

## Features

- Single Voltage Operation Read/Write: 2.65V - 3.6V
- Access Time – 70 ns
- Sector Erase Architecture
  - One Hundred Twenty-seven 32K Word (64K Bytes) Main Sectors with Individual Write Lockout
  - Eight 4K Word (8K Bytes) Sectors with Individual Write Lockout
- Fast Word Program Time – 10  $\mu$ s
- Typical Sector Erase Time: 32K Word Sectors – 700 ms; 4K Word Sectors – 100 ms
- Suspend/Resume Feature for Erase and Program
  - Supports Reading and Programming Data from Any Sector by Suspending Erase of a Different Sector
  - Supports Reading Any Word by Suspending Programming of Any Other Word
- Low-power Operation
  - 10 mA Active
  - 15  $\mu$ A Standby
- VPP Pin for Write Protection and Accelerated Program Operation
- $\overline{\text{RESET}}$  Input for Device Initialization
- Softlock Sector Protection
- Secure Lock and Freeze Feature
- Top or Bottom Boot Block Configuration Available
- 128-bit Protection Register
- Minimum 100,000 Erase Cycles
- Common Flash Interface (CFI)
- CBGA Green (Pb/Halide-free/RoHS Compliant) Packaging

## 1. Description

The AT49BV640S(T) is a 2.7-volt 32-megabit Flash memory organized as 4,194,304 words of 16 bits each. The memory is divided into 135 sectors for erase operations. The device is offered in a 64-ball CBGA package. The device has  $\overline{\text{CE}}$  and  $\overline{\text{OE}}$  control signals to avoid any bus contention. This device can be read or reprogrammed using a single power supply, making it ideally suited for in-system programming.

In some applications, in addition to the standard softlock sector protection mechanism, a requirement exists to allow for the permanent and irreversible locking of selected regions in the memory. The AT49BV640S(T) allows the user to permanently lock thirty-eight regions, and once activated these secure regions cannot be altered or erased through Software or Hardware at any time. Once activated, no facility exists to over-ride the secure lock mechanism. The size and the location of the secure regions is determined by the Top or Bottom Boot Block designation. The location of the secure regions is shown on [pages 3 - 6](#).

The secure regions can be locked in any sequence and at any time during normal device operation. Read operations can still be performed on any region that has the secure lock feature enabled. Full read/write operations and standard sector operations including standard Sector locking can be performed on all regions that are not secure locked.



**64-megabit  
(4M x 16)  
Secure  
3-volt Only  
Memory**

**AT49BV640S  
AT49BV640ST**

**Summary  
(Complete  
Datasheet  
under NDA)**

**NOTE:** This is a summary document. The complete document is available under NDA. For more information, please contact your local Atmel sales office.

