



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.

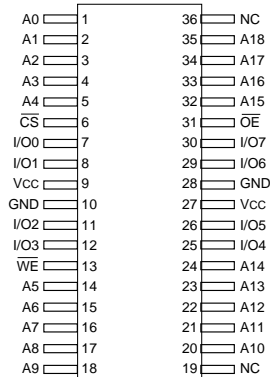
* This data sheet describes a product that is not fully qualified or characterized and is subject to change without notice.

** Package under development.

REVOLUTIONARY PINOUT EVOLUTIONARY PINOUT

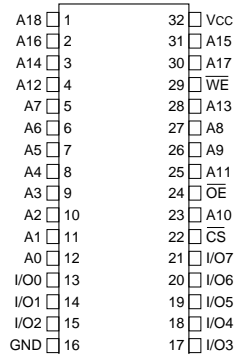
**36 FLAT PACK
36 CSOJ**

TOP VIEW



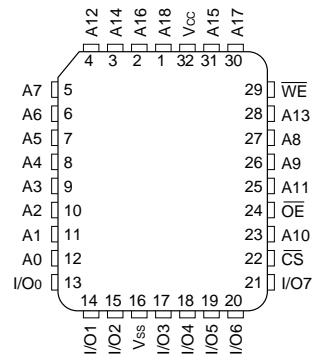
**32 DIP
32 CSOJ (DE)**
32 FLAT PACK (FE)****

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 _A | -55 | +125 | °C |
| Storage Temperature | T _{STG} | -65 | +150 | °C |
| Signal Voltage Relative to GND | V _G | -0.5 | 4.6 | V |
| Junction Temperature | T _J | | 150 | °C |
| Supply Voltage | V _{CC} | -0.5 | 4.6 | V |

RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Min | Max | Unit |
|------------------------|-----------------|------|-----------------------|------|
| Supply Voltage | V _{CC} | 3.0 | 3.6 | 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. (Ind.) | T _A | -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_A = +25°C)

| Parameter | Symbol | Condition | Max | Unit |
|--------------------|------------------|-----------------------------------|-----|------|
| Input capacitance | C _{IN} | V _{IN} = 0V, f = 1.0MHz | 12 | pF |
| Output capacitance | C _{OUT} | V _{OUT} = 0V, f = 1.0MHz | 12 | pF |

This parameter is guaranteed by design but not tested.

DC CHARACTERISTICS

(V_{CC} = 3.3V, GND = 0V, T_A = -55°C to +125°C)

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

NOTE: Contact factory for low power option.



AC CHARACTERISTICS

(V_{CC} = 3.3V, GND = 0V, T_A = -55°C to +125°C)

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

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

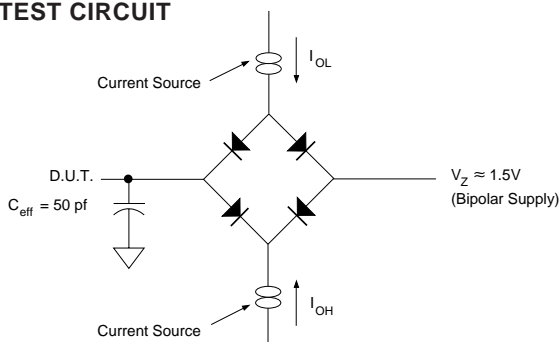
AC CHARACTERISTICS

(V_{CC} = 3.3V, GND = 0V, T_A = -55°C to +125°C)

| Parameter | Symbol | -15 | | -17 | | -20 | | Units |
|----------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-------|
| | | Min | Max | Min | Max | Min | Max | |
| Write Cycle | | | | | | | | |
| Write Cycle Time | t _{WC} | 15 | | 17 | | 20 | | ns |
| Chip Select to End of Write | t _{CW} | 12 | | 12 | | 14 | | ns |
| Address Valid to End of Write | t _{AW} | 12 | | 12 | | 14 | | ns |
| Data Valid to End of Write | t _{DW} | 9 | | 9 | | 10 | | ns |
| Write Pulse Width | t _{WP} | 12 | | 14 | | 14 | | 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 | 2 | | 3 | | 3 | | ns |
| Write Enable to Output in High Z | t _{WHZ} ¹ | | 8 | | 8 | | 9 | ns |
| Data Hold Time | t _{DH} | 0 | | 0 | | 0 | | ns |

