



128Kx8 SRAM

PRELIMINARY*

PLASTIC PLUS™ FEATURES

- Access Times 55, 70, 85ns
- Standard Commercial Off-The-Shelf (COTS) Memory Devices for Extended Temperature Range
- JEDEC Standard Packages:
 - 32 Pin 600mil Plastic DIP
 - 32 Lead 525mil Plastic SOP
 - 32 Lead TSOP(I) Forward and Reverse
- Electrical and Speed Characteristics for:
 - Military Temperature (-55°C to +125°C)
 - Industrial Temperature (-40°C to +85°C)
- Burn-in and Temperature Cycle Available
- Organized as 128K x 8

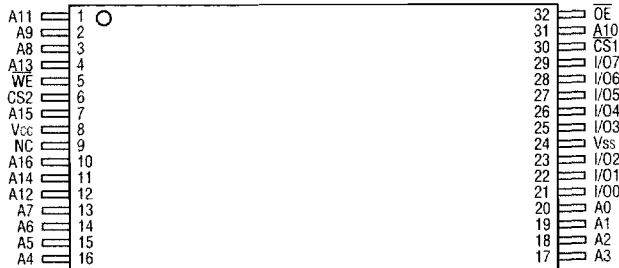
- 5 Volt Power Supply
- Low Power CMOS, 35mW typ.
- Battery Back-Up Operation
- Reliability Test Data Available:
 - High Temperature Operating Life
 - High Temperature Storage
 - Pressure Cooker Test
 - Wet High Temperature Operating Life
 - Thermal Shock
 - Temperature Cycling

* This data sheet describes a product under development, not fully characterized, and is subject to change without notice.

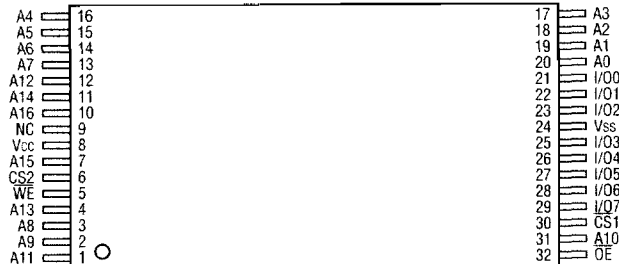
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PLASTIC PLUS SRAM

PIN CONFIGURATIONS

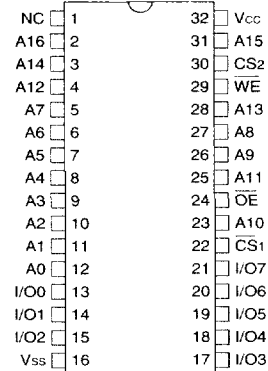
TSOP(I) FORWARD TOP VIEW



TSOP(I) REVERSE TOP VIEW



DIP SOP TOP VIEW



PIN DESCRIPTION

A0-16	Address Inputs
I/O0-7	Data Input/Output
CS1 - CS2	Chip Selects
OE	Output Enable
WE	Write Enable
Vcc	+5.0V Power
Vss	Ground



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Operating Temperature (Mil.)	T _A	-55	+125	°C
Operating Temperature (Ind.)	T _A	-40	+85	°C
Storage Temperature	T _{STG}	-65	+150	°C
Signal Voltage Relative to GND	V _G	-0.5	V _{CC} + 0.5	V
Supply Voltage	V _{CC}	-0.5	7.0	V

TRUTH TABLE

CS ₁	CS ₂	WE	OE	Mode	I/O Pin	V _{CC} Current
H	X	X	X	Power Down	High-Z	I _{SB} , I _{SBL}
X	L	X	X	Power Down	High-Z	I _{SB} , I _{SBL}
L	H	H	H	Out Disable	High-Z	I _{CC}
L	H	H	L	Read	D _{OUT}	I _{CC}
L	H	L	X	Write	D _{IN}	I _{CC}

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} + 0.5	V
Input Low Voltage	V _{IL}	-0.3	+0.8	V
Operating Temperature (Mil.)	T _A	-55	+125	°C
Operating Temperature (Ind.)	T _A	-40	+85	°C

CAPACITANCE

(T_A = +25°C)

Parameter	Symbol	Condition	Max	Unit
Input capacitance	C _{IN}	V _{IN} = 0V, f = 1.0MHz	6	pF
Output capacitance	C _{OUT}	V _{OUT} = 0V, f = 1.0MHz	8	pF

This parameter is guaranteed by design but not tested.

