*PRELIMINARY*

# CYM7450
# CYM7451

# 128K/256K Cache Module for VLSI VL82C483 Chip Set

## Features

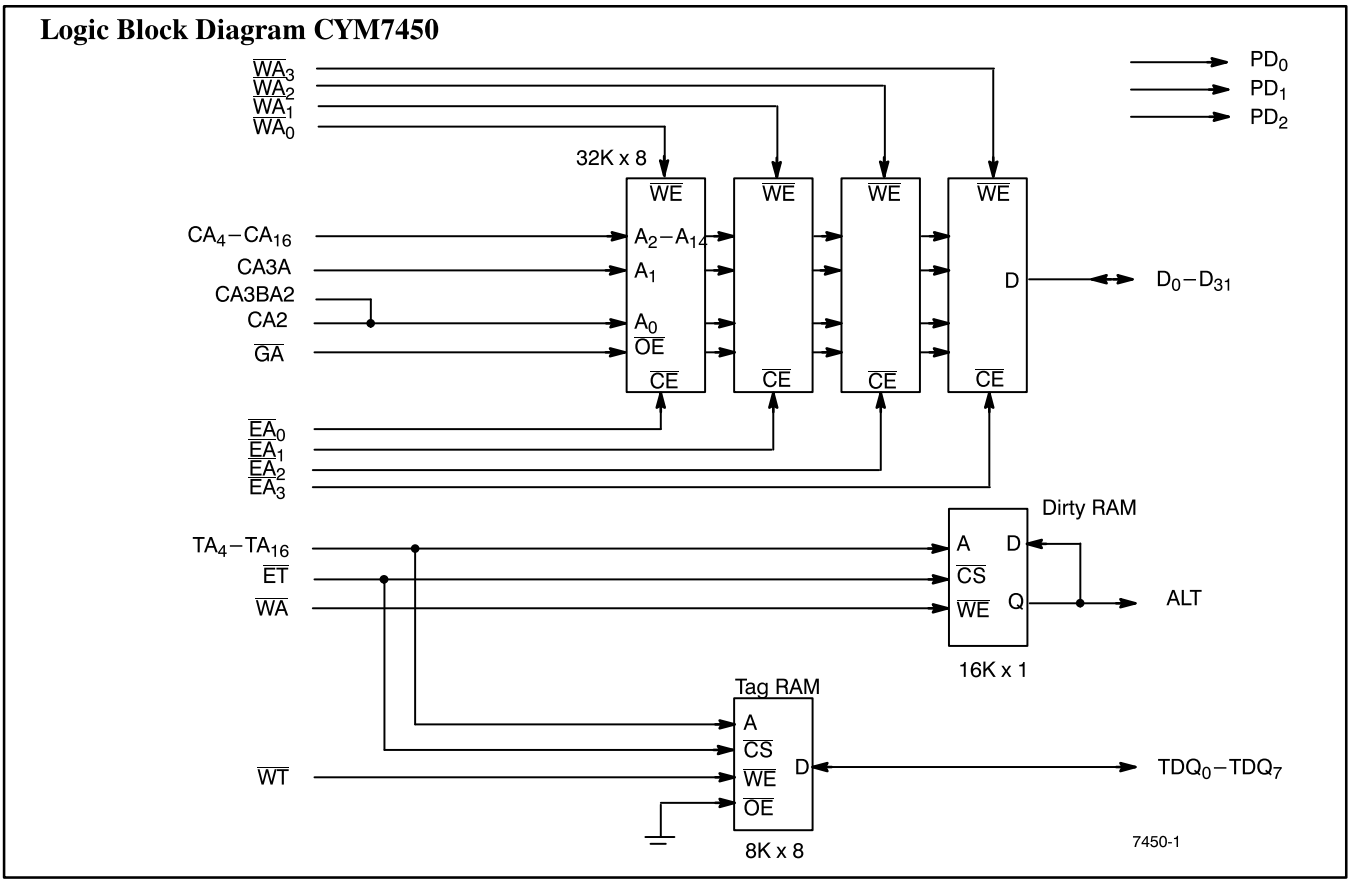
- **128 K-byte (CYM7450 ) or 256 K-byte (CYM7451) secondary cache module organized as 32K by 32 or 64K by 32**
- **Ideal for Intel™ 486-based systems with the VLSI VL82C483 chip set**
- **Zero-wait-state operations at 33 MHz**
- **Constructed using cost-effective CMOS asynchronous SRAMs**
- **On-board decoupling capacitors offer improved noise immunity**
- **128-position Dual Readout SIMM**
- **5V (±5%) power supply**
- **TTL-compatible inputs/outputs**

## Functional Description

These modules are designed specially to function as the secondary cache in Intel 486-based systems with the VLSI VL82C483 chip set. Each module contains either one or two banks of 32-bit wide data SRAMs, an 8-bit wide tag RAM, and a single-bit dirty RAM with separate I/O. Each byte in the data cache can be written individually. Separate address lines for the data RAMs and the tag/dirty RAMs are supported. Asynchronous CMOS SRAMs are used to provide a low-cost, low-power, and zero-wait-state solution for CPU speeds up to 33 MHz. Multiple ground pins and on-board decoupling capacitors ensure maximum protection from noise.

