

□ MN101E01J, MN101E01K, MN101E01L, MN101E01M

Type	MN101E01J	MN101E01K	MN101E01L	MN101E01M	MN101EF01M
Internal ROM type	Mask ROM			FLASH	
ROM (byte)	192K	256K	320K	384K	
RAM (byte)	10K		14K	20K	24K
Package (Lead-free)	QFP100-P-1818B			LQFP100-P-1414, QFP100-P-1818B	
Minimum Instruction Execution Time	<p>[Standard] 0.0625 μs (at 3.0 V to 3.6 V, 32 MHz) 0.1 μs (at 3.0 V to 3.6 V, 20 MHz) 62.5 μs (at 3.0 V to 3.6 V, 32 kHz) [Double speed] 0.10 μs (at 3.0 V to 3.6 V, 10 MHz)</p>			<p>[Standard] 0.0625 μs (at 3.0 V to 3.6 V, 32 MHz) [Double speed] 0.10 μs (at 3.0 V to 3.6 V, 10 MHz)</p>	

■ Interrupts

RESET, Watchdog, External 0 to 5, Timer 0 to 6, Timer 7 (2 systems), Time base, Serial 0 (2 systems), Serial 1 (2 systems), Serial 2, Serial 3, Serial 4 (2 systems), Automatic transfer finish, A/D conversion finish, Key interrupts (8 lines)

■ Timer Counter

Timer counter 0 : 8-bit \times 1

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

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 \times 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 \times 1

(square-wave/8-bit PWM output, event count, synchronous output event, pulse width measurement generation of real time, serial 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; external clock input

Interrupt source coincidence with compare register 2

Timer counter 3 : 8-bit \times 1

(square-wave output, event count, generation of remote control carrier, serial 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 4 : 8-bit \times 1

(square-wave/8-bit PWM output, event count, pulse width measurement, serial 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; external clock input frequency

Interrupt source coincidence with compare register 4

Timer counter 5 : 8-bit \times 1 (square-wave output, event count, serial baud rate timer)

Clock source..... 1/2, 1/4 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 5

Timer counter 4, 5 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/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, 1/4194304 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/UART (full-duplex) × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 4, 5; 1/2, 1/4, 1/8, 1/16, 1/64 of OSC oscillation clock frequency

Serial 2 : synchronous type/single-master I²C × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 2, 3; 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128 of OSC oscillation clock frequency

Serial 3 : synchronous type/single-master I²C × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 3, 5; 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128 of OSC oscillation clock frequency

Serial 4 : synchronous type/UART (full-duplex) × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 2, 5 ; 1/2, 1/4, 1/16, 1/64 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	34	(5 V IF port) Common use , Specified pull-up resistor available, Input/output selectable (bit unit)
	50	(3 V IF port) Common use , Specified pull-up resistor available, Input/output selectable (bit unit)

■ A/D converter

10-bit × 8-ch. (with S/H)

■ D/A converter

8-bit × 1-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 = 32.0 MHz, VDD1 = 3.3 V, (fs = fosc/2)		11 (48)	30 (80)	mA
	IDD2	fosc = 20.0 MHz, VDD1 = 3.3 V, (fs = fosc/2)		8 (43)	22 (75)	mA
	IDD3	fosc = 32.768 kHz, VDD1 = 3.3 V, (fs = fosc/2)		30 (60)	120 (180)	μA
Supply current at HALT	IDD4	fx = 32.768 kHz, VDD1 = 3.3 V		12	30	μA
Supply current at STOP	IDD5	VDD1 = 3.3 V, Ta = 25°C		0.3	3.0	μA
	IDD6	VDD1 = 3.3 V, Ta = 85°C			80	μA

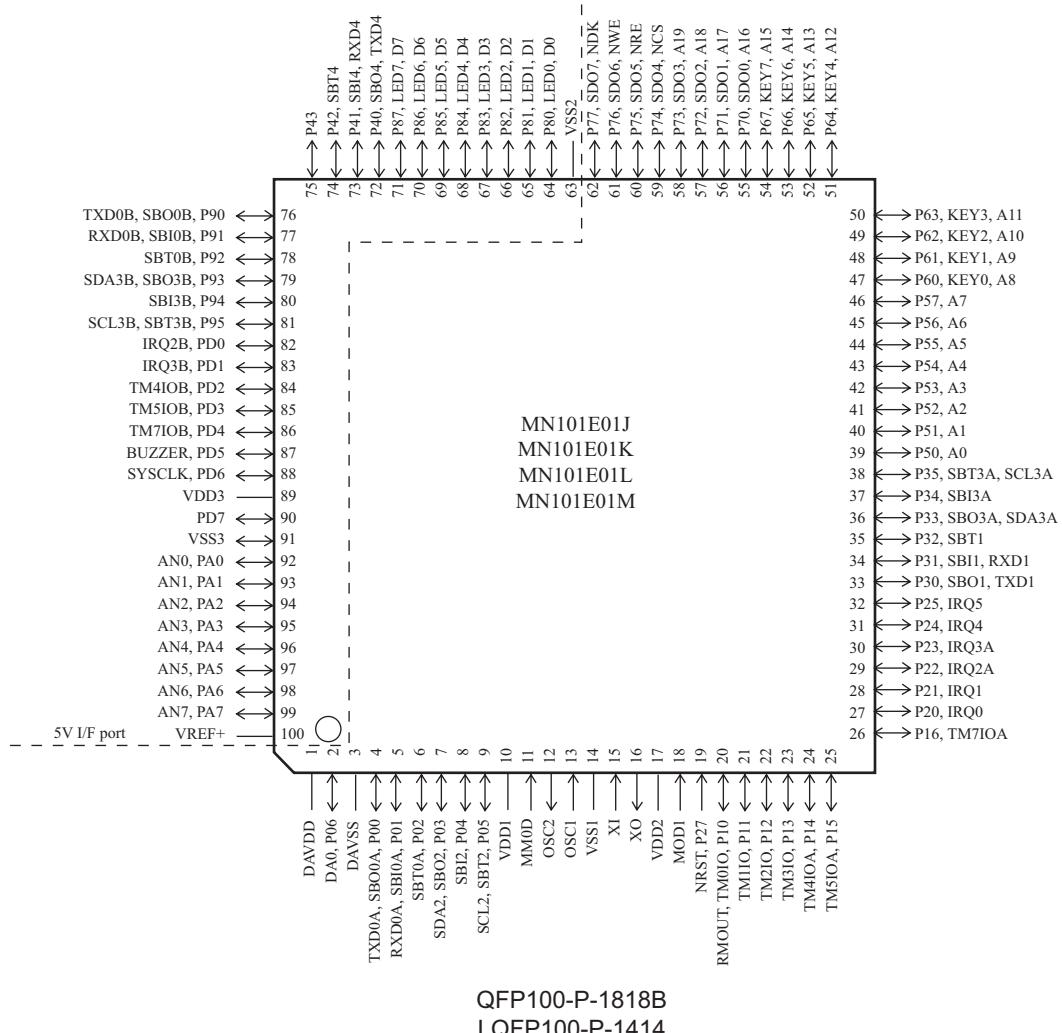
() : Flash memory built-in type

■ Development tools

In-circuit Emulator

PX-ICE101E+PRBV101E01-QFP100-P-1818B
PX-ICE101E+PRBV101E01-LQFP100-P-1414

■ Pin Assignment



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