❑ MN101C70C , MN101C70G

Type	MN101C70C(under development)	MN101C70G(under planning)
ROM (×8-bit)	48 K	128 K
RAM (×8-bit)	2 K	10 K
Package	LQFP080-P-1414A *Lead-free, TQFP080-P-1212D *Lead-free	
Minimum Instruction Execution Time	0.1 µs (at 2.7 V to 3.6 V, 10 MHz) 0.5 µs (at 1.8 V to 3.6 V, 4 MHz) 62.5 µs (at 1.8 V to 3.6 V, 32 kHz)	
Interrupts	• RESET • Watchdog • External 0 • External 1 • External 2 • External 4 (key interrupt dedicated) • Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 6 • Time base • Timer 7 (2 systems) • Timer 8 (2 systems) • Serial 0 (2 systems) • Serial 2 • A/D conversion finish • Automatic transfer 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, 1/64, 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 × 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, 1/128, 1/8192 of OSC oscillation clock frequency; 1/1, 1/128, 1/8192 of XI oscillation clock frequency
- Interrupt source ····· coincidence with compare register 6

Timer counter 7 : 16-bit × 1
(square-wave output, 16-bit PWM output (cycle / duty continuous variable), event count, synchronous output evevt, 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 (Continue)

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 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 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; pulse output of timer counter 1 or 2;
1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency

Serial 2 : synchronous type/single-master I^2C × 1
Clock source ····· 1/2, 1/4 of system clock frequency; pulse output of timer counter 2 or 3;
1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency

I/O Pins	**I/O**	66	• Common use • Specified pull-up resistor available • Input/output selectable (bit unit)

A/D Inputs 10-bit × 16-ch. (with S/H)

LCD

32 segments × 4 commons (static, 1/2, 1/3, or 1/4 duty)
LCD power supply separated from VDD (usable if VDD ≤ VLCD ≤ 3.6 V)
LCD power step-up circuit contained (3/2, 2 and 3 times)
LCD power shunt resistance contained

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

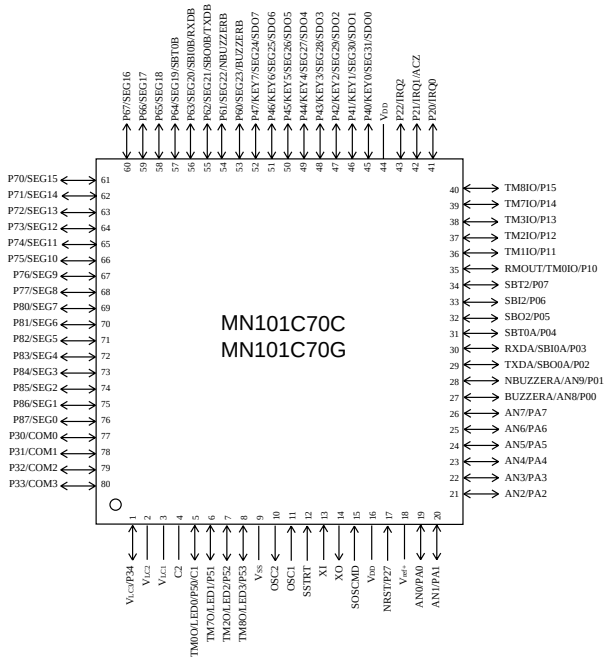
Electrical Characteristics

Supply current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 4 MHz, VDD = 3 V		1	2	mA
	IDD2	fx = 32 kHz, VDD = 3 V		8	20	µA
Supply current at HALT	IDD3	fx = 32 kHz, VDD = 3 V, Ta = 25°C		3	7	µA
	IDD4	fx = 32 kHz, VDD = 3 V, Ta = –40°C to +85°C			25	µA
Supply current at STOP	IDD5	VDD = 3 V, Ta = 25°C			2	µA
	IDD6	VDD = 3 V, Ta = –40°C to +85°C			20	µA

See the next page for pin assignment and support tool.

Pin Assignment



LQFP080-P-1414A *Lead-free

TQFP080-P-1212D *Lead-free

Support Tool

In-circuit Emulator

PX-ICE101C / D + PX-PRB101C70-LQFP080-P-1414A-M (under development)
PX-ICE101C / D + PX-PRB101C70-TQFP080-P-1212-M (under planning)

Flash Memory Built-in Type

Type	MN101CF70G (under development)
ROM (× 8-bit)	128 K
RAM (× 8-bit)	10 K
Minimum instruction execution time	0.1 µs (at 2.7 V to 3.6 V, 10 MHz) 0.25 µs (at 2.7 V to 3.6 V, 4 MHz) 62.5 µs (at 2.7 V to 3.6 V, 32 kHz)
Package	LQFP080-P-1414A *Lead-free, TQFP080-P-1212D *Lead-free (under planning)

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

(1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.

(2) The technical information described in this material is limited to showing representative characteristics and applied circuits examples of the products. It neither warrants non-infringement of intellectual property right or any other rights owned by our company or a third party, nor grants any license.

(3) We are not liable for the infringement of rights owned by a third party arising out of the use of the product or technologies as described in this material.

(4) The products described in this material 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.

(5) The products and product specifications described in this material 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.

(6) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage, and heat radiation characteristics. 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.

(7) When using products for which damp-proof packing is required, observe the conditions (including shelf life and amount of time let standing of unsealed items) agreed upon when specification sheets are individually exchanged.