

uEASE connection manual

ML610Qxxx

Revision 4.0

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Table of Contents

Introduction	1
1.1 Recommended circuitry of user target board for uEASE connection	2
1.1.1 Recommended circuitry using 3.3VOUT supplied from uEASE	3
1.1.2 Recommended circuitry using power supply on your target board	4
1.1.3 Recommended circuitry using RESET_N terminal and TEST terminal	5
1.1.4 Recommended circuitry using TEST1_N terminal and TEST0 terminal.....	6
1.1.5 Recommended socket and loacation on your PCB	7
1.1.6 Terminals of uEASE interface connector	8
1.2 Available function	9
1.2.1 On-chip debug function.....	9
1.2.2 Flash ROM writer function.....	9
1.3 Notes	10
1.3.1 Notes for on-chip debug emulator.....	10

Introduction

This material describes how uEASE has to be connected to ML610Qxxx on your target board, and the notations about using uEASE.

To understand well about the connection to each device, refer each devices' user's manual accordingly.

1.1 Recommended circuitry of user target board for uEASE connection

The examples of a circuit for connecting uEASE with a target microcomputer are shown below

The interface terminal of a target microcomputer changes with your target microcomputer.

When you connect with uEASE, please be sure to check by the target microcomputer's manual.

Connection of the power supply terminal of a target microcomputer

- Refer to chapter 1.1.1, when you supply the power supply of a target microcomputer from uEASE
- Refer to chapter 1.1.2, when you supply the power supply of a target microcomputer from your target board.

Connection of a debugging terminal

- Refer to chapter 1.1.3 for a target microcomputer which uses RESET_N terminal and TEST terminal as an interface of uEASE.
- Refer to chapter 1.1.4 for a target microcomputer which uses TEST1_N terminal and TEST0 terminal as an interface of uEASE.

1.1.1 Recommended circuitry using 3.3VOUT supplied from uEASE

uEASE is capable to supply +3.3V/100mA(max.) through 3.3VOUT terminal.

With uEASE, to program Flash ROM in the devices or to do debug by downloading your software into the device, uEASE programs the Flash ROM. In addition, in case to use software breakpoint function on the DTU8 debubber, Flash ROM is programmed every time you set software breakpoints.

Below is a recommended circuitry using 3.3VOUT supplied from uEASE.

