

# □ MN101D01C / D / E / F / G

<b>Type</b>	<b>MN101D01C / D / E / F / G</b>	
<b>ROM (x8-bit)</b>	48K / 64K / 80K / 96K / 128K	
<b>RAM (x8-bit)</b>	1536 / 2048 / 2304 / 2560 / 3072	
<b>Minimum Instruction Execution Time</b>	With Main Clock operated	<b>0.1397 <math>\mu</math>s (at 4.0 to 5.5V, 14.32MHz)</b> <b>0.1128 <math>\mu</math>s (at 4.0 to 5.5V, 17.73MHz)</b>
	When Sub-clock operated	<b>143 <math>\mu</math>s (at 2.7 to 5.5V fixed to 14.32MHz internal division)</b> <b>122 <math>\mu</math>s (at 2.7 to 5.5V, 32.768MHz)</b>
<b>Interrupts</b>	<ul style="list-style-type: none"> <li>• RESET • Runaway • External 0, 1, 2, 3, 4/key input (P50 to 54) • Timer 0 • Timer 1 • Timer 2 • Timer 3</li> <li>• Timer 4 • Timer 6 • Capstan FG • Control • HSW • Cylinder FG • VSYNC • Continuous Synchronous Output</li> <li>• OSD • XDS • Serial 0 • Serial 1 • Serial 2 • A/D (common with PWM 14 reference frequency)</li> </ul>	
<b>Timer Counter</b>	<p><b>Timer Counter 0: 16-bit x 1</b> (Timer Output, Clock Function [max. 2 s])  Clock Source.....1/2, 1/4, 1/8, 1/16 of System Clock, 1/512 of XI Oscillation Clock or OSC Oscillation Clock  Interrupt Source.....Overflow of Timer Counter 0</p> <p><b>Timer Counter 1: 16-bit x 1</b> (Timer Output, linear Timer Counter Function)  Clock Source.....1/2, 1/4, 1/8, 1/16, CTL Signal of System Clock  Interrupt Source.....Overflow of Timer Counter 1</p> <p><b>Timer Counter 2: 16-bit x 1</b> (Timer Output, Input Capture (DCTL Specified Edge), Duty Judgment of DCTL Signal)  Clock Source.....1/2, 1/4, 1/8, 1/12, 1/16, 1/24 of System Clock  Interrupt Source.....Overflow of Timer Counter 2, Input of DCTL Specified Edge, Underflow of Timer  2 Shift Register 4-bit Counter, Coincidence of Timer 2 Shift Register with Timer  2 Shift Register Compare Register</p> <p><b>Timer Counter 3: 16-bit x 1</b> (Timer Output, Detection of Serial Indexing, Generation of Remote Control Output  Carrier Frequency)  Clock Source.....1/2, 1/4, 1/8, 1/16 of System Clock  Interrupt Source.....Overflow of Timer Counter 3</p> <p><b>Timer Counter 4: 16-bit x 1</b> (Timer Output, Event Count (P15 Input), Generation of Serial Transmission Clock)  Clock Source.....1/8, 1/16 of System Clock, External Clock Input  Interrupt Source.....Overflow of Timer Counter 4, Coincidence of Timer Counter 4 with OCR4</p> <p><b>Timer Counter 5: 17-bit x 1</b> (Watchdog, Stable Oscillation Waiting Function)  Clock Source.....System Clock  Watchdog Interrupt Source ....1/2<sup>13</sup>, 1/2<sup>15</sup> of Timer Counter 5  Clear by Stable Oscillation...After 256 Counts by Timer Counter 5 (2<sup>18</sup> Counts of OSC Oscillation Clock)</p> <p><b>Timer Counter 6: 16-bit x 1</b> (Clock Function [max. 2 s])  Clock Source.....1/512 of OSC Oscillation Clock, XI Oscillation Clock, 1/4, 1/8, 1/64, 1/128 of System Clock  Interrupt Source.....1/2<sup>13</sup>, 1/2<sup>14</sup>, 1/2<sup>15</sup>, Overflow of Timer Counter 6</p>	
<b>Serial Interface</b>	<p><b>Serial 0: 8-bit x 1</b> (Synchronous Type/Start-stop Synchronous Type) (Transfer Direction of MSB/LSB Selectable)  Synchronous Type Clock Source...1/4, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256 of System Clock,  2-division timer 4 output, <math>\overline{\text{SBT0}}</math> pin input  Clock for UART .....8-division of Above Clock, 2-division Timer 4 Output, <math>\overline{\text{SBT0}}</math> Pin Input</p> <p><b>Serial 1: 8-bit x 1</b> (Synchronous Type/Remote Control Transmission/Simple Remote Control Receive) (Transfer  Direction of MSB/LSB Selectable, Start Condition Function)  Clock Source.....1/4, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256 of System Clock, 2-division Timer 4  Output, <math>\overline{\text{SBT1}}</math> Pin Input  Remote Control Clock....2-division Timer Output</p> <p><b>Serial 2: 8-bit x 1 (Sync/I<sup>2</sup>C)</b> (Master Transmission/Reception, Slave Transmission/Reception)  Clock Source.....1/72, 1/80, 1/84, 1/96, 1/102, 1/112, 1/128, 1/144, 1/160, 1/168,  1/192, 1/224, 1/256, 1/320, SCK Pin Input of System Clock</p>	

