**NOTE:** The 72 pin module standards that follow describe two separate devices. Both have a 4 byte data interface. One is intended to be used with or without parity bits while the other contains error correction bits ECC). The one with ECC is similar to the parity module but is not completely pin compatible

## 4.4.2 – 72 PIN SIMM DRAM MODULE FAMILY

CAPACITY—256K TO 512M WORDS OF 32 or 36 BITS
CONFIGURATION—SINGLE OR DOUBLE SIDED MODULES
—USING 1M, 4M, 16M. 64M, or 256M MEMORY DEVICES
LOGIC FEATURES, These modules contain a "presence detect" feature which conists of output pins which supply an encoded value which defines the storage capacity and speed of the module.
PACKAGE—72 PIN SIMM MODULE
PIN ASSIGNMENTS—Fig. 4.4.2–2A
BLOCK DIAGRAMS—Fig. 4.4.2–2 A⇒K. A series of block diagrams for recommended configurations is summarized in Fig 4.4.2–1 and detailed in Figs. 4.4.2–2 B⇒K
POWER & INTERFACE VOLTAGE LEVELS: A pinout is provided for 5.0 V and for 3.3 V power and interface levels as defined by a voltage key in the socket.

## – 72 PIN SIMM DRAM ECC MODULE FAMILY

CAPACITY—256K TO 512M WORDS OF 36 or 39 BITS
CONFIGURATION—SINGLE OR DOUBLE SIDED MODULES
—USING 1M, 4M, 16M. 64M, or 256M MEMORY DEVICES
LOGIC FEATURES, These modules are optimized for ECC applications. They are similar to but not the same as the modules described in Fig. 4–6. The Standard defines a "presence detect" feature which consists of output pins which supply an encoded value which defines the storage capacity and speed of the module. The PD code identifies the presence of an ECC module as well as the speed and organization of the module. The Standard also defines the logic organization of the modules in Figs. 4.4.2–3B & 4.4.2–3C.
PACKAGE—72 PIN SIMM MODULE
PIN ASSIGNMENTS—Fig. 4.4.2–3A
BLOCK DIAGRAMS—Figs. 4.4.2–3 B & C. A series of block diagrams for recommended configurations is summarized in Fig 4.4.2–1 and detailed in Figs. 4.4.2–3 B & C
POWER & INTERFACE VOLTAGE LEVELS: A pinout is provided for 5.0 V and for 3.3 V power and interface levels as defined by a voltage key in the socket.

## 72 Pin SIMM Block Diagrams

The block diagrams given in the 12 pages, Figs 4.4.2–2 B ⇒ K and Figs 4.4.2–3 B & C), are applicable to the 72 Pin SIMM pinouts shown in Figures 4.4.2–2 A and 4.4.2–3 A. These block diagrams are provided for guidance only. **Other implementations with different block configurations are also acceptable**.

The following table shows the applicability of the block configurations given to the 5 V and 3.3 V Non–ECC and ECC modules.

| Configuration | # Banks | Applies to: 5 V SIMM | Applies to: 3.3 V SIMM |
|---|---|---|---|
| **Parity, Non–Parity** | | | |
| X32/36 W/X4, X1 (X36) | 1 or 2 | X | X |
| X32/36 W/X16, X18 | 1 or 2 | X | X |
| X36 W/X4, X4/4CE | 1 or 2 | X | X |
| X36 W/X4, X2/2CE | 1 or 2 | X | X |
| X36 W/X16, X4/4CE | 1 or 2 | X | X |
| X36 W/X16, X2/2CE | 1 or 2 | X | X |
| X32 W/X8 | 1 or 2 | | X |
| X36 W/X8, X2/2CE | 1 or 2 | | X |
| X32 W/X32 | 1 or 2 | | X |
| X36 W/X32, X2/2CE | 1 or 2 | | X |
| **ECC** | | | |
| X36/40 W/X4 | 1 or 2 | X | X (X36 only) |

**Note: To reduce the number of diagrams, only 2 bank versions are shown. In addition, in cases where one SIMM I/O width can be described as a depopulation of another SIMM (i.e. X36⇒X32), the depopulated devices are shown by a ”dashed” outline.**

| $\overline{RE}$ AND $\overline{G}$ WIRING FOR BYTE WRITE SIMMS. | | |
|---|---|---|
| SIGNAL NAME | 5 V SIMMs | 3.3 V SIMMs |
| $\overline{G}$ | Tied to GND | Wired to Pin 46 |
| $\overline{RE0}$ | Connected as shown. Tied to pin 44 ($\overline{RE0}$) | $\overline{RE0}$, $\overline{RE2}$ nets connected together and tied to pin 44 ($\overline{RE0}$) |
| $\overline{RE1}$ | Connected as shown. Tied to pin 45 ($\overline{RE1}$) | $\overline{RE1}$, $\overline{RE3}$ nets connected together and tied to pin 45 ($\overline{RE1}$) |
| $\overline{RE2}$ | Connected as shown. Tied to pin 34 ($\overline{RE2}$) | $\overline{RE0}$, $\overline{RE2}$ nets connected together and tied to pin 44 ($\overline{RE0}$) |
| $\overline{RE3}$ | Connected as shown. Tied to pin 33 ($\overline{RE3}$) | $\overline{RE1}$, $\overline{RE3}$ nets connected together and tied to pin 45 ($\overline{RE1}$) |

**FIGURE 4.4.2–1**
**72 PIN DRAM SIMM APPLICABILITY TABLE**

| | 5 V Byte Write | 3.3 V Byte Write | | 5 V Byte Write | 3.3 V Byte Write |
|---|---|---|---|---|---|
| PIN # | PIN NAME | PIN NAME | PIN # | PIN NAME | PIN NAME |
| 1 | VSS | VSS | 37 | PDQ17, NC | PDQ17, NC |
| 2 | DQ0 | DQ0 | 38 | PDQ35,, NC | PDQ35,, NC |
| 3 | DQ18 | DQ18 | 39 | VSS | VSS |
| 4 | DQ1 | DQ1 | 40 | $\overline{CE0}$ | $\overline{CE0}$ |
| 5 | DQ19 | DQ19 | 41 | $\overline{CE2}$ | $\overline{CE2}$ |
| 6 | DQ2 | DQ2 | 42 | $\overline{CE3}$ | $\overline{CE3}$ |
| 7 | DQ20 | DQ20 | 43 | $\overline{CE1}$ | $\overline{CE1}$ |
| 8 | DQ3 | DQ3 | 44 | $\overline{RE0}$ | $\overline{RE0}$ |
| 9 | DQ21 | DQ21 | 45 | NC, $\overline{RE1}$ | NC, $\overline{RE1}$ |
| 10 | VDD | VDD | 46 | NC | $\overline{G}$ |
| 11 | NU | PD5 | 47 | $\overline{W}$ | $\overline{W}$ |
| 12 | A0 | A0 | 48 | PD(ECC) | PD(ECC) |
| 13 | A1 | A1 | 49 | DQ9 | DQ9 |
| 14 | A2 | A2 | 50 | DQ27 | DQ27 |
| 15 | A3 | A3 | 51 | DQ10 | DQ10 |
| 16 | A4 | A4 | 52 | DQ28 | DQ28 |
| 17 | A5 | A5 | 53 | DQ11 | DQ11 |
| 18 | A6 | A6 | 54 | DQ29 | DQ29 |
| 19 | NC, A10 | NC, A10 | 55 | DQ12 | DQ12 |
| 20 | DQ4 | DQ4 | 56 | DQ30 | DQ30 |
| 21 | DQ22 | DQ22 | 57 | DQ13 | DQ13 |
| 22 | DQ5 | DQ5 | 58 | DQ31 | DQ31 |
| 23 | DQ23 | DQ23 | 59 | VDD | VDD |
| 24 | DQ6 | DQ6 | 60 | DQ32 | DQ32 |
| 25 | DQ24 | DQ24 | 61 | DQ14 | DQ14 |
| 26 | DQ7 | DQ7 | 62 | DQ33 | DQ33 |
| 27 | DQ25 | DQ25 | 63 | DQ15 | DQ15 |
| 28 | A7 | A7 | 64 | DQ34 | DQ34 |
| 29 | NC, A11 | NC, A11 | 65 | DQ16 | DQ16 |
| 30 | VDD | VDD | 66 | NC | $\overline{EDO}$ |
| 31 | A8 | A8 | 67 | PD1 | PD1 |
| 32 | NC, A9 | NC, A9 | 68 | PD2 | PD2 |
| 33 | NC, $\overline{RE3}$ | NC, A12 | 69 | PD3 | PD3 |
| 34 | $\overline{RE2}$ | NC, A13 | 70 | PD4 | PD4 |
| 35 | PDQ26, NC | PDQ26, NC | 71 | NC | PD(REF) |
| 36 | PDQ8, NC | PDQ8, NC | 72 | VSS | VSS |

