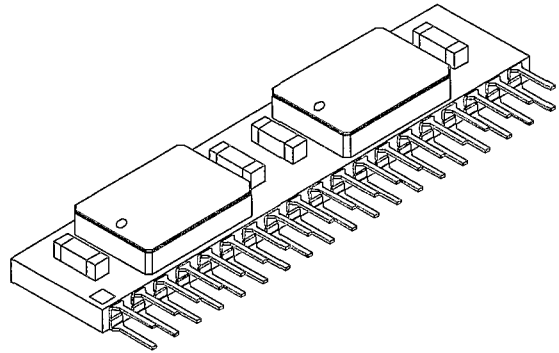


**DESCRIPTION:**

The DPS16X16 is part of a new family of high speed Static RAM modules developed by Dense-Pac Microsystems, Inc. The DPS16X16 uses advanced packaging concepts which mount four LCC memory devices on a single multilayer ceramic substrate. The DPS16X16 is intended for use in applications where high speed memories are required and/or board space is of prime concern. It has been designed to the high quality and reliability requirements of the Military and Aerospace industries.

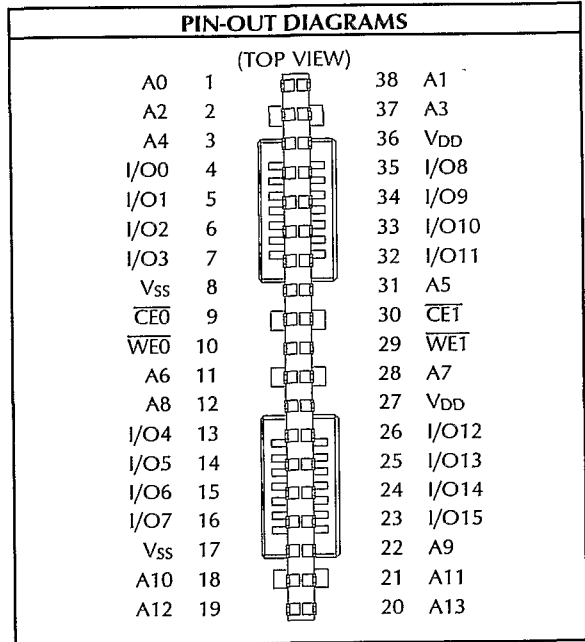


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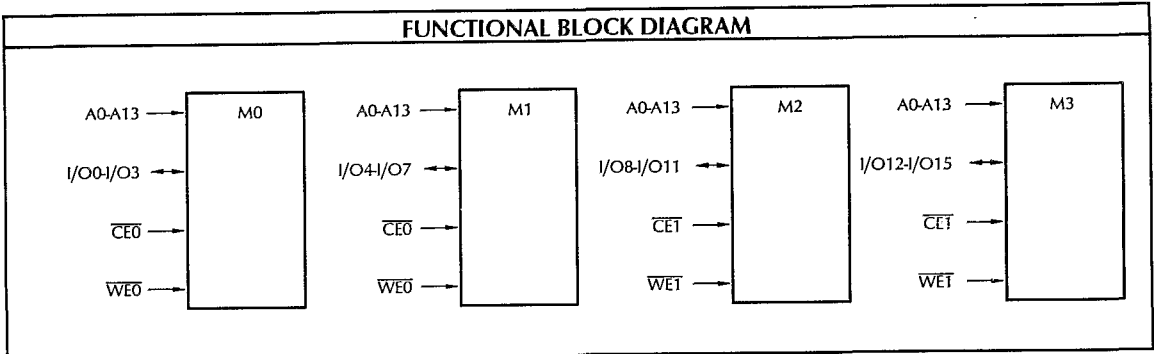
**FEATURES:**

- Organized as 16,384 by 16 Bits
- Fast Access Times: 25, 35, 45, 55ns (max)  
(Faster Speeds Available Upon Request)
- Individual Byte Select and Write enables
- Completely Static Operation: No Clock or Refresh Needed
- Single +5V Supply Voltage, ±10% Tolerance
- Common Data Inputs and Outputs
- $\overline{CE}$  Power-Down Function
- Data Retention Function
- Includes Decoupling Capacitors
- 38-Pin Dual-Leaded SIP Package

