OBJECTIVE SPECIFICATION

2115/2115L-F,I,N • 2125/2125L-F,I,N

DESCRIPTION

The 2115 and 2125 family are read/write RAMs which are designed for buffer control storage and high performance main memory applications.

These devices offer the advantages of high performance, low power dissipation, and system cost savings, making them ideal where cost is a prime factor. N-channel technology allows the design and production of high speed MOS RAMs which are compatible to the performance of Bipolar RAMs.

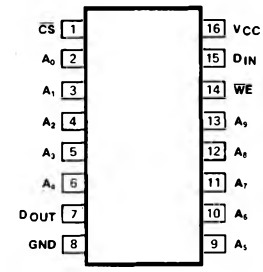
FEATURES

- **Power dissipation: 0.2mW/bit typ (2115L, 2125L)**
- **Output options:**
  2115: Uncommitted collector*
  2125: Three-state
- **Non-inverting data output**
- **Dual-in-line package**
- **N-channel MOS silicon gate technology**
- **Fully pin compatible to 93415 (2115) and 93425 (2125)**
- **Fully compatible with TTL logic families including inputs, output and single 5V supply**

* The 2115 is an MOS device and the output is actually an uncommitted drain.

PIN CONFIGURATION

F,I,N PACKAGE



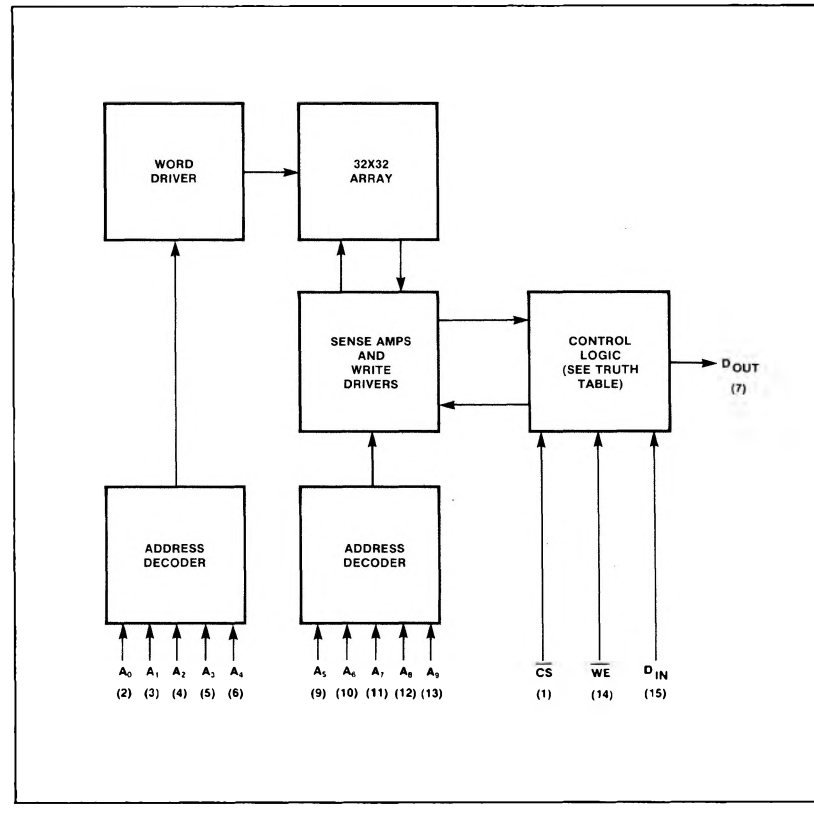
TRUTH TABLE

INPUTS			OUTPUT 2115 FAMILY	OUTPUT 2125 FAMILY	MODE
$\overline{CS}$	$\overline{WE}$	D_{IN}	D_{OUT}	D_{OUT}	
H	X	X	H	High Z	Not selected
L	L	L	H	High Z	Write "0"
L	L	H	H	High Z	Write "1"
L	H	X	D_{OUT}	D_{OUT}	Read

PIN DESIGNATION

PIN NO.	SYMBOL	FUNCTION
1	$\overline{CS}$	Chip select
2-6, 9-13	A_{0-9}	Address inputs
7	D_{OUT}	Data output
8	GND	Ground
14	$\overline{WE}$	Write enable
15	D_{IN}	Data input

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS[1]

PARAMETER	RATING	UNIT
Temperature range		°C
T_A Operating	-10 to 85	
T_{STG} Storage	-65 to 150	
All output or supply voltages	-0.5 to 7	V
All input voltages	-0.5 to 5.5	V
Dc output current	20	mA

