

## Features

- Pin- and function-compatible with CY7C1020CV33
- Temperature Ranges
  - Commercial: 0 °C to 70 °C
  - Industrial: -40 °C to 85 °C
  - Automotive: -40 °C to 125 °C
- High speed
  - $t_{AA} = 10$  ns
- CMOS for optimum speed/power
- Low active power
  - 325 mW (max)
- Automatic power-down when deselected
- Independent control of upper and lower bits
- Available in Pb-free and non Pb-free 44-pin TSOP II package

## Functional Description

The CY7C1020CV33 is a high-performance CMOS static RAM organized as 32,768 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 ( $\overline{BLE}$ ) is LOW, then data from I/O pins ( $I/O_1$  through  $I/O_8$ ), is written into the location specified on the address pins ( $A_0$  through  $A_{14}$ ). If Byte High Enable ( $\overline{BHE}$ ) is LOW, then data from I/O pins ( $I/O_9$  through  $I/O_{16}$ ) is written into the location specified on the address pins ( $A_0$  through  $A_{14}$ ).

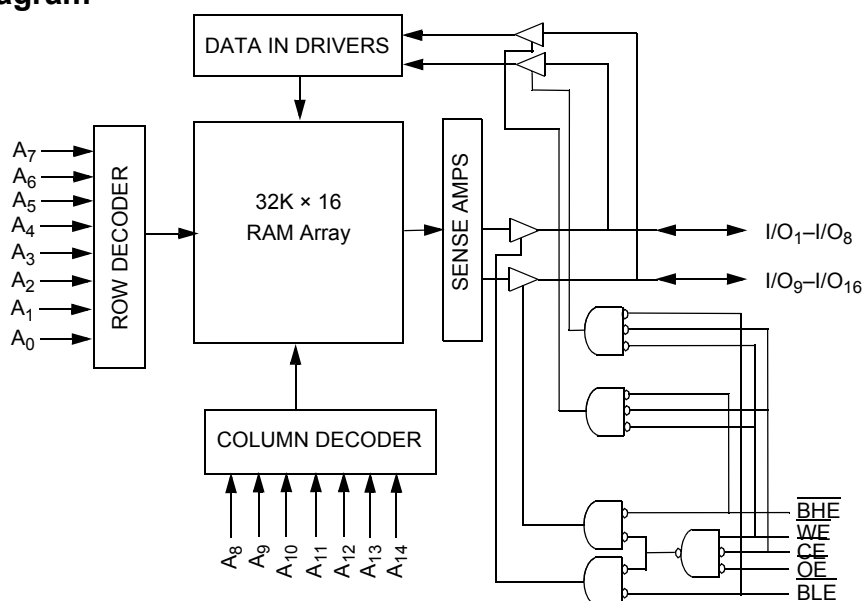
Reading from the device is accomplished by taking Chip Enable ( $\overline{CE}$ ) and Output Enable ( $\overline{OE}$ ) LOW while forcing the Write Enable (WE) HIGH. If Byte Low Enable ( $\overline{BLE}$ ) is LOW, then data from the memory location specified by the address pins will appear on  $I/O_1$  to  $I/O_8$ . If Byte High Enable ( $\overline{BHE}$ ) is LOW, then data from memory will appear on  $I/O_9$  to  $I/O_{16}$ . See the truth table at the back of this data sheet for a complete description of read and write modes.

The input/output pins ( $I/O_1$  through  $I/O_{16}$ ) are placed in a high-impedance state when the device is deselected ( $\overline{CE}$  HIGH), the outputs are disabled ( $\overline{OE}$  HIGH), the  $\overline{BHE}$  and  $\overline{BLE}$  are disabled ( $\overline{BHE}$ ,  $\overline{BLE}$  HIGH), or during a write operation ( $\overline{CE}$  LOW, and WE LOW).

The CY7C1020CV33 is available in standard 44-pin TSOP Type II package.

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

## Logic Block Diagram



## Contents

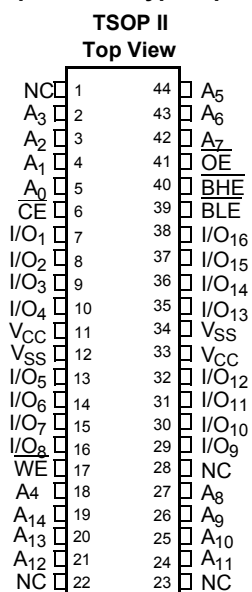
|                                          |           |                                                      |           |
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## Selection Guide

| Description                  |                       | -10 | -12 | -15 | Unit |
|------------------------------|-----------------------|-----|-----|-----|------|
| Maximum Access Time          |                       | 10  | 12  | 15  | ns   |
| Maximum Operating Current    | Commercial/Industrial | 90  | 85  | 80  | mA   |
|                              | Automotive            | –   | –   | 85  | mA   |
| Maximum CMOS Standby Current | Commercial/Industrial | 5   | 5   | 5   | mA   |
|                              | Automotive            | –   | –   | 10  | mA   |

