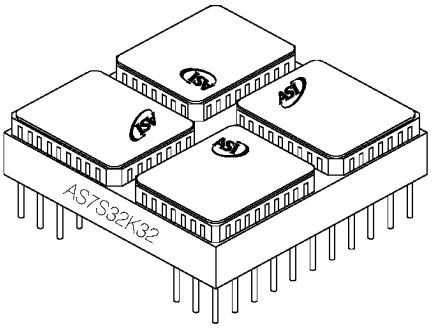
SRAM MODULE

FEATURES

MIL-STD 883

- SMD- 5962-94614 Pin Compatible
- Access times of 20, 25, 35, 45 ns
- Built in decoupling capacitors for low noise operation
- Organized as 32K x 32
- Operation with single 5 volt supply
- Low power CMOS
- TTL Compatible Inputs and Outputs
- Packaging
  - 66 pin PGA type 1.09 inch square
  - 68 lead J leaded LCC (contact factory)
  - 68 lead quad flatpack (contact factory)

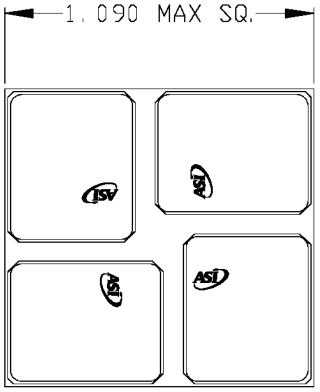


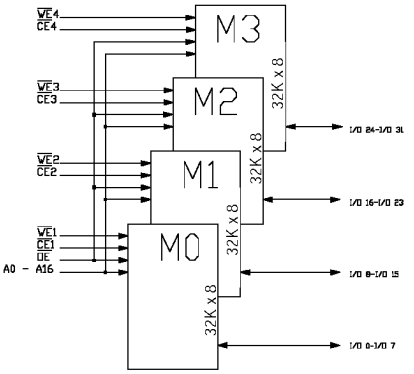
GENERAL DESCRIPTION

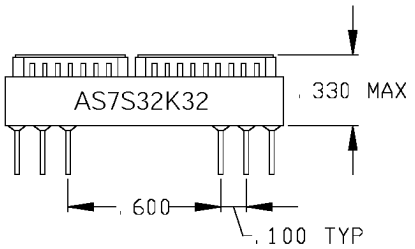
The Austin Semiconductor, Inc. AS7S32K32P is a 1 Megabit CMOS SRAM Module organized as 32Kx32 and user configurable to 64Kx16 or 128Kx8. The AS7S32K32 achieves high speed access, low power consumption and high reliability by employing advanced CMOS memory technology.

These advanced features make ASI modules ideally suited for military applications.

The AS7S32K32 module is constructed using a 1.09 inch square ceramic pin grid array substrate. This compact layout reduces space requirements for board assembly to a minimum.







PIN CONFIGURATION

I/O8	1	$\overline{WE}$	12	I/O15	23		I/O24	34	VCC	45	I/O31	56
I/O9	2	$\overline{CE2}$	13	I/O14	24		I/O25	35	$\overline{CE4}$	46	I/O30	57
I/O10	3	GND	14	I/O13	25		I/O26	36	$\overline{WE4}$	47	I/O29	58
A13	4	I/O11	15	I/O12	26		A6	37	I/O27	48	I/O28	59
A14	5	A10	16	$\overline{OE}$	27		A7	38	A3	49	AO	60
NC	8	VCC	19	I/O7	30		A9	41	$\overline{WE3}$	52	I/O23	63
I/O0	9	$\overline{CE1}$	20	I/O6	31		I/O16	42	$\overline{CE3}$	53	I/O22	64
I/O1	10	NC	21	I/O5	32		I/O17	43	GND	54	I/O21	65
I/O2	11	I/O3	22	I/O4	33		I/O18	44	I/O19	55	I/O20	66

ABSOLUTE MAXIMUM RATINGS*

Voltage of Vcc Supply Relative to Vss.....-1V to +7V
Storage Temperature.....-55°C to +150°C
Short Circuit Output Current(per I/O).....50mA
Voltage on Any Pin Relative to Vss.....-1V to +7V
Junction Temperature**.....+150°C

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

**Maximum junction temperature depends upon package type, cycle time, loading, ambient temperature and airflow.

ELECTRICAL CHARACTERISTICS AND RECOMMENDED DC OPERATING CONDITIONS

(-55°C ≤ TA ≤ 125°C; V_{CC} = 5V ± 10%)

