FEATURES

- Fast access time : 8/10/12/15 ns (max.)
- Low operating power consumption : 80 mA (typical)
- Single 5V power supply
- All inputs and outputs TTL compatible
- Fully static operation
- Three state outputs
- Package : 28-pin 300 mil SOJ

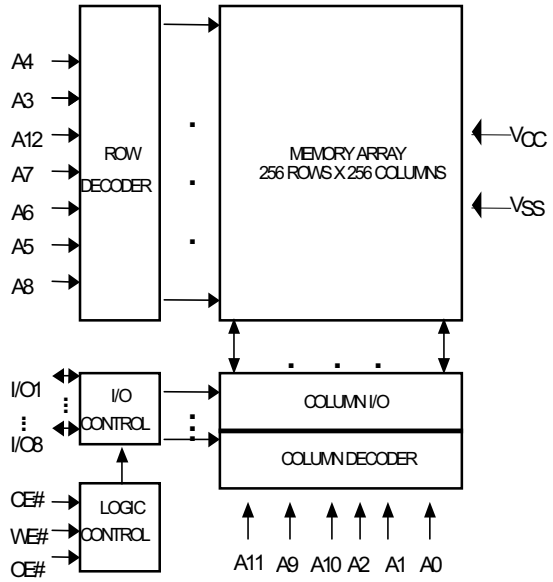
GENERAL DESCRIPTION

The UT6164B is a 65,536-bit high-speed CMOS static random access memory organized as 32,768 words by 8 bits. It is fabricated using high performance, high reliability CMOS technology.

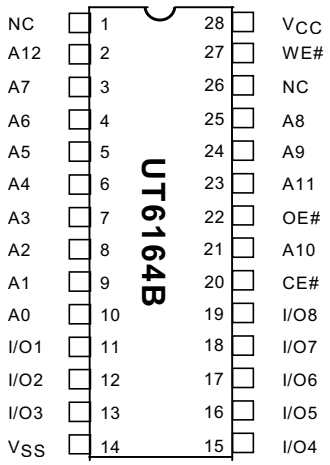
The UT6164B is designed for high-speed system applications. It is particularly suited for use in high-density high-speed system applications.

The UT6164B operates from a single 5V power supply and all inputs and outputs are fully TTL compatible.

FUNCTIONAL BLOCK DIAGRAM



PIN CONFIGURATION



PDIP/SOP/SOJ

PIN DESCRIPTION

SYMBOL	DESCRIPTION
A0 - A12	Address Inputs
I/O1 - I/O8	Data Inputs/Outputs
CE#	Chip Enable Inputs
WE#	Write Enable Inputs
OE#	Output Enable Inputs
V_{CC}	Power Supply
V_{SS}	Ground

ABSOLUTE MAXIMUM RATINGS*

PARAMETER	SYMBOL	RATING	UNIT
Terminal Voltage with Respect to Vss	V_{TERM}	-0.5 to +6.5	V
Operating Temperature	T_A	0 to +70	℃
Storage Temperature	T_{STG}	-65 to +150	℃
Power Dissipation	P_D	1	W
DC Output Current	I_{OUT}	50	mA
Soldering Temperature (under 10 sec)	Tsolder	260	℃

*Stress 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 or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to the absolute maximum rating conditions for extended period may affect device reliability.

TRUTH TABLE

MODE	CE#	OE#	WE#	I/O OPERATION	SUPPLY CURRENT
Standby	H	X	X	High - Z	I_{SB},I_{SB1}
Output Disable	L	H	H	High - Z	I_{CC}
Read	L	L	H	D_{OUT}	I_{CC}
Write	L	X	L	D_{IN}	I_{CC}

Note: H = V_{IH}, L=V_{IL}, X = Don't care.

