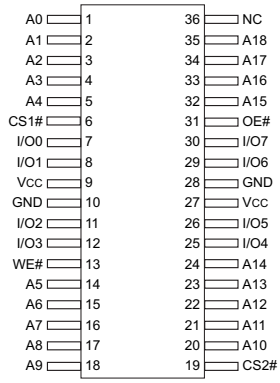
2x512Kx8 DUALITHIC™ SRAM

FEATURES

- Access Times 17, 20, 25, 35, 45, 55ns
- Revolutionary, Center Power/Ground Pinout
- Packaging:
  - 32 pin, Hermetic Ceramic DIP (Package 300)
  - 36 lead Ceramic SOJ (Package 100)
  - 36 lead Ceramic Flatpack (Package 226)
- Organized as two banks of 512Kx8
- Commercial, Industrial and Military Temperature Ranges
- 5 Volt Power Supply
- Low Power CMOS
- TTL Compatible Inputs and Outputs

PIN CONFIGURATION FOR WS1M8-XDJX AND WS1M8-XFX

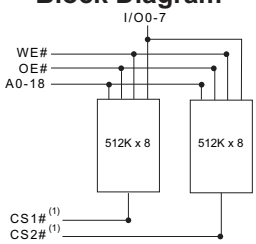
36 CSOJ
36 FLATPACK
TOP VIEW



Pin Description

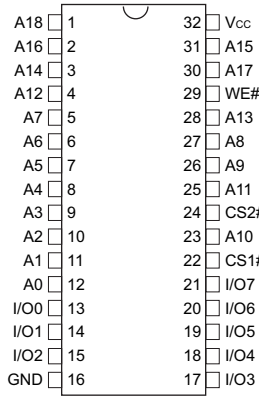
A0-18	Address Inputs
I/O0-7	Data Input/Output
CS1-2#	Chip Selects
OE#	Output Enable
WE#	Write Enable
VCC	+5.0V Power
GND	Ground

Block Diagram



PIN CONFIGURATION FOR WS1M8-XCX

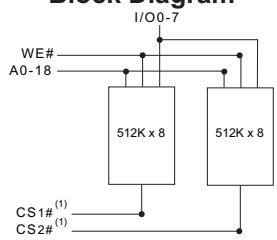
32 DIP
TOP VIEW



Pin Description

A0-18	Address Inputs
I/O0-7	Data Input/Output
CS1-2#	Chip Selects
WE#	Write Enable
VCC	+5.0V Power
GND	Ground

Block Diagram



NOTE:
1. CS1# and CS2# are used to select the lower and upper 512Kx8 of the device. CS1# and CS2# must not be enabled at the same time.

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

TRUTH TABLE

CS#	OE#	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

NOTE: OE# is internally tied to the GND and not accessible on the WS1M8-XCXX.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	4.5	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 Temp. (Mil.)	T_A	-55	+125	°C

CAPACITANCE

T_A = +25°C

Parameter	Symbol	Condition	Max	Unit
Input capacitance	C_{IN}	V_{IN} = 0V, f = 1.0MHz	20	pF
Output capicitance	C_{OUT}	V_{OUT} = 0V, f = 1.0MHz	20	pF

This parameter is guaranteed by design but not tested.

DC CHARACTERISTICS

V_{CC} = 5.0V, V_{SS} = 0V, -55°C ≤ T_A ≤ +125°C

Parameter	Sym	Conditions	Min	Max	Units
Input Leakage Current	I_{LI}	V_{CC} = 5.5, V_{IN} = GND to V_{CC}		10	µA
Output Leakage Current	I_{LO}[1]	CS# = V_{IH}, OE# = V_{IH}, V_{OUT} = GND to V_{CC}		10	µA
Operating Supply Current	I_{CC}[1]	CS# = V_{IL}, OE# = V_{IH}, f = 5MHz, V_{CC} = 5.5		180	mA
Standby Current	I_{SB}[1]	CS# = V_{IH}, OE# = V_{IH}, f = 5MHz, V_{CC} = 5.5		40	mA
Output Low Voltage	V_{OL}	I_{OL} = 6mA		0.4	V
Output High Voltage	V_{OH}	I_{OH} = -4.0mA	2.4		V

