

262,144-word × 1 bit High Speed CMOS Static RAM
Description

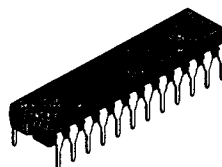
CXK51256P is 262,144-word × 1 bit high speed CMOS static RAM organized as 262,144-word by 1 bit and operates from a single 5V supply.

This device is suitable for use in high speed and low power applications.

Features

- Fast access time (Access time)
CXK51256P-35 35ns (Max.)
CXK51256P-45 45ns (Max.)
CXK51256P-55 55ns (Max.)
- Low power consumption (operation) :
100mW (Typ.)
- Single + 5V supply : 5V ± 10 %
- Fully static memory...No clock or timing strobe required.
- Equal access and cycle time.
- Separate data input and output.
- Three-state output.
- Directly TTL compatible : All input and output.
- High density : 300mil 24 pin plastic package

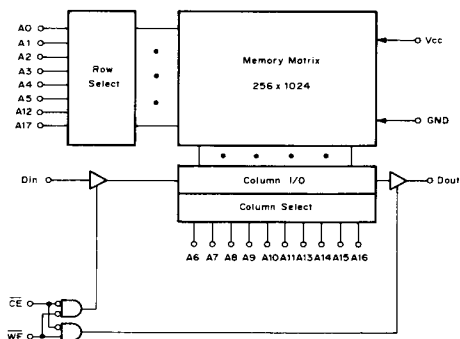
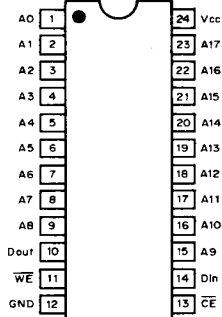
24 pin DIP (Plastic)


Function

262,144-word × 1 bit static RAM

Structure

Silicon gate CMOS IC

Block Diagram

**Pin Configuration
(Top View)**

Pin Description

Symbol	Description
A0 to A17	Address input
Din	Data input
Dout	Data output
CE	Chip enable input
WE	Write enable input
Vcc	+ 5V Power supply
GND	Ground

Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	V _{CC}	- 0.5* to + 7.0	V
Input voltage	V _{IN}	- 0.5* to V _{CC} + 0.5	V
Voltage applied to output	V _{OUT}	- 0.5* to V _{CC} + 0.5	V
Allowable power dissipation	P _D	1.0	W
Operating temperature	T _{opr}	0 to + 70	°C
Storage temperature	T _{stg}	- 55 to + 150	°C
Soldering temperature	T _{solder}	260 • 10	°C • sec

* **Note)** V_{CC}, V_{IN}, V_{OUT} min = - 3.5V for pulse width less than 20ns.

Truth Table

$\overline{CE}$	$\overline{WE}$	Mode	Data out	V _{CC} Current
H	X	Not selected	High Z	I _{SB1} , I _{SB2}
L	H	Read	Data out	I _{CC1} , I _{CC2}
L	L	Write	High Z	I _{CC1} , I _{CC2}

X: "H" or "L"

DC Recommended Operating Conditions

T_a = 0 to + 70 °C, GND = 0V

Item	Symbol	Min.	Typ.* ¹	Max.	Unit
Supply voltage	V _{CC}	4.5	5.0	5.5	V
Input high voltage	V _{IH}	2.2	—	V _{CC} + 0.3	V
Input low voltage	V _{IL}	- 0.3* ²	—	0.8	V

Note) *1. V_{CC} = 5V, T_a = 25 °C

*2. V_{IL} min = - 3.0V for pulse width less than 20ns.

