Arm-based Computing Platform Solutions

Accelerating Your Arm Project Development

- Standard Hardware Solutions
- AIM-Linux & AIM-Android Services
- Integrated Peripherals
- Trusty Ecosystem

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

Key Factors for Arm Business Success

Advantech's Arm computing solutions provide an open and unified development platform that minimizes effort and increases resource efficiency when deploying Arm-based embedded applications. Advantech Arm computing platforms fulfill the requirements of power-optimized mobile devices and performance-optimized applications with a broad offering of Computer-on-Modules, single board, and box computer solutions based on the latest Arm technologies. This year, Advantech's Arm computing will roll out three new innovations to lead embedded Arm technologies into new arena:

1. The i.MX 8 series aims for next generation computing performance and targets new application markets like AI.
2. Developing a new standard: UIO20/40-Express, an expansion interface for extending various I/Os easily and quickly for different embedded applications.
3. We are announcing the Advantech AIM-Linux and AIM-Android, which provide unfiled BSP, modularized App Add-Ons, and SDKs for customers to accelerate their application development.

Standardized Hardware Solutions
- Computer on Module
- Single Board Computer
- Computer Box

AIM-Linux
AIM-Android

AIM-Linux & AIM-Android
- Unified Embedded Platforms
- App Add-Ons & SDKs

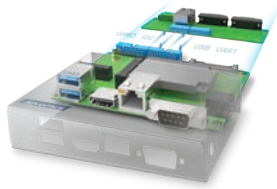
Integrated Peripherals
- Wireless Modules
- Display Modules
- Storage Modules

ELA
Embedded Linux & Android Alliance

Trusty Ecosystem
- Application Modules
- SW Components & Middleware

Innovations of the Arm Computing Platform

NXP i.MX 8
Empower embedded applications to the next generation



UIO20/40-Express
Build systems for your vertical applications with speed

Linux
ANDROID

AIM-Linux & AIM-Android
Allied, industrial and modular software for embedded Linux and Android applications

AIM-Linux & AIM-Android Services

AIM (Allied, Industrial and Modular) forms the core of Advantech's Embedded Operation System Services for Linux and Android. AIM-Linux and AIM-Android were created to help our customers accelerate their software development on Arm-based platforms by providing a flexible and modular framework, targeting the foundations of industrial markets, and focusing on long-term BSP maintenance and longevity support. With AIM, Advantech provides you with a verified solid foundation (Unified Embedded Platforms) and industrial-focused value-added supports (App Add-Ons and SDKs) embedded Linux and Android that allow you to simply focus on your own vertical application development.

AIM-Linux Services Landscape

PaaS & Cloud Platform

WISE-PaaS IoT Edge Intelligence | WISE-PaaS/DeviceOn | arm PELION

App Add-Ons

AIM-Linux/Security
- Secure Boot
- License Management
- Cipher SDK

AIM-Linux/Launcher
- Quick Boot
- Auto Run
- Multi Boot
- Splash Screen
- Boot Logo

AIM-Linux/Management
- SNMP
- Multi-Screen Control
- Audio Path Control

AIM-Linux/Distribution
- Yocto
- Debian
- Realtime

AIM-Linux/DevelopSDK
- Qt
- HTML5
- EdgeX Foundry
- Java
- Python
- Go

AIM-Linux/Diagnostic
- RF Diagnostic
- Connection Diagnostic
- System Diagnostic

AIM-Linux/Protocol
- CANopen
- J1708
- J1939
- MODBUS
- 1-Wire

Development Network

Unified Embedded Platforms

Unified Core | Industrial I/O Drivers | Performance Optimization | Peripheral Integration

AIM-Android Services Landscape

PaaS & Cloud Platform

WISE-PaaS IoT Edge Intelligence | WISE-PaaS/DeviceOn | F-Droid | SOTI MOBICONTROL | AI

App Add-Ons & SDKs

AIM-Android/Security
- Anti-Virus
- Lock Device
- Location Restriction Area
- Secure On-Device Data

AIM-Android/Launcher
- Boot Animation
- Quick Setting Menu
- Status Bar
- Navigation Bar

AIM-Android/Management
- Resource Mgmt
- Applications Mgmt
- Connectivity Mgmt

AIM-Android/Maintenance
- OTA
- Remote Desktop
- App Manage

AIM-Android/Control
- Extension Port Access
- Extension Modules Access
- Device Control
- System Control

AIM-Android/Diagnostic
- RF Diagnostic
- Connection Diagnostic
- System Diagnostic

AIM-Android/Protocol
- CANopen
- J1708
- J1939
- MODBUS
- 1-Wire

Development Network

Unified Embedded Platforms

Unified Core | Industrial I/O Drivers | Performance Optimization | Peripheral Integration

Development Documentation

ELA FORUM Embedded Linux & Android Alliance

Unified Embedded Platforms

To ally with you on development and long-term product maintenance, Advantech provided a reliable foundation including the “Unified Core following LTS kernel,” “Platform Performance Optimization,” and “Industrial I/O Drivers and Peripherals integration.” With those unified add-on features, Advantech’s AIM-Linux and AIM-Android offers users superior core size, performance, and I/O integration compared with standard BSP from SoC suppliers.

Unified Core

As the most important base for simplifying software development, the AIM core structure is unified and consistent for all hardware with the same SOC platform from Advantech.

Industrial I/O Drivers

Pre-integration most frequently uses industrial I/Os (CANbus, Ethernet, Digital I/O…) into AIM-Linux and AIM-Android BSP offerings to accelerate your embedded Linux and Android development.

Performance Optimization

Advantech will optimize hardware features and performance to make sure customers can always get the best user experience on their applications based on AIM-Linux and AIM-Android. We accelerate GPU performance via hardware and software integration and fine-tune LAN port performance to maximize data transmission.

Peripheral Integration

Wide-ranged peripherals such as WIFI, 4G modules, touch controllers, and LCDs are verified and integrated in AIM-Linux and AIM-Android to shorten the software integration process for customers.

App Add-Ons & SDKs

Advantech provides seven types of App Add-Ons and SDKs in both Linux and Android OS. They cover most embedded software features for different industrial scenarios and accelerate your application software development. Comprehensive documentation and highly efficient libraries are also ready for your implementation.

Launcher

The high flexibility launcher SDK provides a series of booting feature customizations, such as boot logo changes and splash screens definition.

AIM-Linux/Launcher
AIM-Android/Launcher

Distribution

We offer many distributions, such as Yocto and Debian, which are available for your application development in a preferred environment.

AIM-Linux/Distribution

Management

We provide a series of utilities that enable system applications as well as resource monitoring and maintenance.

AIM-Linux/Management
AIM-Android/Management

Development SDK

AIM-Linux integrates a series of popular development SDKs, such as Qt/HTML5/Java, to allow customer applications to run smoothly with those features.

AIM-Linux/DevelopSDK

Diagnostic

Complete diagnostic utilities of RF, connectivity, and hardware I/O features are ready for your leverage.

AIM-Linux/Diagnostic
AIM-Android/Diagnostic

Maintenance

Different from standard Android BSP, AIM-Android enables OS OTA feature to update Android OS on several units through group management to setup your device in no time.

AIM-Android/Maintenance

Protocol

Integrated protocols transfer features for different vertical applications like CANopen and MODBUS.

AIM-Linux/Protocol
AIM-Android/Protocol

Security

Several security boot features are verified and built-in to secure your device and application via intrusion detection or device lock by criterion.

AIM-Linux/Security
AIM-Android/Security

Control

Convenient access is offered to control devices, extension ports, and modules under Android OS.

