

**AK594096AS/AK594096AG**  
**4,194,304 Word by 9 Bit CMOS**  
**Dynamic Random Access Memory**
**DESCRIPTION**

The Accutek AK594096AS or ~~AK594096AG~~ high density memory module is a CMOS dynamic RAM organized in 4 Meg x 9 bit words. The assembly consists of nine 4 Meg x 1 DRAMs in plastic SOJ packages mounted to a printed wiring board in 30 pad SIM (leadless) or ~~SIP (leadless)~~ configuration. The module is only 0.8 inch high (same height as standard 1 Meg modules), making it ideally suited for applications with low height restrictions.

The operation of the AK594096A is identical to nine 4 Meg x 1 dynamic RAMs. For the lower eight bits, the data input is tied to the data output and brought out separately for each device, with common  $\overline{\text{RAS}}$  and  $\overline{\text{CAS}}$  control. This common I/O feature dictates the use of early-write cycles to prevent contention of D and Q. Since the Write-Enable ( $\overline{\text{WE}}$ ) signal must always go low before  $\overline{\text{CAS}}$  in a write cycle, Read-Write and Read-Modify-Write operation is not possible. For the ninth bit, the data input ( $\text{D}_9$ ) and data output ( $\text{Q}_9$ ) pins are brought out separately and controlled by a separate  $\overline{\text{CAS}}_9$  for that bit. Bit nine is generally used for parity.

**FEATURES**

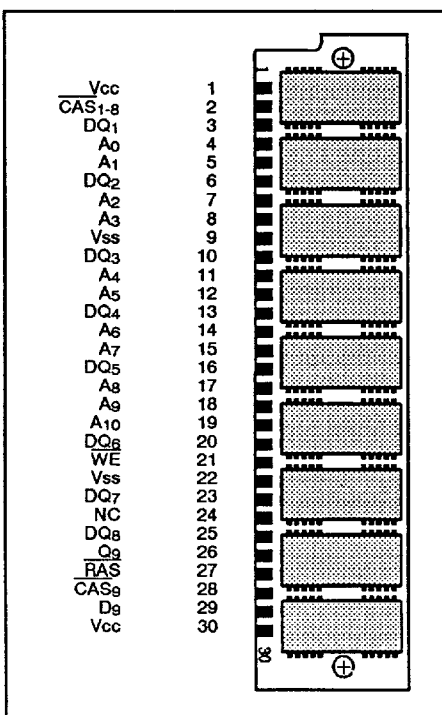
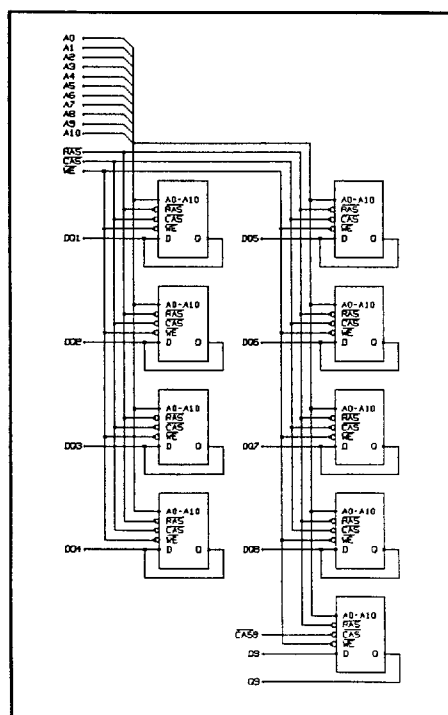
- 4,194,304 x 9 bit organization
- 30 pad (SIM) Single In-Line Module or ~~(SIP) Single In-Line~~ package
- JEDEC approved pinout
- Common  $\overline{\text{CAS}}$  and common  $\overline{\text{RAS}}$  control for eight common DQ lines
- Separate  $\overline{\text{CAS}}$  control for one separate pair of D and Q lines
- $\overline{\text{CAS}}$ -before- $\overline{\text{RAS}}$  refresh
- Power  
4.45 Watt Max Active (80 nS)  
3.96 Watt Max Active (100 nS)  
49.5 mWatt Max Standby
- Operating free air temperature 0°C to 70°C
- Downward compatible with AK491024 and AK59256/49256
- Available in leadless (S) or ~~leadless~~ version (~~S~~)
- Fast Page Mode, Nibble Mode and Static Column Mode versions available
- 8 bit version (no parity bit) also available

**PIN NOMENCLATURE**

DQ <sub>1</sub> - DQ <sub>8</sub>	Data In/Data Out
D <sub>9</sub>	Data In Parity Bit
Q <sub>9</sub>	Data Out Parity Bit
A <sub>0</sub> - A <sub>10</sub>	Address Inputs
CAS <sub>1-8</sub>	Column Address Strobe
RAS	Row Address Strobe
WE	Write Enable
Vcc	5v Supply
Vss	Ground
NC	No Connection