**See Figure 4–18 for applicable block diagrams**

**PRESENCE DETECT TRUTH TABLE**

| CONFIGURATION | tRAC | $\overline{ECC}$ | PD1 | PD2 | PD3 | PD4 |
|---|---|---|---|---|---|---|
| 1MB (256K X 36) | 100 nS | O | S | O | S | S |
| 64MB (16M X 32/36) | 80 nS | O | S | O | O | S |
| | 70 nS | O | S | O | S | O |
| | 60 nS | O | S | O | O | O |
| 2MB (512K X 36) | 100 nS | O | O | S | S | S |
| 128MB (32M X 32/36) | 80 nS | O | O | S | O | S |
| | 70 nS | O | O | S | S | O |
| | 60 nS | O | O | S | O | O |
| 4MB (1M X 36) | 100 nS | O | S | S | S | S |
| 256MB (64M X 32/36) | 80 nS | O | S | S | O | S |
| | 70 nS | O | S | S | S | O |
| | 60 nS | O | S | S | O | O |
| 8MB (2M X 36) | 100 nS | O | O | O | S | S |
| 0.5GB (128M X 32/36) | 80 nS | O | O | O | O | S |
| | 70 nS | O | O | O | S | O |
| | 60 nS | O | O | O | O | O |
| 16MB (4M X 36) | 50 nS | O | S | O | S | S |
| 1GB (256M X 32/36) | 80 nS | O | S | O | O | S |
| | 70 nS | O | S | O | S | O |
| | 60 nS | O | S | O | O | O |
| 32MB (8M X 36) | 50 nS | O | O | S | S | S |
| 2GB (512M X 36) | 80 nS | O | O | S | O | S |
| | 70 nS | O | O | S | S | O |
| | 60 nS | O | O | S | O | O |

O = NO CONNECTION S = CONNECTED TO VSS

$\overline{EDO}$ Pin: VSS for EDO, NC for Fast Page.

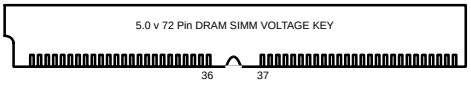
Note: The $\overline{ECC}$ Function (Pin 48) is not a defined function for the devices in this standard, however, it is used in a companion Standard for 72 pin ECC modules shown in Fig. 4.4.2–3. The presence of a VSS connection on this pin signifies that an ECC module has been inserted.

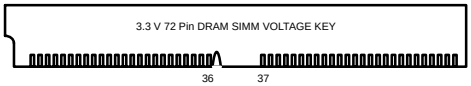
**CONFIGURATION PIN ASSIGNMENT TABLE**

| | MODULE SIZE, 36 BIT WORDS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIN # | 256K | 512K | 1M | 2M | 4M | 8M | 16M | 32M | 64M | 128M | 256M | 512M |
| 19 | NC | NC | NC | NC | A10 | A10 | A10 | A10 | A10 | A10 | A10 | A10 |
| *29 | NC | NC | NC | NC | A11 | A11 | A11 | A11 | A11 | A11 | A11 | A11 |
| 32 | NC | NC | A9 | A9 | A9 | A9 | A9 | A9 | A9 | A9 | A9 | A9 |
| *33 | NC | $\overline{RE3}$ | NC | $\overline{RE3}$ | NC | $\overline{RE3}$ | A12 | A12 | A12 | A12 | A12 | A12 |
| *34 | NC | $\overline{RE2}$ | NC | $\overline{RE2}$ | NC | $\overline{RE2}$ | NC | NC | A13 | A13 | A13 | A13 |
| 45 | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | RE1 |

* A11, A12, or A13 on Pins 29, 33, or 34 are used on modules containing devices that require asymetric ROW/ COLUMN addresses.

NOTE – This family of pinouts is approved for use in SIMM modules which are nominally 4.25" long and with a height which varies depencing on the configuration and the memory devices used. See JEDEC Publication 95.