AIM-Android/Control

AIM-Linux Roadmap

V1.0 2018/12E

App Add-Ons

- Yocto 2.1
- Debian 8
- Security Boot
- Modbus
- CANopen

Kernel V4.1

+Plus

- NXP i.MX 6
- TI AM3352
- TI AM5728

V2.0 2019/6E

App Add-Ons

- Yocto 2.4
- Debian 9
- EdgeX
- Multi-Screen Control
- License Management

Kernel V4.14 LTS

+Plus

- NXP i.MX 8
- Rockchip RK3288

V3.0 2019/12E

App Add-Ons

- Yocto 2.5
- Debian 10
- SNMP Manger
- Data Services with EdgeX
- Cipher SDK

Kernel V5.X

+Plus

- Rockchip RK3399

System Integration

- New Peripheral Module List
- New Display & Touch List

AIM-Android Roadmap

V2.1 2018/12E

App Add-Ons & SDKs

- Software Development Kit 2.1
- System Property 2.1
- Customization Tool 2.1

Android 6.0 Core

+Plus

- NXP i.MX 6
- Intel Bay Trail
- Intel Cherry Trail (AIM8)

V3.0 2019/6E

App Add-Ons & SDKs

- Software Development Kit 3.0
- System Property 3.0
- Customization Tool 3.0
- OTA
- Remote Desktop

Android 8.0 Core

+Plus

- Intel Apollo Lake
- Rockchip RK3288

V3.1 2019/12E

App Add-Ons & SDKs

- Software Development Kit 3.1
- System Property 3.1
- Customization Tool 3.1
- OTA
- Remote Desktop
- App Manage

Android 8.0 Core

+Plus

- NXP i.MX 8
- Rockchip RK3399

System Integration

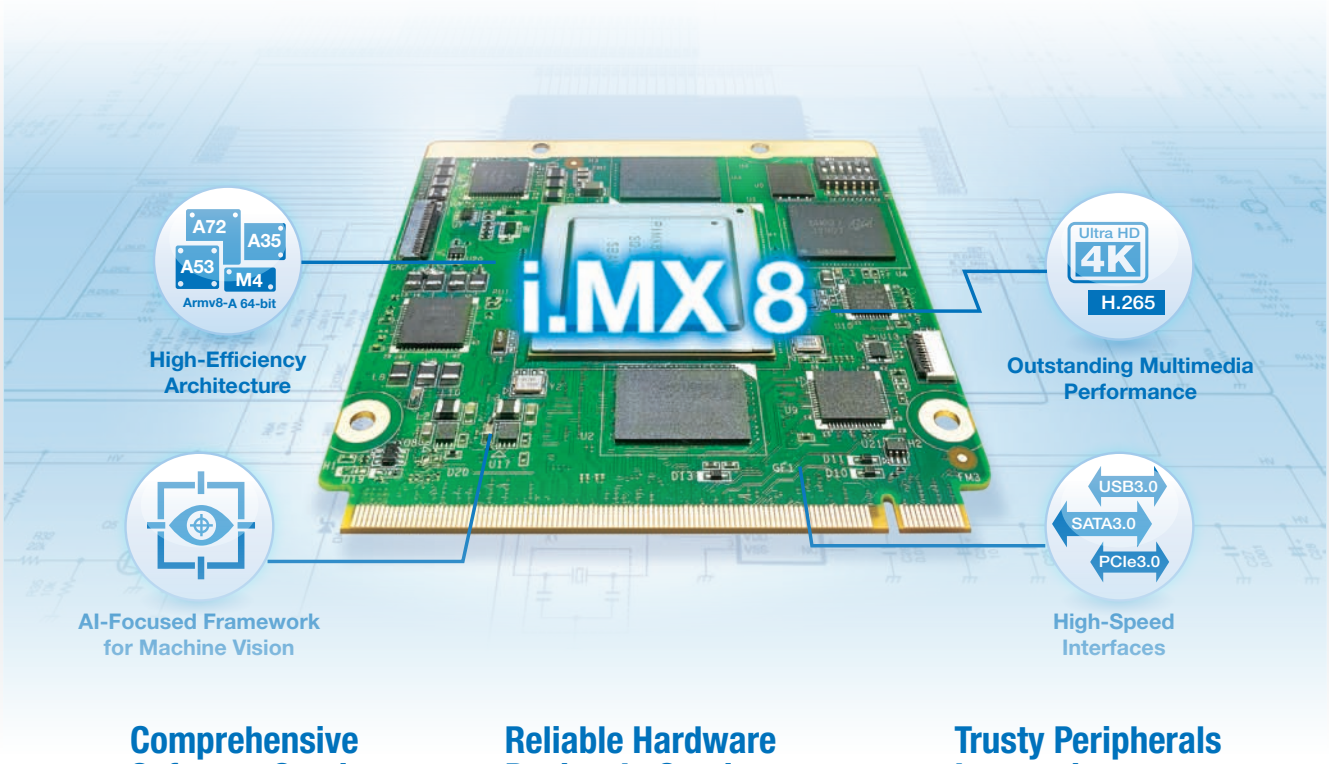
- New Peripheral Module List
- New Display & Touch List

Standardized Hardware Solutions

Advantech has been working with Arm technology for over 10 years beginning with the Cortex-A8, A9 to A72 architecture. We believe standardizing the form factor is key to making arm technology more popular in the embedded market. With this concept in mind, Advantech launched the COM (Computer-on-Module), SBC (Single Board Computer) and System into the market to speed up the implementation of arm technology in embedded markets.

Latest Platform: NXP i.MX 8 Solutions

The i.MX 8 series SOCs are NXP's latest and first Armv8-A 64-bit application processors, featuring up to six Armv8-A cortex cores, and an additional two Cortex M4 cores. This new design delivers high performance advanced graphics, hardware based virtualization, and enhanced security with product longevity of 10-15 years and industrial-grade quality. The i.MX 8 series is ideal for AI, advanced graphics, machine vision, automotive, safety-critical, and other industrial applications.



Comprehensive Software Services

- Multi OS support
- Longevity BSP
- AIM-Linux & AIM-Android

Reliable Hardware Design-In Services

- Carrier board reference design
- Design review
- Consulting services

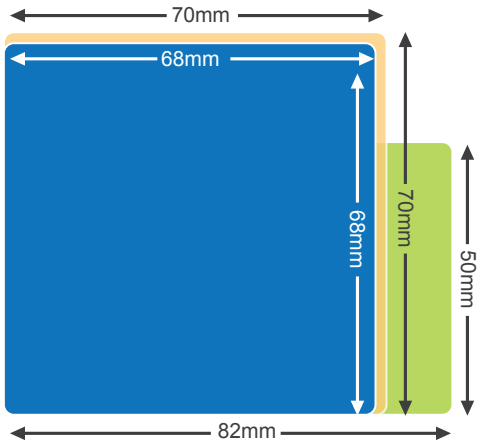
Trusty Peripherals Integration

- Industrial touch panel
- WIFI, 4G module
- Storage module

NXP i.MX 8 Offerings

Qseven	SMARC 2.0	SMARC 2.0	Qseven
ROM-7720	**ROM-5720**	**ROM-5620**	**ROM-7421**
▪ NXP i.MX 8 Cortex-A72 1.6GHz Quad Max ▪ Strong image processing capability ▪ Designed for video analysis	▪ NXP i.MX 8M Cortex-A53 1.5GHz Quad/Dual cores ▪ Outstanding graphic performance ▪ Designed for multimedia applications	▪ NXP i.MX 8X Cortex-A35 1.2GHz Quad plus ▪ Low power optimized performance ▪ Designed for industrial control and automation applications	▪ NXP i.MX 6 Cortex-A9 1GHz Dual Plus/Quad plus ▪ Strong multimedia performance ▪ Designed for Kiosk and HMI

Computer On Modules



Computer On Module (COM) is a type of form factor which tightly integrates all main components on the CPU module and is open to working with different application I/O carrier boards made by the customers. The modularized design allows customers to build their own carrier boards for their unique applications and quickly serves their target markets.

RTX (Advantech)
68mm x 68mm

Qseven
70mm x 70mm

SMARC
82 mm x 50 mm

Qseven

Qseven is a standard COM form factor, which was defined by SGET and which has specified pinouts based on the high speed MXM system connector. Qseven focuses on handheld, HMI, and signage applications.

Compact | Fanless | Flexible

SMARC

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

Compact | Fanless | Dual Lan

RTX

Advantech originally introduced the RTX 2.0 (Ruggedized Technology extended) which is a Arm-based standard platform designed for rugged applications such as military, logistics, and transportation.

