



**512Kx8 MONOLITHIC SRAM** PRELIMINARY\*

**FEATURES**

- Access Times 15, 17, 20ns
- Revolutionary, Center Power/Ground Pinout JEDEC Approved
  - 36 lead Ceramic SOJ (Package 100)
  - 36 lead Ceramic Flat Pack (Package 226)
- Evolutionary, Corner Power/Ground Pinout JEDEC Approved
  - 32 pin Ceramic DIP (Package 300)
  - 32 lead Ceramic SOJ (Package 101)\*\*
  - 32 lead Ceramic Flat Pack (Package 220)\*\*
- 32 pin, Rectangular Ceramic Leadless Chip Carrier (Package 601)

- Low Power CMOS
- Low Voltage Operation:
  - 3.3V ± 10% Power Supply
- Commercial, Industrial and Military Temperature Range
- TTL Compatible Inputs and Outputs
- Fully Static Operation:
  - No clock or refresh required.
- Three State Output.

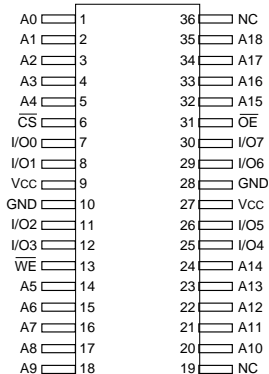
\* This data sheet describes a product that is not fully qualified or characterized and is subject to change without notice.

\*\* Package under development.

**REVOLUTIONARY PINOUT      EVOLUTIONARY PINOUT**

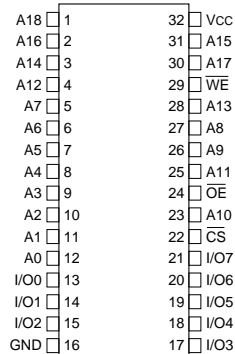
**36 FLAT PACK  
36 CSOJ**

**TOP VIEW**



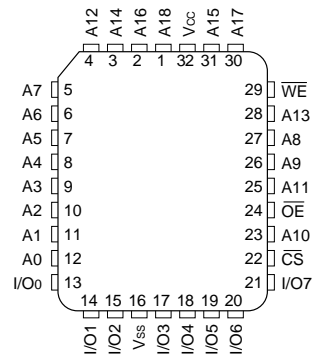
**32 DIP  
32 CSOJ (DE)\*\*  
32 FLAT PACK (FE)\*\***

**TOP VIEW**



**32 CLCC**

**TOP VIEW**



**PIN DESCRIPTION**

A0-18	Address Inputs
I/O0-7	Data Input/Output
CS	Chip Select
OE	Output Enable
WE	Write Enable
Vcc	Power Supply
GND	Ground



**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Min	Max	Unit
Operating Temperature	T <sub>A</sub>	-55	+125	°C
Storage Temperature	T <sub>STG</sub>	-65	+150	°C
Signal Voltage Relative to GND	V <sub>G</sub>	-0.5	4.6	V
Junction Temperature	T <sub>J</sub>		150	°C
Supply Voltage	V <sub>CC</sub>	-0.5	4.6	V

**RECOMMENDED OPERATING CONDITIONS**

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V <sub>CC</sub>	3.0	3.6	V
Input High Voltage	V <sub>IH</sub>	2.2	V <sub>CC</sub> + 0.3	V
Input Low Voltage	V <sub>IL</sub>	-0.3	+0.8	V
Operating Temp. (Ind.)	T <sub>A</sub>	-40	+85	°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<sub>A</sub> = +25°C)

Parameter	Symbol	Condition	Max	Unit
Input capacitance	C <sub>IN</sub>	V <sub>IN</sub> = 0V, f = 1.0MHz	12	pF
Output capacitance	C <sub>OUT</sub>	V <sub>OUT</sub> = 0V, f = 1.0MHz	12	pF

This parameter is guaranteed by design but not tested.

