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User's Manual

EZ-0009

Development Kit for μPD78F8024, μPD78F8025

Target Device
μPD78F8024
μPD78F8025

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Safety Precautions

This document explains matters to be noted for safe use of EZ-0009. Be sure to read this before using EZ-0009.

Symbols Used

This document uses the following symbols for matters to be observed for the safe use of the unit. The symbols are followed by a brief explanation of the possible extent of problems which may occur if the notices are not observed.

Warning	The user may suffer death or serious injury if the warning is not observed.
Caution	Human injury or property damage may occur if the caution is not observed.

The following symbols express matters which are prohibited in order to prevent injury or accident.

General prohibition The action mentioned is prohibited.	**Do not touch** Touching the specified location may cause injury.	**Do not disassemble** Disassembly may cause a problem such as electrical shock or product failure.
Keep away from water Use near water poses the risk of electrical shock or product failure if moisture were to contact the unit.	**Flammable** A nearby flame may cause the unit to catch fire.	**Do not touch with wet hands** Touching with wet hands may cause electric shock or product failure.

The following symbols are used for instructions to prevent product failure and accidents.

	Compulsory action based on an instruction for the user.

Warnings

Warnings	
	Do not drop or jolt the unit. Doing so may break or damage the unit, causing fire or electric shock.
	Do not disassemble or modify the unit. Doing so may cause product failure, emission of smoke, fire, or electric shock.
	Do not heat the unit or expose it to fire, and do not short the terminals. Doing so may cause product failure, generation of heat, fire, or rupture.
	Do not use with excessive voltage, and do not use or store outside the specified temperature range. Doing so may cause product failure, generation of heat, fire, or rupture.
	To keep from generating a difference of potential between the ground (GND) of the simple on-chip debug emulator and the GND of the target system, do not power on the simple on-chip debug emulator by connecting USB cable until after connecting the simple on-chip debug emulator to the target system Doing so may cause failure, generation of heat, fire, or rupture.
	Make sure the target system has been connected securely before connecting the USB cable to the simple on-chip debug emulator. Make sure also to connect the USB cable correctly. Doing so may cause failure, generation of heat, fire, or rupture.
	Do not excessively bend or pull on the USB cable, target cable, or other part. Doing so may cause product failure, generation of heat, fire, or rupture.
	Do not plug in or unplug a connector or cable with power applied to the unit. Doing so may cause product failure, generation of heat, fire, or rupture.
	Do not touch with wet hands. Touching the unit with wet hands while power is being supplied poses a risk of electrical shock.
	If smoke or an abnormal smell or sound is emitted, or heating occurs, promptly do the following. ・Unplug the USB cable from the PC. ・Switch off the target system power. Using the unit in such a state poses a risk of fire, burning, or electric shock.
	Remove the USB cable, and target cable when transporting or relocating the unit. Moving the unit with cables connected may damage the cables, causing product failure, generation of heat, fire, or electrical shock.

Cautions

Cautions	
	Do not use or store this unit in any of the following locations. - Environments with copious water, humidity, dust, fumes, etc. - Environments where static electricity or electrical noise is readily generated. Such influences can lead to electric shock or product failure. If a liquid enters the unit, cut the power supply, and consult your dealer or NEC Electronics sales representative. Even if the unit appears to be dry, internal moisture may remain.
	To prevent static electricity damage, guard against energizing when touching metal parts such as connectors. Static electricity can cause product failure.
	Observe the specified order for the power-on and power-off procedures of the simple On-chip debug emulator and the target system. Doing otherwise may cause the emulator or the target system to fail.

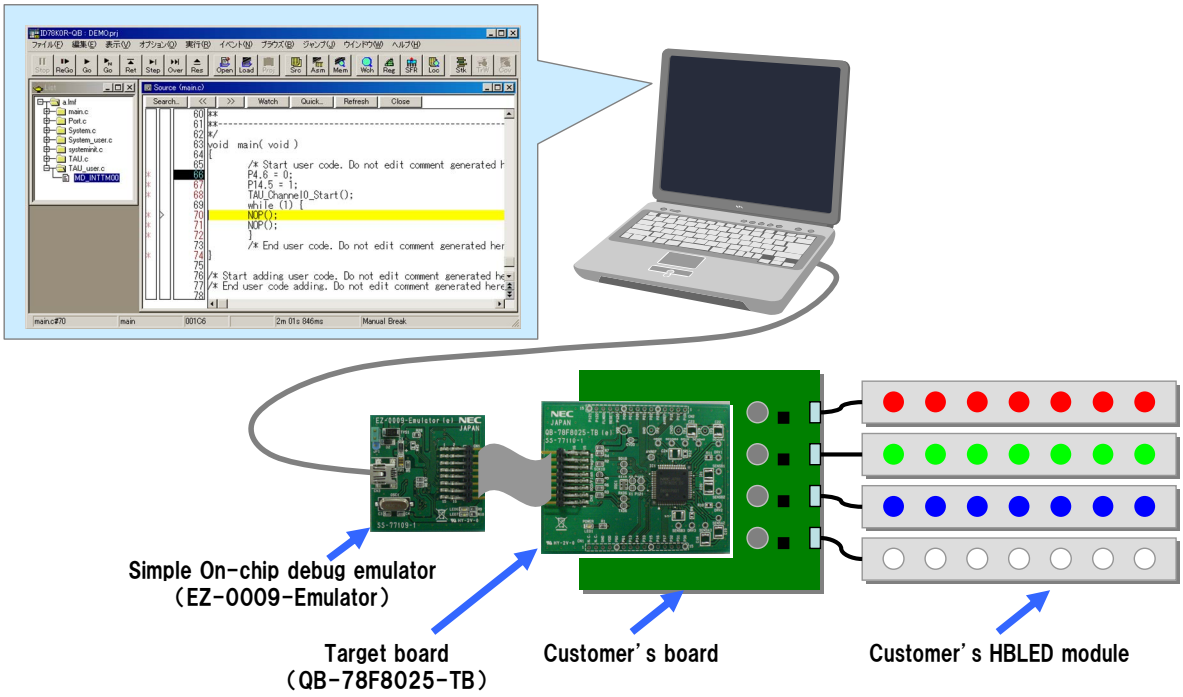
CONTENTS

INTRODUCTION

μPD78F8024, μPD78F8025 Development Kit (EZ-0009) is the kit which can develop application system by using uPD78F8024, uPD78F8025 microcontrollers.

