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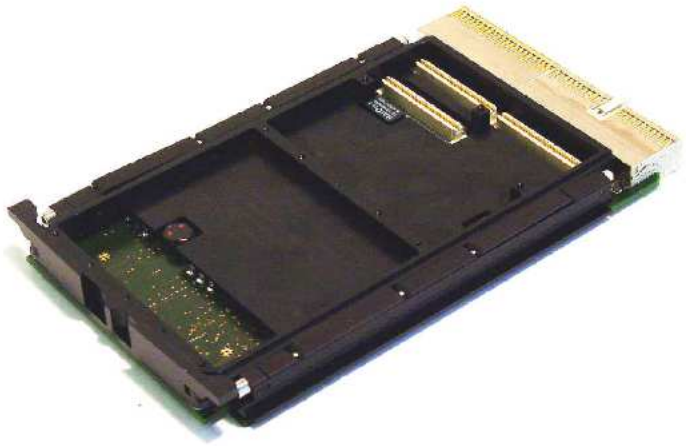
RL4

Single Slot PowerPC™ 750/755 3U CompactPCI Embedded Computer

SINGLE BOARD COMPUTERS

Features

- 750/755 400-500 MHz,
- 1 MB L2 Cache, 1.6 GB/s
- Ultra compact, 1 slot only
- CHRP architecture
- VxWorks®, LynxOS® support
- Up to 128 MB, 100 MHz SDRAM with ECC
- Up to 64 MB Flash, 64-bit
- 8 MB Boot Flash
- 32 kB AutoStore nvSRAM
- Fast Ethernet 10/100 Mbit
- PMC extension slot
- Two asynchronous RS-232
- Two asynchronous RS-422/485
- Four timer/counters
- Two DMA channels
- RTC, Watchdog, temperature sensor
- 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



RL4 is a CompactPCI® all-in-one 3U single board computer designed to meet the needs of embedded application developers addressing markets like industrial automation, medical, scientific, imaging, telecommunications, military and aerospace. The RL4 features an ultra compact single slot, all-in-one design with flexible processor and memory configurations, and a wide array of onboard peripherals, fast Ethernet, timers, serial channels and a 32-bit PMC interface.

Rugged and military needs are addressed with optional conduction cooling and extended temperature range of up to -40°C to +85°C, increased shock and vibration immunity using stiffener bars and wedge locks, and conformal coating. Even with an attached conduction cooled PMC module, the RL4 fits into a single slot.

Special features include four serial channels with flexible RS-232 and RS-422/485 interfacing, two DMA controllers, four timers, 32 kBytes non-volatile SRAM, RTC, watchdog, temperature sensor and I_2O intelligent I/O support.

Supported operating systems are VxWorks®, INTEGRITY® and LynxOS® (upon request).

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Specifications

cPCI - TI PCI2050
- PICMG 2.0 R3.0 compliant cPCI local bus standard
- 32-bit PCI-PCI bridge for up to 8 slots (33 MHz)
- J1+J2, 2mm pin and socket connectors (IEC-1076-4-101)

Processor - BGA
- Scaleable processing power with flexible processor design
- Motorola PowerPC™ 755, 400 MHz
- IBM PowerPC 750™, 500 MHz
  (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
750	500 MHz	~23.5	~15.2

Chipset - MPC107
- 100 MHz, 64-bit wide system bus
- PCI burst mode transfers faster than 110 Mbytes/s, 32 bit wide PCI bus (33 MHz)
- Two DMA controllers for lots of memory and PCI bus 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
750	64 kB	1 MB
755	64 kB	1 MB

Level 2 peak bandwidth 1.6 GB/s at 200 MHz

Memory - PC100
- High-speed 100 MHz SDRAM
- 32 to 128 Mbytes, 72-bit wide with error correction (ECC)
- Rugged design with soldered chips

FlashDrive - Up to 64 MB
- 32 to 64 MB, 64-bit wide direct memory mapped Flash memory with software selected write protection
- 8 MB Boot-Flash, 8-bit wide, Boot-Select via rear I/O

