

REVISION HISTORY

Revision	Description	Issue Date
1.0	Initial issue	Feb 2007
2.0	Add-in industrial temperature option for 28-pin 600 mil PDIP. Standby current(Isb1) reduced to be 20uA for I-grade and 10uA for C grade	July 2017



8K X 8 BIT LOW POWER CMOS SRAM

FEATURES

- Access time :55ns
- Low power consumption:
Operation current :
15mA (TYP.), $V_{CC} = 3.0V$
Standby current :
1 μ A (TYP.), $V_{CC} = 3.0V$
- Wide range power supply : 2.7 ~ 5.5V
- Fully Compatible with all Competitors 5V product
- Fully Compatible with all Competitors 3.3V product
- All inputs and outputs TTL compatible
- Fully static operation
- Tri-state output
- Data retention voltage :1.5V (MIN.)
- **All products ROHS Compliant**
- Package : 28-pin 600 mil PDIP
28-pin 330 mil SOP
28-pin 8mm x 13.4mm sTSOP

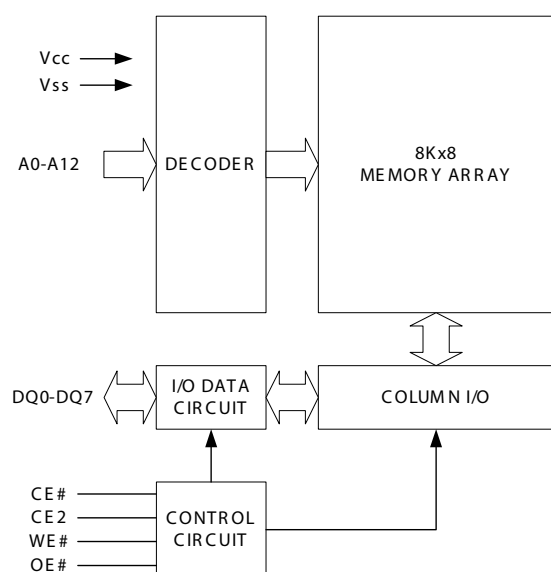
GENERAL DESCRIPTION

The AS6C6264 is a 65,536-bit low power CMOS static random access memory organized as 8,192 words by 8 bits. It is fabricated using very high performance, high reliability CMOS technology. Its standby current is stable within the range of operating temperature.

The AS6C6264 is well designed for low power application, and particularly well suited for battery back-up nonvolatile memory application.

The AS6C6264 operates with wide range power supply.

