



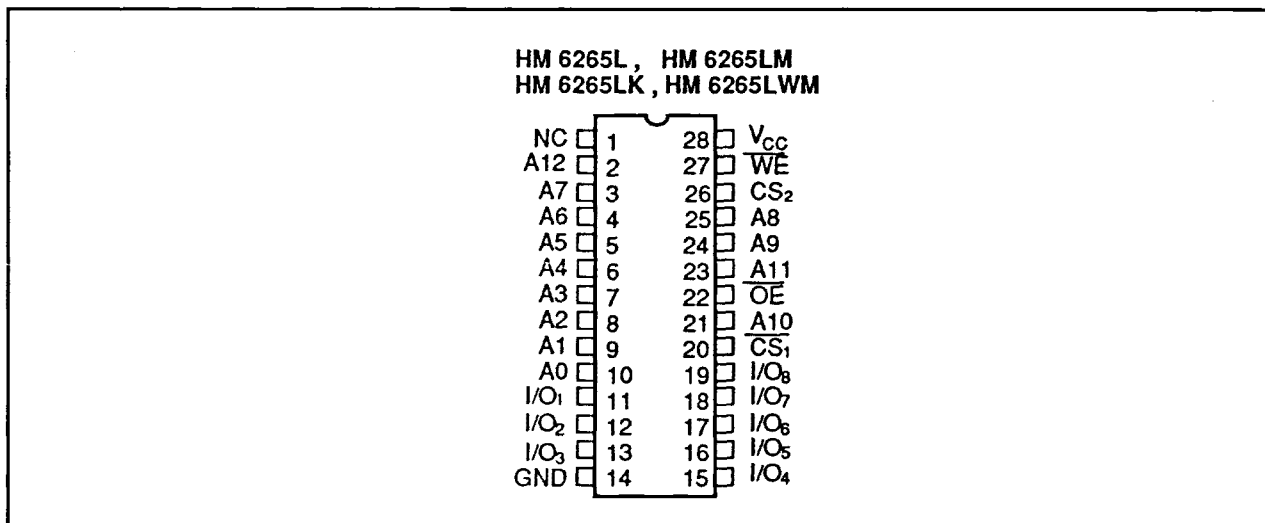
## General Description

The HM 6265L is a 65,536-bit static random access memory organized as 8,192 words by 8 bits and operates from a single 5 volt supply. It is built with high performance twin tub CMOS process. Inputs and three-state outputs are TTL compatible and allow for direct interfacing with common system bus structures.

## Features

- \* High speed - 45/55/70/90 ns(MAX.).
- \* Low Power consumption :  
HM 6265L : 150mW (Typ.)(f=1MHz) operating.  
10μW (Typ.)standby.
- \* Single 5V power supply.
- \* Fully static operation.
- \* All inputs and outputs directly TTL compatible.
- \* Three-state outputs.
- \* Data retention supply voltage : 2.0-5.5V.
- \* Package : HM 6265L -28 pin 600 mil - plastic DIP.  
HM 6265LK - 28 pin 300 mil - plastic Skinny DIP.  
HM 6265LM - 28 pin 300 mil - plastic SOP.  
HM 6265LWM - 28 pin 300 mil - plastic SOP.

## Pin Assignment



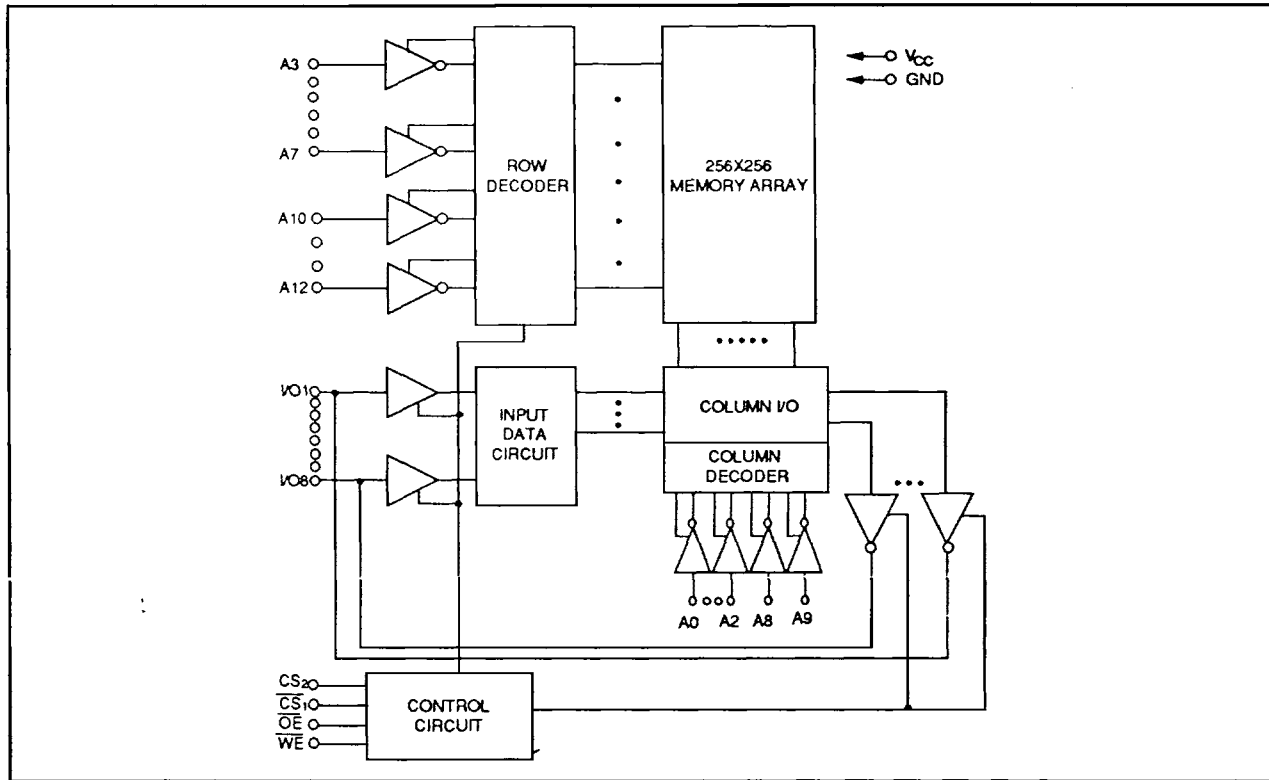
## Pin Description

A <sub>0</sub> - A <sub>12</sub>	ADDRESS	WE	WRITE ENABLE
I/O <sub>1</sub> - I/O <sub>8</sub>	DATA INPUT/OUTPUT	OE	OUTPUT ENABLE
V <sub>CC</sub>	POWER	CS <sub>1</sub>	CHIP SELECT ONE
GND	GROUND	CS <sub>2</sub>	CHIP SELECT TWO
NC	NO CONNECTION		



