



128Kx32 SRAM MODULE

FEATURES

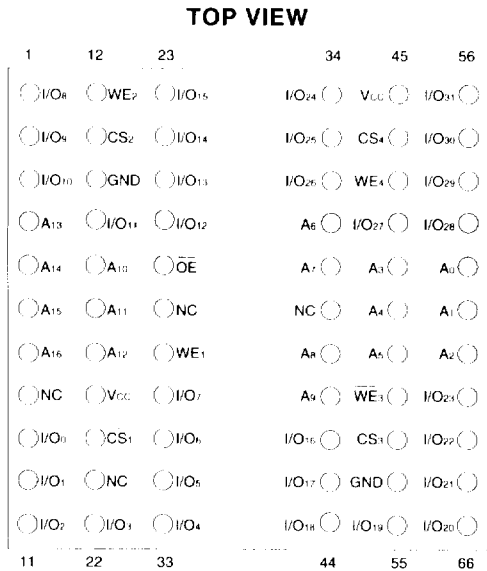
- Access Times of 25 to 45nS
- MIL-STD-883 Compliant Devices Available
- Rad Tolerant Devices Available
- Packaging
 - 66-pin, PGA Type, 1.185 inch square Hermetic Ceramic HIP (Package 401), SMD Number 5962-93187
 - 68 lead, 40mm, Hermetic CQFP (Package 501), SMD Number 5962-95595
 - 68 lead, 40mm Low Profile CQFP, 3.5mm (0.140") (Package 502)
 - 68 lead, Hermetic CQFP (G2), 22mm (0.880 inch) square (Package 500). Designed to fit JEDEC 68 lead 0.990" CQFJ footprint (Fig. 3)

- Organized as 128Kx32, User Configurable as 256Kx16 or 512Kx8
- Commercial, Industrial and Military Temperature Ranges
- 5 Volt Power Supply
- Low Power CMOS
- TTL Compatible Inputs and Outputs
- Built in Decoupling Caps and Multiple Ground Pins for Low Noise Operation
- Weight
 - WS128K32-XHX - 13 grams typical
 - WS128K32-XG4X - 20 grams typical
- Each of these devices is upgradeable to 512Kx32

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FIG. 1 PIN CONFIGURATION FOR WS128K32N-XHX, SMD 5962-93187



PIN DESCRIPTION

I/O ₀₋₃₁	Data Inputs/Outputs
A ₀₋₁₆	Address Inputs
WE ₁₋₄	Write Enables
CS ₁₋₄	Chip Selects
OE	Output Enable
V _{CC}	Power Supply
GND	Ground
NC	Not Connected

BLOCK DIAGRAM

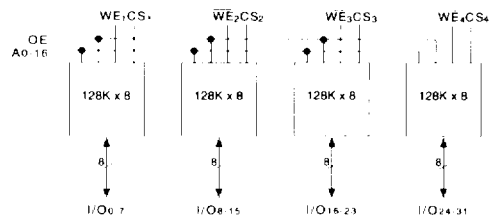
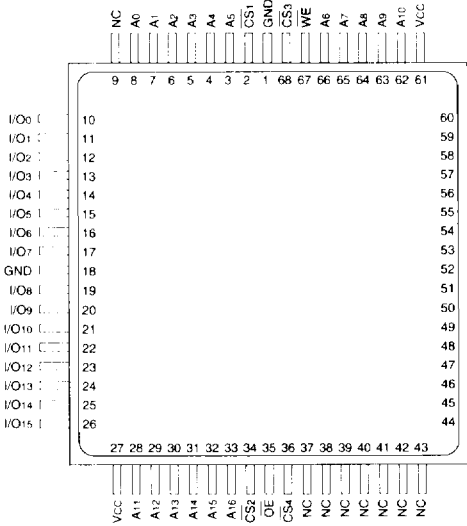




FIG. 2 PIN CONFIGURATION FOR WS128K32-XG4X, SMD 5962-95595

TOP VIEW



PIN DESCRIPTION

Table with 2 columns: Pin Function and Description. Includes I/O0-31, A0-16, WE, CS1-4, OE, Vcc, GND, and NC.

