❑ MN101C57C, MN101C57D

Type	MN101C57C	MN101C57D	MN101CF57D
Internal ROM type	Mask ROM		FLASH
ROM (byte)	48K	64K	
RAM (byte)	2K		
Package (Lead-free)	QFP100-P-1818B		
Minimum Instruction Execution Time	0.1 µs (at 4.5 V to 5.5 V, 20 MHz) 0.25 µs (at 2.7 V to 5.5 V, 8 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

RESET, Watchdog, External 0 to 3, External 4 (key interrupt selectable), External 5 (key interrupt dedicated), External 6, External 7, Remote control, Timer 0 to 3, Timer 6, Timer 7 (2 systems), Timer 8 (2 systems), Time base, Serial 0 (2 systems), Serial 2, A/D conversion finish

■ Timer Counter

Timer counter 0 : 8-bit × 1
(square-wave/8-bit PWM output, event count, generation of remote control carrier, simple pulse width measurement)
(square-wave/PWM output to large current terminal P50 possible)
Clock source..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input
Interrupt source ..... coincidence with compare register 0

Timer counter 1 : 8-bit × 1 (square-wave output, event count, synchronous output event)
Clock source..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/8192, 1/32768 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input
Interrupt source ..... coincidence with compare register 1

Timer counter 0, 1 can be cascade-connected.

Timer counter 2 : 8-bit × 1
(square-wave output, additional pulse type 10-bit PWM output, event count, synchronous output event, simple pulse width measurement)
(square-wave/PWM output to large current terminal P52 possible)
Clock source..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input
Interrupt source ..... coincidence with compare register 2

Timer counter 3 : 8-bit × 1
(square-wave output, event count, generation of remote control carrier, serial 0 baud rate timer)
Clock source..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/64, 1/128 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input
Interrupt source ..... coincidence with compare register 3

Timer counter 2, 3 can be cascade-connected.

Timer counter 6 : 8-bit freerun timer
Clock source..... 1/1 of system clock frequency; 1/1, 1/4096, 1/8192 of OSC oscillation clock frequency; 1/1, 1/4096, 1/8192 of XI oscillation clock frequency
Interrupt source ..... coincidence with compare register 6

Timer counter 7 : 16-bit × 1
(square-wave output, IGBT/16-bit PWM output (cycle / duty continuous variable), event count, synchronous output evevt, pulse width measurement, input capture)
(square-wave/PWM output to large current terminal P51 possible)
Clock source..... 1/1, 1/2, 1/4, 1/16 of system clock frequency; 1/1, 1/2, 1/4, 1/16 of OSC oscillation clock frequency; 1/1, 1/2, 1/4, 1/16 of external clock input frequency
Interrupt source ..... coincidence with compare register 7 (2 lines)

Timer counter 8 : 16 bit × 1
(square-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)
Clock source..... 1/1, 1/2, 1/4, 1/16, 1/128 of system clock frequency; 1/1, 1/2, 1/4, 1/16, 1/128 of OSC oscillation clock frequency; 1/1, 1/2, 1/4, 1/16 of external clock input frequency
Interrupt source ..... coincidence with compare register 8 (2 lines)

Timer counters 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)
Clock source..... 1/1 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency
Interrupt source ..... 1/128, 1/256, 1/512, 1/1024, 1/8192, 1/32768 of clock source frequency

Watchdog timer
Interrupt source ..... 1/65536, 1/262144, 1/1048576 of system clock frequency

■ Serial interface

Serial 0 : synchronous type/UART (full-duplex) × 1
Clock source..... 1/2, 1/4 of system clock frequency; 1/2 of pulse output of timer counter 3 frequency ; 1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency

Serial 2 : synchronous type × 1
Clock source..... 1/2, 1/4 of system clock frequency; 1/2 of pulse output of timer counter 3 frequency; 1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency

■ Remote Contorol Interface

Remote control output : timer 0 and 3 output : the remote control carrier output of 1/2 and 1/3 duty.
Remote control reception : correspondence with low speed clock waiting Correspondence with AEHA (Association for Electric Home Appliances) format (selection of a formart is available by the set-up)

■ I/O Pins

I/O	77	Common use , Specified pull-up resistor available, Input/output selectable (bit unit)
Input	6	Common use , Specified pull-up resistor available

■ A/D converter

10-bit × 16-ch. (with S/H)

■ Display control function

LCD
47 segments × 4 commons (static, 1/2, 1/3, or 1/4 duty)
LCD power supply separated from VDD (usable if VLCD ≤ VDD)
LCD power shunt resistance contained

■ Special Ports

Buzzer output, remote control carrier signal output, high-current drive port

■ Electrical Charactreistics (Supply current)