HM 6265L, HM 6265LK, HM 6265LM, HM 6265LWM  
8K X 8 CMOS STATIC RAM

Block Diagram



Absolute Maximum Ratings

Parameter	Sym.	Rating	Units
Terminal Voltage With Respect to GND	$V_{TERM}$	-0.3 to 7.0	V
Temp under Bias	$T_{BIAS}$	-10 to +85	°C
Storage Temperature	$T_{STG}$	-55 to +125	°C
Power Dissipation	$P_T$	1.0	W

\* Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Operation Range

Range	Ambient Temperature	$V_{CC}$
Commerical	0°C to +70°C	5V±10%

Recommended DC Operating Conditions ( $T_A=0$  to +70°C)

Parameter	Sym.	Min.	Typ.	Max.	Unit
Supply Voltage	$V_{CC}$	4.5	5.0	5.5	V
Supply Voltage	GND	0	0	0	V
Input High Voltage	$V_{IH}$	2.2	3.5	6.0	V
Input Low Voltage	$V_{IL}$	-0.3	0	0.8	V



**D.C. Electrical Characteristics**

( $V_{CC}=5V\pm 10\%$ ,  $GND=0V$ ,  $T_A=0$  to  $+70^\circ C$ )

Parameter	Sym.	6265L-45		6265-55		6265L-70		6265L-90		Unit	Test Condition	
		Min	Typ <sup>(1)</sup> Max	Min	Typ <sup>(1)</sup> Max	Min	Typ <sup>(1)</sup> Max	Min	Typ <sup>(1)</sup> Max			
Input Leakage Current	$I_{LI}$	-	-	1	-	-	1	-	-	1	-	$V_{IN}=GND$ to $V_{CC}$
Output Leakage	$I_{LO}$	-	-	1	-	-	1	-	-	1	-	$\overline{CS}_1=V_{IH}$ , $CS_2=V_{IL}$ or, $OE=V_{IH}$ , $WE=V_{IL}$ $V_{IO}=GND$ to $V_{CC}$
Operating Power Supply Current	$I_{CC}$	-	30	50	-	30	50	-	30	50	-	$\overline{CS}_1=V_{IL}$ , $CS_2=V_{IH}$ , $I_{IO}=0mA$
Dynamic Operating Current	$I_{CC1}$	-	30	50	-	30	50	-	30	50	-	$t_{cycle}=1\mu s$
	$I_{CC2}$	-	55	80	-	50	70	-	45	60	-	$t_{cycle}=T_{AA}$ Min. Duty Cycle =100%, $\overline{CS}_1=V_{IL}$ $CS_2=V_{IH}$
Standby Power Supply Current	$I_{SB}$	-	2	5	-	2	5	-	2	5	-	$\overline{CS}_1=V_{IH}$ , $I_{IO}=0mA$
	$I_{SB1}$	-	2	100	-	2	100	-	2	100	-	$\overline{CS}_1 \geq V_{CC}-0.2V$ , $V_{IN} \geq V_{CC}-0.2V$ or $V_{IN} \leq 0.2V$
	$I_{SB2}$	-	2	100	-	2	100	-	2	100	-	$CS_2 \leq 0.2V$ , $V_{IN} \geq V_{CC}-0.2V$ or $V_{IN} \leq 0.2V$
Output Voltage (1)	$V_{OL}$	-	-	0.4	-	-	0.4	-	-	0.4	-	$I_{OL}=8mA$
	$V_{OH}$	2.4	-	-	2.4	-	-	2.4	-	-	-	$I_{OH}=-4mA$

Note : Typical limits are at  $V_{CC}=5.0V$ ,  $T_A=25^\circ C$  and specified loading.

**Truth Table**

Mode	WE	$\overline{CS}_1$	$CS_2$	OE	I/O Operation	$V_{CC}$ Current
Not Selected (Power Down)	X	H	X	X	High Z	$I_{SB}$ , $I_{SB1}$
	X	X	L	X	High Z	$I_{SB}$ , $I_{SB2}$
Output Disable	H	L	H	H	High Z	$I_{CC}$ , $I_{CC1}$
Read	H	L	H	L	$D_{OUT}$	$I_{CC}$ , $I_{CC1}$
Write	L	L	H	X	$D_{IN}$	$I_{CC}$ , $I_{CC1}$

**Capacitance\***

( $T_A=25^\circ C$ ,  $f=1.0MHz$ )

Parameter	Sym.	Max.	Unit	Conditions
Input Capacitance	$C_{IN}$	8	pF	$V_{IN}=0V$
Input/Output Capacitance	$C_{IO}$	10	pF	$V_{IO}=0V$

\* This parameter is periodically sampled and not 100% tested.



**AC Test Conditions**

Input Pulse Levels	0V to 3.0V
Input Rise and Fall Times	5ns
Input and Output	1.5V
Timing Reference Levels	
Output Load	1 TTL Gate and CL=30pF (see Fig.1 and Fig.2)

\* This parameter is periodically sampled and not 100% tested.

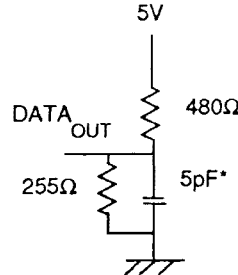
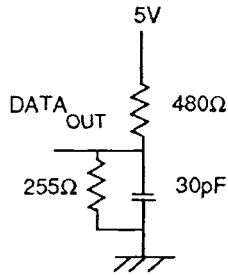


Figure 1. Output Load      Figure 2. Output Load for ( $t_{OLZ}$ ,  $t_{CLZ}$ ,  $t_{OHZ}$ ,  $t_{WHZ}$ ,  $t_{CHZ}$ ,  $t_{OW}$ )  
\*Including scope and jig

