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512K x 32 SRAM MODULE

SYS32512ZK/LK - 020/025/30/35

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Description

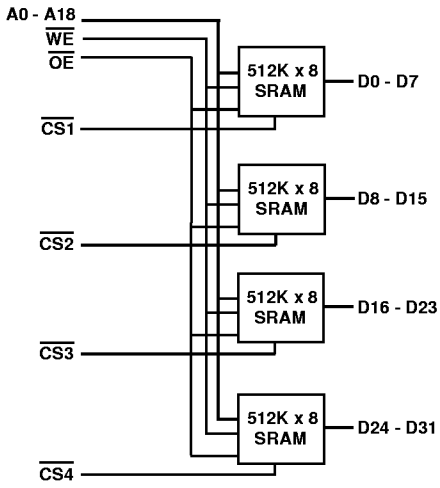
The SYS32512ZK/LK is plastic 16Mbit Static RAM Module housed in a 72 pin plastic SIMM, ZIP package organised as 512K x 32. The module utilises four fast 512K x 8 SRAMs housed in SOJ packages, mounted on one side of an FR4 epoxy substrate to achieve a very high density module.

The module has four Chip Selects, which when used correctly allow reading and writing to individual bytes or words. The pins PD0-3, are used to identify module memory density in applications where alternative modules can be interchanged.

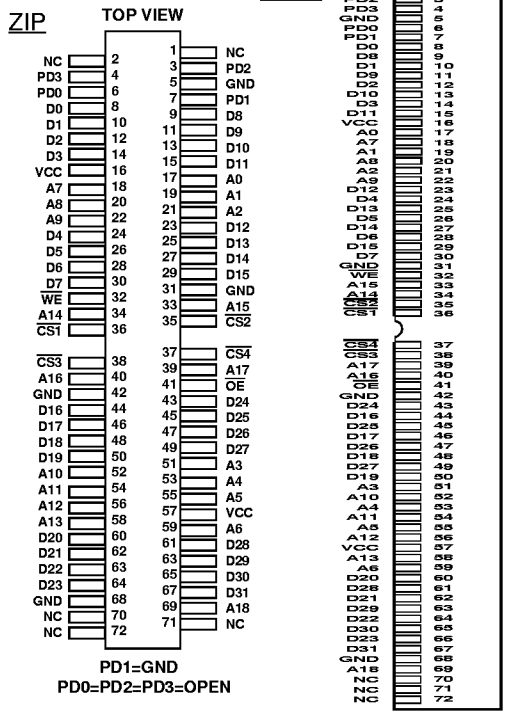
Features

- Access Times of 020/025/30/35 ns.
- 72 Pin ZIP, SIMM package
- 5 Volt Supply ± 10%.
- Low Power Dissipation:
  Operational 4.4 W (maximum).
  Standby (-L Version) 11 mW (maximum).
- Completely Static Operation.
- On-board Supply Decoupling Capacitors.
- Upgrade path to SYS321000ZK/LK.

Block Diagram



Pin Definition



Pin Functions

Address Inputs	**A0~A18**
Data Input/Output	**D0~D31**
Chip Select	**$\overline{CS1}$~4**
Presence Detect	**PD0~3**
Write Enable	**$\overline{WE}$**
Output Enable	**$\overline{OE}$**
No Connect	**NC**
Power (+5V)	**V_{CC}**
Ground	**GND**

Package Details

Plastic 72 Pin SIMM

Plastic 72 Pin ZIP

DC OPERATING CONDITIONS

Absolute Maximum Ratings (1)

Parameter	*Symbol*	*Min*	*Typ*	*Max*	*Unit*
Voltage on any pin relative to V_{SS}	V_T (2)	-0.3	-	7.0	V
Power Dissipation	P_T	-	-	4.0	W
Storage Temperature	T_{STG}	-55	-	125	°C

Notes : (1) Stresses above those listed may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(2) V_T can be -2.0V pulse of less than 2 ns.

