



A23L36166/A23L361662 Series

8M X 16 / 16M X 8 BIT CMOS MASK ROM WITH PAGE MODE

Preliminary

Document Title

8M X 16 / 16M X 8 BIT CMOS MASK ROM WITH PAGE MODE

Revision History

<u>Rev. No.</u>	<u>History</u>	<u>Issue Date</u>	<u>Remark</u>
0.0	Initial issue	September 15, 2008	Preliminary
0.1	Add 56-pin TSOP(1) package type	October 8, 2008	
0.2	Remove -70 grade	December 17, 2009	



A23L36166/A23L361662 Series

Preliminary

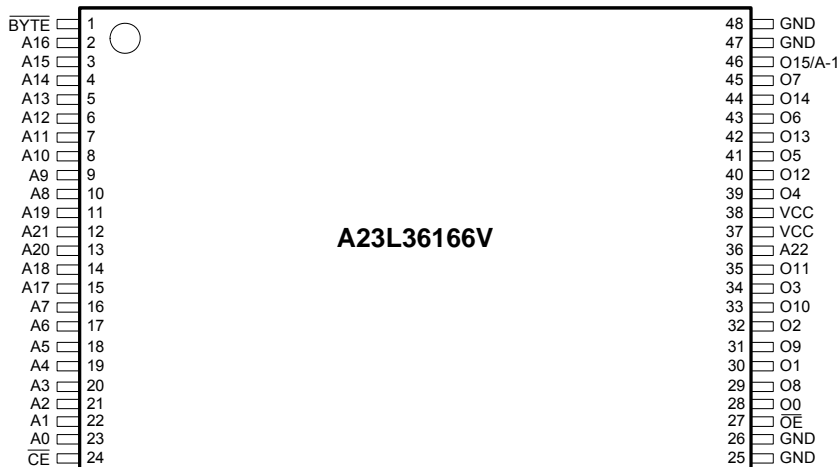
8M X 16 / 16M X 8 BIT CMOS MASK ROM

Features

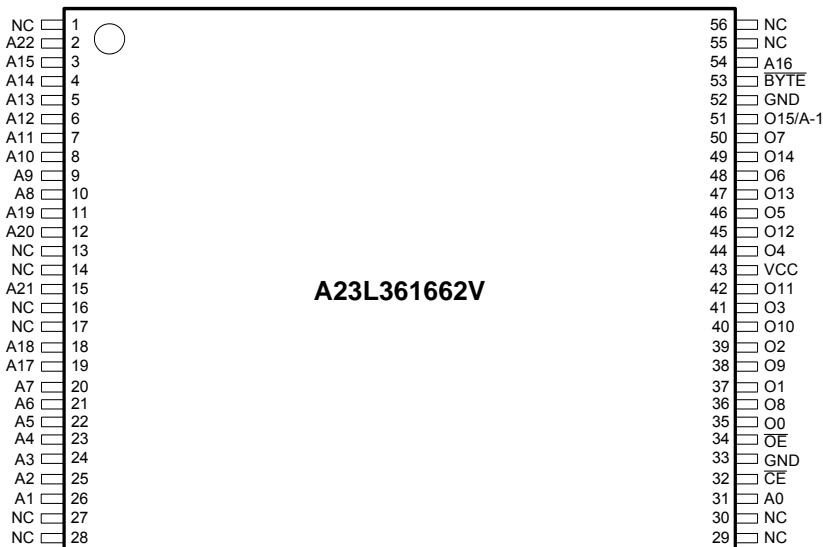
- 8M x 16 bit or 16M x 8 bit organization
- Supply voltage range: 2.7V~3.6V
- Random access time: 90ns (max.)/2.7V~3.6V
- Current: Operating: 30mA
Standby: 30 μ A
- Page Size:
 - 8 words per page
 - Page access: 30ns (max.)/2.7V~3.6V
- Three-state outputs for wired-OR expansion
- Full static operation
- All inputs and outputs are directly TTL-compatible
- Available in 48-pin TSOP (Mask ROM type) and 56-pin TSOP(I) packages
- All Pb-free (Lead-free) products are RoHS compliant