**AC Electrical Characteristics**

over the operating range

Parameter	Sym.	6265L-45		6265L-55		6265L-70		6265L-90		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
<b>Read Cycle</b>										
Read Cycle Time	$t_{RC}$	45	-	55	-	70	-	90	-	ns
Address Access Time	$t_{AA}$	-	45	-	55	-	70	-	90	ns
Chip Select Access Time	$\overline{CS}_1$ $t_{ACS1}$	-	45	-	55	-	70	-	90	ns
	$\overline{CS}_2$ $t_{ACS2}$	-	45	-	55	-	70	-	90	ns
Output Enable to Output Valid	$t_{OE}$	-	20	-	25	-	30	-	35	ns
Chip Selection to Output in Low Z	$\overline{CS}_1$ $t_{CLZ1}$	5	-	5	-	5	-	5	-	ns
	$\overline{CS}_2$ $t_{CLZ2}$	5	-	5	-	5	-	5	-	ns
Output Enable to Output in Low Z	$t_{OLZ}$	5	-	5	-	5	-	5	-	ns
Chip Deselection to Output in High Z	$\overline{CS}_1$ $t_{CHZ1}$	0	20	0	25	0	30	0	35	ns
	$\overline{CS}_2$ $t_{CHZ2}$	0	20	0	25	0	30	0	35	ns
Output Disable to Output in High Z	$t_{OHZ}$	0	20	0	25	0	30	0	35	ns
Output Hold from Address Change	$t_{OH}$	10	-	10	-	10	-	10	-	ns
<b>Write Cycle</b>										
Write Cycle Time	$t_{WC}$	45	-	55	-	70	-	90	-	ns
Chip Selection to End of Write	$t_{CW1,2}$	40	-	50	-	60	-	80	-	ns
Address Set-up Time	$t_{AS}$	0	-	0	-	0	-	0	-	ns
Address Valid to End of Write	$t_{AW}$	40	-	50	-	60	-	80	-	ns
Write Pulse Width	$t_{WP}$	35	-	40	-	45	-	50	-	ns
Write Recovery Time	$\overline{CS}_1, \overline{WE}$ $t_{WR1}$	0	-	0	-	0	-	0	-	ns
	$\overline{CS}_2$ $t_{WR2}$	0	-	0	-	0	-	0	-	ns
Write to Output in High Z	$t_{WHZ}$	0	20	0	25	0	30	0	35	ns
Data to Write Time Overlap	$t_{DW}$	20	-	25	-	30	-	35	-	ns
Data Hold from Write Time	$t_{DH}$	0	-	0	-	0	-	0	-	ns
OE to Output in High Z	$t_{OHZ}$	0	20	0	25	0	30	0	35	ns
Output Active from End of Write	$t_{OW}$	5	-	5	-	5	-	5	-	ns

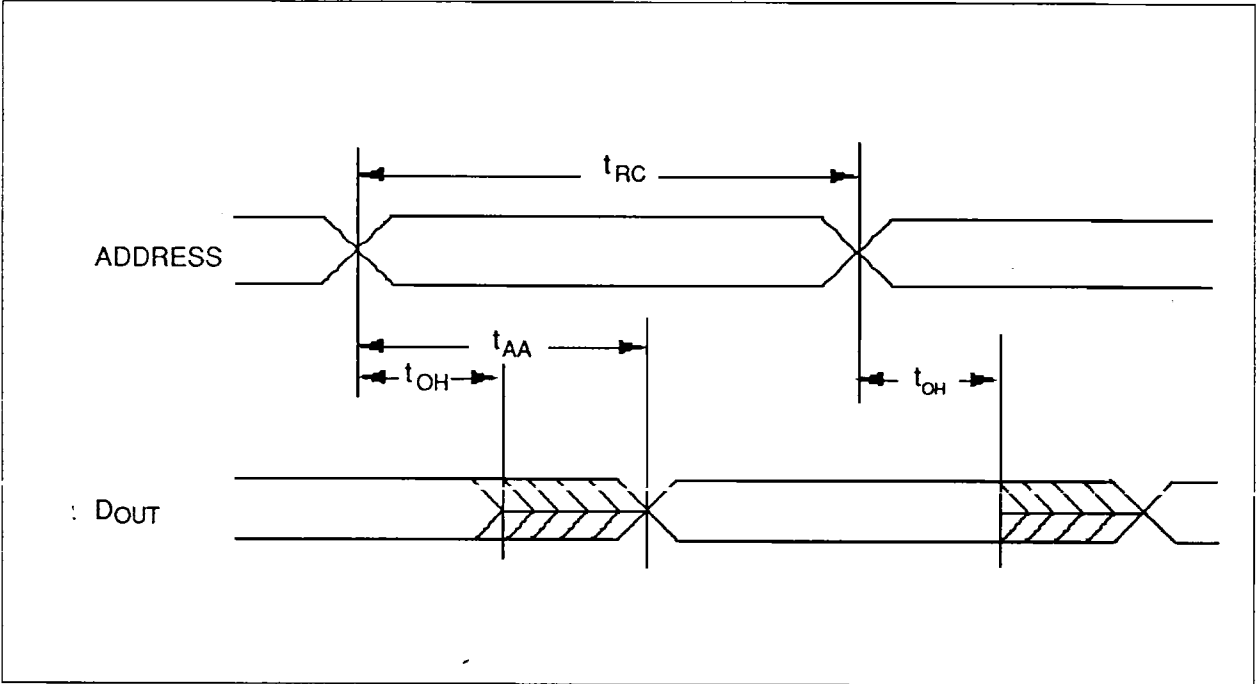
Note s:  $t_{CHZ1,2}$ ,  $t_{OHZ}$  and  $t_{WHZ}$  are defined as the time at which the outputs achieve the open circuit condition and are not referred to output voltage levels.



### Timing Waveforms

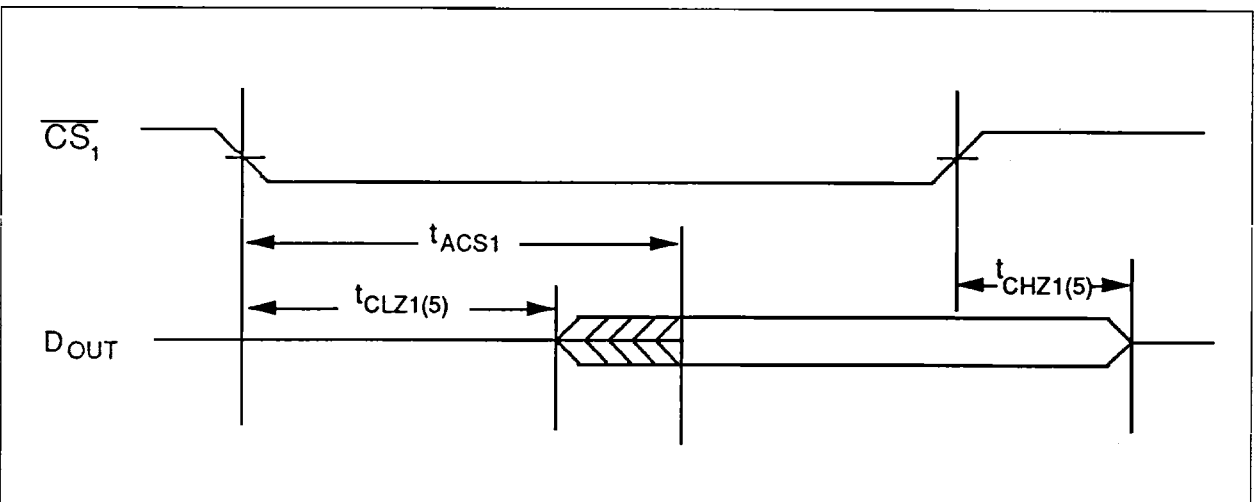
#### Read Cycle 1

Note (1,2,4)



