



512Kx32 SRAM 3.3V MODULE ADVANCED*

FEATURES

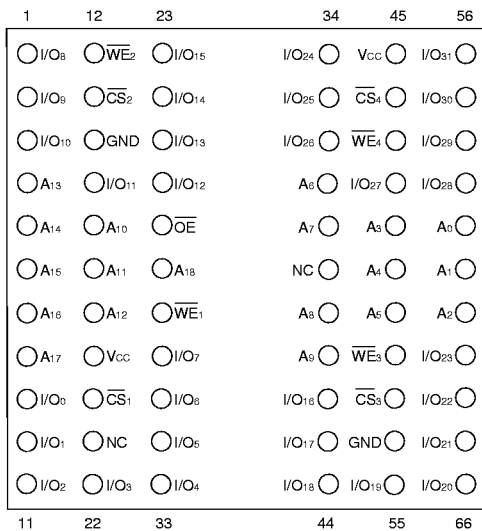
- Access Times of 15, 17, 20ns
- MIL-STD-883 Compliant Devices Available
- Low Voltage Operation
- Packaging
 - 66-pin, PGA Type, 1.075 inch square, Hermetic Ceramic HIP (Package 400)
 - 68 lead, 22mm Low Profile CQFP, 4.6mm (0.180"), (Package 509)
- Organized as 512Kx32; User Configurable as 1Mx16 or 2Mx8
- Commercial, Industrial and Military Temperature Ranges
- Low Voltage Operation:
 - 3.3V ± 10% Power Supply

- Low Power CMOS
- TTL Compatible Inputs and Outputs
- Fully Static Operation:
 - No clock or refresh required.
- Three State Output.
- Built-in Decoupling Caps and Multiple Ground Pins for Low Noise Operation
- Weight
 - WS512K32V-XG2TX - 8 grams typical
 - WS512K32NV-XH1X - 13 grams typical

** This data sheet describes a product that may or may not be under development and is subject to change or cancellation without notice.*

PIN CONFIGURATION FOR WS512K32NV-XH1X

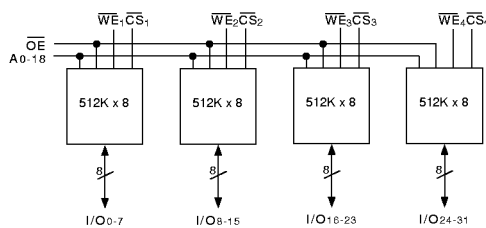
TOP VIEW



PIN DESCRIPTION

I/O ₀₋₃₁	Data Inputs/Outputs
A ₀₋₁₈	Address Inputs
\overline{WE}_1-4	Write Enables
\overline{CS}_1-4	Chip Selects
\overline{OE}	Output Enable
V _{CC}	Power Supply
GND	Ground
NC	Not Connected

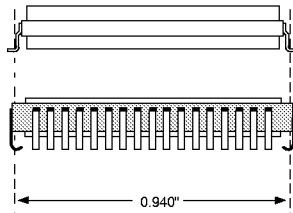
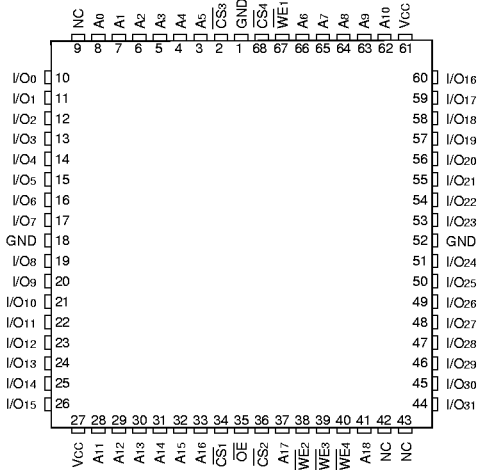
BLOCK DIAGRAM





PIN CONFIGURATION FOR WS512K32V-XG2TX

TOP VIEW

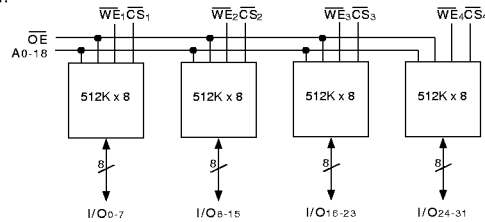


The White 68 lead G2T CQFP fills the same fit and function as the JEDEC 68 lead CQFJ or 68 PLCC. But the G2T has the TCE and lead inspection advantage of the CQFP form.

