



MX23C4000

4M-BIT MASK ROM (8 BIT OUTPUT)

FEATURES

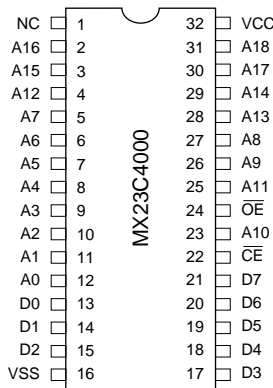
- Bit organization
 - 512K x 8 (byte mode)
- Fast access time
 - Random access: 90ns (max.)
- Current
 - Operating: 35mA
 - Standby: 100uA
- Supply voltage
 - 5V ± 10%
- Package
 - 32 pin PDIP (600 mil)
 - 32 pin PLCC
 - 32 pin SOP (450 mil)
 - 32 pin TSOP (8mm x 20mm)

ORDER INFORMATION

Part No.	Access Time	Package
MX23C4000PC-90	90ns	32 pin PDIP
MX23C4000PC-10	100ns	32 pin PDIP
MX23C4000PC-12	120ns	32 pin PDIP
MX23C4000PC-15	150ns	32 pin PDIP
MX23C4000QC-10	100ns	32 pin PLCC
MX23C4000QC-12	120ns	32 pin PLCC
MX23C4000QC-15	150ns	32 pin PLCC
MX23C4000MC-90	90ns	32 pin SOP
MX23C4000MC-10	100ns	32 pin SOP
MX23C4000MC-12	120ns	32 pin SOP
MX23C4000MC-15	150ns	32 pin SOP
MX23C4000TC-10	100ns	32 pin TSOP
MX23C4000TC-12	120ns	32 pin TSOP
MX23C4000TC-15	150ns	32 pin TSOP

PIN CONFIGURATION

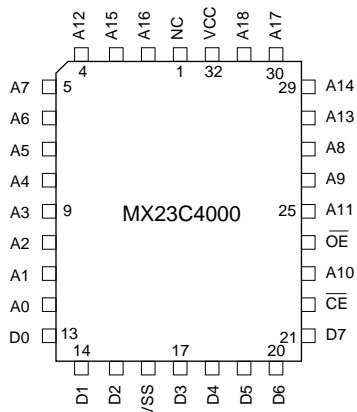
32 PDIP / 32 SOP



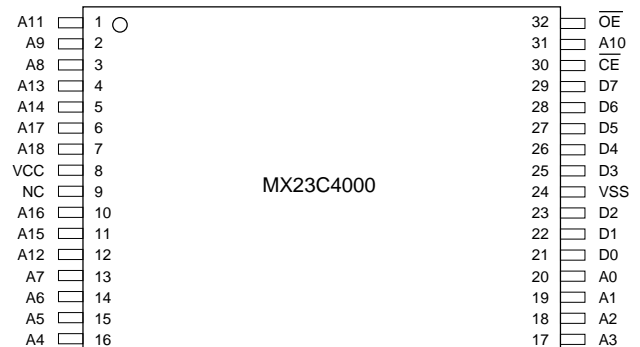
PIN DESCRIPTION

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 PLCC



32 TSOP



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings
Power Supply Voltage	VCC	-0.5V to 7.0V
Input Voltage	VI	-0.5V to VCC + 0.5V
Output Voltage	VO	-0.5V to VCC + 0.5V
Ambient Operating Temperature	Topr	-10°C to 70°C
Storage Temperature	Tstg	-65°C to 125°C

DC CHARACTERISTICS (Ta = -10°C ~ 70°C, VCC = 5.0V ± 10%)

Item	Symbol	MIN.	MAX.	Conditions
Output High Voltage	VOH	0.8VCC	-	IOH = -100uA
Output Low Voltage	VOL	-	0.4V	IOL = 2.1mA
Input High Voltage	VIH	2.2V	VCC+0.5V	
Input Low Voltage	VIL	-0.3V	0.8V	
Input Leakage Current	ILI	-	10uA	0V, VCC
Output Leakage Current	ILO	-	10uA	0V, VCC
Operating Current	ICC1	-	35mA	tRC = 100ns, all output open
Standby Current (TTL)	ISTB1	-	1mA	CE = VIH
Standby Current (CMOS)	ISTB2	-	100uA	CE > VCC - 0.2V
Input Capacitance	CIN	-	10pF	Ta = 25°C, f = 1MHz
Output Capacitance	COUT	-	10pF	Ta = 25°C, f = 1MHz

