

FEATURES

- 512K x 8 organization
- Single +5V power supply
- Fast access time: 100/120/150/200ns (max)
- Totally static operation
- Completely TTL compatible

GENERAL DESCRIPTION

The MX23C4000 is a 5V only, 4M-bit, Read Only Memory. It is organized as 512K words by 8 bit, operates from a single +5 volt supply, has a static standby mode, and has an access time of 100/120/150/200ns. It is designed to be compatible with all microprocessors and similar applications in which high performance, large bit storage and simple interfacing are important design considerations.

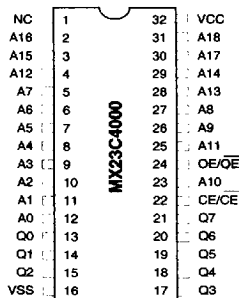
- Operating current: 40mA
- Standby current: 100 μ A
- Package type:
 - 32 pin plastic DIP
 - 32 pin plastic SOP
 - 32 pin plastic PLCC
 - 32 pin plastic TSOP

The MX23C4000 offers automatic power-down, with power-down controlled by the chip enable($\overline{CE}$) Input. When $\overline{CE}$ goes high, the device automatically powers down and remains in a low-power standby mode as long as $\overline{CE}$ remains high.

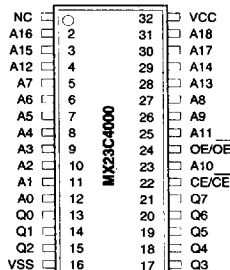
MX23C4000 pin 24 may also be programmed either active HIGH or LOW in order to eliminate bus contention in multiple-bus microprocessor systems.

PIN CONFIGURATIONS

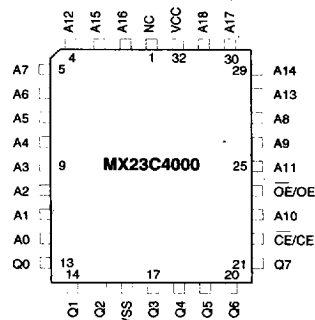
32 PDIP



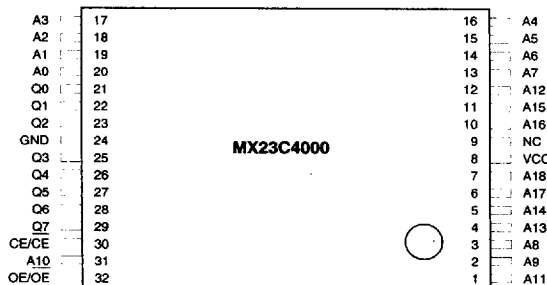
32 SOP



32 PLCC



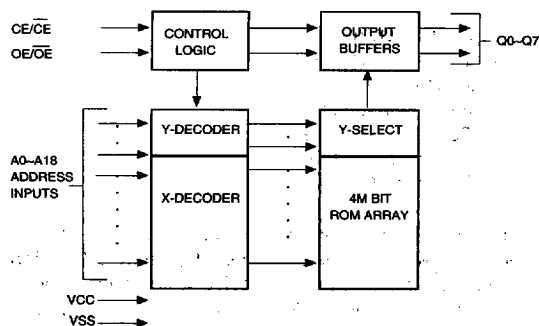
32 TSOP



PIN DESCRIPTION:

SYMBOL	PIN NAME
A0-A18	Address Input
Q0-Q7	Data Output
CE/ $\overline{CE}$	Chip Enable Input
OE/ $\overline{OE}$	Output Enable Input
VCC	Power Supply Pin (+5V)
VSS	Ground Pin

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS*

RATING	VALUE
Ambient Operating Temperature	0°C to 70°C
Storage Temperature	-65°C to 125°C
Applied Input Voltage	-0.5V to VCC + 0.5
Applied Output Voltage	-0.5V to VCC + 0.5
VCC to Ground Potential	-0.5V to 7.0V
Power Dissipation	1.0W

*NOTICE:

Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended period may affect reliability.

DC CHARACTERISTICS TA = 0°C TO 70°C, VCC = 5V ± 10%

SYMBOL	PARAMETER	MIN.	MAX.	UNIT	CONDITIONS
VOH	Output High Voltage	2.4		V	IOH = -1.0mA
VOL	Output Low Voltage		0.4	V	IOL = 2.1mA
VIH	Input High Voltage	2.2	VCC + 0.3	V	
VIL	Input Low Voltage	-0.3	0.8	V	
ILI	Input Leakage Current		10	μA	VIN = 0 to 5.5V
ILO	Output Leakage Current		10	μA	VOUT = 0 to 5.5V
ICC3	Power-Down Supply Current		100	μA	CE > VCC - 0.2V
ICC2	Standby Supply Current		1.0	mA	CE = VIH
ICC1	Operating Supply Current		40	mA	Note 1

CAPACITANCE TA = 25°C, f = 1.0 MHz (Note 2)

