Video/Cameras, High Bandwidth Data Handling on iMX6 Cortex-A9 Single Board Computer

Features

- ✓ i.MX6 Cortex®-A9 Quad Core processor, 1GHz w/ NEON® GPU
- ✓ Programmable Kintex®-7 FPGA
- ✓ Up to 60Gb/s full duplex throughput
- ✓ 2GB DDR3 SDRAM, 8GB Flash
- ✓ PCIe bridge from CPU to FPGA
- ✓ 6 USB ports, 250 digital I/O, 1 CAN
- ✓ Dual Gigabit Ethernet / Web Server
- ✓ -40° to +85℃ operation

The SBC4661 is a powerful 1GHz Quad Core ARM Cortex-A9 with multiple camera-ready ports, abundant USB 3.0 ports, and dual Gigabit Ethernet. Freescale's i.MX6® multimedia CPU includes ARM's NEON GPU for running multi-media applications or multiple videos. Onboard is a powerful Kintex®-7 FPGA with its own DDR3 memory, plus 22 10-bit analog ports and over 250 DIO lines making the SBC4661 a highly user-configurable industrial controller.

Ideal for vision and radio applications, the SBC4661 includes hardware interfaces and software support for popular camera interfaces including MIPI CSI, NTSC/PAL, FLIR® Thermal Imaging, USB3 Vision®, GigE Vision®, CameraLink®, and CoaXPress®. Onboard vision processing can be hosted and processed in the Kintex-7 FPGA and output into multiple video configurations.

The SBC4661 has standard industrial I/O including a real-time clock, watchdog timer, audio, 24-bit LVDS/TFT flat panel display, HDMI, 4-wire touchscreen interface, one PWM output, SATA II, two SD/MMC card slots, and multiple USB 2.0 and USB 3.0 ports. Additional I/O expansion through StackableUSB provides DAC and ADC board-to-board communication via USB, I^2C, and/or SPI.
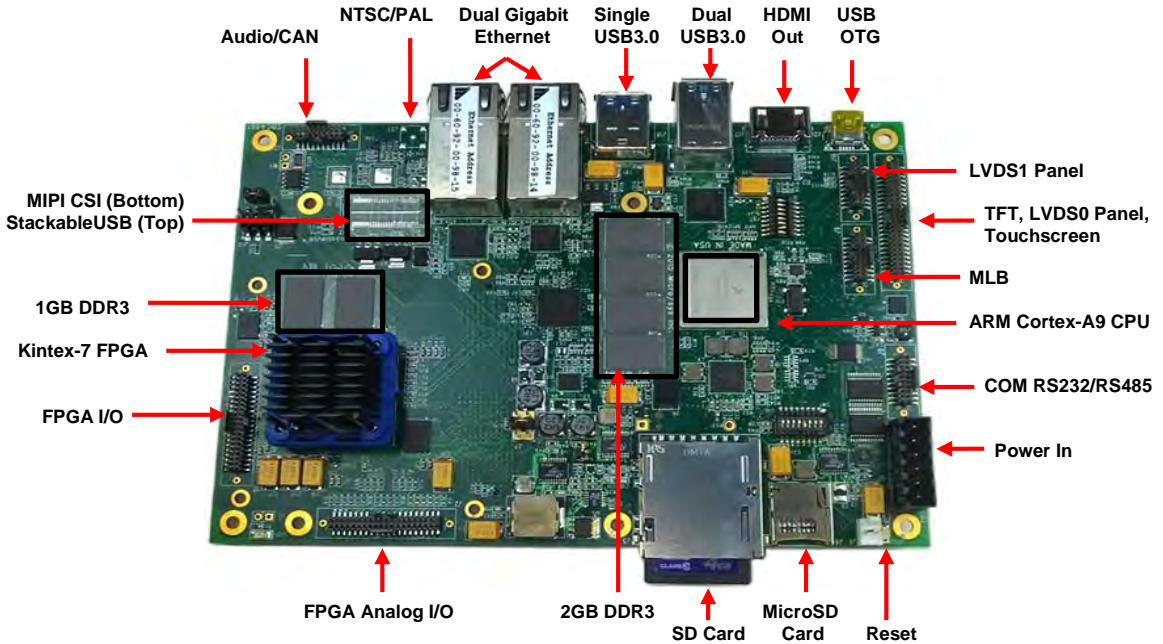
Software Support	Compatible Hardware	Mounting/Packaging
Linux *Windows CE* *VxWorks* *Android* *C, compilers*	*StackableUSB Client Devices* *PC Hosts* *LVDS FP-Kits* *PSxxx, Power Supplies* *Secure Digital Devices* *RS232/RS485 Devices* *CAN Devices* *Ethernet Networks*	*Standoffs, STDOFFUSB* *ENC104*

