PRELIMINARY

MX23L12810

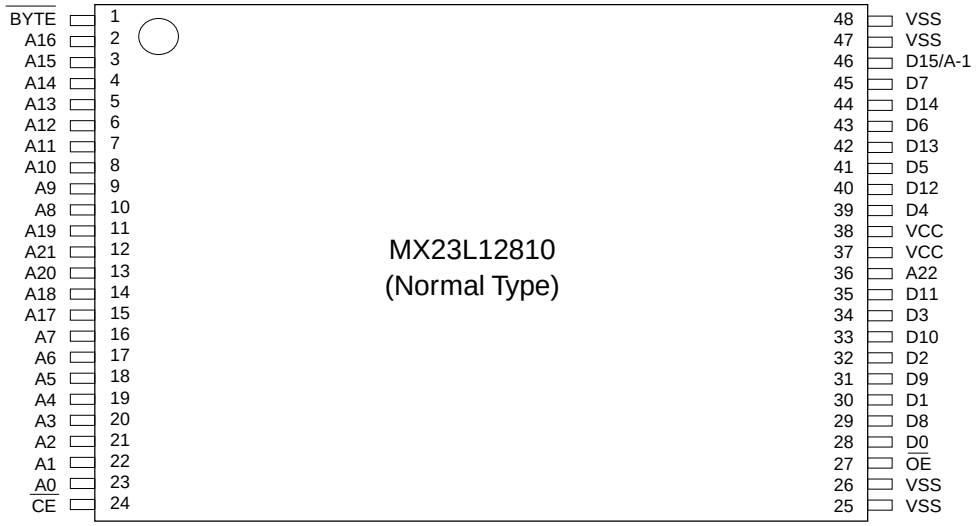
NEW 128M-BIT (16M x 8 / 8M x 16) MASK ROM FOR TSOP PACKAGE

FEATURES

- Bit organization
  - 16M x 8 (byte mode)
  - 8M x 16 (word mode)
- Fast access time
  - Random access: 100ns (max.)
- Current
  - Operating:30mA
  - Standby:15uA(max.)
- Supply voltage
  - 2.7V~3.6V for 120ns
  - 3.0V~3.6V for 100ns
- Package
  - 48 pin TSOP (12mm x 20mm)
  - 48 pin TSOP reverse type
- Temperature
  - 0 ~ 70℃

PIN CONFIGURATION

48 TSOP (Top View)



48 TSOP (Top View)

PIN DESCRIPTION

Symbol	Pin Function
A0~A22	Address Inputs
D0~D14	Data Outputs
D15/A-1	D15 (Word Mode)/ LSB Address (Byte Mode)
$\overline{CE}$	Chip Enable Input

Symbol	Pin Function
$\overline{OE}$	Output Enable Input
$\overline{Byte}$	Word/ Byte Mode Selection
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

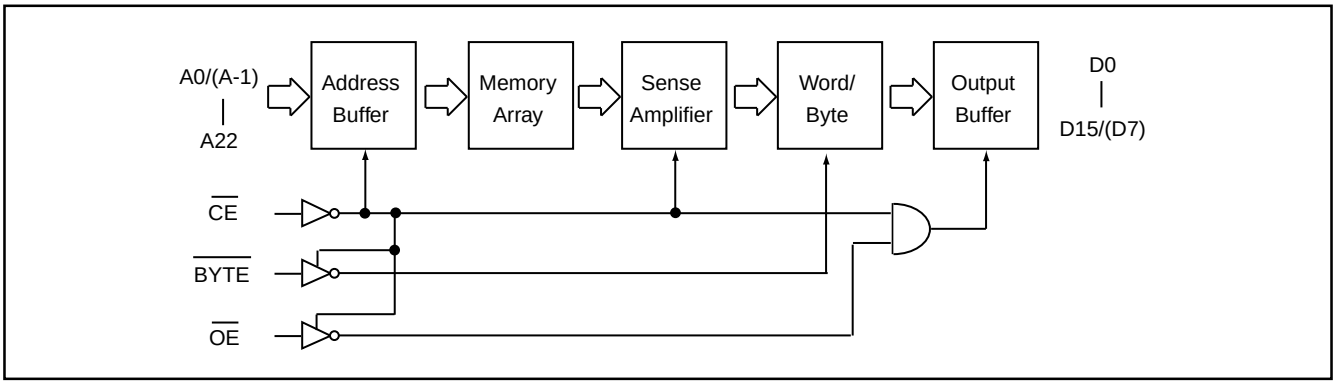
ORDER INFORMATION

Part No.	Access Time	Package	VCC
MX23L12810TC-10	100ns	48 pin TSOP	3.0V~3.6V
MX23L12810TC-12	120ns	48 pin TSOP	3.0V~3.6V
*MX23L12810TC-12	120ns	48 pin TSOP	2.7V~3.6V (under development)
MX23L12810RC-10	100ns	48 pin TSOP (Reverse type)	3.0V~3.6V
MX23L12810RC-12	120ns	48 pin TSOP (Reverse type)	3.0V~3.6V
*MX23L12810RC-12	120ns	48 pin TSOP (Reverse type)	2.7V~3.6V (under development)

