CY7C1484BV25

72-Mbit (2 M × 36) Pipelined DCD Sync SRAM

Features

- Supports bus operation up to 250 MHz
- Available speed grades are 250 MHz
- Registered inputs and outputs for pipelined operation
- Optimal for performance (double cycle deselect)
- Depth expansion without wait state
- 2.5 V core power supply (V_{DD})
- 2.5 V I/O supply (V_{DDQ})
- Fast clock to output times
  - 3.0 ns (for 250 MHz device)
- Provide high performance 3-1-1-1 access rate
- User selectable burst counter supporting Intel® Pentium® interleaved or linear burst sequences
- Separate processor and controller address strobes
- Synchronous self timed writes
- Asynchronous output enable
- CY7C1484BV25 available in JEDEC-standard Pb-free 100-pin TQFP package
- "ZZ" sleep mode option

Functional Description

The CY7C1484BV25 SRAM integrates 2 M × 36 SRAM cells with advanced synchronous peripheral circuitry and a 2-bit counter for internal burst operation. All synchronous inputs are gated by registers controlled by a positive edge triggered Clock Input (CLK). The synchronous inputs include all addresses, all data inputs, address pipelining Chip Enable ($\overline{CE_1}$), depth expansion Chip Enables (CE_2 and $\overline{CE_3}$), Burst Control inputs (ADSC, ADSP, and ADV), Write Enables ($\overline{BW_X}$ and $\overline{BWE}$), and Global Write ($\overline{GW}$). Asynchronous inputs include the Output Enable ($\overline{OE}$) and the ZZ pin.

Addresses and chip enables are registered at the rising edge of clock when either Address Strobe Processor ($\overline{ADSP}$) or Address Strobe Controller ($\overline{ADSC}$) are active. Subsequent burst addresses can be internally generated as controlled by the Advance pin (ADV).

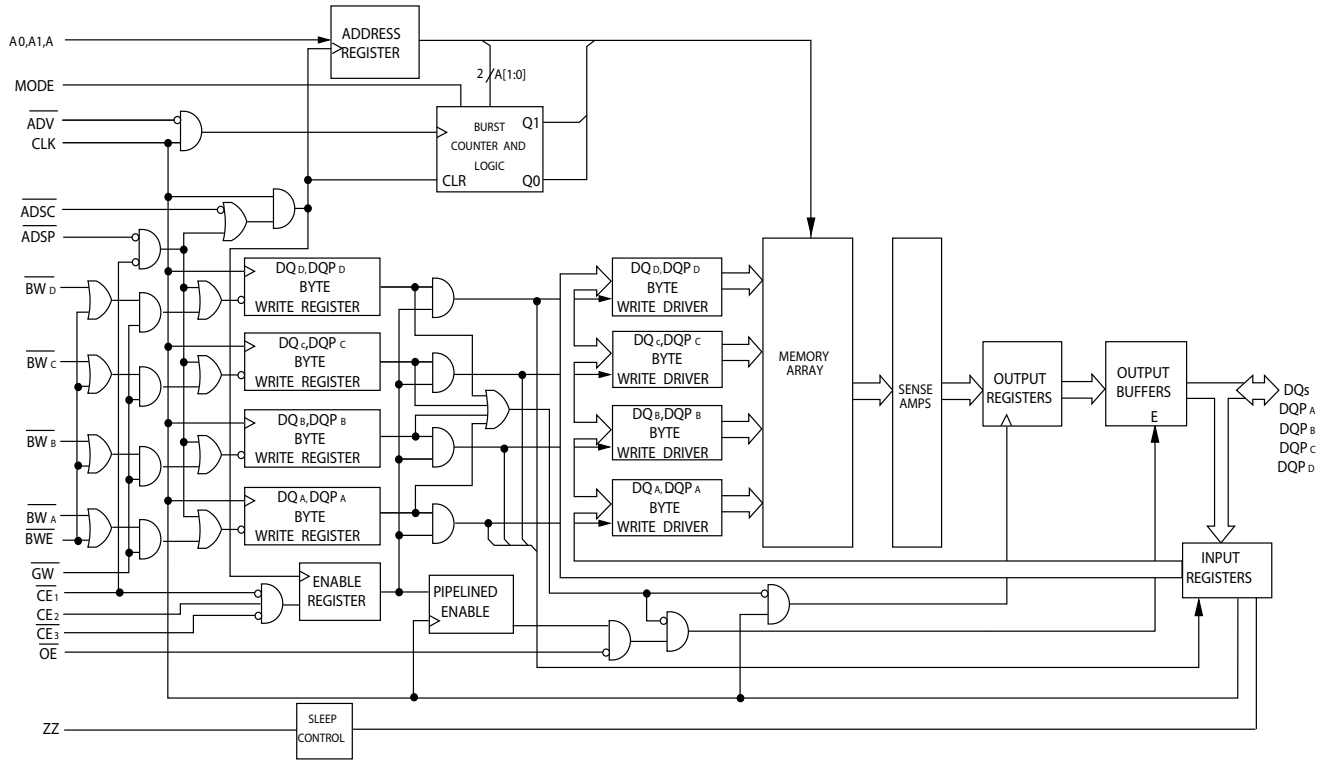
Address, data inputs, and write controls are registered on-chip to initiate a self timed write cycle. This part supports byte write operations (see Pin Definitions on page 5 and Truth Table on page 8 for more information). Write cycles can be one to four bytes wide as controlled by the byte write control inputs. $\overline{GW}$ active LOW causes all bytes to be written. This device incorporates an additional pipelined enable register, which delays turning off the output buffers an additional cycle when a deselect is executed. This feature allows depth expansion without penalizing system performance.

For a complete list of related documentation, click here.

Selection Guide

Description	250 MHz	Unit
Maximum Access Time	3.0	ns
Maximum Operating Current	450	mA
Maximum CMOS Standby Current	120	mA

