

## Features

- Very high speed: 45 ns
  - Wide voltage range: 2.20 V–3.60 V
- Pin compatible with CY62158DV30
- Ultra low standby power
  - Typical standby current: 2  $\mu$ A
  - Maximum standby current: 8  $\mu$ A
- Ultra low active power
  - Typical active current: 6 mA at  $f = 1$  MHz
- Easy memory expansion with  $\overline{CE}_1$ ,  $CE_2$ , and  $\overline{OE}$  features
- Automatic power down when deselected
- CMOS for optimum speed/power
- Offered in Pb-free 48-ball VFBGA and 44-pin TSOP II packages

## Functional Description

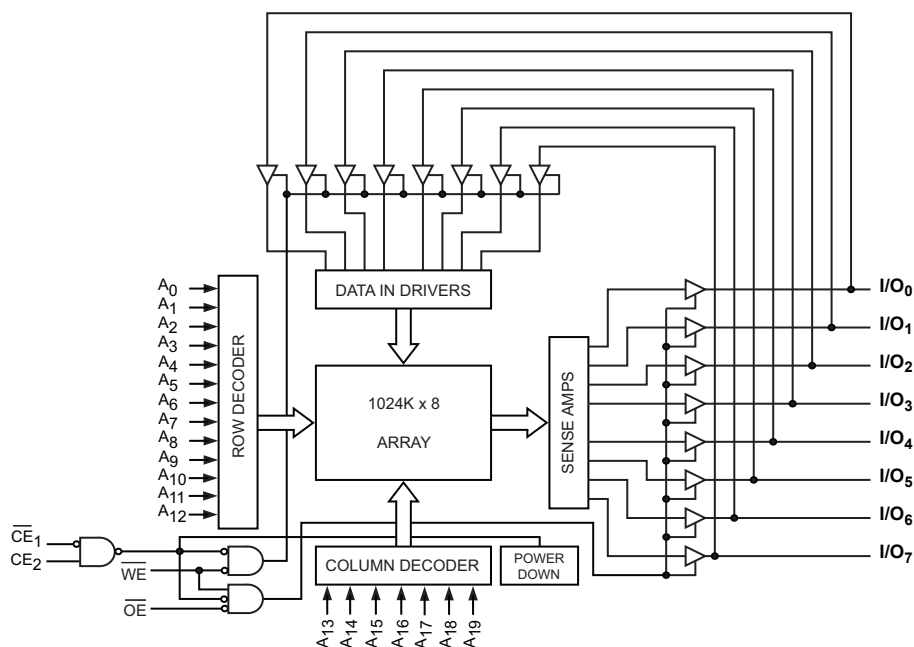
The CY62158EV30 is a high performance CMOS static RAM organized as 1024K words by 8 bits. This device features advanced circuit design to provide ultra low active current. This is ideal for providing More Battery Life™ (MoBL®) in portable applications such as cellular telephones. The device also has an automatic power down feature that significantly reduces power consumption. Placing the device into standby mode reduces power consumption significantly when deselected ( $\overline{CE}_1$  HIGH or  $CE_2$  LOW). The eight input and output pins ( $I/O_0$  through  $I/O_7$ ) are placed in a high impedance state when the device is deselected ( $\overline{CE}_1$  HIGH or  $CE_2$  LOW), the outputs are disabled ( $\overline{OE}$  HIGH), or a write operation is in progress ( $\overline{CE}_1$  LOW and  $CE_2$  HIGH and WE LOW).

To write to the device, take Chip Enables ( $\overline{CE}_1$  LOW and  $CE_2$  HIGH) and Write Enable (WE) input LOW. Data on the eight I/O pins ( $I/O_0$  through  $I/O_7$ ) is then written into the location specified on the address pins ( $A_0$  through  $A_{19}$ ).

To read from the device, take Chip Enables ( $\overline{CE}_1$  LOW and  $CE_2$  HIGH) and  $\overline{OE}$  LOW while forcing the WE HIGH. Under these conditions, the contents of the memory location specified by the address pins appear on the I/O pins. See [Truth Table on page 11](#) for a complete description of read and write modes.

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

## Logic Block Diagram



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## Pin Configurations

Figure 1. 48-ball VFBGA pinout (Top View) <sup>[1]</sup>

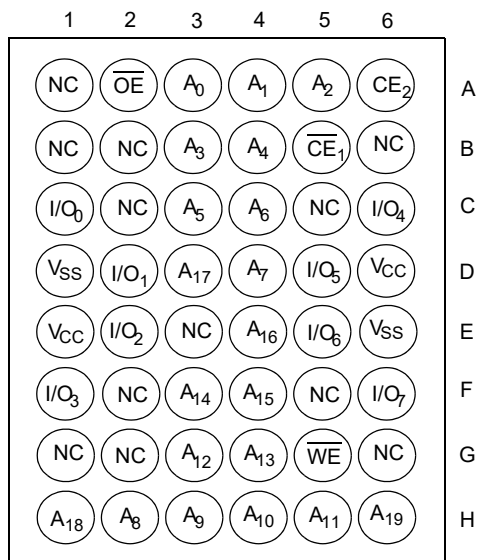
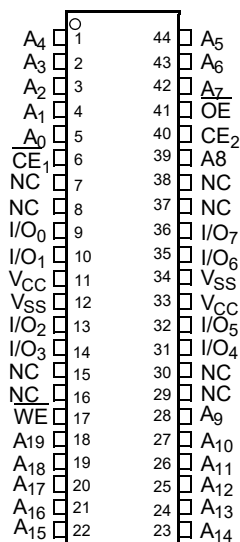


Figure 2. 44-pin TSOP II pinout (Top View) <sup>[1]</sup>



## Product Portfolio

| Product       | V <sub>CC</sub> Range (V) |                    |                      | Speed (ns) | Power Dissipation              |     |                    |     |                                |     |
|---------------|---------------------------|--------------------|----------------------|------------|--------------------------------|-----|--------------------|-----|--------------------------------|-----|
|               |                           |                    |                      |            | Operating I <sub>CC</sub> (mA) |     |                    |     | Standby, I <sub>SB2</sub> (μA) |     |
|               | f = 1 MHz                 |                    | f = f <sub>max</sub> |            |                                |     |                    |     |                                |     |
|               | Min                       | Typ <sup>[2]</sup> | Max                  |            | Typ <sup>[2]</sup>             | Max | Typ <sup>[2]</sup> | Max | Typ <sup>[2]</sup>             | Max |
| CY62158EV30LL | 2.2                       | 3.0                | 3.6                  | 45         | 6                              | 7   | 18                 | 25  | 2                              | 8   |

### Notes

1. NC pins are not connected on the die.
2. Typical values are included for reference only and are not guaranteed or tested. Typical values are measured at V<sub>CC</sub> = V<sub>CC(typ)</sub>, T<sub>A</sub> = 25 °C.

