

16-Mbit (1M words × 16 bit) Static RAM

Features

- High speed
 - $t_{AA} = 10 \text{ ns}/15 \text{ ns}$
- Low active power
 - $I_{CC} = 90 \text{ mA}$ at 100 MHz
- Low CMOS standby current
 - $I_{SB2} = 20 \text{ mA}$ (typ)
- Operating voltages of 2.2 V to 3.6 V
- 1.0 V data retention
- Automatic power down when deselected
- TTL compatible inputs and outputs
- Easy memory expansion with \overline{CE}_1 and CE_2 features
- Available in Pb-free 48-pin TSOP I, 54-pin TSOP II, and 48-ball VFBGA packages
- Offered in dual Chip Enable options

Functional Description

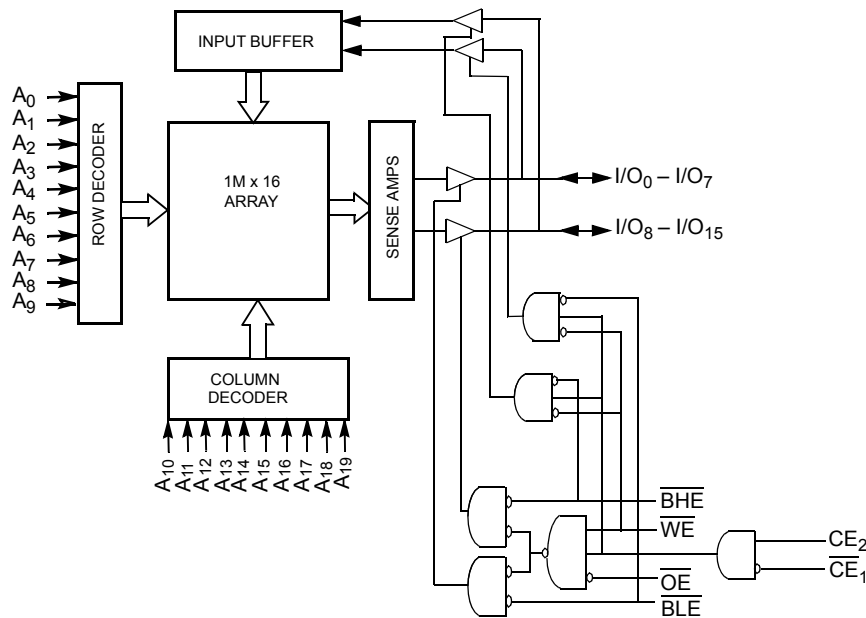
The CY7C1061GN/CY7C10612GN is a high performance CMOS Static RAM organized as 1,048,576 words by 16 bits.

To write to the device, take Chip Enables (\overline{CE}_1 LOW and CE_2 HIGH) and Write Enable (\overline{WE}) input LOW. If Byte Low Enable (\overline{BLE}) is LOW, then data from I/O pins (I/O_0 through I/O_7), is written into the location specified on the address pins (A_0 through A_{19}). If Byte High Enable (\overline{BHE}) is LOW, then data from I/O pins (I/O_8 through I/O_{15}) is 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 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_0 to I/O_7 . If Byte High Enable (\overline{BHE}) is LOW, then data from memory appears on I/O_8 to I/O_{15} . See Truth Table on page 13 for a complete description of Read and Write modes.

The input or output pins (I/O_0 through I/O_{15}) are placed in a high impedance state when the device is deselected (\overline{CE}_1 HIGH/ CE_2 LOW), 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}_1 LOW, CE_2 HIGH, and \overline{WE} LOW).

Logic Block Diagram



Contents

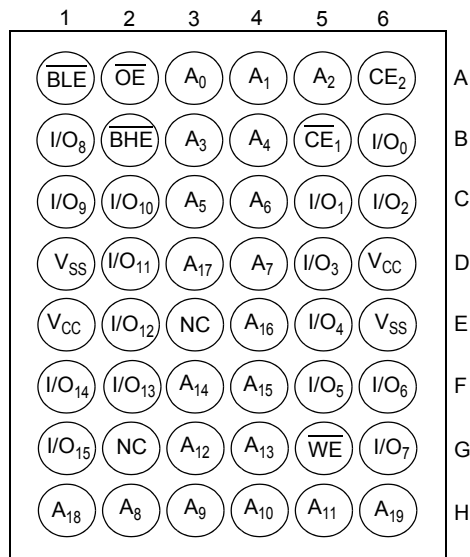
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Selection Guide

Description	-10	-15	Unit
Maximum access time	10	15	ns
Maximum operating current	110	80	mA
Maximum CMOS standby current	30	30	mA

Pin Configurations

Figure 1. 48-ball VFBGA (8 × 9.5 × 1 mm) Dual Chip Enable pinout, Package/Grade ID: BVXI ^[1]



Note

1. NC pins are not connected internally to the die.

Pin Configurations (continued)

Figure 2. 48-ball VFBGA (6 × 8 × 1.0 mm)
Single Chip Enable pinout, Package/Grade ID: BV1XI [2]

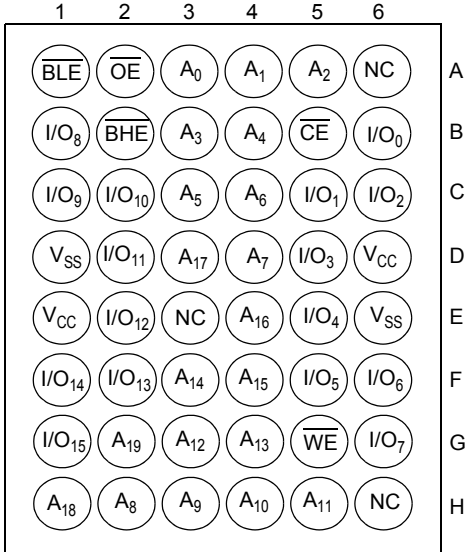


Figure 3. 48-ball VFBGA (6 × 8 × 1.0 mm)
Dual Chip Enable pinout, Package/Grade ID: BVJXI [2]

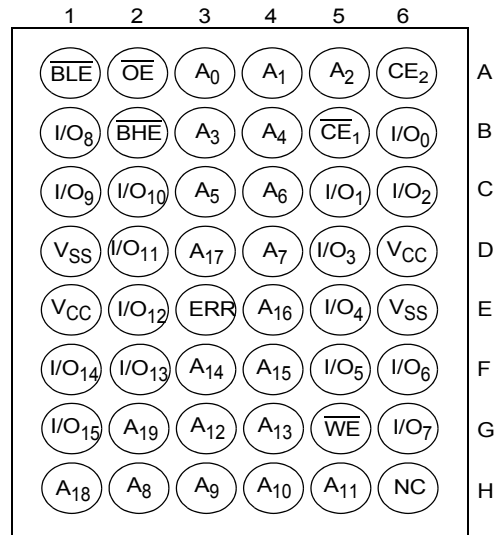


Figure 4. 54-pin TSOP II (22.4 × 11.84 × 1.0 mm)
Dual Chip Enable pinout (Top View) [2]

