MICROCIRCUIT CORPORATION

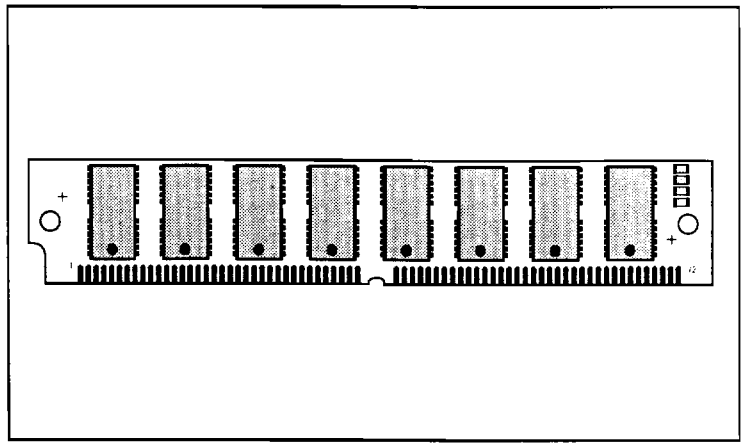
AK5328192WP
8,388,608 by 32 B it CMOS
Dynamic Random Access Memory

DESCRIPTION

The Accutek AK5328192WP high density memory module is a CMOS dynamic RAM organized in 8192K x 32 bit words. The module consists of sixteen standard 4 Meg x 4 DRAMs in plastic SOJ packages. The assembly has 8 drams mounted on the front side and 8 drams mounted on the back side of a printed circuit board in a 72 pad leadless SIM configuration.

This configuration allows socket-mounting of large quantities of memory in applications where high density and ease of inserting additional memory are important.

The operation of the AK5328192 is identical to sixteen 4M x 4 Drams. There are four $\overline{CAS}$ lines and four $\overline{RAS}$ lines. On each bank of 4M x 32, independent byte control is accomplished by four $\overline{CAS}$ lines. Each separate $\overline{CAS}$ line controls two 4M x 4 Drams to form an 8 bit byte. Two banks of 32 bits are controlled by the two pairs of $\overline{RAS}$ lines. A sixteen bit data path can be produced by connecting DQ_0 to DQ_{16}, DQ_1 to DQ_{17}, etc. and alternately strobing $\overline{RAS_0}$ with $\overline{RAS_1}$ and $\overline{RAS_2}$ with $\overline{RAS_3}$.



FEATURES

- 8,388,608 x 32 bit organization
- 72 pad Single In-Line Module
- Multiple $\overline{CAS}$ and $\overline{RAS}$ lines allow x16 or x32 bit widths
- $\overline{CAS}$-before-$\overline{RAS}$, $\overline{RAS}$-only or hidden refresh
- Power
  5.32 Watt Max Active (60nS)
  4.48 Watt Max Active (70 nS)
  88 mW Max Standby
- Operating free air temperature 0°C to 70°C
- Single 5 Volt Power Supply
- 2048 Refresh Cycles, 32 mSEC
- 4096 Refresh Cycles, 64 mSEC available for all module sizes
- Available in Fast Page Mode, EDO and Static Column mode
- Available in leadless (W) or leaded Zip (Z) versions
- Downward compatible with AK5324096W through AK532256W sizes

EXAMPLES

AK5328192WP-60

8Meg x 32 CMOS Dynamic RAM, SIM, Page Mode, Commercial 60 nSEC Access Time

PIN NOMENCLATURE

A_0 - A_{10}	Address Inputs
DQ_0 - DQ_{31}	Data In/Data Out
$\overline{CAS_0}$ - $\overline{CAS_3}$	Column Address Strobe
$\overline{RAS_0}$ - $\overline{RAS_3}$	Row Address Strobe
$\overline{WE}$	Write Enable
$\overline{OE}$	Output Enable
PD_1 - PD_4	Presence Detect
Vcc	5v Supply
Vss	Ground
NC	No Connect