DC ELECTRICAL CHARACTERISTICS (V_{CC} = 5V± 10%, T_A = 0℃ to 70℃)

PARAMETER	SYMBOL	TEST CONDITION		MIN.	MAX.	UNIT
Input High Voltage	V_{IH}			2.2	V_{CC}+0.5	V
Input Low Voltage	V_{IL}			- 0.5	0.8	V
Input Leakage Current	I_{LI}	$V_{SS} \leqq V_{IN} \leqq V_{CC}$		- 1	1	μA
Output Leakage Current	I_{LO}	$V_{SS} \leqq V_{I/O} \leqq V_{CC}$ CE# = V_{IH} or OE# = V_{IH} or WE# = V_{IL}		- 1	1	μA
Output High Voltage	V_{OH}	I_{OH} = - 4mA		2.4	-	V
Output Low Voltage	V_{OL}	I_{OL} = 8mA		-	0.4	V
Operating Power Supply Current	I_{CC}	CE# = V_{IL} , $I_{I/O}$ = 0mA Cycle=Min.	- 8	-	190	mA
			- 10	-	180	mA
			- 12	-	160	mA
			- 15	-	140	mA
Standby Power Supply Current	I_{SB}	CE# = V_{IH}		-	30	mA
	I_{SB1}	CE#≧V_{CC}-0.2V		-	5	mA

CAPACITANCE (T_A=25℃, f=1.0MHz)

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Input Capacitance	C_{IN}	-	8	pF
Input/Output Capacitance	$C_{I/O}$	-	10	pF

Note : These parameters are guaranteed by device characterization, but not production tested.

AC TEST CONDITIONS

Input Pulse Levels	0V to 3.0V
Input Rise and Fall Times	3ns
Input and Output Timing Reference Levels	1.5V
Output Load	C_L=30pF, I_{OH}/I_{OL}=-4mA/8mA

AC ELECTRICAL CHARACTERISTICS (V_{CC} = 5V± 10% , T_A = 0℃ to 70℃)

(1) READ CYCLE

PARAMETER	SYMBOL	UT6164B-8		UT6164B-10		UT6164B-12		UT6164B-15		UNIT
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
Read Cycle Time	t_{RC}	8	-	10	-	12	-	15	-	ns
Address Access Time	t_{AA}	-	8	-	10	-	12	-	15	ns
Chip Enable Access Time	t_{ACE}	-	8	-	10	-	12	-	15	ns
Output Enable Access Time	t_{OE}	-	4	-	5	-	6	-	7	ns
Chip Enable to Output in Low Z	t_{CLZ*}	2	-	2	-	3	-	4	-	ns
Output Enable to Output in Low Z	t_{OLZ*}	0	-	0	-	0	-	0	-	ns
Chip Disable to Output in High Z	t_{CHZ*}	-	4	-	5	-	6	-	7	ns
Output Disable to Output in High Z	t_{OHZ*}	-	4	-	5	-	6	-	7	ns
Output Hold from Address Change	t_{OH}	3	-	3	-	3	-	3	-	ns

(2) WRITE CYCLE

PARAMETER	SYMBOL	UT6164B-8		UT6164B-10		UT6164B-12		UT6164B-15		UNIT
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
Write Cycle Time	t_{WC}	8	-	10	-	12	-	15	-	ns
Address Valid to End of Write	t_{AW}	6.5	-	8	-	10	-	12	-	ns
Chip Enable to End of Write	t_{CW}	6.5	-	8	-	10	-	12	-	ns
Address Set-up Time	t_{AS}	0	-	0	-	0	-	0	-	ns
Write Pulse Width	t_{WP}	6.5	-	8	-	9	-	10	-	ns
Write Recovery Time	t_{WR}	0	-	0	-	0	-	0	-	ns
Data to Write Time Overlap	t_{DW}	5	-	6	-	7	-	8	-	ns
Data Hold from End of Write Time	t_{DH}	0	-	0	-	0	-	0	-	ns
Output Active from End of Write	t_{OW*}	1.5	-	2	-	3	-	4	-	ns
Write to Output in High Z	t_{WHZ*}	5		-	6	-	7	-	8	ns

*These parameters are guaranteed by device characterization, but not production tested.