3583AS-FLASH-9/06

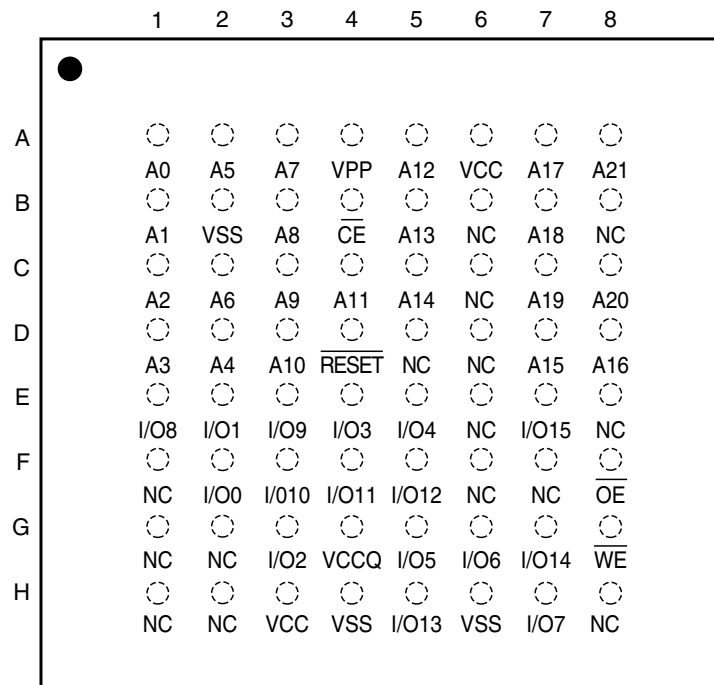


The AT49BV640S(T) device also contains a freeze feature that will freeze the lock status of the secure regions. The freeze feature prevents any further locking of the secure regions. If the user requires certain regions to be locked, then these regions must be programmed and locked prior to activation of the freeze command. It is important to note that enabling the freeze feature is irreversible.

## 2. Pin Configurations

| Pin Name           | Pin Function                                                         |
|--------------------|----------------------------------------------------------------------|
| A0 - A21           | Addresses                                                            |
| $\overline{CE}$    | Chip Enable                                                          |
| $\overline{OE}$    | Output Enable                                                        |
| $\overline{WE}$    | Write Enable                                                         |
| $\overline{RESET}$ | Reset                                                                |
| VPP                | Write Protection and Power Supply for Accelerated Program Operations |
| I/O0 - I/O15       | Data Inputs/Outputs                                                  |
| NC                 | No Connect                                                           |
| VCCQ               | Output Power Supply                                                  |

### 2.1 64-ball CBGA Top View



## 3. Memory Organization – AT49BV640S

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 0                   | SA0    | 4K           | 00000 - 00FFF                |
|                     | SA1    | 4K           | 01000 - 01FFF                |
|                     | SA2    | 4K           | 02000 - 02FFF                |
|                     | SA3    | 4K           | 03000 - 03FFF                |
|                     | SA4    | 4K           | 04000 - 04FFF                |
|                     | SA5    | 4K           | 05000 - 05FFF                |
|                     | SA6    | 4K           | 06000 - 06FFF                |
|                     | SA7    | 4K           | 07000 - 07FFF                |
| 1                   | SA8    | 32K          | 08000 - 0FFFF                |
| 2                   | SA9    | 32K          | 10000 - 17FFF                |
| 3                   | SA10   | 32K          | 18000 - 1FFFF                |
| 4                   | SA11   | 32K          | 20000 - 27FFF                |
| 5                   | SA12   | 32K          | 28000 - 2FFFF                |
| 6                   | SA13   | 32K          | 30000 - 37FFF                |
| 7                   | SA14   | 32K          | 38000 - 3FFFF                |
| 8                   | SA15   | 32K          | 40000 - 47FFF                |
|                     | SA16   | 32K          | 48000 - 4FFFF                |
|                     | SA17   | 32K          | 50000 - 57FFF                |
|                     | SA18   | 32K          | 58000 - 5FFFF                |
| 9                   | SA19   | 32K          | 60000 - 67FFF                |
|                     | SA20   | 32K          | 68000 - 6FFFF                |
|                     | SA21   | 32K          | 70000 - 77FFF                |
|                     | SA22   | 32K          | 78000 - 7FFFF                |
| 10                  | SA23   | 32K          | 80000 - 87FFF                |
|                     | SA24   | 32K          | 88000 - 8FFFF                |
|                     | SA25   | 32K          | 90000 - 97FFF                |
|                     | SA26   | 32K          | 98000 - 9FFFF                |
| 11                  | SA27   | 32K          | A0000 - A7FFF                |
|                     | SA28   | 32K          | A8000 - AFFFF                |
|                     | SA29   | 32K          | B0000 - B7FFF                |
|                     | SA30   | 32K          | B8000 - BFFFF                |
| 12                  | SA31   | 32K          | C0000 - C7FFF                |
|                     | SA32   | 32K          | C8000 - CFFFF                |
|                     | SA33   | 32K          | D0000 - D7FFF                |
|                     | SA34   | 32K          | D8000 - DFFFF                |