FUNCTIONAL BLOCK DIAGRAM

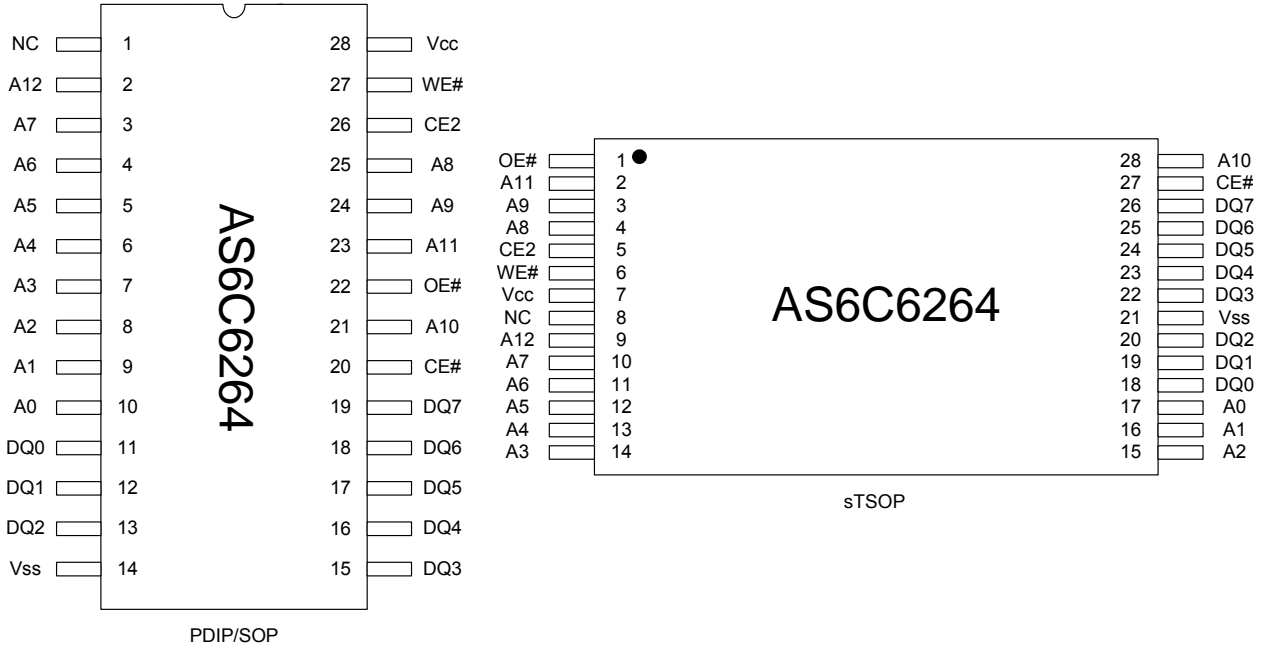


PIN DESCRIPTION

SYMBOL	DESCRIPTION
A0 - A12	Address Inputs
DQ0 - DQ7	Data Inputs/Outputs
CE#, CE2	Chip Enable Inputs
WE#	Write Enable Input
OE#	Output Enable Input
Vcc	Power Supply
Vss	Ground
NC	No Connection



PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS*

PARAMETER	SYMBOL	RATING	UNIT
Terminal Voltage with Respect to Vss	V _{TERM}	-0.5 to 7.0	V
Operating Temperature	T _A	0 to 70(C grade)	°C
		-40 to 85(I grade)	
Storage Temperature	T _{STG}	-65 to 150	°C
Power Dissipation	P _D	1	W
DC Output Current	I _{OUT}	50	mA
Soldering Temperature (under 10 sec)	T _{SOLDER}	260	°C

*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 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#	CE2	OE#	WE#	I/O OPERATION	SUPPLY CURRENT
Standby	H	X	X	X	High-Z	I _{SB} , I _{SB1}
	X	L	X	X	High-Z	I _{SB} , I _{SB1}
Output Disable	L	H	H	H	High-Z	I _{CC} , I _{CC1}
Read	L	H	L	H	D _{OUT}	I _{CC} , I _{CC1}
Write	L	H	X	L	D _{IN}	I _{CC} , I _{CC1}

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



8K X 8 BIT LOW POWER CMOS SRAM

DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP. ⁵	MAX.	UNIT
Supply Voltage	V _{CC}		2.7	3.0	5.5	V
Input High Voltage	V _{IH} ¹		2.4V	-	V _{CC} +0.3	V
Input Low Voltage	V _{IL} ²		- 0.5	-	0.6	V
Input Leakage Current	I _{LI}	V _{CC} ≥ V _{IN} ≥ V _{SS}	- 1	-	1	μA
Output Leakage Current	I _{LO}	V _{CC} ≥ V _{OUT} ≥ V _{SS} , Output Disabled	- 1	-	1	μA
Output High Voltage	V _{OH}	I _{OH} = -1mA	2.4	3.0	-	V
Output Low Voltage	V _{OL}	I _{OL} = 2mA	-	-	0.4	V
Average Operating Power supply Current	I _{CC}	Cycle time = Min. CE# = V _{IL} and CE2 = V _{IH} , I _{I/O} = 0mA	- 55	15	45	mA
	I _{CC1}	Cycle time = 1μs CE# ≤ 0.2V and CE2 ≥ V _{CC} -0.2V, I _{I/O} = 0mA other pins at 0.2V or V _{CC} -0.2V	-	3	10	mA
Standby Power Supply Current	I _{SB1}	CE# ≥ V _{CC} -0.2V	-C	1	10 ^{*4}	μA
		or CE2 ≤ 0.2V	-I	1	20 ^{*4}	μA

Notes: C = Commercial Temperature I = Industrial temperature
 1. V_{IH}(max) = V_{CC} + 3.0V for pulse width less than 10ns.
 2. V_{IL}(min) = V_{SS} - 3.0V for pulse width less than 10ns.
 3. Over/Undershoot specifications are characterized, not 100% tested.
 4. 10 μA for special request
 5. Typical values are included for reference only and are not guaranteed or tested.
 Typical valued are measured at V_{CC} = V_{CC}(TYP.) and T_A = 25°C

CAPACITANCE (T_A = 25°C, f = 1.0MHz)