MODE SELECTION

$\overline{CE}$	$\overline{OE}$	$\overline{Byte}$	D15/A-1	D0~D7	D8~D15	Mode	Power
H	X	X	X	High Z	High Z	-	Stand-by
L	H	X	X	High Z	High Z	-	Active
L	L	H	Output	D0~D7	D8~D15	Word	Active
L	L	L	Input	D0~D7	High Z	Byte	Active

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings
Voltage on any Pin Relative to VSS	VIN	-1.3V to VCC+2.0V (Note)
Ambient Operating Temperature	Topr	0℃ to 70℃
Storage Temperature	Tstg	-65℃ to 125℃

Note: Minimum DC voltage on input or I/O pins is -0.5V. During voltage transitions, inputs may undershoot VSS to -1.3V for periods of up to 20ns. Maximum DC voltage on input or I/O pins is VCC+0.5V. During voltage transitions, inputs may overshoot VCC to VCC+2.0V for periods of up to 20ns.

DC CHARACTERISTICS (Ta = 0℃ ~ 70℃, VCC = 2.7V~3.6V)

Item	Symbol	MIN.	MAX.	Conditions
Output High Voltage	VOH	2.4V	-	IOH = -0.4mA
Output Low Voltage	VOL	-	0.4V	IOL = 1.6mA
Input High Voltage	VIH	2.2V	VCC+0.3V	
Input Low Voltage	VIL	-0.3V	0.2 x VCC	
Input Leakage Current	ILI	-	5uA	0V, VCC
Output Leakage Current	ILO	-	5uA	0V, VCC
Operating Current	ICC	-	30mA	f=5MHz, all outputs open, $\overline{CE}$=VIL(Chip Enable) $\overline{OE}$=VIH(Output Disabled)
Standby Current (TTL)	ISTB1	-	1mA	$\overline{CE}$ = VIH
Standby Current (CMOS)	ISTB2	-	15uA	$\overline{CE}$>VCC-0.2V
Input Capacitance	CIN	-	10pF	Ta = 25℃, f = 1MHZ
Output Capacitance	COUT	-	10pF	Ta = 25℃, f = 1MHZ

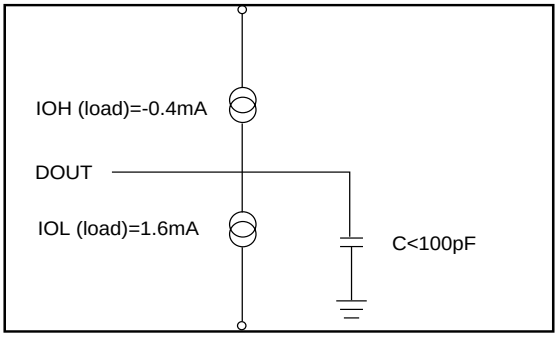
AC CHARACTERISTICS (Ta = 0℃ ~ 70℃, VCC = 2.7V~3.6V)

Item	Symbol	23L12810-10		23L12810-12		23L12810-15	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	100ns	-	120ns	-	150ns	-
Address Access Time	tAA	-	100ns	-	120ns	-	150ns
Chip Enable Access Time	tACE	-	100ns	-	120ns	-	150ns
Output Enable Time	tOE	-	30ns	-	50ns	-	70ns
Output Hold After Address	tOH	0ns	-	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns	-	20ns

