To our customers,

## Old Company Name in Catalogs and Other Documents

On April 1$^{st}$, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

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RENESAS

# MESC TECHNICAL NEWS    No. M16C-58-0007

## Notes on Control Transfer of
## M30240 Group One Time PROM version

**1. Affected devices**
   M30240 Group One Time PROM version

**2. Symptom**
   The M30240EC's USB block design has an error detection circuit that will detect:

   (1) If the host sends out a packet that is larger than the MAXP size. This will cause the device to flag an error and return a STALL handshake.

   (2) If the CPU writes a packet that is larger than the MAXP size. This will limit the packet to its MAXP size.

   In doing this error detection, there is a counter that loads the endpoint's MAXP value for tracking purposes. This tracking value can be corrupted if another endpoint's transaction occurs in between the control transfer SET/DATA or DATA/DATA packets. This problem is due to an improper MAXP loading time for endpoint0 (it loads the MAXP before an IN or an OUT token is received). There are four cases shown in the next page.
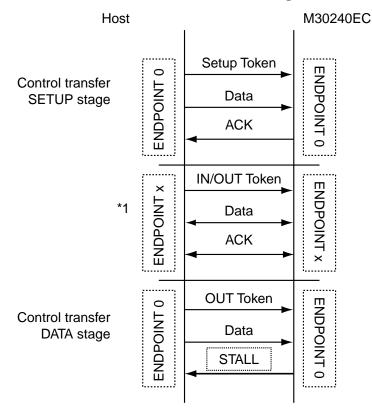   Case 3 occurs if the following two conditions are added to the above.
   (a) The actual packet size the host sends/receives to/from other endpoints is not equal to its endpoint's MAXP.

   (b) The difference of MAXP and the actual packet size is less than EP0 MAXP.

**3. Countermeasures**
   These four cases can be prevented by avoiding occurrence of any transfer of Endpoint x during SETUP stage and DATA stage of control transfer.
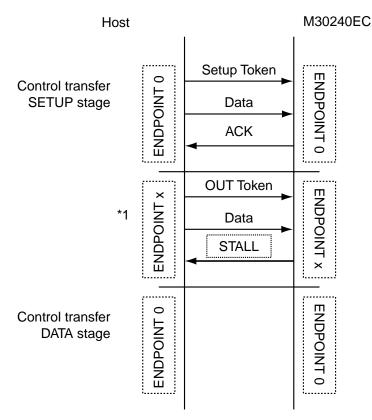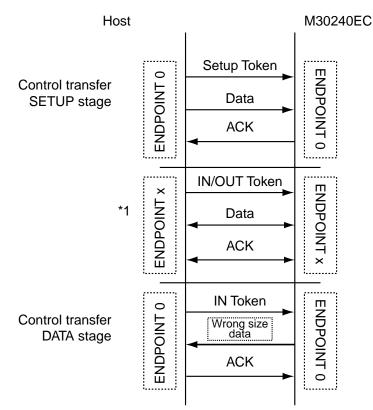
**4. Remarks**
   Mask ROM version (M30240M5/6-XXXFP) does not have this problem.

**(1/3)**

**Case 1: At Control Write transfer DATA stage, M30240EC sends STALL for the handshake.**

Host                    M30240EC

Control transfer
SETUP stage

ENDPOINT 0 → Setup Token → ENDPOINT 0
Data →
← ACK

*1

ENDPOINT x ← IN/OUT Token → ENDPOINT x
← Data →
← ACK →

Control transfer
DATA stage

ENDPOINT 0 → OUT Token → ENDPOINT 0
Data →
← STALL

**Case 2: During transfer of ENDPOINT x (*1), M30240EC sends STALL for the handshake.**

Host                    M30240EC

Control transfer
SETUP stage

ENDPOINT 0 → Setup Token → ENDPOINT 0
Data →
← ACK

*1

ENDPOINT x → OUT Token → ENDPOINT x
Data →
← STALL

Control transfer
DATA stage

ENDPOINT 0                ENDPOINT 0

**Case 3: At Control Read transfer DATA stage, M30240EC sends wrong size data.**

Host                                    M30240EC

Control transfer
SETUP stage

ENDPOINT 0 → ENDPOINT 0

Setup Token →
Data →
← ACK

*1

ENDPOINT x → ENDPOINT x

IN/OUT Token →
← Data →
← ACK

Control transfer
DATA stage

ENDPOINT 0 → ENDPOINT 0

IN Token →
← Wrong size data
ACK →

**Case 4: During transfer of ENDPOINT x (*1), M30240EC sends wrong size data.**

Host                                    M30240EC

Control transfer
SETUP stage

ENDPOINT 0 → ENDPOINT 0

Setup Token →
Data →
← ACK

*1

ENDPOINT x → ENDPOINT x

IN Token →
← Wrong size data
ACK →

Control transfer
DATA stage