

## Microcontroller Technical Information

<b>QB-78K0SKX1MINI</b> In-Circuit Emulator for Low Pin Count Microcontrollers 78K0S/KA1+, 78K0S/KB1+, 78K0S/KU1+, 78K0S/KY1+  Usage Restrictions		Document No.	ZBG-CD-07-0052	1/1
		Date issued	August 28, 2007	
		Issued by	Development Tool Solution Group Multipurpose Microcomputer Systems Division Microcomputer Operations Unit NEC Electronics Corporation	
Related documents	QB-78K0SKX1MINI User's Manual: U17272EJ4V0UM00	Notification classification	√	Usage restriction
				Upgrade
				Document modification
				Other notification

### 1. Affected product

Product	Outline	Control Code <sup>Note</sup>
QB-78K0SKX1MINI	In-circuit emulator for low pin count microcontrollers 78K0S/KA1+, 78K0S/KB1+, 78K0S/KU1+, 78K0S/KY1+	A, B

### 2. New restriction

Restriction No. 3 and specification No. 2 have been added. See the attachment for details.

### 3. Workaround

See the attachment for details.

### 4. Modification schedule

Product in which No. 3 is corrected is scheduled for release as follows.

Upgrade for already shipped products: Available from September 10, 2007

\* Note that this schedule is subject to change without notice. For the detailed release schedule of modified products, contact an NEC Electronics sales representative.

### 5. List of restrictions

See the attachment.

### 6. Document revision history

Document Number	Issued on	Description
ZBG-CD-05-0024	March 28, 2005	Newly created
ZBG-CD-07-0052	August 28, 2007	Control code A, B

**Note** The "control code" is the second digit from the left in the 10-digit serial number.

If the product has been upgraded, the control code can be checked in the About dialog box in the ID78K0S-QB.

"X" in version information "MINICUBE \*\*\*\* X F/W: V\*.\*\*" is the control code.

## Operating Precautions for QB-78K0SKX1MINI

This document describes restrictions and cautions applicable only to the emulator and restrictions and cautions that are planned for correction in the emulator.

Refer to the following documents for the restrictions in the target device.

- User's manual of target device
- Restrictions notification document for target device

Also refer to the user's manual of the emulator for cautions on using the emulator.

### 1. Product Version

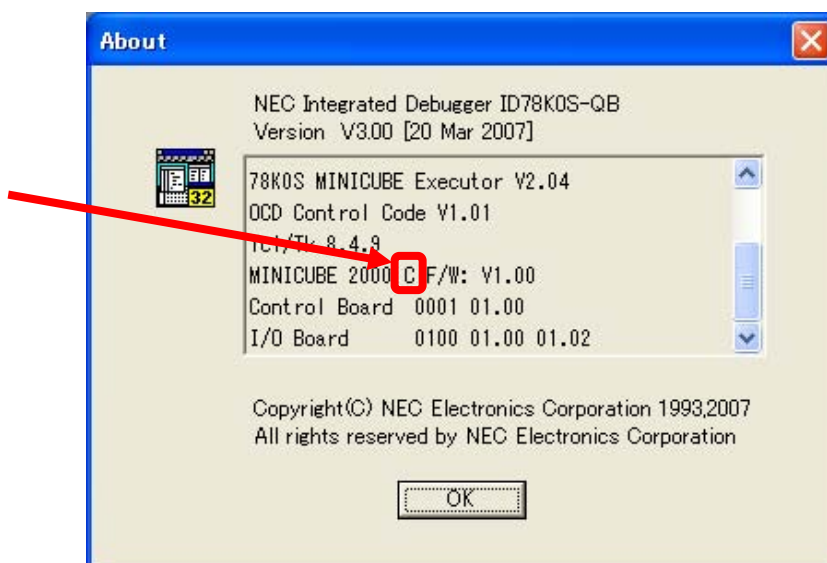
Part number: QB-78K0SKX1MINI

Control Code <sup>Note</sup>	Remark
A	—
B	Correction of bug No. 1
C	Addition of specification No. 2 and correction on bug No. 3

**Note** The “control code” is the second digit from the left in the 10-digit serial number.

If the product has been upgraded, the control code can be checked by selecting [About] from the [Help] menu while the ID78K0S-QB is running.

“X” in version information “MINICUBE \*\*\*\* X F/W: V\*.\*\*\*” is the control code.



## 2. Product History

No.	Bugs and Changes/Additions to Specifications	Control Code		
		A	B	C
1	Debugger hangs up after execution of STOP instruction	×	○	○
2	Addition of support for $\mu$ PD78F9500, $\mu$ PD78F9501 and $\mu$ PD78F9502 (restriction partially applies)	–	–	○
3	A program does not stop at a software breakpoint	×	×	○

–: Addition or change of specification not implemented, ×: Bug not corrected, ○: Bug corrected or addition or change of specification implemented.