## 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  
to Ground Potential <sup>[3, 4]</sup> ..... -0.3 V to  $V_{CC(max)}$  + 0.3 V

DC Voltage Applied to Outputs  
in High Z State <sup>[3, 4]</sup> ..... -0.3 V to  $V_{CC(max)}$  + 0.3 V

DC Input Voltage <sup>[3, 4]</sup> ..... -0.3 V to  $V_{CC(max)}$  + 0.3 V

Output Current into Outputs (LOW) ..... 20 mA

Static Discharge Voltage  
(MIL-STD-883, Method 3015) ..... > 2001 V

Latch up Current ..... > 200 mA

## Operating Range

| Product       | Range      | Ambient Temperature (T <sub>A</sub> ) | V <sub>CC</sub> <sup>[5]</sup> |
|---------------|------------|---------------------------------------|--------------------------------|
| CY62158EV30LL | Industrial | -40 °C to +85 °C                      | 2.2 V–3.6 V                    |

## Electrical Characteristics

Over the Operating Range

| Parameter                       | Description                                   | Test Conditions                                                                                                                                                                                                                        | 45 ns |                    |                         | Unit |
|---------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------|-------------------------|------|
|                                 |                                               |                                                                                                                                                                                                                                        | Min   | Typ <sup>[6]</sup> | Max                     |      |
| V <sub>OH</sub>                 | Output HIGH voltage                           | I <sub>OH</sub> = -0.1 mA                                                                                                                                                                                                              | 2.0   | –                  | –                       | V    |
|                                 |                                               | I <sub>OH</sub> = -1.0 mA, V <sub>CC</sub> ≥ 2.70 V                                                                                                                                                                                    | 2.4   | –                  | –                       | V    |
| V <sub>OL</sub>                 | Output LOW voltage                            | I <sub>OL</sub> = 0.1 mA                                                                                                                                                                                                               | –     | –                  | 0.4                     | V    |
|                                 |                                               | I <sub>OL</sub> = 2.1 mA, V <sub>CC</sub> ≥ 2.70 V                                                                                                                                                                                     | –     | –                  | 0.4                     | V    |
| V <sub>IH</sub>                 | Input HIGH voltage                            | V <sub>CC</sub> = 2.2 V to 2.7 V                                                                                                                                                                                                       | 1.8   | –                  | V <sub>CC</sub> + 0.3 V | V    |
|                                 |                                               | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                                                                                                                                                       | 2.2   | –                  | V <sub>CC</sub> + 0.3 V | V    |
| V <sub>IIL</sub>                | Input LOW voltage                             | V <sub>CC</sub> = 2.2 V to 2.7 V                                                                                                                                                                                                       | -0.3  | –                  | 0.6                     | V    |
|                                 |                                               | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                                                                                                                                                       | -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>O</sub> ≤ V <sub>CC</sub> , Output Disabled                                                                                                                                                                               | -1    | –                  | +1                      | μA   |
| I <sub>CC</sub>                 | V <sub>CC</sub> operating supply current      | f = f <sub>max</sub> = 1/t <sub>RC</sub>                                                                                                                                                                                               | –     | 18                 | 25                      | mA   |
|                                 |                                               | f = 1 MHz                                                                                                                                                                                                                              | –     | 6                  | 7                       | mA   |
| I <sub>SB1</sub>                | Automatic CE power down current — CMOS Inputs | $\overline{CE}_1 \geq V_{CC} - 0.2$ V, CE <sub>2</sub> ≤ 0.2 V,<br>V <sub>IN</sub> ≥ V <sub>CC</sub> - 0.2 V, V <sub>IN</sub> ≤ 0.2 V,<br>f = f <sub>max</sub> (Address and Data Only),<br>f = 0 (OE and WE), V <sub>CC</sub> = 3.60 V | –     | 2                  | 8                       | μA   |
| I <sub>SB2</sub> <sup>[7]</sup> | Automatic CE Power down Current — CMOS inputs | CE <sub>1</sub> ≥ V <sub>CC</sub> - 0.2 V or CE <sub>2</sub> ≤ 0.2 V,<br>V <sub>IN</sub> ≥ V <sub>CC</sub> - 0.2 V or V <sub>IN</sub> ≤ 0.2 V,<br>f = 0, V <sub>CC</sub> = 3.60 V                                                      | –     | 2                  | 8                       | μA   |

### Notes

3. V<sub>IIL(min)</sub> = -2.0 V for pulse durations less than 20 ns.

4. V<sub>IH(max)</sub> = V<sub>CC</sub> + 0.75 V for pulse duration less than 20 ns.

5. Full device AC operation assumes a 100 μs ramp time from 0 to V<sub>CC(min)</sub> and 200 μs wait time after V<sub>CC</sub> stabilization.

6. Typical values are included for reference only and are not guaranteed or tested. Typical values are measured at V<sub>CC</sub> = V<sub>CC(typ)</sub>, T<sub>A</sub> = 25 °C.

7. Chip enables (CE<sub>1</sub> and CE<sub>2</sub>) must be at CMOS level to meet the I<sub>SB2</sub>/I<sub>CCDR</sub> spec. Other inputs can be left floating.

## Capacitance

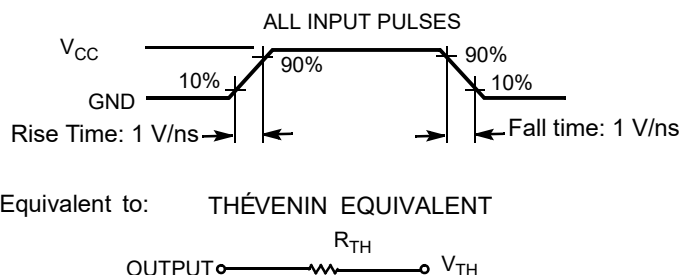
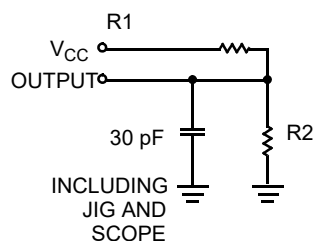
| Parameter <sup>[8]</sup> | Description        | Test Conditions                                                               | Max | Unit |
|--------------------------|--------------------|-------------------------------------------------------------------------------|-----|------|
| $C_{IN}$                 | Input capacitance  | $T_A = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ , $V_{CC} = V_{CC(\text{typ})}$ | 10  | pF   |
| $C_{OUT}$                | Output capacitance |                                                                               | 10  | pF   |

## Thermal Resistance

| Parameter <sup>[8]</sup> | Description                              | Test Conditions                                                               | 48-ball BGA | 44-pin TSOP II | Unit               |
|--------------------------|------------------------------------------|-------------------------------------------------------------------------------|-------------|----------------|--------------------|
| $\Theta_{JA}$            | Thermal resistance (junction to ambient) | Still Air, soldered on a $3 \times 4.5$ inch, two-layer printed circuit board | 36.92       | 65.91          | $^\circ\text{C/W}$ |
| $\Theta_{JC}$            | Thermal resistance (junction to case)    |                                                                               | 13.55       | 13.96          | $^\circ\text{C/W}$ |

