



512Kx8 MONOLITHIC SRAM

ADVANCED*

EVOLUTIONARY PINOUT

32 DIP
32 CSOJ (DE)

TOP VIEW

A18	1	32	VCC
A16	2	31	A15
A14	3	30	A17
A12	4	29	$\overline{WE}$
A7	5	28	A13
A6	6	27	A8
A5	7	26	A9
A4	8	25	A11
A3	9	24	$\overline{OE}$
A2	10	23	A10
A1	11	22	CS
A0	12	21	I/O7
I/O0	13	20	I/O6
I/O1	14	19	I/O5
I/O2	15	18	I/O4
GND	16	17	I/O3

PIN DESCRIPTION

A0-18	Address Inputs
I/O0-7	Data Input/Output
$\overline{CS}$	Chip Select
$\overline{OE}$	Output Enable
$\overline{WE}$	Write Enable
VCC	+3.3V Power Supply
GND	Ground

FEATURES

- Access Times 70, 85, 100, 120ns
- MIL-STD-883 Compliant Devices Available
- Low Voltage Operation
- Evolutionary, Corner Power/Ground Pinout
JEDEC Approved
 - 32 pin Ceramic DIP (Package 300)
 - 32 lead Ceramic SOJ (Package 101)
- Commercial, Industrial and Military Temperature Ranges
- Low Power CMOS
- Low Voltage Operation
 - 3.3V $\pm$ 10% Power Supply
- Low Power Data Retention
- TTL Compatible Inputs and Outputs

* Advanced product, which may or may not be under development, and is subject to change or cancellation without notice.



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Operating Temperature	T _A	-55	+125	°C
Storage Temperature	T _{STG}	-65	+150	°C
Signal Voltage Relative to GND	V _G	-0.5	V _{CC} +0.5	V
Junction Temperature	T _J		150	°C
Supply Voltage	V _{CC}	-0.5	7.0	V

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{CC}	3.0	3.6	V
Input High Voltage	V _{IH}	2.2	V _{CC} + 0.3	V
Input Low Voltage	V _{IL}	-0.3	+0.8	V
Operating Temp. (Mil.)	T _A	-55	+125	°C

TRUTH TABLE

$\overline{CS}$	$\overline{OE}$	$\overline{WE}$	Mode	Data I/O	Power
H	X	X	Standby	High Z	Standby
L	L	H	Read	Data Out	Active
L	X	L	Write	Data In	Active
L	H	H	Out Disable	High Z	Active

CAPACITANCE

(T_A = +25°C)

Parameter	Symbol	Condition	Max	Unit
Input capacitance	C _{IN}	V _{IN} = 0V, f = 1.0MHz	12	pF
Output capacitance	C _{OUT}	V _{OUT} = 0V, f = 1.0MHz	12	pF

This parameter is guaranteed by design but not tested.

DC CHARACTERISTICS

(V_{CC} = 3.3V, GND = 0V, T_A = -55°C to +125°C)

Parameter	Symbol	Conditions	Min		Units
				Max	
Input Leakage Current	I _{LI}	V _{CC} = 3.6, V _{IN} = GND to V _{CC}		10	μA
Output Leakage Current	I _{LO}	$\overline{CS}$ = V _{IH} , $\overline{OE}$ = V _{IH} , V _{OUT} = GND to V _{CC}		10	μA
Operating Supply Current	I _{CC}	$\overline{CS}$ = V _{IL} , $\overline{OE}$ = V _{IH} , f = 5MHz, V _{CC} = 3.6		25	mA
Standby Current	I _{SB}	$\overline{CS}$ = V _{IH} , $\overline{OE}$ = V _{IH} , f = 5MHz, V _{CC} = 3.6		400	μA
Output Low Voltage	V _{OL}	I _{OL} = 2.1mA, V _{CC} = 3.0		0.4	V
Output High Voltage	V _{OH}	I _{OH} = -1.0mA, V _{CC} = 3.0	2.4		V

NOTE: DC test conditions: V_{IH} = V_{CC} - 0.3V, V_{IL} = 0.3V



AC CHARACTERISTICS

(V_{CC} = 3.3V, GND = 0V, T_A = -55°C to +125°C)

Parameter	Symbol	-70		-85		-100		-120		Units
		Min	Max	Min	Max	Min	Max	Min	Max	
Read Cycle Time	t _{RC}	70		85		100		120		ns
Address Access Time	t _{AA}		70		85		100		120	ns
Output Hold from Address Change	t _{OH}	5		5		5		5		ns
Chip Select Access Time	t _{ACS}		70		85		100		120	ns
Output Enable to Output Valid	t _{OE}		35		40		50		60	ns
Chip Select to Output in Low Z	t _{CLZ} ¹	10		10		10		10		ns
Output Enable to Output in Low Z	t _{OLZ} ¹	5		5		5		5		ns
Chip Disable to Output in High Z	t _{CHZ} ¹		25		25		35		35	ns
Output Disable to Output in High Z	t _{OHZ} ¹		25		25		35		35	ns