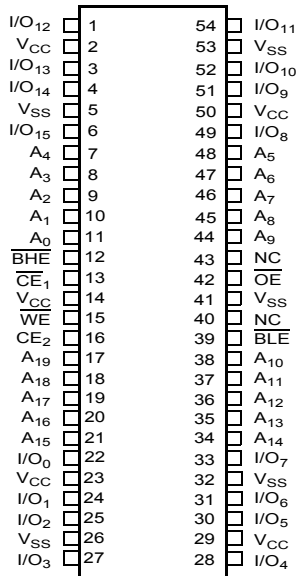
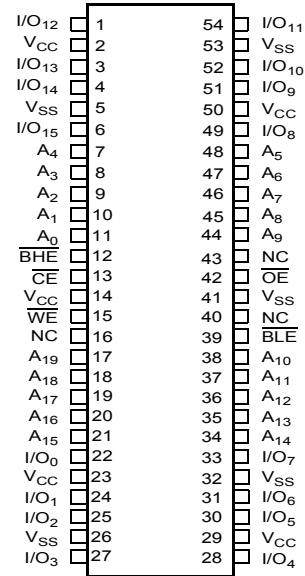


Figure 5. 54-pin TSOP II (22.4 × 11.84 × 1.0 mm)
Single Chip Enable pinout (Top View) [2]

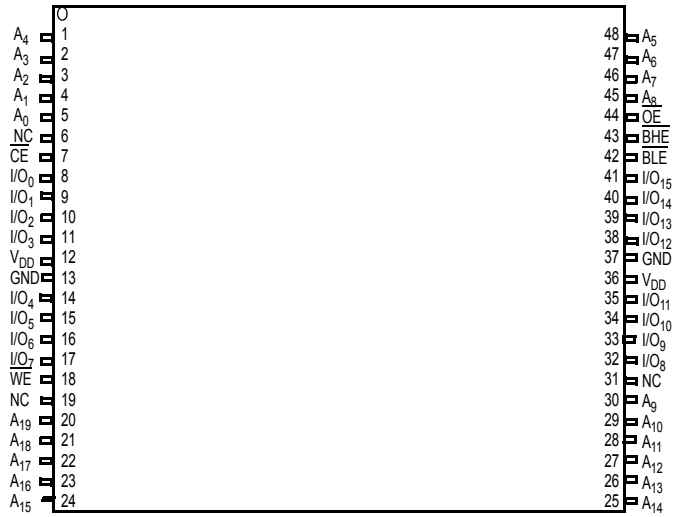


Note

2. NC pins are not connected internally to the die.

Pin Configurations (continued)

Figure 6. 48-pin TSOP I (12 × 18.4 × 1 mm) pinout (Top View) ^[3]



Note

- NC pins are not connected internally to the die.

Maximum Ratings

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

Storage Temperature	-65 °C to +150 °C
Ambient Temperature with Power Applied	-55 °C to +125 °C
Supply Voltage on V _{CC} relative to GND [4]	-0.5 V to V _{CC} + 0.5 V
DC Voltage Applied to Outputs in High Z State [4]	-0.5 V to V _{CC} + 0.5 V

DC Input Voltage [4]	-0.5 V to V _{CC} + 0.5 V
Current into Outputs (LOW)	20 mA
Static Discharge Voltage (MIL-STD-883, Method 3015)	>2001 V
Latch Up Current	>200 mA

Operating Range

Range	Ambient Temperature	V _{CC}
Industrial	-40 °C to +85 °C	1.65 V to 2.2 V, 2.2 V to 3.6 V

DC Electrical Characteristics

Over the Operating Range

Parameter	Description	Test Conditions	10 ns/15 ns			Unit	
			Min	Typ [5]	Max		
V _{OH}	Output HIGH voltage	1.65 V to 2.2 V	V _{CC} = Min, I _{OH} = -0.1 mA		1.4	-	V
		2.2 V to 2.7 V	V _{CC} = Min, I _{OH} = -0.1 mA		2.0	-	
		2.7 V to 3.0 V	V _{CC} = Min, I _{OH} = -4.0 mA		2.2	-	
		3.0 V to 3.6 V	V _{CC} = Min, I _{OH} = -4.0 mA		2.4	-	
V _{OL}	Output LOW voltage	1.65 V to 2.2 V	V _{CC} = Min, I _{OL} = 0.1 mA		-	-	V
		2.2 V to 2.7 V	V _{CC} = Min, I _{OL} = 2 mA		-	-	
		2.7 V to 3.6 V	V _{CC} = Min, I _{OL} = 8 mA		-	-	
V _{IH}	Input HIGH voltage [4]	1.65 V to 2.2 V	-		1.4	-	V
		2.2 V to 2.7 V	-		2.0	-	
		2.7 V to 3.6 V	-		2.0	-	
V _{IL}	Input LOW voltage [4]	1.65 V to 2.2 V	-		-0.2	-	V
		2.2 V to 2.7 V	-		-0.3	-	
		2.7 V to 3.6 V	-		-0.3	-	
I _{IX}	Input leakage current	GND ≤ V _I ≤ V _{CC}		-1	-	+1	μA
I _{OZ}	Output leakage current	GND ≤ V _{OUT} ≤ V _{CC} , Output disabled		-1	-	+1	μA
I _{CC}	V _{CC} operating supply current	V _{CC} = Max, I _{OUT} = 0 mA, CMOS levels	f = 100 MHz	-	90	110	mA
			f = 66.7 MHz	-	70	80	
I _{SB1}	Automatic CE power down current – TTL inputs [6]	Max V _{CC} , CE ₁ ≥ V _{IH} , CE ₂ ≤ V _{IL} , V _{IN} ≥ V _{IH} or V _{IN} ≤ V _{IL} , f = f _{MAX}		-	-	40	mA
I _{SB2}	Automatic CE power down current – CMOS inputs [6]	Max V _{CC} , CE ₁ ≥ V _{CC} - 0.3 V, CE ₂ ≤ 0.3 V, V _{IN} ≥ V _{CC} - 0.3 V or V _{IN} ≤ 0.3 V, f = 0		-	20	30	mA

Notes

- V_{IL(min)} = -2.0 V and V_{IH(max)} = V_{CC} + 2 V for pulse durations of less than 20 ns.
- Typical values are included only for reference and are not guaranteed or tested. Typical values are measured at V_{CC} = 1.8 V (for a V_{CC} range of 1.65 V–2.2 V), V_{CC} = 3 V (for a V_{CC} range of 2.2 V–3.6 V) at T_A = 25 °C.
- For all dual chip enable devices, CE is the logical combination of CE₁ and CE₂. When CE₁ is LOW and CE₂ is HIGH, CE is LOW; when CE₁ is HIGH or CE₂ is LOW, CE is HIGH.

