SILICON360

Features

- Industry-proven, high-performance 64-bit VMEbus interconnect
- Fully compliant, 32-bit or 64-bit, 33-MHz PCI bus interconnect
- Integral FIFOs for write posting to maximize bandwidth utilization
- Programmable DMA controller with Linked-list mode (scatter/gather) support
- Flexible interrupt logic
- Sustained transfer rates up to 60-70 MBps
- Extensive suite of VMEbus address and data transfer modes
- Automatic initialization for slave-only applications
- Flexible register set, programmable from both the PCI bus and VMEbus ports
- Full VMEbus system controller
- Support for Read Modify Write (RMW), Address Only with Handshake (ADOH), PCI LOCK # cycles, and semaphores
- IEEE 1149.1 JTAG

Benefits

- Provides high performance on the PCI bus
    - Zero-wait state implementation
    - Multi-beat transactions
    - Supports bus parking
- Features a wide range of VMEbus address and data transfer modes
    - A32/A24/A16 master and slave
    - D64/D32/D16/D08 master and slave
    - MBLT, BLT, ADOH, RMW, LOCK, location monitors
- Supports nine user programmable slave images on VMEbus and PCI bus ports
- Provides seven interrupt lines on either bus and flexible mapping of software and hardware sources of hardware interrupt
- Provides four mailboxes and location monitor for message oriented systems

Universe II™:
High Performance 64-bit VMEbus-to-PCI Interconnect

Product Feature Sheet

Device Overview

Universe II supports the latest VME applications with its high performance 64-bit VMEbus interface and fully compliant, 32-bit or 64-bit, PCI bus interface. Its zero wait state implementation, multi-beat transactions, and support for bus parking ensure high performance on the PCI bus. The device is ideally suited for CPU boards functioning as both master and slave in the VMEbus system and that require access to PCI systems.

Absolute Maximum Ratings:

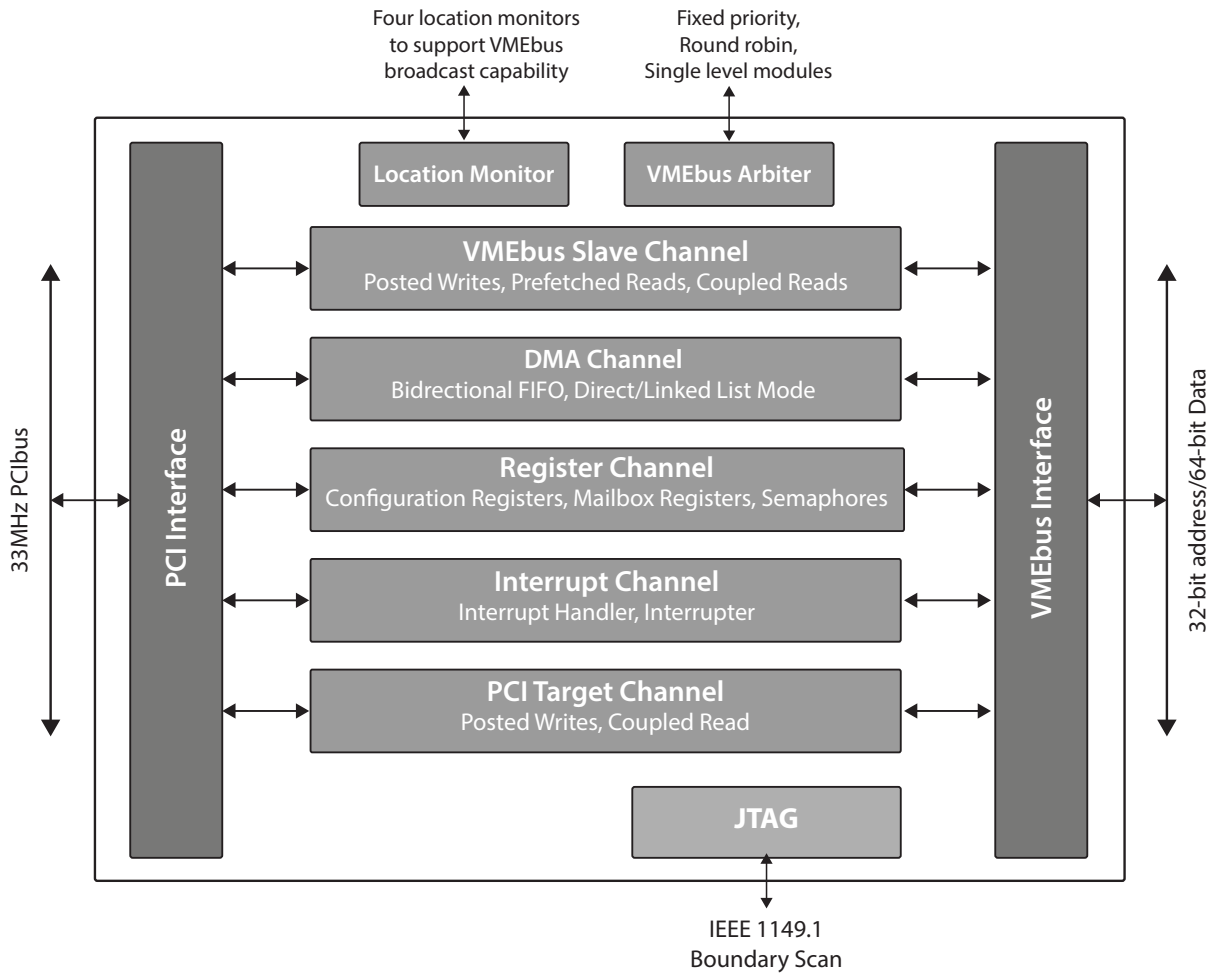|	
DC Supply Voltage	-0.3 to 7 V
Input Voltage (V_{IN})	-0.5V to V_{DD} +0.5 V
DC current Drain per pin Any single Input or Output	± 50mA
DC current Drain per pin Any paralleled outputs	± 100 mA
DC Current Drain V_{DD} and V_{SS} pins	± 75 mA
Storage Temperature T_{STG}	-40 ºC to + 125 ºC

