

REVISION HISTORY

<u>Revision</u>	<u>Description</u>	<u>Issue Date</u>
Rev. 1.0	Initial Issue	February 2007
Rev. 1.1	Revision of Supply current ISB1 – page 3 Commercial temp 20 μ A Industrial temp 30 μ A	March 26, 2013
	Revision of Alliance Memory address	March 26, 2013
Rev 1.2	Further Revision of Supply current - page 3 Commercial temp 15 μ A Industrial temp 30 μ A IdR (data-retention current) to be 20uA - page 7	March 23, 2016

32K X 8 BIT LOW POWER CMOS SRAM

FEATURES

- Access time : 55ns
- Low power consumption:
 - Operation current : 15mA (TYP.), Vcc = 3.0V
 - Standby current : 1µA (TYP.), Vcc = 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

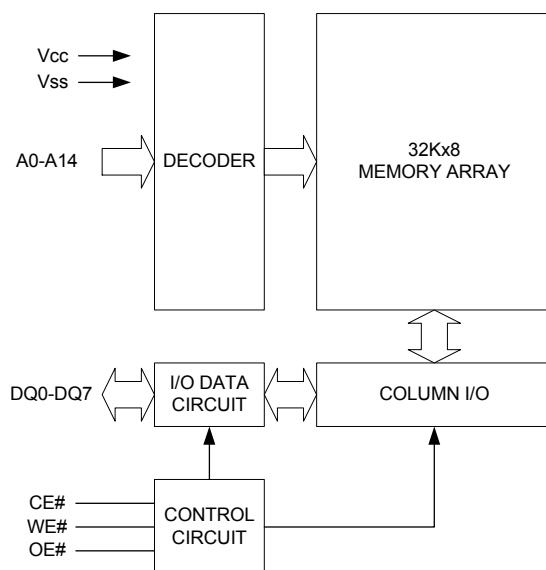
GENERAL DESCRIPTION

The AS6C62256 is a 262,144-bit low power CMOS static random access memory organized as 32,768 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 AS6C62256 is well designed for low power application, and particularly well suited for battery back-up nonvolatile memory application.

