DESCRIPTION

The 93415A and 93425A, with a typical access time of 30ns, are ideal for cache buffer applications and for systems requiring very high speed main memory.

Both the 93415A and 93425A require a single +5V power supply and feature very low current pnp input structures. They include on-chip decoding and a chip enable input for ease of memory expansion, and feature either open collector or tri-state outputs for optimization of word expansion in bused organizations.

Both devices are available in the commercial temperature range (0°C to +75°C).

FEATURES

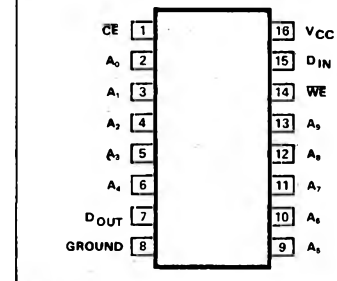
- **Address access time: 45ns max**
- **Write cycle time: 45ns max**
- **Power dissipation: 0.5mW/bit typ**
- **Input loading: -250μA max**
- **On-chip address decoding**
- **Output options:**
  - **93415A: Open collector**
  - **93425A: Tri-state**
- **Non-inverting output**
- **Blanked output during Write**
- **Fully TTL compatible**

APPLICATIONS

- **High speed main frame**
- **Cache memory**
- **Buffer storage**
- **Writable control store**

PIN CONFIGURATION

F,N PACKAGE*



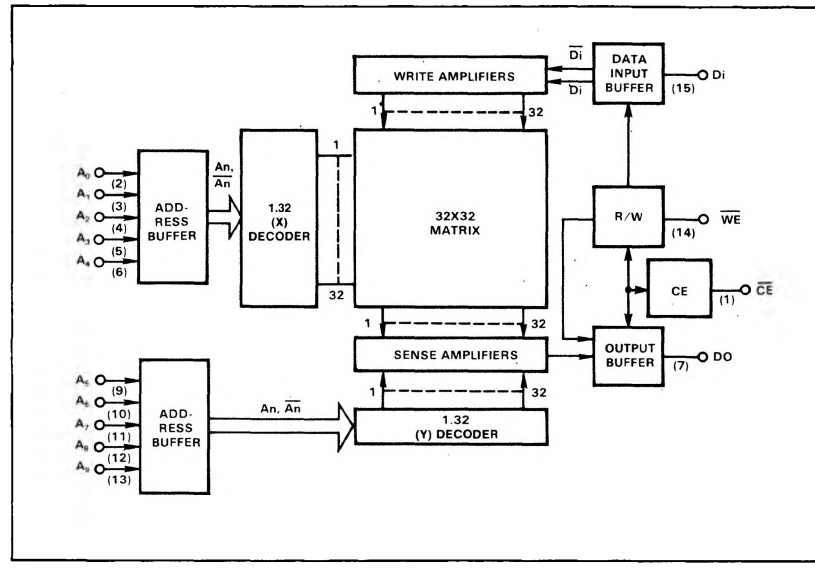
*F = Cerdip
N = Power plastic

TRUTH TABLE

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT}	
				93415A	93425A
Read	0	1	X	Stored data	Stored data
Write low	0	0	0	1	High-Z
Write high	0	0	1	1	High-Z
Disabled	1	X	X	1	High-Z

X = Don't care

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER[1]		RATING	UNIT
V_{CC}	Supply voltage	+7	Vdc
V_{IN}	Input voltage	+5.5	Vdc
	Output voltage		Vdc
V_{OH}	High (93415A)	+5.5	
V_O	Off-state (93425A)	+5.5	
	Temperature range		°C
T_A	Operating	0 to +75	
T_{STG}	Storage	-65 to +150	

