



**Please note that Cypress is an Infineon Technologies Company.**

The document following this cover page is marked as “Cypress” document as this is the company that originally developed the product. Please note that Infineon will continue to offer the product to new and existing customers as part of the Infineon product portfolio.

**Continuity of document content**

The fact that Infineon offers the following product as part of the Infineon product portfolio does not lead to any changes to this document. Future revisions will occur when appropriate, and any changes will be set out on the document history page.

**Continuity of ordering part numbers**

Infineon continues to support existing part numbers. Please continue to use the ordering part numbers listed in the datasheet for ordering.

## Features

- Very high speed: 45 ns
- Wide voltage range: 4.5 V to 5.5 V
- Ultra low standby power
  - Typical standby current: 2.5  $\mu$ A
  - Maximum standby current: 7  $\mu$ A
- Ultra low active power
  - Typical active current: 3.5 mA at f = 1 MHz
- Easy memory expansion with  $\overline{CE}$  and  $\overline{OE}$  features
- Automatic power down when deselected
- Complementary metal oxide semiconductor (CMOS) for optimum speed and power
- Available in Pb-free 44-pin thin small outline package (TSOP) Type II package

## Functional Description

The CY62146E is a high performance CMOS static RAM organized as 256K words by 16 bits. This device features advanced circuit design to provide ultra low active current. It is ideal for providing More Battery Life™ (MoBL®) in portable applications. The device also has an automatic power down feature that reduces power consumption when addresses are

not toggling. Placing the device into standby mode reduces power consumption by more than 99% when deselected ( $\overline{CE}$  HIGH). The input and output pins (I/O<sub>0</sub> through I/O<sub>15</sub>) are placed in a high impedance state when the device is deselected ( $\overline{CE}$  HIGH), the outputs are disabled ( $\overline{OE}$  HIGH), both Byte High Enable and Byte Low Enable are disabled ( $\overline{BHE}$ ,  $\overline{BLE}$  HIGH) or during a write operation ( $\overline{CE}$  LOW and  $\overline{WE}$  LOW).

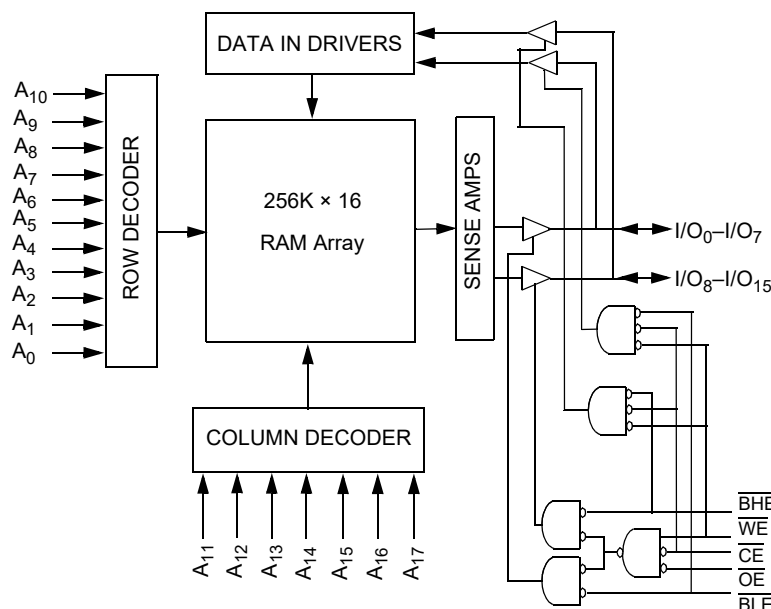
To write to the device, take Chip Enable ( $\overline{CE}$ ) and Write Enable ( $\overline{WE}$ ) inputs LOW. If Byte Low Enable ( $\overline{BLE}$ ) is LOW, then data from I/O pins (I/O<sub>0</sub> through I/O<sub>7</sub>) is written into the location specified on the address pins (A<sub>0</sub> through A<sub>17</sub>). If Byte High Enable ( $\overline{BHE}$ ) is LOW, then data from I/O pins (I/O<sub>8</sub> through I/O<sub>15</sub>) is written into the location specified on the address pins (A<sub>0</sub> through A<sub>17</sub>).

To read from the device, take Chip Enable ( $\overline{CE}$ ) and Output Enable ( $\overline{OE}$ ) LOW while forcing the Write Enable ( $\overline{WE}$ ) HIGH. If Byte Low Enable ( $\overline{BLE}$ ) is LOW, then data from the memory location specified by the address pins appears on I/O<sub>0</sub> to I/O<sub>7</sub>. If Byte High Enable ( $\overline{BHE}$ ) is LOW, then data from memory appears on I/O<sub>8</sub> to I/O<sub>15</sub>. See Truth Table on page 11 for a complete description of read and write modes.

The CY62146E device is suitable for interfacing with processors that have TTL I/P levels. It is not suitable for processors that require CMOS I/P levels. Please Electrical Characteristics on page 4 for more details and suggested alternatives.

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

## Logic Block Diagram

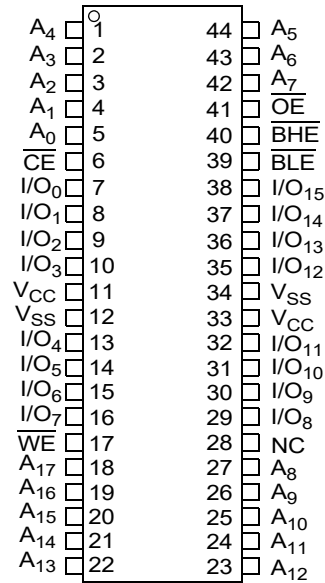


## Contents

<b>Pin Configurations</b> .....	<b>3</b>	<b>Ordering Information</b> .....	<b>12</b>
<b>Product Portfolio</b> .....	<b>3</b>	Ordering Code Definitions .....	12
<b>Maximum Ratings</b> .....	<b>4</b>	<b>Package Diagram</b> .....	<b>13</b>
<b>Operating Range</b> .....	<b>4</b>	<b>Acronyms</b> .....	<b>14</b>
<b>Electrical Characteristics</b> .....	<b>4</b>	<b>Document Conventions</b> .....	<b>14</b>
<b>Capacitance</b> .....	<b>5</b>	Units of Measure .....	14
<b>Thermal Resistance</b> .....	<b>5</b>	<b>Document History Page</b> .....	<b>15</b>
<b>AC Test Loads and Waveforms</b> .....	<b>5</b>	<b>Sales, Solutions, and Legal Information</b> .....	<b>17</b>
<b>Data Retention Characteristics</b> .....	<b>6</b>	Worldwide Sales and Design Support .....	17
<b>Data Retention Waveform</b> .....	<b>6</b>	Products .....	17
<b>Switching Characteristics</b> .....	<b>7</b>	PSoC® Solutions .....	17
<b>Switching Waveforms</b> .....	<b>8</b>	Cypress Developer Community .....	17
<b>Truth Table</b> .....	<b>11</b>	Technical Support .....	17

## Pin Configurations

Figure 1. 44-pin TSOP II pinout (Top View) [1]



## Product Portfolio

Product	Range	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
CY62146ELL	Industrial/ Automotive-A	4.5	5.0	5.5	45	3.5	6	15	20	2.5	7

### 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 impair the useful life of the device. These user guidelines are not tested.

