

□ MN101D10F , MN101D10G

Type	MN101D10F	MN101D10G
ROM (×8-bit)	96 K	128 K
RAM (×8-bit)	2.5 K	3.5 K
Package	QFP100-P-1818B *Lead-free	
Minimum Instruction Execution Time	With main clock operated	0.1397 μs (at 4.0 V to 5.5 V, 14.32 MHz) 71.5 μs (at 2.7 V to 5.5 V fixed to 14.32 MHz internal frequency division)
	When sub-clock operated	61 μs (at 2.5 V to 5.5 V, 32,768 kHz)
Interrupts	<ul style="list-style-type: none"> • RESET • Runaway • External 0 • External 1 • External 2 • External 3 • External 4 • Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 6 • Capstan FG • Control • HSW • Cylinder(Drum) FG • Servo V-sync • Synchronous output • OSD • XDS • Serial 0 • Serial 1 • Serial 2 • PWM 4 • OSDV-sync 	
Timer Counter	Timer counter 0: 8-bit × 1 (timer function)	
	Clock source 1/4, 1/16 of system clock frequency	
	Interrupt source overflow of timer counter 0	
	Timer counter 1: 8-bit × 1 (timer function, linear timer counter function)	
	Clock source 1/4 of system clock frequency; CTL signal	
	Interrupt source overflow of timer counter 1	
	Timer counter 2: 16-bit × 1 (timer function, input capture, duty judgment of CTL signal(VISS/VASS detection function), generation of remote control output carrier frequency)	
Clock source 1/4, 1/16, 1/24 of system clock frequency		
Interrupt source overflow of timer counter 2; input of CTL specified edge; underflow of timer 2 shift register 4-bit counter; coincidence of timer 2 shift register with timer 2 shift register compare register		
Timer counter 3: 16-bit × 1 (timer function, generation of serial transmission clock)		
Clock source 1/4, 1/16 of system clock frequency		
Interrupt source overflow of timer counter 3		
Timer counter 5: 19-bit × 1 (watchdog, stable oscillation waiting function)		
Clock source system clock		
Watchdog interrupt source ... 1/2 ¹⁶ , 1/2 ¹⁹ of timer counter 5 frequency		
Clear by stable oscillation ... after 256 counts by timer counter 5 (2 ¹⁸ counts of OSC oscillation clock)		
Timer counter 6: 16-bit × 1 (clock function [max. 2 s])		
Clock source 1/512 of OSC oscillation clock frequency; XI oscillation clock; 1/8, 1/128 of system clock frequency		
Interrupt source 1/2 ¹³ , 1/2 ¹⁴ , 1/2 ¹⁵ overflow of timer counter 6		
Serial Interface	Serial 0: 8-bit × 1 (synchronous type)	
	(transfer direction of MSB/LSB selectable, start condition function)	
	Clock source 1/8, 1/16, 1/32, 1/64, 1/128, 1/256 of system clock frequency; NSBT0 pin input	
	Serial 1: 8-bit × 1 (synchronous type/remote control transmission)	
	(transfer direction of MSB/LSB selectable, start condition function)	
Clock source 1/8, 1/16, 1/32, 1/64, 1/128, 1/256 of system clock frequency; 2-division timer 3 output; NSBT1 pin input		
Remote control clock 2-division timer 3 output		
Serial 2: 8-bit × 1 (I ² C) (master transmission/reception, slave transmission/reception)		
Clock source 1/144 to 1/252 of system clock; SCK pin input		

OSD		Display mode	:	menu(internal synchronized) display, superimpose(externally synchronized) display
		Applicable broadcasting system	:	NTSC, PAL, PAL-M, PAL-N
		Screen configuration	:	24 characters × 2n rows (n = 1 to 6)
		Character type	:	max. 256 character types (variable, include special characters)
		Character size	:	12 × 18 dots (vertical direction: 1 dot for 2H at not enlargement)
		Enlarged characters	:	each × 2 settings in horizontal and vertical
		Character interpolation	:	none
		Line background color	:	8-hue settable in the row unit at menu display
		Line background intensity	:	8 gradations settable in the row unit
		Screen background color :	:	8-huesettable at menu display
		Character color	:	white
		Character intensity	:	8 gradations settable in the row unit
		Border function	:	1-dot border in 8 directions
		Border brightness	:	4 gradations settable in the row unit
		Blinking	:	none (covered by software)
		Inverted character	:	settable in the character unit
		Half-tone	:	none
		Input	:	composite video signal input (output level: 1 V[p-p] / 2 V[p-p])
		Clamp method	:	sync tip clamp, clamp level in 4 levels
		Output	:	composite video output
		Measure against image fluctuation	:	built-in AFC circuit
		Dot clock	:	1/2 of OSC oscillation clock (automatic phase adjustment)
		MESECAM compatibility	:	Subcarrier leak function for superimpose display
XDS		Built-in U.S. closed caption data slicer (optional 1 line data can be extracted.)		
ROM Correction		Correcting address designation: up to 3 addresses possible Correction method: correction program being saved in internal RAM		
I/O Pins	I/O	76	• Common use: 56	
	Input	1	• Common use: 1	
A/D Inputs		8-bit × 12-ch. (without S/H)		
PWM		13-bit × 2-ch. (at repetition cycle 572 μs at 14.32 MHz), 8-bit × 1-ch. (at repetition cycle 35.7 μs, 0.572 ms, 1.14 ms, 2.29 ms at 14.32 MHz)		
ICR		16-bit × 2-ch.(Speed system), 18-bit × 4-ch.(Phase system)		
OCR		16-bit × 3 (Synchronous output × 2, Rec CTL × 1)		
Special Ports		3-state output (PTO) VLP pin; CTL input;Capstan FG input; Cylinder(Drum) PG/FG inputs; HSW output; Head amp/ Rotary outputs; built-in FG amp; output of 1/4 OSC oscillation clock (1 V[p-p])		
Notes				

