To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 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 Electronics Corporation

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GRADE **A**

MESC TECHNICAL NEWS No.M16C-49-0004

M16C/80 Series, M16C/60 Series

Cautions for Using Memory Expansion Mode or Microprocessor Mode

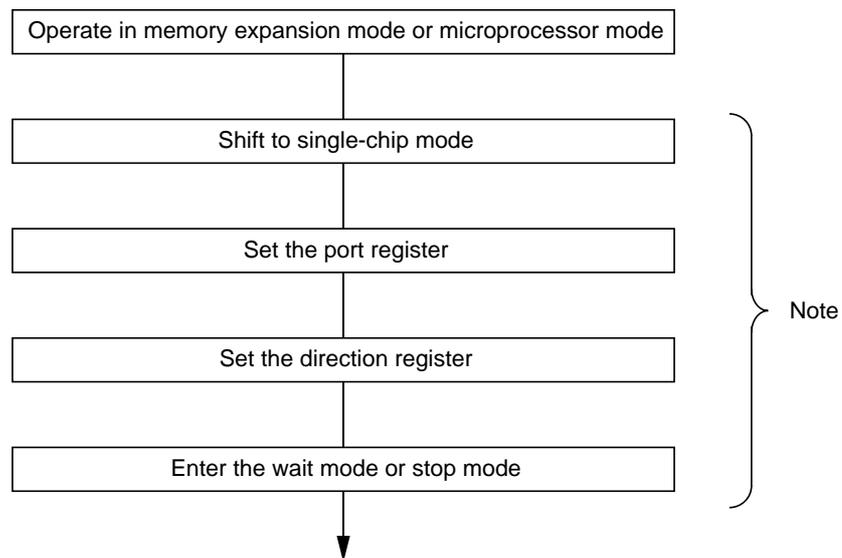### 1. Affected devices

- M16C/80 Series
- M16C/60 Series

2. Cautions

When the MCU enters wait mode while operating in memory expansion mode or microprocessor mode, <u>a pin functioning as part of the address or data bus</u> retains it's state on the bus before wait mode is entered. Shift to single-chip mode and output an arbitrary value in order to reduce current consumption. By shifting to single-chip mode, a pin which was functioning as part of the bus becomes a general-purpose port and can output an arbitrary value. <u>Set the port registers and direction registers after shifting to single-chip mode (this implies that any control pins ($\overline{CS},\overline{WR},\overline{RD}$,etc..) being used for access of an external device be changed as well).</u>

If the port registers and direction registers are set while in memory expansion mode or microprocessor mode, the operation will be ignored.

This is similar when entering stop mode.

Setting procedure is following.

```
┌────────────────────────────────────────────────────────────┐
│ Operate in memory expansion mode or microprocessor mode      │
└────────────────────────────────────────────────────────────┘
                              │
┌────────────────────────────────────────────────────────────┐
│                 Shift to single-chip mode                    │
└────────────────────────────────────────────────────────────┘
                              │
┌────────────────────────────────────────────────────────────┐
│                   Set the port register                      │
└────────────────────────────────────────────────────────────┘       Note
                              │
┌────────────────────────────────────────────────────────────┐
│                 Set the direction register                   │
└────────────────────────────────────────────────────────────┘
                              │
┌────────────────────────────────────────────────────────────┐
│               Enter the wait mode or stop mode               │
└────────────────────────────────────────────────────────────┘
                              │
                              ▼
```

Note: This program does not work in external area. Transfer a program to internal RAM and work on internal RAM.