## AC Test Loads and Waveforms

Figure 3. AC Test Loads and Waveforms



| Parameters | 2.5 V | 3.0 V | Unit     |
|------------|-------|-------|----------|
| $R1$       | 16667 | 1103  | $\Omega$ |
| $R2$       | 15385 | 1554  | $\Omega$ |
| $R_{TH}$   | 8000  | 645   | $\Omega$ |
| $V_{TH}$   | 1.20  | 1.75  | V        |

### Note

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

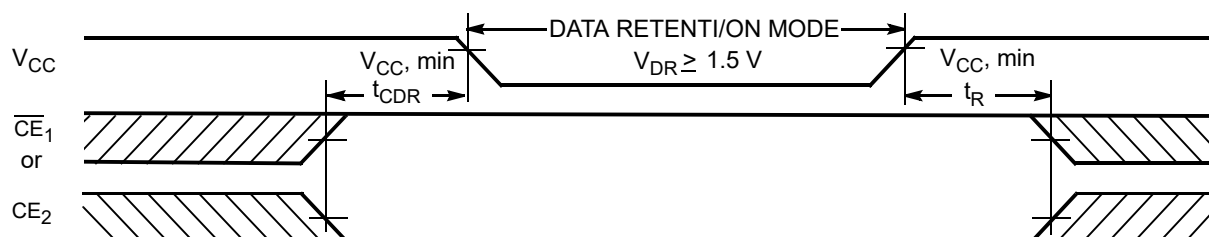
## Data Retention Characteristics

Over the Operating Range

| Parameter         | Description                          | Conditions                                                                                                                                                                   | Min | Typ <sup>[9]</sup> | Max | Unit          |
|-------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|-----|---------------|
| $V_{DR}$          | $V_{CC}$ for data retention          |                                                                                                                                                                              | 1.5 | –                  | –   | V             |
| $I_{CCDR}^{[10]}$ | Data retention current               | $V_{CC} = 1.5\text{ V}$ , $\overline{CE}_1 \geq V_{CC} - 0.2\text{ V}$<br>or $CE_2 \leq 0.2\text{ V}$ , $V_{IN} \geq V_{CC} - 0.2\text{ V}$<br>or $V_{IN} \leq 0.2\text{ V}$ | –   | 3.2                | 8   | $\mu\text{A}$ |
| $t_{CDR}^{[11]}$  | Chip deselect to data retention time |                                                                                                                                                                              | 0   | –                  | –   | ns            |
| $t_R^{[12]}$      | Operation recovery time              |                                                                                                                                                                              | 45  | –                  | –   | ns            |

## Data Retention Waveform

Figure 4. Data Retention Waveform



### Notes

9. Typical values are included for reference only and are not guaranteed or tested. Typical values are measured at  $V_{CC} = V_{CC(\text{typ})}$ ,  $T_A = 25^\circ\text{C}$ .
10. Chip enables ( $\overline{CE}_1$  and  $CE_2$ ) must be at CMOS level to meet the  $I_{SB2}/I_{CCDR}$  spec. Other inputs can be left floating.
11. Tested initially and after any design or process changes that may affect these parameters.
12. Full Device AC operation requires linear  $V_{CC}$  ramp from  $V_{DR}$  to  $V_{CC(\min)} \geq 100\text{ }\mu\text{s}$  or stable at  $V_{CC(\min)} \geq 100\text{ }\mu\text{s}$ .

## Switching Characteristics

Over the Operating Range

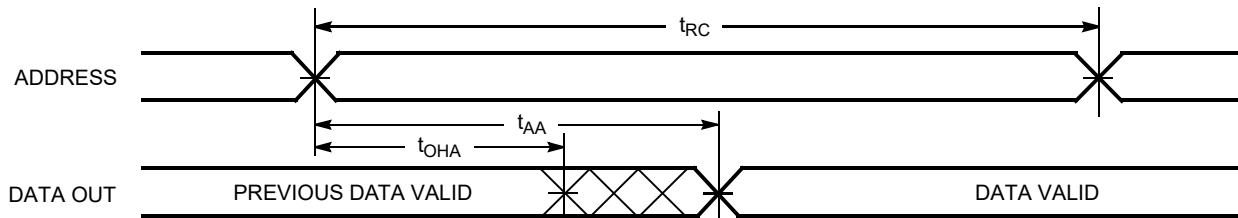
| Parameter <sup>[13, 14]</sup>   | Description                                                                 | 45 ns |     | Unit |
|---------------------------------|-----------------------------------------------------------------------------|-------|-----|------|
|                                 |                                                                             | Min   | Max |      |
| Read Cycle                      |                                                                             |       |     |      |
| t <sub>RC</sub>                 | Read cycle time                                                             | 45    | –   | ns   |
| t <sub>AA</sub>                 | Address to data valid                                                       | –     | 45  | ns   |
| t <sub>OHA</sub>                | Data Hold from address change                                               | 10    | –   | ns   |
| t <sub>ACE</sub>                | $\overline{CE}_1$ LOW and CE <sub>2</sub> HIGH to data valid                | –     | 45  | ns   |
| t <sub>DOE</sub>                | $\overline{OE}$ LOW to data valid                                           | –     | 22  | ns   |
| t <sub>LZOE</sub>               | $\overline{OE}$ LOW to Low Z <sup>[15]</sup>                                | 5     | –   | ns   |
| t <sub>HZOE</sub>               | $\overline{OE}$ HIGH to High Z <sup>[15, 16]</sup>                          | –     | 18  | ns   |
| t <sub>LZCE</sub>               | $\overline{CE}_1$ LOW and CE <sub>2</sub> HIGH to Low Z <sup>[15]</sup>     | 10    | –   | ns   |
| t <sub>HZCE</sub>               | $\overline{CE}_1$ HIGH or CE <sub>2</sub> LOW to High Z <sup>[15, 16]</sup> | –     | 18  | ns   |
| t <sub>PU</sub>                 | $\overline{CE}_1$ LOW and CE <sub>2</sub> HIGH to Power Up                  | 0     | –   | ns   |
| t <sub>PD</sub>                 | $\overline{CE}_1$ HIGH or CE <sub>2</sub> LOW to Power Down                 | –     | 45  | ns   |
| Write Cycle <sup>[17, 18]</sup> |                                                                             |       |     |      |
| t <sub>WC</sub>                 | Write cycle time                                                            | 45    | –   | ns   |
| t <sub>SCE</sub>                | $\overline{CE}_1$ LOW and CE <sub>2</sub> HIGH to Write End                 | 35    | –   | ns   |
| t <sub>AW</sub>                 | Address setup to Write End                                                  | 35    | –   | ns   |
| t <sub>HA</sub>                 | Address Hold from Write End                                                 | 0     | –   | ns   |
| t <sub>SA</sub>                 | Address setup to Write Start                                                | 0     | –   | ns   |
| t <sub>PWE</sub>                | $\overline{WE}$ pulse width                                                 | 35    | –   | ns   |
| t <sub>SD</sub>                 | Data setup to Write End                                                     | 25    | –   | ns   |
| t <sub>HD</sub>                 | Data Hold from Write End                                                    | 0     | –   | ns   |
| t <sub>HZWE</sub>               | $\overline{WE}$ LOW to High Z <sup>[15, 16]</sup>                           | –     | 18  | ns   |
| t <sub>LZWE</sub>               | $\overline{WE}$ HIGH to Low Z <sup>[15]</sup>                               | 10    | –   | ns   |

