

MN101E33G, MN101E33K

| Type | MN101E33G | MN101E33K | MN101EF33N |
|------------------------------------|---|------------------------------------|--|
| Internal ROM type | Mask ROM | | FLASH |
| ROM (byte) | 128K | 256K | 512K |
| RAM (byte) | 6K | 12K | 30K |
| Package (Lead-free) | QFP100-P-1818B (Under planning) | QFP100-P-1818B (Under development) | |
| Minimum Instruction Execution Time | 0.05 μ s (at 3.0 V to 3.6 V, 20 MHz at internal 2, 4, 8 times oscillation)) 0.0588 μ s (at 2.7 V to 3.6 V, 17 MHz) 30.6 μ s (at 2.7 V to 3.6 V, 32.768 kHz) | | 0.05 μ s (at 3.0 V to 3.6 V, 20 MHz) |

■ Interrupts

RESET, Watchdog, External 0 to 5, Timer 0 to 3, Timer 6, Timer 7 (2 systems), Timer A to E, Time base, Serial 0 (2 systems), Serial 1 (2 systems), Serial 2, Serial 3 (2 systems), Serial 4 (2 systems), Automatic transfer finish (2 systems), A/D conversion finish, Key interrupts, IEBus*

* IEBus is a trademark of NEC Electronics Corporation.

■ Timer Counter

Timer counter 0 : 8-bit \times 1

(square-wave/8-bit PWM output, event count, simple pulse width measurement, real time output control)

Clock source..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input

Interrupt source coincidence with compare register 0

Timer counter 1 : 8-bit \times 1

(square-wave output, event count, synchronous output event, 16-bit timer with cascade connection (Timer 0 and connection), serial clock output)

Clock source..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/64, 1/128 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input

Interrupt source coincidence with compare register 1

Timer counter 0, 1 can be cascade-connected.

Timer counter 2 : 8-bit \times 1

(square-wave/8-bit PWM output, event count, synchronous output event, pulse width measurement, real time output control, serial baud rate timer)

Clock source..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input

Interrupt source coincidence with compare register 2

Timer counter 0, 1, 2 can be cascade-connected.

Timer counter 3 : 8-bit \times 1 (square-wave output, event count, serial baud rate timer)

Clock source..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/64, 1/128 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input

Interrupt source coincidence with compare register 3

Timer counter 2, 3 can be cascade-connected.

Timer counter 0, 1, 2, 3 can be cascade-connected.

Timer counter 6 : 8-bit freerun timer , time base timer

Clock source..... 1/1 of system clock frequency; 1/1, 1/4096, 1/8192 of OSC oscillation clock frequency; 1/1, 1/4096, 1/8192 of XI oscillation clock frequency

Interrupt generating cycle.... 1/128, 1/256, 1/512, 1/1024, 1/8192 1/32768 of OSC oscillation clock frequency; 1/128, 1/256, 1/512, 1/1024, 1/8192, 1/32768 of XI oscillation clock frequency

Interrupt source coincidence with compare register 6

Timer counter 7 : 16-bit × 1

(square-wave/16-bit PWM output, cycle / duty continuous variable, event count, synchronous output event, pulse width measurement, input capture)

Clock source..... 1/1, 1/2, 1/4, 1/16 of system clock frequency; 1/1, 1/2, 1/4, 1/16 of OSC oscillation clock frequency; 1/1, 1/2, 1/4, 1/16 of external clock input frequency

Interrupt source coincidence with compare register 7 (2 lines)

Timer counter A, B, C, D, E : 8-bit × 5

Clock source..... 1/2, 1/4 of system clock frequency; 1/1, 1/2, 1/4, 1/8, 1/16, 1/32 of OSC oscillation clock frequency

Interrupt source coincidence with compare register A, B, C, D, E

Time base timer (one-minute count setting)

Clock source..... 1/1 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency

Interrupt source 1/128, 1/256, 1/512, 1/1024, 1/8192, 1/32768 of clock source frequency

Watchdog timer

Interrupt source 1/65536, 1/262144, 1/1048576, 1/4194304 of system clock frequency

■ **Serial interface**

Serial 0 : synchronous type/UART (full-duplex) × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 2, A; 1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency

Serial 1 : synchronous type/UART (full-duplex) × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 3, B; 1/2, 1/4, 1/8, 1/16, 1/64 of OSC oscillation clock frequency

Serial 2 : synchronous type/single-master I²C × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 3, C; 1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency

Serial 3 : synchronous type/ I²C × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 2, D; 1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency

