

VG6

Dual Node/Single Node Dual Core PowerPC® – 8641D 6U VMEbus Embedded Computer

Features

- Dual or single processor node
- For each node one MPC8641D with dual core or MPC8641 with single core; 1000 - 1333 MHz
- Freescale 8640/8640D ready
- 64 KB L1 + 1 MB L2 cache with ECC on-die per core
- E600 core with Altivec™
- MPC8641 includes low latency dual DDR2 memory controller. (2x 64bit + ECC)
- VITA 30.1-2001 and ANSI/VITA 20-2001 compliant
- IEEE Std. 1101.2-1992 and ANSI/VITA 20-2001 compliant
- Up to 2 GB DDR2 SDRAM with ECC for each node
- 256 MB boot flash per node
- Three Gigabit Ethernet ports 10/100/1000 Mbit
- Two 10/100Mbit Ethernets
- Two SATA Ports
- One PMC/XMC (on request) extension slot with PCI-X 133 or 8x PCI Express
- One PMC extension slot with PCI-X 100
- VME64 2eSST interface
- Two Serial I/O (RS-232)
- Two Serial I/O (RS-422)
- Three USB interfaces per node
- 4x high resolution timers per node.
- 4x DMA channels per node
- One RTC with 128 Kbyte nvRAM per node
- Optional -40 °C / +85 °C TBD
- Optional conduction cooling
- High shock and vibration immunity
- Optional conformal coating
- Custom specific assembly versions

The VG6 is a dual or single node processor VME bus computer board. Each node has a Freescale MPC8641(D), which includes a single or dual e600 CPU core and chipset functionality as dual low latency DDR2 SDRAM controller, a local bus controller, dual PCI Express 8 lane busses and several peripheral units. The VG6 can have up to four cores in total.

The VG6 is designed to meet the needs of high-performance embedded applications. It addresses such markets as industrial automation, medical, scientific and aerospace where real-time and/or signal processing are needed. Operating system support includes VxWorks® and Linux®. LynxOS® and Integrity are available upon request.

The ultra compact 6U single slot, all-in-one design with flexible memory, Flash configurations and on-board peripherals includes up to three Gigabit (VITA 31.1-compliant), up to two 10/100Mbit Ethernet ports, up to four UARTS, up to six USB ports, two serial-ATA compatible ports, two PMC extension slots and timer/counter.

Each processor features up to two cores with on-chip dual DDR2 SDRAM guaranteeing low latency. The two nodes are coupled via a PCI Express x8 lane bus. Two on-board 64-bit PCI-X buses are supported in the dual processor version:

- One site exclusively for 64-bit 133 MHz PCI-X PMC1
- One for the on-board VME bridge and the second PMC site (64-bit PCI-X 100 MHz)

Combined with custom assembly for specific applications, the VG6 provides optimum price/performance for all kinds of OEM applications. The VG6 rugged version addresses extreme environment applications with optional conduction cooling, which extends the temperature range to -40°C to +85°C, increased shock and vibration immunity using stiffener bars and wedge locks, and conformal coating. The conduction-cooled VG6 complies with VITA 30.1-2001 and IEEE Std. 1101.2-1992 specifications.

Specifications

Processor

- MPC8641D or MPC8641 @ 1.0 GHz or 1.33 GHz
- MPC8640D or MPC8640 offers a lower power option
- 1 MB L2 cache per core on die

SDRAM

- 1 GB to 2 GB DDR2 SDRAM soldered for added durability in rugged environments

Flash Boot ROM

- Up to 256 MB, 32-bit, high speed for each node with hardware write protection

Ethernet

Node A (or Single Node)

- One 10/100/1000 Mbit/s Ethernet port with front-IO
- One 10/100/1000 Mbit/s Ethernet port with rear-IO on P0 (VITA 31.1-compliant)
- One 10/100 Mbit/s Ethernet port with rear-IO on P2

Node B (only Dual Node)