The AS6C62256 operates with wide range power supply 2.7 ~ 5.5V

FUNCTIONAL BLOCK DIAGRAM

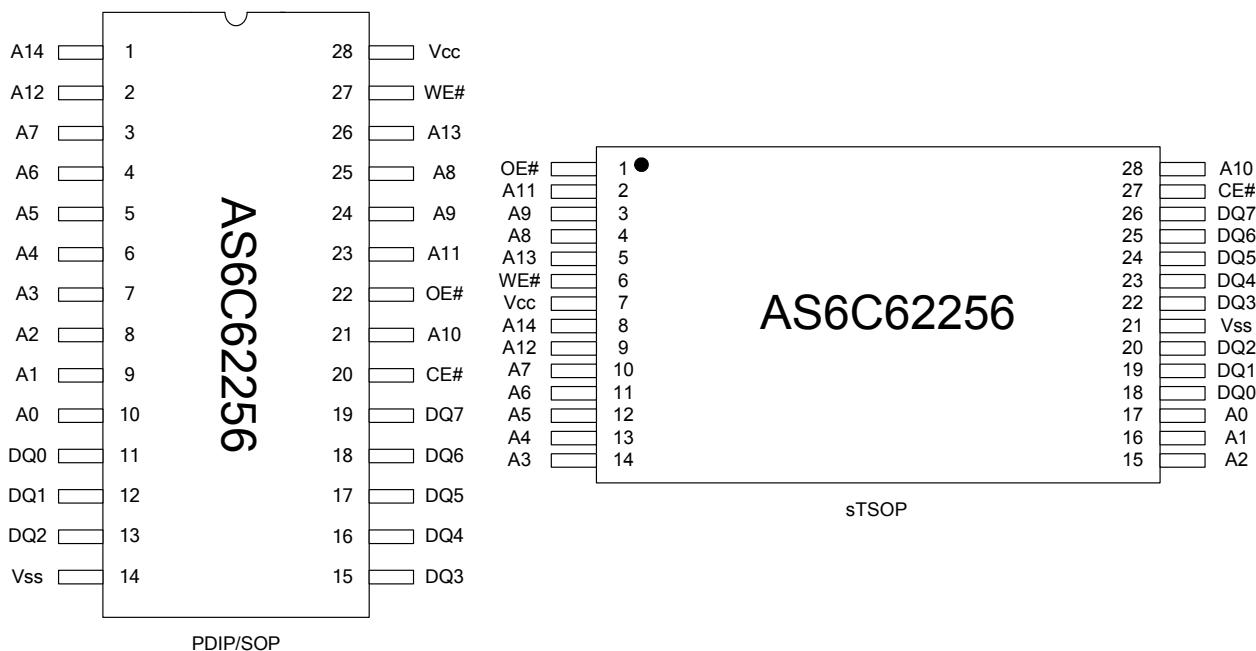


PIN DESCRIPTION

SYMBOL	DESCRIPTION
A0 - A14	Address Inputs
DQ0 – DQ7	Data Inputs/Outputs
CE#	Chip Enable Input
WE#	Write Enable Input
OE#	Output Enable Input
Vcc	Power Supply
Vss	Ground



PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS*

PARAMETER	SYMBOL	RATING	UNIT
Terminal Voltage with Respect to Vss	VTERM	-0.5 to 7.0	V
Operating Temperature	TA	0 to 70(C grade)	°C
			°C
		-40 to 85(I grade)	°C
Storage Temperature	TSTG	-65 to 150	
Power Dissipation	PD	1	W
DC Output Current	IOUT	50	mA
Soldering Temperature (under 10 sec)	TSOLDER	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#	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} , I _{CC1}
Read	L	L	H	D _{OUT}	I _{CC} , I _{CC1}
Write	L	X	L	D _{IN}	I _{CC} , I _{CC1}

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



32K 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	3.3	5.5	V
Input High Voltage	V _{IH} ¹		2.4 V	-	V _{CC} +0.5	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} , I _{IO} = 0mA	-55	-	15	mA
	I _{CC1}	Cycle time = 1μs CE# ≤ 0.2V and I _{IO} = 0mA other pins at 0.2V or V _{CC} -0.2V	-	3	10	mA
Standby Power Supply Current	I _{SB}	CE# = V _{IH}	-	1	3	mA
	I _{SB1}	CE# ≥ V _{CC} - 0.2V -C Others at 0.2V or V _{CC} -0.2V -I	-	1	15 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. 10μA for special request

5. Typical values are included for reference only and are not guaranteed or tested.

Typical values are measured at V_{CC} = V_{CC(TYP)} and T_A = 25°CCAPACITANCE (T_A = 25°C, f = 1.0MHz)

PARAMETER	SYMBOL	MIN.	MAX	UNIT
Input Capacitance	C _{IN}	-	6	pF
Input/Output Capacitance	C _{IO}	-	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	AS6C62256-55		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

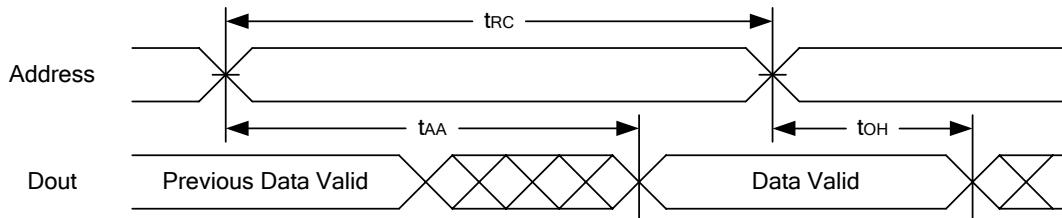
(2) WRITE CYCLE

PARAMETER	SYM	AS6C62256-55		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

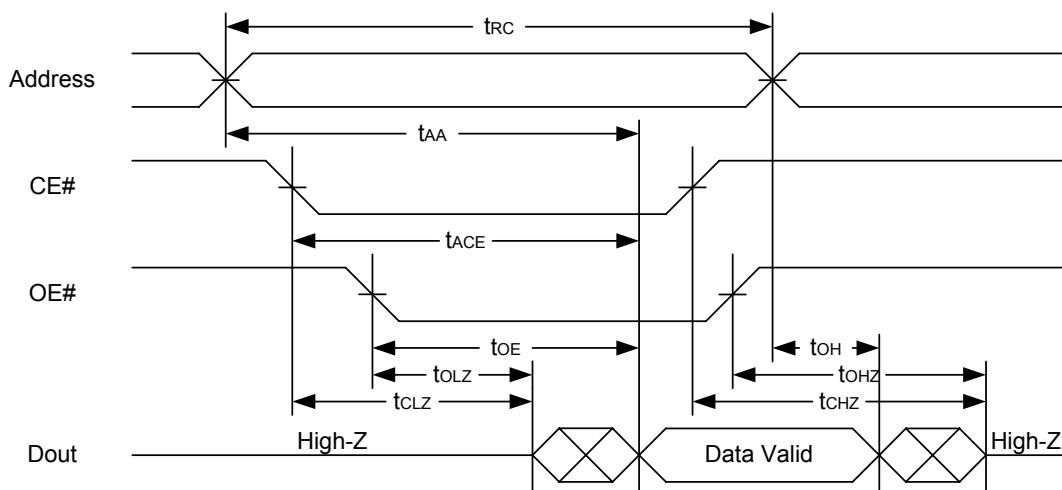
*These parameters are guaranteed by device characterization, but not production tested.

