

# MN101C49G / 49K

<b>Type</b>	<b>MN101C49G (under planning) / 49K (under planning)</b>
<b>ROM (×8-Bit)</b>	128 K / 224 K (External memory can be expanded)
<b>RAM (×8-Bit)</b>	4 096 / 10 240 (External memory can be expanded)
<b>Minimum Instruction Execution Time</b>	<p><b>Standard:</b>    <b>0.10 μs (at 4.5 V to 5.5 V, 20 MHz)</b>  <b>0.25 μs (at 2.7 V to 5.5 V, 8 MHz)</b>  <b>125 μs (at 2.0 V to 5.5 V, 32 kHz)*</b></p> <p><b>Double speed:</b> <b>0.12 μs (at 4.5 V to 5.5 V, 8.38 MHz)</b>  <b>0.25 μs (at 3.0 V to 5.5 V, 4 MHz)</b>  <b>62.5 μs (at 2.0 V to 5.5 V, 32 kHz)*</b></p> <p><b>* The lower limit for operation guarantee for EPROM built-in version is 2.7 V.</b></p>
<b>Interrupts</b>	<ul style="list-style-type: none"> <li>• RESET   • Watchdog   • External 0   • External 1   • External 2   • External 3   • External 4   • Timer 0</li> <li>• Timer 1   • Timer 2   • Timer 3   • Timer 4   • Timer 6   • Time Base   • Serial 0   • Serial 1   • Serial 2   • Serial 3</li> <li>• Automatic Transfer finish   • A/D Conversion finish   • External 5   • Timer 7 (2 systems)</li> <li>• Key Interrupts (8 lines)</li> </ul>
<b>Timer Counter</b>	<p><b>Timer Counter 0 : 8-Bit × 1</b> (Square-Wave/8-Bit PWM Output, Event Count, Generation of Remote Control Carrier, Pulse Width Measurement)</p> <p>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</p> <p>Interrupt Source        Coincidence with Compare Register 0</p> <p><b>Timer Counter 1 : 8-Bit × 1</b> (Square-Wave Output, Event Count, Synchronous Output Event)</p> <p>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</p> <p>Interrupt Source        Coincidence with Compare Register 1</p> <p><b>Timer Counter 0, 1 can be cascade-connected.</b></p> <p><b>Timer Counter 2 : 8-Bit × 1</b> (Square-Wave/8-Bit PWM Output, Event Count, Synchronous Output Event, Pulse Width Measurement)</p> <p>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</p> <p>Interrupt Source        Coincidence with Compare Register 2</p> <p><b>Timer Counter 3 : 8-Bit × 1</b> (Square-Wave Output, Event Count, Generation of Remote Control Carrier)</p> <p>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</p> <p>Interrupt Source        Coincidence with Compare Register 3</p> <p><b>Timer Counter 2, 3 can be cascade-connected.</b></p> <p><b>Timer Counter 4 : 8-Bit × 1</b> (Square-Wave/8-Bit PWM Output, Event Count, Pulse Width Measurement, Serial 1 Baud Rate Timer)</p> <p>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</p> <p>Interrupt Source        Coincidence with Compare Register 4</p> <p><b>Timer Counter 6 : 8-Bit Freerun Timer</b></p> <p>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</p> <p>Interrupt Source        Coincidence with Compare Register 6</p>

**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, 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 0 : 8-Bit × 1** (Synchronous Type/UART[Full-Duplex])  
 Clock Source . . . 1/2, 1/4 of System Clock  
 Pulse Output of Timer Counter 2, 4  
 1/2, 1/4, 1/16, 1/64 of OSC Oscillation Clock

**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 I<sup>2</sup>C)  
 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

<b>A/D Inputs</b>	10-Bit × 8ch (with S/H)
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<b>D/A Inputs</b>	8-Bit × 4ch
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<b>Special Ports</b>	Buzzer Output, Remote Control Carrier Signal Output, High-Current Drive Port
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<b>Package</b>	QFP100-P-1818B
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**Electrical Characteristics**

**Supply Current**

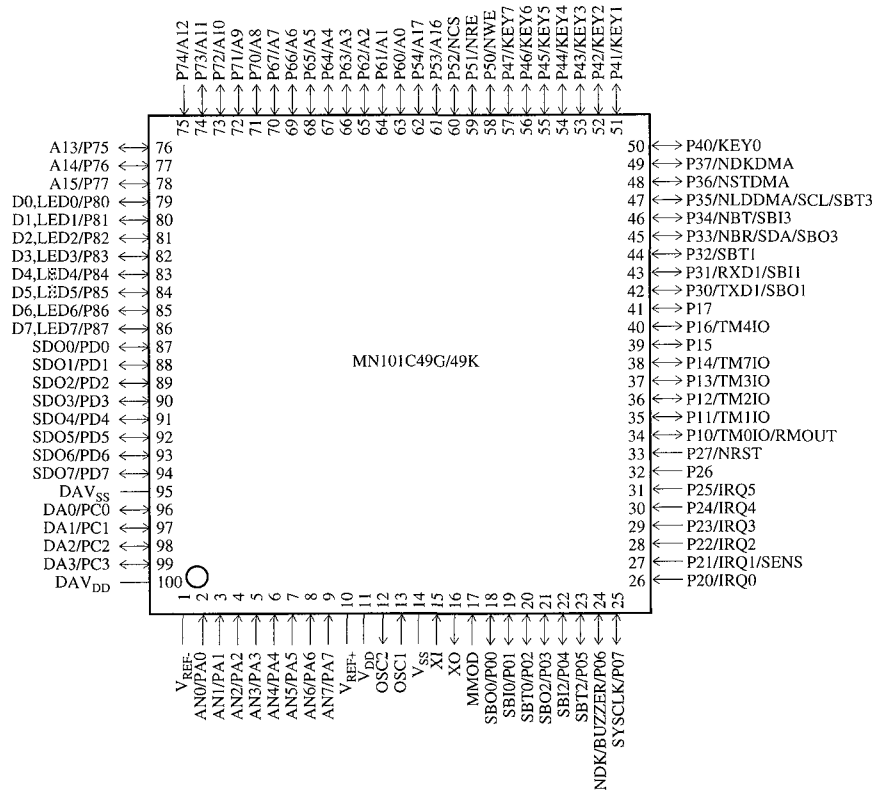
Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating Supply Current	IDD1	fosc = 20 MHz, VDD = 5 V			60	mA
	IDD2	fosc = 8.39 MHz, VDD = 5 V			25	mA
	IDD3	fx = 32 768 kHz, VDD = 3 V			100	μA
Supply Current at HALT	IDD4	fx = 32 kHz, VDD = 3 V			8	μA
	IDD5	fx = 32 768 kHz, VDD = 3 V, Ta = -40 °C to +85 °C			20	μA
Supply Current at STOP	IDD6	VDD = 5 V, Ta = 25 °C			1	μA
	IDD7	VDD = 5 V, Ta = -40 °C to +85 °C			30	μA

See the next page for support tool and pin assignment.

## Support Tool

<b>In-Circuit Emulator</b>	PX-ICE101C / D + PX-PRB101C49-C / D	
<b>EPROM built-in Type</b>	<b>Type</b>	MN101CP49G (under planning) / 49K (under planning)
	<b>ROM (× 8-Bit)</b>	128 K / 224 K
	<b>RAM (× 8-Bit)</b>	4 096 / 10 240
	<b>Minimum Instruction Execution Time</b>	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)
	<b>Package</b>	QFP100-P-1818B

## Pin Assignment



QFP100-P-1818B