



128Kx8 MONOLITHIC SRAM, SMD 5962-96691

FEATURES

- Access Times 70, 85, 100, 120ns
- Revolutionary, Center Power/Ground Pinout JEDEC Approved
 - 32 lead Ceramic SOJ (Package 101)
- 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 206)
- MIL-STD-883 Compliant Devices Available
- Commercial, Industrial and Military Temperature Range
- 5 Volt Power Supply
- Low Power CMOS
- 2V Data Retention Devices Available (Low Power Version)
- TTL Compatible Inputs and Outputs

REVOLUTIONARY PINOUT

32 CSOJ (DR)

TOP VIEW

A0	1	32	A16
A1	2	31	A15
A2	3	30	A14
A3	4	29	A13
\overline{CS}	5	28	\overline{OE}
I/O1	6	27	I/O8
I/O2	7	26	I/O7
Vcc	8	25	GND
GND	9	24	Vcc
I/O3	10	23	I/O6
I/O4	11	22	I/O5
\overline{WE}	12	21	A12
A4	13	20	A11
A5	14	19	A10
A6	15	18	A9
A7	16	17	A8

EVOLUTIONARY PINOUT

32 DIP (C)
32 CSOJ (DE)
32 FLATPACK (FE)

TOP VIEW

NC	1	32	Vcc
A16	2	31	A15
A14	3	30	NC
A12	4	29	\overline{WE}
A7	5	28	A13
A6	6	27	A8
A5	7	26	A9
A4	8	25	A11
A3	9	24	\overline{OE}
A2	10	23	A10
A1	11	22	\overline{CS}
A0	12	21	I/O7
I/O0	13	20	I/O6
I/O1	14	19	I/O5
I/O2	15	18	I/O4
GND	16	17	I/O3

PIN DESCRIPTION

A0-16	Address Inputs
I/O0-7	Data Input/Output
\overline{CS}	Chip Select
\overline{OE}	Output Enable
\overline{WE}	Write Enable
Vcc	+5.0V Power
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	V _{CC} +0.5	V
Junction Temperature	T _J		150	°C
Supply Voltage	V _{CC}	-0.5	7.0	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	H	H	Out Disable	High Z	Active
L	X	L	Write	Data In	Active

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

**CAPACITANCE
(TA = +25°C)**

Parameter	Symbol	Condition	Package	Max	Unit
Input capacitance	C _{IN}	V _{IN} = 0V, f = 1.0MHz	32 Pin CSOJ, DIP, Flat Pack Evolutionary	12	pF
			32 Pin CSOJ Revolutionary	20	pF
Output capacitance	C _{OUT}	V _{OUT} = 0V, f = 1.0MHz	32 Pin CSOJ, DIP, Flat Pack Evolutionary	12	pF
			32 Pin CSOJ Revolutionary	20	pF

This parameter is guaranteed by design but not tested.

**DC CHARACTERISTICS
(VCC = 5.0V, GND = 0V, TA = -55°C TO +125°C)**

Parameter	Sym	Conditions	-70		-85		-100		-120		Units
			Min	Max	Min	Max	Min	Max	Min	Max	
Input Leakage Current	I _{LI}	V _{CC} = 5.5, V _{IN} = GND to V _{CC}		10		10		10		10	μA
Output Leakage Current	I _{LO}	$\overline{CS} = V_{IH}, \overline{OE} = V_{IH}, V_{OUT} = GND \text{ to } V_{CC}$		10		10		10		10	μA
Operating Supply Current	I _{CC}	$\overline{CS} = V_{IH}, \overline{OE} = V_{IH}, f = 5\text{MHz}, V_{CC} = 5.5$		30		30		30		30	mA
Standby Current	I _{SB}	$\overline{CS} = V_{IH}, \overline{OE} = V_{IH}, f = 5\text{MHz}, V_{CC} = 5.5$		5		5		5		5	mA
Output Low Voltage	V _{OL}	I _{OL} = 2.1mA, V _{CC} = 4.5		0.4		0.4		0.4		0.4	V
Output High Voltage	V _{OH}	I _{OH} = -1.0mA, V _{CC} = 4.5	2.4		2.4		2.4		2.4		V

NOTE: DC test conditions: V_{IH} = V_{CC} - 0.3V, V_{IL} = 0.3V

**DATA RETENTION CHARACTERISTICS
(TA = -55°C TO +125°C)**

Parameter	Symbol	Conditions	-70		-85		-100		-120		Units
			Min	Max	Min	Max	Min	Max	Min	Max	
Data Retention Supply Voltage	V _{DR}	$\overline{CS} \geq V_{CC} - 0.2V$	2.0	5.5	2.0	5.5	2.0	5.5	2.0	5.5	V
Data Retention Current	I _{CCDR1}	V _{CC} = 3V		1		1		1		1	mA