### Notes

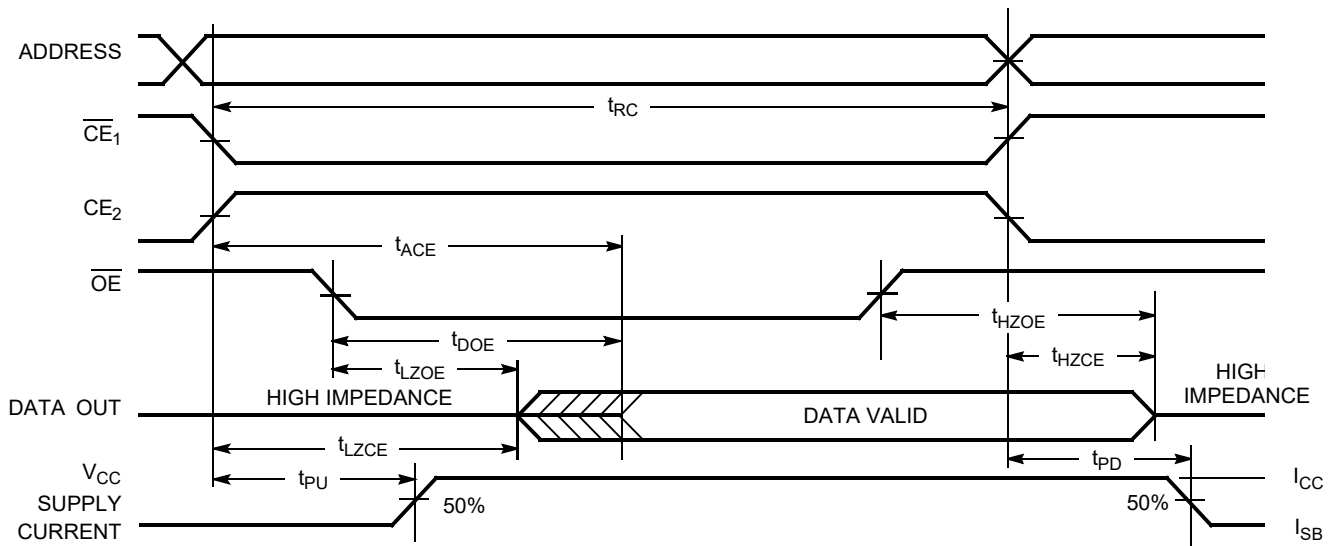
13. In an earlier revision of this device, under a specific application condition, READ and WRITE operations were limited to switching of the chip enable signal as described in the Application Note [AN66311](#). However, the issue has been fixed and in production now, and hence, this Application Note is no longer applicable. It is available for download on our website as it contains information on the date code of the parts, beyond which the fix has been in production.
14. Test conditions for all parameters other than tri-state parameters assume signal transition time of 3 ns or less (1V/ns), timing reference levels of  $V_{CC(typ)}/2$ , input pulse levels of 0 to  $V_{CC(typ)}$ , and output loading of the specified  $I_{OL}/I_{OH}$  as shown in [Figure 3 on page 5](#).
15. 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.
16.  $t_{HZOE}$ ,  $t_{HZCE}$ , and  $t_{HZWE}$  transitions are measured when the outputs enter a high impedance state.
17. The internal write time of the memory is defined by the overlap of  $\overline{WE}$ ,  $\overline{CE}_1 = V_{IL}$ , and  $CE_2 = V_{IH}$ . All signals must be ACTIVE to initiate a write and any of these signals can terminate a write by going INACTIVE. The data input setup and hold timing should be referenced to the edge of the signal that terminates the write.
18. The minimum write cycle pulse width for Write Cycle No. 3 ( $\overline{WE}$  Controlled,  $\overline{OE}$  LOW) should be equal to the sum of  $t_{SD}$  and  $t_{HZWE}$ .