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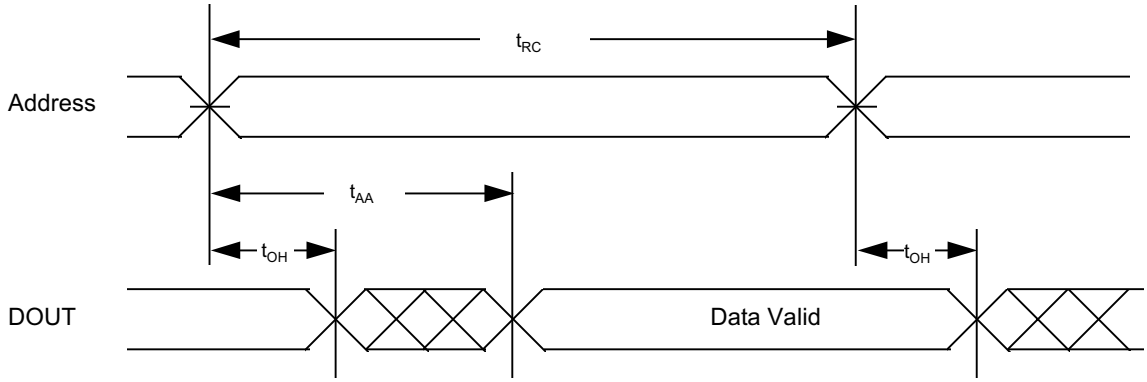
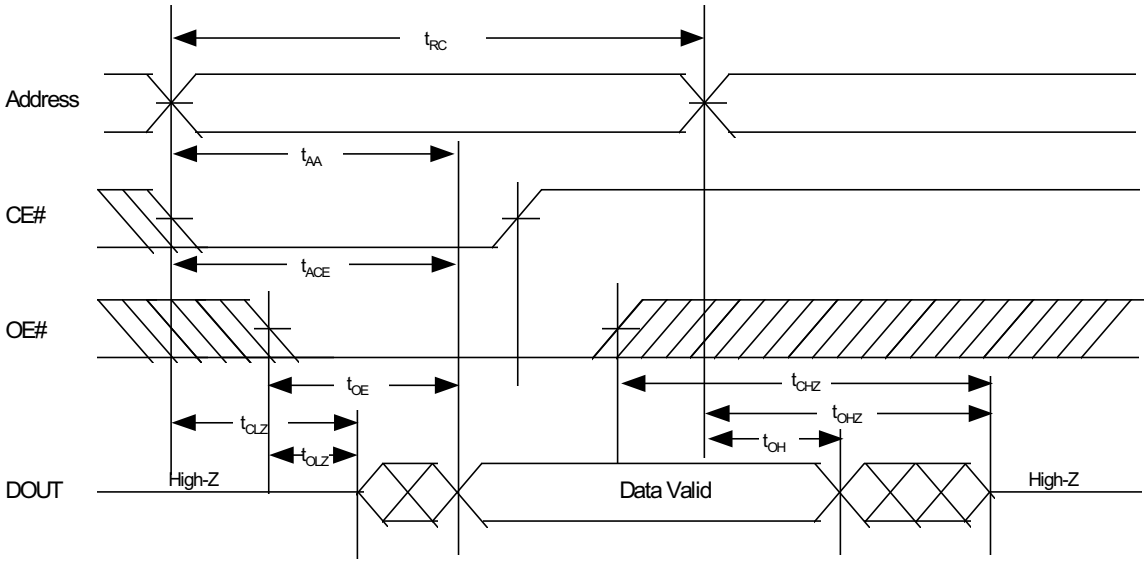
TEL: 886-3-5777882 FAX: 886-3-5777919

TIMING WAVEFORMS

READ CYCLE 1 (Address Controlled) (1,2,4)

