

□ MN103S33N

Type	MN103S33N (under development)						
Command ROM (x64-bit)	512 K-byte						
Data RAM (x32-bit)	24 K-byte						
Package	MLGA344-C-1313						
Minimum Instruction Execution Time	25 ns (at 2.3 V to 2.7 V, 40 MHz)						
Interrupts	<ul style="list-style-type: none"> • RESET • IRQ × 15 • NMI • Key input • Timer × 44 • Input capture × 16 • PWM × 8 • SIF × 25 • DMA × 12 • WDT • A/D • System error 						
Timer Counter	<p>8-bit timer × 12</p> <p>Reload-down count</p> <p>Cascade connection possible (usable as a 16-, 32-bit timer)</p> <p>8-bit timer with PWM × 8</p> <p>Reload-down count</p> <p>Cascade connection possible (usable as a 16-, 32-bit timer)</p> <p>PWM generating function</p> <p>16-bit timer × 6</p> <p>Up-down count</p> <p>Input capture function</p> <p>PWM generating function</p> <p>Compare/capture register 2-ch.</p> <p>16-bit timer × 6</p> <p>Reload-down count</p> <p>Watchdog timer × 1</p>						
DMA Controller	<p>Number of channels: 4</p> <p>Unit of transfer: 8/16/32 bits</p> <p>Max. Transfer cycles: 65535</p> <p>Starting factor: external interrupt, timer factor, PNM factor, serial transmission/reception factor, A/D conversion finish, software factor</p> <p>Transfer method: 2-bus cycle transfer</p> <p>Addressing modes: fixed, increment, decrement</p> <p>Transfer modes: word transfer, burst transfer, intermittent transfer</p>						
Serial Interface	<p>Serial 0, 1, 3 to 8, A, B: start-stop synchronization/synchronization/I²C commonly used, 10 lines</p> <p>Serial 2, 9: 2 lines for start-stop synchronization only, serial 2: 10 bytes containing receive FIFO</p>						
I/O Pins	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>I/O</td> <td>170</td> <td>• Common use</td> </tr> <tr> <td>Input</td> <td>25</td> <td>• Common use</td> </tr> </table>	I/O	170	• Common use	Input	25	• Common use
I/O	170	• Common use					
Input	25	• Common use					
A/D Inputs	10-bit × 25-ch.						
PWM	12-, 14-bit resolution × 5-ch. output waveform value load control function provided 16-bit resolution × 2-ch.						
ICR	28-bit × 13-ch. + 16-bit × 6-ch. (common with timer)						
OCR	16-bit × 4-ch. (common with timer)						
Timer Synchronous Output	4-bit (synchronous output) × 2-ch.						

Electrical Characteristics

T.B.D.