TIMING WAVEFORMS

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



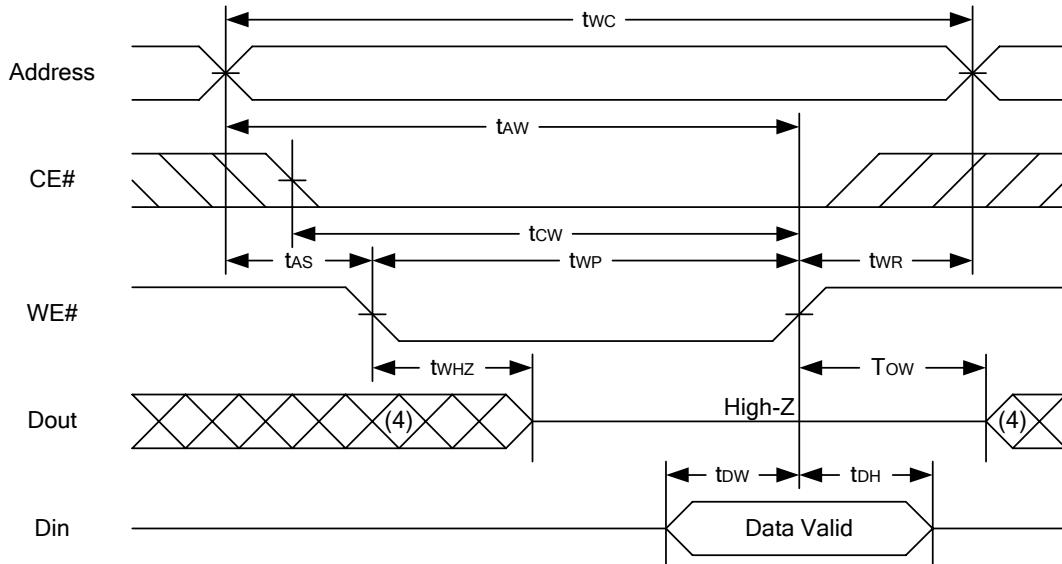
READ CYCLE 2 (CE# and OE# Controlled) (1,3,4,5)



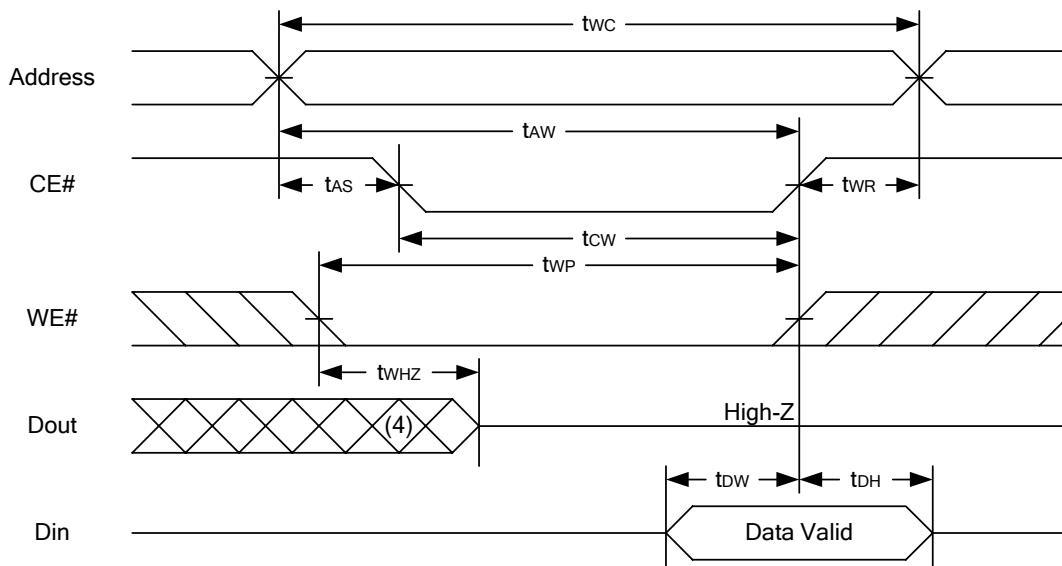
Notes :