## 3. Memory Organization – AT49BV640S (Continued)

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 13                  | SA35   | 32K          | E0000 - E7FFF                |
|                     | SA36   | 32K          | E8000 - EFFFF                |
|                     | SA37   | 32K          | F0000 - F7FFF                |
|                     | SA38   | 32K          | F8000 - FFFFF                |
| 14                  | SA39   | 32K          | 100000 - 107FFF              |
|                     | SA40   | 32K          | 108000 - 10FFFF              |
|                     | SA41   | 32K          | 110000 - 117FFF              |
|                     | SA42   | 32K          | 118000 - 11FFFF              |
| 15                  | SA43   | 32K          | 120000 - 127FFF              |
|                     | SA44   | 32K          | 128000 - 12FFFF              |
|                     | SA45   | 32K          | 130000 - 137FFF              |
|                     | SA46   | 32K          | 138000 - 13FFFF              |
| 16                  | SA47   | 32K          | 140000 - 147FFF              |
|                     | SA48   | 32K          | 148000 - 14FFFF              |
|                     | SA49   | 32K          | 150000 - 157FFF              |
|                     | SA50   | 32K          | 158000 - 15FFFF              |
| 17                  | SA51   | 32K          | 160000 - 167FFF              |
|                     | SA52   | 32K          | 168000 - 16FFFF              |
|                     | SA53   | 32K          | 170000 - 177FFF              |
|                     | SA54   | 32K          | 178000 - 17FFFF              |
| 18                  | SA55   | 32K          | 180000 - 187FFF              |
|                     | SA56   | 32K          | 188000 - 18FFFF              |
|                     | SA57   | 32K          | 190000 - 197FFF              |
|                     | SA58   | 32K          | 198000 - 19FFFF              |
| 19                  | SA59   | 32K          | 1A0000 - 1A7FFF              |
|                     | SA60   | 32K          | 1A8000 - 1AFFFF              |
|                     | SA61   | 32K          | 1B0000 - 1B7FFF              |
|                     | SA62   | 32K          | 1B8000 - 1BFFFF              |
| 20                  | SA63   | 32K          | 1C0000 - 1C7FFF              |
|                     | SA64   | 32K          | 1C8000 - 1CFFFF              |
|                     | SA65   | 32K          | 1D0000 - 1D7FFF              |
|                     | SA66   | 32K          | 1D8000 - 1DFFFF              |
| 21                  | SA67   | 32K          | 1E0000 - 1E7FFF              |
|                     | SA68   | 32K          | 1E8000 - 1EFFFF              |
|                     | SA69   | 32K          | 1F0000 - 1F7FFF              |
|                     | SA70   | 32K          | 1F8000 - 1FFFFF              |

### 3. Memory Organization – AT49BV640S (Continued)

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 22                  | SA71   | 32K          | 200000 - 207FFF              |
|                     | SA72   | 32K          | 208000 - 20FFFF              |
|                     | SA73   | 32K          | 210000 - 217FFF              |
|                     | SA74   | 32K          | 218000 - 21FFFF              |
| 23                  | SA75   | 32K          | 220000 - 227FFF              |
|                     | SA76   | 32K          | 228000 - 22FFFF              |
|                     | SA77   | 32K          | 230000 - 237FFF              |
|                     | SA78   | 32K          | 238000 - 23FFFF              |
| 24                  | SA79   | 32K          | 240000 - 247FFF              |
|                     | SA80   | 32K          | 248000 - 24FFFF              |
|                     | SA81   | 32K          | 250000 - 257FFF              |
|                     | SA82   | 32K          | 258000 - 25FFFF              |
| 25                  | SA83   | 32K          | 260000 - 267FFF              |
|                     | SA84   | 32K          | 268000 - 26FFFF              |
|                     | SA85   | 32K          | 270000 - 277FFF              |
|                     | SA86   | 32K          | 278000 - 27FFFF              |
| 26                  | SA87   | 32K          | 280000 - 287FFF              |
|                     | SA88   | 32K          | 288000 - 28FFFF              |
|                     | SA89   | 32K          | 290000 - 297FFF              |
|                     | SA90   | 32K          | 298000 - 29FFFF              |
| 27                  | SA91   | 32K          | 2A0000 - 2A7FFF              |
|                     | SA92   | 32K          | 2A8000 - 2AFFFF              |
|                     | SA93   | 32K          | 2B0000 - 2B7FFF              |
|                     | SA94   | 32K          | 2B8000 - 2BFFFF              |
| 28                  | SA95   | 32K          | 2C0000 - 2C7FFF              |
|                     | SA96   | 32K          | 2C8000 - 2CFFFF              |
|                     | SA97   | 32K          | 2D0000 - 2D7FFF              |
|                     | SA98   | 32K          | 2D8000 - 2DFFFF              |
| 29                  | SA99   | 32K          | 2E0000 - 2E7FFF              |
|                     | SA100  | 32K          | 2E8000 - 2EFFFF              |
|                     | SA101  | 32K          | 2F0000 - 2F7FFF              |
|                     | SA102  | 32K          | 2F8000 - 2FFFFF              |

