❑ MN101E31 Series

Type	MN101E31D	MN101E31G	MN101EF31D	MN101EF31G
Internal ROM type	Mask ROM		FLASH	
ROM (byte)	64K	128K	64K+8K	128K+4K
RAM (byte)	4K	6K	4K	6K
Package (Lead-free)	LQFP080-P-1414A			
Minimum Instruction Execution Time	50 ns (at 2.2 V to 5.5 V, 20 MHz) *: at internal 2 , 3 , 4 , 5 , 6 , 8 , 10 times oscillation used		50 ns (at 2.7 V to 5.5 V, 20 MHz) *: at internal 2 , 3 , 4 , 5 , 6 , 8 , 10 times oscillation used	50 ns (at 2.2 V to 5.5 V, 20 MHz) *: at internal 2 , 3 , 4 , 5 , 6 , 8 , 10 times oscillation used

■ Interrupts

6 external interrupts. 23 internal interrupts

RESET. NMI. External 0 to 4. Timer 0 to 4. Timer 6. Timer 7 (2 systems). Timer 8 (2 systems). Time base. Serial 0 (2 systems). Serial 1 (2 systems). Serial 2 (2 systems). Serial 4. Serial 5. A/D conversion. ATC. Key interrupt

■ Timer Counter

8-bit timer × 7

Timer 0 .....Timer pulse output. Event count. Added pulse (2-bit) type PWM output. Remote control carrier output. Simple pulse width measurement. Real time output control

Timer 1 .....Timer pulse output. Event count. 16-bit cascade connected (timer 0, 1). Timer synchronous output

Timer 2 .....Timer pulse output. Event count. Added pulse (2-bit) type PWM output. Simple pulse width measurement. 24-bit cascade connected (timer 0, 1, 2). Timer synchronous output. Real time output control

Timer 3 .....Timer pulse output. Event count. Remote control carrier output. 16-bit cascade connected (timer 2, 3). 32-bit cascade connected (timer 0, 1, 2, 3)

Timer 4 .....Timer pulse output. Added pulse (2-bit) type PWM output. Event count. Serial transfer clock output. Simple pulse width measurement

Timer 6 .....8-bit freerun timer. Time base timer

Timer A.....Event count. Baud rate timer. Clock output for peripheral function

16-bit timer × 2

Timer 7 .....Timer pulse output. Event count. High accuracy PWM. High performance IGBT output (cycle/duty continuous variable). Timer synchronous output. Input capture (both edge available). Real time output control. Double buffer compare register

Timer 8 .....Timer pulse output. Event count. High accuracy PWM output (cycle/duty continuous variable). Pulse width measurement. Input capture (both edge available). 32-bit cascade connected (timer 7, 8). 32-bit PWM output. Synchronous output event. Double buffer compare register

Watchdog timer × 1

■ Serial interface

Synchronous type/UART (full-duplex) × 3: Serial 0 to 2

Synchronous type/Multi-master I^2C × 1: Serial 4

I^2C slave × 1: Serial 5

■ DMA controller

1 systems. Maximum transfer cycles are 255

Starting factor: External request. Internal event. Software

■ I/O Pins

I/O 70 : Common use. Specified pull-up/pull-down resistor available. Input/output selectable (bit unit)

■ A/D converter

10-bit × 12 channels

■ Display control function

LCD: 41 segments × 4 commons (Static, 1/2, 1/3, or 1/4 duty) 1/3 bias

Usable if VLC1 ≤ VDD

■ Special Ports

Buzzer output. Inverted buzzer output. Remote control carrier output. High-current drive port

