



PRELIMINARY
MX23L12811

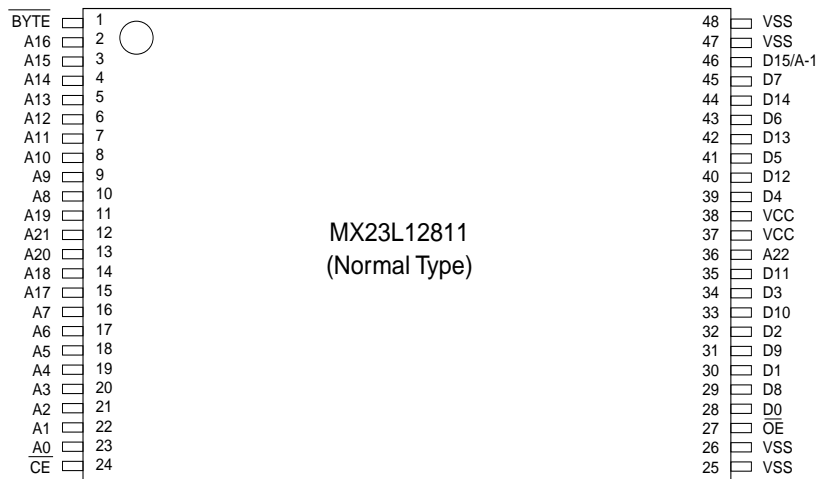
**NEW 128M-BIT (16M x 8/8M x 16) MASK ROM WITH PAGE MODE
(TSOP PACKAGE)**

FEATURES

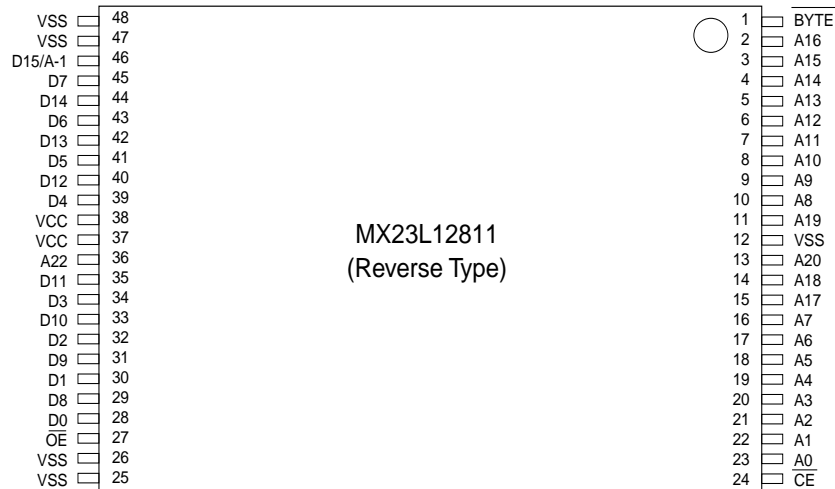
- Bit organization
 - 16M x 8 (byte mode)
 - 8M x 16 (word mode)
- Fast access time
 - Random access: 100ns (max.)
 - Page access: 30ns (max.)
- Page size
 - 8 words per page
- Current
 - Operating:40mA
 - Standby:15uA
- Supply voltage
 - 2.7V~3.6V for 120ns
 - 3.0V~3.6V for 100ns
- Package
 - 48 pin TSOP (12mm x 20mm)
 - 48 pin TSOP reverse type
- Temperature
 - 0 ~ 70°C

PIN CONFIGURATION

48TSOP (Normal Type)



48TSOP (Reverse Type)