MODULE OPTIONS

Leadless SIM: AK5328192W
Leaded ZIP: AK5328192Z

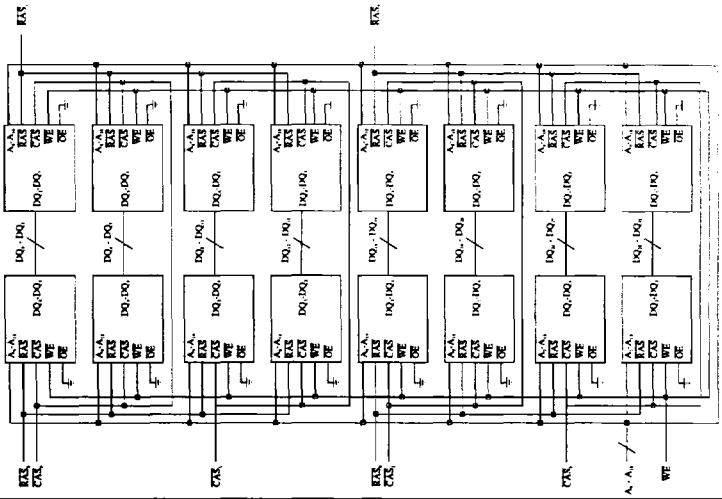
PIN ASSIGNMENT

PIN #	SYMBOL	PIN #	SYMBOL	PIN #	SYMBOL	PIN #	SYMBOL
1	Vss	19	A10	37	NC	55	DQ11
2	DQ0	20	DQ4	38	NC	56	DQ27
3	DQ16	21	DQ20	39	Vss	57	DQ12
4	DQ1	22	DQ5	40	$\overline{CAS0}$	58	DQ28
5	DQ17	23	DQ21	41	$\overline{CAS2}$	59	Vcc
6	DQ2	24	DQ6	42	$\overline{CAS3}$	60	DQ29
7	DQ18	25	DQ22	43	$\overline{CAS1}$	61	DQ13
8	DQ3	26	DQ7	44	$\overline{RAS0}$	62	DQ30
9	DQ19	27	DQ23	45	$\overline{RAS1}$	63	DQ14
10	Vcc	28	A7	46	NC	64	DQ31
11	NC	29	NC	47	$\overline{WE}$	65	DQ15
12	A0	30	Vcc	48	NC	66	NC
13	A1	31	A8	49	DQ8	67	PD1
14	A2	32	A9	50	DQ24	68	PD2
15	A3	33	$\overline{RAS3}$	51	DQ9	69	PD3
16	A4	34	$\overline{RAS2}$	52	DQ25	70	PD4
17	A5	35	NC	53	DQ10	71	NC
18	A6	36	NC	54	DQ26	72	Vss

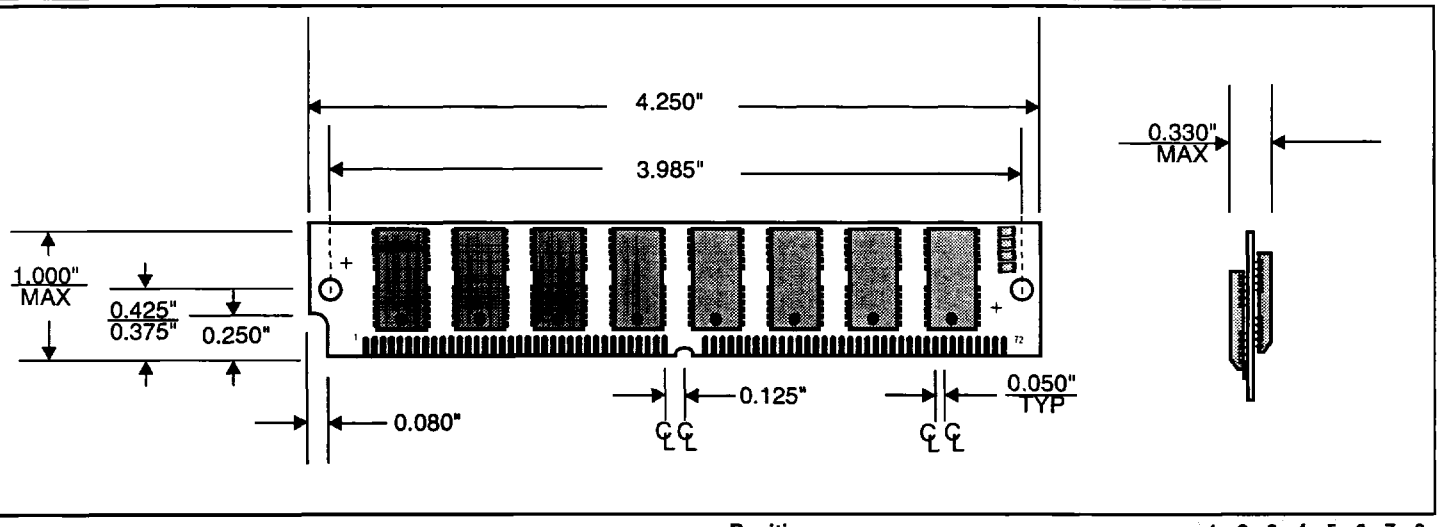
Presence Detect -

	-60	-70
PD1	NC	NC
PD2	Vss	Vss
PD3	NC	Vss
PD4	NC	NC

FUNCTIONAL DIAGRAM



MECHANICAL DIMENSIONS



ORDER INFORMATION

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 = b y 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

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.

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Position 1 2 3 4 5 6 7 8

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

8 Speed (first two significant digits)

DRAMS		SRAMS	
60	= 60 nS	12	=12 nS
70	= 70 nS	20	=20 nS
80	= 80 nS	25	=25 nS
10	= 100 nS	35	=35 nS