Storage temperature .....	-65 °C to +150 °C
Ambient temperature with power applied .....	-55 °C to +125 °C
Supply voltage to ground potential .....	-0.5 V to 6.0 V
DC voltage applied to outputs in high Z state <sup>[3, 4]</sup> .....	-0.5 V to 6.0 V
DC input voltage <sup>[3, 4]</sup> .....	-0.5 V to 6.0 V

Output current into outputs (LOW) .....	20 mA
Static discharge voltage (MIL-STD-883, Method 3015) .....	>200 V
Latch-up current .....	>200 mA

## Operating Range

Device	Range	Ambient Temperature	V <sub>CC</sub> <sup>[5]</sup>
CY62146ELL	Industrial/Automotive-A	-40 °C to +85 °C	4.5 V–5.5 V

## Electrical Characteristics

Over the Operating Range

Parameter	Description	Test Conditions		45 ns (Industrial/Automotive-A)			Unit
				Min	Typ <sup>[6]</sup>	Max	
V <sub>OH</sub>	Output high voltage	V <sub>CC</sub> = 4.5 V	I <sub>OH</sub> = -1.0 mA	2.4	–	–	V
		V <sub>CC</sub> = 5.5 V	I <sub>OH</sub> = -0.1 mA	–	–	3.4 <sup>[7]</sup>	
V <sub>OL</sub>	Output low voltage	I <sub>OL</sub> = 2.1 mA		–	–	0.4	V
V <sub>IH</sub>	Input high voltage	4.5 ≤ V <sub>CC</sub> ≤ 5.5		2.2	–	V <sub>CC</sub> + 0.5	V
V <sub>IL</sub>	Input low voltage	4.5 ≤ V <sub>CC</sub> ≤ 5.5		-0.5	–	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>	V <sub>CC</sub> = V <sub>CCmax</sub>	–	15	20	mA
		f = 1 MHz	I <sub>OUT</sub> = 0 mA, CMOS levels	–	3.5	6	
I <sub>SB2</sub> <sup>[8]</sup>	Automatic CE power down current – CMOS inputs	$\overline{CE} \geq V_{CC} - 0.2 \text{ V}$ , $V_{IN} \geq V_{CC} - 0.2 \text{ V}$ or $V_{IN} \leq 0.2 \text{ V}$ , $f = 0$ , $V_{CC} = V_{CC(max)}$		–	2.5	7	μA

### Notes

- V<sub>IL</sub>(min) = -2.0 V for pulse durations less than 20 ns for I < 30 mA.
- V<sub>IH</sub>(max) = V<sub>CC</sub> + 0.75 V for pulse durations less than 20 ns.
- Full Device AC operation assumes a minimum of 100 μs ramp time from 0 to V<sub>CC</sub> (min) and 200 μs wait time after V<sub>CC</sub> stabilization.
- 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.
- Please note that the maximum V<sub>OH</sub> limit does not exceed minimum CMOS V<sub>IH</sub> of 3.5 V. If you are interfacing this SRAM with 5 V legacy processors that require a minimum V<sub>IH</sub> of 3.5 V, please refer to Application Note AN6081 for technical details and options you may consider.
- Chip enable (CE) and byte enables (BHE and BLE) need to be tied to CMOS levels to meet the I<sub>SB2</sub>/I<sub>CCDR</sub> spec. Other inputs are left floating.

### Capacitance

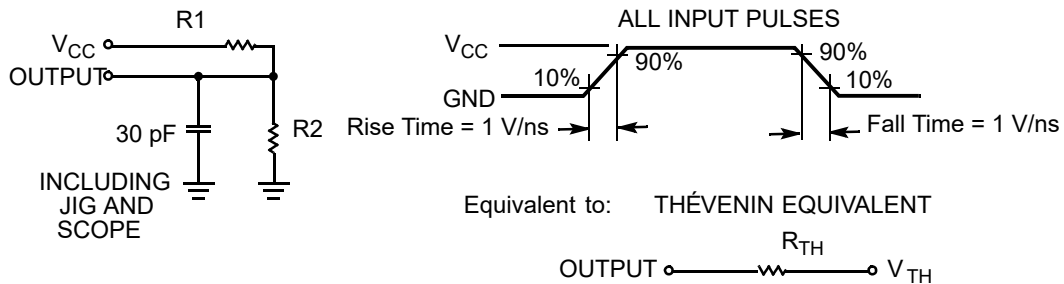
Parameter <sup>[9]</sup>	Description	Test Conditions	Max	Unit
C <sub>IN</sub>	Input capacitance	T <sub>A</sub> = 25 °C, f = 1 MHz, V <sub>CC</sub> = V <sub>CC(typ)</sub>	10	pF
C <sub>OUT</sub>	Output capacitance		10	pF

### Thermal Resistance

Parameter <sup>[9]</sup>	Description	Test Conditions	44-pin TSOP II	Unit
θ <sub>JA</sub>	Thermal resistance (junction to ambient)	Still Air, soldered on a 3 × 4.5 inch, four-layer printed circuit board	55.52	°C/W
θ <sub>JC</sub>	Thermal resistance (junction to case)		16.03	°C/W

### AC Test Loads and Waveforms

Figure 2. AC Test Loads and Waveforms



Parameters	5.0 V	Unit
R1	1800	Ω
R2	990	Ω
R <sub>TH</sub>	639	Ω
V <sub>TH</sub>	1.77	V

**Note**

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

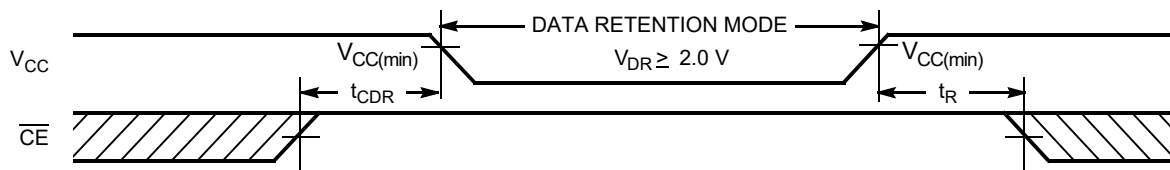
## Data Retention Characteristics

Over the Operating Range

Parameter	Description	Conditions	Min	Typ <sup>[10]</sup>	Max	Unit
$V_{DR}$	$V_{CC}$ for data retention		2	–	–	V
$I_{CCDR}$ <sup>[11]</sup>	Data retention current	$V_{CC} = 2\text{ V}$ , $\overline{CE} \geq V_{CC} - 0.2\text{ V}$ , $V_{IN} \geq V_{CC} - 0.2\text{ V}$ or $V_{IN} \leq 0.2\text{ V}$	–	3	8.8	$\mu\text{A}$
$t_{CDR}$ <sup>[12]</sup>	Chip deselect to data retention time		0	–	–	ns
$t_R$ <sup>[13]</sup>	Operation recovery time		45	–	–	ns

