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Find the *Abaco Systems / SBS VG4* at our website: ***Click HERE***

VG4

Single Slot PowerPC™ 7400/75x

6U VMEbus Embedded Computer

Features

- **7400 / 755 / 750**, 400-**500 MHz** with **AltiVec™** technology
- **2**/1 **MB** L2 **Cache**, **1.6 GB/sec**

- Ultra compact, **1 slot only**

- CHRP Architecture
- **VxWorks, LynxOS, Linux** Support

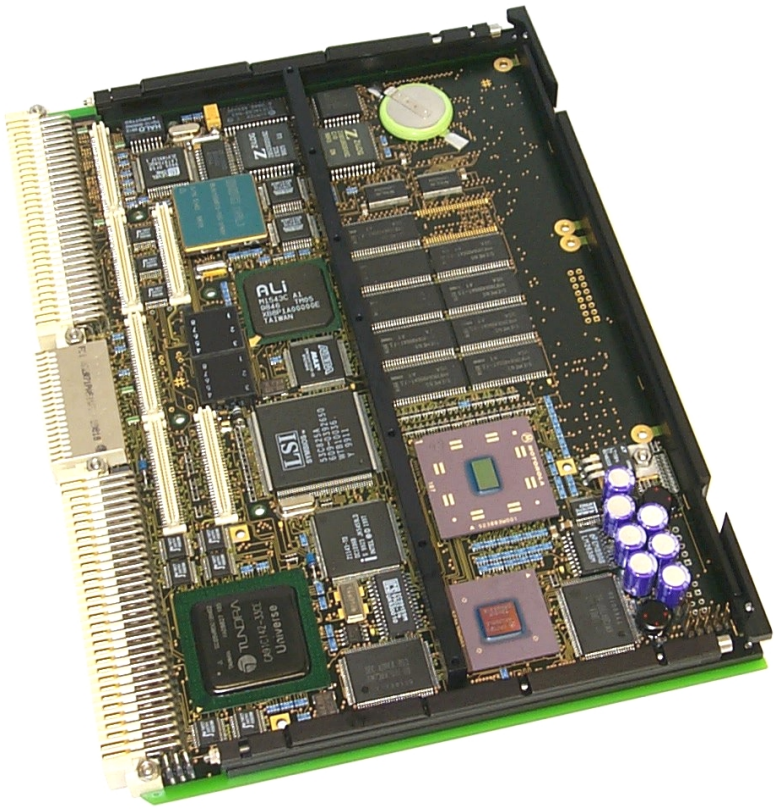
- Up to **512 MB, 100 MHz SDRAM** with **ECC**

- Up to **64 MB Flash**, 64-bit
- **512 KB** Boot Flash
- **32 KB** AutoStore **nvSRAM**

- **Fast Ethernet 10/100 Mbit**
- **Wide SCSI** up to 40 MB/sec
- **MIL-STD-1553**
- **2x PMC** extension slots

- **4x serial** I/O with FIFOs
  2x async. RS-232
  2x async./sync RS-232/**422/485**
- IEEE 1284 **parallel** port
- **USB**, **Mouse**, **Keyboard**
- **7x Timer**/Counter
- **2x DMA** channels
- **RTC, watchdog**, **temperature sensor**

- Single **+5 volt** supply **only**
- Optional **–40°/+85°C**
- **Conduction Cooling**
- High **shock** and **vibration immunity** with **stiffener bars** and **wedge locks**
- Conformal **coating**
- **Custom specific**, **low cost** assembly versions



The *VG4* VMEbus all-in-one 6U single board computer is designed to meet the needs of embedded application developers addressing markets like industrial automation, medical, scientific, imaging, telecommunication (high bandwidth, broadband data or intelligent network switching), military and aerospace. Supported operating systems are VxWorks, Linux and LynxOS (on request).