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

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AC CHARACTERISTICS

V_{CC} = 5.0V, V_{SS} = 0V, -55°C ≤ T_A ≤ +125°C

Parameter Read Cycle	Symbol	-17		-20		-25		-35		-45		-55		Units
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Read Cycle Time	t_{RC}	17		20		25		35		45		55		ns
Address Access Time	t_{AA}		17		20		25		35		45		55	ns
Output Hold from Address Change	t_{OH}	0		0		0		0		0		0		ns
Chip Select Access Time	t_{ACS}		17		20		25		35		45		55	ns
Output Enable to Output Valid	t_{OE}[2]		9		10		12		25		25		25	ns
Chip Select to Output in Low Z	t_{CLZ}[1]	2		2		2		4		4		4		ns
Output Enable to Output in Low Z	t_{OLZ}[2]	0		0		0		0		0		0		ns
Chip Disable to Output in High Z	t_{CHZ}[1]		9		10		12		15		20		20	ns
Output Disable to Output in High Z	t_{OHZ}[2]		9		10		12		15		20		20	ns

1. This parameter is guaranteed by design but not tested.
2. OE# is internally tied to the GND and not accessible on the WS1M8-XCXX.

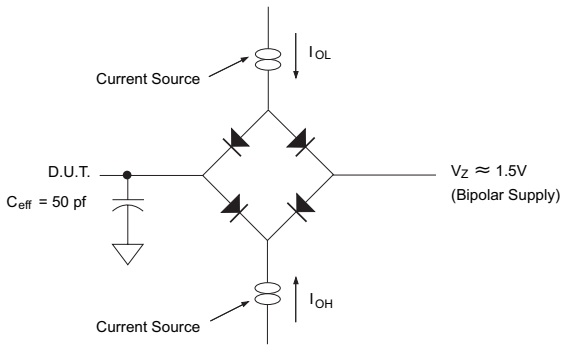
AC CHARACTERISTICS

V_{CC} = 5.0V, V_{SS} = 0V, -55°C ≤ T_A ≤ +125°C

Parameter Write Cycle	Symbol	-17		-20		-25		-35		-45		-55		Units
Write Cycle Time	t_{WC}	17		20		25		35		45		55		ns
Chip Select to End of Write	t_{CW}	14		14		15		25		35		50		ns
Address Valid to End of Write	t_{AW}	14		14		15		25		35		50		ns
Data Valid to End of Write	t_{DW}	9		10		10		20		25		25		ns
Write Pulse Width	t_{WP}	14		14		15		25		35		40		ns
Address Setup Time	t_{AS}	0		0		0		0		0		0		ns
Address Hold Time	t_{AH}	0		0		0		0		5		5		ns
Output Active from End of Write	t_{OW}[1]	2		3		4		4		5		5		ns
Write Enable to Output in High Z	t_{WHZ}[1]		9		9		10		15		15		25	ns
Data Hold Time	t_{DH}	0		0		0		0		0		0		ns

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

AC TEST CIRCUIT

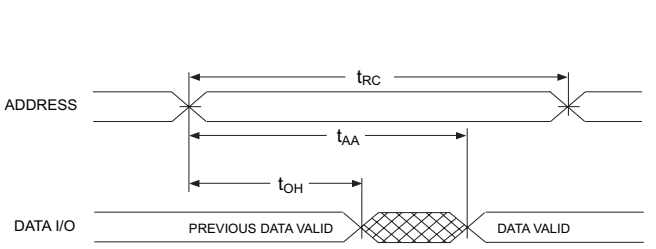


AC TEST CONDITIONS

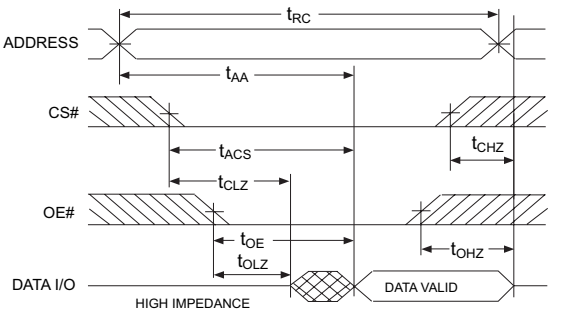
Parameter	Typ	Unit
Input Pulse Levels	VIL = 0, VIH = 3.0	V
Input Rise and Fall	5	ns
Input and Output Reference Level	1.5	V
Output Timing Reference Level	1.5	V