# FIGURE 4.4.2–2 A
# 256K TO 256M BY 36, 72 PIN DRAM MODULE PINOUT

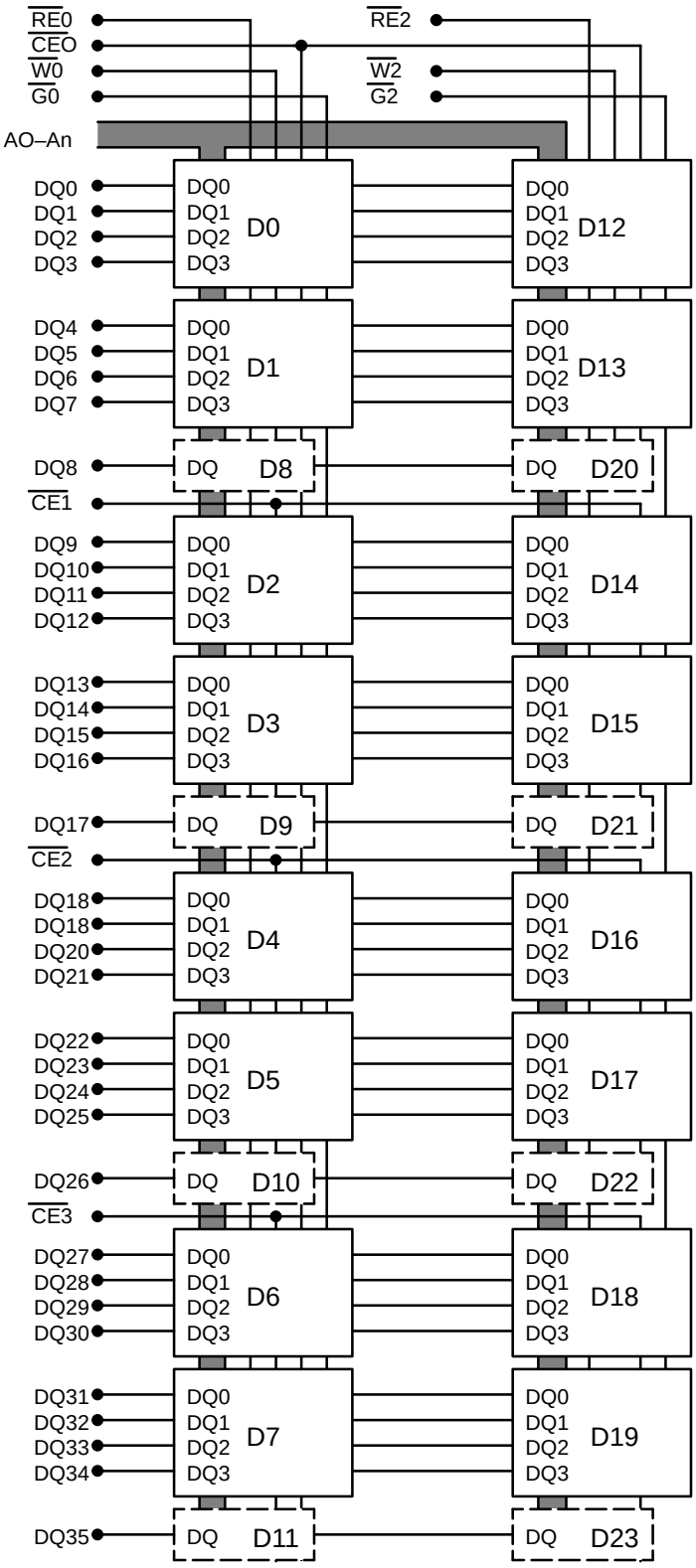
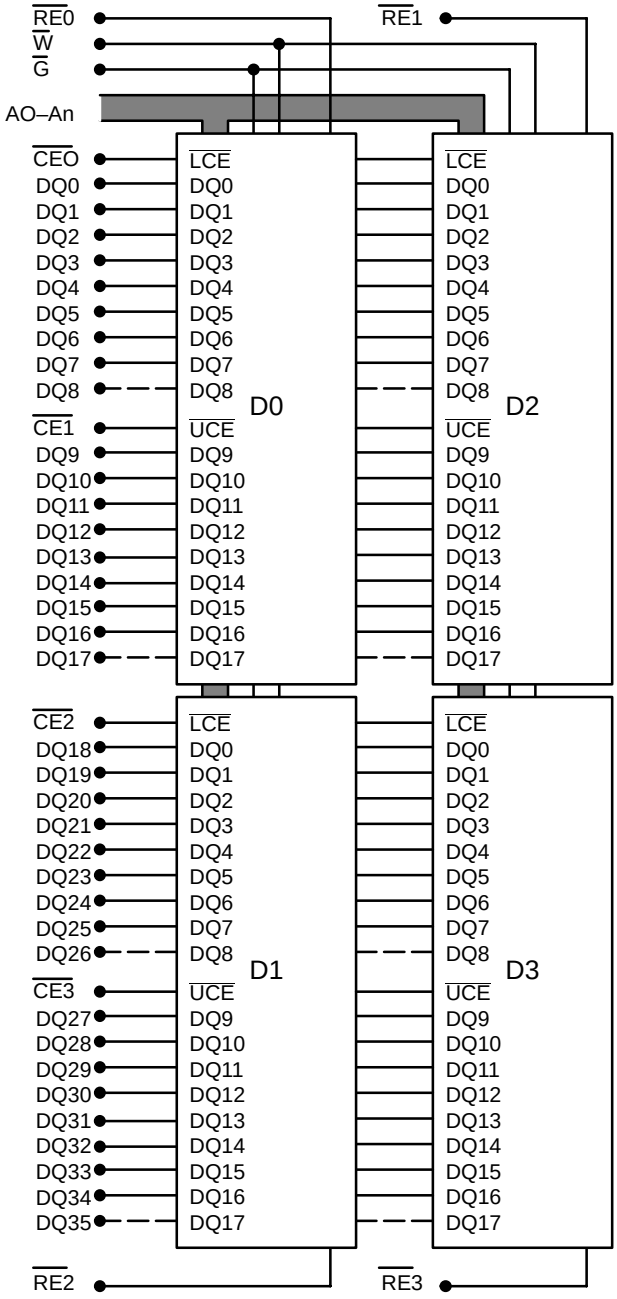