Recommended Operating Conditions

Parameter		*Symbol*	*Min*	*Typ*	*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	-	0.8	V
Operating Temperature	(Commercial)	T_A	0	-	70	°C
	(Industrial)	T_{AI}	-40	-	85	°C

DC Electrical Characteristics (V_{CC}=5V±10%) T_A 0 to 70 °C

Parameter		*Symbol*	*Test Condition*	*Min*	*Typ*	*max*	*Unit*
I/P Leakage Current	Address,$\overline{OE}$,$\overline{WE}$	I_{LI}	$0V \le V_{IN} \le V_{CC}$	-8	-	8	µA
Output Leakage Current	Worst Case	I_{LO}	$\overline{CS}$ = V_{IH}, $V_{I/O}$ = GND to V_{CC}	-8	-	8	µA
Average Supply Current	32-bit	I_{CC1}	Min. Cycle, $\overline{CS}$ = V_{IL}, $V_{IL} \le V_{IN} \le V_{IH}$	-	-	800	mA
Standby Supply Current	TTL	I_{SB1}	$\overline{CS}$ = V_{IH}	-	-	240	mA
	CMOS	I_{SB2}	$\overline{CS} \ge V_{CC}$-0.2V, $0.2 \le V_{IN} \le V_{CC}$-0.2V	-	-	60	mA
	-L Version (CMOS)	I_{SB3}	$\overline{CS} \ge V_{CC}$-0.2V, $0.2 \le V_{IN} \le V_{CC}$-0.2V	-	-	2	mA
Output Voltage		V_{OL}	I_{OL} = 8.0mA	-	-	0.4	V
		V_{OH}	I_{OH} = -4.0mA	2.4	-	-	V

Typical values are at V_{CC}=5.0V, T_A=25°C and specified loading. $\overline{CS}$ above refers to $\overline{CS1}$~4.

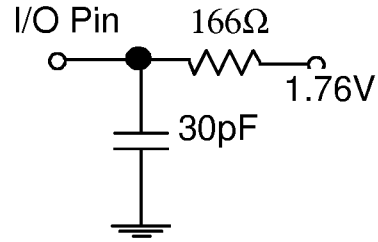
Capacitance (V_{CC}=5V±10%, T_A=25°C) Note: Capacitance calculated, not measured.

Parameter	*Symbol*	*Test Condition*	*max*	*Unit*
Input Capacitance (Address,$\overline{OE}$,$\overline{WE}$)	C_{IN1}	V_{IN} = 0V	24	pF
I/P Capacitance (other)	C_{IN2}	V_{IN} = 0V	6	pF
I/O Capacitance	$C_{I/O}$	$V_{I/O}$ = 0V	40	pF

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: see diagram
* V_{CC}=5V±10%

Output Load



Operation Truth Table

$\overline{CS}$	$\overline{OE}$	$\overline{WE}$	*DATA PINS*	*SUPPLY CURRENT*	*MODE*
H	X	X	High Impedance	I_{SB1} , I_{SB2} , I_{SB3}	Standby
L	L	H	Data Out	I_{CC1}	Read
L	H	L	Data In	I_{CC1}	Write
L	L	L	Data In	I_{CC1}	Write
L	H	H	High-Impedance	I_{SB1} , I_{SB2} , I_{SB3}	High-Z

Notes : H = V_{IH} : L =V_{IL} : X = V_{IH} or V_{IL}

Low V_{cc} Data Retention Characteristics - L Version Only

Parameter	*Symbol*	*Test Condition*	*min*	*typ(1)*	*max*	*Unit*
V_{CC} for Data Retention	V_{DR}	$\overline{CS} \geq V_{CC}$-0.2V				
Data Retention Current		V_{CC} = 3.0V, $\overline{CS} \geq V_{CC}$-0.2V	2.0	-	5.5	V
	I_{CCDR1} (2)	$T_{OP} = T_A$	-	-	1.0	mA
Chip Deselect to Data Retention Time	t_{CDR}	See Retention Waveform	0	-	-	ns
Operation Recovery Time	t_R	See Retention Waveform	5	-	-	ms

Notes (1) Typical figures are measured at 25°C.
(2) This parameter is guaranteed not tested.