Anti-vibration | Anti-oxidation | Wide Temperate

RTX

NXP i.MX 6 Offerings

SMARC	RTX
ROM-5420	ROM-3420
▪ NXP i.MX 6 Cortex-A9 1GHz Dual/ Quad cores ▪ Strong multimedia performance ▪ Designed for Kiosk and HMI	▪ NXP i.MX 6 Cortex-A9 1GHz Dual/ Quad cores ▪ Outstanding graphic performance ▪ Designed for rugged applications

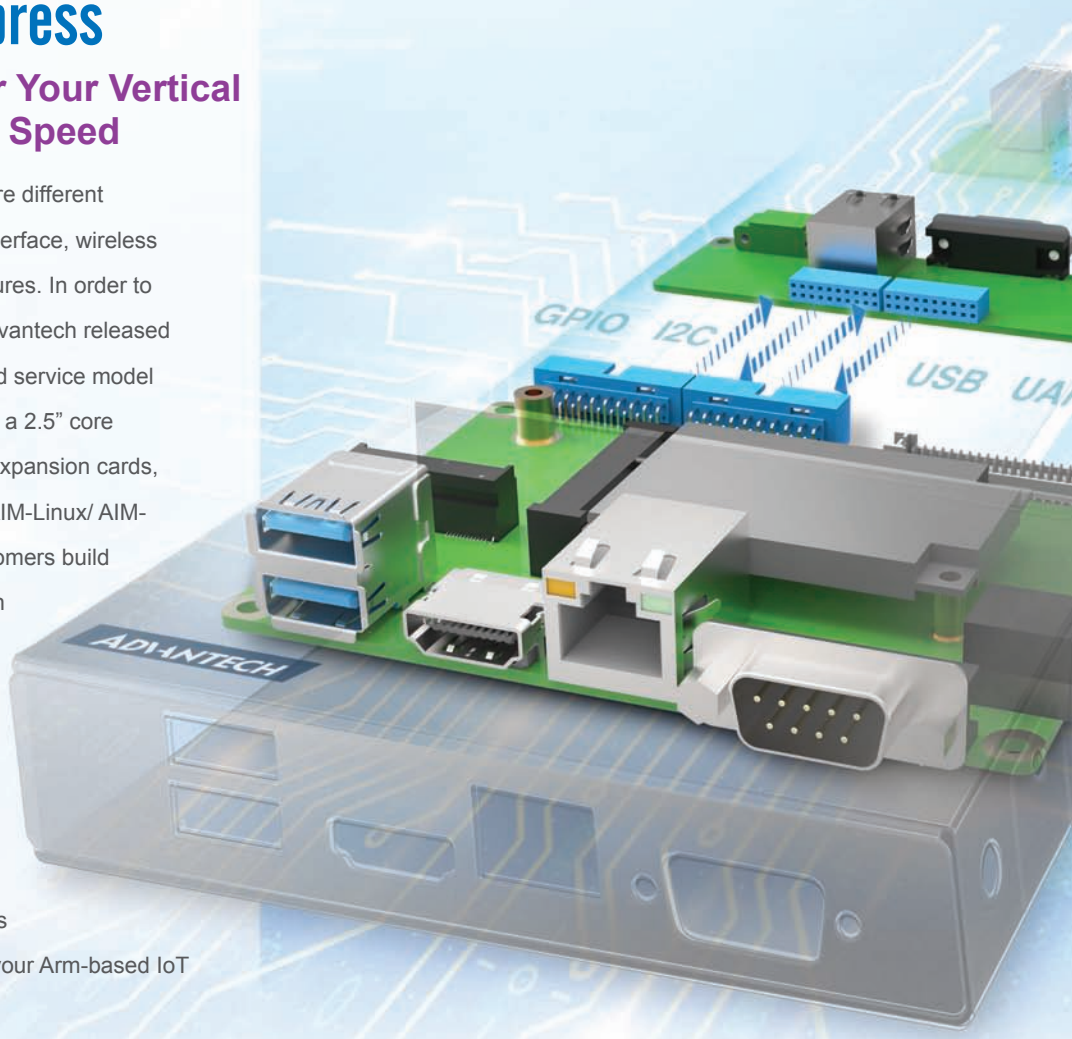
TI Offerings

Qseven	RTX
ROM-7510	ROM-3310
▪ TI Sitara AM5728 Cortex-A15 Dual cores ▪ Outstanding computing ability ▪ Designed for video surveillance applications	▪ TI Sitara AM3352 Cortex-A8 1GHz Single core ▪ Wide range temperature and power input support ▪ Designed for automation and railway application

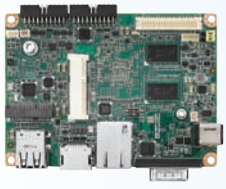
UIO20/40-Express

Build Systems for Your Vertical Applications with Speed

Different IoT applications require different computing performance, I/O interface, wireless connectivity, and software features. In order to meet rapid growth demand, Advantech released the UIO20/40-Express standard service model as the best solution. It includes a 2.5" core board, different UIO20/40 I/O expansion cards, compact design chassis, and AIM-Linux/ AIM-Android packages to help customers build up their Arm-based system with speed. UIO20/40-Express also provides "WISE-PaaS EdgeSense" and a "Device On" IoT cloud framework to move customer's current applications to IoT applications. UIO20/40-Express is the best tool for building up your Arm-based IoT solutions quickly and easily.

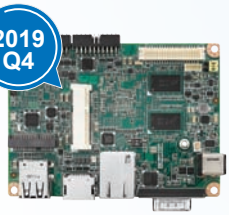


2.5" Core Board



RSB-3430DL-MDA1E
- NXP i.MX 6 Dual-lite 1GHz
- 1 HDMI, Dual LVDS for full HD display
- 2 USB 2.0, 1 RS-232/422/485

2019 Q4



RSB-3710CD-MDA1E
- NXP i.MX 8M Dual 1.5GHz
- 4K HDMI, Dual LVDS for 2K
- 2 USB 3.0, 1 RS-232/422/4855

Vertical I/O Board

UIO-4030
RS-485 x 1, RS-232 x 1, GPI x 4, GPO x 4

UIO-4032
USB 2.0 x 2, RS-232 x 2, GbE x 1

UIO-4034
CAN x 1, RS-232 x 2

Vertical Applicati

EPC-R3430
for I/O Board UIO-4030

EPC-R3432
For I/O Board UIO-4032

EPC-R3434
For I/O Board UIO-4034

Compact Structure

- 2.5” PICO-ITX core main board
- Unified edge I/O definition
- Complete wireless expansion

Various I/O Options

- Unified I/O expansion
- Vertical focused I/O expansion boards
- Reference design and customization service

Unified Software Package

- AIM-Linux and AIM-Android
- Up-to-date and longevity support BSP
- WISE-PaaS cloud connectivity enabled service

on System

AIM-Linux & AIM-Android

Modularized Framework

Efficient resource allocation

Value-Added Industrial App & SDK

Accelerated development

Longevity BSP Maintenance

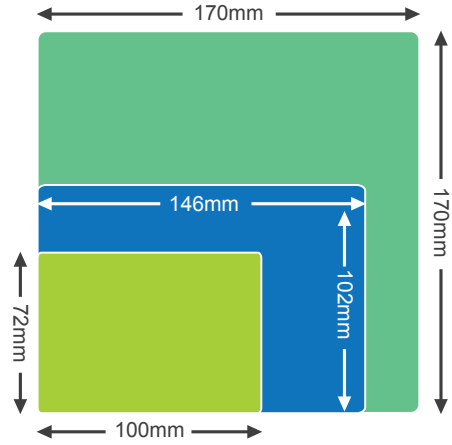
Reliable foundation

WISE-PaaS/ DeviceOn

- Secure automated device onboarding
- Remote device monitoring and control
- Software over-the-air update

Target-Focused SBCs

Advantech Arm-based Single Board Computers (SBC Computer) offer a range from 2.5 inches (100x72mm) to mini-ITX (170x170mm). Advantech embedded SBCs come with standard form factors, compact size, rich I/O, low power consumption design, and easy expansion capabilities. With the aforementioned benefits, Advantech SBC offerings will be the best choice for your embedded applications.

