

## Features

- Temperature ranges
  - Industrial: -40 °C to 85 °C
  - Automotive-A: -40 °C to 85 °C
- Pin-and function-compatible with CY7C1021CV33
- High speed
  - $t_{AA} = 10 \text{ ns}$
- Low active power
  - $I_{CC} = 60 \text{ mA @ } 10 \text{ ns}$
- Low CMOS standby power
  - $I_{SB2} = 3 \text{ mA}$
- 2.0 V data retention
- Automatic power-down when deselected
- CMOS for optimum speed/power
- Independent control of upper and lower bits
- Available in Pb-free 44-pin 400-Mil wide molded SOJ, 44-pin TSOP II and 48-ball VFBGA packages

## Functional Description

The CY7C1021DV33 is a high-performance CMOS static RAM organized as 65,536 words by 16 bits. This device has an automatic power-down feature that significantly reduces power consumption when deselected.

Writing to the device is accomplished by taking Chip Enable ( $\overline{CE}$ ) and Write Enable (WE) inputs LOW. If Byte Low Enable (BLE) is LOW, then data from I/O pins (I/O<sub>0</sub> through I/O<sub>7</sub>), is written into the location specified on the address pins (A<sub>0</sub> through A<sub>15</sub>). If Byte High Enable (BHE) is LOW, then data from I/O pins (I/O<sub>8</sub> through I/O<sub>15</sub>) is written into the location specified on the address pins (A<sub>0</sub> through A<sub>15</sub>).

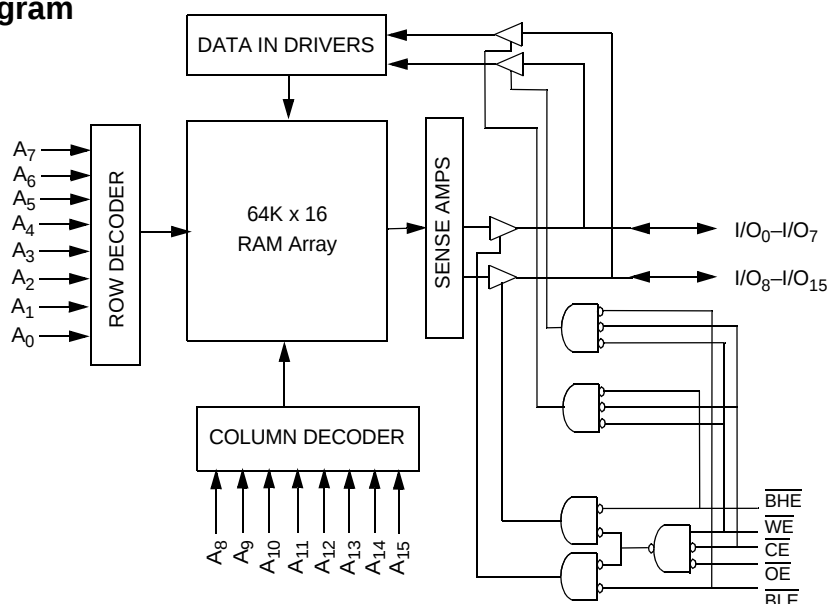
Reading from the device is accomplished by taking Chip Enable (CE) and Output Enable ( $\overline{OE}$ ) LOW while forcing the Write Enable (WE) HIGH. If Byte Low Enable (BLE) is LOW, then data from the memory location specified by the address pins will appear on I/O<sub>0</sub> to I/O<sub>7</sub>. If Byte High Enable (BHE) is LOW, then data from memory will appear on I/O<sub>8</sub> to I/O<sub>15</sub>. See the truth table at the end of this data sheet for a complete description of Read and Write modes.

The input/output pins (I/O<sub>0</sub> through I/O<sub>15</sub>) are placed in a high-impedance state when the device is deselected ( $\overline{CE}$  HIGH), the outputs are disabled ( $\overline{OE}$  HIGH), the BHE and BLE are disabled (BHE, BLE HIGH), or during a Write operation (CE LOW, and WE LOW).

The CY7C1021DV33 is available in Pb-free 44-pin 400-Mil wide Molded SOJ, 44-pin TSOP II and 48-ball VFBGA packages.

For a complete list of related resources, [click here](#).

## Logic Block Diagram



## Contents

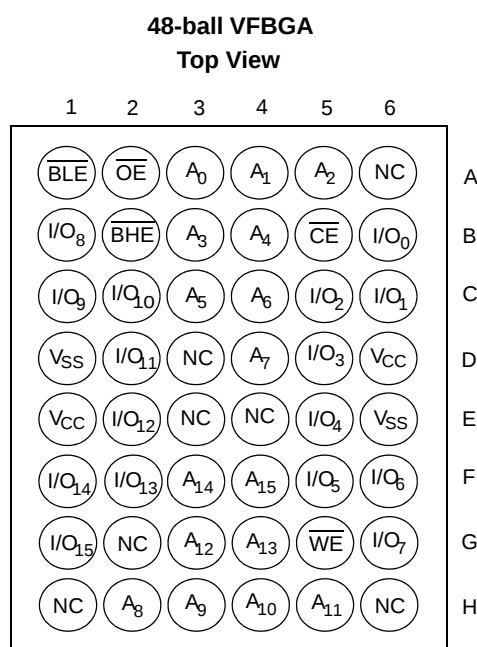
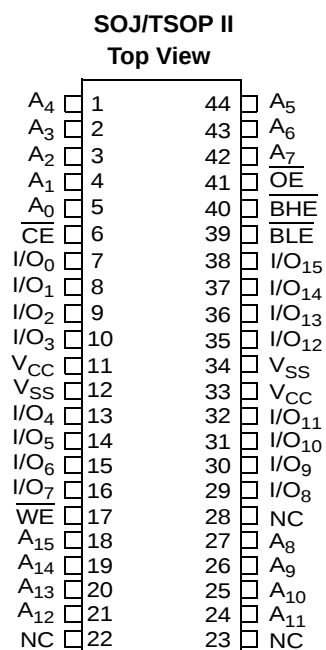
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|---------------------------------------------|-----------|------------------------------------------------------|-----------|
| <b>Selection Guide .....</b>                | <b>3</b>  | <b>Ordering Information .....</b>                    | <b>12</b> |
| <b>Pin Configurations .....</b>             | <b>3</b>  | Ordering Code Definitions .....                      | 12        |
| <b>Maximum Ratings .....</b>                | <b>4</b>  | <b>Package Diagrams .....</b>                        | <b>13</b> |
| <b>Operating Range .....</b>                | <b>4</b>  | <b>Acronyms .....</b>                                | <b>15</b> |
| <b>Electrical Characteristics .....</b>     | <b>4</b>  | <b>Document Conventions .....</b>                    | <b>15</b> |
| DC Electrical Characteristics .....         | 4         | Units of Measure .....                               | 15        |
| <b>Capacitance .....</b>                    | <b>5</b>  | <b>Document History Page .....</b>                   | <b>16</b> |
| <b>Thermal Resistance .....</b>             | <b>5</b>  | <b>Sales, Solutions, and Legal Information .....</b> | <b>18</b> |
| <b>AC Test Loads and Waveforms .....</b>    | <b>5</b>  | Worldwide Sales and Design Support .....             | 18        |
| <b>Data Retention Characteristics .....</b> | <b>6</b>  | Products .....                                       | 18        |
| <b>Data Retention Waveform .....</b>        | <b>6</b>  | PSoC® Solutions .....                                | 18        |
| <b>Switching Characteristics .....</b>      | <b>7</b>  | Cypress Developer Community .....                    | 18        |
| <b>Switching Waveforms .....</b>            | <b>8</b>  | Technical Support .....                              | 18        |
| <b>Truth Table .....</b>                    | <b>11</b> |                                                      |           |

## Selection Guide

| Description                  | -10 (Industrial / Automotive-A) | Unit |
|------------------------------|---------------------------------|------|
| Maximum access time          | 10                              | ns   |
| Maximum operating current    | 60                              | mA   |
| Maximum CMOS standby current | 3                               | mA   |

## Pin Configurations

SOJ, TSOP II and VFBGA pinouts are as follows. <sup>[1]</sup>



### Note

1. NC pins are not connected on the die.

## Maximum Ratings

Exceeding maximum ratings may impair the useful life of the device. These user guidelines are not tested.