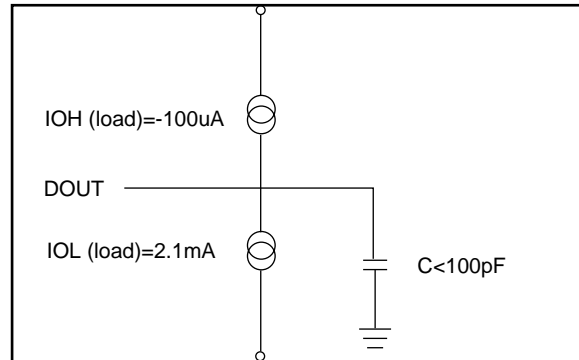
AC CHARACTERISTICS (Ta = -10°C ~ 70°C, VCC = 5.0V ± 10%)

Item	Symbol	23C4000-90		23C4000-10		23C4000-12		23C4000-15	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	90ns	-	100ns	-	120ns	-	150ns	-
Address Access Time	tAA	-	90ns	-	100ns	-	120ns	-	150ns
Chip Enable Access Time	tACE	-	90ns	-	100ns	-	120ns	-	150ns
Output Enable Time	tOE	-	45ns	-	50ns	-	60ns	-	70ns
Output Hold After Address	tOH	0ns	-	0ns	-	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns	-	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

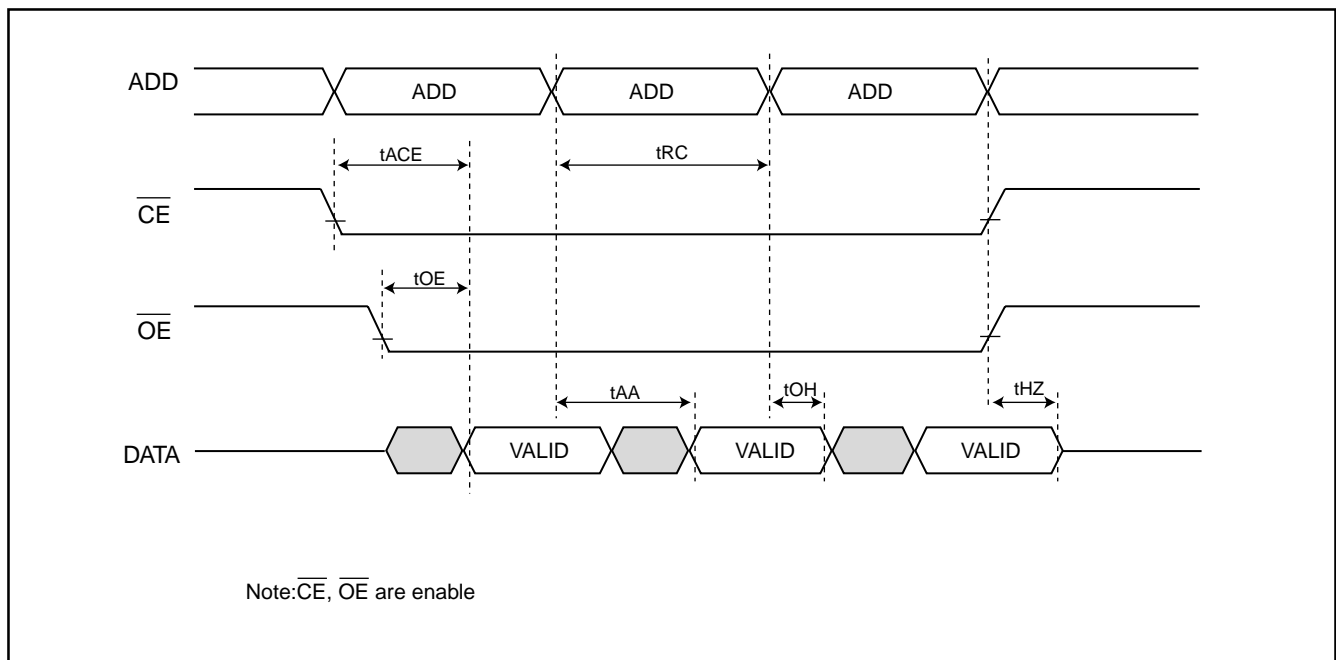
- Input Pulse Levels : 0.4V~2.4V
- Input Rise and Fall Times : 10ns
- Input Timing Level : 1.5V
- Output Timing Level : 0.8V and 2.0V
- Output Load : See Figure



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.

