ACCUTEK
MICROCIRCUIT CORPORATION

AK5916384S / AK5916384G
**16,777,216 Word by 9 Bit CMOS**
Dynamic Random Access Memory

DESCRIPTION

The Accutek AK5916384S high density memory module is a CMOS random access memory organized in 16 Meg x 9 bit words. The assembly consists of nine 16 Meg x 1 DRAMs in plastic SOJ packages mounted on the front side of a printed circuit board in 30 pad SIM (leadless) or 30 pin SIP (leaded) 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 AK5916384 is identical to nine 16 Meg x 1 dynamic RAMs. For the lower eight bits data input is tied to data output and brought out separately for each device, with common $\overline{RAS}$, $\overline{CAS}$ and $\overline{WE}$ control. This common I/O feature dictates the use of early-write cycles to prevent contention of D and Q. Since the Write-Enable ($\overline{WE}$) signal must always go low before $\overline{CAS}$ in a write cycle, Read-Write and Read-Modify-Write operation is not possible. For the ninth bit, the data input (D_9) and the data output (Q_9) pins are brought out separately and controlled by a separate $\overline{PCAS}$ for that bit. Bit nine is generally used for parity.

FEATURES

- 16,777,216 x 9 bit organization
- Optional 30 Pad leadless SIM (Single In-Line Module) or 30 Pin leaded SIP (Single In-Line Package)
- JEDEC standard pinout
- Common $\overline{CAS}$ and $\overline{RAS}$ control for the lower eight bits
- Separate $\overline{PCAS}$ control for D_9 and Q_9
- $\overline{CAS}$-before-$\overline{RAS}$ refresh

Front View

30-Pin SIM

30-Pin SIP
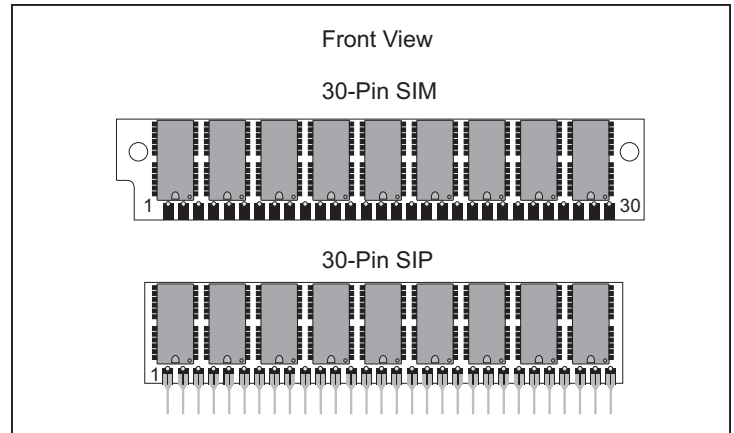
- Downward compatible with AK594096, AK591024, and AK59256
- TTL-Compatible Inputs and Outputs
- $\overline{RAS}$-Only Refresh
- 4096 Cycle Refresh every 64mSEC
- Power:
  4.45 Watt Max Active (60 nS)
  3.96 Watt Max Active (70 nS)
  49.5 mWatt Max Standby
- Operating free air temperature 0°C to 70°C
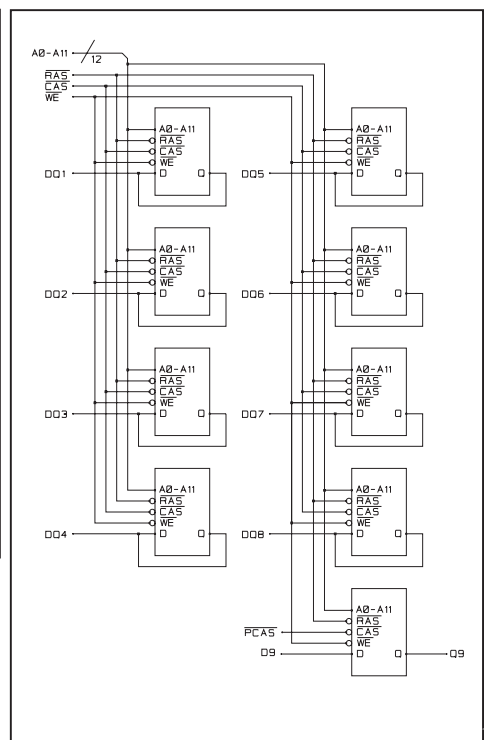- Fast Page Mode
- 8 Bit version (without parity bit) also available

PIN NOMENCLATURE

DQ_1 - DQ_8	Data In/Data Out
D_9	Data In
Q_9	Data Out
A_0 - A_{11}	Address Inputs
$\overline{CAS}$, $\overline{PCAS}$	Column Address Strobe
$\overline{RAS}$	Row Address Strobe
$\overline{WE}$	Write Enable
Vcc	5v Supply
Vss	Ground
NC	No Connect

MODULE OPTIONS

Leadless SIM: AK5916384S
Leaded SIP: AK5916384G

PIN ASSIGNMENT

PIN #	SYMBOL	PIN #	SYMBOL
1	Vcc	16	DQ5
2	$\overline{CAS}$	17	A8
3	DQ1	18	A9
4	A0	19	A10
5	A1	20	DQ6
6	DQ2	21	$\overline{WE}$
7	A2	22	Vss
8	A3	23	DQ7
9	Vss	24	A11
10	DQ3	25	DQ8
11	A4	26	Q9
12	A5	27	$\overline{RAS}$
13	DQ4	28	$\overline{PCAS}$
14	A6	29	D9
15	A7	30	Vcc