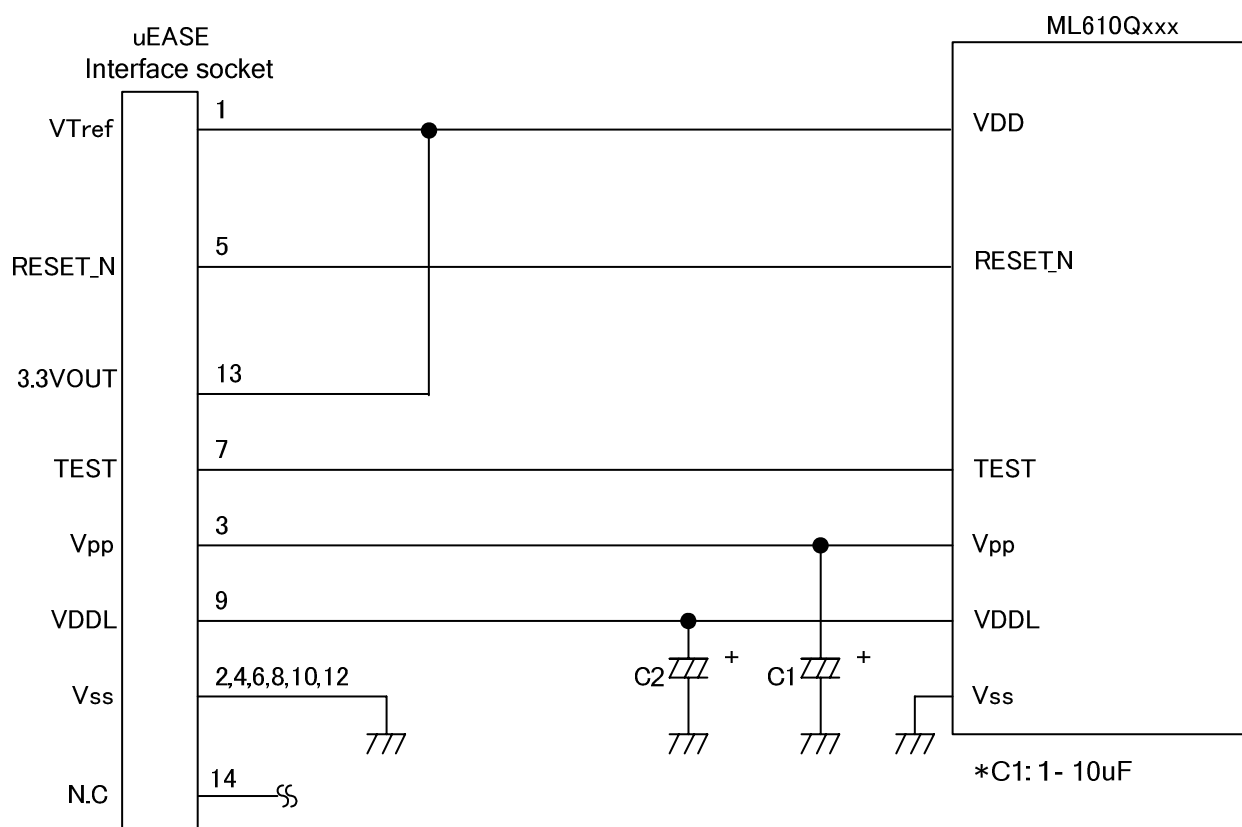


Fig 1 recommended circuitry using 3.3VOUT supplied from uEASE



Caution

When using uEASE connecting with ML610Qxxx on your target board, Vpp and VDDL on ML610Qxxx has to be connected to corresponding terminals of uEASE user cable only. Do not forget to isolate other Vpp and VDDL supply from your target board. Otherwise, not only uEASE broken, but also burst and /or fire or electric component may be caused.



Caution

uEASE controls reset of ML610QXXX.

When you connect uEASE, do not mount parts to RESET_N terminal of ML610QXXX

1.1.2 Recommended circuitry using power supply on your target board

The example of a circuit which uses power supply on your target board.

When you use the power supply of your target board, make 3.3VOUT terminal of uEASE open.

