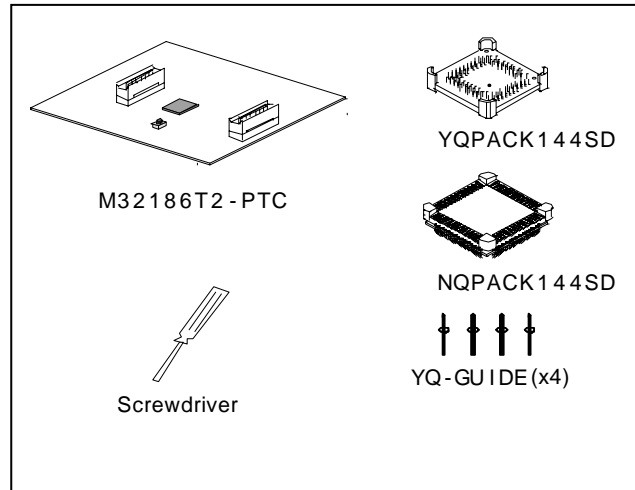

Figure 2.1 Package components

3. Specifications

Table 3.1 Specifications

Applicable package	PLQP0144KA-A, 144P6Q-A (144-pin 0.5mm pitch LQFP)
Applicable MCU	M32186FxxFP
Supported emulator	M32100T-SDI-E, M32170T-SDI, M32100T2-SDI-E, M32100T3-SDI-E or M32100T5-SDI-E With the M32100T-SDI-E, M32170T-SDI, separately available M3T-PTC-CNV is required.
Mounted MCU	M32192F8VWG (M32186EVA)
Clock	8 MHz
MCU power supply	Supplied from the user system

4. Usage

The M32186T2-PTC can be used for debugging and on-board evaluation in common by mouting the NQPACK144SD on the user system.

(1)   For debugging
    Mount the NQPACK144SD (included with the M32186T2-PTC) on the 144-pin QFP foot pattern of the user system. Then connect the M32186T2-PTC via YQPACK144SD. As the M32192F8VWG (M32186EVA) is mounted on the M32186T2-PTC, all functions of the emulator such as real-time tracing can be used.
    Before using the M32186T2-PTC, be sure to read "8. Precautions" on page 6.

(2)   For on-board evaluation
    Mount the M32186FxxFP and the HQPACK144SD (separately available) in that order on the NQPACK144SD on the user system.

5. Connection Procedure

5.1 For M32100T-SDI-E or M32170T-SDI.

(1) Mount the NQPACK144SD on the user system

(2) Connect the YQPACK144SD on the NQPACK144SD.

(3) Secure the four corners of the YQPACK144SD with the YQ-GUIDE's.

(4) Mount the M32186T2-PTC on the YQPACK144SD.

(5) Set the clock select switch.

(6) Mount the M3T-PTC-CNV on the M32186T2-PTC.

(7) Connect the emulation pod probe to the M32186T2-PTC via the SDI MCU control interface cable and the SDI trace interface cable.
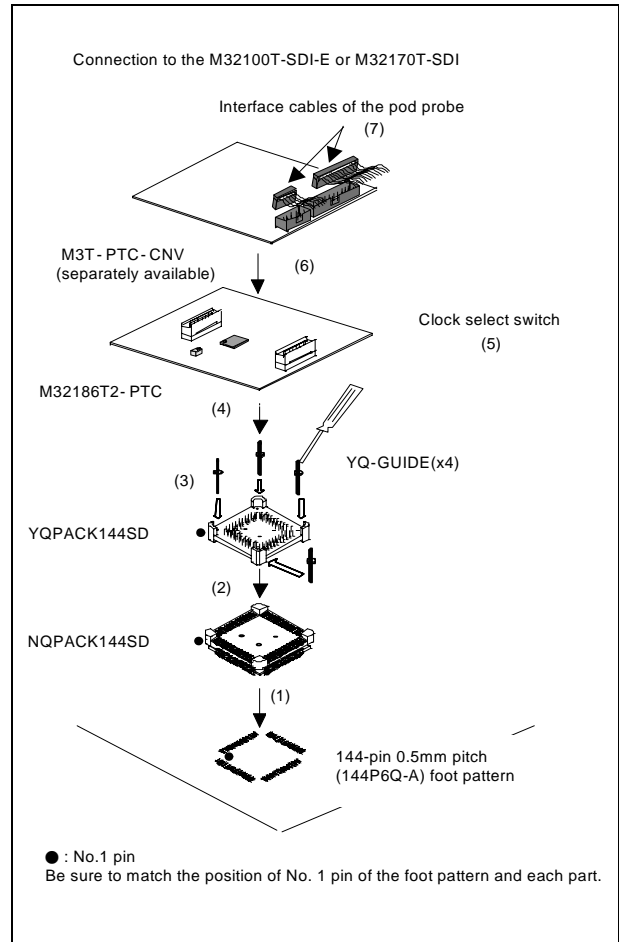
Connection to the M32100T-SDI-E or M32170T-SDI

