

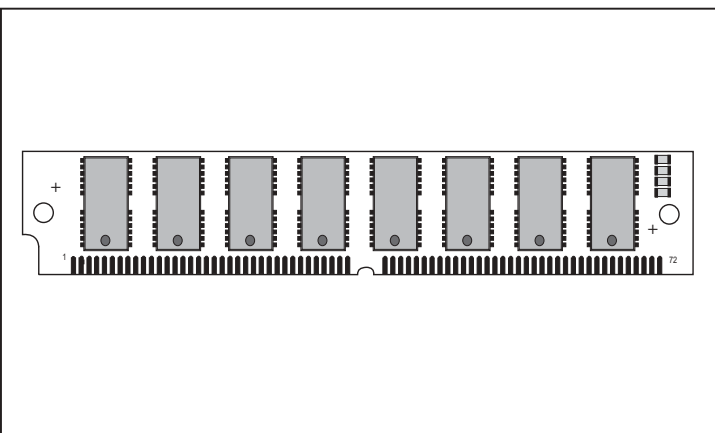
# Accutek Microcircuit Corporation

## AK5364096W 4,194,304 Word by 36 Bit CMOS Dynamic Random Access Memory

### DESCRIPTION

The Accutek AK5364096W high density memory module is a CMOS Dynamic RAM organized in 4096K x 36 bit words. The module consists of eight standard 4 Meg x 4 DRAMs and four 4 Meg x 1 DRAMs in plastic SOJ packages. The 4 Meg x 4 DRAMs are mounted on the front surface and the 4 Meg x 1 parity DRAMs are mounted on the back surface of a printed circuit board with a low profile height of only 0.875" in a 72 pin 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 AK5364096W is identical to eight 4Meg x 4 plus four 4Meg x 1 DRAMs. There are four  $\overline{\text{CAS}}$  lines and two  $\overline{\text{RAS}}$  lines. Independent byte control is accomplished by four  $\overline{\text{CAS}}$  lines. Each separate  $\overline{\text{CAS}}$  line controls two 4Meg x 4 DRAMs, along with a 4Meg x 1 DRAM with data in tied to data out to form a 9 bit byte. The bank of 36 bits is controlled by the two  $\overline{\text{RAS}}$  lines. An eighteen bit data path can be produced by connecting  $\text{DQ}_0$  to  $\text{DQ}_{18}$ ,  $\text{DQ}_1$  to  $\text{DQ}_{19}$ , etc. and alternately strobing  $\overline{\text{RAS}}_0$  with  $\overline{\text{RAS}}_2$ .



- Single 5 Volt Power Supply
- 2048 Refresh Cycles, 32 mSEC
- Available in Fast Page Mode, EDO and Static Column Mode
- Available in leadless SIM or leaded ZIP versions
- Downward compatible with AK5362048W, AK5361024W, AK536512W and AK536256W
- Upward compatible with AK5368192W
- Operating free air temperature 0°C to 70°C

### FEATURES

- 4,194,304 x 36 bit organization
- Low profile board height of 0.875 inch
- 72 pad Single In-Line Module
- Multiple  $\overline{\text{CAS}}$  and  $\overline{\text{RAS}}$  lines allow x18 or x36 bit widths
- Power:  
7.92 Watt Max Active (60nS)  
6.60 Watt Max Active (70 nS)  
66 mW Max Standby
- $\overline{\text{CAS}}$ -before- $\overline{\text{RAS}}$ ,  $\overline{\text{RAS}}$ -only or hidden refresh

### EXAMPLE

#### AK5364096WP-70

4Meg x 36 CMOS Dynamic RAM, SIM, Page Mode, Commercial  
70nSEC Access Time

### PIN NOMENCLATURE

A <sub>0</sub> - A <sub>10</sub>	Address Inputs
DQ <sub>0</sub> - DQ <sub>35</sub>	Data In/Data Out
$\overline{\text{CAS}}_0$ - $\overline{\text{CAS}}_3$	Column Address Strobe
$\overline{\text{RAS}}_0$ , $\overline{\text{RAS}}_2$	Row Address Strobe
$\overline{\text{WE}}$	Write Enable
$\overline{\text{OE}}$	Output Enable
PD <sub>1</sub> - PD <sub>4</sub>	Presence Detect
V <sub>cc</sub>	5v Supply
V <sub>ss</sub>	Ground
NC	No Connect