Electrical Characteristics**DC and operating characteristics** $V_{CC} = 5V \pm 10\%$, $GND = 0V$, $T_a = 0$ to $+70^\circ C$

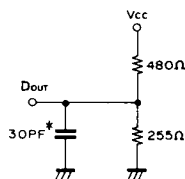
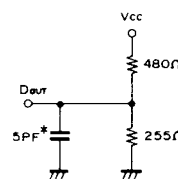
Item	Symbol	Test condition	- 35/45/55			Unit
			Min.	Typ.	Max.	
Input leakage current	I_{LI}	$V_{IN} = GND$ to V_{CC} $V_{CC} = 5.5V$	- 1	—	1	μA
Output leakage current	I_{LO}	$\overline{CE} = V_{IH}$ $V_{OUT} = GND$ to V_{CC}	- 1	—	1	μA
Operating power supply current	I_{CC1}	$\overline{CE} = V_{IL}$, $I_{OUT} = 0mA$, $V_{IN} = V_{IH}/V_{IL}$	—	20	45	mA
Average operating current	I_{CC2}	Cycle = Min, Duty = 100 % $I_{OUT} = 0mA$	—	55	85	mA
Standby current	I_{SB1}	$\overline{CE} \geq V_{CC} - 0.2V$, $V_{IN} \geq V_{CC} - 0.2V$ or $V_{IN} \leq 0.2V$	—	—	2	mA
	I_{SB2}	$\overline{CE} = V_{IH}$	—	15	30	mA
Output high voltage	V_{OH}	$I_{OH} = -4.0mA$	2.4	—	—	V
Output low voltage	V_{OL}	$I_{OL} = 8.0mA$	—	—	0.4	V

I/O capacitance $T_a = 25^\circ C$, $f = 1MHz$

Item	Symbol	Test condition	Min.	Max.	Unit
Input capacitance	C_{IN}	$V_{IN} = 0V$	—	7	pF
Output capacitance	C_{OUT}	$V_{OUT} = 0V$	—	7	pF

Note) This parameter is sampled and is not 100 % tested.**AC characteristics****● AC test conditions** $V_{CC} = 5V \pm 10\%$, $T_a = 0$ to $+70^\circ C$

Item	Condition
Input pulse high level	$V_{IH} = 3.0V$
Input pulse low level	$V_{IL} = 0V$
Input rise time	$t_R = 5ns$
Input fall time	$t_F = 5ns$
Input and output timing reference level	1.5V
Output load	Fig. 1

Output Load (1)**Output Load (2)****

* Including scope and jig

** For t_{LZ} , t_{HZ} , t_{OW} , t_{WHZ} **Fig. 1**

Read cycle

Item	Symbol	- 35		- 45		- 55		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
Read cycle time	t _{RC}	35	—	45	—	55	—	ns
Address access time	t _{AA}	—	35	—	45	—	55	ns
Chip enable access time ($\overline{\text{CE}}$)	t _{CO}	—	35	—	45	—	55	ns
Output hold from address change	t _{OH}	5	—	5	—	5	—	ns
Chip enable to output in low Z ($\overline{\text{CE}}$)	t _{LZ} *	5	—	5	—	5	—	ns
Chip disable to output in high Z	t _{HZ} *	0	20	0	20	0	25	ns
Chip enable to power up time	t _{PU}	0	—	0	—	0	—	ns
Chip disable to power down time	t _{PD}	—	30	—	30	—	30	ns

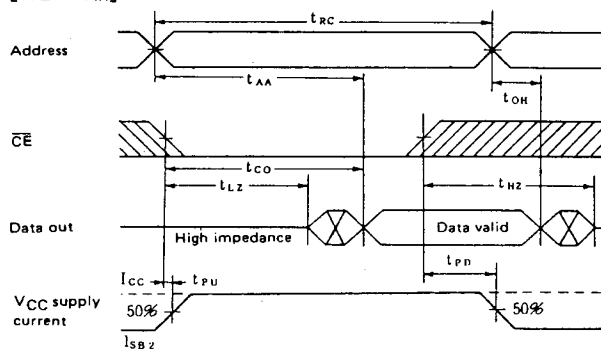
* **Note)** Transition is measured $\pm 200\text{mV}$ from steady voltage with specified loading in Fig. 1.
This parameter is sampled and is not 100% tested.