## Pin Configuration

Figure 1. 44-pin TSOP Type II pinout (Top View) <sup>[1]</sup>



### Note

1. NC pins are not connected on the die.

## Pin Definitions

| Pin Name                                       | Pin Number                                             | I/O Type      | Description                                                                                                                                                                                                   |
|------------------------------------------------|--------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A <sub>0</sub> –A <sub>14</sub>                | 5, 4, 3, 2, 18, 44, 43, 42, 27, 26, 25, 24, 21, 20, 19 | Input         | <b>Address Inputs used to select one of the address locations.</b>                                                                                                                                            |
| I/O <sub>1</sub> –I/O <sub>16</sub>            | 7–10, 13–16, 29–32, 35–38                              | Input/Output  | <b>Bidirectional Data I/O lines.</b> Used as input or output lines depending on operation.                                                                                                                    |
| NC                                             | 1, 22, 23, 28                                          | No Connect    | <b>No Connects.</b> Not connected to the die.                                                                                                                                                                 |
| $\overline{\text{WE}}$                         | 17                                                     | Input/Control | <b>Write Enable Input, active LOW.</b> When selected LOW, a Write is conducted. When deselected HIGH, a Read is conducted.                                                                                    |
| $\overline{\text{CE}}$                         | 6                                                      | Input/Control | <b>Chip Enable Input, active LOW.</b> When LOW, selects the chip. When HIGH, deselects the chip.                                                                                                              |
| $\overline{\text{BHE}}, \overline{\text{BLE}}$ | 40, 39                                                 | Input/Control | <b>Byte Write Select Inputs, active LOW.</b> $\overline{\text{BHE}}$ controls I/O <sub>16</sub> –I/O <sub>9</sub> , $\overline{\text{BLE}}$ controls I/O <sub>8</sub> –I/O <sub>1</sub> .                     |
| $\overline{\text{OE}}$                         | 41                                                     | Input/Control | <b>Output Enable, active LOW.</b> Controls the direction of the I/O pins. When LOW, the I/O pins are allowed to behave as outputs. When deasserted HIGH, I/O pins are tri-stated, and act as input data pins. |
| V <sub>SS</sub>                                | 12, 34                                                 | Ground        | <b>Ground for the device.</b> Should be connected to ground of the system.                                                                                                                                    |
| V <sub>CC</sub>                                | 11, 33                                                 | Power Supply  | <b>Power Supply inputs to the device.</b>                                                                                                                                                                     |

## Maximum Ratings

Exceeding maximum ratings may shorten the useful life of the device. 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> ..... -0.5 V to +4.6 V

DC voltage applied to outputs in high Z State <sup>[2]</sup> ..... -0.5 V to  $V_{CC} + 0.5$  V

DC input voltage <sup>[2]</sup> ..... -0.5 V to  $V_{CC} + 0.5$  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 | $V_{CC}$    |
|------------|---------------------|-------------|
| Commercial | 0 °C to +70 °C      | 3.3 V ± 10% |
| Industrial | -40 °C to +85 °C    | 3.3 V ± 10% |
| Automotive | -40 °C to +125 °C   | 3.3 V ± 10% |

## Electrical Characteristics

Over the Operating Range

| Parameter        | Description                                   | Test Conditions                                                                                                                                        |                         | -10  |                       | -12  |                       | -15  |                       | Unit |
|------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|
|                  |                                               |                                                                                                                                                        |                         | Min  | Max                   | Min  | Max                   | Min  | Max                   |      |
| V <sub>OH</sub>  | Output HIGH voltage                           | V <sub>CC</sub> = Min, I <sub>OH</sub> = −4.0 mA                                                                                                       |                         | 2.4  | −                     | 2.4  | −                     | 2.4  | −                     | V    |
| V <sub>OL</sub>  | Output LOW voltage                            | V <sub>CC</sub> = Min, I <sub>OL</sub> = 8.0 mA                                                                                                        |                         | −    | 0.4                   | −    | 0.4                   | −    | 0.4                   | V    |
| V <sub>IH</sub>  | Input HIGH voltage                            |                                                                                                                                                        |                         | 2.0  | V <sub>CC</sub> + 0.3 | 2.0  | V <sub>CC</sub> + 0.3 | 2.0  | V <sub>CC</sub> + 0.3 | V    |
| V <sub>IL</sub>  | Input LOW voltage <sup>[2]</sup>              |                                                                                                                                                        |                         | −0.3 | 0.8                   | −0.3 | 0.8                   | −0.3 | 0.8                   | V    |
| I <sub>IX</sub>  | Input leakage current                         | GND ≤ V <sub>I</sub> ≤ V <sub>CC</sub>                                                                                                                 | Commercial / Industrial | −1   | +1                    | −1   | +1                    | −1   | +1                    | μA   |
|                  |                                               |                                                                                                                                                        | Automotive              | −    | −                     | −    | −                     | −20  | +20                   | μA   |
| I <sub>OZ</sub>  | Output leakage current                        | GND ≤ V <sub>I</sub> ≤ V <sub>CC</sub> ,<br>Output Disabled                                                                                            | Commercial / Industrial | −1   | +1                    | −1   | +1                    | −1   | +1                    | μA   |
|                  |                                               |                                                                                                                                                        | Automotive              | −    | −                     | −    | −                     | −20  | +20                   | μA   |
| I <sub>CC</sub>  | V <sub>CC</sub> operating supply current      | V <sub>CC</sub> = Max,<br>I <sub>OUT</sub> = 0 mA,<br>f = f <sub>MAX</sub> = 1/t <sub>RC</sub>                                                         | Commercial / Industrial | −    | 90                    | −    | 85                    | −    | 80                    | mA   |
|                  |                                               |                                                                                                                                                        | Automotive              | −    | −                     | −    | −                     | −    | 85                    | mA   |
| I <sub>SB1</sub> | Automatic CE power-down current – TTL Inputs  | Max V <sub>CC</sub> ,<br>CE ≥ V <sub>IH</sub> ,<br>V <sub>IN</sub> ≥ V <sub>IH</sub> or<br>V <sub>IN</sub> ≤ V <sub>IL</sub> ,<br>f = f <sub>MAX</sub> | Commercial / Industrial | −    | 15                    | −    | 15                    | −    | 15                    | mA   |
|                  |                                               |                                                                                                                                                        | Automotive              | −    | −                     | −    | −                     | −    | 20                    | mA   |
| I <sub>SB2</sub> | Automatic CE power-down current – CMOS inputs | Max V <sub>CC</sub> ,<br>CE ≥ V <sub>CC</sub> − 0.3 V,<br>V <sub>IN</sub> ≥ V <sub>CC</sub> − 0.3 V,<br>or V <sub>IN</sub> ≤ 0.3 V,<br>f = 0           | Commercial / Industrial | −    | 5                     | −    | 5                     | −    | 5                     | mA   |
|                  |                                               |                                                                                                                                                        | Automotive              | −    | −                     | −    | −                     | −    | 10                    | mA   |

