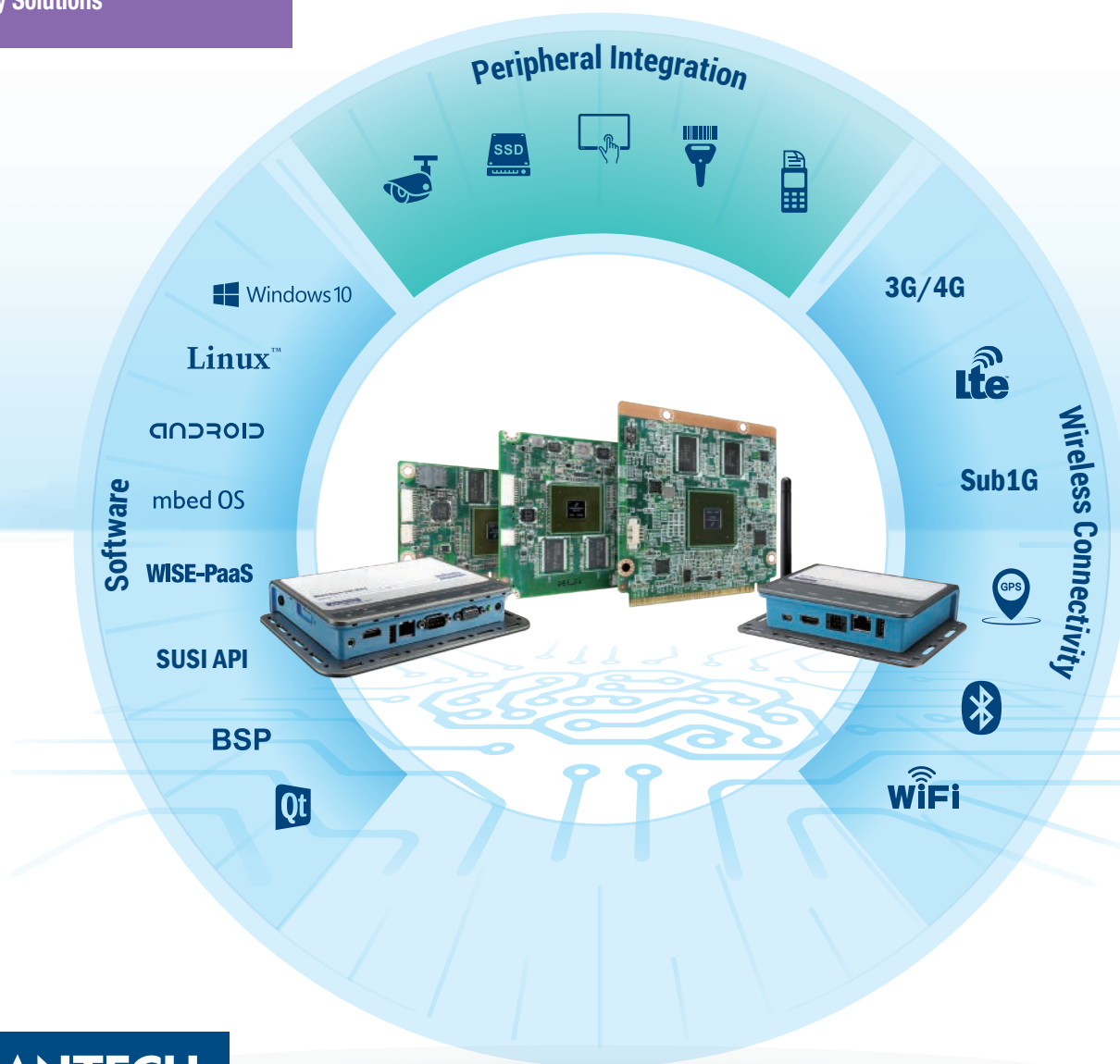# IoT-Enabled ARM-Based Platforms

Enhanced Software Packages and Integration Services

╱ **H/W & S/W Design-in Services**

╱ **Peripheral Integration Services**

╱ **COM Modules: RTX, Qseven, SMARC**

╱ **Low power SBCs**

╱ **Box Computers**

╱ **IoT Gateway Solutions**

Peripheral Integration

SSD

Windows 10

Linux™

ANDROID

mbed OS

WISE-PaaS

SUSI API

BSP

Qt

Software

3G/4G

Lte

Sub1G

GPS

Bluetooth

WiFi

Wireless Connectivity

ADVANTECH

Enabling an Intelligent Planet

Leading RISC Technology

Advantech has been working with RISC technology for over 10 years beginning with MIPS. We design products for many different RISC platforms, from ARM 7 to Cortex-A8 and Cortex-A73. We maintain a leading role in the ARM market and we promise to continuously provide quality and performance industrial grade computing solutions to RISC platform users. Advantech's RISC products will bring ubiquitous, cost effective and power saving solutions that improve people's lives in 21st century.

Comprehensive RISC Platforms

We have dozens of products for various target markets and applications, including industrial control, embedded computers, handheld devices, signage and IoT applications. We have a full range of computer-on-module solutions for developers of customized carrier boards for niche markets; along with an increasing number of single board computers designed for vertical markets and low-power gateways for IoT applications. We not only research and develop hundreds of new products every year, but we also manufacture easy-to-use products for consumers.

General Box PCs

IoT Gateways

SMARC   RTX   Qseven

Computer On Modules

2.5" SBC   3.5" SBC   miniITX

Single Board Computers & Motherboards

Intelligent Factory

Medical / Healthcare

Intelligent Surveillance

Smart Retail

Smart Parking

Digital Signage

Excellence in Partner Innovation

Advantech has recently been building partnerships with different partners in different markets. We ally not only with chip vendors but also with software partners, peripheral designers, system integrators and solution providers. Our partnerships make it simple and quick to innovate a new application and benefit from global support and product distribution. We help partners with customization and specialization, and they push us become the most capable, powerful hardware platform provider in the RISC market.

Advantech Design-in Services

In the past, RISC-based application development was time-consuming and resource-intensive in development due to lack of technical know-how, experience and an incomplete ecosystem. Advantech was aware of that and created a brand new service model to enhance product design-in by an experienced service team with abundant technical know-how. We offer a full-range of assistance in software, hardware and integration and we're capable of software development, board design, test execution, system integration and trouble-shooting, which expedites the development cycles and boosts your own product's time-to-market.

Software
- OS Support
- Middleware/SUSI APIs
- Board Support Package
- Customization

Hardware
- Development Kit
- Reference Design
- Design Review
- Trouble Shooting

Integration
- Test Plan/Program
- Function/Reliability Test
- Certification
- Peripherals/Accessories

Production
- Worldwide Delivery
- Global After Services
- Longevity
- Excellent Quality

Advantech Software Services

To simplify the hardware and software integration process and accelerate application development, Advantech offers software design-in services for all Advantech RISC computing platforms to assist customers with system integration.

Seamless RISC Integration Services for Rapid Application Development

With a dedicated service team and complete documentation and reference guides, customers can easily integrate their own application with our hardware platforms. Furthermore, with Advantech's specialized SUSI API software suite, it's easier to implement customized features into our solutions with I/O that can be fully utilized without waste.

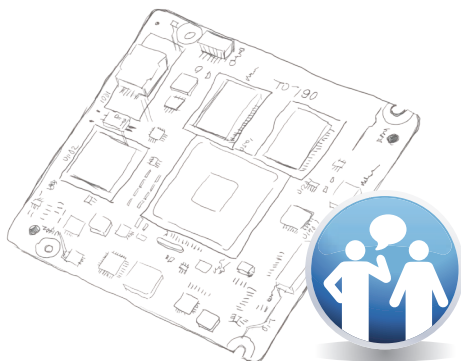## Modularized RISC Software Services for Application Differentiation

Modularized RISC Software services can help make your application more portable so that users can easily move their application between different platforms. Our standardized software development package is available in different form factors and helps facilitate your product development process. It's particularly useful for system integration and function verification since our development tool is standardized and verified.

