

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.

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RENESAS TECHNICAL NEWS

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M16C/62P Group and M16C/26 Group Precautions when using Programmable I/O Ports

<p>Classification Corrections and supplementary explanation of document</p> <p>√ Notes Knowhow Others</p>	<p>Concerned Products M16C/62P Group M16C/26 Group</p>
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1. Precautionary Note

The input threshold differs for each input pin that shares inputs with other peripherals. Figure 1 shows a block diagram of the P55, P77, P91 and P97 pins of M16C/62P. If an input port shares its input with inputs to peripheral function, the input threshold for signal level determination may be different when the input signal level applied to these pins is between the recommended operating conditions, VIH and VIL (neither “H” nor “L”).

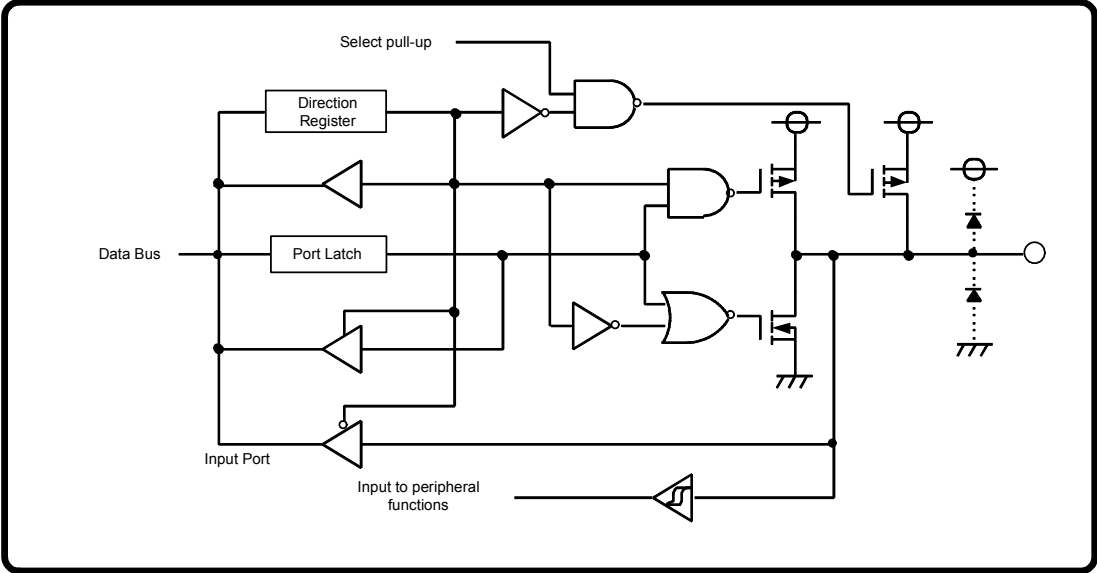


Figure 1: Pins Block Diagram

2. Explanation

Figure 2 shows an example of an input port, shared with other peripherals, being determined “H” or “L” when the voltage applied to the pin changes slowly. Figure 3 shows the same when the voltage applied to the pin changes rapidly.

If the input port threshold is lower than the hysteresis of peripheral functions (V_{T-}), as shown in Figure 2, and the input voltage is lower than V_{T-} and higher than the input port threshold, the result on determining the input level voltage will differ. However, if the input voltage level changes rapidly, as shown in Figure 3, input voltage is lower than V_{T-} and is higher than the input port threshold for a shorter amount of time. Therefore, the amount of time the input level voltage results differ, is also shorter.

In addition, if the input voltage is higher than the hysteresis of peripheral function (V_{T-}) but lower than the input voltage threshold, determining the input level will also differ.

