128Kx8 MONOLITHIC SRAM *PRELIMINARY**

FEATURES

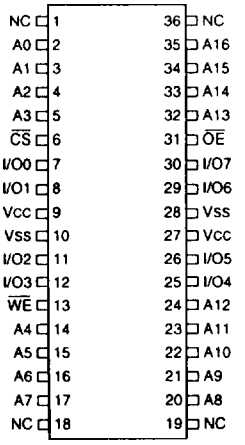
- Access Times 17, 20, 25, 35, 45, 55nS
- Radiation Tolerant Devices Available
- Revolutionary, Center Power/Ground Pinout JEDEC Approved
  - 32 lead Ceramic SOJ (Package 101)
  - 36 lead Ceramic SOJ (Package 100)
  - 36 lead Ceramic Flat Pack (Package 200)
- Evolutionary, Corner Power/Ground Pinout JEDEC Approved
  - 32 pin Ceramic DIP (Package 300)
  - 32 lead Ceramic SOJ (Package 101)
- MIL-STD-883 Compliant Devices Available
- Commercial, Industrial and Military Temperature Range
- 5 Volt Power Supply
- Low Power CMOS
- 2V Data Retention Devices Available (Low Power Version)
- TTL Compatible Inputs and Outputs

* *This data sheet describes a product not fully characterized and is subject to change.*

REVOLUTIONARY PINOUT

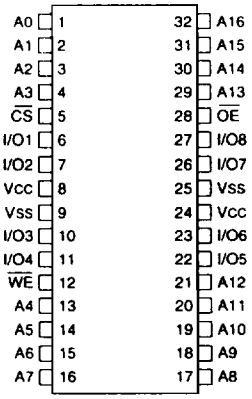
36 FLAT PACK
36 CSOJ

TOP VIEW



32 CSOJ (DR)

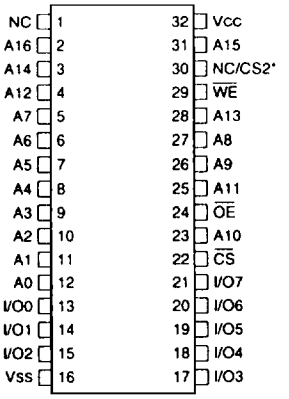
TOP VIEW



EVOLUTIONARY PINOUT

32 DIP
32 CSOJ (DE)

TOP VIEW



* NC for single chip select devices
CS_2 for dual chip select devices

PIN DESCRIPTION

A_{0-16}	Address Inputs
I/O_{0-7}	Data Input/Output
$\overline{CS}$	Chip Select
$\overline{OE}$	Output Enable
$\overline{WE}$	Write Enable
Vcc	+5.0V Power
Vss	Ground

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	Vcc+0.5	V
Junction Temperature	T_J		150	°C
Supply Voltage	V_{CC}	-0.5	7.0	V

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

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	4.5	5.5	V
Input High Voltage	V_{IH}	2.2	Vcc + 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

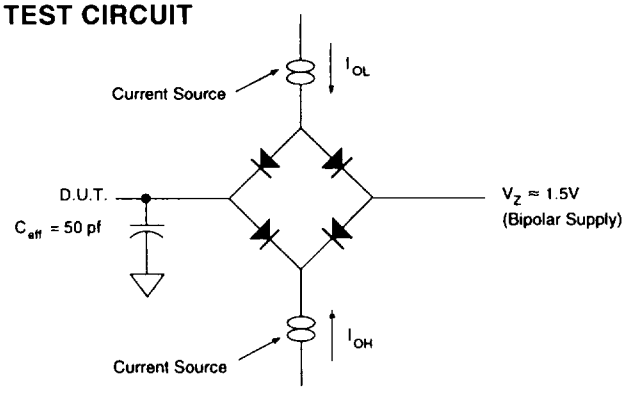
(V_{CC} = 5.0V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Sym	Conditions	-17		-20		-25		Units
			Min	Max	Min	Max	Min	Max	
Input Leakage Current	I_{LI}	V_{CC} = 5.5, V_{IN} = GND to V_{CC}		10		10		10	µA
Output Leakage Current	I_{LO}	$\overline{CS}$ = V_{IH}, $\overline{OE}$ = V_{IH}, V_{OUT} = GND to V_{CC}		10		10		10	µA
Operating Supply Current	I_{CC}	$\overline{CS}$ = V_{IL}, $\overline{OE}$ = V_{IH}, f = 5MHz, V_{CC} = 5.5		110		110		110	mA
Standby Current	I_{SB}	$\overline{CS}$ = V_{IH}, $\overline{OE}$ = V_{IH}, f = 5MHz, V_{CC} = 5.5		30		30		30	mA
Output Low Voltage	V_{OL}	I_{OL} = 8mA, V_{CC} = 4.5		0.4		0.4		0.4	V
Output High Voltage	V_{OH}	I_{OH} = -4.0mA, V_{CC} = 4.5	2.4		2.4		2.4		V