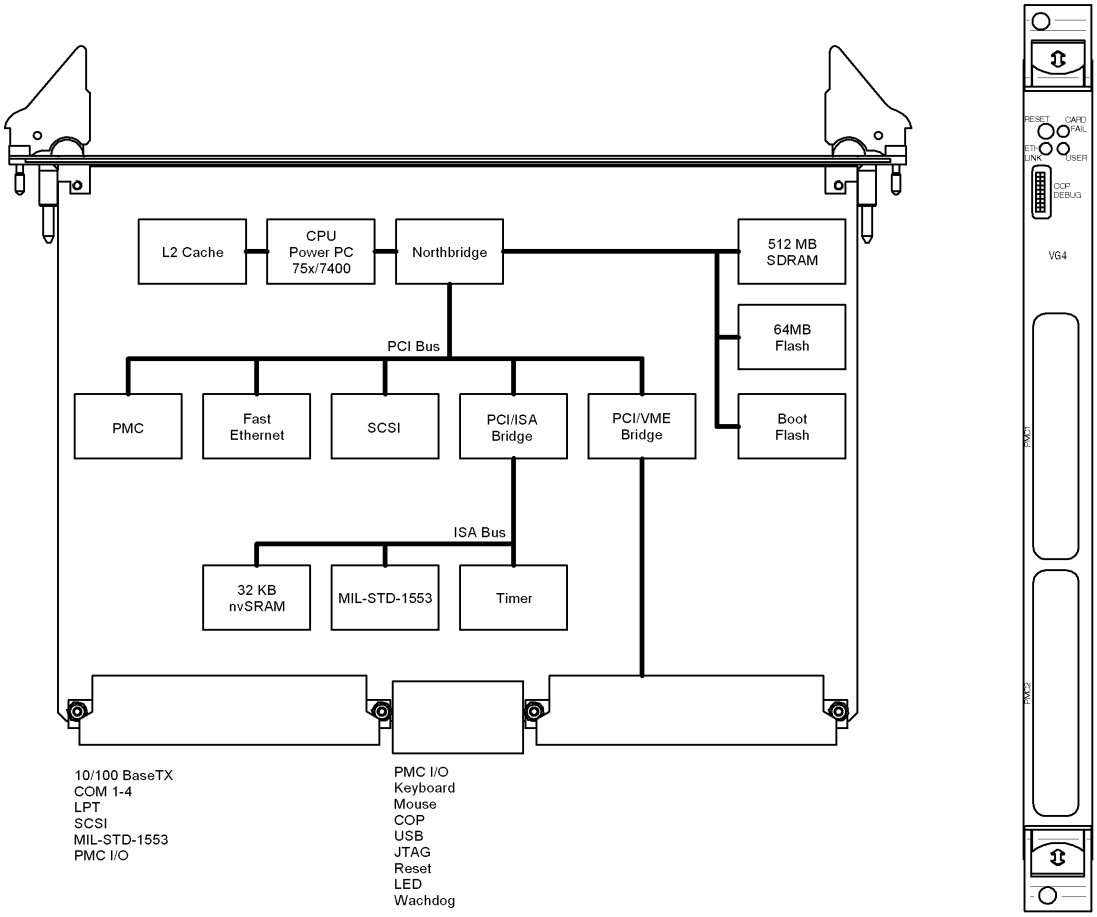
The ultra compact single slot, all-in-one design with flexible processor and RAM configurations, and an impressive array of on-board peripherals includes Fast Ethernet, Wide-SCSI, MIL-STD-1553, and two PMC extension slots. Combined with a custom specific assembly service it provides optimized price / performance for all kinds of OEM applications.

Rugged needs are addressed with optional conduction cooling and extended temperature range of up to –40°C to +85°C (conduction cooled), increased shock and vibration immunity using stiffener bars and wedge locks, and conformal coating.

Special features include four serial channels with flexible RS-232 or RS-422/485 interfacing, two DMA controllers, 7 timers, 32 Kbytes non volatile SRAM, single +5V supply, RTC, watchdog, temperature sensor and I_2O intelligent I/O support.

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Block Diagram



Specifications

VME64 - Tundra Universe IIB
Industry standard CA91C142B PCI to VMEbus controller
60-70 Mbytes/sec transfer rate, full VMEbus system controller
FIFOs for write posting, DMA controller with linked list support
Master/slave transfer modes: BLT, ADOH, RMW, LOCK, RETRY
A32 / A24 / A16 and D64(MBLT) / D32 / D16 / D8

Processor - BGA
Scaleable processing power with flexible processor design
Motorola PowerPC™ 755, 400 MHz
IBM PowerPC 750™, 500 MHz
Motorola PowerPC™ 7400, 400 MHz with AltiVec™ technology
Please contact factory for latest CPU versions
High efficiency on-board switching regulator (DC/DC)
Fanless cooling with heatsink

Performance

CPU	Frequency	SPECint95	SPECfp95
755	400 MHz	~18.8	~12.2
7400	400 MHz	~19.0	~16.0
750	500 MHz	~23.5	~15.2

Chipset - MPC107
100 MHz, 64-bit wide system bus
PCI burst mode transfers faster than 110 Mbytes/sec
32-bit wide PCIbus (33 MHz)
2 DMA controllers for all kind of memory and PCIbus transfers
Four 32-bit timers for system timing or periodic interrupts
I_2O intelligent I/O support with message and door bell registers

Cache	level 1	level 2
75x	64 KB	1 MB
7400	64 KB	2 MB

Level 2 peak bandwidth 1.6 GB/sec at 200 MHz

Memory - PC100
High-speed 100 MHz SDRAM
64 to 512 Mbytes, 72-bit wide with error correction (ECC) or parity
Rugged design with soldered chips