<b>OSD</b>		Accommodation with Menu or Super Impose Display Applicable Broadcasting System: NTSC, PAL, PAL-M, PAL-N Screen Configuration : 24 Characters x 2n Rows (n=1 to 6) Character Type : Max. 512 Character Types (Variable) Character Size : 12x18 Dots Enlarged Characters : Each x 2, x 3 or x 4 Settings in Horizontal and Vertical Character Interpolation : None Background Color : 8 Gradations Settable (Settable in The Row Unit at Menu Display) Background Intensity : 8 Gradations Settable in The Row Unit Character Color : White Character Intensity : 8 Gradations Settable in The Row Unit Frame Function : 1-Dot frame in 4 or 8 Directions Frame Intensity : 4 Gradations Settable in The Row Unit Box Shade Function : Settable in The Character Unit (Only at Composite Output with 128 Character Types or More)  Blinking : None (Covered by Software) Inverted Character : Settable in The Character Unit Halftone : Settable in The Row Unit in 2 Intensity Gradations (Setting in The Row Unit) Input : Composite Video Signal Input (Output Level: 1 Vpp/2 Vpp) Clamp Method : Sync Chip Clamp, Clamp Level in 4 Levels Output : Composite Video Output : Digital Output (6 pins) : 8 Character and Background Colors Each Settable at Digital Output.  Measure Against Image Fluctuation : Built-in AFC Circuit Sync Signal Detection Function : Detection Functions for Horizontal and Vertical Sync Signals (Integral System) With Horizontal Sync Signal Interpolation Function
<b>XDS</b>		Built-in U.S. Closed Caption Data Slicer (Optional 2 Line Data can be Extracted.)
<b>ROM Correction</b>		Correcting Address Designation: Up to 2 Addresses Possible Correction Method: Correction Program Being Saved in Internal RAM
<b>I/O Pins</b>	<b>I/O</b>	<b>73</b> • Common use: 73 ports 0, 1, 2, 4, 5, 6, 7, A, B, by-bit
	<b>Input</b>	<b>4</b> • Common use: 4
<b>A/D</b>		8-bit x 12ch (Without S/H)
<b>PWM</b>		13-bit x 2ch (at Repetition Cycle 572μs, 14.32MHz), 10-bit x 2ch (at Repetition Cycle 71.5μs, 14.32MHz), 14-bit x 1ch (at Repetition Cycle 1144μs, 14.32MHz)
<b>ICR</b>		18-bit x 6ch
<b>OCR</b>		16-bit x 7ch, 8-bit x 1ch
<b>Special Ports</b>		Buzzer Output, 3-State Output (PTO) VLP Pin, Synchronous Output: 7, 3-State Synchronous Output: 4, Remote Control Receive, CTL Amp, Built-in FG Amp, Output of 1/2 OSC Oscillation Clock (2Vpp), Output of 1/4 OSC Oscillation Clock (1 Vpp)
<b>Notes</b>		VISS/VASS Detection Function
<b>Package</b>		QFP-100-P-1818

