

VME Interface Component

The ML7C964 is a VME interface component, pin-compatible with the now-discontinued Cypress CY7C964. The ML7C960 VME controller in concert with ML7C964 interface chips provides a simple VME interface solution.

Feature Summary

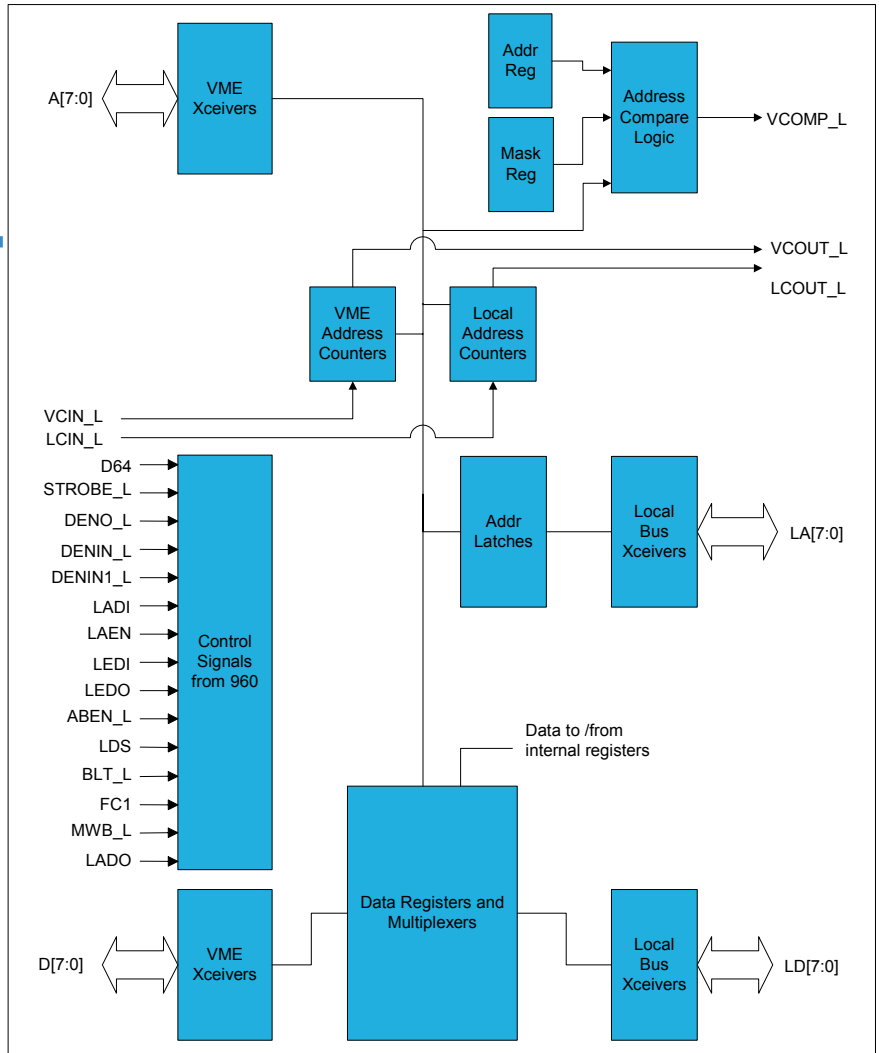
- High-current drivers for direct connection to VME address and data bus signals
- Cascadable to support multiple VME widths
- VME address matching
- Address counters for block transfers and local bus DMA.
- Supports all standard (Rev. C) VMEbus transactions
- 80-Mbyte-per-second block transfer rates
- Multiplexers for D64 support
- 64 pin PLCC package

Applications

VME64 has been widely used in industrial and military applications. The ML7C964 with the ML7C960 provides an integrated solution for VME and VME64 Slave devices.

The Millogic synthesizable core for the ML7C964 has been widely used to generate functional replacements for the Cypress CY7C964. The ML7C964 now provides a direct chip level replacement, requiring no printed circuit board changes.

Block Diagram



General Description

The ML7C964 is a byte-slice VME address and data interface. Millogic also provides the ML7C960, a pin compatible replacement device for the CY7C960 chips. The ML7C964 together with the ML7C960 provide a complete VME slave interface solution.

The ML7C964 is cascadable to support D8, D16, D32, MD32 and D64 data transfers. It can also support A16, A24, A32, A40, A64 addressing modes. Single-cycle and block-transfer read and write cycles, Read-Modify-Write cycles and Address-only cycles are all supported.