Capacitance

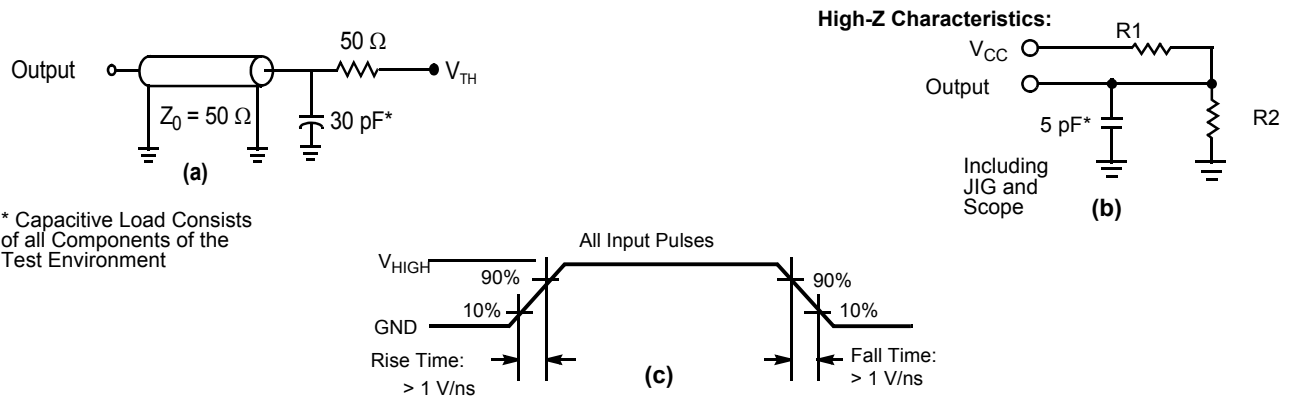
Parameter [7]	Description	Test Conditions	48-pin TSOP I	54-pin TSOP II	48-ball VFBGA	Unit
C _{IN}	Input capacitance	T _A = 25 °C, f = 1 MHz, V _{CC} = 3.3 V	10	10	10	pF
C _{OUT}	I/O capacitance		10	10	10	pF

Thermal Resistance

Parameter [7]	Description	Test Conditions	48-pin TSOP I	54-pin TSOP II	48-ball VFBGA	Unit
θ _{JA}	Thermal resistance (junction to ambient)	Still air, soldered on a 3 × 4.5 inch, four layer printed circuit board	57.99	93.63	31.50	°C/W
θ _{JC}	Thermal resistance (junction to case)		13.42	21.58	15.75	°C/W

AC Test Loads and Waveforms

Figure 7. AC Test Loads and Waveforms [8]



Parameters	1.8 V	3.0 V	Unit
R1	1667	317	Ω
R2	1538	351	Ω
V _{TH}	0.9	1.5	V
V _{HIGH}	1.8	3	V

Notes

- 7. Tested initially and after any design or process changes that may affect these parameters.
- 8. Full-device AC operation assumes a 100-μs ramp time from 0 to V_{CC} (min) and 100-μs wait time after V_{CC} stabilizes to its operational value.

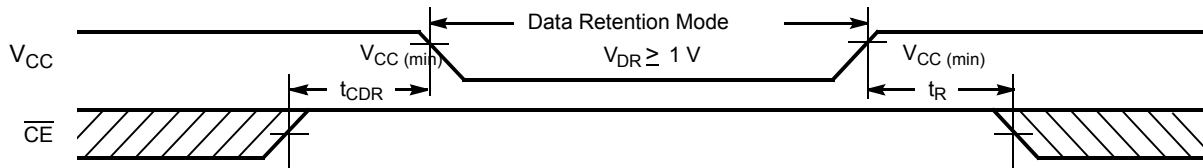
Data Retention Characteristics

Over the Operating Range

Parameter	Description	Conditions	Min	Max	Unit
V_{DR}	V_{CC} for data retention	–	1	–	V
I_{CCDR}	Data retention current	$V_{CC} = 1.2\text{ V}$, $\overline{CE}_1 \geq V_{CC} - 0.2\text{ V}$, $CE_2 \leq 0.2\text{ V}$, $V_{IN} \geq V_{CC} - 0.2\text{ V}$ or $V_{IN} \leq 0.2\text{ V}$	–	30	mA
$t_{CDR}^{[9]}$	Chip deselect to data retention time	–	0	–	ns
$t_R^{[10]}$	Operation recovery time	$V_{CC} \geq 2.2\text{ V}$	10	–	ns
		$V_{CC} < 2.2\text{ V}$	15	–	

Data Retention Waveform

Figure 8. Data Retention Waveform ^[11]



Notes

- 9. Tested initially and after any design or process changes that may affect these parameters.
- 10. Full device operation requires linear V_{CC} ramp from V_{DR} to $V_{CC(min.)} \geq 100\ \mu\text{s}$ or stable at $V_{CC(min.)} \geq 100\ \mu\text{s}$.
- 11. \overline{CE} is the logical combination of \overline{CE}_1 and CE_2 . When \overline{CE}_1 is LOW and CE_2 is HIGH, \overline{CE} is LOW; when \overline{CE}_1 is HIGH or CE_2 is LOW, \overline{CE} is HIGH.

AC Switching Characteristics

Over the Operating Range

Parameter ^[12]	Description	-10		-15		Unit
		Min	Max	Min	Max	
Read Cycle						
t _{power}	V _{CC} (typical) to the first access ^[13]	100	–	100	–	μs
t _{RC}	Read cycle time	10	–	15	–	ns
t _{AA}	Address to data valid	–	10	–	15	ns
t _{OHA}	Data hold from address change	3	–	3	–	ns
t _{ACE}	\overline{CE}_1 LOW/CE ₂ HIGH to data valid	–	10	–	15	ns
t _{DOE}	\overline{OE} LOW to data valid	–	5	–	8	ns
t _{LZOE}	\overline{OE} LOW to low Z ^[14]	0	–	1	–	ns
t _{HZOE}	\overline{OE} HIGH to high Z ^[14, 15]	–	5	–	8	ns
t _{LZCE}	\overline{CE}_1 LOW/CE ₂ HIGH to low Z ^[14]	3	–	3	–	ns
t _{HZCE}	\overline{CE}_1 HIGH/CE ₂ LOW to high Z ^[14, 15]	–	5	–	8	ns
t _{PU}	\overline{CE}_1 LOW/CE ₂ HIGH to power-up ^[16]	0	–	0	–	ns
t _{PD}	\overline{CE}_1 HIGH/CE ₂ LOW to power-down ^[16]	–	10	–	15	ns
t _{DBE}	Byte enable to data valid	–	5	–	8	ns
t _{LZBE}	Byte enable to low Z	0	–	1	–	ns
t _{HZBE}	Byte disable to high Z	–	6	–	8	ns
Write Cycle ^[17, 18]						
t _{WC}	Write cycle time	10	–	15	–	ns
t _{SCE}	\overline{CE}_1 LOW/CE ₂ HIGH to write end ^[19]	7	–	12	–	ns
t _{AW}	Address setup to write end	7	–	12	–	ns
t _{HA}	Address hold from write end	0	–	0	–	ns
t _{SA}	Address setup to write start	0	–	0	–	ns
t _{PWE}	\overline{WE} pulse width	7	–	12	–	ns
t _{SD}	Data setup to write end	5	–	8	–	ns
t _{HD}	Data hold from write end	0	–	0	–	ns
t _{LZWE}	\overline{WE} HIGH to low Z ^[14]	3	–	3	–	ns
t _{HZWE}	\overline{WE} LOW to high Z ^[14, 15]	–	5	–	8	ns
t _{BW}	Byte Enable to End of Write	7	–	12	–	ns

