LUMISSIL Microsystems

A Division of ISSI

T40-HULK Demo Development Kit

T40-HULK is an AIoT application development kit based on the BGA package of T40. T40 has a Starlight Enhancement level ISP and a variety of peripheral interface. The T40-HULK development kit helps customers to be familiar with some algorithms and to speed up their product development. It consists of an operating system, a SDK package and two boards (Ethernet board and core module: CPU, sensor, wifi, memory). With an Ingenic's SoC T40 as the processor, the kit is featured with high performance compute capacity, real-time controller, large-volume on chip memory, a variety of multimedia processing ability as well as Megabit Ethernet networking and other connectivity options.

T40-HULK is not to be considered as a turnkey solution or a product, it is a demo that demonstrates the reliability of our chip and the performance of our algorithms. The target applications are surveillance, home monitoring camera, 4k conferencing camera, dash camera, AIoT, etc... Users can design and evaluate such solutions with the kit easily.

Open source operating system, drivers, programming tools and other software packages and documentation of hardware design are available. The whole package is useful for developers' R&D efforts, and is available as a standalone demo.

FEATURES

• Ingenic T40SoC, includes XBurst2 (main 1.2GHz dual-core CPU), with MIPS ISA, 512bit MXA, FPU and MMU, 64kB data L1 cache, 128kB L2 cache.

• Memory: 2Gb DDR3 in chip, 16MB SPI Nor Flash, TF socket.

• Tizano-III ISP engine, maximum 3840x2160 processing resolution, dual sensor input, 3A/3D/WDR/rgb-ir, LDC, 90 and 270 rotations.

• Camera Interface: Support DVP camera interface or MIPI-2lane or 4lane, up to 4K (3840 x 2160) @ 20 fps .

• MIC and Speaker on board.

• USB WIFI support.

• ETH MAC, 10/100Mbps Ethernet.

• USB2.0(Micro-B), full speed and high-speed modes are supported, it can be used as host OTG also.

• USB-To-UART for debugging.

• Extension port for I2C/USB/SDIO/RMII/ADC.

• Power consumption: Approximately 120mA@12V for a 4K@20fps H.265 streaming via Ethernet.

• Linux 4.4 with open source code.

• Interrupt Controller, Watch Dog, System Timers, DMA, and PWM with timer and counter.

• 2 keys for user self-definition, 1 reset key and 1 key to select the booting mode of the system.

BENEFITS

• Open Source Hardware & Software - Hardware schematic diagram, PCB design, BOM, OS (Linux4.4) and driver software packages.

• Core Module – With a design of stamp-holes, mass shipment is available.

• High Quality Multimedia Capacity - VPU with H.264 and H.265 encoding; dual ISPs; connecting up to 3 cameras; digital and analog audio interfaces.

• Advanced Connectivity - Megabit Ethernet (compliant with IEEE 1588-2002), UART, ADC, I2C.

• Advanced AI development platform, known as "Magik"; typical AI algorithms available: smart tracking, person detection, multi-object detection, etc...

APPLICATION/SOLUTIONS

• AIoT: Service robot, Machine learning box, edge AI applications such as:

Detection solutions: Human body detection, vehicle detection, human face detection, motion detection, etc...

Recognition solutions: Car plate recognition, facial recognition, etc...

• Human Machine Interfaces: Smart Small Appliances, Smart toys, Smart oven, Smart Pet Feeder.

• Surveillance camera or Home monitoring camera: Easy to use, it can connect to network via wireless or wired connection. Ex: Indoor/Outdoor camera, cube camera, security cameras, IPC.

• 4K Conferencing camera: USB cameras, UVC, ...

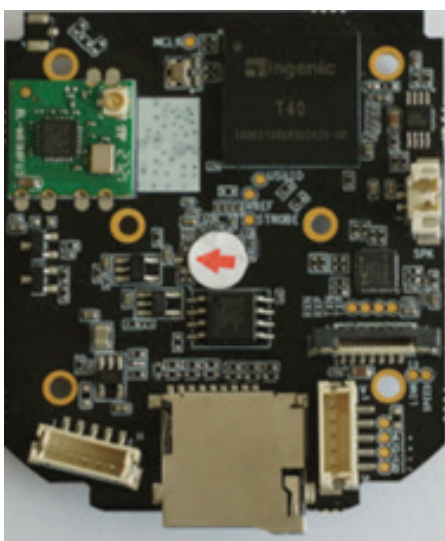• Dash camera: Vehicle driving video recorders.