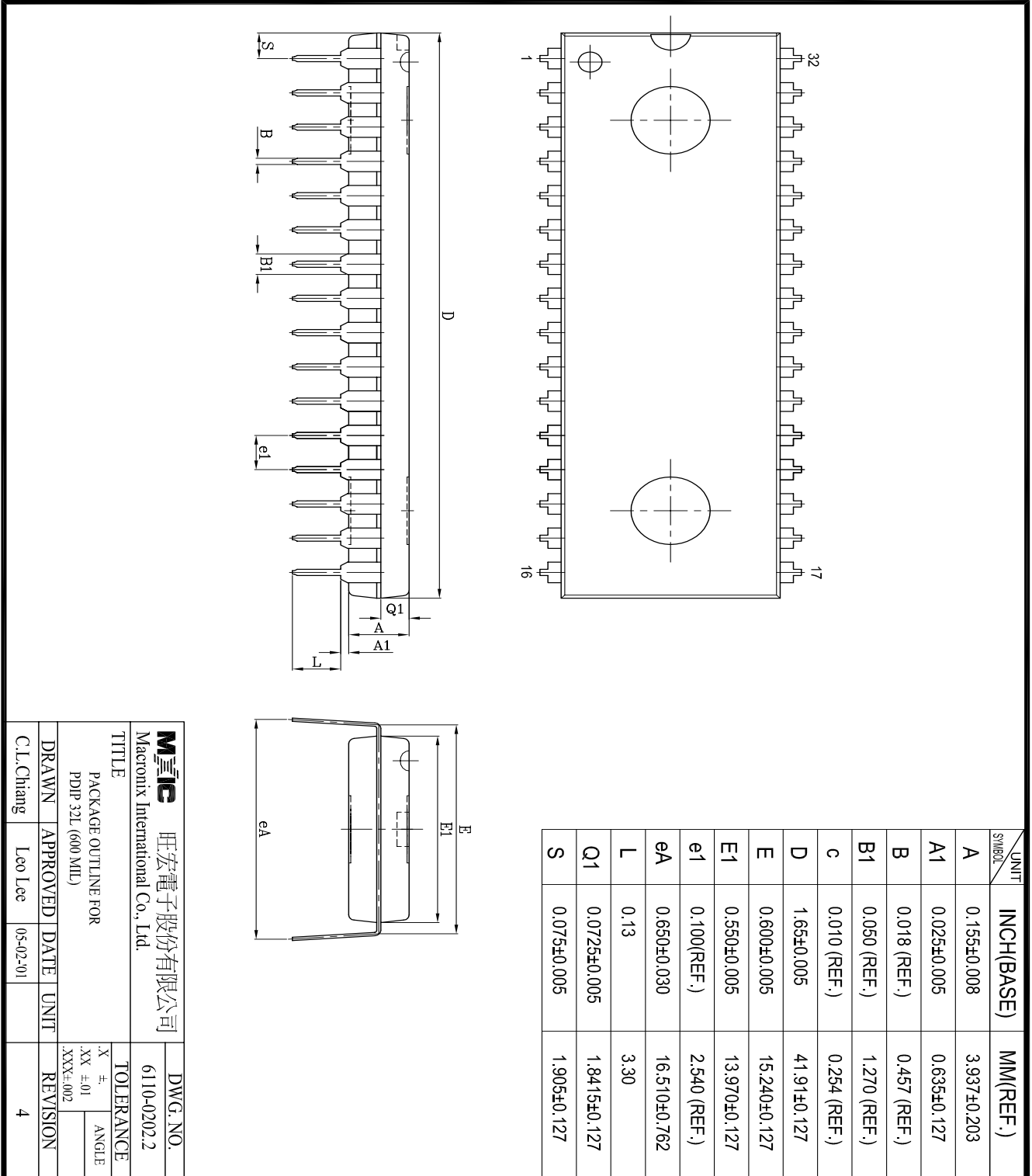
TIMING DIAGRAM

RANDOM READ