### PIN ASSIGNMENT

PIN #	SYMBOL	PIN #	SYMBOL	PIN #	SYMBOL	PIN #	SYMBOL
1	V <sub>ss</sub>	19	A <sub>10</sub>	37	DQ <sub>17</sub>	55	DQ <sub>12</sub>
2	DQ <sub>0</sub>	20	DQ <sub>4</sub>	38	DQ <sub>35</sub>	56	DQ <sub>30</sub>
3	DQ <sub>18</sub>	21	DQ <sub>22</sub>	39	V <sub>ss</sub>	57	DQ <sub>13</sub>
4	DQ <sub>1</sub>	22	DQ <sub>5</sub>	40	CAS <sub>0</sub>	58	DQ <sub>31</sub>
5	DQ <sub>19</sub>	23	DQ <sub>23</sub>	41	CAS <sub>2</sub>	59	V <sub>cc</sub>
6	DQ <sub>2</sub>	24	DQ <sub>6</sub>	42	CAS <sub>3</sub>	60	DQ <sub>32</sub>
7	DQ <sub>20</sub>	25	DQ <sub>24</sub>	43	CAS <sub>1</sub>	61	DQ <sub>14</sub>
8	DQ <sub>3</sub>	26	DQ <sub>7</sub>	44	RAS <sub>0</sub>	62	DQ <sub>33</sub>
9	DQ <sub>21</sub>	27	DQ <sub>25</sub>	45	NC	63	DQ <sub>15</sub>
10	V <sub>cc</sub>	28	A <sub>7</sub>	46	NC	64	DQ <sub>34</sub>
11	NC	29	NC	47	WE	65	DQ <sub>16</sub>
12	A <sub>0</sub>	30	V <sub>cc</sub>	48	NC	66	NC
13	A <sub>1</sub>	31	A <sub>8</sub>	49	DQ <sub>9</sub>	67	PD <sub>1</sub>
14	A <sub>2</sub>	32	A <sub>9</sub>	50	DQ <sub>27</sub>	68	PD <sub>2</sub>
15	A <sub>3</sub>	33	NC	51	DQ <sub>10</sub>	69	PD <sub>3</sub>
16	A <sub>4</sub>	34	RAS <sub>2</sub>	52	DQ <sub>28</sub>	70	PD <sub>4</sub>
17	A <sub>5</sub>	35	DQ <sub>26</sub>	53	DQ <sub>11</sub>	71	NC
18	A <sub>6</sub>	36	DQ <sub>8</sub>	54	DQ <sub>29</sub>	72	V <sub>ss</sub>