PARAMETER	SYMBOL	MIN.	MAX	UNIT
Input Capacitance	C _{IN}	-	6	pF
Input/Output Capacitance	C _{I/O}	-	8	pF

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

AC TEST CONDITIONS

Input Pulse Levels	0.2V to V _{CC} - 0.2V
Input Rise and Fall Times	3ns
Input and Output Timing Reference Levels	1.5V
Output Load	C _L = 50pF + 1TTL, I _{OH} /I _{OL} = -1mA/2mA



AC ELECTRICAL CHARACTERISTICS

(1) READ CYCLE

PARAMETER	SYM.	AS6C6264-55		UNIT
		MIN.	MAX.	
Read Cycle Time	t _{RC}	55	-	ns
Address Access Time	t _{AA}	-	55	ns
Chip Enable Access Time	t _{ACE}	-	55	ns
Output Enable Access Time	t _{OE}		30	ns
Chip Enable to Output in Low-Z	t _{CLZ} *	10	-	ns
Output Enable to Output in Low-Z	t _{OLZ} *	5	-	ns
Chip Disable to Output in High-Z	t _{CHZ} *	-	20	ns
Output Disable to Output in High-Z	t _{OHZ} *		20	ns
Output Hold from Address Change	t _{OH}	10	-	ns

(2) WRITE CYCLE

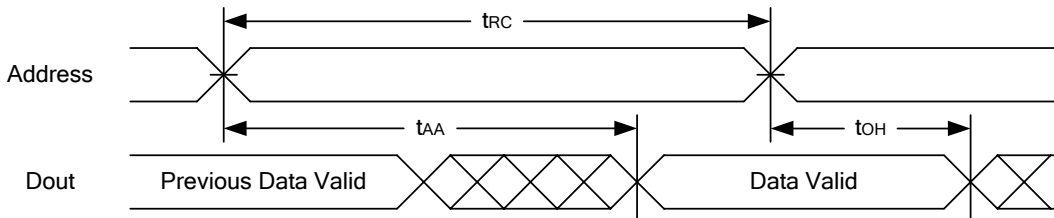
PARAMETER	SYM.	AS6C6264-55		UNIT
		MIN.	MAX.	
Write Cycle Time	t _{WC}	55	-	ns
Address Valid to End of Write	t _{AW}	50	-	ns
Chip Enable to End of Write	t _{CW}	50	-	ns
Address Set-up Time	t _{AS}	0	-	ns
Write Pulse Width	t _{WP}	45	-	ns
Write Recovery Time	t _{WR}	0	-	ns
Data to Write Time Overlap	t _{DW}	25	-	ns
Data Hold from End of Write Time	t _{DH}	0	-	ns
Output Active from End of Write	t _{OW} *	5	-	ns
Write to Output in High-Z	t _{WHZ} *	-	20	ns

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

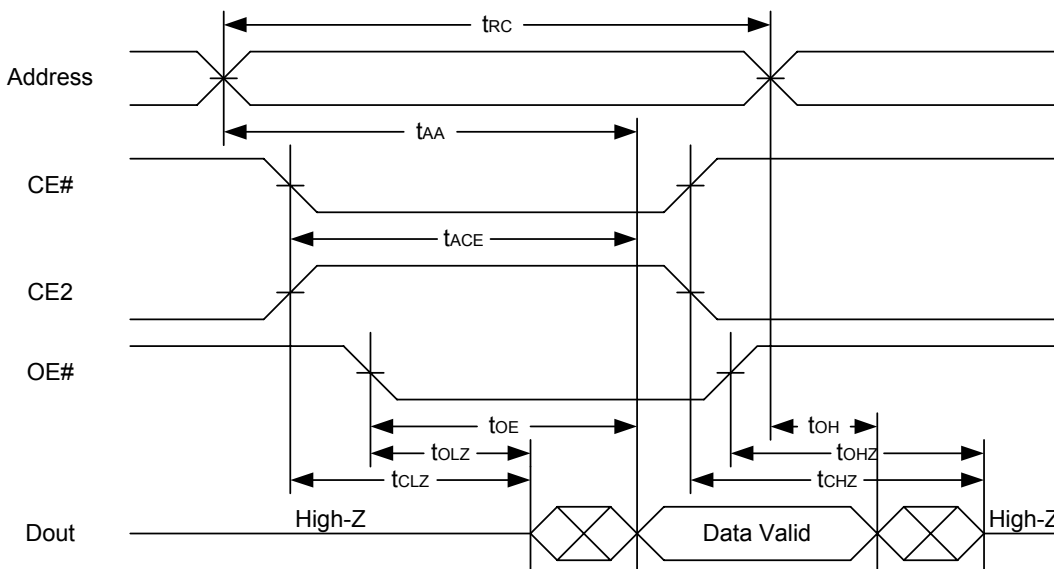


TIMING WAVEFORMS

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



READ CYCLE 2 (CE# and CE2 and OE# Controlled) (1,3,4,5)