### Note

2.  $V_{IL}(\text{min}) = -2.0 \text{ V}$  and  $V_{IH}(\text{max}) = V_{CC} + 0.5 \text{ V}$  for pulse durations of less than 20 ns.

## Capacitance

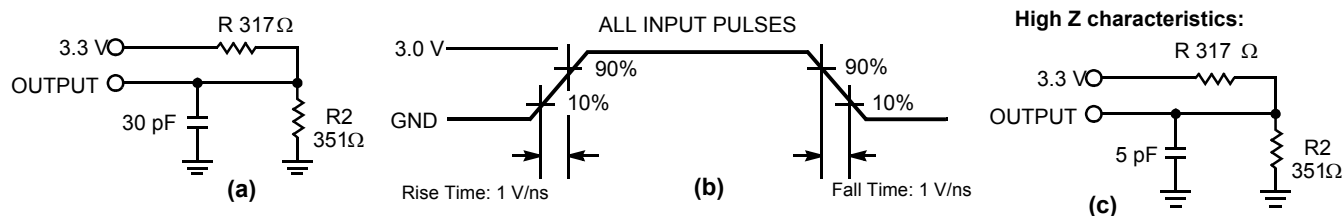
| Parameter <sup>[3]</sup> | Description        | Test Conditions                                                         | Max | Unit |
|--------------------------|--------------------|-------------------------------------------------------------------------|-----|------|
| $C_{IN}$                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

## Thermal Resistance

| Parameter <sup>[3]</sup> | Description                              | Test Conditions                                                                                              | 44-pin TSOP-II | Unit               |
|--------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------|--------------------|
| $\Theta_{JA}$            | Thermal resistance (junction to ambient) | Test conditions follow standard test methods and procedures for measuring thermal impedance, per EIA/JESD51. | 76.92          | $^\circ\text{C/W}$ |
| $\Theta_{JC}$            | Thermal resistance (junction to case)    |                                                                                                              | 15.86          | $^\circ\text{C/W}$ |

## AC Test Loads and Waveforms

Figure 2. AC Test Loads and Waveforms <sup>[4]</sup>



### Notes

- Tested initially and after any design or process changes that may affect these parameters.
- 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.

