

□ MN101C57C, MN101C57D

| Type | MN101C57C | MN101C57D | MN101CF57D |
|------------------------------------|--|-----------|------------|
| Internal ROM type | Mask ROM | | FLASH |
| ROM (byte) | 48K | 64K | |
| RAM (byte) | 2K | | |
| Package (Lead-free) | QFP100-P-1818B | | |
| Minimum Instruction Execution Time | 0.1 μs (at 4.5 V to 5.5 V, 20 MHz) 0.25 μs (at 2.7 V to 5.5 V, 8 MHz) 62.5 μs (at 2.0 V to 5.5 V, 32 kHz)* * The lower limit for operation guarantee for flash memory built-in type is 2.5 V. | | |

■ Interrupts

RESET, Watchdog, External 0 to 3, External 4 (key interrupt selectable), External 5 (key interrupt dedicated), External 6, External 7, Remote control, Timer 0 to 3, Timer 6, Timer 7 (2 systems), Timer 8 (2 systems), Time base, Serial 0 (2 systems), Serial 2, A/D conversion finish

■ Timer Counter

Timer counter 0 : 8-bit × 1

(square-wave/8-bit PWM output, event count, generation of remote control carrier, simple pulse width measurement)
 (square-wave/PWM output to large current terminal P50 possible)

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 × 1 (square-wave output, event count, synchronous output event)

Clock source..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/8192, 1/32768 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 × 1

(square-wave output, additional pulse type 10-bit PWM output, event count, synchronous output event, simple pulse width measurement)

(square-wave/PWM output to large current terminal P52 possible)

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 3 : 8-bit × 1

(square-wave output, event count, generation of remote control carrier, serial 0 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 6 : 8-bit freerun 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 source coincidence with compare register 6

Timer counter 7 : 16-bit × 1

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

(square-wave/PWM output to large current terminal P51 possible)

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 8 : 16 bit × 1

(square-wave/16-bit PWM output [duty continuous variable], event count, pulse width measurement, input capture)
 (square-wave/PWM output to large current terminal P53 possible)

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

Interrupt source coincidence with compare register 8 (2 lines)

Timer counters 7, 8 can be cascade-connected.

(square-wave output, PWM, input capture, pulse width measurement is possible as a 32-bit timer.)

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 of system clock frequency

■ **Serial interface**

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

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

Serial 2 : synchronous type × 1

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

■ **Remote Control Interface**

Remote control output : timer 0 and 3 output : the remote control carrier output of 1/2 and 1/3 duty.

Remote control reception : correspondence with low speed clock waiting Correspondence with AEHA (Association for Electric Home Appliances) format (selection of a format is available by the set-up)

■ **I/O Pins**

| | | |
|-------|----|---|
| I/O | 77 | Common use , Specified pull-up resistor available, Input/output selectable (bit unit) |
| Input | 6 | Common use , Specified pull-up resistor available |

■ **A/D converter**

10-bit × 16-ch. (with S/H)

■ **Display control function**

LCD

47 segments × 4 commons (static, 1/2, 1/3, or 1/4 duty)

LCD power supply separated from VDD (usable if VLCD ≤ VDD)

