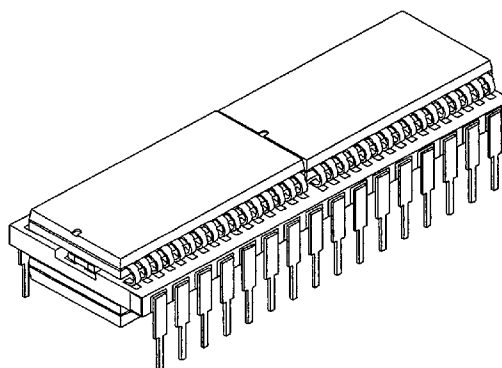


DESCRIPTION:

The DPS512S8AP is a high speed 512K x 8 high-density, low-power static RAM module comprised of four high speed ceramic 128K x 8 monolithic SRAM's, an advanced high-speed CMOS decoder and decoupling capacitors surface mounted on a co-fired ceramic substrate having side-brazed leads.

The DPS512S8AP is available in a 600-mil-wide, 32-pin dual-in-line package that conforms to the same JEDEC standard pin configuration as the future four megabit monolithics.

The DPS512S8AP operates from a single +5V supply and all input and output pins are completely TTL-compatible. The low power of the DPS512S8AP make it ideal for battery-backed applications.

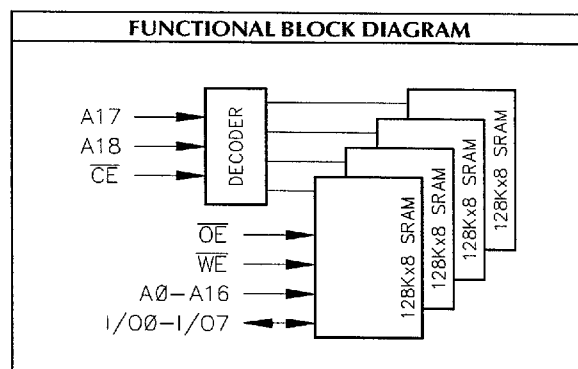


FEATURES:

- Organized Available: 524, 288 by 8 bit configuration
- Access Times: 25*, 35, 45, 55, 70ns
- Low Power Dissipation:
2.0 mW (typ.) Standby
450 mW (typ.) Operating
- 2 - Volt Data Retention
- Fully Static Operation - No clock or refresh required
- All inputs and outputs are TTL-Compatible
- 600 mil, 32 - Pin JEDEC standard DIP pinout

* Available in Commercial only.

PIN NAMES	
A0 - A18	Address Inputs
I/O0 - I/O7	Data In/Out
$\overline{CE}$	Chip Enable
$\overline{WE}$	Write Enable
$\overline{OE}$	Output Enable
V _{DD}	Power (+5V)
V _{SS}	Ground



PIN-OUT DIAGRAM

A18	1	32	VDD
A16	2	31	A15
A14	3	30	A17
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	$\overline{CE}$
A0	12	21	I/O7
I/O0	13	20	I/O6
I/O1	14	19	I/O5
I/O2	15	18	I/O4
VSS	16	17	I/O3

RECOMMENDED OPERATING RANGE ¹					
Symbol	Characteristic	Min.	Typ.	Max.	Unit
V _{DD}	Supply Voltage	4.5	5.0	5.5	V
V _{IH}	Input HIGH Voltage	2.2		V _{DD} + 0.3	V
V _{IL}	Input LOW Voltage	-0.5 ²		0.8	V
T _A	Operating Temperature	C	0	+25	°C
		I	-40	+25	
				+70	
				+85	

TRUTH TABLE					
Mode	$\overline{CE}$	$\overline{WE}$	$\overline{OE}$	I/O Pin	Supply Current
Not Selected	H	X	X	HIGH-Z	Standby
DOUT Disable	L	H	H	HIGH-Z	Active
Read	L	H	L	DOUT	Active
Write	L	L	X	DIN	Active

