☐ MN101C61D, MN101C61G

Type	MN101C61D (under development)	MN101C61G
ROM (×8-bit)	64 K	128 K
RAM (×8-bit)	3 K	12 K
Package	TQFP080-P-1212D *Lead-free*	

| **Minimum Instruction Execution Time** | Standard: 0.1 µs (at 2.5 V to 3.6 V, 20 MHz)
0.2 µs (at 2.1 V to 3.6 V, 10 MHz)
0.5 µs (at 1.8 V to 3.6 V, 4 MHz)*
125 µs (at 1.8 V to 3.6 V, 32 kHz)*
Double speed: 0.1 µs (at 2.5 V to 3.6 V, 10 MHz)
0.2 µs (at 2.1 V to 3.6 V, 5 MHz)
0.5 µs (at 1.8 V to 3.6 V, 2 MHz)*
62.5 µs (at 1.8 V to 3.6 V, 32 kHz)*

* The operation guarantee range for flash memory built-in type is 2.2V to 3.0 V or 2.7V to 3.6 V. | | |

| **Interrupts** | • RESET • Watchdog • External 0 • External 1 • External 2 • External 3 • External 4 • External 5
• Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 4 • Timer 5 • Timer 6 • Time base
• Serial 0 reception • Serial 0 transmission • Serial 1 reception • Serial 1 transmission • Serial 2 • Serial 3
• Automatic transfer finish • A/D conversion finish • Timer 7 (2 systems) • Key interrupts (8 lines) | | |

Timer Counter

Timer counter 0 : 8-bit × 1
(square-wave/8-bit PWM output, event count, generation of remote control carrier, pulse width measurement)
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/8-bit PWM output, event count, synchronous output event, pulse width measurement)
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)
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 4 : 8-bit × 1
(square-wave/8-bit PWM output, event count, pulse width measurement, serial 1 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; 1/1 of external clock input frequency
Interrupt source ·············· coincidence with compare register 4

Timer counter 5 : 8-bit × 1
(square-wave/8-bit PWM output, event count, pulse width measurement, serial 0 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; 1/1 of external clock input frequency
Interrupt source ·············· coincidence with compare register 5

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Timer Counter (Continue)		Timer counter 6 : 8-bit freerun timer

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/16-bit PWM output, cycle / duty continuous variable, event count, synchronous output evevt, 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)

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

DMA controller (automatic data transfer)

        Max. Transfer cycles ······· 255
        Starting factor ··················· external request, various types of interrupt, software
        Transfer mode ···················· 1-byte transfer, word transfer, burst transfer

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 5;
                          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 4;
                          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; pulse output of timer counter 3;
                          1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency

Serial 3 : synchronous type/single-master I²C × 1

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

I/O Pins	**I/O**	62	• Common use • Specified pull-up resistor available • Input/output selectable (bit unit)
	Input	6	• Common use • Specified pull-up resistor available

A/D Inputs	10-Bit × 6-ch. (with S/H)

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

See the next page for electrical characteristics, pin assignment and support tool.

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Electrical Characteristics

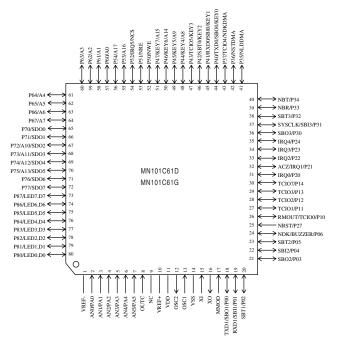### Supply current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 20 MHz, VDD = 3 V, (fs = fosc/2)		5	12	mA
	IDD2	fosc = 8.39 MHz, VDD = 3 V, (fs = fosc/2)		2	5	mA
	IDD3	fx = 32.768 kHz, VDD = 3 V, (fs = fx/2)			40	μA
Supply current at HALT	IDD4	fx = 32.768 kHz, VDD = 3 V, Ta = 25°C		4	8	μA
	IDD5	fx = 32.768 kHz, VDD = 3 V			30	μA
Supply current at STOP	IDD6	VDD = 3 V, Ta = 25°C			2	μA
	IDD7	VDD = 3 V			20	μA

Ta = −40°C to +85°C, VDD = 1.8 V to 3.6 V, VSS = 0 V

Note) Ta = −20°C to +70°C for a flash memory built-in version. Supply voltage range ans supply current ratings are also different from the values mentioned above. Refer to Chapter 18 "Flash EEPROM" for details

Pin Assignment

TQFP080-P-1212D *Lead-free

NC serves as the VPP pin in the MN101CF61G, and cannot be used as a user pin.

Support Tool

■ **In-circuit Emulator**	PX-ICE101C / D + PX-PRB101C61-TQFP080-P-1212-M	
■ **Flash Memory Built-in Type**	Type	MN101CF61G
	ROM (× 8-bit)	128 K
	RAM (× 8-bit)	12 K
	Minimum instruction execution time	0.1 µs (at 2.7 V to 3.6 V, 20 MHz)
		0.2 µs (at 2.7 V to 3.6 V, 10 MHz)
		0.5 µs (at 2.7 V to 3.6 V, 4 MHz)
		125 µs (at 2.7 V to 3.6 V, 32 kHz)
	Package	TQFP080-P-1212D *Lead-free
	Type	MN101CF60G
	ROM (× 8-bit)	128 K
	RAM (× 8-bit)	12 K
	Minimum instruction execution time	0.1 µs (at 2.5 V to 3.0 V, 20 MHz)
		0.2 µs (at 2.2 V to 3.0 V, 10 MHz)
		0.5 µs (at 2.2 V to 3.0 V, 4 MHz)
		125 µs (at 2.2 V to 3.0 V, 32 kHz)
	Package	TQFP080-P-1212D *Lead-free

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