Complete Documentation and Programming Guide for Application Software Development

Advantech provides specialized documents for every single Advantech product. Instead of copying documents from the original SoC vendor and applying them to all products, our product documents are available for specific platforms and operating systems. We provide user manuals, BSP porting guides, sample codes and test related documents specifically for each Advantech product. Clear guidelines for application software development and system integration help you better integrate our products into your application.
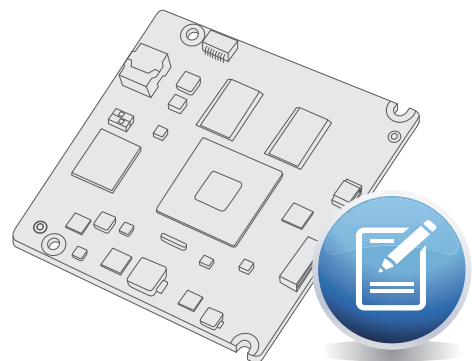
Planning   Design

- ◆ **Complete hardware platform from low power to high performance**
- ◆ **Multiple OS support Linux and Android**
- ◆ **Well integrated industrial-grade peripherals for evaluation**

- ◆ **Embedded QT package for UI design**
- ◆ **Optimized BSP for application development**
- ◆ **WISE-Paas/RMM API for cloud communication**

Bootloader and BSP

To customize your operating system, we offer optimized kernel and drivers for performance enhancement. Multiple bootup selection and secure boot protection bring more flexibility to application design and the reference codes speed up the process of peripheral integration.

SUSI API

To speed up application development and enrich the usability of RISC systems, Advantech incorporates a series of utilities: H/W Monitoring, Watchdog Timer, I2C Control, GPIO Control, Display Power Management, Brightness Control, Security, Signage API, and Remote Upgrade.

Cloud Services

To help transform our RISC platforms into IoT devices, we provide Advantech WISE-Paas IoT software platform, and ARM mbed cloud service to build the communication structure between devices and cloud services. All RISC platforms are also certified by Microsoft Azure so users can easily adopt Azure cloud computing services.

OS Package

To enhance the feasibility of application development, we provide various operating systems with full toolchain for Advantech bootloader, plus OS updates and customization service. For application development and verification, we also offer testing tools and a design guide for the corresponding OS environment.

QT Package

QT is a cross-platform, modularized UI framework for application development. Advantech provides a reliable QT package supporting mainstream Linux dev projects such as Yocto in RISC products. You can easily integrate QT into your build environment by using our Quick Start Guide and reference code. The QT built-in test apps help you verify performance and reliability of the applications you designed.

RISC Developer Forum

We offer an online forum to Advantech RISC users for development consultancy and trouble shooting. You will get an immediate response from our service engineers and get the latest software packages/patches online.
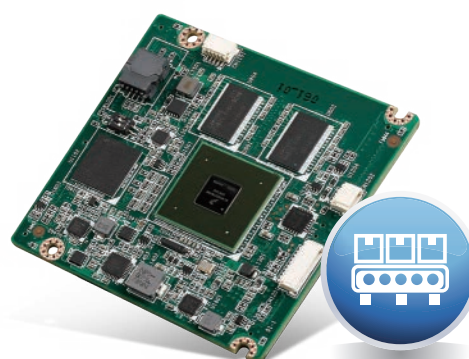
Verification

- Test tools for hardware platform
- ISO certified test cases
- Trouble shooting consultants
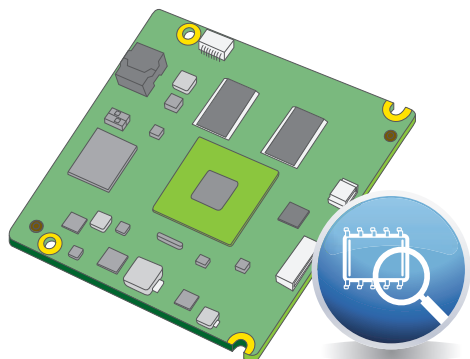
Production

- OEM production service with advanced manufacturing apparatus
- ISO-compliant manufacturing test
- Global RMA service and long-life warranty

Trusted Peripheral Integration

Most industrial-grade product users face the same challenge of product longevity. For the motherboard and PC, they can count on Advantech's industrial grade products but for certain peripheral devices, consumer grade products are the only option but don't last as long or provide product lifecycle longevity support. So Advantech provides customers with robust long-life peripherals including industrial grade display solutions, storage modules and embedded wireless modules. With thorough function verification, compatibility and reliability testing, we can provide you with trusted quality peripherals that match your industrial applications.

Advantech Industrial Display Solutions

Advantech Industrial Display Kit series provides 5.7~31.5" industrial LCD panels and outdoor displays with resistive, projective capacitive touch options.

- Proposal
- Design
- Prototype
- Verification
- Production

Trustworthy Industrial-Grade Peripherals

WiFi Module	WiFi/BT Combo Module	3G Module	GPS Module	Adapter
EWM-W150H02E	**EWM-W155H01E**	**968EMW0093**	**EWM-G108H01E**	**96PSA-A36W12R1**
1750005885 RF Cable	1750006043 Antenna cable	1750007156-01 RF Cable	1750006264 RF Cable	ADAPTER 100-240V 36W 12V 3A DC PLUG 90°
1750000318 Antenna	1750000318 Antenna	1750005865 Antenna	1750007991-01 Antenna	

Advantech Wireless Module Solutions

Advantech Wireless Module Solutions include Wifi modules, 3G/4G and GPS modules, which combine our versatile embedded modules with Linux and Android drivers for worry-free integration and faster time to market.

Advantech Storage Solutions

Advantech Storage Modules include SSD, mSATA, CF and SD cards. We provide reliable wide-temperature storage modules with proven compatibility.

Panels

IDK-1115R-40XGC1E
15" LED panel 1024x768(G) with 5W R-touch

IDK-1115P-40XGC1E
15" LED panel 1024x768(G) with PCAP touch

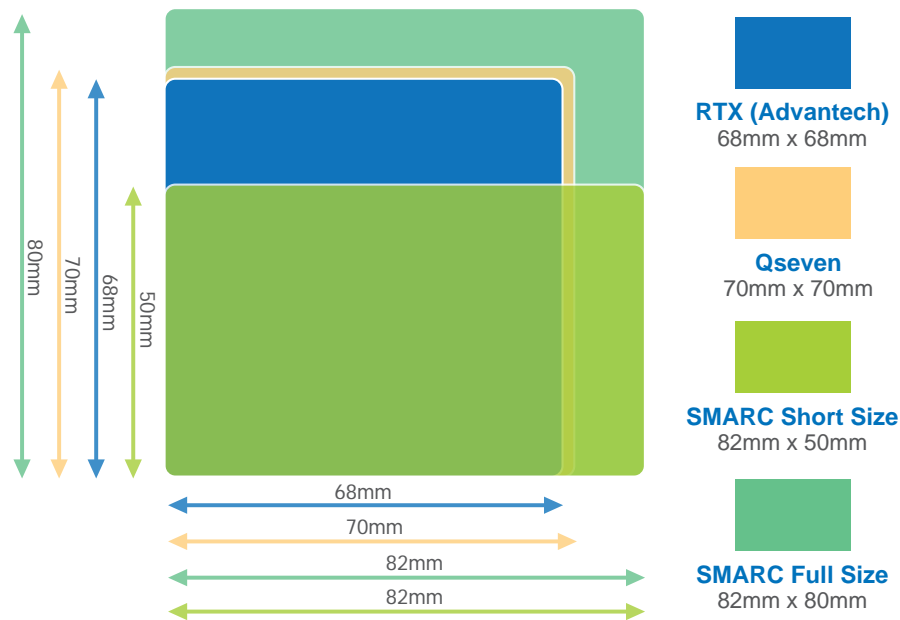**IDK-1107WR-40WVA1E**
7" LED PANEL 400N with 4WR touch, 800x480(G)

96LEDK-A070WV40NB1
7" LED PANEL 400N 800x480(G), AUO G070VW01 V0

Advantech ARM-based Computer-on-Module

Most RISC platform developers know that software development is often more difficult than hardware development. It takes a lot of time to develop the board with every function and the cost as ever increases. As a result, Advantech RISC Computer-on-Module (COM) might be your best choice to save cost and extra effort. We provide a board support package, driver and a reference design ready solution. So there's no need for additional effort on memory calibration and driver adjustments, all the key parameters are well-verified and fine-tuned with examples available for your reference.

RTX (Advantech)
68mm x 68mm

Qseven
70mm x 70mm

SMARC Short Size
82mm x 50mm

SMARC Full Size
82mm x 80mm

80mm
70mm
68mm
50mm

68mm
70mm
82mm
82mm

SMARC

Advantech joined the SGET consortium to contribute to defining the SMARC form factor. The new global standard under the brand name SMARC (Smart Mobility ARCHitecture) is based on ULP-COM, a term which up to now was used for Ultra Low Power Computer-on-Modules.

