# ❑ MN102L2403

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| **Type** | **MN102L2403 [ES (Engineering Sample) available]** |
| **ROM (×8-Bit / ×16-Bit)**<br>**RAM (×8-Bit / ×16-Bit)** | Maximum 16 M in total (Special Register 1 K included)<br>External ROM, RAM 3 K |
| **Minimum Instruction Execution Time** | **100 ns (at 4.5 V to 5.5 V, 20 MHz)** |
| **Interrupts** | • RESET • Watchdog • Timer Counter 0 to 7 • Timer Counter 8 to 10<br>• Timer Counter 8 to 10 Compare Capture A • Timer Counter 8 to 10 Compare Capture B<br>• DMA 0 to 5 Transfer finish • External 0 to 7 • Serial ch 0 to 2, 1 Transmission • Serial ch 0 to 2 Reception<br>• $\overline{KI}$ Pin (OR) • A/D Conversion finish • NMI Pin • Address coincidence |
| **Timer Counter** | **Timer Counter 0 : 8-Bit × 1** (Timer Output, Event Count)<br>Clock Source . 1/(1 to 256) of System Clock, External Clock<br>Interrupt Source Underflow of Timer Counter 0<br><br>**Timer Counter 1 : 8-Bit × 1** (Timer Output, Event Count, DMA Start up)<br>Clock Source 1/(1 to 256) of System Clock, External Clock<br>Interrupt Source Underflow of Timer Counter 1<br><br>**Timer Counter 2 : 8-Bit × 1** (Timer Output, Event Count, Synchronous Output (4-Bit × 2ch))<br>Clock Source 1/(1 to 256) of System Clock, External Clock, 1/4 of Low Speed Clock<br>Interrupt Source Underflow of Timer Counter 2 4<br><br>**Timer Counter 3 : 8-Bit × 1** (Timer Output, Event Count, A/D Conversion Start up)<br>Clock Source 1/(1 to 256) of System Clock, External Clock, 1/4 of Low Speed Clock<br>Interrupt Source Underflow of Timer Counter 3<br><br>**Timer Counter 4 : 8-Bit × 1** (Time Output, Event Count, DMA start up)<br>Clock Source . 1/(1 to 256) of System Clock, External Clock<br>Interrupt Source . Underflow of Timer Counter 4<br><br>**Timer Counter 5 to 7 : 8-Bit × 1** (Timer Output, Event Count, UART Baud Rate Generator, Synchronous Serial Clock Generator)<br>Clock Source .. 1/(1 to 256) of System Clock, External Clock<br>Interrupt Source Underflow of Timer Counter 5 to 7<br><br>**Timer Counter 8, 9 : 16-Bit × 1** (Timer Output, Event Count, Input Capture, Output Compare, PWM Output, 2-Phase Encoder Input)<br>Clock Source 1/(1 to 256) of System Clock, External Clock<br>Interrupt Source Coincidence with Compare Capture A or at Capture, Coincidence with Compare Capture B or at Capture, Underflow of Timer Counter 8, 9<br><br>**Timer Counter 10 : 16-Bit × 1** (Timer Output, Event Count, Input Capture, Output Compare, PWM Output, Synchronous Output (4-Bit × 2ch))<br>Clock Source 1/(1 to 256) of System Clock, External Clock<br>Interrupt Source .Coincidence with Compare Capture A or at Capture, Coincidence with Compare Capture B or at Capture<br><br>Connectable Timer Counter 0 to 7 |
| **Serial Interface** | **Serial 0 : 7,8-Bit × 1** (Common use with UART, Transfer direction of MSB/LSB selectable)<br>Clock Source .. 1/2 Timer Counter 5, 1/16 of Timer Counter 5, External Clock, Automatic Baud Rate<br><br>**Serial 1 : 7,8-Bit × 1** (Common use with UART, Transfer direction of MSB/LSB selectable)<br>Clock Source . . .. 1/2 Timer Counter 6, 1/16 of Timer Counter 6, 7, External Clock<br><br>**Serial 2 : 7,8-Bit × 1** (Common use with UART, Transfer direction of MSB/LSB selectable)<br>Clock Source 1/2 of Timer Counter 7, 1/16 of Timer Counter 5, 7, External Clock<br><br>**UART × 3** (Common use with Serial 0, 1, 2)<br><br>**$I^2C$ × 3** (Single master) |