Write cycle

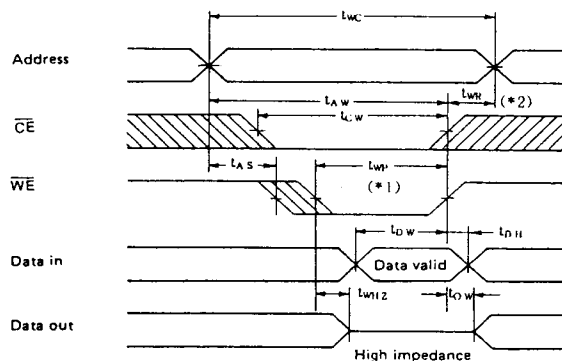
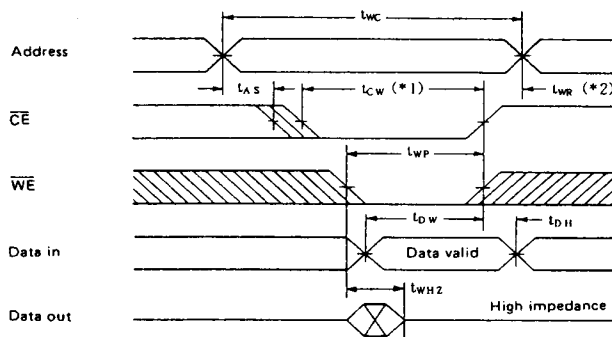
Item	Symbol	- 35		- 45		- 55		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
Write cycle time	t _{WC}	35	—	45	—	55	—	ns
Address valid to end of write	t _{AW}	30	—	35	—	45	—	ns
Chip enable to end of write	t _{CW}	30	—	35	—	45	—	ns
Data to write time overlap	t _{DW}	20	—	25	—	25	—	ns
Data hold from write time	t _{DH}	0	—	0	—	0	—	ns
Write pulse width	t _{WP}	25	—	25	—	35	—	ns
Address setup time	t _{AS}	0	—	0	—	0	—	ns
Write recovery time	t _{WR}	0	—	0	—	0	—	ns
Output active from end of write	t _{OW} *	5	—	5	—	5	—	ns
Write to output in high Z	t _{WHZ} *	0	20	0	20	0	25	ns

* **Note)** Transition is measured $\pm 200\text{mV}$ from steady voltage with specified loading in Fig. 1.
This parameter is sampled and is not 100% tested.

Timing Waveform

1) Read cycle [$\overline{WE} = V_{IH}$]

2) Write cycle

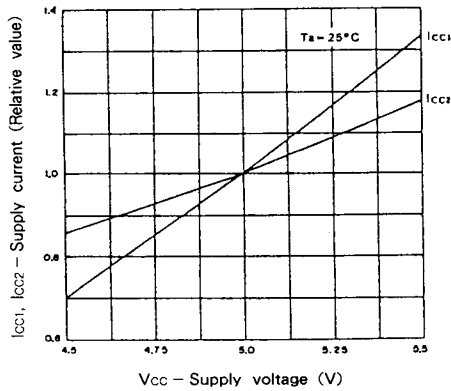
• Write cycle 1 : $\overline{WE}$ control• Write cycle 2 : $\overline{CE}$ control

* Note)

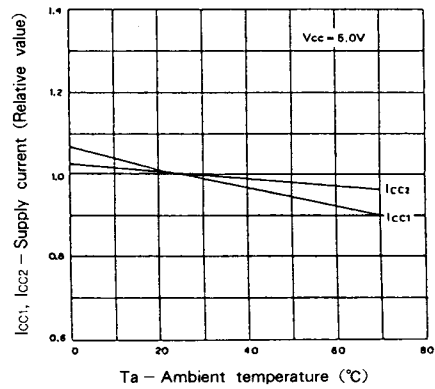
1. A write occurs during the low overlap of $\overline{CE}$ and $\overline{WE}$.
2. t_{WR} is measured from the earlier of $\overline{CE}$ or $\overline{WE}$ going high to the end of write cycle.