ROM-5420

- NXP i.MX6 Cortex-A9 1GHz Dual Core
- SMARC 1.0 specification
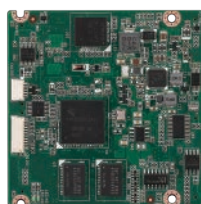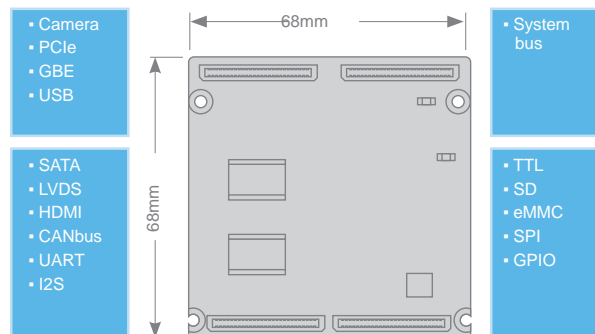- Designed for handheld devices
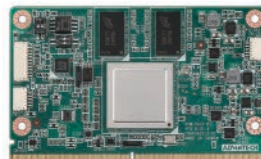
ROM-5420 B1

- NXP i.MX6 Cortex-A9 1GHZ Solo/Dual/Quad core
- SMARC 1.1 specification with wide temperature support
- Designed for handheld devices

RTX

Advantech introduced the RTX 2.0 (RISC Technology eXtended) specification which is a RISC standard platform designed for rugged applications. Through its innovative mechanical and electrical design, products designed with RTX 2.0 can perform in complex and challenging environments such as military, logistics, transportation / fleet management, and many other industrial applications.

- Camera
- PCIe
- GBE
- USB

- SATA
- LVDS
- HDMI
- CANbus
- UART
- I2S

68mm

68mm

- System bus

- TTL
- SD
- eMMC
- SPI
- GPIO

ROM-3310

- TI Sitara AM335x Cortex-A8 1GHz Single core
- Wide range temperature and power input support
- Designed for automation

ROM-3420

- NXP i.MX6 Cortex-A9 1GHz Dual/Quad core
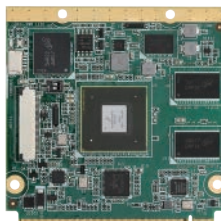- Outstanding graphic performance
- Designed for industrial control

Qseven

The Qseven concept is an off-the-shelf, multi vendor, Computer-On-Module that integrates all the core components of a common PC and is mounted onto an application specific carrier board. Qseven modules have a standardized form factor of 70mm x 70mm and have specified pinouts based on the high speed MXM system connector that has a standardized pinout regardless of the vendor. The Qseven module provides the functional requirements for an embedded application. These functions included, but are not limited to, graphics, sound, mass storage, network and multiple USB ports. A single ruggedized MXM connector provides the carrier board interface to carry all the I/O signals to and from the Qseven module.
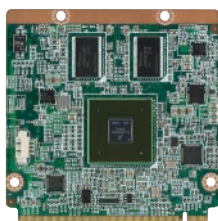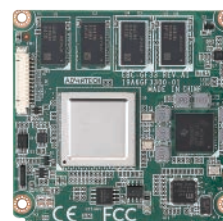
ROM-7420

- NXP i.MX6 Cortex-A9 1GHZ Dual/Quad core
- Cost effective module solution
- Designed for networking and signage

ROM-7421

- NXP i.MX6 Cortex-A9 1GHZ Dual Plus/Quad Plus
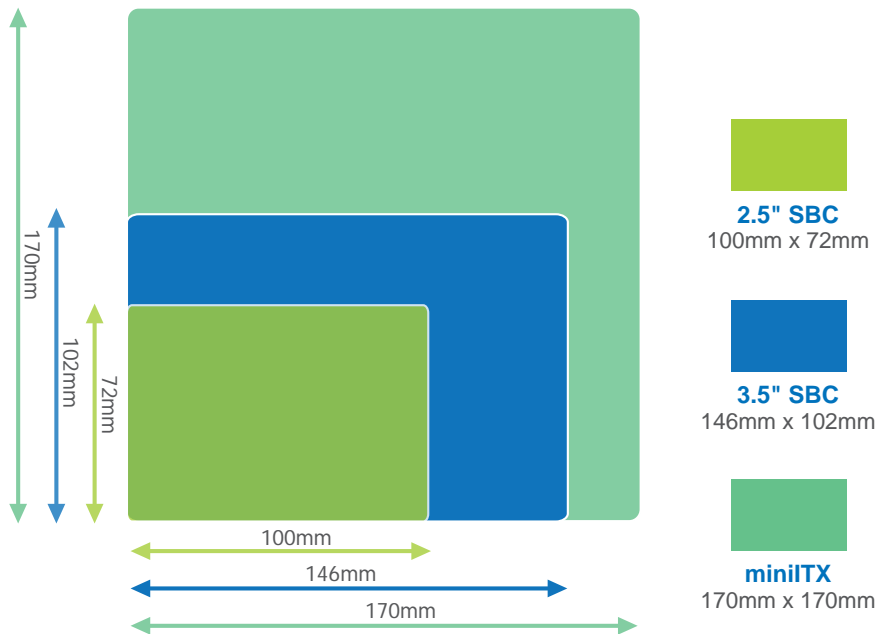- Strong multimedia performance
- Designed for Kiosk and HMI

ROM-7510

- TI Sitara AM5728 Cortex-A15 Dual core
- Outstanding computing ability
- Designed for video surveillance applications

Target-Focused SBCs

Advantech RISC Single Board Computer (SBC Computer) series range from 2.5 inches (100x72mm) to mini-ITX (170x170mm). These embedded computers come in standard form factors in compact sizes and rich I/O, extremely low power consumption and easy expansion capabilities.

2.5" SBC
100mm x 72mm

3.5" SBC
146mm x 102mm

miniITX
170mm x 170mm

170mm
102mm
72mm
100mm
146mm
170mm

Optimized I/O for Vertical Market

All Advantech SBCs are designed specifically for vertical applications including signage, kiosks, industrial control and automation. The I/O specifications are optimized to enhance the performance of the boards and reduce additional cost. In order to facilitate device integration and application development, Advantech offers various OS images, board support package (BSP), middleware and corresponding documents and design guides for reference.

Trusted and Reliable Platforms

With Advantech's global support services and RISC technical support website, it's easy to develop your applications in a short time and deploy fast time-to-market solutions. We offer low power, fanless, compact and standardized single board computers with optional extended temperature support. Advantech is the trusted brand that delivers quality, long-life and reliable RISC-based single board computers.

Cloud Computing

Signage & Kiosk

Automation

Networking

RSB-3850

- Intel Quark X1000 400MHz Single Core
- Power on Ethernet (PoE)
- Yocto Linux Support

RSB-3851

- Intel Quark X1000 400MHx Single Core
- Cost effective IoT gateway solution
- Yocto Linux Support
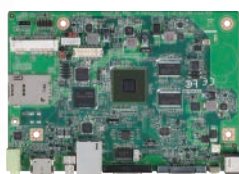
RSB-4410

- NXP i.MX6 Cortex-A9 1GHZ Dual/Quad core
- High resolution 3-display support
- Embedded Linux/Yocto Linux/ Android Support
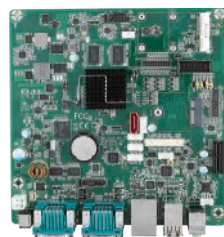
RSB-6410

- NXP i.MX6 Cortex-A9 1GHZ Dual/ Quad core
- Rich I/O for device connection and control
- Android/Yocto Linux support

RSB-4210

- NXP i.MX53x Cortex-A8 800MHz Single Core
- Wide temperature and wide range power input
- Embedded Linux

RSB-4220

- TI Sitara AM3352 Cortex-A8 1GHz Single Core
- Up to 5 COM port with ESD protection and 8 GPIO with Isolation
- Yocto Linux/Android
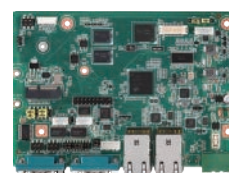
RSB-4221

- TI Sitara AM3358 Cortex-A8 1GHz Single Core
- Dual Ethernet and M.2 Key E for wireless connection
- Yocto Linux/Android

RSB-3410

- NXP i.MX6 Cortex-A9 1GHz Dual Lite
- Dual mini-PCIe slot for wireless connection
- Embedded Linux/Yocto Linux/Android

RSB-4411

- NXP i.MX6 Cortex-A9 1GHz Dual Core/Quad Core/Dual Plus/ Quad Plus
- High performance and full-function I/O support
- Yocto Linux/ Android

Coming soon

RSB-4760

- Qualcomm Snapdragon 410 Cortex-A53 1.2GHz Quad Core
- Onboard GPS/WI-FI/Bluetooth
- Yocto Linux/Windows 10 IoT Core

Optimized Box Solutions

UBC Box Series

RISC-based UBC (Ubiquitous Box Computer) series is designed to meet demands across vertical markets. With an optimized I/O configuration, it's easy to install UBC box computers in your factory, store, parking lot, elevator or wherever you want.

