❏ MN101C12D , MN101C12F , MN101C12G

■ Type	MN101C12D , MN101C12F , MN101C12G
■ ROM (×8-Bit)	64 K / 96 K / 128 K (External memory can be expanded)
■ RAM (×8-Bit)	2 048 / 4 096 / 4 096 (External memory can be expanded)

■ 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)
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, 8.38 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 version is 2.7 V.

■ Interrupts

- RESET • Watchdog • External 0 • External 1 • External 2 • External 3 • External 4 • Timer 0
- Timer 1 • Timer 2 • Timer 3 • Timer 4 • Timer 6 • Time Base • Serial 3 • Serial 1 • Serial 2
- Automatic Transfer finish • A/D Conversion finish • External 5 • Timer 7 (2 systems)
- 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, 1/1, 1/4, 1/16, 1/32, 1/64 of OSC Oscillation Clock, 1/1 of XI Oscillation Clock, 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, 1/1, 1/4, 1/16, 1/64, 1/128 of OSC Oscillation Clock, 1/1 of XI Oscillation Clock, 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, 1/1, 1/4, 1/16, 1/32, 1/64 of OSC Oscillation Clock, 1/1 of XI Oscillation Clock, 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, 1/1, 1/4, 1/16, 1/64, 1/128 of OSC Oscillation Clock, 1/1 of XI Oscillation Clock, 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, 1/1, 1/4, 1/16, 1/32, 1/64 of OSC Oscillation Clock, 1/1 of XI Oscillation Clock, 1/1 of External Clock Input
Interrupt Source	Coincidence with Compare Register 4

Timer Counter 6 : 8-Bit Freerun Timer

Clock Source	1/1 of System Clock, 1/1, 1/4096, 1/8192 of OSC Oscillation Clock, 1/1, 1/4096, 1/8192 of XI Oscillation Clock
Interrupt Source	Coincidence with Compare Register 6

■ Timer Counter (Continue)

Timer Counter 7 : 16-Bit × 1 (Square-Wave/16-Bit PWM Output, Cycle / Duty continuous variable, Event Count, Synchronous Output Evevt, Pulse Width Measurement, Input Capture)

Clock Source — 1/1, 1/2, 1/4, 1/16 of System Clock, 1/1, 1/2, 1/4, 1/16 of OSC Oscillation Clock, 1/1, 1/2, 1/4, 1/16 of External Clock Input

Interrupt Source . — Coincidence with Compare Register 7 (2 lines)

Time Base Timer (One-Minute Count Setting)

Clock Source — 1/1 of OSC Oscillation Clock, 1/1 of XI Oscillation Clock

Interrupt Source — 1/128, 1/256, 1/512, 1/1024, 1/8192, 1/32768, of Clock Source

Watchdog Timer

Interrupt Source — 1/65536, 1/262144, 1/1048576 of System Clock

DMA Controller (Automatic data transfer)

Max Transfer Cycles — 255

Starting Factor — External Request, Various Types of Interrupt, Software

Transfer Mode . — 1-Byte Transfer, Word Transfer, Burst Transfer

■ Serial Interface

Serial 1 : 8-Bit × 1 (Synchronous Type/Simple UART[Half-Duplex])

Clock Source — 1/2, 1/4 of System Clock
Pulse Output of Timer Counter 4
1/2, 1/4, 1/16, 1/64 of OSC Oscillation Clock

Serial 2 : 8-Bit × 1 (Synchronous Type)

Clock Source — 1/2, 1/4 of System Clock
Pulse Output of Timer Counter 3
1/2, 1/4, 1/16, 1/32 of OSC Oscillation Clock

Serial 3 : 8-Bit × 1 (Synchronous Type/Simple I²C)

Clock Source — 1/2, 1/4 of System Clock
Pulse Output of Timer Counter 3
1/2, 1/4, 1/16, 1/32 of OSC Oscillation Clock

■ I/O Pins

| I/O | 73 | • Common use • Specified pull-up Resistor available • Input / Output selectable (bit unit) |
| Input | 15 | • Common use • Specified pull-up Resistor available |

■ A/D Inputs

10-Bit × 8ch (with S/H)