DESCRIPTION	CONDITIONS	SYMBOL	MIN	MAX	UNITS	NOTES
Input High (Logic 1) Voltage		V_{IH}	2.2	V_{CC}+.5	V	1
Input Low (Logic 0) Voltage		V_{IL}	-0.5	0.8	V	1, 2
Input Leakage Current	0V ≤ V_{IN} ≤ V_{CC}	I_{LI}	-5	5	µA	
Output Leakage Current	Outputs Disabled 0V ≤ V_{OUT} ≤ V_{CC}	I_{LO}	-5	5	µA	
Output High Voltage	I_{OH} = -4.0mA	V_{OH}	2.4		V	1
Output Low Voltage	I_{OL} = 8.0mA	V_{OL}		0.4	V	1
Supply Voltage		V_{CC}	4.5	5.5	V	1

			MAX					
DESCRIPTION	CONDITIONS	SYMBOL	-20	-25	-35	-45	UNITS	NOTES
Power Supply Current: Operating	$\overline{CE}$ ≤ V_{IL}; V_{CC} = MAX f = MAX = 1/ ^tRC (MIN) Output Open	I_{CC}	600	560	540	520	mA	3, 13
Power Supply Current: Standby	$\overline{CE}$ ≥ V_{IH}; V_{CC} = MAX f = MAX = 1/ ^tRC (MIN) Output Open	I_{SBT1}	180	160	160	160	mA	
	$\overline{CE}$ ≥ V_{IH}, All Other Inputs ≤ V_{IL} or ≥ V_{IH}, V_{CC} = MAX f = 0 Hz	I_{SBT2}	100	100	100	100	mA	
	$\overline{CE}$ ≥ V_{CC} -0.2V; V_{CC} = MAX V_{IL} ≤ V_{SS} +0.2V V_{IH} ≥ V_{CC} -0.2V; f = 0 Hz	I_{SBC2}	20	20	20	20	mA	
	"L" Version Only	I_{SBC2}	16	16	16	16	mA	

CAPACITANCE

DESCRIPTION	CONDITIONS	SYMBOL	MIN	MAX	UNITS	NOTES
Input Capacitance	T_A = 25°C, f = 1MHz	C_I		32	pF	4
Output Capacitance	V_{CC} = 5V	C_O		12	pF	4

ELECTRICAL CHARACTERISTICS AND RECOMMENDED AC OPERATING CONDITIONS

(-55°C ≤ T_A ≤ 125°C; Vcc = 5V ±10%)

DESCRIPTION		-20		-25		-35			
	SYM	MIN	MAX	MIN	MAX	MIN	MAX	UNITS	NOTES
READ Cycle									
READ cycle Time	t_{RC}	20		25		35		ns	
Address access time	t_{AA}		20		25		35	ns	
Chip Enable access time	t_{ACE}		20		25		35	ns	
Output hold from address change	t_{OH}	2		2		2		ns	
Chip Enable to output in Low-Z	t_{LZCE}	3		3		3		ns	
Chip disable to output in High-Z	t_{HZCE}		9		10		12	ns	6,7
Chip Enable to power-up time	t_{PU}	0		0		0		ns	4
Chip disable to power-down time	t_{PD}		20		25		35	ns	4
Output Enable access time	t_{AOE}		8		10		12	ns	
Output Enable to output in Low-Z	t_{LZOE}	0		0		0		ns	
Output disable to output in High-Z	t_{HZOE}		9		10		12	ns	6
WRITE Cycle									
WRITE cycle time	t_{WC}	20		25		35		ns	
Chip Enable to end of write	t_{CW}	15		17		20		ns	
Address valid to end of write	t_{AW}	15		17		20		ns	
Address setup time	t_{AS}	0		0		0		ns	
Address hold from end of write	t_{AH}	1		1		1		ns	
WRITE pulse width	t_{WP1}	15		17		20		ns	
Data setup time	t_{DS}	10		12		15		ns	
Data hold time t_{DH}	0		0		0		ns		
Write disable to output in Low-Z	t_{LZWE}	3		3		3		ns	7
Write Enable to output in High-Z	t_{HZWE}		10		12		15	ns	6,7

AC TEST CONDITIONS

Input pulse levels	VSS to 3V
Input rise and fall times	5ns
Input timing reference levels	1.5V
Output reference levels	1.5V
Output load	See Figures 1 and 2

