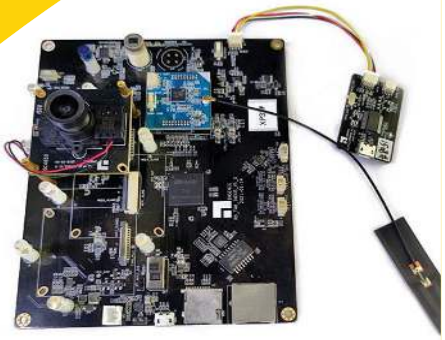
LUMISSIL Microsystems
A Division of ISSI

T40_INDUS Development Kit



T40_INDUS 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_INDUS development kit helps customers to speed up their product development, it consists of development boards (core module, WIFI module and sensor board), an operating system and a SDK package. 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. The target applications are battery camera, portable/mobile home monitoring camera, 4k conferencing camera, 4k dash camera, etc... Users can design and evaluate such solutions with the kit easily.

Open source operation system, drivers, programming tools and other software packages and documentation of hardware design are available. The core module is useful for R&D, and it is available as a standalone demo.

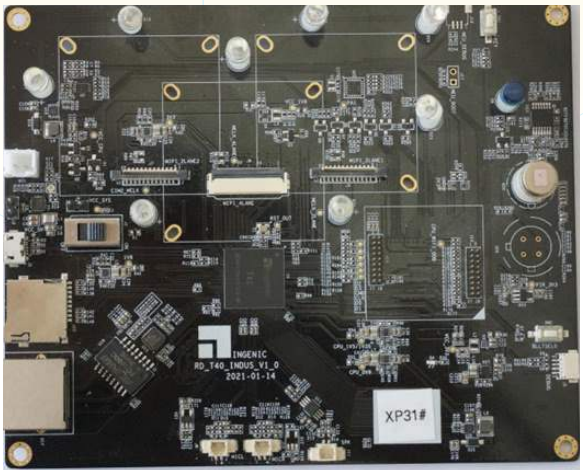
BENEFITS

- 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, baby cry detection, etc...

FEATURES

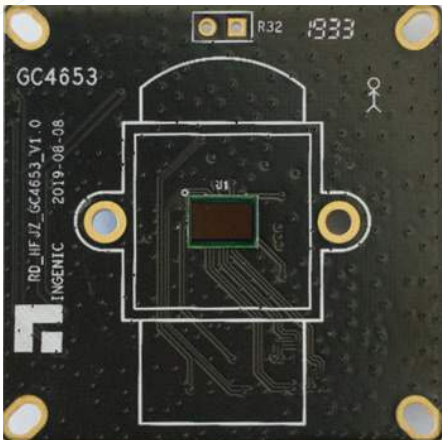
- Ingenic T40SoC, includes a 1.2GHz dual core XBurst2 CPU, with MIPS ISA, 512bit MXU, FPU and MMU, 64kB data L1 cache, 1MByte L2 cache.
- Memory: 1Gb or 2Gb DDR3L in chip, 16MB SPI Nor Flash, TF socket.
- Tizano-III ISP engine, maximum 3840x2160 processing resolution, dual sensor input, 3A/3D/WDR/rgb-ir, LDC, 90 and 270 rotations.
- Camera Interface: Support DVP camera interface or MIPI-2lane or 4lane, up to 4K (3840 x 2160) @ 20 fps .
- Advanced 2D/3D de-noise, 3A, DRC.
- MIC and Speaker on board.
- USB WIFI support.
- 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.
- Fastboot on Linux OS, less than 300ms.
- Low power modes: Idle, Sleep, Deep-sleep, Hibernate.
- 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.