## 3. Details of Bugs and Added Specifications

### No. 1 Debugger hangs up after execution of STOP instruction

#### [Description]

Regarding the standby release conditions after a STOP instruction is executed, if an arbitrary interrupt mask flag is cleared to 0 while an interrupt enable flag is 0 (by executing the DI instruction), an interrupt is generated (interrupt request flag = 1), then the STOP instruction is executed, the standby state is not released and the debugger hangs up. Moreover, the standby state is not released even if a standby release signal is generated due to another interrupt request, and the debugger hangs up.

**Example 1** A standby release signal is generated due to INTP0 immediately before executing a STOP instruction while interrupts are disabled

```
DI           ; Disables interrupts
SET1 PIF0   ; Sets INTP0 interrupt request flag
CLR1 PMK0   ; Clears masking of INTP0 interrupt
SET1 P2.0   ; Sets port 20 to "1"
STOP        ; Enters STOP mode
CLR1 P2.0   ; Clears port 20 to "0" (not executed)
```

The same situation occurs when a standby release signal is generated while interrupts are enabled and an instruction that holds interrupt requests pending is executed immediately before a STOP instruction.

**Example 2** A standby release signal is generated due to INTP0 immediately before executing a STOP instruction while interrupts are enabled

```
EI           ; Enables interrupts
SET1 P2.0   ; Sets port 20 to "1"
SET1 PIF0   ; Sets interrupt request flag
CLR1 PMK0   ; Executes an instruction that holds interrupt requests pending
                ; immediately before executing a STOP instruction
STOP        ; Enters STOP mode
CLR1 P2.0   ; Clears port 20 to "0" (not executed)
```

**Remark** Instructions that hold interrupt requests pending

- Instructions that perform writing to the interrupt request flag register (IF0 or IF1)
- Instructions that perform writing to the interrupt mask flag register (MK0 or MK1)

[Workaround]

Be sure to set the interrupt enable flag to 1 (EI instruction) before executing a STOP instruction. Moreover, do not execute an instruction that holds interrupt requests pending immediately before executing the STOP instruction.

**Example** Execute an EI instruction immediately before executing the STOP instruction

```
DI                ; Disables interrupts
SET1 PIF0        ; Sets INTP0 interrupt request flag
CLR1 PMK0        ; Clears masking of INTP0 interrupt
SET1 P2.0        ; Sets port 20 to "1"
EI               ; Enables interrupts
STOP             ; Enters STOP mode
CLR1 P2.0        ; Clears port 20 to "0" (executed)
```

**Remark** In the case that an interrupt occurs immediately before a STOP instruction, the interrupt request flag is cleared before executing the STOP instruction. To release the STOP mode, therefore, another interrupt must be generated.

[Correction]

This issue has been corrected in QB-78K0SKX1MINI with control code B and later.

No. 2 Addition of support for  $\mu$ PD78F9500,  $\mu$ PD78F9501 and  $\mu$ PD78F9502 (restriction partially applies)

[Description]

The  $\mu$ PD78F9500,  $\mu$ PD78F9501 and  $\mu$ PD78F9502 are now supported.

[Restriction]

When debugging the  $\mu$ PD78F9500,  $\mu$ PD78F9501 or  $\mu$ PD78F9502 as the target device, the operation resulting from the settings of the P34/RESET pin differs between the device and the QB-78K0SKX1MINI, as follows.

(1) Bit 4 (PU34) of pull-up resistor option register (PU3): Operation differs between the device and the QB-78K0SKX1MINI.

PU34	Selection of on-chip pull-up resistor connected to P34	
	Device	QB-78K0SKX1MINI
0	On-chip pull-up resistor is not connected	On-chip pull-up resistor is not connected
1	On-chip pull-up resistor is connected	On-chip pull-up resistor is connected

(2) ENPU34 of option byte: Operation differs between the device and the QB-78K0SKX1MINI.

ENPU34	Selection of on-chip pull-up resistor connected to $\overline{\text{RESET}}$ pin	
	Device	QB-78K0SKX1MINI
1	On-chip pull-up resistor is connected to $\overline{\text{RESET}}$ pin	On-chip pull-up resistor is not connected to $\overline{\text{RESET}}$ pin
0	On-chip pull-up resistor is not connected $\overline{\text{RESET}}$ pin	On-chip pull-up resistor is not connected to $\overline{\text{RESET}}$ pin

No. 3 A program does not stop at a software breakpoint

[Description]

A program does not stop at a software breakpoint that is set to an instruction following the instruction whose instruction code is  $0A0Axx$ . Moreover, the instruction is not executed correctly.

