☐ MN101C62 Series

Type	MN101C62D	MN101C62F	MN101CF62G
Internal ROM type	Mask ROM		FLASH
ROM (byte)	64K	96K	128K
RAM (byte)	2K	4K	10K
Package (Lead-free)	LQFP080-P-1414A		
Minimum Instruction Execution Time	[Standard] 0.10 μs (at 4.5 V to 5.5 V, 20 MHz) 0.25 μs (at 2.7 V to 5.5 V, 8 MHz) 1.00 μs (at 2.0 V to 5.5 V, 2 MHz)* 125 μs (at 2.0 V to 5.5 V, 32 kHz)* [Double speed] 0.125 μs (at 4.5 V to 5.5 V, 8 MHz) 0.25 μs (at 3.0 V to 5.5 V, 4 MHz) 62.5 μs (at 2.0 V to 5.5 V, 32 kHz)* *: The lower limit for operation guarantee for flash memory built-in type is 2.5 V.		

■ Interrupts

Watchdog. External 0 to 4. Timer 0 to 4. Timer 6. Timer 7 (2 systems). Timer 8 (2 systems). Time base. Automatic transfer finish. Serial 0 (2 systems). Serial 1 (2 systems). Serial 2. A/D conversion finish. Key interrupt

■ Timer Counter

8-bit timer × 6

    Timer 0 ....Square-wave/8-bit PWM output. Event count. Remote control carrier output. Simple pulse width measurement

    Timer 1 ....Square-wave output. Event count. Synchronous output event. Serial baud rate timer

    Timer 2 ....Square-wave output. Event count. Synchronous output event. Simple pulse width measurement. Real time output control. Serial baud rate timer

    Timer 3 ....Square-wave output. Event count. Remote control carrier output. Serial baud rate timer

    Timer 4 ....Square-wave/8-bit PWM output. Event count. Remote control carrier output. Simple pulse width measurement

    Timer 6 ....8-bit freerun timer

    Timer 0, 1 can be cascade-connected

    Timer 2, 3 can be cascade-connected

16-bit timer × 2

    Timer 7 ....Square-wave output. 16-bit PWM output (cycle/duty continuous variable). Event count. Synchronous output event. Pulse width measurement. Input capture. Real time output control

    Timer 8 ....Square-wave output. 16-bit PWM output (cycle/duty continuous variable). Event count. Synchronous output event. Pulse width measurement. Input capture. Real time output control

Watchdog timer × 1

■ Serial interface

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

Synchronous type/Single-master I^2C × 1: Serial 2

■ I/O Pins

I/O   68 :   Common use. Specified pull-up resistor available. Input/output selectable (bit unit)

■ A/D converter

10-bit × 8 channels (with S/H)

■ Special Ports

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

■ ROM Correction

Correcting address designation: Up to 3 addresses possible

<div align="center">Panasonic</div>

MAD00020KEM

■ Electrical Charactreistics (Supply current)

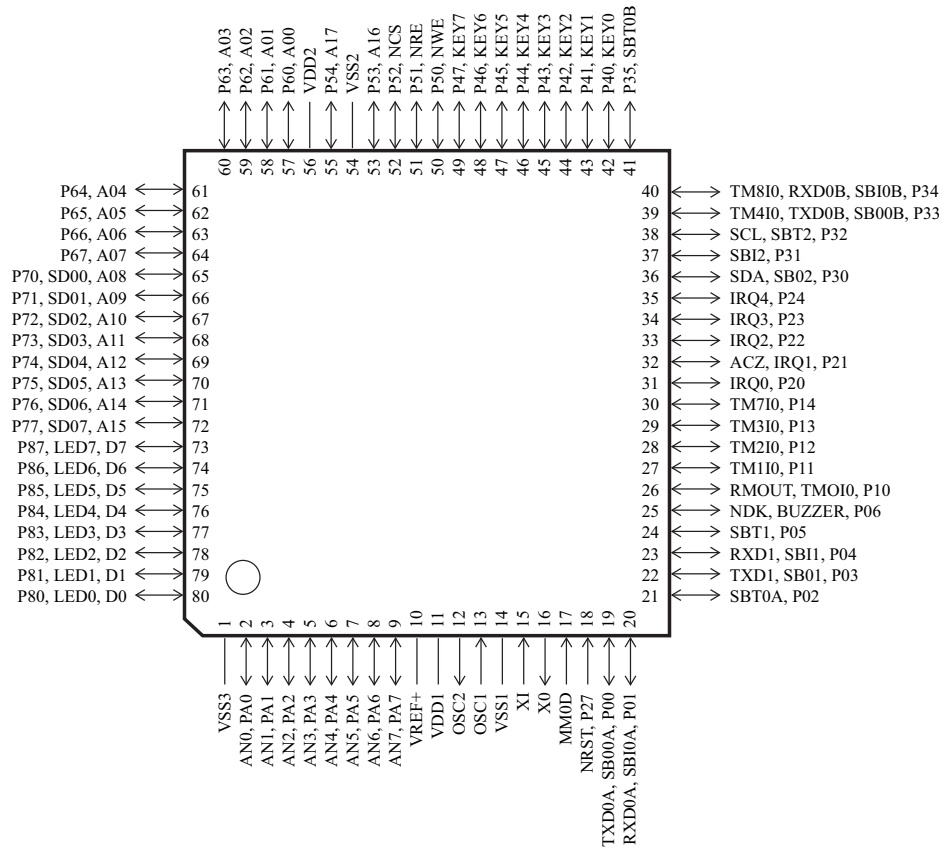| Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 20 MHz. VDD = 5 V		15(20)	30(40)	mA
	IDD2	fx = 32 kHz. VDD = 3 V		30(50)	60(100)	μA
Supply current at HALT	IDD3	fx = 32 kHz. VDD = 3 V. Ta = 25 °C		6	8	μA
Supply current at HALT	IDD4	fx = 32 kHz. VDD = 3 V. Ta = 85 °C			30	μA
Supply current at STOP	IDD5	VDD = 5 V. Ta = 25 °C			2	μA
	IDD6	VDD = 5 V. Ta = 85 °C			50	μA