**FIGURE 4.4.2–2 B**
**X32/36 DRAM SIMM, 2 Banks with X4 & X1 DRAMs**




DQ8, DQ17, DQ26, & DQ35 ARE NOT USED
ON THE X32 MODULE USING X16 DRAM

**FIGURE 4.4.2–2 C**
**X32/36 DRAM SIMM, 2 Banks with X16/18 DRAMs**

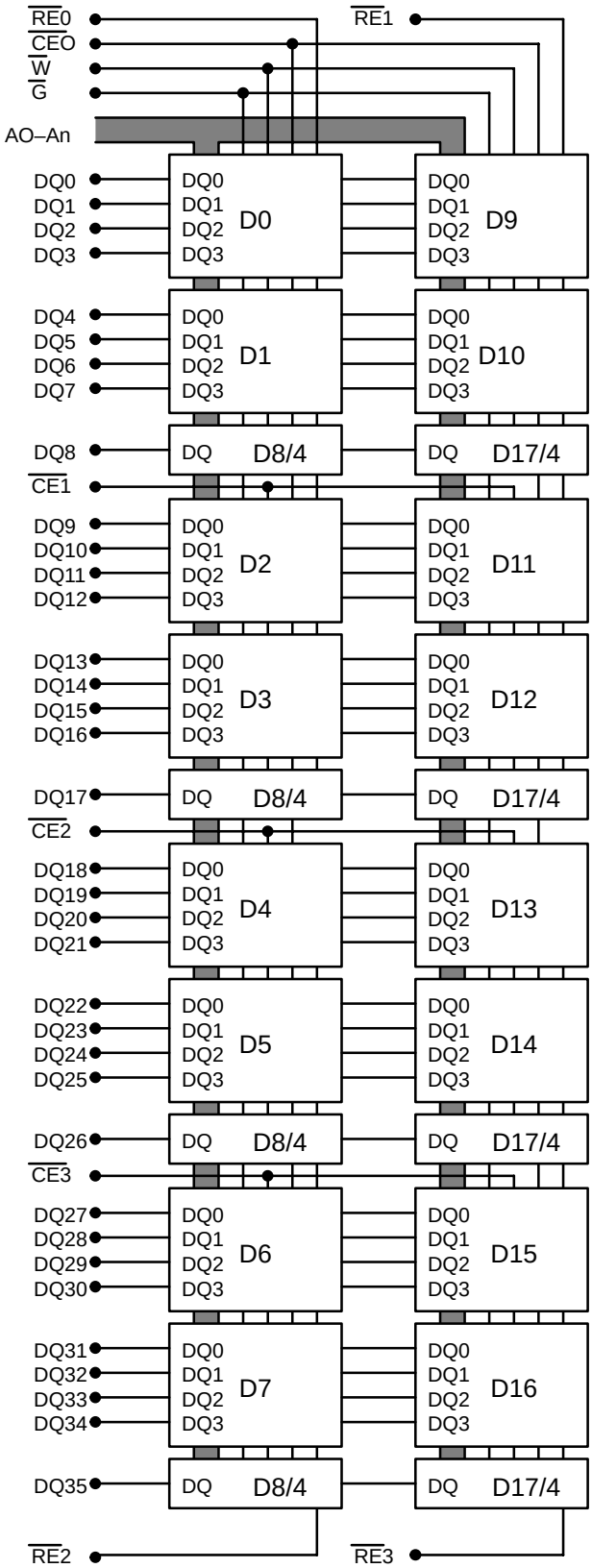



**FIGURE 4.4.2–2 D**
**X36 DRAM SIMM, 2 Banks with X4 & X4 W/4 $\overline{CE}$ DRAMs**

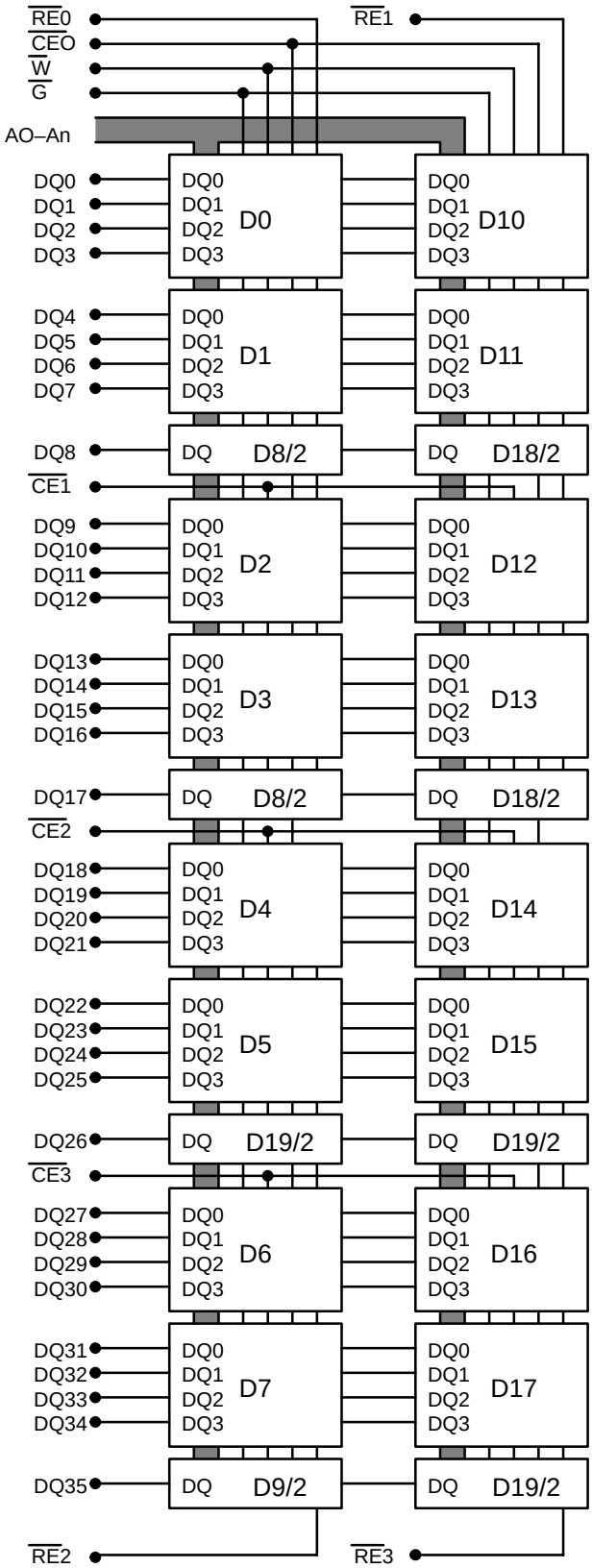