DC ELECTRICAL CHARACTERISTICS $0°C \le T_A \le +75°C$, $4.75V \le V_{CC} \le 5.25V$

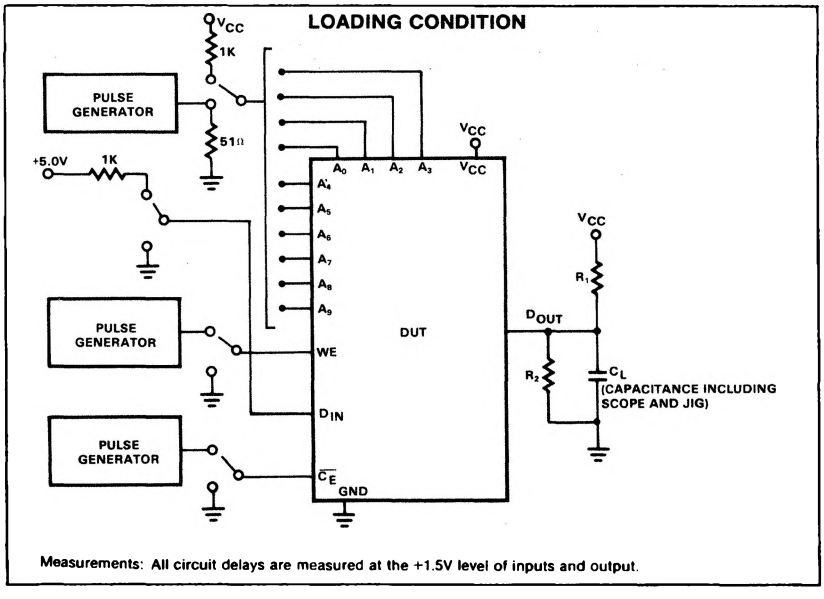
PARAMETER		TEST CONDITIONS	LIMITS			UNIT
			Min	Typ[2]	Max	
	Input voltage					V
V_{IL}	Low[1]	V_{CC} = Min			.85	
V_{IH}	High[1]	V_{CC} = Max	2.1			
V_{IC}	Clamp[1,3]	V_{CC} = Min, I_{IN} = -12mA		-1.0	-1.5	
	Output voltage	V_{CC} = Min				V
V_{OL}	Low[1,4]	I_{OL} = 16mA		0.35	0.45	
V_{OH}	High (93425A)[1,5]	I_{OH} = -2mA	2.4			
	Input current					μA
I_{IL}	Low	V_{IN} = 0.45V		-10	-250	
I_{IH}	High	V_{IN}= 5.5V		1	25	
	Output current	V_{CC} = Max				
I_{OLK}	Leakage (93415A)[6]	V_{OUT} = 5.5V		1	40	μA
$I_{O(OFF)}$	Hi-Z state (93425A)	V_{OUT} = 5.5V		1	60	μA
		V_{OUT} = 0.45[6]		-1	-60	
I_{OS}	Short circuit (93425A)[7]	V_{OUT} = 0V	-20		-100	mA
I_{CC}	V_{CC} supply current[8]	V_{CC} = Max				mA
		$0 < T_A < 25°C$		120	155	
		$T_A \ge 25°C$		95	130	
		$T_A \le 0°C$			170	
	Capacitance	V_{CC} = 5.0V				pF
C_{IN}	Input	V_{IN} = 2.0V		4		
C_{OUT}	Output	V_{OUT} = 2.0V		7		

AC ELECTRICAL CHARACTERISTICS[9] $R_1 = 270\Omega$, $R_2 = 600\Omega$, $C_L = 30pF$, $0°C \le T_A \le +75°C$, $4.75V \le V_{CC} \le 5.25V$

PARAMETER		TO	FROM	LIMITS Min	LIMITS Typ[2]	LIMITS Max	UNIT
	Access time						ns
T_{AA}	Address				30	45	
T_{CE}	Chip enable				15	30	
	Disable time						ns
T_{CD}		Output	Chip enable		15	30	
T_{WD}		Output	Write enable		20	30	
T_{WR}	Write recovery time				20	30	ns
	Setup and hold time						ns
T_{WSA}	Setup time	Write enable	Address	5	0		
T_{WHA}	Hold time						
T_{WSD}	Setup time[10]	Write enable	Data in	40	35		
T_{WHD}	Hold time			5	0		
T_{WSC}	Setup time	Write enable	$\overline{CE}$	5	0		
T_{WHC}	Hold time						
	Pulse width						ns
T_{WP}	Write enable[11]			35	25		

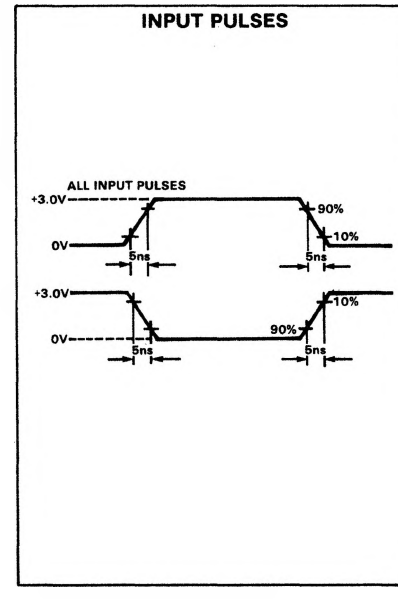
NOTES
1. All voltage values are with respect to network ground terminal.
2. All typical values are at $V_{CC} = 5V$, $T_A = 25°C$.
3. Test each input one at a time.
4. Measured with a logic low stored. Output sink current is supplied through a resistor to V_{CC}.
5. Measured with V_{IL} applied to $\overline{CE}$ and a logic high stored.
6. Measured with V_{IH} applied to $\overline{CE}$.
7. Duration of the short circuit should not exceed 1 second.
8. I_{CC} is measured with the write enable and memory enable inputs grounded, all other inputs at 4.5V, and the output open.
9. The operating ambient temperature ranges are guaranteed with transverse air flow exceeding 400 linear feet per minute and a 2-minute warm-up. Typical thermal resistance values of the package at maximum temperature are:
   θ_{JA} junction to ambient at 400fpm air flow-50°C/watt
   θ_{JA} junction to ambient-still air-90°C/watt
   θ_{JA} junction to case-20°C/watt
10. For minimum Write pulse width.
11. Minimum required to guarantee a Write into the slowest bit.