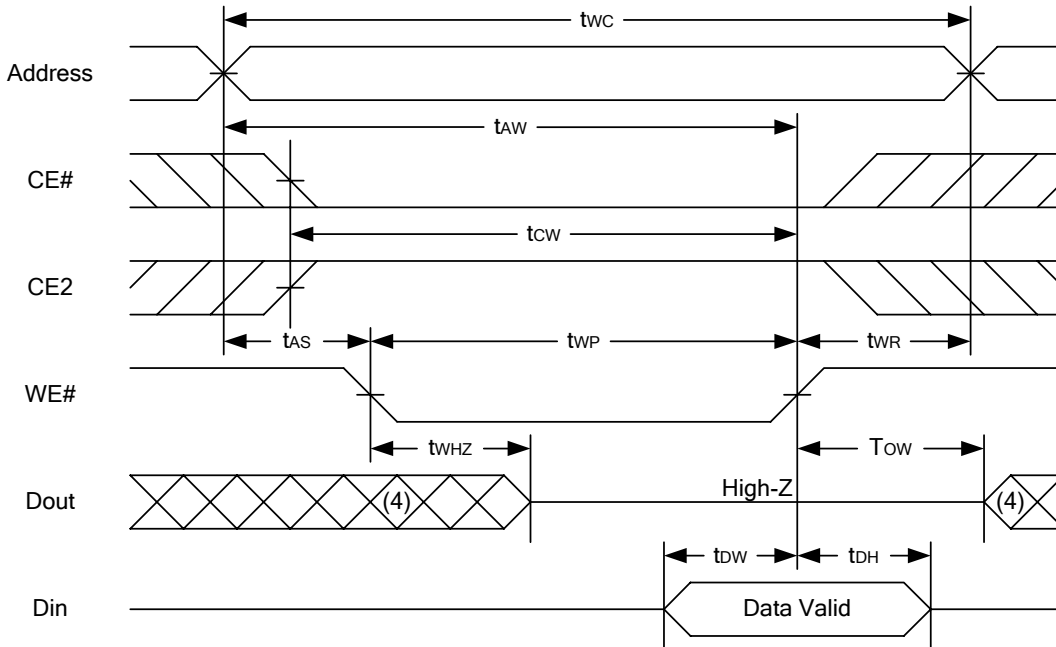
Notes :

1. WE# is high for read cycle.
2. Device is continuously selected OE# = low, CE# = low, CE2 = high.
3. Address must be valid prior to or coincident with CE# = low, CE2 = high; otherwise t_{AA} is the limiting parameter.
4. t_{CLZ} , t_{OLZ} , t_{CHZ} and t_{OHZ} are specified with $C_L = 5pF$. Transition is measured $\pm 500mV$ from steady state.
5. At any given temperature and voltage condition, t_{CHZ} is less than t_{CLZ} , t_{OHZ} is less than t_{OLZ} .

