# ■ MN103000

Туре	MN103000
Command RAM (x64-bit)	16 K-byte
Data RAM (×32-bit)	16 K-byte
Package	QFP160-P-2828F *Lead-free
(Conventional Package)	(QFP160-P-2828B)
Minimum Instruction Execution Time	17 ns (at 3.3 V to lerance = $\pm$ 5%, 60 MHz)
Interrupts	• RESET • IRQ × 8 • NMI • Timer × 28 • SIF × 4 • DMAC × 4 • WDT • A/D • System error
Timer Counter	Timer counter 0 to 3: 32-bit × 1  (interval timer, event count, timer output, interrupt, clock source for serial I/F, A/D conversion trigger)  Clock Source IOCLK; external clock input; underflow of timer counter  Interrupt Source
	Timer counter 4 to 7: 32-bit × 1  (interval timer, event count, timer output, interrupt, clock source for serial L/F)  Clock source
	*: Configuration of each of timer counters 0 to 3 and timer counters 4 to 7 can be changed to 8-, 16- and 24-bit time counters.  Timer counter 8: 16-bit × 1  (interval timer, event count, toggle output (2 lines), PWM output, one-shot output, input capture (2 lines), interrupt, DMA start, generation of timer synchronous output timing)  Clock source
	Timer counter 11: 16-bit × 1  (interval timer, event count, toggle output (4 lines), PWM output, inter-offset 3-phase PWM output, one-shot output, input capture (4 lines), interrupt, DMA start, 2-phase encode)  Clock source
	Timer counter 12: 16-bit × 1  (interval timer, event count, toggle output (4 lines), PWM output (3 lines), one-shot output, input capture (4 lines), interrupt, 2-phase encode)  Clock source

1 Panasonic MAF00001DEM

compare capture (4 lines) or at capture

Timer Counter (c	continue)	Watchdog timer: 16-bit to 25-bit $\times$ 1						
Serial Interface		Serial 0, 1: 7-bit, 8-bit × 2 (clock synchronous mode, start-stop synchronous mode, I <sup>2</sup> C mode)						
		Clock source: (clock synchronous mode, start-stop synchronous mode)						
		IOCLK; underflow of timer counter; external clock						
			(I <sup>2</sup> C mode)					
			IOCLK; underflow of timer counter					
I/O Pins	I/O	51	• Common use					
	Output	25	• Common use					
	Input	13	• Common use					
A/D Inputs		10-bi	t × 8-ch.					
PWM	WM		16-bit × 5-ch.					
ICR OCR Timer Synchronous Output		16-bit × 15-ch. (common with OCR)  16-bit × 15-ch. (common with ICR)  4-bit (synchronous output) × 2-ch.						
					DMAC		4-ch.	No.
					Electrical Characteristics			

Parameter	Symbol	Condition		Limit		Unit
rarameter	Syllibol	Condition 12 Mark 19 Condition	min	typ	max	Ullit
<b>*</b>	IDDÌ	VDD , PVDD , AVDD = 3.3 V		250		mA
Operating supply current		VI = VDD or VSS, fosc = 15.0 MHz			250	
Operating supply current		FRQS pin = Hr level			230	
		Output open				
Supply current at SLEEP	IDD2	VDD , PVDD , AVDD = 3.465 V				mA
		VI VDD or VSS, fosc = 15.0 MHz			50	
		FRQS pin = Hi level			30	
		Output open				
	IDD3	VDD , PVDD , AVDD = 3.465 V		5		mA
Supply current at HALT		VI = VDD or VSS, fosc = 15.0 MHz			5	
		FRQS pin = Hi level			liiiA	
		Output open				
	IDD4	VDD, $PVDD$ , $AVDD = 3.465 V$			300	μА
Supply current at stopping		VI = VDD or $VSS$ , $Fosc = Oscillation$ stopped			300	
		Output open				

 $(Ta = -20^{\circ}C \text{ to } +70^{\circ}C)$ 

Supply current

#### **Electrical Characteristics (Continue)**

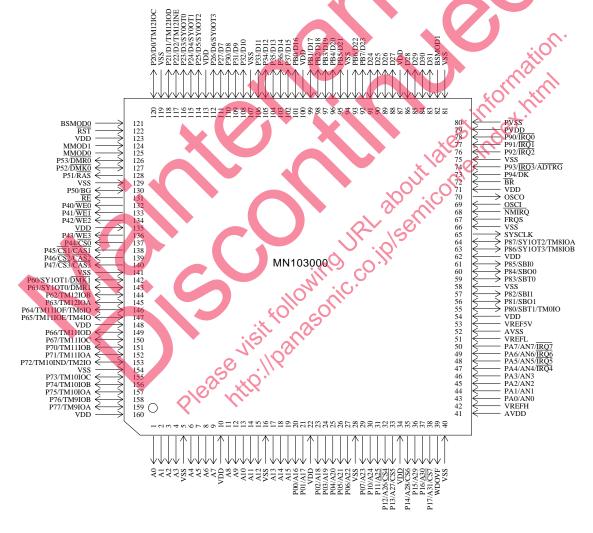
#### A/D conversion performance

Parameter	Symbol	Condition		Limit		
Parameter			min	typ	max	Unit
Resolution					10	Bits
A/D conversion absolute error		VREF+ = 3.3 V, VREF- = 0.0 V A/D conversion clock = 5 MHz			± 7	LSB
A/D conversion relative error					± 5	LSB
A/D conversion time					μs	

 $(Ta = -20^{\circ}C \text{ to } +70^{\circ}C, \text{ AVDD} = 3.3 \text{ V}, \text{ AVSS} = 0.0 \text{ V})$ 

### Pin Assignment

): Conventional Package



QFP160-P-2828F \*Lead-free (QFP160-P-2828B)

#### **Support Tool**

In-circuit Emulator	PX-ICE103000-QFP160-P-2828B
On-board Development Tools	CSIDE-MN10300 (Computex Co., Ltd, product)



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