



ACCUTEK

MICROCIRCUIT CORPORATION

AK5322048N

2,097,152 Word by 32 Bit CMOS

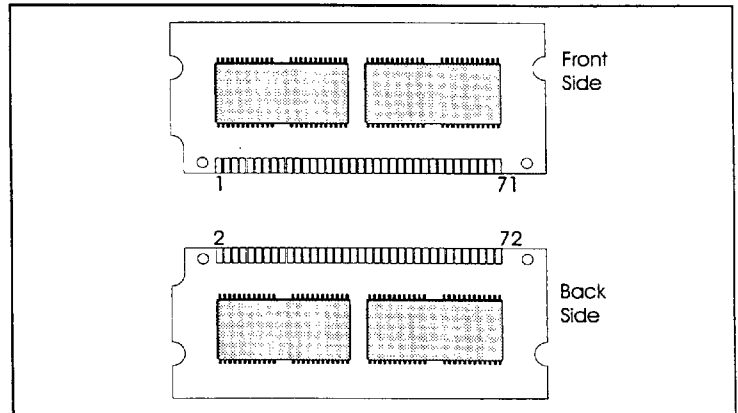
Dynamic Random Access Memory

DESCRIPTION

The Accutek AK5322048N high density memory module is a CMOS dynamic RAM organized in 2048K x 32 bit words. The module consists of four standard 1 Meg x 16 DRAMs in plastic TSOP packages. The assembly has 2 chips mounted on each side of a printed circuit board in a 72 pad leadless Dual Row Sodim 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 AK5322048A is identical to four 1M x 16 Drams. There are four $\overline{\text{CAS}}$ lines and four $\overline{\text{RAS}}$ lines. On each bank of 1M x 32, independent byte control is accomplished by four $\overline{\text{CAS}}$ lines. Each separate $\overline{\text{CAS}}$ line controls one byte of the 1M x 16 Dram. Two banks of 32 bits are controlled by the two pairs of $\overline{\text{RAS}}$ 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 $\overline{\text{RAS}}_0$ with $\overline{\text{RAS}}_1$ and $\overline{\text{RAS}}_2$ with $\overline{\text{RAS}}_3$.



FEATURES

- 2,097,152 x 32 bit organization
- 72 pad Dual Row Sodim Module
- Multiple $\overline{\text{CAS}}$ and $\overline{\text{RAS}}$ lines allow x16 or x32 bit widths
- $\overline{\text{CAS}}$ -before- $\overline{\text{RAS}}$, $\overline{\text{RAS}}$ -only or hidden refresh
- Operating free air temperature 0°C to 70°C
- Single 5 Volt Power Supply
- 1024 Refresh Cycles, 16 mSEC

- Available in Fast Page Mode and Static Column Mode versions
- Power
 - 1.80 Watt Max Active (60nS)
 - 1.66 Watt Max Active (70 nS)
 - 1.44 Watt Max Active (80 nS)
 - 22 mW Max Standby Available

ADDITIONAL OPTIONS AVAILABLE

1 Meg x 32 version, AK5321024N

PIN NOMENCLATURE

$\text{DQ}_0 - \text{DQ}_{31}$	Data In/Data Out
$\text{A}_0 - \text{A}_9$	Address Inputs
$\overline{\text{CAS}}_0 - \overline{\text{CAS}}_3$	Column Address Strobe
$\overline{\text{RAS}}_0 - \overline{\text{RAS}}_3$	Row Address Strobe
$\overline{\text{WE}}$	Write Enable
$\text{PD}_0 - \text{PD}_6$	Presence Detect
V_{CC}	5v Supply
V_{SS}	Ground
NC	No Connect

