

# □ MN101C49G, MN101C49H, MN101C49K

Type	MN101C49G	MN101C49H	MN101C49K	MN101CF49K	MN101CP49K
Internal ROM type	Mask ROM			FLASH	EPROM
ROM (byte)	128K	160K	224K		
RAM (byte)	4K	6K	10K		
Package (Lead-free)	LQFP100-P-1414, QFP100-P-1818B				
Minimum Instruction Execution Time	[Standard] 0.10 μs (at 4.5 V to 5.5 V, 20 MHz) 0.238 μs (at 2.7 V to 5.5 V, 8.39 MHz) 125 μs (at 2.0 V to 5.5 V, 32 kHz)* [Double speed] 0.12 μs (at 4.5 V to 5.5 V, 8.39 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 EPROM built-in type is 2.7 V. * The lower limit for operation guarantee for flash memory built-in type is 4.5 V.				

## ■ Interrupts

RESET, Watchdog, External 0 to 5, Timer 0 to 4, Timer 6, Timer 7 (2 systems), Time base, Serial 0 to 3, Automatic transfer finish, A/D conversion finish, Key interrupts (8 lines)

## ■ Timer Counter

Timer counter 0 : 8-bit × 1

(square-wave/8-bit PWM output, event count, generation of remote control carrier, pulse width measurement)

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, 1/64, 1/128 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/8-bit PWM output, event count, synchronous output event, pulse width measurement)

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)

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 4 : 8-bit × 1

(square-wave/8-bit PWM output, event count, pulse width measurement, serial 1 baud rate timer)

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; 1/1 of external clock input frequency

Interrupt source ..... coincidence with compare register 4

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/16-bit PWM output, cycle / duty continuous variable, event count, synchronous output event, pulse width measurement, input capture)

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)

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; pulse output of timer counter 2, 4; 1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency

Serial 1 : synchronous type/simple UART (half-duplex) × 1

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

Serial 3 : synchronous type/single-master I<sup>2</sup>C × 1

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

■ DMA controller

Max. Transfer cycles : 255

Starting factor : external request, various types of interrupt, software

Transfer mode : 1-byte transfer, word transfer, burst transfer

■ I/O Pins

I/O	73 (72)	Common use , Specified pull-up resistor available, Input/output selectable (bit unit) ( ) : Flash memory built-in type.
Input	15 (14)	Common use , Specified pull-up resistor available ( ) : Flash memory built-in type.

■ A/D converter

10-bit × 8-ch. (with S/H)

■ D/A converter

8-bit × 4-ch.

■ Special Ports

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

■ ROM Correction

Correcting address designation : up to 3 addresses possible

## Electrical Characteristics (Supply current)

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 20 MHz , VDD = 5 V		30	70	mA
	IDD2	fosc = 8.39 MHz , VDD = 5 V		15	30	mA
	IDD3	fx = 32.768 kHz , VDD = 3 V		40	120	μA
Supply current at HALT	IDD4	fx = 32 kHz , VDD = 3 V (5 V), Ta = 25°C		5 (13)	11 (30)	μA
	IDD5	fx = 32.768 kHz , VDD = 3 V (5 V) , Ta = 85°C			30 (90)	μA
Supply current at STOP	IDD6	VDD = 5 V , Ta = 25°C			3	μA
Supply current at STOP	IDD7	VDD = 5 V , Ta = 85°C			60	μA

( ) : Flash memory built-in type

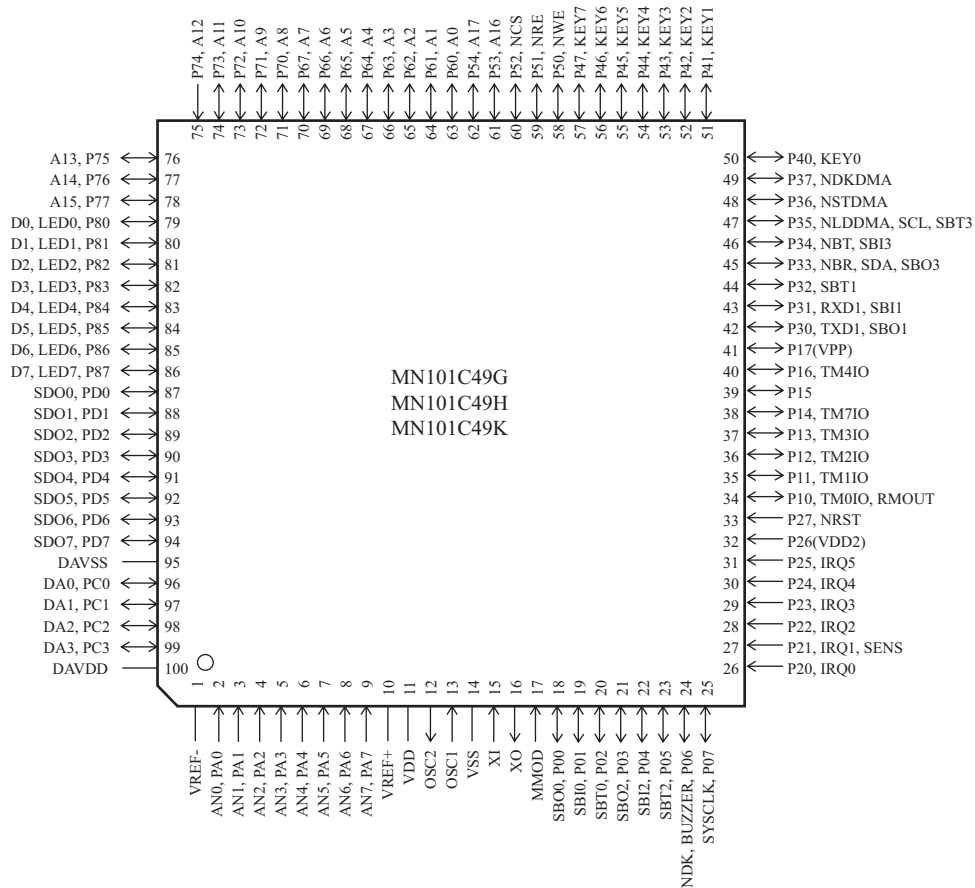
## Development tools

### In-circuit Emulator

PX-ICE101C/D+PX-PRB101C49-QFP100-P-1818B

PX-ICE101C/D+PX-PRB101C49-LQFP100-P-1414

## Pin Assignment



QFP100-P-1818B  
LQFP100-P-1414

Note) ( ) : Flash memory built-in type.

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