❑ MN101C88 Series

Type	MN101C88D	MN101C88F	MN101C88G	MN101CF88G
Internal ROM type	Mask ROM			FLASH
ROM (byte)	64K	96K	128K	
RAM (byte)	2K	4K		10K
Package (Lead-free)	QFP100-P-1818B	QFP100-P-1818B (Under planning)	QFP100-P-1818B	
Minimum Instruction Execution Time	0.1 µs (at 4.5 V to 5.5 V, 20 MHz) 0.24 µs (at 2.7 V to 5.5 V, 8.4 MHz) 0.48 µs (at 2.3 V to 5.5 V, 4.19 MHz)* 1.0 µs (at 2.0 V to 5.5 V, 2.0 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 4. Timer 0 to 3. Timer 6. Timer 7 (2 systems). Time base. Serial 0 (2 systems). Serial 1 (2 systems). Serial 2. A/D conversion finish. Automatic transfer finish. FL display key scan. FL display dimmer

■ Timer Counter

8-bit timer × 5

Timer 0 .....Square-wave/8-bit PWM output. Event count. Remote control carrier output. Simple pulse width measurement
Timer 1 .....Square-wave output. Event count. Serial transfer clock output
Timer 2 .....Square-wave/8-bit PWM output. Serial transfer clock output. Event count. Simple pulse width measurement
Timer 3 .....Square-wave output. Event count. Remote control carrier output. Serial transfer clock output
Timer 6 .....8-bit freerun timer
Timer 0, 1 can be cascade-connected
Timer 2, 3 can be cascade-connected

16-bit timer × 1

Timer 7 .....Square-wave output. 16-bit PWM output (cycle/duty continuous variable). Event count. Pulse width measurement. Input capture

Time base timer: One-minute count setting
Watchdog timer × 1

■ Serial interface

Synchronous type/UART (full-duplex) × 2: Serial 0, 1
Synchronous type/Single-master I^2C × 1: Serial 2

■ DMA controller

Maximum 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	35 :	Common use. Specified pull-up resistor available. Input/output selectable (bit unit)
High Voltage	53 :	Output: 29. I/O: 24. P-ch. open drain (breakdown voltage –40 V): FL drive: 53. Specified pull-down resistor mask option: 35

■ A/D converter

10-bit × 8 channels (with S/H)

■ Display control function

FL: (35 to 43) segments × (18 to 10) digits
16 levels dimmer function
Light-and-dark 2-tones display function
Can support automatic display to universal grid display tubes
Output dimmer waveform for FL driver connection (DROUT)
Internal pull down resister is available between Port 6 and Vpp, Port 9 and Vpp, Port B and Vpp, Port C and Vpp, Port D and Vpp by Mask option (only for Mask ROM version)
Internal pull down resister between Port 4 and Vpp, Port 7 and Vpp, Port 8 and Vpp

■ Special Ports

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

■ ROM Correction

Correcting address designation: Up to 3 addresses possible

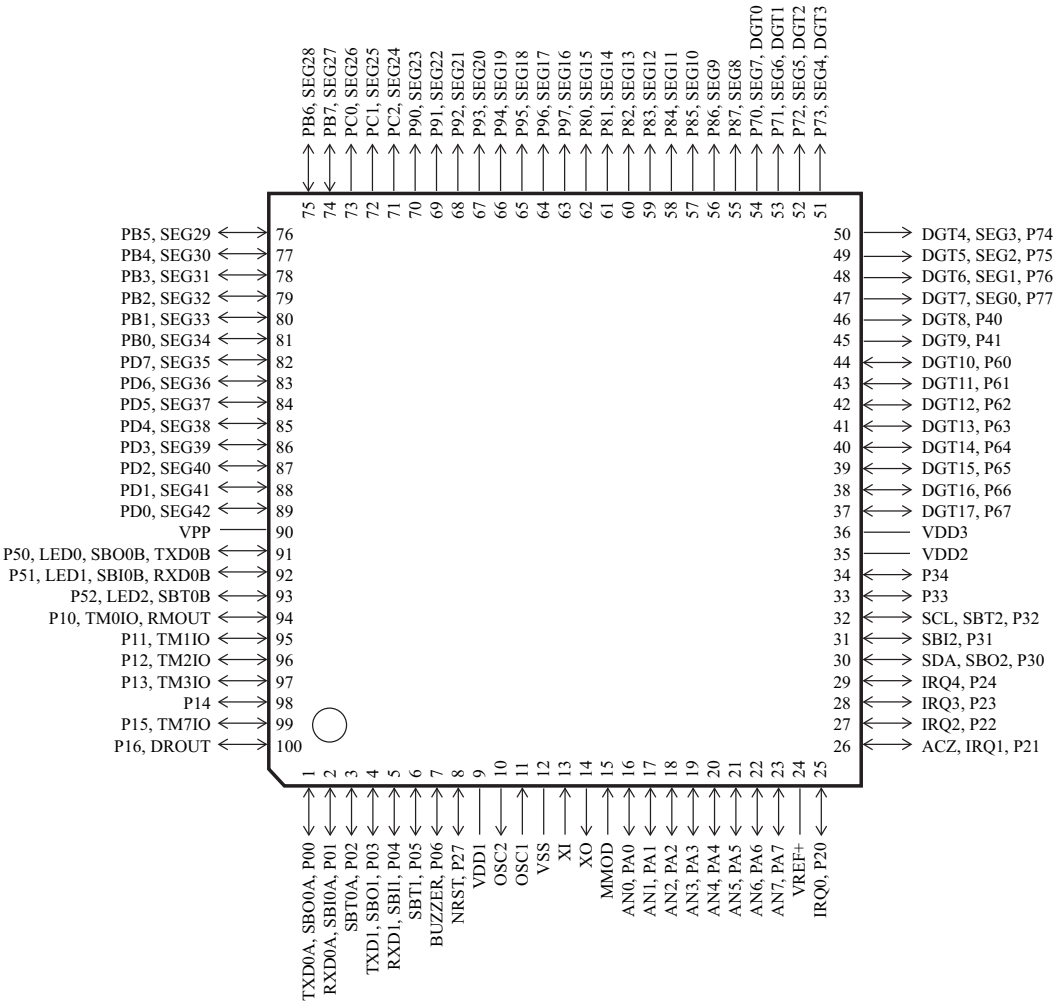
■ Development tools

In-circuit Emulator

PX-ICE101C/D + PX-PRB101C88-QFP100-P-1818B-M

■ Pin Assignment

QFP100-P-1818B



Request for your special attention and precautions in using the technical information and semiconductors described in this book

(1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.

(2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products, and no license is granted under any intellectual property right or other right owned by our company or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.

(3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(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.