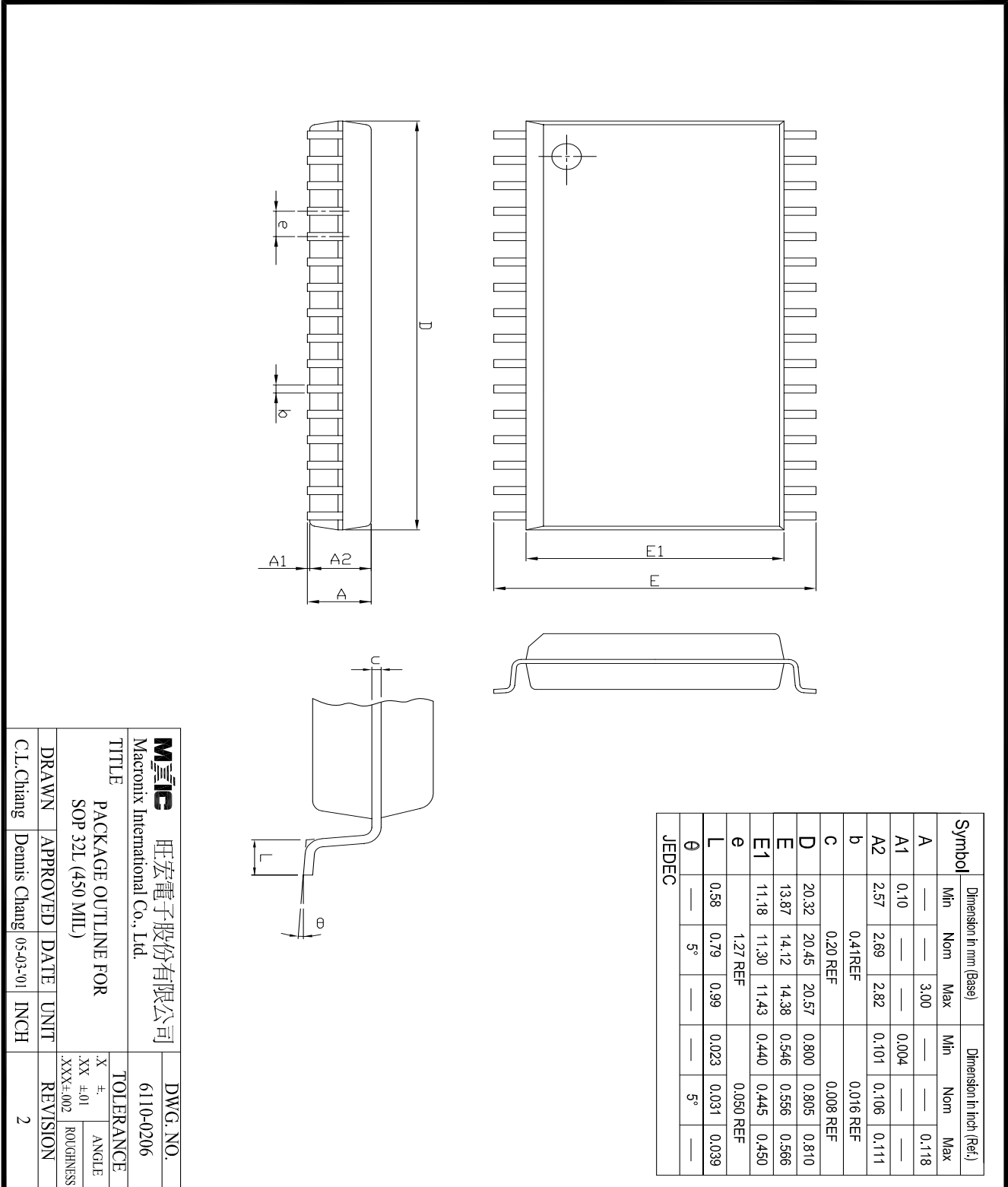
PACKAGE INFORMATION

32-PIN PLASTIC DIP (600 mil)