Serial 4 : synchronous type/UART (full-duplex) × 1

Clock source..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 2, E ; 1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency

■ **IEBus Interface**

Serial 0 : asynchronous

Clock source 1/2, 1/3 of system clock frequency

■ **DMA controller**

Number of channels : 2

Max. Transfer cycles : 255

Starting factor : external request, various types of interrupt, software

Transfer mode : 1-byte transfer, word transfer, burst transfer

■ **I/O Pins**

| | | |
|-----|----|---|
| I/O | 22 | (5 V IF port) Common use , Specified pull-up resistor available, Input/output selectable (bit unit) |
| | 62 | (3 V IF port) Common use , Specified pull-up resistor available, Input/output selectable (bit unit) |
| | 1 | (3 V IF port) Common use |

■ **A/D converter**

10-bit × 8-ch. (with S/H)

■ **Special Ports**

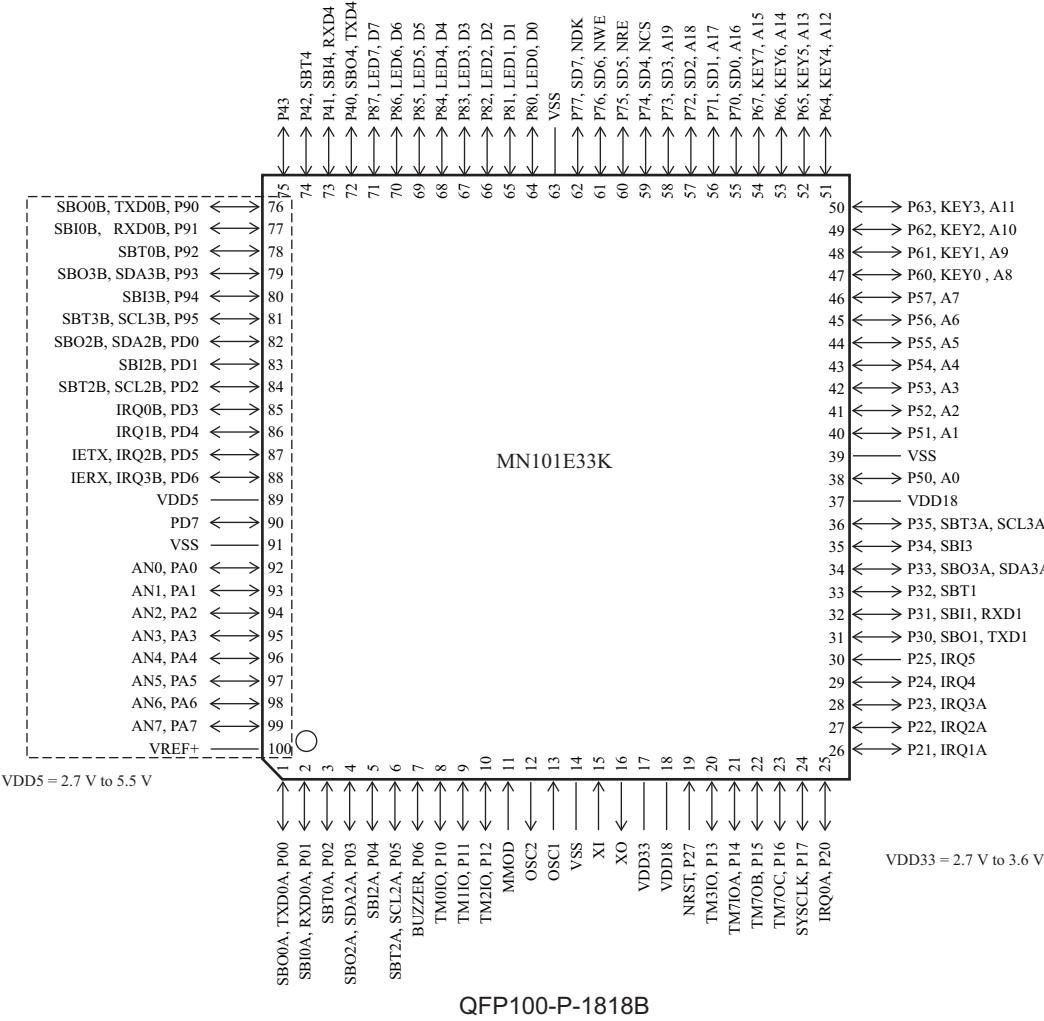
Buzzer output, high-current drive port

■ **ROM Correction**

Correcting address designation : up to 7 addresses possible

■ Development tools
In-circuit Emulator (under development)

■ Pin Assignment



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