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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-16C-A244A/E	Rev.	1.00
Title	Notes on the POR (Power-On Reset) Function and Power-On Start		Information Category	Technical Notification		
Applicable Product	M16C/65,M16C/64A,M16C/6S1 M16C/6B,M16C/6C,M16C/64C,M16C/65C M16C/63	Lot No. –	Reference Document	—		

This document describes usage notes for the following products.

1. Target products

   M16C/65 Group,M16C/64A Group,M16C/6S1 Group,M16C/6BGroup,M16C/6C Group,

   M16C/64C Group,M16C/65C Group, and M16C/63 Group

2. Note on the POR(Power-On Reset) Function

   When the MCU is powered on with residual voltage (0.83 to 0.85 V),the power-on reset function may not work properly. If the hardware reset is used, this does not apply.

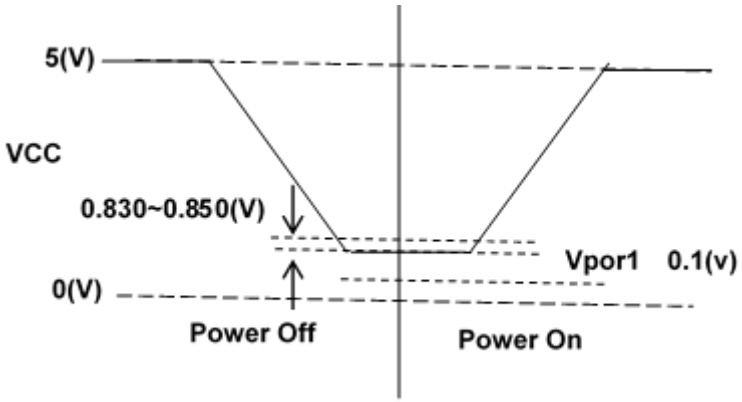

Figure 1. Waveform on Power-On Start with Residual Voltage

Note that the M16C/6S1 Group and the M16C/6B Group do not have the power-on reset function, so this does not apply to them.

3. Notes on Power-On Start

If the target product is powered on with the power supply rising gradient below the standard, reset functions (hardware reset and power-on reset) may not work properly.

Pages and chapters shown here are for M16C/65 Group. Please see the last page for the information of the other products.

3.1 32.4.1 Power Supply Rising Gradient (page 787 of 837)

The standard for the power supply rising gradient between 0V and 2.0V shall be changed as follows:

Before Change

Symbol	Parameter		Standard			Unit
			Min.	Typ.	Max.	
SVcc	Power supply V_{cc1} rising gradient (Voltage range:0 to 2.0 V)		0.05			V/ms
	Power supply V_{cc1} rising gradient (Voltage range:2.0V to V_{cc1})	3.6V ＜ V_{CC1} ≦ 5.5V			5.5	V/ms

After Change

Symbol	Parameter		Standard			Unit
			Min.	Typ.	Max.	
SVcc	Power supply V_{cc1} rising gradient (Voltage range:0 to 2.0 V)		0.1			V/ms
	Power supply V_{cc1} rising gradient (Voltage range:2.0V to V_{cc1})	3.6V ＜ V_{CC1} ≦ 5.5V			5.5	V/ms

3.2 31.1.6 Voltage Detector and Power Supply Circuit Electrical Characteristics,
Table 31.14 Power-On Reset Circuit (page 733 of 837)

The standard for the power supply rising gradient when using the power-on reset function shall be changed as shown below. Note that the M16C/6S1 Group and the M16C/6B Group do not have the power-on reset function, so this does not apply to them.

Before Change

Symbol	Parameter	Condition	Standard			Unit
			Min.	Typ.	Max.	
V_{por1}	Voltage at which power-on reset enabled(1)				0.1	V
t_{rth}	External power V_{cc1} rise gradient		2.0		50000	mV/ms
$t_{w(por)}$	Time necessary to enable power-on reset		300			ms

Note:

1. To use the power-on reset function, enable voltage monitor 0 reset by setting the LVDAS bit in the OFS1 address to 0. Also, set the VDSEL1 bit to 0 (Vdet0_2).

After Change

Symbol	Parameter	Condition	Standard			Unit
			Min.	Typ.	Max.	
V_{por1}	Voltage at which power-on reset enabled(1)				0.1	V
t_{rth}	External power V_{cc1} rise gradient		100		50000	mV/ms
$t_{w(por)}$	Time necessary to enable power-on reset		300			ms

Note:

1. To use the power-on reset function, enable voltage monitor 0 reset by setting the LVDAS bit in the OFS1 address to 0. Also, set the VDSEL1 bit to 0 (Vdet0_2).

4. Measures

Please use the current product within the limited power supply range.

5. Reference Documents

Applicable Product	Document Number of User's Manual:Hardware	Section in this document	
		3.1	3.2
M16C/65 Group	R01UH0135EJ0210	Page 787 of 837	Page 733 of 837
M16C/64A Group	R01UH0136EJ0210	Page 752 of 800	Page 708 of 800
M16C/6S1 Group	R01UH0105EJ0110	Page 569 of 607	-
M16C/6B Group	R01UH0197EJ0120	Page 306 of 331	-
M16C/6C Group	R01UH0138EJ0210	Page 781 of 827	Page 736 of 827
M16C/63 Group	R01UH0137EJ0220	Page 807 of 855	Page 748 of 855
M16C/65C Group	R01UH0093EJ0110	Page 793 of 839	Page 740 of 839
M16C/64C Group	R01UH0092EJ0110	Page 762 of 807	Page 718 of 807