Parameter	Sym	Conditions	-35		-45		-55		Units
			Min	Max	Min	Max	Min	Max	
Input Leakage Current	I_{LI}	V_{CC} = 5.5, V_{IN} = GND to V_{CC}		10		10		10	µA
Output Leakage Current	I_{LO}	$\overline{CS}$ = V_{IH}, $\overline{OE}$ = V_{IH}, V_{OUT} = GND to V_{CC}		10		10		10	µA
Operating Supply Current	I_{CC}	$\overline{CS}$ = V_{IL}, $\overline{OE}$ = V_{IH}, f = 5MHz, V_{CC} = 5.5		110		70		70	mA
Standby Current	I_{SB}	$\overline{CS}$ = V_{IH}, $\overline{OE}$ = V_{IH}, f = 5MHz, V_{CC} = 5.5		30		25		25	mA
Output Low Voltage	V_{OL}	I_{OL} = 8mA, V_{CC} = 4.5		0.4		0.4		0.4	V
Output High Voltage	V_{OH}	I_{OH} = -4.0mA, V_{CC} = 4.5	2.4		2.4		2.4		V

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

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 Z_O = 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	-17		-20		-25		-35		-45		-55		Units
Read Cycle		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}	3		3		3		3		3		3		nS
Chip Select Access Time	t_{ACS}		17		20		25		35		45		55	nS
Output Enable to Output Valid	t_{OE}		9		10		12		25		35		45	nS
Chip Select to Output in Low Z	t_{CLZ}[1]	3		3		3		3		3		3		nS
Output Enable to Output in Low Z	t_{OLZ}[1]	0		0		0		0		0		0		nS
Chip Disable to Output in High Z	t_{CHZ}[1]		10		10		12		15		15		15	nS
Output Disable to Output in High Z	t_{OHZ}[1]		10		10		12		15		15		15	nS

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

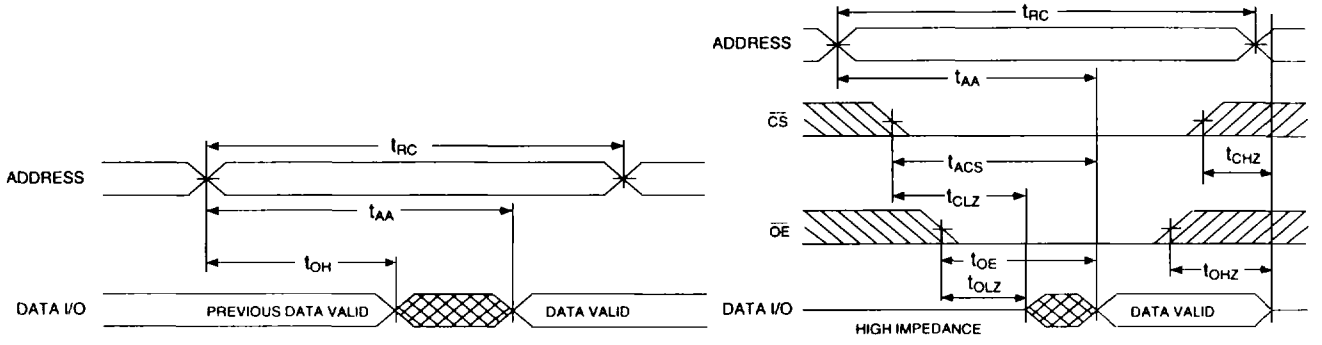
AC CHARACTERISTICS

(Vcc = 5.0V, Vss = 0V, TA = -55°C to +125°C)

