



# 128Kx8 3.3V MONOLITHIC SRAM

PRELIMINARY\*

## FEATURES

- Access Times 15, 17, 20, 25, 35ns
- Revolutionary, Center Power/Ground Pinout JEDEC Approved
  - 32 lead Ceramic SOJ (Package 101)
  - 32 lead Ceramic Flat Pack (Package 220)\*\*
- Evolutionary, Corner Power/Ground Pinout JEDEC Approved
  - 32 pin Ceramic DIP (Package 300)
- 32 pin, Rectangular Ceramic Leadless Chip Carrier (Package 601)

- MIL-STD-883 Compliant Devices Available
- Commercial, Industrial and Military Temperature Range
- 3.3 Volt Power Supply
- Low Power CMOS
- TTL Compatible Inputs and Outputs

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

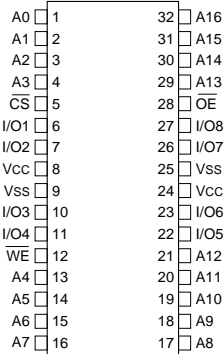
\*\* Package under development.

### REVOLUTIONARY PINOUT

### EVOLUTIONARY PINOUT

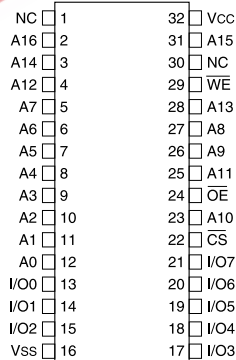
32 CSOJ (DR)  
32 FLATPACK (FR)\*\*

TOP VIEW



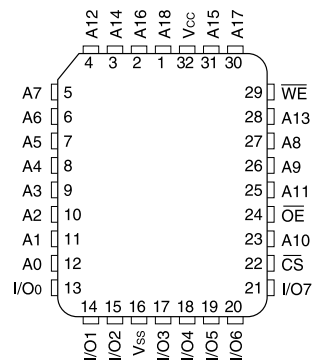
32 DIP (C)

TOP VIEW



32 CLCC

TOP VIEW



### PIN DESCRIPTION

A0-16	Address Inputs
I/O0-7	Data Input/Outputs
CS	Chip Select
OE	Output Enable
WE	Write Enable
Vcc	+3.3V Power
Vss	Ground
NC	Not Connected



**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	V <sub>CC</sub> +0.5	V
Junction Temperature	T <sub>J</sub>		150	°C
Supply Voltage	V <sub>CC</sub>	-0.5	5.5	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 <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. (Mil.)	T <sub>A</sub>	-55	+125	°C

**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	20	pF
Output capacitance	C <sub>OUT</sub>	V <sub>OUT</sub> = 0V, f = 1.0MHz	20	pF

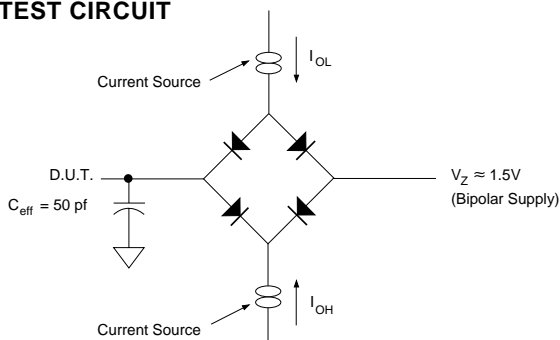
This parameter is guaranteed by design but not tested.

**DC CHARACTERISTICS**

(V<sub>CC</sub> = 3.3V ±0.3V, V<sub>SS</sub> = 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> = 3.3, V <sub>IN</sub> = GND to V <sub>CC</sub>		10	μA
Output Leakage Current	I <sub>LO</sub>	$\overline{CS}$ = V <sub>IH</sub> , $\overline{OE}$ = V <sub>IH</sub> , V <sub>OUT</sub> = GND to V <sub>CC</sub>		10	μA
Operating Supply Current (x 32 Mode)	I <sub>CC</sub>	$\overline{CS}$ = V <sub>IL</sub> , $\overline{OE}$ = V <sub>IH</sub> , f = 5MHz, V <sub>CC</sub> = 3.3		120	mA
Standby Current	I <sub>SB</sub>	$\overline{CS}$ = V <sub>IH</sub> , $\overline{OE}$ = V <sub>IH</sub> , f = 5MHz, V <sub>CC</sub> = 3.3		8	mA
Output Low Voltage	V <sub>OL</sub>	I <sub>OL</sub> = 8mA		0.4	V
Output High Voltage	V <sub>OH</sub>	I <sub>OH</sub> = -4.0mA	2.4		V