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

AC Test Conditions

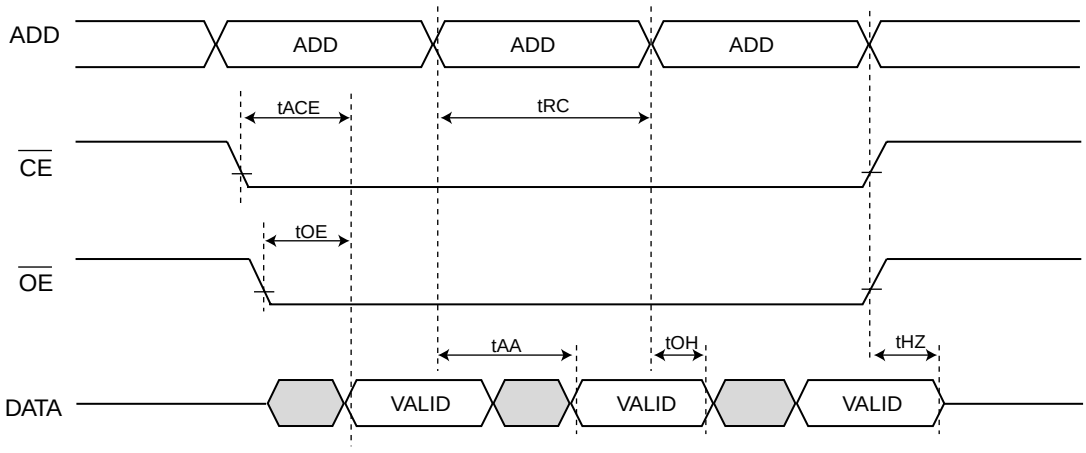
Input Pulse Levels	0.4V~2.4V
Input Rise and Fall Times	10ns
Input Timing Level	1.4V
Output Timing Level	1.4V
Output Load	See Figure



