

ARC HS Development Kit

Highlights

- Supports all ARC HS3x processors with one platform
- Single-, dual- and quad-core configurations
- Ethernet 10/100/1000, USB 2.0
- Free software includes U-Boot bootloader, ARC Linux and embARC Open Software Platform (OSP)
- Comprehensive debugging with JTAG debug and real-time trace support
- Customize with Arduino, Pmod (x3), and mikroBUS connectors
- Extend with HapsTrak3 extension connectors with fast AXI tunnel for system prototyping

Target Applications

- Routers
- Gateways
- Storage and SSDs

Overview

The MIPS ARC[®] HS Development Kit is a ready-to-use platform for rapid software development on the ARC HS3x family of processors. It supports single- and multi-core ARC HS34, HS36 and HS38 processors and offers a wide range of interfaces including Ethernet, USB, SDIO, I²C, SPI, UART, I²S, ADC, PWM and GPIO. A Vivante GPU is also contained in the ARC-based chip. This allows developers to build and debug complex software on a comprehensive hardware platform.

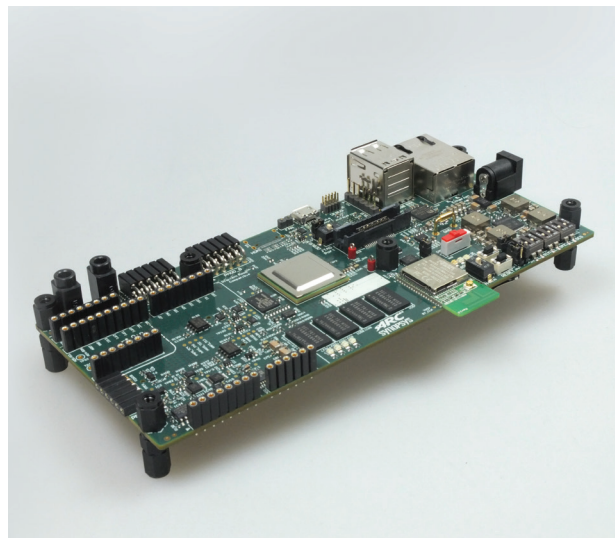


Figure 1: ARC HS Development Kit hardware

Figure 1 shows the development board with the ARC Development System SoC that runs at 1GHz. The kit is supported with an extensive range of open source software from bare metal drivers and RTOSes to complete Linux distributions. The Linux distributions can be built with Buildroot and Yocto. The embARC Open Software Platform (OSP) supports the ARC HS Development Kit and includes drivers, FreeRTOS and middleware targeted at IoT and general embedded applications. Toolchain support is provided by the GNU Toolchain for ARC Processors and the MetaWare Development Toolkit. All the open source software is available from the embARC.org web site. The MetaWare Development Toolkit is a commercial tool available from MIPS.

For debugging and trace, JTAG debug probes can be connected via one of the two debug headers. It is also possible to use a standard USB cable for debugging. In addition, ARC Real-Time Trace (RTT) is supported.