Notes

- Test conditions assume signal transition time (rise/fall) of 3 ns or less, timing reference levels of 1.5 V (for V_{CC} ≥ 3 V) and V_{CC}/2 (for V_{CC} < 3 V), and input pulse levels of 0 to 3 V (for V_{CC} ≥ 3 V) and 0 to V_{CC} (for V_{CC} < 3V). Test conditions for the read cycle use the output loading, shown in part (a) of Figure 7 on page 7, unless specified otherwise.
- t_{POWER} gives the minimum amount of time that the power supply is at typical V_{CC} values until the first memory access is performed.
- 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.
- t_{HZOE}, t_{HZCE}, t_{HZWE}, and t_{HZBE} are specified with a load capacitance of 5 pF, as shown in part (b) of Figure 7 on page 7. Hi-Z, Lo-Z transition is measured ±200 mV from steady state voltage.
- These parameters are guaranteed by design and are not tested.
- The internal write time of the memory is defined by the overlap of \overline{WE} , $\overline{CE}_1 = V_{IL}$, and CE₂ = V_{IH}. Chip enables must be active and \overline{WE} and byte enables must be LOW to initiate a write, and the transition of any of these signals can terminate. The input data setup and hold timing should be referenced to the edge of the signal that terminates the write.
- The minimum write cycle time for Write Cycle No. 2 (\overline{WE} Controlled, \overline{OE} LOW) is the sum of t_{HZWE} and t_{SD}.
- For all dual chip enable devices, \overline{CE} is the logical combination of CE₁ and CE₂. When \overline{CE}_1 is LOW and CE₂ is HIGH, \overline{CE} is LOW; when \overline{CE}_1 is HIGH or CE₂ is LOW, \overline{CE} is HIGH.

Switching Waveforms

Figure 9. Read Cycle No. 1 (Address Transition Controlled) [20, 21]

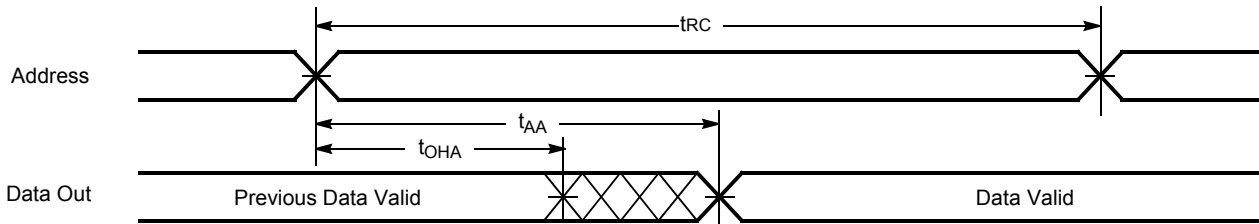
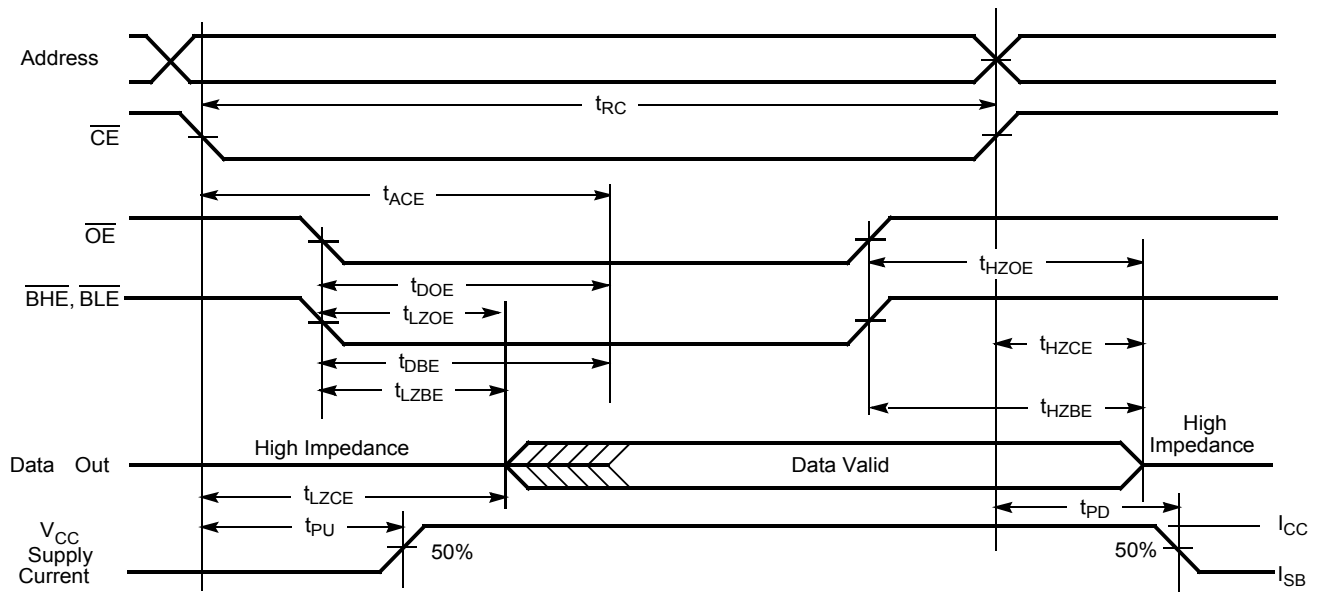


Figure 10. Read Cycle No. 2 (\overline{OE} Controlled) [21, 22, 23]



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. \overline{CE} is the logical combination of \overline{CE}_1 and CE_2 . When \overline{CE}_1 is LOW and CE_2 is HIGH, \overline{CE} is LOW; when \overline{CE}_1 is HIGH or CE_2 is LOW, \overline{CE} is HIGH.