**PIN-OUT DIAGRAMS**



**FUNCTIONAL BLOCK DIAGRAM**



PIN NAMES	
A0-A13	Address Inputs
I/O0-I/O15	Data Input/Output
$\overline{CE0}, \overline{CE1}$	Chip Enables
$\overline{WE0}, \overline{WE1}$	Write Enables
V <sub>DD</sub>	Power (+5 Volts)
V <sub>SS</sub>	Ground

RECOMMENDED OPERATING RANGE <sup>1</sup>					
Symbol	Characteristic	Min.	Typ.	Max.	Unit
V <sub>DD</sub>	Supply Voltage	4.5	5.0	5.5	V
V <sub>IH</sub>	Input HIGH Voltage	2.2		V <sub>DD</sub> +0.5	V
V <sub>IL</sub>	Input LOW Voltage	-0.5 <sup>2</sup>		0.8	V

ABSOLUTE MAXIMUM RATINGS <sup>3</sup>		
Parameter	Value	Unit
Storage Temperature	-65 to +150	°C
Operating Temperature	-55 to +125	°C
Supply Voltage <sup>1</sup>	-0.5 to +7.0	V

CAPACITANCE <sup>4</sup> : T <sub>A</sub> = 25°C, F = 1.0MHz				
Symbol	Parameter	Max.	Unit	Condition
C <sub>I/O</sub>	Data Input/Output	20	pF	V <sub>OUT</sub> = 0V
C <sub>ADR</sub>	Address Input	45	pF	V <sub>IN</sub> = 0V
C <sub>CE</sub>	Chip Enable	45		
C <sub>WE</sub>	Write Enable	45		

TRUTH TABLE			
MODE	$\overline{CE}$	$\overline{WE}$	I/O Operation
Standby	H	X	HIGH-Z
Read	L	H	D <sub>OUT</sub>
Write	L	L	D <sub>IN</sub>

H = HIGH      L = LOW      X = Don't Care

DC OPERATING CHARACTERISTICS: Over operating ranges									
Symbol	Characteristics	Test Conditions	C		I		M/B		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
I <sub>IN</sub>	Input Leakage Current (All Inputs)	V <sub>DD</sub> = 5.5V V <sub>IN</sub> = 0V and 5.5V	-20	+20	-20	+20	-40	+40	µA
I <sub>OUT</sub>	Output Leakage Current (on Data Outputs)	$\overline{CE} = V_{IH}$ V <sub>OUT</sub> = 0V and 5.5V	-10	+10	-10	+10	-10	+10	µA
I <sub>CC1</sub>	Operating Power Supply Current	$\overline{CE} = V_{IL}$ , f = max. Outputs Open		540		600		620	mA
I <sub>SB1</sub>	Standby Power Supply Current (TTL)	$\overline{CE} = V_{IH}$ , f = 0		220		235		240	mA
I <sub>SB2</sub>	Full Standby Power Supply Current (CMOS)	$\overline{CE} \geq V_{DD} - 0.2V$ , V <sub>IN</sub> ≤ V <sub>DD</sub> - 0.2V or V <sub>IN</sub> ≤ 0.2V		80		80		80	mA
V <sub>OL</sub>	Output Low Voltage	V <sub>OL</sub> = 8.0mA		0.4		0.4		0.4	V
V <sub>OH</sub>	Output High Voltage	V <sub>OH</sub> = -4.0mA	2.4		2.4		2.4		V

NOTE: Dense-Pac has other specialized suppliers that may provide better D.C. Characteristics.

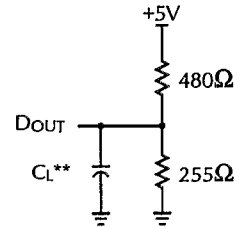
AC TEST CONDITIONS	
Input Pulse Levels	0V to 3.0V
Input Pulse Rise and Fall Times	5ns*
Input Timing Reference Levels	1.5V

\* Transition measured from 0.8V and 2.2V.

AC TEST CONDITIONS		
Load	C <sub>L</sub>	Parameters Measured
1	30pF	except t <sub>CLZ</sub> , t <sub>CHZ</sub> , t <sub>WHZ</sub> and t <sub>WLZ</sub>
2	5 pF	t <sub>CLZ</sub> , t <sub>CHZ</sub> , t <sub>WHZ</sub> , and t <sub>WLZ</sub>

Figure 1. Output Load

\*\* Including Probe and Jig Capacitance.