**FIGURE 4.4.2–2 E**

**X36 DRAM SIMM, 2 Banks with X4 & X2 W/2 $\overline{CE}$ DRAMs**

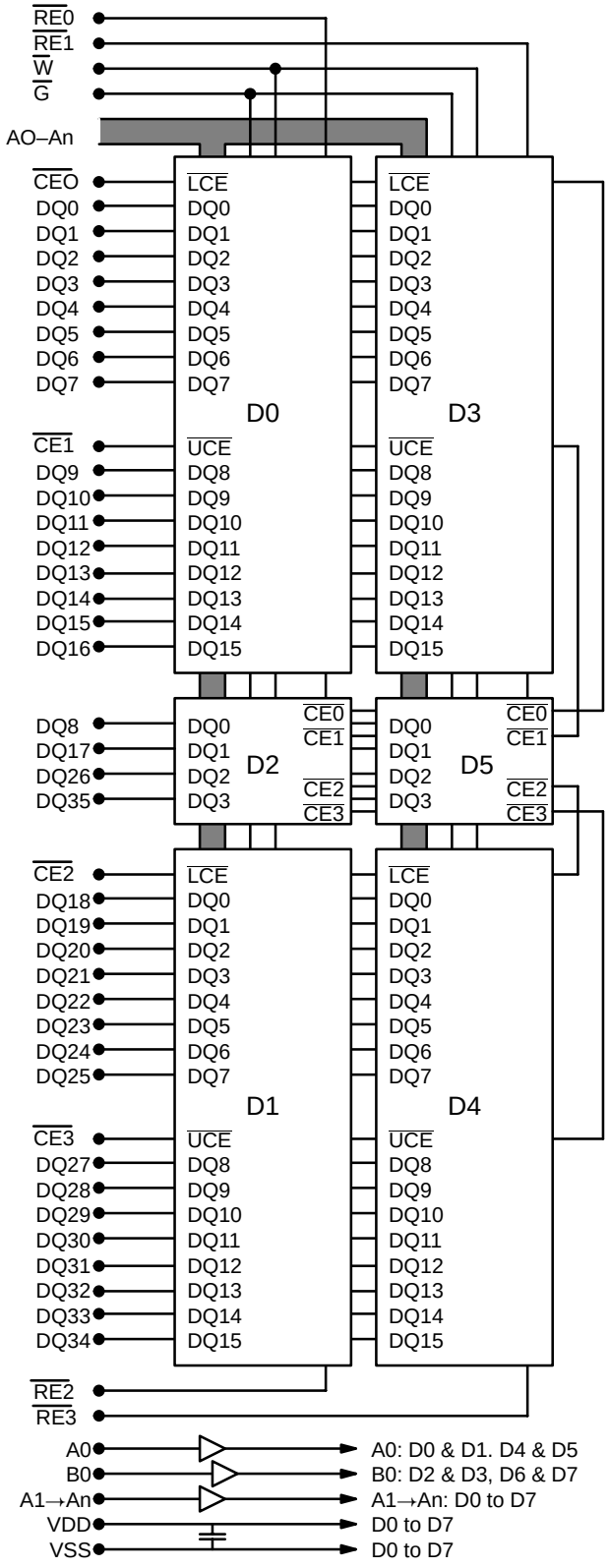



**FIGURE 4.4.2–2 F**
**X36 DRAM SIMM, 2 Banks with X16 & X4 W/4 $\overline{CE}$ DRAMs**

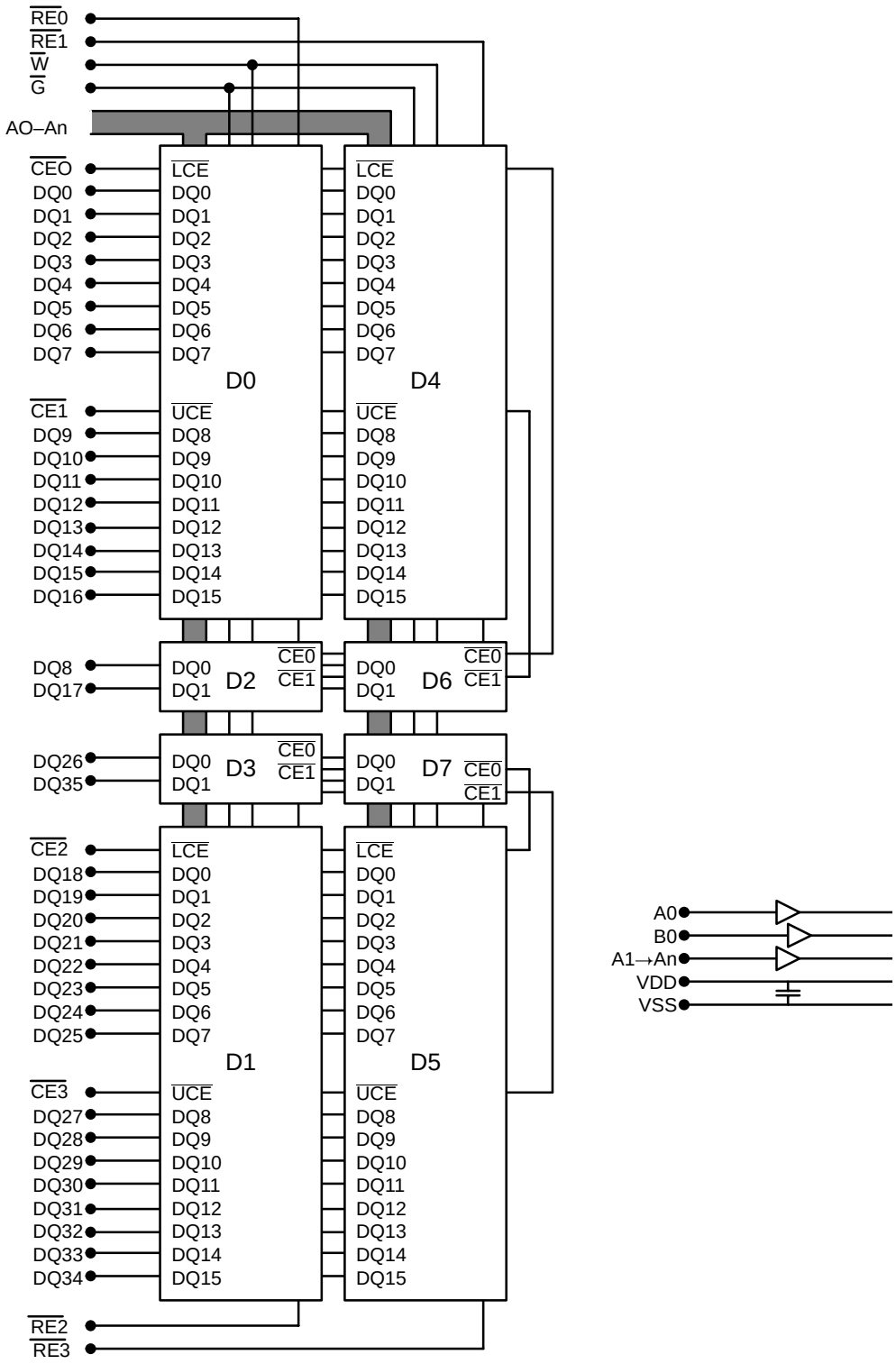
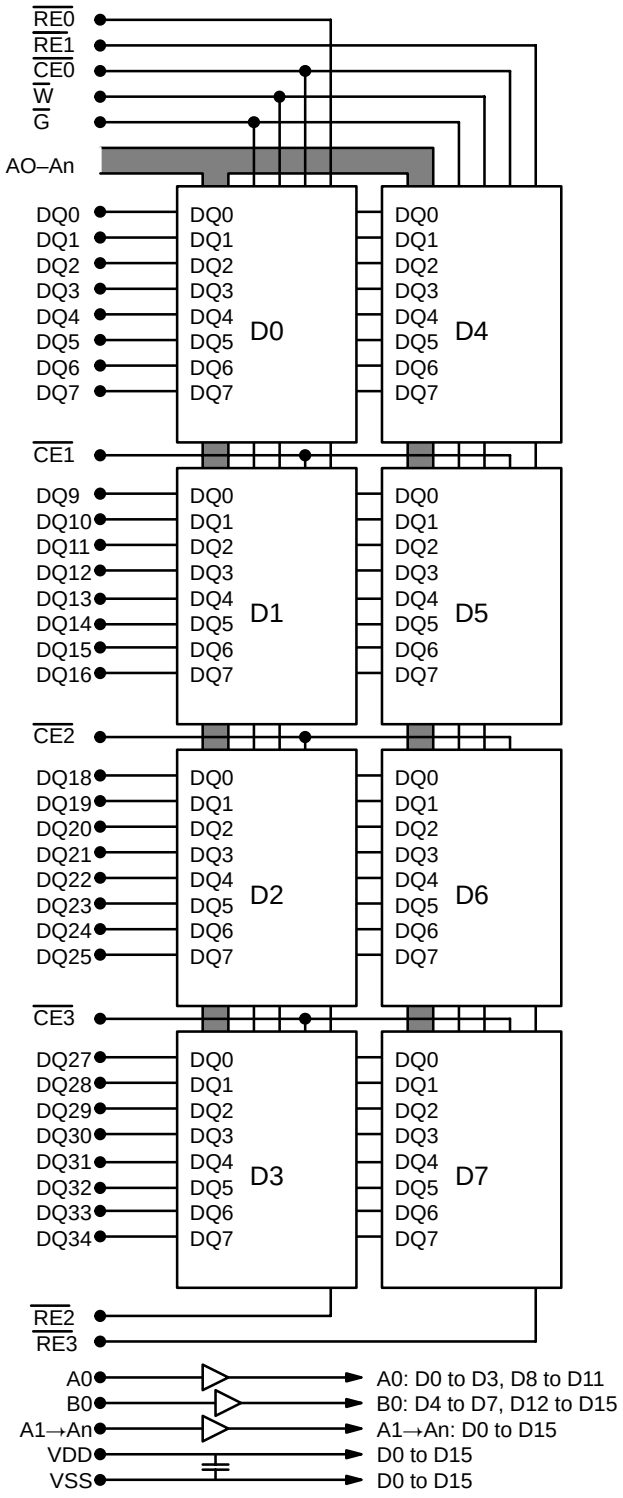