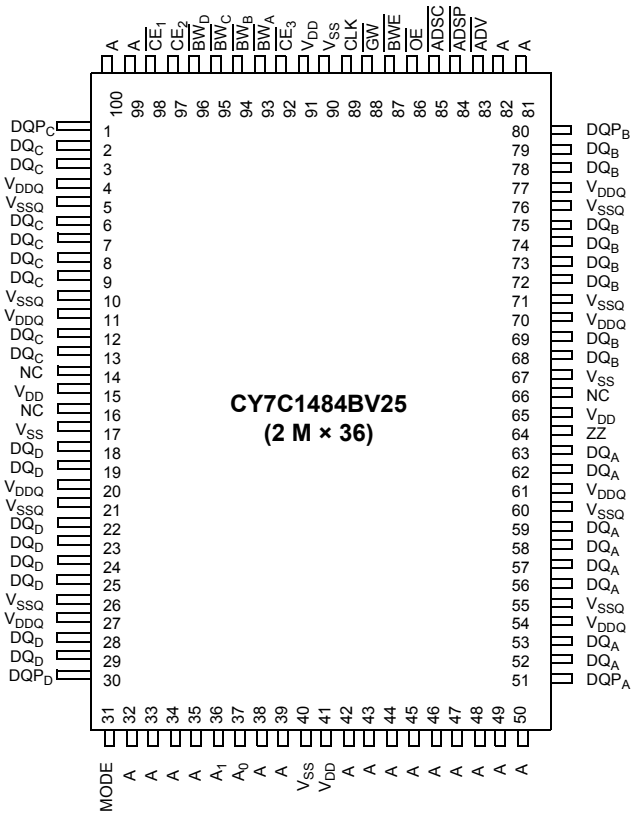
Logic Block Diagram – CY7C1484BV25



Contents

Pin Configurations

Figure 1. 100-pin TQFP (14 × 20 × 1.4 mm) pinout



Pin Definitions

Pin Name	I/O	Description
A_0, A_1, A	Input-Synchronous	**Address Inputs Used to Select One of the Address Locations**. Sampled at the rising edge of the CLK if $\overline{ADSP}$ or $\overline{ADSC}$ is active LOW, and $\overline{CE}_1$, CE_2, and $\overline{CE}_3$ are sampled active. A1:A0 are fed to the 2-bit counter.
$\overline{BW}_A$, $\overline{BW}_B$, $\overline{BW}_C$, $\overline{BW}_D$	Input-Synchronous	**Byte Write Select Inputs, Active LOW**. Qualified with $\overline{BWE}$ to conduct byte writes to the SRAM. Sampled on the rising edge of CLK.
$\overline{GW}$	Input-Synchronous	**Global Write Enable Input, Active LOW**. When asserted LOW on the rising edge of CLK, a global write is conducted (ALL bytes are written, regardless of the values on $\overline{BW}_X$ and $\overline{BWE}$).
$\overline{BWE}$	Input-Synchronous	**Byte Write Enable Input, Active LOW**. Sampled on the rising edge of CLK. This signal must be asserted LOW to conduct a byte write.
CLK	Input-Clock	**Clock Input**. Captures all synchronous inputs to the device. Also used to increment the burst counter when $\overline{ADV}$ is asserted LOW during a burst operation.
$\overline{CE}_1$	Input-Synchronous	**Chip Enable 1 Input, Active LOW**. Sampled on the rising edge of CLK. Used in conjunction with CE_2 and $\overline{CE}_3$ to select or deselect the device. $\overline{ADSP}$ is ignored if $\overline{CE}_1$ is HIGH. $\overline{CE}_1$ is sampled only when a new external address is loaded.
CE_2	Input-Synchronous	**Chip Enable 2 Input, Active HIGH**. Sampled on the rising edge of CLK. Used in conjunction with $\overline{CE}_1$ and $\overline{CE}_3$ to select or deselect the device. CE_2 is sampled only when a new external address is loaded.
$\overline{CE}_3$	Input-Synchronous	**Chip Enable 3 Input, Active LOW**. Sampled on the rising edge of CLK. Used in conjunction with $\overline{CE}_1$ and CE_2 to select or deselect the device. $\overline{CE}_3$ is sampled only when a new external address is loaded.
$\overline{OE}$	Input-Asynchronous	**Output Enable, Asynchronous Input, Active LOW**. Controls the direction of the I/O pins. When LOW, the I/O pins behave as outputs. When deasserted HIGH, DQ pins are tri-stated, and act as input data pins. $\overline{OE}$ is masked during the first clock of a read cycle when emerging from a deselected state.
$\overline{ADV}$	Input-Synchronous	**Advance Input Signal, Sampled on the Rising Edge of CLK, Active LOW**. When asserted, it automatically increments the address in a burst cycle.
$\overline{ADSP}$	Input-Synchronous	**Address Strobe from Processor, Sampled on the Rising Edge of CLK, Active LOW**. When asserted LOW, addresses presented to the device are captured in the address registers. A1:A0 are also loaded into the burst counter. When $\overline{ADSP}$ and $\overline{ADSC}$ are both asserted, only $\overline{ADSP}$ is recognized. ASDP is ignored when $\overline{CE}_1$ is deasserted HIGH.
$\overline{ADSC}$	Input-Synchronous	**Address Strobe from Controller, Sampled on the Rising Edge of CLK, Active LOW**. When asserted LOW, addresses presented to the device are captured in the address registers. A1:A0 are also loaded into the burst counter. When $\overline{ADSP}$ and $\overline{ADSC}$ are both asserted, only $\overline{ADSP}$ is recognized.
ZZ	Input-Asynchronous	**ZZ "Sleep" Input, Active HIGH**. When asserted HIGH, places the device in a non time-critical "sleep" condition with data integrity preserved. For normal operation, this pin must be LOW or left floating. ZZ pin has an internal pull down.
DQs, DQPs	I/O-Synchronous	**Bidirectional Data I/O Lines**. As inputs, they feed into an on-chip data register that is triggered by the rising edge of CLK. As outputs, they deliver the data contained in the memory location specified by the addresses presented during the previous clock rise of the read cycle. The direction of the pins is controlled by $\overline{OE}$. When $\overline{OE}$ is asserted LOW, the pins behave as outputs. When HIGH, DQs and DQP_X are placed in a tri-state condition.
V_{DD}	Power Supply	**Power Supply Inputs to the Core of the Device**.
V_{SS}	Ground	**Ground for the Core of the Device**.
V_{SSQ}[1]	I/O Ground	**Ground for the I/O Circuitry**.
V_{DDQ}	I/O Power Supply	**Power Supply for the I/O Circuitry**.

Note
1. Applicable for TQFP package.

Pin Definitions (continued)

Pin Name	I/O	Description
MODE	Input-Static	**Selects Burst Order**. When tied to GND, selects linear burst sequence. When tied to V_{DD} or left floating, selects interleaved burst sequence. This is a strap pin and must remain static during device operation. Mode Pin has an internal pull up.
NC	–	**No Connects**. Not internally connected to the die
NC(144M, 288M, 576M, 1G)	–	**These Pins are Not Connected**. They are used for expansion to the 144M, 288M, 576M, and 1G densities.

Functional Overview

All synchronous inputs pass through input registers controlled by the rising edge of the clock. All data outputs pass through output registers controlled by the rising edge of the clock.

The CY7C1484BV25 supports secondary cache in systems using either a linear or interleaved burst sequence. The interleaved burst order supports Pentium and i486™ processors. The linear burst sequence is suited for processors that use a linear burst sequence. The burst order is user selectable and is determined by sampling the MODE input. Accesses are initiated with either the $\overline{ADSP}$ or $\overline{ADSC}$. The $\overline{ADV}$ input controls address advancement through the burst sequence. A 2-bit on-chip wraparound burst counter captures the first address in a burst sequence and automatically increments the address for the rest of the burst access.

Byte write operations are qualified with the Byte Write Enable ($\overline{BWE}$) and Byte Write Select ($\overline{BW_X}$) inputs. $\overline{GW}$ overrides all byte write inputs and writes data to all four bytes. All writes are simplified with on-chip synchronous self timed write circuitry.

Synchronous Chip Selects $\overline{CE_1}$, CE_2, $\overline{CE_3}$ and an asynchronous Output Enable ($\overline{OE}$) provide easy bank selection and output tri-state control. $\overline{ADSP}$ is ignored if $\overline{CE_1}$ is HIGH.