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



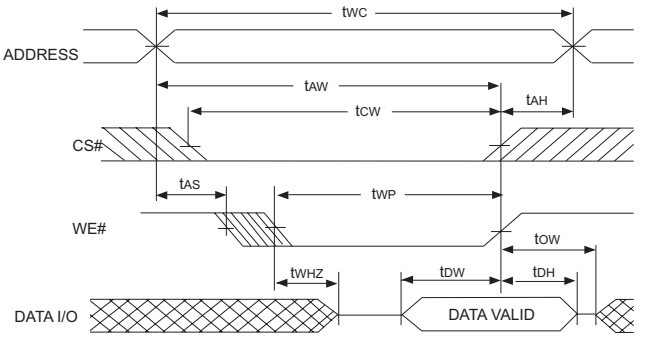
READ CYCLE 1 (CS# = OE# = V_{IL}, WE# = V_{IH})



READ CYCLE 2 (WE# = V_{IH})

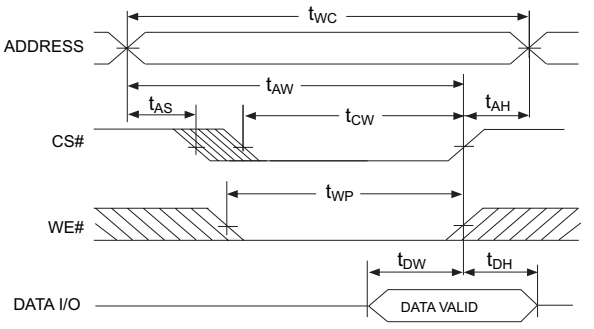
NOTE: OE# is internally tied to the GND and not accessible on the WS1M8-XCXX.