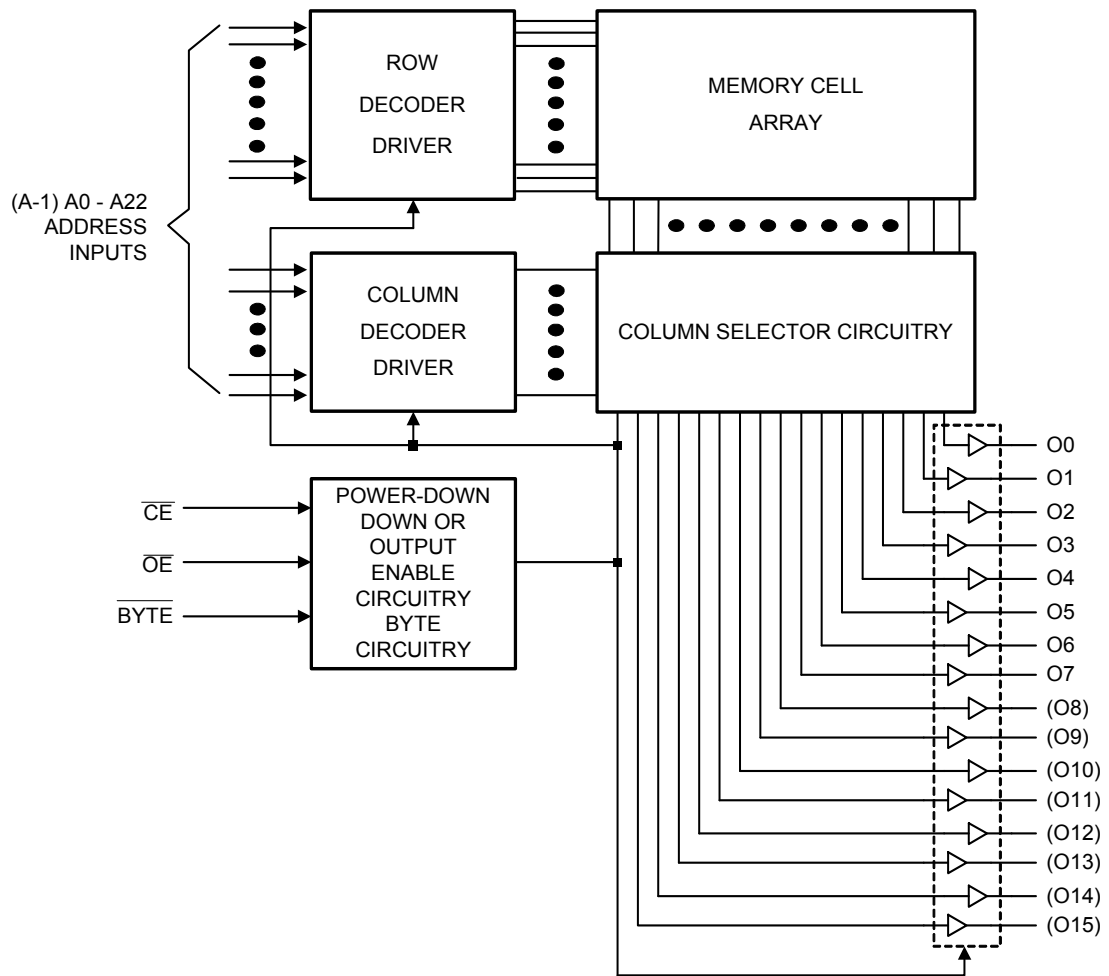
Pin Configurations

■ 48-pin TSOP (Mask ROM type)



■ 56-pin TSOP(I)



Block Diagram


Pin Descriptions

Pin No.		Symbol	Description
48L TSOP (A23L36166)	56L TSOP (23L361662)		
2-23, 36	2-12, 15, 18-26, 31, 54	A0-A22	Address Inputs
28-35, 39-45	35-42, 44-50	O0-O14	Data Outputs
46	51	O15/A-1	Output 15(WORD mode) / LSB Address (BYTE mode)
24	32	\overline{CE}	Chip Enable Input
27	34	\overline{OE}	Output Enable Input
1	53	\overline{BYTE}	BYTE or WORD mode Selection
37-38	43	VCC	Power Supply
25-26, 47-48	33, 52	GND	Ground
-	1, 13-14, 16-17, 27-28, 29-30, 55-56	NC	No Connection

Recommended DC Operating Conditions

 (T_A = 0°C to + 70°C)

Symbol	Parameter	Min.	Max.	Unit
VCC	Supply Voltage	2.7	3.6	V
GND	Ground	0	0	V
V _{IH}	Input High Voltage	2.2	VCC+0.3	V
V _{IL}	Input Low Voltage	-0.3	0.6	V

Absolute Maximum Ratings*

Ambient Operating Temperature 0°C to + 70°C
 Storage Temperature -65°C to + 125°C
 Output Voltage -0.5V to VCC + 0.5V
 Input Voltage -0.5V to VCC + 0.5V

***Comments**

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to this device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied or intended. Exposure to the absolute maximum rating conditions for extended periods may affect device reliability.