By installing software development tools and USB driver software to PC, and by connecting USB cable, total development flow can be realized.

Debugging System Image



Organization This manual is divided into the following sections.

- Overview
- Names and functions of hardware
- How to use

Readers This manual is intended for users who wish to perform debugging using uPD78F8024, uPD78F8025 Development Kit (EZ-0009).
The readers of this manual are assumed to be familiar with the device functions and usage of uPD78F8024, uPD78F8025, and to have knowledge of debuggers and flash programming.

Purpose This manual is intended to give users an understanding of the basic specifications and correct use of EZ-0009.

Chapter1 Overview

EZ-0009 is Development Kit for uPD78F8024, µPD78F8025 microcontrollers.
This Development Kit consisted of Simple On-chip debug emulator (EZ-0009-Emulator) and Target Board (QB-78F8025-TB). By connecting these boards to host PC, software development and debugging are possible.

1.1 Features

- Target board (QB-78F8025-TB) is included with shipment.
  Target board which uPD78F8025 microcontroller is mounted is included.
  Easy to build up evaluation and debug environment by connecting simple On-chip debug emulator (EZ-0009-Emulator).
- Simple On-chip debugging
  By using this development kit, the debugging of uPD78F8024, uPD78F8025 is possible.
- Flash memory programming
  Flash memory programming is possible by this development kit.
- USB connection
  Simple On-chip debug emulator (EZ-0009-Emulator) can be connected to the host PC via USB interface 2.0 or 1.1.

1.2 Supported Devices

uPD78F8024 and uPD78F8025

1.3 Hardware Specifications

This section describes the EZ-0009 hardware specification.

The specifications related to the on-chip debug and flash memory programming functions are described in the following chapters.

Table 1-1 Hardware Specification

Classification	Item	Specifications
Simple On-chip debug Emulator (EZ-0009-Emulator)	Operating power supply	Supplied via USB interface (5V)
	Operating environment conditions	Temperature : 0 to +40degC Humidity : 10 to 80% RH (no condensation)
	Storage environment conditions	Temperature : -15 to +60degC Humidity : 10 to 80% RH '(no condensation)
	External dimensions	43 x 43 x 15 mm
	Weight	Approximately 13 g
Host machine interface	Target host machine	IBM PC/AT™compatibles
	Target OS	Windows2000, Windows XP
	USB	2.0 (1.1compatible[Note])
	USB cable	2m
	Current consumption	500mA max.
Target interface	Target cable length	10cm
	Supported connector	2.54mm pitch general-purpose connector
	Supply voltage	5V
	Supply current	100mA max.
	Current consumption	8mA (Typ)
Target board (QB-78F8025-TB)	Microcontroller	uPD78F8025
	Operation voltage	VDD/CVDD: 5V Vin : 9V - 38V
	Operating environment conditions	Temperature : 0 to +40degC Humidity : 10 to 80% RH (no condensation)
	Storage environment conditions	Temperature : -15 to +60degC Humidity : 10 to 80% RH '(no condensation)
	External dimensions	55 x 71 x 1.5 mm
	Weight	Approximately 16 g

Note In case power supply to target system is used from EZ-0009-Emulator, current supply capacity have to be 500mA.

Chapter2 Names and Functions of Hardware

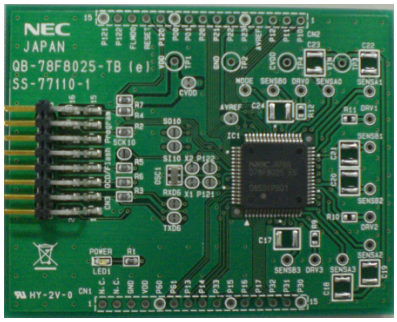
This chapter describes the part names and functions of EZ-0009 Development Kit.
The part names described in this chapter are used throughout this document. This chapter provides an overview of the various functions. Reading it through, the reader will gain a basic of EZ-0009. While reading this chapter, also check if the hardware has a defect.

2.1 Names of Supplied Hardware

Figure 2-1 shows the names of hardware supplied with EZ-0009.

Figure 2-1 Names of Supplied Hardware

Simple On-chip debug emulator (EZ-0009-Emulator)



Target board (QB-78F8025-TB)

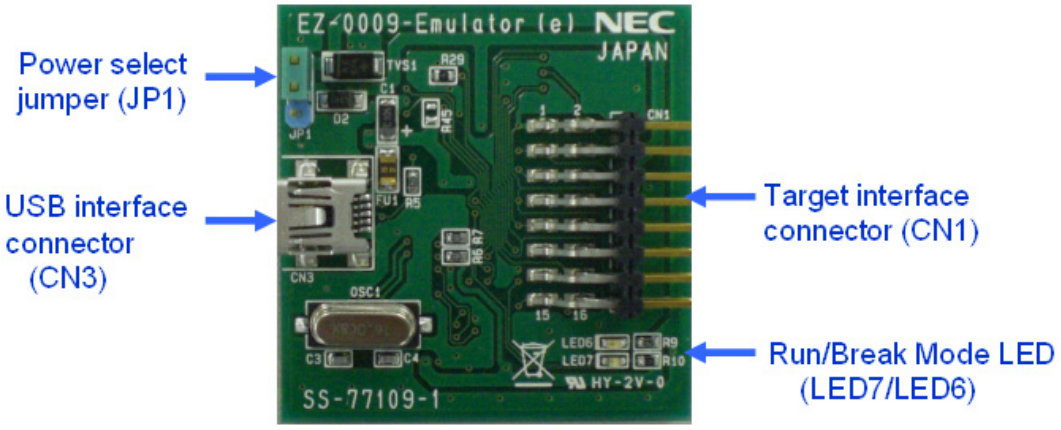
16pin Target cable

USB cable

2.2 Part Names and Functions of Simple On-chip debug emulator (EZ-0009-Emulator)

Figure 2-2 shows the part names of the Simple on-chip debug emulator (EZ-0009-Emulator). For their functions, refer to (1) to (4) below.

