

# Difference among various products of 3826 Group

Renesas Technology Corporation  
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## Products effected

- Emulator MCU Standard version  
M38267RLFS
- One-time PROM version Standard version  
M38267E8FP/GP, M3826AEFFP/GP
- Mask ROM version L version (Low voltage version : 2.2v)  
M38267M8LXXXFP/GP, M38268MCLXXXFP/GP, M3826AMFLXXXFP/GP
- Mask ROM version A version  
M38268MCA-XXXFP/GP, M3826AMFA-XXXFP/GP

## Precaution

- When Mask ROM version, One-time PROM version and memory size differ in one group, actual values such as an electrical characteristics, operation margin, A-D conversion accuracy, noise immunity, and noise radiation may differ from the ideal values due to the difference in the manufacturing processes.  
When these products are used switching, perform system evaluation for each product of every after confirming product specification.
- This document shows difference, some specifications and standards, not for all.  
Be sure to refer to the most current data sheet as for the latest detailed specification and an electrical characteristics.

# 1. Difference among various products of 3826 Group

		One-time PROM version		Mask ROM version (L version)		Mask ROM version(A version)
		38267E8	3826AEF	38267M8L	38268MCL, 3826AMFL	38268MCA, 3826AMFA
ROM/RAM size[byte]		32K/1K	60K/2.5K	32K/1K	60K/2.5K, 48K/1.5K	60K/2.5K, 48K/1.5K
Oscillation circuit constants		The oscillation circuit constants of XIN-XOUT, XCIN-XCOUT will depend on each product.				
Hysteresis characteristics (See 3.section)		Almost fixed	←	←	It depends on the power supply and becomes narrow.	←
Circuit structure of the peripheral function input pins		See 4.section				
sub-clock oscillation circuit		Without regulator	←	←	←	With regulator
Vpp power supply pin connection (P70)		Serial resistor (5k ) is necessary. Make the length of wiring which is connected to the Vpp pin as short as possible. It protects input noise.		Serial resistor is unnecessary.		←
Absolute Maximum ratings	Power source voltage(Vcc) Input voltage (C1, C2) Output voltage (VL3) Output voltage (C1, C2)	-0.3V to 7.0V	←	←	-0.3V to 6.5V	←
	Input voltage (VL3)	VL2 to 7.0V	←	←	VL2 to 6.5V	←
Power source current		See 6.section				
Power supply(Vcc) / Main-clock input oscillation frequency		See 7.1. and 7.2. Section				
RAM retention voltage (Min.)		2.0V	←	←	←	1.8V
Reference power source input current (DA) (IVREF )		6.0mA	3.2mA	6.0mA	3.2mA	←
Power source voltage of VLI (At using voltage multiplier)		1.3V to 2.3V	←	←	1.3V to 2.1V	←
Timer X,Y input frequency (Max.) f(CNTR0),f(CNTR1)		2.5<=Vcc<=4.0V : (2 x Vcc - 4) MHz 4.0<=Vcc<=5.5V : 4 MHz	2.5<=Vcc<=4.0V : (2 x Vcc - 4) MHz 4.0<=Vcc<=5.5V : 4 MHz	2.2<=Vcc<=4.0V : (10 x Vcc - 4)/9 MHz 4.0<=Vcc<=5.5V : 4 MHz	2.2<=Vcc<=4.0V : (10 x Vcc - 4)/9 MHz 4.0<=Vcc<=5.5V : 4 MHz	1.8<=Vcc<=2.0V : (5 x Vcc - 8) MHz 2.0<=Vcc<=4.0V : (Vcc) MHz 4.0<=Vcc<=4.5V : (2 x Vcc - 4) MHz 4.5<=Vcc<=5.5V : 5 MHz

The oscillation circuit constants of XIN-XOUT, XCIN-XCOUT will depend on each product of Mask ROM version (L version, A version) and One-time PROM version.