Storage temperature ..... -65 °C to +150 °C

Ambient temperature with power applied ..... -55 °C to +125 °C

Supply voltage on  $V_{CC}$  to Relative GND <sup>[2]</sup> ..... -0.3 V to +4.6 V

DC Voltage applied to outputs in high Z State <sup>[2]</sup> ..... -0.3 V to  $V_{CC} + 0.3$  V

DC input voltage <sup>[2]</sup> ..... -0.3 V to  $V_{CC} + 0.3$  V

Current into outputs (LOW) ..... 20 mA

Static discharge voltage (per MIL-STD-883, method 3015) ..... > 2001 V

Latch-up current ..... > 200 mA

## Operating Range

| Range        | Ambient Temperature | $V_{CC}$          | Speed |
|--------------|---------------------|-------------------|-------|
| Industrial   | -40 °C to +85 °C    | 3.3 V $\pm$ 0.3 V | 10 ns |
| Automotive-A | -40 °C to +85 °C    |                   | 10 ns |

## Electrical Characteristics

Over the Operating Range

### DC Electrical Characteristics

Over the Operating Range

| Parameter        | Description                                   | Test Conditions                                                                                                                                      |         | -10 (Industrial / Automotive-A) |                       | Unit |
|------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------|-----------------------|------|
|                  |                                               |                                                                                                                                                      |         | Min                             | Max                   |      |
| V <sub>OH</sub>  | Output HIGH voltage                           | V <sub>CC</sub> = Min, I <sub>OH</sub> = −4.0 mA                                                                                                     |         | 2.4                             | –                     | V    |
| V <sub>OL</sub>  | Output LOW voltage                            | V <sub>CC</sub> = Min, I <sub>OL</sub> = 8.0 mA                                                                                                      |         | –                               | 0.4                   | V    |
| V <sub>IH</sub>  | Input HIGH voltage                            |                                                                                                                                                      |         | 2.0                             | V <sub>CC</sub> + 0.3 | V    |
| V <sub>IL</sub>  | Input LOW voltage <sup>[2]</sup>              |                                                                                                                                                      |         | −0.3                            | 0.8                   | V    |
| I <sub>IX</sub>  | Input leakage current                         | GND ≤ V <sub>I</sub> ≤ V <sub>CC</sub>                                                                                                               |         | −1                              | +1                    | μA   |
| I <sub>OZ</sub>  | Output leakage current                        | GND ≤ V <sub>I</sub> ≤ V <sub>CC</sub> , Output Disabled                                                                                             |         | −1                              | +1                    | μA   |
| I <sub>CC</sub>  | V <sub>CC</sub> operating supply current      | V <sub>CC</sub> = Max, I <sub>OUT</sub> = 0 mA,<br>f = f <sub>MAX</sub> = 1/t <sub>RC</sub>                                                          | 100 MHz | –                               | 60                    | mA   |
|                  |                                               |                                                                                                                                                      | 83 MHz  | –                               | 55                    | mA   |
|                  |                                               |                                                                                                                                                      | 66 MHz  | –                               | 45                    | mA   |
|                  |                                               |                                                                                                                                                      | 40 MHz  | –                               | 30                    | mA   |
| I <sub>SB1</sub> | Automatic CE Power-Down Current – TTL Inputs  | Max V <sub>CC</sub> , $\overline{CE} \geq V_{IH}$ ,<br>V <sub>IN</sub> ≥ V <sub>IH</sub> or V <sub>IN</sub> ≤ V <sub>IL</sub> , f = f <sub>MAX</sub> |         | –                               | 10                    | mA   |
| I <sub>SB2</sub> | Automatic CE Power-Down Current – CMOS Inputs | Max V <sub>CC</sub> , $\overline{CE} \geq V_{CC} - 0.3 \text{ V}$ ,<br>V <sub>IN</sub> ≥ V <sub>CC</sub> − 0.3 V or V <sub>IN</sub> ≤ 0.3 V, f = 0   |         | –                               | 3                     | mA   |

#### Note

2.  $V_{IL(\text{min})} = -2.0 \text{ V}$  and  $V_{IH(\text{max})} = V_{CC} + 1 \text{ V}$  for pulse durations of less than 5 ns.

## Capacitance

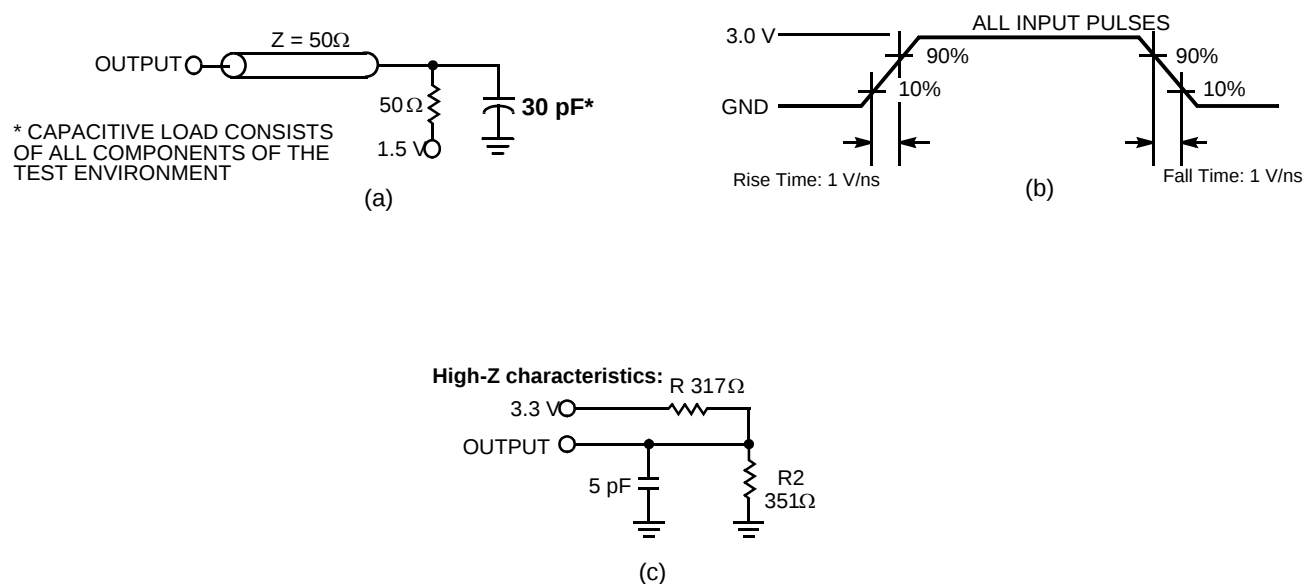
| Parameter <sup>[3]</sup> | Description        | Test Conditions                                                                   | Max | Unit |
|--------------------------|--------------------|-----------------------------------------------------------------------------------|-----|------|
| $C_{IN}$                 | Input capacitance  | $T_A = 25\text{ }^{\circ}\text{C}$ , $f = 1\text{ MHz}$ , $V_{CC} = 3.3\text{ V}$ | 8   | pF   |
| $C_{OUT}$                | Output capacitance |                                                                                   | 8   | pF   |

