❑ MN102L610B

Type			MN102L610B
ROM (×8-bit / ×16-bit)			External
RAM (×8-bit / ×16-bit)			4 K
Package			LQFP100-P-1414 *Lead-free
Minimum Instruction Execution Time			88.5 ns (at 4.5 V to 5.5 V, 22.6 MHz)
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 × 1 (timer output, event count) Clock source ····· 1/1, 1/128 of system clock frequency; 1/4 of low speed clock frequency; external clock Interrupt source ····· underflow of timer counter 0 Timer counter 1 : 8-bit × 1 (timer output, event count, A/D conversion start up) Clock source ····· system clock; 1/4 of low speed clock frequency; external clock; timer counter 0 output Interrupt source ····· underflow of timer counter 1 Timer counter 2 to 3 : 8-bit × 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 × 1 (timer output, event count) Clock source ····· 1/4 of low speed clock frequency; 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 × 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 × 1 (common use with UART, transfer direction of MSB/LSB selectable) Clock source ····· 1/16 of timer counter 2 frequency; 1/16 of timer counter 3 frequency; external clock; 1/2 of timer counter 2 frequency Serial 1 : 7, 8-bit × 1 (common use with UART, transfer direction of MSB/LSB selectable) Clock source ····· 1/16 of timer counter 2 frequency; 1/16 of timer counter 3 frequency; external clock; 1/2 of timer counter 3 frequency UART × 2 (common use with serial 0, 1) I^2C × 2 (single master)
I/O Pins	**I/O**	80 48	• Common use : 16 (by 8 bits), 8 (by 4 bits), 56 (by bit)(MN102LF61G) • Common use : 8 (by 4 bits), 40 (by bit)(MN102L610B)
A/D Inputs			8-bit × 8-ch. (with S/H)
PWM			16-bit × 2-ch.
Special Ports			LED drive port × 2
Notes			Burst ROM inferface support, ATC (between serial 0ch and internal RAM) support

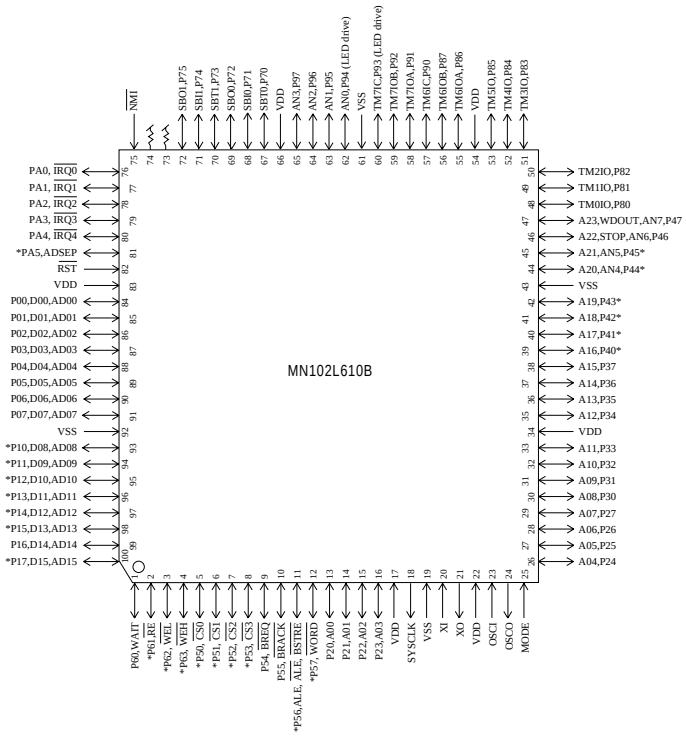
Electrical Characteristics

A/D characteristics

Parameter	Symbol	Condition		Limit			Unit
				min	typ	max	
A/D conversion relative error		VDD = 5 V , VSS = 0 V	ch.0 to 3			±3	LSB
			ch.4 to 7			±4	
A/D conversion time				4.248			µs
Analog input voltage	VIA			VSS		VDD	V

(Ta = 25°C , VDD = 5.0 V , VSS = 0 V)

Pin Assignment



LQFP100-P-1414 *Lead-free

*Port unusable in MN102L610B

* The MN102LF61G is manufactured and sold under license agreement with BULL CP8 Inc. Note that MN102LF61G cannot be used as the IC card.

Support Tool

In-circuit Emulator	PX-ICE102L00 + PX-PRB102L53-LQFP100-P-1414	
Flash Memory Built-in Type	Type	MN102LF61G
	ROM (× 8-bit / × 16-bit)	128 K
	RAM (× 8-bit / × 16-bit)	4 K
	Minimum instruction execution time	88.5 ns (at 4.5 V to 5.5 V, 22.6 MHz)
	Package	LQFP100-P-1414 *Lead-free

Request for your special attention and precautions in using the technical information and semiconductors described in this material

(1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.

(2) The technical information described in this material is limited to showing representative characteristics and applied circuits examples of the products. It neither warrants non-infringement of intellectual property right or any other rights owned by our company or a third party, nor grants any license.

(3) We are not liable for the infringement of rights owned by a third party arising out of the use of the product or technologies as described in this material.

(4) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(5) The products and product specifications described in this material are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(6) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage, and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(7) When using products for which damp-proof packing is required, observe the conditions (including shelf life and amount of time let standing of unsealed items) agreed upon when specification sheets are individually exchanged.