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Renesas Electronics Corporation

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M32176T-PTC

Converter Board for In-circuit Connection (for M32176FxxFP)

User's Manual

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CAUTION

If the requirements shown in the "CAUTION" sentences are ignored, the equipment may cause personal injury or damage to the products.

1. Outline

The M32176T-PTC is a converter board for featuring the debugging function such as real-time tracing when using the SDI emulator, M32170T-SDI, M32100T-SDI-E, M32100T2-SDI-E or M32100T3-SDI-E with the M32176FxxFP.

2. Package Components

- (1) M32176T-PTC converter board
- (2) YQPACK144SD (made by Tokyo Electech Corporation)
- (3) NQPACK144SD-ND (made by Tokyo Electech Corporation)
- (4) YQ-GUIDE x 4 (made by Tokyo Electech Corporation)
- (5) M32176T-PTC User's Manual (This manual)
- (6) M32176T-PTC User's Manual (Japanese)

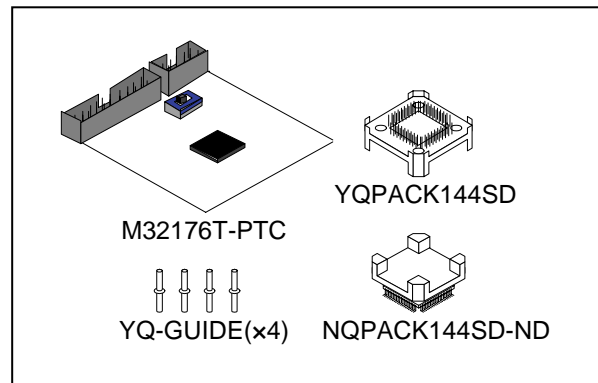


Figure 2.1 Package components

3. Specifications

Table 3.1 Specifications

Applicable package	144-pin LQFP (PLQP0144KA-A, previous code 144P6Q-A)
Applicable MCU	M32176FxxFP
Supported emulator	M32170T-SDI, M32100T-SDI-E, M32100T2-SDI-E or M32100T3-SDI-E
Mounted MCU	M32176F4VWG
Clock	10MHz
MCU power supply	Supplied from the user system

4. Usage

The M32176T-PTC can be used for debugging and on-board evaluation in common by mounting the NQPACK144SD-ND on the user system.

- (1) For debugging
Mount the NQPACK144SD-ND (included with the M32176T-PTC) on the 144-pin QFP foot pattern of the user system. Then connect the M32176T-PTC via the YQPACK144SD. As the M32176F4VWG is mounted on the M32176T-PTC, all functions of the emulator such as real-time tracing can be used.
Before using the M32176T-PTC, be sure to read “8. Precautions” on page 6.
- (2) For on-board evaluation
Mount the M32176FxxFP and the HQPACK144SD (separately available) in that order on the NQPACK144SD-ND on the user system.

5. Connection Procedure

5.1 For Debugging with the Emulator

- (1) Mount the NQPACK144SD-ND on the user system
- (2) Connect the YQPACK144SD on the NQPACK144SD-ND.
- (3) Secure the four corners of the YQPACK144SD with the YQ-GUIDES.
 - Do NOT use the screws included with the YQPACK144SD.
 - Do NOT use the screwdriver included with the NQPACK144SD-ND for fixing the YQ-GUIDES. That is used only for the HQPACK144SD.
- (4) Set the clock select switch.

Refer to "6. Selecting a Clock" on page 5.
- (5) Mount the M32176T-PTC on the YQPACK144SD.
- (6) Connect the emulation pod probe to the M32176T-PTC via the SDI MCU control interface cable and the SDI trace interface cable.

