



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 μA (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

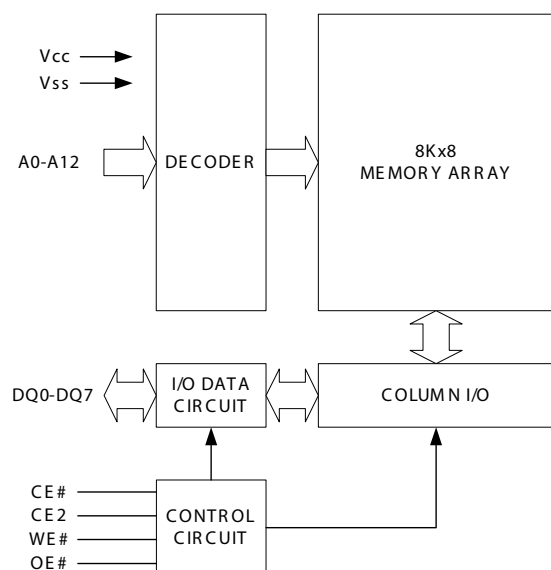
GENERAL DESCRIPTION

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



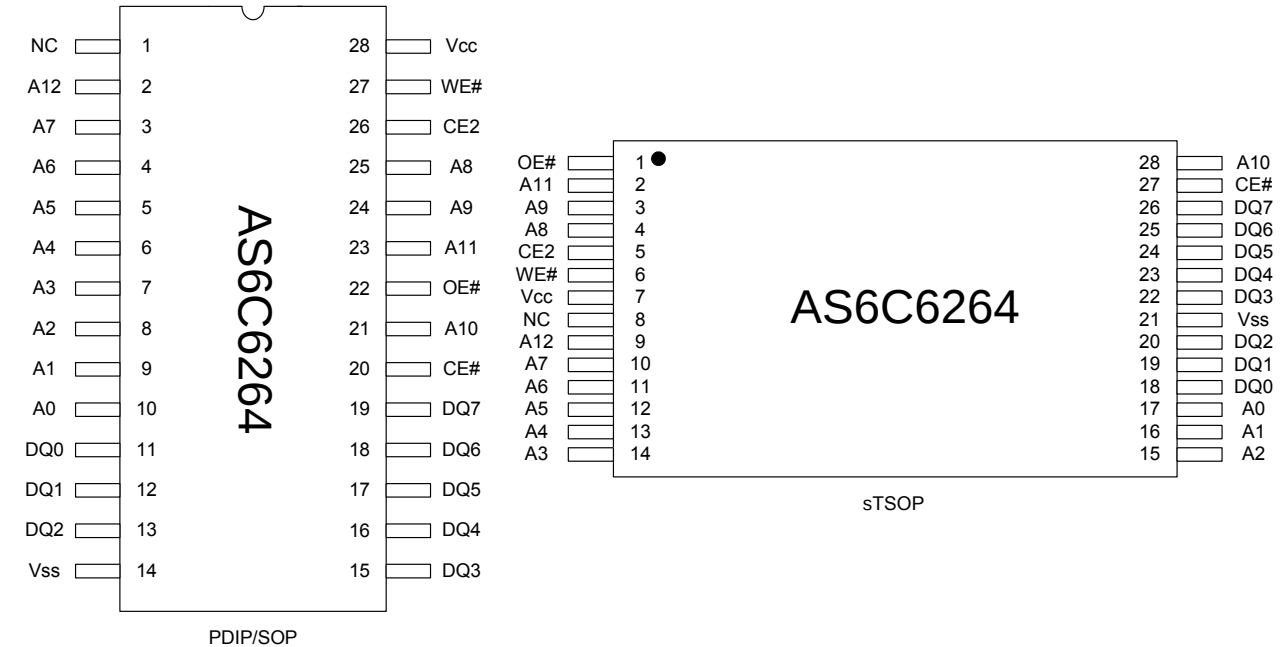
PIN DESCRIPTION

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



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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.



