

## 512 x 8-Bit Static CMOS RAM

### SAB 81C54

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Preliminary Data

CMOS IC

#### Features

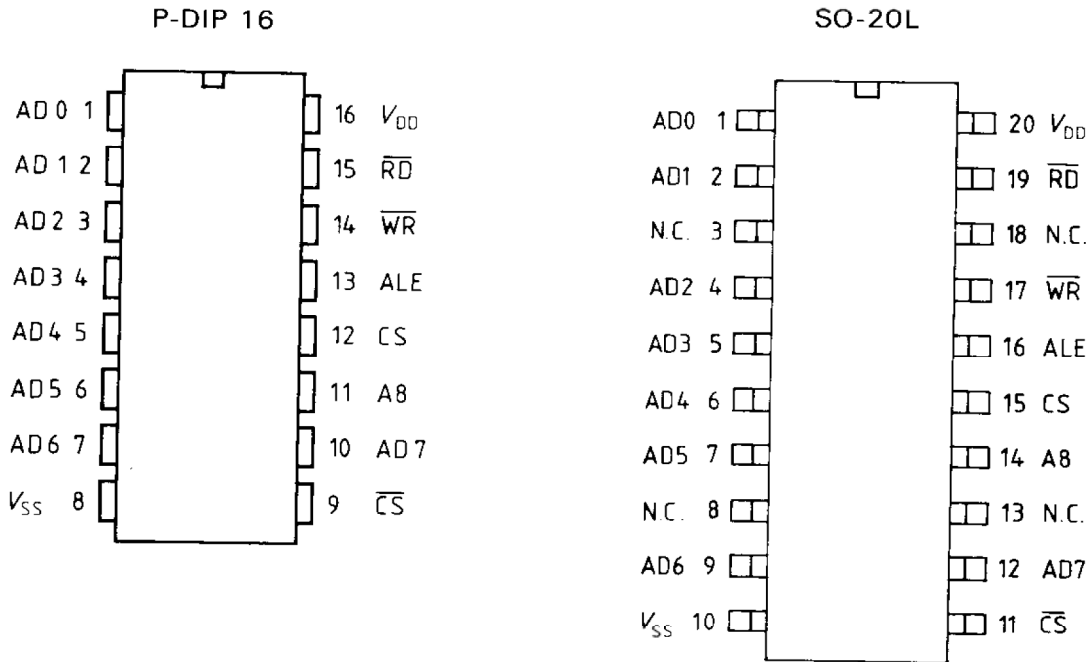
- 512 x 8-bit organization
- Multiplexed address and data bus
- Tristate address / data lines
- On-chip address register
- Very low power consumption
  - Operation: 500  $\mu$ A at 6 V<sup>1)</sup>
  - Standby: 1  $\mu$ A at 6 V
- Two chip selects
- Wide supply voltage range: 2.5 V to 6 V
- Data retention: 1.0 V

#### General Description

The SAB 81C54 is a 4096-bit static random access memory (RAM) organized as 512 words by 8 bits, manufactured using advanced CMOS technology. The multiplexed address and data bus allows to interface directly with 8-bit organized processors and microcomputers, for example with SAB 8085, SAB 8086, SAB 8088, SAB 8048, SAB 80C48, SAB 8051 and SAB 80C482. Low standby power dissipation (<1  $\mu$ A) minimizes system power requirements.

<sup>1)</sup> For ALE = 100 kHz and CMOS input levels

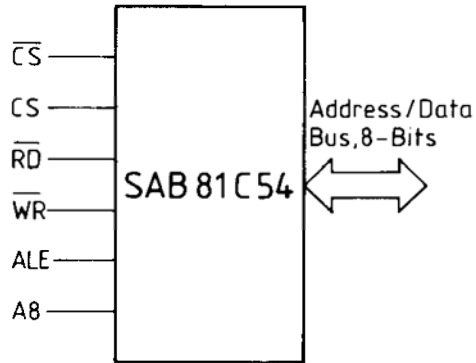
**Pin Configurations**  
(top view)



**Pin Definitions**

P-DIP 16 Pin	SO-20L Pin	Symbol	Function
1... 7, 10	1, 2, 4 ... 7, 9, 11	AD0 to AD7	Address/ data lines
11	14	A8	Address line
12	15	CS	Chip select (active high)
9	11	$\overline{CS}$	Chip select (active low)
13	16	ALE	Address latch enable
14	17	$\overline{WR}$	Write enable (active low)
15	19	$\overline{RD}$	Read enable (active low)
16	20	$V_{DD}$	Power supply (2.5 V... 6 V)
8	10	$V_{SS}$	Ground (0 V)
-	3, 8, 13, 18	NC	Not connected