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 |

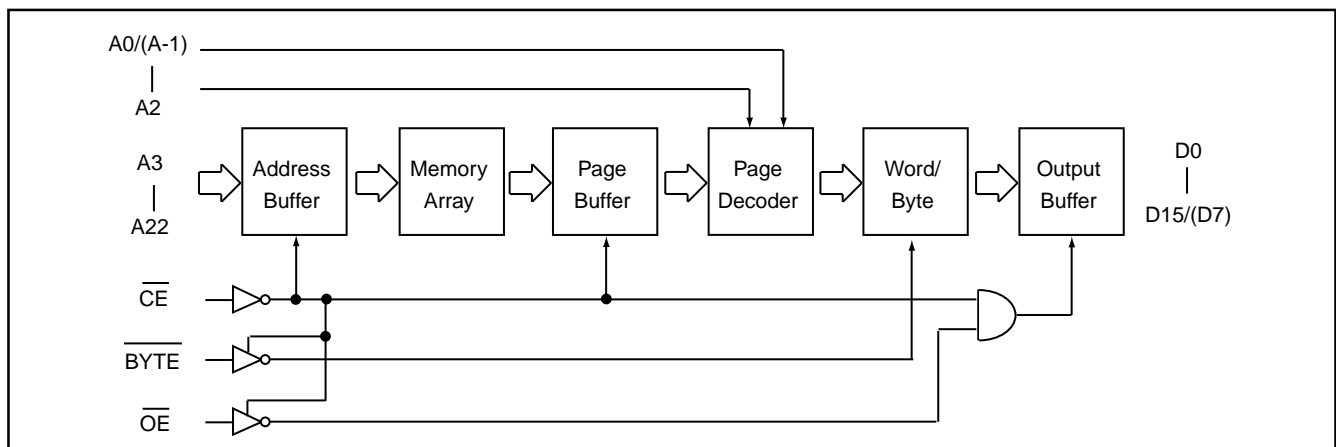
ORDER INFORMATION

| Part No. | Access Time | Page Time | Package | VCC |
|------------------|-------------|-----------|----------------------------|----------------------------------|
| MX23L12811TC-10 | 100ns | 30ns | 48 pin TSOP | 3.0V~3.6V |
| MX23L12811TC-12 | 120ns | 30ns | 48 pin TSOP | 3.0V~3.6V |
| *MX23L12811TC-12 | 120ns | 30ns | 48 pin TSOP | 2.7V~3.6V (under development) |
| MX23L12811RC-10 | 100ns | 30ns | 48 pin TSOP (Reverse type) | 3.0V~3.6V |
| MX23L12811RC-12 | 120ns | 30ns | 48 pin TSOP (Reverse type) | 3.0V~3.6V |
| *MX23L12811RC-12 | 120ns | 30ns | 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°C to 70°C |
| Storage Temperature | Tstg | -65°C to 125°C |

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°C ~ 70°C, 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 | - | 40mA | 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°C, f = 1MHZ |
| Output Capacitance | COUT | - | 10pF | Ta = 25°C, f = 1MHZ |

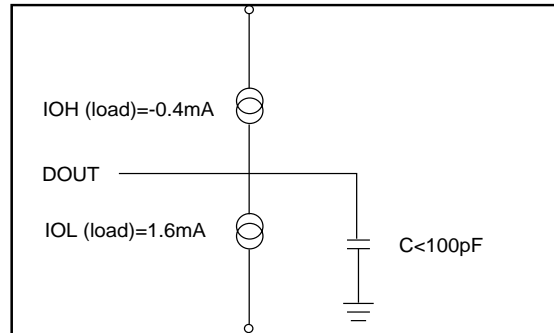
AC CHARACTERISTICS (Ta = 0°C ~ 70°C, VCC = 2.7V~3.6V)

| Item | Symbol | 23L12811-10 | | 23L12811-12 | |
|---------------------------|--------|--------------------|-------|--------------------|-------|
| | | MIN. | MAX. | MIN. | MAX. |
| Read Cycle Time | tRC | 100ns | - | 120ns | - |
| Address Access Time | tAA | - | 100ns | - | 120ns |
| Chip Enable Access Time | tACE | - | 100ns | - | 120ns |
| Page Mode Access Time | tPA | - | 30ns | - | 30ns |
| Output Enable Time | tOE | - | 30ns | - | 30ns |
| 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 |