## Data Retention Waveform

Figure 3. Data Retention Waveform



### Notes

10. Typical values are included for reference only and are not guaranteed or tested. Typical values are measured at  $V_{CC} = V_{CC(typ)}$ ,  $T_A = 25\text{ }^\circ\text{C}$ .
11. Chip enable ( $\overline{CE}$ ) and byte enables ( $\overline{BHE}$  and  $\overline{BLE}$ ) need to be tied to CMOS levels to meet the  $I_{SB2}/I_{CCDR}$  spec. Other inputs are left floating.
12. Tested initially and after any design or process changes that may affect these parameters.
13. Full device 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>[14, 15]</sup>	Description	45 ns (Industrial/Automotive-A)		Unit
		Min	Max	
<b>Read Cycle</b>				
$t_{RC}$	Read cycle time	45	–	ns
$t_{AA}$	Address to data valid	–	45	ns
$t_{OHA}$	Data hold from address change	10	–	ns
$t_{ACE}$	$\overline{CE}$ LOW to data valid	–	45	ns
$t_{DOE}$	$\overline{OE}$ LOW to data valid	–	22	ns
$t_{LZOE}$	$\overline{OE}$ LOW to Low Z <sup>[16]</sup>	5	–	ns
$t_{HZOE}$	$\overline{OE}$ HIGH to High Z <sup>[16, 17]</sup>	–	18	ns
$t_{LZCE}$	$\overline{CE}$ LOW to Low Z <sup>[16]</sup>	10	–	ns
$t_{HZCE}$	$\overline{CE}$ HIGH to High Z <sup>[16, 17]</sup>	–	18	ns
$t_{PU}$	$\overline{CE}$ LOW to power-up	0	–	ns
$t_{PD}$	$\overline{CE}$ HIGH to power-down	–	45	ns
$t_{DBE}$	$\overline{BLE}/\overline{BHE}$ LOW to data valid	–	22	ns
$t_{LZBE}$	$\overline{BLE}/\overline{BHE}$ LOW to Low Z <sup>[16]</sup>	5	–	ns
$t_{HZBE}$	$\overline{BLE}/\overline{BHE}$ HIGH to High Z <sup>[16, 17]</sup>	–	18	ns
<b>Write Cycle<sup>[18, 19]</sup></b>				
$t_{WC}$	Write cycle time	45	–	ns
$t_{SCE}$	$\overline{CE}$ LOW to write end	35	–	ns
$t_{AW}$	Address setup to write end	35	–	ns
$t_{HA}$	Address hold from write end	0	–	ns
$t_{SA}$	Address setup to write start	0	–	ns
$t_{PWE}$	$\overline{WE}$ pulse width	35	–	ns
$t_{BW}$	$\overline{BLE}/\overline{BHE}$ LOW to write end	35	–	ns
$t_{SD}$	Data setup to write end	25	–	ns
$t_{HD}$	Data hold from write end	0	–	ns
$t_{HZWE}$	$\overline{WE}$ LOW to High Z <sup>[16, 17]</sup>	–	18	ns
$t_{LZWE}$	$\overline{WE}$ HIGH to Low Z <sup>[16]</sup>	10	–	ns

### Notes

14. Test conditions for all parameters other than tri-state parameters assume signal transition time of 3 ns (1 V/ns) or less, timing reference levels of 1.5 V, input pulse levels of 0 to 3 V, and output loading of the specified  $I_{OL}/I_{OH}$  as shown in [Figure 2 on page 5](#).
15. In an earlier revision of this device, under a specific application condition, READ and WRITE operations were limited to switching of the byte enable and/or chip enable signals as described in the Application Notes [AN13842](#) and [AN66311](#). However, the issue has been fixed and in production now, and hence, these Application Notes are no longer applicable. They are available for download on our website as they contain information on the date code of the parts, beyond which the fix has been in production.
16. At any temperature and voltage condition,  $t_{HZCE}$  is less than  $t_{LZCE}$ ,  $t_{HZBE}$  is less than  $t_{LZBE}$ ,  $t_{HZOE}$  is less than  $t_{LZOE}$ , and  $t_{HZWE}$  is less than  $t_{LZWE}$  for any device.
17.  $t_{HZOE}$ ,  $t_{HZCE}$ ,  $t_{HZBE}$ , and  $t_{HZWE}$  transitions are measured when the outputs enter a high-impedance state.
18. The internal write time of the memory is defined by the overlap of  $\overline{WE}$ ,  $\overline{CE} = V_{IL}$ ,  $\overline{BHE}$ ,  $\overline{BLE}$  or both =  $V_{IL}$ . 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 must be referenced to the edge of the signal that terminates the write.
19. 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 4. Read Cycle No. 1 (Address Transition Controlled) [20, 21]

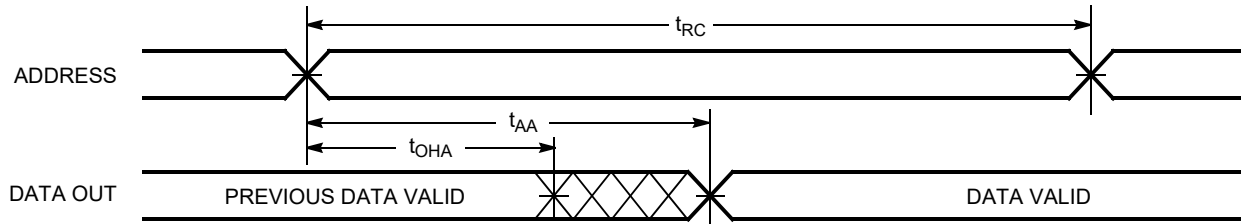
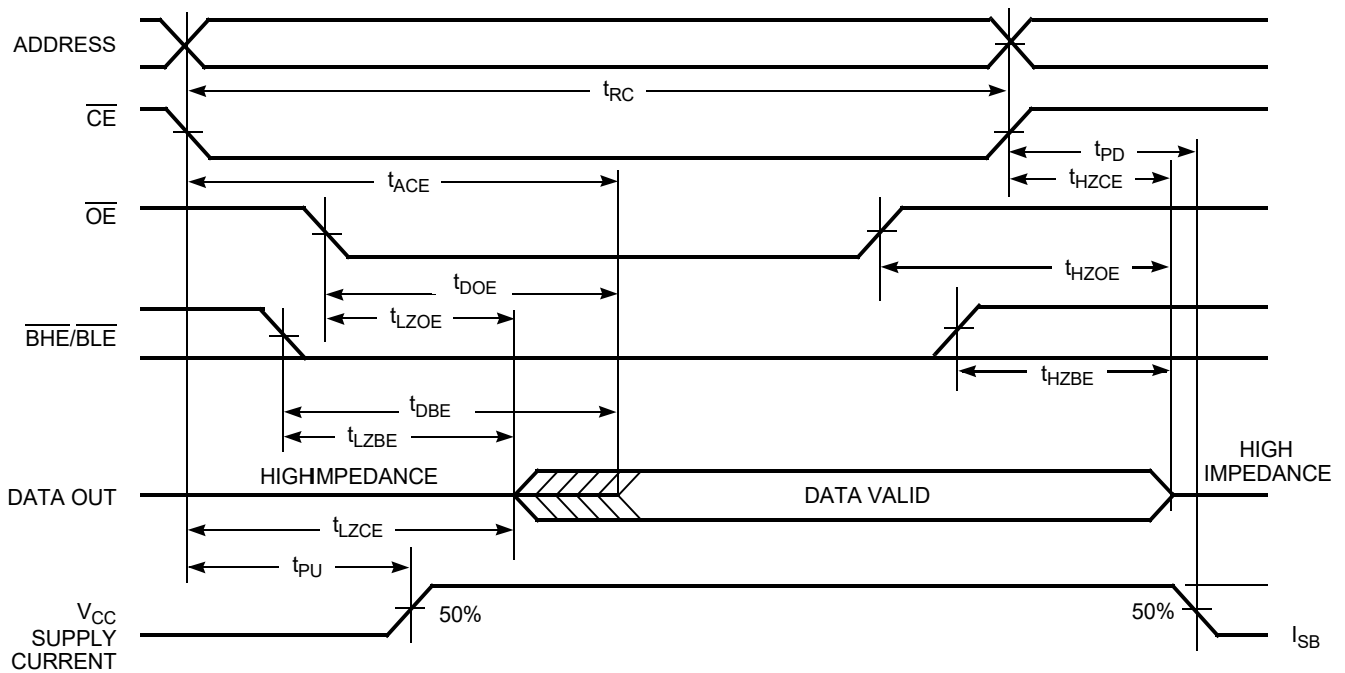


