

# MN102LP25G / L25G / LP25Z / LF25Z / L25Z / LP25D / L25D / LP25A / L25A / L2503

**Type** MN102LP25G / L25G / LP25Z / LF25Z / L25Z / LP25D / L25D / LP25A / L25A / L2503  
(For MN102LP25G and L25G, ES samples are available.  
LF25Z, LP25A and L25A are under development.)

**ROM (x8-bit / x16-bit)** 128K (OTP) / 128K / 128K (OTP) / 128K (Flash) / 128K / 64K (OTP) / 64K / 32K (OTP) / 32K / External

**RAM (x8-bit / x16-bit)** 5K / 5K / 3K / 3K / 3K / 3K / 3K / 2K / 2K / 3K

**Minimum Instruction Execution Time** All models: 100ns (at 4.5 to 5.5V 20MHz)  
All models except MN102LF25Z: 200ns (at 2.7 to 3.6V 10MHz)

**Interrupts**

- RESET • Watchdog • Timer Counter 0 to 5 • Timer Counter 6 to 7
- Timer Counter 6 to 7 Compare Capture A • Timer Counter 6 to 7 Compare Capture B
- ATC Transfer finish • External 0 to 4 • Serial ch 0, 1 Transmission • Serial ch 0, 1 Reception
- NMI Pin • A/D Conversion finish

**Timer Counter**

**Timer Counter 0 : 8-bit x 1** (Timer Output, Event Count)  
Clock Source .....1/1, 1/128 of System Clock, 1/4 of Low Speed Clock, External Clock  
Interrupt Source .....Underflow of Timer Counter 0

**Timer Counter 1 : 8-bit x 1** (Timer Output, Event Count, A/D Conversion Start up)  
Clock Source .....System Clock, 1/4 of Low Speed Clock, External Clock,  
Timer Counter 0 Output  
Interrupt Source .....Underflow of Timer Counter 1

**Timer Counter 2 to 3 : 8-bit x 1** (Timer Output, Event Count, UART Baud Rate Generator)  
Clock Source .....System Clock, External Clock, Timer Counter 0 Output,  
Timer Counter 1, 2 Output  
Interrupt Source .....Underflow of Timer Counter 2, 3

**Timer Counter 4, 5 : 8-bit x 1** (Timer Output, Event Count)  
Clock Source .....1/4 of Low Speed Clock, External Clock, Timer Counter 0 Output,  
Timer Counter 3, 4 Output  
Interrupt Source .....Underflow of Timer Counter 4, 5

**Timer Counter 6, 7 : 16-bit x 1** (Timer Output, Event Count, Input Capture, Output Compare, PWM Output,  
2-Phase Encoder Input)  
Clock Source .....System Clock, External Clock, Timer Counter 4, 5 Output  
Interrupt Source .....Coincidence with Compare Capture A or at Capture, Coincidence with Compare  
Capture B or at Capture, Underflow of Timer Counter 6, 7

Connectable Timer Counter 0 to 5

**Serial Interface**

**Serial 0 : 7, 8-bit x 1** (Common use with UART, Transfer direction of MSB/LSB selectable)  
Clock Source .....1/16 Timer Counter 2, 1/16 of Timer Counter 3,  
External Clock 1/2 of Timer Counter 2

**Serial 1 : 7, 8-bit x 1** (Common use with UART, Transfer direction of MSB/LSB selectable)  
Clock Source .....1/16 Timer Counter 2, 1/16 of Timer Counter 3,  
External Clock 1/2 of Timer Counter 3

**UART x 2** (Common use with Serial 0, 1)

**I<sup>2</sup>C x 2** (Single master)

<b>I/O Pins</b>	<b>I/O</b>	<b>80</b>	• Common use : 16 (by 8-bit), 8 (by 4-bit), 56 (by-bit) (all models except MN102L2503)
		<b>48</b>	• Common use : 8 (by 4-bit), 40 (by-bit) (MN102L2503)

**A/D Inputs** 8-bit x 8ch (with S/H)

**PWM** 16-bit x 2ch

MN102LP25G / L25G / LP25Z / LF25Z / L25Z / LP25D / L25D / LP25A / L25A / L2503 □

**Notes** Burst ROM interface support, ATC (between serial 0ch and internal RAM) support

**Package** LQFP100-P-1414

The MN102LF25Z is manufactured and sold under license agreement with BULL CP8 Inc. Note that MN102LF25Z cannot be used as the IC card.