AC CHARACTERISTICS
(VCC = 5.0V, TA = -55°C To +125°C)

Parameter	Symbol	-70		-85		-100		-120		Units
		Min	Max	Min	Max	Min	Max	Min	Max	
Read Cycle										
Read Cycle Time	t _{RC}	70		85		100		120		ns
Address Access Time	t _{AA}		70		85		100		120	ns
Output Hold from Address Change	t _{OH}	3		3		3		3		ns
Chip Select Access Time	t _{ACS}		70		85		100		120	ns
Output Enable to Output Valid	t _{OE}		35		45		50		60	ns
Chip Select to Output in Low Z	t _{CLZ} ¹	3		3		3		3		ns
Output Enable to Output in Low Z	t _{OLZ} ¹	0		0		0		0		ns
Chip Disable to Output in High Z	t _{CHZ} ¹		25		25		35		35	ns
Output Disable to Output in High Z	t _{OHZ} ¹		25		25		35		35	ns

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

AC CHARACTERISTICS
(VCC = 5.0V, TA = -55°C To +125°C)

Parameter	Symbol	-70		-85		-100		-120		Units
		Min	Max	Min	Max	Min	Max	Min	Max	
Write Cycle										
Write Cycle Time	t _{WC}	70		85		100		120		ns
Chip Select to End of Write	t _{CW}	60		75		80		100		ns
Address Valid to End of Write	t _{AW}	60		75		80		100		ns
Data Valid to End of Write	t _{DW}	30		35		40		50		ns
Write Pulse Width	t _{WP}	50		55		70		80		ns
Address Setup Time	t _{AS}	0		0		0		0		ns
Address Hold Time	t _{AH}	5		5		5		5		ns
Output Active from End of Write	t _{OW} ¹	5		5		5		5		ns
Write Enable to Output in High Z	t _{WHZ} ¹		25		30		35		35	ns
Data Hold Time	t _{DH}	0		0		0		0		ns

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

AC TEST CIRCUIT



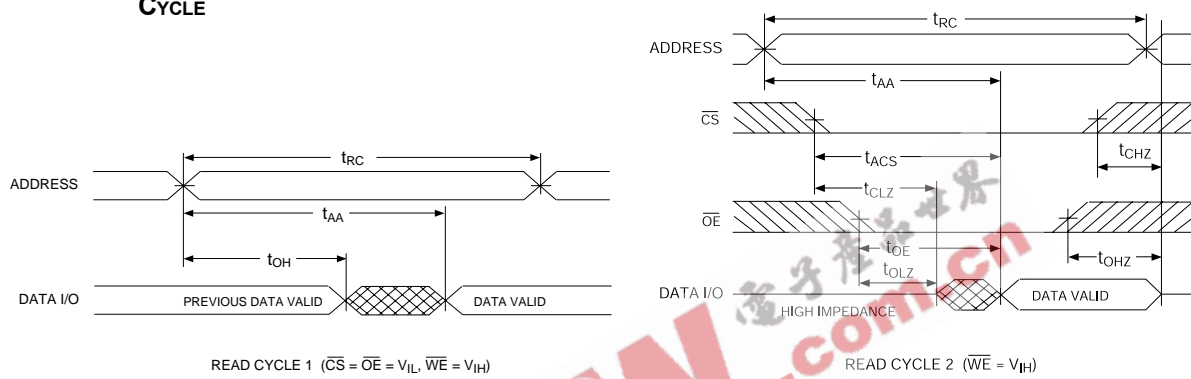
AC TEST CONDITIONS

Parameter	Typ	Unit
Input Pulse Levels	$V_{IL} = 0, V_{IH} = 3.0$	V
Input Rise and Fall	5	ns
Input and Output Reference Level	1.5	V
Output Timing Reference Level	1.5	V

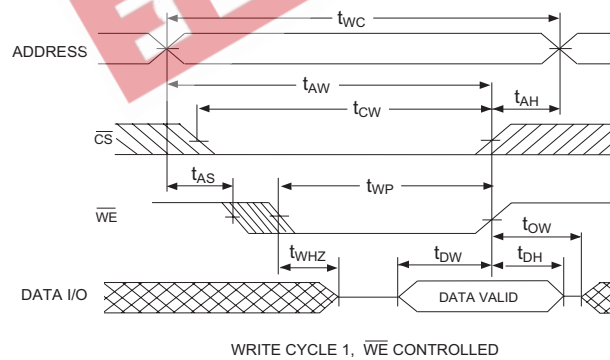
Notes:
 V_Z is programmable from -2V to +7V.
 I_{OL} & I_{OH} programmable from 0 to 16mA.
 Tester Impedance $Z_0 = 75\Omega$.
 V_Z is typically the midpoint of V_{OH} and V_{OL} .
 I_{OL} & I_{OH} are adjusted to simulate a typical resistive load circuit.
 ATE tester includes jig capacitance.