**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.



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

Parameter	Symbol	-15		-17		-20		-25		-35		Units
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
<b>Read Cycle</b>												
Read Cycle Time	t <sub>RC</sub>	15		17		20		25		35		ns
Address Access Time	t <sub>AA</sub>		15		17		20		25		35	ns
Output Hold from Address Change	t <sub>OH</sub>	0		0		0		0		0		ns
Chip Select Access Time	t <sub>ACS</sub>		15		17		20		25		35	ns
Output Enable to Output Valid	t <sub>OE</sub>		10		11		12		15		20	ns
Chip Select to Output in Low Z	t <sub>CLZ</sub> <sup>1</sup>	5		5		5		5		5		ns
Output Enable to Output in Low Z	t <sub>OLZ</sub> <sup>1</sup>	5		5		5		5		5		ns
Chip Disable to Output in High Z	t <sub>CHZ</sub> <sup>1</sup>		8		9		10		12		15	ns
Output Disable to Output in High Z	t <sub>OHZ</sub> <sup>1</sup>		8		9		10		12		15	ns

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

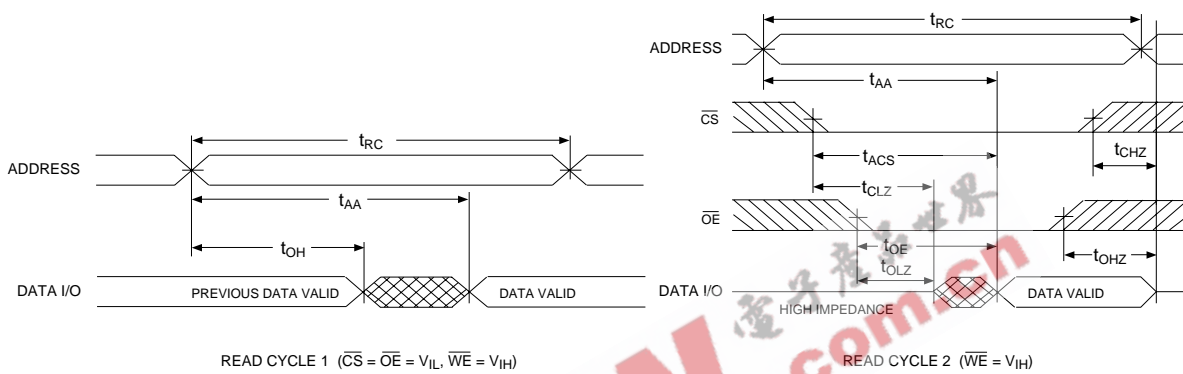
**AC CHARACTERISTICS**  
(V<sub>CC</sub> = 3.3V, T<sub>A</sub> = -55°C to +125°C)

Parameter	Symbol	-15		-17		-20		-25		-35		Units
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
<b>Write Cycle</b>												
Write Cycle Time	t <sub>WC</sub>	15		17		20		25		35		ns
Chip Select to End of Write	t <sub>CW</sub>	13		14		15		20		30		ns
Address Valid to End of Write	t <sub>AW</sub>	13		14		15		20		30		ns
Data Valid to End of Write	t <sub>DW</sub>	10		11		12		15		18		ns
Write Pulse Width	t <sub>WP</sub>	13		14		15		20		30		ns
Address Setup Time	t <sub>AS</sub>	0		0		0		0		0		ns
Address Hold Time	t <sub>AH</sub>	0		0		0		0		0		ns
Output Active from End of Write	t <sub>OW</sub> <sup>1</sup>	5		5		5		5		5		ns
Write Enable to Output in High Z	t <sub>WHZ</sub> <sup>1</sup>		8		9		10		10		15	ns
Data Hold Time	t <sub>DH</sub>	0		0		0		0		0		ns