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

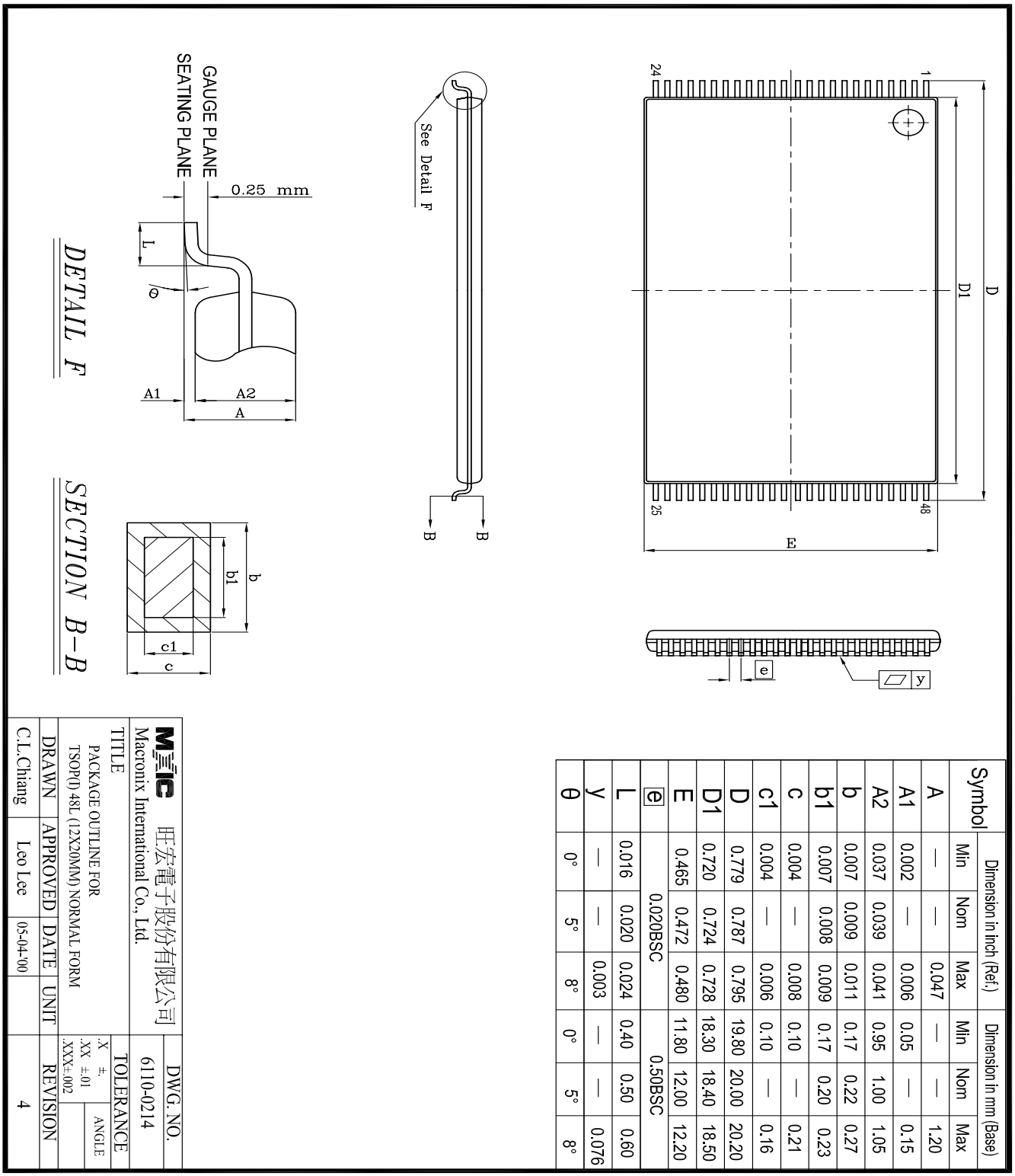
RANDOM READ



Note:$\overline{CE}$, $\overline{OE}$ are enable

PACKAGE INFORMATION

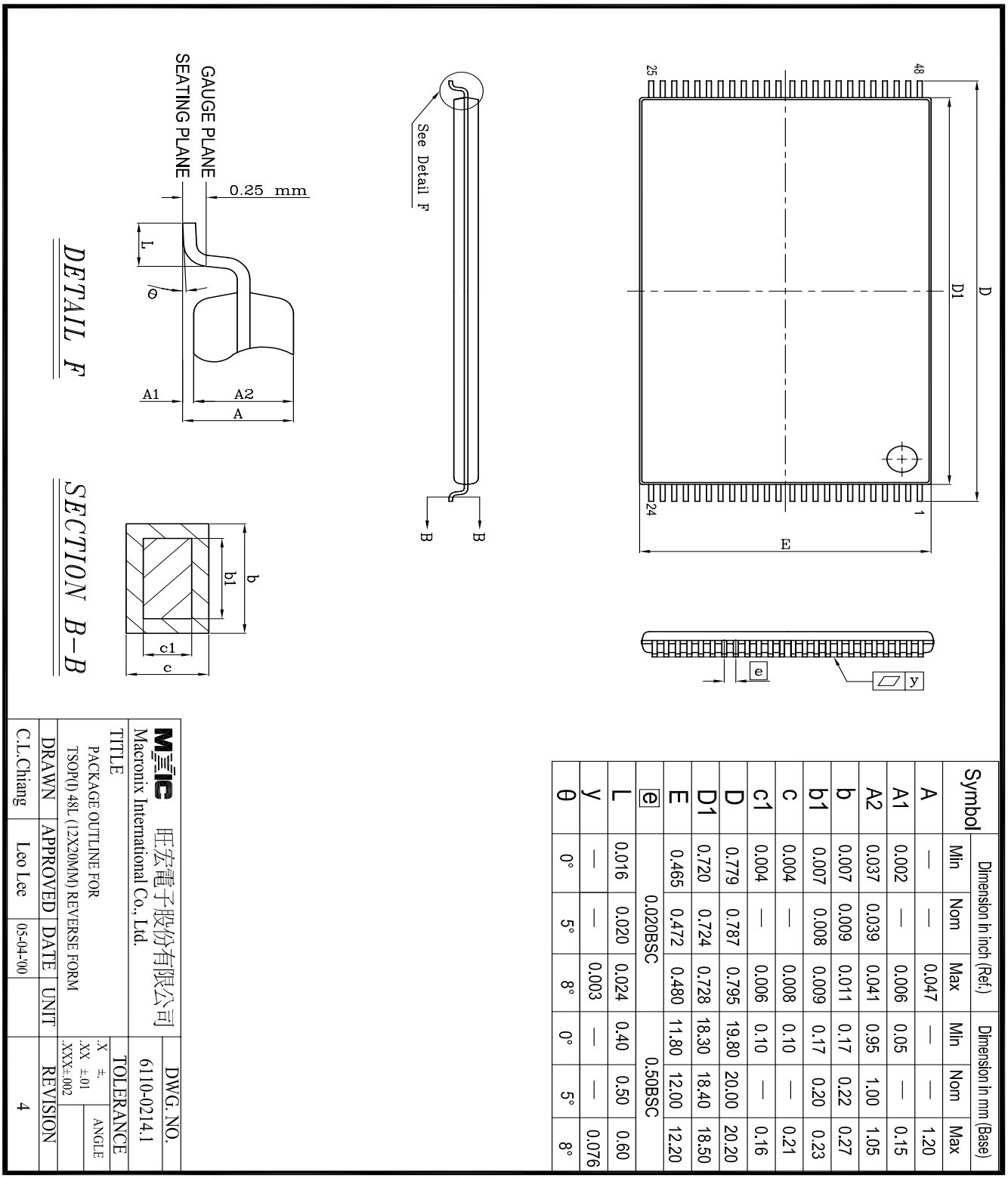
48-PIN PLASTIC TSOP (NORMAL FORM)