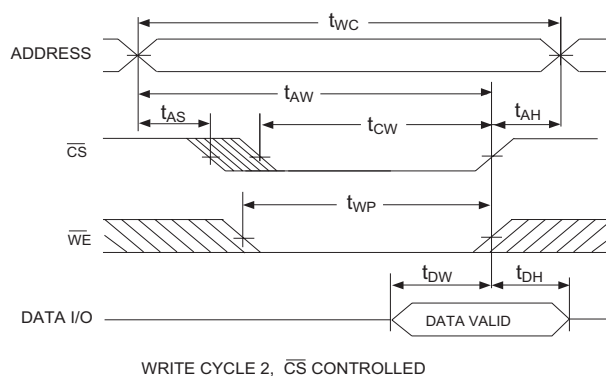
TIMING WAVEFORM - READ CYCLE



WRITE CYCLE - \overline{WE} CONTROLLED

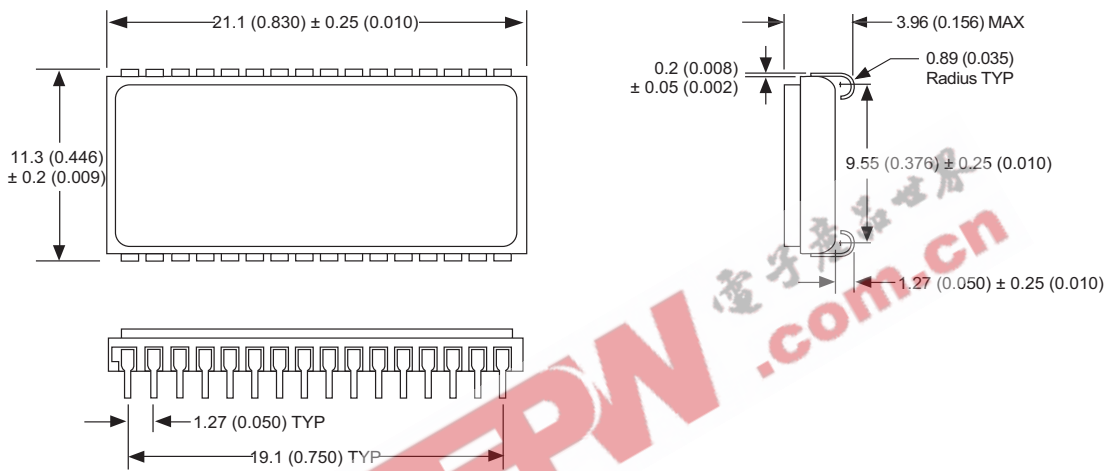


WRITE CYCLE - \overline{CS} CONTROLLED



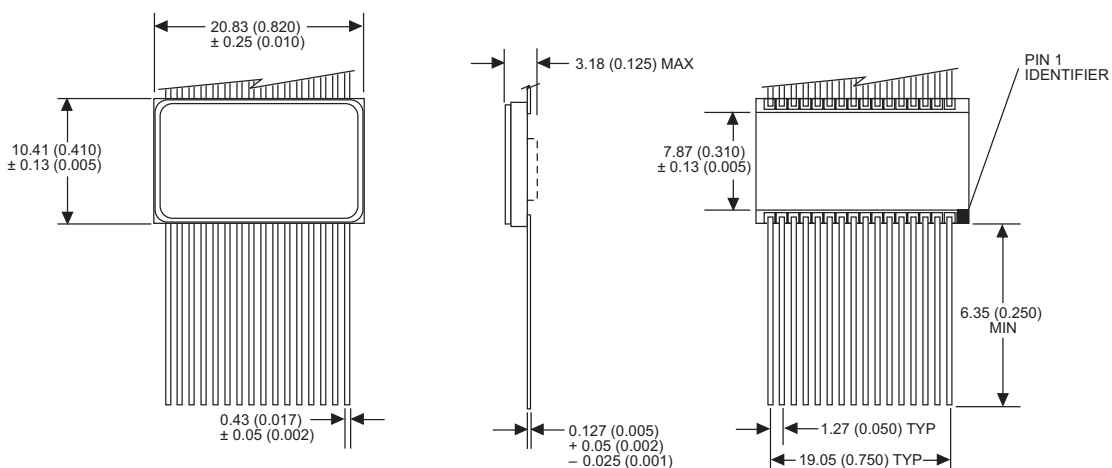


PACKAGE 101: 32 LEAD, CERAMIC SOJ



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

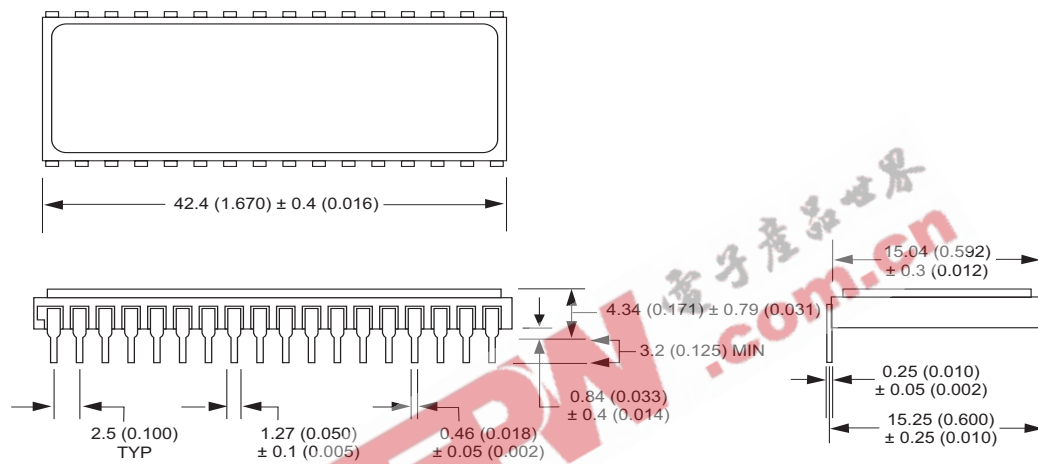
PACKAGE 206: 32 LEAD, CERAMIC FLAT PACK



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



**DATA RETENTION CHARACTERISTICS
(TA = -55°C TO +125°C)
LOW POWER VERSION ONLY**

Parameter	Symbol	Conditions			Units
			Min	Max	
Data Retention Supply Voltage	VDR	$\overline{CS} \geq V_{CC} - 0.2V$	2.0	5.5	V
Data Retention Current	ICCDR3	VCC = 2V		750	μA

ORDERING INFORMATION

W M S 128K 8 X - XXX X X X

LEAD FINISH:

Blank = Gold plated leads
A = Solder clip 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)
DE = 32 Lead Ceramic SOJ (Package 101) Evolutionary
DR = 32 Lead Ceramic SOJ (Package 101) Revolutionary
FE = 32 Lead Ceramic Flat Pack (Package 206)

ACCESS TIME (ns)

IMPROVEMENT MARK

L = Low Power for 2V Data Retention

ORGANIZATION, 128Kx8

SRAM

MONOLITHIC

