

Notification about the transfer of the semiconductor business

The semiconductor business of Panasonic Corporation was transferred on September 1, 2020 to Nuvoton Technology Corporation (hereinafter referred to as "Nuvoton"). Accordingly, Panasonic Semiconductor Solutions Co., Ltd. became under the umbrella of the Nuvoton Group, with the new name of Nuvoton Technology Corporation Japan (hereinafter referred to as "NTCJ").

In accordance with this transfer, semiconductor products will be handled as NTCJ-made products after September 1, 2020. However, such products will be continuously sold through Panasonic Corporation.

Publisher of this Document is NTCJ.

If you would find description "Panasonic" or "Panasonic semiconductor solutions", please replace it with NTCJ.

※ Except below description page

"Request for your special attention and precautions in using the technical information and semiconductors described in this book"

Nuvoton Technology Corporation Japan

□ MN101C78 Series

Type	MN101C78A	MN101CF78A
Internal ROM type	Mask ROM	FLASH
ROM (byte)	32K	
RAM (byte)	1.5K	
Package (Lead-free)	TQFP048-P-0707B	
Minimum Instruction Execution Time	0.100 μ s (at 3.0 V to 3.6 V, 10 MHz) 0.118 μ s (at 2.7 V to 3.6 V, 8.5 MHz) 0.235 μ s (at 1.8 V to 3.6 V, 4.25 MHz)* 62.5 μ s (at 1.8 V to 3.6 V, 32 kHz)* *: The lower limit for operation guarantee for flash memory built-in type is 2.2 V.	

■ Interrupts

RESET. Watchdog. External 0 to 2. External 4 (key interrupt dedicated). Timer 0 to 3. Timer 6. Timer 7 (2 systems). Timer 8 (2 systems). Time base. Serial 0 (2 systems). Serial 1 (2 systems). Serial 3. Serial 4. A/D conversion finish

■ Timer Counter

8-bit timer \times 5

- Timer 0Square-wave/8-bit PWM output. Event count. Remote control carrier output. Simple pulse width measurement. Added pulse (2-bit) type PWM output. Real time output control. Square-wave/PWM output to large current terminal P50 possible
- Timer 1Square-wave output. Event count. Synchronous output event
- Timer 2Square-wave output. Added pulse (2-bit) type PWM output. PWM output. Serial transfer clock output. Real time output control. Event count. Synchronous output event. Simple pulse width measurement. Square-wave/PWM output to large current terminal P52 possible
- Timer 3Square-wave output. Event count. Remote control carrier output. Serial 0 baud rate timer
- Timer 68-bit freerun timer
- Timer 0, 1 can be cascade-connected
- Timer 2, 3 can be cascade-connected

16-bit timer \times 2

- Timer 7Square-wave output. 16-bit PWM output (cycle/duty continuous variable). Event count. Synchronous output event. Pulse width measurement. Input capture. Real time output control. High performance IGBT output. Square-wave/PWM output to large current terminal P51 possible
- Timer 8Square-wave/16-bit PWM output (duty continuous variable). Event count. Pulse width measurement. Input capture. Square-wave/PWM output to large current terminal P53 possible
- Timer 7, 8 can be cascade-connected: Square-wave output, PWM, input capture, pulse width measurement is possible as a 32-bit timer

Time base timer: One-minute count setting

Watchdog timer \times 1

■ Serial interface

Synchronous type/UART (full-duplex) \times 2: Serial 0, 1

Synchronous type/Single-master I²C \times 1: Serial 3

I²C slave \times 1: Serial 4

Serial 4.....I²C high-speed transfer mode. 7-bit/10-bit address setting. General call

■ I/O Pins

I/O 39 : Common use. Specified pull-up resistor available. Input/output selectable (bit unit)

■ A/D converter

10-bit \times 7 channels (with S/H)

■ Display control function

LCD: 12 segments \times 4 commons (Static, 1/2, 1/3, or 1/4 duty)

Usable if VLCD \leq VDD

■ Special Ports

Buzzer output. Inverted buzzer output. Remote control carrier output. High-current drive port