Single Read Accesses

This access is initiated when the following conditions are satisfied at clock rise: (1) $\overline{ADSP}$ or $\overline{ADSC}$ is asserted LOW, (2) chip selects are all asserted active, and (3) the write signals ($\overline{GW}$, $\overline{BWE}$) are all deasserted HIGH. $\overline{ADSP}$ is ignored if $\overline{CE_1}$ is HIGH. The address presented to the address inputs is stored into the address advancement logic and the address register while being presented to the memory core. The corresponding data is allowed to propagate to the input of the output registers. At the rising edge of the next clock the data is allowed to propagate through the output register and onto the data bus within t_{CO} if $\overline{OE}$ is active LOW. The only exception occurs when the SRAM is emerging from a deselected state to a selected state; its outputs are always tri-stated during the first cycle of the access. After the first cycle of the access, the $\overline{OE}$ signal controls the outputs. Consecutive single read cycles are supported.

The CY7C1484BV25 is a double cycle deselect part. After the SRAM is deselected at clock rise by the chip select and either $\overline{ADSP}$ or $\overline{ADSC}$ signals, its output tri-states immediately after the next clock rise.

Single Write Accesses Initiated by $\overline{ADSP}$

This access is initiated when both the following conditions are satisfied at clock rise: (1) $\overline{ADSP}$ is asserted LOW and (2) chip select is asserted active. The address presented is loaded into the address register and the address advancement logic while being delivered to the memory core. The write signals ($\overline{GW}$, $\overline{BWE}$, and $\overline{BW_X}$) and $\overline{ADV}$ inputs are ignored during this first cycle.

$\overline{ADSP}$ triggered write accesses require two clock cycles to complete. If $\overline{GW}$ is asserted LOW on the second clock rise, the data presented to the DQ_X inputs is written into the corresponding address location in the memory core. If $\overline{GW}$ is HIGH, then the $\overline{BWE}$ and $\overline{BW_X}$ signals control the write operation. The CY7C1484BV25 provides byte write capability that is described in the Truth Table for Read/Write on page 9. Asserting $\overline{BWE}$ with the selected Byte Write input selectively writes to only the desired bytes. Bytes not selected during a byte write operation remain unaltered. A synchronous self timed write mechanism is provided to simplify the write operations.

Because the CY7C1484BV25 is a common I/O device, the Output Enable ($\overline{OE}$) must be deasserted HIGH before presenting data to the DQ inputs. Doing so tri-states the output drivers. As a safety precaution, DQ are automatically tri-stated whenever a write cycle is detected, regardless of the state of $\overline{OE}$.

Single Write Accesses Initiated by $\overline{ADSC}$

$\overline{ADSC}$ write accesses are initiated when the following conditions are satisfied: (1) $\overline{ADSC}$ is asserted LOW, (2) $\overline{ADSP}$ is deasserted HIGH, (3) chip select is asserted active, and (4) the appropriate combination of the write inputs ($\overline{GW}$, $\overline{BWE}$, and $\overline{BW_X}$) are asserted active to conduct a write to the desired byte(s). $\overline{ADSC}$ triggered write accesses require a single clock cycle to complete. The address presented is loaded into the address register and the address advancement logic while being delivered to the memory core. The $\overline{ADV}$ input is ignored during this cycle. If a global write is conducted, the data presented to the DQ_X is written into the corresponding address location in the memory core. If a byte write is conducted, only the selected bytes are written. Bytes not selected during a byte write operation remain unaltered. A synchronous self timed write mechanism is provided to simplify the write operations.

Because the CY7C1484BV25 is a common I/O device, the Output Enable ($\overline{OE}$) must be deasserted HIGH before presenting data to the DQ_X inputs. Doing so tri-states the output drivers. As a safety precaution, DQ_X are automatically tri-stated whenever a write cycle is detected, regardless of the state of $\overline{OE}$.

Burst Sequences

The CY7C1484BV25 provides a 2-bit wraparound counter, fed by $A_{[1:0]}$, that implements either an interleaved or linear burst sequence. The interleaved burst sequence is designed

specifically to support Intel Pentium applications. The linear burst sequence is designed to support processors that follow a linear burst sequence. The burst sequence is user selectable through the MODE input. Both read and write burst operations are supported.

Asserting $\overline{ADV}$ LOW at clock rise automatically increments the burst counter to the next address in the burst sequence. Both read and write burst operations are supported.

Sleep Mode

The ZZ input pin is asynchronous. Asserting ZZ places the SRAM in a power conservation “sleep” mode. Two clock cycles are required to enter into or exit from this “sleep” mode. While in this mode, data integrity is guaranteed. Accesses pending when entering the “sleep” mode are not considered valid nor is the completion of the operation guaranteed. The device must be deselected before entering the “sleep” mode. CEs, $\overline{ADSP}$, and $\overline{ADSC}$ must remain inactive for the duration of t_{ZZREC} after the ZZ input returns LOW.

Interleaved Burst Address Table (MODE = Floating or V_{DD})

First Address A1:A0	Second Address A1:A0	Third Address A1:A0	Fourth Address A1:A0
00	01	10	11
01	00	11	10
10	11	00	01
11	10	01	00

Linear Burst Address Table (MODE = GND)

First Address A1:A0	Second Address A1:A0	Third Address A1:A0	Fourth Address A1:A0
00	01	10	11
01	10	11	00
10	11	00	01
11	00	01	10

ZZ Mode Electrical Characteristics

Parameter	Description	Test Conditions	Min	Max	Unit
I_{DDZZ}	Sleep mode standby current	ZZ $\geq$ V_{DD} – 0.2 V	–	120	mA
t_{ZZS}	Device operation to ZZ	ZZ $\geq$ V_{DD} – 0.2 V	–	$2t_{CYC}$	ns
t_{ZZREC}	ZZ recovery time	ZZ $\leq$ 0.2 V	$2t_{CYC}$	–	ns
t_{ZZI}	ZZ Active to sleep current	This parameter is sampled	–	$2t_{CYC}$	ns
t_{RZZI}	ZZ Inactive to exit sleep current	This parameter is sampled	0	–	ns

Truth Table

The truth table for CY7C1484BV25 follows. [2, 3, 4, 5, 6]

Operation	Address Used	$\overline{CE_1}$	CE_2	$\overline{CE_3}$	ZZ	$\overline{ADSP}$	$\overline{ADSC}$	$\overline{ADV}$	$\overline{WRITE}$	$\overline{OE}$	CLK	DQ
Deselect Cycle, Power Down	None	H	X	X	L	X	L	X	X	X	L–H	Tri-State
Deselect Cycle, Power Down	None	L	L	X	L	L	X	X	X	X	L–H	Tri-State
Deselect Cycle, Power Down	None	L	X	H	L	L	X	X	X	X	L–H	Tri-State
Deselect Cycle, Power Down	None	L	L	X	L	H	L	X	X	X	L–H	Tri-State
Deselect Cycle, Power Down	None	L	X	H	L	H	L	X	X	X	L–H	Tri-State
Sleep Mode, Power Down	None	X	X	X	H	X	X	X	X	X	X	Tri-State
Read Cycle, Begin Burst	External	L	H	L	L	L	X	X	X	L	L–H	Q
Read Cycle, Begin Burst	External	L	H	L	L	L	X	X	X	H	L–H	Tri-State
Write Cycle, Begin Burst	External	L	H	L	L	H	L	X	L	X	L–H	D
Read Cycle, Begin Burst	External	L	H	L	L	H	L	X	H	L	L–H	Q
Read Cycle, Begin Burst	External	L	H	L	L	H	L	X	H	H	L–H	Tri-State
Read Cycle, Continue Burst	Next	X	X	X	L	H	H	L	H	L	L–H	Q
Read Cycle, Continue Burst	Next	X	X	X	L	H	H	L	H	H	L–H	Tri-State
Read Cycle, Continue Burst	Next	H	X	X	L	X	H	L	H	L	L–H	Q
Read Cycle, Continue Burst	Next	H	X	X	L	X	H	L	H	H	L–H	Tri-State
Write Cycle, Continue Burst	Next	X	X	X	L	H	H	L	L	X	L–H	D
Write Cycle, Continue Burst	Next	H	X	X	L	X	H	L	L	X	L–H	D
Read Cycle, Suspend Burst	Current	X	X	X	L	H	H	H	H	L	L–H	Q
Read Cycle, Suspend Burst	Current	X	X	X	L	H	H	H	H	H	L–H	Tri-State
Read Cycle, Suspend Burst	Current	H	X	X	L	X	H	H	H	L	L–H	Q
Read Cycle, Suspend Burst	Current	H	X	X	L	X	H	H	H	H	L–H	Tri-State
Write Cycle, Suspend Burst	Current	X	X	X	L	H	H	H	L	X	L–H	D
Write Cycle, Suspend Burst	Current	H	X	X	L	X	H	H	L	X	L–H	D

