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Find the *Aitech Defense Systems TM912* at our website: *Click HERE*

C912

Freescale™ QorIQ™ T4 3U VPX SBC

Aitech
Embedded Computing *without* Compromise



- Rugged 3U VPX Single-Slot SBC
- Freescale QorIQ Multicore SoC
  - 8/4 e6500 Dual Thread Cores (T4160/T4080)
  - Altivec Unit
  - Secure Boot and Trust Architecture 2.0
- PCIe and 10G (XAUI) Fabric Options
- 4 GB DDR3 with ECC
- 128 MB NOR Flash Memory
- 16 GB SATA Flash Drive
- 512 kB NVRAM (MRAM)
- Versatile Board I/O
  - USB
  - Serial
  - GbE
  - SATA
  - Discrete
- XMC Slot
- WWDT, IPMI, ETR, RTC, Temp. Sensors
- VxWorks®, Linux®, INTEGRITY® Support
- OpenVPX Compliant
- 2LM Option per VITA 48.2
- Conduction and Air-Cooled Versions
- Vibration and Shock Resistant



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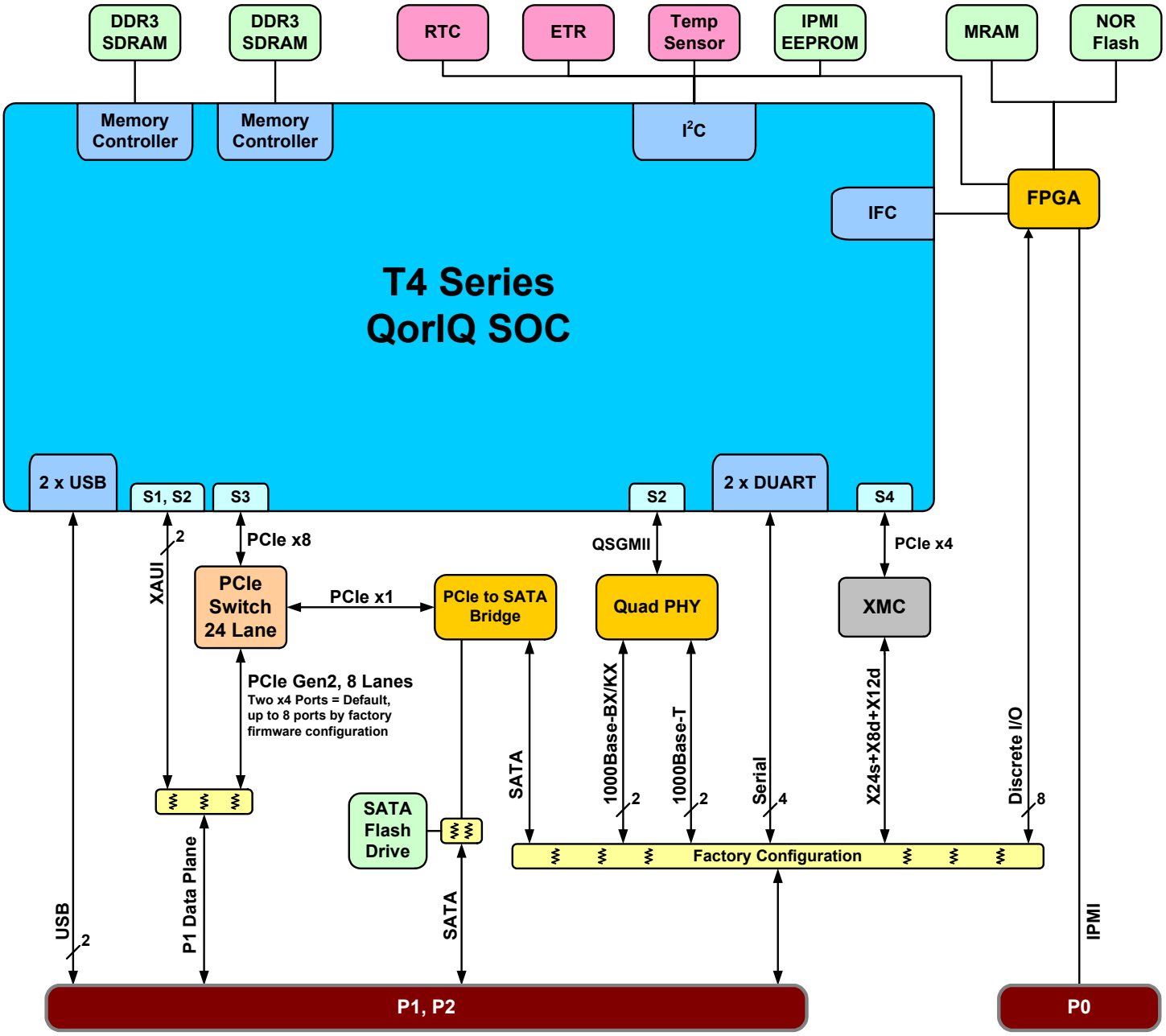
Aitech
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The C912 is Aitech's latest generation 3U VPX PowerPC SBC, based on Freescale's new QorIQ T4 Series SoC multi-core, multi-thread processors.