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

AC TEST CIRCUIT



AC TEST CONDITIONS

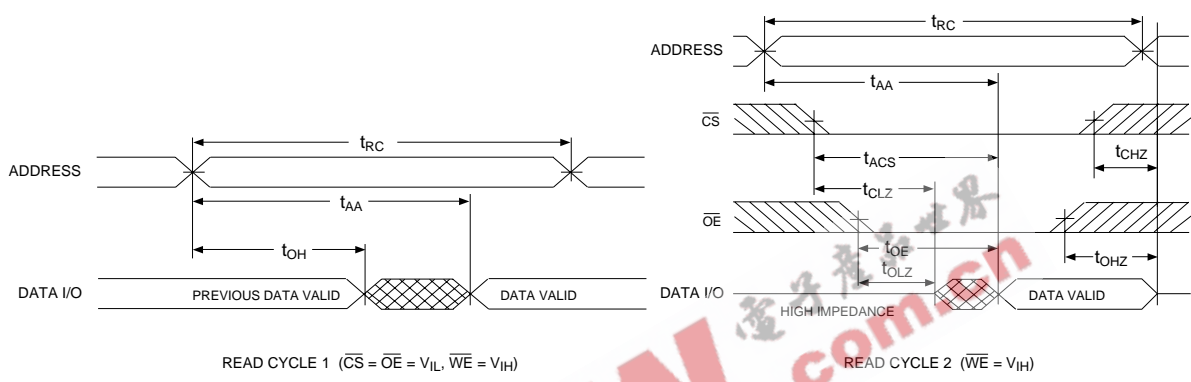
| Parameter | Typ | Unit |
|----------------------------------|--|------|
| Input Pulse Levels | V _{IL} = 0, V _{IH} = 2.5 | V |
| Input Rise and Fall | 5 | ns |
| Input and Output Reference Level | 1.5 | V |
| Output Timing Reference Level | 1.5 | V |

NOTES:

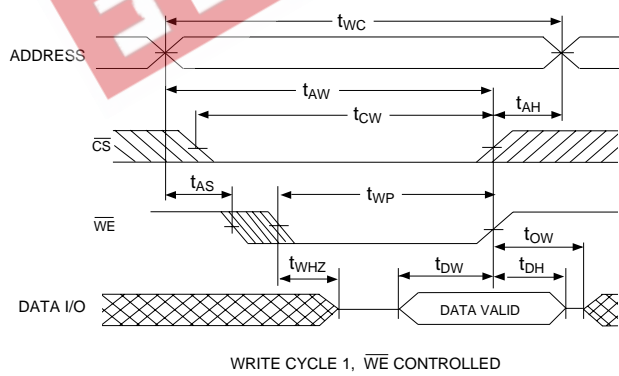
V_Z is programmable from -2V to +7V.
 I_{OL} & I_{OH} programmable from 0 to 16mA.
 Tester Impedance Z₀ = 75 Ω.
 V_Z is typically the midpoint of V_{OH} and V_{OL}.
 I_{OL} & I_{OH} are adjusted to simulate a typical resistive load circuit.
 ATE tester includes jig capacitance.



