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April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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H8/300L SLP Series

Setting Up the Internal Step-Down Circuit (H8/3867)

Introduction

The H8/3867 series incorporates an internal power supply step-down circuit. Features, usages, cautions, and relationship between the power supply voltages and operating ranges of the internal power supply voltage step-down circuit are described below.

Target Device

H8/3867

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1. Usage

The H8/3867 series incorporates an internal power supply step-down circuit. Features, usages, cautions, and relationship between the power supply voltages and operating ranges of the internal power supply voltage step-down circuit are described below.

1.1 Features of the Internal Power Supply Voltage Step-Down Circuit

1. Utilization of the internal power supply voltage step-down circuit allows fixation of the internal power supply to approximately 1.5 V independent of the power supply voltage connected to an external Vcc pin.
2. Electric current to be consumed when using the external power supply of 1.8 V or greater can be suppressed as almost the same as when using the external power supply of approximately 1.5 V.
3. The external power supply voltage and the internal power supply voltage can be set to the same value without using the internal power supply voltage step-down circuit.

1.2 Power Supply Connection when Using the Internal Power Supply Voltage Step-Down Circuit

As shown in figure 1.1, an external power supply is connected to a Vcc pin, and a capacitor of approximately 0.1 μF is connected between the CVcc and the Vss. The addition of this external circuit enables the internal power supply voltage step-down circuit.

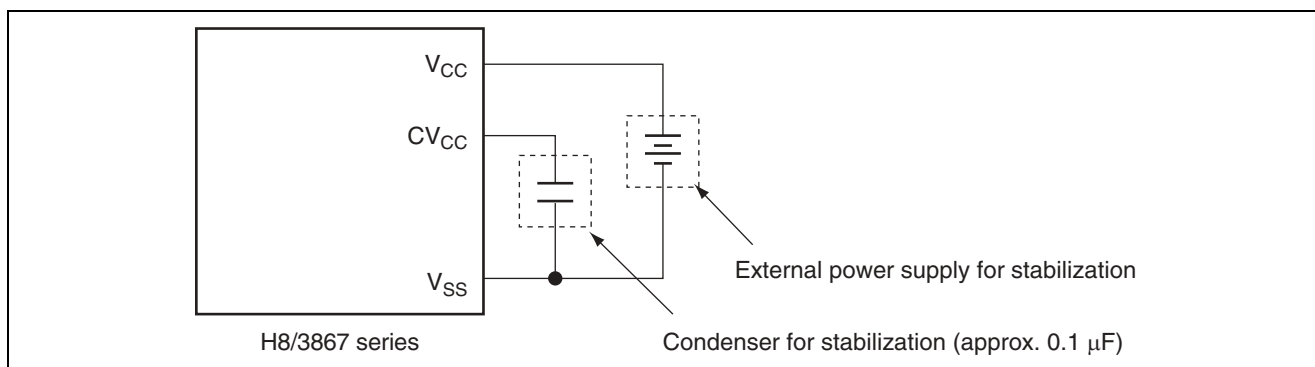


Figure 1.1 Power Supply Connection when Using Internal Power Supply Voltage Step-Down Circuit

1.3 Cautions when Using the Internal Power Supply Voltage Step-Down Circuit

1. An interface of the external circuit uses the external power supply voltage connected to the Vcc pin and the GND potential connected to the Vss pin as standard. In the case of input/output level of a port, for example, "High" uses the Vcc level standard and 'Low' uses the Vss level standard.
2. The operating frequency when using the internal power supply voltage step-down circuit is $f_{osc} = 0.4 \text{ MHz to } 2 \text{ MHz}$ when $V_{cc} = 2.2 \text{ to } 5.5 \text{ V}$, otherwise, $f_{osc} = 0.4 \text{ MHz to } 1 \text{ MHz}$.
3. The LCD power supply and the analog power supply of the A/D converter are not affected by the internal step-down voltage.

1.4 Power Supply Connection when not using the Internal Power Supply Voltage Step-Down Circuit

As shown in figure 1.2, the external power supply is connected to the V_{CC} pin and CV_{CC} pin. The external power supply is directly supplied to the internal power supply.