#### Read Cycle 2

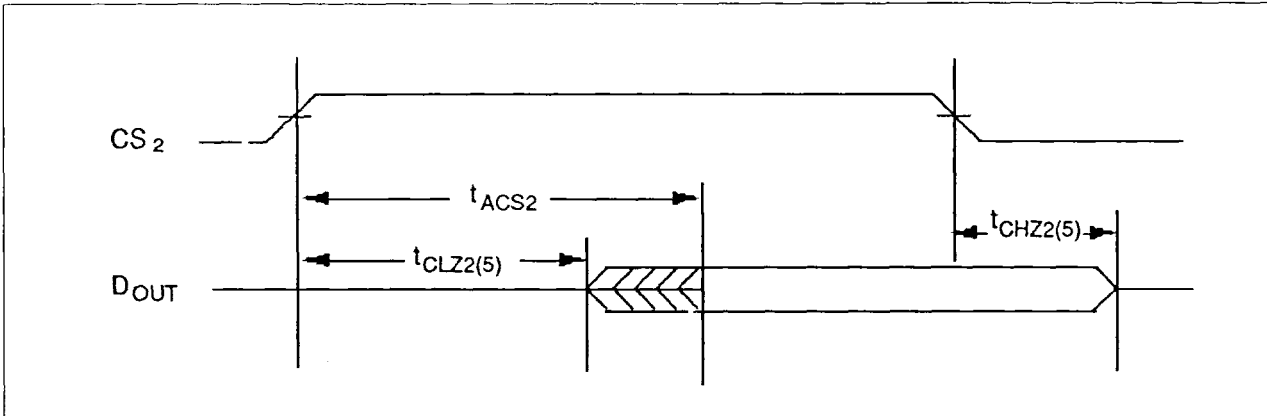
Note (1,3,4,6)





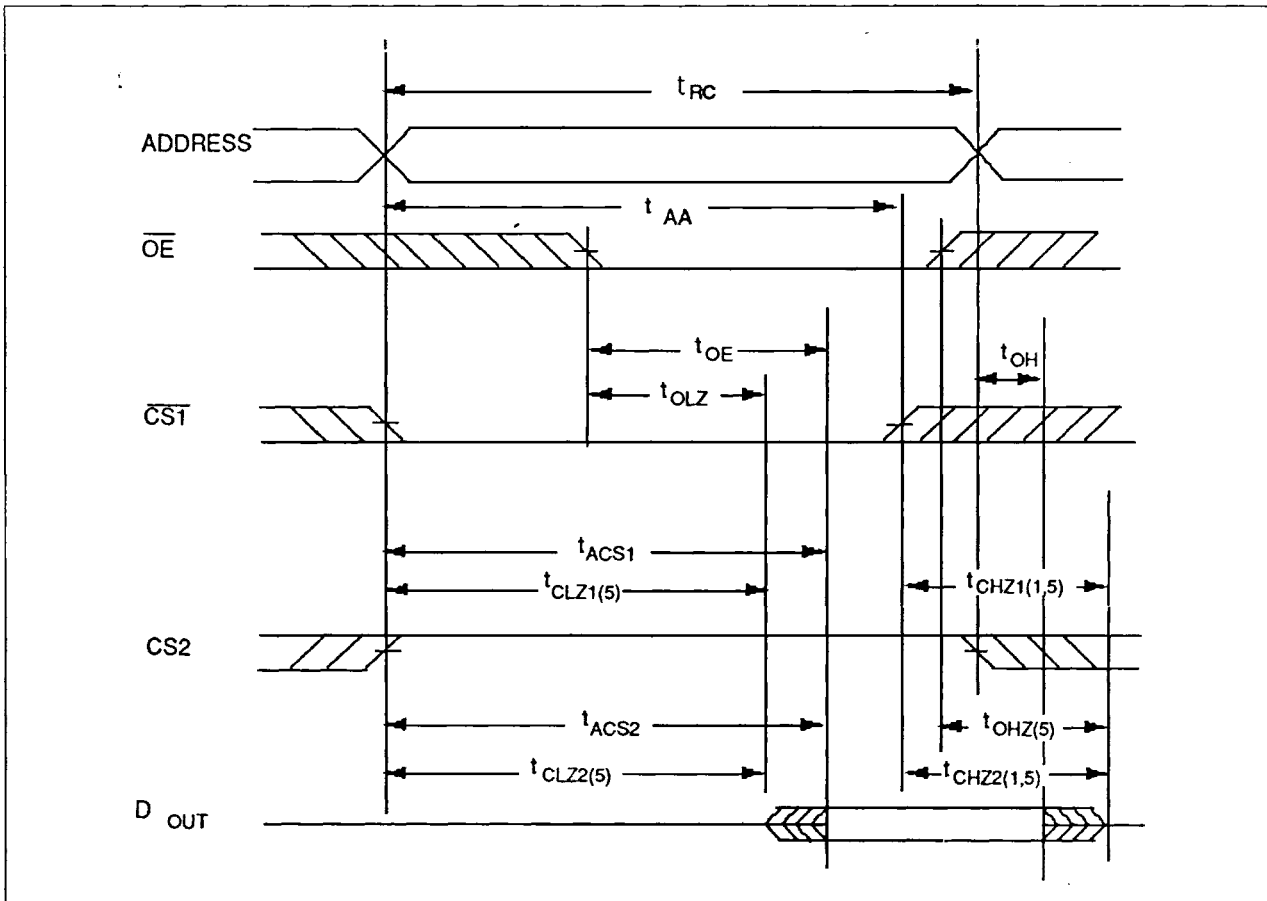
**Read Cycle 3**

Note (1,4,7,8)



**Read Cycle 4**

Note (1)



Notes :1.  $\overline{WE}$  is High for Read Cycle.

2. Device is continuously selected,  $\overline{CS}_1 = V_{IL}$  and  $\overline{CS}_2 = V_{IH}$ .

3. Address valid prior to or coincident with  $\overline{CS}_1$  transition low.

4.  $\overline{OE} = V_{IL}$ .