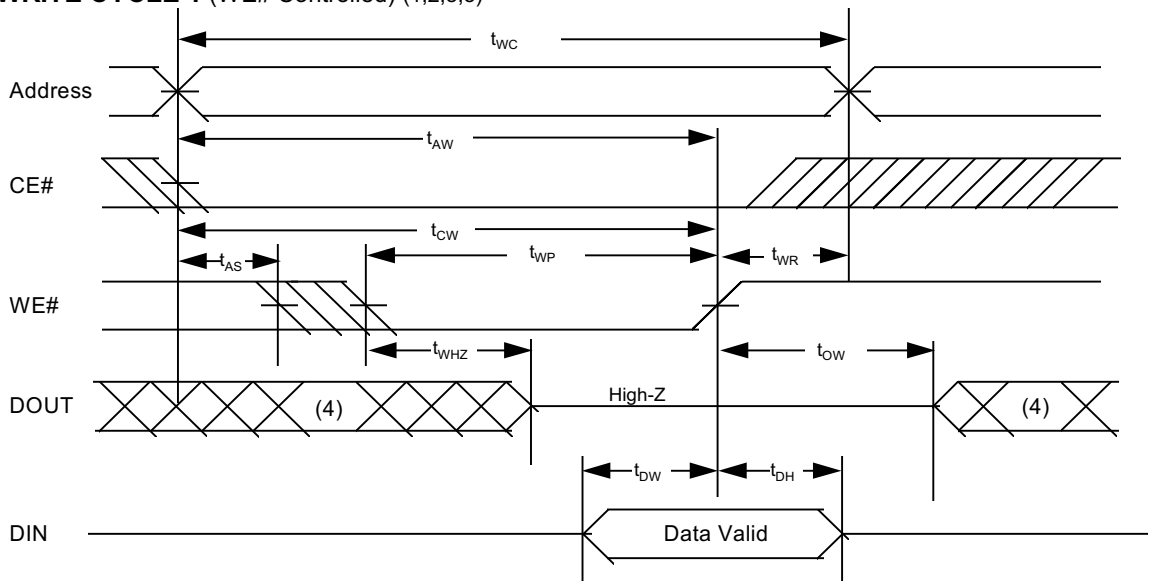


READ CYCLE 2 (CE# and OE# Controlled) (1,3,5,6)

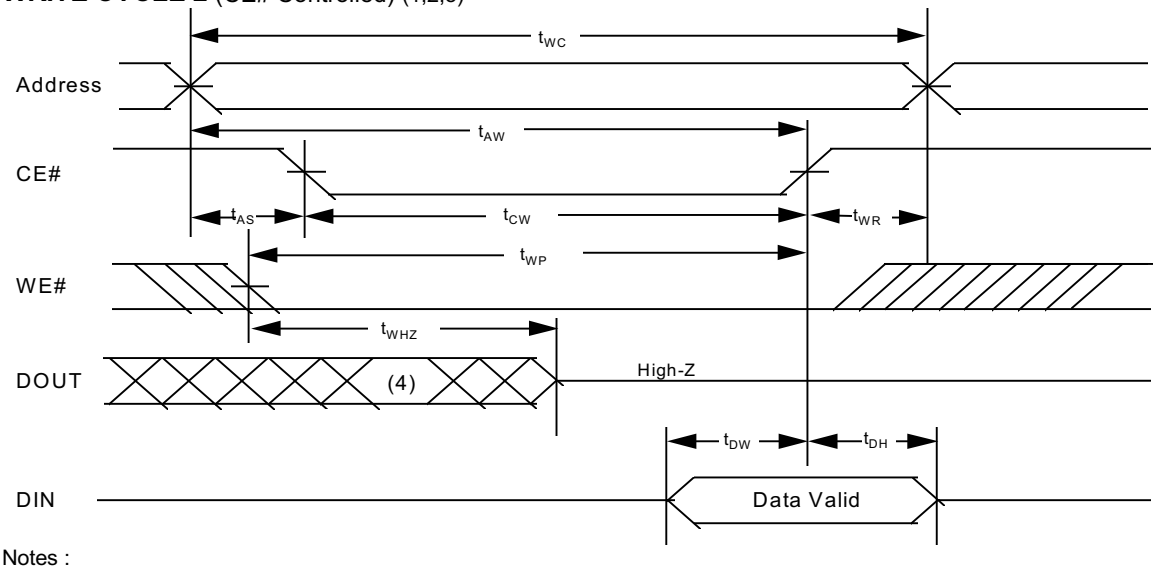


Notes :
1. WE# is HIGH for read cycle.
2. Device is continuously selected CE#=V_{IL}.
3. Address must be valid prior to or coincident with CE# transition; otherwise t_{AA} is the limiting parameter.
4. OE# is LOW.
5. t_{CLZ}, t_{OLZ}, t_{CHZ} and t_{OHZ} are specified with C_L = 5pF. Transition is measured ± 500mV from steady state.
6. At any given temperature and voltage condition, t_{CHZ} is less than t_{CLZ}, t_{OHZ} is less than t_{OLZ}.