## Switching Waveforms

**Figure 5. Read Cycle No. 1 (Address Transition Controlled)** [19, 20]



**Figure 6. Read Cycle No. 2 ( $\overline{OE}$  Controlled)** [20, 21]

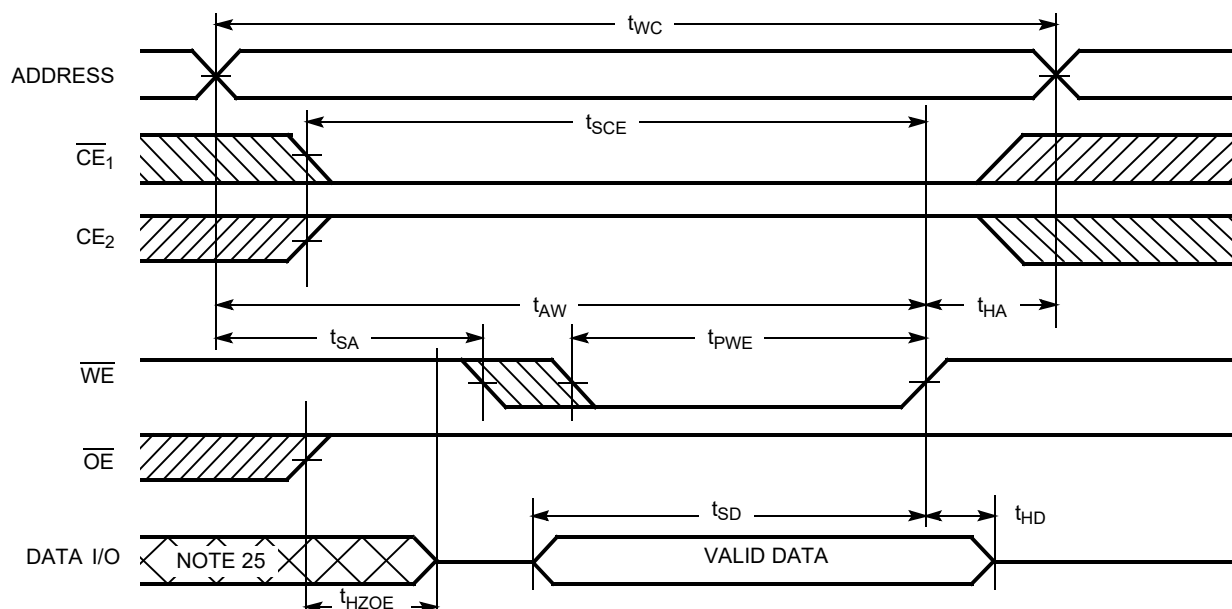
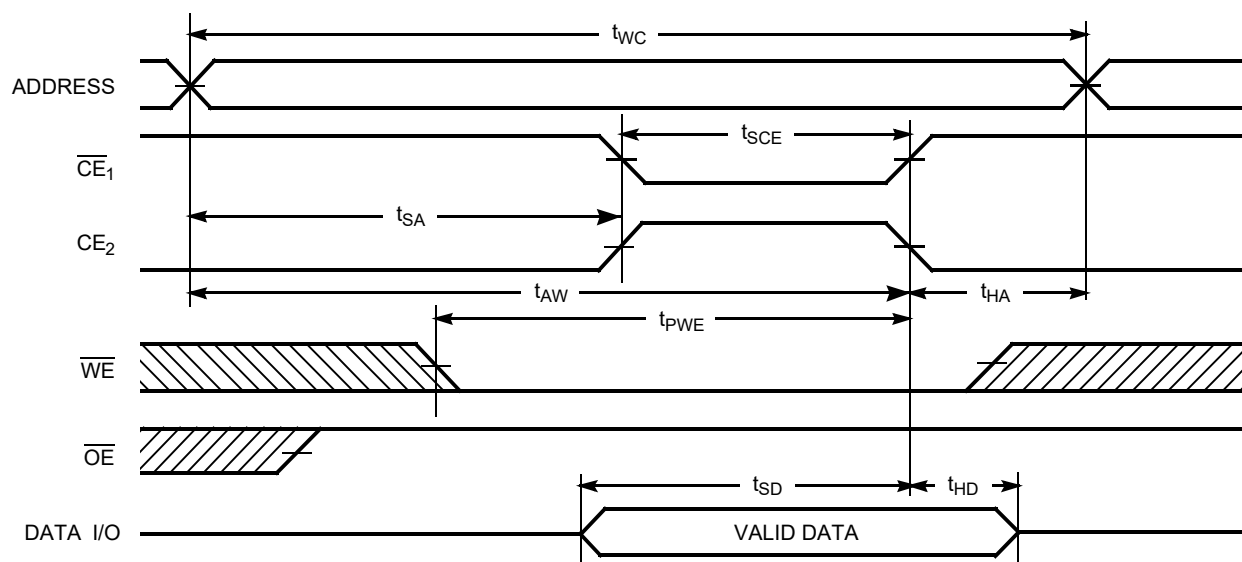


### Notes

19. Device is continuously selected.  $\overline{OE}$ ,  $\overline{CE}_1 = V_{IL}$ ,  $CE_2 = V_{IH}$ .

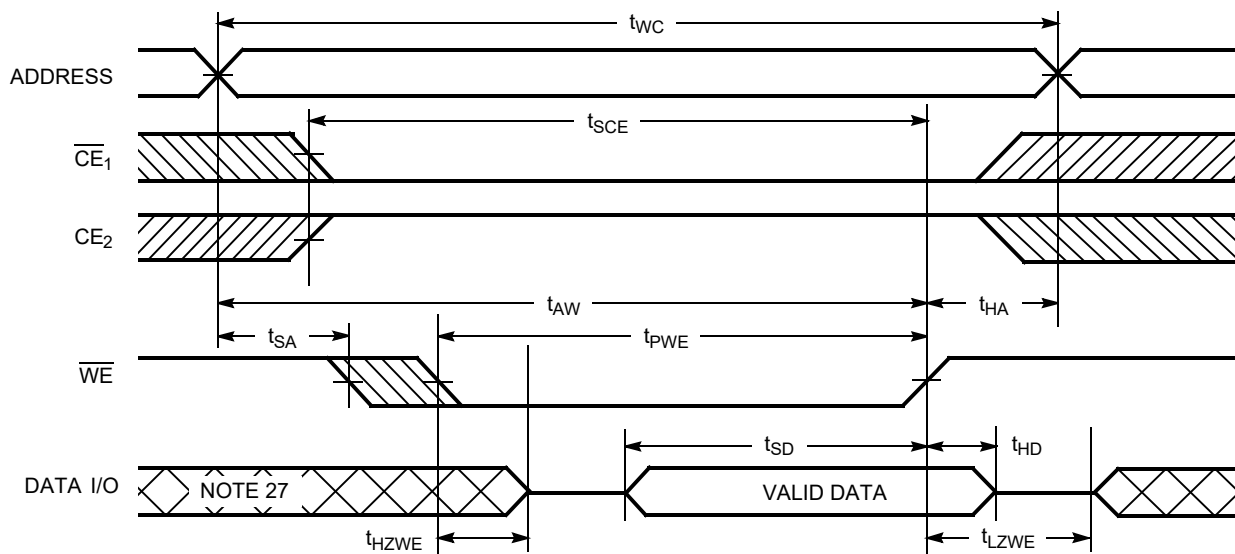
20.  $\overline{WE}$  is HIGH for read cycle.

21. Address valid before or similar to  $\overline{CE}_1$  transition LOW and  $CE_2$  transition HIGH.

**Switching Waveforms (continued)**
**Figure 7. Write Cycle No. 1 ( $\overline{\text{WE}}$  Controlled)** [22, 23, 24]

**Figure 8. Write Cycle No. 2 ( $\overline{\text{CE}}_1$  or  $\text{CE}_2$  Controlled)** [22, 23, 24]

**Notes**

22. The internal write time of the memory is defined by the overlap of  $\overline{\text{WE}}$ ,  $\overline{\text{CE}}_1 = V_{\text{IL}}$ , and  $\text{CE}_2 = V_{\text{IH}}$ . All signals must be ACTIVE to initiate a write and any of these signals can terminate a write by going INACTIVE. The data input setup and hold timing should be referenced to the edge of the signal that terminates the write.
23. Data I/O is high impedance if  $\overline{\text{OE}} = V_{\text{IH}}$ .
24. If  $\overline{\text{CE}}_1$  goes HIGH or  $\text{CE}_2$  goes LOW simultaneously with  $\overline{\text{WE}}$  HIGH, the output remains in high impedance state.
25. During this period, the I/Os are in output state. Do not apply input signals.

**Switching Waveforms** (continued)

**Figure 9. Write Cycle No. 3 ( $\overline{WE}$  Controlled,  $\overline{OE}$  LOW)** [26, 28]

**Notes**

26. If  $\overline{CE}_1$  goes HIGH or  $\overline{CE}_2$  goes LOW simultaneously with  $\overline{WE}$  HIGH, the output remains in high impedance state.