PIN DESCRIPTION

I/O0-31	Data Inputs/Outputs
A0-18	Address Inputs
\overline{WE} 1-4	Write Enables
\overline{CS} 1-4	Chip Selects
\overline{OE}	Output Enable
Vcc	Power Supply
GND	Ground
NC	Not Connected

BLOCK DIAGRAM



**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

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	Conditions	Max	Unit
\overline{OE} capacitance	C _{OE}	V _{IN} = 0 V, f = 1.0 MHz	50	pF
\overline{WE} ₁₋₄ capacitance HIP (PGA) CQFP G2T	C _{WE}	V _{IN} = 0 V, f = 1.0 MHz	20 20	pF
\overline{CS} ₁₋₄ capacitance	C _{CS}	V _{IN} = 0 V, f = 1.0 MHz	20	pF
Data I/O capacitance	C _{I/O}	V _{I/O} = 0 V, f = 1.0 MHz	20	pF
Address input capacitance	C _{AD}	V _{IN} = 0 V, f = 1.0 MHz	50	pF

This parameter is guaranteed by design but not tested.

DC CHARACTERISTICS(V_{CC} = 3.3V ± 0.3V, T_A = -55°C to +125°C)

Parameter	Sym	Conditions	Units	
			Min	Max
Input Leakage Current	I _{LI}	V _{IN} = GND to V _{CC}		10 μA
Output Leakage Current	I _{LO}	\overline{CS} = V _{IH} , \overline{OE} = V _{IH} , V _{OUT} = GND to V _{CC}		10 μA
Operating Supply Current (x 32 Mode)	I _{CC} x 32	\overline{CS} = V _{IL} , \overline{OE} = V _{IH} , f = 5MHz, V _{CC} = 3.6V		600 mA
Standby Current	I _{SB}	\overline{CS} = V _{IH} , \overline{OE} = V _{IH} , f = 5MHz, V _{CC} = 3.6V		60 mA
Output Low Voltage	V _{OL}	I _{OL} = 8mA		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



AC CHARACTERISTICS
(Vcc = 3.3V, TA = -55°C to +125°C)

Table with 8 columns: Parameter, Symbol, -15 Min, -15 Max, -17 Min, -17 Max, -20 Min, -20 Max, Units. Rows include Read Cycle Time, Address Access Time, Output Hold from Address Change, Chip Select Access Time, Output Enable to Output Valid, Chip Select to Output in Low Z, Output Enable to Output in Low Z, Chip Disable to Output in High Z, Output Disable to Output in High Z.

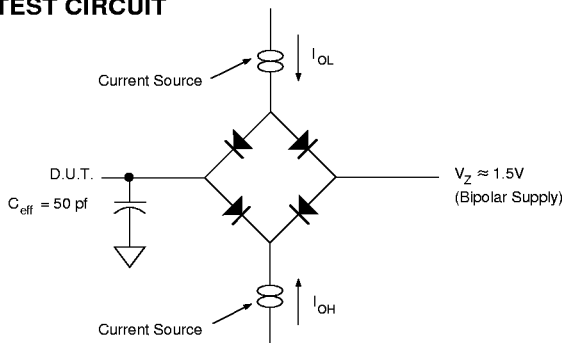
1. This parameter is guaranteed by design but not tested.

AC CHARACTERISTICS
(Vcc = 3.3V, TA = -55°C to +125°C)

Table with 8 columns: Parameter, Symbol, -15 Min, -15 Max, -17 Min, -17 Max, -20 Min, -20 Max, Units. Rows include Write Cycle Time, Chip Select to End of Write, Address Valid to End of Write, Data Valid to End of Write, Write Pulse Width, Address Setup Time, Address Hold Time, Output Active from End of Write, Write Enable to Output in High Z, Data Hold Time.