Notes
2. X = Don't Care, H = Logic HIGH, L = Logic LOW.
3. $\overline{WRITE}$ = L when any one or more Byte Write Enable signals and $\overline{BWE}$ = L or $\overline{GW}$ = L. $\overline{WRITE}$ = H when all Byte Write Enable signals, $\overline{BWE}$, $\overline{GW}$ = H.
4. The DQ pins are controlled by the current cycle and the $\overline{OE}$ signal. $\overline{OE}$ is asynchronous and is not sampled with the clock.
5. The SRAM always initiates a read cycle when $\overline{ADSP}$ is asserted, regardless of the state of $\overline{GW}$, $\overline{BWE}$, or $\overline{BW_X}$. Writes may occur only on subsequent clocks after the ADSP or with the assertion of $\overline{ADSC}$. As a result, $\overline{OE}$ must be driven HIGH prior to the start of the write cycle to allow the outputs to tri-state. $\overline{OE}$ is a don't care for the remainder of the write cycle.
6. $\overline{OE}$ is asynchronous and is not sampled with the clock rise. It is masked internally during write cycles. During a read cycle all data bits are tri-state when $\overline{OE}$ is inactive or when the device is deselected, and all data bits behave as output when $\overline{OE}$ is active (LOW).

Truth Table for Read/Write

The read/write truth table for CY7C1484BV25 follows. [7, 8]

Function	$\overline{GW}$	$\overline{BWE}$	$\overline{BW_D}$	$\overline{BW_C}$	$\overline{BW_B}$	$\overline{BW_A}$
Read	H	H	X	X	X	X
Read	H	L	H	H	H	H
Write Byte A – (DQ_A and DQP_A)	H	L	H	H	H	L
Write Byte B – (DQ_B and DQP_B)	H	L	H	H	L	H
Write Bytes B, A	H	L	H	H	L	L
Write Byte C – (DQ_C and DQP_C)	H	L	H	L	H	H
Write Bytes C, A	H	L	H	L	H	L
Write Bytes C, B	H	L	H	L	L	H
Write Bytes C, B, A	H	L	H	L	L	L
Write Byte D – (DQ_D and DQP_D)	H	L	L	H	H	H
Write Bytes D, A	H	L	L	H	H	L
Write Bytes D, B	H	L	L	H	L	H
Write Bytes D, B, A	H	L	L	H	L	L
Write Bytes D, C	H	L	L	L	H	H
Write Bytes D, C, A	H	L	L	L	H	L
Write Bytes D, C, B	H	L	L	L	L	H
Write All Bytes	H	L	L	L	L	L
Write All Bytes	L	X	X	X	X	X

Notes
7. The DQ pins are controlled by the current cycle and the $\overline{OE}$ signal. $\overline{OE}$ is asynchronous and is not sampled with the clock.
8. Table includes only a partial listing of the byte write combinations. Any combination of $\overline{BW}_X$ is valid. Appropriate write is based on which byte write is active.

Maximum Ratings

Exceeding the 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_{DD} Relative to GND .....–0.5 V to +3.6 V

Supply Voltage on V_{DDQ} Relative to GND .... –0.5 V to +V_{DD}

DC Voltage Applied to Outputs in Tri-State .....–0.5 V to V_{DDQ} + 0.5 V

DC Input Voltage .....–0.5 V to V_{DD} + 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_{DD}	V_{DDQ}
Commercial	0 °C to +70 °C	2.5 V – 5% / + 5%	2.5 V – 5% to V_{DD}
Industrial	–40 °C to +85 °C		

Electrical Characteristics

Over the Operating Range

Parameter [9, 10]	Description	Test Conditions		Min	Max	Unit
V_{DD}	Power Supply Voltage			2.375	2.625	V
V_{DDQ}	I/O Supply Voltage	For 2.5 V I/O		2.375	V_{DD}	V
V_{OH}	Output HIGH Voltage	For 2.5 V I/O, I_{OH} = –1.0 mA		2.0	–	V
V_{OL}	Output LOW Voltage	For 2.5 V I/O, I_{OL} = 1.0 mA		–	0.4	V
V_{IH}	Input HIGH Voltage [9]	For 2.5 V I/O		1.7	V_{DD} + 0.3 V	V
V_{IL}	Input LOW Voltage [9]	For 2.5 V I/O		–0.3	0.7	V
I_X	Input Leakage Current except ZZ and MODE	GND ≤ V_I ≤ V_{DDQ}		–5	5	µA
	Input Current of MODE	Input = V_{SS}		–30	–	µA
		Input = V_{DD}		–	5	µA
	Input Current of ZZ	Input = V_{SS}		–5	–	µA
		Input = V_{DD}		–	30	µA
I_{OZ}	Output Leakage Current	GND ≤ V_I ≤ V_{DDQ}, Output Disabled		–5	5	µA
I_{DD} [11]	V_{DD} Operating Supply Current	V_{DD} = Max., I_{OUT} = 0 mA, f = f_{MAX} = 1/t_{CYC}	4.0 ns cycle, 250 MHz	–	450	mA
I_{SB1}	Automatic CE Power Down Current—TTL Inputs	V_{DD} = Max, Device Deselected, V_{IN} ≥ V_{IH} or V_{IN} ≤ V_{IL}, f = f_{MAX} = 1/t_{CYC}	4.0 ns cycle, 250 MHz	–	200	mA
I_{SB2}	Automatic CE Power Down Current—CMOS Inputs	V_{DD} = Max, Device Deselected, V_{IN} ≤ 0.3 V or V_{IN} ≥ V_{DDQ} – 0.3 V, f = 0	4.0 ns cycle, 250 MHz	–	120	mA
I_{SB3}	Automatic CE Power Down Current—CMOS Inputs	V_{DD} = Max, Device Deselected, V_{IN} ≤ 0.3 V or V_{IN} ≥ V_{DDQ} – 0.3 V, f = f_{MAX} = 1/t_{CYC}	4.0 ns cycle, 250 MHz	–	200	mA
I_{SB4}	Automatic CE Power Down Current—TTL Inputs	V_{DD} = Max, Device Deselected, V_{IN} ≥ V_{IH} or V_{IN} ≤ V_{IL}, f = 0	4.0 ns cycle, 250 MHz	–	135	mA

Notes

9. Overshoot: $V_{IH(AC)}$ < V_{DD} + 1.5 V (pulse width less than t_{CYC}/2). Undershoot: $V_{IL(AC)}$ > –2 V (pulse width less than t_{CYC}/2).
10. Power up: assumes a linear ramp from 0 V to $V_{DD(minimum)}$ within 200 ms. During this time V_{IH} < V_{DD} and V_{DDQ} ≤ V_{DD}.
11. The operation current is calculated with 50% read cycle and 50% write cycle.