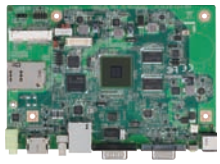


2.5" SBC
100mm x 72mm

3.5" SBC
146mm x 102mm

mini-ITX
170mm x 170mm

Industry 4.0



RSB-4410

- NXP i.MX 6 Cortex-A9 1GHZ Dual/Quad cores
- High resolution 3-display support
- Yocto Linux/Android support

RSB-4411

- NXP i.MX 6 Cortex-A9 1GHZ Dual/Quad cores
- High resolution 3-display support
- Yocto Linux/Android support

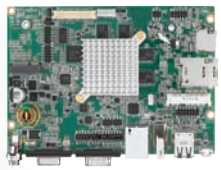
RSB-4220

- TI Sitara AM3352 Cortex-A8 1GHz Single Core
- Up to 5 COM and 4GPI/4PGO with Isolation
- Yocto Linux support

RSB-4221

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

Multimedia



RSB-4680

- Rockchip RK3288 Cortex-A17 1.6GHz Quad cores
- 4K display and rich I/O for device connection and control
- Debian Linux/Android support

RSB-6410

- NXP i.MX 6 Cortex-A9 1GHZ Dual/Quad cores
- Rich I/O for device connection and control
- Yocto Linux/Android support

Network Connectivity

RSB-3410

- NXP i.MX 6 Cortex-A9 1GHz Dual Lite cores
- Dual mini-PCIe slots for wireless connection
- Yocto Linux/Android support

RSB-3430

- NXP i.MX 6 Cortex-A9 1GHz Dual Lite cores
- Dual mini-PCIe slots for wireless connection
- Yocto Linux/Android support

Optimized Box Solutions

UBC Box Series

Arm-based UBC (Ubiquitous Box Computer) series and EPC-R series are 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

EPC-R4680 and EPC-R6410 are Arm-based signage boxes powered by multimedia enhanced processor with on-board DDR3 and eMMC. The high graphics performance and built-in signage player software help you plug-and-play your multimedia advertisements. UBC-330 and UBC-200 are 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. EPC-RS210 and UBC-220 provide high speed network connectivity in a compact enclosure to make your multi-tasking applications smooth and quick. With maximum power consumption under 5 Watts, the Advantech Arm-based box computers are your ideal 24/7 computing systems.

Industrial 4.0

- 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 support

TAIWAN EXCELLENCE 2013

UBC-200

- NXP i.MX 6 Cortex-A9 1GHz Dual/Quad cores
- Ultra high speed Ethernet & wireless connectivity
- Yocto Linux/Android support

Multimedia

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

EPC-R4680

- Rockchip RK3288 Cortex-A17 1.6GHz Quad cores
- 4K display and rich I/O
- Android/Debian Linux suppot

EPC-R6410

- NXP i.MX 6 Cortex-A9 1GHz Dual/Quad cores
- Powerful multi-display capability, multiple I/O, and wireless connectivity
- Yocto Linux/Android support

Networking

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

EPC-R3220

- TI Sitara AM3352 Cortex-A8 800MHz
- Dual Ethernet and WiFi/4G solution ready for IOT application
- Yocto Linux support

TAIWAN EXCELLENCE 2013

UBC-220

- NXP i.MX 6 Cortex-A9 1GHz Dual Lite cores
- Sufficient I/O for device control
- Yocto Linux/Android support

Trusted Peripheral Integration

Arm application development can be difficult due to peripheral integration, as well as driver support which is not so mature or well developed. Most engineers rely on open source drivers which are not thoroughly verified and may need to be modified in order to be integrated on different platforms. So to make things much easier, we streamlined the Arm platform integration process by consolidating compatible peripherals in the kernel source code and included detailed documentation for peripheral integration.

Industrial Grade Reliable Peripherals

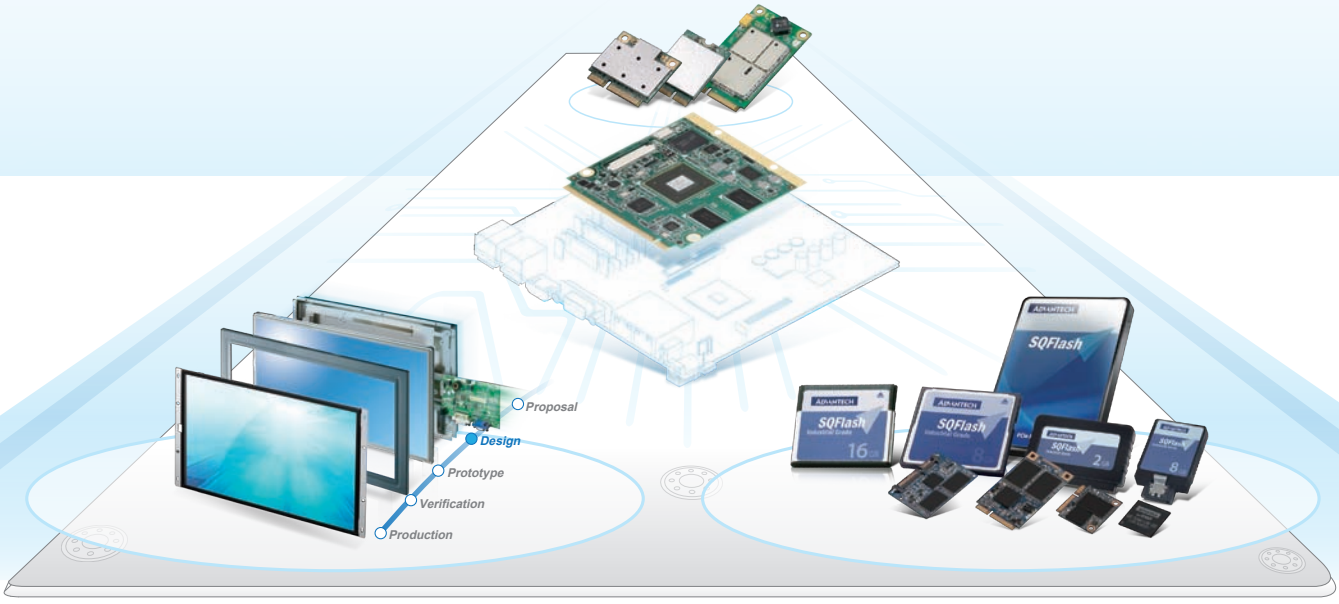
Advantech offers high quality branded peripherals with longevity support, global warranty and rapid distribution, and customization flexibility. Industrial grade peripherals include display kits, RF modules, storage devices and expansion cards.

Integrated Driver in Various OS

To help users implement peripherals quickly, we pre-build drivers into a Linux kernel to save time in cross-compiling and driver porting. Drivers are verified in various OS environments including Linux and Android.

Documentation for Driver Porting and Device Testing

To help users integrate additional peripherals, we share our know-how of driver integration to help users porting drivers onto their own platforms. Additionally, we offer our test tools, commands and sample codes freely on the Advantech online forum, along with consultant services for those who would need help.



WiFi Module

EWM-W142H01E

1750005885	RF Cable
1750000318	Antenna

WiFi/BT Combo Module

EWM-W157H01E

1750007965-01	RF Cable
1750002842	Antenna

Cellular Module

EWM-C117 series

1750007156-01	RF Cable
1750005865	Antenna

GPS Module

EWM-G109H01E

1750006264	RF Cable
1750007991-01	Antenna

Adapter

96PSA-A36W12R1

ADAPTER 100-240V 36W
12V 3A DC PLUG 90°

Panels

IDK-1115R-50XGA1
15" 1024 x 768 LED panel,
500 nits with 5W resistive touch

IDK-1107WR-40WVA1E
7" 800 x 480 LED panel,
400 nits with 4WR touch

IDK-1107WP-50WVA1E
7" 800 x 480 LED panel,
500 nits with P-CAP touch

IDK-1115P-50XGA1E
15" 1024 x 768 LED panel,
500 nits with P-CAP touch

96LEDK-A070WV40NB1
7" 800 x 480 LED panel,400 nits
w/o touch

96LEDK-A190SX35NF1
19" 1280 x 1024 LED
panel,350 nits w/o touch

Embedded Linux & Android Alliance

Embedded Linux & Android Alliance (ELAA) is an industry alliance committed to driving the unification and board adoption of an open architecture standard for embedded Linux and Android cores in industrial embedded systems.

ELAA Features

Unified Architecture

The ELAA Unified Development Platform provides a unified hardware and software architecture across different industrial embedded applications. Users can leverage resources from one project to another with minimized learning curves and effort.

Longevity Support

Provide hardware platform, kernel and firmware upgrades to members and customers during the whole SoC life cycle.

Peripheral Integrated

ELAA Unified Development Platform integrates multiple industrial peripherals verified on different OS and hardware platforms.

Extensive Software Offerings

Empowered by alliance members, ELAA provides extensive software offerings throughout various kinds of OS, kernels, drivers and industrial applications.

Faster Time-to-market

Pre-integrated hardware and software platform to accelerate the POC to MP cycle.

Global Partner Eco-system

Partners across the supply chain and geo-regions support customers' business development and expansion.

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

In the past, banknote recycling machines were only used in large businesses like banks so their size didn't really matter. However, as more and more stores and companies received fake notes, they started searching for small-sized functional banknote recycling machines to protect their own interests.

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 for a simple and quick way to evaluate performance. The development kit includes everything they need including a COM module and its corresponding carrier board, a 12V AC/DC power adapter, cables to connect peripherals, and an LED panel for display and touch panel development.