## Thermal Resistance

| Parameter <sup>[3]</sup> | Description                              | Test Conditions                                                                | SOJ   | TSOP II | VFBGA | Unit                 |
|--------------------------|------------------------------------------|--------------------------------------------------------------------------------|-------|---------|-------|----------------------|
| $\Theta_{JA}$            | Thermal resistance (junction to ambient) | Still Air, soldered on a $3 \times 4.5$ inch, four-layer printed circuit board | 59.52 | 53.91   | 36    | $^{\circ}\text{C/W}$ |
| $\Theta_{JC}$            | Thermal resistance (junction to case)    |                                                                                | 36.75 | 21.24   | 9     | $^{\circ}\text{C/W}$ |

## AC Test Loads and Waveforms

Figure 1. AC Test Loads and Waveforms <sup>[4]</sup>



### Notes

- Tested initially and after any design or process changes that may affect these parameters.
- AC characteristics (except High Z) are tested using the load conditions shown in Figure 1 (a). High Z characteristics are tested for all speeds using the test load shown in Figure 1 (c).

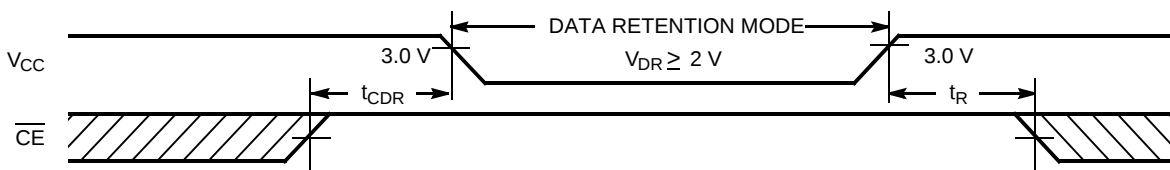
## Data Retention Characteristics

Over the Operating Range

| Parameter       | Description                          | Conditions                                                                                                                                                      | Min      | Max | Unit |
|-----------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|------|
| $V_{DR}$        | $V_{CC}$ for data retention          |                                                                                                                                                                 | 2        | –   | V    |
| $I_{CCDR}$      | Data retention current               | $V_{CC} = V_{DR} = 2.0\text{ V}$ , $\overline{CE} \geq V_{CC} - 0.3\text{ V}$ ,<br>$V_{IN} \geq V_{CC} - 0.3\text{ V}$ or $V_{IN} \leq 0.3\text{ V}$ Industrial | –        | 3   | mA   |
| $t_{CDR}^{[5]}$ | Chip deselect to data retention time |                                                                                                                                                                 | 0        | –   | ns   |
| $t_R^{[6]}$     | Operation recovery time              |                                                                                                                                                                 | $t_{RC}$ | –   | ns   |

## Data Retention Waveform

Figure 2. Data Retention Waveform



### Notes

- Tested initially and after any design or process changes that may affect these parameters.
- Full device operation requires linear  $V_{CC}$  ramp from  $V_{DR}$  to  $V_{CC(min)} \geq 50\text{ }\mu\text{s}$  or stable at  $V_{CC(min)} \geq 50\text{ }\mu\text{s}$ .

## Switching Characteristics

Over the Operating Range

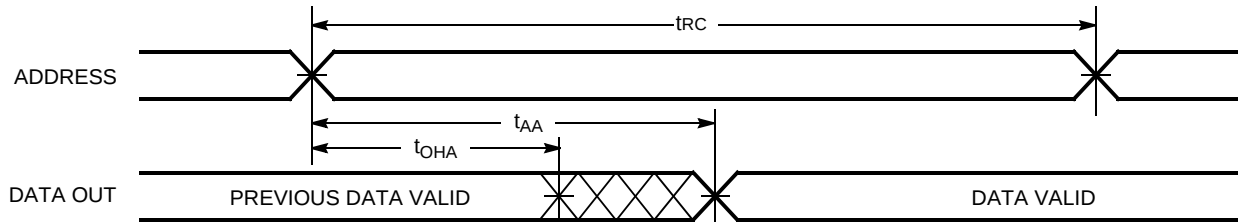
| Parameter <sup>[7]</sup>          | Description                                              | -10 (Industrial / Automotive-A) |     | Unit |
|-----------------------------------|----------------------------------------------------------|---------------------------------|-----|------|
|                                   |                                                          | Min                             | Max |      |
| Read Cycle                        |                                                          |                                 |     |      |
| t <sub>power</sub> <sup>[8]</sup> | V <sub>CC</sub> (typical) to the first access            | 100                             | –   | μs   |
| t <sub>RC</sub>                   | Read cycle time                                          | 10                              | –   | ns   |
| t <sub>AA</sub>                   | Address to data valid                                    | –                               | 10  | ns   |
| t <sub>OHA</sub>                  | Data hold from address change                            | 3                               | –   | ns   |
| t <sub>ACE</sub>                  | $\overline{\text{CE}}$ LOW to data valid                 | –                               | 10  | ns   |
| t <sub>DOE</sub>                  | $\overline{\text{OE}}$ LOW to data valid                 | –                               | 5   | ns   |
| t <sub>LZOE</sub>                 | $\overline{\text{OE}}$ LOW to low Z <sup>[9]</sup>       | 0                               | –   | ns   |
| t <sub>HZOE</sub>                 | $\overline{\text{OE}}$ HIGH to high Z <sup>[9, 10]</sup> | –                               | 5   | ns   |
| t <sub>LZCE</sub>                 | $\overline{\text{CE}}$ LOW to low Z <sup>[9]</sup>       | 3                               | –   | ns   |
| t <sub>HZCE</sub>                 | $\overline{\text{CE}}$ HIGH to high Z <sup>[9, 10]</sup> | –                               | 5   | ns   |
| t <sub>PU</sub> <sup>[11]</sup>   | $\overline{\text{CE}}$ LOW to power-up                   | 0                               | –   | ns   |
| t <sub>PD</sub> <sup>[11]</sup>   | $\overline{\text{CE}}$ HIGH to power-down                | –                               | 10  | ns   |
| t <sub>DBE</sub>                  | Byte Enable to data valid                                | –                               | 5   | ns   |
| t <sub>LZBE</sub>                 | Byte Enable to low Z                                     | 0                               | –   | ns   |
| t <sub>HZBE</sub>                 | Byte Disable to high Z                                   | –                               | 6   | ns   |
| Write Cycle <sup>[12, 13]</sup>   |                                                          |                                 |     |      |
| t <sub>WC</sub>                   | Write cycle time                                         | 10                              | –   | ns   |
| t <sub>SCE</sub>                  | $\overline{\text{CE}}$ LOW to write end                  | 8                               | –   | ns   |
| t <sub>AW</sub>                   | Address set-up to write end                              | 8                               | –   | ns   |
| t <sub>HA</sub>                   | Address hold from write end                              | 0                               | –   | ns   |
| t <sub>SA</sub>                   | Address set-up to write start                            | 0                               | –   | ns   |
| t <sub>PWE</sub>                  | $\overline{\text{WE}}$ pulse width                       | 7                               | –   | ns   |
| t <sub>SD</sub>                   | Data set-up to write end                                 | 5                               | –   | ns   |
| t <sub>HD</sub>                   | Data hold from write end                                 | 0                               | –   | ns   |
| t <sub>LZWE</sub>                 | $\overline{\text{WE}}$ HIGH to low Z <sup>[9]</sup>      | 3                               | –   | ns   |
| t <sub>HZWE</sub>                 | $\overline{\text{WE}}$ LOW to high Z <sup>[9, 10]</sup>  | –                               | 5   | ns   |
| t <sub>BW</sub>                   | Byte enable to end of write                              | 7                               | –   | ns   |