WRITE CYCLE 1 (WE# Controlled) (1,2,3,5)



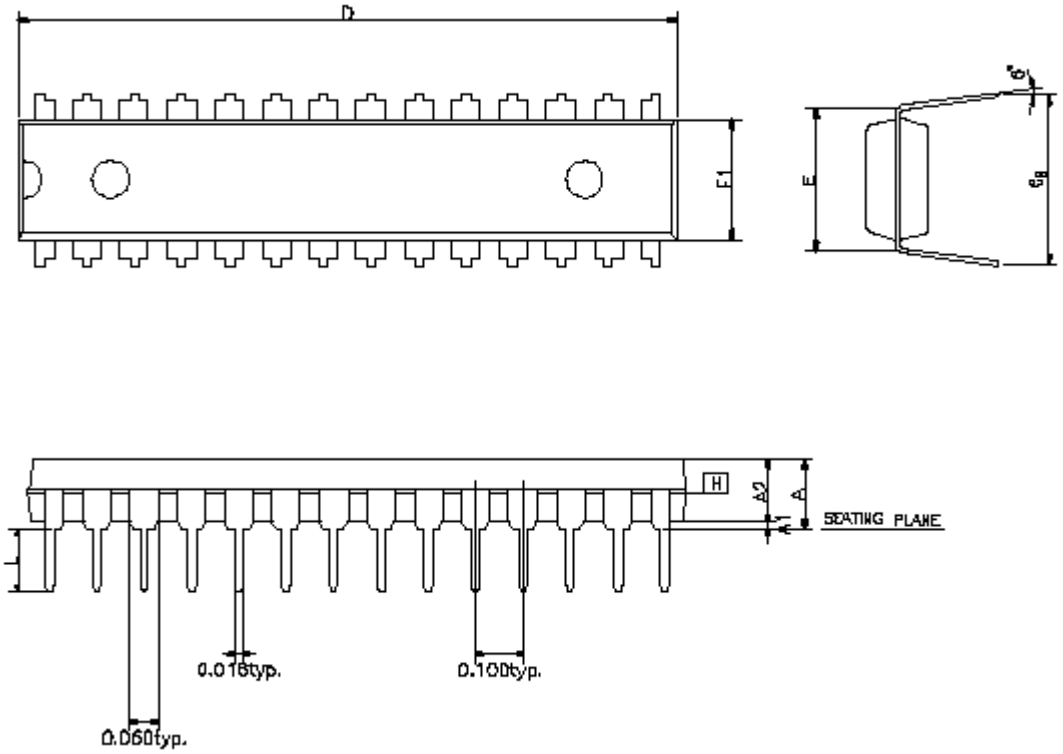
WRITE CYCLE 2 (CE# Controlled) (1,2,5)



Notes :
1. WE# or CE# must be HIGH during all address transitions.
2. A write occurs during the overlap of a low CE# and a low WE#.
3. During a WE# controlled with write cycle with OE# LOW, t_{WP} must be greater than $t_{WHZ}+t_{DW}$ to allow the drivers to turn off and data to be placed on the bus.
4. During this period, I/O pins are in the output state, and input singals must not be applied.
5. If the CE# LOW transition occurs simultaneously with or after WE# LOW transition, the outputs remain in a high impedance state.
6. t_{OW} and t_{WHZ} are specified with C_L = 5pF. Transition is measured ± 500mV from steady state.