DC Electrical Characteristics

(T_A = 0°C to + 70°C, VCC = 2.7V~3.6V, GND = 0V)

Symbol	Parameter	Min.	Max.	Unit	Conditions	Note
V _{OH}	Output High Voltage	2.4		V	I _{OH} = -0.4mA (3V)	
V _{OL}	Output Low Voltage		0.4	V	I _{OL} = 1.6mA (3V)	
V _{IH}	Input High Voltage	2.2	VCC + 0.3	V		
V _{IL}	Input Low Voltage	-0.3	0.6	V		
I _{LI}	Input Leakage Current		+10	μA	VCC = max. V _{IN} = VCC to GND	
I _{LO}	Output Leakage Current		+10	μA	VCC = max. V _{OUT} = VCC to GND	1
I _{CC}	Operating Supply Current		50	mA	t _{CYC} = min.	2
I _{SB}	Standby Supply Current (TTL)		1.5	mA	$\overline{CE} = V_{IH}$	
I _{SB1}	Standby Supply Current (CMOS)		30	μA	$\overline{CE} \geq VCC - 0.2V$	

Capacitance

Symbol	Parameter	Min.	Max.	Unit	Test Conditions	Note
C _i	Input Capacitance		10	pF	T _A = 25°C f = 1.0MHz	3
C _o	Output Capacitance		10	pF		