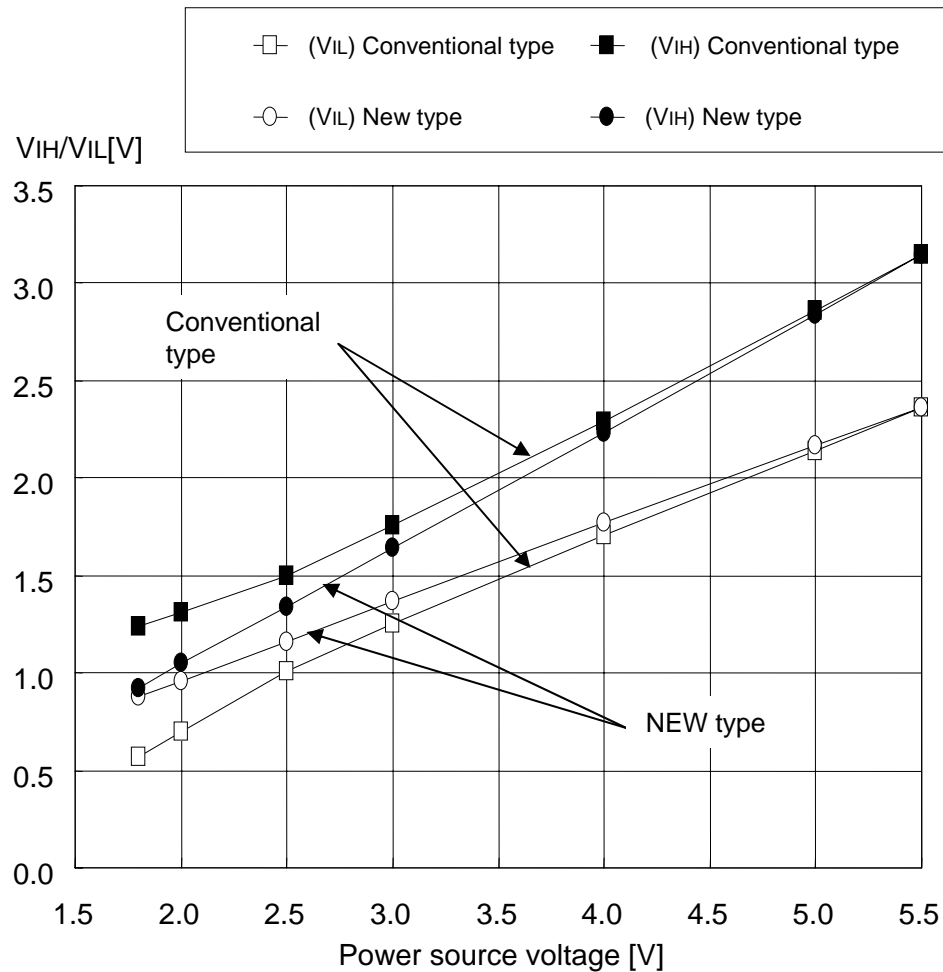
So that the product used for mass production obtains the stabilized operation clock on the user system and its condition, contact the resonator manufacturer and select the resonator and oscillation circuit constants. Be careful especially when range of voltage and temperature is wide.

We recommend to design the circuit in consideration of the wiring pattern of the feed-back resistor, the dumping resistor and the load capacity in advance.

We publish the reference-use oscillation circuit parameters in Renesas Technology home page.