BLOCK DIAGRAM

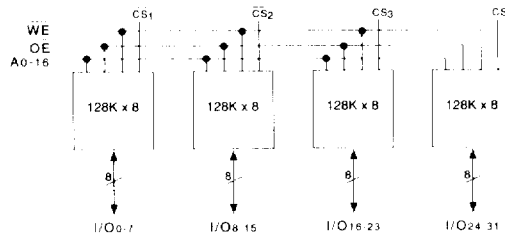
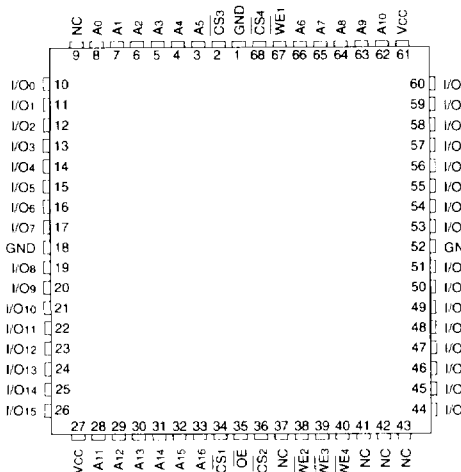


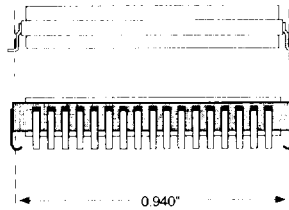
FIG. 3 PIN CONFIGURATION FOR WS128K32-XG2X

TOP VIEW



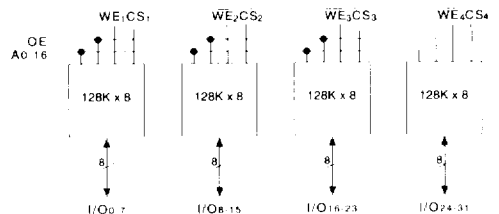
PIN DESCRIPTION

Table with 2 columns: Pin Function and Description. Includes I/O0-31, A0-16, WE1-4, CS1-4, OE, Vcc, GND, and NC.



The White 68 lead G2 CQFP fills the same fit and function as the JEDEC 68 lead CQFJ or 68 PLCC. But the G2 has the TCE and lead inspection advantage of the CQFP form.

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 _I	-0.5	V _{CC} +0.5	V
Junction Temperature	T _J		150	°C
Supply Voltage	V _{CC}	-0.5	7.0	V

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{CC}	4.5	5.5	V
Input High Voltage	V _{IH}	2.2	V _{CC} + 0.3	V
Input Low Voltage	V _{IL}	-0.5	+0.8	V

TRUTH TABLE

CS	OE	WE	Mode	Data I/O	Power
H	X	X	Standby	High Z	Standby
L	L	H	Read	Data Out	Active
L	H	H	Out Disable	High Z	Active
L	X	L	Write	Data In	Active

CAPACITANCE

(T_A = +25°C)

Parameter	Symbol	Conditions	Max	Unit
OE capacitance	C _{OE}	V _{IN} = 0 V, f = 1.0 MHz	50	pF
WE _{1,4} capacitance HIP (PGA) CQFP G4 CQFP G2	C _{WE}	V _{IN} = 0 V, f = 1.0 MHz	20 50 20	pF
CS _{1,4} capacitance	C _{CS}	V _{IN} = 0 V, f = 1.0 MHz	20	pF
Data I/O capacitance	C _{I/O}	V _{IO} = 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} = 5.0V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Sym	Conditions	-25		-35		-45		Units
			Min	Max	Min	Max	Min	Max	
Input Leakage Current	I _{II}	V _{CC} = 5.5, V _{IN} = GND to V _{CC}		10		10		10	µA
Output Leakage Current	I _{IO}	CS = V _{IH} , OE = V _{IH} , V _{OUT} = GND to V _{CC}		10		10		10	µA
Operating Supply Current x 32 Mode	I _{CC} x 32	CS = V _{IL} , OE = V _{IH} , f = 5MHz, V _{CC} = 5.5		500		500		420	mA
Standby Current	I _{SB}	CS = V _{IH} , OE = V _{IH} , f = 5MHz, V _{CC} = 5.5		60		60		60	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