Each module interfaces with the rest of the system via a 128-pin connector. All components on the cache module are surface mounted on a multi-layer epoxy laminate (FR-4) substrate. The package dimensions are 3.85″ x 0.33″ x 1.07″. All inputs and outputs of the CYM7450 and CYM7451 cache modules are TTL compatible and operate from a single 5V power supply. The contact pins are plated with 100 micro-inches of nickel covered by 5 micro-inches of gold flash.

## Logic Block Diagram CYM7450




## Selection Guide

| | CYM7450PB–20C | CYM7451PB–203C |
|---|---|---|
| Cache Size (KB) | 128 | 256 |
| Data SRAM (ns) | 20 | 20 |
| Dirty SRAM (ns) | 15 | 15 |
| Tag/Valid SRAM (ns) | 15 | 15 |

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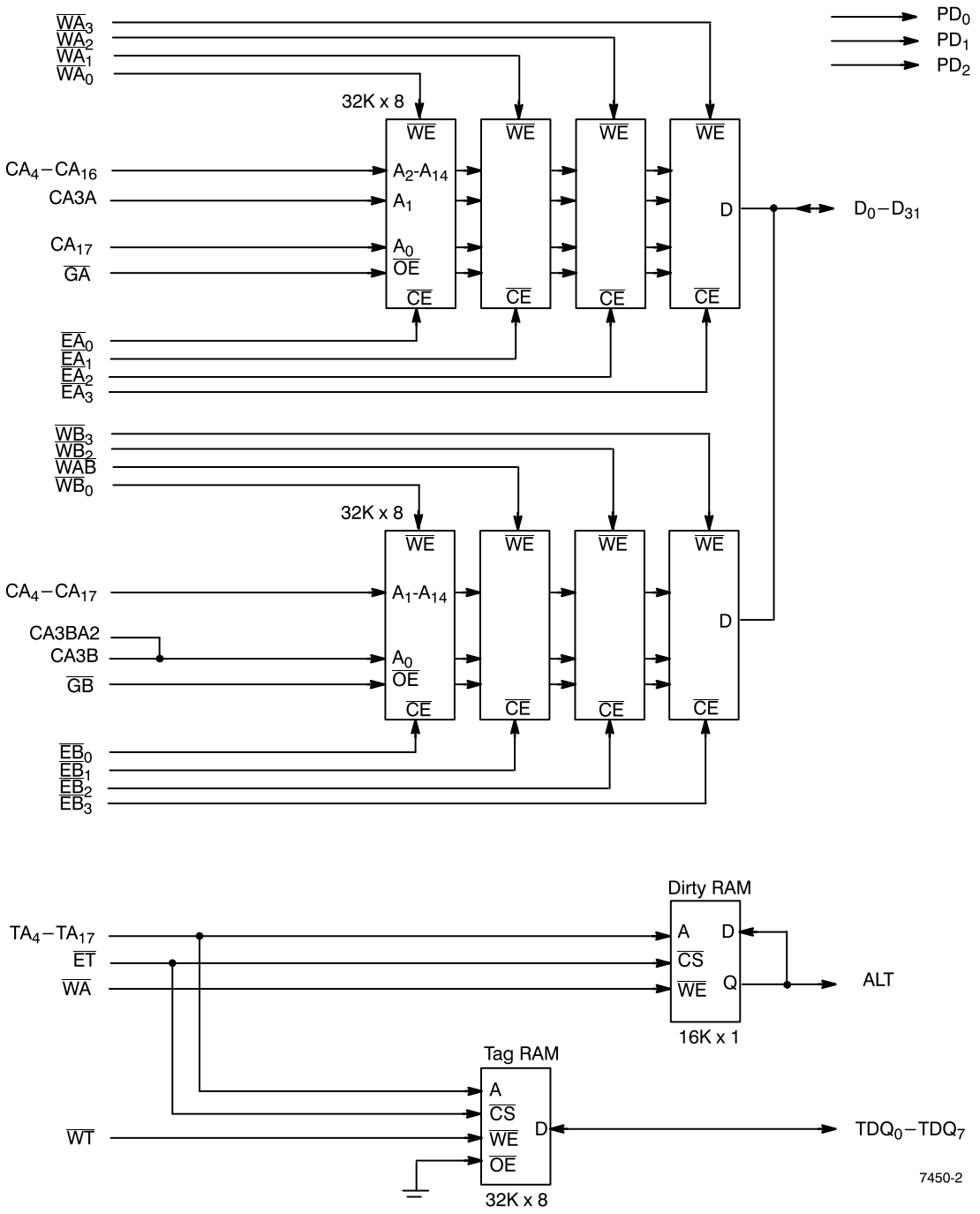
## Logic Block Diagram
## CYM7451