Capacitance

Parameter [12]	Description	Test Conditions	100-pin TQFP Package	Unit
$C_{ADDRESS}$	Address Input Capacitance	T_A = 25 °C, f = 1 MHz, V_{DD} = 2.5 V, V_{DDQ} = 2.5 V	6	pF
C_{DATA}	Data Input Capacitance		5	pF
C_{CTRL}	Control Input Capacitance		8	pF
C_{CLK}	Clock Input Capacitance		6	pF
C_{IO}	Input/Output Capacitance		5	pF

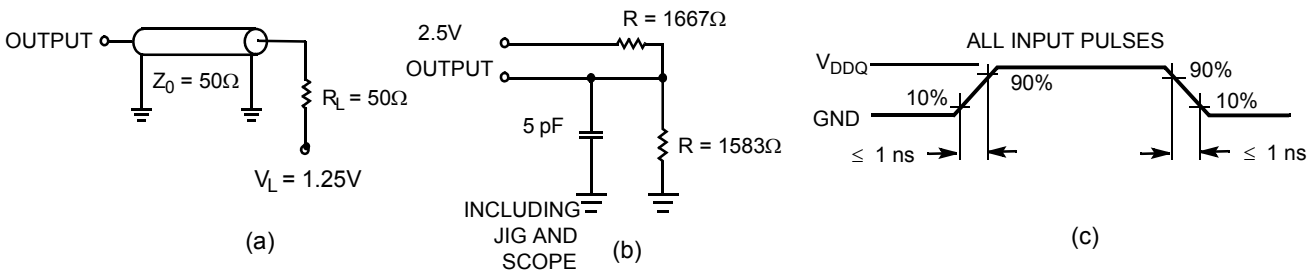
Thermal Resistance

Parameter [12]	Description	Test Conditions	100-pin TQFP Package	Unit
Θ_{JA}	Thermal resistance (junction to ambient)	Test conditions follow standard test methods and procedures for measuring thermal impedance, per EIA/JESD51.	24.63	°C/W
Θ_{JC}	Thermal resistance (junction to case)		2.28	°C/W

AC Test Loads and Waveforms

Figure 2. AC Test Loads and Waveforms

2.5 V I/O Test Load



Note
12. Tested initially and after any design or process change that may affect these parameters.

Switching Characteristics

Over the Operating Range

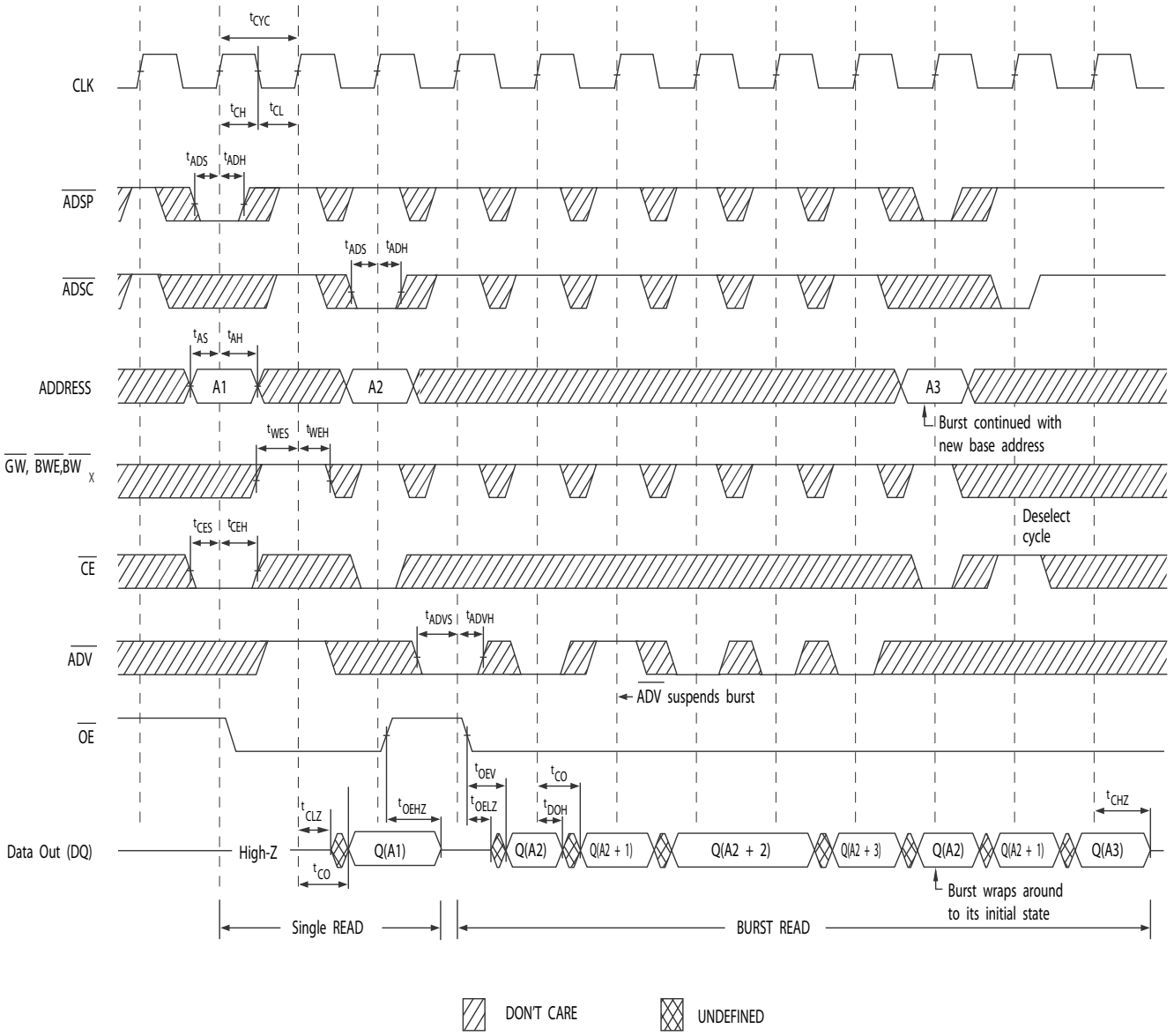
Parameter [13, 14]	Description	250 MHz		Unit
		Min	Max	
t_{POWER}	V_{DD}(typical) to the First Access [15]	1	–	ms
Clock				
t_{CYC}	Clock Cycle Time	4.0	–	ns
t_{CH}	Clock HIGH	2.0	–	ns
t_{CL}	Clock LOW	2.0	–	ns
Output Times				
t_{CO}	Data Output Valid After CLK Rise	–	3.0	ns
t_{DOH}	Data Output Hold After CLK Rise	1.3	–	ns
t_{CLZ}	Clock to Low Z [16, 17, 18]	1.3	–	ns
t_{CHZ}	Clock to High Z [16, 17, 18]	–	3.0	ns
t_{OEV}	$\overline{OE}$ LOW to Output Valid	–	3.0	ns
t_{OELZ}	$\overline{OE}$ LOW to Output Low Z [16, 17, 18]	0	–	ns
t_{OEHZ}	$\overline{OE}$ HIGH to Output High Z [16, 17, 18]	–	3.0	ns
Setup Times				
t_{AS}	Address Setup Before CLK Rise	1.4	–	ns
t_{ADS}	$\overline{ADSC}$, $\overline{ADSP}$ Setup Before CLK Rise	1.4	–	ns
t_{ADVS}	$\overline{ADV}$ Setup Before CLK Rise	1.4	–	ns
t_{WES}	$\overline{GW}$, $\overline{BWE}$, $\overline{BW_X}$ Setup Before CLK Rise	1.4	–	ns
t_{DS}	Data Input Setup Before CLK Rise	1.4	–	ns
t_{CES}	Chip Enable Setup Before CLK Rise	1.4	–	ns
Hold Times				
t_{AH}	Address Hold After CLK Rise	0.4	–	ns
t_{ADH}	$\overline{ADSP}$, $\overline{ADSC}$ Hold After CLK Rise	0.4	–	ns
t_{ADVH}	$\overline{ADV}$ Hold After CLK Rise	0.4	–	ns
t_{WEH}	$\overline{GW}$, $\overline{BWE}$, $\overline{BW_X}$ Hold After CLK Rise	0.4	–	ns
t_{DH}	Data Input Hold After CLK Rise	0.4	–	ns
t_{CEH}	Chip Enable Hold After CLK Rise	0.4	–	ns