### Notes

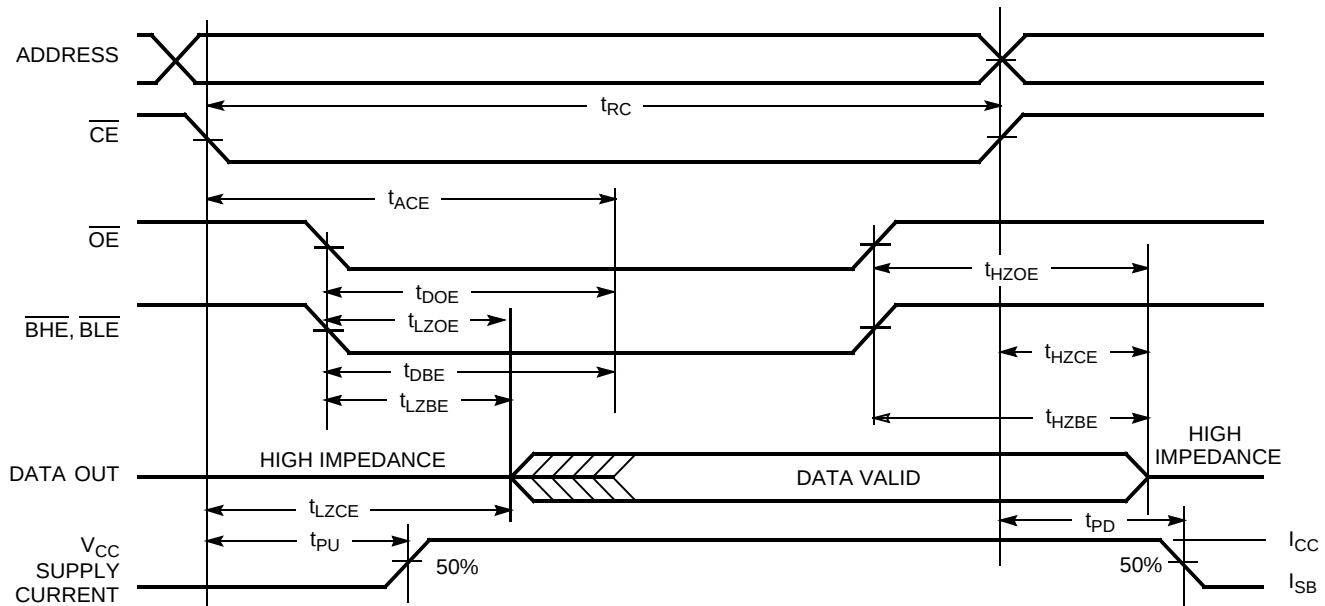
7. Test conditions assume signal transition time of 3 ns or less, timing reference levels of 1.5 V, input pulse levels of 0 to 3.0 V.
8.  $t_{\text{POWER}}$  gives the minimum amount of time that the power supply should be at typical  $V_{\text{CC}}$  values until the first memory access can be performed.
9. At any given temperature and voltage condition,  $t_{\text{HZCE}}$  is less than  $t_{\text{LZCE}}$ ,  $t_{\text{HZOE}}$  is less than  $t_{\text{LZOE}}$ , and  $t_{\text{HZWE}}$  is less than  $t_{\text{LZWE}}$  for any given device.
10.  $t_{\text{HZOE}}$ ,  $t_{\text{HZBE}}$ ,  $t_{\text{HZCE}}$ , and  $t_{\text{HZWE}}$  are specified with a load capacitance of 5 pF as in (c) of [Figure 1 on page 5](#). Transition is measured when the outputs enter a high impedance state.
11. This parameter is guaranteed by design and is not tested.
12. The internal Write time of the memory is defined by the overlap of  $\overline{\text{CE}}$  LOW,  $\overline{\text{WE}}$  LOW and  $\overline{\text{BHE}}/\overline{\text{BLE}}$  LOW.  $\overline{\text{CE}}$ ,  $\overline{\text{WE}}$  and  $\overline{\text{BHE}}/\overline{\text{BLE}}$  must be LOW to initiate a Write and the transition of these signals can terminate the Write. The input data set-up and hold timing should be referenced to the leading edge of the signal that terminates the Write.
13. The minimum write pulse width for Write Cycle No. 3 ( $\overline{\text{WE}}$  Controlled,  $\overline{\text{OE}}$  LOW) should be equal to the sum of  $t_{\text{SD}}$  and  $t_{\text{HZWE}}$ .