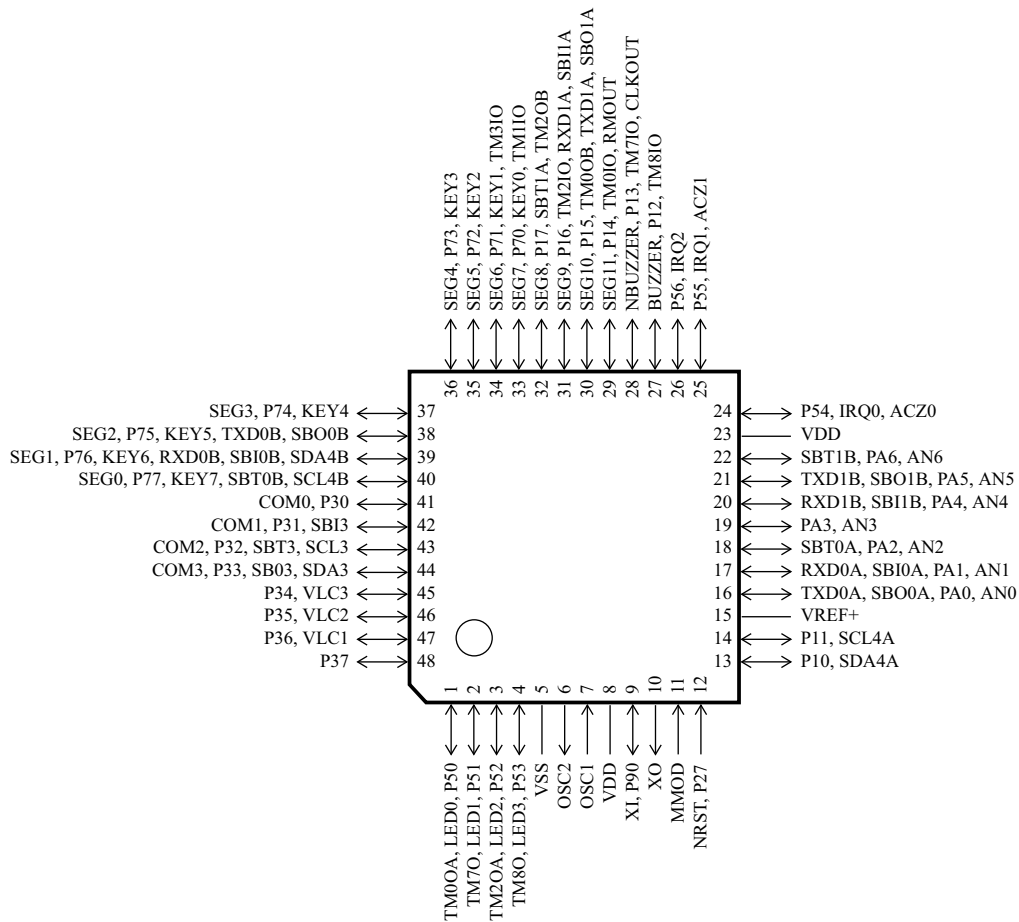
■ Electrical Characteristics (Supply current)

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 4.25 MHz (fs = fosc/2). VDD = 3 V		0.6(1.3)	1.1(2.2)	mA
	IDD2	fx = 32 kHz (fs = fx/2). VDD = 3 V		4(46)	15(90)	μA
Supply current at HALT	IDD3	fx = 32 kHz. VDD = 3 V. Ta = 25 °C		2(3)	5(13)	μA
	IDD4	fx = 32 kHz. VDD = 3 V. Ta = -40 °C to +85 °C			10(40)	μA
Supply current at STOP	IDD5	VDD = 3 V. Ta = 25 °C			2(3)	μA
	IDD6	VDD = 3 V. Ta = -40 °C to +85 °C			8(30)	μA

Note) (): Flash memory built-in type

■ Pin Assignment

TQFP048-P-0707B



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Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
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