Full Range of Plug-and-Play Solutions

UBC-DS31 and UBC-310 are RISC-based signage boxes powered by the Freescale i.MX6 ultra-low power processor with on-board DDR3 and eMMC. The high graphic performance and built-in signage player software help you plug-and-play your multimedia advertisements. UBC-330 is the most compact box computer designed for automation and industrial control. With rich I/O up to 5 x COM ports, it brings all your devices together and can be controlled by a single host PC, which is cost effective and power-saving. UBC-200 provides high speed network connectivity in a strong metal enclosure and Dual/Quad core processors make your multi-tasking applications smooth and quick. With maximum power consumption under 5 Watts, the UBC series box computers are your ideal 24/7 computing systems.

Signage

- Excellent graphic performance
- High resolution multi-display support
- Power saving technology

UBC-DS31
- NXP i.MX6 Cortex-A9 1GHz Dual Core
- Dual 1080P high resolution displays
- Embedded Linux/Yocto Linux/Android

UBC-310
- NXP i.MX6 Cortex-A9 1GHz Dual Lite
- Dual mini-PCIe slot for wireless connection
- Embedded Linux/Yocto Linux/Android

Automation

- Rich I/O for device control
- ESD/EMI protection/isolation
- Easy mounting/installation design

UBC-330
- TI Sitara AM3352 Cortex-A8 1GHz
- Sufficient I/O for device control
- Yocto Linux/Android

Networking

- Multi-High speed Giga Ethernet
- Stable wireless connectivity
- Outstanding system performance for data transaction

UBC-200
- NXP i.MX6 Cortex-A9 1GHz Dual/Quad Core
- Ultra high speed Ethernet & wireless connectivity
- Embedded Linux/Yocto Linux/Android

UBC-320
- NXP i.MX6 Cortex-A9 1GHz Dual/Quad Core
- Rich I/O for data acquisition & transmission
- Embedded Linux/Yocto Linux/Android

Coming soon

Intelligent IoT Gateway

Specially Designed Gateway Solutions

Advantech provides a series of IP-based RISC compact computers for edge computing. With powerful central processing units, we bring you a complete product line of intelligent IoT gateways. These high performance gateway solutions with abundant connectivity include Gigabit Ethernet and additional Wi-Fi/3G/4G support extended by mini-PCIe card. An internal antenna and dual mini-PCIe slots links your gateway to up to 3 different network communications. For easy mounting they support wall mount brackets and optional VESA/Din-rail for installing UBCs anywhere.

Built-in Innovative WISE-PaaS/RMM

Advantech WISE-Paas/RMM is the soul of these IoT gateways. WISE-Paas/RMM is an IoT device management software platform which provides standard and popular IoT M2M protocols for device and server communication. With WISE-PaaS/RMM, you can remotely control and manage devices and build efficient connections between sensors, gateways and cloud servers.

IoT Gateway

Streaming   Integration   Microsoft Azure   WISE-PaaS   Analytics   Prediction
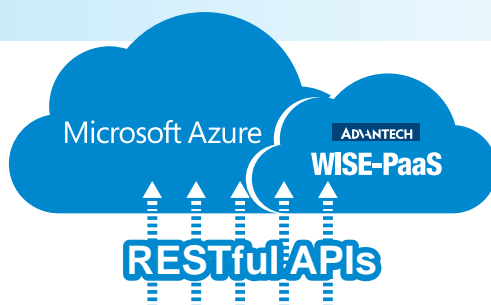
RESTful APIs

WISE-PaaS/RMM
IoT Data and Device
Management Platform   Data Storage   Device Management   Data Flow Logic Designer   Dashboard Builder
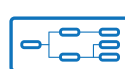
UBC-110   *Coming soon*
- IoT Wi-Fi sensor node solution
- IP68 water/dust proof
- Ultra low power

UBC-220   TAIWAN EXCELLENCE 2014
- IoT sensor gateway
- Gigabit Ethernet, Wi-Fi and 3G support
- High computing ability

UBC-221
- IoT data gateway
- Power on Ethernet and extended wireless support
- WISE Paas/RMM support

UBC-222
- IoT data gateway
- Dual high speed Ethernet and extended wireless support
- WISE Paas/RMM support

Innovative RISC Platforms - Computing + Communication

Demands of Next-generation RISC Computing

There are many technologies that enable IOT as more and more devices and applications are connected to the Internet. A key foundation piece is the network used to communicate between nodes and devices of an IOT installation, a role that several wireless and/or wired technologies may fulfill.

Highly Integrated Wireless Connectivity

RSB-4760 is a next-generation ARM-based single board computer which is rich in wireless connectivity. With built-in Wi-Fi, Bluetooth and GPS module, onboard mini-PCIe slots for 3G/4G/LTE connection and M.2 slot for Sub 1G modules, it brings you at least 5 different wireless connections in one single 3.5" board. As well as the connectivity, RSB-4760 is equipped with Qualcomm Cortex-A53 high performance CPU and up to 2GB LPDDR3 memory, enabling lower power consumption and stunning RISC computing performance.

Compact
- PCB size 102 x 146 mm(3.5")

Connectivity
- 10/ 100/ 1000 GbE
- Wi-Fi/ Bluetooth/ GPS on board
- mini PCI-e for cellular M.2 for Sub1G

Integrated
- Configure-to-order Service
- One-stop Peripheral & Enclosure Integration
- Customized Thermal Solution

Powerful
- Onboard 8GB e.MMC flash
- USB 2.0 and OTG
- RS-232/ RS-422/ RS-485
- GPIO/ I2C/ SPI

Optimized
- Windows 10 IoT Core
- Debian Linux
- Yocto Linux
- Android

Industrial ARM-based Starter Kits

10-minute Startup for Your ARM Project

Designed to assist developers get up and running quickly on ARM-based platforms and applications. Advantech Industrial ARM starter kit is a complete package that includes the basic components necessary to quickly start development on ARM architectures.

We've built a streamlined evaluation process with follow up design-in services.

Concept POC (Proof of Concept) Evaluation   Design Application Implementation   Mass Production

Advantech
Design-in Services

HW   OS   BSP   Tool

Schematics   Layout

Quality   Longevity

Advantech ARM-based Starter Kit   Your Carrier Board   Your Product
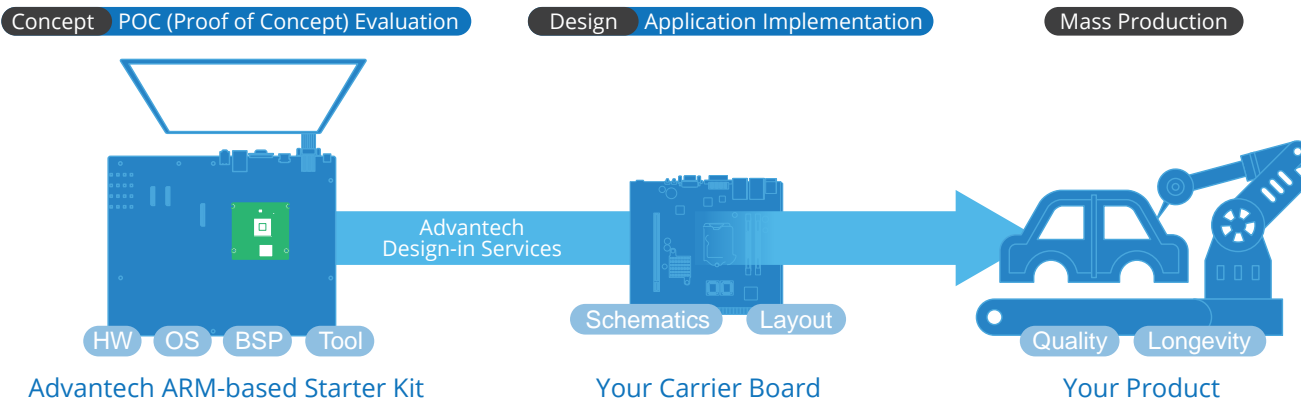
Verified Hardware and Software for Immediate Start

We provide you with a complete hardware platform for function and performance evaluation. This includes everything you need including, main board, cables, power adapter, LED panel and SD card. We also have a built-in Linux OS for your quick evaluation, and if you are not familiar with Linux in console mode, we have an Ubuntu OS image online for download. We also offer Android support to keep ahead of the trends in ARM-based application development. You can use the SD card included in your starter kit to install an image on.

