VEGA AS4161 – 64-bit High performance Quad Core Microprocessor

1. Device Overview

1.1. Features

- RISC-V 64G (RV64IMAFD) ISA
- 13-16 stage out-of-order pipeline implementation
- Advanced branch predictor: BTB, BHT, RAS
- Harvard architecture
- Privilege Levels : User-, Supervisor- and Machine-mode
- Fully-featured memory subsystem with Linux support
  - Memory Management Unit
  - Page-based virtual memory
  - Configurable L1 caches
  - Configurable L2 caches
- High-performance IEEE 754-2008 compliant floating-point unit
- Vectored interrupt support
- Platform Level Interrupt Controller
  - Up to 127 IRQs
  - Low interrupt latency
- AXI4- / ACE, AHB- compliant external interface
- Advanced Integrated Debug Controller
  - JTAG compliant interface
  - HW/SW breakpoints support
- Debug extension allowing Eclipse debugging via a GDB >> openOCD >> JTAG connection
- Linux compatible

1.2. Applications

- Media Server
- Single Board Computer
- Storage devices
- Energy Gateway
- Electricity Grid and Distribution
- Building Safety
- Circuit Breaker
- Smart Power Socket, Light Switch
- Networking
- Medical Imaging
- Defibrillator
- Hospital Admission Machine
- Powered Patient Beds
- Vital Signs Monitor
- Biometric access control
- Public Address Systems

1.3. Description

VEGA AS4161 features a quad core out-of-order processing engine with a 16-stage pipeline for high performance compute requirements. The processor also supports single and double precision floating point instructions, and MMU for Linux based applications. This high-performance application core comes with Instruction Cache, Data Cache and an advanced branch prediction for efficient branch execution. The processor has separate Level 1 Instruction cache and Data cache along with Level 2 Cache facilitating high performance applications such as Media server, Single Board Computer, Storage, and Networking etc.

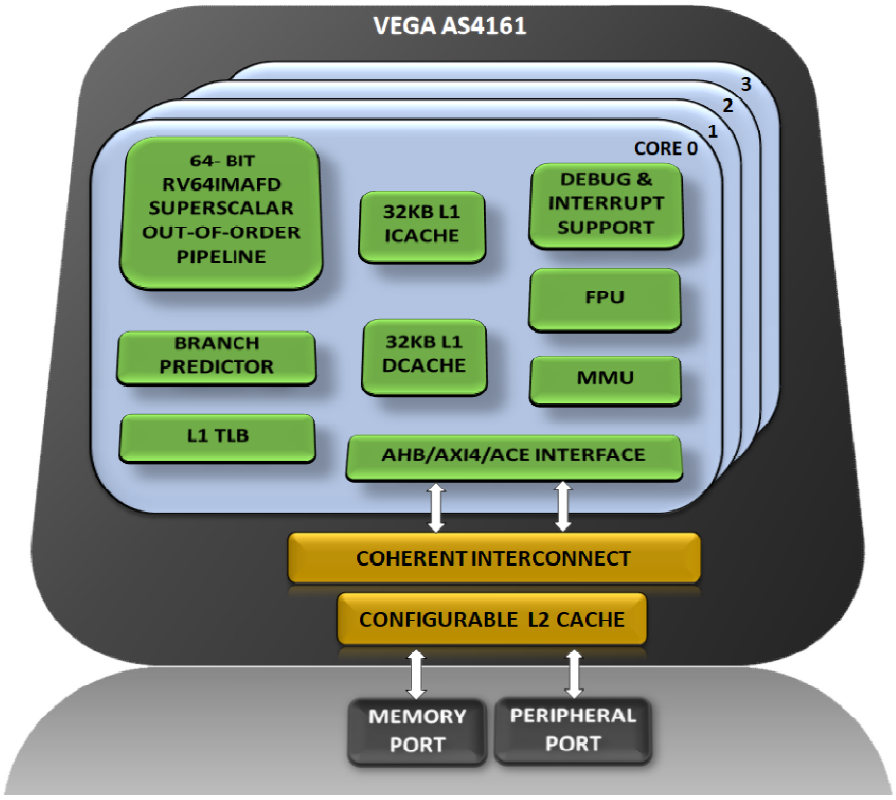

Figure 1: VEGA AS4161 Block Diagram

1.4. Deliverables

- RTL Source Code
- Test Benches
- Synthesis Scripts
- Product Specification
- User Guide
- Integration Guidelines

2. References

2.1. Website

https://vegaprocessors.in/

2.2. YouTube

https://www.youtube.com/VEGAProcessors

Hardware Design Group
C-DAC Thiruvananthapuram, Kerala – 695033
Phone: 0471-272 5897, 2723333 (Ext: 347)
Fax: 0471-2723456 E-Mail: vega@cdac.in
www.vegaprocessors.in