27. During this period, the I/Os are in output state. Do not apply input signals.

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

## Truth Table

| $\overline{CE}_1$ | $CE_2$            | $\overline{WE}$ | $\overline{OE}$ | Inputs/Outputs | Mode                       | Power                |
|-------------------|-------------------|-----------------|-----------------|----------------|----------------------------|----------------------|
| H                 | X <sup>[29]</sup> | X               | X               | High Z         | Deselect/Power down        | Standby ( $I_{SB}$ ) |
| X <sup>[29]</sup> | L                 | X               | X               | High Z         | Deselect/Power down        | Standby ( $I_{SB}$ ) |
| L                 | H                 | H               | L               | Data Out       | Read                       | Active ( $I_{CC}$ )  |
| L                 | H                 | L               | X               | Data In        | Write                      | Active ( $I_{CC}$ )  |
| L                 | H                 | H               | H               | High Z         | Selected, Outputs Disabled | Active ( $I_{CC}$ )  |

### Note

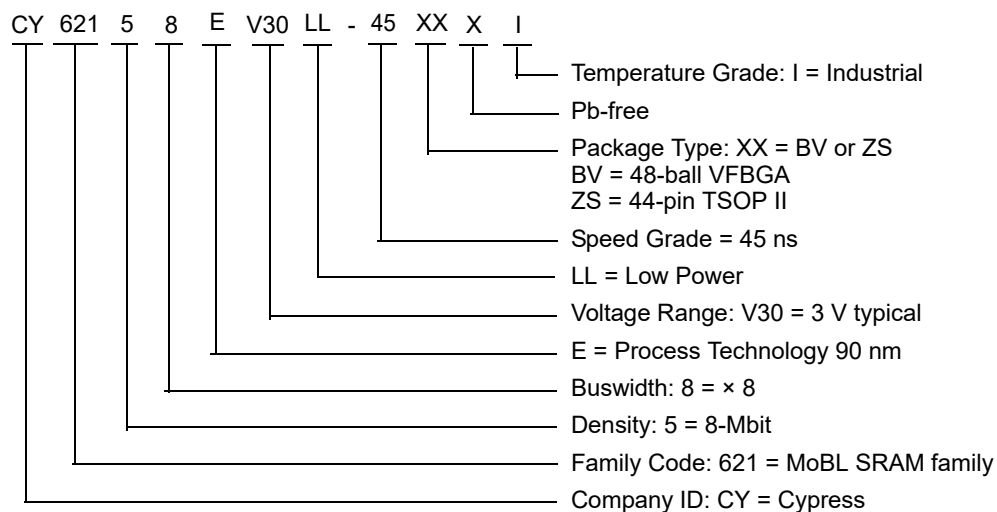
29. The 'X' (Don't care) state for the Chip enables in the truth table refer to the logic state (either HIGH or LOW). Intermediate voltage levels on these pins is not permitted.

## Ordering Information

| Speed (ns) | Ordering Code        | Package Diagram | Package Type                  | Operating Range |
|------------|----------------------|-----------------|-------------------------------|-----------------|
| 45         | CY62158EV30LL-45BVXI | 51-85150        | 48-ball VFBGA (Pb-free)       | Industrial      |
|            | CY62158EV30LL-45ZSXI | 51-85087        | 44-pin TSOP Type II (Pb-free) |                 |

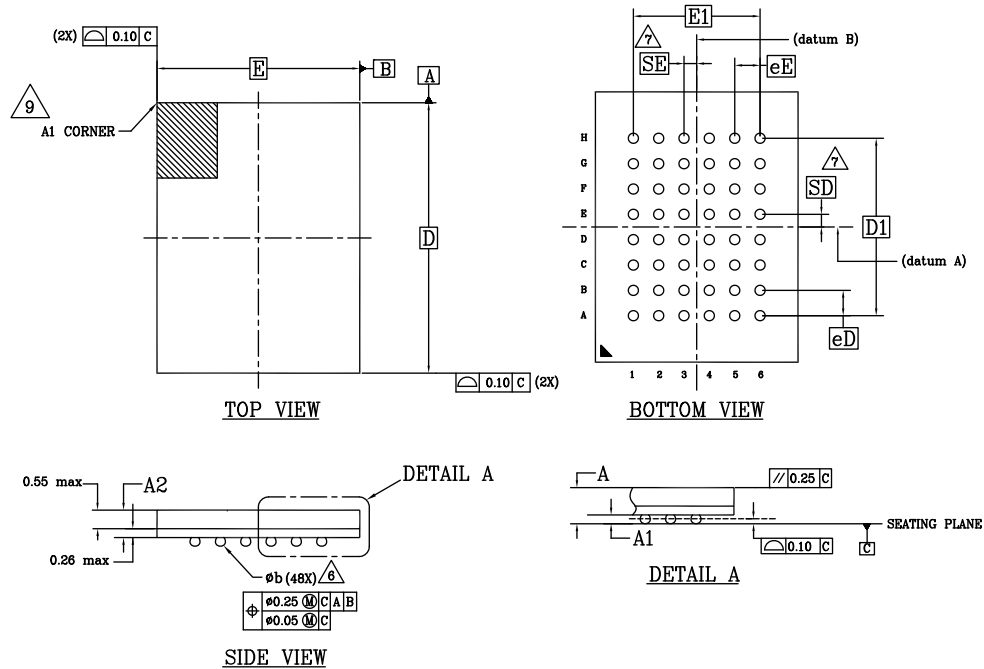
Contact your local Cypress sales representative for availability of these parts.