<http://www.renesas.com/en/38000>

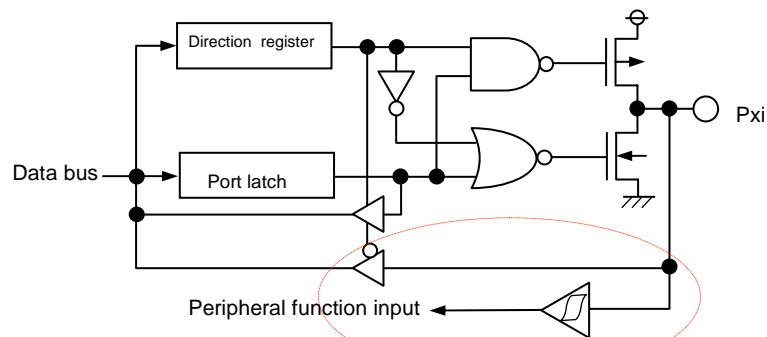
# 3. Hysteresis characteristic



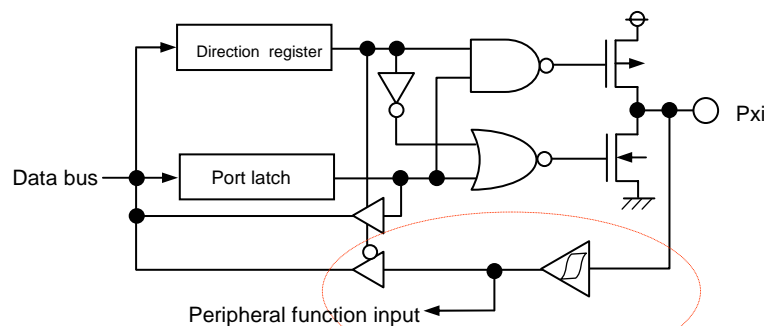
	Conventional type	New type	
Emulator MCU	○		
One-time PROM version	○		
Mask ROM version	38267M8L	○	
	38268MCL		○
	3826AMFL		○
	38268MCA		○
	3826AMFA		○

Note: Data described here are characteristic examples.  
The data values are not guaranteed.

# 4. Circuit structure of the peripheral function input pins



**Type A**



**Type B**

Type A : Input level of port does not always correspond with it of the peripheral function input pin.

Type B : Input level of port corresponds with it of the peripheral function input pin.  
(The port input also has hysteresis.)

	Type A	Type B	
Emulator MCU	O		
One-time PROM version	O		
Mask ROM version	38267M8L	O	
	38268MCL		O
	3826AMFL		O
	38268MCA		O
	3826AMFA		O

Pins ;  
P20 to P27, P41/INT1, P42/INT2, P44/RXD, P46/SCLK1,  
P54/CNTR0, P55/CNTR1, P57/ADT, P60/SIN2, P62/SCLK21,  
P70/INT0

# 5. LCD power supply pins

M38267M8L,  
M38267E8

M3826AEF

M38268MCL,  
M3826AMFL

M38268MCA,  
M3826AMFA

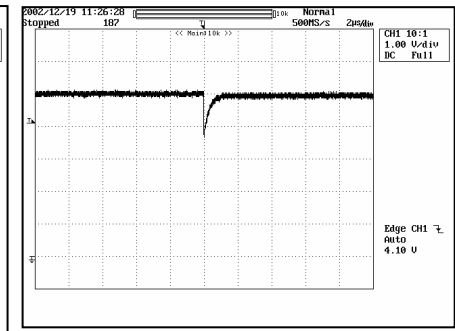
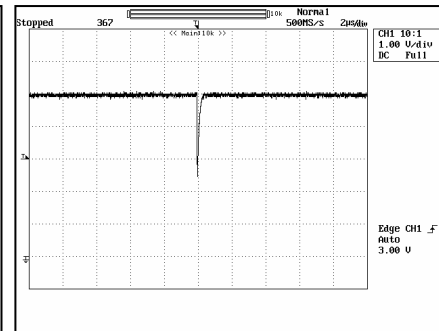
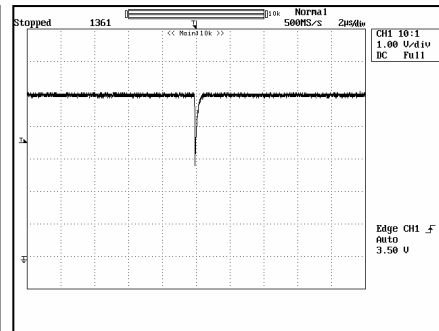
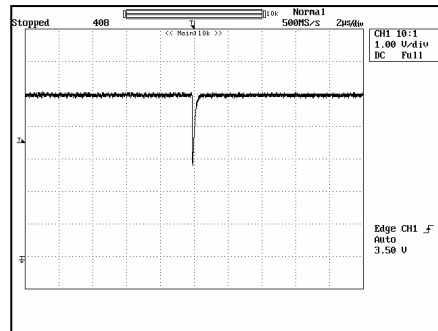
VL3 falling voltage =2.2V

VL3 falling voltage =2.2V

VL3 falling voltage =2.5V

VL3 falling voltage =1.4V

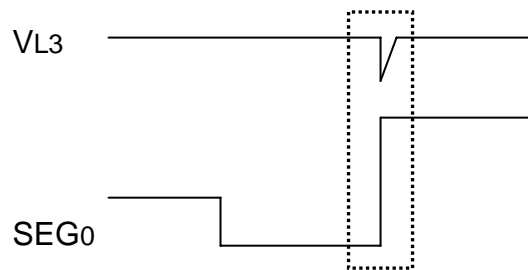
VL3



Note: Data described here are characteristic examples. The data values are not guaranteed.