Figure 5. Read Cycle No. 2 ( $\overline{OE}$  Controlled) [21, 22]



**Notes**

- 20. The device is continuously selected.  $\overline{OE}$ ,  $\overline{CE}$  =  $V_{IL}$ ,  $\overline{BHE}$ ,  $\overline{BLE}$ , or both =  $V_{IL}$ .
- 21.  $\overline{WE}$  is HIGH for read cycle.
- 22. Address valid before or similar to  $\overline{CE}$ ,  $\overline{BHE}$ ,  $\overline{BLE}$  transition LOW.

Switching Waveforms (continued)

Figure 6. Write Cycle No. 1 ( $\overline{WE}$  Controlled) [23, 24, 25]

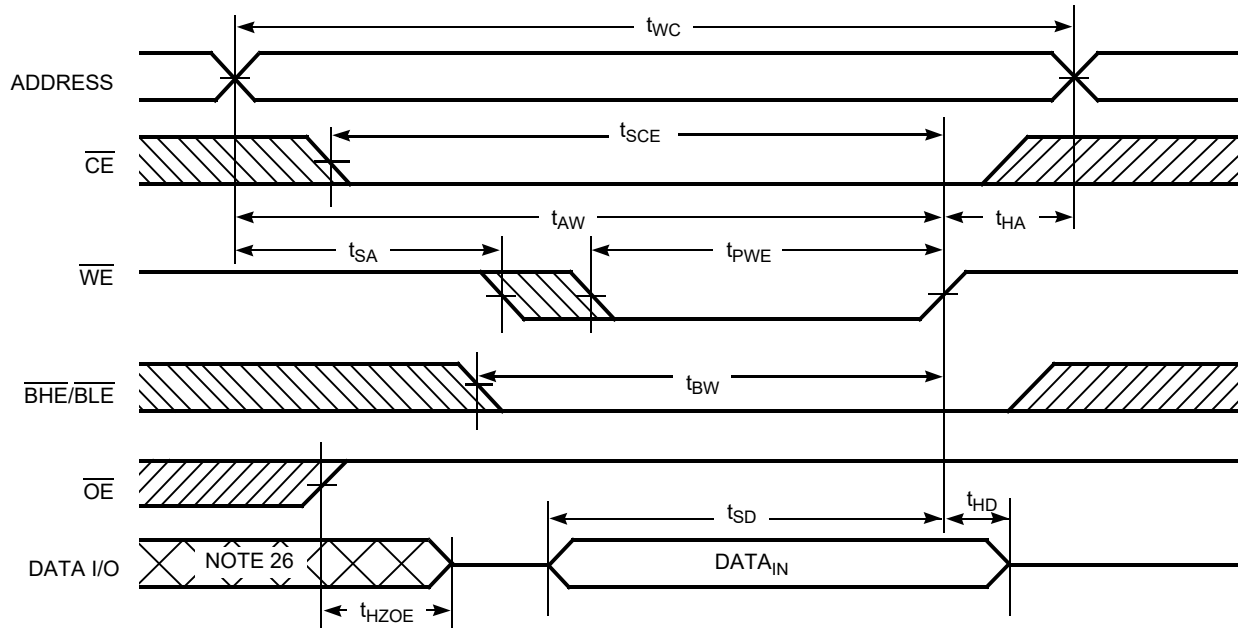
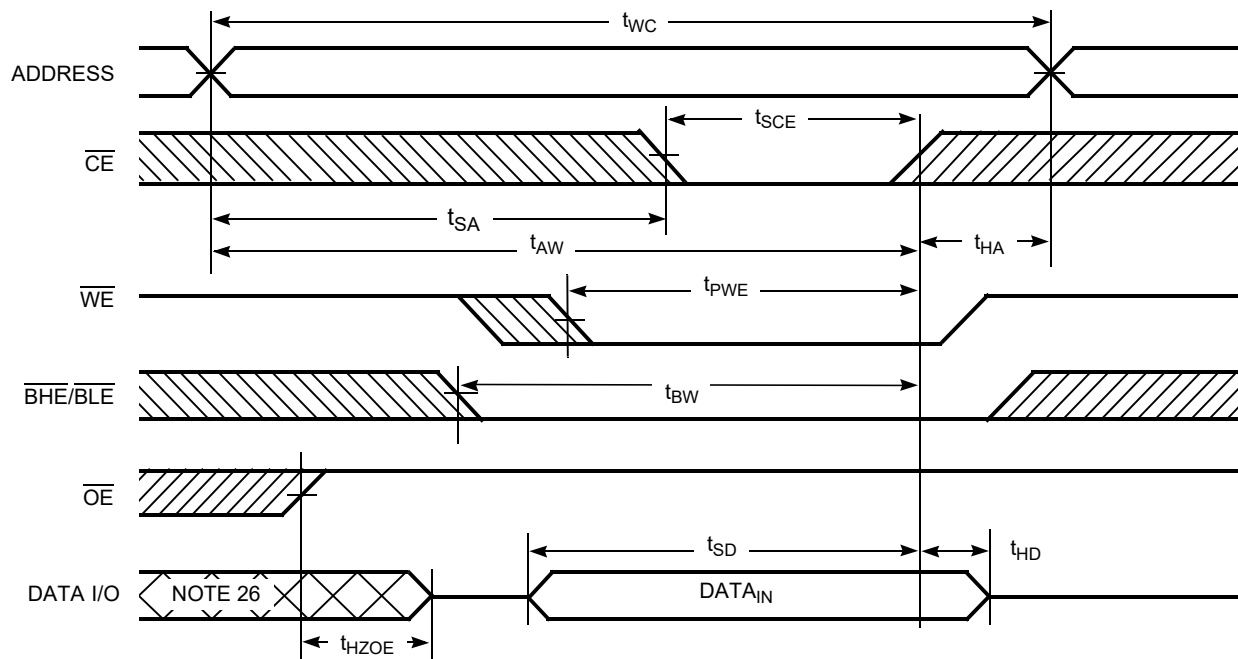