Note) ( ): Flash memory built-in type

■ Development tools
In-circuit Emulator
PX-ICE101C/D + PX-PRB101C62-LQFP080-P-1414A-M

■ Pin Assignment
LQFP080-P-1414A

Top pins (left to right, 60→41):
P63, A03 (60); P62, A02 (59); P61, A01 (58); P60, A00 (57); VDD2 (56); P54, A17 (55); VSS2 (54); P53, A16 (53); P52, NCS (52); P51, NRE (51); P50, NWE (50); P47, KEY7 (49); P46, KEY6 (48); P45, KEY5 (47); P44, KEY4 (46); P43, KEY3 (45); P42, KEY2 (44); P41, KEY1 (43); P40, KEY0 (42); P35, SBT0B (41)

Left pins (61–80):
P64, A04 (61); P65, A05 (62); P66, A06 (63); P67, A07 (64); P70, SD00, A08 (65); P71, SD01, A09 (66); P72, SD02, A10 (67); P73, SD03, A11 (68); P74, SD04, A12 (69); P75, SD05, A13 (70); P76, SD06, A14 (71); P77, SD07, A15 (72); P87, LED7, D7 (73); P86, LED6, D6 (74); P85, LED5, D5 (75); P84, LED4, D4 (76); P83, LED3, D3 (77); P82, LED2, D2 (78); P81, LED1, D1 (79); P80, LED0, D0 (80)

Right pins (40–21):
TM8I0, RXD0B, SBI0B, P34 (40); TM4I0, TXD0B, SB00B, P33 (39); SCL, SBT2, P32 (38); SBI2, P31 (37); SDA, SB02, P30 (36); IRQ4, P24 (35); IRQ3, P23 (34); IRQ2, P22 (33); ACZ, IRQ1, P21 (32); IRQ0, P20 (31); TM7I0, P14 (30); TM3I0, P13 (29); TM2I0, P12 (28); TM1I0, P11 (27); RMOUT, TMOI0, P10 (26); NDK, BUZZER, P06 (25); SBT1, P05 (24); RXD1, SBI1, P04 (23); TXD1, SB01, P03 (22); SBT0A, P02 (21)

Bottom pins (1–20):
VSS3 (1); AN0, PA0 (2); AN1, PA1 (3); AN2, PA2 (4); AN3, PA3 (5); AN4, PA4 (6); AN5, PA5 (7); AN6, PA6 (8); AN7, PA7 (9); VREF+ (10); VDD1 (11); OSC2 (12); OSC1 (13); VSS1 (14); XI (15); X0 (16); MM0D (17); NRST, P27 (18); TXD0A, SB00A, P00 (19); RXD0A, SBI0A, P01 (20)

MAD00020KEM

Panasonic

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

(1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.

(2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products, and no license is granted under any intellectual property right or other right owned by our company or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.

(3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
・Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
・Any applications other than the standard applications intended.

(4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
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.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.

(7) This book may be not reprinted or reproduced whether wholly or partially, without the prior written permission of Matsushita Electric Industrial Co., Ltd.