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

Fast Ethernet - Intel® 82559ER
- 10/100 Mbits/sec controller with PCI local bus DMA
- 10BaseT and 100BaseTX auto-negotiation interface

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

Four Serial I/O - Exar ST16C2550
- Two asynchronous 16550-compatible half-duplex serial RS-232 channels
- Two asynchronous 16550-compatible full-duplex serial RS-422/485 channels
- High-speed transfer up to 1.5 MB/S with 16 byte FIFOs
- COM1: RS-232 RxD, TxD
- COM2: RS-232 RxD, TxD
- COM3: RS-422/485 RxD, TxD, CTS, RTS
- COM4: RS-422/485 RxD, TxD, CTS, RTS

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

Real-Time Clock
- RTC 146818 compatible

Backup
- Via rear I/O pin

Watchdog
- Activates reset and interrupt under software control

Temperature Sensor
- Remote temperature (CPU case) software readable from 0°C to +127°C, 4°C increments

Status LED
- Card fail (user programmable) at rear I/O

JTAG Interface
- JTAG interface for test chipset, Ethernet controller, PCI-to-PC bridge and PMC available on backplane (J1)

COP Interface
- Debug interface for external emulator

Power Requirements
- +5V, +3.3V: Required
- ±12V: Only if required by mounted PMC module

Power Allowances - PMC Slot
- +5V, +3.3V: Total power max. 7W
- ±12V: 50 mA each

Power Consumption

- Typical current, 128 MB RAM without PMC module
- Power measured at VxWorks prompt

CPU	Frequency	+3.3V	+5V	Total Power
755	400 MHz	.66 A	1.40 A	9.2 W
750	500 MHz	.66 A	1.60 A	10.2 W

Humidity (Non-Condensing)

- Operating: 5 - 95% @ 40°C
- Storage: 5 - 95% @ 40°C

Altitude

- Operating: 15,000 ft (4.5 km) altitude
- Storage: 40,000 ft (12 km) altitude

(Vacuum for N-Style)

Shock and Vibration (C-, I-style)

- 12g / 6ms
- 2g rms @ 5Hz to 100Hz

Shock and Vibration (N-style)

- 100g / 6ms
- 40g / 11ms
- 14g rms @ 5Hz to 2000Hz, 30 minutes each axis

MTBF

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

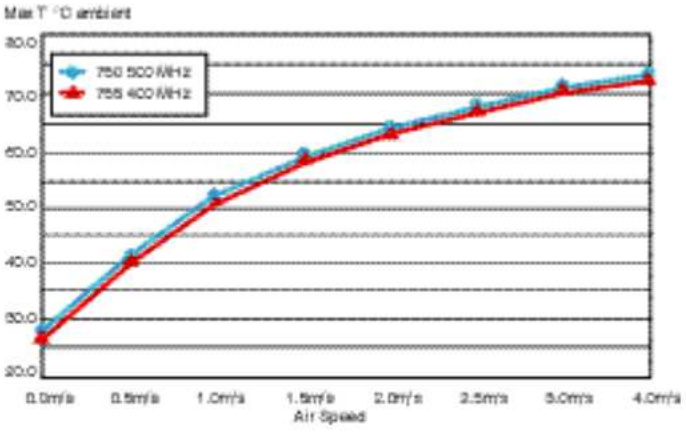
Safety

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

Temperature Ranges (except N-style)

- Highest reachable operating temperature depends on processor type, speed and ambient conditions (airflow) as shown below
- All values under typical conditions without PMC module
- Complete board may be limited to a smaller temperature range by mounted PMC module

	Operating	Storage
Standard	0°C to +70°C	-40°C to +85°C
Extended	-40C° to +80°C	-40°C to +85°C



Extended Temperature Ranges (N-style)

- Highest reachable operating temperature depends on processor type, speed & ambient conditions (card edge temp.)
- All values under typical conditions without 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
750	500 MHz	60°C

*1 For further information a Thermal Report for VG4 is available. Contact factory.