TIMING WAVEFORM - READ CYCLE

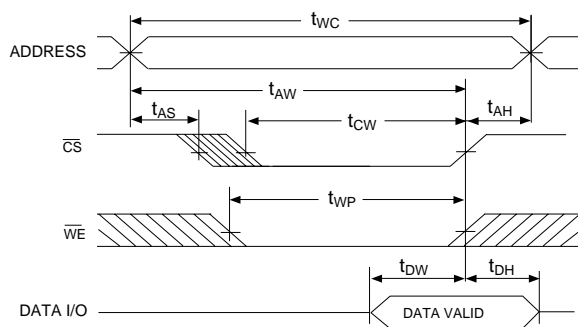


WRITE CYCLE - \overline{WE} CONTROLLED



WRITE CYCLE 1, \overline{WE} CONTROLLED

WRITE CYCLE - \overline{CS} CONTROLLED



WRITE CYCLE 2, \overline{CS} CONTROLLED



PACKAGE 100: 36 LEAD, CERAMIC SOJ



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

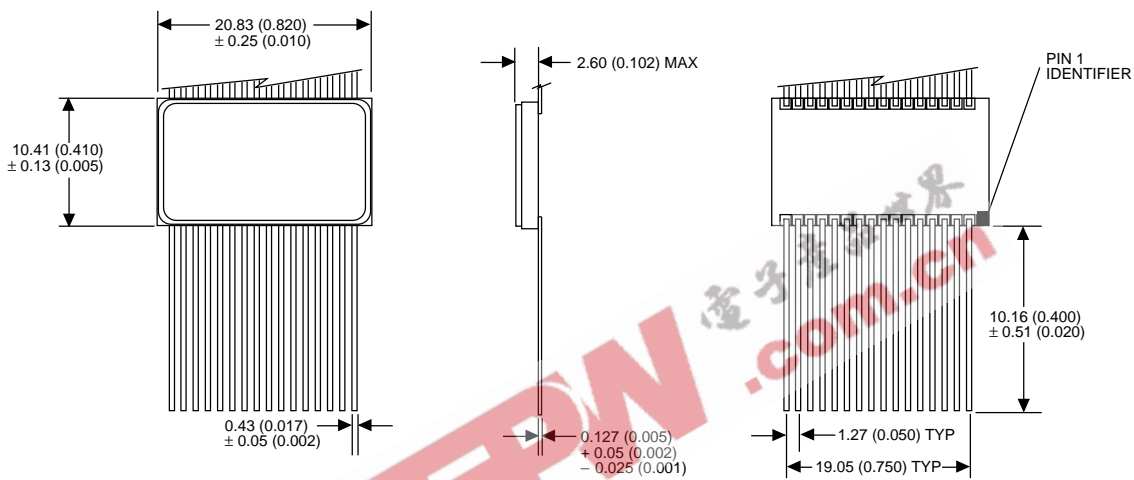
PACKAGE 101: 32 LEAD, CERAMIC SOJ



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

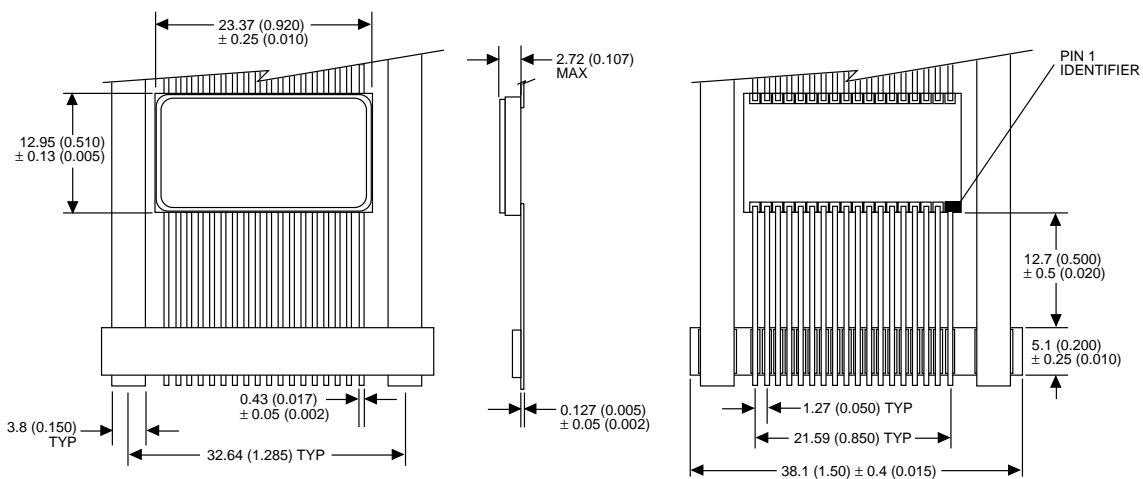


PACKAGE 220: 32 LEAD, CERAMIC FLAT PACK



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

PACKAGE 226: 36 LEAD, CERAMIC FLAT PACK



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES



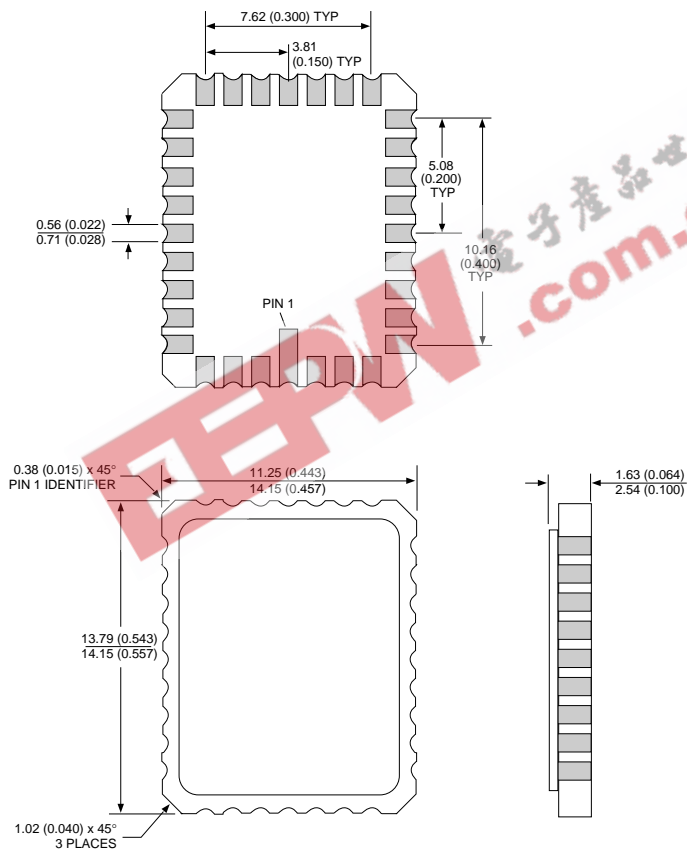
PACKAGE 300: 32 PIN, CERAMIC DIP, SINGLE CAVITY SIDE BRAZED



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES



PACKAGE 601: 32 PIN, RECTANGULAR CERAMIC LEADLESS CHIP CARRIER



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES



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.