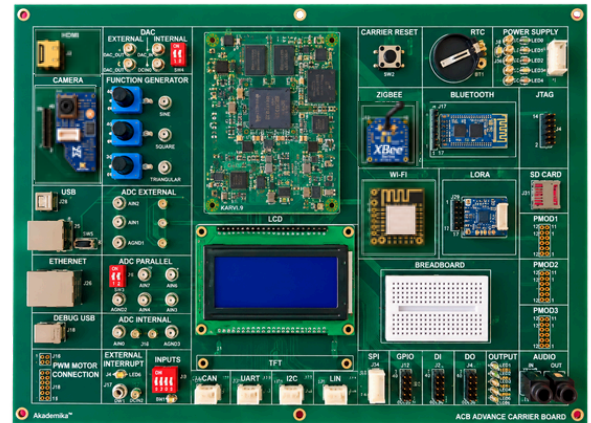


VL-ZYNQ

Zynq 7000 Series SoM with Advanced Carrier Board



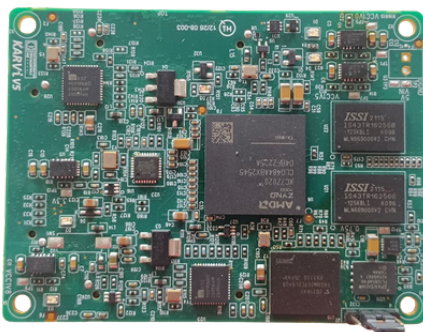
FEATURES

SYSTEM-ON-MODULE — ZYNQ 7000

- Powered by ARM® Dual-Core Cortex™A9 Core Processor
- Based on Xilinx's high-end Zynq XC7Z020 Series. All-Programmable SoC
- Support Zynq devices XC7Z007 / 20 CLG 484 Pin package
- 87mm x 67mm board size Compact form factor
- Available in Production ready with industrial temperature range
- Linux BSP, tool chain and Support available
- Combines Flexibility of SBC with the FPGA configurability
- Industrial Grade, Rugged platform to optimize overall BOM cost
- On module required power supplies for efficient power management
- Linux board support package along with Root file system enables seamless integration
- Customized Carrier boards for instant board bring-up and quick prototyping
- Software : Vivado + Vitis

SPECIFICATIONS

SYSTEM-ON-MODULE — ZYNQ 7000



Processor

- Dual-Core Cortex™A9 Core @ 866MHz
- 32KB Instruction and Data L1 cache

- Based on Xilinx's high-end Zynq XC7Z000 Series. All-Programmable SoC
- Support Zynq devices XC7Z007 / 20 CLG 484 Pin package
- Enhanced NEON Extension and Single & double precision FPU
- 512KB Unified L2 Cache
- 256KB On-chip Memory

Memory

- 1 GB DDR3 Support
- 8Gb/16Gb eMMC (Expandable)
- Upto 128 Mbit QSPI Support

FPGA

- Xilinx Artix-7 28nm Advanced low power FPGA fabric
- Up to 85K Logic Cells (approximately 1.3M of equivalent ASIC gates)
- 560KB Block RAM
- 220 programmable DSP slices (18x25MAC)

Power Supply

- 4.5-5.5V
- 5W (Max)

Boot Support

- JTAG / QSPI / microSD / eMMC

Ethernet - 2 Nos

- 1 x 10/100/1000 BASE-T On module
- 1 x 10/100/1000 BASE-T (Optional on carrier)

USB

- 1 x USB 2.0 OTG

Display

- Through LVDS Interface

Serial (on EMIOs)

- 1 x UART, 2 x I2C, 2X CAN2.0

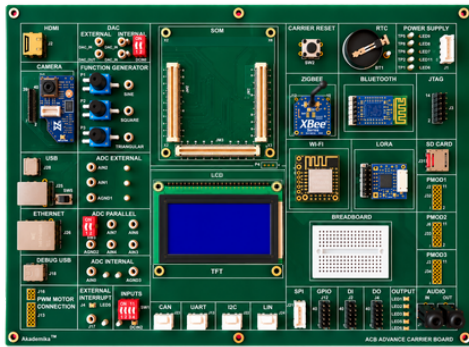
Form Factor And Board to Board Interface

- 85 mm x 67 mm
- 2 x 100 Pin High Speed Connectors
- Differential and Single ended I/O

Software Support

- Linux

CARRIER BOARD



CARRIER - CORE, RESET & DEBUG

- Power : Regulated supply as per SOM & peripheral load
- Reset : Board reset and SOM reset support
- RTC : External real-time-clock provision
- Test points : For important signals and power rails
- SOM Interface : high-density board-to-board for SOM

CARRIER - ANALOG & SIGNAL

- ADC : Internal & external (analog / SPI / parallel)
- DAC : external SPI interface DAC support
- Function Generator : Sine, square and Triangular waveform generation
- Audio : analog audio input & output

CARRIER - DIGITAL I/O & DISPLAY

- PWM — motor driver / control output
- GPIO — general-purpose digital I/O
- User I/O — input switches & LED indication outputs
- Display — TFT / GLCD
- PMOD — PMOD-compatible expansion connectors

CARRIER — COMMUNICATION & WIRELESS INTERFACES

- SPI — serial communication interface
- I2C — serial communication interface
- UART — serial communication interface
- CAN — industrial communication interface
- LIN — automotive communication interfaceBluetooth — external module interface
- ZigBee — external module interface
- Wi-Fi — external module interface
- LoRa — external module interface

CARRIER — MULTIMEDIA & CONNECTIVITY

- Camera — DCMI camera interface (STM32 DCMI or equivalent)
- HDMI / Display — HDMI or display conversion interface
- USB — USB Host and USB Device interfaces
- Ethernet — for networking applications
- microSD — SDIO / SPI card interface

SOFTWARE

- AMD Vivado Design Suite and the AMD Vitis Software

AMD Vivado

- Hardware-centric design
- Core tasks: Handles design entry (writing Verilog, VHDL, or block diagrams),
- Output: Generates the hardware bitstream file,

AMD Vitis

- Software-centric design
- Used for writing the software that runs on the processors (like Arm cores) inside your SoC or managing high-level synthesis.

EXPERIMENTS

AMBA Bus Design

- AXI4-Lite to Memory
- AXI-GPIO with Switch/LED
- APB Timer
- AXI DMA Controller
- AXI Burst Verification

Core DSP

- FFT
- FIR Filter
- IIR Filter
- Convolution and Correlation
- Real-Time Audio Equalizer

Image Processing

- Greyscale Conversion
- Edge Detection (Sobel)
- Smoothing / Gaussian Blur
- VGA Display of Processed Image

SoC Design

- Hello World on Soft-Core Processor
- GPIO LED Control
- UART Communication
- SPI / I2C Peripheral

RISC Architecture

- Single-Cycle RISC CPU
- ALU Design
- Register File
- Instruction Fetch Unit
- 5-Stage Pipelined Processor

Communication Systems

- PN Sequence Generator
- DSSS
- CDMA
- Modulation (BPSK / QPSK / FSK)