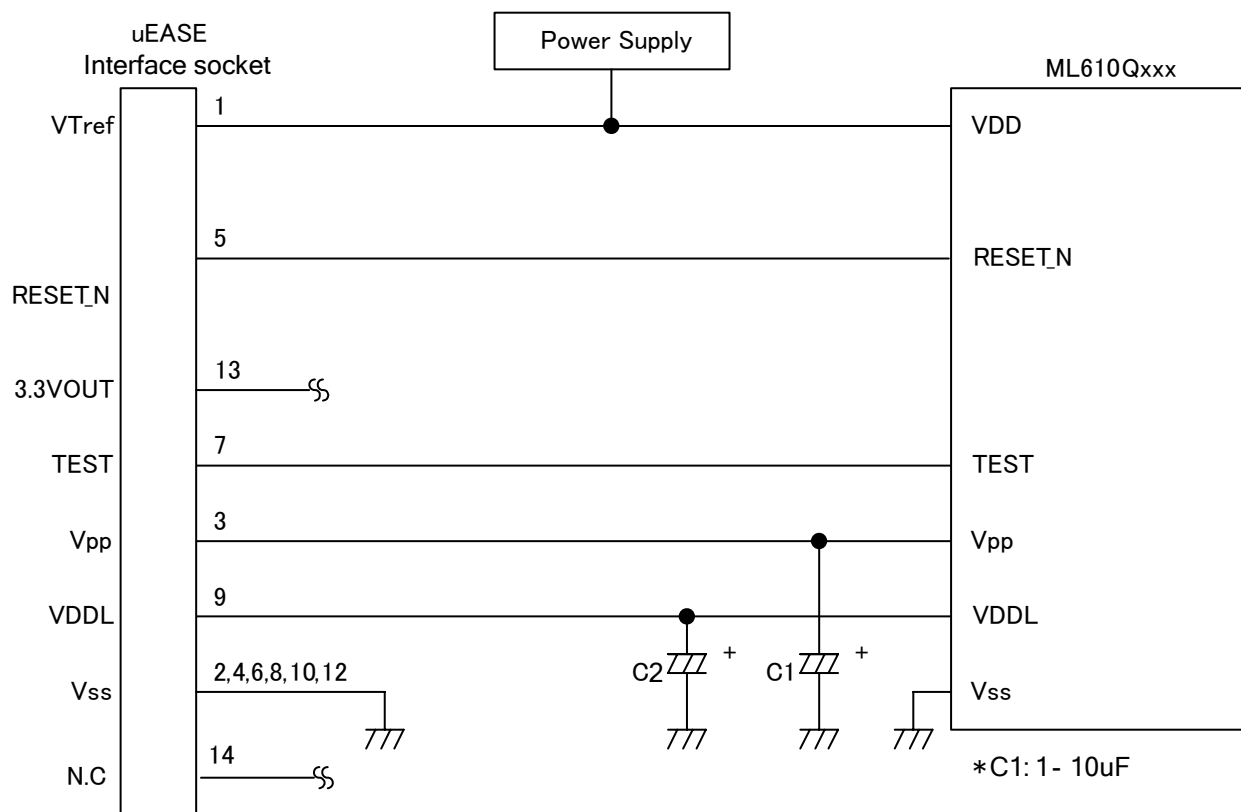


Fig 2 recommended circuitry using power supply on target board



Caution

When using uEASE connecting with ML610Qxxx on your target board, Vpp and VDDL on M610Qxxx has to be connected to corresponding terminals of uEASE user cable only. Do not forget to isolate other Vpp and VDDL supply from your target board. Otherwise, not only uEASE broken, but also burst and / or fire or electric component may be caused.



Caution

The input voltage of VDD pin should set higher than VDDL pin. When writing the flash ROM by uEASE, the VDDL pin is set to +2.8V (includes downloading your software into flash ROM, and setting the software breakpoints). Therefore, when you use the uEASE for programming the flash ROM or debugging your software, we recommend the voltage of VDD pin is set to +3.0V or higher.

1.1.3 Recommended circuitry using RESET_N terminal and TEST terminal

The example of a circuit connected with uEASE using RESET_N terminal and TEST terminal is shown below.

Since the RESET_N terminal and TEST terminal of target microcomputer are use as a debugging terminal of uEASE, do not connect any parts to these terminals.