Interface cables of the pod probe
(7)

M3T-PTC-CNV
(separately available)
(6)

Clock select switch
(5)

M32186T2-PTC
(4)

YQ-GUIDE(x4)

(3)

YQPACK144SD

(2)

NQPACK144SD

(1)

144-pin 0.5mm pitch
(144P6Q-A) foot pattern

● : No.1 pin
Be sure to match the position of No. 1 pin of the foot pattern and each part.

Figure 5.1 Connection Procedure (1)

5.2 For M32100T2-SDI-E, M32100T3-SDI-E or M32100T5-SDI-E.

(1) Mount the NQPACK144SD on the user system

(2) Connect the YQPACK144SD on the NQPACK144SD.

(3) Secure the four corners of the YQPACK144SD with the YQ-GUIDE's.

(4) Mount the M32186T2-PTC on the YQPACK144SD.

(5) Set the clock select switch.
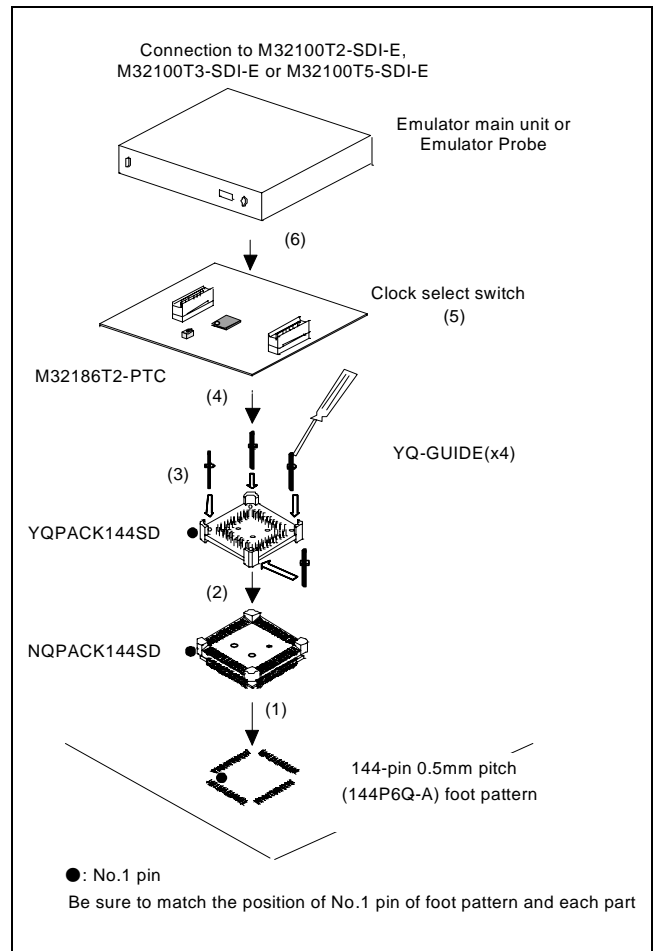
(6) Connect the emulator probe to the M32186T2-PTC.

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Figure 5.2 Connection Procedure (2)

5.3 On-board Evaluation

(1) Mount the NQPACK144SD on the user system

(2) Mount the M32186FxxFP on the NQPACK144SD.