DC CHARACTERISTICS

(V_{CC} = 5V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Symbol	Conditions			Units
			Min	Max	
Input Leakage Current	I _{LI}	V _{CC} = 5.5, V _{IN} = GND to V _{CC}		10	µA
Output Leakage Current	I _{LO}	CS ₁ = V _{IH} , CS ₂ = V _{IL} , OE = V _{IH} , V _{OUT} = GND to V _{CC}		10	µA
Operating Supply Current	I _{CC}	CS ₁ = V _{IL} , CS ₂ = V _{IH} , OE = V _{IH} , f = 5MHz, V _{CC} = 5.5		30	mA
Standby Current	I _{SB}	CS ₁ = V _{IH} , CS ₂ = OE = V _{IH} , f = 5MHz, V _{CC} = 5.5		0.25	mA
Output Low Voltage	V _{OL}	I _{OL} = 2.1mA, V _{CC} = 4.5		0.4	V
Output High Voltage	V _{OH}	I _{OH} = -1.0mA, V _{CC} = 4.5	2.4		V

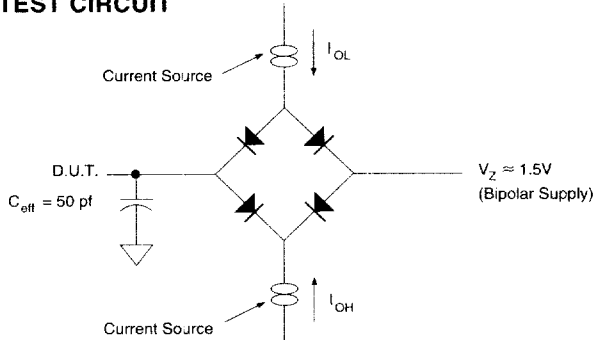
NOTE: DC test conditions: V_{IL} = 0.3V, V_{IH} = V_{CC} - 0.3V

DATA RETENTION CHARACTERISTICS

(T_A = -55°C to +125°C)

Parameter	Symbol	Conditions				Units
			Min	Typ	Max	
Data Retention Supply Voltage	V _{DR}	CS ₁ Controlled: CS ₁ ≥ V _{CC} - 0.2V, CS ₂ ≥ V _{CC} - 0.2V CS ₂ Controlled: CS ₂ ≤ 0.2V	2.0		5.5	V
Data Retention Current	I _{CCDR}	V _{CC} = 3V		3	180	µA

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.

**AC CHARACTERISTICS**

(VCC = 5.0V, VSS = 0V, TA = -55°C to +125°C)

Parameter	Symbol	-55		-70		-85		Units
		Min	Max	Min	Max	Min	Max	
Read Cycle								
Read Cycle Time	t _{RC}	55		70		85		ns
Address Access Time	t _{AA}		55		70		85	ns
Output Hold from Address Change	t _{OH}	5		5		5		ns
Chip Select Access Time	t _{ACS}		55		70		85	ns
Output Enable to Output Valid	t _{OE}		25		35		45	ns
Chip Select to Output in Low Z	t _{CLZ} ¹	10		10		10		ns
Output Enable to Output in Low Z	t _{OLZ} ¹	5		5		5		ns
Chip Disable to Output in High Z	t _{CHZ} ¹		20		25		30	ns
Output Disable to Output in High Z	t _{OHZ} ¹		20		25		30	ns

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

AC CHARACTERISTICS

(VCC = 5.0V, TA = -55°C to +125°C)