23. Address valid before or similar to \overline{CE} transition LOW.

Switching Waveforms (continued)

Figure 11. Write Cycle No. 1 ($\overline{\text{CE}}$ Controlled) [24, 25, 26]

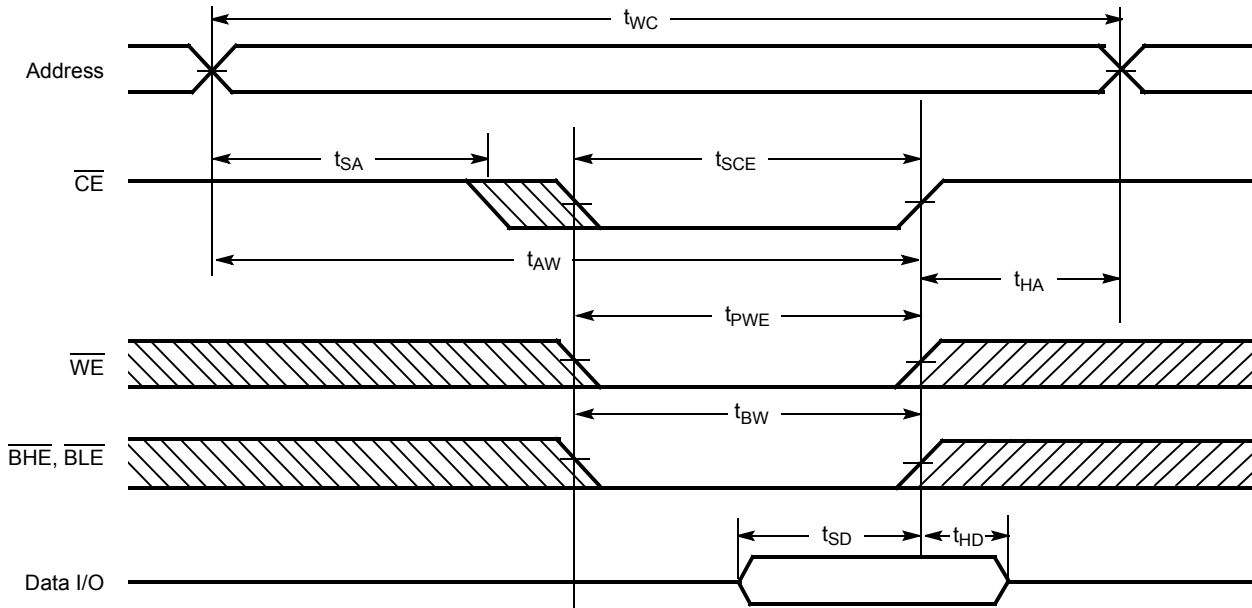
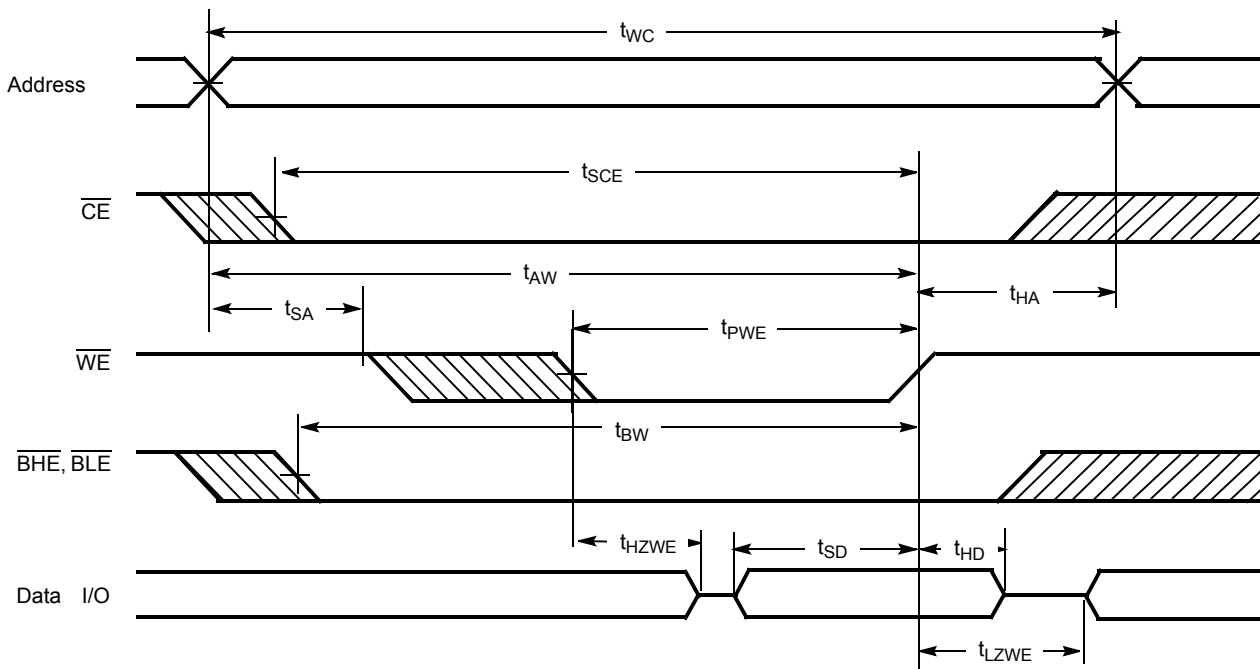


Figure 12. Write Cycle No. 2 ($\overline{\text{WE}}$ Controlled, $\overline{\text{OE}}$ LOW) [24, 25, 26]