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 20 MHz , VDD = 5 V		15	30	mA
	IDD2	fosc = 8 MHz , VDD = 5 V		8	16	mA
	IDD3	fx = 32 kHz , VDD = 3 V		30	60 (70)	µA
Supply current at HALT	IDD4	fx = 32 kHz , VDD = 3 V, Ta = 25°C		4	8	µA
	IDD5	fx = 32 kHz , VDD = 3 V , Ta = –40°C to +85°C			30	µA
Supply current at STOP	IDD6	VDD = 5 V , Ta = 25°C			2	µA
	IDD7	VDD = 5 V , Ta = –40°C to +85°C			50	µA

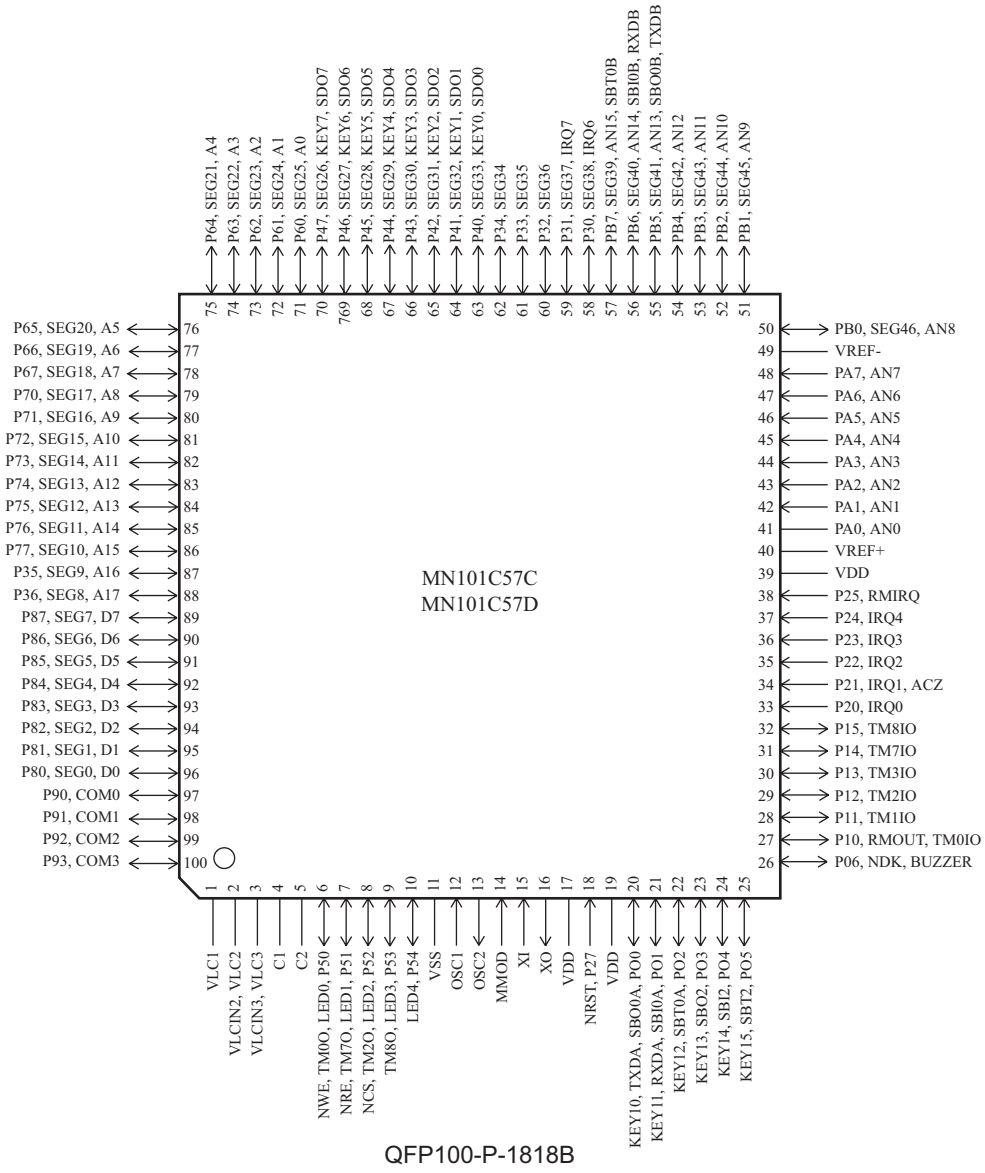
( ) : Flash memory built-in type

■ Development tools

In-circuit Emulator

PX-ICE101C/D+PX-PRB101C57-QFP100-P-1818B-M

■ Pin Assignment



QFP100-P-1818B

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. Industrial Co., Ltd.