128Kx8 Plastic Monolithic 3.3V SRAM

FEATURES

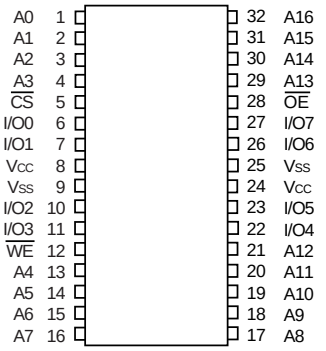
- Access Times of 15, 20, 25ns
- TTL Compatible Inputs and Outputs
- Fully Static Operation
- Center Power and Ground Pins
- Industrial and Military Temperature Ranges
- JEDEC Approved Revolutionary Pinout
  - 32 pin Plastic SOJ (Package 7)
- Single +3.3V (±10%) Supply Operation

WEDC's ruggedized plastic 128Kx8 SRAM allows the user to capitalize on the cost advantage of using a plastic component while not sacrificing all of the reliability available in a full military device.

Extended temperature testing is performed with the test patterns developed for use on WEDC's fully compliant 128Kx8 SRAMs. WEDC fully characterizes devices to determine the proper test patterns for testing at temperature extremes. This is critical because the operating characteristics of device change when it is operated beyond the commercial temperature range. Using commercial test methods will not guarantee a device that operates reliably in the field at temperature extremes. Users of WEDC's ruggedized plastic benefit from WEDC's extensive experience in characterizing SRAMs for use in military systems.

FIG. 1 PIN CONFIGURATION

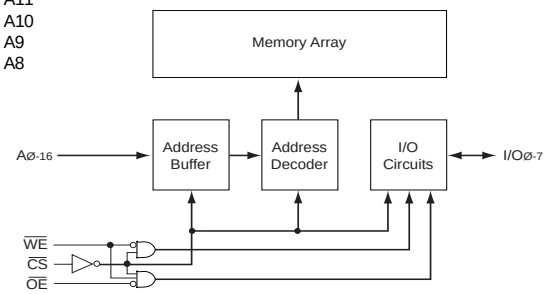
TOP VIEW



PIN DESCRIPTION

I/O0-7	Data Inputs/Outputs
A0-16	Address Inputs
$\overline{WE}$	Write Enable
$\overline{CS}$	Chip Select
$\overline{OE}$	Output Enable
VCC	Power (+3.3V ±10%)
VSS	Ground
NC	Not Connected

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter		Unit
Voltage on any pin relative to Vss	-0.5 to 4.6	V
Operating Temperature T_A (Ambient)		
Commercial	0 to +70	°C
Industrial	-40 to +85	°C
Military	-55 to +125	°C
Storage Temperature, Plastic	-65 to +125	°C
Power Dissipation	1.5	W
Output Current	20	mA
Junction Temperature, T_J	175	°C

NOTE:
Stress greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions greater than those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

TRUTH TABLE

$\overline{OE}$	$\overline{CS}$	$\overline{WE}$	Mode	Output	Power
X	H	X	Standby	High Z	I_{CC2}, I_{CC3}
H	L	H	Output Deselect	High Z	I_{CC1}
L	L	H	Read	Data Out	I_{CC1}
X	L	L	Write	Data In	I_{CC1}

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	3.0	3.3	3.6	V
Supply Voltage	V_{SS}	0	0	0	V
Input High Voltage	V_{IH}	2.2	—	6.0	V
Input Low Voltage	V_{IL}	-0.3	—	+0.8	V

CAPACITANCE

(T_A = +25°C)

Parameter	Symbol	Condition	Max	Unit
Address Lines	C_I	V_{IN} = Vcc or Vss, f = 1.0MHz	6	pF
Data Lines	C_O	V_{OUT} = Vcc or Vss, f = 1.0MHz	8	pF

These parameters are sampled, not 100% tested.