Example of Representative Characteristics

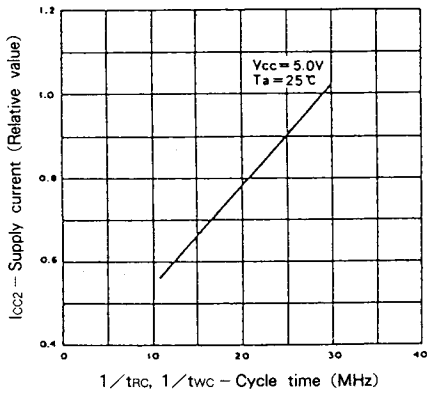
Supply current vs. Supply voltage



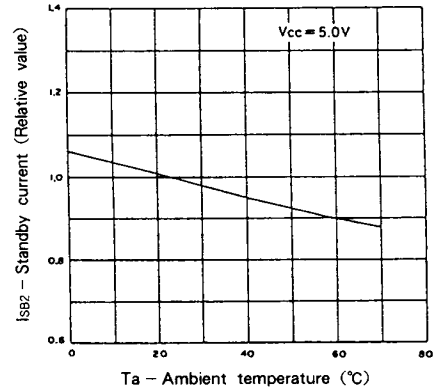
Supply current vs. Ambient temperature



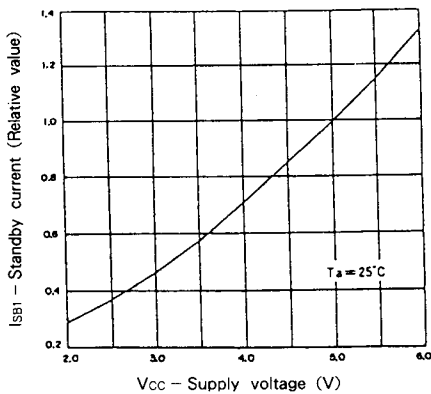
Supply current vs. Cycle time



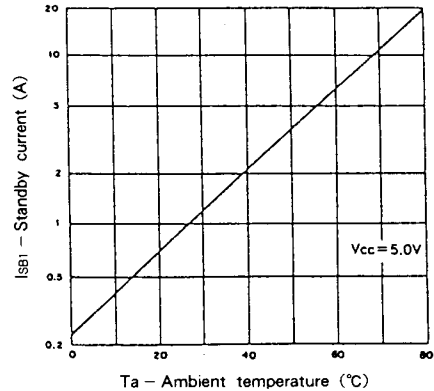
Standby current vs. Ambient temperature



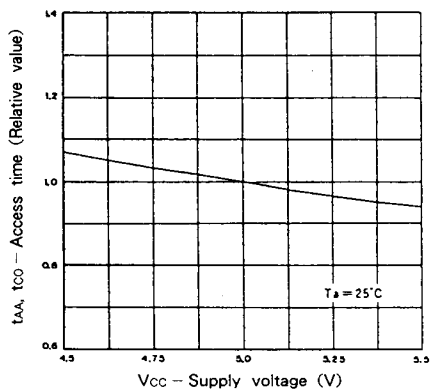
Standby current vs. Supply voltage



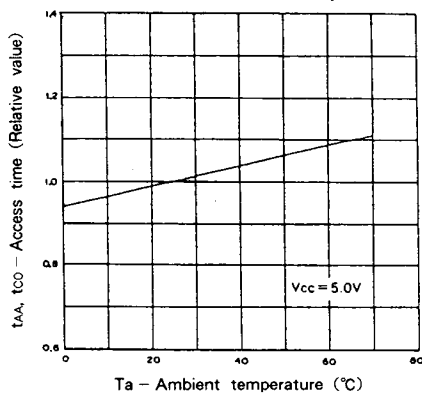
Standby current vs. Ambient temperature