DC ELECTRICAL CHARACTERISTICS[2] V_{CC} = 5V ± 5%, T_A = 0°C to 75°C

PARAMETER	TEST CONDITIONS	2115/2115L			2125/2125L			UNIT
		Min	Typ	Max	Min	Typ	Max	
Input voltage								V
V_{IL} Low				0.8			0.8	
V_{IH} High		2.1			2.1			
Output voltage								V
V_{OL} Low	I_{OL} = 16mA			0.45			0.45	
V_{OH} High	I_{OH} = -3.2mA	2.4			2.4			
Input current	V_{CC} = Max							µA
I_{IL} Low	V_{IN} = 0.4V		-1	-40		-1	-40	
I_{IH} High	V_{IN} = 4.5V		1	40		1	40	
Output current	V_{CC} = Max							
I_{CEX} Leakage	V_{OUT} = 4.5V		10	100				µA
I_{OFF} High Z	V_{OUT} = 0.5V/2.4V					10	50	µA
I_{OS}[3] Short circuit	V_{CC} = 4.5V						-100	mA
Supply current	All inputs grounded, output open							mA
I_{CCL} 2115L, 2125L			50	65		50	65	
I_{CC1} 2115, 2125			75	100		75	100	
Capacitance	All inputs = OV, Output open							pF
C_{IN} Input			4	8		4	8	
C_{OUT} Output	$\overline{CS}$ = 5V		5	8		5	8	

AC ELECTRICAL CHARACTERISTICS V_{CC} = 5V ± 5%, T_A = 0°C to 75°C

PARAMETER	TO	FROM	2115/2125			2115L/2125L			UNIT
			Min	Typ	Max	Min	Typ	Max	
READ CYCLE									
t_{ACS} Chip select time	Output	Address	5		45	5		50	ns
t_{RCS} Chip select recovery time					40			40	ns
t_{AA} Access time				75	95		75	95	ns
t_{OH} Previous read data valid after change of address			10			10			ns
WRITE CYCLE									
Enable time									ns
t_{WS}	Write enable	Data out							
t_{ZWS} (2125, 2125L)	High Z	Write enable			40			40	
t_{WR} Write recovery time			5		45	5		50	ns
t_W Write pulse width			50			50			ns
Setup and hold time									ns
t_{WSD} Setup time prior to write	$\overline{WE}$	Data	5			15			
t_{WHD} Hold time after write	Data	$\overline{WE}$							
t_{WSA} Setup time	$\overline{WE}$	Address	30			30			
t_{WHA} Hold time	Address	$\overline{WE}$	5			15			
t_{WSCS} Setup time	$\overline{WE}$	Chip select	5			15			
t_{WHCS} Hold time	Chip select	$\overline{WE}$							

NOTES on following page.

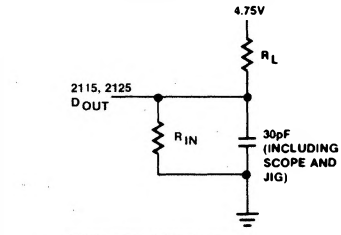
NOTES

1. Stresses above 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 at any other condition above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.
2. 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} (@ 400fpm air flow) = 45°C/W
   θ_{JA} (still air) = 60°C/W
   θ_{JC} = 25°C/W.
3. Duration of short circuit current should not exceed 1sec.

TEST LOAD CIRCUITS

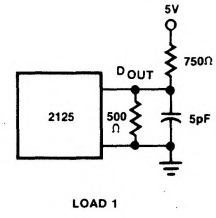
2115/2125

AC AND DC LOADING CONDITIONS



	2115	2125
R_L	330Ω	330Ω
R_{IN}	600Ω	300Ω

2125

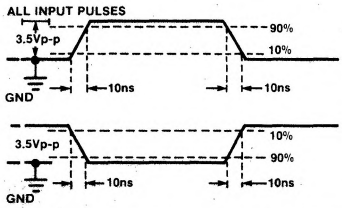


LOAD 1

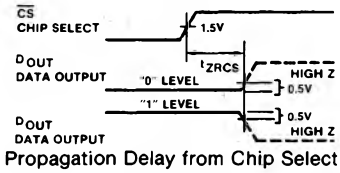
Write Enable to High Z Delay

VOLTAGE WAVEFORMS

2115/2125



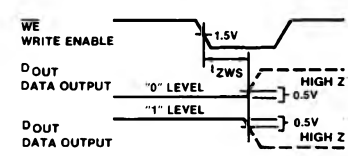
2125



Propagation Delay from Chip Select to High Z

All tzxxx parameters are measured at a delta of 0.5V from the logic level and using Load 1.