DATA RETENTION CHARACTERISTICS

(T_A = -55°C to +125°C)

Parameter	Symbol	Conditions	-25			-35			-45			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Data Retention Supply Voltage	V _{DR}	CS > V _{CC} - 0.2V	2.0		5.5	2.0		5.5	2.0		5.5	V
Data Retention Current	I _{DD1}	V _{CC} = 3V		0.5	8.0		0.5	8.0		0.5	8.0	mA
	I _{DD2}	V _{CC} = 2V		0.25	4.0		0.25	4.0		0.25	4.0	mA

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AC CHARACTERISTICS
(Vcc = 5.0V, TA = -55°C to +125°C)

Table with 9 columns: Parameter, Symbol, -25 (Min, Max), -35 (Min, Max), -45 (Min, Max), Units. Rows include Read Cycle Time, Address Access Time, Output Hold from Address Change, etc.

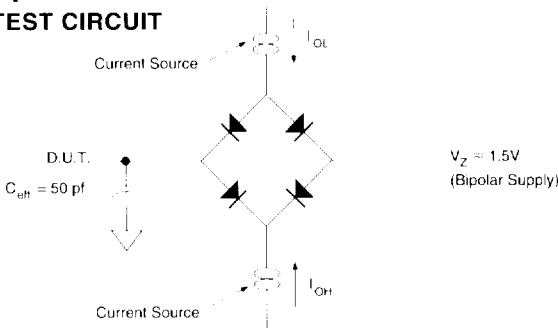
1. This parameter is guaranteed by design but not tested.

AC CHARACTERISTICS
(Vcc = 5.0V, TA = -55°C to +125°C)

Table with 9 columns: Parameter, Symbol, -25 (Min, Max), -35 (Min, Max), -45 (Min, Max), Units. Rows include Write Cycle Time, Chip Select to End of Write, Address Valid to End of Write, etc.

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

FIG. 4
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.
Iin & Ioh programmable from 0 to 16mA.
Tester Impedance Z0 = 75 Ω.
VZ is typically the midpoint of VIH and VOL.
Iin & Ioh are adjusted to simulate a typical resistive load circuit.
ATE tester includes jig capacitance.

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ORDERING INFORMATION

W S 128K 32 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 TYPE:

H = Ceramic Hex-In-line Package, HIP (Package 401)

G2 = 22 mm Ceramic Quad Flat Pack, CQFP (Package 500)

G4 = 40 mm Ceramic Quad Flat Pack, CQFP (Package 501)

G4T = 40 mm Low Profile CQFP (Package 502)

ACCESS TIME in nS

IMPROVEMENT MARK:

N = No Connect at pin 8, 21, 28 and 39 in HIP for Upgrades

ORGANIZATION, 128Kx32

User configurable as 256Kx16 or 512Kx8

SRAM

WHITE MICROELECTRONICS

SRAM MODULES

Device Type	Speed	Package	SMD Number
128K x 32 SRAM Module	45nS	66 pin HIP	5962-93187 06HXX
128K x 32 SRAM Module	35nS	66 pin HIP	5962-93187 07HXX
128K x 32 SRAM Module	25nS	66 pin HIP	5962-93187 08HXX
128K x 32 SRAM Module	45nS	68 pin CQFP	5962-95595 06HXX
128K x 32 SRAM Module	35nS	68 pin CQFP	5962-95595 07HXX
128K x 32 SRAM Module	25nS	68 pin CQFP	5962-95595 08HXX