Advantech Design-in Service

During development, a fatal issue popped up and risked the launch schedule. Advantech jumped in without hesitation with a professional support team focused on software and hardware debugging. By providing timely support and onsite service, the customer was able to quickly resolve all issues and get the project back on track.

ROM-7420

- Qseven 1.2 Computer-on-Module
- NXP i.MX 6 Dual/Quad cores 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

Rugged RTX Form-factor Solution for Railway Monitoring System

The railway systems in China have grown rapidly due to their convenience and widespread economic benefits. It is now the major public transportation system and serves millions of people every day. However, a total solution for data collection, processing and storage for the trains was still needed and data/network security and reliability issues presented a crucial challenge to overcome.

Solution

Advantech ROM-3420 is an ultra low power computer-on-module followed by RTX 2.0 form factor, which is specifically designed for ruggedized application with vibration-proof, anti-oxidation and anti-corrosion capabilities. It provided reliable core computing ability and steady network connectivity in the railway monitoring system and efficiently secured the data flow through Advantech built-in software API. Pairing with Advantech peripherals including SSD and WiFi 2.4GHz module, the industrial grade total solution facilitated data collection, processing and management in railway monitoring system and enhanced the smoothness and performance in its daily operation.

Rugged Form-factor with Wide Range Working Temperature

Advantech offered the ROM-3420 RTX module with four robust B2B connectors, SATA interface for data collection, and wide operating temperature features, which fulfilled the reliability requirement of a railway system that continuously operated in extreme environments in the southern and northern regions of China.

ROM-3420

- NXP Arm Cortex™-A9 i.MX6 Dual cores 1GHz high performance processor
- Onboard DDR3 1 GB memory / 4GB flash
- Supports wide range power input 5V~24V

Carrier Board Solution Service

In order to extend the usability of the module, Advantech tried to speed up the development of the carrier board by providing carrier board reference schematics, design guidelines, and checklists. As well as documentation, we shared our reference design including recommended transceiver and transmitter IC selection. After they finished the carrier board schematics, Advantech also helped to review/debug the system and provided additional production ideas to improve their time-to-market.

UIO20/40-Express Solutions for Citybike Service Station

Due to air pollution issues and the growth of short-distance commuters, there are more and more Citybike service stations being set up across China. Service stations have pressing computing needs: efficient power consumption and support for multiple I/Os for diverse functions — such as display, wireless connectivity. The cloud server and client framework are also required for status monitoring and gauging reactions between client sites and servers. However, it takes a lot of time to search for suitable solutions for end application integration.

Solution

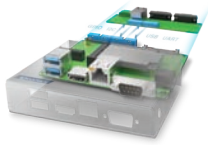
Advantech provided a specific solution, including the 2.5" main boards, various UIO20/40-Express cards, and a compact chassis for this project. Besides hardware solution, we integrated AIM-Linux/Protocol, AIM-Linux/Launcher and WISE-PaaS/DeviceOn for remote management and configuration deployment. Advantech provided necessary hardware and software packages, to make sure the solutions were deployed simply, quickly and reliably.

UIO20/40-Express Solutions for Speedy System Development

RSB-3430 is powered by NXP i.MX 6 and supports LVDS and HDMI for display functions, M.2 and mini-PCIe w/ SIM for complete wireless connectivity, USB 2.0, RS-232/485 for a device control, and it can extend the I/O by UIO20/40-Express interface with our Express card. Advantech also integrates a compact chassis for making a complete box solution.

Unified Software Services

Advantech's AIM-Linux embedded software integrated Protocol and Launcher app add-ons simplify the edge box control communication and configuration of deployment. For device management, we offer WISE-PaaS/DeviceOn to implement the central management of devices, and remote power source function for switching to the solar power stock at night to reduce the total power consumption.



UIO20/40-Express: RSB-3430 + UIO-4032 + EPC-R3432

- NXP i.MX 6 Dual-lite cores 1GHz
- Dual LVDS for full HD display
- 1 HDMI, 2 USB 2.0, 4GPI, 4GPO, 1 GbE
- 1 RS-232/422/485, 1 RS-485, 1 RS-232

AIM-Linux/ Launcher

- Quick Boot
- Multi Boot
- Boot Logo
- Auto Run

AIM-Linux/ Protocol

- CANopen
- J1708
- J1939
- MODBUS
- Wire

WISE-PaaS/ DeviceOn

- Securely Instant Onboard
- Real-time Actions
- Visualized Operations

High Performance Computer on Module for LTE Signal Acquisition Application

People often crowd together at certain places for major festivals, national holidays, and celebrations. Guaranteeing signal quality and LTE connectivity for cell phones has become a special challenge for LTE service companies. The operators need to analyze the signals from timing domain to frequency domain by FFT skill, then sending vehicles with mobile base stations to secure LTE connectivity.

Solution

Advantech's ROM-7720 with NXP i.MX 8 CPU provides advanced edge computing performance. It's not only an Arm-based CPU with DSP for FFT calculation, but also includes AIM-Linux, new add-ons software features, which contain convenient API in maintenance development and remote control service. The ROM-7720 with an i.MX 8 heterogeneous processor provides stability, cost value, and operation performance highlights.

Development Kit for Quick Evaluation

Advantech provides a ROM-7720 development kit for an agile way to test and build prototypes. The development kit includes the ROM-7720 Qseven module, carrier board, and all I/O necessary cables, panels, daughter boards, and adapters. Except for the H/W, we also provide ready-to-use BSP and online development websites for assisting developers in evaluations.

AIM-Linux App Add-Ons

Advantech provides seven types of App Add-Ons and SDKs to cover most of the demands for Embedded Software Usage in Industrial Scenarios and accelerate your software development, such as complete diagnostic utilities of RF, connectivity, system information, and integrated protocols transition service for embedded application.

ROM-7720

- Qseven 2.1 Computer on Module
- NXP i.MX 8 QuadMax Processor
- LPDDR4 4GB, 16 GB eMMC Flash Memory
- 4K H.265 decoder, HD H.264 Encoder
- Yocto Linux and Android Support

AIM-Linux/Protocol

- CANopen
- J1708
- J1939
- MODBUS
- Wire

AIM-Linux/Diagnostic

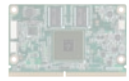
- RF Diagnostic
- Connection Diagnostic
- System Diagnostic