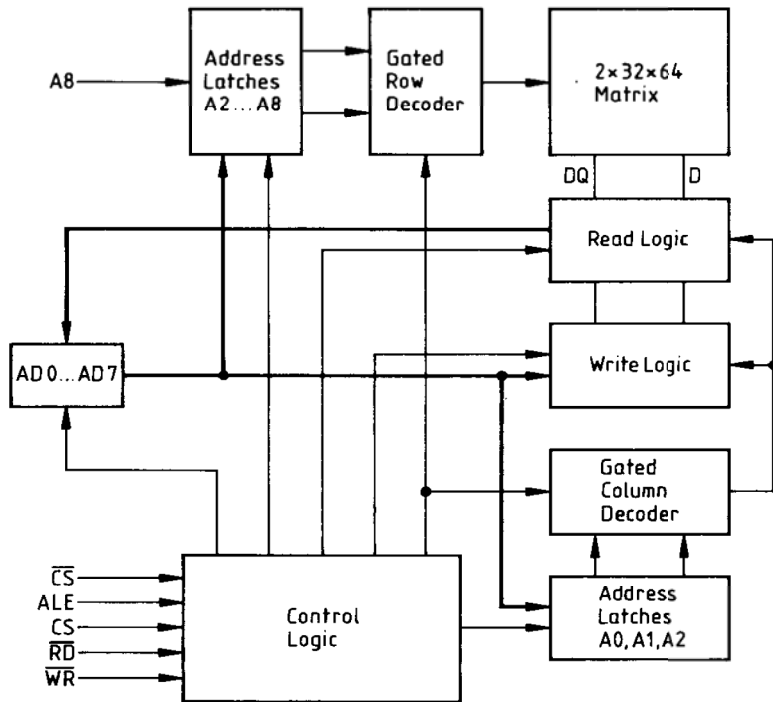
### Logic Symbol



### Truth Table for Control and Data Bus Pin Status

$\overline{CS}$	CS	$\overline{RD}$	$\overline{WR}$	AD0 ... AD7 during data portion of cycle	Function
H	X	X	X	floating	none
X	L	X	X	floating	none
L	H	L	H	data from memory	read
L	H	H	L	data to memory	write

Block Diagram



### Maximum Ratings

Ambient temperature under bias	$T_A$	-25 to 70	°C
Storage temperature	$T_{stg}$	-55 to 125	°C
Supply voltage with respect to GND ( $V_{SS}$ )	$V_S$	0 to 7	V
Total power dissipation	$P_{tot}$	250	mW
All input and output voltages	V	-0.8 to $V_{DD} + 0.8$	V

### DC Characteristics

$T_A = -25^\circ\text{C}$  to  $+70^\circ\text{C}$ ;  $V_{DD} = 2.5\text{ V}$  to  $6\text{ V}$ ;  $V_{SS} = 0\text{ V}$