Figure 2-2 Part Names of Simple On-chip debug emulator (EZ-0009-Emulator)



(1) Power select jumper (JP1)

This jumper is used to set the power supplied to the target system. Table 2-1 describes the setting details. This jumper is set to "1-2 pin short" at shipment.

Table 2-1 Setting of Power select jumper

Setting	Description
1-2pin short	5V is supplied from EZ-0009-Emulator to the target system. (for VDD/CVDD of uPD78F8024,uPD78F8025)
2-3pin short	Power supply of the target system is used.

(2) USB Interface connector (CN3)

This is a connector used to connect EZ-0009-Emulator with the host machine, via a USB cable.

(3) Target interface connector (CN1)

This is a connector used to connect EZ-0009-Emulator with the target system, via a 16-pin target cable.

Since this connector is compatible with 16-core 2.54 mm pitch general-purpose connectors, a commercially available cable can be substituted.

(4) Run/Break Mode LED (LED7/LED6)

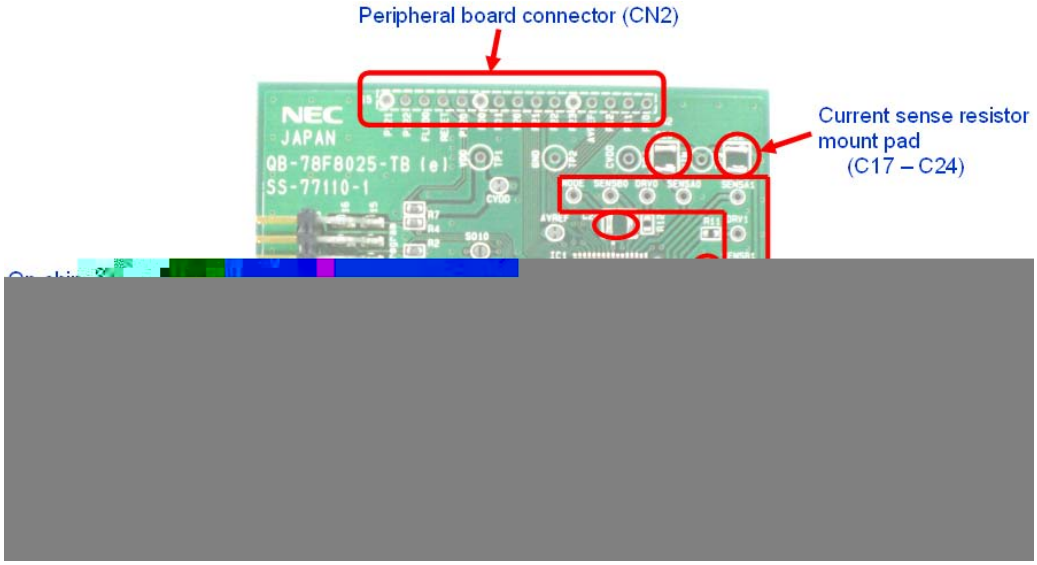
Run mode : Run LED (LED7:Green) is turned on.

Break mode : Break LED (LED6:Red) is turned on.

2.3 Part Names and Functions of Target Board (QB-78F8025-TB)

Figure 2-3 shows the part names of the Target board (QB-78F8025-TB).
For their functions, refer to (1) to (6) below.

Figure 2-3 Part Names of Target board (QB-78F8025-TB)



(1) On-chip debug interface connector (CN3)
This is a connector used to connect QB-78F8025-TB with EZ-0009-Emulator, via a 16-pin target cable.

(2) Peripheral board connector (CN1/CN2)
These are connectors for external board connection (2.54mm pitch). All I/O ports except for constant current drive port of uPD78F8025 are connected.

(3) Connector for external constant current drive circuit
(MODE/SENSB0/DRV0/SENSA0/SANSA1/DRV1/SENSB1/SENSB2/
DRV2/SENSA2/SENSA3/DRV3/SENSB3)
Constant current drive ports of uPD78F8025 such as SENSAn, SENSBn, DRVn are connected. (n: 0-3)

(4) Current sense resistor mount pad (C17/C18/C19/C20/C21/C22/C23/C24)
These pads are mount pattern for current sense resistor.
When using Boost mode of uPD78F8025, current sense resistor should be mounted to the pad connected to SENSBn. When using Buck mode of uPD78F8025, current sense resistor should be mounted to the pad connected to SENSAn.

(5) Resonator (OSC1)

This board is using 8MHz ceramic resonator for main clock of uPD78F8025. Need to connect 8MHz resonator as main clock when on-chip debug is used.

(6) Power LED (LED1)

This LED (Red) is turned on when power is supplied.

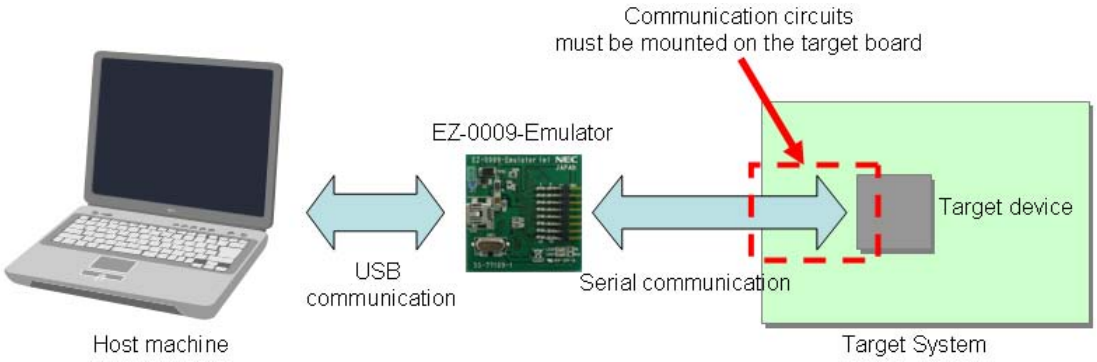
Chapter3 How to Use

This chapter describes how to use EZ-0009 when performing on-chip debugging and flash programming.
To perform on-chip debugging for uPD78F8025 microcontroller, a specific program (debug function) must be downloaded to the microcontroller, and then debug the microcontroller mounted on the target system.
Flash programming is a method to write a program to the flash memory embedded in a microcontroller. Erasing and writing the program can be performed on-board with the microcontroller.