**DC CHARACTERISTICS**

(V<sub>CC</sub> = 3.3V, GND = 0V, T<sub>A</sub> = -55°C to +125°C)

Parameter	Sym	Conditions	Units		
			Min	Max	
Input Leakage Current	I <sub>LI</sub>	V <sub>CC</sub> = 3.6, V <sub>IN</sub> = GND to V <sub>CC</sub>		10	μA
Output Leakage Current	I <sub>LO</sub>	$\overline{CS} = V_{IH}, \overline{OE} = V_{IH}, V_{OUT} = GND \text{ to } V_{CC}$		10	μA
Operating Supply Current	I <sub>CC</sub>	$\overline{CS} = V_{IL}, \overline{OE} = V_{IH}, f = 5\text{MHz}, V_{CC} = 3.6$		100	mA
Standby Current	I <sub>SB</sub>	$\overline{CS} = V_{IH}, \overline{OE} = V_{IH}, f = 5\text{MHz}, V_{CC} = 3.6$		50	mA
Output Low Voltage	V <sub>OL</sub>	I <sub>OL</sub> = 4.0mA		0.4	V
Output High Voltage	V <sub>OH</sub>	I <sub>OH</sub> = -4.0mA	2.4		V

NOTE: DC test conditions: V<sub>IH</sub> = V<sub>CC</sub> - 0.3V, V<sub>IL</sub> = 0.3V

NOTE: Contact factory for low power option.



**AC CHARACTERISTICS**  
(V<sub>CC</sub> = 3.3V, GND = 0V, T<sub>A</sub> = -55°C to +125°C)

Parameter	Symbol	-15		-17		-20		Units
		Min	Max	Min	Max	Min	Max	
Read Cycle								
Read Cycle Time	t <sub>RC</sub>	15		17		20		ns
Address Access Time	t <sub>AA</sub>		15		17		20	ns
Output Hold from Address Change	t <sub>OH</sub>	0		0		0		ns
Chip Select Access Time	t <sub>ACS</sub>		15		17		20	ns
Output Enable to Output Valid	t <sub>OE</sub>		8		8		10	ns
Chip Select to Output in Low Z	t <sub>CLZ</sub> <sup>1</sup>	1		1		1		ns
Output Enable to Output in Low Z	t <sub>OLZ</sub> <sup>1</sup>	0		0		0		ns
Chip Disable to Output in High Z	t <sub>CHZ</sub> <sup>1</sup>		8		8		10	ns
Output Disable to Output in High Z	t <sub>OHZ</sub> <sup>1</sup>		8		8		10	ns

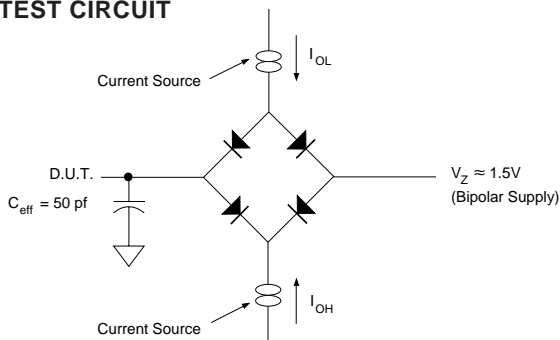
1. This parameter is guaranteed by design but not tested.

**AC CHARACTERISTICS**  
(V<sub>CC</sub> = 3.3V, GND = 0V, T<sub>A</sub> = -55°C to +125°C)

Parameter	Symbol	-15		-17		-20		Units
		Min	Max	Min	Max	Min	Max	
Write Cycle								
Write Cycle Time	t <sub>WC</sub>	15		17		20		ns
Chip Select to End of Write	t <sub>CW</sub>	12		12		14		ns
Address Valid to End of Write	t <sub>AW</sub>	12		12		14		ns
Data Valid to End of Write	t <sub>DW</sub>	9		9		10		ns
Write Pulse Width	t <sub>WP</sub>	12		14		14		ns
Address Setup Time	t <sub>AS</sub>	0		0		0		ns
Address Hold Time	t <sub>AH</sub>	0		0		0		ns
Output Active from End of Write	t <sub>OW</sub> <sup>1</sup>	2		3		3		ns
Write Enable to Output in High Z	t <sub>WHZ</sub> <sup>1</sup>		8		8		9	ns
Data Hold Time	t <sub>DH</sub>	0		0		0		ns