AC OPERATING CONDITIONS

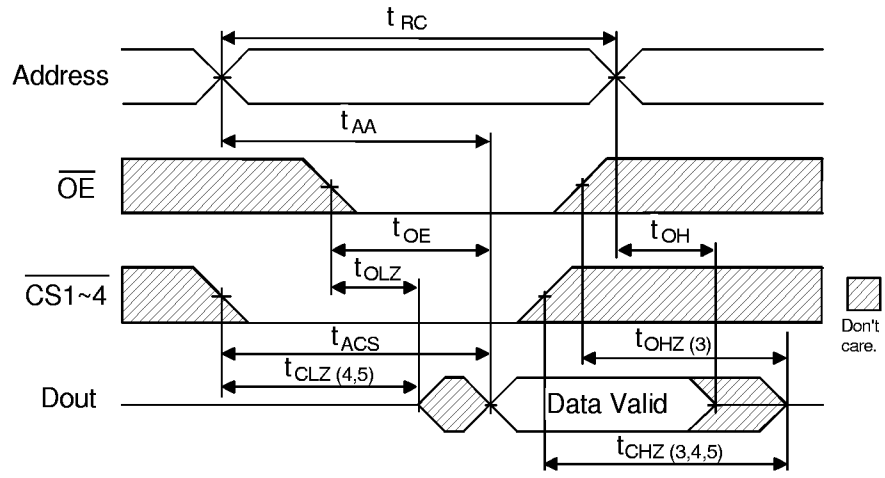
Read Cycle

		-20		-25		-30		-35		
Parameter	Symbol	min	max	min	max	min	max	min	max	Unit
Read Cycle Time	t_{RC}	20	-	25	-	30	-	35	-	ns
Address Access Time	t_{AA}	-	20	-	25	-	30	-	35	ns
Chip Select Access Time	t_{ACS}	-	20	-	25	-	30	-	35	ns
Output Enable to Output Valid	t_{OE}	-	10	-	12	-	14	-	16	ns
Output Hold from Address Change	t_{OH}	3	-	3	-	3	-	3	-	ns
Chip Selection to Output in Low Z	t_{CLZ}	3	-	3	-	3	-	3	-	ns
Output Enable to Output in Low Z	t_{OLZ}	0	-	0	-	0	-	0	-	ns
Chip Deselection to O/P in High Z	t_{CHZ}	0	8	0	10	0	13	0	15	ns
Output Disable to Output in High Z	t_{OHZ}	0	8	0	10	0	13	0	15	ns

Write Cycle

		-20		-25		-30		-35		
Parameter	Symbol	min	max	min	max	min	max	min	max	Unit
Write Cycle Time	t_{WC}	20	-	25	-	30	-	35	-	ns
Chip Selection to End of Write	t_{CW}	15	-	17	-	20	-	25	-	ns
Address Valid to End of Write	t_{AW}	15	-	17	-	20	-	25	-	ns
Address Setup Time	t_{AS}	0	-	0	-	0	-	0	-	ns
Write Pulse Width	t_{WP}	15	-	17	-	20	-	25	-	ns
Write Recovery Time	t_{WR}	3	-	3	-	3	-	3	-	ns
Write to Output in High Z	t_{WHZ}	0	8	0	10	0	12	0	12	ns
Data to Write Time Overlap	t_{DW}	10	-	12	-	15	-	15	-	ns
Data Hold from Write Time	t_{DH}	0	-	0	-	0	-	0	-	ns
Output active from End of Write	t_{OW}	0	-	0	-	0	-	0	-	ns

Read Cycle Timing Waveform (1,2)



AC Read Characteristics Notes

(1) $\overline{WE}$ is High for Read Cycle.

