M32176T-PTC

Converter Board for In-circuit Connection (for M32176FxxFP)

User's Manual

Keep safety first in your circuit designs!

- Renesas Technology Corporation and Renesas Solutions Corporation put the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

Notes regarding these materials

- These materials are intended as a reference to assist our customers in the selection of the Renesas Technology product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Renesas Technology Corporation, Renesas Solutions Corporation or a third party.
- Renesas Technology Corporation and Renesas Solutions Corporation assume no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Renesas Technology Corporation and Renesas Solutions Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Renesas Technology Corporation, Renesas Solutions Corporation or an authorized Renesas Technology product distributor for the latest product information before purchasing a product listed herein. The information described here may contain technical inaccuracies or typographical errors. Renesas Technology Corporation and Renesas Solutions Corporation assume no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors. Please also pay attention to information published by Renesas Technology Corporation and Renesas Solutions Corporation by various means, including the Renesas home page (http://www.renesas.com).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Renesas Technology Corporation and Renesas Solutions Corporation assume no responsibility for any damage, liability or other loss resulting from the information contained herein.
- Renesas Technology semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Renesas Technology Corporation, Renesas Solutions Corporation or an authorized Renesas Technology product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of Renesas Technology Corporation and Renesas Solutions Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination. Any diversion or reexport contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact Renesas Technology Corporation or Renesas Solutions Corporation for further details on these materials or the products contained therein.

Precautions to be taken when using this product

- This product is a development supporting unit for use in your program development and evaluation stages. In mass-producing your program you have finished developing, be sure to make a judgment on your own risk that it can be put to practical use by performing integration test, evaluation, or some experiment else.
- In no event shall Renesas Solutions Corporation be liable for any consequence arising from the use of this product.
- Renesas Solutions Corporation strives to renovate or provide a workaround for product malfunction at some charge or without charge. However, this does not necessarily mean that Renesas Solutions Corporation guarantees the renovation or the provision under any circumstances.
- This product has been developed by assuming its use for program development and evaluation in laboratories. Therefore, it does not fall under the application of Electrical Appliance and Material Safety Law and protection against electromagnetic interference when used in Japan.

Renesas Tools Homepage http://www.renesas.com/en/tools

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

Rev. 1.00
June 16, 2003
REJ10J0154-0100Z

Renesas Technology
www.renesas.com

1. Outline

The M32176T-PTC is a converter board for featuring the debugging function such as real-time tracing when using a Renesas M32R emulator with the M32176FxxFP.

2. Package Components

(1) M32176T-PTC converter board
(2) YQPACK144SD (made by Tokyo Eletech Corporation)
(3) NQPACK144SD (made by Tokyo Eletech Corporation)
(4) YQ-GUIDE's (4 pieces)
(5) Screwdriver (made by Tokyo Eletech Corporation)
(6) M32176T-PTC User's Manual (This manual)

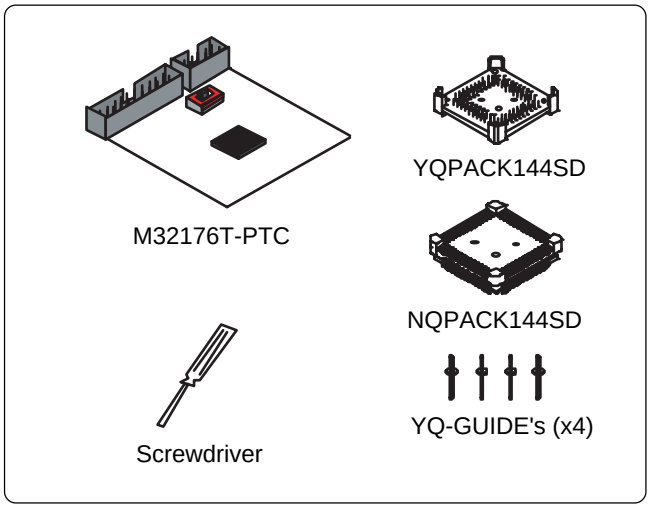

Figure 1 Package components of the M32176T-PTC

3. Specifications

Table 1 Specifications

Applicable package	144P6Q-A (144-pin 0.5-mm-pitch QFP)
Supported MCU	M32176FxxFP
Supported emulator	M32170T-SDI M32100T-SDI-E M32100T2-SDI-E M32100T3-SDI-E
Mounted MCU	M32176F4VWG
Clock	10 MHz
Power supply	Supplied from target board