H = HIGH

L = LOW

X = Don't Care

DC OUTPUT CHARACTERISTICS					
Symbol	Parameter	Conditions	Min.	Max.	Unit
V _{OH}	HIGH Voltage	I _{OH} = -4.0mA	2.4	-	V
V _{OL}	LOW Voltage	I _{OL} = 8.0mA		0.4	V

ABSOLUTE MAXIMUM RATINGS ³				
Symbol	Parameter	Max.	Unit	
T _{STC}	Storage Temperature	-40 to +125	°C	
T _{BIAS}	Temperature Under Bias	-10 to +85	°C	
V _{DD}	Supply Voltage ¹	-0.5 to +7.0	V	
V _{IO}	Input/Output Voltage ¹	-0.5 to V _{DD} + 0.5	V	

CAPACITANCE ⁴ : T _A = 25°C, F = 1.0MHz				
Symbol	Parameter	Max.	Unit	Condition
C _{ADR}	Address Input	50	pF	V _{IN} = 0V
C _{CE}	Chip Enable	20		
C _{WE}	Write Enable	45		
C _{OE}	Output Enable	45		
C _{IO}	Data Input/Output	50		

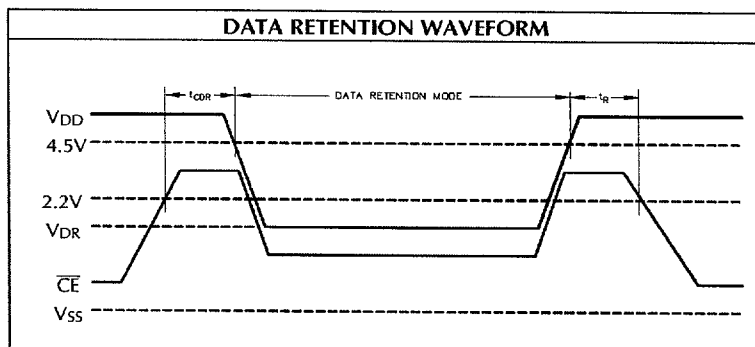
DC OPERATING CHARACTERISTICS: Over operating ranges							
Symbol	Characteristics	Test Conditions	COMMERCIAL		INDUSTRIAL		Unit
			Min.	Max.	Min.	Max.	
I _{IN}	Input Leakage Current	V _{IN} = 0V to V _{DD}	-20	+20	-20	+20	μA
I _{OUT}	Output Leakage Current	V _{IO} = 0V to V _{DD} , CE or OE = V _{IH} , or WE = V _{IL}	-40	+40	-40	+40	μA
I _{CC2}	Operating Supply Current	Cycle = min., Duty = 100%, I _{OUT} = 0mA		230		245	mA
I _{SB1}	Full Standby Supply Current (CMOS)	V _{IN} ≥ V _{DD} - 0.2V or V _{IN} ≤ V _{SS} + 0.2V		20		20	mA
I _{SB2}	Standby Current (TTL)	CE = V _{IH}		80		100	mA
V _{OL}	Output Low Voltage	I _{OUT} = 8.0mA		0.4		0.4	V
V _{OH}	Output High Voltage	I _{OUT} = -4.0mA	2.4		2.4		V

DATA RETENTION CHARACTERISTICS								
Symbol	Parameter	Test Conditions	TYP.	COMMERCIAL		INDUSTRIAL		Unit
				Min.	Max.	Min.	Max.	
V _{DR}	Data Retention Voltage	CE ≥ V _{DR} -0.2V		2.0	5.5	2.0	5.5	V
I _{CCDR2}	Data Retention Supply Current	V _{DR} = 2.0V	0.14		1.00		1.60	mA
I _{CCDR3}	Data Retention Supply Current	V _{DR} = 3.0V	0.28		1.60		2.40	mA
t _{CDR}	Chip Disable to Data Retention Time			0		0		ns
t _r	Recovery Time	t _{RC} = Read Cycle Timing		5		5		ms

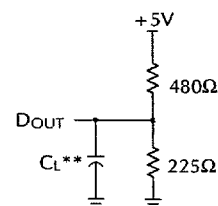
AC TEST CONDITIONS	
Input Pulse Levels	0V to 3.0V
Input Pulse Rise and Fall Times	5ns *
Input and Output Timing Reference Levels	1.5V

* Transition measured between 0.8V and 2.2V.