1. This parameter is guaranteed by design but not tested.

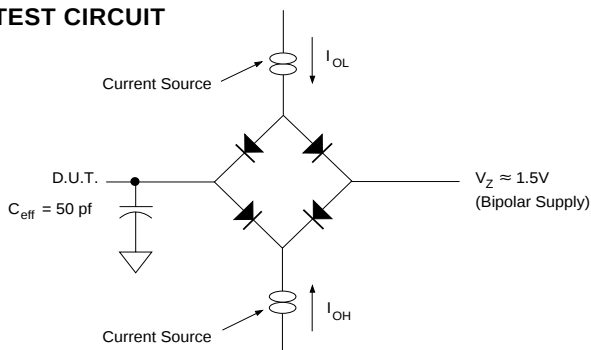
AC CHARACTERISTICS

(V_{CC} = 3.3V, GND = 0V, T_A = -55°C to +125°C)

Parameter	Symbol	-70		-85		-100		-120		Units
		Min	Max	Min	Max	Min	Max	Min	Max	
Write Cycle Time	t _{WC}	70		85		100		120		ns
Chip Select to End of Write	t _{CW}	60		75		80		100		ns
Address Valid to End of Write	t _{AW}	60		75		80		100		ns
Data Valid to End of Write	t _{DW}	30		35		40		40		ns
Write Pulse Width	t _{WP}	50		50		60		60		ns
Address Setup Time	t _{AS}	0		0		0		0		ns
Address Hold Time	t _{AH}	5		5		5		5		ns
Output Active from End of Write	t _{OW} ¹	5		5		5		5		ns
Write Enable to Output in High Z	t _{WHZ} ¹		25		25		35		35	ns
Data Hold from Write Time	t _{DH}	0		0		0		0		ns

1. This parameter is guaranteed by design but not tested.

AC TEST CIRCUIT



AC TEST CONDITIONS

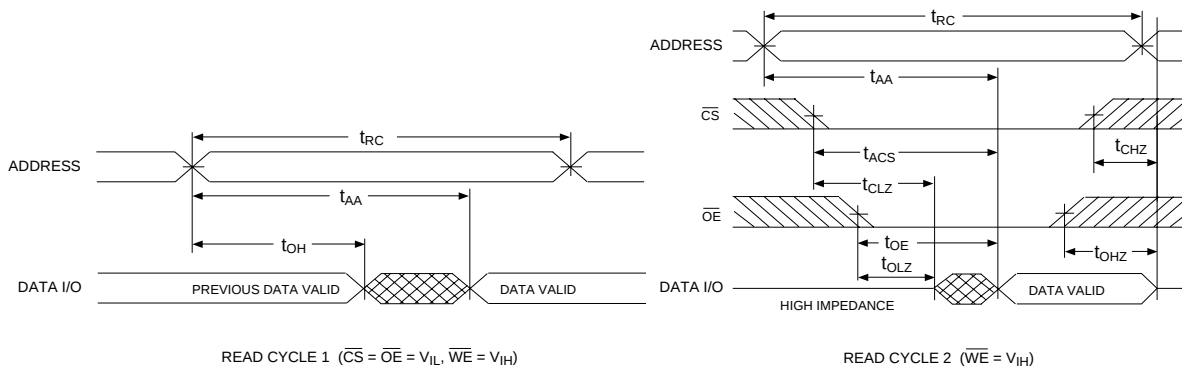
Parameter	Typ	Unit
Input Pulse Levels	V _{IL} = 0, V _{IH} = 3.0	V
Input Rise and Fall	5	ns
Input and Output Reference Level	1.5	V
Output Timing Reference Level	1.5	V

NOTES:

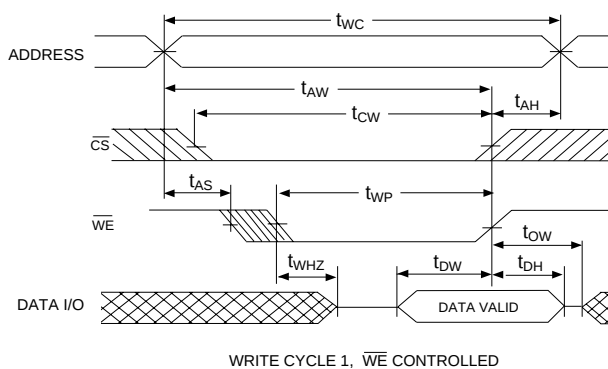
V_Z is programmable from -2V to +7V.
I_{OL} & I_{OH} programmable from 0 to 16mA.
Tester Impedance Z₀ = 75 Ω.
V_Z is typically the midpoint of V_{OH} and V_{OL}.
I_{OL} & I_{OH} are adjusted to simulate a typical resistive load circuit.
ATE tester includes jig capacitance.