4. Usage

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

(1) For debugging

Mount the NQPACK144SD (included with the M32176T-PTC) on the 144QFP foot pattern of the target board. 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.

(2) For board-mounted evaluation

Mount the M32176FxxFP and the HQPACK144SD (separately available) in that order on the NQPACK144SD on the target system.

Before using the M32176T-PTC, be sure to read "8. Precautions" on page 5.

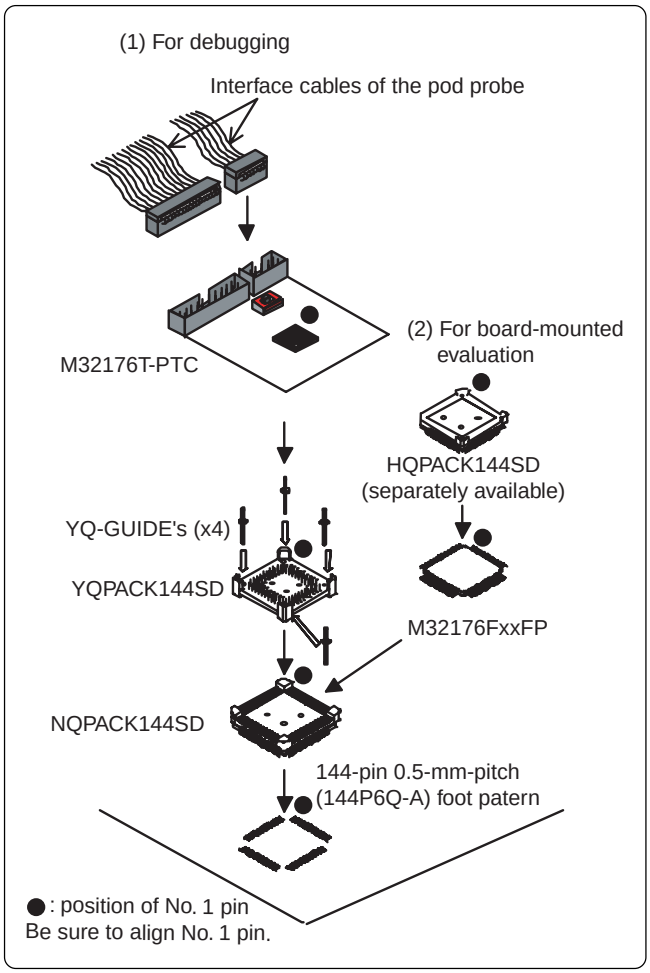

Figure 2 Usage of the M32176T-PTC

5. Connection Procedure

The procedure for connecting the M32176T-PTC is shown below.

(1) Mount the NQPACK144SD.

(2) Mount the YQPACK144SD on the NQPACK144SD.

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

(4) Set the clock select switch.

For details, refer to "6. Selecting a Clock" shown below.

(5) Connect the probe of the emulation pod and the M32176T-PTC via the SDI MCU control interface cable and the SDI trace interface cable.

(6) Mount the M32176T-PTC on the YQPACK144SD.