3.1 Target System Design

This section describes the target system circuit design required for on-chip debugging and flash programming.
Figure 3-1 present an overview of the EZ-0009-Emulator communication interface.
As shown on the figure, EZ-0009-Emulator performs serial communication with the target microcontroller on the target system. For this communication, communication circuits must be mounted on the target system. Refer to this section to design circuits appropriately.

Figure 3-1 Outline of Communication Interface



* Communication circuits are mounted on Target board (QB-78F8025-TB)

3.1.1 Pin assignment

This section describes the interface signals used between EZ-0009-Emulator and the target system. Table 3-1 describes the pin assignment. Table 3-2 describes the functions of each pin.

Table 3-1 Pin Assignment

Pin No.	Pin Name	Pin No.	Pin Name
1	GND	9	R.F.U.
2	RESET_OUT	10	R.F.U.
3	RxD	11	R.F.U.
4	VDD	12	R.F.U.
5	TxD	13	R.F.U.
6	R.F.U.	14	FLMD0
7	R.F.U.	15	RESET_IN
8	R.F.U.	16	R.F.U.

Table 3-2 Pin Functions

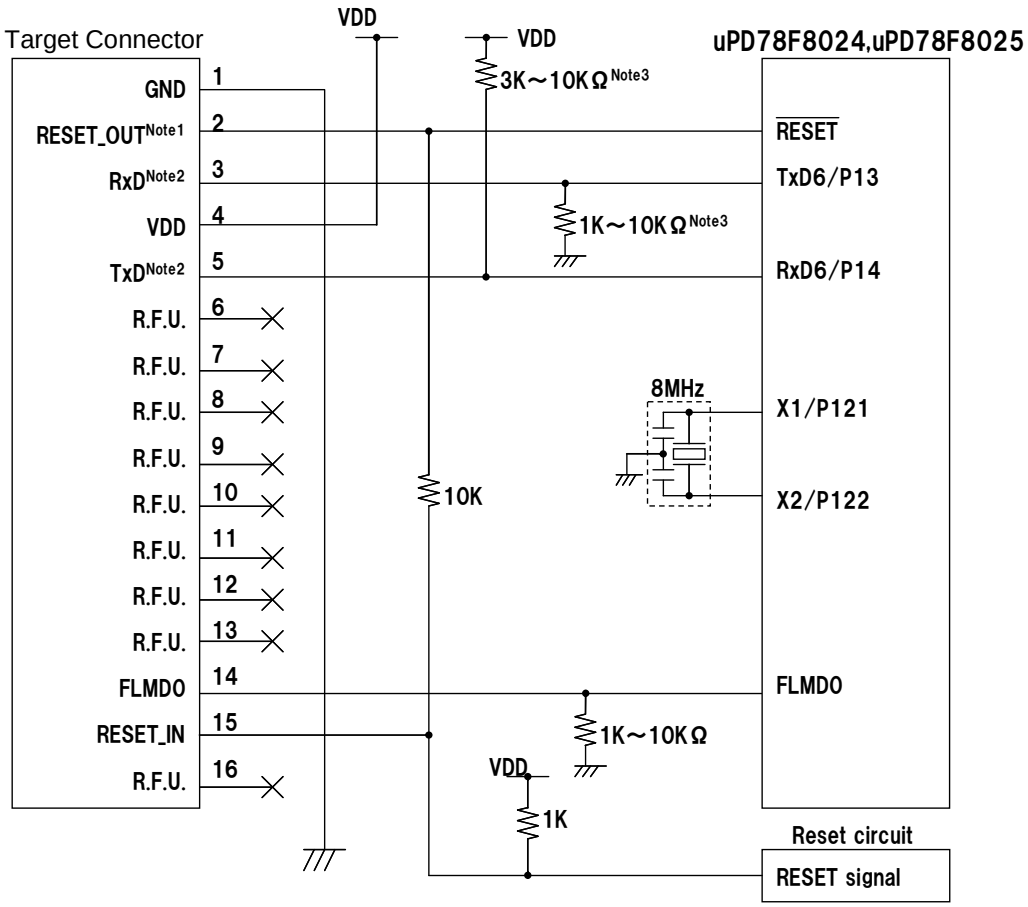
Pin Name	IN/OUT	Description
RESET_IN	IN	Pin used to input reset signal from the target system
RESET_OUT	OUT	Pin used to output reset signal to the target microcontroller
FLMD0	OUT	Pin used to set the target microcontroller to debug mode or programming mode
RxD	IN	Pin used to receive command / data from the target microcontroller
TxD	OUT	Pin used to transmit command / data to the target microcontroller

3.1.2 Circuit connection example

Figure 3-2 shows circuit connection example.

Note The value described in the circuit connection example is reference value.

Figure 3-2 Circuit Connection Example



Note1. This connection is designed assuming that the RESET signal is output from an N-ch open-drain buffer (output resistance: 100Ohm or less).

Note2. Connect TxD (transmit side) of the target microcontroller to RxD (receive side) of the target connector, and TxD (transmit side) of the target connector to RxD (receive side) of the target microcontroller.

Note3. This is for pin processing when not used as a microcontroller.

3.2 Simple On-chip debugging

This section describes the system configuration, startup procedure for debugging when simple on-chip debugging is performed with EZ-0009-Emulator.