5. Transition is measured  $\pm 500mV$  from steady state. This parameter is sampled and not 100% tested.

6.  $\overline{CS}_2$  is high.

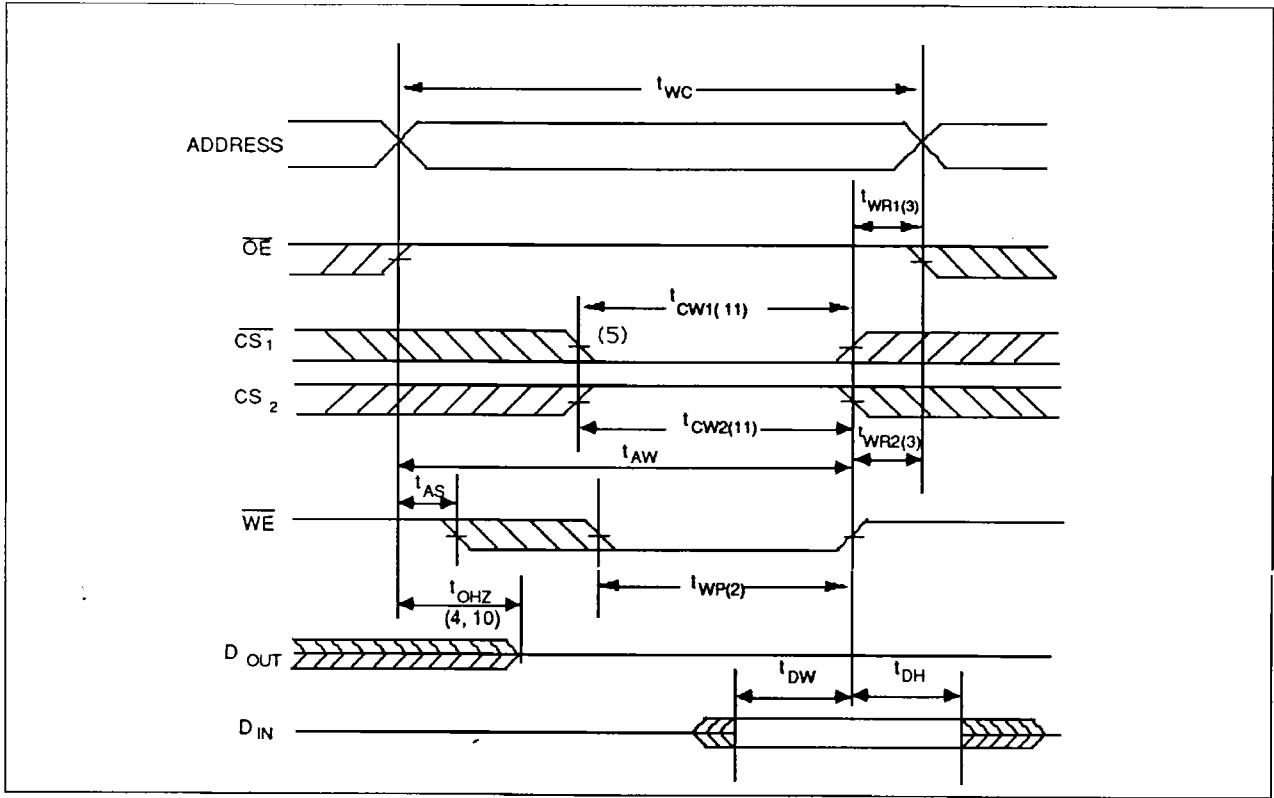
7.  $\overline{CS}_1$  is low.

8. Address valid prior to or coincident with  $\overline{CS}_2$  transition high.



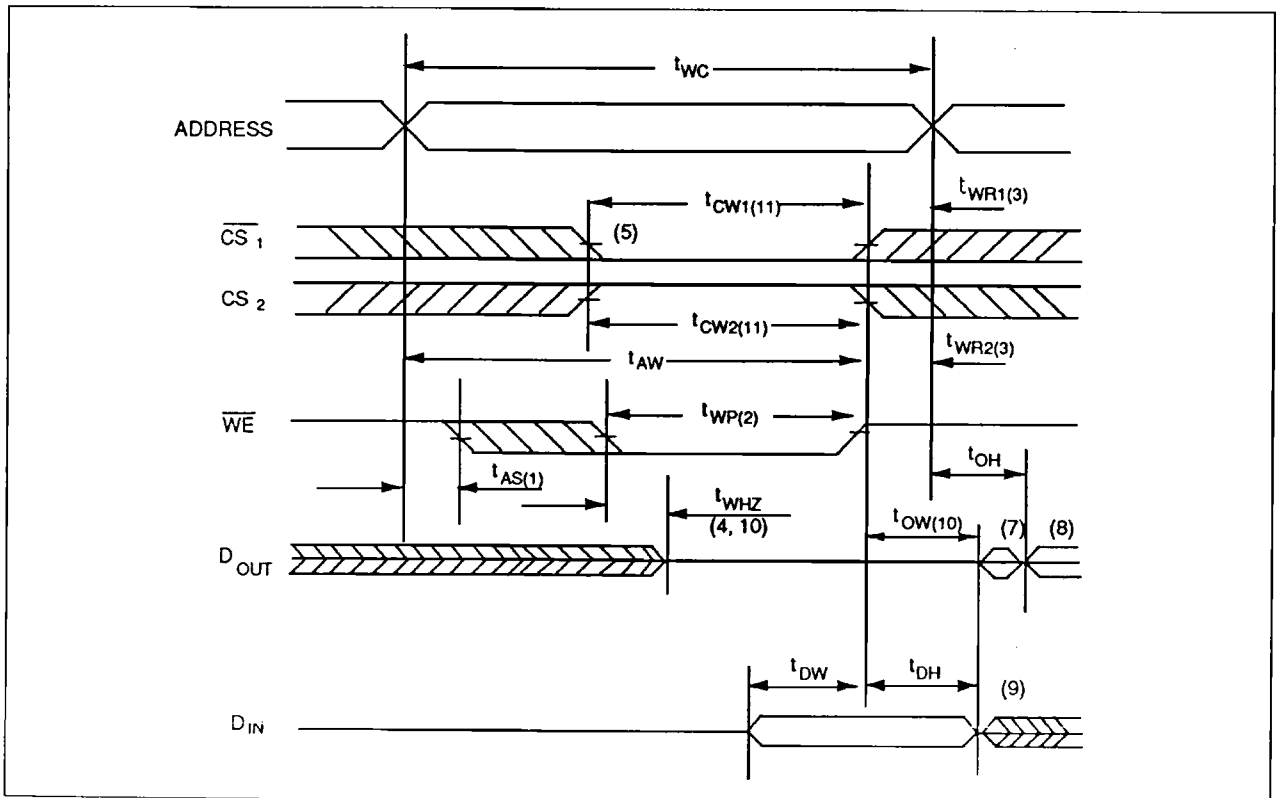
### Timing Waveforms of Write Cycle 1

Note (1).