Symbol	Dimension in inch (Ref.)			Dimension in mm (Base)		
	Min	Nom	Max	Min	Nom	Max
A	—	—	0.047	—	—	1.20
A1	0.002	—	0.006	0.05	—	0.15
A2	0.037	0.039	0.041	0.95	1.00	1.05
b	0.007	0.009	0.011	0.17	0.22	0.27
b1	0.007	0.008	0.009	0.17	0.20	0.23
c	0.004	—	0.008	0.10	—	0.21
c1	0.004	—	0.006	0.10	—	0.16
D	0.779	0.787	0.795	19.80	20.00	20.20
D1	0.720	0.724	0.728	18.30	18.40	18.50
E	0.465	0.472	0.480	11.80	12.00	12.20
e		0.020BSC			0.50BSC	
L	0.016	0.020	0.024	0.40	0.50	0.60
y	—	—	0.003	—	—	0.076
θ	0°	5°	8°	0°	5°	8°

旺宏電子股份有限公司 Macronix International Co., Ltd.			DWG. NO.
TITLE			6110-0214
PACKAGE OUTLINE FOR TSOP(I) 48L (12X20MM) NORMAL FORM			TOLERANCE .X ± .XX ±.01 .XXX±.002 ANGLE
DRAWN	APPROVED	DATE	UNIT
C.L.Chiang	Leo Lee	05-04-'00	REVISION 4

48-PIN PLASTIC TSOP (REVERSE FORM)



Symbol	Dimension in inch (Ref.)			Dimension in mm (Base)		
	Min	Nom	Max	Min	Nom	Max
A	—	—	0.047	—	—	1.20
A1	0.002	—	0.006	0.05	—	0.15
A2	0.037	0.039	0.041	0.95	1.00	1.05
b	0.007	0.009	0.011	0.17	0.22	0.27
b1	0.007	0.008	0.009	0.17	0.20	0.23
c	0.004	—	0.008	0.10	—	0.21
c1	0.004	—	0.006	0.10	—	0.16
D	0.779	0.787	0.795	19.80	20.00	20.20
D1	0.720	0.724	0.728	18.30	18.40	18.50
E	0.465	0.472	0.480	11.80	12.00	12.20
e		0.020BSC			0.50BSC	
L	0.016	0.020	0.024	0.40	0.50	0.60
y	—	—	0.003	—	—	0.076
θ	0°	5°	8°	0°	5°	8°

MXIC 旺宏電子股份有限公司 Macronix International Co., Ltd.			DWG. NO. 6110-0214.1
TITLE PACKAGE OUTLINE FOR TSOP(I) 48L (12X20MM) REVERSE FORM			TOLERANCE .X ± .1 ANGLE .XX ±.01 .XXX±.002
DRAWN	APPROVED	DATE	UNIT
C.L.Chiang	Leo Lee	05-04-'00	
			REVISION 4

REVISION HISTORY

Revision #	Description	Page	Date
1.2	DC Characteristics ISTB2(CMOS Standby Current) 5uA-->15uA	P3	DEC/15/1999
1.3	Del Package 44-pin SOP	P1,5	SEP/07/2000
1.4	Modify Current Operating:60mA-->40mA	P1	DEC/12/2000
	Modify ICC1:60mA-->40mA, f=5MHz, all outputs open	P3	
	Del ICC2	P3	
1.5	Modify Current Operating:40mA-->50mA	P1	DEC/14/2000
	Modify ICC1:40mA-->50mA	P3	
1.6	1.Modify Fast access time:120ns-->90ns	P1	JUL/10/2001
	2.Modify Operating:50mA-->30mA	P1	
	3.Added Temperature:0~70°C	P1	
	4.Modify Supply Voltage : 3.3V±10%-->2.7V~3.6V	P1,3	
	5.Modify Package Information	P5,6	
1.7	Delete Access Time:90ns	P1,2,3	AUG/28/2001
1.8	1.Add Supply Voltage: 2.7~3.6V for 120ns, 3.0~3.6V for 100ns	P1,2	OCT/15/2001
	2.Modify Order Information	P2	
	3.Add $\overline{CE}$=VIL, $\overline{OE}$=VIH in DC Characteristics	P3	

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