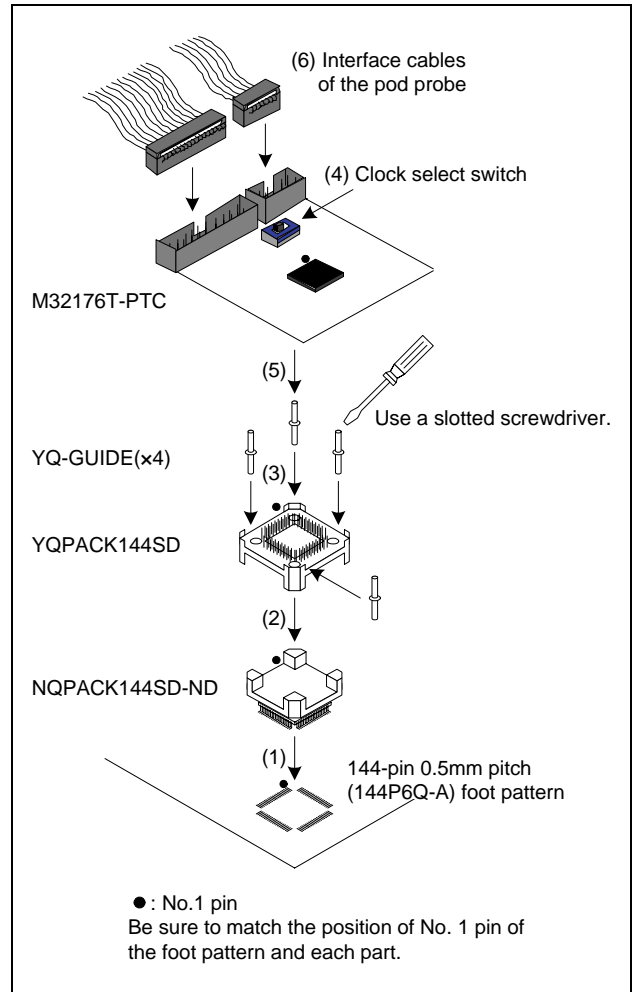


Figure 5.1 Connection Procedure (1)

5.2 On-board Evaluation

- (1) Mount the NQPACK144SD-ND on the user system
- (2) Mount the M32176FxxFP on the NQPACK144SD-ND.
- (3) Mount the HQPACK144SD on the NQPACK144SD-ND.

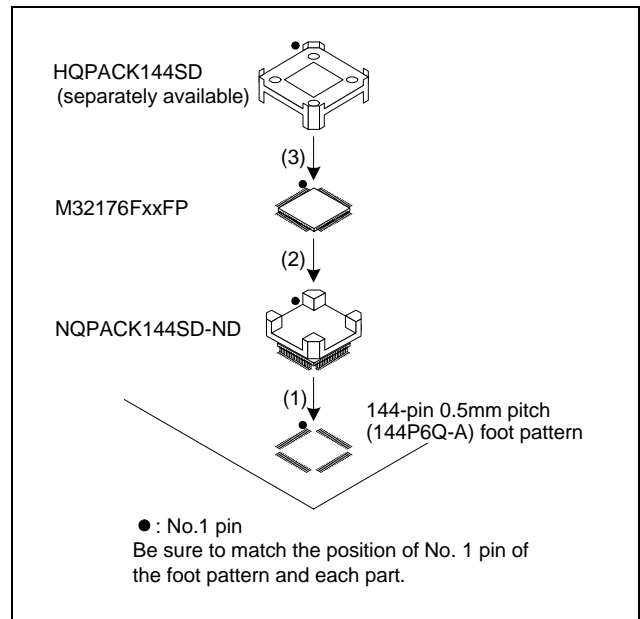


Figure 5.2 Connection Procedure (2)

6. Selecting a Clock

With the M32176T-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 M32176T-PTC, the clock cannot be supplied from the user system.

(1) 10 MHz

Supplies the clock (X1: 10 MHz) on the M32176T-PTC board to the MCU.

(2) SOCKET

Supplies the clock to the MCU from the socket (X2) for mounting an oscillator on the M32176T-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.