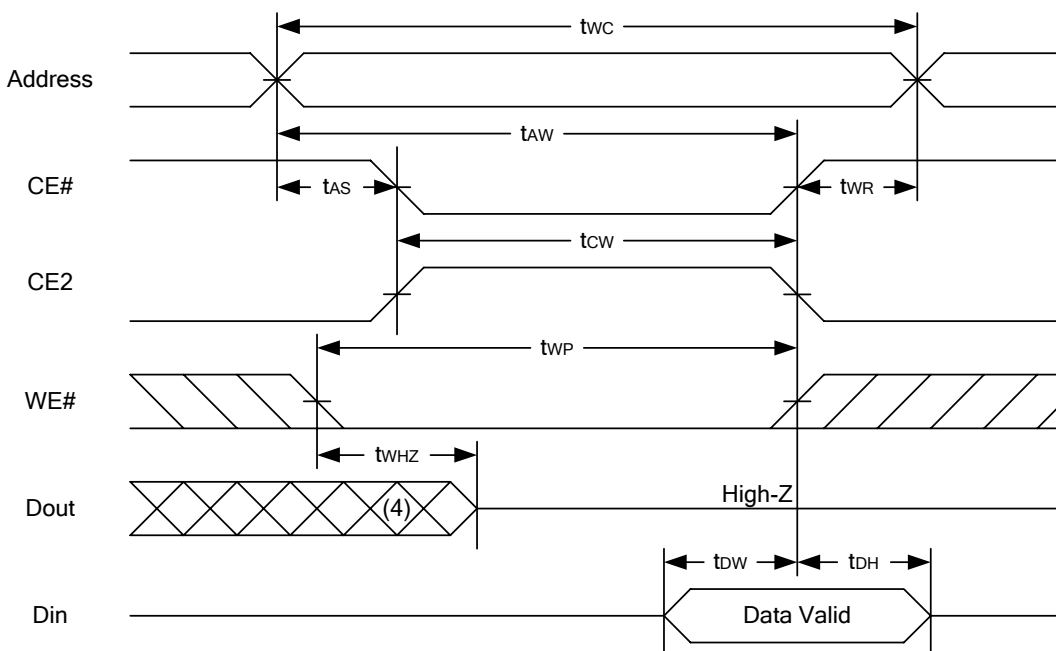


8K X 8 BIT LOW POWER CMOS SRAM

WRITE CYCLE 1 (WE# Controlled) (1,2,3,5,6)



WRITE CYCLE 2 (CE# and CE2 Controlled) (1,2,5,6)



Notes :

1. WE#, CE# must be high or CE2 must be low during all address transitions.
2. A write occurs during the overlap of a low CE#, high CE2, low WE#.
3. During a WE#-controlled 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 signals must not be applied.
5. If the CE# low transition and CE2 high 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 $\pm 500mV$ from steady state.



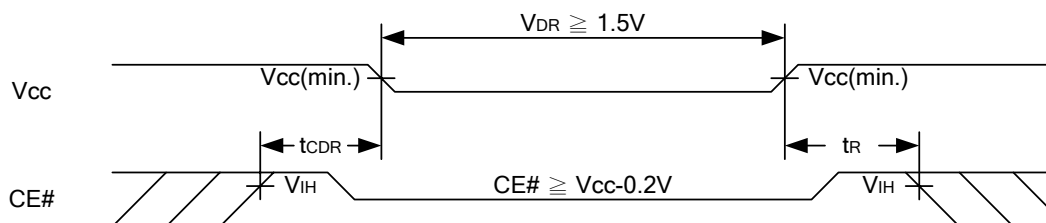
DATA RETENTION CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Vcc for Data Retention	V _{DR}	CE# ≥ V _{CC} - 0.2V or CE2 ≤ 0.2V	1.5	-	5.5	V
Data Retention Current	I _{DR}	V _{CC} = 1.5V CE# ≥ V _{CC} - 0.2V or CE2 ≤ 0.2V	-	0.5	10	μA
Chip Disable to Data Retention Time	t _{CDR}	See Data Retention Waveforms (below)	0	-	-	ns
Recovery Time	t _R		t _{RC*}	-	-	ns

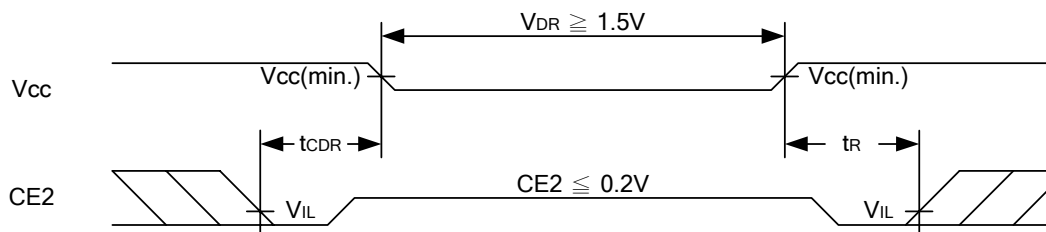
t_{RC*} = Read Cycle Time

DATA RETENTION WAVEFORM

Low Vcc Data Retention Waveform (1) (CE# controlled)