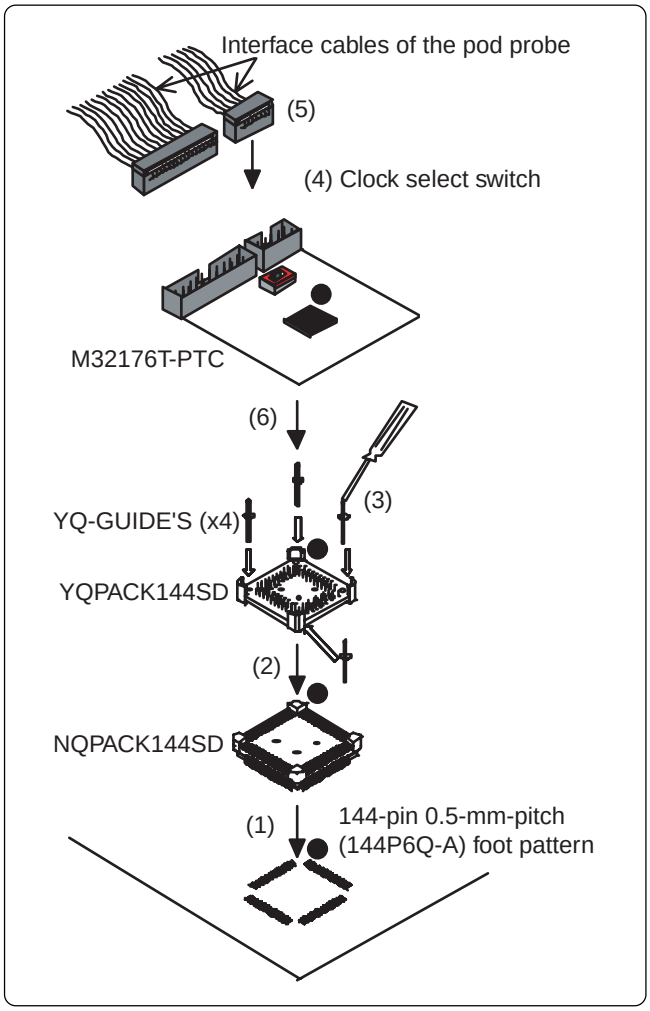

Figure 3 Connection procedure of the M32176T-PTC

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 using the M32176T-PTC, the clock cannot be supplied from the target system.

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

SOCKET: Supplies a clock to the MCU from the socket (X2) for mounting an oscillator on the M32176T-PTC board. By mounting the oscillator to the X2 socket of the MCU, it is possible to change the operating frequency.

For more details on connecting the X2 socket and the MCU, see Figure 4 (right).