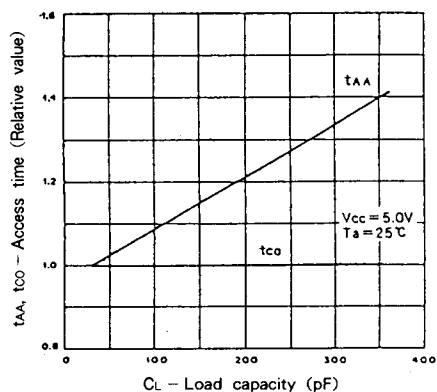
Access time vs. Supply voltage



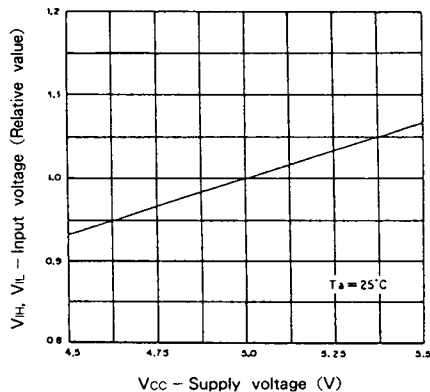
Access time vs. Ambient temperature



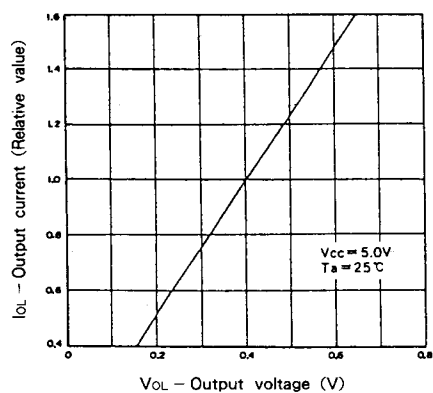
Access time vs. Load capacity



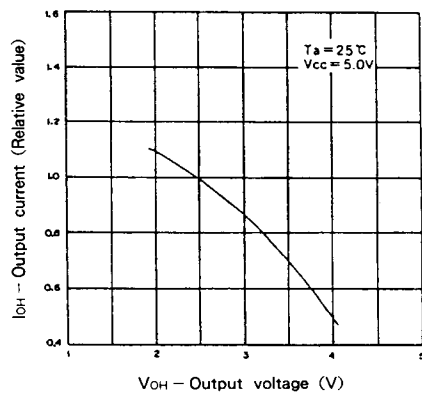
Input voltage vs. Supply voltage



Output current vs. Output voltage

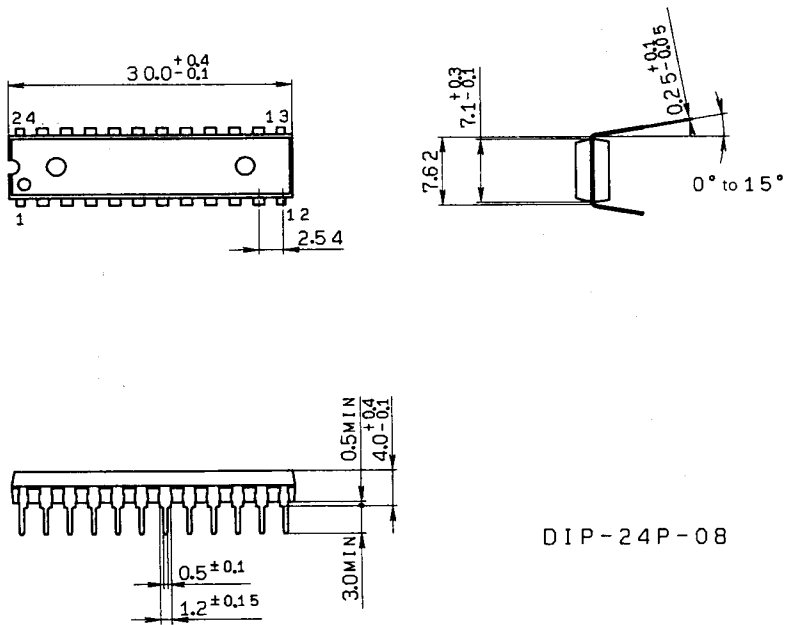


Output current vs. Output voltage



Package Outline Unit : mm

24 pin DIP (Plastic) 300mil 1.5g



DIP-24P-08