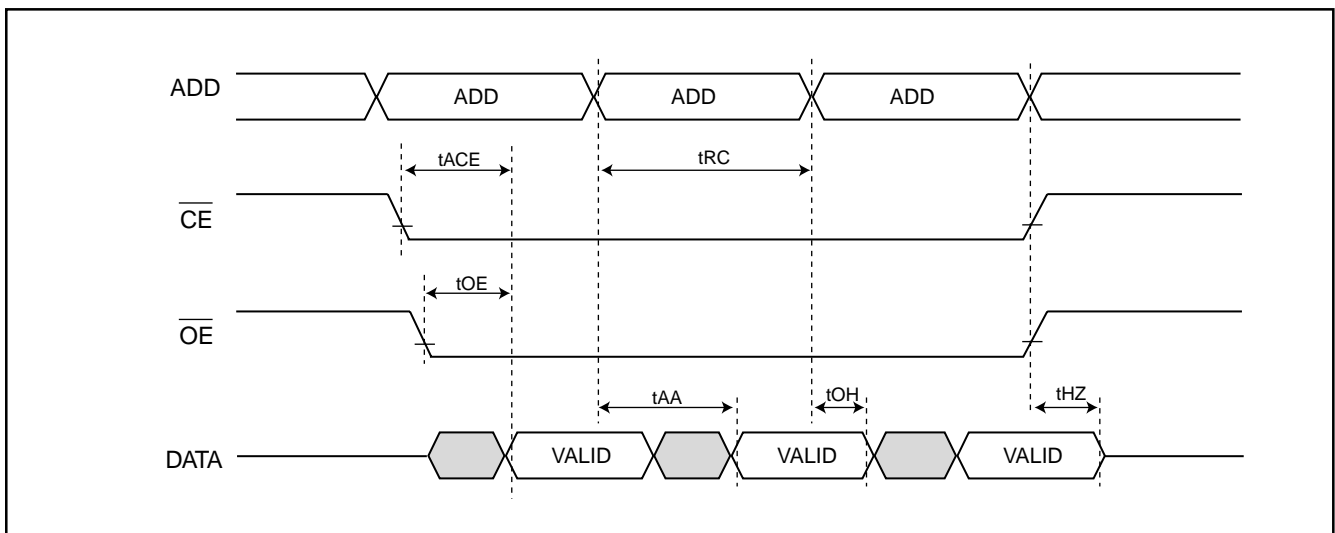
Note: No output loading is present in tester load board.

Active loading is used and under software programming control.

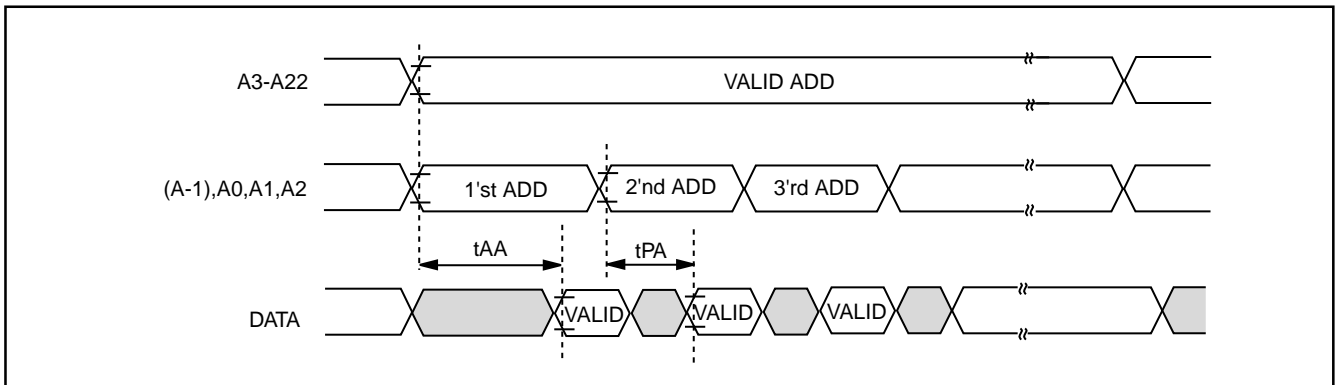
Output loading capacitance includes load board's and all stray capacitance.