3.5" SBC TI Sitara AM3352 Starter Kit	**RTX NXP i.MX6 Starter Kit**	**Qseven NXP i.MX6 Starter Kit**
RSB-DK4220	ROM-DK3420	RSB-DK7420
3.5" SBC TI Sitara AM3358 Starter Kit	**RTX TI Sitara AM3352 Starter Kit**	**SMARC NXP i.MX6 Starter Kit**
RSB-DK4221	ROM-DK3310	ROM-DK5420
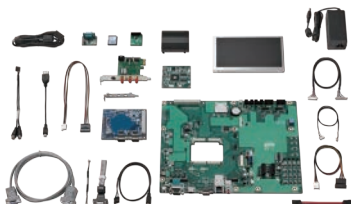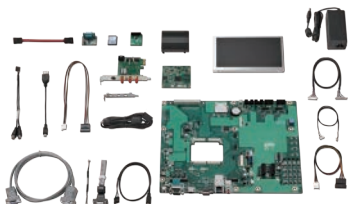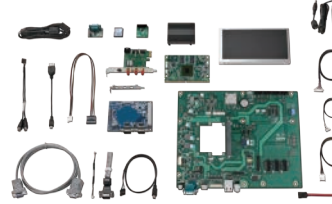
As the impacts of climate change and population explosion affect us, humans are facing unprecedented challenges and potential food crisis. In order to avoid waste, better utilize limited resources, and increase crop yields, the effective harnessing of the power of modern technology has becomes critical. Intelligent agriculture not only helps improve harvests but it also saves human resources, and decreases the detrimental harm from pesticides and chemical fertilizers.

Intelligent Agriculture System with Advantech Intelligent Gateway and Sensor Node Integration

Application Requirements

One of Advantech's clients, an agriculture corporation located in the north of the U.S. has been facing serious water shortages and insufficient human resources. Although there are strong demands from the market for safe organic food products, they unfortunately suffer from seriouspest infestation problems due to the nature of their production. Consequently, the industry decided that a modern, smart and more efficient method of cultivation was essential to the long-term survival of their industry.

System Solutions

To meet these demands, Advantech introduced a series of intelligent agriculture solutions using high performance embedded RISC systems. For this customer, Advantech deployed a solution that included a UBC-330 RISC box PC with wireless IoT node solutions WISE-1000 Series, combined with WISE-Cloud software service to manage temperature/moisture optimization, remote farm management, automatic irrigation, pest control, and energy control. The totally integrated solution was able to help overcome water shortages through better resource management and bring about a more efficient profitable operation for the organic food producers.

UBC-330 Box PC

Powered by ARM Cortex-A8 TI Sitara processor which collects data from sensor nodes and manages the control devices accordingly.

WISE-1021 IoT Node with WISE-1251 Extension Module

Connects temperature, humidity and PH value sensors through RS-422 or RS-485, and transforms analog data into digital data and sends it to a sensor gateway.

WISE-1021 IoT Node with WISE-1252 Extension Module

Controls electronic farming facilities such as water sprays and heat boosters. It receives orders/commands from the data gateway and controls devices accordingly.

Benefits

- Integrated solutions from intelligent gateways and sensor nodes, to remote management with software built-in.
- Easily implemented reliable Wireless Sensor Networks solution.

Reliable Intelligent Solution for Logistics – Faster and Precise Delivery for Online Shopping

With the popularization of the Internet, more and more people choose to use online shopping. The ever increasing domestic demand requires a huge supply chain, so efficient logistics systems will be crucial to the success of online shopping, and intelligent devices will play an increasing role in expanding shipping bandwidth and improving customer service.

Challenge

Facing massive online business orders, the customer realized they had to change their ways to fulfill all delivery requirements. Labor costs and resource needed to be carefully managed and a new intelligent logistics business model needed to be introduced—supplementing the workforce with intelligent devices, so total control and monitoring can be enabled through the implementation of a cloud service.

Solution

Advantech offered various solutions to meet the customer's requirements. This included a UBC-220 RISC-based low power box computer in each truck, and a ROM-3420 high performance fanless computer-on-module in each intelligent parcel and dispatch center for shipment dispatch, control, and tracking log data storage. WISE-1020 sensor nodes are bundled with WISE-PaaS support so data can be gathered efficiently, stored securely, and transmitted rapidly.

Reliable Intelligent Solution for Logistics

All trucks, transfer posts and dispatch centers are connected to Advantech WISE-PaaS with wireless monitoring, especially the in-vehicle solution UBC-220, powered by a RISC-based SoC, which is a cost effective, reliable and power-saving hardware platform to accomplish 24/7 transportation monitoring. With add-on GPS and 3G module, it connects to the cloud and obtains real-time traffic information, and gets the best routes from the cloud which saves the time and fuel costs— benefitting both users and the environment. Plus, the implementation of EDR and wireless sensors improve security and the logistics flow is now much more accurate and dependable.

Effective Data Mining and Information Analysis

All data generated during transaction, including the information of the online shoppers and the sellers, the content of the shipments, the shipping methods and the routes, all go back to the cloud, and through an effective data mining analyzer, can be reused in many different ways. Advantech offers ROM-3420 as the data collector and I/O manager, which is an ultra-low-power computer-on-module powered by a high performance RISC-based SoC. It's totally fanless and the module design makes it flexible enough to implement any additional I/O demands. The high computing capability helps analyze and processes the data, transfers it into valuable information and synchronizes it to the cloud database. ROM-3420 empowers intelligent logistic solutions and changes our lives.

UBC-220

- Freescale i.MX6 Dual Lite 1GHz
- 1GB DDR3/ 4GB e.MMC Flash Memory
- Support dual independent display by 24-bit LVDS and, HDMI
- GPS/3G/WiFi module compatible

ROM-3420

- Freescale i.MX6 Dual/Quad 1GHz
- DDR3 up to 2GB/4GB e.MMC Flash Memory
- Rich I/O RTX 2.0 module design
- -40°C wide operating temp. support
- Supports SUSI API, Embedded Linux, Yocto Linux and Android

WISE-1020

- Mesh networkwith 99.999% reliability
- Easy installation and configuration
- External SMA dipole antenna or on-board chip-antenna

Complete ARM-based Development Kit and Design-in Services for Compact Banknote Recycler

Through the use of online payments, the popularity of electronic money has grown enormously these last few years,but real hard cash is still used every day by most people. Currency is the basis of global economics and it's inevitable that counterfeit banknotes circulate in the financial system, and governments, banks, companies and individuals are all looking at ways to overcome the counterfeit banknote problem. A banknote recycler machine might be the best weapon to combat fake bills as these are smart enough to distinguish between real and fake notes. With a banknote recycler, receiving bogus bills is not something to worry about anymore.

Challenge

In the past, banknote recycling machines were only used in large businesses like banks and casinos so the size of the machine didn't really matter. However, as more and more stores and companies received fake notes, they started searching for banknote recycling machines to protect their own interests. One of the leading companies of banknote recycler machines found that new customers were asking for a small-sized functional banknote recyclers, but at that time they didn't really have this kind of solution. New customers had no interest in the traditional stand-alone, powerful banknote machines, they want something compact, noiseless, power saving, cost effective and it needed to be portable.

Solution

Advantech ROM-7420 is a cost-effective Computer-on-Module based on advanced ARM technology. It provides plenty of I/O and outstanding system performance to easily run the banknote identifier device which categorizes the notes by country or by value. The advanced graphic engine also helped distinguish fake notes by using a graphical analysis program developed by the banknote machine designer.

Development Kit for Prototype

Advantech offered a ROM-7420 development kit to the designer in order to provide them with a simple and quick way to evaluate performance. The development kit includes everything they need including ROM-7420 module board and its corresponding carrier board ROM-DB7500, a 12V AC/DC power adapter, cables to connect peripherals, and an LED panel for display and touch panel development. Building a prototype using the development kit meant less effort and they received lots of reference documents from Advantech's website to help them. In the end, theROM-7420 development kit efficiently speeded up development and helped get the next generation banknote recycler to the market faster.