Labels around board: Audio/CAN, NTSC/PAL, Dual Gigabit Ethernet, Single USB3.0, Dual USB3.0, HDMI Out, USB OTG, LVDS1 Panel, TFT, LVDS0 Panel, Touchscreen, MLB, ARM Cortex-A9 CPU, COM RS232/RS485, Power In, Reset, MicroSD Card, SD Card, 2GB DDR3, FPGA Analog I/O, FPGA I/O, Kintex-7 FPGA, 1GB DDR3, MIPI CSI (Bottom) StackableUSB (Top)

Technical Details:

At the heart of the SBC4661 is the Freescale i.MX6 multimedia processor, a System on Chip (SOC) offering high- performance processing. The core of i.MX6 is a Quad Core 1GHz ARM Cortex-A9 CPU. The CPU is augmented by a floating-point coprocessor, ARM's NEON SIMD media accelerator, and OpenGL ES 2.0 and OpenVG 1.1 hardware accelerators for fast, power-efficient 3D and 2D graphics operations.

The i.MX6 SOC integrates many peripherals, including an interrupt controller, watchdog timer, DDR3 SDRAM and flash memory controllers, One High-Speed USB port, one Full-Speed USB On-The-Go port, a gigabit Ethernet MAC, four 16C550 UARTs, 24-bit flat panel display output, LVDS panel display output, HDMI display output, Camera Sensor Interface port, Audio, FlexCAN, I2C, and PWM.

In addition to the standard peripherals built into the i.MX6, the SBC4661 packs on a second gigabit Ethernet port, four more USB 3.0 Super Speed ports, 4-wire resistive touch screen, and 200 bits of programmable parallel I/O via a Kintex-7 FPGA.

The Kintex-7 FPGA offers users the option of expanding I/O and processing needs. 95% of the FPGA core is available for the user's firmware. Kintex-7 can communicate with the Cortex-A9 CPU via PCIe and Fast memory bus interface. The SBC4661 also provides five IRQ lines from the CPU to FPGA for user firmware needs. For user firmware that requires large amounts of memory, the Kintex-7 has up to 1GB of DDR3 memory interface to it.

The SBC4661 offers three boot options: A dedicated 4MB SPI NOR flash memory, a partition of the NAND flash, and a bootable SD/MMC card slot.

The memory subsystem provides 1GB of DDR3 SDRAM for application data. The 4MB SPI NOR flash memory holds the bootloader and operating system. Up to 8GB NAND flash is also available for operating system and non-volatile user storage.

Large application programs, data storage, and/or portability of either of these items is available by using the second SD card slot or connecting to the SATAII HDD connector to attach an external hard drive.

Four (4) 16C550-compatible RS232 serial ports allow communication with low-speed devices. They are jumper-configurable for full-duplex RS485 communication.

The SBC4661 becomes a powerful front-end processor for control applications with the standard StackableUSB expansion. This popular I/O channel accommodates multiple I/O boards on the top side and/or the bottom side of the board without use of a hub.

For true 32-bit application development, the SBC4661 supports 32-bit operating systems such as Linux and Android. All have full tool suites available, including compilers and debuggers.