LCD power shunt resistance contained

■ **Special Ports**

Buzzer output, remote control carrier signal output, high-current drive port

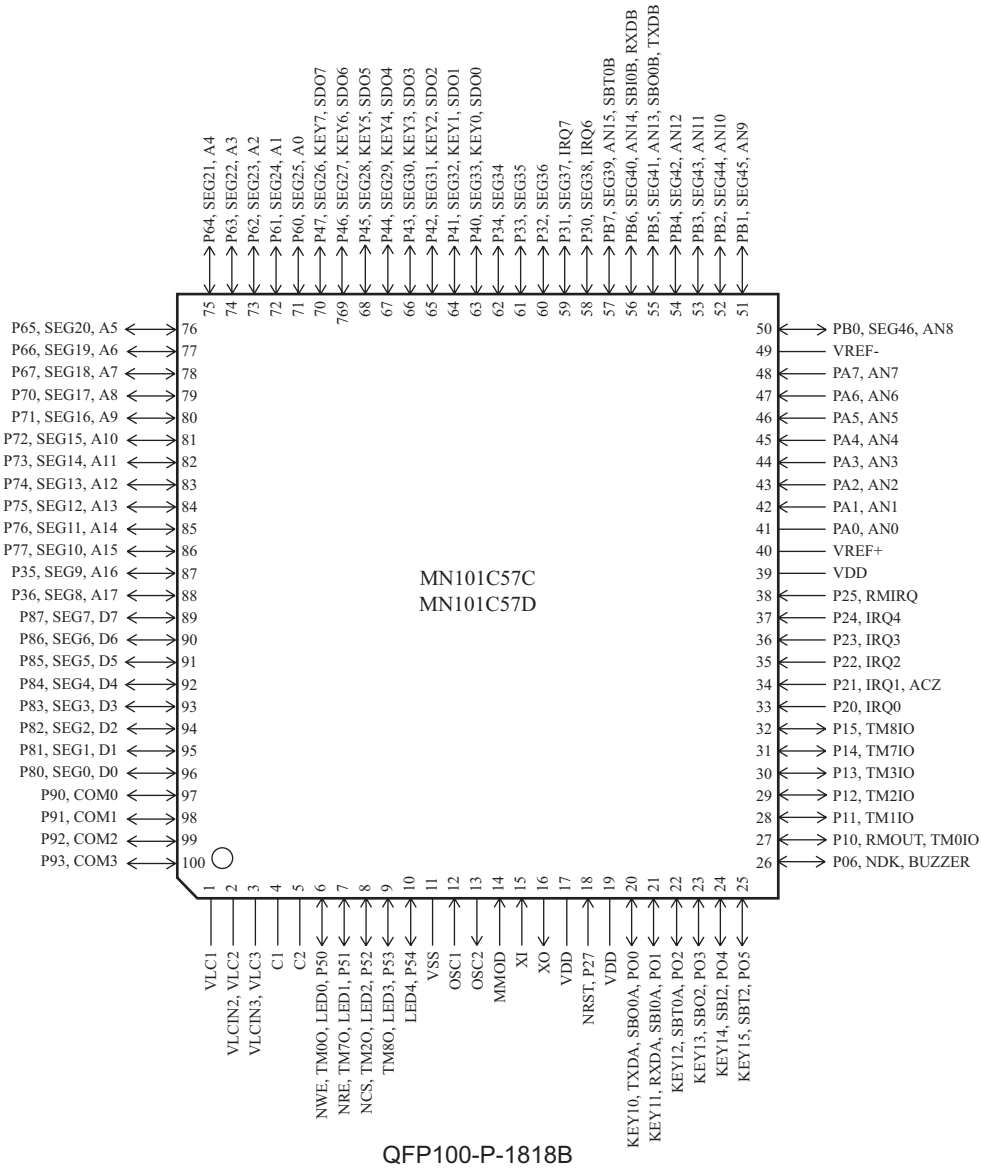
■ **Electrical Characteristics (Supply current)**

| Parameter | Symbol | Condition | Limit | | | Unit |
|--------------------------|--------|---|-------|-----|---------|------|
| | | | min | typ | max | |
| Operating supply current | IDD1 | fosc = 20 MHz , VDD = 5 V | | 15 | 30 | mA |
| | IDD2 | fosc = 8 MHz , VDD = 5 V | | 8 | 16 | mA |
| | IDD3 | fx = 32 kHz , VDD = 3 V | | 30 | 60 (70) | μA |
| Supply current at HALT | IDD4 | fx = 32 kHz , VDD = 3 V, Ta = 25°C | | 4 | 8 | μA |
| | IDD5 | fx = 32 kHz , VDD = 3 V , Ta = -40°C to +85°C | | | 30 | μA |
| Supply current at STOP | IDD6 | VDD = 5 V , Ta = 25°C | | | 2 | μA |
| | IDD7 | VDD = 5 V , Ta = -40°C to +85°C | | | 50 | μA |

() : Flash memory built-in type

■ Development tools
 In-circuit Emulator
 PX-ICE101C/D+PX-PRB101C57-QFP100-P-1818B-M

■ Pin Assignment



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