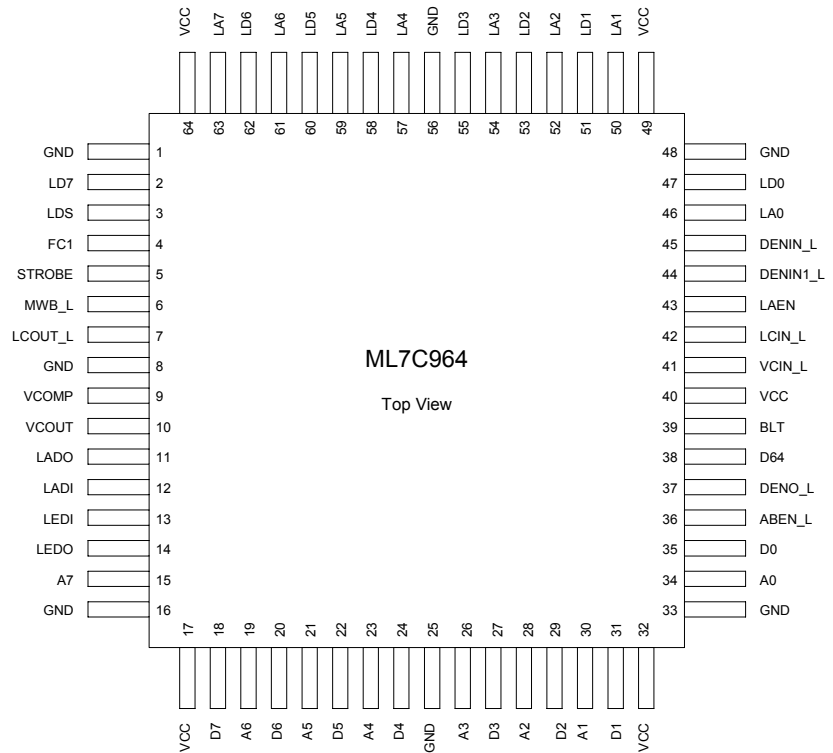
General Description (continued)

The ML7C964 contains three address counters to support both master and slave block transfers. One counter supplies the local address during master block transfer operations, A second counter provides the local address during slave block transfers, and also serves as the address latch for non-block transfer slave operations. The third counter provides the VME address during VME master block transfers.

The address comparison logic comprises a base address register, a mask register. The VCOMP_L output is driven low when the VME address bits selected by the mask register match the corresponding bits in the base address register.

In D64 operation, data are transferred over both the VME A and D pins. The ML7C964 handles the sequencing and routing of data between the local data (LD) pins and the A and D pins appropriately.

Pin Configuration



Package - 64 pin PQFP

ML7C964—CY7C964

A Comparison

Functionally, the ML7C964 and CY7C964 are the equivalent. With the ML7C964, in D64 mode (when data are driven on both the D and A signals,) the VME drive current limit is reduced to 20 ma per pin.

Pin Description

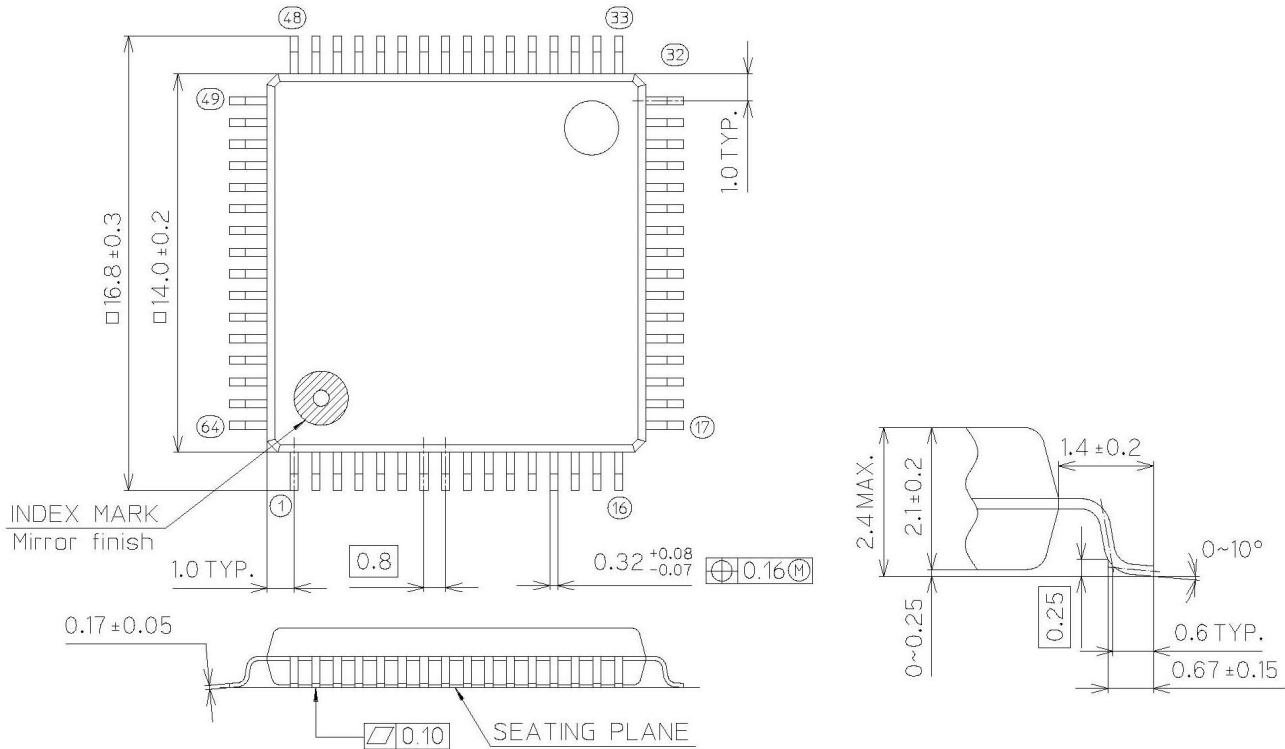
| Signal | Signal Direction | Description |
|----------|------------------|--|
| A(7:0) | Bidir | VME address |
| D(7:0) | Bidir | VME data |
| LA | Bidir | Local address bus |
| LD | Bidir | Local data bus |
| LCOUT_L | Out | Local address counter enable out |
| VCOUT_L | Out | VME address counter enable out |
| VCOMP_L | Out | VME address compare out |
| D64 | Input | ML7C960 interface - Informs external hardware D64 VME block xfer in progress |
| STROBE_L | Output | ML7C960 interface - Used during INIT to load 964 regs |
| DENO_L | Input | ML7C960 interface - Data Enable Out - Enables VME data drivers |
| DENIN_L | Input | ML7C960 interface - Data Enable In; used with DENIN1_L and SWDEN_L |
| DENIN1_L | Input | ML7C960 interface - Data Enable In; used with DENIN_L and SWDEN_L |
| LADI | Input | ML7C960 interface - Latch Address In |
| LAEN | Input | ML7C960 interface - Local Address Enable |
| LEDI | Input | ML7C960 interface - Latch Enable Data In |
| LEDO | Input | ML7C960 interface - Latch Enable Data Out |
| ABEN_L | Input | ML7C960 interface - Address Bus Enable; enables data onto VME address bus for D64 cycles |
| LDS | Input | Local Data Select; used during mux-ed data VME transactions and INIT |
| LCIN_L | Input | Local address counter enable in |
| VCIN_L | Input | VME address counter enable in |
| BLT_L | Input | Block transfer enable |
| FC1 | Input | Function code 1 |
| MWB_L | Input | Module Wants Bus - local bus requesting VME |
| LADO | Input | Latch Address Out |