Product Selection Guide

Computer-on-Modules

Preliminary NEW




Model Name		ROM-3310	ROM-3420	ROM-5420 B1	ROM-5620	ROM-5720
Form Factor		RTX V2.0	RTX V2.0	SMARC V1.1	SMARC V2.0	SMARC V2.0
Processor System	CPU	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-A35 i.MX8X 1.2 GHz	NXP Arm Cortex-A53 i.MX8M 1.5 GHz
Memory	Technology	DDR3 800 MHz	DDR3 1066 MHz	DDR3 1066 MHz	LPDDR4 1200 MHz	LPDDR4 1866 MHz
	Capacity	On-board DDR3 512 MB	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board LPDDR4 2 GB	On-board LPDDR4 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	16 GB eMMC NAND Flash for O.S. and 8MB QSPI NOR FLASH for Advantech boot loader	16 GB eMMC NAND Flash for O.S. and 8MB QSPI NOR FLASH for Advantech boot loader
Graphics	LVDS	-	1 x 24-bit LVDS, 1366 x 768 at 60Hz	1 x 24-bit LVDS, 1366 x 768 at 60Hz	2 x single channel LVDS*	-
	MIPI-DSI	-	-	-	2 x 4-lane MIPI DSI*	1 x 4-lane MIPI DSI
	HDMI	-	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	-	4096 x 2160 at 60 Hz
	Parallel RGB	1 x 24-bit TTL, 1366 x 768 at 60Hz	1 x 24-bit TTL, 1920 x 1200 at 60Hz	1 x 24-bit TTL, 1920 x 1200 at 60Hz	-	-
	VGA	-	-	-	-	-
	Graphics Engine	Direct3D Mobile, OGL-ES 1.1 and 2.0,OpenVG 1.0, and OpenMax	2 x IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	2 x IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	Vivante GC7000 Lite	GC7000L/GC7000LVX
	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: HEVC/H.265(4Kp60), VP9(4Kp60), H.264(4Kp30), MPEG-2, MPEG-4p2, VC-1, VP8, RV9, AVS, MJPEG, H.263	Decoder: HEVC/H.265(4Kp60), VP9(4Kp60), H.264(4Kp30), MPEG-2, MPEG-4p2, VC-1, VP8, RV9, AVS, MJPEG, H.263
Ethernet	Chipset	TI AM3352 Integrated RGMII	NXP i.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	2 x NXP i.MX8X Integrated RGMII	1 x NXP i.MX8M integrated RGMII 1 x RTL8119I PCIE GbE controller
	Speed	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	2 x 10/100/1000 Mbps	2 x 10/100/1000 Mbps
RTC		Yes	Yes	Yes	Yes	Yes
WatchDog Timer		1~6553s, default 60s, power on/off 1s	256-level timer interval, from 0 ~ 128 sec	256-level timer interval, from 0 ~ 128 sec	1~6553s, default 60s, power on/off 1s	1~6553s, default 60s, power on/off 1s
I/O	PCIe	-	1 PCIe 1x	1 PCIe 1x	1 PCIe 1x	1 PCIe 1x
	SATA	-	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 3.0, 2 USB 2.0 OTG	2 USB 3.0, 4 USB 2.0, 1 USB 2.0 OTG
	Audio	I2S	I2S	I2S	2 x I2S	2 x I2S
	SPDIF	-	-	1	-	-
	SDIO	1	1	1	1	1
	Serial Port	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)	3 UART (1 x 4-wire, 2 x 2-wire)	4 UART (1 x 4-wire, 3 x 2-wire)
	SPI	1	2	4	2	2
	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	-
	GPIO	10	10	12	12	12
	I2C	1	4	5	4	4
	Camera Input	-	1 x 4-Lane MIPI CSI-2	1 x 4-Lane MIPI CSI-2	1 x 4-Lane MIPI CSI-2	1 x 4-Lane MIPI CSI-2 1 x 2 Lane MIPI CSI-2
	System Bus	-	Address: 26 bits Data: 16 bits	-	-	-
	Touch	-	-	-	-	-
	Keypad	-	-	-	-	-
	PWM	-	-	-	-	-
Power	Power Supply Voltage	5 ~ 24 V	5 ~ 24 V	3 ~ 5.25 V	Fixed 5V DC source and allow 3.3 V ~ 5.25 V operates directly from single level Lithium-ion cells	Fixed 5V DC source and allow 3.3 V ~ 5.25 V operates directly from single level Lithium-ion cells
	Power Consumption	2.11W (Max)	3.3W (Max)	3.4W (Max)	TBD	TBD
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
	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)	68 x 68 mm	68 x 68 mm	82 x 50 mm	82 x 50 mm	82 x 50 mm
Operating System		Linux	Linux Android	Linux Android	Linux Android	Linux Android
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B

*LVDS & MIPI-DSI are shared interface



Model Name		ROM-7420	ROM-7421	ROM-7510	ROM-7720
Form Factor		Qseven V1.2	Qseven V2.0	Qseven V2.0/2.1	Qseven V2.1
Processor System	CPU	NXP Arm Cortex-A9 i.MX6 1 GHz	NXP Arm Cortex-A9 i.MX6 Plus 1 GHz	TI Sitara AM5728 Cortex-A15 1.5 GHz	NXP Arm Cortex-A72 i.MX8 1.6 GHz
Memory	Technology	DDR3 1066 MHz	DDR3 1066 MHz	DDR3L 1066 MHz	LPDDR4 1200 MHz
	Capacity	On-board DDR3 1 GB	On-board DDR3 1 GB/ 2 GB	On-board DDR3L 2 GB	On-board LPDDR4 4 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	8 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	16 GB eMMC NAND Flash for O.S.and 32MB QSPI NOR FLASH for Advantech boot loader
Graphics	LVDS	2 x 24-bit LVDS, 1366 x 768 for 1ch; 1920x1080 for 2ch at 60Hz	2 x 24-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	1 x Dual channel 24-bit LVDS, 1920 x 1200	2 x 24-bit LVDS, 1366 x 768 for 1ch; 1920x1080 for 2ch at 60Hz
	MIPI-DSI	-	-	-	-
	HDMI	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	4096 x 2160 at 60Hz
	Parallel RGB	-	-	-	-
	VGA	1920 x 1080 at 60Hz	-	-	-
	Graphics Engine	2 x IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1	2 x 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	Vivante GC7000XS/VX
	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	Video Processing Engine (VPE)	Decoder: HEVC/H.265(4Kp60), VP9(4Kp60), H.264(4Kp30), MPEG-2, MPEG-4p2, VC-1, VP8, RV9, AVS, MJPEG, H.263
Ethernet	Chipset	NXP i.MX6 integrated RGMII	NXP i.MX6 Plus integrated RGMII	TI Sitara integrated RGMII	NXP i.MX8 integrated RGMII
	Speed	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
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, default 60s, power on/off 1s
I/O	PCIe	1 PCIe 1x	1 PCIe 1x	2 PCIe 1x	2 PCIe 1x
	SATA	1 SATA II	1 SATA II	1 SATA II	1 SATA III
	USB	1 USB 2.0, 1 USB 2.0 OTG	4 USB 2.0, 1 USB 2.0 OTG	1 x USB3.0, 1 x USB 2.0 OTG, 4 x USB2.0 Host	3 USB 3.0, 1 USB 2.0 OTG
	Audio	I2S	I2S	I2S	I2S
	SPDIF	-	-	-	-
	SDIO	1	1	1	1
	Serial Port	4 UART (4 x 2-wire w/ 3.3V)	2 UART (2 x 4-wire w/ 3.3V)	2 UART (2 x 4-wire w/ 3.3V)	2 UART (2 x 4-wire w/ 3.3V)
	SPI	1	1	1	1
	CAN	2 x CAN bus 2.0 A/B	1 x CAN bus 2.0 A/B	1	1
	GPIO	8	8	8	8
	I2C	3	2	2	2
	Camera Input	-	-	-	1 x 4-Lane MIPI CSI-2 1 x 2-Lane MIPI CSI-2
	System Bus	-	-	-	-
	Touch	-	-	-	-
	Keypad	-	-	-	-
	PWM	-	-	2	-
Power	Power Supply Voltage	5V	5V	5V	5V
	Power Consumption	3.4W (Max)	4W (Max)	10W (Burning)	TBD
Environment	Operating 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
	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
Mechanical	Dimensions (W x D)	70 x 70 mm	70 x 70 mm	70 x 70 mm	70 x 70 mm
Operating System		Linux Android	Linux Andorid	Linux	Linux
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B

Note: "-" : means Not Applicable (N/A)

Single Board Computers

NEW




Model Name		RSB-3410	RSB-3430	RSB-4220	RSB-4221
Form Factor		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	NXP Arm Cortex-A9 i.MX6 1 GHz	TI Sitara AM3352 Cortex-A8 1 GHz	TI Sitara AM3358 Cortex-A8 1 GHz
Memory	Technology	DDR3 800 MHz	DDR3 1066 MHz	DDR3 800 MHz	DDR3 800 MHz
	Capacity	On-board DDR3 1 GB	On-board DDR3 1 GB	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 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 18/24-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	1 x 18-bit LVDS, 1366 x 768	1 x 18-bit LVDS, 1366 x 768
	HDMI	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	-	-
	VGA	-	-	-	-
	Graphics Engine	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	Direct3D Mobile, OGL-ES 1.1 and 2.0,OpenVG 1.0, and OpenMax	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	NXP i.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	TI AM3352 integrated RGMII	TI AM3358 integrated RGMII
	Speed	1 x 10/100/1000 Mbps	1 x 10/100/1000 Mbps	2 x 10/100/1000 Mbps	2 x 10/100/1000 Mbps
WatchDog Timer		1~6553s, default 60s, power on/off 1s	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	-	-	-	-
	SATA Power	-	-	-	-
	USB	1 x USB 2.0 Host, 1 x USB OTG	2 x USB 2.0 Type A, 4 x USB 2.0 in UIO 20	1 x USB 2.0 Host/OTG (Jumper selection)	2 x USB 2.0 Host Type A, 2 x USB 2.0 Host pin header
	Audio	-	1 x Line-out, 1 x Line-in via pin header	-	-
	SPDIF	-	-	-	-
	SDIO	1 x SD slot	-	1 x SD slot	1 x SD slot
	Serial Port	1 x 4-wire RS-232	3 x 2 wires RS-232 in UIO 40 1 x 4 wires RSB-232/422/485, DB9	1 x 4-wire RS-232/422/485 and 4 x 2-wire RS-232	4 x 2-wire RS-232 by pin header 1 x 4-wire RS-232/422/485 by DB9
	SPI	-	-	-	-
	CAN	-	1 CAN 2.0B in UIO 40 (share w/ UART)	1	1
	GPIO	-	12 GPIO, 4 GPIO in UIO 20 and 8 GPIO in UIO 40, 3.3V level	4 GPI/ 4 GPO w/ isolation	12 GPIO
	I2C	-	1 in UIO 40	1	1
	System Bus	-	-	-	-
	Touch	-	-	-	-
	Keypad	-	-	-	-
	Button	-	-	1 x Reset button	1 x Reset button
Indicator	LED	1 Power LED 1 Programmable LED	1 Green LED for the system power 1 Green LED (Programmable)	1 Power LED 1 Programmable LED	-
Expansion	Mini PCIe	2x mini PCIe slot (1 x half size, 1 x full size w/ USB signal ONLY)	1 x mini PCIe slot (Only USB singal)	1 x mini PCIe slot (Only USB singal)	-
	M.2	-	1 x M.2 slot Key E, Type 2230	-	1 x M.2
	SD Socket	1x SD slot	1 x Micro SD slot	1 x SD slot	1 x SD slot
	SIM	1x SIM slot	1 x SIM slot	-	-
Power	Power Supply Voltage	12 V	12 V	12~24V	12 V
	Power Type	DC-in	DC-in	2-pole lockable DC-in	2-pole lockable DC-in
	Power Consumption	4.4W (Max)	TBD	4W (Max)	4W (Max)
Environment	Operating Temperature	0 ~ 60 °C	0 ~ 60 °C / -40 ~ 85 °C	0 ~ 60 °C/ -40 ~ 85 °C	0 ~ 60 °C
	Operating Humidity	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)	100 x 72 x 19 mm	100 x 72 x 20mm	146 x 102 x 16 mm	146 x 102 x 20 mm
Operating System		Linux Android	Linux Android	Linux	Linux Android
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B