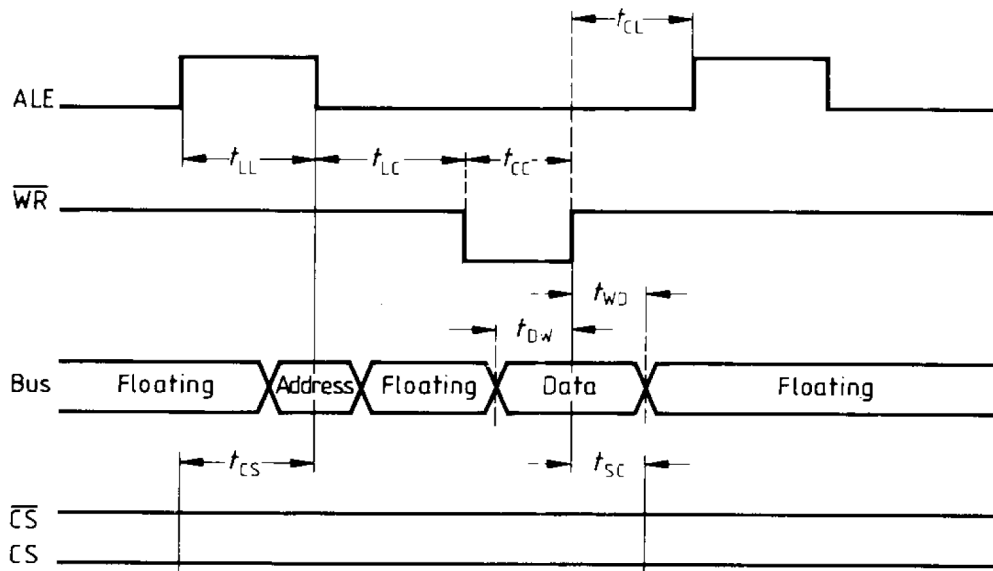
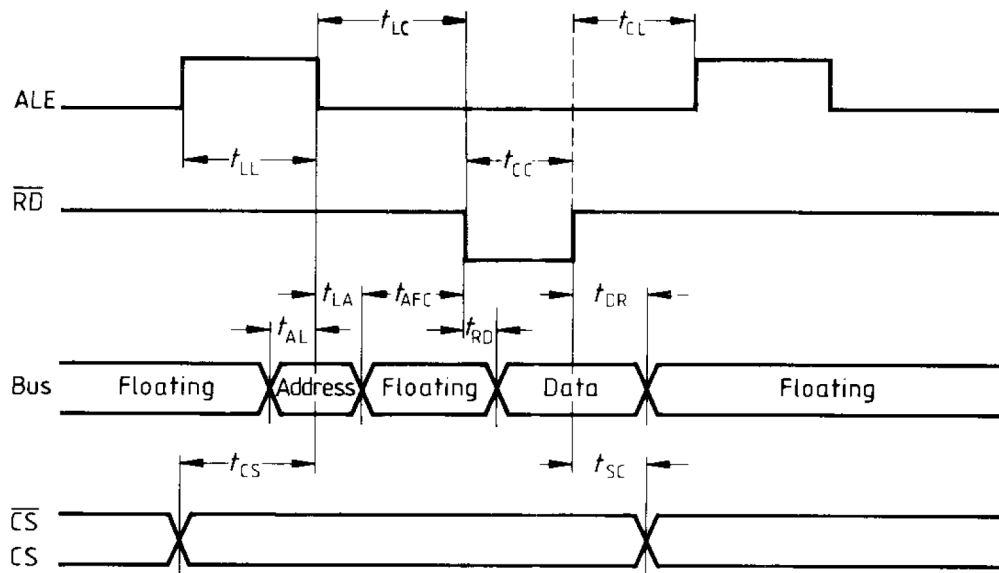
		Test conditions	min.	typ.	max.	Unit
Standby supply current	$I_{DD}$				1	$\mu\text{A}$
Operating supply current	$I_{DD}$	100 kHz ALE		500		$\mu\text{A}$
Operating supply voltage	$V_{DD}$		2.5		6	V
Standby voltage	$V_{DD}$	for data retention	1.0			V
Input current	$I_{IL}$	$V_I = 0$ to $6\text{ V}$			1	$\mu\text{A}$
Output leakage current	$I_{OL}$	$V_O = 0$ to $6\text{ V}$ high impedance			1	$\mu\text{A}$
L input voltage	$V_{IL}$	$V_{DD} < 4.5\text{ V}$	-0.8		0.6	V
L input voltage	$V_{IL}$	$V_{DD} > 4.5\text{ V}$	-0.8		0.8	V
H input voltage	$V_{IH}$		$0.6 \times V_{DD}$		$V_{DD} + 0.8$	V
H input voltage	$V_{IH}$	$V_{DD} = 5\text{ V}$	2.0		$V_{DD} + 0.8$	V
L output voltage	$V_{OL}$	$I_{OL} = 1\text{ mA}$ $V_{DD} < 4.5\text{ V}$			0.4	V
L output voltage	$V_{OL}$	$I_{OL} = 2\text{ mA}$ $V_{DD} > 4.5\text{ V}$			0.4	V
H output voltage	$V_{OH}$	$I_{OH} = 1\text{ mA}$ $V_{DD} < 4.5\text{ V}$	$0.75 \times V_{DD}$			V
H output voltage	$V_{OH}$	$I_{OH} = 2\text{ mA}$ $V_{DD} > 4.5\text{ V}$	$0.75 \times V_{DD}$			V