Parameter	Symbol	-17		-20		-25		-35		-45		-55		Units
Write Cycle		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Write Cycle Time	t_{WC}	17		20		25		35		45		55		nS
Chip Select to End of Write	t_{CW}	13		15		20		25		30		45		nS
Address Valid to End of Write	t_{AW}	13		15		20		25		30		45		nS
Data Valid to End of Write	t_{DW}	9		10		15		20		25		40		nS
Write Pulse Width	t_{WP}	13		15		20		25		30		45		nS
Address Setup Time	t_{AS}	0		0		0		0		0		0		nS
Address Hold Time	t_{AH}	0		0		0		0		0		0		nS
Output Active from End of Write	t_{OW}[1]	5		5		5		5		5		5		nS
Write Enable to Output in High Z	t_{WHZ}[1]		10		12		15		20		25		25	nS
Data Hold Time	t_{DH}	0		0		0		0		0		0		nS

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

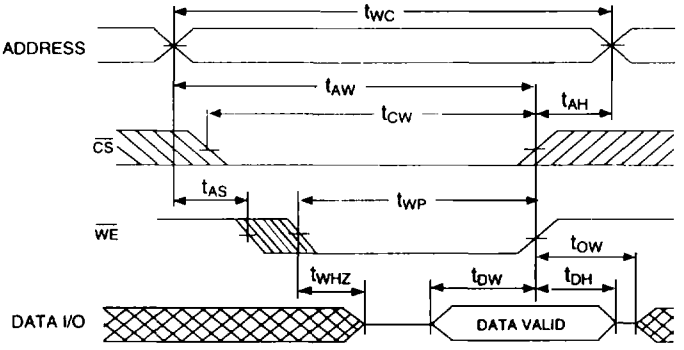
TIMING WAVEFORM - READ CYCLE



READ CYCLE 1 ($\overline{CS}$ = $\overline{OE}$ = V_{IL}, $\overline{WE}$ = V_{IH})

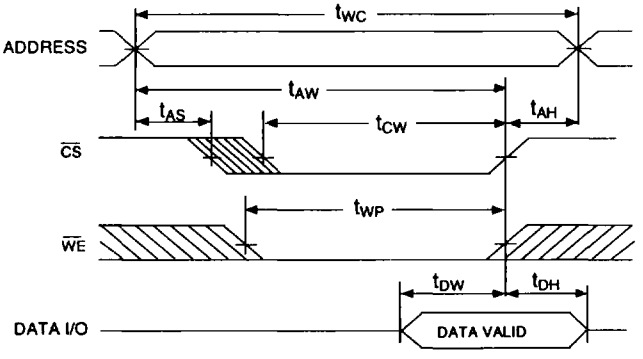
READ CYCLE 2 ($\overline{WE}$ = V_{IH})

WRITE CYCLE - $\overline{WE}$ CONTROLLED



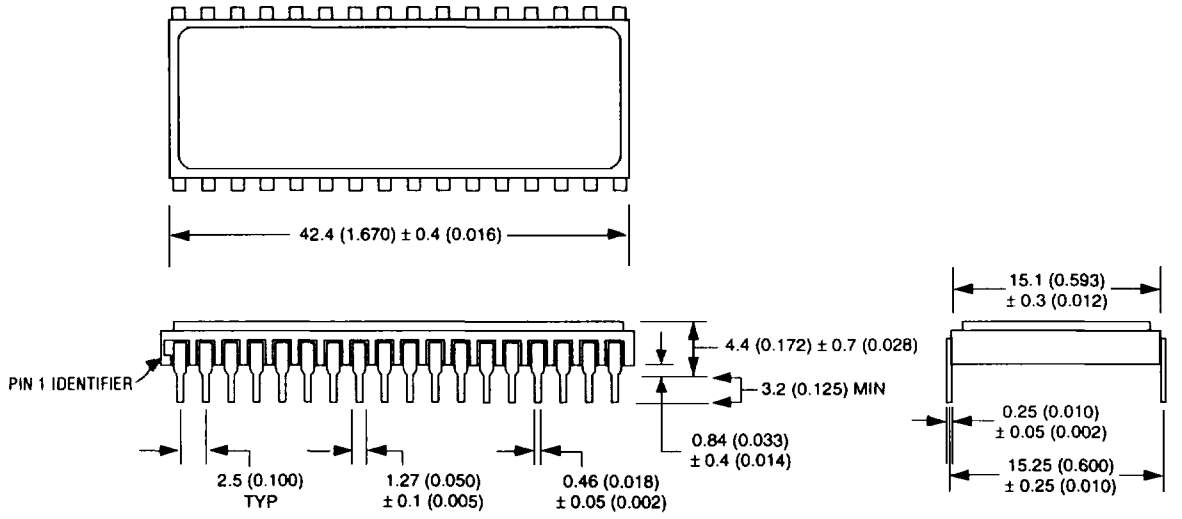
WRITE CYCLE 1, $\overline{WE}$ CONTROLLED ($\overline{OE}$ = V_{IH})