Notes

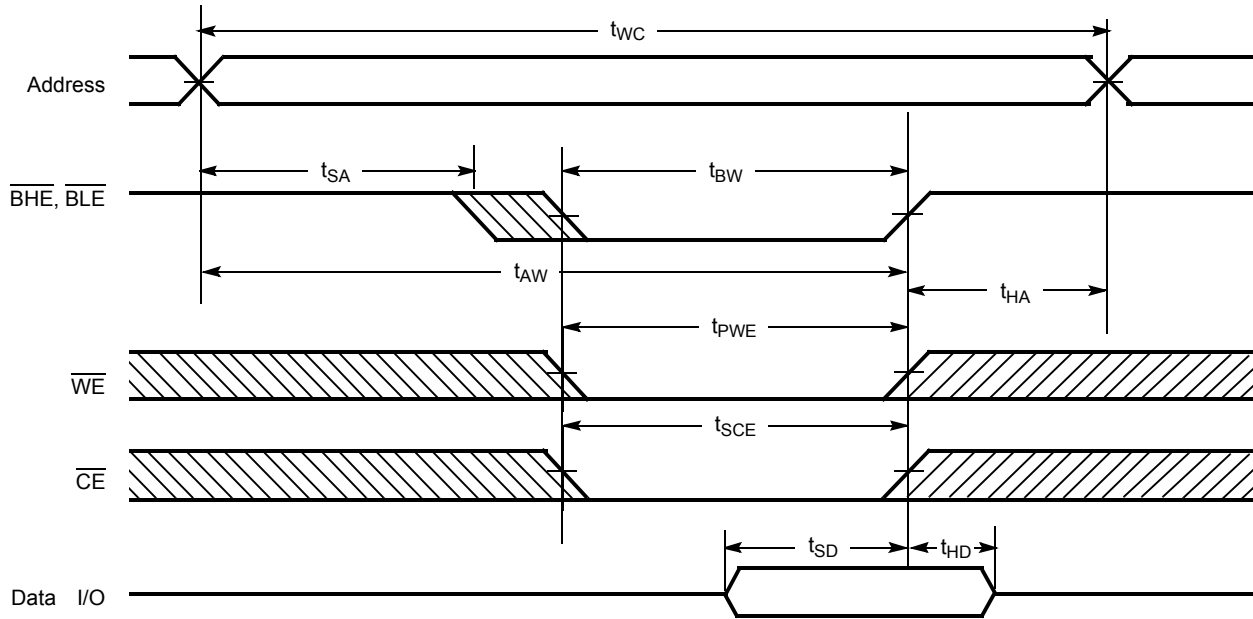
24. $\overline{\text{CE}}$ is the logical combination of $\overline{\text{CE}}_1$ and CE_2 . When $\overline{\text{CE}}_1$ is LOW and CE_2 is HIGH, $\overline{\text{CE}}$ is LOW; when $\overline{\text{CE}}_1$ is HIGH or CE_2 is LOW, $\overline{\text{CE}}$ is HIGH.

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

26. 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 13. Write Cycle No. 3 ($\overline{\text{BLE}}$ or $\overline{\text{BHE}}$ Controlled) ^[27]



Note

27. $\overline{\text{CE}}$ is the logical combination of $\overline{\text{CE}}_1$ and CE_2 . When $\overline{\text{CE}}_1$ is LOW and CE_2 is HIGH, $\overline{\text{CE}}$ is LOW; when $\overline{\text{CE}}_1$ is HIGH or CE_2 is LOW, $\overline{\text{CE}}$ is HIGH.

Truth Table

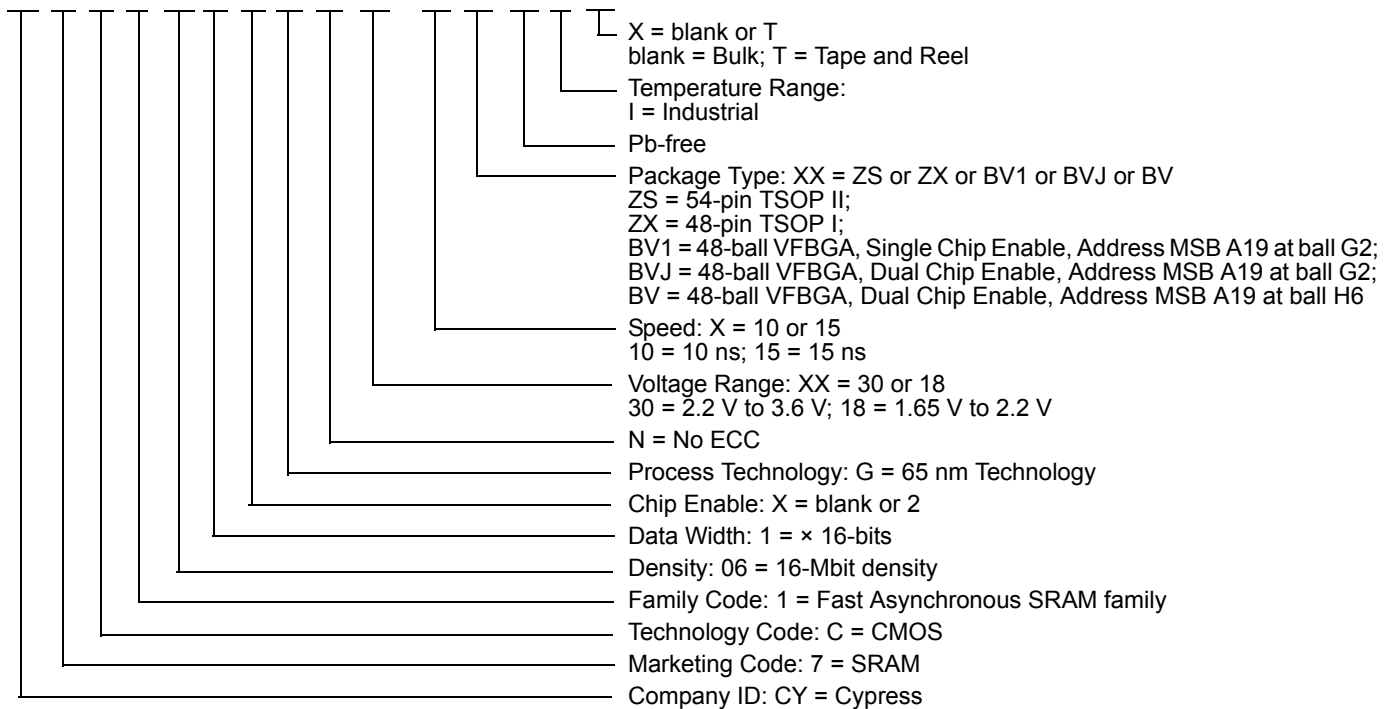
\overline{CE}_1	CE_2	\overline{OE}	\overline{WE}	\overline{BLE}	\overline{BHE}	I/O ₀ -I/O ₇	I/O ₈ -I/O ₁₅	Mode	Power
H	X	X	X	X	X	High Z	High Z	Power down	Standby (I _{SB})
X	L	X	X	X	X	High Z	High Z	Power down	Standby (I _{SB})
L	H	L	H	L	L	Data out	Data out	Read all bits	Active (I _{CC})
L	H	L	H	L	H	Data out	High Z	Read lower bits only	Active (I _{CC})
L	H	L	H	H	L	High Z	Data out	Read upper bits only	Active (I _{CC})
L	H	X	L	L	L	Data in	Data in	Write all bits	Active (I _{CC})
L	H	X	L	L	H	Data in	High Z	Write lower bits only	Active (I _{CC})
L	H	X	L	H	L	High Z	Data in	Write upper bits only	Active (I _{CC})
L	H	H	H	X	X	High Z	High Z	Selected, outputs disabled	Active (I _{CC})