CORE MODULE IMAGE



RD_T40_INDUS_V1.0

SENSOR BOARD IMAGE



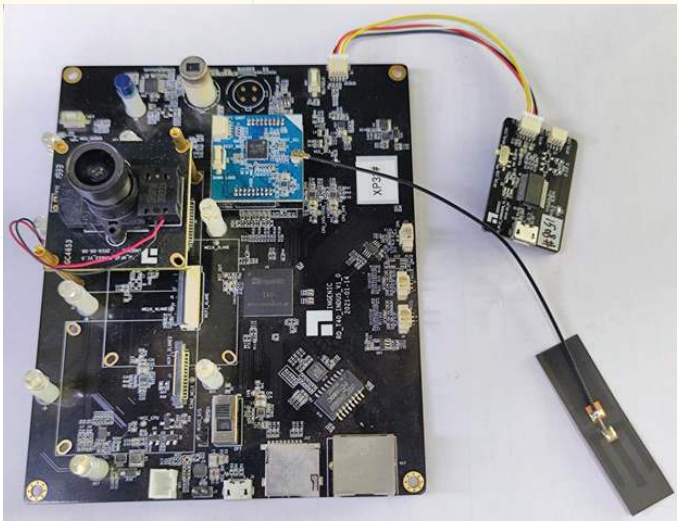
RD_HFJZ_GC4563_V1.0

APPLICATIONS & SOLUTIONS

- Power consumption: The system is running on battery, then the power needs to be used wisely. T40 is always powered off, it will be powered on when an event is detected.
- Fast boot feature: This demo will save a number of frames in less than 300 ms in order to help the user knows what trigger the T40 to be powered on.
- Edge Deep Learning: Detection solutions - Human body detection, vehicle detection, human face detection, motion detection etc.; Recognition solutions - Plate recognition, facial recognition etc.
- Battery Camera/ Mobile home monitoring camera: Such cameras are mostly in sleep mode, they wake up when an event happens, they usually connect to network via wireless. Ex: Doorbell Camera, Hunting Camera, Portable Indoor/Outdoor Camera.

WIFI MODULE IMAGE

EVALUATION KIT

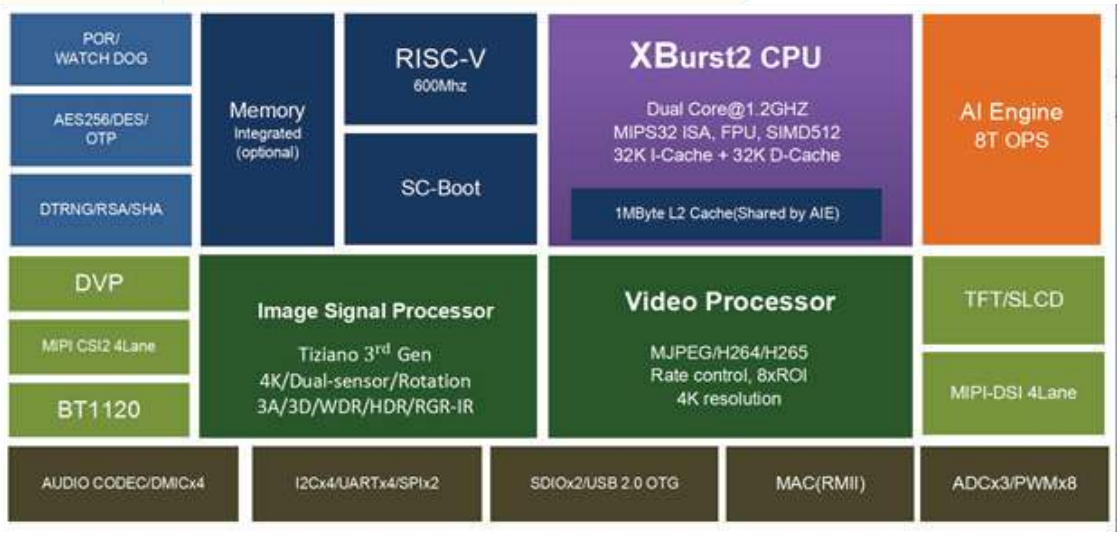


ORDERING INFORNATION

EVK Part Number: **T40-INDUS-EB**

EVK Components:
1) RD_T40_INDUS_V1.0 (1)
2) RD_HFJZ_GC4653_V1.0 (1)
3) RD_ZRT_ATBM6441_IOT_V1.0 (1)
4) RD_HFJZ_USBDEBUG_V1.1 (1)
5) Antenna (1)

SYSTEM DIAGRAM



SYSTEM ARCHITECTURE