Recommended Operating Conditions

| Operating Conditions | | | | |
|---|-----------------------------------|--|------------|-------|
| Parameter | Description | Test Conditions | Value | Units |
| V _{CC} | Operating power supply | | 5 +/- 10% | V |
| T _J | Junction Temperature | | -40 to 125 | °C |
| DC Specifications—All Inputs | | | | |
| Parameter | Description | Test Conditions | Value | Units |
| V _{IH} | Minimum High-level Input Voltage | | 2.2 | V |
| V _{IL} | Maximum Low-level Input Voltage | | 0.8 | V |
| I _{IH-max} | Maximum High-level Input Current | V _{IN} = V _{CC} | 10 | µA |
| | | V _{IN} = V _{CC} ; 50K pulldown | 250 | µA |
| I _{IH-min} | Minimum High-level Input Current | V _{IN} = V _{CC} ; 50K pulldown | 20 | µA |
| I _{IL-max} | Maximum Low-level Input Current | V _{IN} = GND | -10 | µA |
| | | V _{IN} = GND; 50K pullup | -250 | µA |
| I _{IL-min} | Minimum Low-level Input Current | V _{IN} = GND; 50K pullup | -20 | µA |
| DC Specifications—VME D Outputs | | | | |
| Parameter | Description | Test Conditions | Value | Units |
| V _{OH} | Minimum High-level Output Voltage | V _{CC} = Min, I _{OH} = -3ma | 2.4 | V |
| V _{OL} | Maximum Low-level Output Voltage | V _{CC} = Min, I _{OH} = 40ma | 0.6 | V |
| DC Specifications—VME A Outputs (D64 mode) | | | | |
| Parameter | Description | Test Conditions | Value | Units |
| V _{OH} | Minimum High-level Output Voltage | V _{CC} = Min, I _{OH} = -3ma | 2.4 | V |
| V _{OL} | Maximum Low-level Output Voltage | V _{CC} = Min, I _{OH} = 20ma | 0.6 | V |
| DC Specifications—All Other Outputs | | | | |
| Parameter | Description | Test Conditions | Value | Units |
| V _{OH} | Minimum High-level Output Voltage | V _{CC} = Min, I _{OH} = -8ma | 2.8 | V |
| V _{OL} | Maximum Low-level Output Voltage | V _{CC} = Min, I _{OH} = 8ma | 0.4 | V |
| DC Specifications—All Tristate Outputs—Leakage currents | | | | |
| Parameter | Description | Test Conditions | Value | Units |
| I _{ozH-max} | Max high-level leakage current | V _{IN} = V _{CC} | 10 | µA |
| | | V _{IN} = V _{CC} ; 50K pulldown | 250 | µA |
| I _{ozH-min} | Minimum pulldown current | V _{IN} = V _{CC} ; 50K pulldown | 20 | µA |
| I _{ozL-max} | Max low-level leakage current | V _{IN} = GND | -10 | µA |
| | | V _{IN} = GND; 50K pullup | -250 | µA |
| I _{ozL-min} | Minimum pullup current | V _{IN} = GND; 50K pullup | -20 | µA |

Package Outline



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