### 3. Memory Organization – AT49BV640S (Continued)

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 30                  | SA103  | 32K          | 300000 - 307FFF              |
|                     | SA104  | 32K          | 308000 - 30FFFF              |
|                     | SA105  | 32K          | 310000 - 317FFF              |
|                     | SA106  | 32K          | 318000 - 31FFFF              |
| 31                  | SA107  | 32K          | 320000 - 327FFF              |
|                     | SA108  | 32K          | 328000 - 32FFFF              |
|                     | SA109  | 32K          | 330000 - 337FFF              |
|                     | SA110  | 32K          | 338000 - 33FFFF              |
| 32                  | SA111  | 32K          | 340000 - 347FFF              |
|                     | SA112  | 32K          | 348000 - 34FFFF              |
|                     | SA113  | 32K          | 350000 - 357FFF              |
|                     | SA114  | 32K          | 358000 - 35FFFF              |
| 33                  | SA115  | 32K          | 360000 - 367FFF              |
|                     | SA116  | 32K          | 368000 - 36FFFF              |
|                     | SA117  | 32K          | 370000 - 377FFF              |
|                     | SA118  | 32K          | 378000 - 37FFFF              |
| 34                  | SA119  | 32K          | 380000 - 387FFF              |
|                     | SA120  | 32K          | 388000 - 38FFFF              |
|                     | SA121  | 32K          | 390000 - 397FFF              |
|                     | SA122  | 32K          | 398000 - 39FFFF              |
| 35                  | SA123  | 32K          | 3A0000 - 3A7FFF              |
|                     | SA124  | 32K          | 3A8000 - 3AFFFF              |
|                     | SA125  | 32K          | 3B0000 - 3B7FFF              |
|                     | SA126  | 32K          | 3B8000 - 3BFFFF              |
| 36                  | SA127  | 32K          | 3C0000 - 3C7FFF              |
|                     | SA128  | 32K          | 3C8000 - 3CFFFF              |
|                     | SA129  | 32K          | 3D0000 - 3D7FFF              |
|                     | SA130  | 32K          | 3D8000 - 3DFFFF              |
| 37                  | SA131  | 32K          | 3E0000 - 3E7FFF              |
|                     | SA132  | 32K          | 3E8000 - 3EFFFF              |
|                     | SA133  | 32K          | 3F0000 - 3F7FFF              |
|                     | SA134  | 32K          | 3F8000 - 3FFFFF              |

