

CUSTOMER NOTIFICATION

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IE-789468-NS-EM1  
(Control Code: A, B, C)

Operating Precautions

Be sure to read this document before using the product.

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

### 1. Product Version

Part number: IE-789468-NS-EM1

Control Code <sup>Note</sup>	Remark
A	I/O EVA chip $\mu$ PD78F9328 V1.2
B	I/O EVA chip $\mu$ PD78F9328 V1.3
C	I/O EVA chip $\mu$ PD78F9328 V1.31/ $\mu$ PD78F9468 E1.3

**Note** The “control code” is the second digit from the left in the 10-digit serial number (if it has not been upgraded). 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
1	Bug in port 4 operation	×	√	√
2	Bug in low-voltage emulation	Permanent restriction		
3	Bug in $\mu$ PD789327 Subseries LCD emulation	×	×	√
4	Bugs in $\mu$ PD789467 Subseries LCD emulation	Permanent restriction		
5	Bugs in $\mu$ PD789327, $\mu$ PD179327 Subseries LCD emulation	Permanent restriction		
6	Support of $\mu$ PD179327 Subseries	√	√	√

×: 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.

#### No.2 Bug in low-voltage emulation

[Description]

Emulation cannot be performed at a low voltage.

Emulation cannot be performed correctly in a product with a voltage range of 1.8 V to 2.5 V.

[Workaround]

There is no workaround. Use the product with a voltage between 2.5 V and 5.5 V.

Regard this as a permanent restriction.

No.3 Bug in  $\mu$ PD789327 Subseries LCD emulation

## [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  $V_{LC0}$  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  $3/3 V_{LCD} = V_{LC0}$ ,  $1/3 V_{LCD}$ , 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  $V_{LC0}$  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.

No.4 Bugs in  $\mu$ PD789467 Subseries LCD emulation

## [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** 4.5 V specification LCD panel when  $GAIN = 0$

3 V specification LCD panel when  $GAIN = 1$

## [Workaround]

- (1) When  $GAIN = 0$ , supply a voltage lower than 4.5 V to  $V_{DD}$ .
  - (2) When  $GAIN = 1$ , supply a voltage lower than 3.5 V to  $V_{DD}$ .
- Regard these items as permanent restrictions.

No.5 Bugs in  $\mu$ PD789327,  $\mu$ PD179327 Subseries LCD emulation

## [Description]

- (1) When  $V_{DD}$  is  $V_{LC0}$  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  $V_{DD}$  is lower than 2 V ( $V_{DD} < 2 V$ ).

**Remark**  $V_{DD}$ : Power supply voltage (1.8 to 5.5 V),  $V_{LC0}$ : LCD driving voltage (1.8 to 5.5 V)

## [Workaround]

- (1) Emulate the LCD at  $V_{DD} = V_{LC0}$ .
  - (2) There is no workaround.
- Regard these items as permanent restrictions.

No.6 Support of  $\mu$ PD179327 Subseries

[Description]

The  $\mu$ PD179327 Subseries is now supported.

#### 4. Cautions

- Read value of port 2 when the target system is not connected

Port 2 of the  $\mu$ PD789327,  $\mu$ PD179327 Subseries 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.

- Oscillation stabilization wait time cannot be changed

The oscillation stabilization wait time of the  $\mu$ PD789327,  $\mu$ PD179327 Subseries (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 time:  $2^{15}/f_x$  (fixed)

- POC function of  $\mu$ PD789327,  $\mu$ PD179327 Subseries (1)

When the IE-789468-NS-EM1 is activated, 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.

- POC function of  $\mu$ PD789327,  $\mu$ PD179327 Subseries (2)

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.