**FIGURE 4.4.2–2 G**

**X36 DRAM SIMM, 2 bank with X16 & X2 W/2 $\overline{CE}$ DRAMs**




## FIGURE 4.4.2–2 H
## X32 DRAM SIMM, 2 Banks with X8 DRAMs

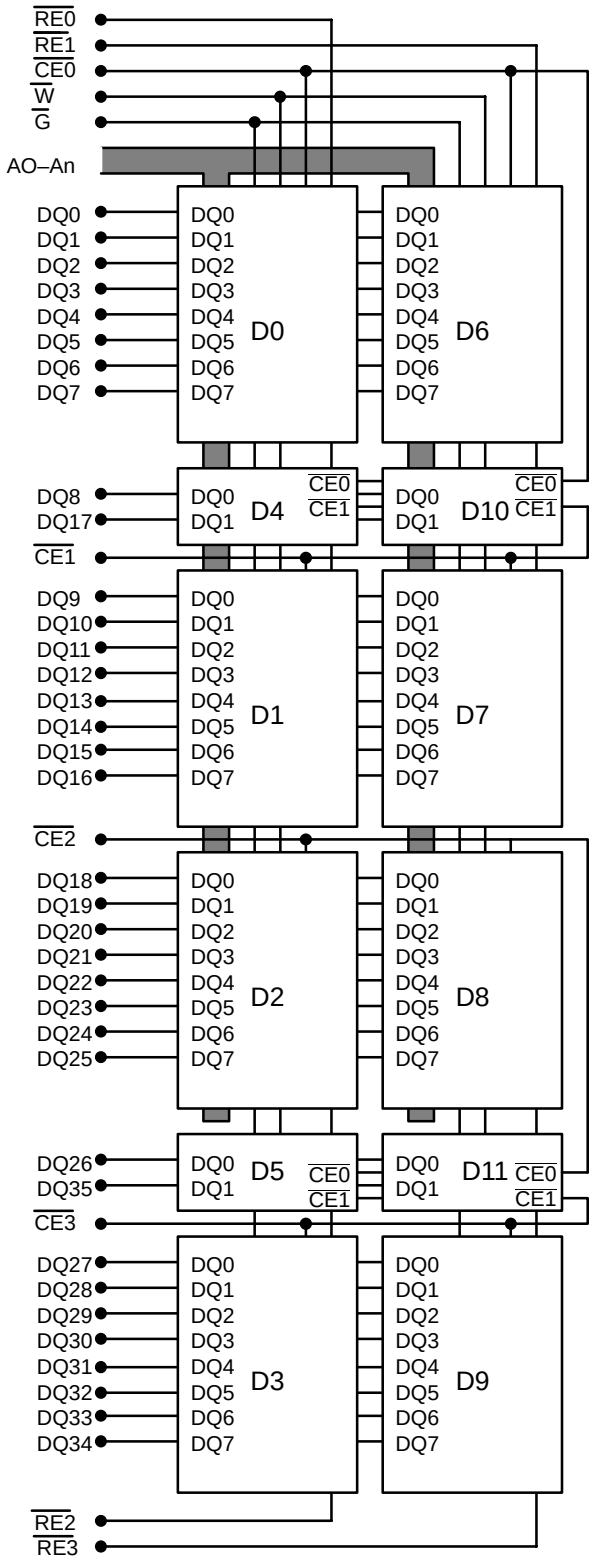



**FIGURE 4.4.2–2 I**
**X36 DRAM SIMM, 2 Banks with X8 & X2 W/2 $\overline{CE}$ DRAMs**

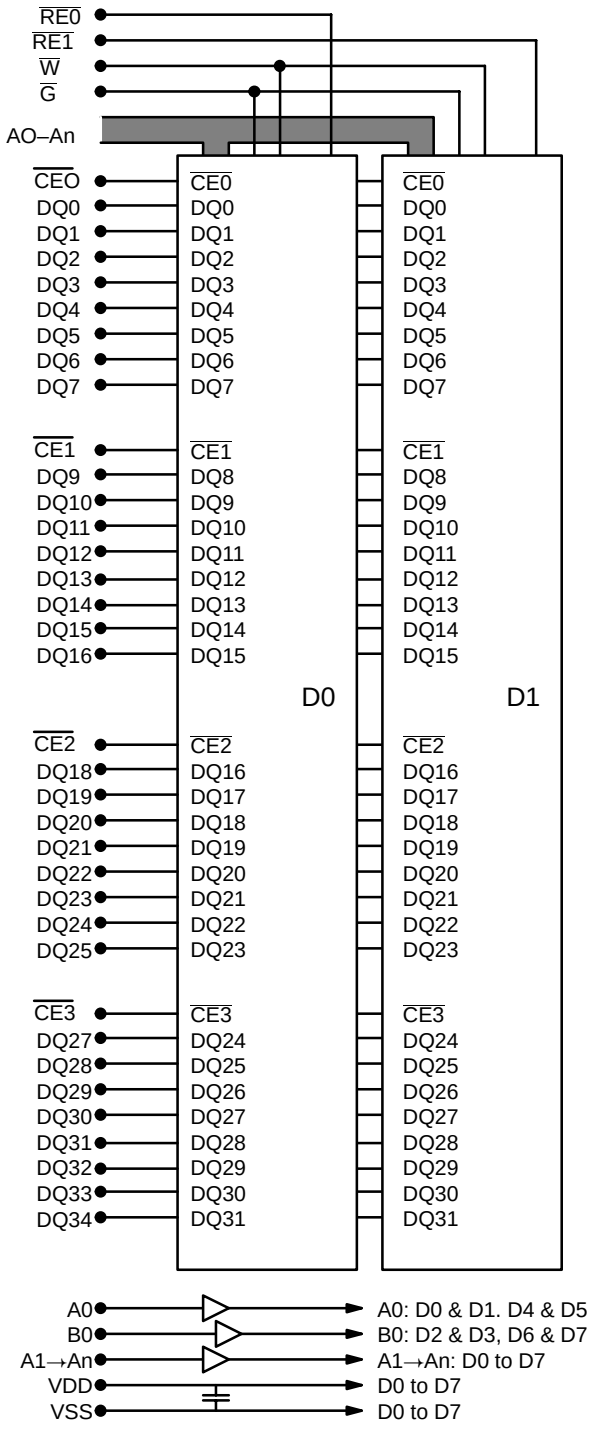



**FIGURE 4.4.2–2 J**
**X32 DRAM SIMM, 2 bank with X32 DRAMs**

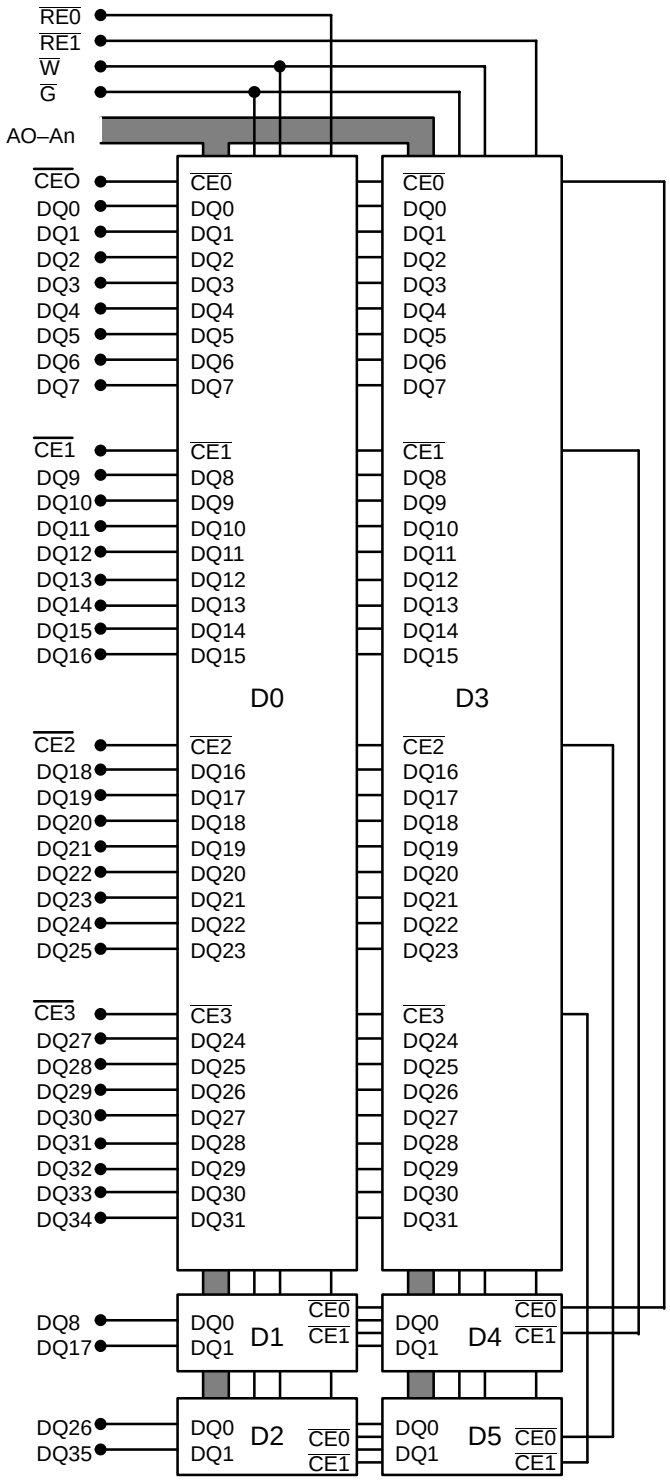



**FIGURE 4.4.2–2 K**

**X36 DRAM SIMM, 2 bank with X32 & X2 W/2 $\overline{CE}$ DRAMs**

| | 5 V ECC | 3.3 V ECC |
|---|---|---|
| PIN # | PIN NAME | PIN NAME |
| 1 | VSS | VSS |
| 2 | DQ0 | DQ0 |
| 3 | DQ1 | DQ1 |
| 4 | DQ2 | DQ2 |
| 5 | DQ3 | DQ3 |
| 6 | DQ4 | DQ4 |
| 7 | DQ5 | DQ5 |
| 8 | DQ6 | DQ6 |
| 9 | DQ7 | DQ7 |
| 10 | VDD | VDD |
| 11 | PD5 | PD5 |
| 12 | A0 | A0 |
| 13 | A1 | A1 |
| 14 | A2 | A2 |
| 15 | A3 | A3 |
| 16 | A4 | A4 |
| 17 | A5 | A5 |
| 18 | A6 | A6 |
| 19 | $\overline{G}$ | $\overline{G}$ |
| 20 | DQ8 | DQ8 |
| 21 | DQ9 | DQ9 |
| 22 | DQ10 | DQ10 |
| 23 | DQ11 | DQ11 |
| 24 | DQ12 | DQ12 |
| 25 | DQ13 | DQ13 |
| 26 | DQ14 | DQ14 |
| 27 | DQ15 | DQ15 |
| 28 | A7 | A7 |
| 29 | DQ16 | DQ16 |
| 30 | VDD | VDD |
| 31 | A8 | A8 |
| 32 | A9 | A9 |
| 33 | NC | NC, A12 |
| 34 | NC | NC, A13 |
| 35 | DQ17 | DQ17 |
| 36 | DQ18 | DQ18 |

| | 5 V ECC | 3.3 V ECC |
|---|---|---|
| PIN # | PIN NAME | PIN NAME |
| 37 | DQ19 | DQ19 |
| 38 | DQ20 | DQ20 |
| 39 | VSS | VSS |
| 40 | $\overline{CE0}$ | $\overline{CE0}$ |
| 41 | NC, A10 | A10 |
| 42 | NC, A11 | A11 |
| 43 | NC, $\overline{CE1}$ | $\overline{CE1}$ |
| 44 | $\overline{RE0}$ | $\overline{RE0}$ |
| 45 | NC, $\overline{RE1}$ | $\overline{RE1}$ |
| 46 | DQ21 | DQ21 |
| 47 | $\overline{W}$ | $\overline{W}$ |
| 48 | $\overline{ECC}$ | $\overline{ECC}$ |
| 49 | DQ22 | DQ22 |
| 50 | DQ23 | DQ23 |
| 51 | DQ24 | DQ24 |
| 52 | DQ25 | DQ25 |
| 53 | DQ26 | DQ26 |
| 54 | DQ27 | DQ27 |
| 55 | DQ28 | DQ28 |
| 56 | DQ29 | DQ29 |
| 57 | DQ30 | DQ30 |
| 58 | DQ31 | DQ31 |
| 59 | VDD | VDD |
| 60 | DQ32 | DQ32 |
| 61 | DQ33 | DQ33 |
| 62 | DQ34 | DQ34 |
| 63 | DQ35 | DQ35 |
| 64 | DQ36,NC | NC |
| 65 | DQ37,NC | NC |
| 66 | DQ38,NC | $\overline{EDO}$ |
| 67 | PD1 | PD1 |
| 68 | PD2 | PD2 |
| 69 | PD3 | PD3 |
| 70 | PD4 | PD4 |