WRITE CYCLE – WE# CONTROLLED



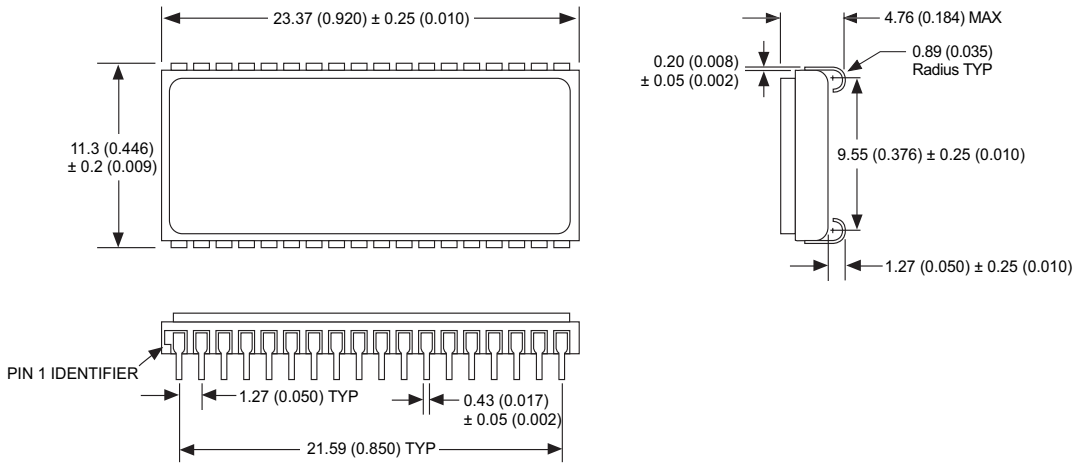
WRITE CYCLE 1, WE# CONTROLLED

WRITE CYCLE – CS# CONTROLLED



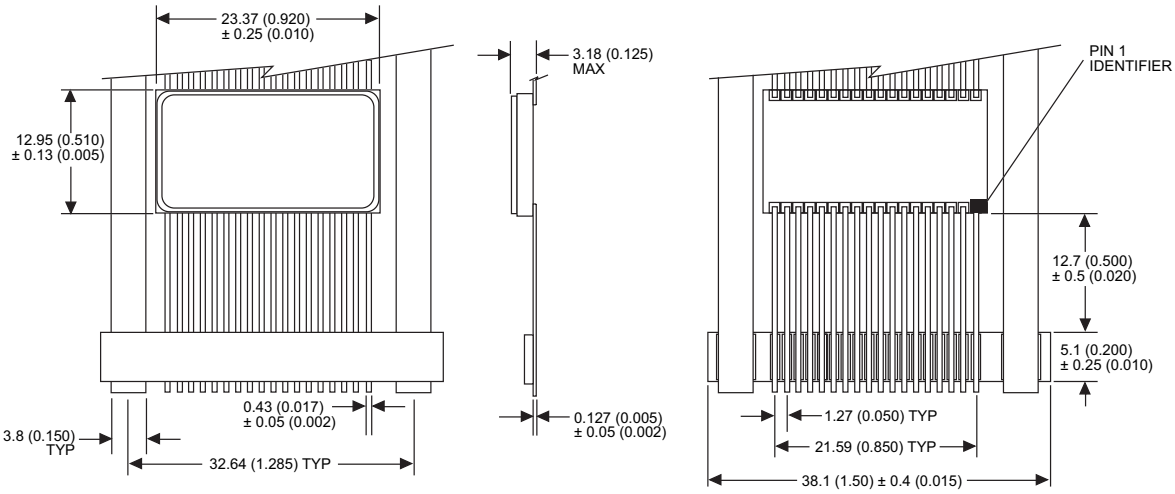
WRITE CYCLE 2, CS# CONTROLLED

PACKAGE 100: 36 LEAD, CERAMIC SOJ



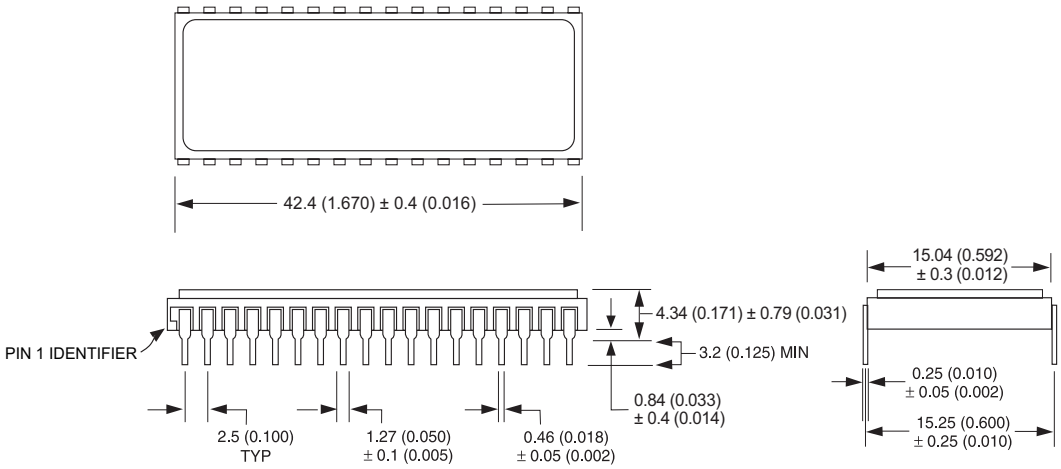
ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

PACKAGE 226: 36 LEAD, CERAMIC FLAT PACK



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

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



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ORDERING INFORMATION

W S 1M8 X - XXX X X X

LEAD FINISH:
Blank = Gold plated leads
A = Solder dip leads

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)
DJ = 36 Lead Ceramic SOJ (Package 100)
F = 36 Lead Ceramic Flatpack (Package 226)

ACCESS TIME (ns)

IMPROVEMENT MARK:
Blank = Standard Power

ORGANIZATION, two banks of 512K x 8

SRAM

WHITE ELECTRONIC DESIGNS CORP.