## Pin Configuration

**Dual Read-out SIMM**
**Top View**

| | | | |
|---|---|---|---|
| $PD_0$ | 1 | 65 | $PD_1$ |
| $PD_2$ | 2 | 66 | $V_{SS}$ |
| $DQ_0$ | 3 | 67 | $DQ_1$ |
| $DQ_2$ | 4 | 68 | $DQ_3$ |
| $DQ_4$ | 5 | 69 | $V_{CC}$ |
| $DQ_6$ | 6 | 70 | $DQ_5$ |
| $DQ_8$ | 7 | 71 | $DQ_7$ |
| $V_{SS}$ | 8 | 72 | $DQ_9$ |
| $DQ_{10}$ | 9 | 73 | $DQ_{11}$ |
| $DQ_{12}$ | 10 | 74 | $DQ_{13}$ |
| $DQ_{14}$ | 11 | 75 | $DQ_{15}$ |
| $DQ_{16}$ | 12 | 76 | $DQ_{17}$ |
| $DQ_{18}$ | 13 | 77 | $DQ_{19}$ |
| $DQ_{20}$ | 14 | 78 | $DQ_{21}$ |
| $V_{SS}$ | 15 | 79 | $V_{SS}$ |
| $DQ_{22}$ | 16 | 80 | $DQ_{23}$ |
| $DQ_{24}$ | 17 | 81 | $DQ_{25}$ |
| $V_{CC}$ | 18 | 82 | $V_{CC}$ |
| $DQ_{26}$ | 19 | 83 | $DQ_{27}$ |
| $DQ_{28}$ | 20 | 84 | $DQ_{29}$ |
| $DQ_{30}$ | 21 | 85 | $DQ_{31}$ |
| NC | 22 | 86 | NC |
| NC | 23 | 87 | NC |
| $V_{SS}$ | 24 | 88 | $V_{SS}$ |
| $\overline{EA}_0$ | 25 | 89 | $\overline{EB}_0$ |
| $\overline{EA}_1$ | 26 | 90 | $\overline{EB}_1$ |
| $\overline{EA}_2$ | 27 | 91 | $V_{CC}$ |
| $\overline{EA}_3$ | 28 | 92 | $\overline{EB}_2$ |
| $V_{SS}$ | 29 | 93 | $\overline{EB}_3$ |
| $\overline{GA}$ | 30 | 94 | $\overline{GB}$ |
| $\overline{WA}_0$ | 31 | 95 | $\overline{WB}_0$ |
| $\overline{WA}_1$ | 32 | 96 | $\overline{WB}_1$ |
| $\overline{WA}_2$ | 33 | 97 | $\overline{WB}_2$ |
| $\overline{WA}_3$ | 34 | 98 | $\overline{WB}_3$ |
| $\overline{WT}$ | 35 | 99 | $\overline{WA}$ |
| $\overline{ET}$ | 36 | 100 | $V_{CC}$ |
| NC | 37 | 101 | NC |
| NC | 38 | 102 | NC |
| CA3A | 39 | 103 | CA3BA2 |
| $CA_2$ | 40 | 104 | CA3B |
| $V_{SS}$ | 41 | 105 | $V_{SS}$ |
| $CA_4$ | 42 | 106 | $CA_5$ |
| $CA_6$ | 43 | 107 | $CA_7$ |
| $CA_8$ | 44 | 108 | $CA_9$ |
| $CA_{10}$ | 45 | 109 | $CA_{11}$ |
| $CA_{12}$ | 46 | 110 | $CA_{13}$ |
| $CA_{14}$ | 47 | 111 | $CA_{15}$ |
| $CA_{16}$ | 48 | 112 | $CA_{17}$ |
| $CA_{18}$ | 49 | 113 | $CA_{19}$ |
| $V_{SS}$ | 50 | 114 | $V_{SS}$ |
| $TA_4$ | 51 | 115 | $TA_5$ |
| $TA_6$ | 52 | 116 | $TA_7$ |
| $TA_8$ | 53 | 117 | $TA_9$ |
| $TA_{10}$ | 54 | 118 | $TA_{11}$ |
| $TA_{12}$ | 55 | 119 | $TA_{13}$ |
| $TA_{14}$ | 56 | 120 | $TA_{15}$ |
| $TA_{16}$ | 57 | 121 | $TA_{17}$ |
| $TA_{18}$ | 58 | 122 | $TA_{19}$ |
| $V_{SS}$ | 59 | 123 | $V_{SS}$ |
| $TDQ_0$ | 60 | 124 | $TDQ_1$ |
| $TDQ_2$ | 61 | 125 | $TDQ_3$ |
| $TDQ_4$ | 62 | 126 | $TDQ_5$ |
| $TDQ_6$ | 63 | 127 | $TDQ_7$ |
| ALT | 64 | 128 | $V_{CC}$ |