## Switching Waveforms

**Figure 3. Read Cycle No. 1 (Address Transition Controlled)** [14, 15]

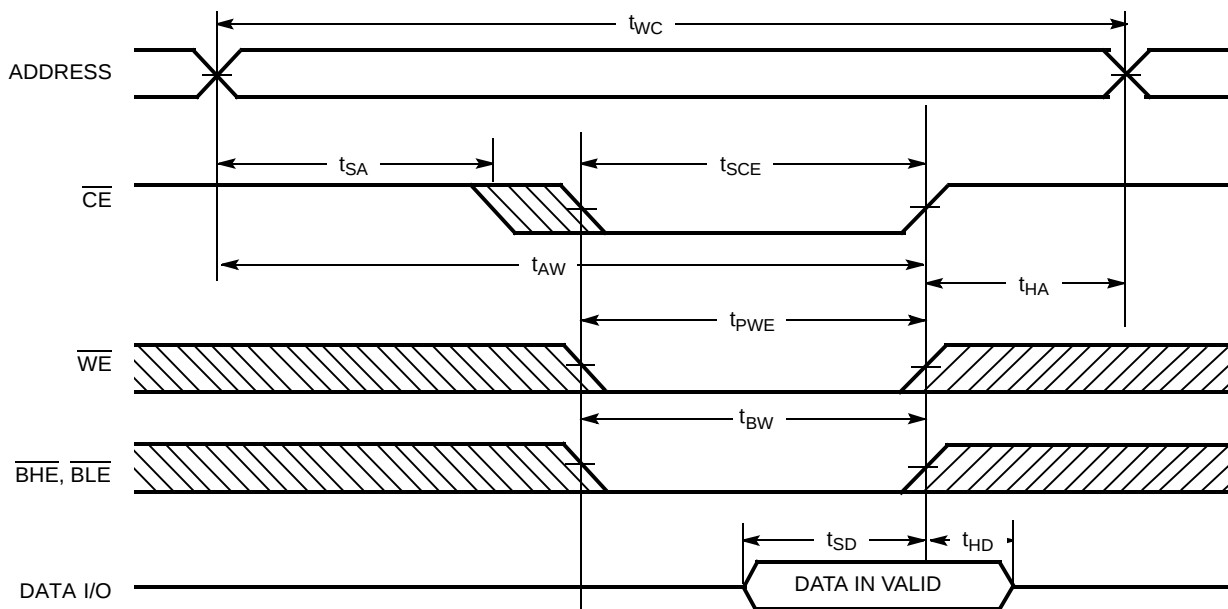
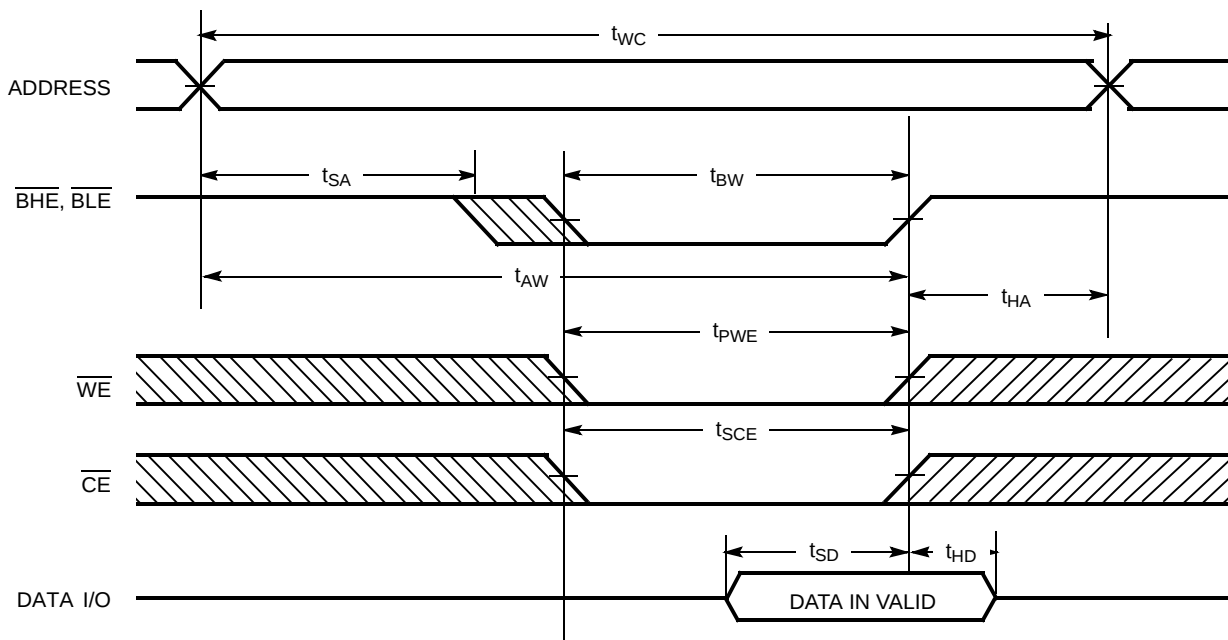


**Figure 4. Read Cycle No. 2 ( $\overline{OE}$  Controlled)** [15, 16]



### Notes

14. Device is continuously selected.  $\overline{OE}$ ,  $\overline{CE}$ ,  $\overline{BHE}$  and/or  $\overline{BLE}$  =  $V_{IL}$ .
15.  $\overline{WE}$  is HIGH for Read cycle.
16. Address valid prior to or coincident with  $\overline{CE}$  transition LOW.

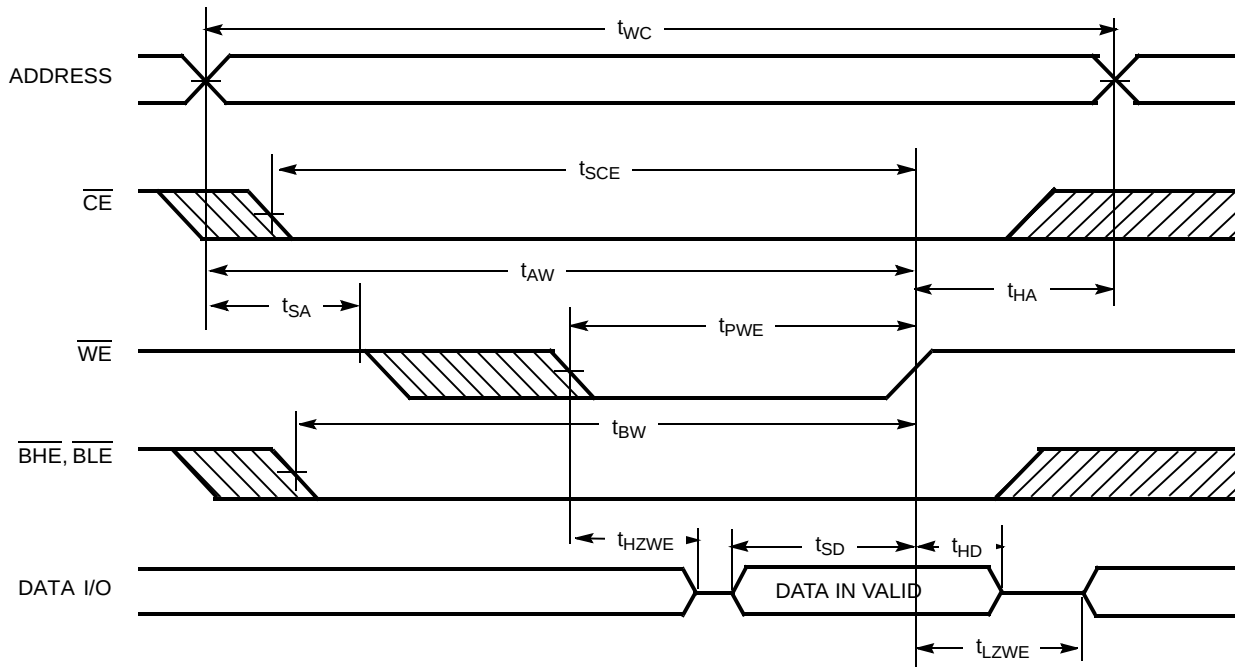
**Switching Waveforms (continued)**
**Figure 5. Write Cycle No. 1 ( $\overline{\text{CE}}$  Controlled) [17, 18]**

**Figure 6. Write Cycle No. 2 ( $\overline{\text{BLE}}$  or  $\overline{\text{BHE}}$  Controlled)**

**Notes**

 17. Data I/O is high impedance if  $\overline{\text{OE}}$  or  $\overline{\text{BHE}}$  and/or  $\overline{\text{BLE}} = V_{IH}$ .