Figure 7. Write Cycle No. 2 ( $\overline{CE}$  Controlled) [23, 24, 25]



Notes

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

Switching Waveforms (continued)

Figure 8. Write Cycle No. 3 ( $\overline{WE}$  Controlled,  $\overline{OE}$  LOW) [27, 28, 30]

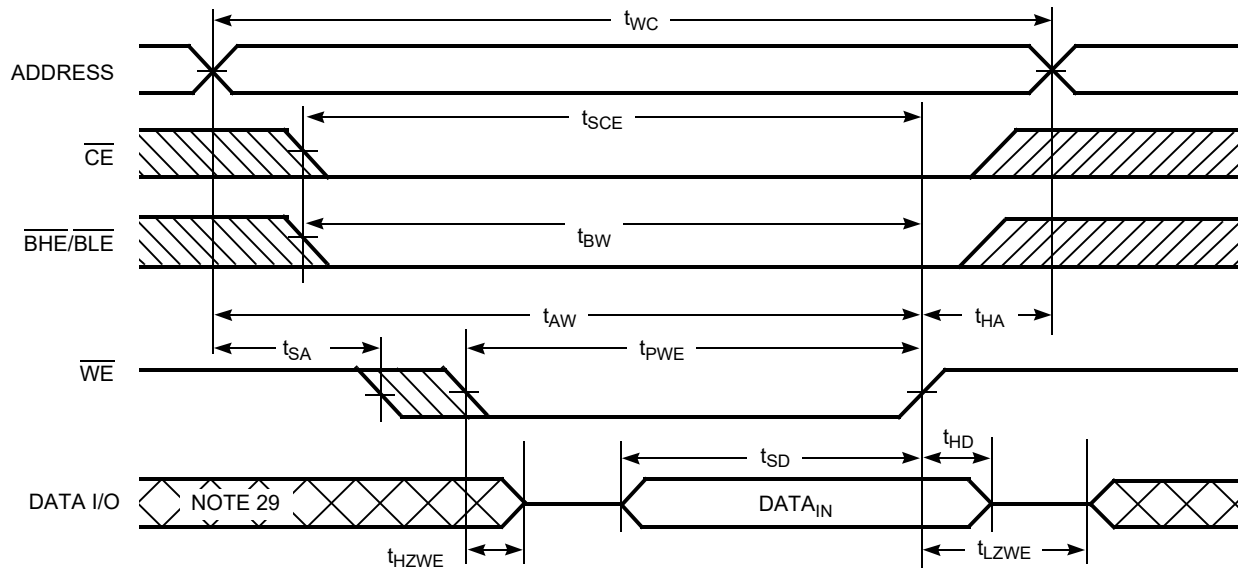
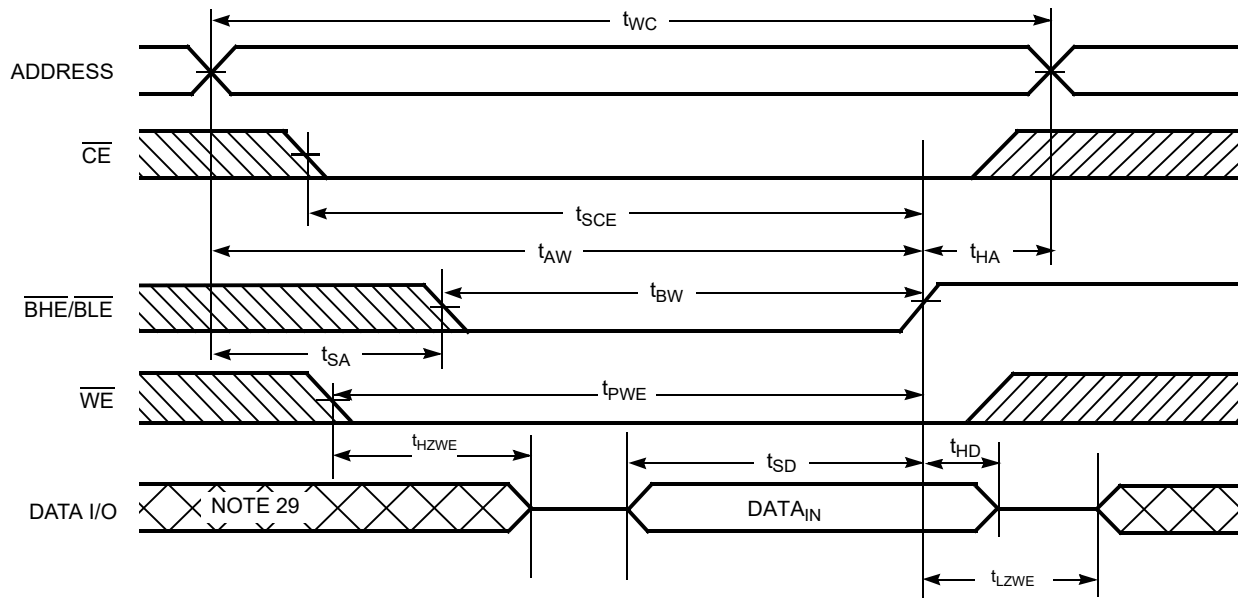


Figure 9. Write Cycle No. 4 ( $\overline{BHE}/\overline{BLE}$  Controlled,  $\overline{OE}$  LOW) [27, 28]



Notes

27. If  $\overline{CE}$  goes HIGH simultaneously with  $\overline{WE} = V_{IH}$ , the output remains in a high impedance state.

28. The internal write time of the memory is defined by the overlap of  $\overline{WE}$ ,  $\overline{CE} = V_{IL}$ ,  $\overline{BHE}$ ,  $\overline{BLE}$  or both =  $V_{IL}$ . All signals must be active to initiate a write and any of these signals can terminate the write by going inactive. The input setup and hold timing must be referenced to the edge of the signal that terminate the write.