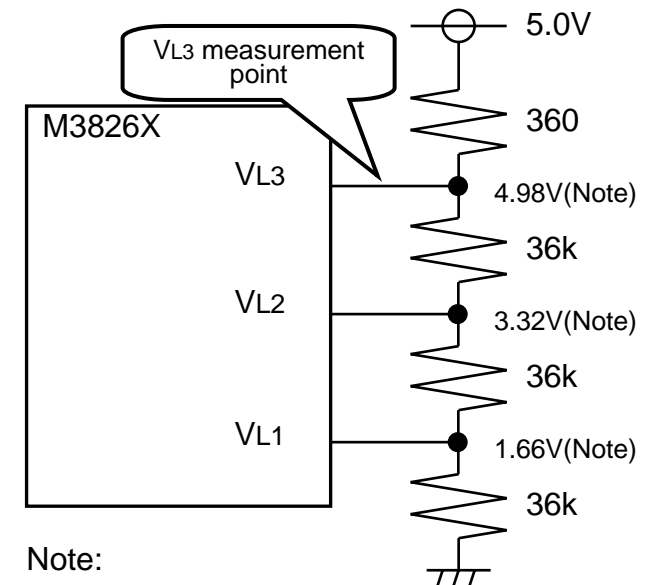
### <Measure condition>

- Only SEG exclusive pins output the LCD drive waveform.
- PORT pins shared with LCD outputs are selected as PORT function.
- COM and SEG pins are open.(No load)
- All data of LCDRAM is 55h.



Voltage falling occurs in every LCDCK cycle

- (1) Shorten the wiring pattern in right diagram.
- (2) Connect condensers to the LCD power supply pin and Vss with the shortest possible wiring to steady voltage level. (reference value: 0.1  $\mu$ F to 0.33  $\mu$ F).



