

□ MN101C49G , MN101C49H , MN101C49K

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| Type | MN101C49G | MN101C49H | MN101C49K |
| ROM (×8-bit) External memory can be expanded | 128 K | 160 K | 224 K |
| RAM (×8-bit) External memory can be expanded | 4 K | 6 K | 10 K |

Package QFP100-P-1818B *Lead-free

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| 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.

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| Interrupts | <ul style="list-style-type: none"> • RESET • Watchdog • External 0 • External 1 • External 2 • External 3 • External 4 • External 5 • Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 4 • Timer 6 • Timer 7 (2 systems) • Time base • Serial 0 • Serial 1 • Serial 2 • Serial 3 • Automatic transfer finish • A/D conversion finish • Key interrupts (8 lines) |
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| 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 |

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| Timer Counter (Continue) | 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 |
| | 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 |

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| 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/simple I ² 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 |

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| 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. |

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| A/D Inputs | 10-bit × 8-ch. (with S/H) |
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| D/A Outputs | 8-bit × 4-ch. |
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| Special Ports | Buzzer output, remote control carrier signal output, high-current drive port |
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See the next page for electrical characteristics, pin assignment and support tool.

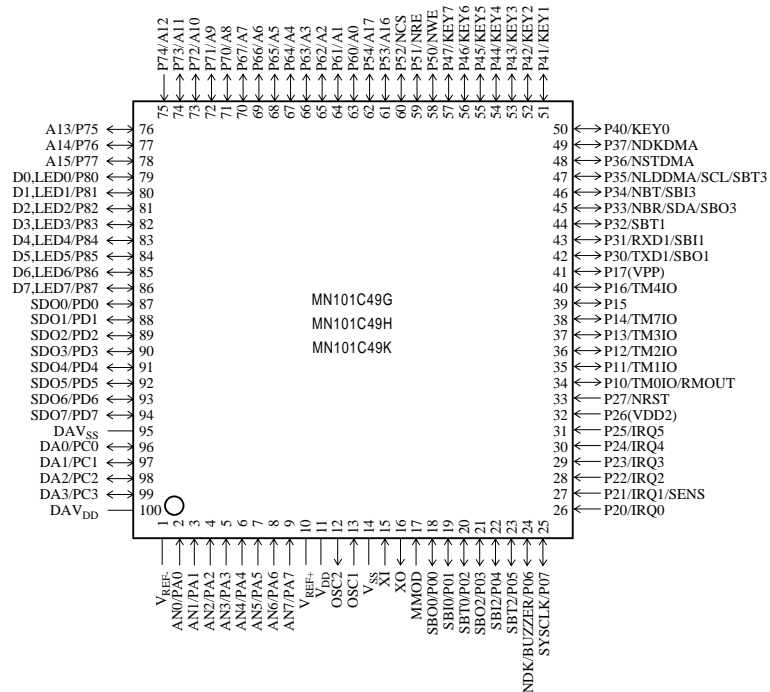
Electrical Characteristics

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 (70°C) | | | 30 (90) | μA |
| Supply current at STOP | IDD6 | VDD = 5 V, Ta = 25°C | | | 3 | μA |
| | IDD7 | VDD = 5 V, Ta = 85°C (70°C) | | | 60 | μA |

() : Flash memory built-in type.

Pin Assignment



QFP100-P-1818B *Lead-free

() : Flash memory built-in type.

Support Tool

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|-----------------------------------|--|--|--|
| In-circuit Emulator | PX-ICE101C / D + PX-PRB101C49-QFP100-P-1818B | | |
| EPROM Built-in Type | Type | MN101CP49K | |
| | ROM (× 8-bit) | 224 K | |
| | RAM (× 8-bit) | 10 K | |
| | 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, 8.39 MHz) |
| | | 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) |
| | Package | QFP100-P-1818B *Lead-free | |
| Flash Memory Built-in Type | Type | MN101CF49K [ES (Engineering Sample) available] | |
| | ROM (× 8-bit) | 224 K | |
| | RAM (× 8-bit) | 10 K | |
| | Minimum instruction execution time | Standard: | 0.10 μs (at 4.5 V to 5.5 V, 20 MHz) Double speed: 0.12 μs (at 4.5 V to 5.5 V, 8.39 MHz) |
| | | Double speed: | 0.12 μs (at 4.5 V to 5.5 V, 8.39 MHz) |
| | Package | QFP100-P-1818B *Lead-free | |

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