Ordering Information

Speed (ns)	Ordering Code	Package Diagram	Package Type (Pb-free)	Operating Range
10	CY7C1061GN30-10ZSXI	51-85160	54-pin TSOP II, Dual Chip Enable	Industrial
	CY7C1061GN30-10ZSXIT	51-85160	54-pin TSOP II, Dual Chip Enable, Tape and Reel	
	CY7C10612GN30-10ZSXI	51-85160	54-pin TSOP II, Single Chip Enable	
	CY7C10612GN30-10ZSXIT	51-85160	54-pin TSOP II, Single Chip Enable, Tape and Reel	
	CY7C1061GN30-10ZXI	51-85183	48-pin TSOP I, Single Chip Enable	
	CY7C1061GN30-10ZXIT	51-85183	48-pin TSOP I, Single Chip Enable, Tape and Reel	
	CY7C1061GN30-10BV1XI	51-85150	48-ball VFBGA, Single Chip Enable, Address MSB A19 at ball G2	
	CY7C1061GN30-10BV1XIT	51-85150	48-ball VFBGA, Single Chip Enable, Address MSB A19 at ball G2, Tape and Reel	
	CY7C1061GN30-10BVJXI	51-85150	48-ball VFBGA, Dual Chip Enable, Address MSB A19 at ball G2	
	CY7C1061GN30-10BVJXIT	51-85150	48-ball VFBGA, Dual Chip Enable, Address MSB A19 at ball G2, Tape and Reel	
	CY7C1061GN30-10BVXI	51-85150	48-ball VFBGA, Dual Chip Enable, Address MSB A19 at ball H6	
	CY7C1061GN30-10BVXIT	51-85150	48-ball VFBGA, Dual Chip Enable, Address MSB A19 at ball H6, Tape and Reel	
15	CY7C1061GN18-15ZSXI	51-85160	54-pin TSOP II	Industrial
	CY7C1061GN18-15ZSXIT	51-85160	54-pin TSOP II, Tape and Reel	

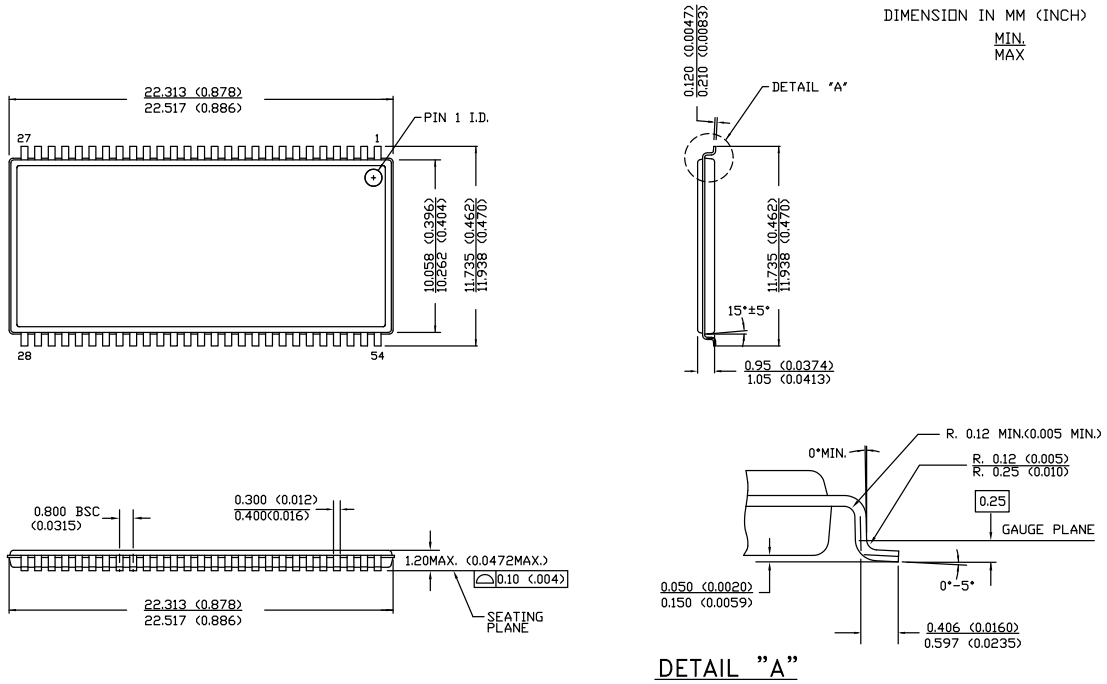
Ordering Code Definitions

CY 7 C 1 06 1 X G N XX - X XX X I X



Package Diagrams

Figure 14. 54-pin TSOP II (22.4 × 11.84 × 1.0 mm) Z54-II Package Outline, 51-85160



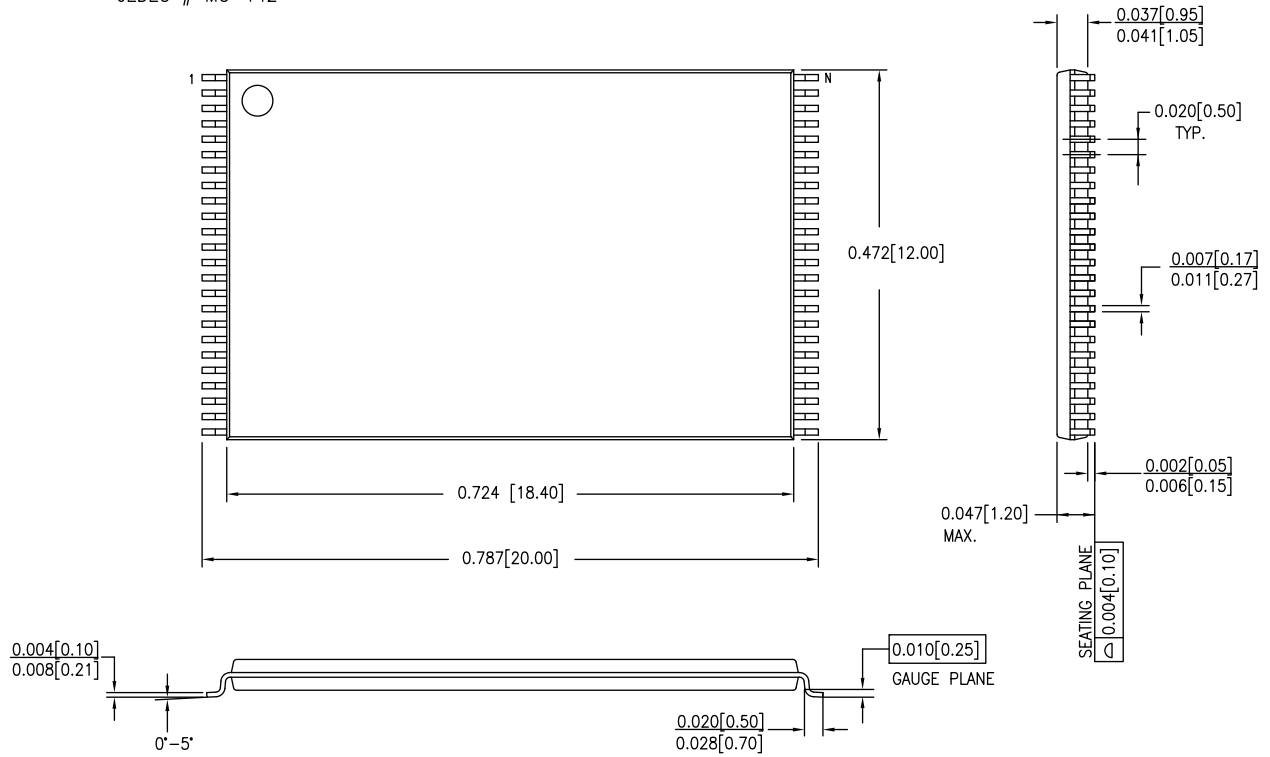
51-85160 *E

Package Diagrams (continued)