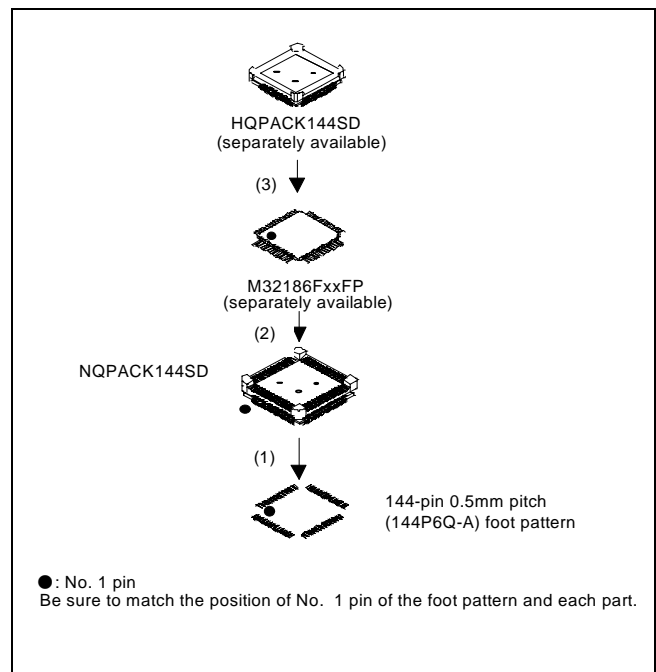(3) Mount the HQPACK144SD on the NQPACK144SD.

Figure 5.3 Connection Procedure (3)

6. Selecting a Clock

With the M32186T2-PTC, it is possible to select a clock supply to the MCU by the clock select switch (SW1). Select a clock supply as shown below.

However, when used with the M32186T2-PTC, the clock cannot be supplied from the user system.

(1) 8 MHz:

Supplies the clock (X1: 8 MHz) to the MCU from the oscillator on the M32186T2-PTC board

(2) SOCKET:

Supplies the clock to the MCU from the socket (X2) for mounting an oscillator on the M32186T2-PTC board. By mounting an oscillator to the X2 socket of the MCU, it is possible to change the operating frequency.

Figure 6.1 shows the connecting the X2 socket and the MCU.
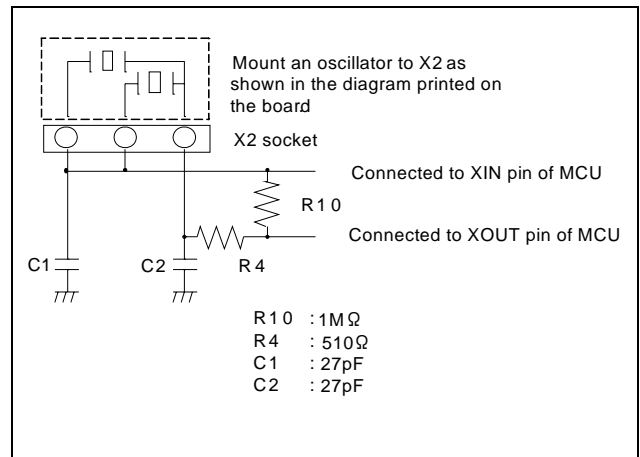

