

Indian Institute of Information Technology Tiruchirappalli



इलेक्ट्रॉनिक्स एवं
सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF
ELECTRONICS AND
INFORMATION TECHNOLOGY



सी डैक
CDAC



Chips to Startup
Programme

Chips to Startup Programme (C2S)

Special Manpower Development Program for Chips to System Design (SMDP-C2SD)

Category-II: Development of Application Oriented Working Prototype of IPs/ASICs/SoCs

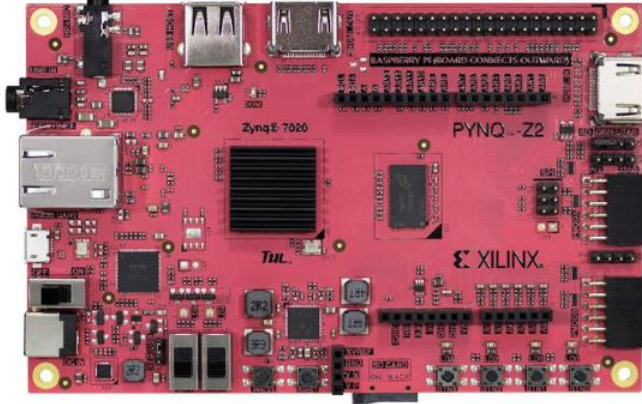
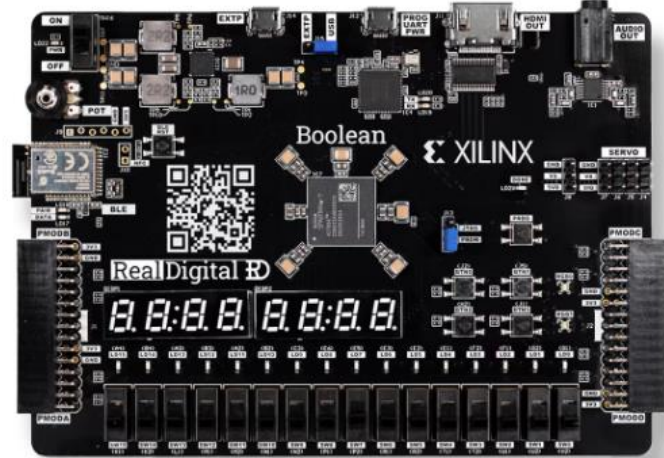
Project Title: Ultra Low Power SHAKTI RISC V Based Lightweight Edge AI Processor for IoT enabled Healthcare Applications

Hardware Details

S.No	Item/Description	Part Number/Item ID	Quantity
1	Pynq Z2	1M1-M000127DVA	6
2	Pmod KYPD: 16-Button Keypad	410-195	6
3	Pmod OLEDrbg: 96 x 64 RGB OLED Display Pmod	410-323	6
4	Pmod DA2: Two 12 bit DIA Outputs	410-113	6
5	Pmod TPH2: 12-Pin Test Point Header	410-135	40
6	Boolean Board	Boolean Board	16
7	Urbana Board	Urbana Board	2
8	Arty A7-100T	410-319-1	1
		USB Cable	1
9	KRIA KR 260	SK-KR260-G	1
10	KRIA KV Video	SK-KV260-G	1
		HW-BACCP01-SK-G	1
11	Pynq ZU	2M1-M00009300G	1
12	Zynq Ultrascale + MPSoC ZCU104	EK-U1-ZCU104-G	1
Total Cost		Rs. 8,59,302/-	

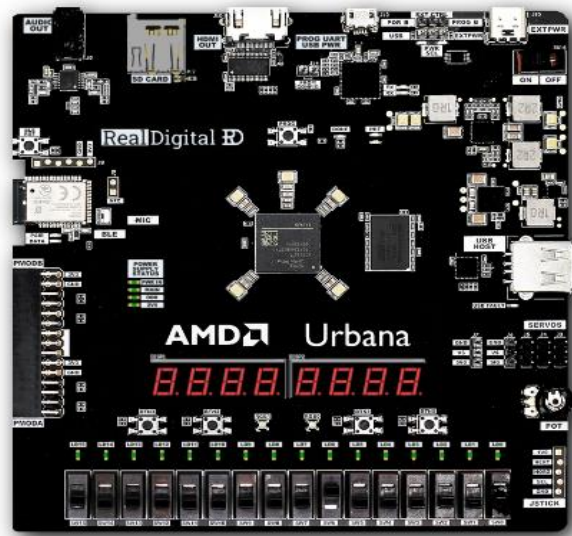
Note: Hardware sponsored by MeitY in association with CDAC