TEST LOAD CIRCUIT

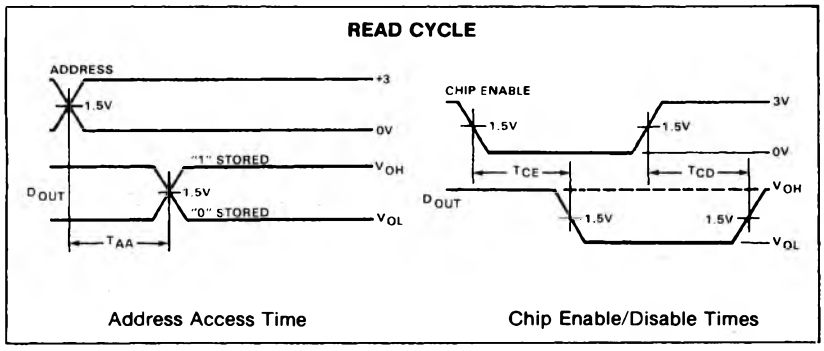


Measurements: All circuit delays are measured at the +1.5V level of inputs and output.

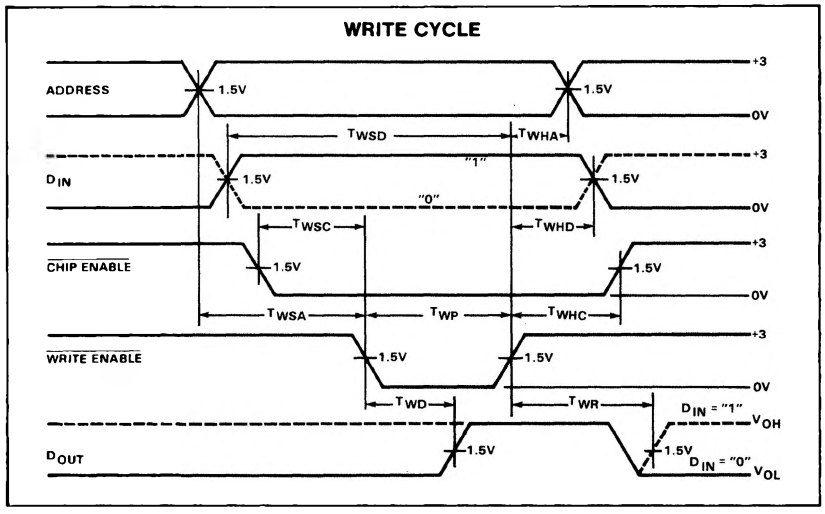
VOLTAGE WAVEFORM



TIMING DIAGRAMS



Address Access Time Chip Enable/Disable Times



MEMORY TIMING DEFINITIONS

T_{WR}	Delay between end of Write Enable pulse and when Data Output becomes valid. (Assuming Address still valid—not as shown.)
T_{CE}	Delay between beginning of Chip Enable low (with Address valid) and when Data Output becomes valid.
T_{CD}	Delay between when Chip Enable becomes high and Data Output is in off state.
T_{AA}	Delay between beginning of valid Address (with Chip Enable low) and when Data Output becomes valid.
T_{WSC}	Required delay between beginning of valid Chip Enable and beginning of Write Enable pulse.
T_{WHD}	Required delay between end of Write Enable pulse and end of valid Input Data.
T_{WP}	Width of Write Enable pulse.
T_{WSA}	Required delay between beginning of valid Address and beginning of Write Enable pulse.
T_{WSD}	Required delay between beginning of valid Data Input and end of Write Enable pulse.
T_{WD}	Delay between beginning of Write Enable pulse and when Data Output is in off state.
T_{WHC}	Required delay between end of Write Enable pulse and end of Chip Enable.
T_{WHA}	Required delay between end of Write Enable pulse and end of valid Address.