3.2.1 Debug functions

Table 3-3 lists the debug functions of this development kit.

Table 3-3 Debug Functions

Functions	Specifications
Security ID	Unavailable [Note]
Download	Available
Execution	Go & Go, Start from Here, Come Here, Restart, Step execution
Hardware break	Unavailable
Software break	2000 points
Forced break	Available except while interrupts are disabled
RAM monitoring	Unavailable
DMM (writing to memory during RUN)	Unavailable
Pin masking	Available (external reset pin only)
Time measurement (from execution start to break)	Measurement resolution : 100us Max. measurement time : Approximately 100 hours
User spaces used for debugging	Internal ROM : 902 bytes Internal RAM : 16 bytes (used as stack)
Function pins used for debugging	TxD6, RxD6
Main clock condition	Need to use external 8MHz oscillator

Note Security ID can be set on configuration dialog of ID78K0-QB-MON-HCD, but this setting is ignored.

3.2.2 Software Installation

This section describes software installation which is need for on-chip debug.

(1) Compiler Installation

- Download RA78K0, CC78K0 from following URL.
  http://www.necel.com/micro/en/solution/lighting/download.html
- Install RA78K0. PM+ (project manager) is also installed automatically.
- Install CC78K0.

(2) Device file installation

- Download DF788025 (device file for uPD78F8024, uPD78F8025) from following URL.
  http://www.necel.com/micro/en/solution/lighting/download.html
- Install device file
  Refer to user's manual included in download files for installation method.

(3) Debugger (ID78K0-QB, ID78K0-QB-MON-HCD) installation

- Download both ID78K0-QB (debugger) and ID78K0-QB-MON-HCD (debugger for EZ-0009-Emulator) from following URL.
  Both ID78K0-QB and ID78K0-QB-MON-HCD have to be installed.
  http://www.necel.com/micro/en/solution/lighting/download.html
- Install ID78K0-QB
- Install ID78K0-QB-MON-HCD

(4) USB Driver installation

- Download driver from following URL.
  http://www.necel.com/micro/en/solution/lighting/download.html
- When connecting EZ-0009-Emulator to PC by using USB cable, "Found New Hardware Wizard" dialog box is displayed.
  Select "Yes, now and every time I connect a device", and click [Next].
- Select "Install from a list or specific location (Advanced)", and click [Next].
- Select "Include this location in the search" and then click [Browse]
  Specify the folder to which download files are saved, and click [Next].
- Installation starts
  Click [Continue Anyway] while "Hardware Installation" dialog is displayed.
- Click [Finish]. Installation is complete.

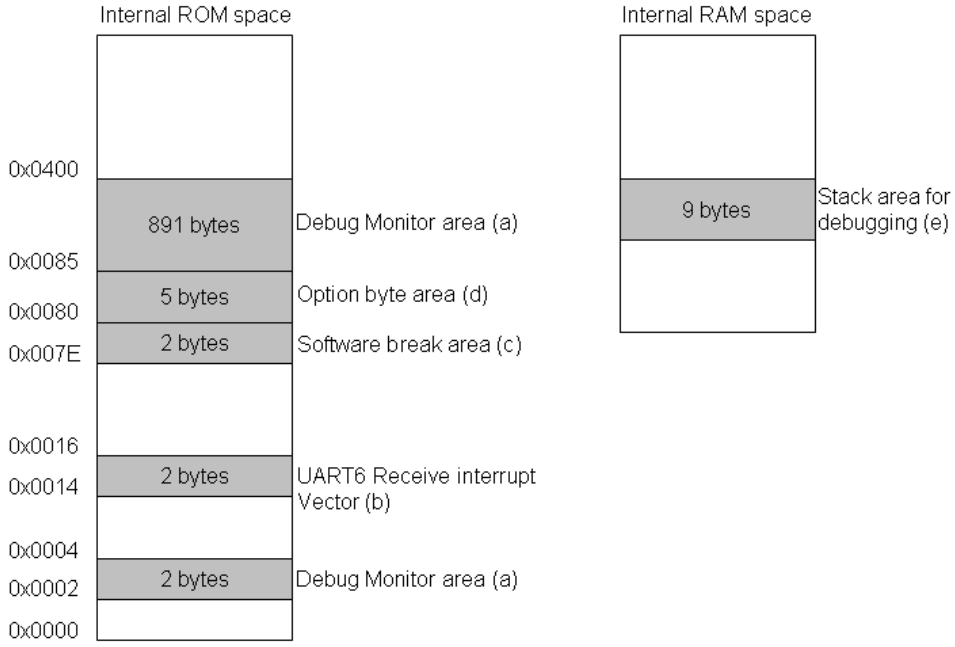
3.2.3 Securing of user resource

The user must prepare the following to perform communication between EZ-0009-Emulator and uPD78F8024, uPD78F8025 and implement each debug function.

- Secure of memory space

The shaded portions in Figure 3-3 are the areas reserved for placing the debug monitor program, so user program cannot be allocated in these spaces.

Figure 3-3 Memory spaces Where Debug Monitor Programs are allocated



(a) Debug monitor area

This area must be secured for placing the debug monitor program. In case this area is re-programmed by self-programming, on-chip debug function will not work.
This area must be filled with 0xFF.

• Assemble source example

```
------------------------------------------------------------------
SS1   CSEG AT 02H      ;"SS1" is an arbitrary symbol name (eight characters or less)
DB    0FFH, 0FFH       ;

SS2   CSEG AT 085H     ;"SS2" is an arbitrary symbol name (eight characters or less)
DB   0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,
0FFH,0FFH,0FFH,0FFH
DB   0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,
0FFH,0FFH,0FFH,0FFH                                                  } 55 lines
:
:
DB   0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,
0FFH,0FFH,0FFH,0FFH
DB   0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH
```

(b) UART6 receive interrupt vector area for Communication interface

UART6 is used for on-chip debug communication interface. The setting of TxD6 and RxD6 pin of UART6 is executed by debug monitor program. In case the setting of UART6 is changed by user program, debug communication will be incorrect and error will be occurred.
Therefore, in user program, it needs to secure UART6 interrupt vector area.
This area must be filled with 0xFF.

