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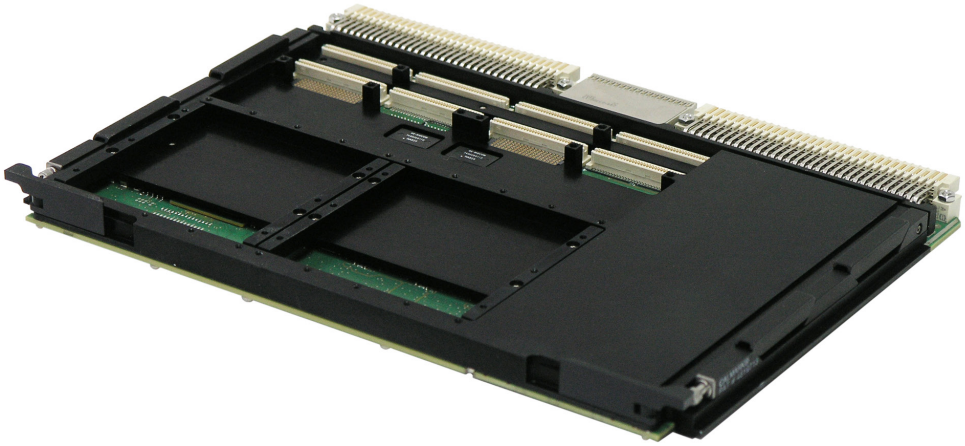
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VR12

Intel Core i7 Based Rugged VME Single Board Computer

The VR12 Rugged Single Board Computer (SBC) from Abaco Systems features the high performance, highly integrated Core i7 processor platform from Intel.

Core i7 offers integrated graphics and memory controller plus dual core processing up to 2.53 GHz all in one device. Coupled with the Mobile Intel QM57 Express Chipset this provides an unmatched level of I/O bandwidth for both on-board and off-board functions.

Features of the Core i7 processor

- Intel Intelligent Power Technology allows processors to operate at optimal frequency and power.
- Intelligent performance on-demand with Intel Turbo Boost Technology
- Multi-level shared cache improves performance and efficiency by reducing latency to frequently used data
- Hyper-Thread Technology – 2 threads per core
- Streaming SIMD extensions 4.1/4.2

In addition to a comprehensive range of on-board IO features, the VR12 also offers two on-board mezzanine expansion sites for enhanced system flexibility, both of which offer PMC and XMC capability. Memory resources include up to 8GB DDR3 SDRAM, 16GB NAND Flash, optional SATA Hard drive, BIOS Flash and optional BIOS backup Flash

The VR12 is designed to meet the requirements of a wide range of applications from industrial through to fully rugged Defense and Aerospace programs. It offers extended temperature capability and a range of air and conduction cooled build levels.

FEATURES:

- 6U VME Single Board Computer
- Intel® Core i7 Processor up to 2.53 GHz
- Integrated two channel DDR3-1067 memory controller with ECC
  - Up to 4 MB shared cache
- Up to 8 GB soldered DDR3 SDRAM with ECC
- Up to 16 GB NAND Flash (soldered)
- Dual on-board Expansion Sites:
  - Two PCI-X PMC/ x8 PCIe XMC
- Front IO
  - 2 x Gigabit Ethernet
  - 1 x USB
  - 1 x VGA
  - 1 x COM port
- Rear IO
  - 2x Gigabit Ethernet ports (VITA31.1)
  - 1x VGA (2 ports possible if front IO not required)
  - 2x DVI
  - 2x SATA ports
  - 2x COM ports
  - 2x USB ports
  - 12x GPIO
  - 2x PMC IO signals
  - IPMI 2.0, PICMG® 2.9
- Optional BIOS backup Flash
- Optional onboard SATA HDD
- Optional Conduction cooling
- Optional extended operating temperature range
- Single slot 6U VME64 form factor
- Compliant to IEEE STD 1101.2-1992 & ANSI/ VITA 20-2001, VITA 30.1
- Operating system support for VxWorks®, Linux®, and Windows®.

abaco SYSTEMS

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VR12 *Intel Core i7 Based Rugged VME Single Board Computer*

Specifications

Processor
- Intel Core i7 32nm Processor, options include but are not limited to
  - ULV @ 1.06 GHz
  - LV @ 2.0 GHz
  - SV @ 2.53 GHz
- Up to 4 MB shared cache
- Integrated two channel DDR3-1067 memory controller with ECC

SDRAM
- Maximum memory configuration of up to 8 GB DDR3 SDRAM soldered with ECC

Flash Memory
- Soldered NAND flash array up to 16 GB

UEFI (replaces BIOS)
- The VR12 System UEFI includes all functions required by the processor core and chipset
- Will also support expansion ROM code for remote booting from either of the dual Ethernet ports

Ethernet
- Dual Gigabit Ethernet interface via two Intel 82574 Gigabit Ethernet controllers – routed to front panel
- Dual Gigabit Ethernet interface via two Intel 82574 Gigabit Ethernet controllers – routed to rear (VITA31.1 compliant)