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 C912 the right SBC for many applications, right out of the box. An industry standard XMC slot provides flexibility and expandability, along with the availability, convenience, and cost benefits of COTS.

For improved security assurance, the C912 also includes the latest QorIQ Secure Boot and Trust Architecture 2.0.

C912 mechanical and electrical designs guarantee its operation over the full range of rugged application environments. It is available in industry standard conduction-cooled and air-cooled form factors.



C912

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Board Architecture

Processor	Freescale T4 Series QorIQ SoC: 8 (T4160) or 4 (T4080) dual-threaded e6500 cores with integrated memory, bus, and I/O controllers. Includes on-chip 32k/32k L1 per core, and 2 MB shared L2 caches per cluster (cluster = 4 cores).
Board Resources	• Watchdog Timers (Windowed + Standard) • Secure Boot and Trust Architecture 2.0 • Intelligent Platform Management Interface (IPMI) • Real Time Clock • Elapsed Time Recorder • Temperature Sensors • 8 Counters/Timers
OpenVPX (VITA 65) Slot Profiles	• **SLT3-PAY-2F2U** (supported by standard configurations of the C912) Payload board, Two Fat Pipes (Factory Configured as PCIe or 10G XAUI), Two Ultra-Thin Pipes (1000Base-BX/KX) • **SLT3-PAY-2F2T** (available as a special order option, contact your Aitech representative for more information) Payload board, Two Fat Pipes (Factory Configured as PCIe or 10G XAUI), Two Thin Pipes (1000Base-T) Backplane PCIe interfaces are configured as two x4 ports by default. Additional port configurations (up to 8 ports) are available by factory configuration of the PCIe switch firmware, contact your Aitech representative for more information.

Memory Resources

RAM	4 GB of DDR3 SDRAM with ECC operates at 1600 MT/s, configured in dual channels
Flash Disk	Optional 16 GB SATA Flash Disk, using SLC (Single-Level Cell) Flash memory
Boot Flash	128 MB NOR Flash – 64 MB allocated for Boot; 64 MB available to user
NVRAM	512 kB high speed MRAM with unlimited writes & long term data retention

I/O

	I/O Variant (1)	
	Variant #1 On-board I/O	**Variant #2 XMC I/O**
USB 2.0	2	2
SATA 2.0	2 (2) or 1 (3)	1 (2) or 0 (3)
Gigabit Ethernet: 10/100/1000Base-T + 1000Base-BX/KX	2+2 (4)	1+2 (4)
Serial Ports Asynchronous UARTs. Software configurable as RS-232/422.	4	3
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	4
XMC I/O: Diff Pairs + SE Routed per VITA 46.9 pattern X24s+X8d+X12d	10+24	20+24

Notes:
(1) C912 I/O Variants offer different quantities of on-board and XMC I/O via factory configuration; additional I/O routing options may be available per customer request, contact an Aitech representative for more information
(2) In boards without on-board SATA Flash drive
(3) In boards equipped with the on-board SATA Flash drive
(4) These Ethernet port quantities are relevant to the default C912 slot profile configuration (SLT3-PAY-2F2U). The SLT3-PAY-2F2T configuration (available as a special order option) provides two 1000Base-T ports and no 1000Base-BX/KX ports.

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XMC Slot

PCIe x4 interface supporting Gen2 and Gen1 speeds and port widths of x4/x2/x1, 5 V VPWR supply

Note: The SDRAM devices on the second memory channel may cause a mechanical conflict with some XMCs. Contact an Aitech representative for more information.

Software

Operating Systems	Wind River VxWorks®, Linux®, and Green Hills INTEGRITY® are supported
Drivers	Operating system specific device drivers for board resources are available
BIT	Built-In Tests are available

Mechanical

	Form Factor & Dimensions	Pitch	Weight
Air-Cooled	3U VPX REDI per ANSI/VITA 48.1	1"	< 400 g (0.88 lbs.) – Commercial version
			< 700 g (1.55 lbs.) – Rugged and Military versions
Conduction-Cooled	3U VPX REDI per ANSI/VITA 48.2	0.8"	< 780 g (1.72 lbs.)
Conduction-Cooled 2LM	3U VPX REDI 2LM (Two Level Maintenance) per ANSI/VITA 48.2	0.85"	< 860 g (1.90 lbs.)

