□ MN102L59D

Type	MN102L59D
ROM (×8-bit / ×16-bit)	64 K
RAM (×8-bit / ×16-bit)	2 K
Package	LQFP064-P-1414 *Pb free*
Minimum Instruction Execution Time	With main clock operated: 100 ns (at 4.5 V to 5.5 V, 5 MHz externally, multiplied by 4 internally)
Interrupts	• RESET • Watchdog • Timer counter 0 to 11 • External 0 to 5 • Serial ch 0, 1 transfer finish • NMI pin • A/D conversion finish

Timer Counter

Timer counter 0 : 8-bit × 1 (timer output, event count)
      Clock source ···················· 1/1, 1/64, 1/128 of system 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 ···················· 1/1, 1/64 of system clock frequency; external clock; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 1

Timer counter 2 : 8-bit × 1 (timer output, event count)
      Clock source ···················· system clock; external clock; timer counter 0, 1 output
      Interrupt source ·············· underflow of timer counter 2

Timer counter 3 : 8-bit × 1 (interval timer, UART baud rate generator)
      Clock source ···················· 1/1, 1/2, 1/64 of system clock frequency; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 3

Timer counter 4 : 8-bit × 1 (interval timer)
      Clock source ···················· 1/1, 1/64, 1/128 of system clock frequency; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 4

Timer counter 5 : 8-bit × 1 (interval timer)
      Clock source ···················· 1/1, 1/64 of system clock frequency; timer counter 0, 4 output
      Interrupt source ·············· underflow of timer counter 5

Timer counter 6 : 16-bit × 1 (timer output, event count)
      Clock source ···················· 1/1, 1/128 of system clock frequency; external clock; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 6

Timer counter 7 : 16-bit × 1 (timer output, event count)
      Clock source ···················· 1/2, 1/128 of system clock frequency; external clock; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 7

Timer counter 8 : 8-bit × 1 (timer output, event count, simple PWM output)
      Clock source ···················· 1/2, 1/8 of system clock frequency; external clock; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 8

Timer counter 9 : 8-bit × 1 (timer output, event count, simple PWM output)
      Clock source ···················· 1/2, 1/8 of system clock frequency; external clock; timer counter 0 output
      Interrupt source ·············· underflow of timer counter 9

Timer counter 10 : 8-bit × 1 (timer output, simple inverter control [simple 6-phase PWM output])
      Clock source ···················· high-speed clock (after multiplication); 1/1, 1/2, 1/8 of system clock frequency
      Interrupt source ·············· overflow of timer counter 10

Timer counter 11 : 16-bit updown counter × 1
  (highly functional inverter control [simple 6-phase PWM output], A/D conversion start)
      Clock source ···················· high-speed clock (after multiplication); 1/1 of system clock frequency
      Interrupt source ·············· overflow of timer counter 11; underflow of timer counter 11

(Connectable)   timer counter 0, 1, 2 timer counter 0, 4, 5

Serial Interface	Serial 0, 1 : 1 to 8-Bit × 1 (common use with half-duplex UART, transfer direction of MSB/LSB selectable)
	Clock source ···················· 1/2, 1/4, 1/16 of system clock, 1/2 of timer counter 3, external clock
	Half-duplex UART × 2 (common use with serial 0, 1)

I/O Pins	**I/O**	52	• Common use : 52 (by bit)

A/D Inputs	10-bit × 12-ch. (with S/H) : 4 channels for common use

PWM	16-bit × 2-ch.; simple 6-phase PWM output 8-bit × 1-ch.; 6-phase PWM output 16-bit × 1ch.

Notes	6-phase PWM output 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	ch0 to 3			±3	LSB
			ch4 to 11			±4	
A/D conversion time				11.2			µs
Analog input voltage	VIA			VSS		VDD	V

(Ta = 25°C , VDD = 5.0 V , VSS = 0 V)

■ Pin Assignment

LQFP064-P-1414 *Pb free
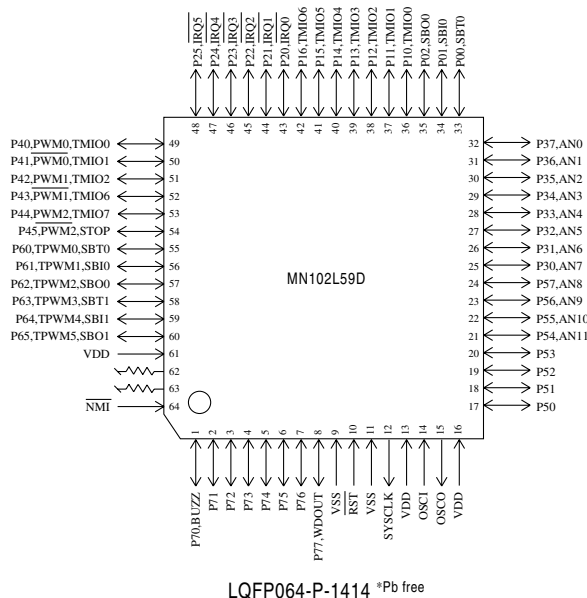
* The MN102LF59D is manufactured and sold under license agreement with BULL CP8 Inc.
Note that MN102LF59D cannot be used as the IC card.

Support Tool

In-circuit Emulator	PX-ICE102L00 + PX-PRB102L59-LQFP064-P-1414

Flash Memory Built-in Type	Type	MN102LF59D [ES (Engineering Sample) available]
	ROM (× 8-bit / × 16-bit)	64 K
	RAM (× 8-bit / × 16-bit)	2 K
	Minimum instruction execution time	100 ns (at 4.5 V to 5.5 V, 5 MHz externally, multiplied by 4 internally)
	Package	LQFP064-P-1414 *Pb free

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