## Switching Characteristics

Over the Operating Range

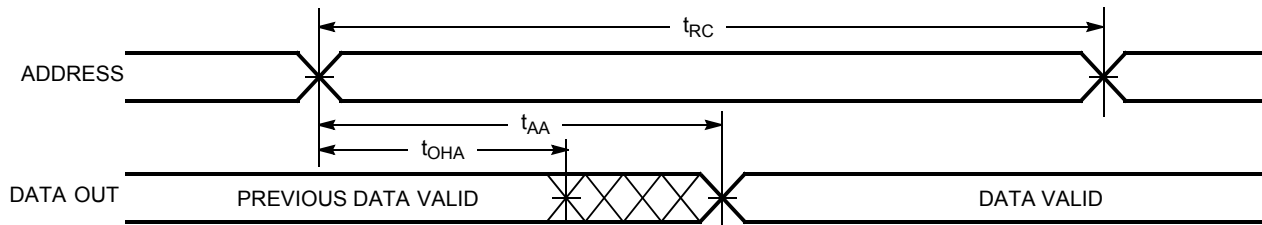
| Parameter <sup>[5]</sup>       | Description                                             | -10 |     | -12 |     | -15 |     | Unit |
|--------------------------------|---------------------------------------------------------|-----|-----|-----|-----|-----|-----|------|
|                                |                                                         | Min | Max | Min | Max | Min | Max |      |
| Read Cycle                     |                                                         |     |     |     |     |     |     |      |
| t <sub>RC</sub>                | Read cycle time                                         | 10  | –   | 12  | –   | 15  | –   | ns   |
| t <sub>AA</sub>                | Address to data valid                                   | –   | 10  | –   | 12  | –   | 15  | ns   |
| t <sub>OHA</sub>               | Data hold from address change                           | 3   | –   | 3   | –   | 3   | –   | ns   |
| t <sub>ACE</sub>               | $\overline{\text{CE}}$ LOW to data valid                | –   | 10  | –   | 12  | –   | 15  | ns   |
| t <sub>DOE</sub>               | $\overline{\text{OE}}$ LOW to data valid                | –   | 5   | –   | 6   | –   | 7   | ns   |
| t <sub>LZOE</sub>              | $\overline{\text{OE}}$ LOW to low Z <sup>[6]</sup>      | 0   | –   | 0   | –   | 0   | –   | ns   |
| t <sub>HZOE</sub>              | $\overline{\text{OE}}$ HIGH to high Z <sup>[6, 7]</sup> | –   | 5   | –   | 6   | –   | 7   | ns   |
| t <sub>LZCE</sub>              | $\overline{\text{CE}}$ LOW to low Z <sup>[6]</sup>      | 3   | –   | 3   | –   | 3   | –   | ns   |
| t <sub>HZCE</sub>              | $\overline{\text{CE}}$ HIGH to high Z <sup>[6, 7]</sup> | –   | 5   | –   | 6   | –   | 7   | ns   |
| t <sub>PU</sub> <sup>[8]</sup> | $\overline{\text{CE}}$ LOW to power-up                  | 0   | –   | 0   | –   | 0   | –   | ns   |
| t <sub>PD</sub> <sup>[8]</sup> | $\overline{\text{CE}}$ HIGH to power-down               | –   | 10  | –   | 12  | –   | 15  | ns   |
| t <sub>DBE</sub>               | Byte enable to data valid                               | –   | 5   | –   | 6   | –   | 7   | ns   |
| t <sub>LZBE</sub>              | Byte enable to low Z                                    | 0   | –   | 0   | –   | 0   | –   | ns   |
| t <sub>HZBE</sub>              | Byte disable to high Z                                  | –   | 5   | –   | 6   | –   | 7   | ns   |
| Write Cycle <sup>[9, 10]</sup> |                                                         |     |     |     |     |     |     |      |
| t <sub>WC</sub>                | Write cycle time                                        | 10  | –   | 12  | –   | 15  | –   | ns   |
| t <sub>SCE</sub>               | $\overline{\text{CE}}$ LOW to write end                 | 8   | –   | 9   | –   | 10  | –   | ns   |
| t <sub>AW</sub>                | Address set-up to write end                             | 7   | –   | 8   | –   | 10  | –   | ns   |
| t <sub>HA</sub>                | Address hold from write end                             | 0   | –   | 0   | –   | 0   | –   | ns   |
| t <sub>SA</sub>                | Address set-up to write start                           | 0   | –   | 0   | –   | 0   | –   | ns   |
| t <sub>PWE</sub>               | $\overline{\text{WE}}$ pulse width                      | 7   | –   | 8   | –   | 10  | –   | ns   |
| t <sub>SD</sub>                | Data set-up to write end                                | 5   | –   | 6   | –   | 8   | –   | ns   |
| t <sub>HD</sub>                | Data hold from write end                                | 0   | –   | 0   | –   | 0   | –   | ns   |
| t <sub>LZWE</sub>              | $\overline{\text{WE}}$ HIGH to low Z <sup>[6]</sup>     | 3   | –   | 3   | –   | 3   | –   | ns   |
| t <sub>HZWE</sub>              | $\overline{\text{WE}}$ LOW to high Z <sup>[6, 7]</sup>  | –   | 5   | –   | 6   | –   | 7   | ns   |
| t <sub>BW</sub>                | Byte enable to end of write                             | 7   | –   | 8   | –   | 9   | –   | ns   |