### Write Cycle 2

Note (6).



- Notes :
1.  $t_{AS}$  is measured from the address valid to the beginning of write.
  2. A write occurs during the overlap of a low  $\overline{CS}_1$ , a high  $CS_2$  and low  $\overline{WE}$ .
  3.  $t_{WR}$  is measured from the earlier of  $\overline{CS}_1$  or  $\overline{WE}$  going high or  $CS_2$  to the end of write cycle.
  4. During this period, I/O pins are in the output state so that the data input signals to the outputs must not be applied.
  5. If the  $\overline{CS}_1$  low transition or the  $CS_2$  transition occurs simultaneously with the  $\overline{WE}$  low transitions or after the  $\overline{WE}$  transition, outputs remain in a high impedance state.
  6.  $\overline{OE}$  is continuously low ( $\overline{OE}=V_{IL}$ ).
  7.  $D_{OUT}$  is the same phase of write data of this write cycle.
  8.  $D_{OUT}$  is the read data of next address.
  9. If  $\overline{CS}_1$  is low and  $CS_2$  is high during this period, I/O pins are in the output state. Then the data input signals to the outputs must not be applied to I/O pins.
  10. Transition is measured  $\pm 500mV$  from steady state. This parameter is sampled and 100% tested.
  11.  $t_{CW}$  is measured from the later of  $\overline{CS}_1$  going low or  $CS_2$  going high to the end of write.

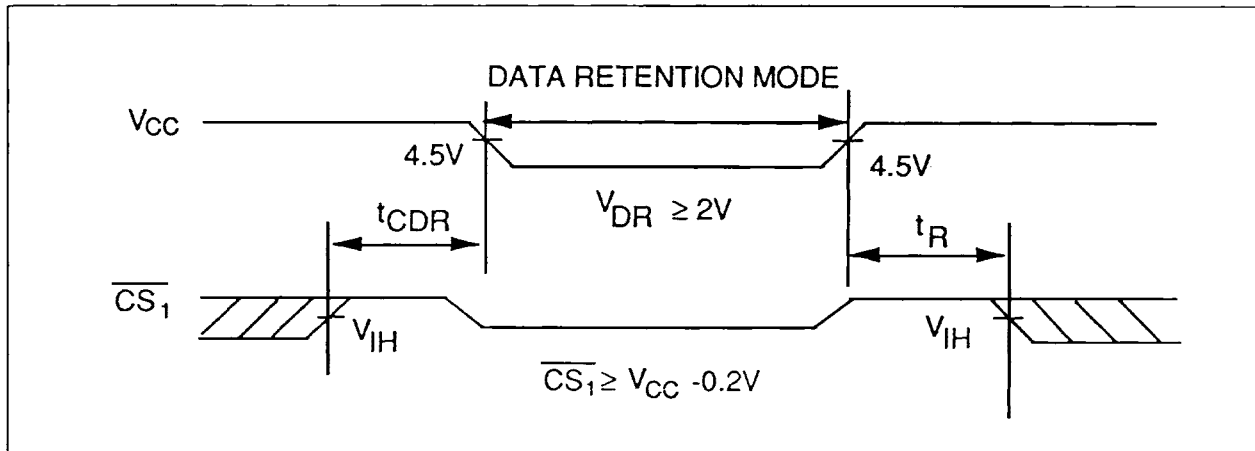
### Data Retention Characteristics

( $T_A=0$  to  $+70^\circ C$  ; L version only)

Parameter	Sym.	Min.	Typ <sup>(1)</sup>	Max.	Unit	Test Conditions
$V_{CC}$ for Data Retention	$V_{DR1}$	2.0	-	5.5	V	$\overline{CS}_1 \geq V_{CC}-0.2V, V_{IN} \geq V_{CC}-0.2V, \text{ or } V_{IN} \leq 0.2V$
	$V_{DR2}$	2.0	-	5.5	V	$CS_2 \leq 0.2V, V_{IN} \geq V_{CC}-0.2V, \text{ or } V_{IN} \leq 0.2V$
Data retention Current	$I_{CCDR1}$	-	2	50	$\mu A$	$\overline{CS}_1 \geq V_{CC}-0.2V, V_{IN} \geq V_{CC}-0.2V, \text{ or } V_{IN} \leq 0.2V$
	$I_{CCDR2}$	-	2	50	$\mu A$	$CS_2 \leq 0.2V, V_{IN} \geq V_{CC}-0.2V, \text{ or } V_{IN} \leq 0.2V$
Chip Deselect to Data Retention Time $t_{CDR}$		0	-	-	ns	See Retention
Operation Recovery Time	$t_R$	$t_{RC(2)}$	-	-	ns	Waveform

1.  $V_{CC}=2V, T_A=+25^\circ C$ .
2.  $t_{RC}$ =Read Cycle Time.

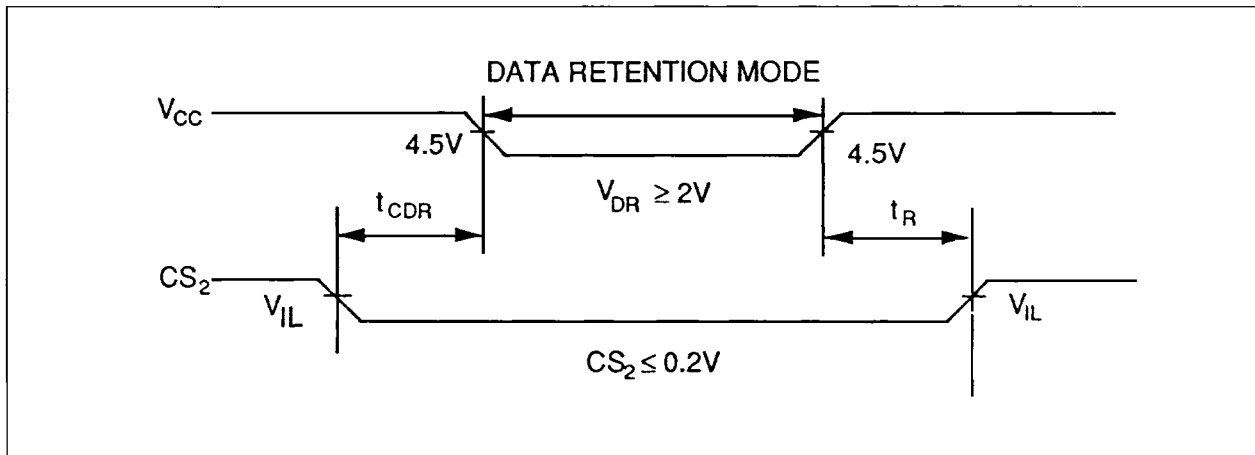
### Low $V_{CC}$ Data Retention Waveform (1) ( $\overline{CS}_1$ Controlled)