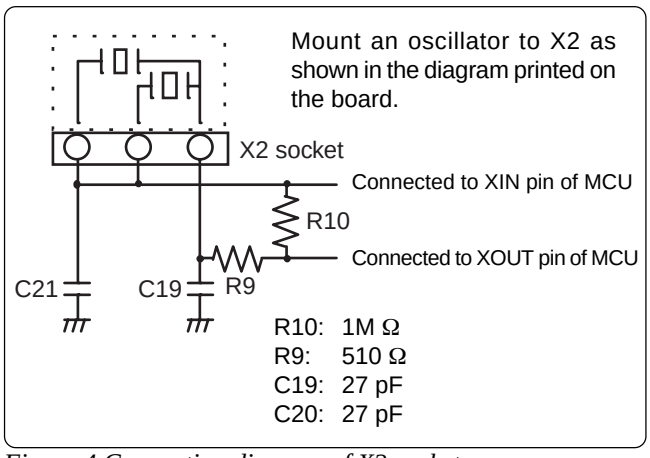

Figure 4 Connection diagram of X2 socket

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

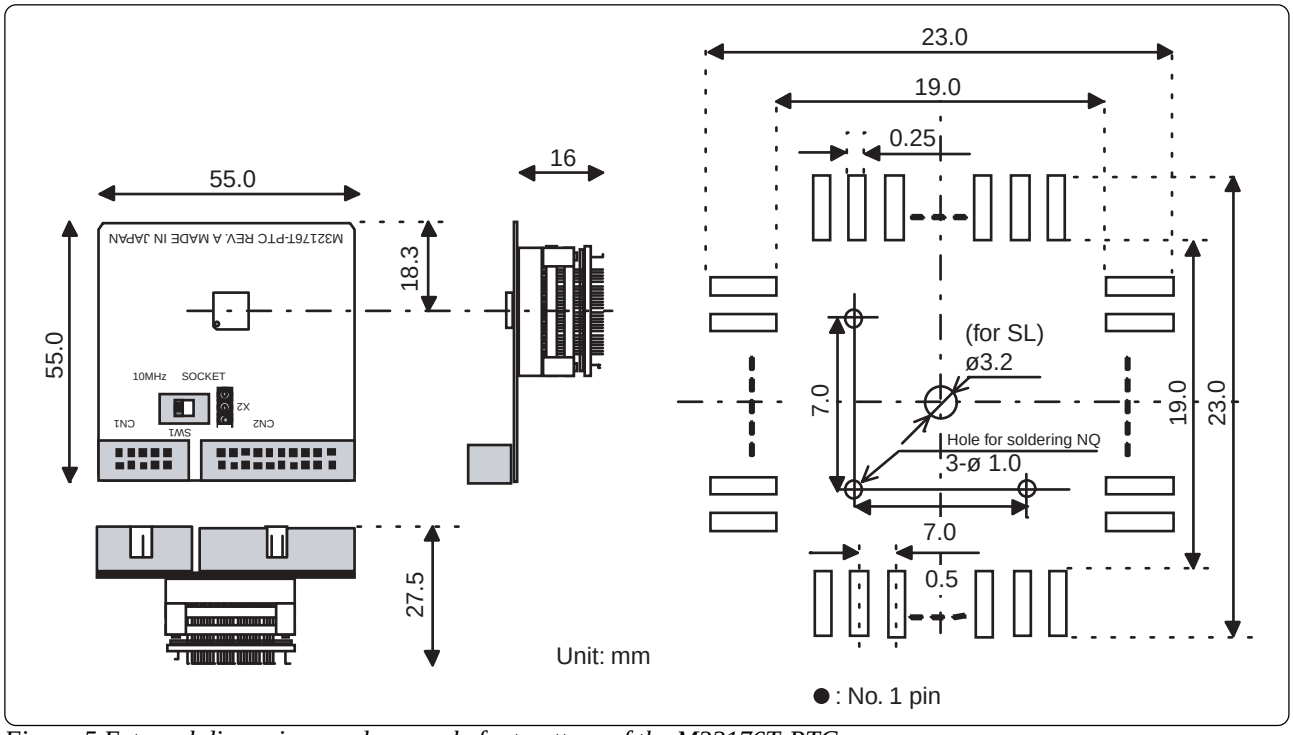

Figure 5 External dimensions and a sample foot pattern of the M32176T-PTC

8. Precautions

⚠CAUTION

Cautions to Be Taken for Emulator:

- For debugging, use this product in the combination with the M32100T2-SDI-E, M32170T-SDI, M32100T-SDI-E or M32100T3-SDI-E emulator.
- 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.
- 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 the emulator debugger.

Cautions for Differences between MCU and This Product:

- For debugging, as the M32176F4VWG (512KB internal flash ROM) on the M32176T-PTC is used, be careful about the difference of the internal flash ROM size.
- When setting the clock select switch to the "SOCKET" side, oscillation occurs by itself, be careful about the difference of the resister value and the capacitor.
- The capacity 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:

  ~~Daimaru Kogyo Ltd.~~
  ~~http://www.daimaru-kogyo.com/~~

  Tokyo Eletech Corporation
  http://www.tetc.co.jp/e_tet.htm

- For inquiries about the product or the contents of this manual, contact your local distributor.

  Renesas Tools Homepage http://www.renesas.com/en/tools