

# □ MN101C23A , MN101C23C , MN101C23D , MN101C35D

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| <b>Type</b>                               | MN101C23A (under planning) , MN101C23C (under planning) ,<br>MN101C23D , MN101C35D (under development)   |
| <b>ROM (×8-Bit)</b>                       | 32 K / 48 K / 64 K / 64 K  |
| <b>RAM (×8-Bit)</b>                       | 1 024 / 2 048 / 2 048 / 2 048  |
| <b>Minimum Instruction Execution Time</b> | 0.238 μs (at 4.5 V to 5.5 V, 8.4 MHz)<br>122 μs (at 4.5 V to 5.5 V, 32.768 kHz)*<br>* The lower limit for operation guarantee for MN101C35D is 2.7 V.  |
| <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 5 • Time Base • Serial 0 • Serial 1 • Serial 2</li> <li>• Automatic Transfer finish • A/D Conversion finish • Key Scan</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)</p> <p>Clock Source . . . . . 1/1, 1/4 of System Clock, 1/1 of OSC 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 . . . . . 1/16, 1/64 of System 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)</p> <p>Clock Source . . . . . 1/1, 1/4 of System 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, Serial 0 Baud Rate Timer)</p> <p>Clock Source . . . . . 1/4, 1/16 of System Clock, 1/1 of OSC 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 : 16-Bit × 1</b> (Square-Wave/16-Bit PWM Output, Event Count, Synchronous Output Event, Input Capture)</p> <p>Clock Source . . . . . 1/4, 1/16 of System Clock, 1/1 of OSC Oscillation Clock, External Clock Input</p> <p>Interrupt Source . . . . . Coincidence with Compare Register 4</p> <p><b>Time Base Timer</b> (One-Minute Count Setting, Five independently operable 8-Bit Timer Counter)</p> <p>Clock Source . . . . . 1/4 of System Clock, 1/1, 1/8192 of OSC Oscillation Clock,<br/>1/1, 1/8192 of XI Oscillation Clock</p> <p>Interrupt Source . . . . . Coincidence with Compare Register 5, 1/8192 Prescaler Overflow</p> <p><b>Watchdog Timer</b></p> <p>Interrupt Source . . . . . 1/2097152 of System Clock</p> |
| <b>Serial Interface</b>                   | <p><b>Serial 0 : 8-Bit × 1</b> (Synchronous Type/Simple UART[Half-Duplex])</p> <p>Clock Source . . . . . 1/2, 1/4, 1/16 of System Clock<br/>1/2 of Timer Counter 3</p> <p><b>Serial 1 : 8-Bit × 1</b> (Synchronous Type)</p> <p>Clock Source . . . . . 1/2, 1/8, 1/64 of System Clock<br/>1/2 of Timer Counter 3</p> <p><b>Serial 2 : 8-Bit × 1</b> (Synchronous Type/Simple I<sup>2</sup>C)</p> <p>Clock Source . . . . . 1/1, 1/2, 1/4 of System Clock<br/>1/2 of Timer Counter 0</p>  |

MN101C23A , MN101C23C , MN101C23D □  
MN101C35D

|               |              |  |   |
|---------------|--------------|--|---|
| I/O Pins      | I/O          | 36   | • Common use 28 • Specified pull-up Resistor available • Input / Output selectable (bit unit)   |
|               | High Voltage | 53   | • Output 29 • Number of I/O 24 • Pch open drain (Breakdown Voltage -30V) FL drive 53<br>• Specified pull-down resistor mask option 35 |
| A/D Inputs    |              | 8-Bit × 8ch (with S/H)   |   |
| FL            |              | (35 to 43) segments × (18 to 10) digits  |   |
| Special Ports |              | Buzzer Output, Remote Control Carrier Signal Output  |   |
| Package       |              | MN101C23A , MN101C23C , MN101C23D LQFP100-P-1414<br>MN101C23A , MN101C23C , MN101C23D , MN101C35D QFP100-P-1818B |   |

Electrical Characteristics

Supply Current (MN101C23A , MN101C23C , MN101C23D)

| Parameter                | Symbol | Condition                  | Limit |     |     | Unit |
|--------------------------|--------|----------------------------|-------|-----|-----|------|
|                          |        |                            | min   | typ | max |      |
| Operating Supply Current | IDD1   | fosc = 8.4 MHz, VDD = 5 V  |       |     | 25  | mA   |
|                          | IDD2   | fx = 32.768 kHz, VDD = 5 V |       |     | 120 | μA   |
| Supply Current at HALT   | IDD3   | fx = 32.768 kHz, VDD = 5 V |       |     | 20  | μA   |
| Supply Current at STOP   | IDD4   | VDD = 5 V                  |       |     | 10  | μA   |

Supply Current (MN101C35D)

| Parameter                | Symbol | Condition                  | Limit |     |     | Unit |
|--------------------------|--------|----------------------------|-------|-----|-----|------|
|                          |        |                            | min   | typ | max |      |
| Operating Supply Current | IDD1   | fosc = 8.4 MHz, VDD = 5 V  |       |     | 25  | mA   |
|                          | IDD2   | fx = 32.768 kHz, VDD = 3 V |       |     | 120 | μA   |
| Supply Current at HALT   | IDD3   | fx = 32.768 kHz, VDD = 3 V |       |     | 10  | μA   |
| Supply Current at STOP   | IDD4   | VDD = 3 V                  |       |     | 10  | μA   |

See the next page for support tool and pin assignment.

# Support Tool

|  |  |
|--|--|
| In-Circuit Emulator                    | PX-ICE101C / D + PX-PRB101C23-100LF14-C / D  |
|  | PX-ICE101C / D + PX-PRB101C23-100QF18-C / D  |
| EPROM built-in Type                    | Type MN101CP23D , MN101CP35D [ES (Engineering Sample) available]   |
|  | ROM (× 8-Bit) 64 K / 64 K  |
|  | RAM (× 8-Bit) 2 048 / 2 048  |
|  | Minimum Instruction Execution Time 0 238 μs (at 4.5 V to 5.5 V, 8.4 MHz)*<br>122 μs (at 4.5 V to 5.5 V, 32.768 kHz)* |
|  | * The lower limit for operation guarantee for MN101C35D is 2.7 V   |
| Package LQFP100-P-1414, QFP100-P-1818B |  |

## Pin Assignment



LQFP100-P-1414 MN101C23A, MN101C23C, MN101C23D  
 QFP100-P-1818B MN101C23A, MN101C23C, MN101C23D, MN101C35D

Maintenance/Discontinued type, planned maintenance type, discontinued type, discontinued type  
 Maintenance/Discontinued type, planned maintenance type, discontinued type, discontinued type

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