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| **I/O Pins** | **I/O** | **39** | • Common use · 39 (by-bit) |
| | **Input** | **13** | • Common use 13 (by-bit) |
| | **Output** | **14** | • Common use 6 (by-bit), 8 (by 4-Bit) |
| **A/D Inputs** | | | 10-Bit × 8ch (with S/H) |
| **PWM** | | | 16-Bit × 3ch |
| **Notes** | | | Burst ROM Interface, DMA Controller, DRAM Reflesh Controller, DRAM High Speed Page Mode, EDO Mode Support |
| **Package** | | | LQFP128-P-1818B |

## Electrical Characteristics

**A/D Characteristics**

| Parameter | Symbol | Condition | Limit min | Limit typ | Limit max | Unit |
|---|---|---|---|---|---|---|
| **A/D Conversion Absolute Error** | | AVDD = 5 V, AVSS = 0 V | | | ±4 | LSB |
| **A/D Conversion Time** | | | 5 6 | | | µs |
| **Analog Input Voltage** | VIA | | VSS | | VDD | V |

**(Ta = 25 °C, VDD = 5.0 V, VSS = 0 V)**

## Support Tool

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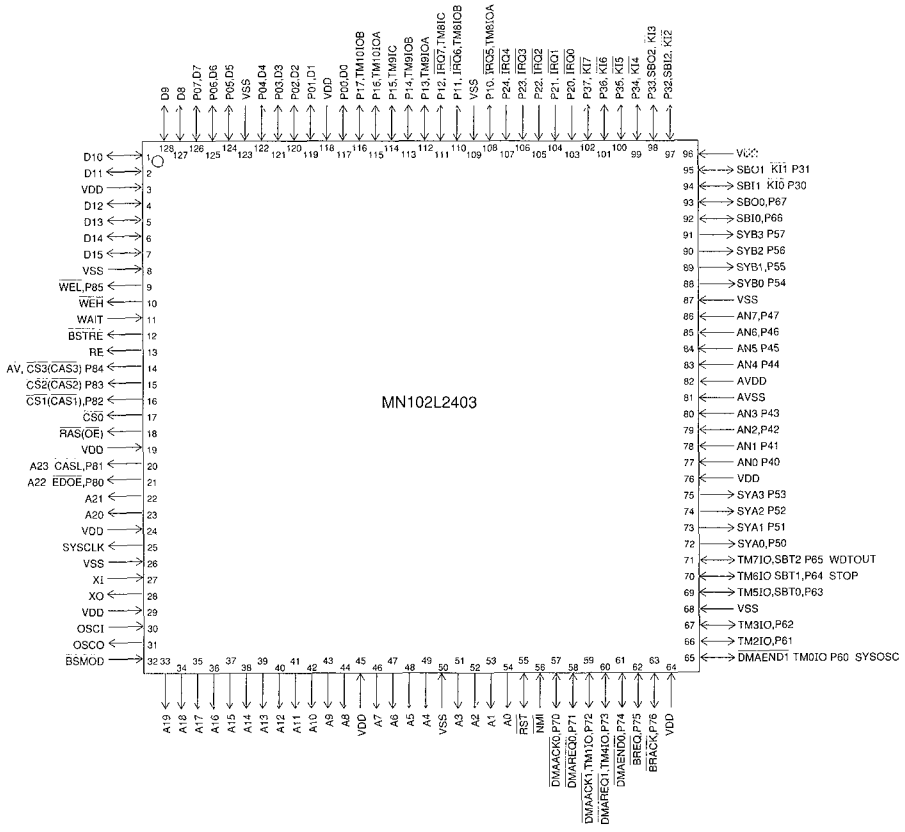
| **In-Circuit Emulator** | PX-ICE102L00 + PX-PRB102L24 |

## Pin Assignment

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