PACKAGE OUTLINE DIMENSION

28 pin 300 mil skinny PDIP PACKAGE OUTLINE DIMENSION

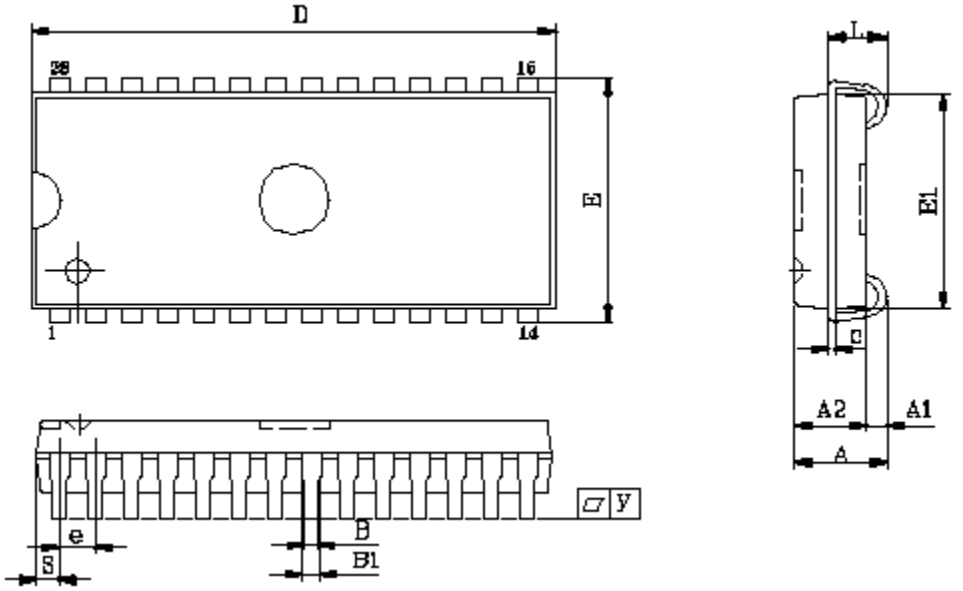


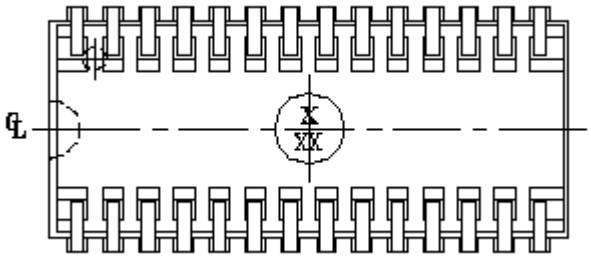
UNIT / SYMBOL	MIN	NOR.	MAX
A	-	-	0.210
A1	0.015	-	-
A2	0.125	0.130	0.135
D	1.385	1.390	1.400
E		0.310 BSC	
E1	0.283	0.288	0.293
L	0.115	0.130	0.150
eB	0.330	0.350	0.370
Θ°	0	7	15

