C114

NXP QorIQ™ T1/T2 Series 6U VME SBC

Aitech
Embedded Computing *without* Compromise

- Rugged 6U VME Single-Slot Low Power SBC
- Compatible Upgrade for Aitech C106 and C108 SBCs
- NXP T1/T2 Series QorIQ SoC
  - T2081 (4 x e6500 Dual-Threaded Cores w/Altivec)
  - T1042 (4 x e5500 Cores)
- Secure Boot and Trust Architecture 2.0
- 4 GB DDR3L with ECC
- 256 MB NOR Flash
- Up to 64 GB NAND Flash
- 512 kB NVRAM (MRAM)
- Versatile Board I/O
  - USB
  - CANbus
  - Gigabit and Fast Ethernet
  - Serial
  - MIL-STD-1553B
  - Discrete
- One PMC Slot + One PMC/XMC Slot
- WWDT, ETR, RTC, Temp. Sensors
- VxWorks®, Linux® Support
- Conduction and Air-Cooled Versions
- Vibration and Shock Resistant

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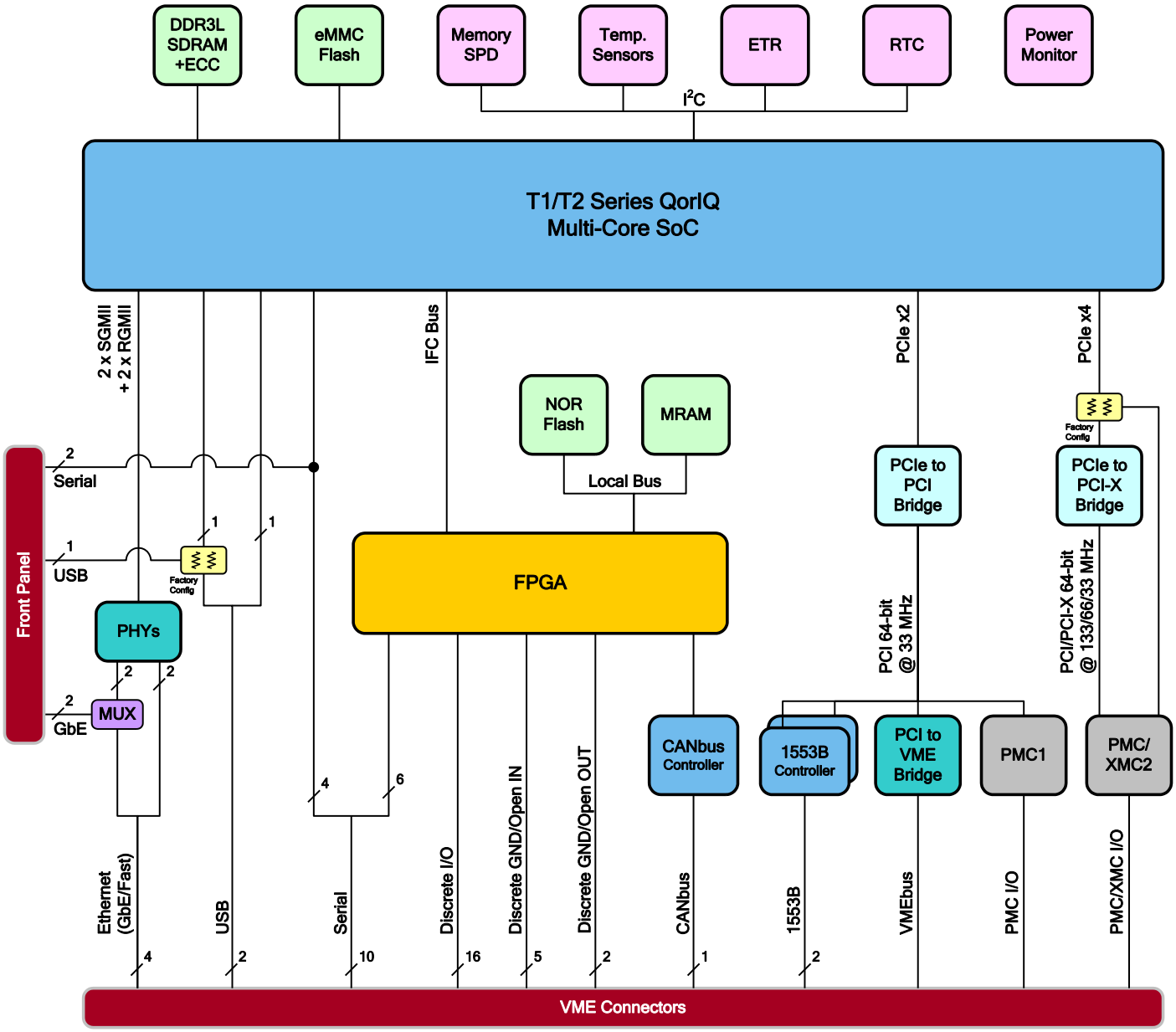
The C114 is one of Aitech's latest generation VME PowerPC SBCs, based on NXP's new T1/T2 Series QorIQ System-on-Chip (SoC) multi-core processors, with numerous integrated bus, memory, and I/O controllers.