Notes

13. Timing reference level is 1.25 V when V_{DDQ} = 2.5 V.
14. Test conditions shown in (a) of Figure 2 on page 11 unless otherwise noted.
15. This part has an internal voltage regulator; t_{POWER} is the time that the power is supplied above $V_{DD(minimum)}$ initially before a read or write operation can be initiated.
16. t_{CHZ}, t_{CLZ},t_{OELZ}, and t_{OEHZ} are specified with AC test conditions shown in part (b) of Figure 2 on page 11. Transition is measured ±200 mV from steady-state voltage.
17. At any supplied voltage and temperature, t_{OEHZ} is less than t_{OELZ} and t_{CHZ} is less than t_{CLZ} to eliminate bus contention between SRAMs when sharing the same data bus. These specifications do not imply a bus contention condition, but reflect parameters guaranteed over worst case user conditions. Device is designed to achieve High Z before Low Z under the same system conditions.
18. This parameter is sampled and not 100% tested.

Switching Waveforms

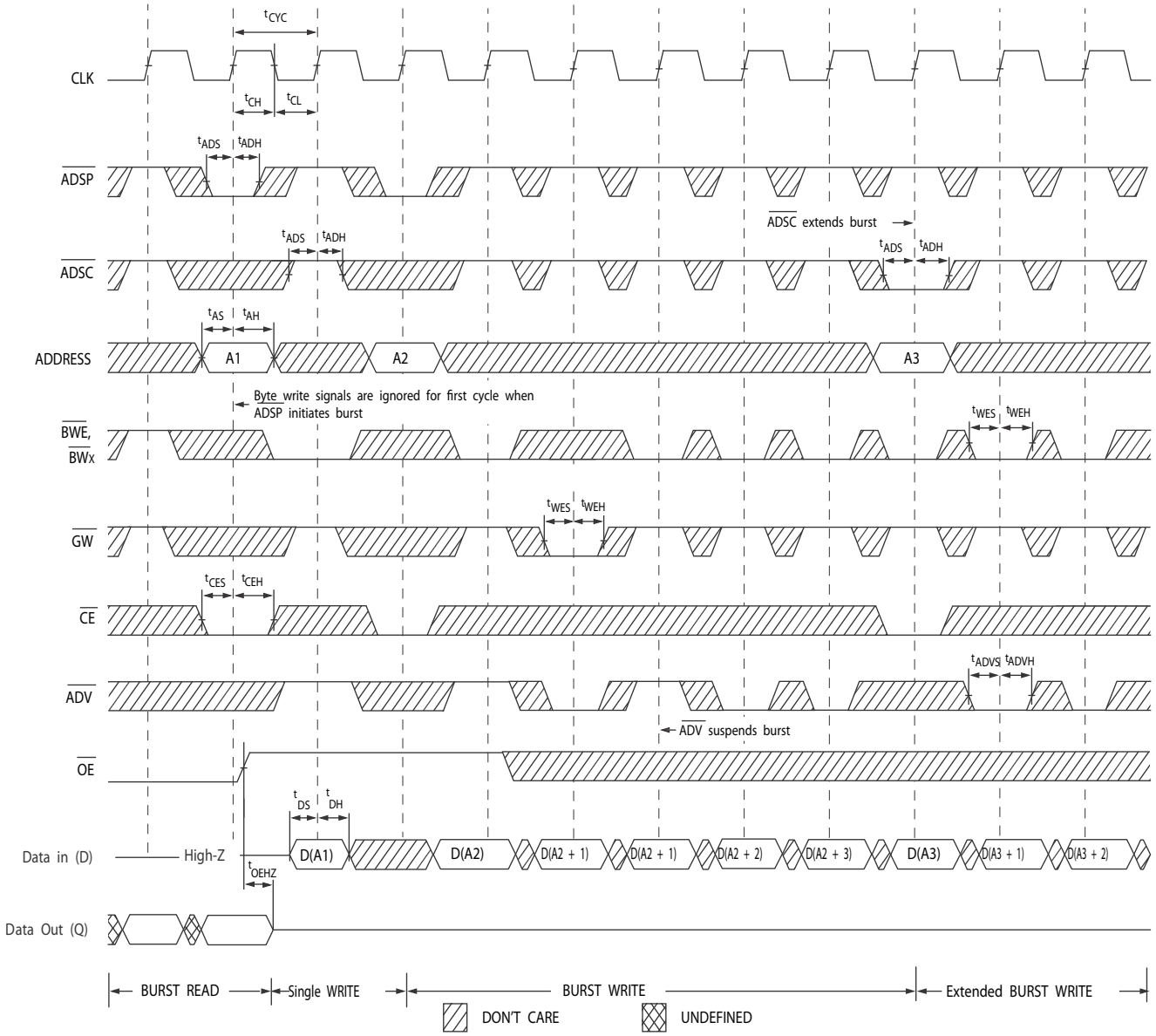
Figure 3. Read Cycle Timing [19]



Note
19. On this diagram, when $\overline{CE}$ is LOW: $\overline{CE}_1$ is LOW, CE_2 is HIGH, and $\overline{CE}_3$ is LOW. When $\overline{CE}$ is HIGH: $\overline{CE}_1$ is HIGH, CE_2 is LOW, or $\overline{CE}_3$ is HIGH.