## 4. Memory Organization – AT49BV640ST

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 37                  | SA0    | 32K          | 00000 - 07FFF                |
|                     | SA1    | 32K          | 08000 - 0FFFF                |
|                     | SA2    | 32K          | 10000 - 17FFF                |
|                     | SA3    | 32K          | 18000 - 1FFFF                |
| 36                  | SA4    | 32K          | 20000 - 27FFF                |
|                     | SA5    | 32K          | 28000 - 2FFFF                |
|                     | SA6    | 32K          | 30000 - 37FFF                |
|                     | SA7    | 32K          | 38000 - 3FFFF                |
| 35                  | SA8    | 32K          | 40000 - 47FFF                |
|                     | SA9    | 32K          | 48000 - 4FFFF                |
|                     | SA10   | 32K          | 50000 - 57FFF                |
|                     | SA11   | 32K          | 58000 - 5FFFF                |
| 34                  | SA12   | 32K          | 60000 - 67FFF                |
|                     | SA13   | 32K          | 68000 - 6FFFF                |
|                     | SA14   | 32K          | 70000 - 77FFF                |
|                     | SA15   | 32K          | 78000 - 7FFFF                |
| 33                  | SA16   | 32K          | 80000 - 87FFF                |
|                     | SA17   | 32K          | 88000 - 8FFFF                |
|                     | SA18   | 32K          | 90000 - 97FFF                |
|                     | SA19   | 32K          | 98000 - 9FFFF                |
| 32                  | SA20   | 32K          | A0000 - A7FFF                |
|                     | SA21   | 32K          | A8000 - AFFFF                |
|                     | SA22   | 32K          | B0000 - B7FFF                |
|                     | SA23   | 32K          | B8000 - BFFFF                |
| 31                  | SA24   | 32K          | C0000 - C7FFF                |
|                     | SA25   | 32K          | C8000 - CFFFF                |
|                     | SA26   | 32K          | D0000 - D7FFF                |
|                     | SA27   | 32K          | D8000 - DFFFF                |
| 30                  | SA28   | 32K          | E0000 - E7FFF                |
|                     | SA29   | 32K          | E8000 - EFFFF                |
|                     | SA30   | 32K          | F0000 - F7FFF                |
|                     | SA31   | 32K          | F8000 - FFFFF                |
| 29                  | SA32   | 32K          | 100000 - 107FFF              |
|                     | SA33   | 32K          | 108000 - 10FFFF              |
|                     | SA34   | 32K          | 110000 - 117FFF              |
|                     | SA35   | 32K          | 118000 - 11FFFF              |

## 4. Memory Organization – AT49BV640ST (Continued)

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 28                  | SA36   | 32K          | 120000 - 127FFF              |
|                     | SA37   | 32K          | 128000 - 12FFFF              |
|                     | SA38   | 32K          | 130000 - 137FFF              |
|                     | SA39   | 32K          | 138000 - 13FFFF              |
| 27                  | SA40   | 32K          | 140000 - 147FFF              |
|                     | SA41   | 32K          | 148000 - 14FFFF              |
|                     | SA42   | 32K          | 150000 - 157FFF              |
|                     | SA43   | 32K          | 158000 - 15FFFF              |
| 26                  | SA44   | 32K          | 160000 - 167FFF              |
|                     | SA45   | 32K          | 168000 - 16FFFF              |
|                     | SA46   | 32K          | 170000 - 177FFF              |
|                     | SA47   | 32K          | 178000 - 17FFFF              |
| 25                  | SA48   | 32K          | 180000 - 187FFF              |
|                     | SA49   | 32K          | 188000 - 18FFFF              |
|                     | SA50   | 32K          | 190000 - 197FFF              |
|                     | SA51   | 32K          | 198000 - 19FFFF              |
| 24                  | SA52   | 32K          | 1A0000 - 1A7FFF              |
|                     | SA53   | 32K          | 1A8000 - 1AFFFF              |
|                     | SA54   | 32K          | 1B0000 - 1B7FFF              |
|                     | SA55   | 32K          | 1B8000 - 1BFFFF              |
| 23                  | SA56   | 32K          | 1C0000 - 1C7FFF              |
|                     | SA57   | 32K          | 1C8000 - 1CFFFF              |
|                     | SA58   | 32K          | 1D0000 - 1D7FFF              |
|                     | SA59   | 32K          | 1D8000 - 1DFFFF              |
| 22                  | SA60   | 32K          | 1E0000 - 1E7FFF              |
|                     | SA61   | 32K          | 1E8000 - 1EFFFF              |
|                     | SA62   | 32K          | 1F0000 - 1F7FFF              |
|                     | SA63   | 32K          | 1F8000 - 1FFFFF              |
| 21                  | SA64   | 32K          | 200000 - 207FFF              |
|                     | SA65   | 32K          | 208000 - 20FFFF              |
|                     | SA66   | 32K          | 210000 - 217FFF              |
|                     | SA67   | 32K          | 218000 - 21FFFF              |
| 20                  | SA68   | 32K          | 220000 - 227FFF              |
|                     | SA69   | 32K          | 228000 - 22FFFF              |
|                     | SA70   | 32K          | 230000 - 237FFF              |
|                     | SA71   | 32K          | 238000 - 23FFFF              |