 18. If  $\overline{\text{CE}}$  goes HIGH simultaneously with  $\overline{\text{WE}}$  going HIGH, the output remains in a high-impedance state.

## Switching Waveforms (continued)

**Figure 7. Write Cycle No. 3 ( $\overline{\text{WE}}$  Controlled,  $\overline{\text{OE}}$  LOW) <sup>[19]</sup>**



### Note

19. The minimum write pulse width should be equal to the sum of  $t_{\text{SD}}$  and  $t_{\text{HZWE}}$ .

**Truth Table**

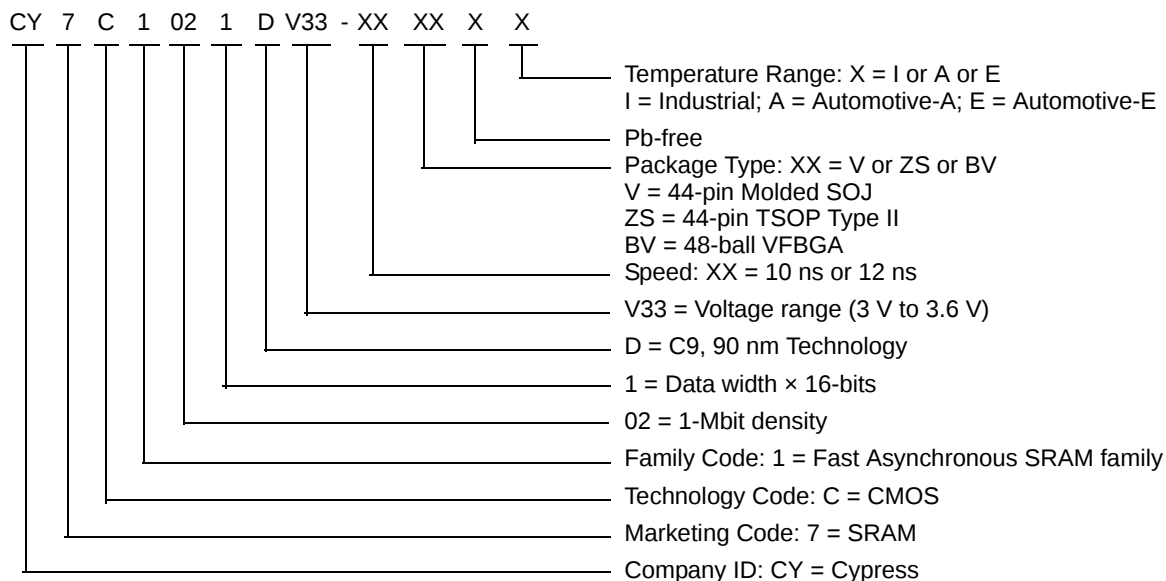
| $\overline{\text{CE}}$ | $\overline{\text{OE}}$ | $\overline{\text{WE}}$ | $\overline{\text{BLE}}$ | $\overline{\text{BHE}}$ | I/O <sub>0</sub> –I/O <sub>7</sub> | I/O <sub>8</sub> –I/O <sub>15</sub> | Mode                       | Power                      |
|------------------------|------------------------|------------------------|-------------------------|-------------------------|------------------------------------|-------------------------------------|----------------------------|----------------------------|
| H                      | X                      | X                      | X                       | X                       | High-Z                             | High-Z                              | Power-down                 | Standby (I <sub>SB</sub> ) |
| L                      | L                      | H                      | L                       | L                       | Data Out                           | Data Out                            | Read – All bits            | Active (I <sub>CC</sub> )  |
|                        |                        |                        | L                       | H                       | Data Out                           | High-Z                              | Read – Lower bits only     | Active (I <sub>CC</sub> )  |
|                        |                        |                        | H                       | L                       | High-Z                             | Data Out                            | Read – Upper bits only     | Active (I <sub>CC</sub> )  |
| L                      | X                      | L                      | L                       | L                       | Data In                            | Data In                             | Write – All bits           | Active (I <sub>CC</sub> )  |
|                        |                        |                        | L                       | H                       | Data In                            | High-Z                              | Write – Lower bits only    | Active (I <sub>CC</sub> )  |
|                        |                        |                        | H                       | L                       | High-Z                             | Data In                             | Write – Upper bits only    | Active (I <sub>CC</sub> )  |
| L                      | H                      | H                      | X                       | X                       | High-Z                             | High-Z                              | Selected, outputs disabled | Active (I <sub>CC</sub> )  |
| L                      | X                      | X                      | H                       | H                       | High-Z                             | High-Z                              | Selected, outputs disabled | Active (I <sub>CC</sub> )  |

## Ordering Information

| Speed (ns) | Ordering Code       | Package Diagram | Package Type                          | Operating Range |
|------------|---------------------|-----------------|---------------------------------------|-----------------|
| 10         | CY7C1021DV33-10VXI  | 51-85082        | 44-pin (400-Mil) Molded SOJ (Pb-free) | Industrial      |
|            | CY7C1021DV33-10ZSXI | 51-85087        | 44-pin TSOP Type II (Pb-free)         |                 |
|            | CY7C1021DV33-10BVXI | 51-85150        | 48-ball VFBGA (Pb-free)               |                 |
| 10         | CY7C1021DV33-10ZSXA | 51-85087        | 44-pin TSOP Type II (Pb-free)         | Automotive-A    |

Please contact your local Cypress sales representative for availability of these parts.