Typical Applications

- Single board computers
- Telecommunications equipment
- Test equipment
- Command and control systems
- Factory automation equipment
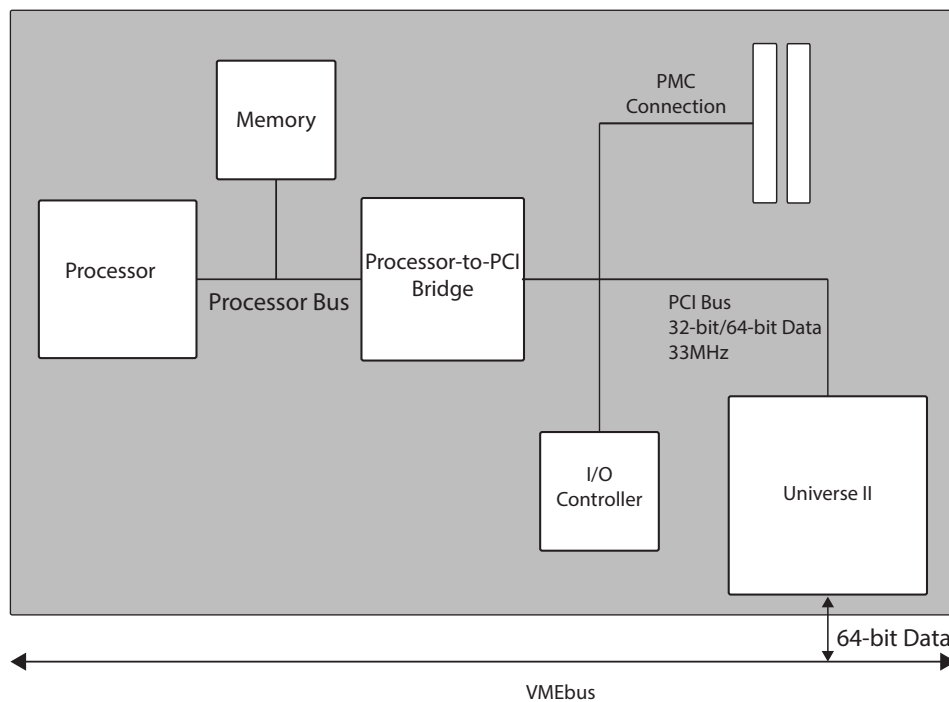- Medical equipment
- Military
- Aerospace

Packaging

- 25 mm x 25 mm, 361-contact dimpled ceramic Ball Grid Array (DBGA)

Universe II™: High Performance 64-bit VMEbus-to-PCI Interconnect

Four location monitors to support VMEbus broadcast capability

Fixed priority, Round robin, Single level modules

Location Monitor	VMEbus Arbiter

VMEbus Slave Channel
Posted Writes, Prefetched Reads, Coupled Reads

DMA Channel
Bidirectional FIFO, Direct/Linked List Mode

Register Channel
Configuration Registers, Mailbox Registers, Semaphores

Interrupt Channel
Interrupt Handler, Interrupter

PCI Target Channel
Posted Writes, Coupled Read

JTAG

PCI Interface

VMEbus Interface

33MHz PCIbus

32-bit address/64-bit Data

IEEE 1149.1
Boundary Scan

Functional Block Diagram

Memory

PMC Connection

Processor

Processor-to-PCI Bridge

Processor Bus

PCI Bus
32-bit/64-bit Data
33MHz

I/O Controller

Universe II

64-bit Data

VMEbus

In Single Board Computer Application

Operating Conditions:

Symbol	Parameter	Min	Max	Frequency Operation (MHZ)
V_{dd}	DC Supply Voltage	4.5 V	5.5 V	
T_a (Commerical)	Ambient Temperature	0 °C	70 °C	25 - 33 MHz
T_a (Industrial)	Ambient Temperature	-40 °C t	85 °C	25 - 33 MHz
T_a (Extended)	Ambient Temperature	-55 °C	125 °C	25 MHz

Typical Application: Single Board Computers

The Universe II is widely used on VME-based Single Board Computers (SBC) that employ PCI as their local bus and VME as the backplane bus, as shown in the diagram on the facing page. These SBC cards support a variety of applications including telecom, datacom, medical, industrial, and military equipment. The Universe II high performance architecture seamlessly bridges the PCI and VME buses, and is the VME industry standard for single board computer interconnect device.

Power Dissipation:

Parameter	Rating
IDLE	
Power Dissipation (32 Bit)	1.97 W
Power Dissipation (64 Bit)	2.12 W
TYPICAL	
Power Dissipation (32 Bit)	2.65 W
Power Dissipation (64 Bit)	3.15 W

Ordering Information:

Part #	PCI Frequency	Voltage	Temperature	Package
CA91C142D-33CB	33 MHz	5 V	0 °C to 70 °C	DBGA (ceramic)
CA91C142D-33IB	33 MHz	5 V	-40 °C to 85 °C	DBGA (ceramic)
CA91C142E-25EB	25 MHz	5 V	-55 °C to 125 °C	DBGA (ceramic)