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

**AC TEST CIRCUIT**



**AC TEST CONDITIONS**

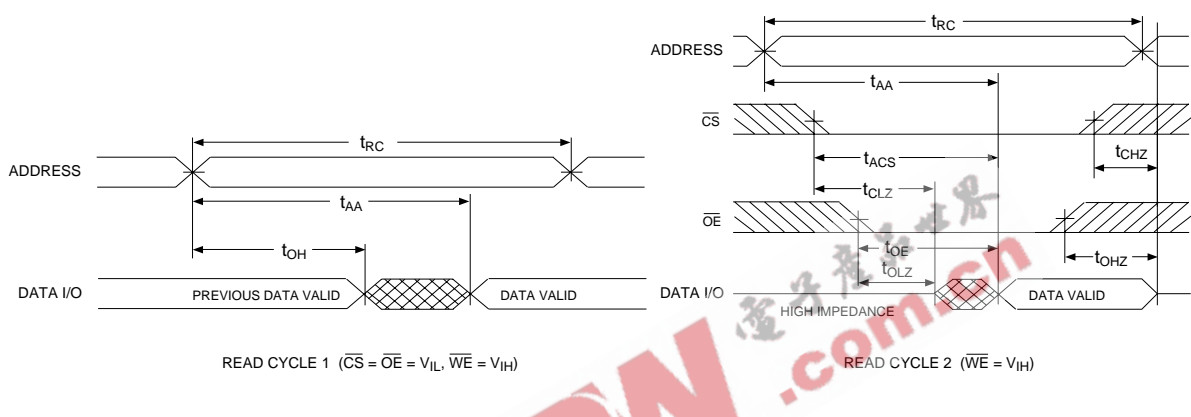
Parameter	Typ	Unit
Input Pulse Levels	V <sub>IL</sub> = 0, V <sub>IH</sub> = 2.5	V
Input Rise and Fall	5	ns
Input and Output Reference Level	1.5	V
Output Timing Reference Level	1.5	V

**NOTES:**

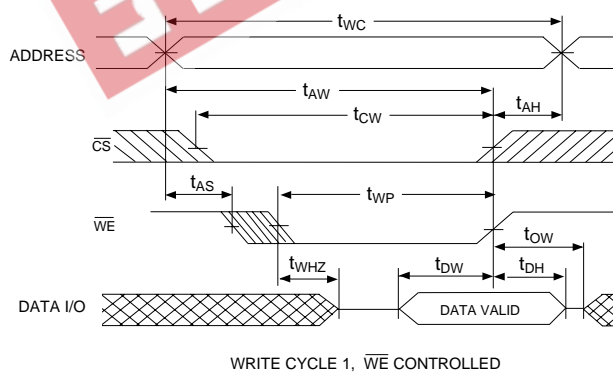
V<sub>Z</sub> is programmable from -2V to +7V.  
I<sub>OL</sub> & I<sub>OH</sub> programmable from 0 to 16mA.  
Tester Impedance Z<sub>0</sub> = 75 Ω.  
V<sub>Z</sub> is typically the midpoint of V<sub>OH</sub> and V<sub>OL</sub>.  
I<sub>OL</sub> & I<sub>OH</sub> are adjusted to simulate a typical resistive load circuit.  
ATE tester includes jig capacitance.