The wide variety of on-board I/O and large memory resources, including on-board mass storage, in combination with the powerful SoC processor, make the C114 the right VME SBC for many applications, out of the box. The industry standard PMC/XMC slots provide flexibility and expandability, with the availability, convenience, and cost benefits of COTS.

For improved security assurance in real time/embedded systems, the C114 also includes the latest QorIQ Secure Boot and Trust Architecture.

The C114 board provides the ideal solution for a low power SBC based on NXP Power architecture. The Electrical, Software, and Mechanical interfaces compatibility with Aitech previous generation C108 and C106 SBCs makes the C114 the natural upgrade for existing programs that utilize these boards.

The C114 mechanical and electrical designs guarantee its operation over the full range of rugged application environments.



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Board Architecture

Processor Options	• NXP QorIQ T2081 – 4 dual threaded e6500 cores w/Altivec @ 1.8 GHz • NXP QorIQ T1042 – 4 e5500 cores @ 1.4 GHz
CoreNet	CoreNet coherency fabric connects processor cores, platform-level caches, memory sub systems, peripheral devices, and I/O host bridges.
VMEbus	VME64 per ANSI/VITA 1 and VME64x per ANSI/VITA 1.1
Board Resources	• Watchdog Timers (Windowed + Standard) • Secure Boot and Trust Architecture 2.0 • Real Time Clock • Elapsed Time Recorder • Temperature Sensors • 8 Counters/Timers

Memory Resources

RAM	4 GB of DDR3L SDRAM with ECC @ 1600 MT/s
eMMC Flash	Up to 64 GB of MLC (Multi-Level Cell) NAND Flash, options per *Ordering Information* below (additional options may be available per customer request, contact an Aitech representative for more information)
NOR Flash	256 MB NOR Flash – 64 MB allocated for Boot; 192 MB available to user
NVRAM	512 kB high speed MRAM with unlimited writes & long term data retention

I/O

		I/O Variant (1)			
		1	**2**	**3** **C108 Compatible**	**4** **C106 Compatible** (2)
USB 2.0		2 (3)	2 (3)	2 (3)	2 (3)
Ethernet	**Gigabit (10/100/1000Base-T)**	2 (4)	4 (4)	1	N/A
	Fast (10/100Base-TX)	N/A	N/A	2 (4)	3 (4)
Serial Ports	**RS-232/422**	2 (5)	2 (5)	2 (5)	4 (5)
	RS-232/422/485	N/A	6	6	6
Discrete I/O Lines Individually software configurable as input (with optional interrupts) or output and as SE (1 line per channel) or DIFF RS-422 (2 lines per channel)		8	16	16	8
Discrete I/O GND/Open Lines		N/A	N/A	N/A	5 IN + 2 OUT
CANbus		N/A	1	1	N/A
MIL-STD-1553B BC or Multi RT operation with Concurrent Bus Monitor with DMA support		Up to 2 – see *Ordering Information*			
PMC Site #1 I/O		49	41	57	17
PMC/XMC Site #2 I/O	**PMC**	N/A	N/A	41	12
	XMC	14 DIFF + 35 SE	8 DIFF + 29 SE	N/A	N/A

Notes:
(1) C114 I/O Variants offer different combinations/quantities of board I/O and PMC/XMC site configurations via factory configuration; additional options may be available per customer request, contact an Aitech representative for more information
(2) The C106 compatible variant does not include the P0 PCI bus interface
(3) In air-cooled boards, one of these ports is routed by factory configuration to the Front Panel instead of to the Backplane
(4) In air-cooled boards, two of these ports can be routed to the Backplane or to the Front Panel via user firmware configuration
(5) In air-cooled boards, two of these ports are routed to both the Front Panel and Backplane, ports at the front panel support RS-232 only