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Flash - up to 64 Mbytes
16 to 64 Mbytes, 64-bit wide direct memory mapped Flash memory with software selected write protection
512 Kbytes Boot-Flash, 8-bit wide, Boot-Select via jumper or rear I/O

nvSRAM – STK 14C88
32 Kbytes non volatile SRAM
Automatic data transfer to/from EEPROM on power-up/down meets safety and reliability

Fast Ethernet - DEC 21143
10/100 Mbits/sec controller with PCI local bus DMA
10BaseT and 100BaseTX auto-negotiation interface

Wide SCSI - SYM 53C875
Wide SCSI controller with PCI local bus DMA
SCSI transfer speed up to 40 Mbytes/sec
Active low power termination on-board

MIL-STD-1553 - DDC BU-61688
1553 device supporting BC, RT and MT mode, 128 KB shared RAM
Transceiver with long and short stub interface

PCI-ISA Bridge – ALI M1543C
PCI-ISA bridge with keyboard, mouse, serial, parallel and USB-controller

2x PMC Extension Slot - IEEE P1386/1386.1
32-bit PCIbus interface with front panel I/O and rear I/O
Supports ccPMC Draft standard Vita 20 - 199x with N-style

4x Serial I/O - ALI M1543C / Z85230
Two async. 16550 compatible full duplex serial RS-232 channels
High-speed transfer up to 115.2 kbaud with 16 byte FIFOs
Two sync./async. channels (HDLC/SDLC), 2.5 MB/sec (sync.) or 38.4 KB/sec (async.), RS-232 or RS422/485 interface

COM1:	RS232	RxD, TxD, DSR (optional RTS, CTS, DTR)
COM2:	RS232	RxD, TxD, (optional DSR, RTS, CTS, DTR)
COM3	RS232	RxD, TxD, RTS, CTS, DSR, DCD, DTR
	RS422/485	RxD, TxD TxC (sync.), RxC (sync.)
COM3	RS232	RxD, TxD, RTS, CTS, DSR, DCD, DTR
	RS422/485	RxD, TxD TxC (sync.), RxC (sync.)

Parallel Port – ALI M1543C
Bi-directional, IEEE 1284 compatible enhanced parallel port (including EPP and ECP) for printer or general purpose I/O

Counter/Timer - Z8536
Three 16-bit timers, two can be linked to form a 32-bit timer

BIT
A Power-Up-BIT (PBIT) will be performed to provide confidence that the hardware is operating correctly.

USB	12 Mbits/sec universal serial bus channels
Keyboard	PS/2 compatible
Mouse	PS/2 compatible
Real-time clock	RTC 146818 compatible
Backup	On-board Li-battery (120 mAh, -40° to +150°C) or +5V standby
Watchdog	Activates reset under software control
Temp. Sensor	Local temperature SW readable from –55°C to +125°C, 0.5°C increments Remote temperature (CPU case) software readable from 0°C to +127°C, 4°C increments
Status LEDs	Card fail (red) user programmable, Ethernet link (green) and user LED (red)
JTAG Interface	Processor, VMEbus controller and others
COP Interface	Debug interface for external emulator (not with MIL-1553)

Styles:	C	I	R	K	N
Front panel	✓	✓	✓	-	-
Front stiffener	-	-	-	✓	✓
Middle stiffener	-	-	✓	✓	✓
Wedge locks	-	-	-	✓	✓
Parts soldered	✓	✓	✓	✓	✓
Li-Battery	✓	✓	✓	✓	-
Extended temp.	-	✓	✓	✓	✓
Conformal coating	-	-	✓	✓	✓
Conduction cooled	-	-	-	-	✓

Front Panel and Rear I/O (transition module VGTM)
The pinouts of the transition module connectors (rear I/O) corresponds to standard PC connectors (press-fit cables).

Function Panel	full PMC-I/O[*2]	partly PMC-I/O[*2]	Front
COM 1	10-pin (3)	10-pin (6)	-
COM 2	10-pin (2)	10-pin (6)	-
COM 3	10-pin (7/8)	10-pin (7/8)	-
COM 4	10-pin (7/8)	10-pin (7/8)	-
10/100BaseTX	10-pin	10-pin	-
SCSI	50-pin	50-pin	-
SCSI	68-pin	68-pin	-
PMC1	64-pin	64-pin	yes
PMC2	64-pin	64-pin (37)	yes
Keyboard	[*1]	[*1]	-
Mouse	[*1]	[*1]	-
USB 1	[*1]	[*1]	-
USB 2	-	[*1]	-
Reset	[*1]	[*1]	button
Watchdog	[*1]	[*1]	-
BootSel	[*1]	[*1]	-
CardFail	[*1]	[*1]	LED
User	[*1]	[*1]	LED
Link	-	-	LED
LPT 1	-	26-pin	-
MIL-1553[*3]	10-pin	10-pin	-
COP[*3]	16-pin	16-pin	-
JTAG[*3]	10-pin	10-pin	-