Switching Waveforms (continued)

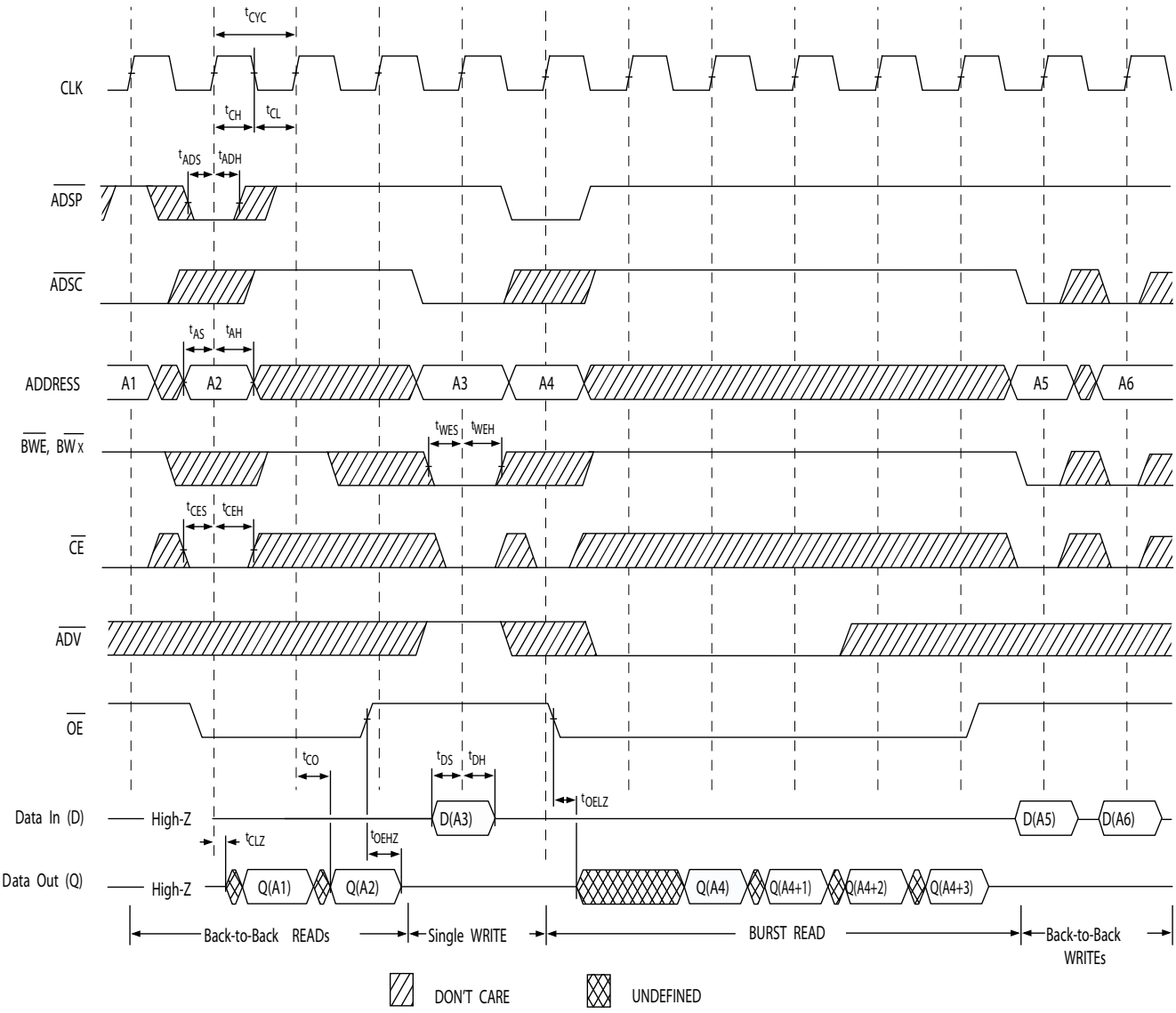
Figure 4. Write Cycle Timing [20, 21]



Notes
20. On this diagram, when $\overline{CE}$ is LOW: $\overline{CE}_1$ is LOW, CE_2 is HIGH, and $\overline{CE}_3$ is LOW. When $\overline{CE}$ is HIGH: $\overline{CE}_1$ is HIGH, CE_2 is LOW, or $\overline{CE}_3$ is HIGH.
21. Full width write is initiated by either $\overline{GW}$ LOW; or by $\overline{GW}$ HIGH, $\overline{BWE}$ LOW, and $\overline{BW}_X$ LOW.

Switching Waveforms (continued)

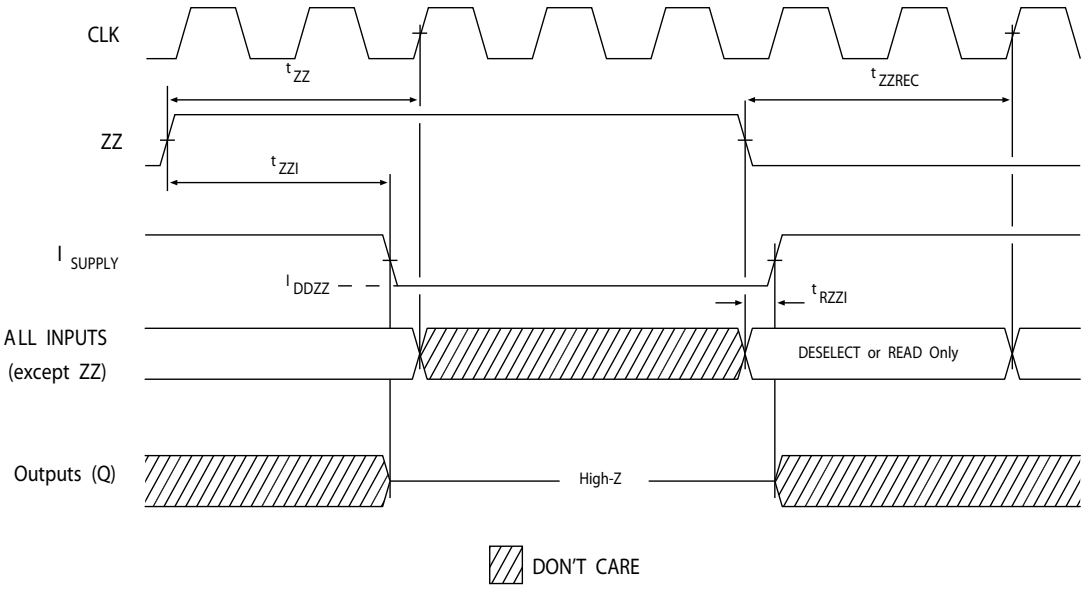
Figure 5. Read/Write Cycle Timing [22, 23, 24]



Notes
22. On this diagram, when $\overline{CE}$ is LOW: $\overline{CE}_1$ is LOW, CE_2 is HIGH, and $\overline{CE}_3$ is LOW. When $\overline{CE}$ is HIGH: $\overline{CE}_1$ is HIGH, CE_2 is LOW, or $\overline{CE}_3$ is HIGH.
23. The data bus (Q) remains in High Z following a write cycle unless a new read access is initiated by $\overline{ADSP}$ or $\overline{ADSC}$.
24. $\overline{GW}$ is HIGH.