### Notes

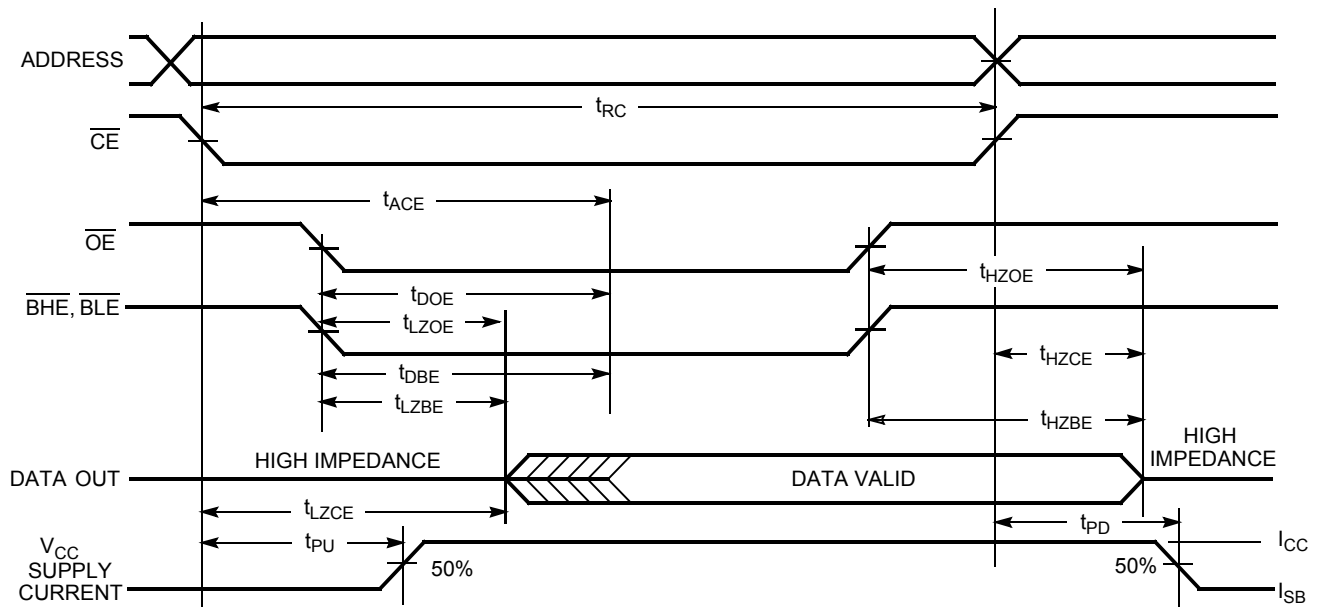
- Test conditions assume signal transition time of 3 ns or less, timing reference levels of 1.5 V, input pulse levels of 0 to 3.0 V.
- At any given temperature and voltage condition,  $t_{HZCE}$  is less than  $t_{LZCE}$ ,  $t_{HZOE}$  is less than  $t_{LZOE}$ , and  $t_{HZWE}$  is less than  $t_{LZWE}$  for any given device.
- $t_{HZOE}$ ,  $t_{HZBE}$ ,  $t_{HZCE}$ , and  $t_{HZWE}$  are specified with a load capacitance of 5 pF as in part (c) of AC Test Loads. Transition is measured  $\pm 500$  mV from steady-state voltage.
- This parameter is guaranteed by design and is not tested.
- The internal Write time of the memory is defined by the overlap of  $\overline{CE}$  LOW,  $\overline{WE}$  LOW and  $\overline{BHE}/\overline{BLE}$  LOW.  $\overline{CE}$ ,  $\overline{WE}$  and  $\overline{BHE}/\overline{BLE}$  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.
- The minimum write pulse width for Write Cycle No. 3 ( $\overline{WE}$  Controlled,  $\overline{OE}$  LOW) should be sum of  $t_{SD}$  and  $t_{HZWE}$ .