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

AC TEST CIRCUIT



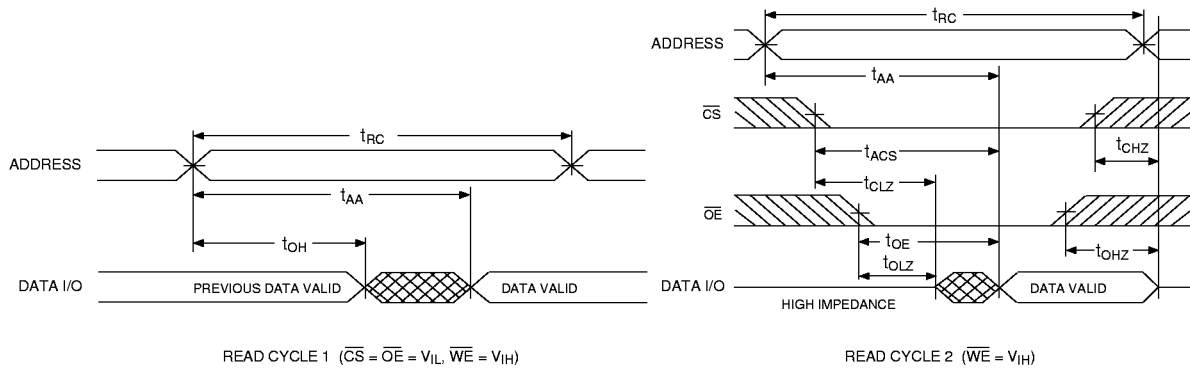
AC TEST CONDITIONS

Table with 3 columns: Parameter, Typ, Unit. Rows include Input Pulse Levels, Input Rise and Fall, Input and Output Reference Level, Output Timing Reference Level.

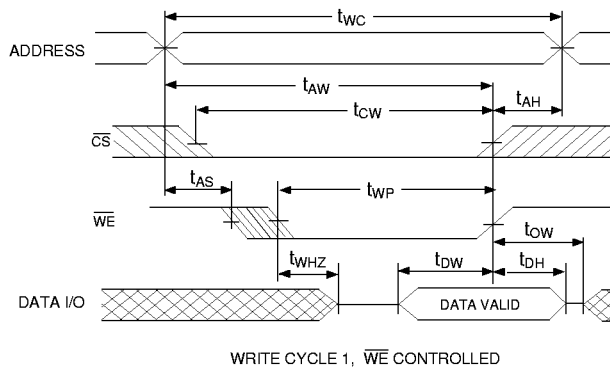
NOTES: Vz is programmable from -2V to +7V. IOL & IOH programmable from 0 to 16mA. Tester Impedance Z0 = 75 Ohm. Vz is typically the midpoint of VOH and VOL. IOL & IOH are adjusted to simulate a typical resistive load circuit. ATE tester includes jig capacitance.