Note：

1. JEDEC OUTLINE：N / A

28 pin 300 mil SOJ PACKAGE OUTLINE DIMENSION



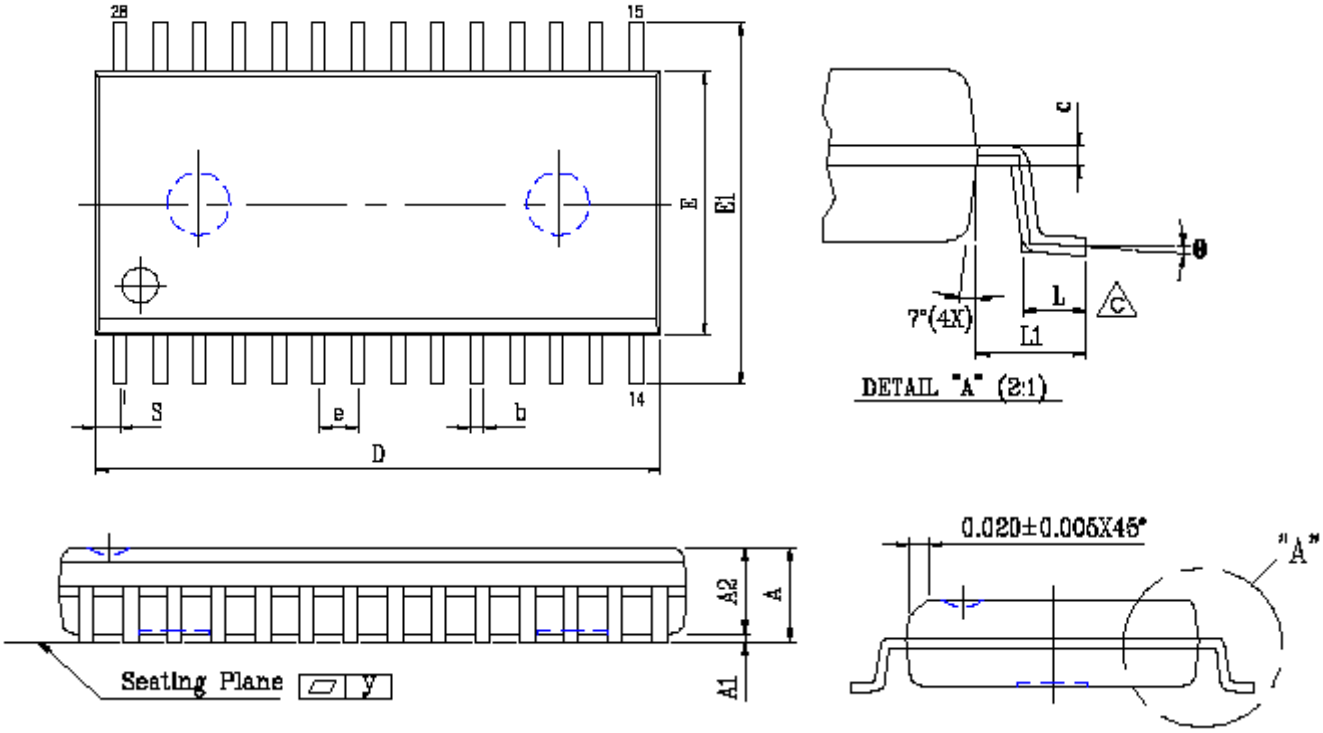


UNIT / SYMBOL	INCH(BASE)	MM(REF)
A	0.148 (MAX)	3.759 (MAX)
A1	0.026(MIN)	0.660(MIN)
A2	0.100± 0.005	2.540± 0.127
B	0.018 (TYP)	0.457(TYP)
B1	0.028 (TYP)	0.711(TYP)
c	0.010 (TYP)	0.254 (TYP)
D	0.710 (TYP)	18.034 (TYP)
E	0.335(TYP)	8.509(TYP)
E1	0.3 (TYP)	7.620(TYP)
e	0.050 (TYP)	1.270 (TYP)
L	0.087± 0.010	2.210± 0.254
S	0.030 (TYP)	0.762 (TYP)
△D Y	0.003(MAX)	0.076(MAX)

Note:

1. S/E/D DIM. NOT INCLUDEING MOLD FLASH.
2. THE END FLASH IN PACKAGE LENGTHWISE IS NOT MORE THE 10 MILS EACH SIDE.

28 pin 330 mil SOP Package Outline Dimension



SYMBOL \ UNIT	INCH(BASE)	MM(REF)
A	0.120 (MAX)	3.048 (MAX)
A1	0.002(MIN)	0.05(MIN)
A2	0.098± 0.005	2.489± 0.127
b	0.016 (TYP)	0.406(TYP)
c	0.010 (TYP)	0.254(TYP)
D	0.728 (MAX)	18.491 (MAX)
E	0.350 (MAX)	8.890 (MAX)
E1 (B)	0.465± 0.012	11.811± 0.305
e	0.050 (TYP)	1.270(TYP)
L (C)	0.05 (MAX)	1.270 (MAX)
L1	0.067± 0.008	1.702± 0.203
S	0.047 (MAX)	1.194 (MAX)
y (E)	0.003(MAX)	0.076(MAX)
θ	0°～10°	0°～10°

ORDERING INFORMATION

PART NO.	ACCESS TIME (ns)	PACKAGE
UT6164BJC-8	8	28PIN SOJ
UT6164BJC-10	10	28PIN SOJ
UT6164BJC-12	12	28PIN SOJ
UT6164BJC-15	15	28PIN SOJ