Output Load		
Load	C _L	Parameters Measured
1	30pF	except tCLZ, tOLZ, tCHZ, tOHZ, tWHZ, and tWLZ
2	5pF	tCLZ, tOLZ, tCHZ, tOHZ, tWHZ, and tWLZ

**Figure 1. Output Load**

** Including Probe and Jig Capacitance.



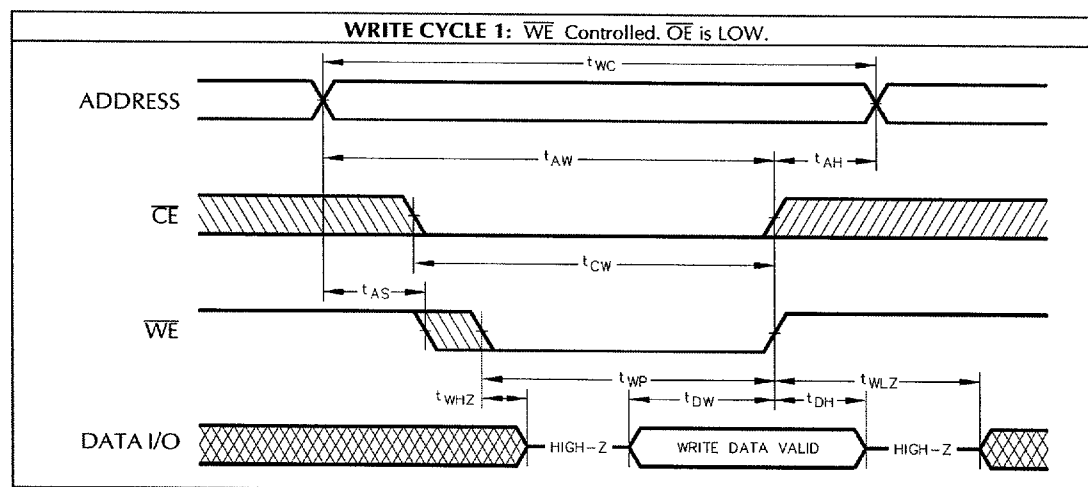
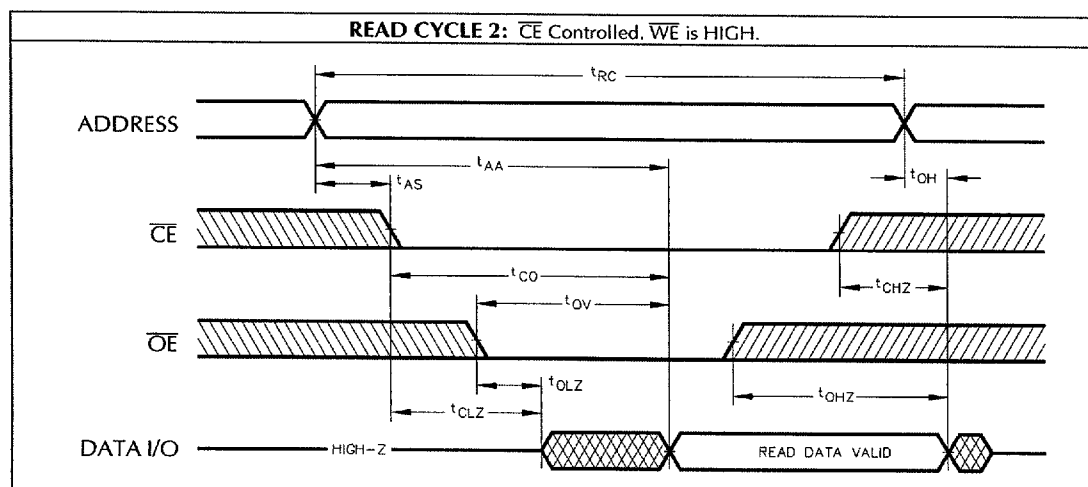
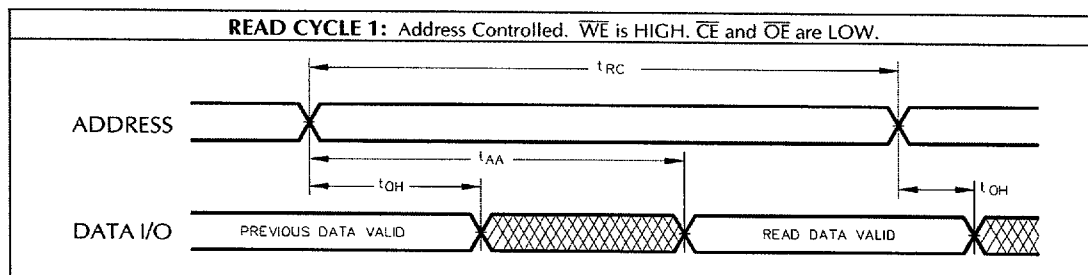
AC OPERATING CONDITIONS AND CHARACTERISTICS- READ CYCLE: Over operating ranges													
No.	Symbol	Parameter	25ns †		35ns		45ns		55ns		70ns		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	t _{RC}	Read Cycle Time	25		35		45		55		70		ns
2	t _{AA}	Address Access Time		25		35		45		55		70	ns
3	t _{CO}	Chip Enable to Output Valid		25		35		45		55		70	ns
4	t _{OV}	Output Enable to Output Valid		10		25		35		40		45	ns
5	t _{CLZ}	Chip Enable to Output in LOW-Z ^{4, 6}	5		5		5		5		5		ns
6	t _{OLZ}	Output Enable to Output in LOW-Z ^{4, 6}	0		0		0		0		0		ns
7	t _{CHZ}	Chip Enable to Output in HIGH-Z ^{4, 6}		12		25		25		30		35	ns
8	t _{OHZ}	Output Enable to Output in HIGH-Z ^{4, 6}		10		15		20		25		30	ns
9	t _{OH}	Output Hold from Address Change	3		3		5		5		10		ns