TIMING DIAGRAM

RANDOM READ

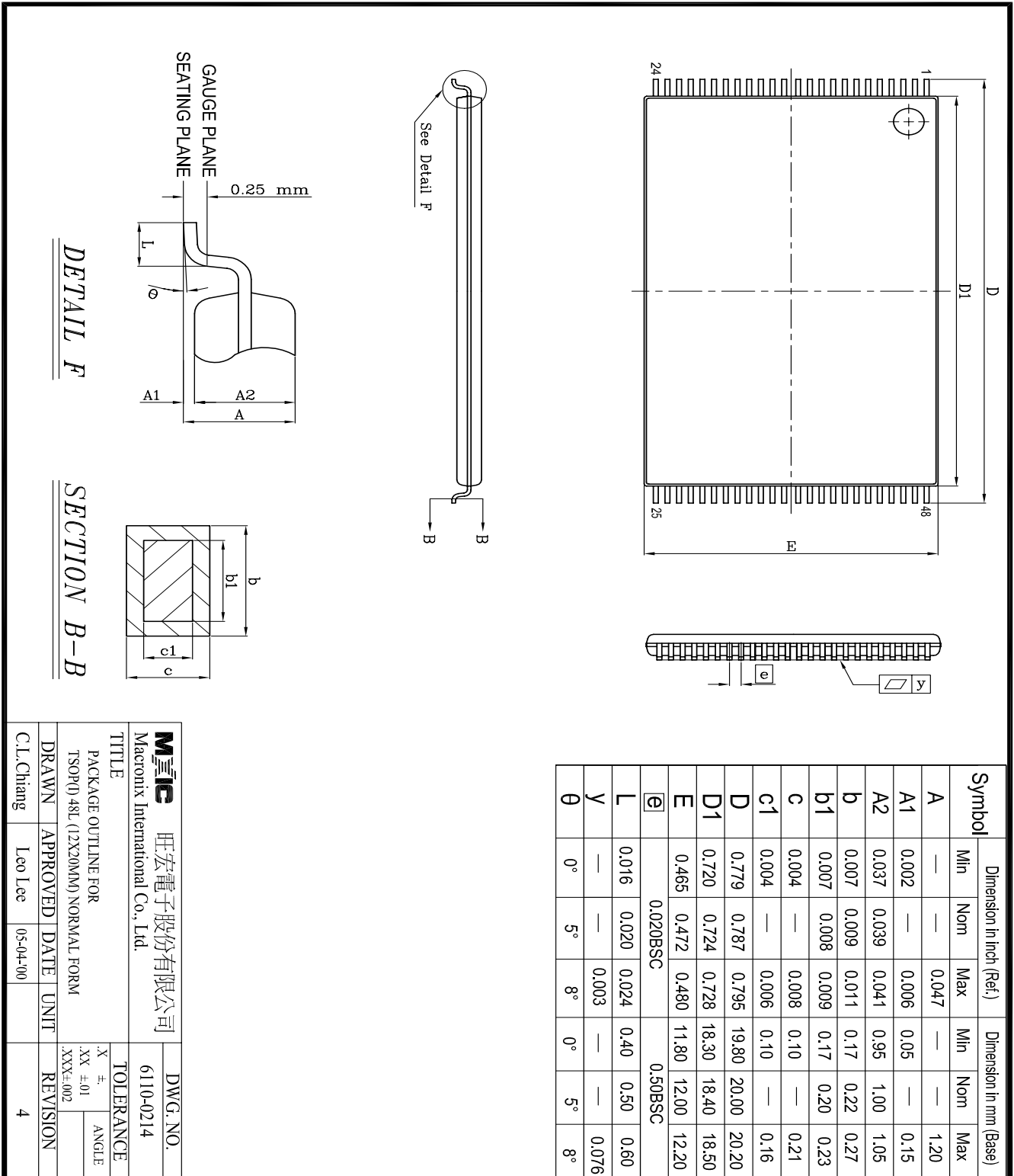


PAGE READ



PACKAGE INFORMATION

48-PIN PLASTIC TSOP (NORMAL FORM)