- One 10/100/1000 Mbit/s Ethernet port with rear-IO on P0 (VITA 31.1-compliant)
- One 10/100 Mbit/s Ethernet port with rear-IO on P2

USB Ports

- Three USB ports per node:
 - One to front panel (not in conduction cooled)
 - Two to rear I/O

Serial I/O - RS-232/422/485

- Two 16550 compatible UARTs per MPC8641 with FIFOs

Node A (or Single Node)

- A_COM 0: RS232 up to 115.2 Kbaud with front-IO (Tx, Rx, RTS, CTS) and rear-IO (Tx, Rx)
- A_COM 1: RS422 up to 500 Kbit with rear-IO (Tx, Rx, RTS, CTS)

Node B (only Dual Node)

- B_COM 0: RS232 up to 115.2 Kbaud with rear-IO (Tx, Rx)
- B_COM 1: RS422 up to 500 Kbit with rear-IO (Tx, Rx, RTS, CTS)

VMEbus Backplane Interface

- Industry standard PCI-X to VME bus controller
- Full VME bus system controller
- FIFOs for write posting, DMA controller with linked list support
- Geographical addressing

Two Serial ATA Channel – Silicon Image SIL3132

- Two serial ATA with rear I/O at P0 (Rear I/O of PMC1 only, partially available)



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Specifications continued

Mezzanine Sites

- IEEE Std. 1101.2-1992 and ANSI/VITA 20-2001 compliant
 - B_PMC1: 64-bit 33 MHz–133 MHz PCI(-X) and full rear-I/O* at P0 or usable as XMC (on request) slot with 8x PCI Express lanes (Vita42).
 - A_PMC2: 64-bit 33 MHz–100 MHz PCI(-X) and full rear-I/O* at P2
- * Depends on configuration (shared with SATA + UGPIO)

NVRAM/Real-Time Clock/Watchdog / ETI

- 128 KB non-volatile RAM with autostore
- Real-time clock
- Watchdog timer
- Elapsed time indicator (records cycles and on-time)

Temperature Sensors

- CPU die and ambient temperature

Power Requirements

- +5 V - required
- ±12 V - only if required by mounted PMC module

Dimensions

- 6U (4HP) single slot Eurocard form factor
- Height: 9.2 in. (233.4mm)
- Depth: 6.3 in. (160mm)
- Thickness: 1.6 in. (40.6mm)

Front Panel and Rear I/O (Transition Module VG6TM)

- PMC I/O slot 1 with full rear I/O support or partial configuration with serial ATA feature
- PMC I/O slot 2 available in full or partial configuration