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## Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature ..... −55°C to +125°C

Ambient Temperature with Power Applied ..... −0°C to +70°C

Supply Voltage to Ground Potential ..... −0.5V to +7.0V

DC Voltage Applied to Outputs in High Z State ..... −0.5V to +7.0V

DC Input Voltage ..... −0.5V to +7.0V

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

## Operating Range

| Range | Ambient Temperature | $V_{CC}$ |
|---|---|---|
| Commercial | 0°C to +70°C | 5V ± 5% |

## Electrical Characteristics Over the Operating Range

| Parameter | Description | Test Conditions | CYM7450 CYM7451 Min. | CYM7450 CYM7451 Max. | Unit |
|---|---|---|---|---|---|
| $V_{OH}$ | Output HIGH Voltage | $V_{CC}$ = Min., $I_{OH}$ = −4 mA | 2.4 | | V |
| $V_{OL}$ | Output LOW Voltage | $V_{CC}$ = Min., $I_{OL}$ = 8 mA | | 0.4 | V |
| $V_{IH}$ | Input HIGH Voltage | | 2.2 | $V_{CC}$+0.3 | V |
| $V_{IL}$ | Input LOW Voltage | | −0.5 | 0.8 | V |
| $I_{CC}$ | $V_{CC}$ Operating Supply Current (CYM7450 only). | $V_{CC}$=Max., $I_{OUT}$=0 mA, f=$f_{MAX}$=1/$t_{RC}$ | | 950 | mA |
| $I_{CC}$ | $V_{CC}$ Operating Supply Current (CYM7451 only). | $V_{CC}$=Max., $I_{OUT}$=0 mA, f=$f_{MAX}$=1/$t_{RC}$ | | 1700 | mA |

## Presence Detect Table

| | $PD_2$ | $PD_1$ | $PD_0$ |
|---|---|---|---|
| CYM7450 | NC | GND | GND |
| CYM7451 | NC | NC | GND |

## Ordering Information

| Cache Memory Size | Ordering Code | Package Name | Package Type | Operating Range |
|---|---|---|---|---|
| 128 K-byte | CYM7450PB−20C | PM13 | 128-Pin Dual-Readout SIMM | Commercial |
| 256 K-byte | CYM7451PB−20C | PM14 | 128-Pin Dual-Readout SIMM | Commercial |

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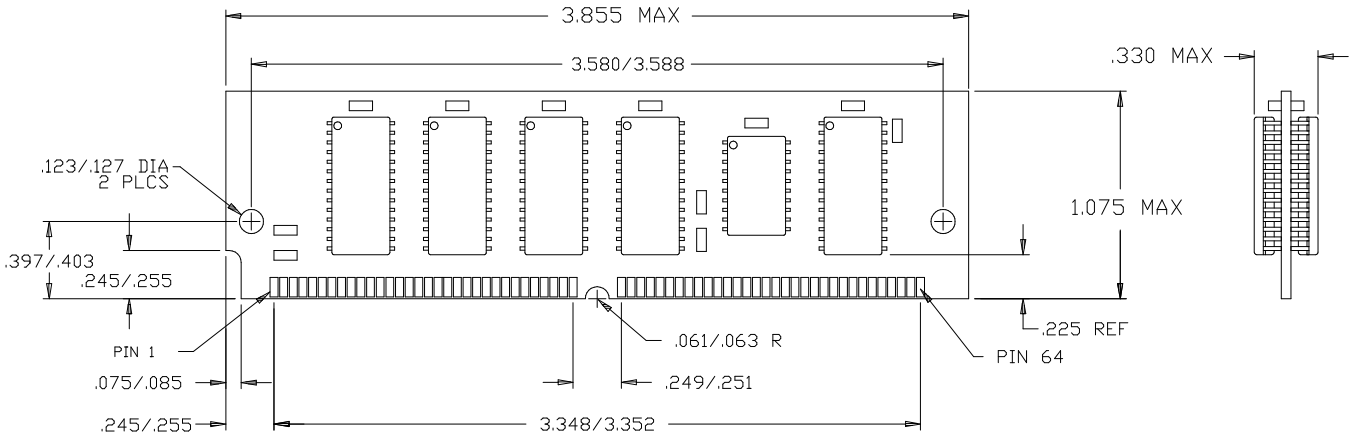
## Package Diagrams

**128-Pin Dual-Readout SIMM PM13**




**128-Pin Dual-Readout SIMM PM14**