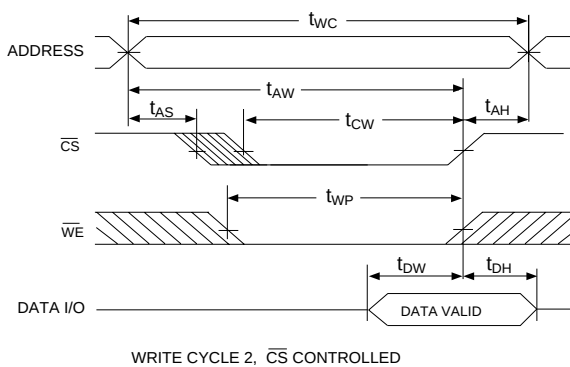
TIMING WAVEFORM - READ CYCLE



WRITE CYCLE - $\overline{WE}$ CONTROLLED

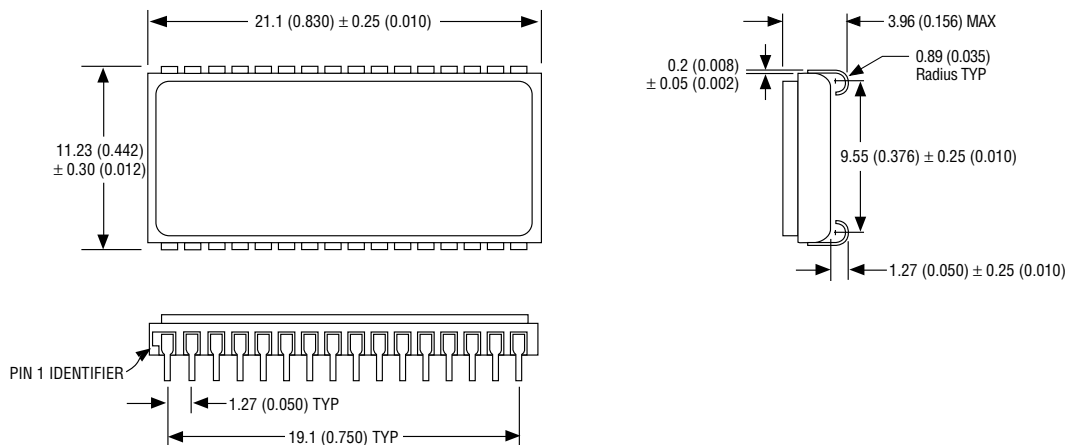


WRITE CYCLE - $\overline{CS}$ CONTROLLED



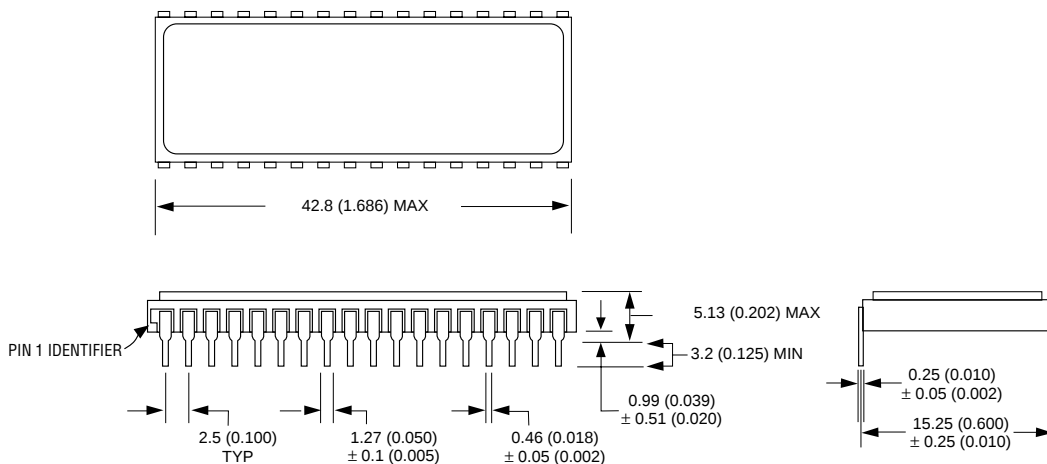


PACKAGE 101: 32 LEAD, CERAMIC SOJ



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

PACKAGE 300: 32 PIN, CERAMIC DIP, SINGLE CAVITY SIDE BRAZED



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES



ORDERING INFORMATION

W M S 512K 8 V L - XXX X X X X

LEAD FINISH:

Blank = Gold plated leads

A = Solder dip leads

SPECIAL PROCESSING:

E = Epitaxial Layer

DEVICE GRADE:

M = Military Screened -55°C to +125°C

I = Industrial -40°C to +85°C

C = Commercial 0°C to +70°C

PACKAGE:

C = 32 Pin Ceramic 0.600" DIP (Package 300)

DE = 32 Lead Ceramic SOJ (Package 101) Evolutionary

ACCESS TIME (ns)

IMPROVEMENT MARK

L = Low Power Data Retention

Low Voltage Supply 3.3V ± 10%

ORGANIZATION, 512K x 8

SRAM

MONOLITHIC

WHITE ELECTRONIC DESIGNS CORP.