

MN101C49G , MN101C49H , MN101C49K

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		
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 • 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)		
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 (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	
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 I²C × 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	
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 Inputs		10-bit × 8-ch. (with S/H)	
D/A Outputs		8-bit × 4-ch.	
Special Ports		Buzzer output, remote control carrier signal output, high-current drive port	

See the next page for electrical characteristics, pin assignment and support tool.

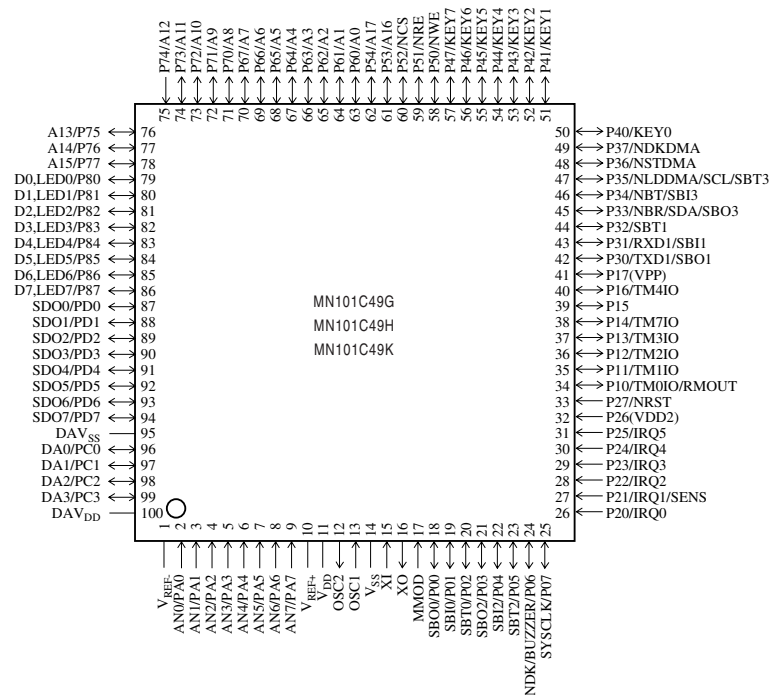
Electrical Characteristics

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

■	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)
	Package	QFP100-P-1818B *Lead-free	

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