## Ordering Code Definitions



## Package Diagrams

Figure 8. 44-pin SOJ (400 Mils) V44.4 Package Outline, 51-85082

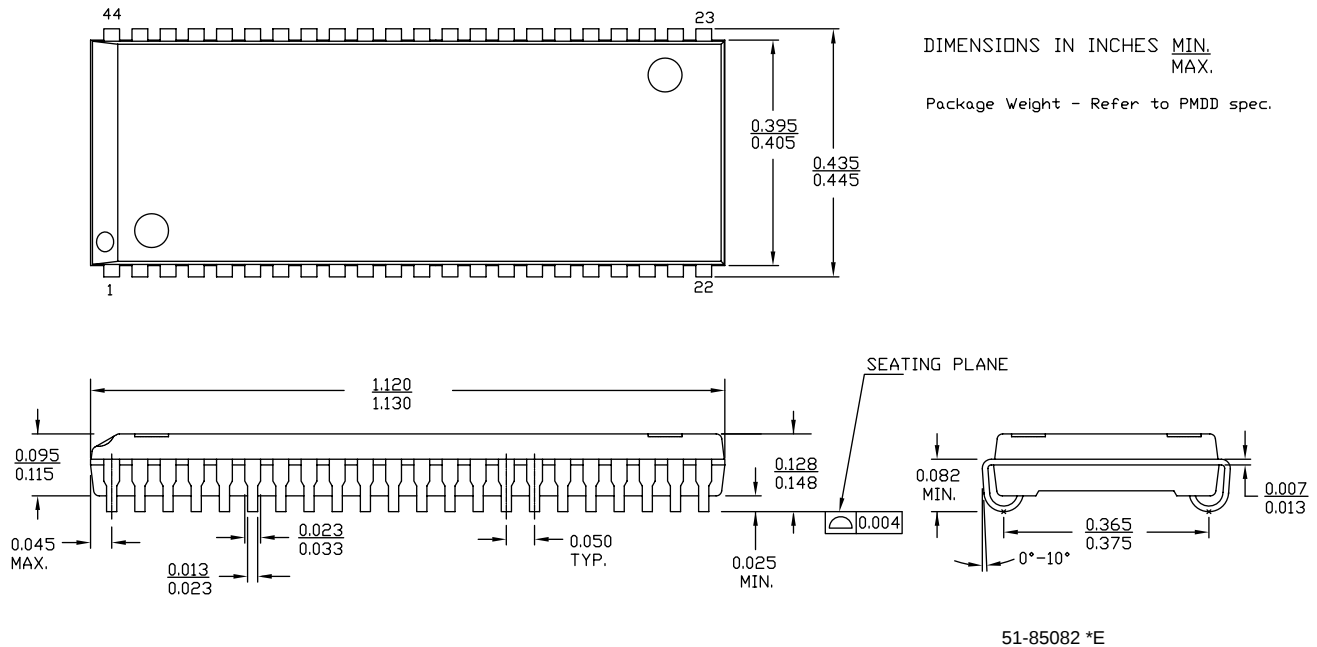
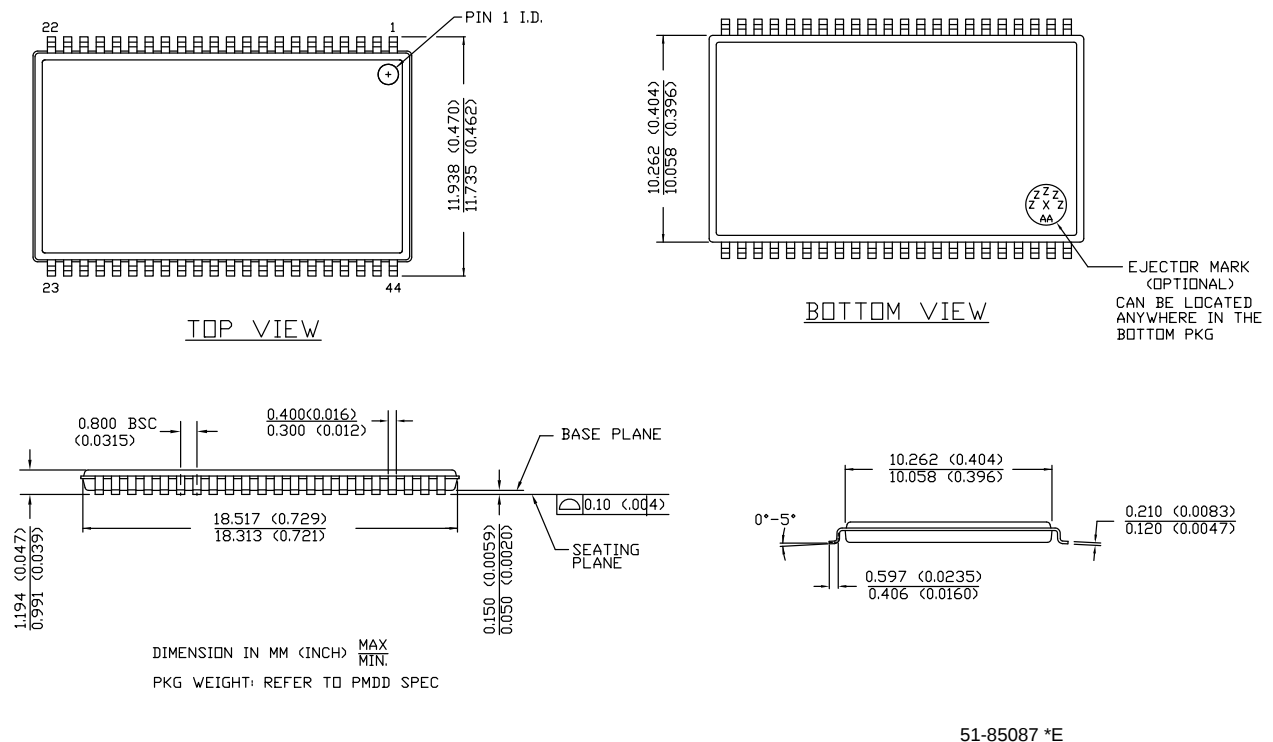
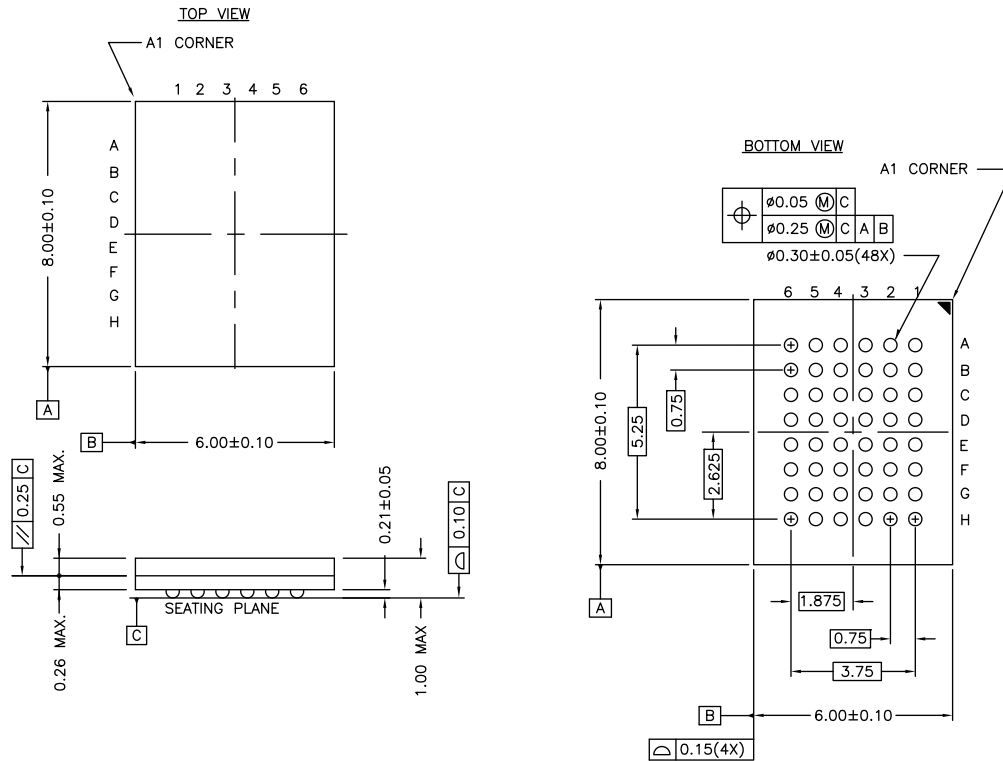


Figure 9. 44-pin TSOP Z44-II Package Outline, 51-85087



**Package Diagrams** (continued)

**Figure 10. 48-ball VFBGA (6 × 8 × 1.0 mm) BV48/BZ48 Package Outline, 51-85150**



NOTE:  
PACKAGE WEIGHT: See Cypress Package Material Declaration Datasheet (PMDD)  
posted on the Cypress web.