ORDERING INFORMATION
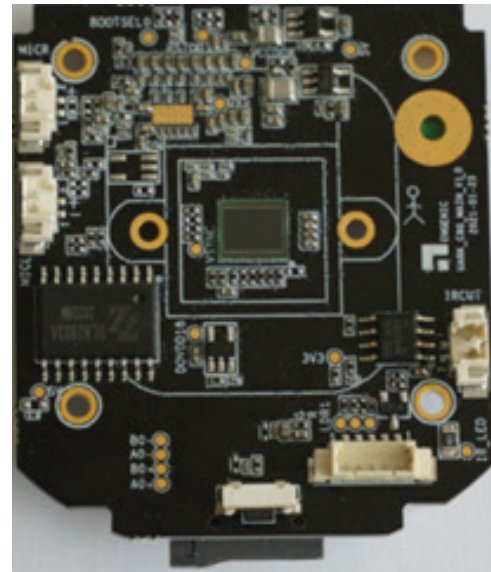
EVK Part Number: T40-HULK-EB

EVK Components:

1) MARK_C80_MAIN_V1.0 (1)

    a) CPU (1)

    b) Sensor (1)

    c) WiFi (1)

2) MARK_C7X_USB_V1.0 (1)
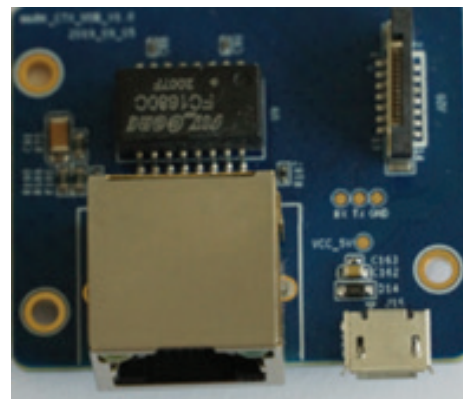
3) Power/Serial cable (1)

SENSOR BOARD IMAGE

MARK_C80_MAIN_V1.0 (Sensor side)

MARK_C7X_USB_V1.0

CORE MODULE IMAGE

MARK_C80_MAIN_V1.0 (CPU side)