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	14.32 MHz operation without load, VDD = 5 V		50	100	mA
	IDD2	1/1024 of 14.32 MHz operation without load, VDD = 2.7 V		2	5	mA
	IDD3	Stop of 14.32 MHz oscillation, VDD = 2.7 V 32 kHz oscillation operation without load		50	100	μA
Supply current at STOP	IDSP	Stop of oscillation without load, VDD = 5 V, Ta = 55 °C			10	μA
Supply current at HALT	IDHT0	14.32 MHz oscillation without load, VDD = 5 V		5	15	mA
	IDHT1	Stop of 14.32 MHz oscillation, VDD = 2.7 V 32 kHz oscillation operation without load		5	20	μA

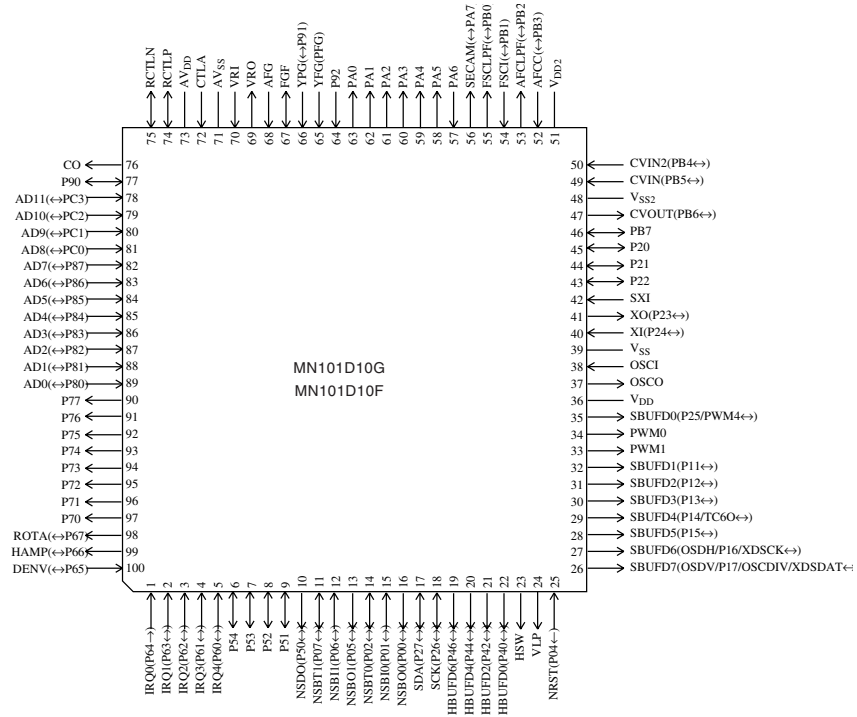
(Ta = 25 °C ± 2 °C, VSS = 0 V)

A/D Converter Performance

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Conversion relative error	ΔNLAD				± 3	LSB
A/D Conversion Time	tAD	fosc = 14.32 MHz		8		μs
Analog Input Voltage					5	V

(Ta = 25 °C ± 2 °C, VDD = 5.0 V, VSS = 0 V)

Pin Assignment



QFP100-P-1818B *Lead-free

Support Tool

In-circuit Emulator	PX-ICE101C / D + PX-PRB101D10-QFP100-P-1818B-CN-M	
Flash Memory Built-in Type	Type	MN101DF10GAF
	ROM (× 8-bit)	128 K
	RAM (× 8-bit)	4 K
	Minimum instruction execution time	0.1397 μs (at 4.0 V to 5.5 V, 14.32 MHz) 71.5 μs (at 2.7 V to 5.5 V, fixed to 14.32 MHz internal division) 61 μs (at 2.5 V to 5.5 V, 32.768 kHz)
	Package	QFP100-P-1818B *Lead-free

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