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PMC/XMC Slots

Site #1	**PMC**	64-bit PCI @ 33 MHz, supports 3.3 V PCI I/O signaling levels
Site #2 (1)	**PMC**	64-bit PCI/PCI-X @ 133/66/33 MHz, universal site supports 3.3 V and 5 V PCI I/O signaling levels
	XMC	PCIe x4 port supporting Gen2 and Gen1 speeds and x4/x2/x1 port widths, 5 V VPWR supply

Notes: (1) Site #2 is factory configured as either PMC or XMC, determined by C114 I/O Variant (see *I/O* section above)

Software

Operating Systems	WindRiver VxWorks® and Linux® are supported
Drivers	Operating system specific device drivers for board resources are available
BIT	Built-In Tests are available

Mechanical

	Form Factor & Dimensions	Weight
Air-Cooled	6U VME per IEEE Std 1101.10-1996	< 675 g (1.5 lbs)
Conduction-Cooled	6U VME per IEEE Std 1101.2-1992	< 800 g (1.8 lbs)

Power

CPU Option	C114 Power (Typical)
T1042	18 W
T2081	22 W

Environmental

Specs per VITA 47	Air-Cooled			Conduction-Cooled	
	Commercial	**Rugged**	**Military**	**Rugged**	**Military**
Operating Temp.	AC1 (0 to +55 ºC) (2)	AC3 (-40 to +70 ºC) (2)	AC4 (-40 to +85 ºC) (1,2)	CC3 (-40 to +70 ºC) (3)	CC4 (-40 to +85 ºC) (1,3)
Non-Operating Temp.	C1 (-40 to +85 ºC)	C3 (-50 to +100 ºC)	C4 (-55 to +125 ºC)	C3 (-50 to +100 ºC)	C4 (-55 to +125 ºC)
Vibration	V1	V2	V2	V3	V3
Operating Shock	OS1	OS1	OS1	OS2	OS2
Altitude	15,000 ft.	35,000 ft.	70,000 ft.	35,000 ft.	70,000 ft.
Relative Humidity (4)	0 - 90%	0 - 95% with Acrylic (Standard),			
Conformal Coating	N/A	0 - 100% with Urethane (Optional)			

Notes: (1) -55 ºC available, contact an Aitech representative for more information
(2) Operating ambient air temperature (with sufficient airflow)
(3) Operating card edge temperature
(4) Non-condensing

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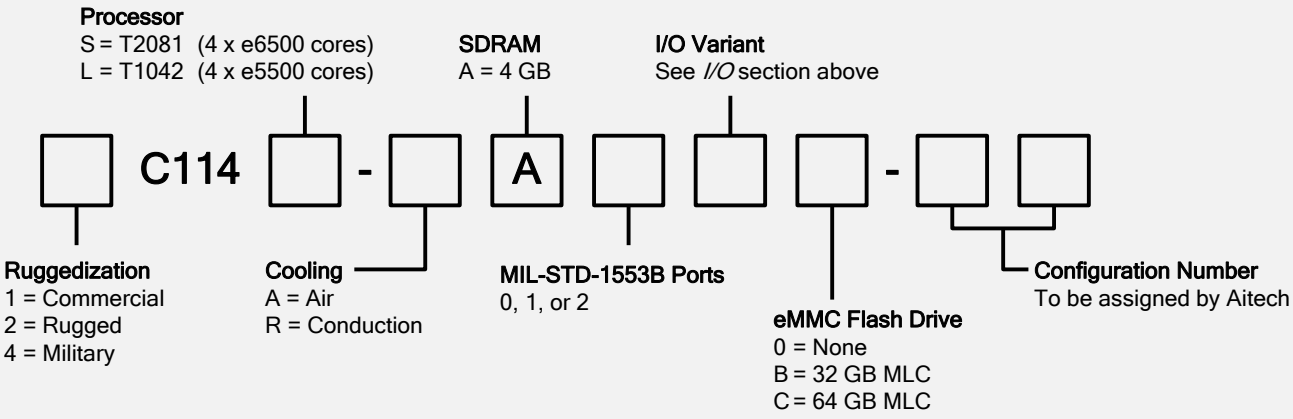
Ordering Information



Example: 4C114S-RA11C-00

Optional Accessories

TM102, TM100, TM106

Rear Transition Modules (RTM) providing convenient access to C114 I/O interfaces via standard connectors and to all PMC/XMC I/O via headers. Supports both air and conduction-cooled C114 mounted in commercial air-cooled chassis.

Different C114 I/O Variants (see *I/O* section above) are supported by different Aitech transition modules, as listed in the table below

Variant #1	TM102
Variant #2	TM102
Variant #3	TM100
Variant #4	TM106

For more information, see the transition module datasheets or contact an Aitech representative.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the C114 and additional software support.

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