

# APPLICATION NOTE-23



## DESIGN-IN WITH WINBOND W39V040A/W39V040B(LPC) PRODUCT

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# DESIGN-IN WITH WINBOND

## W39V040A/W39V040B(LPC) PRODUCT



### 1. GENERAL DESCRIPTION

W39V040A and W39V040B LPC flash are application-specific devices which are used for Non-Intel Chipset solution. Both W39V040A and W39V040B are 4-Mb 3.3-volt only CMOS flash memory organized as 512K × 8 bits and compatible for each other in most applications.

This application note listed the features comparisons between W39V040A and W39V040B.

### 2. DETAIL DESCRIPTION

For W39V040B, the 4Mbits of data are divided into 8 uniform sectors of 64 Kbytes.

For W39V040A, the 4Mbits of data are divided into 8 uniform sectors of 64 Kbytes, which are composed of 16 smaller even pages with 4 Kbytes.

The comparison on Function, Command, and Pin Assignment in Programmer mode and LPC mode is described in the following:

#### 2.1 Function

**Function Comparison Table**

| FUNCTION COMPARISON             | WINBOND<br>W39V040B | WINBOND<br>W39V040A |
|---------------------------------|---------------------|---------------------|
| Device ID                       | Yes(54H)            | Yes(3DH)            |
| Sector Definition               | Uniform 64KB        | Uniform 4KB         |
| LPC Interface Mode              | LPC                 | LPC                 |
| Programmer Interface Mode       | Yes                 | Yes                 |
| Internal Boot Block Lockout     | Yes (64KB)          | Yes(64KB/16KB)      |
| External H/W Protect Pins       | Yes                 | Yes                 |
| Chip Erase                      | No                  | Yes                 |
| Sector Erase                    | Yes                 | Yes                 |
| Page erase                      | No                  | Yes                 |
| Multiple Device Selection       | Yes                 | Yes                 |
| Device ID Register              | Yes                 | Yes                 |
| Vpp For Fast Programming        | Yes                 | No                  |
| General Purpose Inputs Register | Yes                 | Yes                 |

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## 2.2 Command

| FUNCTION COMPARISON | WINBOND<br>W39V040B | WINBOND<br>W39V040A |
|---------------------|---------------------|---------------------|
| Byte Program        | A0H                 | A0H                 |
| Chip Erase          | -----               | 10H                 |
| Sector Erase        | 30H                 | 30H                 |
| Page erase          | -----               | 50H                 |
| Product ID Entry    | 90H                 | 90H                 |
| Product ID Exit     | F0H                 | F0H                 |

## 2.3 Pin Assignment

The pin assignment of W39V040A and W39V040B are arranged to be easily adapted for each other. Therefore, there's only minor differences between W39V040A and W39V040B.

For Vpp pin of W39V040B, it may be left disconnected or driven. If it is driven, the voltage levels should satisfy VIH and VIL requirements. For RD/BY# pin of W39V040B, it is a open-drain output pin.