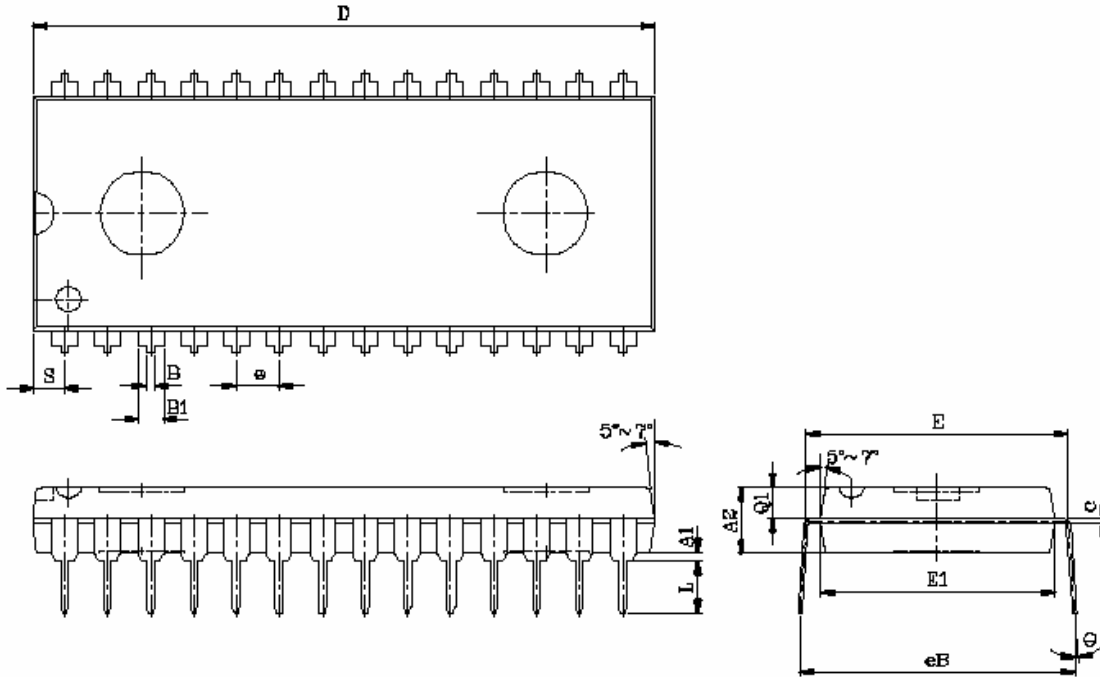
Low Vcc Data Retention Waveform (2) (CE2 controlled)





PACKAGE OUTLINE DIMENSION

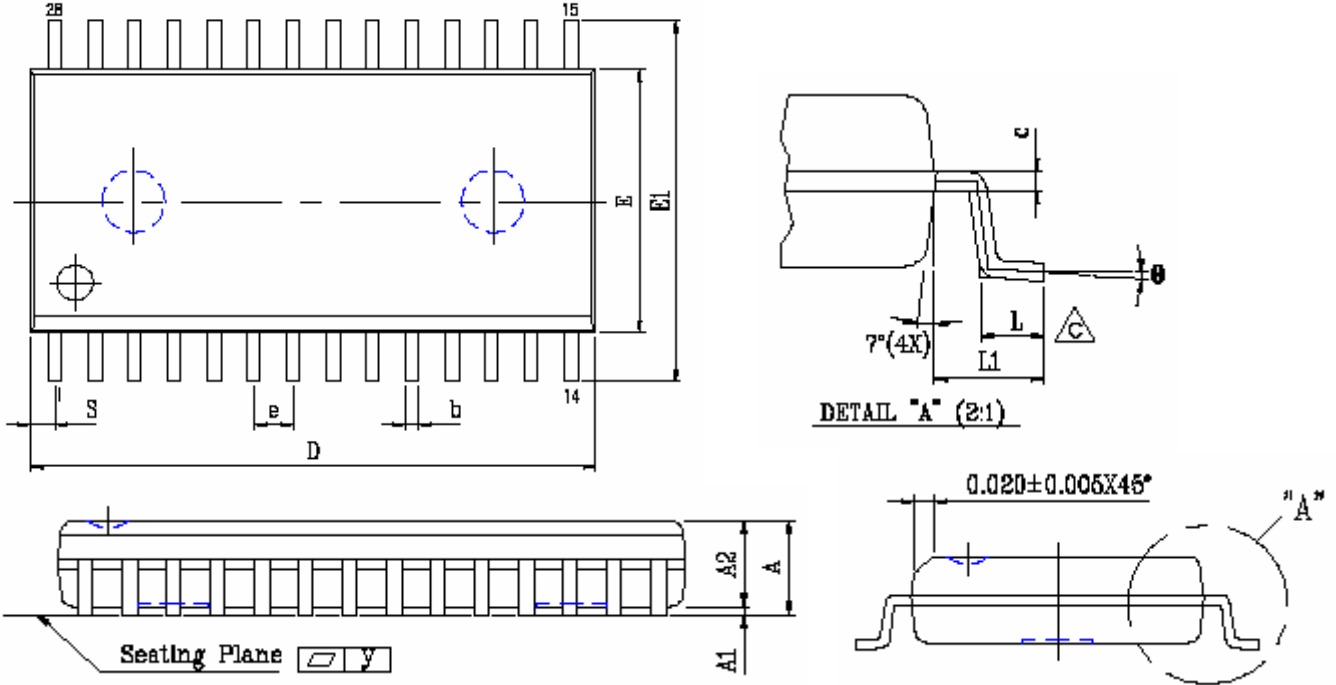
28 pin 600 mil PDIP Package Outline Dimension