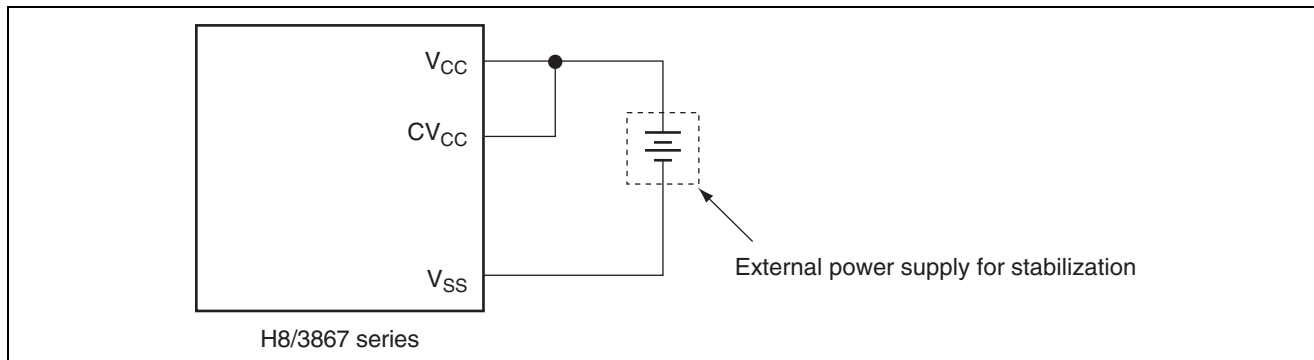


Figure 1.2 Power Supply Connection when not Using Internal Power Supply Voltage Step-Down Circuit

1.5 Cautions when not Using the Internal Power Supply Voltage Step-Down Circuit

1. The available range of the power supply voltage is 1.8 V to 5.5 V. Normal operation cannot be guaranteed if the voltage exceeds this range (less than 1.8 V, or greater than 5.5 V).

1.6 Relationship between the Power Supply Voltages and Oscillating Frequency Range

Figure 1.3 shows the relationship between the power supply voltages and oscillating frequency range (shaded area).

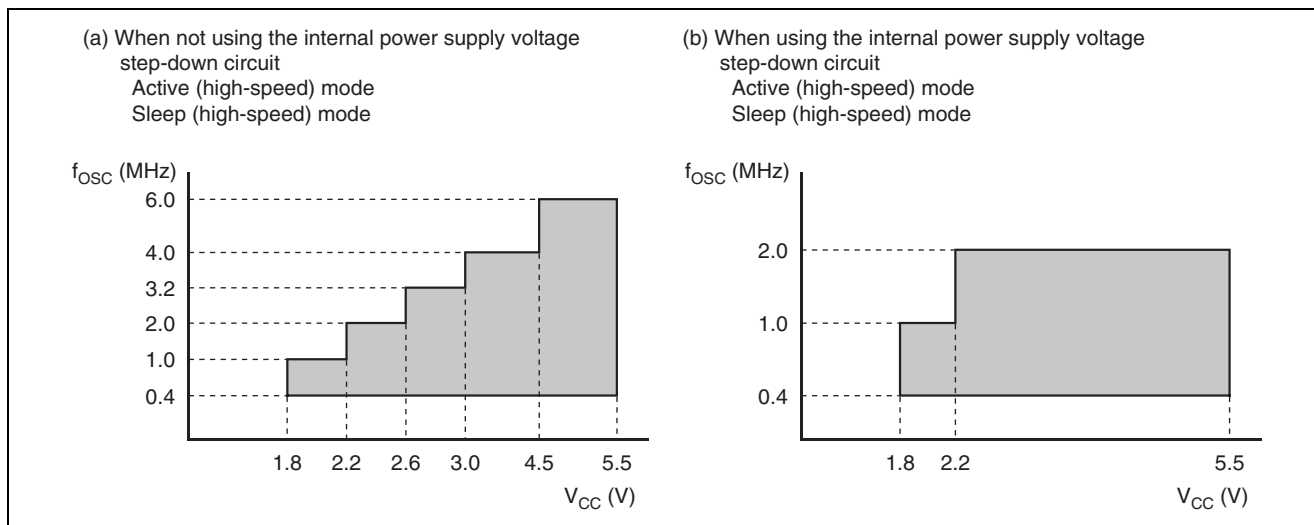


Figure 1.3 Relationship between the Power Supply Voltages and Oscillating Frequency Range

1.7 Relationship between the Power Supply Voltages and Operating Frequency Range

Figure 1.4 shows the relationship between the power supply voltages and operating frequency range (shaded area).