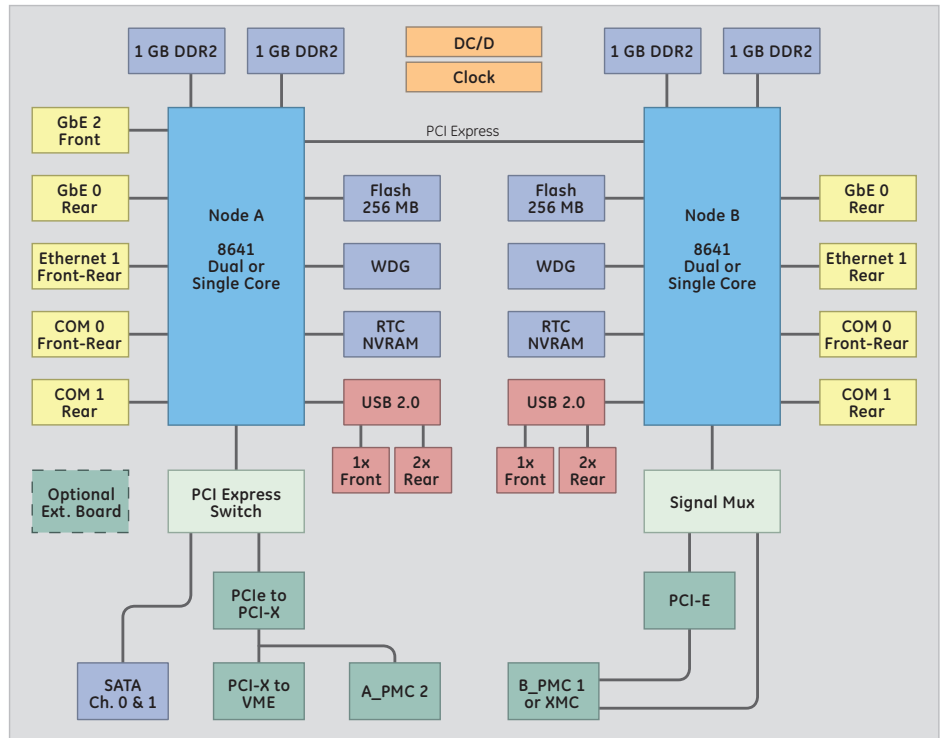
Function	Full PMC2 -I/O	Partly PMC2 -I/O	Front Panel I/O
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Single and Dual Node VG6S/D			
A_COM 0	√	√	√
A_COM 1	√	√	-
A_Eth. 0 100 Mbit	√	√	-
A_Eth. 1 1000 Mbit	√	√	-
A_Eth. 2 1000 Mbit	√	√	√ ¹
A_USB Channel 0 & 1	√	√	-
A_USB Channel 2	-	-	√ ¹
B_PMC 1			
(XMC on request)	64-pin	64-pin 2)	√
A_PMC 2	64-pin	-	√
Reset	Reset	√	√ ³
Watchdog A	-	√	-
Boot Select A	√	√	-
User LED A / B	-	-	LED
Card Fail	√	√	LED
COP A (onboard)	-	-	- ⁴

Additional for Dual Node VG6D (Node B)			
B_COM 0	√	√	√
B_COM 1	√	√	-
B_Eth. 0 100 Mbit	√	√	-
B_Eth. 1 1000 Mbit	√	√	-
B_USB Channel 0 & 1	√	√	-
B_USB Channel 2	-	-	√ ¹
Watchdog B	-	√	-
Boot Select B	√	√	-
COP B (onboard)	-	-	- ⁴

- 1) Not available in Style 8
- 2) Only partially PMC2 Rear-I/O when SATA
- 3) Reset push button on front panel and on transition module
- 4) Connector near front on board

Block Diagram



	Style 1	Style 3	Style 6	Level 8
Cooling method	Convection	Convection	Convection	Conduction
Conformal coat	Optional	Optional	Standard	Standard
High/low temp - operational	0 to 70°C *	-40 to +70°C *	-40 to +70°C *	-40 to +80°C
Storage temperature	-55 to +105°C **	-55 to +105°C **	-55 to +105°C **	-55 to +105°C **
Random vibration	2g rms (5-100 Hz)	2g rms (5-100 Hz)	2g rms (5-2000 Hz)	14g rms (5-2000 Hz)
Shock	12g (6ms)	20g (6ms)	20g (6ms)	40g (11ms)

*upper temperature dependant on airflow - consult manual **limited to -40 to +85°C if battery included

Ordering Information

Contact your GE Fanuc Intelligent Platforms sales person for ordering information.

About GE Fanuc Intelligent Platforms Embedded Systems

GE Fanuc Intelligent Platforms is a leading global provider of embedded computing solutions for a wide range of industries and applications. Our comprehensive product offering includes many types of I/O, single board computers, high performance signal processors, fully integrated, rugged systems including flat panel displays, plus high speed networking and communications products. The company is headquartered in the U.S. and has design, manufacturing and support offices throughout the world. Whether you're looking for one of our standard products or a fully custom solution, GE Fanuc Intelligent Platforms has the breadth, experience and 24/7 support to deliver what you need. For more information, visit www.gefanuc.com.

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Additional Resources

For more information, please visit the GE Fanuc Intelligent Platforms web site at:

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