Hardware Details

S.No	Name of the Hardware	Equipment Details	Description
1	Pynq Z2 [1M1-M000127DVA]		• Device: Zynq Z7020 • Memory: 512MB DDR3 • Storage: MicroSD • Video: HDMI In & Out ports • Audio: ADAU1761 codec with HP + Mic, Line in • Network: 10/100/1000 Ethernet • Expansion: USB host (PS) • GPIO: 1x Arduino Header, 2x Pmod*, 1x RaspberryPi header* • Other I/O: 6x user LEDs, 4x Pushbuttons, 2x Dip switches • Dimensions: 3.44" x 5.51" (87mm x 140mm) *PYNQ-Z2 RaspberryPi header shares 8 pins with 1 Pmod
2	Boolean Board		• A Xilinx XC7S50-CSG324A Spartan 7 FPGA • 16 Slide switches, 16 LEDs, 4 Pushbuttons and 2 RGB LEDs • An 8-digit seven segment display • A stereo PWM audio-out port • A 1080P HDMI port • Four servo connectors (conventional or continuous rotation) • On board analog-to-digital converter • USB2 high-speed port for programming and user UART port • Four Pmod – compatible expansion ports

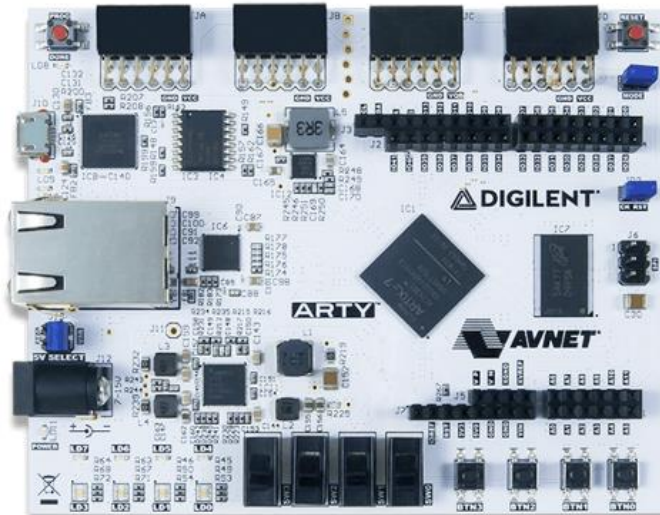
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Urbana Board



- An AMD XC7S50-CSG324A Spartan 7 FPGA
- 128 Mbytes DDR3 SDRAM (x16 bus width)
- Bluetooth 5.0 low energy radio based on the Nordic nRF52
- 16 slide switches, 16 LEDs, 4 pushbuttons and 2 RGB LEDs
- An 8-digit seven-segment display
- A stereo PWM audio-out port
- USB host port for peripherals
- A 1080P HDMI output port (with VGA to HDMI IP)
- Four servo motor connectors
- Analog-to-digital converter
- USB2 high-speed port for programming and user UART port
- Two Pmod compatible expansion ports

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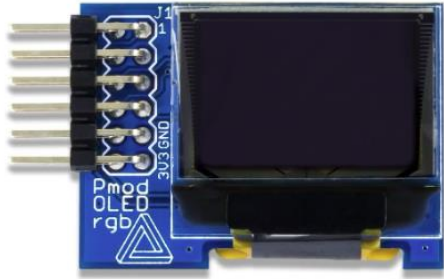
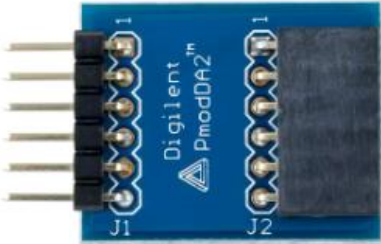
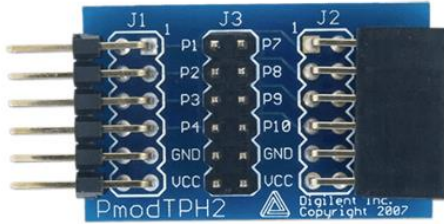
Arty A7-100T
[410-319-1]

- Features the Xilinx Artix-100T FPGA
- 256MB DDR3L/16MB Quad-SPI Flash
- UART, SPI, I²C, 10/100 Ethernet
- On-board programming
- Powered from USB or any 7V-15V source
- Hardware compatibility with 'shield' add-on boards
- 4 Pmod connectors for unlimited expansion
- 4 Switches, 4 buttons, 8 LEDs (4 RGB)