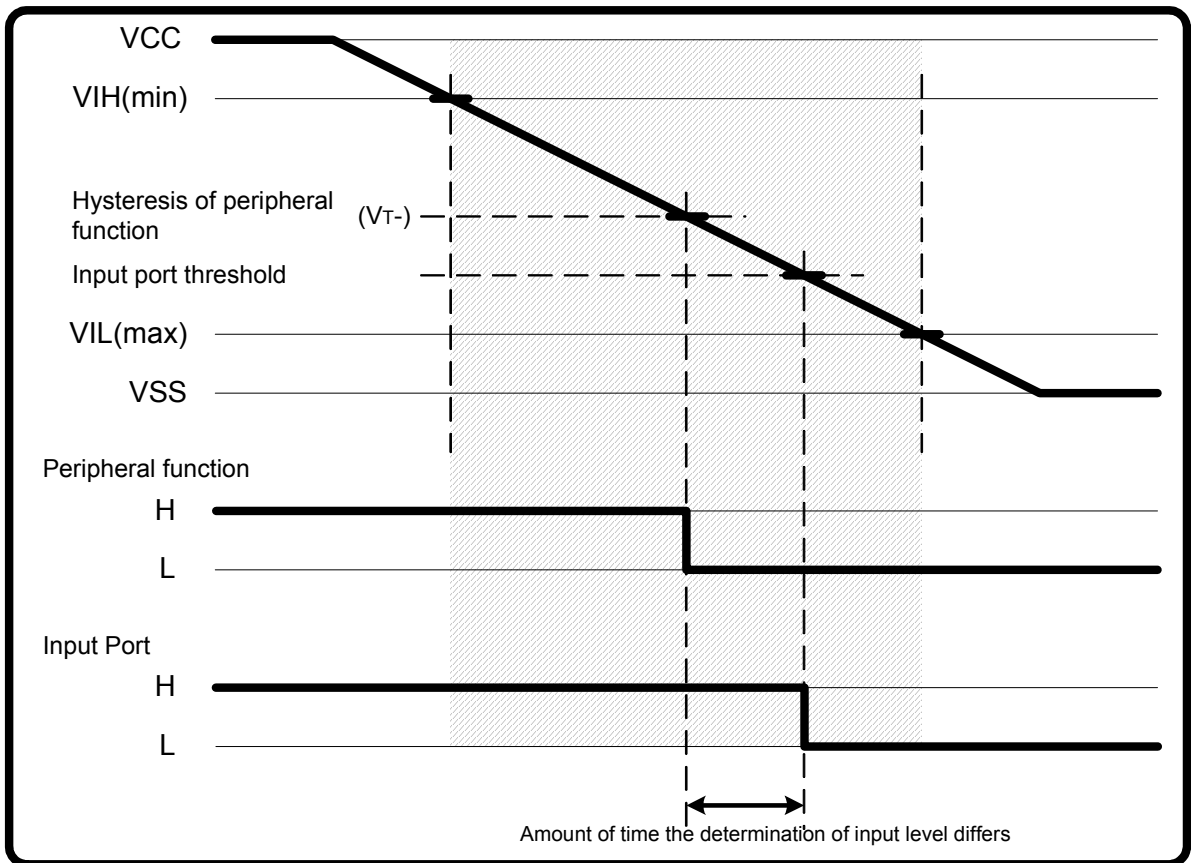


Figure 2: Example of an Input with Voltage Level Changing Slowly.

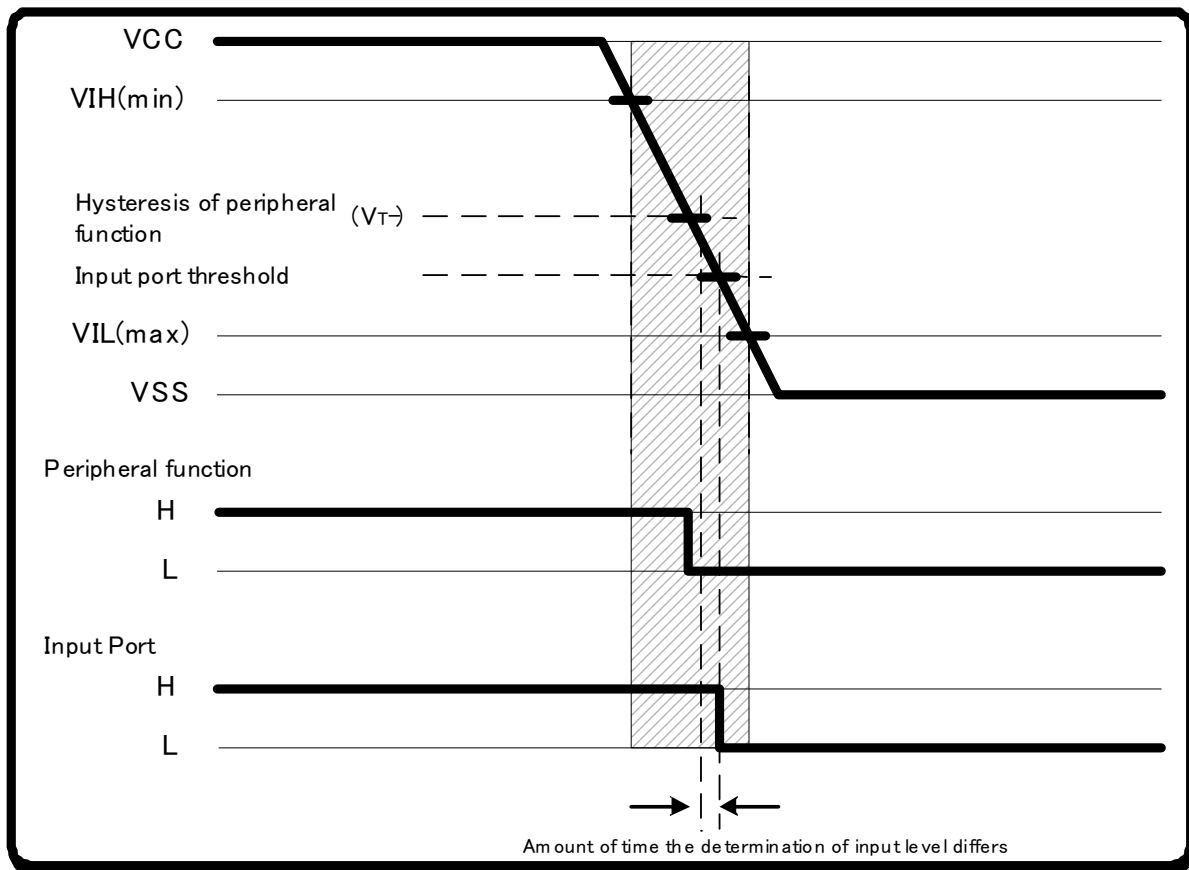


Figure 3: Example of an Input with Voltage Level Changing Rapidly

3. Countermeasure

If a signal applied to a pin changes from "H" to "L", wait until the input voltage is below VIL before determining the input level. If a signal applied to a pin changes from "L" to "H", wait until the input voltage is higher than VIH before determining the input level.