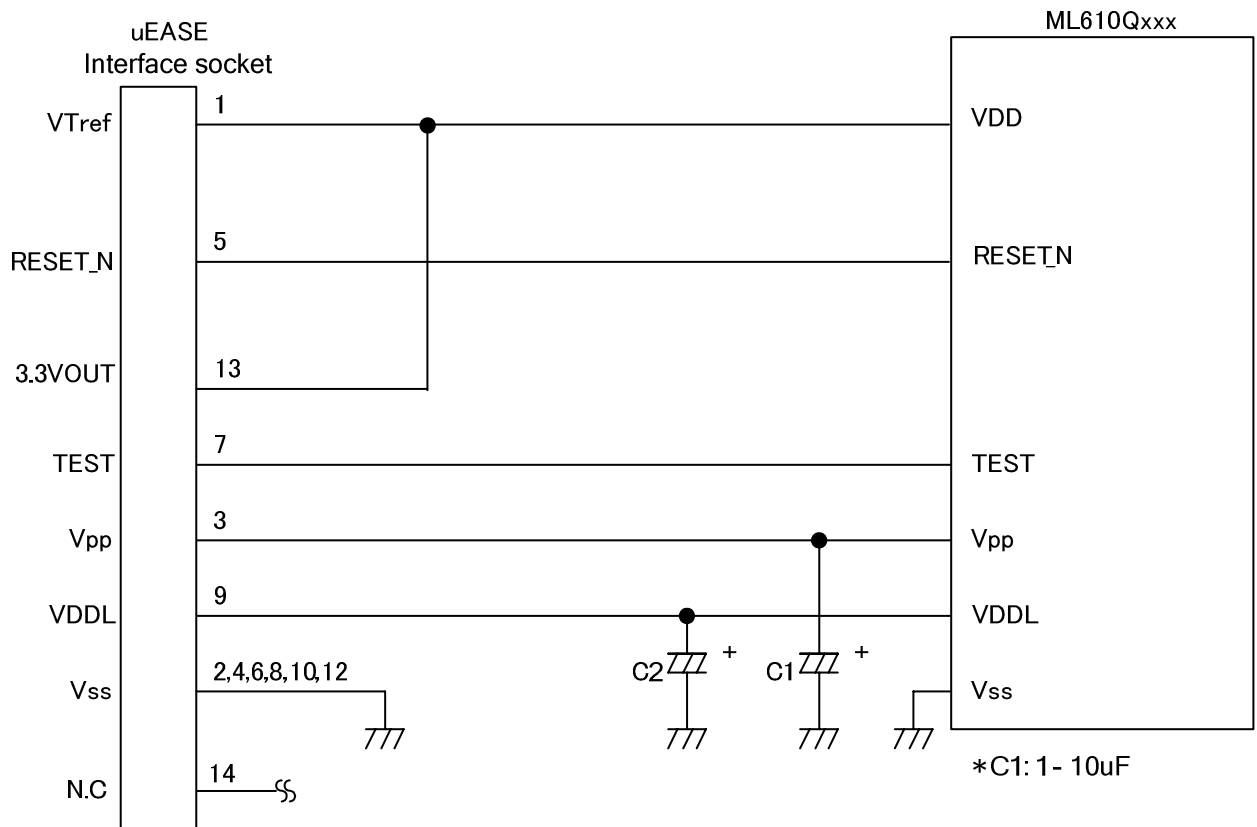


Fig 3 Recommended circuitry not using RESET_N terminal and TEST terminal

1.1.4 Recommended circuitry using TEST1_N terminal and TEST0 terminal

The example of a circuit connected with uEASE using TEST1_N terminal and TEST0 terminal is shown below.

Since the TEST1_N terminal and TEST0 terminal of target microcomputer are use as a debugging terminal of uEASE, do not connect any parts to these terminals.

Since uEASE controls reset of a target microcomputer, do not reset from a RESET_N terminal during debugging.