FUNCTIONAL DIAGRAM

PART NUMBER CODING INTERPRETATION

Position	1	2	3	4	5	6	7	8

1 Product

   AK = Accutek Memory

2 Type

   4 = Dynamic RAM
   5 = CMOS Dynamic RAM
   6 = Static RAM

3 Organization/Word Width

   1 = by 1   16 = by 16
   4 = by 4   32 = by 32
   8 = by 8   36 = by 36
   9 = by 9

4 Size/Bits Depth

   64   = 64K   4096   = 4 MEG
   256   = 256K   8192   = 8 MEG
   1024 = 1 MEG   16384 = 16 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
   Z = Zig-Zag In-Line Package (ZIP)

6 Special Designation

   P = Page Mode
   N = Nibble Mode
   K = Static Column Mode
   W = Write Per Bit Mode
   V = Video Ram

7 Separator

   - = Commercial 0^{0}C to +70^{0}C
   M = Military Equivalent Screened
   **   (-55^{0}C to +125^{0}C)**
   I = Industrial Temperature Tested
   **   (-45^{0}C to +85^{0}C)**
   X = Burned In

8 Speed (first two significant digits)
   DRAMS   SRAMS
   60 = 60 nS   8 =   8 nS
   70 = 70 nS   12 =   12 nS
   80 = 80 nS   15 =   15 nS

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 Accutek if other information is required.
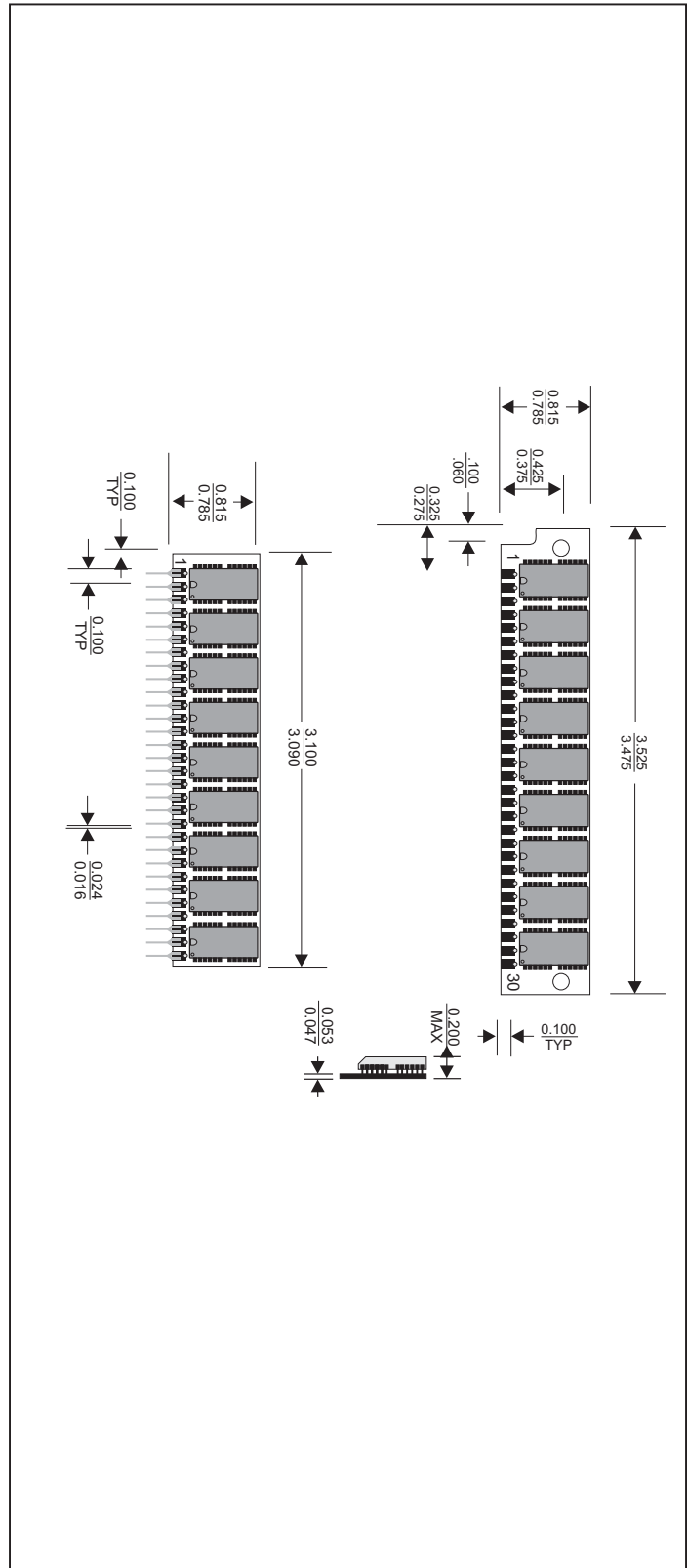
EXAMPLES:

AK5916384SP-70
16 Meg x 9, 70 nSEC, Leadless SIM, Fast Page Mode

AK5916384GP-60
16 Meg x 9, 60 nSEC, Leaded SIP, Fast Page Mode

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MECHANICAL DIMENSIONS

Inches

Accutek reserves the right to make changes in specifications at any time and without notice. Accutek does not assume any responsibility for the use of any circuitry described; no circuit patent licenses are implied. Preliminary data sheets contain minimum and maximum limits based upon design objectives, which are subject to change upon full characterization over the specific operating conditions.