**AC Characteristics**

$T_A = -25^\circ\text{C}$  to  $+70^\circ\text{C}$ ;  $V_{DD} = 5\text{ V}$ ;  $V_{SS} = 0\text{ V}$

		min.	typ.	max.	Unit
ALE pulse width	$t_{LL}$	60			ns
Address set-up before ALE	$t_{AL}$	10			ns
Address hold from ALE	$t_{LA}$	45			ns
$\overline{RD}$ , $\overline{WR}$ pulse width	$t_{CC}$	150			ns
Data set-up before $\overline{WR} \uparrow$	$t_{DW}$	100			ns
Data hold after $\overline{WR} \uparrow$	$t_{WD}$	25			ns
Data hold after $\overline{RD} \uparrow$	$t_{DR}$	0		95	ns
$\overline{RD} \downarrow$ to data out (access time)	$t_{RD}$			150	ns
Address float to $\overline{RD} \downarrow$	$t_{AFC}$	0			ns
CS before ALE	$t_{CS}$	30			ns
CS after $\overline{WR}$ or $\overline{RD}$	$t_{SC}$	30			ns
ALE to $\overline{RD} - \overline{WR}$ control	$t_{LC}$	100			ns
$\overline{RD} - \overline{WR}$ control to ALE high	$t_{CL}$	30			ns

Timing Waveforms

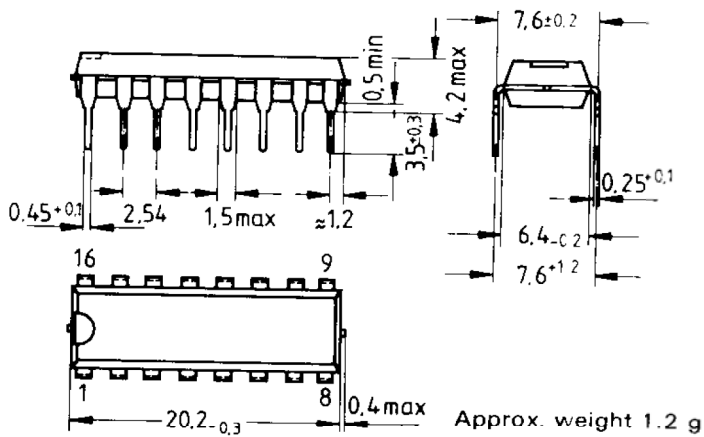


Ordering Information

Type	Ordering Code	Package
SAB 81C54	Q67100-H3226	P-DIP 16
SAB 81C54-T	Q67100-H8458	SO-20L (SMD) if requested

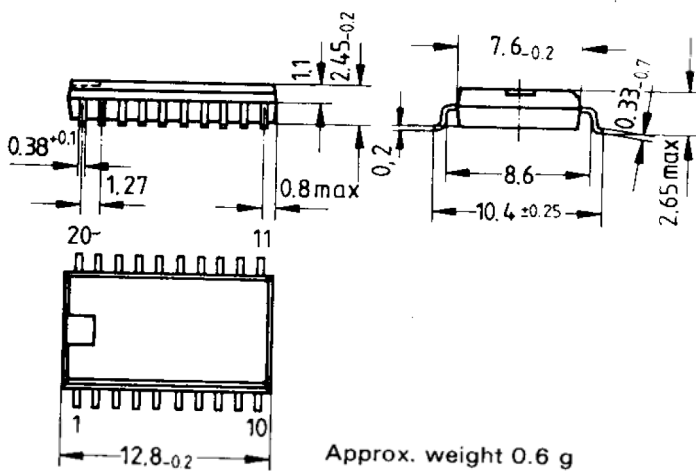
Plastic package

20 A 16 DIN 41866, P-DIP, 16 pins



Miniature plastic package (SMD)

SO-20L, 20 pins



Dimensions in mm



## Spain

Siemens S.A.  
Orense, 2  
Apartado 155  
**E-28080 Madrid**  
☎ (01) 4552500, Tlx 27247

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Siemens AB  
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Box 23141  
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Siemens Limited  
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Head Office  
134-A, Dr. Annie Besant Road,  
Worli  
P.O.B. 6597  
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Fuji Electronic Components Ltd.  
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Siemens Components Pte. Ltd.  
Promotion Office  
10-15 E, 5th floor  
47 Ayer Rajah Crescent No.06-12  
**Singapore 0513**  
☎ 7760044, Tlx RS 21000

## Taiwan

TAI Engineering Co. Ltd.  
6th Floor Central Building  
108, Chung Shan N. Rd. Sec. 2  
P.O.Box 68-1882  
**Taipei**  
☎ 5363171, Tlx 27860

## AUSTRALIA

Siemens Ltd.  
544 Church Street, Richmond  
**Melbourne, Vic. 3121**  
☎ (03) 4207111, Tlx 30425

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