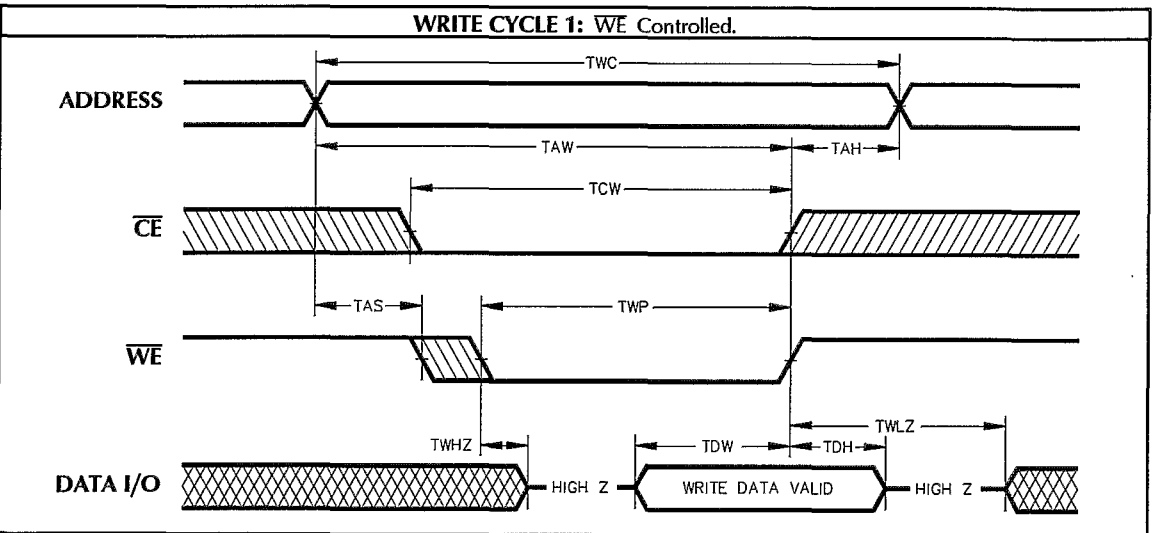
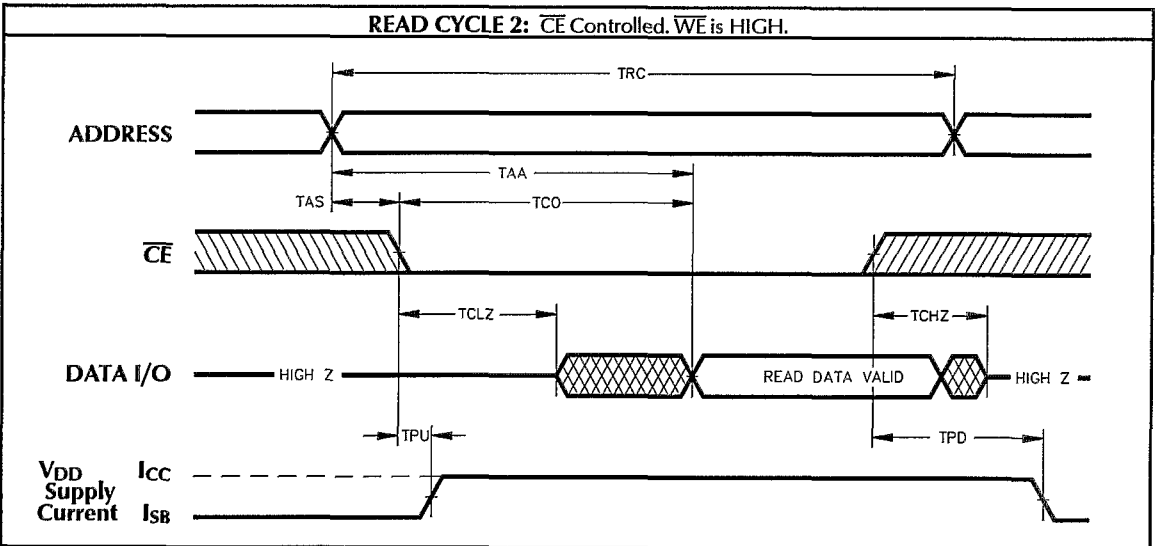
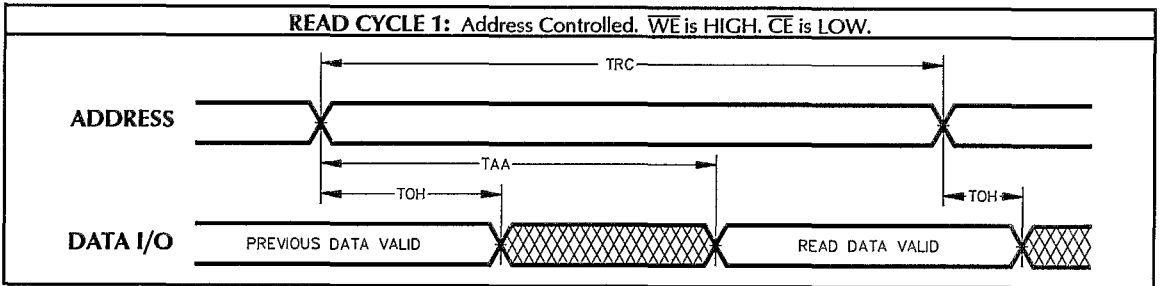
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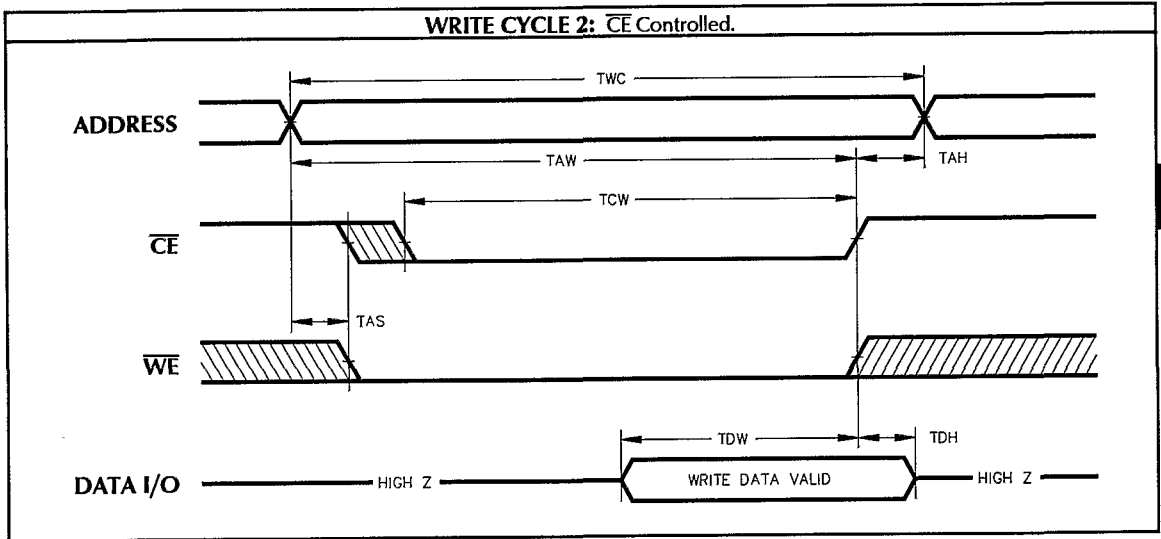
AC OPERATING CONDITIONS AND CHARACTERISTICS - READ CYCLE: Over operating ranges											
No.	Symbol	Parameter	-25		-35		-45		-55		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	t <sub>RC</sub>	Read Cycle Time	25		35		45		55		ns
2	t <sub>AA</sub>	Address Access Time		25		35		45		55	ns
3	t <sub>CO</sub>	Chip Enable to Output Valid		25		35		45		55	ns
4	t <sub>OH</sub>	Output Hold from Address Change	5		5		5		5		ns
5	t <sub>CLZ</sub>	Chip Enable to Output in LOW-Z <sup>4, 5</sup>	5		5		5		5		ns
6	t <sub>CHZ</sub>	Chip Enable to Output in HIGH-Z <sup>4, 5</sup>		10		15		15		20	ns
7	t <sub>PU</sub>	Chip Enable to Power Up Time	0		0		0		0		ns
8	t <sub>PD</sub>	Chip Disable to Power Down Time		25		35		45		55	ns