### 2.3.1 In Programmer Mode

Table 1. 32L-PLCC Pin Assignment in Programmer Mode

| WINBOND<br>W39V040A | WINBOND<br>W39V040B | PIN ASSIGNMENT IN<br>PROGRAMMER MODE |   | WINBOND<br>W39V040B | WINBOND<br>W39V040A |                 |
|---------------------|---------------------|--------------------------------------|---|---------------------|---------------------|-----------------|
| ---                 | Vpp                 | 1                                    | <b>WINBOND<br/>32-LEAD PLCC<br/>STANDARD PINOUT</b> | 32                  | V <sub>DD</sub>     |                 |
| RESET#              | RESET#              | 2                                    |   | 31                  | R/C#                | R/C#            |
| A9                  | A9                  | 3                                    |   | 30                  | A10                 | A10             |
| A8                  | A8                  | 4                                    |   | 29                  | MODE                | MODE            |
| A7                  | A7                  | 5                                    |   | 28                  | GND                 | GND             |
| A6                  | A6                  | 6                                    |   | 27                  | ---                 | ---             |
| A5                  | A5                  | 7                                    |   | 26                  | ---                 | ---             |
| A4                  | A4                  | 8                                    |   | 25                  | V <sub>DD</sub>     | V <sub>DD</sub> |
| A3                  | A3                  | 9                                    |   | 24                  | OE#                 | OE#             |
| A2                  | A2                  | 10                                   |   | 23                  | WE#                 | WE#             |
| A1                  | A1                  | 11                                   |   | 22                  | RY/BY#              | ---             |
| A0                  | A0                  | 12                                   |   | 21                  | DQ7                 | DQ7             |
| DQ0                 | DQ0                 | 13                                   |   | 20                  | DQ6                 | DQ6             |
| DQ1                 | DQ1                 | 14                                   |   | 19                  | DQ5                 | DQ5             |
| DQ2                 | DQ2                 | 15                                   |   | 18                  | DQ4                 | DQ4             |
| GND                 | GND                 | 16                                   |   | 17                  | DQ3                 | DQ3             |

Note: (- - -: NC)

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## 2.3.2 In LPC Mode

**Table 2. 32L-PLCC Pin Assignment in LPC Mode**

| WINBOND W39V040A | WINBOND W39V040B | PIN ASSIGNMENT IN LPC MODE |   | WINBOND W39V040B | WINBOND W39V040A |
|------------------|------------------|----------------------------|---|------------------|------------------|
| ---              | V <sub>PP</sub>  | 1                          | <b>WINBOND<br/>32-LEAD PLCC<br/>STANDARD PINOUT</b> | 32               | V <sub>DD</sub>  |
| RESET#           | RESET#           | 2                          |   | 31               | CLK              |
| FGPI3            | FGPI3            | 3                          |   | 30               | FPGI4            |
| FGPI2            | FGPI2            | 4                          |   | 29               | MODE             |
| FGPI1            | FGPI1            | 5                          |   | 28               | GND              |
| FGPI0            | FGPI0            | 6                          |   | 27               | ---              |
| WP#              | WP#              | 7                          |   | 26               | ---              |
| TBL#             | TBL#             | 8                          |   | 25               | V <sub>DD</sub>  |
| ID3              | ID3              | 9                          |   | 24               | INIT#            |
| ID2              | ID2              | 10                         |   | 23               | LFRAME#          |
| ID1              | ID1              | 11                         |   | 22               | ---              |
| ID0              | ID0              | 12                         |   | 21               | RSV              |
| LAD0             | LAD0             | 13                         |   | 20               | RSV              |
| LAD1             | LAD1             | 14                         |   | 19               | RSV              |
| LAD2             | LAD2             | 15                         |   | 18               | RSV              |
| GND              | GND              | 16                         |   | 17               | LAD3             |

**Note:** (- - -: NC)

## 2.4 Reminder for end-check of sector erase operation (For W39V040B only)

System designer can use DQ6 (Toggle Bit) or DQ7(Data Polling bit) to determine whether a erase operation is complete or in progress.

While doing end-check of sector erase, please note the following:

The minimum interval between toggling-check (or polling-check) should be more than 50 mS.

W39V040A and W39V040B are already well supported by all famous BIOS vendors like AMI, Award/Phoenix.

## 3. CONCLUSION

The W39V040A and W39V040B are already well supported by all famous third parties like BIOS vendors AMI, Award/Phoenix, and Programmer vendors. They have made efforts to cover the differences on device's command sets and programming algorithm.

W39V040B provides a very cost-effective solution for most 4Mb-LPC applications.

W39V040A provides flexible erase capability for specific 4Mb-LPC application, which small segmentation is needed.

In summary, both W39V040A and W39V040B are compatible for each other in most applications.

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## 4. VERSION HISTORY

| VERSION | DATE          | PAGE | DESCRIPTION    |
|---------|---------------|------|----------------|
| A1      | Dec. 21, 2005 | -    | Initial Issued |

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*Publication Release Date: December 21, 2005  
Version A1*