NEW

Model Name		RSB-4410	RSB-4411	RSB-4760	RSB-4680	RSB-6410
Form Factor		3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC	Mini-ITX SBC
Processor System	CPU	NXP Arm Cortex-A9 i.MX6 1 GHz	NXP Arm Cortex-A9 i.MX6 1 GHz	Qualcomm Snapdragon™ 410E APQ8016 Arm Cortex-A53 1.2 GHz	Rockchip Arm Cortex-A17 RK3288 Quad core 1.6 GHz	NXP Arm Cortex-A9 i.MX6 1 GHz
Memory	Technology	DDR3 1066 MHz	DDR3 1066 MHz	LPDDR3 1066 MHz	DDR3L 1333 MHz	DDR3 1066 MHz
	Capacity	On-board DDR3 1 GB	On-board DDR3 1 GB	On-board LPDDR3 1 GB/2 GB	On-board DDR3L 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	8 GB eMMC NAND Flash for O.S. and 4 MB SPI NOR Flash for Advantech boot loader	8GB eMMC NAND Flash for O.S. and 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, up to 1366 x 768 at 60Hz	1 x 18/24 bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	-	1 x 18/24/30-bit LVDS, 1366 x 768 for 1ch; 1920 x 1080 for 2ch at 60Hz	1 x 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	3840 x 2160 at 60Hz	1920 x 1080 at 60Hz
	VGA	1920 x 1080 at 60Hz	1920 x 1080 at 60Hz	-	1920 x 1200 at 60Hz	1920 x 1080 at 60Hz
	Graphics Engine	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	OpenGL,ES1.1/2.0/3.0, OpenCL1.1,DirectX11	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-1, MPEG-2, MPEG-4, H.263, H.264, AVS, VC-1, VP8, MVC, HEVC/H.265 decoder, 4k@60FPS Encoder: H.264 (BP@level4.0, MP, HP@level4.0), MVC and VP8	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.MX6 integrated RGMII	NXP i.MX6 integrated RGMII	Microchip LAN7500	TI DP83867	NXP i.MX6 integrated RGMII
	Speed	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
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	0~22s, default 22s	1~6553s, default 60s, power on/off 1s
I/O	SATA	-	1	-	-	1
	SATA Power	-	1	-	-	1
	USB	1 x USB 2.0 Host 2 x USB 2.0 pin header	1 x USB OTG, 2 x USB Type A and 3 x USB pin header	2 x USB 2.0 Host 1 x micro USB OTG	1 x USB OTG, 2 x USB 2.0 Type A 3 x USB 2.0 pin header	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 via pin header	1 x Line-out, 1 x Mic-in
	SPDIF	-		-	-	-
	SDIO	1 x SD slot	1 x SD slot	1 x SD slot	1 x Micro SD slot	1 x SD slot
	Serial Port	2 x 2-wire RS-232 by pin header 1 x 4-wire RS-232 by DB9	2 x 2-wire RS-232 pin header 1 x 4-wire RS-232/422/485	1 x 4-wire RS-232/422/485	1 x 4-wire RS-232/485, DB9 1 x 2-wire RS-232/Debug port, pin header selected by jumper 4 x 4-wire RS-232, pin header	3 x 4-wire RS-232 and 1 x 4-wire RS-232/422/485
	SPI	-	1	1	1	-
	CAN	-	2	-	-	1
	GPIO	-	20 GPIO w/o Isolation via pin header	8 x GPIO via D-SUB 9 / 8 x GPIO via pin header (3.3V TTL level)	8 x GPIO via pin header (3.3V TTL level)	18 GPIO
	I2C	-	2	1	1	2
	System Bus	-	-	-	-	-
	Touch	-	-	-	-	-
	Keypad	-	-	-	-	-
	Button	1 x Reset button	-	-	1 x Reset button 1 x Power button by pin header	1 x Reset button by pin header 1 x Power button by pin header
Indicator	LED	1 Power LED 1 RF status LED	1 Power LED	1 Green LED for system power 1 Green LED for RF status	1 Green LED for system power	1 Green LED for system power
Expansion	Mini PCIe	1 x mini PCIe slot	1 x mini PCIe slot	1 x mini PCIe slot	1 x mini PCIe slot	1 x mini PCIe slot
	M.2	-	1 x M.2 2230 Key E slot	1 x M.2 2230 Key E slot	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 Micro SD Slot	1 x SD slot
	SIM	1 x SIM slot	1 x SIM slot	1 x SIM slot	1 x SIM slot	1 x SIM slot
Power	Power Supply Voltage	12 V	12~24V	9~36V	12V	12 V
	Power Type	DC-in	DC-in	DC-in	DC-in	DC-in
	Power Consumption	5.6W (Max)	5.6W (Max)	6W (Max)	11.6W (Max)	9W (Max)
Environment	Operational Temperature	0 ~ 60°C / -40 ~ 85°C	0 ~ 60°C / -40 ~ 85°C	0 ~ 60 °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, non-condensing	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	Yocto Linux Android Debian Linux	Debian Linux Android	Linux Yocto Android
Certifications		CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B	CE/FCC Class B

Note: "-" : means Not Applicable (N/A)