## Electrical Characteristics

### Supply Current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating Supply Current	IDD1	14.32MHz operation without load		30	60	mA
	IDD2	14.32MHz oscillation SLOW operation without load		2	5	mA
	IDD3	Stop of 14.32MHz oscillation 32kHz oscillation operation without load		0.1	1.0	mA
Supply Current at STOP	IDSP	Stop of oscillation without load			20	μA
Supply Current at HALT	IDHT0	14.32MHz oscillation without load		5	15	mA
	IDHT1	Stop of 14.32MHz oscillation 32kHz oscillation operation without load		5	20	μA

(Ta=25±2°C, VDD=5.0V, VSS=0V)

### A/D Converter Performance

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Conversion Relative Error	ΔNLad				±3	LSB
A/D Conversion Time	Tad	fosc = 14.32Mhz		8		μs
Analog Input Voltage			0.5		4.5	V

(Ta= 25±2°C, VDD=5.0V, VSS=0V)

## Support Tool

### In-Circuit Emulator

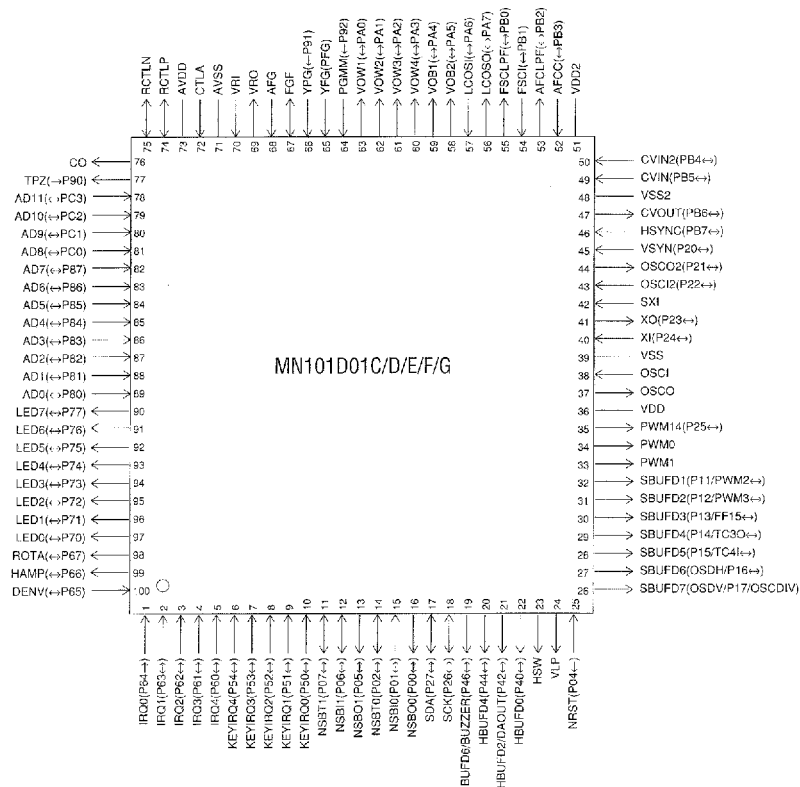
PX-ICE1880-2 + PX-PRB67508

### EPROM built-in Type

Use MN101DP01G [ES (Engineering available) ].

## Pin Assignment

www.DataSheet4U.com



QFP100-P-1818B