■ D/A Inputs

8-Bit × 4ch

■ Special Ports

Buzzer Output, Remote Control Carrier Signal Output, High-Current Drive Port

■ Package

QFP100-P-1818B

■ Electrical Characteristics

Supply Current

Parameter	Symbol	Condition	Limit min	Limit typ	Limit max	Unit
Operating Supply Current	IDD1	fosc = 20 MHz, VDD = 5 V			60	mA
	IDD2	fosc = 8 39 MHz, VDD = 5 V			25	mA
	IDD3	fx = 32 768 kHz, VDD = 3 V			100	μA
Supply Current at HALT	IDD4	fx = 32 kHz, VDD = 3 V			8	μA
	IDD5	fx = 32 768 kHz, VDD = 3 V, Ta = -40 ℃ to +85 ℃			20	μA
Supply Current at STOP	IDD6	VDD = 5 V, Ta = 25 ℃			1	μA
	IDD7	VDD = 5 V, Ta = -40 ℃ to +85 ℃			30	μA

See the next page for support tool and pin assignment.

Support Tool

In-Circuit Emulator

PX-ICE101C / D + PX-PRB101C12-C / D

EPROM built-in Type

Type	MN101CP12GAF	
ROM (× 8-Bit)	128 K	
RAM (× 8-Bit)	4 096	
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)
	Double speed	0 12 µs (at 4 5 V to 5 5 V, 8 38 MHz)
		0 25 µs (at 3 0 V to 5 5 V, 4 MHz)
Package	QFP100-P-1818B	

Pin Assignment
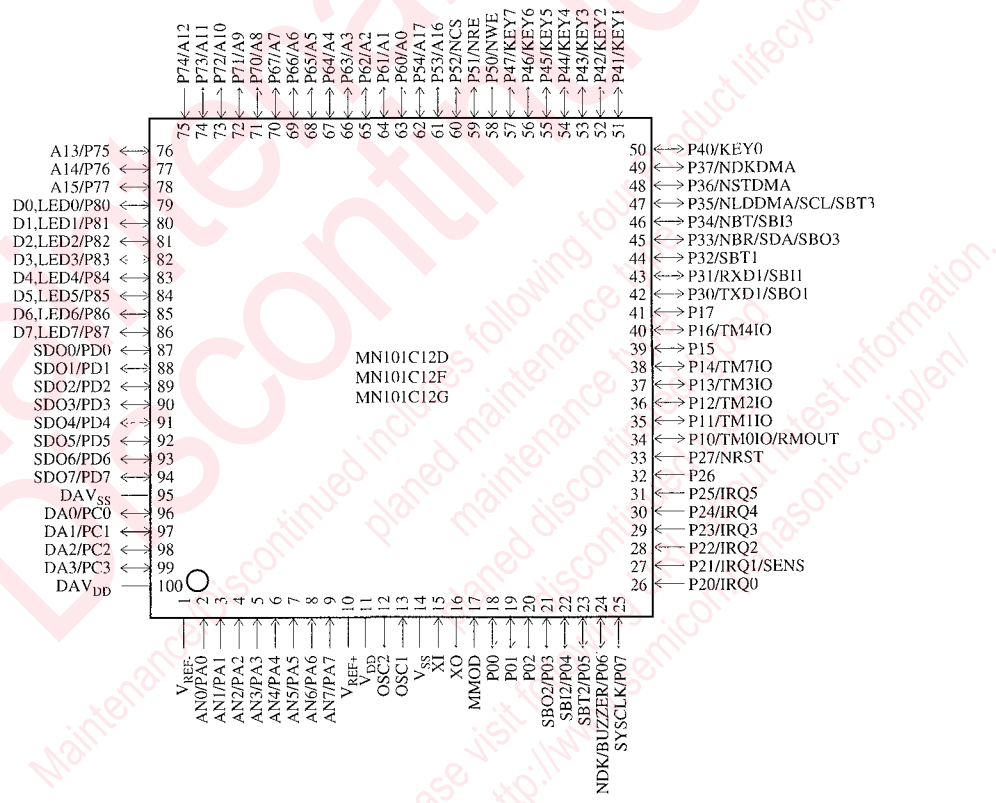
QFP100-P-1818B

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