SYMBOL	PARAMETER	MIN.	MAX.	UNIT	CONDITIONS
CIN	Input Capacitance		10	pF	VIN = 0V
COUT	Output Capacitance		10	pF	VOUT = 0V

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AC CHARACTERISTICS TA = 0°C to 70°C, VCC = 5V ± 10%

SYMBOL	PARAMETER	23C4000-10		23C4000-12		23C4000-15		23C4000-20		UNIT	CONDITIONS
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		
tCYC	Cycle Time	100		120		150		200		ns	
tAA	Address Access Time		100		120		150		200	ns	
tOH	Output Hold Time After Address Change	10		10		10		10		ns	
tACE	Chip Enable Access Time		100		120		150		200	ns	
tAOE	Output Enable/Chip Select Access Time		60		70		80		100	ns	
tLZ	Output Low Z Delay	0		0		0		0		ns	Note 3
tHZ	Output High Z Delay		40		40		40		40	ns	Note 4

NOTE:

1. Measured with device selected at f = 5 MHz and output unloaded.
2. This parameter is periodically sampled and is not 100% tested.
3. Output low-impedance delay (tLZ) is measured from CE/OE going low.

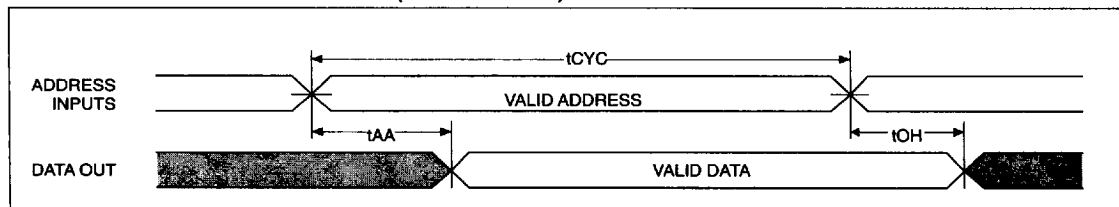
4. Output high-impedance delay (tHZ) is measured from CE/OE going high.

AC TEST CONDITIONS

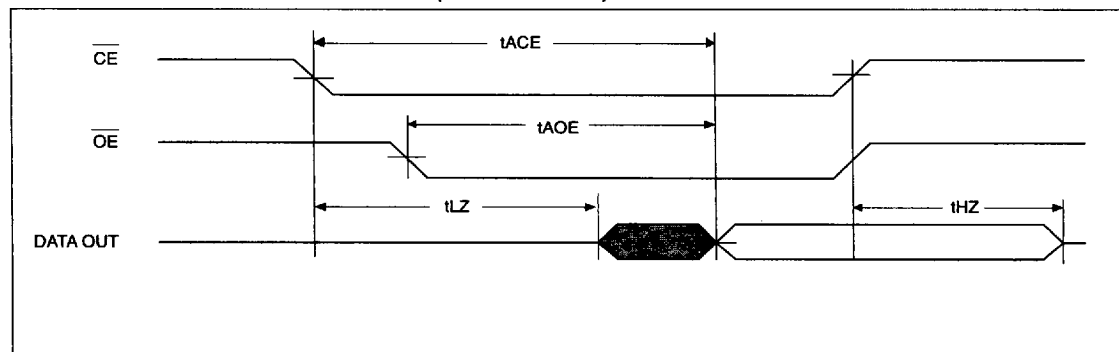
Input Pulse Levels	0.4V to 2.4V
Input Rise and Fall Times	10ns
Input Timing Level	1.5V
Output Timing Level	0.8V and 2.0V
Output Load	1TTL + 100pF

WAVEFORMS

PROPAGATION DELAY FROM ADDRESS (CE/OE = ACTIVE)



PROPAGATION DELAY FROM CHIP ENABLE (ADDRESS VALID)



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ORDERING INFORMATION

PART NO.	ACCESS TIME(ns)	OPERATING CURRENT MAX.(mA)	STANDBY CURRENT MAX.(μA)	PACKAGE
MX23C4000PC-10	100	40	100	32 Pin DIP
MX23C4000MC-10	100	40	100	32 Pin SOP
MX23C4000QC-10	100	40	100	32Pin PLCC
MX23C4000TC-10	100	40	100	32 Pin TSOP
MX23C4000PC-12	120	40	100	32 Pin DIP
MX23C4000MC-12	120	40	100	32 Pin SOP
MX23C4000QC-12	120	40	100	32 Pin PLCC
MX23C4000TC-12	120	40	100	32 Pin TSOP
MX23C4000PC-15	150	40	100	32 Pin DIP
MX23C4000MC-15	150	40	100	32 Pin SOP
MX23C4000QC-15	150	40	100	32 Pin PLCC
MX23C4000TC-15	150	40	100	32 Pin TSOP
MX23C4000PC-20	200	40	100	32 Pin DIP
MX23C4000MC-20	200	40	100	32 Pin SOP
MX23C4000QC-20	200	40	100	32 Pin PLCC
MX23C4000TC-20	200	40	100	32 Pin TSOP