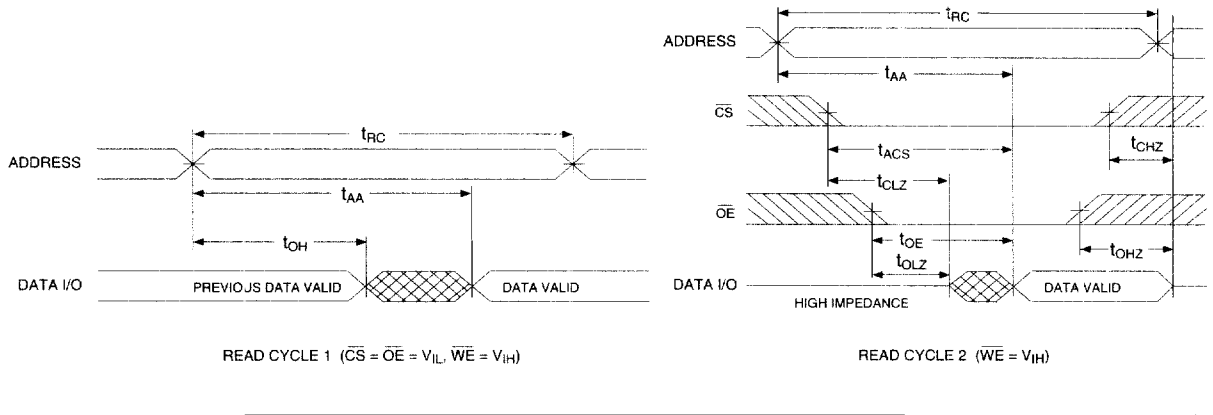
Parameter	Symbol	-55		-70		-85		Units
		Min	Max	Min	Max	Min	Max	
Write Cycle								
Write Cycle Time	t _{WC}	55		70		85		ns
Chip Select to End of Write	t _{CW}	45		60		70		ns
Address Valid to End of Write	t _{AW}	50		60		70		ns
Data Valid to End of Write	t _{DW}	25		30		35		ns
Write Pulse Width	t _{WP}	40		50		55		ns
Address Setup Time	t _{AS}	0		0		0		ns
Address Hold Time	t _{AH}	0		0		0		ns
Output Active from End of Write	t _{OW} ¹	5		5		5		ns
Write Enable to Output in High Z	t _{WHZ} ¹		20		25		30	ns
Data Hold Time	t _{DH}	0		0		0		ns

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

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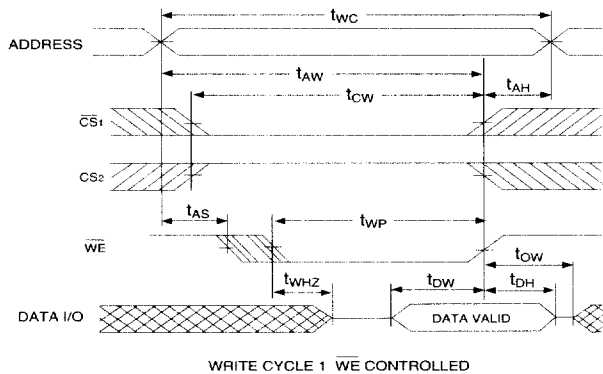


TIMING WAVEFORM - READ CYCLE

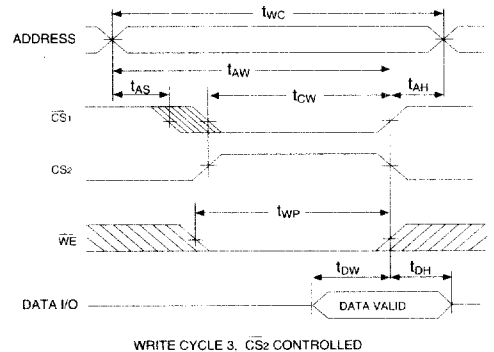
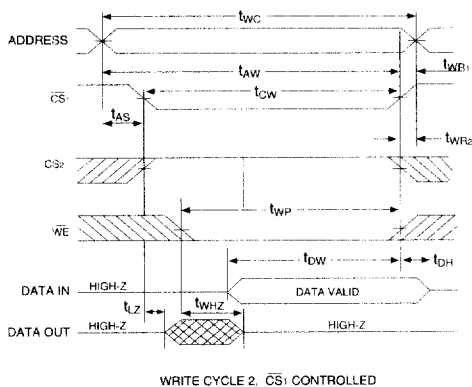