Pin Assignment

		Perspective																	
N.D.		TDI	PF5, TM251OB	PF1, TM241OB	VDD2	PD5, TM151O	PD2, TM121O	PC6, SY10T2, SB18	PC4, SY10T0, SB18	VSS	PB2, IRQ14	PA2, SBT6	P91, ICR9	P87, ICR7	P83, ICR3	P81, ICR1	N.D.		
		TCK	PF2, TM251OA	PE0, TM201OA	PE5, TM221OB	PE3, TM131O	PD3, VDD2	PC2, SY00T2	PB4, BR	PA4, SBO7	PA0, SBI6	VSS	P85, ICR5	P60, IRQ8	P80, ICR0	P62, IRQ10	P63, IRQ11	P61, IRQ9	
TDO	PV2, SBTA	PV1, SBOA	PE6, TM231OA	PE2, TM211OA	PD4, TM141O	PD1, TM111O	PC7, SY10T3	PC1, SY00T1	PB5, BG	PB1, IRQ13	PA5, SBT7	PA3, SBI7	P92, ICR10	P86, ICR6	VSS	P62, IRQ11	P63, IRQ9	P61, IRQ9	
PV0, SRIA	PG6, AN6	VREFL	TMS	PF0, TM241OA	PE4, TM231OA	PE7, TM221OA	PE1, TM201OB	PD0, TM101O	PC0, SY00T0	PB0, IRQ12	P93, ICR11	P94, ICR12	VDD2	P82, ICR2	P84, ICR4	P54, ICR4	P33, D27, SBT2	VDDF	
PV3, ADTRG	VSS	PG2, AN2	VDD	TRST	N.D.	VDD	N.C.*1 (VSS)	VSS	PC5, SY10T1, SB08	PC3, SY00T3	PB3, WDOVF	PA1, SBO6	N.C.*1 (VSS)	P90, ICR8	P56, ICR6	P54, D28, SB13	P25, D21, SBT0	P57, IRQ7	
PG3, AN3	AVDD	PG4, AN4	VREFH	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P52, IRQ2	P43, PWM4	P53, IRQ3	P51, IRQ1	
PG7, AN7	PG5, AN5	PH2, AN10	PG1, AN1	PG0, AN0	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P50, IRQ0	P55, P41, PWM2, TM11O	VSS	P40, PWM1, TM01O	
PH5, AN13	PH3, AN11	PH4, AN12	PH1, AN9	PH0, AN8	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P36, D30, SBT3	P42, PWM3, TM21O	P37, D31, PWMO	P35, D29, SBO3	
P15, AN21	P13, AN19	P17, AN15	P11, AN17	P10, AN16	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P27, D23, SBO1	VSS	P31, D25, SB12	P32, D26, SBT1	
AVSS	PI7, AN23	PH6, AN14	PI4, AN20	PI6, AN22	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P21, D17, SBOB	P24, D20, SB00	P23, D19, SB10	P22, D18, SBT8	
VSS	PM1, CS1	PI2, AN18	P70, AN24	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P12, D10	P16, D14	N.C.*1 (VSS)	P20, D16, SB1B	VSS
PM3, CS3	PN0, WE0, SDQM0	PM0, CS0	PM4, CS4	VSS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P10, D8	VDDH	P17, D15	P13, D11	N.C.*2 (VDDF)
PN2, SYSCLK	VSS	PM5, RWSEL	PN4, DK	VDD	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P02, D2	VSS	P15, D13	P07, D7	P11, D9
P00, ADM0, A0	VDD	PM2, CS2	PN5, AS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	P00, D0	P06, D6	P03, D3	P05, D5	
VDDB	P05, ADM5, A5	PN1, WE1, SDQM1	PO1, ADM1, A1	VSS	N.D.	PVSS	MMOD1	VSS	PK3, TM331O	PL2, TM51O	PR1, A20, K11	PR7, K17, PWM5	N.D.	PT1, SBO9	VOUT	P04, D4	P14, D12	P01, D1	
P03, ADM3, A3	P02, ADM2, A2	PN3, RE	PO7, ADM7, A7	VSS	RST	VDDH	CKSEL	VDD	PK4, TM341O	PL3, TM61O	PR2, A21, K12	PS0, SB14	VSS	PS5, SBT5	PS3, SB15	VDDH	VOUT	electrode (pin) none	
P06, ADM6, A6	VDDB	PP2, ADM10, A10	PP4, ADM4, A4	PK1, TM311O	PK5, TM351O	PK7, TM371O	PK0, TM301O	PL1, TM41O	PL4, TM71O	PQ0, A16	PQ2, A18	VDDH	PR4, A23, K14	PU0, WE2, SCAS	NMIRQ	VDDH	VSS		
N.D.		PP6, ADM14, A14	PJ0, EXM0D0	PP3, ADM11, A11	PP7, ADM15, A15	PJ1, EXM0D1	FRQS	PK2, TM321O	PK6, TM361O	PL5, PWNM6	PR0, A19, K10	PS2, SDCLK1	PT0, SBT4	PS1, SB19	PS4, SB05	PT2, SBT9	PU1, WE2, SRAS	N.D.	
		PP0, ADM8, A8	PP1, ADM9, A9	PP5, ADM13, A13	PVDD	MMOD0	OSCO	OSCI	PL0, TM31O	VSS	PQ1, A17	PR3, A22, K13	PR6, A25, K16	PSB19	PS4, SB05	PT2, SBT9	PU1, WE2, SRAS		

19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

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* N.D. has an electrode (pin) but N.C. is not guaranteed.

* Each of VDDH, VDD, VDDB, VDDF, VDD2, and VSS has multiple electrodes (pins). Connect the same electrode names to the same power supply.

*1: Connect the J3, R6, and R12 pins to the VSS for the MN103SF33N.

*2: Connect the H1 and T1 pins to the VDDF power for the MN103SF33N.

Support Tool

In-circuit Emulator	PX-ICE103S33 (under development)	Not applicable to MLGA344-C-1313.
Flash Memory Built-in Type	Type	MN103SF33N (under development)
	Command ROM (x 64-bit)	512 K-byte
	Data RAM (x 32-bit)	24 K-byte
	Minimum instruction execution time	25 ns (at 2.3 V to 2.7 V, 40 MHz)
	Package	MLGA344-C-1313

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