- 1.WE# is high for read cycle.
- 2.Device is continuously selected OE# = low, CE# = low.
- 3.Address must be valid prior to or coincident with CE# = low; otherwise tAA is the limiting parameter.
- 4.tCLZ, tOLZ, tCHZ and tOHZ are specified with CL = 5pF. Transition is measured $\pm 500\text{mV}$ from steady state.
- 5.At any given temperature and voltage condition, tCHZ is less than tCLZ , tOHZ is less than tOLZ.

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



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



Notes :

1. WE#, CE# must be high during all address transitions.
2. A write occurs during the overlap of a low CE#, low WE#.
3. During a WE# controlled write cycle with OE# low, t_{WP} must be greater than $t_{WHZ} + t_{OW}$ 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 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.

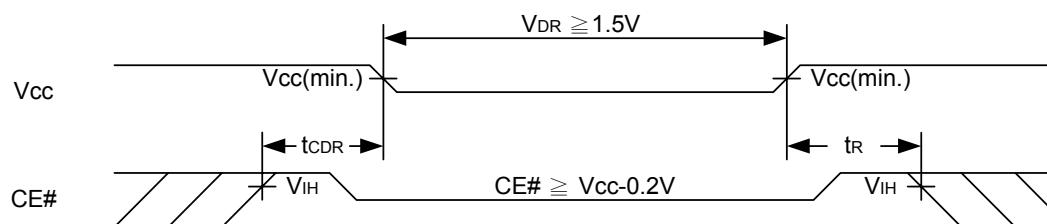


DATA RETENTION CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Vcc for Data Retention	V_{DR}	$CE\# \geq V_{cc} - 0.2V$	1.5	-	5.5	V
Data Retention Current	I_{DR}	$V_{cc} = 2.0V$ $CE\# \geq V_{cc} - 0.2V$	-	0.5	20	μA
Chip Disable to Data Retention Time	t_{CDR}	See Data Retention Waveforms (below)	0	-	-	ns
Recovery Time	t_R		t_{RC^*}	-	-	ns