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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 or CE2 ≤ 0.2V	-C	1	50 ⁴	μA
			-I	1	80 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 values 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



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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

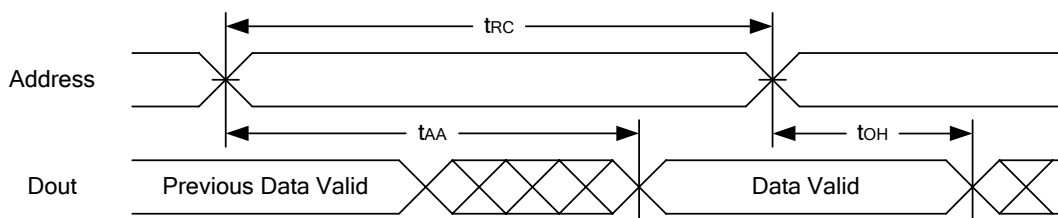
*These parameters are guaranteed by device characterization, but not production tested.



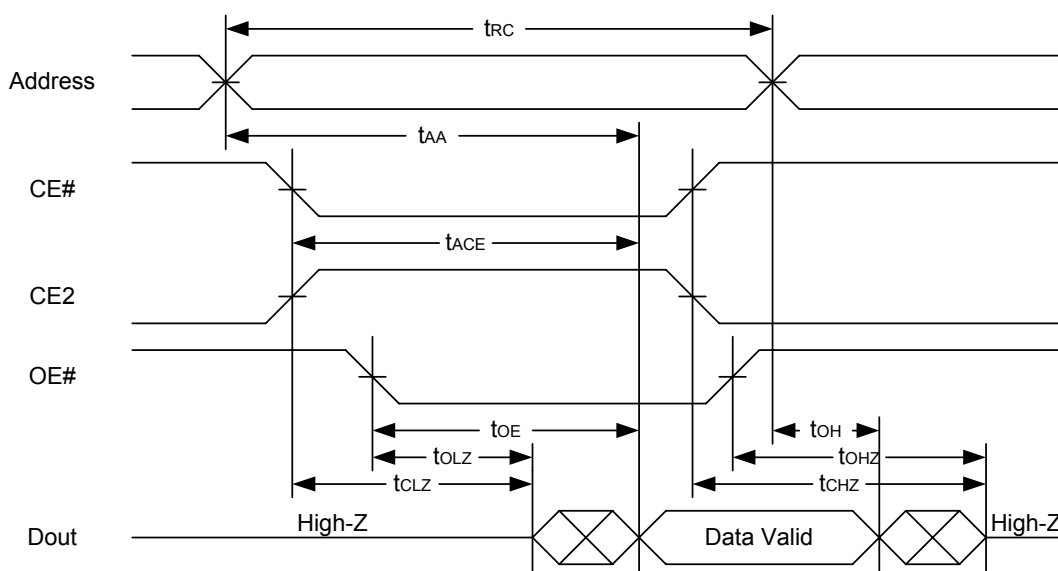
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TIMING WAVEFORMS

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 tAA is the limiting parameter.
- 4.tCLZ, tOLZ, tCHZ and tOHZ are specified with $C_L = 5\text{pF}$. 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.

[illegible]

The diagram illustrates the timing relationships for a memory access. The signals and their timing parameters are as follows:

- Address:** The address bus signal. The total time from the first address change to the last is labeled t_{WC} .
- CE# (Chip Enable):** The active-low chip enable signal. The time from its falling edge to the start of data output is t_{AS} . The time from its rising edge to the end of data output is t_{WR} . The total time it is active is t_{AW} .
- CE2 (Chip Enable 2):** The second active-low chip enable signal. The time from its falling edge to the start of data output is t_{CW} .
- WE# (Write Enable):** The active-low write enable signal. The time from its falling edge to the start of data output is t_{WP} .
- Dout (Data Output):** The data bus output. It shows a sequence of data bytes, with the fourth byte labeled (4). The time from the falling edge of WE# to the start of data output is t_{WHZ} . After the data output, the signal goes to High-Z.
- Din (Data Input):** The data bus input. The time from the start of data input to the start of data output is t_{DW} . The time from the end of data output to the end of data input is t_{DH} . The period during which data is valid on the input is labeled "Data Valid".

6. t_{OW} and t_{WHZ} are specified with $C_L = 5pF$. Transition is measured $\pm 500mV$ from steady state.