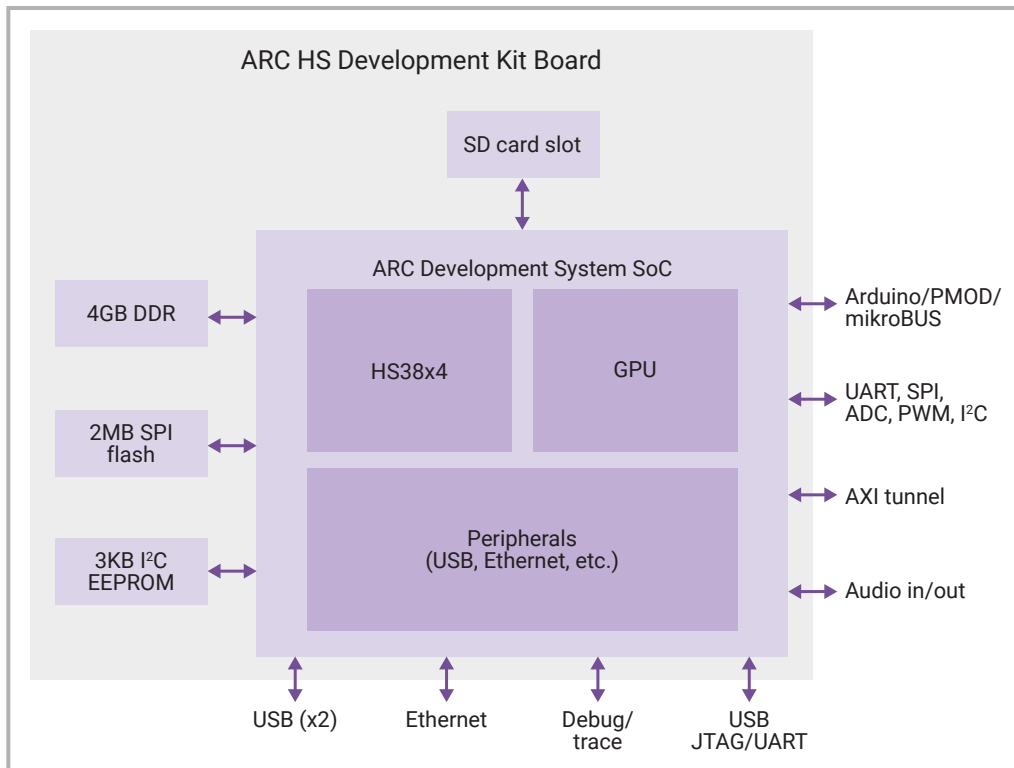


Figure 2: ARC HS Development Kit Block Diagram

Board Features

- 1GHz quad-core ARC HS chip
- 4GB DDR3 memory
- USB 2.0 (x 2)
- Ethernet 10/100/1000 connector
- Audio in/out connectors
- UART, SPI, ADC and PWM
- SD card slot
- Debug and trace connectors
- Extension headers for Arduino, Pmod and mikroBUS
- HAPS[®] extension connector
- Boot selection via U-Boot

Boot Modes

The board can boot up in single-, dual- or quad-core mode. For ARC HS34, the maximum configuration is HS34x2. Two of the cores have large Closely Coupled Memories (CCMs) of 256KB. For ARC HS36 & HS38, the maximum configuration is HS36x4 and HS38x4. There is 64KB each of I & D cache and 512KB of system-level cache. I/O coherency is supported.

Software—Linux

ARC Linux supports the ARC HS38 in single and multi-processor mode (SMP) with device driver support for Ethernet, USB, SDIO, GPU, UART, GPIO, SPI and I2C. The GNU Toolchain for ARC supports Linux kernel and userland development. ARC Linux is also supported with OpenWRT, Buildroot and Yocto distribution build systems.

The U-Boot loader supports SPI flash, SD Card, Ethernet and USB.

Software—RTOS and Bare Metal

The embARC OSP supports the ARC HS Development Kit with pre-integrated and verified software stacks for FreeRTOS. The software includes many protocol stacks for IoT and embedded applications. In addition, bare metal device drivers are also provided for the peripherals.

Tools

The ARC HS Development Kit is supported by the ARC MetaWare Development Toolkit, enabling the development and debugging of highly optimized, high-density code. For Linux development, the HS Development Kit is supported with the GNU Toolchain for ARC Processors.

Debug and Trace

There are many options for debug and trace. A USB cable can be connected to the board for debugging with the MetaWare Debugger and GDB. There are also 10-pin and 6-pin debug connectors for Ashling Opella-XD, Lauterbach and Digilent HS1 and HS2 probes and cables.

ARC RTT is available for both off-chip and on-board DDR trace. Off-chip trace is supported through the use of an Ashling Ultra-XD Pod or a Lauterbach Trace Pod.

Extensibility

The ARC HS Development Kit is extensible through the available Digilent Pmod, mikroBUS and Arduino connectors. In addition, two HapsTrak3 connectors, enabling designers to easily connect the ARC HS Development Kit to MIPS' HAPS FPGA-based prototyping system, extends the platform so that it can be used for prototyping of new IP and associated driver development.

Deliverables

- Hardware platform board
- 100-240V AC power adapter
- USB cable
- All documentation and software available from www.embarc.org

About MIPS:

MIPS by GlobalFoundries delivers software to silicon with RISC-V for building physical AI platforms. MIPS delivers software-hardware co-design, optimized AI, and custom ASSP design and manufacturing. Together with ARC, MIPS delivers the open, standards-based processor IP portfolio for embedded applications. Physical AI is built on MIPS.

For more information, visit www.mips.com/arc.