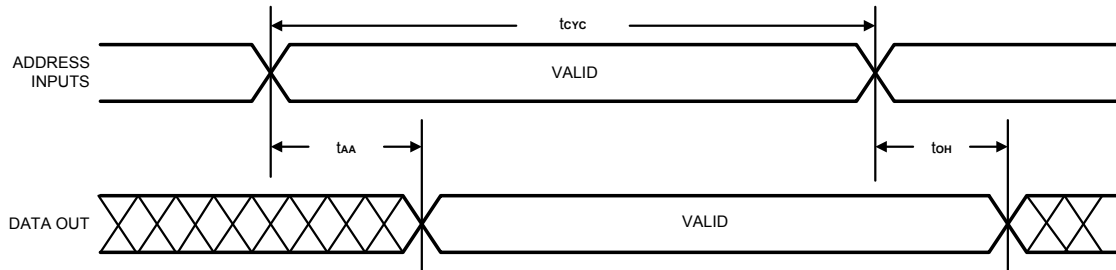
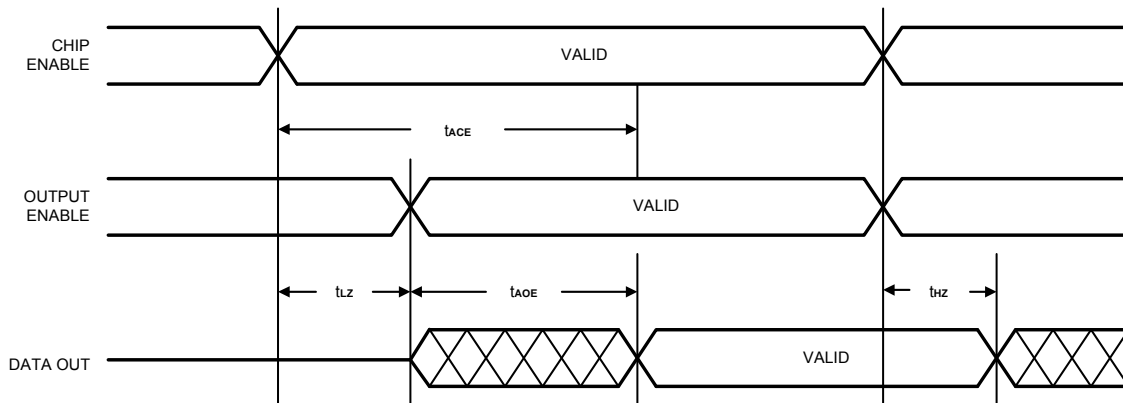
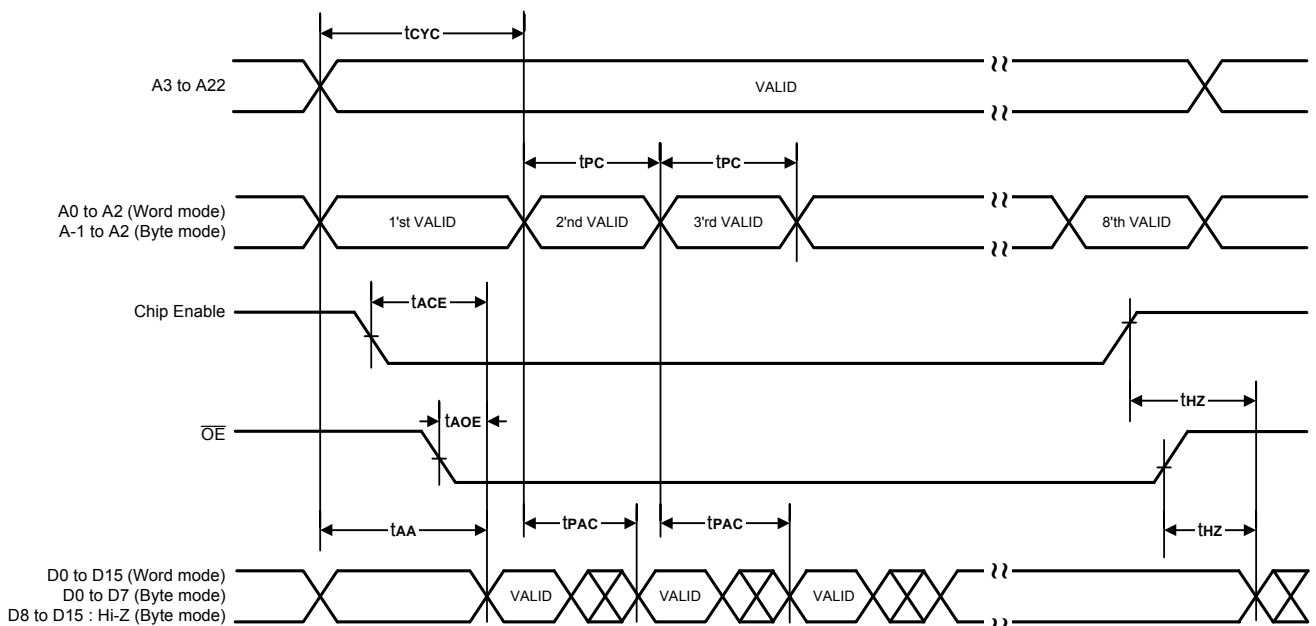
AC Characteristics (T_A = 0°C to +70°C, VCC = 2.7V~3.6V)

Symbol	Parameter	A23L36166/ A23L361662-90		Unit	Note
		Min.	Max.		
t _{cyC}	Cycle Time	90		ns	
t _{AA}	Address Access Time		90	ns	
t _{ACE}	Chip Enable Access Time		90	ns	
t _{PC}	Page Cycle Time	30		ns	
t _{PAC}	Page Access Time		30	ns	
t _{AOE}	Output Enable Access Time		30	ns	
t _{OH}	Output Hold after Address Change	10		ns	
t _{LZ}	Output Low Z Delay	10		ns	4, 6
t _{HZ}	Output High Z Delay*		20	ns	5, 6

* t_{HZ} is specified from either \overline{OE} or \overline{CE} going disabled, whichever occurs first.

Notes:

1. $\overline{OE} / \overline{CE} = V_{IH}$ (Output is unloaded)
2. $V_{IN} = V_{IH}/V_{IL}$, $\overline{OE} / \overline{CE} = V_{IL}$ (Output is unloaded)
3. This parameter is periodically sampled and is not 100% tested. All pins, except pins under test, are tied to AC ground.
4. Output LOW impedance delay (t_{LZ}) is measured from \overline{CE} or \overline{OE} going active.
5. Output HIGH impedance delay (t_{HZ}) is measured from \overline{CE} or \overline{OE} going inactive.
6. This parameter is sampled and not 100% tested.