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WRITE CYCLE 1

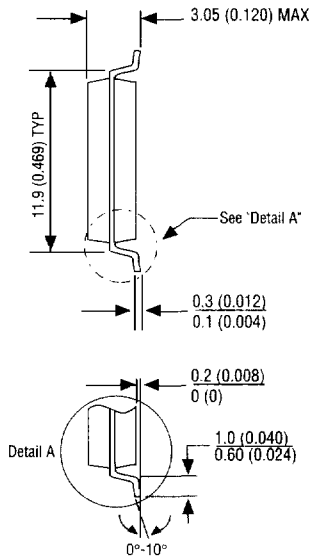
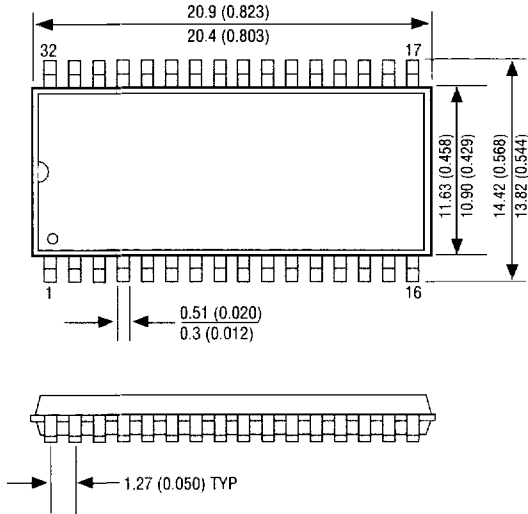


WRITE CYCLES 2 & 3





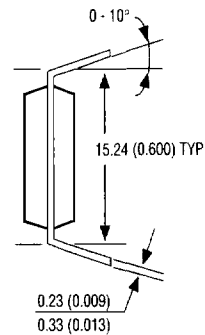
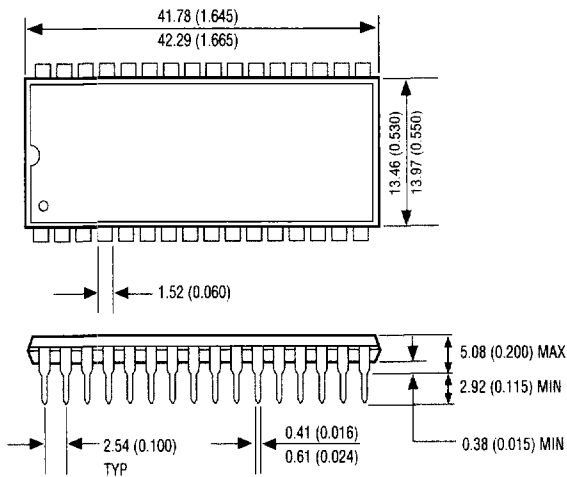
32 LEAD, PLASTIC SOP (525 mil) PACKAGE DIMENSION



DIMENSIONS IN MILLIMETERS AND (INCHES)