## Switching Waveforms

**Figure 3. Read Cycle No. 1** [11, 12]



**Figure 4. Read Cycle No. 2 ( $\overline{OE}$  Controlled)** [12, 13]



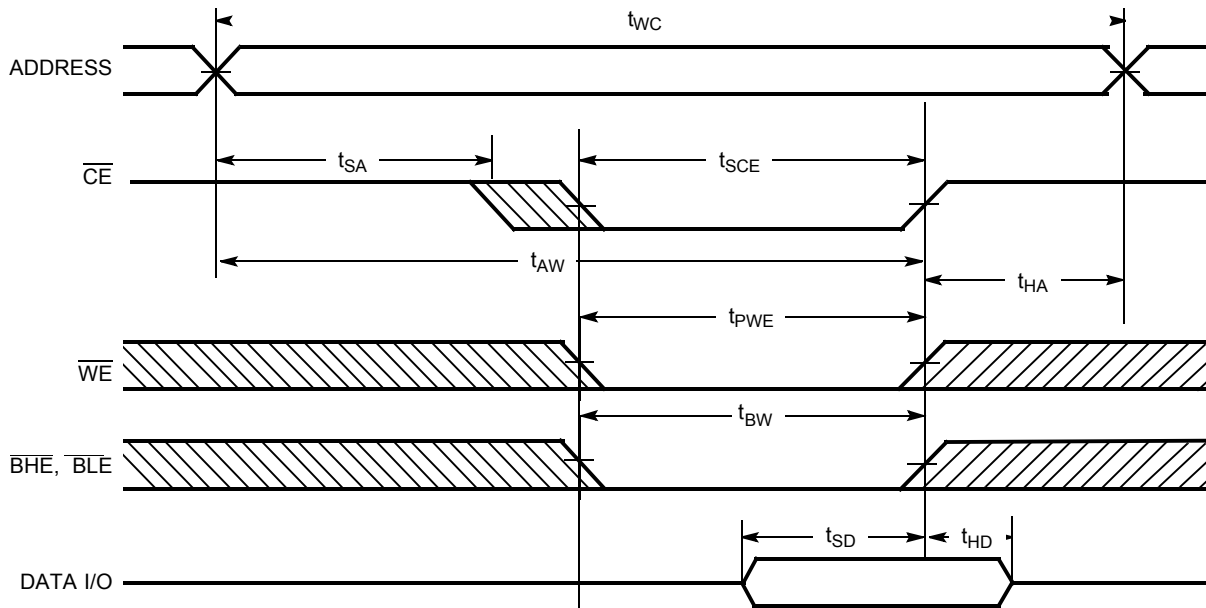
### Notes

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

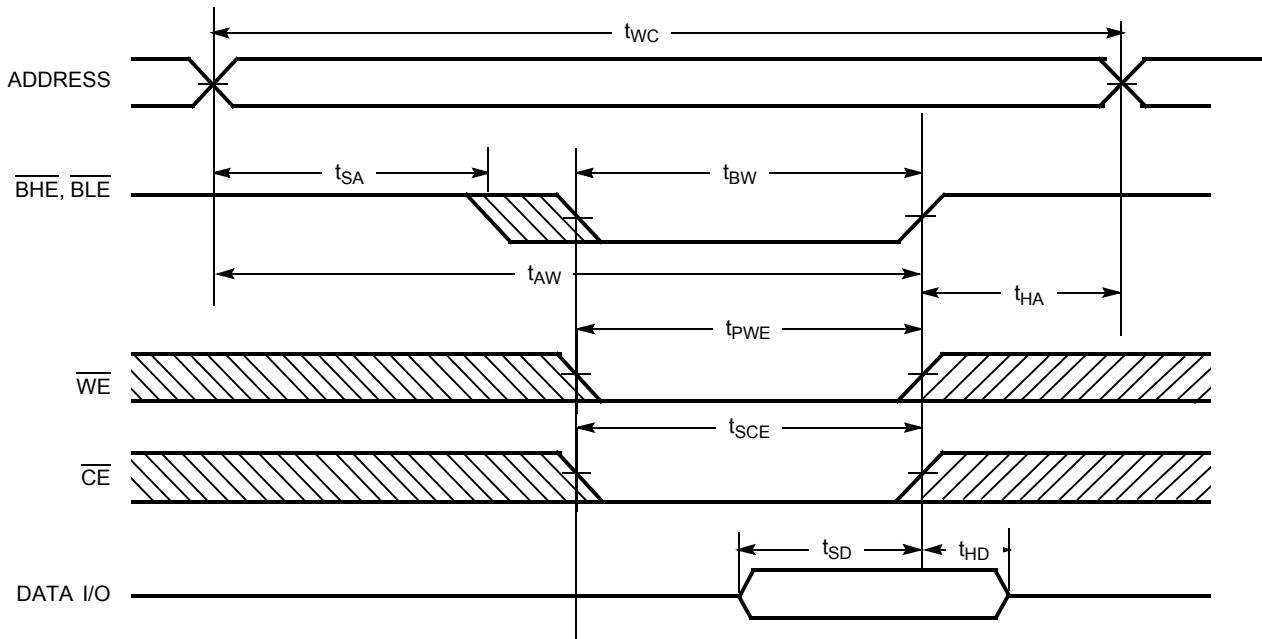


## Switching Waveforms (continued)

**Figure 5. Write Cycle No. 1 ( $\overline{\text{CE}}$  Controlled)** [14, 15]



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



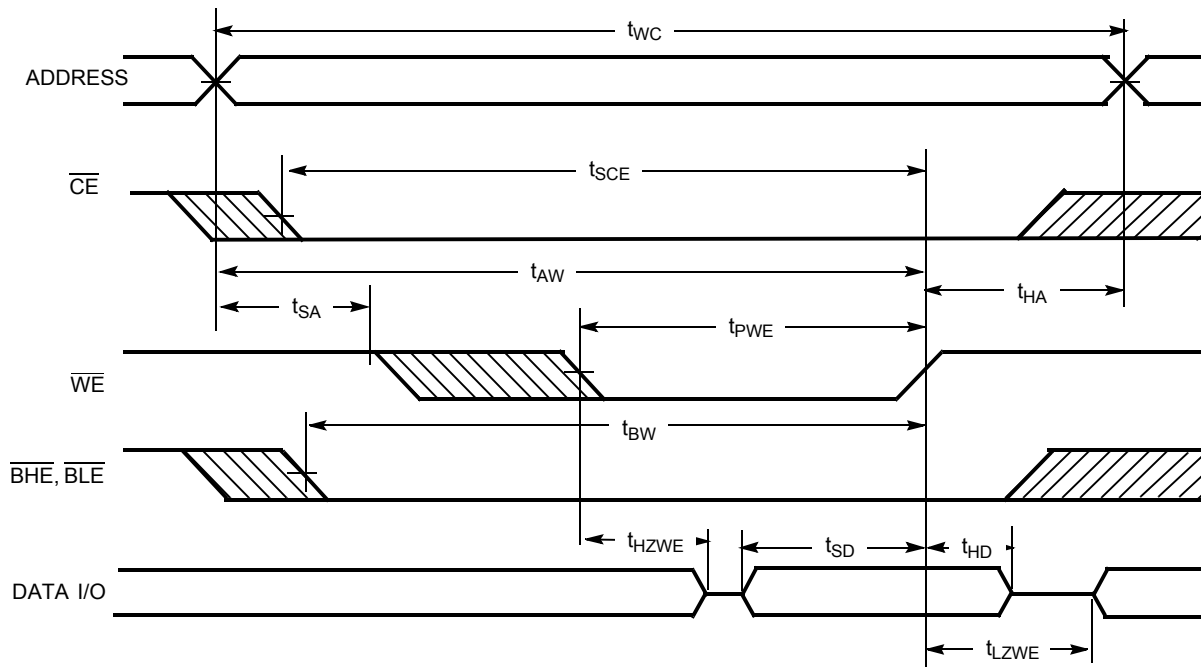
### Notes

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

15. 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>[16]</sup>**



**Note**

16. The minimum write pulse width for Write Cycle No. 3 ( $\overline{\text{WE}}$  Controlled,  $\overline{\text{OE}}$  LOW) should be sum of  $t_{\text{SD}}$  and  $t_{\text{HZWE}}$ .