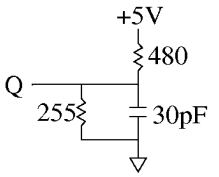


Fig. 1 OUTPUT LOAD EQUIVALENT

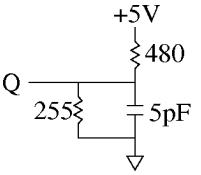
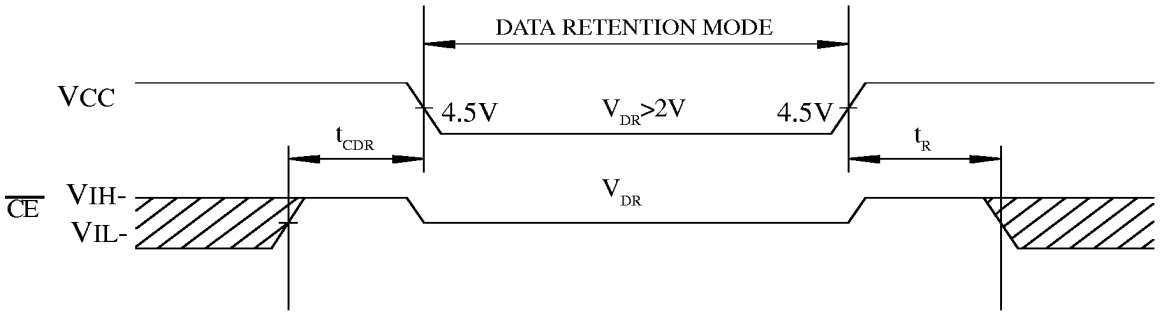


Fig. 2 OUTPUT LOAD EQUIVALENT

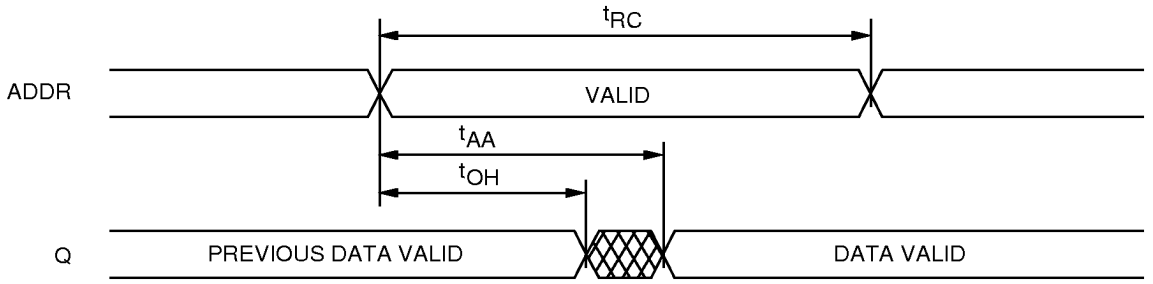
NOTES

1. All voltages referenced to VSS (GND).
2. -3v for pulse width <20ns.
3. ICC is dependent on output loading and cycle rates. The specified value applies with the outputs unloaded, and f= $\frac{1}{t_{RC}(MIN)}$ HZ.
4. This parameter is sampled.
5. Test conditions as specified with output loading as shown in Fig. 1 unless otherwise noted.
6. t_{HZCE}, t_{HZOE} and t_{HZWE} are specified with CL= 5pF as in Fig. 2. Transition is measured +/- 500 mV typical from steady state voltage, allowing for actual tester RC time constant.
7. At any given temperature and voltage condition, t_{HZCE} is less than t_{LZCE} and t_{HZWE} is less than t_{LZWE}.
8. $\overline{WE}$ is HIGH for READ cycle.
9. Device is continuously selected. Chip enables and output enable are held in their active state.
10. Address valid prior to or coincident with latest occurring chip enable.
11. t_{RC}= READ cycle time.
12. Chip enable ($\overline{CE}$) and write enable ($\overline{WE}$) can initiate and terminate a WRITE cycle.
13. ICC is for 32 bit mode.