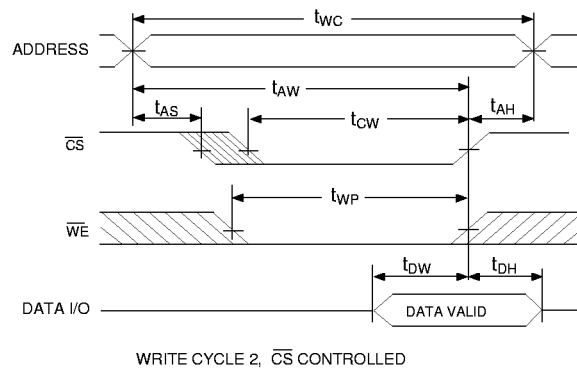
TIMING WAVEFORM - READ CYCLE



WRITE CYCLE - \overline{WE} CONTROLLED

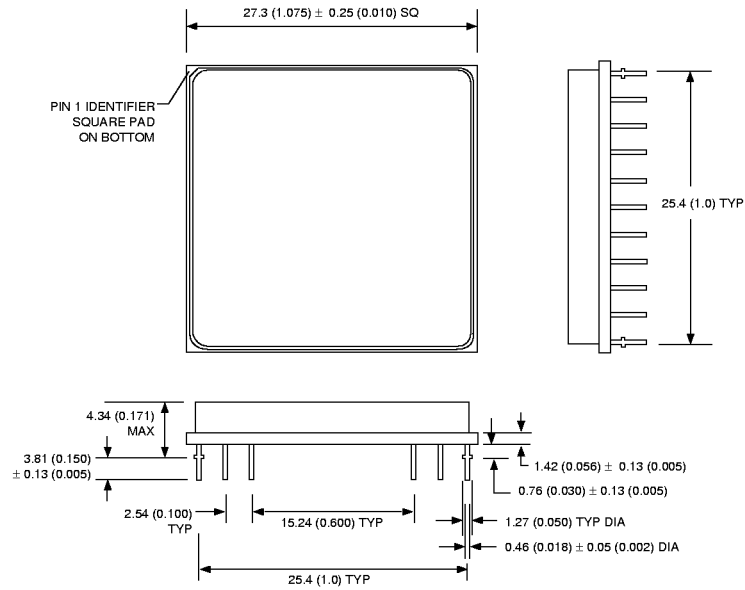


WRITE CYCLE - \overline{CS} CONTROLLED





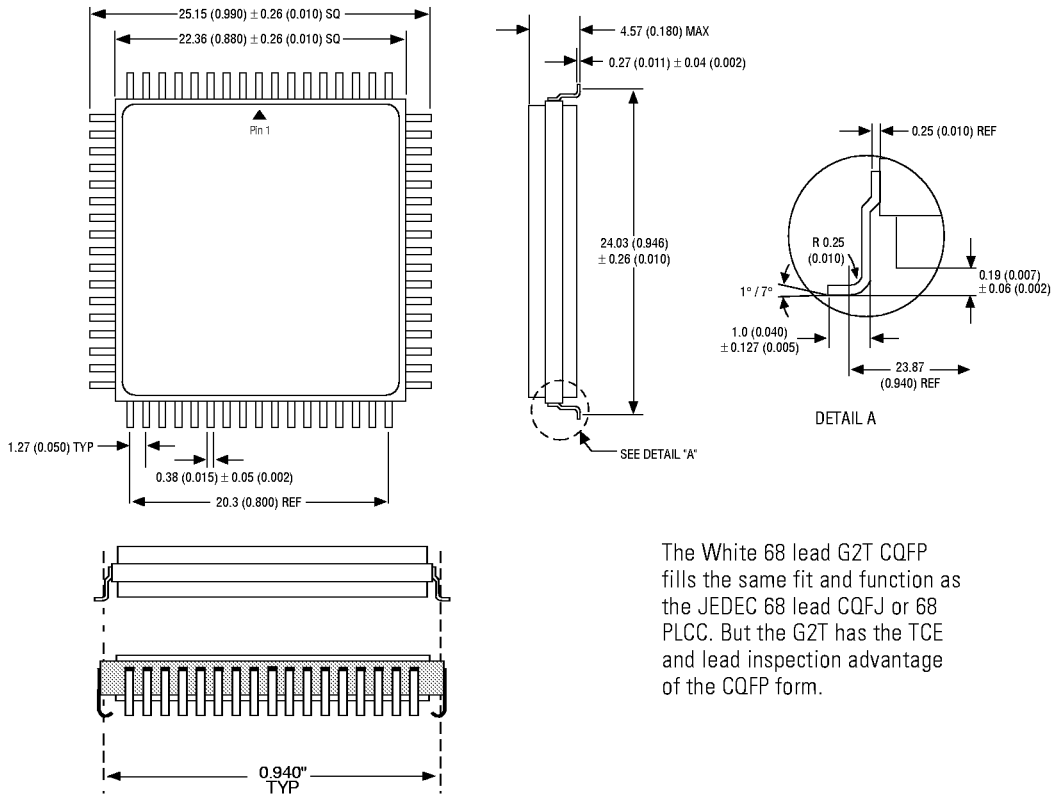
PACKAGE 400: 66 PIN, PGA TYPE, CERAMIC HEX-IN-LINE PACKAGE, HIP (H1)



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHECALLY IN INCHES



PACKAGE 509: 68 LEAD, LOW PROFILE CERAMIC QUAD FLAT PACK, CQFP (G2T)



The White 68 lead G2T CQFP fills the same fit and function as the JEDEC 68 lead CQFJ or 68 PLCC. But the G2T has the TCE and lead inspection advantage of the CQFP form.

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ORDERING INFORMATION

W S 512K 32 X 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 TYPE:

- H1 = 1.075" sq. Ceramic Hex In Line Package, HIP (Package 400)
- G2T = 22mm Ceramic Quad Flat Pack, Low Profile CQFP (Package 509)

ACCESS TIME (ns)

Low Voltage Supply 3.3V ± 10%

IMPROVEMENT MARK:

- N = No Connect at pin 21 and 39 in HIP for Upgrades

ORGANIZATION, 512Kx32

- User configurable as 1Mx16 or 2Mx8

SRAM

WHITE MICROELECTRONICS