

# □ MN103SE4 Series

Type	MN103SE4D	MN103SE4G	MN103SE4K	MN103SFE4G	MN103SFE4K
Internal ROM type	Mask ROM			FLASH	
ROM (byte)	64K	128K	256K	128K	256K
RAM (byte)	4K		8K	4K	8K
Package (Lead-free)	LQFP080-P-1414A				
Minimum Instruction Execution Time	16.7 ns (4.5 V to 5.5 V)				

## ■ Interrupts

9 external interrupts  
 47 internal interrupts: Watchdog timer. Timer. Serial I/F. PWM. A/D conversion finish. System error

## ■ Timer Counter

8-bit timer × 12  
 Timer 0 to 7, 14 to 17 Interval timer. Event count. Cascading connectable  
 16-bit timer × 6  
 Timer 8 to 10 .....Interval timer. Event count. PWM output. Double buffer  
 Timer 11 .....Interval timer. Event count. PWM output (6 pins simultaneous output are available). Double buffer  
 Timer 12, 13 .....Interval timer. Double buffer. Start synchronized with 3-phase PWM are available  
 Watchdog timer × 1

## ■ Serial interface

UART (full duplex) /Synchronous interfaces selective × 3  
 Serial 0, 1 .....7-bit, 8-bit transmission  
 Serial 2 .....1-bit to 8-bit transmission (synchronous). 2 and 3 channel type selectable (synchronous)

## ■ I/O Pins

I/O 61 : Common use × 61

## ■ A/D converter

10-bit × 3 unit. 16 channels  
 Minimum conversion time: 1.0 μs  
 Simultaneous conversion of 3 series are available  
 Conversion start synchronized with 3-phase PWM or timer 12, 13 are available

## ■ Motor Control PWM

16-bit 3-phase PWM × 2  
 Triangular waveform or jigsaw waveform. Dead time setup. Double buffer. Output polar switching is available. PWM output pin protect function

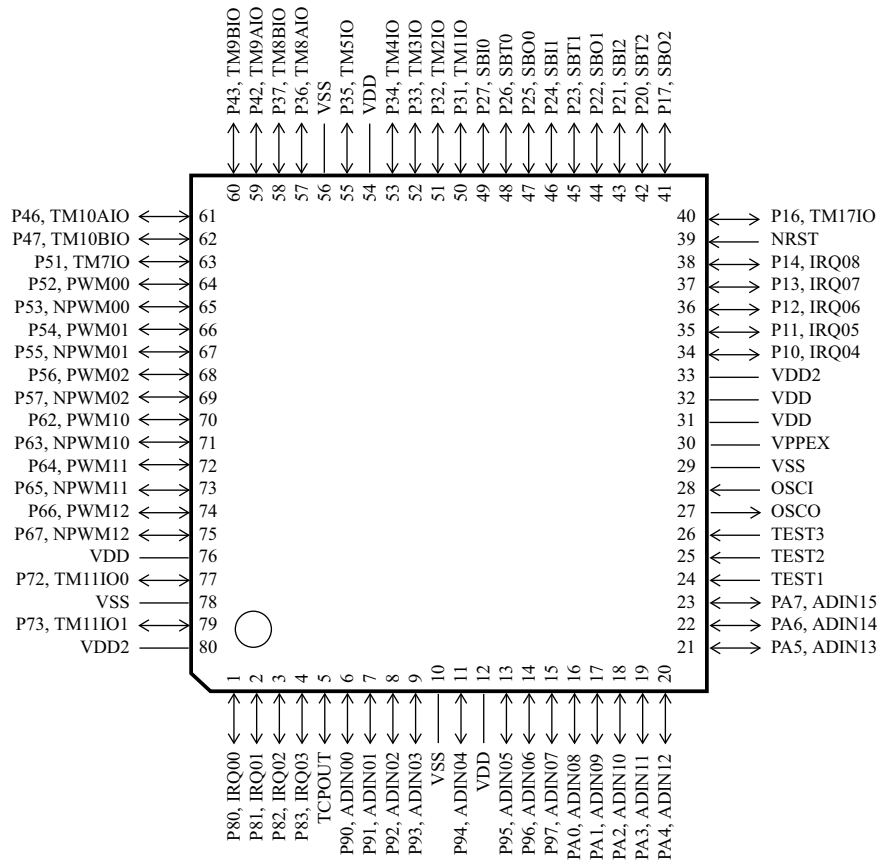
## ■ Electrical Characteristics (A/D converter characteristics)

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Non-linear error		10-bit			±3	LSB
A/D conversion time	TAD		1.0			μs
Analog input voltage	VIA		VSS		VDD	V

Ta = 25 °C. VDD = 5.0 V. VSS = 0 V

MN103SE4D, MN103SE4G, MN103SE4K, MN103SFE4G, MN103SFE4K □

■ Pin Assignment  
LQFP080-P-1414A



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