**MODULE OPTIONS**

Leadless SIM: AK594096AS  
 Single In-Line Module  
~~Leadless SIP: AK594096AG~~  
~~Single In-Line Package~~

**PIN ASSIGNMENT**

**FUNCTIONAL DIAGRAM**


## ORDERING INFORMATION

### PART NUMBER CODING INTERPRETATION

- Position: 1 2 3 4 5 6 7 8
- 1 - Product \_\_\_\_\_  
AK = Accuthek Memory
  - 2 - Type \_\_\_\_\_  
4 = Dynamic RAM  
5 = CMOS Dynamic RAM  
6 = Static RAM
  - 3 - Organization/Word Width \_\_\_\_\_  
1 = by 1  
4 = by 4  
8 = by 8  
9 = by 9
  - 4 - Size/Bits Depth \_\_\_\_\_  
256 = 256K  
1024 = 1 MEG  
4096 = 4 MEG
  - 5 - Package Type \_\_\_\_\_  
G = Single In-Line Package (SIP)  
S = Single In-Line Module (SIM)  
D = Dual In-Line Package (DIP)  
W = .050 inch Pitch Edge Connect Module
  - 6 - Special Designation \_\_\_\_\_  
P = Page Mode  
N = Nibble Mode  
K = Static Column Mode  
W = Write Per Bit Mode
  - 7 - Separator \_\_\_\_\_  
- = Commercial (0°C to +70°C)  
M = Military Equivalent Screened (-55°C to +125°C)  
I = Industrial Temperature Tested (-45°C to +85°C)  
X = Burned In
  - 8 - Speed (first two significant digits) \_\_\_\_\_  
60 = 60 nS  
70 = 70 nS  
80 = 80 nS  
10 = 100 nS  
12 = 120 nS  
etc.

The numbers and coding on this page do not include all variations available, but are shown as examples of the most widely used variations. Contact Accuthek if other information is required.

## EXAMPLES:

### AK594096ASP-80

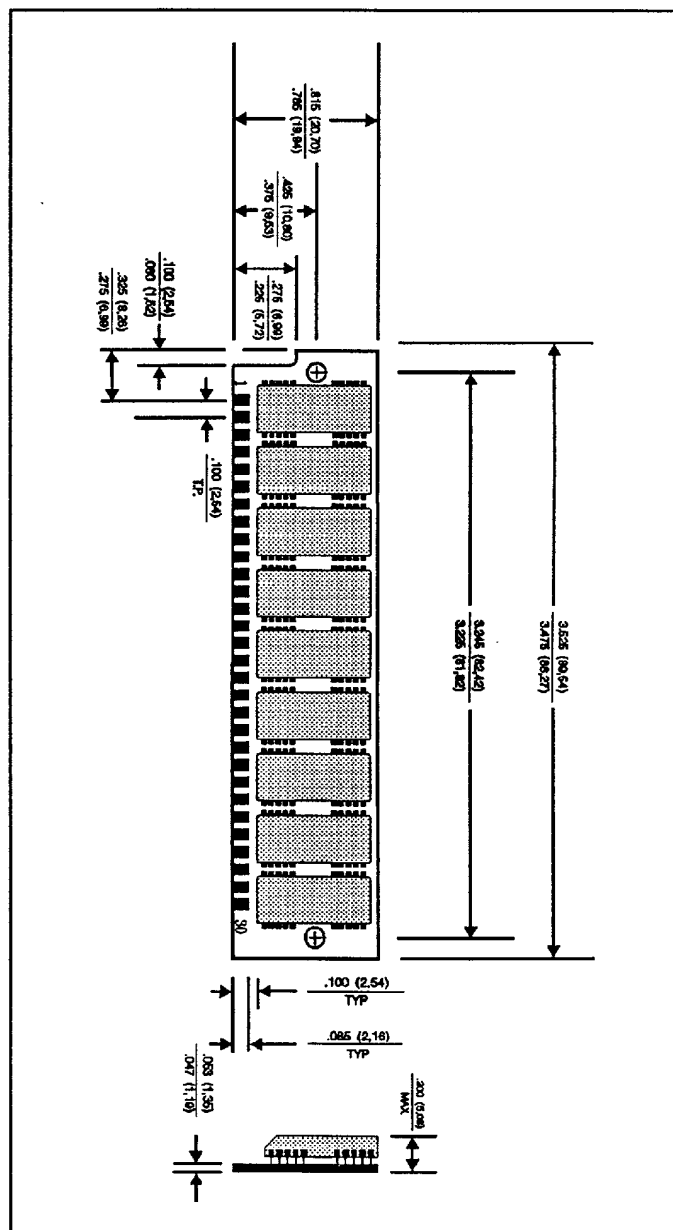
4 Meg x 9 CMOS Dynamic RAM, Leadless SIM, Page Mode, Commercial, 80 nS Access Time

### ~~AK594096AGK-70~~

~~4 Meg x 9 CMOS Dynamic RAM, Loaded SIP, Static Column Mode, Commercial, 70 nS Access Time~~

## MECHANICAL DIMENSIONS

Inches (millimeters)



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