❑ 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

Timer Counter (Continue)

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 I^2C × 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.

Electrical Characteristics

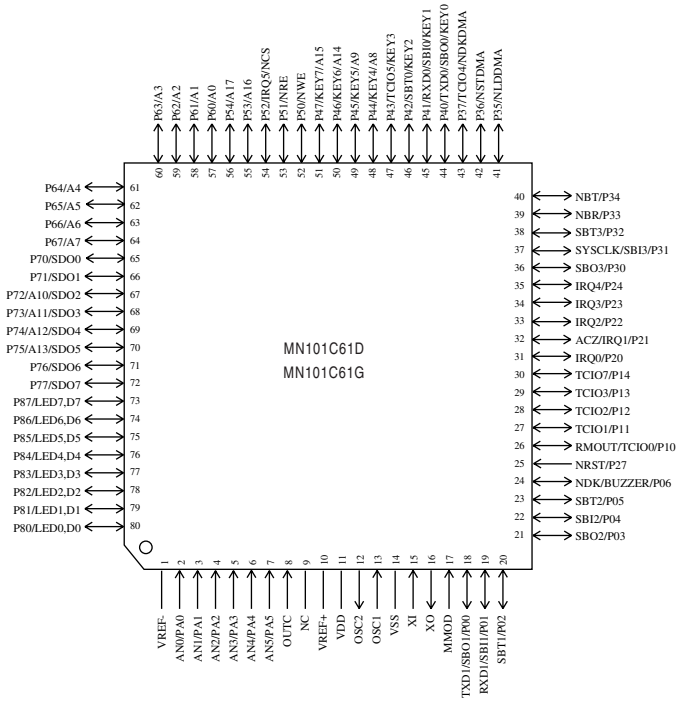
Supply current

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 detailes

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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