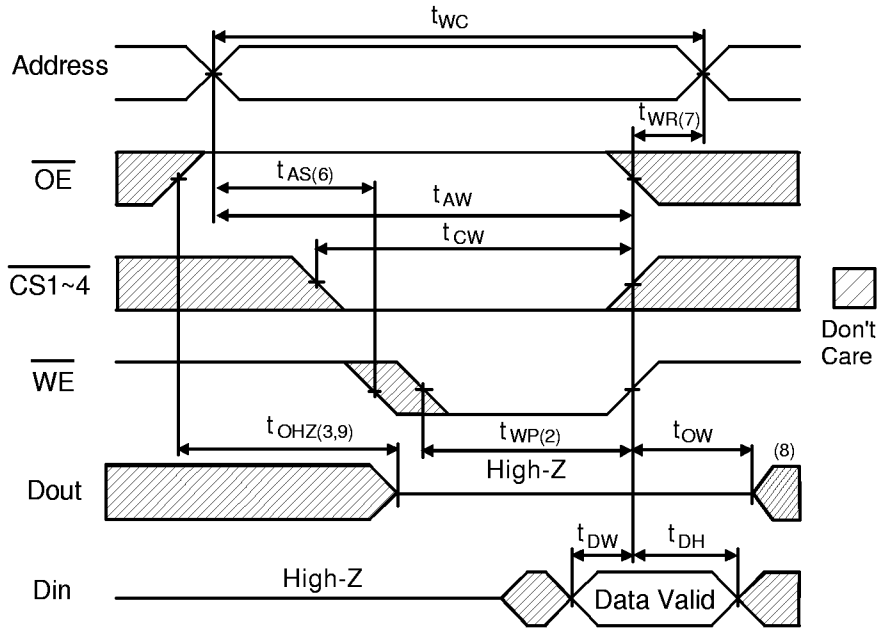
(2) All read cycle timing is referenced from the last valid address to the first transition address.

(3) t_{CHZ} and t_{OHZ} are defined as the time at which the outputs achieve open circuit conditions and are not referenced to output voltage levels.

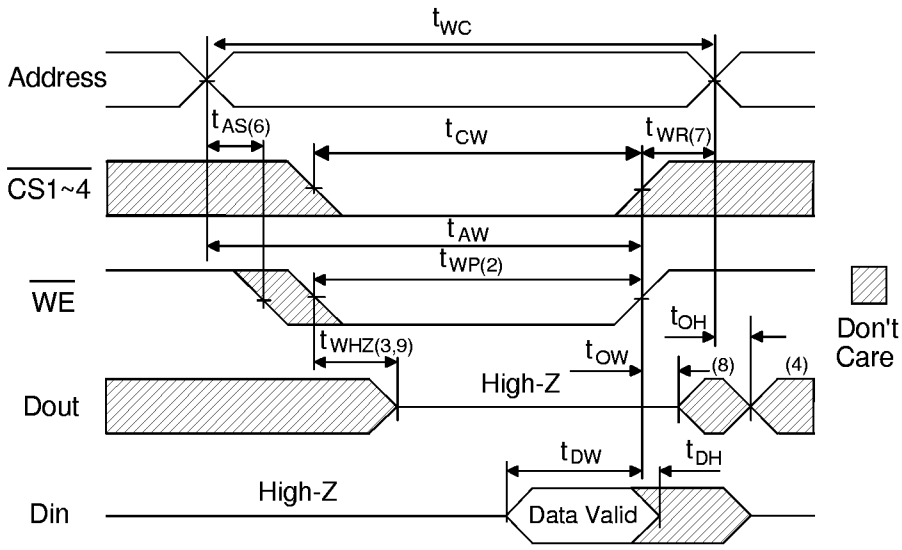
(4) At any given temperature and voltage condition, t_{CHZ} (max) is less than t_{CLZ} (min) both for a given module and from module to module.

(5) These parameters are sampled and not 100% tested.

Write Cycle No.1 Timing Waveform (1,4)



Write Cycle No.2 Timing Waveform (1,5)



AC Write Characteristics Notes

(1) All write cycle timing is referenced from the last valid address to the first transition address.

(2) All writes occur during the overlap of $\overline{CS1\sim4}$ and $\overline{WE}$ low.

(3) If $\overline{OE}$, $\overline{CS1\sim4}$, and $\overline{WE}$ are in the Read mode during this period, the I/O pins are low impedance state. Inputs of opposite phase to the output must not be applied because bus contention can occur.

(4) Dout is the Read data of the new address.

(5) $\overline{OE}$ is continuously low.