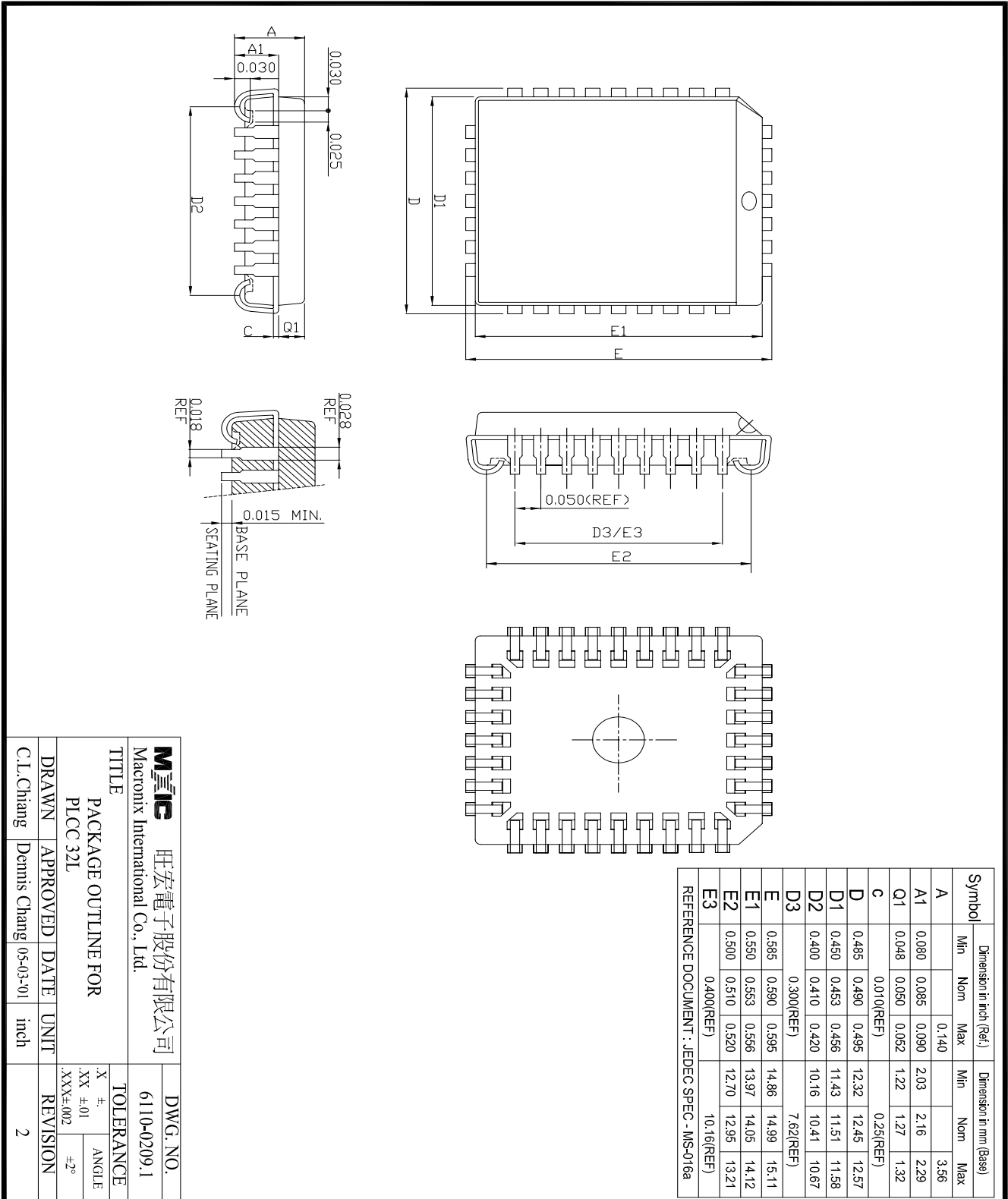
旺宏電子股份有限公司 Macronix International Co., Ltd.		DWG. NO.	6110-0202.2
TITLE		TOLERANCE	
PACKAGE OUTLINE FOR		.X ±.	ANGLE
PDP 32L (600 MIL)		.XX ±.01	
DRAWN		.XXX±.002	REVISION
C.L.Chang	APPROVED	DATE	UNIT
Leo Lee	05-02-01		4

32-PIN PLASTIC SOP (450 mil)



