



MX23L4000

4M-BIT MASK ROM (8 BIT OUTPUT)

FEATURES

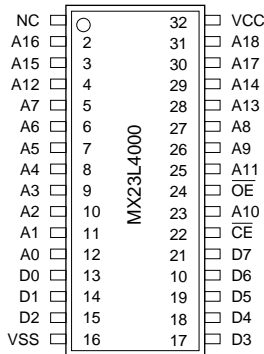
- Bit organization
 - 512Kb x 8 (byte mode)
- Fast access time
 - Random access: 150ns (max.) for 2.7~3.6V
- Current
 - Operating: 20mA
 - Standby: 20uA
- Supply voltage
 - 2.7V~3.6V
- Package
 - 32 pin SOP (450mil)
 - 32 pin TSOP (8mm x 20mm)

ORDER INFORMATION

Part No.	Access Time	Package
MX23L4000MI-15	150ns	32 pin SOP (Industrial)
MX23L4000MI-20	200ns	32 pin SOP (Industrial)
MX23L4000TC-15	150ns	32 pin TSOP
MX23L4000TC-20	200ns	32 pin TSOP
MX23L4000TI-15	150ns	32 pin TSOP (Industrial)
MX23L4000TI-20	200ns	32 pin TSOP (Industrial)

PIN CONFIGURATION

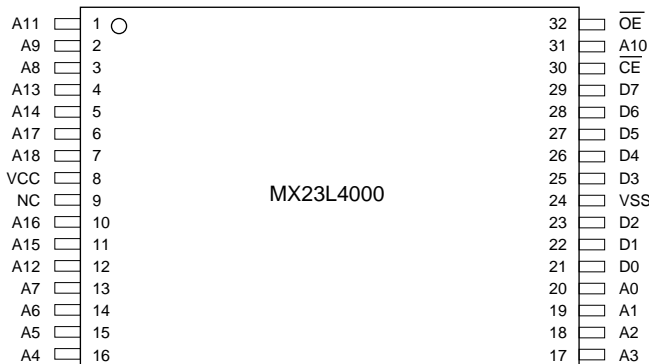
32 SOP



PIN DESCRIPTION

Symbol	Pin Function
A0~A18	Address Inputs
D0~D7	Data Outputs
\overline{CE}	Chip Enable Input
\overline{OE}	Output Enable Input
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

32 TSOP



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings
Voltage on any Pin Relative to VSS	VIN	-0.3V to 3.9V
Ambient Operating Temperature	Topr	-40°C to 85°C
Storage Temperature	Tstg	-65°C to 125°C

DC CHARACTERISTICS (Ta = -40°C ~ 85°C, VCC = 2.7V~3.6V)

Item	Symbol	MIN.	MAX.	Conditions
Output High Voltage	VOH	VCC-0.2V	-	IOH = -0.4mA
Output Low Voltage	VOL	-	0.2V	IOL = 1.6mA
Input High Voltage	VIH	2.1V	VCC+0.3V	
Input Low Voltage	VIL	-0.3V	0.4V	
Input Leakage Current	ILI	-	10uA	0V, VCC
Output Leakage Current	ILO	-	10uA	0V, VCC
Operating Current	ICC1	-	20mA	f=5MHz, all output open
Standby Current (TTL)	ISTB1	-	1mA	\overline{CE} =VIH
Standby Current (CMOS)	ISTB2	-	20uA	\overline{CE} > VCC - 0.2V
Input Capacitance	CIN	-	10pF	Ta = 25°C, f = 1MHZ
Output Capacitance	COUT	-	10pF	Ta = 25°C, f = 1MHZ

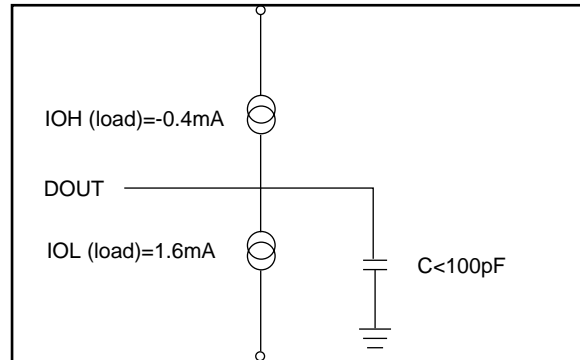
AC CHARACTERISTICS (Ta = -40°C ~ 85°C, VCC = 2.7V~3.6V)

Item	Symbol	23L4000-15		23L4000-20	
		MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	150ns	-	200ns	-
Address Access Time	tAA	-	150ns	-	200ns
Chip Enable Access Time	tACE	-	150ns	-	200ns
Output Enable Time	tOE	-	70ns	-	100ns
Output Hold After Address	tOH	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns

Note: Output high-impedance delay (tHZ) is measured from OE or CE going high, and this parameter guaranteed by design over the full voltage and temperature operating range - not tested.