## Ordering Code Definitions



## Package Diagrams

**Figure 10. 48-ball VFBGA (6 × 8 × 1 mm) BV48/BZ48 Package Outline, 51-85150**

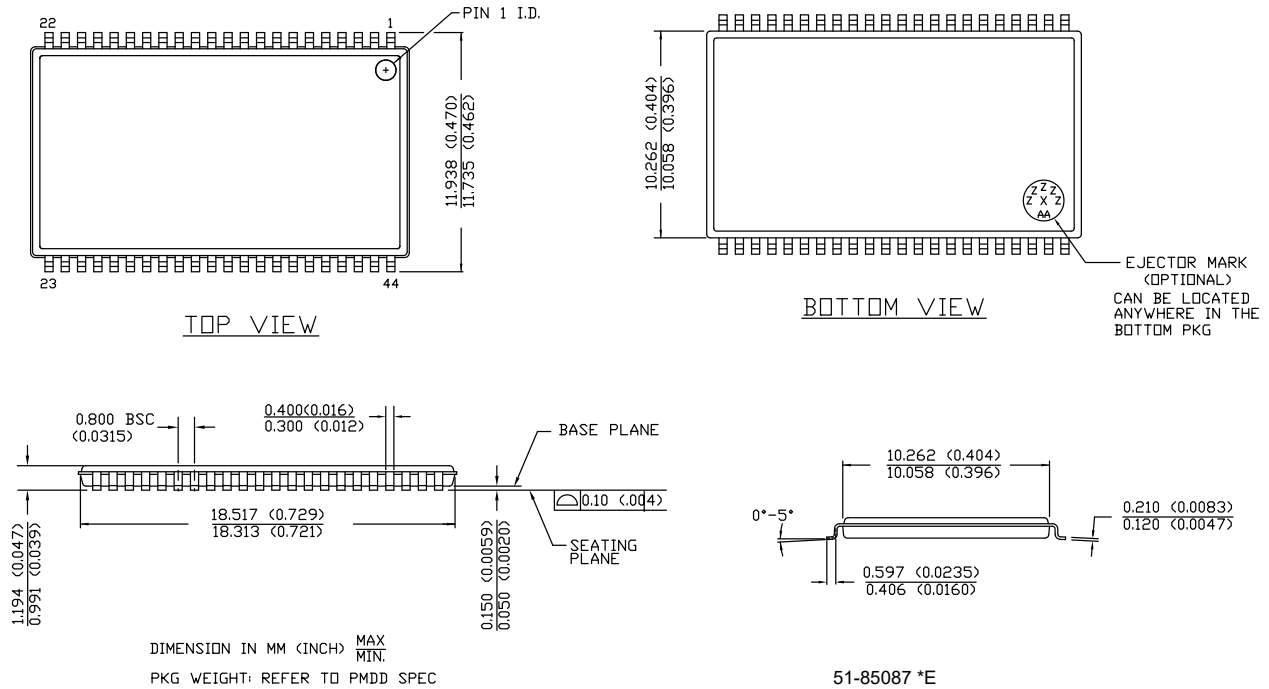


| SYMBOL | DIMENSIONS |      |      |
|--------|------------|------|------|
|        | MIN.       | NOM. | MAX. |
| A      | -          | -    | 1.00 |
| A1     | 0.16       | -    | -    |
| A2     | -          | -    | 0.81 |
| D      | 8.00 BSC   |      |      |
| E      | 6.00 BSC   |      |      |
| D1     | 5.25 BSC   |      |      |
| E1     | 3.75 BSC   |      |      |
| MD     | 8          |      |      |
| ME     | 6          |      |      |
| n      | 48         |      |      |
| Ø b    | 0.25       | 0.30 | 0.35 |
| eE     | 0.75 BSC   |      |      |
| eD     | 0.75 BSC   |      |      |
| SD     | 0.375 BSC  |      |      |
| SE     | 0.375 BSC  |      |      |

### NOTES:

- DIMENSIONING AND TOLERANCING METHODS PER ASME Y14.5M-2009.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- BALL POSITION DESIGNATION PER JEP95, SECTION 3, SPP-020.
- SE REPRESENTS THE SOLDER BALL GRID PITCH.
- SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.  
SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.  
n IS THE NUMBER OF POPULATED SOLDER BALL POSITIONS FOR MATRIX SIZE MD X ME.
- DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO DATUM C.
- "SD" AND "SE" ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.  
WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW  
"SD" OR "SE" = 0.  
WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW,  
"SD" = eD/2 AND "SE" = eE/2.
- "\*" INDICATES THE THEORETICAL CENTER OF DEPOPULATED BALLS.
- A1 CORNER TO BE IDENTIFIED BY CHAMFER, LASER OR INK MARK METALIZED MARK, INDENTATION OR OTHER MEANS.

51-85150 \*I

**Package Diagrams (continued)**
**Figure 11. 44-pin TSOP Z44-II Package Outline, 51-85087**


## Acronyms

| Acronym                | Description                             |
|------------------------|-----------------------------------------|
| $\overline{\text{CE}}$ | Chip Enable                             |
| CMOS                   | Complementary Metal Oxide Semiconductor |
| I/O                    | Input/Output                            |
| $\overline{\text{OE}}$ | Output Enable                           |
| RAM                    | Random Access Memory                    |
| SRAM                   | Static Random Access Memory             |
| TTL                    | Transistor-Transistor Logic             |
| TSOP                   | Thin Small Outline Package              |
| 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     |
| mm     | millimeter      |
| ns     | nanosecond      |
| Ω      | ohm             |
| %      | percent         |
| pF     | picofarad       |
| V      | volt            |
| W      | watt            |

## Document History Page

| Document Title: CY62158EV30 MoBL, 8-Mbit (1024K × 8) Static RAM<br>Document Number: 38-05578 |         |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| Rev.                                                                                         | ECN No. | Submission Date | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| **                                                                                           | 270329  | 09/28/2004      | New data sheet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| *A                                                                                           | 291271  | 11/19/2004      | Changed status from Advance Information to Preliminary.<br>Updated <a href="#">Data Retention Characteristics</a> :<br>Changed maximum value of I <sub>CCDR</sub> parameter from 4 µA to 4.5 µA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| *B                                                                                           | 444306  | 04/13/2006      | <p>Converted from Preliminary to Final.</p> <p>Removed 35 ns Speed Bin related information in all instances across the document.</p> <p>Removed 44-pin TSOP II Package related information in all instances across the document.</p> <p>Included 48-pin TSOP I Package related information in all instances across the document.</p> <p>Removed "L" from the part numbers across the document.</p> <p>Updated <a href="#">Product Portfolio</a>:</p> <p>Changed maximum value of "Operating I<sub>CC</sub>" from 2.3 mA to 3 mA corresponding to "f = 1 MHz".</p> <p>Changed typical value of "Operating I<sub>CC</sub>" from 16 mA to 18 mA corresponding to "f = f<sub>max</sub>".</p> <p>Changed maximum value of "Operating I<sub>CC</sub>" from 28 mA to 25 mA corresponding to "f = f<sub>max</sub>".</p> <p>Changed typical value of "Standby I<sub>SB2</sub>" from 0.9 µA to 2 µA.</p> <p>Changed maximum value of "Standby I<sub>SB2</sub>" from 4.5 µA to 8 µA.</p> <p>Updated <a href="#">Electrical Characteristics</a>:</p> <p>Changed typical value of I<sub>SB1</sub> parameter from 0.9 µA to 2 µA.</p> <p>Changed maximum value of I<sub>SB1</sub> parameter from 4.5 µA to 8 µA.</p> <p>Changed typical value of I<sub>SB2</sub> parameter from 0.9 µA to 2 µA.</p> <p>Changed maximum value of I<sub>SB2</sub> parameter from 4.5 µA to 8 µA.</p> <p>Updated <a href="#">AC Test Loads and Waveforms</a>:</p> <p>Updated <a href="#">Figure 3</a> (Changed Test Load Capacitance from 50 pF to 30 pF).</p> <p>Updated <a href="#">Data Retention Characteristics</a>:</p> <p>Added 2 µA as typical value for I<sub>CCDR</sub> parameter.</p> <p>Changed maximum value of I<sub>CCDR</sub> parameter from 4.5 µA to 5 µA.</p> <p>Changed minimum value of t<sub>R</sub> parameter from 100 µs to t<sub>RC</sub> ns.</p> <p>Updated <a href="#">Switching Characteristics</a>:</p> <p>Changed minimum value of t<sub>LZOE</sub> parameter from 3 ns to 5 ns corresponding to 45 ns speed bin.</p> <p>Changed minimum value of t<sub>LZCE</sub> parameter from 6 ns to 10 ns corresponding to 45 ns speed bin.</p> <p>Changed maximum value of t<sub>HZCE</sub> parameter from 22 ns to 18 ns corresponding to 45 ns speed bin.</p> <p>Changed minimum value of t<sub>PWE</sub> parameter from 30 ns to 35 ns corresponding to 45 ns speed bin.</p> <p>Changed minimum value of t<sub>SD</sub> parameter from 22 ns to 25 ns corresponding to 45 ns speed bin.</p> <p>Changed minimum value of t<sub>LZWE</sub> parameter from 6 ns to 10 ns corresponding to 45 ns speed bin.</p> <p>Updated <a href="#">Ordering Information</a>:</p> <p>Updated part numbers.</p> <p>Removed "Package Name" column.</p> <p>Added "Package Diagram" column.</p> <p>Updated <a href="#">Package Diagrams</a>:</p> <p>spec 51-85150 – Changed revision from *B to *D.</p> <p>Removed spec 51-85087 *A.</p> <p>Added spec 51-85183 *A.</p> <p>Updated to new template.</p> |