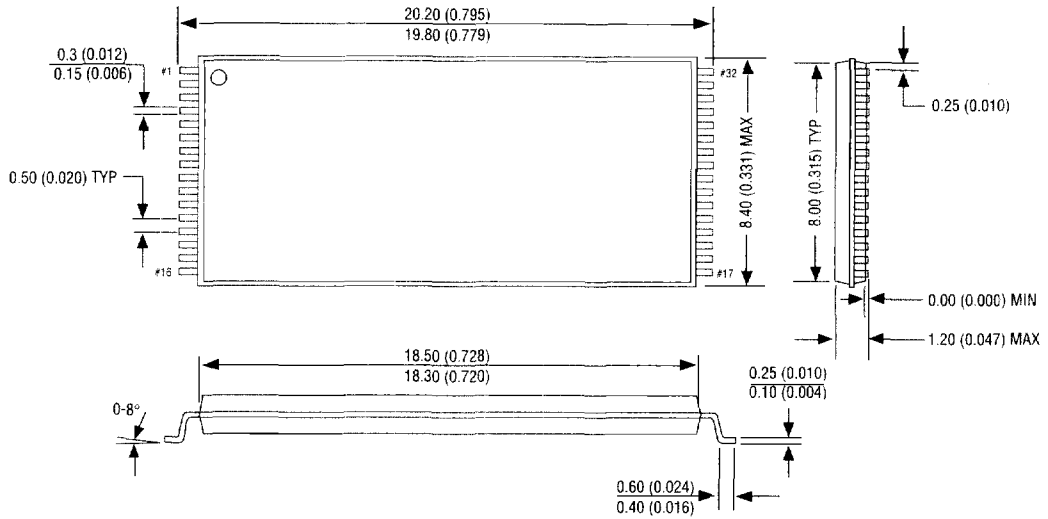
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32 PIN, PLASTIC DIP PACKAGE DIMENSION



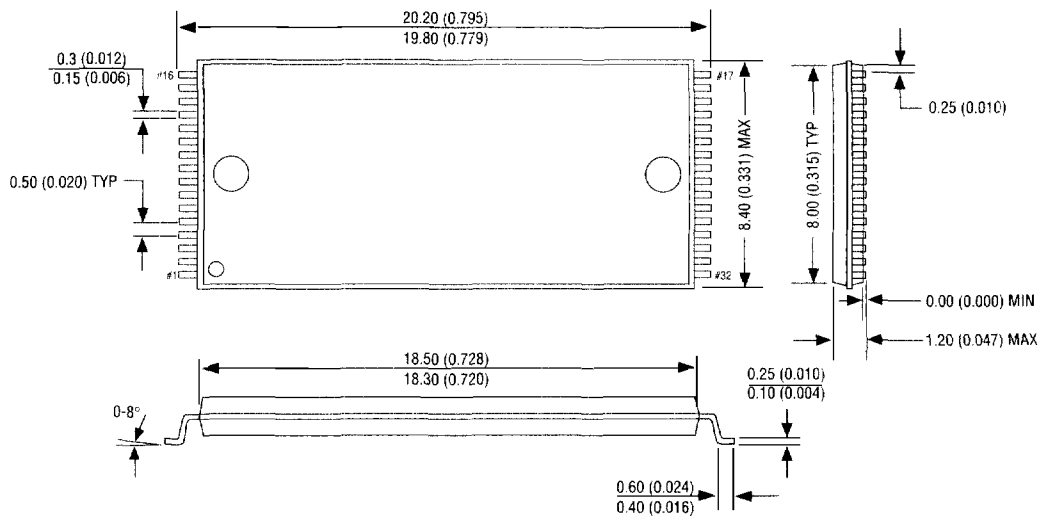


32 LEAD, PLASTIC TSOP I FORWARD PACKAGE DIMENSION



DIMENSIONS IN MILLIMETERS AND (INCHES)

32 LEAD, PLASTIC TSOP I REVERSE PACKAGE DIMENSION



DIMENSIONS IN MILLIMETERS AND (INCHES)

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PLASTIC TSOP I
SRAM



ORDERING INFORMATION

W P S 128K 8 X - XXX X X

DEVICE GRADE:

M = Military Temperature -55°C to +125°C

I = Industrial Temperature -40°C to +85°C

PACKAGE:

W = 32 pin 600mil Plastic DIP

G = 32 lead SOP (525 mil)

TF = 32 TSOP(I) Forward

TR = 32 TSOP(I) Reverse

ACCESS TIME (ns)

IMPROVEMENT MARK

B = Burn-in

T = Temperature Cycle

C = Burn-in and Temperature Cycle

ORGANIZATION, 12CK x 8

SRAM

PLASTIC PLUS™

WHITE MICROELECTRONICS

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