USB Ports
- Three USB 2.0 ports: one routed to front panel I/O, and two to rear P2 connector
- Keyboard and Mouse (PS2) emulation via USB

VMEbus Backplane Interface
- 2eSST capable via TSi148 (ANSI/VITA 1.5-2003 offering bandwidths up to 320 MB/s)

Serial Ports
- Three 16550 compatible full duplex async serial ports
  - One routed to front panel RS232 (COM3)
  - Two routed to P2, with user selectable RS232/422/485
- Ports feature independent 16-byte FIFO supporting baud rates up to 115 Kbaud

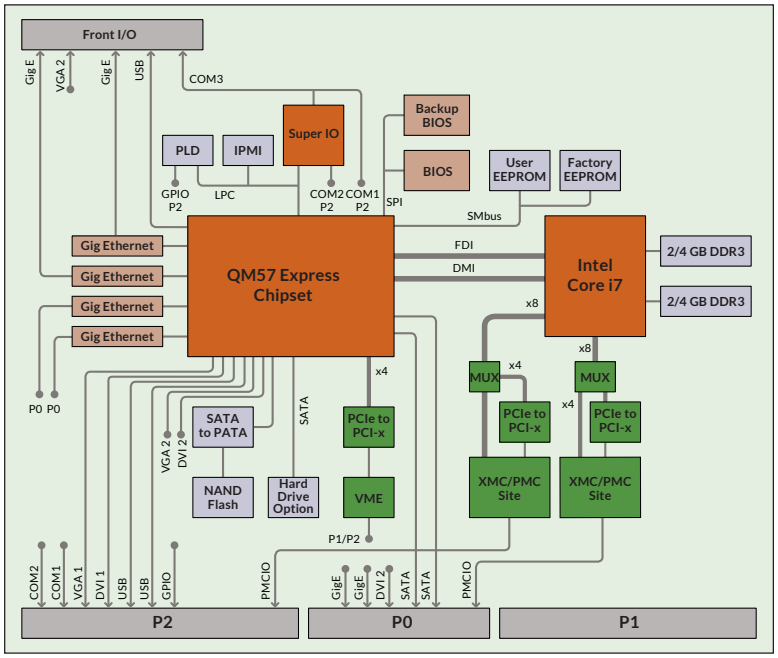
PMC/XMC Expansion
- Up to 2 on-board mezzanine expansion sites, both of which are PMC (PCI-X up to 64bit /133MHz) and XMC (x8 PCIe Gen 2) capable
- PCI signaling is 3.3V, with 5V tolerance when operated at 33 MHz

Video
- Provided via the integrated Intel Graphics Controller
- One VGA port routed to front panel (or optionally to rear panel)
- One VGA port plus two TMDS (DVI-D) ports routed to rear IO (for use with VTM24)
- Any two ports can be used for dual display operation

SATA
- Two SATA to rear IO (P0)

GPIO
- 12 GPIO pins – software configurable

Block diagram



IPMI
- Optional IPMI interface via Baseboard Management Controller (PICMG 2.9)

On-board hard drive
- 2.5" SATA hard drive or Flash disk can be optionally ordered (precludes use of PMC/XMC site 2)

Power requirements
- +5, +3.3V (plus +12V/-12V if required by mounted PMC module)

EEPROM / Watchdog / RTC / Timers / Temp sensors
- 512 kbit serial EEPROM for non-volatile user data
- SuperIO watchdog
- 146818 compatible with Li battery (battery not on conduction cooled variants)
- Legacy PC-AT timer and HPET (High Precision Event Timer) provided from Ibex Peak Controller
- CPU die and Chipset die, software readable

Other HW features
- Hardware Write Protection (rear pin)
- Front power button (and rear)
- Three status LEDs and four BIT status LEDs at front, two status LED signals at rear
- IPMI 2.0 Controller (VITA 38)
- Compliant to IEEE STD 1101.2-1992 and ANSI/VITA 20-2001, VITA 30.1

Transition Module
- VTM24

Software
- Support for Windows, Linux, VxWorks

Ordering information

	Level A	Level B	Level C	Level D	Level E
Cooling Method	Convection	Convection	Convection	Conduction	Conduction
Conformal Coating	Optional	Standard	Standard	Standard	Standard
Operating Temp (For upper limit, please consult manual)	0 / 55°C max (300 ft/m) (dependent on CPU)	-20 / +65°C max (300 ft/m) (dependent on CPU)	-40 / +71°C max (600 ft/m) (dependent on CPU)	-40 / +75°C max At cold wall (dependent on CPU)	-40 / +85°C At cold wall (dependent on CPU)
Random Vibration	0.002g2/Hz*	0.002g2/Hz*	0.04g2/Hz**	0.1g2/Hz**	0.1g2/Hz**
Shock	20g***	20g***	20g***	40g***	40g***

**With a flat response to 1000 Hz, 6 dB/Oct roll-off from 1000 to 2000 Hz ** From 10 to 1000 Hz ***Peak sawtooth 11 ms duration

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