Figure 15. 48-pin TSOP I (12 × 18.4 × 1.0 mm) Z48A Package Outline, 51-85183

DIMENSIONS IN INCHES[MM] MIN.
MAX.

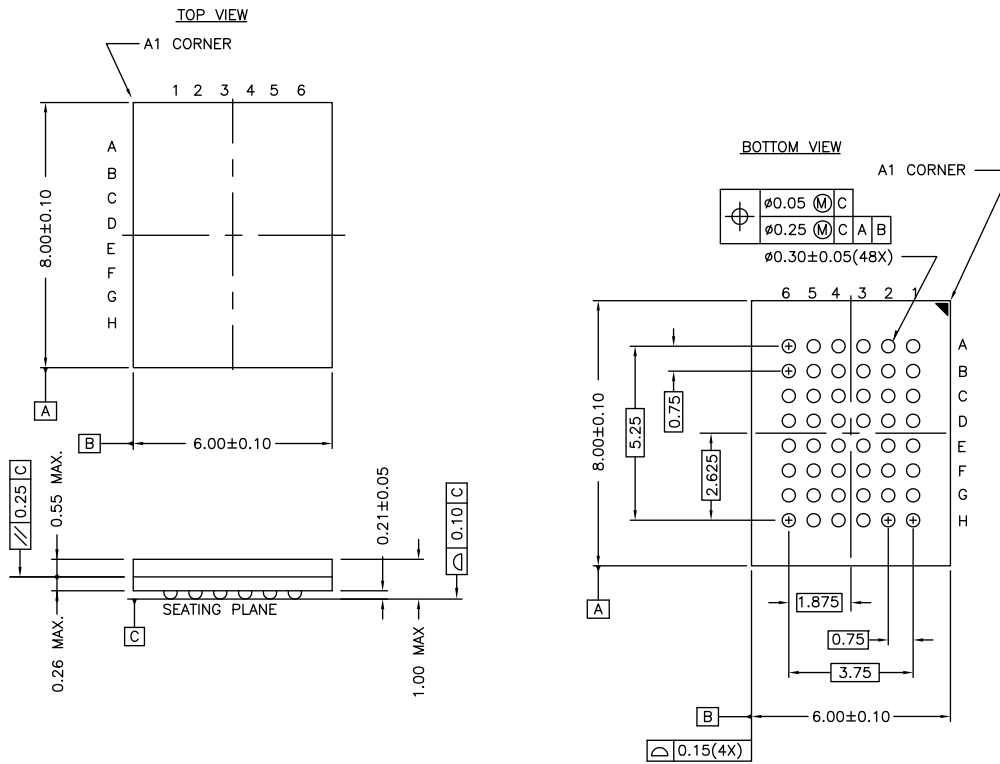
JEDEC # MO-142



51-85183 *D

Package Diagrams (continued)

Figure 16. 48-ball VFBGA (6 × 8 × 1.0 mm) BV48/BZ48 Package Outline, 51-85150



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

51-85150 *H

Acronyms

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

Document Conventions

Units of Measure

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

Document History Page

Document Title: CY7C1061GN/CY7C10612GN, 16-Mbit (1M words × 16 bit) Static RAM				
Document Number: 001-93680				
Rev.	ECN No.	Orig. of Change	Submission Date	Description of Change
**	4505531	VINI	01/02/2015	New data sheet.
*A	4900408	NILE	09/11/2015	Updated DC Electrical Characteristics : Updated details in “Test Conditions” column of V _{OH} and V _{OL} parameters. Updated Ordering Information : No change in part numbers. Replaced “51-85178” with “51-85150” in “Package Diagram” column. Replaced “8 × 9.5 × 1 mm” with “6 × 8 × 1.0 mm” in “Package Type” column. Updated Package Diagrams : Removed spec 51-85178 *C. Added spec 51-85150 *H. Updated to new template.
*B	5415385	NILE	09/07/2016	Updated Document Title to read as “CY7C1061GN/CY7C10612GN, 16-Mbit (1M words × 16 bit) Static RAM”. Added CY7C10612GN part related information in all instances across the document. Added “1.65 V to 2.2 V” voltage range related information in all instances across the document. Added 48-pin TSOP I package related information in all instances across the document. Added 15 ns speed bin related information in all instances across the document. Updated Pin Configurations : Added Figure 2 . Added Figure 3 . Added Figure 4 . Added Figure 5 . Added Figure 6 . Removed figure “54-pin TSOP II (22.4 × 11.84 × 1.0 mm) pinout (Top View)”. Updated DC Electrical Characteristics : Updated details in “Test Conditions” column of I _{CC} parameter (Added condition “f = 66.7 MHz” and added corresponding values). Added Note 6 and referred the same note in description of I _{SB1} and I _{SB2} parameters. Updated AC Test Loads and Waveforms : Updated Note 8 referred in Figure 7 . Updated AC Switching Characteristics : Updated Note 12. Added Note 14 and referred the same note in description of t _{LZOE} , t _{HZOE} , t _{LZCE} , t _{HZCE} parameters. Updated Note 15. Added Note 19 and referred the same note in description of t _{SCE} parameter. Updated Ordering Information : Updated part numbers. Updated Package Diagrams : Added spec 51-85183 *D. Updated to new template.

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Rev.	ECN No.	Orig. of Change	Submission Date	Description of Change
*C	5454555	NILE	09/29/2016	<p>Updated Maximum Ratings: Updated Note 4 (Replaced “2 ns” with “20 ns”). Updated DC Electrical Characteristics: Removed Operating Range “2.7 V to 3.6 V” and all values corresponding to V_{OH} parameter. Included Operating Ranges “2.7 V to 3.0 V” and “3.0 V to 3.6 V” and all values corresponding to V_{OH} parameter. Updated Ordering Information: Updated part numbers. Updated Ordering Code Definitions.</p>

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