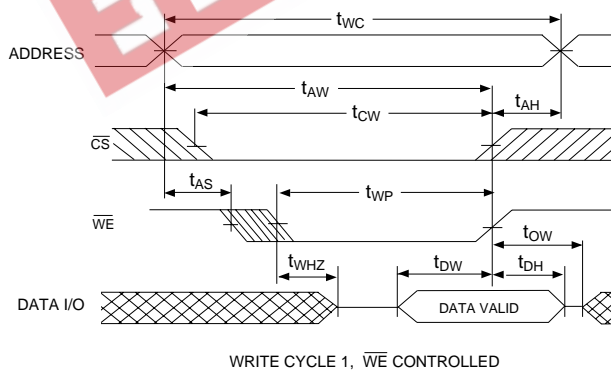
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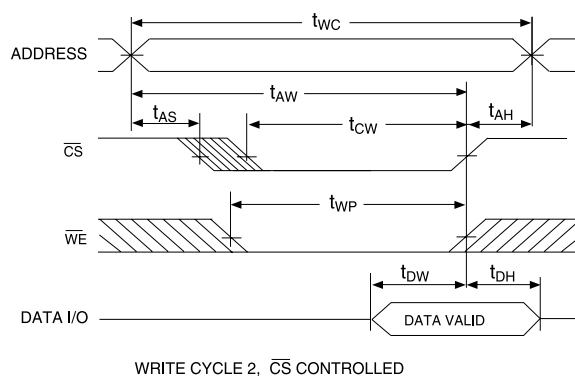
**TIMING WAVEFORM - READ CYCLE**