DC CHARACTERISTICS

(V_{CC} = 5V, T_A = -55°C to +125°C)

Parameter	Symbol	Conditions	Min	Max	Units
Input Leakage Current	I_{LI}	V_{IN} = 0V to V_{CC}	-10	+10	µA
Output Leakage Current	I_{LO}	$V_{I/O}$ = 0V to V_{CC}	-10	+10	µA
Operating Power Supply Current	I_{CC1}	$\overline{WE}$, $\overline{CS}$ = V_{IL}, $I_{I/O}$ = 0mA, Min Cycle	—	170	mA
Standby (TTL) Power Supply Current	I_{CC2}	$\overline{CS} \geq V_{IH}$, $V_{IN} \leq V_{IL}$, $V_{IN} \geq V_{IH}$	—	30	mA
Full Standby Power Supply Current	I_{CC3}	$\overline{CS} \geq V_{CC}$ -0.2V $V_{IN} \geq$ Vcc -0.2V or $V_{IN} \leq$ 0.2V	—	10	mA
Output Low Voltage	V_{OL}	I_{OL} = 8.0mA	—	0.4	V
Output High Voltage	V_{OH}	I_{OH} = -4.0mA	2.4	—	V

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

AC CHARACTERISTICS – READ CYCLE

(V_{CC} = 5.0V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Symbol JEDEC	Symbol Alt.	15ns Min	15ns Max	20ns Min	20ns Max	25ns Min	25ns Max	Units
Read Cycle Time	t_{AVAV}	t_{RC}	15		20		25		ns
Address Access Time	t_{AVQV}	t_{AA}		15		20		25	ns
Chip Enable Access Time	t_{ELQV}	t_{ACS}		15		20		25	ns
Chip Enable to Output in Low Z (1)	t_{ELQX}	t_{CLZ}	3		3		3		ns
Chip Disable to Output in High Z (1)	t_{EHQZ}	t_{CHZ}	0	7	0	8	0	10	ns
Output Hold from Address Change	t_{AVQX}	t_{OH}	3		3		3		ns
Output Enable to Output Valid	t_{GLQV}	t_{OE}		7		8		10	ns
Output Enable to Output in Low Z (1)	t_{GLQX}	t_{OLZ}	0		0		0		ns
Output Disable to Output in High Z (1)	t_{GHQZ}	t_{OHZ}	0	7	0	8	0	10	ns

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

AC CHARACTERISTICS – WRITE CYCLE

(V_{CC} = 5.0V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Symbol JEDEC	Symbol Alt.	15ns Min	15ns Max	20ns Min	20ns Max	25ns Min	25ns Max	Units
Write Cycle Time	t_{AVAV}	t_{WC}	15		20		25		ns
Chip Enable to End of Write	t_{ELWH} t_{ELEH}	t_{CW} t_{CW}	10 10		12 12		17 17		ns ns
Address Setup Time	t_{AVWL} t_{AVEL}	t_{AS} t_{AS}	0 0		0 0		0 0		ns ns
Address Valid to End of Write	t_{AVWH} t_{AVEH}	t_{AW} t_{AW}	10 10		12 12		17 17		ns ns
Write Pulse Width	t_{WLWH} t_{WLEH}	t_{WP} t_{WP}	10 10		12 12		17 17		ns ns
Write Recovery Time	t_{WHAX} t_{EHAX}	t_{WR} t_{WR}	0 0		0 0		0 0		ns ns
Data Hold Time	t_{WHDX} t_{EHDX}	t_{DH} t_{DH}	0 0		0 0		0 0		ns ns
Write to Output in High Z (1)	t_{WLQZ}	t_{WHZ}	0	7	0	8	0	10	ns
Data to Write Time	t_{DVWH} t_{DVEH}	t_{DW} t_{DW}	7 7		10 10		12 12		ns ns
Output Active from End of Write (1)	t_{WHQX}	t_{WLZ}	0		0		0		ns

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

AC TEST CONDITIONS

Figure 1

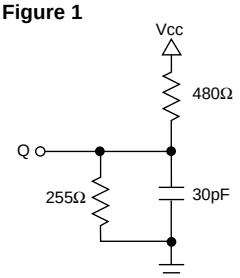
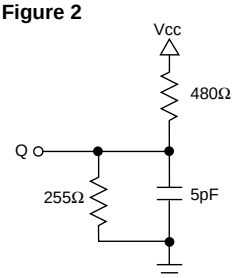


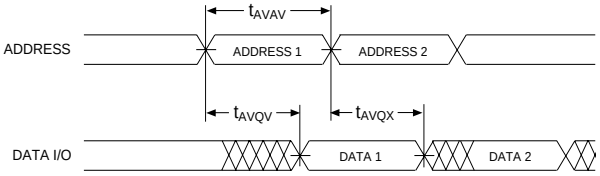
Figure 2



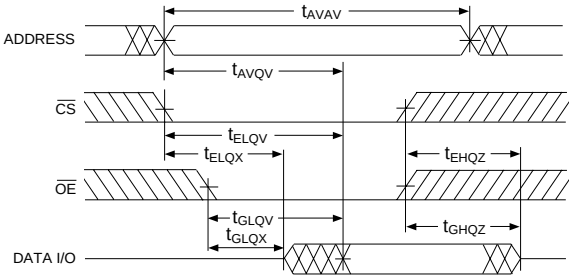
Input Pulse Levels	V_{SS} to 3.0V
Input Rise and Fall Times	5ns
Input and Output Timing Levels	1.5V
Output Load	Figure 1