Advantech Design-in Service

In the middle of development, a fatal issue popped up which bothered the designer and risked the product's launch schedule. Advantech jumped in without hesitation with a professional support team focused on software and hardware debugging. As a result of providing timely support and onsite service to their customer, they were able to quickly resolve all issues and get the project back on track. Advantech customers enjoy a dedicated global support team for ARM-based technology design-in services. No matter where you are, you can easily contact with Advantech's team and get the resources you need. They can help you debug and fine-tune your system in a short time, and can also offer free training courses. For more information, please visit risc.advantech.com
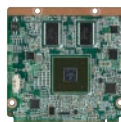
ROM-7420

- Qseven 1.2 Computer-on-Module
- NXP i.MX6 plus Dual/Quad 1GHz
- DDR3 1 GB/2 GB; 4 GB e.MMC Flash Memory
- Rich I/O for device control
- 7-year longevity support

IDK-1107

- 7 inch High Brightness LED
- 4-wire Resistive Touch
- Reliable touch assembly
- Standard 2-year warranty

Application Story

In factories, industrial safety is the most important issue in the workplace. The health and safety of each shop floor worker is an important issue for all companies so there are various common practices that need to be applied in order to avoid danger and accidents. This includes SOPs, posting warning notices, and developing training sessions. All this investment requires a lot of time and effort so it's no surprise that technology is playing a role in implementing industrial safety procedures.

Rich I/O for Reading Sensor Data and Control Devices to Build Intelligent Factory Automation System

Challenge

In chemical factories, chemical materials and finished liquid and gas products are transmitted via pipes. Those gasses and liquids are not all neutral; most of them are alkaline or acidic and some are caustic so there are very real dangers if there are leaks. Making sure substances are stable in the pipes is very important. In general, factories install pressure meters to monitor pipe conditions, and use speakers or warning lights to notify if there are emergencies or abnormalities.

Solution

Advantech offered RSB-4420, a cost-effective 3.5" single board computer based on advanced ARM technology which is compact in size and completely fanless. It has rich I/O for reading sensor data and controlling devices. Unlike low level microcontroller solutions, RSB-4220 has a rich control interface including RS-232/422/485, CAN bus, and GPIO. There are also 2 x Gigabit Ethernet, mini PCIe for Wi-Fi, and standard Linux OS for factory automation applications.

Compact 3.5" Single Board Computer for Factory Automation

RSB-4220 is a compact 3.5" Single Board Computer (SBC) which supports RS-232 interface for reading and monitoring pressure sensor values. Through its GPIO interface and warning lights, it displays status, controls the pipe valves, and adjusts the pressure accordingly. It sends back sensor data to the server for recording and analysis, and remotely upgrades its software through the internet. RSB-4220 was integrated into the real-time monitoring system which helped the factory reliably manage production as well as health and safety.

Software Design-In service for Application Development

Advantech provides a Software Design-In Service to help customers develop their own application. This includes an Advantech loader, optimized BSP, Embedded OS package, SUSI API, and QT software package to assist customers with integration of firmware and UI development. They also provide a service for peripheral driver integration, porting, and system integration. Advantech provides a reliable H/W platform and a rich S/W package to simplify the development of factory automation applications and help companies comply with industrial safety regulations.

RSB-4220
- TI Sitara AM3352 Cortex A8 1GHz
- On-board DDR3 800MHz 512MB & 4GB eMMC NAND flash
- Supports 4 GPI/GPO with isolation
- Supports 6 x UARTS with ESD protection
- Supports network capability of 2x Gigabit Ethernet and 1x MiniPCIe socket for WiFi
- Supports Linux BSP V3.2.0

RISC Computing Platforms

Computer-on-Modules

Model Name		ROM-1210	ROM-3310	ROM-3420	ROM-5420 B1	ROM-7420	ROM-7421	ROM-7510
Form Factor		RTX V1.6	RTX V2.0	RTX V2.0	SMARC V1.1	Qseven V1.20	Qseven V2.0	Qseven 2.0
Processor System	CPU	NXP ARM Cortex-A8 i.MX53 800 MHz	TI AM3352 Cortex-A8 1 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz	NXP ARM Cortex-A9 i.MX6 Plus 1 GHz	TI Sitara AM5728 Cortex-A15 Dual Core 1.5 GHz
Memory	Technology	DDR3 800 MHz	DDR3 800 MHz	DDR3 1066 MHz	DDR3 1066 MHz	DDR3 1066 MHz	DDR3 1066 MHz	DDR3L 1066 MHz
	Capacity	On-board DDR3 512 MB	On-board DDR3 512 MB	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board DDR3 1 GB/ 2 GB	On-board DDR3L 2 GB
	Flash	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	8 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader
Graphics	LVDS	2 24-bit LVDS, 1024 x 768 at 60Hz	-	1 Single 24-bit LVDS, 1366 x 768 at 60Hz	1 Single 24-bit LVDS, 1366 x 768 at 60Hz	2 24-bit LVDS, 1366 x 768 for 1ch; 1920x1080 for 2ch at 60Hz	2 24-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	2 24-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz
	HDMI	-	-	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz
	Parallel RGB	1 24-bit TTL, 1600 x 1200 at 60Hz	1 24-bit TTL, 1366 x 768 at 60Hz	1 24-bit TTL, 1920 x 1200 at 60Hz	1 24-bit TTL, 1920 x 1200 at 60Hz	-	-	-
	VGA	-	-	-	-	1920x1080 at 60Hz	-	-
	Graphics Engine	1 IPU. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	Integrated LCD Interface Display Driver (LIDD) Controller	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	2 IPUs. OpenGL ES 3.0 for 3D, BitBlt for 2D and OpenVG 1.1	2D-Graphics Accelerator (BB2D) Subsystem and Dual-Core PowerVR® SGX544™ 3D GPU
	H/W Video Codec	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	-	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP
Ethernet	Chipset	NXP i.MX53 integrated RMII	TI AM3352 Integrated RGMII	NXP i.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	NXP i.MX6 Plus integrated RGMII	TI Sitara integrated RGMII
	Speed	1 x 10/100 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps
RTC		Yes	Yes	Yes	Yes	Yes	Yes	Yes
WatchDog Timer		256-level timer interval, from 0 ~ 128 sec	1~6553s, default 60s, power on/off 1s	256-level timer interval, from 0 ~ 128 sec	256-level timer interval, from 0 ~ 128 sec	256-level timer interval, from 0 ~ 128 sec	1~6553s, default 60s, power on/off 1s	256-level timer interval, from 0 ~ 128 sec
I/O	PCIe	-	-	1 PCIe x 1	1 PCIe x 1	1 PCIe x 1	1 PCIe x 1	1 PCIe x 1
	SATA	1 SATA I	-	1 SATA II	1 SATA II	1 SATA II	1 SATA II	1 SATA II
	USB	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 1 USB 2.0 OTG	1 USB 2.0, 1 USB 2.0 OTG	4 USB 2.0 (1 USB OTG)	1 USB 3.0, 3 USB 2.0 (1 USB OTG)
	Audio	I2S	I²S	I2S	I2S	I2S	I2S	-
	SPDIF	-	-	-	1	-	-	-
	SDIO	2	1	1	1	1	1	1
	Serial Port	5 UART (2 x 2 wire, 3 x 4 wire w/ 3.3V)	4 UART (1 x 4 wire, 3 x 2 wire w/ 3.3V)	3 UART (3 x 4 wire w/ 3.3V)	4 UART (2 x 2 wire, 2 x 4 wire w/ 3.3V)	4 UART (4 x 2 wire w/ 3.3V)	2 UART (2 x 4 wire w/ 3.3V)	2 UART (4 wire)
	SPI	1	1	2	4	1	1	1
	CAN	2 x CAN bus 2.0 A/B	2 x CAN bus 2.0 A/B	2 x CAN bus 2.0 A/B	2 x CAN bus 2.0 A/B	2 x CAN bus 2.0 A/B	1 x CAN bus 2.0 A/B	1
	GPIO	20	10	10	12	8	8	8
	I2C	2	1	4	5	3	1	1
	Camera Input	-	-	1 MIPI v1.0, 4 x Lane	1 MIPI v1.0, 4 x Lane	-	-	-
	System Bus	Address:25 bits Data:16 bits	-	Address: 26 bits Data: 16 bits	-	-	-	-
	Touch	1	-	-	-	-	-	-
	Keypad	6 x 6 Matrix	-	-	-	-	-	-
	PWM	-	-	-	-	-	-	2
Power	Power Supply Voltage	3.3 ~ 3.6 V	5 ~ 24 V	5 ~ 24 V	3 ~ 5.25 V	5 V	5V	5V
	Power Consumption	2.2W	2.11W (Max)	3.3W (Max)	3.4W (Max)	3.4W (Max)	4W (Max)	7W (TBC)
Environment	Operational Temperature	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C/ -40 ~ 85° C	0~60° C / 40~85° C	0~60
	Operating Humidity	0% ~ 90% relative humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% relative humidity, non-condensing	0% ~ 90% relative humidity, non-condensing
Mechanical	Dimensions (W x D)	68 x 68 mm	68 x 68 mm	68 x 68 mm	82 x 50 mm	70 x 70 mm	70 x 70 mm	70 x 70 mm
Operating System		Linux	Linux	Linux Android	Linux Android	Linux Android	Linux Andorid	Linux
Certifications		CE/FCC Class A	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B