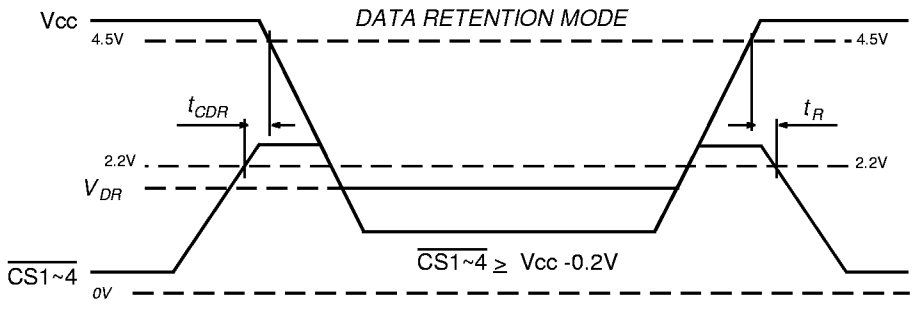
(6) Address is valid prior to or coincident with $\overline{CS1\sim4}$ and $\overline{WE}$ low, too avoid inadvertant writes.

(7) $\overline{CS1\sim4}$ or $\overline{WE}$ must be high during address transitions.

(8) When $\overline{CS1\sim4}$ are low : I/O pins are in the output state. Input signals of opposite phase leading to the output should not be applied.

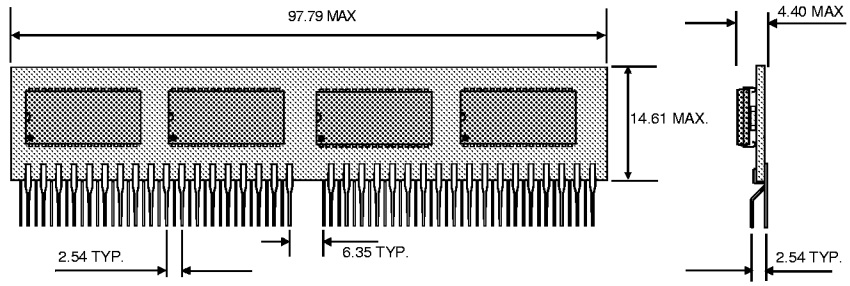
(9) Defined as the time at which the outputs achieve open circuit conditions and are not referenced to output voltage levels. These parameters are sampled and not 100% tested.

Data Retention Waveform

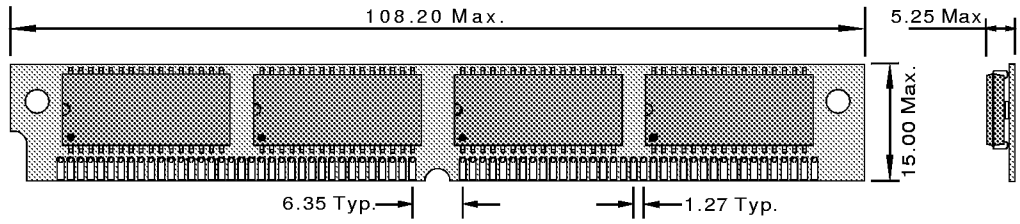


Package Information Dimensions in mm

Plastic 72 Pin ZIP



Plastic 72 Pin SIMM



Ordering Information

SYS32512 ZK/LK LI - 020

Speed	020	= 20 ns
	025	= 25 ns
	30	= 30 ns
	35	= 35 ns
Temperature range	Blank	= Commercial Temp.
	I	= Industrial Temp.
Power Consumption	Blank	= Standard Part
	L	= Low Power Part
Package	ZK	= Plastic 72 Pin ZIP
	LK	= Plastic 72 Pin SIMM
Organisation	32512	= 512K X 32
Memory Type	SYS	= Static RAM

Note :

Although this data is believed to be accurate, the information contained herein is not intended to and does not create any warranty of merchantibility or fitness for a particular purpose.

Our products are subject to a constant process of development. Data may be changed at any time without notice.

Products are not authorised for use as critical components in life support devices without the express written approval of a company director.