SYM.	UNIT	INCH.(BASE)	MM(REF)
A1		0.010 (MIN)	0.254 (MIN)
A2		0.150±0.005	3.810±0.127
B		0.020 (MAX)	0.508(MAX)
B1		0.055 (MAX)	1.397(MAX)
c		0.012 (MAX)	0.304 (MAX)
D		1.430 (MAX)	36.322 (MAX)
E		0.6 (TYP)	15.24 (TYP)
E1		0.52 (MAX)	13.208 (MAX)
e		0.100 (TYP)	2.540(TYP)
eB		0.625 (MAX)	15.87 (MAX)
L		0.180(MAX)	4.572(MAX)
S		0.06 (MAX)	1.524 (MAX)
Q1		0.08(MAX)	2.032(MAX)
Θ		15°(MAX)	15°(MAX)



28 pin 330 mil SOP Package Outline Dimension

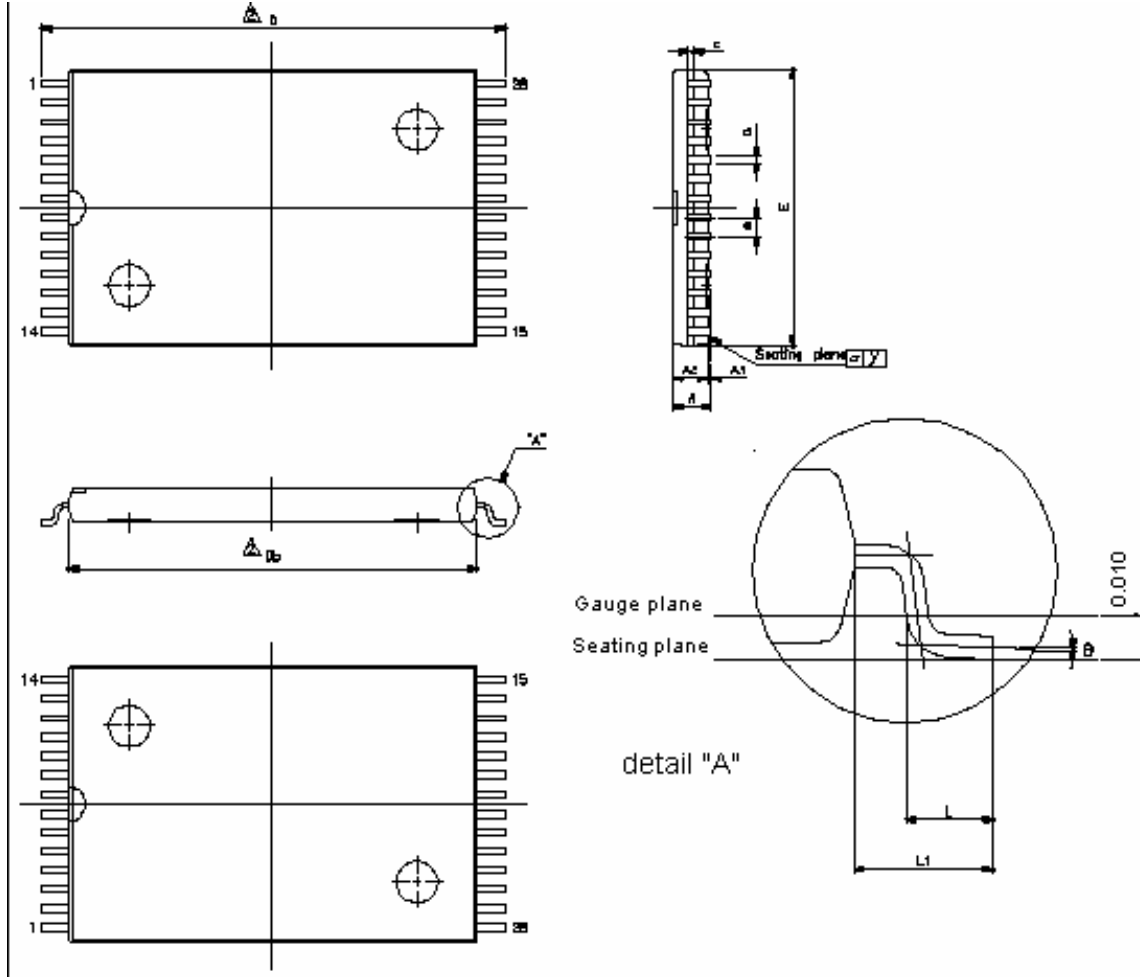


SYM.	UNIT	INCH(BASE)	MM(REF)
A		0.120 (MAX)	3.048 (MAX)
A1		0.002(MIN)	0.05(MIN)
A2		0.098±0.005	2.489±0.127
b		0.016 (TYP)	0.406(TYP)
c		0.010 (TYP)	0.254(TYP)
D		0.728 (MAX)	18.491 (MAX)
E		0.340 (MAX)	8.636 (MAX)
E1		0.465±0.012	11.811±0.305
e		0.050 (TYP)	1.270(TYP)
L		0.05 (MAX)	1.270 (MAX)
L1		0.067±0.008	1.702 ±0.203
S		0.047 (MAX)	1.194 (MAX)
y		0.003(MAX)	0.076(MAX)
θ		0°~10°	0°~10°



8K X 8 BIT LOW POWER CMOS SRAM

28 pin 8mm x 13.4mm sTSSOP Package Outline Dimension



SYM.	UNIT	INCH(BASE)	MM(REF)
A		0.047 (MAX)	1.20 (MAX)
A1		0.004±0.002	0.10±0.05
A2		0.039±0.002	1.00±0.05
b		0.006 (TYP)	0.15(TYP)
c		0.010 (TYP)	0.254(TYP)
Db		0.465±0.004	11.80±0.10
E		0.315±0.004	8.00±0.10