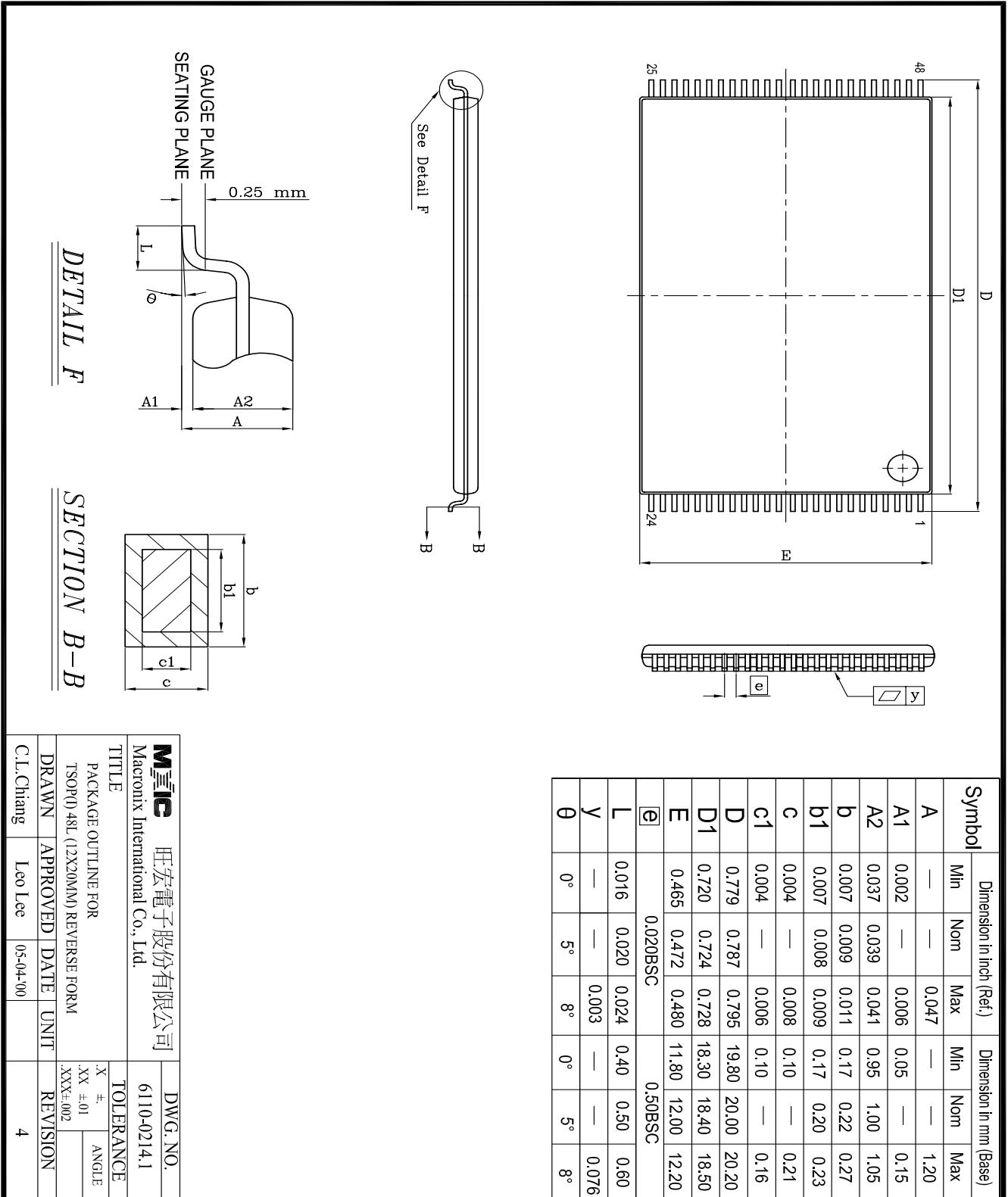


DETAIL F

SECTION B-B

| | | | |
|---|----------|-----------------------|----------|
| Mxic 旺宏電子股份有限公司 Macronix International Co., Ltd. | | DWG. NO. 6110-0214 | |
| TITLE PACKAGE OUTLINE FOR TSOP(0) 48L (12X20MM) NORMAL FORM | | | |
| TOLERANCE .X ±. XX ±.01 .XXX ±.002 | | ANGLE | |
| DRAWN | APPROVED | DATE | REVISION |
| C.L.Chang | Leo Lee | 05-04-00 | 4 |

48-PIN PLASTIC TSOP (REVERSE FORM)



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

REVISION HISTORY

| Revision # | Description | Page | Date |
|-------------------|---|-------------|-------------|
| 1.2 | DC Characteristics ISTB2(CMOS Standby Current) 5uA-->15uA | P3 | DEC/15/1999 |
| | AC Characteristics TPA(Page Mode Access Time) 50ns-->30ns | P3 | |
| | AC Characteristics TOE(Output Enable Time) 50ns-->30ns | P3 | |
| 1.3 | Del Package 44-pin SOP | P1,5 | JUL/14/2000 |
| 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-->100ns | P1,3 | AUG/28/2001 |
| | 2.Modify Operating:50mA-->40mA | 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 | 1.Add Supply Voltage: 2.7~3.6V for 120ns, 3.0~3.6V for 100ns | P1,2 | OCT/12/2001 |
| | 2.Modify Order Information | P2 | |
| | 3.Add $\overline{CE}=V_{IL}$, $\overline{OE}=V_{IH}$ in DC Characteristics | P3 | |



MX23L12811

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)