[*1] Multi-I/O connector with Keyboard, Mouse, 2x USB, Reset, Watchdog, BootSel, LEDs
[*2] Versions are available with full PMC Rear I/O or partly Rear-IO
[*3] JTAG/COP not with MIL-1553
(x) Values in brackets represent available signals.
See also ***4x Serial I/O, 2x PMC Extension Slot***

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Power Requirements

+5 V	Required
+3.3 V, ±12 V	Only if required by mounted PMC module

Power Consumption - +5 volt, typical current

128 MB memory, w/o module

CPU	Frequency	
755	400 MHz	2.8 A
750	500 MHz	2.9 A
7400	400 MHz	3.0 A

Power measured at VxWorks prompt

Power Allowances - PMC slot (each)

+5 V, +3.3V	Total power max. 7W
±12 V	50 mA each

Mechanical

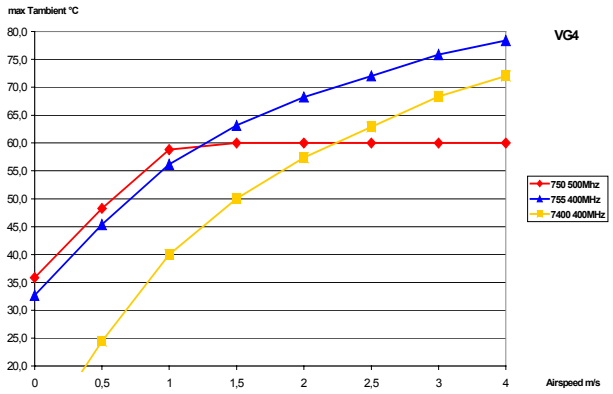
6U, 1 slot wide (233 x 160 x 20 mm)

Temperature – (except N-style)

Highest reachable operating temperature depends on processor type, speed and ambient conditions (airflow) as shown below. .All values under typical conditions w/o PMC module.

	Operating*1	Storage*1
Standard	0°C to +70°C	–40°C to +85°C
Extended	–40°C to +80°C	–40°C to +85°C

*1 Complete board may be limited to a smaller temperature range by mounted PMC module.



Temperature – (N-style)

Highest reachable operating temperature depends on processor type, speed and ambient conditions (card edge temp.) as shown below. All values under typical conditions w/o ccPMC module.

	Operating*1	Storage*1
Extended	–40°C to +85°C	–40°C to +85°C

*1 Complete board may be limited to a smaller temperature range by mounted ccPMC module.

CPU	Frequency	Max. Card Edge Temp. *1
755	400 MHz	85°C
7400	400 MHz	85°C
750	500 MHz	60°C

*1 For further information a 'Thermal Report for VG4' is available. Please contact factory.

	Operating	Storage
Humidity	5 - 90% @ 40°C	5 - 95% @ 40°C
Altitude*1	15.000 ft. (4.5 km)	40.000 ft. (12 km)

*1 Vacuum for conduction cooled board (N-style)

	C-, I-, R-style	K-, N-style
Shock	20g / 6 ms	100g / 6ms
Vibration	2g rms @ 5-100 Hz	14 g rms @ 5 to 2000 Hz, 30 minutes each axis

MTBF Calculations are available in accordance with MIL-HDBK-217. Please contact factory.

Safety All PWBs are manufactured with flammability rating of 94V-0 by UL recognized manufacturer.

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Ordering Information

For detailed information call factory.

Hardware Accessories

VGTM	I/O transition module for VME-64 backplane
SC306HS18G	3U, 06TE, SCSI hard disk 3.5", 18.1 GB
YLBCOM304A	Flatcable for 2x COM, 3U/4HP front panel
YLBLPT308D	Flatcable for LPT, Ethernet (RJ45), keyboard and mouse (2x miniDIN), 3U/8HP front panel
YLBSCSI304A	Flatcable for external SCSI drive, 60 cm, 3U/4HP front panel, 50-pin Centronics connector

Operating Systems

VXW-BVG4	VxWorks board support package Tornado 2 (with VMEbus driver)
LYNX-BVG4	LynxOS board support package

LinuxOS board support package on request

Chassis

SCC784TM05VG4	"StarterCage: 19"", 7U, 84TE card cage, 5x 6U VME64 slots; 3x fan, 250W power supply +3,3V/12A, +5V/22A, +12V/7A, -5V/0,3A, -12V/0,8A, EMC, SCSI CD-ROM, I/O transition module (VGTM), SCSI HDD 18GByte, FP I/O, YLBLPT308D, YLBCOM304A, 0°C/+50°C"

Special chassis, supplies, backplanes and drives on request.

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