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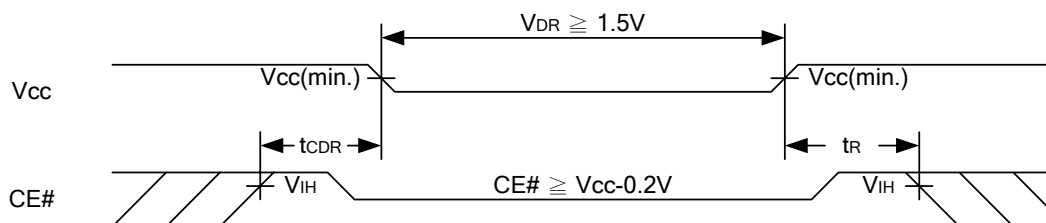
DATA RETENTION CHARACTERISTICS

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

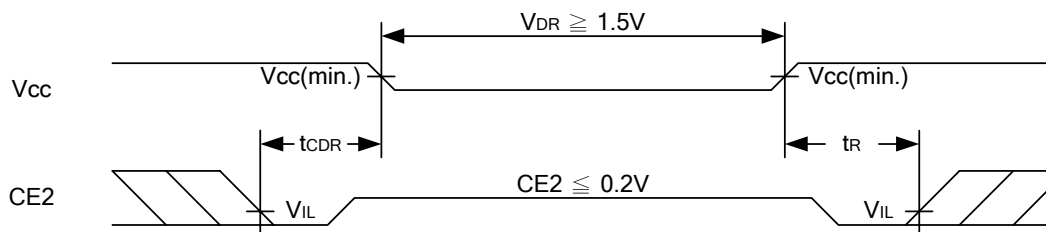
t_{RC}* = Read Cycle Time

DATA RETENTION WAVEFORM

Low V_{CC} Data Retention Waveform (1) (CE# controlled)



Low V_{CC} Data Retention Waveform (2) (CE2 controlled)