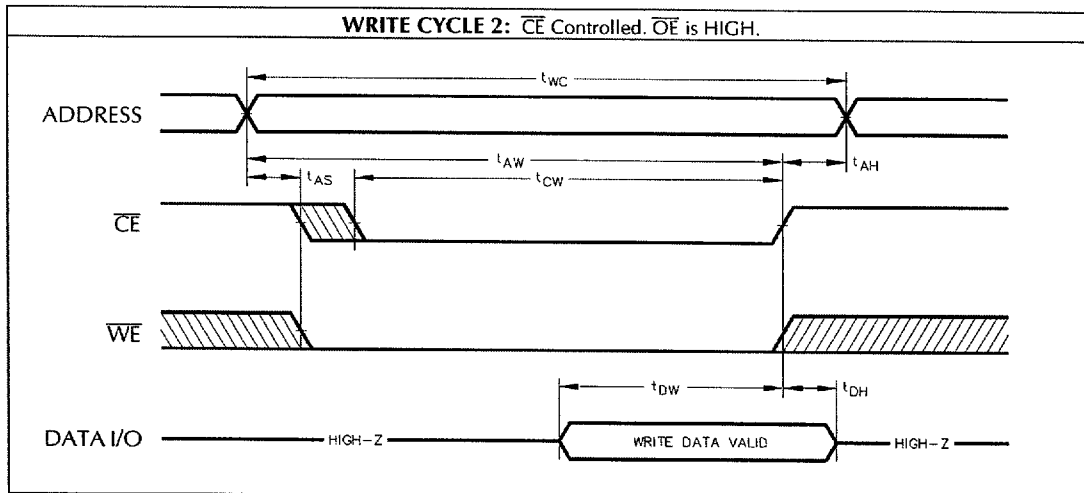
AC OPERATING CONDITIONS AND CHARACTERISTICS - WRITE CYCLE: Over operating ranges ^{6, 7}													
No.	Symbol	Parameter	25ns †		35ns		45ns		55ns		70ns		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
10	t _{WC}	Write Cycle Time	25		35		45		55		70		ns
11	t _{AW}	Address Valid to End of Write	20		30		40		50		65		ns
12	t _{CW}	Chip Enable to End of Write	20		30		40		50		65		ns
13	t _{AS}	Address Set-up Time ***	0		0		0		0		0		ns
14	t _{WP}	Write Pulse Width	20		25		35		40		55		ns
15	t _{AH}	Address Hold Time	5		5		5		5		5		ns
16	t _{WHZ}	Write Enable to Output in HIGH-Z ^{4, 6}		10		15		20		25		30	ns
17	t _{DW}	Data to Write Time Overlap	15		15		20		25		35		ns
18	t _{DH}	Data Hold Time from Write Time	0		0		0		0		0		ns
19	t _{OW}	Output Active from End of Write	0		3		5		5		5		ns