#### 4. Memory Organization – AT49BV640ST (Continued)

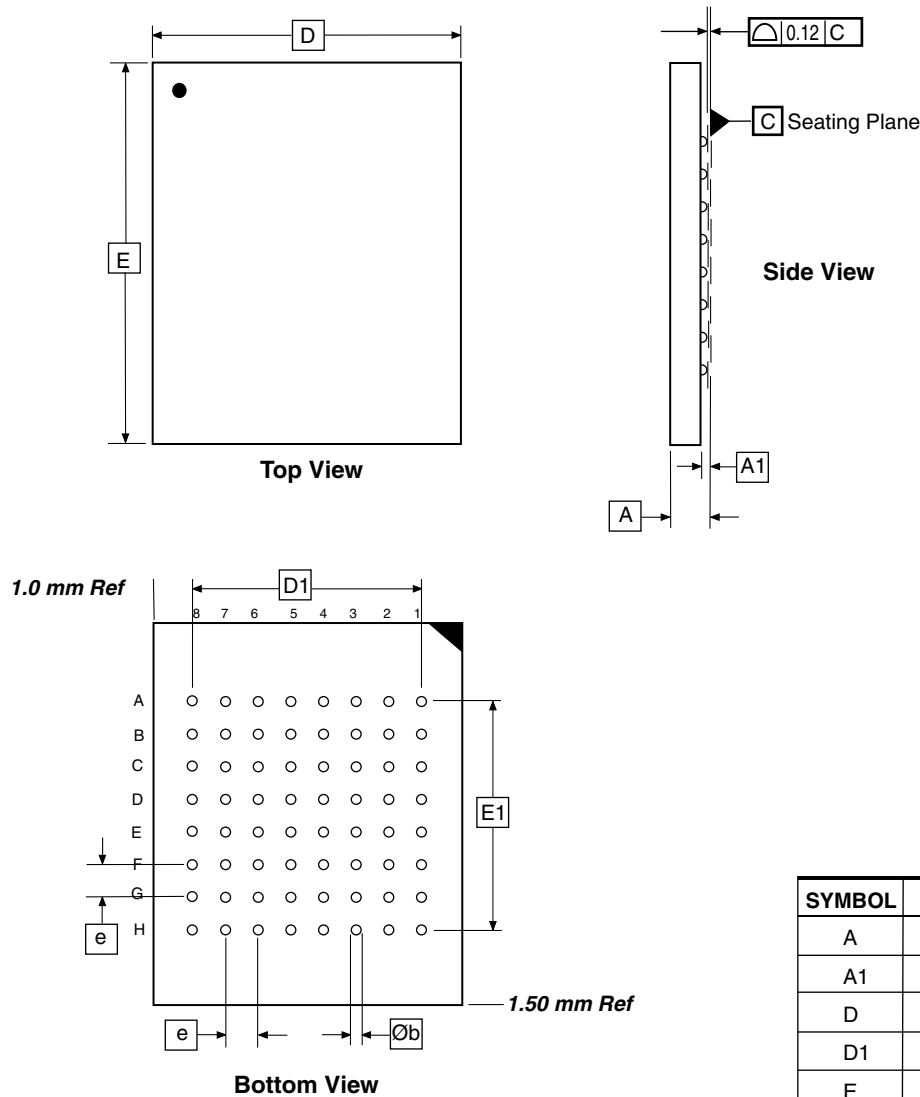
| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 19                  | SA72   | 32K          | 240000 - 247FFF              |
|                     | SA73   | 32K          | 248000 - 24FFFF              |
|                     | SA74   | 32K          | 250000 - 257FFF              |
|                     | SA75   | 32K          | 258000 - 25FFFF              |
| 18                  | SA76   | 32K          | 260000 - 267FFF              |
|                     | SA77   | 32K          | 268000 - 26FFFF              |
|                     | SA78   | 32K          | 270000 - 277FFF              |
|                     | SA79   | 32K          | 278000 - 27FFFF              |
| 17                  | SA80   | 32K          | 280000 - 287FFF              |
|                     | SA81   | 32K          | 288000 - 28FFFF              |
|                     | SA82   | 32K          | 290000 - 297FFF              |
|                     | SA83   | 32K          | 298000 - 29FFFF              |
| 16                  | SA84   | 32K          | 2A0000 - 2A7FFF              |
|                     | SA85   | 32K          | 2A8000 - 2AFFFF              |
|                     | SA86   | 32K          | 2B0000 - 2B7FFF              |
|                     | SA87   | 32K          | 2B8000 - 2BFFFF              |
| 15                  | SA88   | 32K          | 2C0000 - 2C7FFF              |
|                     | SA89   | 32K          | 2C8000 - 2CFFFF              |
|                     | SA90   | 32K          | 2D0000 - 2D7FFF              |
|                     | SA91   | 32K          | 2D8000 - 2DFFFF              |
| 14                  | SA92   | 32K          | 2E0000 - 2E7FFF              |
|                     | SA93   | 32K          | 2E8000 - 2EFFFF              |
|                     | SA94   | 32K          | 2F0000 - 2F7FFF              |
|                     | SA95   | 32K          | 2F8000 - 2FFFFF              |
| 13                  | SA96   | 32K          | 300000 - 307FFF              |
|                     | SA97   | 32K          | 308000 - 30FFFF              |
|                     | SA98   | 32K          | 310000 - 317FFF              |
|                     | SA99   | 32K          | 318000 - 31FFFF              |
| 12                  | SA100  | 32K          | 320000 - 327FFF              |
|                     | SA101  | 32K          | 328000 - 32FFFF              |
|                     | SA102  | 32K          | 330000 - 337FFF              |
|                     | SA103  | 32K          | 338000 - 33FFFF              |