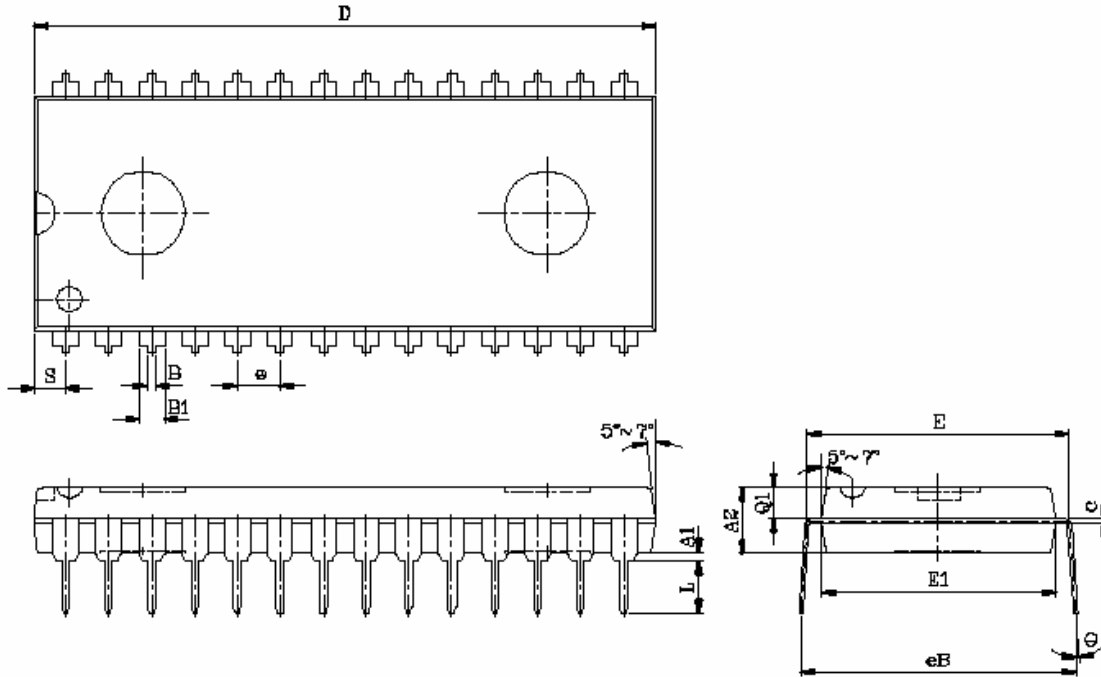




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PACKAGE OUTLINE DIMENSION

28 pin 600 mil PDIP Package Outline Dimension

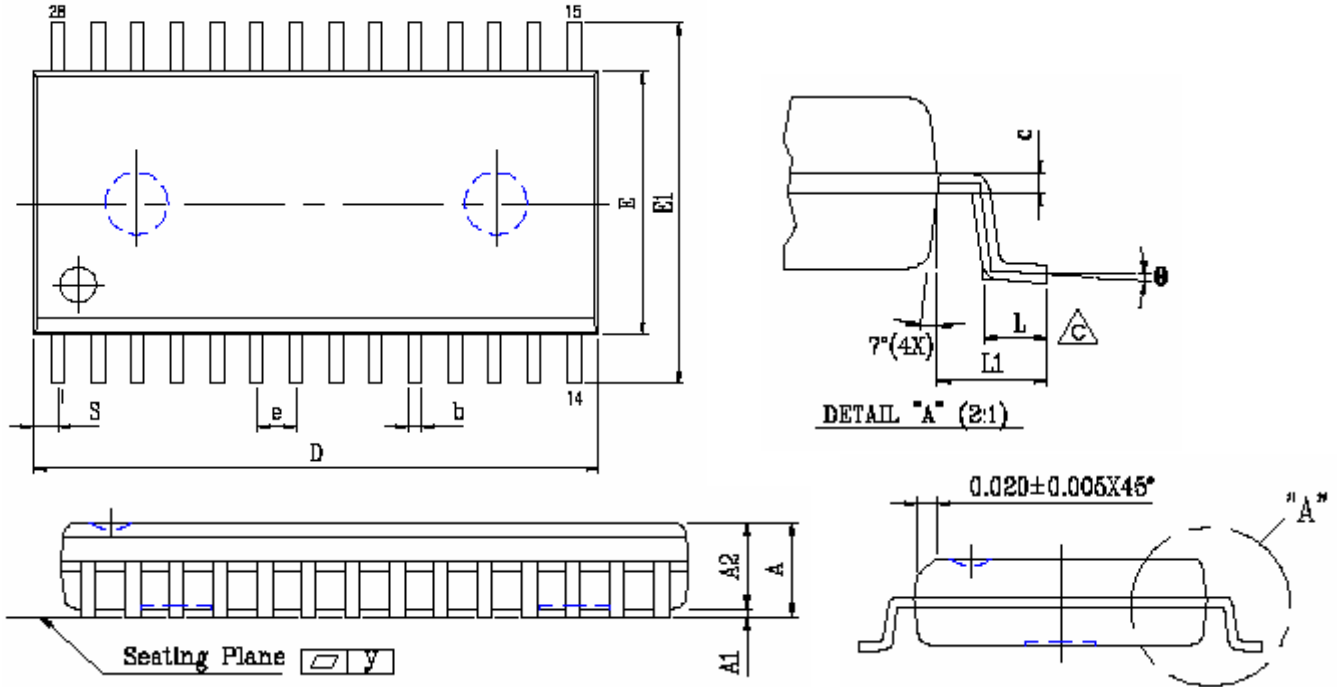


SYM.	UNIT	INCH.(BASE)	MM(REF)
A1		0.010 (MIN)	0.254 (MIN)
A2		0.150±0.005	3.810±0.127
B		0.020 (MAX)	0.508(MAX)
B1		0.055 (MAX)	1.397(MAX)
c		0.012 (MAX)	0.304 (MAX)
D		1.430 (MAX)	36.322 (MAX)
E		0.6 (TYP)	15.24 (TYP)
E1		0.52 (MAX)	13.208 (MAX)
e		0.100 (TYP)	2.540(TYP)
eB		0.625 (MAX)	15.87 (MAX)
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)



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28 pin 330 mil SOP Package Outline Dimension

