

# Microcontroller Technical Information

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IE-789468-NS-EM1 Emulation Board for Microcontrollers $\mu$ PD78932x, $\mu$ PD78946x, $\mu$ PD17932x  Usage Restrictions		Document No.	ZBG-CD-06-0082	1/2
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		Issued by	Development Tool Group Multipurpose Microcomputer Systems Division 4th Systems Operations Unit NEC Electronics Corporation	
Related documents	IE-789468-NS-EM1 User's Manual: U16482EJ1V0UM00	Notification classification	<input checked="" type="checkbox"/> Usage restriction <input type="checkbox"/> Upgrade <input type="checkbox"/> Document modification <input type="checkbox"/> Other notification	

## 1. Affected product

Product	Outline	Control Code <sup>Note</sup>
IE-789468-NS-EM1	Emulation board for microcontrollers $\mu$ PD78932x, $\mu$ PD78946x, $\mu$ PD17932x	A, B, C, D

## 2. Restriction details

Restriction No. 7 has been added. See the attachment for details.

## 3. Workaround

See the attachment for details.

## 4. Modification schedule

Products in which No. 7 is modified are scheduled for release as follows.

Newly shipped products: From the shipment of October 2006 (control code<sup>Note</sup>: D)  
 Upgrade for already shipped products: Available from October 10, 2006

\* 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.

**Note** The "control code" is the second digit from the left in the 10-digit serial number starting with E. If the product has been upgraded, a label indicating the new version is attached to the product and the x in V-UP LEVEL x on this label indicates the control code.

## 6. Document revision history

Document Number	Date Issued	Description
SBG-TT-0052-E	December 25, 2001	Addition of bug (No. 3)
SBG-TT-0122-E	June 5, 2002	Addition of bug (No. 4)
SBG-DT-04-0123	April 2, 2004	Classification of No. 2, No. 4, and No. 5 as restrictions Addition of specification (No. 6)
ZBG-CD-06-0082	September 27, 2006	Addition of bug (No. 7)

## Notes on Using IE-789468-NS-EM1

This document describes restrictions applicable only to the emulator and restrictions 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: IE-789468-NS-EM1

Control Code <sup>Note</sup>	Remark
A	Emulation CPU $\mu$ PD78F9328 V1.2
B	Emulation CPU $\mu$ PD78F9328 V1.3
C	Emulation CPU $\mu$ PD78F9328 V1.31/ $\mu$ PD78F9468 E1.3
D	Emulation CPU $\mu$ PD78F9328 V1.31/ $\mu$ PD78F9468 E1.4

**Note** The "control code" is the second digit from the left in the 10-digit serial number starting with E. If the product has been upgraded, a label indicating the new version is attached to the product and the x in V-UP LEVEL x on this label indicates the control code.

### 2. Product History

No.	Bugs and Changes/Additions to Specifications	Control Code			
		A	B	C	D
1	Bug in port 4 operation	×	√	√	√
2	Restriction on low-voltage emulation of $\mu$ PD78932x or $\mu$ PD17932x microcontroller	Permanent restriction			
3	Bug in LCD emulation of $\mu$ PD78932x or $\mu$ PD179327 microcontroller	×	×	√	√
4	Restrictions on LCD emulation of $\mu$ PD78946x microcontroller	Permanent restriction			
5	Restrictions on LCD emulation of $\mu$ PD789327 or $\mu$ PD179327 microcontroller	Permanent restriction			
6	Addition of support for $\mu$ PD17932x microcontrollers	√	√	√	√
7	Bug in low-voltage LCD emulation of $\mu$ PD789327 or $\mu$ PD179327 microcontroller	×	×	×	√

×: Applicable, √: Not applicable

### 3. Details of Bugs and Added Specifications

#### No. 1 Bug in port 4 operation

##### [Description]

A 1 V under-shoot waveform is generated during output.

When a value is input to port 4, the input value is not read correctly and 00h is read instead.

##### [Workaround]

This bug has been corrected in control code B and later.

#### No. 2 Restriction on low-voltage emulation of $\mu$ PD78932x or $\mu$ PD179327 microcontroller

##### [Description]

If 3-wire serial communication is performed at  $V_{DD} = 1.8$  to  $2.5$  V during emulation of a  $\mu$ PD789327x or  $\mu$ PD17932x microcontroller, the SCK and SO signals are fixed at Hi level.

##### [Workaround]

Use the product with a voltage between  $2.5$  V and  $5.5$  V.

Regard this item as a permanent restriction.

#### No. 3 Bug in LCD emulation of $\mu$ PD78932x or $\mu$ PD17932x microcontroller

##### [Description]

The common and segment signals are not output with a normal waveform.