*** Valid for both Read and Write Cycles.

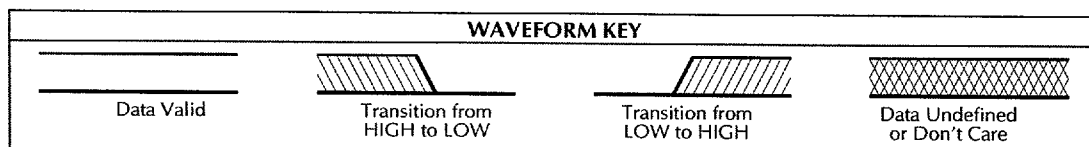
† Available in commercial only.

30A034-01
REV. D



**NOTES:**

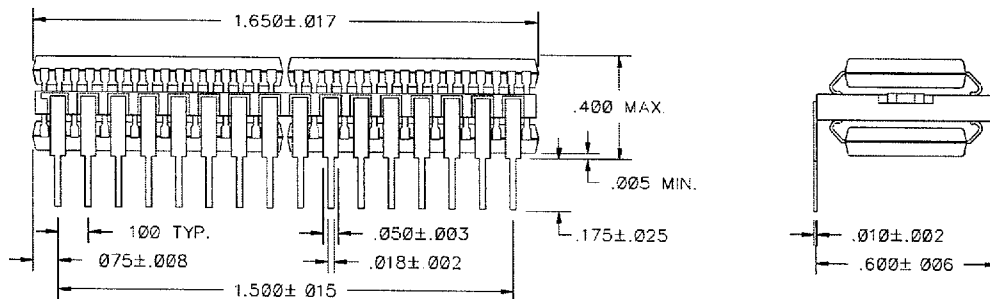
1. All voltages are with respect to V_{SS} .
2. -2.0V min. for pulse width less than 20ns (V_{IL} min. = -0.5V at DC level).
3. Stresses greater than those under **ABSOLUTE MAXIMUM RATINGS** may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions 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.
4. This parameter is guaranteed and not 100% tested.
5. Transition is measured at the point of $\pm 500\text{mV}$ from steady state voltage.
6. When $\overline{OE}$ and $\overline{CE}$ are LOW and $\overline{WE}$ is HIGH, I/O pins are in the output state, and input signals of opposite phase to the outputs must not be applied.
7. The outputs are in a high impedance state when $\overline{WE}$ is LOW.



ORDERING INFORMATION

PREFIX	TYPE	MEMORY DEPTH	DESIG.	MEMORY WIDTH	DESIG.	PACKAGE	SPEED	GRADE	
DP	S	512	S	8	A	P	-XX	X	
									I INDUSTRIAL -40°C to +85°C
									C COMMERCIAL 0°C to +70°C
							25	25ns	(COMMERCIAL ONLY)
							35	35ns	
							45	45ns	
							55	55ns	
							70	70ns	
									32-PIN CERDIP WITH PLASTIC DEVICES
									HIGH SPEED
									MEMORY MODULE WITH SUPPORT LOGIC
									CMOS SRAM

MECHANICAL DRAWING



Dense-Pac Microsystems, Inc.

7321 Lincoln Way ♦ Garden Grove, California 92841-1428
 (714) 898-0007 ♦ (800) 642-4477 (Outside CA) ♦ FAX: (714) 897-1772 ♦ <http://www.dense-pac.com>