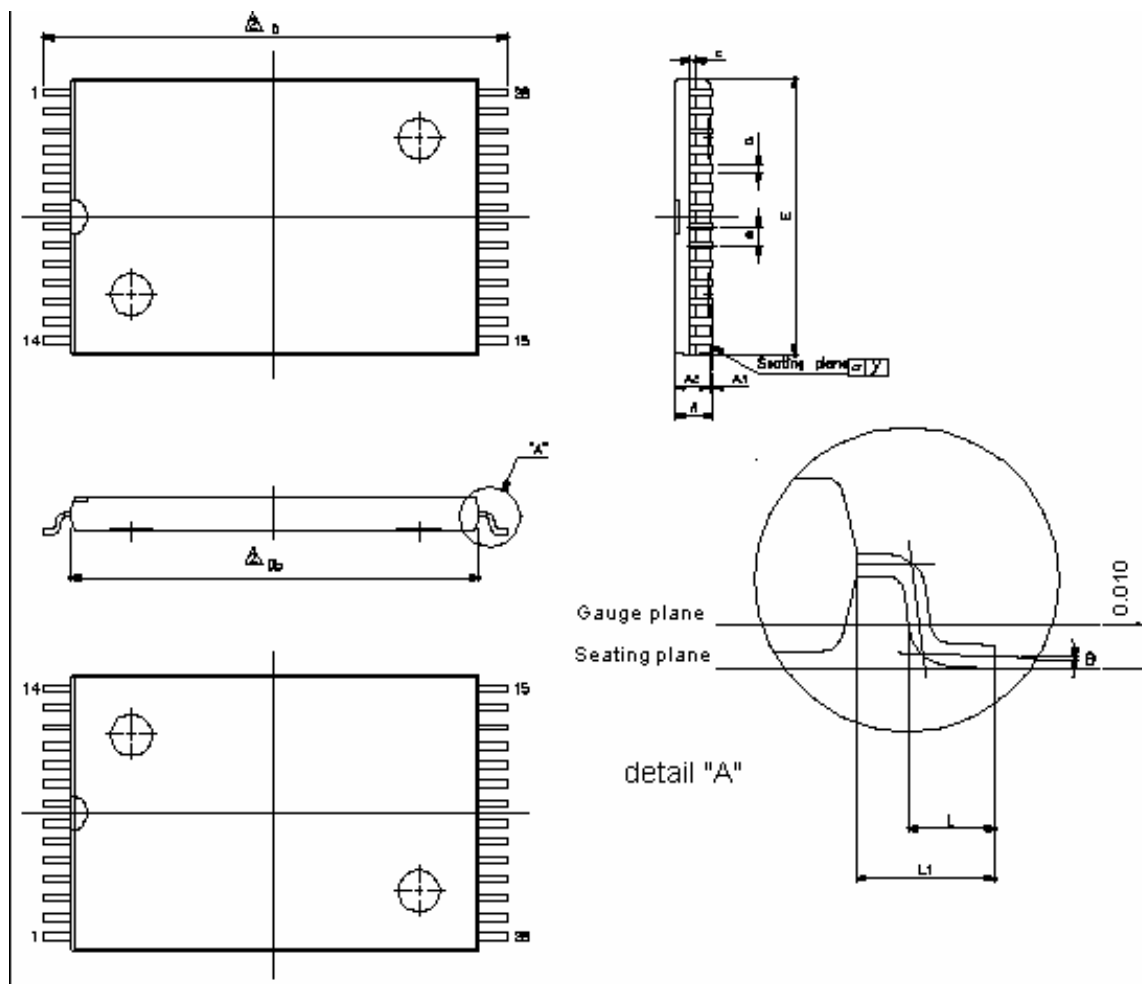


SYM.	UNIT	INCH(BASE)	MM(REF)
A		0.120 (MAX)	3.048 (MAX)
A1		0.002(MIN)	0.05(MIN)
A2		0.098±0.005	2.489±0.127
b		0.016 (TYP)	0.406(TYP)
c		0.010 (TYP)	0.254(TYP)
D		0.728 (MAX)	18.491 (MAX)
E		0.340 (MAX)	8.636 (MAX)
E1		0.465±0.012	11.811±0.305
e		0.050 (TYP)	1.270(TYP)
L		0.05 (MAX)	1.270 (MAX)
L1		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°



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28 pin 8mm x 13.4mm sTSP Package Outline Dimension



UNIT SYM.	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.



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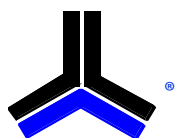
ORDERING INFORMATION

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
AS6C6264-55SCN	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



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