**Electrical Characteristics**

**A/D Characteristics (at VDD=5V)**

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
A/D Conversion Relative Error		VDD=5V, VSS=0V	ch0 to 3		±3	LSB
			ch4 to 7		+4	
A/D Conversion Time			4.8			µs
Analog Input Voltage	VIA		VSS		VDD	V

(Ta= 25°C, VDD=5.0V, VSS=0V)

**A/D Characteristics (at VDD=3V)**

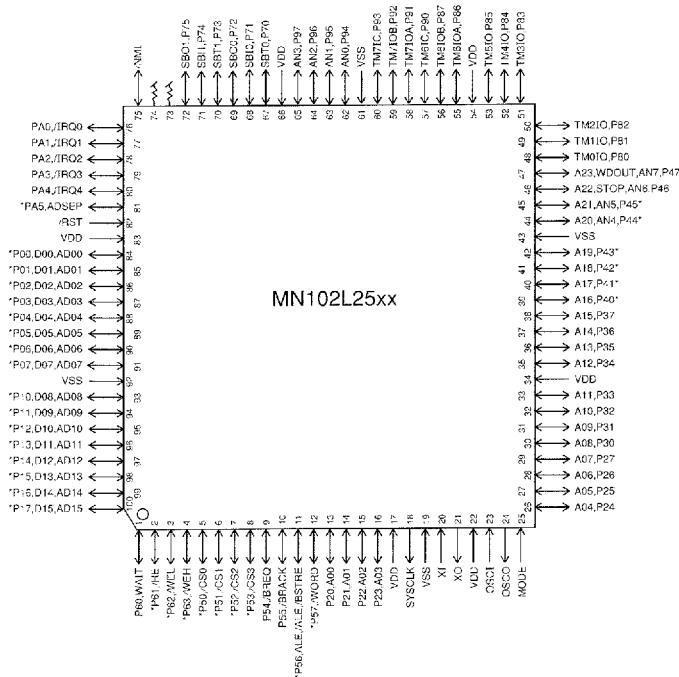
Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
A/D Conversion Relative Error		VDD=3V, VSS=0V	ch0 to 3		±3	LSB
			ch4 to 7		+4	
A/D Conversion Time			9.6			µs
Analog Input Voltage	VIA		VSS		VDD	V

(Ta= 25°C, VDD=3.0V, VSS=0V)

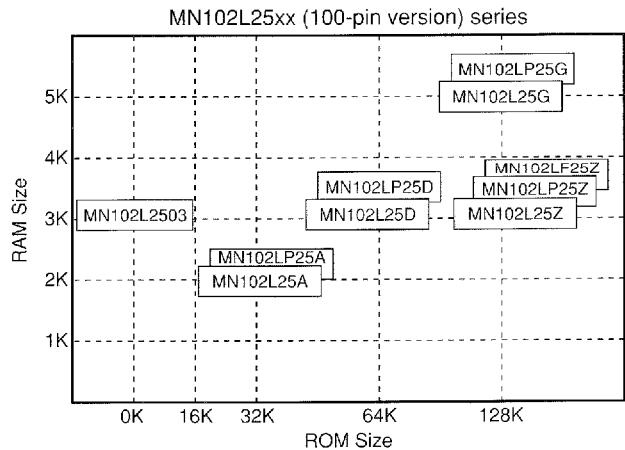
**Support Tool**

**In-Circuit Emulator** PX-ICE102L00 + PX-PRB102L25

**Pin Assignment**



LQFP100-P-1414



\* Use of these ports are disabled for MN102L2503.