AC OPERATING CONDITIONS AND CHARACTERISTICS - WRITE CYCLE <sup>8, 9</sup> : Over operating ranges											
No.	Symbol	Parameter	-25		-35		-45		-55		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
9	t <sub>WC</sub>	Write Cycle Time	20		30		40		50		ns
10	t <sub>AW</sub>	Address Valid to End of Write	20		25		35		50		ns
11	t <sub>CW</sub>	Chip Enable to End of Write	20		30		35		50		ns
12	t <sub>DW</sub>	Data Valid to End of Write	13		15		20		25		ns
13	t <sub>DH</sub>	Data Hold Time	0		5		5		5		ns
14	t <sub>WP</sub>	Write Pulse Width	20		25		35		50		ns
15	t <sub>AS</sub>	Address Set-up Time <sup>***</sup>	0		0		0		0		ns
16	t <sub>AH</sub>	Address Hold Time	0		0		0		0		ns
17	t <sub>WHZ</sub>	Write Enable to Output in HIGH-Z <sup>4, 5</sup>		10		15		20		25	ns
18	t <sub>WLZ</sub>	Write Enable to Output in LOW-Z <sup>4, 5</sup>	7		10		15		15		ns

\*\*\* Valid for both Read and Write Cycles.

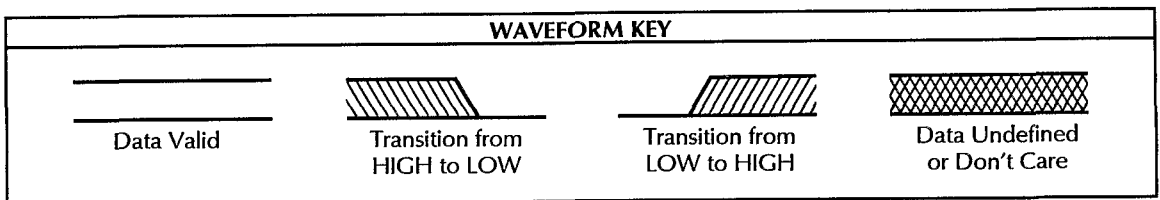






**NOTES:**

1. All voltages are with respect to  $V_{SS}$ .
2.  $V_{IL}$  min. = -3.0V min. for pulse width less than 20ns.
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  $\pm 500mV$  from steady state voltage, with the load shown in Figure 1.

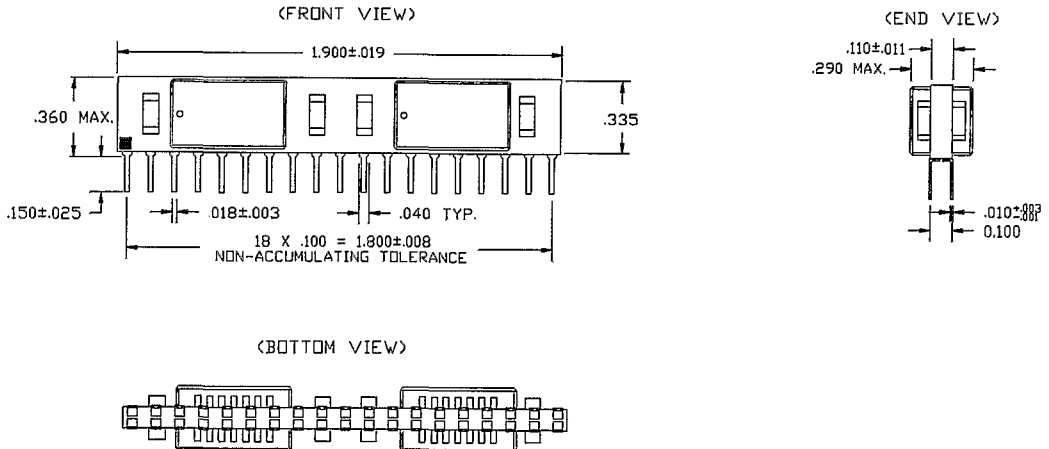


## ORDERING INFORMATION

<u>DP</u> PREFIX	<u>S16X16</u> DEVICE TYPE	<u>- XX</u> SPEED	<u>X</u> GRADE			
				C	COMMERCIAL	0°C to +70°C
				I	INDUSTRIAL	-40°C to +85°C
				M	MILITARY	-55°C to +125°C
				B*	MIL-PROCESSED	-55°C to +125°C
				25	25ns	
				35	35ns	
				45	45ns	
				55	55ns	
				16K X 16 CMOS SRAM MODULE		

NOTE: B grade modules are constructed with 883 devices.

## MECHANICAL DIAGRAMS



**Dense-Pac Microsystems, Inc.**

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