Figure 6.1 Connection diagram of X2 socket

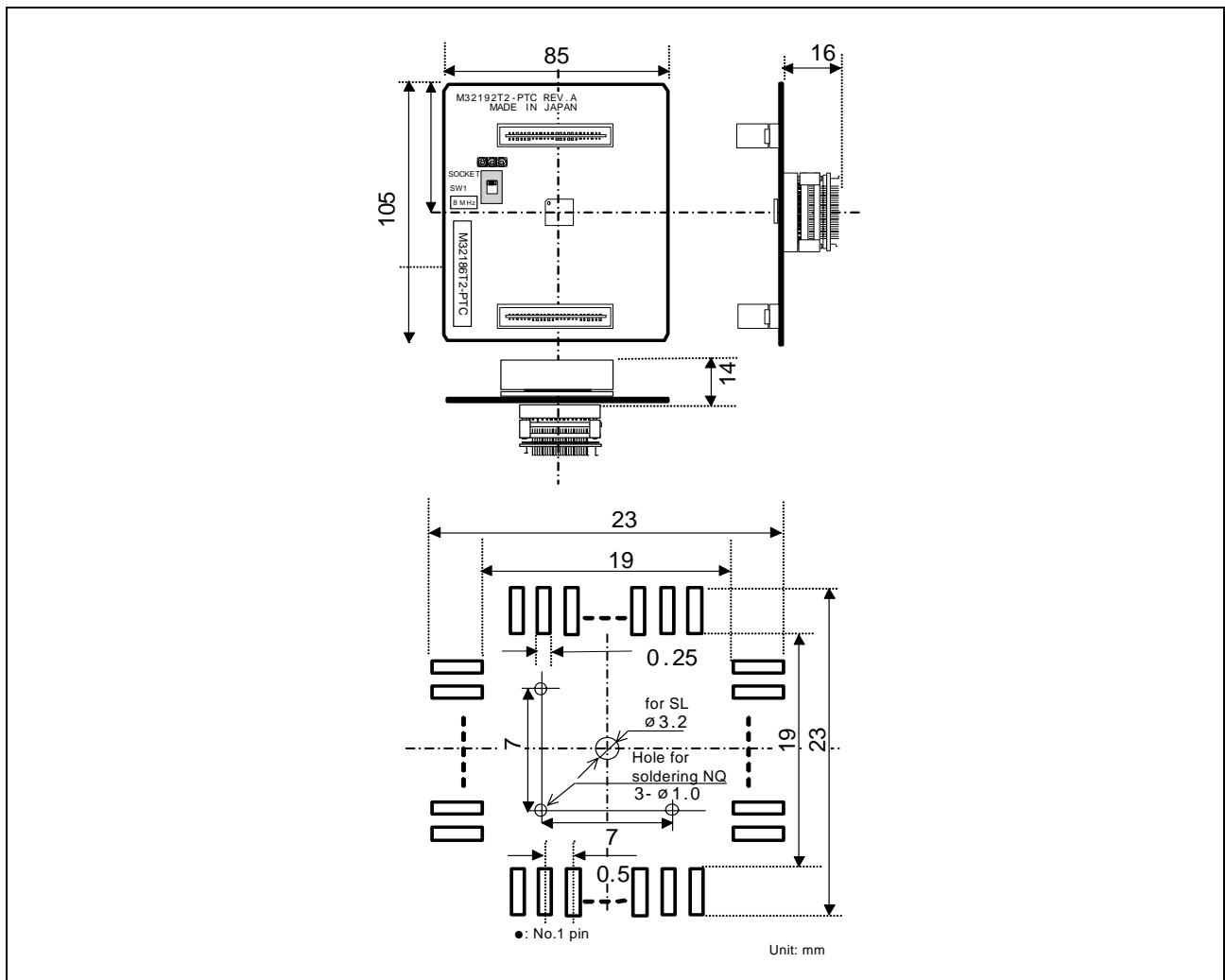## 7. External Dimensions and a Sample Foot Pattern of the M32186T2-PTC

Figure 7.1 External dimensions and a sample foot pattern of the M32186T2-PTC

8. Precautions

⚠ CAUTION

Cautions to Be Taken for Emulator:

- For debugging, use this product in the combination with the SDI emulator, M32100-SDI-E, M32170T-SDI, M32100T2-SDI-E, M32100T3-SDI-E or M32100T5-SDI-E.

- When using with the M32100T-SDI-E or M32170T-SDI, the following restrictions are applied according to the MCU operating frequency. The M32186T2-PTC is recommended to use with the M32100T3-SDI-E or M32100T5-SDI-E.
   - More than 66 MHz:
     Compared with the M32100T2-SDI-E, M32100T3-SDI-E, or M32100T5-SDI-E, more loss of trace information occurs.
   - 66 MHz or less:
     Same as the M32100T2-SDI-E, M32100T3-SDI-E or M32100T5-SDI-E.

- When using with the M32100T-SDI-E or M32170T-SDI, separately available M3T-PTC-CNV is required.

- When connecting to the M32100T-SDI-E or M32170T-SDI, connect the both cables for connecting the emulator, the SDI MCU control interface cable (10-pin) and the SDI trace interface cable (20-pin).

- When using this product connecting to the M32100T-SDI-E, M32170T-SDI or M32100T2-SDI-E, do not change the MCU operating voltage.

- For the precautions for the combination of the emulator, refer to the user's manual of each emulator.

Cautions for Differences between MCUs and This Product:

- For debugging, as the M32192F8VWG (1MB internal Flash ROM) on the M32186T2-PTC is used, be careful about the difference of the internal memory size.

- When the clock select switch is set to the "SOCKET" side, the oscillation occurs by itself, be careful about the difference of the resistance and the capacitor.

- The capacitive load of the all lines of the MCU will increase depending on wirings and connectors. Use the part whose timing is critical after checking it works properly.

Cautions to Be Taken for This Product:

- When connecting the YQPACK144SD, be sure to use the included YQ-GUIDE's.

- We cannot accept any request for repair.

- For purchasing the NQPACK144SD, YQPACK144SD and HQPACK144SD contact the following:
   Tokyo Eletech Corporation   http://www.tetc.co.jp/e_index.htm

- For inquiries about the product or the contents of this manual, contact your local distributor.
   Renesas Tools Homepage   http://www.renesas.com/tools