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

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

**Truth Table**

$\overline{CE}^{[31]}$	$\overline{WE}$	$\overline{OE}$	$\overline{BHE}$	$\overline{BLE}$	Inputs/Outputs	Mode	Power
H	X	X	X <sup>[31]</sup>	X <sup>[31]</sup>	High Z	Deselect/power down	Standby ( $I_{SB}$ )
L	X	X	H	H	High Z	Output disabled	Active ( $I_{CC}$ )
L	H	L	L	L	Data out ( $I/O_0$ – $I/O_{15}$ )	Read	Active ( $I_{CC}$ )
L	H	L	H	L	Data out ( $I/O_0$ – $I/O_7$ ); $I/O_8$ – $I/O_{15}$ in High-Z	Read	Active ( $I_{CC}$ )
L	H	L	L	H	Data out ( $I/O_8$ – $I/O_{15}$ ); $I/O_0$ – $I/O_7$ in High-Z	Read	Active ( $I_{CC}$ )
L	H	H	L	L	High Z	Output disabled	Active ( $I_{CC}$ )
L	H	H	H	L	High Z	Output disabled	Active ( $I_{CC}$ )
L	H	H	L	H	High Z	Output disabled	Active ( $I_{CC}$ )
L	L	X	L	L	Data in ( $I/O_0$ – $I/O_{15}$ )	Write	Active ( $I_{CC}$ )
L	L	X	H	L	Data in ( $I/O_0$ – $I/O_7$ ); $I/O_8$ – $I/O_{15}$ in High Z	Write	Active ( $I_{CC}$ )
L	L	X	L	H	Data in ( $I/O_8$ – $I/O_{15}$ ); $I/O_0$ – $I/O_7$ in High Z	Write	Active ( $I_{CC}$ )

**Note**

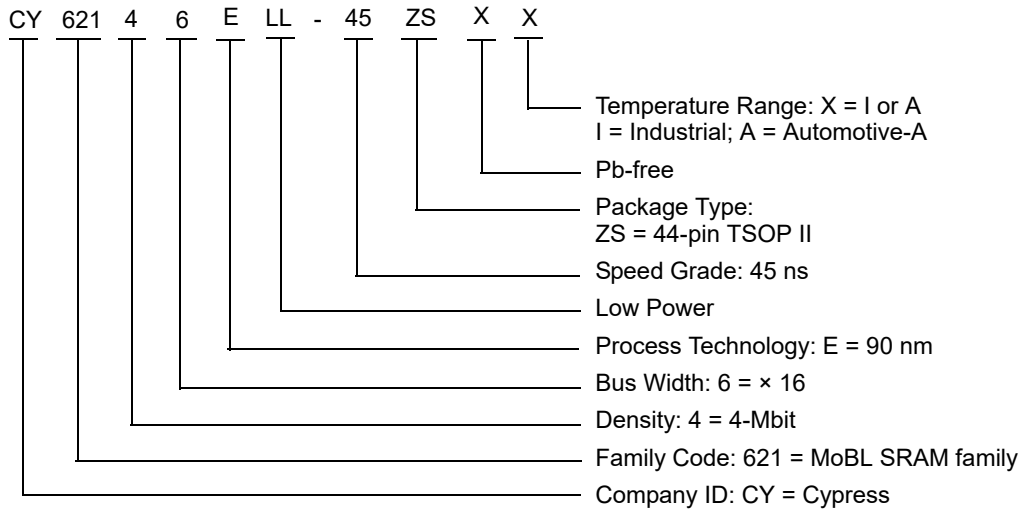
31. Chip enable ( $\overline{CE}$ ) and byte enables ( $\overline{BHE}$  and  $\overline{BLE}$ ) must be at CMOS levels (not floating) to meet the  $I_{SB2}$  /  $I_{CCDR}$  spec. Intermediate voltage levels on these pins is not permitted.

### Ordering Information

Speed (ns)	Ordering Code	Package Diagram	Package Type	Operating Range
45	CY62146ELL-45ZSXI	51-85087	44-pin TSOP II (Pb-free)	Industrial

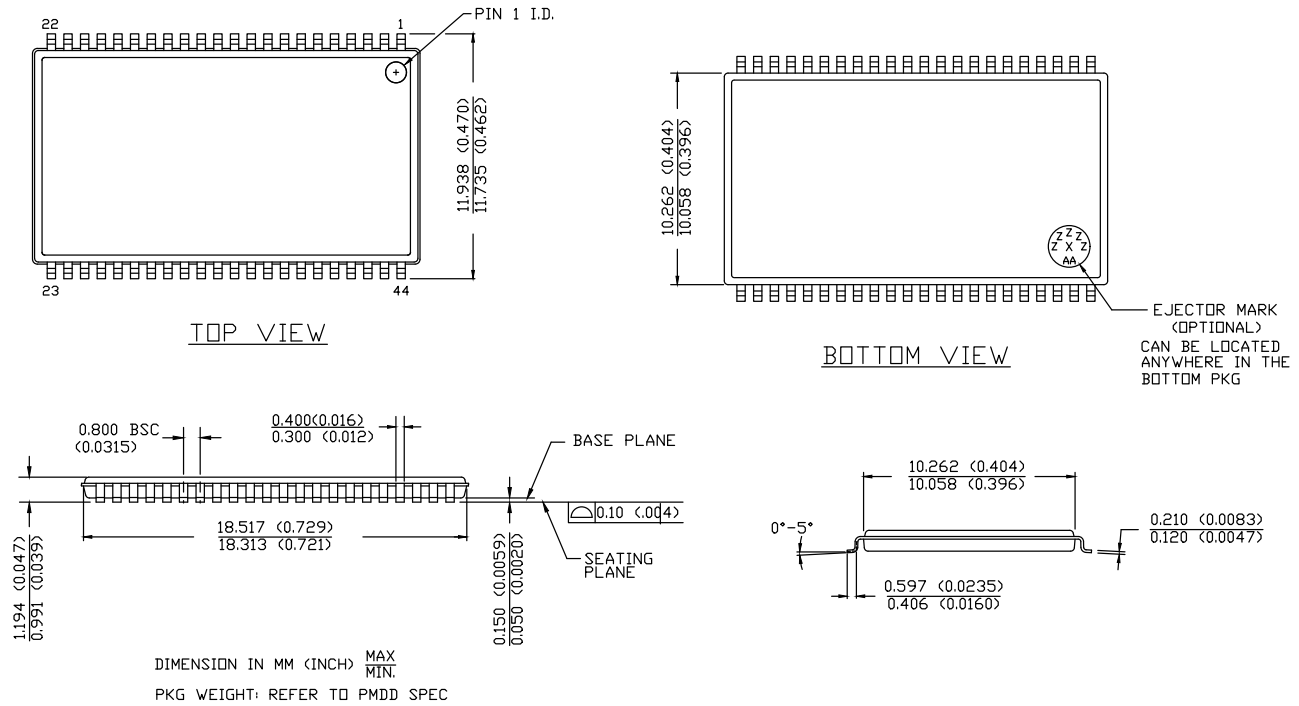
Contact your local Cypress sales representative for availability of these parts.