#### 4. Memory Organization – AT49BV640ST (Continued)

| Secure Region (SCR) | Sector | Size (Words) | x16 Address Range (A21 - A0) |
|---------------------|--------|--------------|------------------------------|
| 11                  | SA104  | 32K          | 340000 - 347FFF              |
|                     | SA105  | 32K          | 348000 - 34FFFF              |
|                     | SA106  | 32K          | 350000 - 357FFF              |
|                     | SA107  | 32K          | 358000 - 35FFFF              |
| 10                  | SA108  | 32K          | 360000 - 367FFF              |
|                     | SA109  | 32K          | 368000 - 36FFFF              |
|                     | SA110  | 32K          | 370000 - 377FFF              |
|                     | SA111  | 32K          | 378000 - 37FFFF              |
| 9                   | SA112  | 32K          | 380000 - 387FFF              |
|                     | SA113  | 32K          | 388000 - 38FFFF              |
|                     | SA114  | 32K          | 390000 - 397FFF              |
|                     | SA115  | 32K          | 398000 - 39FFFF              |
| 8                   | SA116  | 32K          | 3A0000 - 3A7FFF              |
|                     | SA117  | 32K          | 3A8000 - 3AFFFF              |
|                     | SA118  | 32K          | 3B0000 - 3B7FFF              |
|                     | SA119  | 32K          | 3B8000 - 3BFFFF              |
| 7                   | SA120  | 32K          | 3C0000 - 3C7FFF              |
| 6                   | SA121  | 32K          | 3C8000 - 3CFFFF              |
| 5                   | SA122  | 32K          | 3D0000 - 3D7FFF              |
| 4                   | SA123  | 32K          | 3D8000 - 3DFFFF              |
| 3                   | SA124  | 32K          | 3E0000 - 3E7FFF              |
| 2                   | SA125  | 32K          | 3E8000 - 3EFFFF              |
| 1                   | SA126  | 32K          | 3F0000 - 3F7FFF              |
| 0                   | SA127  | 4K           | 3F8000 - 3F8FFF              |
|                     | SA128  | 4K           | 3F9000 - 3F9FFF              |
|                     | SA129  | 4K           | 3FA000 - 3FAFFF              |
|                     | SA130  | 4K           | 3FB000 - 3FBFFF              |
|                     | SA131  | 4K           | 3FC000 - 3FCFFF              |
|                     | SA132  | 4K           | 3FD000 - 3FDFFF              |
|                     | SA133  | 4K           | 3FE000 - 3FEFFF              |
|                     | SA134  | 4K           | 3FF000 - 3FFFFF              |