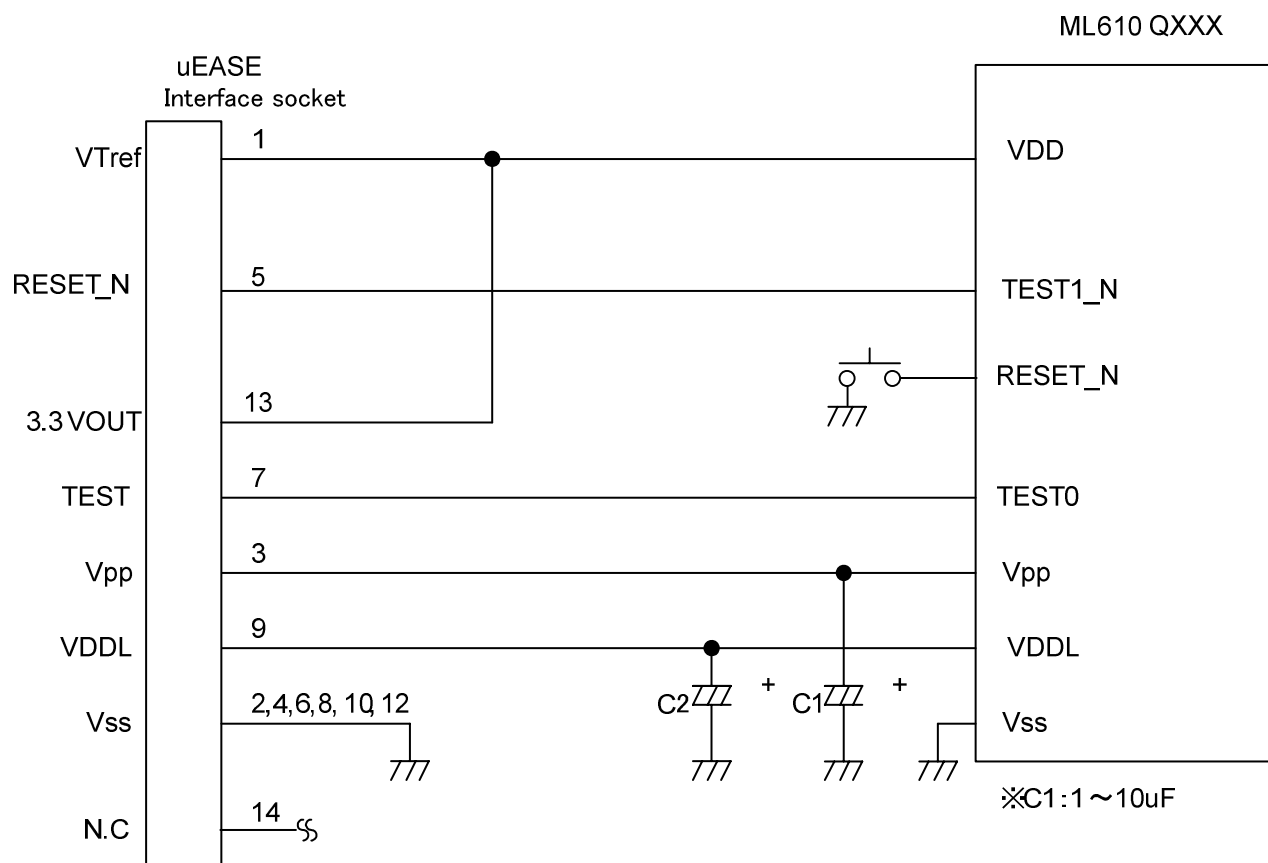


Fig 4 Recommended circuitry using TEST_1N terminal and TEST0 terminal

1.1.5 Recommended socket and location on your PCB

- **Recommended socket on your PCB for uEASE I/F cable is**

Part Number : 7614-6002

Supplier : 3M

- **Socket location on your PCB for uEASE I/F cable**

Below is a recommended socket location on your PCB for uEASE interface socket.-

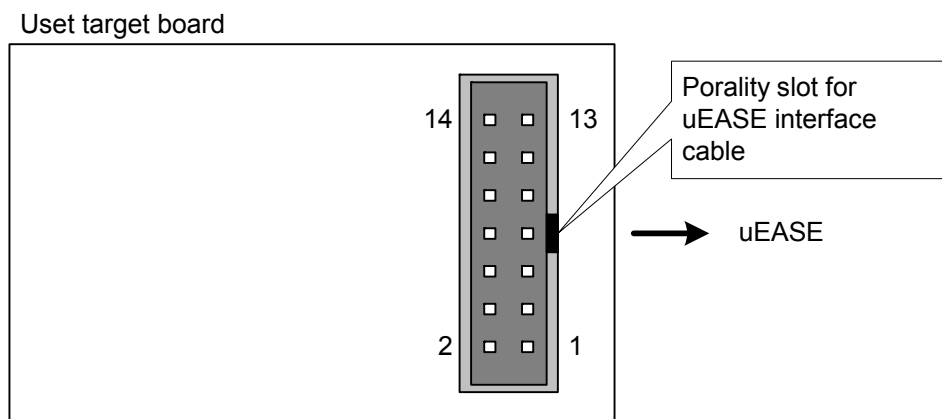


Fig 5 recommended board layout of uEASE interface socket

The length of the cable (uEASE interface cable) which connects a user target system with uEASE is about 15cm. A uEASE interface connector should be located as much as possible in the end of PCB, and please arrange it so that wiring with a uEASE interface connector and ML610Qxxx serves as the shortest.

(Conformity pin header: HIF3FC-14PA-2.54DSA)

1.1.6 Terminals of uEASE interface connector

Below is a table for terminals of uEASE interface connector.