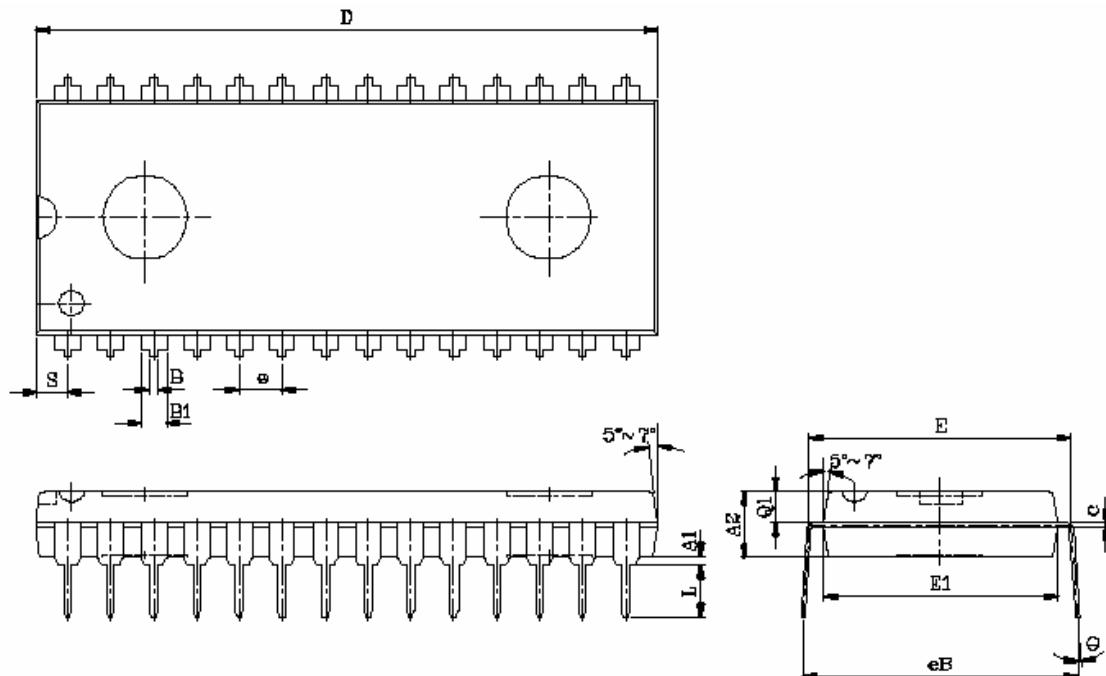
t_{RC^*} = Read Cycle Time

DATA RETENTION WAVEFORM



PACKAGE OUTLINE DIMENSION

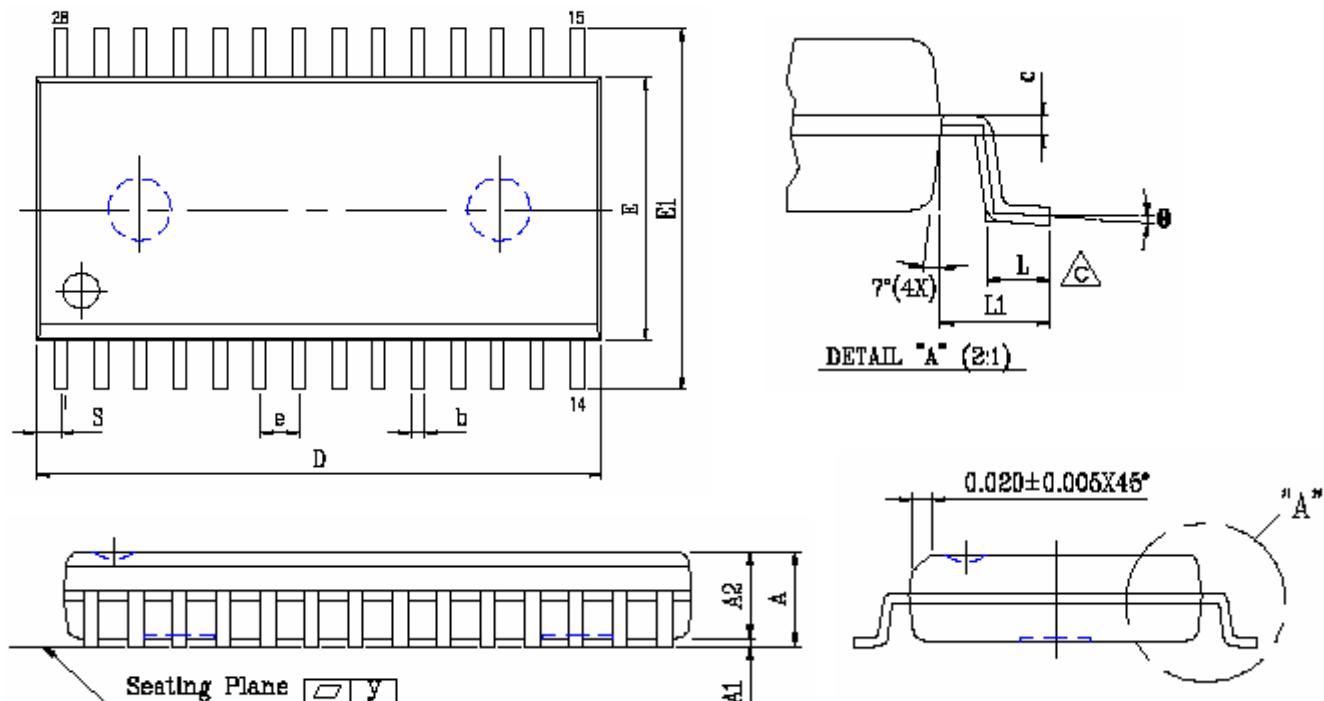
28 pin 600 mil PDIP Package Outline Dimension



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)