• Assemble source example

```
------------------------------------------------------------------------------
SS3   CSEG AT 014H     ;"SS3" is an arbitrary symbol name (eight characters or less)
DB    0FFH, 0FFH       ;
```

(c) Software break area

This area is used for software break.
This area must be filled with 0xFF.

• Assemble source example

```
--------------------------------------------------------------------------------
SS4   CSEG AT 07EH      ;"SS4" is an arbitrary symbol name (eight characters or less)
DB    0FFH, 0FFH        ;
```

(d) Option byte area

This area is for option byte area.
This area must be filled with 0x00.
(Watchdog timer and POC cannot be emulated by this debugger)

• Assemble source example

```
--------------------------------------------------------------------------------
SS5   CSEG AT 080H      ;"SS5" is an arbitrary symbol name (eight characters or less)
DB    00H, 00H, 00H, 00H, 00H
```

(e) Stack area for debugging

This area is used for stack area (7 bytes to 9 bytes). Since this area is allocated immediately before the stack area that is used by the user program, the address of this area varies depending on the stack increase and decrease. Therefore, the stack pointer must be set by making allowances for the stack size used for debugging.
Refer to the address range shown below and set the stack pointer.

Example When internal high-speed RAM starts from 0xFD00
Within the range 0xFD10 to 0xFEDF

3.2.4 System startup procedure

This section describes the system startup procedure.
Observe the following order.

(1) Jumper setting
Set the power select jumper (JP1) of EZ-0009-Emulator by referring to table 3-4.

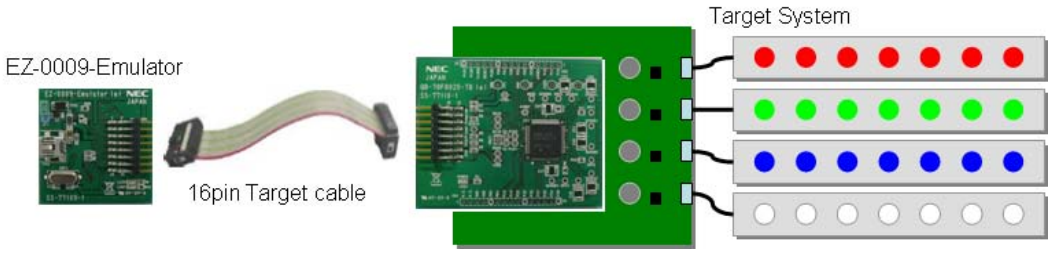
Caution Do not change the jumper setting while the USB cable is connected.

Table3-4 Setting of Power Select Jumper (JP1)

Setting	Description
1-2pin short	5V is supplied from EZ-0009-Emulator to the target system. (for VDD/CVDD of uPD78F8024,uPD78F8025)
2-3pin short	Power supply of the target system is used.

(2) Connecting the target system
Connect EZ-0009-Emulator to the target system as shown in Figure 3-4.

Figure3-4 Connecting EZ-0009-Emulator to Target System



(3) Connecting the USB cable
Connect EZ-0009-Emulator to the host machine as shown in Figure 3-5.

Figure3-5 Connecting EZ-0009-Emulator to Host machine

(4) Applying power to target system

Turn on power to the target system.

In case Power select jumper is set to "1-2pin short": provide Vin power supply

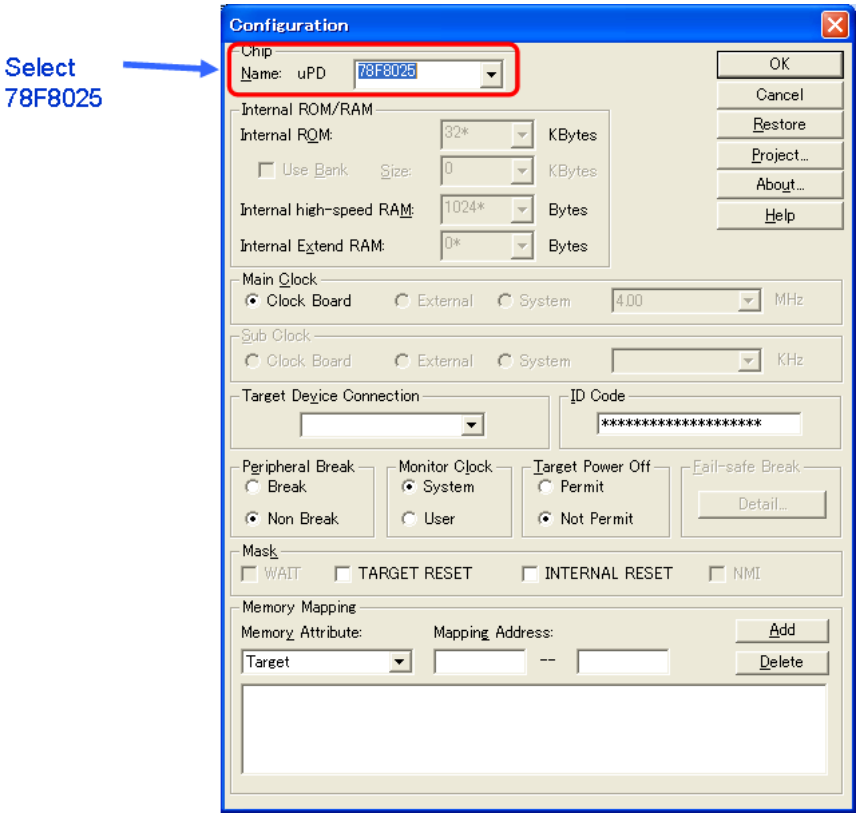
In case Power select jumper is set to "2-3pin short": provide Vin,VDD,CVDD power supply

(5) Debugger startup

Start the debugger (ID78K0-QB-MON-HCD).

Select 78F8024 or 78F8025 as microcontroller name in Configuration window as shown in Figure 3-6.