**Document History Page** (continued)

| Document Title: CY62158EV30 MoBL, 8-Mbit (1024K × 8) Static RAM<br>Document Number: 38-05578 |         |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Rev.                                                                                         | ECN No. | Submission Date | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| *C                                                                                           | 467052  | 06/06/2006      | Included 44-pin TSOP II Package related information in all instances across the document.<br>Updated <a href="#">Features</a> :<br>Added Note "For 48-pin TSOP I pin configuration and ordering information, please refer to CY62157EV30 Data sheet." and referred the same note in 48-pin TSOP I package.<br>Updated <a href="#">Ordering Information</a> :<br>Updated part numbers.<br>Updated <a href="#">Package Diagrams</a> :<br>Removed spec 51-85183 *A.<br>Added spec 51-85087 *A,                                                                                                                                                    |
| *D                                                                                           | 1015643 | 04/28/2007      | Updated <a href="#">Electrical Characteristics</a> :<br>Added Note 7 and referred the same note in I <sub>SB2</sub> parameter.<br>Updated <a href="#">Data Retention Characteristics</a> :<br>Added Note 10 and referred the same note in I <sub>CCDR</sub> parameter.                                                                                                                                                                                                                                                                                                                                                                         |
| *E                                                                                           | 2934396 | 06/03/2010      | Updated <a href="#">Truth Table</a> :<br>Added Note 29 and referred the same note in "X" under $\overline{CE}_1$ and CE <sub>2</sub> columns.<br>Updated <a href="#">Package Diagrams</a> :<br>spec 51-85150 – Changed revision from *D to *E.<br>spec 51-85087 – Changed revision from *A to *C.<br>Updated to new template.                                                                                                                                                                                                                                                                                                                  |
| *F                                                                                           | 3110202 | 12/14/2010      | Updated <a href="#">Logic Block Diagram</a> .<br>Updated <a href="#">Ordering Information</a> :<br>No change in part numbers.<br>Added <a href="#">Ordering Code Definitions</a> .<br>Updated <a href="#">Package Diagrams</a> :<br>spec 51-85150 – Changed revision from *E to *F.                                                                                                                                                                                                                                                                                                                                                            |
| *G                                                                                           | 3269641 | 05/30/2011      | Removed 48-pin TSOP I Package related information in all instances across the document.<br>Updated <a href="#">Functional Description</a> :<br>Removed the note "For best practice recommendations, refer to the Cypress application note "System Design Guidelines" at <a href="http://www.cypress.com">http://www.cypress.com</a> ." and its reference.<br>Updated <a href="#">Data Retention Characteristics</a> :<br>Changed minimum value of t <sub>R</sub> parameter from t <sub>RC</sub> ns to 45 ns.<br>Added <a href="#">Acronyms</a> and <a href="#">Units of Measure</a> .<br>Updated to new template.<br>Completing Sunset Review. |
| *H                                                                                           | 3598409 | 04/24/2012      | Updated <a href="#">Package Diagrams</a> :<br>spec 51-85150 – Changed revision from *F to *G.<br>spec 51-85087 – Changed revision from *C to *D.<br>Completing Sunset Review.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| *I                                                                                           | 4100078 | 08/20/2013      | Updated <a href="#">Switching Characteristics</a> :<br>Added Note 13 and referred the same note in "Parameter" column.<br>Updated <a href="#">Package Diagrams</a> :<br>spec 51-85150 – Changed revision from *G to *H.<br>spec 51-85087 – Changed revision from *D to *E.<br>Updated to new template.                                                                                                                                                                                                                                                                                                                                         |
| *J                                                                                           | 4576526 | 11/21/2014      | Updated <a href="#">Functional Description</a> :<br>Added "For a complete list of related documentation, <a href="#">click here</a> ." at the end.<br>Updated <a href="#">Switching Characteristics</a> :<br>Added Note 18 and referred the same note in "Write Cycle".<br>Updated <a href="#">Switching Waveforms</a> :<br>Added Note 28 and referred the same note in <a href="#">Figure 9</a> .                                                                                                                                                                                                                                             |

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| Rev.                                                                                         | ECN No. | Submission Date | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| *K                                                                                           | 4790694 | 06/08/2015      | Updated <a href="#">Maximum Ratings</a> :<br>Referred Notes 3, 4 in "Supply Voltage to Ground Potential".<br>Updated to new template.<br>Completing Sunset Review.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| *L                                                                                           | 5979591 | 11/29/2017      | Updated Cypress Logo and Copyright.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| *M                                                                                           | 6819908 | 02/28/2020      | Updated <a href="#">Features</a> :<br>Updated description.<br>Updated <a href="#">Product Portfolio</a> :<br>Updated all values of "Operating I <sub>CC</sub> " corresponding to "f = 1 MHz".<br>Updated <a href="#">Electrical Characteristics</a> :<br>Updated all values of I <sub>CC</sub> parameter corresponding to "45 ns" and "f = 1 MHz".<br>Updated <a href="#">Thermal Resistance</a> :<br>Updated all values of $\Theta_{JA}$ , $\Theta_{JC}$ parameters corresponding to all packages.<br>Updated <a href="#">Data Retention Characteristics</a> :<br>Updated all values of I <sub>CCDR</sub> parameter.<br>Updated <a href="#">Package Diagrams</a> :<br>spec 51-85150 – Changed revision from *H to *I.<br>Updated to new template. |

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