SOLID STATE SCIENTIFIC

SCM2114AL

1024 x 4 Static CMOS RAM

Preliminary

Features

- Fast Access Time Selection: 100ns/120ns/150ns/200ns
- Direct Replacement for NMOS 2114 RAMs
- 883 Qualified Version: 883/2114ALM
- Three-State Outputs
- True TTL Compatibility
- Single 5V ± 10% Supply
- Fully Static Asychronous Operation
- Three-State Outputs
- Common Data I/O Bus

Description

The SCM2114AL is a static silicon-gate CMOS RAM, a direct replacement for the NMOS 2114 4K RAM. The device is fully static and requires no clocks.

The Common Data lines (I/O) allow for simple interfacing with most microprocessors. A Chip Select input ($\overline{CS}$) is provided for memory expansion. The I/O lines are in a high impedance state when the chip is not selected ($\overline{CS} = 1$). The Write Enable ($\overline{WE}$) is used to select either the read ($\overline{WE} = 1$) or write ($\overline{WE} = 0$) mode.

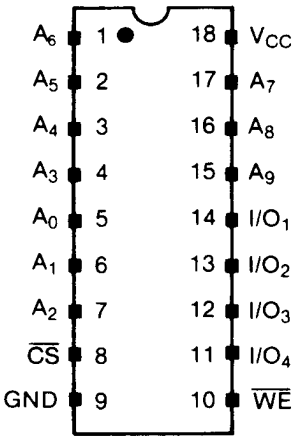
The SCM2114AL is fully socket and spec compatible with NMOS 2114 RAMS. For applications where $\overline{CS}$ and address access timing can be coincident, even lower power can be achieved using the SCM21C14 which features a standby current of 50μA max.

The SCM2114AL is available in industry standard 18 pin packages. The different versions of the SCM2114AL are outlined below.

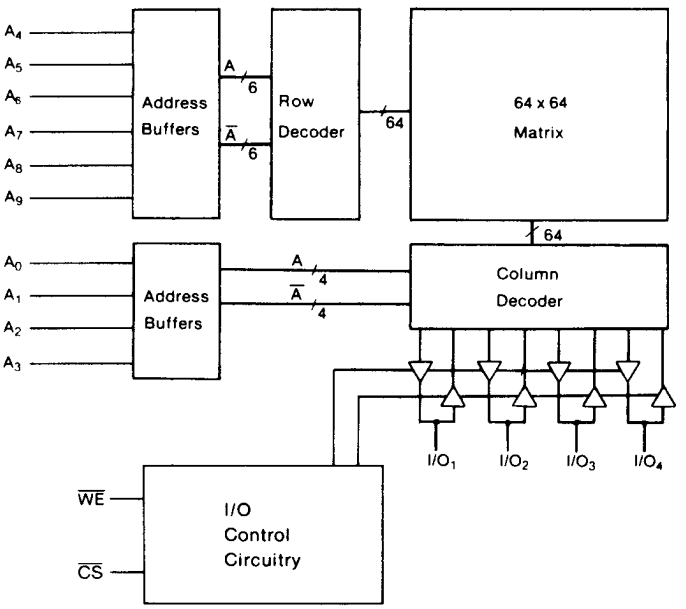
Operating Characteristics Summary

Type	Access Time t_A (max.)	Operating Current I_{CC} (max.)
SCM2114AL-1	100ns	40mA
SCM2114AL-2	120ns	40mA
SCM2114AL-3	150ns	40mA
SCM2114AL-4	200ns	40mA
SCM2114ALM	200ns	50mA
883/2114ALM	200ns	50mA

Pin Configuration



Block Diagram



Absolute Maximum Limits

DC Supply Voltage (V_{CC}): −0.5 to +6.0V
Storage Temperature (T_S): −65° to +150°C
Input Voltage (V_{IN}): $(V_{SS} - 0.3V) \leq V_{IN} \leq (V_{CC} + 0.3V)$

Recommended Operating Conditions

Parameter	Limits
DC Supply Voltage (V_{CC})	5V ± 10%
Operating Temperature (T_A)	
2114AL-1/-2/-3/-4	0° to +70°C
2114ALM	−55° to +125°C

Pin Description

A_{0-9}	Address Inputs
$\overline{CS}$	Chip Select
$\overline{WE}$	Write Enable
I/O_{1-4}	Data In/Out