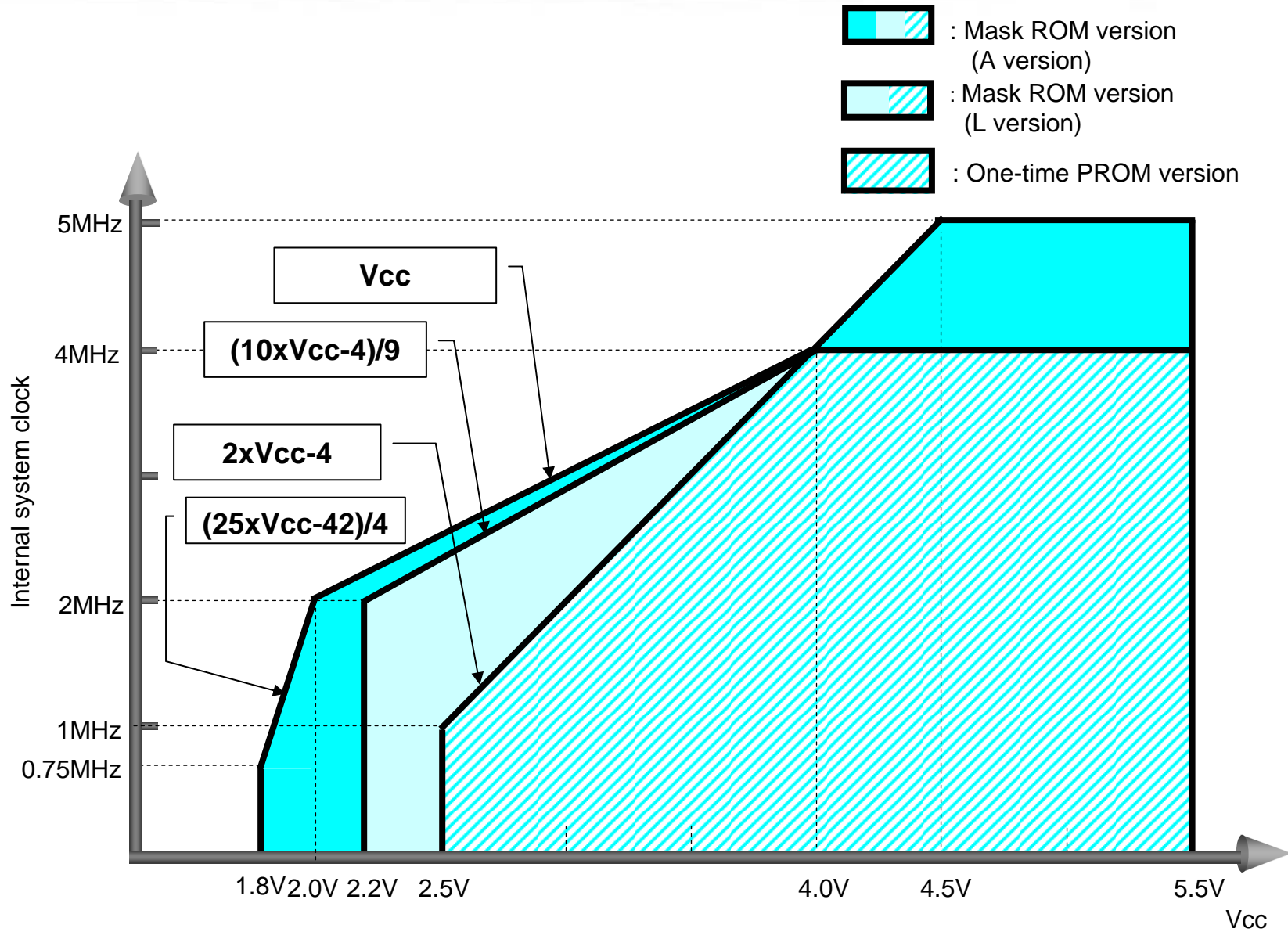
Note:  
Theoretical voltage value

## 6. Electrical characteristics (Power source current)

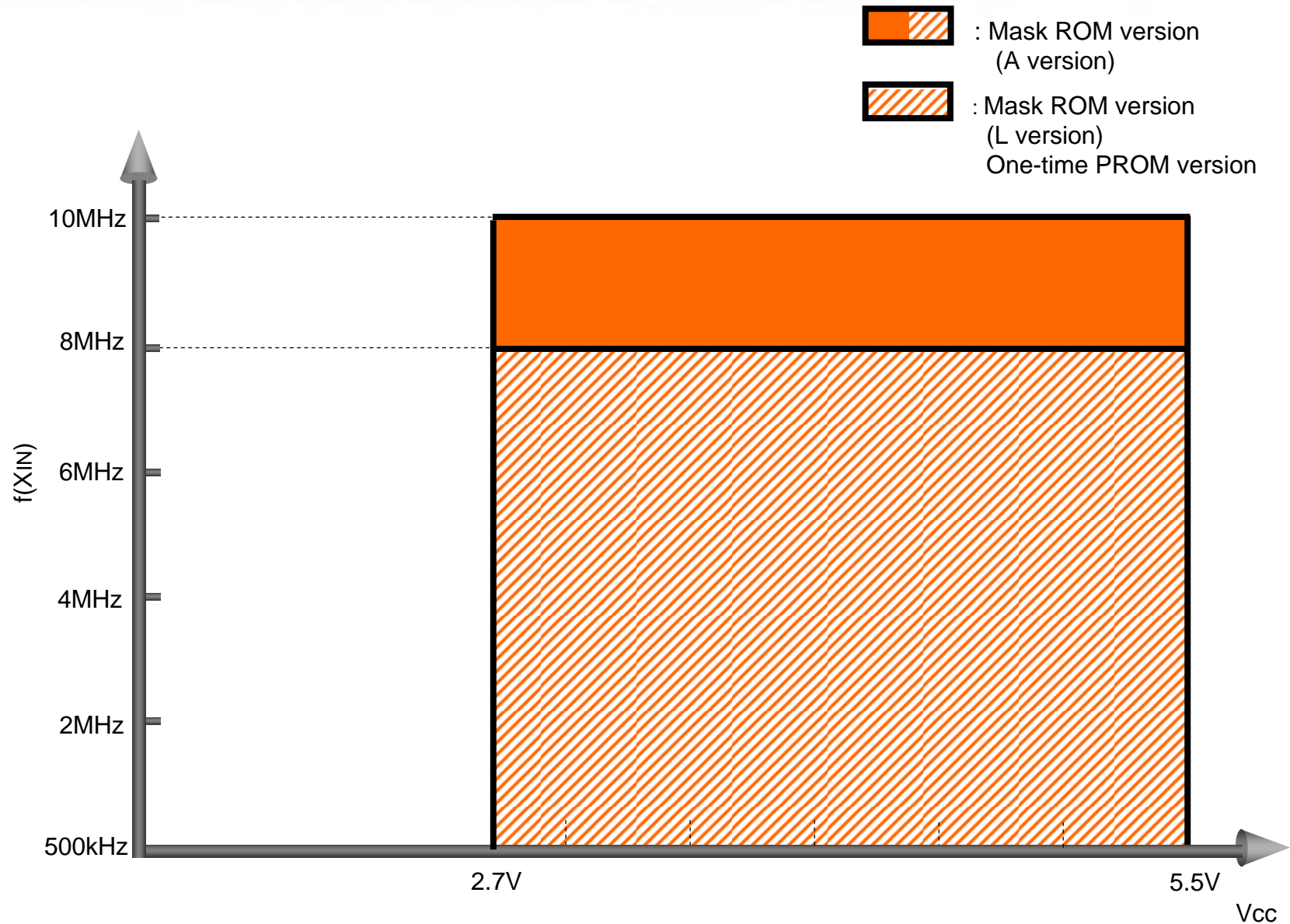
Symbol	Parameter	Test conditions	38267M8L 38267E8		38268MCL 3826AMFL 3826AEF		38268MCA 3826AMFA		Unit
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
I <sub>cc</sub>	Power source current	High-speed mode, V <sub>cc</sub> = 5V, f(XIN) = 10MHz, f(XCIN) = 32.768kHz Output transistors "off", A-D converter in operating	-	-	-	-	5.5	11.0	mA
		High-speed mode, V <sub>cc</sub> = 5V, f(XIN) = 8MHz, f(XCIN) = 32.768 kHz Output transistors "off", A-D converter in operating	8.0	15	8.0	15	4.5	9.0	mA
		High-speed mode, V <sub>cc</sub> = 5V, f(XIN) = 8MHz (in WIT state), f(XCIN) = 32.768kHz, Output transistors "off", A-D converter stop	2.5	4.0	2.5	4.0	1.2	2.4	mA
		Low-speed mode, V <sub>cc</sub> = 5V, T <sub>a</sub> ≤ 55 ° C, f(XIN) = stopped f(XCIN) = 32.768kHz, Output transistors "off"	45	67	45	67	15	30	μA