For pre-configured sets of options, Micro/sys can provide OEMs with a single part number for ordering. In addition, custom versions of the SBC4661 are available.
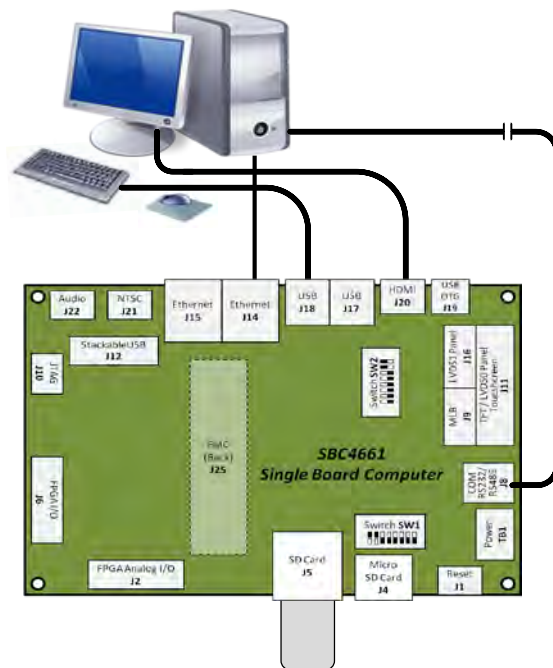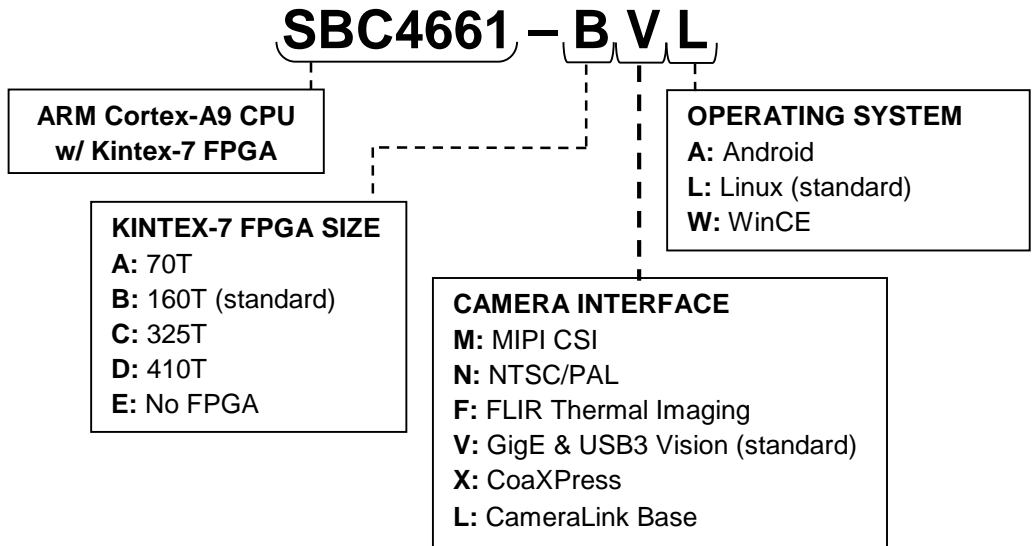

Figure 1 SBC4661 Development Environment

Ordering Information:

SBC4661 – B V L

ARM Cortex-A9 CPU w/ Kintex-7 FPGA

KINTEX-7 FPGA SIZE
A: 70T
B: 160T (standard)
C: 325T
D: 410T
E: No FPGA

CAMERA INTERFACE
M: MIPI CSI
N: NTSC/PAL
F: FLIR Thermal Imaging
V: GigE & USB3 Vision (standard)
X: CoaXPress
L: CameraLink Base

OPERATING SYSTEM
A: Android
L: Linux (standard)
W: WinCE

OEM Single Board Computers	
4661OPT8	Upgrade to 8GB flash
4661OPT24	CFAST Interface
4661OPT45	Audio Interface
4661OPT48	Video Decoder
4661OPT60	StackableUSB Host
4661OPT61	StackableUSB Client

Related Products	
CS4661	Complete Cable Set
BA2020	20-pin high density to 20-pin screw terminal
BA4040	40-pin high density to 40-pin screw terminal
BA4052	50-pin high density to 50-pin screw terminal
CA4133	RJ45 Ethernet Cable
CA4136	Mini B to Type A USB
CA4157	SATAII Cable
CA4158	HDMI Display Cable
CA4159	USB 3.0 Cable

Cables nominally 15", other lengths available
StackableUSB trademark Micro/sys, Inc., VxWorks trademark Wind River, Android trademark Google, Inc.