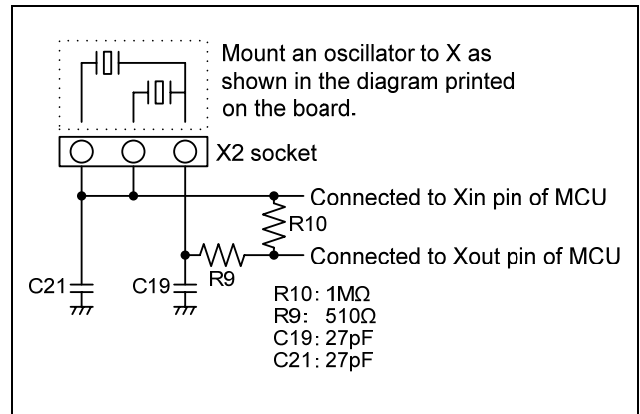


Figure 6.1 Connection diagram of X2 socket

7. External Dimensions and a Sample Foot Pattern of the M32176T-PTC

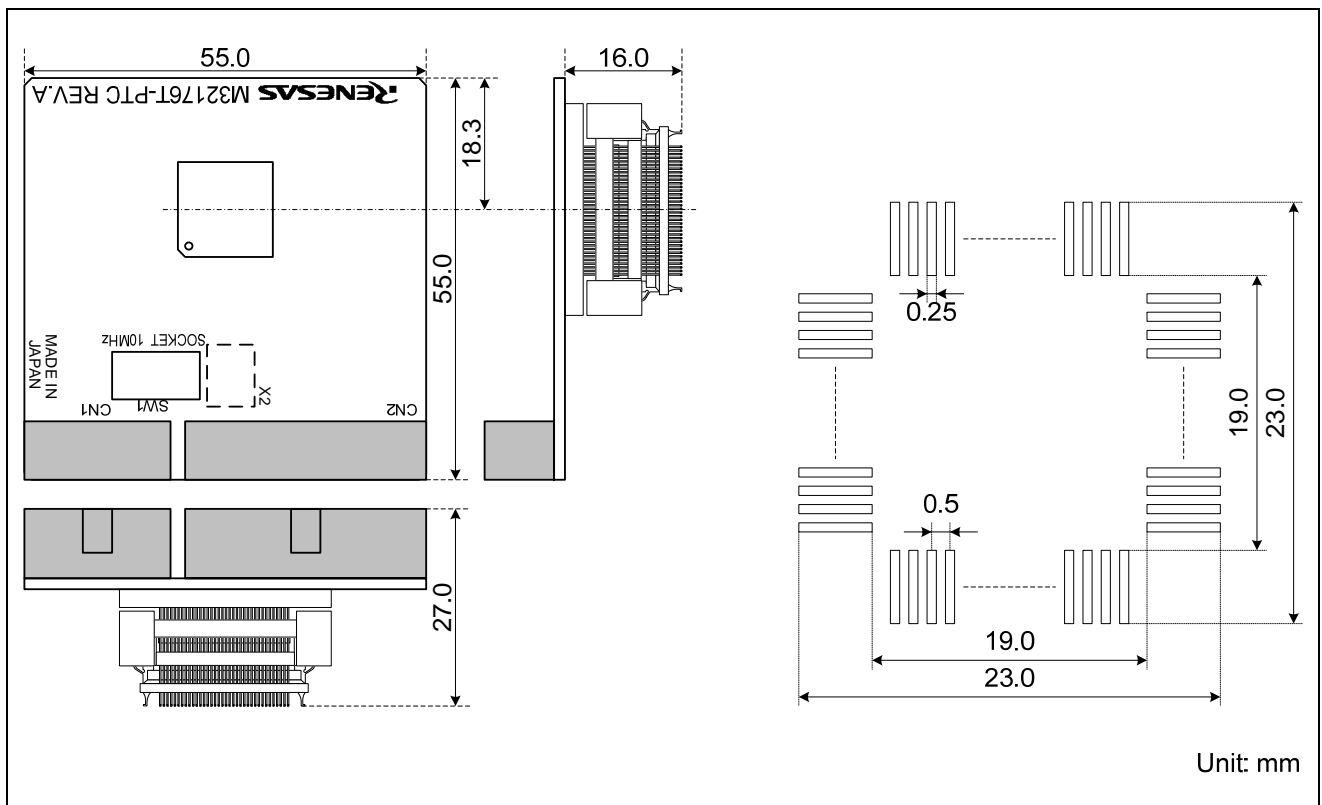


Figure 7.1 External dimensions and a sample foot pattern of the M32176T-PTC

8. Precautions

CAUTION

Cautions to Be Taken for Emulator:



- For debugging, use this product in the combination with the SDI emulator, M32170T-SDI, M32100T-SDI-E, M32100T2-SDI-E or M32100T3-SDI-E.
- When starting up an emulator debugger (M3T-PD32R or M3T-PD32RM), select an MCU file according to the type name and the operation mode of the MCU to be debugged. For details on the MCU file to be selected, refer to the emulator debugger's release notes.
- When connecting to the M32170T-SDI or M32100T-SDI-E connect the both cables for connecting the emulator, the SDI MCU control interface cable (10-pin) and the SDI trace interface cable (20-pin).
- 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 M32176F4VWG (512 KB internal Flash ROM) on the M32176T-PTC is used, be careful about the difference of the internal ROM 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-GUIDES.
- We cannot accept any request for repair.
- For purchasing the NQPACK144SD-ND, 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>