

MN101C78A

Type	MN101C78A (under development)
ROM (×8-bit)	32 K
RAM (×8-bit)	1.5 K
Package	TQFP048-P-0707B *Lead-free (under development), QFP044-P-1010F *Lead-free (under planning)
Minimum Instruction Execution Time	0.1 μs (at 3.0 V to 3.6 V, 10 MHz) 0.235 μs (at 1.8 V to 3.6 V, 4.25 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 1 (2 systems) • Serial 3, Serial 4 • A/D conversion 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, added pluse (2-bit) system PWM output, real time output control) (square-wave/PWM output to large current terminal P50 possible) Clock source1/2, 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 sourcecoincidence with compare register 0 Timer counter 1 : 8-bit × 1 (square-wave output, event count, synchronous output event) Clock source1/2, 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 sourcecoincidence with compare register 1 Timer counter 0, 1 can be cascade-connected. Timer counter 2 : 8-bit × 1 (square-wave output, added pluse (2-bit) system PWM output, PWM output, serial transfer clock output, real time output control, event count, synchronous output event, simple pulse width measurement) (square-wave/PWM output to large current terminal P52 possible) Clock source1/2, 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 sourcecoincidence with compare register 2 Timer counter 3 : 8-bit × 1 (square-wave output, event count, generation of remote control carrier, serial transfer clock) Clock source1/2, 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 sourcecoincidence with compare register 3 Timer counter 2, 3 can be cascade-connected. Timer counter 6 : 8-bit freerun timer Clock source1/4 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 sourcecoincidence 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 event, pulse width measurement, input capture, real time output control, high performance IGBT output) (square-wave/PWM output to large current terminal P51 possible) Clock source1/4, 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 sourcecoincidence with compare register 7 (2 lines), input capture register

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	1/4, 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), input capture register

Timer counters 7, 8 can be cascade-connected.
(square-wave output, PWM input capture, pluse width measurement is possible as a 32-bit timer.)

Time base timer (one-minute count setting)

Clock source	1/4 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 source1/65536, 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, external clock
Serial 1 : 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, external clock
Serial 3 : synchronous type/single-master I ² C × 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, external clock

Serial 4 : I²C slave × 1
Applicable for I²C high-speed transfer mode, 7bit/10bit address setting, general call

I/O Pins	I/O	40 (35)	• Common use • Specified pull-up resistor available • Input/output selectable (bit unit) () : QFP044-P-1010F
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A/D Inputs

10-bit $\times$ 8-ch. (with S/H)

LCD

12 segments $\times$ 4 commons (static, 1/2, 1/3, or 1/4 duty)
(usable if $V_{LCD} \leq V_{DD}$)

Special Ports

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

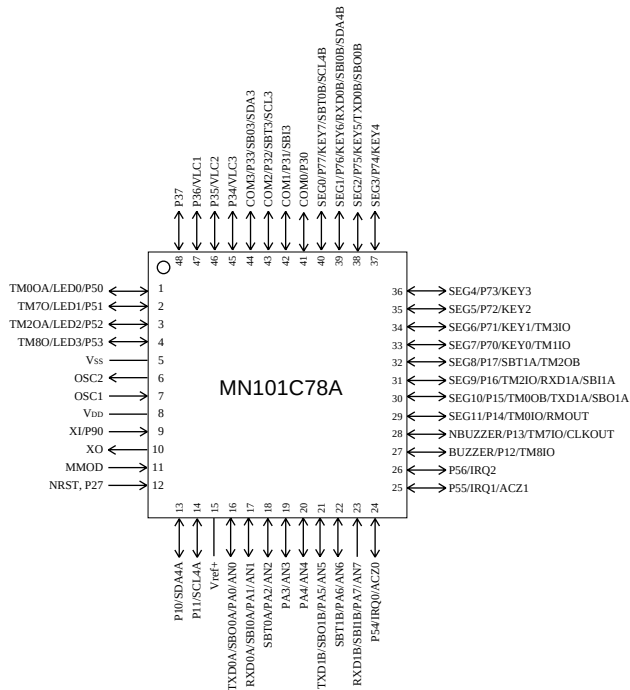
Electrical Characteristics

Supply current

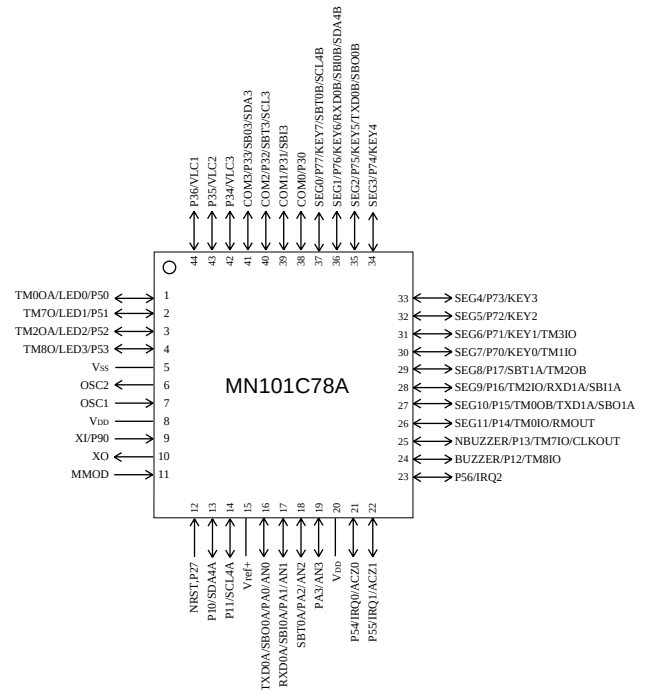
Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 4 MHz, VDD = 3 V		1	2	mA
	IDD2	fx = 32 kHz, VDD = 3 V		4	15	μA
Supply current at HALT	IDD3	fx = 32 kHz, VDD = 3 V, Ta = 25°C		2	10	μA
	IDD4	fx = 32 kHz, VDD = 3 V, Ta = -40°C to +85°C			40	μA
Supply current at STOP	IDD5	VDD = 3 V, Ta = 25°C			2	μA
	IDD6	VDD = 3 V, Ta = -40°C to +85°C			30	μA

See the next page for pin assignment and support tool.

Pin Assignment



TQFP048-P-0707B *Lead-free (under development)



QFP044-P-1010F *Lead-free (under planning)

Support Tool

In-circuit Emulator

PX-ICE101C / D + PX-PRB101C78-TQFP048-P-0707B-M (under development)

PX-ICE101C / D + PX-PRB101C78-QFP044-P-1010F-M (under planning)

Flash Memory Built-in Type

Type	MN101CF78A (under development)
ROM (× 8-bit)	32 K
RAM (× 8-bit)	1.5 K
Minimum instruction execution time	0.1 μs (at 3.0 V to 3.6 V, 10 MHz) 0.235 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	TQFP048-P-0707B *Lead-free (under development)

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