MODULE OPTIONS

Leadless SODIM: AK5322048N

PIN ASSIGNMENT

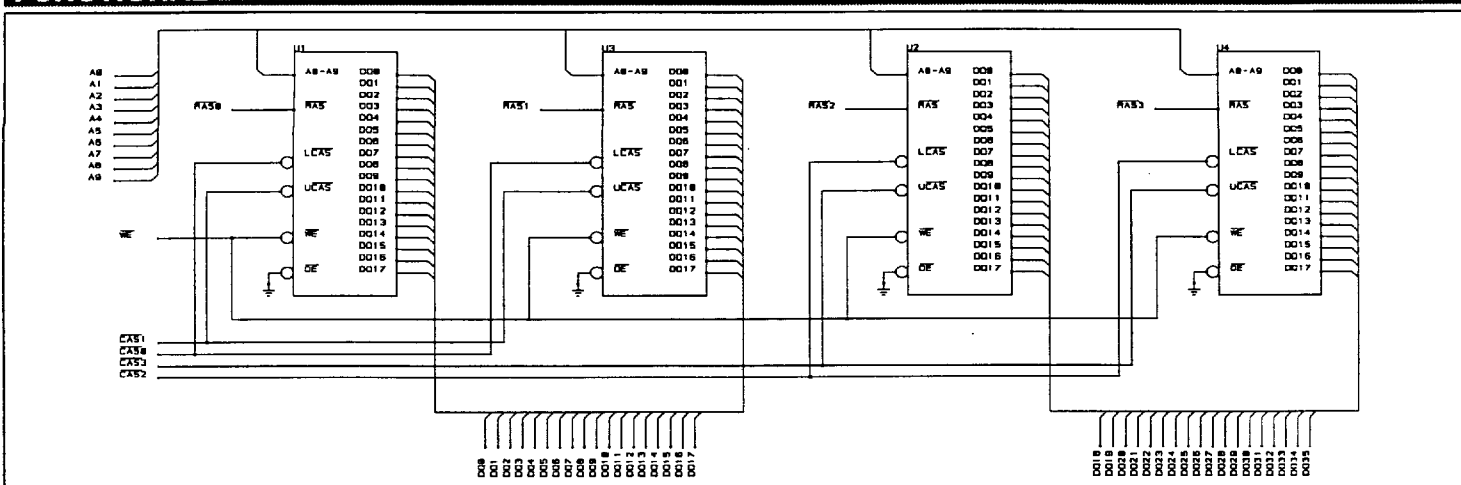
PIN #	SYMBOL	PIN #	SYMBOL	PIN #	SYMBOL	PIN #	SYMBOL
1	V_{SS}	19	NC	37	DQ_{16}	55	NC
2	DQ_0	20	NC	38	DQ_{17}	56	DQ_{24}
3	DQ_1	21	DQ_8	39	V_{SS}	57	DQ_{25}
4	DQ_2	22	DQ_9	40	$\overline{\text{CAS}}_0$	58	DQ_{26}
5	DQ_3	23	DQ_{10}	41	$\overline{\text{CAS}}_2$	59	DQ_{28}
6	DQ_4	24	DQ_{11}	42	$\overline{\text{CAS}}_3$	60	DQ_{27}
7	DQ_5	25	DQ_{12}	43	$\overline{\text{CAS}}_1$	61	V_{CC}
8	DQ_6	26	DQ_{13}	44	$\overline{\text{RAS}}_0$	62	DQ_{29}
9	DQ_7	27	DQ_{14}	45	$\overline{\text{RAS}}_1$	63	DQ_{30}
10	V_{CC}	28	A_7	46	NC	64	DQ_{31}
11	PD_0	29	NC	47	$\overline{\text{WE}}$	65	NC
12	A_0	30	V_{CC}	48	NC	66	PD_1
13	A_1	31	A_8	49	DQ_{18}	67	PD_2
14	A_2	32	A_9	50	DQ_{19}	68	PD_3
15	A_3	33	$\overline{\text{RAS}}_3$	51	DQ_{20}	69	PD_4
16	A_4	34	$\overline{\text{RAS}}_2$	52	DQ_{21}	70	PD_5
17	A_5	35	DQ_{15}	53	DQ_{22}	71	PD_6
18	A_6	36	NC	54	DQ_{23}	72	V_{SS}

Presence Detect -

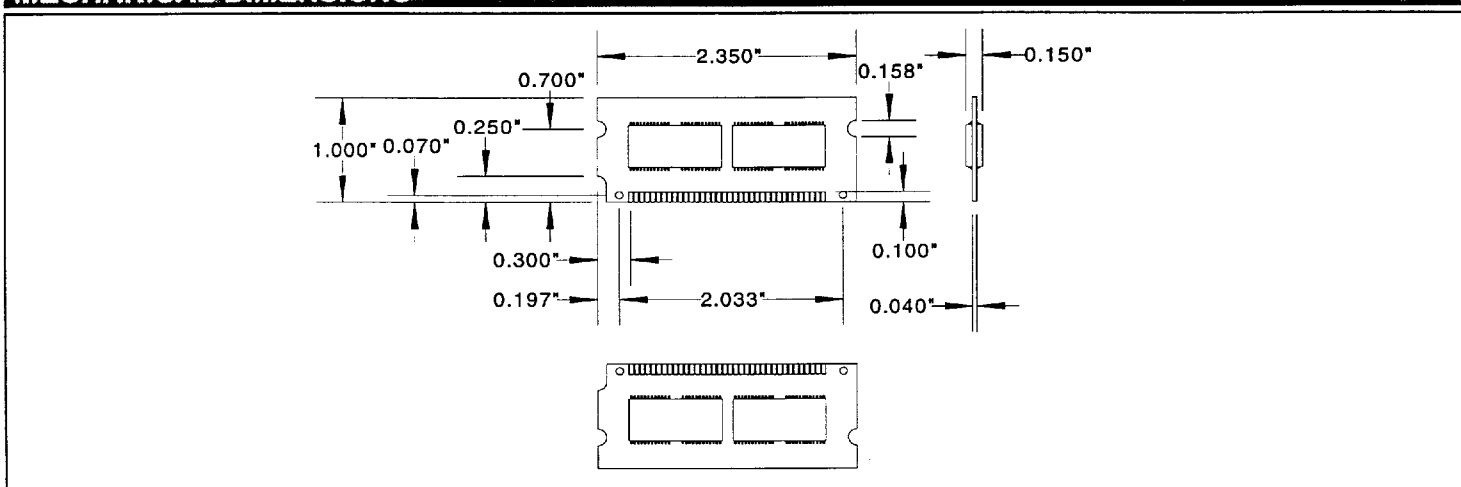
Access Time	PD_0	PD_1	PD_2	PD_3	PD_4	PD_5	PD_6
-60	NC	V_{SS}	V_{SS}	V_{SS}	NC	NC	NC
-70	NC	V_{SS}	V_{SS}	V_{SS}	V_{SS}	NC	NC

0107647 0000063 T38

FUNCTIONAL DIAGRAM



MECHANICAL DIMENSIONS



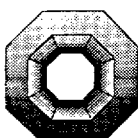
ORDER INFORMATION

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 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 Accuthek 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
N = Dual Row SODim
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
60 = 60 nS	12 = 12 nS
70 = 70 nS	15 = 15 nS
80 = 80 nS	20 = 20 nS

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