Example: Assemble window display

```
*   0180  0A0A0D  SET1 P13.0H
B   0183  0A5A04 SET1 P4.5H ←
*   0186  0A3A0C  SET1 P12.3H
```

A program does not stop at this breakpoint because the instruction code immediately before this instruction is  $0A0Axx$ . Moreover, this instruction is not executed correctly.

[Workaround]

There is no workaround.

[Correction]

This issue will be corrected in QB-78K0SKX1MINI with control code C and later.

## 4. Cautions

### 4.1 General cautions on handling this product

#### 4.1.1 Circumstances not covered by product guarantee

- If the product was disassembled, altered, or repaired by the customer
- If it was dropped, broken, or given another strong shock
- Use at overvoltage, use outside guaranteed temperature range, storing outside guaranteed temperature range
- If power was turned on while the power supply unit, USB cable, or target system connection was in an unsatisfactory state
- If the power supply cable, USB cable, target cable, or the like was bent or pulled excessively
- If a power supply unit other than the one supplied with the product is used
- If the product got wet
- If the product and target system were connected while a potential difference existed between the GND of the product and the GND of the target system
- If a connector or cable was removed while the power was being supplied to the product
- If an excessive load was placed on a connector or socket

#### 4.1.2 Safety precautions

- If used for a long time, the product may become hot (50°C to 60°C). Be careful of low temperature burns and other dangers due to the product becoming hot.
- Be careful of electrical shock. There is a danger of electrical shock if the product is used as described above in **4.1.1 Circumstances not covered by product guarantee**.
- The AC adapter supplied with the product is exclusively for this product, so do not use it with other products.

### 4.2 Caution on debugger and device file versions

Use ID78K0S-QB V3.00 or later, or  $\mu$ PDF789234 V3.10 or later with the QB-78K0SKX1MINI control code C or later.

## 5. Corrections to User's Manual

Corrections to the *QB-78K0SKX1MINI User's Manual* (document number: U17272EJ, 4th edition) are described below.

### Correction of restrictions

- Location  
*CHAPTER 4 RESTRICTIONS* on page 32
- Description

#### Before correction:

- When the  $\mu$ PD78F950x is selected as the target device, the P34/RESET pin is subject to the following restrictions.  
The QB-78K0SKX1MINI is not pulled up even if bit 4 (PU34) of the pull-up resistor option register (PU3) is set to "Connect internal pull-up resistor". Neither is it pulled up if bit 4 (RPRCE) of the option byte is set to "Connect internal pull-up resistor".
- Clock oscillation or clock input via a resonator on the target system is not supported. The clock differs between the device and the tool (QB-78K0SKX1MINI) according to the option byte (OSCSEL1, OSCSEL0) setting as follows.

When the target device is other than the  $\mu$ PD78F950x

Option Byte		Device	Tool
OSCSEL1	OSCSEL0		
0	0	Crystal/ceramic oscillation clock	System clock on QB-78K0SMINI
0	1	External clock input	System clock on QB-78K0SMINI
1	x	Internal high-speed oscillation clock	Internal high-speed oscillation clock of QB-78K0SMINI

When the target device is the  $\mu$ PD78F950x

Option Byte		Device	Tool
OSCSEL1	OSCSEL0		
0	0	Internal high-speed oscillation clock	Setting prohibited
0	1	External clock input	System clock on QB-78K0SMINI
1	x	Internal high-speed oscillation clock	Internal high-speed oscillation clock of QB-78K0SMINI

After correction:

- When the  $\mu$ PD78F950x is selected as the target device, the P34/ $\overline{\text{RESET}}$  pin is subject to the following restrictions.

The QB-78K0SKX1MINI is not pulled up even if bit 4 (PU34) of the pull-up resistor option register (PU3) is set to “Connect internal pull-up resistor”. Neither is it pulled up if bit 4 (ENPU34) of the option byte is set to “Connect internal pull-up resistor to the  $\overline{\text{RESET}}$  pin”.

- Clock oscillation or clock input via a resonator on the target system is not supported. The clock differs between the device and the tool (QB-78K0SKX1MINI) according to the option byte (OSCSEL1, OSCSEL0) setting as follows.

When the target device is other than the  $\mu$ PD78F950x

Option Byte		Device	Tool
OSCSEL1	OSCSEL0		
0	0	Crystal/ceramic oscillation clock	System clock on QB-78K0SMINI
0	1	External clock input	System clock on QB-78K0SMINI
1	x	Internal high-speed oscillation clock	Internal high-speed oscillation clock of QB-78K0SMINI

When the target device is the  $\mu$ PD78F950x

Option Byte		Device	Tool
OSCSEL1	OSCSEL0		
0	0	Setting prohibited	Setting prohibited
0	1	External clock input	System clock on QB-78K0SMINI
1	x	Internal high-speed oscillation clock	Internal high-speed oscillation clock of QB-78K0SMINI