- (1) The target device can output common and segment signals only by applying (connecting) a voltage to the  $V_{LCD}$  pin. The IE-789468-NS-EM1 cannot output the common and segment signals at the  $1/3 V_{LCD}$  and  $2/3 V_{LCD}$  levels. The initial status of the common signal is  $3/3 V_{LCD} = V_{LCD}$ ,  $1/3 V_{LCD}$ , or  $2/3 V_{LCD} = GND$ , and that of the segment signal is low level.
- (2) When the target device displays the LCD at  $2.7$  to  $5.5$  V, the LCD can be displayed with the setting "no internal boost ( $VAON0 = 0$ )". In the IE-789468-NS-EM1, however, the LCD cannot be displayed unless the setting "internal boost enabled ( $VAON0 = 1$ )" is added to the program. By enabling the internal boost ( $VAON0 = 1$ ), the common and segment signals with  $1/3 V_{LCD}$  and  $2/3 V_{LCD}$  levels can be output.
- (3) When a voltage less than  $4.5$  V is applied (connected) to the  $V_{LCD}$  pin, the  $1/3 V_{LCD}$  level is not correctly output as common and segment signals.  $1/3 V_{LCD} = 1.5$  V,  $2/3 V_{LCD} = 3.0$  V

##### [Workaround]

There is no workaround.

This bug has been corrected in control code C and later.

#### No. 4 Restrictions on LCD emulation of $\mu$ PD78946x microcontroller

##### [Description]

- (1) If a voltage  $4.5$  V or higher is supplied to  $V_{DD}$  when  $GAIN = 0$ , the LCD reference voltage becomes  $0.5$  to  $1$  V higher than the expected value.
- (2) If a voltage  $3.5$  V or higher is supplied to  $V_{DD}$  when  $GAIN = 1$ , the LCD reference voltage becomes  $0.5$  to  $1$  V higher than the expected value.

**Remark**  $GAIN = 0$ :  $4.5$  V specification LCD panel,  $GAIN = 1$ :  $3$  V specification LCD panel

[Workaround]

- (1) When GAIN = 0, supply a voltage lower than 4.5 V to V<sub>DD</sub>.
- (2) When GAIN = 1, supply a voltage lower than 3.5 V to V<sub>DD</sub>.

Regard these items as permanent restrictions.

No. 5 Restrictions on LCD emulation of  $\mu$ PD789327 or  $\mu$ PD179327 microcontroller

[Description]

- (1) When V<sub>DD</sub> is V<sub>LC0</sub> or higher ( $V_{DD} \geq V_{LC0}$ ), the LCD reference voltage becomes 0.5 to 1 V higher than the expected value.
- (2) The LCD function cannot be used if V<sub>DD</sub> is lower than 2 V ( $V_{DD} < 2$  V).

**Remark** V<sub>DD</sub>: Power supply voltage (1.8 to 5.5 V), V<sub>LC0</sub>: LCD driving voltage (1.8 to 5.5 V)

[Workaround]

- (1) Emulate the LCD at V<sub>DD</sub> = V<sub>LC0</sub>.
- (2) There is no workaround.

Regard these items as permanent restrictions.

No. 6 Addition of support for  $\mu$ PD17932x microcontrollers

[Description]

The  $\mu$ PD17932x microcontrollers are now supported.

The methods for emulation CPU selection and debugging are the same as those of the  $\mu$ PD78932x microcontrollers.

No. 7 Bug in low-voltage LCD emulation of  $\mu$ PD789327 or  $\mu$ PD179327 microcontroller

[Description]

If V<sub>DD</sub> of 2 V or lower is applied while GAIN (reference voltage level selection bit) = 1 (1.0 V) and voltage boost is enabled (VAON = 1) within approximately four seconds, the voltage is not boosted (V<sub>LC0</sub> = 1 V, V<sub>LC1</sub> = 2 V, and V<sub>LC2</sub> = 3 V are not set) but becomes V<sub>LC0</sub> = V<sub>LC1</sub> = V<sub>LC2</sub> = 0 V. Consequently, the LCD display may not be output.

[Workaround]

There is no workaround.

This bug has been corrected in control code D and later.

## 4. Cautions

### (1) Read value of port 2 when the target system is not connected

Port 2 of the  $\mu$ PD78932x and  $\mu$ PD17932x microcontrollers is directly connected to a 1 M $\Omega$  pull-up resistor. When the port value is read in input mode when the target system is not connected, the value read from port 2 is 07h.

### (2) Oscillation stabilization wait time cannot be changed

The oscillation stabilization wait time of the  $\mu$ PD78932x and  $\mu$ PD17932x microcontrollers (mask ROM versions) after STOP mode is released by  $\overline{\text{RESET}}$  input or power-on clear is the same as that of the  $\mu$ PD78F9328 (flash memory version).

- Oscillation stabilization wait time:  $2^{15}/f_x$  (fixed)

### (3) POC function of $\mu$ PD78932x and $\mu$ PD17932x microcontrollers

(a) When the IE-789468-NS-EM1 is started, bit 2 (POCOF1) of power-on-clear register 1 (POCF1) becomes 1, which disables use of the power-on-clear function.

[Workaround] Clear bit 2 (POCOF1) to 0 in the startup routine.

(b) Even if a reset occurs due to power-on clear, the value of bit 2 (POCOF1) of power-on-clear register 1 (POCF1) does not change (POCOF1 remains 0).

[Workaround] There is no workaround.

### (4) General cautions on handling this product

#### (a) 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 AC adapter, interface cable, or target system connection was in an unsatisfactory state
- If the AC adapter cable, interface cable, target cable, or the like was bent or pulled excessively
- If an AC adapter 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

#### (b) 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 **(a) Circumstances not covered by product guarantee**.