### Ordering Code Definitions



Package Diagram

Figure 10. 44-pin TSOP II (18.4 × 10.2 × 1.194 mm) Package Outline, 51-85087



51-85087 \*F

**Acronyms**

Acronym	Description
BHE	Byte High Enable
BLE	Byte Low Enable
CE	Chip Enable
CMOS	Complementary Metal Oxide Semiconductor
I/O	Input/Output
OE	Output Enable
SRAM	Static Random Access Memory
TSOP	Thin Small Outline Package
VFBGA	Very Fine-Pitch Ball Grid Array
WE	Write Enable

**Document Conventions**

**Units of Measure**

Symbol	Unit of Measure
°C	degree Celsius
MHz	megahertz
μA	microampere
mA	milliampere
ns	nanosecond
Ω	ohm
pF	picofarad
V	volt
W	watt

Document History Page

Document Title: CY62146E MoBL, 4-Mbit (256K × 16) Static RAM Document Number: 001-07970			
Rev.	ECN No.	Submission Date	Description of Change
**	463213	05/19/2006	New data sheet.
*A	684343	01/17/2007	Added Automotive-A Temperature Range related information in all instances across the document and made the information Preliminary (by shading in required places). Updated <a href="#">Ordering Information</a> : Updated part numbers.
*B	925501	04/09/2007	Updated <a href="#">Electrical Characteristics</a> : Added Note 8 and referred the same note in I <sub>SB2</sub> parameter. Updated <a href="#">Data Retention Characteristics</a> : Added Note 11 and referred the same note in I <sub>CCDR</sub> parameter. Updated <a href="#">Switching Characteristics</a> : Added Note 15 and referred the same note in "Parameter" column.
*C	1045260	05/07/2007	Changed status of Automotive-A Temperature Range related information from Preliminary to Final (by unshading in required places). Updated <a href="#">Ordering Information</a> : No change in part numbers. Unshaded the Automotive-A MPNs (Changed status from Preliminary to Final).
*D	2073548	02/06/2008	Updated <a href="#">Data Retention Waveform</a> : Updated <a href="#">Figure 3</a> (Corrected typo). Removed Note "BHE, BLE is the AND of BHE and BLE. Deselect the chip by either disabling the chip enable signals or by disabling BHE and BLE." and its reference. Updated to new template.
*E	2943752	06/03/2010	Updated <a href="#">Truth Table</a> : Added Note 31 and referred the same note in "CE" column. Updated <a href="#">Package Diagram</a> : spec 51-85087 – Changed revision from *A to *C. Updated to new template.
*F	3109050	12/13/2010	Changed Table Footnotes to Notes in all instances across the document. Updated <a href="#">Ordering Information</a> : No change in part numbers. Added <a href="#">Ordering Code Definitions</a> .
*G	3149059	01/20/2011	Updated <a href="#">Ordering Information</a> : No change in part numbers. Updated <a href="#">Ordering Code Definitions</a> (Corrected Errors). Added <a href="#">Acronyms and Units of Measure</a> . Updated to new template. Completing Sunset Review.
*H	3296704	06/29/2011	Updated <a href="#">Functional Description</a> : Updated description (Removed "For best practice recommendations, refer to the Cypress application note <a href="#">AN1064, SRAM System Guidelines</a> .").
*I	3921993	03/05/2013	Updated <a href="#">Switching Waveforms</a> : Added Note 25 and referred the same note in <a href="#">Figure 6</a> , <a href="#">Figure 7</a> . Removed Note "WE is HIGH for read cycle." and its references in <a href="#">Figure 6</a> , <a href="#">Figure 7</a> . Added Note 28 and referred the same note in <a href="#">Figure 8</a> , <a href="#">Figure 9</a> . Updated <a href="#">Package Diagram</a> : spec 51-85087 – Changed revision from *C to *E. Completing Sunset Review.



Document History Page (continued)

Document Title: CY62146E MoBL, 4-Mbit (256K × 16) Static RAM Document Number: 001-07970			
Rev.	ECN No.	Submission Date	Description of Change
*J	4013949	06/04/2013	Updated <a href="#">Functional Description</a> : Updated description. Updated <a href="#">Electrical Characteristics</a> : Added one more Test Condition “V <sub>CC</sub> = 5.5 V, I <sub>OH</sub> = -0.1 mA” for V <sub>OH</sub> parameter and added maximum value corresponding to that Test Condition. Added Note 7 and referred the same note in maximum value for V <sub>OH</sub> parameter corresponding to Test Condition “V <sub>CC</sub> = 5.5 V, I <sub>OH</sub> = -0.1 mA”.
*K	4102022	08/14/2013	Updated <a href="#">Switching Characteristics</a> : Updated Note 15. Updated to new template.
*L	4576478	11/21/2014	Updated <a href="#">Functional Description</a> : Added “For a complete list of related documentation, <a href="#">click here</a> .” at the end. Updated <a href="#">Switching Characteristics</a> : Added Note 19 and referred the same note in “Write Cycle”. Updated <a href="#">Switching Waveforms</a> : Added Note 30 and referred the same note in <a href="#">Figure 8</a> .
*M	5196888	04/14/2016	Updated <a href="#">Thermal Resistance</a> : Updated values of $\Theta_{JA}$ and $\Theta_{JC}$ parameters in “44-pin TSOP II” column. Updated to new template. Completing Sunset Review.
*N	6049346	01/29/2018	Updated <a href="#">Ordering Information</a> : Updated part numbers. Updated to new template. Completing Sunset Review.
*O	6560791	04/29/2019	Updated to new template.
*P	6906316	06/26/2020	Updated <a href="#">Features</a> : Changed value of Typical standby current from 1 $\mu$ A to 2.5 $\mu$ A. Changed value of Typical active current from 2 mA to 3.5 mA. Updated <a href="#">Product Portfolio</a> : Changed typical value of Operating I <sub>CC</sub> from 2 mA to 3.5 mA corresponding to “f = 1 MHz”. Changed maximum value of Operating I <sub>CC</sub> from 2.5 mA to 6 mA corresponding to “f = 1 MHz”. Changed typical value of Standby, I <sub>SB2</sub> from 1 $\mu$ A to 2.5 $\mu$ A. Updated <a href="#">Electrical Characteristics</a> : Changed typical value of I <sub>CC</sub> parameter from 2 mA to 3.5 mA corresponding to Test Condition “f = 1 MHz”. Changed maximum value of I <sub>CC</sub> parameter from 2.5 mA to 6 mA corresponding to Test Condition “f = 1 MHz”. Changed typical value of I <sub>SB2</sub> parameter from 1 $\mu$ A to 2.5 $\mu$ A. Updated <a href="#">Data Retention Characteristics</a> : Changed typical value of I <sub>CCDR</sub> parameter from 1 $\mu$ A to 3 $\mu$ A. Changed maximum value of I <sub>CCDR</sub> parameter from 7 $\mu$ A to 8.8 $\mu$ A. Updated <a href="#">Package Diagram</a> : spec 51-85087 – Changed revision from *E to *F. Updated to new template.

## Sales, Solutions, and Legal Information

### Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at [Cypress Locations](#).