WHITE ELECTRONIC DESIGNS CORP.



DEVICE TYPE	SPEED	PACKAGE	SMD NO.
128K x 8 SRAM Monolithic	120ns	32 lead SOJ Revol (DR)	5962-96691 01HUX
128K x 8 SRAM Monolithic	100ns	32 lead SOJ Revol (DR)	5962-96691 02HUX
128K x 8 SRAM Monolithic	85ns	32 lead SOJ Revol (DR)	5962-96691 03HUX
128K x 8 SRAM Monolithic	70ns	32 lead SOJ Revol (DR)	5962-96691 04HUX
128K x 8 SRAM Monolithic	120ns	32 lead SOJ Evol (DE)	5962-96691 01HTX
128K x 8 SRAM Monolithic	100ns	32 lead SOJ Evol (DE)	5962-96691 02HTX
128K x 8 SRAM Monolithic	85ns	32 lead SOJ Evol (DE)	5962-96691 03HTX
128K x 8 SRAM Monolithic	70ns	32 lead SOJ Evol (DE)	5962-96691 04HTX
128K x 8 SRAM Monolithic	120ns	32 pin DIP (C)	5962-96691 01HYX
128K x 8 SRAM Monolithic	100ns	32 pin DIP (C)	5962-96691 02HYX
128K x 8 SRAM Monolithic	85ns	32 pin DIP (C)	5962-96691 03HYX
128K x 8 SRAM Monolithic	70ns	32 pin DIP (C)	5962-96691 04HYX
128K x 8 SRAM Monolithic	120ns	32 pin Flatpack (FE)	5962-96691 01HNX
128K x 8 SRAM Monolithic	100ns	32 pin Flatpack (FE)	5962-96691 02HNX
128K x 8 SRAM Monolithic	85ns	32 pin Flatpack (FE)	5962-96691 03HNX
128K x 8 SRAM Monolithic	70ns	32 pin Flatpack (FE)	5962-96691 04HNX