## 5. Packaging Information

### 5.1 64C1 – CBGA



1/25/05



2325 Orchard Parkway  
San Jose, CA 95131

#### TITLE

**64C1**, 64-ball (8 x 8 Array), 9 x 10 x 1.0 mm Body, 1.0 mm Ball Pitch  
Chip-scale Ball Grid Array Package (CBGA)

#### DRAWING NO.

64C1

#### REV.

B





## Atmel Corporation

2325 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: 1(408) 441-0311  
Fax: 1(408) 487-2600

## Regional Headquarters

### Europe

Atmel Sarl  
Route des Arsenaux 41  
Case Postale 80  
CH-1705 Fribourg  
Switzerland  
Tel: (41) 26-426-5555  
Fax: (41) 26-426-5500

### Asia

Room 1219  
Chinachem Golden Plaza  
77 Mody Road Tsimshatsui  
East Kowloon  
Hong Kong  
Tel: (852) 2721-9778  
Fax: (852) 2722-1369

### Japan

9F, Tonetsu Shinkawa Bldg.  
1-24-8 Shinkawa  
Chuo-ku, Tokyo 104-0033  
Japan  
Tel: (81) 3-3523-3551  
Fax: (81) 3-3523-7581

## Atmel Operations

### Memory

2325 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: 1(408) 441-0311  
Fax: 1(408) 436-4314

### Microcontrollers

2325 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: 1(408) 441-0311  
Fax: 1(408) 436-4314

La Chantrerie  
BP 70602  
44306 Nantes Cedex 3, France  
Tel: (33) 2-40-18-18-18  
Fax: (33) 2-40-18-19-60

### ASIC/ASSP/Smart Cards

Zone Industrielle  
13106 Rousset Cedex, France  
Tel: (33) 4-42-53-60-00  
Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.  
Colorado Springs, CO 80906, USA  
Tel: 1(719) 576-3300  
Fax: 1(719) 540-1759

Scottish Enterprise Technology Park  
Maxwell Building  
East Kilbride G75 0QR, Scotland  
Tel: (44) 1355-803-000  
Fax: (44) 1355-242-743

### RF/Automotive

Theresienstrasse 2  
Postfach 3535  
74025 Heilbronn, Germany  
Tel: (49) 71-31-67-0  
Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.  
Colorado Springs, CO 80906, USA  
Tel: 1(719) 576-3300  
Fax: 1(719) 540-1759

### Biometrics/Imaging/Hi-Rel MPU/ High-Speed Converters/RF Datacom

Avenue de Rochepleine  
BP 123  
38521 Saint-Egreve Cedex, France  
Tel: (33) 4-76-58-30-00  
Fax: (33) 4-76-58-34-80

---

## Literature Requests

[www.atmel.com/literature](http://www.atmel.com/literature)

**Disclaimer:** The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. **EXCEPT AS SET FORTH IN ATMEL'S TERMS AND CONDITIONS OF SALE LOCATED ON ATMEL'S WEB SITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.** Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

© 2006 Atmel Corporation. All rights reserved. Atmel®, logo and combinations thereof, Everywhere You Are® and others are registered trademarks or trademarks of Atmel Corporation or its subsidiaries. Other terms and product names may be trademarks of others.