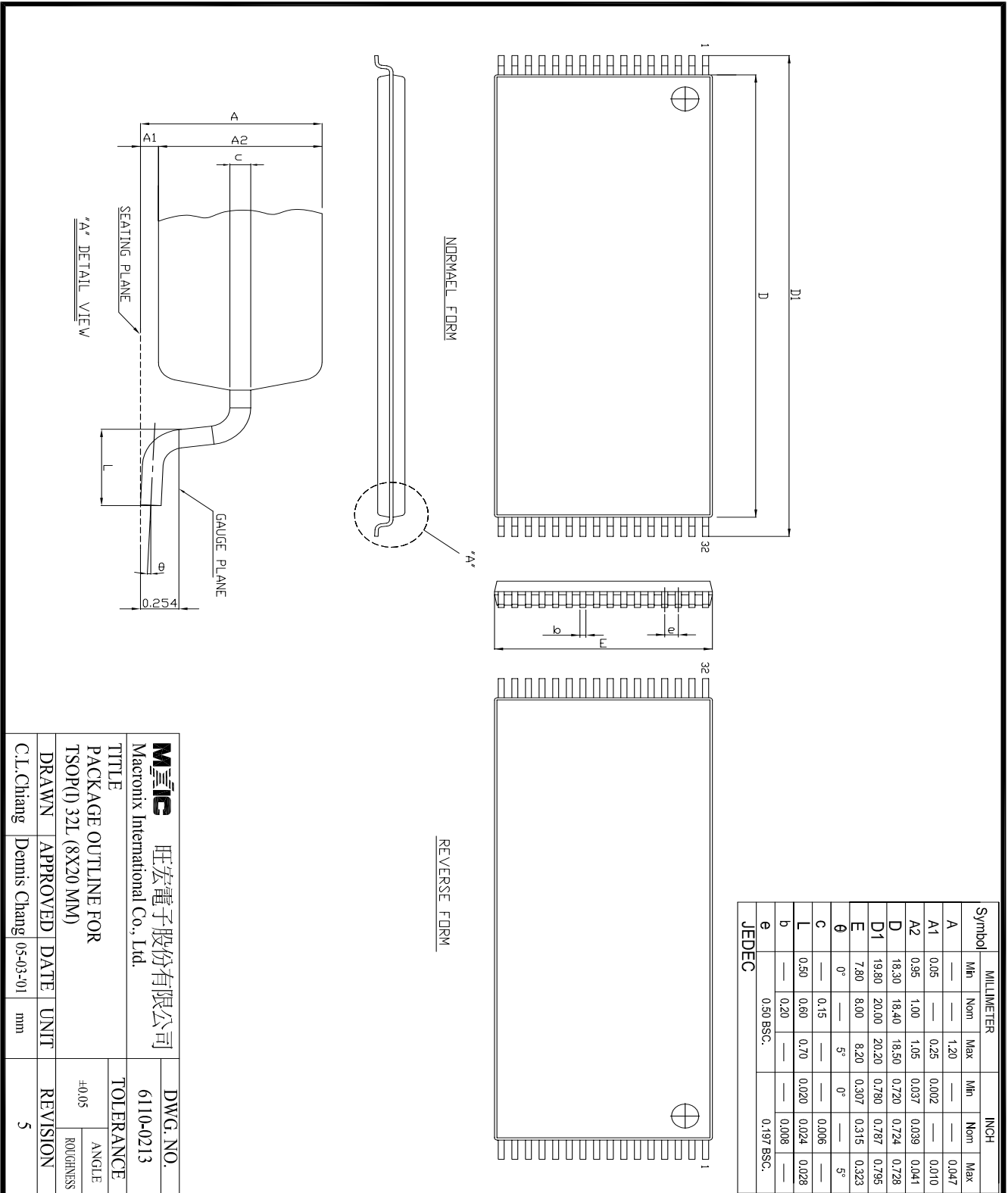
Mxic 旺宏電子股份有限公司 Macronix International Co., Ltd.		DWG. NO. 6110-0206	
TITLE PACKAGE OUTLINE FOR SOP 32L (450 MIL)			
DRAWN C.L.Chiang	APPROVED Dennis Chang	DATE 05-03-01	UNIT INCH
TOLERANCE X ±. XX ±.01 XXX±.002		REVISION 2	

32-PIN PLASTIC LEADED CHIP CARRIER (PLCC)



MIIIC 旺宏電子股份有限公司		DWG. NO.	
Macronix International Co., Ltd.		6110-0209.1	
TITLE			
PACKAGE OUTLINE FOR		TOLERANCE	
PLCC 32L		.X ±.	
DRAWN		APPROVED	
C.L.Chang		Dennis Chang	
DATE		05-03-01	
UNIT		inch	
REVISION		2	
ANGLE		±2°	
XXX±.002			

32-PIN PLASTIC TSOP



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



REVISION HISTORY

REVISION	DESCRIPTION	PAGE	DATE
3.7	AC Characteristics: tOH 10ns --> 0ns	P3	JAN/29/1999
3.8	Add 4000PC-90 32 pin PDIP	P1	JUN/02/1999
3.9	Modify DC Characteristics:ILI/ILO:5uA-->10uA; ISTB2:100mA-->100uA	P2	OCT/17/2000
4.0	Modify Package Information	P4~7	JUL/16/2001



MX23C4000

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