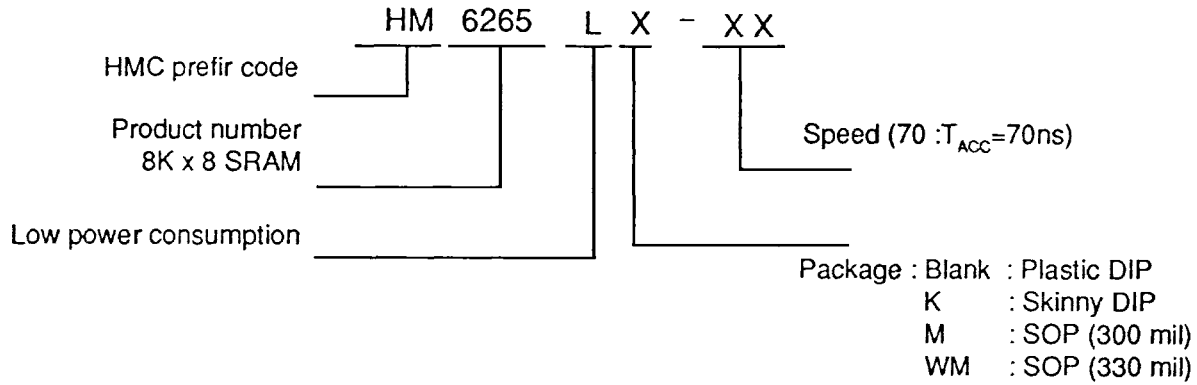
Low  $V_{CC}$  Data Retention Waveform (2) ( $CS_2$  Controlled)





HM 6265L, HM 6265LK, HM 6265LM, HM 6265LWM  
8K X 8 CMOS STATIC RAM

Ordering Information

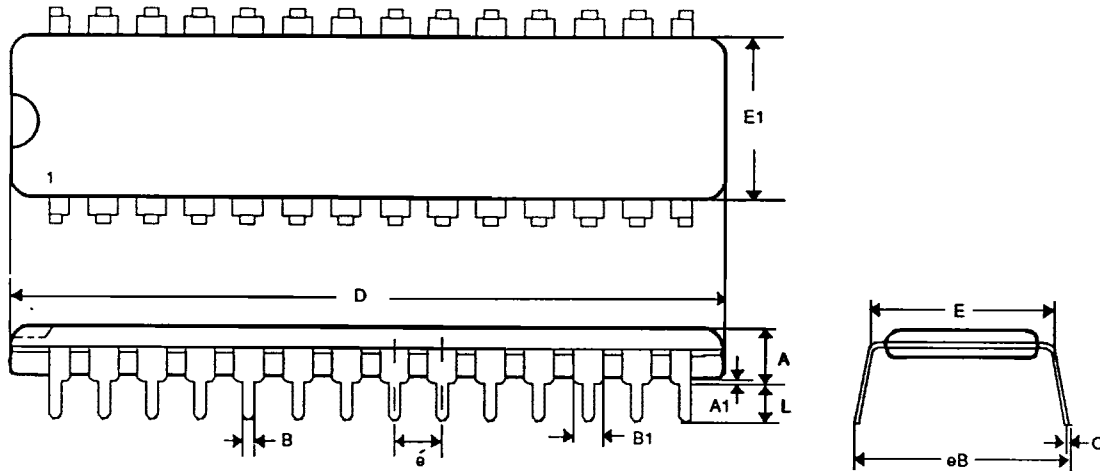


Order Number	Access Time (ns)	Operation Current (mA)	Standby Current (μA)	Package Type
HM 6265L-45	45	80	100	28L DIP
HM 6265L-55	55	70	100	
HM 6265L-70	70	60	100	
HM 6265L-90	90	60	100	
HM 6265LK-45	45	80	100	28L Skinny DIP
HM 6265LK-55	55	70	100	
HM 6265LK-70	70	60	100	
HM 6265LK-90	90	60	100	
HM 6265LM-45	45	80	100	28LSOP (300 mil)
HM 6265LM-55	55	70	100	
HM 6265LM-70	70	60	100	
HM 6265LM-90	90	60	100	
HM 6265LWM-45	45	80	100	28LSOP (330 mil)
HM 6265LWM-55	55	70	100	
HM 6265LWM-70	70	60	100	
HM 6265LWM-90	70	60	100	



HM 6265L, HM 6265LK, HM 6265LM, HM 6265LWM  
8K X 8 CMOS STATIC RAM

28 Lead Plastic Skinny DIP



Notes :

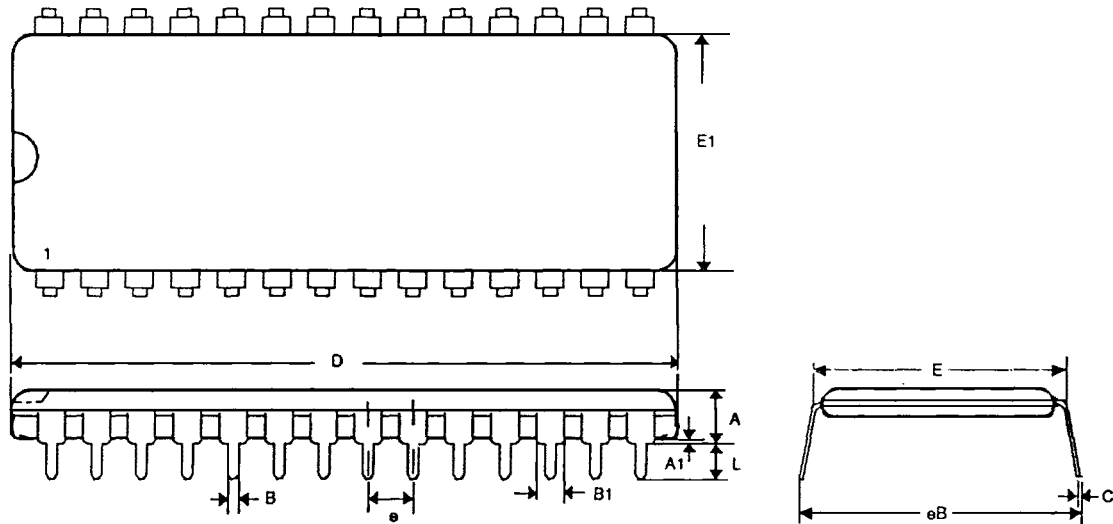
1. DIM D & E1 do not include mold flash or protrusions.
2. DIM eB measured at the lead tips with the leads unconstrained.