#### Products

Arm <sup>®</sup> Cortex <sup>®</sup> Microcontrollers	<a href="http://cypress.com/arm">cypress.com/arm</a>
Automotive	<a href="http://cypress.com/automotive">cypress.com/automotive</a>
Clocks & Buffers	<a href="http://cypress.com/clocks">cypress.com/clocks</a>
Interface	<a href="http://cypress.com/interface">cypress.com/interface</a>
Internet of Things	<a href="http://cypress.com/iot">cypress.com/iot</a>
Memory	<a href="http://cypress.com/memory">cypress.com/memory</a>
Microcontrollers	<a href="http://cypress.com/mcu">cypress.com/mcu</a>
PSoC	<a href="http://cypress.com/psoc">cypress.com/psoc</a>
Power Management ICs	<a href="http://cypress.com/pmic">cypress.com/pmic</a>
Touch Sensing	<a href="http://cypress.com/touch">cypress.com/touch</a>
USB Controllers	<a href="http://cypress.com/usb">cypress.com/usb</a>
Wireless Connectivity	<a href="http://cypress.com/wireless">cypress.com/wireless</a>

#### PSoC<sup>®</sup> Solutions

[PSoC 1](#) | [PSoC 3](#) | [PSoC 4](#) | [PSoC 5LP](#) | [PSoC 6 MCU](#)

#### Cypress Developer Community

[Community](#) | [Code Examples](#) | [Projects](#) | [Video](#) | [Blogs](#) | [Training](#) | [Components](#)

#### Technical Support

[cypress.com/support](http://cypress.com/support)

© Cypress Semiconductor Corporation, 2006–2020. This document is the property of Cypress Semiconductor Corporation and its subsidiaries ("Cypress"). This document, including any software or firmware included or referenced in this document ("Software"), is owned by Cypress under the intellectual property laws and treaties of the United States and other countries worldwide. Cypress reserves all rights under such laws and treaties and does not, except as specifically stated in this paragraph, grant any license under its patents, copyrights, trademarks, or other intellectual property rights. If the Software is not accompanied by a license agreement and you do not otherwise have a written agreement with Cypress governing the use of the Software, then Cypress hereby grants you a personal, non-exclusive, nontransferable license (without the right to sublicense) (1) under its copyright rights in the Software (a) for Software provided in source code form, to modify and reproduce the Software solely for use with Cypress hardware products, only internally within your organization, and (b) to distribute the Software in binary code form externally to end users (either directly or indirectly through resellers and distributors), solely for use on Cypress hardware product units, and (2) under those claims of Cypress's patents that are infringed by the Software (as provided by Cypress, unmodified) to make, use, distribute, and import the Software solely for use with Cypress hardware products. Any other use, reproduction, modification, translation, or compilation of the Software is prohibited.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS DOCUMENT OR ANY SOFTWARE OR ACCOMPANYING HARDWARE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No computing device can be absolutely secure. Therefore, despite security measures implemented in Cypress hardware or software products, Cypress shall have no liability arising out of any security breach, such as unauthorized access to or use of a Cypress product. CYPRESS DOES NOT REPRESENT, WARRANT, OR GUARANTEE THAT CYPRESS PRODUCTS, OR SYSTEMS CREATED USING CYPRESS PRODUCTS, WILL BE FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION (collectively, "Security Breach"). Cypress disclaims any liability relating to any Security Breach, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from any Security Breach. In addition, the products described in these materials may contain design defects or errors known as errata which may cause the product to deviate from published specifications. To the extent permitted by applicable law, Cypress reserves the right to make changes to this document without further notice. Cypress does not assume any liability arising out of the application or use of any product or circuit described in this document. Any information provided in this document, including any sample design information or programming code, is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. "High-Risk Device" means any device or system whose failure could cause personal injury, death, or property damage. Examples of High-Risk Devices are weapons, nuclear installations, surgical implants, and other medical devices. "Critical Component" means any component of a High-Risk Device whose failure to perform can be reasonably expected to cause, directly or indirectly, the failure of the High-Risk Device, or to affect its safety or effectiveness. Cypress is not liable, in whole or in part, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from any use of a Cypress product as a Critical Component in a High-Risk Device. You shall indemnify and hold Cypress, its directors, officers, employees, agents, affiliates, distributors, and assigns harmless from and against all claims, costs, damages, and expenses, arising out of any claim, including claims for product liability, personal injury or death, or property damage arising from any use of a Cypress product as a Critical Component in a High-Risk Device. Cypress products are not intended or authorized for use as a Critical Component in any High-Risk Device except to the limited extent that (i) Cypress's published data sheet for the product explicitly states Cypress has qualified the product for use in a specific High-Risk Device, or (ii) Cypress has given you advance written authorization to use the product as a Critical Component in the specific High-Risk Device and you have signed a separate indemnification agreement.

Cypress, the Cypress logo, Spansion, the Spansion logo, and combinations thereof, WICED, PSoC, CapSense, EZ-USB, F-RAM, and Traveo are trademarks or registered trademarks of Cypress in the United States and other countries. For a more complete list of Cypress trademarks, visit [cypress.com](http://cypress.com). Other names and brands may be claimed as property of their respective owners.

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [SRAM](#) category:*

*Click to view products by [Cypress](#) manufacturer:*

Other Similar products are found below :

[CY6116A-35DMB](#) [CY7C1049GN-10VXI](#) [CY7C128A-45DMB](#) [GS8161Z36DD-200I](#) [GS88237CB-200I](#) [RMLV0408EGSB-4S2#AA0](#)  
[IDT70V5388S166BG](#) [IS64WV3216BLL-15CTLA3](#) [IS66WVE4M16ECLL-70BLI](#) [PCF8570P](#) [K6F2008V2E-LF70000](#) [K6T4008C1B-GB70](#)  
[CY7C1353S-100AXC](#) [AS6C8016-55BIN](#) [AS7C164A-15PCN](#) [515712X](#) [IDT71V67603S133BG](#) [IS62WV51216EBLL-45BLI](#)  
[IS63WV1288DBLL-10HLI](#) [IS66WVE2M16ECLL-70BLI](#) [70V639S10BCG](#) [IS66WVE4M16EALL-70BLI](#) [IS62WV6416DBLL-45BLI](#)  
[IS61WV102416DBLL-10TLI](#) [CY7C1381KV33-100AXC](#) [CY7C1381KVE33-133AXI](#) [8602501XA](#) [5962-3829425MUA](#) [5962-3829430MUA](#)  
[5962-8855206YA](#) [5962-8866201YA](#) [5962-8866204TA](#) [5962-8866206MA](#) [5962-8866208UA](#) [5962-8872502XA](#) [5962-9062007MXA](#) [5962-](#)  
[9161705MXA](#) [70V3579S6BFI](#) [GS882Z18CD-150I](#) [M38510/28902BVA](#) [8413202RA](#) [5962-9161708MYA](#) [5962-8971203XA](#) [5962-](#)  
[8971202ZA](#) [5962-8872501LA](#) [5962-8866208YA](#) [5962-8866205YA](#) [5962-8866205UA](#) [5962-8866203YA](#) [5962-8855202YA](#)