| 71 | DQ39,NC | PD(REF) |
| 72 | VSS | VSS |

**PRESENCE DETECT TRUTH TABLE**

| TYPE | tRAC | $\overline{ECC}$ | PD1 | PD2 | PD3 | PD4 | #PD5 |
|---|---|---|---|---|---|---|---|
| 256K X 36 or 40 | 100 nS | S | S | O | S | S | O |
| 16M X 36/39 | 80 nS | S | S | O | O | S | O |
| | 70 nS | S | S | O | S | O | O |
| | 60 nS | S | S | O | O | O | O |
| 512K X 36 or 40 | 100 nS | S | O | S | S | S | O |
| 32M X 36/39 | 80 nS | S | O | S | O | S | O |
| | 70 nS | S | O | S | S | O | O |
| | 60 nS | S | O | S | O | O | O |
| 1M X 36 or 40 | 100 nS | S | S | S | S | S | O |
| 64M X 36/39 | 80 nS | S | S | S | O | S | O |
| | 70 nS | S | S | S | S | O | O |
| | 60 nS | S | S | S | O | O | O |
| 2M X 36 or 40 | 100 nS | S | O | O | S | S | O |
| 128M X 36/39 | 80 nS | S | O | O | O | S | O |
| | 70 nS | S | O | O | S | O | O |
| | 60 nS | S | O | O | O | O | O |
| 4M X 36 or 40 | 80 nS | S | S | O | O | S | S |
| 256M X 36/39 | 70 nS | S | S | O | S | O | S |
| | 60 nS | S | S | O | O | O | S |
| | 50 nS | S | S | O | S | S | S |
| 8M X 36 or 40 | 80 nS | S | O | S | O | S | S |
| 512M X 36/39 | 70 nS | S | O | S | S | O | S |
| | 60 nS | S | O | S | O | O | S |
| | 50 nS | S | O | S | S | S | S |

O = NC CONNECTION) S = CONNECTED TO VSS

$\overline{EDO}$ Pin: VSS FOR EDO, NC for Fast Page.

$\overline{ECC}$ Pin: VSS for ECC Module, OPEN for NON ECC Module

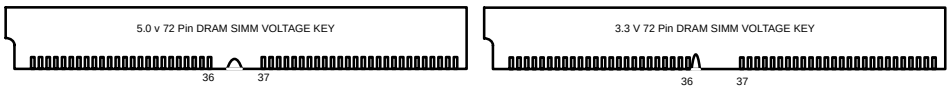
# The connection of PD5 to VSS must be made through a 2..6 KΩ resistor

**CONFIGURATION PIN ASSIGNMENT TABLE**

| | MODULE SIZE, 36 or 39/40 BITS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIN # | 256K | 512K | 1M | 2M | 4M | 8M | 16M | 32M | 64M | 128M | 256M | 512M |
| 19 | NC | NC | NC | NC | A10 | A10 | A10 | A10 | A10 | A10 | A10 | A10 |
| *29 | NC | NC | NC | NC | A11 | A11 | A11 | A11 | A11 | A11 | A11 | A11 |
| 32 | NC | NC | A9 | A9 | A9 | A9 | A9 | A9 | A9 | A9 | A9 | A9 |
| *33 | NC | $\overline{RE3}$ | NC | $\overline{RE3}$ | NC | $\overline{RE3}$ | A12 | A12 | A12 | A12 | A12 | A12 |
| *34 | NC | $\overline{RE2}$ | NC | $\overline{RE2}$ | NC | $\overline{RE2}$ | NC | NC | A13 | A13 | A13 | A13 |
| 45 | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | $\overline{RE1}$ | NC | RE1 |