**WRITE CYCLE -  $\overline{WE}$  CONTROLLED**

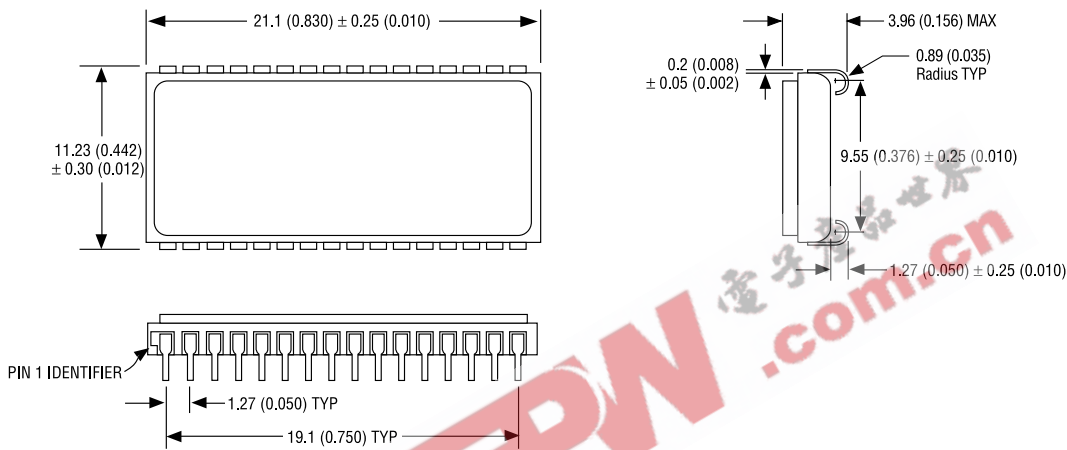


**WRITE CYCLE -  $\overline{CS}$  CONTROLLED**



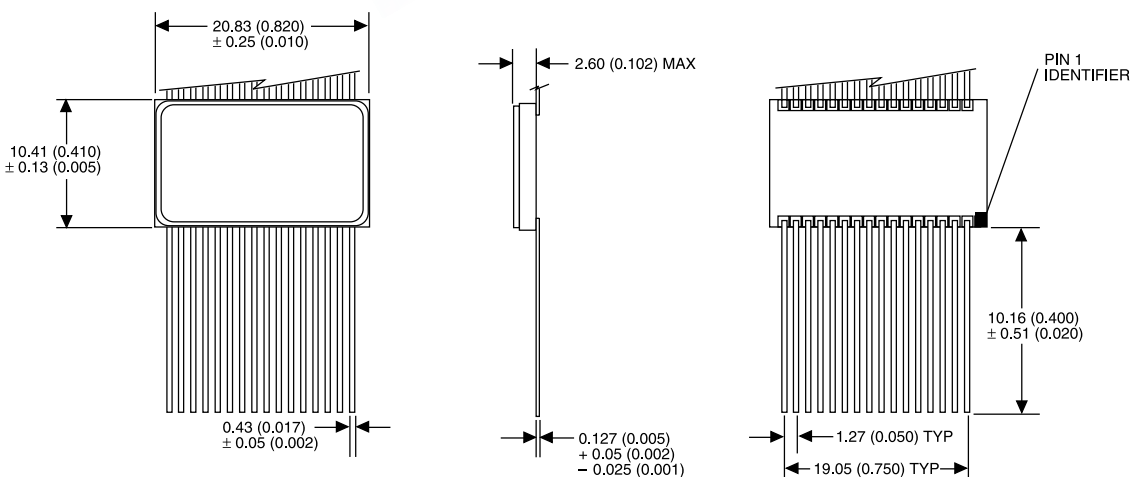


**PACKAGE 101: 32 LEAD, CERAMIC SOJ**



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

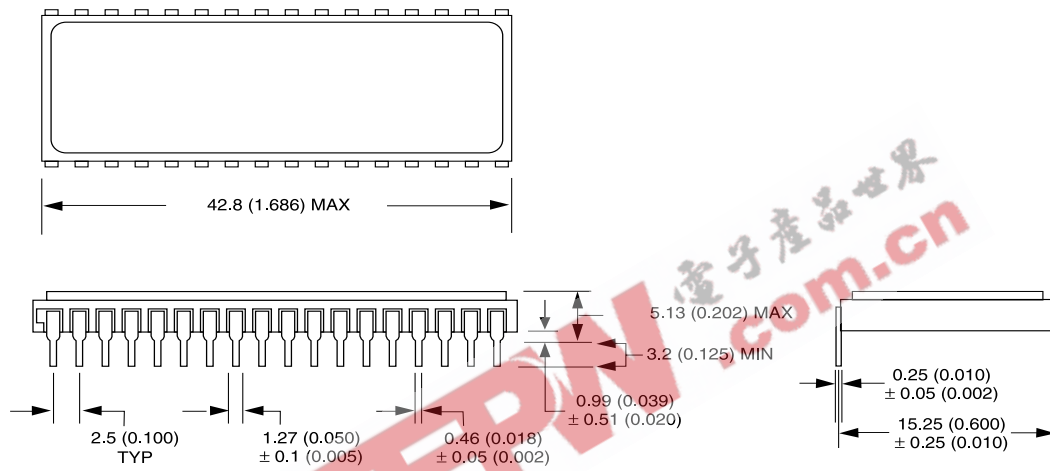
**PACKAGE 220: 32 LEAD, CERAMIC FLAT PACK**



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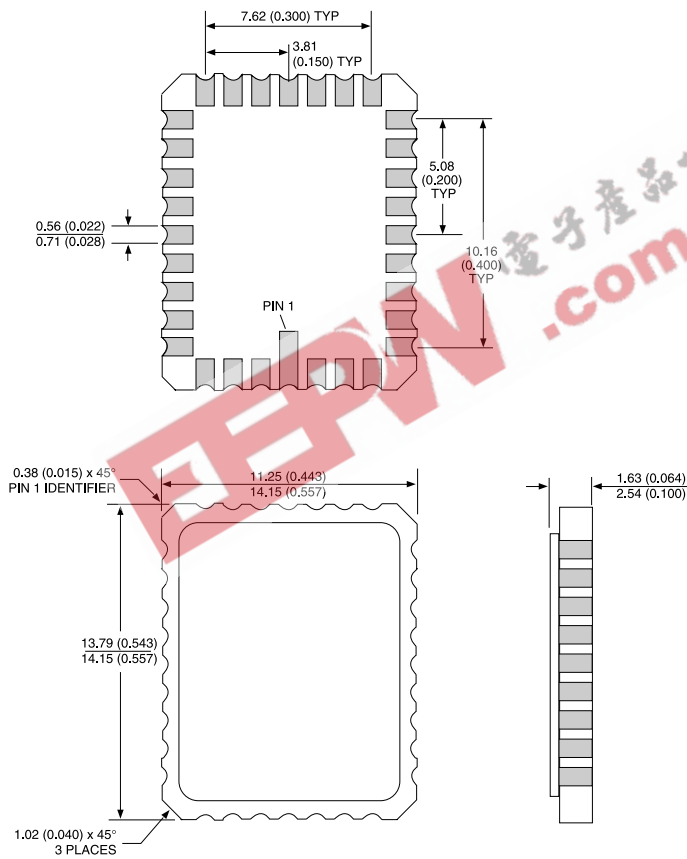
**PACKAGE 300: 32 PIN, CERAMIC DIP, SINGLE CAVITY SIDE BRAZED**



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



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**ORDERING INFORMATION**

**W M S 128K8 V - 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 .600" DIP (Package 300)
- CL = 32 Pin Rectangular Ceramic Leadless Chip Carrier (Package 601)
- DR = 32 Lead Ceramic SOJ (Package 101) Revolutionary
- FR = 32 Lead Ceramic Flat Pack (Package 220\*\*) Revolutionary

**ACCESS TIME (ns)**

**IMPROVEMENT MARK:**

- Low Voltage Supply 3.3V ± 10%

**ORGANIZATION, 128K x 8**

**SRAM**

**MONOLITHIC**

**WHITE ELECTRONIC DESIGNS CORP.**

\*\* Package under development.