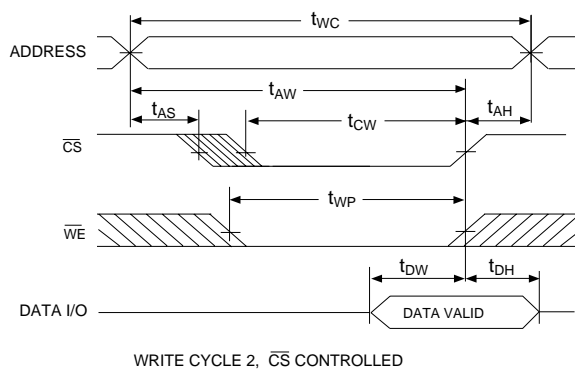
TIMING WAVEFORM - READ CYCLE



WRITE CYCLE -  $\overline{WE}$  CONTROLLED



WRITE CYCLE -  $\overline{CS}$  CONTROLLED





**PACKAGE 100: 36 LEAD, CERAMIC SOJ**



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

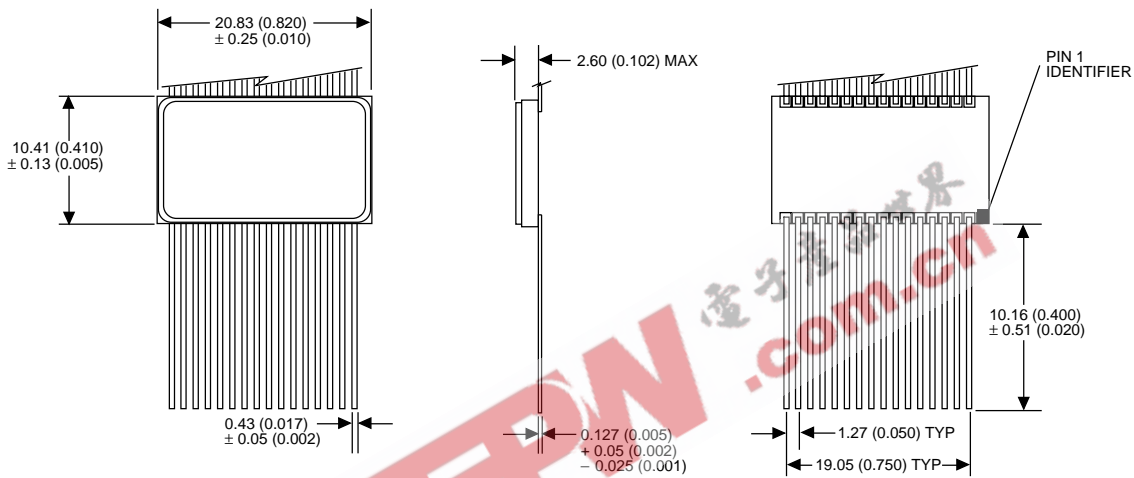
**PACKAGE 101: 32 LEAD, CERAMIC SOJ**



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

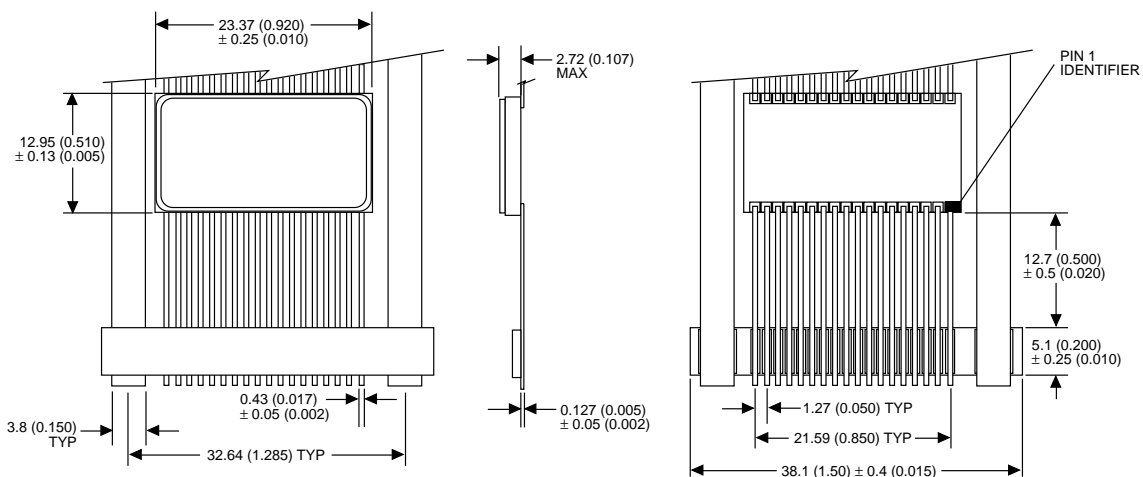


**PACKAGE 220: 32 LEAD, CERAMIC FLAT PACK**



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHEMICALLY IN INCHES

**PACKAGE 226: 36 LEAD, CERAMIC FLAT PACK**



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHEMICALLY IN INCHES



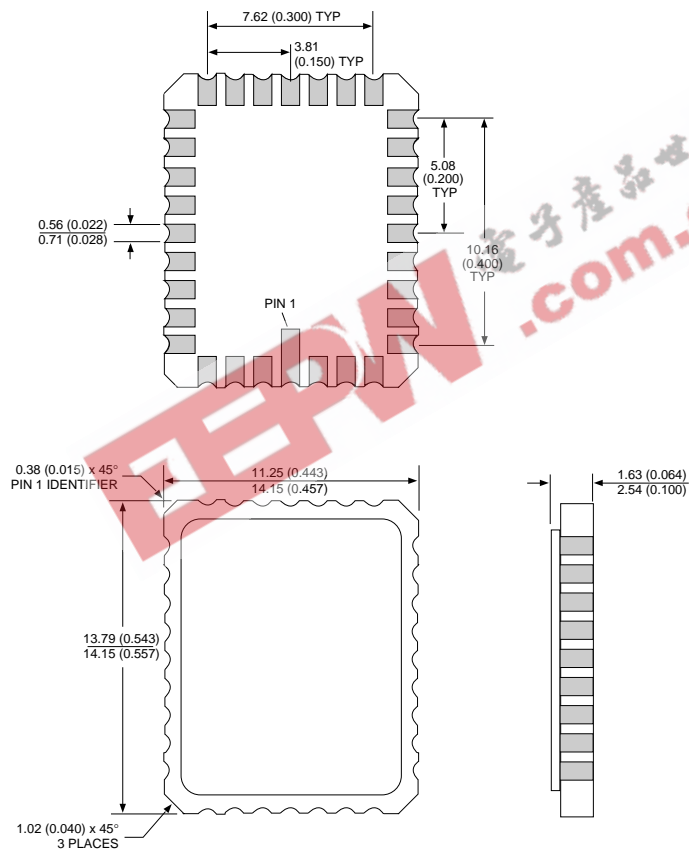
**PACKAGE 300: 32 PIN, CERAMIC DIP, SINGLE CAVITY SIDE BRAZED**



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES



**PACKAGE 601: 32 PIN, RECTANGULAR CERAMIC LEADLESS CHIP CARRIER**



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ORDERING INFORMATION

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

LEAD FINISH:

- Blank = Gold plated leads
- A = Solder dip leads

DEVICE GRADE:

- M = Military -55°C to +125°C
- I = Industrial -40°C to +85°C
- C = Commercial 0°C to +70°C

PACKAGE:

- C = 32 Pin Ceramic .600" DIP (Package 300)
- CL = 32 Pin Rectangular Ceramic Leadless Chip Carrier (Package 601)
- DE = 32 Lead Ceramic SOJ (Package 101) Evolutionary\*
- DJ = 36 Lead Ceramic SOJ (Package 100)
- F = 36 Lead Ceramic Flat Pack (Package 226)
- FE = 32 Lead Ceramic Flat Pack (Package 220)\*

ACCESS TIME (ns)

Low Voltage Supply 3.3V ± 10%

ORGANIZATION, 512K x 8

SRAM

MONOLITHIC

WHITE ELECTRONIC DESIGNS CORP.

\* Package under development.