DIM	MILIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	----	5.334	----	.210
A1	0.254	----	.010	----
B	0.356	0.558	.014	.022
B1	1.150	1.778	.045	.070
C	0.204	0.381	.008	.015
D	35.54	35.81	1.360	1.410
E	7.62	8.255	.300	.325
E1	6.6	7.366	.260	.290
e	2.286	2.794	.090	.110
eB	----	10.92	----	.430
L	2.921	4.064	.115	.160



Package Information

28 Lead Plastic Dual - Inline Package



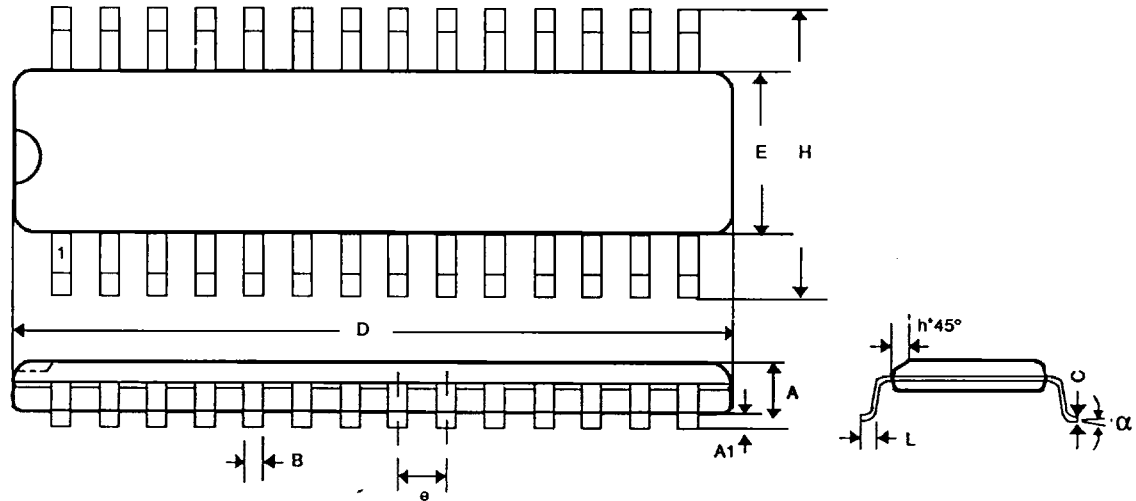
Notes :

1. DIM D & E1 do not include mold flash or protrusions.
2. DIM eB measured at the lead tip with the leads unconstrained.

DIM	MILIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	----	6.350	----	.250
A1	0.381	----	.015	----
B	0.356	0.558	.014	.022
B1	1.016	1.778	.040	.070
C	0.204	0.381	.008	.015
D	35.56	37.85	1.400	.490
E	15.24	15.88	.600	.625
E1	13.21	14.73	.520	.580
e	2.286	2.794	.090	.110
eB	----	17.78	----	.700
L	2.921	5.080	.115	.200



28 Lead Plastic Small Outline Package



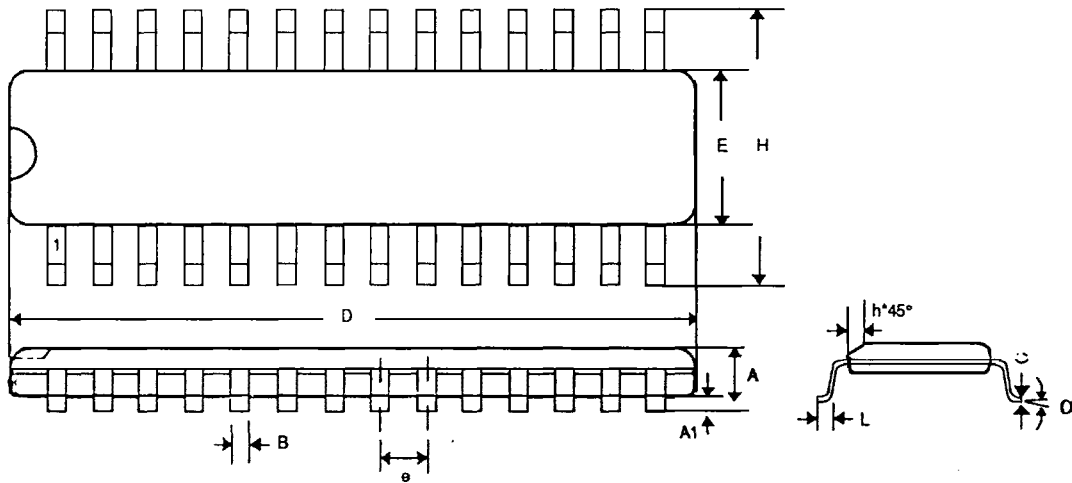
Notes :

1. DIM D & E do not include mold flash or protrusions protrusions shall not exceed 0.15mm/.006in.
2. Controlling dimension : millimeter.

DIM	MILIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.35	2.65	.0926	.1043
A1	0.10	0.30	.0040	.0118
B	0.35	0.49	.0138	.0192
C	0.23	0.32	.0091	.0125
D	17.70	18.10	.6969	.7125
E	7.40	7.60	.2914	.2992
e	1.27 BSC		.050 BSC	
H	10.00	10.65	.394	.419
h	.25	0.75	.010	.029
L	0.40	1.27	.016	.050
α	0°	8°	0°	8°



28 Lead Plastic SOP Width Body 330 mil



Notes :

1. DIM D & E do not include mold flash or protrusions protrusions shall not exceed 0.15mm/.006in.
2. Controlling dimension : millimeter/inch.

DIM	MILIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.5	2.9	.0984	.114
A1	0.1	0.3	.004	.0118
B	0.35	0.49	.0138	.0192
C	0.15	0.28	.006	.011
D	17.8	18.3	.700	.712
E	8.3	8.6	.327	.338
e	1.27 BSC		.050 BSC	
H	11.5	12.1	.453	.476
h	.25	0.75	.010	.029
L	0.40	1.27	.016	.050
α	0°	8°	0°	8°