NOTE: For t_{EHQZ}, t_{GHQZ} and t_{WLQZ}, CL = 5pF Figure 2)

FIG. 2
TIMING WAVEFORM - READ CYCLE

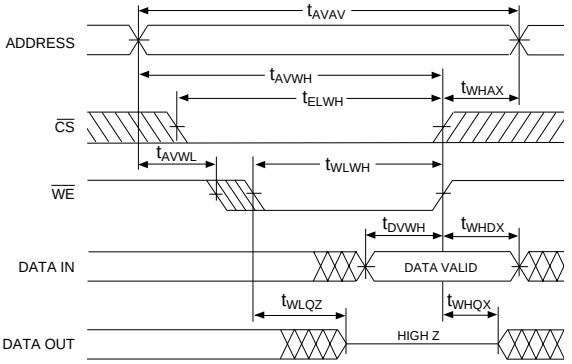


READ CYCLE 1 ($\overline{WE}$ HIGH; $\overline{OE}$, $\overline{CS}$ LOW)



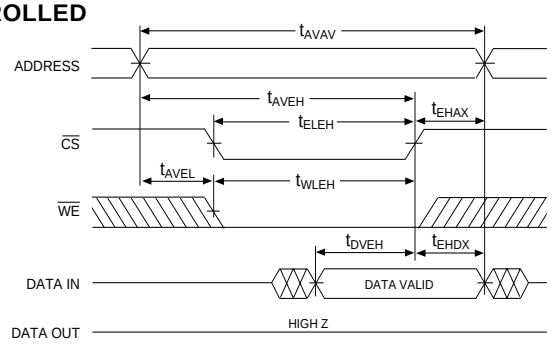
READ CYCLE 2 ($\overline{WE}$ HIGH)

FIG. 3
WRITE CYCLE - $\overline{WE}$ CONTROLLED



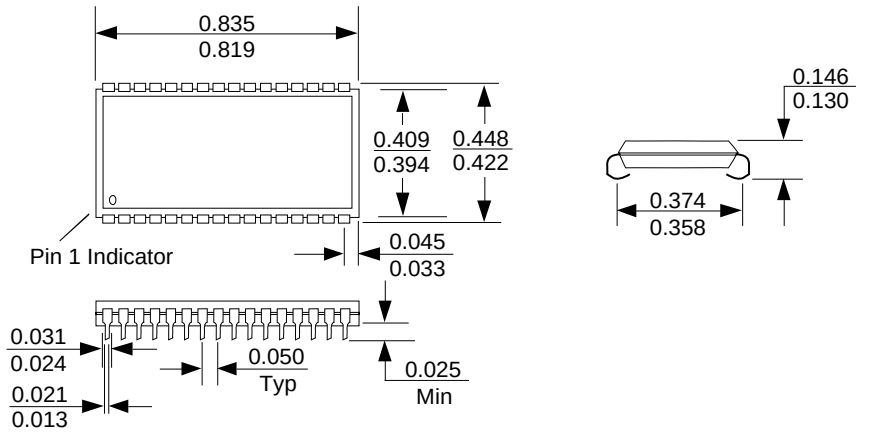
WRITE CYCLE 1, $\overline{WE}$ CONTROLLED

FIG. 4
WRITE CYCLE - $\overline{CS}$ CONTROLLED



WRITE CYCLE 2, $\overline{CS}$ CONTROLLED

PACKAGE 7: 32 PIN PLASTIC SOJ



ALL DIMENSIONS ARE IN INCHES

ORDERING INFORMATION

EDI 8 8 128 V X X X

WHITE ELECTRONIC DESIGNS

SRAM

ORGANIZATION, 128Kx8

3.3V POWER SUPPLY

ACCESS TIME (ns)

PACKAGE TYPE:
M = 32 pin Plasticic SOJ (Package 7)

DEVICE GRADE:

M = Military Screened	-55°C to +125°C
I = Industrial	-40°C to +85°C