Timing Waveforms
Propagation Delay from Address (\overline{CE} = Active, \overline{OE} = Active)

Propagation Delay from Chip Enable or Output Enable (Address Valid)

Page Access Mode Read Cycle


AC Test Conditions

Part No.	A23L36166/ A23L361662-90
Applied Voltage	2.7V~3.6V
Input Pulse Levels	0.4V to 2.4V
Input Rise and Fall Time	10 ns
Timing Measurement Reference Level	$V_{IN} = 1.4V, V_{OUT} = 1.4V$
Output Load	1 TTL gate and $C_L = 100pF$

Function Table

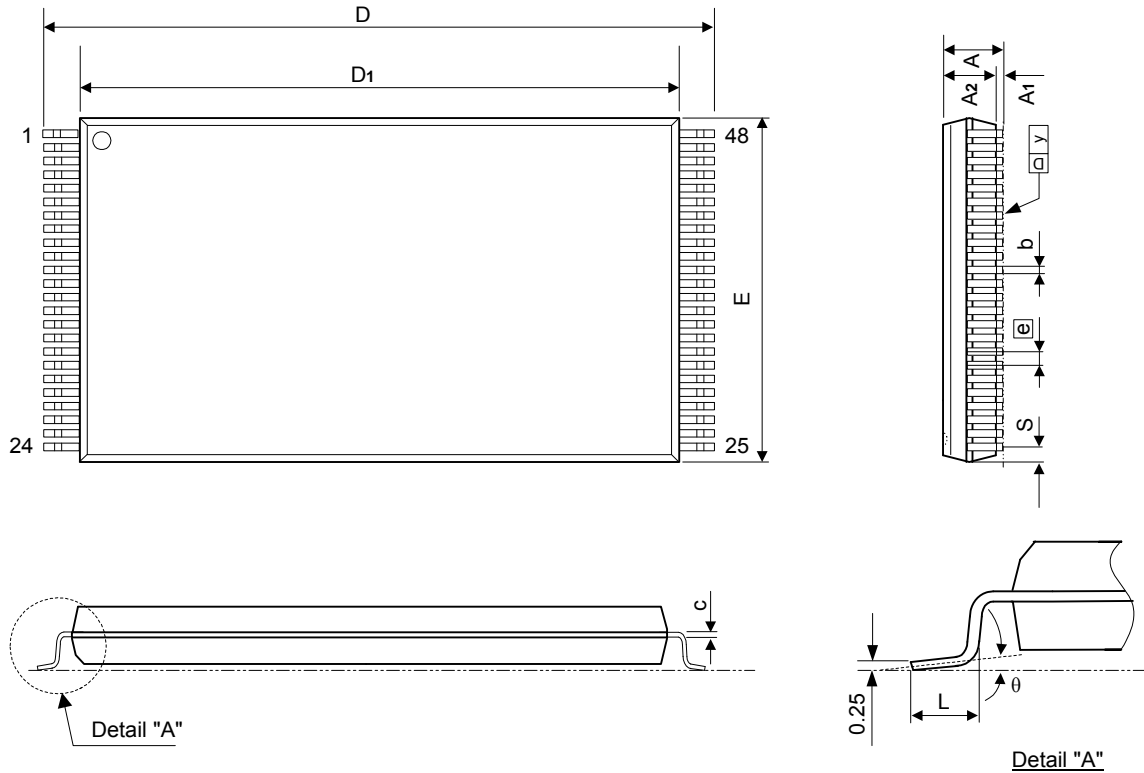
\overline{CE}	$\overline{OE/NC}$	\overline{BYTE}	O15/A-1	O0 - O7	O8 - O15	Mode
L	L	H	Data Pin O15	Data Out	Data out	Word
L	L	L	LSB Address A-1	Data Out	Hi - Z	Byte
H	X	X	X	Hi - Z	Hi - Z	Power-down
L	H	X	X	Hi - Z	Hi - Z	Output Disable

Ordering Information

Part No.	Access Time (ns)	Package
A23L36166V-90F	90	48L Pb-Free TSOP (Mask ROM)
A23L361662V-90F	90	56L Pb-Free TSOP (I)