EVALUATION KIT

SYSTEM DIAGRAM

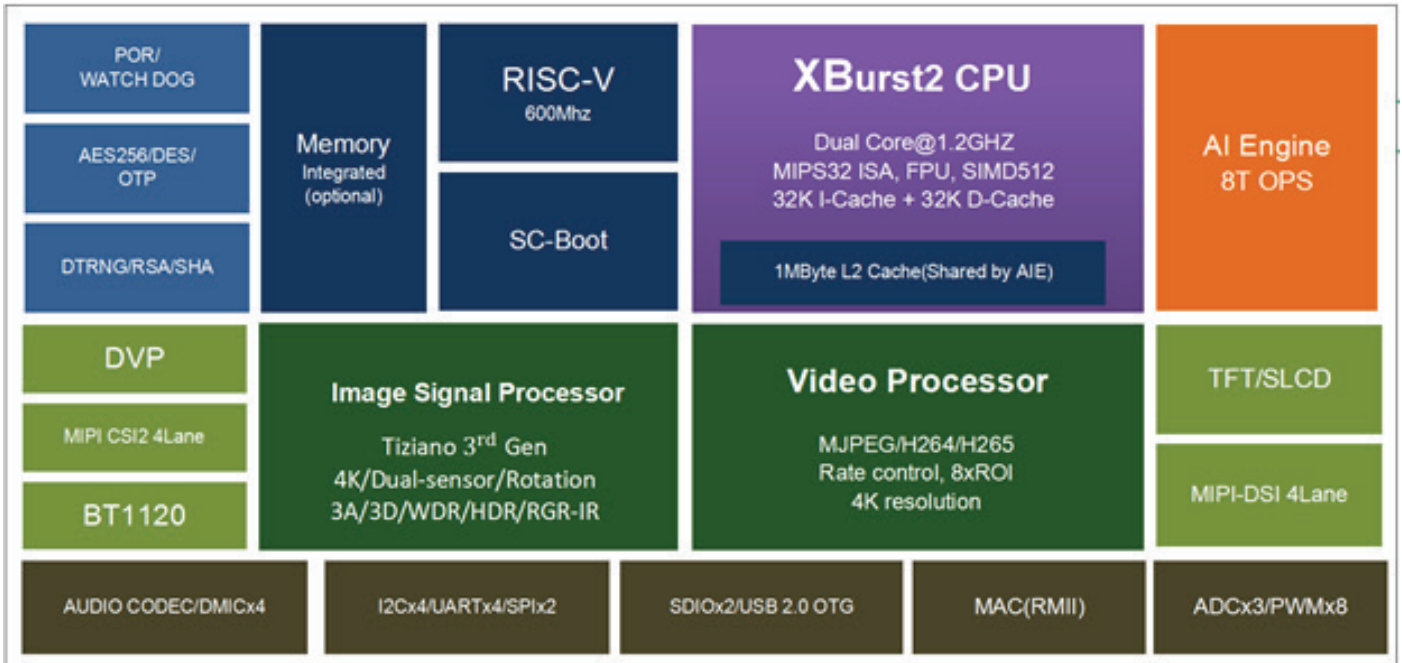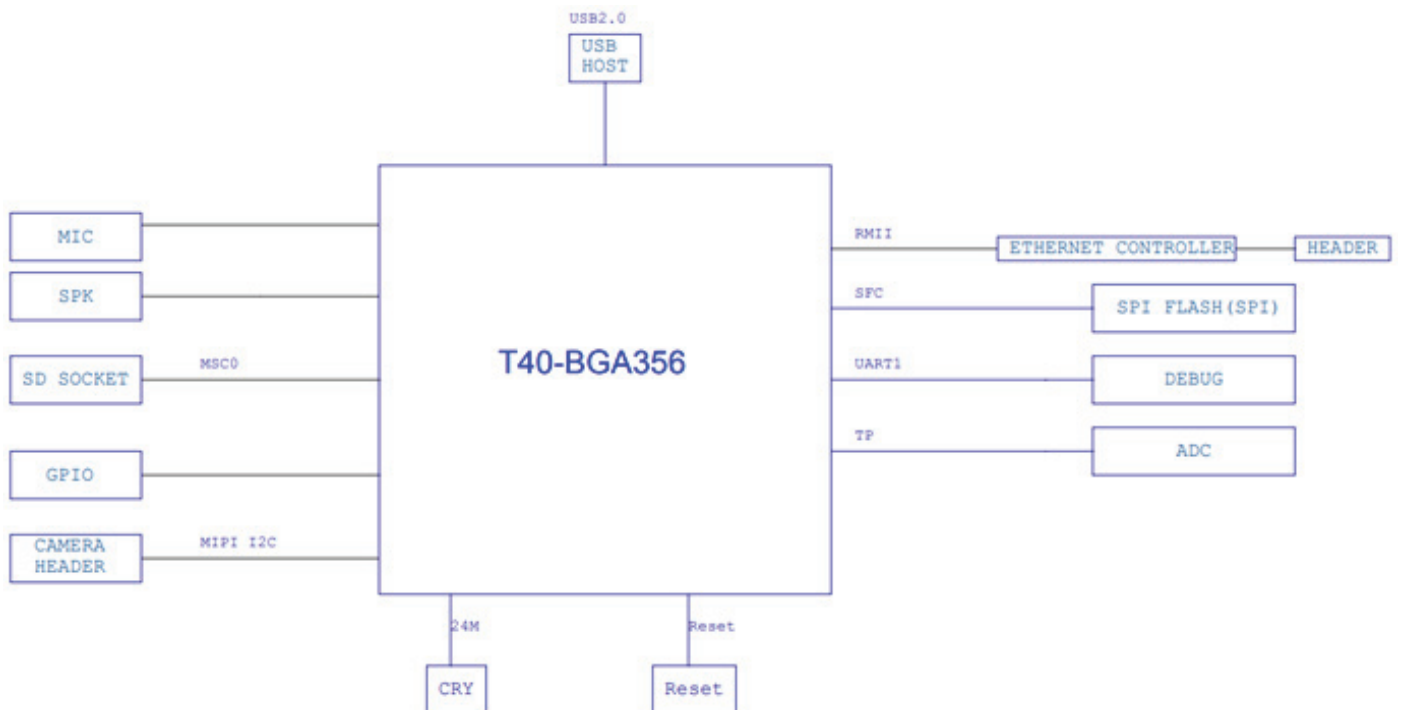| POR/ WATCH DOG	Memory Integrated (optional)	RISC-V 600Mhz	XBurst2 CPU Dual Core@1.2GHZ MIPS32 ISA, FPU, SIMD512 32K I-Cache + 32K D-Cache	AI Engine 8T OPS
AES256/DES/ OTP		SC-Boot	1MByte L2 Cache(Shared by AIE)	
DTRNG/RSA/SHA				
DVP	Image Signal Processor Tiziano 3rd Gen 4K/Dual-sensor/Rotation 3A/3D/WDR/HDR/RGR-IR		Video Processor MJPEG/H264/H265 Rate control, 8xROI 4K resolution	TFT/SLCD
MIPI CSI2 4Lane				
BT1120				MIPI-DSI 4Lane
AUDIO CODEC/DMICx4	I2Cx4/UARTx4/SPIx2	SDIOx2/USB 2.0 OTG	MAC(RMII)	ADCx3/PWMx8

SYSTEM ARCHITECTURE

Questions or feedback may be sent to:
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