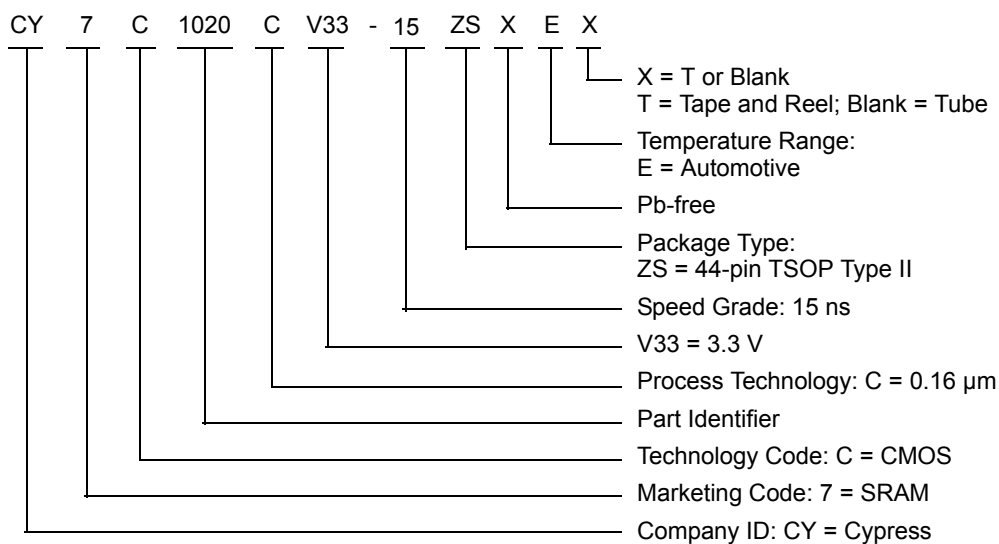
**Truth Table**

| $\overline{CE}$ | $\overline{OE}$ | $\overline{WE}$ | $\overline{BLE}$ | $\overline{BHE}$ | I/O <sub>1</sub> –I/O <sub>8</sub> | I/O <sub>9</sub> –I/O <sub>16</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

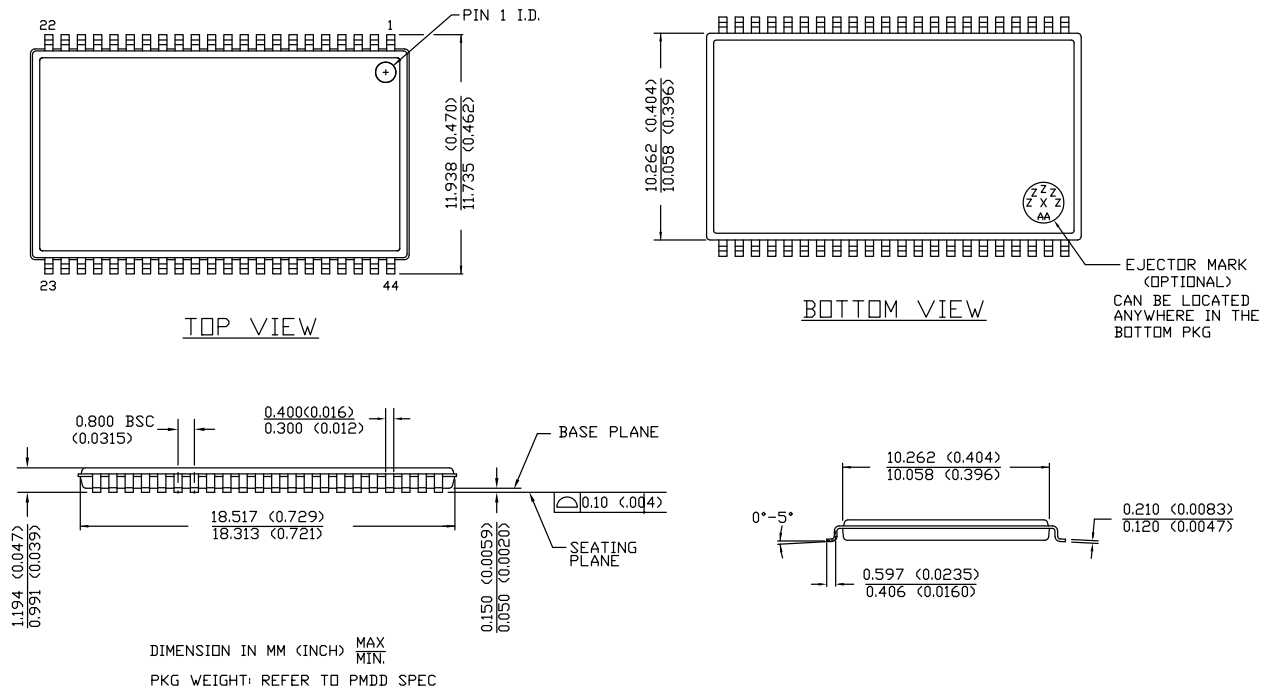
| Speed (ns) | Ordering Code        | Package Diagram | Package Type                  | Operating Range |
|------------|----------------------|-----------------|-------------------------------|-----------------|
| 15         | CY7C1020CV33-15ZSXE  | 51-85087        | 44-pin TSOP Type II (Pb-free) | Automotive      |
|            | CY7C1020CV33-15ZSXET | 51-85087        | 44-pin TSOP Type II (Pb-free) | Automotive      |

## Ordering Code Definitions



## Package Diagrams

Figure 8. 44-pin TSOP Z44-II Package Outline, 51-85087



51-85087 \*E

## Acronyms

| Acronym                | Description                             |
|------------------------|-----------------------------------------|
| CMOS                   | Complementary Metal Oxide Semiconductor |
| $\overline{\text{CE}}$ | Chip Enable                             |
| I/O                    | Input/Output                            |
| $\overline{\text{OE}}$ | Output Enable                           |
| SRAM                   | Static Random Access Memory             |
| TSOP                   | Thin Small-Outline Package              |
| TTL                    | Transistor-Transistor Logic             |
| $\overline{\text{WE}}$ | Write Enable                            |

