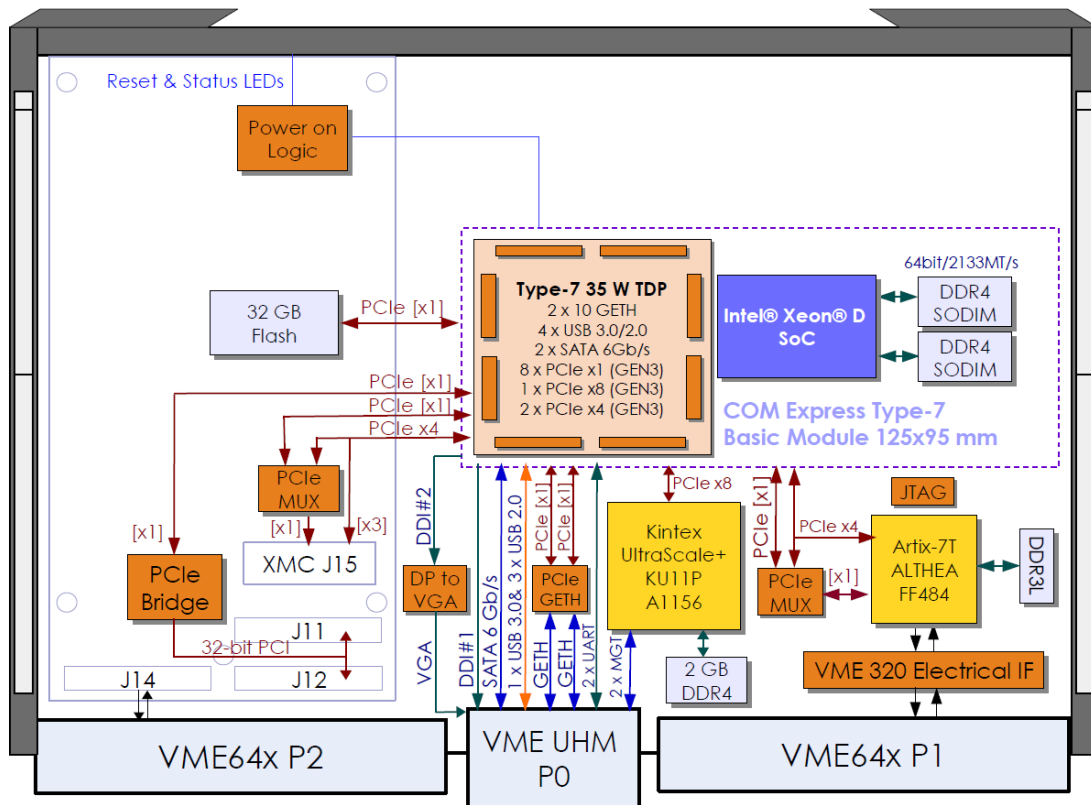


# VCC\_1244 “AROLLA V2” Conduction Cooled VME64x COM Express™ Rugged Single Board Computer Data Sheet



## Key Features

- 6U VME64x COM Express™ Rugged Single Board Computer in conduction cooled form factor
- Support for COM Express™ Type 7 Basic (125 x 95 mm) modules
- Built in 32 GBytes flash memory
- Network Interfaces trough VME P0:
  - ✓ 2 x Gigabit Ethernet
- Graphical Interfaces trough VME P0:
  - ✓ VGA
  - ✓ DDI supporting Display Port / HDMI / DVI
- I/O Interfaces trough VME P0:
  - ✓ 1 x USB 3.0 and 3 x USB 2.0
  - ✓ 2 x UART (RS232)
  - ✓ 1 x SATA 6 Gb/s
- Central high-end FPGA for user application:
  - ✓ Xilinx Kintex UltraScale+ KU11P
  - ✓ 2 Gbytes DDR4 with ECC
  - ✓ More than 95% logic resources available for user application
  - ✓ Powered by TOSCA FPGA Design Kit (FDK)
- FPGA base VME64x interface ALTHEA 7910:
  - ✓ Implemented in Xilinx Artix-7 device
  - ✓ Supports VME Data D08, D16, D32, BLT32, MBLT64, 2eVME, 2eSST and 2eSST Broadcast
- Single VITA 42.3 XMC/PMC slot with PCIe x4 support
- UHM VME P0 extension (7 Gb/s)
- Conformal coating
- Industrial temperature grade (-40°C to +55°C)
- Designed to meet MIL-STD-810G and MIL-STD-461F
- Linux and Microsoft® Windows 10

## Overview

IOxOS Technologies releases the VCC\_1244 “AROLLA V2”, a new member of its second generation of 6U VME64x COM Express™ Type-7 carrier to provide a powerful VME Rugged Single Board Computer based on latest generations of Intel® Xeon® D SoC.

The wide availability of COM Express™ Modules from several suppliers, allows the upgrade of VME64x based applications to the latest computing technology. In addition, long term obsolescence can be easily managed with de facto standard COM Express™ Type-7 modules.

A custom designed heat spreader and the wedge lock mechanism allow to support, in a single width (4HP) VME configuration, COM Express™ modules with TDP (Thermal Design Power) up to 35W.