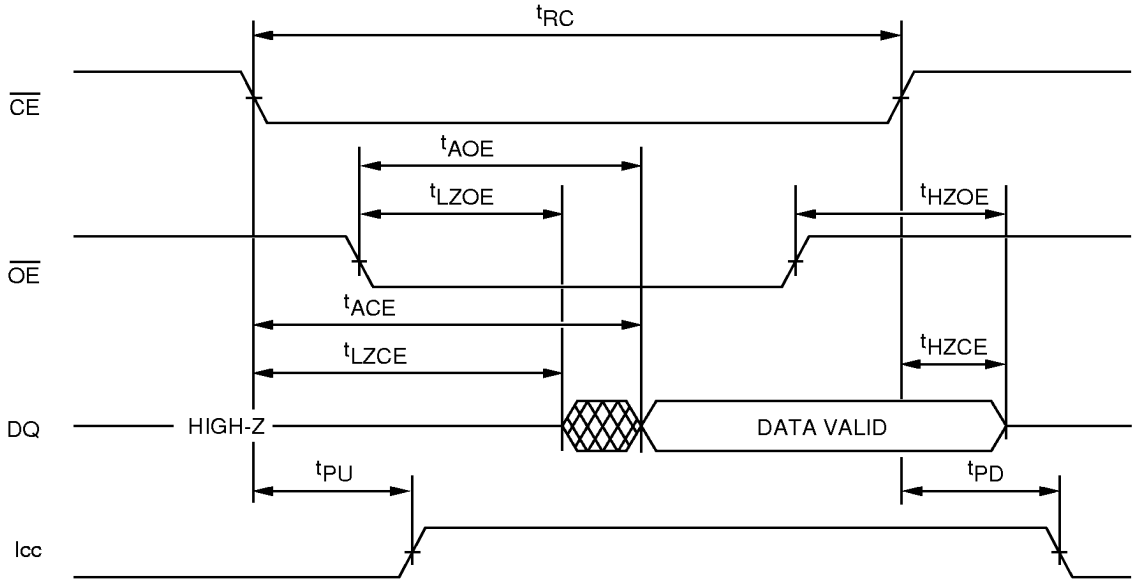
DESCRIPTION	CONDITIONS		SYMBOL	MIN	MAX	UNITS	NOTES
V_{CC} for Retention Data			V_{DR}	2	—	V	
Data Retention Current	$\overline{CE} \geq (V_{CC} - 0.2V)$ $V_{IN} \geq (V_{CC} - 0.2V)$ or $\leq 0.2V$	V_{CC} = 2V	I_{CCDR}		4	mA	
		V_{CC} = 3V			8	mA	
Chip Deselect to Data Retention Time			t_{CDR}	0	—	ns	4
Operation Recovery Time			t_R	t_{RC}		ns	4, 11



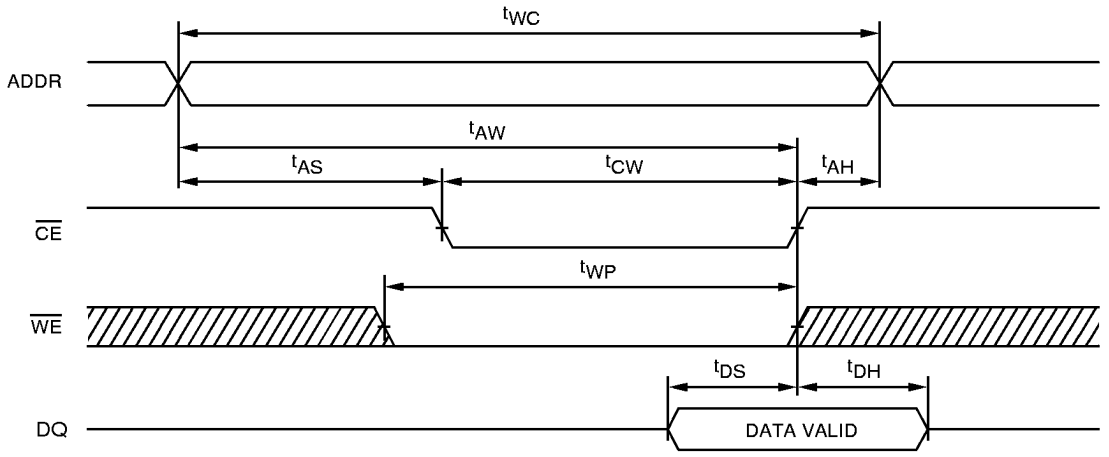
READ CYCLE NO. 1 [8, 9]



READ CYCLE NO. 2 [7, 8, 10]



WRITE CYCLE NO. 1 [12]
(Chip Enable Controlled)



WRITE CYCLE NO. 2 [7, 12]
(Write Enable Controlled)