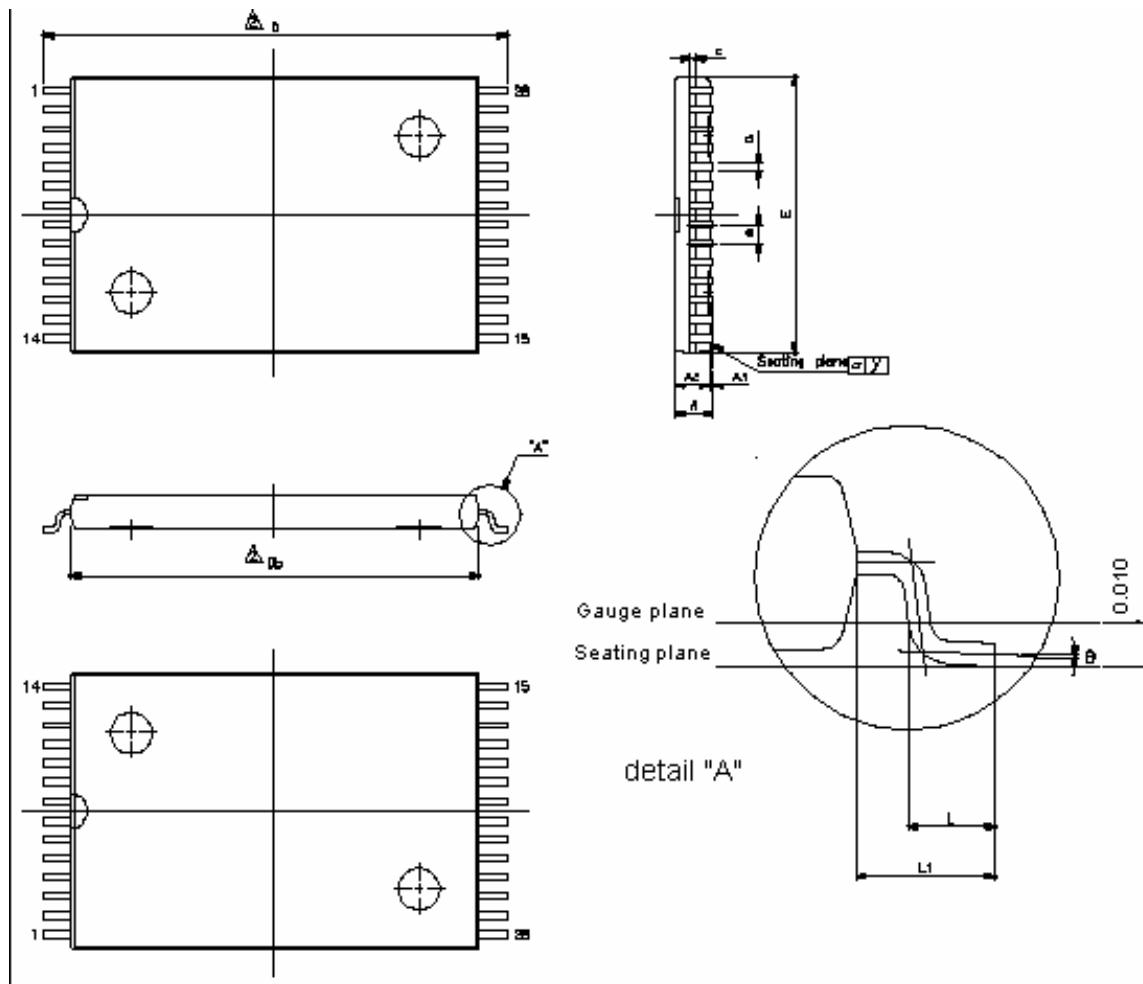


28 pin 330 mil SOP Package Outline Dimension



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°

28 pin 8mm x 13.4mm sTSOP 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.



ORDERING INFORMATION

Ordering Codes

Alliance	Organization	VCC range	Package	Operating Temp	Speed ns
AS6C62256-55PCN	32k x 8	2.7-5.5V	28pin 600mil PDIP	Commercial ~ 0° C to 70° C	55
AS6C62256-55SCN	32k x 8	2.7-5.5V	28pin 330mil SOP	Commercial ~ 0° C to 70° C	55
AS6C62256-55SIN	32k x 8	2.7-5.5V	28pin 330mil SOP	Industrial ~ -40°C to 85° C	55
AS6C62256-55STCN	32k x 8	2.7-5.5V	28pin sTSOP (8 x 13.4 mm)	Commercial ~ 0° C to 70° C	55
AS6C62256-55STIN	32k x 8	2.7-5.5V	28pin sTSOP (8 x 13.4 mm)	Industrial ~ -40°C to 85° C	55

Part numbering system

AS6C	62256	- 55	X	X	N
low power SRAM prefix	Device Number 62256	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

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