Styles

Front Panel	C	I	N
Front Panel	✓	✓	-
Front stiffener	-	-	✓
Middle stiffner	-	-	✓
Wedge locks	-	-	✓
Parts soldered	✓	✓	✓
Extended Temperature	-	✓	✓
Conformal coating	-	-	✓
Conduction cooled	-	-	✓

Front and Rear I/O

With Transition Module RLTM

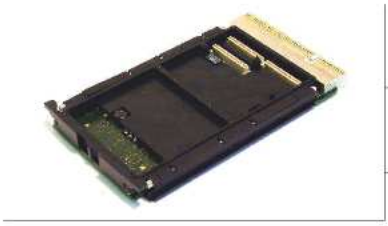
The pinouts of the transition module connectors (rear I/O) correspond to standard PC connectors (press-fit cables).

Function	Function	Function
COM1	10-Pin (2)	-
COM2	10-Pin (2)	-
COM3	10-Pin (8)	-
COM4	10-Pin (8)	-
10/100BaseTX	10-Pin	-
Reset	*1	-
Watchdog	*1	-
BootSel	*1	-
CardFail - LED	*1	-
RTC Backup	*1	-
COP	Yes	-
PMC I/O	64-Pin (35)	Yes

*1 Multi-I/O connector with Reset, Watchdog, BootSel, Cardfail - LED and RTC backup

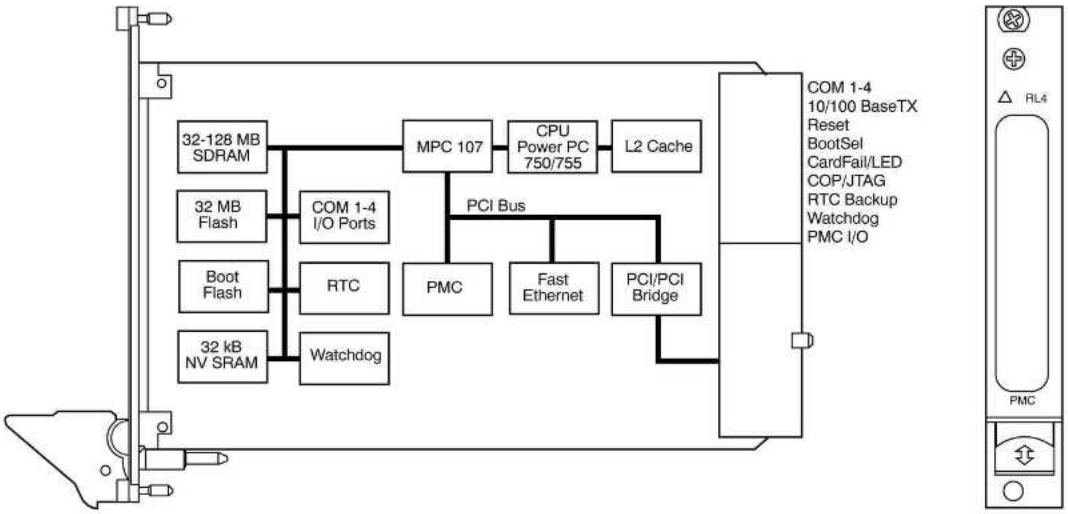
(x) Values in brackets represent available signals
See also Four Serial I/O and Two PMC Extension Slots

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RL4

Block Diagram



Ordering Information

Hardware Accessories

RLTM I/O transition module for CompactPCI backplane
YLBCOM304A Flat cable for 2x COM, 3U/4HP front-panel

Chassis

SC-484TC04RL4
Starter cage: 19", 4U, 84TE card cage, 4x 3U cPCI slots (3U left); 3x fans, 250W power supply +3.3V/12A, +5V/22A, +12V/7A, -5V/0.3A, -12V/0.8A, EMC, I/O transition module (RLTM), YLBCOM304A + Ethernet 0°C/+50° C

Special chassis, supplies, backplanes and drives on request

Operating Systems

VXW-BRL4 VxWorks board support package, Tornado 2

LynxOS board support package available upon request.

Special chassis, supplies, backplanes and drives upon request.

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