Power

SoC	+5 V	+3.3 V	+12 V_AUX (1)	-12 V_AUX (1)	Total (2, 3, 4)
T4080	4.3 A	1 A	0 A	0 A	24.8 W
T4160	5 A	1 A	0 A	0 A	28.3 W

Notes:
(1) ±12V_AUX required for XMC only (not installed during test)
(2) Power measured during VxWorks idle condition at room temperature
(3) +3.3V_AUX and +12V supplies are not required
(4) Actual power consumption depends on configuration and assembly options

Environmental

Specs per VITA 47	Air-Cooled			Conduction-Cooled	
	Commercial	**Rugged**	**Military**	**Rugged**	**Military**
Operating Temp.	AC1 (0 to +55 °C) (2)	AC3 (-40 to +70 °C) (2)	AC4 (-40 to +85 °C) (1,2)	CC3 (-40 to +70 °C) (3)	CC4 (-40 to +85 °C) (1,3)
Non-Operating Temp.	C1 (-40 to +85 °C)	C3 (-50 to +100 °C)	C4 (-55 to +125 °C)	C3 (-50 to +100 °C)	C4 (-55 to +125 °C)
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 - 100%			
Conformal Coating	N/A	Acrylic (Silicone and Urethane Optional)			

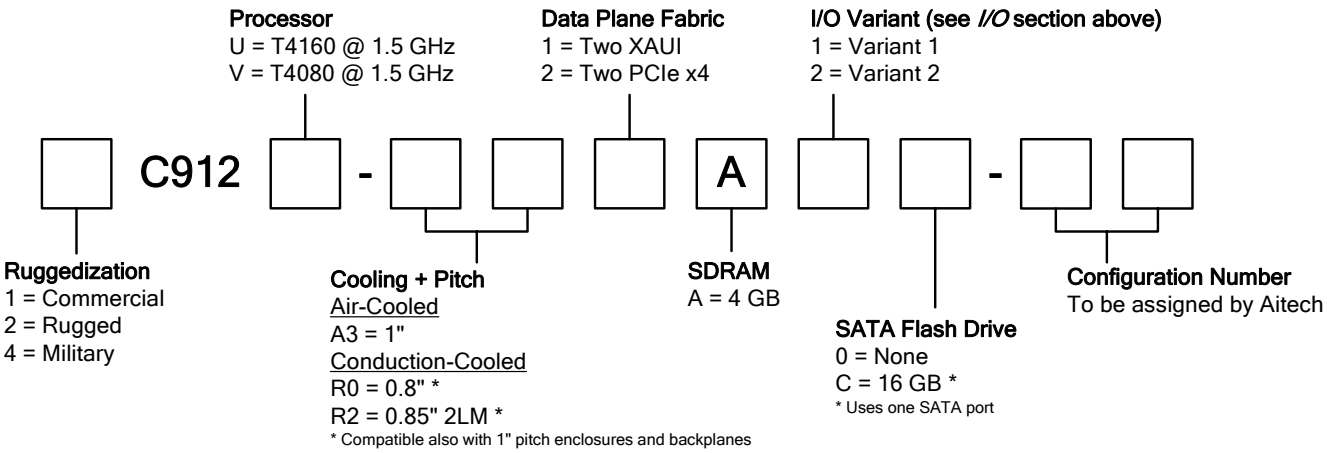
Notes:
(1) -55 °C available, contact an Aitech representative for more information
(2) Operating ambient air temperature (with sufficient airflow)
(3) Operating card edge temperature
(4) Non-condensing

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Ordering Information



Example: 4C912U-R01A2C-00

Accessories

TM912	Rear Transition Module (RTM) providing convenient access to all C912 on-board I/O interfaces via standard connectors and to all XMC I/O via headers. Supports both air and conduction-cooled C912 mounted in commercial air-cooled chassis. Refer to the TM912 datasheet for further information.
CM870	3U VPX PMC/XMC carrier board. Using one or more CM870s, system functionality can be significantly expanded, enabling the C912 to control additional XMCs/PMCs over the VPX backplane. Compatible only with versions of the C912 that utilize PCIe Data Plane fabric. Refer to the CM870 datasheet for further information.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the C912 and additional software support.



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