## Document Conventions

### Units of Measure

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

## Document History Page

| Document Title: CY7C1020CV33, 512 K (32 K × 16) Static RAM<br>Document Number: 38-05133 |         |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------|---------|------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rev.                                                                                    | ECN No. | Issue Date | Orig. of Change | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| **                                                                                      | 109428  | 12/16/01   | HGK             | New data sheet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| *A                                                                                      | 115045  | 05/30/02   | HGK             | Added 8 ns speed bin related information in all instances across the document.<br>Updated <a href="#">Selection Guide</a> :<br>Changed value of “Maximum Operating Current” corresponding to 10 ns speed bin from 100 mA to 90 mA.<br>Changed value of “Maximum Operating Current” corresponding to 12 ns speed bin from 100 mA to 85 mA.<br>Changed value of “Maximum Operating Current” corresponding to 15 ns speed bin from 100 mA to 80 mA.<br>Updated <a href="#">Electrical Characteristics</a> :<br>Changed maximum value of I <sub>CC</sub> parameter corresponding to 10 ns speed bin from 100 mA to 90 mA.<br>Changed maximum value of I <sub>CC</sub> parameter corresponding to 12 ns speed bin from 100 mA to 85 mA.<br>Changed maximum value of I <sub>CC</sub> parameter corresponding to 15 ns speed bin from 100 mA to 80 mA.<br>Changed maximum value of I <sub>SB1</sub> parameter corresponding to 10 ns, 12 ns and 15 ns speed bins from 40 mA to 15 mA.<br>Updated <a href="#">Ordering Information</a> :<br>Updated part numbers. |
| *B                                                                                      | 117615  | 08/14/02   | DFP             | Removed SOJ package related information in all instances across the document.<br>Removed 8 ns speed bin related information in all instances across the document.<br>Updated <a href="#">Pin Configuration</a> :<br>Updated <a href="#">Figure 1</a> (Replaced “A <sub>4</sub> ” with “NC” for pin 1 and replaced “NC” with “A <sub>4</sub> ” for pin 18).<br>Updated <a href="#">Ordering Information</a> :<br>Updated part numbers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| *C                                                                                      | 262949  | See ECN    | RKF             | Added Automotive Temperature Range related information in all instances across the document.<br>Updated <a href="#">Ordering Information</a> :<br>Updated part numbers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| *D                                                                                      | 334398  | See ECN    | SYT             | Updated <a href="#">Ordering Information</a> :<br>Updated part numbers (Added Lead-Free Product Information).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| *E                                                                                      | 493543  | See ECN    | NXR             | Updated <a href="#">Pin Configuration</a> :<br>Added Note 1 and referred the same note in <a href="#">Figure 1</a> .<br>Updated <a href="#">Electrical Characteristics</a> :<br>Changed the description of I <sub>LX</sub> parameter from “Input Load Current” to “Input Leakage Current”.<br>Removed I <sub>OS</sub> parameter and its details.<br>Updated <a href="#">Ordering Information</a> :<br>Updated part numbers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| *F                                                                                      | 2897691 | 03/23/2010 | RAME            | Updated <a href="#">Ordering Information</a> :<br>Updated part numbers.<br>Updated <a href="#">Package Diagrams</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| *G                                                                                      | 3057593 | 10/13/2010 | PRAS            | Updated <a href="#">Ordering Information</a> :<br>Updated part numbers.<br>Added <a href="#">Ordering Code Definitions</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Document History Page** *(continued)*

| Document Title: CY7C1020CV33, 512 K (32 K × 16) Static RAM<br>Document Number: 38-05133 |         |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Rev.                                                                                    | ECN No. | Issue Date | Orig. of Change | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                       |
| *H                                                                                      | 3100106 | 12/02/2010 | PRAS            | Minor edits across the document.<br>Added <a href="#">Acronyms</a> and <a href="#">Units of Measure</a> .<br>Updated to new template.                                                                                                                                                                                                                                                                                       |
| *I                                                                                      | 4146968 | 10/04/2013 | VINI            | Updated <a href="#">Package Diagrams</a> :<br>spec 51-85087 – Changed revision from *C to *E.<br>Updated to new template.<br>Completing Sunset Review.                                                                                                                                                                                                                                                                      |
| *J                                                                                      | 4567799 | 11/12/2014 | VINI            | Updated <a href="#">Functional Description</a> :<br>Added “For a complete list of related resources, <a href="#">click here</a> .” at the end.<br>Updated <a href="#">Switching Characteristics</a> :<br>Added Note 10 and referred the same note in “Write Cycle”.<br>Updated <a href="#">Switching Waveforms</a> :<br>Added Note 16 and referred the same note in <a href="#">Figure 7</a> .<br>Completing Sunset Review. |
| *K                                                                                      | 4573200 | 11/18/2014 | VINI            | No technical updates.                                                                                                                                                                                                                                                                                                                                                                                                       |
| *L                                                                                      | 5004033 | 11/05/2015 | VINI            | Updated to new template.<br>Completing Sunset Review.                                                                                                                                                                                                                                                                                                                                                                       |



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