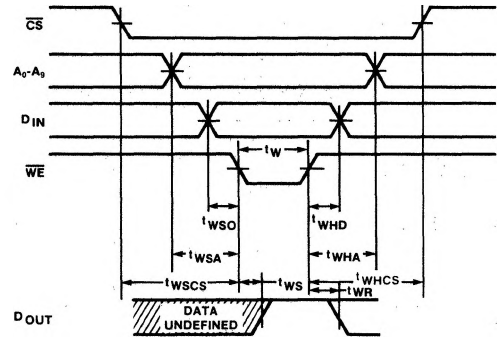
2125



Write Enable to High Z Delay

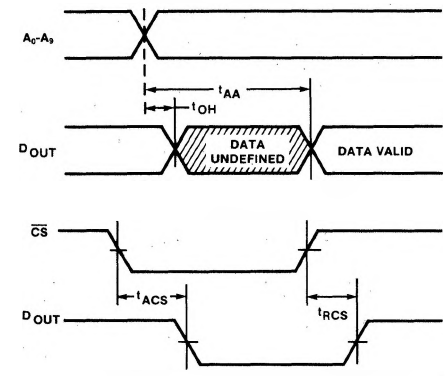
TIMING DIAGRAMS

2115 WRITE CYCLE



All measurements referenced to 1.5V

2115 READ CYCLE

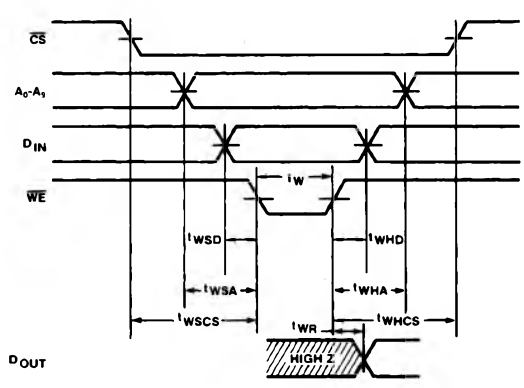


Propagation Delay from Chip Select

All measurements referenced to 1.5V

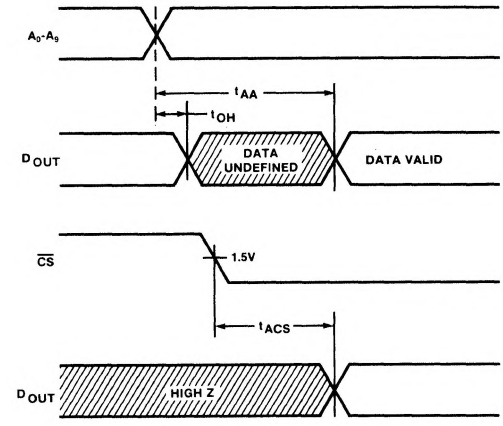
TIMING DIAGRAMS (Cont'd)

2125 WRITE CYCLE



All measurements referenced to 1.5V

2125 READ CYCLE

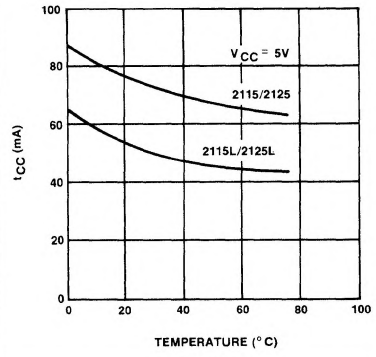


Propagation Delay from Chip Select

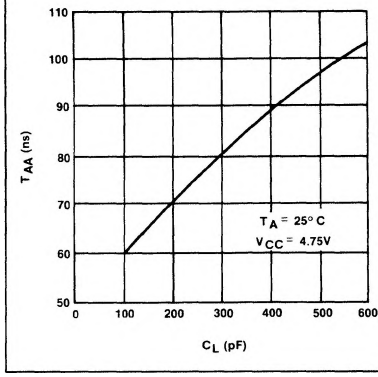
All measurements referenced to 1.5V

TYPICAL PERFORMANCE CHARACTERISTICS

ICC vs TEMPERATURE



ACCESS TIME vs CAPACITANCE



ICC vs VCC