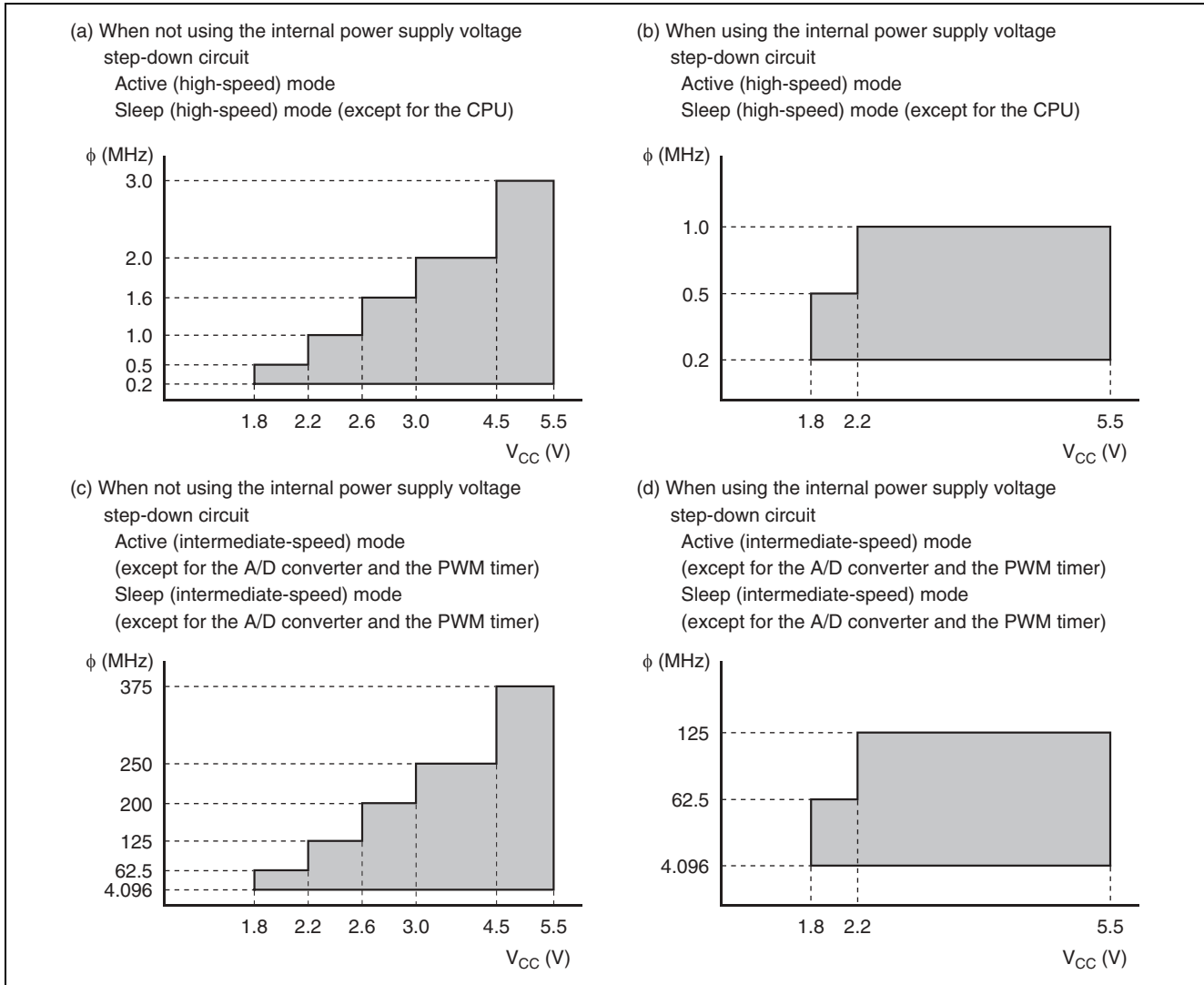


Figure 1.4 Relationship between the Power Supply Voltages and Operating Frequency Range

Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Dec.19.03	—	First edition issued

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