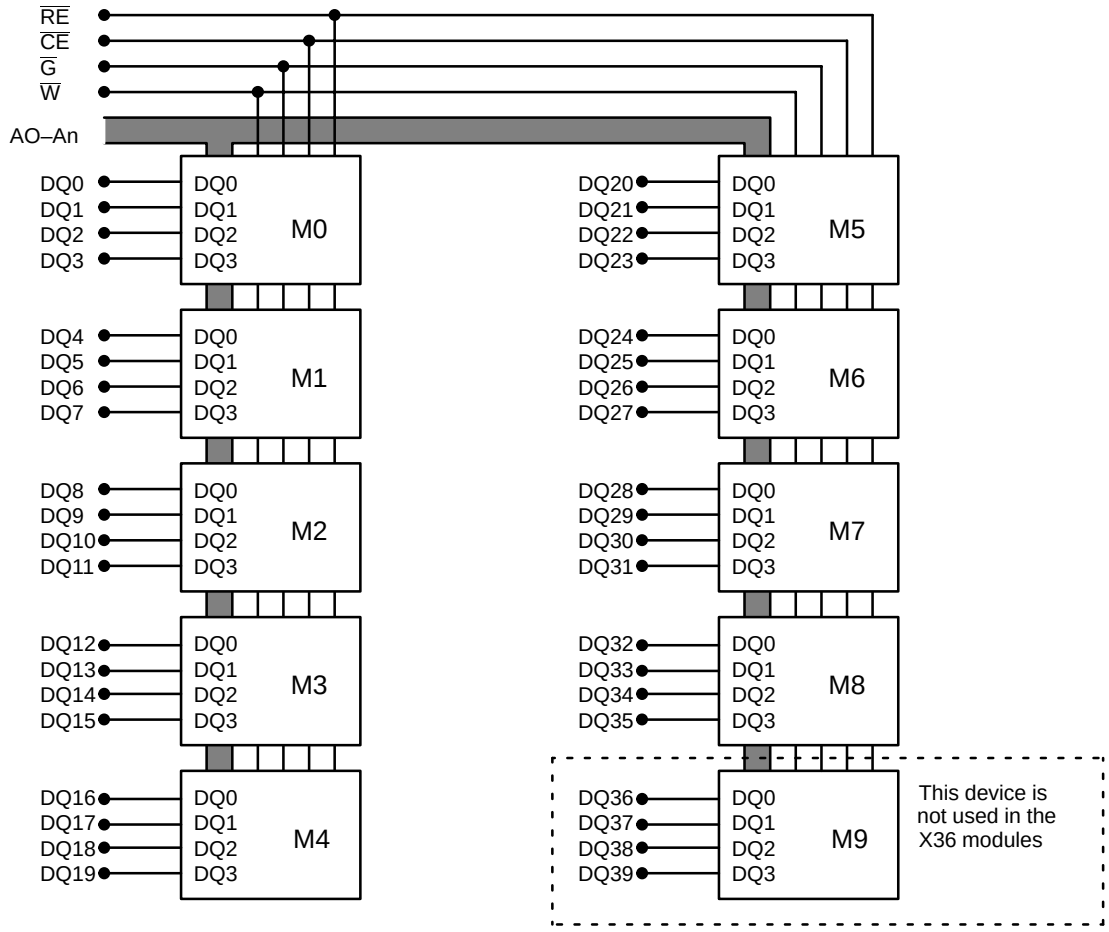
*A11, A12, or A13 on Pins 29, 33, or 34 are used on modules containing devices that require asymetric ROW/ COLUMN addresses.

NOTE – This family of pinouts is approved for use in SIMM modules which are nominally 4.25" long and with a height which varies depencing on the configuration and the memory devices used. See JEDEC Publication 95.




## FIGURE 4.4.2–3 A

## 256K TO 8M BY 36 or 40, 72 PIN ECC DRAM MODULE PINOUT




**BLOCK DIAGRAM for 256K/1M/4M X 36 or 40 USING X4 DRAM**

## FIGURE 4.4.2–3 B
## 36/40 BIT 72 PIN ECC DRAM SIMM, 1 Bank with X4 DRAMs

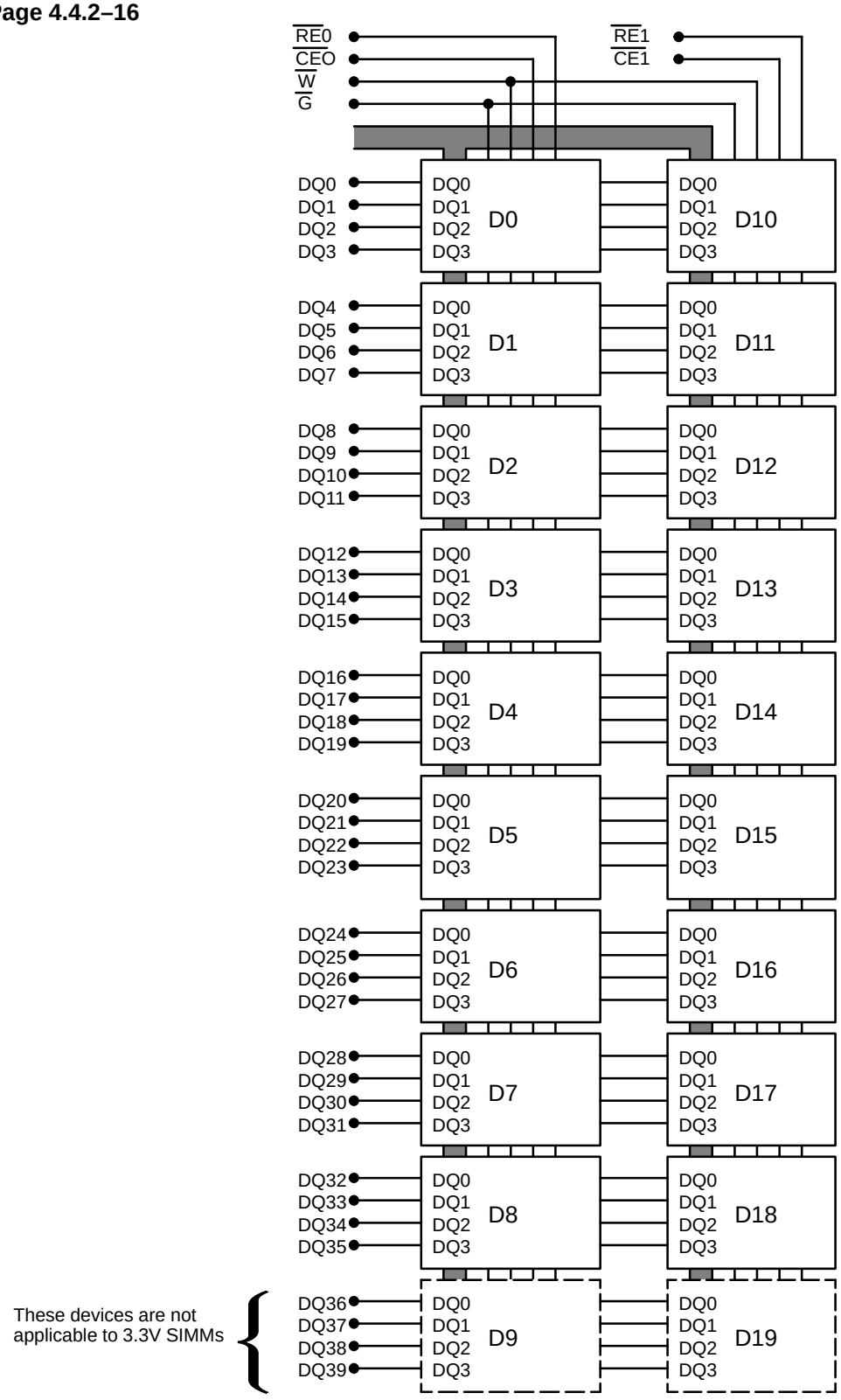



**FIGURE 4.4.2–3 C**
**36/40 BIT 72 PIN ECC DRAM SIMM, 2 Banks with X4 DRAMs**