Switching Waveforms (continued)

Figure 6. ZZ Mode Timing [25, 26]



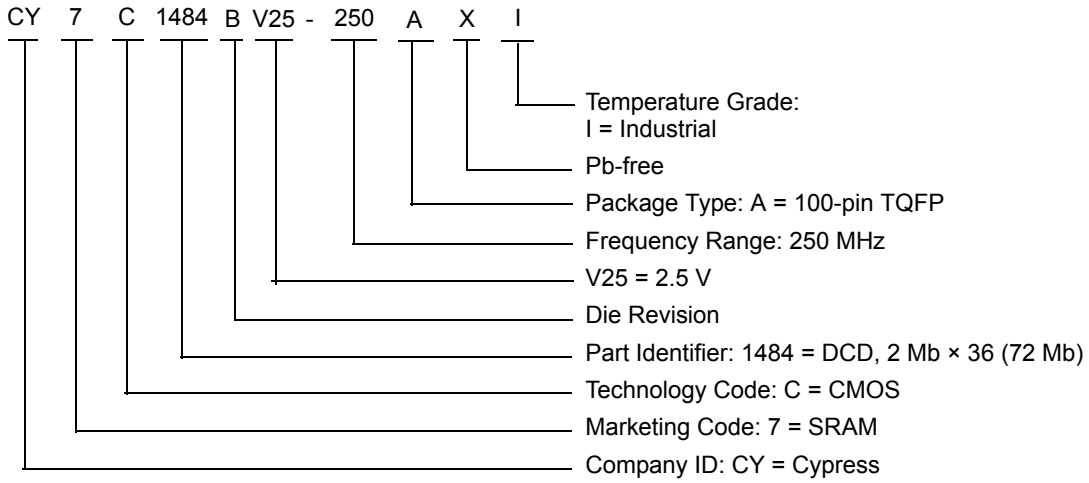
Notes
25. Device must be deselected when entering ZZ mode. See Truth Table on page 8 for all possible signal conditions to deselect the device.
26. DQs are in High Z when exiting ZZ sleep mode.

Ordering Information

Not all of the speed, package and temperature ranges are available. Please contact your local sales representative or visit www.cypress.com for actual products offered.

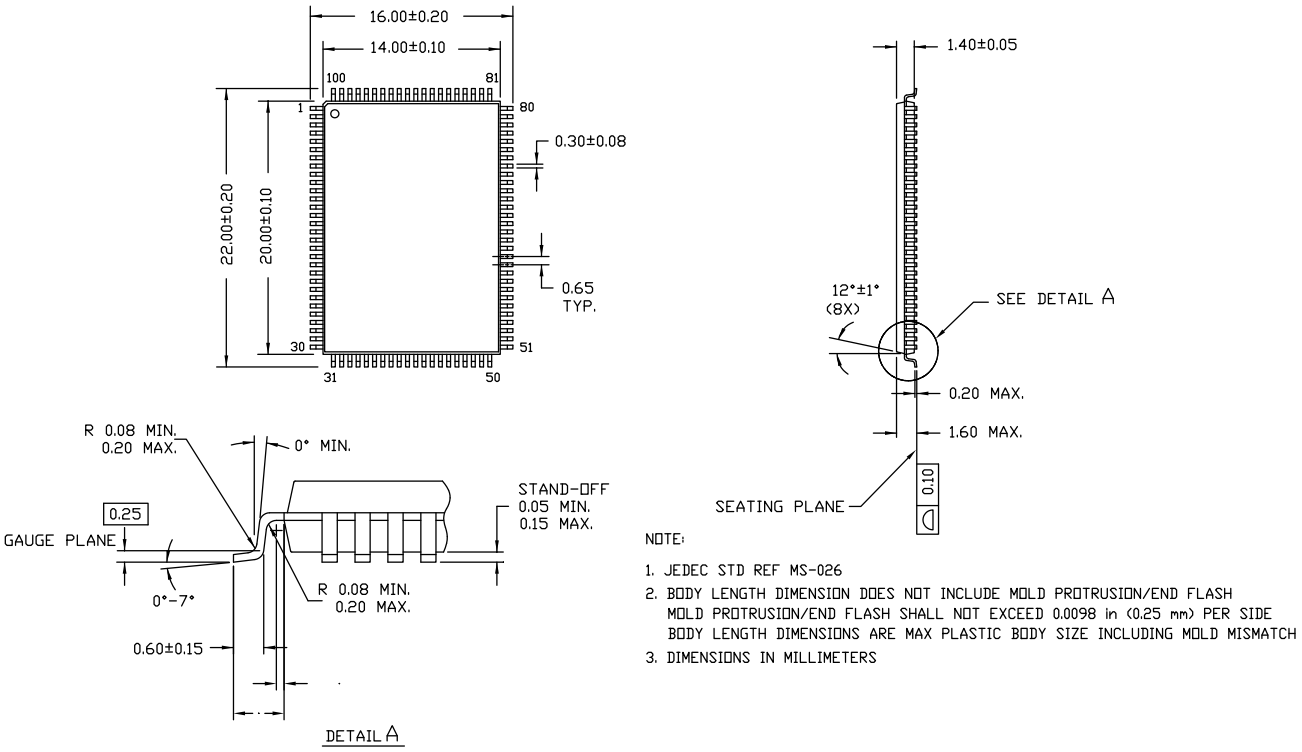
Speed (MHz)	Ordering Code	Package Diagram	Part and Package Type	Operating Range
250	CY7C1484BV25-250AXI	51-85050	100-pin TQFP (14 × 20 × 1.4 mm) Pb-free	Industrial

Ordering Code Definitions



Package Diagrams

Figure 7. 100-pin TQFP (14 × 20 × 1.4 mm) A100RA Package Outline, 51-85050



NOTE:

1. JEDEC STD REF MS-026
2. BODY LENGTH DIMENSION DOES NOT INCLUDE MOLD PROTRUSION/END FLASH
   MOLD PROTRUSION/END FLASH SHALL NOT EXCEED 0.0098 in (0.25 mm) PER SIDE
   BODY LENGTH DIMENSIONS ARE MAX PLASTIC BODY SIZE INCLUDING MOLD MISMATCH
3. DIMENSIONS IN MILLIMETERS

51-85050 *E

Acronyms

Acronym	Description
$\overline{CE}$	Chip Enable
CMOS	Complementary Metal Oxide Semiconductor
EIA	Electronic Industries Alliance
I/O	Input/Output
JEDEC	Joint Electron Devices Engineering Council
$\overline{OE}$	Output Enable
SRAM	Static Random Access Memory
TQFP	Thin Quad Flat Pack
TTL	Transistor-Transistor Logic

Document Conventions

Units of Measure

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

Document History Page

Document Title: CY7C1484BV25, 72-Mbit (2 M × 36) Pipelined DCD Sync SRAM Document Number: 001-75258				
Rev.	**ECN No.**	**Issue Date**	**Orig. of Change**	**Description of Change**
**	3489504	01/10/2012	GOPA	New data sheet.
*A	3756097	09/27/2012	PRIT	Changed status from Preliminary to Final.
*B	3861547	01/08/2013	PRIT	No technical updates. Completing Sunset Review.
*C	4573182	11/18/2014	PRIT	Updated Functional Description: Added “For a complete list of related documentation, click here.” at the end. Updated Package Diagrams: spec 51-85050 – Changed revision from *D to *E.
*D	5071123	01/04/2016	PRIT	Updated to new template. Completing Sunset Review.

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