WRITE CYCLE - $\overline{CS}$ CONTROLLED



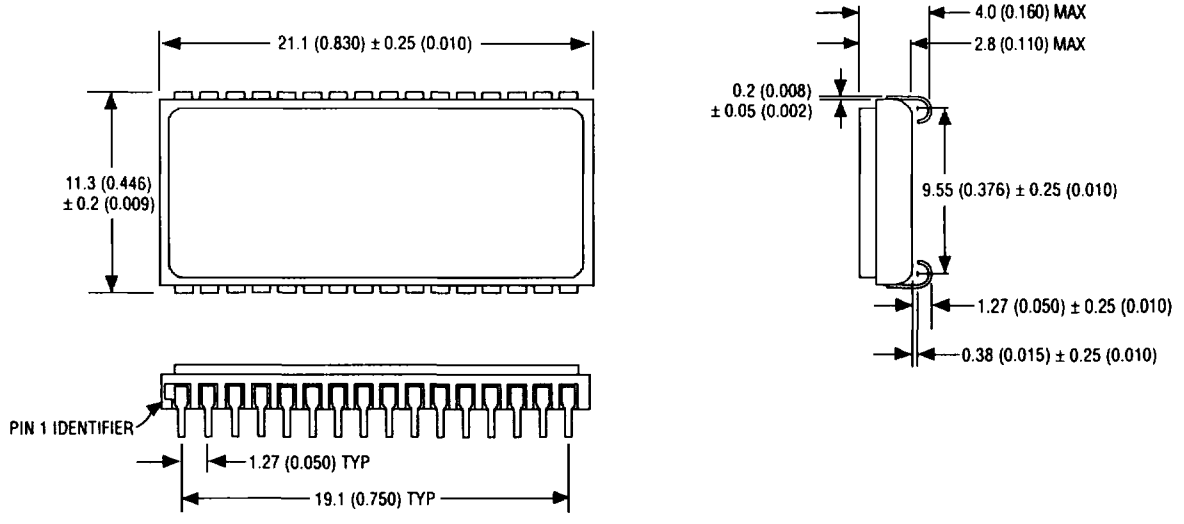
WRITE CYCLE 2, $\overline{CS}$ CONTROLLED ($\overline{OE}$ = V_{IH})

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



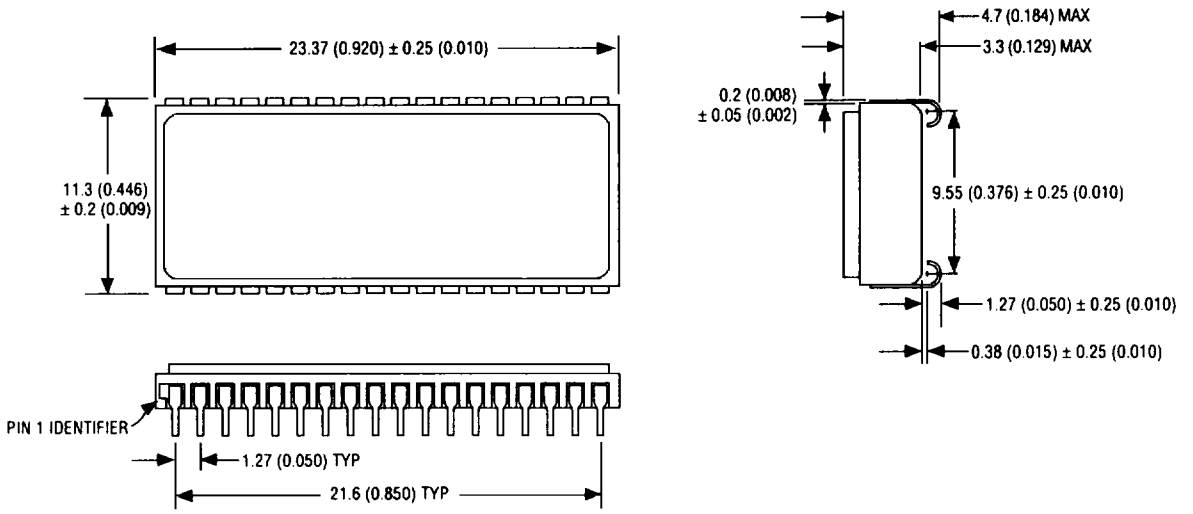
ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