■ ROM Correction

Correcting address designation: Up to 7 addresses possible

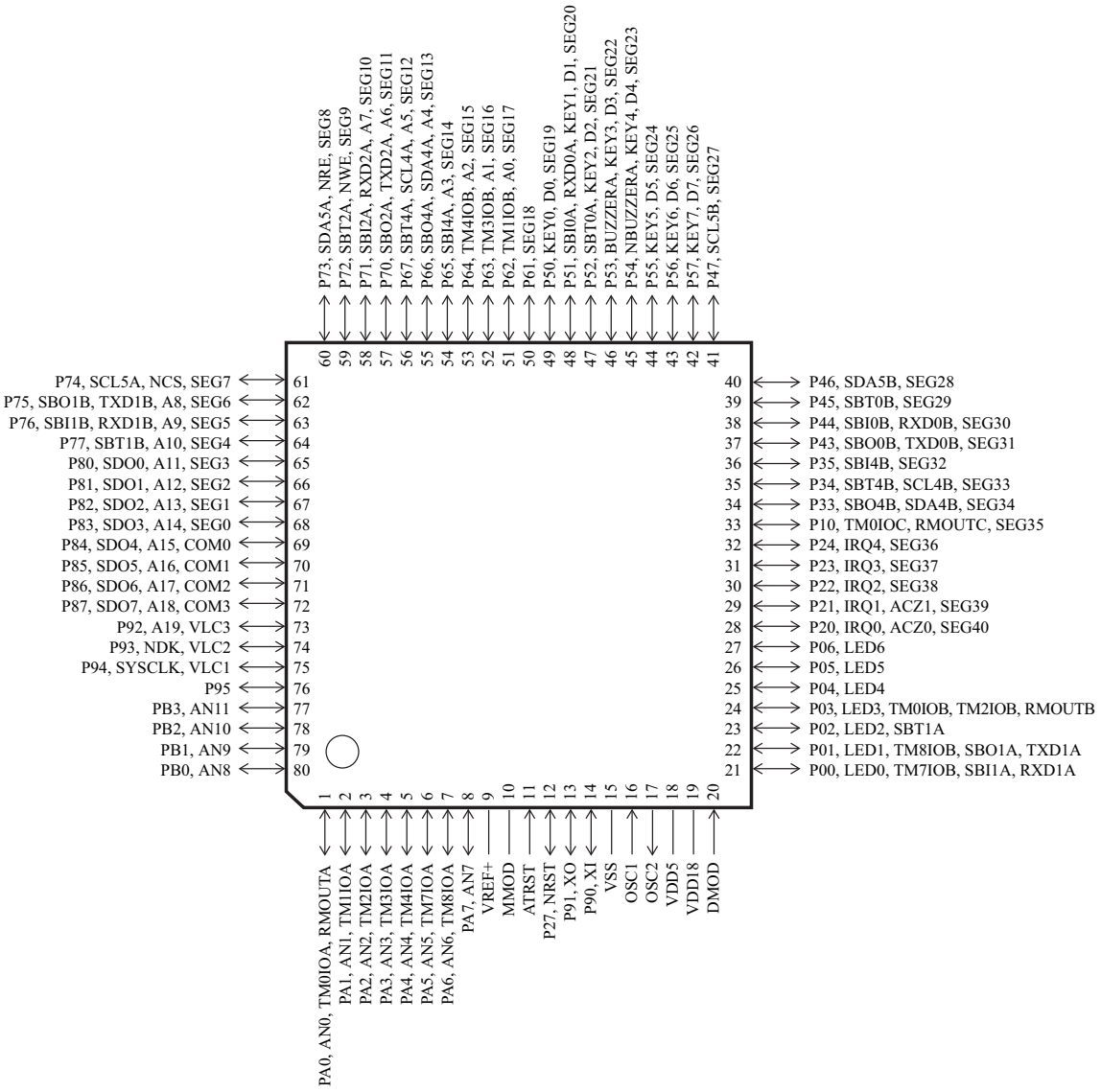
■ Development tools

In-circuit Emulator

PX-ICE101E + PRBV101E31-LQFP080-P-1414A

■ Pin Assignment

LQFP080-P-1414A



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(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.