		Low-speed mode, V <sub>cc</sub> = 5V, T <sub>a</sub> =25 ° C, f(XIN) = stopped f(XCIN) = 32.768kHz(in WIT state), Output transistors "off"	23	46	23	46	7	14	μA
		Low-speed mode, V <sub>cc</sub> = 3V, T <sub>a</sub> ≤ 55 ° C, f(XIN) = stopped f(XCIN) = 32.768kHz, Output transistors "off"	18	36	18	36	9	18	μA
		Low-speed mode, V <sub>cc</sub> = 3V, T <sub>a</sub> =25 ° C, f(XIN) = stopped f(XCIN) = 32.768kHz(in WIT state), Output transistors "off"	8.0	16	8.0	16	4.5	9	μA
		All oscillation stopped (in STP state), T <sub>a</sub> =25 ° C, Output transistors "off"	0.5	10	0.1	1.0	0.1	1.0	μA
		All oscillation stopped (in STP state), T <sub>a</sub> =55 ° C, Output transistors "off"	-	60	-	-	-	-	μA
		All oscillation stopped (in STP state), T <sub>a</sub> =85 ° C, Output transistors "off"	-	-	-	10	-	10	μA



# 7.1. Internal-clock vs. Vcc (Except A-D converter)



## 7.2. External-clock vs. Vcc (A-D converter in operating)



To our customers,

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

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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