### MODULE OPTIONS

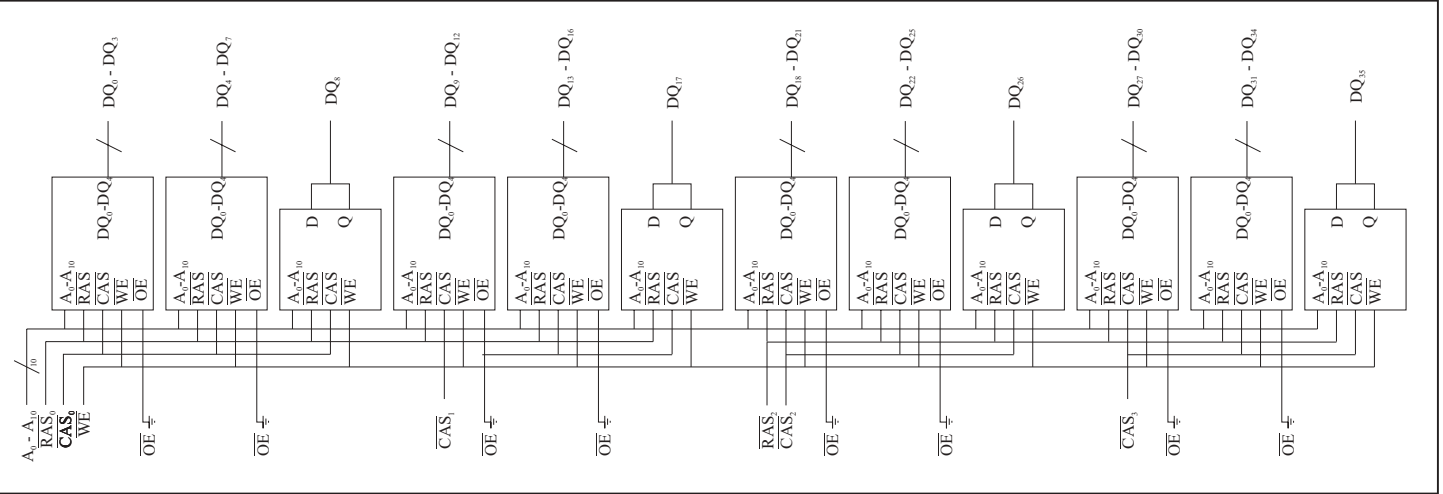
Leadless SIM: AK5364096W

Leaded ZIP: AK5364096Z

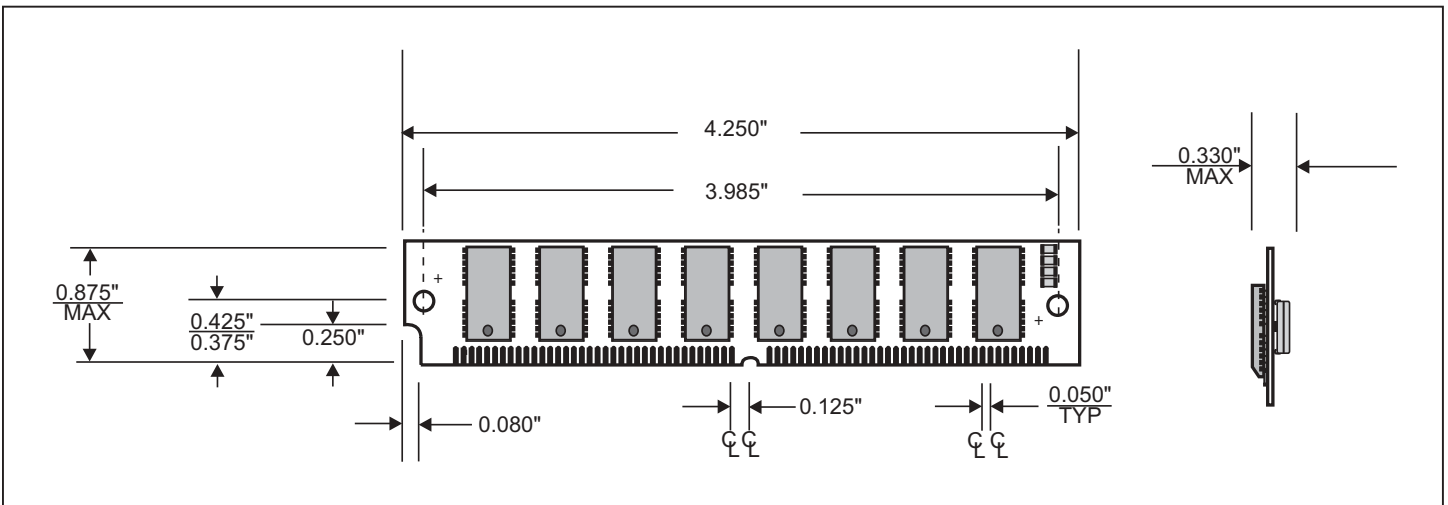
#### Presence Detect -

	-60	-70
PD <sub>1</sub>	V <sub>ss</sub>	V <sub>ss</sub>
PD <sub>2</sub>	NC	NC
PD <sub>3</sub>	NC	V <sub>ss</sub>
PD <sub>4</sub>	Nc	NC

## FUNCTIONAL DIAGRAM



## MECHANICAL DIMENSIONS



## ORDER INFORMATION

### PART NUMBER CODING INTERPRETATION

Position	1	2	3	4	5	6	7	8
<b>1 Product</b>	AK = Accutek Memory							
<b>2 Type</b>	4 = Dynamic RAM 5 = CMOS Dynamic RAM 6 = Static RAM							
<b>3 Organization/Word Width</b>	1 = by 1 16 = by 16 4 = by 4 32 = by 32 8 = by 8 36 = by 36 9 = by 9							
<b>4 Size/Bits Depth</b>	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°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)

DRAMS	SRAMS
50 = 50 nS	8 = 8 nS
60 = 60 nS	12 = 12 nS
70 = 70 nS	15 = 15 nS

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.