Embedded PCs

NEW

Model Name		EPC-R4760	EPC-R4680	EPC-R6410
Barebone system	Description	Arm based Fan-less Barebone System	Arm based Fan-less Barebone System	Arm based Fan-less Barebone System
Processor System	Compatible Motherboard	RSB-4760	RSB-4680	RSB-6410
	Thermal Solution	Fanless	Fanless	Fanless
	CPU	Qualcomm Snapdragon™ 410E APQ8016 Arm Cortex-A53 1.2 GHz	Rockchip Arm Cortex-A17 RK3288 Quad core 1.6 GHz	NXP Arm Cortex-A9 i.MX6 1 GHz
	BIOS	Advantech boot loader	Advantech boot loader	Advantech boot loader
Memory	Socket	On-board	On-board	On-board
	Technology	LPDDR3 1066MHz	DDR3L 1333MHz	DDR3L 1333MHz
	Max. Capacity	1 GB	2 GB	1 GB/2 GB
Graphics	Chipset Integrated	Adreno™ 306 GPU	Mali-T764 GPU processor with OpenGL ES3.0, OpenCL1.1 and DirectX11	2 IPUs. OpenGL ES 2.0 for 3D, BitBlt for 2D and OpenVG 1.1
Storage	On-board Storage	8GB eMMC NAND Flash for O.S. 4MB SPI NOR Flash for ADV.	8GB eMMC NAND Flash for O.S. and Advantech boot loader	8GB eMMC NAND Flash for O.S. 4MB SPI NOR Flash for ADV.
	mSATA Slot	-	-	-
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps	10/100/1000 Mbps
	Controller	Microchip LAN7500	TI DP83867	NXP i.MX6 integrated RMII
	Connector	RJ45	RJ45	RJ45
Audio	Codec	PM8916	Realtek ALC5660	SGTL5000
Internal expansion Slot	Mini-PCIe	1 x Full-size	1 x Full-size	1 x Full-size
	M.2	1 x M.2 Key E slot	1 x M.2 Key E slot	1 x M.2 Key E slot
	SIM slot	1	1	1
	SD slot	1 x SD slot	1 x Micro SD slot	1 x SD slot
Front Panel	DP++	-	-	-
	DP/HDMI	1 x HDMI	-	-
	VGA	-	-	-
	DVI	-	-	-
	COM	1 x 4-wire RS-232/422/485	4 x 4-wire RS-232	2 x 4-wire RS-232 1 x debug port
	LAN	1	-	-
	USB	2 USB 2.0	3 USB2.0	-
	Audio Jack	-	-	-
	Antenna (optional)	2 x antenna hole	3 x antenna hole	2 x antenna hole
Rear Panel/ Side Panel	DP++	-	-	-
	DP/HDMI	-	1x HDMI 2.0 up to 3840 x 2160	1
	VGA	-	1	1
	DVI	-	-	-
	COM	-	1 x 4-wire RS-232/485 1 x 2-wire RS-232/Debug port	1 x 4-wire RS-232/485/422 1 x 4-wire RS-232
	LAN	-	1	1
	USB	2 x USB2.0 Host	2 x USB2.0 Host 1 x USB2.0 OTG	6 x USB2.0 Host
	Audio Jack	-	1 x Line out 1 x Mic in	1 x Line out 1 x Mic in
	GPIO	-	8 x GPIO by DB9 CONN	6
	Antenna (optional)	3 x Antenna holes	2 x Antenna holes	2 x Antenna holes
Miscellaneous	LED Indicators	1 Green LED for system power 1 Yellow LED for WLAN	1 Green LED for system power 1 Orange LED for WLAN	1 Green LED for system power
	Switch	-	1 x Reset button 1 x Power button	1 x Reset button 1 x Power button
	Circular Cutouts	-	-	-
Mounting		Wall mount	Wall mount	Wall mount
Power Requirements	Power Voltage	9~36V	12V	12V
	Power Input Type (Inlet)	DC-in	DC-in	DC-in
	Consumption	TBD	11.6W (heavy loading burning)	9W (heavy loading burning)
Environment	Operating Temperature	0 ~ 40 °C	0 ~ 55 °C	0 ~ 55 °C
	Non-operating Temperature	-40 ~ 85 °C	-40 ~ 85 °C	-40 ~ 85 °C
	Humidity	5 ~ 95% Relative Humidity, non-condensing	5 ~ 95% Relative Humidity, non-condensing	5 ~ 95% Relative Humidity, non-condensing
	Vibration (5 ~ 500Hz)	IEC60068-2-64 random 2.0Grms IEC60068-2-6 sinusoidal 2.0G	IEC60068-2-64 random 2.0Grms IEC60068-2-6 sinusoidal 2.0G	IEC60068-2-64 random 2.0Grms IEC60068-2-6 sinusoidal 2.0G
	Shock	IEC60068-2-27 half-sine 10G/11ms	IEC60068-2-27 half-sine 10G/11ms	IEC60068-2-27 half-sine 10G/11ms
Certification		CE/FCC Class B CB/UL/CCC/BSMI	CE/FCC Class B CCC/BSMI	CE/FCC Class B CCC/BSMI
Physical Characteristics	Dimensions (W x H x D)	188 x 150 x 39 mm	190 x 150 x 43 mm	200 x 230 x 50 mm
	Weight	1.2KG	0.95KG	2.26KG

Box Computers

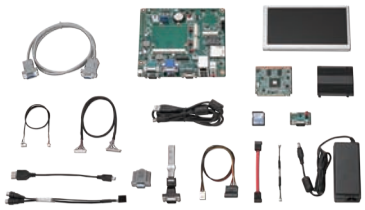
Preliminary

Model Name		UBC-220	UBC-330	EPC-R3220
Processor System	CPU	NXP Arm Cortex-A9 i.MX6 1 GHz	TI Sitara™ AM3352 Cortex-A8 1 GHz	TI Sitara™ AM3352 Cortex®-A8 800MHz
Memory	Technology	DDR3 800 MHz	DDR3 800 MHz	DDR3 800 MHz
	Capacity	On-board DDR3 1 GB	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	8 GB of eMMC NAND Flash for OS and 4 MB of SPI NOR Flash for Advantech boot loader
Graphics	LVDS	1 x 24-bit LVDS, 1366 x 768 at 60Hz	-	-
	HDMI	1920 x 1080 at 60Hz	-	-
	VGA	-	-	-
	Graphics Engine	1 x IPU. 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	-	-
Ethernet	Chipset	NXP i.MX6 integrated RGMII	TI AM3352 Integrated RGMII	TI AM3352 Integrated RGMII
	Speed	1 x 10/100/1000 Mbps	2 x 10/100/1000 Mbps	2 x 10/100/1000 Mbps
Cellular	LTE	-	-	-
WLAN	WIFI/BT	-	-	IEEE 802.11ac/a/b/g/n 2*2 WLAN+BT 5.0 (option)
WatchDog Timer		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	USB	1 USB 2.0 Host	1 USB 2.0 Host	1 USB 2.0 OTG
	Audio	-	-	-
	SDIO	1 x SD slot	1 x SD slot	1 x micro SD slot
	Serial Port	1 x 4-wire RS-232	1 x 4-wire RS-232/422/485 4 x 2-wire RS-232	2 x 4-wire RS-232/485
	GPIO	-	4 GPI/ 4 GPO w/ isolation	6
	CANBus	-	1	-
	I2C	-	1	1
	Button	-	1 x Reset button	1 x Reset button
Indicator	LED	1 Green LED for system power 1 Green LED for user to define	1 Green LED for system power 1 Green LED for RF status	1 LED for system power 3 LEDs for user to define
Expansion	Mini PCIe	2x mini PCIe slot	1x mini PCIe slot (Only USB Signal)	1x mini PCIe slot (Only USB Signal)
	SD Socket	1x SD slot	1 x SD slot	1 x Micro SD slot
	SIM	1x SIM slot	-	1 x Nano SIM slot
	Antenna Hole	1 x Antenna hole	1 x Antenna hole	4 x Antenna holes
	Others	1x Internal antenna support	-	-
Power	Power Supply Voltage	12V	12 V , 19 V , 24 V	12~24V
	Power Type	DC-in	DC-in	2-pole lockable DC-in
	Power Consumption	4.4W (Max)	3.3W (Max)	4.7W (Burning)
Environment	Operational Temperature	0 ~ 60 °C	0 ~ 60 °C	-20 ~ 70 °C
	Operating Humidity	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)	120 x 89 x 30 mm	191 x 129 x 30 mm with metal plate 166 x 117 x 30 mm without metal plate	139 x 85 x 30 mm
	Mounting	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/DIN rail mount
	Weight	215g	265g	TBD
Operating System		Linux Android	Linux	Yocto Linux
Certifications		CCC/CE/FCC/VCCI	CCC/CE/FCC Class B	CE/FCC/CCC/BSMI/SRRC

Note: "-" : means Not Applicable (N/A)

Starter Kits

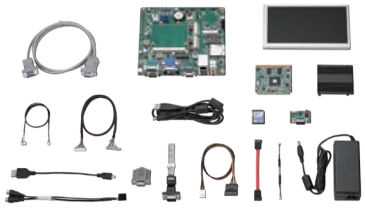
ROM-DK7720
Qseven NXP i.MX 8



ROM-DK5720
SMARC NXP i.MX 8M

ROM-DK5620
SMARC NXP i.MX 8X

ROM-DK7420
Qseven NXP i.MX 6



ROM-DK5420
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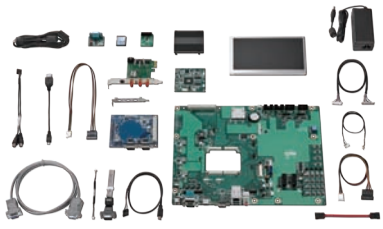
RTX TI Sitara AM3352



RSB-DK4220
3.5" SBC TI Sitara AM3352

RSB-DK4221
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