AC Test Conditions

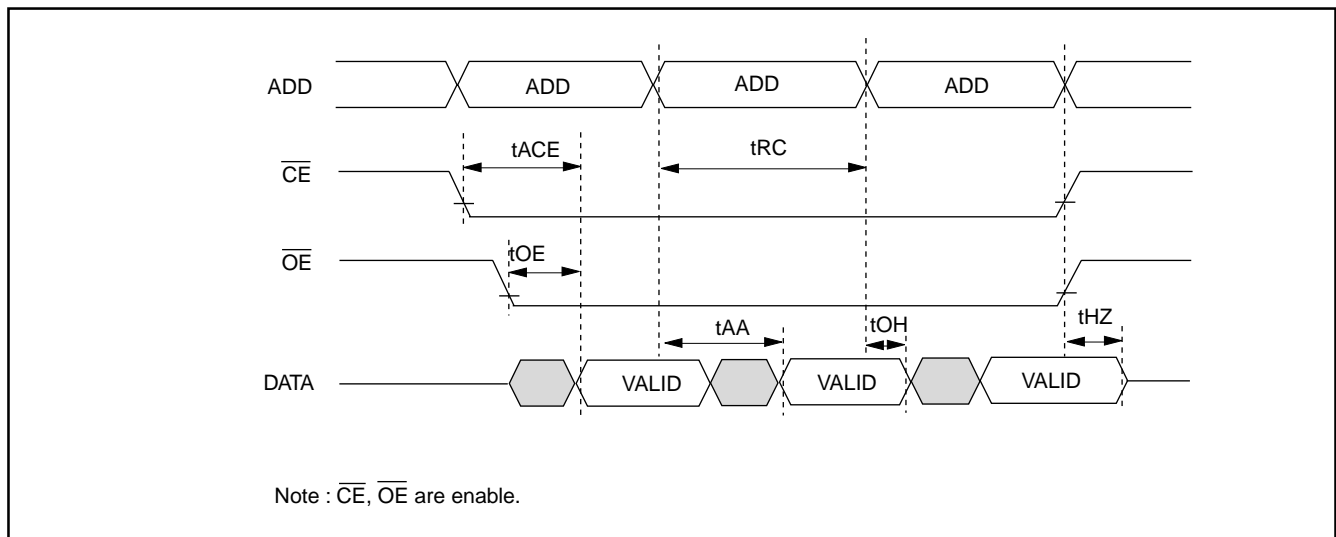
Input Pulse Levels	0.4V~2.4V
Input Rise and Fall Times	10ns
Input Timing Level	1.4V
Output Timing Level	1.4V
Output Load	See Figure



Note: No output loading is present in tester load board.
 Active loading is used and under software programming control.
 Output loading capacitance includes load board's and all stray capacitance.

TIMING DIAGRAM

RANDOM READ



PACKAGE INFORMATION

32-PIN PLASTIC SOP (450 mil)