Box Computers

NEW

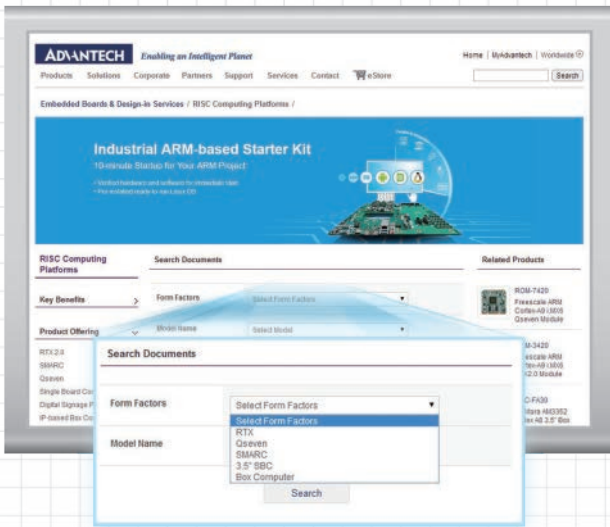| Model Name		UBC-200	UBC-220	UBC-221	UBC-222	UBC-330	UBC-DS31
Processor System	CPU	NXP ARM Cortex-A9 i.MX6 1 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz	Intel Quark x1000 400MHz	Intel Quark x1000 400MHz	TI AM3352 Cortex-A8 1 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz
Memory	Technology	DDR3 1066 MHz	DDR3 800 MHz	DDR3 800 MHz	DDR3 800 MHz	DDR3 800 MHz	DDR3 1066 MHz
	Capacity	On-board DDR3 1 GB/2 GB	On-board DDR3 1 GB	On-board DDR3 512 MB	On-board DDR3 512 MB	On board DDR3 512 MB	On-board DDR3 1 GB
	Flash	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 MB SPI NOR Flash for Advantech boot loader	4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader
Graphics	LVDS	-	1 24-bit LVDS, 1366 x768 at 60Hz	-	-	-	-
	HDMI	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	-	-	-	1920 x 1080 at 60Hz
	VGA	-	-	-	-	-	1920 x 1080 at 60Hz
	Graphics Engine	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	1 IPU. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	-	-	-	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1
	H/W Video Codec	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP Encoder: MPEG-4 SP, H.264 BP, H.263	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263,MJPEG BP	-	-	-	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP Encoder: MPEG-4 SP, H.264 BP, H.263
Ethernet	Chipset	NXP i.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	Intel Quark integrated RMII	Intel Quark integrated RMII	TI AM3352 Integrated RGMII	NXP i.MX6 integrated RGMII
	Speed	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	2 x 10/100 Mbps (One w/ PoE)	2 x 10/100 Mbps	2 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps
WatchDog Timer		256-level timer interval from 0~128 sec	1~6553s, default 60s, power on/off 1s	1~6553s, default 60s, power on/off 1s	1~6553s, power on/off 1s	1~6553s, default 60s, power on/off 1s	256-level timer interval from 0~128 sec
I/O	USB	1 USB 2.0 Host	power on/off 1s	1 USB 2.0 Host	1 USB 2.0 Host	1 USB 2.0 Host	1 USB 2.0 Host
	Audio	HDMI Audio	HDMI Audio	-	-	-	1 x Line-out
	SDIO	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot
	Serial Port	-	1 x 4 wire RS-232	1 x 4 wire RS-232	1 x 4 wire RS-232/422/485	1 x 4 wire RS-232/422/485 4 x 2 wire RS-232 w/ ESD protection	1 x 4 wire RS-232
	GPIO	-	-	2 GPI/ 2 GPO w/isolation	-	4 GPI/ 4 GPO w/ isolation	-
	CANBus	-	-	-	-	1	-
	I2C	-	-	-	-	1	-
	Button	1 x Reset button	-	-	-	1 x Reset button	1 x Reset button
Indicator	LED	1 Green LED for system power	1 Green LED for system power 1 Green LED for user define	1 Green LED for system power 1 Green LED for user define	1 Green LED for system power 1 Yellow LED for user define	1 Green LED for system power 1 Green LED for RF status	1 Green LED for system power 1 Green LED for RF status
Expansion	Mini PCIe	1x mini PCIe slot	2x mini PCIe slot	1x mini PCIe slot	1x mini PCIe slot	1x mini PCIe slot (Only USB Signal)	1x mini PCIe slot
	SD Socket	1 x SD slot	1x SD slot	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot
	SIM	1x SIM slot	1x SIM slot	1 x SIM slot	1 x SIM slot	-	1x SIM slot
	Antenna Hole	1x Antenna hole	1 x Antenna hole	1x Antenna hole	1x Antenna hole	1 x Aetenna hole	1x Antenna hole
	Others	-	1x Internal antenna support	1x Internal antenna support	1x Internal antenna support	-	-
Power	Power Supply Voltage	12 V , 19 V , 24 V	12V	12 V / PoE 802.3 at Class 3	5 V	12 V , 19 V , 24 V	12 V
	Power Type	DC-in	DC-in	DC-in / PoE 802.3 at Class 3	DC-in	DC-in	DC-in
	Power Consumption	6.6W (Max)	4.4W (Max)	2.76W (Max)	2.76W (Max)	3.3W (Max)	3.8W (Max)
Environment	Operational Temperature	0 ~ 60° C / -20 ~ 70° C	0 ~ 60° C	0 ~ 60° C	0 ~ 60° C	0~60°C	0 ~ 40° C
	Operating Humidity	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing
Mechanical	Dimensions (W x D x H)	108 x 79 x 30 mm	120 x 89 x 30 mm	120 x 89 x 30 mm	120 x 89 x 30 mm	191 x 129 x 30 mm with metal plate 166 x 117 x 30 mm without metal plate	191 x 129 x 30 mm with metal plate 166 x 117 x 30 mm without metal plate
	Mounting	Wall mount, DIN rail by option	Wall mount, DIN rail, VESA 75/100 by option	Wall mount, DIN rail, VESA 75/100 by option	Wall mount, DIN rail, VESA 75/100 by option	Wall mount, VESA 75/100, Flexible mount with two screw holes on the metal plate	Wall mount, VESA 75/100, Flexible mount with two screw holes on the metal plate
	Weight	312g	215g	210g	210g	265g	265g
Operating System		Linux Android	Linux Android	Linux	Linux	Linux	SUSIAccess for Signage
Certifications		CE/FCC Class B	CCC/CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CCC / CE / FCC Class B	CCC / CE / FCC Class B