Truth Table

$\overline{CS}$	$\overline{WE}$	I/O_{1-4}	Mode
1	X	High Z	Not Selected
0	1	Outputs	Read
0	0	Inputs	Write

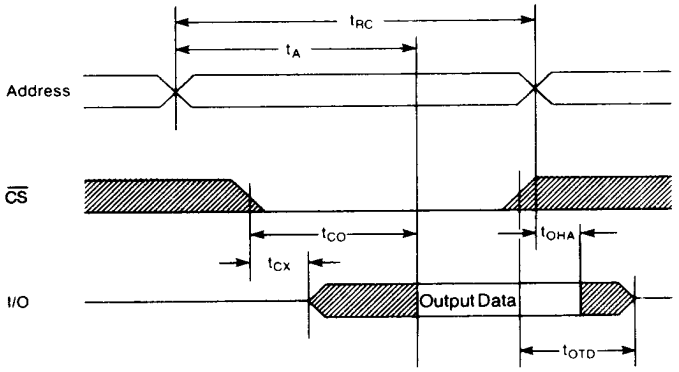
D. C. Characteristics (V_{CC} = 5V ± 10%)

Symbol	Parameter	Min.	Typ.(1)	Max.	Units	Test Conditions
I_{LI}	Input Current			1.0	μA	
I_{LO}	Output Leakage Current			1.0	μA	
V_{IL}	Input Low Voltage			0.8	V	
V_{IH}	Input High Voltage	2.0			V	
V_{OL}	Output Low Voltage			0.4	V	I_{OL} = 3.2mA
V_{OH}	Output High Voltage	2.4			V	I_{OH} = −1.0mA
I_{CC}	Operating Current 2114AL		25	40	mA	V_{IH}/V_{IL} = 2.0/0.8V
I_{CC}	Operating Current 2114ALM		25	50	mA	V_{IH}/V_{IL} = 2.0/0.8V

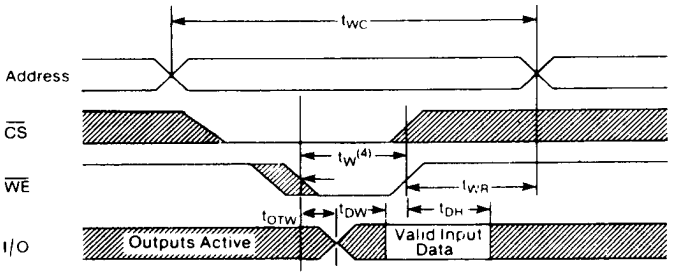
A. C. Characteristics(2) (V_{CC} = 5V ± 10%)

Symbol	Parameter	2114AL-1 Min.	2114AL-1 Max.	2114AL-2 Min.	2114AL-2 Max.	2114AL-3 Min.	2114AL-3 Max.	2114AL-4/M Min.	2114AL-4/M Max.	Units
Read Cycle										
t_{RC}	Read Cycle	100		120		150		200		ns
t_A	Access from Address		100		120		150		200	ns
t_{CO}	Chip Select to Output Valid		50		70		70		70	ns
t_{CX}	Chip Select to Output Active	5		5		5		5		ns
t_{OTD}	Chip Select to Output Float		30		35		40		50	ns
t_{OHA}	Output Hold from Address Change	5		5		5		5		ns
Write Cycle										
t_{WC}	Write Cycle	100		120		150		200		ns
t_W	Write Pulse Width	50		70		90		120		ns
t_{DW}	Data Setup	50		70		90		120		ns
t_{DH}	Data Hold	0		0		0		0		ns
t_{OTW}	Write to Output Float		30		35		40		50	ns
t_{WR}	Write Recovery	0		0		0		0		ns

Read Cycle [3]



Write Cycle



1. T_A = 25°C; V_{CC} = 5.0V
2. A.C. TEST CONDITIONS

Input Pulse Levels:	0.8 to 2.4V
Input Rise/Fall Times:	≤ 10ns
Time Measurement Reference Level:	1.5V
Output Load:	1 TTL Load and C_L = 100 pF

3. $\overline{WE}$ is high for a read cycle.
4. t_W is measured from the latter of $\overline{CS}$ or $\overline{WE}$ going low to the earlier of $\overline{CS}$ or $\overline{WE}$ going high. $\overline{WE}$ must be high during address transitions.