Figure 3-6 Configuration window



Note ID78K0-QB-MON-HCD is used as debugger in this development kit. Operation of debugger is same as ID78K0-QB.

For the operation after this step, refer to the user's manual for the debugger (ID78K0-QB). If the debugger does not start normally or the operation is unstable, the possible causes may be the following.

- Communication error between EZ-0009-Emulator and target system
- The user resource has not been secured
- Unsupported software (debugger, device file, or firmware) is used
- Defect of EZ-0009-Emulator

3.2.5 Caution on debugging

(1) Use external 8MHz oscillator as main system clock for debugging.

(2) Forced break cannot be used during following status is kept.
When forced break is executed, "monitor timeout error*" will occur.
- During DI (disable interrupt) status

(3) UART6 is used for on-chip debug communication interface. So UART6 cannot be used during debugging mode. When control registers related to UART6 is changed, "monitor timeout error*" will occur. Do not change any control registers / flags related to UART6 shown below.

Control Register / Flag Name	Symbol
Asynchronous serial interface operation mode register 6	ASIM6
Asynchronous serial interface reception error status register 6	ASIS6
Asynchronous serial interface transmission status register 6	ASIF6
Clock selection register 6	CKSR6
Baud rate generator control register 6	BRGC6
Asynchronous serial interface control register 6	ASICL6
Input switch control register	ISC
Port mode register 1	PM13 PM14
Port register 1	P13
Interrupt Request Flag	SREIF6 SRIF6 STIF6
Interrupt Mask Flag	SREMK6 SRMK6 STMK6
Interrupt Priority Specification Flag	SREPR6 SRPR6 STPR6

(4) Disables watchdog timer operation (illegal access detection operation) by option byte.

(5) Following debug function cannot be used
- Hardware break (before Run/access break)
- Uninitialized Stack Pointer detection Break
- Peripheral Break (Stop the peripheral emulation function of emulator during a break)
- Mask the Internal Reset signal

* Especially need to pay attention to peripheral break. Peripheral functions like Timer do not stop during break. So multiple interrupts may happen from peripheral functions during break, and when restart the program pending multiple interrupts may be acknowledged at the same time.

(6) RRM (Real-time RAM monitor) and DMM (Dynamic Memory Modification) cannot be used.
Setting itself by ID78K0-QB-MON-HCD is possible, but "monitor timeout error*" will occur.
When RRM or DMM is set on ID78K0-QB-MON-HCD, debugger will hang up.
In case such status is occurred, close debugger without saving project, and start debugger again.

(7) Security ID
Security ID can be set on configuration dialog of ID78K0-QB-MON-HCD, but this setting is ignored.

(8) Emulation of POC function
POC function cannot be emulated. Do not turn off the power supply for target system during debug mode.

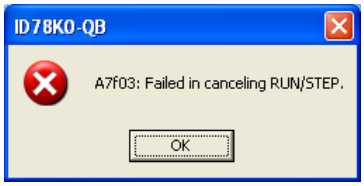
(9) Operation after reset
After an external pin reset, the monitor program performs debug initialization processing. Consequently, stop the user program execution.

(10) Flash self-programming
If a space where the debug monitor program is allocated is rewritten by flash self programming, the debugger can no longer operate normally.

(11) Cause where debugger operation speed is degraded
The debugger operation speed may be degraded in following conditions.

- When too many contents of the memory or registers are displayed in a debugger window.
- When using a host machine with USB 1.1 interface.
- While flash memory is being rewritten.

* Monitor timeout error
When monitor timeout error is occurred, following message is displayed. In case such status is occurred, close debugger without saving project, and start debugger again.



3.3 Simple Flash Programming

This section describes the system startup procedure when executing flash memory programming to uPD78F8024, uPD78F8025 by using EZ-0009-Emulator.
Observe the following order.
Use this simple flash programming function by using EZ-0009-Emulator only for evaluation in your system development.

3.3.1 Software Installation

This section describes software installation which is need for simple flash programming.

(1) Programmer (WriteEZ5) setup

- Download WriteEZ5 and parameter file (PRM78F8025) from following URL.
  * WriteEZ5 can be used for uPD78F8024, uPD78F8025.
  http://www.necel.com/micro/en/solution/lighting/download.html
- Decompress the downloaded pack.

(2) USB driver installation

- Download driver from following URL.
  http://www.necel.com/micro/en/solution/lighting/download.html
- When connecting EZ-0009-Emulator to PC by using USB cable, "Found New Hardware Wizard" dialog box is displayed.
  Select "Yes, now and every time I connect a device", and click [Next].
- Select "Install from a list or specific location (Advanced)", and click [Next].
- Select "Include this location in the search" and then click [Browse]
  Specify the folder to which download files are saved, and click [Next].
- Installation starts
  Click [Continue Anyway] while "Hardware Installation" dialog is displayed.
- Click [Finish]. Installation is complete.

3.3.2 Flash Programming Procedure

This section describes the flash programming procedure.
Observe the following order.

(1) Jumper setting
Set the power select jumper (JP1) of EZ-0009-Emulator by referring to table 3-5.

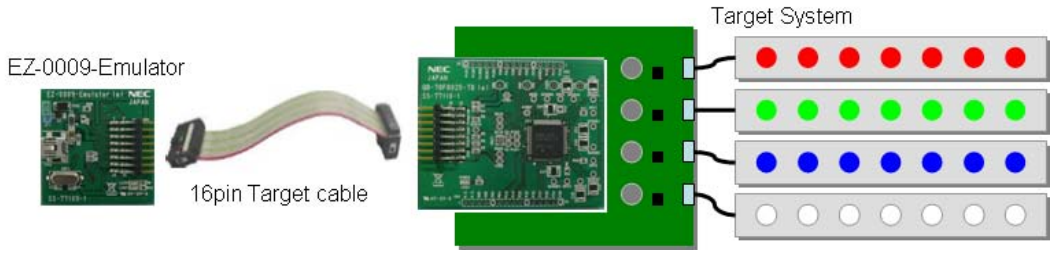
Caution Do not change the jumper setting while the USB cable is connected.