Table1 uEASE interface connector terminals

Terminal No.	uEASE terminal	Corresponding terminals of ML610Qxxx
1	VTref	ML610Qxxx VDD, +Power supply
2	Vss	ML610Qxxx Vss, -Power supply (GND)
3	Vpp	ML610Qxxx Vpp
4	Vss	ML610Qxxx Vss, -Power supply (GND)
5	RESET_N	ML610Qxxx RESET_N
6	Vss	ML610Qxxx Vss, -Power supply (GND)
7	TEST	ML610Qxxx TEST
8	Vss	ML610Qxxx Vss, -Power supply (GND)
9	VDDL	ML610Qxxx VDDL
10	Vss	ML610Qxxx Vss, -Power supply (GND)
11	N.C.	Do not connect. Keep it open.
12	Vss	ML610Qxxx Vss, -Power supply (GND)
13	3.3VOUT	3.3V output
14	N.C	Do not connect. Keep it open.

It recommends shielding wiring of a RESET_N terminal and a TEST terminal by VSS (GND).

1.2 Available function

The provided functions by using the uEASE are shown below.

1.2.1 On-chip debug function

The uEASE provides the on-chip debug function by linking to the DTU8 Debugger.

■ Application Program download function

A download and display the application program in the Flash ROM which is embedded in a target microcomputer.

■ A display and change the resources of a target microcomputer

- Processor's internal registers
- Program ROM
- Data RAM
- Special Function Register (SFR)

■ Emulation function

- Real-time emulation
- Single step emulation

■ Break function

- Hardware breakpoints (3 points)
- Software breakpoints
- Address pass count break (1 point)
- RAM data match break (1 point)
- Force break

1.2.2 Flash ROM writer function

■ Flash ROM writer function

The uEASE provides the Flash ROM programming function by linking to the FWuEASE Flash Writer host program.

1.3 Notes

The notations of debugging or programming by using the uEASE are shown below.

1.3.1 Notes for on-chip debug emulator

■ A RAM data match break

- When the RAM data match break occurs, the emulation is stopped after the CPU executes until 3 instructions from the satisfied of break condition.

■ Any break functions

As following, the behavior of the ML610Qxxx is influenced by break functions. Therefore, do not use the break function during the final check of application programs.

-When the break occurred, the following peripherals of ML610Qxxx are stopped.

- LTBC
- Real-time clock
- 1kHz timer
- Timer 0/1/2/3
- Watch dog timer
- Melody driver

If peripherals are enabled, the behavior will restart when the emulation is started.

- When the interruption occurs in the break, the CPU defers the execution of each interruption handler to the next emulation.
- If you use the force break function when CPU is STOP/HALT mode, the STOP/HALT mode is released by the break. And, if you set the breakpoints to next instruction of the instruction to change to the STOP/HALT mode, the STOP/HALT mode is released by the break.

■About the frequency control register (FCON0,1) in case of uEASE use

- Do not write the program made into the clock mode which is not mounted for the OSCM0/OSCM1 bit of FCON0 in the flash memory of target LSI. When this program is written in and the emulation is executed, the operation about execution becomes impossible, because the clock is not supplied to CPU. And DTU8+uEASE cannot be started by target LSI which wrote in this program. In these cases, Error number: 6300H is displayed. When you write in this program and the error occurs, please erase or change the flash memory by FWuEASE+uEASE.
- The OSCM0/OSCM1 bit of FCON0 cannot be changed in the SFR window on DTU8.
- When ENOSC and SYSCLK of FCON1 are set to 1, even if ENOSC is set to 0 in the SFR window on DTU8, the display of SYSCLK is still 1. However, SYSCLK inside target LSI is 0. Therefore, the emulation is executed in the state of SYSCLK=0 as it was operated in the SFR window.

Revision History

Revision No.	Date	Description
1.0	Oct. 30, 2008	First edition.
2.0	Mar.23, 2009	An execution time measurement function is indicated. ML610Q421/Q422, and ML610Q340/Q346/Q347 addition
3.0	Oct. 28, 2009	Notes about the frequency control register at the time of uEASE use (FCON0, 1) are described.
4.0	Feb. 3, 2011	The model name of a connectable microcomputer is deleted. Note about the 3.3VOUT terminal