e		0.022 (TYP)	0.55(TYP)
D		0.528±0.008	13.40±0.20
L		0.020±0.004	0.50±0.10
L1		0.0315±0.004	0.80±0.10
y		0.08(MAX)	0.003(MAX)
θ		0°~5°	0°~5°

Note : E dimension is not including end flash. The total of both sides' end flash is not above 0.3mm.



8K X 8 BIT LOW POWER CMOS SRAM

ORDERING INFORMATION

Ordering Codes

Alliance	Organization	VCC range	Package	Operating Temp	Speed ns
AS6C6264-55PCN	8k x 8	2.7-5.5V	28pin 600mil PDIP	Commercial ~ 0° C to 70° C	55
AS6C6264-55PIN	8k x 8	2.7-5.5V	28pin 600mil PDIP	Industrial ~ -40° C to 85° C	55
AS6C6264-55SCN	8k x 8	2.7-5.5V	28pin 330mil SOP	Commercial ~ 0° C to 70° C	55
AS6C6264-55SIN	8k x 8	2.7-5.5V	28pin 330mil SOP	Industrial ~ -40° C to 85° C	55
AS6C6264-55STCN	8k x 8	2.7-5.5V	28pin sTSOP (8 x 13.4 mm)	Commercial ~ 0° C to 70° C	55
AS6C6264-55STIN	8k x 8	2.7-5.5V	28pin sTSOP (8 x 13.4 mm)	Industrial ~ -40° C to 85° C	55

Part numbering system

AS6C	6264	- 55	X	X	N
low power SRAM prefix	Device Number 6264	Access Time	Package Options: P = 28 pin 600 mil P-DIP S = 28 pin 330 mil SOP ST = 28 pin sTSOP (8mm x 13.4 mm)	Temperature Range: C = Commercial (0°C to +70° C) I = Industrial (-40° to +85° C)	N = Lead Free ROHS Compliant Part