51-85150 \*H

## Acronyms

| Acronym                 | Description                             |
|-------------------------|-----------------------------------------|
| $\overline{\text{BHE}}$ | Byte High Enable                        |
| $\overline{\text{BLE}}$ | Byte Low Enable                         |
| CMOS                    | Complementary Metal Oxide Semiconductor |
| $\overline{\text{CE}}$  | Chip Enable                             |
| I/O                     | Input/Output                            |
| $\overline{\text{OE}}$  | Output Enable                           |
| SOJ                     | Small-Outline J-leaded                  |
| SRAM                    | Static Random Access Memory             |
| TSOP                    | Thin Small-Outline Package              |
| TTL                     | Transistor-Transistor Logic             |
| VFBGA                   | Very Fine-Pitch Ball Grid Array         |
| $\overline{\text{WE}}$  | Write Enable                            |

## Document Conventions

### Units of Measure

| Symbol | Unit of Measure |
|--------|-----------------|
| °C     | degree Celsius  |
| MHz    | megahertz       |
| μA     | microampere     |
| μs     | microsecond     |
| mA     | milliampere     |
| ns     | nanosecond      |
| %      | percent         |
| pF     | picofarad       |
| V      | volt            |
| W      | watt            |

## Document History Page

| Document Title: CY7C1021DV33, 1-Mbit (64 K × 16) Static RAM<br>Document Number: 38-05460 |         |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| Rev.                                                                                     | ECN No. | Issue Date | Orig. of Change | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| **                                                                                       | 201560  | See ECN    | SWI             | Advance Information data sheet for C9 IPP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| *A                                                                                       | 233693  | See ECN    | RKF             | Updated <a href="#">Electrical Characteristics</a> (modified as per Eros (Spec # 01-02165)).<br>Updated <a href="#">Ordering Information</a> (included Pb-free offering).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| *B                                                                                       | 263769  | See ECN    | RKF             | Updated <a href="#">Functional Description</a> (Changed I/O <sub>1</sub> –I/O <sub>16</sub> to I/O <sub>0</sub> –I/O <sub>15</sub> ).<br>Updated <a href="#">Pin Configurations</a> (Changed I/O <sub>1</sub> –I/O <sub>16</sub> to I/O <sub>0</sub> –I/O <sub>15</sub> ).<br>Added <a href="#">Data Retention Characteristics</a> and <a href="#">Data Retention Waveform</a> .<br>Updated <a href="#">Switching Characteristics</a> (Added T <sub>power</sub> parameter and its details).<br>Updated <a href="#">Ordering Information</a> (Added shade, no change in part numbers).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| *C                                                                                       | 307601  | See ECN    | RKF             | Updated <a href="#">Selection Guide</a> (Reduced Speed bins to -8 and -10 ns (Removed -12 and -15 speed bins related information)).<br>Updated <a href="#">Electrical Characteristics</a> (Reduced Speed bins to -8 and -10 ns (Removed -12 and -15 speed bins related information)).<br>Updated <a href="#">Switching Characteristics</a> (Reduced Speed bins to -8 and -10 ns (Removed -12 and -15 speed bins related information)).<br>Updated <a href="#">Ordering Information</a> (Updated part numbers).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| *D                                                                                       | 520652  | See ECN    | VKN             | Changed status from Preliminary to Final.<br>Updated <a href="#">Features</a> (Removed Commercial Operating range related information and included Automotive-A, Automotive-E Operating range related information).<br>Updated <a href="#">Selection Guide</a> (Removed -8 speed bin related information and included -12 speed bin related information).<br>Updated <a href="#">Operating Range</a> (Removed Commercial Operating range related information and included Automotive-A, Automotive-E Operating range related information).<br>Updated <a href="#">Electrical Characteristics</a> (Updated <a href="#">DC Electrical Characteristics</a> (Removed -8 speed bin related information and included -12 speed bin related information, removed Commercial Operating range related information and included Automotive-A, Automotive-E Operating range related information),<br>Updated Note 2 (Changed V <sub>IH(max)</sub> from V <sub>CC</sub> + 2 V to V <sub>CC</sub> + 1 V), added I <sub>CC</sub> parameter values for the frequencies 83 MHz, 66 MHz and 40 MHz).<br>Updated <a href="#">Thermal Resistance</a> (Replaced TBD with values for all packages).<br>Updated <a href="#">Switching Characteristics</a> (Removed -8 speed bin related information and included -12 speed bin related information, removed Commercial Operating range related information and included Automotive-A, Automotive-E Operating range related information).<br>Updated <a href="#">Data Retention Characteristics</a> (Removed Commercial Operating range related information and included Automotive-A, Automotive-E Operating range related information).<br>Updated <a href="#">Ordering Information</a> (Updated part numbers). |
| *E                                                                                       | 2898399 | 03/24/2010 | AJU             | Updated <a href="#">Package Diagrams</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| *F                                                                                       | 3109897 | 12/14/2010 | AJU             | Added <a href="#">Ordering Code Definitions</a> .<br>Updated <a href="#">Package Diagrams</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**Document History Page** (continued)

| Document Title: CY7C1021DV33, 1-Mbit (64 K × 16) Static RAM<br>Document Number: 38-05460 |         |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------|---------|------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rev.                                                                                     | ECN No. | Issue Date | Orig. of Change | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| *G                                                                                       | 3421856 | 10/25/2011 | TAVA            | Updated <a href="#">Features</a> (Removed Automotive-E Operating range related information).<br>Updated <a href="#">Selection Guide</a> (Removed Automotive-E Operating range related information, removed -12 speed bin related information).<br>Updated <a href="#">Operating Range</a> (Removed Automotive-E Operating range related information, removed -12 speed bin related information).<br>Updated <a href="#">Electrical Characteristics</a> (Updated <a href="#">DC Electrical Characteristics</a> (Removed Automotive-E Operating range related information, removed -12 speed bin related information)).<br>Updated <a href="#">Switching Characteristics</a> (Removed Automotive-E Operating range related information, removed -12 speed bin related information).<br>Updated <a href="#">Data Retention Characteristics</a> (Removed Automotive-E Operating range related information).<br>Updated <a href="#">Switching Waveforms</a> .<br>Updated <a href="#">Ordering Information</a> (Updated part numbers).<br>Updated <a href="#">Package Diagrams</a> .<br>Updated to new template. |
| *H                                                                                       | 4578364 | 11/24/2014 | MEMJ            | Updated <a href="#">Functional Description</a> :<br>Added "For a complete list of related resources, <a href="#">click here</a> ." at the end.<br><br>Updated <a href="#">Switching Characteristics</a> :<br>Added Note 13 and referred the same note in "Write Cycle".<br><br>Updated <a href="#">Switching Waveforms</a> :<br>Added Note 19 and referred the same note in <a href="#">Figure 7</a> .<br><br>Updated <a href="#">Ordering Information</a> (Removed shade, no change in part numbers).<br><br>Updated <a href="#">Package Diagrams</a> :<br>spec 51-85082 – Changed revision from *D to *E.<br>spec 51-85087 – Changed revision from *D to *E.<br>spec 51-85150 – Changed revision from *G to *H.<br><br>Added <a href="#">Acronyms</a> and <a href="#">Units of Measure</a> .<br><br>Updated to new template.<br><br>Completing Sunset Review.                                                                                                                                                                                                                                            |

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