Single Board Computers

NEW   NEW

	Model Name	RSB-3410	RSB-3850	RSB-3851	RSB-4210	RSB-4220
Form Factor		2.5" SBC	2.5" SBC	2.5" SBC	3.5" SBC	3.5" SBC
Processor System	CPU	NXP ARM Cortex-A9 i.MX6 Dual-Lite 1 GHz	Intel Quark x1000 400MHz	Intel Quark x1000 400 MHz	NXP ARM Cortex-A8 i.MX53 800 MHz	TI Sitara AM3352 Cortex A8 1 GHz
Memory	Technology	DDR3 800 MHz	DDR3 800 MHz	DDR3 800 MHz	DDR3 800 MHz	DDR3 800 MHz
	Capacity	On-board DDR3 1 GB	On-board DDR3 512 MB	On-board DDR3 512 MB	On-board DDR3 512 MB	On-board DDR3 512 MB
	Flash	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	"4 MB SPI NOR Flash for Advantech boot loader"	4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader
Graphics	LVDS	1 x 18/24-bit LVDS, up to 1366 x 768 at 60Hz	-	-	2 x 24-bit LVDS, 1280 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	1 18-bit LVDS, 1366 x 768
	HDMI	1920 x 1080 at 60Hz	-	-	-	-
	VGA	-	-	-	1600 x 1200 at 60Hz	-
	Graphics Engine	1 IPU. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	-	-	1 IPU. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	Direct3D Mobile, OGL-ES 1.1 and 2.0,OpenVG 1.0, and OpenMax
	H/W Video Codec	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263,MJPEG BP	-	-	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	-
Ethernet	Chipset	Freescale i.MX6 integrated RGMII	Intel Quark integrated RMII	Intel Quark Integrated RMII	Freescale i.MX53 integrated RMII	TI AM3352 integrated RGMII
	Speed	1 x 10/100/1000 Mbps	2 x 10/100 Mbps	2 x 10/100 Mbps	2 x 10/100 Mbps	2 x 10/100/1000 Mbps
WatchDog Timer		1~6553s, default 60s, power on/off 1s	"From 1~6553s, power on/off 4s"	1~6553s, default 60s, power on/off 1s	256-level timer interval from 0~128 sec	"From 1~6553s, power on/off 4s"
I/O	SATA	-	-	-	1	-
	SATA Power	-	-	-	Yes	-
	USB	1 USB 2.0 Host 1 USB OTG	1 x USB 2.0 Host	1 USB 2.0 Host	3 USB 2.0 Host 1 USB 2.0 OTG	1 x USB 2.0 Host/OTG (Jumper selection)
	Audio	-	-	-	Line-in, Speaker-out, Mic-in	-
	SPDIF	-	-	-	-	-
	SDIO	1 SD Slot	1 x SD slot	1 SD Slot	1 SD Slot, 1 Pin header	1 x SD slot
	Serial Port	1 x 4 wire RS-232	1 x 4 wire RS-232	1 x 4 wire RS-232	2 x 2 wire RS-232 by pin header, 1 x 2 wire RS-232/422/485 by DB9	1 x 4-wire RS-232/422/485 and 5 x 2-wire RS-232 w/ESD protection
	SPI	-	-	-	1	-
	CAN	-	-	-	1	1
	GPIO	-	4	-	20 GPIO w/o Isolation	8 GPIO w/Isolation
	I2C	-	-	-	1	1
	System Bus	-	-	-	Address : 25 pins Data : 16 pins	-
	Touch	-	-	-	4-wire resistive type	-
	Keypad	-	-	-	6 x 6 matrix	-
	Button	-	-	-	-	1 x Reset button
Indicator	LED	1 Power LED 1 Programmable LED	"1 Green LED for system power 1 Green LED for user define"	1 Green LED for system power 1 Green LED for user define	-	"1 Green LED for system power 1 Green LED for RF Status"
Expansion	Mini PCIe	2x mini PCIe slot (One only USB signal)	1x mini PCIe slot	1x mini PCIe slot	1 x mini PCIe slot (Only USB Signal)	1x mini PCIe slot
	M.2	-	-	-	-	-
	SD Socket	1x SD slot	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot
	SIM	1x SIM slot	1 x SIM slot	1 x SIM slot	1 x SIM slot	1 x SIM slot
Power	Power Supply Voltage	12 V	12 V	5V	12 V , 19 V , 24 V	12 V , 19 V , 24 V
	Power Type	DC-in	DC-in	DC-in	DC-in	2-pole lockable DC-in
	Power Consumption	4.4W (Max)	2.76W (Max)	2.76W (Max)	3.8W (Max)	4W (Max)
Environment	Operational Temperature	0 ~ 60° C	0 ~ 60° C	0 ~ 60° C	0 ~ 60° C/ -40 ~ 85° C	0 ~ 60° C/ -40 ~ 85° C
	Operating Humidity	5%~95% Relative Humidity, non-condensing	"5%~95% Relative Humidity, non-condensing"	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5 ~ 95% relative humidity, non-condensing
Mechanical	Dimensions (W x D x H)	100 x 72 x 19 mm	100 x 72 x 21 mm	100 x 72 x 21 mm	146 x 102 x 20 mm	146 x 102 x 16 mm
Operating System		Linux Android	Linux	Linux	Linux	Linux
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class A	CE/FCC Class B

Single Board Computers

Model Name		RSB-4221	RSB-4410	RSB-4411	RSB-4760	RSB-6410
Form Factor		3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC	Mini-ITX SBC
Processor System	CPU	TI Sitara AM3358 Cortex A8 1.0 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz	NXP ARM Cortex-A9 i.MX6 1 GHz	Qualcomm Snapdragon™ 410 APQ8016 ARM Cortex-A53 1.2 GHz	Freescale ARM Cortex-A9 i.MX6 1 GHz
Memory	Technology	DDR3 800 MHz	DDR3 1066 MHz	DDR3 1066 MHz	LPDDR3 1066MHz	DDR3 1066 MHz
	Capacity	On board DDR3 512 MB	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board DDR3 1 GB/2 GB	On-board DDR3 1 GB/2 GB
	Flash	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	4 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	8 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	8 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader
Graphics	LVDS	1 x 18-bit LVDS, 1366 x 768 for 1ch	1 x 18-bit LVDS, up to 1366 x 768 at 60Hz	1 18/24-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	-	1 18/24-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz
	HDMI	-	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz
	VGA	-	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	-	1920 x 1080 at 60Hz
	Graphics Engine	Integrated LCD Interface Display Driver (LIDD) Controller	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	Adreno™ A306 3D graphics core	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1
	H/W Video Codec	-	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP	Decoder: 30 fps 1080p (MPEG-4/H.264/H.263/DivX/MPEG2/VC1/Soreson/VP8) Encoder: 30 fps 720p (H.264 Baseline/MPEG-4); 30 fps 1080p (MPEG-4/H.264/VP8/H.263)	Decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP Encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP
Ethernet	Chipset	TI AM3358 integrated RGMII	NXP i.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	Microchip LAN7500	NXP i.MX6 integrated RGMII
	Speed	2 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps
WatchDog Timer		1~6553s, default 60s, power on/off 1s	256-level timer interval from 0~128 sec	1~6553s, default 60s, power on/off 1s	1~6553s, default 60s, power on/off 1s	1~6553s, default 60s, power on/off 1s
I/O	SATA	-	-	1	-	1
	SATA Power	-	-	1	-	1
	USB	2 x USB Type A and 2 x USB pin header	1 USB 2.0 Host 2 USB 2.0 Pin Header	1 x USB OTG, 2 x USB Type A and 3 x USB pin header	2 USB 2.0 Host, 1 micro USB OTG	6 x USB 2.0 Host
	Audio	-	1 x Line-out	1 x Line-out, 1 x Mic-in via pin header	1 x Line-out, 1 x Mic-in via pin header	1 x Line-out, 1 x Mic-in
	SPDIF	-	-	-	-	-
	SDIO	-	1 SD Slot	1 SD Slot	1 SD Slot	1 SD Slot
	Serial Port	3 x 2 wires RS-232 by pin header 1 x 4 wires RSB-232/422/485 by DB9 1 x 2 wires RSB-232 by DB9	2 x 2 wire RS-232 by pin header 1 x 4 wire RS-232 by DB9	2 x 2 wires RS-232 pin header 1 x 4 wires RSB-232/422/485, DB9	1 x 4-wire RS-232/422/485	3 x 4-wire RS-232 and 1 x 4-wire RS-232/422/485
	SPI	-	-	1	1	-
	CAN	1	-	2	-	-
	GPIO	12 GPIO w/o Isolation	-	20 GPIO w/o Isolation	14 (2/4 kv ESD IC protect)	20 GPIO w/o Isolation
	I2C	1	-	2	1	-
	System Bus	-	-	-	-	-
	Touch	-	-	-	-	-
	Keypad	-	-	-	-	-
	Button	1 x Reset button	1 x Reset button	-	-	-
Indicator	LED	-	1 Power LED 1 RF Status LED	1 Power LED	1 Green LED for system power 1 Green LED for RF Status	-
Expansion	Mini PCIe	-	1 x mini PCIe slot	1 x mini PCIe slot	1x mini PCIe slot	1x mini PCIe slot
	M.2	1 x M.2	-	1 x M.2 2230 Key E slot	1 x M.2 2230 Key E slot	-
	SD Socket	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot	1 x SD slot
	SIM	-	1 x SIM slot	1 x SIM slot	1 x SIM slot	1 x SIM slot
Power	Power Supply Voltage	12 V	12 V	12 V , 19 V , 24 V	12 V , 19 V , 24 V , 36 V	12 V
	Power Type	DC-in	DC-in	DC-in	DC-in	DC-in; PSU
	Power Consumption	TBC	5.6W (Max)	TBD	TBD	7W (Max)
Environment	Operational Temperature	0 ~ 60°C	0 ~ 60°C / -40 ~ 85°C	0 ~ 60°C / -40 ~ 85°C	0 ~ 60 °C	0 ~ 60 °C
	Operating Humidity	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, non-condensing	5%~95% Relative Humidity, noncondensing	5 ~ 95% relative humidity, non-condensing	5 ~ 95% relative humidity, non-condensing
Mechanical	Dimensions (W x D x H)	146 x 102 x 20 mm	146 x 102 x 20 mm	146 x 102 x 20 mm	146 x 102 x 20 mm	170 x 170 x 35 mm
Operating System		Linux Android	Linux Android	Linux Android	Yocto Linux Android Debian Linux Windows 10 IoT Core	Linux Android
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B

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