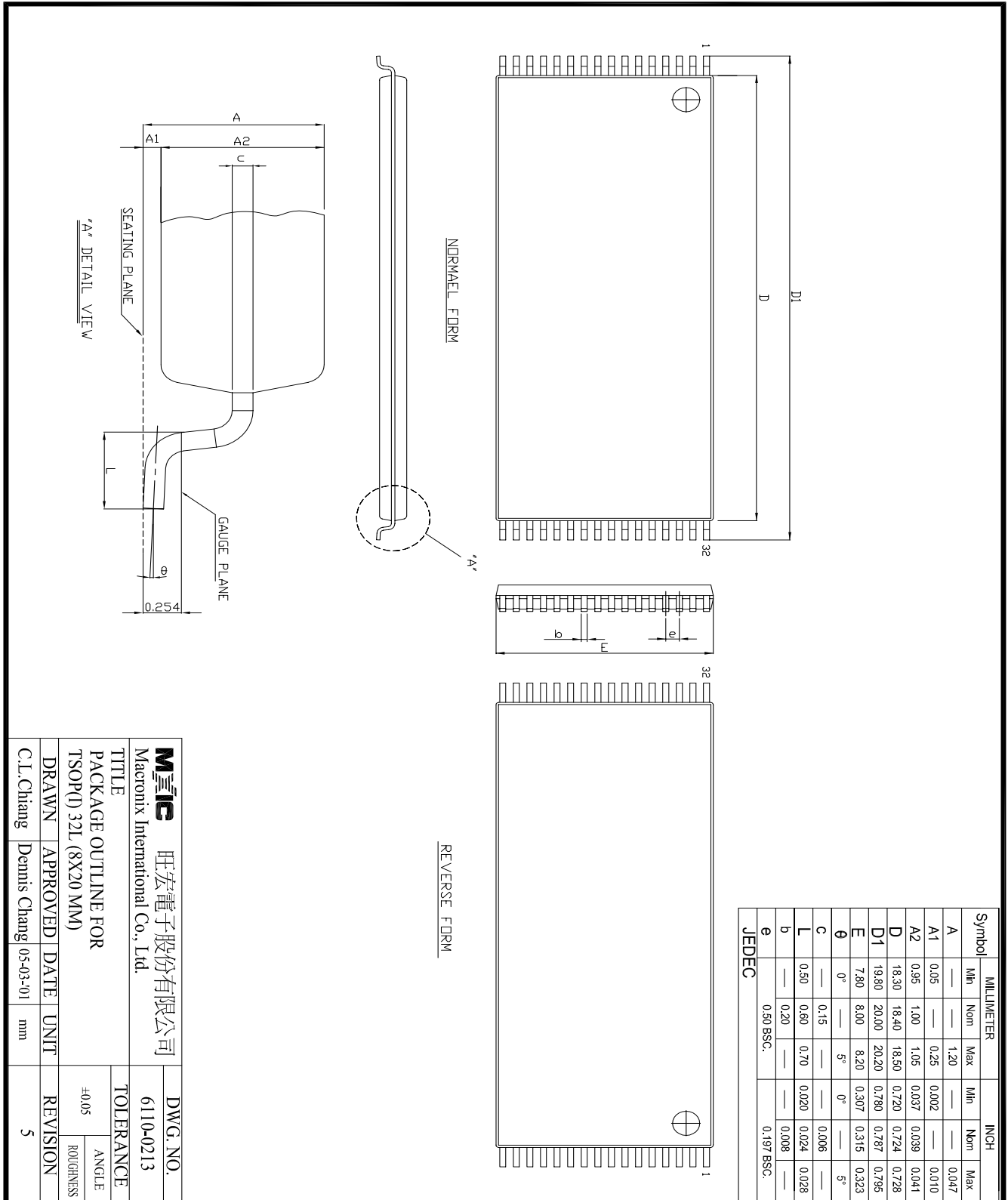
Symbol	Dimension in mm (Base)			Dimension in inch (Ref.)		
	Min	Nom	Max	Min	Nom	Max
A	—	—	3.00	—	—	0.118
A1	0.10	—	—	0.004	—	—
A2	2.57	2.69	2.82	0.101	0.106	0.111
b	0.41 REF			0.016 REF		
C	0.20 REF			0.008 REF		
D	20.32	20.45	20.57	0.800	0.805	0.810
E	13.87	14.12	14.38	0.546	0.556	0.566
E1	11.18	11.30	11.43	0.440	0.445	0.450
e	1.27 REF			0.050 REF		
L	0.58	0.79	0.99	0.023	0.031	0.039
θ	5°			5°		

JEDEC

TITLE		PACKAGE OUTLINE FOR SOP 32L (450 MIL)	
DRAWN	C.L.Chang	APPROVED	Dennis Chang
DATE	05-03-01	UNIT	INCH
REVISION	2		

Mxic 旺宏電子股份有限公司		DWG. NO.	6110-0206
Macronix International Co., Ltd.			
TOLERANCE			
X #	±		
XX	±.01	ANGLE	
.XXX±.002		ROUGHNESS	

32-PIN PLASTIC TSOP



MIIIC 旺宏電子股份有限公司		DWG. NO.	
Macronix International Co., Ltd.		6110-0213	
TITLE		TOLERANCE	
PACKAGE OUTLINE FOR		±0.05	
TSOP(I) 32L (8X20 MM)		ANGLE	
DRAWN		REVISION	
APPROVED		5	
DATE		UNIT	
05-03-01		mm	
C.I. Chiang		Dennis Chang	



REVISION HISTORY

REVISION	DESCRIPTION	PAGE	DATE
1.4	AC CHARACTERISTICS tOH 25ns-->0ns	P3	FEB/01/1999
1.5	1.To modify Absolute Maximum Ratings 2.To modify DC Characteristics 3.To modify Package Information	P2 P2 P4,5	JUN/19/2001



MX23L4000

MACRONIX INTERNATIONAL CO., LTD.

HEADQUARTERS:

TEL:+886-3-578-6688

FAX:+886-3-563-2888

EUROPE OFFICE:

TEL:+32-2-456-8020

FAX:+32-2-456-8021

JAPAN OFFICE:

TEL:+81-44-246-9100

FAX:+81-44-246-9105

SINGAPORE OFFICE:

TEL:+65-348-8385

FAX:+65-348-8096

TAIPEI OFFICE:

TEL:+886-2-2509-3300

FAX:+886-2-2509-2200

MACRONIX AMERICA, INC.

TEL:+1-408-453-8088

FAX:+1-408-453-8488

CHICAGO OFFICE:

TEL:+1-847-963-1900

FAX:+1-847-963-1909

[http : //www.macronix.com](http://www.macronix.com)