Table3-5 Setting of Power Select Jumper

Setting	Description
1-2pin short	5V is supplied from EZ-0009-Emulator to the target system. (for VDD/CVDD of uPD78F8024,uPD78F8025)
2-3pin short	Power supply of the target system is used.

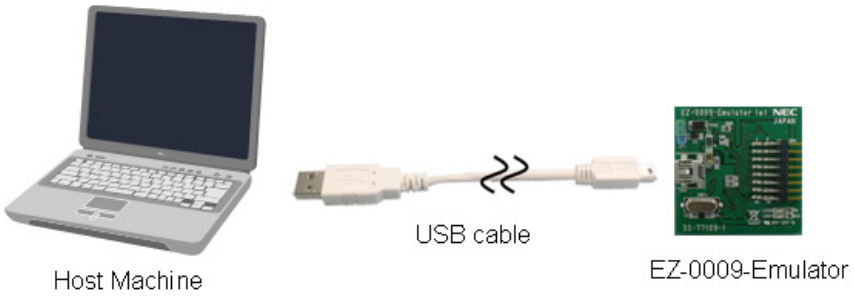
(2) Connecting the target system
Connect EZ-0009-Emulator to the target system as shown in Figure 3-7.

Figure3-7 Connecting EZ-0009-Emulator to Target System



(3) Connecting the USB cable
Connect EZ-0009-Emulator to the host machine as shown in Figure 3-8.

Figure3-8 Connecting EZ-0009-Emulator to Host machine



(4) Applying power to target system

Turn on power to the target system.

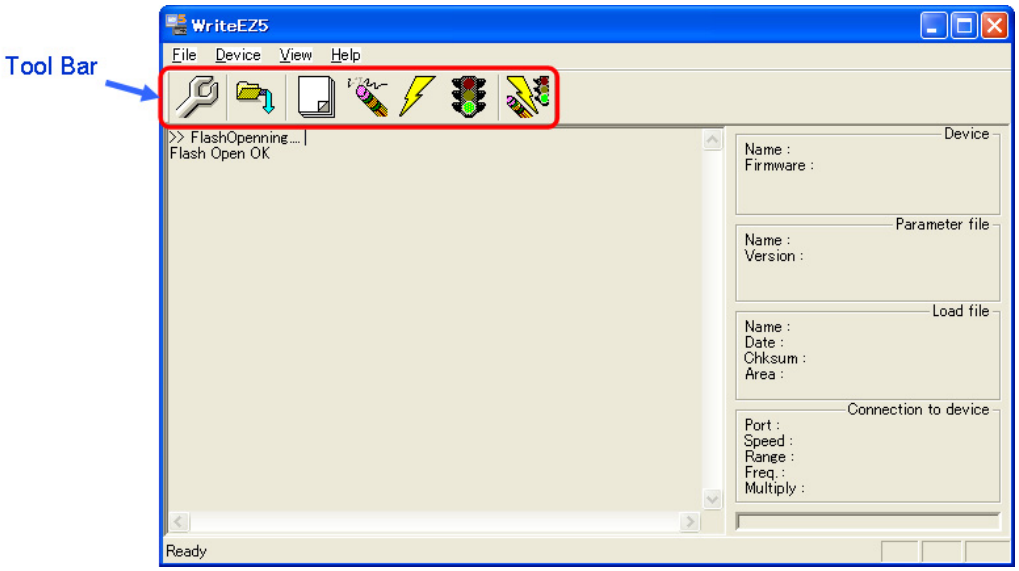
In case Power select jumper is set to "1-2pin short": provide Vin power supply

In case Power select jumper is set to "2-3pin short": provide Vin,V_{DD},CV_{DD} power supply

(5) WriteEZ5 startup

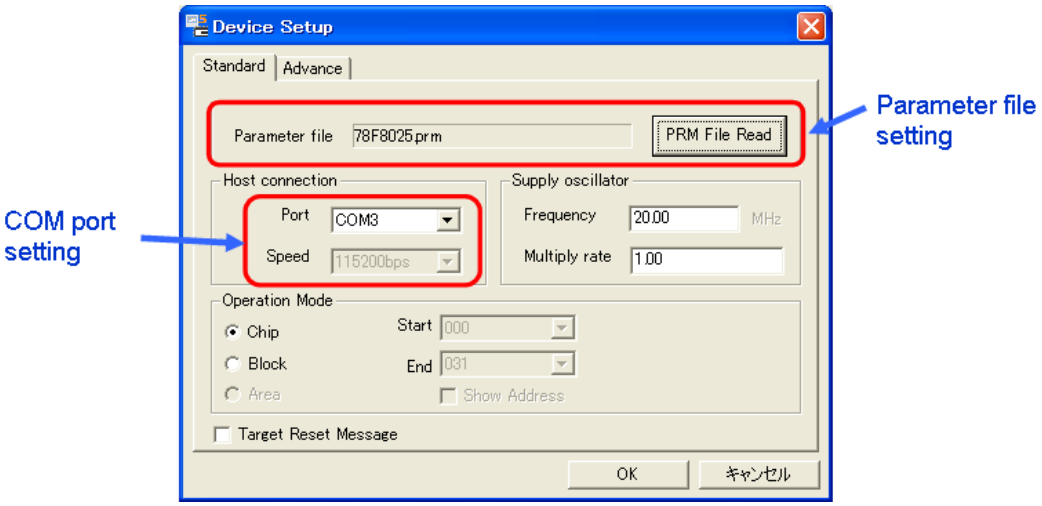
Start the simple flash programming soft (WriteEZ5).

Figure 3-9 WriteEZ5 main window



(6) Set the parameter file (78F8024.prm or 78F8025.prm) on [Setup] dialog, and set COM port.

Figure 3-10 Setup dialog



(7) Click [Load] to select the HEX file to be programmed.

(8) Click [Autoprocedure] to do flash programming.

(9) Close "WriteEZ5"

(10) Disconnect USB cable