

# □ MN103SE3 Series

|                                    |                          |            |
|------------------------------------|--------------------------|------------|
| Type                               | MN103SE3K                | MN103SFE3K |
| Internal ROM type                  | Mask ROM                 | FLASH      |
| ROM (byte)                         | 256K                     |            |
| RAM (byte)                         | 8K                       |            |
| Package (Lead-free)                | QFP100-P-1818B           |            |
| 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 81 : Common use × 81

## ■ A/D converter

- 10-bit × 3 unit. 20 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

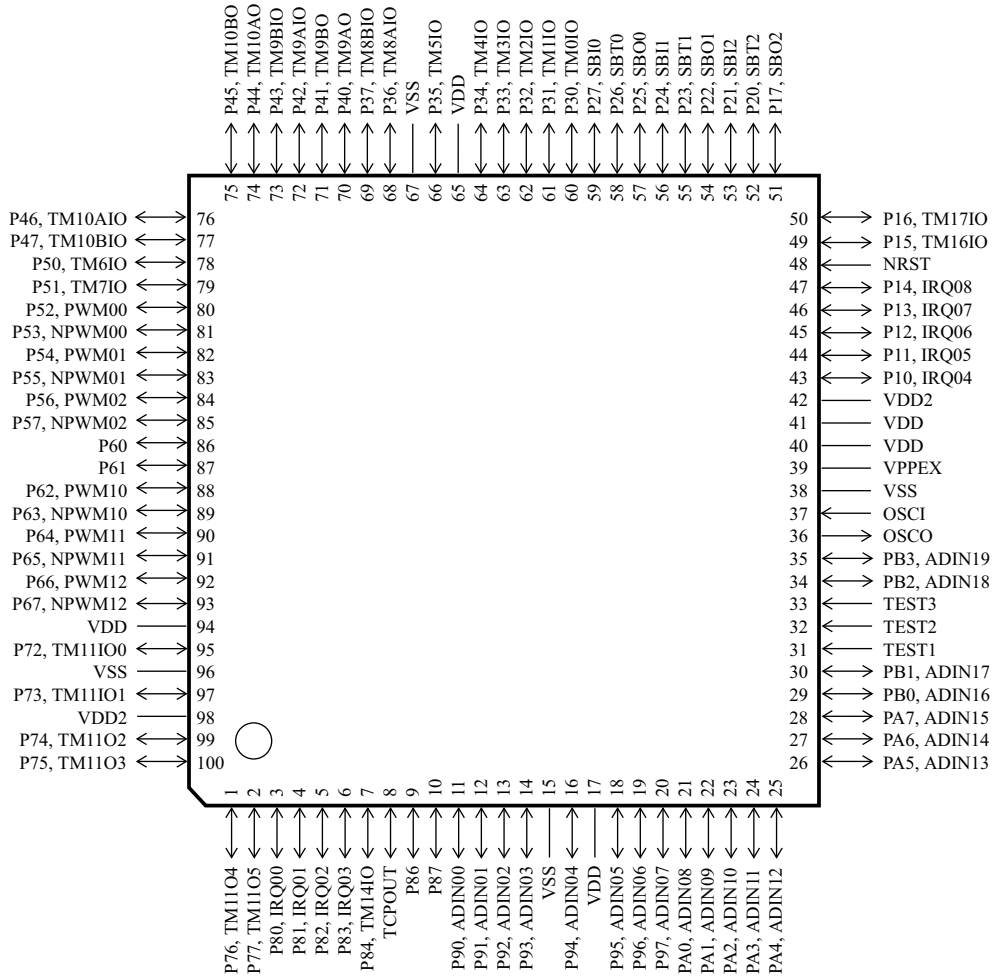
- 16-bit 3-phase PWM × 2
- Triangular waveform or jigsaw waveform. Dead time setup. Double buffer. Output polar switching is available. PWM output pin protect function

## ■ 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

■ Pin Assignment  
QFP100-P-1818B



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