The onboard high-end Xilinx Kintex UltraScale+ KU11P FPGA makes this platform ideal for the implementation of high-performance signal processing applications running in harsh environments.

A single PMC / XMC (VITA 42.3) slot is available featuring PCI 32-bit @ 33MHz (PCI 2.3) (PMC slot), PCI Express x4 GEN3 (XMC slot) and direct connection to VME P2 user I/O following VITA 35 standard.

The VCC\_1244 features IOxOS Technologies' ALTHEA 7910 solution, a PCI Express to VME64x Bridge implemented in a Xilinx Artix-7 FPGA to deliver an extremely competitive COTS in terms of cost, performance and power consumption. This field proven solution natively supports all Master/Slave VME64x modes of operation with Slot\_1 System Controller function, including VME64x data transport 2eVME and 2eSST modes with maximal burst length capability, while guaranteeing very long term availability of the board as a result of not depending on already obsolete third party VME interfaces.

## Introduction

The VCC\_1244 "AROLLA V2" belongs to the second generation of 6U VME64x COM Express™ carrier boards from IOxOS Technologies, designed to provide a powerful VME Single Board Computer based on latest generation of Intel® Xeon™ processors.

This platform supports COM Express™ Type 7 modules in basic (125 x 95 mm) size, providing digital display interfaces, the latest generation of Intel® Xeon® D SoC, and additional PCI Express lanes to enhance VME based systems with a high-performance and long term available solution.

## ALTHEA 7910 FPGA based VME64x Interface

The VME64x interface is implemented using IOxOS Technologies proprietary [ALTHEA 7910](#) solution, a Xilinx Artix-7 based PCI Express to VME64x Bridge. Since 2014, this interface is marketed and used by relevant VME manufacturers worldwide to replace the obsolete TS1148 VME interface.

The PCI Express to VME64x interface includes new features such as:

- Embedded SRAM Shared Memory SMEM 64K/128K
- High performance DMA PCIe-VME64x
- Message Passing FIFO and Semaphores
- VME A24, A16 Slave windows mapping
- Integration of TS1148 specific functions

## Central FPGA for User Application

The VCC\_1244 features a high-end Xilinx Kintex UltraScale+ in A1156 package with more than 95% of logic resources available for signal processing applications:

- KU11P (populated by default)
- Footprint compatible with:
  - Kintex UltraScale+ KU15P
  - Kintex UltraScale KU035, KU040, KU060 and KU095
- 653K -System Logic Cells
- 21.1 Mbits of total Block RAM
- 2'928 DSP Slices

## VME64x P0 I/O Allocation

The following resources are provided on the VME64x P0 legacy connector:

- Two (2) Gigabit Ethernet (VITA 31.1)
- One (1) USB 3.0 and three (3) USB 2.0
- One (1) SATA 6 Gb/s interface
- Two (2) UART (configurable as RS232)
- DDI supporting Display Port / HDMI / DVI
- VGA interface
- Two (2) MGT SerDes from Central FPGA

The VCC\_1244 features the new generation of 3M Ultra Hard Metric (UHM) connector supporting data rates up to 7 Gb/s and fully compatible with standard VME64x backplanes.

## VME64x P2 User I/O

The VCC\_1244 is equipped with a 5-row P2 connector providing 64 user I/O on rows A and C directly routed to P4 PMC/XMC connector following the VITA35 standard.

## TOSCA FPGA Design Kit

The TOSCA FPGA Design Kit enhances the versatility of the VCC\_1244 board, providing the user with a powerful tool for straight forward implementation of custom applications within the on-board Kintex UltraScale+ FPGA. This solution also makes possible a significant reduction of the FPGA development time, by allowing developers to focus on their specific application.

## Built-In Health Monitor

The VCC\_1244 provides health status of the board by monitoring temperature (ambient and junction) with its built-in XADC System Monitor hard macro, and by monitoring power supply parameters through dedicated PMBus.

## Software Support

The VCC\_1244 supports Linux (x86/x64) and Microsoft® Windows 10 (X86/x64) and uses ALTHEA 7910 Software Suite containing:

- AltMon Command Interpreter
- User API, Device Drivers and Examples

## Environmental Specifications

Estimated Power (PMC/XMC not plugged) (USB3.0 not plugged)	VME +5V → 6[A] (VITA 1.7 max 7.5[A]) +3.3V locally generated from +5V VME ±12V PMC/XMC only
Compliance	VME64x VITA 1.1 + VITA 1.5-2003 XMC VITA 42.3 / PMC IEEE 1386
Operating Temperature	-40°C to +55°C
Storage Temperature	-55°C to +85°C
Humidity	10% to 90% non-condensing
Regulatory Compliance	Immunity: EN50082-2 / EN55024 Emission: EN55022 Class A Safety: EN60950

## Ordering Information

Article Reference	Product Description
VCC_1244-A0-D1539	Single slot (4HP) VME board featuring Intel® Xeon® D1539 at 1.6/2.2 GHz 32 Gbytes DDR4 at 1867/2133 MHz with ECC COM Express™ Type 7 Basic size Conformal coating Xilinx Kintex UltraScale+ KU11P (for a different FPGA please contact us)
VCR_1162-A0	Rear I/O companion for VCC_1244-A0-D1539

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