PACKAGE 101: 32 LEAD, CERAMIC SOJ



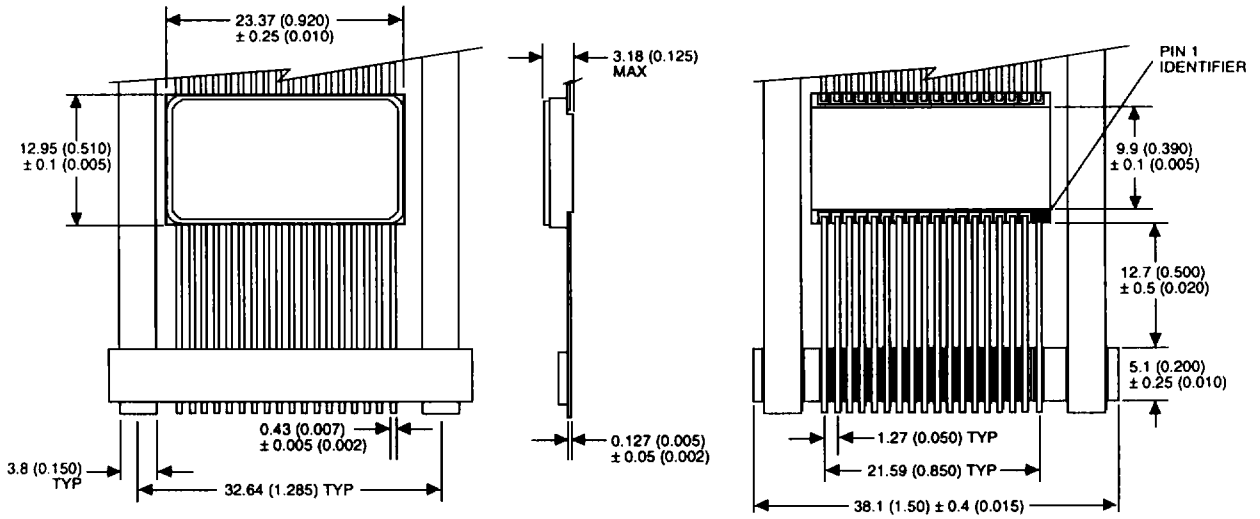
ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

PACKAGE 100: 36 LEAD, CERAMIC SOJ



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

PACKAGE 200: 36 LEAD, CERAMIC FLAT PACK



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

DATA RETENTION CHARACTERISTICS

(T_A = -55°C to +125°C)

LOW POWER VERSION ONLY

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Data Retention Supply Voltage	V_{DR}	$\overline{CS} \geq V_{CC}$ -0.2V	2.0		5.5	V
Data Retention Current	I_{CCDR2}	V_{CC} = 2V		500	750	µA

ORDERING INFORMATION

W M S 128K8 X - XXX X X X

SPECIAL PROCESSING:
E = Epitaxial Layer

DEVICE GRADE:
Q = MIL-STD-883 Compliant
M = Military Screened -55°C to +125°C
I = Industrial -40°C to +85°C
C = Commercial 0°C to +70°C

PACKAGE:
DE = 32 Lead Ceramic SOJ (Package 101) Evolutionary
DR = 32 Lead Ceramic SOJ (Package 101) Revolutionary
DJ = 36 Lead Ceramic SOJ (Package 100)
F = 36 Lead Ceramic Flat Pack (Package 200)
C = 32 Pin Ceramic .600" DIP (Package 300)

ACCESS TIME in nS

IMPROVEMENT MARK
C = Dual Chip Select Device
L = Low Power for 2V Data Retention

ORGANIZATION, 128K x 8

SRAM

MONOLITHIC

WHITE MICROELECTRONICS