Package Information
TSOP 48L (Type I) Outline Dimensions

unit: inches/mm



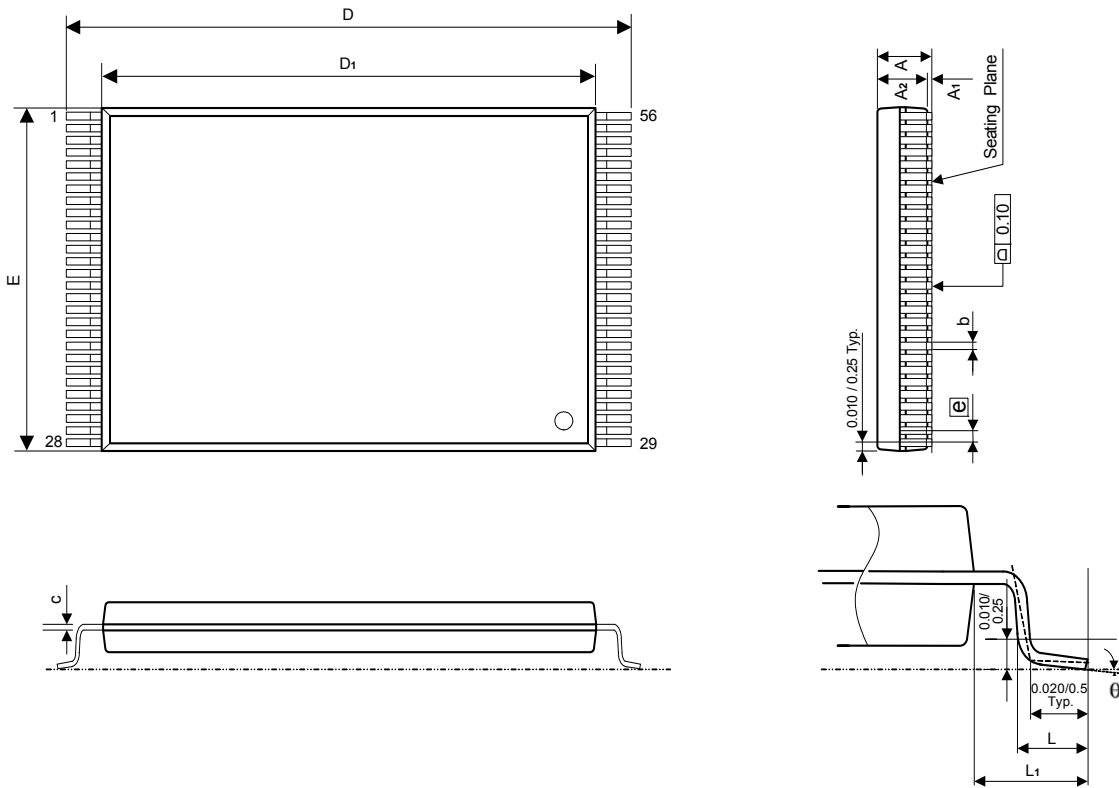
Symbol	Dimensions in inches			Dimensions in mm		
	Min	Nom	Max	Min	Nom	Max
A	-	-	0.047	-	-	1.20
A ₁	0.002	-	0.006	0.05	-	0.15
A ₂	0.037	0.039	0.042	0.94	1.00	1.06
b	0.007	0.009	0.011	0.18	0.22	0.27
c	0.004	-	0.008	0.12	-	0.20
D	0.779	0.787	0.795	19.80	20.00	20.20
D ₁	0.720	0.724	0.728	18.30	18.40	18.50
E	-	0.472	0.476	-	12.00	12.10
\square e	0.020 BASIC			0.50 BASIC		
L	0.016	0.020	0.024	0.40	0.50	0.60
S	0.011 Typ.			0.28 Typ.		
y	-	-	0.004	-	-	0.10
θ	0°	-	8°	0°	-	8°

Notes:

1. The maximum value of dimension D includes end flash.
2. Dimension E does not include resin fins.
3. Dimension S includes end flash.

Package Information
TSOP 56L (Type I) Outline Dimensions

unit: inches/mm



Symbol	Dimensions in inches			Dimensions in mm		
	Min	Nom	Max	Min	Nom	Max
A	-	-	0.047	-	-	1.20
A ₁	0.002	-	0.006	0.05	-	0.15
A ₂	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
c	0.005	0.007	0.009	0.12	0.17	0.22
D	0.780	0.787	0.795	19.80	20.00	20.20
D ₁	0.720	0.724	0.728	18.30	18.40	18.50
E	0.547	0.551	0.555	13.90	14.00	14.10
\bar{e}	0.020 BSC			0.50 BSC		
L	0.018	0.024	0.030	0.45	0.60	0.75
L ₁	0.024	0.031	0.039	0.60	0.80	1.00
θ	0°	-	8°	0°	-	8°