5	KRIA KR 260 [SK-KR260-G]		• Device: Zynq™ UltraScale+™ MPSoC EV (XCK26) • Form factor: SOM + Carrier Card + Thermal Solution • Starter kit dimensions: 119mm x 140mm x 36mm • Thermal cooling solution: Active (Fan + Heatsink) • System logic cells: 256K • Block RAM blocks: 144 • Ultra RAM blocks: 64 • DSP slices: 1.2K • Ethernet interface: 4x 10/100/1000 Mb/s RJ-45s, 1x SFP+ Cage • DDR memory: 4GB (4 x 512Mb x 16 bit) [non-ECC] DDR4 • Primary boot memory: 512Mb QSPI • Secondary boot memory: SDHC card • Device Security: Zynq UltraScale+ MPSoC hardware root of trust (RoT) in support of secure boot. Infineon TPM2.0 in support of measured boot. • Video: x1 SLVS-EC Gen2 x2 lane interface, DisplayPort 1.2a Output for 1920 x 1080 at 60Hz • I/O expansion: x4 Pmod 12-pin interface, x1 Raspberry Pi HAT header with 26 I/Os • USB3.0/2.0 interfaces: x4
6	KRIA KV Video [SK-KV260-G HW-BACCP01-SK-G]		• Device: Zynq™ UltraScale+™ MPSoC • Form factor: SOM + Carrier Card + Thermal Solution • Starter kit dimensions: 119mm x 140mm x 36mm • Thermal cooling solution: Active (Fan + Heatsink) • System logic cells: 256K • Block RAM blocks: 144 • Ultra RAM blocks: 64 • DSP slices: 1.2K • Ethernet interface: One 10/100/1000 Mb/s • DDR memory: 4GB (4 x 512Mb x 16 bit) [non-ECC] • Primary boot memory: 512Mb QSPI • Secondary boot memory: SDHC card • Device Security: Zynq UltraScale+ MPSoC hardware root of trust (RoT) in support of secure boot. Infineon TPM2.0 in support of measured boot.

			• Image sensor processor: OnSemi AP1302 ISP • IAS MIPI sensor interfaces: x2 • Raspberry Pi camera interface: x1 • Pmod 12-pin interface: x1 • USB3.0/2.0 interface: x4 • DisplayPort 1.2a: x1 • HDMI 1.4: x1
7	Pynq ZU [2M1-M00009300G]		• Zynq Ultrascale+ XCZU5EG • 4GB DDR4 • Mini DisplayPort • HDMI In and Out • Composite USB 3.0, USB 3.0 Host • WiFi & Bluetooth • Audio codec • Camera Serial Interface (CSI) • User LEDs, buttons and switches • Expansion interfaces include FMC (LPC), SYZYGY, Pmod, Raspberry Pi connector, and Grove

8	Zynq Ultrascale + MPSoC ZCU104 [EK-U1-ZCU104-G]		• Featuring the Zynq UltraScale+ XCZU7EV-2FFVC1156 MPSoC • Configuration: (USB-JTAG FT4232H, Dual Quad-SPI flash memory, MicroSD Card) • Memory: (PS DDR4 64-bit Component, Quad-SPI flash, Micro SD card slot) • Control & I/O: (4x directional pushbuttons, DIP switches, PMBUS, clocks, and I2C bus switching, USB2/3) • Expansion Connectors: (FMC LPC (1x GTH), 3 PMOD connectors, PL DDR4 SODIMM Connector – 64 bit) • Communication & Networking: (USB-UARTs with FT4232H JTAG/3xUART Bridge, RJ-45 Ethernet connector, SATA (M.2) for SSD access) • Display: (HDMI 2.0 video input and output (3x GTH), DisplayPort (2x GTR)) • Clocking: (Programmable clocks, System clock, user clock, Jitter attenuator) • Power: (12V wall adaptor or ATX)
9	Pmod KYPD: 16- Button Keypad [410-195]		• 16 momentary push-buttons • Can detect simultaneous button presses • Isolated rows and columns • 12-pin Pmod port with GPIO interface • Follows the Digilent Pmod Interface Specification Type 1

10	Pmod OLEDrgb: 96 x 64 RGB OLED Display Pmod [410-323]		• 96×64 pixel RGB OLED screen • 0.8“ x 0.5” graphical display • 16-bit color resolution • 16 brightness settings • Two low-power display shutdown modes • 12-pin Pmod connector with SPI interface • Features a Solomon Systech SSD1331 display controller
11	Pmod DA2: Two 12 bit DIA Outputs [410-113]		• Features the Texas Instruments Dac121s101 • 12-bit digital-to-analog converter (x2) • Two simultaneous D/A conversion channels • Very low power consumption • 6-pin Pmod connector with GPIO interface
12	Pmod TPH2: 12-Pin Test Point Header [410-135]		• Provides simple test-point access • Test the signals between your 12-pin Pmod and its host board